Geophysical Research Abstracts, Vol. 7, 03324, 2005
SRef-ID: 1607-7962/gra/EGU05-A-03324

Modelling drainage perturbation related to the propagation of the North Anatolian Fault in the Marmara Sea region, Turkey with S R T M (SRTM) data

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Geological and geomorphological offsets of river basin drainages are used to constrain the deformation and basin change rates over Neogene-Holocene timescales along the central and eastern North Anatolian Fault (NAF) in Turkey. We present a preliminary tectonic and geomorphologic analysis of SRTM data from Marmara Sea region. Our method of analysis is based on a delineation of surface flow patterns using a fast, multipixel outflow algorithm. We then use forward modelling surface flow approach to evaluate interactions between faulting and drainage patterns. Also we would to

define the relationship between tectonic setting and drainage basin evolution looking at the drainage divide longitudinal profiles.

The initial results obtained looking at the longitudinal river profiles show: 1) on the southern coast of Izmit Gulf the river profiles are not in equilibrium due to subsidence along the NAF that results in the seaward tilting of the southern block and probabily leads to the formation of an extensional roll-over anticline on the land; 2) on the northern coast of Izmit Gulf, the river profiles are characterized by abrupt drop or knick point that we suggest is linked to the lithospheric flexural response due to the subsidence of the southern blocks; 3) along the Black Sea southern margin the river profiles show a gentle tilting northward indicating a more distal response of the subsidence of the southern block along the NAF. These results are consistent with Cormier et al. (submitted to JGR) findings that document a subsidence rate > 1 mm per year for Karamursel Basin and a tilting rate of the southern blocks of 0.3 $^{\circ}$/ ka. Cormier et al. (submitted to JGR) tectonic rates were derived from dating the late Pleistocene-Holocene submarine paleoshoreline of Karamursel Basin.

All our results tend to show that most of the evolution of river basins located in this region is induced by the propagation of the North Anatolian Fault indicating that our modelling can be used as an effective tool to extract tectonic informations.

Future plans consist into use this modelling to evaluate the tectonic frame in the Cariaco Basin and in the Calabrian Arc.