FROM MEDGLOSS SEA LEVEL WATCH TO MULTI HAZARD SEA LEVEL ALERTS (TSUNAMI, METEO-MARINE EXTREME EVENTS)

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Abstract
MedGLOSS was established by CIESM and IOC/UNESCO a decade ago, to monitor sea level in the Mediterranean and Black Sea. After a process of stations upgrading to GLOSS standards until 2005, the disasters induced by the Indian Ocean tsunami and the Katharina hurricane raised awareness for the need to upgrade MedGLOSS stations to be able to detect a variety of sea level induced hazards, some relatively frequent (seasonal, yearly, every few years) others rare (decades, centuries). The February 2007 IPCC climate change assessment report further confirms this need to upgrade MedGLOSS to provide low latency data and early alerting of extreme events detected.
Keywords : Sea Level, Time Series.

The MedGLOSS sea level monitoring network was established jointly by CIESM and IOC/UNESCO a decade ago, to serve as a densified regional sub-system of the global GLOSS network of sea level stations and enable provision of data for long-term relative and absolute sea level variation for national, regional and global operational oceanography models and for monitoring tectonic movements and rates at the sea level stations. Progress has been achieved during 2002-2005 by joint work with the European Sea Level Service in the ESEAS-RI research infrastructures project partly funded by the EC FP5 research program via establishing common standards of data processing and analysis methods, stations upgrading to near real time monitoring and Continuous GPS stations installations at the key sea level stations. However, following the dramatic encounters of the Indian Ocean tsunami event on 26 December 2004 and of the Kathrina hurricane over the New Orleans coastal area in September 2005, it became clear that the MedGLOSS stations can and must assume additional duties, by low latency detection and alerting of signals of multi hazard types of sea level variation. Among these we note the occurrence of tsunami events (the Mediterranean inducing fast rising/lowering sea level changes), more frequent meteo-tsunami atmospheric pressure fluctuations induced events (few minutes - to be monitored with a low latency of 10 to 30 seconds), anomalous sea level rise at the coasts from storm surge induced by strong and/or prolonged onshore winds as well as by high storm wave heights via radiation stress growing in the surf zone towards the shoreline or set-down by strong offshore winds (few hours to days - to be monitored by a latency of minutes to hourly), plus a combination of the latter with spring or neap tides and climate change-induced sea level rise and other oceanographic circulation processes in the Mediterranean and the Black sea by world wide processes such as the North Atlantic circulation and the El Nino/La Nina. To meet increasing funding needs, the MedGLOSS focal center, at the Israel Oceanographic & Limnological Research (IOLR) coordinated the preparation and submission of research proposals. One of these, named MedAlert [1] was submitted to the Mediterranean region commission of the Global Climate Observing System (jointly established by WMO, UNEP, IOC/UNESCO and ICSU) and was included in its new Action Plan for the Mediterranean. Sea level rise assessed by the new IPCC report is lower than its previous 2001 assessment (although the climate warming is even more dramatic), but a number of contributions were not taken into account. Based on the previous warming forecast scenarios and applying a new indirect assessment method, Stefan Rahmstorf [3] assessed higher sea levels by the end of 2100. Given the higher warming assessed by the new IPCC report, and applying Rahmstorf method, one reaches even higher sea level rise by the end of the century. The sea level rise, together with the forecasted climate warming-induced increased frequency of extreme storm events, make MedGLOSS an important tool for the monitoring, detection and early warning of sea level induced hazards at various time scales.

References

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