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Preliminary Investigations on Geomorphological and Paleoseismological Studies on Yedisu Seismic Gap, North Anatolian Fault Zone, Eastern Turkey

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Yedisu Fault is located on the eastern part of the North Anatolian Fault Zone (NAFZ) between Erzincan and Bingöl cities. It elongates with N60-80W orientation and has a length of 65 kilometers. Yedisu segment remained unruptured after the sequence of earthquakes (M>6.9) in the last century that began in 1939 Erzincan earthquake where NAFZ ruptured from Karliova in the east to Yalova in the west. Previous studies of energy transfer models have revealed a high energy accumulation on Yedisu Fault. Earthquakes in 1949 and 1992, on the east and west of the neighboring faults and 2005 Karliova earthquakes increased the stress accumulation and the earthquake risk. According to the historical records, last earthquake on this segment occurred in 1784. Therefore, a possible failure of 65-km segment would cause an earthquake (M>7) in the near future.

This study contains the geological, geomorphological and paleoseismological studies in the vicinity of Yedisu Basin. Wedge-shaped Yedisu Basin has a long axis striking in WNW-ESE direction with a length of 10 km, and a maximum width of 3 km. Fault geometry has been mapped by definition of morphological features around Yedisu Basin. Offset streams between 2-80m, pressure ridges, hot springs and small travertine formations are clear geological and geomorphological evidences for fault geometry.

One trench study is made in north side of the basin and a few charcoal samples dated to identify historical earthquake and calculate the rate of the sedimentation. Paleoseismologic study revealed two ancient earthquakes. First of which has occurred between 50 and 450 AD, whereas the other after 450 AD. These results, although do not sug-

gest a recurrence period, will contribute to the later paleoseismological studies.