Bibliography of Indonesian Geology

BIBLIOGRAPHY OF THE GEOLOGY OF INDONESIA AND SURROUNDING AREAS

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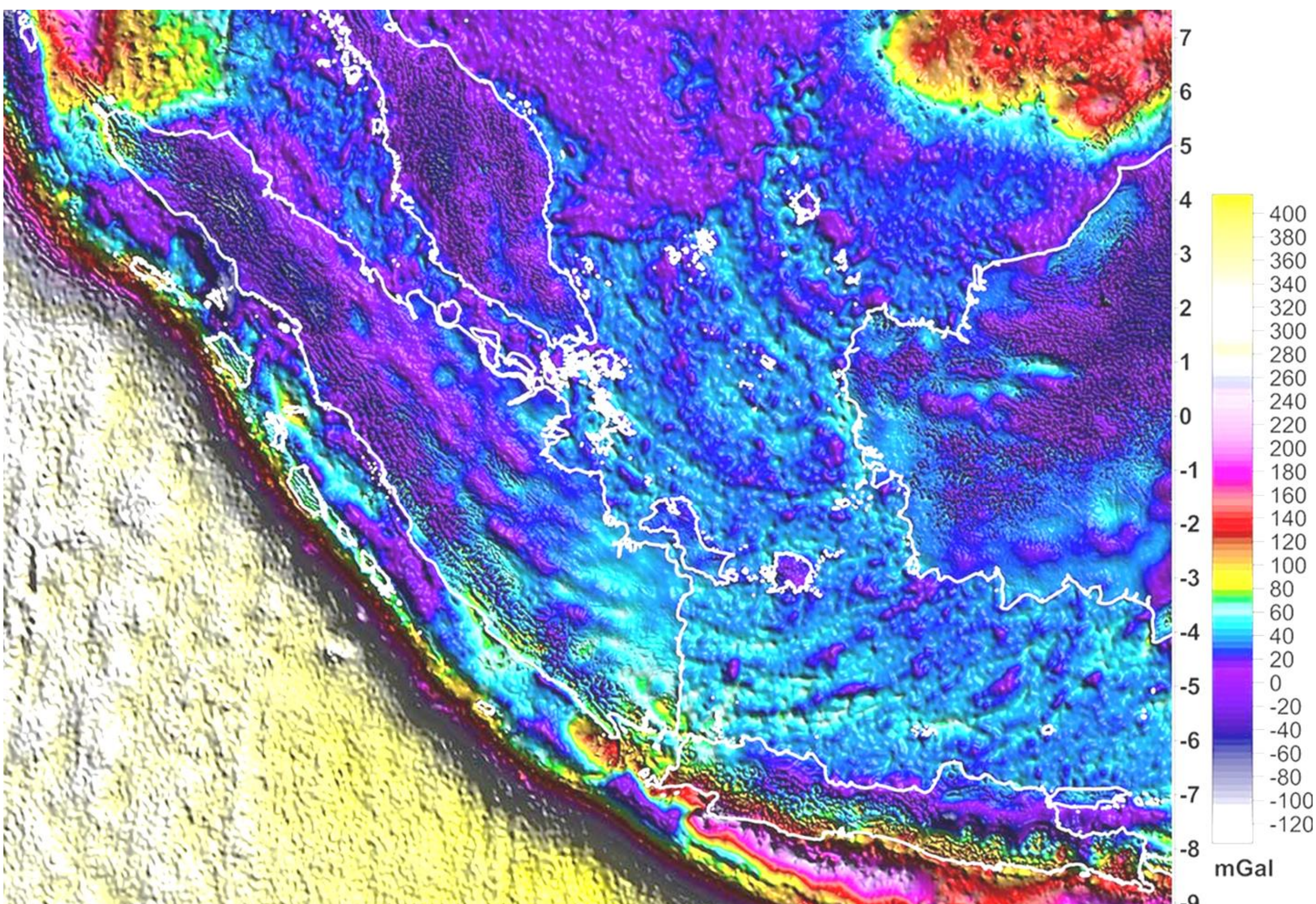
J.T. VAN GORSEL

II. SUMATRA- SUNDALAND

(Sumatra, 'Tin Islands', Sunda Shelf, Natuna)



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II. SUMATRA- SUNDALAND

This chapter II of the Bibliography 7.0 contains 310 pages with ~2250 titles, subdivided in five sub-chapters II.1- II.5. It includes literature on the relatively old and stable continental crustal region of West Indonesia ('Sundaland'), a collage of continental blocks, volcanic arcs and accretionary terranes that (1) amalgamated in Late Triassic time with the Eurasia continent and (2) grew further in Cretaceous time by accretionary of terranes along the active margins of West Sumatra, SE Kalimantan, North Borneo and the Natuna area.

It includes the large islands of Sumatra, Java and Borneo, island that are now separated by a shallow, broad, recently flooded shelfal region, the Sunda Shelf.

II.1. Sumatra- General

The geology of Sumatra was ably summarized recently in the comprehensive volume by Barber, Crow and Milsom (editors) (2005). Additional information may be found in the >1780 Sumatra papers listed in this bibliography.

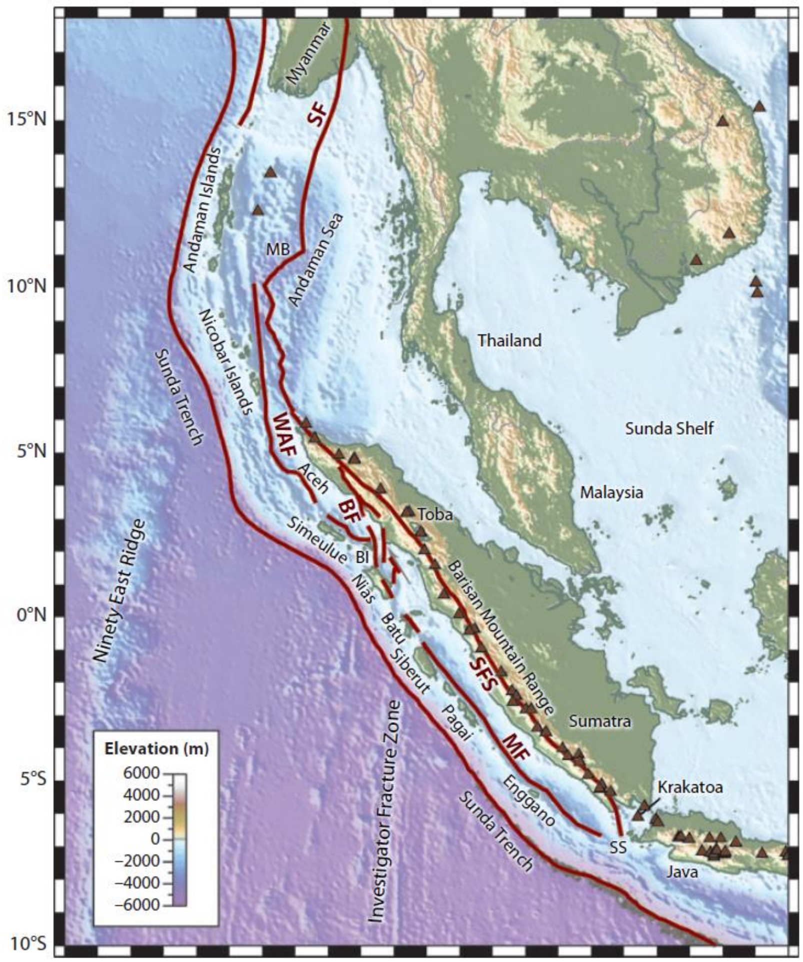

Figure II.1.1. Physiography and tectonic setting of Sumatra, located in a sector of oblique convergence between the NW-trending continental margin of Sundaland/ SE Asia and the North-moving Indian Ocean plate. Triangles are active volcanoes, MF: Mentawai fault, SF: Sagaing fault, SFS: Sumatran fault system, SS: Sunda Strait, WAF: West Andaman fault (McCaffrey 2009).

Sumatra is SW part of the continental Sundaland block and is located above an active subduction zone of the North-moving Indian Ocean plate. Its main physiographic elements are (Figure II.1.1):

1. The 'spine' of Sumatra island is the Barisan Mountains Range, which is primarily an active volcanic arc, built on basement substrate of deformed and uplifted Late Paleozoic- Early Mesozoic sediments, igneous and volcanic rocks, a Cretaceous accretionary complex (Woyla Group) and a Late Paleogene arc system.
2. The area behind the arc is occupied mainly by the Cenozoic North, Central and South Sumatra basins, which are separated by basement highs
3. In front of the volcanic arc are the onshore and offshore parts of the Sumatra forearc, composed of continental basement that has also undergone phases of basin formation, but shows little or no evidence of compressinal deformation;
4. The belt of "Outer Arc' Mentawai islands (Simeulue, Nias, etc.) represents the exposed parts of the accretionary prism formed at the Sunda Trench. It is composed of complexly folded and imbricated Tertiary sediments, with slivers of ophiolites.

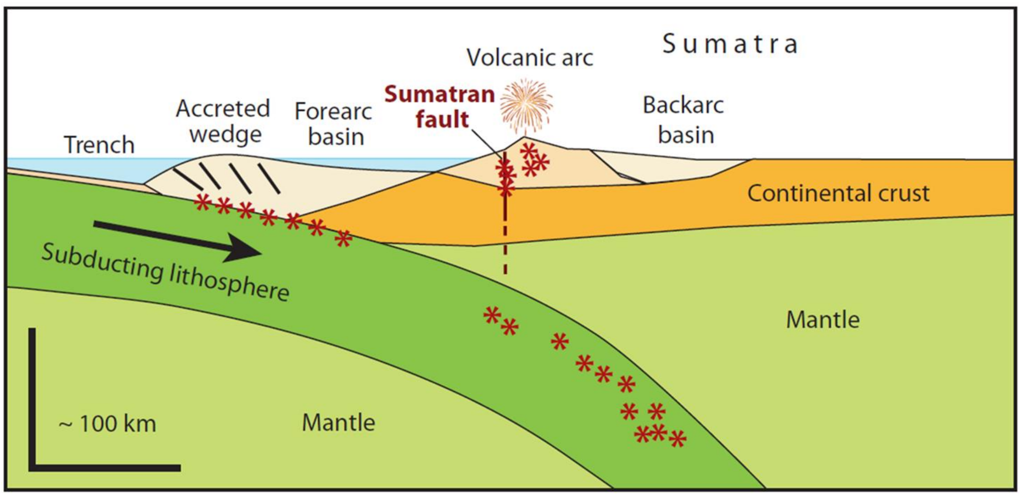

Figure II.1.2 Schematic SW-NE cross-section across Sumatra plate boundary and subduction zone (McCaffrey 2009).

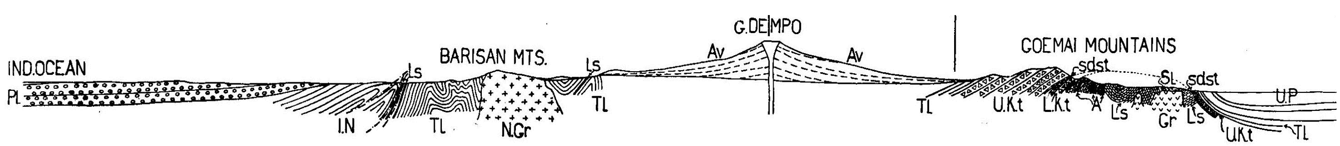

Figure II.1.3 Historic SW-NE cross-section across the Barisan Range West of the South Sumatra basin (Westerveld 1941). Showing active Dempo volcano above the Gumai Mountains basement complex, which is part of a mid-Cretaceous collisional complex ('Woyla Terranes').

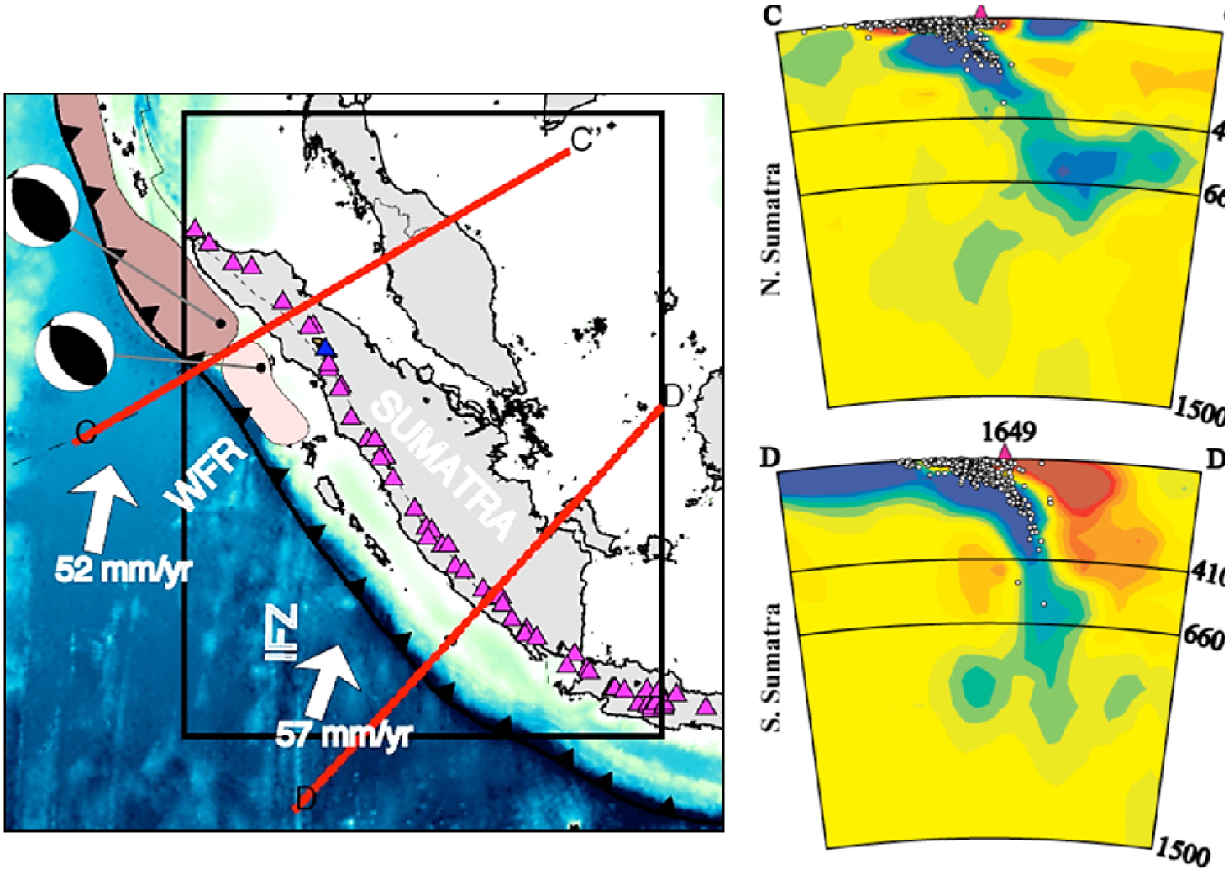

Figure II.1.4. Tomographic sections across the Sunda subduction system at North Sumatra (C-C) and South Sumatra (D-D), showing subducted high velocity (cool) Indian Ocean slab down to >700km in mantle (even though earthquakes only go as deep as 300-400km) (Pesicek 2009).

Sumatra Basement terranes

The Pretertiary 'basement' complex of the large island of Sumatra is composed of highly deformed Late Paleozoic- Mesozoic sediments and associated volcanic and igneous rocks. The intense compressional deformation and juxtaposition of unrelated stratigraphies was already recognized by Tobler (1917), which led him to propose a tectonic model with large Alpine-style nappes.

The first regional synthesis of the Sumatra basement terranes in modern plate tectonic terms was by Pulunggono and Cameron (1984) and Pulunggono (1985) (Figure II.1.5). Later papers on this topic include Hutchison (1994), McCourt et al. (1996), Barber and Crow (2005), Kusnama and Andi Mangga (2007; Figure II.1.6) and Ridd (2016).

All authors recognized that the geology of most of Sumatra is a continuation of that of the Malay Peninsula, with its Gondwana-derived terranes that amalgamated in the Late Triassic to form 'Sundaland'. Much of Sumatra is part of the Sibumasu Block (= Shan-Tai terrane = Mergui + Malacca microplates of Pulunggono and Cameron 1984), as evidenced by the 'Gondwanan' Early Permian glacial diamictites of the Bohorok Formation in much of North and Central Sumatra, which is the equivalent of the Singa Formation of the NW Malay Peninsula and the Phuket Group of Peninsular Thailand. This terrane is generally recognized as part of the 'Cimmerian Terranes' that that separated from the North Gondwana margin in Early Permian and collided with Eurasia in Late Triassic time.

In Cretaceous time the SW margin of Sumatra/Sundaland grew with the collision of the 'Woyla terranes', an amalgamation of Cretaceous magmatic arc and accretionary complex with several microcontinental terranes (Natal, Sikuleh Terranes; Cameron et al. 1980, Wajzer et al. 1991, Barber 2000). Most of the present-day fore-arc region of Sumatra (probably also of the West Java forearc and all of East Java) may be part of this 'Woyla complex.

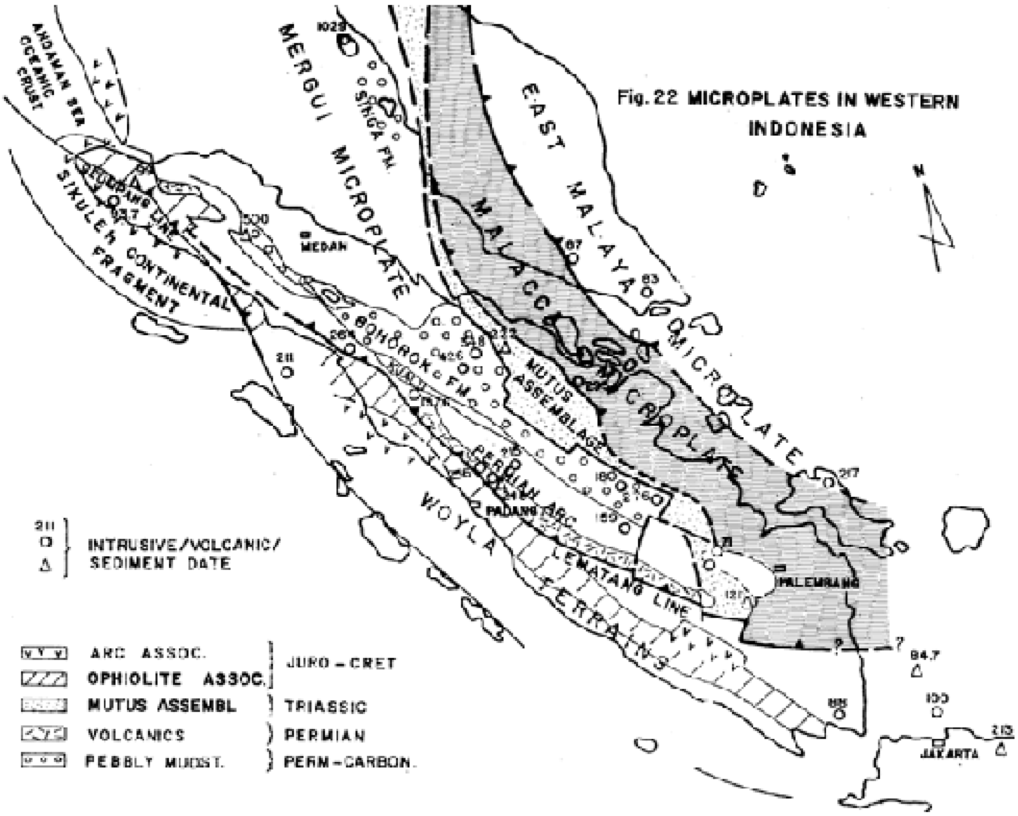

Figure II.1.5. Basement terranes/ microplates of Sumatra, showing amalgamation of Late Paleozoic and Mesozoic terranes. Mergui microplate is now generally referred to as Sibumasu Block (Pulunggono, 1985).

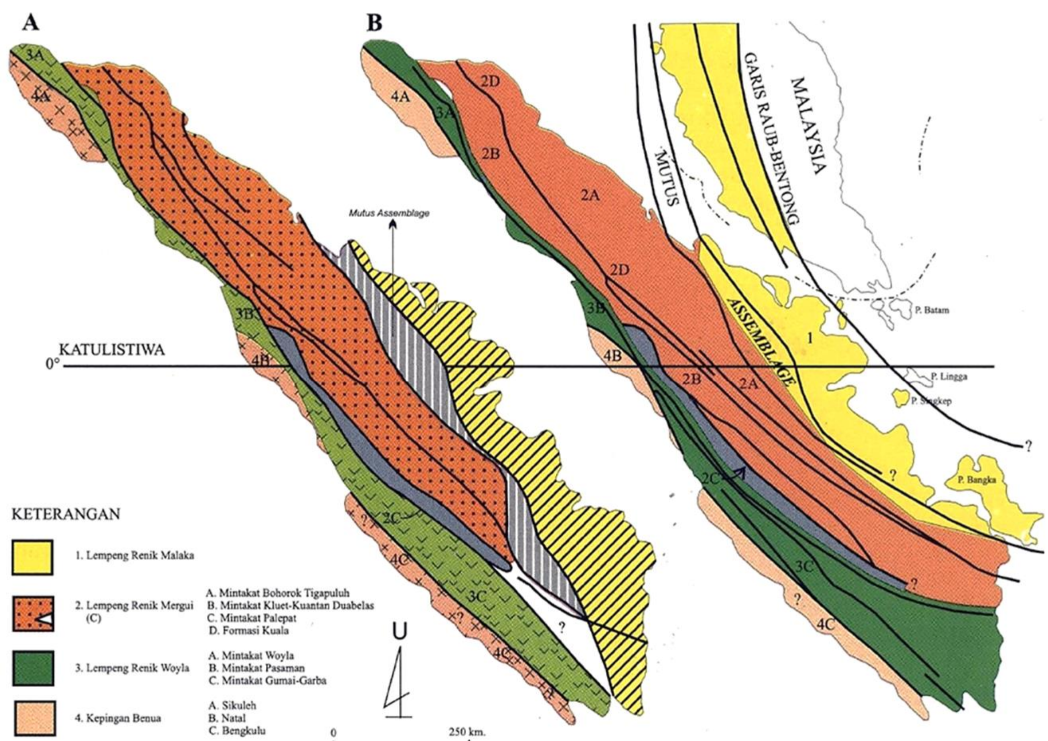

Figure II.1.6. Sumatra terranes interpretations. Left:, redrawn after McCourt et al. (1996), from NE to SW: 1. Malacca Microplate, 2. Mergui microplate (1+2 = Sibumasu), 2C Palepat terrane (E-M Permian volcanic arc?), 3. Woyla microplate, 4. Continental fragments (4A Sikuleh, 4B Natal, 4C Bengkulu). Right: Modified interpretation in Kusnama and Andi Mangga 2007)

There is no consensus on how the basement terranes recognized in the Malay Peninsula and Sumatra continue in the direction of Kalimantan, and whether the core of SW Kalimantan is a continuation of the 'East Malaya- Indochina terranes' of mainland SE Asia (as assumed in many older models), or whether SW Borneo is a separate block (e.g. Hall, Metcalfe models; see Regional chapter). What is clear is that the belt of latest Triassic post-collisional tin-bearing granites that straddle the Raub-Bentong Paleotethys suture on the Malay Peninsula, continues into the 'Tin Islands' of Indonesia (Figure II.1.7.)

Magmatic arcs

Sumatra has a long history of arc volcanics, probably going back to Permian time.
Early Permian Karing Volcanics associated with the 'Jambi Flora' has been viewed as representing a volcanic arc (Crow et al. 2015), but other authors viewed these as possible intra-continental rift volcanism associated with the breakup of Pangea (Suparka and Sukendar Asikin 1981).

For instance, Sutanto (1997) identified eight or more episodes of volcanism-magmatism:
(1) Triassic- E Jurassic (215-180 Ma);
(2) Late Jurassic (~165-150 Ma), intruded into Permo-Carboniferous packages in center of island;
(3) volcano-plutonic arc in Early Cretaceous (Valanginien-Aptian);
(4) (5) Late Cretaceous (Albian- Campanian);
(6) Paleocene- Lower Eocene;
(7) Middle- Upper Eocene;
(8) Oligocene- E Miocene and Late Miocene- Recent

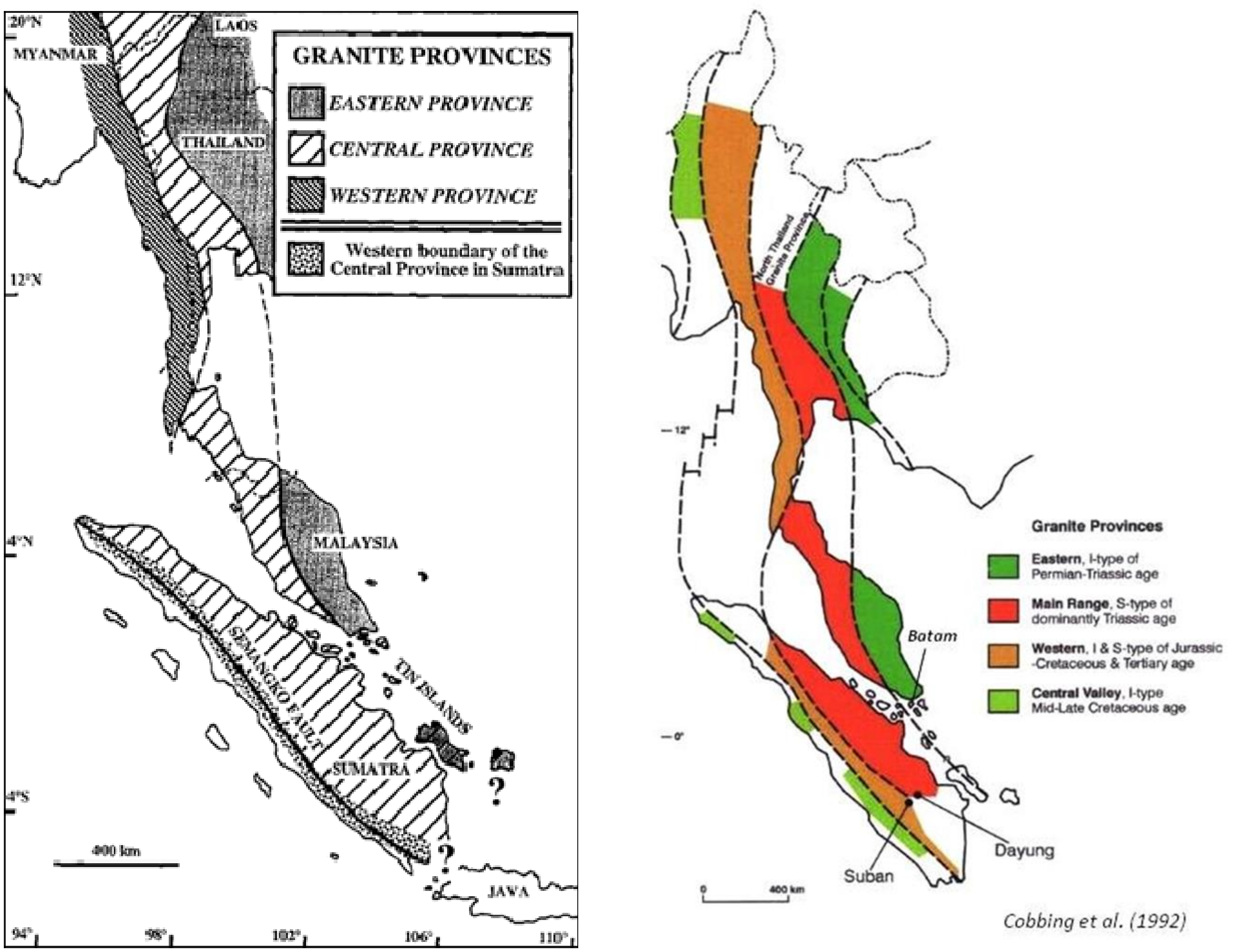

Figure II.1.7. Permian-Cretaceous granites provinces (Left: Gasparon and Varne 1995, Right: Cobbing et al 1992).

Uplift of the Barisan Range

The Barisan Range today forms the backbone of Sumatra, with elevations over 3700m for the tallest volcanoes. It represents the active volcanic arc, but also contains uplifted Late Paleozoic and younger sediments.

The Barisan Mountains probably did not exist in Early Miocene and older times, as suggested by similarities in pre-Middle Miocene stratigraphic patterns and structural styles (N-S Paleogene rifts) in the backarc basins, forearc basins (e.g. Bengkulu) and intra-montane basins (Ombilin, etc.). One good indicator of uplift timing is in the Central Sumatra Basin, where prior to Middle Miocene all sediments were derived from a northerly Sundaland source, but the first significant clastic source from the Barisan Range is not until Middle Miocene time (planktonic foram zone N9-N15?; Carnell et al. 1998) ('Wingfoot Delta' or Petani Member of Caltex).

Great Sumatra Fault zone

A major, ~1900 km long NW-SE trending right-lateral strike slip fault zone runs across all of Sumatra, across the axis of the Barisan Mountains. It is an active seismic zone and was called the Semangko fault zone by Van Bemmelen (1949) and De Coster (1974) and Great Sumatran Fault since Westerveld (1953).

The fault zone runs between two extensional systems: (1) the southern margin of the Andaman Sea spreading center in the NW, and (2) the Sunda Straits/ Semangko Bay pull-apart basin between Sumatra and West Java in the SE (Figure II.1.1). Djajadihardja et al. (1992) suggested the fault zone may actually extend another 400km further East, into the SW Java forearc.

The Sunda Straits basin contains 1000's of meters of Pleistocene- Recent sediment fill. The basin is viewed as a a pull-apart basin that accommodates most of the extension required at the termination of the Great Sumatra Fault zone, thus attesting to the young age of the fault zone.

The Sumatran fault zone is a response to the oblique subduction of the North-moving Indian Ocean plate under the NW trending continental Sumatra/ Sundaland and accommodates part of the 50-60 mm/year north-directed convergence.

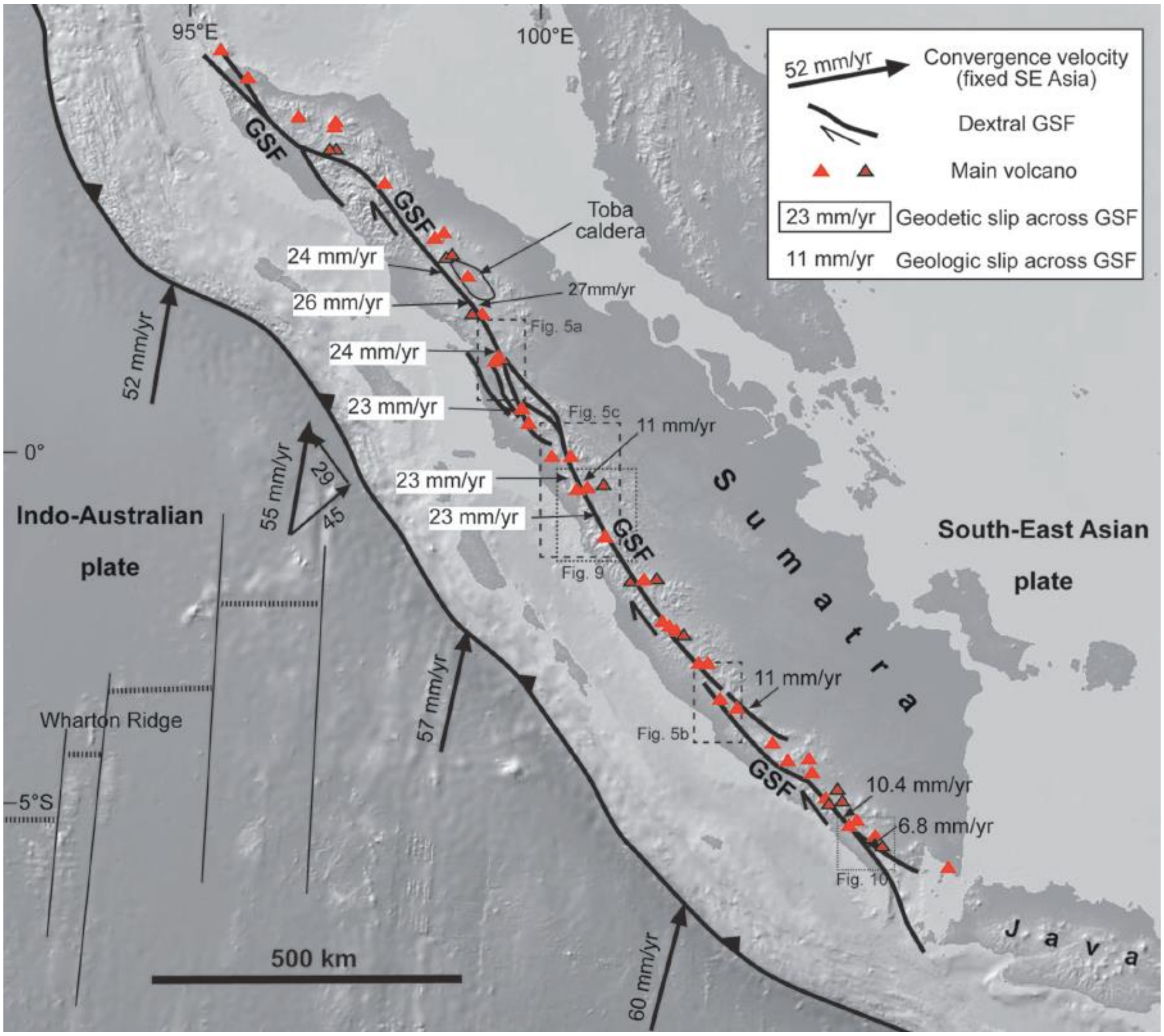

Figure II.1.8. Left-lateral Great Sumatra Fault Zone with active slip rates and locations of active volcanoes (red triangles (Acocella et al. 2018).

For more detailed reviews of the Sumatra fault zone see Durham (1940), Westerveld (1953), Katili (1970), McCarthy et al. (1977), Sieh and Natawidjaja (2000) and Natawidjaja (2002, 2014, 2018).

The Sumatran Fault is not one simple fault, but, unlike most other major wrench faults in the world, it is composed of 18-20 segments that are ~60-200 km long. Rhomb-shaped lakes and small pull-apart basins basins form between releasing stepover fault segments (e.g. Ranau, Suwoh, etc.; Bellier and Sebrier 1994) (Figures II.1.8, II.1.9).

Slip-rates and total offset

Bellier and Sebrier (1994, 1995) argued that the present-day dextral slip rate along the Sumatra Fault Zone increased from <10 mm/yr near Sunda Strait to ~20 mm/yr near Lake Toba, to >40mm/yr in the Andaman Sea area, but this is disputed by Natawidjaja (2018), who argues for a more uniform slip rate of ~15mm/ year.

GPS-derived slip rates in North Sumatra are around 23-28 mm/year (Duquesnoy et al. 1999, Genrich et al. 2000).

Figure II.1.9. South Sumatra, showing Barisan Range with segmented Great Sumatra Fault zone following the trend of Quaternary volcanic centers. South Sumatra 'back-arc' basin with anticlinal axes at an angle to Barisan trend in (part of map of Westerveld 1952).

Estimates of total right-lateral offsets along the Sumatran fault zone vary considerably:
- ~150km offset of Mesozoic units (McCarthy 1997);
- ~20-25 km offset since Middle Miocene (Katili and Hehuwat 1967, Tjia 1978, Sieh and Natawidjaja, 2000).

McCaffrey (2009) argued that the latter 20-25km total offset seems low, and might represent only offsets of relatively young rocks. However, as argued by Natawidjaya (2018) the total amount of extension calculated for Sunda Straits pull-apart system is ~19km, which is in line with this low number.

The Sumatra fault zone closely follows the trend of active volcanic arc centers (Figures II.1.8, II.1.9), possibly because this is probably a zone of thermally weakened crust. However, there appears to be limited tectonic control of the Great Sumatra Fault on the locations of active arc volcanic centers (Acocella et al. 2018).

Another fault zone that is similar to and parallel to the Great Sumatra Fault Zone is the offshore Mentawai Fault zone. This makes the ~600km long area between these fault zones a separate microcontinental sliver plate (see below in Fore-arc chapter)

Volcanism and mineral deposits

Early reviews of Sumatra mineral deposits were by Wing Easton (1926); recent reviews are by Crow and Van Leeuwen (2005) and Van Leeuwen (2014).

Epithermal gold-silver deposits have been exploited on Sumatra since the 1700's, first on behalf of the 'Dutch East Indies Company' (VOC), later by the colonial government and by private enterprises..

Economic mineral deposits of Sumatra are essentially in two groups (Figure II.1.10):

1. gold, silver and copper deposits all along the Barisan Range, and associated with the volcanic arc and the Great Sumatran Fault Zone;
2. tin deposits, associated with eroded Mesozoic post-collisional 'tin granites' of Sundaland, mainly of Late Triassic- Early Jurassic ages, possibly also Cretaceous tin granites.

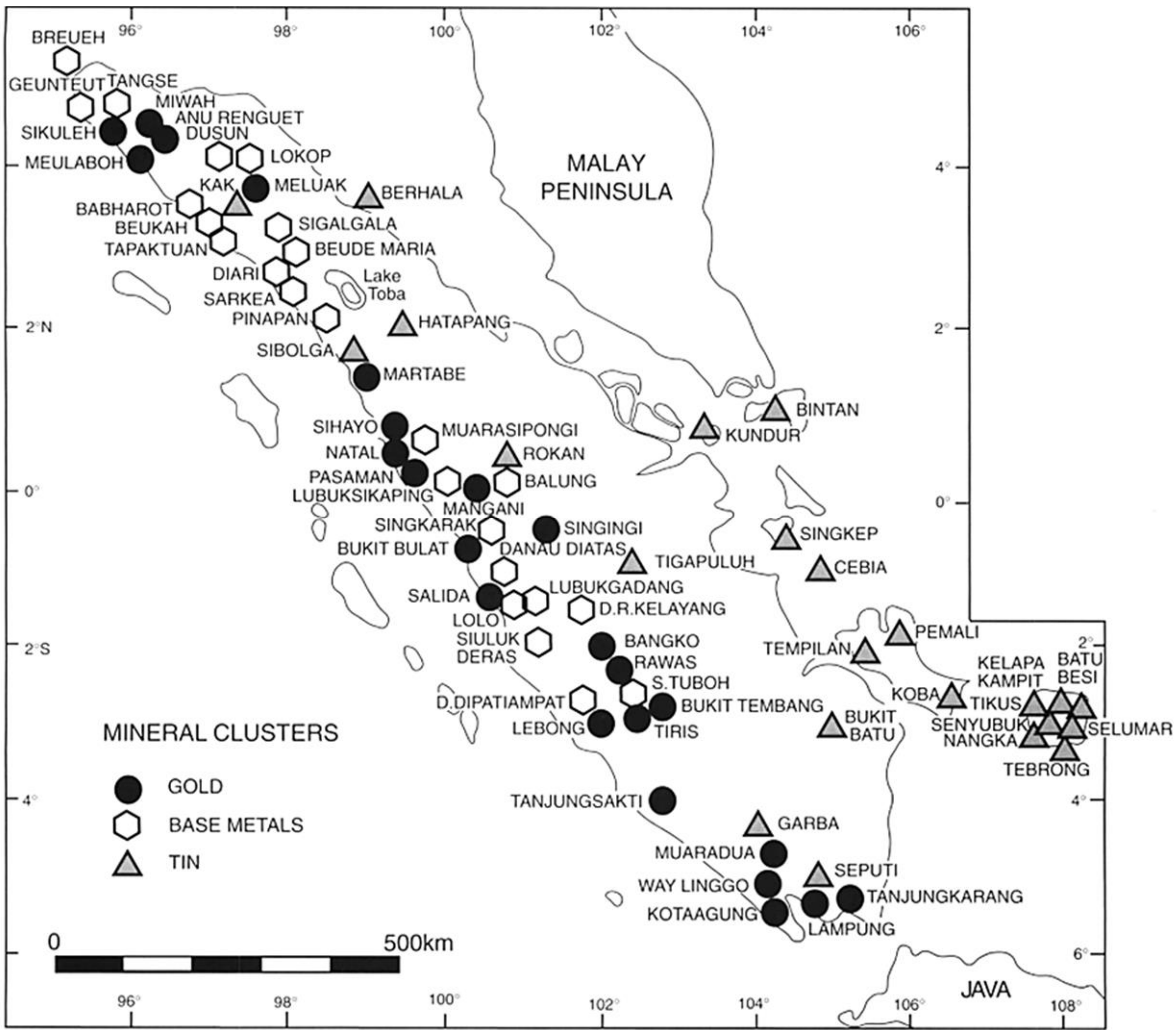

Figure II.1.10 Principal mineral deposits of Sumatra (from Crow and Van Leeuwen 2005). Gold and base metal deposits all associated with Miocene end younger volcanism along the Barisan Range. Tin deposits in backarc region, associated with Early Mesozoic (mainly Late Triassic) granites.

MIJNBOUW-MAATSCHAPPIJ „SIMAU"

Figure II.1.11. Simau gold-silver mine in Barisan Mountains of West Sumatra. Operated between 1910-1941 by 'Simau mijnbouw maatschappij' (Ligthart 1926). Mineralization of this mine was described by Koolhoven and Aernout (1928).

Paleozoic- Mesozoic paleontology of Sumatra

The earliest studies of Sumatra fossils are from the late 1800's- early 1900's, mainly on material collected during the surveys of Verbeek and Volz.

A good overview of Carboniferous- Cretaceous sediments and fossils is the book by Fontaine and Gafoer (1989). Most of the Permian deposits of West Sumatra have near-tropical faunas, including fusulinid limestones and floras (the classic 'Cathaysian' 'Jambi Flora'), and have been tied to the Indochina- East Malaya group of plates that separated from Gondwana probably in the Devonian.

One of the more significant fossil assemblages of Sumatra is the Early Permian 'Jambi Flora' in the Merangin area of the Barisan Mountain front at the west side of the Jambi Basin (Jongmans 1925, 1935, Zwierzycki 1935, Vozenin-Serra 1980-1989, Van Waveren et al. 2005, 2007, 2018, Crippa et al. 2014, Matysova et al. 2018).

This has been interpreted as a relatively low latitude 'Cathaysian flora', which has big implications for plate reconstructions of West Sumatra as it is outboard of outcrops with an earliest Permian glacial signature (Bohorok Fm) and does not fit with the pattern of accretion in the SE Asia margin of terranes that left Gondwana at successively later times. For more see the chapter X.5- Paleontology.

II.2. Sumatra - Cenozoic Basins, Stratigraphy, Hydrocarbons, Coal

Pre-Tertiary basement of Sumatra is unconformably overlain by sediments of multiple Late Eocene-Oligocene rift basins and their succeeding broader Mio-Pliocene sag basins. In the western half of Sumatra is dominated by arc volcanics, mainly of Oligocene- Early Miocene and Late Miocene-Recent ages

Basins formation

The Late Eocene- Miocene oil and gas basins of Sumatra and Java have often been referred to as 'back-arc basins', due to their present-day position behind the modern volcanic arc. However:

- 1. the orientation of rifts and bounding faults is dominantly North-South and NW-SE, neither trend paralleling the orientation of the volcanic arc (many probably follow older basement grain);
- 2. active volcanism (and therefore presumably subduction activity?) appeared to be at a relatively low during rifting/ basin subsidence compared to the times before and after.
- 3. rift-basins of comparable ages formed across much of Sundaland, far away from the Sunda volcanic arc, and including the Sumatra forearc.

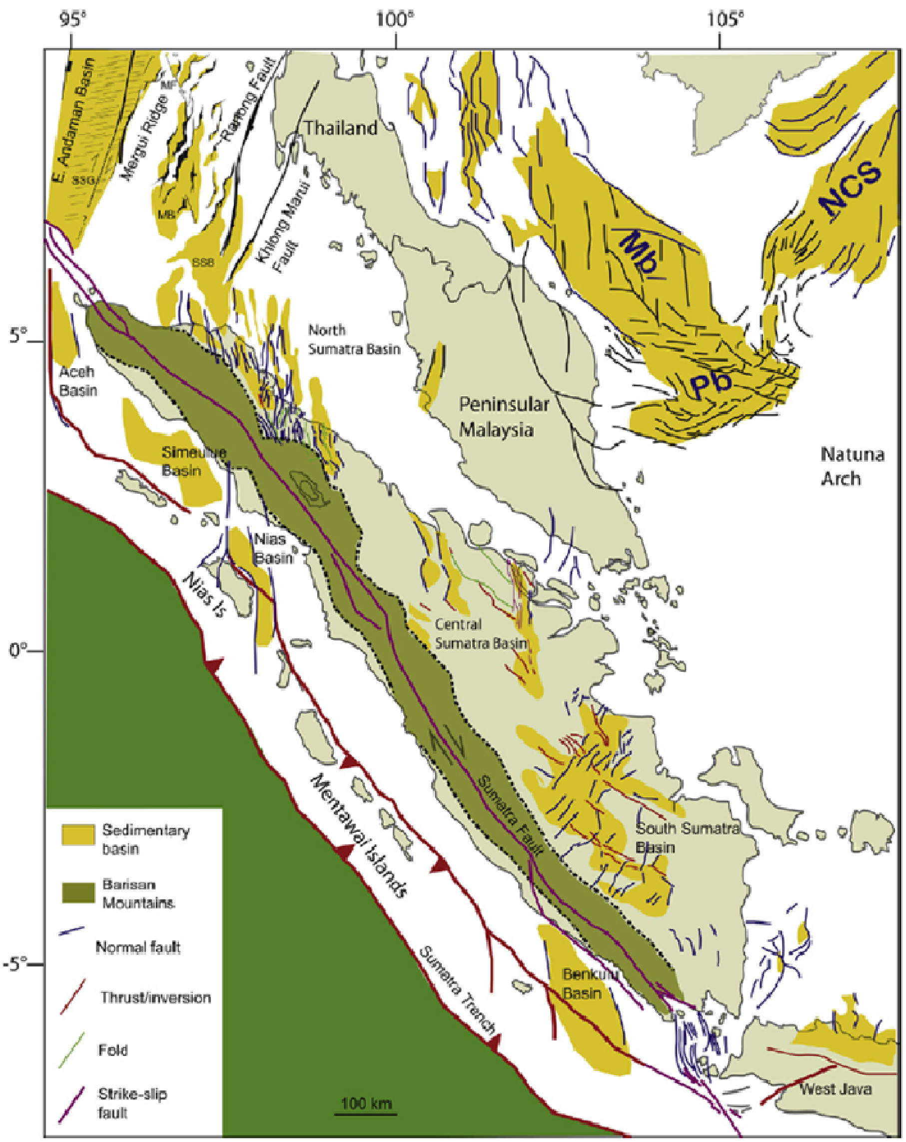

Figure II.2.1. Cenozoic rift-basins of the Sumatra region (Pubellier and Morley, 2014). Many of the initial rifts in the back-arc area are bound primarily by N-S and NW-SE trending normal faults and have been viewed by many authors as pull-apart basins in a transtensional setting.

It is therefore not appropriate to characterize the Sumatra basins as 'back-arc basins', implying formation by subduction-driven extension. Viewing them as pull-apart basins in some broad transtensional regime across

Sundaland, possibly tied to major block rotations driven by the India- Eurasia collision, may be more appropriate.

The South Sumatra basin is composed of several sub-basins (Jambi, North Palembang, Central Palembang, South Palembang), separated by paleo-highs (Ketaling, Iliran, Pendopo, etc.) and flanked by high blocks that are sites of Early Miocene reef development (Musi- Kikim Platform, Kuang High, etc.).

Likewise, the Central Sumatra Basin contains two main N-S trending rifts, the Central Deep and the Bengkalis Trough, separated by the Minas, Beruk and other paleo-highs.

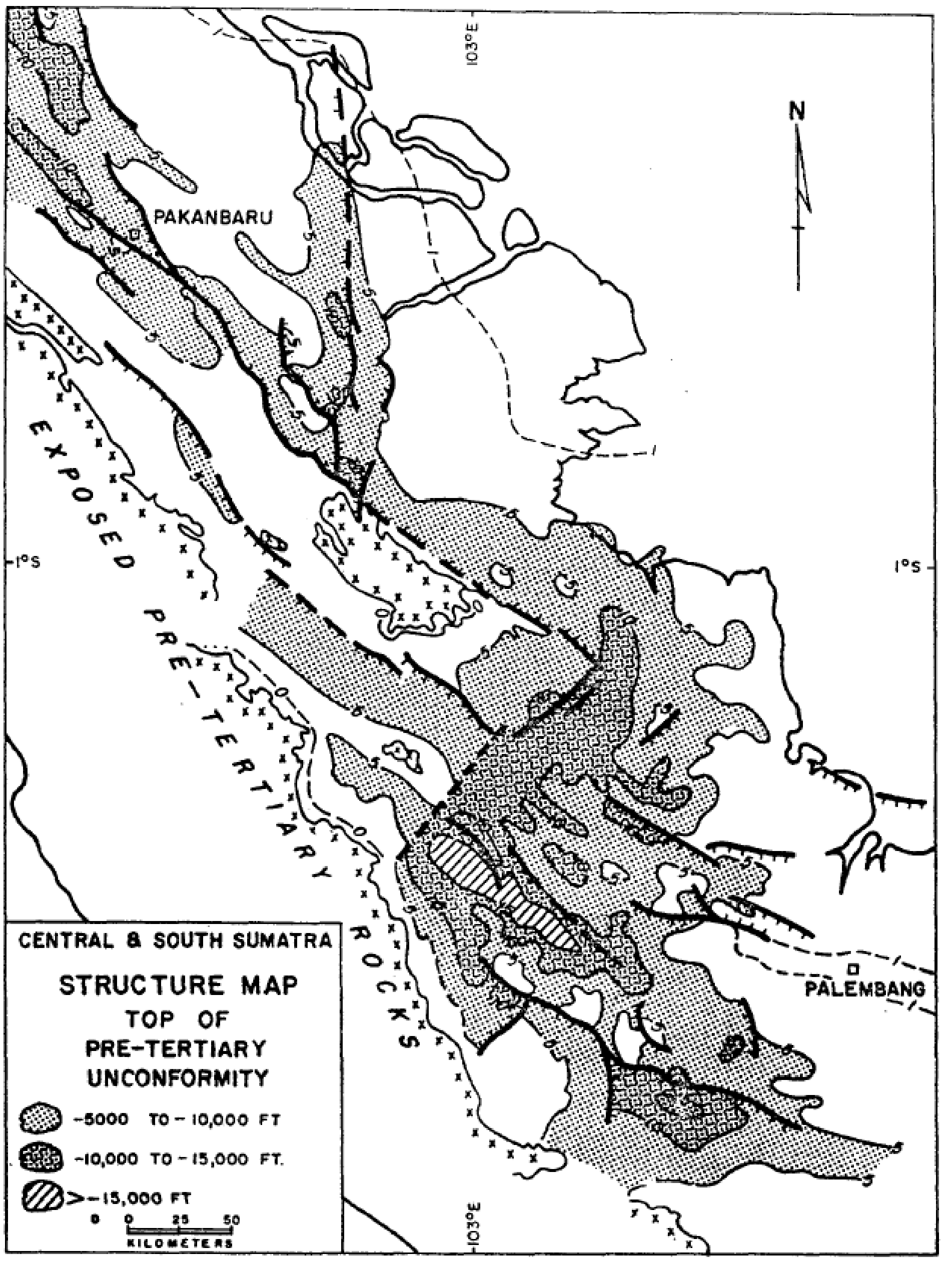

Figure II.2.2. Example of the complexity of the South Sumatra Cenozoic rift sub-basins. Main depocenters are the Jambi Trough and the South Palembang basin, locally with depths to Pretertiary >15,000 feet (De Coster 1974)

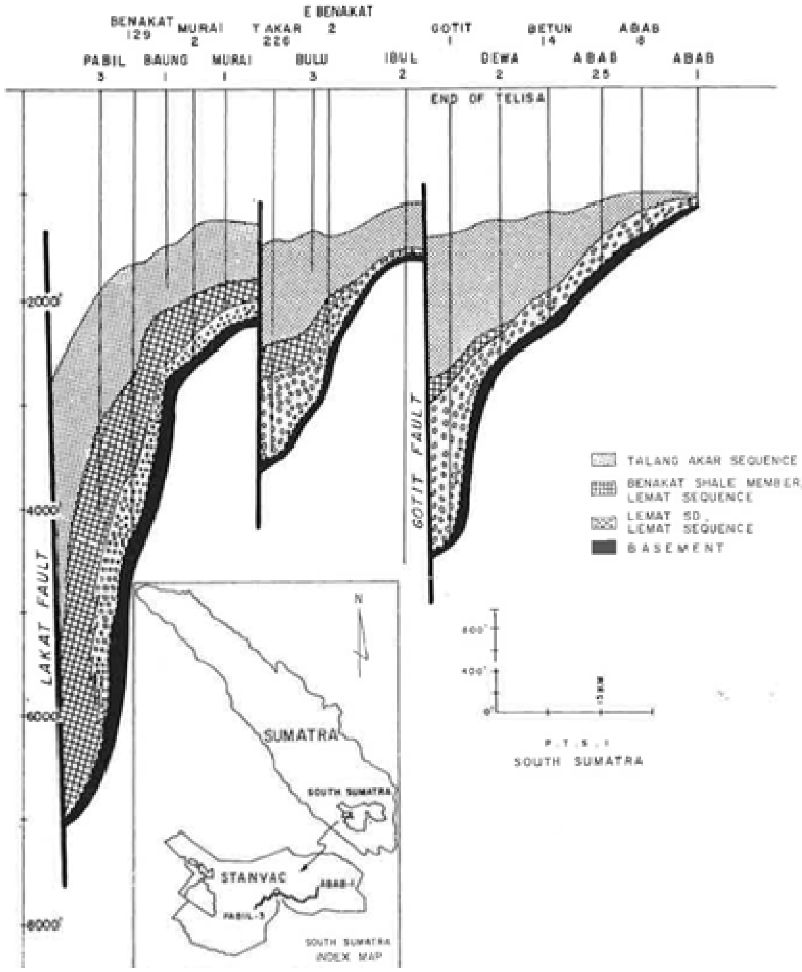

Figure II.2.3. Most of the Central and South Sumatra Paleogene rift sub-basins are half-grabens (Harsa 1978).

Cenozoic basins stratigraphy

Most of the Tertiary basins of Sumatra show a similar tectonostratigraphic succession (e.g. Fig. II.2.4):

1. Late Cretaceous- ?Middle Eocene: non-deposition: widespread exposure of Sumatra after ~80 Ma Woyla terrane collision (Cottam 2011?, Zahirovic et al. 2016);
2. Late Eocene- Oligocene rifting, with deposition of fluvial, alluvial and lacustrine sediments;
3. latest Oligocene- earliest Miocene transgressive 'sag phase', with several overall backstepping deltaic cycles, In North and South Sumatra basins followed by locally developed reefal limestone (Baturaja/ Basal Telisa Limestone);
4. Early- early Middle Miocene maximum marine phase (Telisa/ Gumai Fm shales); regional seal
5. Middle Miocene and younger regressive phase (overall shalowing-upward from marine to deltaic deposits (Lower Palembang/ Air Benakat Fms);
6. late Middle- Late Miocene fluvial deposits with locally common coal (Middle Palembang/ Muara Enim Fm);
7. Late? Pliocene- Recent volcanics/ volcanoclastics-dominated formations (Upper Palembang Fm).

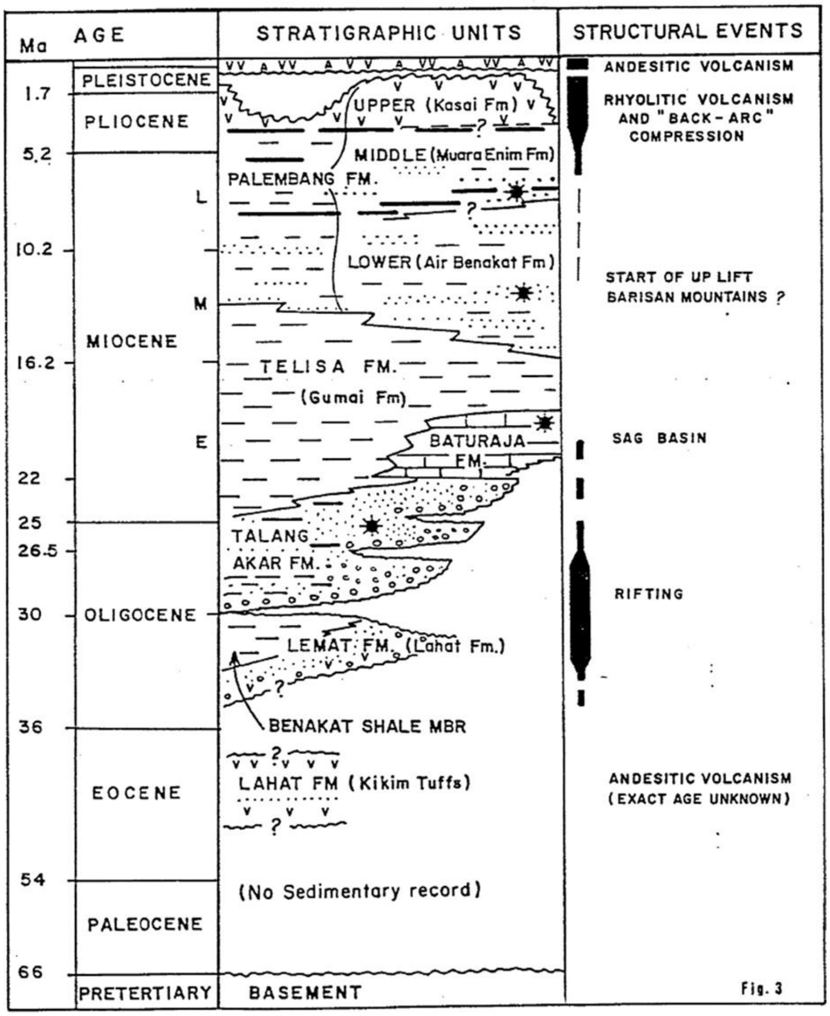

Figure II.2.4. Stratigraphy of the South Sumatra Basin ('Stanvac' formation nomenclature; Van Gorsel 1988).

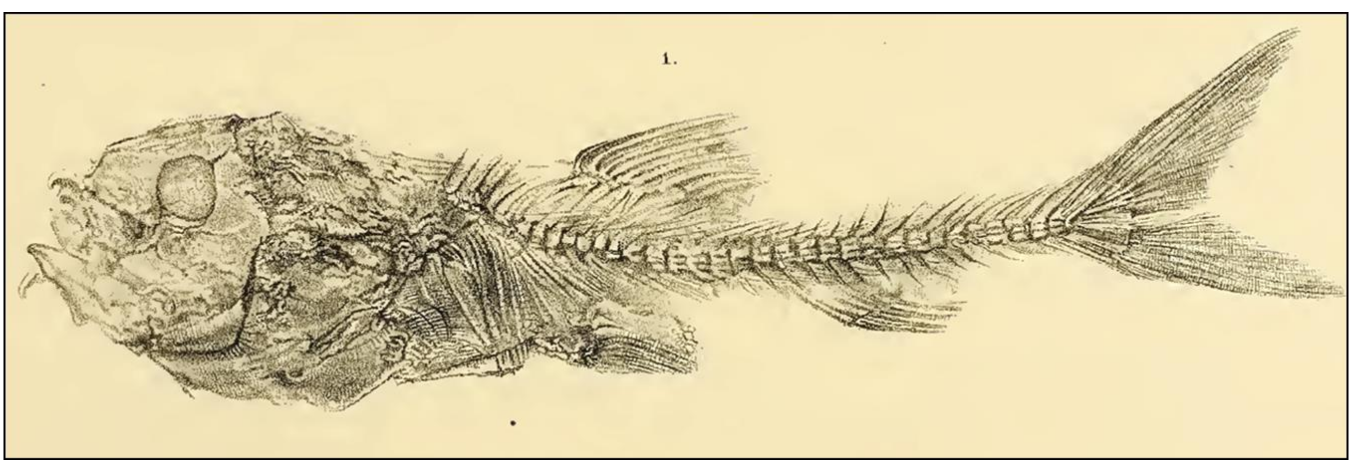

Figure II.2.x. Bonus picture: fish fossil from Eocene lacustrine deposits, Ombilin Basin, Central Sumatra, described as Sardinoides amblyostoma by Von der Marck (1876).

Plio-Pleistocene 'Sunda orogeny'

A widespread Plio-Pleistocene compressional event that affected most of Sundaland is commonly referred to as the 'Plio-Pleistocene orogeny'. (Smit Sibinga 1932, 1933, Westerveld 1952). It caused most of today's young surface anticlines on Sumatra, Java, Kalimantan and offshore basins like Natuna and the Malay basin.

Many of these young reverse faults appear to be inversions of Paleogene rift-bounding faults, although very few of the most prominent N-S trending rift margins in Sumatra and offshore NW Java have been inverted. The remarkable style of anticlinal inversion of half-grabens that is common in the Sumatra basins, was termed 'Sunda folding' by Eubank and Makki (1981; see also Harding 1983).

In the Sumatra back-arc region the trend of most of these young anticlines is WNW-ESE, i.e. at an angle with the NW-SE trend of the Barisan Range (Figures II.1.9, II.2.5). These backarc anticlines have been interpreted as en-echelon folds associated with the Great Sumatra left-lateral fault system (Wilcox et al 1973), possibly as decoupled strike-slip and compressional components of deformation within a broadly transpressive zone (Mount and Suppe 1992).

It appears that neither the Late Paleogene rifting, nor the Plio-Pleistocene compression/ inversion trends have a simple genetic relationship with the volcanic arc.

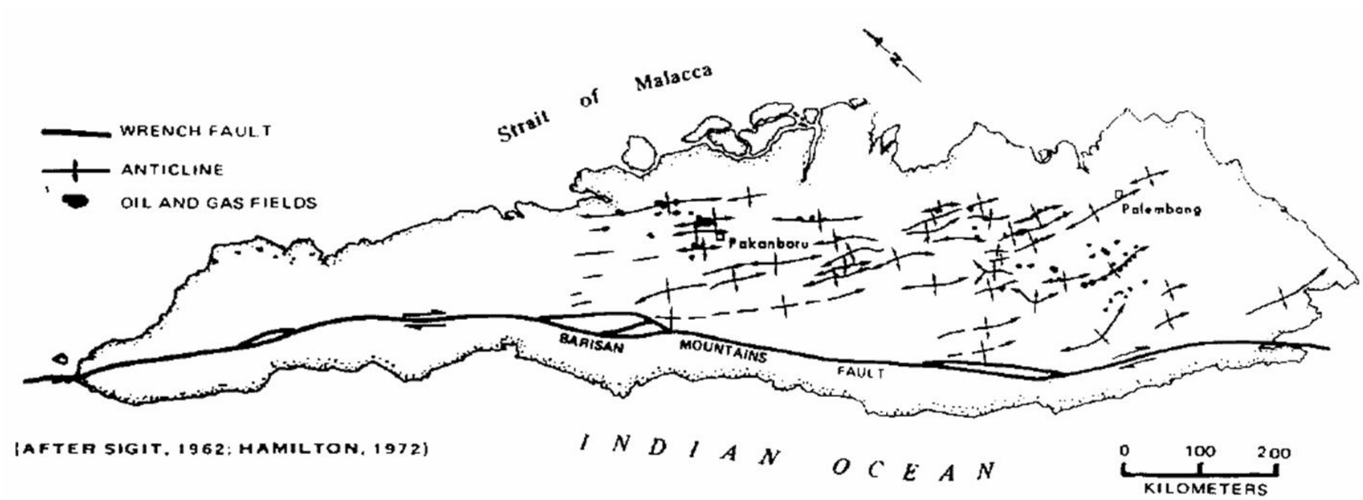

Figure II.2.5. Map of Sumatra, showing Great Sumatra wrench fault in Barisan Range and anticlinal axes in backarc areas at angle to Barisan trend (Wilcox, Harding and. Seeley, 1973).

Sumatra oil and gas fields

Sumatra has long been Indonesia's most important hydrocarbon province, with oil and gas production from the North, Central and South Sumatra 'back-arc' basins since the late 1800's. Oil and gas seeps are also known from forearc areas (oil in Bengkulu basin, gas in offshore forearc region), but no commercial deposits have been identified here.

Most oils are sourced from lacustrine and coaly facies in Paleogene rift basins, and are trapped in anticlinal structures formed during the 'Plio-Pleistocene orogeny'; other traps drape over paleotopographic highs (e.g. Harsa 1978).

The distribution of oil and gas fields in Sumatra is very uneven, with 'sweet spots' and areas with no hydrocarbons. This is controlled primarily by the distribution of source rocks, i.e. syn-rift Eocene-Oligocene lacustrine shales and the volumetrically less important but more widespread Late Oligocene- Miocene coals. Oil and gas fields are therefore either directly above the syn-rift source kitchens, or a short migration distance (~50km) away from these.

Remarkably, the North and South Sumatra basins have common seeps and numerous small to medium size fields, that were found early in the exploration cycle (late 1800's). The Central Sumatra basin has no surface seeps, but contains the largest oil fields and by far the largest total reserves, which were first discovered relatively late (1940's) (Figure II.2.6).

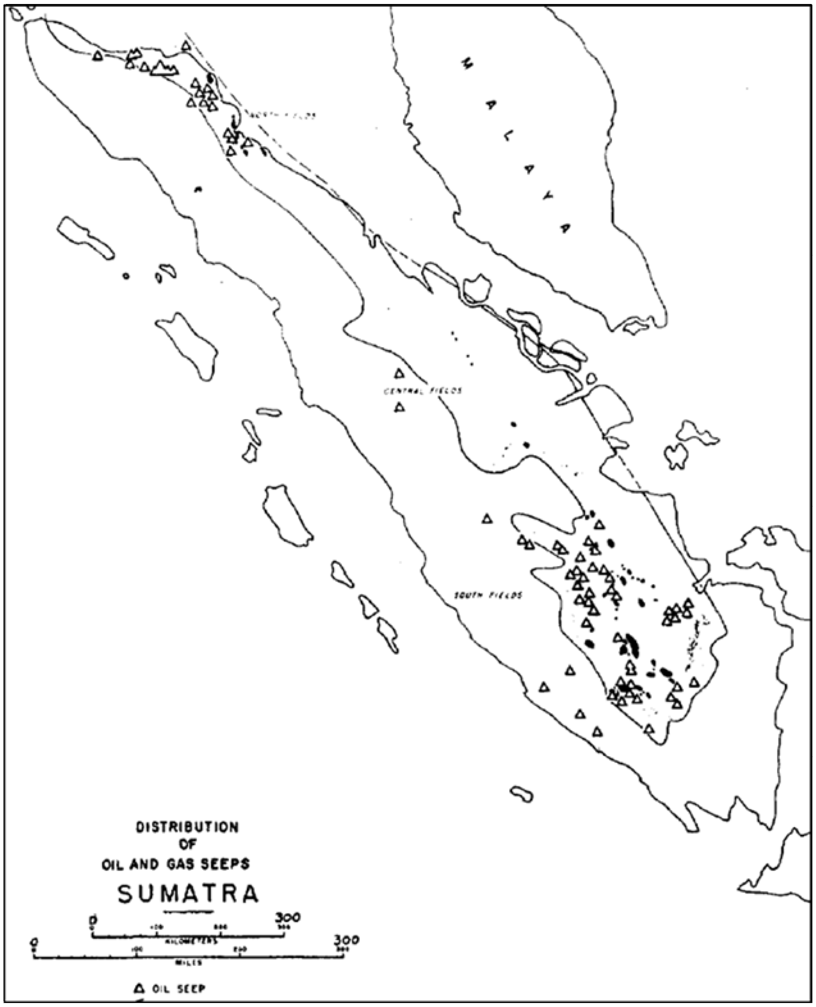

Figure II.2.6. Oil and gas seeps on Sumatra (Link 1952). Seeps are common in the North and South Sumatra basins, but not in Central Sumatra where the largest oil fields are located.

Three major and two minor oil-gas plays are found across Sumatra:

1. Initial oil exploration in the late 1800's and early 1900's focused on drilling the easily identifiable surface anticlines, many of them with surface seeps. These targeting the relatively shallow Middle-Late Miocene sandstone reservoirs of the 'regressive' basin phase and drilling stopped after the Telisa/ Gumai shales were reached. Many fields were discovered in this paly in the North and South Sumatra basins, but by present-day standard most of these are relatively small. By the 1940's all anticlines had been tested and most fields were depleted.

2. A deeper and volumetrically most important, play is in Late Oligocene- basal Miocene fluvial-deltaic sandstones of the 'transgressive' part of the basin evolution, in anticlinal structures. It was first discovered accidentally by NKPM/Stanvac, by drilling 'too deep' through the thick Early Miocene marine shale section over Christmas in 1922 at the Talang Akar-Pendopo field in S Sumatra (~400 MBO cumulative production from the Talang Akar Fm).

The first discovery in the Central Sumatra basin was in 1939 in the Lirik field, is in the 'transgressive clastics' play. The largest fields oil fields in Sumatra are the giant 3-5 billion barrels Duri and Minas fields in C Sumatra, discovered in 1941 and 1944.

3. A third play, which required seismic data as it could not be explored from surface anticline mapping, is in Early- Middle Miocene reefal carbonate buildups, and was a main focus of 1970's- 1980's exploration. The

Arun field in N Sumatra, discovered in this play in 1971, was one of Indonesia's largest gas fields, but is now largely depleted.

4. Fractured and weathered Pre-Tertiary basement, has generated interest since the mid-1980's, but volumes have been relatively minor.
5. Sandstones in Eocene- Oligocene syn-rift section. Only a few minor accumulations were tested. The lacustrine 'Brown Shale' in the synrift section is a potential unconvential oil shale target.

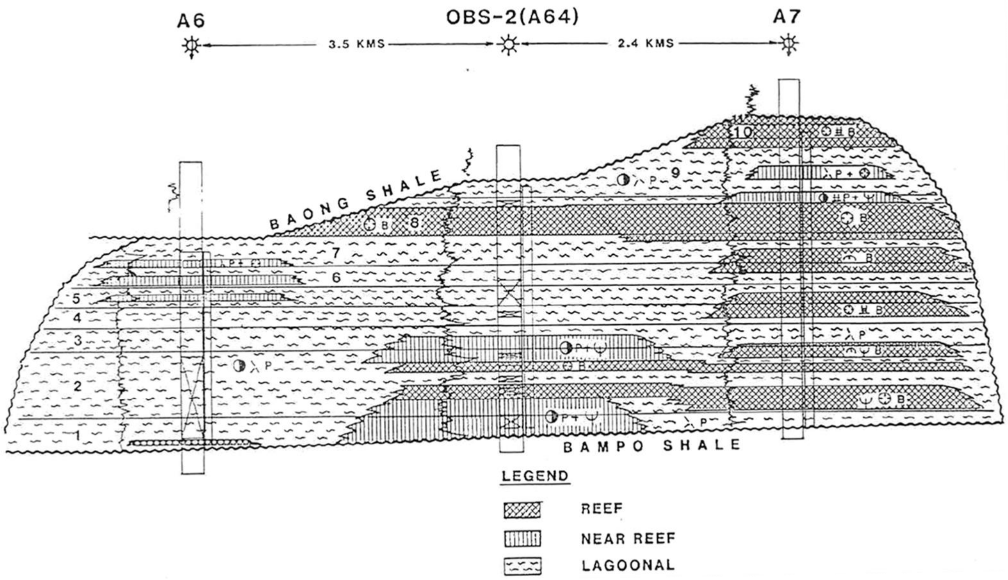

Figure II.2.7. North-South stratigraphic cross-section of Arun gas field, North Sumatra, with depositional facies.(Djamil 1988). Early- Middle Miocene reefal limestone buildup with thickness up to ~370m. Thickest and highest percentage of reefal facies in South (= windward side?)

Sumatra coal

Sumatra is home to the largest coal mines of Indonesia. The most important coal deposits are in the Middle-Late Miocene of the South Sumatra basin, but coal is also mined from the Eocene of the Ombilin intermontane basin in the Barisan Mountains and in small mines in the Miocene of the onshore Bengkulu Basin in the SW Sumatra fore-arc zone.

Coal in Sumatra is present in three or four formations, in order of importance:

1. Middle - Late Miocene of the 'regressive phase' of the South Sumatra Basin: mined extensively in the Muara Enim area;
2. Late Eocene -Oligocene in the late rift phase of the Central and South Sumatra basins and the Ombilin basin: mined in the Ombilin basin since the late 1800's;
3. Early Permian coal in the Mengkareng Formation in the West Jambi area: thin, non-commercial, but of interest due to its association with plant fossils of the Cathaysian 'Jambi Flora'.

Mining in the Ombilin coal mines started in 1892, operated by the colonial government, and these have been in continuous production since then. Coal is produced from three major seams (A,B,C; 1-5m thick) in the Eocene Sawahlunto Formation. Some of these have been in production since the late 1800's, operated mainly by the national government.

The other long-running, government operated coal mine is in the Lematang/ Tanjung coal fields of South Sumatra. It started at the Bukit Asam coal mine South of Muara Enim in 1916, and is still operational today. Coals are mined from the Middle- Late Miocene Middle Palembang Formation (= Muara Enim Fm). The formation is ~700m thick and contains ~90m coal in 11-12 horizons (Mannhardt 1921, Ziegler 1921, Schurmann 1922). The four main coal horizons are, from old to young: Merapi (D; 8-10m), Petai (C; 5-8m), Suban (B; 7-10m) and Mangus (A; 14-22m). A recent review of coal distribution and characteristics in the Muara Enim area is by Sanusi et al. (2014).

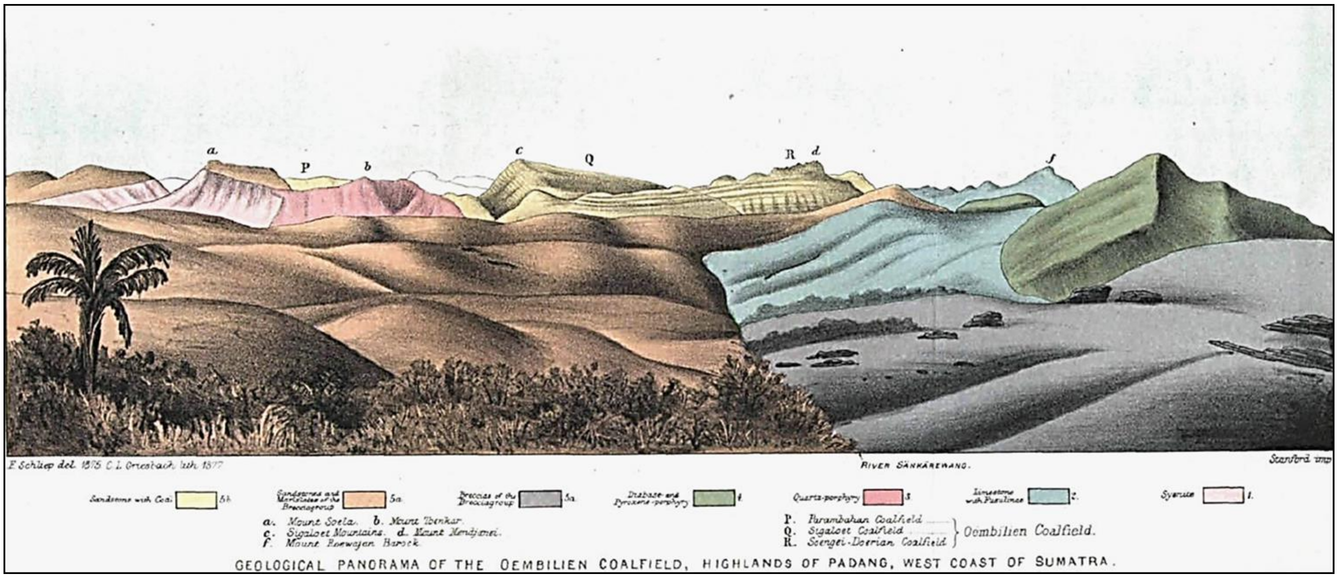

Figure II.2.8. Panorama of the Ombilin coalfield area. Coal-bearing Eocene formations (yellow, marked P, Q, R.) overlie Permian limestone and Pretertiary igneous rocks (Verbeek 1877).

Some suggested reading Sumatra- General and Basins *(not a complete list of all relevant papers)*

General, Structure	*Verbeek 1875, 1876, 1877, Tobler 1914, 1917, 1922, Brouwer 1915, Moerman 1916, Klein 1918, Kugler 1921, Rutten 1927, Musper 1928, 1930, 1934, Van Bemmelen 1931, 1949, Klompe 1955, Katili 1974, Sasajima et al. 1978, Page et al. 1979, Hahn and Weber 1981, Suparka and Asikin 1981, Davies 1984, Pulunggono and Cameron 1984, Pulunggono 1985, Moulds 1989, Clure 1991, Surono et al. 1999, McCarthy and Elders 1997, Barber 2000, Gafoer 2002, Barber, Crow and Milsom 2005, Milsom 2005, 2016, Barber and Crow 2003, 2005, 2009, Ridd 2016.*
North Sumatra	*Volz 1899, 1909, 1912, Wing Easton 1894, Zwierzycki 1922, 'T Hoen 1922, Van Lohuizen 1924, British Geol. Survey N Sumatra Cameron, Clarke; 1980's), Kirby et al. 1989, 1993, Davies 1989, Tiltman 1990, Wajzer et al. 1991, Yulihanto and Situmorang 2002, Hidayatillah et al. 2017*
West Sumatra	*Verbeek 1875-1919, Fennema 1887, Volz. 1899-1914*
South Sumatra	*Verbeek 1881, Tobler 1903-1925, Musper 1928-1937, Van Bemmelen 1930, 1949 Westerveld 1941, Westerveld 1931-1941, Wennekers 1958, Pulunggono 1969, 1986, 1992, Panggabean et al. 2007*
Paleozoic- Mesozoic paleontology	*Roemer 1881, Krumbeck 1914, Meyer 1922, Baumberger 1922, 1925, Tobler 1923, Silvestri 1925, 1935, Lange 1925, Posthumus 1927, Tan Sin Hok 1933, Yabe 1946, De Neve 1949, 1961, Kobayashi and Masatani 1968, Yancey and Alif 1977, Fontaine et al. 1981, 1992, Beauvais et al. 1985, 1989, Tien 1986, 1989, Vachard 1989, Metcalfe 1979-1989, Hasibuan 1993, Kato et al. 1999, McCarthy et al. 2001, Booi et al. 2008, 2009, 2017, Crippa et al. 2014,*
Sumatra Fault zone	*Durham 1940, Westerveld 1953, Katili 1969, 1970, Tjia 1970, 1972, 1977, Posavec et al. 1973, McCarthy et al. 1977, Kristanto 1991, Bellier et al. 1991, 1997, Bellier and Sebrier 1994, 1995, Beaudouin et al. 1995, Sieh and Natawidjaja 2000, Prawirodirdjo et al. 2000, Natawidjaja 2002, 2007, 2014, 2018, Situmorang and Yulihanto 2007, Weller et al. 2012, Fernandez-Blanco et al. 2016, Putra and Husein 2016*
Sumatra granites	*Katili 1962, Hutchison 1989, Sato 1991, Cobbing et al. 1992, Subandrio 2003, 1997, Subandrio and Suparka 1994, Gasparon and Varne 1995, Saefudin 2000, Sukarna et al. 2000, Hartono 2002*

Sumatra volcanism	*Kemmerling 1921, Westerveld 1942, 1947, 1952, Katili 1968, 1969, Rock et al. 1982, Gasparon 1993, 2005, McCourt et al. 1996, Sutanto 1997, 1998, 2005, Bellon et al. 2004, Crow 2005, Soeria-Atmadja and Noeradi 2005, Harahap 2006, 2011, Zulkarnain 2005-2016*
Mining	*Truscott 1912, Wing Easton 1926, Koolhoven and Aernout 1928, Osberger 1954, Van Leeuwen et al. 1987, Schwartz and Surjono 1990, Lubis et al. 2000, Crow and Van Leeuwen 2005, Subandrio 2007,2009, 2012, Maryono et al. 2014, Van Leeuwen 2014, McCarroll et al. 2014, Rivai et al. 2017, Setiawan 2017*
South Sumatra oil-gas	*Tobler 1906,1913, 1918, Hovig 1917, Dufour 1957, De Coster 1974, Akuanbantin and Ardiputra 1976, Harsa 1978, Hutapea 1981, 1988, 2002, Wahab and Purnomo 1982, Kalan et al. 1984, Martadinata 1984, 1999, Zeliff et al. 1985, Hasan and. Soebandrio 1988, Pertamina BPPKA1996, Rashid et al. 1998, Agus et al. 2005, Argakoesoemah et al.2004, 2005, 2006, Ginger and Fielding 2005, Firmansyah et al. 2007, Guttormsen 2010*
Central Sumatra oil-gas	*De Coster 1974, Hasan et al. 1977, Houpt and Kersting 1978, Eubank and Makki 1981, Williams et al. 1985, 1995, Robinson and Kamal 1988, Longley et al. 1990, Heidrick and Aulia 1993, Kelley et al. 1995, Pertamina BPPKA1996, Katz and Dawson 1997, Toha et al. 1999, Dawson et al. 2005,*
North Sumatra oil- gas	*Graves and Weegar 1973, Kingston 1978, McArthur et al. 1982, Mundt 1983, Soeparjadi 1983, Nayoan et al. 1984, Abdullah and Jordan 1987, Courteney et al. 1990, Rory 1990, Jordan and Abdullah 1992, Caughey and Wahyudi 1993, Fuse et al. 1996, Buck and McCulloh 1994, Collins et al. 1996, Pertamina BPPKA1996, Meckel et al. 2012, Meckel 2013*
Ombilin basin coal	*Verbeek 1875, Wally 1939, Whateley and Jordan 1989.*
South Sumatra Coal	*Everwijn 1860, 1873, Hirschi 1916, Philippi 1918, Tromp 1919, Anonymous 1919, Mannhardt 1921, Ziegler 1921, Tobler 1922, Mukherjee 1935, Matasak and Kendarsi 1980, Von Schwartzenberg 1989, Amier 1991, Pujobroto 1997, Subiyanto and Panggabean 2004, Amijaya 2005, Amijaya and Littke 2005, 2006, Susilawati and Ward 2006, Daulay and Santoso 2008, Permana 2008, 2011, Belkin et al. 2007, 2008, Sosrowidjojo and Saghafi 2009, Mazumder et al. 2010, Bahtiar and Ningrum 2012*
Permian Mengkareng Fm (with Jambi Flora)	*Tobler 1922, Zwierzycki 1935, Jongmans 1925, 1935, Thompson 1936, Vozenin-Serra 1980-1989, Fontaine and Gafoer 1989, Andi Mangga et al. 1996, Van Waveren et al. 2005, 2007, 2018, Suwarna 2006, Ueno et al. 2006, 2007, Hasibuan 2000,2007, Nainggolan 2012, Crippa et al. 2014, Matysova et al. 2018,*

II.3. Sumatra - Forearc

The Sumatra forearc is the region between the Sunda volcanic arc and the offshore accretionary prism, in a zone of oblique convergence between the Northward subducting Indian Ocean (~65mm/year) and the Sundaland margin at Sumatra. An elegant recent review of the Sumatra forearc region is by McCaffrey (2009).

The forearc region overlies a North-dipping subduction zone. Depths to the top of the subducting Indian Ocean Plate ranges from about ~6 km at the trench to ~40 km at the shoreline, to >100 km below the volcanic arc. (e.g. Klingelhoefer et al, 2010).

The Sumatra forearc region is underlain by continental or accretionary crust of the Eurasia/ Sundaland margin, presumably mainly part of the the West Burma- Woyla magmatic arc terrane that collided with Sundaland around ~80-90 Ma. (Barber 2000, Zahirovich et al. 2016). Classic studies of the Cenozoic evolution of the offshore forearc region include Beaudry and Moore (1981, 1985), Berglar et al. 2010, 2017)

As already noted by Hamilton (1979) and Karig et al. (1980), despite the proximity to a major convergent plate margin, there is little or no compressional deformation in the upper plate of the forearc region (except in the accretionary prism). Over 90% of the convergence between the Eurasian and Indian Ocean plates is absorbed at the trench/ distal accretionary prism and the thrusting of off-scraped sediments in the accretionary prism.

The northern part of the offshore forearc has been investigated in great detail recently after the 26 December 2004 mega-earthquake and tsunami offshore Aceh (e.g. Seeber et al. 2007, Sieh 2012, etc.).

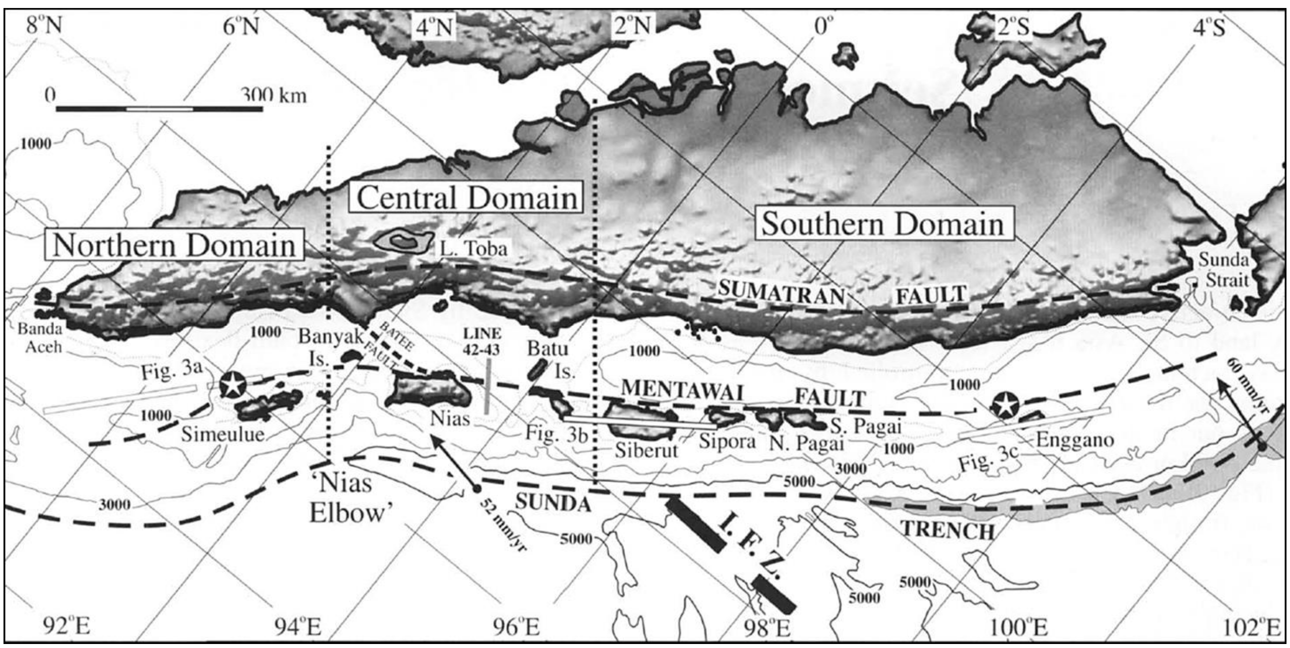

Figure II.3.1 . Sumatra forearc region, showing positions of major faults and islands (Milsom 2005).

Indentation of the Sunda Trench, indentation, and accretionary prism

The Sunda Trench (water depths of >6000 m in the South, <5000m in the North), displays a distinct change in trend between 96°E and 97°E, looking like a major indentation of the trench off Central Sumatra. This was termed the 'Nias Elbow' may have been caused by the collision/subduction of the 2 km high Investigator Ridge (Milsom 2005, Figures II.3.1, II.3.2, Lange et al. 2010).

This area of indentation of the trench corresponds with a narrower accretionary accretionary prism, and which is also the sector with more highly uplifted parts of the prism, which now form the Mentawai islands (Simeulue, Nias, Siberut, Pagai).

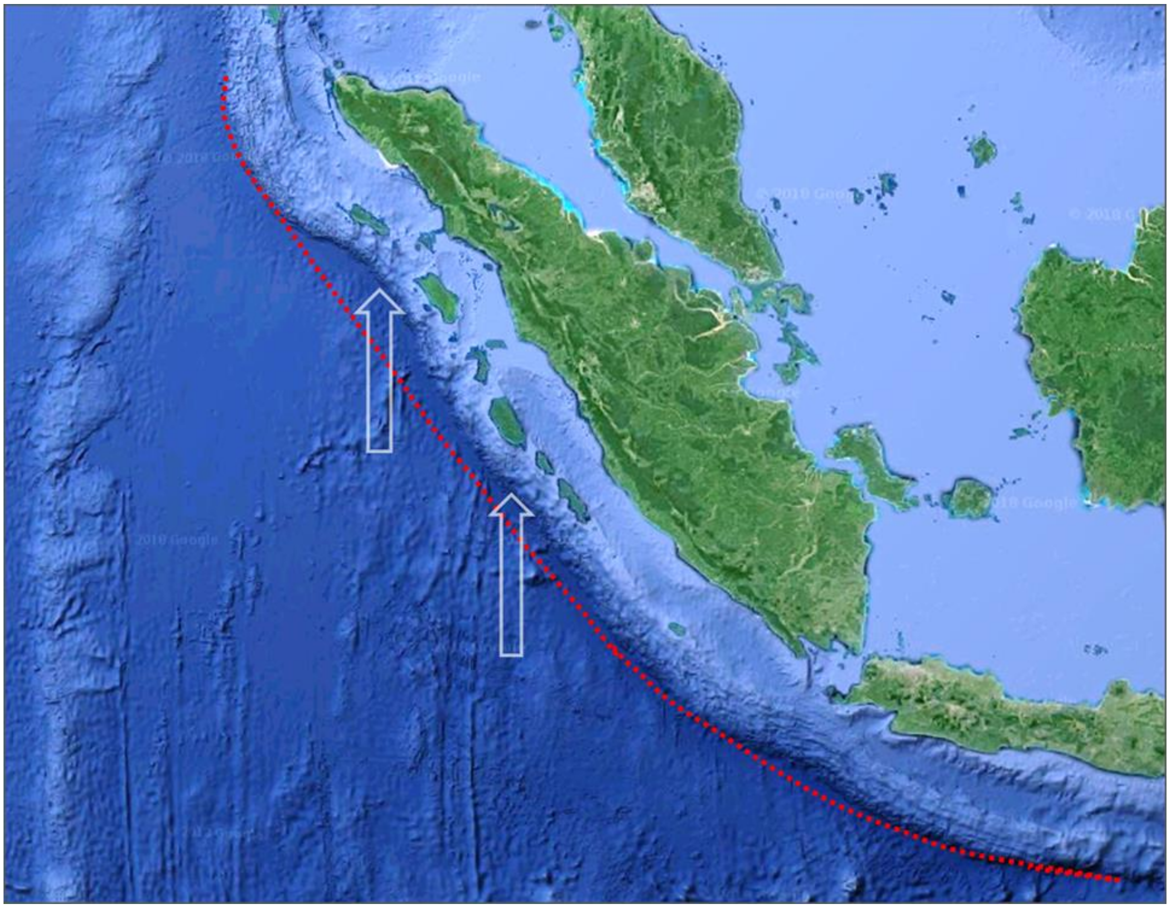

Figure II.3.2 . Sumatra forearc area, showing distinct indentation of the trench South of the Mentawai islands. This is most pronounced at the 'Nias Elbow' and is probably caused by collision/ subduction of large Indian Ocean seamounts and the Investigator and 97°Fracture Zones (Milsom 2005) (Google map).

Accretionary prism

The accretionary prism inboard of the Sunda Trench is ~180km wide in the segment off northermost Sumatra, but narrows to <125 km near Simeulue and islands further South (Frederik et al. 2015, 2016) (see also Figure II.3.2).

Thrusting within the prism is as landward-dipping faults/ folds at the trench side, steepening and increasing in age in landward direction (Figures II.3.3, II.3.4; Moore and Karig, Karig 1977, Frederik et al. 2015). Along parts of its length seaward-dipping thrusts at the landward side have been interpreted (Mukti et al. 2012), but some or all of these could be the expression of the Mentawai strike-slip system that runs immediately landward of the accretionary prism.

The age of imbricational deformation decreases upward and in the direction of the trench, and there probably also is systematic oceanward younging of the unconformity that separates the imbricated series from overlying little-deformed bathyal sediments of intra-slope/piggy-back' basins (Karig et al. 1980).

On Nias island the oldest 'post-Oyo melange' Nias beds lack calcareous microfossils, indicating deposition below the Carbonate Compensation Depth, and are probably of Early Miocene age (Moore et al. 1980).

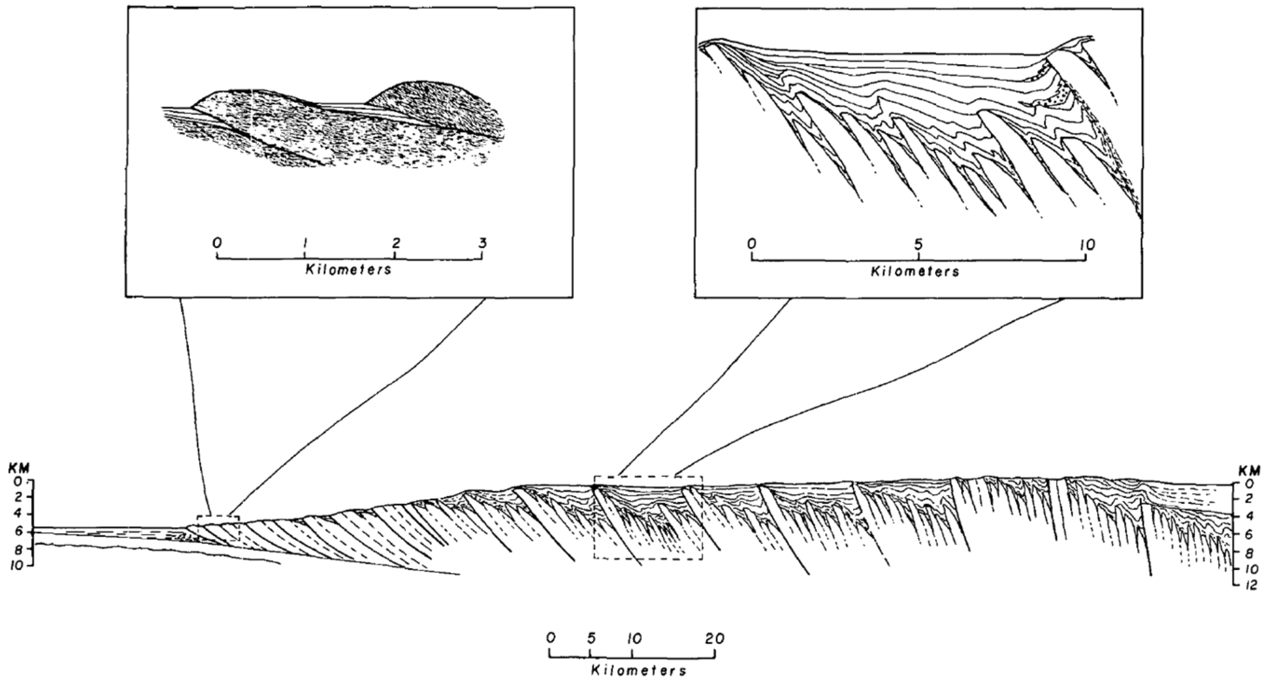

Figure II.3.3 Diagrammatic cross-section through the accretionary prism of Sumatra (Moore and Karig 1976).

Schluter et al. (2002) suggested the presence of two accretionary wedges: an older (Late Oligocene) inner Accretionary wedge I at the landward side and Neogene-Recent outer Accretionary wedge II. Wedge I forms the highest elvations of the accretionary systems.

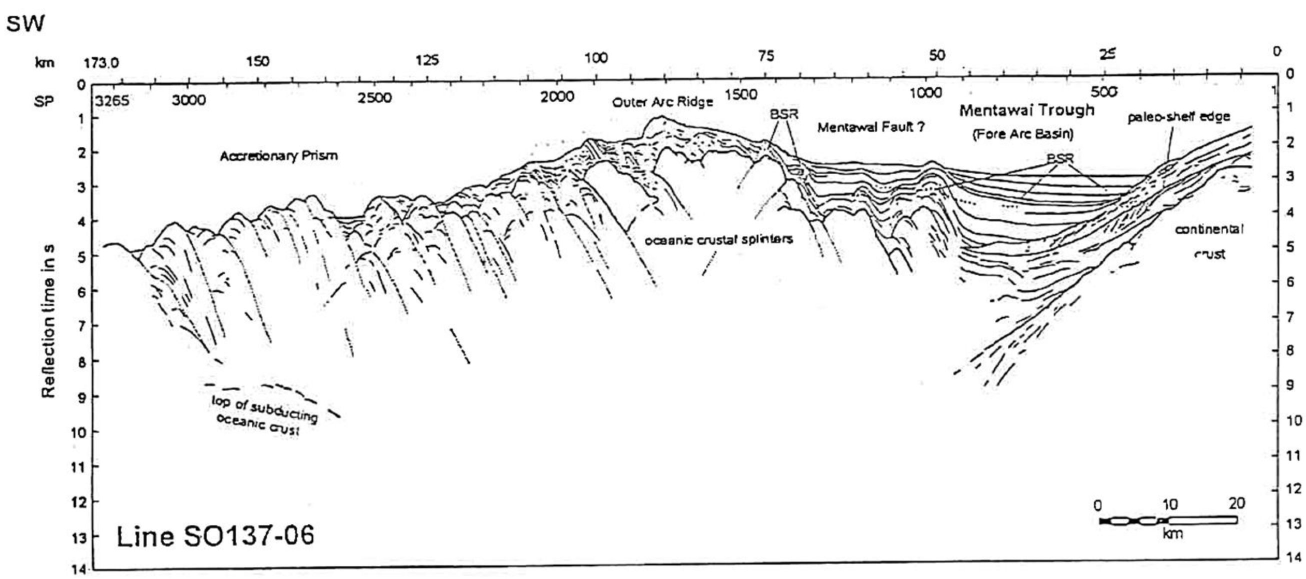

Figure II.3.4. Interpretation of SW-NE seismic line offshore SE Sumatra, showing part of the accretionary prism of imbricated sediments, overlain by post-deformational slope basins with deep marine sediments, and the Mentawai Trough intra-slope basin on continental crust of the Sumatra margin upper plate (Djajadihardja et al. 1999).

.. Forearc basins

As already noted by Hamilton (1979), despite the position close to a convergent plate margin, there is little or no compressional deformation in the upper plate of the forearc region (except in the accretionary prism). Instead structuring is dominated by strike-slip and extension. Most of the shortening between the Eurasian and

Indian Ocean plates is absorbed at the trench, as reflected by the thrusting of off-scraped ocean floor sediments in the accretionary prism.

The forearc regions appear to have undergone multiple episodes of Paleogene and Neogene rifting (Hall et al. 1993), Paleogene rifting is well-developed offshore Bengkulu and other basins, which have >3-4 km of Cenozoic sediment fill and may be temporally related to extension in the Sumatra 'back-arc region.(Howles 1986).

The six main Cenozoic forearc basins of Sumatra are, from NW to SE, Aceh, Simuelue, Siberut, Bengkulu, Enggano and Mentawai. (Figure II.3.4)

A significant Early Miocene unconformity/ basin inversion event has been suggested by several authors (e.g. Samuel and Harbury 1995, 1997).

Mentawai Fault zone

The oblique convergent setting of the Sumatra forearc region caused NW-SE trending, right-lateral strike-slip faulting. One of these faults is the ~600km long, right-lateral wrench fault zone immediately behind the accretionary prism offshore West Sumatra, and which was named Mentawai Fault Zone by Diament et al. (1992) and Malod et al. (1993, 1996). It runs closely along the thrust front of the accretionary prism and may follow the continent- ocean boundary (Zen 1993) (Figures II.3.1, II.3.4, II.3.5).

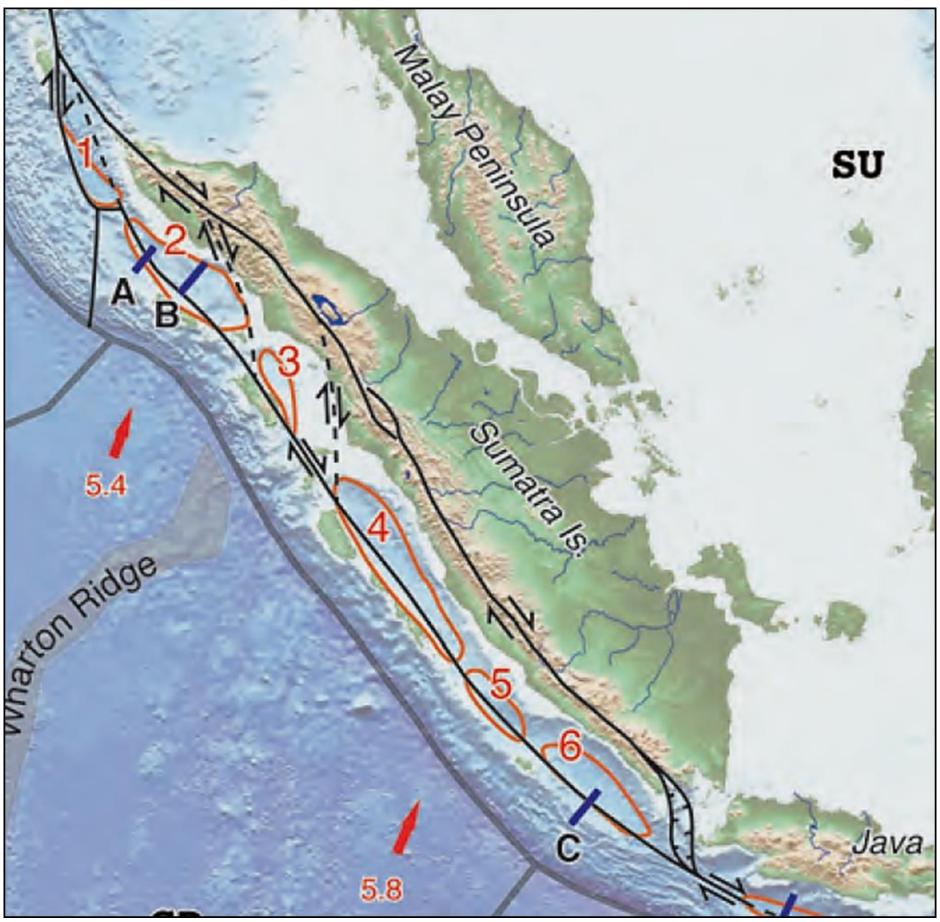

Figure II.3.4. The Sumatra fore-arc today is a 'sliver plate' between the onshore Sumatra and offshore Mentawai right-lateral fault zones. Cenozoic forearc basins: 1- Aceh, 2- Simuelue, 3- Siberut, 4- Bengkulu, 5- Enggano, 6- Mentawai. (part of Noda et al. 2017 figure).

Today the entire forearc area between the Melawai Fault zone and the Great Sumatra fault moves as a separate microplate or 'sliver plate' along most of Sumatra.

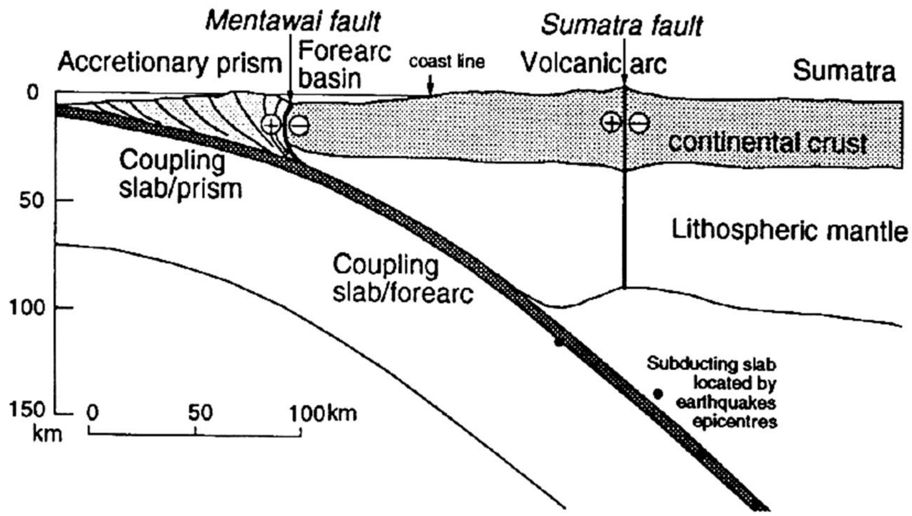

Figure II.3.5. Most of the Sumatra forearc is a tectonic sliver plate between the Mentawai and Great Sumatra Fault zones. The Mentawai Fault zone probably follows the margin of continental crust, Sumatran FZ follows the volcanic arc.

Mentawai Islands

The Mentawai islands (Simeulue, Nias, Siberut, Pagai, Enggano, etc.) between the West coast of Sumatra and the Sunda Trench are generally interpreted as the emergent parts of the Sunda accretionary prism (Karig et al. 1980, Moore?, Harbury and Kallagher 1991,). Rocks are dominated by complexly imbricated, predominantly NE-dipping Eocene- Early Miocene deep marine sediments, with common diapyric remobilization features.

There are also blocks and slivers of ophiolitic rocks, presumably fragments of Indiian Ocean floor crust. Gabbro from the East Simeulue ophiolite gave Late Eocene K-Ar ages (~35.4, 40.1 Ma; Kallagher 1990). This is close to the age of a red radiolarian chert sample from ophiolitic basment, interpreted to be of Middle Eocene age (Ling and Samuel 1998).

Imbricated sediments are unconformably overlain by less deformed ?Middle Miocene- Pliocene deep marine sediments. (Djamal et al. 1995, Aribowo et al. 2014, 2015; e.g. Figure II.3.6). These ages probably vary along the accretionary complex. The exposed parts of the Sumatra accretionary complex probably represent older sediment imbrication than the parts of the accretionary prism closer to the trench, where this underthrusting is happening today.

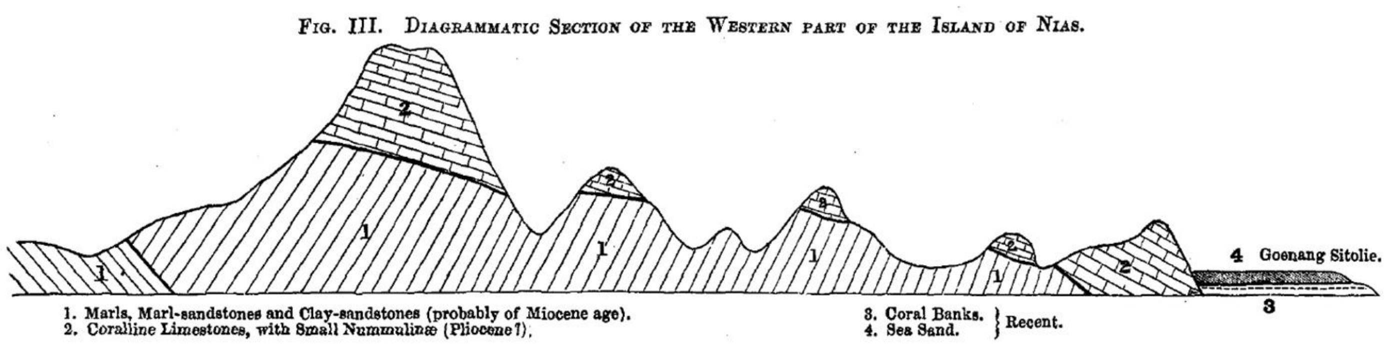

Figure II.3.6. Historic cross-section of the western part of Nias Island, showing steeply dipping Miocene(?) sediments, unconformably overlain by uplifted Pliocene? limestone (Verbeek, 1876).

Oil and gas seeps, hydrocarbon exploration

Like other forearc regions, the Sumatra forearc region has low low heat flows (e.g. Lutz et al. 2009). This means that areas with adequate thermogenic petroleum system are absent or very limited in the Sumatra forearc (e.g. Specht et al. 2000). This is probably the main reason why hydrocarbon prospectivity of the region is perceived to be low, because most other play elements (source facies, carbonate and clastic reservoirs, structure, etc.) appear to be largely similar to the prolific 'back-arc' basins of Sumatra, which have unusually high heat flows.

A number of hydrocarbon exploration wells were drilled in several rounds: Jenney group (1969-1974, Hariadi and Soeparjadi 1975), Union Oil (1968-1978; Rose 1983) and Caltex (1996-?; Specht et al. 2000). Several of the wells tested methane gas, but none were deemed to be commercial accumulations.

In the offshore area active gas seepage has been identified on modern seismic lines and core sampling (Lutz et al. 2010, Siegert et al. 2011, Ardhyastuti et al. 2017). Most of the gas encountered in forearc basin wells is biogenic gas, which mostly reflects the traditionally low geothermal gradients in the forearc (Dobson et al. 1998). Oil seeps have long been known from the onshore Bengkulu basin (e.g. Figure II.2.6).

Sunda Straits

The Sunda Straits basin, also called Semangka Graben, is commonly viewed as a very young transtensional pull-apart basin at the SE termination of the Great Sumatra Fault zone (Figure II.3.7) (Huchon and Le Pichon 1984, Malod et al. 1995, Lelgemann et al 2000, Schluter et al. 2002, Mulyana 2006).

Suggested ages of the onset of transtension include latest Miocene (Lassal et al. 1989) or Early Miocene (Schluter et al. 2002; too old?).

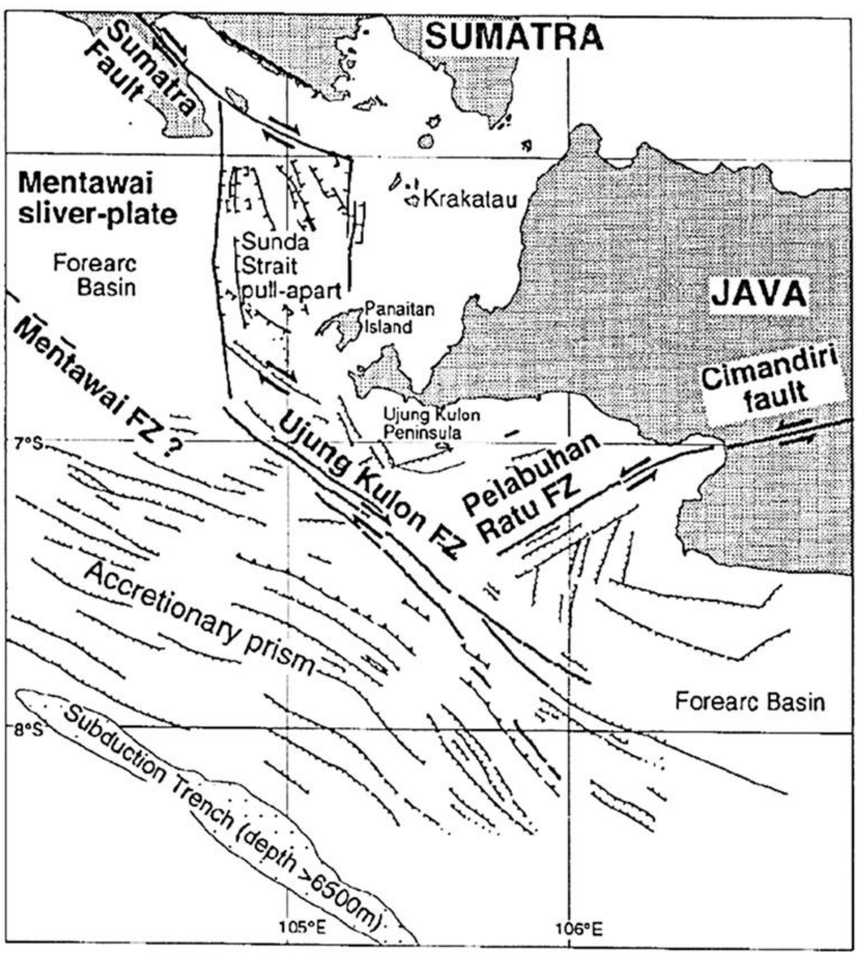

Figure II.3.7. Sunda Strait pull-apart basin at the SE end of the Great Sumatra Fault Zone (Malod et al. 1996).

One deep, 1970's oil exploration well in the Sunda Straits graben reportedly penetrated 3 km of Pleistocene sediments (Mike Scrutton, pers. comm.), suggesting much of the subsidence in the Sunda Straits pull-apart basin(s) is quite young, and possibly still active.

<u>Some suggested reading- Sumatra forearc</u> *<u>(not a complete listing of all relevant papers)</u>*

General, Structure	*Karig et al. 1978, 1980, Situmorang et al. 1987, Zen 1993, Malod et al. 1993, Malod and Kemal 1996, Kopp et al. 2001, 2008, McCaffrey 1992, 2009, Berglar 2010, Berglar et al. 2008, 2010, 2017, Mukti et al. 2011, 2012, 2017, Hananto et al. 2012*
Forearc stratigraphy	*Beaudry and Moore 1981, 1985, Rose 1983, Matson and Moore 1992, Izart et al. 1994, Lutz et al. 2009 Berglar et al. 2008, 2010, 2017, Frankowicz 2011, Deighton et al. 2014*
Accretionary complex	*Moore and Karig 1976, Karig 1977, Stevens and Moore 1985, Moore et al. 1982, Klingelhoefer et al. 2010, McNeill and Henstock 2014, Frederik et al. 2015.*
Hydrocarbons, seeps	*Hariadi and Soeparjadi 1975, Djajadihardja et al. 1999, Yulihanto and Wiyanto 1999, Lutz et al. 2010, Siegert et al. 2011, Ardhyastuti et al. 2017*
Mentawai Fault Zone	*Diament et al. 1992, Samuel and Harbury 1996, Mukti et al. 2010, 2012,*
Mentawai Islands	*Verbeek 1874, 1876, Icke and Martin 1907, Douville 1912, Van der Veen 1913, Tappenbeck 1936, Tjia, and Boentaran 1969, Moore 1978, Moore et al. 1979, 1980,Budhitrisna, 1989, 1990, Harbury et al. 1989, Situmorang et al. 1990, Harbury and Kallagher 1991, Pubellier et al. 1992,Djamal et al. 1994, Endharto et al. 1994, Andi Mangga et al. 1994, Samuel and Harbury 1995, 1997, Ling and Samuel 1998, Aribowo et al. 2014, 2015*
Sunda Straits basin (Semangka Graben)	*Malod and Kemal 1996, Lelgemann et al. 2000, Schluter et al. 2002, Mulyana 2006, Mukti et al. 2015, Handayani and Harjono 2008, Arisbaya et al. 2015, 2016*
Bengkulu basin	*Van Dijk 1860, Fennema 1885, Amin and Gafoer 1985, Mulhadiono and. Asikin 1989, Hall et al. 1993, Daulay and Nursarya 1996, Yulihanto et al. 1995, 1996, Kusnama 2002.*

II.4. Sunda Shelf (incl. 'Tin Islands', Karimata)

The Sunda Shelf is part of the relatively stable core of 'Sundaland', an area of Paleozoic and older continental terranes (Indochina- East Malaya- SW Borneo?) that amalgamated with SE Asia by Late Triassic time. On the islands Pre-Tertiary rocks outcrop extensively, or are covered by only a thin veneer of Quaternary fluvial and shelfal relict sediments. Except for the areas of Late Paleogene-Neogene basins like the Malay, Natuna and Gulf of Thailand basins it has mainly been an area of erosion and non-deposition since the Jurassic.

The Sunda Shelf today is a broad, relatively flat, shallow epicontinental sea, that is essentially a peneplained land area that was exposed during Pleistocene glacial lowstands and was drowned during the Holocene sealevel rise of ~120m. The stepwise flooding of the Sunda plain since ~13,500 years ago is described in papers from Sonne cruises by Hanebuth and Stategger (2003, 2004) and Hanebuth et al. (2000, 2009).

During the Last Glacial Maximum between ~16-22 ka (and probably also during earlier Pleistocene lowstands) much of the exposed Sunda shelf was covered by tropical rainforest, as suggested by pollen records (Sun et al. 2000, Wang et al. 2007, 2009). Temperatures were slighly cooler, but there was no decrease in humidity that was significant enough to prevent rainforest vegetation.

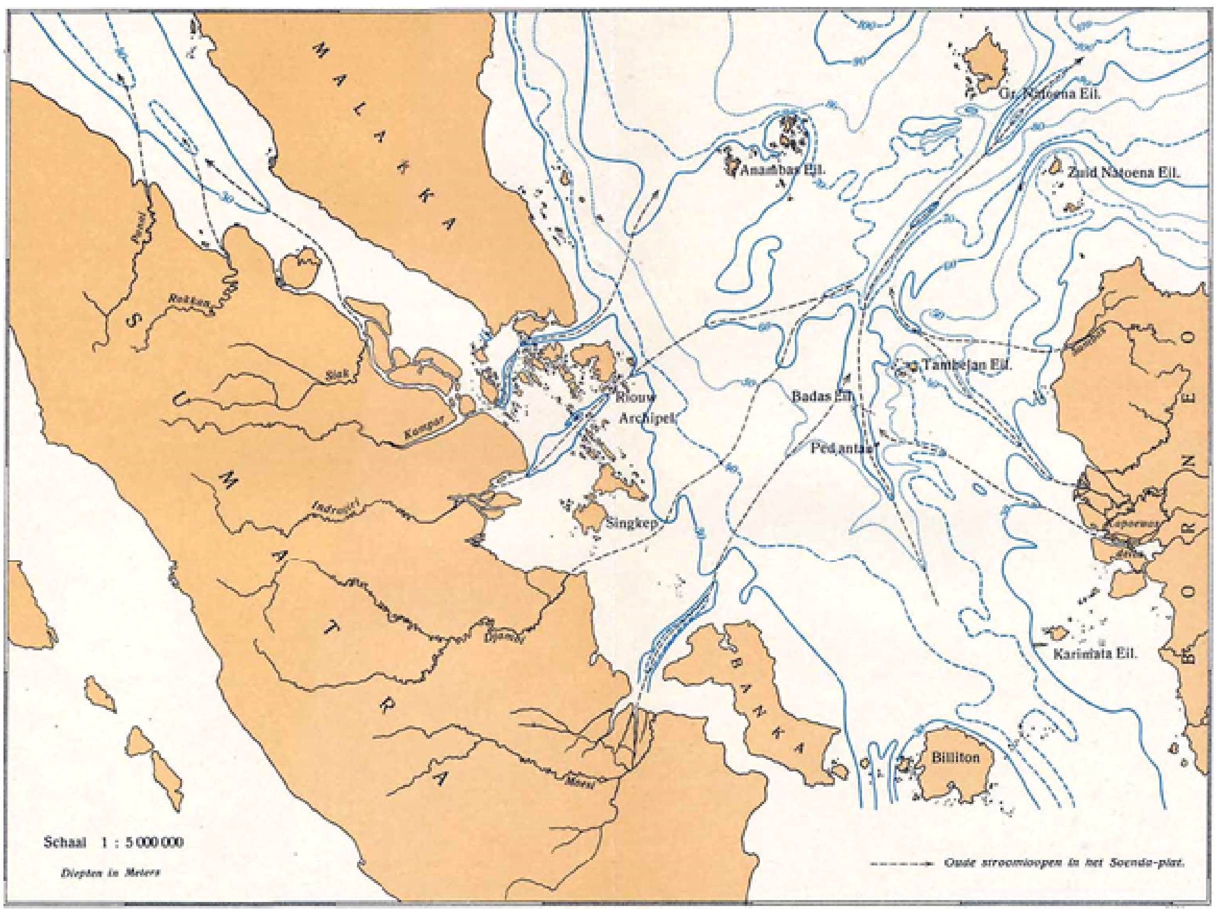

Figure II.4.1. Sunda shelf with drowned incised river valleys that connect to major rivers on Sumatra and West Kalimantan (Molengraaf, 1922)

A pattern of Late Pleistocene relict incised river valleys, draining from Sumatra and Borneo into the South China Sea, was discussed by Molengraaff (1919), Kuenen (1950), Hanebuth et al. (2000), Sathiamurthy and Rachman (2017), Hantoro (2018), etc. (Figures II.4.1, II.4.2). These formed during the Last Glacial Maximum of ~18,000 years ago, when sealevel was ~120m below present-day level.

Over the Penyu Basin (Malaysian part of the Sunda Shelf) the average depth to the Late-Pleistocene exposed surface is 53- 64m below present-day MSL, with ~16- 50m of valley incision (Rahmad et al. 2016).

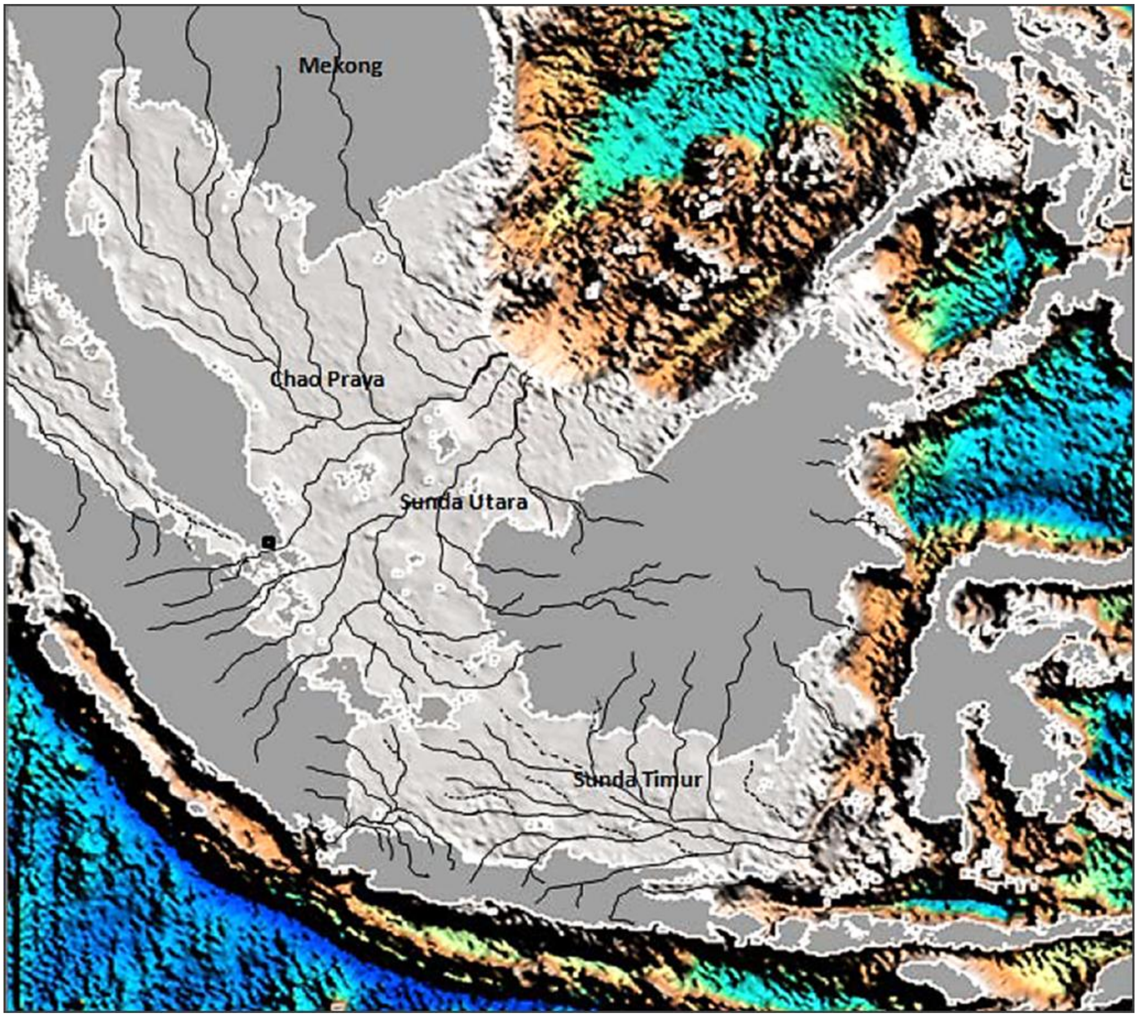

Figure II.4.2. The Sunda Shelf and Java Sea are drowned land areas that were exposed during Pleistocene glacial lowstand intervals, developed large incised drainage systems of rivers flowing to the South China Sea and Flores Sea (Hantoro 2018).

Sunda shelf basement

Not much is known about the composition of basement rocks of the submerged Sunda shelf. On Bangka and Belitung islands the oldest rocks are Late Paleozoic mica schists and low-metamorphic metasediments of the Pemali Group (U Ko Ko 1986). They are isoclinally folded, steeply dipping, WNW-ESE trending (and generally south-dipping?) turbiditic clastics of Permian- Middle Triassic age, with basalts and thin limestones and thin-bedded radiolarian cherts (Figure II.4.3). Some serpentinite has been reported as well.

These intensely folded beds are unconformably overlain by gently folded Upper Triassic Tempilang Fm sandstones and are intruded by large 'post-collisional 'granite intrusives of latest Triassic age (possibly also Early Jurassic), many of which are associated with tin mineralization (see below).

Rare fossils in the highly folded basal series are mainly of Permian age, but also includes some Triassic (Norian) fauna:

- Lower Permian cassiteritized ammonoid *Agathiceras sundaicum* from the Lenggang district, Belitung (Kruizinga 1950). This was deemed to be more likely of lower Middle Permian age by Fontaine (1989);
- Permian fusulinid foraminifera *Fusulina* and *Schwagerina* in white silicified limestone bands in 'flysch' series (De Roever 1951);
- In SE of Belitung island rare Permian plant assemblages provisionally identified by Jongmans as Cathaysian flora with *Gigantopteris* (Van Overeem 1960);
- Fragment of a straight nautiloid *Neorthoceras* at Kelapa Kampit, NE Belitung, suggests Early-Middle Permian age (Archbold 1983);

- Crinoid stems in magnetite-cassiterite ore body at Selumar (East Belitung) assigned to *Moscovicrinus*, and believed to be of E Permian age Hosking et al. 1977).
- Radiolaria in folded cherts of Belitung 'probable Late Paleozoic age (Hinde, in Verbeek 1897).
- Late Triassic (Norian?) corals, calcareous sponges and crinoids from low-metamorphic limestone in folded phyllite-quartzite section at the Lumut mine on Bangka (De Neve and De Roever 1947). The presence of Triassic beds in the folded Pemali series also appears to be supported by the (poorly documented) presence of bivalve mollusc *Daonella* (Westerveld 1941).

These intensely folded rocks can be interpreted as an accretionary complex of Paleo-Tethys ocean-floor and continental margin material, imbricated before and during the Middle-Late Triassic collision with the Sibumasu terrane (Hutchison1994, Barber and Crow 2009).

A poorly known but potentially important occurrence of 'pebbly mudstones'/diamictites with granitic pebbles near Toboali in SE Bangka (Zwartkruis 1962, U Ko Ko 1986) may represent glacial deposits and, if so, would link this to the margin of the Sibumasu terrane.

This Pemali complex is unconformably overlain by gently folded, probably Tempilan Formation sandstones and shales with poorly preserved latest Triassic- earliest Jurassic 'Bintan flora' on SW Bintan Island (Jongmans1951, Wade-Murphy and Van Konijnenburg 2008). This stratigraphy and flora suggests affinities with the Malay Peninsula and NW Kalimantan.

Cretaceous and Tertiary deposits are absent or very thin in the Sunda Shelf region.

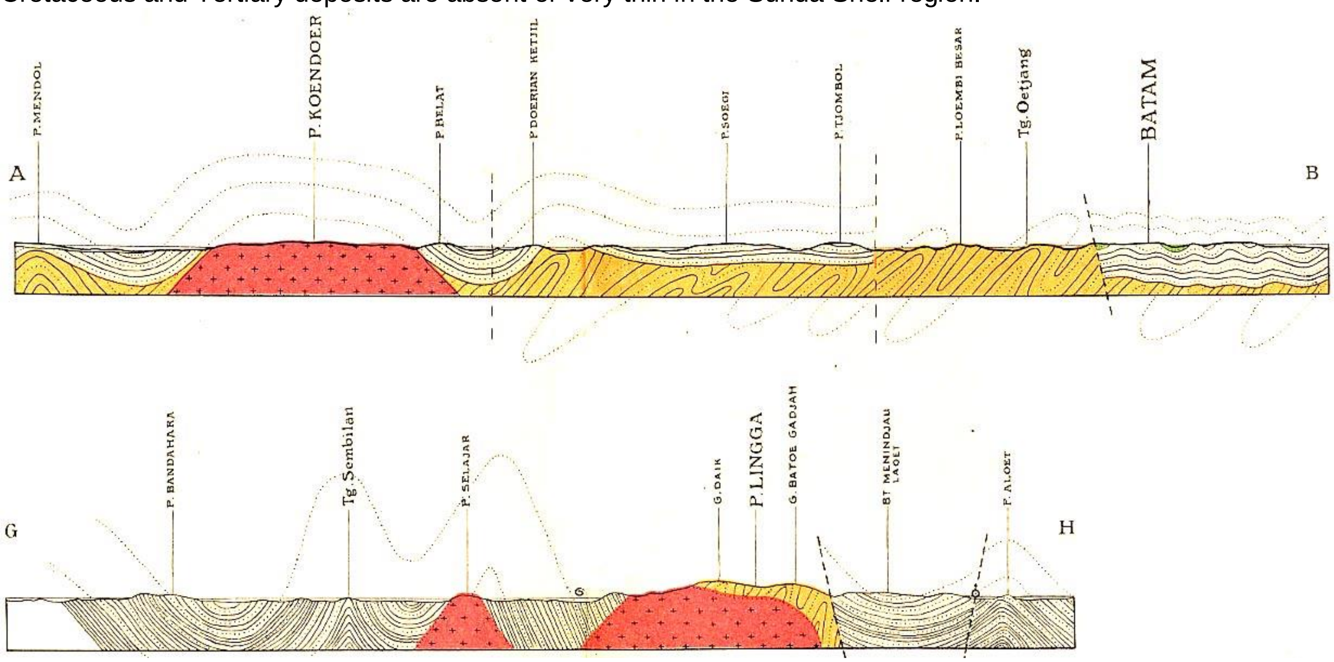

Figure II.4.3. SW-NE cross-sections across islands of Kundur and Batam (top) and Singkep and Lingga (bottom), showing imbricated Permo-Carboniferous, overlain by less-deformed Triassic clastics, intruded by Late Triassic granites (Bothe, 1928)

Gravity maps over the Sunda shelf show distinct and continuous bands that may be used to link the geology of East Sumatra with that of SW Kalimantan (Figure II.4.4 free-air satellite gravity map and the Bouguer gravity map on the front cover; from www.bandaarcgeophysics.co.uk/WestIndo_lines/3D-BA267v2.jpg). Several authors (Hall, Metcalfe, Morley 2012, Satyana, etc.) postulated a major Cretaceous-age N-S suture zone across the Sunda shelf, between the Indochina/ West Sumatra block in the West and SW Borneo block in the East, but no obvious discontinuity can be seen on this geophysical data that would suggest a major terrane boundary.

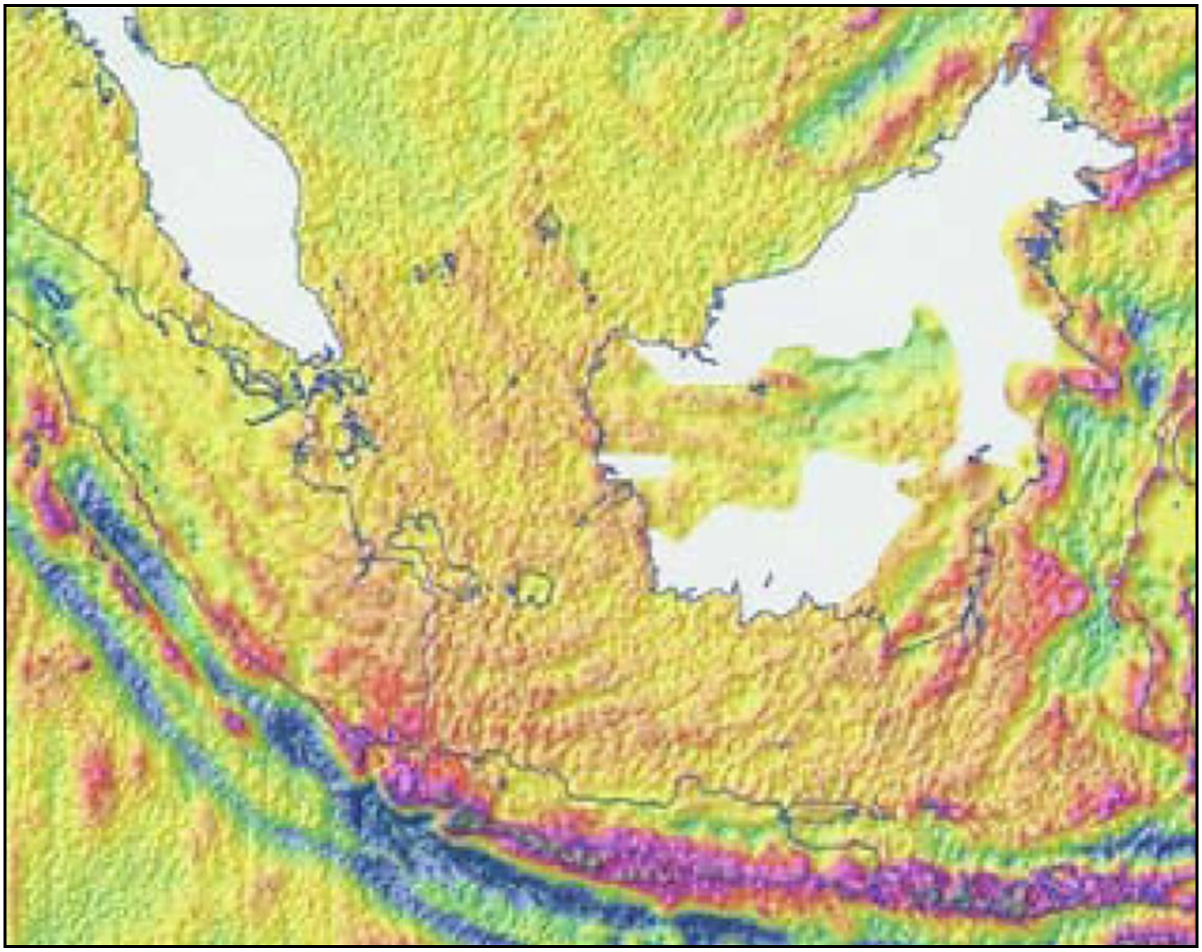

Figure II.4.4. Sunda Shelf- Java Sea part of IUGG 2003 Gravity anomaly map of Indonesia, compiled from land Bouguer values and Free-air in the marine area. Showing apparent continuity of geology between SE Sumatra and South Kalimantan.

Tin islands

The main economic interest of the Sunda Shelf region is in the tin deposits around Bangka and Belitung (Billiton) islands off the NE coast of Sumatra, which extend to the islands of Lingga and Singkep, NE Sumatra and probably extending to the Karimata islands off SW Kalimantan (Sarmili 1998, 1999, Setijadji et al. 2014, Batchelor 2015). These tin deposits are part of the SE Asia tin belt that stretches for ~3000km from Myanmar through West Thailand and the Malay Peninsula Main Range granites to Bangka- Belitung and possibly further East (Soeria-Atmadja et al. 1986, Schwartz et al. 1995).

Numerous papers have been published on the tin deposits of the Indonesian 'Tin Islands Bangka, Belitung and others, dating back to the 1800's. Tin mining has been ongoing since the at least the early 1700's on Bangka, with much of the early mining involving Chinese contract laborers. On Belitung full-scale tin mining started with the creation of the 'Billiton Maatschappij' in 1860, after several small-scale operations. The first offshore dredging started off Belitung in 1938. Indonesia has produced ~15% of all tin mined in the world, but tin reserves are largely depleted today.

Primary tin mineralization

Primary tin (cassiterite) deposits formed in and around 'post-collisional 'granites' with Sn-W-Sb minerals of Late Triassic age (mainly 200-220 Ma), possibly also including Early Jurassic; Priem et al. 1975, Jones et al. 1977). A predominatly Norian age of the Bangka and Belitung tin granites seems well established: Priem and Bon (1982) noted that most radiometric ages of are in the 214-217 Ma range, while the latest dating from Bangka granites are zircon U-Pb ages of ~225 and ~220 Ma (Ng et al. 2017).

The Bangka tin granites are mainly biotite granites, and include both hornblende-bearing (previously I-type) and hornblende-barren (previously S-type) granites, apparently randomly distributed, and are geochemically similar to the Malaysian Main Range granites (Ng et al. 2017). They formed during excessive thickening and heating of continental crust after the collision of the Indochina and Sibumasu continental plates along the Paleotethys suture.

The Indonesian tin granites that are at the SE end of the long SE Asian tin belt, which extends from Northern Myanmar through West Thailand and West Malaysia (Hutchison 1983, Pitfield 1987, Schwartz et al. 1995, etc.). There is also a second, more western belt of tin-bearing granites of Late Cretaceous age that extends from northern Peninsular Thailand and Myanmar to the western Malay Peninsula and probably extending into North Sumatra (~80 Ma Hatapang granite; Hamidsyah and Clarke 1982, Johari 1988).

Primary tin deposits of the Tin islands occur as cassiterite-bearing hydrothermal veins in and around Late Triassic granite plutons. Veins are usually in country rocks of isoclinally folded, steeply dipping Permian-Triassic marine metaclastics with radiolarite beds of the Pemali Group. Only a few of these primary vein systems were mined commercially on Bangka island (Groothoff 1916, Wing Easton 1937, Adam 1960, Meyer 1975, U Ko Ko 1984, Schwartz and Surjono 1990,1995).

Pleistocene tin placer deposits

Most of the tin ores (>95%) has been extracted from onshore and offshore Quaternary alluvial placer deposits, that formed from chemical weathering and erosion of the granites and surrounding mineralized zones (Figures II.4.5, II.4.6).

Tin miners on Bangka distinguished two types of alluvial tin-bearing deposits (Aleva 1985):

1. '*Kulit*': relatively in-situ 'eluvial' and 'colluvial' residual concentrations of cassiterite from weathered granites and mineralized aureoles, in interfluve hilly areas and on valley slopes;
2. '*Kaksa*': eroded and transported cassiterite, concentrated as placer deposits near the bases of incised fluvial drainage channels. These are the largest and richest of tin deposits. Most of the valleys in which the placers formed probably originated during glacial lowstand periods when sealevel was at least 30-50m lower than today

Economic cassiterite placers appear to be limited to an area within 15 km from the contacts with granitic mother rocks, with the largest number of known tin placers ~5-12 km from granites (Kanayama 1973). These deposits are now largely depleted.

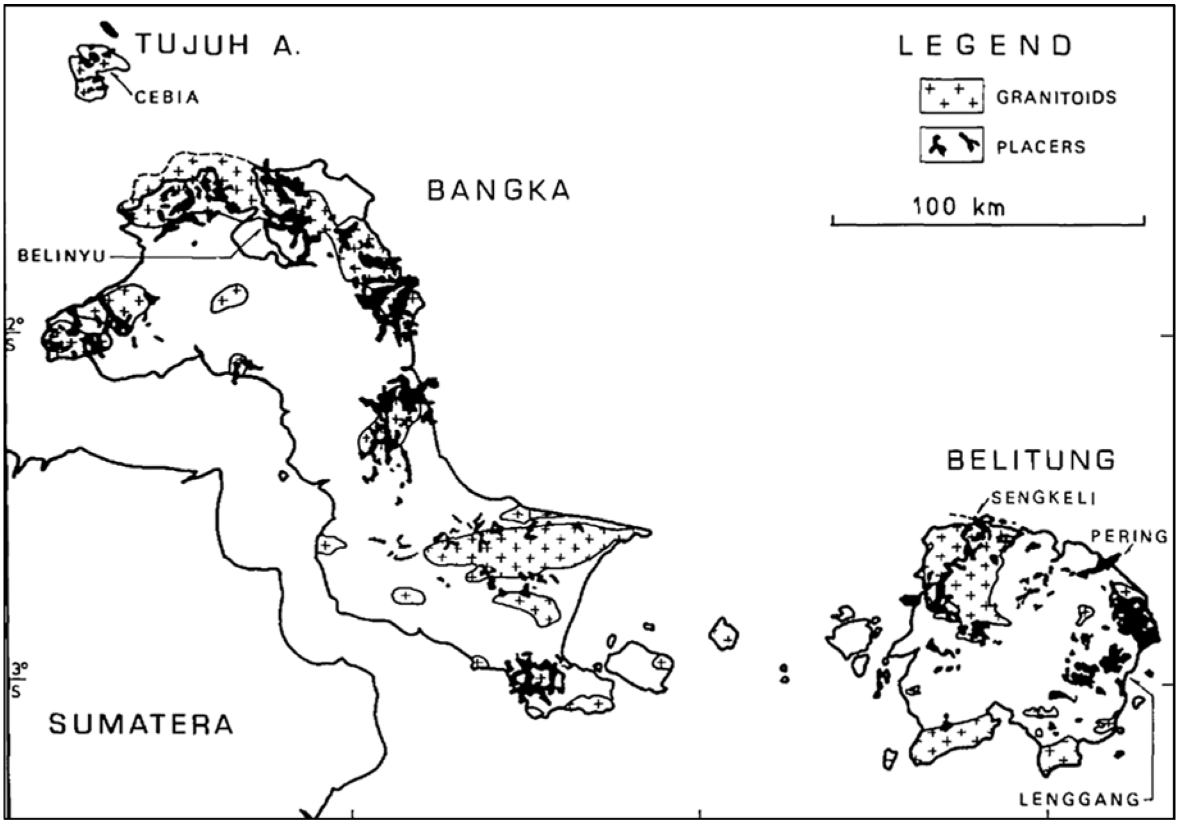

Figure II.4.5. Distribution of main cassiterite placer deposits (black) and main exposed Late Triassic granitoid plutons of Bangka and Belitung (Aleva, 1985). These tin-bearing valley-fills continue offshore.

The tin placer deposits appear to be in similar stratigraphic positions on the Indonesian tin islands and along the western Malay Peninsula, i.e. primarily in latest Pliocene- Middle Pleistocene 'Old Alluvium' and Transitional beds that overlie highly weathered bedrock. Late Pleistocene- Holocene 'Young Alluvium' is generally barren of tin (Batchelor 1986, 1988). Present-day depositional environments are apparently unfavorable for tin placer formation.

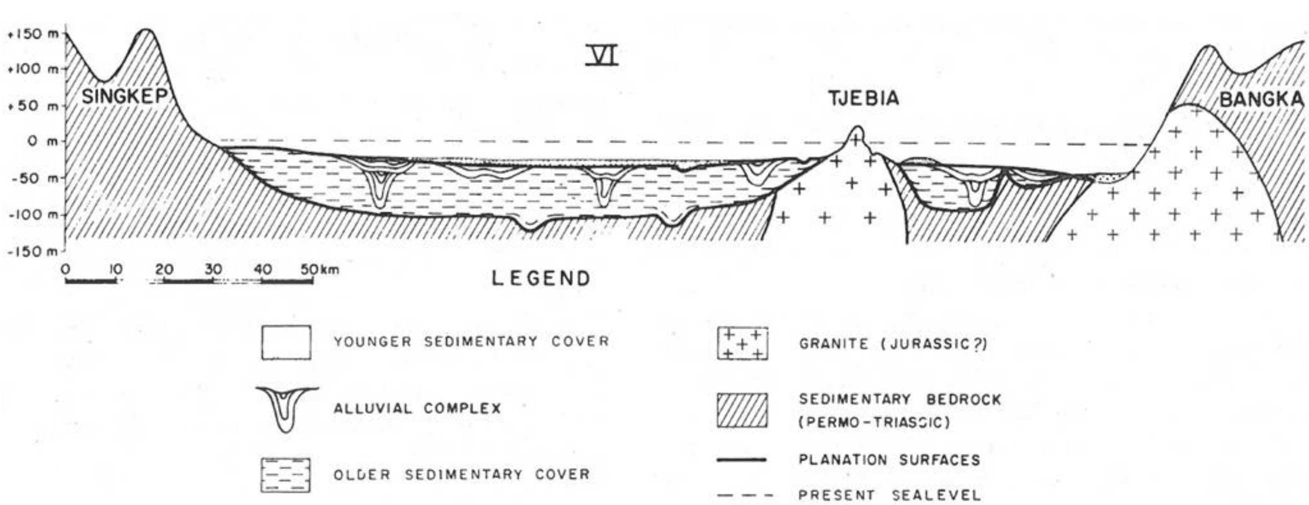

Figure II.4.6. NW-SE cross-section from Singkep- Cebia to Bangka island, showing steeply dipping Permo-Triassic basement metasediments, intruded by Late Triassic granitoids, overlain by thin Miocene sediments and a Pleistocene Alluvial Complex of 30-45m deep tin-bearing incised valleys and very thin Late Quaternary sediment cover (Aleva, 1973).

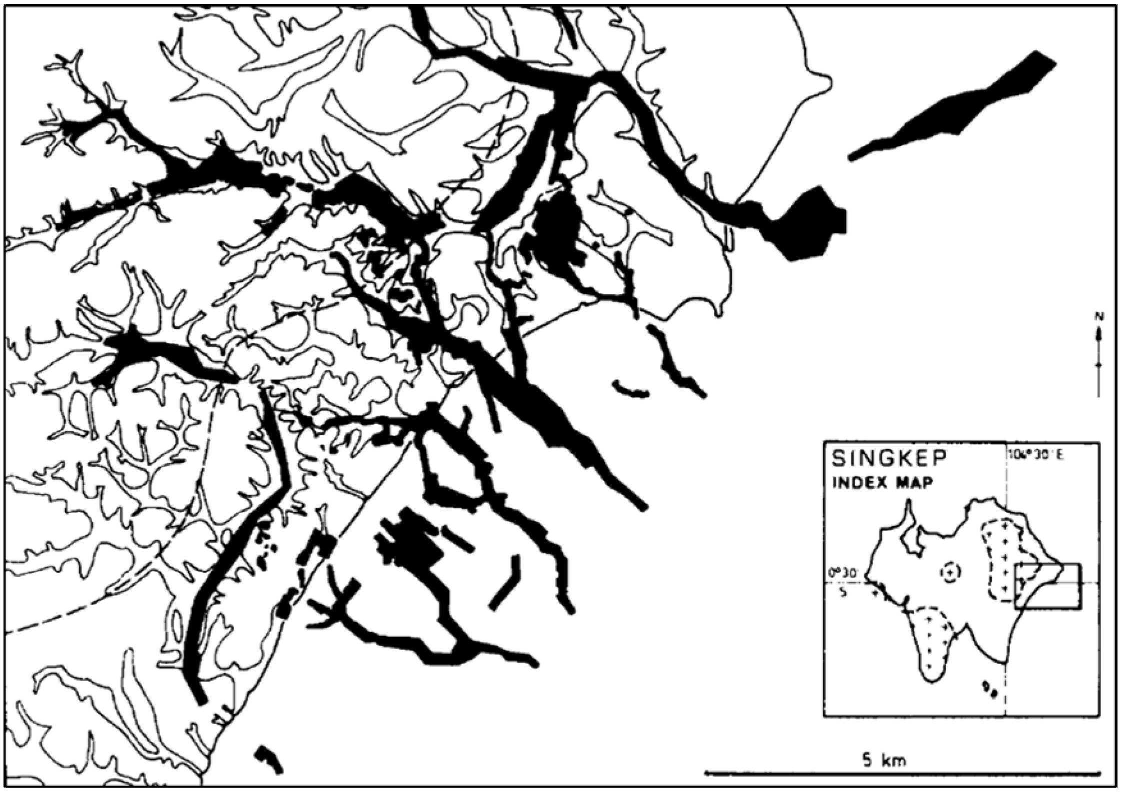

Figure II.4.7. Example of distribution of channelized tin placer deposits (black) on Singkep Island, extending from onshore to offshore SE (Aleva 1985).

Billitonites tektites

One interesting aspect of Belitung geology is the presence of Middle Pleistocene 'billitonites' at the base of the tin-bearing placer deposits. These are black glassy spheres up 5 centimeters in diameter that formed at the 'Australasian' asteroid impact in mainland SE Asia at ~0.8 Ma, and rained over much of SE Asia and Australia (Figure II.4.8). Papers on Belitung tektites include Van Dijk (1879), Wichmann (1893), Verbeek (1897), Krause (1898), Hovig (1923) Wing Easton (1915, 1921) and Koomans (1938).

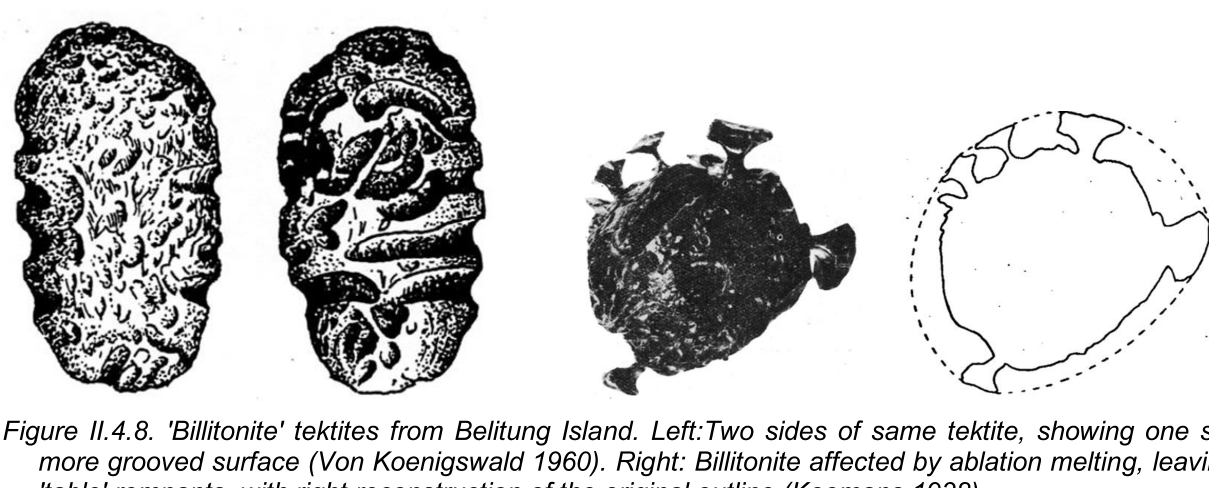

Figure II.4.8. 'Billitonite' tektites from Belitung Island. Left:Two sides of same tektite, showing one side with more grooved surface (Von Koenigswald 1960). Right: Billitonite affected by ablation melting, leaving small 'table' remnants, with right reconstruction of the original outline (Koomans 1938).

Some suggested reading - Sunda Shelf- 'Tin Islands' *(not a complete listing of all relevant papers)*

Geology: *Akkeringa 1872, Posewitz 1885,Verbeek 1897, Molengraaff 1919, 1921, Aernout 1922, Bothe 1928, Zwierzycki 1933, Westerveld 1936, 1937, 1941, Zwartkruis 1962, Katili 1967, 1968, Ben-Avraham and Emery 1973, U Ko Ko 1986, Andi Mangga and Djamal 1994, Baharuddin and Sidarto 1995*

Triassic granites *Westerveld 1936, Aleva 1960, Edwards and McLaughlin 1965, Priem and Bon 1982, Sitanggang 1986, Soeria-Atmadja et al. 1986, Dirk 2003, 2004, 2013, Abidin and Harahap 2005, Widana 2013, Widana et al. 2014, 2015, Widana and Priadi 2015, Irzon 2015, 2017, Ng et al. 2017*

Primary tin deposits *Akkeringa 1873, Groothoff 1916, Van Lohuizen 1918, Akkersdijk 1932, Westerveld 1937, 1941, Adam 1960, Cissarz and Baum 1960, Katili 1967, Hosking 1970, Meyer 1975, Jones et al. 1977, Wisoko 1981, U Ko Ko 1984, Van Wees and de Vente 1984, Notosiswojo and Sugeng 1987, Schwartz and Surjono 1990, 1991, Abidin 2001, 2002, 2003, 2004*

Alluvial Tin deposits/ mining *Van Diest, P.H. 1873, Posewitz 1886, Verbeek 1897, Rueb 1915, 1920, Bothe 1925, Wing Easton 1925, 1933, 1937, Krol 1960, Osberger 1967, 1968, Hosking 1971, Sujitno 1977, Batchelor 1979, 1986, 1988, Aleva et al.1973, Aleva 1985, Hamza 1995, 1998, Abidin et al. 1999, Soehaimi and Moechtar 1999, Aryanto and Kamiludin 2016*

Permian-Triassic fauna/ flora: *Hinde 1897, De Neve and De Roever 1947, Kruizinga 1950, Jongmans 1951,De Roever 1951, Van Overeem 1960, Krol 1960, Kanayama 1973, Strimple and Yancey 1976, Hosking et al. 1977, Archbold 1983, Wade-Murphy and Van Konijnenburg 2008*

Pleistocene: *Molengraaff and Weber 1921, Dickerson 1941, Van Baren and Keil 1950, Emery 1969, Hehuwat 1972, Aleva et al. 1973, Hanebuth et al. 2000-2010, Rahmad et al. 2016, Hantoro 2018*

II.5. Natuna, Anambas

This chapter II.5 on the Natuna area contains127 publications, most of which are on oil and gas exploration and fields in the Cenozoic West and East Natuna basins.

The Natuna area forms the northern edge of the Sunda shelf. During much of Cretaceous time and was most likely an active margin that faced Paleo-Pacific Ocean subduction. The mid-and Late Cretaceous (~?110-70 Ma) granites along this margin have been viewed as plutons of a magmatic arc that formed the westerly continuation of the Cretaceous active continental margin of NW Borneo, and which continues further NW into the Yanshanian granite belt of SE China (West-dipping Paleo-Pacific subduction) (Figure II.5.1).

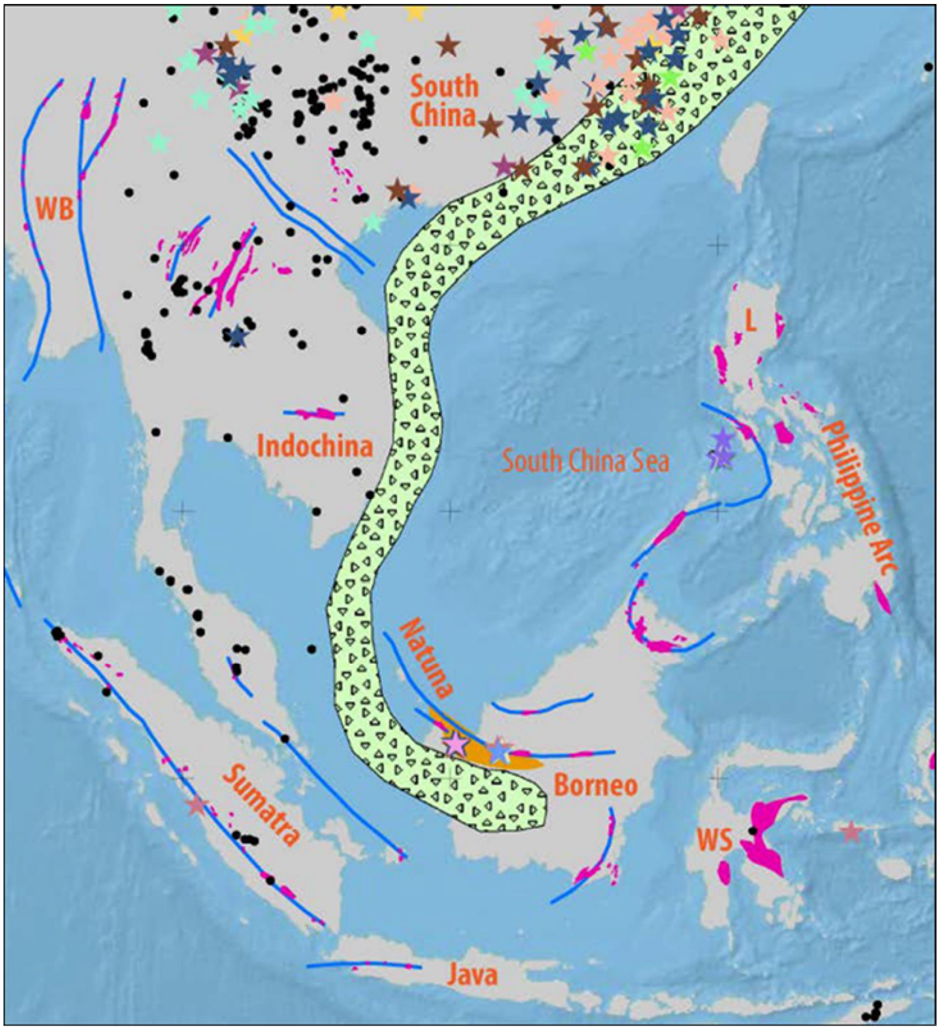

Figure II.5.1. Cretaceous continental margin magmatic arc, from SE China, SE Vietnam, Natuna into Borneo, reflecting westward subduction of Paleo-Pacific Ocean (Zahirovic at al. 2014). In all these areas magmatism appears to stop around ~85 Ma.

Natuna island is on the N-S trending Natuna Arch basement high, which is part of the non-extended Sunda Shelf, and formed a long-standing high between the Cenozoic West and East Natuna basins. Its core is composed of the intensely folded Jurassic- Cretaceous Bunguran Fm deep marine clastics and volcanics with radiolarian cherts and Jurassic- Cretaceous gabbros-serpentinites (Bothe 1928, Haile 1970, Hakim 2004, etc.). It looks very similar to the 'Danau Formation' of Central Kalimantan (Bothe 1928), and both probably represent similar (or the same) Jurassic-Cretaceous forearc active margin complexes.

The highly deformed Pre-Tertiary rocks of the Natuna- Anambas area were intruded by Late Cretaceous granites (with ~73- 86 Ma K-Ar ages; Haile and Bignell 1971), one of which forms the highest mountain on the island of Natuna Besar (Mt. Tanai; 1035m). This Mesozoic basement complex is unconformably overlain by thin Oligocene- Miocene fluvial sediments on Natuna Island, but signicant Tertiary basins developed in the surrounding offshore areas.

Crustal scale seismic summarized by Granath et al. (2012) is compatible with the interpretation of underlying accretionary prism and magmatic arc crust in the Natuna area, with a crustal thickess of 25 km in the East to 35 km in the West. West-dipping planar fabric under the East Natuna Basin is compatible with a Mesozoic forearc above a West- dipping subduction zone.

The geology of the Anambas islands SW of Natuna Besar is very similar to Natuna Besar, with Cretaceous Anambas Granite (probably Late Cretaceous) intruded into melange/ oceanic accretionary complex of strongly folded Matak Fm (with NW-SE axes; Samodra 1995).

Tertiary petroleum basins- Natuna

The Natuna islands are bordered on three sides by Oligocene rift basins, the Malay- West Natuna basin in the WNW, the South China Sea in the North and the East Natuna basin in the NE (Figures II.5.2, II.5.3).

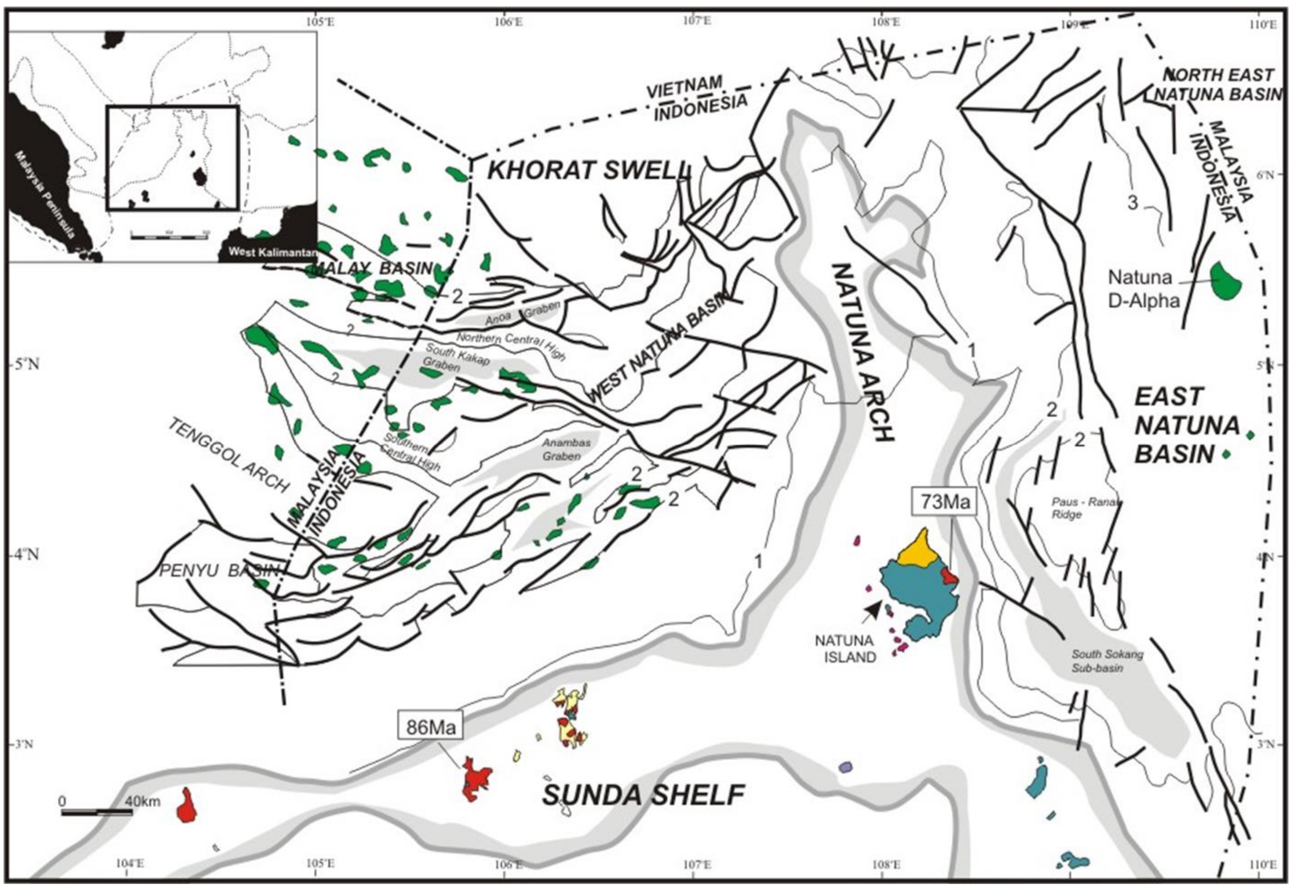

Figure II.5.2. Structural elements and basins around Natuna Island.
(from Herman Darman, https://upload.wikimedia.org/wikipedia/commons/6/6a/Natuna_geological_map.JPG

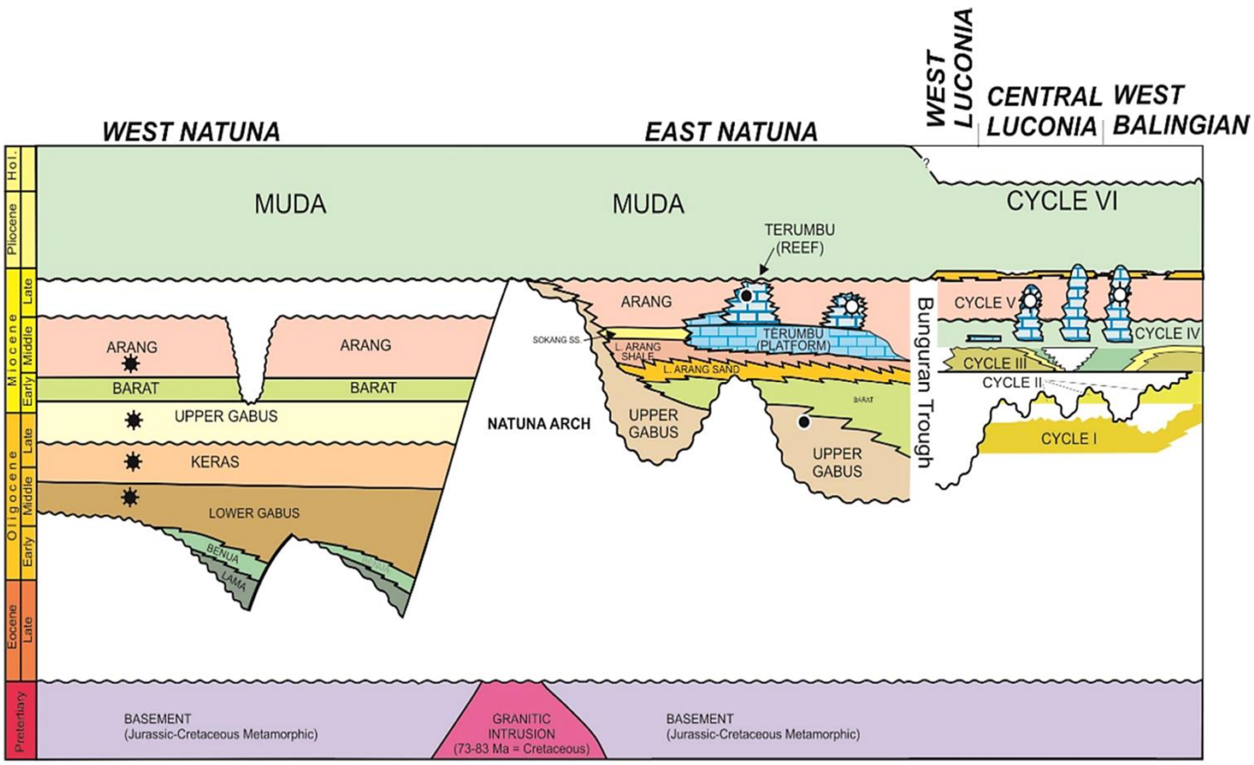

Figure II.5.3. Chronostratigraphic chart of the West and East Natuna basins and the Luconia region in NW Sarawak, showing proven oil and gas occurrences (Darman 2017, modified from Wirojudo and Wongsosantiko (1995).

West Natuna Basin

The West Natuna Basin is located West of the Natuna Arch and WNW and West of Natuna island. It is an intra-continental rift system that is composed of several sub-basins (Anambas, South Kakap, Anoa, Penyu), which generally exhibit half-graben geometries (Figure II.5.4). The Late Eocene- Recent basin fill is mainly in non-marine and very shallow marine facies.

The West Natuna basin is connected to the large Malay Basin system to the West. It is commonly described as an Eocene-Oligocene transtensional basin, that was subjected to multiple Middle Miocene- Recent right-lateral transpression/ inversion events, peaking in Late Miocene time (Daines 1985, Ginger et al. 1993, Fainstein and Meyer 1997, Darman 2017).

Hydrocarbon exploration and production focused on Late Oligocene- Miocene fluvial-deltaic clastic reservoirs, mainly in young (Middle-Late Miocene) inversion structures (Figures II.5.4, II.5.5).

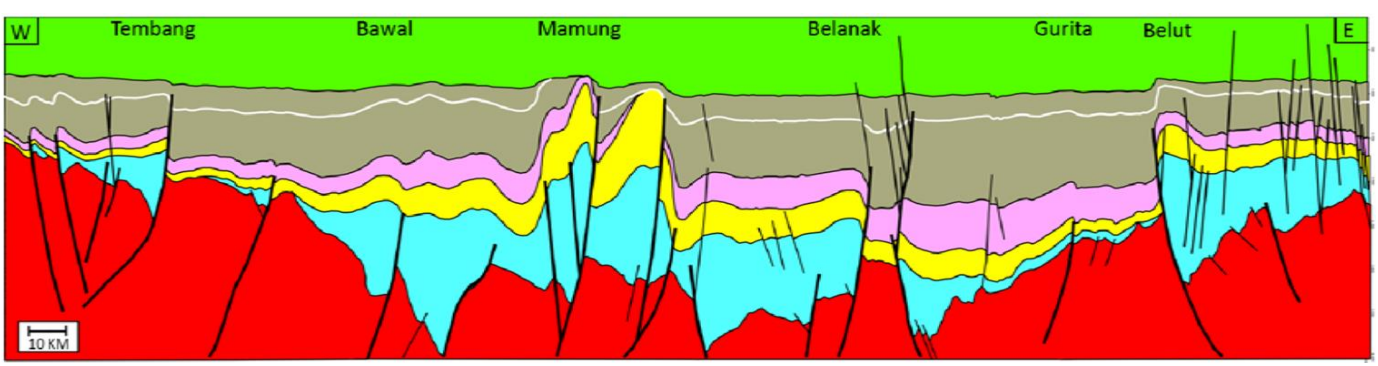

Figure II.5.4. West- East cross-section of West Natuna basin showing common inversion of half-grabens around Middle Late Miocene boundary (Light green formation at top is post-inversion Late Miocene-Pleistocene Muda Frmation (Simabrata et al. 2016).

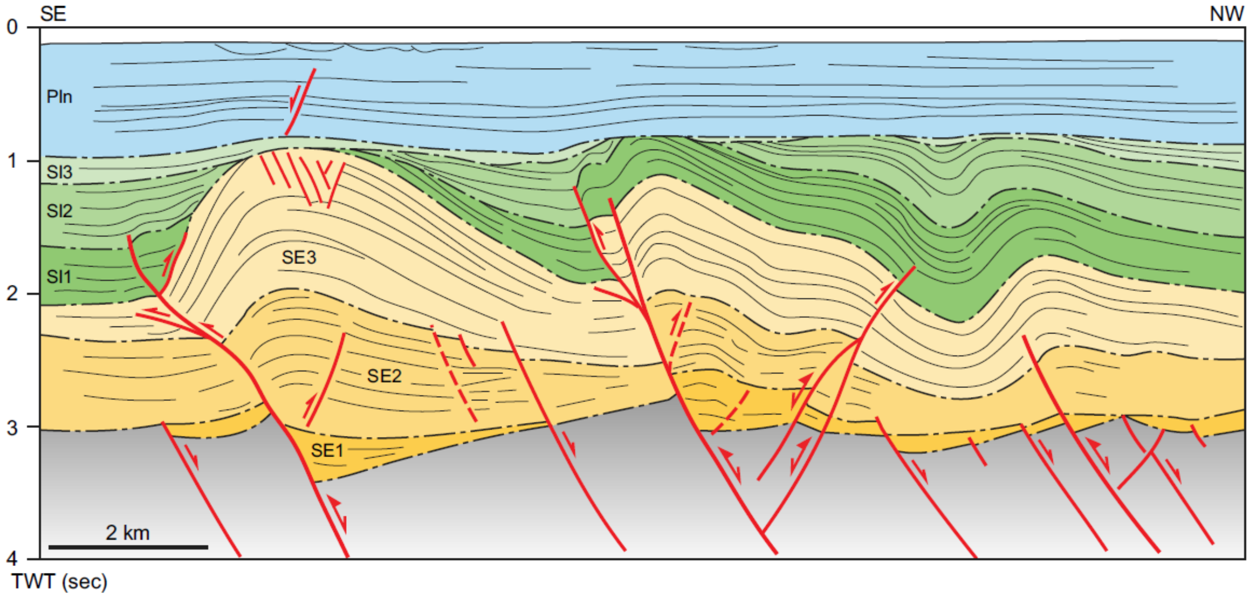

Figure II.5.5. Diagrammatic mdel of Middle Eocene- Oligocene half-grabens of the Bawal Graben area, West Natuna Basin, inverted in Early-Middle Miocene time. SE1 =M-L Eocene syn-extension, SE2= Late Eocene-Early Oligocene extension, SE3 = Late Oligocene syn-extension. SI 1-3 = Early-Middle Miocene syn-inversion phases; PIn = Post-inversion Muda Formation (Jagger and McClay, 2018).

East Natuna Basin

The East Natuna basin may be viewed as the west flank of the greater Sarawak Basin (Bunguran Trough; Mujito et al. 1995), and shows many similarities with the Nam Con Son basin to the North (offshore Vietnam) (Darman 2017). The basin shows a N-S trending series of basement highs and lows that parallel the N-S trending Natuna Arch. The main rift event here may well be younger (Early- Middle Miocene .e.g. Raharja et al. 2013).and of different orientations than in the West Natuna basins.

The East Natuna basin differs from the West Natuna basin in that (1) it was not affected by young inversion tectonics, and (2) it has a more marine Miocene facies development, including widespread development of Middle- Late Miocene carbonate platforms on basement highs,capped by Late Miocene- Early Pliocene reefal buildups, several of which are gas bearing (e.g. Franchino and Viotti 1986, Bachtel et al. 2004).

The East Natuna field, formerly known as the Natuna D-Apha field, was discovered in 1973 and is a very large gas field (>220 TCF). However, is was never developed due to the 71% CO_2 content of the gas (67% in upper zones to 82% near base; Kraft and Sangree 1982).

Gas fills most of the >1600m thick carbonate platform and reefal buildup of the Middle- Late Miocene Terumbu Limestone, with a vertical gas column of >1600m (Figure II.5.6) (Sangree 1981, Eyles and May 1984, May and Eyles 1985, Rudolph and Lehmann 1988, Dunn et al. 1996,)

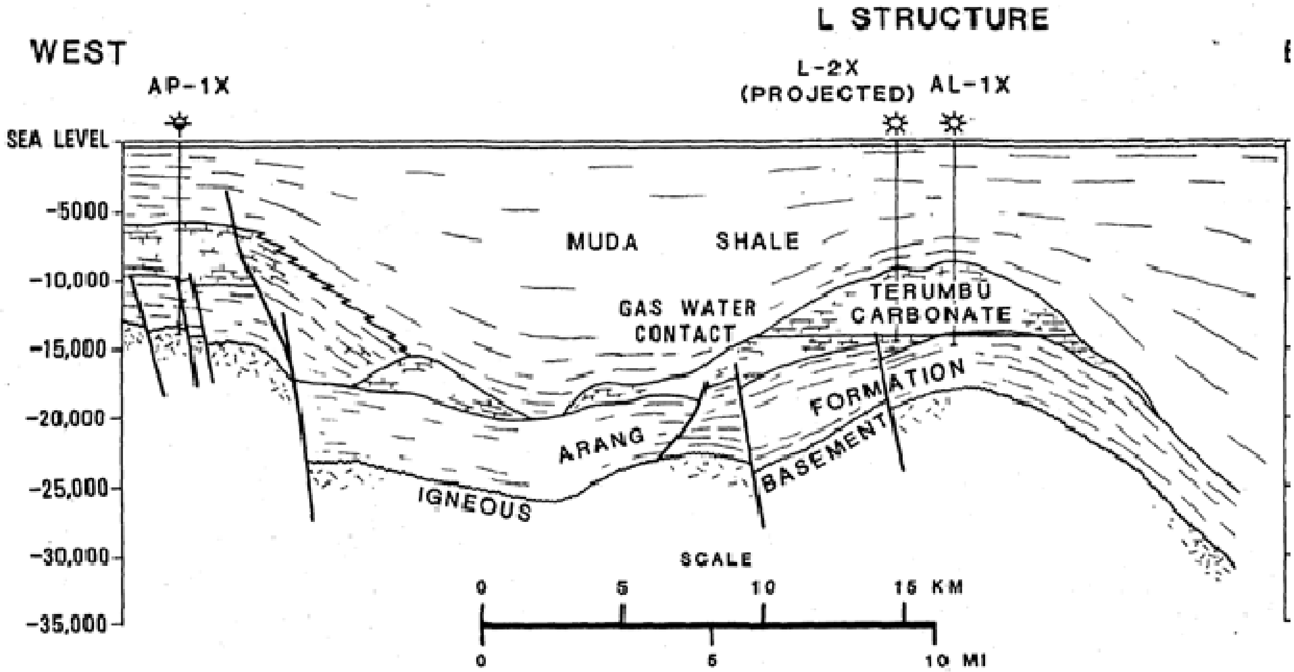

Figure II.5.6. The East Natuna gas field in the former Natuna D-Alpha block (Eyles and May 1984)

Some suggested reading- Natuna area *(not a complete listing of all relevant papers)*

Natuna area geology:	*Krause 1898, Bothe 1928, Haile 1970, 1971, Haile and Bignell 1971, Pupilli 1973, Franchino 1990, Franchino and Liechti 1983, Harahap and Wiryosujono 1994, Hakim and Suryono 1994, 1997, Harahap et al. 1996, Hakim 2004, Indranadi et al. 2010*
West Natuna Basin:	*Wongkosantiko and Wirojudo 1984, Wirojudo and Wongsosantiko 1985, Daines 1985, Koswara and Suryono 2001,Ginger et al. 1993, Michael and Adrian 1996, Pertamina BPPKA (Natanegara et al.) 1996, Fainstein and Meyer 1997, Phillips et al. 1997, Gunarto et al. 2000, Prasetyo 2002, Maynard et al. 2002, Maynard and Murray 2003, Morley et al. 2003, Hakim et al. 2008, Burton and Wood 2010, Darmadi et al. 2011, Haribowo et al. 2013, Manur and Jacques 2014, Riadini et al. 2017.*
East Natuna Basin:	*Sangree 1981, Kraft and Sangree 1982, Eyles and May 1984, May and Eyles 1985, Franchino and Viotti 1986, Rudolph and Lehmann 1989, Mujito et al. 1995, Dunn et al. 1996, Bachtel et al. 2004, Raharja et al. 2013, Darman 2017.*

II. SUMATRA- SUNDALAND

II.1. Sumatra - General, Onshore geology, Volcanism, Minerals

Abdurrachman, M., M.E. Suparka, C.I. Abdullah, S. Piadhy & M. Latuconsina (2008)- Pre-Tertiary basement petrography: Suban Barat-1, South Sumatra. In: Sumatra stratigraphy workshop, Duri (Riau) 2005, Indon. Assoc. Geol. (IAGI), p. 115-125.
(Suban 1910 shallow gas discovery, 180km NW of Palembang. W Suban 1 well drilled 479m of hydrothermally altered granite- from 2771-3006m, and mainly granodiorite with some spilitic basalt and marble between 3010-3250m)

Abidin, H.Z. (2008)- Pb-Zn-Ag deposits at Tanjung Balit, Limapuluh Kota Regency, West Sumatera. J. Sumber Daya Geologi 18, 4, p. 253-263.
(online at: http://jgsm.geologi.esdm.go.id/index.php/JGSM/article/view/247/227)
(Epithermal Pb-Zn-Ag mineralization in district Limapuluh Kota, NNE of Padang, in metasediments of Tapanuli Gp/ Kuantan Fm (Permian). Veins up to 5m thick. Main ores sphalerite, chalcopyrite, pyrite, silver.)

Abidin, H.Z. (2010)- Characteristics of the Arai Granite associated with the iron ore and Zn-Cu-Pb deposits in Musi Rawas Regency, South Sumatera. J. Sumber Daya Geologi 20, 3, p. 133-146.
(online at: http://jgsm.geologi.esdm.go.id/index.php/JGSM/article/view/167/162)
(Cretaceous Arai Granite near Jangkat Village (SW of Jambi, S Sumatra), part of 'Rawas cluster' of mineralization. Intruded into Peneta and Rawas Fms. (or Kuantan/ Kluet Fm?). Tectonically part of 'Cathaysian' W Sumatra Block. I-type granite associated with skarn-like Zn-Cu-Pb limestone replacement. Chemistry suggest Volcanic Arc or syn-collisional tectonic environment)

Abidin, H.Z. & B.H. Harahap (2007)- Indikasi mineralisasi epitermal emas bersulfi da rendah, di Wilayah Kecamatan Bonjol, Kabupaten Pasaman, Sumatera Barat. J. Geologi Indonesia 2, 1, p. 55-67.
(online at: www.bgl.esdm.go.id/publication/index.php/dir/article_detail/184)
(Bonjol gold prospect, Pasaman District, N of Padang, W Sumatra, several ore bodies in E Miocene age (9.3-11.9 Ma; should be Late Miocene?;JTvG) altered rhyolitic volcanics of Gunung Amas Fm. Gold deposit probably of low sulphidation epithermal type)

Abidin, H.Z. & B.H. Harahap (2007)- Prospek emas Bonjol bersulfida rendah di Wilayah Kecamatan Bonjol, Kabupaten Pasaman, Sumatera Barat. J. Teknologi Mineral Batubara 15, 42, p. 1-9.
(Bonjol gold prospect paper, similar to above)

Abidin, H.Z. & T. Suwarti (2005)- Petrology and gochemistry of the Neogene granite in the Kerinci Regency Region, Jambi. Majalah Geologi Indonesia 20, 3, p. 155-164.
(Reprinted in 'Metalogeni Sundaland I (2014), p. 15-24. Mio-Pliocene Sungau Penuh granite pluton in Barisan Range, age 3.6- 13.9 Ma. S-type and transitional/ I-type granite, derived from island arc. Mineralization potential)

Abidin, H.Z. & Suyono (2004)- Indication of mineral deposit in the Kerinci Regency Region, Jambi. Majalah Geologi Indonesia 19, 3, p. 173-185.
(Reprinted in 'Metalogeni Sundaland I (2014), p. 3-13. Sulfide alteration in Hulu Simpang Fm volcanics ('Old Andesite') in Barisan Range W of Sungeipenuh, S Sumatra. Tied to granite with 3.6- 13.9 Ma fission track ages)

Abidin, H.Z. &.H. Utoyo (2014)- Mineralization of the selected base metal deposits in the Barisan Range, Sumatera, Indonesia (case study at Lokop, Dairi, Latong, Tanjung Balit and Tuboh). Indonesian Mining J. 17, 3, p. 122-133.
(online at: http://jurnal.tekmira.esdm.go.id/index.php/imj/article/view/316/199)
(Three types of base metal occurrences along Barisan Range: (1) skarn (e.g. Lokop, Latong, Tuboh) (2) sedimentary exhalative (sedex) (Dairi; in Kluet Fm) and (3) hydrothermal (Tanjung Balit; in Silungkang Fm)

Acocella, V., O. Bellier, L. Sandri, M. Sebrier & S. Pramumijoyo (2018)- Weak tectono-magmatic relationships along an obliquely convergent plate boundary, Sumatra, Indonesia. Frontiers Earth Sci. 6, 3, p. 1-20.
(online at: https://www.frontiersin.org/articles/10.3389/feart.2018.00003/full)
(Sumatra volcanic arc 48 active volcanoes; 46% within 10 km from dextral Great Sumatra Fault, which carries most horizontal displacement on overriding plate. Half of these show possible structural relation to GSF. Data suggest limited tectonic control of GSF on arc volcanism)

Adinegoro, U. & P. Hartoyo (1974)- Paleogeography of North East Sumatra. Proc. 3rd Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, p. 45-61.
(Broad Oligo-Miocene paleogeographic map of N Sumatra onshore, E of Barisan Range, between Tamiang River to N and Toba-Asahan River to S. Eo-Oligocene sediments in NE Sumatra basin 5000-7000m thick. With discussion of N Sumatra geology and stratigraphy

Adiwidjaja, P. & G.L. de Coster (1973)- Pre-Tertiary paleotopography and related sedimentation in South Sumatra. Proc. 2nd Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, p. 89-103.

Advokaat, E., M. Bongers, A. Rudyawan, M. Boudagher-Fadel, C.G. Langereis & D. van Hinsbergen (2018)- Early Cretaceous origin of the Woyla Arc (Sumatra, Indonesia) on the Australian plate. Earth Planetary Sci. Letters 487, p. 151-164.
(online at: https://www.sciencedirect.com/science/article/pii/S0012821X18300463)
((Paper retracted 2018, shortly after publication due to erroneous paleomag data) Intra-oceanic Woyla Arc formed above W-dipping subduction zone in E Cretaceous and accreted to W Sundaland in Mid-Cretaceous. Oceanic plate that existed between Woyla Arc and Sundaland now lost to subduction. Paleomagnetic results indicate Woyla Arc formed at equatorial latitudes, presumably on edge of Australian plate. Accretion of Woyla Arc to W Sundaland margin diachronous. Continuing convergence of Australia- Eurasia accommodated by subduction polarity reversal behind Woyla Arc, possibly recorded by Cretaceous ophiolites in Indo-Burman Ranges and Andaman-Nicobar Islands. Biostrat from limestones in Woyla Gp: N Sumatra Lamno and Raba Lst Late Jurassic- E Cretaceous, C Sumatra massive Indarung/Lubuk Peraku Lst Aptian- E Albian)

Advokaat, E., M. Bongers, D. van Hinsbergen, A. Rudyawan & E. Marshal (2017)- Paleomagnetic tests for tectonic reconstructions of the Late Jurassic- Early Cretaceous Woyla Group, Sumatra. EGU General Assembly 2017, Geophysical Research Abstracts 19, EGU2017-4720, 1p. *(Abstract only)*
(Woyla Arc exposed in W Sumatra mainly basaltic- andesitic volcanics, dykes, volcaniclastics and limestones with volcanic debris, interpreted as fringing reefs. Interpreted as remnants of E Cretaceous intra-oceanic arc. New preliminary paleomagnetic data from U Jurassic- Lower Cretaceous limestones suggest Woyla Arc formed near equatorial latitudes, precluding origin from Gondwana, and more likely intra-oceanic arc formed above SW dipping subduction zone in E Cretaceous, thrusted over W Sumatra margin in M Cretaceous)

Aernout, W.A.J. (1927)- Enkele nieuwere gegevens over de ertsafzettingen van Salida. De Mijningenieur 8, p. 73-76.
('Some newer data on the ore deposits of Salida'. W Sumatra gold-silver mine)

Aernout, W.A.J. (1927)- De ertsmijn Lebong Donok. De Mijningenieur 8, p. 162-177.
('The ore mine Lebong Donok'. Gold-silver mine in Barisan Mts of SW Sumatra)

Aldiss, D.T. & S.A. Ghazali (1984)- The regional geology and evolution of the Toba volcanotectonic depression, Indonesia. Quart. J. Geol. Soc., London, 141, 3, p. 487-500.
(Sumatra Late Quaternary Toba volcano-tectonic depression largest resurgent cauldron and one of largest ignimbrite fields (Toba Tuffs: 3000 km3 of acid tuffs over 20,000 km2). Greater part of Toba Tuffs single ignimbrite cooling unit, formed ~100,000 years ago. Toba depression formed after lithification of Toba Tuffs by collapse along regional faults. Resurgent uplift raised lake sediments in depression by 500 m. Eruption of Toba Tuffs and post-ignimbrite volcanism on line of W marginal fault of depression. This marginal fault once extended N offshore into zone of Miocene back-arc rifting)

Aldiss, D.T., R. Whandoyo, S.A. Ghazali & Kusyono (1983)- The geology of the Sidikalang and part of the Sinabang quadrangles (0618), Sumatra, 1:250,000. Geol. Res. Dev. Centre (GRDC), Bandung, 41p.
(North Sumatra map sheet with Lake Toba caldera. W of Lake Toba common Permian Tapanuli Gp (Kluet Fm metasediments, Alat Fm limestone intruded by large Sibolga Complex granites, E of Lake E Permian Bohorok Fm. Widespread cover of Toba Tuffs)

Alloway, B.V., A. Pribadi, J.A. Westgate, M. Bird, L.K. Fifield, A. Hogg & I. Smith (2004)- Correspondence between glass-FT and 14C ages of silicic pyroclastic flow deposits sourced from Maninjau caldera, west-central Sumatra. Earth Planetary Sci. Letters 227, p. 121-133.
(Concordant ages of 52±3 ka derived from glass-FT and 14C techniques for latest silicic eruptive activity at Maninjau caldera)

Amin, T.C., Kusnama, E. Rustandi & S. Gafoer (1993)- Geological map of the Manna and Enggano Sheets (0910, 0911), Sumatra, 1:250,000. Geol. Res. Dev. Centre (GRDC), Bandung.
(Geologic map of part of W coastal area of S Sumatra around Manna- Bintunan, and offshore Enggano Island (folded Miocene clastics). Manna area oldest rock Late Oligocene- E Miocene Hulusimpang andesitic volcanics, interfingering with latest Oligocene- M Miocene marine Seblat Fm clastics. NW-SE trending belt of rel. small and closely spaced Middle Miocene granites. Incl. fission track age of granite near Tanjungsakti of 9.5 ± 0.6 Ma)

Amin, T.C., Sidarto, S. Santosa & W. Gunawan (1994)- Geology of the Kotaagung Quadrangle, Sumatra. Geol. Res. Dev. Centre (GRDC), Bandung.
(Map sheet of SW corner of Sumatra, around Semangko Bay. In NE corner Late Paleozoic Gunungkasih meta-sediment complex, overlain by M Cretaceous Menanga Fmclastics with some limestone, chert and basalt (equivalent of Lingsing Fm of Gumai Mts?). Intruded by Late Cretaceous Padean and Curug granite intrusions (K-Ar ages 79-85 Ma; McCourt and Cobbing 1993) (part of Lampung High?))

Amiruddin (2011)- Tectonic rifting of Upper Paleozoic- Mesozoic intra-cratonic basins in the southeastern Gondwanaland and its economic aspects; with reference to the geology of North Sumatra and West Australia. J. Sumber Daya Geologi 21, 5, p. 249-255.
(online at: http://jgsm.geologi.esdm.go.id/index.php/JGSM/article/view/151/147)
(Lower Permian fluvio-marine glacial sediments of Bohorok Fm in Bohorok- Mentulu Basin of N Sumatra probably originally located in SE part of Gondwanaland. Occurrence of ultrapotassic Late Permian?- Triassic A-type Sibolga granite (radiometric ages 257, 217 Ma) may suggest rifting episode. Paleomag data from Nishimura & Suparka (1997) suggest paleolatitudes of ~47S?, possibly closest to NW Australian margin in Permian- Triassic)

Andi Mangga, S. (2000)- Amalgamasi mintakat pegungan Tigapuluh dengen mintakat Kuantan- Pegunungan Duabelas, Sumatra Bagian Selatan. J. Geologi Sumberdaya Mineral 10, 105, p. 12-18.
('Amalgamation between the Tigapuluh Mts zone with the Kuantan- Duabelas Mts zone, S Sumatra'. S Sumatra four amalgamated terrranes, separated by sutures: (1) Tigapuluh Mts, (2), Kuantan- Duabelas Mts, (3) Gumai-Garba and (4) Gunungkasih- Tanjungkarang. Kuantan- Duabelas Mts separated from Eurasia continent in pre-Triassic (Permian), drifted from N to S and collided with Gondwana-derived Tigapuluh Mts Terrane in Triassic, forming Proto-Sundaland. Paleomag position for N part Tigapuluh Mts = 41°S)

Andi Mangga, S. (2001)- Karakteristik dan genesa mintakat Gunungkasih- Tanjungkarang dan mintakat Gumai-Garba di daerah Lampung, Sumatera. J. Geologi Sumberdaya Mineral 11, 115, p. 2-8.
('Characteristics and genesis of the Gunungkasih- Tandjungkarang zone and Gumai-Garba zone in Lampung area, Sumatra'. Two terranes in S Sumatra of different origin: Tanjungkarang-Gunungkasih of Lampung High Paleozoic metamorphics (schist, amphibolite, quartzite, gneiss, etc.), probably tectonized in E Jurassic time and intruded by Cretaceous I-type granites. Gumai-Garba terrane collided with Sundaland in Late Jurassic-Cretaceous)

Andi Mangga, S., Amiruddin, T. Suwarti, S. Gafoer & Sidarto (1993)- Geological map of the Tanjungkarang Quadrangle (1110), Sumatra, 1:250,000. Geol. Res. Dev. Centre (GRDC), Bandung.
(SE Sumatra map sheet. With outcrops of old rocks of Lampung High at N end of Lampung Bay, SE corner of Sumatra. With Paleozoic? Gunung Kasih complex metamorphics (schist, gneiss, amphibolite schist, quartzite, marble, migmatitie), mid-Cretaceous Menanga Fm sediments with thin limestones with Orbitolina, interbedded with basalts and arc volcanics. Associated amphibolite schist 125-108 Ma. Intruded by large mid-upper Cretaceous Sulan granite (111, 113 Ma) and farther North Seputih granodiorite, others)

Andi Mangga, S., Sukardi & Sidarto (1993)- Geological map of the Tulung Selapan Quadrangle (1112), Sumatra, 1:250,000. Geol. Res. Dev. Centre (GRDC), Bandung.
(SE Sumatra map sheet of SE part of S Sumatra Basin, SE of Palembang. Mainly coastal plain swamp. In NW two small outcrops of light-colored ?Jurassic Bukit Batu biotite granite (with quartz-cassiterite veins; Crow and Van Leeuwen 2005; related to 'Main Range' Triassic- E Jurassic tin granites?; Gasparon and Varne 1995))

Andi Mangga, S., K. Sutisna & Suminto (1996)- Karakteristik batuan klastika Formasi Peneta dan kaitannya dengan indikasi minyak dan gas bumi. J. Geologi Sumberdaya Mineral 6, 52, p. 1-11.
('Characteristics of the Peneta Fm clastics and its relation to oil and gas indications'. Late Jurassic- Early Cretaceous clastics with limestone intercalations at NW side of Jambi/ S Sumatra basin.Mainly fine-grained in E, coarse in W. Q-F-L diagrams suggest sandstone derived from 'recycled orogen' and quartzose orogens. Vitrinite reflectivity rel. high (Ro typically between 1.2- 1.7%), i.e. in gas window)

Andi Mangga, S., Suminto, Suyoko & K. Sutisna (1996)- Lingkungan tektonik formasi Mengkarang di daerah Dusunbaru, Jambi. J. Geologi Sumberdaya Mineral 6, 60, p. 16-20.
('Tectonic setting of the Mengkarang Fm in the Dusunbaru area, Jambi'. Permian Mengkarang Fm sediments near Duabelas Mts with warm water fauna and Cathaysian flora, part of Kuantan- Duabelas Mts Terrane. In Late Carboniferous Bohorok- Tigapuluh Mts Terrane separated from Gondwana and moved N-ward, colliding with Kuantan- Tigapuluh (Duabelas?) Terrane in Triassic (evidenced by NW-SE trending strike slip fault contact). E Permian subduction activity in SW Sumatra produced tholeitic and basalto-andesitic volcanics in island arc setting known as Palepat Fm, changing to sedimentary facies of Mengkarang Fm in backarc basin. Q-F-L diagrams of Mengkarang Fm sandstones collected along Merangin River show dominant quartz %, with 'recycled orogen' and 'craton interior' provenance (contradicts volcanic arc setting?; JTvG))

Andi Mangga, S., S. Santosa & B. Hermanto (1993)- Geological map of the Jambi Quadrangle (1014), Sumatra, 1:250,000. Geol. Res. Dev. Centre (GRDC), Bandung.
(Geologic map of NE part of Jambi Basin, E of Jambi town. Many young surface anticlines, with oldest exposed rocks in core M-L Miocene Air Benakat Fm)

Andi Mangga, S.A. & Suyono (2007)- Perkembangan tektonik dan petrogenesis batuan ranitan Kapur hingga Tersier di daerah Lampung. In: Geologi Indonesia: dinamika dan produknya, Geol. Res. Dev. Centre (GRDC), Bandung, Spec. Publ. 33, 1, p. 69-82.
(Cretaceous- Tertiary granitoids exposed in Lampung, especially SE side of Barisan Mts. I and S type granites, volcanic arc granites and syn-collisional granites and volcanic rocks related to subduction)

Andrews, M. (2013)- The exploration, discovery and development of the Way Linggo epithermal gold-silver mine in Southern Sumatra. Proc. Symposium East Asia: Geology, exploration technologies and mines, Bali, Australian Inst. Geoscientists p. 3-4. *(Abstract only)*
(Way Linggo gold-silver mine in S Sumatra prodicing since 2010. At N end of Semangka Graben, a pull-apart basin with Trans Sumatra Fault in W and Semangka Fault in E. Low sulphidation epithermal vein system in porphyritic dacite host)

Anonymous (1918)- Mijnbouwkundig-geologisch onderzoek in Bengkoelen en Palembang, delen Rawas en Palembang. Verslagen Mededelingen Indische Delfstoffen en hare toepassingen, Dienst Mijnwezen Nederlandsch Oost-Indie, Bandung, 3, p. 1-62.

('Mining- geological investigations in Bengkulu and Palembang, Rawas and Palembang'. Surveys of iron, gold, silver occurrences in Barisam Mountains of S Sumatra in 1905-1915)

Anonymous (1921)- Uitkomsten van mijnbouwkundig-geologische verkenningen in Kerintji (Residentie Djambi). Verslagen Mededelingen Indische delfstoffen en hare toepassingen, Dienst Mijnbouw in Nederl. Oost-Indie, 13, p. 1-24.
('Results of geological-mining reconnaissance in Korinci (Jambi Residency)'. Brief review of geology (mainly summary of Tobler 1910: folded Permian sedments overlain by Tertiary sediments and Quaternary volcanic deposits) and of gold-silver occurrences in Barisan Mts of SW Sumatra. With 1:200,000 scale geologic map of Jambi part of Barisan Mts, Rawas 'Slate Mountains', Lake Korinci area, etc.))

Aribowo, S. (2018)- The geometry of pull-apart basins in the southern part of Sumatran strike-slip fault zone. Proc. Global Colloquium on GeoSciences and Engineering, Bandung 2017, IOP Conf. Series, Earth Environm. Science 118, 012002, p. 1-5.
(online at: http://iopscience.iop.org/article/10.1088/1755-1315/118/1/012002/pdf)
(On two lake-forming pull-apart basins between overstepping segments of Great Sumatra Fault zone in S Sumatra; Ranau and Suoh)

Aribowo, S., Munasri, M.M. Mukti, H. Permana & N. Supriatna (2016)- Geologi struktur pada daerah subduksi purba di Komplek Gunungkasih, Provinsi Lampung. In: R. Delinom et al. (eds.) Pros. Geotek Expo 2016, Pusat Penelitian Geoteknologi (LIPI), Bandung, p. 363-371.
(online at: http://pustaka.geotek.lipi.go.id/index.php/2017/10/05/prosiding-2016/)
('Structural geology of ancient subduction zone in the Gunungkasih Complex, Lampung Province')

Arsadi, E.M., S. Nishimura, Suwijanto & J. Nishida (1989)- Preliminary report on magnetotelluric (MT) survey crossing the Semangko fault zone in Sumatra. Geologi Indonesia (IAGI) 12, 1, p. 215-226.

Aspden, J.A., W. Kartawa, D.T.Aldiss, A. Djunuddin, D. Diatma, M.C.G. Clarke, R. Whandoyo & H. Harahap (1982)- Geologic map of the Padangsidempuan and Sibolga Quadrangles (0717), Sumatra, 1:250,000. Geol. Res. Dev. Centre (GRDC), Bandung.
(Map sheet at Sumatra W coast near Sibolga. Rel. widespread Late Paleozoic)

Aspden, J.A., B. Stephenson & N.R. Cameron (1982)- Tectonic map of northern Sumatra (1:500,000). Directorate of Overseas Surveys, Inst. Geol. Science, p. *(Unpublished)*

Aulia, K., R. Soeripto, D. Sudradjat & S.P. Silaban (1990)- Geo-traverse across Central Sumatra- Post Convention field trip, 1990. Indon. Petroleum Assoc. (IPA), p. 1-32.
(Pakanbaru to Padang fieldtrip guidebook, via Ombilin Basin)

Bachri, S., S. Andi Mangga, H. Panggabean, D.A. Agustiyanto & B. Hermanto (2004)- Genesis kompleks Sekampung, daerah Tanjungkarang, Lampung dengan penekanan data struktur lipatan dan nilai kemagnetan. J. Sumber Daya Geologi, 14, 2 (146), p. 93-101.
('Genesis of the Sekampung complex, Tanjung Karang area, Lampung, with emphasis on fold structures and the value of magnetism'. Pretertiary Way Sekampung complex of Lampung, S-most Sumatra, with isoclinally foliated metamorphic rocks (originally thin-bedded sediments) and I-type granitoids with high magnetic susceptibility)

Bachtiar, A., P.T. Setyobudi, S. Asyiah, A. Suleiman & P.A. Suandhi (2014)- Sedimentology and petrography of selected North Sumatra Pre-Tertiary formations: anticipating new petroleum systems in Western Indonesia. Proc. 3rd Int. Conf. Geological and Environmental Sciences, IPCBEE 73, Singapore, p. 35-39. *(Extended Abstract)*
(online at: www.ipcbee.com/vol73/008-ICGES2014-B0004.pdf)
(Paleozoic- Mesozoic stratigraphy of N Sumatra mainly part of East Sumatra (Sibumasu) Terrane. Divided into Carboniferous- E Permian Tapanuli Gp (Alas Fm, Kluet Fm, Bohorok Fm) and Permian- Triassic Peusangan

Gp (Pangururan Bryozoa Bed, Batumilmil Fm, Kaloi Fm, Kualu Fm). Deposited in deep marine (Triassic Sibaganding Lst with radiolarian limestone); shallow marine (Permian Batumilmil- Kaloi Fm limestone); moraine glacier and till (Bohorok pebbly mudstone); and shallow water (Kualu Mudstone with Halobia charlyana, Pangururan Bryozoa Bed). Source rock potential in Batumilmil and Kualu Mudstone)

Bachtiar, A., J.B. Unir, A. Bunyamin, H.I. Darmawan, F.H. Darmawan, F.H. Korah et al. (2014)- The Pre-Tertiary petroleum system in North Sumatra Basin: an integrated study from onshore North Sumatra outcrops and subsurface data from offshore West Glagah Kambuna. Proc. 38th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA14-G-175, 31p.
(On potential Pre-Tertiary 'basement' play in W Glagah Kambuna Block, offshore N Sumatra Basin, N of Medan. Basement of W Glagah Kambuna area probably mainly Permian-Triassic, similar to outcrops in W, which consist of Permian Tapanuli Gp and Batumilmil crinoidal Lst, and Triassic Kaloi Lst and Kualu Fm claystone (with Norian bivalve Halobia charlyana), which outcrop to W (all part of Sibumasu Block). (with some unusual K-Ar radiometric age dates of sedimentary rocks?; JTvG)

Barber, A.J. (2000)- The origin of the Woyla Terranes in Sumatra and the Late Mesozoic evolution of the Sundaland margin. J. Asian Earth Sci. 18, 6, p. 713-738.
(Jurassic-Cretaceous Woyla Gp of N Sumatra includes fragments of volcanic arcs and imbricated oceanic assemblage. Arc rocks intruded by granitic batholith and separated from original margin of Sundaland by oceanic assemblage. Arc assemblage underlain by continental basement. Quartzose sediments correlated with units in Paleozoic basement. Continental sliver separated from margin of Sundaland in Late Jurassic-Early Cretaceous in extensional strike-slip faulting regime, producing short-lived marginal basin. Separated Sikuleh and Natal microcontinents. In mid-Cretaceous extension followed by compression, crushing continental fragments back against Sundaland, with destroyed marginal basin now represented by imbricated oceanic assemblage. Volcanic assemblage and intrusive granites in Natal area part of Eocene-Oligocene volcanic arc. Radiolarian chert in Woyla Gp of Natal and Padang areas show it is part of Triassic- M Cretaceous ocean basin. Sikuleh microcontinent may be allochthonous and may have originated on N margin of Gondwana)

Barber, A.J. & M.J. Crow (2003)- An evaluation of plate tectonic models for the development of Sumatra. Gondwana Research 6, 1, p. 1-28.
(Greater part of Sumatra considered to form part of Sibumasu Block, which accreted to Indochina Block in Triassic. S part of Sibumasu divided into Malacca and Mergui microplates by Mutus Assemblage, which represents another suture. Permo-Carboniferous in N Sumatra with tilloids links Sumatra to Sibumasu Block in N. Permo-Carboniferous in C Sumatra contains Cathaysian flora and fauna which relates to Indochina Block and is associated with E Permian volcanic arc, which probably formed at margin of Cathaysian Block and was emplaced in present position by strike-slip faulting. Woyla Group is Jurassic- E Cretaceous oceanic volcanic arc, which was thrust over W margin of Sumatra in mid-Cretaceous)

Barber, A.J. & M.J. Crow (2005)- Pre-Tertiary stratigraphy. In: A.J. Barber, M.J. Crow & J.S. Milsom (eds.) Sumatra- geology, resources and tectonic evolution, Geol. Soc., London, Mem. 31, chapter 4, p. 24-53.
(Carboniferous- Cretaceous rocks widely exposed in Barisan Mts in W part of Sumatra. Rocks are variably metamorphosed and were termed the 'Barisan-Schiefer' and 'Old-Slates Formation' in C Sumatra, and 'Crystalline Schists' in Lampung area. Locally these rocks contain E Carboniferous and Permian fossils. Carboniferous- E Permian Tapanuli Gp clastics include 'glacial' unbedded pebbly mudstones)

Barber, A.J. & M.J. Crow (2005)- Structure and structural history. In: A.J. Barber, M.J. Crow & J.S. Milsom (eds.) Sumatra- geology, resources and tectonic evolution, Geol. Soc., London, Mem. 31, chapter 13, p. 175-233.

Barber, A.J. & M.J. Crow (2008)- The origin and emplacement of the West Burma- West Sumatra ribbon-continent. In: Proc. Int. Symp. Geoscience Resources and Environments of Asian Terranes (GREAT 2008), 4th IGCP 516 and 5th APSEG, Bangkok 2008, p. 18-21.
(online at: www.geo.sc.chula.ac.th/Geology/Thai/News/Technique/GREAT_2008/PDF/001.pdf)

(Combined W Burma-W Sumatra ribbon-continent has Cathaysian E Permian fauna and flora similar to S China and Vietnam. Became separated in M-L Permian from E margin of Cathaysia as thin continental sliver by formation of backarc basin. By M Triassic had moved along transcurrent fault system around Indochina into present position W of Sibumasu. In Miocene two blocks were separated by formation of Andaman Sea)

Barber, A.J. & M.J. Crow (2009)- The structure of Sumatra and its implications for the tectonic assembly of Southeast Asia and the destruction of Paleotethys. Island Arc 18, 1, p. 8-20.
(From E to W Malay Peninsula and Sumatra 3 continental blocks: (1) E Malaya with Cathaysian Permian fauna and flora; (2) Sibumasu (W Malay Peninsula and E Sumatra) with glaciogenic Late Carboniferous-Early Permian; (3) W Sumatra, also Cathaysian. Woyla nappe is intra-oceanic arc, thrust over W Sumatra block in M Cretaceous. Age of Sibumasu- East Malaya collision and destruction of Paleotethys Triassic? W Sumatra block derived from Cathaysia and emplaced against Sibumasu W margin by dextral transcurrent faulting. E Malaya block is part of Indochina block. W Burma block is extension of W Sumatra block, from which it separated by formation of Andaman Sea in Miocene. Woyla nappe correlated with Mawgyi nappe of Myanmar)

Barber, A.J., M.J. Crow & M.E.M de Smet (2005)- Tectonic evolution. In: A.J. Barber, M.J. Crow & J.S. Milsom (eds.) Sumatra- geology, resources and tectonic evolution, Geol. Soc., London, Mem. 31, chapter 14, p. 234-259.
(Review of crustal blocks of Sumatra and proposed models of assembly)

Barber, A.J., M.J. Crow & J.S. Milsom (eds.) (2005)- Sumatra: geology, resources and tectonic evolution. Geol. Soc., London, Mem. 31, p. 1-290.
(Major overview of Sumatra geology and mineral occurrences)

Barton, M.D., C. Kieft, E.A.J. Burke & I.S. Oen (1978)- Uytenbogaardtite, a new silver-gold sulfide. Canadian Mineralogist 16, p. 651-657.
(New mineral uytenbogaardtite (Ag_3AuS_2) from hydrothermally-altered Tertiary andesitic rocks of Tambang Sawah, Bengkulu District, W Sumatra)

Bassoulet, J.P. (1989)- New micropaleontological data on some Upper Jurassic- Lower Cretaceous limestones of Sumatra. In: H. Fontaine & S. Gafoer (eds.) The Pre-Tertiary fossils of Sumatra and their environments, CCOP Techn. Publ. TP 19, Bangkok, p. 227-241.
(Latest Jurassic- basal Cretaceous limestones with Pseudocyclammina lituus from N Sumatra (Tapaktuan, Raba Lamno) and S Sumatra (Tembesi Basin). Also Early Cretaceous limestone with primitive orbitolinids from Gumai Mts, S Sumatra. All representative of 'Woyla Terranes'?; JTvG))

Baumberger, E. (1922)- Uber die Valanginienfauna von Pobungo auf Sumatra. Eclogae Geol. Helvetiae 16, 5, p. 581-582
(online at: www.e-periodica.ch/digbib/view?pid=egh-001:1920-1922:16#598)
('On the Valanginian fauna from Pobungo on Sumatra' (Jambi Basin). Brief report on Lower Cretaceous (Valanginian) fossils from thick shales in Barisan Mts, collected by Tobler in Jambi area. Mainly small ammonites, like Neocomites neocomiensis and N. pseudo-pexiptychus/platycostatus, Kilianella, etc., and Nucula and Arca-like bivalves. Typical Early Cretaceous 'Mediterranean' fauna. See also Baumberger 1925)

Baumberger, E. (1925)- Die Kreidefossilien von Dusun Pobungo, Batu Kapur-Menkadai und Sungi Pobungo (Djambi, Sumatra). Verhandelingen Geologisch-Mijnbouwkundig Genootschap Nederland Kol., Geol. Serie 8 (Verbeek volume), p. 17-47.
(Lower Cretaceous fossils collected by Tobler in 1907 from 3 Jambi localities. Dark folded shales with ammonites (Neocomites neocomiensis, N. teschensis, Thurmannites spp.), bivalves (Cardita, Amussium, Nucula, Arca) and gastropods (Nerinea) of Valanginian age in Dusun Pobungo and Batu Kapur show open marine facies with European 'alpine' and Himalayan (Spiti) affinities. Breccious calcareous sandstones with Nerinea in Sungi Pobungo also similar to European Valanginian species ('Himalayan Province' of Uhlig 1911))

Beaudouin, T., O. Bellier & M. Sebrier (1995)- Segmentation et alea sismique sur la grande faille de Sumatra (Indonesie). Comptes Rendus Academie Sciences, Paris 321, 409-416.
('Segmentation and seismic hazard along the Great Sumatran Fault, Indonesia')

Beauvais, L. (1983)- Jurassic Cnidaria from the Philippines and Sumatra. CCOP Techn. Bull. 16, p. 39-76.
(Brief descriptions of poorly preserved Upper Jurassic coral and stromatoporoids fauna from Indarung, E of Padang, W Sumatra, incl. Cladocoropsis (placed in Lovcenipora by Renz 1926, but different), Actinostroma, etc. (also described by Yancey and Alif (1977). Coral- stromatoporoid (Cladocoropsis) faunas related to those described from Japan and Tethys Also M and U Jurassic corals from reefal limestones in Philippines)

Beauvais, L. (1985)- Donnees nouvelles sur les calcaires ŕecifauxô du Jurassique superieur de Sumatra. Mem. Soc. Geologique France, n.s., 147, p. 21-27.
('New data on the 'reefal' limestones of the Upper Jurassic of Sumatra')

Beauvais, L. (1989)- Upper Jurassic Madreporia and calcisponges of Sumatra. In: H. Fontaine & S. Gafoer (eds.) The Pre-Tertiary fossils of Sumatra and their environments, CCOP Techn. Publ. 19, Bangkok, p. 243-297.
(Taxonomic descriptions of diverse Upper Jurassic coral and calcisponge assemblages from N Sumatra, C Sumatra (Tembesi River) and Gumai Mts (S Sumatra). Incl. occurrences of Late Jurassic Tethyan reefal sponge Cladocoropsis mirabilis Felix 1907 from Gumai Mts., Jambi, Aceh))

Beauvais, L., M.C. Bernet-Rolande & A.F. Maurin (1985)- Re-interpretation of pre-Tertiary classical reefs from Indo-Pacific Jurassic examples. In: Proc. 5th Int. Coral Reef Symposium, Tahiti, 6, p. 581-586.
(M-U Jurassic carbonates of Thailand, Sumatra and Philippines not classic reefs, but mud mounds. Corals and calcareous sponges (Cladocoropsis) present, but often in mud matrix and main rock-building organisms are algae of Baccinellid- Lithocodium- stromatolite consortium. C Sumatra, Tembesi River mounds assembled in clusters at different bathymetric levels)

Beauvais, L., M.C. Bernet-Rolande & A.F. Maurin (1989)- Microfacies analysis of the Triassic limestone of Sibaganding. In: H. Fontaine & S. Gafoer (eds.) The Pre-Tertiary fossils of Sumatra and their environments, CCOP Techn. Publ. 19, Bangkok, p. 195-204.
(Massive Triassic reefal limestones at Sibaganding, N of Prapat, Lake Toba area, N Sumatra with branching corals, calcisponges (Cladocoropsis?) and stromatolites in carbonate mud matrix; see also Vachard 1989)

Beauvais, L., M.C. Bernet-Rolande & A.F. Maurin (1989)- Microfacies analysis of the Upper Jurassic limestones of Sumatra. In: H. Fontaine & S. Gafoer (eds.) The Pre-Tertiary fossils of Sumatra and their environments, CCOP Techn. Publ. 19, Bangkok, p. 299-309.
(Upper Jurassic limestones of Sumatra with common corals but are not true reefs. Most species thin, in sediments with high mud content)

Beauvais, L., P. Blanc, M.C. Bernett-Rollande & A.F. Maurin (1988)- Sedimentology of Upper Jurassic deposits in the Tembesi River area, Central Sumatra. Bull. Geol. Soc. Malaysia 22, p. 45-64.
(online at: https://gsmpubl.files.wordpress.com/2014/09/bgsm1988003.pdf)
(Tembesi River area interbedded black limestone with U Jurassic corals and black shales-sandstones. 'Tethyan' corals in limestones indicate Kimmeridgian in Padang area, and Tithonian age in Jambi area. With Stylosmilia corallina and Cladocoropsis mirabilis. U Jurassic corals of Sumatra do not build true reefs, but form mud-mounds, probably due to terrigenous sediments coming from nearby continent)

Beauvais, L., H. Fontaine, S. Gafoer & J.R. Geyssant (1989)- The Cretaceous. In: H. Fontaine & S. Gafoer (eds.) The Pre-Tertiary fossils of Sumatra and their environments. CCOP Techn. Publ. 19, Bangkok, p. 313-319.
(Cretaceous rel. common on Sumatra, especially S Sumatra. Lower Cretaceous limestones hard to distinguish from Upper Jurassic. Upper Cretaceous may be absent. Two areas with E Cretaceous Orbitolina in S Sumatra)

Beauvais, L., H. Fontaine, Suharsono & D. Vachard (1984)- The Pretertiary palaeontology of the Sarolangun sheet, 1:250,000, South Sumatra. CCOP Newsletter, p.

Beck, M.E. (1983)- On the mechanism of tectonic transport in zones of oblique subduction. Tectonophysics 93, p. 1-11.
(Sumatra oblique subduction created strike-slip fault that traverses magmatic arc)

Beddoe-Stephens, B., J.A. Aspden & T.J. Shepherd (1983)- Glass inclusions and melt compositions of the Toba Tuffs, Northern Sumatra. Contrib. Mineralogy Petrology 83, p. 278-287.
(Glass (melt) inclusions in quartz and feldspar phenocrysts in Toba Tuff ignimbrites all highly evolved, rhyolitic compositions, identical to glass forming matrix of rocks. Ignimbritic magmas at Toba erupted from ~3-4 kms depth and represent silicic cap to batholithic body consolidating beneath Toba caldera)

Beddoe-Stephens, B., T.J. Shepherd, J.F.W. Bowles & M. Brook (1987)- Gold mineralization and skarn development near Muara Sipongi, West Sumatra, Indonesia. Economic Geology 82, p. 1732-1749.
(Gold-mineralized skarns along Sumatra Fault Zone near Muara Sipongi, W Sumatra, mined in Pagaran Siayu mine before WW II. Hosted in Permo-Triassic limestones and andesitic volcanics, into which Late Jurassic I-type diorites and granodiorites intruded in volcanic arc-related environment. Rb-Sr dating of emplacement of Muara Sipongi batholith 158 ±23 Ma)

Bellier, O., H. Bellon, M. Sebrier, Sutanto & R. Maury (1999)- K/Ar age of the Ranau tuffs: implications for the Ranau caldera emplacement and slip-partitioning in Sumatra (Indonesia). Tectonophysics 312, p. 347-359.
(Great Sumatran dextral Fault follows approximately magmatic arc, where major calderas are installed. Ranau caldera tuff sample yielded K-Ar ages of 0.55±0.15 Ma for separated feldspars, which places major Ranau caldera collapse between 0.7- 0.4 Ma)

Bellier, O. & M. Sebrier (1994)- Relationship between tectonism and volcanism along the Great Sumatran Fault zone deduced by SPOT image analyses. Tectonophysics 233, p. 215-231.
(Satellite images provide evidence for numerous stepovers, pull-apart grabens and volcanic structures along NW-trending right-lateral Great Sumatran Fault Zone. Geometry of strike-slip fault evolves through time. Huge volcanic calderas in large releasing stepover fault zones and bounding faults of rectangular pull-apart basins are analogous to circular ring faults of calderas. Toba caldera elongated parallel to present trace of Great Sumatran Fault and associated with wide pull-apart basin not active at present)

Bellier, O. & M. Sebrier (1995)- Is the slip rate variation on the Great Sumatran Fault accommodated by fore-arc stretching? Geophysical Research Letters 22, p. 1969-1972.
(Along Great Sumatran Fault zone, which is associated with oblique convergent Sunda subduction system, a N-ward increase of slip rate, from <10mm/yr near Sunda Strait to ~20mm/yr near Lake Toba to >40mm/yr in Andaman Sea. Transpressional back-arc deformation accommodates part of slip rate variation while no significant fore-arc stretching is observed. Oblique convergence may be accommodated by deformation of 500 km wide zone, from fore-arc toe back-arc domains)

Bellier O., M. Sebrier & S. Pramumijoyo (1991)- La grande faille de Sumatra: geometrie, cinematique et quantite de deplacement mises en evidence par l'imagerie satellitaire.Comptes Rendus Academie Sciences, Paris, 312, 2, p. 1219-1226.
('The Great Sumatra fault zone: kinematics and amount of displacement as shown by satellite imagery'. Satellite image analysis of S part of fault zone suggests right-lateral strike slip motion at ~6 ± 4 mm/yr)

Bellier, O., M. Sebrier, S. Pramumijoyo, T. Beaudouin, H. Harjono, I. Bahar & O. Forni (1997)- Paleoseismicity and seismic hazard along the Great Sumatran Fault (Indonesia). J. Geodynamics 24, p. 169-183.
(Great Sumatran Fault is 1650-km-long dextral strike-slip fault zone which accommodates part of oblique convergence of subduction between Indo-Australian and Eurasian plates. Segmentation map shows 18 major fault segments (45-200 km long). Historical seismicity 17 earthquakes since 1835. N-ward increase of segment lengths, which parallels GSF slip-rate increase. Seismic gap of 300 km between 3-5°N)

Bellon, H., R.C. Maury, Sutanto, R. Soeria-Atmadja, J. Cotton & M. Polve (2004)- 65 m.y.-long magmatic activity in Sumatra (Indonesia), from Paleocene to Present. Bull. Soc. Geologique France 175, 1, p. 61-72.
(NW-SE volcanic arc location closely follows Great Sumatran Fault Zone (GSFZ). K-Ar ages show magmatic activity from Paleocene (~63 Ma) until Present. Spatial distribution increased at ~20 Ma, possibly connected to development of GSFZ. Position of Plio-Quaternary magmatic rocks shifted away from trench by few 10's of km relative to Paleogene- Miocene arcs, consistent with Cenozoic tectonic erosion of Sundaland margin. Samples display typical subduction-related signatures, but no clear geochemical trends. Lack of regular variations reflects complex igneous petrogenesis where contribution of Sundaland continental crust overprinted those of mantle wedge and subducted slab)

Bennett, J.D. (1978)- The structure and metamorphism of Sumatra North of latitude 38°N. In: Proc. Second Symposium Integrated Geological Survey North Sumatra, 1977, Directorat Min. Resources, Bandung, Indonesia, 3, 1, p. 5-19.

Bennett, J.D., D. McC Bridge, N.R. Cameron, A. Djunuddin, S.A. Ghazali, D.H. Jeffrey, W. Kartawa et al. (1981)- The geology of the Calang Quadrangle, Sumatra (1:250,000). Geol. Res. Dev. Centre (GRDC), Bandung, 15p.
(NW Sumatra sheet, mainly occupied by Late? Cretaceous Sikuleh Batholith, surrounded by Woyla Group, incl. Tangse serpentinite)

Bennett, J.D., D. McC Bridge, N.R. Cameron, A. Djunuddin, S.A. Ghazali, D.H. Jeffery et al. (1981)- Geologic map of the Banda Aceh Quadrangle, Sumatra, 1:250,000. Geol. Res. Dev. Centre (GRDC), Bandung.
(With Tangse serpentinite and Indrapura Complex melange. Incl. Woyla Group with thick Late Jurassic- E Cretaceous Lamno Lst with Pseudocyclammina lituus above similar age Bentaro Volcanics magmatic arc basalts, unconformably overlain by Oligocene and younger Tangla Fm clastics, etc.)

Berman, A.E. (2005)- Northern Sumatra earthquake: 40 years of ignoring plate tectonics. First Break 23, 3, p. 77-85.

Bonhomme, M., J. Philibert & Y. Vialette (1960)- Table des ages apparents determines en 1959 par la methode au plombe-alpha et par la methode au strontium. Travaux Lab. Geol. Min. Fac. Sciences Clermont-Ferrand, Serie documentation, 2, p.
('Table of apparent ages determined in 1959 by the Lead-alpha method and by the Strontium method'. Early radiometric age dating results, including for Lassi biotite granite of C Sumatra: zircon 99 Ma, Rb-Sr 135± 55 and 112± 25 Ma. Latter number believed to be most reliable (= mid-Cretaceous; Klompe 1962))

Booi, M.(2017)- Innovation and stasis: gymnosperms from the early Permian Jambi flora. Ph.D. Thesis Leiden University, p. 1-220.
(parts online at: https://openaccess.leidenuniv.nl/handle/1887/57351)
(E Permian (296 Ma) 'Cathaysian' Jambi Flora from outcrops near Bangko in Sumatra characterized by plant groups known from classic coal swamp floras, as well as newly emerging groups that would play important role in vegetations of Permian era. Latter group with ecology generally drier than swamp flora species. Quantitative morphologic analysis of early gymnosperm woods suggests no individual species can be discerned)

Booi, M., I.M. van Waveren & J.H.A. van Konijnenburg-van Cittert (2009)- *Comia* and *Rhachiphyllum* from the early Permian of Sumatra, Indonesia. Review Palaeobotany Palynology 156, p. 418-435.
(E Permian flora from Mengkarang Fm of Jambi with Comia, Rhachiphyllum, Supaia-like material and Autunia fructification, corroborating peltasperm affinity. Material shows strong relationships with N China and even Angaran region, but no Gondwanan elements, suggesting migration zone running from N China Block to W Sumatra- W Myanmar terrane)

Booi, M., I.M. van Waveren & J.H.A. van Konijnenburg-van Cittert (2009)- The Jambi gigantopterids and their place in gigantopterid classification. Botanical J. Linnean Soc. 161, 3, p. 302-328.

(online at: https://academic.oup.com/botlinnean/article/161/3/302/2418339)
(Two gigantopterid species/genera from E Permian Mengkarang Fm of Jambi, originally described by Jongmans & Gothan 1935 as Gigantopteris bosschana (reclassified to Gothanopteris by Koidzumi 1936) and G. mengkarangensis (reclassified to Palaeogoniopteris by Koidzumi 1936). Similar to other gigantopterids, but not directly related. Possible scenario for evolution of gigantopterid leaf morphology)

Booi, M., I.M. van Waveren & J.H.A. van Konijnenburg-van Cittert (2014)- Wood anatomical variability in Early Permian ǵaraucarioidsǥ. Int. Assoc. Wood Anatomists (IAWA) J. 35, 3, p. 307-331.
(E Permian from Merangin River with rel. common gymnosperm wood (one trunk 2.4m high), also some angiosperm woods (Dipterocarpaceae). Some are upright tree trunks up to 3.4 m tall in encased in pyroclastic deposits Anatomical analysis of araucarioid wood from E Permian Mengkarang Fm of Jambi, Sumatra, Indonesia. Many species of Araucarioxylon described in literature, but woods from Mengkareng Fm form contiguous micromorphological unit in which no individual species can be distinguished)

Booi, M., I.M. van Waveren, J.H.A. van Konijnenburg-van Cittert & P.L. de Boer (2008)- New material of *Macralethopteris* from the Early Permian Jambi flora (Middle Sumatra, Indonesia) and its palaeoecological implications. Review Palaeobotany Palynology 152, p. 101-112.
(New material of E Permian Jambi flora. Comparison with related Cathaysian and Euramerican species show isolated occurrence of alethopterid genus Macralethopteris in Cathaysian region)

Boomgaart, L. (1948)- Tectonics and ore deposits of Mangani (Sumatra). Geologie en Mijnbouw 10, 11, p. 293-298.
(online at: https://drive.google.com/file/d/0B7j8bPm9Cse0bDRJVnhGMkVyWG8/view)
(Critical discussion of De Haan (1933) monograph on Mangani ore deposits in Barisan Mts and new map of ore-bearing veins)

Bora, D.K., K. Borah & A. Goyal (2016)- Crustal shear-wave velocity structure beneath Sumatra from receiver function modeling. J. Asian Earth Sci. 121, p. 127-138.
(Shear velocity structuremodel of crust of Sumatra region. Large variations of sediment thicknesses (3-7 km). Crustal thickness beneath Sumatra mostly between 27-35 km, except beneath Nias island (19 km))

Bowles, J.F.W. (1984)- The distinctive low-silver gold of Indonesia and Malaysia. In: R.P. Foster (ed.) The geology, geochemistry and genesis of gold deposits, Geol. Soc. Zimbabwe, Spec. Publ. 1, p. 249-260.

Bowles, J.F.W., N. Cameron, B. Beddoe-Stephens & R.D. Young (1984)- Alluvial gold, platinum, osmium-iridium, copper-tin and copper-zinc alloys from Sumatra- their composition and genesis. Trans. Inst. Mining Metallurgy, London, 93, p. B23-B30.

Bowles, J.F.W., B. Beddoe-Stephens, M.C.G.Clarke, A. Djunuddin, S.A. Ghazali & Miswar (1985)- Precious metal mining prospects in northern Sumatra. In: Proc. Asian Mining '85 Conf., London, Inst. Mining Metallurgy, p. 173-184.

Bronto, S., P. Asmoro, G. Hartono & S. Sulistiyono (2012)- Gunung api purba di daerah Bakauheni- Pulau Sangiang, Selat Sunda, Kabupaten Lampung Selatan. J. Geologi Sumberdaya Mineral 22, 1, p. 3-14.
(online at: http://jgsm.geologi.esdm.go.id/index.php/JGSM/article/view/102/94)
('Paleovolcanoes in the Bakauheni area- Sangiang Island, Sunda Strait, South Lampung Regency'. Three paleovocanoes in N Sunda Straits, along planned Sunda Strait bridge route between Merak- Bakauheni)

Brouwer, H.A. (1915)- Erosieverschijnselen in puimsteentuffen der Padangsche Bovenlanden. Tijdschrift Kon. Nederlands Aardrijkskundig Genootschap (2), 32, p. 338-345.
(online at: https://babel.hathitrust.org/cgi/pt?id=mdp.39015078113514;view=1up;seq=378)
('Erosional features in pumice tuffs of the Padang Highlands'. On formation of canyons in soft pumice formations near Fort De Kock, etc.)

Brouwer, H.A. (1915)- Uber einen Granitkontakthof in Mittelsumatra. Geol. Rundschau 5, p. 551-554.
(online at: https://www.digizeitschriften.de/dms/img/?PID=GDZPPN000452483)
('About a granite contact zone in Central Sumatra'. Hornfels contactmetamorphism rich in biotite at contact between granite and adjacent shales, between Rakan and Lubuk Bandhara))

Brouwer, H.A. (1915)- On the granitic area of Rokan (Middle Sumatra) and on contact-phenomena in the surrounding schists. Proc. Kon. Nederl. Akademie Wetenschappen, Amsterdam 17, 3, p. 1190-1202.
(online at: www.dwc.knaw.nl/DL/publications/PU00012756.pdf)

Brouwer, H.A. (1915)- Bijdrage tot de geologie van Boven Kampar- en Rokan streken (Midden Sumatra). Jaarboek Mijnwezen 42 (1913), Verhandelingen, p. 130-170.
('Contribution to the geology of the Upper Kampar and Rokan areas (C Sumatra)'. Early review of C Sumatra surface geology, incl. unfossiliferous Pretertiary micaschists, schistose claystones and sandy quartzites and granites and poorly dated Tertiary sediments, incl ?Eocene quartz sandstones with coal. Also undated conglomeratic rocks with clasts of quartz/quartzite and common radiolarian cherts, reminescent of rocks on Malay Peninsula. With brief report on Neogene mollusc from Padang Highlands by Tesch))

Brouwer, H.A. (1915)- Pneumatolytic hornfels from the hill countries of Siak (Sumatra). Proc. Kon. Nederl. Akademie Wetenschappen, Amsterdam, 18, 1, p. 584-591.
(online at: www.dwc.knaw.nl/DL/publications/PU00012536.pdf)
(Contact-metamorphic hornfelsels near contact with tourmaline-bearing granites (without biotite?) in hill countries of Siak with common tourmaline. Also alluvial tin ores in area)

Brouwer, H.A. (1916)- On the post-Carboniferous age of granites of the highlands of Padang. Proc. Kon. Akademie Wetenschappen, Amsterdam, 18, 2, p. 1513-1520.
(online at: www.dwc.knaw.nl/DL/publications/PU00012618.pdf)
(Contact metamorphism of Carboniferous (should be E Permian) fusulinid limestone around granites demonstrates younger age of granites of Padang Highlands)

Bucking, H. (1912)- Zur Geologie von Nord und Ost-Sumatra. Sammlungen Geol. Reichs-Museums Leiden, ser. 1, 8, p. 1-101.
(online at: www.repository.naturalis.nl/document/552376)
('On the geology of North and East Sumatra'. Geological observations during 1899 visit to N Sumatra. With contribution by Tornquist on 'probably Carboniferous-age' coral (Lophophyllum vermiforme n. sp., Zaphrentis?) and brachiopod Martinia glabra from red limestones along Besitang River (=Permian?; JTvG))

Budiharto, R. (1985)- Effects of the Indian Ocean plate convergent to the Central and South Sumatra Basin during Tertiary. Proc. Ann. Conv. Indon. Assoc. Geol. (IAGI), Jakarta, p.

Burhan, G., W. Gunawan & Y. Noya (1993)- Geologic map of the Menggala Quadrangle (1111), Sumatra, 1:250,000. Geol. Res. Dev. Centre (GRDC), Bandung.
(Map sheet in SE corner of Sumatra. Mainly coastal plain, with oldest rocks M-L Miocene Muaraenim Fm)

Burton, P.W & T.R. Hall (2014)- Segmentation of the Sumatran fault. Geophysical Research Letters 41, 12, p. 4149-4158.
(Segmentation of Sumatran fault zone reconstructed from earthquakes. Fault has 16 earthquake clusters, with segment lengths from 22- 196 km. Eight great central segments, distributed symmetrically about Lake Maninjau, dominate e hazard, which is less in far north because segments are shorter)

Cameron, N.R. (1981)- The geological framework of Northern Sumatra. Berita Direkt. Geologi, Geosurvey Newsletter 4, p. 37-39.

Cameron, N.R. (1981)- The regional tectonic setting of Sumatra. In: Proc. Second Symposium Integrated geological survey of northern Sumatra, Bandung, Bull. Direct. Mineral Resources Indonesia, 1981, 3B, p. 137-150.

Cameron, N.R., J.A. Aspden, D.McC. Bridge, A. Djunuddin, S.A. Ghazali, H. Harahap et al. (1982)- Geologic map of the Medan Quadrangle (0619), Sumatra, 1:250,000. Geol. Res. Dev. Centre (GRDC), Bandung.
(Map sheet in N Sumatra, with in SW partly metamorphosed Permo-Carboniferous clastics and oolitic limestones of Kluet, Bohorok and Alas Fms of Tapanuli Gp. In E flanked by folded Tertiary basin with Telaga Said oilfield)

Cameron, N.R., J.A. Aspden, Miswar & H.H. Syah (1981)- Geologic map of the Tebingtinggi Quadrangle (0719), Sumatra, 1:250,000. Geol. Res. Dev. Centre (GRDC), Bandung.
(Map sheet at E coast of Central Sumatra. All Quaternary volcanics and alluvium)

Cameron, N.R., J.D. Bennett, D.McC. Bridge, M.C.G.Clarke, A. Djunuddin, S.A. Ghazali et al. (1982)- The geology of the Tapaktuan Quadrangle (0519), Sumatra, 1: 250,000. Geol. Res. Dev. Centre (GRDC), Bandung, 19p. + map
(N Sumatra sheet S of Takengon sheet, with complex Barisan Mts geology. Widespread metamorphic Permian Kluet and Alas Fms, intruded by Permian Sibubung and other intrusives. Flanked in W by folded Late Jurassic-E Cretaceous Tapaktuan basaltic volcanics with calcilutite limestone member)

Cameron, N.R., J.D. Bennett, D.McC. Bridge, M.C.G.Clarke, A. Djunuddin, S.A. Ghazali et al. (1983)- The geology of the Takengon Quadrangle (0520), Sumatra, 1: 250,000. Geol. Res. Dev. Centre (GRDC), Bandung, 26p. + map
(NW Sumatra map sheet with complex Barisan Mts geology, with Late Permian- Triassic metamorphics with Tawar Fm reefal limestones, Late Permian Situtup Fm volcanics, Permian Kluet Fm, occurrences of Woyla Group with basalts, serpentinite, red chert and Late Jurassic reefal Sise Lst with Pseudocyclammina, Montlivaltia, Myriopora, etc., etc)

Cameron, N. R., M.C.G. Clarke, D.T. Aldiss, J.A. Aspden & A. Djunuddin (1980)- The geological evolution of Northern Sumatra. Proc. 9th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, p. 149-187.
(Three pre-Tertiary and one Tertiary- Recent volcano-sedimentary sequences, separated by unconformities. Late Paleozoic Tapanuli Gp primarily clastic, probably Permian glaciomarine. Two deformation periods. Metamorphism prior to deposition of Peusangan Gp Late Permian volcanic arc assemblage (E-dipping subduction) and M-L Triassic back-arc succession. Late Mesozoic Woyla Gp volcanic arc rocks and dismembered ophiolite with back-arc basin cover sequence. Late Cretaceous basin closure and Tertiary low angle plate convergence resulted in deformation of Woyla Group ophiolite. Since at least Late Eocene N Sumatra volcanic arc activity, with sedimentation in fore-arc. Last event, contemporary with start of Andaman Sea sea-floor spreading, led to rise of Barisan Mts in Pleistocene and growth of Sumatran Fault System. Serpentinites from Woyla Group ophiolite emplaced from latest Miocene)

Cameron, N.R. & A. Djunuddin (1980)- The occurrence and structural evolution of a dismembered late Mesozoic ophiolite in N. Sumatra, Indonesia. Geologi Indonesia (J. Indon. Assoc. Geologists IAGI) 7, 1, p. 8-16.

Cameron, N.R., A. Djunuddin, S.A. Ghazali, H. Harahap, W. Keats, W. Kartawa, Miswar, H. Ngabito et al. (1981)- Geologic map of the Langsa Quadrangle, 1:250,000. Geol. Res. Dev. Centre (GRDC), Bandung.
(Map sheet at NE coast of N Sumatra. Mainly Cenozoic basin with late folding, with oilfields in anticlines. At W margin Barisan Mts front with Oligocene sediments over Permian granodiorite and Permo-Triassic Sembuang and Kaloi Limestones, E Permian Bohorok Fm low metamorphic 'pebbly mudstones' and Kluet Fm metasediments with Serbajadi Batholith, etc. Kaloi Lst with Permian trilobites Phillipsia, Neoproetus indicus; (Tesch 1916). Barber et al. 2005, p. 43: Massive limestones in Woyla Group W and SW of Banda Aceh, interpreted as fringing reefs of volcanic islands. With corals (Actinastraea, Stylosmilia), algae (Clypeina,

Permocalculus, Thaumatoporella parvovesiculifera, Boueina) and foraminifera (Pseudocyclammina lituus), indicating Late Jurassic- E Cretaceous age. Also E Oligocene (?) Tampur Limestone outcrops)

Cameron, N.R., S.A. Ghazali & S.J. Thompson (1982)- Geologic map of the Bengkalis Quadrangle (0917), Sumatra, 1: 250,000. Geol. Res. Dev. Centre (GRDC), Bandung.
(Quaternary deposits of Coastal plain of C Sumatra Basin and part of Karimun Besr Island with Permian and Triassic granite intrusives and Mesozoic (Rhaetian- Jurassic? Bintang Fm clastics and conglomerates

Cameron, N.R., S.A. Ghazali & S.J. Thompson (1982)- Geologic map of the Siaksriindrapura and Tandjung Pinang Quadrangles (0916-1016), Sumatra, 1: 250,000. Geol. Res. Dev. Centre (GRDC), Bandung.
(Geologic map of Central Sumatra basin coastal plain, with oil fields Beruk, Zamrud, Merbau, etc., and Pulau Kundur islands group in Malacca Straits (mainly granite))

Cameron, N.R., W. Kartawa & S.J.Thompson (1982)- Geologic map of the Dumai and Bagansiapiapi Quadrangles (0817), Sumatra, 1: 250,000. Geol. Res. Dev. Centre (GRDC), Bandung.
(Geologic map of part of C Sumatra Basin, with Duri, Petani and many other oilfields. Oldest rocks Oligocene Pematang Fm in core of anticline)

Caron, M.H. (1917)- Korte mededeelingen over Indische delfstoffen. Het zilver-gouderts voorkomen van Ajer Gedang Ilir, afdeeling Lebong der residentie Benkoelen, Sumatra. Jaarboek Mijnwezen Nederlandsch Oost-Indie 44 (1915), Verhandelingen 2, p. 55-69.
('The silver-gold occurrence of Ayer Gedang Ilir, Lebong, Benggkulu' Three gold-silver-bearing veins in propylitised volcanic breccia, 9 km N of Rejang Lebong mine)

Carthaus, E. (1902)- Uber Goldlagerstatten in Niederlandisch Indien, nebst Beobachtungen uber den Aufbau des Gebirges im Flussgebiet des oberen Gadis (Sumatra). Tijdschrift Kon. Nederlands Aardrijkskundig Genootschap, ser. 2, 19, p. 581-586.
('On gold deposits in the Netherlands Indies, with observations on the structures of the mountains in the Upper Gadis drainage area, Sumatra')

Chambers, M.J.G. & A. Sobur (1975)- The rates and processes of recent coastal accretion in the province of South Sumatra, a preliminary study. In: Regional Conf. Geology, Mineral Hydrocarbon Resources of Southeast Asia, Jakarta 1975, Indon. Assoc. Geol. (IAGI), p.
(Palembang had open sea access 700 years ago, now 70km inland, suggesting coastal accretion of ~100m/ yr)

Chesner, C.A. (1998)- The Toba Tuffs and caldera complex, Sumatra, Indonesia: insights into magma bodies and eruptions. Ph.D. Thesis Michigan Technological University, p. 1-428.
(Since 1.2 Ma, a magma chamber of batholithic proportions developed under the 100x30 km Toba Caldera Complex. Four eruptions from vents within present collapse structure document growth of laterally continuous magma body which eventually erupted 2800 km2 Youngest Toba Tuff at 75 ka)

Chesner, C.A. (1998)- Petrogenesis of the Toba Tuffs, Sumatra, Indonesia. J. Petrology 39, p. 397-438.
(online at: http://petrology.oxfordjournals.org/content/39/3/397.full.pdf+html)
(In last 1-2 my, at least 3400 km3 of magma erupted in four ash flow tuff units from Toba Caldera Complex. Fourth eruption at 74 ka was largest, producing 2800 km3 of magma and caldera of 100 x 30 km. First phase dacite, successive eruptions rhyodacite-rhyolite with up to 40% crystals of quartz, sanidine, plagioclase, biotite and amphibole. Much of crystallization of quartz-bearing tuffs between 700-760°C at depths of 10 km. Dense welding of all units except top of youngest unit, and thick rhyodacitic magma in collapsing calderas)

Chesner, C.A. (2012)- The Toba caldera complex. Quaternary Int. 258, p. 5-18.
(online at: http://pages.mtu.edu/~raman/VBigIdeas/Supereruptions_files/Toba%20QI.pdf)
(Review of Toba Caldera, N Sumatra. During past 1.3 My Toba erupted intermediate lavas, followed by intermediate pyroclastics. Three quartz-bearing silicic tuffs, followed by intermediate to silicic lavas.

Apparent migration of activity to W. Oldest Toba Tuff with 40Ar/39Ar age of 840 ka (Diehl et al., 1987). Middle Toba Tuff ~500ka age? Youngest Toba Toff age 74 ka)

Chesner, C.A. & A.D. Ettlinger (1989)- Composition of volcanic allanite from the Toba Tuffs, Sumatra, Indonesia. American Mineralogist 74, p. 750-758.
(Toba Tuffs with common accessory allanite (monoclinic member of epidote group), which is rare or absent in most volcanic rocks. Allanite compositions vary with magma composition and temperature)

Chesner, C.A. & J.F. Luhr (2010)- A melt inclusion study of the Toba Tuffs, Sumatra, Indonesia. J. Volcanology Geothermal Res. 197, p. 259-278.
(Quartz-rich Pleistocene Toba Tuff with melt inclusions indicating that parental melts were high-silica rhyolites, with 74.5- 77% SiO2)

Chesner, C.A. & W.I. Rose (1991)- Stratigraphy of the Toba tuffs and the evolution of the Toba caldera complex, Sumatra, Indonesia. Bull. Volcanology 53, p. 343-356.
(During past 1.2 Ma magma chamber of batholithic proportions developed under 100 x 30 km Toba Caldera Complex, N Sumatra. Four eruptions occurred within present collapse structure, which formed from eruption of Youngest Toba Tuff (YTT) at 74 ka. Calderas of three older tuffs obscured by collapse and resurgence resulting from YTT eruption. Samosir Island composed of thick YTT caldera fill, whereas Uluan Block consists mainly of Oldest Toba Tuff (OTT). Toba eruptions document growth of laterally continuous magma body)

Chesner, C.A., W.I. Rose, A. Deino, R. Drake & J.A. Westgate (1991)- Eruptive history of Earth's largest Quaternary caldera (Toba, Indonesia) clarified. Geology 19, 3, p. 200-203.
(Two youngest Toba tuffs dated as ~73 and 501 Ma. Timing of youngest and largest eruption coincident with early Wisconsin glacial advance)

Clarke, M.C.G. & B. Beddoe-Stephens (1987)- Geochemistry, mineralogy and plate tectonic setting of a Late Cretaceous Sn-W granite from Sumatra, Indonesia. Mineralogical Magazine 51, 3, p. 371-387.
(online at: www.minersoc.org/pages/Archive-MM/Volume_51/51-361-371.pdf)
(Hatapang granite in N Sumatra S-type two-mica granite with Sn and W mineralization. Rb-Sr and biotite K-Ar ages of 80 Ma, emplaced in Tapanuli Gp Carboniferous-Triassic greywackes with diamictites. Identification of Cretaceous Sn-W granite in N Sumatra provides link with economically important Late Cretaceous Sn-W granites in Thailand and Burma)

Clarke, M.C.G., S.A. Ghazali, H. Harahap, Kusyono & B. Stephenson (1982)- Geologic map of the Pematangsiantar Quadrangle (0718), Sumatra, 1:250,000. Geol. Res. Dev. Centre (GRDC), Bandung.
(Geologic map of sheet between N and C Sumatra basins, E of Laka Toba. In Barisan Mts below Toba volcanic cover mainly Permian conglomeratic Bohorok Fm and finer Tapanuli Gp, intruded by Permo-Triassic? (or Cretaceous?) Hatapang and other granites. With remnants of Miocene- Pliocene sediments)

Clarke, M.C.G., W. Kartawa, A. Djunuddin, E. Suganda & M. Bagdja (1982)- Geologic map of the Pakanbaru Quadrangle (0816), Sumatra, 1:250,000. Geol. Res. Dev. Centre (GRDC), Bandung.
(C Sumatra map sheet. Most of map Cenozoic C Sumatra basin around Pakanbaru, with Minas Field. Oldest rocks in Barisan Mts Permo-Carboniferous Kuantan and Bohorok Fms with Triassic granite intrusives. Overlain by Miocene Sihapas and Telisa Fms))

Cobbing, E.J. (2005)- Granites. In: A.J. Barber, M.J. Crow & J.S. Milsom (eds.) Sumatra- geology, resources and tectonic evolution, Geol. Soc., London, Mem. 31, chapter 5, p. 54-62.
(Sumatra many granite units within batholiths such as Lassi, Bungo and Garba, as well as numerous isolated plutons. Carboniferous-Permian and Late Triassic-E Jurassic cycles of syn-post collisional granites, peaking at 220-200 Ma, with tin granites. Younger plutonism associated with arc volcanism, broad age range: 203-5 Ma)

Costa, A., V.C. Smith, G. Macedonio & N.E. Matthews (2014)- The magnitude and impact of the Youngest Toba Tuff super-eruption. Frontiers Earth Sci. 2014, 2, 16, p. 1-8.

(online at: http://journal.frontiersin.org/article/10.3389/feart.2014.00016/full)
(Model of ash distribution and volume of Youngest Toba Tuff, erupted 75,000 years ago. Eruption dispersed ~8600 km3 of ash (= ~3800 km3 dense rock equivalent/ DRE), covering ~40 million km2 with >5 mm of ash. Total volume (incl. 1500 km3 DRE pyroclastic density current deposits on Sumatra) was ~5300 km3 DRE)

Crippa, G., L. Angiolini, I. Van Waveren, M.J. Crow, F. Hasibuan, M.H. Stephenson & K. Ueno (2014)- Brachiopods, fusulines and palynomorphs of the Mengkarang Formation (Early Permian, Sumatra) and their palaeobiogeographical significance. J. Asian Earth Sci. 79, p. 206-223.
(Brachiopods, fusulines and palynomorphs from Lower Permian Mengkarang Fm, Jambi, part of W Sumatra Block Volcanic Arc deposits. Brachiopods 6 genera (mainly Stereochia aff. S. irianensis, and Neochonetes carboniferus, also Marginifera, Reticulatia, etc.), mainly anti-tropical taxa (but here grouped with warm water taxa rather than with cold water taxa from Gondwanan-Perigondwanan region). Fusulinids at one level at Teluk Gedang (poor assemblage of 6 species, mainly Pseudofusulina rutschi Thompson, also Eostaffella, Schubertella, Pseudoschwagerina cf. afghanensis, P. meranginensis, Eoparafusulina ?haydeni), rel. poor assemblage of widespread genera but of tropical Tethyan affinity due to common occurrence large schwagerinids. Most likely age Sakmarian, but E Artinskian age cannot be excluded. Palynomorphs dominated by Laevigatosporites spp., Florinites florini and Convolutispora sp., different from coeval assemblages of Gondwanan region, but affinity with Cathaysian province as represented in N China, etc.)

Crispin, S., J. Hertrijana & P. Albert (2015)- Exploration success at the Martabe gold mine, Indonesia. In: Proc. PACRIM 2015 Congress, Hongkong, Australasian Inst. of Mining and Metallurgy (AusIMM), Melbourne, Publ. Ser. 2/2015, p. 567-572. *(Extended Abstract)*
(Large Martabe gold mine SE of Sibolga near W coast of N Sumatra province, producing since mid-2012. Martabe deposit cluster of 6 high-sulfidation epithermal deposits in ~8 x 1.5 km N-S corridor. Limited geology)

Crow, M.J. (2005)- Pre-Tertiary volcanic rocks. In: A.J. Barber, M.J. Crow & J.S. Milsom (eds.) Sumatra- geology, resources and tectonic evolution, Geol. Soc., London, Mem. 31, chapter 6, p. 63-85.
(Long range of volcanic activity in Sumatra, mainly arc volcanics: Carboniferous, Permian (W Sumatra belt), Triassic, Jurassic-Late Cretaceous (oceanic volcanic arc in Woyla terrane, associated with limestones). Most widespread E-M Permian and Late Jurassic- Early Cretaceous)

Crow, M.J. (2005)- Tertiary volcanicity. In: A.J. Barber, M.J. Crow & J.S. Milsom (eds.) Sumatra- geology, resources and tectonic evolution, Geol. Soc., London, Mem. 31, chapter 8, p. 98-119.
(Well-defined Paleocene- E Eocene 'Kikim Volcanics' (65-50 Ma) in S Sumatra, Late M Eocene along W coast, 50-46 Ma non-volcanic interval, Late Eocene- E Oligocene volcanic episode (~37-30 Ma), Late E- M Miocene arc volcanics along W coast and high K- shoshonitic intrusions in C Sumatra back arc basin, Late Miocene-Pliocene (6-1.6 Ma; mainly in Sumatra, contemporaneous with back-arc inversion at ~5 Ma?) (for Sumatra Quaternary volcanism see Gasparon 2005))

Crow, M.J., C.C. Johnson, W.J. McCourt & Harmanto (1993)- The simplified geology and known metalliferous mineral occurrences, Padang Quadrangle, Southern Sumatra. Direct. Mineral Resources, Bandung/ British Geol. Survey, Spec. Publ. 49-B, p. 1-18.
(Brief review of W Sumatra Padang map sheet geology and metallic mineral occurrences (Au-Ag, Cu, Pb-Zn). With old gold-silver mines Mangani, Balimbing, Pamicikan, Pagadis, etc., in epithermal quartz veins, associated with Plio-Pleistocene andesitic volcanics and young extensional faults. Also Pb-Zn anomalies at Salodako NNE of Padang near skarn associated with Tertiary granite)

Crow, M.J., C.C. Johnson, W.J. McCourt & Harmanto (1993)- The simplified geology and known metalliferous mineral occurrences, Solok Quadrangle Southern Sumatra. Direct. Mineral Resources, Bandung/ British Geol. Survey, Spec. Publ. 50-B, p. 1-19.
(Summary of SW Sumatra Solok quad geology and metallic mineral occurrences (Cu, Au, Ag, Fe). Gold-silver in quartz veins hosted in Oligo-Miocene volcanics, copper mineralization in hydrothermal veins (Timbulan) and limestone skarns and alluvial gold deposits in Bengkalis area)

Crow, M.J., C.C. Johnson, W.J. McCourt & Harmanto (1993)- The simplified geology and known metalliferous mineral occurrences, Painan Quadrangle, Southern Sumatra. Direct. Mineral Resources, Bandung/ British Geol. Survey, Spec. Publ. 52-B, p. 1-30.
(Painan Sheet of W Sumatra with basement of Carboniferous? and Permo-Triassic metasediments (with Permian arc volcanism, deep marine Triassic), Late Triassic- Jurassic granitoids, late Jurassic- E Cretaceous metalimestones and clastics (Woyla Gp), also serpentinite bodies. Unconformably overlain by Oligocene and younger sediments and volcanics. With listing of metallic mineral occurrences)

Crow, M.J., C.C. Johnson, W.J. McCourt & Harmanto (1993)- The simplified geology and known metalliferous mineral occurrences, Sungaipenuh and Ketaun Quadrangles, Southern Sumatra. Direct. Mineral Resources, Bandung/ British Geol. Survey, Spec. Publ. 54-B, p. 1-17.
(SW Sumatra map sheets, with active Lebong Tandai gold-silver mine in mineralized breccia in Ketaun Quad. Oldest rock is extreme NE corner: M Permian volcanics of Palepat Fm, intruded by laterst Triassic- E Jurassic Tantan Granite. M-L Jurassic flysch-type Asai Fm and shallow marine Late Jurassic- E Cretaceous Peneta Fm (part of Woyla Gp foreland to island arc). With listing of metallic mineral occurrences (Cu, Pb, Zn, Au, Ag))

Crow, M.J., C.C. Johnson, W.J. McCourt & Harmanto (1994)- The simplified geology and known metalliferous mineral occurrences, Bengkulu Quadrangle Southern Sumatra. Direct. Mineral Resources, Bandung/ British Geol. Survey, Spec. Publ. 57-B, p. 1-19.
(Map sheet dominated by Tertiary- Recent volcanic products of Barisan Range. In SE corner Gumai Mts with remnants of Late Mesozoic subduction Complex, similar to Woyla Gp in N Sumatra. With many former mines of Lebong Mining District, active between ~1906-1941. Etc. With listing of metallic mineral occurrences (Au, Ag, Pb, Zn, Cu))

Crow, M.J., C.C. Johnson, W.J. McCourt & Harmanto (1994)- The simplified geology and known metalliferous mineral occurrences, Manna Quadrangle (0911), Southern Sumatra. Direct. Mineral Resources, Bandung/ British Geol. Survey, Spec. Publ. 59-B, p. 1-19.
(SW Sumatra map sheet dominated by Tertiary- Recent volcanic products of Barisan Arc and flanking Bengkulu forearc basin. With listing of metallic mineral occurrences (Au, Pb- Zn, Ag, Cu), mainly around Tanjungsakti of Sumatra Fault Zone)

Crow, M.J., W.J. McCourt & Harmanto (1994)- The simplified geology and known metalliferous mineral occurrences, Rengat Quadrangle, southern Sumatra (0915). Direct. Mineral Resources, Bandung/ British Geol. Survey, Spec. Publ. 51-B, p. 1-22.
(SE Sumatra map sheet with oldest exposed rocks metasediments and NW-SE striking low metamorphic Permo-Carboniferous Tigapuluh Gp meta-clastics and limestones (probaby correlative to glacial or debris flow Bohorok Fm of N Sumatra). Intruded by porphyritic granitoids with K-Ar ages from ~198-128 Ma (most whole rock radiometric ages too young; granites may be slightly younger (earliest Jurassic) continuation of Late Triassic (~220 Ma) Main Range-equivalent S-type granites of Malay Peninsula). Three deformation phases. Many small alluvial Sn, W(cassiterite) occurrences near granites of Tigapuluh Mts in S, Au occurrences in W. Also primary cassiterite veins in greisen at Sungei Isahan granite))

Crow, M.J., W.J. McCourt & Harmanto (1994)- The simplified geology and known metalliferous mineral occurrences, Muarabungo and Jambi Quadrangles Southern Sumatra. Direct. Mineral Resources, Bandung/ British Geol. Survey, Spec. Publ. 53-B, p. 1-19.
(Oldest rocks exposed in Tigapuluh Mts: NW-SE striking low metamorphic Permo-Carboniferous Tigapuluh Gp meta-clastics and limestones, intruded by Late Triassic- E-M Jurassic granitoids (K-Ar mineral ages ~198, 180 Ma). With Permian pebbly mudstones, probaby correlative to glacial Bohorok Fm of N Sumatra. Etc. With listing of metallic mineral (Sn, Au) deposits (rel. common alluvial cassiterite, but non-economic))

Crow, M.J., W.J. McCourt, C.C. Johnson & Harmanto (1994)- The simplified geology and known metalliferous mineral occurrences, Baturaja Quadrangle, Southern Sumatra. Direct. Mineral Resources, Bandung/ British Geol. Survey, Spec. Publ. 60-B, p. 1-19.

(Oldest rocks exposed in Baturaja Sheet in Garba Mts and are ?Carboniferous- Mesozoic metasediments. Mesozoic of Garba Mts includes highly tectonized late Jurassic- E Cretaceous radiolarian cherts, associated with metavolcanics, melange and ultrabasic rocks; can be correlated with Lingsing series of Gumai Mts and oceanic sequences of Woyla Gp. Granitoids along E side of Barisan Range of M-L Cretaceous age (115-80 Ma), postdating accretion of Woyla Gp. With listing of metallic (Au, Ag, Sn) mineral deposits)

Crow, M.J. & T.M. van Leeuwen (2005)- Metallic mineral deposits. In: A.J. Barber, M.J. Crow & J.S. Milsom (eds.) Sumatra- geology, resources and tectonic evolution, Geol. Soc., London, Mem. 31, chapter 12, p. 147-174.
(Review of Paleozoic- Neogene mineral deposits of Sumatra: Paleozoic lead-zinc, Late Triassic- E Triassic tin granites, Late Cretaceous tin, gold, Mio-Pliocene arc magmatism with copper, molybdenum, silver, gold)

Crow, M.J. & I.M. Van Waveren (2010)- A preliminary account of the Karing Volcanic Complex in the Permian West Sumatra Volcanic Arc. In: C.P. Lee et al. (eds.) 6th Symp. Int. Geol. Correl. Progr. Project 516 (IGCP516), Geological anatomy of East and South Asia, Kuala Lumpur 2010, p. 36 *(Abstract only)*
(Karing Volcanic Complex, host of E Permian Cathaysian 'Jambi Flora', is eroded remnant of subaerial volcanic complex on margin of Permian W Sumatra volcanic arc. Mineralogy of complex entirely volcanic provenance, with no 'continental' mineral components. Olivine basalts and dacitic pyroclastics may support E-M Permian oceanic island arc within W Sumatra Block)

Crow, M.J., I.M. Van Waveren & S.K. Donovan (2008)- Tobler's oyster and the age of the Tabir Formation, Jambi Province, Central Sumatra. Geological Journal 44, 1, p. 117-121.
(Tabir Fm of Jambi long considered to be Upper Jurassic, based on small molluscs collected by Tobler and assigned to Ostrea by Frech. These are not oysters and other fauna/flora show Tabir Fm is Late Permian)

Crow, M.J., I.M. Van Waveren & F. Hasibuan (2015)- Two Hg-Au occurrences in the West Sumatra Permian volcanic-plutonic arc West of Bangko in Sumatra, Indonesia. In: Proc. PACRIM 2015 Congress, Hongkong, Australasian Inst. of Mining and Metallurgy (AusIMM), Melbourne, Publ. Ser. 2/2015, p. 573-578. *(Presentation)*
(online at: http://www.pacrim2015.ausimm.com.au/Media/PACRIM2015/presentations/Day%202/1415%20-%20Au-Hg%20Sumatra_PACRIM.pdf)
(Two Hg-Au occurrences W of Bangko in W Sumatra Permian Volcanic Plutonic Arc: (1) Melipun Hg-Au occurrence, exploited in 1970's, with mineralisation in hydrothermally altered cupola of buried intrusion; (2) Salak Hg-Au occurrence in outcrop of Asselian Dusunbaru pluton/ volcanic center, likely within caldera in which (Triassic?) hydrothermal mineralisation developed. Both formed late in history of volcanic arc, probably Triassic- E Jurassic)

Dahlius, A.Z., A. Purba & H. Wibowo (2007)- Geology and alteration-mineralization characteristics of Timbaan epithermal gold deposit in South Solok, West Sumatra, Indonesia. Proc. Joint Conv. 32nd HAGI, 36th IAGI and 29th IATMI, Bali, p. 1339-1346.

Da Silva Carvalho, H., Purwoko, Siswoyo, M. Thamrin & V. Vacquier (1980)- Terrestrial heat flow in the Tertiary basin of Central Sumatra. Tectonophysics 69, p. 163-188.
(Heat flow in C Sumatra basin of calculated from 92 wells. Average T gradient 3.7 °F/ 100 ft (67.6°C/km) and average heat flow of 3.27 ± 0.93 HFU, twice world average. Gradient and heat flow vary inversely with depth. Heat flow in N Sumatra basin, S Sumatra Basin, Sunda Strait and W Java is 2.5 HFU, while in Java E of 110°E it drops to 1.9 HFU)

Davies, P.R. (1989)- Tectonics of North Sumatra. In: B. Situmorang (ed.) Proc. 6th Regional Conf. Geology mineral hydrocarbon resources of Southeast Asia (GEOSEA VI), Jakarta 1987, IAGI, p. 207-227.
(*Tertiary structural evolution of N Sumatra basin described as consequence of position along trailing edge of Sunda Plate. Oblique convergence during Eocene- E Oligocene caused N-propagating dextral overstepping wrench faults along W edge of plate. Counterclockwise rotating Sunda microplate, starting in Late Oligocene.*

E-M Miocene uplift, followed by rapid subsidence. Second phase of CCW rotation in late M Miocene. LateM Miocene regional compression with Barisan Mts uplift and regressive sedimentation across N Sumatra basin)

De Haan, W. (1918)- Herinneringen aan mijnbouwkundig exploratiewerk in het Zuiden der Residentie Tapanoeli (een bijdrage tot de geschiedenis van de Nederlandsch-Indischen mijnbouw). Verhandelingen Geologisch-Mijnbouwkundig Genootschap Nederland Kol., Mijnbouwkundig Ser.1, p. 229-296.
('Memories of mining exploration work in the South of the Tapanuli Residency (a contribution to the history of Netherlands Indies mining)'. Report on 1910-1913 survey work for 'Midden Sumatra Exploratie Maatschappij' in W Sumatra. Account of personal and historic prospecting work on ore deposits in late 1800's- early 1900's)

De Haan, W. (1929)- De Mangani breccia. De Mijningenieur 10, 3, p. 62-65.

De Haan, W. (1935)- Gesteeenten van Sumatraǫs Westkust. De Ingenieur in Nederlandsch-Indie (IV), 3, 10, p. 88-97.
('Rocks of Sumatra's West coast'. Descriptions of igneous and metamorphic rocks from W Sumatra: Salida, Fort de Kock, Soeliki, Mangani. No maps or figures)

De Haan, W. (1942)- Over de stratigraphie en tektoniek van het Mangani gebied (Sumatra's Westkust). Geologie en Mijnbouw 4, 2, p. 21-31.
(online at: https://drive.google.com/file/d/0B7j8bPm9Cse0OXNPRVdRWFNfaUU/view)
('On the stratigraphy and tectonics of the Mangani area, West coast of Sumatra')

De Haan, W. (1942)- Hydrothermale veranderingen te Mangani. Geologie en Mijnbouw 4, 9-10, p. 65-77.
(online at: https://drive.google.com/file/d/0B7j8bPm9Cse0M2J4MHJoQVhiZ1E/view)
('Hydrothermal alterations at Mangani'. Mangani volcanics in Mangani gold mine in Barisan Mts of Sumatra probably part of 'Old Andesites'. Multiple phases of hydrothemal alteration in gabbro, basalt, andesites and dacites. No figures)

De Haan, W. (1943)- Over de goud-zilververhouding in the jonge edelmetaalformatie op Sumatra. Geologie en Mijnbouw 5, 5-6, p. 33-47.
(online at: https://drive.google.com/file/d/1igqddPxVjZzDN8aWW_der3FAZe6UxZ7M/view)
('On the gold-silver ratio in the young precious metals formation on Sumatra'. Highly variable gold-silver ratios in young precious metal deposits of Barisan Mts of Sumatra (But generally much more silver). Formed probably in Late Miocene. Silver-rich veins appear to be from higher parts of igneous systems and generally associated with granodiorites, gold-rich veins from deeper parts and and more granitic compositions)

De Haan, W. (1943)- Gissingen omtrent de geologische gesteldheid in de omgeving van het Singkarak meer. Geologie en Mijnbouw 5, 11-12, p. 86-89.
(online at: https://drive.google.com/file/d/1O4CV_zUaki3dQOBEe8iaNPEyrDoJK8DV/view)
('Speculations on the geology of the area of Singkarak Lake'. Mainly descriptions of granitoid rocks in Delft collection, collected by Verbeek around Lake Singkarak, W Sumatra. No figures)

De Haan, W. (1948)- The Mangani vein system. Geologie en Mijnbouw 10, 11, p. 298-300.
(online at: https://drive.google.com/file/d/0B7j8bPm9Cse0bDRJVnhGMkVyWG8/view)
On mineralization at Mangani gold mine district, C Sumatra. Presents alternative interpretation of tectonics of Mangani gold-silver region to that of Boomgaart (1948))

De Haan, W. (1948)- Raadselachtige ertsvondsten ter Sumatra's westkust (Pagadis). Geologie en Mijnbouw 10, 12, p. 325-327.
(online at: https://drive.google.com/file/d/1udDmKuje2-QNnT1aVuwwItPV_lYZOGCd/view)
('Mysterious ore discoveries at Sumatra's West coast'. Occurrence of silver and gold float of enigmatic origin at Pagadis, W coast of Sumatra, in 1910)

De Haan, W. (1949)- Bevat Sumatra porphyry coppers? Geologie en Mijnbouw 11, 5, p. 162-164.

(online at: https://drive.google.com/file/d/1v14MEpc91FtsXSyltIFg0O2l2MjkSkZ7/view)
('Does Sumatra contain porphyry coppers?'. Possible presence of copper porphyries at depth near Soelit Ajer, E of Lake Singkarak. Region with granite intruded into Triassic sediments, probably during Cretaceous. Copper ores disseminated in granite and intruded sediments of no economic significance. No figures)

De Haan, W. (1950)- De ertsafzettingen bij Moeara Sipongi (Tapanoeli, Sumatra). Geologie en Mijnbouw 12, 2, p. 61-67.
(online at: https://drive.google.com/file/d/0B7j8bPm9Cse0dk9TUHlaUEs2dk0/view)
('The ore deposits near Moeara Sipongi (Tapanuli, Sumatra)'. Gold-bearing minralization in limestones and sandstones)

De Haan, W. (1954)- De Tertiaire ertsgangtektoniek op Sumatra. Geologie en Mijnbouw 16, 1, p. 1-7.
(online at: https://drive.google.com/file/d/0B7j8bPm9Cse0aXROSlVpbXN0a1U/view)
('The Tertiary ore vein tectonics of Sumatra'. Directions of mineralized joint systems in Sumatra usually N-NE trending abd steeply E-dipping, suggesting pressure normal to the axis of Sumatra (N50° E))

De Haan, W. (1956)- Dekblad of autochtoon in het Ombilin gebied (Sumatra). Geologie en Mijnbouw 18, 6, p. 199.
('Nappes or autochthonous in the Ombilin region, C Sumatra'. Brief commentary on Osberger (1955) paper on postulated nappe structure of Java)

De Haan, W., C. Schouten & P.M. Matthijsen (1933)- Monografie van de ertsafzettingen te Mangani (Sumatra) op de concessies der Mijnbouw-Maatschappij "Aequator". Verhandelingen Geologisch-Mijnbouwkundig Genootschap Nederland Kol., Mijnbouwkundig Ser. 3, p. 1-212.
('Monograph on the ore deposits at Mangani (Sumatra) on the concessions of the Aequator mining company'. Detailed descriptions of geology, rocks, mineralization and mine development of Mangani mine, West Sumatra, 185km from Padang (first discovered in 1907). Associated with M Miocene or younger Mangani andesitic-basaltic volcanics. Multiple mineralization events. Gold in veins in steeply folded Miocene shales, related to Plio-Pleistocene volcanism (?))

De Meyier, J.E. (1911)- De goud- en zilvermijn Salida ter Sumatras Westkust. Indische Gids 33, p. 28-67.
('The gold and silver mine Salida at Sumatra's west coast')

De Neve, G.A. (1949)- *Mizzia* in Palaeozoische gesteenten uit de omgeving van Palembang. Chronica Naturae, Batavia, 106, 9, p. 224-225.
(M Permian dasyclad calcareous algae Mizzia velebitana Pia in grey-black limestone from two localities at Bukit Pendopo, S Sumatra, collected by Keil in 1931. Associated with fusulinids Fusulina and Neoschwagerina. (also known from Guguk Bulat, Padang Highlands (Pia 1935, Fontaine 1983))

De Neve, G.A. (1961)- Mesozoic orogenies in the island of Sumatra and their ore deposits. Proc. 9th Pacific Science Congress, Bangkok 1957, Geology and Geophysics 12, p. 116. *(Brief abstract only)*
(Two two main periods of orogenesis tied to economic ore-deposits in Sumatra: (1) cassiterite, gold, wolframite and bauxite deposits in Upper Jurassic tectonic unit, called Malayan orogen by Westerveld; (2) Cretaceous tectonic unit in Sumatra with iron ore and gold-silver deposits of the so-called Sumatran orogen)

De Neve, G.A. (1961)- Correlation of fusulinid rocks from southern Sumatra, Bangka, and Borneo, with similar rocks from Malaya, Thailand and Burma. Proc. 9th Pacific Science Congress, Bangkok 1957, Geology and Geophysics 12, p. 249. *(Abstract only)*
(Four occurrences of U. Paleozoic rocks with fusulinids in Indonesia: (1) U Paleozoic pebbles with Fusulina spp. in Lower Tertiary conglomerate in Kutai, E Kalimantan (Tan Sin Hok 1930); (2) Permo-Carboniferous Fusulinidae in limestones, marbles and combustible shales from W Borneo found by Krekeler (1932, 1933); (3) Two localities of limestone with Neoschwagerina and Fusulina spp. in Palembang area, S Sumatra, (3a) E of Bukit Pendopo, discovered by Keil and (3b) 18 km W of Palembang, in Sekaju area pebbles with fusulinids in

Old Neogene conglomerate by Van Tuyn (1931) and (4) silicified limestones and fine crystalline quartzites with fusulinids of Sungailiat area near Aerduren, Bangka island collected by de Roever)

De Neve, G.A. (1983)- Quaternary volcanism and other phenomena attributed to volcanicity in the Aceh region North Sumatra. Proc. 12th Ann. Conv. Indon. Assoc. Geol. (IAGI), p. 67-90.

De Neve, G.A. (1984)- Pleistocene- Holocene volcanism of Aceh (North Sumatra). Berita Geologi 16, 18, p. 150-158.

De Neve, G.A. (1993)- Preliminary outline of the inventory on the old workings and recent mining for gold and/or other precious metals in the Aceh North and West Sumatra Provinces. Proc. 22nd Ann. Conv. Indon. Assoc. Geol. (IAGI), Bandung, 2, p. 926-936.
(Listing of old mining sites and prospects in Sumatra N of Equator. Alluvial gold mined in Sumatra for centuries)

De Roever, W.P. (1966)- Dacitic ignimbrites with upwards increasing compactness near Sibolangit (NE Sumatra, Indonesia) and their peculiar hydrology. Bull. Volcanologique 29, 1, p. 105-112.
(Water springs between Medan and Brastagi from level about half way up in massive, 150-200m thick layer of ignimbrite or ash-flow tuff of Quaternary age, here called Sibolangit Tuff. Ignimbritic biotite-hypersthene-hornblende dacite vitrophyre- tuff, very hard in upper part, with gradual transition to rather loose at base)

Detourbet, C. (1995)- Analyse des relations entre la Grande Faille de Sumatra (Indonesie) et les structures compressives del lôarriere arc. Ph.D. thesis, Universite de Paris 11, Paris Sud, Orsay, p. *(Unpublished)*
('Analysis of the relations between the Great Sumatra Great Fault and the compressiional structures of the back arc'. Total young shortening in C Sumatra basin ~14 km since M Miocene, representing 4% of initial width of basin. Compressional movements in back-arc accommodate only small portion of oblique convergence in Sumatra)

Detourbet, C., O. Bellier & M. Sebrier (1993)- La caldera volcanique de Toba et le systeme de faille de Sumatra (Indonesia) vue par SPOT. Comptes Rendus Academie Sciences, Paris, Ser II, 316, p. 1439-1445.
('The volcanic caldera of Toba and the Sumatra fault system viewed by SPOT')

Dieckmann, W. (1917)- Praetertiaire goudafzettingen en de hieruit voortgekomen stroomgoudbeddingen in het gebied tussen de rivieren Rawas (Res. Palembang) en Tabir (Res. Djambi). Jaarboek Mijnwezen Nederlandsch Oost-Indie 46 (1917), Verhandelingen 1, p. 78-135.
(‘Pre-tertiary gold deposits and the alluvial gold deposits in the area between the Rawas and Tabir rivers', S Sumatra. Gold in veins in Paleozoic metamorphic rocks associated with Pretertiary granodiorite intrusions and in alluvial deposits of most rivers in area)

Diehl, J.F., T.C. Onstott, C.A. Chesner & M.D. Knight (1987)- No short reversals of Brunhes Age recorded in the Toba Tuffs, North Sumatra, Indonesia. Geophysical Research Letters 14, 7, p. 753-756.
(Paleomagnetic and 40Ar/39Ar data indicate two tuffs at Siguragura, N Sumatra: (1) reversely magnetized earliest tuff of Toba caldera, of Matuyama age (0.84 Ma) and (2) normally magnetized Young Toba Tuff of late Brunhes age. No reversely magnetized tuffs of late Brunhes age present, as suggested by previous investigators. Dating of oldest Toba Tephra to 834 ± 10 ka (also 200m thick Middle Toba Tuff, normally magnetized))

Djumhana, D. (1995)- Petrogenesa batuan granit daerah Toba dan sekitarnya. Geol. Res. Dev. Centre (GRDC), Bandung, Spec. Publ. 16, p. 80-100.
('Petrogenesis of granites of the Toba area and its surroundings')

Donovan, S.K., I.M. van Waveren & R.W. Portell (2013)- Island slopes and jumbled shell beds. J. Geol. Soc., London, 170, 3, p. 527-534.
(Examples of fossil shell beds of different ages and locations, supposedly representing deeper marine facies around islands. Incl. example of basal interval of Permian Mengkarang Fm of Sumatra, which represents deep-

water facies at base of volcanic arc section. Nektonic cephalopods overlie possibly turbiditic, redeposited vitric tuff with broken brachiopod shells and diverse association of terrestrial pollen. Overlain by marine shales with brachiopod Stereochia semireticulata)

Druif, J.H. (1933)- De bodem van Deli. I. Inleiding tot de geologie van Deli.. Mededeelingen Deli Proefstation Medan, ser. 2, 75, p. 1-158.
('The soil of Deli. 1. Introduction to the geology of Deli'. Part 1 of 3-volume series on soils of NE Sumatra)

Druif, J.H. (1934)- De bodem van Deli. II. Mineralogische onderzoekingen van de bodem van Deli. Bulletin Deli Proefstation Medan 32, p. 1-195.
('The soil of Deli. II. Mineralogical investigations of the soil of Deli'. Part 2 of 3-volume series)

Druif, J.H. (1935)- Over gesteenten van Poeloe Berhala (Straat van Malakka, Sumatra Oostkust). Proc. Kon. Akademie Wetenschappen, Amsterdam 38, 6, p. 639-650.
(online at: www.dwc.knaw.nl/DL/publications/PU00016745.pdf)
('On rocks from Pulau Berhala (Malacca Straits, Sumatra East coast)'. Island 90 km E of Belawan Deli mainly composed of granites, also aplite-pegmatite, gneiss, mica schists, hornfels. Gneiss and mica schist highly deformed, strike NE-SW, dipping ~35-40° to NW)

Druif, J.H. (1938)- De bodem van Deli (Slot). De Deli gronden en hun eigenschappen. Buitenzorgsche Drukkerij, p. 1-140.
('The soil of Deli (Final). The soils of Deli and their characteristics'. Part 3 of 3-volume series)

Duquesnoy, T., O. Bellier, M. Sebrier, M. Kasser, C. Vigny, F. Ego, I. Baha, E. Putranto & I. Effendi (1999)- Etude geodesique d'un segment sismique de la Grande Faille de Sumatra (Indonesie). Bull. Soc. Geologique France 170, 1, p. 25-30.
('Geodetic study of a seismic segment of the Great Sumatra fault'. Deformation around central part of Great Sumatran Fault determined by geodetic surveys 1991-1994. About 90 mm displacement of far field points. Fault segment is locked. Slip rate calculated from far field points (27.5 mm/yr) similar with geologically determined long term slip rate (23 mm/yr))

Durham, J.W. (1940)- Oeloe Aer fault zone, Sumatra. American Assoc. Petrol. Geol. (AAPG) Bull. 24, 2, p. 359-363.
(One of earliest observations of right-lateral stream offsets along Medan-Padang segment of Great Sumatra Fault zone)

Durham, J.W. (1940)- Triassic fossils near Rantauprapat. De Ingenieur in Nederlandsch-Indie 1940, 3, p. 41-42.
(At Sungei Bila and Aek Pamengka W and NW of Rantauprapat, N-C Sumatra, four localities with casts of Triassic bivalve Halobia in red-brown W-dipping series of sandstones, silts and shales. To W Triassic overlain by non-marine Paleogene quartz sandstones and conglomerates, with material derived from underlying sediments. Occurrences of Halobia probably in same formation as locality noted by Volz (1899) on Soengei Koeala to NW and other places)

Eklund, O. (1933)- Guldsilverbergsbruket i vastra Sumatra. Teknisk Tidskrift Bergsvetenskap 1933, 1, p. 1-5.
(online at: http://runeberg.org/tektid/1933b/0003.html)
(In Swedish; 'Gold-silver mines in West Sumatra'. Brief review of geology and mineralization at W Sumatra gold mines Mangani, Simau, etc. With follow-up on mining practices and reserves in 1933-2 issue, p. 12-16)

Elber, R. (1938)- Geologie des Kustengebietes von Benkoelen zwischen Seblat (NW) und Bintoehan (SE) (Westkueste von Sumatra). BPM Report, p. 1-24.
(Unpublished BPM report on geology of W Sumatra coastal region near Bengkulu between Seblat in NW and Bintuhan in SE)

Elbert, J. (1909)- Magnet- und Roteisenerzvorkommen in Sud-Sumatra. Zeitschrift Praktische Geologie 17, p. 509-513.
('Magnetite and hematite occurrences in S Sumatra'. Occurrence of iron ores in mica schist formation of Lampung. Most of Lampong area composed of mica schists (more than mapped by Verbeek), mostly covered by laterite. Main strike of schist WNW-ESE, dips up to 75°. Locally significant magnetite ore bodies in schist (= banded iron ore formation of Subandrio & Tabir 2006?; JTvG). Intrusions of red granites with some gold-silver mineralization. No figures)

Erb, F. (1905)- Beitrage zur Geologie und Morphologie der sudlichen Westkuste von Sumatra. Zeitschrift Gesellschaft Erdkunde zu Berlin 4, p. 251-284.
('Contributions to the geology and morphology of the southern West coast of Sumatra'. Mainly summary of observations on coastal geomorphology of Bengkulu province)

Faridsyah, W.A., R. Yustiawan, N. Muhamad, U. Sukanta & A. Wibowo (2015)- Basement rocks of the Malacca Strait coastal plain, Central Sumatra Basin. Proc. Joint Conv. HAGI-IAGI-IAFMI-IATMI, Balikpapan, JCB2015-087, 11p.
(On Pre-Tertiary basement rocks in Malacca Straits PSC. Late Triassic melange/suture zone between Sibumasu and Indochina terranes believed to propagate S across coastal plain of C Sumatra Basin where Malacca Straits PSC is located. Wells in PSC penetrated quartzite, meta-siliciclastics and black shale-limestone facies. Basement cores from Kurau field fractured and recrystallized limestone and claystone with K-Ar age of 275 Ma (late E Permian), and correlated to Gua Musang Fm in Central Belt of Malay Peninsula)

Fauzi, R.M., R. McCaffrey, D. Wark, P.Y. Prih Haryadi & Sunarjo (1996)- Lateral variation in slab orientation beneath Toba caldera, northern Sumatra. Geophysical Research Letters 23, p. 443-446.
(Investigator Fracture zone subducts beneath Toba caldera, suggesting possible relationship to volcanism. High rate of seismicity along subducted Investigator Fracture Zone uncommon at subducted fracture zones)

Fediaevsky, A. & Sujatmiko (1975)- Existence d'une episode climatique aride a la base du Tertiaire de Sumatra. Proc. 9th Int. Sedimentology Congress, Nice 1975, 1, p. 79-85.
('Existence of a dry climate period at the base of the Tertiary of Sumatra'. Faceted sand-blasted pebbles from basal Tertiary conglomerate near Murobungo, Barisan mountain front, C Sumatra, below Talang Akar Fm white quartz-rich sandstones)

Fennema, R. (1876)- Sumatra's Westkust. Verslag No. 8. Onderzoek naar het voorkomen van kwikerts bij den berg Sombong in de nabijheid van Sibelaoe, zoomede aan de riviertjes Tapir en Gade-Talang, Sumatra's Westkust. Jaarboek Mijnwezen Nederlandsch Oost-Indie 5 (1876), 1, p. 35-70.
('Investigation of the occurrence of mercury ore near Sombong mountain, near Sibelaoe, as well as in creeks Tapir and Gade-Talang, Sumatra west Coast'. Area of steeply dipping slates and massive limestones with (Permian) brachiopods, intruded by porphyry granite and veins, W of Sibelabu and along Tapir River, Tanah Datar district, S Padang Highlands. Alluvial cinnabar associated with magnetite, from veins in slate)

Fennema, R. (1887)- Topographische en geologische beschrijving van het Noordelijk gedeelte van het Gouvernement Sumatra's Westkust. Jaarboek Mijnwezen Nederlandsch Oost-Indie 16 (1887), Wetenschappelijk Gedeelte, p. 129-252.
('Topographic and geologic description of the northern part of the Sumatra West Coast province'. Geologic description of W Sumatra from Tapanuli Bay in NW to Fort de Kock (Bukittinggi) in SE. With 1:500,000 geologic map, 11 cross sections. Oldest rocks 'old slate-quartzite' formation. Overlain by unfossiliferous steeply dipping shales and limestones, probably of Carboniferous age (now assigned to Permian; JTvG). Intruded by granites and diabase. Unconformably overlain by rel. gently dipping Eocene/ Old Tertiary with quartz sandstones and thin coal beds. Late Tertiary volcanics. Minor occurrences of gold, copper, lead)

Fernandez-Blanco, D., M. Philippon & C. von Hagke (2016)- Structure and kinematics of the Sumatran Fault System in North Sumatra (Indonesia). Tectonophysics 693, B, p. 453-464.
(online at: www.ged.rwth-aachen.de/files/publications/publication_2733.pdf)

(Study of northern sector of Sumatran Fault System at northernmost tip of Sumatra and islands to NW. Fault bifurcates into two fault strands and two independent kinematic regimes evolve: E branch is classic Riedel system, W branch features fold-thrust belt, accommodating ~20% of shortening of system in study area)

Fliegel, G. (1898)- Die Verbreitung des marinen Obercarbon in Sud- und Ostasien. Zeitschrift Deutschen Geol. Gesellschaft, Berlin, 50, p. 385-408.
(online at: https://www.biodiversitylibrary.org/item/150471#page/435/mode/1up)
('The distribution of marine Upper Carboniferous in South and East Asia'. Review of fossiliferous 'Upper Carboniferous (= E-M Permian) limestones near Padang, W Sumatra, and localities in China. Similarities with age-equivalent faunas of European Russia and Mediterranean)

Fliegel, G. (1901)- Uber Oberkarbonische Faunen aus Ost und Sudasien. I. Oberkarbonische Fauna von Padang. Palaeontographica 48, 2-3, p. 91-136.
(online at: http://archive.org/details/palaeontographic48cass)
('On Upper Carboniferous faunas from East and South Asia, 1. Upper Carboniferous of Padang'. Re-description of 59 Permian fossil species from dark limestones in Padang Highlands, collected by Verbeek, donated to Breslau University, and first described by Roemer (1880). Incl. fusulinids (Fusulina granum-avenae, Mollerina/ Schwagerina verbeeki), corals, brachiopods (Dalmanella, Orthothetes, Productus, Spirifer, Spirigera, etc.), bivalves (Aviculopecten verbeeki), gastropods (Bellerophon spp.), cephalopods (Orthoceras, etc.), nautiloids (Pleuronautilus sumatrensis), trilobites (Phillipsia). (Now regarded as mainly M Permian age; JTvG))

Fontaine, H. (1983)- Some Permian corals from the Highlands of Padang, Sumatra, Indonesia. Publ. Geol. Res. Dev. Centre (GRDC), Bandung, Seri Paleontologi 4, p. 1-31.
(M Permian reefal limestone from Guguk Bulat and Silungkang areas E of Singkarak lake, C Sumatra. Coral faunas include Sinophyllum, Pavastehphyllum, Thomasiphyllum, Ipciphyllum fliegeli (Lange), I. subelegans, I. laosense, Wentzelophyllum, Wentzelloides frechi, etc.. Similar to those from mainland SE Asia. Associated with rich fusulinid fauna, small foram Hemigordius sp. and algae Mizzia velebitana, Permocalculus)

Fontaine, H. (1986)- Microfacies of a few Permian limestones of Sumatra, Peninsular Malaysia and Thailand. United Nations CCOP Techn. Bull. 18, p. 148-157.
(Incl. photomicrographs of Permian foram-algal grainstones-packstones and oolitic limestone from Jambi Province)

Fontaine, H. (1986)- Discovery of Lower Permian corals in Sumatra. In: G.H. Teh & S. Paramananthan (eds.) Proc. 5th Reg. Congress Geology, Mineral and Energy Resources of SE Asia (GEOSEA V), Kuala Lumpur 1984, 1, Bull. Geol. Soc. Malaysia 19, p. 183-191.
(online at: https://gsmpubl.files.wordpress.com/2014/09/bgsm1986015.pdf)
(First E Permian corals from Sumatra, in Jambi Province, W of Bangko, in tributaries of Merangin River with 'Jambi Flora'. Pulau Apat, Muara Liso, Batu Gajah, Batu Impi localities with Protomichelinia (in Thailand mainly 'Artinskian'; Fontaine et al. 1994), Kepingophyllum, Chusenophyllum? and Polythecalis. Associated with M-L Asselian Pseudoschwagerina zone fusulinids. Lower Permian sediments well developed in upper Mesumai River area and represent forested volcanic arc surrounded by shallow sea)

Fontaine, H. (1989)- Lower Carboniferous corals. In: H. Fontaine & S. Gafoer (eds.) The Pre-Tertiary fossils of Sumatra and their environments, CCOP Techn. Paper 19, Bangkok, p. 41-44.
(Corals present but not prolific in Lower Carboniferous limestones of N and C Sumatra. Mainly solitary Rugosa (Zaphrentites) and compound Rugosa (Siphodendron). No massive Rugosa found)

Fontaine, H. (1989)- Lower Permian corals of Sumatra. In: H. Fontaine & S. Gafoer (eds.) The Pre-Tertiary fossils of Sumatra and their environments, CCOP Techn. Paper 19, Bangkok, p. 95-98.
(Two species of colonial rugose coral (Kepingophyllum sp.) and large colonies of tabulate coral (Protomichelinia) from Lower Permian Batu Gajah and Batu Impi localities, Mesumai River, Jambi Province)

Fontaine, H. (1989)- Middle Permian corals of Sumatra. In: H. Fontaine & S. Gafoer (eds.) The Pre-Tertiary fossils of Sumatra and their environments, CCOP Techn. Paper 19, Bangkok, p. 149-165.
(M Permian corals from three localities: some Tabulata (Sinopora asiatica) and abundant Tetracoralliia. Guguk Bulat rich and massive tetracorallia colonies (mainly Ipciphyllum spp., and Wentzelloides (called Lonsdaleia by Volz 1904 and Lange 1925)), and is reefal facies)

Fontaine, H. (1990)- Guguk Bulat, a very famous Permian limestone locality of Sumatra, Indonesia. In: H. Fontaine (ed.) Ten years of CCOP Research on the Pre-Tertiary of East Asia, CCOP Techn. Publ., 20, p. 43-54.
(Reprint of Fontaine (1982) paper in CCOP Newsletter. Classic locality 3.5 km NE of Singkarak Lake in Padang Highlands of ~150m thick grey, bedded M Permian limestone rich in corals (including massive tetracorallia of Waagenophyllidae family), tubular sponges, algae and occasional fusulinids (type locality of Sumatrina, also Verbeekina). Faunas many similarities with M Permian rocks on SE Asia mainland. Limestone not metamorphosed, but some local recrystallization near ?Triassic granite intrusions)

Fontaine, H., M.S. Asiah & S.H. Sanatul (1992)- Pre-Tertiary limestones found at the bottom of wells drilled in Malacca Straits. CCOP Newsletter 17, 4, p. 12-17.
(Four wells: Singa Besar-1 gas-bearing basal carbonate ('Melaka carbonate' fractured limestone and dolomite = 'Tampur Fm' of North Sumatra basin?) contains Middle Permian age fossils, including foram genus Shanita at depth 2630'- 2740' (generally associated with 'Sibumasu'/ Cimmerian terranes: JTvG))

Fontaine, H. & S. Gafoer (eds.) (1989)- The pre-Tertiary fossils of Sumatra and their environments. Comm. Co-ord. Joint Prospecting Mineral Resources in Asian Offshore Areas (CCOP), Techn. Publ. TP 19, Bangkok, p. 1-356.
(Extensive collectionof papers on Carboniferous- Cretaceous fossils of Sumatra. Main localities: Aceh area, Tapaktuan, Sungai Alas, Rantauprapat, Sibaganding near Lake Toba, Sawahlunto, Agam River, Kuantan Go)

Fontaine, H. & S. Gafoer (1989)- Pre-Carboniferous rocks. In: H. Fontaine & S. Gafoer (eds.) The Pre-Tertiary fossils of Sumatra and their environments, CCOP Techn. Publ. TP 19, Bangkok, p. 15-17.
(Pre-Carboniferous ages postulated for low-metamorphic sediments wells in C Sumatra and for metamorphics in Lampung, S Sumatra (possibly Archean; Umbgrove 1938))

Fontaine, H. & S. Gafoer (1989)- The Carboniferous. In: H. Fontaine & S. Gafoer (eds.) The Pre-Tertiary fossils of Sumatra and their environments, CCOP Techn. Publ. TP 19, Bangkok, p. 19-29.
(Carboniferous rel. widespread in N Sumatra and correlates with Carboniferous of western Malay Peninsula. Kuantan Fm shows affinities with Carboniferous of eastern Malay Peninsula. N Sumatra Bohorok Fm contains pebbly mudstones, of possible glacial origin. Lower Carboniferous limestones with cosmopolitan foram faunas)

Fontaine, H. & S. Gafoer (1989)- The Lower Permian. In: H. Fontaine & S. Gafoer (eds.) The Pre-Tertiary fossils of Sumatra and their environments, CCOP Techn. Publ. TP 19, Bangkok, p. 47-51.
(Lower Permian of Merangin River area W of Bangko, Jambi Province, well known since 1930's for its Cathaysian 'Jambi Flora' in Mengkarang Fm. This E Permian flora and fauna similarities with C Europe; nothing similar in Australia. Limestones with fusulinids, incl. Monodiexodina wanneri in Padang Higlands (Hahn & Weber 1981))

Fontaine, H. & S. Gafoer (1989)- The Middle Permian. In: H. Fontaine & S. Gafoer (eds.) The pre-Tertiary fossils of Sumatra and their environments, Papers 22nd Sess. CCOP, Guangzhou 1985, Comm. Co-ord. Joint Prospecting Mineral Resources in Asian Offshore Areas (CCOP), Techn. Publ. TP 19, Bangkok, p. 99-112.
(Review of M Permian fossil localities of Sumatra. Mainly limestones, many with fusulinids, some associated with volcanics: Padang Highlands (Guguk Bulat, Silungkang, Tanjung Alai), Jambi Province (Sungei Luati, Batang Tabir, Sg. Kibul, Sg. Palepat), Bukit Pendopo (Palembang), near Lubuksikaping (Muara Sipongi) and N Sumatra near Takengon (Situtup Lst))

Fontaine, H. & S. Gafoer (1989)- Upper Permian- Lower Triassic. In: H. Fontaine & S. Gafoer (eds.) The Pre-Tertiary fossils of Sumatra and their environments, CCOP Techn. Publ. TP 19, Bangkok, p. 167.

(Upper Permian not established with certainty on Sumatra. Lower Triassic also absent or rare)

Fontaine, H. & S. Gafoer (1989)- Triassic. In: H. Fontaine & S. Gafoer (eds.) The Pre-Tertiary fossils of Sumatra and their environments, CCOP Techn. Publ. 19, Bangkok, p. 169-177.
(Middle-Late Triassic sediments known from N Sumatra since 1899, when Volz described 6 species of Daonella and Halobia. Also present in Padang Highlands, Lake Toba area (Sibaganding Limestone), Bangka and Belitung (Norian), etc. Deep water Mutus assemblage in oil wells in Pakanbaru area, C Sumatra)

Fontaine, H. & S. Gafoer (1989)- The Jurassic. In: H. Fontaine & S. Gafoer (eds.) The Pre-Tertiary fossils of Sumatra and their environments, CCOP Techn. Publ. 19, Bangkok, p. 207-225.
(Overview of Jurassic localities in N, C and S Sumatra.Almost 30 formations identified. Mainly shallow marine shelf deposits)

Fontaine, H., S. Gafoer & Suharsono (1990)- Well-dated horizons of the pre-Tertiary of Sumatra. In: H. Fontaine (ed.) Ten years of CCOP research on the Pre-Tertiary of East Asia, CCOP Techn. Publ. 20, p. 55-58.
(Reprint of Fontaine et al. (1988) paper in CCOP Newslett. 13, 2, p. 26-30. Table of occurrences of fossiliferous Lower Carboniferous, Permian, Triassic, Jurassic and Cretaceous outcrops on Sumatra)

Fontaine, H. & D. Vachard (1981)- A note on the discovery of Lower Carboniferous (Middle Visean) in Central Sumatra. CCOP Newslett. 8, 1, p. 14-18.
(Lower Carboniferous limestones with M Visean foraminifera in Agam River, E of Bukit Tinggi along road to Payakumbuh. Lower Carboniferous limestones rel. poor in fossils and darker than associated Permian fusulinid limestone. No regional metamorphism, just local contact metamorphism around igneous intrusions)

Fontaine, H. & D. Vachard (1990)- A note on the discovery of Lower Carboniferous (Middle Visean) in Central Sumatra. In: H. Fontaine (ed.) Ten years of CCOP research on the Pre-Tertiary of East Asia, CCOP Techn. Publ. 20, p. 35-41.
(Reprint of Fontaine and Vachard (1981))

Fontaine, H. & D. Vachard (1984)- New palaeontological data on the Upper Paleozoic of Sumatra. Mem. Soc. Geologique France, n.s., 147, p. 49-54.
(Lower Carboniferous corals in Padang Highlands may be considered part of Chinese province. Early Permian volcanics, clastics and limestone with fusulinids in Jambi Province, with no evidence of glaciations)

Fontaine, H. & D. Vachard (1986)- Study of Permian samples collected from Sumatra. CCOP Techn. Bull. 18, p. 112-116.
(Brief review of five Permian limestone localities in Jambi Province, one Asselian, others Murgabian in age)

Force, E.R., S. Djaswadi & T. Van Leeuwen (1984)- Contributions to the geology of mineral deposits: A. Exploration for porphyry metal deposits based on rutile distribution- a test in Sumatra. U.S. Geol. Survey (USGS) Bull. 1558 A, p. A1-A9.
(online at: http://pubs.usgs.gov/bul/1558a-b/report.pdf)
(Rutile in thick soil at Tangse porphyry-copper prospect, along Sumatra Fault Zone in Aceh reflects distribution of quartz-sericite and biotite-chlorite zones of hydrothermal alteration at depth)

Frech, F. & O.E. Meyer (1922)- Mitteljurassische Bivalven von Sungi Temalang im Schieferbarissan (Residentschaft Djambi). Verhandelingen Geologisch-Mijnbouwkundig Genootschap Nederland Kol., Geol. Serie 5, 5. p. 223-229.
('Middle Jurassic bivalves from Sungei Temalang, Jambi, in the 'Schieferbarisan'. Small bivalve fauna of probable M Jurassic age collected by Tobler in isoclinally folded phyllitic rocks in tributary of Limun River in S part of Jambi Residency. With Astarte, spp., Opis and Cypricardia. Ammonites-belemnites absent)

Frijling, H. (1928)- Geologisch-mijnbouwkundig onderzoek in den omtrek van de Asahan- and Koealoe rivieren (Toba landen, Oost Sumatra). Jaarboek Mijnwezen Nederlandsch-Indie 54 (1925), Verhandelingen 2, p. 153-173.
(‘Geological-mining investigation around the Asahan and Kualu rivers, Toba Lands, E Sumatra’. Primarily investigation of folded Triassic limestones, unconformably overlain by Eocene conglomerates and coaly beds)

Furqan, R.A. (2014)- The geology of Pinang-Pinang Au-Cu±Mo skarn, Aceh, Indonesia. In: I. Basuki & A.Z. Dahlius (eds.) Sundaland Resources, Proc. Indon. Soc. Econ. Geol. (MGEI) Ann. Conv., Palembang, p. 291-299.
(Pinang-Pinang gold-copper±molybdenum project ~20km SE of Tapaktuan on SW coast of Aceh consists of two skarn deposits,~3km apart. Granitoids and limestones present but no ages discussed)

Gafoer, S. (2002)- Stratigrafi dan karakter mintakat Pra-Tersier di Sumatra bagian selatan. J. Geologi Sumberdaya Mineral 12, 121, p. 2-24.
('Stratigraphy and character of the Pre-Tertiary zone in South Sumatra'. Four basement terranes in S Sumatra: (1) MTB Tigapuluh- Bohorok (Permo-Carboniferous, incl. glaciomarine deposits, with Late Triassic- E Jurassic granites; paleolatitude 41°S, 115° CW rotation) (=Sibumasu); (2) MKD Kuantan- Duabelas (Carboniferous- Cretaceous sediments and low-grade metamorphics, from N latitudes; 30°N paleolatitude for E Permian Mengkareng Fm with 'Jambi flora'; ~90° CW rotation; with Late Permian, Late Triassic- E Jurassic and Cretaceous granites); (3) MGk Gunungkasih (pre-Carboniferous? high metamorphic rocks, also with Late Permian, Late Triassic- E Jurassic and Cretaceous granite, from low-latitude S Hemisphere (19°N/ 339°CW rotation for Pre-Carboniferous in Table4?; JTvG)= Malacca microcontinent of Pulunggono and Cameron 1984); (4) MGW Garba-Woyla Terrane (latest docked; Jurassic- E Cretaceous oceanic and accretionary zone rock types with ultramafics). Raub-Bentong suture interpreted to run through N Bangka)

Gafoer, S. & T.C. Amin (1993)- Tinjauan kembali geologi Pra-Tersier daerah Garba, Sumatera Selatan. Bull. Geol. Res. Dev. Centre 16, p. 17-26.
(New geologic observations in the pre-Tertiary area of Garba, S Sumatra. Oldest rocks are low-grade metamorphics of possible Carboniferous age. Tectonically juxtaposed against Late Jurassic- E Cretaceous volcanic rocks and chert of possible oceanic affinity in E Cretaceous (melange complex of Barremian- Aptian age 125-120 Ma). Both rock types intruded by Late Cretaceous granites; 116-80 Ma)

Gafoer S., T.C. Amin & R. Pardede (1992)- Geological map of the Bengkulu Quadrangle (0912), Sumatra, 1: 250,000, 2nd Ed., Geol. Res. Dev. Centre (GRDC), Bandung.
(Geologic map sheet of SW Sumatra NE of Bengkulu, with folded Oligo-Miocene clastics in Bengkulu forearc area, young volcanics only in Barisan Mountains and SW part of S Sumatra (Palembang) Basin in NE. In SE corner Gumai Mts anticlinorium with Late Jurassic- E Cretaceous interfingering Saling Fm andesitic-basaltic lavas and Lingsing Fm bathyal clastics (=oceanic; Barber et al. 2005), both unconformably overlain by Sepingtiang Fm reefal limestones (with Orbitolina?) and calcarenites, unconformably overlain by ?Paleo-Eocene Kikim Tuffs)

Gafoer S., T.C. Amin & R. Pardede (1993)- Geological map of the Baturaja Quadrangle, Sumatra. Geol. Res. Dev. Centre (GRDC), Bandung.
(Geologic map of SE part of S Sumatra Basin, with folded Late Oligocene- Miocene sediments, incl. E Miocene limestone outcrops at Baturaja town and around Garba Mts. Pre-Tertiary rocks in Garba Mts Anticlinorium look like Cretaceous accretionary complex with Late Paleozoic/ E Carboniferous? Tarap Fm meta-sediments, Late Jurassic- E Cretaceous Garba Fm with radiolarian cherts and basalts interbedded with chert and occasional serpentinite, with NW-SE foliation, mid-Cretaceous melange complex (mixed boulders in scaly clay), intruded by M-L Cretaceous Garba Granite (~115, 80 Ma ages; Saefudin 2000), unconformably overlain by Tertiary sediments (incl. Paleogene quartz sandstone of Cawang Fm, Kikim volcanic breccia and tuffs)

Gafoer, S., G. Burhan & J. Purnomo (1986)- The geology of the Palembang Quadrangle, Sumatra (Quadrangle 1013), 1:250,000. Geol. Res. Dev. Centre (GRDC), Bandung, 18p. + map.

(Also 2nd Edition 1995. Map sheet of folded Miocene- Pleistocene sediments of South Sumatra Basin NW of Palembang. Large NW-SE trending anticlines (Babat, Keluang, Tamiang, Berau-Bentayan, etc.))

Gafoer, S., T. Cobrie & J. Purnomo (1986)- The geology of the Lahat Quadrangle, Sumatra (Quadrangle 1012), 1:250,000. Geol. Res. Dev. Centre (GRDC), Bandung, 25p. + map.
(Map sheet mainly of SW part of S Sumatra (Palembang) Basin. With large Pendopo- Limau and Benuang-Prabumulih anticlines, all with old oil fields. Series of smaller anticlines in Muara Enim- Lahat area in SW with outcrops of coal-bearing M-L Miocene sediments, intruded by Quaternary volcanic necks (Bukit Serelo, etc.))

Gafoer, S. & K.D. Kusumah (2002)- Cekungan batubara Paleogen daerah Pangkalan Kotabaru dan sekitarnya, Sumatra Barat-Riau. J. Geologi Sumberdaya Mineral 12, 129, p. 2-22.
('Paleogene coal basins in the area of Pangkalan Kotabaru and surroundings, Sumatra West Riau'. W margin of C Sumatra rift basin near Barisan Mts front with outcrops of up to 8m? thick M-L Eocene coals in Pematang Fm (age supported by Florschuetzia trilobata, Gemmatricolporites pilatus a.o.))

Gafoer, S., K.D. Kusumah & N. Suryono (2001)- Kegiatan tektonik Tersier: hubunannya dengan pembentukan cekungan dan akumulasi batubara di sub-cekungan Jambi bagian Barat. Geol. Res. Dev. Centre (GRDC), Bandung, Spec. Publ. 26, p. 73-97.
('Relations between Tertiary tectonics and coal deposits in W Jambi sub-basin, S Sumatra')

Gafoer, S. & M.M. Purbo-Hadiwidjoyo (1986)- The geology of Southern Sumatra and its bearing on the occurrence of mineral deposits. Bull. Geol. Res. Dev. Centre (GRDC), Bandung, 12, p. 15-30.
(Oldest rocks in S Sumatra locally metamorphosed Carboniferous and Permian sediments. Silurian- Devonian granites known from two wells. Also Permian volcanics, unconformably overlain by Triassic clastics. Late Triassic tin-granites on Bangka-Belitung. Flysch-type U Jurassic- Lw Cretaceous. M-Late Cretaceous granites and Kikim Tuffs. Widespread Late Oligocene- earliest Miocene 'Old Andesite' along Barisan Range)

Gasparon, M. (1993)- Origin and evolution of mafic volcanics of Sumatra (Indonesia): their mantle sources, and the role of subducted oceanic sediments and crustal contamination. Ph.D. Thesis, University of Tasmania, p. 1-395.
(online at: http://eprints.utas.edu.au/19511/1/whole_GasparonMassimo1994_thesis.pdf)
(Sediments, or fluids derived from sediments subducted along Sunda Trench, affect chemistry of Quaternary arc volcanics in some sectors of Sunda arc, whereas isotopic signature of other sectors mainly reflects composition of mantle source. Two groups of ganitoids identified in Sumatra: (1) Arc-related granitoids along calcalkaline trend of arc rocks, with Sr, Nd, and Pb isotope systematics similar to those of Indian Ocean basalts (including basalts from S Sumatra);(2) E of Semangko fault, granitoids and pyroclastic rocks mainly of 'S-type', with high 87Sr/86Sr values, similar to C Granitoid Province of SE Asia. Therefore, Semangko fault and Quaternary arc may define SE margin of Sibumasu terrane. No systematic variations in geochemical and isotopic composition from N to S Sumatra observed in two groups of granitoids. Sr, Nd, and Pb isotopes suggest pre-Mesozoic continental crust present in Sumatra and W Java, but absent from E Java- Lombok)

Gasparon, M. (2005)- Quaternary volcanicity. In: A.J. Barber, M.J. Crow & J.S. Milsom (eds.) Sumatra: geology, resources and tectonic evolution, Geol. Soc. London, Mem. 31, Chapter 9, p. 120-130.
(Quaternary volcanics of Sumatra rel. rich in young silicic volcanic rocks, associated with major caldera-forming events)

Gasparon, M. & R. Varne (1995)- Sumatran granitoids and their relationship to Southeast Asian terranes. Tectonophysics 251, p. 277-299.
(Three subparallel Late Paleozoic- Mesozoic granitoid provinces in SE Asia: (1) East (E peninsular Malaysia); (2) Central (NW Thailand to W Peninsular Malaysia and 'Tin Islands', Indonesia) and (3) West (W Thailand-Burma). Compositions of Sumatran granitoids suggest (1) granitoids in E/ NE Sumatra (incl. 'Tin Islands', Bukit Batu near Palembang, Hatapang pluton, Lake Toba area and possibly Sijunjung pluton in C Sumatra), all have high Sr-87/86 values and other S-type similarities, and can be related to 'Sibumasu terrane'/ Central Granitoid Province;(2) granitoids W of Semangko fault and in basement of Quaternary volcanics low initial Sr-

87/Sr-86 values and I-type characteristics, similar to young arc volcanics and may represent young post-Gondwanan Sumatran arc lithosphere; (3) Granitoids comparable to W Province not known in Sumatra, and (4) granitoids similar to E Province are rare. Semangko fault and Sunda Strait may mark SW- and SE-most limits of Sibumasu terrane. Boundary between Central and E Granite Provinces may run through 'Tin Islands')

Geinitz, H.B. (1876)- Zur Geologie von Sumatra. I. Zur Geologie von Sumatra's Westkuste. Palaeontographica 22, p. 399-414.
(online at: https://www.biodiversitylibrary.org/item/103416#page/7/mode/1up)
('On the geology of Sumatra'. Brief description of rocks collected by Verbeek from Ombilin area, W Sumatra. Incl. descriptions of grey limestone with globular fusulinids (incl. Fusulina verbeeki n.sp.), crinoids, brachiopods, etc.. Also 50m thick Eocene coral limestone. With companion paper by Von der Marck (1876) on Tertiary fossil fish from region, p. 405-414)

Geinitz, H.B. (1878)- Zur Geologie von Sumatra's Westkuste. Jaarboek Mijnwezen Nederlandsch-Indie 7 (1878), 1, p. 127-137.
('On the geology of Sumatra'. Reprint of Geinitz (1876))

Genrich, J.F., Y. Bock, R. McCaffrey, L. Prawirodirdjo, C.W. Stevens, S.S.O. Puntodewo, C. Subarya & S. Wdowinski (2000)- Distribution of slip at the northern Sumatran fault system. J. Geophysical Research 105, B12, p. 28327-28342.
(online at: http://onlinelibrary.wiley.com/doi/10.1029/2000JB900158/epdf)
(Sumatran fault in N Sumatra (1°S- 3°N) GPS-derived slip rates increase slightly N-ward from 23 mm/yr at 0.8°S to 26 mm/yr at 2.7°N. Banda Aceh embayment is extruded to NW at 5 mm/yr. N part of back arc basin is part of rigid Sunda Shelf, while N forearc is subjected to extension nearly parallel to arc)

Gibbons, A., J.M. Whittaker & P. Muller (2010)- Revisiting the magnetic anomalies along the West Australian margin identifies a new continental fragment that accreted to Sumatra during the Early Eocene. American Geophys. Union (AGU), Fall Meeting 2010, Poster Abstract T13C-2223. *(Abstract only)*
(Reconstruction of abyssal plains along W Australian margin reveals that, apart from Greater India and Argoland, a third continental block (Gascoyneland) rifted from Australia since Jurassic. From 132 Ma (Hauterivian; E Cretaceous) it formed stretched continental crust of Exmouth Plateau, then oceanic crust of Gascoyne and Cuvier abyssal plains. At 115 Ma (= late Aptian) Gascoyneland began moving N while Greater India continued West. Gascoyneland would have reached W Sumatra at ~60 Ma. Woyla Group, consisting of Sikuleh, Natal and Bengkulu terranes, along W coast of Sumatra, identified as oceanic arc, which accreted in Jurassic-E Cretaceous after formation of short-lived, narrow marginal sea and may overlie continental crust due to presence of Sikuleh granitoid batholith. Gascoyneland now probably buried beneath Woyla Terrane)

Graha, D.S. (1992)- Percontohan untuk penarikhan metoda kalium-argon batuan daerah Danau Toba dan sekitarnya, Sumatera Utara. J. Geologi Sumberdaya Mineral 2, 11, p. 2-8.
('Sampling for study of potassium-argon method in rocks from Lake Toba area and surroundings, N Sumatra')

Graha, D.S. & T. Hardjono (1990)- Biotit sebagai petunjuk umur granit di Aceh selatan. J. Geologi Sumberdaya Mineral 2, 5, p. 2-5.
('Biotite as age indicator of granite in southern Aceh'. K-Ar age of biotite from west coast of W Sumatra, S Aceh (Tapaktuan map sheet; Woyla Terranes?). Wide spread of ages: Susoh 98.2 Ma, Kila 130 Ma and Samadua 51.3 Ma)

Graha, D.S., T. Hardjono, I. Rustami, A. Sonjaya, P. Kawoco & Herwinsyah (1998)- Perioda pengendapan Tuf Toba, Sumatera Utara, berdasarkan hasil penarikhan. J. Geologi Sumberdaya Mineral 8, 76, p. 11-17.
('Periods of Toba Tuff deposition, based on the results of withdrawal' (?). Thick Quaternary Toba Tuff deposits consist of andesitic lava in lower part and alternating pyroclastic flows, ignimbrites and welded tuffs in upper part). Five phases: (1) Dacite tuff (1.2 Ma), (2) Older Toba Tuff (0.84-0.71 Ma), (3) Middle Toba Tuff (0.50-0.39 Ma, (4) Younger Toba Tuff (0.10- 0.05 Ma) and (5) Post- Younger Toba Tuff (0.031-0.017 Ma))

#Graha, D.S., S. Permanadewi & D.A. Siregar (1990)- Penarikhan Kalium Argon dan radiokarbon di daerah Propinsi Bengkulu. Proc. 19th Ann. Conv. Indon. Assoc. Geol. (IAGI), 2, p. 42-49.
('K-Ar and radiocarbon analyses in the area of the Bengkulu province'. K-Ar age of plagioclase of Gunung Muncung diorite ~4.76 Ma (Pliocene). Also young C14 ages for Quaternary alluvium around Bengkulu city)

Grand Pre, C.A., B.P. Horton, H.M. Kelsey, C.M. Rubin, A.D. Hawkes, M.R. Daryono, G. Rosenberg & S.J. Culver (2012)- Stratigraphic evidence for an early Holocene earthquake in Aceh, Indonesia. Quaternary Science Reviews 54, p. 142-151.
(Holocene stratigraphy of coastal plain of NW Aceh 6 m of sediment with three regionally consistent buried soils above pre-Holocene bedrock or sediment. Rapid change in relative sea-level caused by coseismic subsidence during E Holocene megathrust earthquake suggested by mangrove soil overlain by thin tsunami sand with abraded foraminifera of both offshore and onshore environments. Tsunami sand age ~7000 yrs BP)

Grey, D.W.J. (1935)- Notes on the Balimbing Mine, West Coast of Sumatra. Trans. Inst. Mining Metallurgy 45, p. 221-281.
(Overview of orebodies and operations at rel. small Balimbing gold mine in Barisan Mts, 2km E of Bonjol village, 60km from Fort de Kock and 8km WSW of now depleted Mangani mine. Young gold-silver hydrothermal mineralization, mainly along two N10°E-striking faults. Surrounding rocks isoclinally folded Permo-Carboniferous slates and sandstones, Eocene 'Brani-conglomerate', Early Miocene bituminous shales with Lepidocyclina, Miogypsina, etc., overlain by younger Balimbing- Mangani volcanic rocks)

Grutterink, J.A. (1925)- Truscottiet. In: R.D.M. Verbeek Memorial volume, Verhandelingen Geologisch-Mijnbouwkundig Genootschap Nederland Kol., Geol. Serie 8, p. 197-200.
(Description and analysis of rare mineral truscottite from Lebong Donok Au-Ag mine, Bengkulu, Sumatra, first described by Hovig (1914). Spheroidal aggregates of Ca-zeolite, closely related to gyrolite (see also MacKay and Taylor (1954); mineral since then also found in Japan, Hawaii, Yellowstone; JTvG))

Gunawan, W., A. Kadir, S. Sukmono, M.T. Zen, L. Hendrajaya & D. Santoso (1996)- Gravity evidence for the thinning of the crust around the North Sumatra area. Proc. 25th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 81-91.
(Major structural discontinuity around N Sumatra, tied to split in descending oceanic plate along continuation of Investigator Ridge Transform. Discontinuity reflected by a change of Sumatra Fault segment's geometrical fractal dimension, volcanic line offset and major changes to strike of Batee fault and Batee trench. Area around discontinuity characterized by very low gravity anomaly closure (up to -96 mgal) with higher anomaly in center, indicating low density body of mantle material intruded by higher density igneous material in center)

Gunderson, R.P., P.F. Dobson, W.D. Sharp, R. Pudjianto & A. Hasibuan (1995)- Geology and thermal features of the Sarulla Contract Block, North Sumatra, Indonesia. Proc. World Geothermal Congress 1995, Florence, 2, p. 687-692.
(online at: www.geothermal-energy.org/pdf/IGAstandard/WGC/1995/2-Gunderson.pdf)
(Exploration for geothermal energy in Sarulla area of W Sumatra, along active Sumatra Fault System. No active volcanoes in contract area, but extensive Quaternary andesite-rhyolite lavas and dacite-rhyolite ash flow tuffs (dated between 1.8- 0.12 Ma). Hydrothermal features clustered in four groups: Namora-I-Langit, Silangkitang, Donotasik, and Sibualbuali; each associated with Quaternary volcanic eruptive center)

Gunderson, R., N. Ganefianto, K. Riedel, L. Sirad-Azwar & S. Suleiman (2000)- Exploration results in the Sarulla Block, North Sumatra, Indonesia. Proc. World Geothermal Congress 2000, Kyushu- Tohoku, Japan, p. 1183-1188.
(online at: www.geothermal-energy.org/pdf/IGAstandard/WGC/2000/R0892.PDF)
(Geothermal exploration in Sarulla Block discovered three new geothermal systems in Quaternary andesitic and rhyolitic volcanics along Great Sumatra Fault Zone in W Sumatra)

Gutzwiller, E. (1914)- Petrografische beschrijving der eruptiefgesteenten van het Goemai-gebergte. Jaarboek Mijnwezen Nederlandsch Oost-Indie 41 (1912), Verhandelingen, p. 50-86.

(Petrographic descriptions of igneous rocks from Gumai Mountains, collected by Tobler: Pre-Tertiary granites, porphyrites, diabase, tuffs and Young Tertiary liparite, dacite, andesite, basalt)

Hahn, L. & H.S. Weber (1979)- Zur Methodik der Uranprospektion in tropischen Regenwald-Gebieten am Beispiel Sumatras. Zeitschrift Deutschen Geol. Gesellschaft 130, 2, p. 405-420.
('On the methodology of uranium prospecting in tropical rain forests areas in the example of Sumatra'. On regional uranium reconnaissance survey in Sumatra in 1976-1978)

Hahn, L. & H.S. Weber (1981)- Geological map of West Central Sumatra 1:250,000- with explanatory notes. Geol. Jahrbuch B47, p. 5-19.
(Geologic map of W Central Sumatra, compiled during 1976-1978 Indonesian- German Uranium Exploration Project. Mainly Barisan Mountains NE of Padang, including Ombilin Basin. Permian Limestones with fusulinids (at Batang Siputar with 'antitropical' Monodiexodina wanneri). Triassic clastics with Halobia and also Triassic limestones. Unconformably overlain by Oligocene lacustrine deposits rich in fish fossils and Oligo-Miocene quartz sandstones. Permian- Recent volcanics and Permian-Tertiary granitic massifs)

Hahn, L. & H.S. Weber (1981)- The structure system of West Central Sumatra. Geol. Jahrbuch B47, p. 21-39.
(Central Barisan Mts area four prominent NW-SE trending fault zones, main one is Central Barisan dextral strike-slip fault zone. Intimate relationship between tectonic and volcanic history. Major tectonic events M Cretaceous, M Miocene and Plio-Pleistocene)

Haile, N.S. (1978)- A comment on stratigraphical relationships in the Indarung Area, Padang District, West Sumatra. Bull. Geol. Soc. Malaysia 10, p. 93-95.
(online at: https://gsmpubl.files.wordpress.com/2014/09/bgsm1978007.pdf)
(Critical discussion of Yancey and Alif (1977). Inclusion of deep water radiolarian cherts with shallow-marine limestones in single formation deemed inappropriate. Cherts less extensive than shown by Yancey and Alif (no chert was seen as outcrops ~0.5 km E of Ngalau Quarry. Some rocks at Ngalau Quarry not chert, but weathered stratified rock)

Haile, N.S. (1979)- Palaeomagnetic evidence for rotation and northward drift of Sumatra. J. Geol. Soc., London, 136, p. 541-546.
(?Permian, U Triassic, Lower Cretaceous, and Lower Tertiary rocks from 25 sites in N and C Sumatra. Results indicate 12° N-ward drift since Late Triassic, with 40° clockwise rotation. Remaining localities less reliable, but confirm low paleolatitudes (within 26° of present latitude) and clockwise rotation since Permian. Clockwise rotation of Sumatra contrasts with anti-clockwise rotation of W Borneo, Malay Peninsula and SW Sulawesi and suggests Sumatra not coupled to 'Sundaland' until mid-Tertiary).

Hakim, A.S. (2003)- Cebakan Sedex Zn-Pb di daerah Pagar Gunung, Kabupaten Kotanopan, Kabupaten Madina, Sumatera Utara. Bul. Geologi, ITB, 35, 3, p. 117-131.
(Zn-Pb sedimentary-exhalative deposits in the Pagar Gunung area, Kotanopan and Madina regencies, North Sumatra')

Hakim, A.Y.A., M.N. Heriawan, T. Indriati, D.B. Darma & M. Sanjaya (2013)- Mineralogical observation of Fe-skarn deposit in Lhoong Prospect, Nanggroe Aceh Darussalam, Indonesia. Int. Symposium on Earth Science and Technology 2013, Fukuoka, p. 274-279.
(Fe-Cu skarn deposit at contact of Miocene? Geunteut granodiorite and E Cretaceous Raba and Lamno Limestones associated with Bentaro Volcanics in Barisan Mts of N Sumatra (= probably part of Woyla arc terranes; see also Susanto and Suparka 2012))

Hall, A. & S.J. Moss (1997)- The occurrence of laumontite in volcanic and volcaniclastic rocks from southern Sumatra. J. Southeast Asian Earth Sci. 15, 1, p. 55-59.
(Laumontite in Tertiary and Quaternary volcanics of Gumai Mts product of hydrothermal alteration rather than weathering or metamorphism)

Hamid, D., S. Ardiansyah & B. Safrihadi (2014)- Discovery, exploration history and geology of the Upper Tengkereng porphyry gold and copper deposit, Gayo Lues, Aceh. In: I. Basuki & A.Z. Dahlius (eds.) Sundaland Resources, Proc. Indon. Soc. Econ. Geol. (MGEI) Ann. Conv., Palembang, p. 219-244.
(Upper Tengkereng Au-Cu-(Mo) porphyry deposit in Gayo Lues regency, C Aceh. One of six porphyries in Tengkereng - Ise Ise mineralization belt, associated with Late Pliocene (~2.0 Ma) age intrusive complexes in M Jurassic? volcanics and limestones of the Woyla Gp)

Hamidsyah, H. & M.C.G. Clarke (1982)- Discovery of primary tungsten and tin mineralisation in North Sumatra, Indonesia. In: J.V. Hepworth & Y.H. Zhang (eds.) Symposium on Tungsten geology, Jiangxi, China, ESCAP/RMRDC (UN), p. 49-58.
(Tin and Tungsten mineralization associated with Late Cretaceous (~80 Ma) Hatapang granite, N Sumatra)

Handarbeni, A., D.K. Dewi & I. SidiqIvaniahu (2012)- Epithermal gold deposit in Tambang Sawah Area, Lebong District, Bengkulu Province. Proc. 41st Ann. Conv. Indon. Assoc. Geol. (IAGI), Yogyakarta, 2012-M-13, p.

Handini, E., N.I. Setiawan, S. Husein, P.C. Adi & Hendarsyah (2017)- Petrologi batuan alas cekungan (Basement) Pra-Tersier di Pegunungan Garba, Sumatera Selatan. Proc. Joint Conv. HAGI-IAGI-IAFMI-IATMI (JCM 2017), Malang, 2p.
('Petrology of basement rocks (Basement) Pre-Tertiary in Garba Mountains, South Sumatra'. Brief report on basement rocks in Garba Mts: (1) metamorphics dominated by phyllites (Carboniferous- E Permian Tarap Fm?);(2) andesites- gabbro (E Cretaceous); (3) polymict breccia of clay matrix with chert, marble blocks; (4) youngest unit Garba granite, with new K-Ar date of 91.3 ± 1.9 Ma. Garba Mts part of Jurassic- Cretaceous Saling volcanic arc, in E Cretaceous collision zone between Woyla and W Sumatra terranes?)

Hanzawa, S. (1947)- Note on some species of *Pseudocyclammina* from Sumatra. Japan J. Geol. Geography 20, 2-4, p. 5-8.
(Fontaine et al. 1983: Upper Jurassic or Lower Cretaceous Pseudocyclammina from Gumai Mountains and in deep well in Kikim oilfield near Gumai Mts. Including P. lamellifera, P. cyclamminoides, P. bemmeleni)

Harahap, B.H. (2006)- Petrology of the Upper Miocene volcanic rocks on the western Barisan Mountain Ranges, Lubuk Sikaping region, West Sumatera. Buletin Geologi (ITB) 38, 3, p. 81-108.
(see also Harahap 2011)

Harahap, B.H. (2007)- Petrologi batuan magmatis Neogen daerah Pangkalan Kotabaru Limapuluh kota, Sumatera Barat. J. Sumber Daya Geologi 17, 4, p. 207-217.
(online at: http://jgsm.geologi.esdm.go.id/index.php/JGSM/article/view/290/261)
('Petrology of Neogene magmatic rocks in Pangkalan Kotabaru region, W Sumatra'. Andesites- dacites NNE of Padang are related to subduction)

Harahap, B.H. (2010)- Ciri geokimia batuan vulkaniklastika di daerah Tanjung Balit, Sumatra Barat: suatu indikasi kegiatan magma pada Eosen. J. Geologi Indonesia 5, 2, p. 75-91.
(online at: www.bgl.esdm.go.id/publication/index.php/dir/article_detail/266)
('Geochemical characteristics of volcanoclastic rocks in the Tunjung Balit area, W Sumatra: some indications of magmatic activity in the Eocene'. Chemistry of ?Eocene red mudstones overlying Permian Kuantan Fm in Barisan Mts suggests altered volcanoclastic origin)

Harahap, B.H. (2011)- Petrology and geochemistry of the Upper Miocene volcanics on the western part of the Barisan Mountain Ranges, Lubuk Sikapeng region, West Sumatra. J. Sumber Daya Geologi 21, 1, p. 9-21.
(online at: http://jgsm.geologi.esdm.go.id/index.php/JGSM/article/view/131/128)
(Andesitic and basaltic lavas are main product of U Miocene volcanism in Lubuk Sikaping region. Associated with base metals and gold, mined in colonial period at Bonjol, Mangani, etc.. Resemble arc setting, with involvement of subducted sediment. Lava from Lubuk Sikaping is product of Maninjau eruption in Late Miocene, overlain by Pleistocene deposits of Maninjau Crater)

Harahap, B.H. (2011)- Magma genesis in Kabanjahe region continental margin arc of Sumatra. J. Geologi Indonesia 6, 2, p. 105-127.
(online at: www.bgl.esdm.go.id/publication/index.php/dir/article_detail/307)
(Volcanic rocks in Kabanjahe area, N Sumatra Province, are products of old Toba Caldera, Sibayak Volcano, and Sipiso-piso Volcano. Rhyolitic tuff most common, also basalt, andesite, dacitic, rhyolite. Rocks originated from magma of continental origin formed at subduction zone environment)

Harahap, B.H. & Z.A. Abidin (2006)- Petrology of lava from Maninjau Lake, West Sumatera. J. Sumber Daya Geologi (GRDC, Bandung) 16, 6 (156), p. 359-370.
(Pleistocene (~0.8 Ma) subaerial volcanics from Maninjau Crater/ caldera, 60km NW of Padang, mainly porphyric andesite and some rhyolite. Lavas distributed over 20 km, ignimbrite tuffs over 100 km. Belong to high-K calc-alkaline arc volcanics. Oldest rocks in area Carboniferous Kuantan Fm phyllite-limestone, under Permian- Jurassic. Barisan Range uplift began in late M Miocene, peaking at Mio-Pliocene boundary)

Harahap, B.H. & Z.A. Abidin (2012)- Karakteristik inklusi fluida dalam mineralisasi emas di daerah Lumban Julu, Tobasa, Sumatra Utara. J. Sumber Daya Geologi 22, 3, p. 155-168.
(online at: http://jgsm.geologi.esdm.go.id/index.php/JGSM/article/view/117/108)
('Characteristics of fluid inclusions in gold mineralization in the Lumban Julu area, Tobasa, North Sumatra'. Quartz veins in Lumban Julu area with Ag-Au-Cu-Pb-Zn mineralization. Fluid inclusions in quartz consist of liquid and vapor. Two systems of mineral deposition in area: (1) associated with high-T with mesothermal system at ~1600m depth and (2) associated with ephythermal system at ~550m depth)

Harahap, B.H., H.Z. Abidin, W. Gunawan & R. Yuniarni (2015)- Genesis of Pb-Zn-Cu-Ag deposits within Permian-Carboniferous carbonate rocks in Madina Regency, North Sumatra. Indonesian J. Geoscience 2, 3, p. 167-184.
(online at: http://ijog.bgl.esdm.go.id/index.php/IJOG/article/view/209/200)
(Latong River outcrops near Siabu in W Sumatra between Sibolga and Natal. Folded Permian-Carboniferous Tapanuli Gp (Kluet/ Kuantan Fms) low-grade metasediments with limestone interbeds with galena-sphalerite-marcasite mineralization. Mineralization origin probably tied to sedimentary processes rather than igneous activity. Also older (Carboniferous; 333 Ma) and younger (E Cretaceous; 119Ma) hornblende and biotite granite intrusives in area)

Harahap, B.H. & Harmanto (1987)- Tin mineralization in Pegunungan Tigapuluh, Central Sumatra. Indonesia. In: W. Gocht (ed.) Proc. Seminar on Importance of primary tin mining in Southeast Asia, Bandung 1986, Intertechnik 28, Aachen, p. 111-124.
(Cassiterite- arsenopyrite mineralization in 70-100cm quartz veins in marginal greisen zone of Sungei Isahan granite, Tigapuluh Mts, E C Sumatra. Up to 7.5 kg/m3 cassiterite in stream sediment (see also Schwartz 1987))

Hardjawidjaksana, K. (1996)- Geochemistry and magnetic susceptibility of Toba ash layer in Indian Ocean (preliminary results of Barat cruise 1994). In: S.Y. Kim et al. (eds.) Proc. 32nd Ann. Sess. Coord. Comm. Coastal Offshore Geosc. Progr. E and SE Asia (CCOP), Tsukuba 1995, p. 219-229.
(On distribution of ash from large Toba eruption of 75,000 years BP, N Sumatra)

Hariawan, M.N. & T. Mulya (2017)- Spatial relations between gold, associated metals and lithologies at the Miwah acid-sulfate (high sulfidation) epithermal deposit, Aceh, North Sumatra, Indonesia. Proc. 14th SGA Biennial Meeting- Mineral resources to discover, Quebec 2017, 4, p.1353-1356.

Harlan, J.B., M.L. Jones, B. Sutopo & T. Hoschke (2005)- Discovery and characterization of the Martabe epithermal gold deposits, North Sumatra, Indonesia. In: H.N. Rhoden et al. (eds.) Proc. Window to the world Symposium, Geol. Soc. Nevada, Reno, p. 917-942.
(Newmont Martabe District high sulphidation epithermal gold deposits 1997 discoveries E of Sibolga. Near strand of Sumatra Fault Zone. See also Sutopo et al. 2003, 2013)

Harris, L. (1989)- Conjugate faulting associated with orthogonal subduction in Indonesia: structural constraints for the timing of the rotation of Sumatra. SGTSG Conference, Kangaroo Island 1989, Geol. Soc. Australia, Abstracts 24, p. 59-60. *(Abstract only)*

Hartmann, E. (1917)- Over de geologie van de Lampongsche Distrikten en het zuidelijk deel der residentie Palembang, Zuid Sumatra. Jaarboek Mijnwezen Nederlandsch Oost-Indie 44 (1915), Verhandelingen 2, p. 90-132.
('On the geology of the Lampung Districts and the southern part of the Palembang Residency, S Sumatra' Results of 1915 reconnaissance. Pretertiary metamorphics and granites, overlain by folded 'Eocene' quartz sandstones with coal, Oligocene Baturaja Limestone (few 100m thick; should be E Miocene age; JTvG), 500m or more marine Telisa/ Gumai clays, tuffs and limestones, 1000m of Miocene-Pliocene L-M Palembang clays-sandstones (rel. little coal in this area) and 500m Upper Palembang Fm quartz-rich tuffs. Overlain by unfolded Quaternary conglomerates and volcanics)

Hartmann, E. (1921)- Geologisch rapport over het kolenvoorkomen in de mijnconcessies 'Soekamarinda' en 'Boenian' en het tusschen deze beide gelegen kolenveld 'Ajer Serillo', gelegen in de onderafdeeling Lematang Oeloe, Residentie Palembang. Jaarboek Mijnwezen Nederlandsch Oost-Indie 47 (1918), Verhandelingen 2, p. 108-140.
(Detailed study of Middle Palembang Fm coals in 3 mining concessions in Lematang Ulu area, Palembang Residency, S Sumatra)

Hartono, U. (2002)- Permian magmatism in Sumatra: their tectonic setting and magmatic source. J. Geologi Sumberdaya Mineral 12, 129, p. 33-46.
(Permian magmatism in W Sumatra demonstrated by volcanic rocks in Barisan Mts in Palepat and Silungkang areas (= Kuantan-Duabelas Mts Block= Mergui Plate). Tectonic setting debated, Volcanic rocks vary from low-K, medium-K to high-K affinities and consist of basalt, andesite and rhyolite. Low MgO and Ti02, enriched in large ion lithophile elements, light Rare Earth Elements (LREE), etc, indicate subduction zone environment. Magma source peridotitic upper mantle. Origin of rhyolite still unknown; characteristics no relationship to andesite)

Hartono, U., A. Achdan & S. Andi Mangga (1998)- Fractionation process evidences on the Palepat volcanic magmatism in Southern Sumatra. J. Geologi Sumberdaya Mineral, 8, 79, p. 2-9.
(Permian Palepat and Silungkang Fm volcanics are oldest rocks exposed along E flank Barisan Mts in S Sumatra. Three groups: (1) low-K basalt, basaltic andesite and low-medium-K andesites (subduction magmatism); (2) high-K andesite and rhyolite and (3) Low Na andesite and rhyolite (origins of 2 and 3 still unclear, but not co-magmatic with Group 1) (Suparka and Asikin 1981: not result of subduction))

Hartono, U., S. Andi Mangga & A. Achdan (1996)- Geochemical results of the Permian Palepat and Silungkang volcanics, southern Sumatra. J. Geologi Sumberdaya Mineral, 5, 56, p. 18-24.
(Permian Palepat and Silungkang volcanics from SW Sumatra (Kuantan- Duabelas Mts Zone= Mergui Plate of Pulunggono and Cameron, 1984). Predominantly andesitic and basaltic in composition, with minor rhyolites. Previously interpreted as products of melting of continental crust (Suparka & Asikin, 1981), but geochemistry more typical of subduction-related magmatism, with high Al2O3 and low MgO and Ti02 concentrations. Silungkang volcanics characterised by FeO enrichment typical of tholeiite, Palepat rocks evolved from tholeiitic basalts to calc-alkaline andesites (no localities information or justification of age assigment; JTvG))

Hasibuan, F. (1993)- *Posidonia* dari Sumatera Barat. Proc. 22nd Ann. Conv. Indon. Assoc. Geol. (IAGI), Bandung, 2, p. 1061-1074.
('Posidonia from West Sumatra'. Two varieties of Triassic (Carnian?) marine mollusc Posidonia cf. kedahensis Kobayashi (A and B) from shaly horizon below M-L Triassic Sawahlunto Limestone in two localities NE of Padang, W Sumatra: S of Sawahlunto (E of Lake Singgkarak) and Sulit Air/ Mt Si Karikir (NE of Lake Singkarak). Associated with ammonite Trachyceras (Protrachyceras). Overlain by limestone with mollusc Paleocardita spp.))

Hasibuan, F. (2007)- A study on paleoflora (Permian) of Jambi, South Sumatera. In: Geologi Indonesia: dinamika dan produknya, Geol. Res. Dev. Centre (GRDC), Bandung, Spec. Publ. 33, 2, p. 135-147.
(Revisit of Mengkarang Fm along Merangin River, W of Bangko, W Jambi, by multi-disciplinary team in 2003. Mengkarang Fm 400m thick, basal basalt overlain by fluviatile system, with marine limestone beds ands shale interbeds containing fusulinids, crinoids, ammonites, and brachiopods. Two plant associations of Jambi Early Permian paleoflora, suggesting one new local and one probable S Cathaysian affinity paleofloral domain)

Hasibuan, F., S. Andi Mangga & Suyoko (2000)- *Stereochia semireticulatus* (Martin) dari Formasi Mengkarang, Jambi, Sumatra. Geol. Res. Dev. Centre, Seri Paleontologi 10, Bandung, p. 59-69.
(Permian brachiopods from Jambi series along Mengkarang River, SW of Bangko, C Sumatra. All belong to Stereochia semireticulatus (Martin), called Productus semireticulatus by Woodward (1879) (reclassified as Stereochia aff. S. irianensis by Crippa et al. 2014) (Sterochia believed to range from Sakmarian- Kungurian; Grant 1976; also known from Bitauni, Timor (Broili 1916) as Productus semireticulatus; JTvG))

Hastuti, E.W.D. (2017)- Geochemical study of pyroclastic rocks in Maninjau Lake, West Sumatra. In: 2nd Int. Conf. Transdisciplinary research on environmental problems in Southeast Asia (TREPSEA), Bandung 2016, IOP Conf. Series, Earth Environm. Science, 71, 012034, p. 1-9.
(online at: http://iopscience.iop.org/article/10.1088/1755-1315/71/1/012034/pdf)
(Pleistocene- Holocene pyroclastic deposits in Maninjau area in Barisan Mts range in composition from high-K rhyolite to calc-alkaline andesite)

Hayes, G.P., M. Bernardino, F. Dannemann, G. Smoczyk, R. Briggs et al. (2013)- Seismicity of the Earth 1900-2012, Sumatra and vicinity. U.S. Geol. Survey (USGS) Open File Report 2010-1083-L, 1p.
(online at: http://pubs.usgs.gov/of/2010/1083/l/pdf/OF10-1083_L-508.pdf)

Heesterman, L.J.H. (1984)- Geology and mineralisation of the Mangani Area, West Sumatra, Indonesia. Ph.D. Thesis University of London, p. 1-418.
(online at: https://kclpure.kcl.ac.uk/portal/files/2932475/542393.pdf)
(Mangani gold mine area in E, inactive part of dextral Sumatra Fault Zone, near Bukittinggi. Several new mineralised areas discovered, incl. unexposed lead/zinc mineralisation)

Hehuwat, F. (1977)- The CCOP/ IDOE Sumatra Transect: a summary of activities. Proc. 14th Sess. CCOP, Manila 1977, p. 399-406.

Hertrijana, J., P. Hehuwat, M.L. Jones & B. Harlan (2005)- Martabe high sulphidation gold deposits, North Sumatra. In: S. Prihatmoko et al. (eds.) Indonesian mineral and coal discoveries, Indon. Assoc. Geol. (IAGI), Jakarta, Spec. Issue, p. 59-73.
(PT Newmont Martabe gold district at NW coast of Sumatra, 30 km E of Sibolga. Epithermal high-sulphidation gold mineralization associated with Late Tertiary (Pliocene?) dacite-andesite dome and diatreme complex, W of Sumatra Fault Zone. Epithermal alteration dated as 2.1-3.3 Ma. Basement rocks in area Carboniferous-Permian Tapanuli Gp meta-clastics, intruded by Late Triassic Nagodang Granite (Ar/Ar age 209 Ma), which may be related to 'Jurassic' Sibolga Granite Complex 30km to NW)

Hinz, K. (1980)- Malacca Strait survey 1979. Proc. 17th Sess. CCOP, Bangkok 1980, p. 212-215.

Hirschi, H. (1910)- Geographisch-geologische Skizze vom Nordrand von Sumatra. Tijdschrift Kon. Nederlands Aardrijkskundig Genootschap (2) 27, p. 741-763.
(online at: https://babel.hathitrust.org/cgi/pt?id=mdp.39015078113365;view=1up;seq=119)
(Early geographic-geological survey of N Sumatra coastal region. Barisan Mts with Permian-Carboniferous rocks, serpentinites and diabase, overlain by folded Tertiary sediments and young volcanics. With 1:800,000 sketch map)

Hirschi, H. (1915)- Geologische Reiseskizze durch das Aquatoriale Sumatra. Tijdschrift Kon. Nederlands Aardrijkskundig Genootschap (2) 32, p. 476-508.

('Geological travels through Equatorial Sumatra')

Hochstein M.P. & S. Sudarman (1993)- Geothermal resources of Sumatra. Geothermics 22, 3, p. 181-200.

Holis, Z. & B. Sapiie (2012)- Fractured Basement reservoirs characterization in Central Sumatera Basin, Kotopanjang Area, Riau, Western Indonesia: an outcrop analog study. AAPG Int. Conv. Exhib., Singapore 2012, Search and Discovery Art. 50735, p. 1-4. *(Poster Presentation)*
(online at: www.searchanddiscovery.com/documents/2012/50735holis/ndx_holis.pdf)
(On fracture characterization of basement outcrops (Carboniferous- E Permian Bohorok Fm pebbly mudstone))

Holthausen, E. (1925)- Beitrag zur Kenntnis der Petrographie des Gebietes des Toba-Sees in Nordsumatra. Inaug. Dissertation, Wilhelms Universitat, Munster, p. 1-44.
('Contribution to the knowledge of the petrography of the Lake Toba area in North Sumatra'. Brief petrographic descriptions of rocks collected by Siccama in 1923 along E bank of Lake Toba, mainly from volcanic massif of Prapat: diorites, porphyrites, liparite, andesite, tuff and contactmetamorphic rocks. No maps or figures)

Hoogenraad, G.B. (1934)- De Salida Mijn. De Ingenieur in Nederlandsch-Indie,1, 4, p. IV.3-IV.13.
('The Salida mine'. Review of operations of Salida gold-silver mine of W Sumatra, 80km from Padang. First exploited with mixed success by East Indies Company (VOC) in 1669-1735 with miners from Hungary and slaves from Madagascar, then from 1912-1928 by Salida Mining company. Two main ore veins hosted by Oligo-Miocene volcanics and sediments. Peak production in 1917: 427 kg gold, 8633 kg silver)

Hovig, P. (1914)- De goudertsen van de Lebongstreek (Benkoelen). Jaarboek Mijnwezen Nederlandsch Oost-Indie 41 (1912), Verhandelingen, p. 87-276.
('The gold ores of the Lebong area (Bengkulu)'. With detail maps of the 8 principal gold mines. Includes first description of truscottite (Ca-zeolite) from Lebong Donok mine in Bengkulu district)

Hovig, P. (1917)- Contactmetamorphe ijzerertsafzettingen in Nederlandsch-Indie. Natuurkundig Tijdschrift Nederlandsch-Indie 77, 3, p. 71-103.
(online at: http://archive.org/details/mobot31753002490198)
('Contact-metamorphic iron ore deposits in Netherlands Indies'. On epithermal iron ore deposits, mainly at contact zones of Salo-Talimbanga, 12km NW of Rante Pao (C Sulawesi), Bukit Rajah at border of Jambi and Palembang provinces (S Sumatra), Lampung, etc.). No maps or figures)

Hovig, P. (1919)- Mijnbouw maatschappij Redjang-Lebong: Rapport uitgebracht over het geologisch onderzoek van het concessie-terrein "Lebong Donok". Ruygrok & Co., Batavia, 76p.
(Report of minerals survey of Lebong Donok terrain near Rejang Lebong gold mine, N of Bengkulu, W Sumatra)

Huchon, P. & X. Le Pichon (1984)- Sunda Strait and central Sumatra fault. Geology 12, p. 668-672.
(Right-lateral Central Sumatra fault accommodates oblique subduction and terminates in SE at extensional zone of Sunda Strait)

Huguenin, O.F.U.J. (1854)- Mijnbouwkundig onderzoek der kopererts en in de Residentie Padangsche Bovenlanden. Natuurkundig Tijdschrift Nederlandsch-Indie 6, p. 223-254.
('Mining investigation of the copper ores in the Padang Highlands'. Old report on survey of relatively widespread copper mineralization in Batipo- Kotta's area of Barisan Range (Timboelon, etc.). No maps)

Hundeshagen, L. (1904)- The occurrence of platinum in wollastinite on the island of Sumatra, Netherlands East Indies. Trans. Inst. Mining Metallurgy 13, p. 550-552.
(Singenggu River locality 35 miles from Sibolga, N Sumatra. occurrence of traces of platinum and gold in wollastonite in limestone lens altered at granodiorite intrusion (skarn) (no peridotites noticed in area))

Hurukawa, N., B.R. Wulandari & M. Kasahara (2014)- Earthquake history of the Sumatran Fault, Indonesia, since 1892, derived from relocation of large earthquakes. Bull. Seismological Soc. America 104, 4, p. 1750-1762.
(Many shallow right-lateral strike-slip fault earthquakes along Sumatran fault zone. Hypocenter relocations of 27 large earthquakes (M $\geq$6:0) from 1921-2012 and identification of fault planes of 6 earthquakes of M $\geq$7:0 s)

Hutchison, C.S. (1989)- Chemical variation of biotite and hornblende in some Malaysian and Sumatran granitoids. Bull. Geol. Soc. Malaysia 24, p. 101-119.
(online at: www.gsm.org.my/products/702001-101309-PDF.pdf)
(Eastern Belt granitoids of Malay Peninsula commonly contain hornblende and biotite. Hornblendes and co-existing biotites equilibrium partitioning of Fe/Mg proving magmatic origin. Aluminium in amphiboles prove epizonal emplacement for E Belt granitoids and even higher sub-volcanic environment for SE province. Known occurrences of amphibole in Main Range are few. Sibolga granite from N Sumatra Permo-Triassic ages (Rb-Sr 247 ± 24 Ma, most K-Ar ages 215 Ma, Late Triassic) S-type granite, but no known tin association. Hornblende of Sumatran plutons suggest shallow emplacements with crystallization pressures $< \sim 2.4$ kb)

Imtihanah (2000)- Isotopic dating of igneous sequences of the Sumatra Fault System. M.Sc. Thesis, London University, p. 1-150. *(Unpublished)*

Imtihanah (2004)- 40Ar/39Ar geochronology of rocks affected by the Sumateran fault system (SFS) collected from West-Central Sumatra. J. Sumber Daya Geologi 14, 3 (147), p. 16-31.
(Ar/Ar dating of 3 granitoid plutons near Sumatra Fault zone: 1) Sulit Air biotite-hornblende granodiorite, SE of Ombilin, intruding folded Permian limestones: 193-192 Ma (E Jurassic) (K-Ar ages by McCourt and Cobbing, 1993) (200-180 Ma and 150-140 Ma), (2) Lassi granite-granodiorite, E of Solok: 56-54.8 Ma (E Eocene) (previous K-Ar ages ~57-53 Ma); and (3) Lolo biotite-hornblende granodiorite (mainly 9-5.6 Ma; one biotite granite sample ~15 Ma) (previous K-Ar ages ~11-5 Ma))

Imtihanah (2005)- A petrographic study of igneous rocks from western part of Central Sumatra and their suitability for 40Ar/39Ar dating (a preliminary study). J. Sumber Daya Geologi 15, 1 (148), p. 26-37.
(Petrography of granites along Sumatra Fault Zone, from Ombilin (muscovite granodiorite, E of Lake Singkarak), Sulit Air (hornblende granodiorite; intruded into folded Permian limestones), Lassi Pluton, Lolo Pluton (biotite-hornblende granodiorite) and Sungaipenuh areas)

Imtihanah (2005)- Rb/Sr geochronology and geochemistry of granitoid rocks from Western part of Central Sumatra. J. Sumber Daya Geologi 15, 2 (149), p. 103-117.
(Radiometric ages of three western C Sumatra granitoid plutons: (1) Sulit Air (~192 Ma; E Jurassic; previous analyses 202 Ma and 200-180 Ma); (2) Lassi (55-52.2 Ma; Eocene)(= much younger than 122 Ma of Katili 1973, but in line with 52-57 Ma ages in McCourt & Cobbing 1993; JTvG) and (3) Lolo (K-Ar and Rb-Srages 15.1- 5.8 Ma; M-L Miocene). All calk-alkaline and with Sr isotopes suggesting similar source)

Indrajat, B., I. Bruce, H. Hardian, S. Prabowo & M.M. Sinaga (2009)- The geology and mineralization of the sedex and MVT deposits of the Dairi District, North Sumatra, Indonesia. Geologi Ekonomi Indonesia, 6, 1, p. 22-36.
(Sedimentary exhalative style mineralisation in Permo-Carboniferous Tapanuli Gp of Sopokomil dome of Dairi Regency)

Irwansyah, Panuju, D. Kurniadi & Y. Helmi (2017)- Paleogene bioevents in the Pematang Group, Central Sumatera Basin, Rokan Block Area, Riau. Proc. Joint Conv. HAGI-IAGI-IAFMI-IATMI (JCM 2017), Malang, 6p.
(M Eocene- Oligocene palynology of Pematang Gp of C Sumatra. Pematang Gp not older than Proxapertites operculatus zone to not younger than Meyeripollis naharkotensis subzone)

Iskandar, E.A.P., I.M. van Waveren & J.H.A. van Konijnenburg-van Cittert (2006)- Pecopterids from the Lower Permian of Jambi Sumatra. Trans. Royal Soc. Scotland, p.

Ivey, J.H. (1904)- Notes on the Redjang-Lebong mine, Sumatra. Trans. Inst. Mining Metallurgy 12, p. 340-347.

Jansen, P.J. (1903)- Verslag ener geologisch- mijnbouwkundige verkenning der Atjeh-Vallei gedurende het jaar 1902. Jaarboek Mijnwezen Nederlandsch-Indie 32 (1903), p. 179-184.
('Report of a geological-mining reconnaissance in the year 1902'. Brief report on geologic reconnaisance in valley of Aceh River, N Sumatra. All Tertiary sediments with some limestones, but no coal beds. With 1:200,000 color geologic map and cross-sections)

Jaxybulatov, K., N.M. Shapiro, I. Koulakov, A. Mordret, M. Landes & C. Sens-Schonfelder (2014)- A large magmatic sill complex beneath the Toba caldera. Science 346, 6209, p. 617-619.
(Size and level of maturity of large volcanic reservoir estimated from radial seismic anisotropy (ambient-noise tomography) below Toba caldera, N Sumatra. Many partially molten sills present in the crust below 7 km)

Jobson, D.H., C.A. Boulter & R.P.Foster (1994)- Structural controls and genesis of epithermal gold-bearing breccias at the Lebong Tandai Mine, western Sumatra, Indonesia. J. Geochemical Exploration 50, p. 409-428.
(Lebong Tandai Neogene low-sulphidation, volcanic-hosted epithermal gold deposit in foothills of Barisan Mts)

Johari, S. (1988)- Geochemistry and tin mineralisation in northern Sumatra, Indonesia. In: C.S. Hutchison (ed.) Geology of tin deposits in Asia and the Pacific, Selected papers from Int. Symp. Geology of tin deposits, Nanning, China, 1984, Springer Verlag, Heidelberg, p. 541-556.
(Two areas in N Sumatra identified with cassiterite tin mineralization: Mabundar-Kutacane and Hatapang Rantau Prapat (SE of Lake Toba; K-Ar age ~76-78 Ma). Both areas are underlain by Carboniferous-Permian sediments, intruded by Late Cretaceous granites. Hatapang pluton mainly coarse-grained porphyritic biotite granites, of 'S' or ilmenite-type. They resemble 'Western Belt' granites in Phuket Cretaceous? tin granite zone of Thailand)

Johnson, C.C., W.J. McCourt & Suganda (1993)- A report on the geochemistry of stream sediment samples and simplified geology of the Palembang Quadrangle (1033). Direct. Mineral Resources/ British Geol. Survey, Bandung, Spec. Publ. 56-A, p. 1-32.
(No known metalliferous occurrences in Palembang Quadrangle, S Sumatra)

Jones, S.C. (2007)- The Toba supervolcanic eruption: tephra-fall deposits in India and paleoanthropological implications. In: M.D. Petraglia & B. Allchin (eds.) The evolution and history of human populations in South Asia, Springer, p. 173-200.
(Youngest Toba Tuff (74 ka) occurrences documented in river valleys throughout Indian subcontinent, ranging in thickness from 0.2-6m (probably thickened due to reworking and redeposition). May have caused mass human extiction. Fossil evidence suggests human colonization of India took place soon after Toba event)

Jongmans, W.J. (1937)- The flora of the upper Carboniferous of Djambi (Sumatra, Netherl. India) and its possible bearing on the paleogeography of the Carboniferous. Compte Rendu 2nd Int. Congress on Carboniferous Stratigraphy and Geology, Heerlen 1935, 1, p. 345-362.
(Abbreviated, English version of Jongmans and Gothan (1925) monograph on new material of E Permian Jambi flora)

Jongmans, W.J. & W. Gothan (1925)- Beitrage zur Kenntnis der Flora des Oberkarbons von Sumatra. Verhandelingen Geologisch-Mijnbouwkundig Genootschap Nederland Kol., Geol. Serie 8 (Verbeek volume), p. 279-303.
('Contributions to the knowledge of the flora of the Upper Carboniferous of Sumatra'. First report on classic Early Permian 'Jambi flora' of W Sumatra: 80 species, incl. 14 Pecopteris spp., Taenopteris, Sphenophyllum, etc. Interpreted here as Upper Carboniferous age (but Posthumus (1927) and subsequent workers all assigned it to Early Permian) and of 'European' affinity, with no relations to Gondwana flora. See also Jongmans & Gothan (1935) and papers by Booi. Van Waveren, etc.)

Jongmans, W.J. & W. Gothan (1935)- Die Ergebnisse der palaobotanischen Djambi-Expedition 1925. 2. Die palaeobotanischen Ergebnisse. Jaarboek Mijnwezen Nederlandsch-Indie (1930), 59, Verhandelingen 2, p. 71-201.
('The results of the 1925 paleobotanic Jambi expedition, 2. The paleobotanic results'. Additional Permian plant fossils of 'Jambi Flora', collected by 1925 Djambi Expedition, led by Zwierzycki and Posthumus. Two plant-bearing horizons in thick tuff-sandstone-shale series, ~100 and 250m above lowest fossil-rich limestone bed (= 'Productus Limestone' of Tobler?). Age of plant fossils here still regarded as 'Upper Carboniferous' instead of more likely E Permian age. Presence of typical low-latitude 'Cathaysian' species including Sphenopteris, Pecopteris, Taeniopteris, Gigantopteris, etc.; no Gondwana elements (NB: Asama et al. (1975) argued only limited % of Cathaysian species in Jambi flora. Two species described here as Gigantopteris not true Cathaysian Gigantopteris; see also Zwierzycki 1935, Van Waveren et al. 2007; JTvG)

Justesen, P.Th. (1920)- De Goenoeng Merapi in de Padangse Bovenlanden. Tijdschrift Kon. Nederlands Aardrijkskundig Genootschap (2) 37, p. 181-194.
('Mount Merapi in the Padang Highlands')

Kadir, W.G.A., S. Sukmono, M.T. Zen, L. Hendrajaya & D. Santoso (1996)- Gravity evidence for the thinning of the crust around the North Sumatra area. Proc. 25th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, p. 81-91.
(Structural discontinuity around N Sumatra effect of split in descending oceanic plate along continuation of Investigator Ridge Transform Fault. Discontinuity reflected by sharp change of Sumatra Fault, volcanic line offset and major changes to strike of Batee fault and Batee trench. Area around discontinuity low gravity anomaly with higher anomaly in center, indicating low density body of mantle material intruded by higher density igneous material in center. Gravity model pattern reflects thinning of crust beneath N Sumatra due to regional tensional stresses of mantle depth at ~20 km depth)

Kanao, N. et al. (1971)- Summary report on the survey of Sumatra, Block No. 5. Japanese Overseas Mineral Development Company Ltd., Bull. N.I.G.M. 2, p. 29-31.
(Wayzer et al. 1991: K/Ar date of W Sumatra Manunggul Granite batholith 87.0 Ma (Late Cretaceous))

Kastowo, G.W. Leo, S. Gafoer & T.C. Amin (1996)- Geological map of the Padang Quadrangle (0715), Sumatra, 1:250,000. Geol. Res. Dev. Centre (GRDC), Bandung
(2nd ed. of 1973 map. Geologic map of W coast of Sumatra, N of Padang.With Quaternary Maninjau crater lake and Merapi volcano. Old rocks in NE corner Permo-Carboniferous metamorphics (equivalent of phyllite Mb of Kuantan Fm) and E-M Permian carbonates N of Padang with fusulinids (Neoschwagerina, Verbeekina, Chusenella) (Limestone Mb of Kuantan Fm), associated with minor serpentinite in fault zone. Cretaceous granite SE of Singkarak dated as 112± 24 Ma by Katili, 1962)

Katili, J.A. (1960)- Geological investigations in the Lassi granite mass (Central Sumatra). Doct. Thesis Inst. Teknologi Bandung (ITB), p. 1-127. *(Unpublished)*

Katili, J.A. (1962)- On the age of the granitic rocks in relation to the structural features of Sumatra. In: G.A. MacDonald & H. Kuno (eds.) The crust of the Pacific Basin. American Geophys. Union (AGU) Mon. 6, p. 116-121.
Most granites of Sumatra post-Triassic and pre-Tertiary in age, but some granites in S Sumatra of Cretaceous age. In C Sumatra only one definite unconformity between Triassic and Tertiary deposits. No accurate age of folding can be established from field data. Radiometric age of Lassi granites in C Sumatra 112 ± 24 Ma, mid-Cretaceous= tied to folding?)

Katili, J.A. (1964)- On the Sumatran nappe hypothesis. Rept. 22nd. Session Int. Geological Congress, New Delhi 1964, Sect. 4, p. 134-147.
(Argues against nappe structures of Sumatra basement, as proposed by Tobler)

Katili, J.A. (1968)- Permian volcanism and its relation to the tectonic development of Sumatra. Bull. Nat. Inst. Geology and Mining (NIGM), Bandung, 1, 1, p. 3-13.
(online at: http://jrisetgeotam.com/index.php/NIGM/article/view/3-13. Also in "Geotectonics of Indonesia- a modern view', Bandung 1980)
(Extensive Permian volcanics SE of Lake Singkarak. Named Silungkang Fm, ~1000m thick, mainly flows of hornblende and augite andesites (= 'diabase' of Verbeek 1883), with calcareous member of thin-bedded limestone-shale in tuffs with Upper Permian fusulinids Doliolina lepida, Pseudofusulina padangensis, Neoschwagerina multiseptata and Fusulinella lantenoisi. Local contact metamorphism around mid-Cretaceous Lassi granites, simultaneous with main folding phase of region)

Katili, J.A. (1969)- Permian volcanism and its relation to the tectonic development of Sumatra. Bull. Volcanologique 33, 2, p. 530-540.
(Same paper as above. Permian volcanics cover extensive area SE of Lake Singkarak, C Sumatra. In Permian C Sumatra was elongated marine with thick sequence of bathyal and neritic sediments. Volcanic products mainly flows of hornblende and augite andesites with their tuffs. Main phase of folding at ~120 Ma, accompanied by emplacement of granitic rocks. Uplift in younger Cretaceous time, followed by erosion. 'Unusual andesitic character of geosynclinal volcanism')

Katili, J.A. (1969)- Large transcurrent faults in Southeast Asia, with special reference to Indonesia. Bull. Nat. Inst. Geology and Mining (NIGM), Bandung, 2, 3, p. 1-20.
(Large wrench fault systems in Indonesia include the 1650km long NW-SE trending dextral Great Sumatra Fault zone (= Semangko Fault of Van Bemmelen), sinistral Palu-Koro Fault ('Fossa Sarasina') of Sulawesi, sinistral Sorong Fault Zone of West Papua)

Katili, J.A. (1970)- Additional evidence of transcurrent faulting in Sumatera and Sulawesi. Bull. Nat. Inst. Geology and Mining (NIGM), Bandung, 3, 3, p. 15-28.
(Additional observations on dextral Great Sumatra Fault Zone and sinistral Palu-Koro Fault of Sulawesi)

Katili, J.A. (1970)- Large transcurrent faults in Southeast Asia, with special reference to Indonesia. Geol. Rundschau 59, 2, p. 581-600.
(Same as Katili 1969)

Katili, J.A. (1970)- Naplet structures and transcurrent faults in Sumatra. Bull. Nat. Inst. Geology and Mining (NIGM), Bandung, 3, 1, p. 11-28.
(Disputes major nappe structure of Sumatra Pre-Tertiary, as proposed by Tobler 1917, etc. Djambi nappe is small overthrust (naplet) along minor transcurrent fault associated with Great Sumatran Fault zone)

Katili, J.A. (1973)- Geochronology of West Indonesia and its implication on plate tectonics. Tectonophysics 19, p. 195-212.
(Radiometric age dates from Sumatra, Java, Natuna, etc.)

Katili, J.A. (1974)- Sumatra. In: A.M. Spencer (ed.) Mesozoic-Cenozoic orogenic belts, Geol. Soc., London, Spec. Publ. 4, p. 317-331.
(Brief review of Sumatra geology. Oldest known rock are of Permo-Carboniferous age, deposited in elongated marine basin, in which thick sequence of bathyal and neritic sediments was deposited. Pelitic sediments dominated, but also volcanic activity, at first mainly tuffs, but later also andesitic lavas, which alternated with thin limestone and shale. Triassic dominantly shale and sandstone in M. Triassic, mainly limestone and marl in U Triassic. In Gumai Mts. volcanic activity continued till E Cretaceous, when volcanic breccias andesitic lava flows formed in alternation with limestones. Main phase of folding in M Cretaceous, when all pre-Tertiary pelitic rocks deformed into isoclinal folds, accompanied by emplacement of granitic and granodioritic rocks. Uplift in younger Cretaceous. Old Andesites in Oligo-Miocene, etc.)

Katili, J.A. & F. Hehuwat (1967)- On the occurrence of large transcurrent faults in Sumatra, Indonesia. J. Geosci. Osaka City University 10, 1, p. 5-17.

(Several geologic features suggesting 20-25km right-lateral slip along Sumatra fault zone)

Katili, J.A. & Kamal (1961)- Laporan sementara mengenai geologi daerah Ombilin pesisir utara Danau Singkarak. Proc. Inst. Teknologi Bandung 1, 1, p. 5-23.
(online at: http://journal.itb.ac.id/index.php?li=article_detail&id=836)
('Interim report on the geology of the Ombilin area N of Lake Singkarak'. Thick (~1000m) Permian volcanic Silungkang Fm, with M-U Permian fusulinid limestone intercalations near top and overlain by 375m thick Triassic limestone, overlain by Oligo-Miocene clastics. Permian fusulinids identified by P. Marks as Doliolina lepida, Pseudofusulina padangensis, Neoschwagerina multiseptata, Fusulinella lantenoisi. Triassic limestones with Myophoria verbeeki, Cardita, etc. Silungkang Fm correlated wtth similar sedimentary-volcanic series with fusulinids of Gk. Gie Si Top Top and Lake Air Tawar in N Sumatra. No Pre-Permian granites at Guguk Bulat: arkosic rocks there part of Tertiary quartz sandstone formation, resulting from weathering of granite of possible Cretaceous age (area also surveyed by Verbeek (1883), Volz (1904), Musper (1930), etc.))

Kato, M., D. Sundari, T.C. Amin, D. Kosasih, S.L. Tobing et al. (1999)- A note on the reconfirmation of Lower Carboniferous age of the Agam River limestone of the Kuantan Formation, West Sumatra. Geol. Res. Dev. Centre (GRDC), Bandung, Seri Paleontologi 9, p. 53-61.
(Corals in massive oolitic Kuantan Fm limestone in Agam River in Padang Highlands E of Bukittingi include corals Michelina, Cyathaxonia, Clisiophyllum and algae Koninckopora. Confirm E Carboniferous (Visean) age (see also Metcalfe 1983, Fontaine and Gafoer 1989)

Kavalieris, I., D.J. Turvey & L.J.L. Heesterman (1987)- The geology and mineralization of the Mangani Mine, Sumatra, Indonesia. In: E. Brennan (ed.) Proc. Pacific Rim Congress 1987, Gold Coast, Australasian Inst. of Mining and Metallurgy (AusIMM), Parkville, p. 221-225.
(Historically important but small Mangani gold-silver mine was discovered in 1907, exploited between 1912-1931 and 1940-1941. Located along splay of NW-SE trending Sumatran Fault System. Mineralization young low sulfur type epithermal system, hosted by Tertiary andesite)

Keats, W., N.R. Cameron, A. Djunuddin, S.A. Ghazali, H. Harahap, W. Kartawa, H. Ngabito, N.M.S. Rock & R. Whandoyo (1981)- The geology of the Lhokseumawe Quadrangle (0521), Sumatra, 1:250,000. Geol. Res. Dev. Centre (GRDC), Bandung.
(Basal Late Permian- Triassic Uneun Unit slate and meta-limestones, overlain by Eocene- Pliocene sediments)

Kemmerling, G.L.L. (1921)- Vulkanen en vulkanische verschijnselen in de Residentien Sumatraȏs Westkust (noordelijke deel) en Tapanoeli. Dienst Mijnwezen Nederlandsch Oost-Indie, Vulkanologische Meded. 1, p. 1-93.
('Volcanoes and volcanic features in the Residencies West Coast (N part) and Tapanuli'. Descriptions of volcanic features and rocks of active volcanoes in Lake Maninjau area, G. Tandikat, G. Merapi, G. Sorik Merapi, G. Talamau)

Kertapati, E.K. (1984)- Penelitian seismotektonik Teluk Lampung dan sekitarnya. Proc. 13th Ann. Conv. Indon. Assoc. Geol. (IAGI), p. 65-96.
('Investigation of seismotectonics of Lampung Bay and surroundings')

Kieft, C. & I.S. Oen (1973)- Ore minerals in the Telluride-bearing gold-silver ores of Salida, Indonesia, with special referenc to the distribution of Selenium. Mineralium Deposita 8, 4, p. 312-320.
(Epithermal gold-silver deposits of old Salida mine, N of Painan, SW Sumatra, were exploited in 1669-1735 and 1914-1928. Ores hosted in two quartz veins in Miocene andesites. With carbonate and sulfidic diffusion bands in quartz incrustations. Earliest or inner zone with concentrations of Zn, Cu, Fe, S (sphalerite, chalcopyrite, pyrite); intermediate zone with concentrations of Pb, Au, Ag, S, Te, Se (galena and Au-Ag-tellurides in Te-bearing parageneses; galena, electrum and acanthite in Te-free parageneses); and zone of As-bearing minerals (tennantite, enargite or luzonite, arsenpolybasite)

Kieft, C. & I.S. Oen (1977)- Ore mineral parageneses in Mn-Sn-Ag-Au-Se-bearing veins of Mangani, Sumatra, Indonesia. In: B. Bogdanov et al. (eds.) Problems of ore deposition, Proc. 4th Symp. Int. Assoc. Genesis of Ore Deposits (IAGOD) 2, Varna 1974, Publ. House Bulgarian Acad. Sci., Sofia, 2, p. 295-302.
(Incl. unusual occurence of tin (as stannite))

Kimpe, W.F.M. (1944)- De eruptiva van het Siboemboen-gebergte en hun contactgesteenten (Padangsche Bovenlanden, Sumatra). Doct. Thesis University of Amsterdam, p. 1-141.
(The volcanic rocks of the Sibumbum Mountains and their contact rocks (Padang Highlands, Sumatra)'. Descriptions of igneous rocks collected by Brouwer in 1913 from area E of Lake Singkarak and W of Ombilin River. Mainly granodiorite massif, with low-metamorphic older sedimentary rocks (unfossiliferous, thermally altered Late Paleozoic?- E Mesozoic marbles, hornfels) and Tertiary clastics)

Klein, W.C. (1916)- On a trilobite fauna of presumably Devonian age in the Dutch East Indies near Kaloee, Tamiang District, S.E. Atjeh). Proc. Kon. Nederl. Akademie Wetenschappen, Amsterdam, 18, 2, p. 1632-1636.
(online at: www.dwc.knaw.nl/DL/publications/PU00012632.pdf)
(English version of 'Een vermoedelijk Devonische trilobietenfauna in Nederlandsch-Indie nabij Kaloee (afdeeling Tamiang, Z.O. Atjeh'. Discovery of presumably Devonian limestones with trilobites W of Kaloee on Simpang Kiri River, SE Aceh, in 190m thick, weakly folded limestone-shale succession. Trilobite probably of genus Proetus. Associated with brachiopods, corals and crinoids. No map or illustrations. Trilobite subsequently determined to be Permian in age by Tesch, 1916)

Klein, W.C. (1917)- Voorloopige mededeeling over de geologie van den oostoever van het Tobameer in N.-Sumatra. Natuurkundig Tijdschrift Nederlandsch-Indie 77, 3, p. 206-216.
(online at: http://archive.org/details/mobot31753002490198)
('Preliminary communication on the geology of the eastern shore of Lake Toba, N Sumatra'. Two amphibole-biotite granite massifs intruded into highly folded Paleozoic limestones and slates, overlain by little- folded ?Eocene quartz sandstones, liparite tuffs and andesite intrusives. Old lake terraces up to 250m above present lake level. No maps or figures)

Klein, W.C. (1918)- De Oostoever van het Toba-meer in Noord-Sumatra. Jaarboek Mijnwezen Nederlandsch Oost-Indie 46 (1917), Verhandelingen 1, p. 136-187.
(Geologic description of eastern shore of Lake Toba, N Sumatra, with 1:200,000 geologic map)

Klompe, Th.H.F. (1954)- On the supposed Upper Paleozoic unconformity in North Sumatra. Indonesian J. Natural Science (Majalah Ilmu Alam untuk Indonesia) 111, p. 151-165.
(No obvious Paleozoic- Mesozoic unconformity along NE shore lake Toba, but folded Upper Triassic shales-limestones unconformably overlain directly by Paleogene conglomerates, E Miocene marine shale, etc.)

Klompe, Th.H.F. (1955)- On the supposed Upper Paleozoic unconformity in North Sumatra. Leidsche Geol. Mededelingen 20, p. 120-134.
(online at: www.repository.naturalis.nl/document/549364)
(Same paper as above. No indications for occurrence of Variscian phase of diastrophism in area of N Sumatra, etc., until we reach E part of Malaya Peninsula (vague indications for stronger movements) and E Thailand (sufficient evidence for Saalian phase of Variscian orogeny)

Knight, M.D., G.P.L. Walker, B.B. Ellwood & J.F. Diehl (1986)- Stratigraphy, paleomagnetism, and magnetic fabric of the Toba tuffs: constraints on the sources and eruptive styles. J. Geophysical Research 91, B10, p. 10355-10382.
(Toba depression in N Sumatra is complex of overlapping calderas resulting from 3 major eruptions. Welded tuffs of Samosir and Uluan different magnetic polarities, so at least two different ignimbrites present. First ignimbrite eruption at 0.84 Ma produced >400 m densely welded unit with reversed polarity. Second ignimbrite normally magnetized. At ~0.075 Ma last and largest ignimbrite eruption from calderas in N and S parts of Toba depression, with ignimbrite mostly non-welded and normally magnetized)

Kobayashi, T. & K. Masatani (1968)- Upper Triassic *Halobia* (Pelecypoda) from North Sumatra with a note on the *Halobia* facies in Indonesia. Japanese J. Geology Geography 39, 2-4, p. 113-123.
(Halobia thin-shelled deeper marine bivalves known from N Sumatra since Volz (1899). Two new localities of Halobia shale: (1) Prapat, Lake Toba area 'Kualu clay-slate' with ?lower Carnian bivalves Halobia tobaensis n.sp. and H. kwaluana Volz; (2) Simaimai tributary of Belumai River in Deli county S of Medan: probably Norian-age Halobia simaimaiensis n.sp. (advanced form of H. norica). Carnian-Norian four zones based on Halobia species. In Lake Singkarak region also Norian with Myophoria (Costatoria) myophoria, similar to Singapore assemblages)

Koesoemadinata, R.P. & S. Sastrawiharjo (1988)- Uranium prospects in Tertiary sediments in the Sibolga area, North Sumatera. In: Proc. Conf. Uranium deposits in Asia and the Pacific; geology and exploration, Jakarta 1985, Int. Atomic Energy Agency (IAEA), Vienna, IAEA-TC-543/9, p. 121-140.
(Small 'Wyoming-type' uranium anomalies in Paleogene Sibolga Fm sediments, adjacent to Triassic granites (206-257 Ma; with 20-50 ppm uranium), Sibolga area, N Sumatra. Sibolga Granite age 201-216 Ma; Late Triassic))

Koolhoven, W.C.B. & W.A.J. Aernout (1928)- De afzettingen van Simau (Res. Benkoelen). De Mijningenieur 9, p. 150-163 and p. 177-187.
('The deposits of Simau, Residency of Bengkulu'. On gold-silver deposits in Simau mine area, SW Sumatra. These mines were in production by 'Simau Mijnmaatschappij' from 1910-1941 and connected to outside world only by 30km narrow guage rail line)

Koulakov, I., E. Kasatkina, N. Shapiro, C. Jaupart, A. Vasilevsky, S. El Khrepy, N. Al-Arifi & S. Smirnov (2016)- The feeder system of the Toba supervolcano from the slab to the shallow reservoir. Nature Communications 7, 12228, p. 1-12.
(online at: www.nature.com/ncomms/2016/160719/ncomms12228/pdf/ncomms12228.pdf)
(Toba Caldera site of several recent, large explosive eruptions, including world's largest Pleistocene eruption 74,000 years ago. Major cause may be subduction of fluid-rich Investigator Fracture Zone under continental crust of Sumatra and possible tear of slab. Seismic tomography model shows multi-level plumbing system. Large amounts of volatiles originate in subducting slab at of ~150 km depth, migrate up and cause melting in mantle wedge. Volatile-rich basic magmas accumulate at base of crust in a ~50,000 km3 reservoir. Overheated volatiles continue ascending through crust, cause melting of upper crust rocks, leading to shallow crustal reservoir responsible for supereruptions)

Koulakov, I., T. Yudistira, B.G. Luhr & Wandono (2009)- P, S velocity and VP/VS ratio beneath the Toba caldera complex (Northern Sumatra) from local earthquake tomography. Geophysical J. Int. 177, 3, p. 1121-1139.
(online at: https://academic.oup.com/gji/article/177/3/1121/625322)
(Local seismicity data beneath Lake Toba caldera and other volcanoes suggest negative P- and S-velocity anomalies of 18% in uppermost layer, 10-12% in lower crust and about 7% in uppermost mantle. At depth of 5 km beneath active volcanoes, small patterns (7-15 km size) with high VP/VS ratio that might be magma chambers with partially molten material. In mantle wedge vertical anomaly with low P and S velocities and high VP/VS ratio that link cluster of events at 120-140 km depth with Toba caldera, possibly image of ascending fluids/ melts released from subducted slab)

Kristanto, A.S. (1991)- Structural analysis of the Sumatran Fault Zone around the Semangka Bay. Proc. 20th Ann. Conv. Indon. Assoc. Geol. (IAGI), Jakarta, p. 354-375.
(Fault movements along Semangka segment of right-lateral Sumatra fault in Lampung intermittently active in at least 3 periods: (1) E-M Miocene NNE-SSW compression, creating Tabuan island, (2) Late Miocene? NE-SW extension creating Semangka Bay pull-apart structure; (3) E Pliocene (~5 Ma) WNW-ESE extension)

Krumbeck, L. (1914)- Obere Trias von Sumatra (Die Padang-Schichten von West-Sumatra nebst Anhang). Palaeontographica Suppl. IV, Beitr. Geologie Niederlandisch-Indien II, 3, p. 195-266.

('Upper Triassic of Sumatra (The Padang Beds of West Sumatra)'. With review of geologic setting of Triassic beds E of Lake Singkarak in Padang Highlands by Verbeek (Triassic overlies Permocarboniferous granites, clastics and fusulinid limestones, described by Volz 1904, and overlain by Eocene sandstones of Ombilin Basin). Stratigraphy- paleontology of >210m thick U Triassic Padang beds from two main localities, Lurah Tambang and Bukit Kandung/Katialo. Poorly fossiliferous clastics with four layers of dark, marly fossiliferous, bituminous platy limestones, rich in thick-walled bivalves that look related to Carnian North Alpine 'Cardita facies': 38 species, incl. Pecten (Aequipecten) verbeeki, Myophoria myophoria, Cardita globiformis, Cassianella verbeeki n.sp., Gervilleia bouei, Pinna blanfordi, Halobia sumatrana n.sp., etc.. Most similar to fauna from Napeng Beds of Upper Myanmar as described by Healy (1908). (Also similar to Jurong Fauna of Singapore; Kobayashi & Tamura 1968) (Some species described earlier by Boettger 1881, but erroneously assigned E Eocene age; JTvG) (Absence of Misolia, despite same age as Fogi Beds of Buru?; JTvG))

Kugler, H. (1921)- Geologie des Sangir-Batangharigebietes (Mittel-Sumatra). Verhandelingen Geologisch-Mijnbouwkundig Genootschap Nederland Kol., Geol. Serie 5, 4, p. 135-201.
('Geology of the Sangir- Batang Hari area (Central Sumatra)'. Geology of S part of Padang Highlands, N of Korinci volcano. Literature compilation and descriptions of rocks collected by Tobler in 1909. Metamorphic rocks of 'Schieferbarisan'. In Vorbarisan 'old diabase' with Permian fusulinid-crinoid limestones, Late Triassic limestones with molluscs Cardita aff. globiformis, Nucula, Gervilleia and Loxonema, granites, , peridotites, etc.. With 1:200,000 geologic compilation map)

Kuntz, J. (1936)- Rapport over een onderzoek van de goudmijnen der Mijnbouw Maatschappij Redjang Lebong. In: Rapporten betreffende geologische onderzoekingen in opdracht van de Directie der Mijnbouw Maatschappij Redjang-Lebong, Batavia, p. 23-36.
('Report on an evaluation of the gold mines of the Redjang Lebong mining company'. Lebong Donok ore body is Au-Ag bearing quartz vein, >20m thick, at contact between dacite body and Miocene shales and sands, dipping ~75°NE. Lebong Simpang mine 30km SSE of Lebong Donok, with two near-vertical, NNE-SSW trending main ore bodies)

Kuntz, J. (1937)- Das Problem Redjang Lebong. Zeitschrift Praktische Geologie 45, p. 167-171.
('The Rejang Lebong problem'. On structure and mineralization of Rejang Lebong gold deposit, Bengkulu District, W Sumatra)

Kurnio, H., U. Schwarz-Schampera & M. Wiedicke (2008)- Structural geological control on the mineralization on Tabuan Island, Semangko Bay, South Sumatera, Indonesia. Bull. Marine Geol. 23, 1, p. 18-25.
(online at: http://isjd.lipi.go.id/admin/jurnal/231081825.pdf)
(Basaltic-andesitic volcanics of Late Oligocene- earliest Miocene Hulusimpang Fm distributed in broad zone along Semangko Fault zone and are hosts for several epithermal-style gold deposits. Mineralization on Tabuan island in Semangko Bay, SE Sumatra, with moderate enrichments in Au, Ag, Zn, Pb, Cu, As, Sb, Ba, and Mn. Normal faults and margins of grabens may have acted as fluid channelling structures)

Kusnama (2005)- Stratigrafi daerah Toba-Samosir, Sumatera Utara. J. Sumber Daya Geologi 15, 2 (149), p. 31-48.
('Stratigraphy of the Toba-Samosir area, N Sumatra'. Area in Barisan magmatic arc and Sumatera back arc. Paleozoic Tapanuli Group with Pangururan Fm slate, marble, and mudstone and glacial Late Carb.- E Permian Bohorok Fm conglomeratic sandstone with schist, quartzite, granitic rocks, marble and quartz fragments, ~600m thick. Unconformably overlain by Triassic Sibaganding Fm bioclastic limestone (~750m?) and Late Triassic Kualu Fm clastics with Halobia and andesitic clasts (~500m). Tertiary consists of Oligo-Miocene Parapat Fm clastics, M-L Miocene Haranggaol Fm welded tuff and pyroclastics and Plio-Pleistocene Simbolon and Takur-Takur Fm. Pyroclastic and lava rocks (incl. 'Toba Tuffs') are youngest rock units (Paleozoic- Mesozoic typical 'Sibumasu' succession; JTvG))

Kusnama & S. Andi Mangga (2007)- Perkembangan geologi dan tektonik Pretersier pada mintakat Kuantan Pegunungan Dua Belas dan mintakat Gumai-Garba, Sumatera Bagian Selatan. J. Sumber Daya Geologi 17, 6 (162), p. 370-384.

('Geological and tectonic development of the Pre-Tertiary in the Kuantan Duabelas Mountains zone and the Gumai-Garba zone, S Sumatra'. Kuantan-Duabelas Mts terrane Carboniferous-Triassic metamorphics intruded by Permian and E Jurassic granitoids. Presence of E-M Permian Cathaysian fusulinids and floras. Gumai-Garba terrane is Jurassic-Cretaceous melange intruded by late Cretaceous granitoids)

Kusnama, R. Pardede, S. Andi Mangga & Sidarto (1992)- Geologic map of the Sungaipenuh and Ketaun sheets, Sumatra, 1: 250.000, 2nd Edition. Geol. Res. Dev. Centre (GRDC), Bandung.
(Map sheet of West coast of C Sumatra, S of Kerinci Lake.Mainly Tertiary- Quaternary volcanics and granodiorites. In NE corner thick Jurassic Asai Fm flysch-type metasediments with Nagan hornblende granodiorite (E Eocene~51-55 Ma). At NE-most corner, across Sumatra Fault Zone? Permian Palepat Fm andesitic lavas and tuffs intruded by Tantan Granodiorite (Late Triassic- E Jurassic?))

Kusnanto, B. & S. Hughes (2014)- Geology and mineralization of Beutong copper deposit, Nagan Raya, Aceh. In: I. Basuki & A.Z. Dahlius (eds.) Sundaland Resources, Proc. Indon. Soc. Econ. Geol. (MGEI) Ann. Conv., Palembang, p. 245-269.
(Beutong porphyry copper deposit ~60 km NE of Meulaboh, Aceh. Two mineralized Cu-Mo-Au porphyry centers in E Pliocene (~4.2 – 4.6 Ma) Beutong Intrusive Complex, into Jurassic-Cretaceous Woyla Gp, which includes NW-SE-trending dismembered ophiolite slivers. Overprinted by high sulphidation epithermal event)

Lange, E. (1925)- Eine mittelpermische Fauna von Guguk Bulat (Padanger Oberland, Sumatra). Verhandelingen Geologisch-Mijnbouwkundig Genootschap Nederland Kol., Geol. Serie 7, 3, p. 213-295.
(‘A Middle Permian fauna from Guguk-Bulat, Padang Highlands, Sumatra’. Famous M Permian reefal limestone locality in Padang Highlands near Lake Singkarak, first decribed as Carboniferous by Volz 1904. Re-sampled by Tobler in 1909. Bivalves, cephalopods and trilobitese absent. Mainly description of 79 species of foraminifera (incl. 18 fusulinid species of Fusulinella, Verbeekina, Doliolina, Neoschwagerina), colonial corals (incl. massive Waagenophyllidae, Lonsdaleia) and 8 brachiopod species (= part of 'Cathaysian' West Sumatra block of Barber et al. (2005); JTvG))

Laumonier, Y. (1997)- The vegetation and physiography of Sumatra. Geobotany 22, Kluwer, p. 1-227.
(Overview of present-day geomorphology and vegetation of Sumatra)

Lawless, J.V., P.J. White, I. Bogie & M.J. Andrews (1995)- Tectonic features of Sumatra and New Zealand in relation to active and fossil hydrothermal systems: a comparison. In: Proc. PACRIM' 95 Conf., Australasian Inst. of Mining and Metallurgy (AusIMM), Melbourne, p. 311-316.

Lee, M.Y., C.H. Chen, K.Y. Wei, Y. Iizuka & S. Carey (2004)- First Toba supereruption revival. Geology 32, 1, p. 61-64.
(Oldest Toba tuff in S China Sea sediments, 2500 km away from source. Tephra deposits below Brunhes-Matuyama geomagnetic boundary (778 ka) and above Australasian microtektite layer (793 ka). Calibration to oxygen isotope stratigraphy (between stages 20 and 19) suggests M Pleistocene Toba eruption occurred during deglaciation at 788 ± 2.2 ka, in good agreement with 40Ar/39Ar date of 800 ± 20 ka for Toba tephra (layer D) at ODP Site 758, but younger than commonly cited Ar/Ar age of 840 ± 30 ka. Eruption expelled at least 800-1000 km3 dense-rock-equivalent of rhyolitic magma)

Leinz, V. (1933)- Petrographische Untersuchungen der Sedimente des Toba-Sees (Nord-Sumatra). Archiv fur Hydrobiologie, Suppl. Band, 12, p. 635-669.
('Petrographic investigations of the sediments of Lake Toba, N Sumatra'. Sub-Recent lacustrine sands from around Lake Toba composed mainly of quartz, volcanic glass, sanidine, plagioclase, biotite and hornblende)

Leo, G.W., C.E. Hedge & R.F. Marvin (1980)- Geochemistry, strontium isotope data, and potassium-argon ages of the andesite-rhyolite association in the Padang area, West Sumatra. J. Volcanology Geothermal Res. 7, p. 139-156.

(Quaternary volcanoes in Padang area, W coast Sumatra. Maninjau caldera andesite compositions 55-61% SiO2. K-Ar whole-rock age determinations range from 0.27- 0.83 Ma. Rel. high high 87Sr/86Sr ratios may reflect crustal source for andesites)

Lohr, R. (1922)- Beitrage zur Petrographie von Sud-Sumatra (West Palembang). Dissertation Munster University, p. 1-65. *(Unpublished)*
('Contributions to the petrography of S Sumatra (W Palembang)'. Descriptions of rocks collected by BPM geologist H.M.E. Schurmann)

Loth, J.E. (1926)- Eenige nieuwe gezichtspunten in verband met het ontstaan der stroomgoudafzettingen in Indragiri en het aangrenzend Zuid-Pelalawan. Handelingen 4e Nederl.-Indie Natuurw. Congres 1926, p. 430- .
('Some new views on the origin of placer gold deposits in Indragiri and bordering South Pelawan')

Lubis, H., T. Situmorang, A.M. Harsono & S. Digdowiroko (2000)- Sedex: a new type explortion target for lead and zinc in Indonesia. Proc. 29th Ann. Conv. Indon. Assoc. Geol. (IAGI), Bandung, 2, p. 121-140.
(Review of sedimentary-exhalative lead-zinc deposits. With example from Sopokomil in Permo-Carboniferous Tapanuli Gp in N Sumatra, with up to 8m thick massive sulphides over ~3km)

Lubis, S., S. Hartosukorahardjo, R. Prawirsasra & M. Widjajanegara (1985)- Shallow seismic reflection survey in Cantu waters, Lampung Bay, South Sumatra. Proc. 21st Sess. Comm. Co-ord. Joint Prospecting Mineral Resources in Asian Offshore Areas (CCOP), 2, p. 33-39.
(Boomer profiles show system of young N-S normal faults in Lampung Bay)

Lyu, X.M., L. Yang, R.H. Wang, W.H. Guo, Q.F. Han & Z.C. Li (2016)- A case study on multiple stratigraphic reservoirs related with weathered granite buried-hill. In: 78th EAGE Conf. Exh., Vienna 2016, Tu P5 01, 5p.
(Betara gas field complex in granite buried-hill at N margin of S Sumatra basin, with gas column height 280 m and area of 80 km2. Basement lithology phyllite, granite and metaquartzite. Reservoir facies in 40-50m thick granitic weathered rind (porosity 12-21%), leached fracture zones in granite and in onlapping/ overlying Eocene -Oligocene alluvial fans. Three groups of faults: NNW trending reactivated basement faults, NE normal faults and NW reverse faults)

MacKay, A.L. & H.F.W. Taylor (1954)- Truscottite. Mineralogical Magazine 30, p. 450-457.
(Mineralogical study of truscottite, a mineral of Ca-zeolite-group, first discovered at Lebong Donok mine, Bengkulu, Sumatra, by Hovig (1914))

Mannhardt, F.G. (1921)- Verslag over de resultaten van geologisch- mijnbouwkundig onderzoek der Tandjoeng kolenvelden (Res. Palembang). Jaarboek Mijnwezen Nederlandsch-Indie 47 (1918), Verhandelingen 2, p. 67-107.
(Investigation of Tanjung coal fields (including Bukit Asam), 13 km S of Muara Enim, S Sumatra. Coal beds in 700-800m thick M Palembang Fm. Coal grade locally improved by andesite intrusives)

Mark, D.F., M. Petraglia, V.C. Smith, L.E. Morgan, D.N. Barfod, B.S.Ellis, N.J. Pearce, J.N.Pal & R. Korisettar (2013)- A high-precision 40Ar/39Ar age for the Young Toba Tuff and dating of ultra-distal tephra: forcing of Quaternary climate and implications for hominin occupation of India. Quaternary Geochronology 21, p. 90-103.
(New inverse isochron 40Ar/39Ar age for youngest Toba super-eruption: 75.0 ± 0.9 ka. See also comments of Haslam 2013)

Mark, D.F., P.R. Renne, R. Dymock, V.C. Smith, J.I. Simon, L.E. Morgan, R.A. Staff & B.S. Ellis (2017)- High-precision 40Ar/39Ar dating of Pleistocene tuffs and temporal anchoring of the Matuyama-Brunhes boundary. Quaternary Geochronology 39, p. 1-23.
(online at: www.sciencedirect.com/science/article/pii/S1871101417300055)
(New 40Ar/39Ar ages for tuffs from Toba volcano on Sumatra in core from ODP Site 758 in Indian Ocean. Tephra layers geochemically correlated to Young Toba Tuff (Ash A; 73.7 ± 0.3 ka) and Middle Toba Tuff (502 ± 0.7 ka). Ash units D (785.6 ± 0.7 ka) and E (792.4 ± 0.5) (tentatively correlated to 'Old Toba Tuff'). Ages and

depth model used here to estimate ages for Matuyama-Brunhes boundary (~784 ka) and Australasian tektites layer (peak 8 cm below Ash D; ~786 ± 2 ka))

Maryanto, S. (1993)- Petrogenesis sabak di sekitar tepi barat Danau Toba, Sumatera Utara. J. Geologi Sumberdaya Mineral 3, 26, p. 14-20.
('Petrogenesis of slate around the western edge of Lake Toba, N Sumatra'. Metamorphic rocks of Permo-Carboniferous Kluet Fm at W side of Lake Toba (slates and metagreywacke) represent dynamic and low burial, greenschist facies metamorphism of greywacke and shales)

Maryono, A., D.H. Natawidjaja, T.M. van Leeuwen, R.L. Harrison & B. Santoso (2014)- Sumatra, an emerging world-class magmatic gold belt. In: I. Basuki & A.Z. Dahlius (eds.) Sundaland Resources, Proc. Ann. Conv. Indon. Soc. Econ. Geol. (MGEI), Palembang, p. 89-101.
(Sumatra has become an emerging world-class magmatic gold belt. Island contains known endowment of 27.2M ounces of gold, 151M ounces of silver and 9.2 Billion pounds of copper from 32 deposits and prospects. Prime gold sources from high-sulfidation epithermal deposits (41.3%), with largest deposit being Martabe. Two distinct metallogenic systems, Aceh-Toba (Au-Cu+Mo) high sulfidation epithermal and porphyryProvince in N Sumatra and Barisan (Au-Ag) low sulfidation epithermal province in C and S Sumatra along with Lubuk Sikaping and W Jambi clusters of Au-Cu-base metals reflect distinctive tectonic and geologic histories.Main gold mineralization across island from 1 to 4 Ma)

Masturyono, R. McCaffrey, D.A. Wark, S.W. Roecker, Fauzi, G. Ibrahim & Sukhyar (2001)- Distribution of magma beneath Toba caldera, North Sumatra, Indonesia, constrained by 3-dimensional P-wave velocities, seismicity, and gravity data. Geochem., Geophys. Geosystems 2, 4, p. 1-24.
(P wave velocity structure under 30 x 100 km large Toba caldera from local earthquakes used to map distribution of magma within this subduction-related volcanic system)

Matthews, N.E., V. C. Smith, A. Costa, A.J. Durant, D.M. Pyle & N.J.G. Pearce (2012)- Ultra-distal tephra deposits from super-eruptions: examples from Toba, Indonesia and Taupo Volcanic Zone, New Zealand. Quaternary Int. 258, p. 54-79.
(The ~74 ka Youngest Toba Tuff eruption deposited ash over Bay of Bengal and Indian subcontinent to W)

Mattinson, P.G. (1987)- Structural controls and alteration assemblages at the Lebong Tandai Mine, Sumatra: implications for the genesis of epithermal silver-gold mineralisation. M.Sc. Thesis, University of Western Australia, Perth, p. 1-285. *(Unpublished)*

Matysova, P., M. Booi, M.C. Crow, F. Hasibuan, A.P. Perdono, I.M. Van Waveren & S.K. Donovan (2018)- Burial and preservation of a fossil forest on an early Permian (Asselian) volcano (Merangin River, Sumatra, Indonesia). Geological J., 19p. *(in press)*
(E Permian (Asselian) Mengkarang Fm of W Jambi Province preserves abundant evidence of E Permian forest, which grew at foot of active volcano, where pyroclastic flows often made way and destroyed vegetation and where epiclastic reworked pyroclastics rapidly entombed vegetation. In situ Agathoxylon close enough to volcanic slope to be buried rapidly, but shallow enough to avoid recrystallization)

McCarroll, R.J., I.T. Graham, R. Fountain, K. Privat & J. Woodhead (2014)- The Ojolali region, Sumatra, Indonesia: epithermal gold-silver mineralisation within the Sunda Arc. Gondwana Research 26, p. 218-240.
(Ojolali region in Lampung, S Sumatra, two main epithermal gold-silver deposits: (1) Tambang intermediate-sulfidation deposit along fault in siltstone and (2) Bukit Jambi high-level, low-sulfidation Au-Ag deposit in andesitic tuffs. Mineralisation hosted in window of Miocene intermediate-mafic volcanics)

McCarthy, A.J. (1997)- The evolution of the transcurrent Sumatran fault system, Indonesia. Ph.D. Thesis, University London, p. 1-387. *(Unpublished)*

McCarthy, A.J. & C.F. Elders (1997)- Cenozoic deformation in Sumatra: oblique subduction and the development of the Sumatran fault system. In: A.J. Fraser & S.J. Matthews (eds.) Petroleum Geology of SE Asia. Geol. Soc., London, Spec. Publ. 126, p. 355-363.
(Sumatra pre-Tertiary history of accretion was followed byPaleogene basin formation. Strong mid-Miocene inversion event recorded in onshore part of forearc basin in S Sumatra, same time as inception of seafloor spreading in Andaman Sea and probable inception of major strike-slip movement along the SFS, possibly following clockwise rotation of Sumatra towards it present NW-SE trend. SFS complex deformation history including polyphase reactivation of fault surfaces and contemporaneous strike-slip and orthogonal compression or extension. New estimate of ~150 km offset of Mesozoic units across SFS in C Sumatra proposed. Several basins formed along SFS in Quaternary)

McCarthy, A.J., B. Jasin & N.S. Haile (2001)- Middle Jurassic radiolarian chert, Indarung, Padang District, and its implications for the tectonic evolution of western Sumatra, Indonesia. J. Asian Earth Sci. 19, 1-2, p. 31-44.
(Radiolaria chert in Indarung Area, 10km E of Padang of Aalenian (lower M Jurassic) age. Beds dipping steeply to to SW. Lubuk Peraku Lst dated as U Jurassic- E Cretaceous based on occurrence of Lovcenipora (= Cladocoropsis?; JTvG). Interbedded with volcanics and limestone conglomerate/breccias, Interpreted as carbonate cap on seamount. Limestone overlain by Golok crystal tuffs (K/Ar age of ~105 ± 3 Ma/ Albian, but suspect?). M Jurassic Ngalau bedded chert probably faulted into younger limestone during Cretaceous ENE-directed compression. Radiolarian assemblage Aalenian or E Bajocian Transhsuum hisuikyoense Zone (= part of oceanic assemblage of Woyla Group: M- Late Cretaceous SW dipping accretionary prism with M Jurassic seafloor oceanic material and Late Jurassic volcanic seamount; JTvG)

McCloskey, J., D. Lange, F. Tilmann, S.S. Nalbant, A.F. Bell, D.H. Natawidjaja & A. Rietbrock (2010)- The September 2009 Padang earthquake. Nature Geoscience 3, February, p. 70-72.
(Mw= 7.6 earthquake of 30 September 2009 with epicenter WNW of Padang at depth of 80-90 km, within lower part of Wadati-Benioff zone. Did not rupture Sunda megathrust or relax stress on Mentawai segment)

McCourt, W.J. & E.J. Cobbing (1993)- The geochemistry, geochronology and tectonic setting of granitoid rocks from southern Sumatra, western Indonesia. South Sumatra Geol. Mineral Exploration Project (SSGMPE) Report 9, Geol. Res. Dev. Centre (GRDC), Bandung, p. *(Unpublished)*
(Includes Eocene (52-57 Ma) ages for Lassi granite/ diorite, 53-55 Ma and 129-169 Ma for Bungo batholith, 79-85 Ma for Padean granite, 111-113 Ma for Sulan pluton, 82-117 Ma for Garba Pluton, 138-149 Ma and 192 Ma for Sulit Air granite, etc. (Barber et al. 2005))

McCourt, W.J., M.J. Crow, E.J. Cobbing & T.C. Amin (1996)- Mesozoic and Cenozoic plutonic evolution of SE Asia: evidence from Sumatra, Indonesia. In: R. Hall & D. Blundell (eds.) Tectonic evolution of Southeast Asia, Geol. Soc., London, Spec. Publ. 106, p. 321-335.
(Barisan Mts of S Sumatra four periods of plutonic activity: Miocene-Pliocene (20-5 Ma), E Eocene (60-50 Ma), Mid-Late Cretaceous (117-80 Ma) and Jurassic-E Cretaceous (203-130 Ma). Also plutonic activity in Permian (287-256 Ma) and suggestions of magmatism in Late Triassic- E Jurassic (220-190 Ma) and M Jurassic-E Cretaceous (170-130 Ma). Ages from E Sumatra indicate Triassic- E Jurassic (240-195 Ma) tin-belt magmatism of Peninsular Malaysia Main Range extends into area. Plutonic suites in NW-SE trending belts. Breaks in plutonic activity correspond to changes in approach angle and/or rate of subduction, and in some instances relate to periods of collision and accretion of allochthonous material. At least two such events: early M Cretaceous collision and accretion of oceanic Woyla terranes, and latest Cretaceous possible collision of continental sliver/block, the W Sumatra terrane to Sundaland margin)

Metcalfe, I. (1983)- Conodont faunas, age and correlation of the Alas Formation (Carboniferous), Sumatra. Geol. Magazine 120, 6, p. 737-746.
(Conodonts Spathognathodus campbelli, S. scitulus, Synprioniodina microdenta and Gnathodus girtyi rhodesi from NW Sumatra Alas Fm shelfal limestones suggest Late Visean (E Carboniferous) age, making it oldest dated formation on Sumatra. Previously single solitary coral identified as Allotropiophyllum sinense Grabau thought to indicate E Permian age. Brachiopods from same locality identified as Cleiothyridina and Marginalia or Inflatia, suggesting probable Visean age)

Metcalfe, I. (1986)- Conodont biostratigraphic studies in Sumatra: preliminary results. In: G.H. Teh & S. Paramananthan (eds.) Proc. 5th Reg. Congress Geology, Mineral and Energy Resources of SE Asia (GEOSEA V), Kuala Lumpur 1984, 2, Bull. Geol. Soc. Malaysia 20, p. 243-247.
(online at: https://gsmpubl.files.wordpress.com/2014/09/bgsm1986b13.pdf)
(Samples from Sumatra Late Paleozoic- Triassic limestones analyzed for conodonts. Lower Carboniferous (Late Visean) with Gnathodus girtyi rhodesi, etc. in Alas Fm of Alas Valley and near near Bukittinggi. Prapat, Lake Toba limestones with Late Carnian Neogondolella polygnathiformis conodont zone. M and U Triassic conodonts from dark limestones of six other localities, some of which (e.g. Sungei Kalue Lst) were previously considered to be Permo-Carboniferous)

Metcalfe, I. (1989)- Triassic conodonts of Sumatra. In: H. Fontaine & S. Gafoer (eds.) The Pre-Tertiary fossils of Sumatra and their environments, CCOP Techn. Publ. 19, Bangkok, p. 191-194.
(Six limestone localities in N Sumatra Lake Toba area with Late Triassic (Carnian) conodonts)

Metcalfe, I. (1989)- Carboniferous conodonts. In: H. Fontaine & S. Gafoer (eds.) The Pre-Tertiary fossils of Sumatra and their environments, CCOP Techn. Publ. 19, Bangkok, p. 45-46.
(Two limestone localities with E Carboniferous conodonts: Alas Fm in Alas Valley (N Sumatra; Late Visean, Metcalfe 1983) and Agam River (C Sumatra near Bukittingi; M-L Visean)

Metcalfe, I., T. Koike, M.B. Rafek & N.S. Haile (1979)- Triassic conodonts from Sumatra. Paleontology 22, 3, p. 737-746.
(online at: http://cdn.palass.org/publications/palaeontology/volume_22/pdf/vol22_part3_pp737-746.pdf)
(Late Carnian conodonts from limestones of N Sumatra (3 km N of Prapat, Lake Toba, overlying Halobia-Daonella shale. Contains Metapolygnathus polygnathiformis, M. nodosa and Epigondolella primitia. Also Late Triassic conodonts from limestones from C Sumatra Padang Highlands, Silungkang- Sawahlunto area)

Meyer, O.E. (1922)- Brachiopoden des Perm und Untercarbon der Residentschaft Djambi (Sumatra). Verhandelingen Geologisch-Mijnbouwkundig Genootschap Nederland Kol., Geol. Serie 5, 5, p. 203-221.
('Brachiopods form the Permian and Late Carboniferous from the Jambi Residency'. 15 species of brachiopods, collected by Tobler from 6 localities in Jambi area. At Sungei Selajau with Dalmanella, Chonetes, Productus, Spiriferina, Spirigera, etc.. Most species described also known from Timor. Productus sumatrensis believed to signify Late Permian age? (Little or no locality or stratigraphic information. Tobler 1922 also mentions fusulinids Verbeekina, Sumatrina from here. Fontaine & Gafoer 1989 assign to late Early- M Permian Silungkang/ Palepat Fm))

Michel, G.W., M. Becker, C. Reigber, R. Tibi, Y.Q. Yu & S.Y. Zhu (2001)- Regional GPS data confirm high strain accumulation prior to the 2000 June 4 Mw=7.8 earthquake at southeast Sumatra. Geophysical J. Int. 146, p. 571-582.

Middleton, T.W. (2003)- The Dairi zinc-lead project, North Sumatra, Indonesia, Discovery to feasability. Bull. Australian Inst. Geoscientists 39, p. 73-82.
(Sediment hosted, massive sulphidic, zinc-lead mineralisation in core of Sopokomil Dome, Dairi Regency, N Sumatra, in laminated carbonaceous shale and dolomitic siltstones of Permo-Carboniferous Tapanuli Group. First of its kind in Indonesia)

Milch, L. (1899)- Ueber Gesteine von der Battak-Hochflache (Central Sumatra). Zeitschrift Deutschen Geol. Gesellschaft, Berlin, 51, p. 62-74.
(online at: https://www.biodiversitylibrary.org/item/148115page/76/mode/1up)
('On rocks from the Batak Highlands (Central Sumatra)'. Petrography of volcanic-igneous and metamorphic rocks of the Batak Highlands, collected by Volz (liparite, dacite, andesites, tuff, granite-gneiss, biotite-gneiss))

Milsom, J. (2005)- Seismology and neotectonics. In: A.J. Barber, M.J. Crow & J.S. Milsom (eds.) Sumatra-geology, resources and tectonic evolution, Geol. Soc., London, Mem. 31, p. 7-15.

(Present-day tectonic processes of Sumatra controlled by three major fault systems: (1) subduction thrust in Sunda Trench (water depths of >6000 m in S but <5000m in N. Change, of more than 45°, in . trend of .trench between 96°E and 97°E ('Nias Elbow') may have been initiated by subduction of 2 km high Investigator Ridge; (2) onland dextral Sumatran Fault runs from Banda Aceh to the Sunda Strait (19 segments; possibly 150km displacement); (3) Mentawai Fault at outer margin of forearc basin. Etc.)

Milsom, J. (2016)- The separated twins: Sumatra and Myanmar in a dynamic world. In: Development of the Asian Tethyan Realm: genesis, process and outcomes, 5th Int. Symposium Int. Geoscience Program (IGCP) Project 589, Yangon, p. 42. *(Abstract only)*
(online at: http://igcp589.cags.ac.cn/5th%20Symposium/Abstract%20Volume.pdf)
(For much of geological history Sumatra and Myanmar occupied adjacent positions at active southern margin of Asian continent. Impact of India on margin rotated them by different amounts and opened gap that is now Andaman Sea. Continuity between Sumatra forearc and Rakhine Yoma via Andaman-Nicobar ridge. Elements of subduction-related tectonics can still be observed in Myanmar despite its present orientation. In Sumatra significant hydrocarbons are produced only N and E of volcanic line; in Myanmar only to its W)

Milsom, J. & A. Walker (2005)- The gravity field. In: A.J. Barber, M.J. Crow & J.S. Milsom (eds.) Sumatra- geology, resources and tectonic evolution, Geol. Soc., London, Mem. 31, chapter 3, p. 16-23.
(Gravity map of Sumatra: onshore Bouguer, offshore free gravity. Fundamental differences between SE and NW Sumatra; junction between these may reflect post-amalgamation processes, but may also be unrecognized basement suture)

Miyamoto, H. (1943)- The mineral resources of Sumatra. J. Geography, Tokyo, 55, 2, p. 62-83.
(online at: www.jstage.jst.go.jp/article/jgeography1889/55/2/55_2_62/_pdf)
(In Japanese; mainly literature review)

Moerman, C. (1916)- Verslag van een geologisch-mijnbouwkundigen verkenningstocht in een gedeelte der residentien Benkoelen en Palembang (Zuid-Sumatra). Jaarboek Mijnwezen Nederlandsch Oost-Indie 44 (1915), Verhandelingen 1, p. 33-198.
('Report of a geological-mining reconnaissance survey in parts of the residencies of Bengkulu and Palembang (S Sumatra)'. Traveled 6450 km in 576 field days in 1909-1911. With 4 maps at 1:200,000 scale. Reports granites, Jurassic phyllites and diabase tuffs, Eocene sst-shales, Miocene marls, Quaternary volcanics, etc.)

Moore, D. E. (1997)- Mineralogical and microstructural investigations of core samples from the vicinity of the Great Sumatran Fault, Indonesia. U.S. Geol. Survey (USGS) Open-File Report 97-694, p. 1-112.
(online at: http://pubs.usgs.gov/of/1997/0694/report.pdf)
(Summary of petrographic investigations of core samples from geothermal wells drilled by Unocal near Great Sumatran fault zone.)

Monecke, K., W. Finger, D. Klarer, W. Kongko, B.G. McAdoo, A.L. Moore & S.U. Sudrajat (2008)- A 1,000- year sediment record of tsunami recurrence in northern Sumatra. Nature 455, p. 1232-1234.
(2004 tsunami in N Aceh deposited sand sheet up to 1.8 km inland on marshy beach ridge plain. Sediment cores from coastal marshes with two older similar extensive sand sheets, deposited soon after AD 1290-1400 and AD 780-990, probably from earlier tsunamis. Additional sand sheet of limited extent may correlate with smaller tsunami of AD 1907)

Moore, D.E., S. Hickman, D.A. Lockner & P.F. Dobson (2001)- Hydrothermal minerals and microstructures in the Silangkitang geothermal field along the Great Sumatran fault zone, Sumatra, Indonesia. Geol. Soc. America (GSA) Bull. 113, 9, p. 1179-1192.
(Core samples of silicic tuff from geothermal wells along Great Sumatran fault zone near Silangkitang, N Sumatra, suggest enhanced hydrothermal circulation adjacent to fault)

Muchsin, A.M., C.C. Johnson, M.J. Crow, A. Djumsari & Sumartono (1997)- Atlas geokimia daerah Sumatera bagian selatan. Regional Geochemical Atlas series of Indonesia 2, Direct. Mineral Resources (Bandung) and British Geol. Survey, p. 1-63.
('Geochemical atlas of Southern Sumatra'. Distributions of 15 metals/elements (Ag, As, Co, Cr, Cu, Fe, K, Li, Mn, Ni, Pb, Sn, W, Mo, Zn) in 13,187 stream sediments from Sumatra S of Equator. Identified clusters of increased Au, Sn-W and base metals)

Muksin, U., K. Bauer & C. Haberland (2013)- Seismic Vp and Vp/Vs structure of the geothermal area around Tarutung (North Sumatra, Indonesia) derived from local earthquake tomography. J. Volcanology Geothermal Res. 260, p. 27-42.

Mulja, T., M. Collins, H.H. Wong, R. Rizal, T. Brown & M. Zainuddin (2003)- An integrated mineral exploration programme in the Takengon tenement, Aceh magmatic arc, north Sumatra. Geochemistry Expl., Env. Analysis, 3, 4, p. 321-335.
(Discovery of gold and base metals in 1996-1998 in Takengon tenement of Aceh magmatic arc, N Sumatra. NNW-SSE and NNE-SSW trending fault zones related to mineralization.)

Mulyaningsih, S. (2014)- Vulkanisme Pratersier batuan gunung api Kelompok Woyla di Kecamatan Beutong dan Darul Makmue, Kabupaten Nagan Raya, Provinsi Nangroe Aceh Darussalam. Majalah Geol. Indonesia 29, 3, p. 183-198.
(Pre-Tertiary volcanism of the volcanic rocks of the Woyla Group in the Beutong and Darul Makmue sub-regency, Nagan Raya Regency, Nanggroe Aceh Darussalam'. Woyla Gp with intermediate volcanic rocks, metamorphic rocks and granodiorite intrusions. Metamorphic rocks thought to be alterations of volcanism)

Muksin, U., C. Haberland, K. Bauer & M. Weber (2013)- Three-dimensional upper crustal structure of the geothermal system in Tarutung (North Sumatra, Indonesia) revealed by seismic attenuation tomography. Geophysical J. Int. 195, p. 2037-2049.
(Geothermal potential in Tarutung controlled by Sumatra Fault system and young arc volcanism. Spatial distribution of seismic attenuation was used to map subsurface temperature anomalies and fluid distribution. In SW of Tarutung Basin high attenuation zone associated with Martimbang volcano. In Sarulla region anomaly along graben near Hopong caldera)

Muksin, U., C. Haberland, M. Nukman, K. Bauer & M. Weber (2014)- Detailed fault structure of the Tarutung pull-apart basin in Sumatra, Indonesia, derived from local earthquake data. J. Asian Earth Sci. 96, p. 123-131.
(Tarutung pull-apart basin in N central segment of dextral strike-slip Sumatran Fault System. Earthquake lineations reflect extensional duplex fault system and negative flower structure within basin. Focal mechanisms of events at edge of basin dominantly strike-slip type representing dextral strike-slip Sumatran Fault System. N-S striking normal fault events along extensional zones correlate with maximum principal stress direction which is direction of Indo-Australian plate motion)

Mulya, R.C. & D. Hendrawan (2014)- The Anjing Hitam underground zinc lead deposit, North Sumatra. In: I. Basuki & A.Z. Dahlius (eds.) Sundaland Resources, Proc. Indon. Soc. Econ. Geol. (MGEI) Ann. Conv., Palembang, p. 309-317.
(Anjing Hitam deposit large shale-hosted Zn-Pb system within Late Carboniferous or E Permian Tapanuli Gp in N Sumatra. Includes black shale-hosted massive sulfide Zn-Pb mineralisation, Zn mineralisation in veins, breccias, polymetallic Zn-Pb-Cu- Ag vein mineralisation and secondary Zn-Pb mineralisation Same as Dairi project of earlier authors)

Munasri, M.M. Mukti, H. Permana & A.M. Putra (2015)- Jejak subduksi Mesozoikum di Komplek Garba, Sumatra bagian Selatan berdasarkan fosil radiolaria dan data geokimia. In: H. Harjono et al. (eds.) Pros. Pemaparan Hasil Penelitian Geoteknologi 2015, Pusat Penelitian Geoteknologi (LIPI), Bandung, p. I63-I72.
(online at: http://pustaka.geotek.lipi.go.id/wp-content/uploads/2016/04/Prosiding-2015.pdf
('Traces of Mesozoic subduction in the Garba Complex, S Sumatra, from radiolarian fossils and geochemical analysis'. In S Sumatra trace of Mesozoic subduction complex(es) exposed in Gumai, Garba and Gunung Kasih

(Lampung). In SE Garba Mts subduction complex rocks from continental margin and from oceanic plates. Presence of island arc basalts and radiolaria of possible Triassic age)

Muraoka, H., M. Takahashi, H. Sundhoro, S. Dwipa, Y. Soeda, M. Momita & K. Shimada (2010)- Geothermal systems constrained by the Sumatran Fault and its pull-apart basins in Sumatra, Western Indonesia. Proc. World Geothermal Congress 2010, Bali, 8p.
(online at: http://b-dig.iie.org.mx/BibDig/P10-0464/pdf/1248.pdf)
(Two types of geothermal systems in Sumatra (1) on the slope of volcanic edifices and (2) in pull-apart basins along the Sumatran strike-slip fault zone. Thirteen pull-apart basins identified)

Musper, K.A.F.R. (1928)- Indragiri en Pelalawan. Uitkomsten van het mijnbouwkundig- geologisch onderzoek in de jaren 1922-1926. Jaarboek Mijnwezen Nederlandsch Oost-Indie 56 (1927), Verhandelingen 1, p. 1-245.
(Report on 1922-1926 geological-mining investigations in Indragiri and Pelalawan)

Musper, K.A.F.R. (1928)- Geologische waarnemingen in de Padangsche Bovenlanden, I. Over een voorkomen van Trias in de omgeving van Sawahloento. De Mijningenieur 9, 7, p. 124-127.
('Geological observations in the Padang Highlands, I. On an occurrence of Triassic in the area of Sawahlunto'. Sawahlunto at SW side of Tertiary Ombilin Basin. Pretertiary limestones SW of Sawahlunto originally believed to be Permian fusulinid-bearing limestones by Verbeek, but fusulinids are present only in reworked limestone clasts in basal Tertiary conglomerates. In-situ limestone series at least 500m thick, thin-bedded, and locally rich in Triassic bivalve molluscs: Myophoria verbeeki, M. myophoria, Cardita globiformis, Gonodon sphaerioides, Anatina and possible Gervilleia (fauna described by Boettger 1881 and Krumbeck 1914) (limestones overlie Permian 'Silungkang Fm' diabase-shale series?; JTvG))

Musper, K.A.F.R. (1929)- Geologische waarnemingen in de Padangsche Bovenlanden, II. Het Si Karikir-gebergte. De Mijningenieur 10, 5, p. 112-118.
('Geological observations in the Padang Highlands, II. The Si Karikir Mountains'. Mountain chain between Ombilin River and Lake Singkarak composed of intensely folded, grey Upper Triassic limestone, similar to described in 1928 in Sawahlunto area. Limestone at least 750m thick, locally rich in molluscs (Cardita, Myophoria myophoria, Gervilleia, possible Gonodon sphaerioides; no Halobia), rare corals and ammonoids (Trachyceras, Cyrtopleurites, Drepanites). Limestones conformable over 'Kiezel en mergel schiefers' of Verbeek. Intruded by younger granodiorite of Mesozoic age, because erosional products present in E Tertiary)

Musper, K.A.F.R. (1930)- Beknopt verslag over uitkomsten van nieuwe geologische onderzoekingen in de Padangsche bovenlanden. Jaarboek Mijnwezen Nederlandsch Oost-Indie 58 (1929), Verhandelingen, p. 265-331.
('Brief report on the results of new geological investigations in the Padang Highlands. Fieldwork in 1927-1928, in area E of Lake Singkarak and surrounding Tertiary Ombilin Basin with its Eocene fish locality. Presence of folded limestones of (1) M Permian (Guguk Bulat and E of Lake Singkarak: fusulinid limestones interbedded with porphyrite/tuffs; see also Lange 1925), (2) Carboniferous (N of Moeko Moeko; with Paleozoic tabulate corals) and (3) >500m thick (Late?) Triassic (S of Sawah Loento; rich in Triassic bivalves Cardita, Myophoria, Gonodon) and ammonoid Trachyceras. Also Mesozoic granites and Tertiary sediments including basal Miocene/ Te limestones)

Musper, K.A.F.R. (1933)- Geologische kaart van Sumatra 1:200 000. Toelichting bij Blad 15 (Praboemoelih). Dienst Mijnbouw Nederlandsch-Indie, Bandung, 41p. + map.
('Geologic map of Sumatra 1:200,000, Explanatory Notes of Sheet 15 (Prabumulih)')

Musper, K.A.F.R. (1934)- Nieuwe fossielresten en de ouderdom der kalksteenen in het Pretertiair van het Goemai Gebergte. De Ingenieur in Nederlandsch-Indie (IV) 1, 8, p. 134-142.
('New fossils and the age of the limestones in the Pre-Tertiary of the Gumai Mountains'. Limestones from folded Saling series interbedded with basic andesitic volcanics in Saling River, S Sumatra, contain Orbitolina, Loftusia and nerineids, suggesting E-M Cretaceous age. Earlier determination of Triassic age based on

Lovcenipora wrong (Yabe 1943 suggested Late Jurassic age; JTvG). Also new species of gastropod Nerinea palembangensis)

Musper, K.A.F.R. (1934)- Een bezoek aan de grot Soeroeman Besar in het Goemaigebergte (Palembang, Zuid-Sumatra). Tijdschrift Kon. Nederlands Aardrijkskundig Genootschap 51, 4, p. 521-531.
('A visit to the Suruman Besar cave in the Gumai Mountains, S Sumatra'. Extensive cave system in Cretaceous limestones. Little geology information)

Musper, K.A.F.R. (1937)- Geologische kaart van Sumatra 1:200,000. Toelichting bij Blad 16 (Lahat). Dienst Mijnbouw Nederlandsch-Indie, Bandung, 110p.
(Map sheet Lahat, S Sumatra, with explanatory notes)

Nainggolan, D.A. (2007)- Tinjauan analisis gaya berat terhadap bentukan struktur bawah permukaan di Lembar Medan, Sumatera Utara. J. Sumber Daya Geologi 17, 4 (160), p. 243-256.
(online at: http://jgsm.geologi.esdm.go.id/index.php/JGSM/article/view/293/264)
(A review of gravity analysis on the formation of subsurface structures in the Medan Sheet, North Sumatra'))

Nainggolan, M.J.H., E.S. Siregar, B.P. Sitanggang & G. Sinaga (2012)- Fasies and paleo-environment of Permian Mengkarang Formation and its implication to potensial of coal. Proc. 41st Ann. Conv. Indon. Assoc. Geol. (IAGI), Yogyakarta, 2012-SS-38, 5p.
(Permian flora and fauna in intact positions in Mengkarang coal bearing formation in Jambi Province. Fossil flora includes Lepidodendracreae shaped stems and leaves of tree or branched fork-shape Sphenophyllaceae. Coal organic facies suggest deposition in swamp zone, in area surrounded by active volcanoes)

Nakano, M., H. Kumagai, S. Toda, R. Ando, T. Yamashina, H. Inoue & Sunarjo (2010)- Source model of an earthquake doublet that occurred in a pull-apart basin along the Sumatran fault, Indonesia. Geophysical J. Int. 181, p. 141-153.
(2007 earthquake doublet along Sumatran Fault Zone near Padang Panjang, C Sumatra. Focal mechanisms indicate right-lateral strike-slip faults, consistent with geometry of Sumatran fault. Both nucleated below N end of Lake Singkarak, which is pull-apart basin between Sumani and Sianok segments of Sumatran fault system)

Nash, J.M.W. (1929)- Radiolarienhoudende gesteenten van Sumatra. De Mijningenieur 10, 11, p. 249-255.
('Radiolarian-bearing rocks from Sumatra'. Many new localities with radiolarians in S Sumatra, but no age-diagnostic species identified. Listing of radiolarian-bearing rocks encountered across Sumatra:7 in S Palembang area (Muara Dua Massif= Garba Mts?), 1 in S Bengkulu, 1 near Singkarak Lake in W Sumatra (in Permian- Triassic transition beds),12 localities in Lampung Districts on middle peninsula of S Sumatra (some associated with E Cretaceous Orbitolina; in Ratai Bay red deep sea clay). No true radiolarites anywhere, but all interpreted as deep marine deposits (No ages given; probably ranging from Permian- Cretaceous; JTvG))

Nash, J.M.W. (1930)- De Trias ten zuiden van Sawah Loento. De Mijningenieur 11, 8, p. 159-164.
('The Triassic South of Sawahlunto'. In area S of Sawahlunto intensely folded Upper Triassic marls and limestone with bivalves Myophoria, Gervilleia, etc., mainly dipping to N-NE, unconformably overlain by Eocene and younger quartz sandstones. Triassic sediments intruded by augite-microdiorite porphyry in Jurassic or Cretaceous, during or after folding)

Natawidjaja, D.H. (2002)- Neotectonics of the Sumatran Fault and paleogeodesy of the Sumatran subduction zone. Ph.D. Thesis California Institute of Technology, Pasadena, p. 1-289.
(online at: http://thesis.library.caltech.edu/1939/)
(Australian-Indian plate is subducting under Sumatran plate boundary at ~60 mm/yr. Oblique convergence partitioned into trench-parallel slip, accommodated largely by Sumatran fault zone and trench-perpendicular slip, accommodated by subduction zone. Sumatran fault zone highly segmented. Largest geomorphic offsets along fault zone ~20 km, and may represent total offset across fault. Location of Sumatran fault and active volcanic arc highly correlated with shape and character of underlying subducting oceanic lithosphere. Coral microatolls in W Sumatra used to document evidence for deformation)

Natawidjaja, D.H. (2014)- The Sumatran Fault Zone: neotectonics, magmatism, and metal resources. In: I. Basuki & A.Z. Dahlius (eds.) Sundaland Resources, Proc. Ann. Conv. Indon. Soc. Econ. Geol. (MGEI), Palembang, p. 59-87.
(Extensive review of 1900km-long, trench-parallel Sumatran fault zone. SFZ highly segmented, with 18 major segments. Many volcanoes, geothermal activities and metal resources near breaks between segments and also on and around major fault traces. Maximum offsets of rivers and folds along fault ~20-25 km. Measured fault slip rates 10- 27 mm/year, suggesting presently active SFZ may only about 1-3 Myrs old, which correlates with ages of most of major gold mineralizations between 1-3 Ma)

Natawidjaja, D.H. (2018)- Updating active fault maps and slip rates along the Sumatran Fault Zone, Indonesia. Proc. Global Colloquium on GeoSciences and Engineering, Bandung 2017, IOP Conf. Series, Earth Environm. Science 118, 012001, p. 1-11.
(online at: http://iopscience.iop.org/article/10.1088/1755-1315/118/1/012001/pdf)
(Latest geological and GPS studies suggest slip rates along Sumatran Fault Zone ~15 mm/yr. Total amount of extension in the Sunda-strait marine grabens ~18.7 km, almost identical with largest geomorphic offset along SFZ. Sumatran fore-arc moving N along SFZ like rigid block instead of being stretched)

Natawidjaja, D.H., K. Bradley, M.R. Daryono, S. Aribowo & J. Herrin (2017)- Late Quaternary eruption of the Ranau Caldera and new geological slip rates of the Sumatran Fault Zone in Southern Sumatra, Indonesia. Geoscience Letters (AOGS) 4, 21, p. 1-15.
(online at: https://geoscienceletters.springeropen.com/articles/10.1186/s40562-017-0087-2)
(Paleosols buried under Ranau Tuff constrain large caldera-forming eruption to ~33,830–33,450 yrs BP. In N Sumatra lateral displacement of river channels incised into Ranau Tuff show right-lateral channel offsets of ~350 ± 50m (minimum slip rate 10.4 ± 1.5 mm/yr). S of Suoh pull-apart depression. In SW Sumatra West Semangko segment offsets Semangko River by 230 ± 60m, (slip rate of 6.8 ± 1.8 mm/yr))

Natawidjaja, D.H., L. Handayani & C. Widiwijayantani (1994)- Proses subduksi miring pengaruhnya terhadap variasi slip-rate sesar Sumatra serta deformasi pada busur depan: pendekatan model kuantitatif tektonik dan elemen hingga. Proc. 23rd Ann. Conv. Indon. Assoc. Geol. (IAGI), Jakarta, 1, p. 413-432.
(The oblique subduction process and its effects on slip-rate variation of the Sumatra fault and deformation of the forearc: quantitative tectonic model and finite element approach')

Natawidjaja, D.H. & W. Triyoso (2007)- The Sumatran fault zone- from source to hazard. J. Earthquake and Tsunami 1, 1, p. 21-47.
(Substantial portion of Sumatran oblique convergence accommodated by Sumatran fault. 1900 km-long active strike-slip fault, 20 major segments, ranging from ~60- 200 km. Slip rates along fault increase NW-ward, from ~5 mm/yr around Sunda Strait to 27 mm/yr around Toba Lake)

Neeb, E.A. (1902)- Verslag omtrent het onderzoek naar tinertsafzettingen in een gedeelte van Midden- Sumatra, omvattende de landschappen V. Kota, III. Kota Kampar, IV. Kota di Moedik, VII. Kota Kampar di Ilir, Rokan Kiri, IV. Kota, Koento, Ramba, Daloe-Daloe, Kapenoean en aangrenzende streken. Jaarboek Mijnwezen Nederlandsch Oost-Indie 31 (1902), p. 113-145.
('Report on the investigation of tin ore deposits in a part of C Sumatra, in the areas of Kota, Kota Kampar, etc.'. Oldest rocks slates and quartzites ('probably Silurian or Devonian', but no fossils), locally with crystalline limestone (Permian?). Concludes that, despite some local exploitation, there are no commercial tin deposits left in this part of C Sumatra. With two 1:100,000 scale geologic maps of Upper Kampar, Rokan Kiri rivers areas)

Ninkovich, D. (1976)- Late Cenozoic clockwise rotation of Sumatra. Earth Planetary Sci. Letters 29, p. 269-275.
(Clockwise rotation of Sumatra of ~20° about axis near Sunda Strait inferred from: (1) Sumatra volcanic arc at angle of 20° with volcanic arc farther E; (2) Benioff zone maximum depth of 600 km E of Sunda Strait, but decreases to 200 km NW along Sumatra island; (3) age of volcanic activity younging to NW (?). Increase in sea-floor spreading rate since 10 Ma pushed N Sumatra and Malaya NE for ~500 km along system of presently

inactive faults, causing CW of Sumatra and Malaya. When this rotation ceased underthrusting of N Sumatra begin, producing shallow and short Benioff zone and delayed volcanic activity)

Ninkovich, D., N.J. Shackleton, A.A. Abdel-Monem, J.D. Obradovich & G. Izett (1978)- K-Ar age of the Pleistocene eruption of Toba, North Sumatra. Nature 276, p. 574-577.
(Late Pleistocene eruption of Toba is largest explosive eruption documented from Quaternary. K–Ar dating of the uppermost Toba Tuff (welded tuff along Asahan River) gives age of ~75,000 yr. Similar in composition to widepread ash layer in Indian Ocean deep sea cores and 1.5m thick ash bed at Tampan, W Malay Peninsula)

Ninkovich, D., R.S.J. Sparks & M.T. Ledbetter (1978)- The exceptional magnitude and intensity of the Toba eruption, Sumatra: an example of the use of deep-sea tephra layers as a geological tool. Bull. Volcanology 41, 3, p. 286-298.
(Eruption of Toba, N Sumatra at 75,000 yr BP, is largest magnitude Quaternary eruption. Produced largest-known caldera (100 x 30 km), surrounded by rhyolitic ignimbrite covering area of >20,000 km2. Associated deep-sea tephra layer found in piston cores in NE Indian Ocean covering minimum area of 5 M km2. Volume of ignimbrite and distal tephra fall deposit of Toba eruption at least 1000 km3 of dense rhyolitic magma. Eruption estimated to last 9-14 days)

Nishimura, S., E. Abe, J. Nishida, T. Yokoyama, A. Dharma, P. Hehanussa & F. Hehuwat (1984)- A gravity and volcanostratigraphic interpretation of the Lake Toba region, North Sumatra, Indonesia. Tectonophysics 109, p. 253-261, 265-272.

Nishimura, S., S. Sasajima, K. Hirooka, K.H. Thio & F. Hehuwat (1978)- Radiometric ages of volcanic products in Sunda Arc. CCOP/ SEATAR Workshop on the Sumatra Transect, Parapat, p.

Nocker, H. (1919)- Beitrage zur Petrographie von Sud-Sumatra (Lampong Distrikte). Inaugural Dissertation, Wilhelms Universitat, Munster, p. 1-53.
('Contributions to the petrography of South Sumatra (Lampong Districts)'. Petrographic descriptions of igneous (granite, gabbro, diorite), volcanic (andesite, liparite, dacite) and metamorphic rocks (gneiss, amphibolite, muscovite schist, quartzite) collected by Elbert around Lampung Bay. No pictures; poor locality descriptions)

Nugroho, B., H. Mustapha, A. Prasetya, J. Boast, M. Kaur, R.W.C. Nusantara, S. Dewawisesa & H. Utomo (2015)- Aruah Island's geology, northeastern edge of Central Sumatra Basin. Proc. Joint Conv. HAGI-IAGI-IAFMI-IATMI, Balikpapan, JCB2015-056, 17p.
(Fieldwork on Aruah Islands in Malacca Straits, 80km N of Bagiansiapiapi, C Sumatra. Steeply dipping meta-quartzites and meta-conglomerate, inferred to be of Paleozoic age, with regional dip ~60° to E, and N-S oriented fractures. Unconformably overlain by Miocene? Sihapas Fm? quartz sandstones. Islands believed to be part of Mutus Assemblage terrane and structurally on trend with Minas, Duri, Bagansiapiapi and Perak Highs. Similar meta-quartzite in Malacca Straits CSB A-1 well (90 km SE of Aruah) had spores indicating Devonian-E Carboniferous age)

Oppenoorth, W.F.F. & J. Zwierzycki (1918)- Geomorfologische en tektonische waarnemingen als bijdrage tot verklaring van de landschapsvormen van Noord Sumatra. Jaarboek Mijnwezen Nederlandsch Oost-Indie 46 (1917), Verhandelingen 1, p. 276-311.
('Geomorphological and tectonic observations as a contribution to the explanation of the landforms of North Sumatra')

Osberger, R. (1954)- Die Geologie des Sibumbungebirges nebst Beschreibung der hier und in benachbarten Gebieten liegenden Ertzvorkommen (Mittel-Sumatra). Sitzungsberichte Osterreich. Akademie Wissenschaften, Math.-Naturwiss. Kl., 1, 163, 9-10, p. 689-723.
('The geology of the Sibumbun Mountrains with description of associated and nearby ore occurrences (Central Sumatra)'. Summary of geology and copper and iron mineralizations associated with Carboniferous- Triassic intrusives in area NE of Singkarak Lake, Padang province. At least 1400m thick Carboniferous-Permian-

Triassic series, followed by non-deposition from Late Triassic to end-Mesozoic. Intruded by various intrusive rocks, from dacite to gabbro to granodiorite)

Osberger, R. (1955)- Uber Deckenbau und andere geologische Probleme im Pratertiair Sumatras. Neues Jahrbuch Geol. Palaont., Monatshefte 1955, 8, p. 321-341.
('On nappe structures and other geological problems in the Pre-Tertiary of Sumatra'. Assumes existence of nappe structure in Padang Highlands and Toba area of N Sumatra. Main thrusting was to NE and took place in post-Turonian Cretaceous time. Folding at depth in Tertiary responsible for movement to SW. Neither rock facies nor structural evidence supports view that root zone of nappes is in Riau islands or Malaya)

Osberger, R. (1956)- On the nappe structure and other geological problems in the Pre-Tertiary of Sumatra. 20th Sess. Int. Geological Congress, Mexico, 5, p. 411-420.
(Similar to paper above. Previous investigators showed nappe structures Jambi province, C Sumatra. Present studies confirmed existence of nappe in Padang highlands and probable existence of post-Turonian(?) 'Toba nappe' in E part of N Sumatra. Lithofacies studies indicate Permo-Carboniferous continent E of Malaya and Sumatra. Main thrusting was to NE in Cretaceous)

Ozawa, Y. (1929)- A new occurrence of *Schwagerina princeps* in Sumatra. Eclogae Geol. Helvetiae 22, p. 51-52.
(online at: http://retro.seals.ch/cntmng?type=pdf&rid=egh-001:1929:22::8&subp=hires)
(Short paper on fusulinids in Productus limestone of Teluk Gedang on Merangin River, below plant beds with Pecopteris ('Jambi Flora'; JTvG) of Garing River. Some already described by Lange (1925). Schwagerina princeps, Neoschwagerina craticulifera Fusulina japonica not reported from Sumatra before. (Schwagerina princeps from this locality re-described as Pseudoschwagerina meranginensis n.sp. by Thompson (1936))

Page, B.G.N. (1981)- Late Palaeozoic pebbly mudstones in Sumatra. In: M.J. Hambrey & W.B. Harland (eds.) Earth's pre-Pleistocene glacial record, Cambridge University Press, p. 337. *(Brief abstract only)*
(Pebbly mudstones dated as Carboniferous- E Permian found in Sumatra along Barisan Mountain Range. In places they are interbedded with limestones and calcareous siltstones. Glacial origin less likely than submarine mass-flow deposit along continental margin)

Page, B.G.N., J.D. Bennett, N.R. Cameron, D.M. Bridge, D.H. Jeffrey et al. (1979)- A review of the main structural and magmatic features of northern Sumatra. J. Geol. Soc., London, 136, 5, p. 569-579.
(Three main periods of Cenozoic volcanism in N Sumatra: E Oligocene, Oligo-Miocene and Miocene- Recent. Large transcurrent movements on SFS indicated by (a) regional slivers of oceanic crust trapped at leading junction of W continental plate as it moved NW against main mass of island; (b) paleomagnetic evidence showing E Sumatra as part of Malaya block and in equatorial position since Cretaceous, while paleolatitude of NW tip of Sumatra (W of SFS), was farther S; (c) juxtaposition of Li-rich and Li-poor geochemical provinces along SFS. Sumatran magmatic arc commenced at least in Mesozoic. Offset of current arc to E at Lake Toba ascribed to change in angle of Benioff Zone, divided by split in descending plate coincident with prolongation of Investigator transform fault)

Page, B.G.N. & R.D. Young (1981)- Anomalous geochemical patterns from northern Sumatra: their assessment in terms of mineral exploration and regional geology. J. Geochemical Exploration 15, p. 325-365.
(Stream sediment geochemical survey in Sumatra N of 4°N. Linear high-copper zone along axial Barisan Mts, derived from ophiolites and copper-rich calc-alkaline intrusives. High chromium over ophiolites. High lead E of linear copper zone and along oil and gas basins of E coast strip. High tin values W of copper-rich intrusives. Pattern does not conform to classic zonation of mineral deposits across simple subduction system. High Lithium values E Sumatran Fault System and virtually absent W of it)

Pardede, R. & K. Brata (1984)- Geologic map of the Sungaipenuh and Ketaun Quadrangles, Sumatra (Quadrangle 0812 and 0813), 1:250,000. Geol. Res. Dev. Centre (GRDC), Bandung.
(see also 2nd Edition, Kusnama et al. 1995)

Patton, J.R., C. Goldfinger, A.E. Morey, K. Ikehara, C. Romsos, J. Stoner, Y. Djadjadihardja, Udrekh, S. Ardhyastuti, E. Zulkarnaen Gaffar & A. Vizcaino (2015)- A 6600 year earthquake history in the region of the 2004 Sumatra-Andaman subduction zone earthquake. Geosphere 11, 6, p. 2067-2129.
(Paleoseismic history from offshore 144 deep-sea sediment cores in trench and lower slope piggyback basins of Sumatra accretionary prism. Include very young surface turbidites along N Sumatra margin, probablyemplaced in the past few decades in 2004 and 2005 earthquake rupture zones, with no overlying hemipelagic sediment)

Peng, H.U., Z. Zhu & W. Xiang (2014)- The lithogeochemical characteristics and tectonic setting research of Sulit skarn-type copper deposit in Sumatra Island, Indonesia. Acta Geologica Sinica 88, 2, p. 875. *(Abstract only)*
(Sulit copper deposit associated with E Jurassic low-SiO2 Sulit Diorite, with tholeitic geochemistry. May be related to intrusion of magma from extensional settings after late Indosinian period)

Permana, H., Munasri, S. Aribowo & M.M. Mukti (2016)- Petrologi batuan dasar Kompleks Gunungkasih, Tanjungkarang, Lampung Selatan. In: R. Delinom et al. (eds.) Pros. Geotek Expo 2016, Pusat Penelitian Geoteknologi (LIPI), Bandung, p. 623-636.
(online at: http://pustaka.geotek.lipi.go.id/index.php/2017/10/05/prosiding-2016/)
('Petrology of basement rocks of the Gunungkasih Complex, Tanjungkarang, South Lampung'. Pretertiary Gunungkasih complex rocks in Lampung greenschist-facies metamorphics (derived from volcanic arc or oceanic crust rocks; Sikuleh-Sekampung arc?). Basement rocks of Ratai Bay mica schist, chlorite schist and quartzite (meta-sediments; part of Woyla Accretionary Complex?))

Permana, R., B. Sutopo, Y.P. Simanjuntak, R. Pitaloka & E. Sukmawan (2014)- High sulfidation epithermal Au-Cu and porphyry Cu-Au mineralization in Bujang prospect, Batangasai, Jambi Province, Indonesia. In: I. Basuki & A.Z. Dahlius (eds.) Sundaland Resources, Proc. Indon. Soc. Econ. Geol. (MGEI) Ann. Conv., Palembang, p. 281-290.

Petersen, M.D., J. Dewey, S. Hartzell, C. Mueller, S. Harmsen, A.D. Frankel & K. Rukstales (2004)- Probabilistic seismic hazard analysis for Sumatra, Indonesia, and across the Southern Malaysian Peninsula. Tectonophysics 390, p. 141-158.
(Ground motion hazard models for Sumatra and Malay Peninsula by USGS)

Philippi, H. (1917)- Morphologische en geologische aantekeningen bij de kaart van Zuid-Sumatra, 1. Het Ranau Meer. Jaarverslag Topographische Dienst Nederl. Indie 1916, p, 182-207.
('Morphological and geological notes with the map of South Sumatra, 1. Ranau Lake')

Philippi, H. (1918)- Morphologische en geologische aantekeningen bij de kaart van Zuid-Sumatra, 2. Kolenterreinen in Benkoelen. Meded. Encyclopedisch Bureau (Batavia) 18, p. 1-86.
('Morphological and geological notes with the map of South Sumatra, 2. Coal terrains in Bengkulu'. Notes on coal occurrences in Bengkulu area, made during topographic survey. Coal in Bengkulu surveyed earlier by Van Dijk (1875), Verbeek (1881) and Moerman (1915). Coal in two horizons, both folded/ faulted: 'Old Miocene' (rel. good quality; locally improved by thermal metamorphism by common young igneous intrusions) and 'Young Miocene' (low grade, poor quality, water content 15-19%), separated by 'Middle Miocene' interval rich in tuffs (Sekajoen Tuffs, Balai Tuffs, Kaboe andesites-breccias). Age control of formations poor)

Philippi, H. (1923)- Contributions a la geologie de la partie meridionale de Sumatra: gisements de fer dans les districts des Lampongs. Thesis Universite de Geneve Fac. Sciences, 720, p. 1-42.
('Contributions to the geology of the southern part of Sumatra; iron-bearing beds in the Lampung District.' Rel. little detailed description of iron-bearing rocks near Sukadana/ Telukbetung)

Philippi, H. (1925)- Beschrijving van ijzerertsafzettingen op de hellingen van den Radjabasa (Lampongsche Districten). Verhandelingen Geologisch-Mijnbouwkundig Genootschap Nederland Kol., Geol. Serie 8 (Verbeek volume), p. 393-403.

('Description of iron ore deposits on the slopes of the Rajabasa (Lampong Districts)'. Non-commercial iron ore on N slope Rajabasa volcano, S Sumatra)

Poedjoprajitno, S. (2007)- Morfotektonik dan reaktivitas sesar Sumatera di Padangpanjang, Sumatera Barat. J. Sumber Daya Geologi 17, 3, p. 187-204.
(online at: http://jgsm.geologi.esdm.go.id/index.php/JGSM/article/view/289/260)
('Morphotectonics and Sumatran fault reactivation in Padangpanjang, West Sumatra'. Remote sensing study)

Poedjoprajitno, S. (2008)- Morfostratigrafi tuf ignimbrit Maninjau di Ngarai Sianok, Dusun Belakang Balok-Bukittinggi, Sumatera Barat. J. Sumber Daya Geologi 18, 3, p. 171-184.
(online at: http://jgsm.geologi.esdm.go.id/index.php/JGSM/article/view/264/244)
('Morphostratigraphy of the Maninjau ignimbrite tuff in Sianok Gorge, Belakang Balok village, Bukittinggi, West Sumatera'. Ignimbrite plateau of Sianok Valley produced by two periods of Maninjau volcanic eruptions, separated by fluvio-volcanic sands and conglomerates. Pyroclastic deposits faulted, forming terrace morphology. Sianok Valley formed by reactivation of basement faults)

Posavec, M., D. Taylor, T. van Leeuwen & A. Spector (1973)- Tectonic controls of volcanism and complex movements along the Sumatran fault system. In: B.K. Tan (ed.) Proc. Reg. Conference on the Geology of SE Asia, Kuala Lumpur 1972, Bull. Geol. Soc. Malaysia 6, p. 43-60.
(online at: www.gsm.org.my/products/702001-101354-PDF.pdf)
(Rio Tinto work along Sumatra fault zone. Igneous activity along E-W alignments suggested by magnetic lineaments. Active volcanic centers spaced at 75-100 km along active fault zone. Total horizontal offset along fault ~130 km since inception of present volcanic cycle)

Posthumus, O. (1927)- Some remarks concerning the Palaeozoic flora of Djambi, Sumatra. Proc. Kon. Nederl. Akademie Wetensch. Amsterdam 30, 6, p. 628-634.
(online at: www.dwc.knaw.nl/DL/publications/PU00015487.pdf)
(Carboniferous or Permian fossil plants from Jambi show most resemblance to Gigantoperis flora of E Asia, not Gondwana Glossopteris fauna. Also first author to suggest 'Jambi Flora' is of E Permian age, not Carboniferous as initially suggested by Jongmans (1925, 1935))

Pramumijoyo, S. (1991)- Neotectonique et sismotectonique de la terminaison meridionale de la Grande Faille de Sumatra et du Detroit de la Sonde (Indonesie). Doct. Thesis, Universite Paris XI, Orsay, p. 1-230. *(Unpublished)*
('Neotectonics and seismotectonics at the southern end of the Great Sumatra Fault and Sunda Straits')

Prasetyono, B., H. Irdhan, P. Ibnu, M. Farmer & D. den Boer (2014)- Review of geology and mineral resources at the Tembang Deposit, Sumatra, Indonesia. In: I. Basuki & A.Z. Dahlius (eds.) Sundaland Resources, Proc. Indon. Soc. Econ. Geol. (MGEI) Ann. Conv., Palembang, p. 271-279.
(Tembang low-sulphidation epithermal Au-Ag vein system in Barisan Mts, 130km NNE of Bengkulu, S Sumatra. Hosted in volcanics of E Miocene Hulusimpang Fm ('Old andesites') and M Miocene andesitic intrusions. Age of mineralization assumed to be similar to known epithermal Au-Ag deposits in S Sumatra and W Java. Near Rawas open pit mine, operational from 1997-2000)

Prawirodirdjo, L.M. (2000)- A geodetic study of Sumatra and the Indonesia region: kinematics and crustal deformation from GPS and triangulation. Ph.D. Thesis University of California, San Diego, p. 1-150. *(Unpublished)*
(Analysis of geodetic GPS data collected in Indonesia from 1959 to 1994 suggests three large blocks: (1) Sunda Shelf, with low velocities to ESE, (2) S Banda Arc- E New Guinea, moving NE and NNE, (3) Birds Head region of W Papua, with high velocity to NW and WNW. NE Sulawesi is fourth, smaller block)

Prawirodirdjo, L., Y. Bock, J.F. Genrich, S.S.O. Puntodewo, J. Rais, C. Subarya & S. Sutisna (2000)- One century of tectonic deformation along the Sumatran fault from triangulation and Global Positioning System surveys. J. Geophysical Research 105, p. 28343-28361.

(online at: http://onlinelibrary.wiley.com/doi/10.1029/2000JB900150/pdf)
(Analysis combining historical triangulation and recent GPS measurements in W and N Sumatra reveals detailed slip history along central part of Sumatran fault. Sumatra fault arc-parallel slip rates 23-24mm/yr)

Pribadi, A., E. Mulyadi & I. Pratomo (2007)- Mekanisme erupsi ignimbrit kaldera Maninjau, Sumatera Barat. J. Geologi Indonesia 2, 1, p. 31-41.
(online at: www.bgl.esdm.go.id/publication/index.php/dir/article_detail/182)
('Mechanism of ignimbrite eruption of Maninjau caldera, West Sumatra'. Maninjau is collapse caldera, formed by major eruption around 70-80 ka, scattering 220-250 km3 of pyroclastic material up to >75 km from center of eruption. Two types of rocks: pyroclastic surge deposits and air-fall deposits))

Priyomarsono, S. & A. Sumarsono (1993)- Tektonik geologi daerah pegunungan Tigapuluh dan daerah sekitarnya, cekungan Sumatra selatan. Proc. 22nd Ann. Conv. Indon. Assoc. Geol. (IAGI), Bandung, 1, p. 103-111.
('Tectonics and geology of the Tigapuluh Mountains and surrounding area, S Sumatra Basin')

Pudjowalujo, H. (1990)- Cenozoic tectonics of North Sumatra with particular reference to the Sumatran fault system. In: Proc. Pacific Rim Congress 90, Gold Coast 1990, Australasian Inst. of Mining and Metallurgy (AusIMM), Parkville, 3, p. 209-215.

Pulunggono, A. & N.R. Cameron (1984)- Sumatran microplates, their characteristics and their role in the evolution of Central and South Sumatra basins. Proc. 13th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, p. 121-143.
(Milestone paper on Sumatra Pre-Tertiary mosaic of basement terranes. Mergui, Malacca and East Malaya continental microplates joined in Late Triassic to form Sundaland, followed by Late Cretaceous accretion of W coast Woyla volcanic arc terrain(s). Suture zone between Mergui and Malacca microplates, named Mutus assemblage, major zone of weakness during formation of Tertiary C and S Sumatra basins. It is a zone of high heat flow and underlies ~95% of two basin's oil production. Young Tertiary structures in this zone are related to wrenching in N and S, and to compressional reactivation of cross cutting WNW-ESE faults formed during Cretaceous accretion of Woyla Terrains)

Pulunggono, A., A. Suparman, A. Assegaf & T. Purwanto (1990)- Geologi daerah Garba dan sekitarnya, Sumatra Selatan. Universitas Trisakti, Jakarta, 56 p. *(Unpublished)*

Purbo-Hadiwidjoyo, M.M., M.L. Sjachrudin & S. Suparka (1979)- The volcano-tectonic history of the Maninjau caldera, western Sumatra, Indonesia. In: W.J.M. van der Linden (ed.) Fixism, mobilism or relativism: Van Bemmelenȏs search for harmony, Geologie en Mijnbouw 58, 2, p. 193-200.
(online at: https://drive.google.com/file/d/0B7j8bPm9Cse0T3BxRWpTaFRPUlU/view)
(Mt. Maninjau 15km W of Bukittinggi, W Sumatra, three stages: pre-volcanic edifice stage, pre-caldera stage (number of strato-volcanoes forming N-S oriented Maninjau volcanic complex) and caldera-formation stage. Caldera-formation stage preceded by the ejection of ~220-250 km3 of pumiceous tuff, followed by collapse of the top part of volcano, and radial failure of W flank. Two eruptions of acid magma: (1) unwelded and (2) welded tuff. Since then obvious volcanic activity ceased)

Purucker, M. & T. Ishihara (2005)- Magnetic images of the Sumatra region crust. EOS Transactions American Geophys. Union (AGU) 86, 10, p. 101-102.
(Magnetic images near Great Sumatra earthquake. Along fault rupture magnetic crustal thicknesses increase to E and NE. Island arc and subducting slab are magnetic, and subducting slab is diving into mantle at steep angle, increasing magnetic thickness. Between Singapore and S coast Borneo, a previously unrecognized first-order feature parallels active subduction zone. Like present subduction zone, it is characterized by 2-3 fold increase in magnetic thickness in NE direction, probably reflecting past history of subduction in region)

Putra, A.F. & S. Husein (2016)- Pull-apart basins of Sumatra fault: previous works and current perspectives. In: R. Hidayat et al. (eds.) Proc. 9th Seminar Nasional Kebumian, Dept. Teknik Geologi, Gadjah Mada University, Yogyakarta, p. 42-60.
(online at: https://repository.ugm.ac.id/273463/)
(Sumatran Fault zone 1900 km long NW-SE trending transcurrent fault. 19 segments from Aceh to Sunda Strait with stepoves with pull-apart basin. CCW rotation of Sundaland in M Miocene triggered activation of fault in right-handed kinematics, facilitated by pre-existing basement grain (obduction of Woyla nappe))

Putra, A.M. & Munasri (2016)- Characteristics of Radiolaria and its bearing rocks in the Garba mountains, South Sumatra. Proc. GEOSEA XIV and 45th Ann. Conv. Indon. Assoc. Geologists (IAGI) (GIC 2016), Bandung, p. 576-578.
(Massive chert of Situlanglang Mb of Garba Fm in Garba Mts with poor-moderate preserved radiolaria, low diversity and abundance. Presence of Triassocampe suggests Triassic age (older than supposed Jurassic-Cretaceous age of Woyla Group)

Putra, P.S. & E. Yulianto (2017)- Karakteristik endapan tsunami Krakatau 1883 di daerah Tarahan, Lampung. J. Riset Geologi Pertambangan (LIPI) 27, 1, p. 83-95.
(online at: http://jrisetgeotam.com/index.php/jrisgeotam/article/view/301/pdf)
('Characteristics of the 1883 Krakatau tsunami deposits in the Tarahan area, Lampung'. Tsunami deposit of 1883 Krakatau volcano eruption off Lampung Bay is f-c sand layer (10-30cm thick?) with pumice and volcanic ash. Shallow marine benthic foraminifera and molluscs show tsunami waves erode sea floor sediments down to 30-40m depth. Four fining upward patterns indicate at least four tsunami waves inundated study area.

Qiu, Z., X. Han, X. Jin, Y. Wang, & J. Zhu (2014)- Tephra records from abyssal sediments off western Sumatra in recent 135 ka: evidence from Core IR-GC1. Acta Oceanol. Sinica 33, 12, p. 75-80.
(Three volcanic ash layers in deep-sea Core IR-GC1 from NE Indian Ocean, adjacent to W Indonesian arc, ~1000km W of Lake Toba. Tephra dominated by glass shards with minor plagioclase, biotite, and hornblende. Layer A correlated to youngest Toba tuff (~76–80 ka), Layer B with older eruption of Toba caldera (~98-100 ka), Layer C (>135 ka) different composition and originated from another volcanic eruption event)

Rampino, M.R. & S.H. Ambrose (1992)- Volcanic winter in the Garden of Eden: the Toba supereruption and the late Pleistocene human population crash. Geol. Soc. America (GSA), Spec. Paper 345, p. 71-82.

Rampino, M.R. & S. Self (1992)- Volcanic winter and accelerated glaciation following the Toba super-eruption. Nature 359, 6390, p. 50-52.
(Eruption of Toba in Sumatra 73,500 years ago largest known explosive volcanic event in Late Quaternary. Model calculations of climatic effects of volcanic cloud suggest it may have produced 'volcanic winter', followed by few years surface-temperature decreases of 3-5 °C. Eruption during Stage 5a-4 transition of oxygen isotope record may have accelerated shift to glacial conditions that was already underway)

Rampino, M.R. & S. Self (1993)- Climate- volcanism feedback and the Toba eruption of ~74000 years ago. Quaternary Research 40, p. 269-280.
(Toba eruption (~74,000 yrs ago) during δ18O Stage 5a-4 transition period of rapid ice growth and falling global sea level, which may have been a factor in creating stresses that triggered volcanic event. Stratospheric dust and sulfuric acid aerosol clouds may have created brief cooling ('volcanic winter'), with N Hemisphere surface T decreases of ~3°-5°C. Summer T decreases of >10°C at high N latitudes adjacent to regions already covered by snow may have increased snow/ sea-ice extent, accelerating cooling already in progress)

Ratman, N. & G.P. Robinson (1999)- Umur batuan sedimen meta dan batugamping Mesozoikum di daerah Tembesi, Jambi, Sumatera Bagian Selatan. J. Geologi Sumberdaya Mineral 9, 89, p. 2-9.
('Age of Mesozoic metasediments and limestones in the Tembesi area, S Sumatra'. Middle? Jurassic- U Cretaceous 'flysch-type' accretionary wedge sediments of M Jurassic Asai Fm (but with Late Jurassic nannofossils?) and Late Jurassic- Cretaceous Rawas Fm, with some serpentinites W of Jambi and SW of Bangko (= Woyla Terrane of Pulunggono & Cameron 1984, Schieferbarisan of Tobler 1922). ?Unconformably

overlain by Mersip Fm limestone Mb with Maastrichtian nannofossils (Watznaueria spp, etc.). Arai Granite with K-Ar age 141 Ma (earliest Cretaceous))

Reid, M.R. & J.A. Vazquez (2017)- Fitful and protracted magma assembly leading to a giant eruption, Youngest Toba Tuff, Indonesia. Geochem. Geophys. Geosystems 18, 1, p. 156-177.
(online at: http://onlinelibrary.wiley.com/doi/10.1002/2016GC006641/epdf)
(Eruption of 74 ka Youngest Toba Tuff of N Sumatra produced 2800 km3 of ignimbrite and coignimbrite ashfall. Relatively many zircons nucleated before earlier eruption at 501 ka, but most zircons yielded interior dates 100-300 ka thereafter. Zircon growth likely episodic over protracted time intervals of >100- >500 ka. Repeated magma recharge may have contributed to development of compositional zoning in YTT, but perturbations to magma reservoir over >400 ka did not lead to eruption until 74 ka)

Rivai, T.A., K. Yonezu, Syafrizal & K. Watanabe (2017)- Dairi Zn-Pb±Ag deposit, North Sumatra, Indonesia: preliminary study on host rock petrology and ore mineralogy. Proc. Int. Forum for Green Asia 2017, Kyushu University, P23, p. 61-66.
(online at: http://www.tj.kyushu-u.ac.jp/leading/pdf/06-2017Seminar-Proceedings_P23.pdf)
(Dairi sediment-hosted Zn-Pb±Ag deposit along E limb of Sopokomil dome, ~290km SW of Medan. Orebodies hosted by metasediments of Kluet Fm of Sibumasu Block. Minerals sphalerite, galena, chalcopyrite, arsenopyrite, etc.)

Robock, A., C.M. Ammann, L. Oman, D. Shindell, S. Levis & G. Stenchikov (2009)- Did the Toba volcanic eruption of ~74k BP produce widespread glaciation? J. Geophysical Research 114, D10107, p. 1-9.
(online at: https://pubs.giss.nasa.gov/docs/2009/2009_Robock_ro09900j.pdf)
(Climate simulation model of 'volcanic winter' following supervolcano eruption of size of Toba suggests devastating consequences for humanity and global ecosystems)

Rock, N.M.S., D.T. Aldiss, J.A. Aspden, M.C.G. Clarke, A. Djunuddin, W. Kartawa, Miswar, S.J. Thompson & R. Whandoyo (1983)- Geologic map of the Lubuksikaping Quadrangle (0716), Sumatra, 1:250,000. Geol. Res. Dev. Centre (GRDC), Bandung.
(Map sheet of W side of C Sumatra near Natal. Oldest rocks in Barisan Mts Permo-Carboniferous Kuantan Fm, incl. meta-limestones and meta-volcanics, and Permian Silungkang Fm basic meta-volcanic, sandstones, tuffs and limestone member, intruded by Permo-Triassic and younger granites. In W juxtaposed against Woyla Gp, incl. melange, argillites, schist, meta-limestones, etc.)

Rock, N.M.S., H.H. Syah, A.E. Davis, D. Hutchison M.T. Styles & R. Lena (1982)- Permian to Recent volcanism in northern Sumatra, Indonesia: a preliminary study of its distribution, chemistry and peculiarities. Bull. Volcanologique 45, 2, p. 127-152.
(Sumatra has been volcanic arc above NE-dipping subduction zone since Late Permian. Main volcanic episodes N of Equator: (1) Late Permian Peusangan Gp porphyritic basic lavas interstratified with limestones and phyllites; (2) Late Mesozoic Woyla Gp volcanic rocks widely distributed along and W of Sumatra Fault System, include ophiolite-related spilites, andesites and basalts; (3) Paleogene volcanic rocks include altered basalt pile in NW, intruded by E Miocene (19 Ma) dioritic stock; and basic lavas in SW; (4)Miocene volcanic rocks widely distributed along W coast; (5) Quaternary volcanism irregular and anomalous relative to S Sumatra and Java-Bali. Depths to subduction zone below calc-alkaline volcanoes in Java/Bali 160-210 km, but little >100 km in N Sumatra, possibly because Sumatra underlain by continental crust and more akin to destructive continental margins than typical island-arcs such as E Java or Bali)

Roemer, F. (1880)- Kurzer Bericht uber Kohlenkalkversteinerungen von Sumatra und Timor. Lethaea Geognostica, I, 1880, 5, p. 75- .
('Brief note on Carboniferous fossils from the West coast of Sumatra and Timor'. Incl. first description of Permian fusulinid Schwagerina verbeeki)

Roemer, F. (1880)- Uber eine Kohlenkalk-fauna der Westkuste von Sumatra. Palaeontographica 27, 3, p. 5-11.
(online at: http://archive.org/details/palaeontographic27cass)

('On a 'coal-limestone' (=Carboniferous) fauna from the West coast of Sumatra'. Same as Roemer 1981, below)

Roemer, F. (1881)- Uber eine Kohlenkalk-fauna der Westkuste von Sumatra. Jaarboek Mijnwezen Nederlandsch Oost-Indie 10 (1881), 1, p. 289-305.
('On a 'coal-limestone' (=Carboniferous) fauna from the West coast of Sumatra'. First description of dark grey, limestone from Padang Highlands, W Sumatra, with striking resemblance to Upper Carboniferous 'Kohlenkalk' of NW Europe. Contains fusulinids (Fusulina granum-avenae n.sp., Schwagerina verbeeki= Verbeekina verbeeki), brachiopods (incl. Productus sumatrensis n.sp.= Stereochia sumatrensis), crinoids, nautiloids, gastropods and trilobite (incl. Phillipsia sumatrensis n.sp.= Pseudophillipsia) (From Silungkang Fm; Age now commonly accepted as M Permian; JTvG))

Rolker, C.M. (1891)- The alluvial tin deposits of Siak, Sumatra. Trans. American Inst. Mining Engineers 20, New York, p. 50-84.
(Old review of alluvial tin mining operations in headwaters of Siak (and Rokan and Kampar) rivers near Pakanbaru, in east part of C Sumatra. Worked mainly by Chinese contract miners (tin deposits known to VOC agents since 1670's; Barnard 2013))

Rose, W.I. & C.A. Chesner (1987)- Dispersal of ash in the great Toba eruption, 75 ka. Geology 15, p. 913-917.
(Pleistocene Toba eruption of 75 ka left caldera of 100x30km, with caldera ash fill >600m. It produced minimum of 2800 km3 of magma, >800 km3 deposited as ash fall, covering area of 4 million km2. Extensive rhyolite ash horizon in deep sea cores of Bay of Bengal, possibly also in India (3100 km away))

Rose, W.I. & C.A. Chesner (1990)- Worldwide dispersal of ash and gases from earth's largest known eruption: Toba, Sumatra, 75 ka. Palaeogeogr. Palaeoclim. Palaeoecology 89, 3, p. 269-275.
(Eruption of Youngest Toba Tuff at ~75 ka in N Sumatra produced >2800 km3 of dense rock equivalent rhyolite magma. Much of volume preserved as non-welded outflow sheet covering 20,000-30,000 km2 and thick, welded intra-caldera tuff. At least 800 km3 of Toba ash deposited in ash blanket over Indian Ocean and S Asia. Masses of ash and gases released nearly two orders of magnitude higher than any known historic eruption)

Rosidi, H.M.D, S. Tjokrosaputro, B. Pendowo, S. Gafoer & Suharsono (1996)- Geologic map of the Painan and northeastern part of the Muarasiberut Quadrangles (0714-0814), Sumatra, 1:250,000. Geol. Res. Dev. Centre (GRDC), Bandung.
(2nd edition of 1975 map. W part of C Sumatra, cut by Sumatra Fault zone and with Kerinci Volcano (3800m). Most of area underlain by Permian 'Barisan Fm' phyllites and metagreywacke with slaty cleavage and chert, with limestone intercalations with fusulinid foraminifera (Schwagerina). Intruded by Jurassic, Cretaceous and Miocene granites. Along NE part of Barisan Mts 1100m thick non-metamorphic Permian Palepat Fm, volcanoclastics, mainly composed of andesitic lavas and tuffs, with less basalt and rhyolite, and with shales and thin limestones with brachiopods and fusulinids (and famous E Permian 'Jambi Flora'), all overlying large (Jurassic??) granite body. Tabir Fm conglomeratic sandstones with Ostrea and reworked Paleozoic andesitic clast assigned to Jurassic (But is Late Permian; Crow et al. 2008). Jurassic Siguntur Fm with limestone member with stromatoporoids Cretaceous Siulak Fm clastics and andesitic-dacitic tuffs with limestone member with Loftusia and hydrocoralline fossils. Unconformably overlain by Oligocene- Miocene sediments of northern S Sumatra (Jambi) basin.)

Rutten, L.M.R. (1927)- Sumatra, Chapters 24-31. In: L.M.R. Rutten (1927) Voordrachten over de geologie van Nederlandsch Indie, Wolters, Groningen, p. 343-497.
(1927 review of geology of Sumatra in Rutten's classic lecture series)

Ruttner, F. (1935)- Kieselgur und andere lakustrische Sedimente im Tobagebiet. Archiv. Hydrobiologie, Suppl. vol. 13, Tropische Binnengewasser 5, p. 399-461.
('Diatomite and other lacustrine sediments in the Toba area'. Quaternary lake sediments in Lake Toba area, N Sumatra. See also Van der Marel 1947)

Ryberg, T., U. Muksin & K. Bauer (2016)- Ambient seismic noise tomography reveals a hidden caldera and its relation to the Tarutung pull-apart basin at the Sumatran Fault Zone, Indonesia. J. Volcanology Geothermal Res. 321, p. 73-84.
(Tomography velocity model shows strong velocity decrease off Great Sumatran Fault Zone, at NE margin of the young Tarutung pull-apart basin, coinciding with caldera-like morphological feature interpreted as hidden volcanic caldera)

Saefudin, I., S. Permanadewi, T. Hardjono & S.D. Graha (1991)- Penarikhan jekak belah batuan granitik di daerah Tangse, Aceh. J. Geologi Sumberdaya Mineral 1, 1, p. 3-6.
('Fission track ages of granite rocks in the Tangse area, Aceh'. Fisssion track dating of granite- granodiorite samples gives Late Miocene ages, from 5.8-10.2 Ma. Previous K-Ar ages 42 Ma (E Eocene))

Saefudin, I. (2000)- Kecepatan pangangkatan dan pendinginan pluton granit Bukit Garba, Baturaja, Sumatera Selatan. J. Geologi Sumberdaya Mineral 10, 101, p. 10-15.
('Rate of removal and cooling of the Bukit Garba granite pluton, Baturaja, South Sumatra'. Fission track dating of zircon from Garba Mts granite gave ages of 84.3 ± 4.1 Ma and 79.5 ± 3.5 Ma; apatite FT ages ~63.5- 34 Ma. K-Ar dating of biotite 113 and 116 Ma. Uplift rate of Garba granite body 0.03-0.04 mm/yr, possibly caused by tectonic activities at 116-80 Ma and 60-30 Ma)

Saing, S. et al. (2015)- Magmatic hydrothermal system at the southeastern Martabe high-sulfidation epithermal deposit, North Sumatra, Indonesia. Proc. 5th Asia Africa Mineral Resources Conf., Quezon City, p. 15-20.

Saing, S., R. Takahashi & A. Imai (2016)- Fluid inclusion and stable isotope study at the southeastern Martabe deposit: Purnama, Barani and Horas ore bodies, North Sumatra, Indonesia. Resource Geology 66, 2, p. 127-148.
(Martabe Au-Ag deposit in N Sumatra is high sulfidation epithermal deposit, hosted by Neogene sandstone, siltstone, volcanic breccia, and andesite to basaltic andesite of Angkola Fm. Deposit consists of six ore bodies, controlled by N-S and NW-SE trending faults. Barani and Horas ore bodies SE of Purnama ore body.

Salisbury, M.J. (2012)- Convergent margin magmatism in the Central Andes and its near antipodes in Western Indonesia: spatiotemporal and geochemical considerations. Ph.D. Thesis, Oregon State University, p. 1-131.
(online at: http://ir.library.oregonstate.edu/..)
(Incl. chapter on marine tephra deposits in deep sea sediment cores from Sunda trench near Sumatra, which reveal evidence for seven large (minimum volume 0.6-6.3 km3), previously undocumented, explosive eruptions in region over last ~110,000 years, presumably from mainland Sumatra. Composition varies with age:rhyolitic Group 3 tephras oldest (~30 – 110 ka), and Group 1 and 2 andesites-rhyodacites within last 14 ka. (see also paper below))

Salisbury, M.J., J.R. Patton, A.J.R. Kent, C. Goldfinger, Y. Djadjadihardja & U. Hanifa (2012)- Deep-sea ash layers reveal evidence for large, late Pleistocene and Holocene explosive activity from Sumatra, Indonesia. J. Volcanology Geothermal Res. 231-232, p. 61-71.
(Tephra ash layers in deep-sea sediment cores from Sunda trench area off Sumatra reveal evidence for five previously undocumented, large explosive eruptions over last ~31,000 years, presumably from Sumatra)

Sandberg, C.G.S. (1913)- Bijdragen tot de kennis van de geologische gesteldheid van de residentie Benkoelen (Sumatra) en van de propylitiseering en mineraliseering van jong-vulkanische gesteenten. Handelingen XIV Nederlandsch Natuur- Geneeskundig Congres, Delft 1913, Kleinenburg, Haarlem, p. 524-537.
('Contributions to the knowledge of the geological conditions of the Residency Bengkulu (Sumatra) and of the propylitization and mineralization of young-volcanic rocks'. Bengkulu province of W Sumatra contains granite, gneiss and other crystalline schists, partly covered by young volcanics, with associated propylitization of rocks and gold mineralization)

Santoso, D., M.E. Suparka, S. Sudarman & S. Suari (1995)- The geothermal fields in central part of the Sumatra fault Zone as derived from geophysical data. In: Proc. World Geothermal Congress, 4, p. 1363-1366.
(online at: www.geothermal-energy.org/pdf/IGAstandard/WGC/1995/2-Santoso.pdf)

(Geothermal systems in Central Part of Great Sumatra Fault Zone are graben-type geothermal systems, closely related to Quaternary volcanism)

Santoso & U.M. Lumbanbatu (2007)- Morfogenesis daerah Danau kaldera Maninjau, Sumatera Barat. J. Sumber Daya Geologi 17, 2, p. 105-115.
(online at: http://jgsm.geologi.esdm.go.id/index.php/JGSM/article/view/282/253)
('Morphogenesis of the Laka Maninjau caldera, West Sumatra'. Two volcanic centers in Maninjau Lake)

Sasajima, S, Y. Otofuji, K. Hirooka, Suparka, Suwijanto & F. Hehuwat (1978)- Paleomagnetic studies on Sumatra Island: on the possibility of Sumatra being part of Gondwanaland. In: M. Kono (ed.) Rock magnetism and Paleogeophysics, Japan, 5, p. 104-110.
(online at: http://peach.center.ous.ac.jp/)
(Summary of paleomagnetic work. Samples from 53 sites across Sumatra, ranging in age from Permian-Pleistocene. Triassic data believed to be reliable, and show paleogeographic position of Sumatra at 38°S and 100°E, suggesting Sumatra area was part of Gondwanaland (N India) in Triassic. Between Triassic and E Tertiary Sumatra rotated 62° CW, presumably during breakup from Gondwanaland or during N-ward drift)

Sato, K. (1991)- K-Ar ages of granitoids in Central Sumatra, Indonesia. Bull. Geol. Survey Japan 42, p. 111-181.
(online at: www.gsj.jp/Pub/Bull/vol_42/42-03_01.pdf)
(K-Ar ages of 3 granitoid plutons in Barisan Mts, C Sumatra. Tourmaline-bearing biotite granite N of Sijunjung dated at 247 Ma, which may tie to Early Triassic granites of East Belt of Malay Peninsula. Two Late Cretaceous-Paleocene granodiorite-tonalites near Sumatran Fault zone: Lassi pluton E of Solok (56 Ma) and Padangpanjang pluton S of Bukittinggi (64 Ma). Petrography different from Late Cretaceous Hatapang pluton in N Sumatra (with tin-tungsten mineralization and 78-81 Ma age))

Satyana, A.H., R. Hutagalung & U. Latifah (2013)- Supererupsi Toba 74,000 years ago: catastrophe geology and mass extinction. Proc. HAGI-IAGI Field Joint Convention, Medan 2013, 12p.
('The Toba super-eruption 74,000 years ago: geological catastrophe and mass extinction')

Schmidt, C. (1901)- Observations geologiques a Sumatra et a Borneo. Bull. Soc. Geologique France IV, 1, p. 260-267.
('Geological observations on Sumatra and Borneo'. Summary description of Sumatra and Borneo geology, with cross sections through Bangka and S Sumatra)

Schouten, C. (1928)- Mineragrafisch onderzoek van goudertsen van Lebong Bahroe en Tandaiberg (Mijnbouwmaatschappij Simau, Sumatra). Verhandelingen Geologisch-Mijnbouwkundig Genootschap Nederland Kol., Mijnbouwkundig Ser. 2, 4, p. 161-233.
(Minerographic study of gold ores from Lebong Baru and Tandaiberg (Mining company Simau, Sumatra)'. Miscroscopic study of gold, silver and copper minerals from hydrothermal veins associated with andesites from Lebong Baru and Lebong Tandai, complex, NE of Bengkulu, C Sumatra)

Schurmann, H.M.E. (1929)- Ofiolieten en abyssieten in Noord Sumatra. De Mijningenieur 10, 11, p. 235-237.
('Ophiolites and abyssal rocks in North Sumatra'. In Barisan Mts area between Tangse and Geumpang, Central Aceh. Serpentinites and gabbro can be followed over >25km. Associated with deep water red siliceous shales and radiolarites, also limestones with possible Lovcenipora, suggesting Late Triassic age (younger?). Possibly similar to rocks from Pahang area, Malay Peninsula (= Woyla Group; JTvG))

Schurmann, H.M.E. (1930)- Geologische notities uit de Batak landen, Noord Sumatra. De Mijningenieur 11, 10, p. 197-200.
('Geologic notes from the Batak territories, N Sumatra'. Paleogene outcrops in several areas. Pre-Eocene rocks in Wilhelmina mountains)

Schwartz, M.O. & Surjono (1990)- Sungai Isahan- a new primary tin occurrence in Sumatra. Bull. Geol. Soc. Malaysia 26, p. 181-188.
(online at: https://gsmpubl.files.wordpress.com/2014/09/bgsm1990013.pdf)
(New primary tin occurrence at Sg Isahan, near S termination of Bengkalis Trough at Tigapuluh Mts, C Sumatra. Cassiterite mineralization in hydrothermally altered fine-grained muscovite granite. K/Ar radiometric age (193, 197 Ma= earliest Jurassic). Tectonic position suggests correlation with Main Range of Peninsular Malaysia (230-200 Ma))

Setiawan, I. (2017)- Geology and REE geochemistry in granitoids at western part of North Sumatra, Indonesia. D.Engin. Thesis Akita University, Fukuoka, p. 1-208.
(online at: https://air.repo.nii.ac.jp/?action=repository_uri&item_id=3061&file_id...2)
(Geological, geochemical and isotopic study on granitoids at Sibolga, Panyabungan, Muarasipongi and Kotanopan, western N Sumatra. Metaluminous and I-type granitoids of Sibolga produced by Paleo-Tethys subduction under amalgamated W Sumatra- E Malaya- Indochina blocks in E Permian, followed possibly by tectonic translation which resulted in peraluminous, ilmenite-series and A-type granitoids in Sibuluhan Sihaporas, Sibolga Julu, Sarudik and Tarutung. Peraluminous, ilmenite-series and S-type granitoids at Panyabungan, and I-type granitoids from Muara Sipongi and Kotanopan formed due to E Triassic- E Jurassic subduction of Meso-Tethys beneath amalgamated W Sumatra and Sibumasu blocks)

Setiawan, I., R. Takahashi & A. Imai (2017)- Petrochemistry of granitoids in Sibolga and its surrounding areas, North Sumatra, Indonesia. In: 5th Asia Africa Mineral Resources Conf., Quezon City, Philippines 2015, Resource Geology 67, 3, p. 254-278.
(Granitoids in Sibolga area, N Sumatra, with characteristics of A- and I-type ilmenite series. REE enriched in syenites from Sibolga Julu, Sarudik, Tarutung and Sibuluhan Sihaporas: highly-differentiated granitoids formed within plate settings. In contrast, the ΣREE content of hornblende-bearing granitoids formed in volcanic arc settings is low)

Setijadji, L.D. (2009)- Overview of the metallogeny of Sumatera. Indonesian Soc. Econ. Geol. (MGEI) Bull. 1, p.

Shell Mijnbouw (1978)- Geological map of the South Sumatra coal province, 1:250,000.
(Unpublished but frequently quoted geologic map of S Sumatra)

Sidarto & S. Andi Mangga (2001)- Struktur geologi daerah Tanjungkarang dan sekitarnya, Sumatera dan hubungannya dengan terjadinya mineralisasi di Gunung Ranggal. J. Geologi Sumberdaya Mineral 11, 118, p. 2-18.
('The geological structure of the Tanjung Karang area and surroundings, area, Sumatra and their relation to the mineralization at Mt Ranggal'. Area at SE tip of Sumatra with several NW-SE right-lateral faul zones. Pretertiary rocks amalgamation of 4 terranes. M Miocene mineralization at G. Ranggal controlled by diorite/rhyolite intrusions at stepover of Branti and Panjang dextral faults)

Sieh, K. & D. Natawidjaja (2000)- Neotectonics of the Sumatran fault, Indonesia. J. Geophysical Research 105, p. 28295-28326.
(1900km long Sumatran Fault accommodates much of right-lateral component of oblique convergence between Eurasian- Indian/ Australian plates. Fault zone highly segmented: 19 subaerial segments identified. Proximity of Sumatra fault zone and volcanic arc suggestive of relationship, possibly following zone of lithosphere weakened by magmatism. However, most trench-parallel strike-slip faults in oblique subduction settings worldwide not coincident with their volcanic arc, so Sumatra fault location through arc may be coincidence)

Sieh, K., D.H. Natawidjaja, A.J. Meltzner, C.C. Shen, H. Cheng et al. (2008)- Earthquake supercycles inferred from sea-level changes recorded in the corals of West Sumatra. Science 322, p. 1674-1678.

Silitonga, P.H. & D. Kastowo (1975)- Geologic map of the Solok Quadrangle (0815), Sumatra, 1:250,000. Geol. Res. Dev. Centre (GRDC), Bandung.

(see also 2nd Ed., 1995. NE part of map is SW part of C Sumatra Basin, with unconformably onlapping Miocene sediments over widespread Permo-Carboniferous Kuantan Fm phyllites, quartzites, limestones, overlain by Triassic? metasediments of Tuhur Fm, intruded by Triassic granites. Singkarak crater lake in W. (Small outcrops of E Miocene limestones in Barisan Mts front W of Petai probably much older; JTvG pers. observation in 1986))

Silvestri, A. (1925)- Sur quelques foraminiferes et pseudoforaminiferes de Sumatra. Verhandelingen Geologisch-Mijnbouwkundig Genootschap Nederland Kol., Geol. Serie 8 (Verbeek volume), p. 449-458.
('On some foraminifera and pseudoforaminifera from Sumatra'. Foraminifera from Late Jurassic or Early Cretaceous limestones from Sungi Tuo (Korinci, Jambi) with Choffatella cyclamminoides n.sp. (= Pseudocyclammina; Yabe and Hanzawa, 1926) and Gumai Mts Saling series with Lacazina (= Loftusia))

Silvestri, A. (1932)- Revisione di foraminiferi preterziarii del Sud-Ouest di Sumatra. Rivista Italiana Paleont. 38, p. 75-107.
('Revision of Pre-Tertiary foraminifera from SW Sumatra'. Early Cretaceous foraminifera from SW Sumatra described by Silvestri (1925) as Choffatella should be assigned to Pseudocyclammina Yabe and Hanzawa 1926 and Lacazina lamellifera is Loftusia)

Simanjuntak, T.O., T. Budhitrina, Surono, S. Gafoer & T.C. Amin (1994)- Geological map of the Muara Bungo Quadrangle (0914), Sumatera, 1: 250,000. Geol. Res. Dev. Centre (GRDC), Bandung.
(Most of map sheet is northern S Sumatra (Jambi) Basin, with folded Tertiary sediments with oil-gas fields. Pretertiary outcrops in N (southern Tigapuluh Mts) and S (Duabelas Mts), both cored by Permo-Carboniferous Tigapuluh Gp metamorphics and intruded by relatively small 'Jurassic' granites (but K-Ar dates of 180 and 159 Ma may be reset ages of older granites; Pulunggono & Cameron 1984))

Situmorang, B. & B. Yulihanto (2007)- Formation of pull-apart basin along transcurrent fault: lesson from Sumatera. In: Geologi Indonesia: dinamika dan produknya, Geol. Res. Dev. Centre (GRDC), Bandung, Spec. Publ. 33, 1, p. 29-48.
(Two prominent NW-SE transcurrent fault zones in Sumatra: (1) Sumatra FZ parallel to axis of Barisan Mountains; (2) Mentawai FZ along E slope of fore-arc ridge. N of Nias. MFZ and SFZ are linked by Batee Fault. Transtensional basins in back-arc (N, C, S Sumatra, Ombilin) and fore-arc (Singkel, Pini in NW, Bose, Sipora grabens in Mentawai area and Pagarjati, Kedurang in Bengkulu to SE).

Smith, V.C., N.J.G. Pearce, N.E. Matthews, J.A. Westgate, M.D. Petraglia et al. (2011)- Geochemical fingerprinting of the widespread Toba tephra using biotite compositions. Quaternary Int. 246, p. 97-104.
(Three major tuff eruptions at Toba caldera, N Sumatra: 790 ka- Older Toba Tuff, 500 ka- Middle Toba Tuff, and 74 ka- Younger Toba Tuff. Ash dispersed from India to Malaysia to Indonesia. Composition of biotite can be used to fingerprint deposits of Younger Toba Tuff, which has lower FeO/MgO than older eruptions)

Sobari, I., A. Manurung & N. Buyung (1992)- Bouguer anomaly map of the Bengkulu Quadrangle, Sumatera. Geol. Res. Dev. Centre (GRDC), Bandung.

Soeria-Atmadja, R. & D. Noeradi (2005)- Distribution of Early Tertiary volcanic rocks in South Sumatra and West Java. The Island Arc 14, 4, p. 679-686.
(Three phases of Tertiary- Quaternary volcanism (1) Early Tertiary (43-33 Ma) flows of island arc tholeiites; (2) tholeiitic pillow basalt at beginning of Late Miocene (11 Ma); (3) Pliocene-Quaternary medium-K calc-alkaline magmatism. Paleogene volcanic rocks wider distribution than recognized. Early investigators assumed continuation from S Sumatra- Java to S Kalimantan, but E Tertiary volcanics can be traced from Java S coast East as far as Flores)

Song, S.R., C.H. Chen, M.Y. Lee, T.F. Yang, Y. Iizuka & K.Y. Wei (2000)- Newly discovered eastern dispersal of the youngest Toba Tuff. Marine Geology 167, p. 303-312.
(Volcanic glass shards with minor biotite and hornblende in Late Pleistocene of deep-sea core of S China Sea identified as eruptive products of Youngest Toba Tuff, N Sumatra, Indonesia. Tephra layer between marine

oxygen isotopic event 5.1 (79.3 ka) and event 4.22 (64.1 ka), with interpolated age of 74.0 ka, consistent with previous radiometric dating (73-75 ka). Shows 1500km NE-ward dispersal of coarse Toba glass shards)

Stankiewicz, J., T. Ryberg, C. Haberland, Fauzi & D. Natawidjaja (2010)- Lake Toba volcano magma chamber imaged by ambient seismic noise tomography. Geophysical Research Letters 37, L17306, p. 1-5.
(online at: https://agupubs.onlinelibrary.wiley.com/doi/epdf/10.1029/2010GL044211)
(Ambient noise tomography used to image low-velocity body representing magma chamber under Quaternary Lake Toba caldera. Chamber complex 3-D geometry, with at least two separate sub-chambers. Deep low velocity body below 7 km depth SW of lake possibly another magma chamber. Sumatra Fault marks velocity contrast, but only down to 5 km)

Stauffer, P.H., S. Nishimura & B.C. Batchelor (1980)- Volcanic ash in Malaya from catastrophic eruption of Toba, Sumatra, 30,000 years ago. In: S. Nishimura (ed.) Physical geology of Indonesian island arcs, Kyoto University, p. 156-164.

Stegmann, H. (1909)- Die jungen Ergussgesteine der Bataklander (Sumatra). Neues Jahrbuch Mineral. Geol. Palaont., Beilage Band 27, p. 399-459.
('The young volcanic rocks of the Batak Lands (Sumatra'. Petrographic descriptions from Lake Toba area. From Greifswald University Inaugural-Dissertation)

Stephenson, B., S.A. Ghazali & H. Widjaja (1982)- Regional Geochemical Atlas Series of Indonesia, 1. Northern Sumatra. Direktorat Sumber Daya Mineral, Bandung, p. .

Storey, M., R.G. Roberts & M Saidin (2012)- Astronomically calibrated 40Ar/39Ar age for the Toba supereruption and global synchronization of late Quaternary records. Proc. National Academy Sciences USA 109, 46, p. 18684-18688.
(online at: www.pnas.org/content/109/46/18684.full.pdf)
(Toba supereruption in N Sumatra largest Quaternary terrestrial volcanic event, with ash and sulfate aerosol deposits in both hemispheres. Astronomically calibrated 40Ar/39Ar age of 73.88 ± 0.32 ka for sanidine crystals from up to 5m thick Toba ash deposits in Lenggong Valley, Malaysia, 6 km from archeological site with stone artifacts buried by ash. If made by Homo sapiens, age indicates modern humans reached SE Asia by ~74 ka. Timing of eruption tied to peak in sulfate concentration in Greenland ice cores in middle of cold interval between Dansgaard-Oeschger events 20 and 19. Peak is followed by ~10 °C drop in Greenland surface temperature over ~150 yr, revealing possible climatic impact of eruption)

Subandrio, A.S. (1993)- Zur Petrologie, Geochemie und Uranmineralization des Granitkomplexes von Sibolga in Nord Sumatra, Indonesien. Thesis (Diplom Arbeit), RWTH Aachen, p. 1-148. *(Unpublished)*
('On the petrology, geochemistry and uranium mineralization of the Sibolga granite complex,in North Sumatra')

Subandrio, A.S. (1997)- Uranium and Molybdenum mineralization associated with A-type Sibolga granitoid, North Sumatra Indonesia, In: Proc. Mineral Exploration Technology in Indonesia, Directorat Technol. Mineral Res. Dev. (BPPT), p.
(Late Permian- Triassic granite with Mo enrichment)

Subandrio, A.S. (2006)- The possibility Archean- Proterozoic sedimentary rocks in Indonesian island arc related to controversial discovery of banded iron formation (BIF) in Tanggumas, Lampung. Proc. 35th Ann. Conv. Indon. Assoc. Geol. (IAGI), Pekanbaru, p. 1-20.
(Banded Iron ore Formation deposits generally associated with old craton or shield of Archaen- Proterozoic age. First discovery of thin 'BIF-like' outcrops in Tanggamus area of Lampung, SE Sumatra, presumably in Permian magmatic arc deposits. Characterized by intercalation of laminations meta-quartzite and iron oxide. Two different kinds of iron formation recognized)

Subandrio, A.S. (2007)- Indonesian Banded Iron Formation (BIF): a controversial in age and tectonic setting of BIF formation in Tanggamus area- Lampung, South Sumatra. Proc. Joint Conv. 32nd HAGI, 36th IAGI and 29th IATMI, Bali 2007, JCB2007-024, p. 1-12.
(Banded Iron Formation mineralization in Tanggamus area, Lampung, presumably associated with Permian-Cretaceous magmatism. Classified on Algoma type iron formation, rel. small, and associated with submarine rift hydrothermalism. Oldest rock units in S Sumatra Permian (286-248 Ma))

Subandrio, A.S. (2009)- Mineralization associated with Pre-Tertiary magmatism of Western Belt Sumatra. Geologi Ekonomi Indonesia 1, p. 37-57.

Subandrio, A.S. (2012)- Evolusi magmatik granitoid Tipe-A da metalogenesis bijih Molibdenum dan Uranium di kompleks granitoid Sibolga- Sumatra Utara. Doct. Thesis Padjadjaran University (UNPAD), Bandung, p. 1-230. *(Unpublished)*
('Magmatic evolution and metallogenesis of molybdenum and uranium ore in the Sibolga Type A granitoid complex, North Sumatra'. Late Paleozoic- E Mesozoic granites in SE Asia, incl. Bangka and Belitung islands marked generally by S-type granitoid emplacement with regional tin mineralization. Sibolga Granitoid Complex of N Sumatra shows different, A-type granitoid. Biotite granites most common. Sibolga granitoid intruded into Kluet Fm. K/Ar ages of ~219 Ma and 211 Ma by Rb/Sr on biotite (Late Triassic). A-type granitoid of Sibolga probably associated with anorogenic or rift related environment. Molybdenum anomalies imply magmas derived by partial melting of Late-Paleozoic lower-crustal rocks)

Subandrio, A.S., R. Gatzweiler & G. Friedrich (2007)- Relationship between magnetite- ilmenite series and porphyry copper-tin metallogenic province of Sumatra Island- with special aspects of Sibolga and Bangka granitoid complex. Proc. Joint Conv. 32nd HAGI, 36th IAGI and 29th IATMI, Bali 2007, JCB2007-027, p. 147-155.
(Sibolga granitoid plutons in area of 50x50 km along W coast of N Sumatra, intruded into Kluet Fm. Radiometric ages 257±24 Ma (K/Ar, biotite; late Permian) and 217.4±4.4 Ma (Rb/Sr, biotite; Triassic). Mainly A-type biotite granites. Most Sibolga igneous rocks in Magnetite-Series, different from SE-Asia/ Bangka tin granites, which fall in I & S-type, Ilmenite-Series)

Subandrio, A.S. & R. Soeria-Atmadja (1995)- Petrologic and geochemical aspects of Uranium distribution in the Sibolga granitoid complex, North Sumatra, Indonesia.In: Proc. 8th Reg. Congress Geology, Mineral and Energy Resources of Southeast Asia (GEOSEA ô95), Manila, 19p.

Subandrio, A.S., A. Sudradjat, M.F. Rosana & I. Syafri (2010)- Uranium mineralisation hosted by albite-rich granitoid rocks of Sibolga- North Sumatra. Proc. 39th Ann. Conv. Indon. Assoc. Geol. (IAGI), Lombok, PIT-IAGI-2010-266, 15p.
(On uranium mineralisation in albite-rich granitoids of Permo-Carboniferous crystalline- metasedimentary Tapanuli Group)

Subandrio, A.S. & M.E. Suparka (1994)- Petrological and geochemical characteristics of A-type Sibolga granitoid rock, North Sumatra, Indonesia. Proc. 23rd Ann. Conv. Indon. Assoc. Geol. (IAGI), Jakarta, 1, p. 334-354.

Subandrio, A.S. & K.N. Tabri (2006)- Indonesian Banded Iron Formation (BIF): a new controversial discovery of BIF deposit associated with island arc system in Tanggamus Area- Lampung, South Sumatra. Jurnal Geoaplika 1, 1, p. 55-70.
(online at: http://fosi.iagi.or.id/bsarchives/geoaplika_55_70_2006.pdf)
(Banded Iron Formation deposits generally associated with sedimentary or meta-sedimentary rift basins in Archaean- Precambrian cratons. Late Paleozoic 'BIF-like' meta-sedimentary rocks outcrop at Tanggamus, Lampung, over narrow, >50 km belt along depositional strike, slightly parallel to main direction of Sumatra)

Subandrio, A.S., K. Zaw, C.K. Lai & A. Salam (2013)- New discoveries in the mineralization associated with Pre-Tertiary magmatism in the Sumatra Western Belt, Indonesia. Proc. 10th Ann. Mtg. Asia Oceania

Geosciences Soc. (AOGS), Brisbane, 1p. *(Abstract only)*
(On Sumatra 3 types of mineralization associated with Pre-Tertiary rocks, widely exposed in Barisan Range: (1) U-Mo-Cu-Pb mineralization in Permo-Triassic Sibolga Granitoid Complex of Sumatra; a composite pluton with geochemical affinities to magnetite series, within-plate granitoids and Cu-Mo porphyry host intrusive (2) Massive Pb-Zn sulfides in Permo-Carboniferous sediments in Dairi district, N Sumatra; (3) Banded Iron Formation at Subullussallam, Aceh and Tanggamus, S Sumatra, characterized by alternating silicate and magnetite-hematite layers. Affected by regional metamorphism and possibly of Paleozoic to E Mesozoic age)

Sukarna, D., S. Andi Mangga & N. Suwarna (2000)- Batuan granitan Jura-Kapur Sumatra bagian selatan: ciri geokimika dan kaitannya dengan evolusi tektonika. J. Geologi Sumberdaya Mineral 10, 100, p. 15-26.
('Jurassic- Cretaceous granitic rocks of South Sumatra and their relationship to the tectonic evolution'. Granitoid rocks of Jurassic- E Cretaceous age (170-110 Ma) at W side of S Sumatra include, from NW to SE: Sulitair granitoid (200-180 and 150-140 Ma), Bungo batholith near Muara Bungo (169-129 Ma), Garba plutonics (117-115 and 86-82 Ma) and Sulan plutonics (Lampung; 113-111 Ma). I-type granites- diorites, formed in magmatic arc. Relatively wide range of ages)

Sumotarto, U. (1985)- Tambang emas rakyat di Kabupaten Rejang Lebong-Bengkulu. Proc. 14th Ann. Conv. Indon. Assoc. Geol. (IAGI), p. 233-251.
('Local people's gold mines in the Rejang-Lebong district, Bengkulu')

Sun, J. & T.C. Pan (1995)- Seismic characteristics of Sumatra and its relevance to Peninsular Malaysia and Singapore. J. Southeast Asian Earth Sci. 12, 1-2, p. 105-111.
(Earthquake risking; little or no geology)

Suparka (1983)- Posisi tektonik batuan kegunungapian Musala, Sibolga, Sumatra Utara. Proc. 12th Ann. Conv. Indon. Assoc. Geol. (IAGI), p. 233-242.
('Tectonic position of the Musala volcanic rocks, Sibolga, N Sumatra'. Musala volcanic rocks in coastal area of Sibolga consists of basalt and andesite. Similar rocks common along W coast of Sumatra. Also gabbro intrusive rocks, diorite and micro-granite. Intrusive rocks and volcanics of Eocene-Oligocene to Miocene age and consists of calc-alkaline, high-K calc-alkaline and shoshonite of island arc/ continental margin type)

Suparka, S. (1984)- Posisi tektonik batuan kegunungapian Musala, Sibolga, Sumatra Utara. J. Riset Geologi Pertambangan (LIPI) 5, 2, p. 37-50.
(online at: http://pustaka.geotek.lipi.go.id/wp-content/uploads/2016/02/Riset-Vol.5-No.2-2.pdf)
('Tectonic position of Musala volcanic rocks, Sibolga, North Sumatra'. Musala and adjacent islands, just offshore NW Sumatra, with Eocene- Oligocene-Miocene basalt-andesite, similar to rocks along W coast of Sumatra. Radiometric ages 43 ±3 Ma and 17.2 ± 5Ma. Calkalkaline, high K calkalkaline and shoshonitic types, typical of island arc/ continental margin volcanism. Probably formed closer to trench than usual, result of trench-ridge triple junction displacement)

Suparka (1984)- Posisi tektonik batuan kegunungapian Musala, Sibolga, Sumatra Utara. J. Riset Geologi Pertambangan (LIPI) 5, 2, p. 37-50.
('Tectonic position of the Musali volcanic rocks, Sibolga, N Sumatra'. Same paper as Suparka 1983)

Suparka (1995)- Tectonic development of Sibolga fore arc, North Sumatra. Doct. Thesis, Institut Teknologi Bandung ITB), p. *(Unpublished)*

Suparka, S. & Sukendar Asikin (1981)- Pemikiran perkembangan tektonik Pra-Tersier di Sumatra Bagian Tengah. J. Riset Geologi Pertambangan (LIPI) 4, 1, p. 1-13.
(online at: http://pustaka.geotek.lipi.go.id/wp-content/uploads/2016/02/Riset-Vol.4-No.1-2-.pdf)
('Thoughts on the tectonic development of the Pre-Tertiary of Central Sumatra'. Late Paleozoic- Triassic clastic sedimentation. E-M Permian andesitic volcanics not believed to be result of subduction, but of melting of continental crust in relatively shallow basin during breakup of Pangea continent. End Triassic characterized by

granitic intrusions, folding, metamorphism and erosion. Later sedimentation in shallow environments. Includes M Jurassic 'Gumai Melange', reversal of direction subduction at end Mesozoic, etc.)

Suparman, A., A. Asseggaf & A. Haryo S. (1991)- Garba Mtn.- South Sumatra. Indon. Petroleum Assoc. (IPA), Post Convention Field Trip, p. 1-40.
(Fieldtrip guidebook with brief descriptions of geologic localities in and around Garba Mountains)

Suprapto S.J. (2008)- Geokimia regional Pulau Sumatera: conto endapan sungai aktif fraksi -80 Mesh. Bul. Sumber Daya Geologi 3, 3, p. 2-13.
(online at: www.bgl.esdm.go.id/publication/index.php/dir/article_detail/519)
('Regional geochemistry of Sumatra Island: active stream sediment samples of -80 mesh fraction'. Distributions of 15 metal elements(Ag, As, Co, Cr, Cu, Fe, K, Li, Mn, Ni, Pb, Sn, W, Mo, Zn) in stream sediments samples across Sumatra (summary of Stephenson et al, 1982 and Muchsin et al. 1997 reports?))

Surjono & S. Ichihara (1984)- The tin-tungsten occurrences in the Hatapang area, North Sumatra, Indonesia. Report Int. Symposium on the geology of tin deposits, Nanning, China, 1984, ESCAP Regional Mineral Resources Development Centre, p. 87. *(Abstract only)*

Surono, N. Suwarna & S. Andi-Mangga (1999)- Batulumpur kerakalan pada Formasi Mentulu, Pegunungan Tigapuluh, Sumatera. J. Geologi Sumberdaya Mineral 9, 98, p. 2-7.
('Pebbly mudstone of the Mentulu Formation, Tigapuluh Mountains, Sumatra'. Permo- Carboniferous pebbly mudstone is dominant rock in Mentulu Fm near Tigapuluh Mts. Pebbles are slate, quartzite, quartz, mica schist, silicified rock and granite. Matrix rock alternating sandstone-siltstone-shale. Deposited in glacial conditions. Paleolatitude 41°S)

Susanto, A. & E. Suparka (2012)- Hydrothermal alteration and mineralization of porphyry-skarn deposits in the Geunteut area, Nanggroe Aceh Darussalam, Indonesia. Bull. Geol. Soc. Malaysia 58, p. 15-21.
(online at: /www.gsm.org.my/products/702001-100356-PDF.pdf)
(Geunteut area 55 km S of Banda Aceh, NW Sumatra, with porphyry-skarn deposits related to M Miocene Geunteut granodiorite (14.3 Ma), intruded into Late Jurassic- E Cretaceous Woyla terrane Bentaro volcanics and Lamno Limestones. Five hydrothermal alteration zones (biotite-orthoclase-actinolite, epidote-chlorite-actinolite, garnet clinopyroxene-tremolite, quartz-sericite and chlorite-calcite-clinoptilolite), suggesting formation temperatures between 120-360°C. Porphyry-skarn deposits two episodes of mineralization: early hypogene mineralization (magnetite, ilmenite, chalcopyrite, pyrite) and late supergene enrichment)

Sutanto (1997)- Evolution temporelle du magmatisme dôarc insulaire: geochronologie, petrologie et geochimie des magmatismes mesozoiques et cenozoiques de Sumatra (Indonesie). Doct. Thesis, Universite de Bretagne Occidentale, Brest, p. 1-212. *(Unpublished)*
('Evolution through time of island arc magmatism: petrology and geochemistry of Mesozoic and Cenozoic magmas of Sumatra (Indonesia)'. 175 new K-Ar ages. Eight episodes of volcanism-magmatism identified: (1) Triassic- E Jurassic (215-180 Ma) and (2) Late Jurassic (~165-150 Ma) intruded into Permo-Carboniferous packages in center of island. (3) Significant volcano-plutonic arc in Early Cretaceous (Valanginien-Aptian), (4) (5) Late Cretaceous (Albian- Campanian), (6) Paleocene- Lower Eocene, (7) M-U Eocene;(8) Oligocene- E Miocene and Late Miocene- Recent)

Sutanto (2005)- Palaeogene volcanic activities in Sumatera. Majalah Geologi Indonesia (IAGI) 20, p. 51-60.

Sutanto, R. Soeria Atmadja, R.C. Maury & H. Bellon (1998)- Origin of high-K Paleogene volcanics from the Natal Region, Sumatera; a response to subducted fracture zone. Proc. 27th Ann. Conv. Indon. Assoc. Geol. (IAGI), Yogyakarta, 3 (Geodin., Magmat. Volkanologi), p. 37-43.
(Incl. K/Ar radiometric ages of basalt dikes and lava from Woyla Group at Aceh ~50-58 Ma and basalts-andesites from Natal ~37- 63 Ma)

Sutopo, B. (2013)- The Martabe Au-Ag high sulfidation epithermal deposits, Sumatra: implications for ore genesis and exploration. Ph.D. Thesis University of Tasmania, p. 1-332.
(online at: http://eprints.utas.edu.au/17607/2/Whole-Sutopo-_thesis.pdf)
(Study of largest recent gold discovery on NW coast of Sumatra SE of Sibolga. Contains four high-sulfidation epithermal gold-silver deposits (Purnama, Baskara, Kejora and Gerhana) and one low-sulfidation epithermal gold-silver deposit (Pelangi). Located in Sunda magmatic arc within and adjacent to Late Tertiary porphyritic dacite and andesite dome and diatreme complex and near splays of Sumatra Fault System. Magmatic/ hydrothermal system active from 3.8-2.1 Ma)

Sutopo, B., M.L. Jones & B.K. Levet (2003)- The Martabe gold discovery: a high-sulphidation epithermal gold-silver deposit, North Sumatra, Indonesia. In: Proc. New generation gold conference (NewGenGold 2003), Case histories of discovery, Perth, Gold Mining J., p. 147-158.
(Rel. recent epithermal high-sulphidation gold discovery in NW Sumatra, now Newmont-operated largest gold producer in Sumatra)

Suwarna, N. (2000)- Tataan geologi Sumatra bagian selatan. In: N. Suwarna et al. (eds.) Evolusi tektonik Pratersier Sumatera bagian Selatan, Geol. Res. Dev. Centre, Spec. Publ., p. 15-28.
('Data on the geology of S Sumatra')

Suwarna, N. (2006)- Permian Mengkarang coal facies and environment, based on organic petrology study. J. Geologi Indonesia 1, 1, p. 1-8.
(online at: www.bgl.esdm.go.id/dmdocuments/jurnal20060101.pdf)
(Analysis of E-M Permian Mengkarang coal from Mengkarang-Merangin, Bangko Area, C Sumatera. Mengkarang coal measures up to 1000m thick, with Cathaysian flora, brachiopods and fusulinids, and intruded by Triassic- Jurassic granite. Dominant maceral vitrinite, less inertinite. Coals formed in wet zone of mire (limnic-telmatic to telmatic wet forest)

Suwarna, N., S. Andi Mangga, N. Surono, T.O. Simundjuntak & H. Panggabean (eds.) (2000)- Evolusi tektonik Pra-Tersier Sumatera bagian selatan. Pusat Penelitian dan Pengembangan Geologi, Bandung, p.
('The Pre-Tertiary tectonic evolution of the southern part of Sumatra')

Suwarna, N., T. Buditrishna, S. Santosa & S. Andi Mangga (1994)- Geologic map of Rengat Quadrangle (0915), Sumatra, 1:250,000. Geol. Res. Dev. Centre (GRDC), Bandung.
(Most of map sheet is S part of C Sumatra basin, with Lirik Trend/ Japura Anticline. In S N part of Tigapuluh Mts, dominated by Permo-Carboniferous meta-sediments and meta-tuffs of Tigapuluh Group, intruded by Late Triassic- E Jurassic Akar and other granites. Unconformably overlain by Oligo-Miocene of Kelasa, Lakat, Tualang, Gumai and Air Benakat Fms.)

Suwarna, N. & H. Hermianto (2010)- Mesozoic sediment characteristics in the Asai- Rawas region of the Southern Sumatra. Proc. IGCP 507 Project Symp. Paleoclimates in Asia during the Cretaceous, Yogyakarta 2010, 2p. *(Abstract only)*
(Jurassic-Cretaceous of Asai- Garba Terrane in S Sumatra (= Woyla or W Sumatra Terrane?; JTvG) two facies domains: shallow marine Asai (M Jurassic), Mersip (Late J) and Peneta (Late J- early K) Fms and deep marine facies Rawas Fm (Late J- Early K). All thermally mature. Paleomagnetic work suggests paleolatitudes of 30°-32°S and counterclockwise rotation)

Suwarna, N. & Y. Kusumahbrata (2010)- Macroscopic, microscopic, and paleo-depositional features of selected coals in Arahan, Banjarsari, Subanjeriji, and South Banko Regions, South Sumatra. J. Geologi Indonesia 5, 4, p. 269-290.
(online at: www.bgl.esdm.go.id/publication/index.php/dir/article_detail/283)
(Coal samples from Mio-Pliocene Muaraenim Fm of Lematang Depression, S Palembang sub-basin. Nine named coal horizons. Dominant maceral group vitrinite (69- 97.4%), less inertinite (0.4- 22%), exinite (0.4-18%). Vitrinite reflectance low- moderate (0.34- 0.59%). Coals deposited in lower delta plain)

Suwarna, N., H. Panggabean & R. Heryanto (2001)- Oil shale study in the Kiliranjao Sub-basin, Central Sumatera. Proc. Ann. Conv. Indon. Assoc. Geol. (IAGI) and GEOSEA 10, Yogyakarta, p.
(SW part of C Sumatra basin)

Suwarna, N., Suharsono, Amiruddin & Hermanto (1998)- Geological map of the Bangko Quadrangle, Sumatera (Quad. 0913), 1:250,000. Geol. Res. Dev. Centre (GRDC), Bandung.

Suwarna, N., Suharsono, S. Gafoer, T.C. Amin, Kusnama & B. Hermanto (1992)- Geologic map of the Sarolangun Quadrangle (0913), Sumatera, 1:250,000. Geol. Res. Dev. Centre (GRDC), Bandung.
(Geologic map of NW side of S Sumatra (Jambi) Basin with folded Mio-Pliocene sediments and adjacent Barisan Mountains W of Tembesi River. Oldest rocks in NW corner W of Bangko with E Permian Mengkareng Fm clastics with minor limestone and coal (and 'Jambi Flora'; JTvG), associated with Permian Palepat Fm andesitic volcanics, intruded (?) by Arai Granite. Permian complex juxtaposed along NW-SE trending thrust fault zone with 'Woyla Group' of Jurassic Asai Fm and Late Jurassic-Cretaceous Peneta Fm clastics (with limestones with Cladocoropsis miriabilis = Late Jurassic hydrozoan; JTvG). Rawas Fm intruded by several Late? Cretaceous Arai biotite and hornblende granite bodies)

Suwarna, N., Suharsono & K. Sutisna (1999)- Stratigraphy, sedimentology and provenance analysis of the Jurassic-Cretaceous Asai-Rawas Group, Southern Sumatera. In: H. Darman & F.H. Sidi (eds.) Tectonics and sedimentation of Indonesia, FOSI-IAGI-ITB Regional Seminar to commemorate 50th anniversary of Van Bemmelen's Geology of Indonesia, Bandung 1999, p. 36-39.
(Thick (>2000m?), deformed Jurassic Cretaceous sediments at E flank of Barisan Range, at S Sumatra (Jambi) Basin margin, intruded by Cretaceous Arai- Angai granite. M-L Jurassic Asai Fm marine 'flysch-type' meta-sandstones and phyllite with minor limestone, rel. quartz rich, of continental provenance. Overlying Late Jurassic- E Cretaceous more variable, of recycled orogen and arc provenance. Paleomagnetic study suggests paleolatitude of 32°S. To N in tectonic? contact with Permian Mengkareng Gp)

Suwarna, N. & Suminto (1999)- Sedimentology and hydrocarbon potential of the Permian Mengkarang Formation, Southern Sumatera. Proc. Southeast Asian Coal Geology, Bandung.

Suwarna, N., Surono, S.A. Mangga, Suyoko, Sumito, A. Achdan, H. Wahyono, N. Suryono, T.O. Simundjuntak & T. Suwarti (2000)- Mintak Kuantan- Duabelas. In: Suwarna et al. (eds.) Evolusi tektonic Pra-Tersier Sumatera bagian Selatan, Geol. Res. Dev. Centre (GRDC), Bandung, Spec. Publ., p. 47-81.

Suwarti, T., S. Andi Mangga & Amiruddin (1985)- Ciri-ciri batuan granitoid daerah Tanjungbintang Lampung Selatan. Proc. 14th Ann. Conv. Indon. Assoc. Geol. (IAGI), p. 141-148.
('Characteristics of granitoids in the Tanjungbintang area, South Lampung', S Sumatra')

Suyoko (1996)- Penelitian sedimentologi dan paleontologi formasi Mengkarang di daerah Dusunbaru, Kabupaten Bangko, Jambi. In: Evolusi tektonik Pratertier Sumatera bagian selatan. Proyek kajian dan informasi geologi tematik Pusat Penelitian dan Pengembangan Geologi, 32p.
('Sedimentology and paleontology of Mengkareng Fm in the Dusunbaru area, Bangko District, Jambi'. Incl. Early Permian brachiopods interpreted to signify Sakmarian age)

Syarif, M.N., M.R. Pahlevi & A.S. Annas (2015)- Basement reservoir play concept and its potential in Western Indonesia. Proc. 39th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, p.
(Brief review of concept of basement hydrocarbon reservoirs, with examples from Sumatra)

Syafrie, I., E.T. Yuningsih & H. Matsueda (2015)- Geochemistry study of granitoid basement rock in Jambi Sub basin, South Sumatera, Indonesia, based on JSB-3, JSB-4 and JSB-6 wells data. In: ICG 2015, 2nd Int. Conf. and 1st Joint Conf. Faculty of Geology Universitas Padjaran and University of Malaysia Sabah, p. 305-311.
(online at: http://seminar.ftgeologi.unpad.ac.id/wp-content/uploads/2016/02/Geochemistry-study-of-Granitoid-Basement-Rock-in-Jambi-Sub-Basin.pdf)

(Mesozoic? granitoid basement in Jambi sub basin is intermediate-acid, calc-alkaline, medium- high K, metalluminous (subduction at active continental margin). Granitoid basement rock of JSB-4 and JSB-6 shows magnetite series and I type (late orogenic). Mesozoic granitoid probably extension of Thailand and Burma granite province (see also Yuningsih 2006))

Tan Sin Hok (1933)- Notiz uber das Basalskelett von "*Verbeekina*". Wetenschappelijke Mededeelingen Dienst Mijnbouw Nederlandsch-Indie 25, p. 57-65.
('Note on the basal skeleton of Verbeekina'. Permian fusulinids from Padang Highlands, W Sumatra, thought by Verbeek 1876 to lack 'parachomata', distinguishing it from Doliolina, so new genus Verbeekina was created by Von Staff (1909). However, new material from Guguk Bulat type locality near Lake Singkarak shows this feature in later stages, so species belong in Doliolina (NB: Verbeekina still commonly used genus name; JTvG))

Tan Sin Hok (1933)- Uber *Leptodus* (*Lyttonia* auctorum) cf. *tenuis* (Waagen) vom Padanger Oberland (Mittel Sumatra). Wetenschappelijke Mededeelingen Dienst Mijnbouw Nederlandsch-Indie 25, p. 66-70.
(Permian brachiopod Leptodus collected by Musper from Padang Highlands, C Sumatra, confirms presence of rocks of younger Permian in Sumatra. Other Leptodus in Indonesia only known from Timor)

Tasrif, A. (1985)- Kompleks melange di daerah Siguntur, Sumatera Utara. J. Riset Geologi Pertambangan (LIPI) 6, 1, p. 1-6.
(online at: http://pustaka.geotek.lipi.go.id/wp-content/uploads/2016/02/Riset-Vol.6-No.1-2-3-2.pdf)
('Melange complex in the Siguntur area, North Sumatra'. Siguntur melange composed of blocks of various sizes, including slate, phyllite, mica schist, greywacke, chert and basalt in metasediment and silt-clay matrix)

Taverne, N.J.M. (1924)- Bijdrage tot de geologie van de Gajo-Lesten en aangrenzende gebieden. Jaarboek Mijnwezen Nederlandsch Oost-Indie, 50 (1921), Verhandelingen 1, p. 162- 186.
('Contribution to the geology of the Gajo-Lesten and adjacent regions', Aceh, N Sumatra. Followed by petrographic rock descriptions of Taverne samples by W.F. Gisolf, p. 187-268)

Teguh, F. & Agus H.P. (2011)- Jabung block basement- their characteristics and their economic potential. Proc. 36th HAGI and 40th IAGI Ann. Conv., Makassar, JCM2011-002, 10p.
(On hydrocarbon potential of fractured Pre-Tertiary basement rocks in Jambi sub-basin, S Sumatra. Assumed to be part of 'Malacca Microplate', with SW part of block possibly Mutus Assemblage. With E Jurassic granite (K/Ar age ~180 Ma) in middle and W of block, limestone in N and S (post-Mutus Kluang Lst?), and low-grade metamorphics)

Terpstra, H. (1932)- The joint systems in the vicinity of the Salida Mine (West coast of Sumatra). Proc. Kon. Nederl. Akademie Wetenschappen, Amsterdam, 35, p. 891-897.
(online at: www.dwc.knaw.nl/DL/publications/PU00016298.pdf)
(Four groups of orientation of quartz veins in Salida mine area: N30°E, N40°W, N10°E, N90°E)

Tesch, P. (1916)- Permische trilobieten van Atjeh. Tijdschrift Kon. Nederlands Aardrijkskundig Genootschap Ser. 2, 33, p. 610-611.
('Permian trilobites from Aceh'. Two species of trilobite casts in dark red, tuffaceous marly rock, associated with corals, crinoids, brachiopods and gastropods. Previously reported by Klein 1916 and believed to be of Devonian age. Species very similar those described form Permian in Timor)

Thamrin, M., Siswoyo & Prayitno (1981)- Heat flow in the Tertiary Basin of North Sumatra. Proc. 17th Sess. Comm. Co-ord. Joint Prospecting Mineral Resources in Asian Offshore Areas (CCOP), Bangkok, 58, Paper 25, p. 394-408.

Thamrin, M., Siswoyo, S. Sandjojo, Prayitno & S. Indra (1980)- Heat flow in the Tertiary basin of South Sumatra, Indonesia. Proc. 16th Sess. Comm. Co-ord. Joint Prospecting Mineral Resources in Asian Offshore Areas (CCOP), Bandung 1979, p. 250-271.

(Heat flow of S Sumatra basin determined from 358 wells in 54 oil fields. Average heatflow 2.58 Mcal/cm sec. Centre of basin rel. cool with <3 HFU, NE and SW flanks >3 HFU)

'T Hoen, C.W.A. (1931)- Mededeeling over een vondst van diamanten in de Siaboe Rivier, ten zuiden van Bangkinang (Midden-Sumatra). De Mijningenieur 12, 10, p. 176-178.
('Communication on a discovery of diamonds in the Siabu River, S of Bangkinang (C Sumatra)'. About 150 small diamonds found during exploration for tin ore, SW of Pakanbaru. Bedrock is Tertiary clay-shales and granite. Diamonds were found in parts of kaksa richest in tin ore)

Thompson, M.L. (1936)- The fusulinid genus *Verbeekina*. J. Paleontology 10, 3, p. 193-201.
(Genus Verbeekina includes 5 species and two varieties. Description of Verbeekina verbeeki (Geinitz) from Padang Highlands, W. Sumatra)

Thompson, M.L. (1936)- Lower Permian fusulinids from Sumatra. J. Paleontology 10, 7, p. 587-592.
(Two new species of Early Permian fusulinids, Schwagerina rutschi and Pseudoschwagerina meranginensis, from dark grey, ~100' thick 'Productus limestone' of Telok Gedang, C Sumatra (Merangin, Jambi). Interpreted age Early Permian. Overlain by Soengi Garing plant beds with famous 'Jambi Flora', studied by Jongmans & Gothan, etc. P. meranginensis looks like fusulinids of the Schwagerina princeps group. See also Ueno et al (2006) and Ueno in Crippa et al 2014))

Tien, Nguyen D. (1986)- Foraminifera and algae from the Permian of Guguk Bulat and Silungkang, Sumatra. In: H. Fontaine (ed.) The Permian of Southeast Asia, Appendix 3, United Nations CCOP Techn. Bull. 18, p. 138-147.
(Illustrations of foraminifera from two Permian limestone localities from Padang Highlands, C Sumatra. Guguk Bulat reefal limestone with corals and diverse fusulinids (Colania, Pseudodoliolina, Sumatrina, Schwagerina, Verbeekina), small benthic foram assemblages (incl. Hemigordius) and algae (incl. Mizzia, Permocalculus). Fauna from this locality first described by Lange (1925). Silungkang locality with common Tubiphytes)

Tien, Nguyen D. (1989)- Lower Permian foraminifera. In: H. Fontaine & S. Gafoer (eds.) The Pre-Tertiary fossils of Sumatra and their environments, CCOP Techn. Papers 19, Bangkok, p. 71-93.
(Rel. rich Lower Permian foram assemblages of fusulinids, smaller benthic forams (incl. Hemigordius)and algae (incl. Permocalculus) from W Jambi province. Mesumai River localities with fusulinids Boultonia willsi, B. cheni, Schubertella kingi, Fusulinella cf. utahensis, Schwagerina sp., Pseudoschwagerina cf. meranginensis, Rugosofusulina rutschi and Parafusulina n. spp., suggesting Late Asselian age (near locality of famous 'Jambi flora; see also Ueno et al. 2006 who restudied Batu Impi locality and prefers Artinskian- Kungurian age; JTvG))

Tien, Nguyen D. (1989)- Middle Permian foraminifera. In: H. Fontaine & S. Gafoer (eds.) The Pre-Tertiary fossils of Sumatra and their environments, CCOP Techn. Papers 19, Bangkok, p. 113-148.
(Review of M Permian foraminifera from four areas on Sumatra, incl. rich basal Murghabian fusulinid assemblage with Neoschwagerina cf. simplex Cancellina, Neofusulinella, etc., at Bukit Pendopo outcrop, S Sumatra. At Guguk Bulat fusulinids Verbeekina verbeeki, Colania douvillei, Pseudodoliolina, Pseudofusilina padangensis, Sumatrina annae, etc. and algae Mizzia velebitana, Permocalculus spp.)

Tiltman, C.J. (1990)- A structural model for North Sumatra. Lemigas Scientific Contr. 14, 1, Spec. Issue, p. 24-44.
(Geological evolution of N Sumatra controlled by strike slip tectonics trough most of Tertiary. Extensional and transtensional regimes during Paleogene opened rift basins between major wrench faults. Extensional faults inverted by phase of post- M Miocene compression and transpression. Plio-Pleistocene strike slip faulting caused major dextral wrench fauling along NW-SE and N-S fault trends. Structural blocks root down to depths of ~10 km and are bounded by listric faults that shallow out to basal decollement at this depth. Deformation at decollement horizon corresponds to brittle/ductile transition in upper crust)

Tissot van Patot, A. (1920)- Aanteekeningen uit de Bataklanden. Verhandelingen Geologisch-Mijnbouwkundig Genootschap Nederland Kol., Geol. Serie 5, 2, p. 37-52.
(‘Notes from the Batak Lands’. Notes on volcanoes between Lake Toba and W coast of N Sumatra)

Tjia, H.D. (1970)- Nature of displacements along the Semangko fault zone, Sumatra. J. Tropical Geography, Singapore, 30, p. 63-67.
(One of first papers to recognize Central Sumatra fault zone as major left-lateral wrench fault)

Tjia, H.D. (1976)- Radiometric ages of ignimbrites of Toba, Sumatra. Warta Geologi 2, 2, p. 33-34.
(online at: https://gsmpubl.files.wordpress.com/2014/09/ngsm1976002.pdf)
(At least four ignimbrite banks, intercalated with less competent volcanic beds, present in Lake Toba area, with total thickness of ignimbrites ~500m. Radiometric age of (youngest?) ignimbrite 72 ± 12 ka, biotite from oldest level 1.9 ±0.4 Ma))

Tjia, H.D. (1977)- Late Cenozoic clockwise rotation of Sumatra- comments. Earth Planetary Sci. Letters 34, p. 450-451.
(Critique of Ninkovich (1976) paper. Oldest Toba Tuffs in N Sumatra dated at 1.9 ± 0.4 Ma, older than 70 ka obtained by Ninkovich (is still younger than E Miocene onset of volcanism in S Sumatra, therefore does not change by much the Ninkovich (1976) argument for older onset of volcanism in S; JTvG)

Tjia, H.D. (1977)- Tectonic depressions along the transcurrent Sumatra fault zone. Geologi Indonesia 4, 1, p. 13-27.
(Depressions along Sumatra fault zone tied to dextral strike slip movement. About 25 km horizontal displacement since Late Miocene. Offset of Jurassic outcrops suggest total displacement may be 180 km. Fault zone at least 18 segments, mainly en echelon arrangement)

Tjia, H.D. (1989)- Tectonic history of the Bentong- Bengkalis suture. Geologi Indonesia 12, 1 (Katili Volume), p. 89-111.
(Bentong suture in Peninsular Malaysia continues into Bengkalis depression of Sumatra until it abuts against Tigapuluh Mts. Suture separates Gondwana terrane in W from Cathaysian terrane in E)

Tjia, H.D. & K. Kusnaeny (1976)- An Early Quaternary age of an ignimbrite layer, Lake Toba, Sumatra. Sains Malaysiana 5, 1, p. 67-70.
(K-Ar date of biotite in ignimbrite collected at lake level at Tuktuk Siadong, Samosir Peninsula, Toba, dated the as 1.9 ± 0.4 Ma)

Tjia, H.D. & M. Posavec (1972)- The Sumatra fault zone between Padangoenjang and Muaralabuh. Sains Malaysiana 1, 1, p. 77-105.
(Study of complex fault displacements along right-lateral Sumatra Fault zone. Jurassic-Triassic outcrops suggest dextral offset between 190-270 km)

Tobler, A. (1904)- Einige Notizen zur Geologie von Sudsumatra. Verhandlungen Naturforschenden Gesellschaft Basel 15, 3, p. 272-292.
(online at: https://www.biodiversitylibrary.org/item/100720#page/282/mode/1up)
(‘Some notes on the geology of South Sumatra’. Early, brief review of S Sumatra geology-stratigraphy (S part of Palembang basin and Barisan Range). With small map)

Tobler, A. (1906)- Topographische und geologische Beschreibung der Petroleumgebiete bei Moeara Enim (Sud-Sumatra). Tijdschrift Kon. Nederlands Aardrijkskundig Genootschap (2) 23, 2, p. 199-315.
('Topographic and geologic descriptions of the petroleum areas near Muara Enim, S Sumatra'. Extensive report on geology of southern part of S Sumatra basin. With geologic maps, cross-sections, etc.)

Tobler, A. (1906)- Zur Geologie von Sumatra. Petermanns Geogr. Mitteilungen 52, p. 88-91.

('On the geology of Sumatra'. Brief review of papers on pioneering geological investigations of Sumatra by Prof. W. Volz from Breslau: Volz (1899; on 1897-1898 travels E coast and Batak lands) and Volz (1904; 1899-1901 travels to Padang Highlands). Reports presence of Precambrian metamorphics, Upper Carboniferous (should be Permian) fusulinid limestones, unconformably (and associated with basic volcanics) overlain by Upper Triassic clastics with Daonella. Post-Triassic folding followed by Jurassic-Cretaceous hiatus and deposition of Tertiary clastics, limestone, coal and ?Pleistocene- Recent volcanics)

Tobler, A. (1907)- Uber das Vorkommen von Kreide- und Carbonschichten in Sudwest-Djambi (Sumatra). Centralblatt Mineralogie Geologie Palaont. 16, p. 484-489.
('On the occurrence of Cretaceous and Carboniferous beds in SW Jambi, Sumatra'. Preliminary note on Tobler's Sumatra surveys. Batu Kapur locality on Limoen river steeply dipping dark limestones and claystones with Lower Cretaceous Hoplites ammonites, possibly underlain by Carboniferous and unconformably overlain by Miocene U Palembang beds. Similar Cretaceous outcrops with ammonites near Poboengo village. (Macrofossils described by Baumberger (1925). In Merangin River area Permian limestones with fusulinids))

Tobler, A. (1908)- Mededeeling over de eerste ontdekking van jurassische gesteenten (leigesteenten met belemnitiden en pentacrinitiden) in Boven-Djambi (Sumatra). Verslag Mijnwezen, 1e kwartaal 1908, p. 18- .
('Note on the first discovery of Jurassic rocks (shales with belemnitids and pentacrinids) in Upper Jambi (Sumatra)')

Tobler, A. (1912)- Voorlopige mededeeling over de geologie der Residentie Djambi. Jaarboek Mijnwezen Nederlandsch Oost-Indie 39 (1910), Verhandelingen, p. 1-29.
('Provisional note on the geology of the Jambi Residency'. Brief overview of Jambi work; subsequently reported in greater detail by Tobler in 1918, 1922. (fusulinid limestone reported from Muara Labu in Korinci not Permian fusulinids but Jurassic-Cretaceous Loftusia; Kugler 1921))

Tobler, A. (1914)- Geologie van het Goemai gebergte (Res. Palembang, Zuid Sumatra). Jaarboek Mijnwezen Nederlandsch Oost-Indie 41 (1912), Verhandelingen, p. 6-49.
('Geology of the Gumai Mountains, Palembang Residency, S Sumatra'. Old, but excellent description of geology of Gumai Mountains at SW margin of S Sumatra basin)

Tobler, A. (1917)- Uber Deckenbau im Gebiet von Djambi. Verhandlungen Naturforschenden Gesellschaft Basel 28, 2, p. 123-147.
(online at: https://www.biodiversitylibrary.org/item/100699#page/379/mode/1up)
('On the nappe structures in the Jambi area, Sumatra'. Classic paper on presence of large nappe structures in Pre-Tertiary of Sumatra, with 'Hoch-Barisan' and 'Vor-Barisan' thrusted over autochthonous 'Schiefer-Barisan'. Interpretation accepted by Zwierzycki, Van Bemmelen, etc., but challenged by subsequent authors (Klompe et al. 1957, Katili 1970, etc. With descriptions of Paleozoic-Mesozoic geology of 'Schist-Barisan', Duabelas and Tigapluh Mts, Vorbarisan ('Pre-Barisan';incl. Merangin Permian; with Permian limestones) and 'High-Barisan'. With map and cross-section)

Tobler, A. (1922)- Djambi verslag. Uitkomsten van het geologisch- mijnbouwkundig onderzoek in de residentie Djambi 1906-1912. Jaarboek Mijnwezen Nederlandsch-Indie (1919), Verhandelingen III, p. 1-585 + Atlas
(Extensive report on geological survey of Jambi province, including parts of the Barisan, Pre-Barisan and 'Schiefer Barisan' Mts., Duabelas Mts, Tigapuluh Mts and sedimentary basins in-between. Petroleum geology previously described in Tobler (1918). Cross-sections show large thrust sheets of 'normal' Permian- Mesozoic sediments over highly folded metamorphic Mesozoic and older rocks ('Schieferbarisan'). Permian limestones in Jambi and Padang Highlands with fusulinids and associated with volcanics ('Diabase-formation'). Upper Miocene coals autochthonous and widespread, but thinner (~3-4m) than in Muara Enim area to S, and thinning in N direction. With 1:200,000 scale geologic map on 4 sheets)

Tobler, A. (1923)- Unsere palaeontologische Kenntniss von Sumatra. Eclogae Geol. Helvetiae 18, 2, p. 313-342.
(online at: http://retro.seals.ch/cntmng?type=pdf&rid=egh-001:1923-1924:18::756&subp=hires)

('Our paleontological knowledge of Sumatra'. Review of localities with Carboniferous- Neogene macrofossils across Sumatra)

Tobler, A. (1925)- Mesozoikum und Tertiar des Gumaigebirges. Verhandelingen Geologisch-Mijnbouwkundig Genootschap Nederland Kol., Geol. Serie 8 (Verbeek volume), p. 521-535.
('Mesozoic and Tertiary of the Gumai Mts', S Sumatra. Anticlinorium with core of Pre-Tertiary metamorphics, tuffs, diabase and ?Triassic and U Cretaceous limestones. Unconformably overlain by ?Eocene quartz sandstones with fossil wood. Miocene Gumai marine shales, locally with reefal limestone (Baturaja Fm) at base; much thicker in East (1500m) than in West (300m). Capped by Mio-Pliocene Palembang Beds)

Toh, E.C. (1979)- Rio Tinto's placer gold work in Sumatera. In: A. Prijono, C. Long and R. Sweatman (eds.) The Indonesian mining industry, its present and future, Proc. First Indonesian Mining Symposium, Jakarta 1977, Indonesian Mining Assoc., Jakarta, p. 356-386.
(On gold placer exploration in in drainage basins of major E-flowing rivers of C Sumatra, Rawas-Tembesi, Batang Hari and Indragiri- Singingi. No commercially viable gold deposits found)

Tornquist, A. (1901)- Ueber mesozoische Stromotoporiden. Sitzungsberichte Kon. Preuss. Akad. Wissenschaften Berlin 47, 9p.
('On Mesozoic stromatoporids'. Includes description of Neostroma sumatrensis n.gen., n.sp. from float in Sekoendoer Besar River, tributary of the Besirtan in Langkat, E Sumatra (=Actinacis sumatrensis; Late Cretaceous)

Truscott, S.J. (1912)- Gold and silver in Sumatra. The Mining Magazine 6, 5, p. 355-364.
(online at: www.archive.org/details/miningmagazine06londuoft)
(Brief review of gold mining activities and geology of Sumatra prior to 1912)

Ubaghs, J.G.H. (1941)- The geology of Benkoelen and the oil possibilities. Indonesia Geol. Survey, Bandung, Open File Report A41-2, p. 1-35. *(Unpublished survey report)*

Ubaghs, J.G.H. (1941)- De geologie van de Lampongsche districten. Indonesia Geol. Survey, Bandung, Open File Report, p. 1-24. *(Unpublished)*
('The geology of the Lampung districts')

Ueno, K., S. Nishikawa, I.M.van Waveren, M. Booi, F. Hasibuan, Suyoko, E.P.A. Iskandar et al. (2007)- Early Permian fusuline faunas from Jambi, Sumatra, Indonesia: faunal characteristics and palaeobiogeographic implications. 16th Int. Congress Carboniferous and Permian, Nanjing, J. of Stratigraphy 31, Suppl. 1, p. 138-139. *(Abstract only)*
(Fusulinids in Telok Gadang limestone bed at base of Mengkarang Fm (below E Permian 'Jambi flora'). Samples collected in 2004 contain Pseudoschwagerina meranginensis, Pseudofusulina rutschi, and others. Comparison with N Afghanistan study by Leven (1971) suggest Sakmarian age (Late Asselian age proposed by Vachard, 1989). Younger 21m-thick, dark gray, fusulinid limestone in Palepat Fm at Batu Impi (18 km W of Bangko) with Minojapanella, Toriyamaia, Praeskinnerella, Chalaroschwagerina, Paraschwagerina, etc., indicating Yakhtashian or Bolorian (= ~Artinskian- Kungurian) age, most probably Yakhtashian due to absence of Brevaxina and Misellina.)

Ueno, K., S. Nishikawa, I.M.van Waveren, F. Hasibuan, Suyoko, P.L. de Boer, D.S. Chaney et al. (2006)- Early Permian fusuline faunas of the Mengkarang and Palepat Formations in the West Sumatra Block, Indonesia: their faunal characteristics, age and geotectonic implications. In: Proc. 2nd Int. Symp. Geological anatomy of East and South Asia, paleogeography and paleoenvironment in Eastern Tethys (IGCP 516), Quezon City, p. 98-102. *(Extended Abstract)*
(Rel. high diversity E Permian fusulinid assemblages in Bangko area of Jambi (W Sumatra Block), associated with famous 'Jambi flora'. Mengkarang Fm ~360m thick paralic clastics with intercalations of shallow marine limestone and thin coal seams. In lower part ~5m thick dark grey limestone at Telok Gedang on Merangin River, ~17 km SW of Bangko with Pseudoschwagerina and Pseudofusulina? suggesting Asselian age (N.B.:

same genera as E coast of Peninsular Thailand= Sibumasu; Ingavat-Helmcke 1993?). Overlying Palepat Fm >200m arc volcanics with limestone interbeds with fusulinids (first described by Thompson 1938, Tien 1989). Restudy of Batu Impi locality shows Minojapanella, Schubertella, Toriyamaia, Praeskinnerella, Chalaroschwagerina? and Paraschwagerina?, suggesting Artinskian- Kungurian age and Cathaysian/ Tethyan paleobiogeographic affinity (similar to E Malay Peninsula Terengganu Lst fauna described by Fontaine et al. 1998?; also similar age as basal Ratburi Lst in Sibumasu Block of Thailand?; JTvG))

Umbgrove, J.H.F. (1926)- Neogene en Pleistoceene koralen van Sumatra. Wetenschappelijke Mededeelingen Dienst Mijnbouw Nederlandsch-Indie 4, 32, p. 25-55.
('Neogene and Pleistocene corals from Sumatra'. Descriptions of Miocene-Pleistocene corals from N Aceh, collected by 'Mijnbouw' and from other N Sumatra localities collected by Tobler)

Umbgrove, J.H.F. (1928)- Een *Zaphrentis* van Kota Tengah (Padangsche Bovenlanden). Jaarboek Mijnwezen Nederlandsch-Indie 56 (1927), Verhandelingen 1, p. 246-247.
('A Zaphrentis from Kota Tengah (Padang Highlands)'. Carboniferous or Permian solitary corals Zaphrentis and Caninia? from limestone collected by Zwierzycki near Kota Tengah, Lisun-Kwantan-Lalo Mts., W Sumatra)

Umbgrove, J.H.F. (1929)- *Lepidocyclina transiens*, spec. nov. van Sumatra. Wetenschappelijke Mededeelingen Dienst Mijnbouw Nederlandsch-Indie 9, p. 109-113.
(New species of Lepidocyclina from marly limestone in Ayer Laje, a few km S of Bataraja, S Palembang, S Sumatra. Embryon advanced nephrolepidine to trybliolepidine. Probably Upper Tf, Middle-Late Miocene age)

Umbgrove, J.H.F. (1931)- The Sibajak volcano (N.E. Sumatra). Zeitschrift Vulkanologie 13, p. 237-244.
(Brief description of crater area of Sibajak volcano, N Sumatra)

Umri, N.H. & Indrawardana (2014)- Basement reservoir opportunity in Central Sumatra Basin. Proc. 38th Ann. Conv., Indon. Petroleum Assoc. (IPA), Jakarta, IPA14-G-057, 20p.
(Pre-Tertiary Basement play underexplored in C Sumatra Basin, despite success at Beruk NE field. C Sumatra basin underlain by metasedimentary rocks of Permo-Carboniferous age in Kuala and Mergui Terranes in W and Triassic Jurassic Mutus terrane argillite and Paleozoic Malacca Terrane quartzite/ granite in E of C Sumatra Basin)

Untung, M., N. Buyung, E. Kertapati, Undang & C.R. Allen (1985)- Rupture along the Great Sumatran fault, Indonesia, during the earthquakes of 1926 and 1943. Bull. Seismological Soc. America 76, p. 313-317.
(1943 earthquake at least 2-3 m lateral displacement along 60 km segment)

Utoyo, H. (1996)- Pentarikhan K-Ar daerah Bukit Kayumambang, Pegunungan Tigapuluh, Riau. In: Sampurno et al. (eds.) Pros. Seminar Nasional Geoteknologi III, Puslitbang Geoteknologi (LIPI), Bandung, p. 601-610.
(online at: http://pustaka.geotek.lipi.go.id/index.php/2016/04/07/prosiding-1996/)
('K-Ar analyses from the Bukit Kayumambang Hill, Tigapuluh Mountains, Riau'. Kayumambang Hill granite with K-Ar age of ~124 ± 5 Ma (E Aptian), Mentulu Fm phyllite (contact-metamorphic?) ~116 ±2 Ma)

Vachard, D. (1989)- Microfossils and microfacies of the Lower Carboniferous limestones. In: H. Fontaine & S. Gafoer (eds.) The Pre-Tertiary fossils of Sumatra and their environments, CCOP Techn. Papers 19, p. 31-40.
(Rel. rich Lower Carboniferous foraminifera assemblage from C Sumatra limestones. At least 3 biozones)

Vachard, D. (1989)- A rich algal microflora from the Lower Permian of Jambi Province. In: H. Fontaine & S. Gafoer (eds.) The Pre-Tertiary fossils of Sumatra and their environments, CCOP Techn. Papers 19, p. 59-69.
(Microfauna of grainstone sample from Mengkareng Fm of Pulau Apat, W of Bangko, Jambi (same general area, but ~10km N of 'Jambi Flora' localities). Limestone rich in algae (incl. Tubiphytes, Mizzia velebitana, Permocalculus, etc.), oncolites, foraminifera (incl. fusulinids Boultonia willsi, Darvasites, Mesoschubertella giraudi, Schubertella kingi, Rugofusulina, etc.) and small volcanic clasts. Warm climate assemblage and probably Late Asselian age. Calcareous algae strong Tethyan affinities)

Vachard, D. (1989)- Triassic micro-organisms from the Sibaganding Limestone. In: H. Fontaine & S. Gafoer (eds.) The Pre-Tertiary fossils of Sumatra and their environments, CCOP Techn. Papers 19, p. 179-189.
(Illustrations of U Ladinian- Lower Carnian algae (Thaumotoporella parvovesiculifera, Globochaete) and rich foraminifera fauna (lituolids, Endothyra, Duotaxis, Aulotortus) from reefal limestones with corals, oncoliths, etc., off Lake Toba. Resembles microfauna from Kodiang Lst of NW Malay Peninsula and Namyua Gp in E Burma, but different from U Triassic of Seram)

Vacquier, V. & P.T. Taylor (1966)- Geothermal and magnetic survey off the coast of Sumatra. 1. Presentation of data. Bull. Earthquake Res. Inst. (Tokyo University) 44, p. 531-540.
(online at: http://repository.dl.itc.u-tokyo.ac.jp/dspace/bitstream/2261/12265/1/ji0442007.pdf)
(Band of high heat flow in front of deep sea trench off Sumatra. Magnetic anomalies trend mostly E-W; do not follow curve of Indonesian island arc)

Van Beek, C.G.G. (1982)- Een geomorfologische bodemkundige studie van het Gunung Leuser Nationale Park, Noord Sumatra, Indonesia. Ph.D. Thesis, University of Utrecht, p. 1-187. *(Unpublished)*
(online at: http://library.wur.nl/isric/fulltext/isricu_i00006134_001.pdf)
('A geomorphological soil science study of the Gunung Leuser National Park, north Sumatra')
(Gunung Leuser in N Sumatra >3400m high. Leuser Mt not a volcano, but part of uplifted Barisan range, with rocks composed of Late Paleozoic- E Mesozoic and E Tertiary sediments. Traces of Pleistocene glacial deposits in highest parts of area)

Van Bemmelen, R.W. (1930)- The origin of Lake Toba. Proc. Fourth Pacific Science Congress, Java 1929, IIA, p. 115-124.
(Lake Toba in N Sumatra largest lake in Indonesia, 87x 31 km. Formed as large collapse crater, in which younger acidic volcanoes developed)

Van Bemmelen, R.W. (1931)- Het Boekit Mapas- Pematang Semoet vulkanisme (Zuid-Sumatra). Verhandelingen Geologisch-Mijnbouwkundig Genootschap Nederland Kol., Geol. Serie 9, p. 57-76.
('The Bukit Mapas- Pematang Semut volcanism (South Sumatra)'. Different types of volcanism in two nearby young volcanic centers in S Sumatra: Bukit Mapas basic andesite and basalt flows, Pg. Semoet acid tuffs)

Van Bemmelen, R.W. (1932)- Geologische waarnemingen in de Gajo landen (N-Sumatra). Jaarboek Mijnwezen Nederlandsch-Indie 59 (1930), Verhandelingen 3, p. 71-94.
('Geological observations in the Gajo lands (North Sumatra). Geological survey in 'conjunction with road building project in, Aceh, in N Sumatra sector of Barisan Mts (area also described by Volz, 1912). Common thick, isoclinally folded, mainly S-dipping, dynamometamorphic Pretertiary rocks, including 'Phyllite Group (with intercalations of Jurassic? limestones with demosponge Myriopora and coral Montlivaultia; also some serpentinite and basalt), overlain by Late Mesozoic 'Greywacke Group' (with phyllite, granite detritus). Unconformably overlain by Paleogene clastics in irregular basins among Barisan Range, with 3 members, from top to bottom: Black marine claystone, Mica-sandstone (metamorphic and igneous detritus) and Quartz-sandstone (with limestone intercalations with reticulate Nummulites = E Oligocene). Some Neogene sediments at margin of eastern coastal plain, including E Miocene (Te5) reefal limestones)

Van Bemmelen, R.W. (1932)- Geologische Kaart van Sumatra 1:200,000. Toelichting bij Blad 10 (Batoeradja). Dienst Mijnbouw Nederlandsch-Indie, Bandung, p. 1-45.
(‘Geologic map of Sumatra 1:200k; Sheet 10- Baturaja’. Unfossiliferous Pretertiary in Garba Mountains composed of Lower Garba Fm volcanics, meta-sediments and granite and Upper Garba Fm deep marine radiolarian-bearing sediments. Overlain by Tertiary 'Old Andesites', then Baturaja Fm coaly sediments, overlain by up to 300m thick E Miocene limestone with Spiroclypeus, Eulepidina and Miogypsina (upper Te), well exposed around Garba Mountains and Baturaja. Overlain by 500m Telisa Fm and 600m Lower Palembang Fm)

Van Bemmelen, R.W. (1933)- Geologische Kaart van Sumatra 1:200,000. Toelichting bij Blad 6 (Kroei). Dienst Mijnbouw Nederlandsch-Indie, Bandung, p. 1-61.

('Geologic map of Sumatra 1:200k, Sheet 6- Krui')

Van Bemmelen, R.W. (1934)- De tektonische structuur van Zuid-Sumatra (in verband met de aardbeving van 25 Juni 1933). Natuurkundig Tijdschrift Nederlandsch-Indie 94, 1, p. 7-14.
('The tectonic structure of South Sumatra, in connection with the earthquake of 25 June 1933'. With block diagram)

Van Bemmelen, R.W. (1939)- The volcano-tectonic origin of Lake Toba (North Sumatra). De Ingenieur in Nederlandsch-Indie (IV) 6, 9, p. 126-140.
(Another review on the origin of Lake Toba caldera)

Van Bemmelen, R.W. (1949)- Sumatra. In: The geology of Indonesia, Government Printing Office, Nijhoff, The Hague, 1, p. 659-707.

Van Bemmelen, R.W. & P. Esenwein (1932)- De liparitische eruptie van den bazaltischen Tanggamoes-vulkaan. Wetenschappelijke Mededeelingen Dienst Mijnbouw Nederlandsch-Indie 22, p. 33-62
('The liparitic eruption of the basaltic Tanggamus volcano', S Sumatra. Tanggamus on Semangka Bay, S Sumatra, first example in Indonesia of basaltic volcano with eruption of light-colored, acid, 'plagio-liparite' magma with well-developed quartz phenocrysts)

Van Bemmelen, R.W. & J. Zwierzycki (1936)- Het Paleogeen van Sumatra. De Ingenieur in Nederlandsch-Indie (IV) 3, 9, p. 160-161.
('The Paleogene of Sumatra'. Critical discussion of Sumatra chapter of Badings (1936) review paper)

Van der Kaars, S., M.A.J. Williams, F. Bassinot, F. Guichard & E. Moreno (2011)- The influence of the 73 ka Toba super-eruption on the ecosystems of northern Sumatra as recorded in marine core BAR94-25. Quaternary Int. 258, p. 45-53.
(The 73 ka Toba super-eruption had instantaneous and devastating effect on pine forests of N Sumatra. Evidence for impact on regional climatic conditions remains inconclusive)

Van der Marel, H.W. (1941)- Onderzoek omtrent het voorkomen van de mineralen orthiet en zirkoon in de liparietgronden van Sumatra's Oostkust. De Ingenieur in Nederlandsch-Indie (IV) 8, 4, p. 33-38.
('Investigation of the occurrence of orthite and zircon in the liparite areas of Sumatra's E coast'. Acid volcanic liparite tuffs of Sumatra East coast, probably of Lake Toba origin, always with minerals orthite and zircon)

Van der Marel, H.W. (1947)- Diatomeenaardeafzettingen in de omgeving van het Tobameer. De Ingenieur, 1947, 48, p. 1-7.
('Diatomaceous deposits in the surroundings of Lake Toba'. Extended, Dutch version of Van der Marel (1947)

Van der Marel, H.W. (1947)- Diatomaceous deposits at Lake Toba. J. Sedimentary Petrology 17, 3, p. 129-134.
(Description of Early Quaternary fresh-water diatomaceous deposits around Toba caldera lake, N Sumatra, Now at 150m above lake level and formed when lake level was up to 450m above present lake level. Layers up to 75-100 cm thick. Some diatomites mainly composed of mainly of Synedra rumpens, others mainly Denticula spp., Melosira, Cyclotella, Pinnularia, etc.)

Van der Marel, H.W. (1948)- Het Tobameer. Geologie en Mijnbouw 10, 4, p. 80-89.
('Lake Toba' Review of Late Paleozoic- Quaternary geology of Lake Toba area, with focus on Quaternary Toba Tuffs and diatomaceous deposits)

Van der Marel, H.W. (1948)- Volcanic glass, allanite and zircon as characteristic minerals of the Toba rhyolite at Sumatra's East coast. J. Sedimentary Petrology 18, p. 24-29.
(Widespread rhyolitic tuff from Toba eruption characterized by common volcanic glass, allanite and zircon)

Van der Vlerk, I.M. & J.H.L. Wennekers (1929)- Einige foraminiferenfuhrende Kalksteine aus Sud-Palembang (Sumatra). Eclogae Geol. Helvetiae 22, 2, p. 166-172.
(online at: https://www.e-periodica.ch/digbib/view?pid=egh-001:1929:22#204)
('Some foraminifera-bearing limestones from South Palembang (S Sumatra)'. Larger foraminifera from Early Miocene (lower Tf) Baturaja limestones between Batu Raja and Muara Dua, with Lepidocyclina (N.) spp., Lepidocyclina (Eulepidina), Spiroclypeus spp., Miogypsina dehaarti)

Van Dijk, P. (1860)- Inleiding tot de geologie van Sumatra's Westkust. Natuurkundig Tijdschrift Nederlandsch-Indie, Batavia, 22, p. 145-180.
(www.biodiversitylibrary.org/item/48386#page/168/mode/1up)
('Introduction to the geology of Sumatra's West coast')

Van Eek, D. (1937)- Foraminifera from the Telisa and Lower Palembang beds of South Sumatra. De Ingenieur in Nederlandsch-Indie (IV), 4, 4, p. 47-55.
(E-M Miocene Lepidocyclinids and Miogypsina from 4 localities on Gedongratoe map, Lampong Districts, collected by Van Tuyn. Telisa Fm E-M Miocene (Te5- Tf2) assemblages A (with Lepidocyclina (N) besaiensis n.sp., Miogypsina borneensis) and B (with Miogypsina indonesiensis, M borneensis, Lepidocyclina (T.) martini). Lower Palembang Fm localities C and D M Miocene zone Tf3(?) with Miogypsina indonesiensis and Lepidocyclina pilifera. Little or no stratigraphic info)

Van Es, L.J.C. (1930)- Over eenige nieuwe vondsten van graniet en Trias in the Beneden-Rokan en Midden-Siak streken en hare beteekenis voor de tektoniek van Midden Oost-Sumatra. De Mijningenieur 8, p. 164-167.
('On some new discoveries of granite and Triassic in the Lower Rokan and middle Siak regions, and their significance for the tectonics of C Sumatra'. Low hills of Pre-Tertiary granite and quartz sandstone at both sides of Lower Rokan River, E Central Sumatra, represent southern continuation of geology of Belitung-Bangka and W Malay Peninsula)

Van Leeuwen, T.M. (2014)- A brief history of mineral exploration and mining in Sumatra. In: I. Basuki & A.Z. Dahlius (eds.) Sundaland Resources, Proc. Ann. Conv. Indon. Soc. Econ. Geol. (MGEI), Palembang, p. 35-57.
(Review of gold-silver mining activity in Sumatra from 1669 re-opening of ancient silver-rich Salido gold mine in W Sumatra by the Dutch East Indies Company (VOC) to recent new developments of small-medium size epithermal Au-Ag deposits. During Dutch colonial era 16 Au-Ag deposits were exploited, mostly for short periods, with only Lebong Donok and Lebong Tandai mines profitable. Majority of porphyry Cu-Au, epithermal Au-Ag and sediment-hosted Au deposits are associated with Sumatra Fault Zone and volcanic arc. Time of mineralizations probably mainly Pliocene)

Van Leeuwen, T.M., R.P. Taylor & J. Hutagalung (1987)- The geology of the Tangse porphyry copper-molybdenum prospect, Aceh, Indonesia. Economic Geology 82, 1, p. 27-42.
(Copper-molybdenum deposit at Tangse, Aceh, N Sumatra, hosted by multiphase quartz diorite intrusions, termed Tangse stock, emplaced along segment of transcurrent Sumatera fault system. Intrusive rocks belong to normal K calc-alkaline suite. Low initial strontium isotope ratios prohibit significant involvement of sialic crustal component in magma genesis. M-L Miocene K-Ar ages for intrusion-cooling (13.1 Ma) and hydrothermal alteration-mineralization (9.0 Ma). Three intrusive phases, the older porphyries forming bulk of Tangse stock)

Van Lohuizen, H.J. (1924)- Verslag over het onderzoek van het Landschap Langkat (Oostkust van Sumatra). Jaarboek Mijnwezen Nederlandsch Oost-Indie, 50 (1921), Verhandelingen 1, p. 56-94.
('Report on the survey of the Langkat region, East coast of Sumatra'. Early geological survey of part of N Sumatra basin in Aceh, the 'petroleum terane Langkat', around Pangkalan Brandan- Binjai. With two 1:100,000 geologic maps, showing Telaga Said and other surface anticlines, oil seeps, etc. Pretertiary rocks at basin margin are probably Permo-Carboniferous-age sediments, generally steeply dipping to NE. Pretertiary unconformably overlain by thick, folded Tertiary sediments)

Van Raalten, C.H. (1932)- Geologische kaart van Sumatra 1:200,000. Toelichting bij Blad 7 (Bintoehan). Dienst Mijnbouw Nederlandsch-Indie, Bandung, p. 1-34.
('Geologic map of Sumatra 1:200,000, sheet 7 Bintuhan'. Oldest rocks 'Old Andesites', overlain by Miocene marine Telisa Fm. Upper Telisa Fm with Middle Miocene (Tf) Katacycloclypeus annulatus and Lepidocyclina radiata. Overlain by Palembang Fm acid tuffs. Includes presence of river terrace up to 40 m altitude along A. Loeas river)

Van Schelle, C.J. (1876)- Sumatra's Westkust. Verslag No. 7. Over het voorkomen van looderts aan de rivier Talang, distrikt Alahan Panjang, Sumatra Westkust. Jaarboek Mijnwezen Nederlandsch Oost-Indie 5 (1876), 1, p. 15-33.
('On the occurrence of lead ore along Sungei Talang (Talang River), Alahan Panjang district, Sumatra West coast'. First report on geology of S part of Padang Highlands, with pockets of galena in fractures in limestone. Formerly gold mining area, with primary gold mainly near contacts of quartz veins and slaty rocks. With 1:5000 map)

Van Steenis, C.G.G.J. (1938)- Exploratie in de Gajo Landen (Algemeene resultaten van de 1937 Losir Expeditie). Tijdschrift Kon. Nederlands Aardrijkskundig Genootschap, Ser. 2, 55, 5, p. 728-801.
('Exploration in the Gajo Lands; general results of 1937 Losir expedition' Mainly botanic expedition to Losir Mountain area, Barisan Range, N Sumatra)

Van Tongeren, W. (1935)- Chemische analyses van gesteenten van Poeloe Berhala. Proc. Kon. Nederl. Akademie Wetenschappen, Amsterdam, 38, 6, p. 634-639.
(online at: www.dwc.knaw.nl/DL/publications/PU00016744.pdf)
('Chemical analyses of rocks from Poeloe Berhala', Malacca Straits. Rocks collected by Druif: granite, gneiss (very high quartz), aplite-pegmatite and lime-silica hornfels. No tin detected)

Van Tongeren, W. (1936)- Mineralogical and chemical composition of the syenite-granite from Boekit Batoe near Palembang, Sumatra, Neth. East Indies. Proc. Kon. Nederl. Akademie Wetenschappen, Amsterdam, 39, 5, p. 670-673.
(online at: www.dwc.knaw.nl/DL/publications/PU00016908.pdf)
(Bukit Batu hill 60 km E of Palembang. Ridge 50 km long, 15 km wide in E Sumatra coastal swamp, and is E-ward continuation of Palembang anticline. Mainly composed of Late Miocene Lower Palembang Fm claystones. Highest hills formed by syenite, quartz-syenitic and granitic rocks, comparable in composition to other 'tin granites' and rel. rich in Rare Earth Elements. Batholithic rocks outcrop ~5 km2 (Gasparon & Varne 1995: = Jurassic? quartz syenite))

Van Tuijn, J. (1931)- Geologische kaart van Sumatra 1:200.000. Toelichting bij blad 4 (Soekadana). Dienst Mijnbouw Nederlandsch-Indie, Bandung, 20p.
('Geological map of Sumatra 1:200,000, 4 (Sukadana sheet)'. Crystalline schists massif in W, with gneiss and quartz-mica schist. Overlain by young acid tuffs and Quaternary fluvial deposits. Large olivine-bearing Sukadana plateau basalt complex in SE of map sheet (ages around 1.0 Ma; Gasparon 2005))

Van Tuijn, J. (1934)- Geologische kaart van Sumatra 1:200.000. Toelichting bij blad 8 (Menggala). Dienst Mijnbouw Nederlandsch-Indie, Bandung, 24p.
('Geological map of Sumatra 1: 200,000, 8 (Menggala Sheet)'. Coastal area of SE Sumatra, much of it coastal swamp. Slightly folded Late Miocene-Pliocene Middle Palembang lignite-bearing tuffaceous sandstones and lignite-free Upper Palembang Fm)

Van Tuyn, J. (1937)- Geologische kaart van Sumatra 1:200.000. Toelichting bij blad 9 (Gedongratoe). Dienst Mijnbouw Nederlandsch-Indie, Bandung, p. 1-37.
('Geological map of Sumatra 1: 200,000, 9 (Gedongratu Sheet)'. Map sheet in SE Sumatra on Lampung Plateau, between sheet 8 (Menggala) in E and 10 (Baturaja) in W. Most outcrops are of Upper Palembang Fm. Oldest rocks are 'Old Andesites', overlain by marine Telisa Fm sediments with Miogypsina borneensis and M.

indonesiensis (Younger than E Miocene Baturaja Limestone fauna). Lower Palembang Fm also with Miogypsina indonesiensis)

Van Tuyn, J. (1937)- Geologische kaart van Sumatra 1:200.000. Toelichting bij blad 13 (Wiralaga). Dienst Mijnbouw Nederlandsch-Indie, Bandung, p. 1-28.
(Geological map of Sumatra, Wiralaga sheet SE of Palembang. Mainly coastal plain, with low hills up to 25m elevation, composed of weakly folded, unfossiliferous (M-Late Miocene?) 'Middle Palembang Fm' tuffaceous deposits and lignites, surrounded by swamps area with near-recent sediments)

Van Valkenburg, S. (1922)- Geomorphologische beschouwingen over de Padangsche Bovenlanden. Jaarboek Topographischen dienst 1921, Batavia, p. 1-30.
('Geomorphologic observations on the Padang Highlands'. Geomorphologic description of W Sumatra highlands. Most of area underlain by folded Late Paleozoic- Mesozoic clastic sediments and limestones, intruded by Pretertiary granites and intruded/ overlain by Quaternary volcanics)

#Van Waveren, I.M., M. Booi, M.J. Crow, F. Hasibuan, J.H.A .Konijnenburg-van Cittert, A.P. Perdono & S.K. Donovan (2018)- Depositional settings and changing composition of the Jambi palaeoflora within the Mengkarang Formation (Sumatra, Indonesia). Geological Journal, 22p. *(in press)*
(Merangin River section in W Sumatra exposes Lower Permian (late Asselian) Mengkarang Fm. Section ~400m thick, composed of 8 fining-upward of volcanic tuffs and volcaniclastic sedimentary rocks, incl. pyroclastic flows, overlain by their reworked alluvial products. Base of section marine, with common brachiopods. Zircon dating indicates duration of ~630,000 years (296.77 ± 0.04 near base to 296.14 ± 0.09 Ma near top). Change in paleobotanical composition from dominated by Cordaites, ferns or club mosses, to seed fern-dominant. Similar paleofloral trends observed in other areas of Paleotethys.)

Van Waveren, I. M., M. Booi, J.H.A. Konijnenburg van Cittert (2006)- Paleogeographic and ecologic aspects of the Early Permian flora of Sumatra (Indonesia). In: Galtier Conference, A life of ferns and gymnosperms, Montpellier April 2006, p. 29.
(Early Permian Jambi paleoflora is tropical wet flora, best matched to S Cathaysian floras, in accordance with reconstructions that place W Sumatra Terrane in contact with Indochina and S Cathaysia blocks)

Van Waveren, I.M., F. Hasibuan, Suyoko, Makmur, P.L. de Boer, D. Chaney, K. Ueno, M. Booi et al. (2005)- Taphonomy, paleoecology and paleobotany and sedimentology of the Mengkarang Formation (Early Permian, Jambi, Sumatra, Indonesia). In: S.G. Lucas & K.E. Zeigler (eds.) The non-marine Permian, New Mexico Museum Natural History & Science, Bull. 30, p. 333-341.
(Mengkarang Fm W of Bangko is 360m thick Asselian-Sakmarian regressive sequence with 'Jambi Flora'. Floodplain deposits of meandering system follow marine and deltaic deposits. Bottom of section intrusive Triassic or Jurassic granite. Braided river deposits in upper part, followed by alluvial fan conglomerates. Both delta and braided river systems hold tree trunks and tree roots. Jambi Flora is North Cathaysian flora)

Van Waveren, I.M., E.A.P. Iskandar, M. Booi & J.H.A. van Konijnenburg-van Cittert (2007)- Composition and palaeogeographic position of the Early Permian Jambi flora from Sumatra. Scripta Geologica 135, p. 1-28.
(Online at: www.repository.naturalis.nl/document/144475)
(E Permian Jambi flora from Mengkareng Fm on W Sumatra Block first described by Posthumus (1927) and Jongmans & Gothan (1935). Revision of flora results in fewer taxa (60; 18 of which 'endemic'). Brachiopods and fusulinids indicate E Permian age (Asselian-Sakmarian?). Five groups of Pecopteris-type ferns. Paleogoniopteris and Gothanopteris considered to be primitive 'Cathaysian' gigantopterids. Posthumus (1927) reported presence of Walchia conifer, but this is Lepidodendrales. Comparisons with E Asian Permian floras of Cathaysian realm indicate Jambi paleoflora greatest similarity with (M Permian) Lower Shihhotse beds in N China, a relatively xeric Cathaysian flora, possibly indicative of relatively high latitude in S Hemisphere)

Vazquez, J.A. & M.R. Reid (2004)- Probing the accumulation history of the voluminous Toba magma. Science 305, 5686, p. 991-994.

(Age and compositional zonation in allanite crystals from Youngest Toba Tuff retain record of 150,000 years of magma storage and evolution. Subvolcanic magma relatively homogeneous for ~110,000 years. In 35,000 years before eruption diversity of melts increased as system grew in size before erupting 75,000 years ago)

Veldkamp, J. (1957)- Mechanism of shallow and intermediate earthquakes in Sumatra. Verhandelingen Kon. Nederl. Geol.-Mijnbouwkundig Gen., Geol. Serie 18 (Gedenkboek Vening Meinesz), p. 295-303.
(Mechanism of shallow earthquakes in Sumatra region points to widely variable stress systems)

Verbeek, R.D.M. (1875)- De fossielen in de kolenkalksteen van Sumatra's westkust. Jaarboek Mijnwezen Nederlandsch Oost-Indie 4 (1875), 2, p. 186-189.
('The fossils of the coal-limestone of Sumatra's west coast'. Kolenkalk ('coal-limestone') is Dutch term for Carboniferous limestone that underlies coal measures in NW Europe (and look like Permian limestones from Sumatra). Fusulinid limestones from Padang Highlands with brachiopods (Productus semireticulatus, Euomphalus, Spirifer, Streptorhynchus), trilobites (Phillipsia) and crinoids. No illustrations. (Fossils initially believed to be of Carboniferous age, but subsequently shown to be of E-M Permian age; JTvG))

Verbeek, R.D.M. (1875)- On the geology of Central Sumatra. Geol. Magazine, new ser., decade 2, 11, p. 477-486.
(Introduction to series of papers by Gunther, Rupert Jones, Woodward and Brady on Sumatra fossils collected by Verbeek in 1873- 1874 in Padang Highlands of W Sumatra and Nias island. Oldest rocks in Padang Highlands are granites, overlain by Carboniferous or Permian with clay slate in lower and fusulinid limestone in upper part, intruded by probably younger quartz porphyries. Unconformably overlain by Tertiary sedments with basal breccias and marl-slates with Eocene fish and plant fossils (highly variable thickness), overlain by sandstones with clays and coals, (300-500m; with Ombilin coalfield), then marls (500m) and limestones rich in Orbitoides (120m). Finally middle-late Tertiary trachytic and andesitic volcanic series. With small map and two cross-sections)

Verbeek, R.D.M. (1876)- Geologische beschrijving van het Siboemboem Gebergte. Jaarboek Mijnwezen Nederlandsch Oost-Indie 5 (1876), 2, p. 51-79.
('Sumatra's West coast- Report 6. Geologic description of the Sibumbum Mountains')

Verbeek, R.D.M. (1877)- The geology of Sumatra. Geol. Magazine 4, 10, p. 443-444.
(Brief follow-up of Verbeek (1875), mainly description of colored geological panorama of of Ombilin coal complex. Panorama shows three coal mines (Parambahan, Sigalut and Sungei Durian) in Eocene clastics formation, Carboniferous-Permian limestones with Fusulina verbeeki, quartz porphyry of Mount Toenkar, etc.)

Verbeek, R.D.M. (1877)- Geologische beschrijving van de landstreek tussen Siboga en Sipirok, Residentie Tapanoeli, Sumatra's Westkust. Jaarboek Mijnwezen Nederlandsch Oost-Indie 6 (1877), 1, p. 21-37.
('Geologic description of the area between Siboga and Sipirok, Residency Tapanuli, W Sumatra')

Verbeek, R.D.M. (1877)- Yzererts bij den Goenoeng Bessie, in de nabijheid van Fort van der Capellen. Jaarboek Mijnwezen Nederlandsch Oost-Indie 6 (1877), 1, p. 39-44.
('Sumatra's West coast- Report 11. Iron ore near Gunung Besi, in the proximity of Batusangkar, Tanah Datar')

Verbeek, R.D.M. (1877)- Voorlopig verslag over een geologische verkenningstocht door Bengkoelen en Palembang in 1876. Jaarboek Mijnwezen Nederlandsch Oost-Indie 6 (1877), 2, p. 111-135.
('Preliminary report on a geological reconnaissance trip through Bengkulu and Palembang in 1876')

Verbeek, R.D.M. (1878)- Voorlopig verslag over een geologische verkenningstocht door de Lampongse Districten en een deel van Palembang in 1877. Jaarboek Mijnwezen Nederlandsch Oost-Indie 7 (1878), 1, p. 185-200.
('Preliminary report on a geological reconnaissance trip through Bengkulu and Palembang in 1876')

Verbeek, R.D.M. (1880)- Geologische Notizen uber die Inseln des Niederlandisch-Indischen Archipels im Allgemeinen, und uber die fossilfuhrenden Schichten Sumatra's im Besonderen. Palaeontographica, Suppl 3, 8-9, p. 7-28.
('Geologic notes on the islands of the Netherland-Indies Archipelago in general and on the fossiliferous beds of Sumatra in particular'. Part 1 of 2)

Verbeek, R.D. (1880)- De zilver- en goudmijnen van de Salida op Sumatra's Westkust. Algemeen Dagblad van Nederlandsch Indie, 16, 19 and 20 March 1880, Batavia, p.
('The silver and gold mines of the Salida on Sumatra's west coast'. Gold mined at Salida mined since 1660's)

Verbeek, R.D.M. (1881)- Geologische aanteekeningen over de eilanden van de Nederlandsch-Indischen Archipel in het algemeen en over de fossielhoudende lagen van Sumatra in het bijzonder. Verhandelingen Kon. Akademie Wetenschappen, Amsterdam, Afd. Natuurkunde, 21, p. 1-27.
('Geologic notes on the islands of the Netherland-Indies Archipelago and on the fossiliferous beds of Sumatra in particular'. Dutch version of Verbeek (1880). Brief review of literature describing Paleozoic, Eocene and Miocene fossil localities. With cross-section and rock descriptions of Padang Highlands, S Sumatra, Nias, SE Kalimantan and W Java)

Verbeek, R.D.M. (1881)- Topographische en geologische beschrijving van Zuid-Sumatra, bevattende de Residentieen Bengkoelen, Palembang en Lamponsche Districten. Jaarboek Mijnwezen Nederlandsch Oost-Indie 10 (1881), 1, p. 3-215.
('Topographic and geological description of South Sumatra, containg the districts Bengkulu, Palembang and Lampong Districts'. Early description of geology of South Sumatra, including Krakatoa before 1883 eruption)

Verbeek, R.D.M. (1882)- Geologische Notizen uber die Inseln des Niederlandisch-Indischen Archipels im Allgemeinen, und uber die fossilfuhrenden Schichten Sumatra's im Besonderen. Palaeontographica, Suppl 3, 10-11, p. 3-16.
('Geologic notes on the islands of the Netherland-Indies Archipelago in general and on the fossiliferous beds of Sumatra in particular'. Part 2 of 2)

Verbeek, R.D.M. (1883)- Topographische en geologische beschrijving van een gedeelte van Sumatraôs Westkust. Landsdrukkerij, Batavia, p. 1-674 + Atlas.
(Text online at: http://books.google.com/books/....)
('Topographic and geological description of a part of Sumatra's West coast'. With atlas with 19 maps, 7 cross sections, etc.)

Verbeek, R.D.M. (1914)- Die Lagerungsverhaltnisse der Trias-Schichten im Padangsche Hochlande. Palaeontographica, Suppl. IV, p. 199-202.
('Stratigraphic relations of the Triassic beds in the Padang Highlands', W Sumatra. Discussion of probable Late Triassic age of dark claystones, sandstones and thin platy limestones E and NE of Lake Singkarak. Wanner noted similarities of this 'Padang fauna' with Upper Norian Nucula marl of Misool. Faunas subsequently described as Carnian by Krumbeck (1914). Triassic unconformably overlain by Eocene sands-conglomerates)

Verstappen, H.Th. (1955)- Geomorphic notes on Kerintji (Central Sumatra). Indonesian J. Natural Science 3, p. 166-177.
(Brief geomorphologic description of Kerinci valley, a longitudinal graben along Great Sumatran fault zone (Sungeipenuh area). At SW end evidence of former crater lake, with several terrace levels in tuff deposits)

Verstappen, H.Th. (1961)- Some óvolcano-tectonicô depressions of Sumatra: their origin and mode of development. Proc. Kon. Nederl. Akademie Wetenschappen, B64, 3, p. 428-443.
(Lakes Kerinci, Singkarak and Toba represent volcanic features formed in pre-existing graben structures, not volcano-tectonic collapse features as proposed by Van Bemmelen)

Verstappen, H.Th. (1973)- A geomorphological reconnaissance of Sumatra and adjacent islands. Wolters-Noordhoff, Groningen, p. 1-182.
(Relief of Sumatra Barisan mountain range strongly influenced by fault movements accompanied by volcanism, especially along Median Graben or Semangko fault zone which extends over length of island. Etc.)

Verstappen, H.Th. (1975)- The effect of Quaternary tectonics and climates on erosion and sedimentation in Sumatra. Proc. 4th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 49-53.
(Drier climate in glacial times reduced vegetation from rainforest to tree-savannah with more physical weathering. During interglacials tropical-humid climate, dense rainforests, more confined river systems and more chemical weathering)

Veth, P.J. (1881)- Midden-Sumatra. Reizen en onderzoekingen der Sumatra-expeditie, uitgerust door het Aardrijkskundig Genootschap, 1877-1879. Brill, Leiden, 4 vols.
(Vol. 2, without plates, online at: http://bhl.ala.org.au/bibliography/46719/summary)
('Central Sumatra- travels and investigations of the Sumatra-expedition by the Geographical Society'. Report of early geographic expedition to C Sumatra; with minimal geological observations)

Vinassa de Regny, P. (1925)- Sur lôage des calcaires du Barissan et des Monts Gumai a Sumatra. Verhandelingen Geologisch-Mijnbouwkundig Genootschap Nederland Kol., Geol. Serie 8 (Verbeek volume), p. 405-414.
('On the age of the limestones of the Barisan and Gumai Mountains in Sumatra'. Mesozoic limestones collected by Tobler in Barisan Mts, Jambi and Gumai Mts, S Sumatra. Part of Gumai Mts limestones determined as Triassic based on Lovcenipora (but Musper (1934) found good Orbitolina indicating E-M Cretaceous age; JTvG))

Volz, W. (1899)- Beitrage zur geologischen Kenntnis von Nord-Sumatra. Zeitschrift Deutschen Geol. Gesellschaft, Berlin, 51, p. 1-61.
(online at: https://www.biodiversitylibrary.org/item/148115#page/15/mode/1up)
('Contributions to the geological knowledge of North Sumatra'. Extensive review. Oldest rocks rel. widespread schist- quartzite formation, intruded by pre-Late Carboniferous granites. Unconformably overlain by grey, massive 'Upper Carboniferous' fossiliferous limestones (with brachiopods, fusulinids) and shales (now generally viewed as mainly Permian; JTvG), cut by slightly younger diabase. Overlain by 600-800m thick, folded marine U Triassic near Lake Toba with molluscs Daonella (Carnian D. cassiana, D. styriaca, D sumatrensis n.sp.) and Halobia (H. battakensis, h. mengalemensis, H. kwaluana n.sp.). Overlain with hiatus by Eocene with coals, and younger rocks.Incl. Batak Highlands and Lake Toba (Also as Thesis Breslau University, 1899) (with Appendix by L. Milch on petrography of volcanic and igneous rocks of the Batak Highlands))

Volz, W. (1904)- Zur Geologie von Sumatra. Beobachtungen und Studien. Geol. Palaeont. Abhandlungen, Jena, N.F. 6, 2, 112, p. 87-194.
(online at: http://openlibrary.org/works/OL1123202W/Zur_geologie_von_Sumatra)
('On the geology of Sumatra; observations and studies'. Early description of geology, Paleozoic-Tertiary stratigraphy, Ombilin coal field, young volcanoes, etc., of W Sumatra Padang Highlands)

Volz, W. (1904)- Zur Geologie von Sumatra. Beobachtungen und Studien, Anhang II, Einige neue Foraminiferen und Korallen sowie Hydrokorallen aus dem Obercarbon Sumatras. Geol. Palaeont. Abhandlungen, Jena, N.F. 6, 2, 112, p. 177-194.
(Appendix II in Volz (1904): 'Some new foraminifera and corals as well as hydrocorals from the Upper Carboniferous of Sumatra'. Descriptions of Permian-age fossils from limestones of Padang Highlands, incl. smaller foraminifera Bigenerina spp. and new fusulinid foram genus/species Sumatrina annae from Bukit Bessi, NE of Lake Singkarak. Also new colonial coral species Lonsdaleia frechi and L. fennemai and stromatoporid Myriopora)

Volz, W. (1907)- Die Battak-Lander in Zentral Sumatra. Zeitschrift Gesellschaft Erdkunde Berlin 1907, p. 662-693.

('The Batak lands in Central Sumatra'. Mainly early geographic descriptions)

Volz, W. (1907)- Vorlaufiger Bericht uber eine Forschungsreise zur Untersuchung des Gebirgsbaus und der Vulkane von Sumatra in den Jahren 1904-1906. Sitzungsberichte Kon. Preuss. Akademie Wissenschaften, Phys.-Math. Cl., 6, p. 127-140.
('Preliminary report on a research trip to investigate the mountain building and volcanoes of Sumatra in the years 1904-1906'. No maps or figures)

Volz, W. (1908)- Kartographische Ergebnisse meiner Reisen durch die Karo- und Pakpak-Bataklander (Nord-Sumatra). Tijdschrift Kon. Nederlands Aardrijkskundig Genootschap 25, p. 1345-1382.
('Cartographic results of my travels through the Karo- and Pakpak-Batak Lands (North Sumatra)')

Volz, W. (1909)- Jungpliozanes Trockenklima in Sumatra und die Landverbindung mit dem asiatischen Kontinent. Gaea 1909, 7-8, 16p.
('Late Pliocene dry climate of Sumatra and the land connection with the Asian continent)

Volz, W. (1909)- Die geomorphologische Stellung Sumatras. Geogr. Zeitschrift 151, p. 1-12.
('The geomorphological position of Sumatra'. Brief review of geology of Sumatra. With 5 regional cross-sections NW of Lake Toba area))

Volz, W. (1909)- Nord Sumatra. Bericht uber eine im Auftrage der Humboldt-stiftung der Koniglich Preussischen Akademie der Wissenschaften zu Berlin in den Jahren 1904-1906 ausgefuhrte Forschungsreise, Band 1, Die Bataklander. Dietrich Reimer, Berlin, p. 1-385.
(online at: http://openlibrary.org/books/OL22888050M/Nord-Sumatra)
('North Sumatra. Report on a research trip in 1904-1906 commisioned by the Royal Prussian Academy of Sciences in Berlin, vol. 1, The Batak lands'. First of two books by German geographer Volz, traveling 6000km on foot, describing geography, geology and people of North Sumatra. First to document that N Sumatra rocks are dominated by metamorphic rocks, folded Paleozoic sediments, granites and 'old Tertiary' volcanics)

Volz, W. (1912)- Nord Sumatra. Bericht uber eine im Auftrage der Humboldt-stiftung der Koniglich Preussischen Akademie der Wissenschaften zu Berlin in den Jahren 1904-1906 ausgefuhrte Forschungsreise, Band II, Die Gajolander. Dietrich Reimer, Berlin, p. 1-428.
(online at: http://archive.org/details/nordsumatraberic01volzuoft)
('North Sumatra. Report on a research trip in 1904-1906 commisioned by the Royal Prussian Academy of Sciences in Berlin, vol. 2, The Gajo lands'. Second of two books by German geographer Volz, describing geography, geology and people of Aceh, N Sumatra)

Volz, W. (1913)- Oberer Jura in West-Sumatra. Centralblatt Mineralogie Geologie Palaont. 24, p. 753-758.
(online at: https://babel.hathitrust.org/cgi/pt?id=uc1.b4291846;view=1up;seq=779)
(‘Upper Jurassic in West Sumatra’. Stromotoparoid Myriopora verbeeki from limestones in Padang Highlands (SE of Merapi volcano) looks identical to Stromatopora japonica Yabe from U Jurassic Torinosu Lst in Japan (Yabe 1914 does not agree; re-assigned to demosponge Myoporina by Hudson 1956))

Volz, W. (1914)- Sud-China und Nord-Sumatra. Zur Charakterisierung des Zerrungs-Phanomens in Sudostasien. Mitteilungen Ferdinand von Richthofen-Tages 1913, Dietrich Reimer, Berlin, p. 29-54.
(Old paper on structural geology of Sumatra and comparison with South China)

Von der Marck, W. (1876)- Fossile Fische von Sumatra. Palaeontographica 22, 7, p. 405-414.
(online at: http://archive.org/details/palaeontographic22cass)
('Fossil fish from Sumatra'. First paper on fresh water fish fossils from bituminous shale in Ombilin Basin, W Sumatra, collected by Verbeek. Four new species, incl. Sardinioides amblyostoma, Brachyspondylus indicus, Protosyngnathus sumatrensis, etc. (fauna described in more detail by Sanders (1934). vdM assigned fish U Cretaceous age, but Eocene age of lacustrine shale now commonly accepted; JTvG))

Von der Marck, W. (1878)- Fossile Fische von Sumatra. Jaarboek Mijnwezen Nederlandsch Oost-Indie 7 (1878), 1, p. 138-155.
('Fossil fish from Sumatra'. Reprint of Von der Marck (1876))

Von Schwartzenberg, T. (1989)- The Air Laya coal deposit- South Sumatra. Braunkohle 38, p. 307-315.

Von Steiger, H. (1922)- Resultaten van geologisch-mijnbouwkundige verkenningen in een gedeelte van Midden Sumatra. Jaarboek Mijnwezen Nederlandsch Oost-Indie 49 (1920), Verhandelingen 1, p. 87-200.
('Results of geological-mining reconnaissance of Central Sumatra'. Geological reconnaissance in upper reaches of Kampar, Siak and Rokan Rivers. With 4 sheets of 1:200,000 scale map and cross-sections)

Vozenin-Serra, C. (1980)- Sur une nouvelle Dipterocarpacee du Tertiaire de Sumatra: *Shoreoxylon rangatense* n. sp.. Comptes Rendus 105th Conf. Nat. Societe Savantes, Caen, Sciences, p. 225-231.
('On a new dipterocarp from the Tertiary of Sumatra: Shoreoxylon rangatense n. sp.'. Description of new fossil wood species, collected S of Peranap, W of Rengat, C Sumatra (= Tigapuluh Mts))

Vozenin-Serra, C. (1985)- Bois homoxyles du Permien inferieur de Sumatra: implications paleogeographiques. Actes 110th Congres Nat. Societe Savantes, sect. Sciences, 5, p. 55-63.
('Homoxyle' wood from the Lower Permian of Sumatra: paleogeographic implications'. 'Jambi Flora' woods include Dadoxylon roviengense Vozenin and D. saxonium. Both lack growth rings, suggesting tropical or subtropical regime)

Vozenin-Serra, C. (1986)- Two gymnospermous woods from the Lower Permian of Jambi, Sumatra. In: H. Fontaine (ed.) The Permian of Southeast Asia, CCOP Tech. Bull. 18, Bangkok, p. 168-171.
(Lower Permian fossil wood abundant at Telok Gedang, left bank of Merangin River. Tropical species assigned to Dadoxylon, not related to Gondwanan woods)

Vozenin-Serra, C. (1989)- Lower Permian continental flora of Sumatra. In: H. Fontaine & S. Gafoer (eds.) The Pre-Tertiary fossils of Sumatra and their environments. CCOP Techn. Publ. 19, Bangkok, p. 53-57.
(Mainly summary of Jongmans and Gothan (1925) work. Famous Lower Permian Jambi flora probably Upper Asselian, possibly Sakmarian age and corresponds to oldest stage and southernmost occurrence of Cathaysian flora. Cordaites and coniferous wood fragments show no annual growth rings)

Wajzer, M.R. (1986)- Geology and tectonic evolution of the Woyla Group, Natal Area, N. Sumatra. Ph.D. Thesis University of London, p. 1-802. *(Unpublished)*

Wajzer, M.R., A.J. Barber, S. Hidayat & Suharsono (1991)- Accretion, collision and strike-slip faulting: the Woyla Group as a key to the tectonic evolution of North Sumatra. J. Southeast Asian Earth Sci. 6, p. 447-461.
(Woyla Group re-interpreted as part of accretionary complex formed from ocean floor materials of Triassic- E Cretaceous age, incorporating collided seamounts, plateaux and volcanic arc fragments accumulated during subduction of major ocean (Tethys III) prior to India's collision with Asia. Time of accretion mid-Cretaceous. Langsat volcanics at W end dated as Late Oligocene, demonstrating they are unrelated to rest of complex and emplaced along strike-slip faults prior to M Miocene)

Wardhani, R., E. Wiwik & A. Idrus (2017)- Granitoid petrology, geochemistry and occurrences of hydrothermal mineralization in Mehanggin area, Muaradua district, South Sumatra Province, Indonesia. Proc. Joint Conv. HAGI-IAGI-IAFMI-IATMI (JCM 2017), Malang, 4p.
(Lower Cretaceous(?) granitoid in Garba Mts near Mehanggin, Muaradua area, S Sumatra, classified as S-type, high-K, calk-alkaline (island arc or active continental margin))

Weller, O., D. Lange, F. Tilmann, D. Natawidjaja, A. Rietbrock, R. Collings & L. Gregory (2012)- The structure of the Sumatran Fault revealed by local seismicity. Geophysical Research Letters 39, 1, L01306, p. 1-7.
(online at: http://onlinelibrary.wiley.com/doi/10.1029/2011GL050440/epdf)

(Combination of Sunda megathrust and strike-slip Sumatran Fault example of slip-partitioning. Superimposed on Sumatra Fault are geometrical irregularities that disrupt local strain field. Seismic evidence for duplex system between two main fault branches in C Sumatra)

Westaway, R., S. Mishra, S. Deo & D.R. Bridgland (2011)- Methods for determination of the age of Pleistocene tephra, derived from eruption of Toba, in central India. J. Earth System Science 120, 3, p. 503-530.
(online at: www.ias.ac.in/article/fulltext/jess/120/03/0503-0530)
(Tephra from Pleistocene eruption of 'supervolcano' Toba, N Sumatra, occurs at many localities in India. Discrimination between products of eruption A (~75ka) and eruption D (~790 ka) of Toba is difficult. Average Ar-Ar apparent age for samples from eruption D is 799 ± 24 ka)

Westerveld, J. (1931)- Geologische kaart van Sumatra 1:200 000. Toelichting bij Blad 5 (Kotaboemi). Dienst Mijnbouw Nederlandsch-Indie, Bandung, p. 1-28.
(Kotabumi map sheet, S Sumatra)

Westerveld, J. (1933)- Geologische kaart van Sumatra 1:200 000. Toelichting bij Blad 3 (Bengkoenat). Dienst Mijnbouw Nederlandsch-Indie, Bandung, p. 1-44.
(Bengkunat map sheet, SW coastal area of Sumatra. Oldest rocks are 'Old Andesite' volcanics (Oligocene-E Miocene ?). Overlain by 700m or more folded 'Old Neogene' interbedded claystones, tuffs, thin coal lenses and limestones with Eulepidina and Miogypsina (=Te5, basal Miocene Baturaja equivalent; JTvG). 'Young Neogene' rel. undeformed and with common molluscs. Also large granite intrusion and young volcanics)

Westerveld, J. (1941)- De tektonische bouw van Zuid Sumatra. Handelingen 28e Nederlandsch Natuur-Geneeskundig Congres, Utrecht, Afd. 4, p. 264-267.
('The tectonic structure of South Sumatra')

Westerveld, J. (1941)- Three geological sections across South Sumatra. Proc. Kon. Nederl. Akademie Wetenschappen, Amsterdam, 44, 9, p. 1131-1139.
(online at: www.dwc.knaw.nl/DL/publications/PU00017672.pdf)
(Three SW-NE coast-to-coast regional geological cross-sections across S Sumatra)

Westerveld, J. (1942)- Welded rhyolithic tuffs or 'ignimbrites' in the Pasoemah region, West Palembang, South Sumatra. Leidsche Geol. Mededelingen 13, 1, p. 202-217.
(online at: www.repository.naturalis.nl/document/549396)
(In Pasumah region of Barisan Range in S Sumatra widespread young welded tuffs ('ignimbrites'; >50m thick over >800km2), overlain by andesitic tuffs and agglomerates from young volcanoes (Dempo, Semendo Highland, Isau-Isau)

Westerveld, J. (1947)- On the origin of the acid volcanic rocks around Lake Toba, North Sumatra. A further contribution to the knowledge of welded rhyolite-tuffs deposited along the Sumatran longitudinal fault-trough system. Verhandelingen Kon. Nederl. Akademie Wetenschappen, Amsterdam, Sect. 2, 43, 1, p. 1-52.
(online at: www.dwc.knaw.nl/DL/publications/PU00011879.pdf)
(Overview of geology of Lake Toba region, N Sumatra, particularly young rhyolitic volcanic tuffs)

Westerveld, J. (1952)- Quaternary volcanism on Sumatra. Geol. Soc. America (GSA) Bull. 63, p. 561-594.
(Extensive sheets of acid pumice tuffs in initial stages of Sumatra Quaternary volcanism, followed by cones of andesitic volcanism)

Westerveld, J. (1953)- Eruptions of acid pumice tuffs and related phenomena along the Great Sumatran fault-trough system. Proc. 7th Pacific Science Congress, New Zealand 1953, 2, p. 411-438.

Westerveld, J. & W. Uytenbogaardt (1948)- Eenige mineragrafische notities betreffende het erts van de mijn Salida, S.W.K.. Verhandelingen Nederl. Geologisch Mijnbouwkundig Genootschap, Mijnbouwkundig Ser, 4, p. 59-69.

('Some mineragraphic notes on the ore of the Salida mine, Sumatra's West Coast'. Descriptions of ore minerals in Salida gold-silver mine in Painan District, 80 km from Padang. Initially exploited by Dutch East Indies Company between 1669-1735. Last exploitation period 1914-1928. Ore veins in E Miocene andesitic volcanics)

Westgate, J.A., N.J.G. Pearce, E. Gatti & H. Achyuthan (2014)- Distinction between the Youngest Toba Tuff and Oldest Toba Tuff from northern Sumatra based on the area density of spontaneous fission tracks in their glass shards. Quaternary Research 82, 2, p. 388-393.
(Area density of spontaneous fission tracks in glass shards of Toba tephra is reliable way to distinguish between the Youngest Toba Tuff and Oldest Toba Tuff)

Westgate, J.A., N.J.G. Pearce, W.T. Perkins, S.J. Preece, C.A. Chesner & R.F. Muhammad (2013)- Tephrochronology of the Toba tuffs: four primary glass populations define the 75-ka Youngest Toba Tuff, northern Sumatra, Indonesia. J. Quaternary Science 28, 8, p. 772-776.
(Four primary glass populations in Youngest Toba Tuff, which was deposited during supereruption in N Sumatra at 75 ka. Multiple glass populations easily distinguish YTT from homogeneous glass population of Middle Toba Tuff (~500 ka), as represented by basal vitrophyre, and Oldest Toba Tuff (~800 ka))

Wheeler, R.S. (1999)- Alteration and epithermal zeolite-bearing quartz vein mineralisation at the Way Linggo Au-Ag deposit, southwest Sumatra, Indonesia. M.Sc Thesis, University of Auckland, p. *(Unpublished)*

Wheeler, R.S., P.R.L. Brown & K.A. Rodgers (2001)- Iron-rich and iron-poor prehnites from the Way Linggo epithermal Au-Ag deposit, southwest Sumatra, and the Heber geothermal field, California. Mineralogical Magazine 65, 3, p. 397-406.
(online at: http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.1026.3514&rep=rep1&type=pdf)
(WayLinggo low sulphidation epithermal deposit of S Sumatra series of zeolite-bearing quartz veins emplaced along NW-NNW trending subsidiarystructures of Sumatra Fault Zone, in Miocene andesitic- dacitic pyroclastic rocks, intruded by porphyritic dacitic stock and minor andesite dykes. Prehnites formed below 220°C)

Whitten, A.J., S.J. Damanik, J. Anwar & N. Hisyam (1987)- The ecology of Sumatra. Gadjah Mada University Press, Yogyakarta, p. 1-583. *(also in 'The Ecology of Indonesia' Series, 1, Periplus Editions (HK), 2000, 478p.)*

Wichmann, C.E.A. (1904)- Uber die Vulkane von Nord-Sumatra. Zeitschrift Deutschen Geol. Gesellschaft, Berlin, 56, 3, p. 227-239.
(online at: https://www.biodiversitylibrary.org/item/150453#page/255/mode/1up)
('On the volcanoes of North Sumatra'. Brief review of young volcanoes and activity from Batak Highlands in NW to SE. No maps)

Widi, B.N. & Sukaesih (2016)- Mineralisasi besi tipe skarn di daerah Bukit Gadang Lange, Desa Tarung Tarung, Kecamatan Rao, Kabupaten Pasaman, Provinsi Sumatera Barat. Bul. Sumber Daya Geologi 11, 3, p. 144-156.
(online at: http://buletinsdg.geologi.esdm.go.id/index.php/bsdg/issue/archive)
('Skarn-type iron mineralization in Bukit Gadang Lange, Tarung Tarung Village, Rao Sub-district, Pasaman District, West Sumatra'. Magnetite-hematite associated with garnet in contact zone between Tertiary granodiorite intrusion and Permian Silungkang Fm marble/limestone at Bukit Gadang Lange, Barisan Mts.)

Wikarno, D.A.D. Suyatna & S. Sukardi (1988)- Granitoids of Sumatra and the tin islands. In: C.S. Hutchison (ed.) Geology of tin deposits in Asia and the Pacific, Selected papers from Int. Symp. Geology of tin deposits, Nanning, China, 1984, Springer Verlag, Berlin, p. 571-589.
(Review of Sumatra granitoids (see also Cobbing in Barber et al. 2005). Granitoids common along axis of Sumatra island along Great Fault Zone, also in other parts like Tin Islands. Consist of plutons and batholiths up to several 100km length. Most granite bodies elongated in NW-SE direction parallel to length of island. Ages of many granites Late Triassic, also Permian and Cretaceous ages. Most tin fields associated with Ilmenite series/S-type granite. K-Ar ages Bangka- Belitung granites mainly ~210-220 Ma))

Wilcox, R.E., T.P. Harding & D.R. Seeley (1973)- Basic wrench tectonics. American Assoc. Petrol. Geol. (AAPG) Bull. 57, 1, p. 74-96.
(Includes example of Great Sumatran (Barisan) right lateral strike slip fault zone. Interpreted backarc anticlines as associated en-echelon folds (but deemed unrelated by Mount and Suppe, 1992))

Williams, M. (2012)- The ~73 ka Toba super-eruption and its impact: history of a debate. Quaternary Int. 258, p. 19-29.
(Toba volcano in N Sumatra located at intersection of two major tectonic lineaments. Caldera considered the largest Quaternary caldera on earth. Most recent explosive eruption at ~73 ka was order of magnitude larger than Tambora in 1815. Extent of the impact remains unclear)

Williams, M.A.J., S.H. Ambrose, S. van der Kaars, C. Ruehlemann, U. Chattopadhyaya, J. Pal & P.R. Chauhan (2009)- Environmental impact of the 73 ka Toba super-eruption in South Asia. Palaeogeogr. Palaeoclim. Palaeoecology 284, p. 295-314.
(Eruption of Toba volcano in N Sumatra at 73 ka was largest explosive eruption of past 2 My and caused cooling and deforestation in S Asia. Analysis of pollen from core in Bay of Bengal with stratified Toba ash suggest eruption was followed by cooling and prolonged desiccation, reflected in decline in tree cover in India and adjacent region. Carbon isotopic composition of soil carbonates above and below ash in three sites across C India show that C3 forest was replaced by wooded to open C4 grassland)

Williamson A. & G.J. Fleming (1995)- Miwah prospect high sulphidation Au-Cu mineralisation, northern Sumatra, Indonesia. In: J.L. Mauk & J.D. St George (eds.) Proc. PACRIM Congress 1995, Auckland, Australasian Inst. of Mining and Metallurgy (AusIMM), Carlton, Publ. 9, p. 637-642.
(Miwah prospect within Pliocene volcanic rocks between NW trending segment of Sumatra Fault, and N-trending Samalanga-Sipopok Fault to E)

Wing Easton, N. (1889)- Geologisch onderzoek van den omtrek der Brandewijnsbaai. Jaarboek Mijnwezen Nederlandsch Oost-Indie 1889, Wetenschappelijk Gedeelte, p. 5-23.
('Geological investigations around Padang Bay', W Sumatra)

Wing Easton, N. (1894)- Het voorkomen van Bismuth op het schiereiland Samosir (Toba-Meer). Jaarboek Mijnwezen Nederlandsch Oost-Indie 23 (1894), Technisch Admin. Ged., p. 84-93.
('The occurrence of bismuth on Samosir Peninsula (Lake Toba)'. Small round spheres up to 125 grams of native bismuth in tuffaceous sandstone formation. Periodically exploited by local Batak population for manufacturing bullets. Possibly related to melting of older material during formation of older liparite deposit)

Wing Easton, N. (1894)- Een geologische verkenning in de Toba-landen. Jaarboek Mijnwezen Nederlandsch Oost-Indie 23 (1894), Wetenschappelijk Gedeelte, p. 99-164.
('A geological reconnaissance in the Toba lands', First geological description of geology of Lake Toba area, N Sumatra. Widespread young, very acid volcanics ('quartz-trachyte'); no young andesitic volcanism. At S side of lake also old slates with some quartzite, Carboniferous? shales and dolomitic limestones, etc.)

Wing Easton, N. (1895)- Eenige nadere opmerkingen aangaande de geologie van het Toba-Meer en omgeving. Jaarboek Mijnwezen Nederlandsch Oost-Indie 24 (1895), Wetenschappelijk Gedeelte, p. 149-157.
('Additional comments on the geology of Lake Toba and surroundings', N Sumatra)

Wing Easton, N. (1896)- Der Toba-See, Ein Beitrag zur Geologie von Nord-Sumatra. Zeitschrift Deutschen Geol. Gesellschaft, Berlin, 48, 3, p. 435-467.
(online at: https://www.biodiversitylibrary.org/item/177217#page/447/mode/1up)
('Lake Toba, a contribution to the geology of North Sumatra'. Early geologic description of Lake Toba area, N Sumatra (German summary of Dutch-language papers by Wing Easton 1894, 1895)

Wing Easton, N. (1926)- Die wichtigsten Edelmetall-Lagerstatten Sumatras. Archiv Lagerstattenforschung (Preussischen Geol. Landesanstalt, Berlin) 35, p. 1-53.

('The most important precious metal deposits of Sumatra'. Overview of principal gold-silver occurrences of W Sumatra: Lebong Donok, Lebong Sulit (Kataun), Lebok Tandai (Simau), Karang Suluh, Lebok Husin (Kandis), Tambang Sawah, Gedang Ilir, Lebok Simpang, Sungei Pagu (Puding), Tambang Salida, Mangani, Roemput, Pait, Belimbing)

Wing Easton, N. (1936)- Een nog onbekende oude publikatie over de Salida Mijn. De Ingenieur in Nederlandsch-Indie (IV) 3, 4, p. 74-77.
('An as yet unknown publication on the Salida mine'. Report and translation of brief 1686 report by Hermannus Nicolaas Grimm, written in Latin, on gold-rich samples from the Salida mine in Sumatra, operated by Dutch East Indies Company in late 1600's)

Wong, H., I. Taylor, M. Purwanto & H. Setyawan (2011)- Geology and discovery history of the Miwah gold deposit, Aceh, Sumatra, Indonesia. In: Proc. NewGenGold 2011 Conf., Case histories of discovery, Perth, p. 191-199.
(Miwah high sulphidation epithermal gold system in Aceh)

Yabe, H. (1946)- On some fossils from the Saling Limestone of the Goemai Mts., Palembang, Sumatra- I. Proc. Japan Academy 22, 6, p. 200-203.
(online at: www.jstage.jst.go.jp/article/pjab1945/22/5-7/22_5-7_200/_pdf)
(1943 examination in Bandung of thin sections of Saling Lst (in supposedly Cretaceous-age volcanic Saling Series of Gumai Mts) show common so-called Lovcenipora timorica clavata Vinassa, which is same as Cladocoropsis mirabilis from U Jurassic Torinosu Lst of SW Japan. Also stromatoporoid Myriophorella. Saling series older than mid-Cretaceous Lingsing series quartz sst, shale and Orbitolina limestone (but relative age of formations reverse of that suggested by Musper?; part of 'Woyla Group' Jurassic-E Cretaceous arc terrane; JTvG))

Yabe, H. (1946)- On some fossils from the Saling Limestone of the Goemai Mts., Palembang, Sumatra- II. Proc. Japan Academy 22, 8, p. 259-264.
(Loftusia bemmeleni Silvestri from Saling Lst, S Sumatra, more likely Pseudocyclammina. 'Corals' described from here as Lovcenipora vinassai same as Late Jurassic hydrozoan Cladocoropsis miriabilis from Japan)

Yancey, T.E. & S.A. Alif (1977)- Upper Mesozoic strata near Padang, West Sumatra. Bull. Geol. Soc. Malaysia 8, p. 61-74.
(online at: https://gsmpubl.files.wordpress.com/2014/09/bgsm1977003.pdf)
(U Jurassic- Lw Cretaceous Indarung Fm limestones and clastics exposed near Indarung, few km E of Padang. Massive carbonates ~200m thick, with stromatoporoids Actostroma and Lovcenipora near base and bedded cherts (Ngalan Mb) near top. Indarung Fm used to determine ~200km of offset along Sumatra fault zone. (N.B.: cherts subsequently dated as Aalenian, basal M Jurassic, by McCarthy et al. 2001 (part of Woyla Terranes;Barber 2000) (NB: Lovcenipora reported here probably Late Jurassic Cladocoropsis, also in Gumai Mts; JTvG))

Yokoyama, T., A. Dharma & P. Hehanussa (1989)- Radiometric ages and paleomagnetism of the Sigura-Gura Formation, upper part of the 'Toba Tuffs' in Sumatra, Indonesia. Palaeogeogr. Palaeoclim. Palaeoecology 72, p. 161-175.
(K-Ar and fission-track dating of Sigura-Gura Fm (upper part of Toba Tuffs. K-Ar age: 0.96 Ma, fission-track ages 1.11Ma, 0.87 and 0.86 Ma. (4) Paleomagnetic polarity of Sigura-gura Fm is reversed. Fission-track ages of Younger Toba Tuffs 0.62 Ma)

Yokoyama, T. & P.E. Hehanussa (1981)- The age of "Old Toba Tuff" and some problems on the geohistory of Lake Toba, Sumatra, Indonesia. In: Palaeolimnology of Lake Biwa, Japan, Pleistocene, 9, p. 117-186.

Yokoyama, T., S. Nishimura, E. Abe, Y. Otofuji, T. Ikeda, S. Suparka & A. Dharma (1980)- Volcano-, magneto- and chronostratigraphy and the geologic structure of Danau Toba, Sumatra, Indonesia. In: S. Nishimura (ed.) Physical geology of Indonesian island arcs, Kyoto University, p. 122-143.

Young, R.D. & S. Johari (1978)- The Tangse copper-molybdenum prospect, Indonesia. In: P. Nutalaya (ed.) Proc. 3rd Regional Conf. Mineral Resources SE Asia, Asian Inst. Technology, Bangkok, p. 377-386.

Yulihanto, B., B. Situmorang, A. Nurdjajadi & B. Sain (1995)- Structural analysis of the onshore Bengkulu basin and its implications for future hydrocarbon exploration activity. Proc. 24th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, p. 85-96.

Yuningsih, E.T. (2006)- Mineralogi granitoid Bukit Pagias, Cekungan Ombilin, Sumatera Barat. Bull. Scientific Contr. (UNPAD) 4, 1, p. 67-77.
(online at: http://jurnal.unpad.ac.id/bsc/article/view/8116/3692)
('Mineralogy of the Bukit Pagias granitoid, Ombilin Basin, West Sumatra'. Petrography of (Jurassic?) granite)

Yuningsih, E.T. (2006)- Analisis kimia batuan basemen granitoid de sub cekungan Jambi, Sumatera Selatan berdasarkan data dari sumur JSB-3, JSB-4 and JSB-6. Bull. Scientific Contr. (UNPAD) 4, 2, p. 106-117.
(online at: http://jurnal.unpad.ac.id/bsc/article/view/8120/3696)
('Chemical analysis of granitoid basement rock of the Jambi sub basin, South Sumatra, based on data from wells JSB-3, JSB-4 and JSB-6'. Pre-Tertiary granitoid basement rocks in wells JSB-3 (~1990m) intermediate-acid magma, calc-alkaline, medium-high K, metalluminous (subduction at active continental margin). Granitoids at JSB-4 (2654m) and JSB-6 (2342m) magnetite series and I type, probably extension of Thailand-Burma granite province)

Zen, M.T. (1970)- Origin of Lake Singkarak in the Padang Highlands (Central Sumatra). Inst. Teknologi Bandung (ITB) J. Science 5, 1, p. 1-8.
(Lake Singkarak in Padang Highlands previously interpreted as volcanic caldera, but Singkarak Trough is fault-bounded depression, and part of Sumatra Rift zone, stretching for 1650km from Sumatra's N tip to Semangko valley in SE, and already identified by Westerveld (1952), Katili (1967), etc.)

Zen, M.T. (1971)- Structural origin of Lake Singkarak in Central Sumatra. Bull. Volcanologique 35, 2, p. 453-461.
(Lake Singkarak neither volcanic ruin nor volcano-tectonic depression, but part of 1650 km graben zone along Sumatra's Semangko Fault zone. Lake results from damming process by volcanic material produced by Marapi-Singgalang-Tandikat volcanoes in N and from Talang volcano in S)

Zen, M.T. (1972)- The origin of several pyroclastic plateaux in the Padang Highlands (Central Sumatra). Proc. Inst. Tekn. Bandung (ITB) 6, 3, p. 81-88.
(online at: http://journal.itb.ac.id/index.php?li=article_detail&id=602)
(Several pyroclastic plateaux known in Padang Highlands. Westerveld (1952) suggested rhyolitic volcanics are sheet- like fissure eruptions/ ignimbrites. However, pyroclastic, plateau of Bukit Tinggi may be result of airborn tuff deposition from giant eruption of Maninjau volcano before caldera formation (exposure neither layered nor welded))

Zen, M.T. (1983)- Krakatau and the tectonic importance of Sunda Strait. Bull. Jurusan Geol. (ITB), 12, p. 9-22.

Zen, M.T. (1989)- Seismicity of the Sumatra fault zones. In: B. Situmorang (ed.) Proc. 6th Regional Conf. Geology mineral hydrocarbon resources of Southeast Asia (GEOSEA VI), Jakarta 1987, IAGI, p. 197-205.
(Earthquakes in W Sumatra either shallow and related to oblique subduction of Indian-Australian plate, or related to right-lateral Sumatra Fault)

Zulkarnain, I. (2005)- Geochemical signatures of volcanic rocks related to gold mineralization: a case of volcanic rocks in Pasaman Area, West Sumatra, Indonesia. J. Riset Geologi Pertambangan (LIPI), 15, 1, p. 27-40.

Zulkarnain, I. (2007)- Variasi geokimia batuan volkanik daerah Bengkulu di sabuk pegunungan Bukit Barisan, Sumatera dan implikasi tektoniknya, Jurnal Teknologi Mineral (ITB) 14, 2, p. 89-102.
('Geochemical variation of volcanic rocks in the Bengkulu area in the Barisan mountain belt and tectonic implications'. Bengkulu volcanics derived from two sources. Magma "one" in E area indicates young (<30 Ma) and hot subducted slab involved in subduction, producing adakite-like volcanics. Geochemical character reflects backarc-side of volcanic arc)

Zulkarnain, I. (2007)- Geochemical character of Hulusimpang Formation volcanics around Kota Agung area, and their genetic implication. Jurnal Teknologi Mineral (ITB) 14, 3, p. 156-167.
(Hulusimpang Fm Oligocene- E Miocene volcanics mainly in S Sumatera Bengkulu and Lampung Provinces and associated with gold mineralization. Around Kota Agung bimodal medium-K calc-alkaline magmas of basalt and dacite. Absence of andesitic rocks indicates change from basaltic to dacitic caused by contamination processes instead of fractional crystallization or magmatic differentiation. REE diagrams suggest Hulusimpang Fm rocks derived from same magma source, similar to backarc 'magma one' of Bengkulu; Zulkarnain 2007)

Zulkarnain, I. (2008)- Petrogenesis batuan vulkanik daerah tambang emas Lebong Tandai, Provinsi Bengkulu, berdasarkan karakter geokimianya. J. Geologi Indonesia 3, 2, p. 57-73.
(online at: www.bgl.esdm.go.id/publication/index.php/dir/article_detail/220)
('Petrogenesis of volcanic rocks in the Lebong Tandai gold mine, Bengkulu Province, based on geochemical character'. Lebong Tandai in N Bengkulu known as gold mine since Dutch time. Hulusimpang Fm volcanics dominated by andesites with minor dacite and basalt, transitional between calc-alkaline and tholeiite. Derived from adakitic source. Magma activity since >30 Ma in back-arc environment. Gold mineralization corresponded with observation from Phillippine that adakitic rocks contain higher gold concentration than calc-alkaline rocks)

Zulkarnain, I. (2009)- Geochemical signature of Mesozoic volcanic and granitic rocks in Madina Regency area, North Sumatra, Indonesia, and its tectonic implication. J. Geologi Indonesia 4, 2, p. 117-131.
(online at: www.bgl.esdm.go.id/publication/index.php/dir/article_detail/246)
(Permian-Triassic basalts, Triassic-Jurassic granitic rocks, and Miocene andesite from Madina Regency area, W Sumatra Block. Three different geological settings proposed for W Sumatra Permian Plutonic-Volcanic Belt (1) island-arc, (2) subduction related continental margin arc and (3) continental break-up. Permian-Triassic Silungkang Fm basalts from Kotanopan and Muara Sipongi in Madina Regency low-K rocks of tholeiitic affinities, indicative of volcanism in back-arc marginal basin tectonic setting. Mesozoic granitic rocks and Miocene andesite reflect active continental margin)

Zulkarnain, I. (2011)- Geochemical evidence of island-arc origin for Sumatra Island; a new perspective based on volcanic rocks in Lampung Province, Indonesia. J. Geologi Indonesia 6, 4, p. 213-225.
(online at: www.bgl.esdm.go.id/publication/index.php/dir/article_detail/317)
(Volcanic rock chemistry from (young?) Lampung volcanics suggest suggests volcanics from W are from island-arc fragment and E part belongs to Eurasia continental margin. Collision zone between Sumatra island-arc fragments with Eurasia continental margin probably located along Sumatra Fault System)

Zulkarnain, I. (2012)- New geochemical data of island-arc origin for Sumatera: the Bengkulu case. J. Riset Geologi Pertambangan (LIPI) 22, 1, p. 11-23.
(online at: www.geotek.lipi.go.id/riset/index.php/jurnal/article/viewFile/45/5)
(Sumatra generally viewed as margin of Eurasia continental plate, where Indian oceanic plate is subducting beneath continental material. Subduction system produced magmatic rocks on Sumatera since Cretaceous. Chemical analyses of volcanic rocks from Bengkulu Province show island-arc signature in W and Active Continental Margin signatures in E, similar to results from Lampung area by Zulkarnain (2011). Sumatra continental margin probably ends along E side of Sumatera Fault Zone (ages of volcanic rocks not clearly described; JTvG))

Zulkarnain, I. (2014)- Geochemical evidence of island-arc origin in volcanic rocks of Central Sumatra. J. Riset Geologi Pertambangan (LIPI) 24, 1, p. 23-41.

(online at: http://jrisetgeotam.com/index.php/jrisgeotam/article/view/79/pdf_20)
(Geochemical signatures of trace elements in Pliocene- Recent volcanics in Painan and Muara Labuh in W Central Sumatera confirmed pattern of two volcanic belts (separated by Sumatra Fault Zone?): (1) island-arc tectonic environment in W (Painan; not part of continental margin of Eurasia) and (2) island-arc and continental tectonic environments in E (Solok; more common acidic rocks), similar to pattern found before in Lampung and Bengkulu areas of S Sumatra. Also evidence for third tectonic environment, reflecting back-arc tectonic setting)

Zulkarnain, I. (2016)- Sumatra is not a homogeneous segment of Gondwana derived continental blocks: a new sight based on geochemical signatures of Pasaman Volcanic in West Sumatra. J. Riset Geologi Pertambangan (LIPI) 26, 1, p. 1-13.
(online at: http://jrisetgeotam.com/index.php/jrisgeotam/article/view/271/pdf_84)
(Geochemical signatures of Miocene? Pasaman calk-alkaline volcanics from W Sumatra shows rocks derived from two different tectonic settings: active continental margin (10) and oceanic arc (5). Supports previous results in Lampung, Bengkulu and C Sumatra (but not clearly tied to geographic distribution/ terranes?; JTvG)

Zulkarnain, I., S. Indarto, Sudarsono & I. Setiawan (2005)- Geochemical signatures of volcanic rocks related to gold mineralization; a case of volcanic rocks in Pasaman area, West Sumatera, Indonesia. J. Riset Geologi Pertambangan (LIPI) 16, 1, p. 27-40.
(Gold deposits always associated with volcanics, but not all volcanics gold-bearing. Gold-bearing volcanics can be characterized with trace elements (<10 ppm Ytrium, depleted HREE, etc.))

Zwierzycki, J. (1915)- Voorlopig onderzoek van fossielen afkomstig van eenige vindplaatsen op Sumatra, A. Kroe, B. Lipai bij Bangkinang. Jaarboek Mijnwezen Nederlandsch Oost-Indie 42 (1913), Verhandelingen 2, p. 101-129.
('Preliminary investigation of fossils from some localities on Sumatra. A. Kroe, B. Lipai near Bangkinang'. Brief report on Tertiary macrofossils from near Kroe, Bengkulu (Late? Miocene crustaceans, gastropods, bivalves, corals) and Lipai, Sumatra West coast (Pliocene gastropods, bivalves, corals). No illustrations)

Zwierzycki, J. (1918)- Geologische beschrijving van het eiland Poeloe We, onderafdeeling We der afdeeling Groot Atjeh. Jaarboek Mijnwezen Nederlandsch Oost-Indie 48 (1916), Verhandelingen 2, p. 1-10.
(Geological description of Pulau We, Aceh. Island off NW tip of Sumatra, composed of young andesitic volcanics only)

Zwierzycki, J. (1922)- Geologische overzichtskaart van den Nederlandsch Oost Indischen Archipel, schaal 1: 1000,000- Toelichting bij blad 1 (Noord Sumatra). Jaarboek Mijnwezen Nederlandsch Oost-Indie 48 (1919), Verhandelingen 1, p. 11-71.
(Part of series of 1: 1 million geological overview maps. Map 1: North Sumatra)

Zwierzycki, J. (1922)- Geologische overzichtskaart van den Nederlandsch Oost Indischen Archipel, schaal 1: 1000,000- Toelichting bij blad VII (Tapanoeli, Sumatraĉs Oostkust, Sumatraĉs westkust). Jaarboek Mijnwezen Nederlandsch Oost-Indie 48 (1919), Verhandelingen 1, p. 72-192.
(Geological overview map 1: 1 million- Map VII: Tapanuli, C Sumatra)

Zwierzycki, J. (with W.J. Twiss) (1922)- Verslag over een geologische verkenning van het Jong-Tertiaire gebied van Noordwest Atjeh in de onderafdeeling Groot-Atjeh (Terrrein ñAtjeh IIIò). Jaarboek Mijnwezen Nederlandsch Oost-Indie 48 (1919), Verhandelingen 1, p. 230-249.
('Report on a geological reconnaissance of the Late Tertiary area of NW Aceh'. Permo-Carboniferous and Jurassic unconformably overlain by Paleogene sands and Neogene clastics and limestones. With 1:100,000 scale map)

Zwierzycki, J. (1930)- Geologische overzichtskaart van den Nederlandsch Oost Indischen Archipel, schaal 1: 1000,000- Toelichting bij blad VIII (Midden Sumatra, Bangka en de Riauw eilanden). Jaarboek Mijnwezen Nederlandsch Oost-Indie 58 (1929), Verhandelingen, p. 73-157.

('Geological overview map of the Netherlands Indies Archipelago, scale 1:1 million- VIII, Central Sumatra, Banka and Riau islands'. With review of C Sumatra geology. Incl. observation that volcanic facies of Permo-Carboniferous (which contains E Permian 'Jambi Flora' and brachiopod-fusulinid limestones) contains granite pebbles and detritus and transgressed over older granite basement))

Zwierzycki, J. (1931)- Geologische kaart van Sumatra 1:200.000. Toelichting bij blad 1 (Teloekbetoeng). Dienst Mijnbouw Nederlandsch-Indie, 30p.
('Geological Map of Sumatra, 1:200,000, sheet 1- Telukbetung'. Map sheet SE tip of Sumatra. Crystalline schists, presumably pre-Carboniferous, intruded by granites, presumably Pre-Cretaceous, locally overlain by folded Cretaceous clastics with mid-Cretaceous Orbitolina in adjacent map sheet. Tertiary- Quaternary rocks exclusively volcanics)

Zwierzycki, J. (1932)- Geologische kaart van Sumatera, schaal 1:200 000. Toelichting bij Blad 2 (Kotaagoeng). Dienst Mijnbouw Nederlandsch-Indie, 30p.
('Geological Map of Sumatra, 1:200,000, sheet 2- Kota Agung'. Map sheet S tip of Sumatra. Isoclinally folded crystalline schists in NE, presumably pre-Carboniferous, locally overlain by folded marine Cretaceous shales (strike NW-SE), sandstone, radiolarian cherts and limestone with mid-Cretaceous Orbitolina. Mid Tertiary 'Old Andesites' and older formations overlain by transgressive Neogene clastics and reefal limestones)

Zwierzycki, J. (1935)- Die Ergebnisse der palaobotanischen Djambi-Expedition 1925. 1. Die geologischen Ergebnisse. Jaarboek Mijnwezen Nederlandsch-Indie 59 (1930), Verhandelingen 2, p. 1-70.
('The results of the paleobotanical Jambi expedition 1925, 1. The geological results'. Companion paper of Jongmans and Gothan 1935 on 'Jambi flora'. Expedition to sample E Permian plant fossils West of Bangko, Jambi Province, C Sumatra. Two large granite massifs: Nalo- Airbatoe (older than U Carboniferous; part of large nappe) and Nagan (intruded in isoclinally folded Triassic-Jurassic slates). Paleozoic Vorbarisan thrusted over Mesozoic, probably from E. Plant fossils in >1750m thick volcanics-rich series of Karing Beds (dacite tuffs, etc.), with five thin limestone beds, all with similar fusulinid forams (related to Fusulina alpina Schellwien according to Gerth) and two main plant horizons. Karing Beds overlain by coarse volcanoclastics (see also Van Waveren et al. 2007, Crippa et al. 2014))

Zwierzycki, J. (1936)- De geologie van de goudertsafzetting Redjang Lebong en de kansen van verdere exploratie. In: Rapporten betreffende geologische onderzoekingen in opdracht van de Directie der Mijnbouw Maatschappij Redjang-Lebong, Batavia, p. 37-58.
('The geology of the gold-ore deposit Rejang Lebong and potential of further exploration'. Geologic setting of Rejang Lebong gold-silver mine. Mildly deformed E Miocene marine Telisa Fm Globigerina marls-claystones intruded by three dacite bodies (Donok, Bunut, Gambut), followed by basic augite-andesite intrusives. Breccias and gold mineralization associated with Donok dacite and major Lebong fault zone, which also caused Lebong Depression. Zeolite group mineral Truscottite found only in Rejang Lebong area. Ore deposits nearly depleted and mine expected to be closed within months)

Zwierzycki, J. & R.W. van Bemmelen (1936)- Het Paleogeen van Sumatra. De Ingenieur in Nederlandsch-Indie IV, 3, 9, p. 160-161.
('The Paleogene of Sumatra'. Critical review of Sumatra chapter of Badings (1936) compilation of Paleogene deposits of Indonesia)

Zwierzycki, J. & O. Posthumus (1926)- De paleobotanische Djambi-expeditie (1925). Tijdschrift Kon. Nederlands Aardrijkskundig Genootschap 43, 2, p. 203-216.
('The paleo-botanic Jambi expedition (1925)'. First report of expedition to famous Jambi Early Permian flora localities on the Merangin River, ~75km W of Sarolangun, C Sumatra. (Mainly travel- logistics report; for more extensive geologic report see Zwierzycki 1935))

II.2. Sumatra - Cenozoic Basins, Stratigraphy, Hydrocarbons, Coal

Abdullah, M. & C.F. Jordan (1987)- The geology of the Arun Field Miocene reef complex. Proc. 16th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 65-96.
(Arun gas field 1971 discovery in N Sumatra. Area 18.5 x 5 km. Lower- Middle Miocene carbonate buildup on Arun High with 1080' of gas column)

Abdullah, M. & C.F. Jordan (1988)- The geology of the Arun field Miocene reef complex. Proc. Offshore South East Asia Conf., Singapore 1988, SEAPEX Proc. 8, p. 203-220.
(Similar to paper above)

Achiat, R., J. Guttormsen & R. Waworuntu (2009)- Complex geomodeling: Dayung Field a fractured Pre-Tertiary reservoir in the Southern Sumatra Basin, Indonesia. Proc. 33rd Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA09-G-148, 15p.
(Dayung Field 1991 fractured basement gas field on W flank of C Palembang sub-Basin (Corridor Block), S Sumatera. Mainly Permian meta-carbonate (Leko Fm), intruded by Jurassic (175-205 Ma) granitic complex. Sourced from onlapping Paleogene sediments)

Adhiperdana, B.G. (2010)- A preliminary account of the framework grain composition and provenance of Lower Tertiary sandstone outcropped in the Ombilin Basin, Central Sumatra. Bull. Scientific Contr. (UNPAD) 8, 3, p. 141-157.
(online at: http://jurnal.unpad.ac.id/bsc/article/view/8252/3800)

Adi, P.C., A.S. Ningrum & A. Darmawan (2017)- Exploration potential of Late Upper Miocene limestone reservoir in Muara Enim Deep, South Palembang Sub-Basin field. Proc. Joint Conv. HAGI-IAGI-IAFMI-IATMI (JCM 2017), Malang, 4p.
(Discussion of shifting of Baturaja limestone buildup development towards SE margin of Muara Enim Deep/ Kuang High during Early Miocene (not Upper Miocene suggested in title; see also Pannetier 1994; JTvG))

Adibrata, B.W.H., Y. Hirosiadi, E. Septama & A. Rachmanto (2004)- From non-economic into producing field, a case study in Ketaling Barat field, Indonesia. Proc. 33rd Ann. Conv. Indon. Assoc. Geol. (IAGI), p. 166-171.
(Field 5 km E of Jambi discovered in 1959 in E Miocene Baturaja carbonate, reappraised in 2001)

Adji, E.F., F. Asrul, M.A. Arham & B. Wisnubroto (2014)- Reservoir modeling of carbonate on Fika Field: the challenge to capture the complexity of rock and oil types. Indonesian J. Geoscience 1, 2, p. 83-97.
(online at: http://ijog.bgl.esdm.go.id/index.php/IJOG/article/view/181/178)
(Reservoir model of Medco 'Fika field' (not real name?) in S Sumatra. Field with 38 wells in E Miocene Baturaja Fm carbonate platform. Thin oil column below gas gap)

Adlan, F. (2006)- Potensi hidrokarbon prospek dalam pada lapangan-lapangan tua di sub-cekungan Palembang bagian Selatan. Proc. 35th Ann. Conv. Indon. Assoc. Geol. (IAGI), Pekanbaru 2006, 7p.
('Hydrocarbon prospects in old fields in S part of Palembang sub-basin'. Ten old oil fields on Pendopo-Limau anticlinorium with 1340 MMBO oil and 3 TCF gas in place. Additional prospects remaining in this trend)

Agus, A. Subandrio, S. Widada, Feriyanto, S. Rakimi & Wibisono (2005)- Carbonate development on the ñTNò field in the Lematang Trough, South Sumatra basin. Proc. 13th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, 13p.
(TN 1997 gas discovery in Baturaja Fm carbonate buildup on local high in Lematang Trough at ~12,000' depth, and tested 30.7 MMSCFD from 250' gross interval. Reef complex elongated, NNE-SSE trending, area 18.8 km2 and relief ~600'. Carbonate porosity average 6.8-9.6%, moldic/ vuggy and intercrystalline, microfracture type porosity in several areas with permeability between 0.32-1.7 mD)

Agustin, M.V., M.I. Novian, A. Darmawan & T. Agung (2017)- Sekuen stratigrafi sub-cekungan Palembang Selatan berdasarkan data pemboran pada sumur 'SSB'. Kabupaten Musi Waras, Provinsi Sumatera Selatan.

Proc. 10th Seminar Nasional Kebumian, Dept. Teknik Geologi, Universitas Gadjah Mada (UGM), Yogyakarta, PSP-12, p. 921-934.
(online at: https://repository.ugm.ac.id/274230/1/PSP-12.pdf)
('Sequence stratigraphy of the South Palembang sub-basin stratigraphy based on drilling data of well 'SSB', Musi Waras District, South Sumatra Province'. Four sequences identified in Talang Akar- Air Benakat Fms interval (Early Miocene) in unspecified well 'SSB' in Pertamina block, S Sumatra)

Aimar, A., K.W. Nugroho, K.B. Catim, B.F. Harry & H. Suryanto (2016)- Parit Minyak Field Kisaran Block PSC: strategic approaches to develop a geologically complex, low permeability and remotefield in the Central Sumatera Basin. Proc. 40th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA16-4-E, 14p.
(On development of Parit Minyak field in Barumun sub-basin in NW part of onshore C Sumatera Basin. Oil discovered by Chevron in 2006 in low-permeability sands of fluvial-lacustrine Pematang Fm rift section)

Akuanbantin, H. & D. Ardiputra (1976)- Geology of East Benakat oil field, South Sumatra. Proc. 5th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 59-68.
(East Benakat first drilled in 1930, tested minor oil in Talang Akar Fm in NW-SE trending anticline. Renewewed interest and development decision after Pertamina drilled E Benakat 3 in 1973)

Alamsyah, M.N., B.W. Handono & A. Syafriya (2016)- 3D seismic reservoir characterization and delineation in carbonate reservoir. AAPG/SEG Int. Conf. Exhibition, Melbourne 2015, Search and Discovery Art. 41760, 14p.
(online at: www.searchanddiscovery.com/documents/2016/41760alamsyah/ndx_alamsyah.pdf)
(Seismic reservoir delineation in E Miocene Baturaja carbonate in 2004 West Betara gas field discovery, N part of S Sumatra basin (Jambi))

Alamsyah, M.N., S. Marmosuwito, W. Sutjiningsih, L.P. Marpaung & S. Sukmono (2008)- Seismic reservoir characterization of Indonesia's Southwest Betara Field. The Leading Edge 27, 12, p. 1598-1607.
(SW Betara Field 2005 PetroChina discovery in Talang Akar Fm of Jabung Block, S Sumatra)

Alamsyah, M.N., A. Wasono Aji, Sihman M., B. Wisnu H. et al. (2006)- Reservoir characterization study to determine thin sand reservoirs using AVO Inversion and spectral decomposition analysis, 3D onshore seismic data of Ripah Field. Proc. Jakarta 2006 Int. Geosc. Conf. Exhib., Indon. Petroleum Assoc., 06-RC-04, 6p.
(Identification of Late Oligocene Talang Akar Fm NNE trending deltaic channel sands in 2000 Ripah field, Jabung Basin, S Sumatra)

Alaydrus, J., S. Nurida & H. Mohede (2018)- Optimizing well placement strategy in a giant fractured basement gas reservoir through integrated subsurface analysis. A case study of the Suban Field. Proc. 42nd Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA18-110-G, 23p.
(Suban gas field in Corridor Block, S Sumatra, world-class fractured reservoir with commingled production from fractured Tertiary (carbonate and sandstone) and Carboniferous- Cretaceous igneous and meta-sedimentary basement rocks. Fractures flow hydrocarbon down to 250-450m TVD below top basement. New wells to be placed: (a) high on fractured structure; (b) close to faults; (c) where brittle reservoir facies exist)

Alexander, W.L. & M.R. Nellia (1993)- 3D Seismic facies analysis of a reefal buildup: NSO' A' Field, offshore North Sumatra. Proc. 22nd Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, p. 137-168.
(NSO-A1 1972 gas discovery in M Miocene reefal carbonates. Three facies identified on 3D seismic and wells: reef, near-reef, inter-reef. Near-reef and inter-reef areas better reservoir properties than reef core. Reef facies with zones of vuggy porosity correlatable to lost circulation. Dolomite only in reef facies)

Alfian & P. Manik (1993)- Penyebaran dan proses pembentukkan CO2 serta kaitannya dengan nilai kekonomian prospek di Cekungan Sumatera Utara. Proc. 22nd Ann. Conv. Indon. Assoc. Geol. (IAGI), Bandung, 2, p. 803-813.
('Distribution and process of CO2 formation and its relation with the economic value of prospects in the North Sumatera Basin'. Gases in wells from the N Sumatra basin locally high in CO2 (1-80%). CO2 probably

originated from thermal breakdown of carbonate rocks, both in Pretertiary basement and Eocene(?) Tampur Fm dolomites). With map of CO2% distribution)

Alford, M.E., L.L. Cargile & M.B. Siagan (1975)- Development of the Arun gas field. Proc. 4th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 2, p. 173-187.

Almon, W.R. & W.C. Dawson (2000)- Paleosols as top seals for nonmarine petroleum systems, Central Sumatra Basin, Indonesia. AAPG Int. Conf. Bali 2000, AAPG Bulletin 84, 9 (*Abstract*)
(Paleosols in nonmarine- marginal marine facies in C Sumatra Basin densely compacted, cemented, partially recrystallized clay matrix. Porosity 1.5 -9.7%, perm. 0.2 -0.007 md. Paleosols good seals capable of retaining columns up to 4600' oil and 5900' gas, varying with API gravity, T, and fluid density. Sealing capacity correlates with clay content and position in soil zone. Hydrocarbons can leak across paleosol horizons along faults or where breached by fluvial-tidal channels. Thick paleosol at 25.5 Ma sequence boundary appears to focus migration toward E margin of basin)

Amier, R.I. (1991)- Coals, source rocks and hydrocarbons in the South Palembang sub-basin, south Sumatra, Indonesia. M.Sc. Thesis University of Wollongong, p. 1-161.
(online at: http://ro.uow.edu.au/theses/2828/)
(S Palembang Sub-basin in S part of S Sumatra Basin, with coals in Muara Enim, Talang Akar and Lahat Fms. Main workable coal measures in Muara Enim Fm. Vitrinite reflectance data indicate onset of oil generation below 1500 m. Crude oils high pristane-phytane ratios and with bicadinane-type resin and oleanane, indicating land-derived organic matter. Biomarkers and thermal maturity suggest Talang Akar Fm is most likely oil source rock)

Amijaya, D.H. (2005)- Paleoenvironmental, paleoecological and thermal metamorphism implications on the organic petrography and organic geochemistry of Tertiary Tanjung Enim coal, South Sumatra Basin, Indonesia. Ph.D. Thesis Rheinisch-Westfalischen Technischen Hochschule, Aachen, p. 1-170.
(online at:http://darwin.bth.rwth-aachen.de/opus/volltexte/2005/1266/pdf/Amijaya_Donatus.pdf)
(Organic petrography and organic geochemistry study of Miocene Muara Enim Fm coals in Tanjung Enim area, South Sumatra. Low rank coals (VR 0.35-0.46%), locally thermally metamorphosed to meta-anthracite (VR up to 5.2%))

Amijaya, H. (2006)- Reappraisal of kerogen typing on low rank coal from South Sumatra basin, Indonesia. Proc. 35th Ann. Conv. Indon. Assoc. Geol. (IAGI), Pekanbaru 2006, PITIAGI2006-011, 6p.
(Low rank coals from Tanjung Enim area, S Sumatra, mean huminite reflectance 0.35-0.46%. Dominated by huminite (34-95%), less liptinite (4- 61%) and inertinite (0.2-44%). Lowest Hydrogen Index (HI) values of 171 mg HC/g TOC; sample with high liptinite HI of 507 mg HC/g TOC. Kerogen type mainly type III)

Amijaya, H. & R. Littke (2005)- Microfacies and depositional environment of Tertiary Tanjung Enim low rank coal, South Sumatra Basin, Indonesia. Int. J. Coal Geology 61, p. 197-221.
(Tanjung Enim area, South Sumatra, low rank M-L Miocene coals of Muara Enim Fm. Sequence of maceral assemblages represents change of topogenous to ombrogenous peat and development of a raised peat bog)

Amijaya, H. & R. Littke (2006)- Properties of thermally metamorphosed coal from Tanjung Enim area, South Sumatra Basin, Indonesia with special reference to the coalification path of macerals. Int. J. Coal Geology 66, p. 271-295.
(Tanjung Enim Tertiary age coals thermally metamorphosed by heat from andesitic intrusion. Original coal rank subbituminous- high volatile bituminous, thermally metamorphosed coals medium volatile bituminous-meta-anthracite. Contact metamorphism T= 700-750°C in most metamorphosed coal)

Amijaya, H., J. Schwarzbauer & R. Littke (2006)- Organic geochemistry of the Lower Suban coal seam, South Sumatra Basin, Indonesia: palaeoecological and thermal metamorphism implications. Organic Geochem. 37, p. 261-279.

Amin, T.C. & S. Gafoer (1985)- Hubungan antara Cekungan Bengkulu dengan Sumatera Selatan pada awal Tersier. Proc. 14th Ann. Conv. Indon. Assoc. Geol. (IAGI), Jakarta 1985, p. 49-60.
('Relationship between the Bengkulu Basin and S Sumatra in the Tertiary')

Amir, V., R. Achdiat, M. Meirita & J. Guttormsen (2011)- Facies architecture and depositional relationship of Baturaja carbonates in Letang, Rawa, and Tengah fields, Corridor Block, South Sumatra. Proc. 35th Ann. Conv. Indon. Petroleum Assoc., IPA11-G-090, p. 1-14.
(Letang, Rawa and Tengah eqarly 1990's gas discoveries in Corridor Block E Miocene Baturaja Fm carbonate buildups. Two main carbonate facies, muddy platform facies and coral-algal reefal buildup facies. Build-up facies commonly developed above paleo-highs. Most porosity secondary vuggy and mouldic in leached coral-algal framework. Carbonate platforms separated by deep NW-SE intra-platform channels. Karstification effect related episodes predominantly developed in upper interval)

Amlan, M.H, Hendar S.M., Yarmanto & I.A. Muswar (2006)- Influence of strike-slip fault in structural deformation of Asih and Asih North fields, Central Sumatra basin. Proc. 35th Ann. Conv. Indon. Assoc. Geol. (IAGI), Pekanbaru, PITIAGI2006-048, 10p.
(Asih and Asih North two structural oil fields along N-S strike slip fault, about 30 km from Minas Field. Remapping of Bekasap and Menggala Fm with 3D seismic. Left-stepping en echelon folds and faults represent flower structure formed by NNW-SSE movement along older weak zone or 'suture' after SW-NE compression)

Anderson, B.L., J. Bon & H.E. Wahono (1993)- Reassessment of the Miocene stratigraphy, paleogeography and petroleum geochemistry of the Langsa Block in the offshore North Sumatra Basin. Proc. 22nd Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 169-189.
(Langsa Block Miocene series of multicycles related to tectonic phases. Each multicycle several cycles: 4 in B, 5 in C. Multicycle A not penetrated, but interpreted on seismic. Paleogeographic reconstructions basis for interpretation of source rock distribution. Two source rock types: (1) algal, probably lacustrine (initial A-Multicycle) and (2) mixed marine algal/terrestrial (later A-Multicycle). Younger source rocks (B and C-Multicycles) also identified but no oils typed to these. Oil generation started at beginning of Miocene in deepest grabens and still continues on graben margin. Gas generation started in Late Miocene in most basinal areas)

Anggarini, K.S. & D.S. Djohor (2014)- Studi karakteristik batubara sebagai batuan waduk dan batuan induk pada sistem gas metana batubara di daerah Kabupaten Muara Enim, Propinsi Sumatera Selatan. Bull. Ilmiah Mineral dan Energi (MINDAGI; Trisakti) 7, 1, p. 85-97.
('Study of the characteristics of coal as reservoir and source rock in the coal methane gas system in the area of Muara Enim, S Sumatra'. Study of coal quality, maturity and coalbed methane potential of four main seams in Miocene Muara Enim Fm in Rambutan area)

Anggayana, K., T. Indriati, Syafrizal & Y.B. Adian (1998)- Kandungan abu dan sulfur batubara Air Laya Tanjung Enim yang berasal dari type highmoor pada lingkungan Pengendapan Payau. Jurnal Teknologi Mineral 5, 3, p.
(Air Laya Coal, Tanjung Enim, S Sumatra, formed in ombrogenic moor, while Muara Enim coaly formation was deposited in brackish environment. Depositional environment reflected in sulfur content of roof and underlying sediments. Air Laya A-1 and A-2 seams sulfur <1% and ash contents increases from upper to lower part (~1 to 4%). B-1 seam sulfur <1%, ash contents are 4 2-9.9%. Sulfur in B-2 and C seams post- depositional pyrite as cavity fill and framboidal forms)

Anggayana, K., A.H. Widayat & S. Widodo (2014)- Depositional environment of the Sangkarewang oil shale, Ombilin Basin, Indonesia. J. Engineering Technol. Sci. (ITB) 46, 4, p. 420-435.
(online at: http://journals.itb.ac.id/index.php/jets/article/view/354/549)
(Organic matter in samples from 56m long core of E Oligocene lacustrine Sangkarewang oil shale abundant lamalginite (30%) and minor vitrinite and resinite, suggesting aquatic depositional environment with minor terrestrial influence. Organic matter dominated by pristane, phytane, and n-alkanes. Oil shale likely deposited in anoxic lake environment as suggested by framboidal pyrite (6%) and total organic matter of ~4.9%.)

Anggoro, S., I. Arif, Y. Iswanto, W.F. Mallett & B. Subiyanto (2009)- Finding by-passed oil in a mature field by reprocessing and reinterpreting existing 3D seismic; a case study of Petapahan Field, Sumatera, Indonesia. Proc. 33rd Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA09-G-177, p.
(Petapahan Field 1971 discovery in C Sumatera Basin, with peak production over 48,000 BOPD in 1973. Re-opening sand intervals that had been closed and infill drilling raised production from 3100 to 4900 BOPD)

Angraini, B. & T. Yonathan S (2011)- Sequence stratigraphy and facies analysis of Muara Enim Formation, to predict prospecting areas in TAC Pertamina- Pilona Petro Tanjung Lontar. Proc. 35th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA11-G-157, 11p.
(On Late Miocene fluvio-deltaic Muara Enim Fm, SW part of South Palembang Basin. Barisan Mts main clastic sediment source for M Miocene Air Benakat Fm and younger sediments; Sunda Craton is main clastic source for E Miocene Gumai Fm and older rocks)

Anonymous (1919)- De Lematang kolenvelden (met nadere beschrijving van het Boekit-Asem kolenveld). Verslagen Mededelingen Indische delfstoffen en hare toepassingen, Dienst Mijnbouw in Nederl. Oost-Indie, 10, p. 1-30.
('The Lematang coal fields (with more detailed description of the Bukit Asam coal field)'. Most likely author Tromp. Early publication describing low grade M-L Miocene Middle Palembang Fm coals, improved to higher grades around young andesite intrusions. Mining of Bukit Asam coal started in 1916, by Netherlands Indies government. Four main coals/ coal intervals, named from old to young: Merapi (8-10m), Petai (5-8m), Soeban (7-10m) and Mangoes (14-22m), interbedded with tuff, sandstones and claystones)

Aprilian, S., K. Kurnely & K. Novian (2003)- Rejuvenation of matured oil fields in South Sumatra, Indonesia. In: SPE Asia Pacific Oil and Gas Conf. Exhib., Jakarta 2003, 6p.
(Pertamina operates 55 mature oil fields in S Sumatra in 2 areas, Pendopo and Prabumulih. Rejuvenation projects resulted in 45.6 MMBO of additional oil reserves in 12 fields)

Argakoesoemah, R.M.I. & D.A. Firmansyah (2011)- Half-day visit to Solok-Sawahlunto area, Ombilin Basin: a short observation on non-marine depositional sequences. Berita Sedimentologi 20, p. 12-17.
(online at: www.iagi.or.id/fosi/files/2011/01/BS20-Sumatra1.pdf)
(Outcrop photos of Eocene- Oligocene fluvial clastics of Ombilin Basin)

Argakoesoemah, R.M.I. & A. Kamal (2004)- Ancient Talang Akar deepwater sediments in South Sumatra Basin: a new exploration play. In: R.A. Noble et al. (eds.) Proc. Int. Conf. Deepwater and frontier exploration in Asia & Australasia, Jakarta, Indon. Petroleum Assoc. (IPA), p. 251-267.
(Two potential areas of Talang Akar Fm deepwater play in S Sumatra: C Palembang Sub-basin in W, and Benakat Gully in E. Expected reservoir sandstone wide range of rock properties and compositions. Tuffaceous content in C Palembang sub-basin may be derived from volcaniclastics in Musi Platform and Mambang High. Source rocks mature- overmature Lemat and Talang Akar Fm shales. Sources entered oil window in middle E Miocene and began generating gas in M Miocene. Trap mainly stratigraphic with Late Miocene- Plio-Pleistocene structures. Intraformational deep marine shales provide vertical seal)

Argakoesoemah, R.M.I., M. Rahardja, S. Winardhi, R. Tarigan, T.F. Maksum & A. Aimar (2005)- Telisa shallow marine sandstone as an emerging exploration target in Palembang High, South Sumatra Basin. Proc. 30th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 101-120.
(Lowstand sands in Telisa shale Fm potential hydrocarbon target, but generally poor reservoir quality)

Arham, M.A., Y. Akbar, E.F. Adji & R. Oentoe (2012)- Calcareous siltstone as new hydrocarbon potential on Musi Platform, South Sumatra Basin Proc. 37th Ann. Conv. Indon. Assoc. Geophys. (HAGI), Palembang, PITHAGI2012-196, 5p.
(E Miocene calcareous siltstone in Lower Telisa Fm above Baturaja Fm provides additional potential for oil and gas in Seka and Geka fields, Musi Platform, S Sumatra Basin)

Arham, M.A., A. Juniarti & E.F. Adji (2010)- Effect of carbonate facies changes on hydrocarbon accumulation and distribution in "F" Field, South Sumatra. Proc. 39th Ann. Conv. Indon. Assoc. Geol. (IAGI), Lombok, PIT-IAGI-2010-283, 10p.
(Baturaja Limestone reservoir characterization model of Medco 'F' Field, 3 km E of Soka field, S Sumatra Extension Block. Ten oil producing wells, with average production of ~400 BOD. Some wells tight reservoirs)

Ariani, S., A. Y. Sihombing, I.M. Gunawan, A. Setiawan, P. Adam & A. Tarmusi (2010)- Facies and sandstone distribution pattern of ñMò sandstone reservoir in Air Benakat Formation, Sungai Gelam Field, Jambi Subbasin. Proc. 34th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA10-G-167, 12p.
(M Miocene reservoir sand in lower Air Benakat Fm in Sungei Gelam field interpreted as tidal deposits)

Ariyanto, P. & F. Kusdiantoro (2014)- Secondary hydrocarbon migration and entrapment evaluation in Lematang Area, South Sumatra. Proc. 38th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA14-G-337, 17p.

Ariyanto, P. & I.Y. Syarifuddin (2018)- New insights into the structural devlopment of the Block A area, North Sumatra basin: constraints from subsidence analysis and palinspatic reconstruction. Proc. 42nd Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA18-587-G, 22p.
(Southern N Sumatra basin in E-M Miocene not just post-rift subsidence, but flexural basin (foredeep) in front of Barisan Mts thrust front after ~16-14 Ma)

Arnold, C.W. (1992)- A classical reservoir study of the Petani Field- approach to analyzing an older complex reservoir. Proc. 21st Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 2, p. 487-515.
(Caltex Petani field reservoir study)

Aryanto, N.C.D. (2015)- Penentuan sistem petroleum di subcekungan Palembang Selatan dan Utara, Cekungan Sumatra Selatan berdasarkan analisis geokimia dan pemodelan cekungan. Ph.D. Dissertation Inst. Teknologi Bandung (ITB), p. 1- . *(Unpublished)*
('Determination of the petroleum system in S and N Palembang subbasins, South Sumatra Basin, based on geochemistry analysis and basin modeling')

Asmina, A., E. Sutriyono & E.W.D. Hastuti (2017)- Gas content appraisal of shallow coal seams in the South Palembang Basin of South Sumatra. Int. J. Geomate 12, 33, p. 45-52.
(online at: www.geomatejournal.com/sites/default/files/articles/45-52-2519-Edy-May%202017-33-g1.pdf)
(Gas content of Late Miocene low-rank coal seams in S Palembang basin from well log and core analysis varies from 4.1-5.3 m3/t, increasing with deeper burial. Total estimated gas-in-place ~3,019 MMm3. Onset of biogenic gas generation may be before Plio-Pleistocene inversion)

Aswan, M. Abdurrachman, B.S. Fitriana, M.F. Mustofa, W.D. Santoso, A. Rudyawan, W.D. Rahayu et al. (2017)- Paleoenvironmental study of Miocene sediments from JTB-1 and NRM-1 wells, in West Ogan Komering Block, Meraksa Area, South Sumatra Basin. In: 2nd Int. Conf. Transdisciplinary research on environmental problems in Southeast Asia (TREPSEA), Bandung 2016, IOP Conf. Series, Earth Environm. Science, 71, 012033, p. 1-9.
(online at: http://iopscience.iop.org/article/10.1088/1755-1315/71/1/012033/pdf)
(Comparison of E-M Miocene marine paleoenvironments in two wells in SE part of S Sumatra basin, based on benthic foraminifera)

Aswan, S. Graha, D. Suryadi, T. Wiguna & S.I. Qivayanti (2016)- Oligocene cyclic sedimentation deduced from taphonomic analysis of molluscs in lacustrine deposits of the Pematang Group, Pesada Well, Central Sumatra Basin. J. Mathematical and Fundamental Sciences (ITB) 48, 1, p. 66-81.
(online at: http://journals.itb.ac.id/index.php/jmfs/article/view/471/1155)
(Taphonomic analysis of gastropods used to interpret cyclicity in lacustrine Brown Shale. Four types of shell concentrations: (1) early transgressive deposits erosion surface at base, with abraded and broken shells; (2,3)

late and maximum transgressive deposits with rel. common complete shells in life position; (3) early regressive deposits alternating shell-rich and shell-poor layers. Seven sedimentary cycles in Pesada well)

Aswan, Y. Rizal & A.K.A. Pradana (2009)- Stratal architecture of Pematang Group, Central Sumatra Basin, based on molluscan taphonomic study: case study in Kiliranjao Area. Majalah Geologi Indonesia 24, 3, p. 141-151.
(Eo-Oligocene lacustrine shales with freshwater molluscs Paludina, Brotia and Thiara in SW part of C Sumatra basin)

Atmadibrata, R. (1988)- Top of abnormal pressure zone prediction in the Arun gas field, North Sumatra. Proc. 17th Ann. Conv. Indon. Assoc. Geol. (IAGI), Jakarta, p. 1-12.
(Area around 1971 Arun discovery in N Sumatra basin with overpressure between ~4000 and 8000', im M-U Miocene Baong and Lower Keutupang Fms)

Atmosudiro, H.W. (1977)- Huff & puff stimulation, Duri Field. Proc. 6th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 2, p. 143-155.
(Shallow giant Duri field in C Sumatra 1941 discovery. 516 wells drilled and 270 MBO produced by 1976. Steam injection used to increase viscous oil recovery)

Aziz, A. & L.H. Bolt (1984)- Occurrence and detection of abnormal pressures from geological and drilling data, North Sumatra Basin. Proc. 13th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, p. 195-220.
(On abnormal pressures in Pertamina-Mobil 'B' Block in N Sumatra Basin. Along Arun-Lhok Sukon High and adjacent deeps, overpressure in U-M Miocene Lower Keutapang and Baong formation between 4000-8000' subsea. Overpressure related to rapid sediment deposition)

Bachri, S. & S. Andi Mangga (2000)- Sejarah deformasi Kompleks Ampera, Tanjungkarang. J. Geologi Sumberdaya Mineral (GRDC) 10, 106, p. 25-32.
('Deformation history of the Ampera Complex, Tanjungkarang'. Paleozoic? metasediments of Ampera Complex off Lampung Bay in SE part of S Sumatra (= Lampung Schist of Van Bemmelen, 1949, Gunung Kasih Complex of Amin), subjected to several deformation phases: (1) F1 isoclinal folding with intense metamorphism; (2) open folding with weak metamorphism and (3) weak deformation producing cleavage, possibly also folding. Followed by M Cretaceous gabbro and diorite intrusives (Sulan granodiorite age 113-111Ma))

Bachri, S., U. Sukanta, S. Gafoer, D.S. Nas, Kusmana, Suminto, K. Hasan & E.H. Nugroho (2002)- Stratigrafi batuan sedimen Paleogen sub-cekungan Kiliranjao, Sumatra Barat. J. Geologi Sumberdaya Mineral 12, 128, p. 24-32.
('Stratigraphy of Paleogene sedimentary rocks of the Kiliiranjo subbasin, W Sumatra'. Mainly Oligocene?, ~200m thick clastics section of fluvial, swamp and lacustrine facies at Barisan Mts front, WSW of Rengat, in SW corner of C Sumatra Basin. Lower 70m mainly floodplain mudstone, middle 41m thin coals, mudstone and freshwater limestone with gastropods. Upper 98m lacustrine mudstone, some may be categorized as oil shale)

Bachri, S., E. Susanto, D.S. Nas & W. Gunawan (2002)- Endapan danau Eosen di cekungan Ombilin, Sumatra Barat: suatu studi sedimentologi dan stratigrafi formasi yang mengandung serpih minyak. J. Geologi Sumberdaya Mineral 12, 127, p. 15-24.
('Eocene lake deposits of the Ombilin Basin, W Sumatra: sedimentological- stratigraphic study of the oil source rock'. Eocene Sangkarewang Fm E of Lake Singkarak in Barisan Mts >430m thick, deposited in fluvial and lacustrine environment. Eocene age from pollen Florschuetzia trilobata, Palmaepollenites kutchensis and Verrucatosporites usmensis. Repeated fining- and thinning-upward cycles of sandstones-shales. Upper part of formation dominated by up to 100's of m thick lacustrine 'papery shale')

Bachtiar, A., M. Rozalli, F.I. Barus, K. Simanjuntak, H. Gultaf, I. Ansari & H.R. Melsa (2011)- Tectonics and sedimentation of Sihapas and Telisa formations based on outcrop study in Gunung Tua area, Central Sumatra Basin, Indonesia. Proc. Joint 36th HAGI and 40th IAGI Ann. Conv., Makassar, JCM2011-449, 10p.

(Outcrops along road from Gunung Tua to Padangsidempuan, N Sumatra, include Permian metamorphics and fusulinid limestone (Mergui microcontinent), Sihapas and Telisa Fms. Provenance for synrift Sihapas Fm is Barisan area. Development of structure controlled by strike slip faulting)

Bahesti, F. (2011)- Palinspatic 2D seismic restoration: simple method for reconstructing inverted structure and basin history, a case study in Langkat Area, North Sumatra Basin. Berita Sedimentologi 20, p. 22-25.
(online at: www.iagi.or.id/fosi/bs20-sumatra.html. Restoration of seismic cross-section of Langkat area. Oligocene rifting followed by Miocene quiescence and Plio-Pleistocene 'Barisan' inversion. Detachment depth calculated at ~5000ms in time, extension factor 0.2, compression 0.63)

Bahesti, F. (2017)- Paleozoic- Mesozoic and Eocene outcrops in the North Sumatra Basin and their implication to new exploration play concept. Berita Sedimentologi (Indon. Sediment. Forum, FOSI- IAGI) 37, p. 14-22.
(online at: www.iagi.or.id/fosi/files/2017/03/BS37-03032017.pdf)

Bahesti, F., E.A. Subroto, N.A. Manaf & W. Sadirsan (2011)- Integrated basin analysis and geomechanics study of Lower Baong Shale for preliminary shale gas prospectivity in the North Sumatra Basin. Proc. 38th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA14-G-014, 18p.
(E-M Miocene Lower Baong Fm hydrocarbon source rock in N Sumatra basin Study deemed to have sweet spots with shale gas potential)

Bahesti, F., Taufiqurrahman & A. Prima K. (2011)- Pemodelan struktur shale diapir Formasi Baoung derdasakan data seismik, singapan dan oil seepage di onshore Cekungan Sumatera Utara. Proc. 36th HAGI and 40th IAGI Ann. Conv., Makassar, JCM2011-029, 10p.
('Modeling of Baong Fm shale diapir structures.., and oil seepage in onshore N Sumatra basin')

Bahesti, F., Taufiqurrahman R., A. Prima K., F. Nuri & M. Wahyudin (2013)- Shale diapir tectonic evolution of the Baong Formation as a potential hydrocarbon seal in the North Sumatra Basin. Proc. 37th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA13-G-178, p. 1-9.

Bahesti, F., M. Wahyudin & Y. Hirosiadi (2015)- Mesozoic and Eocene Tampur hydrocarbon exploration potential in the North Sumatra Basin: new evidence from seismic, well and outcrops. Proc. Joint Conv. HAGI-IAGI-IAFMI-IATMI, Balikpapan, JCB2015-089, 10p.
(Tampur Fm recrystallized limestones and dolomites believed to be part of widespread Eocene carbonate/ dolomite platform covering pre-rift sediments in N Sumatra Basin, and part of Sibumasu Terrane. New 75 m thick mature, lagoonal? mudstone source rock with TOC 0.8-2.1% in Tampur Fm in Benggala-1 well, which penetrated 200m of Tampur Fm. Kerogen mixed oxic terrestrial plant facies and algal marine. Pre-Tertiary Batumilmil Fm. Limestone at Gua Batukatak with K-Ar age of 241 ± 7 Ma (E-M Triassic). Good secondary porosity and permeability in Tampur dolomite (NB: No data to support Eocene age of Tampur Fm?; JTvG))

Bahtiar, A. & N.S. Ningrum (2012)- Petrographic characteristics and depositional environment of coal seams D (Merapi) and E (Keladi), Muara Enim Formation, South Sumatera Basin. Indonesian Mining J. 15, 1, p. 1-13.
(online at: http://jurnal.tekmira.esdm.go.id/index.php/imj/article/view/470/335)
(Petrography of seams D and E of M-L Miocene coals from Air Laya mines. Deposited in upper delta plain environment with ombrotrophic peat type)

Banukarso, M., L.D. Meckel, N. Citrajaya & S. Raharjo (2013)- An inverted syn-rift play in the offshore North Sumatra Basin. Proc. 37th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA13-G-176, p. 1-17.
(Several of N-S trending Eo-Oligocene Paleogene half-graben in offshore N Sumatra Basin display M Miocene and younger inversion structures. Create potential hydrocarbon traps in syn-rift clastics)

Barianto, D.H., F. Anggara, S. Husein, T.A. Pribadi & M. Ahmad (2017)- The advancement of Paleogene stratigraphy of South Sumatra Basin in Gumay Mountains. Proc. Joint Conv. HAGI-IAGI-IAFMI-IATMI (JCM 2017), Malang, 5p.

(Stratigraphy of volcanics-rich Paleogene in Gumai Mts area, S Sumatra, overlying Jurassic- Cretaceous volcanic arc basement complex. Kikim Tuffs and quartz-rich Lemat/ Lahat Fms sandstones. No age control)

Barliana, A. (2002)- Oil and gas discoveries in the Baturaja carbonate play, Corridor Block, South Sumatra Basin. IPA News Letter, October 2002, p. 12-16.

Barliana, A., G. Burgon & C.A. Caughey (1999)- Changing perceptions of a carbonate gas reservoir: Alur Siwah Field, Aceh Timur, Sumatra. Proc. 27th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA99-G-160, p. 1-18.
(1972 Alur Siwah discovery looked like substantial gas accumulation. First few wells gas column >110m in E Miocene Peutu Lst build up. OGIP estimated at 727 BCFG. Later wells found poor reservoir quality and OGIP estimates plummeted to 195 BCFG. Subsequent 3D seismic and infill drilling indicates OGIP of 717 BCFG)

Barliana, A., T. Wahyudi & M. Chamberlain (1993)- Stratigraphy of outcropping Miocene deposits, Aceh Timur: implications for hydrocarbon exploration. Proc. 22nd Ann. Conv. Indon. Assoc. Geol. (IAGI), Bandung, 2, p. 814-831.
(N Sumatra Block A exposures of E-dipping late E Miocene Peutu Limestone, 30-75m thick, in foothills of Barisan Mts, forming N-S ridge over 25 km. Clean skeletal limestones formerly called 'Orbitoid Limestone' rich in larger foraminifera (Lepidocyclina) and argillaceous limestones interbedded with shale. Overlain by 2000-3000m thick M-U Miocene Baong Shale (formerly called 'Grensklei'). Regional uplift of Barisan Mts resulted in up to ~500m thick turbidite sands of M Baong (N13) and also younger Fms, derived from West)

Baroek, M.P., T.L. Heidrick & K.D. Kelsch (1999)- Linked tectonics, a powerful new paradigm for deciphering the structural evolution of the Menggala North Field. In: SPE Asia Pacific Oil and Gas Conf., Jakarta 1999, p. 1-26.
(Structural analysis of 3D seismic dataset of N Menggala field, C Sumatra, unraveling deformation patterns over past 30 Ma. Anticlinal trap formed by inversion of S Balam half-graben along N-S-trending S Balam Border Fault. Three episodes of deformation: (F1) Eo-Oligocene (45-28 Ma) transtensional rift formation, linked to SE-directed extrusion of Asia; (F2) Late Oligocene- E Miocene (~28-21 Ma) wrench tectonics, right-lateral transpression and transtension; (F3) Late Pliocene (3.8 Ma)- Recent compression)

Bartram, K.M. & L. Nugrahaningsih (1990)- A palynological study of the Sawahlunto Formation, Ombilin Basin, West Sumatra. Lemigas Scientific Contr. 14, 1, Spec. Issue, p. 123-136.
(50 spore-pollen species from coal-bearing Sawahlunto Fm in Ombilin Basin in W Sumatra indicate Oligocene-E Miocene rather than Eocene age. Palynomorphs mainly from ferns and palms)

Basuki, P. & S.Z. Pane (1976)- The hydrocarbon prospects of the Baturaja Formation in South Sumatra. Proc. 5th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 2, p. 109-131.

Basundara, A.H., A. Mardianza, H. Purba, R.A. Tampubolon, S.A. Diria, D.R. Haryanto, H. Darman & J. Trivanty (2018)- A new insight of hydrocarbon potential in stratigraphic trap in the Keutupang Formation, North Sumatra Basin. Proc. 42nd Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA18-590-G, 20p.
(On potential for hydrocarbons in stratigraphic traps in Late Miocene Lower Keutapang Fm sandstones from seismic amplitudes, and flat spots)

Behaki, W.A., A. Sukapradja, R. Siregar, S. Djaelani, B. Sjafwan & R. Wisnu Y. (2012)- 3D pore pressure prediction model in Bentu Block- Central Sumatra Basin. Proc. 36th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA12-G-104, p. 1-13.
(Several wells in Bentu and Korinci Baru PSC blocks experienced blow-outs in overpressured M-L Miocene Binio sands: Baru-1 (1951), Baru-2(1967), Korinci-1 (1983) and Segat-1 (1965). Overpressure thought to be caused by disequilibrium compaction and exacerbated by recent uplift and erosion)

Benigno, A.Y. (2011)- Tektonostratigrafi dan pola sedimentasi endapan "syn-rift", area Karangmakur, sub cekungan Jambi. Proc. Joint 36th HAGI and 40th IAGI Ann. Conv., Makassar, JCM2011-003, 35p.

('Tectonostratigraphy and sedimentation patterns of 'syn-rift' deposits, Karangmakur area, Jambi sub-basin'. Descriptions of Oligocene- basal Miocene half-graben in N part of S Sumatra Basin, with four cycles of fluvial and deltaic syn-rift deposits (Lahat- Talang Akar Fms). With good seismic and well log examples and seismic attribute maps suggesting multiple deltaic systems, sourced fromW- NW)

Bernheimer, F.L. (1986)- Central Sumatra seismic stratigraphy exploration model. In: Seismic Stratigraphy I, Proc. Joint ASCOPE/ CCOP Workshop I, Jakarta 1986, ESCAP CCOP Techn. Publ. 17, p. 89-114.

Bianchi, N., E. Barres, R.M.I. Argakoesoemah, C. Syafri & A. Kamal (2007)- Managing uncertainties of petroleum system components in basin modelling studies: an example from South Sumatra Basin, Indonesia. Proc. 31st Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 16p.

Bishop, M.G. (2000)- South Sumatra Basin Province, Indonesia: The Lahat/ Talang Akar Cenozoic total petroleum system. U.S. Geol. Survey (USGS) Open File Report 99-50S, p. 1-22.
(online at: http://pubs.usgs.gov/of/1999/ofr-99-0050/OF99-50S/index.html)
(Petroleum resource assessment S Sumatra Basin)

Blow, W.H. & F.T. Banner (1966)- The morphology, taxonomy and biostratigraphy of *Globorotalia barisanensis* LeRoy, *Globorotalia fohsi* Cushman and Ellisor and related taxa. Micropaleontology 12, 3, p. 286-302.
(Taxonomy of planktonic foraminifera around E-M Miocene boundary, particularly evolution of Gr. peripheroacuta- Gr. praefohsi- Gr. fohsi lineage (described earlier as Globorotalia barisanensis by LeRoy, 1939 from Lower Palembang Fm of Kassikan section, Barisan mountain front, C Sumatra))

Boettger, O. (1880)- Die Conchylien der unteren Tertiarschichten (Die Conchylien der Untereocanschichten von Westsumatra; Die Conchylien des sumatranischen Krebsmergels; Die Conchylien des sumatranischen Orbitoidenkalks; Die Conchylien der unteren Miocaenschichten vom Flusse Kamoemoe, Residentschaft Benkoelen in Sud-Sumatra). In: R.D.M. Verbeek et al., Die Tertiarformationen von Sumatra und ihre Tierreste I, Palaeontographica Suppl. 3, 8-9, p. 29-120.
('The molluscs of the Lower Tertiary beds (The bivalves of the Lower Eocene beds of Sumatra, The bivalves of the Sumatran crab marls; the bivalves of the Sumatran orbitoid limestone; the bivalves of the Lower Miocene beds of Kamoemoe River, etc.).' Series of chapters on Eocene- Miocene molluscs from various localities of Sumatra, collected by Verbeek)

Boettger, O. (1880)- Die fossilen Mollusken von Batoe Radja am Fluss Ogan. In: R.D.M. Verbeek et al., Die Tertiarformationen von Sumatra und ihre Tierreste I, Palaeontographica Suppl., Palaeontographica Suppl. 3, 8-9, p. 92-98.
('The fossil molluscs from Batu Raja on the Ogan River' (Type locality of Baturaja Limestone in S Sumatra))

Boettger, O. (1881)- A. Die Conchylien der Untereocanschichten von Westsumatra (Etage I). Jaarboek Mijnwezen Nederlandsch Oost-Indie 10 (1881), 2, p. 49-91.
('The molluscs of the Lower Eocene beds of West Sumatra'. Reprint of 1880 Paleontographica paper. Molluscs collected by Verbeek from Bukit Kandung and Lurah Tambang in beds he held for Lower Eocene, but proved to be of Late Triassic age (corrected and fauna re-described by Krumbeck 1914). With bivalve molluscs Hemicardium myophoria, Lucina, Cardita globiformis, Pholadomya verbeeki, Trigonia dubia, Pinna blanfordi, Pecten verbeeki, etc.)

Boettger, O. (1881)- B. Die Conchylien des Sumatrischen Krebsmergels (Etage III). Jaarboek Mijnwezen Nederlandsch Oost-Indie 10 (1881), 2, p. 91- 114.
('The molluscs of the Sumatra crustacean marl'. Reprint of 1880 Palaeontographica paper. Molluscs collected by Verbeek. Assigned Eocene age)

Boettger, O. (1881)- C. Die Conchylien des sumatranischen Orbitoidenkalks (Etage IV). Jaarboek Mijnwezen Nederlandsch Oost-Indie 10 (1881), 2, p. 114-175.

('The molluscs of the Sumatran orbitoid limestone'. Reprint of 1880 Paleontographica paper. Molluscs collected by Verbeek)

Boettger, O. (1881)- D. Die Conchylien der unteren Miocanschichten vom Flusse Kamoemoe, Residentschaft Benkoelen in Sud-Sumatra. Jaarboek Mijnwezen Nederlandsch Oost-Indie 10 (1881), 2, p. 176-210.
('The molluscs of the Lower Miocene beds of the Kamoemoe River, Bengkulu Residency in South Sumatra'. Reprint of 1880 Paleontographica paper. Molluscs collected by Verbeek)

Boettger, O. (1883)- Die Conchylien der Obereocaen-Schichten von Suliki; Die Conchylien der oberen Tertiarschichten Sumatras. In: R.D.M.Verbeek, O. Boettger & K. von Fritsch, Die Tertiarformationen von Sumatra und ihre Tierreste II, Palaeontographica, Suppl. 3, 10-11, p. 17-151.
(Additional short papers on Eocene- Miocene molluscs from Sumatra, collected by Verbeek)

Boettger, O. (1883)- Orbitoidenkalk von Sumatras Westkuste. Palaeontographica Suppl. 3, 10-11, p. 19-34.
('Orbitoidal foram limestone from the West coast of Sumatra')

Bolt, L.H., M. Soepardi & D. Suherman (1984)- Drilling of Arun Gas Field. J. Petroleum Technology 36, 5, p. 771-778.
(Arun gas field discovered in late 1971 in thick Arun limestone reef. Summary of drilling history. Problems of high temperatures, high-pressured Baong shales and saltwater sands above lower-pressured Arun limestone. Gas contains 13.75% CO_2 and 0.005- 0.01% H_2S)

Boyd, J.D. & S.G. Peacock (1986)- Sedimentological analysis of a Miocene deltaic system: Air Benakat and Muara Enim Formations, Central Merangin Block, South Sumatra. Proc. 15th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, p. 245-258.
(Outcrop study of Miocene regressive Air Benakat-Muara Enim Fm transition in Merangin Block, S Sumatra suggests deposition in humid tropical deltaic system).

Brackman, W., K. Spaargaren, J.P.C.M. van Dongen, P.A. Couperus & F. Bakker (1984)- Origin and structure of the fossil resin from an Indonesian Miocene coal. Geochimica Cosmochimica Acta 48, 12, p. 2483-2487.
(Fossil resin from Miocene coal of Bukit Asam region, S Sumatra, formed from sesqui- and tri-terpenes from trees of Dipterocarp family)

Brady, H.B. (1875)- On some fossil foraminifera from the West-coast district, Sumatra. Geol. Magazine 2, p. 532-539.
(Description of foraminifera collected by Verbeek 1873-1874. Including Eocene Nummulites and Discocyclina from Nias island. Also first description of Paleozoic foraminifera in Indonesia: U Carboniferous or Permian fusulinids named Fusulina princeps (= Verbeekina verbeeki) from Guguk Bulat Padang Highlands)

Brady, H.B. (1878)- On some fossil foraminifera from the West-coast district, Sumatra. Jaarboek Mijnwezen Nederlandsch Oost-Indie 7 (1878), 1, p. 157-169.
(Repint of Brady (1875) paper above. Author's name erroneously printed as H.B. Bary))

Brahmanthya, G.R., B. Syam, B.D. Safitri, M.N. Alamsyah, S. Husein & E. Widianto (2017)- Implication of tectonic inversion for the existence of hydrocarbons in fractured basement reservoirs: a case study from Jabung Block, South Sumatra Basin, Indonesia. Proc. 41st Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA17-177-G, 17p.
(In Jambi sub-basin NE Betara 1 well fractures in basement open and orientated WSW-ENE and good hydrocarbon reservoir (affected by both extensional and inversion tectonics). In NE Betara 2 closed fractures with NNE-SSW orientation)

Buck, S.P. & T.H. McCulloh (1994)- Bampo-Peutu(!) Petroleum System, North Sumatra, Indonesia. In: L.B. Magoon & W.G. Dow (eds.) The Petroleum System- from source to trap, AAPG Mem. 60, p. 625-637.

(Petroleum system in N Sumatra basin discovered reserves 15 TCF of gas and 1.0 Bbbl of condensate and natural gas liquids. Oligocene Bampo Fm principal source of hydrocarbons Miocene Peutu Fm potential secondary source. Timing of peak migration 12-4 Ma. Trapping efficiency of 3.6% calculated for entire system Much higher trapping efficiency (40-70% range) characterizes Arun gas field)

Budiharto, R. (1978)- Predicting source, direction of migration and accumulation of hydrocarbons within the Central and South Sumatra Basin. Geologi Indonesia (J. Indon. Assoc. Geol. (IAGI)) 5, 2, p. 39-47.

Budiman, A. & Hendarsyah (2007)- Reservoir geology of fractured basement in Suban Barat-1 well - South Sumatra- Indonesia. Coord. Comm. Geosciences Programmes in SE Asia (CCOP), Seminar on fractured reservoir exploration & production, Hanoi 2007, p. *(Abstract only?)*

Budiman, A., A. Priyono, A. Samodra, F. Muâin & M. Latuconsina (2011)- Fractures related fault analysis for basement reservoir identification in Pangea Block, South Sumatra Basin. Proc. 36th HAGI and 40th IAGI Ann. Conv., Makassar, JCM2011-124, 15p.
(Structural modeling and seismic attribute analysis used to predict presence of fractures in basement rocks in S Sumatra. Main orientations of open fractures NNE-SSW and NE-SW, formed during Late Eocene extension)

Budiman, A., A. Priyono, A. Samodra, F. Muâin & M. Latuconsina (2012)- Integrated structural modeling and seismic attributes analysis for fractured Basement reservoir identification in Pangea Block, South Sumatera Basin, Indonesia. Proc. Int. Petroleum Techn. Conf. (IPTC), Bangkok 2012, 15222, 10p.
(Basement fracture mapping from seismic attributes in SE margin of Palembang sub-basin, S Sumatra)

Budiono (1988)- Anomalous gas- water contact study, Arun field, onshore North Sumatra. Proc. 17th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 2, p. 49-72.
(Apparent S-ward tilt of gas-water contact in Miocene carbonate reservoir of Arun Field. May be related to differences in diagenetic rock properties, but studies not conclusive)

Budiyono & A. Maylana (2007)- Further development of the Kenali Asam field. Proc. Joint Conv. 32nd HAGI, 36th IAGI and 29th IATMI, Bali, p. 1675-1679.
(Kenali Asam field in Jambi sub-basin, S Sumatra, 1929 NIAM discovery on NNW-SSE anticline, 282 wells)

Budiyono, B., B. Denk, Suprihatin & M. Yunus (1993)- Geological contribution to the enhanced oil recovery project at Kenali Asam Field. Proc. 22nd Ann. Conv. Indon. Assoc. Geol. (IAGI), Bandung, 2, p. 937-949.
(Kenali Asam field 7 km SW of Jambi biggest field in Jambi sub-basin, discovered by NIAM in 1931. NNW-SSE trending anticline with 245 wells, 16 hydrocarbon-productive zones (mainly oil, one gas zone), in sandstones of Miocene Air Benakat and Gumai Fms. Waterflood injection since 1992)

Bunn, G., Chanh Cao Minh, J. Roestenburg & M. Wittmann (1989)- Indonesia's Jene Field; a reservoir simulation case study. Oilfield Review (Schlumberger) 1, 2, p. 4-14.
(online at: www.slb.com/~/media/Files/resources/oilfield_review/ors89/jul89/1_jene_field.pdf)
(Jene field produced from E Miocene Batu Raja Fm reefal buildup since 1986. Reef growth in several shoaling-upward cycles terminating in subaerial exposures, with each cycle producing buildups a few km long and elongated NW-SE parallel to paleo shorelina). Rapid pressure decline necessitated reservoir modeling and water injection program))

Bunyamin, A., T.K. Usman, B. Sutedjo, M. Latuconsina & M.F. Ma'ruf (2006)- Distribusi reservoir lapangan S Blok Japura (Lirik) pada sekuan M. Proc. 35th Ann. Conv. Indon. Assoc. Geol. (IAGI), Pekanbaru 2006, PITIAGI2006-040, 8p.
(On reservoir distribution in 'M sequence' (main Lirik Sand) of the 'S field', Japura Block, Lirik Trend, C Sumatra. Of limited use due to lack of detail and disguised location names)

Burckhardt, R. (1906)- Uber die sechs in den untern und mittlern Palembangschichten gefundenen Selachierzahne. Tijdschrift Kon. Nederlands Aardrijkskundig Genootschap (2), 23, 2, p. 241-243.

('About the six Selachier teeth found in the Lower and Middle Palembang Beds'. Appendix 5 in Tobler (1906) Muara Enim area paper. Brief note on M-L Miocene shark teeth collected by Tobler, provisionally assigned to genera Carcharias, Lamna and Oxyrhina)

Burnaman, M.D., R.B. Helm & C.R. Beeman (1985)- Discovery of the Cunda Gas field, Bee Block, North Sumatra: an integrated geologic/seismic case history. Proc. 14th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 453-495.
(Cunda field 1984 gas discovery NW of Arun, N Sumatra, in Lower Miocene Peutu (Arun) limestone. Cunda-A2a discovery well encountered 336' of gas bearing limestone)

Butterworth, P.J. (1995)- Lowstands and highstands in the lacustrine brown shale of Central Sumatra: field examples from the Teso block. Proc. 24th Ann. Conv. Indon. Petroleum Assoc., p. 577. *(Abstract only)*
(Two distinct lacustrine basin-fill sequences in Pematang Fm brown shale in Teso area, C Sumatra)

Cai, S., Y. Tang, X. Zhang & G. Hong (2014)- Fine description of delta front sand body in Miocene Intra-Gumai Formation of J Block in the Southern Sumatra Basin. J. Oil and Gas Technology 2014, 12, p. 47-50.
(Eocene to Miocene strata in J Block of S Sumatra Basin divided into six sequences. Intra-Gumai Fm deltaic sands in highstand systems tract of SQ4. In the highstand system tract of SQ4,. Etc.)

Cameron, N.R. (1983)- The stratigraphy of the Sihapas Formation in the North West of the Central Sumatra Basin. Proc. 12th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 43-65.
(Sihapas Fm mainly product of Duri-Bekasap delta system from river draining into NE of basin from Sundaland. Second and thicker Barisan-derived depocentre in W of basin, related to rapid uplift and erosion of basement rocks W of Toru-Asik Wrench Fault ahead of magma which initiated E Miocene volcanic arc. Five units recognised)

Candra, A. (2013)- Potential evaluation of Coalbed Methane based on the grade and quantity of coal in the Mangus Seam, Muaraenim Formation, Nibung Region, South Sumatra Basin. Proc. 37th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA13-SG-051, p. 1-8.
(Mangus coal seam of Miocene Muaraenim Fm in S Sumatra is 13.6m thick, categorized as subbituminous class A-B, and low coalbed methane production potential)

Carnell, A., C. Atkinson & P. Butterworth (2013)- A field trip to the syn-rift petroleum system of Central Sumatera. Berita Sedimentologi 27, p. 18-20.
(online at: www.iagi.or.id/fosi/files/2013/08/BS27-Sumatera_Final.pdf)
(Fieldtrip to C Sumatra Ombilin Basin. Karbindo Coal Mine with exposure of Eocene coal and Brown Shale is exposed, Harau canyon with outcrops of syn-rift fluvial sandstones, etc.)

Carnell, A.J.H., P.J. Butterworth, B. Hamid, A.R.L. Livsey, J. Barton & C. Bates (1998)- The Brown Shale of Central Sumatra: a detailed appraisal of a shallow lacustrine source rock. Proc. 26th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, p. 51-70.
(Outcrop study in Karbindo coal mine, Kiliran sub-basin, W Sumatra. From base up: 25 m thick paleosol, 18m black vitreous coal (gas prone source rock), in upper part with brown algal rich coal and freshwater carbonates, interpreted as ephemeral lake deposits. Overlain by 90m Brown Shale facies assemblage of seasonally laminated paper shales, grey shales, red weathering shales, turbidites and gastropod coquinas. Brown Shale excellent algal-rich, oil prone source rock (TOC 2.5- 8.9%, HI up to 743). Interpretation is shallow lake deposition, different from previous deep lacustrine basin interpretations)

Carrillat, A., D. Bora, A. Dubois, F. Kusdiantoro, S. Yudho, E. Wibowo, M. Musri et al. (2013)- Integrated regional interpretation and new insight on petroleum system of South Sumatra Basin, Indonesia. In: SPE Asia Pacific Oil & Gas Conf. Exh. (APOGCE), Jakarta 2013, SPE 165848, p. 1-8.
(Structural restorations show S Sumatra basin rifting until ~23 Ma, with main depocenters in Benakat Gully, Limau Graben, C Palembang and Lematang Depression followed by sagging until 14.6 Ma. Compressive inversion event from 5 Ma to present day. Onset of oil expulsion from ~10-15 Ma from Lemat and Talangakar

Fms and 5 Ma from Telisa Fm. Baturaja Fm. reservoirs close to depressions are filled; charge risk away from kitchen areas. Most hydrocarbons generated between sedimentation of Lower Palembang Fm and inversion time (10-5 Ma); subsequent inversion likely re-migrated hydrocarbons in Talangakar and Baturaja reservoirs)

Caughey, C., T.C. Cavanagh, J.N.J. Dyer, A. Kohar et al. (eds.) (1994)- Seismic Atlas of Indonesian Oil & Gas Fields. I: Sumatra. Indonesian Petroleum Association (IPA), Jakarta, p.

Caughey, C.A. & S. Sofyan (eds.) (1994)- Geology of the petroliferous North Sumatra Basin. Indon. Petroleum Assoc. (IPA), Post Convention Field Trip, October 1994, p. 1-129.

Caughey, C.A. & T. Wahyudi (1993)- Gas reservoirs in the Lower Miocene Peutu Formation, Aceh Timur, Sumatra. Proc. 22nd Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 191-218.
(Peutu Fm outcrops along Barisan Mts foothills vary from thin planktonic shaly beds to 75 m thick skeletal carbonates. Units dip E beneath coastal plain where gas-bearing carbonate buildups reach 300-500 m. Vuggy porosity in foram grainstones and coral boundstones. Platform facies thinner (50m), tight limestone, sandstone, and shale. Widespread gas-prone reservoirs in Peutu Lst. Exploration success depends on (1) field size: presence of buildups critical for commercial accumulations and (2) gas composition: Peutu reservoirs contain H2S (generally manageable) and CO2 (6- 82%). CO2 from thermal decomposition of carbonates, highest where Peutu deeply buried and unconformably on Tampur dolomite or pre-Tertiary basement)

Chacko, S. (1989)- Porosity identification using amplitude variations with offset: examples from south Sumatra. Geophysics 54, 8, p. 942-951.
(AVO seismic modeling used to distinguish between porous and tight facies in E Miocene Baturaja Limestone)

Chalik, M., B. Pujasmadi, M. Fauzi & M. Bazed (2004)- Sumpal Field, South Sumatra- case history of the delineation and production of a fractured basement reservoir. In: R.A. Noble et al. (eds.) Proc. Int. Conf. Deepwater and frontier exploration in Asia & Australasia, Jakarta, Indon. Petroleum Assoc. (IPA), p. 199-224.
(1994 Corridor Block Sumpal Field dry gas discovery in thin Oligocene sandstones and pre-Tertiary fractured granites and metasedimentary rocks. Structure NW-SE trending anticline with fault to NE. Hydrocarbons generated from Lemat and Talang Akar shales. Brief overview of Pre-Tertiary stratigraphy of S Sumatra.)

Christ, H. (1906)- Uber ein Farnkraut der Obern Palembangschichten von Soengi Tjaban (Sud-Sumatra). In: A. Tobler, Topographische und geologische Beschreibung der Petroleumgebiete bei Moeara Enim (Sud-Sumatra), Tijdschrift Kon. Nederlands Aardrijkskundig Genootschap 23, p. 314-315.
(Brief communication on presence of well-preserved leaves of fern plant fossil Meniscium proliferum from Late Miocene-Pliocene Upper Palembang Fm tuffs at Sungi Tjaban in Minyak Itam oilfield. No figures)

Clure, J. (1991)- Spreading centres and their effect on oil generation in the Sunda Region. Proc. 20th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 37-49.
(High-T spreading centre subducted beneath Sumatra, making cool area warmer. Indian Ocean crustal thickness thickens away from spreading centres, affecting Sunda Craton thermal regimes as spreading centres collided with craton. Wharton Ridge paleo-spreading centre collided with Sumatran subduction zone and created ridge/trench triple junction. Collision of Sunda Craton and W Sumatran spreading centre results in parts of trench with thinner crust and certain locations to be hotter. Outer arc basins usually considered non-prospective due to low thermal gradients caused by extra thickness of crust, but areas where spreading centre collides will only be slightly greater than one plate thick and warmer, increasing petroleum potential)

Clure, J. (2005)- Fuel resources: oil and gas. In: A.J. Barber, M.J. Crow & J.S. Milsom (eds.) Sumatra- geology, resources and tectonic evolution, Geol. Soc., London, Mem. 31, p. 131-141.

Clure, J. & N. Fiptiani (2002)- Hydrocarbon exploration in the Merang Triangle, South Sumatra Basin. Proc. 28th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 803-824.
(Merang Triangle, S of Jambi, limited exploration. Talang Akar Fm production in Gelam Field in Baturaja carbonates and further stratigraphic potential highlighted. Plio-Pleistocene Sembilang High structural uplift

resulted in erosion of thousands of feet. Uplift associated with regional tilt to SE, causing possible re-migration. Recent faulting broke up carbonate complex and off-reef platform facies now structurally higher than original reef crest, which resulted in earlier drilling missing build-up)

Collins, J.F. & R. Barton (1994)- Arun gas field and LNG plant, geology of the petroliferous North Sumatra Basin. AAPG, Pre-Conference Field Trip, p. 47-62.

Collins, J.F., A.S. Kristano, J. Bon & C.A. Caughey (1996)- Sequence stratigraphic framework of Oligocene and Miocene carbonates, North Sumatra Basin, Indonesia. Proc. 25th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 267-279.
(N Sumatra Basin Late Eocene - E Miocene early rift, E Miocene N6- N8 sag. Rifting produced N-S trending subsidence with coarse clastics (Bruksah Fm) in rifts prior to P22, followed by widespread marine shales (Bampo Fm) from P22 to N4. Foraminiferal mounds accumulated on ramps and crests of some rifts, with transgressions in P22 and N4. Marine Belumai Fm late rift (N4-N6) sands from craton filled grabens. Unconformity developed above early syn-rift sediments. Sag-phase subsidence accompanied by carbonate deposition (Peutu Fm) associated with flooding events at N7 and N8. On S structures transgressive platforms (N7) overlain by coral reefs or equivalent deep-water carbonates (N8). On craton, carbonate mounds and buildups overlie thick marine sandstones. Between these areas deep-water limestones and marls)

Courteney, S., P. Cockcroft, R. Lorentz & R. Miller (eds.) (1990)- Introduction. Indonesia Oil and Gas Fields Atlas, 1, North Sumatra and Natuna, Indon. Petroleum Assoc. (IPA), Jakarta, p. 1-11, A1-A3.
(Overview of N Sumatra oil-gas fields. First discovery by Zijlker in 1885 at Telaga Said (cum. production 8.4 MMBO). Additional oil discoveries at Darat (1899), Perlak (1900), Serang Jaya (1926), Pulau Panjang (1928), Rantau (1929), Gebang (1936) and Palu Tabuhan (1937), all producing from Miocene Keutapang and Baong sands. Rantau field produced >200 MMB oil, over half of production from Keutapang- Baong play. Additional small oil fields developed in 1960's- 70's by Asamera and Pertarnina, all smaller than Rantau or Perlak. Arun giant gas field in E Miocene carbonate discovered in 1968)

Courteney, S., P. Cockcroft, R. Lorentz, R. Miller et al. (eds.) (1990)- Introduction. Indonesia Oil and Gas Fields Atlas, 3, South Sumatra, Indon. Petroleum Assoc. (IPA), Jakarta, p. 1-9, A1-A2

Courteney, S., P. Cockcroft, R. Lorentz, R. Miller et al. (eds.) (1991)- Introduction. Indonesia, Oil and Gas Fields Atlas, 2, Central Sumatra, Indon. Petroleum Assoc. (IPA), Jakarta, p. 1-15, A1-A4

Crawley, M. & D. Ginger (1998)- Depth prediction ahead of the bit: a case study from the Singa-1 discovery well, South Sumatra: Proc. 26th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, p. 251-264.
(Singa-1 Batu Raja Fm carbonate buildup prospect in Lematang PSC, S Palembang sub-basin at 3026 ms (~12,000'), >3000' deeper than previously drilled Batu Raja targets. Pre-drill depth estimates from seismic stacking velocities not accurate enough for picking casing points, so look-ahead VSP and SWD (seismic-while-drilling) employed during drilling to predict top reservoir)

Crostella, A. (1983)- Malacca Strait wrench fault controlled Lalang and Mengkapan oil fields. Proc. SE Asia Petroleum Expl. Soc. (SEAPEX) 6, p. 24-34.
(Two oil fields discovered in 1980-1981 in anticlinal structures along same N-trending left-lateral wrench fault, reservoired in Early Miocene Sihapas Group sandstones)

Dahlan, Y.I., F. Utama, D. Yudhatama, Y. Yunus & E.M.I. Kusumah (2017)- New perspectives in regaining additional hydrocarbon from near-field prospects. A study case: Irin cluster. Proc. Joint Conv. HAGI-IAGI-IAFMI-IATMI (JCM 2017), Malang, 4p.
(On Irin cluster of small E Miocene Baturaja Lst buildup prospects on Musi Platform, S Sumatra basin. Irin 1 (2013) gas-bearing with 400' of limestone reservoir with up to 28% porosity. Baturaja carbonates six stages of development: oldest in SM-1 well in W part, youngest stage in SE part of Musi platform)

Dahlan, Y.I. & Y. Yunus (2016)- Future exploration in Musi area, South Sumatra: looking for new oil in an old area. Proc. IPA 2016 Technical Symposium, Indonesia exploration: where from- where to, Indon. Petroleum Assoc. (IPA), Jakarta, 30-TS-16, p. 1-9.
(S Sumatra mature basin, with only very small prospects remaining. In Musi Platform area clusters of small E Miocene Baturaja carbonate prospects still offer potential)

Darmadi, Y., A. Harahap, R. Achdiat, M. Ginanjar & J. Hughes (2013)- Reservoir characterization of fractured basement using seismic attributes, Dayung Field case study, South Sumatra, Indonesia. Proc. 37th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA13-G-155, p. 1-12.
(3D seismic mapping of fault and fracture network in Dayung Field, Corridor Block, S Sumatra, which produced gas since 1998 from fractured and weathered Pre-Tertiary basement. Basement lithologies Permian carbonate, intruded by Jurassic granites)

Darmawan, A. & I.F. Sjamsuddin (2012)- Benakat Gulley sebagai sebuah half graben (synrift system) dan implikasinya terhadap play eksplorasi. Proc. 41st Ann. Conv. Indon. Assoc. Geol. (IAGI), Yogyakarta, 2012-E-09, p.
('Benakat Gulley as a half-graben (synrift system) and its implications for exploration play'. Benakat Gulley is NW-trending Paleogene half graben, with faulted W margin and flexure margin in E. Rift structural and stratigraphic plays proven in old fields (Kampung Minyak, Suban Jeriji, Batu Keras). W of half graben fault are carbonate and fractured basement plays. Within depocenter are sandstone lenses in Plio-Pleistocene inversion structures, on E side include onlapping Talang Akar Fm onto basement and platform and reefal carbonate)

Darmono, F.X. (1994)- Geological aspects of horizontal wells in Petani Field, Central Sumatra. Proc. 23rd Ann. Conv. Indon. Assoc. Geol. (IAGI), Jakarta, 2, p. 1160-1183.
(Petani field 1964 discovery in NW-SE trending anticline W of Duri in C Sumatra basin. Produced >293 MBO from earliest Miocene Sihapas Fm 'Menggala 3900' sand'. Start of horizontal drilling program in top of sand)

Darwis, A, S.E. Saputra & Drianto S. (2007)- Exploring in mature basins in Sumatra (Sumatera) Island, Indonesia: a historical review to challenge new idea. Abstract AAPG Ann. Conv., Long Beach 2007, 3p.
(online at: www.searchanddiscovery.net/documents/2007/07114darwis/images/darwis.pdf)
(Sumatra first discovery in 1885 Still active exploration area, particularly S Sumatra. Three producing, 3 non-producing basins)

Daulay, B. & H. Nursarya (1996)- Petrografi batubara: aplikasinya terhadap lingkungan pengendapan di daerah Bengkulu. Proc. 25th Ann. Conv. Indon. Assoc. Geol. (IAGI), 2, p. 531-541.
('Coal petrography: its application towards depositional environments in the Bengkulu area')

Daulay, B. & B. Santoso (2008)- Characteristics of selected Sumateran Tertiary coals regarding their petrographic analysis. Indonesian Mining J. 11, 1, p. 1-18.
(online at: http://jurnal.tekmira.esdm.go.id/index.php/imj/article/view/599/461)
(Type and rank variation of Ombilin and Bukit Asam Tertiary coals assessed in 170 samples. Coals dominated by vitrinite, common liptinite and rare inertinite and mineral matter. Ombilin coals not affected by contact alteration vitrinite reflectances 0.53-0.83%, Bukit Asam coals not affected by contact alteration 0.30-0.57%. Higher vitrinite reflectance of some coals result of the local igneous intrusions in both areas)

Davies, P.R. (1984)- Tertiary structural evolution and related hydrocarbon occurrences, North Sumatra Basin. Proc. 13th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, p. 19-49.
(N Sumatra along trailing edge of counterclockwise (CCW) rotating 'Sunda Microplate' in Tertiary. Eocene-Lower Oligocene high-angle convergence between Sunda and Indian-Australian Plates generated N-propagating, dextral, overstepping wrench faults along W edge of microplate. Late Oligocene CCW rotation of Sunda Microplate result of rifting in Thai and Malay basins. N Sumatra basin developed in Late Oligocene- E Miocene as horst and graben structures between reactivated dextral wrench faults along W edge of microplate. E-M Miocene uplift reactivated earlier rifted structures of N Sumatra basin, causing widespread erosion, followed by subsidence and first marine deposits. Second phase of Sunda CCW rotation in late M Miocene,

continuing to present day, caused by emplacement of oceanic crust in Andaman Sea. Renewed convergence since late M Miocene at less acute angle, causing compression, inception of subduction complex along W edge Sumatra, uplift of Barisan Mountains, and regressive sedimentation across N Sumatra basin. Evolution of N, C and S Sumatran basins essentially identical)

Davis, R.C., W.O. Ardjakusumah & I.S. Soemantri (1998)- Kinetic modeling of the Pematang-Sihapas(!) petroleum system, Malacca Strait PSC, Central Sumatra. Proc. 26th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 35-50.
(Principal and probably only source rock for Malacca PSC oil is Paleogene Pematang Group lacustrine Brown Shale Mb., mature in Bengkalis Graben. Modeling indicates discovery farthest from Bengkalis kitchen likely sourced by long distance migration (~25 km), as local sub-basin (Rangsang Trough) is immature. Other sub-basin (Padang Trough) highly mature due to very high geothermal gradient. Heating event responsible for petroleum expulsion extremely recent in C Sumatra Basin)

Dawson, W.C., W.R. Almon, J.B. Sangree & CALTEX Sequence Stratigraphy Team (2005)- Petroleum system and Miocene sequence stratigraphy: Central Sumatra Basin, Indonesia. In: P. Post et al. (eds.) Petroleum systems of divergent continental margin basins, Proc. 25th Gulf Coast Section SEPM (GCSSEPM) Foundation Annual Bob F. Perkins Research Conf., p. 987-1015.
(C Sumatra basin most prolific petroleum system in SE Asia. Oil sourced from Pematang Gp lacustrine Brown Shale in basal rift sequence, migrated vertically until thick paleosol horizon (25.5 Ma SB), then migrated to E margin of basin charging giant Minas and Duri fields. Erosional truncation (incised valley development) of paleosols and faults provided windows for migration into overlying Miocene Sihapas Gp sandstone reservoirs. Incision common at 25.5, 22, 21, and 17.5 Ma sequence boundaries. Oil accumulated preferentially in basal transgressive sandstones. ~80% of recoverable oil in lower 21 Ma sequence (Bekasap Fm estuarine sst). Marine sandstones in 16.5 and 15.5Ma sequences, but fine-grained and low permeability. Regional top seal for Sihapas reservoirs is Telisa Gp shales of maximum Miocene transgression. Small oil accumulations in underlying Pematang Gp alluvial-fluvial- lacustrine sandstones poor reservoir and sealed by paleosols)

Dawson, W.C. & T.H. Tankersley (1997)- Incised valley sandstone reservoirs: Kotabatak Field, Central Sumatra basin, Indonesia- case example. In: K.W. Shanley & B.F. Perkins (eds.) Shallow marine and non-marine reservoirs, Proc. 18th Gulf Coast Section SEPM (GCSSEPM) Foundation Annual Bob F. Perkins Research Conf., Houston, p. 81-91.

De Beaufort, L.F. (1925)- Het voorkomen van een osteoglosside visch in het Tertiair van Sumatra. Verhandelingen Geologisch-Mijnbouwkundig Genootschap Nederland Kol., Geol. Serie 8 (Verbeek volume), p. 49-52.
('The occurrence of an osteoglossid fish in the Tertiary of Sumatra'. Discussion of Eocene fresh water bone- fish in C Sumatra, collected by Verbeek and Tobler. Fauna described in more detail by Sanders 1934)

De Bruijn Kops, G.F. (1853)- Tocht naar de Reteh Rivier ter onderzoeking van steenkolenlagen. Natuurkundig Tijdschrift Nederlandsch-Indie 4, p. 611-626.
('Trip to the Reteh River to investigate coal beds'. Mainly travel log of trip in 1849 to Reteh River (between Jambi and Indragiri rivers) Sumatra E coast, where, after 5 days sailing from Kota Baru, up to 4' thick coals exposed in river bank)

De Choudens-Sanchez, V. & S. Danudjaja (2013)- Impact of depositional facies on the spatial distribution of reservoir quality in the Batu Raja carbonates of the Corridor Block, South Sumatra. Proc. 37th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA13-G-105, p. 1-12.
(Porosity in E Miocene Batu Raja Fm carbonates of S Sumatra primarily controlled by facies related primary porosity, locally enhanced by enhanced by secondary porosity, developed in phreatic environment as result of periodic sub aerial exposure. Batu Raja carbonates in study area developed in three major isolated platforms)

De Coster, G.L. (1974)- The geology of the Central and South Sumatra basins. Proc. 3rd Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, p. 77-110.

(Overview of C and S Sumatra Tertiary basins structure, stratigraphy, paleogeography by Stanvac geologist)

De Greve, W.H. (1871)- Het Ombilin-kolenveld in de Padangsche Bovenlanden en het transportstelsel op Sumatra's Westkust. Landsdrukkerij, The Hague, p. 1-155.
('The Ombilin coalfield in the Padang Highlands and the transportation system of the Sumatra West coast'. By mining engineer de Greve, credited with discovery of the Ombilin coalfield near Sawahlunto in 1868)

Deibert, D.H. (1961)- Geophysical exploration in Sumatra. Contrib. Dept. Geology Inst. Technology Bandung 43, 9p
(Brief Caltex paper on C Sumatra seismic acquisition)

Den Berger, L.G. (1923)- Fossile houtsoorten uit het Tertiar van Zuid-Sumatra. Verhandelingen Geologisch-Mijnbouwkundig Genootschap Nederland Kol., Geol. Serie 7, 2, p. 143-148.
('Fossil wood species from the Tertiary of South Sumatra'. Brief comments on identifications of Krausel (1922))

De Smet, M.E.M. & A.J. Barber (2005)- Tertiary stratigraphy. In: A.J. Barber, M.J. Crow & J.S. Milsom (eds.) Sumatra- geology, resources and tectonic evolution, Geol. Soc., London, Mem. 31, chapter 7, p. 86-97.
(During Late Cretaceous all of Sumatran basement exposed to erosion. In Eocene parts covered by shallow seas with platform carbonates. Widespread Late Eocene- E Oligocene rift basins, separated by mainly N-S trending horsts, coinciding with collision of India with S margin of Asian continent. Latest Oligocene onset of regional sediment source areas and broad depositional areas, sourced from N later also from Barisan Mts. From M Miocene onwards uplift of Barisan Mts and forearc island areas, coinciding with early inversion of basin sediments and onset of activity of Sumatran Fault System)

Direzza, A., S.S. Surjono & E. Widianto (2011)- Analisis stratigrafi seismik endapan syn-rift area Lembak, cekungan Sumatera Selatan: preliminary study for underexplored area. Proc. Joint 36th HAGI and 40th IAGI Ann. Conv., Makassar, JCM2011-190, 8p.
('Seismic stratigraphic analysis of syn-rift deposits in the Lembak area, South Sumatra basin' Alluvial-fluvial-lacustrine facies interpreted from seismic in half-graben in SE part S Sumatra basin)

Djamaoeddin, A. (2003)- Sedimentology, sequence stratigraphy and reservoir geology of Bangko and upper Menggala (lower Miocene) sandstones, Petani Field, Central Sumatra Basin, Indonesia. M.Sc. Thesis University of Colorado, p. 1-226. *(Unpublished)*
(Study of sequence stratigraphy and facies distribution of E Miocene Bangko and U Menggala Fms in Petani field, C Sumatra. Nine lithofacies. Four facies associations interpreted from facies analysis of cores (1) tidal estuarine channel, (2) tidal estuarine bar, (3) tidal flat and (4) shallow marine shelf or prodelta. Deposited within overall transgressive tide-dominated estuarine system. Third-order sequence boundaries at bases of Menggala 3860' and Bangko 3680' sands)

Djamil, H. (1988)- Reservoir description of the Arun limestone in the Arun OBS-2 (A64) well. Proc. 17th Ann. Conv. Indon. Assoc. Geol. (IAGI), Jakarta, p. 87-97.
(Giant Arun gas field discovered in 1971, in N coast of Aceh. Reservoir Miocene NNW-SSE trending reefal limestone buildup in Arun/ Cunda High, 18.5 x 5km in size, thickness up to 1200'. 12 subunits, with best porosity (av. 17.6%) and permeability (av. 75mD) in lagoonal Unit 6 and reefal Unit 8. Reef thickest and most reefal facies in South (windward side?))

Du, Naizheng (1988)- On some silicified woods from the Quaternary of Indonesia. Proc. Kon. Nederl. Akademie Wetenschappen B 91, p. 339-361.
(Two specimens of silicified wood from Quaternary of S Sumatra identified as being similar to modern plants Shorea negrosensis (Dipterocarpaceae) and Lagerstroemia colletti (Lythraceae) and named as new species Shoreoxylon sumatraense and Lagerstroemioxylon benkoelense)

Dufour, J. (1957)- On regional migration and alteration of petroleum in South Sumatra. Geologie en Mijnbouw 19, 5, p. 172-181.

(online at: https://drive.google.com/file/d/0B7j8bPm9Cse0NkY0QU1ZX3NIT2s/view)
(Well-developed E Miocene basinal shale facies most likely source rock in S Sumatra Basin. Two oil groups: (1) paraffin base; restricted to Lower Miocene sandstone at E margin of basin, bordering Sundaland; (2) light paraffin base oil, mainly in younger Neogene in center of basin. Difference in composition related to migration in different periods)

Dwiyanti, R., J. Prosser & R. Sosrohadisewoyo (2001)- Integrated lithofacies characterization within carbonates of the Baturaja Formation, Soka Field, using borehole image data and conventional cores. Proc. 28th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 643-663.
(Soka oil field recent Medco discovery in central part of Musi Platform, S Sumatra, an area known for gas production from E Miocene Baturaja Fm limestone buildups. Soka 1 170' of gas column. Field on S rim of NE-SW trending Pre-Tertiary high (Bungur High), composed of metavolcanics. Within limestone reservoir several upward shoaling successions; highly variable reservoir quality)

Edwards, T. (2000)- Life in old oil fields: Arahan-Banjarsi Fields, South Sumatra. SEAPEX Press 3, 5, p. 12-17.

Ekaninggarani, F. & K. Aprianto (2011)- Define clastic stratigraphic play on 2D seismic data with field analogy and geological concept. Proc. Joint. 36th HAGI and 40th IAGI Ann. Conv., Makassar, JCM2011-154, 11p.
(On stratigraphic plays in S Sumatra basin. Ibul Field in Talangakar Fm distributary channel sand is proven stratigraphic trap with reserves of 25 MMBOE. Kalidua area N of Ibul Field may have similar traps potential)

England, T.D.J., G. Hollomon, W. Ramadan, C. Tiranda, J. Sykora & G. Begg (2015)- Drilling the unconventional giant in the Sumatran Deep. Proc. SE Asia Petroleum Expl. Soc. (SEAPEX) Conf. 2015, Singapore, 3.3, p. 1-4. *(Extended Abstract + Presentation)*
(Significant tight oil and gas potential in Eocene-Oligocene syn-rift source rocks in petroleum basins of Sumatra)

Eubank, R.T. & A.C. Makki (1981)- Structural geology of the Central Sumatra back-arc basin. Proc. 10th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, p. 153-194.
(Key paper on C Sumatra back-arc basin and hydrocarbons by Caltex. Newly described type of fold, Sunda fold. Basin with very high T gradient of 3.38°F/ 100'. Kerumutan Line separates Pre-Tertiary oceanic Mutus Assemblage of deep water chert, clastics and thin limestones and basalts in SW (possibly equivalent to M-L Triassic Kuala Fm of Malay Peninsula) from quartzitic continental crust in NE. Greywacke terrane SW of Mutus (Bohorok Fm). Seven wells in coastal plain with M Miocene basalt/ gabbro intrusives (~17-12 Ma))

Everwijn, R. (1860)- Onderzoek naar kolen in de Residentie Palembang. Natuurkundig Tijdschrift Nederlandsch-Indie 21, p. 81-88.
('Investigation into coals in the residence Palembang'. Early 'Mijnwezen' survey of Miocene coal near Bali Bukit and Lematang River near Lahat, S Sumatra. Deemed to be poor quality lignite, less valuable than Borneo coals. Also oil seeps S of Bali-Bukit)

Everwijn, R. (1867)- Verslag van een onderzoekingsreis in het rijk van Siak. Natuurkundig Tijdschrift Nederlandsch-Indie 29, p. 289-358. *(also in Jaarboek Mijnwezen Nederl. Oost Indie 1874, 1, p. 83-155)*
(online at: www.biodiversitylibrary.org/item/48369#page/823/mode/1up)
('Report on a reconnaissance trip in the state of Siak', Sumatra. Mainly travel history of journey into Siak River area of Central Sumatra basin, upstream of Pakanbaru. Incl. mention of small tin mining operations near Kotah-renah, along Pingier and Lauw creeks and tributaries. Tin associated with granite outcrops)

Everwijn, R. (1873)- Onderzoek van Sumatra kolen en vergelijking van deze met andere koolsoorten. Jaarboek Mijnwezen Nederlandsch Oost-Indie 2 (1873), 1, p. 203-219.
('Investigation of Sumatra coals and comparison with other coal types')

Everwijn, R. (1876)- Het voorkomen van aardolie in het rijkje Perlak. Sumatra's Oost. Jaarboek Mijnwezen Nederlandsch Oost-Indie 5 (1876), 1, p. 186-187.
('The occurrence of oil in Perlak, Sumatra East coast'. Brief report on oil seep, with continuous gas bubbles one hour from Rantau Panjang, E coast of Aceh, N Sumatra, from which locals collect ~146 liters/ day and used for lamp oil)

Everwijn, R. (1876)- Over nieuwe vindplaatsen van kolen in de assistent-residentie Bengkoelen. Jaarboek Mijnwezen Nederlandsch Oost-Indie 5 (1876), 2, p. 223-241.
('On new localities of coal in the Bengkulu province')

Everwijn, R. (1879)- Onderzoek naar kolen in de Residentie Palembang. Jaarboek Mijnwezen Nederlandsch Oost-Indie 8 (1879), 2, p. 163-171.
(Reprint of Everwijn (1860))

Fahmi, M. (2010)- Sequence stratigraphy of shallow-water deposits in the Sihapas Group, Northwest Central Sumatra Basin. AAPG Hedberg Conference, Jakarta 2009, Search and Discovery Art. 50254, 6p.
(online at: www.searchanddiscovery.com/documents/2010/50254fahmi/ndx_fahmi.pdf)
(Extended Abstract. Five transgressive-regressive sequences identified in shallow-water Sihapas FM in NW part of C Sumatra Basin. Depositional environments from fluvial to offshore marine/shelf. SW-ward prograding sandy delta front/shoreface-belts)

Fardiansyah, I., E. Finaldhi, S. Graha, M.I.S. Harris & A. Susianto (2017)- Early Miocene paleogeography of Central Sumatra Basin: impact on reservoir quality and distribution of the Upper Sihapas Group, Rokan Block. Proc. 41st Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA17-577-G, 19p.
(Updated E Miocene (17.5-22 Ma) depositional models of Bekasap and Bangko, Duri, Lower Telisa Fms in C Sumatra Basin. U Sihapas Gp deposited during marine transgression. Sediment source mainly Malayan Shield to NE, resulting in NE to SW depositional trend. Two major feeder systems controlled sedimentation in C Sumatra Basin, resulting in two major deltas in m-u Early Miocene (best reservoir quality))

Fatchur, M. & M. Irfani (1991)- Perkembangan ñbarrier barò pada batupasir Formasi Keutapang bawah daerah Aru, cekungan Sumatera Utara. Proc. 20th Ann. Conv. Indon. Assoc. Geol. (IAGI), p. 206-230.
('Barrier bar' environment for the Lower Keutapang Fm sandstone, Aru area, N Sumatra basin')

Fathan, H.U., S.M. Tarigan, E. Sutriyono & A. Tarigan (2017)- The Neogene depositional history of Lemau and Bintunan Formations in Bengkulu Basin. Proc. Joint Conv. HAGI-IAGI-IAFMI-IATMI (JCM 2017), Malang, 5p.
(Facies study of Miocene- Pliocene clastic deposits in N Bengkulu Basin)

Fatimah (2009)- Mineralogy and organic petrology of oil shales in the Sangkarewang Formation, Ombilin Basin, West Sumatra, Indonesia. Masters Thesis University of New South Wales, p. 1-150.
(online at: http://unsworks.unsw.edu.au/fapi/datastream/unsworks:8782/SOURCE02?view=true)
(Oil shale deposits in Paleocene-Eocene Sangkarewang Fm of Ombilin Basin)

Fatimah (2016)- Studi awal potensi batubara Muaraenim untuk dikonversi menjadi bahan bakar cair berdasarkan karakter batubara. Bul. Sumber Daya Geologi 11, 3, p. 158-172.
(online at: http://buletinsdg.geologi.esdm.go.id/index.php/bsdg/issue/archive)
('Preliminary study of Muaraenim coal liquefaction potential based on coal characteristics'. Muara Enim coal of S Sumatra good potential to be converted into liquid fuel)

Fatimah & C.R. Ward (2009)- Mineralogy and organic petrology of oil shales in the Sangkarewang Formation, Ombilin Basin, West Sumatra, Indonesia. Int. J. Coal Geology 77, p. 424-435.
(Significant oil shale deposits in Late Eocene- E Oligocene lacustrine shales of Sangkarewang Fm, intercalated with thin laminated calcareous sandstones. Organic matter in oil shales dominated by liptinite, particularly alginate (mainly lamalginite) and sporinite. Dominance of lamalginite in liptinite suggests material is lamosite.

Vitrinite reflectance 0.37- 0.55%, lower than overlying Sawahlunto Fm coal (0.68%). Algal abundance associated with carbonate deposition)

Fennema, R. (1885)- Verslag van het onderzoek van het kolenterrein rondom den Boekit Soenoer, in de Ommelanden van Bengkoelen. Jaarboek Mijnwezen Nederlandsch Oost-Indie 14 (1885), Technisch Admin. Ged., p. 5-66.
('Report on the coal terrains around Bukit Sunur in the Bengkulu region'. Early evaluation of Miocene coal deposits in Bukit Sunur area, ENE of Bengkulu town, W Sumatra. With 1:20,000 geologic map and 2 geologic cross-sections. Oldest rocks in area andesites and rhyolites, overlain by Miocene deposits largely derived from these volcanics and with many outcrops of up to 4.5m thick coal seams. Also post-Miocene andesite intrusives and sills (e.g. Bulit Kandis). Coal seams mainly in E part of area. Mining of coal here deemed uneconomic)

Fennema, R. (1890)- Rapport over het voorkomen van petroleum in Beneden-Langkat, Oostkust van Sumatra. Jaarboek Mijnwezen Nederlandsch Oost-Indie, 1890, Technisch Admin. Ged. 2, p. 10-91.
('Report on the occurrence of petroleum in the lower Langkat, E coast of Sumatra'. Indies government survey with some drilling in 1886 lead to founding of the 'Koninklijke Maatschappij tot exploitatie van petroleum-bronnen in Nederlands Indie', which later became part of 'Royal Dutch/ Shell')

Ferdyanto, G., E. Sunardi & Ismawan (2003)- Analysis of sequence stratigraphy, Lemat Formation to Gumai Formation, GN Field, South Sumatra Basin. Proc. 29th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 1-13.
(Basic paper; few specifics; no field location, not real field name ?)

Feriyanto, F. Kamil, Y. Kusnandar & Y. Yanto (2005)- Successful identification of thin carbonate on paleo-basement high: special case in Palembang High, South Sumatra Basin. Proc. 30th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 91-100.
(On seismic recognition of thin Baturaja Fm buildups on Palembang High, S Sumatra)

Finaldhi, E., I. Fardiansyah, E.H. Sihombing, R. Waren, F. Fitris, H. Semimbar, S. Graha, A.F. Talib & W.R. Paksi (2016)- Reservoir potential of axial fluvial delta vs alluvial fan delta in syn-rift lacustrine: a modern study in Lake Singkarak, Sumatra. Proc. 40th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA16-176-G, 22p.
(Lake Singkarak Sumpur axial fluvial delta and Malalo alluvial fan delta systems analog for Paleogene syn-rift lacustrine reservoir rocks in W Indonesian basins)

Finger, K.L. & W.S. Drugg (1992)- Microfossils as indicators of deltaic subenvironments, Minas Field, Central Sumatra. Proc. 21st Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 225-237.
(Depositional environments of E Miocene Bekasap Fm interpreted as fluvial delta plain to distal delta front or prodelta. Biotic distributions controlled primarily by salinity and pH gradients. Association of large coastal foraminifera with minute deeper water forms implies shoreward transport of latter and supports concept of tide-dominated Bekasap delta)

Firmansyah, D.A., A. Rifai, S. Yudho, A. Kamal & R.M.I. Argakoesoemah (2007)- Exploring shallow prospects in Iliran Basement High, South Sumatra Basin. Proc. 31st Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA07-G-141, 10p.
(Hydrocarbon exploration in Iliran High region since early 1900s, when heavy oil was produced from shallow wells around asphalt, oil and gas seeps. Down flank discoveries W Iliran and S Tabuan in 1980s. Iliran High remained high since Late Oligocene and focal point for hydrocarbon migration since Late Miocene. Plio-Pleistocene tectonics resulted in tilting to SW. Three exploration plays: crest-structure, down-flank, and fractured basement. Prospects all < 2500', and seal highest risk)

Fitriana, B.S., M.F. Mustofa & H.J. Sutrisno (2017)- BDA-1 well: fractured play discovery in the southern part of South Sumatra Basin. Proc. 41st Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA17-358-G, 12p.
(Bandar Agung (BDA)-1 exploration well drilled in 2014 in W of Ogan Komering block, S Palembang sub-basin, S Sumatra Basin, tested thermogenic gas (3.4 MMSCFD) and condensate (73.3 BCPD of 54.7° API) from

fractured basement. Well penetrated >100m of fractured basalt with minor granodiorite and marble, underlain by ~25m of non-fractured phyllite. Basement part of Mutus Assemblage)

Fitrianto, T., H.N. Saputra, B. Syam & A.H. Purwanto (2012)- The origin, distribution and prediction of CO2 in South Sumatra, a case study: Jabung Block and surrounding area. Proc. 36th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA12-G-025, p. 1-10.
(Several gas discoveries in S Sumatra Jabung, South Jambi and Corridor Blocks contain 40-90% CO2 or more. Carbon isotopes in Jabung area suggest origin of CO2 mainly from inorganic mantle degassing, with minor contribution from thermal breakdown of kerogen and carbonate)

Fletcher, G. & Yarmanto (1993)- Post-Convention fieldtrip 1993- Ombilin Basin, West Sumatra. Indon. Petroleum Assoc. (IPA), Jakarta, p. 1-71.
(Outcrop geology of Tertiary intra-montane Ombilin Basin in Barisan Mountains of W Sumatra)

Ford, C. (1985)- Tales from the files: an historical perspective of oil exploration in Sumatra. Proc. 14th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, p. 401-403.

Fuse, A., K. Tsukada, W. Kato, H. Honda, A. Sulaeman, S. Troyer, L. Wamsteeker, M. Abdullah, R.C. Davies & P. Lunt (1996)- Hydrocarbon kitchen and migration assessment of North Aceh Offshore Basin, North Sumatra, Indonesia from views of sequence stratigraphy and organic geochemistry. Proc. 25th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 15-28.
(Hydrocarbon generation and migration pathways evaluated for the deep-water N Aceh Offshore Basin. Best source-rock is the transgressive marine Bampo mudstone (P21 to N4), which is primarily gas-prone. Migration pathway map defined three migration fairways from the North Lho Sukon Deep to its peripheries)

Galushkin, Y.I. & A. Mardianza (2014)- Change in the degree of catagenesis and hydrocarbon generation in the sedimentary rocks of the South Sumatra Basin, Indonesia. Geochemistry Int. 52, 8, p. 643-653.
(Oligocene- Recent 2D burial and thermal history modeling of Limau Graben wells Pandan 81, Petanang 1, Tepus 1,2, Gambir 1, Lembak 8. Suggests significant cooling of basement for last 15-20 Ma and significant heating of basin lithosphere in last 2-5 Ma. Talang Akar Fm oil-generating, probably except for upper horizons in shallowest portions of graben (Lembak 8). Oil generation peaked in last 5-10 Ma)

Gandapradana, M.T., K. Meninta & S.M. Gomaa (2014)- Shale in Telisa Formation, Central Sumatera Basin as a prospective shale gas resource based on geochemical data analysis. In: Second EAGE/SPE/AAPG Shale Gas Workshop in the Middle East, Dubai, 4p. *(Extended Abstract)*
(E-M Miocene Telisa Fm in C Sumatra basin 400-870' thck, TOC range 3.1- 14.8%, considered to be area with good-excellent gas generation potential. Organic matter categorized as oil/gas prone-type II kerogen, dominated by alginite and liptinite)

Gani, R.M.G. & Y. Firmansyah (2017)- Analisis skema pengendapan Formasi Pematang di sub-cekungan Aman Utara, cekungan Sumatera Tengah sebagai batuan induk. Bull. Scientific Contr. (UNPAD) 15, 1, p. 9-15.
(online at: http://jurnal.unpad.ac.id/bsc/article/view/11773/pdf)
('Analysis of the deposition of the Pematang Formation in the North Aman sub-basin, Central Sumatra basin as the source rock'. Brown Shale Fm and Lower Red Bed Formation of Pematang Gp good source rock potential)

Ginger, D. & K. Fielding (2005)- The petroleum systems and future potential of the South Sumatra basin. Proc. 30^{th} Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, p. 67-89.
(S Sumatra Basin mixed terrigenous, volcaniclastic and carbonate fill. Five main plays: Pre-Tertiary fractured basement, Oligocene-E Miocene (Lower Talang Akar Fm) fluvio-deltaic sandstones, E Miocene (Batu Raja Fm) carbonates and E Miocene (Gumai Fm) and M Miocene (Air Benakat Fm) shallow marine sandstones. Oligocene- E Miocene age lacustrine and deltaic source rocks. Pinch-out of Oligocene and Miocene regional seals limit prospectivity on E side of basin. Cumulative oil production >2 BBO, original gas reserves 22 TCF, with <6 TCF produced. Undiscovered 6-10 TCF of gas and 0.2- 0.5 MMB oil in proven plays)

Gluyas J. & N. Oxtoby (1995)- Diagenesis: a short (2 million year) story- Miocene sandstones of Central Sumatra, Indonesia. J. Sedimentary Res. A65, p. 513-521.
(Cementation of Miocene Sihapas Fm sands different in two adjacent oilfields: shallow Melibur Field (300 m) uncemented, deeper Kurau Field (1430 m) has common quartz and illite cement, reducing porosity from 30 to 20%. Cementation believed to have taken place in last 2 My. Conclusion disputed by Wilkinson et al. 1998)

Gough, A. (2015)- Understanding the poorly-exposed Lahat and Lemat Formations of the South Sumatran Basin using an outcrop analogue study. Asia Petrol. Geoscience Conf. Exhib. (APGCE), Kuala Lumpur, 25827, 5p. *(Extended Abstract)*
(Cutler Gp of Paradox Basin, U.S.A., can be used as analogue to poorly exposed Eocene- Oligocene Lahat and Lemat Fms of S Sumatra. No data on Sumatra formations)

Gramberg, J.S.G. (1865)- Over aardolie van Palembang. Natuurkundig Tijdschrift Nederlandsch Indie 28, 6, 3, p. 467-471.
('On petroleum of Palembang'. First description by ship surgeon Gramberg of three oil seeps near Karang Raja along Lematang river, S of Muara Enim, S Sumatra)

Gramberg, J.S.G. (1869)- De petroleum-bronnen van Palembang. De Economist 18, 1, p. 1-16.
('The petroleum seeps of Palembang')

Graves, R.R. & A.A. Weegar (1973)- Geology of the Arun Gas Field, North Sumatra. Proc. 2nd Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, p. 23-51.
(Arun gas-condensate field 225 km NW of Medan in large N-S trending, E-M Miocene reefal carbonate buildup. Depth to crest ~9400' subsea. Arun Limestone thickness ~200' offreef to maximum 1100-1200' at buildup.)

Gsell, R. (1930)- Geologische Untersuchungen in der Umgebung von Batoeradja. BPM Report, p. *(Unpublished)*
('Geological investigations in the Baruraja region', S Sumatra)

Gumert, W.R., V. Gratero & F. Fanani (2003)- The Central Sumatra airborne gravity and magnetic survey; an example of the usefulness of an aerogravity survey and the application of geologically constrained gravity interpretation. Proc. 32nd Ann. Conv. Indon. Assoc. Geol. (IAGI) and 28th Ann. Conv. HAGI, Jakarta, 13p.
(Results of airborne gravity- magnetic survey and modeling over Kondur Petroleum Malacca Strait Block. Study confirms N-S and NW-SE oriented Tertiary basins, connected by major strike slip faults. Basins bound by normal faults, small rift basins with small inversions in central parts)

Gunther, A. (1876)- Contributions to our knowledge of the fish-fauna of the Tertiary deposits of the Highlands of Padang, Sumatra. Geol. Magazine, Decade 2, 3, p. 433-440.
(First description of Eocene or younger fresh-water fish fauna of Ombilin Basin, Padang Highlands. Collected by Verbeek in 1874. Nine genera, including new species Auliscops sumatranus, Pseudeutropius verbeekii, Bagarius gigas, etc. With 5 plates. See also Von der Marck 1876, Rutimeyer 1880, Sanders 1934, Musper 1935)

Gunther, A. (1878)- Contributions to our knowledge of the fish-fauna of the Tertiary deposits of the Highlands of Padang, Sumatra. Jaarboek Mijnwezen Nederlandsch Oost-Indie 7 (1878), 1, p. 171-184.
(Reprint of Gunther (1876))

Guntur, A., S. Hastuti, B. Situmorang & B. Yulihanto (1993)- Studi fasies dan batuan asal formasi Sawahtambang cekungan Ombilin, Sumatra Barat. Proc. 22nd Ann. Conv. Indon. Assoc. Geol. (IAGI), Bandung, 2, p. 1028-1043.
('Study of facies and source rocks of the Sawahtambang Fm, Ombilin Basin, W Sumatra'. Late Oligocene Sawahtambang Fm lithics rich, of 'Recycled Orogen'-type provenance)

Guntur, A., R.S. Himawan & B. Situmorang (1992)- Pembentukan dan evolusi terban Paleogen Talawi Cekungan Obilin, Sumatera Barat. Proc. 21st Ann. Conv. Indon. Assoc. Geol. (IAGI), Yogyakarta, 2, p. 565-584.
('The formation and evolution of the Paleogene Talawi Graben, Ombilin Basin, West Sumatra'. Formation of Talawi graben in W Ombilin basin controlled by dextral strike-slip of NW-SE Sitangkai and Silungkang faults. Strike-slip system active since Cretaceous)

Gutomo, A. & M.B. Satyawan (1995)- Development concept of Rantau Field based on 3-D seismic data. Proc. 24th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 2, p. 583. *(Abstract only)*
(Mature Pertamina Rantau field (originally discovered by BPM in 1929) NW-SE trending anticline in Tamiang Deep, N Sumatra. 53 productive layers between 200-1400m depth in deltaic sands of Seureula and Keutapang Fms. 550 wells drilled. Remaining reserves based on 3D seismic study estimated 324 MMBO)

Guttormsen, J. (2010)- Naturally fractured basement reservoirs: using South Sumatra to characterize the challenges of exploring and exploiting fracture basement reservoirs. Proc. 34th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA10-G-183, 15p.
(Data from S Sumatra fracture basement reservoirs of Suban, Sumpal, and Dayung gas fields. Fractured reservoirs include granite, Permian meta-limestone (Leko), quartzites and pelitic rocks (phyllites and schists). In S Sumatra metasediments dominant reservoir lithology, but better test rates in granites and meta-carbonates)

Guttormsen, J., R. Achiat, R. Indrawan & R. Waworuntu (2009)- Phyllitic fractured reservoirs of Southern Sumatra. Proc. 33rd Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA09-G-149, p. 257-272.
(Major accumulations of hydrocarbons in fractured metasedimentary reservoirs in S Sumatra Basin. Basement composed of Permian- Cretaceous sediments, intruded by felsic magmas)

Haanstra, U. & E. Spiker (1932)- Uber jungneogene Molluskenfaunen aus den Residenzen Benkoelen und Palembang, S.W. Sumatra. Proc. Kon. Nederl. Akademie Wetenschappen, Amsterdam, 35, 10, p. 1313-1324.
(online at: www.dwc.knaw.nl/DL/publications/PU00016359.pdf)
('On Late Neogene mollusc faunas from the Bengkulu and Palembang Residencies, SW Sumatra'. Molluscs from Bengkulu area collected by Erb in 1902 along coast between Bengkulu and Krue (72 species, 36% Recent, suggesting Late Neogene age), and from Lower Palembang Fm at Talang Akar anticline N of Talang Abab, Palembang Province (50 species, 26% Recent, suggesting Miocene age))

Habrianta, L., G. Matthew, F. Fakhrurozi, D. Auliansyah & I.P. Andhika (2018)- A semi-regional play analysis of the Ombilin basin to understand the tectono-stratigrapic framework and identification of potential exploration opportunities. Proc. 42nd Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA18-482-G, 22p.
(Review of Ombilin intermontane rift basin (half-graben) in W Sumatra)

Hada, F.S, M., M. Rizki A. Rahmat, C. Wibowo, D.H. Amijaya & A.A. Aspari (2015)- Parasequence concepts, problems and solutions in CBM exploration using seismic data case study: Muara Enim Formation, South Sumatra Basin. Proc. 39th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA15-G-099, 10p.
(Seismic study of coal distribution in Late Miocene- Pliocene Muara Enim Fm in Suban Block of C Palembang Basin, S Sumatra. Six coal seams identified in five zones (parasequences). Thickest seam named D1 is 17.2 m thick. Overall upward-increase in sand-shale ratio)

Hadi, T. & B. Simbolon (1976)- The carbonate rocks of the Batu Raja Formation in its type locality, Batu Raja, South Sumatra. Proc. Carbonate Seminar, Jakarta 1976, Indon. Petroleum Assoc. (IPA), Spec. Vol., p. 67-78.
(Baturaja Fm in Baturaja area of S Sumatra bedded limestones in lower, massive limestones in upper part. Texture of limestones varies from boundstone to wackestone and wacke-packstone, suggesting depositional environments from open shoal reef, fore reef, transition to open basin to open littoral back reef)

Hadiana, M. (2014)- Mekanisme rifting Paleogen Cekungan Sumatra Tengah. Ph.D. Thesis Inst. Teknologi Bandung (ITB), p.

('Paleogene rifting mechanism of the Central Sumatra Basin'. C Sumatra Basin Paleogene rifting result of dextral strike slip, mainly controlled by pre-existing basement faults. Modeling suggest synrift extension of 7.5% at end of Lower Red Bed Fm deposition, 13% for Brown Shale Fm and 15% for Upper Red Bed Fm)

Hadiyanto (1992)- Organic petrology and geochemistry of the Tertiary formations at Meulaboh area, West Aceh Basin, Sumatera, Indonesia. Ph.D. Thesis, University of Wollongong, Australia, p. 1-219.
(online at: http://ro.uow.edu.au/theses/1397/)
(Onshore Meulaboh forearc basin with thick succession of Oligocene-Pliocene coal-bearing sediments. Coal and clastic rocks potential source rocks but mostly immature and have not produced significant liquid hydrocarbons. Late Oligocene- E Miocene Tangla Fm shales and M Miocene Kueh Fm best source rocks. Oligocene coal and possibly Miocene coal good hydrocarbon generation potential. Onshore vitrinite reflectance gradients greater than offshore, so oil window predicted to be shallower onshore)

Hahn, L. (1981)- The Tertiary deposits of West Central Sumatra. Geol. Jahrbuch B47, p. 41-53.
(W Central Sumatra (Ombilin basin area) Tertiary composed of Oligocene Breccia-marl formation, Oligo-Miocene Quartz sst Fm and Mio-Pliocene Telisa and Palembang Fms. Bituminous marl at base Breccia-Marl Fm with abundant freshwater fish fauna)

Hakim, F., C. Elders & B. September (2006)- Dextral shear induced inversion of the North Sumatra basin, Indonesia.Proc. Jakarta 2006 Int. Geosc. Conf. Exhib., Indon. Petroleum Assoc. (IPA), Jakarta06-PG-22, 6p.
(Extended Abstract. N Sumatra N-S trending basin formed during Late Oligocene- E Miocene rifting. Second extension phase affected Late Miocene and Pliocene, coincident with Pliocene folding. Topaz Anticline growth began in Late Miocene. Main phase of fold activity Late Pliocene to Early Pleistocene).

Hakim, F., M. Gunarto, M. Sompie & S. Raharjo (2014)- Bireun High Complex, a rejuvenated carbonate province in offshore North Sumatra Basin. Proc. 38th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA14-G-177, 15p.
(Bireun High is N-S trending horst block in in Lhokseumawe Block, offshore N Sumatra Basin (formerly called Peusangan High, Western High, etc.). Presence of E Miocene Peutu Fm carbonates initially proven by Mobil Peusangan wells and more recently by Tately 2012 exploration well Jayarani JR-1 (with 3' of gas pay in 150' thick tight carbonate reservoir, rich in planktonic foraminifera suggestive of deeper water facies))

Hakim, M.R., M. Faris & M. Yordan Y.N. (2007)- Hydrocarbon play in North Sumatera basin and sequence stratigraphy application on Keutapang reservoir formation based on well logs data. Proc. 31st Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA07-SG-006, 11p.

Hambali, H. & P. Dolan (1990)- Melibur Field: an integrated approach to reservoir development. Proc. 19th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, p. 141-154.

Hamdani, A.H. (1989)- Regional structural setting and stratigraphy of the Ombilin Basin. In: T. Thanasuthipitak & P. Ounchanum (eds.) Int. Symposium on Intermontane basins: geology and resources, Chiang Mai, p. 399-408.

Handayani, R.S.W., D. Setiawan & T. Afandi (2008)- Reservoir characterization of thin oil columns to improve development drilling in a carbonate reservoir: case study of Gunung Kembang Field. Proc. 32nd Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA08-E-160, 15p.
(Medco Gunung Kembang field in anticlinal structure in E Miocene Baturaja platform carbonate on Musi Platform, S Sumatra. Oil column 40', gas cap 120' thick. Cumulative oil production since 1988: 3.8 MMBO)

Harding, T.P. (1983)- Structural inversion at Rambutan oil field, South Sumatra Basin. In: A.W. Bally (ed.) Seismic expression of structural styles: a picture and work atlas, AAPG Studies Geol. 15, 3, p. 13-18.
(Rambutan oil field shows structural inversion of graben into anticlinal structure)

Hardjono & C.M. Atkinson (1990)- Coal resources in Central Sumatra. Directorate Mineral Res., Bandung, Spec. Publ. 30, p.

Haris, A., H.A. Almunawwar, A. Riyanto & A. Bachtiar (2017)- Shale hydrocarbon potential of Brown Shale, Central Sumatera basin based on seismic and well data analysis. In: Southeast Asian Conference on Geophysics, Bali 2016, IOP Conf. Series, Earth Environm. Science 62, 012018, 6p.
(online at: http://iopscience.iop.org/article/10.1088/1755-1315/62/1/012018/pdf)

Haris, A., N. Nastria, D. Soebandrio & A. Riyanto (2017)- Shale gas characterization based on geochemical and geophysical analysis: case study of Brown shale, Pematang formation, Central Sumatra Basin. In: Int. Symp. Current Progress in Mathematics and Sciences 2016 (ISCPMS 2016), Depok, AIP Conf. Proceedings 1862, 030167,4 p. *(Extended Abstract)*
(online at: http://aip.scitation.org/doi/pdf/10.1063/1.4991271)
(Eocene M Pematang Brown Shale TOC from 0.15-2.71%, classified as poor-very good. Maturity level: vitrinite reflectance Ro = 0.58)

Haris, A., B. Seno, A. Riyanto & A. Bachtiar (2017)- Integrated approach for characterizing unconventional reservoir shale hydrocarbon: case study of North Sumatra Basin. In: Southeast Asian Conference on Geophysics, Bali 2016, IOP Conf. Series, Earth Environm. Science 62, 012023, 6p.
(online at: http://iopscience.iop.org/article/10.1088/1755-1315/62/1/012023/pdf)
(On geochemical, rock mechanic and geophysics to characterize and map unconventional reservoir shale hydrocarbon potential in Baong field. Fair to very good gas potential of Baong Fm shale, with Kerogen Type II, at depth of 1500m)

Harris, M. (2014)- The Kambuna Field, offshore North Sumatra (Part 1). SEAPEX Press 17, 4, p. 78-95.
(Review of 1985 Kambuna gas-condensate discovery in N Malacca Strait and its long history of ownership changes. Trap anticlinal drape structure over basement high, reservoir E Miocene Belumai Fm dolomitic sandstones)

Harris, M. (2015)- The Kambuna Field, offshore North Sumatra (Part 2). SEAPEX Press 18, 1, p. 48-66.
(Continuation of Part 1. Development drilling in 2008. 2P reserves revised upward in 2008 to 29.2 MMboe (119 Bscf sales gas, 9.9 Mbc), then downgraded in 2010/2011 to proven EUR 37 Bscfg and 2.7 MMbc)

Harsa, A.E. (1978)- Some of the factors which influence oil occurrence in the South and Central Sumatra basins. In: Wiryosujono & A. Sudradjat (eds.) Proc. 2nd Regional Conf. Geology and Mineral Resources of SE Asia (GEOSEA), Jakarta 1975, Indon. Assoc. Geol. (IAGI), p. 151-163.
(70% of Indonesian oil production came from S and C Sumatra basins, mainly from Late Oligocene- E Miocene Talang Akar/ Sihapas sandstones. Most oils sourced from Paleogene rift basins and trapped in structures formed during Plio-Pleistocene orogeny, other traps drape over paleotopographic highs)

Harsa, A.E. & A. Kohar (1976)- Distribution of carbonate build-ups in Stanvacôs South Sumatra Area. Proc. Carbonate Seminar, Indon. Petroleum Assoc. (IPA), Jakarta, Spec. Vol., p. 116. *(Abstract only)*

Harsono, D., G.J. Manchester & R. Hanschitz (1989)- Arun field reservoir management, Sumatra. Proc. 18th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 2, p. 67-90.

Hartanto, K., E. Widianto & Safrizal (1991)- Hydrocarbon prospect related to the local unconformities of the Kuang Area, South Sumatra Basin. Proc. 20th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 17-35.
(Kuang area one of most stable parts of S Sumatra Basin. Three local unconformities: (1) vadose zone on top Baturaja Fm, (2) turbidite sediments during sea level drop when Gumai Fm was deposited; (3) local unconformity within Air Benakat Fm)

Hartanto, K., R. Djaafar & I. Yuswar (1990)- Evaluasi cekungan dengan metode restorasi dalam hubungannya dengan akumulasi hidrokarbon di Tinggian Kuang, Sumatra Selatan. Proc. 19th Ann. Conv. Indon. Assoc. Geol. (IAGI), 1, p. 264-291.
('Basin evaluation with restoration methods in relation to hydrocarbon accumulations in the Kuang High, S Sumatra'. Cross-section restoration of Plio-Pleistocene compressional structures S of Prabumulih show several major anticlines (e.g. Tanjung Miring) are inversion structures of Paleogene rifts, and present-day lows are pre-Pliocene highs (e.g. 'Kuang High'). With Talang Akar Fm source-maturation maps)

Harting, A. (1930)- Verslag van een mijnbouwkundig-geologisch onderzoek in de omstreken van Tambang Sawah in de jaran 1924-1927. Jaarboek Mijnwezen Nederlandsch Oost-Indie 58 (1929), Verhandelingen, p. 229-264.
('Report of mining-geological survey in the region of Tambang Sawah in the years 1924-1927'. Investigation of additional gold-silver prospects in Bengkulu region, but no prospective localities found. Area with presumably Mesozoic granites, overlain by M-U Mioceneshales and sands, Late Miocene or Pliocene vlcanic breccias with some coal and younger andesite-liparite volcanics. With 1:20,000 geologic map)

Hasan, M.A., Kamal & F.B. Langitan (1977)- The discovery and development of the Minas Field. Proc. First Ann. Conf. ASEAN Council on Petroleum, p. 323-345. *(also in Oil and Gas J., 22 May 1978, p. 168-177)*

Hasan, M.A., Kamal & F.B. Langitan (1978)- Discovery and development of the Minas Field. SEAPEX Proc. 4, Singapore 1977/78, p. 138-157.
(Minas field 35 km N of Pekanbaru, Sumatra is largest known oil field in SE Asia. Discovered in late 1944. Field is a broad low anticline, with productive area of 57,100 acres and 425' oil column. Main reservoirs in Miocene Sihapas Group. Five major sand units. Cumulative oil production >2 billion bbl)

Hasan, M.M. & D.S. Soebandrio (1988)- The petroleum geology of Tanjung Laban Field, South Sumatera. Proc. 17th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, p. 257-274.
(Tanjung Laban 1982 discovery in Late Oligocene Talang Akar Fm sandstones in WNW-ESE trending structural closure)

Hashimoto, K. (1941)- Geology of Atjeh (Sumatra) oil field. J. Japanese Assoc. Petroleum Technologists 9, 3, p. 289-305. *(in Japanese)*
(online at: https://www.jstage.jst.go.jp/article/japt1933/9/3/9_3_289/_pdf)

Hastuti, S., Sukandarrumidi & S. Pramumijoyo (2001)- Kendali tektonik terhadap perkembangan cekungan ekonomi Tersier Ombilin, Sumatra Barat. Teknosains 14, 1, p. 1-12.
(online at: http://i-lib.ugm.ac.id/jurnal/detail.php?dataId=7607)
('Tectonic control on the develoment of the Ombilin Tertiary economic basin, West Sumatra'. Ombilin intermontane basin in Barisan Mts is pull-apart basin due to dextral movement of Silungkang and Takung Faults since Paleocene, 60 km long and 30 km wide. Two subbasins, Talawi and Sinamar. Five tectonic phases)

Hazairin, B., H. Wisnu & K.M. Mangold (1995)- Extracting reservoir properties from 3-D seismic attributes at Ubi-Sikladi Fields, Central Sumatra. Proc. 24th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 323-335.

Heer, O. (1874)- Ueber fossile Pflanzen von Sumatra. Abhandlungen Schweizerischen Palaont. Gesellschaft 1, p. 3-19.
(online at: https://ia601306.us.archive.org/34/items/abhandlungenders1187schw/abhandlungenders1187schw.pdf)
('On fossil plants from Sumatra'. Description of 13 species of plants from Eocene marls near coalfields of Ombilin Basin, Padang Highlands, collected by Verbeek in 1874. Believed to be Miocene age by Heer. Associated with marls with Eocene fish fauna described by Rutimeyer 1874, Sanders 1934, etc.)

Heer, O. (1879)- Beitrage zur fossilen Flora von Sumatra. Neue Denkschriften Schweizerischen Naturforsch. Gesellschaft, Zurich, 8, 1, p. 3-22.
(online at: https://www.biodiversitylibrary.org/item/47560#page/11/mode/1up)
('Contributions to the fossil flora of Sumatra'. Descriptions of 32 fossil plant species collected by Verbeek in Ombilin coal region of W Sumatra. Incl. Ficus, Daphnophyllum, Dipterocarpus, etc.)

Heer, O. (1880)- Ueber fossile Pflanzen von Sumatra. Jaarboek Mijnwezen Nederlandsch Oost-Indie 9 (1880), Verhandelingen 1, p. 135-168.
('On fossil plants from Sumatra'. Reprint of Heer (1874))

Heer, O. (1880)- Beitrage zur fossilen Flora von Sumatra. Jaarboek Mijnwezen Nederlandsch Oost-Indie 9 (1880), Verhandelingen 1, p. 169-202.
('Contributions to the fossil flora of Sumatra'. Reprint of Heer (1879))

Heidrick, T.L. & K. Aulia (1993)- A structural and tectonic model of the Coastal Plains Block, Central Sumatra basin, Indonesia. Proc. 22nd Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, p. 285-317.
(Coastal Plains in E C Sumatra Basin 15 oil fields. Three structural episodes: (F1) Eo-Oligocene rifting along N-NNE striking basement faults and reactivation of WNW-trending basement arches; (F2) E Miocene sag, regional dextral wrenching; (F3) M Miocene-Recent WSW-directed compression along older NNW-striking wrench faults and transtension along N-NNE-striking elements)

Heim, A. & R. Potonie (1932)- Beobachtungen uber die Entstehung der Tertiaren Kohlen (Humolithe und Saprohumolithe) in Zentral Sumatra. Geol. Rundschau 23, p. 145-172.
('Observations on the origin of Tertiary coals (humoliths and saprohumoliths) in Central Sumatra'. Study of characteristics of 'Oligocene' coal occurrences at upper Singingis tributary of Kampar Kiri River (Sungei Karu and Sungai Sapu concessions). Samples collected during 1928 BPM geological survey. Geology of area first described by Hirschi 1915. Some coals reach anthracite stage due to elevated temperature only. With description of modern coal swamp environments in Sumatra)

Hendrian, D. & A. Fadly (2010)- Development drilling at fault zone in Pedada field, Central Sumatra Basin. Proc. 39th Ann. Conv. Indon. Assoc. Geol. (IAGI), Lombok, PIT-IAGI-2010-219, 7p.

Hennings, P., P. Allwardt, P. Paul, C. Zahm, R. Reid, H. Alley, R. Kirschner, B. Lee & E. Hough (2012)- Relationship between fractures, fault zones, stress, and reservoir productivity in the Suban gas field, Sumatra, Indonesia. American Assoc. Petrol. Geol. (AAPG) Bull. 96, 4, p. 753-772.
(Analysis of fractured Miocene carbonate and Pre-Tertiary crystalline basement reservoirs of Suban gas field, S Sumatra. Structures composite of Paleogene extensional elements, modified by Neogene contraction. Faults along W flank of field show classic oblique-compressional geometry. Reservoir potential most enhanced in areas of field that are in strike-slip stress style and lower in areas of thrust-fault stress)

Heriana, N. (1996)- Prospektifitas hidrokarbon di tepian cekungan Sumatra Utara berdasarkan aspek batuan induk. Proc. 25th Ann. Conv. Indon. Assoc. Geol. (IAGI), 2, p. 459-477.
('Hydrocarbon prospectivity on the margin of the North Sumatra basin based on aspects of source rocks')

Heriana, N. (1999)- Gas habitat in the southern part of the North Sumatra Basin. In: C.A. Caughey & J.V.C. Howes (eds.) Proc. Conf. Gas habitats of SE Asia and Australasia, Jakarta 1998, Indon. Petroleum Assoc. (IPA), p. 135-144
(Gas in S part N Sumatra Basin in Keutapang, Mid-Baong Sandstone (MBS), and Belumai Fms. Usually gas with oil or condensate; Wampu Field gas without associated liquids. Gases two groups: Rantau in N with condensate, Aru-Langkat in S from non-associated sapropelic organic matter. Bampo Fm black shales reached gas generation phase and possible gas source. Traps formed in Plio-Pleistocene and may still be filling)

Heriana, N. & R. Ryacudu (1993)- Structural evaluation of onshore Northern Sumatra. Proc. 22nd Ann. Conv. Indon. Assoc. Geol. (IAGI), Bandung, 1, p. 112-125.

(In Indonesian. Common wrench faulting as result of oblique subduction)

Hermiyanto, H.M. (2008)- Coalbed methane potential and coal characteristics in Kuantan Singingi, Central Sumatera Basin, Riau. J. Sumber Daya Geologi 18, 4, p. 239-251.
(online at: http://jgsm.geologi.esdm.go.id/index.php/JGSM/article/view/246/226)
(Analysis of Eocene coal from Keruh Fm in small intra-montane basin at SW side of C Sumatra basin)

Hermiyanto, H.M. & N.S. Ningrum (2009)- Organic petrology and Rock-Eval characteristics in selected surficial sampes of the Tertiary formation, South Sumatra basin. J. Geologi Indonesia 4, 3, p. 215-227.
(Study of organic matter types and maturation of Oligocene- Miocene outcrop samples from S Sumatra)

Hermiyanto, H.M. & H. Panggabean (2006)- Karakteristik dan diagenesis beberapa percontoh batuan *oil shale* Formasi Kasiro terpilih, di Jambi dan Sumatera Selatan berdasarkan *Scanning Electron Microscope* (SEM). J. Sumber Daya Geologi 16, 6 (156), p. 349-358.
('Characteristics and diagenesis of some oil shale rock samples of the Kasiro Formations in Jambi and South Sumatra by Scanning Electron Microscope (SEM)')

Hermiyanto, H.M. & H. Panggabean (2008)- Karakteristik oil shale di kawasan Bukit Susah, Riau. J. Sumber Daya Geologi 18, 1, p. 3-13.
(online at: http://jgsm.geologi.esdm.go.id/index.php/JGSM/article/view/223/213)
('Characteristics of oil shale in the Bukit Susah District, Riau'. Kelesa Fm at Bukit Susah in SW part of C Sumatra basin with ~28m of lacustrine oil shale horizons. Dominant macerals alginite, resinite, sporinite, etc. Vitrinite reflectance 0.27- 0.43% (immature). Palynology suggests M-L Eocene age)

Hermiyanto, H.M. & R. Setiawan (2010)- Coalbed Methane potential and coal characteristics in Muara Lakitan area, South Sumatra. J. Sumber Daya Geologi 20, 3, p. 147-158.
(online at: http://jgsm.geologi.esdm.go.id/index.php/JGSM/article/view/168/164)
(CBM potential of Late Miocene- Pliocene Muara Enim Fm ~15km NW of Muara Lakitan, S Sumatra basin. Seven coal seams in ~130m interval)

Herudiyanto (2000)- Systematic geological assessment of coal and peat of the South Sumatera Basin, Indonesia. Proc. 36th Sess. Coord. Comm. Coastal and Offshore Progr. E and SE Asia (CCOP), Hanoi 1999, p. 67-71.
(Majority of Indonesian coal in S Sumatra Basin (>70% of low-rank coal). Calculated resources of 6 areas in S Sumatra at least 2.04 billion tonnes coal and 1.59 bilion m3 of peat)

Heryanto, R. & K.D. Kusamah (2001)- Sedimentasi batuan pembawa-batubara Formasi Talang Akar di daerah Lubuk Madrasah, sub-cekungan Jambi. In: Geologi formasi pembawa batubara di beberapa Cekungan Tersier Indonesia, Geol. Res. Dev. Centre (GRDC), Bandung, Spec. Publ. 26, p. 99-114.
(On the E Miocene fluvio-deltaic coal-bearing Talang Akar Fm in W part Jambi basin)

Heruyono, B. & T. Villarroel (1989)- The Parum Field: an example of a stratigraphic trap in P.T. Stanvac's Central Sumatra Kampar Block. Proc. 18th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 193-216.

Heryanto, R. (2004)- Batuan sumber dan diagenesis batupasir Formasi Talangakar di daerah Merlung, Sub Cekungan Jambi. J. Sumber Daya Geologi 14, 3 (147), p. 134-147.
('Provenance and sandstone diagenesis of the Talang Akar Fm in the area of Merlung, Jambi sub-basin'. Merlung area small basin of W Jambi subbasin, SE of Tigapuluh Mts. Oligocene Talang Akar Fm of recycled orogen provenance, former depth of burial 3000-5000m)

Heryanto, R. (2005)- Hubungan antara reflektan vitrinit, diagenesis, dan kematangan hidrokarbon, batuan pembawa hidrokarbon Formasi Lakat di Lereng Timur laut Pegunungan Tigapuluh. J. Sumber Daya Geologi 15, 1 (148), p. 111-123.

('Relation between vitrinite reflectance, diagenesis and hydrocarbon maturation, Lakat Fm at Lereng Timur, Tigapuluh Mts'. Oligocene Lakat Fm transgressive marine sequence at NE side Tigapuluh Mts (S part of C Sumatra Basin), with immature algal vitrinite (VR 0.29-0.38%), reflecting burial to 1500m depth)

Heryanto, R. (2006)- Diagenesis, coalification, and hydrocarbon generation of the Keruh Formation in Kuantan-Singingi Area, Central Sumatera, Indonesia. J. Sumber Daya Geologi 16, 1 (151), p. 3-15.
(Source potential of Eo-Oligocene Keruh Fm at SW margin C Sumatra basin, 10km NW of Petai (correlates to Pematang and Kelesa Fms). Late Eocene age based on pollen Florschuetzia trilobata, Palmaepollenites kutchensis, Cicatricosisporites dorogensis and Verrucatosporites usmensis. Coal in middle Keruh Fm, composed of vitrinite (54-94%), inertinite (< 1.8%) and exinite (<8.8%). Vitrinite reflectance 0.3- 0.56%, suggesting depth of burial 2000-3000m, and paleo-temperature of 65°- 95°C)

Heryanto, R. (2006)- Karakteristik Formasi Seblat di daerah Bengkulu Selatan. J. Sumber Daya Geologi 16, 3 (153), p. 179-195.
('Characteristics of the Seblat Formation in the South Bengkulu area'. E-M Miocene Seblat Fm oldest sediments in outcrop in Bengkulu Basin, SW Sumatra. Arkosic sands, withvolcanic arc and 'recycled orogen' provenance, possibly from Pretertiary of Gumai-Garba Mts. Diagenesis suggests burial to 2-3 km. Limestone interbed with Lepidocyclina, Miogypsina)

Heryanto, R. (2006)- Perbandingan karakteristik lingkungan pengendapan, batuan sumber, dan diagenesis Formasi Lakat di lereng timur laut dengan Formasi Talangakar di tenggara Pegunungan Tigapuluh, Jambi. J. Geologi Indonesia 1, 4, p. 173-184.
('Comparative characteristics of the depositional environment, source rocks and diagenesis of the Lakat Formation at the NE side with Talangakar Formation at the SE side of the Tigapuluh Mts area, Jambi'. Sedimentology of Oligocene Lakat (C Sumatra Basin)- Talang Akar Fm (Jambi Basin). Lakat Fm carbonaceous mudstone contains pollen Meyeripollis naharkotensis (M-L Oligocene), Ancrostichum aureum, Magnastriatites howardi and Lycodium. Diagenesis of Talangakar Fm higher than Lakat Fm (immature))

Heryanto, R. (2007)- Batuan sumber batupasir formasi Lemau di cekungan Bengkulu. In: Geologi Indonesia: dinamika dan produknya, Geol. Res. Dev. Centre (GRDC), Bandung, Spec. Publ. 33, 2, p. 167-179.
('Source rocks of Limau Fm sandstone in the Bengkulu Basin'. M-L Miocene Lemau Fm alternating claystone and sandstone with coal seams. Sandstone feldspatic litharenite and litharenite, grains dominated by rock fragments and quartz with minor feldspar. Provenance 'magmatic arc' and recycled orogen', probably from Pre-Tertiary Gumai zone)

Heryanto, R. (2007)- Diagenesis batupasir Formasi Lemau di Cekungan Bengkulu dan potensinya sebagai batuan reservoar hidrokarbon. Mineral dan Energi 5, p. 58-70.
(Diagenesis of Limau Fm sands in the Bengkulu Basin, and potential as hydrocarbon reservoir rock')

Heryanto, R. (2007)- Hubungan antara diagenesis, reflektan vitrinit, dan kematangan batuan pembawa hidrokarbon batuan sedimen Miosen di Cekungan Bengkulu. J. Geologi Indonesia 2, 2, p. 99-111.
(online at: http://ijog.bgl.esdm.go.id/index.php/IJOG/article/view/32/32)
('Relations between diagenesis, vitrinite reflectance and maturity for hydrocarbons of Miocene sediments of the Bengkulu basin'. M-L Miocene Lemau Fm sandstones, shales and conglomerates, with coal seams in upper part. Source rock maturation late immature- early mature (vitrinite reflectance of coal 0.76- 0.94%), indicating burial to ~2500m)

Heryanto, R. (2007)- Kemungkinan keterdapatan hidrokarbon di Cekungan Bengkulu. J. Geologi Indonesia 2, 3, p. 119-131.
(online at: www.bgl.esdm.go.id/publication/index.php/dir/article_detail/196)
('Hydrocarbon potential of the Bengkulu basin'. Presence of hydrocarbons in Bengkulu Basin suggested by oil seeps. Source rock may be carbonaceous clays of Seblat and Lemau Fms. Possible reservoir rocks Seblat and Lemau Fm sandstones and Seblat Fm limestones. Possible claystone seals in Seblat and Lemau Fms)

Heryanto, R. & H. Hermiyanto (2006)- Potensi batuan sumber (source rock) hidrokarbon di Pegunungan Tigapuluh, Sumatera Tengah. J. Geologi Indonesia 1, 1, p. 37-48.
(online at: www.bgl.esdm.go.id/publication/index.php/dir/article_detail/163)
('Hydrocarbon source rock potential in the Tigapuluh Mts, C Sumatra'. Source rocks S of C Sumatra Basin margin fine grained clastics in Late Eocene Kelesa and Oligocene Lakat Fms. Kelesa Fm TOC 2.3-9.6%, Lakat Fm TOC 0.7-3.5%, Thermal maturation of Kelesa Fm late immature- early mature, kerogen types I and II, Lakat Fm late immature, kerogen types I, II, and III)

Heryanto, R. & H. Panggabean (2006)- The Tertiary source rock potential of the Bengkulu Basin. Proc. Jakarta 2006 Int. Geosc. Conf. Exhib., Indon. Petroleum Assoc. (IPA), Jakarta, 06-PG-26, 4p.
(Bengkulu forearc basin in SW Sumatra intiated in Eocene-Oligocene with deposition of Lahat equivalent Fm, unconformably overlain by Oligo Miocene Hulusimpang Fm volcanics, E-M Miocene Seblat Fm siliciclastics and carbonates, M-L Miocene Lemau Fm, etc. Geochemical analysis of outcrop, well samples and oil seeps identified organic matter of terrestrial origin. Best potential source rocks in Lemau Fm, although these are immature and oil seeps were derived from a mature source rock)

Heryanto, R., N. Suwarna, & H. Panggabean (2001)- The Lakat Formation in the Northeastern flank of the Tigapuluh Mountains and its possibilities as a source rock. Proc. 30th Ann. Conv. Indon. Assoc. Geol. (IAGI) and 10th GEOSEA Reg. Congress, Yogyakarta, p.

Heryanto, R., N. Suwarna & H. Panggabean (2004)- Hydrocarbon source rock potential of the Eocene-Oligocene Keruh Formation in the Southwestern margin of the Central Sumatra basin. J. Sumber Daya Geologi 14, 3 (147), p. 118-133.
(Eo-Oligocene lacustrine shale of Keruh Fm exposed in Kuantan-Singingi area at SW margin of C Sumatra basin. Equivalent of Pematang Fm in other parts of C Sumatra basin and Kelesa Fm of Tigapuluh Mts. Excellent oil source potential. Late Eocene palynolomorphs, incl. Palmaepollenites kuchensis, Florschuetzia trilobata, Meyeripollis naharkotensis, etc. Vitrinite refectance 0.23-0.66%)

Heryanto, R. & Suyoko (2007)- Karakteristik batubara di Cekungan Bengkulu. J. Geologi Indonesia 2, 4, p. 247-259.
(online at: www.bgl.esdm.go.id/dmdocuments/jurnal20070405.pdf)
('Characteristics of coal in the Bengkulu Basin'. M-Upper Miocene Lemau Fm coal seams in Ketaun area 1-2m thick, in Bengkulu area 1-3.5m, in Seluma area up to 4.5m. Vitrinite reflectance generally 0.4 to 0.5%, but up to 1.12% near andesitic sill intrusions. Deposited in delta plain environments)

Hestu S.N., Joan C.T., F. Asrul, E. Wijayati, S. Pujiastuti & T. Iswachyono (2010)- Tight carbonate platform: a new opportunity reservoir in Musi Platform a case study of Naya F4 well. Proc. 39th Conv. Indon. Assoc. Geol. (IAGI), Lombok, PIT-IAGI-2010-172, 7p.
(On oil-bearing, but tight platform carbonate in 2008 Naya F4 well at NE flank of 'Naya field' buildup, SW Sumatra basin (probably not real field name; map looks like Soka field; JTvG))

Hickman, R.G., P.F. Dobson, M. van Gerven, B.D. Sagala & R.P. Gunderson (2004)- Tectonic and stratigraphic evolution of the Sarulla graben geothermal area, North Sumatra, Indonesia. J. Asian Earth Sci. 23, p. 435-448.
(Sarulla graben Plio-Pleistocene basin along Sumatra fault, where fault coincides with volcanic arc. Offset of 0.27 Ma rhyodacite dome by strand of Sumatra fault indicates ~9 mm/y slip, lower than previous estimates of ~25-30 mm/y for Holocene slip on Sumatra fault determined from stream offsets. Discrepancy may be due to (1) difference between Holocene and late Quaternary rates and (2) additional slip on other faults. Sarulla area volcanic centers: Sibualbuali stratovolcano (~0.7- 0.3 Ma), Hopong caldera (~1.5 Ma), and Namora-I-Langit dacitic dome field (0.8- 0.1 Ma). These generated majority of tuffs and tuffaceous sediments of Sarulla graben. Geothermal systems linked to faults and volcanoes)

Hidayatillah, A.S., R.A. Tampubolon, T. Ozza, M.T. Arifin, R.M.A. Prasetio, T.A. Furqan & H. Darman (2017)- North Sumatra Basin: a new perspective in tectonic settings and Paleogene sedimentation. Proc. 41st Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA17-719-G, 18p.

(Literature, etc. compilation of N Sumatra basin)

Hinton, L.B., W.S. Atmadja & P.S. Suwito (1987)- Peusangan C1 reef interpretation with top reef transparent to seismic. Proc. 16th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 339-362.
(Peusangan-XF structure, offshore N Sumatra, ~70 km NW of Arun gas field, is carbonate buildup of E-M Miocene Peutu Fm on paleotopographic Western High. C1 well with ~670' limestone, High amplitude seismic reflector previously interpreted as top carbonate buildup corresponds to lower, tight limestone interval, while top of upper ~400' of porous limestone produces only very weak seismic reflection (largely transparent))

Hirschi, H. (1916)- Kontaktmetamorphe Tertiarkohlen in Sud-Sumatra, sudlich Muara Enim, Residenz Palembang. Tijdschrift Kon. Nederlands Aardrijkskundig Genootschap 33, p. 569-577.
('Contact-metamorphic Tertiary coals in S Sumatra, S of Muara Enim, Palembang Residency'. As already described by Tobler (1906) Miocene Middle Palembang Fm lignites altered into high- grade coal by young andesite intrusions at several localities, including Bukit Asam, Bukit Gendi and Ayer Milang. M Palembang coals associated with common tuffs with quartz crystals, typically unfossiliferous except for plants)

Hoehn, M.H., I Arif, C. Welch, F.H. Sidi, D. Rubyanto, R. van Eykenhof et al. (2005)- Combined geostatistical inversion and simultaneous AVA inversion: extending the life of a mature area, Kotabatak Field, Central Sumatra Basin, Indonesia. Proc. 30th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 25-38.
(Kotabatak Field in C Sumatra 1952 discovery; produced >250 MMBO since 1971. Dense well control, but still surprises with reservoir distribution in Bekasap Fm sands. Inversion helped map reservoirs)

Holis, Z., D.A. Firmansyah, W. Romodhon, M.K. Kamaludin & S. Damayanti (2014)- Structural evolution and its implication to heavy oil potential in Iliran High, South Sumatera Basin, Western Indonesia. In: 76th EAGE Conference & Exhibition 2014, Amsterdam, Tu G104 06, 5p. *(Extended Abstract)*
(Iliran High in S Sumatra is young uplift along Late Miocene-Pleistocene NW-SE trending strike slip fault. Uplift caused biodegradation of early light oil accumulations, changing it to heavy oils)

Holis, Z., B. Sapiie, I.N. Suta, M.K. Utama & M. Hadiana (2010)- Fault characteristic and palinspastic reconstructions of the Jabung Field, South Sumatera Basin. Proc. 39th Ann. Conv. Indon. Assoc. Geol. (IAGI), Lombok, PIT-IAGI-2010-066, 20p.
(Reconstruction of faults around Jabung Field, Jambi Basin, N flank S Sumatra Basin. Area dominated by NW-SE and NE-SW trending basement structures. S Sumatra Basin formed as pull-apart basin related to NW-SE trending dextral strike-slip faults. Early extensional faults formed syn-rift deposits, followed by inversion structures and cross-cut by latter extensional structurs, all formed during continuous strike-slip deformation. since Paleogene. Maximum extension in NW-SE direction and shortening in NNE-SSW direction)

Holleman, W. (1931)- Beschrijving van de afbouwmethode voor ontginning der 8m dikke C-laag der Ombilin steenkolenmijnen. De Mijningenieur 12, 8, p. 126-146.
('Description of the mining method for exploitation of the 8m thick C layer of the Ombilin coal mines')

Hong, K.C., R.L. Schmidt & A.A. Reed (1990)- Steamflood potential of light oil in deltaic deposits of Central Sumatra. Proc. 19th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 2, p. 155-178.
(Channel sands attractive steamflood target because fining-up bedding character places lower permeabilities at top, which retard steam gravity override and result in good vertical sweep. Bar sands, with coarsening-up character accentuates steam gravity override, and not attractive. With Sihapas Gp paleogeography map)

Hopper, R.H. (1976)- The discovery of Indonesia's Minas oilfield. In: Oil- lifestream of progress, Caltex Petroleum Corporation, p. 1-11.
(Caltex Minas field, N of Pekanbaru, C Sumatra, largest oil field in Indonesia. Discovery well drilled in 1944 by Japanese occupation army on site selected and prepared by Caltex in 1942. Large domal structure identified by shallow corehole drilling and seismic. Waxy low-sulfur crude, producing since 1952)

Houpt, J.R. & C.C. Kersting (1978)- Arun Reef, ôBô Block, North Sumatra. Proc. Indon. Petroleum Assoc. (IPA) Carbonate Seminar, Jakarta 1976, p. 42-60.
(Description of large Arun gas-condensate field in large reefal buildup of late Early- early M Miocene (Lower Tf) carbonate, N Sumatra. Area of reef complex 6 x 20 km, NNW-SSE trending, thickness up to 1200'. Entire reef complex recrystallized and diagenetically altered. Porosity mainly moldic and vugular)

Hovig, P. (1917)- De beteekenis der Zuid-Sumatrasche antiklinalen. Verhandelingen Geologisch-Mijnbouwkundig Genootschap Nederland Kol., Geol. Serie 2, 5, p. 233-242.
(online at: https://ia601301.us.archive.org/1/items/verhandelingenva2191geol/verhandelingenva2191geol.pdf)
('The significance of the South Sumatra anticlines'. Early discussion of relation between types of anticlines and oil occurrences in Jambi and Palembang sub-basins)

Howells, C.G. (1997)- Tertiary sedimentology and stratigraphy of the Ombilin intramontane basin, West Sumatra. Ph.D. Thesis University of London, p. *(Unpublished)*

Howells, C.G. (1997)- Tertiary response to oblique subduction and indentation in Sumatra, Indonesia - new ideas for hydrocarbon exploration. In: A.J. Fraser, S.J. Matthews & R.W. Murphy (eds.) Petroleum Geology of Southeast Asia. Geol. Soc. London, Spec. Publ. 126, p. 365-374.
(Sumatra Tertiary basins evolution related to oblique subduction and indentation from Indo-Australian and Eurasian plates collision. Rift-sag geometry with plate-margin parallel sag basins over N-S-oriented grabens. Grabens control lacustrine source-rock distribution. Ombilin Basin three-fold evolution. Eocene sedimentation controlled by normal faults, not strike-slip, suggesting genetic relationship with N-S-oriented early Tertiary of N, C and S Sumatra Basins not local pull-apart related to Sumatra Fault Zone. Oligocene sedimentation dominated by fluvial deposition at time of active volcanism and strike-slip faulting, indicating modification of initial basin style by strike slip along Sumatra Fault Zone. E Miocene dominated by marine deposits and thermal subsidence. Uplift to present intramontane setting and differentiation from C and S Sumatra Basins in M Miocene or later. Similar genetic origin to C and S Sumatra Basins is suggested)

Hudya, F.D., A. Aimar, T. Afandi, D. Setiawan & R.S.W. Handayani (2008)- Recovery optimization strategy for thin oil column reservoir with large gas cap: case study of Gunung Kembang Field. Proc. SPE Asia Pacific Oil & Gas Conf., Perth 2008, 7p.
(Exploitation of thin (25'-40') oil rim below thick gas cap in Gunung Kembang field challenging. Horizontal oil wells in upper oil rim near gas oil contact best strategy for depletion of oil rim. Oil recovery expected to rise to ~8% while gas is being delivered)

Humphreys, B., S.J. Kemp, G.K. Lott, Bermanto, D.A. Dharmayanti & I. Samsori (1994)- Origin of grain-coating chlorite by smectite transformation: an example from Miocene sandstones, North Sumatra back-arc basin, Indonesia. Clay Minerals 29, 4, p. 681-692.
(Grain-coating chlorite cements common in late M and U Miocene sandstones of Keutapang Fm, derived from granitic, metasedimentary and extrusive volcanic lithologies at W flanks of N Sumatra back-arc basin. Cements originated as smectite-rich cement rims whose initial precipitation was related to breakdown of volcanic detritus in sediments after burial, facilitated by high geothermal gradient in back-arc basin)

Hutapea, O.M. (1976)- Depositional environments and their control of oil accumulation in the Abab field, South Sumatra. J. Assoc. Indon. Geol. (IAGI) 3, 1, p. 37-43.

Hutapea, O.M. (1978)- Pengembangan lapangan Benakat: suatu perangkap stratigrafi. Geologi Indonesia (J. Indon. Assoc. Geol., IAGI) 5, 1, p. 45-57.
('Development of the Benakat field; some stratigraphic traps'. S Sumatra)

Hutapea, O.M. (1981)- Pewatasan lapisan waduk Formasi Tualang, di Merbau, Riau. Proc. 10th Ann. Conv. Indon. Assoc. Geol. (IAGI), p. 222-229.
('Traps in the Tualang Fm at Merbau, Riau')

Hutapea, O.M. (1981)- The prolific Talang Akar Formation in Raja Field South Sumatra. Proc. 10th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, p. 251-267.
(S Sumatra Raja field 1940 discovery in Late Oligocene- E Miocene deltaic- shallow marine Talang Akar Sst)

Hutapea, O. (1998)- The Semoga- Kaji discoveries: large stratigraphic Batu Raja oil fields in South Sumatra. Proc. 26th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 313-326.
(Semoga, Kaji and Sembada first E Miocene Baturaja carbonates discoveries on Palembang High and with stratigraphic trapping components. In Rimau Block only Talang Akar Fm had been productive. Good quality reef-related carbonate reservoir. Hydrocarbons from Talang Akar and Lemat Fm lacustrine shales, trapped by combination structural- stratigraphic controls, after initial migration into paleo-traps, then remigrating into present traps. Telisa shales acts as top seal, facies change of Baturaja carbonates acts as lateral seal)

Hutapea, O. (2002)- What makes Kaji-Semoga field so big? In: F.H. Sidi & A. Setiawan (eds.) Proc. Giant field and new exploration concepts seminar, Indon. Assoc. Geol. (IAGI), Jakarta 2002, p. 1-5.
(Extended Abstract. Small 1996 discoveries in E Miocene Baturaja Fm limestones at Semoga 1, Kaji 1 and Sembada 1 wells proved to be part of single large oil pool with recoverable reserves of ~200 MMBO. Oil below structural spill points, demonstrating stratigraphic control on hydrocarbon accumulation)

Hwang, R.J., T. Heidrick, B. Mertani, Qivayanti & M. Li (2000)- Correlation and migration studies of North Central Sumatra oils. Organic Geochem. 33, 12, p. 1361-1379.
(Tertiary lacustrine shale, Brown Shale, long recognized as main source rock for C Sumatra basin oils. Biomarker and carbon isotopic data from producing fields indicate oils quite similar geochemically. Five genetic groups distinguished based on abundance of algal marker botryococcane, relative to pristane and C29 n-paraffin, which can be tied to subtle differences in source facies. With map of kitchens and migration routes)

Ibrahim, M.I. & D. Widhiyatna (2017)- Karakteristik rekahan batubara pada eksplorasi Gas Metana Batubara di Cekungan Ombilin, Provinsi Sumatera Barat. Bul. Sumber Daya Geologi 12, 1, p. 39-53.
(online at: http://buletinsdg.geologi.esdm.go.id/index.php/bsdg/issue/archive)
('Characteristic of coal fractures for Coalbed Methane gas exploration in the Ombilin Basin, W Sumatra'. Cleat distribution in five Eocene coal seams in 451m deep CBM well. Deeper coal seam lower permeability)

Indah, M.S., M. Natsir, F. Suwidiyanto, Suwarto, F. Bahesti & D. Kadar (2017)- Paleoenvironment dan evaluasi lateral distribusi perangkap stratigrafi reservoir batupasir Baoung dan batupasir Belumai pada korelasi fosil absolut integrasi 2D seismik regional, Cekungan Sumatera Utara. Proc. Joint Conv. HAGI-IAGI-IAFMI-IATMI (JCM 2017), Malang, 4p.
('Paleoenvironment and evaluation of lateral distribution of stratigraphic traps of Baong and Belumai sandstone reservoirs by fossil correlation integrated with regional 2D seismic, North Sumatra Basin'. Bio-sequence stratigraphic correlation study of M Miocene sandstones in N Sumatra basin)

Indarto, S., Sudaryanto & E. Soebowo (1994)- Kualitas batubara ditinjau dari kondisi geologi dan analisis proksimat di wilayah Bengkulu, Sumatra. Proc. 23rd Ann. Conv. Indon. Assoc. Geol. (IAGI), 2, p. 1076-1085.
('Coal quality reviewed from geological conditions and proximity analysis in the Bengkulu region, Sumatra'. Rel. common Miocene coal deposits in Bengkulu area, with thickness of 0.25- 8.5m. Sebayar and Napal Putih fields subbituminous grade. Basalt-andesite intrusions increased grade of surrounding coals at Bukit Kandis and Air Kemumu (Bukit Sunur) deposits to High volatile bituminous C)

Indranadi, V.B., L. Sitohang & Wibisono (2011)- Unconformity-bounded stratigraphic units of the Central Sumatra basin: implication for basin history and petroleum system in Bengkalis Trough. Proc. Joint 36th HAGI and 40th IAGI Ann. Conv., Makassar, JCM2011-442, 17p.
(Three main unconformity bounded units in Late Eocene- Pliocene of C Sumatra: (1) Kelesa Synthem: Late Eocene-Oligocene synrift sequence, equivalent to Lower Red Beds, Brown Shale, Upper Red Beds; (2) Sihapas Synthem: Late Oligocene- M Miocene post-rift, equivalent with Lakat, Tualang and Telisa Fms. Terminated by structural inversion of Binio Event in M Miocene and Barisan Mts uplift at 13 Ma; (3) Petani Synthem: M

Miocene- Recent inverted basin sequence, equivalent to Binio and Korinci Fms. Binio Event local unconformity. Minas Event is youngest deformation in Plio-Pleistocene (~5 Ma))

Iqbal, M., N. Suwarna, I. Syafri & Winantris (2014)- Eo-Oligocene oil shales of the Talawi, Lubuktaruk, and Kiliranjao Areas, West Sumatra: are they potential source rocks? Indonesian J. Geoscience 1, 3, p. 135-149.
(online at: http://ijog.bgl.esdm.go.id/index.php/IJOG/article/view/198/182)
(Ombilin and Kiliranjao basins of W Sumatra with Eo-Oligocene lacustrine-brackish oil shales in sediments of Sangkarewang and Kiliran Fms, overlain by Sawahlunto coal measures. Kiliran Fm with freshwater molluscs Paludina, Brotia, and Thiara and Botryococcus algae. TOC 1.1- 8.1%. Maceral composition of oil shales dominated by exinite group, mainly Pediastrum-lamalginite with less Botryococcus-telalginite, liptodetrinite, sporinite, cutinite, resinite and bituminite)

Irzon, R. & S. Maryanto (2016)- Geokimia batugamping Formasi Gumai dan Formasi Baturaja di wilayah Muaradua, Ogan Komring Ulu Selatan, Provinsi Sumatera Selatan. J. Geologi Sumberdaya Mineral 17, 3, p. 125-138.
(online at: http://jgsm.geologi.esdm.go.id/index.php/JGSM/article/view/11/4)
('Geochemistry of limestones from the Gumai and Baturaja Formations in the Muaradua area, south Ogan Komering Ulu, South Sumatra')

Iskandar, E. (1994)- Thermometamorphose im Bukit Asam Kohlenrevier, Sudsumatra, Indonesien. Inaugural-Dissertation, Universitat Koln, p. 1-120.
('Thermal metamorphism in the Bukit Asam coal deposit, S Sumatra'. Thermal influence on Miocene coal seams up to few 100m away from E Pleistocene igneous intrusion. Coal rank increases from 0.4 Rm% (sub-bituminous) in uninfluenced area to 2.5 Rm% (semi-anthracite/anthracite) near contact))

Jacobs, S.T. (1986)- Bentayan Field: unique method of heavy oil production, South Sumatra. Proc. 15th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 2, p. 65-76.
(S Sumatra Corridor Block Bentayan Field discovered by BPM in 1932 in Talang Akar Sst. Undeveloped until 1985 due to heavy crude properties (22° API, pour point 115°F). Downhole blending with low pour point crude allows production of refinery ready product)

Jackson, A. (1961)- Oil exploration- a brief review with illustrations from South Sumatra. Contrib. Dept. Geology Inst. Technology Bandung 40, 9p.
(Brief Shell paper on S Sumatra oil exploration)

Janele, P.T., T.H. Tankersley, G.H. Schmit, B.C. Wibowo, A. Rahardja H. & W.C. Dawson (2000)- Stochastic modeling at Kotabatak Field, Central Sumatra Basin. Proc. 27th Ann. Conv. Indon. Petroleum Assoc. (IPA), 19p.
(Kotabatak oil field modeling. NE-SW trending estuarine channels in Bekasap Fm reservoirs)

Jenkins, O.P. (1930)- Test-pit exploration in Coastal Plain of Sumatra. American Assoc. Petrol. Geol. (AAPG) Bull. 14, 11, p. 1439-1444.
(Mapping of structures in Late Tertiary shales-sandstones of SE Sumatra required digging of systematically located pits below lateritic weathering surface. Very little geology)

Jenkins, S.D., Hendar S.M. & E. J. Kodl (1994)- Integrated analysis of Petani gas sands in selected fields, Central Sumatra. Proc. 23rd Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 373-385.
(Seismic anomalies used to identify M-L Miocene Petani gas sands and allow areal mapping beyond the areas of well control. Anomalies integrated with structure maps, sand isopach maps, facies maps and log gas indications enable quick evaluation of small, shallow gas plays)

Johansen, S.J. & A. Djamaoeddin (2003)- Sequence stratigraphy of Bangko Field, Sihapas Group (Miocene), Central Sumatra Basin, Indonesia. AAPG Ann. Convention, Salt Lake City, AAPG Search and Discovery Art. 90013, 1p. *(Abstract only)*

Johansen, S. & H. Semimbar (2010)- Sand-rich tide-dominated deltaic systems of the Lower Miocene, Central Sumatran Basin, Indonesia. AAPG Hedberg Conference, Jakarta 2009, Extended Abstract, 8p.
(online at: www.searchanddiscovery.net/documents/2010/50255johansen/ndx_johansen.pdf)
(C Sumatran Basin >100 oil-gas fields, mainly in E Miocene Sihapas Group sand-rich, tide-dominated deltaic systems and updip fluvial equivalents. Preserved depositional systems tracts extend from updip fluvio-tidal channels into delta-front inclined tidal-marine sands and muds, then into delta front deposits interbedded with marine mudstones, sandy foram grainstones and cross-bedded glauconitic sands. Overall trend transgressive and capped by marine shales)

Jordan, C.F. & M. Abdullah (1988)- Lithofacies analysis of the Arun reservoir, North Sumatra. In: A.J. Lomando & P.M. Harris (eds.) Giant oil and gas fields, a core workshop, Soc. Econ. Paleont. Mineral. (SEPM) Core Workshop 12, p. 89-117.
(Arun gas-condensate field in N Sumatra, producing from 1100' thick E-M Miocene reefal carbonate buildup. Four facies associated with patch reef complexes. All facies in communication through microporous limestone. Diagenetic reactions creating porosity far outweigh depositional controls on porosity distribution)

Jordan, C.F. & M. Abdullah (1992)- Arun Field- Indonesia North Sumatra Basin. AAPG Treatise Petroleum Geology, Stratigraphic Traps III, p. 1-39.
(Arun largest gas field in N Sumatra basin, with initial dry gas in place of >16 TCF. Reservoir E-M Miocene reefal buildup limestone)

Julikah, Sriwijaya, J.S. Hadimuljono, R. Ginanjar, A.B. Wicaksono, Jakson A. & M. Syaifudin (2016)- Shale oil and shale gas potential of Talang Akar and Lemat/ Lahat Formations in the Jambi sub-basin. Proc. IPA 2016 Technical Symposium, Indonesia exploration: where from- where to, Indon. Petroleum Assoc. (IPA), Jakarta, 20-TS-16, p. 1-19.
(On unconventional oil and gas potential of Late Eocene- E Miocene shales of Jambi Basin, S Sumatra)

Julikah, Sriwidjaya, Jonathan S. & Panuju (2015)- Hydrocarbon shale potential in Talang Akar and Lahat Formations on South and Central Palembang sub basin. Scientific Contr. Oil and Gas, Lemigas, Jakarta, 38, 3, p. 213-223.
(online at: www.lemigas.esdm.go.id/publikasi/read/scientific/1/)
(S Sumatra basin with potential of shale hydrocarbons in Talang Akar and Lemat/Lahat Fms. Generally early maturity of oil (Ro = 0.6%) at ~2000m depth, oil formation (Ro 0.7-0.9%) between 2200 -3100m and formation of gas (Ro values 0.9-1.2%) at 3100-3500m. P50 assessment of non-conventional oil-gas resources up to 4200 MMBOE)

Kadar, D., R. Preece & J.C. Phelps (2008)- Neogene planktonic foraminiferal biostratigraphy of Central Sumatra Basin, Indonesia. In: Sumatra stratigraphy workshop, Duri (Riau) 2005, Indon. Assoc. Geol. (IAGI), p. 5-51.
(Well-documented study of six Late Oligocene- M Miocene planktonic foram zones in C Sumatra subsurface. Early M Miocene hiatus in Minas and other fields, called Duri event, spans zone N10)

Kalan, T., R.J. Maxwell & J.H. Calvett (1984)- Ramba and Tanjung Laban oil discoveries, Corridor Block, South Sumatra. Proc. 13th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 365-384.
(Two oil discoveries in E Miocene Baturaja Limestone reservoirs. Ramba 1 with 57m reefal limestone, average porosity 19%, Tanjung Laban 1 has 63m limestone, 18m oil pay)

Kamal, A. (2000)- Hydrocarbon potential in the Pasemah Block, a frontier area in South Sumatra. Proc. 27th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 49-63.
(Pasemeh Block is small intra-montane basin near Pageralam in Barisan Mts, behind Gumai Mts. Miocene stratigraphy with Talang Akar quartz sandstones and Baturaja Lst suggests it was western extension of S Sumatra basin. Surface oil and gas seeps and thermogenic hydrocarbons (incl. high-CO2 gas) in first

exploration well Ruas-1 suggest working petroleum system in Muara Dua area in SE of block. Quality of seismic data poor, due to presence of young near-surface volcanics)

Kamal, A., R.M.I. Argakoesoemah & Solichin (2008)- A proposed basin-scale lithostratigraphy for South Sumatra Basin. In: Sumatra stratigraphy workshop, Duri (Riau) 2005, Indon. Assoc. Geol. (IAGI), p. 85-97.
(Description of Eocene- Pliocene stratigraphy of S Sumatra basin)

Kamili, Z.A. & A.M. Naim (1973)- Stratigraphy of Lower and Middle Miocene sediments in North Sumatra Basin. Proc. 2nd Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, p. 53-72.
(Discussion of stratigraphy and facies of E Miocene of NE Sumatra basin)

Kamili, Z.A., A. Wahab, J. Kingston, Z. Achmad, S. Sosromihardjo & C.U. Crausaz (1976)- Contribution to the Pre-Baong stratigraphy of North Sumatra. Proc. 5th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, p. 91-108.

Kasim, S.A. & J. Armstrong (2015)- Oil-oil correlation of the South Sumatra Basin reservoirs. J. Petroleum Gas Engineering 6, 5, p. 54-61.
(online at: www.academicjournals.org/journal/JPGE/article-full-text-pdf/E2428FD53192)
(4 groups of oil in S Sumatra Basin: (1) marine/lacustrine (low pristane/phytane), (2) terrestrially derived (high pristane/phytane ratio), (3) lacustrine oils with bimodal distribution of n-alkanes and (4) biodegraded oils. Oils distributed randomly and sourced from terrestrial TalangAkar and lacustrine Lemat/Lahat formations)

Katz, B.J. (1995)- Stratigraphic and lateral variations of source rock attributes of the Pematang Formation, Central Sumatra. Bull. Geol. Soc. Malaysia 37, p. 13-31.
(online at: https://gsmpubl.files.wordpress.com/2014/09/bgsm1995a02.pdf)
(Pematang Fm of Central S basin primary or only source for 10+ billion barrels of recoverable oil. Lacustrine unit, restricted to Paleogene half-grabens. Stratigraphic controls on organic facies within Pematang. Increase in level of organic enrichment and oil-proneness toward top of unit)

Katz, B.J. & W.C. Dawson (1997)- Pematang-Sihapas petroleum system of Central Sumatra. In: J.V.C. Howes & R.A. Noble (eds.) Proc. Conf. Petroleum Systems of SE Asia and Australasia, Indon. Petroleum Assoc. (IPA), p. 685-698.
(Lacustrine Pematang Group Brown Shale Fm generated 60 GB oil. E Miocene Sihapas sandstones principal reservoirs. Giant fields (Minas, Duri) principally along E margins of sub-basins. Smaller fields with Pematang nonmarine reservoirs in deeper troughs. Pematang Group in series of grabens, with basal fluvial/alluvial unit (Lower Red Bed), medial lacustrine unit (Brown Shale), upper fluvial/alluvial unit (Upper Red Bed). Pematang disconformably overlain by Menggala Fm with quartzose- subarkosic sandstones with average porosity >20% and permeability of 1500 mD. Many oil fields associated with paleohighs, drag folds, and post mid-Miocene inversion. Hydrocarbon generation initiated in Miocene and continues currently in parts of basin)

Katz, B.J., W.C. Dawson, C. Atallah, B. Gunardi et al. (1998)- Anatomy of a lacustrine source- the Brown Shale of Central Sumatra, Indonesia. AAPG Ann. Mtg., Salt Lake City 1998 *(Abstract)*
(Brown Shale Fm of Pematang Group lacustrine source rock, with oil-prone facies in more rapidly subsiding sub-basins and more distal settings. Oil-prone facies in upper portion of sequence. Multiple oil sub-families, reflecting environmental variations (water depth, salinity, etc.) and relative proportion of allochthonous organic matter. Oil sub-families geographically restricted, and associated with distinct sub-basin)

Katz, B.J. & B. Mertani (1989)- Central Sumatra- a geochemical paradox. Proc. 18th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 403-425.
(Geochemical data from C Sumatra crude oils (Incl. biomarker, C-isotopic composition), suggest 4 distinct crude oil families, each with distinct source. However, source rock data indicate only one effective oil source rock:Paleogene Pematang Brown Shale. Facies variations hin Brown Shale may explain observed differences)

Keats, W. (1981)- Cainozoic sedimentation in Sumatra north of 3°N. In: Proc. Second Symp. Integrated geological survey of northern Sumatra. Laporan Simposium Direktorat Sumber Daya Mineral, Direct. Min. Res., Bandung, 3A, p. 87-101.
(Cenozoic stratigraphy of N and E parts of N Sumatra well established, from oil and gas exploration activities. Modified formation names proposed. Depositional model postulates presence off NW of Sumatra, of a chain of non-volcanic outer arc islands between 35/32 Ma- 18/17 Ma, similar to present Nias-Mentawai islands. E-M Miocene uplift of Asahan Arch and volcanism, mid-Miocene orogeny linked to initial opening of Andaman Sea, Late Miocene- Quaternary volcanism, and latest Plio-Pleistocene orogenic pulse)

Keil, K.F.G. (1931)- Over het ontstaan van karakteristieke kalk concreties in de Telisa-lagen aan den oostrand van het Goemai-gebergte. De Mijningenieur 12, p. 193-198.
('On the origin of characteristic calcareous concretions in the Telisa beds at the E margin of the Gumai Mountains'. Septarian nodules in E Miocene marine Telisa Fm, S Sumatra, formed by physical-chemical processes)

Kelley, P.A., B. Mertani & H.H. Williams (1995)- Brown Shale Formation: Paleogene lacustrine source rocks of Central Sumatra. In: B.J. Katz (ed.) Petroleum source rocks, Springer-Verlag, Berlin, p. 283-308.
(Review of geochemistry of M-L Eocene? organic-rich lacustrine Brown Shale Fm of Paleogene Pematang Gp. Brown Shale with fresh-water gastropods and algae. Hydrocarbon generation and expulsion from Brown Shale and Coal Zone Fms in Balam, Aman and Kiri Troughs began at ~10 Ma, followed by wet gas and condensate at ~5 Ma (earlier in Rangau and deeper Aman Troughs). Asymmetry of rift troughs drives dominant lateral migration of oil-gas towards gentle hinge margin. Minor vertical migration related to faults and fractures)

Kesumajana, A.H.P. (2009)- Pengaruh mekanisme pembentukan Cekungan tersier terhadap sejarah temperatur dan pembentukan hidrokarbon di Cekungan Sumatra Selatan. Dokt. Dissertation Inst. Teknologi Bandung (ITB), p. 1- . *(Unpublished)*
('The influence of the formation mechanism of a Tertiary Basin and temperature history and the formation of hydrocarbons in the South Sumatra Basin'. S Sumatra basin categorized as hot basin, with average of heat flow value of 108 mWm-2. Start of rifting phase in Late Oligocene (30-25 Ma) re-activating three patterns of old basement faults. Thermal modeling along 3 sections. Thermal model and gravity models indicate Moho depth at 15.6 - 19.5 km (thin crust). Heat flow increased at 15-5 Ma, with average of 117 mW/m2, corresponding with onset of Bukit Barisan volcanic activity. Early mature oil generation reached at 25.2 Ma, end of gas generation at 16 Ma. Top Oil window at 1433m depth)

Kesumajana, A.H.P., D. Noeradi, B. Sapiie & A. Priono (2010)- The role of hydrocarbon maturation modeling, a case study: South Sumatra Basin. Proc. 34th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA10-G-147, 4p.
(Summary of thermal modeling study in S Sumatra basin from hydrocarbon maturity data. Five phases: (1) increase in heat flow during rift phase (30.5- 25 Ma), (2) decrease during sag phase (25- 20 Ma), (3) increase again due to magmatic activity (20- 10 Ma), (4) decline after cessation of magmatism (10- 1.6 Ma) and (5) final increase with final magmatic activity (1.6- 0 Ma).

Khiram, S.U., A.B. Samudra & A. Budianto (2013)- Biogenic gas exploration in Karangringin area, South Sumatra Basin, Indonesia. Proc. Joint Conv. Indon. Assoc. Geoph. (HAGI) - Indon. Assoc. Geol. (IAGI), Medan, JCM2013-0196, 5p.
(Karangringin area with shallow gas occurrences in Late Miocene Muara Enim Fm in wells Sagu 1, Siarak 1, etc.. Main gas reservoir 7-30' thick sand layer at 935-1310' below sea level. Carbon isotopic composition of gas (δ13C) -60.38‰ for methane and for C2 -32.28 and -35.13‰, suggesting biogenic origin)

Khiram, S.U., A.B. Samudra & A. Budianto (2014)- Biogenic gas exploration in Karangringin Area, South Sumatra Basin, Indonesia. Majalah Geologi Indonesia 29, 1, p. 85-99.
(online at: www.bgl.esdm.go.id/publication/index.php/dir/article_detail/841)
(Same as Khiram et al. 2013)

Kingston, J. (1978)- Oil and gas generation, migration and accumulation in the North Sumatra Basin. Proc. 7th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, p. 75-104.
(Early geochemical study of hydrocarbon generation-migration of N Sumatra Basin. Adequate source rock believed to be confined to deeper basinal areas at level of Lower Miocene shales (today most models assume Eocene lacustrine and Oligocene coaly sources; same paper as Kingston (1978) below)

Kingston, J. (1978)- Oil and gas generation, migration and accumulation in the North Sumatra Basin. SEAPEX Proc. 4, Singapore 1977/78, p. 158-182.
(N Sumatra Tertiary source rocks are deep in basin and older than lower Middle Miocene; same as Kingston (1978))

Kirby, G.A., R.J. Morley, B. Humphreys, C.J. Matchette-Downes, M.J. Sarginson, G.K. Lott et al. (1993)- A re-evaluation of the regional geology and hydrocarbon prospectivity of the onshore central North Sumatra basin. Proc. 21st Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 243-264.
(BGS/ LEMIGAS study of onshore central N Sumatra Basin. Results indicate possibility of hydrocarbons in stratigraphic traps and closures in Miocene sediments and Paleogene half-grabens which are believed to have been source kitchens. Marine mudstones poor source potential for gas only. Source rocks probably lacustrine, very mature, located in Paleogene half grabens. Oil generation began at ~11 Ma in deepest of half-grabens)

Kirby, G.A., B. Situmorang & B. Setiardja (1989)- Seismic stratigraphy of the Baong and Keutapang Formations, North Sumatra Basin. Proc. 18th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 289-301.
(Seismic stratigraphy of M-L Miocene sandstones in Pertamina Unit I area, N Sumatra. Dominantly deltaic sequences of Keutapang Fm in S and marine Upper Baong Shale to N. Three phases of delta progradation. Clastic source directions mainly from SSW and SW, from rising Barisan Mountains. Besitang River Sst in NE from continental source in East)

Kjellgren, G.M. & H. Sugiharto (1989)- Oil geochemistry: a clue to the hydrocarbon history and prospectivity of the southeastern North Sumatra Basin, Indonesia. Proc. 18th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, p. 363-384.
(Oils from onshore and offshore N Sumatra basin two separate phases. Oldest severely biodegraded and probably expelled from syn-rift E Oligocene Bampo Fm. Widespread post-rift Late Oligocene- M Miocene Lower Baong/Belumai Fm is source for second and final oil phase)

Koesoemadinata, R.P. & T. Matasak (1981)- Stratigraphy and sedimentation: Ombilin Basin, Central Sumatra (West Sumatra Province). Proc. 10th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, p. 217-249.
(Ombilin basin asymmetric intermontane basin, folded in E part. Carboniferous Limestones (Kuantan Fm), Permian volcanics (Silungkang Fm) and Triassic sediments, intruded by granites. Paleocene Sangkarewang Fm lacustrine shales with fish fossils, interfingering with Brani Fm alluvial fan conglomerates. In NW these units overlain by probably Eocene coal bearing Sawahlunto Fm. Paleogene ~2600m thick, overlain by Ombilin Fm marine clay-marls (Lower Miocene), unconformably overlain by Ranau Fm Quaternary tuffs)

Koning, T. (1985)- Petroleum geology of the Ombilin intermontane basin, West Sumatra. Proc. 14th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 117-137.
(Sinamar No. 1 first oil exploration well in Tertiary intermontane basin in Indonesia. Ombilin Basin rel. small (~1500 km2), but up to 4600m of M Eocene -E Miocene sediments with significant depositional hiatuses. Massive debris flows and extensive alluvial fan deposits on basin margins and large Eocene lake in center. Uplift and erosion since M Miocene reduced Ombilin Basin to present area. Located in Sumatra magmatic arc, but temperature gradients cooler than Sumatra back-arc basins. Eocene lacustrine shales and Oligocene marine shales likely source rocks for hydrocarbons tested in Sinamar 1 and oil seeps along basin margins)

Koning, T. (1992)- Oil production from Pre-Tertiary basement rocks in Indonesia: examples from Sumatra and Kalimantan. AAPG Ann. Mtg. Calgary 1992 *(Abstract)*

(Beruk NE (1976) field in C Sumatra produces from pre-Tertiary basement. Beruk NE 1 tested 1680 BOD and ~2 MBO produced from metaquartzites, weathered argillites and granite. Radiometric ages E Permian- E Cretaceous. Unusual production problems due to reservoir variability, four separate oil-water contacts, and possible unrecognized water-bearing fracture systems. Tanjung field in Barito basin, S Kalimantan (1938), produced 21 MBO from Pre-Tertiary volcanics, pyroclastics and metamorphosed sandstones and claystones, locally weathered and fractured. Both fields faulted anticlines, and oil source rocks adjacent Tertiary shales)

Koning, T. & K. Aulia (2000)- Exploration in the Ombilin intermontane basin, West Sumatra. AAPG Int. Conf. Bali 2000. *(Abstract only)*
(Caltex 1984 Sinamar-1 first well in intermontane Ombilin Basin in Barisan Mts., with noncommercial oil and gas. Apache 1994 South Sinamar-1 was 1140m dry hole. Despite small area (1500 km2), up to 4600m of Tertiary sediments. Basin initially Early Tertiary intermontane trough with debris flows and alluvial fans on margins and Eocene lake in center. Uplift-erosion since M Miocene reduced original basin extent. Although in present-day magmatic arc and partially covered by volcanics, T gradients lower than Sumatra back-arc basins. Eocene lacustrine shales likely source for hydrocarbons in Sinamar-1 and two oil seeps along basin margin)

Koning, T. & F.X. Darmono (1984)- The geology of the Beruk Northeast Field, Central Sumatra; oil production from Pre-Tertiary basement rocks. Proc. 13th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, p. 385-406.
(Beruk NE oil field in C Sumatra discovered in 1976. Tested 1680 BOPD from Pre-Tertiary fractured metaquartzites, weathered argillites, and weathered granite. Radiometric ages mainly Jurassic- E Cretaceous. Bohorok Fm pebbly mudstone in nearby Cucut 1 well contains E-M Carboniferous flora and granitic clast with Rb-Sr age of 348±10 Ma (Visean, E Carboniferous))

Koswara, R., N. Suwarna & I. Syafri (2014)- Karakteristik dan lingkungan pengendapan batubara Formasi Muaraenim berdasarkan petrologi organik di daerah Darmo, Lawang Kidul, Sumatra Selatan. Majalah Geol. Indonesia 29, 3, p. 161-182.
('Characteristics and depositional environment of Muaraenim Formation coal based on organic petrology at Darmo area, Lawang Kidul, South Sumatra'. Petrography of Late Miocene Muara Enim Fm coal in Banko Tenga coalfield, S Sumatra basin. Mainly vitrinite, followed by inertinite and exinite. Vitrinite reflectance ~0.40-0.45% (sub-bituminous B-C rank). Depositional environment lower delta plain)

Krausel, R. (1922)- Fossile Holzer aus dem Tertiar von Sud-Sumatra. Beitr. Geol. Palaont. Sumatra 4, Verhandelingen Geologisch-Mijnbouwkundig Genootschap Nederland Kol., Geol. Serie 5, 5, p. 231-287.
('Fossil wood from the Tertiary of South Sumatra'. Descriptions of Miocene silicified woods collected by Tobler. Up to 10m long silicified tree trunks in tuffaceous Upper Miocene Lower Palembang Fm. Some name changes suggested by Den Berger (1923))

Krausel, R. (1929)- Fossile Pflanzen aus dem Tertiar von Sud-Sumatra. Beitr. Geol. Pal. Sumatra 11, Verhandelingen Geologisch-Mijnbouwkundig Genootschap Nederland Kol., Geol. Serie 9, 1, p. 1-44.
('Fossil plants from the Tertiary of South Sumatra'. Description of plants collected by Tobler from M and U Palembang Fms. Late Miocene S Sumatra forests not much different from present-day. No locality maps, stratigraphy)

Kurnely, K., B. Tamtono, S. Aprilian & I. Doria (2003)- A preliminary study of development of Coalbed Methane (CBM) in South Sumatra. SPE Asia Pacific Oil and Gas Conf., Jakarta 2003, 6p.
(South Sumatra onshore basin assesed potential Coal Bed Methane gas 120 TCF. Not much detail)

Kurniawan, R., A. Nazamzi, D.V. Kusuma & D. Morgan (2015)- Promising small structure discoveries in mature basins: a case study in the South Aman Trough, Central Sumatra Basin. Proc. 39th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA15-G-056, 15p.
(Recent discoveries in poorly explored Oligocene Pematang Gp sandstone reservoirs in small structures within main depocenter area of S Aman Trough, C Sumatra Basin).

Kusdiantoro, F., D.H. Amijaya & J. Setyowiyoto (2018)- Basin modeling for genesis and migration pattern determination of oil and gas in Musi and surrounding area, South Sumatra Basin. Proc. 42nd Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA18-69-G, 12p.
(Petroleum system modeling suggests expulsion in Benakat subbasin started at 13 Ma while in Pigi subbasin it started from 9.5 Ma. Four migration patterns in Musi High, three charged from Benakat and one charged from Pigi subbasin. Saung Naga subbasin on Musi Platform still immature until present day)

Kusnama (2002)- The significance of sedimentary rocks of the Bengkulu Basin in the development of the fore arc basin, Sumatra. J. Geologi Sumberdaya Mineral 12, 128, p. 2-13.
(Bengkulu Basin of SW Sumatra up to 3000m thick Tertiary section. Oldest exposed unit E-M Miocene marine turbiditic clastics)

Kusnama (2004)- Tertiary succession of the Gedongharta Region and its relation to the tectonics of South Sumatra. Geol. Res. Dev. Centre (GRDC), Bandung, Spec. Publ. 31, p. 14-23.

Kusnama, S. Andi Mangga & D. Sukarna (1993)- Tertiary stratigraphy and tectonic evolution of southern Sumatra. In: G.H. Teh (ed.) Proc. Symposium on the Tectonic framework and energy resources of the western margin of the Pacific Basin, Kuala Lumpur 1992, Bull. Geol. Soc. Malaysia 33, p. 143-152.
(online at: https://gsmpubl.files.wordpress.com/2014/09/bgsm1993011.pdf)

Kusnama & H. Panggabean (2009)- Karakteristik batubara dan batuan sedimen pembawanya, Formasi Talangakar, di daerah Lampung Tengah. J. Geologi Indonesia 4, 2, p. 133-144.
(online at: https://ijog.geologi.esdm.go.id/index.php/IJOG/article/viewFile/75/75)
('Characteristics of coal-bearing Talang Akar Fm in the C Lampung area', SW margin S Sumatra Basin. Conglomerates and quartz sst in lower part; shale, claystone, siltstone and coal in upper part. Coal bearing unit believed to be fluvial- paralic Talang Akar Fm coaly section overlain by E-M Miocene limestone and intruded by M-L Miocene granodiorite. Basement is Gunungkasih metamorphics and Cretaceous granite)

Kusumahbrata, Y. & N. Suwarna (2003)- Characteristics of the Keruh Formation oil shale: its implication to oil shale resource assessment. In: Proc. Kolokium Energi dan Sumber Daya Mineral 2003, Puslitbang Teknologi Mineral dan Batubara, Bandung, p. 353-377.
(Eo-Oligocene organic shale in Keruh Fm along Keruh River, NW of Petai, Riau Province, SW margin of C Sumatra Basin)

Laing, J.E. & B.P Atmodipurwo (1992)- The Dalam Sandstone deeper EOR potential in the Duri Field, Sumatra, Indonesia. Proc. 21st Ann. Conv. Indon. Assoc. Geol. (IAGI), Yogyakarta, 1, p. 91-112.
(Duri field in C Sumatra ~7 billion barrels oil-in-place, mostly heavy oil and only 7.5% recoverable by primary production methods. Caltex steam injection project since 1985. Evaluation of E Miocene Dalam Sst deltaic/ tidal flat reservoir interval in Bekasap Fm, Sihapas Gp)

Laing, J.E., B.P. Atmodipurow & A. Rauf (1995)- Structural evolution of the Pematang reservoirs, Kelabu Jingga Gas Fields, Sumatra. In: G.H. Teh (ed.) Southeast Asian Basins: oil and gas for the 21st century, Proc. AAPG-GSM Int. Conf. 1994, Bull. Geol. Soc. Malaysia 37, p. 55-75.
(online at: https://gsmpubl.files.wordpress.com/2014/09/bgsm1995a04.pdf)
(Kelabu and Jingga gas fields in Kiri Trough, C Sumatra Basin, producing from Eo-Oligocene fluvial-lacustrine Pematang Gp. Deposition in transtensional pull-apart grabens and shallow extensional rifts during regional tectonism associated with major plate reorganization in Pacific and Indian Oceans. Syngenetic listric faults and associated 'rollover' folds formed during rifting. Neogene, oblique convergence of Indian Ocean plate resulted in regional dextral-wrenching event in C Sumatra Basin, overprinting older extensional faulting)

Lambrecht, K. (1931)- *Protoplotus beauforti* n.g. n.sp., ein Schlangenhalsvogel aus dem Tertiar von W. Sumatra. Wetenschappelijke Mededeelingen Dienst Mijnbouw Nederlandsch-Indie 17, p. 15-24.
(Long-necked bird skeleton from ?Eocene fish-rich lacustrine clays in Ombilin basin, collected by Musper in 1927. Oldest known member of Anhingidae water-bird family. With common gastroliths (= stomach stones))

Larasati, D., E.A. Subroto, H.N. Saputra & B. Syam (2013)- Source rock distribution at Jabung Block, Jambi sub-basin, South Sumatra Basin, based on well correlation. Proc. Joint Conv. 38th Indon. Assoc. Geoph. (HAGI) - 42nd Indon. Assoc. Geol. (IAGI), Medan, JCM2013-0147, 10p.
(Source rock geochemistry on samples from wells NE Betara 1 and 5, N Geragai 2, Ripah 1 and 2.Best source potential in Late Oligocene Lower Talang Akar Fm)

Larasati, D., E.A. Subroto, H.N. Saputra & B. Syam (2013)- Geochemical characterization and oil-source rock correlation in Jabung Block, Jambi Sub-Basin, South Sumatra Basin. Proc. Joint Conv. 38th Indon. Assoc. Geoph. (HAGI) - 42nd Indon. Assoc. Geol. (IAGI), Medan, JCM2013-0148, 12p.
(Upper and Lower Talang Akar Fms in Jabung Block (Jambi sub-basin) have oil-gas source rock potential with fair-very good organic material, reached oil maturity stage and with good geochemical correlation with oils. Rocks and oil samples contain mixture of algae and land plants, deposited in suboxic environments)

Leach, P.E. & S.K. Kartono (1990)- Pematang Bow Field, Central Sumatra: a case study of 3-D seismic as an effective reservoir management tool. Proc. 19th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 209-224.

Lee, R.A. (1982)- Petroleum geology of the Malacca Strait contract area (Central Sumatra Basin). Proc. 11th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, p. 243-263.

Lelono, E.B. (2004)- Paleogene sediment in South Sumatera - where has it gone. Lemigas Scientific Contr. 2004, 3, p. 29-37.

Lelono, E.B. (2009)- Pollen record of Early/ Middle Miocene boundary in the South Sumatra Basin. Lemigas Scientific Contr. 32, 2, p. 71-81.
(Early- Middle Miocene boundary (= boundaries of foram zones N8/ N9 and calcareous nannoplankton zones NN4/ NN5) in S Sumatra characterized by lowering of sea level (decrease in foraminiferal and calcareous nannoplankton assemblages) and climate change from wet during zone N8 to seasonal/dry climate around N8/ N9 boundary. Gradual changes to wetter climate through zone N9)

Lelono, E.B., C.A. Setyaningsih & L. Nugrahaningsih (2014)- Paleogene palynology of the Central Sumatera Basin. Lemigas Scientific Contr. Oil and Gas, Jakarta, 37, 2, p. 105-116.
(online at: www.lemigas.esdm.go.id/publikasi/read/scientific/1/)
(Pollen assemblage of Paleogene sediments in C Sumatra Basin less rich than in C Java, SE Kalimantan, S Sulawesi. Occurrences of spore Cicatricosisporites dorogensis and pollen Palmaepollenites kutchensis and Meyeripollis naharkotensis suggest most likely Oligocene age for Brown Shale and Upper Red Beds. Surprising absence of lacustrine fresh water algae Pediastrum and Bosedenia))

LEMIGAS and British Geological Survey (1993)- The North Sumatra Basin- Hydrocarbon potential of the PERTAMINA UEP-I area. 2 vols. *(Unpublished)*

LeRoy, L.W. (1939)- Some small foraminifera, ostracoda and otoliths from the Neogene ("Miocene") of the Rokan-Tapanoeli area, Central Sumatra. Natuurkundig Tijdschrift Nederl.- Indie 99, 6, p. 215-296.
(*Descriptions of 95 species of Miocene small benthic foraminifera and six species of ostracoda from Telisa and Palembang formations along E front of Barisan mountains)*

LeRoy, L.W. (1941)- Small foraminifera from the Late Tertiary of the Netherlands East Indies. 2. Small foraminifera from the Late Tertiary of Siberoet Island, off the West coast of Sumatra. Quarterly Colorado School of Mines 36, 1, p. 63-105.

LeRoy, L.W. (1944)- Miocene foraminifera from Sumatra and Java, Netherlands East Indies. 1. Miocene foraminifera of Central Sumatra, Netherlands East Indies. Quarterly Colorado School of Mines 39, 3, p. 1-69.

(Descriptions of 183 species of Miocene small benthic foraminifera from Telisa and L-M Palembang formations along E front of Barisan mountains. Little or no stratigraphic or locations information)

LeRoy, L.W. (1952)- *Orbulina universa* dôOrbigny in Central Sumatra. J. Paleontology 26, 4, p. 576-584.
(Lowest occurrence of planktonic foram Orbulina within Telisa Fm of C Sumatra good basal Middle Miocene marker horizon. With chart of foraminifera distribution in Telisa- M Palembang formations in Kasikan section, Barisan mountain front)

Liew Kit Kong (1995)- Structural patterns within the Tertiary basement of the Strait of Malacca. Bull. Geol. Soc. Malaysia 38, p. 109-126.
(online at: www.gsm.org.my/products/702001-100921-PDF.pdf)
(Basement of Strait of Malacca slopes gently to SW. With N-trending grabens in Malaysian waters, continuing into Sumatra, with depths of 900- 4000m. Four groups of grabens: (1) Bengkalis Trough related, (2) Pematang-Balam Trough related, (3) Asahan Arch-Kepulauan Aruah Nose related and (4) Tamiang-Yang Besar High related grabens. Grabens initiated in E Oligocene by right lateral shearing in NW-SE direction)

Lin, Y.N., K. Sieh & J. Stock (2010)- Submarine landslides along the Malacca Strait- Mergui Basin shelf margin: insights from sequence-stratigraphic analysis. J. Geophysical Research 115, B12102, p. 1-13.
(Seismic profiles over Pleistocene shelf margin of Malacca Strait-Mergui Basin NE of N Sumatra show three sediment packages interpreted as submarine landslides, aged 20-30 ka, 342-364 ka and 435-480 ka. Events occurred near times of sea-level lowstands, implying that high sediment influx during glacial periods is essential for basin-margin submarine landsliding)

Liro, L.M., W.C. Dawson & Yarmanto (1977)- Alluvial fan/ fan delta sequence stratigraphy in a structurally segmented rift basin: Sidingin Field, North Aman Trough, Central Sumatra Basin, Indonesia. In: K.W. Shanley & B.F. Perkins (eds.) Shallow marine and non-marine reservoirs, Gulf Coast Sect. SEPM, 18th Annual Bob F. Perkins Research Conf., Houston 1997, p. 171-181.
(Sidingin Field 1989 discovery at N end Aman Trough, C Sumatra. Reservoir rocks fluvial sands, interpreted to be part of alluvial fan- fan delta complex)

Lismawaty, K. Simanjuntak & A. Bachtiar (2010)- Studi provenance batupasir Formasi Sihapas daerah Gunung Tua- Sumatera Utara. Proc. 39th Ann. Conv. Indon. Assoc. Geol. (IAGI), Lombok, PIT-IAGI-2010-083, 15p.
('Provenance study of Sihapas Fm sandstone, Gunung Tua area, North Sumatra')

Longley, I.M., R. Barraclough, M.A. Bridden & S. Brown (1990)- Pematang lacustrine petroleum source rocks from the Malacca Strait PSC, Central Sumatra, Indonesia. Proc. 19th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, p. 279-299.
(Wells on margins of Bengkalis Trough encountered Eocene-Oligocene Pematang Group lacustrine mudstones ('Brown Shale') in shallow, immature sub-basin. Oil-source correlation suggests similar lacustrine sediments in Bengkalis Trough main source of oil in area. Relative 'deep' and 'shallow' lake and marginal lake sediments encountered, with characteristic palyno- and organo- facies. Anomalous low velocity and density of Brown Shale causes distinct seismic response, which can be used to map distribution of source rock)

Longman, M.W., R.J. Maxwell, A.D.M. Mason & L.R. Beddoes (1987)- Characteristics of a Miocene intrabank channel in Batu Raja Limestone, Ramba field, South Sumatra, Indonesia. American Assoc. Petrol. Geol. (AAPG) Bull. 71, p. 1261-1273.
(Ramba Field produces from Lower Miocene reefal limestone buildup. Channel facies between buildups rel. tight and may act as lateral seal)

Longman, M.W., C.T. Siemers & T. Siwindono (1992)- Characteristics of low-relief carbonate mudbank reservoir rocks, Baturaja Formation (Lower Miocene), Air Serdang and Mandala Fields, South Sumatra Basin, Indonesia. In: Carbonate rocks and reservoirs of Indonesia, a core workshop, Indon. Petroleum Assoc., p. 9.1-9.11.

(Air Serdang and Mandala fields reservoirs skeletal packstones in Lower Miocene Baturaja Fm at ~1500m. Reservoir rocks common fragments of branching corals with molluscs, and benthonic foraminifers in micritic and locally quite porous matrix, deposited in carbonate mudbanks draped over basement paleohigh during E Miocene marine transgression. Low-relief channels separate carbonate mudbanks)

Lott, G.K. & Sundoro (1990)- The sedimentology of hydrocarbon reservoir rocks in Indonesia, a case study from the North Sumatra Basin. Lemigas Scientific Contr. 14, 1, Special Issue, p. 1-23.
(Marine glauconitic sandstones of Besitang River Sand Member with spectacular chlorite cements . Dominant framework grains monocrystalline quartz, feldspars and igneous and metasedimentary lithic fragments)

MacGregor, D.S. & A.S. MacKenzie (1986)- Quantification of oil generation and migration in the Malacca Strait region Central Sumatra. Proc. 15th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 3053-320.
(Oils in fields of Hudbay Malacca Strait PSC believed to be sourced mainly from intraformational coals in Sihapas Fm. Significant oil expulsion starts at ~125°-130° C with most expulsion at ~130-140°C)

Madon, M.B. & M.B.Ahmad (1999)- Basins in the Straits of Melaka. In: The petroleum geology and resources of Malaysia, Chapter 10, Petronas, Kuala Lumpur, p. 235-250.
(Straits of Melaka NE part of North and Central Sumatra basins and basement. N-S trending series of highs and small Oligocene- Miocene rift basins. No petroleum discoveries, but underexplored. Main risks valid traps and maturity of source rocks in grabens)

Maliki, M.A. & S. Soenarwi (1991)- South Lho Sukon-D1 discovery, North Sumatra. Proc. 20th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 235-254.

Manaf, N.A. & N. Mujahidin (1993)- Evaluasi migrasi hidrokarbon di sub cekungan Jambi berdasar pemelajaran biomarker dan sejarah tektoniknya. Proc. 22nd Ann. Conv. Indon. Assoc. Geol. (IAGI), Bandung, 2, p. 736-746.
('Evaluation of hydrocarbon migration in the Jambi sub-basin, based on biomarker learnings and tectonic history'. N part of S Sumatra basin. Positive correlation between Talang Akar Fm source rocks and oils in Air Benakat Fm)

Mandre, D. (2000)- Coal geology of the Bengkulu Block. In: Proc. Southeast Coal Geology Conference, Directorate General of Geology and Mineral Res. Indonesia, Bandung, p.

Mangold, K.M., Erlina & E.B. Hamzah (1992)- Critical aspects of 3-D seismic surveys for field development in Central Sumatra. Proc. 21st Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 257-286.

Mangunkusumo, R.I. (1982)- Infill drilling in old fields. In: SPE Offshore South East Asia Conf, Singapore 1982, 16p.
(On infill drilling program by Stanvac in Raja and Abab old oil fields, onshore S Sumatra, to identify and recover remaining oil not drained by existing wells. Original development on 80-acre spacing did not define all hydrocarbon bearing zones nor establish all drainage points in complex Talang Akar sandstone reservoirs)

Manik, P. & Soedaldjo (1984)- Prediction of abnormal pressure based on seismic data. A case study of exploratory well drilling in Pertamina UEP I and UEP II work areas. Proc. 13th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, p. 507-532.

Mann, P. (2012)- Comparison of structural styles and giant hydrocarbon occurrences within four active strike-slip regions: California, Southern Caribbean, Sumatra, and East China. In: D. Gao (ed.) Tectonics and sedimentation: implications for petroleum systems, American Assoc. Petrol. Geol. (AAPG) Mem. 100, p. 43-94.
(Includes chapter on Sumatra and Gulf of Thailand, Malay and Natuna basins. Sumatra strike-slip system is trench-linked strike-slip fault accommodating strike-slip component of oblique subduction zone, which probably nucleated on weak zones in crust formed by heated and thinned crust of volcanic arc)

Manuyama, J.M.B., Nazirman & Haryoto (2004)- Characterization of reservoir carbonate and hydrocarbon potential Baturaja Formation on Nova structure, South Sumatra. Proc. 33rd Ann. Conv. Indon. Assoc. Geol. (IAGI), p. 172-180.
(Nova field in Baturaja Limestone in SW part S Sumatra basin discovered in 1998. 31 wells drilled, but 8 wells unsuccessful and 3 wells with poor flow, all due to poor reservoir quality. High porosites in reefal buildup, rel. low in platform facies)

Maridhona, H., Gumelar, M. Ricardo & Miftahurochman (2014)- New gas discovery in the Early Miocene carbonate, North Sumatra Basin, Indonesia Proc. 38th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA14-G-077, 10p.
(MDC-1 exploration well in onshore N Sumatra Block A discovered gas in late 2012 in E Miocene carbonate. Well ~25 MMCF gas/day)

Marpaung, L.P., B.J. Katz & M.H. Amlan (2010)- Brown shale characterization in Kiri Trough, Central Sumatra Basin. Proc. 39th Ann. Conv. Indon. Assoc. Geol. (IAGI), Lombok, PIT-IAGI-2010-058, 12p.
(C Sumatra basin prolific hydrocarbons, with most oil sourced from Oligocene lacustrine shales-coal of Brown Shale Fm. Brown Shale in Kiri Trough TOC 0.7-13% for shales, mainly type III kerogen from higher plant material (pristane/phytane ratio >3). Kiri Trough Brown Shale deposited in more paludal setting than lacustrine Brown Shale of other troughs in C Sumatra. This facies of Brown Shale typically generates gas)

Marpaung, L.P., K.A. Maryunani, I.N. Suta & C. Irawan (2007)- Quantitative biostratigraphy of Jabung Block, South Sumatra Basin: a probablilistic approach for biozonation and correlation. Proc. 31st Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 317-331.
(Probabilistic analysis of Oligocene- lower Middle Miocene in ten S Sumatra wells enabled higher precision of correlation and biozonation. Palynology, foram and nannofossil micropaleontology gave 52 biostrat events, 11 of which proved reliable. An eight-biozone scheme is proposed)

Marpaung, L.P., D.H. Mulyono, A.H. Satyana, & E.A. Subroto (2005)- Oil family characterization of Jabung area, Jambi sub-basin. Proc. Joint 34th Ann. Conv. Indon. Assoc. Geol. (IAGI), 30th Indon. Assoc. Geoph. (HAGI), Surabaya, JCS2005-G087, p. 164-172.
(Oils of Jabung area mainly sourced from higher terrestrial-land plants. Shales and coals of Talang Akar are main source rocks of oils)

Marpaung, L.P., I.N. Suta & A.H. Satyana (2006)- Gumai shales of Jabung area: potential source rocks in Jambi sub-basin and their contributions to the new petroleum system. Proc. 35th Ann. Conv. Indon. Assoc. Geol. (IAGI), Pekanbaru 2006, PITIAGI2006-013, 12p.
(E-M Miocene marine Gumai shales in Jambi Basin, C Sumatra, generally low TOC, dominated by Type II and III kerogen and thermally immature to early mature. However, some oils in Jabung area show close correlation to Gumai shales, showing that shales generated oils)

Marpaung, L.P., I.N. Suta, A.H. Satyana & J.A. Paju (2008)- Gas geochemistry of Betara Complex, Jabung Area, South Sumatra Basin: genetic characterization and habitat of natural gases. Proc. 37th Ann. Conv. Indon. Assoc. Geol. (IAGI), Bandung, 1, p. 569-580.
(Jabung area in Jambi sub-basin, N part of S Sumatra Basin, with oil and gas production since 1997 after 1995 discoveries of N Geragai and Makmur Fields, 1997 NE Betara and subsequent discoveries. Gas geochemistry shows wet thermogenic gases. Locally high CO2 gas in Lower Talang Akar Fm from thermal destruction of carbonate. Sources and reservoirs of gas encompass almost whole of Oligocene to Miocene sediments)

Martadinata, A.H. (1982)- Batupasir Beta endapatan "point bar" di ladang Dewa, Sumatera Selatan. Proc. 11th Conv. Indon. Assoc. Geol. (IAGI), Jakarta, p. 81-93.
('Beta sand point bar deposits in the Dewa field, South Sumatra'. Dewa field in S Sumatra basin with 41 wells since 1971. Oil from upper Talang Akar Fm, mainly from Beta sand (76%), a NE-SW trending channel system)

Martadinata, A.H. (1999)- Gas potential of the Musi Platform, South Sumatra. In: C.A. Caughey & J.V.C. Howes (eds.) Proc. Conf. Gas habitats of SE Asia and Australasia, Jakarta 1998, Indon. Petroleum Assoc. (IPA), p. 145-151
(First field on Musi Platform in 1939 (BPM Kikim-1) discovered gas in Baturaja limestone, the main producing reservoir on platform. Over next 60 years, 20 additional wells discovered hydrocarbons: only two were oil; remainder found gas. Five types of carbonate build-up in Baturaja Fm. Exspan 1997 Soka-1 on flank of Bungur basement high substantial gas in Baturaja reefal limestone)

Martadinata, A.H. & J.H. Wright (1984)- Development of Ibul stratigraphic play, South Sumatra Basin, by integration of geologic and seismic data. Proc. 13th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 51-62.

Martin, K. (1881)- Jungtertiare Ablagerungen im Padangschen Hochlande auf Sumatra, nach der Sammlung Hornerôs. Sammlungen Geol. Reichs-Museums Leiden, E.J. Brill, Ser. 1, 1, p. 84-101.
(online at: www.repository.naturalis.nl/document/552440)
('Young Tertairy deposits in the Padang Highlands on Sumatra, from the collection of Horner'. Probably Miocene-age from Tanjung Ampalo, Padang Highlands, W Sumatra. 19 mollusc species, mainly bivalves)

Martin, K. (1882)- Jungtertiare Ablagerungen im Padangschen Hochlande auf Sumatra, nach der Sammlung Hornerôs. Jaarboek Mijnwezen Nederlandsch Oost-Indie 11 (1882), Wetenschappelijk Gedeelte, p. 157-179.
(Same paper as Martin (1881) above)

Martin, K. (1928)- Mollusken aus dem Neogen von Atjeh in Sumatra. Wetenschappelijke Mededeelingen Dienst Mijnbouw Nederlandsch-Indie 10, p. 1-36.
(Descriptions of Neogene molluscs from Aceh, N Sumatra, collected by 'Dienst Mijnwezen'. Indo-Pacific fauna)

Martin, K. (1928)- Concerning the Tertiary of Atcheen. Proc. Kon. Nederl. Akademie Wetenschappen, Amsterdam, 31, 3, p. 300.
(online at: www.dwc.knaw.nl/DL/publications/PU00015579.pdf)
(One-page communication summarizing work on molluscs from ~3000m thick Pliocene deposits of N Aceh. Department of Mines collected >6000 molluscs, belonging to 347 different species. Typical Indo-Pacific fauna)

Martin, K. (1929)- Ein neues Argonautiden Geschlecht von Sumatra. Leidsche Geol. Mededelingen 3, p. 221-226.
(online at: www.repository.naturalis.nl/document/549561)
('A new Argonautid genus from Sumatra'. New octopod nautiloid shell, described as Kapal batavus, from clay nodule 500m below top of M-L Miocene Lower Palembang Beds of Pangadang, 25 km W of Sekayu, S Sumatra)

Ma'ruf, M.F., A. Arsyad, G. Crouzet, S. Handoko & F. Langitan (1996)- Improved reservoir geology model using seismic 3D and well data, a case study, Rantau Field, Indonesia. In: SPE Asia Pacific Oil and Gas Conference, Adelaide 1996, 12p.
(Reservoir geology model for part of Rantau oil field, N Sumatra. Discovered by BPM in 1929, 550 oil wells and recoverable reserves ~300 MMBO, most if which has been produced)

Maryanto, S. (2001)- Stratigrafi cekungan Tersier Bengkulu: kaitannya dengan keterdapatan batubara. Geol. Res. Dev. Centre (GRDC), Bandung, Spec. Publ. 26, p. 53-71.
('Stratigraphy of the Bengkulu Basin and links with coal'. Late Miocene- Pliocene Simpangaur Fm important coal formation. Coalification due to Pliocene (~3.5 Ma) dacite intrusions. Coal seams 30 cm- 7m thick)

Maryanto, S. (2002)- Stratigrafi formasi pembawa batubara Paleogen di Linggapura, Padangratu, Lampung. J. Geologi Sumberdaya Mineral 12, 126, p. 37-67.
('Stratigraphy of the Paleogene lower coal formation in Linggapura, Padangratu, Lampung', S Sumatra'. ~510m thick series of Oligocene- E Miocene Talangakar Fm fluvial clastics with coal at Penandingan River near Padangratu. Overlying Cretaceous granite and overlain by marine Miocene Baturaja Fm)

Maryanto, S. (2005)- Sedimentology batuan karbonat Tersier, Formasi Baturaja, di lintasan Air Napalan, Baturaja, Sumatra Selatan. J. Sumber Daya Geologi 15, 1 (148), p. 83-101.
('Sedimentology of Tertiary Baturaja Fm carbonate at the Air Napalan section, S Sumatra'. 220m thick section of E Miocene Baturaja Fm at Napalan River, NNE of Muaradua. Restricted carbonate platform at W side of S Sumatra basin. Lagoonal facies grading upward into reeal buildup)

Maryanto, S. (2007)- Petrografi dan proses diagenesis batugamping Baturaja di lintasan Air Saka, OKU Selatan, Sumatra Selatan. J. Sumber Daya Geologi 17, 1 (157), p. 13-31.
(online at: http://jgsm.geologi.esdm.go.id/index.php/JGSM/article/view/276/247)
('Petrography and diagenetic processes of the Baturaja Fm limestone at the Air Saka section, S Sumatra'. E Miocene Baturaja Fm 247m thick in Air Saka section. Several diagenetic processes)

Maryanto, S. (2008)- Hubungan antar komponen mikrofasies lereng terumbu dan cekungan lokal terumbu belakang batugamping bioklastika Formasi Baturaja di daerah sekitar Muaradua, Sumatera Selatan. J. Sumber Daya Geologi 18, 2, p. 107-120.
(online at: http://jgsm.geologi.esdm.go.id/index.php/JGSM/article/view/242/221)
('The relationship between the components of the reef slope and local basin microfacies of bioclastic limestones of the Baturaja Formation in the area around Muaradua, S Sumatra')

Maryanto, S. (2010)- Hubungan antar komponen mikrofasies lereng terumbu dan cekungan lokal belakang terumbu pada batugamping bioklastika Formasi Baturaja di daerah sekitar Muaradua, Sumatera Selatan. Bull. Scientific Contr. (UNPAD) 8, 1, p. 1-14.
(online at: http://jurnal.unpad.ac.id/bsc/article/view/8240/3788)
(Same paper as Maryanto (2008) on microfacies of E Miocene Baturaja Lst in Muaradua area, S Sumatra)

Maryanto, S. (2014)- Limestone microfacies of Baturaja Formation along Air Rambangnia Traverse, South OKU, South Sumatra. Indonesian J. Geoscience 1, 1, p. 21-34.
(online at: http://ijog.bgl.esdm.go.id/index.php/IJOG/article/view/173/173)
(~160m thick Late Oligocene- E Miocene reefal Baturaja Lst outcrop section NE of Muaradua, Garba Mts, S Sumatra, overlying Kikim Fm volcanic breccia and sandstone. With 4 facies types)

Maryanto, S. (2014)- Mikrofasies dan diagenesis batugamping Formasi Baturaja di lintasan Air Kiti, Oku, Sumatra Selatan. J. Geologi Sumberdaya Mineral 15, 2, p. 89-103.
('Microfacies and diagenesis of limestone of the Baturaja Fm in the Air Kiti section, Oku, South Sumatra'. Various reefal facies in ~150m thick limestone of E Miocene Baturaja Fm limestone in river section ~25km S of Baturaja town)

Matasak, T. & R. Kendarsi (1980)- Geologi endapan batubara di Bukit Asam, Sumatra Selatan. Bul. Dept. Geologi Inst. Teknologi Bandung (ITB) 1, p. 11-33.
('Geology of coal deposits at Bukit Asam, S Sumatra')

Matchette-Downes, C.J., A.E. Fallick, Karmajaya & S. Rowland (1994)- A maturity and paleoenvironmental assessment of condensates and oils from the North Sumatra Basin, Indonesia. In: A.C. Scott & A.J. Fleet (eds.) Coal and coal-bearing strata as oil-prone source rocks?, Geol. Soc., London, Spec. Publ. 77, p. 139-148.
(Five light oils-condensates from wells in N Sumatra Basin. Source facies dominantly lacustrine with subordinate ombrogenous raised peat bog paleoenvironments. Oils and condensates mature to extremely mature. Some oils mixtures of different maturities and discrete terrestrial sources)

Maulana, E., A. Sudarsana & S. Situmeang (1999)- Characterization of a fluvial oil reservoir in the Lemat Sandstone (Oligocene), Puyuh Field, South Sumatra Basin. Proc. 27th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, p. 83-104.
(Puyuh Field produces oil from thick Lemat Sst in four-way dip closure. Basal Lemat deposits reddish brown shale unconformably over pre-Tertiary metasediment and volcanics. Reservoir sands thin updip and shale out

before reaching Bertak and Kubu. Nested fluvial channels in N-S trending depocenter on W flank of field. Updip pinchout of deeper sand forms separate stratigraphic trap. High net-to-gross (50-80%) and excellent reservoir quality (av. perm. 300 md, 19% porosity). Sands mainly quartz with some lithics and feldspar. Clay content 8-15%. Oil lacustrine origin, 28° API gravity and requires blending with lighter oil for transportation)

Mazumder, S., I.B. Sosrowidjojo & A. Ficarra (2010)- The Late Miocene Coalbed Methane system in the South Sumatra Basin of Indonesia. In: SPE Asia Pacific Oil and Gas Conf., Brisbane 2010, SPE 133488, 29p.
(Review of S Sumatra coalbed methane (CBM) potential. Basin ranked high, but well testing still in early stages. Coal seams in Late Miocene Muara Enim Fm >3500 ft of paralic clastics, with 10-15 thick coal seams. Coals thickest and most numerous in SW half of basin (Lematang Depression, C Palembang sub-basin). Coals eroded over anticlines. Coals sub-bituminous rank (VRr = 0.35-0.46%) and composed of huminite (34-95%), liptinite (4-23%) and inertinite (0.2- 44%). Moisture content 4-21%)

McArthur, A.C. & R.G. Helm (1982)- Miocene carbonate buildups, offshore North Sumatra. Proc. 11th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 127-146.
(Seismic mapping revealed >70 E-M Miocene Belumai Fm carbonate buildups in Mobil North Sumatra offshore area (NSO). Four oil and four gas discoveries from 12 wildcats. First gas discovery NSB-A1 in 1972. Most buildups are pinnacle-like reefs, with up to 1100' of relief and 3000 acres of areal closure, located on basement highs. Gas up to 1.5% H2S and 31% C02. High gravity, low pour point oil in NSB-L1 well)

Meckel, L.D. (2013)- Exploring a 19th century basin in the 21st century: seeing the North Sumatra Basin with new eyes. AAPG Int. Conf. Exhib., Singapore 2012, Search and Discovery Art. 10464, p.
(online at: www.searchanddiscovery.com/documents/2013/10464meckel/ndx_meckel.pdf)
(Argues that 'mature' North Sumatra Basin still has significant hydrocarbon exploration potential)

Meckel, L.D. (2013)- Late syn-rift turbidite systems in the North Sumatra Basin. Berita Sedimentologi 27, p. 15-17.
(online at: www.iagi.or.id/fosi/files/2013/08/BS27-Sumatera_Final.pdf)
(Offshore N Sumatra Basin gas play in Miocene Bampo Fm turbidite systems)

Meckel, L., M. Gidding, M. Banukarso, D. Sim, A. Setoputri, A. Abimanyu, M. Sompie, N. Citajaya & M. Gunarto (2012)- Hydrocarbon systems of the offshore North Sumatra Basin, Indonesia. Proc. 36th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA12-G-012, p. 1-11.
(Offshore North Sumatra Basin considered under-explored, with 130 offshore exploration wells drilled through 2011. At least 5 plays, syn-rift Oligocene clastics (Parapat Fmn), Oligocene-Miocene carbonate build-ups (Tampur and Peutu Fms), and Miocene-Pliocene turbidites (Bampo, Baong, Keutapang, and Seurula Fms))

Mertosono, S. (1975)- Geology of Pungut and Tandun oil fields, Central Sumatra Basin. Proc. 5^{th} Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, p. 156-179.
(Pungut and Tandun oil fields in Riau Province, C Sumatra, ~65 km NW of Pekanbaru, with oil in structural closures in Lower Miocene sandstone reservoirs. Fields different structural styles and may be separated by right-lateral fault. Broken-up by complex system of faults, creating blocks with different oil-water contacts)

Mertosono, S. & G.A.S. Nayoan (1974)- The Tertiary basinal area of Central Sumatra. Proc. 3^{rd} Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, p. 63-76.

Miftah, A. & D. Hernadi (1993)- Tinjauan geologi pada perencanaan EOR dalam upaya meningkatkan perolehan minyak sekunder di struktur Kuala Simpang Barat, Lapangan Rantau. Proc. 22nd Ann. Conv. Indon. Assoc. Geol. (IAGI), Bandung, 2, p. 781-792.
('Geological review for EOR planning in an effort to increase secondary oil recovery in the Kuala Simpang Barat structure, Rantau Field'. On secondary oil recovery in M-L Miocene clastics in Rantau field, N Sumatra. With facies map of Lower Keutupang Sst)

Mijnwezen personnel (1918)- Verslag over het onderzoek der Tertiaire petroleumterreinen in de onderafdeelingen Bireuen, Lho Seumawe en in een gedeelte van Lho Soekon, ter Noordkust van Atjeh (Terrein 'Atjeh I'). Jaarboek Mijnwezen Nederlandsch Oost-Indie 46 (1917), Verhandelingen 1, p. 208-275.
(Description of petroleum areas of Bireuen, Llho Seumawe, etc., N coast Aceh, N Sumatra. Overview of stratigraphy, descriptions and maps of 19 anticlinal structures, oil seeps, etc.)

Mitchel, R.G., B. Subiyanto & I. Arif (2006)- High-density 3D seismic for better reservoir development in CSB, Sumatra. Proc. 35th Ann. Conv. Indon. Assoc. Geol. (IAGI), Pekanbaru 2006, PITIAGI2006-047, p.

Moestopo H.S., E. Jacobs, H. Nur, M. Reinhold, Y. Pramudyo & K. Purwanto (2007)- Utilize geosteering in horizontal wells to maximize value in mature fields, Central Sumatra, Indonesia. In: Soc. Petrol. Engineers (SPE) Asia Pacific Oil and Gas Conf. Exhib., Jakarta, 11p.
(Horizontal wells drilled by Chevron in C Sumatra Basin, mainly in Bekasap and Menggala sandstone reservoirs of 1960's Petani and Bekasap oil fields)

Morley, R.J. (1982)- A palaeoecological interpretation of a 10,000 year pollen record from Danau Padang, Central Sumatra, Indonesia. J. Biogeography 9, p. 151-190.

Morton, A.C., B. Humphreys, D.A. Dharmayanti & Sundoro (1994)- Palaeogeographic implications of the heavy mineral distribution in Miocene sandstones of the North Sumatra Basin. J. Southeast Asian Earth Sci. 10, 3-4, p. 177-190.
(Heavy minerals record changes in provenance in N Sumatra Basin. E Miocene Belumai Mb (Peutu Fm) sandstones derived from granitic terrain in E or SE. Uplift of Barisan Mts in early M Miocene led to introduction of sand from W or SW (Keutapang Fm), from metamorphosed pelitic rocks intruded by granites. Contemporaneous intermediate- acidic volcanic rocks also involved. Chrome spinel abundant in Lower Keutapang but rare in Upper Keutapang Mb, indicating ultramafic rocks important component of Barisan Mountain source in M Miocene, but insignificant by Late Miocene)

Moss, S.J. & A. Carter (1996)- Thermal histories of Tertiary sediments in western Central Sumatra, Indonesia. J. Southeast Asian Earth Sci. 14, 5, p. 351-371.
(AFT and OM data suggest Tertiary sediments exposed in Ombilin Basin have low-medium thermal maturities (Ro-average 0.39–0.50%). This suggests outcrops studied were not part of main Paleogene-Neogene graben system that was subsequently inverted, but likely represent marginal, rift shoulder sedimentation)

Moss, S.J. & C.G. Howells (1996)- An anomalously large liquefaction structure, Oligocene, Ombilin Basin, West Sumatra, Indonesia. J. Southeast Asian Earth Sci. 14, 1-2, p. 71-78.

Moulds, P.J. (1989)- Development of the Bengkalis Depression, Central Sumatra and its subsequent deformation- a model for other Sumatra grabens? Proc. 18th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, p. 217-245.
(Bengkalis Depression N-S Paleogene graben complex: chain of interconnected lozenge-shaped depressions with several side grabens. Formed by extension, with complexities related to basement inhomogeneities. Neogene-Recent compression caused uplift, erosion and destruction of graben and its fill, progressively from S. Compression and tectonic overprinting of earlier extension produced major basement block uplift, normal fault rejuvenation and strike-slip faulting. Interplay of lines of basement weakness with structural grain and compression have produced variety of features: en echelon folds, chains of anticlines and Sunda Folds)

Mount, V. & J. Suppe (1992)- Present-day stress orientations adjacent to active strike-slip faults: California and Sumatra. J. Geophysical Research, Solid Earth, 97, B8, p. 11995-12013.
(Present-day stress directions from well bore breakouts near crustal-scale strike-slip faults (San Andreas in California and Great Sumatran fault in Sumatra) indicate maximum horizontal stress direction (SH) at high angle (70°-90°) to both faults. Young deformation from C and S Sumatra, as determined from borehole breakouts in Stanvac wells, is compressional, indicating decoupling of strike-slip and compressional components of deformation within broadly transpressive zones)

Mucharam, L., W. Nugroho & K. Wibisono (2012)- Improve oil recovery for heavy oil by chemical treatment implementation as an alternative, case study Bentayan Field. In: SPE EOR Conference at Oil and Gas West Asia, Muscat, Oman, Soc. Petrol. Engineers (SPE), 1, SPE 154763, p. 570-576.
(Bentayan field in NE part of S Sumatra basin discovered in 1932. Heavy, paraffinic oil in U Talang Akar Fm fluvial sandstones. Oil gravity of 17°API and viscosity of 82.2 cp at reservoir temperature lead to low recovery factor (14%). Chemical treatment implemented to reduce viscosity of oil)

Muhartanto, A. & E. Iskandar (2006)- Penentuan peta sebaran potensi GMB (sweet spot area) di daerah Bukit Asam, Sumatra Selatan. Bull. Ilmiah Mineral dan Energi (MINDAGI; Trisakti) 10, 1, p. 27-54.
(online at: www.journal.trisakti.ac.id/index.php/MINDAGI/article/view/115/110)
('Determination of potential coalbed methane sweet spot areas in the area of Bukit Asam, South Sumatra'. Determination sweet spot areas, based on: (1) depth range of economic coal bed methane (250- 1000 m); (2) thick coal layers (>5m); and (3) vitrinite reflectance between 0.3- 0.4%. CBM can be economically explored with minimum thickness of 86m)

Mujito, S. Hadipandoyo & J.B. Rachmat (1990)- Middle Baong Sandstone turbidite play, North Sumatra Basin, Indonesia. In: CCOP/WRGA Play modelling exercise 1989-1990, CCOP Techn. Publ. 23, p. 17-38.
(Description and hydrocarbon assessment of M-L Miocene Middle Baong Sst deepwater sand play, N Sumatra)

Mujito, S. Hadipandoyo & T.H. Sunarsono (1990)- Hydrocarbon resources assesment in the North Sumatra Basin. Lemigas Scientific Contr. 14, 1, Spec. Issue, p. 68-86.
(same as Mujito et al. 1990, below)

Mujito, S. Hadipandoyo & T.H. Sunarsono (1990)- Hydrocarbon resources assesment in the North Sumatra Basin. United Nations CCOP Techn. Bull. 21, p. 97-116.
(Lemigas assessment of undiscovered oil and gas in four plays in N Sumatra basin. Keutapang Wedge Top Play ranked highest, with undiscovered oil ranging from 0.37- 504 MMBO)

Mukherjee, A.N. (1935)- Ein Beitrag zur Kenntnis der pliocanen Braunkohle des Tandjoeng Kohlenfeldes Palembang, Sud-Sumatra. Dissertation Sachsischen Bergakademie Freiburg, p. 1-30.
('A contribution to the knowledge of the Pliocene lignites of the Tanjung coalfield, Palembang, S Sumatra'. Early Pliocene Middle Palembang Fm lignites at Bukit Asam locally altered into coal- anthracite by heat from andesite intrusion. Coals composed of wood (incl. palm), cork, amber, leaves and cuticles, fungi, pyite. Good thin section photos)

Muksin, N., D. Yusmen, R. Waren, A. Werdaya & D. Djuhaeni (2012)- Regional depositional environment model of Muara Enim Formation and its significant implication for CBM prospectivity in South Sumatra Basin, Indonesia. AAPG Int. Conv. Exhib., Singapore 2012, Search and Discovery Art. 80272, p. 1-9.
(online at: www.searchanddiscovery.com/documents/2012/80272muksin/ndx_muksin.pdf)
(Late Miocene Muara Enim Fm of S Sumatra widespread coals, deposited on tide dominated coastal plain. With CBM potental)

Mulhadiono (1976)- Depositional study of the Lower Keutupang sandstone in the Aru area, North Sumatra. Proc. 5th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, p. 115-132.
(U Miocene Lower Keutupang sands in coastal and shallow marine facies. Sourced from SE (Barisan Mts))

Mulhadiono & S. Asikin (1989)- The pull-apart basin offshore Bengkulu promises attractive exploration ventures. In: B. Situmorang (ed.) Proc. 6th Regional Conf. Geology, Mineral and Hydrocarbon Resources of Southeast Asia (GEOSEA VI), Jakarta 1987, IAGI, p. 271-289.
(Bengkulu offshore forearc basin Oligo-Miocene pull-apart feature that may be attractive for exploration. Nine wells by Marathon and Aminoil, mostly away from kitchen areas. Oil and gas shows in wells, and seeps around Bengkulu town. Early and Late or M Miocene carbonates. Oligocene volcanics 'basement'. Traditionally thought to be 'cold' basin, but wells suggest normal T gradients?)

Mulhadiono, P. Hartoyo & P.A. Soedaljo (1978)- The Middle Baong Sandstone Unit as one of the most productive units in the Aru area, North Sumatra. Proc. 7th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, p. 107-132.
(M Miocene (N13-N14) sandstone in middle part of Baong Fm oil-bearing at Tabuhan Barat, Telaga Said, Darat oil Fields, and also at new Besitang discovery)

Mulhadiono, R.P. Koesoemadinata & Rusnandar (1982)- Besitang River sand as the first turbidite reservoir in Indonesia. Proc. 11th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 265-298.
(Productive M Miocene (zone N14) Besitang River sands in M Baong Fm, Aru area, N Sumatra, are turbidites within marine shale sequence. Fluid properties and production performance encourage further potential in structural and stratigraphic traps)

Mulhadiono & Marinoadi (1977)- Notes on hydrocarbon trapping mechanism in the Aru area, North Sumatra. Proc. 6th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, p. 95-115.
(N Sumatra Lower Baong and Pre-Baong are best source rocks. Vertical migration important in trapping of hydrocarbon in Aru area)

Mulhadiono & J.A. Sutomo (1984)- Determination of economic basement of rock formation in exploring the Langkat-Medan area, North Sumatra Basin. Proc. 13th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, p. 75-108.
(In N Sumatra basin favourable reservoirs in E Miocene Belumai Fm, but Pre-Belumai rocks, especially "Basal Sandstone" strongly affected by diagnesis, have very low porosity, and should be considered "economic basement". 'Basal Sandstone' belongs to Permo-Triassic-Jurassic Kualu Fm)

Mulyana, B. (2005)- Tektonostratigrafi Cekungan Ombilin Sumatera Barat. Bull. Scientific Contr. (UNPAD) 3, 2, p. 92-102.
(online at: http://jurnal.unpad.ac.id/bsc/article/view/7455/3416) (without figures)
('Tectonostratigraphy of the Ombilin basin, West Sumatra'. Ombilin Basin intramontane basin in Barisan Mts. Basement two parts: Mergui terrane (with Permian Silungkang Fm limestone) and Woyla terrane. Early Paleogene Ombilin Basin rifting in transtensional setting along Sitangkai and Silungkang faults)

Mulyana, B. & R.M.G. Gani (2015)- Litostratigrafi Cekungan Ombilin dalam kerangka tectono-sedimentation rift basin. Bull. Scientific Contr. (UNPAD) 13, 2, p. 93-99.
(online at: http://jurnal.unpad.ac.id/bsc/article/view/8393/3903)
('Lithostratigraphy of the Ombilin Basin in a framework of tectono sedimentation in rift basin'. Paleo-Eocene Brani and Sangkarewang Fms and Oligocene Sawahlunto and Sawahtambang Fms deposited in terrestrial to transition zone during syn-rift phase. E-M Miocene Ombilin and Late Miocene Ranau Fms, dominated by volcanic deposits, formed in post-rift phase with marine influence)

Mundt, P.A. (1983)- Miocene reefs, offshore North Sumatra. In: Proc. SE Asia Petroleum Expl. Soc. (SEAPEX) 6, p. 1-9.
(Mobil exploration and appraisal program for Miocene pinnacle reefs in NSB area off N Sumatra. Up to 70 reefs mapped in area of 1800 km2 on Malacca Shelf. Twelve wells resulted in 8 discoveries. Gas reserves 2 TCF in four fields. Gas contains 1-15% H2S and 28-31% CO2)

Murphy, J. (1993)- The sedimentology of the Early Miocene, Lower Sihapas Sandstone reservoirs in the Kurau Field, Malacca Strait PSC, Central Sumatra Basin, Indonesia. In: C.D. Atkinson et al. (eds.) Clastic rocks and reservoirs of Indonesia: a core workshop, Indon. Petroleum Assoc. (IPA), p. 37-57.
(Well MSBG-1 Early Miocene Lower Sihapas fluviodeltaic sands. Cored complete single parasequence exhibiting a 110' thick progradational cycle from delta front through tidal flat to distributary channel deposits capped by channel abandonment facies. Sediments deposited in tide- dominated delta, with repeated stacking of reservoir units. This is discovery well of Kurau Field with >150 MBO in place)

Murray, A.M., Y. Zaim, Y. Rizal, Y. Aswan, G.F. Gunnel & R.L. Ciochon (2015)- A fossil gourami (Teleostei, Anabantoidei) from probable Eocene deposits of the Ombilin Basin, Sumatra, Indonesia. J. Vertebrate Paleontology 35, 2, e906444, p. 1-11.
(New fish fossil material from freshwater deposits of Eocene(?) Sangkarewang Fm, Datarmasiang-Tanahsirah Main Quarry, Talawi, Ombilin Basin, W Sumatra. Includes new small anabantoid fish, here named Ombilinichthys yamini n.gen., n.sp.. Closely related to Osphronemus)

Musgrove, F.W. & A.C. Sunaryo (1998)- Compression or strike slip along the North Sumatra mountain front: controls on fracture permeability. Proc. 26th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 1-15.
(Production rates at Pase A field controlled by tectonically induced fractures in tight limestone reservoir. Area may have had transpressive deformation associated with oblique plate collision nearby. Much support for dominantly compressional tectonic model, little evidence for strike slip after reservoir was deposited)

Musper, K.A.F.R. (1935)- Die fischfuhrende Breccien- und Mergelschieferabteilung des Tertiars der Padanger Hochlande (Mittel-Sumatra). Verhandelingen Geologisch-Mijnbouwkundig Genootschap Nederland Kol., Geol. Serie 11, 2, p. 145-188.
('The fish-bearing breccia and marl-shale series of the Padang Highlands (C Sumatra)'. Detailed description of area containing Paleogene lacustrine marly shales with famous fresh-water fish fossils near Talawi village on Ombilin River)

Musper, K.A.F.R. (1936)- Einige Bemerkungen zur fossilen Fischfauna von Padang (Sumatra). De Ingenieur in Nederlandsch-Indie (IV) 3, 4, p. 70-74.
('Some remarks on the fossil fish fauna from Padang (Sumatra)'. Critique of Sanders (1934) monograph of Eocene fresh or brackish water fish fauna)

Musper, K.A.F.R. (1938)- Fundorte und stratigraphisches Lager neuer Aufsammlungen Tertiarer Landpflanzen- besonders Kiezelholzreste auf Sumatra und Java. De Ingenieur in Nederlandsch-Indie (IV) 5, 12, p. 169-181.
(Localities and stratigraphic position of new collections of Tertiary land lants- particularly silicified wood remains on Sumatra and Java'. 2020 samples of Tertiary plants and wood from C Sumatra (Padang Highlands, Indragiri), S Sumatra (SW of Palembang) and W Java)

Musper, K.A.F.R. (1939)- Kritische Betrachtungen uber Herkunft und genaueres Alter der aus dem Tertiar Niederlandisch-Indiens beschriebenen Holzer. Natuurkundig Tijdschrift Nederlandsch-Indie 99, 1, p. 1-21.
(online at: http://62.41.28.253/cgi-bin/...)
('Critical notes on the origin and precise ages of Tertiary wood fossils described from Netherlands Indies'. On locations (S Sumatra, Java) and ages (mainly Miocene) of 30 petrified wood species)

Musu, J.T., B. Widarsono, A. Ruswandi, H. Sutantog & H. Purba (2015)- Determination of shale gas potential of North Sumatra Basin: an integration of geology, geochemistry, petrophysics and geophysics analysis. Scientific Contr. Oil and Gas, Lemigas, Jakarta, 38, 3, p. 193-212.
(online at: www.lemigas.esdm.go.id/publikasi/read/scientific/1/)
(In N Sumatra basin potential for shale play with gas sweet spots in Bampo, Belumai and Baong Fms. Total shale gas resource estimated at 48.4 TCF gas)

Nabasir, A., Andriyani S., Hendar S.M., Haruji M.P. & Subagio (1999)- Integrated study of the Telisa shaly sand in the Bangko Field, Central Sumatera Basin. Proc. 28th Ann. Conv. Indon. Assoc. Geol. (IAGI), Jakarta, 2, p. 59-77.
(E Miocene Telisa Fm shale in Bangko Field contains minor shaly sand oil reservoir. Typically thinly laminated, low permeability. Productivity can be improved by hydraulic fracturing)

Napitupulu, H. & W.S. Sadirsan (2000)- The origin of light oil and condensates in the Musi Block- South Sumatra Basin. AAPG Ann. Mtg. New Orleans 2000, p. *(Abstract only)*
(S Sumatra Basin oil, biomarker, carbon isotope analyses show hydrocarbons mainly from Talang Akar- Lahat Fms terrestrial source rock. Light oil and condensate formed by evaporative fractionation. Oil formed and

trapped in lower formation, then light fraction migrated into overlying limestone reservoir. This process responsible for hydrocarbons in Musi and Klingi fields, located in basement high area 20 km W of kitchen)

Nasution, F. & S. Nalendra (2017)- Characterization of coal quality based on ash content from M2 coal-seam group, Muara Enim Formation, South Sumatra Basin. J. Geoscience Engineering Environm. Technol. (JGEET) 2, 3, p. 203-209.
(Discussion of M-L Miocene coals of M2 horizon (Petai, Suban and Mangus coals) in Muara Enim Fm of Bukit Kendi coalfield, S Sumatra. Average ash content of Seam C 6%, Seam B 5%, and Seam A2 3.8%)

Natasia, N., I. Syafri, M.K. Alfadli & K. Arfiansyah (2016)- Stratigraphy seismic and sedimentation development of Middle Baong Sand, Aru Field, North Sumatera Basin. J. Geoscience Engineering Environm. Technol. (JGEET) 1, 1, p. 51-58.
(online at: http://journal.uir.ac.id/index.php/JGEET/article/view/7/299)
(Three sequences in M Miocene Baong deep marine sands in N Sumatra basin. Clastic deposits interpreted to come from S-SW, from Barisan Mts that started uplift at this time)

Natasia, N., I. Syafri, M.K. Alfadli & K. Arfiansyah (2017)- Analisis fasies reservoir A Formasi Menggala di lapangan Barumun Tengah, Cekungan Sumatra Tengah. Bull. Scientific Contr. (UNPAD) 15, 2, p. 139-149.
(online at: http://jurnal.unpad.ac.id/bsc/article/view/13387/pdf)
('Facies analysis of the Menggala Formation A reservoir in the Central Barumun field, Central Sumatra Basin'. Tidal flat and lagoonal facies in E Miocene sandstones in BT-1 and BT-3 wells in NW-most part of Central Sumatra basin (Tonga PSC?))

Natsir, M., T. Nasiruddin & N. Hasani (2010)- Rejuvenation of Niru: an integrated subsurface re-interpretation. Proc. 34th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA10-G-103, 8p.
(S Sumatra Niru field 1949 BPM discovery on flank Limau anticlinorium. Peak production of 6000 BOPD reached in 1958. 2006 step-out drilling found additional reservoir on flank, significantly increasing production)

Nayoan, G.A.S., D. Arpandi & M. Sumawa (1984)- Geological notes on hydrocarbon occurrences in the carbonate rocks of the Belumai Formation, North Sumatra, Indonesia. In: The hydrocarbon occurrence in carbonate rocks, Proc. Joint ASCOPE/CCOP workshop, Surabaya 1982, ASCOPE, Jakarta, p. 383-405.

Nazar, M.A.A. & J. Setyowiyoto (2013)- The sand-rich tide dominated delta model of Bangko Formation in "AB" area using high-resolution sequence stratigraphy and ichnofacies analysis. J. Teknik Geologi (UGM) 1, 2, 14p.
(online at: lib.geologi.ugm.ac.id/ojs/index.php/geo/article/download/34/31)
(Model for E Miocene Bangko Fm deltaic deposition from logs and core of 134 wells in "DR" field (= probably Duri; JTvG), C Sumatra basin. Tide-dominated delta, with main sediment source from Sundaland in NE. With ichnofacies model)

Nelson, H.F., M. Abdullah, C.F. Jordan & A.J. Jenik (1982)- Petrography of the Arun gas field, Aceh Province, Indonesia. In: Joint ASCOPE/CCOP Workshop on hydrocarbon occurrences in carbonates, Surabaya 1982, 38p.

Nicholson, R.A. & S. Soekapradja (1990)- Organic geochemical studies in the North Sumatra Basin. Lemigas Scientific Contr. 14, 1, Spec. Publ., p. 45-67.
(Any one of several Tertiary sediment formations in N Sumatra basin may be responsible for sourcing of hydrocarbon reserves)

Ningrum, N.S. & B. Santoso (2009)- Petrographic study on genesis of selected inertinite-rich coals from the Jambi subbasin. Indonesian Mining J. 12, 3, p. 111-117.
(online at: http://jurnal.tekmira.esdm.go.id/index.php/imj/article/view/553/415)
(Coals of fluvio-deltaic Late Oligocene Talangakar Fm in Jambi Subbasin both rich in vitrinite (56-77%) and inertinite (17-36%). Vitrinite content associated with bright lithotype deposited in wet-swampy area; inertinite

associated with dull lithotype from dry-swampy area. Vitrinite reflectance 0.45-0.47% (subbituminous). Low-medium sulphur (most Sumatra coals <5% inertinite and >80% vitrinite))

Noeradi, D., Djuhaeni & B. Simanjuntak (2005)- Rift play in Ombilin Basin outcrop, West Sumatera. Proc. 30th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 39-52.
(Ombilin Basin Eo-Oligocene half-graben in Barisan Mts. Two wells drilled in 1983 (Sinamar-1, TD 3020m) and 1994 (S Sinamar 1), both on inversion structures and with hydrocarbon shows in cuttings. Abundant Paleogene reservoir potential, but reservoir quality questionable)

Norman, T., M. Willuweit, D. Hernadi & E. Rukmono (2006)- Example of applied stochastic modeling in a mature field, a case study in Zamrud Field, Central Sumatra, Indonesia. In: 68th EAGE Ann. Conf. Exh., Vienna, P342, 5p. *(Extended Abstract)*
(3D model of E Miocene clastic reservoirs in Zamrud field 90 km E of Pekanbaru, in SE part of C Sumatra Basin. Discovered in 1975, production began in 1982)

Nugraha, R., B. Abrar & D. Hernadi (2007)- Pemodelan geologi untuk pengembangan lapangan Beruk North, Blok Coastal plains, Pekanbaru. Proc. Simp. Nas. IATMI, UPN ôVeteranö, Yogyakarta 2007, TS-02, 11p.
(online at: http://elib.iatmi.or.id/uploads/IATMI_2007-TS-02_Reza_Satria_Nugraha,_BOB_PT.pdf)
(3-D geological model of 1985 North Beruk Field, Coastal Plains Block, Central Sumatra)

Nugroho, S.B., Y. Hartono & R.N. Ardianto (2010)- Integrated geology, geophysics and petrophysics data to describe lateral and vertical reservoir heterogeneity to optimize field development plan Limau Field, South Sumatra Basin, Indonesia. In: Proc. SPE Int. Oil and Gas Conf. Exhibition in China, Beijing 2010, 22p.
(Integrated 3D model of E Miocene Talang Akar Fm sandstone reservoirs of Limau oil field, Prabumulih, S Sumatra Basin, discovered by BPM in 1951 and still producing. Original oil in place 823 MMBO, cumulative production 265.4 MMBO))

Nugroho, S.B. & U.B. Santoso (1999)- Using the resistivity and GR log to guide slimhole drilling on 415 m horizontal section of 3 to 5 m thick oil rim between gas cap and water zone within the Baturaja Limestone; an example from Musi-28 Well, Prabumulih, South Sumatera. Proc. 28th Ann. Conv. Indon. Assoc. Geol. (IAGI), Jakarta, 2, p. 147-158.

Nukman, M. & I. Moeck (2013)- Structural controls on a geothermal system in the Tarutung Basin, north Central Sumatra. J. Asian Earth Sci. 74, p. 86-96.
(Fault pattern in Tarutung Basin generated by compressional stress at high angle to right-lateral Sumatra Fault system. NW-SE striking normal faults possibly related negative flower structures and NNW-SSE to NNE-SSW oriented dilative Riedel shears are preferential fluid pathways. ENE-WSW striking faults act as barriers)

Nur'aini, S., S. Martodjojo, F.W. Musgrove & J. Bon (2000)- Deep-water basin floor fans of the Lower Baong Formation, a new exploration objective, offshore North Sumatera. Proc. 27th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, p. 177-184
(Good quality M Miocene sands penetrated on Malaka Shelf in Transgressive System Tract (TST) sheet sands, and will only be trapped structurally. Thick deep-water basin floor fans interpreted past shelf-slope break potential large stratigraphic traps. Prospective stratigraphic traps ideally located next to Lho Sukon Deep kitchen, which sourced most of N Sumatra gas. Primary risk is updip seal of stratigraphic traps)

Nur'aini, S., S. Martodjojo, F.W. Musgrove & J. Bon (2001)- Revisiting the Middle Baong sand: basin floor fan or slope fan in origin? Berita Sedimentologi 15, p. 6-9.
(Late M Miocene (N11-N12, NN5) Middle Baong Sand interpreted as basin floor fan. First turbiditic reservoir in Indonesia)

Nur Hasjim, Panuju, Buskamal & Purwatinah (1994)- Biostratigrafi dan korelasi zonasi nannoplankton terhadap zonasi foraminifera besar, Cekungan Sumatera Selatan. Proc. Diskusi Ilmiah VIII, PPPTMGB Lemigas. p. 1-8.

('Biostratigraphy and correlation of the nannoplankton zonation to the larger foraminifera zonation in the South Sumatra Basin')

Nuryadin, H., F. Kamil, A. Kamal & R.M.I. Argakoesoemah (2006)- A challenge and future potential of basal clastic play in Paleo-Basement high, Musi Platform, South Sumatra Basin. Proc. Jakarta 2006 Int. Geosc. Conf. Exhib., Indon. Petroleum Assoc. (IPA), Jakarta, 06-PG-23, p. 1-5.
(Musi Platform traditional objective Baturaja carbonates. Most exploration wells drilled basement. Some have thin Basal Clastics unit, possibly equivalent to U Talang Akar Fm. Hydrocarbon potential of basal clastic play shown by tests in Soka F-2, Kembar-1 and Fariz-3. Reservoir quality variable. Play mostly combination stratigraphy- structure)

Oetary N., R. Waren, E. Finaldhi, M.I.S. Haris & D. Nugroho (2016)- Reservoir prospectivity of synrift lacustrine system in Central Sumatra Basin. Proc. 40th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA16-394-SG, 12p.
(Seismic facies and well log study of lacustrine- fan delta facies of U Pematang Fm in N Aman Trough)

Oksuanandi, R., Y.F. Yeni, I.M. Gunawan, R. Bramantyo, C.K.L. Nainggolan & A.A. Raihan (2015)- Facies distribution and reservoir characterization of the 2060'SD, Bekasap Formation, Sabak Field, Central Sumatra Basin. Proc. 39th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA15-G-197, 13p.
(Sands in E Miocene Bekasap Fm in Sabak Field NE-SW trending tide-dominated estuarine channel deposits)

Oostingh, C.H. (1941)- Over de Tertiaire molluskenfauna van Palembang. De Ingenieur Nederl.-Indie (IV), 8, 3, p. 21-29.
('On the Tertiary mollusc fauna from Palembang'. Three faunasof bivalves and gastropods distinguished: Lower Telisa (21 species), basal Lower Palembang and typical Lower Palembang (52 species))

OóShea, N.E., A. Bettis, Y. Zaim, Y. Rizal, A. Aswan, G.F. Gunnell, J.P. Zonneveld, R.L. Ciochon (2015)- Paleoenvironmental conditions in the late Paleogene, Sumatra, Indonesia. J. Asian Earth Sci. 111, p. 384-394.
(Open pit mine in Ombilin basin, Barisan Mts, C Sumatra, with stratified paleosol sequence in latest Eocene or Oligocene providing record of paleoenvironmental conditions in fluvial-estuarine setting. Tropical, highly productive lowland forest)

Oppenoorth, W.F. (1918)- Foraminiferen van de Noordkust van Atjeh. Verhandelingen Geologisch-Mijnbouwkundig Genootschap Nederland Kol., Geol. Serie 2, p. 249-258.
('Foraminifera from the North coast of Aceh'. At several localities limestone at base of Neogene, rich in Lepidocyclina (Nephrolepidina) spp., also Miogypsina, Cycloclypeus. Associated Lepidocyclina (Eulepidina) may be Trybliolepidina. Interbedded with marls with Orbulina universa (Age assumed to be E Miocene/ Aquitanian, looks more like Middle Miocene; JTvG))

Panggabean, H. (2005)- Characterization of micro-cleats on coal seams of the Muaraenin Formation using Scanning Electron Microscope (SEM). Indonesian Mining J. 8, 2, p. 23-39.
(see also Permana and Panggabean 2011)

Panggabean, H. & R. Heryanto (2009)- An appraisal for the petroleum source rocks on oil seep and rock samples of the Tertiary Seblat and Lemau Formations, Bengkulu Basin. J. Geologi Indonesia 4, 1, p. 43-55.
(online at: www.bgl.esdm.go.id/dmdocuments/jurnal20090105.pdf)
(Bengkulu Basin Eocene-Oligocene fore-arc basin. Oldest 'Lahat-equivalent' formation unconformably overlain by Oligocene-Miocene Hulusimpang Fm volcanic rocks, then by siliciclastics and minor carbonates of E-M Miocene Seblat Fm. Geochemistry on selected outcrop samples and Padangcapo village oil seep indicates potential source rocks may occurred in Lahat- equivalent Seblat, and Lemau Fms)

Panggabean, H., S.A. Mangga & I.S. Suwardi (2007)- Atlas cekungan sedimen Indonesia- Cekungan Sumatera Selatan. Pusat Survei Geologi, Bandung, p. 1-128.
('Atlas of sedimentary basins of Indonesia- South Sumatra Basin')

Panggabean, H. & L.D. Santy (2012)- Sejarah penimbunan cekungan Sumatera Selatan dan implikasinya terhadap waktu generasi hidrokarbon. J. Sumber Daya Geologi 22, 4, p. 225-235.
(online at: http://jgsm.geologi.esdm.go.id/index.php/JGSM/article/view/122/116)
('Burial history of the South Sumatra basins and its implications for the time of hydrocarbon generation'. S Sumatra Basin four subbasins, Jambi and C, N and S Palembang sub-basins. Eocene- Quaternary sediment fill 2100-3500m thick, with maximum burial depths 2900- 5200 m. Lowest depth oil generation of Lahat Fm 1560m in C Palembang Subbasin, while deepest in Talangakar Fm 2700m in Jambi Subbasin and 2800m in S Palembang Subbasin. Timing of hydrocarbon generation 20.3 Ma (E Miocene)- 3.4 Ma (Pliocene))

Panguriseng, M.J., E. Nurjadi, W.S. Sadirsan, B.W.H. Adibrata & D. Priambodo (2011)- Determination of turbidite "lobe" distribution and geometry in Middle Baong sand, North Sumatra Basin: artificial neural network approach of multi-attribute analysis. Proc. Joint 36th HAGI and 40th IAGI Ann. Conv., Makassar, JCM2011-389, 12p.
(In Indonesian. M Miocene Middle Baong Sand prolific reservoir in N Sumatra Basin. Deep marine sand, with lateral discontinuity major issue. Artificial Neural Network method of seismic multi-attribute analysis used for reservoir characterization and geometry analysis)

Panjaitan, S. (2006)- Struktur dan geometri cekungan oil shale di daerah Taluk, Riau, berdasarkan metode gaya berat. J. Sumber Daya Geologi 16, 2 (152), p. 75-93.
('Structure and geometry of the oil shale basin in the area of Taluk, Riau, based on thegravity method')

Pannetier, W. (1994)- Diachronism of drowning event on Baturaja limestone in the Tertiary Palembang sub-basin, South Sumatra, Indonesia. J. Southeast Asian Earth Sci. 10, 3-4, p. 143-157.
(Oligocene-E Miocene transgression in Lahat and Talang Akar formations from W to E. Deposition of Baturaja carbonate (earliest Miocene; ~N4-N5) on tectonic uplifts interpreted as lowstand system tract. Drowning of carbonate platform by Gumai shales in later E Miocene diachronous. Carbonate drowning coincides with renewed volcanic and tectonic activities and cooling)

Paramita, D. & R. Santoso (2011)- Sequence stratigraphy and facies distribution analyses to define reservoir lateral distribution in Meruap Field, Jambi. Proc. 35th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA11-G-154, 12p.
(Meruap Field in Jambi Sub-basin, discovered in 1974. Main oil reservoir is sand of M Miocene Air Benakat Fm. Total oil produced 10.3 MMBO. Sequence stratigraphy study suggests five sequence boundaries. Sands deposited in deposited in tide- dominated delta, with three depositional facies: tidal channel, tidal sand bar, and tidal sand flat, with depositional trend oriented SW-NE)

Pathak, P., Y. Fidra, A. Yan, H. Avida, Z. Kahar, M. Agnew & D. Hidayat (2004)- The Arun gas field in Indonesia: resource management of a mature field. In: SPE Asia Pacific Conf. Integrated modelling for asset management, Kuala Lumpur 2004, SPE 87042, p. 1-22.
(History of giant Arun gas-condensate field in Aceh, N Sumatra. Discovered in 1971, producing since 1977. Reservoir NNW-SSE trending elongate E-M Miocene limestone reef buildup, with av. thickness 495' (max. 1000'), porosity 16.1%. Initial in-place gas 16.8 TCF gas, 840 MB Condensate, ultimate gas recovery expected to be 94%.

Patra, D.H., D. Noeradi & E. Subroto (2012)- Tectonic evolution at Musi High and its influence to Gumai formation as an active source rock at Sopa Field, South Sumatera Basin. Extended abstract AAPG Int. Conf. Exhib, Milan, 2011, AAPG Search and Discovery Art. 20125, p. 1-16.
(Shale from Eo-Oligocene Lahat and Talang Akar Fms widely accepted as source rocks in Palembang sub-basin of S Sumatra Basin. Sopa Field on Musi Platform paleohigh, where Lahat and Talang Akar Fms not well developed and closest paleo-deep >20 km away. E Miocene Gumai Fm may be regional seal and active source rock)

Permana, A.K. (2008)- Coal characteristics of Sarolangun- Pauh region: implication for coalbed methane potential. J. Sumber Daya Geologi 18, 6, p. 351-360.
(online at: http://jgsm.geologi.esdm.go.id/index.php/JGSM/article/view/255/235)
(Muara Enim Fm coal in Sarolangun- Pauh region, Jambi Provice, S Sumatra, prospective for CBM. Coal mainly vitrinite with rare inertinite, minor exinite and mineral matter. Open microcleats dominate over closed microcleats. Coalbed methane content expected to be low- moderate)

Permana, A.K. & H. Panggabean (2011)- Depositional environment of the Sarolangun coals, South Sumatra basin. J. Sumber Daya Geologi 21, 4, p. 225-235.
(online at: http://jgsm.geologi.esdm.go.id/index.php/JGSM/article/view/149/145)
(Late Miocene Muara Enim Fm in Sarolangun area, W part of S Sumatra Basin, with relatively thin (<1.5m) coal beds. Coal mainly vitrinite (telovitrinite and detrovitrinite), with rare inertinite and minor liptinite and mineral matter. Palynological studies show abundant pollen from mangroves that grew in fresh water environment (Palmaepollenites kutchensis, Florschuetzia trilobata, Acrostichum aureum, Verrucatosporites usmensis). Coal deposition in upper delta plain and fluvial environments (wet forest swamp))

Permana, A.K. & H. Panggabean (2011)- Cleat characteristics in Tertiary coal of the Muaraenim Formation, Bangko area, South Sumatra Basin: implications for coalbed gas potential. J. Sumber Daya Geologi 21, 5, p. 265-274.
(online at: http://jgsm.geologi.esdm.go.id/index.php/JGSM/article/view/153/150)
(Sub-bituminous coal seams in Miocene Muara Enim Fm from Bangko area, 25 km SE of Tanjung Enim, S Sumatra, with well-developed cleat system. Coal dominated by vitrinite (72-89%), with minor inertinite (3.6%), liptinite (1.8-3.8%) and mineral matter (2.4-14.4%). Vitrinite reflectivity 0.44%)

Permana, B.R., Y. Darmadi, I. Rahmawan & T. Siagian (2018)- Revealing hydrocarbon potential in a tight sand reservoir: a case study of the Baturaja sands in Sumpan Field, South Sumatra basin. Proc. 42nd Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA18-318-G, 21p.
(Sumpal Field is large gas field in Corridor block, currently producing from fractured pre-Tertiary crystalline basement rocks. E Miocene silty sandstone (Baturaja Fm/ Lower Telisa equivalent) present in many wells and contains light oil. Thickness 7-18m, but low permeability and requires fracking)

Permana, B.R., Y. Darmadi, I.B. Sinaga, D. Kusmawan & A. Saripudin (2016)- The origin of oil in the Telisa Formation, Suban Baru Field, and the next exploration path. Proc. IPA 2016 Technical Symposium, Indonesia exploration: where from- where to, Indon. Petroleum Assoc. (IPA), Jakarta, 23-TS-16, p. 1-17.
(Oil discovered in Suban 3 and Suban Baru wells in sandstones in marine upper Telisa Fm (late E Miocene) in Suban Baru Field, Corridor Block of C Palembang sub-basin of S Sumatra. Variable reservoir quality. Oils sourced from mixed terrestrial-marine facies, probably from source rock below Telisa Fm, although Telisa Fm may be mature in deeper parts of S Sumatra Basin)

Pertamina BPPKA (M. Abdullah et al.) (1996)- Petroleum geology of Indonesian basins, I: North Sumatra Basin. Petroleum geology of Indonesian basins: principles, methods, and application, Jakarta, p. 1-.

Pertamina BPPKA (B. Mertani et al.) (1996)- Petroleum geology of Indonesian basins, II: Central Sumatra Basin. Petroleum geology of Indonesian basins: principles, methods, and application, Jakarta, p. 157-192.

Pertamina BPPKA (C. Caughey et al.) (1996)- Petroleum geology of Indonesian basins, X: South Sumatra Basin. Petroleum geology of Indonesian basins: principles, methods, and application, Jakarta, p. 1-

Peter, C.K. & Z. Achmad (1976)- The petrography and depositional environment of Belumai Formation Limestone in the Bohorok area, North Sumatra. In: Proc. Int. Carbonate Seminar, Jakarta 1976, Indon. Petroleum Assoc. (IPA), Spec. Vol., p. 61-66.
(E Miocene Belumai Fm Limestone Mb shallow open marine shelf conglomerates and limestones accumulated on local topographic high, overlain by deeper shelf limestones. No reefal facies limestones seen in area)

Pethe, S. (2013)- Subsurface analysis of Sundaland basins: source rocks, structural trends and the distribution of oil fields. M.Sc. Thesis Ball State University, Indiana, p. 1-79.
(online at: http://cardinalscholar.bsu.edu/handle/123456789/197811)
(Test of 'W. Ade Rule', stating that "95% of all commercial oil fields in the Sumatra region occur within 17 km of seismically mappable structural grabens in the producing basins". Graben mapping suggests in S Sumatra Basin 78% of oil fields located within 17 km margin from grabens. For Sunda/Asri basin number is 100%, for Ardjuna basin 92%)

Poerwanto, J.H., C.F. Sugembong, J.M. Bagzis & A.D. Martinez (1995)- Application of hydraulic fracturing technologies to the shallow Telisa Formation. SPE Asia Pacific Oil Gas Conf., Kuala Lumpur 1995, p. 277-284.
(On fracturing treatments in shallow (600'), high permeability (10-100 mD) laminated sandstone reservoir in E Miocene Telisa Fm, South Balam Field, 50 km NW of Duri, C Sumatra)

Pradana, A.Y., M. Imron, I. Kuswinda & B. Sapiie (2013)- Sealing and non-sealing faults of North Prospect area in Jambi Merang Block, Jambi sub Basin- South Sumatera. Proc. Joint Conv. 38th Indon. Assoc. Geoph. (HAGI) - 42nd Indon. Assoc. Geol. (IAGI), Medan, JCM2013-0048, 21p.
(Fault Seal analysis in Jambi Merang Block, in N part of Jambi sub basin. Most faults do not have significant throw and are generally sealing faults. With well correlations and seismic lines across wells E Ketaling 1, Muara Sabak 1 and Merang 1)

Pradana, A.Y., Y. Indriyanto, A.W. Johanes & A.M. Adiwiarta (2017)- Facies, diagenesis, and depositional setting of carbonate build-up in the Merang High, Jambi sub-basin, Indonesia. Proc. Joint Conv. HAGI-IAGI-IAFMI-IATMI (JCM 2017), Malang, 6p.
(Miocene Baturaja Fm carbonate reservoir in Sungai Kenawang and Pulau Gading fields of Jambi Basin (buildups on NE-SW trending Merang and Ketaling Highs))

Pramudyo, Y.B., S.M. Hendar, H. Nur, M.R. Reinhold & G.W. Jacobs (2007)- An integrated study of low permeability reservoir in the Bekasap Field, Central Sumatra Basin, Indonesia. In: Soc. Petrol. Engineers (SPE) Asia Pacific Oil and Gas Conf. Exhib., Jakarta, 5p.
(On study of E Miocene Bekasap and Menggala Fms sandstones in mature Bekasap field (1955; 107 producing wells). Model delineates trends of estuarine, sand ridge and margin facies that reflect paleogeography. Thirty one horizontal wells drilled in field, predicted to improve ultimate recovery from 14% to 28%)

Pranyoto, U., B. Setiardja & E. Sjahbuddin (1990)- Pembentukan, migrasi dan terperangkapnya hidrokarbon di daerah Rantau, Aru dan Langkat-Medan, Cekungan Sumatra Utara. Proc. 19th Ann. Conv. Indon. Assoc. Geol. (IAGI), Bandung, 1, p. 175-200.
('Formation, migration and trapping of hydrocarbons in the Rantau- Aru and Langkat-Medan areas, N Sumatra basin'. Mapping of source horizons (Baong, Belumai Fm), maturation and kitchen areas in N Sumatra basin)

Praptono, S.H., R. Dwiputro, I.M. Longley & R.W. Ward (1991)- Kurau: an example of the low-relief structural play in the Malacca Strait PSC, Sumatra, Indonesia. Proc. 20th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, p. 299-318.
(Kurau field two separate low relief anticlinal structures on E margin of Bengkalis Trough. Traps formed by drape over structures formed in Late Oligocene. These structures, cored by basement and Pematang Group rocks, remained largely unaffected by Late Miocene- Pliocene tectonism. This later tectonism produced many high-relief structures which were focus for early exploration. Stacked oil pools, with >150 MMBO in-place, largest in PSC. Discovered late in exploration history of area due to relatively subtle nature of trap)

Prasetyo, H., E. Suparka & D. Noeradi Darussalam (2009)- Characterization of low-permeability reservoir rock using petrography and depositional studies- case study: optimizing production from low-permeability Bekasap sandstones in Central Sumatra, Indonesia. AAPG Int. Conf. Exh., Rio de Janeiro 2009, Search and Discovery Art. 40513, 13p. *(Extended Abstract)*
(E Miocene Bekasap Fm sandstone reservoirs in C Sumatra basin deposited in estuarine, tide-dominated delta system. Overall fining-upward: lower part m- grained, conglomeratic, cross-bedded and massive sandstones,

with permeability up to 1900 mD, upper part f-vf-grained, bioturbated sandstone with permeability from 10's-200 mD. In general, reservoir quality more controlled by depositional environment than diagenetic processes. At depth both permeability and porosity reductions significantly controlled by cementation)

Pratiwi, F.I., V.B. Indranadi & B. Toha (2011)- Sequence stratigraphy for facies modeling of Upper Lakat and Tualang Formation: implication for Late Oligocene to Early Miocene paleogeography of southern Bengkalis Trough. Proc. Joint 36th HAGI and 40th IAGI Ann. Conv., Makassar, JCM2011-225, 12p.
(Sequence stratigraphy of Late Oligocene-E Miocene fluvial- tidal channel reservoir intervals in field 'X' (= probably Stanvac Kayuara field; JTvG), at S end Bengkalis Trough, C Sumatra Basin. Sands quartz-rich and derived from N-NE part of Bengkalis, from Malacca Terrane basement high)

Premonowati (2011)- Outcrops conservation of Tanjung Baru or Lower Talang Akar Formation, Baturaja city of Palembang area- South Sumatra Basin: how important? Berita Sedimentologi 20, p. 7-11.
(online at: www.iagi.or.id/fosi/bs20-sumatra.html)
Proposal to conserve quarry in Late Oligocene or basal Miocene fluvial conglomeratic quartz sst of Gritsand Mb of Lower Talang Akar Fm E of Baturaja, with proposal to rename into Tanjung Baru Fm. With overview of outcrop stratigraphy of this part of S Sumatra basin)

Primadi, I. (2013)- Economic vs fractured basement: a case study from North Sumatra Basin. Berita Sedimentologi 27, p. 21-25.
(online at: www.iagi.or.id/fosi/files/2013/08/BS27-Sumatera_Final.pdf)
(North Sumatra 'Basement' may include fractured carbonates with hydrocarbon reservoir potential. Carbonates (dolomites and fractured limestones at base of Cenozoic clastic rift section often assigned to Eocene Tampur Formation (but faunas on which this age is based have never been documented. Analogous limestone in Malacca Straits contain Permian foraminifera; JTvG))

Priwastono, D., A. Kohar, J. Layundra & D. Wanengpati (2005)- The seismic characteristics of the Langsa ñLò carbonate build-up, the first offshore oil production in Nanggroe Aceh Darussalam Province. Proc. 30th Ann. Conv. Indon. Petroleum Assoc., IPA05-G-171, 10p.
(L oil field discovered in 1980 by Mobil in Malacca Straits. Reservoir Early Miocene Malacca Fm carbonate buildup with av. porosities 6.4- 10.7%)

Pujasmadi, B., H. Alley & Shofiyuddin (2002)- Suban gas field, South Sumatra- example of a fractured basement reservoir. In: F.H. Sidi & A. Setiawan (eds.) Proc. Seminar Giant field and new exploration concepts, Indon. Assoc. Geol. (IAGI), Jakarta 2002, p. 25-44.
(Suban gas field 1998 discovery 165km WNW of Palembang. >1000m gas column between 1800-3300m, straddling E Miocene Baturaja Fm reefal limestone (33% of reserves), Oligocene Talang Akar Fm sandstones and Eocene- Oligocene Lemat Fm conglomerates (19%) and fractured basement composed of M Jurassic andesites, E Cretaceous granitoids and Permo-Carboniferous marine metasediments (48% of reserves))

Pujobroto, A. (1997)- Organic petrology and geochemistry of Bukit Asam coal, South Sumatra, Indonesia, Ph.D. Thesis, School of Geosciences, University of Wollongong, p. 1-397.
(online at: http://ro.uow.edu.au/cgi/viewcontent.cgi?article=2975&context=theses)
(Petrography and organic properties of M-L Miocene Palembang Fm coal at Bukit Asam, S Sumatra Basin. Bukit Asam coal dominated by vitrinite (88-91%) with minor liptinite (4.2- 5.0%), inertinite (4.1-5.5%) and mineral matter (mainly clay, quartz and minor pyrite. Vitrinite mainly detrovitrinite with significant telovitrinite and minor gelinite. Coal rank from sub-bituminous (Rv 0.35-0.5%) to semi-anthracite (Rv max. 2%) near andesitic igneous intrusions)

Pujobroto, A. & C. Hutton (2000)- Influence of andesitic intrusions on Bukit Asam coal, South Sumatra Basin Indonesia. Proc. Southeast Coal Geology Conference, Directorate General of Geology and Mineral Resources of Indonesia, Bandung, p. 81-84.

Pulunggono, A. (1969)- Basement configuration in the South Palembang basinal area: its signficance to depositional conditions and oil-trappping. In: Fourth ECAFE Symp. Development of petroleum resources Asia and Far East, Canberra 1969, 16p.

Pulunggono, A. (1986)- Tertiary structural features related to extensional and compressive tectonics in the Palembang Basin, South Sumatra. Proc.15th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 187-213.
(Tertiary basin history. Extensional phase in Late Oligocene- E Miocene, coinciding with standstill of Indian oceanic plate subduction below Sundaland. Oblique compression of N-ward converging Indian Ocean plate solely accomodated by NW-SE trending proto-Barisan by lateral movements. The early M Miocene onset of compression connected to renewed subduction. Diastrophism in Palembang Basin mainly confined to narrow N-S zone with highest heatflow and most fields)

Pulunggono, A., C.I. Abdullah, D. Noeradi, E. Suparka, Djuhaeni & L. Samuel (1999)- Sumatran megashears; Their crucial role in (Tertiary) sedimentary basin development. In: H. Darman & F.H. Sidi (eds.) Tectonics and sedimentation of Indonesia, FOSI-IAGI-ITB Regional Seminar to commemorate 50th anniversary of Van Bemmelen's Geology of Indonesia, Bandung 1999, p. 29-34.
(N-S, WNW-ESE and NW-SE major faults dominate basinal framework of Sumatra basins. N-S and WNW-ESE trending major faults 'old megashears' linked to Mesozoic basement configuration. Late Eocene NW-SE extension probably under rollback conditions of subducting Indian Ocean plate. M-L Miocene and younger inversion/compression NNE-SSW directed.)

Pulunggono, A., A. Haryo S. & C.G. Kosuma (1992)- Pre-Tertiary and Tertiary fault systems as a framework of the South Sumatra Basin; a study of SAR-maps. Proc. 21st Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, p. 339-360.
(S Sumatra dominant trends WNW-ESE, N-S, NW-SE and ± N30°E. Distribution of Jurassic and Cretaceous granites important to explain geological evolution of Sundaland. Paleogene initiation of S Sumatra back-arc basin by way of subsiding 'block-areas'along WNW-ESE (Lematang) and N-S trending strike-slip faults of Pre-Tertiary origin, rejuvenated as normal faults. Neogene compressive tectonics marked S Sumatran back-arc basin development a.o. inducing inversion along WNW-ESE faults. NW-SE (Barisan or Semangko) trend offsets WNW-ESE trend and active strike-slip fault zone at crestal parts of Barisan Mountain Range)

Purnama, A.B., S. Salinita, Sudirman, Y.A. Sendjaja & B. Muljana (2018)- Penentuan lingkungan pengendapan lapisan batubara D, Formasi Muara Enim, Blok Suban Burung, Cekungan Sumatera Selatan. J. Teknologi Mineral dan Batubara 14, 1, p. 1-18.
(online at: http://jurnal.tekmira.esdm.go.id/index.php/minerba/article/view/182/533)
('Interpretation of depositional environment of coal seam D, Muara Enim Formation, Suban Burung Block, South Sumatera Basin'. M-L Miocene coal seam D of Muara Enim Fm dominated by vitrinite (~71%), inertinite (17.6%), liptinite (5.9%) and 6.4% mineral matter. Vitrinite reflectance Rvmax 0.25-0.38%, corresponding to lignite-subbituminous rank. Deposited in a limnic depositional environment)

Purwaningsih, M.E.M., B. Mujihardi, L. Prasetya, W.A. Suseno & Y. Sutadiwirya (2006)- Structural evolution of the Jambi Sub-Basin: a rotated strike-slip mechanism. Proc. Jakarta 2006 Int. Geosc. Conf., Indon. Petroleum Assoc (IPA)., Jakarta06-OT-60, 6p. *(Extended Abstract)*
(Structural evolution of Jambi sub-basin three orders. Jambi sub-basin block rotation of 45° clockwise relative to Great Sumatra strike slip fault)

Purwanti, Y., A. Bachtiar & A. Balfas (2003)- Petrophysics and organic geochemistry of basement section in Malacca Strait area. Proc. 32nd Ann. Conv. IAGI and 28th Ann. Conv. HAGI, Jakarta, 6p.
(Basement in N-S trending Bengkalis Trough in Malacca Strait mainly meta-sediments and limestone in N, quartzite and mudstone in S. Hydrocarbon shows in some parts. TOC of basement shales from 0.11- 1.43%, Ro from 1.12- 4.33% (overmature). N area more mature than S. Tectonic uplift of block 2300' to 3850')

Puspoputro, B. (1984)- Tinjauan atas hasil penyelidikan transiel di daerah kerja Pertamina. Proc. 12th Ann. Conv. Indon. Assoc. Geol. (IAGI), p. 127-134.

('An overview of results of a transect study of Pertamina exploration block')

Pustantra, F.Y., Sardjito & Y. Surtiati (2017)- Stratigraphic trap exploration on Paleogene deposit in Puspa area, East Jambi. Proc. Joint Conv. HAGI-IAGI-IAFMI-IATMI (JCM 2017), Malang, 8p.
(On potential for stratigraphic traps in Paleogene rift section of Puspa area in NE part of NE-SW trending Tempino-Kenali Asam Deep/ rift, NE part of Jambi Basin. Six sequences in M Eocene - Late Oligocene rift fill: early synrift (P10-P17; fluvial- lacustrine) and late synrift (P17-N4; fluvio-deltaic). Sediment source from NE)

Putra, D.D. (1999)- Analysis of the possible reserve in Eq. Baturaja Limestone by applying the Bungin Batu geological model; a case study on the West of East Ketaling Structure, Jambi. Proc. 28th Ann. Conv. Indon. Assoc. Geol. (IAGI), Jakarta, 2, p. 99-114.
(Discussion of oil distribution in Bungin Batu and Ketaling fields in Jambi sub-basin, S Sumatra)

Putrohari, R.D. (1992)- MSDC-1: a gas discovery in the Malacca Strait PSC, Sumatra, Indonesia. Proc. 21st Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, p. 201-223.
(MSDC-1 gas well on E margin of Bengkalis Trough, in pre-Sihapas objective. Structure Upper Oligocene inversion anticline. DC structure low relief hydrocarbon column exceeds mapped structural closure. Proposed geological model shows trapping mechanism partly stratigraphically controlled)

Raguwanti, R., A. Sukotjo & B.W.H. Adibrata (2005)- Innovative approach using geostatistical inversion for carbonate reservoir characterization in Sopa Field, South Sumatra, Indonesia. Proc. 30th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 61-66.
(Geostatistical inversion of thin carbonate reservoir of Baturaja Fm in Sopa Field, South Sumatra)

Rahmat, G. (2017)- Quantitative biostratigraphy at Air Benakat Formation and sequence stratigraphy analysis in Tempino Field Jambi Subbasin. Proc. Joint Conv. HAGI-IAGI-IAFMI-IATMI (JCM 2017), Malang, 9p.
(Air Benakat Fm at Tempino Field, Jambi Basin, ~500m thick. Age from late E- M Miocene (NN4-NN6 or N7-N11?; ~18-12 Ma?). Four sequences)

Rahmat, G., Julikah, A. Kholiq & Sriwijaya (2016)- Paleogeography maps based on sequence stratigraphy analysis in Jambi sub-basin and implication to shale hydrocarbon play distributions. Proc. GEOSEA XIV and 45th Ann. Conv. Indon. Assoc. Geologists (IAGI) (GIC 2016), Bandung, p. 614-634.
(Jambi subbasin nine sequences from E Eocene- M Miocene. Paleogeography maps for sequences 1-4 (Lemat-Gumai Fms. Based on richness, maturation, facies and amount of shale highest shale hydrocarbon potential in Sequence 3 (U Talang Akar- lower Baturaja Fm (also as p. 706-726 in same volume))

Rahmat, J. & S. Oemar (1998)- Exploration opportunities in the Bengkulu frontier basin, West Sumatra, offshore Indonesia. In: J.L. Rau (ed.) Proc. 33rd Sess. Co-ord. Comm. Coastal Offshore Geosc. Progr. E and SE Asia (CCOP), Shanghai 1996, 2, Techn. Reports, p. 114-127.
(Hydrocarbon potential potential of Bengkulu fore-arc basin proven by presence of Oligocene or E Miocene brown shales with good TOC, onshore oil seeps and offshore oil shows in wells. Potential reservoirs Baturaja and Parigi Fm equivalent carbonate buildups and E Miocene Talang Akar Fm equivalent sandstones. Temperature gradients in wells 2.8- 4.0 °C/ 100m)

Rashid, H., I.B. Sosrowidjojo & F.X. Widiarto (1998)- Musi Platform and Palembang High: a new look at the petroleum system. Proc. 26th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 265-276.
(Musi Platform and Palembang High in S Sumatra important exploration targets. Source rocks Lahat/ Lemat Fm Paleogene lacustrine shales and fluvio-deltaic to marginal marine Talang Akar shales- coals. Three oil groups: marine, lacustrine, deltaic. Palembang High oils fluvial-deltaic, probably mix of two oils from S and N Palembang High. Marine carbonate oil in condensate from Pre-Tertiary Basement fracture in Musi Platform)

Ratiwi, A.P. & Akmaluddin (2017)- Biostratigrafi nannofossil gampingan pada sumur 'SSB' sub-cekungan Palembang Selatan, Cekungan Sumatera Selatan. Proc. 10th Seminar Nasional Kebumian, Dept. Teknik Geologi, Universitas Gadjah Mada (UGM), Yogyakarta, PSP-01, p. 793-805.

('Calcareous nannofossil biostratigraphy of well 'SSB', South Palembang sub-basin, S Sumatra'. Nannofossils study of (unspecified) well, from Lahat to Air Benakat Formations. Five zones, from Sphenolithus ciperoensis (NP 25) to Reticulofenestra minuta (NN5). Age of Lahat Fm NP25-NN1 (25.2-24.3 Ma), Talang Akar Fm NN1-early NN2 (24.3-23.9 Ma), Baturaja Fm NN2-NN4 (23.9-17.6 Ma), Gumai Fm NN4-early NN5 (17.6-14.9 Ma), and Air Benakat Fm NN5 (14.9-14.8Ma) or younger. Age of Lahat Fm younger than generally assumed Eocene (see also Agustin et al. 2017 for sequence strat interpretation of same well)

Reaves, C.M. (1996)- Variations in sour gas concentrations in the NSB 'A' Field, Offshore North Sumatra. Proc. 25th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 453-464.
(NSB 'A' field gas H_2S content <0.5% to >5%. CO_2 also variable. Variations in sour gas concentrations controlled by production of gas from formation water)

Reaves, C.M. & A. Sulaeman (1994)- Empirical models for predicting CO_2 concentrations in North Sumatra. Proc. 23rd Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 33-43.
(Up to 95% CO_2 in N Sumatra gases, primarily from inorganic sources. Empirical models developed which utilize reservoir lithology, temperature and pressure to calculate CO_2 concentrations. Principal mechanism controlling CO_2 in clastic reservoirs is interaction of silicate transformations and carbonate dissolution. Carbonate reservoirs exposed to significant up dip fluid flow will possess CO_2 concentrations representative of base or entry point of regional flow system)

Redfern, J. (1998)- The deep gas potential of the Batu Raja Formation in South Sumatra. a case history: the Singa gas discovery. Warta Geologi 24, 6, p. 309. *(Abstract only)*.
(Singa 1 gas discovery in E Miocene Baturaja Limestone in Lematang Trough at ~12,000' depth with 258' gross gas reservoir interval)

Redfern, J., P. Ebdale & S. Oesman (1998)- The deep gas potential of the Batu Raja Formation in South Sumatra. A case history : the Singa gas discovery. In: Offshore South East Asia Conf. (OSEA98), Singapore, SEAPEX, p. 123. *(Abstract only)*
(Singa 1 (1997) well tested Batu Raja reefal limestone buildup, deep in Lematang Trough (~12,000'), ~3000' deeper than any wells previously drilled in area. Tested gas at 30.7 MMSCFD from 258' gross interval)

Reksalegora, S.W. & P. Riadini (2013)- Critical parameters in basin modeling of Bungamas PSC, South Sumatra Basin. Proc. 37th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA13-G-109, p. 1-15.
(Bungamas PSC in SW margin of the S Sumatra Basin (W edge of S Palembang Sub-basin). Plio-Pleistocene compression resulted in formation of WNW-ESE trending folds Hydrocarbon generation model shows hydrocarbons in Bungamas PSC were generated mostly from kitchen in E half of block from Talang Akar and Gumai source rocks. Source rock started expelling hydrocarbon since M Miocene)

Renaud, G.P.A. (1885)- Onderzoek naar steenkolen ter westkust van Atjeh. Jaarboek Mijnwezen Nederlandsch-Indie 14 (1885), Wetenschappelijk Gedeelte, p. 131-157.
('Investigation of coal at the West coast of Aceh'. Brief survey of coal deposits near Taloq Penjupian in area of Tampat Tuan mountain, at rugged W coast of Aceh, N Sumatra. Claystone with two up to 60cm thick coal bed, dipping 35° and steeper. Associated with dense recrystallized limestones without clear fossils. Coals not deemed suitable for commercial exploitation. With 1:10,000 scale map)

Renaud, G.P.A. (1890)- Verslag van een onderzoek naar petroleum in Langkat. Jaarboek Mijnwezen Nederlandsch-Indie 19 (1890), Technisch Admin. Ged. 2, p. 1-9.
('Report of an investigation of petroleum in Langkat', N Sumatra)

Riadhy, S., A. Ascaria, D. Martono, A. Sukotjo et al. (2000)- Carbonate play concept in Sopa and surrounding areas: an alternative model for hydrocarbon occurrence, Musi Platform, South Sumatra Basin. Proc. 27th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, p. 145-157.

(Reefal facies in carbonate plays usually good reservoir, but in Musi Platform Sopa carbonate complex platform and reefal facies relatively tight with mainly isolated biomoldic porosity without fractures. In contrast, prograding carbonate clastic facies 15-25% chalky porosity and 300-2000 mD permeability)

Riadhy, S. & A. Gutomo (1993)- Notes: "Basal Sandstone", existence and hydrocarbon potential in the North Sumatra Basin, a case study in Batang Sarangan, Langkat and Gebang Areas. Proc. 22nd Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 265-284.
(Prospectivity of Eocene-Oligocene 'Basal Sandstone' alluvial and fluvial deposits in lows. Two kinds: syn-rift (Batang Sarangan Type) and post-rift deposits (Langkat-Gebang Type)).

Riadhy, S., C. Ismi & S. Iriani (1998)- North Sumatra's Middle Miocene reservoir prediction and characterization using sequence stratigraphy, 2D seismic inversion and 3D seismic data. Proc. 26th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 239-250.
(Lower and Middle Baong sandstones M Miocene age. Lower Baong sourced from Malacca Platform in N, interpreted as highstand- shelf margin-system tract, prograding S. Shift in sediment supply to S (Barisan) and drop of sea level drop resulted in deposition of M Baong lowstand unit in S of area. Differences of two sand members clearly defined from seismic model, sand provenance and well correlation. Prograding shelf margin is less attractive exploration target due to thinner sand thickness in poor quality reservoirs. Lowstand produced medium thickness, good quality sand reservoirs)

Riadhy, S., Medianto B.S. & S. Fajari (1996)- Aplikasi stratigrafi sekuen pada Formasi Belumai- Peutau- Aru-Langkat, Cekungan Sumatra Utara. Proc. 25th Ann. Conv. Indon. Assoc. Geol. (IAGI), 2, p. 275-293.
('Application of sequence stratigraphy on the Belumai- Peutau- Aru- Langkat Fms, N Sumatra basin')

Riadhy, S. & A. Sulaeman (1995)- The Baong reservoir distribution prediction using sequence stratigraphy analysis: a regional study in North Sumatra Basin. Proc. 24th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 2, p. 581. *(Abstract only)*
(M Miocene Baong Fm with lower Baong shale (zones N8-N11 in age, overlain by M Miocene (N11) sandstone viewed as lowstand sand sourced mainly from Malacca Platform with minor contributions from Asahan Arch. Second package of sandstones, sourced from Malacca platform and prograded from that direction, interpreted as highstand to shelf margin systems tract. Shift in sediment supply from N (Malacca) to S (Barisan) during M Miocene zone N13, suggesting emergence of landmass to S. Prograding highstand sands following flooding event in zone N13, but less attractive exploration target due to poor quality and rel. thin sands)

Richmond, W.C., H. Dwidjojuwono, A. Tastari & B. Toha (2002)- Reservoir compartmentalization: an integrated evaluation of supermature Minas oil field, Central Sumatra. Proc. 28th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 2, p. 137-156.
(Minas oil field produced >4 BBO since early 1950's. NW-SE trending anticline. Main producing reservoirs, originally thought to be regionally continuous fluvial/deltaic sands, commonly compartmentalized due to complex stratigraphic-structural setting, with post-depositional diagenesis. Detailed depositional framework built using 1430 wells. Sequence stratigraphic framework of E Miocene Bekasap Fm reservoir 11 regionally correlatable flooding surfaces and five sequence boundaries in overall regressive-transgressive package)

Robinson, K.M. & A. Kamal (1988)- Hydrocarbon generation, migration and entrapment in the Kampar Block, Central Sumatra. Proc. 17th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, p. 211-256.
(Kampar Block 3 oil types. Majority of oils in fields along Merbau and Lirik Trends plus Pekan and Binio Fields, sourced from deep lacustrine, non-marine algal Kelesa shales. Panduk and N Merbau probably sourced from lake edge, mainly terrestrial/minor algal Kelesa shales. Parum Field probably sourced from Kelesa or, Lakat coals and coaly shales. Generation of oils over narrow maturity range of Ro = 0.55- 0.64%. Lacustrine Kelesa shale source rock in deepest parts of S Bengkalis half graben. Lateral extent mapped by paleogeography of pre-29 mybp sequence. Source rock mature and in main to late phase of oil generation. Onset of major oil generation in Plio-Pleistocene, probably due to increase in heat flow. Distribution of oil fields fault controlled. Migration distance small (2-10 km). Quantification of oil charge to prospects/Fields along Lirik and Merbau Trends indicate Kelesa source can easily account for oil found in Block to date)

Rodriguez Maiz, N.D. (2012)- Source rock facies characterization from organic geochemistry in the Central Sumatra Basin, Indonesia. M.Sc Thesis University of Oklahoma, Norman, p. 1-106.
(Geochemical composition of 32 oil samples in C Sumatra Basin from Aman, Balam, Tanjung Medan, Kiri and Bengkalis Troughs. Oils derived from Eocene-Oligocene lacustrine Brown Shale Fm. Molecular and carbon isotopic composition reveal five source rock facies: (1) deep lacustrine; (2) shallow lacustrine; (3) saline lacustrine; (4) coal; (5) mixed coal/ lacustrine shale. Deep stratified lakes developed in Aman and Bengkalis Troughs. Oils in Kiri graben mainly from shallow lacustrine facies, oils S of Aman and Kiri grabens more saline lacustrine facies. Oils from coal and mixed coal/lacustrine shale facies restricted to N part of C Sumatra Basin. Oils in Aman Trough suggest paleoproductivity and paleoclimatic changes during source rock deposition, possibly associated with Eocene-Oligocene paleoclimatic transition)

Rodriguez, N.D. & R.P. Philp (2012)- Productivity and paleoclimatic controls on source rock character in the Aman Trough, north central Sumatra, Indonesia. Organic Geochem. 45, p. 18-28.
(C Sumatra Basin oil sourced from Brown Shale Fm of Pematang Gp. Oils in Aman Trough variable molecular and isotopic compositions, reflecting lateral facies variations in source rock. Source rock deposited in fresh to brackish water stratified lake with CO2 limiting conditions. Isotopic data indicate changes in paleoclimatic conditions, possibly associated with Eocene-Oligocene paleoclimatic transition)

Rodriguez, N.D. & R.P. Philp (2015)- Source rock facies distribution predicted from oil geochemistry in the Central Sumatra Basin, Indonesia. American Assoc. Petrol. Geol. (AAPG) Bull. 99, 11, p. 2005-2022.
(Composition of n-alkanes in 30 oil samples from C Sumatra Basin analyzed to determine facies variations in Eo-Oligocene Brown Shale Fm source rocks. Biomarkers indicate algal and terrigenous organic matter, primarily under oxic or sub-oxic depositional conditions. Five source facies: deep lacustrine (dominant in Aman and Bengkalis Troughs), shallow lacustrine and lacustrine saline (S Aman and Kiri Troughs) to coal and mixed coal and lacustrine shale (N part of basin, in Tanjung Medan and N of Balam grabens))

Roezin, S. (1974)- The discovery and development of Petapahan oil field, Central Sumatra. Proc. 3rd Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 111-127.
(Petapahan 1971 oil discovery 60 km W of Pekanbaru in Lower Miocene Sihapas Group sandstone reservoirs. Young NW-SE trending anticline)

Romodhon, W., Luqman, E. Nadeak, D.J. Ramos, S. Radiansyah, S. Mulyani & A. Zakiyuddin (2014)- Heavy oil resource assessment through static models: a case study of TB-TL structure, Iliran High, South Sumatra, Indonesia. Proc. 38th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA14-G-212, 19p.
(Shallow heavy oil accumulations on Iliran High/ Palembang High in two formations: Lower Telisa Fm (?; depth 50-200') and Talangakar Fm (175-400') (in well-known area of surface oil seeps; not much geologic detail, no resource estimates; see also Firmansyah et al 2007).

Rory, R. (1990)- Geology of the South Lho Sukon 'A' Field, North Sumatra, Indonesia. Proc. 19th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 1-40.
(South Lho Sukon 'A' 1972 gas discovery,~35 km SE of Arun. Reservoir E-M Miocene Peutu Fm reefal buildup, overlain by M Miocene Baong shales. Overlying rocks mildly folded and faulted during Barisan orogeny in Plio-Pleistocene. As at Arun, reservoir limestones deposited in reef, near-reef and "lagoonal" environments in E- M Miocene. Average porosity 8-15%)

Rozalli, M., A. Putra, A. Bachtiar, P.A. Suandhi, W. Utomo & A. Budiman (2012)- New insights into the petroleum geology of the Mountain Front area, Central Sumatra Basin. Proc. 36th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA12-G-178, p. 1-15.
(Mountain front area on S margin of Central Sumatra Basin no proven petroleum system)

Rozeboom, J.J. (1961)- Paleontologic methods of correlation in Central Sumatra. Publ. Council Sci., 2, Contrib. Dept. Geology Inst. Technology Bandung (ITB) 46, p. 199-209.
(Brief Caltex paper on Central Sumatra basin stratigraphy and micropaleontology)

Rudd, R.A., S. Tulot & D. Siahaan (2013)- Rejuvenating play based exploration concept in South Sumatra Basin. Proc. 37th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA13-G-068, p. 1-14.
(S Sumatra Basin reserves ~23% of total conventional hydrocarbon reserves in Indonesia. Produced ~2500 MMB Oil and 9.5 Tcf of gas. Three major plays U Oligocene- Lw Miocene Talang Akar fluvio-deltaic clastics, Lower Miocene Batu Raja carbonates and Pre-Tertiary Basement plays (70% of total reserves).Underexplored minor plays: Eocene Lahat syn-rift clastics, Miocene Gumai shallow marine clastics and Late Miocene Air Benakat transitional to marine clastics)

Rusli, B., M.A. Arham, E. Wijayanti & A. Ridlo (2010)- Acceleration of thin oil rim development of Fariz Field. Proc. 34th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA10-E-029, 7p.
(Small S Sumatra Fariz Field 2004 Medco discovery 3 km E of Soka. with 250' gas cap, surrounded by 80' oil rim in Baturaja limestone and Talang Akar Fm conglomerate)

Rustanto, B. & E. Hartono (1991)- Sekuen pengendapan dan òsystems tractsò Formasi Belumai daerah Aru-Langkat, cekungan Sumatra Utara. Proc. 20th Ann. Conv. Indon. Assoc. Geol. (IAGI), Jakarta, p. 237-260.
('Sequence stratigraphy of the Belumai Fm in the Aru-Langkat area, N Sumatra basin'. E Miocene (N5-N8) Belumai Fm around Medan with 3 depositional sequences and 8 systems tracts. With interpretations for wells A1, C1, E1, F1, G5, J1, L-A1, M1A, P-A1, R-1A, well-log cross-sections and paleogeographic maps)

Rutimeyer, L. (1874)- Bemerkungen zu den fossilen Fischen aus Sumatra. Abhandlungen Schweizerischen Palaont. Gesellschaft 1, p. 20-26.
(online at: https://ia601306.us.archive.org/34/items/abhandlungenders1187schw/abhandlungenders1187schw.pdf)
('Remarks on fossil fishes from Sumatra'. Description of fish fossils from Eocene lacustrine deposits of Ombilin Basin, collected by Verbeek in 1874. Three species, including Smerdis (herring family). (In same volume with Heer 1874 paper on associated with plants; Fish fauna re-described by Sanders 1934))

Ryacudu, R. (2005)- Studi endapan syn-rift Paleogen di cekungan Sumatra Selatan. Doct. Thesis, Dept. Geological Engineering, Institut Teknologi Bandung (ITB), p. *(Unpublished)*
('Study of Paleogene syn-rift deposits in the South Sumatra basin')

Ryacudu, R. (2008)- Neogene tinjauan stratigrafi Paleogen Cekungan Sumatra Selatan. In: Sumatra stratigraphy workshop, Duri (Riau) 2005, Indon. Assoc. Geol. (IAGI), p. 99-114.
(Stratigraphic nomenclature of Paleogene in S Sumatra basin. Classified as pre-rift (Pre-Tertiary and Kikim Fm), syn-rift (Benakat and Lemat Fms of Lahat Group) and post-rift (Tanjungbaru and Talang Akar Fms.)

Ryacudu, R., R. Djaafar & A. Gutomo (1992)- Wrench faulting and its implication for hydrocarbon accumulation in the Kuala Simpang Area- North Sumatra Basin. Proc. 21st Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 93-116.
(On effect of Neogene wrench faulting to hydrocarbon accumulation in Kuala Simpang area, N Sumatra basin)

Ryacudu, R. & E. Sjahbudin (1994)- Tampur Formation, the forgotten objective in North Sumatra basin ? Proc. 21st Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 160-179.
(Tampur Fm Late Eocene shelf carbonate on Tampur Platform. W margin of shelf marked by N-S Lokop-Kutacane Fault zone. E of fault zone, reefal buildups on shelf edge. Dolomitisation may have resulted in reservoir rocks. Formed on basin highs, adjacent to shale-rich troughs. Shales mature since Miocene. Significant gas from Tampur Fm under Peutu carbonates at Alur Siwah, Peulalu and from beneath Malacca Limestone Mb reefs offshore. Strong gas shows also in Sembilan-A1 well in Aru onshore area (NB: Tampur Fm carbonates at base of Malaysian Malacca Straits well of M-L Permian age; Fontaine et al. 1992; JTvG)

Safrizal, R. (2000)- Thermal history of the South Palembang Sub-basin. Ph.D. Thesis University of Tulsa, p. 1-309.

(Slowing of convergence rate in E Tertiary created S Sumatra back-arc basin. Increasing convergence rates between Indo-Australian plate and Sunda microplate since M Miocene created basin inversion with strike-slip component and increased heat flow over past 5 My. S Sumatra basin average heatflow of ~2.6 HFU (5.3°C/100m) higher than global average (1.5 HFU) and higher than W Pacific back-arc basins. Increasing heatflow in short period suggested by Apatite Fission Track Annealing and vitrinite reflectance data)

Sagita, R., Q.S. Chandra, M. Chalik, R. Achdiat, R. Waworntu & J. Guttormsen (2008)- Reservoir characterization of complex basement- Dayung. Proc. 32nd Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA08-G-208, 12p.
(Dayung Field 1991 gas discovery in Corridor Block, S Sumatra, with 11 wells drilled, and with >600 m gas column in fractured Lower Tertiary and basement reservoirs. Basement is Permian Leko Limestone intruded by Jurassic (~170- 205 Ma Ar ages) granitic complex. Also influenced by violent hydrothermal event intruding granite and dated at 17 M.)

Saifuddin, F., M. Soeryowibowo, I.N. Suta & B. Chandra. (2001)- Acoustic impedence as a tool to identify reservoir targets: a case study of the NE Betara-11 horizontal well, Jabung Block, South Sumatra. Proc. 28th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 135-152.
(NE Betara field is largest field in Devon Jabung Block, S Sumatra, with oil and gas in Lower Talang Akar Fm sandstones, deposited in fluvial- estuarine environment. Reservoir distribution varies across field. Acoustic impedance from 3D seismic effective tool for identifying reservoir targets)

Saito, K., S. Tono & Z.A. Kamili (1985)- Sand body correlation in deltaic setting, East Ketaling Field. Proc. 14th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 499-515.
(Correlation of deltaic sand bodies in M Miocene Air Benakat Fm of E Ketaling field, Jambi Basin, S Sumatra)

Samudra A.B.S., J. Jaenudin, Y.A.M. Mizani & Y.S. Surtiati (2014)- Strike-slip fault system characterization and its implication to hydrocarbon entrapment in the Puja High, South Sumatra. In: 76th EAGE Conference and Exhibition 2014, p.
(Puja-1 gas-condensate well drilled by Pertamina in 2009 on local high in Tempino-Kenali Asam Deep, Jambi subbasin, S Sumatra Basin, Indonesia. Structure controlled by SE and NW dipping normal faults, developed in transtensional rift setting and affecting synrift clastic sedimentation)

Samudra A.B.S., S. Sugiri & M.W. Wahyudin (2014)- Fractured basement characterization and its relation to production zone potential in Southern Sumatra Basin, Indonesia. In: EAGE 6th Int. Conf. and Exhibition-Geosciences, Saint Petersburg, Tu BC 06, 5p. *(Extended Abstract)*
(AXL-1 in S Sumatra Basin tested 320 BOPD oil in 2009 in Pre-Tertiary quartzite. Oil and gas 204 m below top Pretertiary basement, associated with faults of dominant NE-SW strike)

Sanders, M. (1934)- Die fossilen Fische der Alttertiaren Susswasser Ablagerungen aus Mittel-Sumatra. Verhandelingen Geologisch-Mijnbouwkundig Genootschap Nederland Kol., Geol. Serie 11, 1, p. 1-144. *(also Thesis University of Amsterdam, 142p.)*
('The fossil fishes from Early Tertiary fresh water deposits from Central Sumatra'. Description of well-preserved Eocene fresh-water fish fossils from bituminous marly shales from S. Sipang, Ombilin basin, Padang Highlands. First discovered by Verbeek in 1874, with further collections by Musper in 1927. Includes 7 species of cyprinid fish, mainly extant species. Associated with plant fossils described by Heer 1874 and water bird described by Lambrecht 1931)

Santoso, B. & B. Daulay (2005)- Vitrinite reflectance variation of Ombilin coal according to its petrographic analysis. Indonesian Mining J. 8, 1, p. 9-20.
(online at: http://jurnal.tekmira.esdm.go.id/index.php/imj/article/view/207/123)
(Ombilin coals from W Sumatra dominated by vitrinite and rare exinite, inertinite and mineral matter. Coals thermally affected igneous intrusions with vitrinite reflectances 3.4- 4.7% (anthracite); thermally unaffected coal 0.55- 0.77% (sub-bituminous to high volatile bituminous). Thermally affected coals higher apparent vitrinite, as exinite cannot be distinguished from vitrinite here)

Santoso, B. & B. Daulay (2006)- Coalification trend in South Sumatera basin. Indonesian Mining J. 9, 3, p. 9-21.
(online at: http://jurnal.tekmira.esdm.go.id/index.php/imj/article/view/637/498 (bad link?))
(Bukit Asam coals in S Sumatera Basin influenced by intrusions of andesite bodies and stratigraphic aspect. Thermally affected coals have vitrinite reflectances 0.69% (high volatile bituminous)- 2.60% (anthracite); coals not affected between 0.30% (brown coal) and 0.53% (sub-bituminous))

Santoso, B. & B. Daulay (2007)- Comparative petrography of Ombilin and Bayah coals related to their origin. Indonesian Mining J. 10, 3, p. 1-12.
(online at: http://jurnal.tekmira.esdm.go.id/index.php/imj/article/view/608/470)
(Comparison of Eocene coals of Ombilin (W Sumatra) and Bayah (SW Java). Bayah with higher mineral matter; Ombilin higher vitrinite and liptinite contents, higher vitrinite reflectance and rank (sub-bituminous to anthracite). Thermally unaffected coals from both coalfields <90 % vitrinite. Variable vitrinite reflectances, due to igneous intrusions)

Santoso, D., W.G.A. Kadir & S. Alawiyah (2000)- Delineation of reservoir boundary using AVO analysis. Exploration Geophysics (J. Australian Soc. Expl. Geophysicists) 31, 2, p. 409-412.
(N Sumatra Basin M Miocene Keutapang Fm sandstones- shale deposited in coastal environment, 500-1300 m thick. Top of porous sandstone reservoir zone is AVO anomaly, so can be used for delineation of reservoir)

Santoso, D., S. Sukmono & H. Setyadi (1994)- The characteristics of Neogene sediments and structure in Siberuang area (Central Sumatra Indonesia) based on gravity data. Bull. Geol. Soc. Malaysia 37, p. 471-478.
(online at: https://gsmpubl.files.wordpress.com/2014/09/bgsm1995a32.pdf)
(Neogene sediments in outcrop of Kampar Kanan intramontane basin of Barisan Mts foothills near Siberuang area, C Sumatra, consists of Sihapas (N4?-N7), Telisa (N7-N10) and Petani (N13-N19) Fms)

Santy, L.B. (2001)- Structural evolution of the North Bengkalis Trough, Malacca Straits, Central Sumatra Basin and its implication in creating traps for hydrocarbon accumulation. Proc. 28th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 739-747.
(N Bengkalis Trough in Malacca Straits PSC. Exploration targets footwall traps of Padang Fault. Structural reconstruction shows four periods: (1) extension (Pematang time, Eocene-Oligocene?), creating N-S trending half graben in which Pematang Brown Shale source rock was deposited; (2) First compression (Menggala-Sihapas time, U Oligocene -E Miocene) NW- SE dextral strike-slip fault zone. Structural growth continued until Lower Sihapas time (3) Tectonic quiescence (Telisa time, E-M Miocene); (4) Second compression (M Miocene-Pliocene)

Saputra, H.N. & B. Sapiie (2005)- Analogue study of basement fractured reservoirs in Kotopanjang Area, Central Sumatra. Proc. 30th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 53-60.

Sapiie, B., D. Aprianyah, E.Y. Tureno & N.A. Manaf (2017)- A new approach in exploring a basement-fractured reservoir in the Sumatra back-arc basin. Proc. 41st Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA17-260-G, 13p.
(Review of 3D fracture modeling in Pretertiary basement rocks of Sumatra, incl. outcrop fracture study in Ombilin Basin)

Sapiie, B., F. Yulian, J. Chandra, A.H. Satyana, D. Dharmayanti, A.H. Rustam & I. Deighton (2015)- Geology and tectonic evolution of fore-arc basins: implications of future hydrocarbon potential in the Western Indonesia. Proc. 39th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA15-G-177, 14p.
(Fore-arc basins in Indonesia mostly underexplored. Mainly discussion of Sumatra -Bengkulu sub-basin, with Eocene- Oligocene pull-apart basin formation, Late Miocene- Recent minor compression, etc.)

Sardjito, E.F., Djumlati & S. Hansen (1991)- Hydrocarbon prospect of Pre Tertiary basement in Kuang Area, South Sumatra. Proc. 20th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 255-277.

(Kuang area ~40 km S of Prabumulih, well known oil and gas producing area. Hydrocarbons structurally trapped in Baturaja and Talang Akar Fms. ASD-1 well proved hydrocarbons also in Pre-Tertiary fractured granodiorite and quartzite basement)

Sarjono, S. & Sardjito (1989)- Hydrocarbon source rock identification in the South Palembang Sub-basin. Proc. 18th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 424-467.
(In S Palembang sub-basin Oligocene syn-rift Lahat Fm contains mature source rocks, thought to generate gas in Gunung Kemala area. Talangakar and Baturaja Fms contain mature source rocks rich in Type I and II sapropel kerogen. E Miocene Gumai Fm with mature humic Type III kerogen. Air Benakat and Muara Enim Fms are immature. First migration of hydrocarbons in Palembang sub-Basin in M Miocene, at end of Gumai Fm time. Early trapped hydrocarbons were redistributed into new traps after Plio-Pleistocene orogeny)

Sartono, S. & H. Murwanto (1990)- Kompleks melange di Sumatera Selatan, Indonesia. Proc. 17th Ann. Conv. Indon. Assoc. Geol. (IAGI), Jakarta 1988, p. 65. *(Abstract only)*
('Melange complex in S Sumatra'. Late Cretaceous chaotic melange rock complexes in S Sumatra, with phyllite matrix and schist and gneiis blocs. No details)

Sartono, S. & R. Sinuraya (1985)- Kelompok Tapanuli di Sumatra Utara. Proc. 14th Ann. Conv. Indon. Assoc. Geol. (IAGI), p. 193-204.
('The Tapanuli Group of North Sumatra')

Satrio, B. & Soejanto (1994)- Asih Field discovery: detailed structural reevalution along a wrench fault system in the Central Sumatra Basin, an exploration opportunity in a mature area. Proc. 23rd Ann. Conv. Indon. Assoc. Geol. (IAGI), Jakarta, 2, p. 1039-1049.
(Asih 1 well (1993) oil discovery in 17 zones in Sihapas Gp and Pematang Fm sandstones at SE side of Aman Trough, C Sumatra basin, NW of Minas field. In low relief fault structure along N-S right-lateral wrench fault)

Sayentika, Syafruddin & B. Sapiie (2003)- Eocene-Middle Miocene structural reconstruction of the Duri Anticline, Central Sumatra Basin, Indonesia. Proc. 29th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 1-11.
(At least four structural events in C Sumatra Basin: Pre-Tertiary basement development, Eocene-Oligocene rifting, M Miocene strike-slip and M Miocene-Recent compression. Duri Anticline reconstruction using flattened seismic lines)

Schenk, C.J., T.R. Klett, M.E. Tennyson, T.J. Mercier, M. E. Brownfield, J.K. Pitman et al. (2016)- Assessment of Coalbed Gas resources of the Central and South Sumatra Basin Provinces, Indonesia. U.S. Geol. Survey, Fact Sheet 2016-3089, 2p.
(online at: https://pubs.usgs.gov/fs/2016/3089/fs20163089.pdf)
(Undiscovered total coalbed gas resource of C and S Sumatra basins is most likely 20 TCF of gas (8 in C, 12 in S Sumatra; F95-F5 range 4.8- 42 TCF). Measurements indicated coals undersaturated with gas. Presence of liptinite led to hydrogen indices as high as 300 mg/g, suggesting coals may be able to produce liquids)

Schultz, R.A., K.A. Soofi, P.H. Hennings, X. Tong & D.T. Sandwell (2014)- Using InSAR to detect active deformation associated with faults in Suban Field, South Sumatra Basin, Indonesia. The Leading Edge 33, 8, p. 882-888.
(Suban field in S Sumatra with fractured carbonate/crystalline basment gas reservoir. Reservoir-scale right-oblique reverse faults and folds trapped hydrocarbons Satellite data show areas of active localized subsidence and horizontal movements above main right-oblique fault zone in SW part of Suban field)

Schurmann, H.M.E. (1922)- Over de Neogene synclinaal van Zuid Sumatra en het ontstaan van bruinkool. De Mijningenieur 3, 5, p. 67-70 and De Mijningenieur 3, 6, p. 77-81.
(online at: https://babel.hathitrust.org/cgi/pt?id=coo.31924081565537;view=1up;seq=283)
('On the Neogene syncline of South Sumatra and the development of lignites'. In S Sumatra basin (Jambi-Palembang) thicker Late Miocene- Pliocene (M Palembang Fm ~650m thick with 90m coal in 11 horizons)

coals than in W Java or C and N Sumatra. Sumatra coals viewed as swamp formations, deposited in areas similar to present-day Palembang, Barito and Mahakam swamp region. Some coals and associated tuffs (e.g. liparitic Mangus Tuff) can be recognized over several 1000 km2))

Schurmann, H.M.E. (1923)- Uber die Neogene Geosynclinale von Sud-Sumatra und das Erstehen der Braunkohle. Geol. Rundschau 14, 3, p. 239-252.
(online at: https://www.digizeitschriften.de/dms/img/?PID=GDZPPN000458651)
('On the Neogene syncline of S Sumatra and the development of lignite'. German presentation summary of 1922 Dutch paper. Does not believe in presence of nappes in Indonesia (Sumatra, Timor, Seram))

Sefein, K.J., T.X. Nguyen & R.P. Philp (2017)- Organic geochemical and paleoenvironmental characterization of the Brown Shale Formation, Kiliran sub-basin, Central Sumatra Basin, Indonesia. Organic Geochem. 112, p. 137-157.
(Late Eocene?- E Oligocene lacustrine Brown Shale Fm of Pematang Group samped in Karbindo coal mine in Kiliran graben on W side of C Sumatra basin. Organic matter primarily from lacustrine organisms with minor terrestrial plant input. 4-Methylsterane concentrations and n-alkane distributions indicate non-marine dinoflagellates and Botryococcus braunii likely significant parts of local biosphere)

Setiadi, D.J., Hendarmawan, E. Sunardi, E.A. Sentani & J. Hutabarat (2017)- Miocene planktonic foraminiferal biozonation for South Sumatra Basin, Indonesia. J. Geol. Sciences Applied Geology (UNPAD) 2, 3, p. 89-99.
(online at: http://jurnal.unpad.ac.id/gsag/article/view/15615/7344)
(General discussion of standard planktonic foram zonation (nothing on how applied to S Sumatra; HvG))

Setiadi, I., B. Setyanta & B.S. Widijono (2010)- Delineasi cekungan sedimen Sumatra Selatan berdasarkan analisis data. J. Sumber Daya Geologi 20, 2, p. 93-106.
(online at: www.bgl.esdm.go.id/publication/index.php/dir/article_detail/322)
(Delineation of 10 sub-basins in S Sumatra basin, using gravity data. 2D modeling suggests basement in S Sumatra is metamorphic rock)

Setiawan, A., S. Rakimi, R. Wisnu Y., R. Siregar, M.R. Anwar, Hendarman & A. Sodli (2013)- Fractured Basement plays in Southern Bentu Block, Central Sumatera. Proc. 37th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA13-G-047, p. 1-13.
(On potential of fractured basement play in S Bentu area, C Sumatra basin. Part of Mutus basement terrane)

Setiawan, A., R. Siregar, D. Arief, S. Rakimi, A. Sodli, R. Wisnu Y & Hendarman (2014)- Integration of seismic attribute and sedimentation concept for paleogeographic and sand distribution modeling in Seng-Segat Field, Bentu Block, Central Sumatra Basin. Proc. 38th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA14-G-205, 14p.
(Seng-Segat Field in Bentu area Block in S Bengkalis Trough, C Sumatra. Bentu area known for biogenic gas production from Late Miocene- E Pliocene Binio Fm. Sand distribution maps for B-5 and B-6 primary gas reservoirs in Seng-Segat Field area (600-2500' depth), deposited in transitional coastal environment)

Setiawan, H., P.S. Widiantoro, Hendarman & M. Primaryanta (2012)- Success story with low resistivity sand in an exploration block, western edge of Central Sumatran Basin. Proc. 36th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA12-G-095, p. 1-8.
(Three exploration wells at W edge C Sumatra Basin tested 3000 BOPD of 44°API oil in E Miocene Lower Sihapas Fm sandstones. Low resistivity (6-8 Ohm m). Resistivity of Sihapas oil sands lower than older U Pematang water sands, probably result of clay minerals in dispersed and laminated shale)

Setiawan, H., S. Yusmananto, I.M. Gunawan & Hendarman (2013)- Sedimentology and diagenesis of estuarine deposits Sihapas Formation, Western Central Sumatran Basin, Indonesia. Proc. 37th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA13-G-027, p. 1-11.

Setyaningsih, C.A. (2013)- Palynological study of the Pematang Formation of the Aman Trough, Central Sumatra Basin. Lemigas Scientific Contr. Oil and Gas 36, 3, p. 131-144.

Setyaningsih, C.A., E.B. Lelono & Firdaus (2015)- Palynological study of the Jambi sub-basin, South Sumatra. Lemigas Scientific Contr. Oil and Gas 38, 1, p. 1-12.
(online at: www.lemigas.esdm.go.id/publikasi/read/scientific/1/)
(Outcrop samples from Talang Akar and younger formations at Merangin River, Muara Jernih and Mengupeh areas show E-M Miocene ages. Top M Miocene age identified by pollen Florschuetzia levipoli and F. meridionalis, whilst base of E Miocene marked by appearance of nannoplankton Sphenolithus compactus)

Setyobudi, E.B. (1982)- Batupasir Binio; lapisan pengandung gas dangkal di lapangan minyak Merbau (Riau). Proc. 11th Ann. Conv. Indon. Assoc. Geol. (IAGI), Jakarta, p. 145-154.
('Binio sandstone, a shallow gas reservoir in the Merbau oil field'. M-L Miocene gas sands above Telisa Fm in C Sumatra basin)

Setyobudi, E.B. & Solichin (1996)- Study of oil migration and remigration in the Southern Kampar Block, Central Sumatra. Proc. 25th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 1-14.
(Small Paleogene Binio sub-graben between Lirik and Binio Fields likely source kitchen for Binio, Pekan and Lirik Trend Fields. Sub-graben part of larger Bengkalis Trough. Major oil generation between ~10-8 Ma, when Binio- Lirik Trend structures not yet formed. Hydrocarbons filled nearby paleo-structures, until Plio-Pleistocene inversion tectonics caused spillage to present-day traps. Remaining exploration potential in subtle folds in migration and remigration pathways)

Setyobudi, P.T., W.H. Bambang, A. Banu, W.N. Krisputranto, N. Hadi & B. Sudaryo (2011)- Karakteristik dan sebaran lateral reservoir batuan dasar granitis dari data sumur pemboran dan seismik 3-D pada lapangan PT, subcekungan Jambi, Cekungan Sumatra Selatan. Majalah Geologi Indonesia 26, 2, p. 113-130.
(online at: www.bgl.esdm.go.id/publication/index.php/dir/article_detail/767)
('Characteristics and lateral distribution of granitic Basement reservoir from well and 3-D seismic data, in PT Field, Jambi sub-basin, S Sumatra Basin'. Fractured and weathered granite of Late Eocene(?) age have hydrocarbon reservoir potential. Core porosities 11.8% - 20.7%, permeability 1.2- 46 mD. Best oil DST in fractured granite in PTD-2 well is 1044 BPOD, best oil/ gas DST's in PT-2 928 BPOD and 0.712 MMCFGPD. Granite wash lower neutron porosity (16-18 npu), flowing oil at 23.8 BOD at WPT-2)

Setyobudi, P.T. & B.W. Handono (2012)- Petrografi dan karakteristik reservoir granit Eosen pada sub-cekungan Jambi, cekungan Sumatra Selatan. Proc. 41st Ann. Conv. Indon. Assoc. Geol. (IAGI), Yogyakarta, 2012-E-14, 5p.
(Petrography and characteristics of Eocene granite reservoir (34.30 ± 0.9 Ma) in Jambi Basin (N part of S Sumatra basin). Main minerals quartz 21-32%, K-feldspar 18- 41% and plagioclase 0-19%, biotite 0-6%, etc.. Dissolution and fracture porosity 1.2-19% and horizontal permeability 0.001-122 mD)

Setyowiyoto, J. (1998)- Sedimentology of the Lower Sihapas Formation identified on conventional core data, Bengkalis Trough. Proc. 27th Ann. Conv. Indon. Assoc. Geol. (IAGI), 2 (Sed. Pal. Strat.), Yogyakarta, p. 146-158.
(Core from U Oligocene- Lower Miocene Lower Sihapas Fm in MSA wells, Bengkalis Trough, Malacca Straits/C Sumatra. Six shallow marine and shoreline lithofacies)

Shaw, J.H., S.C. Hook & E.P. Sitohanh (1997)- Extensional fault-bend folding and synrift deposition: an example from the Central Sumatra Basin, Indonesia. American Assoc. Petrol. Geol. (AAPG) Bull. 81, 3, p. 367-379.
(Geometry and structural history of Paleogene half-grabens in C Sumatra)

Siemers, C.T. & R.A. Lorentz (1992)- Sedimentological/petrological analysis of reservoir units within the fluvial/estuarine/marine depositional complex of the Talang Akar Formation (Oligocene), Bentayan Field, South Sumatra, Indonesia. AAPG Int. Conf., Sydney 1992, Search and Discovery Art. 91015. *(Abstract only)*

(Bantayan field NW trending anticlinal structure on NE flank of S Sumatra basin.1932 discovery in upper Talang Akar sandstones. Up to 12 potentially productive sandstone units. Six main fluvial- shallow marine reservoir intervals, of variable quality. Stacked fluvial channel braidplain deposits are only ones with good reservoir potential; channel-fills tend to merge into well-connected braidplain type reservoir system)

Sijabat, H., T. Usman, Aliftama, H. Indrajaya, D. Susanti, M. Wahyudin & Sugiri (2016)- Petroleum geochemistry of Pre-Tertiary sediment, North Sumatra Basin. Proc. GEOSEA XIV and 45th Ann. Conv. Indon. Assoc. Geologists (IAGI) (GIC 2016), Bandung, p. 439-442.
(Geochemistry of five outcrop samples of shale near Kutacane, along Alas River, Aceh. With Jurassic-Cretaceous nannoplankton, but mapped as Paleozoic on Medan geologic map). TOC 0.29-0.57%, vitrinite reflectance 2.1-2.4% (overmature), gas prone source)

Siregar, B.S.A., Y.A. Nagarani, S.H. Sinaga & K.P. Laya (2008)- Paleogeographic and paleoenvironment reconstruction of Tertiary Leman coal-bearing formation, Bengkulu Basin. Proc. 37th Ann. Conv. Indon. Assoc. Geol. (IAGI), Bandung, 1, p. 399-409.
(M Miocene coal-bearing Lemau Fm in Bengkulu Fore-Arc Basin. Lower Lemau Fm sapropelic coals (durite dominated) forming lenses and thin beds in massive claystone. Upper Lemau Fm humic coals with thicker seams (>2m and significant lateral extent; dominated by vitrites and klarites; marshes on coastal plain). Paleogeographic reconstruction shows rapid shoreline progradation)

Sitompul, N., Rudiyanto, A. Wirawan & Y. Zaim (1992)- Effects of sea level drops during Late Early Miocene to the reservoirs in South Palembang sub Basin, South Sumatra, Indonesia. Proc. 21st Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 309-324.
(Late Early Miocene sea level drops form sequence boundaries in late N6 and late N7. SB in Late N6 in Lower Talang Akar Fm, forming thick sand bodies which could be reservoirs. Late N7 sea level drop produced secondary porosity for carbonate reservoirs)

Situmeang & P.R. Davies (1986)- A geochemical study of Asameraôs Block óAô Production Sharing Contract, North Sumatra Basin. Proc. 15th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, p. 321-340.
(N Sumatra Block "A" with 11 commercial oil fields, which produced over 100 MBO, and one non-commercial gas field at Alur Siwah. In E part of block kerogen characterized by abundant land-derived organic material, while marine sapropelic organic matter increases to W, suggesting influx of land- derived organic matter from eastern land mass in area of Malacca Straits. Oils from Keutapang and Seureula Fm reservoirs of six different fields typically non-waxy, paraffinic, with 49- 59°API gravities. Oils have common origin, probably fine grained marine sediments of M-L Miocene Baong Fm)

Situmeang, S.P., C.W. Zeliff & R.A. Lorents (1992)- Characterization of low relief carbonate banks, Baturaja Formation, Ramba A and B pools, South Sumatra, Indonesia. In: C.T. Siemers et al. (eds.) Carbonate rocks and reservoirs of Indonesia: a core workshop. Indonesian Petroleum Assoc. (IPA), Jakarta, p. 8.1-8.10.
(Ramba Field produced 60 MBO oi1 1982-1992 from A and B pools, separated by paleochannel. Best reservoir rocks coral-rich packstones- wackestones, with 16-18% porosity)

Situmorang, B. & B. Yulihanto (1985)- The role of strike slip faulting in structural development of the North Sumatra Basin. Proc. 14th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 21-38.
(N Sumatra Basin development controlled by strike slip faulting. Several major N-S trending strike slip faults mainly with dextral movements formed in present back-arc region and arranged in en echelon pattern. Since then and until M Miocene, basin characterized by normal faulting. This episode corresponds to change in Indian Ocean spreading direction from N-S in E Paleogene to NE-SW. Convergence highly oblique in Late Miocene, producing compressive deformation and uplift. Compressional structures continuously affected sedimentary cover in Plio-Pleistocene due to strike slip faulting along Sumatran Fault system)

Situmorang, B., B. Yulihanto, A. Guntur, R. Himawan & G. J. Jacob (1991)- Structural development of the Ombilin basin, West Sumatra. Proc. 20st Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, p. 1-15.

Situmorang, B., B. Yulihanto, S. Sofyan, J. F. Collins, R. Barton et al. (1994)- Geology of the petroliferous North Sumatra Basin. Indon. Petroleum Assoc. Post Convention Field Trip, October 1994, p. 1-127.
(Guidebook of 4-day fieldtrip to outcrops and oilfields of N Sumatra, traverse across NE Aceh, Arun gas field and Lake Toba area)

Sjahbuddin, E. & R. Djaafar (1993)- Hydrocarbon source rock characteristics and the implications for hydrocarbon maturation in the North Sumatra Basin. Proc. 22nd Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 509-532.
(Crude oils from Rantau, Aru and Langkat-Medan blocks very light condensates from source in reducing environment. Some difference in level of maturity)

Skeels, D.D. & G.W. Cooper (1985)- North Sumatra, including centenary visit to Telaga Said Field. Guidebook 14th Ann. Conv. Indon. Petroleum Assoc. (IPA), Post Convention Fieldtrip, p. 1-10, 27-108.

Smit Sibinga, G.L. (1932)- The Tertiary virgations on Java and Sumatra, their relation and origin. Proc. Kon. Nederl. Akademie Wetenschappen, Amsterdam, 35, 4, p. 584-593.
(online at: www.dwc.knaw.nl/DL/publications/PU00016261.pdf
(On young anticlinal trends of Sumatra and Java. On Sumatra remarkable divergence of Barisan fold axes to E and disappearing under Neogene basins, causing narrowing of Barisan Mts from N to S. Similar trend on Java, but less pronounced)

Smit Sibinga, G.L. (1949)- Pleistocene eustasy and glacial chronology in Java and Sumatra. Verhandelingen Nederl. Geologisch-Mijnbouwkundig Genootschap, Geol. Serie 15, p. 1-31.
(On the effect of Pleistocene sea level fluctuations on shorelines on Java, river terraces on Sumatra, etc.)

Smit Sibinga, G.L. (1951)- On the origin and age of the peneplain of Palembang (Sumatra). Geologie en Mijnbouw 13, 1, p. 1-11.
(online at: https://drive.google.com/file/d/0B7j8bPm9Cse0N1JjaTJKSVFYSW8/view)
(On drainage system, fluvial terraces, etc., in SE Sumatra. High fluvial terrace tied to eustatic sea level rise during last interglacial ingression)

Smit-Sibinga, G.L. (1952)- Interference of glacial eustasy with crustal movements and rhytmic sedimentation in Java and Sumatra. Geologie en Mijnbouw 14, 6, p. 220-225.
(online at: https://drive.google.com/file/d/0B7j8bPm9Cse0S2czQkxZN3B5cE0/view)
(Rebuttal of Rutten (1952- Geosynclinal subsidence versus glacially controlled movements in Java and Sumatra) critique of Smit Sibinga (1949) paper. Repeats conclusion that Pleistocene eustatic sea level changes do interfere with large scale sedimentation trends)

Soeparjadi, R.A. (1982)- Geology of the Arun gas field. In: Offshore South East Asia Conference, Singapore 1982, Proc. Southeast Asia Petrol. Expl. Soc. (SEAPEX) 6, p. 1163-1171.
(Same as Soeparjadi (1983) paper below)

Soeparjadi, R.A. (1983)- Geology of the Arun Gas Field. J. Petroleum Technology 35, 6, p. 1163-1172.
(Arun gas field discovered in 1971 in Mobil Bee Block in Aceh, N Sumatra, W of Lho Sukon, 225 km NW of Medan. Condensate-rich gas in E-M Miocene reefal carbonates, locally >305m thick. Carbonates on large N-S trending paleotopographic high. Trap mainly stratigraphic, porous reef facies capped by M-U Miocene Lower Baong Fm shales. Structure size ~18.5x 5.0 km. Abnormally high P (7100 psig= 49 MPa) and T (178° C) at 10,000'. Pay thickness averages ~152m. In place reserves 16.2 TCF)

Soeryowibowo, M., T.L. Heidrick & E.G. Frost (1999)- Structural development of the Eo-Oligocene Tapung half-graben, Central Sumatra, Indonesia. Proc. 27th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, p. 127-143.
(Tapung half-graben of C Sumatra 25 km x 8 km. SW of giant Minas Field and viewed as S terminus of N-S-trending Aman rift system. En echelon array of NNW-SSE striking border faults. Detachment of border fault

<6.5 km, consistent with thickness of syn-depositional section (max. 1500 m) and β factor <12%. Development of Tapung half-graben similar to other C Sumatra half-grabens, with oblique extension commencing in Late Eocene and ceasing by Late Oligocene)

Somantri, M. (2000)- Distribution of gamma-ray values and sulphur contents in relation with depositional environment of the coals in Bayunglincir coal area, South Sumatera. Proc. 29th Ann. Conv. Indon. Assoc. Geol. (IAGI), 1, p. 155-176.

Sosromihardjo, S.P.C. (1988)- Structural analysis of the North Sumatra Basin- with emphasis on Synthetic Aperture Radar data. Proc. 17th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 187-209.

Sosrowidjojo, I.B. (1996)- Bicadinanes and related compounds as maturity indicators for oils and sediments. Organic Geochem. 24, p. 43-55.
(SSumatra oils abundant oleananes, high pristane/phytane ratio, bicadinanes and other terpenoids of higher-plant origin. Abundance of biomarkers of terrestrial origin suggest deltaic or nearshore source rock facies)

Sosrowidjojo, I.B. (2006)- Coalbed methane potential in the South Palembang Basin. Proc. Jakarta 2006 Int. Geosc. Conf. Exhib., Indon. Petroleum Assoc. (IPA), 06-CH-05, 5p.

Sosrowidjojo, I.B. (2007)- Ongoing Coalbed Methane (CBM) development in the South Sumatra Basin. Lemigas Scientific Contr. 29, 3, p. 15-24.

Sosrowidjojo, I.B. (2013)- Coal geochemistry of the unconventional Muara Enim coalbed reservoir, South Sumatra Basin: a case study from the Rambutan field. Indonesian Mining J. 16, 2, p. 71-78.
(online at: http://jurnal.tekmira.esdm.go.id/index.php/imj/article/view/425/290)
(Muaraenim coalbeds in Rambutan Field, S Sumatra, high vitrinitic coal (up to 83% huminite), making it target for CBM development. High sub-bituminous rank (Ro<0.5%), high moisture content (up to 21%). Minerals <5%, mostly iron sulfide. Cleat fillings dominated by kaolinite. Rambutan wells 3 main coal seams with thickness ~9-14m, between depths ~480-950m, Ro 0.3- <0.5%. Apparent high degree of undersaturation)

Sosrowidjojo, I.B., R. Alexander & R.I. Kagi (1994)- The biomarker composition of some crude oils from Sumatra. Organic Geochem. 21, p. 303-312.
(Crude oils from N, C and S Sumatra basins analysed for biomarkers. Three types: (1) N Sumatra marine carbonate depositional setting (2) C Sumatra waxy crudes from brackish- lacustrine, and (3) light oil from N Sumatra and two oils from S Sumatra from deltaic/ nearshore depositional setting)

Sosrowidjojo, I.B & F.X. Widiarto (1997)- Temuan baru minyak bumi marin karbonat di Cekungan Sumatera Selatan: suatu kajian awal eksplorasi minyak bumi di sistem karbonat. Proc. 26th Ann. Conv. Indon. Assoc. Geol. (IAGI), Jakarta, Hydrocarbons, p. 50-57.
('New findings of marine carbonate oil in the South Sumatran Basin: an initial assessment of petroleum exploration in carbonate systems'. Condensate sample from BK-1 well, Bungur High, Musi Platform, strong resemblance to oils generated from marine carbonate source rock, incl. 30 norhopanes biomarker)

Sosrowidjojo, I.B. & A. Saghafi (2009)- Development of the first coal seam gas exploration program in Indonesia: reservoir properties of the Muaraenim Formation, South Sumatra. Int. J. Coal Geology 79, p. 145-156.
(Late Miocene Muaraenim Fm thick, low rank coals (lignite to sub-bituminous) in twelve named horizons. Believed most prospective for CBM production in Indonesia. Five exploration wells in Rambutan Gas field to ~1000m depth. Five major coal seams between 450-1000 m. Coals vitrinite-rich (>75%). Gas contents in samples up to 5.8m3/t, mainly methane (CH_4 80-93%, CO_2 6 -19%). Gas released into production well richer in CH_4 (94-98%). Suitable gas recovery parameters for three of five coal seams with total thickness of >30 m)

Sosrowidjojo, I.B., B. Setiardja, Zakaria, P.G. Kralert, R. Alexander & R.I. Kagi (1994)- A new geochemical method for assessing the maturity of petroleum: application to the South Sumatra Basin. Proc. 23rd Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 439-455.
(Assessing maturity of petroleum and source rocks using vitrinite reflectance and conventional biomarker data can be problematic when source rocks subjected to rapid heating and contain abundant land plant remains or when crude oil has been biodegraded. New maturity indicator based upon reactions of cadalene proposed)

Stephenson, B., S A Ghazali & H. Widjaja (1982)- Regional geochemical atlas series, 1. Northern Sumatera. Overseas Division, Inst. Geol. Sciences, UK, and Directorate Mineral Resources, Bandung, p. 1-80. *(Unpublished?)*

Streiff, A. (1877)- Over petroleum van de afdeeling Lematang Ilir, Res. Palembang. Natuurkundig Tijdschrift Nederlandsch-Indie 37, p. 238-240.
('On petroleum of the Lematang Ilir department, Palembang residency'. Brief, early description of two S Sumatra oil seeps (Minyak Linggi) in area subsequently explored by 'Muara Enim Petroleum Co' which became part of Royal Dutch/ Shell)

Suandhi, P.A., M. Rozalli, W. Utomo, A. Budiman & A. Bachtiar (2012)- Paleogene sediment character of Mountain Front Central Sumatera Basin. Proc. 41st Ann. Conv. Indon. Assoc. Geol. (IAGI), Yogyakarta, 2012-SS-30, 9p.
(Paleogene sediments of Barisan Mountain Front of C Sumatra Basin 240-900m thick fluvial-deltaic syn-rift sediments and ranging in age from M Eocene- Late Oligocene. Volcanism in area suggested by volcanic material as lithic material and bentonite layers)

Suandhi, P.A., M. Rozalli, W. Utomo, A. Budiman & A. Bachtiar (2013)- Paleogene sediment character of Mountain Front Central Sumatra Basin. J. Geologi Indonesia 8, 3, p. 143-149.
(online at: http://ijog.bgl.esdm.go.id/index.php/IJOG/article/view/164/164)
(Same paper as Suandhi et al. (2012) above)

Subastedjo, M.T. & Sukarsono (1983)- Penyelidikan geologi untuk perencanaan tambang batubara dengan contoh kasus perencanaan tambang batubara Muara Tiga, Bukit Asam Sumatra Selatan. Proc. 12th Ann. Conv. Indon. Assoc. Geol. (IAGI), p. 209-213.
('Geological investigation for coal mine planning, with example of Muara Tiga mine, Bukit Asam, S Sumatra')

Subiyanto (2003)- Pola penyebaran kualitas batubara dan rencana pemboran eksplorasi di daerah Bukit Kendi, Tanjung Enim, Sumatera Selatan. J. Geologi Sumberdaya Mineral 13, 140, p. 30-60.
('Pattern of coal quality distrubution and exploration drilling plan in the Bukit Kendi area, Tanjung Enim, South Sumatra'. Muara Enim Fm Late Miocene- Pliocene coal in Bukut Kendi area, 12 km S of Bukit Asam coal mines. Folded in NW-SE anticlines. Coal rank increased by basaltic andesite intrusions)

Subiyanto & H. Panggabean (2003)- Batuan terobosan dan pengaruhnya terhadap pematang batubara di daerah Bukit Kendi, Tanjung Enim, Sumatra Selatan. J. Geologi Sumberdaya Mineral 13, 134, p. 18-50.
('Intrusive rocks and and their influence on coal seams in the Bukit Kendi area, Tanjung Enim, S Sumatra'. Mining concession 12 km S of Bukit Asam with coal seams A, B, C and Gantung 1-12 in Late Miocene- Pliocene Muara Enim Fm. Coal-bearing formation intruded by sill of basaltic pyroxene andesite of ~1000°C.)

Subiyanto & H. Panggabean (2004)- Karakteristik pematangan dan peningkatan mutu batubara di daerah Bukit Asam, Muara Enim, Sumatera selatan. J. Sumber Daya Geologi 14, 1, 1, p. 37-54.
(On the enhancement of Muara Enim Fm coal quality by igneous intrusions in Bukit Asam area, S Sumatra)

Subiyantoro, G. (1998)- The application of sequence stratigraphy as a guidance for reactivating observation well to be producer well in Minas field, PT Caltex Pacific Indonesia. Proc. 27th Ann. Conv. Indon. Assoc. Geol. (IAGI), 2 (Sed. Pal. Strat.), Yogyakarta, p. 91-105.
(Sequence stratigraphic interpretations and correlatios in reservoir interval of Minas Field, C Sumatra)

Subroto, E.A., R. Alexander, U. Pranyoto & R.I. Kagi (1992)- The use of 30-norhopanes series, a. novel carbonate biomarker in source rock to crude oil correlation in the North Sumatra Basin, Indonesia. Proc. 21st Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 145-163.
(N Sumatra oils two groups: shaly and coaly, with distinct biomarker distributions. 30-norhopanes carbonate biomarkers proposed recently. Three types of source rocks in N Sumatra Basin: shale, carbonaceous shale and calcareous shale. Recognition of three source types can only be observed using hopane distribution. Crude oil of coaly shale type not found during this study)

Sudarsana, A. & E. Maulana (2000)- Factors affecting productivity in a shallow shoreface sandstone reservoir: a case study from the Rebonjaro Field, South Sumatra Basin. Proc. 29th Ann. Conv. Indon. Assoc. Geol. (IAGI), Bandung, 1, p. 55-69.
(Oil productivity of very shallow A sand near top of M Miocene Lower Palembang Fm in 1929 field is better in cross-bedded facies than in bioturbated facies)

Sudewo, B., A.R Suhendan & S. Chacko (1987)- Physical properties of carbonate reservoirs in South Sumatra. Proc. 16th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 363-383.
(Early Miocene Baturaja Lst in S Sumatra Basin significant oil- gas accumulation. Porosity varies widely between tight platform facies and porous reefal facies. Seismic data may provide indirect evidence of porosity. Increasing trend of acoustic impedance with depth correlated with decrease in porosity, indicative of compaction of limestones)

Sufiati, E. & Purnamaningsih (1994)- Kandungan flora diatomae Formasi Samosir di Pulau Samosir, Sumatera Utara. Geol. Res. Dev. Centre (GRDC), Bandung, Spec. Publ. 15, p. 101-117.
('Composition of diatomaceous flora in the Samosir Formation, Samosir Island, North Sumatra')

Suhendan, A.R. (1984)- Middle Neogene depositional environments in Rambutan area, South Sumatra. Proc. 13th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta,1, p. 63-73.
(Miocene of Rambutan area, SW part of S Sumatra basin. Rambutan field oil in M Miocene Lower Palembang Fm clastics)

Sukanta, U., M.M. Djamaludin, H, Semimbar, Yarmanto, B.S. Simanjuntak, G. Subiyantoro, Mulyadi & Pujiarko (2002)- Depositional environment and paleogeography of Miocene siliciclastic-rich outcrops in the northwest corner of the Central Sumatra basin. Proc. 31st Ann. Conv. Indon. Assoc. Geol. (IAGI), Surabaya, 2, p. 701-710.
(Sand-rich outcrops of Miocene age outcrop in NW corner of C Sumatra basin. Few 100m thick, correlated to Sihapas Group. No figures? and no supporting biostrat control?)

Sukanta, U., Yarmanto, D. Kadar, H. Semimbar & D.A. Firminsyah (2008)- Current interpretation of regional stratigraphy of Late Oligocene- Miocene Sihapas Group in the Central Sumatra Basin. In: Sumatra stratigraphy workshop, Duri (Riau) 2005, Indon. Assoc. Geol. (IAGI), p. 81-82. *(Abstract only)*
(Summary of sequence stratigraphic study of C Sumatra Late Oligocene- E Miocene Sihapas Group. Five lithostratigraphic units (old to young: Menggala, Bangko, Bekasap, Duri and Telisa Fms.). Seven basin-wide sequence boundaries (SB 25.5, 22, 21, 17.5, 16.5, 15.5 and 13.8 Ma), bounding six 3rd order sequences. Younger sands mainly developed in N, NE and E of basin and Telisa shale best developed to W and SW, suggesting sand sourced dominantly from N and NE, from Thailand-Malaysian Highs)

Sukanta, U., Yarmanto, A. Susianto & H. Semimbar (2008)- Syn-rift stratigraphy and sedimentation of Eocene-Oligocene Pematang Group, Central Sumatra Basin. In: Sumatra stratigraphy workshop, Duri (Riau) 2005, Indon. Assoc. Geol. (IAGI), p. 65-79.
(C Sumatra Eocene-Oligocene synrift continental deposits known as Pematang Group. Three units: Lower Red Bed (alluvial fan- fan delta; up to 1000m thick in Dalam depocenter), Brown Shale (up to 600m thick; lacustrine shales, also coal beds) and Upper Red Bed (braided stream, flood plain with paleosols. Pematang Group generally poor quality reservoirs. No documentation of ages))

Sukardjo (1989)- Tertiary depositional environments with emphasis on Sawahlunto coal distribution and quality in Waringin-Sugar area of the Ombilin Basin, West Sumatra, Indonesia. Thesis, University of Wollongong, p. 1-69. *(Unpublished)*

Suklis, J., A. Ames & E. Michael (2004)- CO2 in South Sumatra- observations and prediction. In: R.A. Noble et al. (eds.) Proc. Deepwater and Frontier Exploration in Asia and Australasia Symposium, Jakarta, Indon. Petroleum Assoc. (IPA), p. 269-278.
(Large quantities of gas found in S Sumatra since early 1990's. Along with hydrocarbon gas, high % of CO2. CO2 data suggest mixing from organic and inorganic CO2 sources. Higher concentrations consistent with reservoir temperatures and isotope values expected from carbonate dissociation or magmatic sources. No simple model for high CO2 (>40%) gases in low T reservoirs)

Sukmono, S. (2007)- Application of multi-attribute analysis in mapping lithology and porosity in the Pematang-Sihapas groups of Central Sumatra Basin, Indonesia. The Leading Edge 26, p. 126-131.
(On sand body prediction from seismic attributes in Eo-Oligocene of C Sumatra basin)

Sukmono, S., D. Noeradi, F. Fitris, Tafsillison, W.C. Richmond, Seffibudianti & Pujiyono (2003)- Integrated seismic multi-attribute analysis for complex fluvio-deltaic reservoir properties mapping, Minas Field, Central Sumatra. Proc. 29th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 1-23.
(Minas field 1942 discovery, reservoirs complex fluvio-deltaic depositional system. 3D seismic used to differentiate sands from shales Five main oil-producing reservoirs. Few specific conclusions)

Sukmono, Sigit, M.T. Zen, L. Hendrajaya, W.G.A. Kadir, D. Santoso & J. Dubois (1997)- Fractal pattern of the Sumatra Fault seismicity and its possible application to earthquake prediction. Bull. Seismol. Soc. America 87, 6, p. 1685-1690.
(Similar to Sukmono et al. 1995, 1996)

Sukmono, Sigit, M.T. Zen, W.G.A. Kadir, L. Hendrajaya & D. Santoso (1995)- Geometry and fractal characteristics of the Sumatra active fault. Proc. 24th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 201-214.
(NW-SE trending Sumatra Fault zone 1650km long and composed of 11 segments. Six fractal discontinuities from changes of fractal dimensions and gravity anomaly patterns. Variations suggest Sumatra mainland not rigid, but segmented into several blocks. N-S to NNE-SSW-oriented discontinuities correspond to major structural breaks in Sumatra fore-arc. Segmentation may also explain discrepancy between displacement and velocity of Andaman Sea opening, Sumatra fault motion and Sunda Strait opening)

Sukmono, Sigit, M.T. Zen, W.G.A. Kadir, L. Hendrajaya, D. Santoso & J. Dubois (1996)- Fractal geometry of the Sumatra active fault system and its geodynamical implications. J. Geodynamics 22, 1-2, p. 1-9.
(Similar to Sukmono et al. (1995))

Sukodri, K. & H. Hatuwe (1982)- Evaluasi kandungan minyak: batasan parameter petrofisika dalam formasi Keutapang dan Baong, Sumatra Utara. Geologi Indonesia (IAGI) 9, 2, p. 58-70.

Sulistyo, A., K. Kelsch, V. Noguera, T. Heidrick, M. Djamaludin, A. Linawati et al. (1999)- Integrated reservoir characterization of the Kulin Field- Central Sumatra. Proc. 27th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, p. 105-125.
(Kulin oil field 1970 discovery 135 km NW of Pekanbaru. Original oil in place (OOIP) ~500 MBO, but low recovery (13% after 25 years of production) due to high oil viscosity (20° API) and heterogeneous reservoir. Main reservoir in E Miocene deltaic Duri Fm. Detailed reservoir model lead to better understanding of complex compartmentalization of stratigraphy)

Sulitra, M.D. (1989)- The recognition and mapping of tight zones in the Arun reservoir, Sumatra: a synergistic effort. Proc. 18th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 91-120.

Sumardi, D. & Hertono R.P. (1990)- Kajian komposisi abu dan unsur kimia batubara Ombilin serta lingkungan geokimia pembentukan batubara. Proc. 19th Ann. Conv. Indon. Assoc. Geol. (IAGI), Bandung, 1, p. 242-263.
('Study of Ombilin coal ash composition and chemical factors with geochemical environment of coal formation')

Sumotarto, U. (2014)- Structural and stratigraphic hydrocarbon traps in Bandar Jaya field, South Sumatra. Bull. Ilmiah Mineral dan Energi (MINDAGI; Trisakti) 7, 1, p. 1-8.
(Six hydrocarbon exploration wells in Bandar Jaya, Lampung, SE-most Sumatra, but no discoveries. Examples of seismic lines in area of generally shallow basement (< 1 sec TWT), with rel. small, N-S trending half-grabens with up to ~2000m of Tertiary sediment. No maps (author probably means Bandar Jaya area, not field; JTvG))

Sunardi, E. (2015)- The lithofacies association of Brown Shales in Kiliran Jao subbasin, West Sumatra Indonesia. Indonesian J. Geoscience 2, 2, p. 77-90.
(online at: http://ijog.bgl.esdm.go.id/index.php/IJOG/article/view/211/193)
(Lithology and sequences of Brown Shale Unit of Eo-Oligocene Pematang Gp at Karbindo Coal Mine, Kiliran Jao Subbasin, Ombilin Basin. Lower part consists of coal and evaporitic limestone facies, deposited in marginal lacustrine area. In upper part shales and sandstones deposited in shallow to deep lacustrine environments. High content of reworked organic matter, common turbiditic structures, gastropod, and bivalves)

Sunaryo, A.C. (1994)- NSO ñAò Field: a new geological model, incorporating results of an integrated study of 3D seismic analysis and geologic well data. In: 10th Offshore SE Asia Conf., Singapore 1994, p. 223-237.
(Mobil NSO A 1972 offshore N Sumatra gas discovery in M Miocene Malacca Limestone carbonate buildup Carbonate total thickness ~950'; 415' gas column in discovery well)

Sunaryo, A.C. & A.H. Djamil (1990)- Development of Arun East flank, onshore North Sumatra. Proc. 19th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 2, p. 517-546.

Sunaryo, A.C., R. Widjanarko, F.W. Musgrove, R. Kristanto & D.G. Ward (1998)- Development of the South Lho Sukon reef fields by horizontal wells. Proc. 26th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 17-33.
(South Lho Sukon A and D field produce gas from M Miocene Peutu Lst buildups. Reefal carbonates caused permeability substantial lateral variation, indicating preservation of original reef fabrics)

Suryanto, U. & N. Said (1991)- The Sihapas porosity and hydrocarbon distribution pattern in the Pematang and Bekasap Fields, Central Sumatera. Proc. 20th Ann. Conv. Indon. Assoc. Geol. (IAGI), Jakarta, p. 40-58.
(Porosity/ permaebility trends in E Miocene Sihapas Fm deltaic sandstone reservoirs in Pematang (1959) and Bekasap (1955) fields W of Duri)

Suryanto, U. & W.A. Wycherly (1984)- A high resolution seismic stratigraphy study, Central Sumatra Basin Indonesia. Proc. 13th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 281-300.
(Caltex seismic stratigraphy study of Duri sands near Bangko field, Bima 1 well)

Susanto, E., H. Priadi & P. Pathak (2008)- NSO gas field simulation and production optimization. Proc. 32nd Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA08-E-124, 18p.
(Reservoir model of 1972 NSO gas discovery, 100km off N Sumatra. Producing since 1999. 415' gas column in E-M Miocene Malacca Lst reefal buildup. Area ~7 x 10km, OGIP 2.7 TCF gas. NSO gas ~32.5% CO2 and 1.5% H2S)

Suseno, P.H., Zakaria, N. Mujahidin & E.A. Subroto (1992)- Contribution of Lahat Formation as hydrocarbon source rock in South Palembang Area, South Sumatera, Indonesia. Proc. 21st Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 325-337.
(Lahat or Lemat Fm mainly coarse volcanic rocks, but in some areas also claystone/ shale, like Benakat Shale. Such sediments organic-rich and in oil window. Mixed Type II- III kerogens may yield oil and gas. Biomarkers suggest Lahat and Talang Akar source rocks are identical)

Susianto, A., E.S. Utoro & S. Grahia (2006)- Oligocene- Early Miocene paleogeography models South Balam Trough, Central Sumatra Basin. Proc. 35th Ann. Conv. Indon. Assoc. Geol. (IAGI), Pekanbaru 2006, PITIAGI2006-053, 16p.
(S Balam Trough one of most prolific petroleum systems in C Sumatra Basin. Paleogeographic maps made for three chronostratigraphic intervals. In Oligocene syn-rift time half grabens created with lake deposits in center (Pematang Brown Shale), bordered by fan deltas. Late Oligocene map of early post-rift phase illustrates Pematang Upper Red Bed formation deposition. In late post-rift Early Miocene more shallow marine influence, with fluvial and deltaic deposition (Menggala Fm))

Susilawati, R. (2004)- Minerals and inorganic matter in coals of the Bukit Asam coalfield, South Sumatra Basin, Indonesia. M.Sc. Thesis, University of New South Wales, Australia, p. 1-224. *(Unpublished)*

Susilawati, R. & C.R. Ward (2006)- Metamorphism of mineral matter in coal from the Bukit Asam deposit, South Sumatra, Indonesia. Int. J. Coal Geology 68, p. 171-195.
(Miocene coal of Bukit Asam in S Sumatra mostly sub-bituminous, consistent with regional burial. Effects of Plio-Pleistocene igneous intrusions produced coal with vitrinite reflectance up to 4.17% (anthracite). Unmetamorphosed coals contain well-ordered kaolinite and quartz. Heat-affected coals, with Rv >1.0%, dominated by interstratified illite/smectite, poorly crystallized kaolinite and paragonite)

Susilo, A., B.S. Widjiono & B. Setyanta (1999)- Gravity expression on the North end of the Bengkalis Trough. In: H. Darman & F.H. Sidi (eds.) Tectonics and sedimentation of Indonesia, FOSI-IAGI-ITB Regional Seminar to commemorate 50th anniversary of Van Bemmelen's Geology of Indonesia, Bandung 1999, p. 40-42.
(N-S trending Bengkalis Trough in C Sumatra Basin 20-30km wide and 100km long. With low positive gravity anomalies, suggestive of deeper basement/ thicker sediment, flanked by higher gravity values)

Susilowati, T. & Suyoto (2009)- Model fasies karbonat Formasi Baturaja, lapangan Danendra, Cekungan Sumatra Selatan. J. Ilmiah Magister Teknik Geologi (UPN) 2, 1, 12p.
(online at: http://jurnal.upnyk.ac.id/index.php/mtg/article/view/179/141)
('Carbonate facies model of the Baturaja Formation, Danendra Field, S Sumatra Basin'. Baturaja Fm oil-gas bearing E Miocene isolated reefal builups. In 'Danedra Field' (not real name; JTvG) on Musi Platform five cycles. Moldic and vuggy porosity formed by dissolution in vadose environment)

Suta, I.N. (2003)- Reservoir characterization of a lower Talang Akar reservoir, Northeast (NE) Betara Field, Jabung Sub-Basin, South Sumatra, Indonesia. M.Sc. Thesis, University of Oklahoma, p. 1-74. *(Unpublished)*

Suta, I.N. (2016)- Jabung Block exploration through time: discoveries and challenges. Proc. IPA 2016 Technical Symposium, Indonesia exploration: where from- where to, Indon. Petroleum Assoc. (IPA), Jakarta, 46-TS-16, p. 1-10.
(Exploration history of Jabung Block in Jambi subbasin of S Sumatra basin. CO2 content of gas major challenge)

Suta, I.N. & B.T. Utomo (2006)- An example of integrated characterization for reservoir development and exploration: Northeast Betara field, Jabung Subbasin, South Sumatra, Indonesia. In: R.M. Slatt (ed.) Handbook of petroleum exploration and production, Elsevier, 6, Chapter 12, p. 423-472.
(NE Betara Field in Jambi (N) part of South Sumatra basin is 1995 discovery, downdip of 1971 Betara-1 well. Fault-bounded sandstone reservoirs in Oligocene Talang Akar Fm. Reservoirs lower braided river facies and upper meandering river facies, separated by areally extensive floodplain/marine shale. Better reservoir quality in meandering river sandstones)

Suta, I.N., B.T. Utomo, R.M. Slatt & M. Burnett (2006)- Integrated characterization for development of the Northeast Betara Field, South Sumatra Basin, Indonesia. In: R.M.Slatt et al. (eds.) Proc. 26th Ann. GCSSEPM Foundation Bob F. Perkins Research Conf., Reservoir characterization: integrating technology and business practices, p. 271-317.

(NE Betara Field in N part of S Sumatra basin is 1995 discovery, downdip of Betara-1. Fault-bounded reservoir in Oligocene Talang Akar Fm. Reservoir lower braided river facies and upper meandering river facies, separated by extensive floodplain/marine shale. Better reservoir quality in meandering river sandstones)

Suta, I.N. & Lu Xiaoguang (2005)- Complex stratigraphic and structural evolution of the Jabung Subbasin and its hydrocarbon accumulation: case study from Lower Talang Akar reservoir, South Sumatra basin, Indonesia. Proc. Int. Petrol. Techn. (IPT) Conf., Doha 2005, IPTC 10094, 9p.
(Combined stratigraphic and young inversion structural traps in Oligocene Lower Talang Akar Fm of Betara field complex in N part of S Sumatra basin)

Sutarwan, A.H. (1995)- Petrographical and chemical properties of coals from the Southern Peranap deposit Central Sumatra Basin, Indonesia. M.Sc. Thesis University of Wollongong, p. 1-280.
(online at: http://ro.uow.edu.au/theses/2833/)
(S Peranap coalfield in C Sumatra Basin, with 8 coal seams in Late Miocene-Pliocene Korinci Fm. Vitrinite is dominant (91%., mostly telovitrinite 43% and detrovitrinite 40%; minor gelovitrinite). Coals of brown coal rank with mean maximum vitrinite reflectances (Rmax) of 0.28-0.30%. Coals developed from ombrogenous mires in fluvial floodplain environment. Hydrogen-rich, low sulfur and nitrogen)

Sutiana, F.X. Widiarto, I. Siregar & S.M. Ulibasa (1994)- Analisis biomarker beberapa perconto Formasi Sangkarewang dan Formasi Sawahlunto di cekungan Ombilin. Proc. 23rd Ann. Conv. Indon. Assoc. Geol. (IAGI), Jakarta, 2, p. 1097-1106.
('Biomarker analysis of some samples of the Sangkarewang and Sawahlunto Formations in the Ombilin basin')

Sutriyono, E., E.W.D. Hastuti & B.K. Susilo (2016)- Geochemical assessment of Late Paleogene synrift source rocks in the South Sumatra Basin. Int. J. Geomate (Japan) 11, 23, p. 2208-2215.
(online at: http://geomatejournal.com/sites/default/files/articles/2208-2215-1141-Sutriono-July-2016.pdf)
(Geochemistry of outcropping shales in U Oligocene Talang Akar Fm at Lengkayap and Napalan rivers, Garba Mts, S Sumatra basin.Low-moderate TOC's. Vitrinite reflectance indicates immature- early mature for oil)

Suwardi, S. & R. Koswara (2012)- Muara Enim coal characteristics based on petrographic study; selected sites in Darmo area, Tanjung Enim. Proc. 41st Ann. Conv. Indon. Assoc. Geol. (IAGI), Yogyakarta, 2012-E-04, 1p. *(Abstract only)*
(Coals of Mio-Pliocene Muaraenim Fm in PTBA coalfield, Tanjung Enim area, S Sumatra, mainly consist of vitrinite (telocollinite, desmocollinite, corpocollinite), less inertinite (semifusinite, sclerotinite, inertodetrinite) and minor exinite (sporinite, cutinite, resinite, suberinite, and alginate). Vitrinite reflectance 0.43-0.45% (sub-bituminous). Also minor clay minerals, pyrite, and carbonate. Coal deposited in wet forest swamp zone influenced by anoxic zone and marine incursion).

Suwarna, N. (2004)- Relation of organic facies to paleoenvironmental deposition; case study in the 'Papanbetupang-Kasiro coal measures', South Sumatra. J. Sumber Daya Geologi, 14, 2 (146), p. 61-74.
(Organic petrography of Oligo-Miocene coals in fluvial-lacustrine intra-montane basins of C Sumatra.)

Suwarna, N. (2004)- Sulphide mineral (pyrite) as a paleoenvironmental indicator of the Eo-Oligocene Keruh coal in the Kuansing Regency, Riau Province. J. Sumber Daya Geologi, 14, 2 (146), p. 84-92.
(Eo-Oligocene coal of in 300m thick Keruh coal measures along E flank of Barisan Range, 45km WNW of Taluk Kuantan and W of Petai in N Kuansing subbasin at SW margin of C Sumatra Basin. Four regressive cycles preceding coal accumulation, each starting with marine and brackish conditions, overlying Permo-Carboniferous Kuantan Fm metamorphics and meta-limestone. With 1.4-21.6% pyrite; highest values associated with marine incursions.)

Suwarna, N. (2004)- Maceral composition and rank of Kasiro coals: implications for hydrocarbon generation. J. Sumber Daya Geologi 14, 2 (146), p. 114-126.
(On Early Miocene Kasiro coals from Kasiro-Sarolangun area of S Sumatra with vitrinite-A reflectance 0.75-0.95% (vitrinite-B slightly lower), suggesting maturation level in oil window)

Suwarna, N. (2006)- Source-rock organic geochemistry and petrography of the Eo-Oligocene Kasiro Formation, in the intramountain Papanbetupang Basin, Southern Sumatera. Proc. Jakarta 2006 Int. Geosc. Conf. Exhib., Indon. Petroleum Assoc. (IPA), Jakarta, 06-PG-25, 3p. *(Abstract only)*
(Papanbetupang Sub-basin in Asai-Rawas region of Jambi and S Sumatera Provinces. Meta-sediments of E-M Jurassic Asai Fm and Jurassic-Cretaceous Peneta Fm and Jurassic Mersip limestone form basement. Coals and organic rich mudstones/oil shales of Eo-Oligocene Kasiro Fm good to excellent source potential. Oil shale-bearing formations deposited in WNW- ESE grabens or half-grabens)

Suwarna, N., M. Iqbal, H. Hermiyanto & R. Koswara (2015)- Organic petrographic and geochemical characteristics of Eo- Oligocene Kasiro shales, Southern Sumatra, Indonesia. In: Hydrocarbons in the tropics, Abstracts 32nd Ann. Mtg. Soc. Organic Petrology, Yogyakarta 2015, p. 132-133. *(Extended Abstract)*
(Late Eocene- E Oligocene lacustrine oil shales of Kasiro Fm from Sekeladi Village, Jambi, with high TOC (0.72- 16.1%) and kerogen mainly Type II. Good-excellent oil potential. Thermal maturity late immature- early mature; some samples mature- post mature (Rv 0.22- 0.63%, mainly 0.41%))

Suwarna, N., Y. Kusumahbrata & H. Panggabean (2004)- Shale-gas potential of Tertiary oil shale-bearing Formation in Central Sumatera. J. Sumber Daya Geologi 14, 2 (146), p. 102-113.
(Highest possibilty of shale-gas generation in Eo-Oligocene Keruh (Kuansing sub-basin, Late Eocene), Kiliran and Sangkarewang(Ombilin Basin), Lakat (Tigapuluh Mts; M-L Oligocene) and Kelesa Formations, in C Sumatra region)

Suwarna, N., E. Susanto & H. Panggabean (2003)- Coal petrology and coal seam formation within the Makarya coalfield, a selected area in the Kuantan-Singingi region, Riau. In: Proc. Kolokium Energi dan Sumber Daya Mineral 2003, Puslitbang Teknologi Mineral dan Batubara, Bandung, p. 345-352.
(Eo-Oligocene coal in Keruh Fm, 60km W of Taluk and W of Petai, Riau Province, SW corner of C Sumatra Basin)

Syafri, Chairul (1997)- Geochemical evaluation of the oils and source rocks of the South Palembang Sub-Basin, South Sumatra, Indonesia. M.S. Thesis University of Texas at Dallas, p.

Syafrin, K. Novian (1995)- Deposition of middle Baong Sandstone as post-rift incised valley sequence, Aru onshore area, North Sumatra. Proc. 24th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 131-145.
(Basal Tortonian/ zone N14 Middle Baong Sst interpreted as incised valley system)

Syafrin, K. Novian, Erwinsyah & H. Harun (2008)- Stratigrafi zona dalam di daerah Gunung Kemala, Prabumulih: suatu perspektif baru pada penegasan stratigrafi Paleogen Cekungan Sumatra Selatan. In: Sumatra stratigraphy workshop, Duri (Riau) 2005, Indon. Assoc. Geol. (IAGI), p. 127-141.
('Stratigraphy of the 'Zona Dalam' in Gunung Kemala area, Prabumulih'. Pertamina 1997 Tapus Field with 25 oil-gas horizons in 950m of syn-rift and post-rift deposits. Subsequent deeper wells in old fields Gunung Kemala and Talang Jimar also successful ?)

Syaifudin, M., E.A. Subroto, Dardji Noeradi & A.H.P.Kesumajana (2015)- Character and correlation study of source rocks and oils in Kuang Area, South Sumatera Basin: the potential of Lemat Formation as hydrocarbon source rocks. Proc. 39th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA15-G-034, 9p.
(Kuang area in SE part of Sumatra Basin with three oil fields: Air Serdang, Mandala, and Kuang. Crude oils in area most probably derived from terrestrial source in Lemat and Talangakar Fms in Tanjung Miring Subbasin)

Syaifudin, M. & B. Triwibowo (2002)- Application of the correction vitrinite refectance model in Central Sumatra Basin. Proc. 31st Ann. Conv. Indon. Assoc. Geol. (IAGI), Surabaya, 1, p. 1-28.
(Vitrinite reflance commonly used hydrocarbon maturity parameter. Proven technique for coal samples, but often suppressed in source rocks, especially when rich in hydrogen (e.g. in Brown Shale of C Sumatra))

Syaiful, M. (1999)- Coal exploration in Mampun Pandan Area, Jambi, Sumatera. Proc. 28th Ann. Conv. Indon. Assoc. Geol. (IAGI), Jakarta, 2, p. 301-312.
(Coal exploration in Mampun Pandan area in Jambi sub-basin, S Sumatra, close to W edge of Tigapuluh Mts. Late Oligocene- E Miocene Talang Akar-equivalent rocks with four coal seams in Claystone-coal unit, 4.5-11m thick, and two 4m thick seams in underlying Conglomeratic Sst unit. High Volatile Bituminous A-C grade)

Syaiful, M., D.G. Siahaan, L.M. Hutasoit, A.M. Ramdhan, A.H. Widayat & I.Y.Tribuana (2014)- Shifting of compaction trend in the North Sumatra Basin and its implication to overpressure estimation in the North Sumatra Basin. Proc. 38th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA14-G-358, 16p.

Syam, B., A. Aayuba, H.N. Saputra & T. Fitriano (2010)- Application of surface geochemistry for hydrocarbon detection case study: Panen Field, Jabung Block, South Sumatra. Proc. 34th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA10-G-034, 10p.
(On gas anomalies from surface geochemistry sampling in Jabung Block, S Sumatra)

Syarifuddin, I.Y. & P. Ariyanto (2018)- Tectono-stratigraphy of Block A area, North Sumatra Basin: the impact of local tectonics and eustasy to accommodation space of the Tertiary interval. Proc. 42nd Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA18-586-G, 16p.
(Review of N Sumatra basin. Major subsidence during Paleogene rifting and M Miocene- Recent syn-tectonic episodes, separated by period of tectonic quiescence in E-M Miocene. Very high rate of subsidence (N9-N11), likely related to activation of Barisan Mts uplift, with active thrusting along Barisan front)

Syukri, I.Y., B. Permana, M. Ginanjar, M. Firdaus & S. Windyarsih (2018)- Identifying new potential in a mature field: a mixed siliciclastic carbonate K-Limestone reservoir characterization in Supat Field, South Sumatra Basin. Proc. 42nd Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA18-330-G, 28p.
(Supat Field in Corridor Block discovered in 1984 (Asamera), producing since 1988. Rel. thin latest Oligocene-earliest Miocene 'K-Limestone' at top of Talang Akar Fm along basin margin. Low-porosity sandy limestone with oil shows)

Syukri, I.Y., B. Permana, I. Rahmawan & I.B. Sinaga (2017)- An integrated subsurface study for evaluating potential in Teluk Rendah Field, South Jambi 'B' PSC, South Sumatera Basin. Proc. 41st Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA17-121-G, 25p.
(Study of Teluk Rendah Field, discovered in 1991 in NW corner of S Jambi "B" Block, S Sumatera Basin. Produced gas-condensate from 2004 to 2012 from fluvial Lower Pendopo Fm (= Talang AkarFm?) sandstones in young faulted anticline. Sands sourced from NE)

Tampubolon, R.A., S.A. Diria, H. Purba, A. Basundara & J. Trivianty (2017)- Kajian tektonik dan sedimentasi di Cekungan Sumatera Utara dan impikasinya untuk potensi gas serpih. Lembaran Publikasi Minyak dan Gas Bumi (Lemigas) 51, 2, p. 107-113.
(?online at: http://www.journal.lemigas.esdm.go.id/ojs/index.php/LPMGB/article/view/22)
('Evaluation of tectonics and sedimentation in North Sumatra and its implication to shale gas potential'.)

Tampubolon, R.A., T. Ozza, M.T. Arifin, A.S. Hidayatillah, A. Prasetio & T. Furqan (2017)- A review of regional geology of the North Sumatra Basin and its Paleogene petroleum system. Berita Sedimentologi (Indon. Sediment. Forum, FOSI- IAGI) 37, p. 23-29.
(online at: www.iagi.or.id/fosi/files/2017/03/BS37-03032017.pdf)

Tamtomo, B. & E. Artono (1998)- Reservoar Pra-Tersier sebagai peluang eksplorasi Abad 21 studi kasus di daerah Beringin, Cekungan Sumatera Selatan. Proc. 27th Ann. Conv. Indon. Assoc. Geol. (IAGI), Yogyakarta, 1, p. 106-116.
('Pre-Tertiary reservoirs as exploration play; Abad 21 case study in the Beringin region, S Sumatra basin')

Tamtomo, B., I. Yuswar & E. Widianto (1997)- Transgressive Talang Akar sands of the Kuang area, South Sumatra basin; origin, distribution and implication for exploration play concept. In: J.V.C. Howes & R.A. Noble (eds.) Proc. Conf. Petroleum systems of SE Asia and Australasia, Indon. Petroleum Assoc., p. 699-708.
(Kuang area distribution of Talang Akar reservoirs controlled by basement highs, and stratigraphic traps form as onlaps along flanks of highs. Lower Talang Akar productive in Beringin Field, Upper Talang Akar produces in Air Serdang Field)

Tangkalalo, D. & M.F. Ma'ruf (1993)- Eksploitasi hidrokarbon pada endapan turbid lapisan BRS struktur PTB lapangan Pangkalan Susu. Proc. 22nd Ann. Conv. Indon. Assoc. Geol. (IAGI), Bandung, 2, p. 794-802.
('Hydrocarbon exploitation in bedded turbidite deposits, BRS structure, Pangkalan Susu field', N Sumatra. Besitang River sand in M Miocene Middle Baong Fm turbiditic deposits)

Tangkalalo, D., M.F. Ma'ruf & A. Sudiono (1997)- Gas reservoir delineation of Pantai Pakam Timur field, North Sumatera - Indonesia. Proc. Soc. Petrol. Engineers (SPE) Ann. Tech. Conf., San Antonio 1997, p. 507-520.
(Same as paper below)

Tangkalalo, D., M.F. Ma'ruf, A. Sudiono & Widjiono (1998)- Gas reservoir delineation of Pantai Pakam Timur Field, North Sumatra, Indonesia. In: C.A. Caughey & J.V.C. Howes (eds.) Proc. Conf. Gas habitats of SE Asia and Australasia, Jakarta 1998, Indon. Petroleum Assoc. (IPA), p. 123-133.
(Seismic amplitude anomaly in rel. shallow (~1250m) Lower Keutapang Fm sandstone unit used to delineate gas reservoir. Sediment sourced from SW. Not much geology)

Tangkalalo, D. & A.A.P. Reddy (1994)- Preliminary study of hydrocarbon potential in old oil wells of Pulau Panjang Field, North Sumatra. Proc. 23rd Ann. Conv. Indon. Assoc. Geol. (IAGI), Jakarta, 2, p. 1107-1117.
(Pulau Panjang field in Aru region of N Sumatra basin 1928 BPM discovery on NW-SE trending anticline. 65 wells drilled between 1928-1941. Production from Late Miocene Keutapang Fm deltaic sandstones. Re-evalution of old shut-in oil wells suggests varying degrees of depletion of reservoirs. Recompletion can result in economically viable production)

Tarazona, C., J.S. Miharwatiman, A. Anita, & C. Caughey (1999)- Redevelopment of Puyuh oil field (South Sumatra): a seismic success story. Proc. 27th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, p. 65-82.
(1993 Puyuh oil discovery in small domal closure in ?Oligocene Upper Lemat Sst in NE part of Corridor PSC. Puyuh-1 tested 625 BOPD from 1582-1600 m)

Tarigan, Z.L. & R.T. Silaen (2013)- Dolomite diagenesis of Tampur Formation along Tampur River, Southeast Aceh. Proc. 37th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA13-SG-066, p. 1-9.
(Diagenesis of limestone outcrop samples along Tampur River, N Sumatra, includes dolomitization and fracturing. Tampur Fm generally assigned to Eocene- E Oligocene (but no biostrat support for this age ever published and thin sections published here do not show traditional Eocene limestone forams?; JTvG))

Tarsis A.D. (2005)- Inventarisasi bitumen padat dengan metoda "outcrop drilling" di daerah Petai Kabupaten Kuantan Singingi Provinsi Riau. Kolokium Hasil Lapangan- DIM, 2005, p. 30.1- 30.10.
(online at: http://psdg.bgl.esdm.go.id/kolokium/Batubara/30.%20Pros_petai_No.9.pdf)
(Evaluation of bituminous shale ('bitumen padat') deposits in 'Lower Telisa Fm' of the Petai area, Kuantan Singingi regency, SW part of C Sumatra basin)

Taufiqurrahman, F. Bahesti, F.J. Situngkir, A.F. Kabisat, A.E. Putra & M. Wahyudin (2014)- Belumai Formation facies mapping using seismic paleomorphology and seismic attributes in the offshore North Sumatera. Proc. 38th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA14-G-107, 6p.
(Seismic facies mapping of Lower Miocene Belumai Fm sandstones, offshore N Sumatera Basin)

Terres, R.R. & Soejanto (1995)- Central Sumatra prospect evaluation, structural and stratigraphic fluid barriers and hydrodynamic systems as indicated by wireline formation pressures. Proc. 24th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 19-32.
(Wireline formation pressure determinations from >350 C Sumatra wells. Analyses of depleted pressure anomalies allowed evaluation of structural and stratigraphic barriers to fluid flow. Several major faults have significant pressure anomalies. Sealing potential of faults from greatest to least sealing potential: NW-trending reverse faults, N-trending strike-slip faults and NE-trending normal faults. Stratigraphic barriers to fluid flow observed locally and regionally. Two major aquifer systems, Petani and Sihapas. Pematang Brown Shale Formation aquifer includes isolated sandstones with highly variable, normal to super-normal pressures)

Thamrin, H.M. (1985)- Studi pendahuluan prospek batubara di lapangan Benuang Sumatra Selatan. Proc. 14th Ann. Conv. Indon. Assoc. Geol. (IAGI), p. 223-231.
('Preliminary study of coal prospects in the Benuang field, S Sumatra')

Thesly, H.D., D.S. Asra, E.I. Gartika, T. Febriwan & J.J. Wood (2010)- Integrated geology and reservoir study in determining hydrocarbon reserves in Pangkal field, South Sumatra. Proc. 39th Conv. Indon. Assoc. Geol. (IAGI), Lombok, PIT-IAGI-2010-170, 8p.
(Reserves study of Pangkal field in Palembang High area, S Sumatra basin, NE of Kaji Semoga field (= Medco Langkap field). Discovered in 1987; 35 wells drilled; current production 1400 BOPD from 14 wells. Reservoir Talang Akar Fm stacked fluvial channel sandstones with 15-21% porosity. OOIP of field is 24 MMBO, EUR 7 MMBO, cumulative oil production 5 MMBO)

'T Hoen, C.W.A. (1922)- Verslag over het onderzoek der Tertiaire petroleumterreinen ter Oostkust van Atjeh (terrein Atjeh II). Jaarboek Mijnwezen Nederlandsch-Indie 48 (1919), Verhandelingen 1, p. 163-229.
('Investigation of the Tertiary petroleum terrains of the East coast of Aceh (terrain Aceh II), N Sumatra'. Incl. presence of 'Tampoer Limestone' along Tampur River, at base of Tertiary section and probably of Pretertiary age))

'T Hoen, C.W.A. (1932)- Oliesporen in het Oembilin kolenveld. De Mijningenieur 13, p. 194.
('Oil traces in the Ombilin coal field'. Exploration well penetrated coal between 190-208m and another thin (20cm) coal at 272m. At 283m a 4m thick oil-stained sandstone from which few liters of oil were obtained)

Thomas, L.P. (2005)- Fuel resources: coals. In: A.J. Barber, M.J. Crow & J.S. Milsom (eds.) Sumatra- geology, resources and tectonic evolution, Geol. Soc., London, Mem. 31, p. 142-146.
(Brief overview of coal distribution in N, C and S Sumatra. Producing mines only in Central Sumatra (Ombilin; Eocene-Oligocene), S Sumatra (Late Miocene- Pliocene) and Bengkulu (Miocene) basins)

Tian, X., X. Wang, X. Lu, S. Bi, G. Fang, J. Huang, L. Hong & C. Zheng (2012)- Control of synsedimentary faulting on deposition in the back-arc rift basin of Ripah oilfield in Jabung region, South Sumatra basin, Indonesia. J. Chengdu University of Technology 39, 4, p. 395-402.
(In Chinese with English summary. Study of effect of synsedimentary faults on deposition in Ripah oilfield in back-arc basin of S Sumatra. Synsedimentary faults characterized by episodic activity and displayed in echelon in map view. Target beds in area dominated by delta plain subfacies)

Tiwar, S. & J. Taruno P.H. (1980)- The Tanjung (South Kalimantan) and Sei Teras fields (South Sumatra): a case history of petroleum in Pre-Tertiary basement. Proc. 16th Sess. CCOP, Bandung 1979, p. 238-249.
(Part of oil production in Stanvac NE Teras field, S Sumatra basin, is from Pre-Tertiary weathered and fractured volcanics and volcanoclastics. Cumulative production since 1977 about 15,000 BO)

Tobing, R.L. (2007)- Potensi kandungan minyak dalam bitumen padat, daerah Padanglawas, Sumatra Barat. Bul. Sumber Daya Geologi 2, 1, 18p.
(online at: www.bgl.esdm.go.id/publication/index.php/dir/article_detail/547)

('Potential oil content in tight bitumen, Padanglawas area, West Sumatra'. Oil shale deposit in synclinal structure of U Telisa Fm (M Miocene), at W side of C Sumatra Basin. Oil shale with TOC 3.1- 14.8%. Classified as sapropelic oil shale, with dominant component alginite. Deposited in lacustrine environment)

Tobing, R.L. (2011)- Karakteristik conto batuan serpih minyak Formasi Sangkawerang, di daerah Sawahlunto-Sumatera Barat berdasarkan geokimia organik. Bul. Sumber Daya Geologi 6, 1, p.
(online at: www.bgl.esdm.go.id/publication/index.php/dir/article_detail/566)
('Characteristics of oil shale samples of Sangkawerang Fm in the Sawahlunto area, W Sumatra, based on organic geochemistry'. Organic content in Sangkarewang Fm oil shale 0.11-5.1%. Derived from algae and higher plants, deposited in lake environment. Kerogen Type II and Type III, early mature)

Tobing, R.L. (2016)- Kematangan termal dan estimasi kandungan minyak endapan serpih Formasi Sinamar di daerah Dusun Panjang, Provinsi Jambi. Bul. Sumber Daya Geologi 11, 2, p. 93-101.
(online at: http://buletinsdg.geologi.esdm.go.id/index.php/bsdg/issue/archive)
('Thermal maturity and estimation of shale oil content of the Sinamar Fm in the Dusun Panjang area, Jambi Province'. Oligocene Sinamar Fm shales ~10- >25m thick in outcrop in W part of Jambi basin. Organic content up to 17% , dominated by Types I and II kerogen. Liptinite and vitrinite up to 10%, inertinite up to 0.49%. Immature to overmature. May produce 5- 90 liter oil/ ton shale, giving oil resource of ~69,535,298 barrels(!))

Tobler, A. (1913)- Korte beschrijving der petroleum terreinen gelegen in het zuidoostelijk deel der residentie Djambi (Sumatra). Jaarboek Mijnwezen Nederlandsch Oost-Indie 40 (1911), Verhandelingen, p. 12-28.
('Brief description of the petroleum terrains in the SE part of the Jambi Residency, Sumatra'. Detailed mapping of surface anticlines. Numerous oil-gas seeps)

Tobler, A. (1918)- Korte beschrijving van het petroleum gebied van Midden-, Noordwest en Noord-Beneden-Djambi. Jaarboek Mijnwezen Nederlandsch Oost-Indie 45 (1916), Verhandelingen II, p. 141-201.
('Brief description of the petroleum areas of Central, NW and North Lower Jambi', C. Sumatra. Not-so-brief overview of stratigraphy and descriptions of 26 anticlinal structures. With 1:200k scale geologic map and 1:25,000 scale maps of 20 anticlinal structures)

Toha, B., K. Aulia & H. Primadi (1999)- High resolution sequence stratigraphy of the Minas oil field: a key reference for reservoir management and EOR oil field development. Proc. 28th Ann. Conv. Indon. Assoc. Geol. (IAGI), Jakarta, p. 167-182.

Tromp, H. (1918)- De Lematang-kolenvelden. Weekblad voor Indie 24, 22 Sept. 1918, p. 279-287.
('The Lematang coal fields'. Popular magazine article on S Sumatra Miocene coals)

Tromp, H. (1919)- De wetenschappelijke en technisch-economische beteekenis der Lematang-kolenvelden. De Ingenieur 40, p. 721-734, 41, p. 747-752 and 43, p. 767-774.
('The scientific and technical-economic significance of the Lematang coalfields'. In three parts)

Utomo, W., D. Hendro H.N., K. Simanjutak, A. Krisyunianto & A. Bachtiar (2011)- Characteristic of Pematang facies at Rantauberangin and surrounding area, Riau Province. Proc. 36th HAGI and 40th IAGI Ann. Conv., Makassar, JCM2011-466, 10p.
(Late Eocene- Oligocene Pematang Fm in C Sumatra may contain reservoir rocks. Five Pematang facies identified: braided channel, meandering channel, paleosol- braided river, gravity flow (low energy), and debris flow-alluvial fan (high energy) facies. Braided channel facies good reservoir quality, debris flow facies poor. Deposition in semi-enclosed valleys bounded by normal fault creating alluvial fans, some of which poured into deep lakes, with braided and meandering rivers in other end of valley)

Utoyo, H. (2007)- K/Ar dating of Bukit Asam and Bukit Kendu intrusions related to age of maturity and increasing of coal quality in Tanjung Enim area, South Sumatera. Proc. Joint Conv. 32nd HAGI, 36th IAGI and 29th IATMI, Bali 2007, JCB2007-112, p. 704-713.

(Coal in Muara Enim Fm in Tanjung Enim District, S Sumatera, increases in maturity and quality towards Bukit Asam and Bukit Kendi intrusions. K/Ar analysis shows Bukit Asam age is 0.92 ± 0.26 Ma and Bukit Kendi is 1.15 ± 0.29 Ma. Increase in maturity and quality of coal took place in last 1.15 Myrs. Bukit Serilo probably younger)

Utoyo, H. & Subiyanto (2002)- Batuan terobosan di daerah Bukit Kendi, Sumatera Selatan, kaitannya dengan pematangan dan peningkatan mutu batubara. Proc. 31st Ann. Conv. Indon. Assoc. Geol. (IAGI), Surabaya, 1, p. 103-137.
('Intrusive rocks in the Bukit Kendi area, South Sumatra, related to maturation and improved quality of coal'. Intrusives of Bukit Kendi and Bukit Cepadang and associated sills in Tanjung Enim area generated hydrothermal temperatures of ~230°C, causinglocal improved thermal maturation of Late Miocene- Pliocene Muara Enim Fm coals)

Van Dijk, P. (1860)- Ontginbare kolenlagen in de ommelanden van Benkoelen. Natuurkundig Tijdschrift Nederlandsch-Indie 22, p. 181-217.
(online at: www.biodiversitylibrary.org/item/48386#page/203/mode/1up)
('Exploitable coal beds in the surroundings of Bengkulu'. Early survey of Miocene coals at Bukit Sunur, Duson Baru, etc., in Bengkulu area, SW Sumatra. Quality of coal comparable to SE Kalimantan coal and some localities attractive for exploitation)

Van Dijk, P. (1864)- Bijdragen tot de geologische en mineralogische kennis van Ned. Indie, XXVI. Zwartkolen in en nabij de Baai van Tapanoeli. Natuurkundig Tijdschrift Nederlandsch-Indie 26, 1, p. 41-63.
('Black coal in and near the Bay of Tapanuli', Sumatra. Same paper as Van Dijk 1875. With two maps)

Van Dijk, P. (1864)- Bijdragen tot de geologische en mineralogische kennis van Ned. Indie, XXVII. Koperaders in de Padangsche Bovenlanden. Natuurkundig Tijdschrift Nederl.Indie 27, p. 87-109.
('Copper veins in the Padang Highlands'. Investigations in the canyon of Paningahan (low-Cu in veins in chlorite shale) and in the ore district of the Sibumbun-Djanten (multiple veins with malachite, etc.)

Van Dijk, P. (1864)- Bruinkool van Ketaoen in Moko-Moko, Benkoelen. Natuurkundig Tijdschrift Nederl.Indie 27, p. 259-264.
(online at: www.biodiversitylibrary.org/item/48499#page/793/mode/thumb
('Lignite of Ketaun in Moko-Moko, Bengkulu', SW Sumatra. With small sketch map)

Van Dijk, P. (1875)- Ontginbare kolenlagen in de ommelanden van Benkoelen. Jaarboek Mijnwezen Nederlandsch Oost-Indie 4 (1875), 2, Verhandelingen, p. 97-120.
('Exploitable coal beds in the surroundings of Bengkulu'. Same paper as Van Dijk 1860)

Van Dijk, P. (1875)- Zwartkolen in en nabij de Baai van Tapanoeli. Jaarboek Mijnwezen Nederlandsch Oost-Indie 1875, 2, p. 121-157.
('Black coal in and near the Bay of Tapanuli', Sumatra. Same paper as Van Dijk 1864)

Van Gorsel, J.T. (1988)- Geological fieldtrip to South Sumatra and Bengkulu, October 28-31, 1988. Indon. Petroleum Assoc. (IPA), Jakarta, p. 1-42.
(Guidebook for geology along E-W transect of S Sumatra, from Palembang to Bengkulu)

Van Heurn, F.C. (1923)- Studien betreffende den bodem van Sumatra's Oostkust, zijn uiterlijk en zijn ontstaan. J.H. de Bussy, Amsterdam, p. 1-121.
('Studies on the soil of Sumatra's East coast, its appearance and origin'. With discussion of geologic context of soils of NE Sumatra. With simple map showing boundary between 'high-red soils' and 'low-white soils')

Van Schelle, C.J. (1876)- Mededeeling over het voorkomen van aardolie bij het dorp Kollok, Padangsche Bovenlanden. Jaarboek Mijnwezen Nederlandsch Oost-Indie 5 (1876), 1, p. 188-189.

('Note on the petroleum occurrence near the village of Kollok, Padang Highlands'. Early report of small oil seep along footpath from Kollok to Telaweh, near Soengei Doerian coal field in Ombilin Basin, W Sumatra)

Van Schelle, C.J. (1877)- Mededeeling over het voorkomen van koollagen in het beekje Katjang-Pai, Padangsche Bovenlanden. Jaarboek Mijnwezen Nederlandsch Oost-Indie 6 (1877), 1, p. 241-244.
('Note on the occurrence of coal beds in the Kacang-Pai creek, Padang Highlands', W Sumatra)

Van Tets, G.V., P.V. Rich & H.R. Marino (1989)- A reappraisal of *Protoplotus beauforti* from the Early Tertiary of Sumatera on the basis of a new Pelecaniform family. Geol. Res. Dev. Centre (GRDC), Bandung, Seri Paleontologi 5, p. 57-75.
(Suggest Eocene water bird fossil initially described by Lambrecht 1931 from lacustrine shales of Ombilin basin should be placed in new pelicaniform family, Protoplotidae)

Vendrell-Roc, J. (2009)- Prospectivity of the offshore North Sumatra Basin and the southern part of the Andaman Sea. Proc. 2009 SE Asia Petroleum Expl. Soc. (SEAPEX) Conference, Singapore, p. 1-29. *(Abstract + Presentation)*

Verbeek, R.D.M. (1875)- Over den ouderdom der steenkolen van het Oembilien kolenveld in de Padangsche Bovenlanden en van de sedimentaire van Sumatra in het algemeen. Jaarboek Mijnwezen Nederlandsch Oost-Indie 4 (1875), 1, p. 135-146.
('On the age of coal of the Ombilin coal field in the Padang Highlands and of the sediments of Sumatra in general')

Verbeek, R.D.M. (1875)- Het Oembilin kolenveld in de Padangsche Bovenlanden, Sumatra's Westkust. Jaarboek Mijnwezen Nederlandsch Oost-Indie 4 (1875), 2, p. 3-84.
('Sumatra's West coast- Report 3. The Ombilin coal field in the Padang Highlands'. Descriptions of three main coal fields at Ombilin (Parambahan in N, Sigaloet in C, Soengei Doerian in S), with 1:10,000 scale 'geognostic map' in 8 sheets. Coal beds first discovered by De Greve in 1868. Eocene coal outcrops in mountainous terrain. Oldest rocks in area granites and Permian limestones with rounded fusulinids)

Verbeek, R.D.M. (1875)- Over de beste ontginningswijze van een gedeelte van het Oembilien kolenveld. Jaarboek Mijnwezen Nederlandsch Oost-Indie 4 (1875), 2, p. 85-95.
('On the best way to exploit a part of the Ombilin coal field')

Verbeek, R.D.M. (1877)- Kolen bij Indrapoera, Sumatra's Westkust. Jaarboek Mijnwezen Nederlandsch Oost-Indie 6 (1877), 1, p. 345-350.
('Coal near Indrapura, Sumatra's West coast')

Verbeek, R.D.M. (1877)- Over een onderzoek naar kolen aan de rivier Sepoeti, Lampongsche Districten, Sumatra's Zuidkust. Jaarboek Mijnwezen Nederlandsch Oost-Indie 6 (1877), 2, p. 176-179.
('Investigation of coals along the Seputi River, Lampung districts, S Sumatra')

Verbeek, R.D.M., O. Boettger & K. von Fritsch (1880)- Die Tertiarformationen von Sumatra und ihre Thierreste, I Theil. Geologische Skizze der Sedimentformationen des Niederlandisch-Indischen Archipels, etc.. Palaeontographica Suppl. 3, 8-9, p. 3-120. *(also in Jaarboek Mijnwezen Ned. Oost-Indie 1881, 2, p. 3-210)*
('The Tertiary formations of Sumatra and its animal fossils, vol. 1, Geological overview of the sediment formations of the Netherlands Indies Archipelago'. Introduction on Tertiary geology of Sumatra by Verbeek, followed by series of papers on Eocene and younger molluscs from Sumatra by Boettger: 'Die Conchylien der Untereocaen-Schichten von West Sumatra', 'Die Conchylien des sumatranischen Krebsmergels', 'Die Conchylien des sumatranischen Orbitoidenkalks', 'Die fossilen Mollusken von Batoe Radja am Fluss Ogan, Residenz Palembang, Sud-Sumatra', 'Die Conchylien der unteren Miocanschichten vom Flusse Kamoemoe, Residentschaft Benkoelen in Sud-Sumatra')

Verbeek, R.D.M., O. Boettger & K. von Fritsch (1883)- Die Tertiarformation von Sumatra und ihre Thierreste, II Theil. Palaeontographica Suppl. 3, 10-11, p. 1-148.
('The Tertiary formations of Sumatra and its animal fossils, vol. 2, The molluscs of the Upper Eocene of Suliki, The molluscs of the Upper Tertiary beds of Sumatera', etc.. Introduction on geology by Verbeek, followed by collection of papers on molluscs by Boettger from Sumatra, and also Java: 'Orbitoidenkalk van Sumatra's Westkuste', Die fossilen Mollusken von Suliki im Padangschen Hochland', 'Die Conchylien der Mittelmiocaen-Schichten Sudsumatras', 'Die Conchylien der Mittelmiocaen-Schichten auf der Insel Nias', 'Die Mollusken der oligocaenen Schichten vom Bawang Flusse, Residenz Djokdjakarta, Java')

Verbeek, R.D.M., O. Boettger & K. von Fritsch (1883)- Die Tertiarformation von Sumatra und ihre Thierreste II. Jaarboek Mijnwezen Nederlandsch Oost-Indie 1883, Wetenschappelijk Gedeelte, 2, p. 5-284.
('The Tertiary formations of Sumatra and its animal fossils, 2'. Same paper as above')

Villarroel, T. (1985)- Observations on the sealing properties of faults in Sumatra. Proc. 14th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 105-116.

Von Ettingshausen, C. (1883)- Beitrag zur Kenntnis der Tertiarflora von Sumatra. Sitzungsberichte Akademie Wissenschaften, Wien, 87, p. 395-403.
(online at: www.zobodat.at/pdf/SBAWW_87_0395-0403.pdf)
('Contribution to the knowledge of the Tertiary flora of Sumatra')

Wahab, A. (1986)- Hydrocarbon potential of Klingi area, South Sumatra. Geologi Indonesia 11, 2, p. 7-10.

Wahab, A. & J. Purnomo (1982)- Kesejajaran parameter geologi subcekungan Palembang Selatan dan Jambi (sebuah nota pendahuluan). Proc. 11th Ann. Conv. Indon. Assoc. Geol. (IAGI), Jakarta, p. 253-275.
('Review of the geological parameters of the South Palembang and Jambi sub-basins (a preliminary note)')

Wain, A.S. & B.A. Jackson (1995)- New Pematang depocentres on the Kampar Uplift, Central Sumatra. Proc. 24th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 215-233.
(New Pematang depocentres recognised in Teso and Cenako PSC's, C Sumatra and include S extension to Bengkalis Trough. Bengkalis Trough extends onto Kampar Uplift, previously thought to mark its S boundary. S extension of Bengkalis Trough represented by Cenako half-graben. Seismic facies analysis indicated low velocity, high amplitude reflectors in axis of half-graben represent lacustrine 'brown shales')

Walker, P., M. Maas & M.D. Burnaman (1986)- Structure interpretation problems of a Lower Miocene reef associated with a shallow low velocity anomaly, North Sumatra. Proc. 15th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, p. 279-304.
(On structure mapping of large reefal buildup of Peusangan XL structure, off N Sumatra)

Wally, G.J. (1939)- De Oembilin steenkolenmijnen. De Ingenieur in Nederlandsch-Indie (IV), 6, 10, p. 1-26.
(online at: website Koninklijk Instituut voor de Tropen, Amsterdam, file xx)
('The Ombilin coal mines', C Sumatra. General overview of C Sumatra coal mine operations. Ombilin coals rel. high gas content (35-40%))

Wang, Y.F., F.M. Budijanto, M.L. Johnson & R.S.A. Siringoringo (1989)- Neogene seismic sequences and structural styles in "B" and Peusangan Blocks, North Sumatra Basin, Indonesia. Proc. 18th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 339-361.
(Ten Neogene seismic sequences. E Miocene Peutu Fm deposited during rising sea level, with reefal buildups and subaerial erosion over highs; hemipelagic deposition in lows. M Miocene Baong Fm deep marine shales onlapped and buried highs. In Late Miocene Barisan Mts began emerging, with regressive Keutapang and Lower Seurula Fms. Pliocene U Seurula and Julu Rayeu Fms two prograding units, interrupted by four unconformities of possible eustatic origin. Sedimentation and structural style different across NW trending wrench fault on W flank of Arun-Cunda-Peusangan High. To E sedimentation more responsive to eustatic

changes: sediments less disturbed and well-defined sequence boundaries. To W overpressure facilitates thrusting and slumping and wrench faults cut into shallow structures, complicating correlations)

Waren, R. & Dardji Noeradi (2010)- Reservoir geometry identification of tide dominated estuarine environment deposits and its implication to reservoir qualities: case study within the upper sand of Bekasap Formation, Gadang Field, Central Sumatra Basin, Indonesia. Proc. 34th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA10-SG-043, 11p.
(Core description and well logs of Bekasap Fm in Gadang field, C Sumatra, suggest tide-dominated estuarine environment: WSW-ENE trending estuarine channels and tidal flat/ sand bar)

Waren, R., E. Finaldhi, M. Ramdhan, M. Aji, H. Qadly & A.R. Budiman (2015)- Unlocking the high hydrocarbon potential in very low quality formations in the Bangko and Balam South East Field, Central Sumatra Basin, Indonesia. Proc. 39th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA15-G-207, 18p.
(Traditional high quality siliciclastic reservoirs in C Sumatra basin now mostly depleted. Telisa A shoreface sediment in Bangko Field and distal lacustrine deltaic Brown Shale B in Balam SE Field have high volumes of Original-Oil-in-Place, but recovery factors <4%.)

Waren, R., E. Finaldhi, E.H. Sihombing, I. Fardiansyah, F. Fitris, H. Semimbar, S. Graha, A.F. Tali &, W.R. Paksi (2016)- Syn-rift lacustrine axial delta reservoir quality and its distribution: new insight from Sumpur Delta in Singkarak Lake, West Sumatra, Indonesia. AAPG Asia Pacific Region, Geosciences Technology Workshop, Characterization of Asian Hydrocarbon Reservoirs, Bangkok, Search and Discovery Art. 51263, 3p.
(Abstract and Poster)
(Core sedimentology study from modern lacustrine delta at NW end of Lake Singkarak pull-apart basin)

Wechsler, D. & A.F. Talib (2006)- Reservoir characterization for a thermal recovery projects: North area, Duri Field. Proc. 35th Ann. Conv. Indon. Assoc. Geol. (IAGI), Pekanbaru, PITIAGI2006-045, 15p.
(New North Duri field reservoir characterization after drilling of 20 new wells and seismic reprocessing, in advance of expansion of Duri steamflood project to more complex northern area of field. Not much detail)

Wei, Q.L., L. Xiao, R.C. Cheng & M. Zhang (2012)- High resolution sequence stratigraphic characteristics and reservoir distribution in Lumut Member of NEB Gas Field of Indonesia. J. Stratigraphy (China), 2012, 4, p. 755-760.
(In Chinese with English summary. High resolution sequence stratigraphic of marine delta sedimentary system of Lower Talang Akar Fm in NEB Gas Field of Jabung Block in S Sumatra Basin)

Wennekers, J.H.L. (1958)- South Sumatra basinal area. In: L.G. Weeks (ed.) Habitat of Oil, American Assoc. Petrol. Geol. (AAPG), Spec. Publ. 18, p. 1347-1358.

Whateley, M.K.G. & G. Jordan (1989)- Fan-delta-lacustrine sedimentation and coal development in the Tertiary Ombilin Basin, W Sumatra, Indonesia. In: M.K.G. Whateley & K.T. Pickering (eds.) Deltas: sites and traps for fossil fuels, Geol. Soc., London, Spec. Publ. 41, p. 317-332.
(Coal in Ombilin basin mined in Sawahlunto area since 1891. Basin fill ~4600 m of M Eocene- E Miocene sediments. Fan-delta sediments below oldest M Eocene seam, seam itself and sediments overlying C seam investigated along W margin. Ombilin Basin is graben-like 'pull-apart' basin. Debris flows and fan-delta formation around margin of basin, with lake sediments in basin centre. Peat accumulation influenced by underlying fan-delta lobe geometry. In interlobe areas thick sequences of low ash peat accumulated, while central lobe areas high ash coal or carbonaceous shale formed)

Wibawa, I G.A.A.S., A. Syafriya, B. Syam, M.I. Nursina, M. Risyad & A.D. Fanzuri (2018)- Unlocking overlooked Gumai play potential at Jabung Betara complex: a best case study of gas while drilling classification in finding the new pays. Proc. 42nd Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA18-131-G, 18p.
(Discussion of gas in E Miocene Gumai Fm sandstones) in area of NE Betara Field, Jabung Block, S Sumatra)

Wibiksana, H., G. Mawhinney & R.A. Lorentz (1992)- Bentayan field development- an exploitation success. Proc. 21st Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 2, p. 143-162.
(Bentayan field BPM 1932 discovery in Corridor Block, S. Sumatra. Waxy, heavy oil (19.1°API) in Talang Akar Fm. OOIP reserves 87 MBO. Long regarded as uneconomic, but now being developed by Asamera, using blend with light Jambi crude for handling/ transportation)

Wibisono, R.K. & A. Fanandi (1999)- Application of sequence stratigraphy and core analysis determining well completion and stimulation treatments in Telisa Formation, Minas Field, Riau, Sumatera. Proc. 28th Ann. Conv. Indon. Assoc. Geol. (IAGI), Jakarta, 2, p. 121-146.
(Three oil-bearing calcareous sand layers in Lower Telisa Fm in Minas field area. Require stimulation)

Wibowo, A. & I. Fardiansyah (2016)- Alluvial- fluvial architecture of synrift deposits: an observation from the Outcrops of Brani Fm., Ombilin Basin, West Sumatra. Berita Sedimentologi 36, p. 35-43.
(online at: www.iagi.or.id/fosi/berita-sedimentologi-no-36.html)
(Outcrops of Eocene synrift, alluvial- fluvial Brani Fm of Ombilin Basin useful analogue for subsurface rift-fill of C Sumatra Basin)

Wibowo, B.C., D. Sofyan G., T. Tankersley & W.C. Dawson (1996)- Reservoir characterization by integrating production and geological information; case study: Kotabatak pattern waterflood "high-grade" area selection. Proc. 25th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 2, p. 329-342
(Kotabatak field NW-SE trending anticline, producing since 1971, produced 182 MBO by 1996. Channelized and non-channelized sands reservoirs in Bekasap Fm)

Wibowo, R.A., W. Hindadari, S. Alam, P.D. Silitonga & R. Raguwanti (2008)- Fractures identification and reservoir characterization of gas carbonate reservoir at Merbau Field, South Palembang Basin, Sumatra, Indonesia. AAPG Ann. Conv., San Antonio, Search and Discovery Art. 20064, 35p. *(Abstract + Presentation)*
(online at: http://www.searchanddiscovery.com/documents/2008/08149wibowo/ndx_wibowo.pdf)
(On fractures in Merbau field, a 1975 gas discovery in Baturaja Limestone buildup in S Sumatra basin)

Wibowo, R.A., W. Hindadari, P. D. Silitonga & R. Raguwanti (2006)- Using borehole image data for identification of fractures and reservoir characterization of gas carbonate reservoir at Merbau Field, South Palembang Basin, Sumatra, Indonesia. Proc. 23rd World Gas Conference, Amsterdam 2006, Int. Gas Union, 1.2EF.10, p. 1-24.
(online at: www.igu.org/html/wgc2006/pdf/paper/add10384.pdf)
(Merbau gas field in S part of S Palembang Basin discovered in E Miocene Baru Raja Fm carbonate in 1975. Determination of fracture density and orientation from borehole images of two wells, porosity distribution of carbonate facies, together with seismic inversion and interpretation are main tools in development well location and reservoir zones)

Wibowo, S.S.& E.A. Subroto (2017)- Studi geokimia dan pemodelan kematangan batuan induk Formasi Talangakar pada Blok Tungkal, Cekungan Sumatera Selatan. Bulletin of Geology (ITB) 1, 1, p. 54-64.
(online at: http://buletingeologi.com/index.php/buletin-geologi/issue/view/2/08_BG201614)
('Geochemical study and maturation model of the Talangakar Formation rocks from the Tungkal Block, South Sumatera basin'. Talang Akar Fm sediments with immature - late mature organic matter. Dominated by mixed type II/III and type III kerogen. Modeling at well locations shows presently at early to main oil generation stage (Ro 0.5-1.3%). Maximum burial in Pliocene)

Wicaksono, A., J.D. Mamesah, I. Zuhri & R. Putra (2015)- G&G approach to evaluate shallow gas occurrence in blowout well and surrounding area, case studies: Talang Jimar Field, South Sumatera Basin. Proc. 39th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA15-G-081, 16p.
(Talangjimar Field 1937 BPM oil discovery 5 km SE of Prabumulih, S Sumatra. in earliest Miocene Talang Akar Fm sandstone in Limau- Pendopo anticlinal system. Some wells encountered shallow gas at ~300m in ME1 layer of Late Miocene Muara Enim Fm, causing blowout in development well TLJ 240)

Wicaksono, A.F., H. Sijabat, T.K. Usman, D.N. Susanti, H. Indrajaya, Sugiri & M. Wahyudin (2016)- Defining Pre-Tertiary petroleum system of Langkat Area, North Sumatera Basin, Indonesia. Proc. 40th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA16-347-G, 13p.
(Presence of Pretertiary black shales near Medan interpreted as Kaloi Fm (age and paleoenvironment not clear) suggest possibility of new petroleum system)

Wicaksono, B., J. Setyoko & H. Panggabean (2009)- The North Sumatra Basin: geological framework and petroleum system review. CCOP Ann. Conv., Krabi, 26p. *(Presentation)*
(online at: www.ccop.or.th/eppm/projects/1/docs/IN_NorthSumatera_ccop_2009_krabi.pdf)

Widarmayana, I.W.A. (2007)- The giant Arun gas field (North Sumatra)- gas from beneath the earth to LNG export- a 30 year success story. Proc. 31st Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA 07-E-110, 11p.
(Arun gas field discovered 1971 in E-M Miocene carbonate build-up on NNE- SSW trending basement horst block associated with Paleocene-Oligocene rifting. Sea-level fluctuations in last stages of carbonate development resulted in secondary permeability in upper reservoir unit. Shape carbonate build-up controlled by antecedent topography. 118 wells. 13 TCF of dry gas produced to date)

Widayat, A.H. (2011)- Paleoenvironmental and paleoecological changes during deposition of the Late Eocene Kiliran oil shale, Central Sumatra Basin, Indonesia. Ph.D. Thesis, Johann Wolfgang Goethe University, Frankfurt am Main, p. 1-143.
(online at: https://core.ac.uk/download/pdf/18325618.pdf)
(Palynofacies and geochemical study of samples from 102m core in Late Eocene Kiliran oil shale ('Brown Shale', Pematang Gp). Represents ~240.000 years of lacustrine deposition in warm-humid climate)

Widayat, A.H., K. Anggayana & I. Khoiri (2015)- Precipitation of calcite during the deposition of Paleogene Sangkarewang oil shale, Ombilin Basin, West Sumatra, Indonesia. Indonesian J. Geoscience 2, 3, p. 157-166.
(online at: http://ijog.bgl.esdm.go.id/index.php/IJOG/article/view/217/201)
(Calcite locally common in Ombilin basin lacustrine Sangkarewang oil shale (8.4%). Variation of calcite % related to primary productivity/ precipitation. As lake developed, primary productivity decreased (more negative d13C values))

Widayat, A.H., K. Anggayana, K., Syafrizal, M.N. Heriawan, A.N.H. Hede & A.Y. Al Hakim (2013)- Organic matter characteristics of the Kiliran and Ombilin oil shales. Procedia Earth Planetary Sci. 6, p. 91-96.
(*online at: www.sciencedirect.com/science/article/pii/S1878522013000143)*
(Oil shale samples from Late Eocene syn-rift Brown Shale and Sangkarewang Fms in Kiliran and Ombilin Basins. Organic matter of Kiliran Basin mainly lamalginite and telalginite (originated from lacustrine Botryococcus braunii). Vitrinite reflectance averaging 0.29%. Organic matter in Sangkarewang oil shale dominated by lamalginite, with vitrinite reflectance values ~0.37%. Oil shales immature. TOC ~5.6% and 5.0% for Kiliran and Ombilin shales, respectively)

Widayat, A.H., B. van de Schootbrugge, W. Oschmann, K. Anggayana & W. Puttmann (2016)- Climatic control on primary productivity changes during development of the Late Eocene Kiliran Jao lake, Central Sumatra Basin, Indonesia. Int. J. Coal Geology 165, p. 133-141.
(Palynofacies and inorganic geochemistry of 102 m long core of Late Eocene Kiliran Jao lacustrine oil shale, C Sumatra. Climate changes interpreted from abundance variation of fungal remains: relatively warm in middle part of oil shale. Botryococcus braunii 3-16%; generally more abundant in middle part)

Widianto, E. & N. Muskin (1989)- Seismic stratigraphy study on the Talang Akar Fm in the Selat area, Jambi. Proc. 18th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, p. 323-338.

Widodo, H. (2012)- Potensi batubara daerah Seluma dan sekitarnya, Kabupaten Seluma, Propinsi Bengkulu. J. Ilmiah Magister Teknik Geologi (UPN) 5, 2, p. 1-11.
(online at: http://jurnal.upnyk.ac.id/index.php/mtg/article/view/247/209)

(Coal potential coal in the Seluma area and surroundings, Seluma District, Bengkulu Province')

Widodo, R. (2012)- Integrating wells and 3D seismic data to delineate the sandstone reservoir distribution of the Talang Akar Formation, South Sumatra Basin, Indonesia. In: AAPG Int. Conv. Exhib., Singapore 2012, Search and Discovery Art. 50748, 22p.
(online at: www.searchanddiscovery.com/documents/2012/50748widodo/ndx_widodo.pdf)
(Distribution and depositional environment of selected sandstone reservoirs in Late Oligocene- E Miocene fluvial-deltaic Talang Akar Fm in Jambi sub-basin. Mainly distributary channel fill facies)

Wilkinson, M.R., S. Haszeldine, J. Gluyas & N.H. Oxtoby (1998)- Diagenesis; a short (2 million year) story; Miocene sandstones of central Sumatra, Indonesia; discussion and reply. J. Sedimentary Res. 68, p. 231-234.
(Discussion of Gluyas & Oxtoby 1995 paper, disputing proposed rapid cementation rates)

Williams, H.H. & R.T. Eubank (1995)- Hydrocarbon habitat in the rift graben of the Central Sumatra Basin, Indonesia. In: J.J. Lambiase (ed.) Hydrocarbon habitat in rift basins, Geol. Soc. London, Spec. Publ. 80, p. 331-371.
(C Sumatra prolific oil attributed to graben sequences with thick organic-rich lacustrine shales, overlying marine sag sequence with excellent reservoirs, development of early structures and high heat flows. Geothermal gradient, average 3.38°F/100'. Distribution of oilfields largely fault controlled. Oil migrated vertically out of Eocene-Oligocene Pematang lacustrine shales and laterally up flanks of graben, generally in E direction, filling Miocene Sihapas Fm reservoirs. Hydrocarbos also in rift-fill sequence. Migration distance up to 20km. Differences in oils reflect different depositional and environmental histories of lake systems)

Williams, H.H., P.A. Kelley, J.S. Janks & R.M. Christensen (1985)- The Paleogene rift basin source rocks of Central Sumatra. Proc. 14th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 2, p. 58-90.
(Most of oil and gas in C Sumatra Basin Generated from organic-rich lacustrine shales of Eo-Oligocene Pematang Gp. Oils paraffin-based, with 4-30% wax. Large freshwater lake systems developed in structurally controlled rift basins. Palynology indicates mainly freshwater conditions (with common Pediastrum), but also occurrences of slightly saline conditions or occasional marine incursions)

Willis, B.J. & F. Fitris (2012)- Sequence stratigraphy of Miocene tide-influenced sandstones in the Minas Field, Sumatra, Indonesia. J. Sedimentary Res. 82, 6, p. 400-421.
(online at: http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.902.8446&rep=rep1&type=pdf)
(E Miocene Sihapas Group in Minas field, C Sumatra, composed of succession of 10s of m thick, erosionally based, tide-influenced sandstone intervals interbedded with marine shale intervals. Past interpretations suggested reservoir sandstone intervals are incised-valley deposits. New interpretation suggests tide-influenced shorelines. Five major reservoir intervals over low-grade metamorphic basement. Two older intervals multiple upward-coarsening tide-influenced regressive shoreline successions capped by thin marine shelf transgressive sandstone and shale. Upper three reservoir intervals 4th-order regressive shoreline deposits variably reworked by tidal currents, together comprising 3rd-order forward-stepping sequence set)

Winderasta, W., K. Witjaksono, E. Mastoadji & Yarmanto (2008)- Central Sumatra and Ombilin Basin: a tectonostratigraphic approach for basin correlation. Indon. Asooc. Geol. (IAGI), Sumatra stratigraphy workshop, p. 1-4
(Abstract only. General similarities in C Sumatra and Ombilin Basin fill, but Ombilin Basin development earlier: Paleocene onset, mid-Oligocene rifting. Red Beds and Brown Shale in C Sumatra are Eocene in age with Late Oligocene main rift phase)

Wirasatia, D., E. Arifriadi, R. Adiarsa, R. Adhitiya & Yuki A.N. (2009)- Paleogene system of Bengkulu Basin correlated with South Sumatra basin and source rock prospectivity. Proc. 38th Ann. Conv. Indon. Assoc. Geol. (IAGI), Semarang, PITIAGI2009-148, 14p. *(in Indonesian)*
(Literature review on possible potential of Palegene source rocks in Bengkulu forearc basin)

Wirjodihardjo, K. (1992)- Seismic reef expression in the North Sumatra Basin. Proc. 21st Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 117-144.
(Criteria for E Miocene reefs recognition on N Sumatra seismic. Not much regional info)

#Wisnu, A. & Nazirman (1997)- Statistik "Direct Hydrocarbon indicator" terhadap keberadaan hidrokarbon di blok Raja, Sumatera Selatan. Proc. 26th Ann. Conv. Indon. Assoc. Geol. (IAGI), Jakarta, Hidrokarbon, p. 71-88.
('Statistics of "Direct HC indicators" on the presence of hydrocarbons in the Raja block, South Sumatra'. Positive correlation between seismic DHI's and oil-gas discoveries (Air Hitam, Abab, Tempirai, etc.))

Wisnugroho, P.H. (2014)- Coal deposits in Tanjung Enim coal field, Bukit Asam, South Sumatera Province. In: I. Basuki & A.Z. Dahlius (eds.) Sundaland Resources, Proc. Indon. Soc. Econ. Geol. (MGEI) Ann. Conv., Palembang, p. 451-459.

Wongsosantiko, A. (1976)- Lower Miocene Duri Formation sands, Central Sumatra Basin. Proc. 5th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, p. 63-76.
(E Miocene Duri Fm sand reservoirs productive in 12 fields in C Sumatra. Deltaic sands, derived from North)

Xie, C., H. Ma, H. Liang, D. Li, X. Qi & B. Xian (2007)- Alluvial fan facies and their distribution in the Lower Talang Akar Formation, Northeast Betara Oilfield, Indonesia. Petroleum Sci. 4, 2, p. 18-28.
(Lower Talang Akar Fm in NE Betara Oilfield, Jabung Block, S Sumatra, in alluvial fan facies. Bed F coarse grained, poorly sorted and low quality. Conglomerates characterized by low gamma-ray, low resistance, high density and poor physical reservoir properties)

Yanto, Y. & T. Febriwan (2008)- AVO-inversion for reservoir characterization of Baturaja carbonate, Gunung Kembang Field, South Sumatra basin. Proc. 32nd Ann. Conv. Indon. Petroleum Assoc., IPA08-G-047, 11p.
(Gunung Kembang gas-oil field in E Miocene Baturaja Fm carbonates in anticlinorium with max. reservoir thickness 80m, gas cap 40m, underlain by 8-12m oil column. AVO inversion used to map oil distribution.)

Yarmanto (2010)- Perkembangan batupasir pada sekuen Telisa Cekungan Sumatra Tengah. Ph.D. Thesis Inst. Teknologi Bandung (ITB), p. 1- *(Unpublished)*
('Development of sandstones in the Telisa sequence in the Central Sumatra Basin')

Yarmanto & K. Aulia (1989)- Seismic expression of wrench tectonics in the Central Sumatra Basin. Geol.Indonesia (IAGI) 12, 1 (Katili Volume), p. 145-175.
(Tertiary wrench faulting dominant in C Sumatra basin. Main deformation phases Pre-Tertiary, Eo-Oligocene and Plio-Pleistocene. Plio-Pleistocene deformation NW-SE, older structures trend mostly N-S)

Yarmanto, T.L. Heidrick, Indrawardana & B.L. Strong (1995)- Tertiary tectonostratigraphic development of the Balam depocenter, Central Sumatra basin, Indonesia. Proc. 24th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, p. 33-45.
(Three major Tertiary tectonic- stratigraphic episodes in Balam Depocenter. Eocene (?)- Oligocene rifting (F1, ±45-25.5 Ma) created N-NNW-trending half-grabens. Balam depocenter compartmentalized. Rift margin faults N-S (Manggala) or NNW-SSE (Jakun and Balam) and dip E-ENE at low-angles. ENE-trending Antara-Nella Accommodation Zone (ANAZ) subdivides Balam Depocenter into shallow N and deep central sections. Regional base Miocene unconformity marks beginning of F2 tectonism (25.5-13.8 Ma). It cuts across basement platforms and F1 inversion structures and grades laterally into sag disconformities above F1 graben thicks. Isopach-lithofacies suggest N-S incised braided stream system. Final structuring (F3, 13.8 Ma- Recent) linked to widespread inversion of faults and folds. Giant Bangko and Balam S fields results of F3 structural episode)

Yarmanto, I. Muswar, D. Kadar & S. Johansen (2006)- Re-appraisal of shallow marine reservoirs in the Central Sumatra basin, sixty-five years after first hydrocarbon discovery. Proc. Jakarta 2006 Int. Geosc. Conf. Exh., Indon. Petroleum Assoc. (IPA), Jakarta, PG-07, 3p. *(Abstract only)*
(Sihapas Group 5 major sequences; little or no supporting data)

Yarmanto, D. Noeradi & Hendar (2010)- Telisa deposition model in the Central Sumatra Basin. Proc. 24th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA10-G-204, 11p.
(On depositional environment and paleogeography of Early Miocene marine shale-dominated Telisa Fm, C Sumatra)

Yeni, Y.F. (2011)- Perkembangan sedimentasi Formasi Brani, Formasi Sawahlunto dan Formasi Ombilin ditinjay dari provenance dar komposisi batupasir cekungan Ombilin. Proc. Joint. 36th HAGI and 40th IAGI Ann. Conv., Makassar, JCM2011-070, 21p.
(On composition and provenance of sandstones of Brani, Sawahlunto and Ombilin Fms in Ombilin Basin, W Sumatra)

Yeni, Y.F., R. Wulandari, F. Ruzi, A. Azlin, A. Regina, R. Bramantyo, M.H. Thamrin & Raihan (2017)- Fractured and weathered basement reservoirs in Beruk High, Central Sumatra Basin. Proc. Joint Conv. HAGI-IAGI-IAFMI-IATMI (JCM 2017), Malang, 6p.
(Beruk High part of Coastal Plain Pekanbaru Block in C Sumatra basin. Part of Sibumasu- E Sumatra Block. Oil produced from Permian- E Cretaceous fractured-weathered basement of Beruk High, with open fractures trending NW- SE. Lithologies: quartzite (E Permian K-Ar age: 276 Ma,), granites (Jurassic K-Ar ages: 203, 179, 150 Ma, hornfels (116 ± 6 Ma))

Younita, N. & B. Simandjuntak. (2002)- Indikasi endapan estuaria pada Area II lapangan minyak Duri, Cekungan Sumatera Tengah. Proc. 31st Ann. Conv. Indon. Assoc. Geol. (IAGI), Surabaya, 1, p. 224-245.
('Indications of estuarine deposits in Area II of the Duri oilfield, C Sumatra Basin')

Youens, S. (1986)- Porosity determination from seismic data in the Rawa area, Corridor Block PSC. CCOP Tech. Publ. 17, p. 143-155.

Yulihanto, B. & B. Situmorang (1991)- Structural inversion and its influence on depositional processes in the Aru Area North Sumatra Basin, Indonesia. In: R.P. Aribert-Christ (ed.) Proc. First Offshore Australia Conference, Melbourne 1991, III, p. 25-42.

Yulihanto, B. & B. Situmorang (2002)- Tertiary inversion tectonics in the North Sumatra basin, Indonesia. J. Geologi Sumberdaya Mineral 12, 130, p. 28-48.
(Structure of N Sumatra controlled by dextral motions along NW-SE and N-S trending fault systems. N-S faults associated with isolated Paleogene transtensional graben formation. Late M Miocene structural event caused inversion along NW-SE and N-S trending faults, causing shallowing of W part of basin and migration of depocenter to E, also uplift of Barisan Mountains. Since M Miocene sediments mainly sourced from Barisan Mts. Latest inversions during 'Plio-Pleistocene orogeny')

Yuningsih, E.T. (2007)- Studi provenance batupasir formasi-formasi di Cekungan Ombilin, Sumatra Barat. Bull. Scientific Contr. (UNPAD) 5, 1, p. 33-41.
(online at: http://jurnal.unpad.ac.id/bsc/article/view/8132/3705)
(Sandstone provenance studies of formations in the Ombilin Basin, West Sumatra'. Q-F-L triangle diagrams suggest provenance of quartz-rich (Eocene) Brani Fm is from continental block. (Oligocene) Sawahlunto and Sawahtambang Fms same or 'recycled orogen'. (Miocene) Sangkarewang and Ombilin Fms are 'transitional magmatic arc'. Etc.)

Yunus, M., B. Denk & Suprihatin (1993)- Geological contributions to the enhanced oil recovery project at the Kenali Asam Field. Proc. 22nd Ann. Conv. Indon. Assoc. Geol. (IAGI), Bandung, 2, p. 793-793.

Yustiawan, R., B.A. Pramudhita, A. Prakoso, Y.A. Nagarani & H. Yusuf (2013)- Pematang Brown shale as potensial reservoir for the future Malaca Strait. Proc. Joint Conv. 38th Indon. Assoc. Geoph. (HAGI) - 42nd Indon. Assoc. Geol. (IAGI), Medan, p.

Yuwono, R.W., B.S. Fitriana, P.S. Kirana, S. Djaelani & B.A. Sjafwan (2010)- Bentu & Korinci Baru block: proven and potential shallow biogenic gas in Central Sumatra Basin. Proc. 39th Ann. Conv. Indon. Assoc. Geol. (IAGI), Lombok, PIT-IAGI-2010-226, 16p.
(Bentu and Korinci Baru PSC in C Sumatra contain biogenic gas fields with up to 350 BCF of biogenic gas. Formerly considered drilling hazard in search for deeper oil, now producing. Main gas sands in Late Miocene-Pliocene Binio Fm coastal deposits, in NW-SE anticlines. Reservoirs 600'-2000' below sea level, 7-25' thick, and excellent porosity. Seismic data shows strong amplitude anomalies, but some bright spots are coals or thin stacked water sands. Biogenic gas origin demonstrated by carbon isotope d13C values of -62 to -66 ‰.)

Yuwono, R.W., B.S. Fitriana, P.S. Kirana, S. Djaelani & B.A. Sjafwan (2011)- Biogenic gas exploration and development in Bentu PSC. Proc. 35th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA11-G-108. 17p.
(Same paper as above and also published in AAPG Singapore 2012 Int. Conv.)

Yuwono, R.W., R. Siregar, A. Kurniawan, T. Prabowo, S. Djaelani & Y. Gautama (2012)- Development of marginal Bentu gas field in Central Sumatra Basin. Proc. 41st Ann. Conv. Indon. Assoc. Geol. (IAGI), Yogyakarta, 2012-GG-03, 13p.
(Biogenic gas reservoir in Bentu Field 40-50' sand in Late Miocene - Pliocene Binio Fm. 2P reserve is only 14 BCF, but proximity to power plant justifies development Binio Fm deposited in coastal environment. Gas trapped in NW-SE anticline related to reverse fault)

Zaim, Y., G.F. Gunnell, R.L. Ciochon, Y. Rizal, Aswan & N. O'Shea (2014)- Paleogene vertebrates from Tanahsirah, Talawi- Ombilin Basin, West Sumatra: a preliminary field result. Buletin Geologi (ITB) 41, 3, p. 175-184.
(Paleogene Sangkarewang/Sawahlunto Fms initially known only for fish fossils. Subsequent finds of crocodiles, turtles, small mammal bones and teeth (first Paleogene mammal finds in oceanic SE Asia), and bird trackways)

Zaim, Y., L. Habrianta, C.I. Abdullah, Aswan, Y. Rizal, N.I. Basuki & F. E. Sitorus (2012)- Depositional history and petroleum potential of Ombilin Basin, West Sumatra- Indonesia, based on surface geological data. AAPG Int. Conv. Exhib., Singapore 2012, Search and Discovery Art. 10449, p. 1-9.
(online at: www.searchanddiscovery.com/documents/2012/10449zaim/ndx_zaim.pdf)
(Ombilin Basin Eocene- M Oligocene initial rifting with deposition of Brani and Sangkarewang Fms in alluvial fan and lacustrine environment (with freshwater fish fossils). In Oligocene syn-rift changed from lake to fluvial Sawahlunto Fm and Sawahtambang Fm in Late Oligocene. E Miocene post-rift Ombilin Fm change to marine environment. Etc.)

Zaim, Y., Y. Rizal, G.F. Gunnell, T.A. Stidham & R.L. Ciochon (2011)- First evidence of Miocene avian tracks from Sumatra. Berita Sedimentologi 20, p. 5-6.
(online at: www.iagi.or.id/fosi/files/2011/01/BS20-Sumatra1.pdf)
(Ombilin Basin E Miocene intertidal beach sediments of Sawahlunto Fm with tracks of two different types of shorebirds. Represent first discovery of bird footprint fossils in Indonesia)

Zainetti, F., G.A. Cole & A. Anuar (2015)- Fresh insights into the oil families of the South Sumatra Basin. Asia Petroleum Geoscience Conf. Exhib. (APGCE), Kuala Lumpur, 5p. *(Extended Abstract)*
(Geochemical analyses of 44 oils in S Sumatra Basin. New biomarker interpretation method helps define three main oil families:(1) more algal-dominated; (2) mixed terrigenous with subordinate algal contribution, and (3) typical humic sourced family. All potential source rocks are syn-rift to sag in origin)

Zajuli, M.H.H. & H. Panggabean (2013)- Depositional environment of fine-grained sedimentary rocks of the Sinamar Formation, Muara Bungo, Jambi. J. Geologi Indonesia 8, 1, p. 25-38.
(online at: http://jgi.bgl.esdm.go.id/index.php/JGI/article/view/45/34)
(Lacustrine Oligocene Sinamar Fm at NW side of S Sumatra Basin consists of clastics with coal-seams. Dominant maceral groups exinite (alginite (3.4-18%), and resinite (1.6-5.6%)) and vitrinite (tellocolinite 0.4-0.6%, desmocollinite 0.4%, vitrodetrinite 8.4-16.6%). Organic material of shales derived from higher plants and algae, especially Botryococcus species)

Zajuli, M.H.H. & H. Panggabean (2014)- Hydrocarbon source rock potential of the Sinamar Formation, Muara Bungo, Jambi. Indonesian J. Geoscience 1, 1, p. 53-64.
(online at: http://ijog.bgl.esdm.go.id/index.php/IJOG/article/view/175/175)
(Oligocene Sinamar Fm good-excellent oil source rock, with up to 11% TOC and mainly Type I kerogen. Simamar village outcrop section ~42m thick brown-black shale, with coal and sandstone near base. Immature-early mature in outcrop)

Zajuli, M.H.H., H. Panggabean, Hendarmawan & I. Syafri (2015)- Dinamika kehadiran material organik pada lapisan serpih Formasi Kelesa di daerah Kuburan Panjang, Cekungan Sumatera Tengah, Riau. J. Geologi Sumberdaya Mineral 16, 4, p. 171-181.
('Dynamics of organic material presence Kelesa Fm shale in the Kuburan Panjang region, C Sumatra Basin'. Eocene-Oligocene Kelesa Fm shale in Kuburan Panjang area, Sumai sub-basin (SW of Rengat), good potential source rocks with TOC 1.2- 7.2%. Vitrinite 0.2-5%, eksinite 0.6-4.7%. Pyrite 0.2-16%. Increase in organic material from bottom to top)

Zajuli, M.H.H., H. Panggabean, Hendarmawan & I. Syafri (2017)- Hubungan kelompok maseral liptinit dan vitrinit dengan tipe kerogen batuan sumber hidrokarbon pada serpih Formasi Kelesa bagian atas, Kuburan Panjang, Riau. J. Geologi Sumberdaya Mineral 18, 1, p. 13-23.
(online at: http://jgsm.geologi.esdm.go.id/index.php/JGSM/article/view/101/126)
('Relationship between liptinite and vitrinite maceral groups with kerogen type of hydrocarbon source rock of upper Kelesa shale formation in Kuburan Panjang, Riau'))

Zamiel, F., M. Irfani & K.N. Syafrin (1991)- Perkembangan "barrier bar" pada batupasir Formasi Keutupang bawah daerah Pulau Sembilan, Aru, Sumatra Utara. Proc. 20th Ann. Conv. Indon. Assoc. Geol. (IAGI), Jakarta, p. 206-230.
('Development of a 'barrier bar' in sandstones of the Lower Keutupang Formation in the Pulau Sembilan area, Aru, North Sumatra'. NW-SE trending 'barrier bar' sandbody in Late Miocene of N Sumatra)

Zeliff, C.W. & D. Bastian (2000)- New play in a mature basin: prospecting for gas. AAPG Int. Conf and Exhib., Bali 2000, American Assoc. Petrol. Geol. (AAPG) Bull. 84, 9, 1p. *(Abstract only)*
(Dayung-1 1991 wildcat well, S Sumatra tested gas in fractured pre-Tertiary granite wash and granite. Since Dayung, Gulf discovered 8 gas fields where basement rocks represent primary reservoir)

Zeliff, C.W., S.W. Trollope & E. Maulana (1985)- Exploration cycles in the Corridor Block, South Sumatra. Proc. 14th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 379-400.
(Corridor area in S Sumatra several cycles of petroleum exploration. Exploration by BPM (Shell) in early 1890's, resulted in several small, shallow oil fields. Second cycle concentrating on deep Talang Akar prospects through 1930's terminated by World War II. Low level of activity post WW II through late 1960's. Modern exploration cycle initiated by Stanvac in 1971 and Asamera after 1980, with Tanjung Laban and Ramba fields discoveries in 1982).

Ziegler, K.G.J. (1921)- Verslag over de resultaten van geologisch- mijnbouwkundig onderzoek van het Kendi-Ringin kolenveld (Res. Palembang). Jaarboek Mijnwezen Nederlandsch-Indie 47 (1918), Verhandelingen 2, p. 141-189.
('Report on the results of geological-mining investigation of the Kendi-Ringin coal field (Res. Palembang)'. Coal field with 12 coalbeds in Miocene Middle Palembang Fm. Coal grade improved by andesite intrusives)

Ziegler, K.G.J. (1922)- Verslag over het onderzoek der asfalt-terreinen by Tandjoeng Laoet (Res. Palembang). Jaarboek Mijnwezen Nederlandsch-Indie 47 (1920), Verhandelingen 1, p. 33-69.
('Investigation of asphalt deposits near Tanjung Laut (Res. Palembang)'. Six surface asphalt deposits 50 km WNW of Palembang, S Sumatra, which are large, degraded oil seeps in outcropping ?Pliocene clastics)

Zonneveld, J. P., Y. Zaim, Y. Rizal, R.L. Ciochon, E.A. Bettis, Aswan & G.F. Gunnell (2011)- Oligocene shorebird footprints, Kandi, Ombilin Basin, Sumatra. Ichnos 18, 4, p. 221-227.
(Two types of bird footprints in intertidal sand flat fine sandstone of Oligocene Sawahlunto Fm in outcrop near Kandi Ombilin Mine. Referable to ichnogenus Aquatilavipes and similar to small modern shorebirds)

Zonneveld, J.P., Y. Zaim, Y. Rizal, R.L. Ciochon, E.A. Bettis, Aswan & G.F. Gunnell (2012)- Ichnological constraints on the depositional environment of the Sawahlunto Formation, Kandi, northwest Ombilin Basin, west Sumatra, Indonesia. J. Asian Earth Sci. 45, 2, p. 106-113.
(Low diversity trace fossil assemblage from Oligocene Sawahlunto Fm near Kandi, NW Ombilin Basin, W Sumatra. Traces and mud-draped and bidirectional ripples imply tidally-influenced marine setting. Bird footprints (Aquatilavipes) imply periodic subaerial exposure)

Zulmi, I., A. Inabuy & R. Wisnu Y. (2016)- A hidden gas potential of alluvial fan deposits in Gebang Block, North Sumatra. Proc. GEOSEA XIV and 45th Ann. Conv. Indon. Assoc. Geologists (IAGI) (GIC 2016), Bandung, p. 544-548.
(Up to 300m thick Eo-Oligocene alluvial fan sandstones identified in Anggor and Secanggang Fields and Gebang Block wells in N Sumatra basin. Gas tested in Anggor and GB-04 wells. Risk of overpressure)

II.3. Sumatra - Offshore Forearc and islands

Abercrombie, R., M. Antolik & G. Ekstrom (2003)- The June 2000 Mw 7.9 earthquakes south of Sumatra: deformation in the India-Australia Plate. J. Geophysical Research 108, B1, 2081, 16p.
(June 2000 earthquakes S of Sumatra below Indian Ocean predominantly left-lateral strike-slip on vertical N-S trending faults, probably reactivated fracture zones. Earthquakes consistent with recent models of distributed deformation in India-Australia composite plate. Occurrence of Enggano earthquake implies stress field within Indian plate continues to depth of 50km in subducting slab)

Ammon, C.J., Chen Ji, H.K. Thio, D. Robinson, S. Ni, V. Hjorleifsdottir, H. Kanamori, T. Lay et al. (2005)- Rupture process of the 2004 Sumatra-Andaman earthquake. Science 308, p. 1133-1139.

Andi Mangga, S., G. Burhan, Sukardi & E. Suryanila (1994)- Geologic map of the Siberut Sheet (0614-0714), Sumatra, 1:250,000. Geol. Res. Dev. Centre (GRDC), Bandung.
(Map sheet of Siberut Island in Sumatra forearc/ accretionary prism. SW half of island mainly highly folded Late Miocene- Pliocene Sagulubek Fm. M-L Miocene? Tarikan Melange complex at base of thrust sheets, with blocks of Late Oligocene- E Miocene limestone in sheared tuffaeous claystone. NW part of island mainly strongly folded Late Miocene- Pliocene deep water tuffaceous sediments of Saibi Fm. Structure mainly NW-SE trending, NE dipping thrust faults)

Andi Mangga, S., S. Gafoer & N. Suwarna (1987)- Hubungan geologi antara Kepulauan Mentawai dan dataran Sumatra bagian Selatan. Proc. 16th Ann. Conv. Indon. Assoc. Geol. (IAGI), p.
('Geological relationships between the Mentawai islands and S Sumatra'.)

Andi Mangga, S., Kusnama & Suryono (2006)- Stratigraphy and tectonic development of Mentawai islands West Sumatera, based on plate tectonic theory. J. Sumber Daya Geologi 16, 3 (153), p. 136-143.
(Mentawai Islands off W Sumatra non-volcanic outer arc, related to subduction of IndianOcean. Pre-Oligocene ophiolite and melange complexes uplifted and overlain unconformably by Miocene and younger Mentawai Gp marine ponded basin sediments. Melange with ultramafic ophiolite fragments. Ophiolite overlain by M-L Eocene radiolarian cherts. Mentawai melange formed by mud diapirism, with blocks of serpentinite, basalt, Late Eocene Pellatispira- Nummulites limestone, etc., and N8 E-M Miocene planktonics in matrix (= Oyo Complex of Nias))

Anugrahadi, A., H.S. Koesnadi, Y. Surachman & D. Muljawan (2004)- Geological condition of the convergent margin system off West Java and Southern Sumatra. In: R.A. Noble et al. (eds.) Proc. Int. Conf. Deepwater and frontier exploration in Asia & Australasia, Jakarta, Indon. Petroleum Assoc. (IPA), p. 279-285.
(Short paper based on BGR 1999 seismic and bathymetry data; not much data)

Ardhyastuti, S., Y. Haryadi & T. Wiguna (2017)- Mapping of gas seepage zone in the fore arc basin Sumatra Region. Proc. Joint Conv. HAGI-IAGI-IAFMI-IATMI (JCM 2017), Malang, 6p.
(Description of active gas seep on seafloor in Simeulue- Siberut forearc basin: seismic expression, carbonate hardground cementation of seafloor. Seep vent fauna of white crabs, mytilid bivalves, Vestimentifera polychaete tube worms, etc.)

Aribowo, S., L. Handayani, N.D. Hananto, K.L. Gaol, Syuhada & T. Anggono (2014)- Deformasi kompleks di Pulau Simeulue, Sumatra: interaksi antara struktur dan diapirisma. J. Riset Geologi Pertambangan (LIPI) 24, 2, p. 131-144.
(online at: http://jrisetgeotam.com/index.php/jrisgeotam/article/view/89/pdf_4)
('Complex deformation in Simeuleu Island, Sumatra: interplay between structure and diapyrism'. Simeulue in accretionary complex off NW Sumatra. Deformation generally NE-dipping reverse and thrust faults verging towards trench. NNE blocks tend to be higher than SSW blocks. Out-of-sequence 'backthrusts' present, possibly correlated to mud diapirism)

Aribowo, S., L. Handayani & N.D. Hananto (2015)- Origin of the uplifted Simeulue forearc high island. Proc. Joint Conv. HAGI-IAGI-IAFMI-IATMI, Balikpapan, JCB2015-219, 4p.
(UpliftedMio-Pliocene sediments intruded by diapiric melange in Simeulue Island may not be a part of accretionary complex, but may be forearc basin sediments that originated from Sumatra. Uplift may be related to NW trending Late Pliocene- Pleistocene compressional structures of W Andaman - Mentawai Fault zones)

Arisbaya, I., M.M. Mukti, L. Handayani, H. Permana, M. Schnabel & K. Jaxybulatov (2015)- Tinggian Tabuan-Panaitan jejak sesar Sumatra di Selat Sunda berdasarkan analisis data geofisika. In: H. Harjono et al. (eds.) Pros. Pemaparan Hasil Penelitian Geoteknologi 2015, Pusat Penelitian Geoteknologi (LIPI), Bandung, p. I33-I39.
(online at: http://pustaka.geotek.lipi.go.id/wp-content/uploads/2016/04/Prosiding-2015.pdf)
('The Tabuan- Panaitan Ridge, trace of the Sumatran fault in Sunda Strait, based on geophysical data analysis'. Semangko pull-apart basin in Sunda Straits two sub-basins separated by NW-SE to N-S trending Tabuan-Panaitan Ridge, part of main Sumatra Fault zone in Sunda Strait. With likely magmatic intrusion activity)

Arisbaya, I., M.M. Mukti & H. Permana (2016)- Seismic evidence of the southeastern segment of the Sumatran Fault Zone in Sunda Strait and Southern Java. Proc. GEOSEA XIV and 45th Ann. Conv. Indon. Assoc. Geologists (IAGI) (GIC 2016), Bandung, p. 378-383.
(Bathymetry data and local seismicity in Sunda Strait suggest existence of extension segment of Sumatran Fault Zone S of Ujung Kulon towards Sunda Trench, and is active fault)

Balakina, L. & A. Moskvina (2012)- Andaman-Sumatra island arc: 1. Spatiotemporal manifestations and focal mechanisms of the earthquakes. Izvestiya, Physics of the Solid Earth 48, 2, p. 117-154.

Baroux, E., J.P. Avouac, O. Bellier & M. Sebrier (1998)- Slip-partitioning and fore-arc deformation at the Sunda Trench. Terra Nova 10, p. 139-144.
(Oblique subduction at Sunda Trench causes transpressive deformation of plate leading edge. Right-lateral Great Sumatran Fault absorbs significant fraction of trench-parallel shear. Obliquity of convergence increases N-ward along Sumatra Trench, up to ~30°. Slip partitioning nearly complete along N segment of Sumatra Trench, where Great Sumatra Fault probably accommodates most trench parallel shear. Along S segment, where obliquity <20°, slip-partitioning not complete as indicated by oblique thrusting at subduction)

Beaudry, D. (1983)- Depositional history and structural evolution of a sedimentary basin in a modern forearc setting, western Sunda Arc, Indonesia. Ph.D. Thesis University of California, San Diego, p. 1-168. *(Unpublished)*
(Seismic-stratigraphic interpretation of forearc basin of W Sumatra. Late Oligocene unconformity with subaerial erosion)

Beaudry, D. & G. Moore (1981)- Seismic-stratigraphic framework of the forearc basin off central Sumatra, Sunda Arc. Earth Planetary Sci. Letters 54, p. 17-28.
(Forearc basin W of C Sumatra SE of Nias six seismic-stratigraphic sequences. Paleogene prograding slope deposits onlapped by younger Paleogene(?) trough deposits. Uplift associated with rejuvenation of subduction in Late Oligocene led to erosion of shelf and formation of regional unconformity. E Miocene progradation. Buried reef zone near shelf edge. Erosional unconformity on shelf and slope in Late Miocene/E Pliocene time. Late Pliocene flexure at W boundary of basin, displacing outer-arc ridge upward. Over 1 km of Pliocene-Recent wedge in deep western portion of basin landward of outer-arc ridge. Up to 800 m of shallow-water limestone on shelf since M-Pliocene)

Beaudry, D. & G. Moore (1985)- Seismic stratigraphy and Cenozoic evolution of West Sumatra forearc basin. American Assoc. Petrol. Geol. (AAPG) Bull. 69, p. 742-759.
(W Sumatra forearc 3 tectonic cycles: Paleogene orogeny, Neogene subsidence, Late Tertiary tectonism. Superimposed are 3 transgressive-regressive cycles. Paleogene and older metasedimentary and metamorphic rocks comprise basement beneath landward (inner) margin of forearc basin. Basement rocks and lower Tertiary sedimentary rocks deformed and eroded ~25-30 Ma. Continental shelf exposed to erosion, and basin deposits restricted offshore, coincident with Oligocene lowstand. Paleogene orogeny prior to erosional event

that cut angular unconformity on shelf. Neogene characterized by subsidence and near-continuous sedimentation. Latest Oligocene basal transgression culminated in M Miocene. Alternating limestones and shales comprise two 2nd-order cycles superimposed on overall transgression. Pliocene regressive sequence due to influx of siliciclastics from Sumatra. Shelf-slope break prograded basinward nearly 10 km)

Berglar, K. (2010)- The forearc off Sumatra: basin evolution and strike-slip tectonics. Doct. Thesis Gottfried Wilhelm Leibniz Universitat, Hannover, p. 1-131.

Berglar, K., C. Gaedicke, D. Franke, S. Ladage, F. Klingelhoefer & Y.S. Djajadihardja (2010)- Structural evolution and strike-slip tectonics off north-western Sumatra. Tectonophysics 480, p. 119-132.
(manuscript online at: http://archimer.ifremer.fr/doc/00000/11149/7818.pdf)
(Model for interaction between strike-slip faulting and forearc basin evolution off NW Sumatra between 2°N and 7°N. In Simeulue- and Aceh forearc basins strike-slip faulting controlled forearc basin evolution since Late Miocene. The Mentawai Fault Zone N of Simeulue Island and probably connected to Sumatran Fault Zone until end Miocene. Simeulue Basin two major Neogene unconformities, documenting differences in subsidence evolution along N Sumatran margin linked to subduction processes and strike-slip deformation)

Berglar, K., C. Gaedicke, S. Ladage & H. Thole (2017)- The Mentawai forearc sliver off Sumatra: a model for a strike-slip duplex at a regional scale. Tectonophysics 710-711, p. 225-231.
(At Sumatran oblique convergent margin Mentawai and Sumatran Fault right-lateral fault zones accommodate most of trench- parallel component of strain and bound Mentawai forearc sliver that extends from Sunda Strait to Nicobar Islands. Set of wrench faults obliquely connect two major fault zones, separating at least four horses of regional strike-slip duplex forming forearc sliver, each comprising individual basin in forearc. Duplex formation started in M-L Miocene SW of Sunda Strait, then propagated N-wards over 2000 km until E Pliocene)

Berglar, K., C. Gaedicke, R. Lutz, D. Franke & Y.S. Djajadihardja (2008)- Neogene subsidence and stratigraphy of the Simeulue forearc basin, Northwest Sumatra. Marine Geology 253, p. 1-13.
(Simeulue forearc basin Neogene sedimentary fill up to 5s TWT. Three stages of subsidence evolution after formation of regional basal Neogene unconformity. E-M Miocene stage marked by subsidence in half grabens along W border of basin. Late Miocene/Pliocene change to steadily subsiding trench-parallel trough. Present setup of forearc region under influence of strike-slip faults due to oblique subduction active at least since this time as evidenced by wrench faulting. At end of this stage subsidence expanded significantly E-ward, drowning large carbonate platform that evolved in the then shallows and E parts of basin. Central part of Simeulue basin presently subject to inversion, probably related to reactivation of E-M Miocene half grabens)

Brennan, P.A. & J.H. Shaw (2005)- Wedge structure, Nias Basin, Sumatra, Indonesia. In: J.H. Shaw et al. (eds.) Seismic interpretation of contractional fault-related folds; an AAPG seismic atlas, American Assoc. Petrol. Geol. (AAPG), Studies in Geology 53, p. 141-143.
(Complex inversion structure on seismic in Nias basin between Nias Island and SW Sumatra. Miocene and younger sediments deposited over basement composed of earlier Tertiary subduction complex. Basin underwent E-M Miocene extension, followed by compression in Late Miocene, Pliocene and Pleistocene)

Briggs, R.W., K. Sieh, W.H. Amidon, J. Galetzka, D. Prayudi, I. Suprihanto, N. Sastra, B. Suwargadi, D. Natawidjaja & T.G. Farr (2008)- Persistent elastic behavior above a megathrust rupture patch: Nias island, West Sumatra. J. Geophysical Research 113, B12406, p. 1-28.
(Fore-arc deformation quantified using fossil reefs. Elevated coral reef flats and chenier plains show outer arc island of Nias experienced slow long-term uplift and subsidence during Holocene, but island rose up to 2.9 m during Mw 8.7 Sunda megathrust rupture in 2005. Average uplift rates since mid-Holocene 1.5- 0.2 mm/yr, highest on E coast of Nias, where coseismic uplift was nearly zero in 2005)

Briggs, R.W., K. Sieh, A.J. Meltzner, D. Natawidjaja, J. Galetzka, B. Suwargadi et al. (2006)- Deformation and slip along the Sunda megathrust in the great 2005 Nias-Simeulue earthquake. Science 311, 5769, p. 1897-1901.

(Seismic rupture produced deformation above a 400-kilometer strip of Sunda megathrust, off N Sumatra. Trench-parallel belts of uplift up to 3m on outer-arc islands above rupture and 1 subsidence farther from trench. More than 11m of fault slip under islands)

Budhitrisna, T. (1989)- Melange di Pulau Pagai dan Pulau Sipora, Kepulauan Mentawai. Bull. Geol. Res. Dev. Centre 13, p. 1-8.
('Melange of Pagai and Sipora islands, Melawai Islands'. Islands off W Sumatra with basal melange of sheared rocks with clasts of ophiolite, pelagic sediments, metamorphics, etc., overlain by Miocene-Pliocene sediments)

Budhitrisna, T. & S. Andi Manggal (1990)- Geological map of the Pagai and Sipora Quadrangle (0712-0713), Sumatra, 1:250,000. Geol. Res. Dev. Centre (GRDC), Bandung.
(Map of W Sumatra forearc/ accretionary prism islands Sipura and N and S Pagai)

Bunting, T., S. Singh, M. Bayly & P. Christie (2008)- Seismic imaging of the fault that caused the great Indian Ocean earthquake of 26 December 2004, and the resulting catastrophic tsunami. The Leading Edge, Oct. 2008, p. 1272-1281.
(Deep seismic image over area of 2004 tsunami earthquake)

Carton, H., S.C. Singh, N.D. Hananto, J. Martin, Y.S. Djajadihardja, Udrekh, D. Franke & C.Gaedicke (2014)- Deep seismic reflection images of the Wharton Basin oceanic crust and uppermost mantle offshore Northern Sumatra: relation with active and past deformation. J. Geophysical Research, Solid Earth, 119, p. 32-51.
(Deep seismic reflection images in Wharton Basin offshore N Sumatra. Profile subparallel to Sumatran trench shows strike-slip deformation over two fracture zones of extinct Wharton Spreading Center. Western fracture associated with a wide region of strong basement topography, difference in crustal thickness of ~1.5 km, and age offset of 9 Ma)

Chauhan, A.P.S, S.C. Singh, N.D. Hananto, H. Carton, F. Klingelhoefer, J.X. Dessa et al. (2009)- Seismic imaging of forearc backthrusts at northern Sumatra subduction zone. Geophysical J. Int. 179, 3, p. 1772-1780.
(online at: http://gji.oxfordjournals.org/content/179/3/1772.full.pdf+html)
(Seismic image of N Sumatran forearc, near 2004 earthquake epicentre shows active back thrusts at seaward edge of Aceh forearc basin. Seaward dipping backstop buttress imaged. Uplifting along backthrust branches may explain presence of forearc islands along Sumatran margin)

Chlieh, M., J.P. Avouac, K. Sieh, D.H. Natawidjaja & J. Galetzka (2008)- Heterogeneous coupling of the Sumatran megathrust constrained by geodetic and paleogeodetic measurements. J. Geophysical Research 113, B05305, 31p.
(Heterogeneous pattern of coupling in Sunda subduction zone. Near equator, megathrust is locked over narrow width of only a few tens of km. In contrast, locked fault zone is up to about 175 km wide in areas where great interplate earthquakes have occurred in past)

Collings, R., D. Lange, A. Rietbrock, F. Tilmann, D. Natawidjaja, B. Suwargadi, M. Miller & J. Saul (2012)- Structure and seismogenic properties of the Mentawai segment of the Sumatra subduction zone revealed by local earthquake traveltime tomography. J. Geophysical Research 117, 1, B01312, p. 1-23.
(Seismicity distribution in S section of Mentawai segment of Sumatra subduction zone reveals significant activity along subduction interface and within two clusters in overriding plate either side of forearc basin. Downgoing slab of hydrated oceanic crust can be traced to ∼50 km depth. Above slab, shallow continental Moho of less than 30 km depth can be inferred. Outer arc islands consist of fluid saturated sediments)

Collings, R., A. Rietbrock, D. Lange, F. Tilmann, S. Nippress & D. Natawidjaja (2013)- Seismic anisotropy in the Sumatra subduction zone. J. Geophysical Research, Solid Earth, 118, 10, p. 5372-5390.
(Seismic anisotropy from observations of shear wave splitting from temporary seismic networks deployed between 2007- 2009. Measurements from fore-arc islands exhibit trench-parallel fast directions, in Sumatran Fault region predominant fast direction fault/trench parallel, in back-arc region trench perpendicular)

Cook, B.J., T.J. Henstock, L.C. McNeill & J.M. Bull (2014)- Controls on spatial and temporal evolution of prism faulting and relationships to plate boundary slip offshore north-central Sumatra. J. Geophysical Research, Solid Earth, 119, 7, p. 5594-5612.
(Across- and along-strike variations in morphology and structure of N-C Sumatran forearc (~1.5°S- 1°N) broadly coincident with subducting plate topography. Two major fault structures divide prism into three strike-parallel belts that can be characterized by the relative fault slip rates along major and minor fault structures)

Darman, H. (2011)- Seismic expression of some geological features of Andaman- offshore West Sumatra subduction zone. Berita Sedimentologi 20, p. 18-21.
(online at: www.iagi.or.id/fosi/bs20-sumatra.html. Seismic examples of accretionary prism and forearc basins off NW Sumatra and Andaman Sea)

Deighton, I, M.M. Mukti, S. Singh, T. Travis, A. Hardwick & K. Hernon (2014)- Nias basin, NW Sumatra- new insights into forearc structure and hydrocarbon prospectivity from long-offset 2D seismic data. Proc. 38th Ann. Conv. Indon. Petroleum Assoc., Jakarta, IPA14-G-299, 21p.
(Nias Basin in Sumatran Forearc between Nias island and Sumatran mainland. Mainly oriented N-S, in ~500m water, shallower than larger basins to NW (750-1000m), and SE (~1500m). Most fold and thrust structures can be related to Mentawai segment to SE. Change in direction along Nias segment resulted in increased uplift of Paleogene forearc sediments exposed on Nias Island. Thick sediments (4.5 sec TWT sub seabed) with half-graben/syn-rift character beneath main forearc package, interpreted as Paleogene. Thickest syn-rift section in SE. Even with low geothermal gradients observed in wells, bottom half of Paleogene mature for hydrocarbon expulsion. Reefal prospects updip from Paleogene kitchen on E margin of basin)

Delescluse, M., N. Chamot-Rooke, R. Cattin, L. Fleitout, O. Trubienko & C. Vigny (2012)- April 2012 intra-oceanic seismicity off Sumatra boosted by the Banda-Aceh megathrust. Nature 490, p. 240-244.
(Two large intra-oceanic earthquakes in NE Indian Ocean on 11 April 2012 largest strike-slip events in historical times. Triggered large aftershocks worldwide. Along fossil fabric of extinct Wharton basin and part of intraplate deformation between India and Australia that followed Aceh 2004 and Nias 2005 megathrust earthquakes. Australian plate, driven by slab-pull forces at the Sunda trench, is detaching from Indian plate, which is subjected to resisting forces at Himalayan front)

Delisle, G. & M. Zeibig (2007)- Marine heat flow measurements in hard ground offshore Sumatra. EOS Trans. American Geophys. Union (AGU) 88, 4, p. 38-39.
(online at: http://onlinelibrary.wiley.com/doi/10.1029/2007EO040004/epdf)
(Hydrocarbon potential of fore arc basins between Siberut, Nias, Simeulue islands and Sumatra investigated in 2006 by BGR with marine-geophysical and marine-geological techniques. Average in situ thermal conductivities of 0.97 watts per meter per Kelvin) at 6 'soft ground' stations lower than average (1.23 watts per meter per Kelvin) at the 10 'hard-ground' stations)

DeShon, H., E. Engdahl, C. Thurber & M. Brudzinski (2005)- Constraining the boundary between the Sunda and Andaman subduction systems: evidence from the 2002 Mw 7.3 Northern Sumatra earthquake and aftershock relocations of the 2004 and 2005 great earthquakes. Geophysical Research Letters 32, L24307, 5p.
(online at: http://igpphome.ucsd.edu/~shearer/Files/Sumatra_Papers/deshon_grl05.pdf)
(2004 Mw 9.0 Sumatra-Andaman earthquake initiated along Andaman subduction zone. Earthquakes history suggests S extent of stable Andaman microplate is ~50-100 km NW of previously reported)

Deonath, A. & B. Mukhopadhyay (2013)- A panoptic view of western margin of Sundaland: causes of seismic vulnerability of Sumatra. J. Geol. Soc. India 81, 5, p. 637-646.
(W margin of Sundaland affected by Burmese-Andaman-Sunda Arc. Downgoing oceanic plate more strongly coupled to overlying plate where it is youngest (~ 40 Ma), has highest temperature and is topographically most elevated with highest seismic activity. Increase in convergence rate and presence of youngest oceanic crust appear to be main controlling factors underpinning tectonics and surge of recent seismic activity in Sumatra)

Dessa, J.X., F. Klingelhoefer, D. Graindorge, C. Andre, H. Permana et al. (2009)- Megathrust earthquakes can nucleate in the forearc mantle; evidence from the 2004 Sumatra event. Geology 37, 7, p. 659-662.
(Seismogenic zone along subduction thrusts generally does not extend to forearc mantle below crust of upper plate. Great 2004 Sumatra-Andaman earthquake propagated downdip along interface between forearc mantle and subducting plate and nucleated along reportedly aseismic part of the interplate contact)

Diament, M., H. Harjono, K. Karta, C. Deplus, D. Dahrin, M.T. Zen et al. (1992)- Mentawai fault zone off Sumatra: a new key to the geodynamics of Indonesia. Geology 20, p. 259-262.
(Oblique subduction in Sumatra region gave rise to Sumatra Fault Zone. New data show second ~600km long Mentawai strike-slip zone in fore-arc E of Mentawai islands, creating Sumatra sliver plate)

Djajadihardja, Y.S., A.H. Satyana, Won Soh, C. Gaedicke, T. Eko, Sasaki, R. Riza & S. Neben (2002)- Offshore southeastern extension of the Sumatran dextral fault: a new discovery in Indonesian marine geology and implications on the tectonics of the Sunda Strait- Southwest Java waters. Proc. 31st Ann. Conf. Indon. Assoc. Geol. (IAGI), Surabaya, 1p. *(Abstract only)*
(Sumatran Fault generally assumed to end in Sunda Strait area around Semangko Bay. However, recent new data shows extension of Sumatran Fault zone running SE as far as 400 km from Semangko Bay. Newly discovered extended Sumatran Fault stops ~30 km N of the Java Trench in SW Java waters)

Djamal, B., W. Gunawan, T.O. Simandjuntak & N. Ratman (1994)- Geological map of the Nias sheet, Sumatra, 1:250,000. Geol. Res. Dev. Centre (GRDC), Bandung.
(Nias island in W Sumatra accretionary prism, with core of Melange Complex with blocks of peridotite, gabbro, serpentinite, basalt, schist, etc., unconformably overlain by 2-3km thick, folded marine late E Miocene and younger Lelematua Fm (formerly Nias Fm) clastics and tuffs and coal, overlain by M Miocene- E Pliocene Gomo Fm)

Dobson, P.B., T. Rahardjo, C.A. Atallah, F.I. Frasse, T.D. Specht, A.S. Djamil, Marhadi, R.E. Netherwood & P.J.M. Montaggioni (1998)- Biogenic gas exploration in Miocene carbonate, West Sumatra, Indonesia. Proc. 26th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 349. *(Poster Abstract)*
(Nias PSC offshore W Sumatra fore-arc basin primary exploration play was M Miocene Isolated Reefs. Low geothermal gradient favors biogenic gas generation and entrapment. Biogenic gas in Miocene pinnacle reefs in 5 of 6 wells. Ibusuma 1 dry hole failed due to poor timing between vertical gas generation and entrapment. Analogous nearby Union Oil Suma 1 and Singkel 1 discoveries likely lateral migration component. Miocene carbonate porosity >23% log, 13.4-39.6% SWC, and 16-70 mD permeability)

Douville, H. (1912)- Les foraminiferes de lȏle de Nias. Sammlungen Geol. Reichs-Museums Leiden, 1, 8, 5, p. 253-278.
(online at: www.repository.naturalis.nl/document/552435)
('The foraminifera from Nias Island'. Descriptions of Tertiary larger foraminifera from Nias from samples collected by Schroder and Verbeek. Includes Middle Eocene Nummulites bagelensis, N. pengaronensis, N. kelatensis, Discocyclina (here called Orthophragmina), Assilina granulosa and Assilina javana (from Oyo Melange?; JTvG), also Early Miocene Lepidocyclina spp. (Eulepidina and Nepholepidina) (from Nias Beds?; JTvG). With 3 plates. No stratigraphy, no maps (but locality map in Van der Veen 1913))

Endharto, Mac & Sukido (1994)- Geological map of the Sinabang (0518) sheet, Sumatera, 1:250,000. Geol. Res. Dev. Centre (GRDC), Bandung.
(Geology of Simeulue and Banyak Islands in forearc accretionary prism off W Sumatra. Core of island Oligo-Miocene Kuala Makmur melange, with blocks of gabbro (up to 250m), basalt, metasediments. Unconformably overlain by E Miocene Lasikin Mb polymict conglomerate. Overlying Miocene Sigulai Fm marls with 400m thick E-M Miocene Sibogo reefal limstone mMb with Miogypsina and Spiroclypeus))

Endharto, Mac (1996)- Neogene geology of the outer-arc ridge: with a special reference of Simeuleu island, West of Sumatra. Proc. 25th Ann. Conv. Indon. Assoc. Geol. (IAGI), 3, p. 470-487.

Engdahl, E.R., A. Villasenor, H.R. DeShon & C.H. Thurber (2007)- Teleseismic relocation and assessment of seismicity (1918-2005) in the region of the 2004 Mw 9.0 Sumatra-Andaman and 2005 Mw 8.6 Nias Island great earthquakes Bull. Seismol. Soc. America 97, 1A, p. S43ï S61.
(Seismicity in Sumatra-Andaman Islands region results from subduction of Indian and Australian oceanic plates beneath Eurasian plate (Andaman microplate, Sunda subplate. Oceanic plates vary in age from 60 Ma off Sumatra to 90 Ma along N Andaman Trench)

Farida, W.N., Y. B. Muslih, B.R. Irwansyah, T. Supratama, B. Novrian & D. Mindasari (2016)- Cenozoic Sumatra accretionary prisms: a new geological perspective and implications for hydrocarbon exploration. Proc. IPA 2016 Technical Symposium, Indonesia exploration: where from- where to, Indon. Petroleum Assoc. (IPA), Jakarta, 18-TS-16, p. 1-17.
(Literature review of Sumatra accretionary prism. High-risk frontier exporation area)

Feng, L., E.M. Hill, P. Banerjee, I. Hermawan, L.L.H. Tsang, D.H. Natawidjaja, B.W. Suwargadi & K. Sieh (2015)- A unified GPS-based earthquake catalog for the Sumatran plate boundary between 2002 and 2013. J. Geophysical Research, Solid Earth, 2015, 120, 5, p. 3566-3598.

Feng, L., E.M. Hill, P. Elosegui, Q. Qiu, I. Hermawan, P. Banerjee & K. Sieh (2015)- Hunt for slow slip events along the Sumatran subduction zone in a decade of continuous GPS data. J. Geophysical Research, Solid Earth, 120, 12, p. 8623-8632.

Franke, D., M. Schnabel, S. Ladage, D.R. Tappin, S. Neben, Y.S. Djajadihardja, C. Muller, H. Kopp & C. Gaedicke (2008)- The great Sumatra-Andaman earthquakes-imaging the boundary between the ruptures of the great 2004 and 2005 earthquakes. Earth Planetary Sci. Letters 269, p. 118-130.
(Ridge on subducting Indo-Australian oceanic crust may exert control on margin segmentation. Ridge masked by sediment; most likely trend NNE–SSW. Interpreted as fracture zone on subducting oceanic plate)

Frankowicz, E. (2011)- Tectono-stratigraphic evolution of the Simeulue forearc basin, NW Sumatra. Berita Sedimentologi 20, p. 22-24.
(Brief review of Simeulue basin in NW Sumatra forearc area. Underlain by Jurassic-Cretaceous Woyla terrane, which accreted to Sundaland in late M Cretaceous, after which all of Sumatra subaerially eroded (no Late Cretaceous-Early Paleogene sediments). Early/Mid Paleogene extension in forearc area lead to formation of grabens; oldest oldest rocks penetrated by wells are Upper Eocene- Lower Oligocene dolomitic limestones, calcareous mudstones and pyritic shales. Late Oligocene uplift and erosion of forearc resulted in Top Paleogene unconformity, followed by E Miocene marine transgression. E-M Miocene carbonates overlain by Late Miocene Pliocene clastics derived from Barisan Mts)

Frederik, M.C.G. (2016)- Morphology and structure of the accretionary prism offshore North Sumatra, Indonesia and offshore Kodiak Island, USA: a comparison to seek a link between prism formation and hazard potential. Ph.D. Thesis University of Texas at Austin, p. 1-136.
(online at: https://repositories.lib.utexas.edu/handle/2152/45947)
(Incl. study of accretionary prism offshore N Sumatra between 1-7°N. Steep outer slope (5-12°), plateau ~100-120 km wide, and steep inner slope adjacent to Aceh Basin. Predominantly landward vergence from deformation front for ~70 km landward. Prism toe region prominent mass failures. Etc.)

Frederik, M.C.G., S.P.S. Gulick, J.A. Austin, N.L.B. Bangs & Udrekh (2015)- What 2-D multichannel seismic and multibeam bathymetric data tell us about the North Sumatra wedge structure and coseismic response. Tectonics 34, 9, p. 1910-1926.
(online at: http://onlinelibrary.wiley.com/doi/10.1002/2014TC003614/epdf)
(Bathymetric and seismic surveys across accretionary prism off NW Sumatra. Accretionary wedge in study area up to~180 km wide, narrowing to 125km to S, near Simeulue island. Seafloor depths ~4.5 km near Sunda Trench to <1 km on fore-arc high near fore-arc basin. Wedge consists of steep outer slope (5-12°), plateau ~100-120 km wide with anticlinal folds spaced 2-15km apart, and steep inner slope adjacent to Aceh forearc Basin. Mainly landward-vergent folds at trench side, mainly seaward vergent folds at landward side)

Ghosal, D., S.C. Singh, A.P.S. Chauhan & N.D. Hananto (2012)- New insights on the offshore extension of the Great Sumatran fault, NW Sumatra, from marine geophysical studies. Geochem., Geophys. Geosystems 13, 11, Q0AF06, p. 1-18.
(online at: http://onlinelibrary.wiley.com/doi/10.1029/2012GC004122/epdf)
(High-res bathymetry shows NW offshore extension of Great Sumatra FZ near Banda Aceh into young SW transpressional Breueh and NE transtensional Weh basins, with Sumatran volcanic arc passing through Weh basin)

Ghosal, D., S.C Singh & J. Martin (2014)- Shallow subsurface morphotectonics of the NW Sumatra subduction system using an integrated seismic imaging technique. Geophysical J. Int. 198, 3, p. 1818-1831.
(Improved seismic imaging of accretionary wedge complex in NW Sumatra forearc)

Graindorge, D., F. Klingelhoefer, J.C. Sibuet, L. McNeill, T.J. Henstock, S. Dean, M.A. Gutscher, J.X. Dessa, H Permana et al. (2008)- Impact of lower plate structure on upper plate deformation at the NW Sumatran convergent margin from seafloor morphology. Earth Planetary Sci. Letters 275, p. 201-210.
(Multibeam bathymetric data in region of 26 Dec. 2004 earthquake providing seafloor images of NW Sumatra forearc. Greatest slope gradients in frontal 30 km of forearc, at toe of accretionary wedge. N-S oriented lineaments on incoming oceanic plate, etc.)

Guntoro, A. & Y.S. Djajadiharja (2005)- Tectonic scenario of the Sumatra fore-arc basin in relation to the formation of petroleum systems. In: Proc. Int. Conf. Geology, Geotechnology and Mineral Resources of Indochina (GEOINDO 2005), Khon Kaen, Thailand, p. 28-30.

Hall, D.M., B.A. Duff, M.C. Courbe, B.W. Seubert, M. Siahaan & A.D. Wirabudi (1993)- The southern fore-arc zone of Sumatra: Cainozoic basin forming tectonism and hydrocarbon potential. Proc. 22nd. Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 319-344.
(Bengkulu PSC localized basins with four megasequences: (1) Paleogene syn-rift in NE-trending half grabens; (2) Major unconformity, then Late Paleogene- E Miocene in local pull-apart basins on underlying graben; (3) Unconformity, then M - Late Miocene open marine deposition in unified forearc basin; (4) regressive Pliocene-Recent syn-orogenic megasequence, from main Barisan Mts uplift. Basin inversion intensity increases from offshore to mountain belt. Fore-arc tectonically heterogeneous with potential for localised Paleogene and early Neogene basins and hydrocarbons. Wells indicate mature source and migrated hydrocarbons, and contradict assumption that heat flow in fore-arc areas is insufficient to allow expulsion and migration of hydrocarbons)

Hananto, N.D., S.C. Singh, M. Mukti & I. Deighton (2012)- Neotectonics of North Sumatra Forearc. Proc. 36th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA12-G-100, p. 1-13.
(Strain of oblique subduction at NW Sumatra forearc partitioned into two major directions, perpendicular (fold and thrust system in accretionary wedge) and parallel to trench (Sumatra Fault Zone on Sumatra mainland) Residual strain created two major structural features in forearc: 1) W-Andaman Faults (strike-slip faults/deep rooted backthrust between accretionary wedge sediments and continental crust. 2) Strike slip fault close to Sumatra platform. Deformation along forearc basin mainly compressional)

Handayani, L. & H. Harjono (2008)- Perkembangan tektonik daerah busur muka Selat Sunda dan hubungannya dengan zona sesar Sumatera. J. Riset Geologi Pertambangan (LIPI) 18, 2, p. 31-40.
('The tectonic development of the Sunda Strait forearc area and its relationship to the Sumatran Fault Zone'. Sunda Strait forearc interpreted as ongoing separation of area as Sumatra forearc plate moved NW, bounded by Sumatra Fault. Sumatra Fault can be viewed to extend across fore arc to trench as several graben systems)

Hanus, V., A. Spicak & J. Vanek (1996)- Sumatran segment of the Indonesian subduction zone: morphology of the Wadati-Benioff zone and seismotectonic pattern of the continental wedge. J. Southeast Asian Earth Sci. 13, 1, p. 39-60.
(Earthquake foci in Sumatra either in recent Benioff zone or in continental wedge. Intermediate-depth aseismic gap in Wadati-Benioff zone associated with young calc-alkaline volcanism. Subduction process was correlated

with stratigraphy and geology. Duration of present cycle of subduction ~6-8 Ma. Oligocene volcanism and deep earthquakes point to Tertiary subduction zone underlying present slab. Seismotectonic pattern of continental wedge described by 11 seismically active fracture zones)

Harbury, N.A. & H.J. Kallagher (1991)- The Sunda outer-arc ridge, North Sumatra, Indonesia. J. Southeast Asian Earth Sci. 6, 3-4, p. 463-476.
(Revised stratigraphy and Tertiary evolution of Nias and Simeulue islands in outer part of forearc. Oligocene and Eocene increase in subduction rate led to basin inversion and uplift of outer arc ridge. Deposits include melanges (?Eocene-Oligocene) and Neogene initially (E Miocene) deposited in deep water. Stable convergence rates through M Miocene, with deposition dominated by shallow water clastics and carbonates deposited on well-developed shelf and shelf-break. In Late Miocene, outer shelf limestones. Plio-Pleistocene clastics with volcanic detritus from rapidly eroding Sumatra volcanic arc)

Harbury, N.A., B. Situmorang, Sarjono D., J. Milsom, F.T. Banner & M.G. Audley-Charles (1989)- Tectonic inversions in the Sunda forearc. In: Proc. 24th Sess. Comm. Co-ord. Joint Prospecting Mineral Resources in Asian Offshore Areas (CCOP), Bangkok 1987, 2, p. 116- 122.
(Simeulue island in N Sumatra forearc two compressional and two extensional phases since end of Eocene. Forearc emerged as island in Late Oligocene- E Miocene, exposing imbricated ophiolite and melange. Fringing reefs developed in E-M Miocene. Mio-Pliocene turbidites (extension) followed by re-emergence after strong Late Pliocene- Early Quaternary folding)

Hariadi, N. & R.A. Soeparjadi (1975)- Exploration of the Mentawai Block, West Sumatra. Proc. 4th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 55-65.
(Post-mortem of unsuccessful exploration of Mentawai Block, offshore W Sumatra fore arc, by Jenney group 1969-1974. Two wells drilled in 1972 Mentawai A 1 and C1 with minor methane shows. Two onshore stratigraphic wells drilled in 1974 without hydrocarbon indicatons: Bengkulu X-1 and X2. One active onshore oil seep identified SE of Bengkulu town))

Harmon, N., T. Henstock, F. Tilmann, A. Rietbrock & P. Barton (2012)- Shear velocity structure across the Sumatran forearc-arc. Geophysical J. Int. 189, 3, p. 1306-1314.
(online at: https://academic.oup.com/gji/article/189/3/1306/609255)
(Velocity model across part of W Sumatra forearc region. Progression in shear velocity across forearc to arc associated with thickening of accretionary prism and development of arc crust. Downgoing Indian Plate low seismic velocities, consistent with 14-24 % serpentinization of oceanic crust and upper mantle adjacent to Investigator fracture zone. Rapidly increasing sediment thickness in accretionary wedge of 6-15 km)

Henstock, T.J., L.C. McNeill, J.M. Bull, B.J. Cook, S.P.S. Gulick, J.A. Austin, H. Permana & Y.S. Djajadihardja (2016)- Downgoing plate topography stopped rupture in the A.D. 2005 Sumatra earthquake. Geology 44, 1, p. 71-74.
(online at: http://geology.gsapubs.org/content/44/1/71.full.pdf+html)
(Isolated 3 km basement high off Nias is close to termination of slip of 2005 earthquake. It probably originated at Wharton fossil spreading ridge and may locally strengthen plate boundary, stopping rupture propagation)

Henstock, T.J., L.C. McNeill & D.R.Tappin (2006)- Seafloor morphology of the Sumatran subduction zone; surface rupture during megathrust earthquakes? Geology 34, 6, p. 485-488.
(High-resolution multibeam bathymetry data from Sumatran subduction zone)

Heyde, I., M. Block, Y.S. Djajadihardja, J.P. Hutagaol, H. Lelgemann, H.A. Roeser & B. Schreckenberger (2001)- Gravimetric measurements and their interpretation on the active convergence zone between the East Eurasian and Indo-Australian plates along Indonesia. In: Proc. CCOP 37th Ann. Sess. Bangkok 2000, 2, Techn. Repts., p. 12-26.
(Free air gravity anomaly maps of forearc of SW Sumatra- W Java and Sunda Straits and comparison with satellite gravity. Marine gravity data higher resolution than satellite data)

Hippchen, S. & R.D. Hyndman (2008)- Thermal and structural models of the Sumatra subduction zone: implications for the megathrust seismogenic zone. J. Geophysical Research 113, B12103, p. 1-12.
(Sumatra updip seismogenic limit is thermally controlled, but downdip limit is governed by the intersection of downgoing plate with fore-arc Moho)

Howles, A.C. (1984)- Structural and stratigraphic interpretation of the Bengkulu shelf, southwest Sumatra. M.Sc. Thesis University South Carolina, p. 1-94.

Howles, A.C. (1986)- Structural and stratigraphic evolution of the southwest Sumatran Bengkulu shelf. Proc. 15th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 215-243.
(Paleogene basin with >10,000' sediment under Bengkulu shelf interpreted as continuation of S Sumatran graben system. Mid-Oligocene unconformity truncates basement high and signifies possible change in tectonic configuration of region. Switch of rapid subsidence from E side of basement high to W side with initiation of Sumatran forearc. Right-lateral slip along Sumatran fault began in M Miocene. Restoring ~150 km offset along Sumatran fault causes graben to line up with S Sumatra Benakat Gully. Neogene transgressive cycle began with deposition of E Miocene Baturaja carbonates. M Miocene Parigi carbonate between fine clasticts and younger deltaic regressive sequence. Erosion of Barisan Mountains generated Plio-Pleistocene deltaic/slope deposits which prograde onto E flank of Sumatran forearc basin)

Hupers, A., M.E. Torres, S. Owari, L.C. McNeill, B. Dugan, T.J. Henstock, K.L. Milliken, K.E. Petronotis, J. Backman et al. (2017)- Release of mineral-bound water prior to subduction tied to shallow seismogenic slip off Sumatra. Science 356, 6340, p. 841-844.

Icke, H. & K.Martin (1907)- Over Tertiaire en Kwartaire vormingen van het eiland Nias. Sammlungen Geol. Reichs-Museums Leiden, Ser. 1, 8, p. 204-252.
(online at: www.repository.naturalis.nl/document/552383)
('On Tertiary and Quaternary deposits of Nias Island'. Mainly descriptions of 51 species of gastropods and bivalve molluscs. With 5 plates, but no locality maps. Larger foraminifera from same samples studied by Douville (1912))

Izart, A., B.M. Kemal & J.A. Malod (1994)- Seismic stratigraphy and subsidence evolution of the northwest Sumatra fore-arc basin. Marine Geology 122, 1-2, p. 109-124.
(New seismic in Sumatra margin fore-arc. Area of oblique subduction with two large strike-slip faults parallel to subduction trench: onshore Sumatra fault and offshore Mentawai fault, separating accretionary prism from fore-arc basin. Widespread truncation at Top Paleogene reflect uplift and erosion event. Followed by Miocene subsidence, evidenced by two transgressive-regressive shelf sequences. In Pliocene-Quaternary fore-arc basin segmented into several sub-basins (Aceh, Simeulue and Nias basins) by compressional zones or strike-slip faults. Subsidence rate increased, producing sequence 3 for Pliocene, and 4 for Quaternary. Local variations in sediment thickness indicate tectonics prevail over eustacy)

Kallagher, H.J. (1989)- The structural and stratigraphic evolution of the Sunda Forearc Basin, North Sumatra. Ph.D. Thesis University of London, p. 1-387. *(Unpublished)*

Kallagher, H.J. (1990)- K-Ar dating of selected igneous samples from the Sibolga Basin, Meulaboh and Semeulue Island, Western Sumatra. Lemigas Scientific Contr. 14, 1, Spec. Issue, p. 99-111.
(Biotite from granodiorite in Seumayam Complex in Barisan Mts K-Ar age of ~98.6 Ma; biotites from Meuko River granodiorite ~56.2 and 53.2 Ma, compatible with Cretaceous- E Paleogene granitic activity recorded elsewhere in N Sumatra. Gabbro from E Simeulue ophiolite 35.4± 3.6 and 40.1 ± 2.7 Ma (Late Eocene), possibly representing formation as part of Indian Ocean floor. Basaltic- andesitic volcanics from Barisan Mts on E margin of Sibolga Basin 16- 9 Ma (M-L Miocene). Start of volcanic activity in M Miocene coincided with uplift of Barisan Mts along E margin of Sibolga Basin (E- M Miocene sediments only minor evidence of contemporaneous volcanic activity))

Karig, D.E. (1980)- Material transport within accretionary prisms and the "knocker" problem. J. Geology 88, 1, p. 27-39.
(On presence of high-pressure metamorphic rocks as blocks (knockers) and thrust sheets within non-metamorphic rocks in accretionary complexes. Using analog of modern Sumatra trench system, where deformation is concentrated near base of trench slope, whereas blueschist formation is assumed to occur much deeper. Mixing of incompatible lithologies in subduction complexes might better be explained by strike-slip faulting along trends sub-parallel to arc)

Karig, D.E., M.K. Lawrence, G.F. Moore & J.R. Curray (1980)- Structural framework of the fore-arc basin, NW Sumatra. J. Geol. Soc. London 137, p. 77-91.
(Sumatra fore-arc basin subsiding trough between rising subduction complex and elevated continental core. Up to 4 km of Miocene-Recent on E flank of basin over unconformity cut across Paleogene continental margin that was uplifted and disrupted in Late Oligocene. Large step-like offsets of paleo-shelf edge attributed to right-lateral strike-slip faults, splaying across fore-arc from Sumatra Fault Zone. Offsets up to 100 km+, producing marginal re-entrants that became sites of turbidite-filled basins behind growing Neogene accretionary prism. Larger re-entrants may be floored with oceanic crust. Seaward flank of fore-arc basin migrated W during Neogene subduction. By late M Miocene, trench slope break was near sea level and formed shelf edge high. Thrusting and folding related to subduction probably decreased gradually upslope until LatePliocene, when large flexures and E-directed reverse faults developed)

Karig, D.E., G.F. Moore, J.R. Curray & M.B. Lawrence (1980)- Morphology and shallow structure of the lower trench slope off Nias Island, Sunda Arc. In: D.E. Hayes (ed.) The tectonic and geologic evolution of Southeast Asian seas and islands-1, American Geophys. Union (AGU), Geophys. Monograph 23, p. 179-208.
(In Sunda Arc subduction system 90% of shortening due to plate convergence occurs in distal accretionary prism, within 25 km of trench. Deformation in slope basins decreases rapidly upward as age decreases)

Karig, D.E., S. Suparka, G.F. Moore & P.E. Hehunassa (1978)- Structure and Cenozoic evolution of the Sunda Arc in the Central Sumatra region. UN ESCAP, CCOP Techn. Bull. 12, p. 43-86.
(Same paper as Karig et al. 1978 below)

Karig, D.E., S. Suparka, G.F. Moore & P.E. Hehunassa (1978)- Structure and Cenozoic evolution of the Sunda Arc in the Central Sumatra region. In: J.S. Watkins et al. (eds.) Geological and geophysical investigations of continental margins, American Assoc. Petrol. Geol. (AAPG), Mem. 29, p. 223-237.
(W Sumatra margin reflects effects of subduction and right-lateral slip. Nias consists of mid-Tertiary melange and less deformed younger beds. Forearc basin at least 4km sediment. Unconformity around Paleogene-Miocene boundary. Inner shelf and coastal mountains common Oligocene andesitic intrusives and volcanics (farther W than younger and older volcanic centers). Major uplift of Barisan Mts in Late Miocene- Pliocene)

Karta, K., Zuki & Isnawati (1998)- Geodynamics of the north Sumatra fore arc as caused by oblique subduction: results of the Sumenta expedition of R.V. Baruna Jaya III. In: J.L. Rau (ed.) Proc. 34th Sess. Sess. Co-ord. Comm. Coastal Offshore Geosc. Programs E and SE Asia (CCOP), Taejon, Korea 1997, 2, Techn. Repts, p. 172-185.

Khan, P.K. & P.P. Chakraborty (2009)- Bearing of plate geometry and rheology on shallow-focus mega-thrust seismicity with special reference to 26 December 2004 Sumatra event. J. Asian Earth Sci. 34, p. 480-491.

Kieckhefer, R.M., G.F. Moore, F.J. Emmel & W. Sugiarta (1981)- Crustal structure of the Sunda forearc region west of central Sumatra from gravity data. J. Geophysical Research 86, p. 7003-7012.
(Gravity modeling of transect S of Nias. Free-air anomalies -100 mGal low 10-20 km landward of trench axis and +80 mGal high over outer arc ridge but also large anomalies unrelated to topography. An 80 mGal rise may be near-surface body of high-density material (oceanic crust?). This slab may be exposed on SW coast of Nias, where ultramafic bodies were mapped. A -30 mGal free-air low over forearc basin modeled best if pre-Miocene melange or continental crust underlies basin)

Kieckhefer, R.M., G.G. Shor, J.R. Curray, W. Sugiarta & F. Hehuwat (1980)- Seismic refraction studies of the Sunda trench and forearc basin. J. Geophysical Research 85, B2, p. 863-889.
(Six refraction lines around Nias Island, NW Sumatra, parallel to structure)

Kissling, E.A. (1948)- Enkele stratigrafische mededelingen over de eilanden voor de Z.W. kust van Sumatra. Geologie en Mijnbouw 10, 5, p. 118. *(Abstract only)*
('Some stratigraphic notes on the islands off the SW coast of Sumatra'. Summary of lecture on Mentawai islands (Nias, etc.), which show remarkably similar Tertiary stratigraphy over ~1200km. Common Miocene basic extrusives. In central islands Miocene isoclinally folded at end-Miocene, i.e. earlier than Sumatra)

Klingelhoefer, F., M.A. Gutscher, S. Ladage, J.X. Dessa, D.F. Graindorge, A. Camille, H. Permana, T. Yudistira & A. Chauhan (2010)- Limits of the seismogenic zone in the epicentral region of the 26 December 2004 great Sumatra-Andaman earthquake: Results from seismic refraction and wide-angle reflection surveys and thermal modeling. J. Geophysical Research 115, B1, B01304, p. 1-23.
(online at: http://onlinelibrary.wiley.com/doi/10.1029/2009JB006569/epdf)
(2004 Sumatra earthquake initiated at ~ 30km depth and ruptured 1300km of Indo-Australian- Sunda plate boundary. Seismic velocity model from tomography and forward modeling shows deep structure of earthquake source region. 4-5km of sediments on oceanic crust at trench. Crystalline backstop 120 km from trench axis, below fore-arc basin. Shallow continental Moho (22 km depth), 170 km from trench. Seismogenic zone begins 5-30 km from trench. Deeper part of rupture along contact between mantle wedge and downgoing plate)

Kopp, H. (2001)- Crustal structure along the central Sunda Margin, Indonesia. Dissertation Christian-Albrechts Universitat, Kiel, p. 1-138.
(online at: http://macau.uni-kiel.de/receive/dissertation_diss_00000439)
(Seismic and gravity study of 5600 km long forearc margin of Sumatra- Java. Subduction zone significant variation of trench curvature resulting in areas of normal and of oblique subduction. Frontal part of prism experiencing active accretion between deformation front and active backstop structure, which separates accretionary domain from outer high. Velocities under outer high fairly low, suggesting sedimentary origin. Forearc basin undeformed. Significant change of Moho depth under forearc basin: shallow Moho under Java forearc domain, crust under Sumatra forearc off Sumatra is more continental)

Kopp, H., E.R. Flueh, D. Klaeschen, J. Bialas & C. Reichert (2001)- Crustal structure of the central Sunda margin at the onset of oblique subduction. Geophysical J. Int. 147, 2, p. 449-474.
(online at: http://gji.oxfordjournals.org/content/147/2/449.full.pdf+html)
(Data off S Sumatra and Sunda Strait show lateral increase in dip of subducted plate from 5° to 7° below outer high off Sumatra to Sunda Strait. Downgoing slab traced to >30 km depth. Backstop structure underlying trench slope break defines landward termination of accretionary prism. Velocities of outer high moderate, suggest sediments. Reduced reflectivity beneath rugged top basement supports high degree of deformation and compaction. Several km of sediment in forearc, with distinct basin recognized off S Sumatra but not off Sunda Strait. Bathymetric elevation of Java shelf in S Sunda Strait corresponds to increased basement high velocities and is connected to Sunda Strait transtensional basin. Velocity-depth model indicates continental-type crust under forearc basin off S Sumatra, whereas lower velocities found beneath Sunda Strait forearc)

Kopp, H., R. Weinrebe, S. Ladage, U. Barckhausen, D. Klaeschen, E.R. Flueh, C. Gaedicke, Y. Djajadihardja et al. (2008)- Lower slope morphology of the Sumatra trench system. Basin Research 20, p. 519-529.
(online at: http://onlinelibrary.wiley.com/doi/10.1029/2006EO170001/pdf)
(Lower plate fabric extensively modulates upper plate morphology and morphotectonic segmentation of Sumatra trench system is linked to subduction of reactivated fracture zones and aseismic ridges of Wharton Basin. In general, increasing intensity of mass-wasting processes, from S to N, correlates with oversteepening of lower slope, probably in response to alternating phases of frontal accretion and sediment underthrusting)

Ladage, S., C. Gaedicke, U. Barckhausen, I. Heyde, W. Weinrebe, E.R. Flueh et al. (2006)- Bathymetric survey images structure off Sumatra. EOS Transactions American Geophys. Union (AGU) 87, 17, p. 165.

(Fault rupture models and aftershock activities of 2004 and 2005 earthquakes postulate strong structural segmentation of the Sumatra fore arc. Bathymetric images reveal multitude of morphological features)

Lange, D., F. Tilmann, T. Henstock, A. Rietbrock, D. Natawidjaja & H. Kopp (2018)- Structure of the Central Sumatran subduction zone revealed by local earthquake travel time tomography using amphibious data. Solid Earth Discussions, p. 1-24.
(online at: https://www.solid-earth-discuss.net/se-2017-128/se-2017-128.pdf)
(Tomographic model of C Sumatra subduction zone suggests thinned continental crust below basin E of forearc islands (Nias, Pulau Batu, Siberut) at ~180 km from trench. Reduced vp velocities beneath forearc region between Mentawai Islands and Sumatra mainland possibly reflect reduced thickness of overriding crust)

Lange, D., F. Tilmann, A. Rietbrock, R. Collings, D.H. Natawidjaja, B.W. Suwargadi et al. (2010)- The fine structure of the subducted Investigator Fracture Zone in Western Sumatra as seen by local seismicity. Earth Planetary Sci. Letters 298, p. 47-56.
(Earthquake data from dense local seismic network along segment of Sumatra forearc margin where Investigator Fracture Zone is subducted below Sunda plate. Well-defined linear streak of seismicity extending from 80- 200 km depth along prolongation of IFZ sub-ridges. More intermediate depth seismicity to SE related to subducted rough oceanic seafloor)

Lasitha, S. (2007)- Geodynamics of the Andaman Sumatra Java Trench Arc system based on gravity and seismotectonic study. Doct. Thesis, Cochin University of Science and Technology, p. 1-191. *(Unpublished)*
(online at: http://dyuthi.cusat.ac.in/xmlui/handle/purl/2993)
(Study of variation in subduction zone geometry along and across Sunda arc and fault patterns within subducting plate)

Lasitha, S., M. Radhakrishna & T. D. Sanu (2006)- Seismically active deformation in the Sumatra-Java trench-arc region: geodynamic implications. Current Science 90, 5, p. 690-696.
(Crustal deformation rates for Sumatra-Java arc region highlight (1) large variations in dextral shear motion along the Sumatran Fault Zone (SFZ); (2) dominantly compression offshore Sumatra fore-arc and (3) dominance of compression in W part of offshore Java fore-arc, gradually changing to extension to E. Deformation pattern off Sumatra indicates Mentawai fault partly accommodates oblique subduction motion)

Lawver, L.A. & P.T. Taylor (1987)- Heat flow off Sumatra. In E.N. Shor & C.L. Ebrahimi (eds.) Marine geophysics: a Navy symposium, p. 67-76.

Lay, T., H. Kanamori, C.J. Ammon, M. Nettles, S.N. Ward, R.C. Aster et al. (2005)- The Great Sumatra-Andaman earthquake of 26 December 2004. Science 308, p. 1127-1133.

Lestari, R.A., L. Fauzielly, Winantris & Yudhicara (2014)- Indikasi endapan tsunami berdasarkan subfosil di rawa daerah Simeulue, Sumatera Utara. Bull. Scientific Contr. (UNPAD) 12, 3, p. 163-170.
(online at: http://jurnal.unpad.ac.id/bsc/article/view/8377/3893)
('Indications of tsunami deposits by subfossils in the swamp of the Simeulue area'. Presumed tsunami deposit with mixed marine foraminifera from middle (Elphidium, Pararotalia) and outer neritic (Heterolepa subhaidingeri) environments)

Lin, J.Y., X. Le Pichon, C. Rangin, J.C.Sibuet & T. Maury (2009)- Spatial aftershock distribution of the 26th December 2004 great Sumatra-Andaman earthquake in the northern Sumatra area. Geochem. Geophys. Geosystems 10, 5, Q05006, p. 1-15.
(online at: http://onlinelibrary.wiley.com/doi/10.1029/2009GC002454/epdf)

Lin, J.Y., C.L. Lo, W.N. Wu, J.C. Sibuet, S.K. Hsu & Y.Y. Wen (2015)- Crustal thickening and extension induced by the Great Sumatra-Andaman earthquake of 26 December 2004: revealed by the seismic moment tensor element Mrr. Marine Geophysical Res. 36, 2, p. 187-195.

(Epicenter of 2004 mainshock near area where accumulated 'radial seismic moment' (Mrr) was highest during inter-seismic period. Negative accumulated Mrr at 40-100 km depth suggest down-dip extension caused by slab pull effect)

Lin, J.Y., J.C. Sibuet, S.K. Hsu & W.N. Wu (2014)- Could a Sumatra-like megathrust earthquake occur in the south Ryukyu subduction zone? Earth Planets and Space 2014, 66:49, p. 1-8.
(online at: www.gep.ncu.edu.tw/upload/focus/21/2014_Jing-Yi_Lin_EPS.pdf)
(Comparison of geological- geophysical environments of Himalaya-Sumatra and Taiwan-Ryukyu collision-subduction systems. Both areas highly oblique convergence and similar tectonic stress regimes. Intersections of oceanic fracture zones with subduction systems show trench-parallel high free-air gravity anomalies in fore-arcs and epicenters of large earthquakes at boundary between positive and negative gravity anomalies)

Ling, H.Y. & M.A. Samuel (1998)- Siliceous microfossils from Nias Island: their significance for the Tertiary paleoceanography of the northeast Indian Ocean. J. Asian Earth Sci. 16, 4, p. 407-417.
(M Eocene radiolarians in red chert from ophiolitic basement of SW Nias constrains oldest age of emplacement of ophiolitic basement. Low-latitude assemblage with Dictyoprora amphora, Lithochytris vespertilio, Podocyrtis and Theocotylissa ficus. (Similar to M Eocene radiolarians in ophiolitic melange of S Andaman (Ling and Srinivasan 1993) and nearby DSDP Site 216). Also sample with lateM Miocene radiolaria in diatomite from Lahewa subbasin with rel. cool water diatoms (signifying upwelling?))

Liu, C.S., G.G. Shor & J.R. Curray (1991)- Velocity structure and nature of the forearc basin off West Sumatra from expanding spread experiments. Acta Oceanographica Taiwanica 27, p. 21-39.

Lutz, R., K. Berglar, C. Gaedicke & D. Franke (2007)- Petroleum systems modelling in the Simeulue forearc basin off Sumatra. AAPG Hedberg Conference, The Hague, p. *(Abstract only)*
(Simeulue forearc basin off N Sumatra explored by Union Oil from 1968-1978. Three wells with gas in carbonate reservoirs but none commercial. New 2D seismic by BGR (2006) shows 25 carbonate buildups, most in >1000 m water depth, showing backstepping geometry. Source rocks in area not confirmed by drilling)

Lutz, R., C. Gaedicke, K. Berglar, D. Franke, S. Schloemer & Y.S. Djajadihardja (2010)- Petroleum systems of the Simeulue Fore-arc Basin off Sumatra, Indonesia. AAPG Int. Conf. Exhib., Rio de Janeiro, Brazil 2009, 7p.
(online at: www.searchanddiscovery.net/documents/2010/10230lutz/ndx_lutz.pdf)
(Expanded Abstract; short version of paper below)

Lutz, R., C. Gaedicke, K. Berglar, S. Schloemer, D. Franke & Y.S. Djajadihardja (2009)- Petroleum systems of the Simeulue fore-arc basin, offshore Sumatra, Indonesia. American Assoc. Petrol. Geol. (AAPG) Bull. 95, 9, p. 1589-1616.
(Fore-arc basins generally not considered as important petroleum provinces because of low heat flow. Simeulue fore-arc basin off N Sumatra bright spots on seismic above potential carbonate platform reservoirs, with AVO/AVA analyses indicating presence of gas. Petroleum system modeling of assumed source rocks in Eocene and E-M Miocene reveals hydrocarbon generation is possible in main depocenters of C and S Simeulue Basin and may be more prolific than previously thought)

Malod, J.A., B.M. Kemal, M.O. Beslier, C. Deplus, M. Diament et al. (1993)- Deformations du bassin dûavant-arc au Nord-Ouest de Sumatra: une reponse a la subduction oblique. Comptes Rendus Academie Sciences, Paris 316, p. 791-797.
('Deformation of the fore-arc basin NW of Sumatra; a response to oblique subduction'. NW Sumatra example of oblique convergence, expressed by two major strike-slip fault zones: Sumatra and Mentawai faults. Mentawai fault zone continues N-ward, and fore-arc basin segmented by strike-slip or compressional features)

Malod, J. & B.M. Kemal (1996)- The Sumatra margin: oblique subduction and lateral displacement of the accretionary prism. In: R. Hall & D.J. Blundell (eds.) Tectonic evolution of SE Asia, Geol. Soc., London, Spec. Publ. 106, p. 19-28.

(Oblique convergence in Sumatra forearc partitioned into trench- perpendicular convergence and strike-slip parallel to trench. Strike-slip along two major faults, Sumatra and Mentawai FZ. Mentawai fault attenuated at N end, terminates in accretionary prism. It is relayed and connected to Sumatra fault. Pattern can be explained with two sliver plates, Mentawai and Aceh, on top of which forearc basin developed. Accretionary prism moving NW along Mentawai fault. No extension within Mentawai plate, suggesting uniform motion along Sumatra fault S of 3°N. Strike-slip along Mentawai fault explained by better coupling between subducting slab and upper plate beneath accretionary prism compared to forearc)

Matson, R.G. & G.F. Moore (1992)- Structural influences on Neogene subsidence in the Central Sumatra fore-arc basin. In: J.S. Watkins et al. (eds.) Geology and geophysics of continental margins, American Assoc. Petrol. Geol. (AAPG), Mem. 53, p. 157-181.
(C Sumatra fore-arc Singkel and Pini subbasins with 11 Neogene sequences. In Miocene- E Pliocene both subbasins subsided independently. Initial subsidence of Singkel Basin from lateral translation of structural block between Batee and Singkel faults. Regional basin subsidence from deflection of descending oceanic plate, created when material was added to and/or redistributed in accretionary wedge. Structural influences on fore-arc basin subsidence: (1) location of continental margin; (2) presence of strike-slip faults traversing fore arc; and (3) local and regional deformation within accretionary wedge)

McCaffrey, R. (1991)- Slip-vectors and stretching of the Sumatra fore arc. Geology 19, p. 881-884.
(Thrust earthquakes at Java trench SW of Sumatra suggest Sumatra fore arc translated to NW by oblique plate convergence. NW motion of forearc rel. to SE Asia increases from zero at Sunda Strait to 45-60 mm/yr in NW Sumatra)

McCaffrey, R. (1992)- Oblique plate convergence, slip vectors, and forearc deformation. J. Geophysical Research, Solid Earth, 97, B6, p. 8905-8915.
(On oblique plate convergence, with examples from Sumatra forearc. Thrust earthquakes suggest partial decoupling, where component of arc-parallel motion of leading edge of upper plate results in less oblique thrusting at trench)

McCaffrey, R. (1996)- Estimates of modern arc-parallel strain rates in fore arcs. Geology 24, 1, p. 27-30.
(Arc-parallel extension strain observed in fore arcs of Sumatra, etc. subduction zones. Fore arcs deform even where convergence is perpendicular to curved margins, demonstrating that head-on subduction can produce 3-dimensional strain field)

McCaffrey, R. (2009)- The tectonic framework of the Sumatran subduction zone. Annual Review Earth Planetary Sci. 37, p. 345-366.
(online at: http://www.web.pdx.edu/~mccaf/pubs/mccaffrey_areps_2009.pdf)
(Well-illustrated overview of Sumatra subduction zone and earthquakes)

McCaffrey, R., P.C. Zwick, Y. Bock, L. Prawirodirdjo, J.F. Genrich, C.W. Stevens, S.S.O. Puntodewo & C. Surabaya (2000)- Strain partitioning during oblique plate convergence in northern Sumatra: geodetic and seismologic constraints and numerical modeling. J. Geophysical Research 105, B12, p. 28363-28376.
(online at: http://onlinelibrary.wiley.com/doi/10.1029/1999JB900362/pdf)
(GPS measurements along subduction zone of N Sumatra (2°S- 3°N) reveal oblique convergence strain partitioned between trench-normal contraction in forearc and trench-parallel shear strain in few tens of km of Sumatran fault. Volcanic arc can help partitioning by localizing margin-parallel shear strain in upper plate if weaker than its surroundings. Highest coupling on plate boundary beneath and seaward of forearc islands, consistent with rupture zones large earthquakes there)

McNeill, L.C., B. Dugan, J. Backman, K.T. Pickering, H.F.A. Pouderoux, T.J. Henstock, K.E. Petronotis, A. Carter, F. Chemale, K.L. Milliken, S. Kutterolf, H. Mukoyoshi et al. (2017)- Understanding Himalayan erosion and the significance of the Nicobar Fan. Earth Planetary Sci. Letters 475, 1 p. 134-142.
(online at: https://www.sciencedirect.com/science/article/pii/S0012821X17303977)

(First sampling of full sedimentary section of Bengal-Nicobar Fan W of N Sumatra by IODP Expedition 362. Sources for Nicobar Fan mainly Himalayan-derived Ganges-Brahmaputra and Indo-Burman Ranges/W Burma, with minor contributions from Sunda forearc and arc and Ninetyeast Ridge. Bengal-Nicobar Fan clearly developing before Late Miocene, distinct increase in sediment accumulation rate at ~9.5 Ma suggests restructuring of sediment routing in submarine fan system, coinciding with inversion of E Himalayan Shillong Plateau and encroachment of W-propagating Indo-Burmese wedge)

McNeill, L.C. & T.J. Henstock (2014)- Forearc structure and morphology along the Sumatra-Andaman subduction zone. Tectonics 33, 2, p. 112-134.
(Sunda subduction margin characterized by major changes in accretionary prism and forearc morphology and structure along its 5000km length. In Sumatra-Andaman section (1) narrow and steep prism between Burma and Andamans; (2) broad prism with gentle slope in Andamans, Nicobars, and N Sumatra; (3) steep and narrow in C Sumatra; and (4) wider and less steep offshore S Sumatra, decreasing in width to W Java. Prism width ~90-180km, average surface slope ~1- 3°, with inverse correlation between width and slope. Along-strike changes in morphology linked to input sediment thickness)

Milsom, J. (1993)- Interpretations of gravity data from the vicinity of Nias. Southeast Asia Res. Group, London University, Report 119, p. 1-57. *(Unpublished)*

Milsom, J., S.B.S. Dipowirjo & J. Sipahutar (1990)- Gravity surveys in the North Sumatra forearc. United Nations CCOP Techn. Bull. 21, p. 85-96.
(Land gravity surveys on N Sumatra forearc Nias, Simeulue, Banyak and Butu islands. Regions of high gravity fields and strong gradients associated with presence of mafic and ultramafic rocks)

Milsom, J., S. Dipowirjo, B. Sain & J. Sipahutar (1990)- Gravity surveys in the North Sumatra forearc. Lemigas Scientific Contr. Petrol. Sci. Techn. 14, 1, Spec. Issue, p. 112-122.
(same paper as Milsom et al. (1990) above)

Milsom, J., B. Sain & J. Sipahutar (1995)- Basin Formation in the Nias area of the Sumatra forearc, western Indonesia. In: G.H. Teh (ed.) Proc. AAPG-GSM Int. Conf. 1994, Southeast Asian basins: oil and gas for the 21st century. Bull. Geol. Soc. Malaysia 37, p. 285-299.
(online at: https://gsmpubl.files.wordpress.com/2014/09/bgsm1995a19.pdf)
(Some of the modern structural highs that transect forearc basin of W Sumatra have been positive elements for considerable periods, but Singkel Basin near Banyak Islands overlies deep depression. Formation of this basin may be related to partitioning of strike-slip motion between main Sumatra fault system and Mentawai Fault)

Misawa, A., K. Hirata, L. Seeberd, K. Arai, Y. Nakamura, R. Rahardiawan, Udrekh, T. Fujiwara et al. (2014)- Geological structure of the offshore Sumatra forearc region estimated from high-resolution MCS reflection survey. Earth Planetary Sci. Letters 386, p. 41-51.
(High-resolution seismic around Sunda Trench, trench slope and forearc high regions off NW Sumatra. Trench-parallel anticlinal ridges from trench slope region to forearc high region. Two kinds of vergence systems in forearc: (1) landward vergence dominant in lower trench slope region, (2) seaward vergence dominant in forearc high region. Small piggyback or slope basins between anticlinal ridges. Deformation in uppermost part of these basins suggests 'recent' deformation)

Moeremans, R., S.C. Singh, M. Mukti, J. McArdle & K. Johansen (2014)- Seismic images of structural variations along the deformation front of the Andaman-Sumatra subduction zone: implications for rupture propagation and tsunamigenesis. Earth Planetary Sci. Letters 386, p. 75-85.
(Seven deep seismic reflection profiles across 3000 km-long subduction system from Andaman to S Sumatra. Frontal zone is characterized by thrusts, showing N-ward transition from dominantly seaward vergence of frontal thrusts to dominantly landward vergence of frontal thrusts. Accretionary wedge poor reflections, due to faulting. Oceanic crust highly disturbed by faults and topographic relief along most of margin)

Moore, G.F. (1978)- Structural geology and sedimentology of Nias Island. Indonesia: a study of subduction zone tectonics and sedimentation. Ph.D. Thesis, Cornell University, p. 1-142. *(Unpublished)*
(Study of mid-Tertiary subduction complex exposed on Nias Island, W. Sumatra. Comprises tectonic melanges and slope basin sediments)

Moore, G.F. (1979)- Petrography of subduction zone sandstones from Nias Island, Indonesia. J. Sedimentary Petrology 49, p. 71-84.
(Rocks on Nias two tectonostratigraphic units: (1) deformed late Oligocene-E Miocene trench deposits (tectonic melange) and (2) Miocene-Pliocene trench slope deposits. Sandstone rich in quartz and lithic fragments. Quartzose nature of Nias sediments indicates provenance from Sumatra W coast exposures of E Tertiary quartz-rich sediments and Paleozoic/Mesozoic metamorphic and plutonic rocks. Much lower contents of volcanic lithic grains than most arc-derived sandstones may be due to nonvolcanic source terrane on W coast)

Moore, G.F., H.G. Billman, P.E. Hehanussa & D.E. Karig (1980)- Sedimentology and paleobathymetry of Neogene trench-slope deposits, Nias Island, Indonesia. J. Geology 88, p. 161-180.
(Nias Island Neogene consists of Miocene trench-slope marls, sandstones, and conglomerates of Nias beds that overlie Oyo melange. Lithofacies and sedimentary sequences similar to ancient submarine fan environments. Oldest Nias beds contain very poor fauna or no calcareous microfossils at all, indicating deposition below CCD. Lower Miocene assemblages indicative of depths >2000m. M bathyal (500-2000 m) benthic species in U Miocene strata. Nias beds overlain by Pliocene shelf deposits and Pleistocene coral cap. Lower Miocene strata uplifted 4000 m in ~20 Myrs. Basin sediments folded and faulted penecontemporaneous with sedimentation. Dominant source for Nias beds was arc terrane of mainland Sumatra)

Moore, G.F. & J.R. Curray (1980)- Structure of the Sunda Trench lower slope off Sumatra from multichannel seismic reflection data. J. Marine Geophysical Res. 4, p. 319-340.
(Seismic profiles across Sunda Trench slope off C Sumatra reveal details of subduction zone structure. Oceanic crust not involved in deformation at toe of slope, and it can be observed dipping landward ~25 km under toe of accretionary prism. Middle portion of trench slope underlain by deformed accreted strata. Slope basins in 375-1500m water depths. Seaward flank of one large slope basin recently uplifted, indicated by shallow landward-dipping reflectors. Also arlier periods of uplift indicated by numerous angular unconformities in basin strata)

Moore, G.F., J.R. Curray & F.J. Emmel (1982)- Sedimentation in the Sunda trench and forearc region. In: J.K. Leggett (ed.) Trench-forearc geology, Geol. Soc. London, Spec. Publ. 10, p. 245-258.
(Much of Sumatra fore-arc trench sediment as far as W Sunda Straits is quartzose Himalayan detritus. Nearly all sediment derived from arc terranes of Java and Sumatra in Neogene trapped in forearc basin. Hemipelagic sedimentation dominates on lower inner trench slope (calcareous microfossils and volcanic ash

Moore, G.F., J.R. Curray, D.G. Moore & D.E. Karig (1980)- Variations in geologic structure along the Sunda fore arc, Northeastern Indian Ocean. In: D.E. Hayes (ed.) The tectonic and geologic evolution of Southeast Asian Seas and Islands- I. American Geophys. Union (AGU), Geophys. Monograph 23, p. 145-160.
(On Sunda fore arc from Birma to Sumba. Differences in styles due to oblique versus perpendicular subduction and thickness of sediments entering trench, mainly from Bengal Fan. Sumatran Fault System apparently connected to spreading centers in Andaman Sea. Part of Sumatra SW of Sumatra Fault zone moves NW with 'Burma Plate')

Moore, G.F. & D.E. Karig (1976)- Development of sedimentary basins on the lower trench slope. Geology 4, p. 693-697.
(Discussion of accretionary prisms where oceanic plate with thick cover of sediments is subducted. Accreted sediments form ridges behind which younger sediments are ponded in small (2-10 km wide) deepwater basins. Including examples from Nias Island off W Sumatra)

Moore, G.F. & D.E. Karig (1980)- Structural geology of Nias Island, Indonesia: implications for subduction zone tectonics. American J. Science 280, p. 193-223.

(Nias Island exposes mid-Tertiary subduction complex. Lowest complex (Oyo) strongly sheared melanges, overlain by deformed Neogene (Nias beds))

Mosher, D.C., J.A. Austin, D. Fisher & S.P.S. Gulick (2008)- Deformation of the northern Sumatra accretionary prism from high-resolution seismic reflection profiles and ROV observations. Marine Geology 252, p. 89-99.
(Multibeam bathymetry over 2004 earthquake site suggests 2004 tsunami not triggered by single zone of offset, but series of small faults across broad frontal accretionary wedge)

Mukhopadhyay, B. & S. Dasgupta (2014)- Genesis of a new slab tear fault in the Indo-Australian plate, offshore northern Sumatra, Indian Ocean. J. Geol. Soc. India 83, 5, p. 493-500.
(Slab-tear fault within subducting Indian plate ruptured in 2005 across W Sunda Trench within marginal intra-plate region)

Mukti, M.M. (2015)- Struktur, evolusi dan tektonik daerah busur depan tepian aktif Sundaland bagian barat. In: H. Harjono et al. (eds.) Pros. Pemaparan Hasil Penelitian Geoteknologi 2015, Pusat Penelitian Geoteknologi (LIPI), Bandung, p. I41-I49.
(online at: http://pustaka.geotek.lipi.go.id/wp-content/uploads/2016/04/Prosiding-2015.pdf)
('Structures, evolution and tectonics of the forearc region in the western Sundaland active margin')

Mukti, M.M. (2017)- Deformation in the Andaman- Northern Sumatra forearc revisited: implication for tectonic reconstruction of the western Sundaland margin. Proc. Joint Conv. HAGI-IAGI-IAFMI-IATMI (JCM 2017), Malang, 3p.

Mukti, M.M., S. Singh, I. Arisbaya, I. Deighton, L. Handayani, H. Permana & M. Schnabel (2015)- Geodinamika daerah busur muka Selat Sunda berdasarkan data seismik refleksi. In: H. Harjono et al. (eds.) Pros. Pemaparan Hasil Penelitian Geoteknologi 2015, Pusat Penelitian Geoteknologi (LIPI), Bandung, p. I25-I31.
(online at: http://pustaka.geotek.lipi.go.id/wp-content/uploads/2016/04/Prosiding-2015.pdf)
('Geodynamics of Sunda Strait forearc area based on seismic reflection data'. Sunda Strait transition zone between Java frontal subduction and Sumatra oblique convergence. Disappearance of forearc basin off Sumatra and presence of horsts and grabens. Young faults formed in sediments formerly part of forearc. Horsts and grabens not only related to pull-apart system, but also connected to volcanic-magmatic activities)

Mukti, M.M., S.C. Singh, N.D. Hananto, D. Ghosal & I. Deighton (2011)- Structural style and evolution of the Sumatran forearc basins. Proc. 35th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA11-G-082, p. 1-7.
(Crust beneath Sumatra fore arc basin thin (~20 km), thickens towards mainland. NE-SW extensional structures with probably Late Eocene- E Oligocene syn-rift sediments. Late Oligocene- E Miocene post-rift sediments in grabens and slopes. Grabens exhibit transtensional structures. Inversion of structures related to transpressional strike-slip fault zone, followed by M-L Miocene marked subsidence, overprinting older depocenters)

Mukti, M.M., S.C. Singh, R. Moeremans, N.D. Hananto, H. Permana & I. Deighton (2012)- Neotectonics of the southern Sumatran forearc. Proc. 36th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA12-G-074, p. 1-10.
(Mentawai forearc interpreted as products of compression of accretionary wedge and forearc basin sediments. Compressional phases since Late Miocene)

Mukti, M.M., S.C. Singh, I. Deighton, N.D. Hananto, R. Moeremans & H. Permana (2012)- Structural evolution of backthrusting in the Mentawai Fault Zone, offshore Sumatran forearc. Geochem. Geophys. Geosystems 13, 12, Q12006, p. 1-21.
(online at: http://onlinelibrary.wiley.com/doi/10.1029/2012GC004199/pdf)
(New deep seismic and bathymetry data over Mentawai Fault Zone, along boundary between accretionary wedge and proposed continental backstop. Arcuate ridges on seafloor are landward-vergent imbricated backthrusts at back side of accretionary wedge and backthrusts deforming forearc basin sediments. Backthrusts may have initiated in E-M Miocene, with slide and back-rotation of forearc thrusts. Higher-angle backthrusts

initiated in Late Miocene, continuing to form fold-thrust belt to E in Pliocene. Folds and thrusts disturbed by diapirs and mud volcanoes)

Mukti, M.M. & Suwijanto (2016)- On the update of structural map of Sumatra, from on land to offshore observations: implication for the tectonic reconstruction. Proc. GEOSEA XIV and 45th Ann. Conv. Indon. Assoc. Geologists (IAGI) (GIC 2016), Bandung, p. 375-377.
(Brief review)

Mulyana, B. (2006)- Extension tektonik Selat Sunda. Bull. Scientific Contr. (UNPAD) 4, 2, p. 137-145.
(online at: http://jurnal.unpad.ac.id/bsc/article/view/8123/3699)
('Extension tectonics of Sunda Straits'. Sunda Straits pull-apart basin at SE termination of Great Sumatra Fault Zone, with main opening in Pliocene- Recent. Clearly expressed by bathymetry. Associated with magmatism, with N20°E-trending, S-ward younging volcanic line from Sukadana in N (1.2 Ma) to Krakatau (1 Ma) and Panjaitan(0.5 Ma) in S)

Nainggolan, D.A. & T. Padmawijaya (2003)- Studi geodinamika lajur akresi daerah Siberut dari data gayaberat. J. Geologi Sumberdaya Mineral 13, 143, p. 24-37.
('Study of geodynamics of the accretionary prism in the Siberut area from gravity data'. Subduction melange in center and west of Siberut Island identified by high Bouguer anomaly. Bouguer gravity decreases to E, reflecting W part of Sumatra forearc basin with sediment thickness of 500-1500m)

Nas, D.S. & J.B. Supandjono (1995)- Geological map of the Telo sheet (0615), Sumatra, 1: 250,000. Geol. Res. Dev. Centre (GRDC), Bandung.
(Geologic map of Telo Island, NW of Siberut in Sumatra forearc/ accretionary prism. Oldest rocks Late Oligocene- earliest Miocene Tanahbala Melange with schist, phyllite, serpentinite, dunite and ultrabasic boudins embedded in metamorphic rocks (same as Melange Gp of Nias). Overlain by M-L Miocene sandstones and marls of Sipika and Hiligeho Fms, and Late Miocene- E Pliocene Gunungbala Lst with Cycloclypeus)

Natawidjaja, D.H., K. Sieh, M. Chlieh, J. Galetzka, B.W. Suwargadi, H. Cheng, R.L. Edwards, J.P. Avouac & S.N. Ward (2006)- Source parameters of the great Sumatran megathrust earthquakes of 1797 and 1833 inferred from coral microatolls. J. Geophysical Research 111, B06403, 37p.
(Large uplifts and tilts on Sumatran outer arc islands between 0.5°- 3.3°S during great historical earthquakes in 1797 and 1833)

Natawidjaja, D.H., K. Sieh, J. Galetzka, B.W. Suwargadi, H. Cheng, R.L. Edwards & M. Chlieh (2007)- Interseismic deformation above the Sunda megathrust recorded in coral microatolls of the Mentawai islands, west Sumatra, J. Geophysical Research 112, B02404, 27p.
(Geomorphology and stratigraphy of modern coral microatolls show outer arc Mentawai islands of W Sumatra subsiding over past several decades. Same islands rose up to 3m during giant megathrust earthquakes of 1797 and 1833. Current subsidence may reflect strain that will lead to future large earthquakes)

Natawidjaja, D.H., K. Sieh, S.N. Ward, H. Cheng, R.L. Edwards et al. (2004)- Paleogeodetic records of seismic and aseismic subduction from central Sumatran microatolls, Indonesia. J. Geophysical Research 109, B04306, 34p.
(Coral microatolls in W Sumatra used to document recent vertical deformation associated with subduction)

Noda, A. & A. Miyakawa (2017)- Deposition and deformation of modern accretionary type forearc basins: linking basin formation and accretionary wedge growth. In: Y. Itoh (ed.) Evolutionary models of convergent margins: origin of their diversity, Intech, Japan, Chapter 1, p. 3-27.
(online at: http://repository.osakafu-u.ac.jp/dspace/bitstream/10466/15058/103/Chapter01.pdf)
(Includes brief review of Sumatra- Java forearc basins, classified as doubly-vergent 'two-wedge' accretionary-type forearc basins)

Omura, A., K. Ikehara, K. Arai & Udrekh (2017)- Determining sources of deep-sea mud by organic matter signatures in the Sunda trench and Aceh basin off Sumatra. Geo-Marine Letters 37, 6, p. 549-559.
(In Aceh basin frequency of turbidite mud decreased as sea level rose during Pleistocene- Holocene deglaciation. Terrigenous organic carbon content high at end of Last Glacial period, but during deglaciation most organic carbon of marine origin. In Sunda trench Holocene turbidites consisted of remobilized slope sediments from two sources: (1) old Bengal/Nicobar fan with thermally matured organic fragments, whereas those derived from trench slope contained little terrigenous carbon)

Permana, H., K. Hirata, T. Fujiwara, Udrekh, E.Z. Gaffar, M. Kawano & Y.S. Djajadihardja (2010)- Fault pattern and active deformation of outer arc ridge of Northwest of Simeulue Island, Aceh, Indonesia. Proc. 39th Ann. Conv. Indon. Assoc. Geol. (IAGI), Lombok, PIT-IAGI-2010-241, 6p.
(Interpretation of structural deformation in Sumatra forearc NW Simeuleu from new bathymetry map. General elongated major NW-SE thrust fault complex, with N-S, NNE-SSW, WNW-ESE or ENE-WSW and E-W structural lineaments)

Permana, H., K. Hirata, T. Fujiwara, Udrekh, E.Z. Gaffar, M. Kawano & Y.S. Djajadihardja (2011)- Fault pattern and active deformation of outer arc ridge of northwest of Simeulue Island, Aceh, Indonesia. Bull. Marine Geol. 26, 1, p. 41-49.
(online at: http://ejournal.mgi.esdm.go.id/index.php/bomg/article/view/33/33)
(Same paper as above)

Pesicek, J.D. (2009)- Structure of the Sumatra-Andaman subduction zone. Ph.D. Thesis University of Wisconsin, Madison, p. 1-167. *(Unpublished)*
(online at: http://www.geology.wisc.edu/homepages/to_be_removed/pesicek/public_html/publications/Pesicek_PhD_09.pdf
(Seismic tomography studies of mantle, using new teleseismic data from aftershock sequences of 2004, 2005, and 2007 earthquakes)

Pesicek, J.D., C.H. Thurber, S. Widiyantoro, E.R. Engdahl & H.R. DeShon (2008)- Complex slab subduction beneath northern Sumatra. Geophysical Research Letters 35, L20303, 5p.
(online at: http://onlinelibrary.wiley.com/doi/10.1029/2008GL035262/epdf)
(New data from 2004-2005 Sumatra-Andaman earthquake sequences allows improved detail of P-wave velocity structure beneath Sumatra and adjacent regions. Below N Sumatra slab is folded at depth. Fold plays major role in segmentation of Sumatra megathrust and may impede rupture propagation in region. N of Sumatra, significant slab material in mantle transition zone imaged for first time)

Pesicek, J.D., C.H. Thurber, S. Widiyantoro, H. Zhang, H.R. DeShon & E.R. Engdahl (2010)- Sharpening the tomographic image of the subducting slab below Sumatra, the Andaman Islands and Burma. Geophysical J. Int. 182, 1, p. 433-453.
(online at: https://academic.oup.com/gji/article/182/1/433/563545)
(Increased ray coverage following 2004 and 2005 earthquakes allowed improved imaging of slab geometry in upper-mantle and transition zone regions along Sumatra, Andaman and Burma subduction zones)

Pesicek, J. D., C. H. Thurber, H. Zhang, H.R. DeShon, E.R. Engdahl & S. Widiyantoro (2010)- Teleseismic double-difference relocation of earthquakes along the Sumatra-Andaman subduction zone using a 3-D model. J. Geophysical Research 115, B10303, p. 1-20.
('Double-difference seismic tomography method applied the method to relocate seismicity from Sumatra-Andaman region before and after great earthquakes of 2004 and 2005)

Philibosian, B., K. Sieh, J.P. Avouac, D.H. Natawidjaja, H.W. Chiang, C.C. Wu, H. Perfettini, C.C. Shen, M.R. Daryono & B.W. Suwargadi (2014)- Rupture and variable coupling behavior of the Mentawai segment of the Sunda megathrust during the supercycle culmination of 1797 to 1833. J. Geophysical Research, Solid Earth, 119, 9, p. 7258-7287.
(online at: http://onlinelibrary.wiley.com/doi/10.1002/2014JB011200/epdf)

(Periods of subduction strain accumulation under Mentawai Islands referredto as 'supercycles' because each culminates in partial ruptures of megathrust. Fnale of previous supercycle comprised two giant earthquakes in 1797 and 1833. 2007 earthquakes released only fraction of moment released during previous rupture sequence. Major earthquakes generally do not involve rupture of entire Mentawai segment, but may significantly change state of coupling on megathrust for decades to follow, influencing subsequent ruptures)

Philibosian, B., K. Sieh, J.P. Avouac, D.H. Natawidjaja, H.W. Chiang, C.C. Wu, C.C. Shen, M.R. Daryono et al. (2017)- Earthquake supercycles on the Mentawai segment of the Sunda megathrust in the seventeenth century and earlier. J. Geophysical Research, Solid Earth, 122, 1, p. 1-35.
(online at: http://onlinelibrary.wiley.com/doi/10.1002/2016JB013560/epdf)
(At least five discrete uplift events identified at raised coral reef sites around Siberut, Sipora, Pagai islands in about 1597, 1613, 1631, 1658, and 1703, likely corresponding to large megathrust ruptures)

Philibosian, B., K. Sieh, D.H. Natawidjaja, H.W. Chiang, C.C. Shen, B.W. Suwargadi et al. (2012)- An ancient shallow slip event on the Mentawai segment of the Sunda megathrust, Sumatra. J. Geophysical Research, Solid Earth, 117, B05401, 12p.
(online at: http://onlinelibrary.wiley.com/doi/10.1029/2011JB009075/epdf)
(Coral record at Pulau Pasir implies large rupture of megathrust between trench and islands at ~ 1314 AD. Elevations of four older microatolls at Bulasat suggest at least two other shallow megathrust ruptures before the AD 1314 event)

Prawirodirdjo, L., Y. Bock, R. McCaffrey, J. Genrich, E. Calais, C. Stevens, O. Puntodewo, C. Subarya et al. (1997)- Geodetic observations of interseismic strain segmentation at the Sumatra subduction zone. Geophysical Research Letters 24, 21, p. 2601-2604.
(online at: http://onlinelibrary.wiley.com/doi/10.1029/97GL52691/epdf)
(GPS suggests complete coupling of forearc to subducting plate S of 0.5°S, half as much to N)

Prawirodirdjo, L., R. McCaffrey, C.D. Chadwell, Y. Bock & C. Subarya (2010)- Geodetic observations of an earthquake cycle at the Sumatra subduction zone: role of interseismic strain segmentation. J. Geophysical Research 115, B03414, p. 1-15.
(online at: http://onlinelibrary.wiley.com/doi/10.1029/2008JB006139/epdf)

Pubellier, M., C. Rangin, J.P. Cadet, I. Tjashuri, J. Butterlin & C. Mueller (1992)- Lõile de Nias, un edifice polyphase sur la bordure interne de la fosse de la Sonde (Archipel de Mentawai, Indonesie). Comptes Rendus Academie Sciences, Paris, Ser. II, 8, p. 1019-1026.
('Nias Island, a polyphased tectonic belt along the inner edge of the Sunda trench (Mentawai Archipelago)'. Nias Island classically regarded as emergent accretionary wedge. Complex belt affected by polyphase tectonics in Eocene and M Miocene. Sediments shelf clastics and limestone. Nias Melange extremely thin mylonites and olistostromic scaly clay at several decollement levels. Reactivation of Eocene Tethys suture zone within crustal blocks of Sunda margin alternative hypothesis for structure of Mentawai Islands)

Qiu, Z., X. Han & Y. Wang (2017)- Turbidite events recorded in deep-sea core IR-GC1 off Western Sumatra: evidence from grain-size distribution. Acta Geologica Sinica (English Ed.) 91, 4, p. 1448ï 1456.
(Seven deep-sea turbidite layers identified in Indian Ocean core off Sumatra, corresponding to events that occurred at 128-130, 105-107, 98-100, 86-87, 50-53, 37-41 and 20-29 ka. Possible triggering mechanisms for turbidite events include tsunamis, earthquakes, volcanic eruptions and sea-level changes)

Rangin, C., X. Le Pichon & J. Lin (2007)- Docked or accreted Indian Ocean fracture ridges along the Sumatra subduction zone northern tip. AGU 2007 Fall Mtg., EOS Transactions American Geophys. Union (AGU) 88, 52, Suppl., Abstract T31G-06, 1p. *(Abstract only)*
(Multibeam and echo sounder data off N tip of Sumatra over rupture area of Dec. 26 2004 earthquake show dominant N10°W trending dextral wrenching at W termination of Sunda subduction zone, at prolongation of N-S trending oceanic fracture zone that absorbs Indian-Australian plates relative motion. Structural fabric of wedge due to interaction of 90°-92°E oceanic fracture ridges system with Sumatra backstop and inner wedge)

Rebetskii, Y. & A. Marinin (2006)- Stressed state of the Earthôs crust in the western region of the Sunda subduction zone before the Sumatra-Andaman earthquake on December 26, 2004. Doklady Earth Sciences, 407, 1, p. 321-325.

Rose, R. (1983)- Miocene carbonate rocks of Sibolga Basin, Northwest Sumatra. Proc. 12th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 107-125.
(1970's Union Oil exploration of Sibolga forearc basin discovered gas in six localities, five in carbonate reservoirs. Moderately deformed Neogene 1000'-15,000' thick over folded Paleogene sediments and volcanics. Miocene carbonates primarily beneath present-day shelf on E side of basin. Oldest unit in N is M Miocene, possibly E Miocene shelf limestone with reefs, overlain by deepwater clay-mudstone-siltstone, then U Miocene shelf carbonate-clastics with reefs. In S carbonate deposition late M Miocene- Late Miocene, with fewer reefs than to N. Methane gas in U Miocene in Keudepasi 1 and Singkel 1 wells, both in reefal deposits)

Salman, R., E.M. Hill, L. Feng, E.O. Lindsey, D.M. Veedu, S. Barbot, P. Banerjee, I. Hermawan & D.H. Natawidjaja (2017)- Piecemeal rupture of the Mentawai patch, Sumatra: the 2008 Mw 7.2 North Pagai earthquake sequence. J. Geophysical Research, Solid Earth, 122, 11, p. 9404-9419.
(online at: http://onlinelibrary.wiley.com/doi/10.1002/2017JB014341/epdf)

Samuel, M.A. (1994)- The structural and stratigraphic evolution of islands of the active margin of the Sumatra forearc, Indonesia. Ph.D. Thesis, University of London, p. 1-345. *(Unpublished)*

Samuel, M.A. & N. Harbury (1995)- Basin development and uplift at an oblique-slip convergent margin: Nias Island, Indonesia. In: G.H. Teh (ed.) Proc. AAPG-GSM Int. Conf. 1994, Southeast Asian basins: oil and gas for the 21st century, Bull. Geol. Soc. Malaysia 37, p. 101-116.
(online at: https://gsmpubl.files.wordpress.com/2014/09/bgsm1995a07.pdf)
(Discussion of cross-section across Niasin Sumatra forearc. Basement ophiolite complex, containing pelagic red chert with M Eocene radiolaria. Initial basin sedimentation in Oligocene, below CCD depth. Nias subject to Oligocene-Early Miocene extension with development of half grabens dropping down to SW. Two phases of uplift/deformation: W areas inverted in E Miocene and whole island subject to Pliocene tectonism. 'Melanges' described by earlier authors diapiric in origin; composed mainly of Oligocene- Lower Miocene sedimentary material, intruding all younger formations)

Samuel, M.A. & N.A. Harbury (1996)- The Mentawai fault zone and deformation of the Sumatran forearc in the Nias area. In: R. Hall and D. Blundell (eds.) Tectonic Evolution of Southeast Asia, Geol. Soc., London, Spec. Publ. 106, p. 337-351.
(Sumatran Forearc not behaving as rigid plate and rate of slip increases along right-lateral Sumatran Fault System from SE to NW. Two hypotheses to explain pattern of decoupling: (1) arc-parallel stretching; (2) major right-lateral strike slip zone, parallel to Sumatran Fault System (Mentawai fault zone). Mentawai fault zone S of Nias can be explained as inversion of originally extensional structures and mud diapirism. Strike-slip motion is of limited importance along 600 km long Mentawai fault zone)

Samuel, M.A., N.A. Harbury, A. Bakri, F.T. Banner & L. Hartono (1997)- A new stratigraphy for the islands of the Sumatran Forearc, Indonesia. J. Southeast Asian Earth Sci. 15, 4-5, p. 339-380.
(Nias area heterogeneous Pre-Oligocene basement includes ophiolitic complexes, possibly also continental material. Oyo Fm indicates initial deposition in newly formed extensional sub-basins was deep marine, below CCD. Major E Miocene unconformity as result of period of basin inversion. E and M Miocene phases of differential uplift and subsidence ceased by Late Miocene. Massive influx of Himalayan-derived Bengal Fan sediments reached Sunda Trench in Sumatra area in late M Miocene. Pliocene unconformity represents initiation of major phase of deformation that continues to present day)

Samuel, M.A., N.A. Harbury, M.E. Jones & S. J. Matthews (1995)- Inversion-controlled of an outer-arc ridge: Nias Island, offshore Sumatra. In: J.H. & P.G. Buchanan (eds.) Basin Inversion, Geol. Soc. London, Spec. Publ. 88, p. 473-492.

(Three main sub-basins on Nias. Late Paleogene-Neogene sedimentation controlled by extensional faults. Two inversion phases: (1) E Miocene, in W, (2) initiated in Pliocene, in all sub-basins. Latest Pliocene-Pleistocene rocks unconformably overlie Miocene. Uplift and deformation controlled by reactivation of extensional faults and oblique-slip movements on transecting faults. Diapiric melanges developed during inversion. Uplift of sub-basins on Nias inversion of original major extensional faults rather than thrust-slices in accretionary prism. Nias not part of accretionary complex; accretionary prism SW of Nias)

Santi, L.D., I. Setiadi & H. Panggabean (2010)- Deliniasi cekungan busur muka Simeulue berdasarkan data anomali gaya berat. J. Sumber Daya Geologi 20, 3, p. 159-167.
(online at: http://jgsm.geologi.esdm.go.id/index.php/JGSM/article/view/169/165)
('Delineation of the Simeulue fore-arc basin based on gravity anomaly data'. Simeulue basin, offshore NW Sumatra, maximum length 418 km, in N and S bounded by topographic highs)

Schippers, A., G. Koweker, C. Hoft & B.M.A. Teichert (2010)- Quantification of microbial communities in three forearc sediment basins off Sumatra. Geomicrobiology J. 27, 2, p. 170-182.

Schluter, H.U., C. Gaedicke, H.A. Roeser, B. Schreckenberger, H. Meyer, C. Reichert, Y. Djajadihardja & A. Prexl (2002)- Tectonic features of the southern Sumatra-Java forearc of Indonesia. Tectonics 21, 5, 1047, p. 11/1-11/15.
(online at: https://agupubs.onlinelibrary.wiley.com/doi/epdf/10.1029/2001TC901048)
(Sunda Arc off S. Sumatra-E Java two accretionary wedges: inner wedge I Late Oligocene tectonic flakes and Neogene-Recent outer wedge II. Wedge I forms outer arc high and backstop for outer wedge II. Missing outer arc high of S Sunda Strait explained by Neogene transtension due to clockwise rotation of Sumatra and arc-parallel strike-slip movements. Rotation created pull-apart basins along W Sunda Strait (Semangka Graben) and transpression and inversion on E Sunda Strait in Krakatau Basin. Sumatra FZ probably attached to Java Cimandiri-Pelabuhan Ratu strike-slip fault prior to Sumatra rotation)

Seeber, L., C. Mueller, T. Fujiwara, K. Arai, W. Soh, Y.S. Djajadihardja & M.S. Cormier (2007)- Accretion, mass wasting and partitioned strain over the 26 Dec 2004 Mw9.2 rupture offshore Aceh, northern Sumatra. Earth Planetary Sci. Letters 263, 1-2, p. 16-31.
(Bathymetric, and seismic survey over frontal active part of accretionary prism along Aceh segment where 26 December 2006 mega-earthquake and tsunami were triggered)

Setyanta, B. (2015)- Model kerak daerah busur muka di Pulau Siberut dan perairan di sekitarnya berdasarkan analisis anomali gayaberat. J. Geologi Sumberdaya Mineral 16, 2, p. 55-65.
(online at: http://kiosk.geology.esdm.go.id/artikel/pdf/model-kerak-daerah-busur-muka-di-pulau-siberut...)
('Model of the crust in the forearc area of Siberut Island and surrounding waters based on gravity anomaly'. Gravity profile in W Sumatra forearc from SW of Siberut to NE of Padang suggests trenches and accreted islands underlain by oceanic crust, volcanic arc areas underlain by transitional crust or andesitic crust)

Shulgin, A., H. Kopp, D. Klaeschen, C. Papenberg, F. Tilmann, E.R. Flueh, D. Franke, U. Barckhausen, A. Krabbenhoeft & Y. Djajadihardja (2013)- Subduction system variability across the segment boundary of the 2004/2005 Sumatra megathrust earthquakes. Earth Planetary Sci. Letters 365, 1, p. 108-119.
(On structural variations across rupture segment boundary between 2004 and 2005 earthquakes at Sumatra subduction zone off Simeulue Island. Structure of subduction system N and S of segment boundary attributed to subduction of 96°E fracture zone, which separates areas of different thickness of oceanic crust, decrease in amount of sediment in trench and variations in morphology and volume of accretionary prism)

Sibuet, J.C., C. Rangin, X. Le Pichon, S.C. Singh, A. Cattaneo, D. Graindorge, F. Klingelhoefer, J.Y. Lin, J. Malod et al. (2007)- 26th December 2004 Great Sumatra-Andaman earthquake: seismogenic zone and active splay faults. Earth Planetary Sci. Letters 263, p. 88-103.
(Landward and seaward-verging trench-parallel thrust faults mapped in wedge between N Sumatra and Indian-Indonesian boundary. Spatial aftershocks distribution of 26th December 2004 earthquake shows post-seismic motion partitioned along two thrust faults, the Lower and Median Thrust Faults)

Siegert, M., M. Kruger, B. Teichert, M. Wiedicke & A. Schippers (2011)- Anaerobic oxidation of methane at a marine methane seep in a forearc sediment basin off Sumatra, Indian Ocean. Frontiers Microbiology 2, 249, p. 1-16.
(online at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3245565/pdf/fmicb-02-00249.pdf)
(Cold methane seep in forearc basin off Sumatra, with methane-seep adapted microbial community)

Sieh, K. (2012)- The Sunda megathrust: past, present and future. J. Earthquake and Tsunami, 1, 1, p. 1-22.
(online at: http://www.tectonics.caltech.edu/sumatra/downloads/papers/Snu.pdf)
('Sunda Megathrust' is name for 1600km long seismogenic subduction zone off Myanmar-Andaman- Sumatra-Java, which runs from deep trench on ocean floor under continental margins. Slippage events in 2004 and 2005 caused major earthquakes and tsunamis)

Simoes, M., J. Avouac, R. Cattin & P. Henry (2004)- The Sumatra subduction zone: a case for a locked fault zone extending into the mantle. J. Geophysical Research 109, B10, B10402, p. 1-16.
(online at: http://onlinelibrary.wiley.com/doi/10.1029/2003JB002958/epdf)
Subduction interface locked between large interplate earthquakes (locked fault zone, LFZ), postulated to not extend into mantle because serpentinization of mantle wedge favors aseismic sliding. Uplift rates from coral growth and GPS indicate LFZ extends ~132 km from trench, to 35-57 km depth. LFZ extends below forearc Moho, estimated at ~30 km depth, 110 km from trench, probably into mantle)

Singh, S.C., H. Carton, P. Tapponnier, N.D. Hananto, A.P.S. Chauhan, D. Hartoyo, M. Bayly, S. Moeljopranoto et al. (2008)- Seismic evidence for broken oceanic crust in the 2004 Sumatra earthquake epicentral region. Nature Geoscience 1, p. 777-781.
(Sumatra 2004 earthquake caused by sudden slip along plate interface between subducting Indo-Australian plate and overriding Sunda plate. Seismic section of focal region reveals subducting crust and oceanic Moho are broken and displaced by landward-dipping thrust ramps, suggesting megathrust now lies in oceanic mantle. Active thrust faults at front of accretionary wedgeconsistent with thrust aftershocks on steeply dipping planes. Brittle failure of mantle rocks accounts for initiation of exceptionally large earthquake)

Singh, S.C., A.P.S. Chauhan, A.J. Calvert, N. Hananto, D. Ghosal, A. Rai & H. Carton (2012)- Seismic evidence of bending and unbending of subducting oceanic crust and the presence of mantle megathrust in the 2004 Great Sumatra earthquake rupture zone. Earth Planetary Sci. Letters 321-322, p. 166-176.
(Deep seismic reflection and refraction data image top of subducting oceanic crust down to 60 km depth in 2004 great Sumatra-Andaman earthquake rupture zone. Top of the downgoing plate does not dip gently into subduction zone but displays staircase geometry with three 5-15 km vertical steps, spaced ~50 km apart)

Singh, S.C., N.D. Hananto & A.P.S. Chauhan (2011)- Enhanced reflectivity of backthrusts in the recent great Sumatran earthquake rupture zones. Geophysical Research Letters 38, L04302, p. 1-5.
(Seismic images of backthrusts in the 2004 and 2007 great earthquake ruptured zones in the Sumatra forearc are brighter than those in regions where subduction zone is still locked. Enhanced reflectivity may be due to increase of fluid contents along reactivated backthrusts during or soon after great earthquakes)

Singh, S.C., N.D. Hananto, A.P.S. Chauhan, H. Permana, M. Denolle, A. Hendriyana & D. Natawidjaja (2010)- Evidence of active backthrusting at the NE margin of Mentawai Islands, SW Sumatra. Geophysical J. Int. 180, 2, p. 703-714.
(online at: https://academic.oup.com/gji/article/180/2/703/2101866)
(Onshore Great Sumatra Fault takes up significant part of strike-slip motion of oblique subduction of Indo-Australian plate beneath Sunda plate, but offshoreMentawai Fault characterized by active SW dipping backthrusts)

Singh, S.C., N. Hananto, M. Mukti, H. Permana, Y. Djajadihardja & H. Harjono (2011)- Seismic images of the megathrust rupture during the 25th October 2010 Pagai earthquake, SW Sumatra: frontal rupture and large tsunami. Geophysical Research Letters 38, L16313, p. 1-6.

Singh, S.C., N.D. Hananto, M. Mukti, D.P. Robinson, S. Das, A. Chauhan, H. Carton, B. Gratacos, S. Midnet, Y. Djajadihardja & H. Harjono (2011)- Aseismic zone and earthquake segmentation associated with a deep subducted seamount in Sumatra. Nature Geoscience 4, p. 308-311.
(Imaging of subducted seamount 3-4 km high and 40 km wide at 30-40 km below Sumatra forearc mantle. Seamount remained intact despite >160 km of subduction, and no seismic activity above or below seamount. Coupling between seamount and overriding plate appears weak and aseismic. Subduction of such a topographic feature could lead to segmentation of subduction zone)

Situmorang, B., N.A. Harbury & M.G. Audley-Charles (1987)- Tectonic inversions in the Sunda Forearc: evidence from Simeulue. Proc. 16th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 57-63.
(Cenozoic history of Simeulue, NW of Nias, includes Oligo-Miocene erosional unconformity. Repeated tectonic inversions may be related in part to transpression and transtension stresses generated by strike-slip motion interacting with sinuosities in trench and Sumatran fault system)

Situmorang, B. & Soepatono (1975)- Results of petroleum exploration in the interdeep basin off West Sumatra Indonesia. Proc. 12th Sess. CCOP, p. 255-262.

Situmorang, B., S. Wijaya, M. Husen & B. Yulihanto (1990)- Analisis struktur geologi Pulau Nias. Proc. 19th Ann. Conv. Indon. Assoc. Geol. (IAGI), Bandung, 2, p. 27-41.
('Analysis of the structure of Nias island'. Nias island with highly deformed Oyo Complex (mainly NE dipping imbricates of Eocene- Oligocene accretionary complex?), overlain by E- L Miocene Nias Beds)

Specht, T.D., T. Rahardjo, F.I. Frasse & P.B. Dobson (2000)- A comprehensive evaluation of the exploration potential of the Offshore Sibolga Area, West Coast Sumatra Island, Indonesia. AAPG Int. Conf. Exhib., Bali 2000. *(Abstract only)*
(Caltex Sibolga PSC in Mentawai Forearc Basin acquired in 1996. Water depths from onshore to >2000'; sediments up to ~20,000' thick. Bordered by outer arc and Mesozoic-Paleozoic core and volcanic arc of Sumatra. Basin began to subside around 17 Ma and received nearly continuous Neogene sedimentation. Regional right-lateral strike-slip faults produced differences in structural and stratigraphic evolution between sub basins. Shallow burial depths limit size of biogenic accumulations and low heatflow suggests only limited thermogenic petroleum system)

Stevens, S.H. & G.F. Moore (1985)- Deformational and sedimentary processes in trench slope basins of the western Sunda Arc, Indonesia. Marine Geology 69, 1-2, p. 93-112.
(Structure and stratigraphy of trench slope basins W of Nias Island)

Stockmal G.S. (1983)- Modeling of large-scale accretionary wedge deformation. J. Geophysical Research 88, B10, p. 8271-8287.
(Physical modeling of accretionary wedge deformation, loosely based on C Sumatra forearc)

Subagio & B.S. Widijono (2001)- Model gayaberat, struktur kerak, dan implikasinya terhadap kestabilan lahan di Pulau Nias. J. Geologi Sumberdaya Mineral 11, 120, p. 2-13.
('Gravity model, crustal structureand the implications for the stability of land on the island of Nias'. Gravity model suggests basement at W coast and in C Nias consist of continental accreted granite blocks; Basement in offshore forearc basin continental granitic crust)

Surabaya, C., M. Chlieh, L. Prawirodirdjo, J.P. Avouac, Y. Bock, K. Sieh et al. (2006)- Plate-boundary deformation associated with the great Sumatra-Andaman earthquake. Nature 440, 2, p. 46-51.
(2004 earthquake magnitude >9.0 ruptured Sunda subduction megathrust over >1500km, with >20m of slip off N Sumatra)

Syaefudin (1998)- Studi sekuen stratigrafi sedimen berumur Miosen cekungan muka busur Nias, Sumatera Utara. Proc. 27th Ann. Conv. Indon. Assoc. Geol. (IAGI), 2 (Sed. Pal. Strat.), Yogyakarta, p. 106-122.

('Sequence stratigraphic study of Miocene-age sediments in the Nias fore-arc basin, N Sumatra'. Sequence strat interpretation of Panjang 1 well, in forearc between Nias and Sumatra islands)

Tan Sin Hok (1936)- Bemerkungen uber die Cycloclypeen von Sipoera (Mentawai-Inseln). Geologie en Mijnbouw 15, 7, p. 57-58.
(online at: https://drive.google.com/file/d/1xXrzCscsLSc1mHYjqEKiAgunLMfS1uKT/view)
('Remarks on Cycloclypeus from Sipura, Mentawai Islands'. Brief critique of Tappenbeck (1936) interpretations of Cycloclypeus from Mentawai islands. Tappenbeck's Cycloclypeus koolhoveni probably Heterostegina or Spiroclypeus. Other spp may also be misidentified. No figures)

Tappenbeck, D. (1936)- Uber Tertiare Foraminiferengesteine von Sipoera (Mentawei-Inseln). Proc. Kon. Nederl. Akademie Wetenschappen Amsterdam 39, 5, p. 661-670.
(online at: www.dwc.knaw.nl/DL/publications/PU00016907.pdf)
('On Tertiary foraminifera rocks from Sipura (Mentawai Islands)', W Sumatra. Larger foraminifera in M Eocene black limestone (zone Ta with Assilina, Nummulites), Early Miocene (zone Te with Spiroclypeus, Miogypsina, Nephrolepidina spp.) and Late Miocene (Tf with Pliolepidina and Cycloclypeus cf. guembelianus) marl and limestones (see also commentary by Tan Sin Hok (1936))

Tappin, D.R., L.C. McNeil, T. Henstock & D. Mosher (2007)- Mass wasting processes; offshore Sumatra. In: V. Lykousis (ed.) Submarine mass movements and their consequences, 3rd Int. Symp., Advances in Natural and Technological Hazards Research 27, Springer, p. 327-336.
(online at: www.noc.soton.ac.uk/gg/sumatra/documents/tappin_etal_sumatra_mass_wasting_2007.pdf)
(Mapping of convergent margin offshore Sumatra using swath bathymetry, seismic and seabed photography reveals common seabed failures, but mainly small-scale blocky debris avalanches and sediment flows. Large landslides usually form in areas of high sediment input. Off Sumatra most sediment derived from oceanic plate, and little sediment entering system from adjacent land areas. Input from oceanic source limited due to diversion of sediment entering subduction system, attributed to Ninetyeast Ridge- Sunda Trench collision at ~1.5 Ma)

Terpstra, H. (1932)- Voorloopige mededeeling over een geologischen verkenningstocht op de eilanden Siberoet en Sipoera (Mentawi-eilanden, Sumatra's Westkust). De Mijningenieur 13, 2, p. 16-20.
('Preliminary note on a geological reconnaissance trip on the islands of Siberut and Sipura (Mentawai Islands, Sumatra W coast)'. On Siberut island no Pre-tertiary rocks. On Sipura island schists and amphibolites, and Tertiary similar to Siberut. Between Tertiary rocks serpentinized basic volcanics and dikes of andesite and basalt)

Tjia, H.D. & T. Boentaran (1969)- A morpho-structural study of Nias. Bull. Nat. Inst. Geology and Mining (NIGM), Bandung, 2, 2, p. 21-28.
(Study of topographic maps suggests four anticlinal zones. Also at least 4 terrace levels up to 100m elevation)

Tsukada, K., A. Fuse, W. Kato, H. Honda, M. Abdullah, L. Wamsteeker, A. Sulaeman & J. Bon (1996)- Sequence stratigraphy of North Aceh Offshore Basin, North Sumatra, Indonesia. Proc. 25th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, p. 29-41.
(Main results of stratigraphic prospecting: (1) 30 Ma P21 SB marks sudden break from non-marine to bathyal. A downlap or onlap surface of P22 SB represents favorable combination of porous sandstone and top-sealing compact deep-water mudstone. P21 and P22 SBs overlap on seismic sections because of thin sedimentary separation;(2) SBs of N11-N14 should be markers that identify exploration target in Baong sst. N14 Baong lowstand fan identified as stratigraphic prospect)

Van der Veen, A.L.W.E. (1913)- Bijdrage tot de geologie van Nias. Sammlungen Reichs-Museums Leiden Ser. 1, 9, p. 225-243.
(online at: www.repository.naturalis.nl/document/552442 and www.repository.naturalis.nl/document/552443)
('Contribution to the geology of Nias'. Petrography of samples from Nias island, off W Sumatra, collected by Schroder. Includes ultrabasic rocks (gabbro, sepentinite, basalt), metamorphics (garnet mica schist), sandstones, Eocene foram breccia and Miocene limestone (see also Douville 1912). With sample location map)

Velbel, M.A. (1985)- Mineralogically mature sandstones in accretionary prisms. J. Sedimentary Res. 55, p. 685-690.
(Mid-Tertiary quartz-rich sandstones from Nias Island accretionary prism mineralogically more mature than expected in this tectonic setting. Provenance petrogeneticall may be unrelated to arc-trench system)

Verbeek, R.D.M. (1874)- Eerste verslag over een onderzoek naar kolen op het eiland Nias. Jaarboek Mijnwezen Nederlandsch Oost-Indie 3 (1874), 1, p. 157-163.
('First report on a survey for coal on the island of Nias', W Sumatra'. Five coal occurrences on Nias deemed uneconomic. One 1m thick lignite bed, others much thinner)

Verbeek, R.D.M. (1876)- Sumatra's Westkust. Verslag No. 5. Geologische beschrijving van het eiland Nias. Jaarboek Mijnwezen Nederlandsch Oost-Indie 5 (1876), 1, p. 3-13.
('Geological description of Nias Island, NW Sumatra'. Early, brief report on geology of Nias, with 1:100,000 scale geologic map of NE Nias. Mainly composed of marly Miocene sediments, dipping 20-80°, overlain by near-horizontal , ~50m thick Pliocene? reefal limestones)

Vigny, C., W.J.F. Simons, S. Abu, R. Bamphenyu, C. Satirapod, N. Choosakul, C. Subarya et al. (2005)- Insight into the 2004 Sumatra-Andaman earthquake from GPS measurements in Southeast Asia. Nature 436, p. 201-206.
(Data from 60 GPS sites in SE Asia show rupture plane of 2004 Sumatra-Andaman earthquake must have been at least 1000 km long. Small but significant co-seismic jumps detected more than 3000km from epicenter)

Vita-Finzi, C. (2008)- Neotectonics and the 2004 and 2005 earthquake sequences at Sumatra. Marine Geology 248, p. 47-52.
(Deformation of outer-arc islands Nias and Simeulue associated with 2004 and 2005 earthquakes generally ascribed to stress release on interface between Indian and Eurasian plates at Java trench. Shallow seismicity and Holocene deformation of islands suggest also activity on imbricate faults in sediment prism behind trench)

Vita-Finzi, C. & B. Situmorang (1989)- Holocene coastal deformation in Simeulue and Nias, Indonesia. Marine Geology 89, p. 153-161.
(Islands W of Sumatra with common Late Quaternary elevated coral reefs and abandoned intertidal platforms. Localities sampled at 0.5-3.5 m above normal high tide with ages from <300 yrs to ~5800 yrs B.P. Average uplift rates are 0.3-1.0 mm/yr. Uplifts probably episodic and seismic in origin)

Wang, X., K.E. Bradley, S. Wei &, W. Wu (2018)- Active backstop faults in the Mentawai region of Sumatra, Indonesia, revealed by teleseismic broadband waveform modeling. Earth Planetary Sci. Letters 483, p. 29-38
(online at: www.sciencedirect.com/science/article/pii/S0012821X17306933)
(Fault plane solutions of 2005 and 2009 earthquakes in Mentawai offshore area suggest 'back-thrust' sequences occurred on steeply landward-dipping fault. Interpreted as 'unsticking' of Sumatran accretionary wedge along backstop fault that separates accreted material from stronger Sunda forearc lithosphere, or as reactivation of pre-Miocene normal fault under forearc basin)

Wirasantosa, S., H. Harjono & S. Suparka (1994)- Geoscientific surveys of the Sumatra margin. In: J.L. Rau (ed.) Proc. 29th Sess. Comm. Co-ord. Joint Prospecting Mineral Resources in Asian Offshore Areas (CCOP), Hanoi 1992, Bangkok, 2, p. 147-150.
(Brief discussion of marine cruises and profiles in the S part of the offshore Sumatra forearc)

Wissema, G.G. (1947)- Young Tertiary and Quaternary Gastropoda from the Island of Nias (Malay Archipelago). Doct. Thesis University of Leiden, p. 7-212. *(Unpublished)*

Woodward, H. (1879)- Notes on a collection of fossil shells, etc., from Sumatra (obtained by M. Verbeek, Director of the Geological Survey of the West Coast, Sumatra). Geol. Magazine 6, 9, p. 385-393.

(First of four short papers describing fossils collected by Verbeek in C Sumatra. Including descriptions of four Permian brachiopods from Sibelau, Padang Highlands (Spirifera glabra, Productus undatus, P. semireticulatus, P. costatus) and molluscs from Mio-Pliocene of Nias Island, W Sumatra)

Woodward, H. (1879)- Further notes on a collection of fossil shells, etc., from Sumatra (obtained by M. Verbeek, Director of the Geological Survey of the West Coast, Sumatra), Part II. Geol. Magazine 6, 10, p. 441-444.
(Descriptions of Mio-Pliocene molluscs (Cyrena, Pecten) and solitary corals from Nias island, W Sumatra)

Woodward, H. (1879)- Further notes on a collection of fossil shells, etc., from Sumatra (obtained by M. Verbeek, Director of the Geological Survey of the West Coast, Sumatra), Part III. Geol. Magazine 6, 11, p. 492-500.
(Additional descriptions of Mio-Pliocene molluscs from Nias island, including Oliva pseudoaustralis n.sp.)

Woodward, H. (1879)- Further notes on a collection of fossil shells, etc., from Sumatra (obtained by M. Verbeek, Director of the Geological Survey of the West Coast, Sumatra), Part IV. Geol. Magazine 6, 12, p. 535-549.
(Additional descriptions of Mio-Pliocene molluscs from Nias island, all gastropods, including Pleurotoma, Phos, Cerithium, Turbo, Melania, Strombus sumatranus n.sp.)

Yulihanto, B. & B. Situmorang (1998)- Petroleum system of the Mentawai Bengkulu forearc basin, West Sumatra, Indonesia. Australian Petrol. Explor. Assoc. (APEA) J. 38, p. 891-892. *(Abstract only)*
(Mentawai-Bengkulu Forearc Basin two phases of development. Bengkulu Sub-basin NE-SW Paleocene graben, followed by N-S Late Oligocene-E Miocene graben system. Mentawai Sub-basin N-S Late Oligocene- E Miocene graben system only. Bengkulu Basin Eocene lacustrine sediments poorly documented. Onshore Late Oligocene- E Miocene prospective petroleum source rocks. High pristane/ phytane ratio and alkanes from waxy material of terrestrial plants. Potential reservoir rocks in Eocene and Late Oligocene-E Miocene fluvial-alluvial clastics, Oligo-Miocene carbonate facies and shallow marine sandstones. Other potential reservoirs early M Miocene reefal carbonates in Mentawai Sub-basin. Regional seal U Miocene-Pliocene marine shales)

Yulihanto, B. & B. Situmorang (2002)- Structural inversion and its influence on depositional processes in the Aru area, North Sumatra basin, Indonesia. Proc. First Offshore Australia Conf., p. III25- III42.
(Two asymmetrical grabens in area, Pagarjati Graben in NW, Kedurang Graben in SE, separated by N-S trending Masmambang High. Two rift phases: NE-SW Paleogene grabens, overprinted by N-S Oligo-Miocene grabens, related to dextral motions along Sumatra Fault System. First transtensional episode in Oligo-Miocene (fluvial- shallow marine Seblat Fm sst, conglomerates, tuffaceous shales and limestones). Rejuvenation of extensional faults in M-L Miocene (Lemau Fm sst, claystones, coals). Basin subsidence continued during Late Miocene-Pliocene (littoral Simpangaur Fm). Shallow marine Plio-Pleistocene Bintunan Fm deposited during Barisan orogeny basin uplift and volcanic activity. Exploration potential in Pagarjati and Kedurang Grabens in Seblat Fm sands and M Miocene limestones and potential source rocks in organically rich Lemau Fm. If Paleogene basin initiation model is accepted, may be potential for lacustrine source rocks)

Yulihanto, B., S. Sofyan, S. Widjaja, A. Nurdjajadi & S. Hastuti (1996)- Bengkulu forearc basin (South Sumatra). Post-Convention field trip, October 1996, Indon. Petroleum Assoc. (IPA), 68p.

Yulihanto, B. & I.B. Sosrowijoyo (1996)- Constraints on the new exploration strategies in the future for the Bengkulu forearc basin, Indonesia. In: 11th Offshore SE Asia Conf. Exhib. (OSEA96), Singapore 1996, p. 169-176.
(W Sumatra Bengkulu forearc basin exploration mainly targeting Miocene carbonate buildups and E Miocene basal sandstones. Prior to M Miocene Barisan Range uplift Bengkulu basin was comnnected to S Sumatran basin. Future exploration may be concentrated in Paleo-Eocene and Oligo-Miocene grabens)

Yulihanto, B. & B. Wiyanto (1999)- Hydrocarbon potential of the Mentawai forearc basin, West Sumatra. Proc. 27th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 24p.

(Series of N-S trending Paleogene grabens, partly inverted in M-L Miocene, with various potential hydrocarbon plays)

Zachariasen, J., K. Sieh, F.W. Taylor, R.L. Edwards & W.S. Hantoro (1999)- Submergence and uplift associated with the giant 1833 Sumatran subduction earthquake: evidence from coral microatolls. J. Geophysical Research 104, B1, p. 895-919.
(http://onlinelibrary.wiley.com/doi/10.1029/1998JB900050/epdf)
(Giant Sumatran subduction earthquake of 1833 large emergence event in fossil coral microatolls on reefs of outer-arc ridge. Emergence increased trenchward from ~1 to 2 m. Pattern consistent with ~13 m of slip on subduction interface. Also rapid submergence in decades prior to earthquake, increasing trenchward)

Zachariasen, J., K. Sieh, F.W. Taylor & W.S. Hantoro (2000)- Modern vertical deformation above the Sumatran subduction zone: paleogeodetic insights from coral microatolls. Bull. Seismological Soc. America 90, 4, p. 897-913.
(online at: www.tectonics.caltech.edu/sumatra/downloads/papers/P00b.pdf)
(Stratigraphic analysis of seven coral microatolls (5 outer-arc islands, 2 from mainland coast), indicate Mentawai Islands submerging at 4-10 mm/yr over last 4-5 decades, while Sumatra mainland has remained relatively stable. Presence of fossil microatolls up to several 1000 years old in intertidal zone indicates little permanent vertical deformation over that time)

Zen, M.T. (1993)- Deformation de l'avant-arc en reponse a une subduction a convergence oblique. Exemple de Sumatra. Doct. Thesis, Universite Paris VII, Institut de Physique du Globe, ORSTOM Ed. 130, p. 1-252.
(online at: http://horizon.documentation.ird.fr/exl-doc/pleins_textes/pleins_textes_6/TDM/41116.pdf)
('Deformation of the fore-arc in response to oblique convergence- example of Sumatra'. Oblique plate convergence across trench at Sumatra accommodated through partioning of slip into nearly orthogonal subduction along main subduction thrust zone and trench-parallel translation of forearc slivers along strike slip faults. Sumatra fault zone does not transmit all arc parallel displacement, so forearc sliver must be deformed. Seismic data of forearc shows Mentawai fault zone along ocean-continent boundary, with similar behavior to Sumatra FZ since 15 Ma. Bengkulu forearc basin developed on continental substratum)

II.4. Sunda Shelf (incl. 'Tin islands', Singkep, Karimata)

Abidin, H.Z. (2001)- A NW-SE trending zone of primary tin mineralization in North Bangka: geology, distribution and origin. Indonesian Mining J. 7, 1, p. 1-12.

Abidin, H.Z. (2001)- Penagan tin deposits, Bangka island. J. Geologi Sumberdaya Mineral 11, 117, p. 17-31.
(Primary tin deposit NE of Penagan, W side of Bangka Island, in quartz-cassiterite veins in E Triassic Tanjung Genting Fm quartz sst-siltstone, intruded by Late Triassic- E Jurassic Klabat Granite. Also with quartz-wolframite veins)

Abidin, H.Z. (2002)- Stratiform tin deposit at Sambung Giri, Bangka, Indonesia. J. Geologi Sumberdaya Mineral 12, 126, p. 2-12.
(Quartz veins from granitic intrusions with and without cassiterite in E Triassic Tanjung Genting Fm micaceous sandstones in NE Bangka)

Abidin, H.Z. (2004)- An NW-SE trending zone of primary tin mineralization in North Bangka, Indonesia: geology, distribution and origin. Majalah Geologi Indonesia 19, 3, p. 173-185.
(Same as Abidin 2001. Reprinted in Metalogeni Sundaland Vol. I (2014), p. 161-174. A 17x2 km NW-SE trending belt in NE Bangka with several primary tin deposits: Air Jangkang, Merawang, Sambung Giri and Pemali. Mineralization at contact with Late Triassic- E Jurassic Klabat granites and Permo-Triassic Pemali Fm meta-sediment, or in sediment bedding planes. Greisen mineralization common within granite. Granite emplacement ages peak in 213-217 Ma. Ore minerals mainly cassiterite, also wolframite, monazite, magnetite, chalcopyrite, sphalerite galena and REE elements)

Abidin, H.Z., Baharuddin & Surawardi (1999)- Toboali alluvial tin deposit: geology, depositional processes and material source. Indonesia Mining J. 5, 3, p. 1-12.
(Reprinted in Metallogeni Indonesia I, p. 137-150. Indonesian tin belt continuation of Main Range S-type granite from Thailand- Malaysia. Toboali area of S Bangka with alluvial tin deposits (onshore and adjacent offshore) derived from Toboali biotite granites. Late Miocene- E Pliocene thick lateritic weathering during warm climate, followed by erosion during Late Pliocene- M Pleistocene))

Abidin, H.Z. & B.H. Harahap (2005)- Petrologi granit pluton dari daerah Tenggara Palau Bangka. J. Sumber Daya Geologi 15, 1 (148), p. 102-110.
('Petrology of a granite pluton from the SE area of Bangka Island'. Late Triassic- E Jurassic Klabat granite of SE Bangka closely associated with tin formation. Intrudes Permo-Carboniferous Pemali Complex metasediments and and Triassic- Jurassic Tanjung Genting Fm clastic sediments. 72-74% SiO2, transitional alkaline-calk-alkaline and between syn-collisional, arc volcanic and within-plate granite. Mixed magma sources, 4 samples I-type and one S-type granite)

Abidin, H.Z. & S. Permanadewi (2003)- Greisen tin deposit in the Old Merawang mine, Bangka. Majalah Geologi Indonesia 18, 3, p. 175-184.
(Reprinted in Metalogeni Sundaland Vol. I (2014), p. 195-203. Old Merawang mine operated since 1950's. At contact coarse biotite granite and Triassic Tanjung Genting Fm clastic sediments. Cassiterite mineralization as as greisen, veins and dissemination)

Abidin, H.Z. & E. Rusmana (2004)- Wolframite associated with tin deposit in Bangka: prospect and origin. Majalah Geologi Indonesia 19, 1, p. 39-48.
(Reprinted in Metalogeni Sundaland Vol. I (2014), p. 205-215)
(Wolframite/ tungsten is most common mineral associated with tin deposits all over Bangka. Traditionally viewed as uneconomic, but may have value. Genetic origin similar to tin. Most common as late hydrothermal deposit in cracks and fractures of quartz veins in Triassic Tanjung Genting Fm sandstones)

Adam, J.W.H. (1932)- Kaksa genese. De Mijningenieur 13, 12, p. 217-221.

('Genesis of kaksa' = genesis of alluvial placer tin ore deposits on Bangka. Clear link between tin-bearing non-marine basal alluvial 'kaksa' sediments and erosion of primary ore veins in and around granites)

Adam, J.W.H. (1933)- Kaksa genese (slot). De Mijningenieur 14, 5, p. 81-87.
('Genesis of kaksa (final)'. Continuation of Adam (1932) paper)

Adam, J.W.H. (1960)- On the geology of the primary tin ore deposits in the sedimentary formation of Billiton, Indonesia. Geologie en Mijnbouw 39, 10, p. 405-426.
(https://drive.google.com/file/d/0B7j8bPm9Cse0X2p0TmhuZEVycnc/view)
(Billiton Island part of belt of tin mineralization from Burma, Malaya into Java Sea. Primary cassiterite lodes studied in Klappa Kampit mine (down to 300m below sea level). Minralization in in folded Permo-Carboniferous sediments, near Mesozoic granite intrusives. Most important cassiterite deposits are bedding-plane lodes at contact of shale and sandstone or radiolarite. Magnetite common in many lodes)

Aernout, W.A.J. (1922)- Verslag over eene geologisch-mijnbouwkundige verkenning der Karimata-eilanden. Jaarboek Mijnwezen Nederlandsch Oost-Indie 49 (1920), Verhandelingen 1, p. 305-320.
(Reconnaisance geological-mining investigation of Karimata group of 50 islands off SW Kalimantan. Mainly Lower Cretaceous granites and volcanics. Minor contact-metamorphic Triassic-Jurassic sediments (hornfels, quartzite). Regarded as western continuation of Schwaner Mountains (also related to Bangka-Billiton tin islands?; JTvG). U Cretaceous- Lower Tertiary sediments probably absent. With 1:200,000 scale map)

Akkeringa, J.E. (1872)- Rapport van het Distrikt Blinjoe, eiland Bangka. Jaarboek Mijnwezen Nederlandsch Oost-Indie 1 (1872), p. 41-148.
('Report on the Blinyu District, Bangka island')

Akkeringa, J.E. (1873)- Verslag van een onderzoek naar tinaders op het eiland Billiton. Jaarboek Mijnwezen Nederlandsch Oost-Indie 2 (1873), p. 3-72.
('Report on an investigation of tin ore veins on the island of Belitung')

Akkersdijk, M.E. (1932)- Enkele geologische gegevens betreffende het Pemali-tinertsvoorkomen op het eiland Banka. De Mijningenieur 13, p. 6-10.
('Some geologic data on the Pemali tin ore occurrence on the island of Bangka'. Cassiterite in veins in ?Triassic phyllitic claystones, 100-200m from large Belinloe- Soengeilat granite massif)

Aleva, G.J.J. (1956)- The grain size distribution of quartz in granitic rocks of Billiton, Indonesia. Geologie en Mijnbouw 18, 6, p. 177-187.
(online at: https://drive.google.com/file/d/0B7j8bPm9Cse0M3VVc2Z5VlpZZVU/view)
(Chemical nature of weathering of granites in Billiton causes complete alteration of feldspar and Fe-Mg minerals, leaving residu of quartz and some accessory minerals. Lognormal size distribution of quartz in Billiton granite)

Aleva, G.J.J. (1960)- The plutonic rocks from Billiton. Geologie en Mijnbouw 39, 10, p. 427-436.
(online at: https://drive.google.com/file/d/0B7j8bPm9Cse0X2p0TmhuZEVycnc/view)

Aleva, G.J.J. (1973)- Aspects of the historical and physical geology of the Sunda Shelf, essential to the exploration of submarine tin placers. Geologie en Mijnbouw 52, 2, p. 78-91.
(online at: https://drive.google.com/file/d/0B7j8bPm9Cse0SGRic1l6TklZUTQ/view)
(Sunda shelf is drowned continuation of Bangka- Belitung land areas. Thin tin-bearing Quaternary sediment cover with three sedimentary cycles, etc.).

Aleva, G.J.J. (1985)- Indonesian fluvial cassiterite placers and their genetic environment. J. Geol. Soc., London 142, p. 815-836.
(On tin placer deposits in alluvial valley systems near Belitung and Singkep island. 95% of mineable cassiterite directly on weathered bedrock)

Aleva, G.J.J., E.H. Bon, J.J. Nossin & W.J. Sluiter (1973)- A contribution to the geology of part of the Indonesian tin belt: the area between Singkep and Bangka islands and around the Karimata islands. In: B.K. Tan (ed.) Proc. Reg. Conf. the Geology of SE Asia, Kuala Lumpur 1972, Bull. Geol. Soc. Malaysia 6, p. 257-271.
(online at: https://gsmpubl.files.wordpress.com/2014/09/bgsm1973017.pdf)
(also in Bull. Nat. Inst. Geology and Mining, Bandung, 4, 1, p. 1-22 (1972))
(Acoustic surveys and core holes between Singkep and Bangka and around Karimata islands. Basement covered by unconsolidated sub-horizontal sands with peat interbeds, probably Late Tertiary age. Followed by sediment-filled gullies, incised into older sediments, also with peat, also Late Tertiary. Near-horizontal planation surface at 20-30m below sea level, overlain by young marine sediments)

Aleva, G.J.J., L. J. Fick & G. L. Krol (1973)- Some remarks on the environmental influence on secondary tin deposits. In: N.H. Fisher (ed.) Metallic provinces and mineral deposits in the Southwest Pacific, Bureau Mineral Res. Geol. Geoph., Bull. 141, p. 163-172.
(online at: www.ga.gov.au/corporate_data/108/Bull_141.pdf)
(Five genetically different types of tin placer deposits in SE Asian tin belt. Common factors include deep chemical weathering, selective removal of lightweight material, and adequate catchment areas or traps. Mainly on Bangka- Billiton cassiterite placers ('left-behind deposits'), also W Thailand, Malaysia, Tudjuh archipelago)

Andi Mangga, S. & B. Djamal (1994)- Geological map of the North Bangka Sheet (1114), Sumatra, 1:250,000. Geol. Res. Dev. Centre (GRDC), Bandung.
(N Bangka Island oldest rocks Permian Pemali Fm metamorphics, unconformably overlain by folded Tanjunggenting Fm meta-sandstones and claystone with lenses of limestone. Intruded by Late Triassic Klabat granite (217 ± 5 Ma). Unconformably overlain by Plio-Pleistocene and Holocene clastics)

Archbold, N.W. (1983)- A Permian nautiloid from Belitung, Indonesia. Publ. Geol. Res. Dev. Center, Bandung, Seri Paleontologi 4, p. 32-36.
(Fragment of straight nautiloid Neorthoceras at Kelapa Kampit, NE Belitung, suggests E-M Permian age for part of NE Belitung Island 'basement' complex. Only other occurrence of Neorthoceras in Indonesia is Bitauni, Timor. With summary of other Permian macrofossil occurrences on Belitung)

Aryanto, N.C.D. & U. Kamiludin (2016)- The content of placer heavy mineral and characteristics of REE at Toboali coast and its surrounding area, Bangka Belitung Province. Bull. Marine Geol. 31, 1, p. 45-54.
(online at: http://ejournal.mgi.esdm.go.id/index.php/bomg/article/view/318/273)
(Bangka Island and surrounding areas major tin producer (cassiterite), but also heavy mineral placers (magnetite, ilmenite, zircon, apatite, monazite) and potential REE producer (La, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, etc.). Tectonic environment of Toboali granitoid of S Bangka continental magmatic arc)

Aryanto, N.C.D. & U. Kamiludin (2016)- Heavy mineral placers and REE potential at the Bangka coasts and its surroundings. In: Proc. 52nd Annual Session Coord. Comm. Geoscience Progr. E and SE Asia (CCOP), Bangkok, p. 175-184.
(online at: www.ccop.or.th/download/as/52as2.pdf)
(Presence of REE minerals in beach sand and tin mining tailings in S Bangka island. Bangka granites subdivided in Klabat batholith in N (10 plutons; S-type,Late Triassic- M Jurassic; comparable to Main granite belt of Malay Peninsula) and Bebulu batholith in S (5 plutons; S and IS-types))

Aryanto, N.C.D., Nasrun, A.H. Sianipar & L. Sarmili (2005)- Granit Kelumpang sebagai granit Tipe-I di pantai Balok, Belitung. J. Geologi Kelautan 3, 1, p. 19-27.
(online at: http://ejournal.mgi.esdm.go.id/index.php/jgk/article/view/121/111)
('I-type Kelumpan Granite at Balok beach, Belitung'. In Bangka- Beliting region biotite-granites associated with cassiterite; no cassiterite mineralisation in hornblende granites. Kelumpang granite of SE Belitung hornblende granite, rich in K-feldspar megacrystic minerals, of I-type, and no cassiterite. Age E Jurassic?)

Aryanto, N.C.D., N. Sukmana & P. Rahardjo (2001)- Specific heavy minerals study on the South Bangka island: a statistical approach. Proc. CCOP 37th Ann. Sess. Bangkok 2000, 2, Techn. Repts., p. 65-70.

Aryanto, N.C.D., J. Widodo & P. Rahardjo (2003)- Keterkaitan unsur tanah jarang terhadap mineral berat ilmenit dan rutil perairan Pantai Gundi, Bangka Barat. J. Geol. Kelautan 1, 2, p. 13-18.
(online at: http://ejournal.mgi.esdm.go.id/index.php/jgk/article/view/95/85)
(The relationship between Rare Earth Elements and heavy minerals ilmenite and rutile in waters off Gundi Beach, West Bangka'. Niobium (Nb) and Tantalum (Ta) occur in association with ilmenite (FeTiO2) and rutile (TiO2) in near-coastal sands off SW Bangka)

Baartmans, J.A., H. Boissevain, J. van Galen, P.H. Kuenen, T. Raven, G.L. Smit Sibinga, J. Weeda & J.I.S. Zonneveld (1947)- De morfologie van de Java- en Soenda Zee. Tijdschrift Kon. Nederlands Aardrijkskundig Genootschap II, 64, p. 442-465 and p. 555-576.
('The morphology of the Java and Sunda Sea'. Overview of Java Sea morphology and morphological history)

Baharuddin & Sidarto (1995)- Geologic map of the Belitung Sheet (1212, 1213, 1312, 1313), Sumatra. Geol. Res. Dev. Centre (GRDC), Bandung.
(Map of Belitung (= Billiton) Island, SE of Bangka. Similar geology with folded, low-metamorphic Permo-Carboniferous clastics: (1) Kelapakampit Fm flysch-type deposits with rare Permian fossils, incl. ammonite Agathiceras sundaicum, Fusulina and Schwagerina and Gigantopteris, interfingering with: (2) Tajam Fm quartz sandstones and (3) Siantu Fm basalts and volcanic breccias. Intruded by Tanjungpandan S-type biotite-hornblende granite in NW, locally rich in primary cassiterite (Late Triassic; 215 Ma Rb-Sr age; Schwartz and Surjono 1990) and I-type Baginda adamellite in S (Jurassic?;160-208 Ma; Priem et al. 1975))

Batchelor, B.C. (1979)- Geological characteristics of certain coastal and offshore placers as essential guides for tin exploration in Sundaland, Southeast Asia. In: C.H. Yeap (ed.) Proc. Int. Symp. Geology of tin deposits, Kuala Lumpur 1978, Bull. Geol. Soc. Malaysia 11, p. 283-313.
(online at: www.gsm.org.my/products/702001-101221-PDF.pdf)
(Over 95% of tin production in Malaysia and Indonesia from 'alluvial' placers. Discontinuously rising late Cenozoic eustatic sea-levels and accompanying climate changes main controls on Sundaland sedimentation. Late Cenozoic subdivided into Sundaland regiolith (Late Miocene- E Pliocene), Older sedimentary cover (Pliocene- E Pleistocene) and Young Alluvium (Late Pleistocene- Holocene))

Batchelor, B.C. (1979)- Discontinuously rising late Cainozoic eustatic sea-levels, with special reference to Sundaland, Southeast Asia. Geologie en Mijnbouw 58, 1, p. 1-20.
(online at: https://drive.google.com/file/d/0B7j8bPm9Cse0c2VPc282N1Q3YVE/view)
(M Miocene- Recent se level cyclicity. Late Cenozoic global eustatic sea-level rise, of greater magnitude and opposite trend to previous schemes, indicated by studies in Sundaland area. Abrupt sea-level drop in late M Miocene (~N14/N15; ~14-12 Ma?) to ~1000 m below present, correlated with emergent Sundaland continent. Increased land area resulted in more seasonal semi-arid climates. Sea levels have since risen discontinuously since Late Miocene (~11 Ma) at ~10cm/ 1000 yrs, with maximum transgression in late Quaternary. Pleistocene Sundaland coastlines changed little before M. Once since then seas rose above shelf-break causing major coast line shifts, dramatically affecting sedimentation and climates)

Batchelor, B.C. (1983)- Sundaland tin placer genesis and Late Cenozoic coastal and offshore stratigraphy in Western Malaysia and Indonesia. Ph.D. Thesis, University of Malaya, Kuala Lumpur, 2 vols., 598p.
(Unpublished)

Batchelor, D.A.F. (2015)- Conceptual exploration for tin, gold and diamond placer deposits in ôSundalandô (Indonesia and Malaysia) by understanding the Late Cainozoic stratigraphic context. In: Proc. PACRIM 2015 Congress, Hongkong, Australasian Inst. of Mining and Metallurgy (AusIMM), Melbourne, Publ. Ser. 2/2015, p. 499-506. *(Extended Abstract)*
(W Indonesia- Peninsular Malaysia long known for Pleistocene placer deposits of tin, diamonds and gold. Systematic variation in stratigraphic position of placers: cassiterite mainly in Old Alluvium (Late Pliocene- Lw

Pleistocene; equivalent of U Dahor Fm in Kalimantan); gold richer in gravelly younger deposits. Reworked diamonds in SE Kalimantan/ Martapura area mainly in Late Pleistocene and younger 'Young Alluvium' that fills incised V-shaped valleys. New potential tin areas in W Kalimantan near Ketapang)

Bellwood, P. (1990)- From Late Pleistocene to Early Holocene in Sundaland. In: C. Gamble & O. Soffer (eds.) The world at 18 000 BP, 2, Low latitudes, p. 255-263.

Ben-Avraham, Z. (1973)- Structural framework of the Sunda Shelf and vicinity. Ph.D. Thesis Massachusets Inst. Technology/ Woods Hole Oceanographic Inst., p. 1-269.
(On geology of W Indonesia Sunda Shelf, largely based on Woods Hole OI shallow geophysical surveys over southern Sunda Shelf (Java Sea) and compilation of onshore data)

Ben-Avraham, Z. & K.O. Emery (1973)- Structural framework of Sunda Shelf. American Assoc. Petrol. Geol. (AAPG) Bull. 57, p. 2323-2366.
(Sunda Shelf divided into three major areas: N Sunda Shelf basinal area, Singapore Platform and Java Sea basinal area. Geophysical studies around Natuna Islands suggest region is underlain by relatively thin continental crust (~21 km thick. Natuna Ridge interpreted as Mesozoic subduction zone. During E-M Cretaceous Malay Peninsula was part of Eurasia and Borneo was next to mainland China and Hainan)

Bird, M.I., W.C. Pang & K. Lambeck (2006)- The age and origin of the Straits of Singapore. Palaeogeogr. Palaeoclim. Palaeoecology 241, p. 531-538.
(Straits of Singapore marine connection between Indian Ocean and South China Sea through the Straits may not have existed until last interglacial period (oxygen isotope stage 5e) and probably did not act as significant barrier to migration from mainland Asia to emergent areas of Sunda Shelf for most of Quaternary)

Bodenhausen, J.W.A. (1954)- The mineral assemblage of some residual monazite- and xenotime-rich cassiterite deposits of Banka (Indonesia). Proc. Kon. Nederl. Akademie Wetenschappen B57, 3, p. 322-328.
(Heavy minerals in young sands of Muntok District, NW Bangka, composed of 30-60% cassiterite, 19-22% monazite, 11-31% ilmenite, 1-5% xenotime)

Bon, E.H. (1979)- Exploration techniques employed at the Pulau Tujuh tin discovery. In: A. Prijono, C. Long and R. Sweatman (eds.) The Indonesian mining industry, its present and future, Proc. First Indonesian Mining Symposium, Jakarta 1977, Indon. Mining Assoc. (IMA), Jakarta, p. 147-183.

Bon, E.H. (1979)- Exploration techniques employed in the Pulau Tujuh tin discovery. Trans. Inst. Mining Metallurgy (Sect. A, Min.), 88, p. 13-22.
(Similar to Bon (1979) above)

Bothe, A.C. (1924)- Enkele opmerkingen over stroomtinertsvorming op het eiland Bintan. De Mijningenieur 5, 9, p. 146-151.
('Some remarks on the formation of alluvial tin ore on Bintan island'. With geologic map of South Bintan 1:150,000. Bintan) mainly composed of granites, intruded into unfossiliferous, poorly exposed, steeply dipping (N80°W, dip 70° to SW) 'clay-shales' and sandstones. Alluvial tin ore present, but not very rich)

Bothe, A.C.D. (1925)- Het voorkomen van tinerts in den Riau archipel en op de eilanden van Poelau Toedjoeh (Anambas en Natuna eilanden). Verslagen Mededelingen Indische Delfstoffen en Hare Toepassingen, Dienst Mijnbouw Nederlandsch-Indie 18, p. 1-42.
('The occurrence of tin ore in the Riau Archipelago and the Anambas and Natuna islands'. Survey for tin deposits outside tradional tin islands Bangka- Belitung. Widespread indications of cassiterite ore, but no large deposits. Includes presence of U Triassic Halobia-bearing shales. With maps of islands of Karimon, Kundur, Bintan, Lingga, Batam and Anambas- Natuna. Geology described in more detail in Bothe 1928)

Bothe, A.C.D. (1928)- Geologische verkenningen in den Riouw-Lingga archipel en de eilandengroep der Poelau Toedjoeh (Anambas en Natoena eilanden). Jaarboek Mijnwezen Nederlandsch-Indie 54 (1925), Verhandelingen 2, p. 101-152.
('Geological reconnaissance in the Riau-Lingga Archipelago and Anambas and Natuna islands')

Cahyono, N. (1998)- Sea level controls during the deposition of placer deposits in Cupat offshore, northern Bangka, Indonesia. Proc. 33rd Sess. Comm. Co-ord. Joint Prospecting Mineral Resources in Asian Offshore Areas (CCOP), 2, p. 221-230.
(Cupat offshore data shows potential for tin placer deposits. Materials supplied from Kelabat tin granite, reworked by wave and tidal currents. Morphology of granite and schist basement in area with small basins which filled with Quaternary deposits)

Cissarz, A. & F. Baum (1960)- Vorkommen und Mineralinhalt der Zinnerzlagerstatten von Bangka (Indonesien). Geol. Jahrbuch 77, p. 541-580.
('Occurrence and mineral content of tin ore deposits of Bangka, Indonesia'. Primary tin mineralization associated with Young Cimmerian granites in Triassic sediments)

Cordes, J.H. (1873)- Rapport van het distrikt Pangkal-Pinang, eiland Bangka. Jaarboek Mijnwezen Nederlandsch Oost-Indie 1876 (1878), 1, p. 89-126.
('Report on the Pangkal-Pinang District, Bangka Island')

De Groot, C. (1852)- Eiland Blitong (Biliton). Natuurkundig Tijdschrift Nederlandsch-Indie 3, 2, p. 133-159.
(online at: http://62.41.28.253/cgi-bin/)
('The island Belitung (Biliton)'. Early, brief description of geology and tin mining on Belitung)

De Groot, C. (1887)- Herinneringen aan Blitong, historisch, lithologisch, mineralogisch, geographisch, geologisch en mijnbouwkundig. H.L. Smits, The Hague, p. 1-549.
(online at: http://books.google.com/books/)
('Memories of Belitung, historic, lithologic, mineralogic, geologic and mining'. One of oldest reports on geology and tin mining on Billiton/ Belitung island by mining engineer De Groot)

De Jongh, D. (1883)- Over het voorkomen van goud en tinerts op en langs de oostkust van het district Merawang, Eiland Banka. Jaarboek Mijnwezen Nederlandsch Oost-Indie 12, p. 161-175.
('On the occurrence of gold and tin ore along the East coast of the Merawang District, Bangka Island')

De Neve, G.A. & W.P. de Roever (1947)- Upper Triassic fossiliferous limestones in the island of Bangka. Proc. Kon. Nederl. Akademie Wetenschappen, Amsterdam, 50, 10, p. 1312-1314.
(online at: www.dwc.knaw.nl/DL/publications/PU00018447.pdf)
(Upper Triassic fractured, low metamorphic limestones in Loemoet tin mine, SE of Klabat Bay. Folded with phyllites and fine-crystalline quartzites. First documentation of poorly preserved Norian corals (Montlivaltia molukkana), calcareous sponges (Peronidella moluccana) and crinoids (Entrochus spec., Encrinus). No illustrations (Montlivaltia molukkana also known from U Triassic of Seram, Timor; JTvG))

De Roever, W.P. (1950)- Over een door oplossing van kalksteen gevormde depressive in het kongoppervlak op Banka, waarin een grote hoeveelheid tinerts is geaccumuleerd (mijn 7 der Sectie Belinju). De Ingenieur in Indonesia, IV, 2, 3, p. 6-16.
('On a depression in the kong surface of Bangka formed by dissolution of limestone, in which a large quantity of tin ore accumulated (mine 7 of Belinju sector)'. Limestone blocks in highly folded phyllites, which are striking mainly in WNW-ESE direction)

De Roever, W.P. (1951)- Some additional data on the stratigraphy of Bangka. Geologie en Mijnbouw 13, 10, p. 339-342.
(online at: https://drive.google.com/file/d/0B7j8bPm9Cse0b3JMaG1QbGgzSVk/view)

(New fossil finds on Bangka Island include: Upper Triassic in limestone bed in dynamo-metamorphic clastics and volcanics in Lumut tin mine (coral Montlivaultia molukkana Wanner, sponges Peronidella moluccana Wilckens and crinoids). Also white silicified limestone interbedded in phyllite-sandstone series with Permian fusulinid foraminifera in old tin mine 17 at at Airduren, NE Bangka. Pebbles of radiolarian chert in (Triassic?) conglomerate. Permian of Banka and Billiton may be compared to U Paleozoic of S Malaya Peninsula)

Dickerson, R.E. (1941)- Molengraaff River; a drowned Pleistocene stream and other Asian evidences bearing upon the lowering of sea level during the ice age. In: E.A. Speiser (ed.) Proc. University of Pennsylvania Bicentennial Conf., University of Pennsylvania Press, p. 13-24.
(In Pleistocene a great river, here named Molengraaff River, flowed N between Malay Peninsula and Borneo, with its headwaters in Sumatra. Evidenced by distribution of similar fresh- water fish species in E Sumatra and W Kalimantan and configuration and sediments of drowned valley. Sea level was lowered by 240-300' during last glaciation)

Dirk, M.H.J. (2004)- Granit Menumbing, Pulau Bangka. J. Sumber Daya Geologi 14, 1 (145), p. 84-91.
('The Menumbing granite, Bangka Island'. Menumbing granite of W Bangka porphyritic monzogranite with biotite-muscovite)

Dirk, M.H.J. (2004)- Petrologi dan geokimia unsur utama granit berasosiasi timah dari Pulau Kundur & Pulau Karimun. J. Sumber Daya Geologi 14, 2 (146), p. 3-12.
(also numbered as Vol. 1, No. 2. ' Petrology and geochemistry of the main elements of tin granites of Kundur and Karimun Islands'. Common outcrops of M-U Triassic? tin-associated granites on Kundur and Karimun islands. Monzogranite with porphyritic textures. Silica oversaturated, calk-alkaline, crystallized at <22km)

Dirk, M.H.J. (2004)- Lingkungan tektonik dan skenario pembentukan batuan granitik Menumbing Pulau Bangka, Pulau Karimun, Pulau Kundur dan pulau Bintan, berdasarkan kandungan unsure jejak. J. Sumber Daya Geologi 14, 2 (146), p. 13-25.
('Tectonic overview and formation scenario of Menumbing granitic rocks from the islands Bangka, Karimun, Kundur and Bintan'. tin granites from Bangka, Karimun, Kundur are within plate/ syn-collisional granites with latest Triassic K-Ar (~200- 211± 10 Ma) ages. Bintan Island granitoids Volcanic Arc granites of Late Triassic (~222-230 Ma) age)

Dirk, M.H.J. (2013)- Perbedaan genesa magma antara 'tin bearing granitoid rocks' dari jalur Kepulauan timah Indonesia dan 'Tin barren granitoid rocks' dari Pulau Bintan. J. Sumber Daya Geologi 23, 2, p. 81-92.
(online at: http://jgsm.geologi.esdm.go.id/index.php/JGSM/article/view/92/86)
('Differences in magma genesis between tin bearing granitoid rocks of Indonesia's tin islands and tin barren granitoid rocks of Bintan Island'. Tin-bearing granitoids from Menumbing- Bangka, Karimun and Kundur islands are latest Triassic (~211±10- 200±4 Ma) syn-collisional porphyritic monzogranites of calc-alkaline affinity, formed by melting of greywacke source material during collision of continental margins. Tin-barren granitoids from Bintan island NE of Tin Belt older (M-U Triassic; ~230-222 Ma) pre-collisional monzogranites and granodiorites of calc-alkaline affinity, formed above E-dipping subduction zone)

Dirk, M.H.J. & U. Hartono (2003)- Kondisi yang memungkinkan mineralisasi timah pada batuan granitik: suatu analisis kasus pada batuan granitik dari Menumbing Pulau Bangka, Karimun dan Kundur. J. Geologi Sumberdaya Mineral 13, 144, p. 19-29.
('Conditions favorable for tin mineralization in granitic rocks: an analysis granitic rocks of Bangka, Karimun and Kundur islands'. Granitic rocks of Menumbing-Bangka, Karimun and Kundur Sn-mineralized. SiO_2 content >70%. Biotite more stable than hornblende)

Djumhana, D. (1995)- Beberapa aspek petrologi batuan granitik di daerah bagian barat P. Bangka. In: Kolokium hasil pemetaan dan penelitian Puslitbang Geologi 1992/1993, Geol. Res. Dev. Centre (GRDC), Bandung, Spec. Publ. 16, p. 101-118.
('Some aspects of the petrology of granitic rocks of western Bangka Island')

Doorman, W.H.C. (1910)- De tinontginningen in Nederlands Oost-Indie, in het bijzonder die op Billiton. De Indische Gids 32, 1, p. 595-619.
('The tin exploitation in Netherlands East Indies, particularly those on Belitung')

Edwards, G. & W.A. McLaughlin (1965)- Age of granites from the tin province of Indonesia. Nature 206, 4986, p. 814-816.
(New radiometric ages of granite from Billiton collected by Schurmann: Rb-Sr of biotite 200 Ma, Rb-Sr of K-feldspar 205 Ma. Uranium, Ages of related Singkep granite from Th and Pb isotopes: ~220 Ma for monazites, 205 Ma for xenotimes and 195 Ma for zircon. Late Triassic- earliest Jurassic age spread may indicate long and complex history of crystallization)

Emery, K.O. (1969)- Distribution patterns of sediments on the continental shelves of western Indonesia. United Nations ECAFE, CCOP Techn. Bull. 2, p. 79-82.

Emmel, F.J. & J.R. Curray (1982)- A submerged late Pleistocene delta and other features related to sea level changes in the Malacca Strait. Marine Geology 47, p. 192-216.
(Late Pleistocene alluvial-delta and slope fan complex at NW end of Malacca Straits/ Andaman Sea, deposited during lowered sea level, fed by confluent Sumatran and Malayan rivers. Younger prograding layers probably of mid-Wisconsin (Wurm) age (~40- 20 ka; deeper foresets may be early Illinoian glacial stage (Riss, ~150ka)

Esenwein, P. (1933)- Die Eruptiv-, Sediment- und Kontaktgesteine der Karimata-Inseln. Wetenschappelijke Mededeelingen Dienst Mijnbouw Nederlandsch-Indie 24, p. 1-116.
('The volcanic, sedimentary and contact-metamorphic rocks of the Karimata islands'. Located between Belitung and W Kalimantan and considered to be western geological continuation of Kalimantan Schwaner Mountains. Common ?Triassc-Jurassic? igneous (incl. granites, gabbro, diabase) and contact-metamorphic rocks. Relatively minor ?Triassic- Jurassic? unfossiliferous sediments (Priem et al. 1975 dated Karimata granites as ~74-78 Ma (Campanian) and may be related to similar age granites in W Sarawak (Hutchison 1983))

Everwijn, R. (1872)- Verslag van een onderzoek naar tinerts op eenige eilanden behorende tot de residentie Riouw. Jaarboek Mijnwezen Nederlandsch Oost-Indie 1872, 2, p. 73-126.
('Report of a survey of tin ore on some islands in the Riau residency')

Germeraad, J.H. (1941)- On the rocks of the island of Koendoer, Riauw Archipelago, Netherlands East Indies. Proc. Koninkl. Nederl. Akademie Wetenschappen, Amsterdam 44, 10, p. 1227-1233.
(online at: www.dwc.knaw.nl/DL/publications/PU00017687.pdf)
(Brief review of Kundur island geology, probably continuation of Malay Peninsula geology: granitic batholiths intruded into pre-Carboniferous schists/ amphibolites and lateritized ?Triassic sediments (red quartz-rich conglomerates, quartzites, limonite-rocks), causing contact-metamorphism. Petrography of rocks collected by Roggeveen during tin survey in 1930: amphibolites (metamorphosed gabbro), quartzites, greisens, granites, quartz veins with cassiterite and wolframite, etc.)

Geyh, M. A., H. R. Kudrass & H. Streif (1979)- Sea-level changes during the Late Pleistocene and Holocene in the Strait of Malacca. Nature 278, 5703, p. 441-443.
(Reconstruction of sealevel curve of last 10,000 yrs from C14 dating of peat horizons in cores from Malacca Strait and in coastal areas of Malay Peninsula. Sealevel rose from ~ -65m at ~10 ka to 0 around 7 ka. Sea level indicators for Holocene highstand time between 5000-4000 BP at +2.5 to +5.8m above present mean sea level)

Graha, D.S. (1993)- Granit Bukit Limau, Pulau Karimun Besar, Riau. J. Geologi Sumberdaya Mineral 3, 23, p. 10-15.
(Granite of Bukit Limau, Karimun Besar Island, Riau'. Granite of Bukit Limau, Karimun Besar, Riau Islands, belongs to SE Asian Tin Belt. Leucogranite formed under rel. low T and poor in metallic elements, Age Late Triassic- E Jurassic?)

Groothoff, C.T. (1915)- De greisen-vorming in het Besie granietmassief (Billiton). Verhandelingen Geologisch-Mijnbouwkundig Genootschap Nederland Kol., Geol. Serie 1, 6, p. 319-336.
('Greisen-formation in the Batu Besi granite massif (Belitung)')

Groothoff, C.T. (1916)- De primaire tinertsafzettingen van Billiton. Thesis Technische Hogeschool Delft (Delft Technical University), p. 1-103.
('The primary tin deposits of Billiton Island'. Tin-bearing quartz veins associated with cooling of granites)

Groothoff, C.T. (1916)- Eenige merkwaardige gesteenten van Billiton. Verhandelingen Geologisch-Mijnbouwkundig Genootschap Nederland Kol., Geol. Serie 3 (Molengraaf Volume), p. 89-106.
(online at: https://ia601908.us.archive.org/30/items/verhandelingenva3191geol/verhandelingenva3191geol.pdf)
('Some remarkable rocks from Belitung'. Includes descriptions of granite with primary cassiterite, granite with fluorite, topaze-bearing rocks, tourmaline greisen, etc.)

Gulson, B.L. & M.T. Jones (1992)- Cassiterite: potential for direct dating of mineral deposits and a precise age for the Bushveld Complex granites. Geology 20, 4p. 355-358.
(On U-Pb isotopes in cassiterite as dating tool. Includes measurements on cassiterite from ~200 Ma tin deposits of Belitung)

Gupta, A., A. Rahman, P.P. Wong & J. Pitts (1987)- The old alluvium of Singapore and the extinct drainage system to the South China Sea. Earth Surface Processes and Landforms 12, 3, p. 259-275.

Haile, N.S. (1971)- Quaternary shorelines in West Malaysia and adjacent parts of the Sunda Shelf. Quaternaria 15, p. 333-343.

Haile, N.S. (1973)- The geomorphology and geology of the northern part of the Sunda shelf and its place in the Sunda mountain system. Pacific Geology 1973, 6, p. 73-89.

Hamzah, Y. (1995)- Tin placer deposits off the Rebo area, East coast of Bangka Island, Indonesia. In: J. Ringis (ed.) Proc. 31st Sess. Comm. Co-ord. Joint Prospecting Mineral Resources in Asian Offshore Areas (CCOP), Kuala Lumpur 1994, 2, p. 79-89.

Hamzah, Y. (1998)- Geophysical survey of tin placer deposits in West Singkep offshore, Riau Archipelago, Indonesia. In: J.L. Rau (ed.) Proc. 34th Sess. Sess. Co-ord. Comm. Coastal Offshore Geosc. Programs E and SE Asia (CCOP), Taejon, Korea 1997, 2, Techn. Repts, p. 55-63.
(Geophysical survey W of Singkep, NW of Bangka, to map cassiterite-bearing channels on biotite granite basement surface)

Hanebuth, T.J.J. & K. Stattegger (2003)- The stratigraphic evolution of the Sunda Shelf during the past fifty thousand years. In: F.H. Sidi, D. Nummedal et al. (eds.) Deltas of Southeast Asia and vicinity-sedimentology, stratigraphy and petroleum geology, SEPM Spec. Publ. 76, p. 189-200.
(Sunda shelf exposed during last glaciation, with soil formation and sediment bypass. Analysis of 36 cores from transect in main paleo-valley of North Sunda River on middle Sunda Shelf. Large foresets of delta system extended basinward following sea-level lowering before Last Glacial Maximum. Marshy soil formed after exposure, and sediment bypass dominated during lowstand. Subsequent sea-level rise caused stepwise submergence. Before 13.5 ka drowning restricted mainly to N Sunda River valley. After 13.5 ka flooding of Sunda plain (~70 m below modern sea surface) caused loss of upper course of river system combined with interruption of terrigenous supply)

Hanebuth, T.J.J. & K. Stattegger (2004)- Depositional sequences on a late Pleistocene-Holocene tropical siliciclastic shelf (Sunda Shelf, Southeast Asia). J. Asian Earth Sci. 23, p. 113-126.
(Sunda Shelf tropical siliciclastic shelf with low gradient, extreme width, huge paleo-valley systems, high sediment input due to large catchment area. Four systems tracts during last glacial sea-level fall and subsequent deglacial rise: (a) wide, partly detached deltaic clinoforms indicate forced regression; (b) shoreline

deposits and soil formation of lowstand systems tract; (c) backstepping coastline deposits form confined transgressive systems tract and mainly restricted to paleo-valley system; (d) thin marine mud cover as condensed section over whole shelf (base of HST))

Hanebuth, T.J.J., K. Stattegger & A. Bojanowski (2009)- Termination of the Last Glacial Maximum sea-level lowstand: the Sunda-Shelf data revisited. Global Planetary Change 66, p. 76-84.
(Sunda Shelf Late Pleistocene paleo-coastal relict forms indicating older lowstand 5m deeper than sea level during Last Glacial Maximum (LGM; 21-19 ka BP). Sunda shelf LGM sea level recalculated to 123m below modern water depth)

Hanebuth, T.J.J., K. Stattegger & P.M. Grootes (2000)- Rapid flooding of the Sunda Shelf- a late-glacial sea-level record. Science 288, p. 1033-1035.
(Sea level rise after last glacial maximum at ~20 ka derived from siliciclastic shoreline facies. Record generally confirms reconstructions from coral reefs (~ -115m at 20 ka). Rise of sea level during meltwater pulse 1A was 16m in 300 years between 14.6 to 14.3 ka)

Hanebuth, T.J.J., K. Stattegger & Y. Saito (2002)- The stratigraphic architecture of the central Sunda Shelf (SE Asia) recorded by shallow-seismic surveying. Geo-Marine Letters 22, p. 86-94.
(Shallow seismic identified units and surfaces of last three 100 ka Pleistocene sea-level cycles)

Hanebuth, T.J.J., K. Stattegger, A. Schimanski, T. Ludmann & H.K. Wong (2003)- Late Pleistocene forced regressive deposits on the Sunda Shelf (SE Asia). Marine Geology 199, p. 139-157.
(Late Pleistocene regressive deposits on Sunda Shelf three different morphogenic types, including prograding delta wedges of North Sunda River (= Molengraaff River) system at outer shelf and shelf margin. Regressive units separated from their previous highstand shorelines by broad zone of sedimentary bypass)

Hanebuth, T.J.J., H.K. Voris, Y. Yokoyama, Y. Saito & J. Okuno (2011)- Formation and fate of sedimentary depocentres on Southeast Asia's Sunda Shelf over the past sea-level cycle and biogeographic implications. Earth-Science Reviews 104, p. 92-110.
(Review of sedimentary-biogeographic history of tropical Sunda Shelf as end-member of continental shelves of extreme width, enormous sediment supply and high biodiversity in response to rapid sea-level fluctuations)

Hantoro, W.S. (2018)- Sunda epicontinental shelf and Quaternary glacial-interglacial sea level variation and their implications to the regional and global environmental change. In: Global Colloquium on GeoSciences and Engineering 2017, LIPI, Bandung, IOP Conf. Series: Earth and Environmental Sci. 118, 012053, p. 1-12.
(online at: http://iopscience.iop.org/article/10.1088/1755-1315/118/1/012053/pdf)
(Sunda Shelf epicontinental shallow shelf since Pliocene. Sedimentation and erosion cycles follow glacial-interglacial sea level variation cycles that periodically changed area to open land. During eustatic lowstands important river drainage systems from SE Asia in N (Gulf of Thailand) and system from Malay Peninsula, Sumatra, Bangka-Belitung and Kalimantan, named Palaeo Sunda River)

Hantoro, W.S., P.A. Pirazzoli, H. Faure, R. Djuwansah & L. Faure-Denard (1995)- The Sunda and Sahul continental platform: lost land of the last glacial continent in SE Asia. Quaternary Int. 29-30, p. 129-134.
(Discussion of glacial-nterglacial conditions in Indonesian region. Some maximum glacial periods with sea level ~125m below present sea level, exposing continental platform that was quickly covered by humid lowland tropical forest. Deep pass Indian-Pacific Ocean Gateways remained open. Etc.)

Hardjawidjaksana, K. & B. Dwiyanto (1998)- Submarine surface sediment distribution and mineral resources map of Indonesia. Proc. 33rd Sess. Co-ord. Comm. Coastal Offshore Geosc. Progr. E and SE Asia (CCOP), Shanghai 1996, 2, p. 231-245.
(Broad Sunda shelf region in Indonesia marked by complex depositional and erosional patterns. In addition to tin, large offshore deposits of detrital heavy minerals zircon and rutile offshore S Kalimantan and Java Sea)

Hardjawidjaksana, K., N.A. Kristanto & M. Salahudin (2000)- Offshore mineral deposits, an assessment of sea-bed resources of Indonesia. Proc. 29th Ann. Conv. Indon. Assoc. Geol. (IAGI), 2, p. 45-60.

Harsono, R.A.F. (1975)- Pengaruh gerak Kwarter terhadap akumulasi sekunder bijih timah di Bangka. Geologi Indonesia 2, 3, p. 1-9.
(On Quaternary secondary tin accumulations of Bangka island)

Harsono, R. (1987)- General aspects of the granitoids in the Indonesian Tin islands and the surroundings. SEATRAD Bull. VIII, 2, p. 17-27.

Hehuwat, F. (1973)- The significance of zircon and rutile distribution pattern on the Sunda shelf. UN ESCAP Repts. 9th Session CCOP, Bandung 1972, p. 164-171.
(Sunda Shelf locally covered by thin veneer of Quaternary relict and residual sediments. Zircon and rutile derived from metamorphic and igneous rocks. Main concentrations of heavy minerals at S side of Sunda Shelf platform)

Helfinalis (1993)- Rekaman peristiwa transgressi dan regressi Holosen P. Belitung serta kenaikan suhu muka bumi dewasa ini. Proc. 22nd Ann. Conv. Indon. Assoc. Geol. (IAGI), Bandung, 1, p. 126-134.
('Records of transgression and regression events of Holocene P. Belitung and the rise in temperature of the Earth surface today'. Around Belitung island Holocene transgression from -65m at 11000 BP to +7.5m at 3700 BP, followed by regression until today. Ancient beach ridges and coral at +5.75m)

Hermes, J.J. & D.R. de Vletter (1942)- Contribution to the petrography of Bintan (Riouw Lingga Archipelago). Proc. Kon. Nederl. Akademie Wetenschappen, Amsterdam, 45, 1, p. 82-88.
(online at: www.dwc.knaw.nl/DL/publications/PU00017703.pdf)
(Petrography of rocks collected at Bintan island by Roggeveen in 1930. Bintan dominated by granitic rocks. Sediments two formations: Triassic highly folded phyllites, liparite- dacite-tuffs and quartz schists, intruded by granite and unconformably overlain in S and SW by much less folded clastics with streaks of coal)

Hidayat, S. & H. Moechtar (2009)- Interaksi faktor kendali tektonik, permukaan laut dan perubahan iklim di daerah Teluk Klabat, Kabupaten Bangka Induk, Bangka. J. Sumber Daya Geologi 19, 1, p. 23-36.
('Interaction of tectonic, sea-level and climate change factors in the Klabat Bay area, Bangka Regency, Bangka'. Study of depositional facies/ thickness of Quaternary deposits off N Bangka island)

Hinde, G.J. (1897)- Note on a radiolarian chert from the island of Billiton. In: R.D.M. Verbeek (1897) Geologische beschrijving van Bangka en Billiton, Jaarboek Mijnwezen in Nederl. Oost-Indie 26 (1897), p. 223-227.
(Cherts in folded (Permian or Triassic?) shales-sands of Billiton/ Belitung Island contain poorly preserved radiolaria and siliceous sponge spicules. Beloidea, Sphaeroidea (Cenosphaera, Dorysphaera), Prunoidea (cf. Cenellipsis) and Discoidea (cf. Theodiscus) recognized. Apparent absence of Cyrtoidea indicates probable Paleozoic age of rock. Assemblage contrasts strongly from radiolaria from Danau Fm of C Borneo, where cyrtoidal forms dominate)

Holt, R.A. (1998)- The gravity field of Sundaland- acquisition, assessment and interpretation. Ph.D. Thesis. Birkbeck College and University College, University of London, p.1-342. *(Unpublished)*

Hosking, K.F.G., T.E. Yancey, H.L. Strimple & M.T. Jones (1977)- The discovery of macrofossils at Selumar, Belitung, Indonesia. Bull. Geol. Soc.Malaysia 8, p. 113-116.
(online at: https://gsmpubl.files.wordpress.com/2014/09/bgsm1977008.pdf)
(Up to 40cm long crinoid stems in magnetite-cassiterite ore body at Selumar (E Belitung) assigned to Moscovicrinus, believed to be of E Permian age)

Hosking, K.F.G. & T.B.A. Rabelink (1978)- Galena-bearing grains from the Lenggang stanniferous placers, Belitung, Indonesia. Bull. Geol. Soc. Malaysia 10, p. 63-72.

(online at: https://gsmpubl.files.wordpress.com/2014/09/bgsm1978005.pdf)

Houtz, R.E. & D.E. Hayes (1984)- Seismic refraction data from Sunda Shelf. American Assoc. Petrol. Geol. (AAPG) Bull. 68, 12, p. 1870-1878.
(Seismic refraction data along 2 Sundaland profiles, one NW of Natuna island, one off N Borneo. Offshore Sarawak Basin underlain by oceanic crust and now covered by 8 km of undisturbed sediment, implying shelf edge advanced about 300 km N-ward over oceanic crust as result of post-Eocene progradation)

Hovig, P. (1920)- Banka, de geologie en de tinertsen. Meded. Algemeen Ingenieurs Congres, Batavia 1920, Sect. 5, Mijnbouw en Geologie, Ruygrok, Batavia, p. 1-40.
('Bangka, the geology and the tin ores'. Popular review of Bangka geology. Oldest rocks monotonous, intensely folded, steeply dipping, unfossilferous sediments (except Triassic? radiolaria) with main strike direction E-W (N90E- N120E), into which granites (24% of outcrop) intruded. Unlike much of Sumatra, Bangka never covered by Tertiary sediment. Tin-bearing valley-fill deposits ('kong') of Quaternary age based on Elephas sumatranus tooth), associated with granite intrusives, with valley floors locally deeper than 30m below sea level)

Hovig, P. (1923)- Over billitonieten, ertslaag en woestijnklimaat. Verhandelingen Geologisch-Mijnbouwkundig Genootschap Nederland Kol., Geol. Serie 7, p. 1-13.
(Discussion of Belitung glass tektites, found on top of bedrock ('kong'), below tin-bearing alluvial deposits. Mainly critique of Wing Easton (1921) suggestion that billitonites formed from colloidal solutions. Many billitonites have fragile small 'tables' on a stem, suggesting limited or no transport)

Huguenin, J.A. (1877)- Rapport van het district Toboali, eiland Bangka. Jaarboek Mijnwezen Nederlandsch Oost-Indie 6 (1877), 1, p. 81-185.
(Early geological- mining survey of S peninsula of Bangka island. With rel. detailed 1:60,000 geologic map)

Hutchison, C.S. (1968)- Invalidity of the Billiton granite, Indonesia, for determining the Jurassic/ Upper Triassic boundary in the Thai-Malayan orogen. Geologie en Mijnbouw 47, 1, p. 56-60.
(online at: https://drive.google.com/file/d/0B7j8bPm9Cse0cDYwRnRKR3hxalU/view)
(K-Ar age of 180± 5 Ma (Schurmann et al., 1960) for Billiton granite should not be used for setting the age of Triassic-Jurassic boundary. Emplacement of 'tin-belt' granite much more complex than model)

Iijima, A., K. Kimiya & H. Yanagimoto (1973)- Relationship between mineral composition and grain-size distribution in the low-grade bauxite deposit on Bintan Island. In: Third Int. Congress for the Study of bauxites, alumina and aluminum, Nice 1973, p. 55-61.

Ikhsan, N. & A.D. Titisari (2016)- Mineralogi dan geokimia granitoid Bukit Baginda, Pulau Belitung, Indonesia. In: R. Hidayat et al. (eds.) Proc. 9th Seminar Nasional Kebumian, Dept. Teknik Geologi, Gadjah Mada University, Yogyakarta, p. 469-484.
(online at: https://repository.ugm.ac.id/273552/)
('Mineralogy and geochemistry of Baginda Hill granitoid, Belitung Island'. Granitoids widespread on Belitung; in NW associated with tin deposits, in SW, at Baginda Hill, extremely low Sn content. Magmatic affinity of granitoid calk-alcaline, high K alkaline/ shoshonitic, I-type metaluminous. Rb versus Y+Nb and Nb versus Y suggest Baginda Hill granitoid is Volcanic Arc Granite, associated with subduction)

Ikuno T., A. Imai, K. Yonezu, K. Sanematsu, L.D. Setijadji et al. (2010)- Concentration and geochemical behavior of REE in hydrothermally altered and weathered granitic rocks in Southern Thailand and Bangka Island, Indonesia. Proc. Int. Symp. Earth Science and Technology, Fukuoka, p. 269-273.

Imai, A., R. Osone, R. Takahashi & S.D. Pratiwi (2015)- Classification and Rare Earth Elements geochemistry of granitoids in Belitung Island, Indonesia. Proc. 5th Asia Africa Mineral Resources Conf., Quezon City, p. 51-54.

Irzon, R. (2015)- Contrasting two facies of Muncung Granite in Lingga Regency using major, trace and Rare Earth Element geochemistry. Indonesian J. Geoscience 2, 1, p. 23-33.
(online at: http://ijog.bgl.esdm.go.id/index.php/IJOG/article/view/187/187)
(Two granitic units in Lingga islands group, NW of Bangka: (1) S-type Muncung Granite (Triassic; on S Lingga, Selayar- N Singkep islands) and (2) and I-type Tanjungbuku Granite (Jurassic; S Singkep island). Granitic rocks from Lingga and nearby Selayar Island classified as A facies, others from Singkep Island B facies. Both facies syn-collisional and high-K calc-alkaline granites. Some identical characters with other granitic units in Peninsular Malaysia also detected)

Irzon, R. (2015)- Genesis granit Muncung dari Pulau Lingga berdasarkan data geokimia dan mikroskopis. J. Geologi Sumberdaya Mineral 16, 3, p. 141-149.
(Triassic Muncung Granite on Singkep Island besides Tanjungbuku Granite classified as S-type and in 'Main Range Granite Province' in SE Asia. Strong peraluminous character)

Irzon, R. (2017)- Geochemistry of Late Triassic weak peraluminous A-type Karimun Granite, Karimun Regency, Riau Islands Province. Indonesian J. Geoscience 4, 1, p. 21-37.
(online at: https://ijog.geologi.esdm.go.id/index.php/IJOG/article/view/268/229)
(Late Triassic Karimun Granite on Karimun island S of Singapore differs from other felsic intrusive rocks in Malay Peninsula because of A-type affinity, although it is classified as part of Tin Islands)

Irzon, R., H.Z. Abidin, Baharuddin, P. Sendjadja & Kurnia (2017)- Kandungan Rare Earth Elements pada granitoid Merah Muda dari daerah Lagoi dan perbandingan dengan granitoid sejenis lain. J. Geologi Sumberdaya Mineral 18, 3, p. 137-146.
(online at: http://jgsm.geologi.esdm.go.id/index.php/JGSM/article/view/238/290)
('Rare Earth Element content in pinkish granite of the Lagoi area and its comparison with similar rocks of other regions'. Triassic granite intrusions on Bintan Island part of Main Range Granite belt of SE Asia. Different colours of granite. Granite in Lagoi area of N Bintan (226 ± 8 Ma) pink color, with high REE content (av. 295 ppm)

Isaacs, K.N. (1963)- Interpretation of geophysical profiles between Singapore and Labuan, North Borneo. Geophysics 28, 5, p. 805-811.
(Airborne magnetometer profile and gravity profile from Singapore to Labuan, N Borneo, indicates shallow basement along W half of profile, except for minor sedimentary basins ~50 miles W of Tambelan Islands and in W Borneo. East of Kuching, Sarawak, major basin, with ~10,000' sediment)

Johari, S. (1987)- Relationship between Sn mineralization and geochemical anomalies in non-residual overburden at Tebrong area, Belitung, Indonesia. In: N. Thiramongkol (ed.) Proc. Workshop on Economic geology, tectonics, sedimentary processes and environment of the Quaternary in Southeast Asia, Haid Yai, Thailand 1986, IGCP 218/ Chulalongkorn University, Bangkok, p. 157-172.
(online at: http://library.dmr.go.th/Document/Proceedings-Yearbooks/M_1/1986/5083...)
(Tebrong area of E Belitung underlain by Triassic granite plutons and metasediments with low-grade Sn mineralization in swarms of subvertical quartz-tourmaline-cassiterite veins. Overlain by Quaternary cassiterite 'kaksa' placers)

Johnson, H.D., F.A. Alqahtani, C.A.L. Jackson, M.R.B. Som, D.P. Ghosh & W.K.W. Sulaiman (2010)- Fluvial reservoir analogues in the Malay Basin: analysis of shallow 3D seismic data of Pleistocene rivers on the Sunda Shelf. In: L.J. Wood et al. (eds.) Seismic imaging of depositional and geomorphic systems, Gulf Coast Sect. SEPM, Ann. Perkins Research Conf. 30, Houston, p. 328-329.

Johnson, R.F. & Marjono (1963)- Geology and bauxite deposits of the central Riau Islands, Indonesia. Direktorat Geologi, Bandung, Publ. Teknik, Seri Geologi Ekonomi 6, p. 1-54.
(Occurrence of bauxite (Al2O3) concretions on several islands of C Riau Archipelago (Lobam, Ngenang), in addition to Bintan occurrences known since 1924. Some laterites residual on granitic rocks, some in marine terraces. Geology mainly summarized from Bothe (1928))

Jones, M.T., B.L. Reed, B.R. Doe & M.A. Lanphere (1977)- Age of tin mineralization and plumbotectonics, Belitung, Indonesia. Economic Geology 72, p. 745-752.
(Primary tin deposits on Belitung related to Late Triassic granites with Rb-Sr isochron age of 213± 5 Ma. K-Ar ages of muscovite from two cassiterite-bearing greisens 195 and 200 Ma, suggesting tin mineralization not simple late-stage event in emplacement of plutons. Lead (galena) isotopes unreliable for age dating, but do suggest Precambrian continental origin of ores)

Jongmans, W.J. (1951)- Fossil plants of the Island of Bintan. Proc. Kon. Nederl. Akademie Wetenschappen, B54, 2, p. 183-190.
(First description of latest Triassic 'Bintan flora', Riau islands. Species identified from Tanjung Batu Itam, Bintan island, include Ptilophyllum bintαnense n.sp., Otozamites gagauensis, Pterophyllum muensteri, P. rosenkrantzi, P. nathorsti, Cycadolepis sp. and Protocupressinoxylon malayense Roggeveen. Interpreted as part of Late Triassic Dictophyllum- Clathropteris flora (N.B.: thought to be comparable to E Cretaceous Gagau flora of E Malay Peninsula by Kon'no (1972) and Rishworth (1974), but considered to be Rhaetian-Liassic by Wade-Murphy and Van Konijnenburg (2008); JTvG)

Junker, H.W. (1936)- Bauxit und Laterit auf Banka. Ein Beitrag zur Kenntnis der Geologie von Banka. De Ingenieur in Nederlandsch-Indie IV, 3, p. 15-23.
('Bauxite and laterite on Bangka; a contribution to the knowledge of the geology of Bangka'. Claims to be first to demonstrate presence of bauxite on Bangka (bauxite produced on nearby Bintan since 1935; JTvG))

Kanayama, S. (1973)- Tin bearing granites and tin placers in Bangka and Billition islands, in Indonesia. Kyoto University, Southeast Asian Studies 11, 3, p. 321-337.
(Online at: http://kyoto-seas.org/pdf/11/3/110302.pdf kyoto-seas)
(In Japanese with English abstract. Tin in Indonesia mainly exploited from placers with cassiterite. Source rocks are tin granites of collision type, which are more common in Europe and USA than in Japan. Economic cassiterite concentrations limited to area within 15 km from edges of granitic mother rocks; largest number of known tin placers ~5-12 km from granites. Surrounding rocks of tin placers mainly (Paleozoic?) steeply dipping clastics, mainly dipping to S?)

Katili, J.A. (1967)- Structure and age of the Indonesian tin belt with special reference to Bangka. Tectonophysics 4, p. 403-418.
(Radiometric ages Billiton-Singkep granites Late Jurassic (Late Triassic according to Priem et al. (1975, 1982); JTvG). Oldest rocks in Bangka fossiliferous Permo-Carboniferous and Triassic; locally metamorphosed. Folding in Bangka probably also Late Jurassic)

Katili, J.A. (1968)- Cross-folding in Bangka, West Indonesia. Contrib. Dept. Geology Inst. Teknologi Bandung 68, p. 61-70.
(Cross-folds in N Bangka result of two orogenic movements: NW-SE trending folds formed in Late Jurassic, superimposed on older NE-SW structures, probably Paleozoic)

Keller, G.H. (1966)- Sediments of the Malacca Strait, Southeast Asia. Ph.D. Thesis University of Illinois, p. 1-109.
(Sediments in Malacca Strait largely derived from adjacent land provinces of Sumatra and Malay Peninsula, with highly variable provenance. Dominant NW current due to movement of water into strait from S China and Java Seas and to lesser extent from Andaman Sea)

Keller, G.H. & A.F. Richards (1967)- Sediments of the Malacca Strait, Southeast Asia. J. Sedimentary Petrology 37, 1, p. 102-127.
(Malacca Strait shallow passage between Malay Peninsula and Sumatra assumed present configuration as after post-glacial rise of sea level which drowned Sunda Shelf. Tidal NW current flow prevails throughout year. Surface salinities and T generally lower than surrounding seas. Bottom sediments mainly muddy sands, with common mud near river mouths and in Andaman Sea. Non-calcareous detrital fraction dominated hy quartz

with minor feldspars. Heavy mineral primarily leucoxene, ilmenite, staurolile, biotite and amphiboles. Volcanic ash of andesitic origin in much of area. Many cores penetrate Late Pleistocene surface of indurated silty clay with much peat, with radiocarbon ages of 10,000 years B P., and probable tidal flat or estuarine deposit)

Kieft, C. (1952)- Accessory transparent minerals in tin granites of North Banka, Indonesia. Proc.Kon. Nederl. Akademie Wetenschappen B55, p. 140-149.
(Accessory heavy minerals in Banka tin granites include zircon, orthite, xenotime, monazite and allanite)

Kiel, B.A. (2009)- Three-dimensionality, seismic attributes, and long profile setting of valleys in recent stratigraphy of the Sunda Shelf, Indonesia: M.S. Thesis, University of Texas, Austin, p. 1-85. *(Unpublished)*

Kiel, B.A. & L.J. Wood (2010)- Correlations among seismic attributes and incised valley thicknesses in recent stratigraphy of the Sunda Shelf, Indonesia. In: L.J. Wood, T.T. Simo & N.C. Rosen (eds.) Seismic imaging of depositional and geomorphic systems, Gulf Coast Sect. SEPM (GCSSEPM), Ann. Perkins Research Conf. 30, Houston, p. 23-48.
(3D seismic data set near Gabus Field, W Natuna Basin, image channelized series in upper 500m of Sunda Shelf (Pliocene-Recent U Muda Fm). Ten incised valley features mapped. (mainly on methodology; JTvG))

Kiel, B.A. & L.J. Wood (2012)- Seismic attributes correlated with incised valley thickness in recent stratigraphy of the Sunda Shelf, Indonesia. Zeitschrift Geomorphologie 56, 4, p. 507-524.
(3D seismic data volume in highly channelized stratigraphic series in upper 500 ms of Sunda Shelf, offshore Indonesia, was used to map incised valley development)

Ko, U. Ko (1984)- Geology of Pemali primary tin deposit, Bangka Island, Indonesia. Southeast Asia Tin Research and Development (SEATRAD) Centre, Ipoh, p. 1-10.

Ko, U. Ko (1986)- Preliminary synthesis of the geology of Bangka Island, Indonesia. In: G.H. Teh & S. Paramananthan (eds.) In: G.H. Teh & S. Paramananthan (eds.) Proc. 5th Reg. Congress Geol. Min. Energy Res. SE Asia (GEOSEA V), Kuala Lumpur 1984, 2, Bull. Geol. Soc. Malaysia 20, p. 81-96.
(https://gsmpubl.files.wordpress.com/2014/09/bgsm1986b06.pdf)
(Stratigraphy Bangka 4 main units: (1) U Paleozoic isoclinally folded, imbricated Pemali Gp mudstone-dominated deep marine sediments with bedded radiolarian chert, rare Permian fusulinid limestone; (2) broadly folded shallow marine M-U Triassic marine Tempilang Sst, (3) Lw Tertiary Fan Fm fluvial deposits and (4) U Tertiary- Quaternary Ranggam Gp. Thrusting and granitizaton and uplift in Late Triassic- E Cretaceous, followed by N-S high-angle cross faulting. At Toboali in S Bangka, Permo-Carboniferous with glaciogenic 'pebbly mudstones'?)

Koesoemadinata, R.P. & A. Pulunggono (1975)- Geology of the southern Sunda Shelf in reference to the tectonic framework of Tertiary sedimentary basins of Western Indonesia. J. Indon. Assoc. Geol. (IAGI) 2, 2, p. 1-11.

Kort, M.C. (1920)- Het onderzoek van tinertsafzettingen op Banka. In: Algemeen Ingenieurs Congres, Batavia 1920, sect. 5, Mijnbouw en Geologie, Mededeeling 11, p. 1-32.
('Investigation of tin ore deposits on Bangka'. Old review of exploration methods of alluvial tin deposits on Bangka. No maps)

Krause, P.G. (1898)- Obsidianbomben aus Niederlandisch-Indien. Sammlungen Geol. Reichs-Museums Leiden 5, 5, p. 237-251.
(online at: www.repository.naturalis.nl/document/552416)
('Obsidian bombs from Netherlands Indies'. Early description of black 'glass pebbles' from Belitung (up to 4 cm diameter, 71-75% quartz) and Bungaran (= Natuna Besar; collected by Van Hasselt). Not associated with volcanoes and of possible extraterrestrial origin (In Krause collection up to 4cm long, but Verbeek (1897) described sizes up to 8 x2.5 cm. See also Wing Easton (1921; 'billitonites') and Von Koenigswald (1935; Java

tektite occurrences). These are tektites, and part of Australasian strewn field of M Pleistocene SE Asia mainland meteorite impact; JTvG) (also in Jaarboek Mijnwezen 27-1898, p. 17-31))

Krol, G.L. (1960)- Theories on the genesis of the kaksa. Geologie en Mijnbouw 39, 10, p. 437-443.
(online at: https://drive.google.com/file/d/0B7j8bPm9Cse0UTdoQnkwZjFhTlk/view)
('Kaksa' deposits of Belitung Island are cassiterite-bearing alluvial deposits in valley floors and areas of low relief, resulting from long period of Tertiary denudation and peneplanation of Cretaceous granites, under humid climatic conditions as residual product of chemical weathering. Eluvial or 'kulit' deposits on hill slopes and watersheds, formed by chemical weathering in place; transportation insignificant. No figures)

Kruizinga, A. (1950)- *Agathiceras sundaicum* Han., a Lower Permian fossil from Timor. Proc. Kon. Akademie Wetenschappen, Amsterdam 53, 7, p. 1056-1063. *(should be* fossil from Billiton*)*
(online at: www.dwc.knaw.nl/DL/publications/PU00018850.pdf)
(First Paleozoic fossil found on Belitung island is small ammonite in lump of cassiterite from Lenggang district. Identified as Agathiceras sundaicum, also common in Lower Permian of Timor (Bitauni) and Leti (but 'more likely Lower Middle Permian'; Fontaine 1989, p. 105). New find indicates presence of E-M Permian sediments, subsequently intruded/ metamorphosed by post-Triassic 'tin granites')

Kudrass, H.R. & H.U. Schluter (1994)- Development of cassiterite-bearing sediments and their relation to Late Pleistocene sea-level changes in the Straits of Malacca. Marine Geology 120, p. 175-202.
(Survey of tin-bearing sediments in central parts of Straits of Malacca by seismic profiling and vibrocoring. Placer deposits found in tidal scour channel of Cape Rachado and Pleistocene river valley. Cassiterite derived from local primary mineralization of granite and from long-distance fluvial transport)

Kurnio,H. & N.C.D. Aryanto (2010)- Paleo-channels of Singkawang waters, West Kalimantan, and its relation to the occurrences of sub-bottom gold placers based on strata box seismic record analyses. Bull. Marine Geol. 25, 2, p. 65-76.
(online at: http://ejournal.mgi.esdm.go.id/index.php/bomg/article/view/26/26)
(Sunda shelf off W Kalimantan with Pleistocene incised valleys seen on shallow seismic lines may contain gold placer accumulations, derived from Sintang Intrusives)

Kusnama, K., Sutisna, T.C. Amin, S. Koesoemadinata, Sukardi & B. Hermanto (1994)- Geologic map of the Tandjung Pinang Sheet (1016-1016), Sumatra, 1: 250,000. Geol. Res. Dev. Centre (GRDC), Bandung.
(Geologic map of Batam, Bintan etc., islands in Malacca Straits. Oldest rocks highly deformed meta-sediments of Permo-Carboniferous Berakit Fm (=Mersing Schist on Malay Peninsula?), intruded by Triassic Batam (Nongsa) and Bintan (Kawal Pluton) granites. Unconformably overlain by 600m of latest Triassic (Rhaetian) shales and quartz sandstone of Duriangkang Fm with 'Bintan flora' with Pterophyllum bintanense, 500m Jurassic Pulaupanjang Fm redbeds and ~300+500m of Cretaceous redbeds of Pancur and Semarung Fms (Cretaceous mainly on smaller islands of Lingga Archipelago))

Kusnama, K. Sutisna, T.C. Amin & Sidarto (1995)- Geology of the Batam and Bintan area. Geol. Res. Dev. Centre (GRDC), Bandung, Bull. 18, p. 56-67.
(Batam and Bintan islands, S of Singapore. Outcrops of Permo-Carboniferous Berakit Fm metamorphics, intruded by Late Triassic 'tin granites' (~225-230 Ma). Unconformably overlain by latest Triassic fluvial-shallow marine Duriangkang Fm sands-shales with 'Bintan flora' (see also Wade-Murphy et al. 2008), ?Jurassic redbeds, E Cretaceous Pancur Fm and Late Cretaceous Semarung Fm clastics)

Kusnida, D., P. Astjario & B. Nirwana (2008)- Magnetic susceptibilities distribution and its possibly geological significance of submerged Belitung granite. Indonesian Mining J. 11, 2, p. 24-31.
(online at: http://jurnal.tekmira.esdm.go.id/index.php/imj/article/view/592/454)
(Marine magnetic anomalies over Belitung waters, where zone of <50 nT total magnetic anomaly interpreted to reflect submerged Belitung granite. Correlation between magnetic susceptibility and type of granites indicated submerged Belitung intrusive is biotite-granite, associated with cassiterite minerals)

Lehmann, B. & Harmanto (1990)- Large scale tin depletion in the Tanjung Pandang tin granite, Belitung Island, Indonesia. Economic Geology 85, 1, p. 99-111.
(M Triassic (~215Ma) Tanjungpandan batholith on Belitung associated with major alluvial tin ore deposits (Plio-Pleistocene paleoplacers). Two rock suites: widespread biotite granite and more restricted quartz syenite. Hydrothermal removal of tin by high-T fluids allowed exceptional degree of redistribution of tin)

Mainguy, M. & L.W. Stach (1968)- Regional geology and petroleum prospects for mineral resources on the northern part of the Sunda Shelf. United Nations ECAFE CCOP Techn. Bull. 1, p. 129-142.

Manus, S.A. (1968)- Bijdrage tot de kennis van de geologische gesteldheid in het Toboali-district (Zuid Bangka, Indonesia); in het bijzonder de petrografie en petrologie van de granietische gesteenten. Doct. Thesis, Rijksuniversiteit Gent, p. 1-246. *(Unpublished)*
('Contribution to the knowledge of the geological situation of the Toboali District (S Bangka), in particular the petrography and petrology of granitic rocks')

Margono, U., R.J.B. Supandjono & E. Partoyo (1995)- Geological map of the South Bangka sheet (1113-1213), Sumatera, 1:250,000. Geol. Res. Dev. Centre (GRDC), Bandung.
(Permo-Carboniferous Pemali Fm metamorphic complex, unconformably overlain by ?E Triassic Tanjung Genting Fm clastics with limestone lenses with Montlivaultia. Uplifted and intruded by Late Triassic Klabat biotite granite (radiometric ages 201-223 Ma). Overlain by U Miocene?-Quaternary clastics)

Martin, K. (1880)- On a post-Tertiary fauna from the stream tin deposits of Blitong (Biliton). Notes from the Leyden Museum 3, p. 17-22.
(online at: www.repository.naturalis.nl/document/552195)
(Well-preserved fossils from stream-tin-deposits of Belitung, collected by C. de Groot. 61 species of gastropods, bivalves, corals, echinoids, etc. Fauna agrees with that of Recent faunas in sea around island of Belitung, sediments therefore very young)

Menten, J.H. (1877)- Verslag van een onderzoek naar tinerts op het eiland Singkep. Jaarboek Mijnwezen Nederlandsch Oost-Indie 1877, 2, p. 145-171.
('Report of survey of tin ore on Singkep Island'. Early geological- mining survey of Singkep Island, off NE Sumatra. With rel. detailed 1:75,000 scale map of survey areas. Results not encouraging for commercial exploitation)

Meyer, H.C. (1975)- Mineralogy of the primary tin deposits of Kelapa Kampit, Belitung, Indonesia. Bull. Nat. Inst. Geology and Mining (NIGM) 5, 1, p. 1-12.
(online at: http://pustaka.geotek.lipi.go.id/wp-content/uploads/2016/02/NIGM-5-1.pdf)
(Primary tin mineralization at Kelapa Kampit on NE Belitung cassiterite in hydrothermal veins in steeply dipping, E-W to WNW-ESE trending Permo-Triassic sequence of sand-shale with radiolarian chert. Mineralization related to end-Triassic granite emplacement. Mined since 1908)

Moechtar, H. & S. Hidayat. (2010)- Sedimentologi dan akumulasi kasiterit pada endapan aluvium sepanjang Air Inas hingga laut lepas pantai Tanjung Kubu (Toboali), Bangka Selatan. J. Sumber Daya Geologi 20, 2, p. 59-68.
(online at: http://jgsm.geologi.esdm.go.id/index.php/JGSM/article/view/162/157)
('Sedimentology and cassiterite accumulation in the alluvium deposit along the Inas River to the open sea at Tanjung Kubu beach (Toboali), South Bangka'. Cassiterite placers between elevation +25 and -7.2m)

Molengraaff, G.A.F & M. Weber (1919)- Het verband tusschen den Plistoceenen ijstijd en het ontstaan der Soenda-zee (Java- en Zuid-Chineesche Zee) en de invloed daarvan op de verspreiding der koraalriffen en op de land-en zoetwater-fauna. Kon. Nederl. Akademie Wetenschappen, Amsterdam, Verslagen Vergadering Wis.- en Natuurk. Afd., 28, p. 497-544.
(Early paper explaining origin of continental shelves as drowned coastal peneplains during Pleistocene lowered sea level. Sunda shelf averages 40-50m depth and has remnants of river valleys. Coral reefs relatively rare in Sunda Sea, probably because of rapid drowning. Line of coral islands in S China Sea follows 40

fathoms contour, believed to follow paleo-coastline of Pleistocene Sunda land. Similarly, modern reefs lining Borneo Bank (=Paternoster Platform) near Makassar Straits mark NE margin of Pleistocene Sundaland)

Molengraaff, G.A.F. & M. Weber (1921)- On the relation between the Pleistocene glacial period and the origin of the Sunda Sea (Java- and South China Sea), and its influence on the distribution of coral reefs and on the land- and freshwater fauna. Proc. Kon. Nederl. Akademie Wetenschappen, Amsterdam, 23, 1, p. 395-439.
(online at: www.dwc.knaw.nl/DL/publications/PU00014627.pdf)
(English version of above paper)

Ng, S.W.P., M.J. Whitehouse, M.H. Roselee, C. Teschner, S. Murtadha, G.J.H. Oliver, A.A. Ghani & S.C. Chang (2017)- Late Triassic granites from Bangka, Indonesia: a continuation of the Main Range granite province of the South-East Asian Tin Belt. J. Asian Earth Sci. 138, p. 562-587.
(SE Asian Tin Belt tied to arc-related Eastern granite province and collision-related Main Range granite provinces, running across Thailand, Singapore and Indonesia, and separated by Paleo-Tethys sutures. E Province usually granites with biotite ± hornblende; Main Range granites sometimes characterised by biotite ± muscovite. On Indonesian Tin Islands both hornblende-bearing (previously I-type) and hornblende-barren (previously S-type), apparently randomly distributed. Bangka granites geochemically similar to Malaysian Main Range granites, with zircon U-Pb ages of ~225 Ma and ~220 Ma, within time of Main Range magmatism (~226-201 Ma) in Malay Peninsula. This suggests Paleo-Tethyan suture lies E of Bangka island)

Nitiwisastro, M., W. Wibowo & H. Moechtar (1995)- Geological data in relation to the present and future exploration ("case study in Bangka and Belitung"). Proc. Indonesian Mining Assoc. Conf. 1995, Jakarta, 2, 24p.

Notosiswojo, S. & M.B. Sugeng (1987)- Primary tin mineralization in granite intrusion at Tempilang, Bangka Island. In: W. Gocht (ed.) Proc. Seminar on Importance of primary tin mining in Southeast Asia, Bandung 1986, Intertechnik 28, Aachen, p. 77-90.

Omer-Cooper, W.R.B., W.V. Hewitt & H. van Wees (1974)- Exploration for cassiterite-magnetite-sulphide veins on Belitung, Indonesia. Proc. 4th World Tin Conference, Kuala Lumpur, 2, p. 97-119.

Oosterom, M.G. (1988)- The geochemistry of granitoid-related deposits of Tin and Tungsten in orogenic belts. In: C.S. Hutchison (ed.) Geology of Tin deposits in Asia and the Pacific, Springer Verlag, p. 187-198.
(Includes preliminary survey of trace element geochemistry of Triassic-Jurassic granites from Bangka and Belitung)

Osberger, R. (1965)- Uber die Zinnseifen Indonesiens und ihre genetische Gliederung. Zeitschrift Deutschen Geol. Gesellschaft, Berlin, 117, 2-3, p. 749-766.
('On the tin deposits of Indonesia and their genetic formation'. On distribution and types of cassiterite-bearing deposits on 'Tin islands' Bangka, Belitung, Singkep; less on Karimun, Kundur)

Osberger, R. (1967)- Zur Geologie der Insel Billiton. Report Belitung Tin Mines, p. 1-177. *(Unpublished)*
('On the geology of Belitung Island')

Osberger, R. (1967)- Prospecting tin placers in Indonesia. Mining Magazine 117, p. 97-103.
(Coarse-grained cassiterite in placers, especially with common monazite and xenotime, suggests proximity to source granites. Most placers in valleys controlled by mineralized faults. Richest placers in lower parts of stream valleys. Most favorable conditions for prospecting are offshore from islands of western tin belt of Karimun, Kundur, Singkep, Bangka and Billiton)

Osberger, R. (1967)- Dating Indonesian cassiterite placers. Mining Magazine 117, 4, p. 260-264.
(Cassiterite placers of Indonesian tin region comprise 'kaksa' placers of Pleistocene- early Holocene age. Pre-Pleistocene placers may have existed, as age of tin-bearing granite is Mesozoic, but only few occurrences of extremely fine-grained cassiterite are known. Age of kaksa and mintjan placers based on age of wood, geologic relationships of placers and occurrence of fossils and artifacts)

Osberger, R. (1968)- Billiton tin placers: type occurrence and how they were formed. World Mining 118, p. 34-40.

Osberger, R. (1968)- Drilling for placer tin in Indonesia. Mining Magazine 118, 5, p. 306-313.

Padmanegara, S. & R.P. Johnson (1964)- Geologic investigations on the Singkep island and adjacent islands. Bull. Geol. Survey Indonesia 1, 23p.

Pardiarto, B. (2016)- Karakteristik cebakan timah primer di daerah Parit Tebu, Kabupaten Belitung Timur, Provinsi Kepulauan Bangka Belitung. Bul. Sumber Daya Geologi 11, 2, p. 73-91.
(online at: http://buletinsdg.geologi.esdm.go.id/index.php/bsdg/issue/archive)
('Characteristics of primary tin reserves in the area of Parit Tebu, East Belitung Regency'. Primary tin mineralisation in quartz veins, hosted by quartz-arenite sandstone and metaclaystone, intruded by aplitic granite. Tin mineral cassiterite associated with realgar, molybdenite, pyrite, sphalerite, galena, etc.)

Pelejero, C., M. Kienast, L. Wang & J.O. Grimalt (2000)- The flooding of Sundaland during the last deglaciation: imprints in hemipelagic sediments from the southern South China Sea. Earth Planetary Sci. Letters 171, 4, p. 661-671.
(Postglacial sea level rise of last 30 kyrs modified hydrography of S China Sea, including submergence of Sundaland in S and opening of channels connecting it to tropical Indo-Pacific. Main changes at ~15-13.5 ka BP, when sea surface temperatures rose and clay content dropped, reflecting rapid retreat of coastline and initial flooding of Sundaland. Second change at ~11.5 ka, culminating at 10 ka, establishment of modern hydrographic conditions)

Pitfield, P.E.J. (1987)- Southeast Asia granite project: Report on the geochemistry of Tin Islands granites of Indonesia. British Geol. Survey, Overseas Report MP/87/9/R, p. 1-51. *(Unpublished)*

Posewitz, T. (1885)- Geologische Notizen aus Bangka, 1. Das geotektonische Verhalten der Granitmassive und das Marasgebirge. Natuurkundig Tijdschrift Nederlandsch-Indie 44, p. 108-115.
(online at: www.biodiversitylibrary.org/item/118914#page/130/mode/1up)
('Geologic notes from Bangka: the geotectonic behaviour of the granite massifs and the Maras Mountains'. Bangka Island in same 'geotectonic line' as Malay Peninsula, with similar geology and tin ores. All high peaks on Bangka are granites, except Maras Mountains, which are composed of sediments. Granites believed to be arranged in 3 NW-SE trending rows)

Posewitz, T. (1885)- Die Zinninseln im Indischen Oceane. 1. Geologie von Banka. Als Anhang: Das Diamantvorkommen in Borneo. Mitteilungen Jahrbuch konigl. Ungarischen Geologischen Anstalt 7, p. 153-182.
(online at: http://ia600204.us.archive.org/30/items/mittheilungenaus07magy/mittheilungenaus07magy.pdf)
('The tin islands in the Indian Ocean, 1. Geology of Bangka. With appendix The diamond occurrences of Borneo')

Posewitz, T. (1886)- Die Zinninseln im Indischen Oceane. 2. Das Zinnertzvorkommen und die Zinngewinnung in Banka. Mitteilungen Jahrbuch konigl. Ungarischen Geologischen Anstalt 8, p. 55-106.
('The tin islands in the Indian Ocean, 2. The tin ore occurrences and tin mining on Bangka')

Posewitz, T. (1887)- Das Laterit-Vorkommen in Bangka. Petermanns Geogr. Petrogr. Mitteilungen 33, p. 20-25.
('The laterite occurrence of Bangka'. Rel. common iron-rich 'limonitic' soils on granites and schists)

Posewitz, T. (1887)- Die geologischen-montanistischen Verhaltnisse der Insel Billiton (Blitong). Petermanns Geogr. Petrogr. Mitteilungen 33, p. 108-116.

(The geologic-'montanistic(?) relationships of Belitung island'. Early summary of geology of Belitung and history of discovery and mining of tin ores since 1851 (mainly with Chinese contract labor). Geology similar to Bangka: granites and low metamorphic metasediments. Tin ore both in veins and in Quaternary deposits)

Posewitz, T. (1887)- Das Zinnvorkommen auf den Inseln des Riauw-Lingga Archipels. Petermanns Geogr. Petrogr. Mitteilungen 33, 12, p. 366-369.
('The tin occurrence on the Riau- Lingga archipelago')

Praditwan, J. (1989)- Mineral distribution study for cassiterite associated heavy minerals in Belitung Island, Indonesia. SEATRAD Centre, Ipoh, Malaysia, Report of Investigation 76, p. 1-33.

Priem, H.N.A. (1976)- Geochronological relationships in the Indonesian tin belt. In: Proc. Seminar on isotopic dating, CCOP Tech. Publ. 3, p. 129-135.

Priem, H.N.A., N.A.I.M. Boelrijk, E.H. Bon, E.H. Hebeda, A.E.T. Verdurmen & R.H. Verschure (1975)- Isotope geochronology in the Indonesian tin belt. Geologie en Mijnbouw 54, 1, p. 61-70.
(online at: https://drive.google.com/file/d/0B7j8bPm9Cse0WFBITzVsQjFLcGs/view)
(Rb-Sr ages of 4 granites from Bangka average 217±5 Ma and K-Ar age ~214 Ma (= Late Triassic, near Norian- Rhaetian boundary) (Hutchison 1977: similar to ages of granites of Singapore and Johore; Rb-Sr and K-Ar ages suggest similar ages for cooling of Malay Peninsula East Belt of granites). Granite from Karimata Islands Rb-Sr age ~74 Ma; associated amphibolite K-Ar age 78 Ma (= Campanian, Late Cretaceous). Cassiterite mineralisation associated with both U Cretaceous and U Triassic granites, but main tin deposits related to U Triassic plutons)

Priem, H.N.A. & E.H. Bon (1982)- A calibration point in the Late Triassic: the tin granites of Bangka and Belitung, Indonesia. In: G.S. Odin (ed.) Numerical dating in stratigraphy, Wiley, p. 501-507.
(Bangka steeply folded Late Carboniferous- Triassic (incl. Norian limestones) deep-water low-grade metasediments, intruded by Late Triassic- E Jurassic tin granites. These rocks unconformably overlain by weakly folded Bintan Fm molasse series; originally thought to be Late Triassic age based on plants, but more likely Early Cretaceous. Radiometric ages of Bangka and Belitung tin granites almost all in 214-217 Ma range = M Norian, Late Triassic)

Raes, N., C.H. Cannon, R.J. Hijmans, T. Piessens, Leng Guan Saw, P.C. van Welzen & J.W. F. Slik (2014)- Historical distribution of Sundalandôs Dipterocarp rainforests at Quaternary glacial maxima. Proc. National Academy Sciences USA 111, 47, p. 16790-16795.
(online at: www.pnas.org/content/111/47/16790.full.pdf)
(Climate of C Sundaland during Late Pleistocene Last Glacial Maximum suitable to sustain Dipterocarp rainforest; presence of previously suggested transequatorial savannah corridor at that time unlikely. Dipterocarp species richness lower at LGM, and areas of high species richness mostly off current islands and on emergent Sunda Shelf)

Rahman, M.M., E. Sathiamurthy, G. Zhong, J. Geng & Z. Liu (2016)- CHIRP acoustic characterization of paleo fluvial system of Late-Pleistocene to Holocene in Penyu Basin, Sunda Shelf. Bull. Geol. Soc. Malaysia 62, p. 47-56.
(online at: https://gsmpubl.files.wordpress.com/2017/04/bgsm2016007.pdf)
(Shallow acoustic profiles across paleo-incised valleys in Penyu Basin, S China Sea, formed during several phases of Late Pleistocene regression and subsequent Last Glacial Maximum when sea level was ~123m lower than present-day. Valleys filled during lowstand and subsequent post-glacial marine transgression. Holocene shallow-marine cover (3-10m thick) healed ravinement surface. Average late-Pleistocene surface 53-64m below present-day MSL, with ~16-50m of valley incision)

Rahman, M.M., E. Sathiamurthy, G. Zhong, J. Geng & Z. Liu (2018)- Variations of fluvial patterns and infilling history of a paleoincised valley system during Late Pleistocene to Holocene, Offshore Pahang River, Peninsular Malaysia. Interpretation 6, 1, p. T39-T50.

(Pahang River paleovalleys in S China Sea formed during regressive phase of last glacial cycle, and submerged and filled during postglacial marine transgression. Valley fills overlain by marine transgressive ravinement surface and 5-10m thick Holocene shallow marine deposits. Low-sinuosity lowstand valley system changed to high-sinuosity meander belt and eventually into deltaic distributary channel system, before submergence. Average Late Pleistocene surface between 53-64m below sea level, with ~16-50 m of valley incision)

Roggeveen, P.M. (1932)- Tektonik des Zinnertzgrubengebietes von Klappa Kampit, Billiton, Niederlandisch Ost-Indien. Proc. Kon. Nederl. Akademie Wetenschappen, Amsterdam, 35, p. 575-579.
(online at: www.dwc.knaw.nl/DL/publications/PU00016259.pdf)
('Tectonics of the tin ore quarry area of Klappa-Kampit, NE Belitung'. Steeply dipping (generally to S), isoclinally folded unfossiliferous quartzites and shales, generally striking 90-110°, with veins of tin ore from adjacent granite laccolith)

Roggeveen, P.M. (1932)- Mesozoisches Koniferenholz (*Protocupressinoxylon malayense* n.s.) von der Insel Soegi im Riouw Archipel, Niederlandisch Ost-Indien. Proc. Kon. Nederl. Akademie Wetenschappen, Amsterdam, 35, p. 580-584.
(online at: www.dwc.knaw.nl/DL/publications/PU00016260.pdf)
('Mesozoic conifer wood from Sugi Island, Riau Archipelago'. Silicified conifer wood in sandstone-shale-conglomerate series at cliff of Tanjung Riau, S coast of Sugi island, S of Singapore. Described as Protocupressinoxylon malayense n.sp.. Thought to be Triassic-age by Bothe (1926), but could be Jurassic-Cretaceous (Age of beds poorly constrained and classification uncertain; Philippe et al. 2004; Protocupressinoxylon in China is Jurassic genus; JTvG))

Ronojudo, A. (1972)- Offshore exploration of the cassiterite placers of Belitung, Indonesia. UN ESCAP Repts. 9th Session CCOP, Bandung, p. 149-158.

Ronojudo, A. (1974)- An offshore granite subcrop, East Billiton (Indonesia). Proc. 11th Sess. Comm. Co-ord. Joint Prosp. Mineral Resources Asian Offshore Areas (CCOP), Seoul 1974, UNDP, Bangkok, p. 259-265.

Roselee, M.H., A.A Ghani, S. Ng Wai Pan, S. Murtadha, G.J.H. Oliver, Quek Long Xiang &M.R. Umor (2017)- Geochemistry of Bangka granites, Bangka Island, Sumatera, Indonesia. Proc. 30th Nat. Geosc. Conf. Exhib. (NGC 2017), Kuala Lumpur, PDRG29-171, Warta Geologi 43, 3, p. 326. *(Abstract only)*
(online at: https://gsmpubl.files.wordpress.com/2017/09/ngsm2017_032.pdf)
(Bangka Island granites show evidence of mixed source of greywacke and amphibolite and formed in syn-collisional tectonic setting. Geochemistry of Bangka granites comparable to Main Range granite of Malay Peninsula, although overlapping fields between Main range and East Malaya- Sukhotai granites. Bangka Island is S-ward continuation of Malaysia Main Range granite province)

Rueb, J. (1915)- Ontstaan der alluviale tinerts afzettingen van Banka en Billiton. De Ingenieur 1915, 5, p.
('The origin of the alluvial tin ore deposits of Bangka and Belitung'. Discussion origin of two types of alluvial tin ore: 'koelit' (rel. in place weathered granite material; mainly formed in period of dry-warm climate) and 'kaksa' (erosional products transported by rivers))

Rueb, J. (1920)- Ontstaan der alluviale tinertsafzettingen van Banka en Billiton. De Ingenieur 35, 2, 20p.
('The origin of the alluvial tin ore deposits of Bangka and Belitung'. Discussion of comments on 1915 paper)

Ruswandi, E. (1988)- Application of geophysical methods to investigate the extention of primary tin deposits in the Pemali open pit mine, Bangka, Indonesia. In: C.S. Hutchison (ed.) Geology of tin deposits in Asia and the Pacific, Selected papers from Int. Symposium Geology of tin deposits, Nanning, China, 1984, Springer Verlag, Berlin, p. 557-570.
(Study of primary tin deposits at Pemali Mine, 75km N of Pangkalpinang, Bangka, by geophysical methods)

Sathiamurthy, E. & M.M. Rahman (2017)- Late Quaternary paleo fluvial system research of Sunda Shelf: a review. Bull. Geol. Soc. Malaysia 64, p. 81-92.

(online at: http://www.gsm.org.my/products/702001-101716-PDF.pdf)
(Review of Late Pleistocene paleo-fluvial system on Sunda Shelf (first identified by Molengraaff, 1921). Regional reconstruction mainly based on modern sea floor bathymetry)

Sathiamurthy, E. & H.K. Voris (2006)- Maps of Holocene sea level transgression and submerged lakes on the Sunda Shelf. Natural History J. Chulalongkorn University, Suppl. 2, p. 1-44.
(online at: www.biology.sc.chula.ac.th/TNH/archives/VorisSupplement.pdf)
(26 maps showing drowning of Sunda Shelf during Holocene transgression (21 ka- now), mainly from ETOPO2 Global 2 bathymetry data. Depressions could be paleo-lakes when Sunda Shelf was exposed during Last Glacial Maximum (LGM). These gradually submerged when sea level began to rise from -116m below present-day levels to its maximum, +5m above present SL during mid-Holocene (4.2 ka))

Schurmann, H.M.E., A.H.W. Aten, A.J.H. Boerboom & A.C.W.C. Bot (1960)- Fourth preliminary note on age determinations of magmatic rocks by means of radioactivity. Geologie en Mijnbouw 22, p. 93-105.
(Last of four notes on radiometric age dating. Includes results of two tin-granites from Singkep and Billiton: Feldspar155 Ma, monazite 140 Ma, zircon 175 Ma, zircon Ra 230 Ma, biotite 180 Ma, etc. (Triassic- Jurassic))

Schuurman, J.A. (1898)- Historische schets van de tinwinning op Bangka, I. Tijdperk loopende van 1710-1816. Jaarboek Mijnwezen Nederlandsch Oost-Indie 27 (1898), Technisch Admin. Ged., p. 1-112.
('Historical sketch of the tin mining on Bangka, chapter I, period 1710-1816'. Detailed early history of tin mining on Bangka island, off NE Sumatra)

Schuurman, J.A. (1922)- Historische schets van de tinwinning op Bangka, II: Tijdperk loopende van 1816-1900. Jaarboek Mijnwezen Nederlandsch Oost-Indie 48 (1919), Verhandelingen 2, p. 1-365.
('Historical sketch of the tin mining on Bangka, chapter II, period 1816-1900. Continuation of Schuurman (1898) Banga history paper)

Schwartz, M.O. (1992)- Geochemical criteria for distinguishing magmatic and metasomatic albite-enrichment in granitoids- examples from the Ta-Li granite Yichun (China) and the Sn-W deposit Tikus (Indonesia). Mineralium Deposita 27, 2, p. 101-108.
(On two examples of albite-rich granitoids: Late Triassic Tikus granite on Belitung and Ta-Li in China)

Schwartz, M.O., S.S. Rajah, A.K. Askury, P. Putthapiban & S. Djaswadi (1995)- The Southeast Asian tin belt. Earth-Science Reviews 38, p. 95-290.
(SE Asian tin belt, N-S zone, 2800 km long/ 400 km wide, from Myanmar- Thailand to Malay Peninsula and Indonesian Tin Islands Bangka- Belitung. Granitoids grouped geographically into 5 provinces: (1) Main Range Granitoid Province in W Malay Peninsula, S Peninsular Thailand and C Thailand, almost entirely biotite granite (184-230 Ma). Contributed 55% of tin production of SE Asia; (2) N Granitoid Province in N Thailand (0.1% of tin production), also mainly biotite granite (200-269 Ma); (3) E Granitoid Province of E Peninsular Malaysia- E Thailand (Malaysian part subdivided into E Coast Belt (220-263 Ma), Boundary Range Belt (197-257 Ma) and C Belt (79-219 Ma)). Wide compositional range. Tin deposits only in biotite granite in E Coast Belt (3% of production); (4) W Granitoid Province (22-149 Ma) in N Peninsular and W Thailand and Burma biotite granite (14% of tin production); (5) Granitoids of Indonesian Tin Islands (193-251 Ma) do not permit grouping into above units; most tin deposits associated with Main Range-like plutons)

Schwartz, M.O. & Surjono (1990)- Greisenization and albitization at the Tikus tin-tungsten deposit, Belitung, Indonesia. Economic Geology 85, p. 691-713.
(Tikus primary tin-tungsten deposit on NW Belitung hosted by large Late Triassic Tanjungpandan biotite granite pluton (Rb-Sr age 215±3Ma). Deposition mechanism for cassiterite and wolframite was pH increase and temperature decrease in both greisen and moderately albitized granite)

Schwartz, M.O. & Surjono (1990)- The strata-bound tin deposit Nam Salu, Kelapa Kampit, Indonesia Economic Geology 85, 1, p. 76-98.

(Nam Salu horizon at Kelapa Kampit on Belitung Island is richest strata-bound tin mineralization in SE Asia, in Carboniferous-Permian sediments and volcanics, intruded by Triassic granitoids. Most likely source of Sn-bearing fluids is granitic magmatism)

Schwartz, M.O. & Surjono (1991)- The Pemali tin deposit, Bangka, Indonesia. Mineralium Deposita 26, 1, p. 18-25.
(Pemali Mine in NE Bangka is most important granite-hosted tin deposit in Indonesia. Mineralization in SE part of large Klabat batholith Triassic two-mica granite and consists of disseminated cassiterite and greisen-bordered veins)

Setiady, D. & Faturachman (2004)- Tipe granit sepanjang pantai timur Pulau Batam dan pantai barat Pulau Bintan, perairan selat Batam Bintan. J. Geologi Kelautan 2, 2, p. 9-14.
(online at: http://ejournal.mgi.esdm.go.id/index.php/jgk/article/view/109/99)
('Granite types along the east coast of Batam Island and the west coast of Bintan Island, in waters of the Batam Bintan strait'. Granites of Batam and Bintan mainly S-type granites?)

Sharma, C. (2002)- Late Quaternary paleoenvironmental reconstruction of the Sunda Rivers Delta system, Sunda Shelf, south China Sea: timing of drowning and sea-level changes. Ph.D. Thesis, Dalhousie University, Halifax, p. 1-173.
(Late Quaternary paleoenvironmental reconstruction of Sunda Shelf, S China Sea, using foraminifera, radiocarbon chronology, sedimentology and reflection seismic. Sixteen sediment-cores from water depths 71-151m used to reconstruct evolution of Paleo-Sunda Rivers deltas from time when shelf was subaerially exposed during low sea levels to time when delta flooded by post-glacial sea-level rise. Complete flooding of shelf at ~11,000 yrs BP, which led to drowning and reorganization of Sunda Rivers Delta System)

Simamora (2007)- Penafsiran struktur bawah permukaan daerah Bangka Utara, berdasarkan anomali gaya berat. J. Sumber Daya Geologi 17, 3, p. 163-177.
(online at: http://jgsm.geologi.esdm.go.id/index.php/JGSM/article/view/287/2580)
('Interpretation of subsurface structure of the North Bangka region, based on gravity anomalies' Identification of Pemali Fm Paleozoic basement and lighter Triassic granite intrusions across N Bangka island)

Simatupang, M. (1974)- Problems arising from the presence of accessory minerals in tin mining operations in Indonesia. In: Proc. Fourth World Conference on Tin, Kuala Lumpur 1974, 2, Prospecting and mining, Tin Council, London, p. 144-161.

Simatupang, M. (1979)- Indonesian offshore tin development. In: A. Prijono, C. Long and R. Sweatman (eds.) The Indonesian mining industry, its present and future, Proc. First Indonesian Mining Symposium, Jakarta 1977, Indon. Mining Assoc., Jakarta, p. 93-103.

Siregar, D.A. & M. Situmorang (1994)- The C-14 carbon dating and age of Quaternary deposits in Sunda Shelf. J. Geologi Sumberdaya Mineral, 4, p.

Sitanggang, J.M. (1983)- The use of alkali elements as a guide to tin mineralization in some granite rocks in the island of Bangka. Proc. 12th Ann. Conv. Indon. Assoc. Geol. (IAGI), p. 163-167.

Sitanggang, J.M. (1986)- Distribution of major and some trace elements of some granites from Bangka, Indonesia. In: G.H. Teh & S. Paramananthan (eds.) Proc. 5th Reg. Congress Geology, Mineral and Energy Resources of SE Asia (GEOSEA V), Kuala Lumpur 1984, 2, Bull. Geol. Soc. Malaysia 20, p. 401-422.
(online at: https://gsmpubl.files.wordpress.com/2014/09/bgsm1986b19.pdf)
(Major and trace elements of Menumbing, Pelangas and Tempilang tin granites of Bangka are S-type granites, which may have sedimentary origin)

Sitha, K., L.D. Setijadji, K. Sanematsu, T. Ikuno, A. Imai, A. Dimara & K. Watanabe (2009)- REE in monzo-granites in Bangka Island, Indonesia. Proc. 2nd Reg. Conf. Interdiscipl. Res. Natural Resources and Materials Engineering, Yogyakarta 2009, p. 145-152.

Slik, J.W.F., S. Aiba, M. Bastian, F.Q. Brearley, C.H. Cannon, K.A.O. Eichhorng, G. Fredriksson, K. Kartawinatai, Y. Laumonier et al. (2011)- Soils on exposed Sunda shelf shaped biogeographic patterns in the equatorial forests of Southeast Asia. Proc. National Academy Sciences USA (PNAS) 108, 30, p. 12343-12347.
(online at: www.pnas.org/content/108/30/12343.full.pdf)
(Present-day marked biogeographic difference between West (Malay Peninsula, Sumatra) and East Sundaland (Borneo) surprising as these areas formed single landmass for long time in Pleistocene. Dry savanna corridor dispersal barrier during glacial maxima proposed to explain this, but short duration of dry savanna conditions make it an unlikely sole cause. Analysis of tree inventories suggest exposed sandy sea-bed soils acted as dispersal barrier; no confirmation of savanna corridor)

Soehaimi, A. & H. Moechtar (1999)- Tectonic, sea level or climate controls during deposition of Quaternary deposits on Rebo and Sapur nearshores, East Bangka- Indonesia. In: I. Busono & H. Alam (eds.) Developments in Indonesian tectonics and structural geology, Proc. 28th Ann. Conv. Indon. Assoc. Geol. (IAGI), Jakarta, 1, p. 91-101.
(Survey of tin-bearing alluvial and fluvial deposits off NE Bangka island)

Soeria-Atmadja, R., D. Darda & D. Hasanuddin (1986)- Some aspects of southern granitoid complex and tin mineralization in the northern part of Bangka, Indonesia. In: G.H. Teh & S. Paramananthan (eds.) Proc. 5th Reg. Congress Geology, Mineral and Energy Resources of SE Asia (GEOSEA V), Kuala Lumpur 1984, 1, Bull. Geol. Soc. Malaysia 19, p. 349-367.
(https://gsmpubl.files.wordpress.com/2014/09/bgsm1986026.pdf)
(Petrographic details of Late Triassic S-type granitoids of Bangka. Bangka granitoids high-level intrusions, with thermal aureoles. Bangka granitoids most like correlative to Main Range granites of Malay Peninsula. Tin mineralization along WNW, NNE and N-S directions, related to Late Triassic deformation. Fold-axis of Paleozoic-Triassic folded meta-sedimentary host rock mainly E-W. Bentong-Raub suture zone of Peninsular Malaysia probably continues into Bangka and perhaps also Belitung (small serpentinitic bodies present))

Solihuddin, T. (2014)- A drowning Sunda Shelf model during Last Glacial Maximum (LGM) and Holocene: a review. Indonesian J. Geoscience 1, 2, p. 99-107.
(online at: http://ijog.bgl.esdm.go.id/index.php/IJOG/article/view/182/179)
(Five-stage drowning model of Sunda Shelf after LGM maximum shelf exposure at ~20,500 yrs BP (sea level ~118m below present sea level). Sea level highstand at ~6000-4000 yr BP (~5m above present sea level))

Stattegger, K., W. Kuhnt, H.K. Wong, C. Buhring, C. Haft, T. Hanebuth et al. (1997)- Sequence stratigraphy, Late Pleistocene- Holocene sea level fluctuations and high resolution record of the Post-Pleistocene transgression on the Sunda Shelf. Cruise Report Sonne 115, Sundaflut, Universitat Kiel, Geol.-Palaont. Institut, Reports 86, p. 1-211.

Steinke, S., T.J.J. Hanebuth, C. Vogt & K. Stattegger (2008)- Sea level induced variations in clay mineral composition in the southwestern South China Sea over the past 17,000 yr. Marine Geology 250, p. 199-210.
(Variations in clay mineral composition of Sunda Shelf margin and slope cores over past 17,000 yrs. Deglacial sea level rise principal factor driving changes. Late Glacial high kaolinite reflect higher contribution of clays from soils formed on exposed Sunda Shelf. After coastline retreated close to present-day position in mid-Holocene stronger influence of illite-rich sources (e.g. Borneo))

Steinke, S., M. Kienast & T. Hanebuth (2003)- On the significance of sea-level variations and shelf paleo-morphology in governing sedimentation in the southern South China Sea during the last deglaciation. Marine Geology 201, p. 179-206.
(Quaternary deglacial sedimentation on outer Sunda Shelf, shelf margin and slope controlled by shelf paleo-physiography and changes in sea level and sediment supply. Five sites along transect across outer shelf and

continental slope document four intervals of significant depositional changes in last 20 000 years: drowning of lower course of North Sunda (Molengraaff) River (16.5-14.5 ka), rapid rise in sea level with flooding of middle part of paleo-valley at 14.5-14 ka and flooding of surrounding plains of river valley (14-8.5 ka). Coastline reached modern position between ca. 8.5- 6 ka)

Strimple, H.L. & T.E. Yancey (1976)- *Moscovicrinus* preserved in magnetite from Selumar, Belitung Island, Indonesia. J. Paleontology 50, 6, p. 1195-1202.
(Rare, probably Early Permian age crinoid from folded, E-W trending sandstones-shales in Selumar open pit mine on E side of Billiton Island, near margin of magnetite-cassiterite vein. Moscovicrinus hoskingi n.sp.. Also mention Van Overeem (1960) record of fusulinid limestone in wells just off N coast of Beliting. See also Hosking et al. 1977)

Sudibyo, H.T. (1984)- Paleotopografi dan endapan timah sekunder di daerah air Bara, Bangka. Proc. 13th Ann. Conv. Indon. Assoc. Geol. (IAGI), p. 439-454.
('Paleogeography and secondary tin deposits in the area of Bara waters, Bangka')

Sujitno, S. (1977)- Some notes of offshore exploration for tin in Indonesia. CCOP Techn. Bull. 11, p. 169-182.
(Indonesian tin belt on islands Riau-Lingga, Singkep, Bangka and Belitung, Karimata are S part of the SE Asian tin belt extending from N Burma- Thailand- W Malaysia. Tin tied to Late Triassic granites, except Karimata, where granite dated as Late Cretaceous (74 Ma))

Sujitno, S. (1977)- A new discovery of offshore tin deposit off the west coast of Kundur Island and problems of exploration. Proc. 14th Sess. Comm. Co-ord. Joint Prospecting Mineral Resources in Asian Offshore Areas (CCOP), p. 328-340.

Sujitno, S. & M.K. Ginting (1981)- Search for tin offshore in the Riau Islands, Indonesia. In: Proc. 17th Sess. Comm. Co-ord. Joint Prospecting Mineral Resources in Asian Offshore Areas (CCOP), UNDP, Bangkok, p. 140-156.

Sujitno, S. & P.T. Timah (1977)- Some notes on offshore exploration for tin in Indonesia 1966-1976. In: A. Prijono et al. (eds.) Proc. First Indonesian mining symposium; the Indonesian mining industry, its present and future, Indon. Mining Assoc., Jakarta, p. 124-146.

Sujitno, S., Ronojudo, A. and Muljadi (1981)- The occurrences of complex tin-iron in Belitung, Indonesia. In: A.H.H. Hasbi & H. van Wees (eds.) Complex tin ores and related problems, SE Asia Tin Research Development Centre (SEATRAD), Ipoh, Techn. Publ. 2, p. 107-136.

Sujitno, S. & M. Simatupang (1981)- Review of discoveries of new tin deposits in Indonesia. Proc. 5th World Conf. on Tin, Kuala Lumpur 1981, 44p.

Sun, X., X. Li, Y. Luo & X. Chen (2000)- The vegetation and climate at the last glaciation on the emerged continental shelf of the South China Sea. Palaeogeogr. Palaeoclim. Palaeoecology 160, 3-4, p. 301-316.
(online at: http://users.clas.ufl.edu/krigbaum/6930/Sun_etal_P3_2000.pdf)
(Pollen from hemipelagic sediments from continental slopes of S China Sea show vegetation existed on exposed shelves at Last Glacial Maximum and late Marine Isotope Stage 3. At low sea level stand, Artemisia-dominated grassland covered N continental shelf, tropical lowland rainforest and mangroves grew on S shelf of Sundaland. Sundaland experienced marginally lower temperature but not drier than today)

Surjono & M.C.G. Clarke (1982)- Primary tungsten occurrences in Sumatra and the Indonesian tin islands. In: J.V. Hepworth & Y.H. Zhang (eds.) Proc. Symposium on Tungsten Geology, Jiangxi 1981, UN ESCAP, p. 217-231.
(In NE Bangka discontinuous serpentinites at Pemali Mine (tungsten generally associated with tin; viewed as trace of southern continuation of Triassic Raub-Bentong suture of Malay Peninsula by Pulunggono & Cameron 1984))

Surjono & M.C.G. Clarke (1982)- Primary tungsten occurrences in Sumatra and the Indonesian tin islands. Bul. Direktorat Sumber Daya Mineral, Bandung, 1, 5, p.
(Same paper as Surjono & Clarke (1982) above)

Sutedjo & Sujitno (1979)- Some notes on offshore exploration for tin in Indonesia 1966-1976. In: A. Prijono et al. (eds.) The Indonesian mining industry, its present and future, Proc. First Indonesian Mining Symposium, Jakarta 1977, Indon. Mining Assoc., Jakarta, p. 124-146.

Sutisna, K., G. Burhan & B. Hermanto (1994)- Geologic map of Dabo Quadrangle (1015), Sumatra, 1:250,000. Geol. Res. Dev. Centre (GRDC), Bandung.
(Geologic map of islands E of C Sumatra Basin, incl. Singkep and S part of Lingga islands. Singkep and Selayar islands with core of Permo-Carboniferous Persing Fm phyllites and Duabelas Fm quartzites, intruded by Triassic and Late Jurassic? granites. Lingga different: folded Jurassic Tanjung Datuk Fm meta-clastics, overlain by Cretaceous sandstones and red shales)

Syamsudin, Z. (1994)- Deep seated alluvial tin exploration in offshore areas of Bangka- Indonesia, status and problems. In: J.L. Rau (ed.) Proc. 29th Sess. Comm. Co-ord. Joint Prospecting Mineral Resources in Asian Offshore Areas (CCOP), Hanoi 1992, Bangkok, 2, p. 253-261.

Tjia, H.D. (1964)- Topographic lineaments in Riauw and Lingga Archipelagoes, Indonesia. Their structural significance. Proc. 22nd Int. Geological Congress, New Delhi, p.

Tjia, H.D. (1970)- Quaternary shorelines of the Sunda Land, Southeast Asia. Geologie en Mijnbouw 49, 2, p. 135-144.
(online at: https://drive.google.com/file/d/0B7j8bPm9Cse0cDdVR2QzNkkzbnM/view)
(Sundaland elevated shorelines at +10-12m, 16-18m 30-33m and 50m. Submarine strandlines at -82-90m, -67m, -60m, -50m, -45m, -36m, -30-33m, -28m, -22m, -18m, -13m, -10m and -7m. Sea levels of last 6000 years up to +6m)

Tjia, H.D. (1980)- The Sunda Shelf, Southeast Asia. Zeitschrift Geomorphologie, N.F. 24, 4, p. 405-427.
(During low sea levels of Quaternary Sunda Shelf floor was exposed, and three large and three smaller drainage systems were carved. Radiometrically dated shorelines of northern shelf area indicate that during past 6000 years sea level fluctuated several times above present datum and once reached 4.5m elevation)

Tjia, H. (1996)- Sea-level changes in the tectonically stable Malay-Thai Peninsula. Quaternary Int. 31, p. 95-101.
(Malay-Thai Peninsula area of relative crustal stability. Over 200 Holocene shoreline indicators below and above present sea level have been radiocarbon dated, indicating that before 6 ka sea level rose from >-90 m below present level at initial rates of 15 mm/year, later 6 mm/year. At ~6 ka, rising sea reached +5m above today's. After 6 kamaximum 6 ka transgression regional sea level subsided through series of fluctuations with amplitudes of 2m and periods of ~2000 years)

Tjia, H.D., S. Asikin & R. Soeria-Atmadja (1968)- Coastal accretion in western Indonesia. Bull. Nat. Inst. Geology and Mining (NIGM), Bandung, 1, 1, p. 15-45.
(online at: http://jrisetgeotam.com/index.php/NIGM/article/view/15-45)
(Coastal accretion high near mouths of large streams along Sumatra E coast (60-500m/ year) and Java N coast (55 -214m/year). Elsewhere on same coasts accretion rates ~15-30m/ year. Annual accretion near Padang, Sumatra W coast, less than 10m)

Tjia, H.D., S. Fujii & K. Kigoshi (1977)- Changes of sea-level in the southern China Sea area during Quaternary times. In: Quaternary geology of the Malay-Indonesian coastal and offshore areas, UN ESCAP, CCOP Techn. Publ. 5, p. 11-35.

(Review of shoreline indicators on and around Sunda Shelf (Malay Peninsula, Bangka- Belitung, etc.). Drowned Pleistocene shorelines traced to depths of 82-90m and raised shorelines at elevations up to 50m above sea level)

Tjia, H.D., S. Sujintno, Y. Suklija, R.A.F. Harsono, A. Rachmat, J. Hainim & Djunaedi (1984)- Holocene shorelines in the Indonesian tin islands. Modern Quaternary Research in Southeast Asia 8, Balkema, Rotterdam, p. 103-117.
(On Bangka and Belitung evidence of several marine terraces up to 3m above present-day high-tide level, reflecting eustatic sea level hihs in last 5300 years similar to those affecting Malay Peninsula)

Untung, M. (1967)- Results of a sparker survey for tin ore off Bangka and Belitung islands, Indonesia. United Nations ECAFE, CCOP Reports of 4th Sess., p. 61-67.

Usman, E., A. Sudradjat, E.R. Suparka, I. Syafri & D. Muslim (2013)- Studi geokimia granit Bangka dan seismik refleksi resolusi tinggi untuk identifikasi batuan induk dan Sungai Purba di Prairan Kawasan Barat Indonesia. Proc. Joint Conv. 38th Indon. Assoc. Geoph. (HAGI) - 42nd Indon. Assoc. Geol. (IAGI), Medan, JCM2013-0248, 4p.
(Geochemical studies of Bangka granites and high-resolution seismic reflection for host rock identification and ancient rivers in the western Prairan Region, Indonesia'. Granite in Bangka with 70-75% SiO2 and total alkali content 6.0 - 7.5%. Tectonic environment transitional between intra-plate granite and arc-related granite)

Van Baren, F.A. & H. Kiel (1950)- Contribution to the sedimentary petrology of the Sunda Shelf. J. Sedimentary Petrology 20, 4, p. 185-213.
(As sugggested by Molengraaff, Sunda Shelf is drowned peneplain. Abundant quartz in area around Borneo and Malacca, low-quartz sediments N of Java. Heavy minerals in seafloor sediments suggest ten petrological provinces. Along shore Sumatra and Java augites, hypersthenes and hornblendes of probable Tertiary volcanic source. Metamorphic andalusite and staurolite along Borneo coast, epidote and blue-green hornblende prominent in S China Sea area. Epidote, glaucophane, zircon, and rutile common in Meratus-Pulau Laut group, derived from dynamic metamorphic rocks of Bobaris-Meratus Mts. Also picotite from ultrabasic rocks)

Van Bemmelen, R.W. (1940)- De agmatitische graniet van Tandjoeng Binga (NW-Billiton). De Ingenieur in Nederlandsch-Indie (IV) 7, 5, p. 63-66.
('The agmatitic granite of Tanjung Binga (NW Belitung)'. Granite with numerous angular inclusions of dark rocks of kersantite, spessartite, malchite, microdiorite, minette, etc. Irregular structure with streaks of aplitic and pegmatitic varieties) in biotite-hornblende granite. At short distance from agmatitic granite contact-are metamorphic quartzites. Inclusions probably granitisation of ?Triassic diabase and quartzite)

Van Bemmelen, R.W. (1940)- Komen op Bangka pretriadische kristallijne schisten voor? De Ingenieur in Nederlandsch-Indie (IV) 7, 5, p. 67-68.
('Do pre-Triassic crystalline schists occur on Bangka?'. In Loemoet valley, N Bangka, near contact with Belinjoe-granite, gradual transition of Triassic Bangka Fm shales into micaceous schists with abundant tourmaline. Also seen at Bukit Pemali mine and Mine 40. Schists do not represent older geological cycle, but originated by pneumatolytic metamorphosis of Triassic 'Bangka formation' phyllitic shales)

Van Bemmelen, R.W. (1941)- Origin and mining of bauxite in Netherlands-India. Economic Geology 36, 6, p. 630-640.
(Bauxite of aluminous laterite type, derived from Triassic aphanitic hornfels parent rock (unweathered at ~50m depth) on SE Bintan Island opposite Singapore. Production began in 1935 and now 5-6% of world production)

Van Bemmelen, R.W. (1949)- The Sunda shelf. In: The geology of Indonesia, Government Printing Office, Nijhoff, The Hague, 1, p. 298-325.

Van den Bold, W.A. & J.P. van der Sluys (1942)- On rocks from the isle of Batam (Riouw Archipelago). Proc. Kon. Nederl. Akademie Wetenschappen, Amsterdam, 45, 10, p. 1003-1009.

(online at: www.dwc.knaw.nl/DL/publications/PU00017847.pdf)
(Petrographic descriptions of rocks collected by Roggeveen. Mainly post-Triassic granites, Carboniferous-Triassic 'Pahang Volcanic Series' and Upper Triassic 'Central Batam Fm' sandstones-shales)

Van Diest, P.H. (1872)- Inleiding tot de geognostische mijnbouwkundige rapporten der distrikten van Bangka. Jaarboek Mijnwezen Nederlandsch Oost-Indie 1872, 1, p. 3-40.
(Introduction to geognostic- mining reports of the districts of Bangka'. Part of series of mining evaluations on Bangka Island)

Van Diest, P.H. (1872)- Rapport van het distrikt Soengei-liat, eiland Bangka. Jaarboek Mijnwezen Nederlandsch Oost-Indie 1872, 2, p. 3-71.
('Report on the district Sungei-Liat, Bangka island')

Van Diest, P.H. (1873)- Rapport van het distrikt Merawang, eiland Bangka. Jaarboek Mijnwezen Nederlandsch Oost-Indie 2, 1 (1873), p. 3-104 and 242-243.
('Report on the district Merawang, Bangka island'. Bedrockmainly mainly phyllites and sandstones, overlain by locally tin-bearing alluvial deposits around modern river beds (with numerous mine locations, with 1853-1862 production statistics). Granite in NE corner, surrounded by ~800m wide zone with tin-bearing quartz veins. With 1:60,000 scale geologic map)

Van Dijk, P. (1879)- Obsidiaan van Billiton. Jaarboek Mijnwezen Nederl.-Oost-Indie 8, 2, p. 225-230.
('Obsidian from Billiton'. First description of Pleistocene glassy tektites, locally common in alluvial tin deposits of Belitung island (subsequently also called 'billitonites'; part of large SE Asian- Australia tektite-strewn field and dated at ~0.7-0.8 Ma; JTvG))

Van Lohuizen, H.J. (1918)- Over de wijze van voorkomen van het tinerts in het district Blinjoe op Bangka. Jaarboek Mijnwezen Nederlandsch Oost-Indie 46 (1917), Verhandelingen 1, p. 192-207.
('On the mode of occurrence of tin ore in the district Blinjoe on Bangka')

Van Overeem, A.J.A. (1960)- The geology of the cassiterite placers of Billiton, Indonesia. Geologie en Mijnbouw 39, 10, p. 444-457.
(online at: https://drive.google.com/file/d/0B7j8bPm9Cse0X2p0TmhuZEVycnc/view)
(On cassiterite placers on twice dissected old Sundaland peneplain around Beliting island. Includes discussion of basement geology: probably thick series steeply dipping Permo-Carboniferous sediments (strike ~N110°E, mainly dipping to N), with possible turbiditesand chert, intruded by Cretaceous granitoids. In SE of Belitung island Permian plant assemblages provisionally identified by Jongmans as Cathaysian (Gigantopteris) flora. In SE also Lower Permian cassiterized ammonoid Agathiceras sundaicum (Kruizinga 1950). At NW coast of island poorly preserved fusulinids, possibly M Permian Fusulina (Schwagerina))

Van Overeem, A.J.A. (1960)- Geological control of dredging operation on placer deposits, Billiton, Indonesia. Geologie en Mijnbouw 39, 10, p. 458-463.
(online at: https://drive.google.com/file/d/0B7j8bPm9Cse0X2p0TmhuZEVycnc/view)
(Not much on geology)

Van Raadshoven, B. & J. Swart (1942)- On rocks from Karimon (Riouw Archipelago). Proc. Kon. Nederl. Akademie Wetenschappen, Amsterdam, 45, 1, p. 89-96.
(online at: www.dwc.knaw.nl/DL/publications/PU00017704.pdf)
(Karimun island, SW of Singapore. Rocks collected by Roggeveen. Most of island post-Triassic biotite granites. Sediments in NE of island contact-metamorphic slates, quartzites, limestone, etc., possibly of Carboniferous and Triassic age. Basic plutonic rocks and associated metamorphics (metagabbros, diallagites, microfolded hornblende schists identical to schists of Singkep lsland) on small islands Temblas and Merak, off S coast of Karimun. Interpreted to be trace of Raub-Bentong Triassic suture zone by Pulunggono and Cameron 1984)

Van Wees, H. & C.P. de Vente (1984)- The primary tin-magnetite deposit of Gunung Selumar, Belitung Island, Indonesia: interim results of an exploration research study and ore genetic implications. SE Asia Tin Research Development Centre (SEATRAD), Ipoh, Report 22, p. 1-77. *(Unpublished)*

Van Wessem, A. (1941)- On rocks from the islands of Soegi, Tjombol and Tjitlim, Riouw Archipelago, Netherlands East Indies. Proc. Kon. Nederl. Akademie Wetenschappen, Amsterdam, 44, 10, p. 1219-1226.
(online at: www.dwc.knaw.nl/DL/publications/PU00017686.pdf)
(Petrographic descriptions of rocks collected by Roggeveen: schists, radiolarian chert as pebbles in conglomerate, quartzite, sandstones, greywackes, porphyrite, diotite, etc.)

Verbeek, R.D.M. (1897)- Geologische beschrijving van Bangka en Billiton. Jaarboek Mijnwezen Nederlandsch Oost-Indie 26, Wetenschappelijk Gedeelte, p. 1-272.
(Geological description of Bangka and Billiton (Belitung) Islands, E Sumatra, with focus on occurrences of tin. Incl. descriptions of radiolaria of probable Late Paleozoic age from chert by Hinde (p. 223-227) and 'glass pebbles (tektites))

Verbeek, R.D.M. (1897)- Glaskogels van Billiton. Jaarboek Mijnwezen Nederlandsch Oost-Indie 26, Wetenschappelijk Gedeelte, p. 235-272.
('Glass pebbles from Billiton'. Early description of up to 5cm large tektites, locally common on Belitung island in Pleistocene alluvial deposits. Also known from Java, Kalimantan and Australia. Can not be tied to Indonesian volcanoes, so Verbeek assumes extra-terrestrial origin, possibly from volcanoes on moon (now interpreted as part of large SE Asian- Australia tektite-strewn field, dated at ~0.7-08 Ma (see also Krause (1898), Wing Easton (1915, 1921), Von Koenigswald (1935), Chapman (1964), etc.; JTvG))

Von Koenigswald. G.H.R. (1933)- Soenda-plat en poolverplaatsing. De Mijningenieur. 14, 7, p. 124-130.
('The Sunda Shelf and polar wandering'. Sunda shelf between Sumatra, Java and Borneo is drowned alluvial plain now covered by Java Sea. Usually explained as Pleistocene post-glacial sea level rise of ~70-100m, but drowning may also be due subsidence related to change of geoid with shifting of pole in Pleistocene (?))

Wade-Murphy, J. & J.H.A. van Konijnenburg-van Cittert (2008)- A revision of the Late Triassic Bintan flora from the Riau Archipelago (Indonesia). Scripta Geologica 136, p. 73-105.
(Online at: http://dpc.uba.uva.nl/08/nr136/a04)
(Flora from SW Bintan Island, Riau Archipelago, partly described by Jongmans in 1951. Additional taxa identified. Absence of fern and sphenophytes and dominance of diminutive Pterophyllum and Ptilophyllum leaves. Stronger similarities between Bintan and SW Asia than with SE Asia floras. Differences may point to slightly younger age (E-M Jurassic), but unlikely to be Early Cretaceous as suggested by Kon'no 1972)

Wang, X.M., X.J. Sun, P.X. Wang & K. Stattegger (2007)- A high-resolution history of vegetation and climate history on Sunda Shelf since the last glaciation. Science in China Ser., D- Earth Sci., 50, p. 75-80.
(16,500-year high-resolution pollen and spore records from sediments of core 18287 on continental slope of southern S China Sea. Between 16.5-13.9 ka BP low-mountain rainforest dominated. In 13.9-10.2 ka BP lowland rainforest and ferns expanded, indicating warming at last deglaciation and pollen sedimentation rates reduced, implying rise of sea level/ sub-mergence of shelf. After 10.2 ka BP, decreasing fern indicates early Holocene (10.2- ka BP) cold period, while increasing of fern marks rising temperature (7-3.6 ka BP).

Wang, X.M., X.J. Sun, P.X. Wang & K. Stattegger (2009)- Vegetation on the Sunda Shelf, South China Sea, during the Last Glacial Maximum. Palaeogeogr. Palaeoclim. Palaeoecology 278, p. 88-97.
(online at: http://ocean.tongji.edu.cn/pub/pinxian/eng/2009-04.pdf)
(Pollen from Sonne 1996 cruise sediment cores along paleo-valley of North Sunda River on Sunda Shelf of southern S China Sea. During Last Glacial Maximum (22-16 ka) high percentages of pollen from lowland rain forests and lower montane rainforests, suggesting exposed shelf covered with humid vegetation. Marshy vegetation in valley along N Sunda River. Climate during LGM inferred from vegetation cooler today, but no significant decrease in humidity recorded)

Warburg, O. (1897)- Zwei neu fossile Phanerogamen-Gattungen von der Insel Bangka. Jaarboek Mijnwezen Nederlandsch Oost-Indie 26, p. 229-234.
('Two new phanerogam species from Bangka island'. Fossil Pliocene plant fruit fossils collected by Verbeek, in tin quarry 7 of Lumut River, Blinju District, named Spondiocarpus verbeekii and Monoderosperum bangkanum)

Westerveld, J. (1936)- On the geology of North Banka (Djeboes). Proc. Kon. Nederl. Akademie Wetenschappen, Amsterdam, 39, 9, p. 1122-1132.
(online at: www.dwc.knaw.nl/DL/publications/PU00016981.pdf)
(Survey of NW Bangka Island. Oldest rocks thick, monotonous series of presumably Triassic-age, intensely folded dark shales and yellowish sandstones, steeply dipping, NW-SE or WNW-ESE trending. Sandstones mainly composed of undulose (metamorphic) quartz. Presence of radiolaria in shales similar to Triassic rocks in Malaya, etc. With Djeboes granite, part of large (~100 km) intrusive biotite granite mass. W of granite area diabase intrusions in folded Mesozoic clastics (should not be confused with Pahang series of Malay Peninsula))

Westerveld, J. (1936)- The granites of the Malayan tin belt compared with tin granites from other regions. Proc. Kon. Nederl. Akademie Wetenschappen, Amsterdam 39, p. 1199-1209.
(Brief overview, without figures, of tin granites of Sumatra (Banka, Billiton, etc.), Malay Peninsula, Cornwall, Saxony, Bolivia and S Africa)

Westerveld, J. (1937)- The tin ores of Banca, Billiton and Singkep, Malay Archipelago- a discussion. Economic Geology 32, p. 1019-1041.
(Discussion of Wing Easton 1937 paper, arguing that (1) there is one granite instead of two; depth of granitic intrusion and mineralization was deep; some contact-metamorphism is present. Tin mineralization not Pliocene but post-Triassic and probably pre-Cenomanian, etc.)

Westerveld, J. (1941)- Mineralisatie op de tineilanden. Jaarboek Mijnbouwkundige Studenten Delft 1938-1941, p. 187-233.
('Mineralization on the tin islands'. Review of geology and tin mineralization on Bangka, Billiton and Riau-Lingga Archipelago, from presentation to Delft students in 1939. Tin granites believed to be of Jurassic age, intruded into isoclinally folded but not regionally-metamorphosed Triassic clastic sedimentary series (derived from granitic rocks; with rare Daonella on Lingga and radiolarian chert). Tin Island granites rel. rich in Rare Earth Elements (Y, La, Ce, Nd). Primary cassiterite mineralization veins in sediments surrounding granite and in greisen zones in granite. Most tin mined from residual cassiterite deposits ('kaksa') in Quaternary valley bottoms above and around tin granite outcrops, both onshore and near-offshore. With maps of residual cassiterite deposits of Bangka and Belitung)

Wichmann, A. (1893)- Obsidianbomben der Zinnseifen der Insel Billiton. Zeitschrift Deutschen Geol. Gesellschaft 1893, p. 518-519.
('Obsidian bombs from the tin-bearing beds of Belitung Island'. Brief comment by Wichmann on glass spheres in tin beds of Belitung, but which are not found in Indonesian volcanoes. Described earlier by Van Dijk 1879 (see also Verbeek 1897, Wing Easton 1921, etc.; these are now known to be part of M Pleistocene Australasian tektite strewn field. JTvG))

Wichmann, A. (1912)- Over rhyolieth van de Pelapis-eilanden. Verslagen Vergadering Wis.-Natuurk. Afd., Kon. Akademie Wetenschappen, Amsterdam, 1912, p. 386-391
(online at: https://archive.org/details/p1verslagvandege21akad)
('On rhyolite of the Pelapis islands', between SW coast of Kalimantan and Karimata islands. Rhyolitic volcanic rock sample collected by Everwijn in 1854 from islands composed of claystones intruded by granitic rocks)

Widana, K.S. (2013)- Petrografi dan geokimia unsur utama granitoid Pulau Bangka kajian awal tektonomagmatisme. Eksplorium 34, 2, p. 75-88.
(online at: http://jurnal.batan.go.id/index.php/eksplorium/article/view/708/623)
('Petrography and major element geochemistry of Bangka island granitoids: preliminary study of tectonomagmatism'. Bangka Island granitoids ages range from Late Permian- Late Triassic. Petrographic

analysis show dominant granitoid type as Alkali feldspar- syeno granite. May have formed on continental arc where subduction and collision are involved. Some granitoids generally I- type peraluminous (Pemali, Koba, Pading, Romodong;'continental arc type). S-type granitoids in S and W Bangka (Toboali, Menumbing) characterized by high K2O and abundant biotite+ muscovite + cordierite (continental collision type))

Widana, K.S. & B. Priadi (2015)- Karakteristik unsur jejak dalam diskriminasi magmatisme granitoid Pulau Bangka. Eksplorium 36, 1, p. 1-16.
(online at: http://jurnal.batan.go.id/index.php/eksplorium/article/view/2766/pdf)
('Characteristics of trace elements in granitoid magmatism discrimination on Bangka Island'. Klabat granitoids on Bangka Island studied for trace elements. Granitoids in E (Belinyu) and C Bangka display crust-mantle mixing with calc-alkaline affinity, characteristic of I type(='Eastern Province'?). In S and W Bangka granitoids high K calc-alkaline and of S type (= 'Main Range'?))

Widana, K.S., B. Priadi & Y.T.Handayani (2014)- Profil unsur tanah jaring granitoid Klabat di Pulau Bangka dengan analisis aktivasi neutron. Eksplorium 35, 1, p. 1-12.
('Rare Earth Elements profile of Klabat Granitoid in Bangka Island by neutron activation analysis')

Wilhelm, C.H.J. (1928)- De tinertsafzettingen van het eiland Singkep en de genese der alluviale afzettingen. Doct. Thesis, Technical University Delft, Waltman, Delft, p. 1-126.
(online at: repository.tudelft.nl/assets/uuid...2c32.../73169.pdf)
('The tin ore deposits of Singkep island (E Sumatra) and the genesis of the alluvial deposits'. Singkep geology mainly granite and mica schist. Alluvial tin ores derived from tin-bearing quartz veins in granite. Tin ore reserves of Singkep less than on Belitung and Bangka)

Wing Easton, N. (1921)- The billitonites (an attempt to unravel the tectite puzzle). Verhandelingen Kon. Akademie Wetenschappen, Amsterdam, sect. 2, 22, 2, p. 1-32.
(On 'billitonites' (tektites; black glass pebbles from meteorite impacts), found at the base of the tin-bearing alluvium of Belitung Island, and first reported by Verbeek (1887) and Krause (1898). Believed to be of extraterrestrial origin by earlier authors (Verbeek, Suess), but Wing Easton noted 89% SiO2 is much too high for meteorites and suggested terrestrial origin as colloidal formations in soil horizons (similar tektites also known from tin-bearing beds of the Malay Peninsula, Bunguran (Natuna), N Borneo, SE Kalimantan, Indochina, Philippines, Australia; JTvG))

Wing Easton, N. (1925)- Billiton- herinneringen. Verhandelingen Geologisch-Mijnbouwkundig Genootschap Nederland Kol., Geol. Serie 8 (Verbeek volume), p. 125- 154.
('Billiton memories'. Geological observations on geology and tin mineralization of Belitung island, made in 1919/1920)

Wing Easton, N. (1933)- De geologische geschiedenis van Billiton en het ontstaan der kaksa. De Mijningenieur 14, 10, p. 165-174.
('The geological history of Belitung and the origin of the 'kaksa'. Partly critique of Adam (1933) papers. Kaksa tin ore is residual product of weathering of granite, not alluvial-fluvial transported. Followed by Adam rebuttal)

Wing Easton, N. (1937)- The tin ores of Banca, Billiton and Singkep, Malay Archipelago, Part I. Economic Geology 32, 1, p. 1-30.
(First overview in English languge of geology and tin mining on Bangka, Belitung and Singkep- part 1. Most of tin produced from secondary placer deposits, but primary mineralization in veins in granite. WE believes there are two groups of granites, one older than folded sediments without tin and one younger (Cretaceous) age with tin mineralizion. Mineralization age believed to be Pliocene. Conclusions disputed by Westerveld 1937)

Wing Easton, N. (1937)- The tin ores of Banca, Billiton and Singkep, Malay Archipelago, part II. Economic Geology 32, 2, p. 154-182.

(Overview in English languge of geology and tin mining on Bangka, Belitung and Singkep- part 2. On ore deposits, mainly on formation and distribution of valley placer deposits called 'kaksa beds' (see also critical discussion by Westerveld 1937))

Wisoko (1981)- Geologi endapan timah primer di Pemali, Bangka. Proc. 10th Ann. Conv. Indon. Assoc. Geol. (IAGI), p. 193-203.
('Geology of primary tin deposits in Pemali, Bangka')

Wisoko (1983)- Pengaruh kipas aluvial terhadap penyebaran bijih timah sekunder daerah Mentok Selatan Bangka. Proc. 12th Ann. Conv. Indon. Assoc. Geol. (IAGI), p. 293-300.
('Influence of alluvial fan deposition on secondary tin ore deposition in the South Mentok area, Bangka')

Wong, H.K., T. Ludmann, C. Haft & A.M. Paulsen (2003)- Quaternary sedimentation in the Molengraaff Paleo-delta, Northern Sunda Shelf (Southern South China Sea). In: F.H. Sidi, D. Nummedal et al. (eds.) Tropical deltas of Southeast Asia- sedimentology, stratigraphy and petroleum geology, SEPM Spec. Publ. 76, p. 201-216.
(Seven seismic units in Pleistocene lowstand delta at Sundaland margin, fed by Molengraaff/ North Sunda river during Last Glacial Maximum)

Wu, S.G., H.K. Wong, Y.L. Luo & Z.R. Liang (1999)- Distribution and origin of sediments on the northern Sunda Shelf, South China Sea. Chinese J. Oceanology Limnology 17, p. 28-40.
(77 surface sediment samples and seismic profiles from outer Sunda Shelf analyzed. Seismic shows thick, prograding Pleistocene deltaic sequence near shelf-break and thin Holocene sediment layer on outer shelf. Five sedimentary areas distiguished: modern Mekong sediments, insular shelf area receiving sediments from Borneo rivers, shelf area near Natuna-Anambas islands, area of relict sediments on outer shelf N of Natuna Islands, and coral reefs and detritus)

Zulfikar, M. & N.C.D. Aryanto (2016)- The study of seafloor tin placer resources of Quaternary sediment in Toboali waters, South Bangka. Bull. Marine Geol. 31, 2, p. 67-76.
(online at: http://ejournal.mgi.esdm.go.id/index.php/bomg/article/view/285/275)
(Boomer shallow seismic survey off S coast of Bangka to determine Quaternary sediment thickness (5-20ms))

Zwartkruis, T.C.J. (1962)- Orbicule-bearing blastopsammitic hornfelses from southern Bangka, Indonesia. Ph.D. Thesis University of Amsterdam, p. 1-94. *(Unpublished)*
(Descriptions of contactmetamorphic hornfels, adjacent to tin granites of probable E-M Jurassic-age. Material collected by De Roever in 1947. Orbicular structures probably metamorphosed calcareous concretions in clastic precursor rock. Also first description of 'diamictite' from S Bangka (interpreted as mudflow deposit, possibly same as E Permian glacial 'pebbly mudstone' known from N Sumatra, W Malaysia, peninsular Thailand, etc; U Ko Ko 1986))

Zwierzycki, J. (1920)- Zijn de Indische petroleumterreinen, in het bijzonder die op Sumatra, peneplains of abrasievlakken? De Mijningenieur 1, 2, p. 3-5.
(online at: https://babel.hathitrust.org/cgi/pt?id=coo.31924081565537;view=1up;seq=25)
('Are the Indies petroleum-bearing areas, in particular those on Sumatra, peneplains or abrasion plains?' Landscape of petroleum terrains in N and S Sumatra and Java routinely viewed as peneplains on gently folded Tertiary sediments. Age of folding probably Pleistocene, not leaving much time for peneplanization by complete fluvial erosion cycle; wave abrasion on coastal plains probably faster, and more likely mechanism)

Zwierzycki, J. (1933)- Enkele nieuwere geologische waarnemingen op de tineilanden en op Sumatra betreffende het tinvraagstuk. De Mijningenieur 14, 10, p. 171-176.
('Some newer observations on the tin islands and on Sumatra regarding the tin problem'. Mainly response to Wing Easton (1933). Oldest rocks on Bangka isoclinally folded crystalline schists and non-metamorphic sediments, reminescent of schists of Lampung. (Permian?-)Triassic Pahang Volcanic series of Malay Peninsula probably continues into Batam, Bintan and Lingga, then also to diabase on Bangka and N coast of Belitung

(also >1000m thick, isoclinally folded Triassic 'flysch-type' sediments). 'Kaksa' and overlying 'koelit' tin placers all very young, probably Holocene (with rel. young Elephas sumatranus fossils). In some mines four 'kaksa' tin ore horizons (here clearly fluvial?). (Also interesting observation on S Sumatra, p. 173:'Small anticlinal dome on Palembang-anticline 18 km W of Palembang exposes gravel bank of Lower Palembang Fm, containing chunks of Pahang Volcanic Series with Fusulina and vein quartz with cassiterite crystals; at 191m at Bioekoe granite syenite, similar to exposed at Bukit Batu'; JTvG)

II.5. Natuna, Anambas

Adrian, H., L. Andria & A. Sudarsana (2005)- Horizontal well placements using V shale and facies geomodel: an example from Belanak Field, South Natuna Sea, Indonesia. Proc. 30th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 145-162.
(Main reservoirs in Belanak Field, S Natuna Sea Block 'B' are U Oligocene Gabus Massive Sand and Gabus Zone-3. Massive Sand gas with thin oil rim, deposited in a fluvial channel environment. Multi-storied channel sands. Porosity ranges similar throughout field, but permeabilities are variable)

Alyadrus, M.A. & R.L. Coates (1990)- Successful marginal feld development, Ikan Pari Field, Natuna Sea. Proc. 19th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, p. 345-351.
(Ikan Pari Field, discovered in 1983, 50 miles NE of Udang Field. Developed with four seafloor completions)

Ardhie, M.N. (2004)- An inversion structure and its implication for structural trapping mechanisms: study of Kakap PSC, West Natuna Basin, Indonesia. Masters Thesis, University of Texas at Arlington, p. 1-113. *(Unpublished)*
(W Natuna basin formation Eocene-Oligocene transtension, followed by Miocene- Recent transpression and inversion. In Kakap PSC two rift trends: NW-SE and NE-SW major half-graben and series of smaller half-graben, all associated with Sunda folds and flower structures. Main phase of inversion E-M Miocene (thinning of M-U Arang Fms), second phase in M-L Miocene (base Muda unconformity). Tectonostratigraphy of Kakap PSC four major tectonic events; syn-rift, transitional, inversion and post-inversion)

Arif, F. & C. Kenyon (2017)- Lama play assessment based on reservoir effectiveness using structural evolution modeling in Natuna A Block. Proc. Joint Conv. HAGI-IAGI-IAFMI-IATMI (JCM 2017), Malang, 8p.
(Play assessment of Eo-Oligocene early syn-rift Lama Fm quartz-rich fluvio-lacustrine clastics in Natuna A Block. Due to deep burial, reservoir effectiveness critical risk (especially due to quartz cementation. Two main erosion events: (1) base Miocene (Base Arang shale; ~25 Ma); (2)M Miocene unconformity (~16- 11 Ma). Sweet spots for Lama Play at rift flexural margin)

Bachtel, S.L., R.D. Kissling, D. Martono, S.P. Rahardjanto, P. Dunn & B.A. MacDonald (2004)- Seismic stratigraphic evolution of the Miocene-Pliocene Segitiga platform, East Natuna Sea, Indonesia: the origin, growth, and demise of an isolated carbonate platform. In: G. Eberli et al. (eds.) Seismic imaging of carbonate reservoirs and systems, American Assoc. Petrol. Geol. (AAPG) Mem. 81, p. 309-328.
(High-resolution 2D seismic survey over Segitiga Platform (1400 km2), E Natuna-Sarawak Sea. Terumbu Fm carbonate up to 1800m thick, subdivided into 12 seismic sequences, showing (1) initial isolation; (2) progradation /coalescence; (3) backstepping; (4) terminal drowning. Platform originated as 3 smaller platforms on highs, separated by deep intraplatform seaways. Three platforms merged into composite platform in M-U Miocene. Rapid end Miocene sea level riset caused major backstepping of carbonate margins (and drowning of Natuna field carbonate platform to E) resulting in smaller platform in Lower Pliocene. Rapid subsidence at end of E Pliocene, caused terminal drowning)

Ben-Brahmin, L. et al. (1999)- Characterization of seismic anomalies using converted waves: a case of history from East Natuna Basin. Proc. 27th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, p. 295-302.

Bennett, M. (1999)- Intra-Muda shallow gas in Cumi-Cumi PSC, Natuna Sea- a driller's nightmare becomes a geophysicist's dream. Proc. 27th Ann. Conv. Indon. Petroleum Assoc., p. 303-321.
(M Miocene age Intra-Muda Fm. sandstones draped over inversion feature. Strong seismic amplitude anomaly over crest, with 'flatspots' around flanks of structure and gas-charged in Tenggiri 1 and Mako 1 wells)

Bhikuningputra, D. (1986)- Seismic stratigraphic study to evaluate reservoirs and seals of the Natuna area. In: Seismic Stratigraphy I, Proc. Joint ASCOPE/ CCOP Workshop, Jakarta 1986.CCOP Tech. Publ. 17, p. 157-180.

Bothe, A.C. (1928)- Geologische verkenningen in den Riouw-Lingga archipel en de eilandengroep der Poelau Toedjoeh (Anambas- en Natoena-eilanden). Jaarboek Mijnwezen Nederlandsch Oost-Indie 54 (1925), Verhandelingen 2, p. 101-152.
(Geological reconnaissance surveys of Riau Archipelago (common granites), Anambas Islands (mainly granites) and Natuna islands (metamorphic rocks, possibly Jurassic radiolarian chert, serpentinites, granites). At S coast of Natuna Besar (Bunguran) NW-SE and E-W trending siliceous shales with cherts with Late Jurassic- E Cretaceous radiolaria identical to described by Hinde (1900) from Danau Fm of NW Kalimantan (Cenosphaera, Stichocapsa rotunda, Sethocapsa, Dictyomitra). At W coast of Bunguran gabbro and serpentinite)

Budiyono (2002)- Forel field reservoir characterization and field assessment, West Natuna Basin Indonesia. M.Sc. Thesis University of Texas, Austin, p. 1-178. *(Unpublished)*

Burton, D. & L.J. Wood (2010)- Seismic geomorphology and tectonostratigraphic fill of half grabens, West Natuna Basin, Indonesia. American Assoc. Petrol. Geol. (AAPG) Bull. 94, 11, p. 1695-1712.
(Study of Eo-Oligocene synrift architectures of Cenozoic grabens in W Natuna Basin (WNB) from Gabus and Belanak 3D seismic surveys. Five facies: fluvial, deltaic, alluvial fan, shallow lacustrine and deep lacustrine. Synrift stratigraphy shows strong tectonic control. Hydrocarbon in basin restricted to upper synrift- postrift reservoirs in M Miocene inversion anticlines, but synrift may have potential)

Burton, D. & L.J. Wood (2010)- Interpreting the rift stratigraphy and petroleum systems elements of the West Natuna Basin using 3D seismic geomorphology. In: L.J. Wood et al. (eds.) Seismic imaging of depositional and geomorphic systems, Proc. Gulf Coast Sect. SEPM (GCSSEPM) Annual Bob F. Perkins Research Conf. 30, Houston, p. 376-395.
(Seismic geomorphic facies character and stacking suggest three stages of rift development in W Natuna Basin. (1) alluvial fans and red beds filled small, isolated half-grabens; (2) as faults began to merge, subsidence increased, and deep lakes were established; (3) lakes slowly filled and upper synrift is dominated by fluvial deposits. Best remaining exploration targets deltaic reservoirs in lower middle synrift)

Chalik, M. (2001)- Sealing and non-sealing faults along a major wrench trend in the Kakap area, West Natuna Basin. Proc. 28th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, p. 757-778.
(Oil traps at KG, KRN and KR oil fields in 3-way dip closures against sealing normal faults, splaying from large wrench zone. Faults seal hydrocarbons where fault throw is >300' or where reservoir is in contact with shale across fault)

Challis, M., R. Adhyaksawan & V. Ball (2006)- Seismic prediction of thin sand intervals for development drilling at North Belut Field, Block B, South Natuna Sea. Proc. Jakarta 2006 Int. Geosc. Conf. Exhib., Indon. Petroleum Assoc. (IPA), Jakarta, 06-CH-06, 5p.

Cherdasa, J.R., A. Jollands & S. Carmody (2013)- Structural reconstruction and basin modelling lead to a new charge/migration model for the KB Graben, West Natuna Basin, Indonesia. Proc. 37th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA13-G-039, p. 1-14.
(KB Graben is NE-SW trending rift basin at E flank of Khorat Platform in N West Natuna Basin. Rifting process started at ~38 Ma and continued to 25 Ma; syn-inversion period started at ~23 Ma. Lack of oil in younger structures may be due to late syn-rift Lama Fm overpresssured shales, which provide regional seal for hydrocarbons generated in syn-rift kitchen)

CoreLaboratories (1999)- The petroleum geology and hydrocarbon potential of East Natuna, Indonesia. Unpublished multi-client study.
(Study/ data base, incorporating 23 wells in East Natuna Basin)

Dajczgewand, D. (2005)- Tectonic evolution and structural styles of deformation of southern Kakap Blocks, West Natuna Basin, Indonesia. In: Proc. 6th Congr. Exploracion y desarrollo de hidrocarburos, Mar del Plata, Argentina, 2005, 12p.

(Structural evolution of Kakap oilfield area, W Natuna basin, based on work done for M.Sc Thesis at University of London. Extension started in Late Eocene, creating E-W trending half-graben with N-dipping normal faults. Second extensional phase began in M Oligocene. Compression started in latest Late Oligocene, initial stage being mild, and was stronger in E. Strongest compression/ tectonic inversion in M Miocene. Muda regional unconformity developed in late M Miocene and early Late Miocene and was subsequently deformed by compression, continuing to recent times)

Daines, S.R. (1985)- Structural history of the West Natuna Basin and the tectonic evolution of the Sunda region. Proc. 14th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 39-61.
(Structures in W Natuna Basin formed during two deformation periods: (1) extension from ~38-29 Ma, resulting in graben development in Boundary area; (2) compression, resulting in 2 stages basin inversion, 29-20 Ma left-lateral wrench movement and 15- 10 Ma when most NE-SW oil-bearing anticlines formed. Extensive Jurassic suture, separating Indochina and Sunda, responsible for propagation of Malay-Natuna-Lupar shear zone, and facilitated basin development in area)

Darmadi, Y. (2005)- Three-dimensional fluvial-deltaic sequence stratigraphy Pliocene-Recent Muda Formation, Belida field, West Natuna Basin, Indonesia. M.Sc. Thesis, Texas A&M University, p. 1-72.
(online at: oaktrust.library.tamu.edu/bitstream/.../etd-tamu-2005C-GEOP-Darmadi.pdf)
(Pliocene-Recent Muda interval in W Natuna Basin contains five 3rd-order sequences, with depositional environments confined to shelf and consisting mainly of fluvial elements)

Darmadi, Y., E. Hartadi, B. Pangarso, I. Sihombing & R. Wijayanti (2011)- Reservoir characterization of the Gabus-1 reservoir in North Belut Field: an integration of core, well logs and seismic, Natuna Sea Basin, Indonesia. Proc. 35th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA11-G-196, 19p.
(N Belut 1974 gas discovery with stacked sand reservoirs across 1700' interval deposited in fluvio-deltaic environments in Oligo-Miocene Udang and Gabus Fms. Gabus 1 interval two major sequences with sharp erosional base and shale on top. NNE-SSW trending incised valley system)

Darmadi, Y, B.J. Willis & S.L. Dorobek (2007)- Three-dimensional seismic architecture of fluvial sequences on the low-gradient Sunda Shelf, Offshore Indonesia. J. Sedimentary Res. 77, p. 225-238.
(Sequence stratigraphy of Belida Field area, W Natuna Basin. Upper Muda Fm Pliocene-Holocene fluvial architecture study from high-resolution seismic. 225m dominantly fluvial section. Five main sequences of episodic channel incision and bypass alternating with periods of floodplain aggradation)

Darman, H. (2017)- Seismic expression of key geological features in the East Natuna Basin. Berita Sedimentologi 38, p. 50-61.
(online at: https://drive.google.com/file/d/0B35lLH-Cki2NV01LNEVCcGl2Z2M/view)
(Examples of regional seismic lines across East Natuna basin rifts and highs with carbonate buildups)

Dash, B.P. (1971)- Preliminary report on seismic refraction survey southeast of Natuna Islands and seismic profiling in the vicinity of the Natuna and Tioman Islands on the Sunda Shelf. United Nations ECAFE, 8th Session CCOP, p. 168-174.

Dash, B.P., C.M. Shepstone, S. Dayal, S. Guru, B.L.A. Hains, G.A. King & G.A. Ricketts (1972)- Seismic investigations on the northern part of the Sunda shelf South and East of Great Natuna Island. United Nations ECAFE CCOP Techn. Bull. 6, p. 179-196.
(Regional shallow seismic survey of 1160km, SE of Great Natuna island, showing basinal and ridge-like features. Khorat- Natuna swell may be linked with mainland Asia and NW Kalimantan)

Dickerman, K.M. (1993)- The utilization of 3D seismic for small fields in the South Natuna Sea Block B. Proc. 22nd Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 659-678.

Dunn, P.A., M.G. Kozar & Budiyono (1996)- Application of geoscience technology in a geologic study of the Natuna gas field, Natuna Sea, offshore Indonesia. Proc. 25th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 117-130.
(Natuna D Alpha gas field in the East Natuna Basin in Miocene reefal buildup with >200TCF gas, but gas has 71% CO2)

Evans, H. (1998)- New life in an old basin, an example from Natuna Sea Block A, West Natuna, Indonesia. In: Offshore South East Asia Conf. 1998 (OSEA98), Singapore, SE Asia Petroleum Expl. Soc. (SEAPEX), p. 141-154.
(Review of exploration history West Natuna Basin and its extension into E Malay Basin)

Eyles, D.R. & J.A. May (1984)- Porosity mapping using seismic interval velocities, Natuna L structure. Proc. 13th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 301-316.
(Seismic interval velocities used to produce average porosity map of the gas-bearing carbonate buildup reservoir of 'L-structure' in Natuna D-Alpha Block, S China Sea. Maximum gross gas thickness of L-Structure is 5250', field size ~110 square miles)

Fachmi, M. (2003)- Quantitative seismic geomorphology of Gabus and Belanak fields, West Natuna Basin, Indonesia. M.S. Thesis, University of Texas, Austin, p. 1-74. *(Unpublished)*

Fachmi, M. & L.J. Wood (2005)- Seismic geomorphology: a study from West Natuna Basin, Indonesia. Proc. 30th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, IPA05-G-190, p. 163-178.
(Two types of U-M Miocene fluvial/ fluvial-deltaic systems identified on 3D seismic horizon slices from Belanak and Gabus areas in W Natuna basin: meandering river system and distributary channel system)

Fahman, M., Faisal Nur, J.S. Djalal, Subagio & Kasjati (1991)- An overview of the Anoa field development. Proc. 20th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 2, p. 293-313.
(Small Anoa oilfield in West Natuna Sea, at Indonesian SE end of Malay Basin, E of Tapis Trend. Discovered in 1974 (AGIP), producing since 1990 (Amoseas))

Fainstein, R. & J. Meyer (1997)- Structural interpretation of the Natuna Sea, Indonesia. Soc. Exploration Geophysics (SEG) 1997 Conv. Abstract, p. 639-642.
(W Natuna Basin extensional episodes in Eocene and Oligocene, followed by compression/ inversion peaking in Late Miocene, with oil fields in syn-rift clastics and inversion anticlines. East Natuna basin major features are Miocene carbonate buildups)

Fairburn, J.R. (1994)- Conoco Belida Field- directional driling case study. Proc. 23rd Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 2, p. 315-325.

Franchino, A. (1990)- Notes sur les Iles Natuna. Archipel 39, p. 47-63.
(online at: www.persee.fr/doc/arch_0044-8613_1990_num_39_1_2619)
('Notes on the Natuna islands'. Mainly geographic description with notes and map on geology. Core of island E-W trending high composed of Jurassic- Cretaceous sediments and volcanics of Bunguran Beds, with common red cherts and with gabbros-serpentinites. Late Cretaceous granite intrusions, the largest Mount Ranai (1035m). Overlain by Oligocene Natuna Sandstone)

Franchino, A. & P. Liechti (1983)- Geological notes on the stratigraphy of the island of Natuna, Indonesia. Memorie Scienze Geol., Padova, 36, p. 171-193.
(2/3 of Natuna island with outcrops of Jurassic- Cretaceous Bunguran Beds. Late Cretaceous granite intrusions. Gabbros- peridotites in South, etc.)

Franchino, A. & C. Viotti (1986)- Stratigraphic notes on Middle Miocene-Recent sequence in East Natuna Basin (Indonesia). Memorie Scienze Geol., Padova, 38, p. 111-127.

(M Miocene- Recent stratigraphy of clastic and carbonate sediments and typical foraminifera in Agip oil exploration wells in Natuna Basin. Thick M Miocene- E Pliocene shelf limestone/ reef complex formerly named Terumbu here renamed Ranai Group (>5000' thick?). Ranai Gp subdivided into 3 Formations, Sahi (Tf1-2; M Miocene with Lepidocyclina spp., Miogypsina spp.) Panda (Tf3; Late Miocene, with Lepidocyclina rutteni) and Senua (Tg, latest Miocene, with Alveolinella quoii). Lateral basinal clastic equivalents named Pilong Fm)

Gaynor, J., G. Hepler & M. Thornton (1995)- the importance of reservoir characterization and sedimentology in the Belida Field development. Proc. 24th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 2, p. 361-375.
(On reservoir characterization of 214 MMBO Belida Field. Oil in two major units separated by 200' thick Barat shale: Oligocene Udang Fm fine-grained in lacustrine delta sandstone, and E Miocene Lower Arang Fm m-grained tide dominated marine shelf sandstones)

Ginger, D.C., W.O. Ardjakusumah, R.J. Hedley & J. Pothecary (1993)- Inversion history of the West Natuna Basin: examples from the Cumi-Cumi PSC. Proc. 22nd Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 635-658.
(W Natuna Basin similar to many Sundaland basins with Late Eocene- E Oligocene extension creating complex system of rift basins. From earliest Miocene times basins progressively inverted in right-lateral stress regime. Wrench zones also developed by reactivation of NW-SE faults in earlier rift system. Displacement across faults relatively small, 1-2 km in Cumi-Cumi PSC. Magnitude of graben inversion depends on initial size and orientation of original half graben. Each graben unique inversion history in framework of Miocene inversion)

Grabowski, G.J., R.M. Kick & D.A. Yurewicz (1985)- Carbonate dissolution during late-burial diagenesis of the Terumbu Limestone (Miocene), East Natuna Basin, South China Sea, Indonesia. American Assoc. Petrol. Geol. (AAPG) Bull. 69, 2, p. 258. *(Abstract only)*
(Terumbu Lst reservoir 200 TCF (72% CO2), 1500m of M-L Miocene platform-reef carbonates with complex diagenetic history. Partial marine cementation and micritization in platform environments during deposition. Freshwater diagenesis below subaerial unconformities within and at top Terumbu. Aragonitic grains leached, pores partially cemented by low-Mg calcite. Pressure solution and cementation during burial to ~3000m left minor porosity. Late burial leaching high-Mg calcite. Ferroan-calcite and dolomite cements line pores and fluorite crystals occlude many pores. Whole-rock isotopes suggest high-T carbonate alteration. CO2 derived from dissolved Terumbu Lst. Fluoride-bearing hydrothermal fluids from granitic basement selectively dissolved constituents in deeply buried Terumbu)

Granath, J.W., M.G. Dinkelman, J.M. Christ & P.A. Emmet (2012)- Crustal-scale imaging in the Natuna Basin (Indonesia) and its impact on the tectonic history of the Central Sunda Craton. AAPG Int. Conf. & Exh., Singapore 2012, Search and Discovery Art. 90155, 1p. *(Abstract only)*
(online at: www.searchanddiscovery.com/abstracts/html/2012/90155ice/abstracts/gra.htm)
(Well penetrations of basement in Natuna Basins suggest it is composed of Mesozoic forearc and arc-related lithologies. New regional seismic survey compatible with concept that crust is accretionary prism and arc. Crustal thickess 25 km in E, to 35 km in W. W-dipping planar fabric under E Natuna Basin compatible with forearc above W dipping subduction zone. Arcuate to parabolic reflectors under W Natuna Basin may be plutonic bodies of volcanic arc batholiths. Oligo-Miocene extension in E Natuna roots in this fabric. Miocene inversion with (transpressive?) positive flower structures along Cumi Cumi and Kakap wrench zones. Wrench zones correlate in time with late phase of subsidence in neighboring Malay Basin)

Gunarto, M.O., B.P. Istadi & H.R. Siregar (2000)- Sequence stratigraphy study in Northwest Natuna. Proc. 29th Ann. Conv. Indon. Assoc. Geol. (IAGI), Bandung, 1, p. 103-139.
(11 sequences in Late Eocene- M Miocene between basement and base Muda unconformity (M-L Miocene boundary. Geological history Natuna basin 4 phases: syn-rift (seq. 1-2; Late Eocene- E Oligocene), post-rift (seq. 3-4; Late Oligocene), syn-inversion (seq. 5-10; E-M Miocene), post-inversion (Late Miocene- Recent)

Haile, N.S. (1970)- Radiocarbon dates of Holocene emergence and submergence in the Tambelan and Banguran Islands, Indonesia. Geol. Survey Malaysia Bull. 3, p. 135-137.
(online at: https://gsmpubl.files.wordpress.com/2014/09/bgsm1970011.pdf)

(C14 dates from Tridacna clams in Tambelan islands suggest sea level was higher by at least 0.3m at ~5600 BP and 0.4m at ~5270 BP. Wood from peat below tide level in Bunguran (Natuna) islands indicates sea level 0.7m lower at ~6260 BP)

Haile, N.S. (1970)- Notes on the geology of Tambelan, Anambas and Bunguran (Natuna) islands, Sunda shelf, including radiometric age determinations. United Nations ECAFE, CCOP Techn. Bull. 3, p. 55-90.
(Tambelan Islands S of Natuna composed of basic-intermediate igneous rocks and tuffs, intruded by Late Cretaceous (84 Ma) granite. Anambas Islands, SW of Natuna, composed of granite, andesite, etc. Bunguran-Natuna Islands composed of probably Mesozoic folded cherts and metasediments, with three granite intrusions, one dated as 73 Ma. Unconformably overlain by flat-lying Tertiary Natuna sandstone)

Haile, N.S. (1971)- Confirmation of the Late Cretaceous age for granite from the Bunguran and Anambas islands, Sunda shelf, Indonesia. Geol. Soc. Malaysia Newsl. 30, p. 6-8.
(online at: https://gsmpubl.files.wordpress.com/2014/09/ngsm1971003.pdf)
(Previously published K/Ar determinations by Bignell indicate Late Cretaceous ages for granites from Tambelan (84 Ma) and Bunguran (Natuna) Islands (73 Ma)). Additional analyses by AGIP gave 75.2 Ma age for same Ranai Intrusion of Bunguran Island and 86.6 Ma age for Batu Garam, Anambas Islands)

Haile, N.S. & J.D. Bignell (1971)- Late Cretaceous age based on K/Ar dates of granitic rock from the Tambelan and Bunguran Islands, Sunda Shelf, Indonesia. Geologie en Mijnbouw 50, 5, p. 687-690.
(online at: https://drive.google.com/file/d/0B7j8bPm9Cse0ZTQ4cGxXeDFDVlE/view)
(Late Cretaceous K/Ar ages ages for granites (adamellites) from Tambelan (84 Ma) and Bunguran (Natuna) Islands (73 Ma). These ages throw doubt on supposed 'pre-U Triassic' age of acid batholiths in Anambas Zone of Sunda Shelf and its extension into W Borneo)

Hakim, A.S. (2004)- The occurrence of the dismembered ophiolite in the Bunguran islands, Riau Province, Sumatra. J. Sumber Daya Geologi 14, 3 (147), p. 3-15.
(Bunguran (Natuna Besar, Laut, etc.) islands tectonostratigraphy similar to NW Kalimantan. Along W side of island basement composed of Jurassic peridotites, gabbros and basalts (part of Proto-China Sea crust), overlain by siliceous shale chert and amphibolite (Cretaceous Bunguran Fm). Intruded by Cretaceous granites in E and S: Ranai hornblende-biotite granite (71.6 Ma) and Semiun muscovite-biote granite (100 Ma))

Hakim, M.R., M.Y.Y. Naiola, Y.R.A. Simangunsong, K.P. Laya & T.Y.W. Muda (2008)- Hydrocarbon play of West Natuna basin and challenge for new exploration related to structural setting and stratigraphic succession. Proc. 32nd Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA08-SG-039, 11p.
(W Natuna Basin started to form in Late Eocene by SW-NE trending half-graben rifting within Sunda Platform. M Oligocene- E Miocene tectonic quiescence followed by M Miocene tectonic inversion. Significant inversion in N part of basin, none in main area. Eo-Oligocene lacustrine source rocks. Primary reservoir M-L Oligocene Gabus Sst. Still remaining hydrocarbon potential.

Hakim, A.S. & N. Suryono (1994)- Geological map of the Teluk Butun and Ranai Sheet, Sumatera, Quad 1319-1320, 1:250,000, Geol. Res. Dev. Centre (GRDC), Bandung.
(Natuna Islands surface geology mainly Cretaceous accretionary complex. Oldest rocks in SW part of Bunguran (=Natuna) Besar island Jurassic or E Cretaceoeus peridotites-gabbro-basalt, overlain by widespread E-M Cretaceous Bunguran Fm strongly folded siltstone, tuff and chert (melange sediments?), intruded by Late Cretaceous (100, 72 Ma) granites. Overlain by rel. thin Tertiary clastics)

Hakim, A.S. & N. Suryono (1997)- Geologi Kepulauan Bunguran, Riau. J. Geologi Sumberdaya Mineral 7, 73, p. 17-28.
('Geology of the Bunguran islands, Riau'. Natuna Besar and adjacent islands composed Pre-Tertiary 'Natuna Complex' basement of (1) Jurassic- mafic-ultramafic rocks and amphibolites-schists in SW, (2) Bunguran Fm strongly folded siliceous shales and chert in E, separated by NW-SE trending shear zones. Also (3) Cretaceous granites at Ranai at E side Natuna Besar (K/Ar age 101 Ma) and on Pulau Semiun NW of Natuna Besar (72 Ma). Unconformably overlain by rel. thin (<400m) and flat-lying Oligocene- Miocene Pengadah Fm fluvial

sediments. Sheared zone believed to be continuation of Crocker- Rajang complex in W tip of Sarawak, tectonically close to 'Lupar Zone' of collision between Eurasia and Indian Ocean plate in Jurassic time)

Harahap, B.H. (1994)- Middle to Late Cretaceous age based on K/Ar dating of granitic rocks from the Serasan Islands, South Natuna. J. Geologi Sumberdaya Mineral 4, 31, p. 2-4.
(K/Ar ages of two M-U granitoids from Serasan island S of Natuna Besar island: biotite granodiorite in SW part Serasan (112.3 Ma) and biotite granodiorite of Sedua island, NE of Serasan (69.7 Ma). Part of SW-dipping Cretaceous subduction zone/ volcanic arc that stretches from W Kalimantan to Natuna Besar (with dates of 71, 74 Ma; Haile & Bignell 1971))

Harahap, B.H., S.A. Mangga & U. Hartono (1996)- High Nb content basalts from Midai Island South Natuna: evidence for intraplate volcanism? J. Geologi Sumberdaya Mineral 6, 54, p. 6-11.
(Midai extinct volcano SSW of Bunguran (Natuna Besar) represents youngest volcanism in S China Sea. Plio-Pleistocene basaltic lavas and tuffs. Not subduction-related, but possibly related to rifting of Sundaland continental crust in Natuna area. Classified as continental tholeiite, similar to Matulang and Niut volcanics of Kalimantan, and possibly continuation of same magmatic belt)

Harahap, B.H., S.A. Mangga & S. Wiryosudjono (1995)- Geological map of South Natuna sheet, Quad. 1318, scale 1:250,000. Geol. Res. Dev. Centre (GRDC), Bandung.

Harahap, B.H. & S. Wiryosujono (1994)- Geology of the South Natuna sheet. J. Geologi Sumberdaya Mineral 4, 30, p. 15-23.
(Oldest rocks on Natuna islands are Jurassic Seraya Complex ophiolites (peridotites, gabbros, basalts; may correlate to Serabang Ophiolite of W Kalimantan) and Balau Fm Jurassic- Cretaceous turbiditic sequence in E (no fossils, but correlated to Pedawan Fm of W Borneo). Ophiolite and sediments intruded by Late Cretaceous Serasan/ Tebeian granites/ granodiorites (K/Ar ages ~70 and 112 Ma) and volcanics, representing Cretaceous SW-dipping subduction zone, parallel to 'Lupar Line' of N Borneo. Teraya Fm ?Oligo-Miocene and younger fluvial- shallow marine sediments unconformable over Mesozoic. Midai island S of Natuna with Plio-Pleistocene olivine basalts similar to Mt Niut in N Sanggau, W Kalimantan. Pre-Tertiary rocks dip 17-77°, Tertiary rocks 5-12°)

Haribowo, N., S. Carmody & J. Cherdasa (2013)- Active petroleum system in the Penyu Basin: exploration potential syn rift and basement-drape plays. Proc. 37th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA13-G-041, p. 1-16.
(Penyu Basin, N Natura area, composed of several NE-SW trending Tertiary half grabens. Rifting from M Eocene- E Oligocene controlled deposition of syn-rift Benua/Lama and Belut Fms source rocks. M-L Miocene inversion created ENE-WSW trending anticlines, which proved to be successful hydrocarbon traps in Malay and W Natuna Basins, but 80% failure rate in Penyu Basin)

Hutomo, P. & W.V. Jordan (1985)- Wireline pressures detect fluid contacts, Ikan Pari Field, Natuna Sea. Proc. 14th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, p. 543-563.

Ilona, S. (2006)- 3D structural architecture of the KRA Field, West Natuna Basin, Indonesia. Proc. Jakarta 2006 Int. Geosc. Conf. Exhib., Indon. Petroleum Assoc. (IPA), Jakarta 06-PG-14 3D, 5p. *(Extended Abstract)*
(KRA Field large structure in W Natuna Basin, formed by NNW-SSE trending Eocene-E Oligocene extension, followed by E-M Miocene compression)

Ilona, S. (2006)- 3D structural architecture and evolution of the West Natuna Basin, Indonesia. AAPG Int. Conf. Exhibition, Perth 2006, 6p. *(Extended abstract)*

Indranadi, V.B., Y. Indra, A. Rifai, A. Saripudin, F. Kamil & R. Waworuntu (2018)- Outcrops in Natuna Island: new insights of reservoir potential and sediment provenance of the East Natuna Basin. Proc. 42nd Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA18-319-G, 9p.

('Basement' outcrops on Natuna Islands Jurassic- E Cretaceous ophiolite (peridotite-gabbro- basalt) and (NE-dipping?) ?Cretaceous melange/ subduction complex of Bunguran Fm in SW, with intensely folded deep marine pelagic siltstones, radiolarian cherts and tuffs, and sandstones in scaly clay matrix. In NE and E intruded by Late Cretaceous granodiorites (~71-73 Ma) in Ranai area. Pre-Tertiary overlain by Tertiary fluvial-shallow marine basal conglomerates, stacked sandstones and interbedded siltstone-claystone. Sandstones mostly sub-litharenites, dominated by quartz, chert and metamorphic fragments, of good potential reservoir quality)

Jagger, L.J. & K.R. McClay (2018)- Analogue modelling of inverted domino-style basement fault systems. Basin Research 30, Suppl. 1, p. 363-381.
(Includes previously unpublished figure showing West Natuna M-L Eocene - Oligocene half-grabens, inverted in ?Middle Miocene time)

Jones, P.A., S.R. Freeman, R. Morgan, N.A. McCabe, V.S. O'Connor & R.J. Knipe (2009)- Seismic interpretation of the frontier NW Natuna Basin for hydrocarbon play evaluation. In: 71st EAGE Conf. Exhib., Amsterdam 2009, 5p. *(Extended Abstract)*
(NW Natuna basin is frontier hydrocarbon exploration area N of main W Natuna Basin. Main graben system initiated at Belut times (~45-35Ma), with deposition of source rocks restricted to deepest parts of graben system Gabus times (~35-26Ma) main period of likely reservoir deposition, also confined to deeper parts of graben, with local extensional and strike-slip fault activity. Barat times (~25Ma) major inversion occurs. Lower Arang times (~23Ma) continued minor inversion, sedimentation widespread, locally restricted around inversion topography. Upper Arang time widespread passive deposition likely with seal lithologies), then switching to widespread transtension. Muda time (<5Ma) quiescent)

Jonklaas, P. (1991)- Integration of depth conversion, seismic inversion and modelling over the Belida Field, South Natuna Sea Block ôBö, Indonesia. Proc. 20th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 557-585.
(Belida 1989 oil-gas field in S Natuna Sea with 190 MB oil and 75 GCF of recoverable gas. Structure broad low relief anticline, ~10x5 km with 160' of vertical closure)

Koswara, A. & N. Suryono (2001)- Struktur geologi kepulauan Natuna, Riau Kepulauan, Sumatra. J. Geologi Sumberdaya Mineral 11, 115, p. 17-26.
('Structural geology of the Natuna islands, Riau Islands, Sumatra'. Natuna Islands Pre-Tertiary basement rocks (mafic, ultramafic, chert, granite), overlain by Plateau Sst Fm. Fault orientations N-S (Cretaceous?) and NW-SE (U Cret- M Miocene), parallel to Malay-Natuna shear zone)

Kraft, M.T. & J.B. Sangree (1982)- Seismic stratigraphy in carbonate rocks: depositional history of the Natuna D-Alpha block (L-structure): stage II. Proc. 11th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 299-321.
(Natuna D-Alpha Block with thick Terumbu Fm carbonate buildup of L structure, deposited mainly in Late Miocene time (>5000' of carbonates deposited in ~2 Myrs?). Lower Terumbu Units I-III broad carbonate platform, Upper Terumbu reefal buildup. Carbonate complex with 5250' thick gas column, with C02 content from 67% in upper zones to 82% near base. Reef facies higher porosity than off-reef facies)

Krause, P.G. (1898)- Verzeichniss einer Sammlung von Mineralien und Gesteinen aus Bunguran (Gross Natuna) und Sededap im Natuna-Archipel. Sammlungen Geol. Reichs-Museums Leiden Ser. 1, 5, p. 221-236.
(online at: www.repository.naturalis.nl/document/552437)
(also in Jaarboek Mijnwezen Nederlandsch Oost-Indie 1898, Wetenschappelijk Gedeelte, p. 1-16)
('Description of a collection of minerals and rocks from Bunguran (Natuna Besar) and Sededap in the Natuna Archipelago'. Brief descriptions of granite, quartzite, serpentine, etc. No locality information)

Kurniawan, B.A., A.E. Harahap & I.Y. Syukri (2017)- Fundamental work flow for improving static model using seismic data case study: Upper Gabus zones in Kerisi Field. Proc. 41st Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA17-682-G, 24p.

(Seismic- geologic study of Late Oligocene Upper and Lower Gabus Fm channelized sandstone reservoirs in 1990 Kerisi oil field in Block B)

Livsey, A., S. Carmody & M. Raharja (2014)- The use of fluid inclusion information to understand hydrocarbon charge history in the Sokang Trough, East Natuna Basin. Proc. 38th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA14-G-362, 18p.
(Sokang sub-basin underexplored Neogene depocentre in E Natuna Basin. Sokang-1 well drilled on inversion structure in 1973 tested CO2-rich gas from Late Miocene sandstones. Fluid inclusion study showed multiple populations of liquid petroleum in Late Miocene and deeper sandstones of Sokang 1, proving presence of liquid petroleum system and indicating complex hydrocarbon charge history. Contributions from at least three different source rocks suggested by biomarkers and range of API gravities. Inclusions provide evidence of earlier oil accumulation, displaced by late migration of CO2- rich gas)

Manur, H. & J.M. Jacques (2014)- Deformational characteristics of the West Natuna Basin with regards to its remaining exploration potential. Proc. 38th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA14-G-193, 13p.
(Structural history of W Natuna Basin, in particular temporal variation and magnitude of inversions and effect on spatial distribution of known hydrocarbons. Structural trap styles: (1) Paleogene basement high (KRA field type), (2) Neogene, minor wrench-related (KG, KH), and (3) major inversion structures (KF-Anoa). Initiation of inversion diachronous (~27 Ma-18 Ma), with peak inversion from ~21-15 Ma. This resulted in inversion of many of Eocene- E Oligocene E-W trending half grabens and formation of 'Sunda' propagation folds)

Mattes, E.M. (1979)- Udang Field: a new Indonesian development. Proc. 8th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, p. 177-184.
(Conoco Udang field in Natuna Sea discovered in 1974. Reservoir is GabusFm alluvial fan sands. Production start January 1979)

Mattes, E.M. (1981)- Indonesia's Udang field developed. Oil and Gas J. 79, 18, p. 127-132.

May, J.A. & D.R. Eyles (1985)- Well log and seismic character of Tertiary Terumbu carbonate, South China Sea, Indonesia. American Assoc. Petrol. Geol. (AAPG) Bull. 69, 9, p. 1339-1358.
(Large Miocene gas-bearing carbonate complex, called L-structure, in Natuna D-Alpha block, 200 km NE of Natuna Island. Isolated buildup in front of much larger carbonate shelf)

Maynard, K. & I. Murray (2003)- One million years from the Upper Arang Formation, West Natuna Basin, Implications for reservoir distribution and facies variation in fluvial deltaic deposits. Proc. 29th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 270-276.
(M Miocene Upper Arang Fm important reservoir in fluvial deltaic deposits, with gas sourced from interbedded coals. Periodic marine flooding events provide intra-formational seals. Series of horizon slices over 1 million year time interval, at ~4800' illustrate major changes in reservoir distribution and facies. Lateral and vertical complexity of these reservoir not resolved by limited well penetrations)

Maynard, K., W. Prabowo, J. Gunawan, C. Ways & R. Brotherton (2003)- Maximising the value of a mature asset, the Belida Field, West Natuna- can a detailed subsurface re-evaluation really add value late in field life? Proc. 29th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 2, p. 291-305.
(Belida Field 1989 discovery, EUR ~350 MMBO developed in 1992, with peak oil production of 135,000 bopd in 1994 from two fluvial deltaic sandstone reservoirs, E Miocene Lower Arang Fm and Oligocene Udang Fm)

Maynard, K., P. Siregar & L. Andria (2002)- Seismic stratigraphic interpretation of a major 3D, the Gabus Sub-basin, Blocks B and Tobong, West Natuna Sea, Indonesia: getting the geology back into seismic. Proc. 28th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 87-104.
(Conoco 2000 large regional 3D survey in Gabus Sub-Basin, W Natuna. Interpretation focused on stratigraphy. Source rock distribution re-interpreted based on seismic facies)

Meirita, M.F. (2003)- Structural and depositional evolution, KH Field, West Natuna Basin, Offshore Indonesia. M.Sc. Thesis Texas A&M University, College Station, p. 1-56.
(online at: http://txspace.tamu.edu/..)
(3D seismic study of KH field. Structure formed by N-S trending Eo-Oligocene rifting, reactivated by E-M Miocene inversion)

Michael, E. & H. Adrian (1996)- The petroleum systems of West Block ÕBÕ PSC, South Natuna Sea, Indonesia. Proc. 25th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 465-479.
(Two petroleum systems in Conoco West Block 'B': (1) coals and coaly shales of Late Oligocene- E Miocene Arang and Gabus Fms and (2) Oligocene lacustrine synrift Belut/Gabus Fms. Synrift organic facies divided into 'deep lacustrine' and 'shallow lacustrine'. Early synrift sections expel as early as 29-19 Ma, shallower; more gas prone synrift sections expel from 26-12 Ma and 23-0 Ma. Coals and coaly shales in Arang and Gabus expulsion below 7500' (0.7% Ro) suggesting charging from 8 Ma- present. Late formed traps (<20 Ma) likely charged from gas prone synrift facies or syn-inversion coals and coaly shales)

Michael, E. & D. Bond (1997)- Integration of 2D modelling, drainage polygon analysis and geochemistry as petroleum systems analysis tools: West Block B PSC, S Natuna Sea. In: J.V.C. Howes & R.A. Noble (eds.) Proc. Petroleum Systems of SE Asia and Australasia Conf., Indon. Petroleum Assoc. (IPA), Jakarta, p. 391-401.
(2D modeling of hydrocarbon generation and migration)

Mochammad, F. (2003)- Quantitative seismic geomorphology of Gabus and Belanak Fields, West Natuna Basin, Indonesia. Masters Thesis University of Texas, Austin, p. 1-74.
(Morphology of fluvial and deltaic depositional systems imaged in 3D seismic from W Natuna Basin, Indonesia. Fluvial systems include straight, low-sinuosity, high-sinuosity, anastomosing and braided rivers. No consistency of channel axis. Shore zone represented by prograding strandplain systems. Shelf systems identified from very flat and uniform amplitude map. Channel width ranges from 45- 2174m, meander belt width 243-8750m, meander wavelength 540- 18,450m, radius of curvature 119 to 4635m and sinuosity 1.0 to 3.4)

Mone, A. & S. Samsidi (1993)- A successful gas injection project in the Kakap KF Field: design, implementation and results. Proc. 22nd Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 323-340.

Morley, R.J., H.P. Morley & P. Restrepo-Pace (2003)- Unravelling the tectonically controlled stratigraphy of the West Natuna Basin by means of palaeo-derived Mid-Tertiary climate changes. Proc. 29th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 561-584.
(15 climate cycles interpreted from Late Eocene- M Miocene. Arang Fm climate cycles reflect mainly very wet climates, but with cool lowstand phases, and warm climate highstands. Barat, Udang and Gabus cycles characterized by cool and dry lowstands and warm and slightly wetter highstands. Belut Group cycles trend from drier to wetter with little temperature change)

Morley, R.J., P. Salvador, M.I. Challis, W.R. Morris & I.R. Adhyaksawan (2007)- Sequence biostratigraphic evaluation of North Belut Field, West Natuna Basin. Proc. 31st Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA07-G-120, p. 357-375.
(Stratigraphic model of N Belut field reservoir interval from foraminiferal and palynological analysis of Barat, Udang and Gabus Fms. Fourteen biofacies in lacustrine and coastal plain facies. Shales either allocyclic or autocyclic. 15 cycles, capped by allocyclic shale and interpreted as 4th-order sequences, identified through U Gabus and Udang Fms. Packages can be differentiated into 3 groups, thought to reflect 3rd-order sequences)

Mujito, S. Hadipandoyo & Suprijanto (1995)- Hydrocarbon assesment of the carbonate play, East Natuna basin. In: J. Ringis (ed.) Proc. 31st Sess. Comm. Coord. Joint Prospecting Mineral Resources in Asian Offshore Areas (CCOP), Kuala Lumpur 1994, 2, p. 10-19.
(E Natuna basin considered to form W part of large Sarawak Basin. N-S trending Oligo-Miocene rift-basin. Middle-Late Miocene carbonates with local buildups in N half of E Natuna basin (Terumbu Fm). Risked total resources in carbonate play may be as high as 1196 MT oil and 3110 Gm3 of gas)

Murbini, S. (2000)- Technology challenge for Natuna gas development. Proc. 27th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 2, p. 339-351.

Murti, N.A. & Minarwan (2000)- Natuna. In: H. Darman & F.H. Sidi, F. H. (eds.) An outline of the geology of Indonesia, Indonesian Geologists Association (IAGI), Spec. Publ., p.

Nagura, H., H. Honda & S. Katori (2000)- Tertiary inversion tectonics and petroleum systems in West Natuna Sea Basins, Indonesia. J. Japanese Assoc. Petroleum Technologists 65, 1, p. 91-102.
(online at: www.journalarchive.jst.go.jp/...)
(In Japanese, with English summary. W Natuna Sea Basins inverted Tertiary intra-continental rift-basins on Sunda Shelf. Basin deposits include M-U Eocene lacustrine, Oligocene fluvial-deltaic, E Miocene muddy facies, M Miocene sand-dominant deposits, and Late Miocene-Recent mud-sand deposits. No E-M Miocene carbonates. Four petroleum systems identified: 1A (Belida oil field), 1B (Tembang, Buntal and Bintang Laut gas pools), 2B (Forel oil pool, Belanak oil and gas field) and 2A (Udang oil field))

Navilova, H. & B.A. Kurniawan (2013)- Comparing and contrasting a meandering point bar sequence and barrier island system within the Upper Arang Formation, Belanak Field, West Natuna Basin. Proc. 37th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA13-G-114, p. 1-17.
(Two distinct depositional systems interpreted from M Miocene Upper Arang Fm gas bearing reservoirs from Belanak Field, Block B, W Natuna Sea. Arang-7 seismic amplitudes look like point bar system, Arang-8 amplitudes interpreted as barrier island system)

Nugraha, R.S., R. Wijayanti & H. Mohede (2012)- Geological concept to geomodel: lessons learned from the Belanak Field Arang-3 development. Proc. 36th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA12-G-182, p. 1-13.
(Reservoir model of Late to M Miocene Arang-3 secondary gas reservoir in Belanak oil-gas field in Block B, Natuna Sea. Interpreted as NNE-SSW trending lower delta plain distributary channel complex)

Nugraha, R.S. P.S. Wisman & D.A. Ramdani (2014)- Depositional model of Gabus Massive Zone, Kerisi Field, West Natuna Basin, Indonesia. Proc. 38th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA14-G-075, 15p.
(Late Oligocene- E Miocene Gabus Massive Mb sandstones primary reservoir for several Natuna Sea Block B fields, including 1990 Kerisi oil field. Depositional environment lower delta plain- estuarine distributary system, exposed to autocylic avulsion related floods. Seismic data show SW-NE trending main channel complex ~2 km wide and 40 ms thick with 200-250m wide individual channels inside it. Correlations suggest increased tidal (-marine) influence to SW)

Ozza, T., M. Mazied, F.H. Korah, M. Arisandy, H.I. Darmawan, I W.A. Darma, B.P. Putra & W.N. Farida (2018)- Geochemistry analysis and petroleum system modeling for "X" Block, West Natuna Basin. Proc. 42nd Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA18-417-G, 18p.
(Geochemistry and hydrocarbon charge/ entrapment model for "X" Block close to NW tip of West Natuna Basin and with several inverted half-grabens (Anoa, Gajah, Kakap, Kambing) that delivered hydrocarbon charge. Inversion structures started at ~21 Ma; M Miocene erosion up to 1000m. Oil biomarkers indicate (Paleogene) lacustrine source facies. In deep grabens hydrocarbon expulsion started at 37, 31 Ma)

Pangarso, B., J. Guttormsen, P. Schmitz, I. Sihombing & H. Eko (2010)- North Belut Field- complex clastic diagenesis in an inverted paleo-structure. Proc. 34th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA10-G-184, 16p.
(W Natuna Basin Belut 1974 discovery undeveloped until 2009. Structure originally paleo-tilted fault block, which flooded, filled, then inverted. Hydrocarbon zones in Udang and Gabus Fm fluvial- deltaic clastics. Crest of structure good porosity- permeability sands; downdip portions of field tight due to ferroan cement)

Panjaitan, J.P., B. Siswanto, R.P. Putra, H. Putranto & R. Achdiat (2015)- Comparing overpressure in the West and East Natuna Basins. Proc. 39th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA15-G-235, 17p.

(Little indication of overpressure in W Natuna Basin while in E Natuna Basin significant overpressure common. Overpressure in E Natuna due to both disequilibrium compaction caused by rapid sedimentation and unloading tied to thermal cracking of hydrocarbons as evidenced by high CO2 and high geothermal gradients)

Panjaitan, J.P., A.B. Nugroho, T. Hamonangan, I. Yuliandri, I. Rahmawan & M. Firdaus (2016)- Case study: horizontal drilling challenge in the thin Gamma 1B Member of the Arang Formation, Belida Field. Proc. 40th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA16-36-E, 15p.
(On horizontal drilling into late E Miocene gas sand in Arang Fm of Belida Field)

Permana, B.R. & M. Firdaus (2014)- Temperature profile and geothermal gradient in Block B West Natuna Basin; case study: the impact on SW calculation for Lower Arang Zone Belut-1 Well. Proc. 38th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA14-G-076, 10p.
(Prior studies based on nine wells estimated geothermal gradient for W Natuna Basin between 1.9° F/100' and 2.7°F/100' (Aadland and Phoa, 1981). New temperature profiles from many additional wells suggest deep segment of wells has geothermal gradient of 2.38° F/100', in shallower reservoir sections 3.45° F/100')

Permana, B.R., M. Firdaus, R. Wijayanti & L. Hidayat (2015)- ñCoolò shale in the Udang Formation, South Belut Sub-Basin. Proc. 39th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA15-G-033, 15p.
(Low-radioactive shale in Late Oligocene- E Miocene Udang Fm in S Belut sub-basin of W Natuna basin, caused by dominance of low radioactivite minerals like kaolinite or chlorite)

Pertamina BPPKA (D. Natanegara et al.) (1996)- Petroleum geology of Indonesian basins: West Natuna basin. Petroleum geology of Indonesian basins, principles, methods and applications, XIV, p. 1-86.

Phillips, S., L. Little, E. Michael & V. Odell (1997)- Sequence stratigraphy of Tertiary petroleum systems in the West Natuna Basin, Indonesia. In: J.V.C. Howes & R.A. Noble (eds.) Proc. Petroleum Systems of SE Asia and Australasia Conf., Indon. Petroleum Assoc. (IPA), Jakarta, p. 381-389.
(W Natuna Tertiary 3-4 megasequences (Oligocene syn-rift, Late Oligocene- earliest Miocene post-rift, E-M Miocene syn-inversion, Late Miocene-Recent post inversion), subdivided into third-order sequences. Two major Tertiary petroleum systems: syn-rift and syn-inversion. Two source intervals in syn-rift of larger rift half-grabens: (1) early syn-rift open lacustrine, with algal organic matter, and (2) late syn-rift shallow lacustrine/ shoreline, with mixed algal- terrestrial organic matter. Source rocks of syn-inversion coals and coaly shales)

PND- Patra Nusa Data (2006)- Cakalang, Kerapu and Baronang Blocks, Northwest Natuna. Inameta J. 3, p. 28-32.
(online at: www.patranusa.com)
(Overview of geology and prospectivity of W Natuna Basin tender blocks)

Pollock, R.E., J.B. Hayes, K.P. Williams, & R.A. Young (1984)- The petroleum geology of the KH Field, Kakap, Indonesia. Proc. 13th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 407-424.
(KH oil-gas field in SW corner of Kakap discovered in 1980 in faulted anticline with four-way dip. Reservoirs fluvial channel sands of Late Oligocene Gabus Formation. Overlying E Miocene Arang Fm sands reservoirs for nonassociated gas. Hydrocarbon generation and migration very late (5 Ma), postdating regional unconformity at base Muda Fm. Light, waxy crudes with gravities of 42-47.5° API at 65°F)

Prasetyo, B. (2002)- Source rock evaluation and crude oil characteristics, West Natuna Area, Indonesia. Proc. 28th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 825-837.
(W Natuna Basin source rock candidates Keras, Benua and Barat Shales. Only effective source is Benua Shale at P-13 (10,295-10,895') and P-15 wells (11,138-11,280'). Hydrocarbon generation started at 17.5 Ma and is still occuring in Lower Gabus Fm. Source rock environment shallow lacustrine with terrestrial input)

Prasetyo, E. & D. Ariyono (2013)- Study of sequence stratigraphy in Siput Field and surrounding areas, West Natuna Basin, Indonesia, based on seismic, wireline logs, and cutting data. Proc. Joint Conv. 38th Indon. Assoc. Geoph. (HAGI) - 42nd Indon. Assoc. Geol. (IAGI), Medan, JCM2013-0049, 10p.

(Six depositional sequences identified in Oligocene- E Pliocene from interpretation of 8 wells and seismic data over Siput Field, W Natuna Basin)

Prasetyo, T., S. Danudjaja & Y. Budiningsih (2000)- Reservoir characterization study to improve future field development plans, Tembang Field, West Natuna basin. Proc. 29th Ann. Conv. Indon. Assoc. Geol. (IAGI), Bandung, 1, p. 35-54.
(Tembang 1981 discovery, with gas in 13 deltaic sand horizons in E-M Miocene Arang Fm)

Prasetyo, T., S. Danudjaja & Y. Budiningsih (2001)- Application of reservoir characterization to better handle reservoir management plan for Belida shallow gas. Proc. 28th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 581-596.
(E-M Miocene Beta-1A zone is shallowest gas reservoir in Oligocene- Miocene clastics reservoirs of 1989 Conoco Belida oil-gas Field. Lower delta plain sandstones with general channel direction trend N to NE)

Pribadi, A. & B. Simbolon (1984)- Penyelidikan atas distribusi overpressure dan salinitas di cekungan sedimentasi Tersier daerah Natuna. Proc. 13th Ann. Conv. Indon. Assoc. Geol. (IAGI), p. 463-480.
('Study of distribution of overpressure and salinity in the Tertiary sedimentary basin of the Natuna area')

Rachmad, A., Djuhaeni & P. Sumintadireja (2017)- Tektonostratigrafi dan sikuen stratigrafi endapan lisu Blok Duyung, Cekungan Natuna Barat. Bulletin of Geology (ITB) 1, 2, p. 94-106.
(online at: http://buletingeologi.com/index.php/buletin-geologi/article/view/7/3)
('Tectonostratigraphy and sequence stratigraphy of rift deposits, Duyung Block, West Natuna Basin'. Stratigraphy of Lower Gabus Fm LateOligocene fluvial-deltaic-lacustrine syn-rift deposition in Duyung Block, W Natuna Basin. Syn-rift depositional system 3 sequences)

Raharja, M., S. Carmody, J.R. Cherdasa & N. Haribowo (2013)- Dual Paleogene and Neogene petroleum systems in East Natuna Basin: identification of a new exploration play in the South Sokang Area. Proc. 37th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA13-G-036, p. 1-12.
(Major unconformity previously called 'Top Basement' re-interpreted as E Miocene unconformity and older e section interpreted as Paleogene syn- and post-rift deposits, similar to Eocene/Oligocene sediments in W Natuna area. Two Tertiary petroleum systems in Sokang Sub-Basin (E Natuna): Neogene system related to E Natuna M Miocene rifting and Paleogene petroleum system related to W Natuna Basin rifting in Oligocene)

Riadini, P., A.B. Ritonga, F. Arif, Abdurahman & Budiyono (2017)- Structural evolution and hydrocarbon traps mechanism in the West Natuna Basin, Indonesia. Proc. 41st Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA17-522-G, 18p.
(W Natuna Basin Late Eocene- E Oligocene rifting, NNE-SSW trending inversion structures around M-Late Miocene boundary (right-lateral transpression), etc.)

Rodriguez, F.H. & B. Peribere (1986)- A proposed solution to the challenge of producing oil reserves from offshore marginal fields in the Natuna Sea of Indonesia. Proc. 15th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 2, p. 79-85.

Rudolph, K.W. & P.J. Lehmann (1989)- Platform evolution and sequence stratigraphy of the Natuna Platform, South China Sea. In: P.D. Crevello, J.L. Wilson et al. (eds.) Controls on carbonate platform and basin development, SEPM Spec. Publ. 44, p. 353-361.
(Seven depositional sequences in Miocene Terumbu Fm carbonates of Natuna Platform. Highest porosity in grain-prone carbonates of late highstand-systems tract on platform crest. Porosity also downdip in onlapping lowstand systems tract. Increased subsidence from M Miocene caused retreat of platform, more on W (low-productivity, shelfward) side. Eustatic sea-level rise in E Pliocene, combined with continued subsidence, drowned platform and ended carbonate sedimentation)

Ryer, T.A., J. Meyer, M. Bagge, N.J. Comrie-Smith & G.Van Mechelen (2000)- Sequence stratigraphy and depositional history, Upper Sandy Member of Gabus Formation (Miocene), Kerisi-Hiu area, West Natuna

Basin, South China Sea, Indonesia. Proc. 14th Ann. Conv. AAPG, New Orleans, Search and Discovery Art. 90914. *(Abstract only)*
(Upper Sandy Member of Gabus Fm in Kerisi-Hiu area includes high-stand deposits of earlier sequence, a sequence boundary with >120' of erosional relief and aggradational, transgressive-phase deposits of later sequence. Delta-front sandstones with gas on Hiu structure and two E-trending incised valleys. Aggradational valley fill sand-rich, overlying unconfined river coastal-plain deposits with lower sand content)

Salvador, P., W.R. Morris, R.J. Morley, M. Gunarto, R. Adhyaksawan & M. Challis (2008)- Managing reservoir uncertainty at the North Belut Field, Offshore Indonesia, Natuna Sea: an integrated analysis of biostratigraphy, core, wireline and seismic data. Proc. 32nd Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA08-G-205, 14p.
(Reservoir study of North Belut gas field in Udang and Gabus sands. 1500' section of thin, stacked lacustrine and deltaic sands with significant variation in vertical and lateral reservoir development)

Samodra, H. (1995)- Geological map of the Tarempa and Jemaja Sheet, Riau, Quad 1118-1119, 1:250,000, Geol. Res. Dev. Centre (GRDC), Bandung.
(Geologic maps of Anambas archipelago of small islands SW of Natuna Besar. Widespread Cretaceous Anambas Granite (probably Late Cretaceous 73-84 Ma, as at Tambelan and Natuna). Intruded into melange/ oceanic accretionary complex of strongly folded Matak Fm (with NW-SE axes, locally contactmetamorphic Late Jurassic- Cretaceous sediments), associated with gabbro, diabase and basalt intercalated with radiolarian chert. Matak Fm with Late Jurassic- earliest Cretaeous radiolarian chert with Cenosphaera, Sethocapsa, Stichocapsa rotunda Hinde 1900, Dictyomitra, etc. Radiolaria species similar to Danau Fm accretionary complex of Central Kalimantan, as described by Hinde 1900)

Sangree, J.B. (1981)- Use of seismic stratigraphy in carbonate rocks, Natuna D-Alpha Block Example. Proc. 10th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, p. 135-152.
(Natuna D-Alpha 'L' structure large Late Miocene reef complex, with 5250' gas column. Gas 67- 82% CO2. Arang Fm considered source of methane; CO2 believed to be from deep igneous activity. E-M Miocene Arang and Barat-Gabus shale widespread and uniform thickness, suggesting stable nonmarine-shallow marine shelf conditions. Post-Arang normal faulting resulted in rotation and faulting of 'L' structure and Terumbu (U Miocene) carbonate development Further downfaulting in Lt Miocene- E Pliocene resulted in widespread carbonate deposits with local reef development on W shelf area and local buildups on crest of 'L' structure)

Satriawan, R.W., T. Read & H. Baskara (2005)- Applying seismic attribute analysis and inversion techniques to understand the trapping mechanism in the Gajah Abu Abu Field, West Natuna Offshore. Proc. 30th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 135- 144.
(Gajah Abu Abu field in W Natuna Basin 1992 discovery in faulted Late Miocene inversion anticline. Significant stratigraphic component in Gajah Abu Abu trap)

Simabrata, H., B.R. Permana, A. Sulistiarso, R. Wijayanti & R.D Waworuntu (2016)- Integrated chronostratigraphic correlation and its dilemma: a case study in West Natuna Basin Block ñBò Arang Formation. Proc. 40th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA16-495-G, 20p.
(Integration of biostratigraphy (palynology) and seismic data of M Miocene section in W Natuna Basin showed only few biostratigraphic ages in agreement with seismic markers)

Subono, S., Siswoyo & A. Firman (1995)- Heat flow in border areas of Indonesia, Malaysia and Vietnam. In: J. Ringis (ed.) Proc. 31st Sess. Comm. Co-ord. Joint Prospecting Mineral Resources in Asian Offshore Areas (CCOP), Kuala Lumpur 1994, 2, p. 59-75.
(Mainly on heatflow from 46 wells in West and 24 wells in East Natuna basins. Av. T gradient 39.7 °C/km)

Sugihardjo, S.S. Aprilian, A. Yusuf & S Sumardan (2000)- Investigations of the storage efficiency of CO2 in carbonate aquifers. Proc. 27th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 2, p. 79-93.

Suryono, N. (1997)- Analisa struktur P. Laut dan P. Sekatung, Kepulauan Natuna besar. J. Geologi Sumberdaya Mineral 7, 74, p. 2-24.
('Analysis of the structure of the Laut and Sekatung islands, Natuna Besar island group'. Laut and Sekatung Islands ~80km NNE of Natuna Besar. Composed of Jurassic- Cretaceous Bunguran Fm. Intensely deformed, with 5 types of oblique slip fault, of different orientations, but tied to first order WNW-ESE right-lateral fault)

Sutoto, A. (1991)- Reservoir geology of the Belida Field South Natuna Sea, Block B. Proc. 20th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, 1, p. 453-478.
(1989 Conoco Belida oil field with 187 MBO and 130 BCF gas. Trap four-way closure, a structural inversion of half-graben during E Miocene (later?; JTvG) regional compression. Age of sediments over Cretaceous granite Oligocene- Holocene. Oil reservoirs Oligocene Udang and E Miocene Lower Arang Sands, gas in E Miocene Arang Fm. Udang Fm sands stacked fluvial channels, Lower Arang sands distributary mouth bars in progadational lacustrine delta. Good vertical and lateral reservoir continuity. Sands ~30% porosity)

Syukri, I.Y., J. Hughes & M. Medianesterian (2014)- A comparison of depth conversion methods in Buntal Gas Field, Block B, Natuna Sea, Indonesia. Proc. 38th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, IPA14-G-227, 17p.
(On impact of depth conversion methods on volumetric analysis of Buntal gas field, 1990 discovery 30 km E of Belida field, producing since 2003. WSW-ENE trending structure with three primary reservoirs in fluvial-deltaic M Miocene Arang Fm sandstones)

Thamrin, M., Prayitno, S. Tiwar & Solichin (1983)- Heatflow investigation in the Tertiary basins of Natuna Sea. Proc. 19th Sess. CCOP, Tokyo 1982, 2, Techn. Repts., p. 153-166.
(Heatflow data from 29 wells in Indonesian sector of Natuna Sea. Heatflow in W area of Natuna Arch (av. 2.03 HFU, T gradient av. 3.45 °C/100m) higher than in E (av. 1.59 HFU, T gradient av. 3.36 °C/100m))

Tjia, H.D. (1997)- Regional northwest to west-northwest lineaments in the southern part of the South China Sea Basin. Warta Geologi (Newsl. Geol. Soc. Malaysia) 23, 5, p. 297-302.
(online at: https://gsmpubl.files.wordpress.com/2014/09/ngsm1997005.pdf)
(Several well-developed NW-WNW striking regional lineaments known from S part of S China Sea Basin and adjacent land areas. In W Sarawak: Lupar Line, Tatau horst-graben, W Balingian Line, Tinjar Line, Upper Baram Line, W Baram Line. In Sabah: Kinabalu Lineament and Balabac Fault. Also ~10 major NE/NNW trending wrench-fault zones across continental margin in SE S China Sea. May tie to regional NW faults in mainland SE Asia, believed to have facilitated extrusion of continental SE Asia)

Usman, E. (2015)- The geochemical characteristic of major element of granitoid of Natuna, Singkep, Bangka and Sibolga. Bull. Marine Geol. 30, 1, p. 45-54.
(online at: http://ejournal.mgi.esdm.go.id/index.php/bomg/article/view/74/75)
(Mesozoic granites from Natuna, Bangka and Singkep with SiO2 contents of ~71-75% and classified as acid and calk-alkaline magmas. Sibolga granitoid with SiO2 60- 71% classified as intermediate-acid magma and high K, ultrapotassic island arc granite)

Van Mechelen, G., J. Meyer & R. Gir (1998)- Correlation mapping technique, a powerful tool to minimize risk and to guide future development plans. Proc. 26th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, p. 175-196.
(Geophysical study over two gas fields in W Natuna Basin)

Wagimin, N. & E.A. Sentani (2009)- Opportunities (II), East Natuna area. Inameta J. 7, p. 24-27.
(online at: www.patranusa.com)
(Brief overview of E Natuna Basin, in conjunction with tender round offering)

Wirojudo, G.K. (1985)- Geological studies as a risk-reducing factor in exploration ventures with special references to the South China Sea. Energy 10, 3, p. 517-523.

(40 new exploration wells drilled in E and W Natuna basin in 1981-1982. Decisions on exploration ventures involve knowledge of basin geology. Natuna basins area can be used as a model)

Wirojudo, G.K. & A. Wongsosantiko (1985)- Tertiary tectonic evolution and related hydrocarbon potential in the Natuna area. Energy 10, 3/4, p. 433-455.
((In E Oligocene Natuna area included W Natuna and E Natuna Basins, separated by N-S trending Natuna basement Arch. Basin development in W Natuna began in E Oligocene time with rifting and pull-apart forming SW-NE half-grabens filled with nonmarine sediments, possibly driven by extrusion of Malay Peninsula from Asia during early stages of India-Asia collision. In E Natuna Basin no rifting, but Oligocene sediments only thicken regionally E-ward toward basin center. Compressive forces in W Natuna Basin during E Miocene resulting in inversion of normal faults. Simultaneously in E Natuna Basin mainly tensional forces that produced NW-SE right lateral movements coupled with NE-SW trending normal faulting. Hydrocarbon potential of W Natuna Basin enhanced by presence of locally thick Oligocene and Miocene sediments)

Wongkosantiko, A. & P. Prijosoesilo (1995)- Geologic summary of the Natuna Sea. In: Seismic Atlas of Indonesian Oil and Gas Fields, II: Java, Kalimantan, Natuna, Irian Jaya, Indon. Petroleum Assoc. (IPA), Jakarta, 6p.

Wongkosantiko, A. & G.K. Wirojudo (1984)- Tertiary tectonic evolution and related hydrocarbon potential in the Natuna area. Proc. 13th Ann. Conv. Indon. Petroleum Assoc. (IPA), Jakarta, p. 161-183.
(W and E Natuna Basins separated by N-S trending Natuna basement Arch. W Natuna Basin started in E Oligocene by rifting/ pull-apart, producing SW-NE half-grabens filled with non-marine sediments. Extension in W Natuna little effect on E Natuna Basin, where Oligocene sediments more uniform thickness. Compressive forces started in W Natuna in E Miocene, resulting in inversions of former half grabens)