Geophysical Research Abstracts
Vol. 15, EGU2013-11694, 2013
EGU General Assembly 2013

Local tsunami early warning: the case of Rhodes island, Greece, and the NEARTOWARN (EU-DG ECHO) prevention project

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Local, that is near-field, tsunamis occur in the global ocean including the Mediterranean Sea and its connected seas. For such tsunamis the first wave has very short travel time of arrival (less than 30 min.) to the closest coastal zone thus making the early warning a very difficult task. An efficient, end-to-end early tsunami warning system in local conditions should fulfill the condition that the time needed for the earthquake detection, plus the time needed for the warning message transmission to the authorities and afterwards to the general public and/or other task groups, plus the time needed for response and real evacuation is less than the travel time of the first wave. In the physiographic conditions of the Mediterranean Sea it is extremely hard to satisfy such a condition unless the total time needed to response in early warning is drastically minimized. The project Near-Field Tsunami Warning and Emergency Planning (NEARTOWARN, which is supported by the EU DG-ECHO prevention programme, aims, among others, to establish a system in Rhodes island, Greece, with the purpose to meet needs for local early tsunami warning. To minimize the time for emergency in less than 30 sec, seismic alert devices (SED's) make the core component of the system. SED's are activated and send alerting signals as soon as a P-phase of seismic wave is detected in the near-field but for a predetermined threshold of ground motion. Then, emergency starts while SED's activate remotely other devices, such as computers with data bases of pre-calculated tsunami simulations, surveillance cameras etc. The system is completed with tide-gauges, simulated tsunami scenarios and emergency planning supported by a Geographical Management System. Rhodes island in Dodecanese, South Aegean Sea, Greece, has been selected as a test-area for the development of the prototype system given that it was hit by large tsunamigenic earthquakes several times in the past.