



**Chulalongkorn University**  
**จุฬาลงกรณ์มหาวิทยาลัย**  
Pillar of the Kingdom



ACTIVE FAULT ZONES AND SEISMIC ZONATION MAP OF THAILAND:  
A NEW SCENARIO

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# OUTLINE



- Past: What happened in the past?
- Present: What is the outcome at present?
- Future: What do we plan to do in the future?

(Paleo-)Tectonics and Neotectonic to Paleoseismological Investigations

# Cooperation with Taiwan University Past, Present, and Future

- Prof. [Tony Lee](#) (NTNU) and Mary Yee



Prof. [Ching-Hu Lo](#) (NTU)



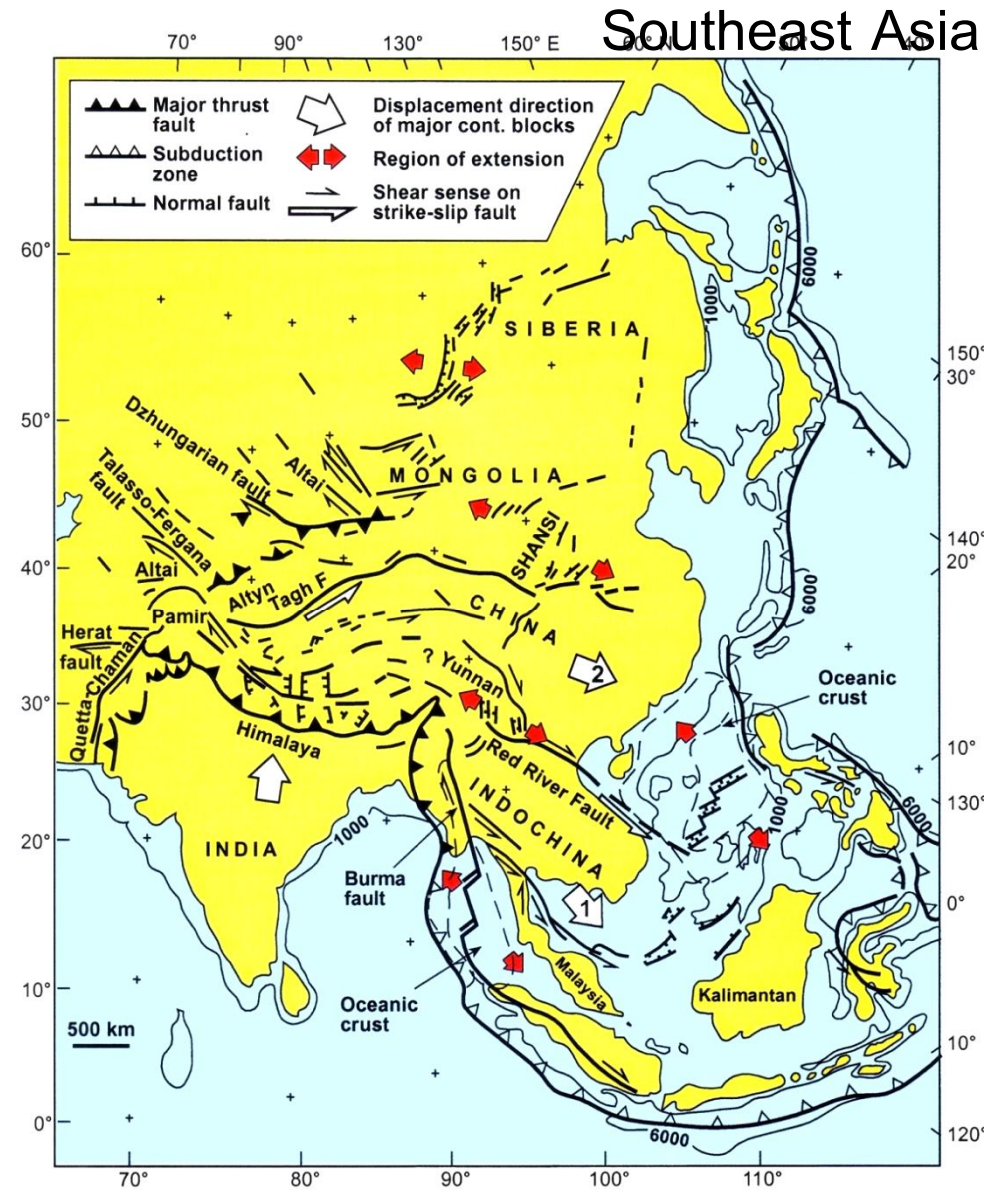
Prof. [C. Lan](#)  
(Academia Sinica)

Hope you will be the next

# Something in common: Tectonic Framework in Mainland



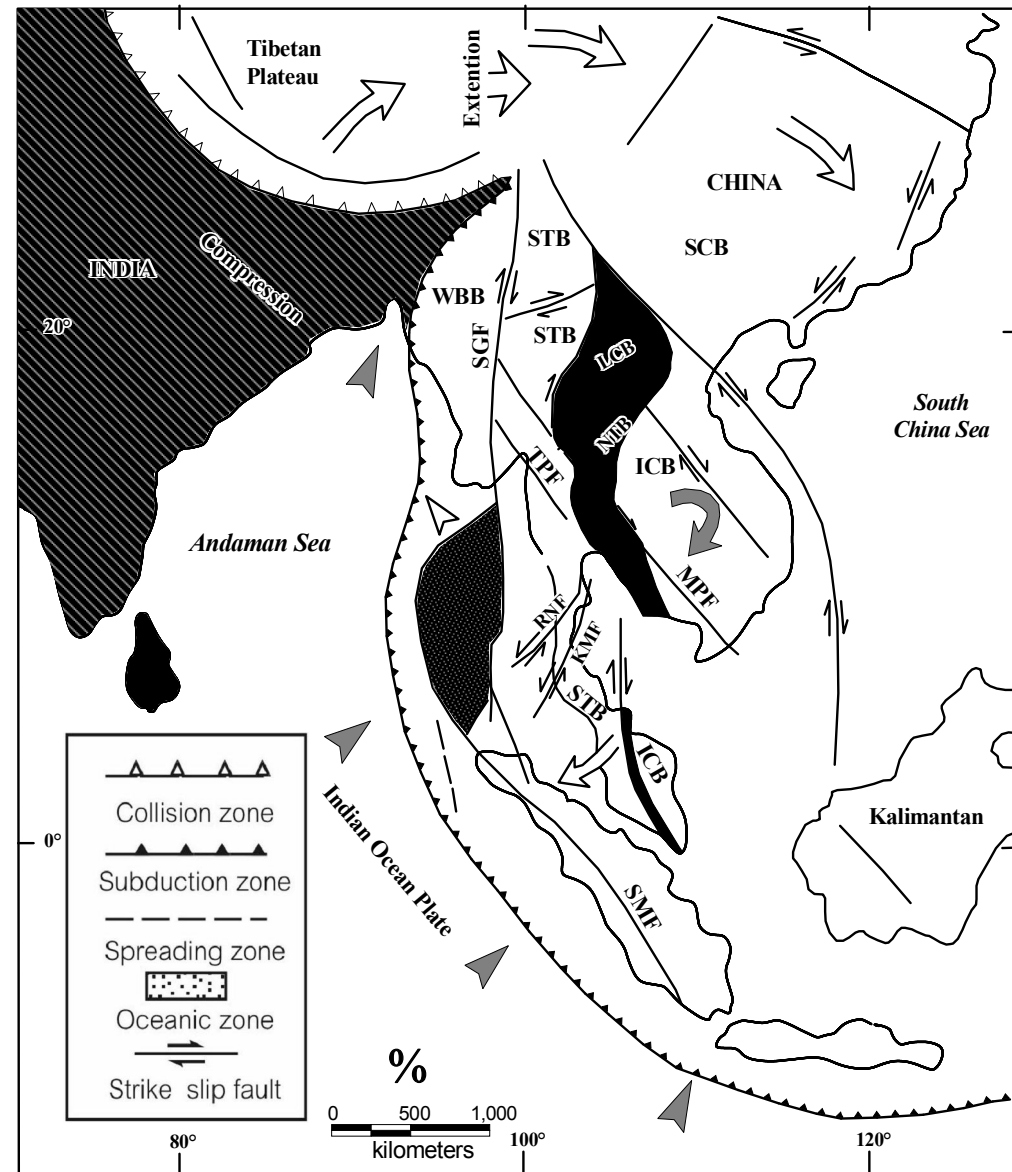
(Tapponnier et al., 1982)





# Tectonic Framework in Mainland Southeast Asia

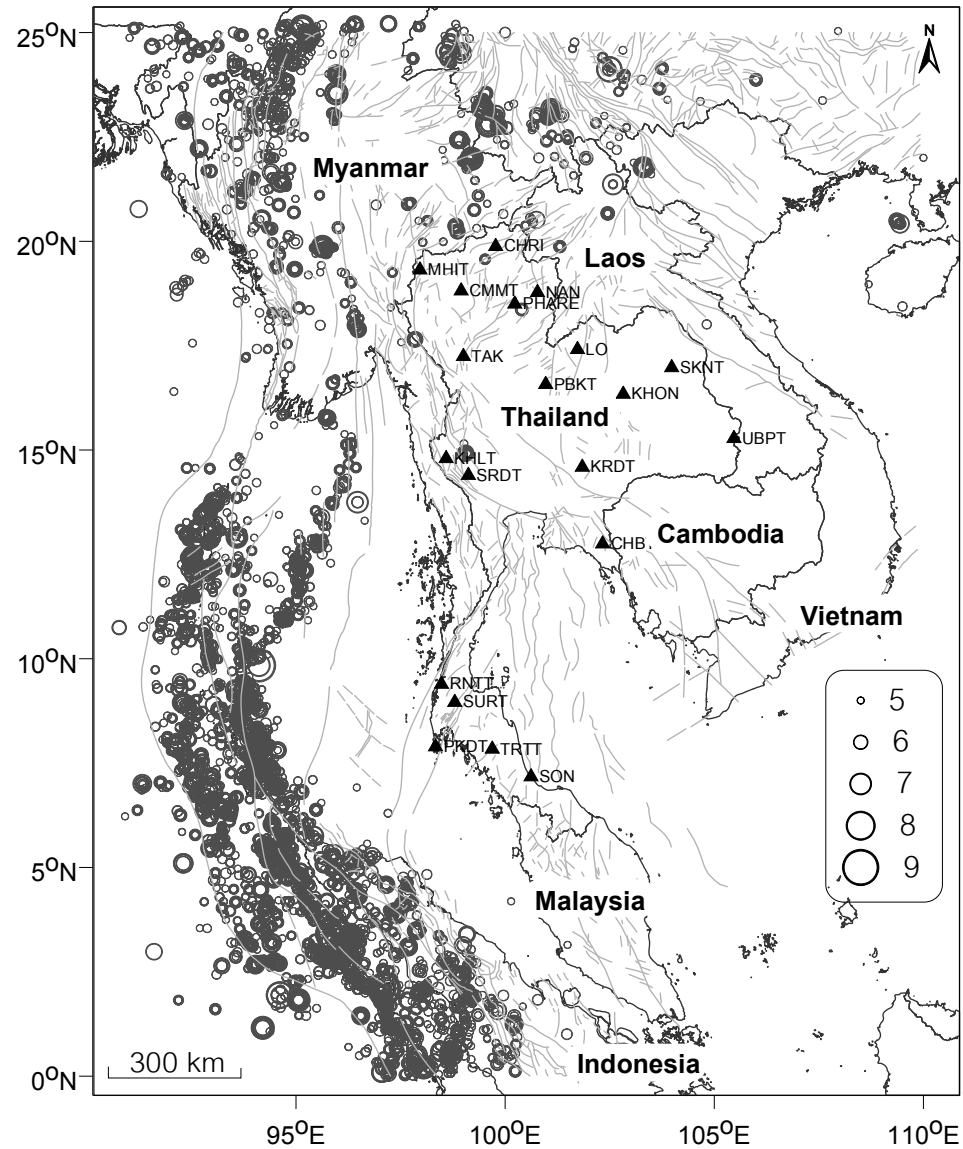
- SGF = Sagaing Fault
- MPF = Mae Ping Fault
- RNF = Ranong Fault
- KMF = Klong Marui Fault
- SMF = Sumatra Fault
- NUF = Nan Uttaradit Fault
- TPF = Three Pagodas Fault
- RRF = Red River Fault



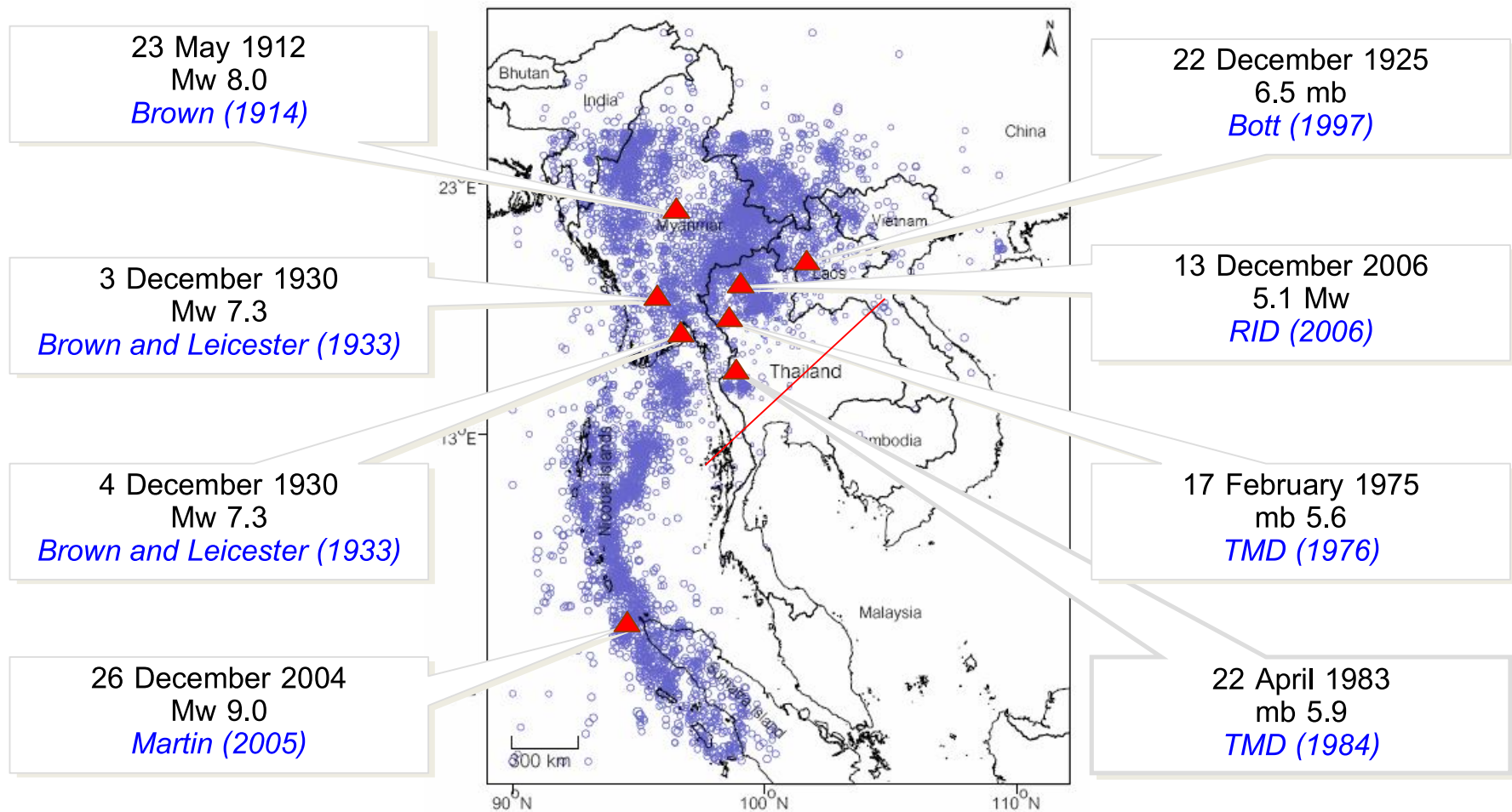
(Polachan et al., 1991)

# Instrumental Earthquake Records

Map of mainland SE Asia showing the distributions of the earthquakes with a  $M_w$  of  $> 5$  from the IRIS earthquake catalogue.



# Instrumental Earthquake Records (Significant earthquake events)



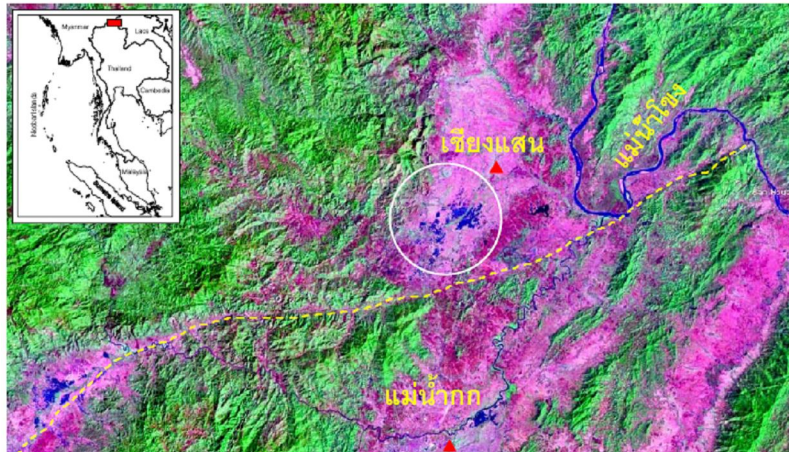
EQ data (1963-2002) : 14,286 events

Source : Thai Meteorological Department (TMD)



# Historical Earthquake Records (Ancient Remains)

A.D. 1009, Wiang Nong Lom



A.D. 1545, Royal Pagoda



A.D. 1764, Pua



A.D. 1839, Innwa EQ

A.D. 1956, Sagaing EQ



A.D. 1917, Bago (Pygu) EQ

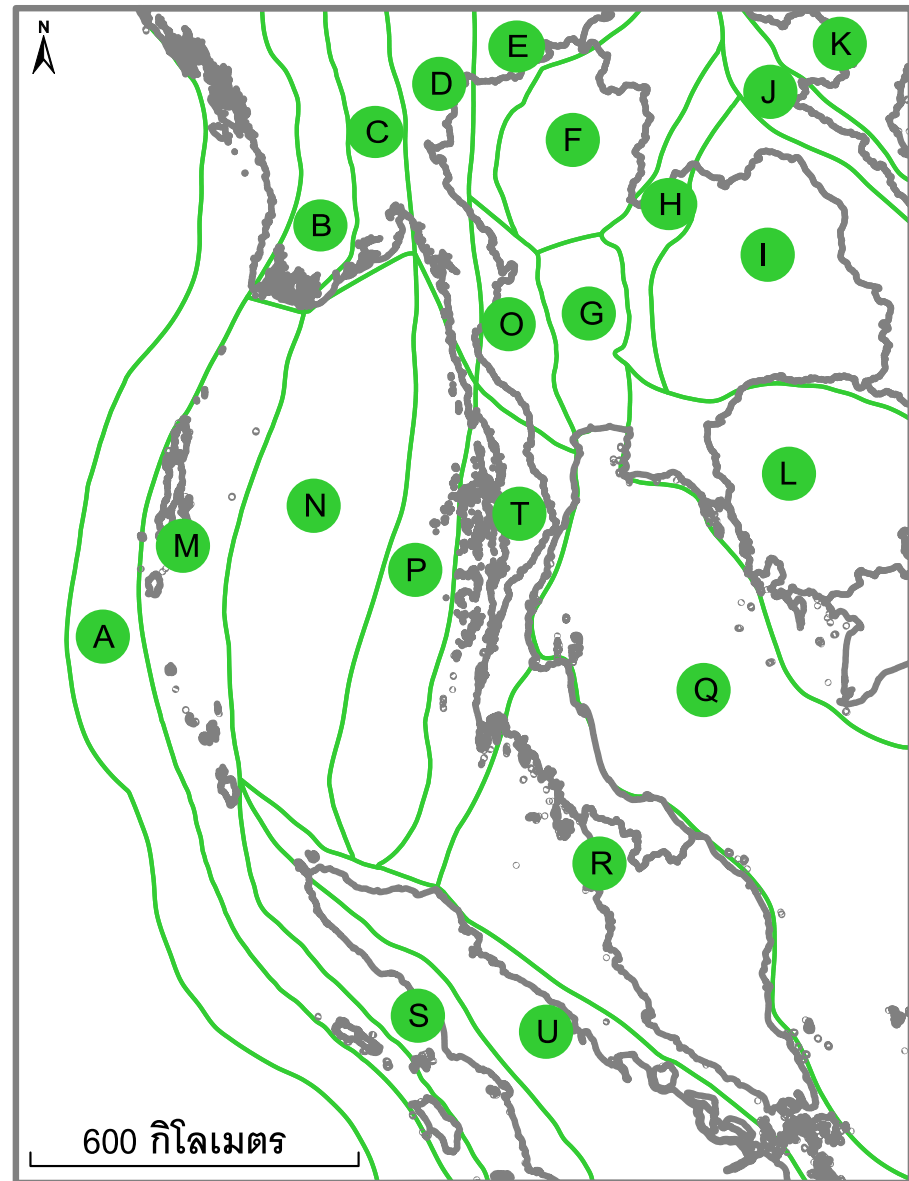


A.D. 2008 Paleo-tsunami



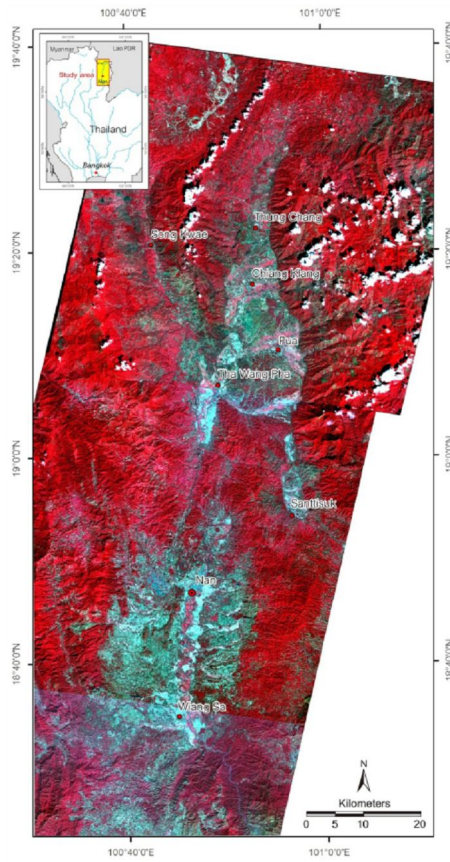
# Seismic Source Zone in Thailand

- A = Andaman subduction zone
- B = Central Myanmar zone
- C = Sagaing Fault Zone
- I = Khorat Plateau
- D = Gulf of Thailand zone
- R = Malay Peninsula zone

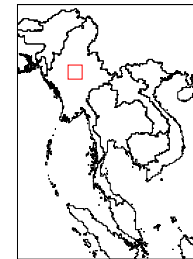
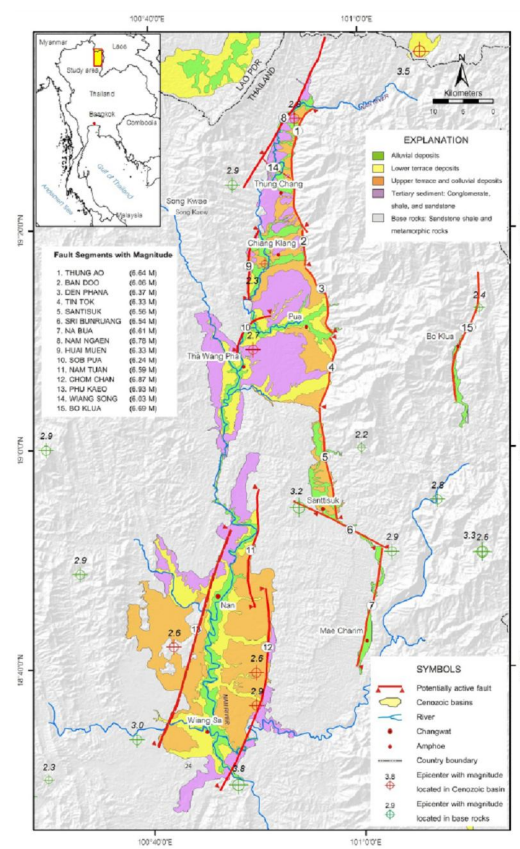




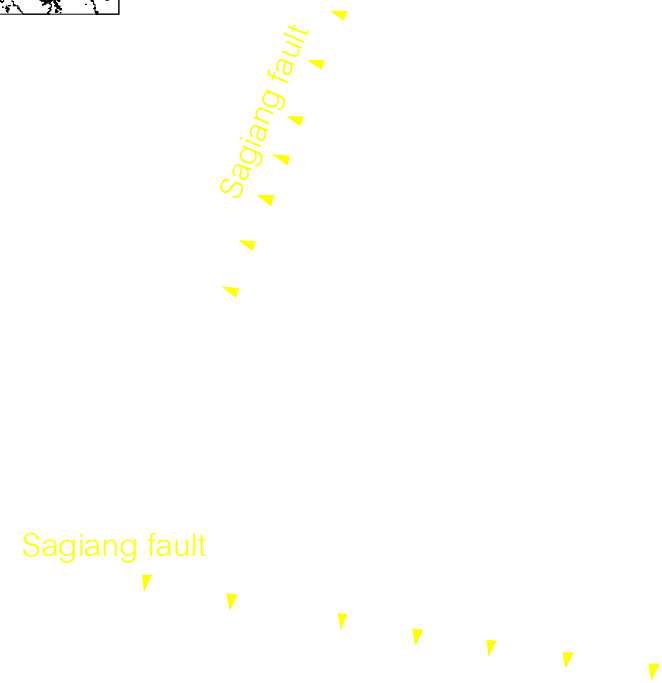
# Remote Sensing Investigation



Pua FZ.



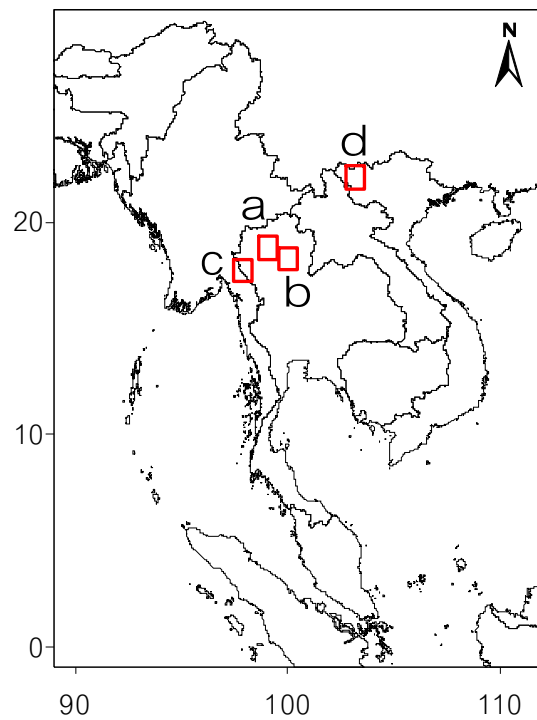
a



b

Sagiang FZ.

# Remote Sensing Investigation



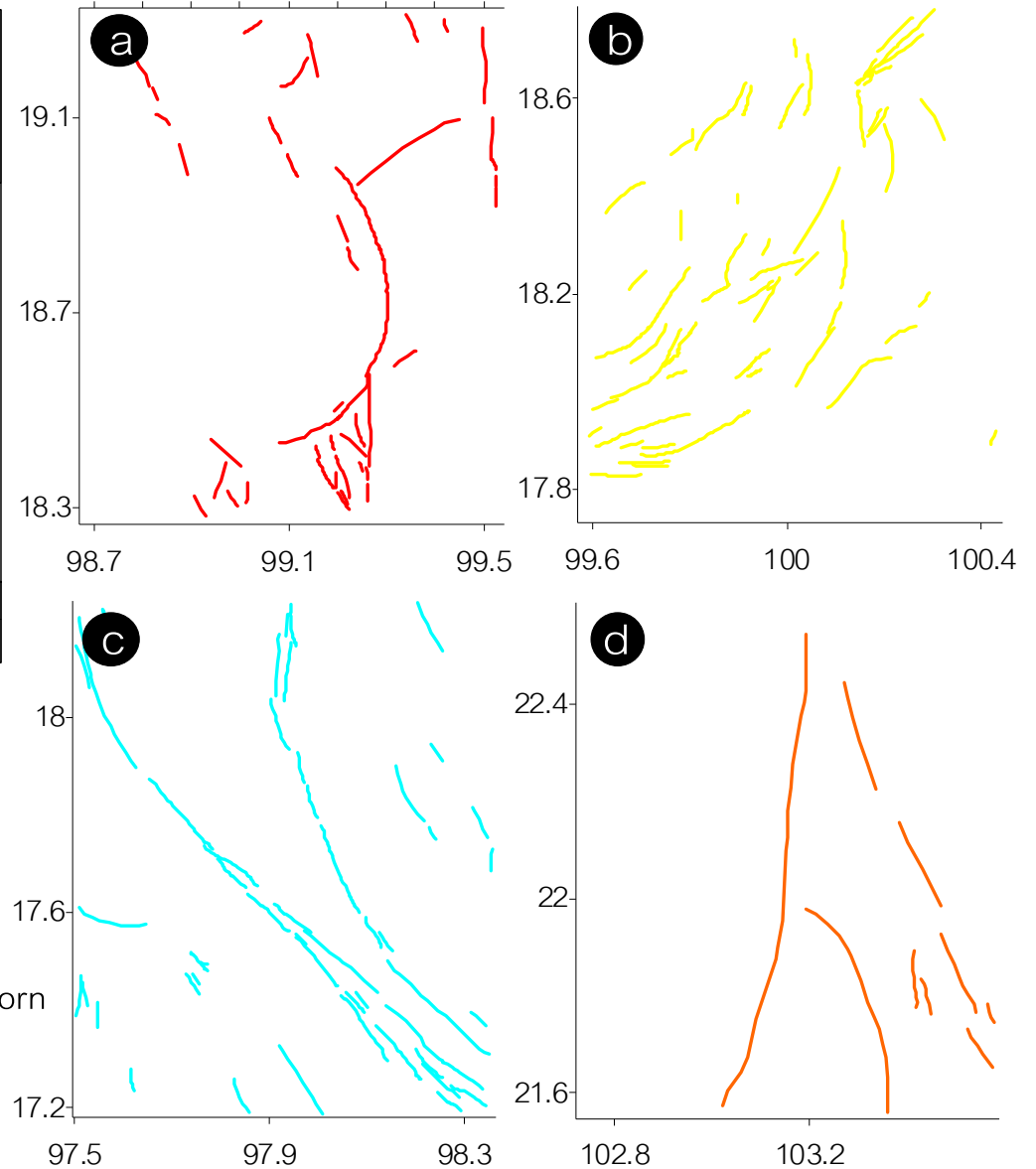
## Fault Zones

a - Mae Tha

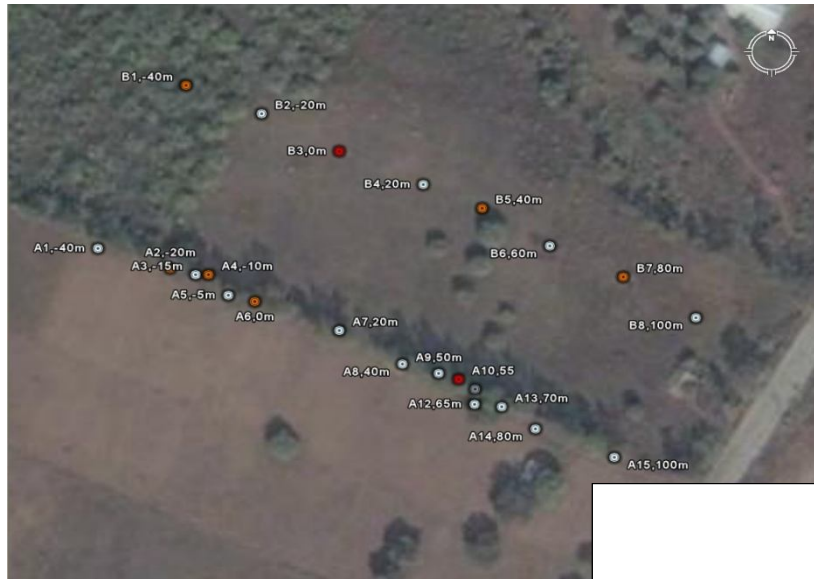
b - Lampang-Thoen and Phrae

c - Moei-Tongyi and Mae Hong Sorn

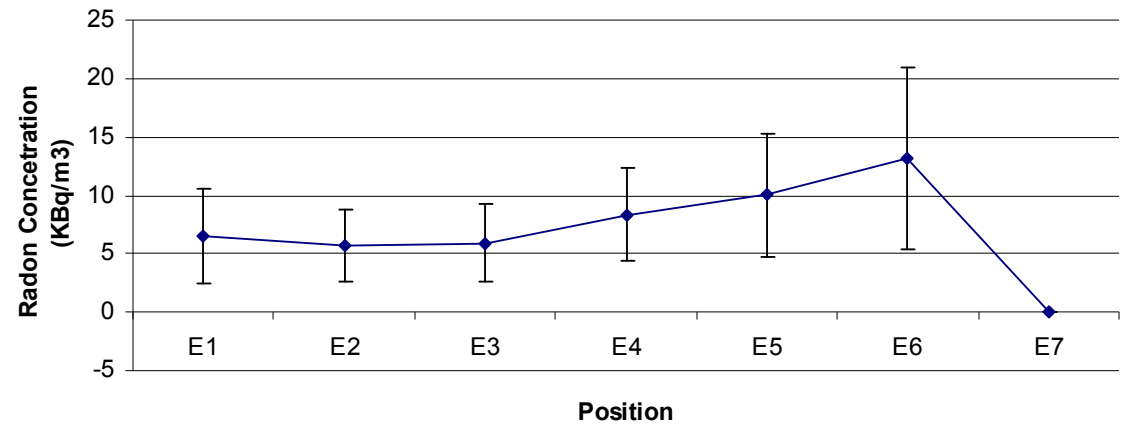
d - Dein Bein Fu



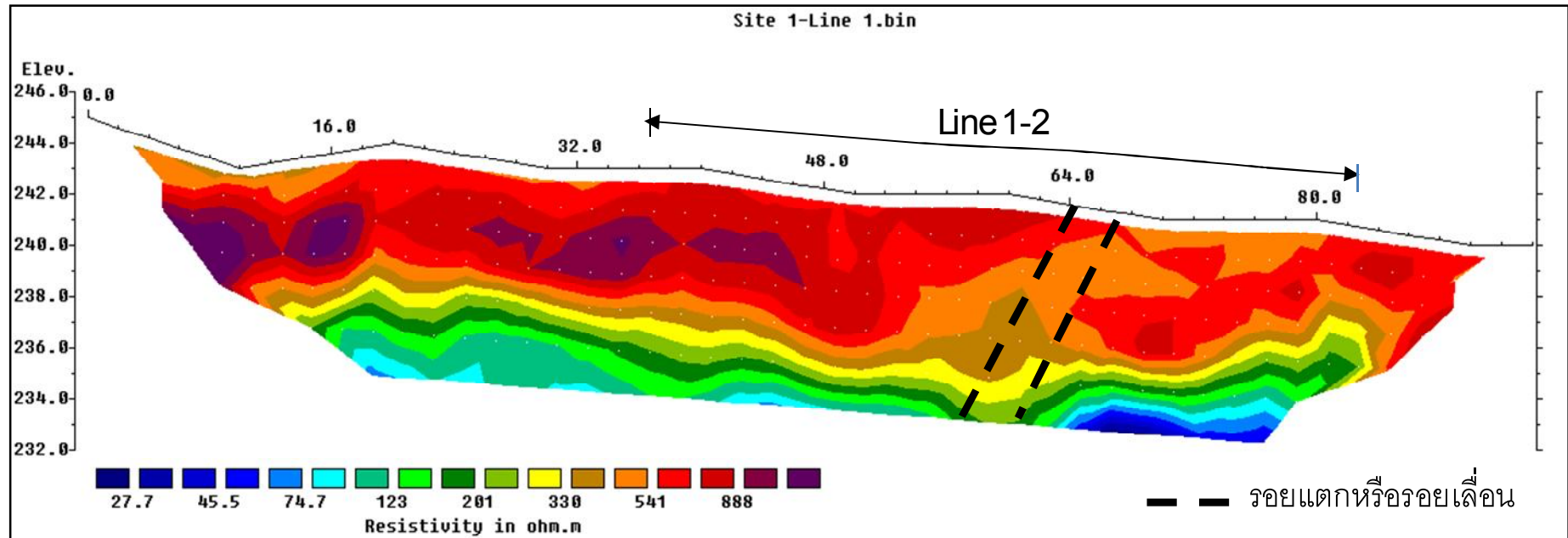
# Radon Survey



พื้นที่ 3 บ้านห้วยเคี้ยว เส้นสำรวจที่ E



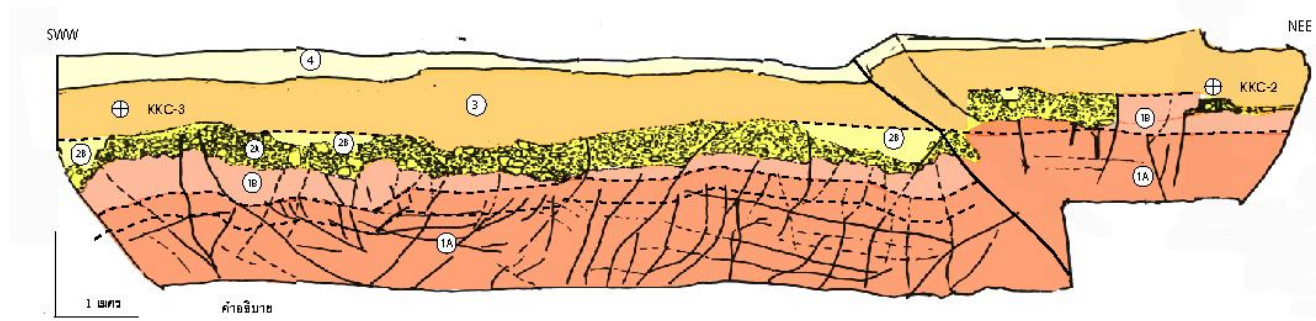
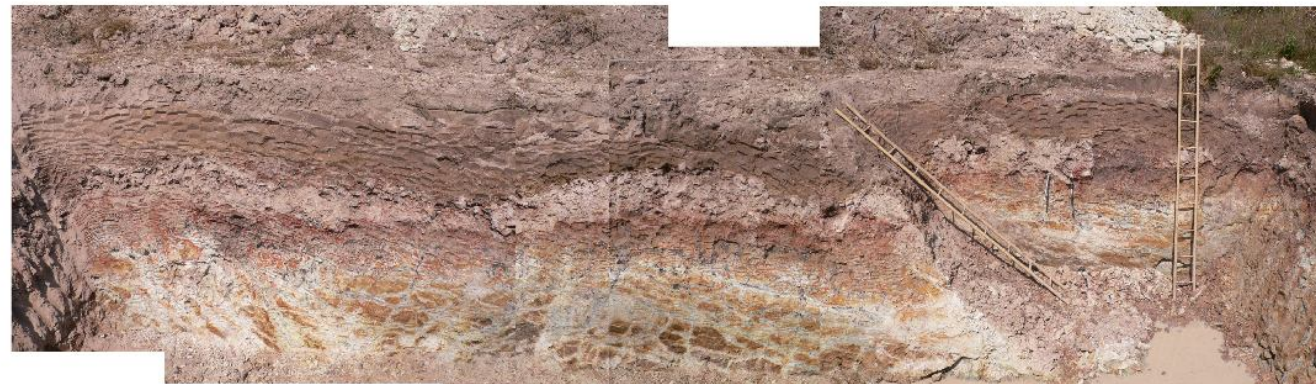
# Resistivity Survey





# Paleoseismological Investigation in Thailand

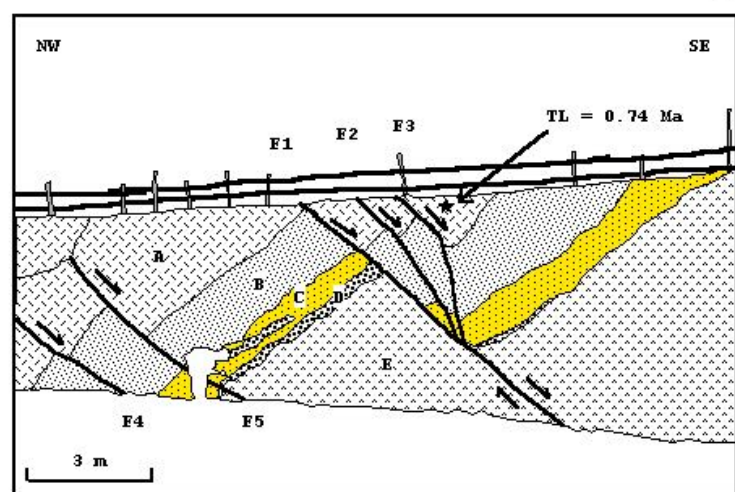
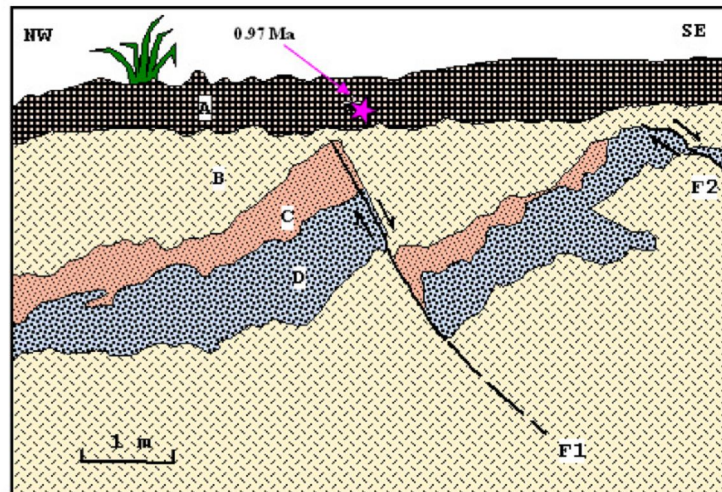
Ongkalak FZ.





# Geological Earthquake Records

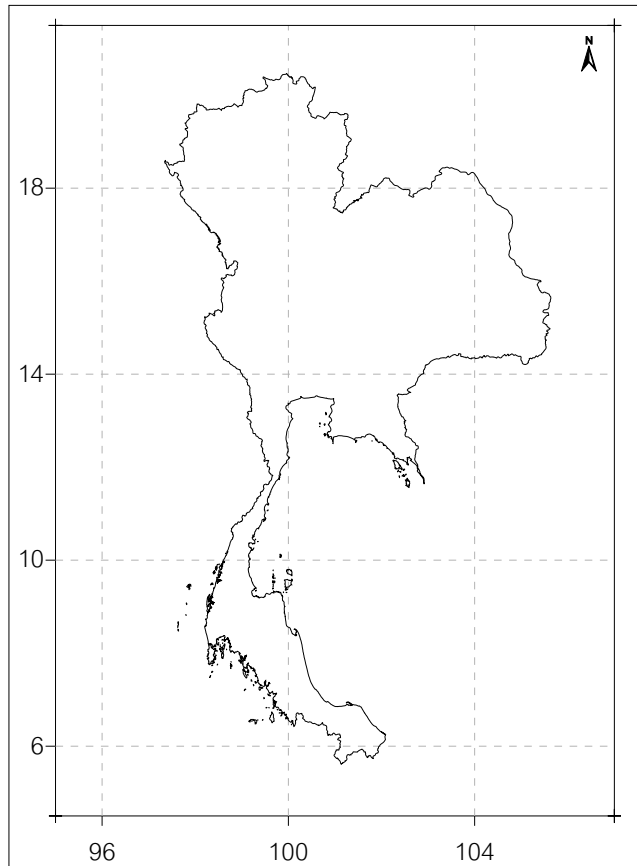
## Phrae FZ.



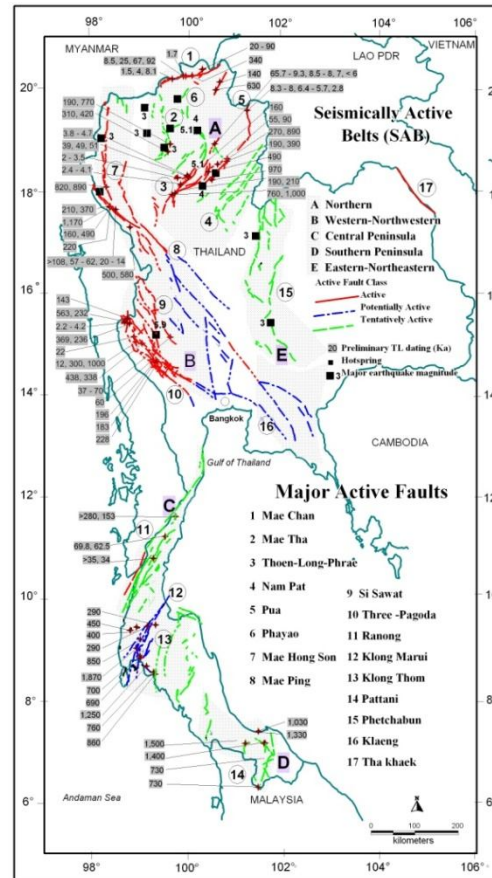
A

B

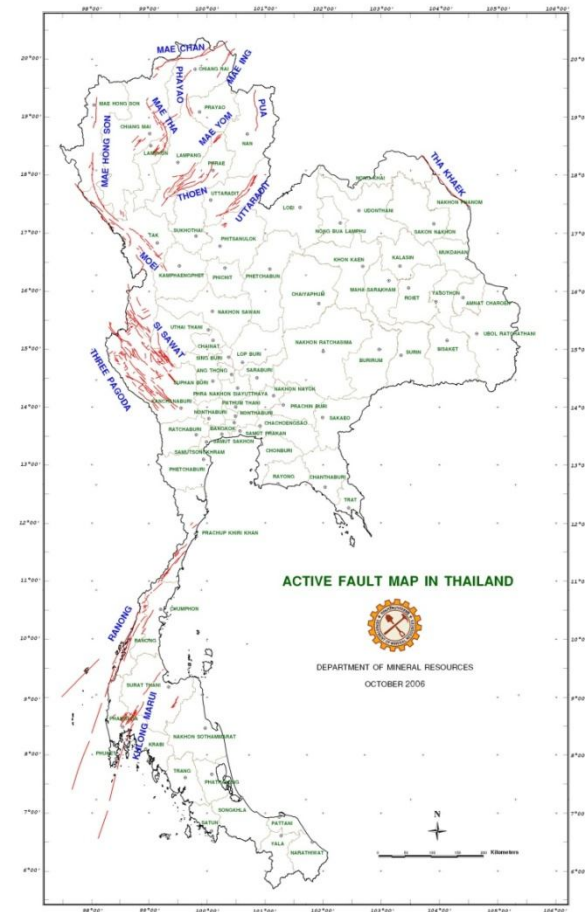
# Active Fault Maps in Thailand



(Chuaviroj, 1991)

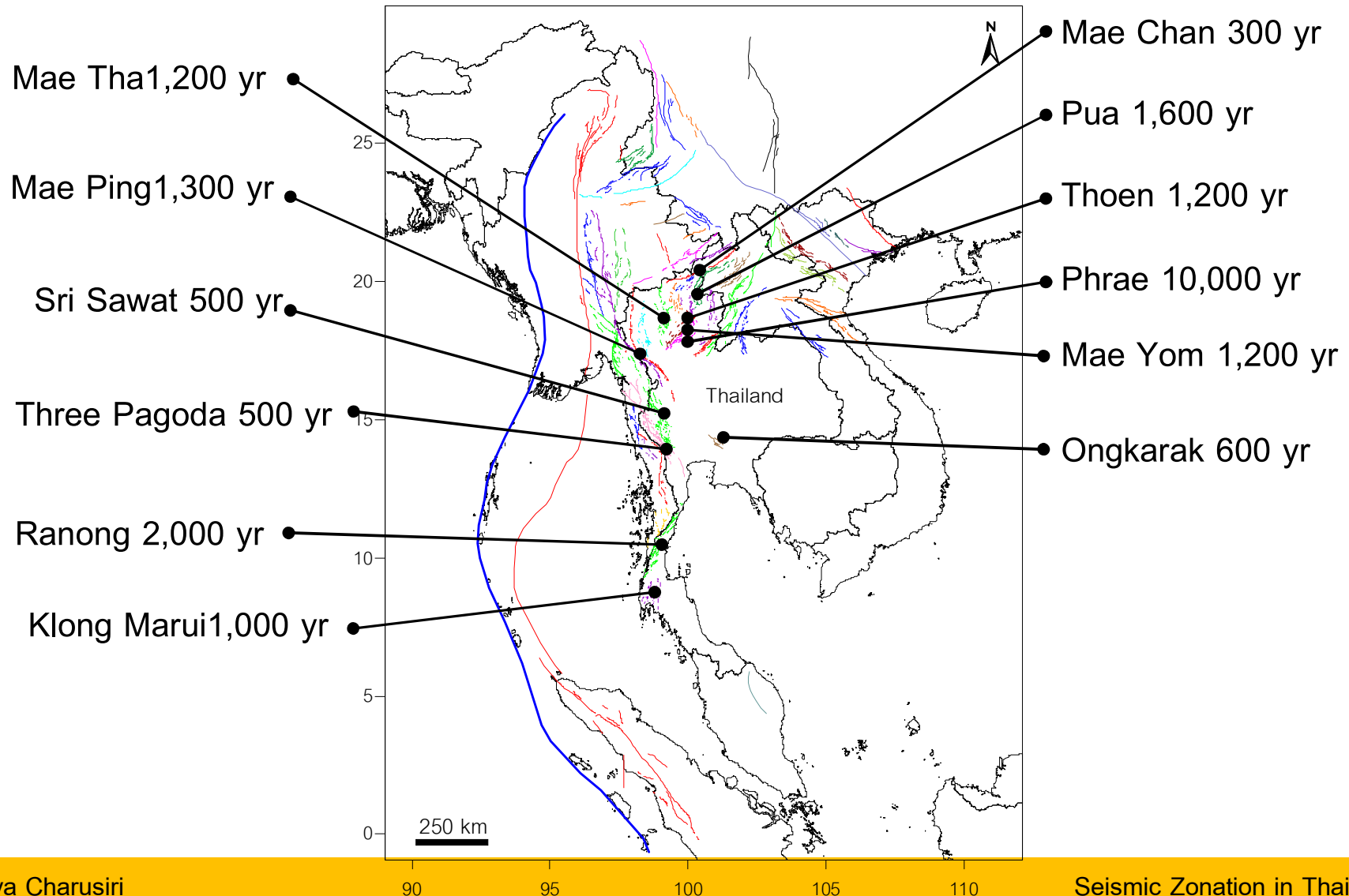


(Charusiri et al., 2000)



(DMR, 2006)

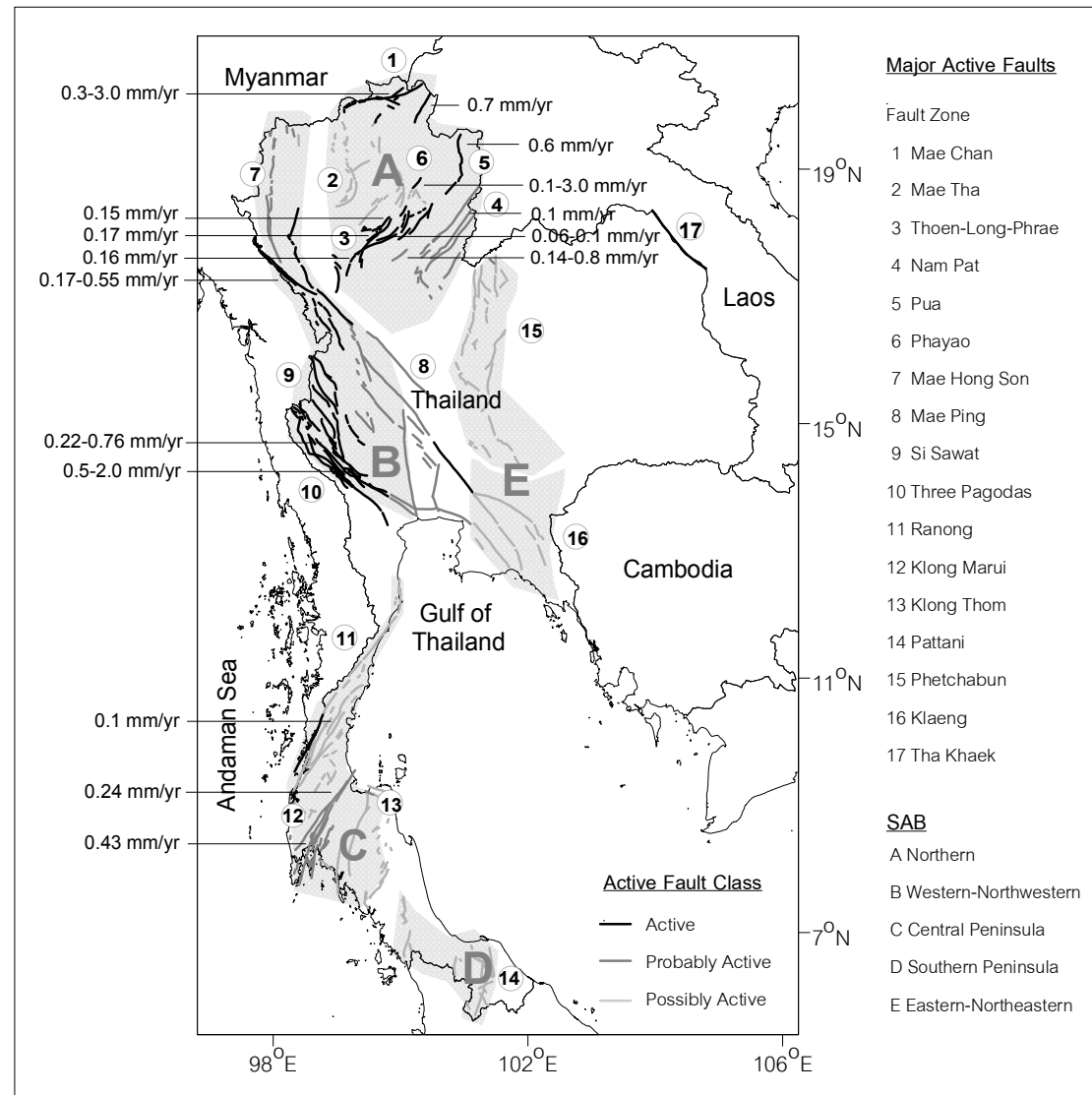
# Recurrence Intervals for Active Faults in Thailand (Latest Results)





# Rate of Fault Slip in Thailand (Base mainly on Active Fault Study)

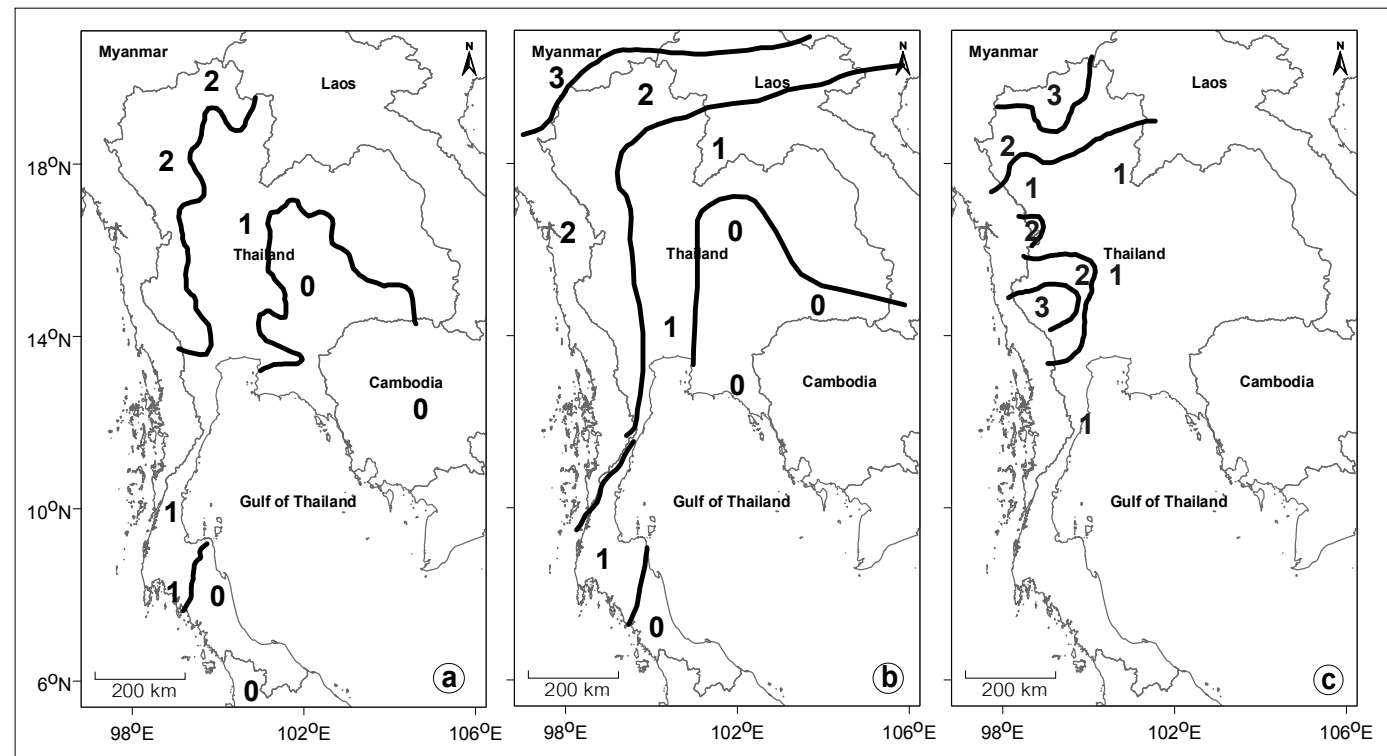
Map of Thailand showing the 17 major active fault zones, active fault class, and the five Seismically Active Belts (SABs), including the slip rate (mm/yr) of each individual fault segment.



## Earlier Seismic Zonation Map in Thailand

Map of Thailand showing earlier seismic zoning data from (a) Chandrarangsu (1986), (b) Prachaub and Wechbunthung (1992) and (c) Lukkunaprasit (1994). S

- (0) Aseismic
- (1) Weak
- (2) Intermediate
- (3) Strong





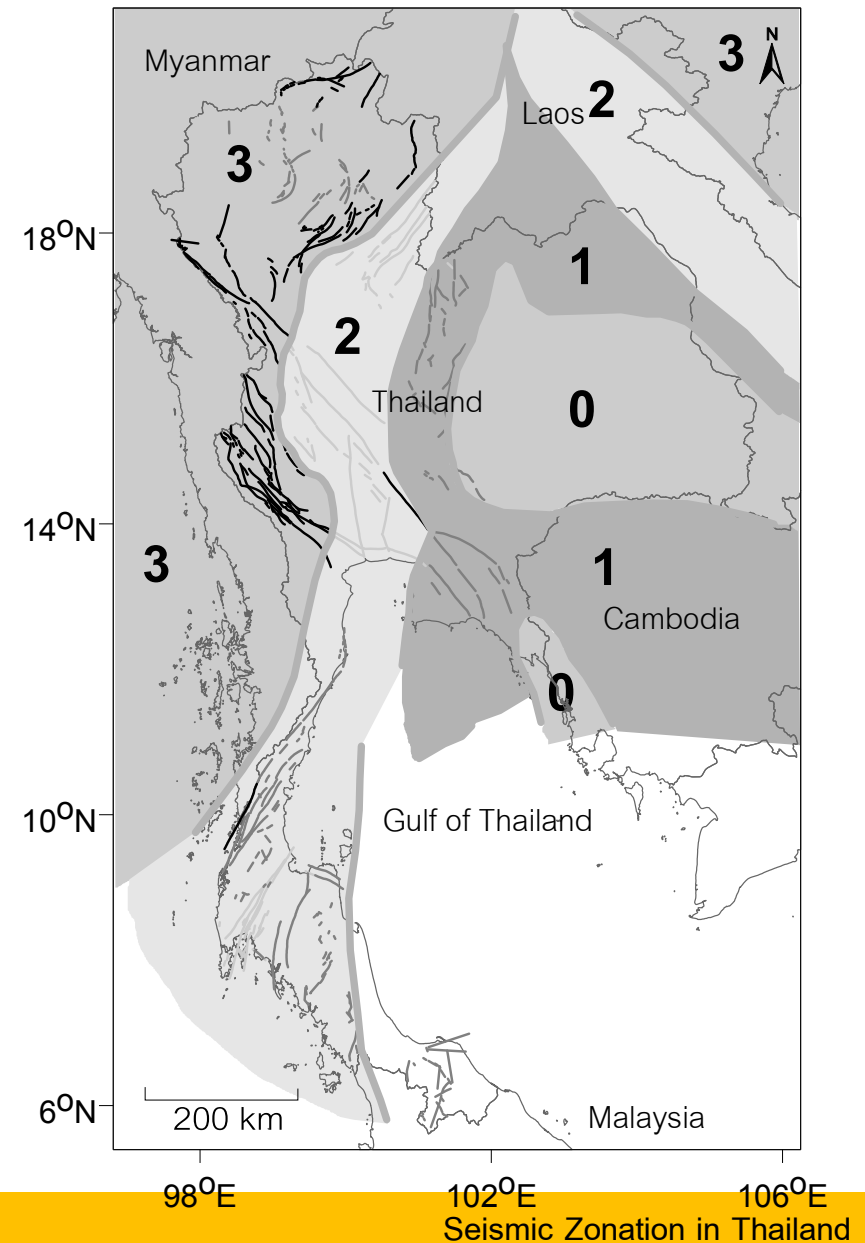
## A New Seismic Zonation Map of Thailand (This Study)

**Zone 0** earthquakes rarely occur; most faults are inactive

**Zone 1** very slightly earthquake prone; most faults are possibly active

**Zone 2** prone to earthquakes and with possibly and probably active faults

**Zone 3** very prone to earthquakes with active and probably active faults





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Future work: Advance techniques in  
Paleoseismological investigation

