Geophysical Research Abstracts
Vol. 12, EGU2010-9993, 2010
EGU General Assembly 2010

Seismic Monitoring at the North Anatolian Fault in the Sea of Marmara offshore Istanbul, NW Turkey

Fatih Bulut (1), Marco Bohnhoff (1), Mustafa Aktar (2), and Georg Dresen (1)
(1) Helmholtz Centre Potsdam GFZ , (2) Bogazici University

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. This segment of the fault lies between the 1912 Ganos and 1999 Izmit ruptures and is the only NAFZ segment that has not ruptured since 1766. To monitor the microseismic activity at the main fault branch offshore of Istanbul below the Çınarcık Basin (ÇB) a permanent seismic array (PIRES) was installed on the Prince Islands, at a few kilometer distance to the fault. In addition, a temporary network of ocean bottom seismometers was deployed throughout the Cinarcik Basin. We observe seismicity rates of 20 events/month for M<2.5 along the basin. The spatial distribution of hypocenters suggest that the two major fault branches bounding the depocenter below the Cinarcik Basin merge to one single master fault below $\sim$17 km depth. Based on cross-correlation technique we group closely spaced earthquakes and determine composite focal mechanisms implementing recordings of surrounding permanent land stations. Fault plane solutions have a predominant right lateral strike-slip mechanism indicating that normal faulting along this part of the NAFZ plays a minor role. Towards the west we observe increasing components of thrust faulting. This supports the model of NW-trending, dextral strike-slip motion along the northern and main branch of the NAFZ below the eastern Sea of Marmara.