

Modeling and Analysis of Theorized Paleo-seismic Event Along the Burma Arc: Implications for an Avulsion of the Meghna River

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The boundary between the India plate and Burma platelet has not produced an earthquake in recent history and the nature of the subduction in this region has always been a point of controversy. It was previously believed that the subduction was inactive (Ni et al. 1989). A Recent GPS study suggests that this the subduction is active and could fail in a megathrusting event of a magnitude Mw 8.2-9.0 9 (Steckler et al. 2016). However, it is not known when it ruptured in the recent past, which is very critical to know in order to understand the seismic hazard potential in that region. As a part of that initiative, an ancient riverbed was discovered on the surface above the active subduction zone and it is thought to have once been the path of the Meghna River. A possible reason for this avulsion is a past megathrust earthquake that produced surface deformation and changed the path of the river. In this study, I have modeled the earthquake using an elastic dislocation model to understand the mode and location of the rupture that could have caused the avulsion. Through this study it is clear that an earthquake rupturing along the detachment fault as well as rupturing onto a splay or on a lone splay could all be possible causes of this ancient earthquake and produce the uplift needed to have avulsed the riverbed. This study is imperative for the people of Bangladesh, one of the most densely populated countries in the world, as well as the surrounding region, for better understanding the earthquake hazard.

References

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