



Monitoring of gas and seismic energy release: new results from the multi-parametric benthic observatory SN-4 at MARsite location (Gulf of Izmit, Turkey)

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Episodic gas seepage occurs at the seafloor in the Gulf of Izmit (Sea of Marmara, NW Turkey) along the submerged segment of the North Anatolian Fault (NAF), which ruptured during the 1999 M_w 7.4 Izmit earthquake, and caused tectonic loading of the fault segment in front of the Istanbul metropolitan area. Marmara site was selected as one EMSO (European Multidisciplinary Seafloor and water column Observatory) node where establish a permanent sea-bottom observatory. An autonomous and long-term multiparametric benthic observatory (SN-4) was deployed in order to study gas seepage and seismic energy release along the NAF. SN-4 operated in the gulf at the western end of the 1999 Izmit earthquake rupture for about one-year at 166 m water depth. The SN-4 payload included a three-component broad-band seismometer, as well as gas and oceanographic sensors. We analysed data collected continuously for 161 days in the first part of the experiment, from October 2009 to March 2010. The main objective of our work was to verify whether tectonic deformation along the NAF could trigger methane seepage. Results from the SN-4 experiment in the Sea of Marmara suggest that neither low-magnitude local seismicity, nor regional events affect intensity and frequency of gas flows from the seafloor. The SN-4 observatory was recently re-deployed in the same site for another one year mission (September 2013) in the framework of MARsite (New Directions in Seismic Hazard assessment through Focused Earth Observation in the Marmara Supersite) EC project which aims assessing the “state of the art” of seismic risk evaluation and management at European level by long-term monitoring activities in Marmara Sea.

References

EMSO web site: <http://www.emso-eu.org>

MARsite web site: <http://www.marsite.eu/>