

## **Paleoseismological investigations on 1999 İzmit earthquake surface rupture**

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17 August 1999 İzmit earthquake ruptured 5 segments on the eastern Marmara region. Sapanca-Akyazı segment is one of the ruptured segments, trending between Sapanca Lake and Akyazı town. Two trench sites on the eastern and western banks of Sakarya River were chosen for 2D and 3D trenching. Both trench sites have good and identifiable stratigraphic units covering river, flood plain and pond deposits. Eastern trench evidenced penultimate and pre-penultimate events while western trenches marked 3 past earthquakes before 1999 event. Western bank of Sakarya river covers different terrace levels and edges. This site is 2 km far from maximum offset site of 5.2 m. On the trench site, 3.8 m and 3.6 m offsets were measured on an asphalt road and a wooden garden fence after 1999 İzmit earthquake respectively. 5 trenches were opened in the western site, three perpendicular and two parallel to the surface rupture. Three previous earthquakes before 1999 event were identified in perpendicular trenches. Western Sakarya river bank has also good evidence for 3D trenching. A terrace edge line is cut by 1999 earthquake surface rupture. This scarp is visible on the southern block of the recent rupture but it was buried on the northern block because of vertical movement on it. Buried terrace scarp is firstly investigated by Ground Penetrating Radar. It was also determined with an excavation, parallel to the surface rupture on the northern part and nearly perpendicular to the terrace scarp. The cumulative lateral displacement was measured by theodolite as  $18.5 \pm 0.5$  m. Comparing dates of previous earthquakes and terrace age with cumulative offset will give slip history of probable past 5 events considering that there was 3.6-3.8 m lateral offset in 1999 earthquake. Dating process of collected charcoal samples are underway.