# QUICKER TSUNAMI SENSORS TESTED IN MEDITERRANEAN

## Speed read

- In the Mediterranean, it is hard to tell if water motion is due to an earthquake
- A new sensor aims to distinguish tsunami signals from sea-floor movements
- Sound waves could also be used to provide faster, more-accurate warnings

[ROME] A new alert system could improve tsunami warnings in the Mediterranean, but most countries bordering the sea still lack evacuation plans, scientists have said ahead of a meeting of 20 countries in Italy this week (19-21 November).

The tenth session of the Intergovernmental Coordination Group for the North-Eastern Atlantic, Mediterranean and connected seas, Tsunami Warning and Mitigation System (NEAMTWS) will discuss establishing new national tsunami warning centres. It will also work towards organising the next tsunami exercise, a simulation of tsunami alerts following several different kinds of earthquakes, to evaluate the communication and response mechanisms throughout the NEATWS network.

NEAMTWS member states include Algeria, Egypt, Lebanon, Libya, Morocco, Tunisia and Turkey. All member countries are signed up to receive the alerts the NEAMTWS network provides.

The current alert system implemented by NEATWS relies on earthquake detection and tide gauges to see if a tsunami has been generated, but in the enclosed Mediterranean Sea it suffers from various challenges arising from local geography.

Rachid Omira, a geophysicist at the Portuguese Institute for the Sea and Atmosphere, Lisbon, tells SciDev.Net that the current system includes French, Greek and Turkish institutions that are being accredited by NEAMTWS as official tsunami alert providers for the whole Mediterranean region. Two more providers are being planned in Italy and Portugal.

Francesco Chierici, a physicist at Italy's Radioastronomy Institute and at the Institute of Marine Sciences, both in Bologna, tells SciDev.Net that the current system uses seismic signals to assess such things as the location, depth and strength of tremors.

"If an earthquake is detected and its characteristics are such that it can potentially trigger a tsunami, a provisional alarm is launched and then confirmed or cleared by measuring water movements with coastal tide gauges," he says.

"But presently we do not know if, after a major earthquake at sea, a destructive tsunami would be generated or not. And false alarms can be very hazardous and costly."

In other places around the world, tsunami warning systems include deep-ocean offshore stations that record water pressure, confirming the tsunami and following its spread in real time, Chierici says.

But in the Mediterranean the geological faults, which need to be monitored for earthquakes, are often near the coasts, where deep-ocean offshore stations do not work well.

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- Rachid Omira, Portuguese Institute for the Sea and Atmosphere

To bypass the problem, the team lead by Chierici is testing two new techniques, including a multi-sensor detector.

"We are experimenting with a new, deep-sea tsunameter that, beyond sensing the water pressure, has a seismometer and an accelerometer that measures the movements of the sea bottom. This way we can distinguish the tsunami signal from those movements," Chierici says.

In collaboration with scientists from two other Italian science institutes, Chierici was involved in the European Union-funded NEAREST project (Integrated observations from NEAR shore sourcES of Tsunamis).

They tested the tsunameter to the south of Portugal in the Gulf of Cadiz, and are continuing their tests off Sicily, Italy.

"It's working well and I'm optimistic about its success. It could help in other areas that need a quick alert, such as Indonesia," Chierici says.

## Listening out for tsunamis

A second technique under test would be even better for rapidly detecting tsunamis generated by various mechanisms, not only earthquakes, he says. It uses submarine sensors to detect hydroacoustic waves, sound waves produced by the sea-floor motion that generates the tsunami. These sound waves spread up to ten times faster than the tsunami wave itself.

“The tsunami would be detected faster and regardless of its origin: not only [a tsunami] from an earthquake but also from a volcano or a submarine landslide,” he says.

“But we are just beginning the tests and it’s uncertain if it will work. Similar sounds are produced by other sources and discriminating [between them] is difficult.”

According to Omira the new systems would help, but an important issue is what to do once an alert is sent out. Most countries bordering the Mediterranean lack evacuation plans, he says.

“The idea is there, but plans are still not being implemented,” he says. “Presently, the single most-useful intervention would be educating the population: if they are near the sea and feel an earthquake, they have to run to higher ground without waiting for the alert.”

Source : http://www.scidev.net/global/disasters/news/quicker-tsunami-sensors-tested-in-mediterranean.html