



Results from the latest SN-4 multi-parametric benthic observatory experiment (MARsite EU project) in the Gulf of Izmit, Turkey: oceanographic, chemical and seismic monitoring

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An autonomous and long-term multiparametric benthic observatory (SN-4) was designed to study gas seepage and seismic energy release along the submerged segment of the North Anatolian Fault (NAF). Episodic gas seepage occurs at the seafloor in the Gulf of Izmit (Sea of Marmara, NW Turkey) along this submerged segment of the NAF, which ruptured during the 1999 Mw7.4 Izmit earthquake. The SN-4 observatory already operated in the Gulf of Izmit at the western end of the 1999 Izmit earthquake rupture for about one-year at 166 m water depth during the 2009-2010 experiment (EGU2014-13412-1, EGU General Assembly 2014).

SN-4 was re-deployed in the same site for a new long term mission (September 2013 – April 2014) in the framework of MARsite (New Directions in Seismic Hazard assessment through Focused Earth Observation in the Marmara Supersite, <http://marsite.eu/>) EC project, which aims at evaluating seismic risk and managing of long-term monitoring activities in the Marmara Sea. A main scientific objective of the SN-4 experiment is to investigate the possible correlations between seafloor methane seepage and release of seismic energy. We used the same site of the 2009-2010 campaign to verify both the occurrence of previously observed phenomena and the reliability of results obtained in the previous experiment (Embriaco et al., 2014, doi:10.1093/gji/ggt436). In particular, we are interested in the detection of gas release at the seafloor, in the role played by oceanographic phenomena in this detection, and in the association of gas and seismic energy release. The scientific payload included, among other instruments, a three-component broad-band seismometer, and gas and oceanographic sensors.

We present a technical description of the observatory, including the data acquisition and control system, results from the preliminary analysis of this new multidisciplinary data set, and a comparison with the previous experiment.