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Tsunami hazard and vulnerability assessment for the south coast of Cyprus

Stefano Tinti (1), Gianluca Pagnoni (1), Alberto Armigliato (1), and Georgios Georgiou (2)

(1) University of Bologna, Department of Physics and Astronomy (DIFA), Sector of Geophysics, Bologna, Italy (stefano.tinti@unibo.it, +39-(0)51-2095058), (2) Oceanography Center, University of Cyprus, Nicosia, Cyprus

The island of Cyprus is situated in the eastern part of the Mediterranean Sea, south of the Anatolian peninsula and is the third largest island in the Mediterranean. In this area tectonic setting is complex and as yet not fully understood. Dominant here are three major tectonic structures, namely the Hellenic arc, the Cyprian arc and the Levantine rift.
The Hellenic Arc has the highest tsunamigenic potential with capability of producing destructive regional tsunamis, like the one that occurred in 1303 following a large earthquake near East Crete.
The Levantine rift is associated with several tsunamis, mostly but not exclusively local, as shown in the tsunami catalog by Fokaefs and Papadopoulos (2007), but it is tectonically unfavorable to tsunami generation since it is located inland and is marked by faults with predominant strike-slip mechanism (Ryan et al., 2005).
The Cyprian Arc runs near the southern coast of the island and can be an important source of tsunamis. In the frame of the European project NearToWarn that is focused on near-shore tsunami generation in the Mediterranean sea, the Cyprian arc is considered as a study area. By means of the fault database compiled in the course of a previous project called TRANSFER, tsunamigenic sources along the arc are taken into account. The most relevant one results to be the Limassol fault that is placed some km off South-West Cyprus striking more or less parallel to the coast.
The hazard assessment is carried out by using the worst credible-case scenario technique, that is known to be the most appropriate when tsunami data are insufficient for the application of a probabilistic analysis. For numerical simulations we use the tsunami code UBO-TSUFD allowing one to compute run-up and inundation focused on given target areas with high space resolution by multiple grid nesting. The paper chief interest is on the southern coast of Cyprus, that is the most affected according to historical reports and one of the most developed regions of the island with important ports and touristic centers like Limassol and Larnaca. Vulnerability analysis is conducted by using the method developed in the SCHEMA project and appropriate to evaluate tsunami impact on urban environment (see application to Alexandria by Tinti et al., 2012).

References

Fokaefs A., Papadopoulos G.A.: Tsunami hazard in the Eastern Mediterranean: strong earthquakes and tsunamis in Cyprus and the Levantine Sea, Nat. Hazards (2007) 40:503–526, doi:10.1007/s11069-006-9011-3.

Ryan, W.B.F., S.M. Carbotte, J.O. Coplan, S. O'Hara, A. Melkonian, R. Arko, R.A. Weissel, V. Ferrini, A. Goodwillie, F. Nitsche, J. Bonczkowski, and R. Zemsky, Global Multi-Resolution Topography synthesis, Geochem. Geophys. Geosyst., (2009), 10, Q03014, doi:10.1029/2008GC002332.

Tinti S., Pagnoni G., Armigliato A., and Tonini R.: Tsunami inundation scenarios and tsunami vulnerability assessment forthe town of Alexandria, Egypt, Geophysical Research Abstracts
(2012) Vol. 14, EGU2012-10325, EGU General Assembly 2012.