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Spanish National Tsunami Warning System

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In February 2013, the National Geographic Institute of Spain (IGN) is entrusted by the Government to implement the National Tsunami Warning Centre (NTWC). Currently, this system is in an advanced implementation stage.

Spain does not experience tsunamis very often although the possibility of very large ones is still present. For example, the 1755 Lisbon event that caused 1200 drowned people only in Spain, and other similar tsunamis in prehistoric times. Apart from the large tsunamis in the Atlantic area, the Spanish coast is exposed to tsunamis generated by sources in the Mediterranean. The last remarkable event was triggered in 2003 by a Magnitude 6.8 earthquake in northern Algeria. This tsunami affected the whole West Mediterranean coast and 2 m high waves arrived at the Balearic Island coasts. The IGN catalogue of Tsunamis in the Spanish Coasts collects information of around 20 mainly small tsunamis from 241 BC up to our days.

The IGN Tsunami Warning System is based on the issuance of a series of alert messages to the Civil Protection authorities. The process starts with an earthquake detection, usually in less than 2 minutes. With this input an automatic procedure decides whether this event has tsunami potential. In that case a warning message is automatically delivered which includes estimated tsunami arrival times and alert levels for a set of coastal locations. These parameters are based on a precomputed scenarios data base and a customized decision matrix, this is the reason why the first tsunami messages are issued just a few seconds after the seismic alert. Once an automatic tsunami alert has been triggered, a real time tsunami simulation is performed to produce more accurate warning messages. Finally, tsunami simulations results will be compared with tide gauge real data. Sea level data will be included in subsequent tsunami warning messages in order to confirm or cancel the tsunami alert.