MARSite–MARMARA SUPERSITE: Accomplishments and Outlook

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MARsite Project, funded under FP7-ENV.2012 6.4-2 (Grant 308417) and successfully implemented to Marmara Region during 2014-2016 indicated that focusing on the monitoring of the region and the integration of data from land, sea and space and the processing of this composed data based on sound earth-science research is an effective tool for mitigating damage from future earthquakes. This was achieved by monitoring the earthquake hazard through the ground-shaking and forecast maps, short- and long-term earthquake rate forecasting and time-dependent seismic hazard maps to make important risk-mitigation decisions regarding building design, insurance rates, land-use planning, and public-policy issues that need to balance safety and economic and social interests.

MARSite has demonstrated the power of the use of different sensors in the assessment of the earthquake hazard. In addition to the more than 30 scientific publication within the MARsite Project framework, a multidisciplinary innovative borehole seismic observatory and a dilatometer have been installed within MARSite where its a data can be used for a range of seismic studies. Due to the encouraging results obtained from this experiment, it was determined that in the future likely smaller number of stations will be required reducing the cost of national seismic networks. The technical infrastructure of the continuous GPS stations of MAGNET network has been updated within MARSite. Tsunami hazard studies in MARSite in Marmara Sea showed that the tsunami hazard in the Marmara Region is primarily due to submarine landslides triggered by an earthquake and a conceptual Tsunami Early Warning System in the Marmara region strongly coupled with the strong ground motion and existing Earthquake Early Warning System was developed. The existing Earthquake Early Warning and Rapid Response system in the Marmara Region was improved and the installation and test of a pilot seismic landslide monitoring system was taken place in the Avcilar-Beylikdüzü Peninsula, a large landslide prone area located in westward part of Istanbul and facing the North Anatolian Fault Zone (NAFZ). An integrated approach based on multi-parameter seafloor observatories was implemented to continuously monitor the micro-seismicity along with the fluid expulsion activity within the submerged fault zone. During MARSite, strong integration and links had been established with major European initiatives focused on the collection of multidisciplinary data, their dissemination, interpretation and fusion to produce consistent theoretical and practical models, the implementation of good practices so as to provide the necessary information to end users, and the updating of seismic hazard and risk evaluations in the Marmara region.

In this perspective, to continue the understanding of and improvement in the preparedness for geological disasters, the existing monitoring infrastructure of Marsite requires the continuation of a strong a European initiative. This presentation will provide a venue for information exchange towards the establishment of such an initiative.