

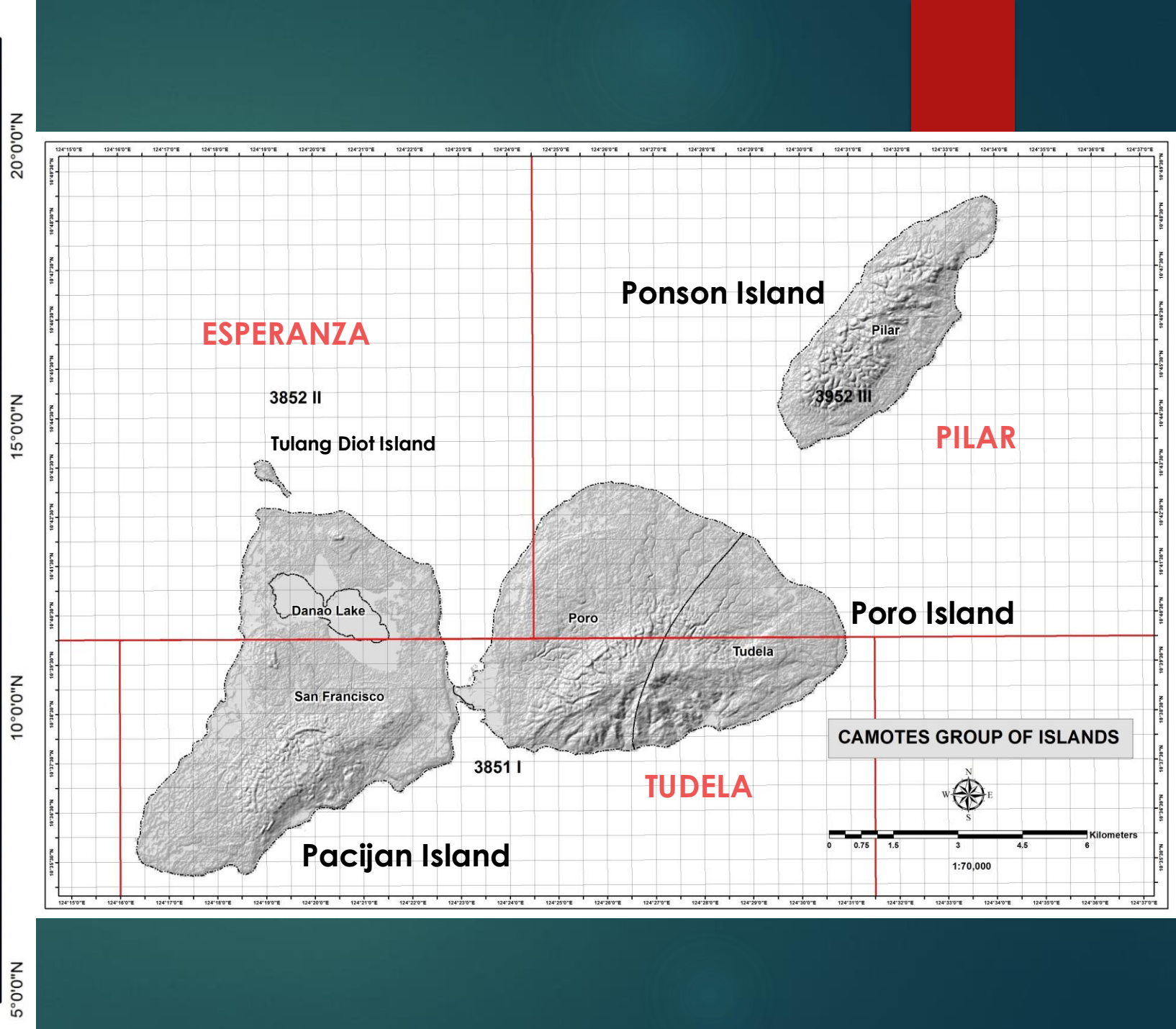
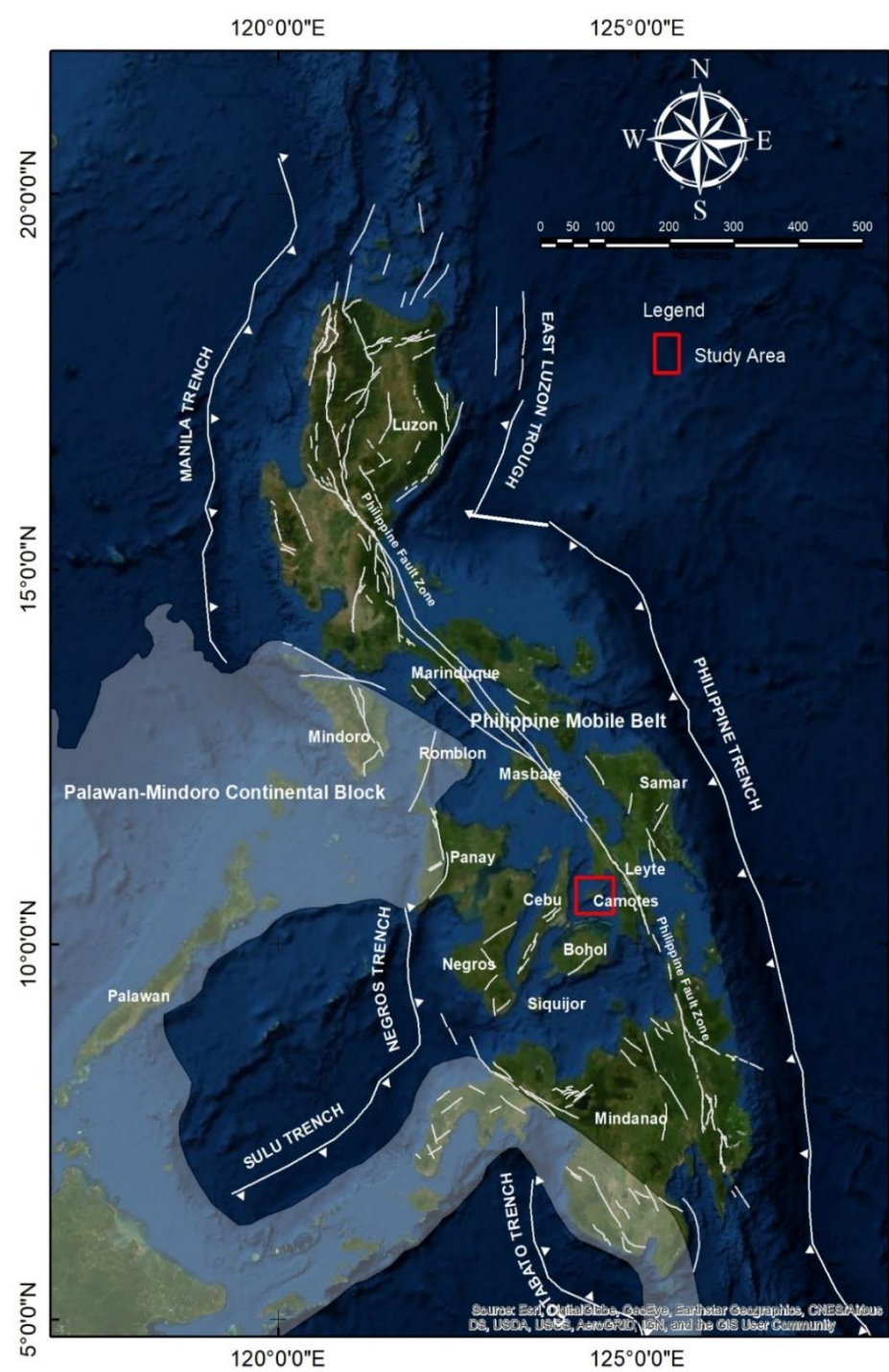
# **Tectonic history of the Camotes Group of Islands: Emergence from a submarine volcano to an isolated carbonate platform**

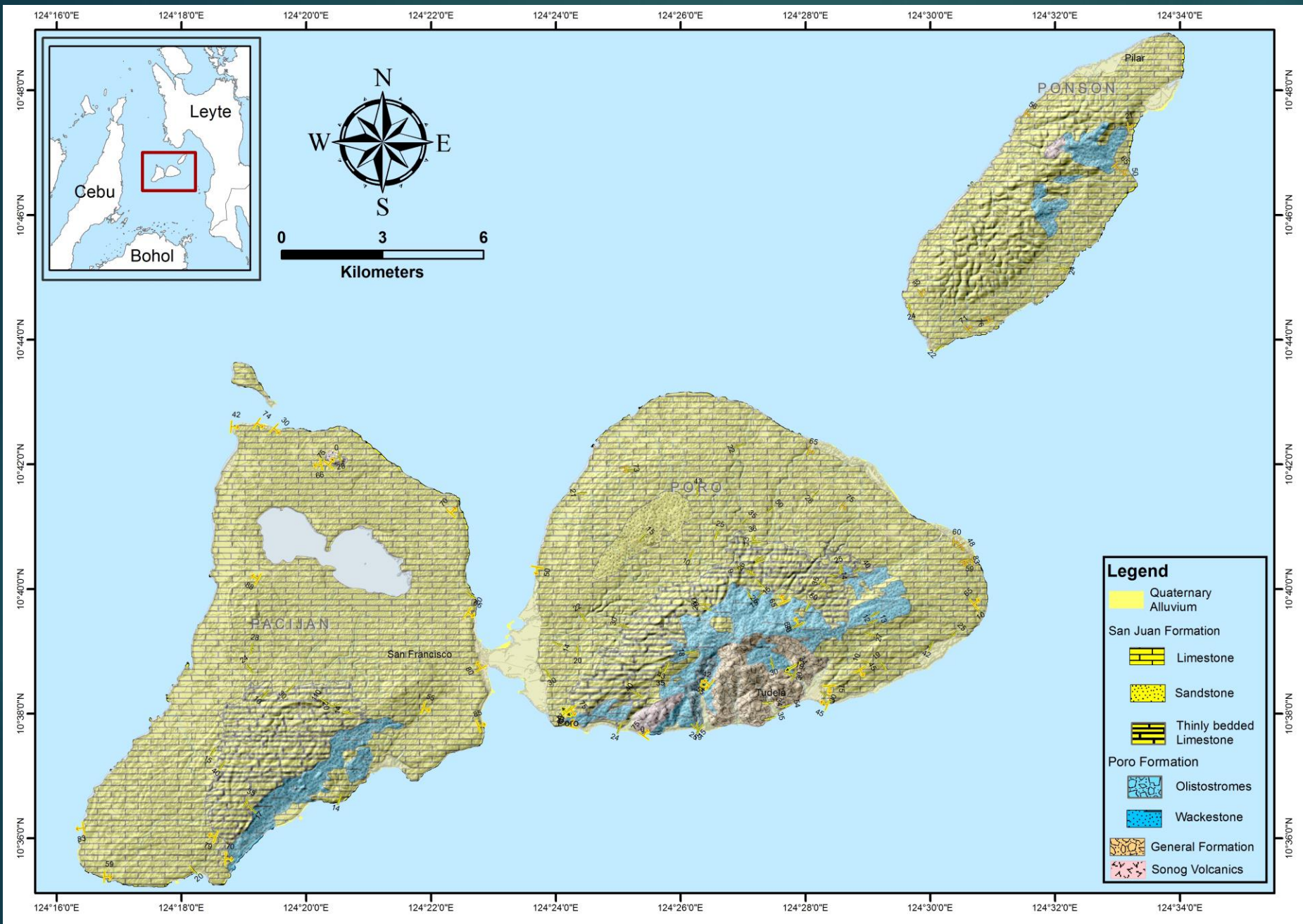
KENNETH JAN F. SANGALANG, JERALI D. RODRIGO,  
DENNIS GERALD A. ALETA, AND AL EMIL G. BERADOR

MINES AND GEOSCIENCES BUREAU REGIONAL OFFICE NO. 7

# Outline

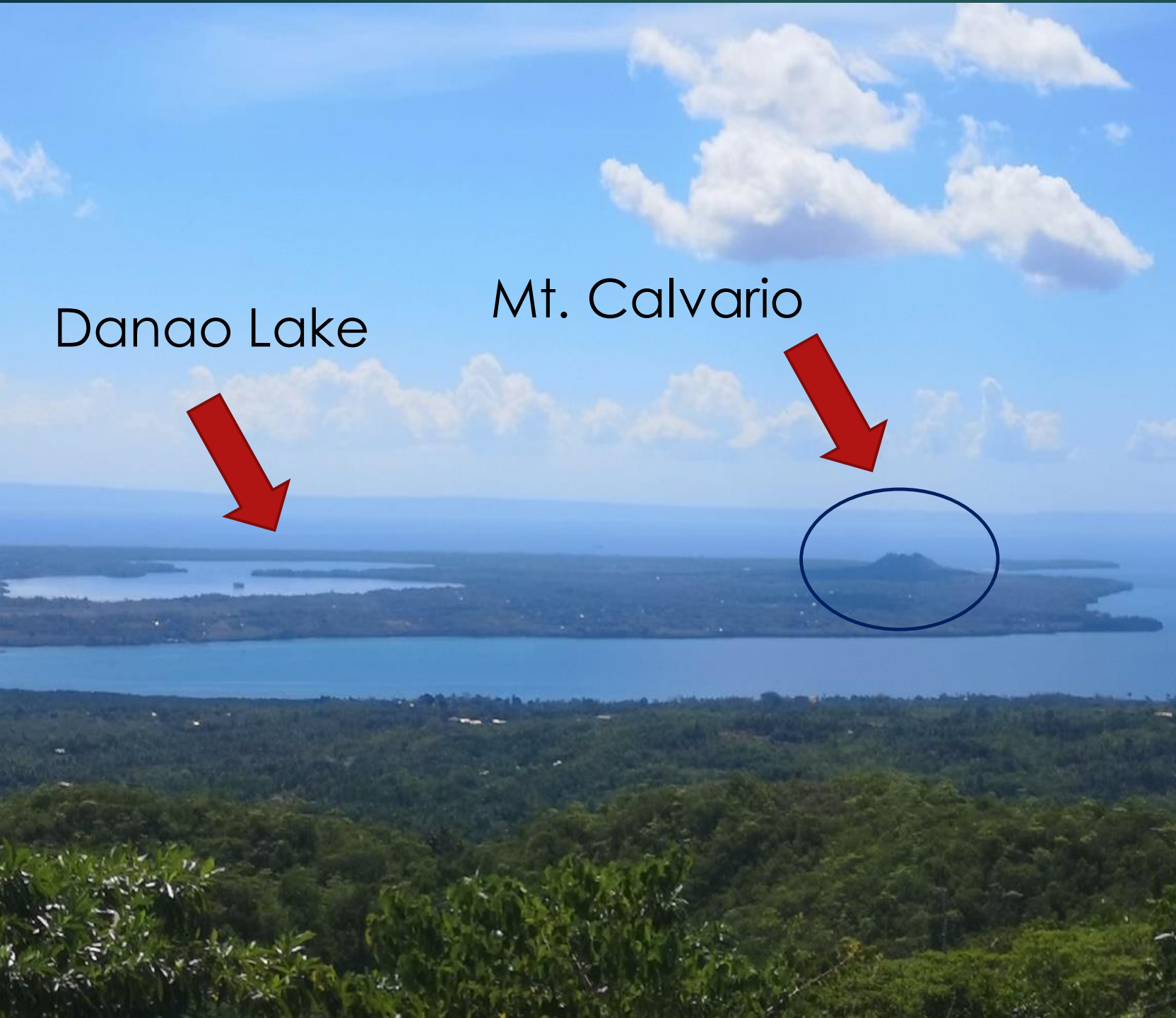
- ▶ Introduction
- ▶ Stratigraphy
- ▶ Structural Geology
- ▶ Tectonic History
- ▶ Conclusions





# Stratigraphy

- ▶ Sonog Volcanics
- ▶ General Formation
- ▶ Poro Formation (Corby et al., 1951)
- ▶ San Juan Formation (Corby et al., 1951)



Danao Lake

Mt. Calvario

# Sonog Volcanics

- ▶ Volcanics (Corby et al., 1951)
- ▶ Basement



Barangay Sonog, San Francisco

# Sonog Volcanics

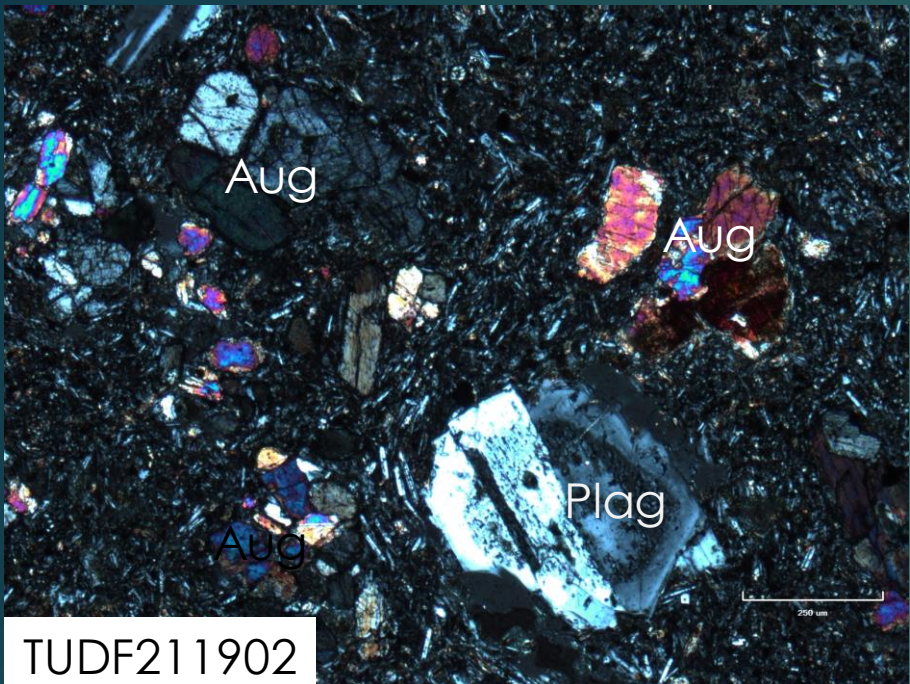
- ▶ Basalt
  - ▶ Hydroclastites
  - ▶ Pillow lava
- “submarine volcanism”



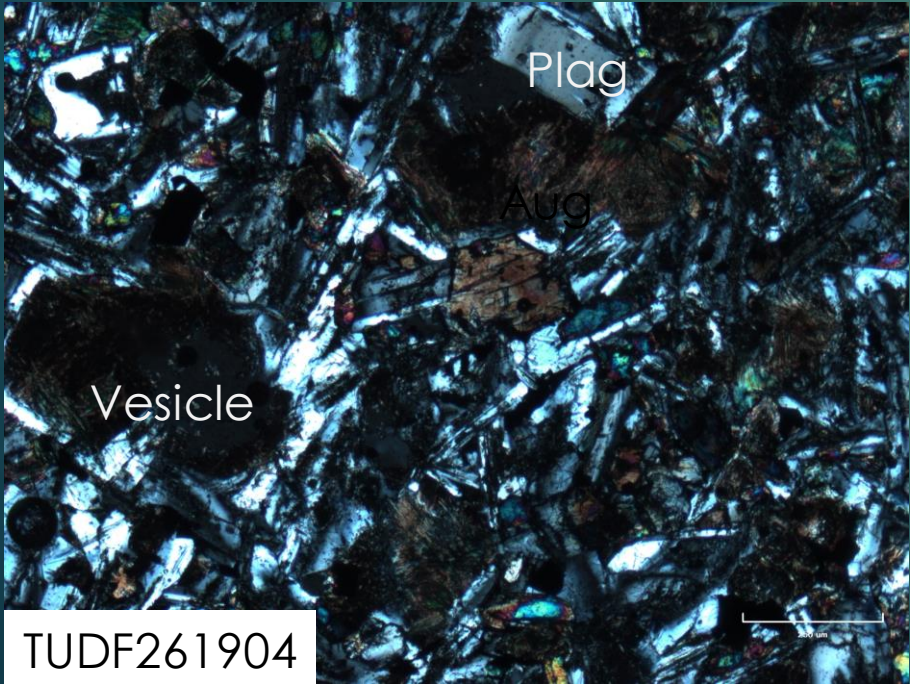
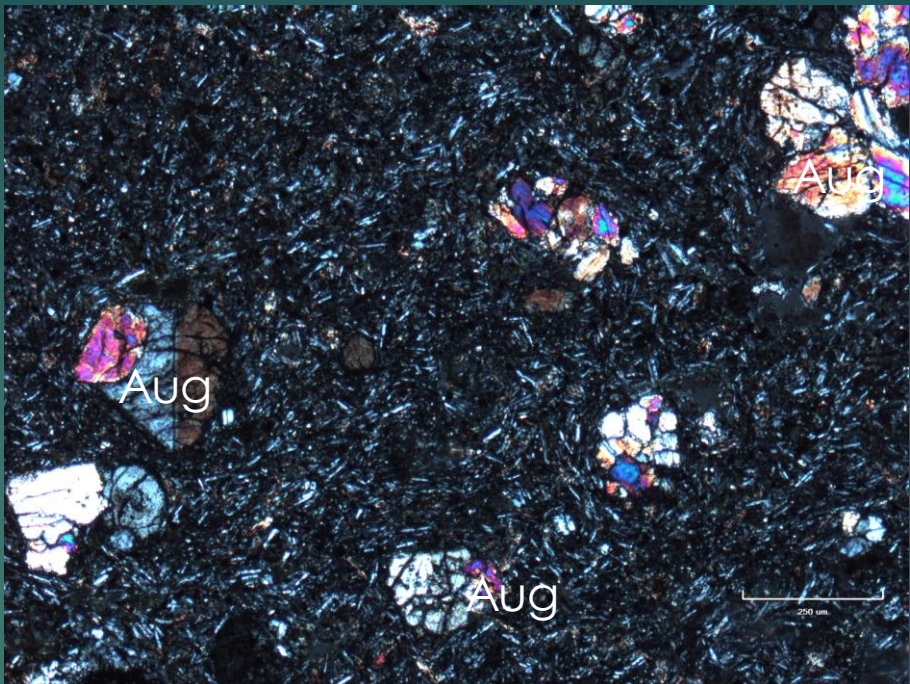
Mt. Calvario, Barangay Sonog, San Francisco



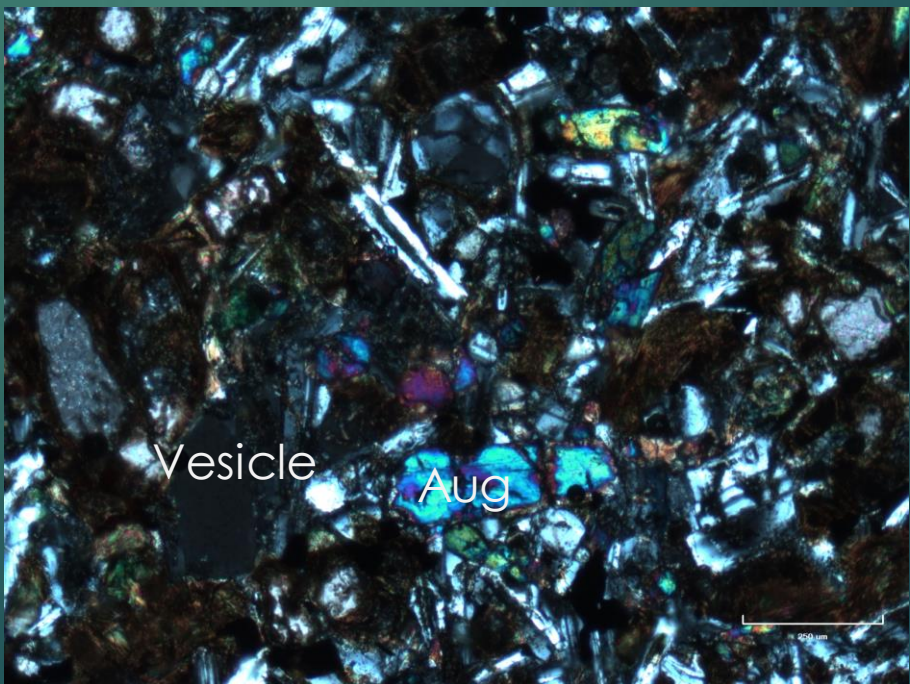
Barangay Libertad, Poro



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# Sonog Volcanics

Vesicular

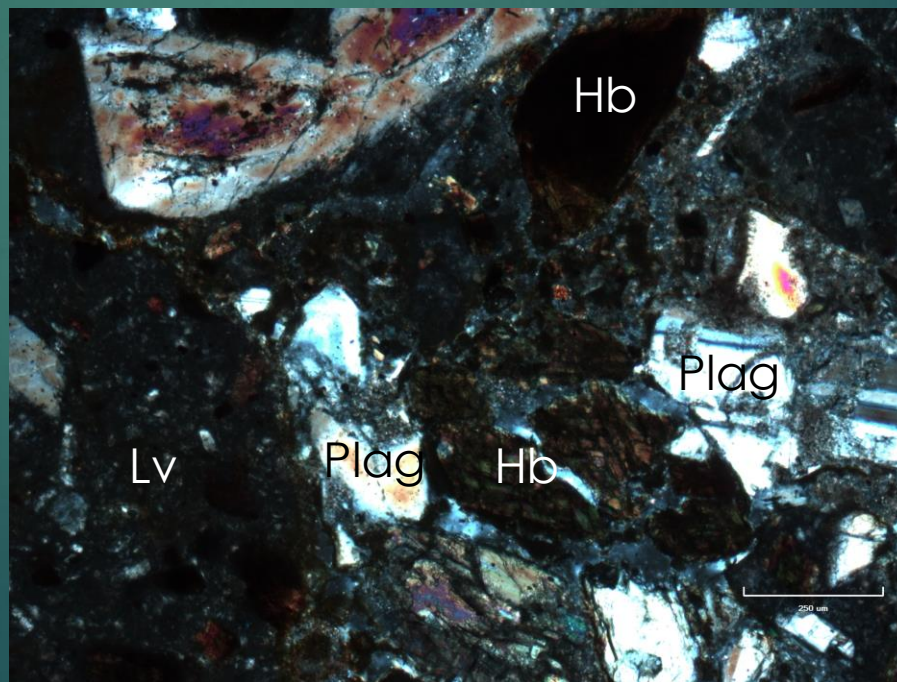
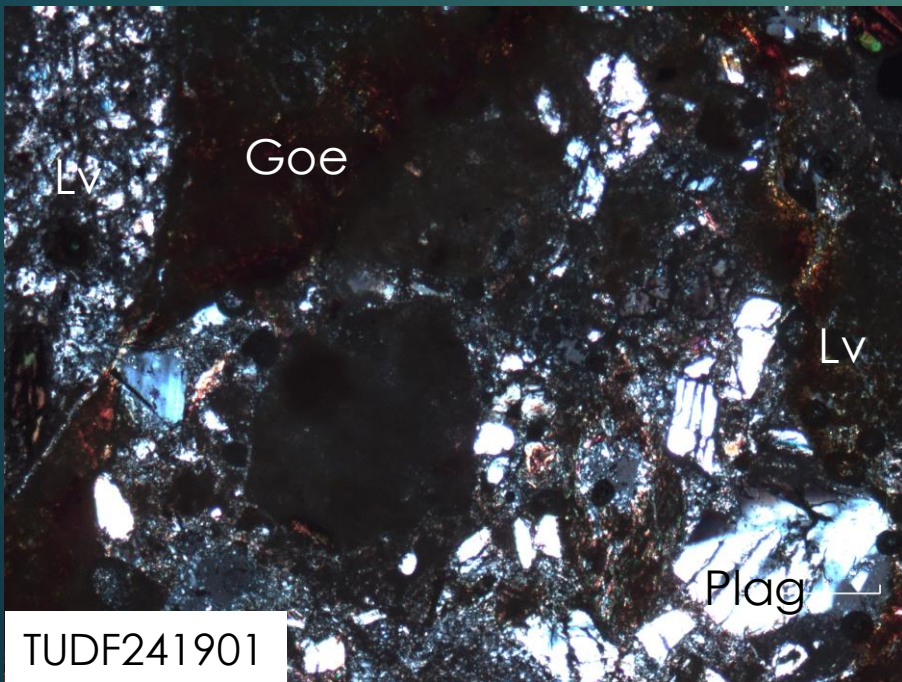
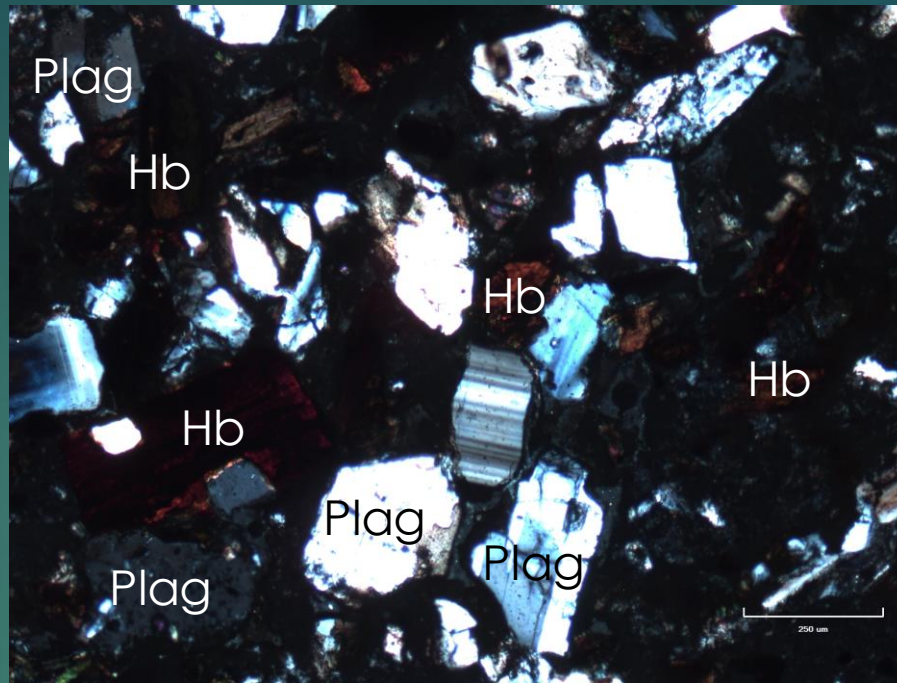
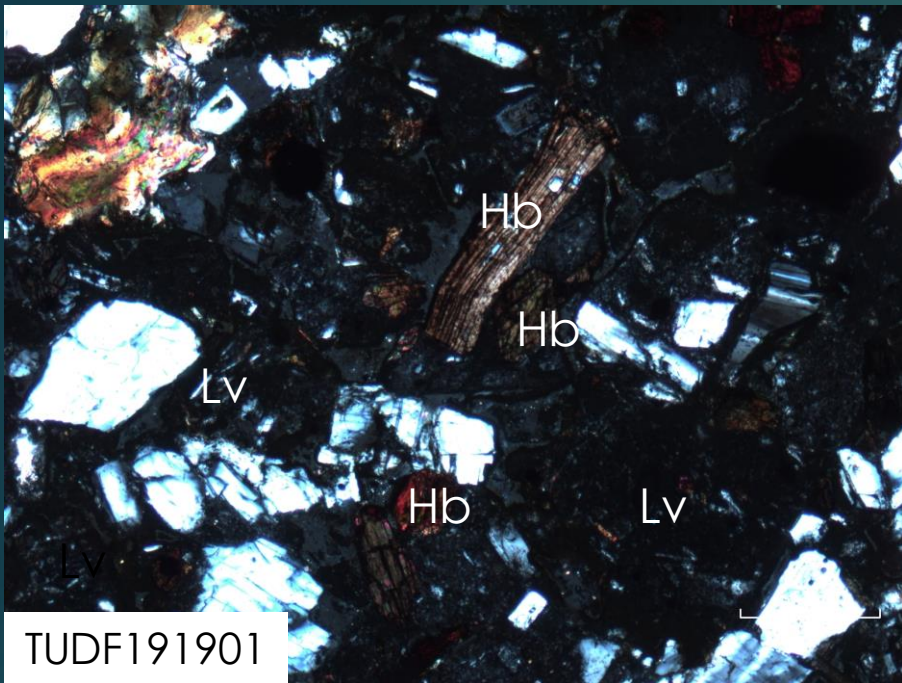
Amygdaloidal

- Porphyritic
- Plagioclase
  - Augite



# General Formation

- ▶ Camotes Sandstone and Conglomerate (Corby et al., 1951)
- ▶ Interbedded conglomerate-sandstone-siltstone-mudstone
- ▶ “High-density turbidite deposit”
- ▶ N17-N19: Late Miocene to Early Pliocene



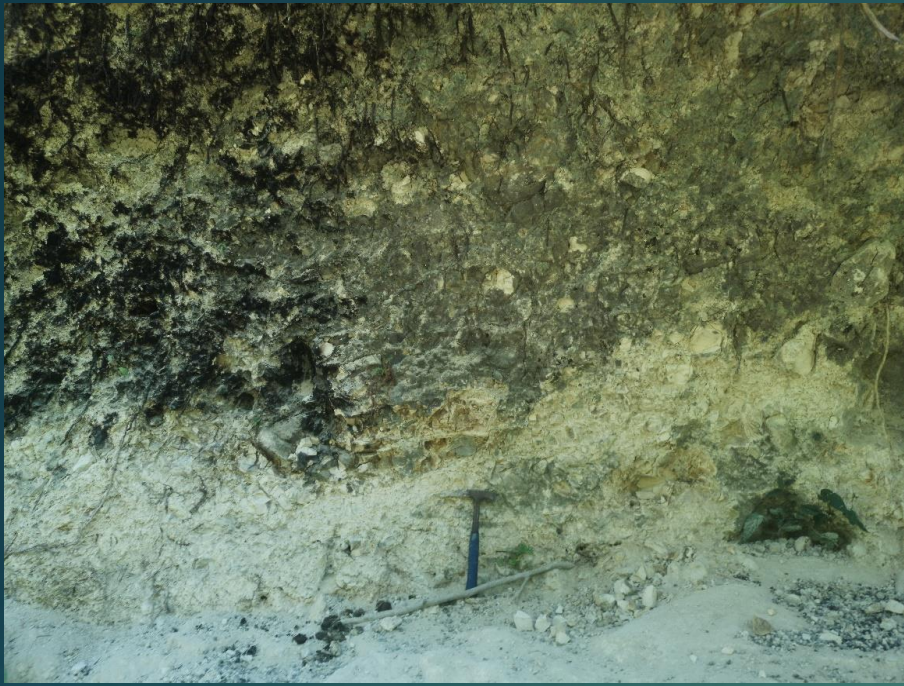
# General Formation

- ▶ Sandstone  
Plagioclase, Hornblende, and Lithic volcanics
- ▶ Conglomerate  
Chlorite altered porphyritic andesite



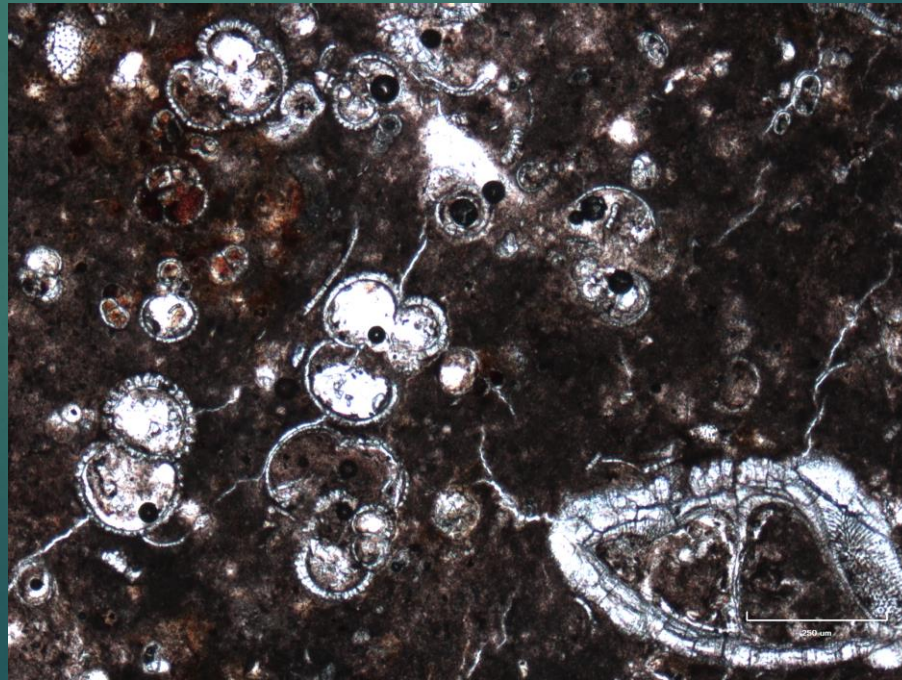
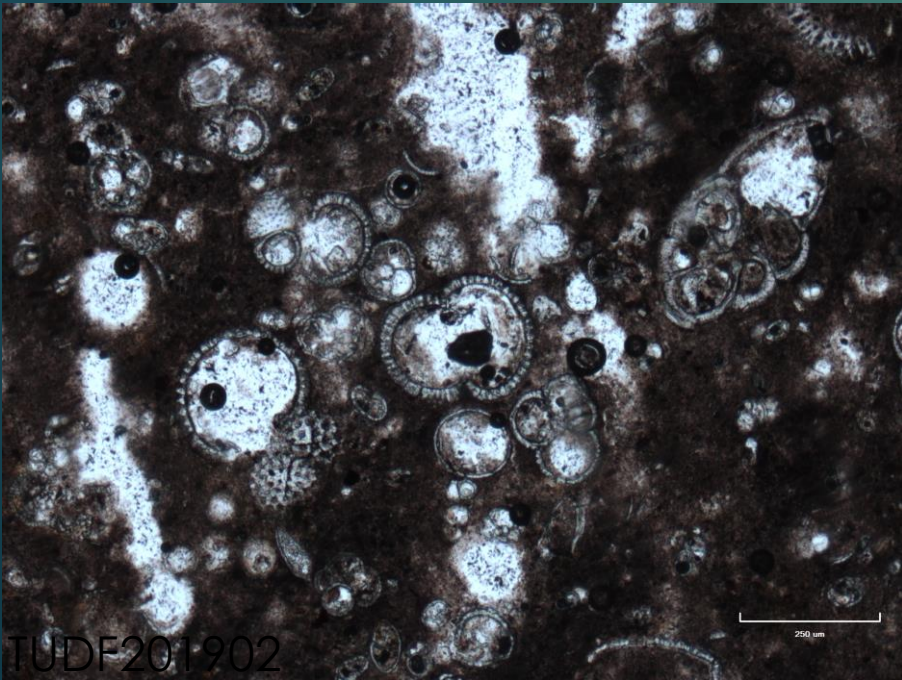
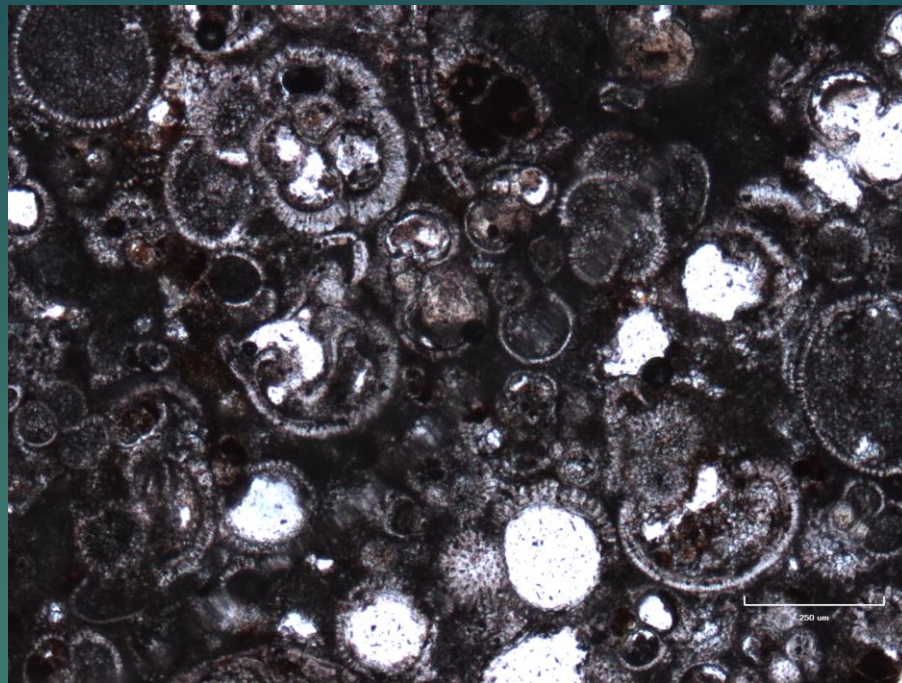
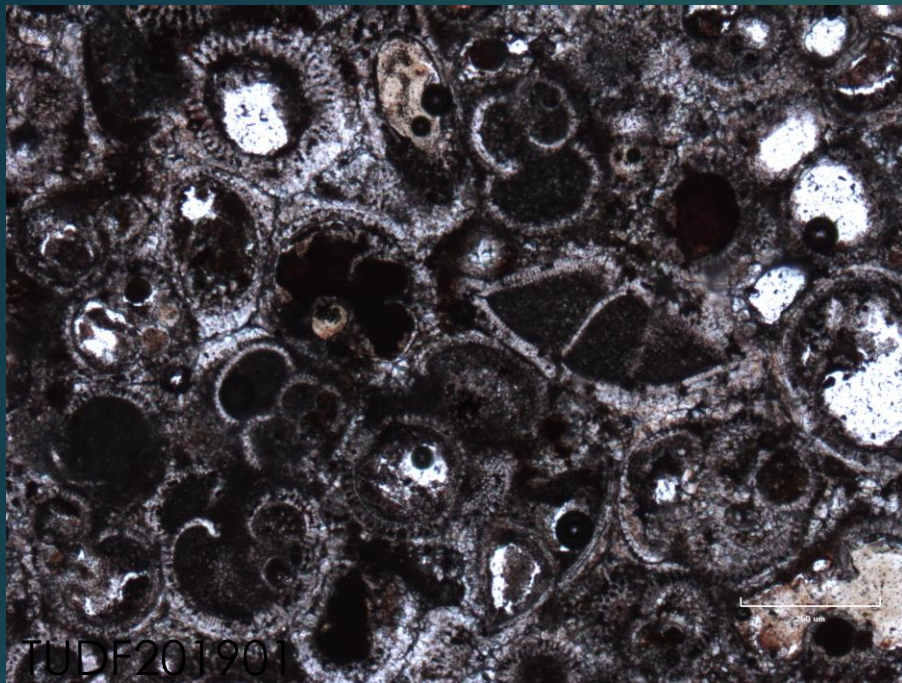
# Porolithothamnium Formation

- ▶ Corby et al. (1951)
- ▶ Overlies the General Formation at Busay Falls, Brgy. General, Tudela
- ▶ Unconformably overlies the Sonog Volcanics at Mt. Calvario, Brgy. Sonog, San Francisco



# Poro Formation

- ▶ Thinly bedded poorly indurated calcareous mudstones
- ▶ Abundant Planktonic Foraminifera
- ▶ Wackestone (Dunham Classification)



# Poro Formation

- ▶ N17-N20
- ▶ Late Miocene to Middle Pliocene
- ▶ *Sphaerodinellopsis seminulina*
- ▶ *Sphaerodinella dehiscens*

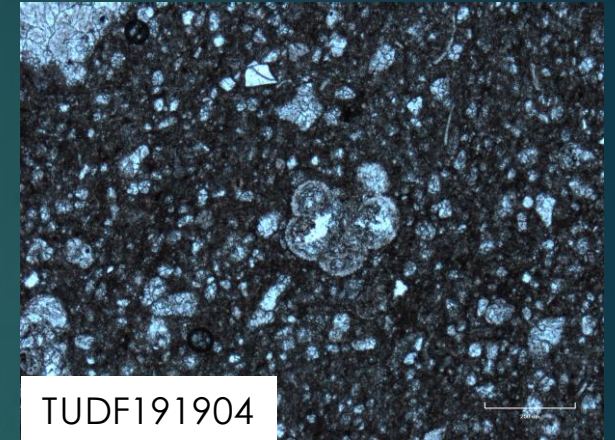
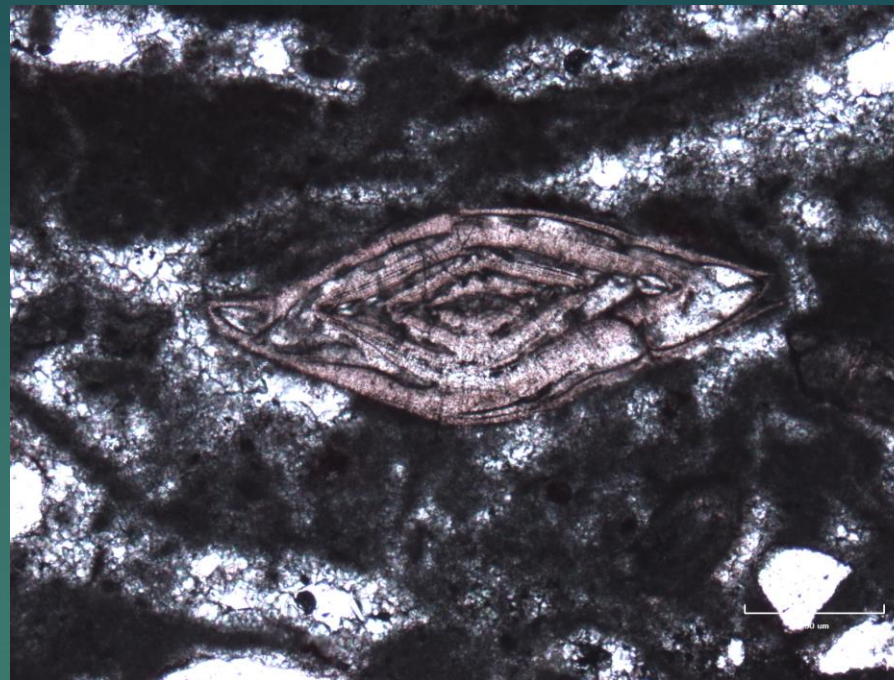
# Poro Formation

- ▶ “Olistostrome”
- ▶ Head and finger corals, echinoid spines, gastropods, pelecypod shells, and large benthic foraminifera
- ▶ Calcareous mud matrix

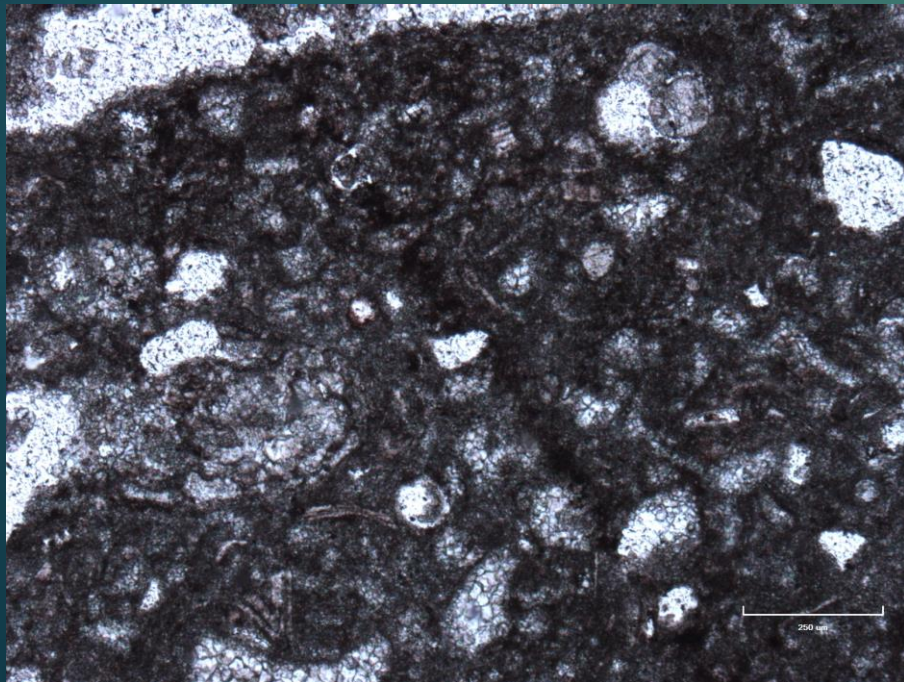




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## Poro Formation

### Mixed Faunal Assemblage

- ▶ *Amphistegina* sp. set in a planktonic foraminifera-bearing matrix
- ▶ Evidence for deposition in a submarine slope environment
- ▶ N19-N21: Early Pliocene to Middle Pliocene

# San Juan Formation

- Corby et al. (1951) white to pink porous limestone in Barangay San Juan Ponson Island
- Comprised of interbedded grainstones, floatstones, rudstones and boundstones



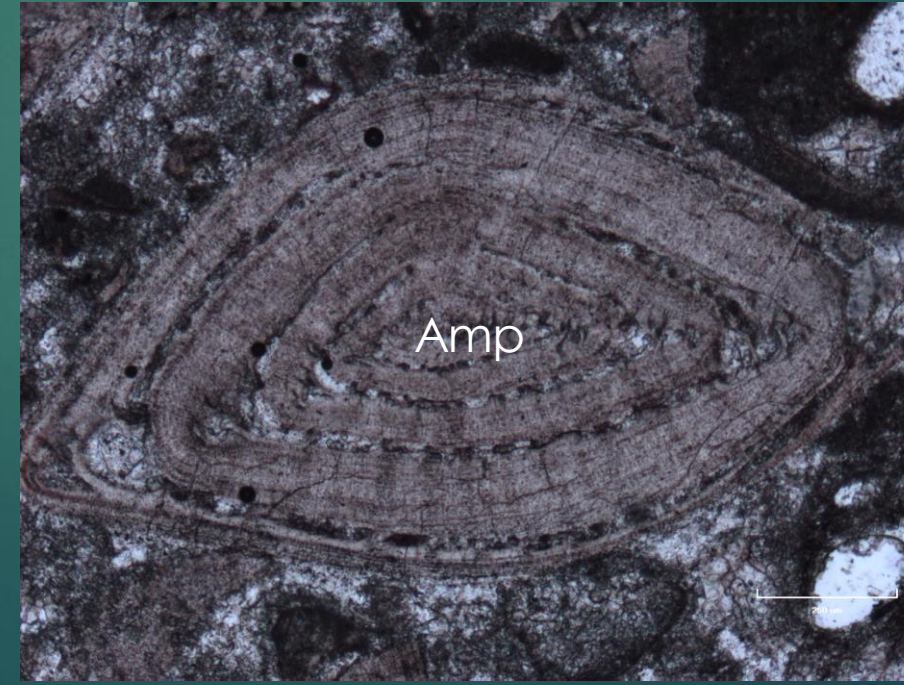
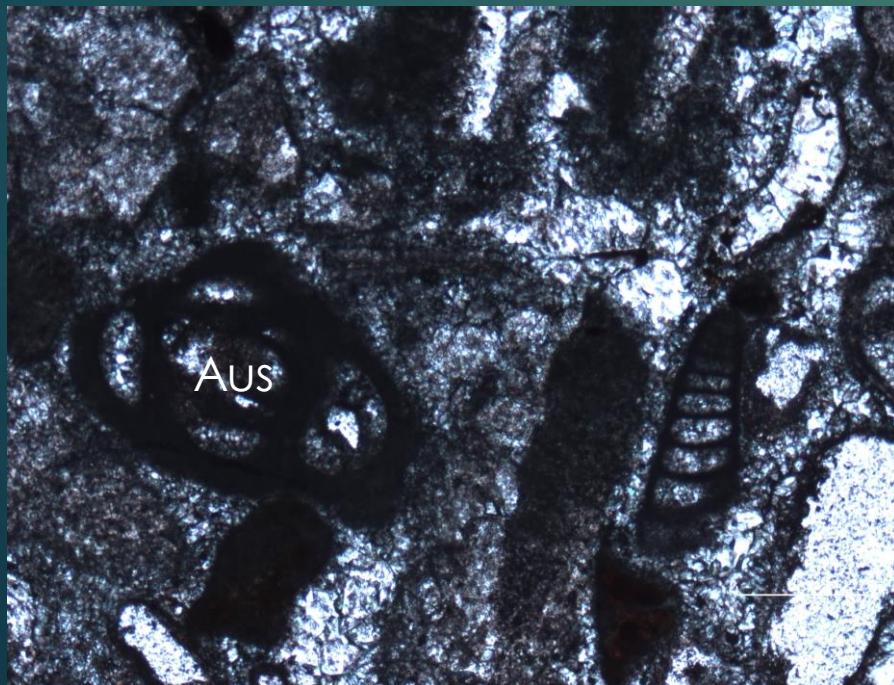
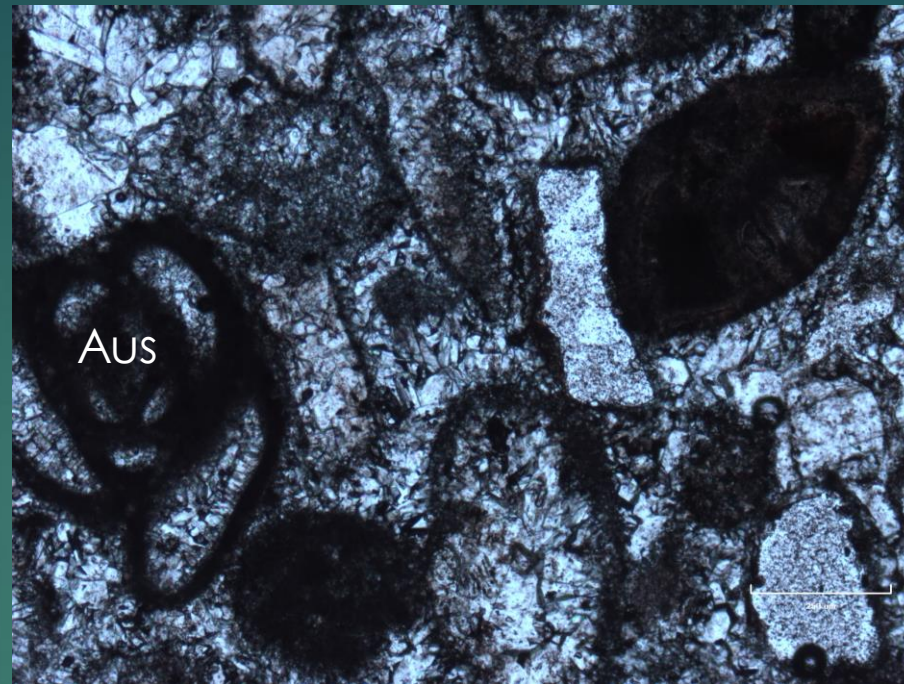
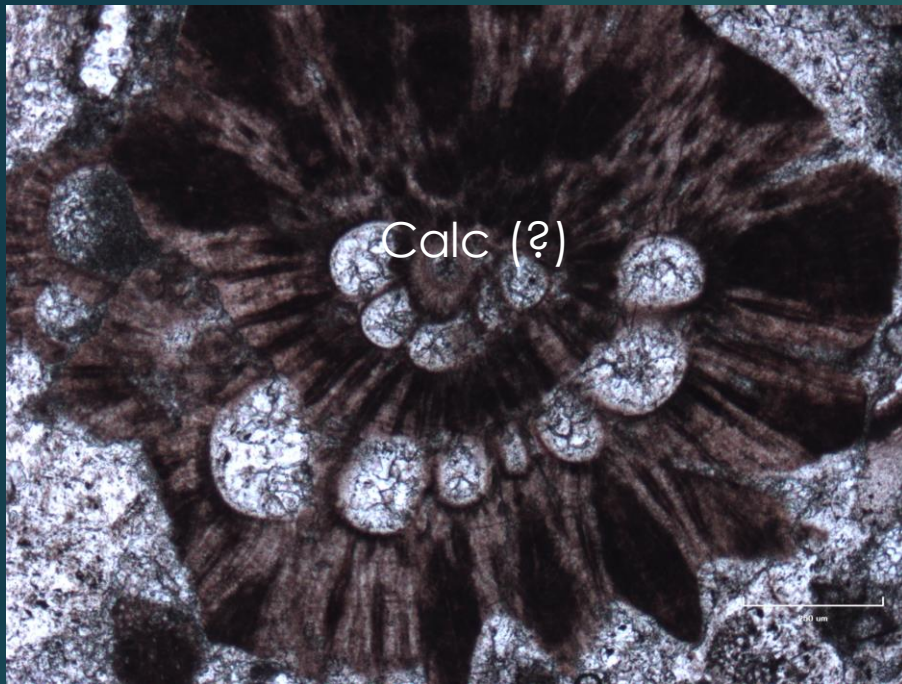
# San Juan Formation

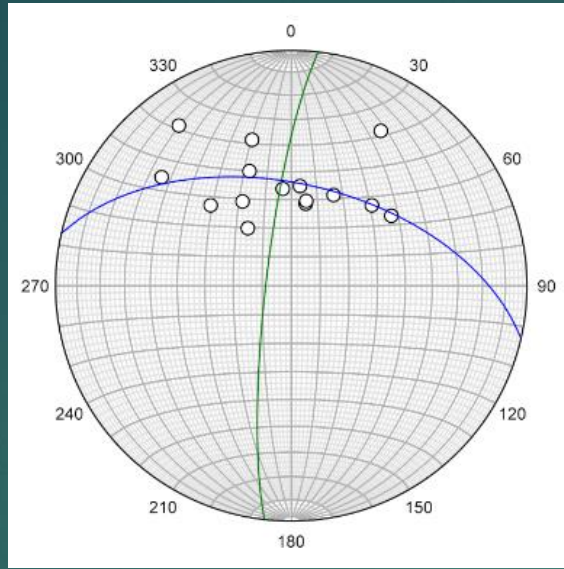
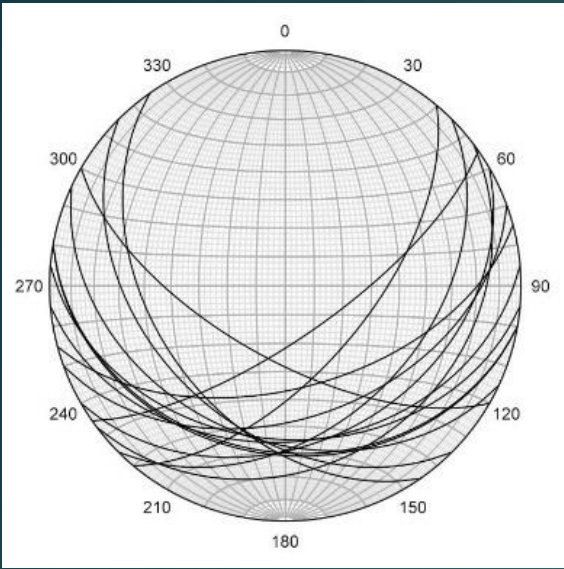
- ▶ “Recent limestone” by Corby et al. (1951)



# San Juan Formation

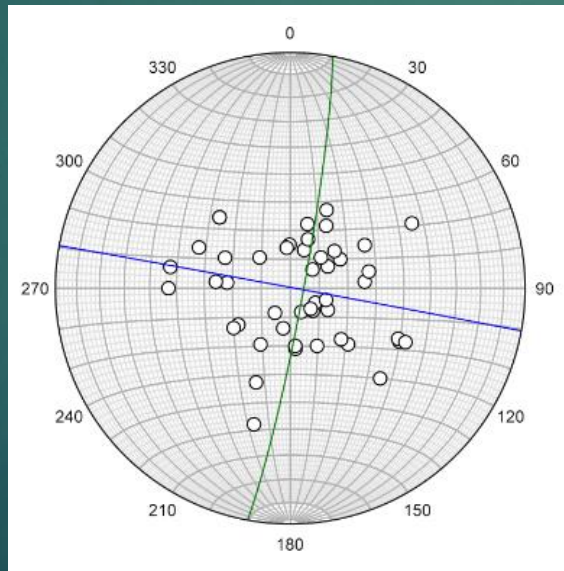
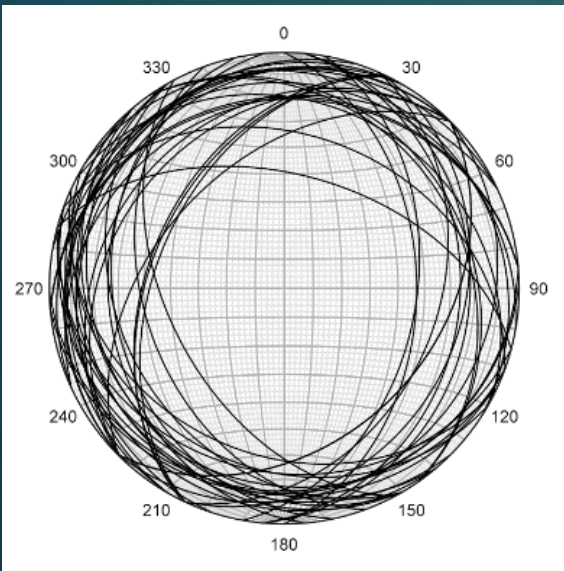
- ▶ Grainstones
- ▶ *Austroliina* sp., *Amphistegina* sp., and *Calcarina* sp.
- ▶ Sparrite matrix
- ▶ Pliocene to Pleistocene





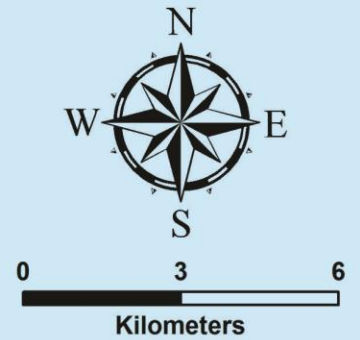
# General Formation

▶ WNW-ESE Compression



# San Juan Formation

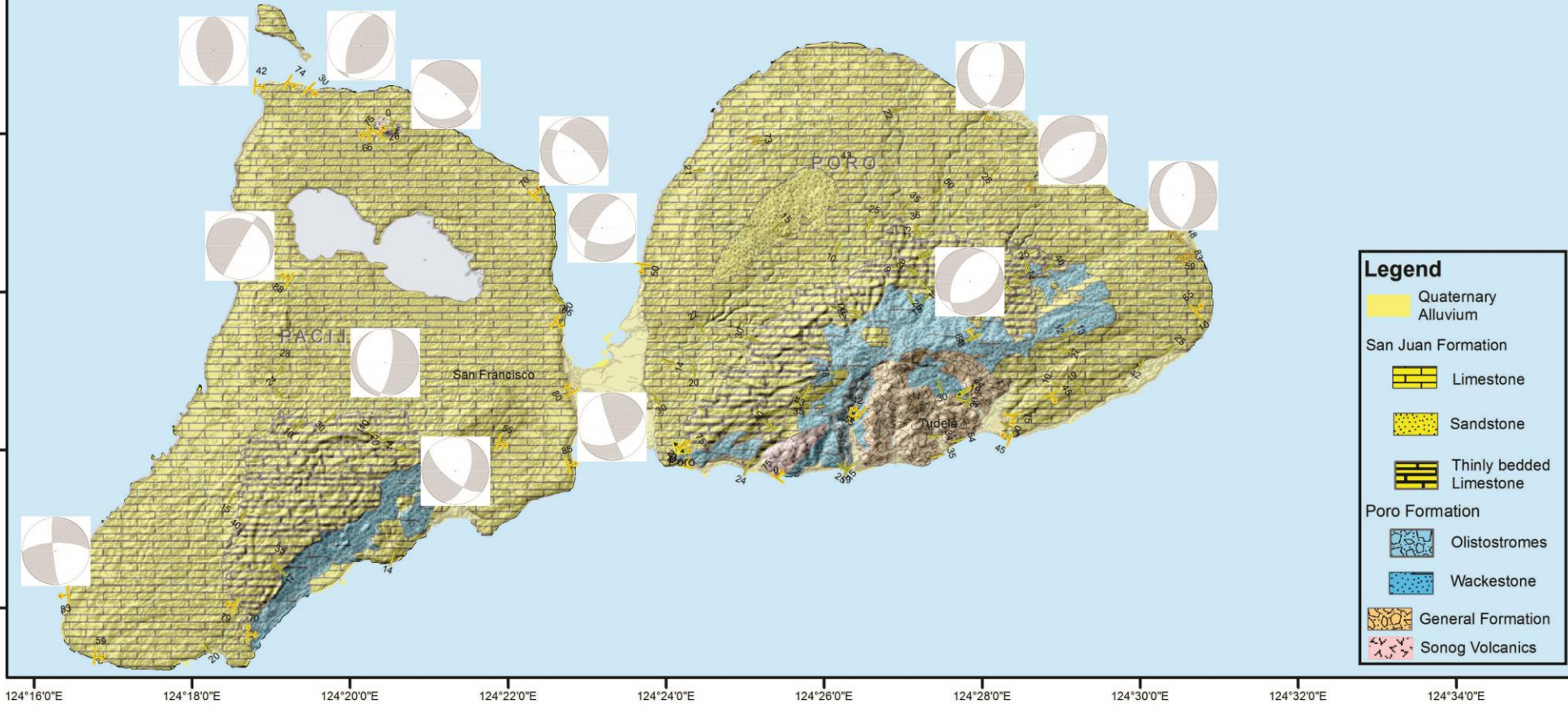
▶ WNW-ESE compression



10°48'0"N  
10°46'0"N  
10°44'0"N  
10°42'0"N  
10°40'0"N  
10°38'0"N  
10°36'0"N

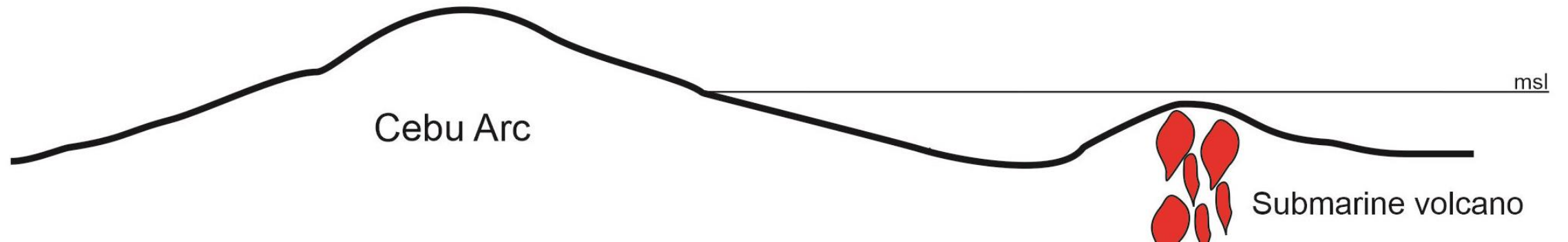
# Fault structures

- ▶ Dominantly NE-SW trending faults
- ▶ Left lateral strike slip faults and Normal fault structures
- ▶ NW trending fault northeast of Danao Lake
- ▶ Thrust/Reverse faults at the northwestern part of Pacijan Island

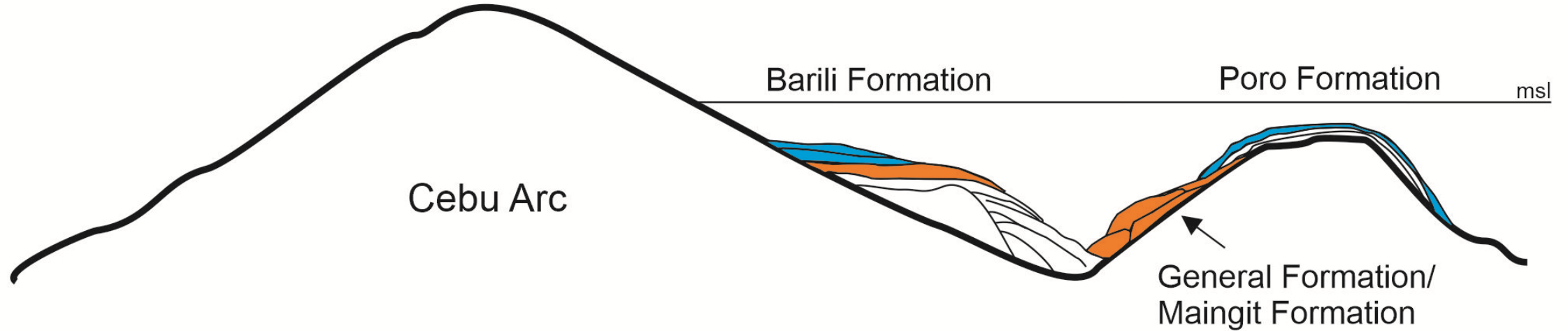


124°16'0"E 124°18'0"E 124°20'0"E 124°22'0"E 124°24'0"E 124°26'0"E 124°28'0"E 124°30'0"E 124°32'0"E 124°34'0"E

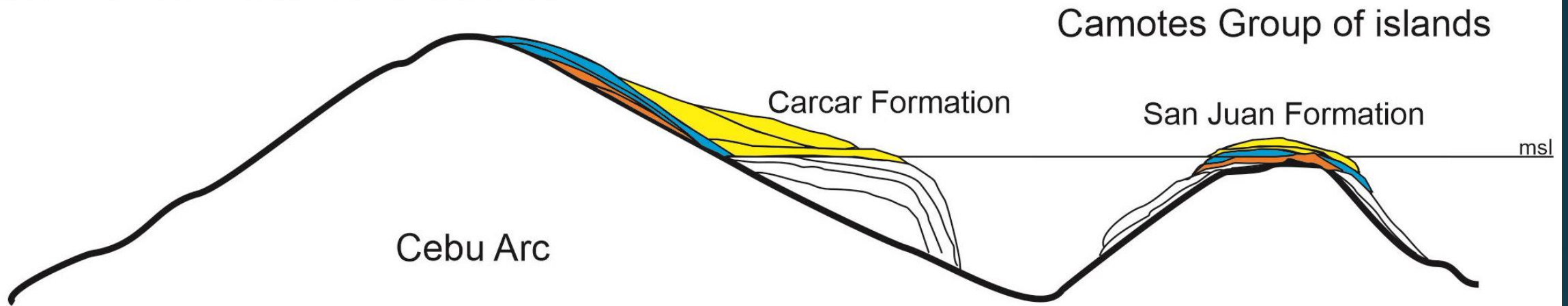
## Early to Middle Miocene



# Late Miocene to Early Pliocene




# Middle Pliocene to Recent



# Conclusions

- ▶ Camotes Group of Islands is underlain by at least four stratigraphic units such as the Sonog Volcanics, General Formation, Poro Formation, and the San Juan Formation.
- ▶ Structural analyses on bed readings consistently suggests a Northwest-Southeast compression from the Late Miocene up to the recent time.
- ▶ Fault structures are generally oriented northeast similar to the trend of the islands. These structures are mostly comprised of left-lateral strike slip faults and normal faults.

- 
- ▶ The Camotes Group of Islands is herein envisaged as an extinct submarine volcano capped by Late Miocene to Early Pliocene open-marine planktic-rich carbonates. Uplift of the isolated carbonate platform was marked by the deposition of the Early to Middle Pliocene olistostromes due to the Northwest-Southeast compression brought by the continued effects of the Palawan-Mindoro Continental Block and the Philippine Mobile Belt collision because deposition of sediment gravity flow deposits are linked with seismotectonic events.



Thank you very much!