Active Tectonics around Western Myanmar: Preliminary mapping result

Yu Wang[1], Kerry Sieh[1], Soe Thura Tun[2], Win Swe[2] and U Than Myint[2]

[1] Tectonics Observatory, California Institute of Technology [2] Myanmar Earthquake Committee

A. Kabow Valley and Kabow fault system

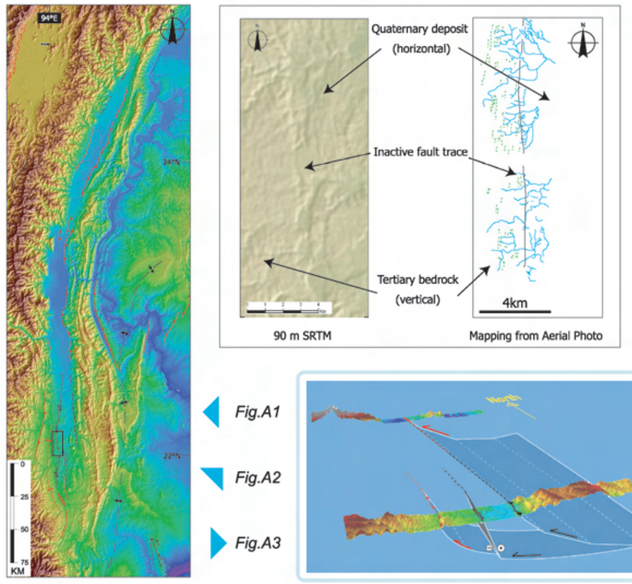


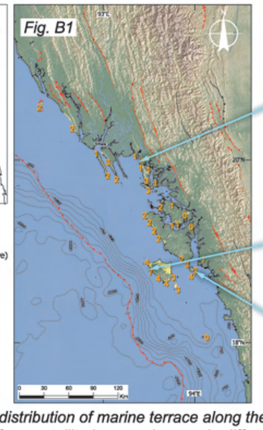
Fig.A1

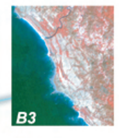
Fig.A2

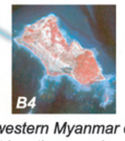
Fig.A3

Fig.A **(A1)** Close view of the Kabow Valley in the eastern limb of Indo-Burma Range. This area is dominated by east dipping thrust faults. Previous GPS study suggested 9-12mm/yr Indo-Sunda plate motion is absorbed along the Kabow fault. **(A2)** The aerial photos' result suggests part of the Kabow fault system is inactive from geomorphic expression. The clear lineation in the SRTM is fault-line scarp. **(A3)** The Kabow fault slip partition system cartoon. We suggest only the western most fault trace in this system is active now.

B. Ramree Island and 1762A.D. earthquake







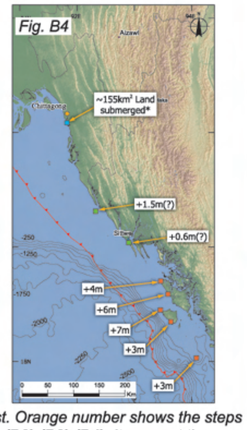
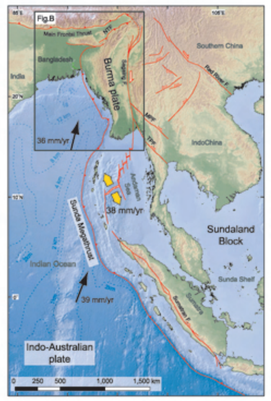


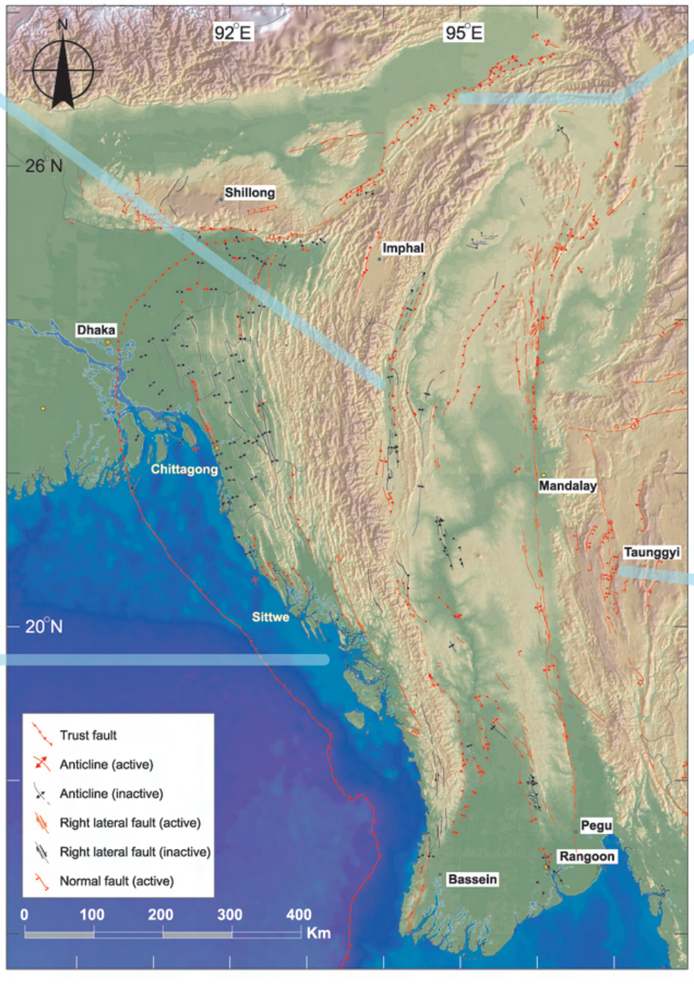
Fig.B **(B1)** The distribution of marine terrace along the western Myanmar coast. Orange number shows the steps of terrace from satellite images. Images in different location are shown in **(B2) (B3) (B4)**. It suggest the northwestern corner of Cheduba Island is the Holocene uploft center in this area. Also, the steps of terrace increases toward the megathrust. This feature suggests the distribution of marine terraces are controled by the active behavior of the megathrust.
(B4) Possible Co-seismic deformation during the 1762A.D. earthquake. Red dot: measured coast elevation in 1842 A.D. Green dot: Possible earthquake related uplift from previous study. Blue dot: Tectonic subsidence or liquefaction during the 1762 earthquake. The uplifting pattern is similar to the distribution of marine terraces



This study presents the active tectonics features around the Burma plate. It is based on the geomorphic expression of 90m SRTM dataset and stereo aerial photos.

Fig.1 Regional tectonic map of the Burma plate. The blue contour shows the thickness of marine sediment in the Bay of Bangle area. The Indo-Australian plate moves 36mm/yr relative to Sunda on the latitude of Burma plate. The central Andaman Sea full spreading rate is ~38mm/yr based on the magnetic anomalies

Fig.2 Active tectonic map around western Myanmar. The landarea is based on 90m SRTM. Offshore area is based on ETOPO2 & previous studies



C. Naga thrust fault system

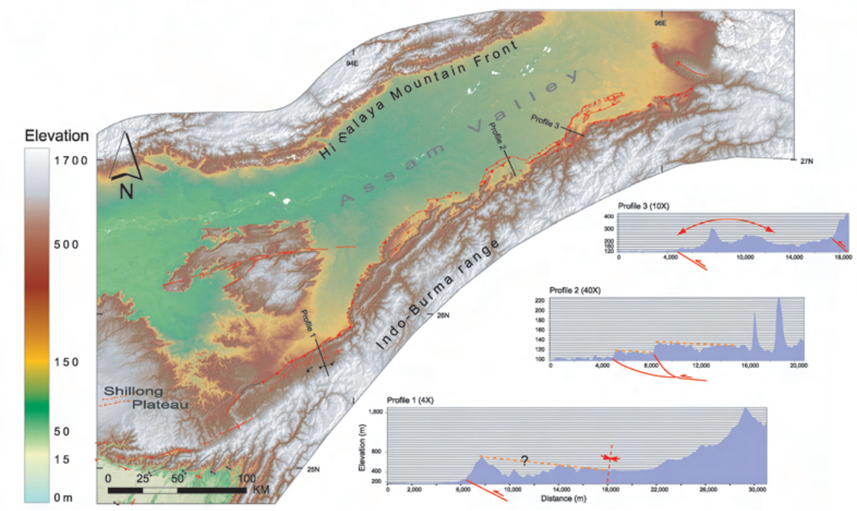
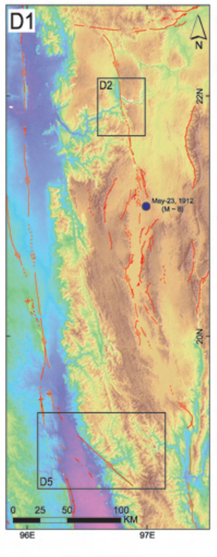


Fig.C The Naga thrust fault system is setting on the northern edge of the Indo-Burma Range. The total fault length is >400km. This fault system consists of 3 major segments. The southern segment, close to the Shillong plateau, shows one major fault scarp in the mountain front. It also affects the surface in the hanging wall, presents back tilting of the alluvial surface **(Profile 1)**. The frontal fault-popagation fold start to developed in middle segment . The northern segment shows various features on the surface. In the location of **Profile 2**, the fault sprays in the shallow part. It futher develops to a fualt-popagation fold in the northern fault branch **(Profile 3)**. We believe these different structural behaviors is controled by the thickness change of the foreland sediment in Assam Valley. The foreland sediment become thicker toward the northeast based on the geological data.

D. Inversion strike-slip fault and 1912A.D. earthquake



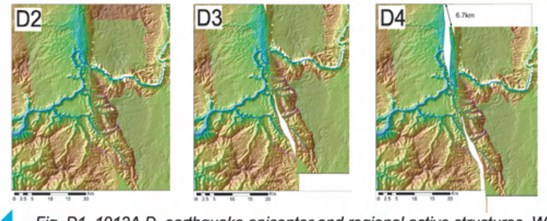


Fig. D1 1912A.D. earthquake epicenter and regional active structures. We believe this earthquake was related to the right-lateral / half graben system in the center of the map. The hairpin river morphology (D2) in the northern extension of this structural system suggests the slip inversion in this region. (D3) shows the restoration of the later right - lateral slip based on the river morphology. It suggests ~ 4km right lateral slip along the fault trace. We futher use the geological contact to reconstruct the early left-lateral slip in (D4). The result suggests 6-7km left-lateral slip along the fault trace.

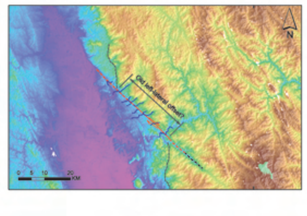


Fig. D5

The other possible inversion strike slip fault near Sagaing fault. The western part of Papun fault next to the Sagaing fault shows right lateral slip on the river morphology. However, the geological contact suggests it was once the left-lateral fault. The surface feature suggest only the western Papun fault is active now.