



Development of a Tsunami Early Warning System (TEWS) Prototype based on the direct monitoring of a potential tsunamigenic structure located near the coasts of SW Iberia: Preliminary results of the EU Project NEAREST

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Here we report the major results of the EU Project NEAREST (Integrated observations from Near Shore Sources of Tsunami: toward an Early Warning System) carried out in the Gulf of Cadiz (SE Iberia) during Oct.1st 2006-March 31 2010.

The Gulf of Cadiz it is one of the few geological environments able to generate transatlantic tsunamis, which can deeply affect the coasts of Iberia and Morocco, but with significant effects in northern Europe and the Caribbean Islands. To face the geo-hazard connected to the tectonic structures that are potentially tsunamigenic and are located near the coast, as it occurs in the whole Mediterranean area, the NEAREST consortium installed a tsunami-detector prototype directly on top of one tsunamigenic structure. To accomplish this task NEAREST carried out a geophysical exploration of this area that led to the complete mapping of the most active tectonic structures of this sector. A GEOSTAR-type deep sea observatory, which hosted the tsunami detector prototype, was installed for one year above one of those potential tsunamigenic structures, south of the Portuguese coast, on August 2007. This observatory allowed the continuous monitoring of a set of geophysical and oceanographic parameters and complemented the land observation networks. It represents a major step for the implementation of a future Tsunami Early Warning System of SW Iberia. In addition, NEAREST improved the numerical models of large tsunami impact based on high-resolution bathymetry and then produced accurate inundation maps in selected areas of SW Portugal. NEAREST also carried out a sedimentological study of paleo-tsunamis and paleo-earthquakes deposits and investigated the tsunami generation mechanisms.