



## **A possible influence of active tectonics on coastline migration in the Marmara region, NW Turkey**

H. Koral

Department of Geological Engineering, Istanbul University, Avcı lar 34320 Istanbul, Turkey

The Marmara region has been a tectonically very active belt in northwestern Turkey with a paleogeographical evolution related to the collision and the escape tectonics, accompanied by the development of the strike-slip North Anatolian Fault (NAF). The effect of active tectonics on the modification of coastal and morphological features NW Turkey is, however extensive, relatively unknown and much less appreciated.

In the Marmara region, Neogene sequence indicates shallow marine, lacustrine and fluvial conditions of Late Miocene-Early Pliocene, and fluvial and colluvial conditions of Late Pliocene-Pleistocene. Alluvial deposits occur in present morphological depressions. It is evident from the distribution of deposits that east-west and northeast-southwest oriented depressions created during the Late Pliocene-Pleistocene and Holocene lakes, marshes, and fluvial systems along early and recent splays of NAF that were filled concurrently with uplift and denudation leading to the formation of wide plains suitable for human settlement. Active tectonics that has forms of uplift, subsidence and lateral displacement continues to reshape the region, as is plainly demonstrated by the 1999 Marmara earthquake sequence, and all three tectonic effects are related to the geometry of the fault and the mode of lateral movement along it.

In northwestern Turkey, there are two questions of principal interest regarding uplifted terraces/beach sands, tilted deposits/erosional surfaces, diverted creeks, deeply-cut valleys, truncated ridges, and sag ponds that indicate the importance of tectonic and lateral movements in the geomorphological/ morphotectonic development of the region. (1) How recently did these features develop? and (2) How far did they influence the paleogeography of the recent geological past? Though very limited at present, data indicate the possibility that many geological/morphological features may be representative of the latest period of neotectonics—as late as Late Pleistocene-Holocene.

Within the last 100,000 years, lateral displacements on the order of a few kilometers, and vertical displacements minimally on the order a few hundred meters must have occurred in northwestern Turkey, which would have seriously modified the connections between adjacent basins and coastal configurations. The distribution of Paleolithic sites exclusively on high terraces, and the total absence of pre-Bronze age (5000-3000 years BP) sites are particularly noteworthy in the area, which includes the Bosphorus, Dardanells, İzmit Bay, Sapanca Lake, and the Sakarya River.