



Providing early tsunami warnings to save lives

The Tsunami Alerting Device (TAD) is an advanced system developed by the European Commission's in-house science service, the Joint Research Centre (JRC), that directly alerts people at risk in the event of an incoming tsunami wave. It is a joint initiative of the United Nations and the European Commission under the 'Global Disaster Alert and Coordination System' (GDACS), which provides reliable alerts on humanitarian and natural disasters to more than 12,000 users engaged in international emergency response and humanitarian relief.



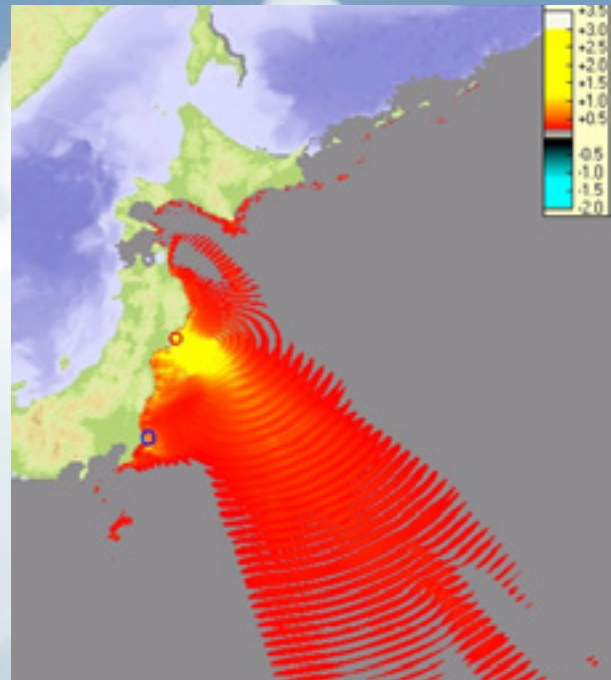
Joint Research Centre (JRC)
– the European Commission's in-house science service

The essential breakthrough is that when an underwater earthquake or a landslide occurs, TAD uses innovative software to automatically calculate, within minutes, an accurate risk assessment. This is based on factors such as the earthquake epicentre and magnitude, estimated wave height and travel time to threatened coastal areas.

The system automatically integrates this information with other important data, such as population densities, and estimates the potential humanitarian impact.

A warning message is then instantaneously relayed to a network of TADs on local beaches which include screens, sirens and loudspeakers. In parallel, a warning is relayed to those involved in international disaster response.

The advantage of TAD is that it has been conceived to connect easily with existing sea level measurement technologies, so it can also be used to warn for landslides and other natural hazards.



The very first automatic calculation from the GDACS system for the tsunami off the coast of Japan (11 March 2011). It was online 20 minutes after the earthquake which triggered the tsunami.



Did you know?

Tsunamis race across the sea at up 970 km/h, about as fast as a jet airplane. Their speed depends on the depth of the sea (the deeper, the faster). A tsunami can travel across the Pacific Ocean in less than one day.

JRC applies its expertise in geo-spatial and information technology to a multitude of global challenges. These include early detection of threats to public health such as infectious diseases, mapping of vulnerable refugee camps, combating illicit harvesting of natural resources and detecting irregular container traffic movements.

Background

TAD is part of a global Tsunami Wave Propagation Model. This has been developed by the Joint Research Centre in its joint efforts with the United Nations Office for Coordination of Humanitarian Affairs (UN-OCHA). This forms part of a wider effort to consolidate the worldwide network of disaster information systems and on-site observations.

Increasingly, advances in satellite, internet or mobile telephony technologies are being harnessed by science and coupled with growing interpretation expertise on the ground. Through the active contribution of innovative disaster preparedness and response technologies, JRC scientists and their partners are on the front line of a coordinated international response.

Since April 2011, the TAD system is being tested as part of Portugal's National Tsunami Early Warning System. TAD's capacity to directly and timely alert people at risk on coastal areas represents a major step forward towards the creation of effective tsunami early warning systems. As part of GDACS, it is designed to fill that critical information and coordination gap that usually occurs in the first phase of a major sudden-onset disaster.