

On controlling factors in tsunami hazard modeling for continental margins of India

Manoj Mukhopadhyay and **Firyal Bou-Rabee**

Department of Earth & Environmental Sciences, University of Kuwait, P.O. Box 5969, Safat 13060, State of Kuwait (firyal@kumail.kuniv.edu)

The continental margins of India experience tsunamis that are generated at the plate margins in NE Indian Ocean and the Makran subduction zone as well as the Cutch region in north Arabian Sea. The 2000 km long Eastern Continental Margin of India (ECMI) experienced four devastating tsunamis in last 125 years, whose, origin was either due to earthquakes or volcanic activity. Latest in this was due to the Sumatran earthquake of Dec. 26, 2004 ($M_w = 9.1$). The tsunami effect at ECMI is felt more intensely towards its southern part; this is regardless of the overall distance between the geographical extent of the ECMI and the corresponding tsunami-source in NE Indian Ocean. To explain this, here we examine the influence by local geotectonic framework as well as the offshore regional physiography of ECMI. The relationship between bathymetry and gravity anomalies for this long Mesozoic continental margin is studied to supplement data on seabed morphology in tsunami hazard modeling. Their main results suggest that the northern segment of ECMI bears different characteristics as compared to its southern parts belonging to the offshore Cauvery basin and Sri Lankan shelf. Crustal downfaulting and a subsided basement below the offshore Cauvery basin are inferred from gravity data. In-situ stress regime data obtained from four wells in the Cauvery basin and the local seismo-geologic setting suggest for active tectonism under south part of ECMI. Going by the experience of tsunamigenic history at ECMI, the Indian Ocean littoral regions should also be investigated for plausible role by seismo-geologic features and offshore regional physiography present in their respective areas, in particular, for those threatened by subduction zone seismicity. The Makran coast tsunami due to the Pakistan earthquake of Nov. 28, 1945 ($M_s = 7.8$) is an example of what this region can produce to affect the Western Continental Margin of India and the Arabian Gulf coast. Submarine slide within the Makran Accretionary Front probably triggered this earthquake that produced the tsunami at the Makran coast.