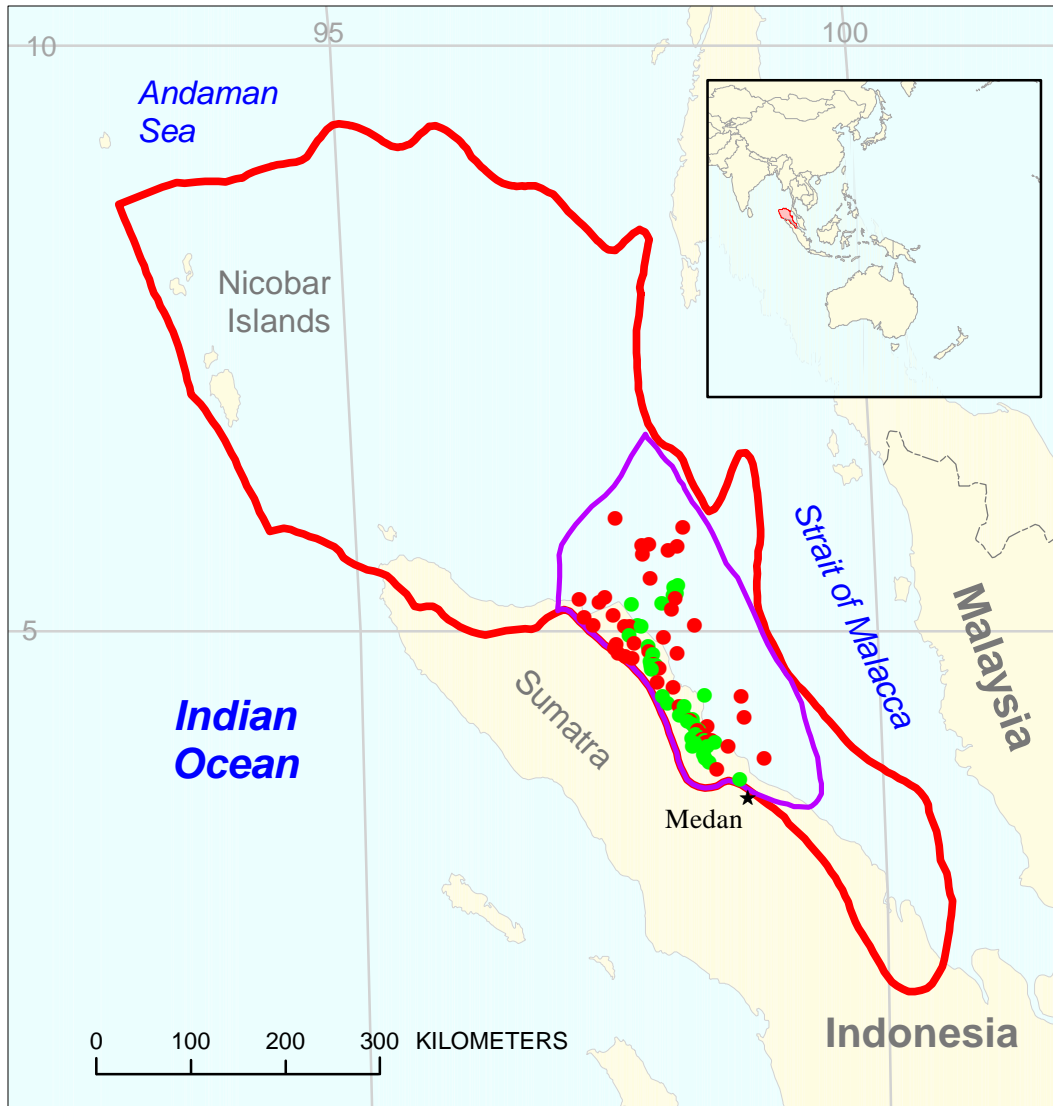




# North Sumatra Assessment Unit 38220101



-  North Sumatra Assessment Unit 38220101
-  North Sumatra Basin Geologic Province 3822

**USGS PROVINCE:** North Sumatra Basin (3822)

**GEOLOGIST:** M.G. Bishop

**TOTAL PETROLEUM SYSTEM:** Bampo-Cenozoic (382201)

**ASSESSMENT UNIT:** North Sumatra (38220101)

**DESCRIPTION:** Onshore and offshore Tertiary rift basins oriented north-south formed on the southern edge of the Sunda Shelf with early lacustrine depositional history followed by marine incursion from the south and carbonate platform deposition and reef formation on paleohighs. Late Miocene compression resulted in a foreland basin with clastic input from the rising mountains to the south, and later, detached folding. Offshore areas are primarily in waters of Indonesia.

**SOURCE ROCKS:** Late Oligocene to Early Miocene transgressive black shales of the Bampo Formation (Black Claystone/Black Mudstone) were deposited in lacustrine to restricted marine environments. Organic matter dominated by land plant detritus yields Type III kerogen, average TOC of 0.5 wt. % and low HI. Southeastern portions of the assessment unit contain more oil prone facies, northwestern areas gas prone facies exist.

**MATURATION:** Began in the deepest half grabens at about 11 Ma and continues.

**MIGRATION:** The first stage in the Early Miocene, the second stage was during Plio-Pleistocene faulting and folding related to the formation of the Barisan Mountains.

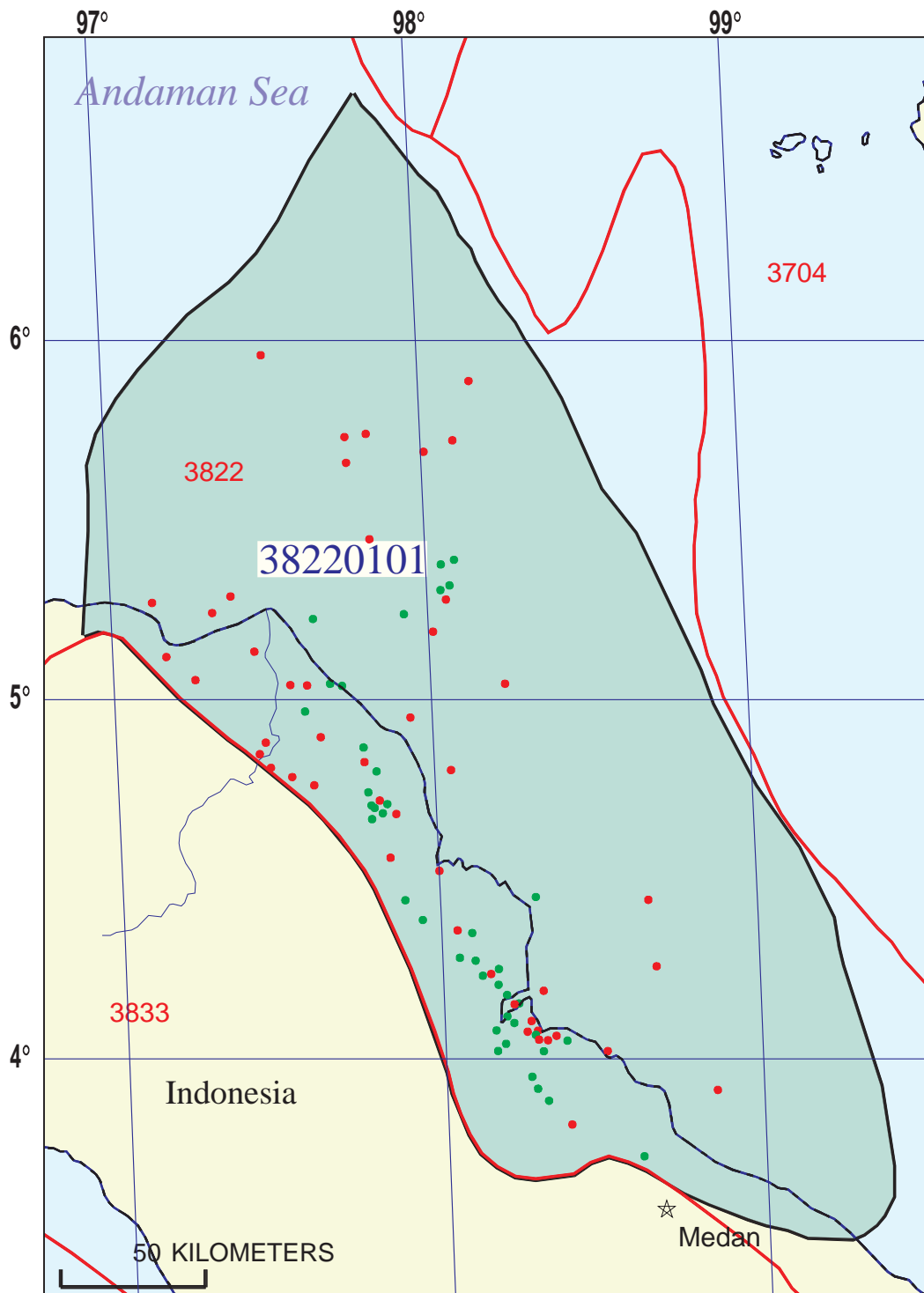
**RESERVOIR ROCKS:** The most important reservoir rocks are Miocene platform carbonates and reefs of the Belumai and Peutu formations.

**TRAPS AND SEALS:** Carbonate reservoir rocks are involved in anticline traps and combination faulted stratigraphic traps. Carbonate reefs and buildups are found on top of and around basement highs. Regional shales of the Middle Miocene Baong Formation seal most of the reservoirs. Intraformational seals also form important traps.

#### **REFERENCES:**

- Buck, S.P., and McCulloh, T.H., 1994, Bampo-Peutu(!) petroleum system, North Sumatra, Indonesia, *in* Magoon, L.B., and Dow, W.G., eds., *The petroleum system-from source to trap*: American Association of Petroleum Geologists Memoir 60, p. 625-637.
- Kirby, G.A., Morley, R.J., Humphreys, B., Matchette-Downes, C.J., Sarginson, M J., Lott, G.K., Nicholson, R.A., Yulihanto, B., Widiastuti, R., Karmajaya, Sundoro, Fitris, F., Sofyan, S., and Sri Wijaya, 1993, A re-evaluation of the regional geology and hydrocarbon prospectively of the onshore central North Sumatra Basin: *Proceedings, Indonesian Petroleum Association Twenty Second Annual Convention, October, 1993*, p. 243-264.
- Pertamina BPPKA, ed., 1996, *Petroleum geology of Indonesian basins principles, methods and application: Volume I North Sumatra Basin*: Pertamina BPPKA, Jakarta, Indonesia, 85 p.

Ryacudu, R., Djaafar, R., and Gutomo, A., 1992, Wrench faulting and its implication for hydrocarbon accumulation in the Kuala Simpang area-North Sumatra Basin: Proceedings, Indonesian Petroleum Association Twenty First Annual Convention, October, 1992, p. 93-116.



## North Sumatra Assessment Unit - 38220101

### EXPLANATION

- Hydrography
- Shoreline
- 3822 Geologic province code and boundary
- - - Country boundary
- Gas field centerpoint
- Oil field centerpoint
- 38220101 — Assessment unit code and boundary

Projection: Robinson. Central meridian: 0



**AVERAGE RATIOS FOR UNDISCOVERED FIELDS, TO ASSESS COPRODUCTS**

(uncertainty of fixed but unknown values)

<u>Oil Fields:</u>	minimum	median	maximum
Gas/oil ratio (cfg/bo).....	1000	2000	3000
NGL/gas ratio (bnl/mmcf).....	30	60	90
<u>Gas fields:</u>	minimum	median	maximum
Liquids/gas ratio (bnl/mmcf).....	5	10	20
Oil/gas ratio (bo/mmcf).....			

---

**SELECTED ANCILLARY DATA FOR UNDISCOVERED FIELDS**

(variations in the properties of undiscovered fields)

<u>Oil Fields:</u>	minimum	median	maximum
API gravity (degrees).....	19	50	55
Sulfur content of oil (%).....	0.01	0.03	0.1
Drilling Depth (m) .....	300	1500	3500
Depth (m) of water (if applicable).....	0	70	200
<u>Gas Fields:</u>	minimum	median	maximum
Inert gas content (%).....	0.05	3.1	14
CO <sub>2</sub> content (%).....	0.1	15	90
Hydrogen-sulfide content (%).....	0	0	0
Drilling Depth (m).....	300	2500	4000
Depth (m) of water (if applicable).....	0	70	600

**ALLOCATION OF UNDISCOVERED RESOURCES IN THE ASSESSMENT UNIT  
TO COUNTRIES OR OTHER LAND PARCELS** (uncertainty of fixed but unknown values)

1. Indonesia represents 91 areal % of the total assessment unit

<u>Oil in Oil Fields:</u>	minimum	median	maximum
Richness factor (unitless multiplier):.....			
Volume % in parcel (areal % x richness factor):...		91	
Portion of volume % that is offshore (0-100%):.....		50	
<u>Gas in Gas Fields:</u>	minimum	median	maximum
Richness factor (unitless multiplier):.....			
Volume % in parcel (areal % x richness factor):...		91	
Portion of volume % that is offshore (0-100%):.....		50	

2. Malaysia represents 6 areal % of the total assessment unit

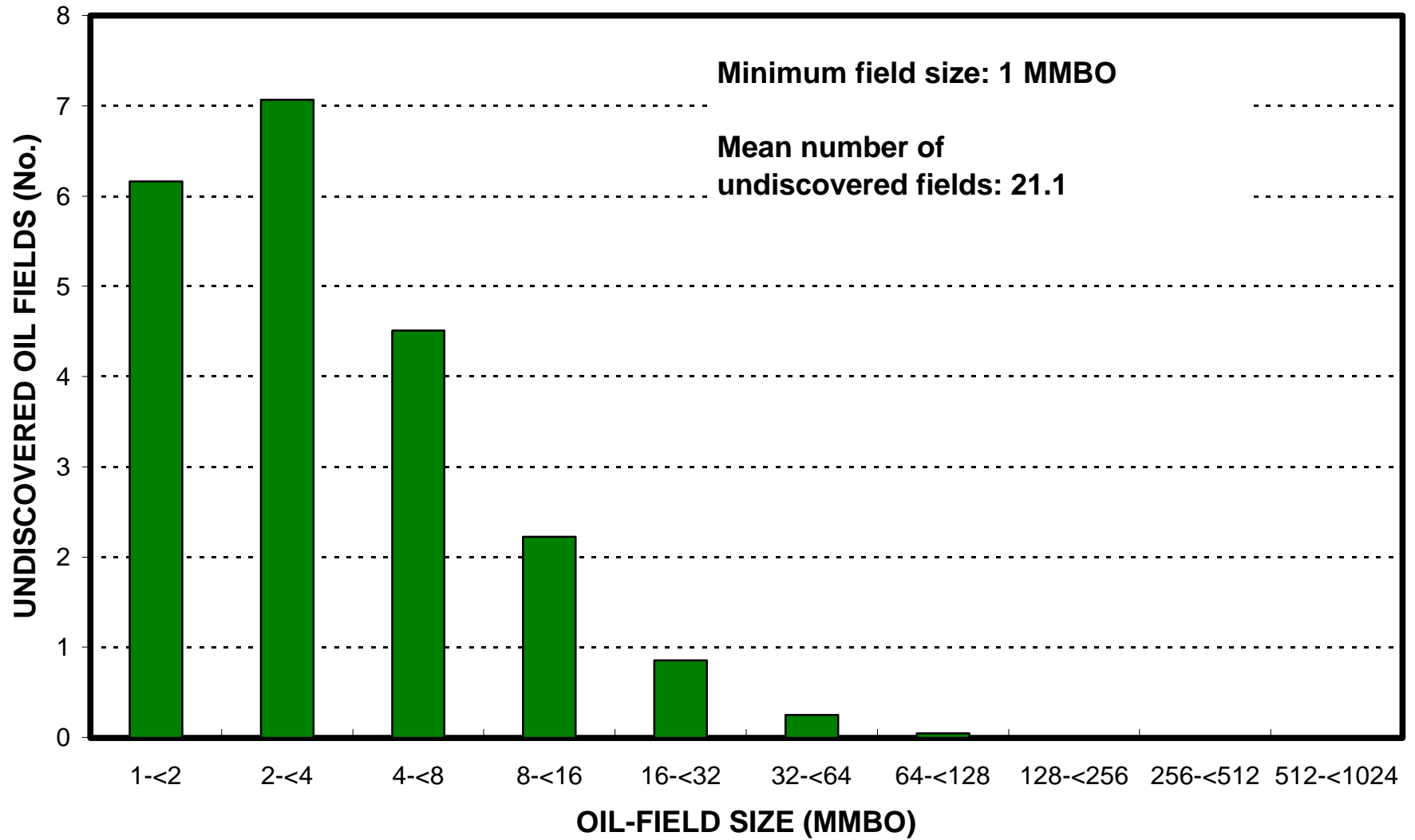
<u>Oil in Oil Fields:</u>	minimum	median	maximum
Richness factor (unitless multiplier):.....			
Volume % in parcel (areal % x richness factor):...		6	
Portion of volume % that is offshore (0-100%):.....		100	
<u>Gas in Gas Fields:</u>	minimum	median	maximum
Richness factor (unitless multiplier):.....			
Volume % in parcel (areal % x richness factor):...		6	
Portion of volume % that is offshore (0-100%):.....		100	

3. Thailand represents 3 areal % of the total assessment unit

<u>Oil in Oil Fields:</u>	minimum	median	maximum
Richness factor (unitless multiplier):.....			
Volume % in parcel (areal % x richness factor):...		3	
Portion of volume % that is offshore (0-100%):.....		100	
<u>Gas in Gas Fields:</u>	minimum	median	maximum
Richness factor (unitless multiplier):.....			
Volume % in parcel (areal % x richness factor):...		3	
Portion of volume % that is offshore (0-100%):.....		100	

# North Sumatra, AU 38220101

## Undiscovered Field-Size Distribution





# North Sumatra, AU 38220101

## Undiscovered Field-Size Distribution

