



Tsunami Early Warning System in Italy and involvement of local communities

Stefano Tinti, Alberto Armigliato, and Filippo Zaniboni

University of Bologna, Italy, Department of Physics, Sector of Geophysics, Bologna, Italy (filippo.zaniboni@unibo.it, +39 051 2095058)

Italy is characterized by a great coastal extension, and by a series of possible tsunamigenic sources: many active faults, onshore and offshore, also near the shoreline and in shallow water, active volcanoes (Etna, Stromboli, Campi Flegrei for example), continental margins where landslides can occur. All these threats justify the establishment of a tsunami early warning system (TEWS), especially in Southern Italy where most of the sources capable of large disastrous tsunamis are located. One of the main characteristics of such sources, that however is common to other countries in not only in the Mediterranean, is their vicinity to the coast, which means that the tsunami lead time for attacking the coastal system is expected to be within 10-15 minutes in several cases.

This constraint of time imposes to conceive and adopt specific plans aiming at a quick tsunami detection and alert dissemination for the TEWS, since obviously the TEWS alert must precede and not follow the tsunami first arrival. The need to be quick introduces the specific problem of uncertainty that is though inherent to any forecast system, but it is a very big issue especially when time available is short, since crucial decisions have to be taken in presence of incomplete data and incomplete processing. This is just the big problem that has to be faced by a system like the a TEWS in Italy. Uncertainties can be reduced by increasing the capabilities of the tsunami monitoring system by densifying the traditional instrumental networks (e.g. by empowering seismic and especially coastal and offshore sea-level observation systems) in the identified tsunamigenic source areas. However, uncertainties, though are expected to have a decreasing trend as time passes after the tsunami initiation, cannot be eliminated and have to be appropriately dealt with: uncertainties lead to under- and overestimation of the tsunami size and arrival times, and to missing or to false alerts, or in other terms they degrade the performance of the tsunami predictors. The role of the local communities in defining the strategies in case of uncertain data is essential: only involvement of such communities since the beginning of the planning and implementation phase of the TEWS as well as in the definition of a decision making matrix can ensure appropriate response in case of emergency, and most importantly, the acceptance of the system in the long run.

The efforts to implement the Tsunami Warning System in Italy should take into proper account the above mentioned aspects. Involvement of local communities should be primarily realized through the involvement of the local components of the Civil Protection Agency that is responsible for the implementation of the system over the Italian territory. A pilot project is being conducted in cooperation between the Civil Protection Service of Sicily and the University of Bologna (UNIBO) that contemplates the empowering of the local sea-level monitoring system (TSUNET) and specific vulnerability and risk analyses, also exploiting results of national and European research projects (e.g. TRANSFER and SCHEMA) where UNIBO had a primary role.