

Complications for modeling GPS:

Reference Frame: Bangladesh and Myanmar data processed together.
Used same IGS stations and Gahalaut

Indian plate motion: Helmert transform to align with Mahesh et al., 2012
Found new pole using 13 sites of Mahesh plus DHAK and RAJS

Projection: How to project velocities along strike to form profile

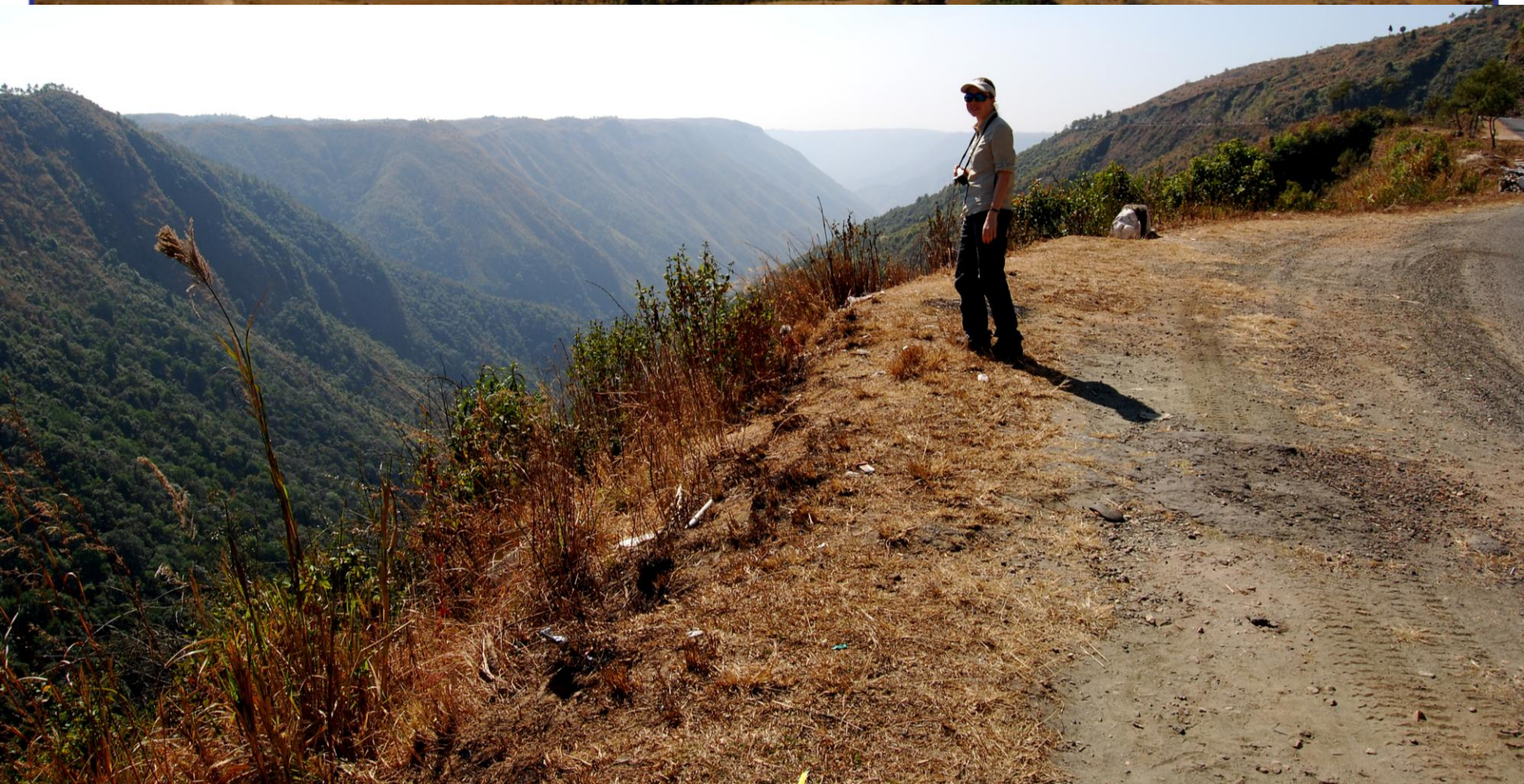
C

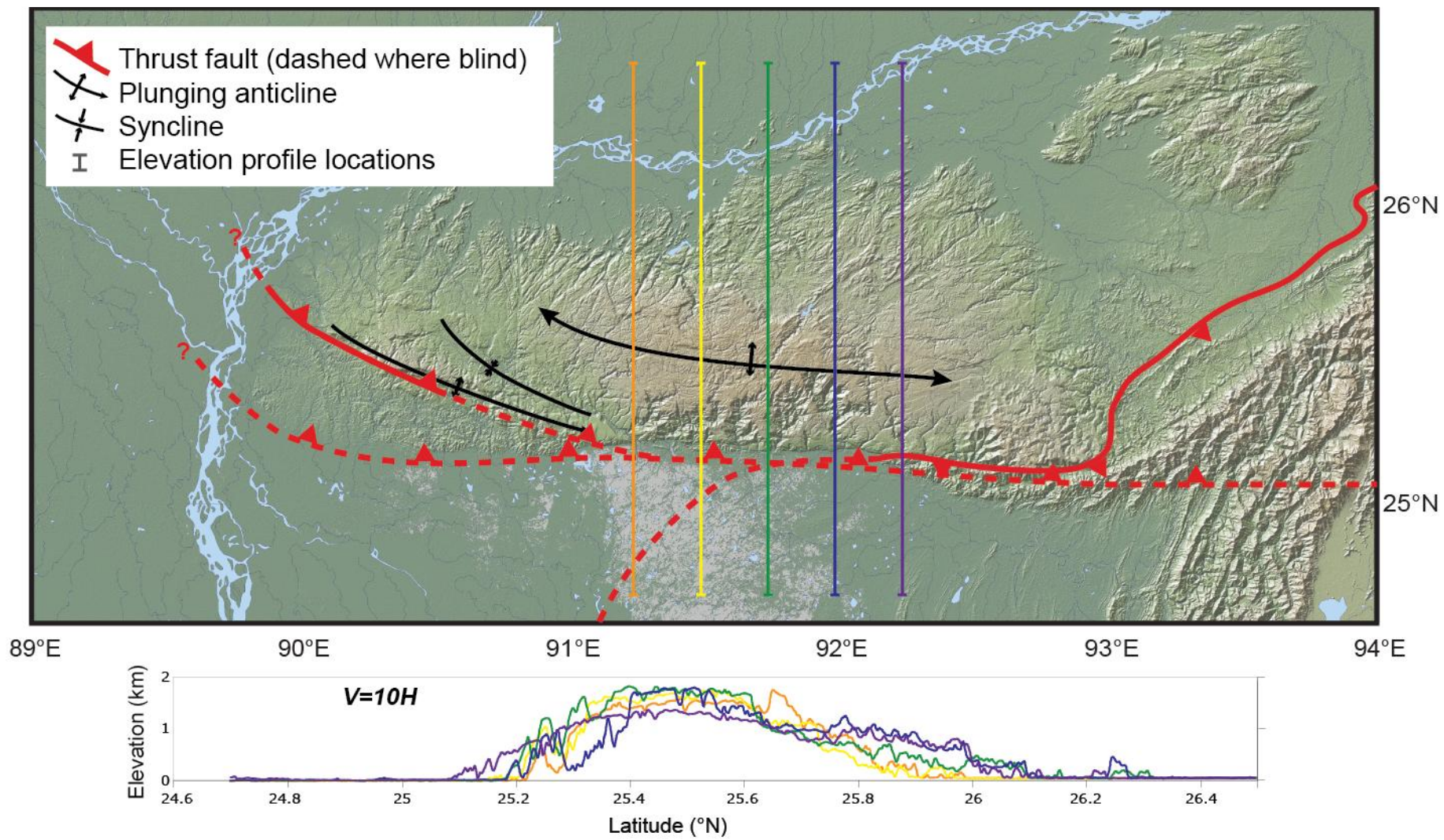
West

Cretaceous SS

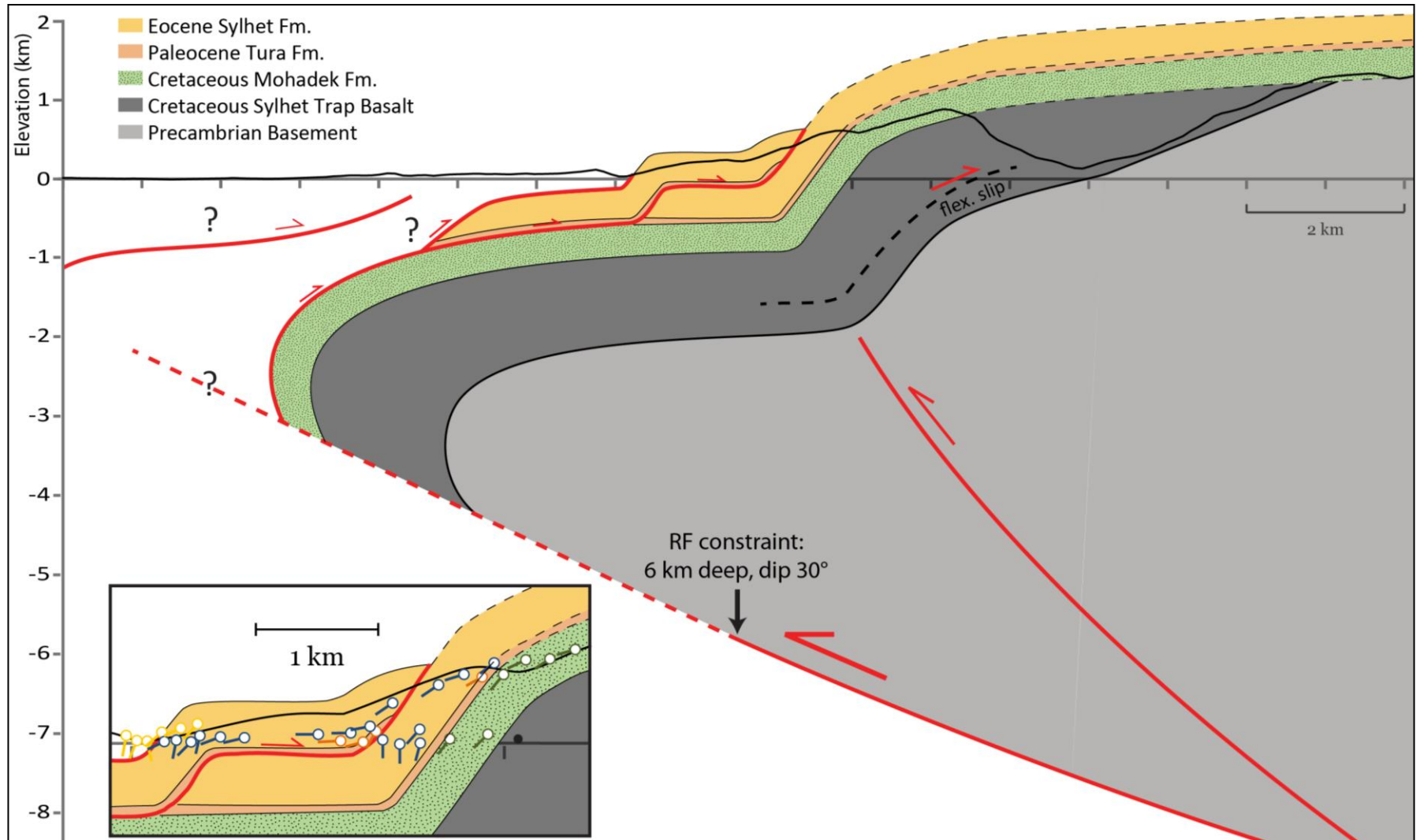
Cretaceous SS

Pre-Uplift Valley





STRUCTURAL INTERPRETATION



Receiver function by Nicola Piana Agostinetti

North

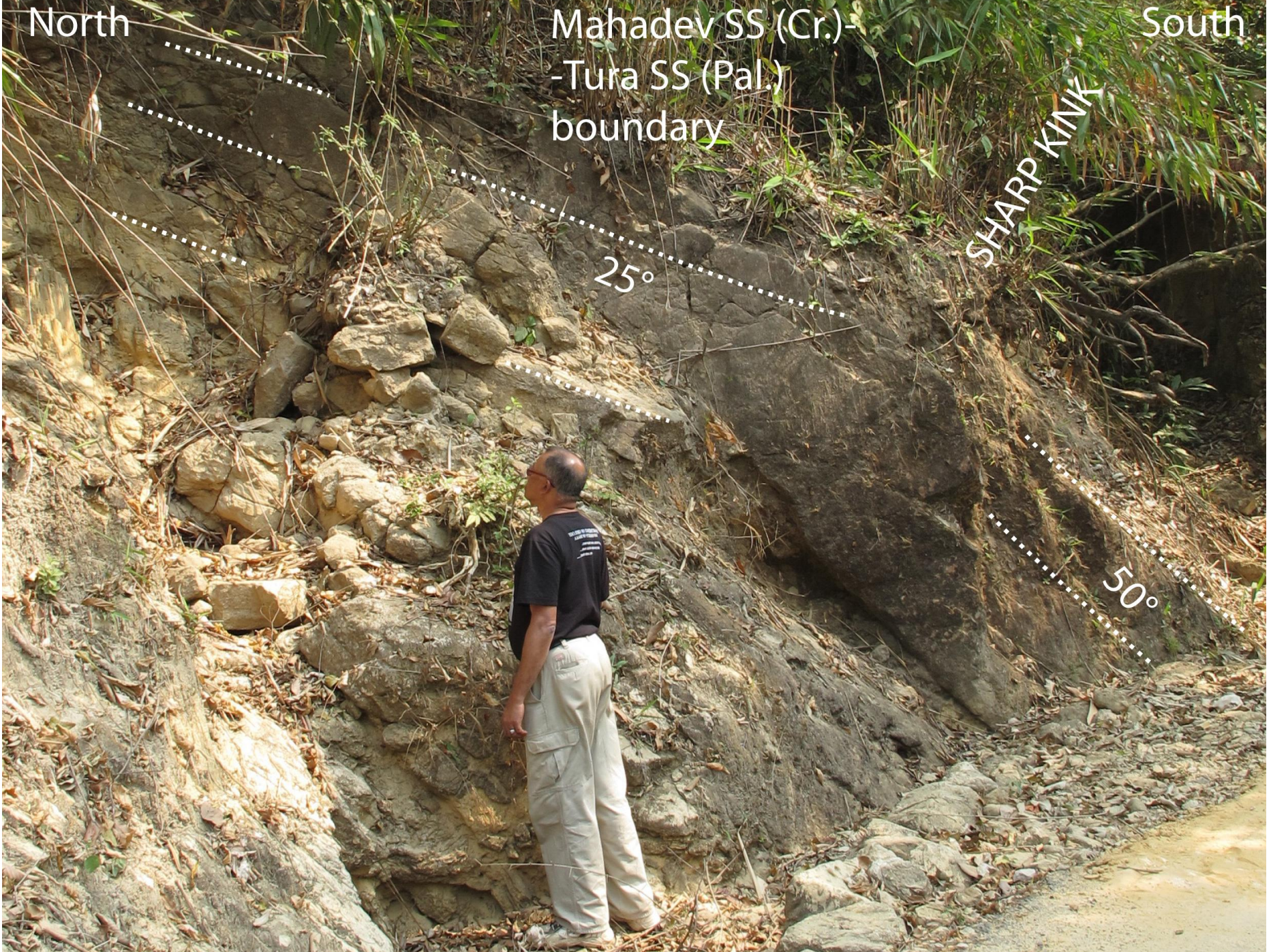
Mahadev SS (Cr.)-
-Tura SS (Pal.)
boundary

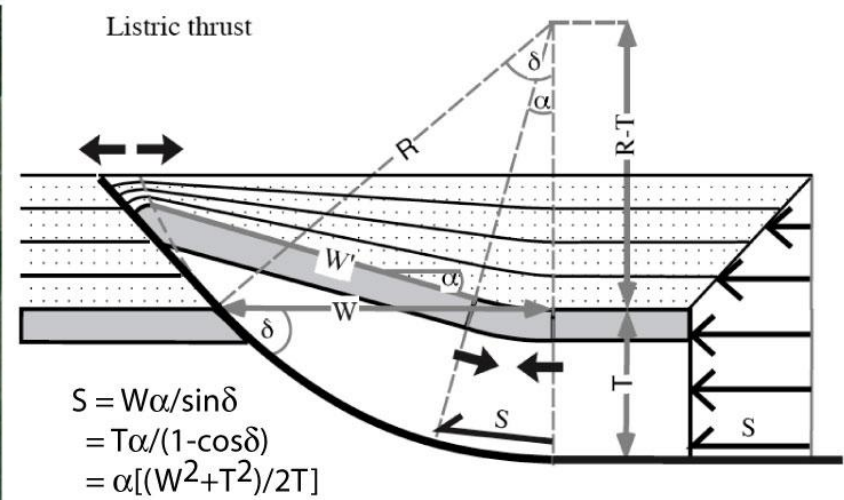
South

SHARP KINK

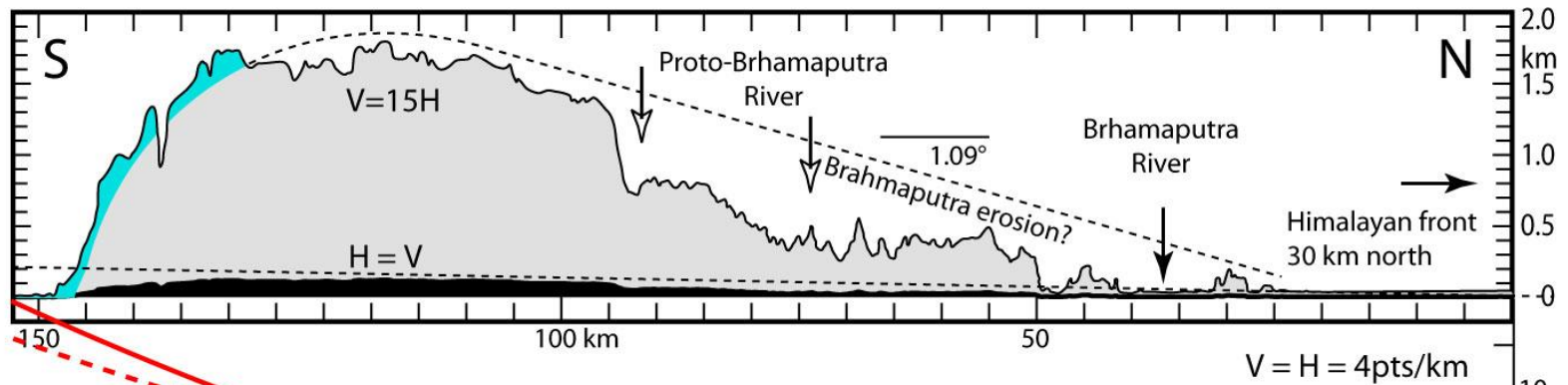
25°

50°

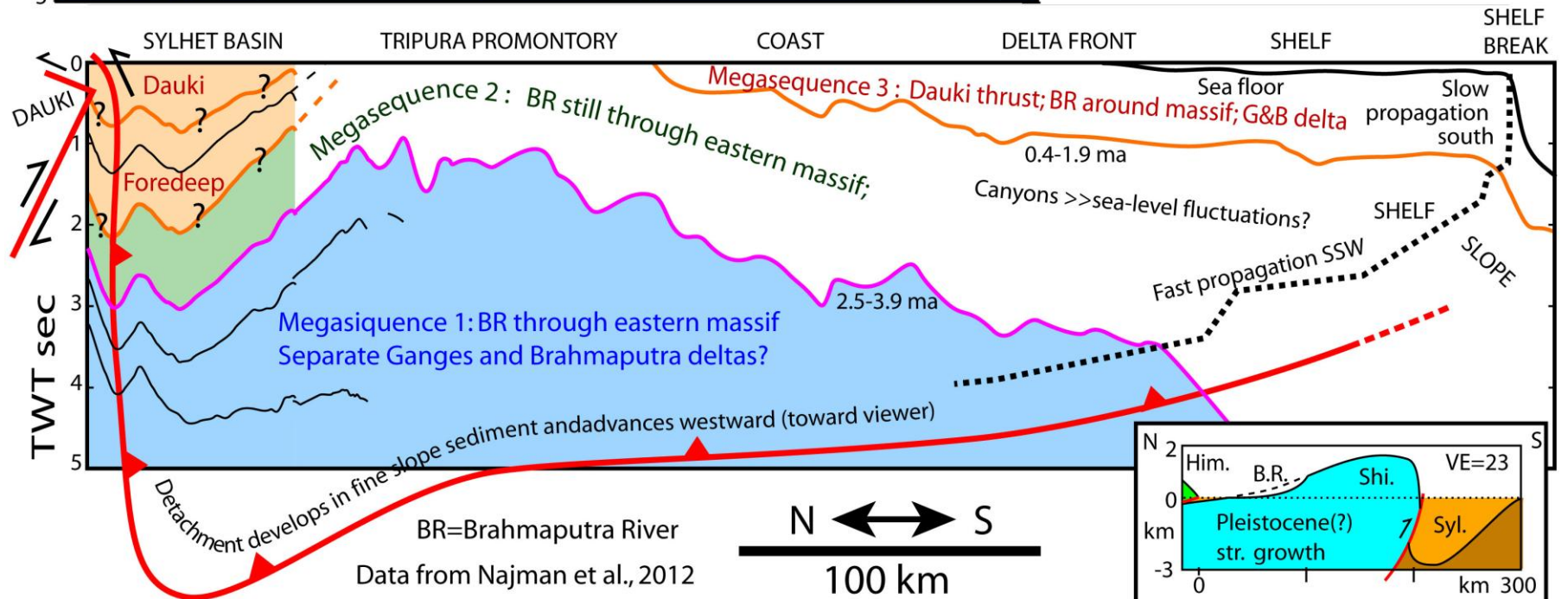
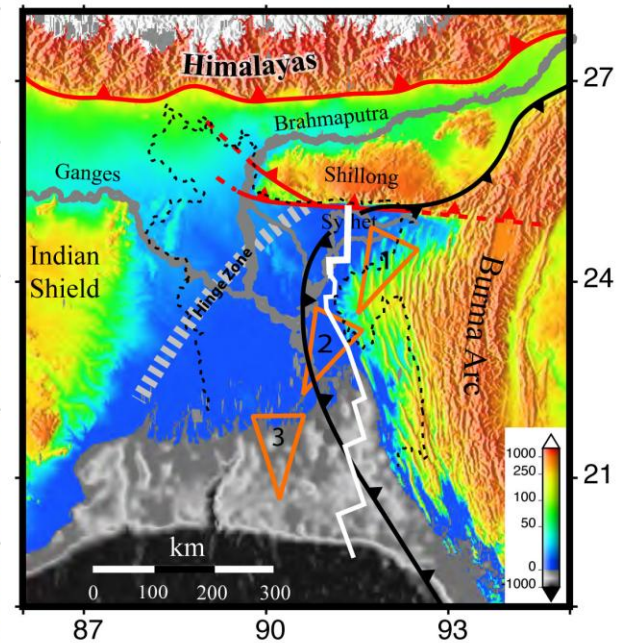
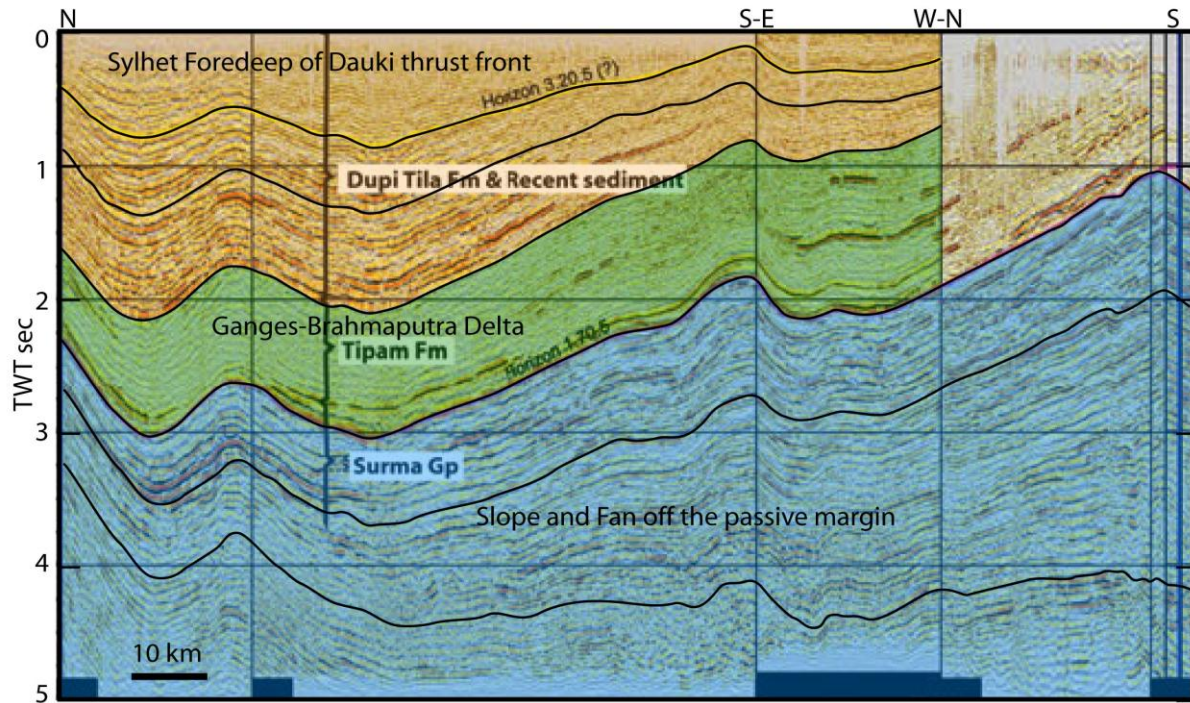


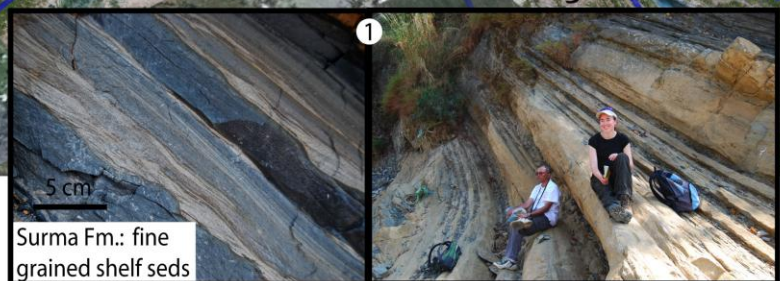
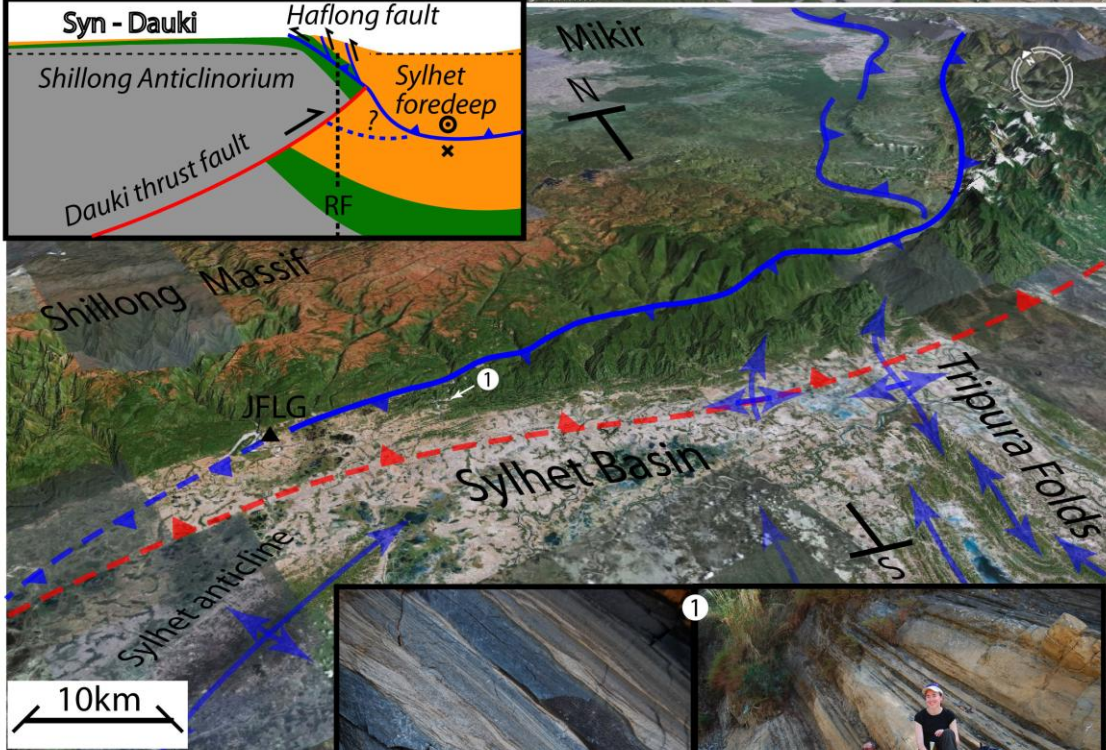
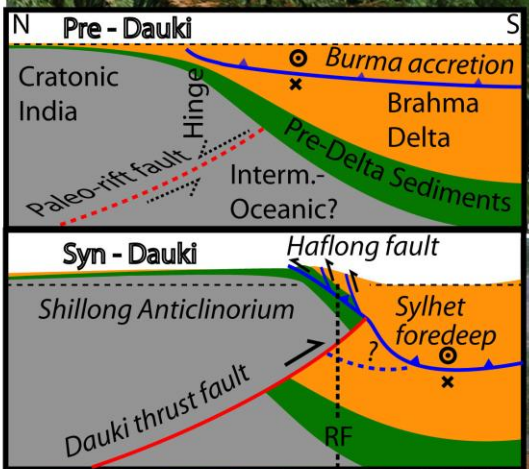
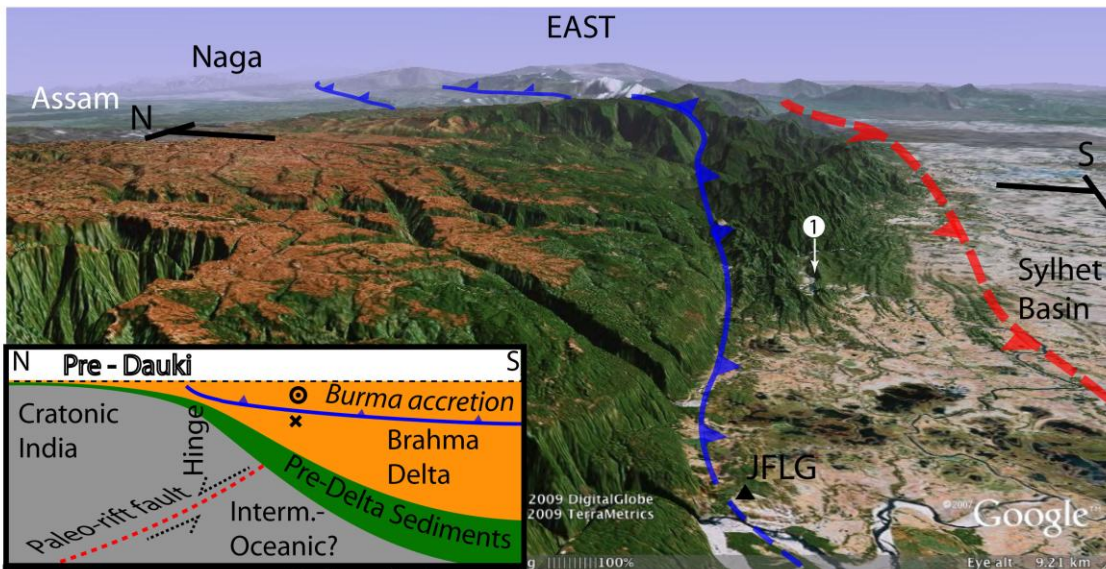


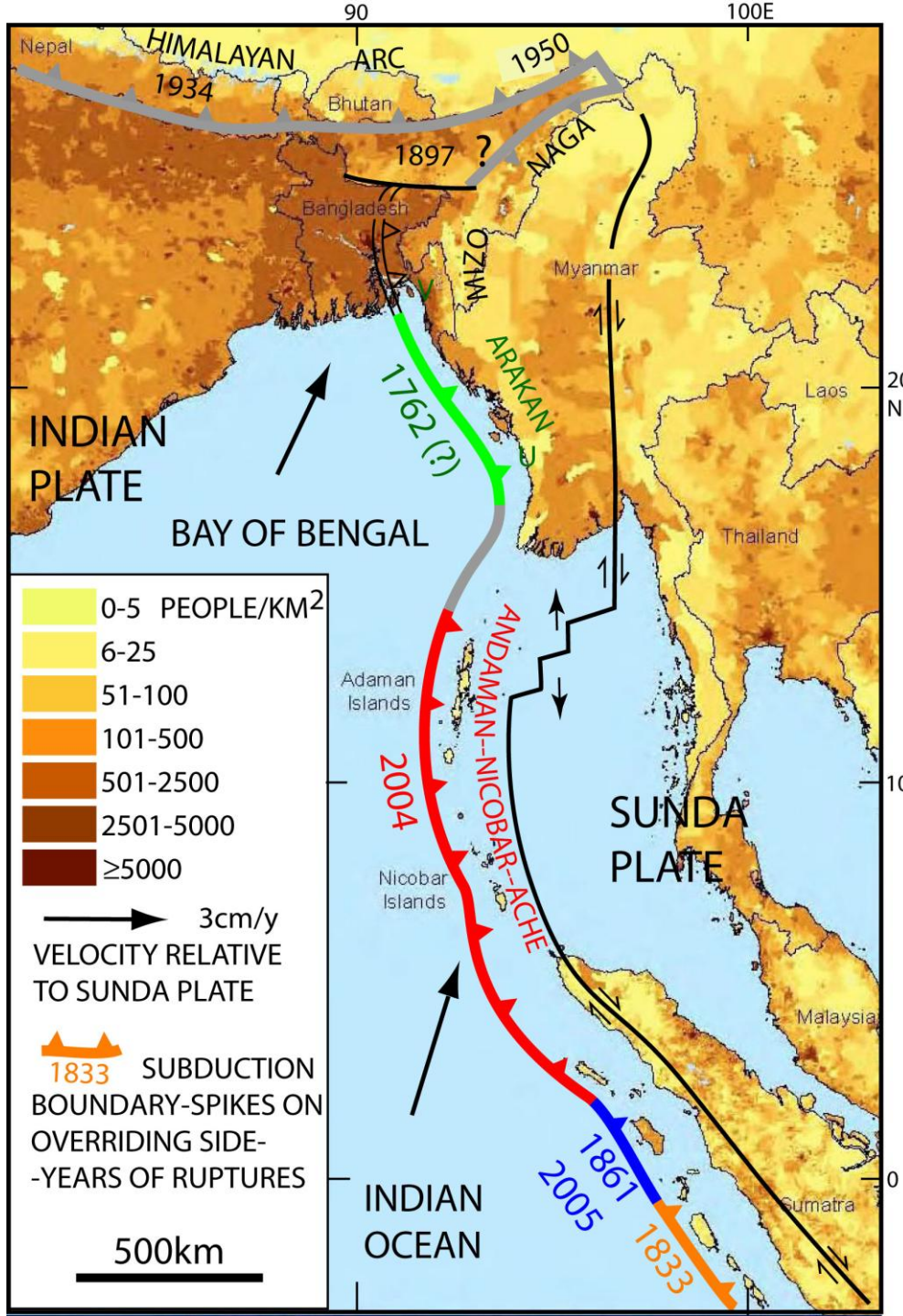
Flexural response across a proto-continental margin



$W = 160 \text{ km}$
 $\alpha = 0.019 \text{ rad}$
 $\delta = 25^\circ$
 $s = 7.2 \text{ km}$
 $T = 34.5 \text{ km}$
 $R = W / \sin\delta = 379 \text{ km}$







Many people live at the transition from Himalayan continent collision to Sunda subduction where earthquake sources may have subtle expressions because

Tectonics is 4D

Large faults with long repeat times

Historic seismicity may not have illuminated all potentially damaging sources (e.g., Sumatra 2004, Tohoku 2011).

Possible example: The land-locked northern-most segment of the Sunda subduction.



The Dauki is a north-dipping thrust fault responsible for the rise of the Shillong Massif. This fault is a blind floor thrust coupled with a south-dipping roof thrust that outcrops and deforms the sedimentary cover along the steep south front of the massif. This antithetic fault has been usually interpreted as the Dauki fault itself. These two faults converge southward below the alluvial sediment of the Sylhet Basin of Bangladesh.

The Shillong Massif is a basement-cored anticlinorium coupled with the Sylhet Basin as its foredeep. The growth of this south-verging couple is recorded in the sedimentary section of the basin, starting ~3Ma.

The young Dauki-Shillong structure could be reactivating a passive margin of the Indian plate where this plate is underthrusting the Burma accretionary belt to the east. This perpendicular superposition of active convergence structures accentuates the northward transition from subduction to collision along the Indo-Burma plate boundary. It also buries the Dauki-Shillong structure progressively more to the east. Nevertheless, this structure is clearly marked by morphology and gravity data eastward to the Imphal Basin, reaching a total E-W length of ~400 km.

The Dauki is a regional deeply rooted fault with a potential for very large earthquakes. We believe it is the most likely source of the one in 1897 and it needs to be considered capable of such earthquakes over its entire length.