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Real-Time Amphibic Montoring and Borehole Observatories (RAMBO)

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Many geodynamic processes are associated with seismicity, slope instability or both, and much progress has been made recently to unravel the mechanisms governing them. Historical records show that S-Europe is particularly vulnerable to geohazards, mostly because of its complex tectonic setting in the collision zone between Africa and Eurasia. In prehistoric times, hazards manifested themselves by destruction of world wonders (e.g., Colossus of Rhodes 224BC, Pharos Lighthouse 365AD) or places such as Troy, Armageddon, to name just a few. At present, the Mediterranean Sea comprises approximately 46000 km of coastline with 160 million people living along it (plus an additional 135 million tourists each year, i.e. 30% of the global tourism). Geohazards pose a considerable risk to society in the circum-Mediterranean, and large cities (Istanbul, Athens, Nice, etc.) plus stretches where the economical loss is potentially huge (e.g. French Riviera, etc.). As a consequence, the understanding of episodic and equally highly infrequent nature of natural hazards has to be improved. The only means to shed light on the processes governing earthquakes and landslides are time series data to identify precursor phenomena to the events. They are particularly critical in the IODP and ICDP context, as is successfully shown in various projects.
The Magellan Workshop sponsored by the European Science Foundation and MARUM Research Centre, Bremen was entitled “Real-time Amphibic Monitoring & Borehole Observatories”. It was recently held in Bremen, Germany, on 14-16 October, 2010. The workshop objectives were to explore the following fields of long-term monitoring and observatory approaches:
- borehole coring, downhole measurements and geophysics as a component of observatory site survey (stress determination, characterise the earth beneath stations)
- shallow borehole monitoring for parameters that cannot be accessed by surface monitoring (e.g. piezometers [currently installed in Nice and Sea of Marmara])
- deep boreholes for in situ characterisation and monitoring of faults.
To maximise the benefit of such observatory data, an efficient network (including a real-time connection) is critical for using the resulting scientific data in early warning. A total of 20 dedicated scientists participated at the rcent ESF-funded RAMBO workshop and gathered knowledge from nine European countries and the USA. The expertise of the group spans over a wide scientific spectrum within geosciences. In addition, several of the participants have been (or are) leaders of scientific drilling expeditions, involved in IODP and ICDP proposals, and/or leaders or associates in ongoing EU projects. The marine component of these amphibic efforts spanning the land, coast and sea, will be planned in close collaboration with the Deep Sea Frontier scientists.