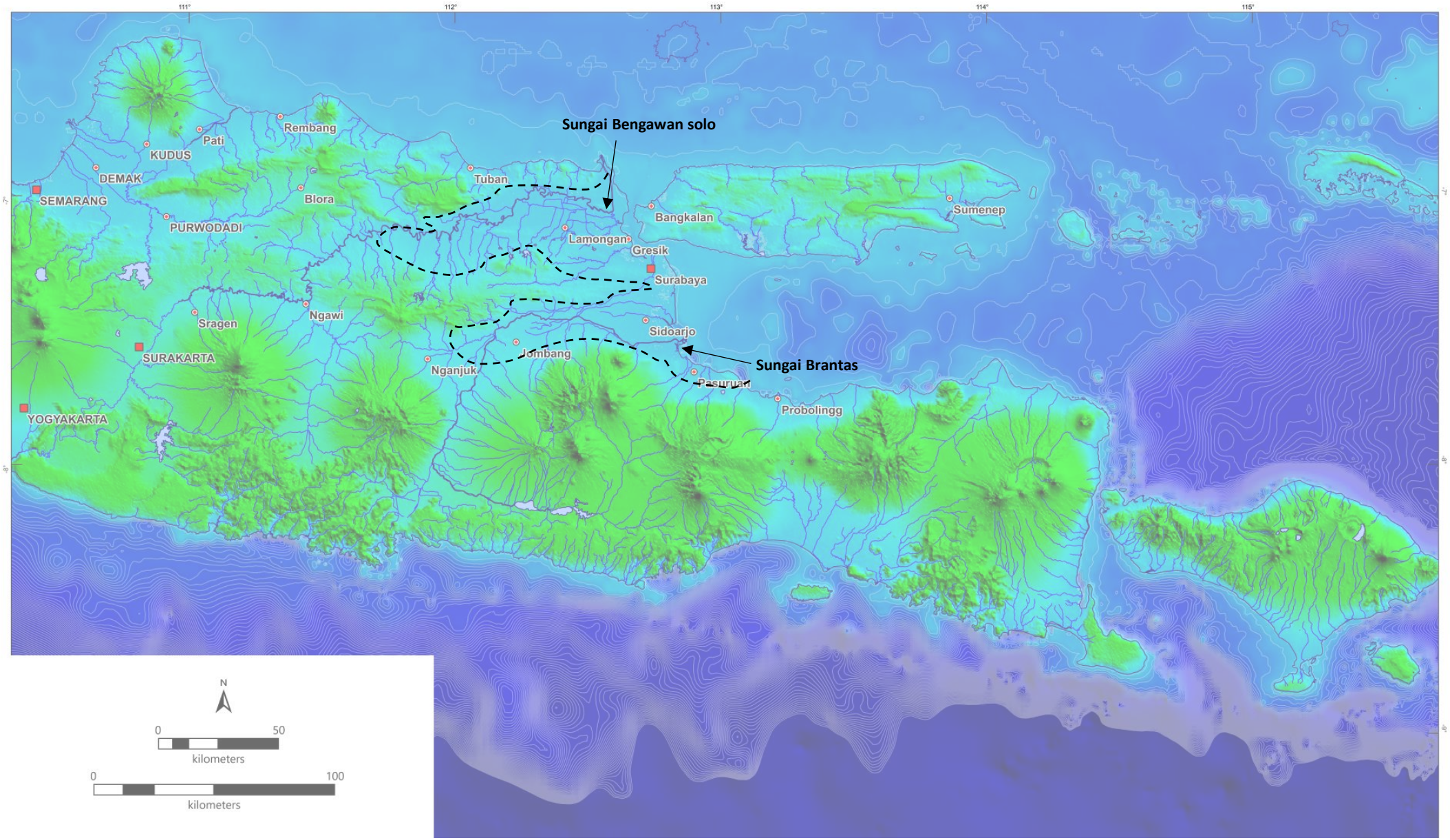
EVOLUSI GEOLOGI JAWA TIMUR

Oleh: DR. Andang Bachtiar M.Sc

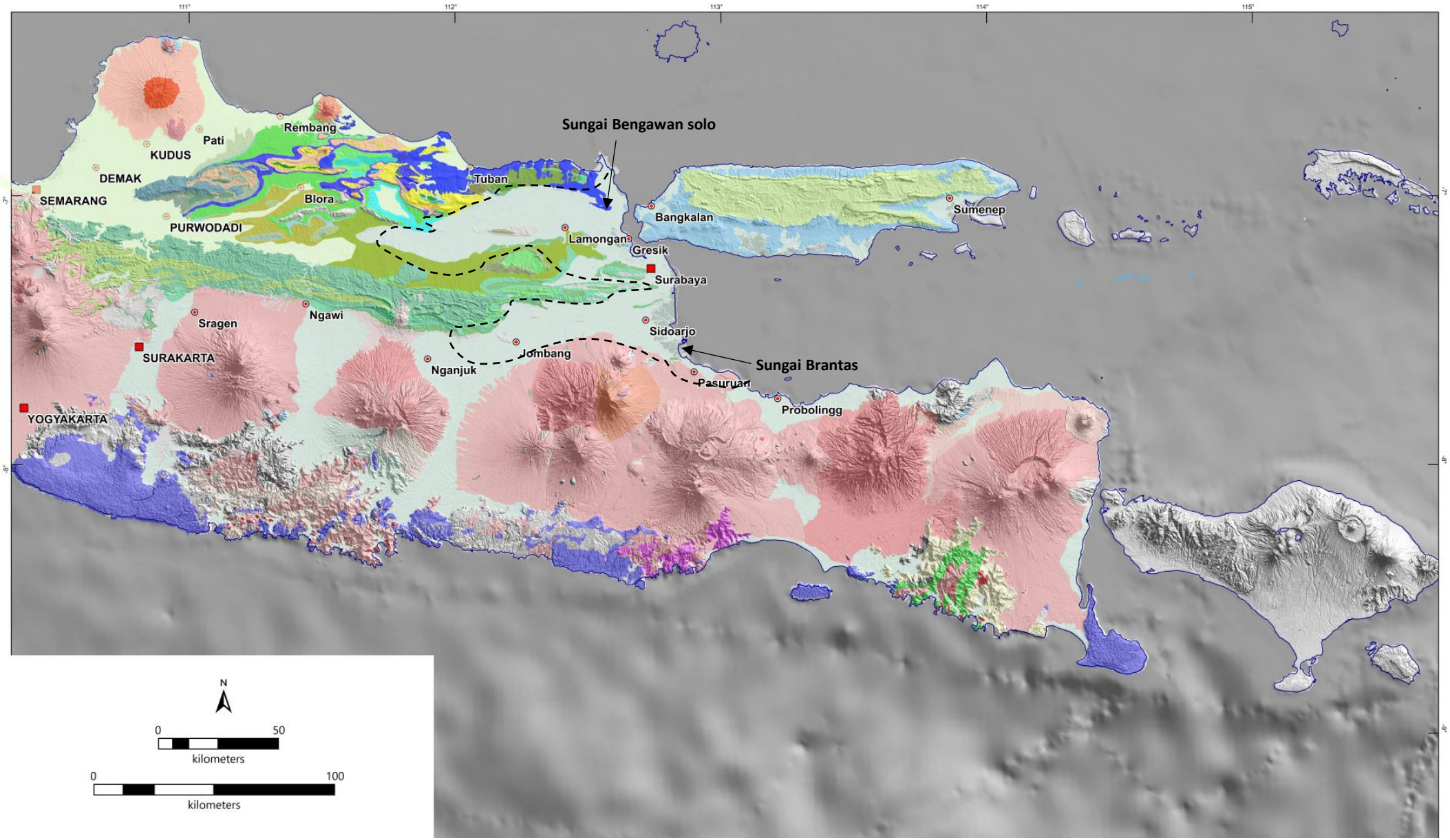
PRESENT DAY TOPOGRAPHY OF EAST JAVA

GEOSAINS DELTA ANDALAN
GOING BEYOND



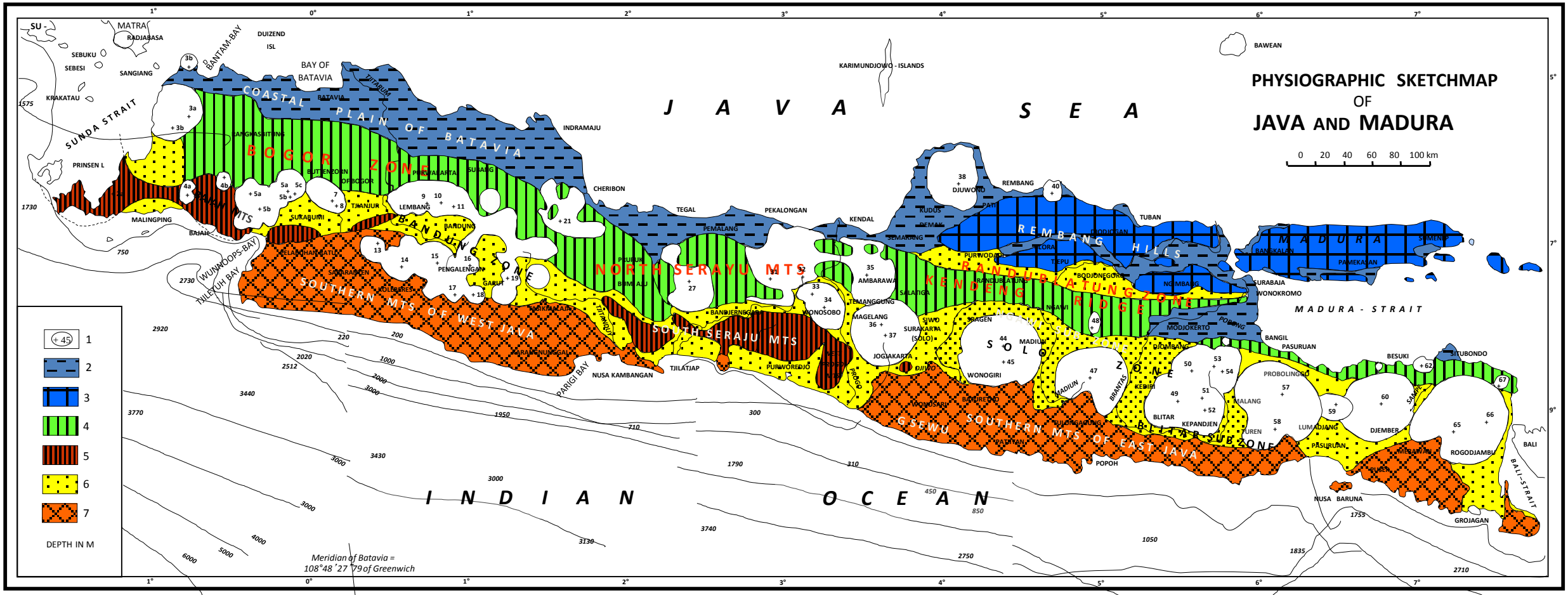
PRESENT DAY SURFACE GEOLOGICAL MAP OF EAST JAVA

GEOSAINS DELTA ANDALAN
GOING BEYOND

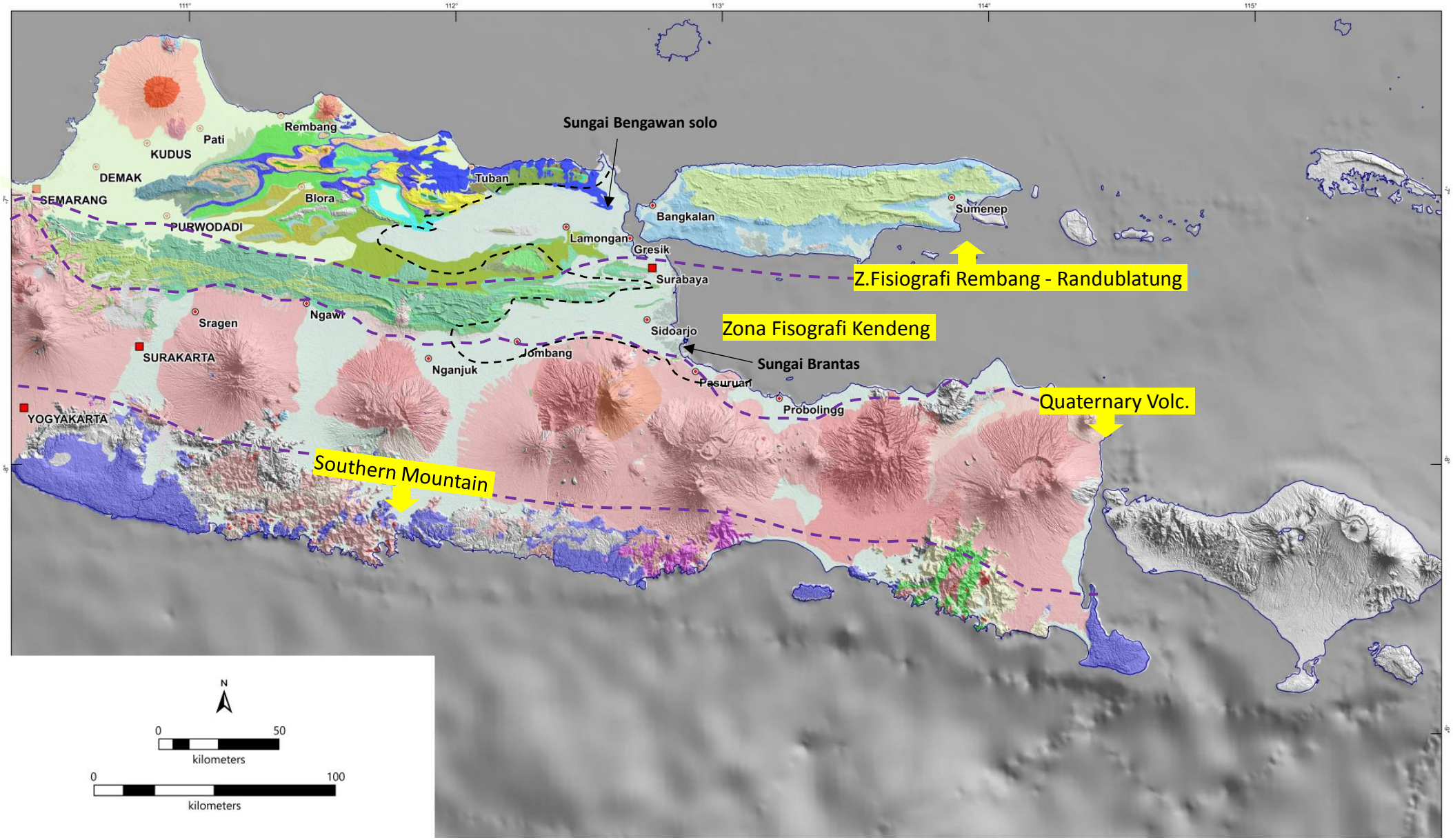


PRESENT DAY PHYSIOGRAPHY MAP

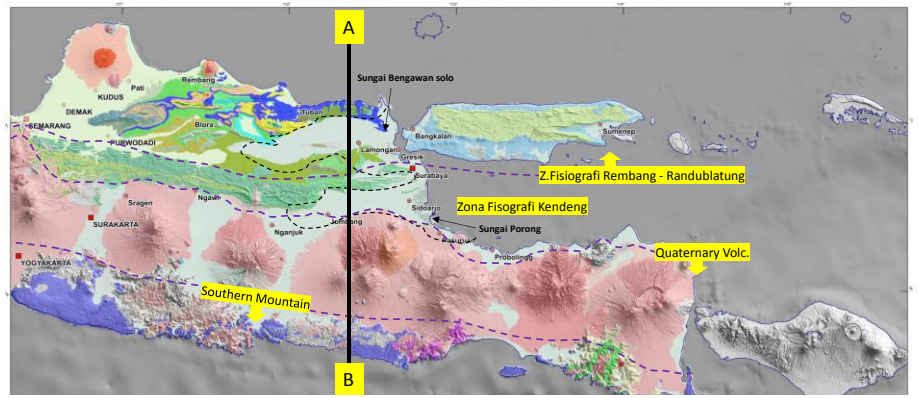
GEOSAINS DELTA ANDALAN
GOING BEYOND

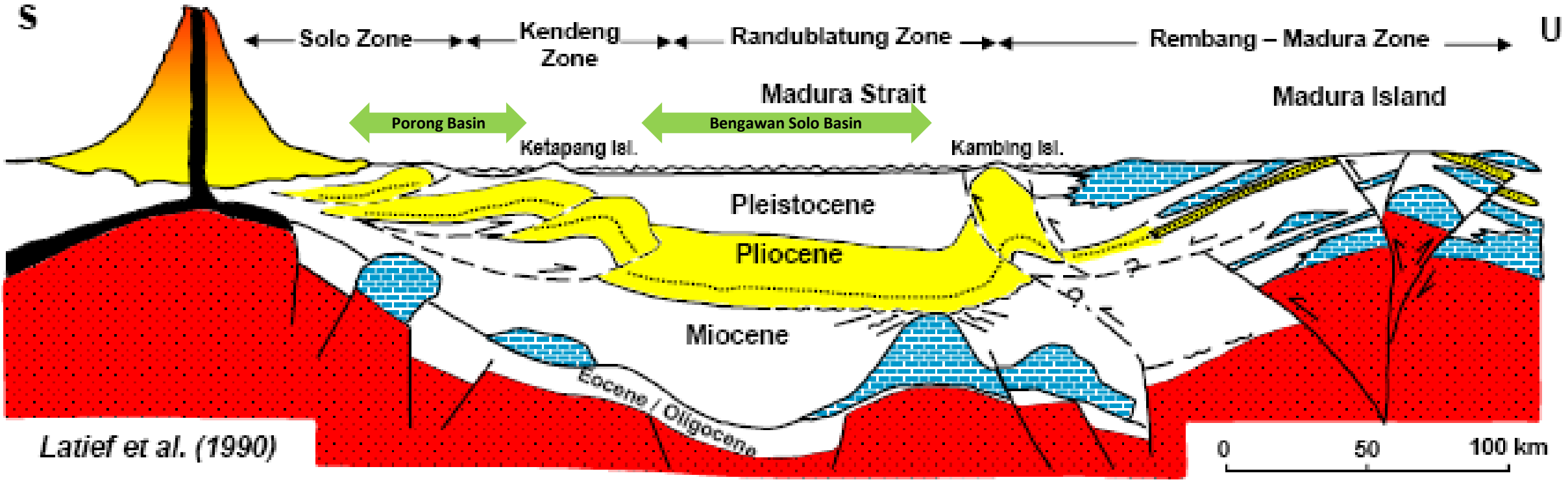


PRESENT DAY PHYSIOGRAPHY MAP



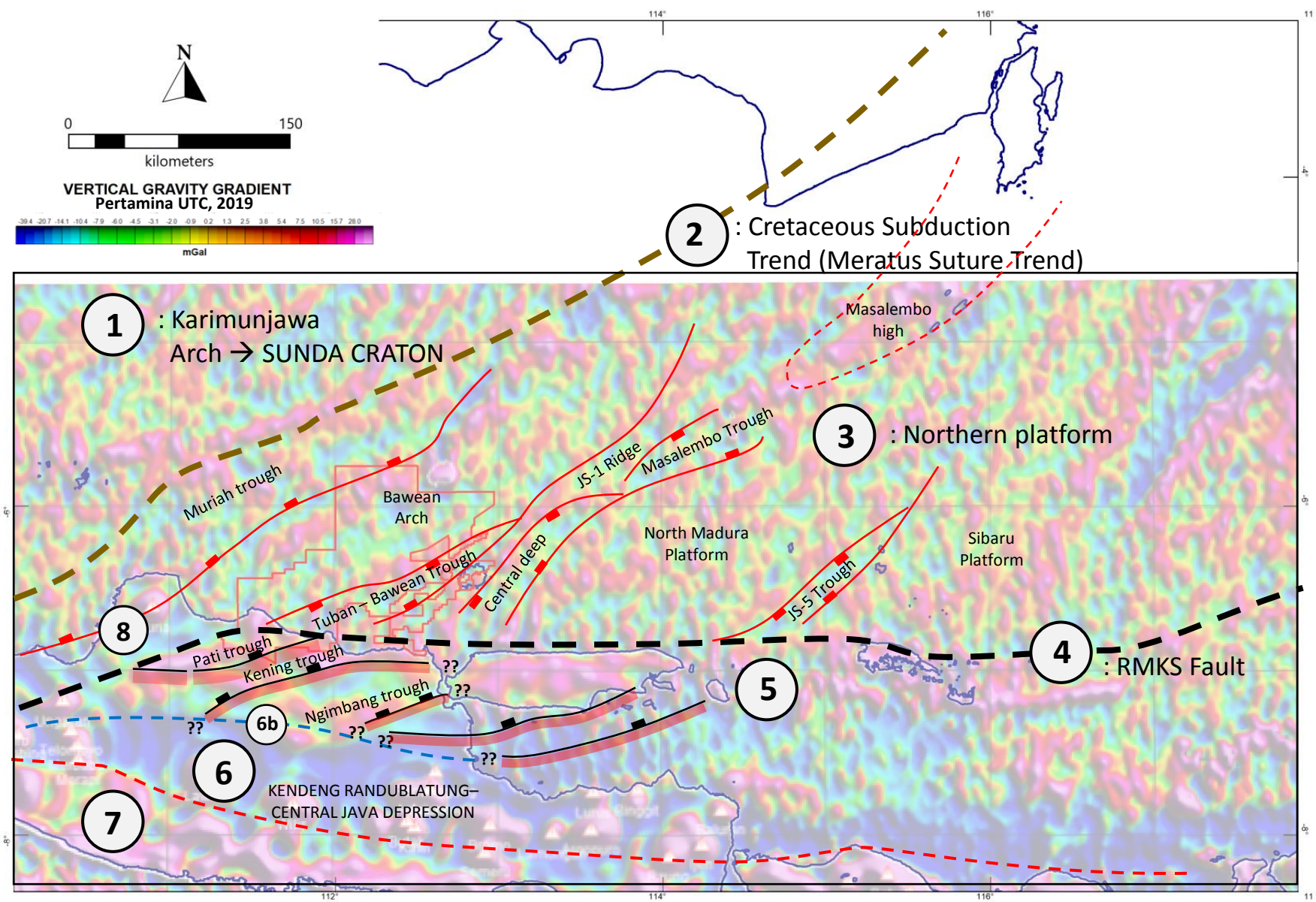
REGIONAL CROSS SECTION





CRITICAL TECTONIC ELEMENTS

GEOSAINS DELTA ANDALAN
GOING BEYOND



1 : Karimunjawa Arch

2 : Cretaceous Subduction Trend (Meratus Suture Trend)

3 : Northern platform

- Muriah arch
- Bawean arch
- Tuban – Bawean Arch
- JS-1 Ridge
- Central Deep
- Masalembo Trough
- JS-5 Trough
- Sibaru Platform

4 : RMKS Fault – PALEO SUTURE?

5 : REMBANG RANDUBLATUNG ZONE

- Pati Trough
- West Cepu, Dermawu, Sumber Ridge
- Kening Trough
- East Cepu Ridge
- Ngimbang Trough
- Kemandung Ridge
- BD Ridge
- XX-1 Ridge

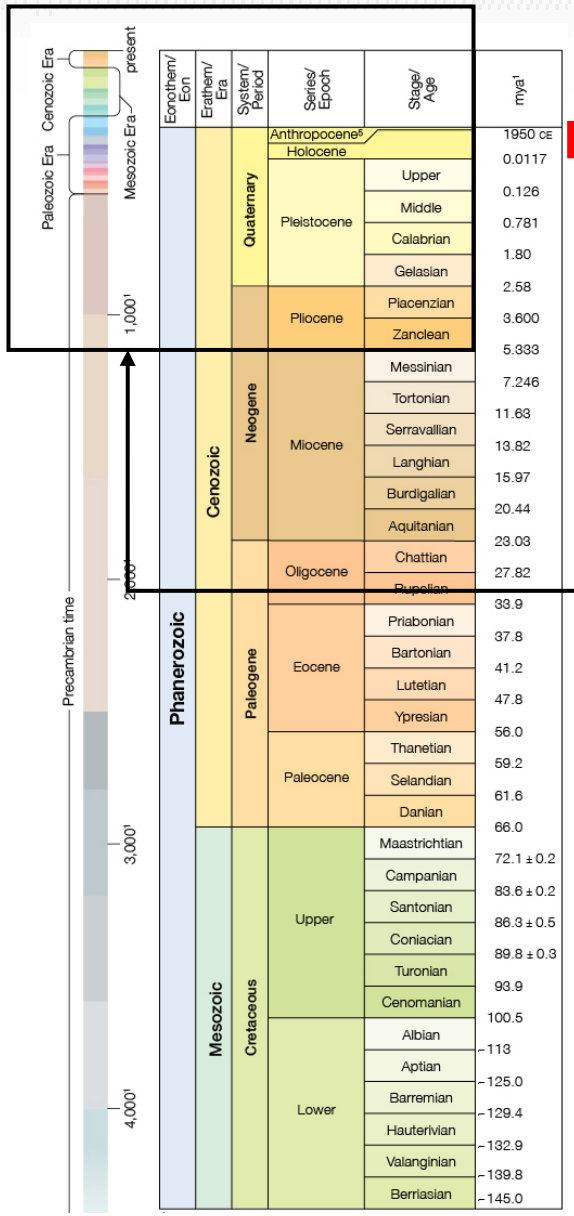
6 : Kendeng – Randublatung – Central Java Depression

7 : Southern Mountain Uplift

8 : Back arc basin magmatism

9 Hindia – Australi Subduction System

REGIONAL STRATIGRAPHY – LONG HISTORY EVOLUTION OF EASTERN JAVA

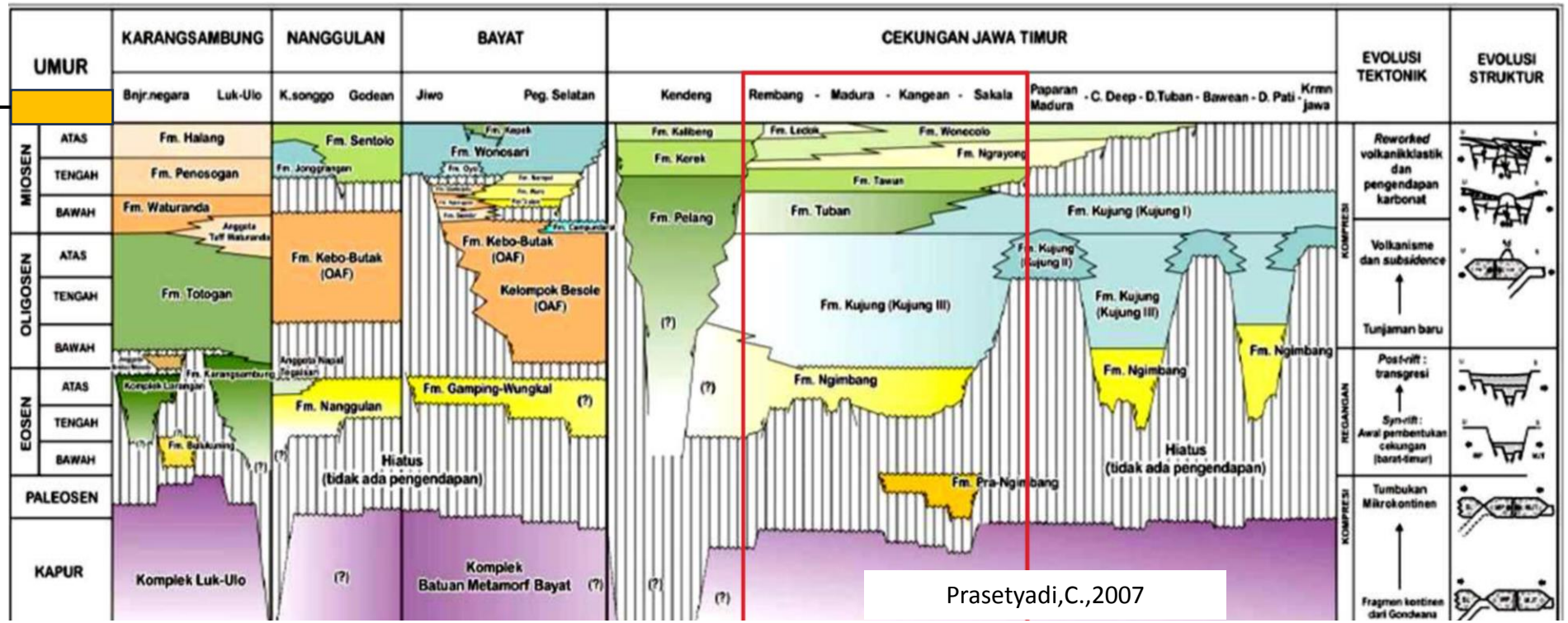


Rentang hidup Manusia Purba di jawa yang sementara ini berhasil ditemukan (Homo Erectus)

- **Pithecanthropus erectus → Ditemukan oleh E.Dubois → Sangiran → estimasi umur 1 jt – 500.000 tahun yang lalu**
- **Dating dari batuan pengisi disekitar tengkorak ditemukan adalah 1.5 – 1.8 juta**

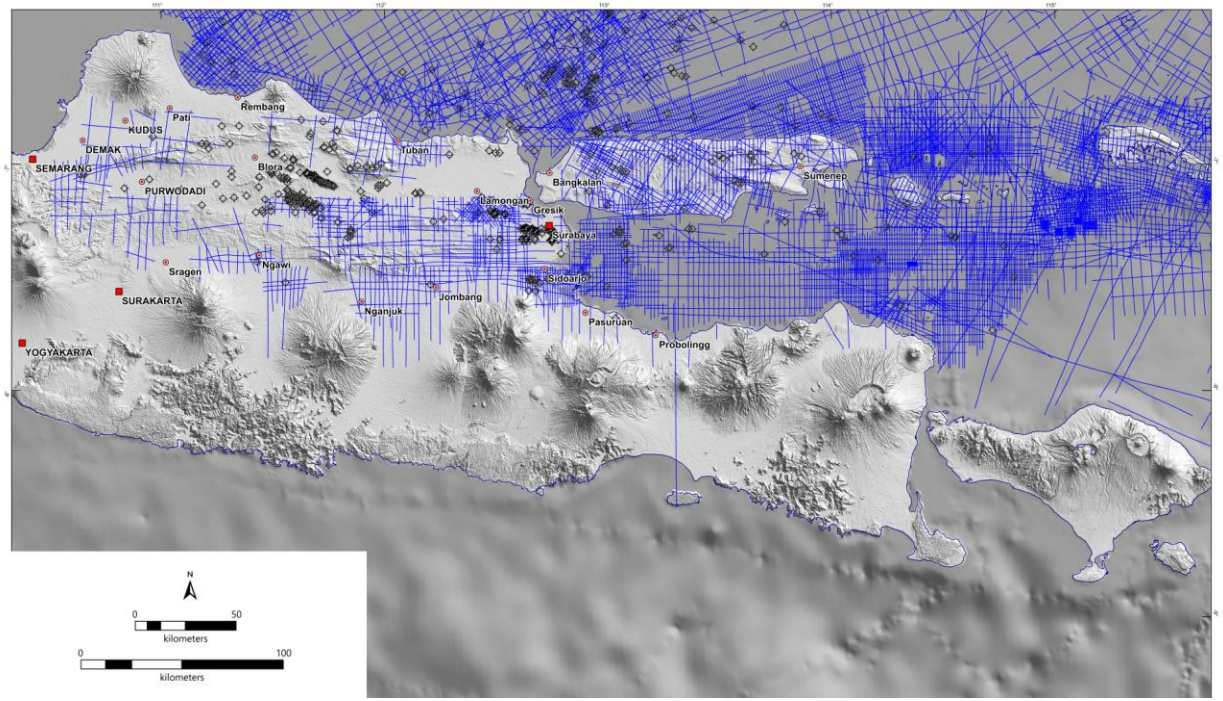
Rentang hidup Masyarakat Modern di Jawa:

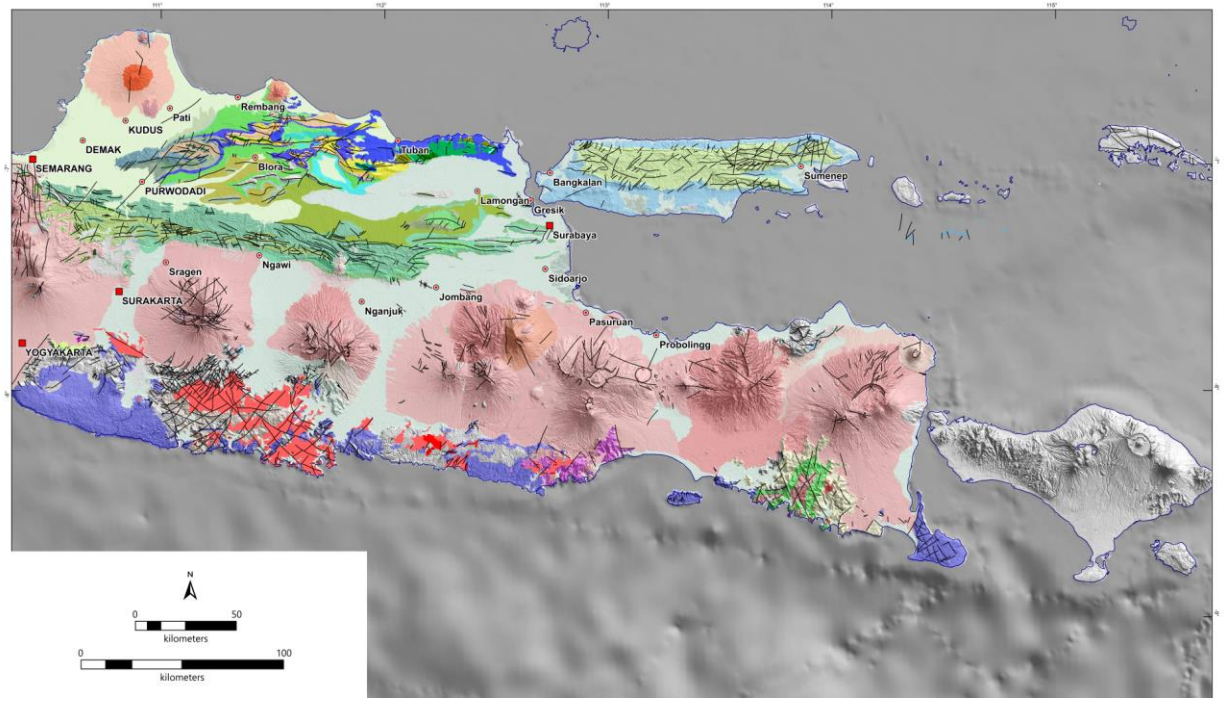
- **Kerajaan Tarumanegara → Jawa Barat sekitar abad ke 4 Masehi**
- **Kerajaan Kalingga → Jawa Tengah sekitar abad 6 -7 Masehi**
- **Kerajaan Mataram Kuno → Jawa Tengah sekitar abad 8 – 10 Masehi**

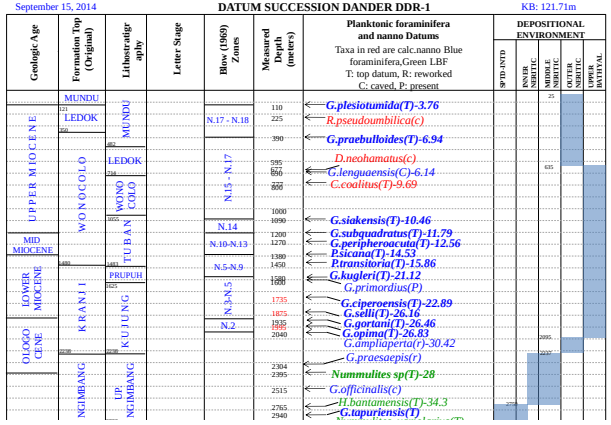


Prasetyadi,C.,2007

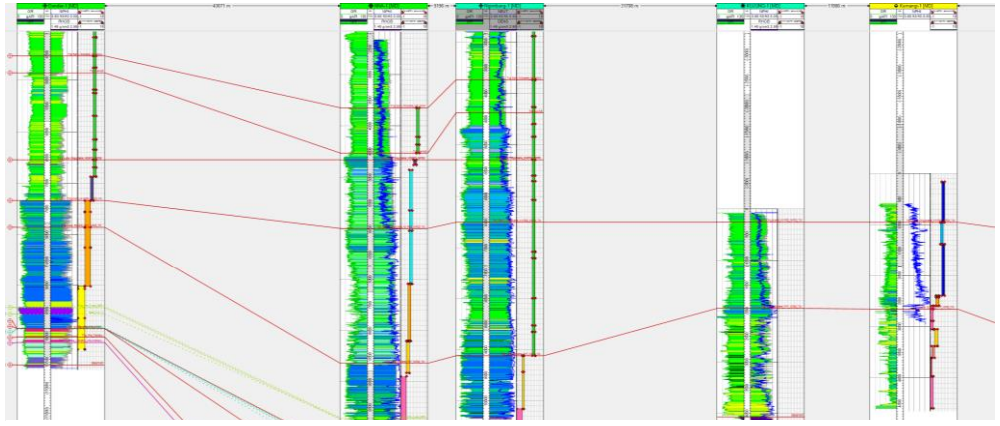
DATASET



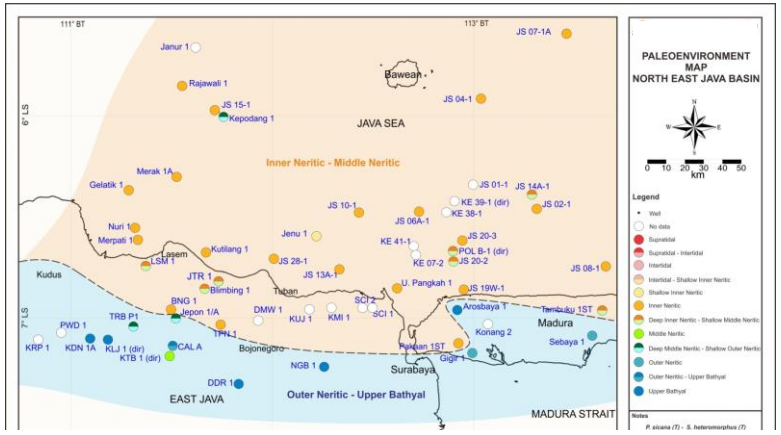




Analisa biostratigrafi sumuran

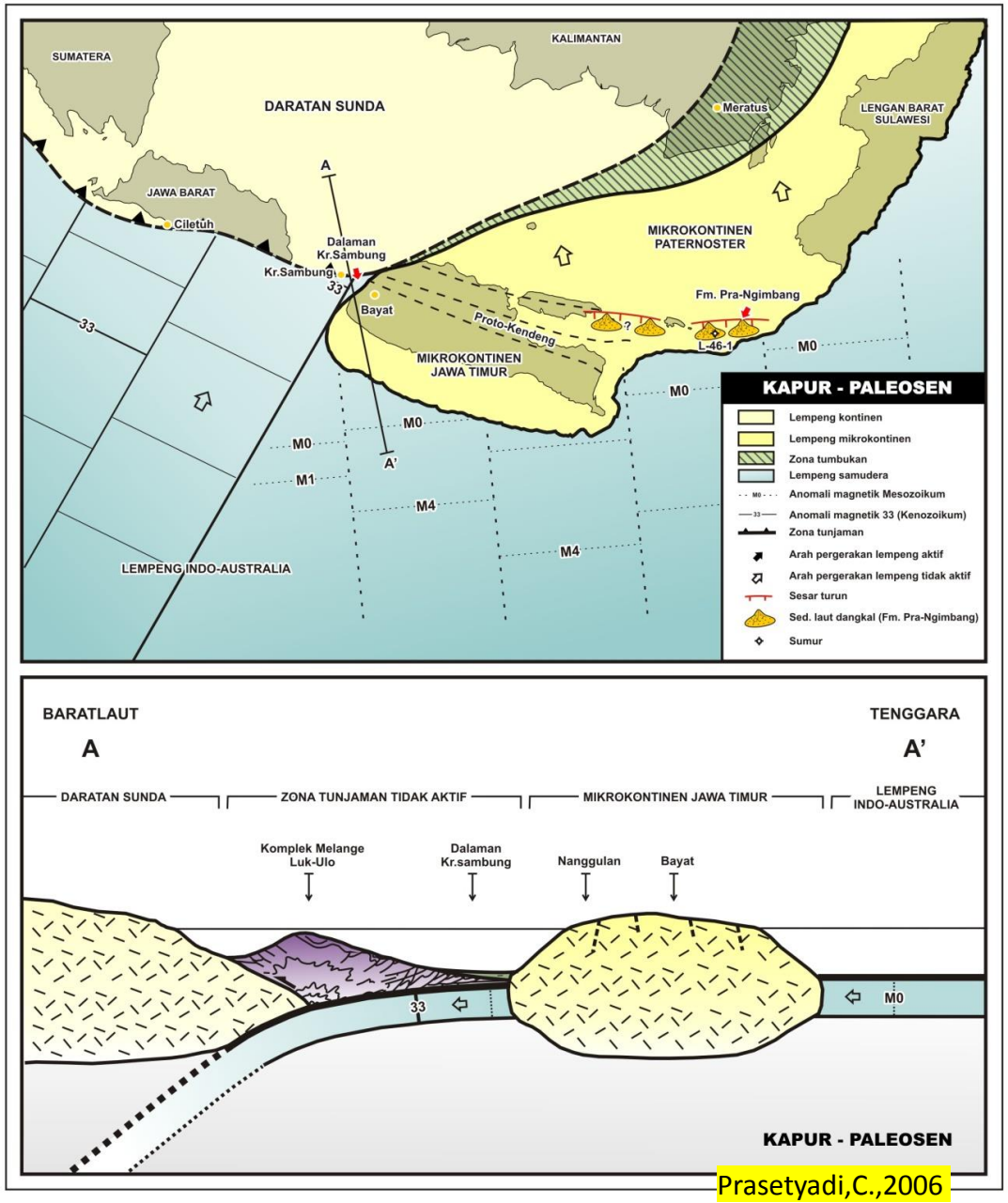


Korelasi lateral marker krono-stratigrafi (garis kesamaan umur batuan

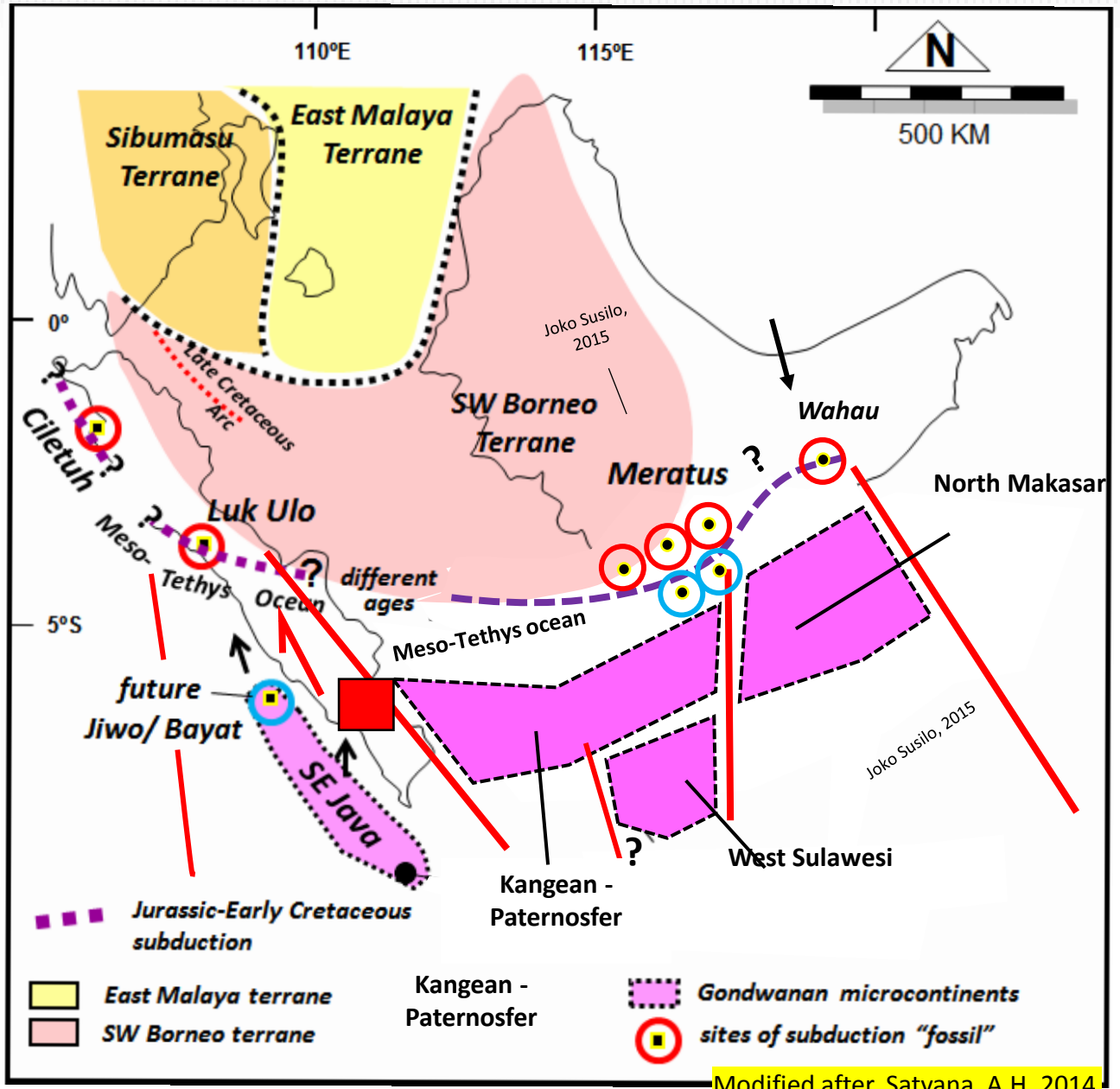


Penyusunan peta paleogeografi

THE SUBSTRATE OF EAST JAVA

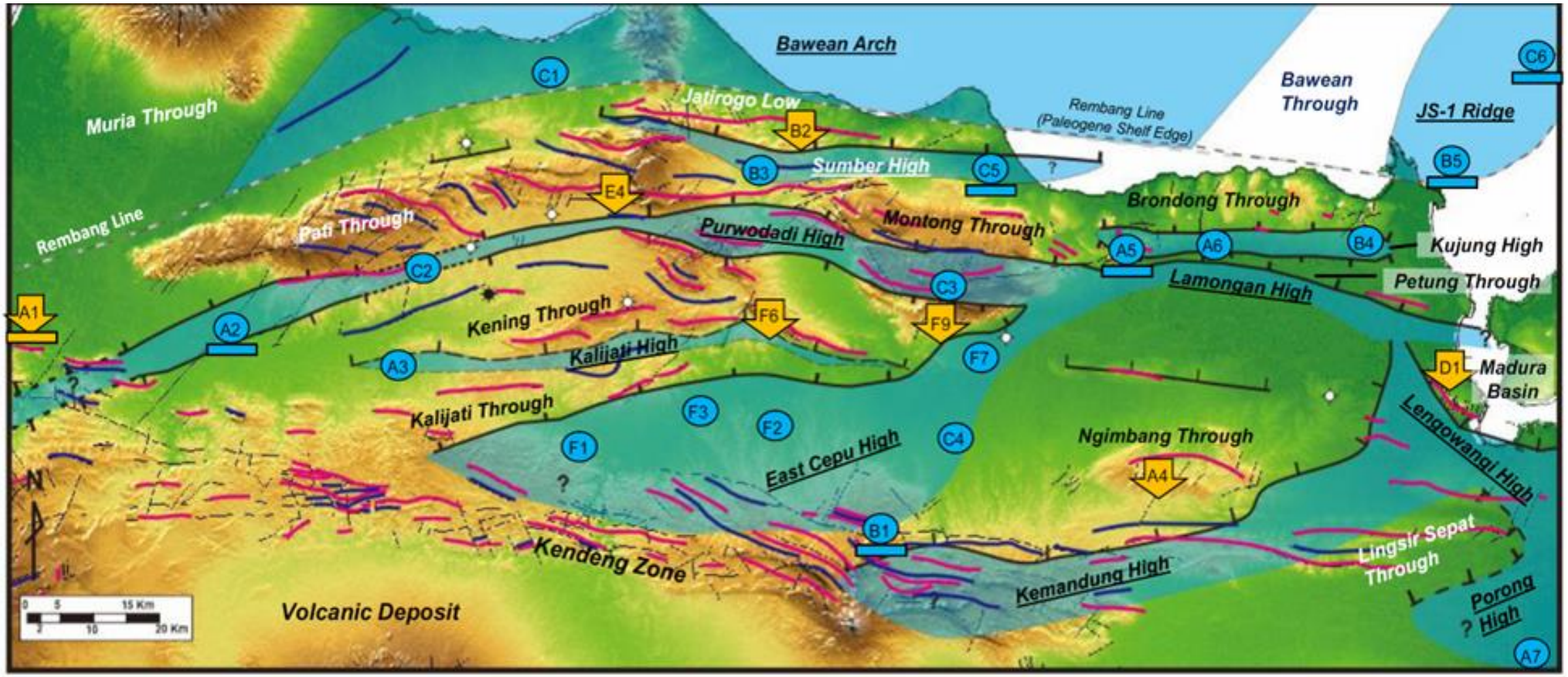


Prasetyadi,C.,2006



Modified after, Satyana, A.H, 2014

PRESENT DAY TOPOGRAPHY VERSUS PALEOGENE BASEMENT CONFIGURATION

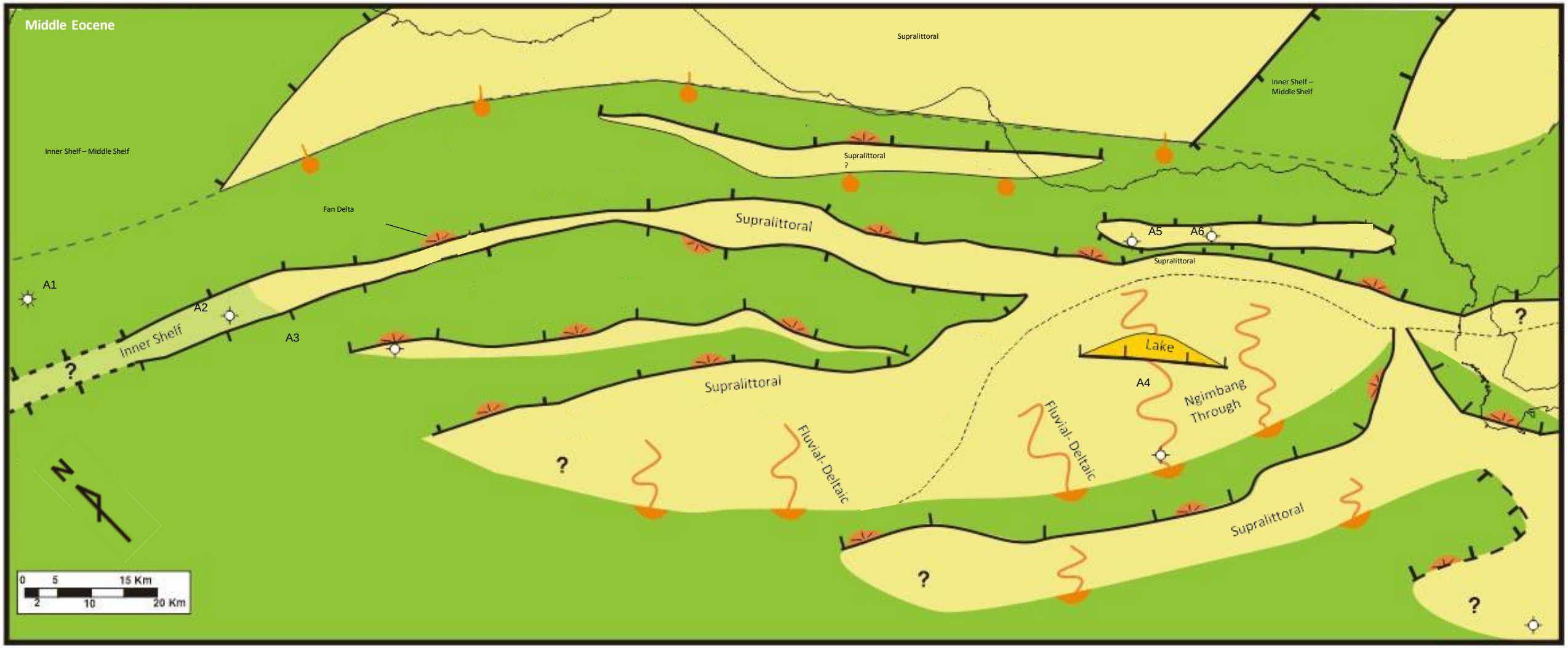


: Syncline axis
: Anticline axis
: Well penetrated Eocene to/or Early Miocene carbonate (Horst indicator)
: Well penetrated carbonate & basement / pre-tertiary rock (Horst indicator)
: Well penetrated thicker sediment & deeper environment (Graben indicator)
: Well penetrated thicker sediment, deeper environment & basement (Graben indicator)

Redefined basin configuration along the Rembang - Randublatung area comes from integrating seismic, wells, and surface geological structure evidence. There are nine horst and ten grabens in Rembang-Randublatung Zones, excluding Muria Through, Bawean Arch, Bawean Through, and JS-1 Ridge. Horst's continuation to the South remains unknown since covered by Kendeng Zone and the quarternary volcanic deposit (Purnama Y.S., 2022).

PALEO-ENVIRONMENT MAP DURING MIDDLE EOCENE

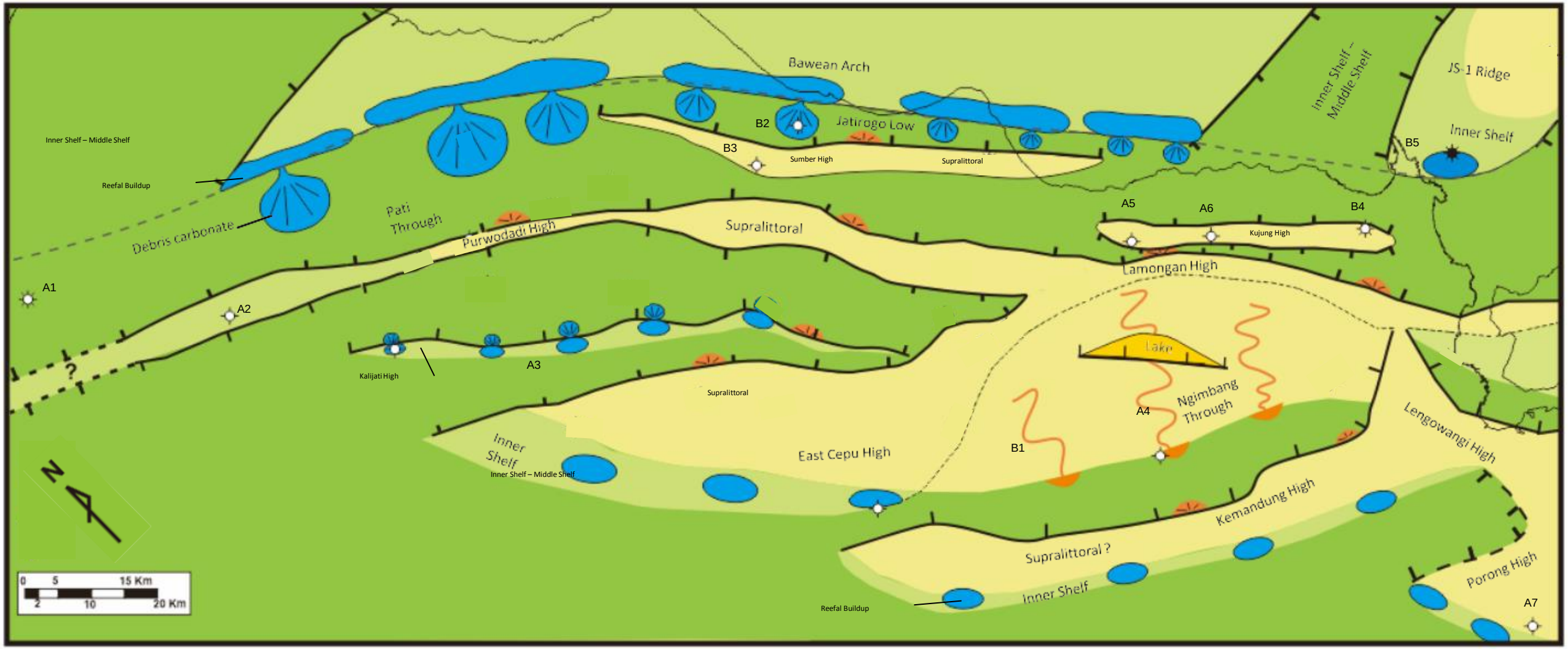
GEOSAINS DELTA ANDALAN
GOING BEYOND



Yudi Satria Purnama, 2022

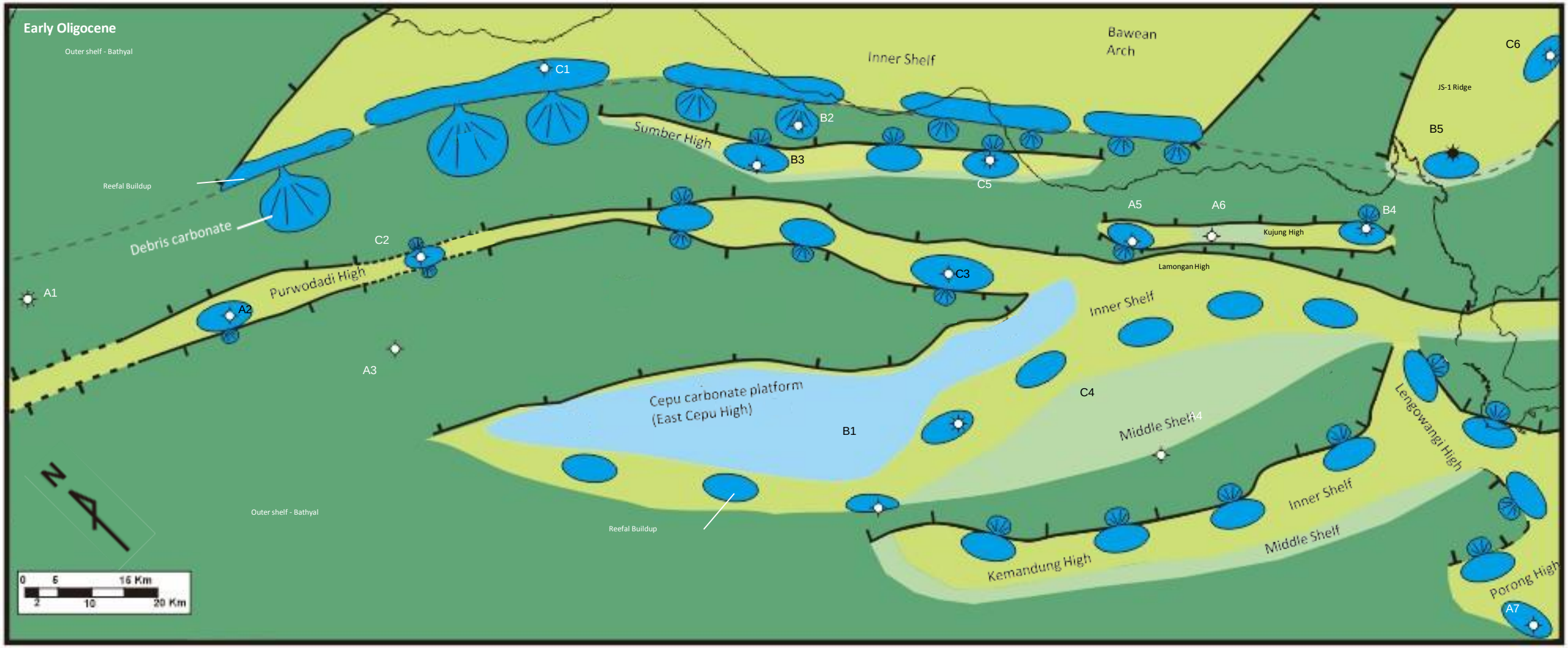
PALEO-ENVIRONMENT MAP DURING LATE EOCENE

GEOSAINS DELTA ANDALAN
GOING BEYOND



Yudi Satria Purnama, 2022

PALEO-ENVIRONMENT MAP DURING LATE EOCENE – EARLY OLIGOCENE

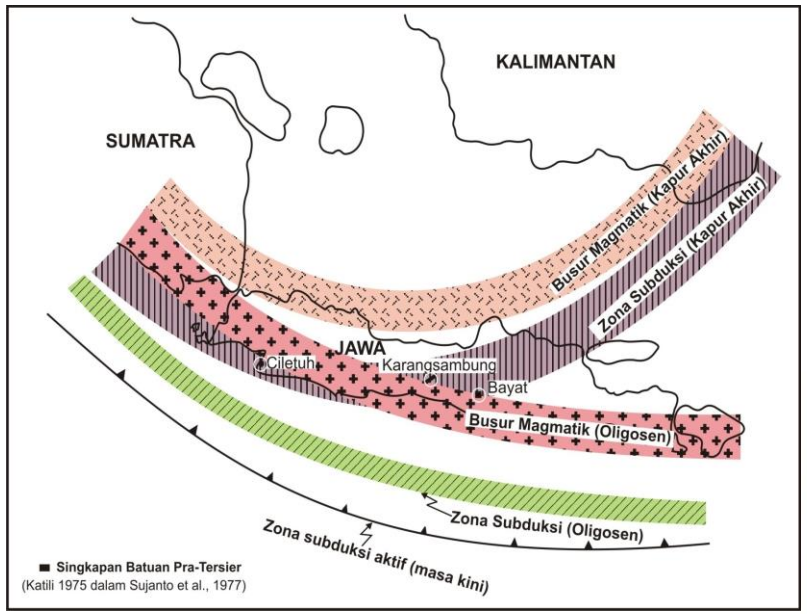


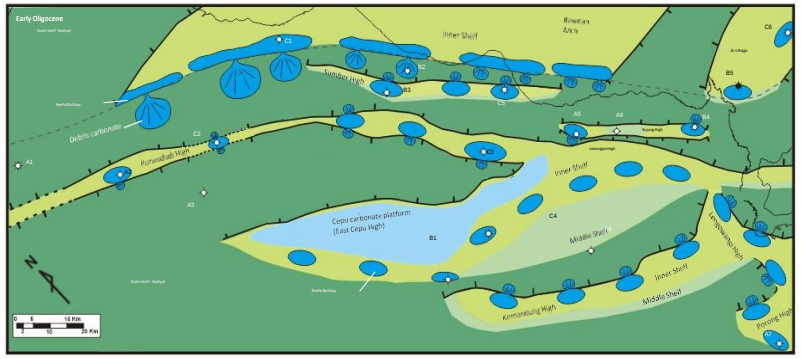
Yudi Satria Purnama, 2022

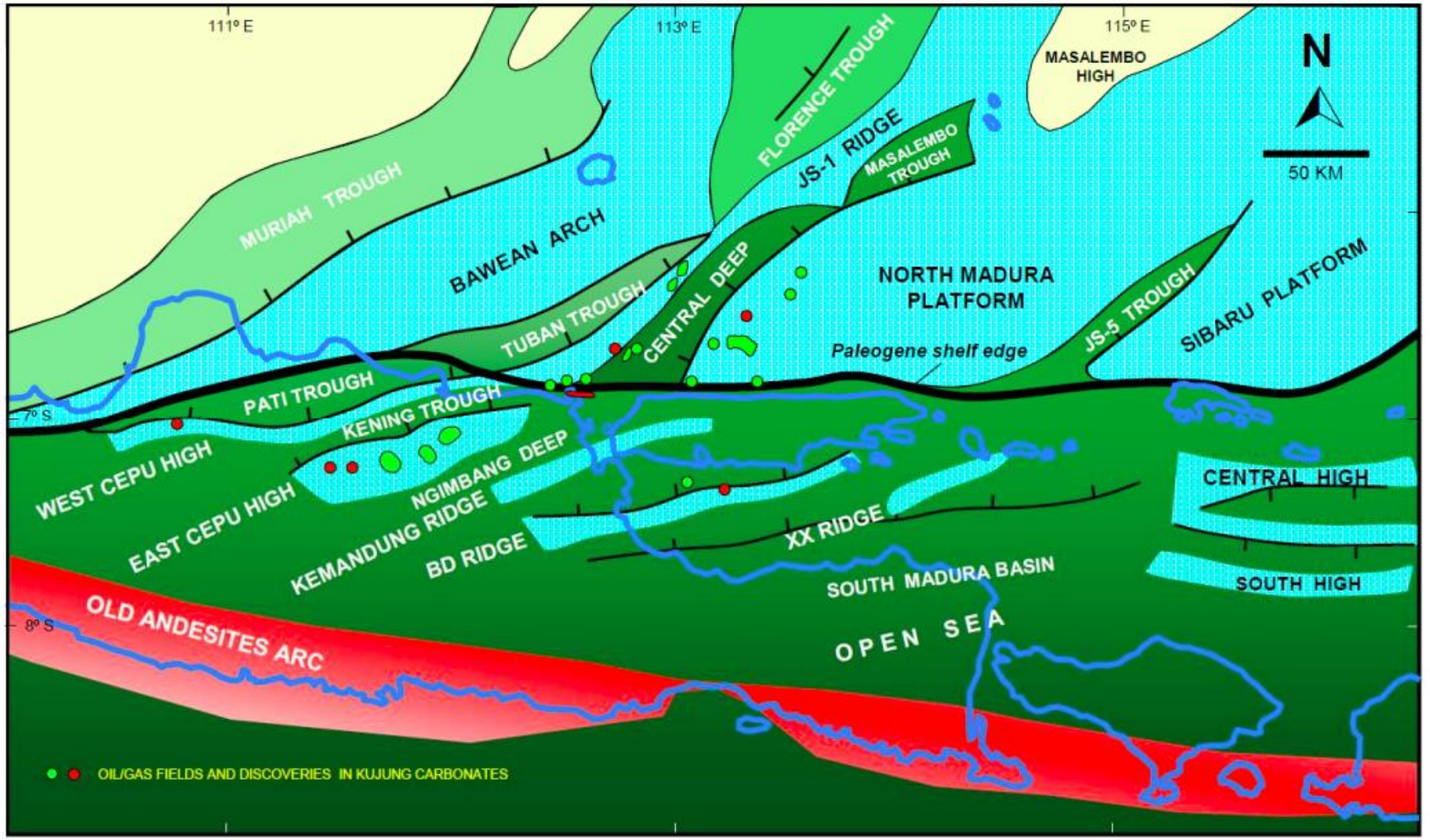
PALEO-ENVIRONMENT MAP DURING LATE OLIGOCENE – EARLY MIOCENE

Yudi Satria Purnama, 2022

PRESENT DAY TOPOGRAPHY VERSUS PALEOGENE BASEMENT CONFIGURATION



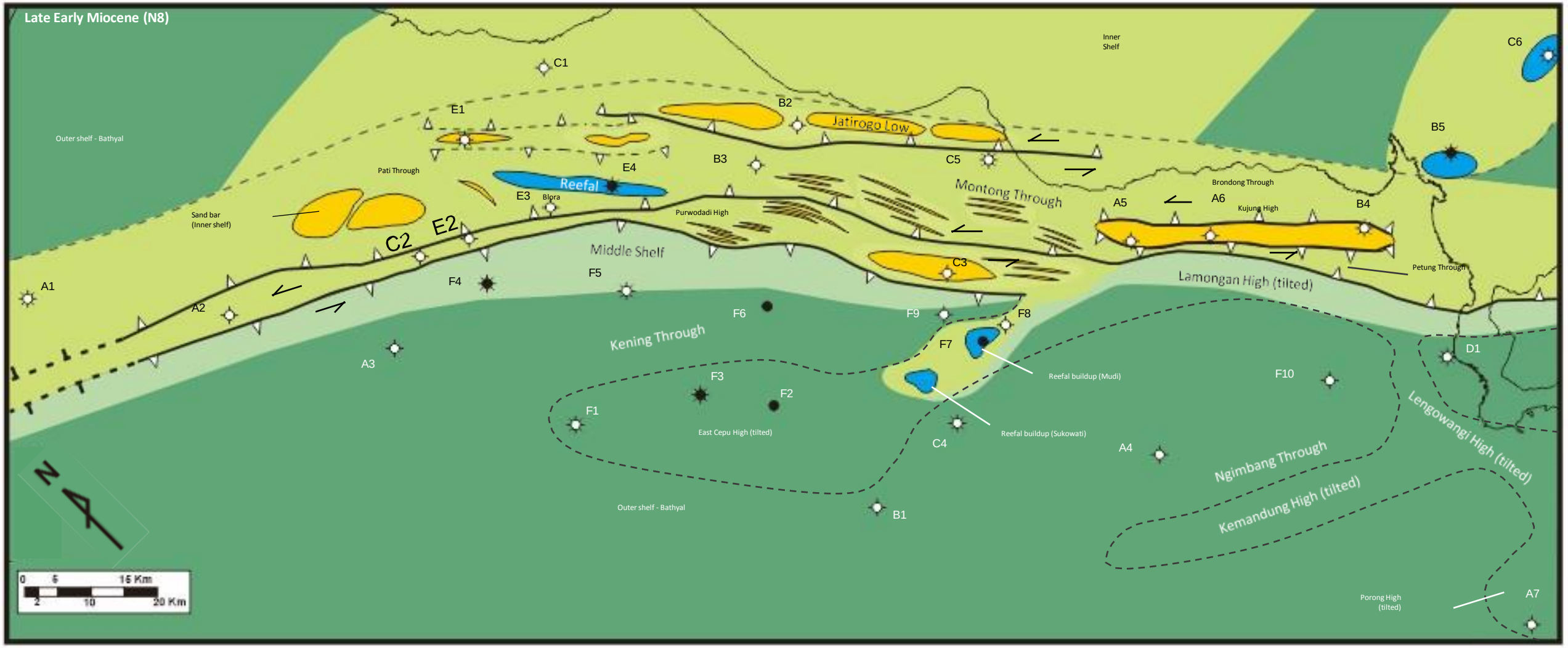




Satyana, 2006

PALEO-ENVIRONMENT MAP DURING MIDDLE MIOCENE

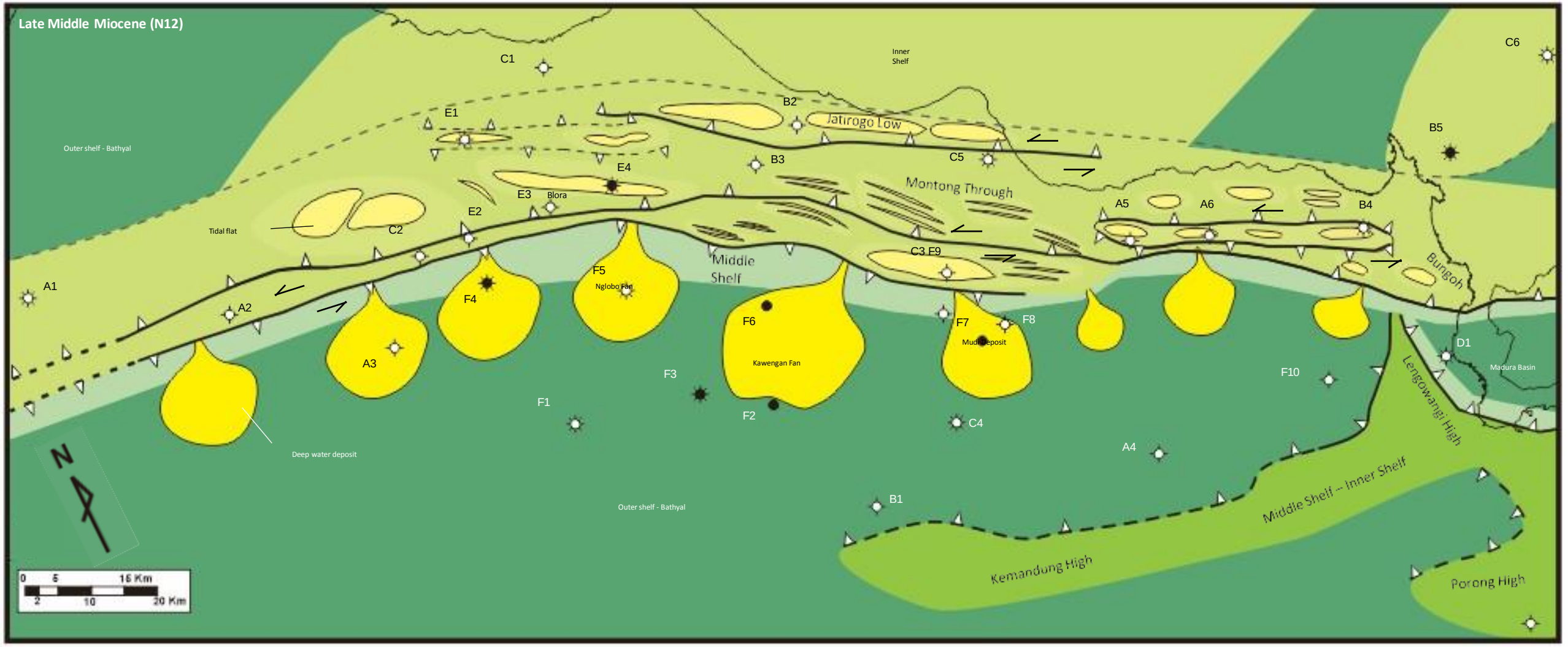
GEOSAINS DELTA ANDALAN
GOING BEYOND



Yudi Satria Purnama, 2022

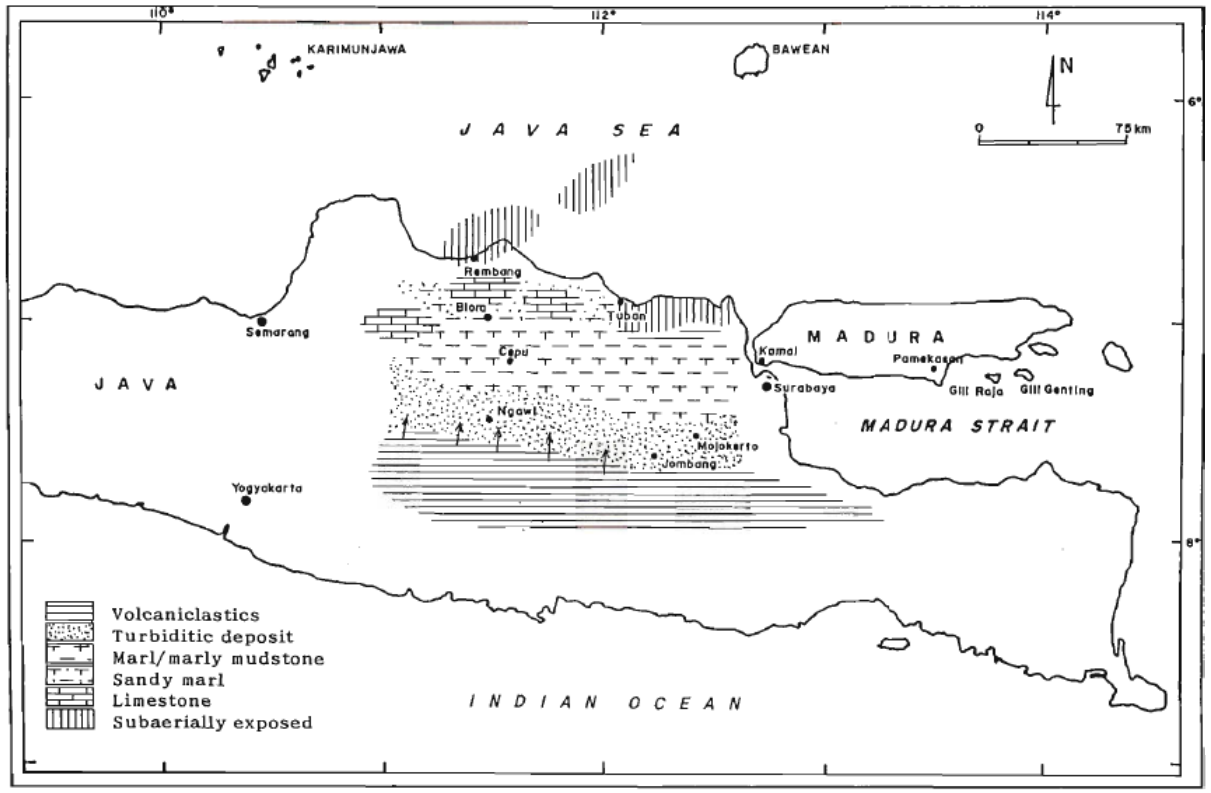
PALEO-ENVIRONMENT MAP DURING LATE OF MIDDLE MIOCENE

GEOSAINS DELTA ANDALAN
GOING BEYOND

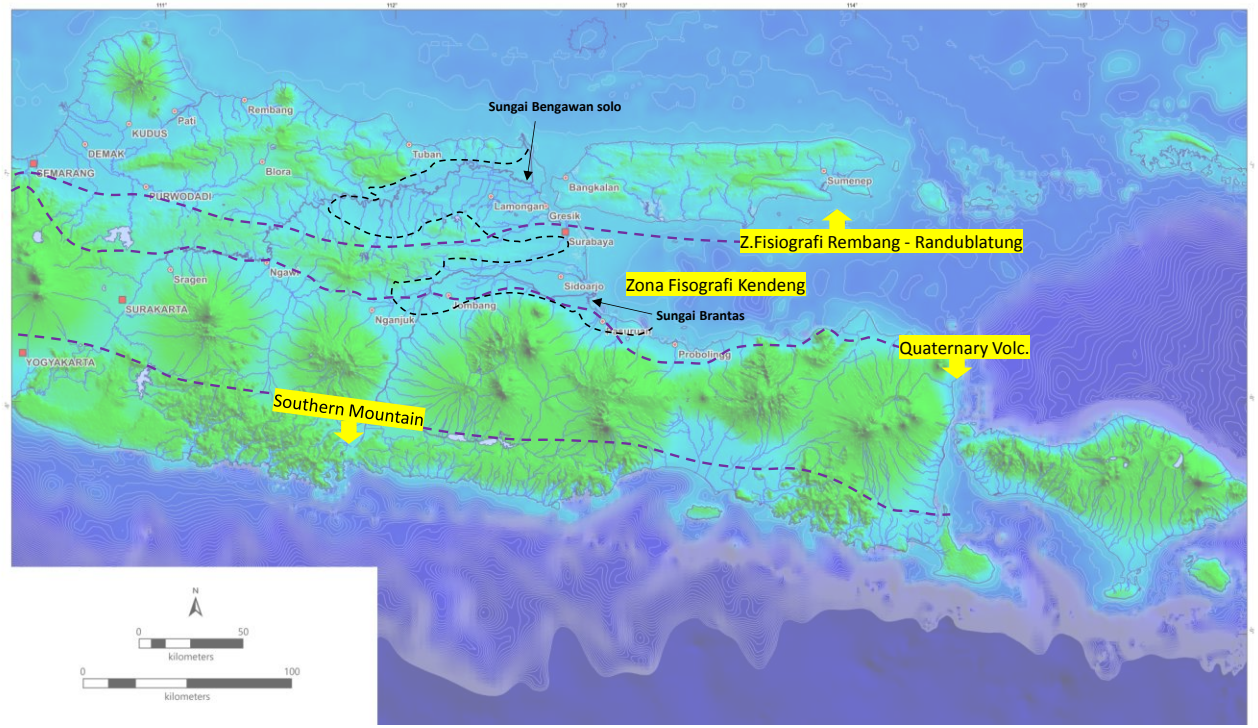


Yudi Satria Purnama, 2022

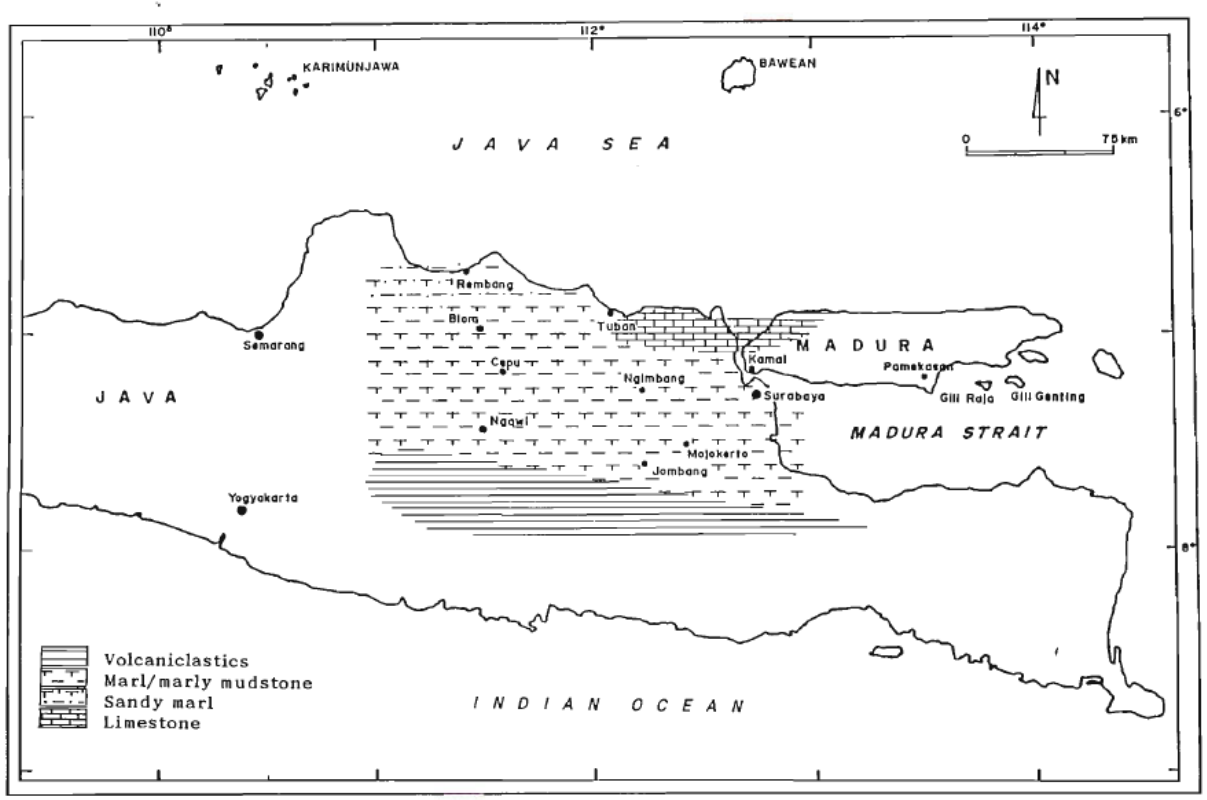
PALEO-ENVIRONMENT MAP LATE MIOCENE



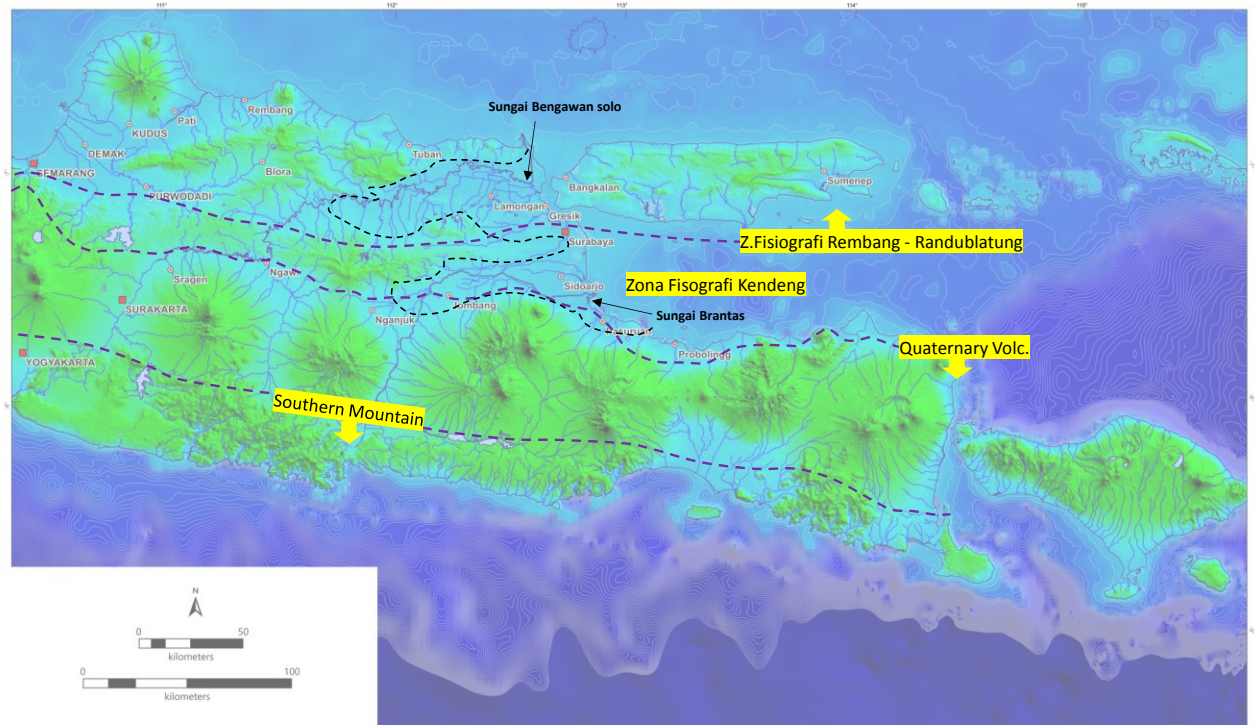
Susilohadi, 1995



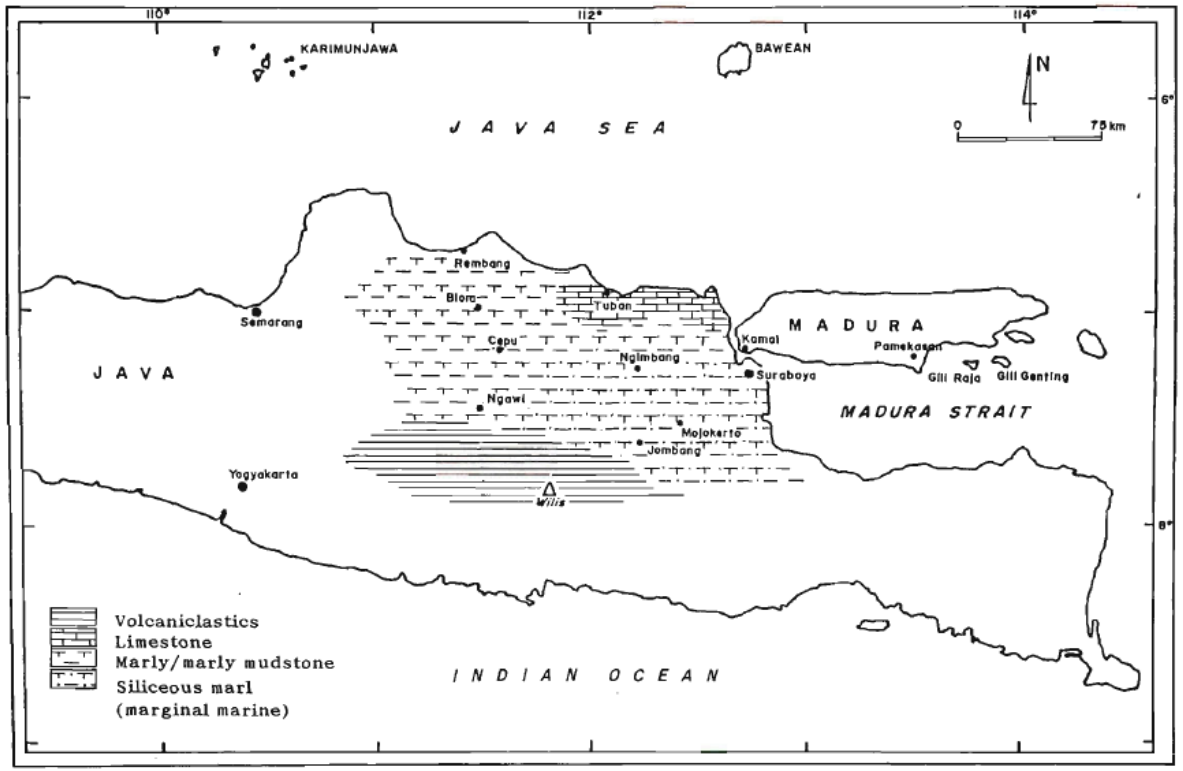
PALEO-ENVIRONMENT MAP OF EARLY PLIOCENE

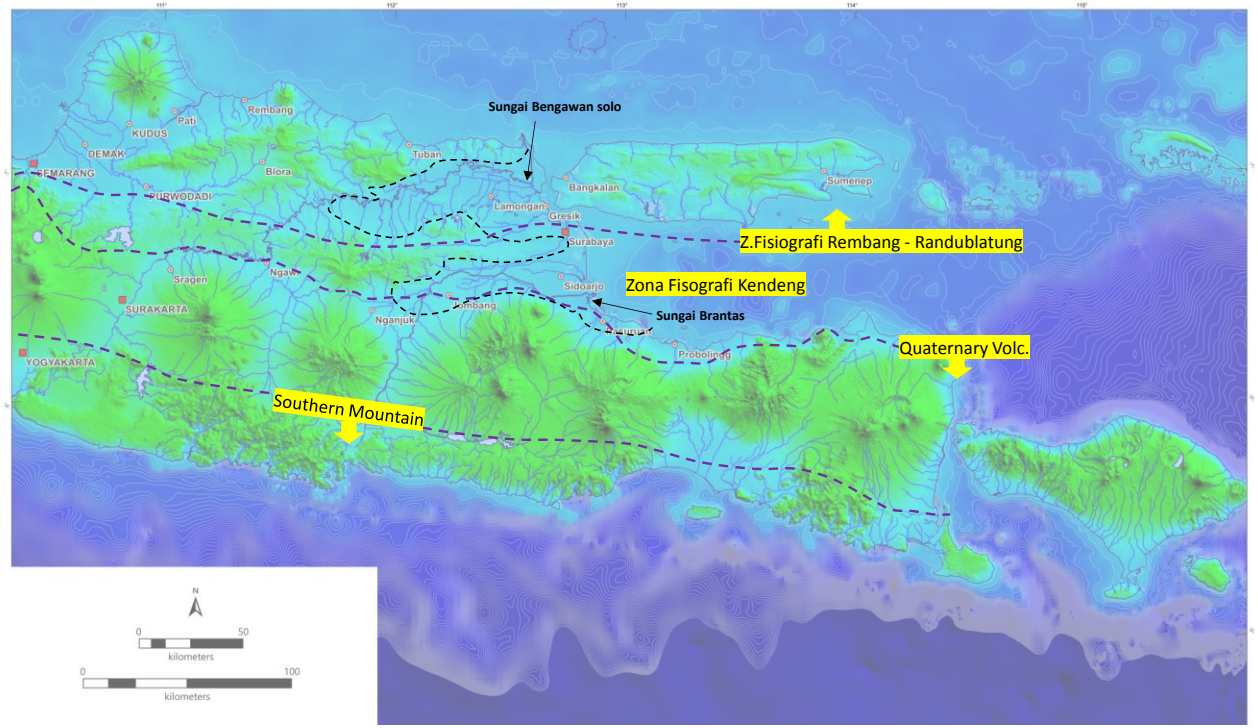


Susilohadi, 1995



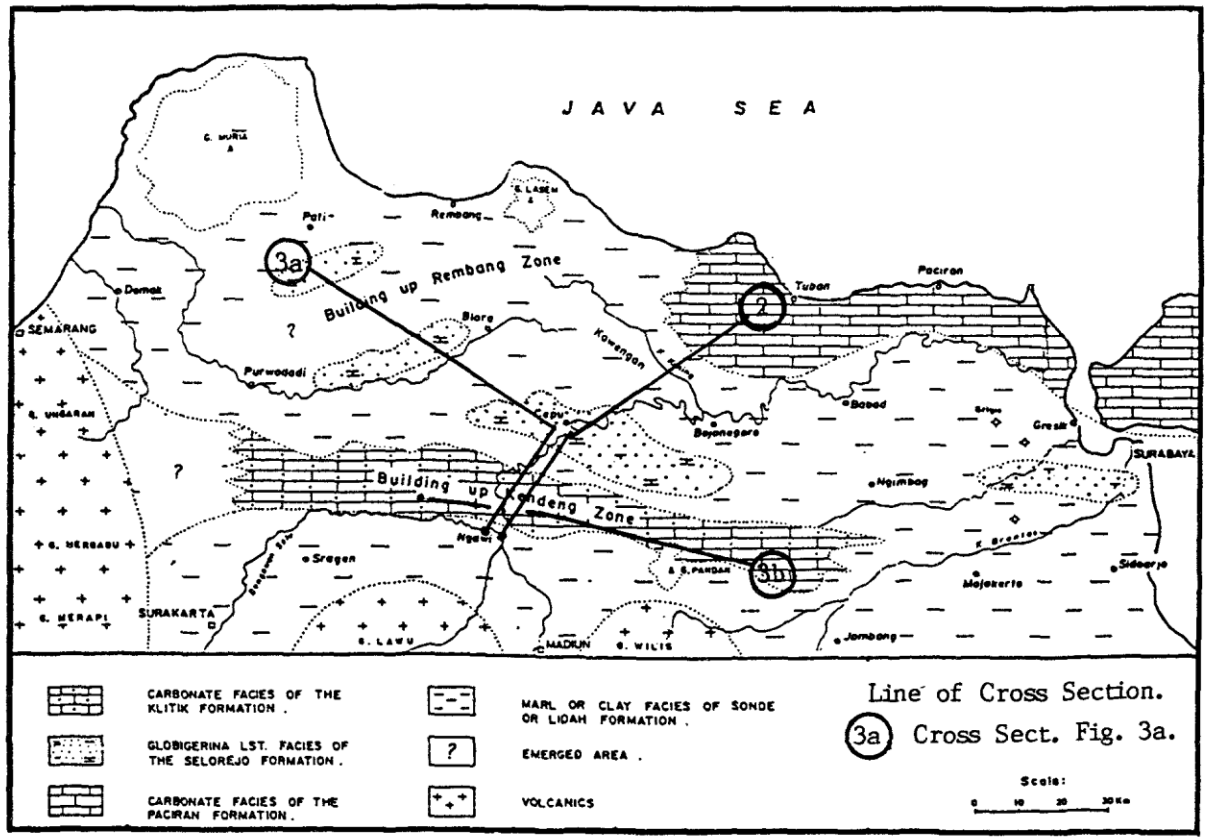
PALEO-ENVIRONMENT MAP MIDDLE PLIOCENE



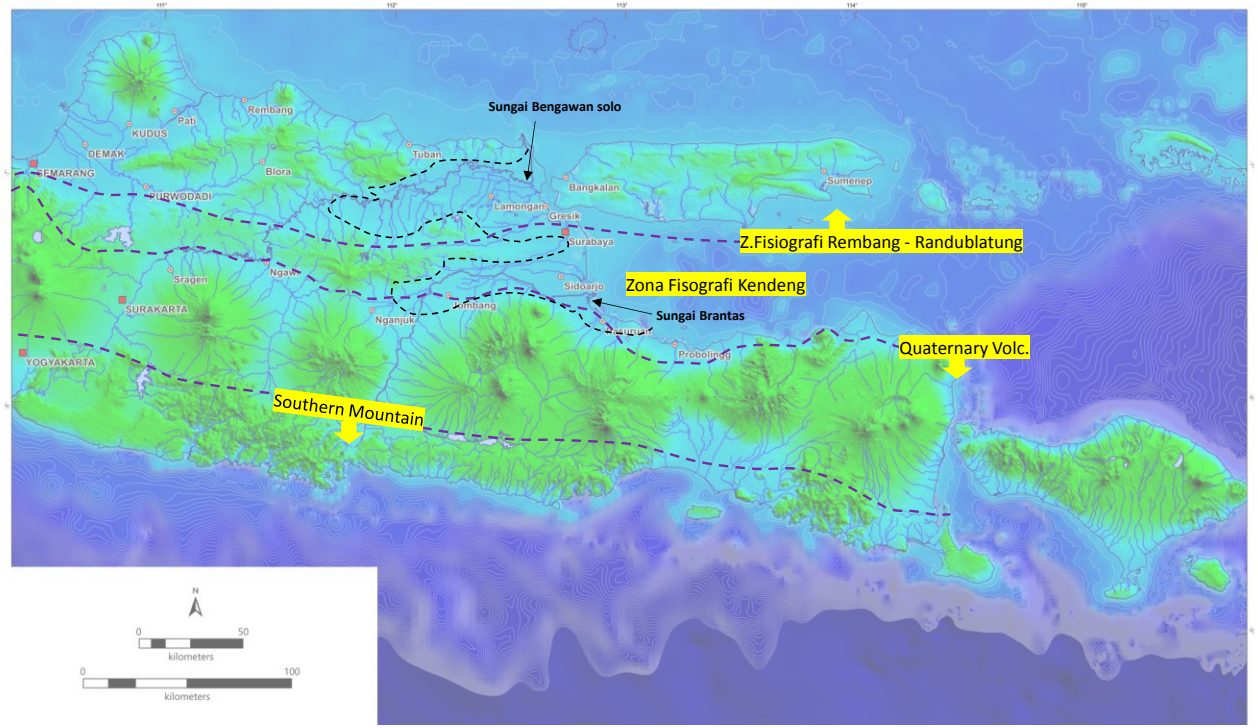


Susilohadi, 1995

PALEO-ENVIRONMENT MAP LATE PLIOCENE



Sabardi Musliki, 1996



PALEO-ENVIRONMENT MAP PLEISTOCENE

O. Frank Huffman, 2003