



GONAF: A borehole-based Geophysical Observatory at the North Anatolian Fault zone in NW Turkey

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The North Anatolian Fault Zone (NAFZ) below the Sea of Marmara represents a 'seismic gap' where a major earthquake is expected to occur in the near future. The Marmara segment of the NAFZ is located between the 1912 Ganos and 1999 Izmit ruptures and is the only segment that has not ruptured since 1766. The GONAF project (Geophysical Observatory at the North Anatolian Fault; www.gonaf.de) involves the installation of a high-resolution borehole seismic observatory at the NAFZ consisting of up to eight 300m deep vertical boreholes around the eastern Sea of Marmara to monitor the NAFZ segment at the transition to the recent 1999 Izmit rupture. GONAF is an international collaboration and co-funded by the International Continental Scientific Drilling Programme (ICDP), GFZ Potsdam and the Disaster and Emergency Management Presidency in Ankara/Turkey (AFAD). Further principal partners are MIT and UNAVCO/both US, IESSE/New Zealand and JAMSTEC/Japan. The principal scientific objective of GONAF is to study physical processes acting before, during and after the expected $M > 7$ earthquake along the Princes Islands segment of the NAFZ by monitoring microseismic activity at significantly reduced magnitude detection threshold and improved hypocentral resolution. In October 2012 the first GONAF borehole was successfully drilled in Istanbul on the Tuzla peninsula and an array of borehole seismometers was installed for permanent operation. In addition a surface station at the same site was installed consisting of short period, broadband and strong motions sensors.