

## **Seismotectonic Features in Western Segment of the North Anatolian Fault, Formed During 19 August 1999 Kocaeli and 12 November 1999 Düzce Earthquakes, NW Turkey**

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The North Anatolian Fault, NAF, about 1700 km length, is one of the major faults in Eastern Mediterranean, combining the area of compressional tectonics (east Anatolia), to area of tensional tectonics (north Egean). It is an intracontinental transform fault zone, between the Eurasian Plate and the Anatolian - Egean plates, which was initiated during early Pliocene and has experienced a westward decreasing in total offset from 40 km to 20 km. Maximum offset recorded till now changes from 7.5 m (Erzincan, 1939) at the east end to 4.5 m (Kocaeli and Düzce, 1999) at the west end. These two events caused surface ruptures with a total length of 200 km, along the western segment of NAF.

17 August 1999 Kocaeli Earthquake,  $M=7.4$ , has generated 160 km seismic rupture striking N 80-90 and consists of two separate fault strands, each being approx. 80 km long. The western strand, between Yalova and Adapazarı, displayed a maximum dextral slip of 4.40 m at Gölcük. The eastern strand, between Sapanca and Gölyaka, displayed maximum dextral slip of 4.70 m to the east of Arifiye. Two macro-seismic epicentres are observed at Gölcük and Arifiye, corresponding to maximum dislocations and damage intensity.

12 November 1999 Düzce Earthquake,  $M=7.2$ , caused surface rupture of about 50 km length, between Bolu and Gölyaka. Maximum right lateral slip measured as 4.30 m, southeast of Gölyaka. The strike of this rupture changes from N55 to N80, which correspond to the same trace of NAF and seismic ruptures of previous events. All these faults have normal slip components and opening, which represent the mechanism of dextral SS faulting, forming pull-apart basins among the different segments of NAF, with east-stepping en echelon pattern.