Geophysical Research Abstracts
Vol. 12, EGU2010-11136, 2010
EGU General Assembly 2010

Tsunami Early Warning for the Indian Ocean Region – Status and Outlook

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The German-Indonesian Tsunami Early Warning System (GITEWS) for the Indian Ocean region has gone into operation in Indonesia in November 2008. The system includes a seismological network, together with GPS stations and a network of GPS buoys additionally equipped with ocean bottom pressure sensors and a tide gauge network. The different sensor systems have, for the most part, been installed and now deliver respective data either online or interactively upon request to the Warning Centre in Jakarta. Before 2011, however, the different components requires further optimization and fine tuning, local personnel needs to be trained and eventual problems in the daily operation have to be dealt with. Furthermore a company will be founded in the near future, which will guarantee a sustainable maintenance and operation of the system. This concludes the transfer from a temporarily project into a permanent service.

This system established in Indonesia differs from other Tsunami Warning Systems through its application of modern scientific methods and technologies. New procedures for the fast and reliable determination of strong earthquakes, deformation monitoring by GPS, the modeling of tsunamis and the assessment of the situation have been implemented in the Warning System architecture. In particular, the direct incorporation of different sensors provides broad information already at the early stages of Early Warning thus resulting in a stable system and minimizing breakdowns and false alarms. The warning system is designed in an open and modular structure based on the most recent developments and standards of information technology. Therefore, the system can easily integrate additional sensor components to be used for other multi-hazard purposes e.g. meteorological and hydrological events.

Up to now the German project group is cooperating in the Indian Ocean region with Sri Lanka, the Maldives, Iran, Yemen, Tanzania and Kenya to set up the equipment primarily for seismological monitoring and data analysis. The automatic seismic data processing software SeisComP3, is not only operational in the warning centre in Jakarta and successfully used for rapid earthquake information, but also in different Indian Ocean rim countries like the once mentioned before as well as in India, Thailand and Pakistan. Close cooperation has been established with Australia, South Africa and India for the real-time exchange mainly of seismological and sea level data.