Experiences integrating autonomous components and legacy systems into tsunami early warning systems

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Fostered by and embedded in the general development of Information and Communication Technology (ICT) the evolution of Tsunami Early Warning Systems (TEWS) shows a significant development from seismic-centred to multi-sensor system architectures using additional sensors, e.g. sea level stations for the detection of tsunami waves and GPS stations for the detection of ground displacements. Furthermore, the design and implementation of a robust and scalable service infrastructure supporting the integration and utilisation of existing resources serving near real-time data not only includes sensors but also other components and systems offering services such as the delivery of feasible simulations used for forecasting in an imminent tsunami threat.

In the context of the development of the German Indonesian Tsunami Early Warning System (GITEWS) and the project Distant Early Warning System (DEWS) a service platform for both sensor integration and warning dissemination has been newly developed and demonstrated. In particular, standards of the Open Geospatial Consortium (OGC) and the Organization for the Advancement of Structured Information Standards (OASIS) have been successfully incorporated. In the project Collaborative, Complex, and Critical Decision-Support in Evolving Crises (TRIDEC) new developments are used to extend the existing platform to realise a component-based technology framework for building distributed TEWS.

This talk will describe experiences made in GITEWS, DEWS and TRIDEC while integrating legacy stand-alone systems and newly developed special-purpose software components into TEWS using different software adapters and communication strategies to make the systems work together in a corporate infrastructure. The talk will also cover task management and data conversion between the different systems. Practical approaches and software solutions for the integration of sensors, e.g. providing seismic and sea level data, and utilisation of special-purpose components, such as simulation systems, in TEWS will be presented.