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Improved protection 4 years after Fukushima

Better protection against tsunami impact and improved risk assessments. These are some of the most important results of a two-year Euro-Japanese research project, coordinated by NGI. The four participating research institutions met for a two-day seminar in Germany on the 5th and 6th March, marking the finalization of a successful project.

The overall aims have been to strengthen cooperation between Japanese and European tsunami researchers, to enhance tsunami mitigation structures, and to improve the quality of the computational models used to analyse risk for

people and critical infrastructure in coastal areas.

The research project, known as RAPSODI, was started in 2013, partly as a result of the 2011 Tohoku tsunami that caused enormous damage along the East Coast of Japan and knocked out the Fukushima Daiichi power plant. Today,on the 11th of March, this is exactly four years ago.

The project has been coordinated by NGI, Norwegian Geotechnical Institute, with technical expert Carl B. Harbitz as project coordinator. The other participants were The Port and Airport Research Institute (PARI) of Japan, Technische Universität Braunschweig with its Leichtweiss-Institut für Wasserbau (TU-BS, LWI) of Germany, and the Middle East Technical University (METU) of Turkey.

Laboratory tests at LWI, TU-BS to study foundation and design of mitigation structures against tsunamis. Scale 1:30. (Photo: TU-BS)

- The research collaboration has provided new knowledge and experience, says Carl B. Harbitz of NGI. He adds: - The Japanese interest in our research represents an important acknowledgement to those of us who have worked on tsunami computational models and risk analysis for several years. Initially, we saw that the expectation of the European and the Japan researchers were rather different. Therefore, the project has given us new insight into the challenges of working across cultural and language barriers.

Harbitz underlines the importance of the exchange of information as well as cooperation on designing practical measures. Both Japan and Germany have very good laboratories, facilitating the testing of various mitigation structures. This results in improved foundations and design of breakwaters giving better protection of people and infrastructure along the coast.

- Through the project, we have gained access to some of the data from the Tohoku tsunami, enabling us to test and improve our GIS risk analysis model by way of comparing it with real data. The model takes several factors into consideration, such as the onland flowdepth of the tsunami, the vulnerability of buildings, and the population exposure. Overall, this enables us to better predict the consequences of various tsunami scenarios, explains Carl B. Harbitz.

The origin of the project name RAPSODI is Risk Assessment and Design of

Prevention Structures for Enhanced Disaster Resilience. It is part of the CONCERT-Japan Joint Call on Efficient Energy Storage and Distribution/Resilience against Disasters, initiated by the EU through its 7th framework programme, but financed through the participating institutions national research organizations, as for NGI financed by the Research Council of Norway.

During the project, the participating researchers have met in Japan, Turkey, South Korea and Norway - including a field trip to the Norwegian fjords exposed to rockslide tsunamis. The concluding seminar was held at LWI, the water research institute of the Technical University, Braunschweig, Germany.

The Norwegian Geotechnical Institute (NGI) is a leading international centre for research and consulting within the geosciences. NGI develops optimum solutions for society, and offers expertise on the behaviour of soil, rock and snow and their interaction with the natural and built environment.
NGI works within the markets Offshore energy; Building, construction and transportation; Natural hazards, and Environmental Engineering.
NGI is a private foundation with office and laboratory in Oslo, branch office in Trondheim, and daughter companies in Houston, Texas, USA, and Perth, Western Australia. NGI was established in 1953.

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