Tsunami hazard in the Makran region and the threat for the provinces of Hormozgan and Sistan & Baluchistan

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Introduction

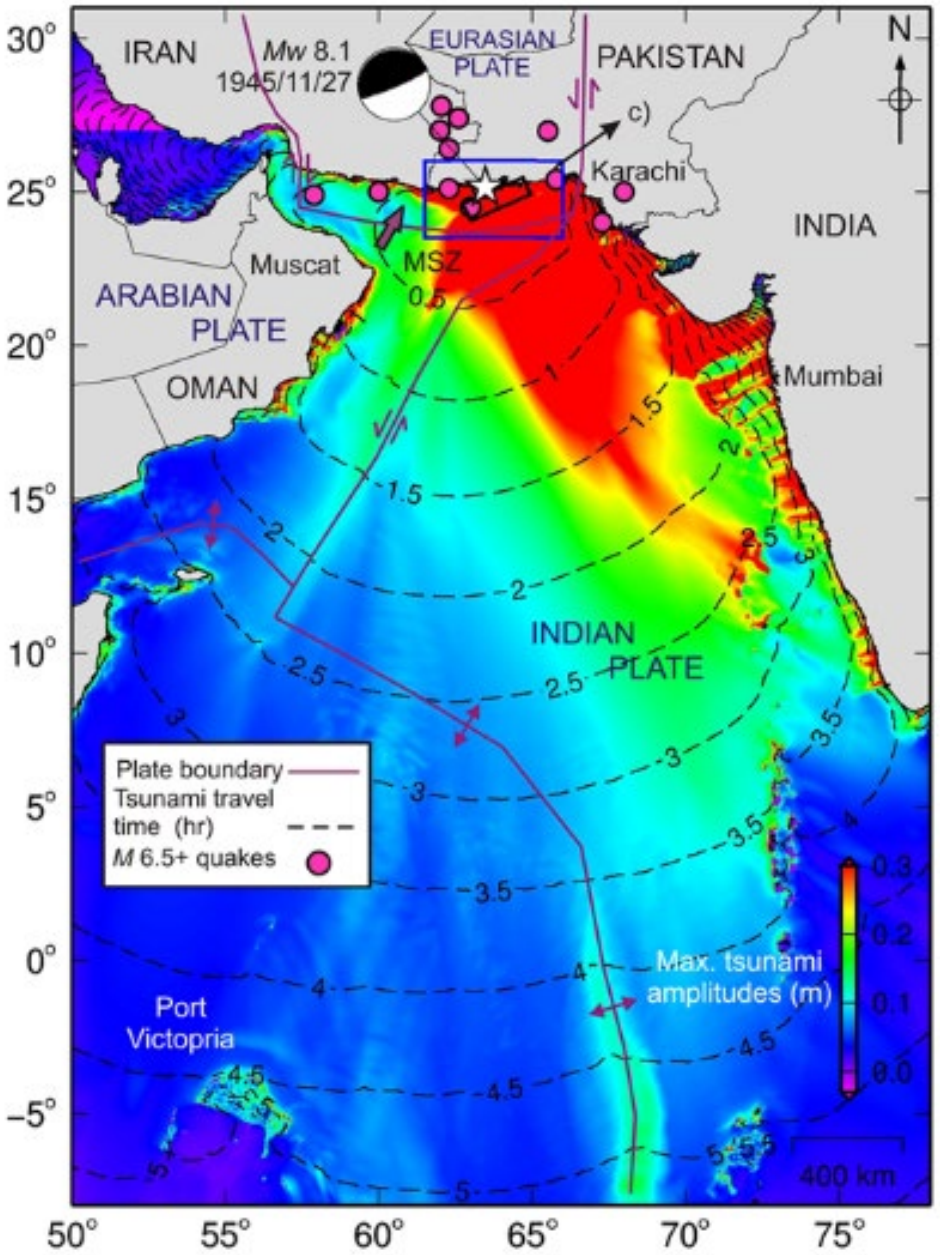
- The Makran subduction zone is a result of the northward subduction of the Arabian plate beneath the Eurasian plate. It is located in a complicated tectonic setting. Although showing relatively low seismicity, few earthquakes generating tsunamis in the Makran region have been reported. Specially the 1945 event.

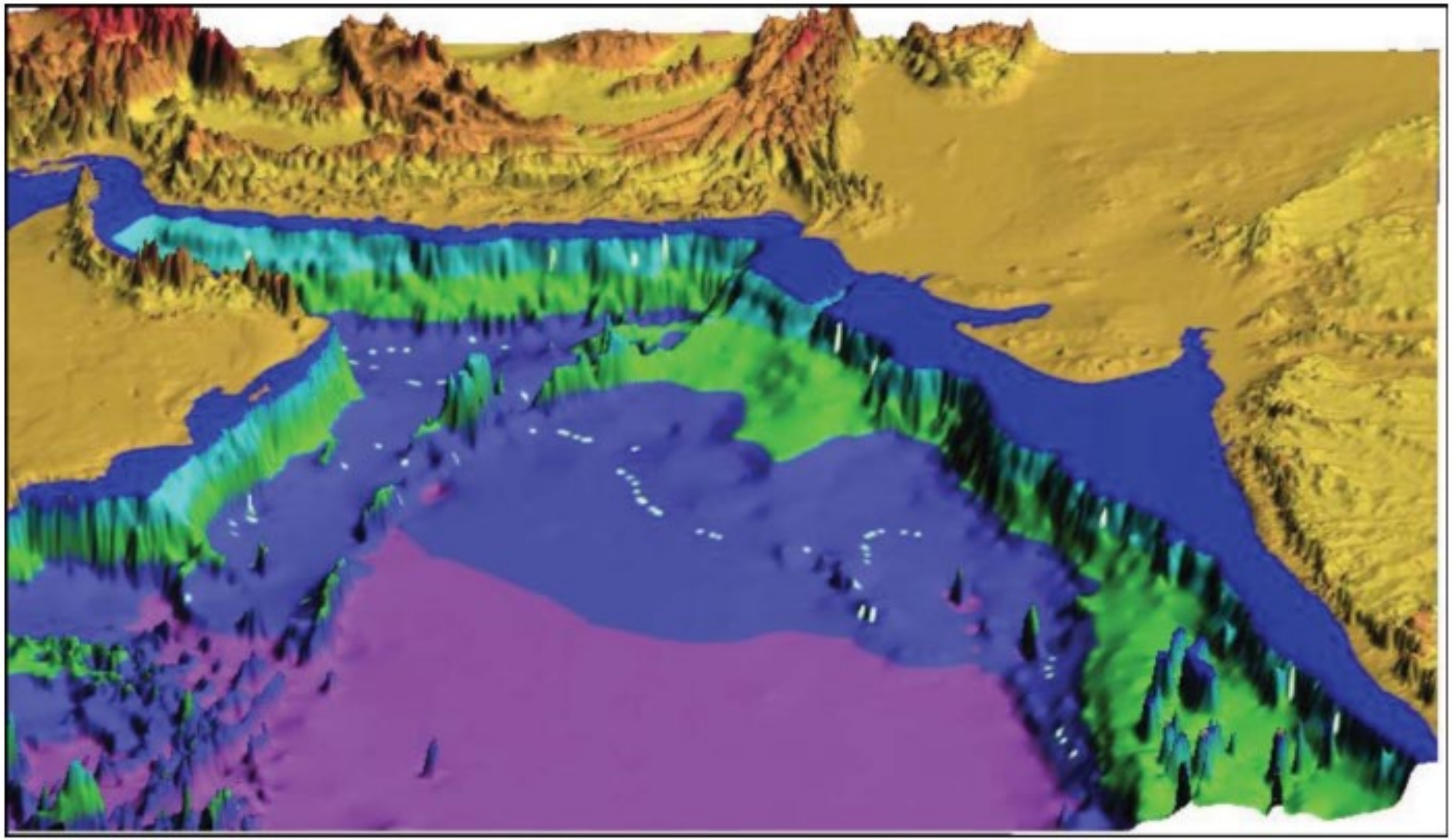
- For **better risk assessment and reduction** we need to better determine the plate geometry of the Makran subduction zone, the crustal structure and hence the seismogenic and tsunamogenic potential of this region.

- To achieve some of the above Seismic profiles with north-south direction both onshore and offshore is required.

- Here also the future planned activities such as data sharing/integration and a regional group/committee setup will be discussed

Main tectonic elements and 1945 tsunami propagation and wave travel time





Bathymetry of the Makran Region.

Background and steps for hazard map

Tsunami hazard assessment is aiming at assessing:

- ✓ **Hazard Assessment (PTHA) in the Makran region.**
- ✓ ***This will be the base line for the further risk and*** vulnerability ***study in the region.***
- ✓ ***The other part would be extension of this modelling to local level for local hazard analysis.***
- ✓ ***These then will produce hazard, run-up, and evacuation map in turn engineering information for build up and development.***

In this process so it is important to achieve the followings:

- Identification of the possible tsunami sources.
- Modelling of the tsunami propagation and its inundation on land.
- Determination of inundation maximum and run-up height.
- Analysis of the probabilities or return periods of the tsunami events.
- Presentation of the results through hazard maps.

Some examples of Environmental impacts

Discussion and Conclusions

- Tsunami risk assessment for coastal areas including Makran:
- – Hazard map (hazard probability and hazard zones).
- – Exposure map (population and critical facilities).
- – Response map (evacuation time).
- – Risk map. These maps provide an overview on the overall risk for the respective coastal region. Areas with high risk can be identified and can be used to prioritize mitigation measures. The high risk areas are characterized by a high probability of being hit by a tsunami and a low evacuation capability of the population.
- This means that people in high risk areas will not be able to reach a tsunami safe place in a time corresponding to the calculated median estimated time of tsunami arrival.

Discussion and conclusions

- Facts about Makran:
- The Makran region has potential for tsunami occurrence, the last one was in 1945, but had some small scales events.
- The Makran lacks a better understanding from seismo-tectonic point of view.
- The pervious uncompleted modeling and research show one can wait a water height of between 4-16 m in all coasts of Makran, depending on the location in connection with source location.
- Makran can suffer both from far field and near field sources, so if possible the EWS should take in to account both. The first wave reaching the coast is about 20 minutes, which in seismolocal point of view is long long time.