2010 Fall Meeting
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Cite abstracts as **Author(s) (2010), Title, Abstract xxxxx-xxxx presented at 2010 Fall Meeting, AGU, San Francisco, Calif., 13-17 Dec.**

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drab

HR: 0800h
AN: **EP41B-0696 *Poster***
TI: Evolution of the Kızılırmak river and its interaction with the North Anatolian Fault, Turkey
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AB: The North Anatolian Fault (NAF) is a 1500km long dextral strike-slip fault, which accommodates the extrusion of the Anatolian Plate away from the Arabia/Eurasia collision zone at a rate of 20-25mm/yr. The fault strongly affects the whole drainage network and, especially, the Kızılırmak River. The Kızılırmak River is the longest river in Turkey (1350km); it formed during the Pliocene and rose in eastern Anatolia. The river drains a part of the Anatolian Plateau, crosses the North Anatolian Fault and the Pontides mountains before reaching the Black Sea. Whereas wide terraces are preserved along the Kızılırmak River in the Anatolian Plateau, where a recent study (Dogan 2009) determines an incision rate of 0.08 mm/yr according to 40Ar/39Ar datations on basalts, no clear terraces can be mapped further North where the river incises through the Pontides Mountains. Our study focuses on the central part of the fault affected by the 280 km long 1943 Tosya earthquake rupture. In this area the NAF makes a wide convex arc about 100km south to the Black Sea coast, and offset by 30 km the Kızılırmak River. Indeed, south of the NAF the Kızılırmak River flows to North/East. Then it is deviated along the NAF in the Kargı pull-apart and flows to the East parallel to the fault for 30km before bending again to the North/East in the Kamil pull-apart. Around the two bends of the River three alluvial terraces can be mapped. The lowest one (10m high above the present river level) is preserved in the Kargı pull-apart. The two other ones (60 and 100m above the Kızılırmak River) are situated further east in the Kamil pull-apart. The highest terrace is offset by at least 300m offset along the NAF. The ages of sampled terraces are constrained using 10Be and 36Cl cosmogenic dating methods. The in situ cosmogenic 36Cl exposure ages calculated apply from 22ka for the lowest terrace, to 100 ka for the highest terrace in the erosion preserved area. The highest terrace

shows a contribution of younger ages (the same time interval of 50ka of the intermediate terrace) certainly coming from the catchement just above. The proximity of ages may be due to the short time-interval between the both highest terraces incision by the Kızılırmak river. 10Be measurements on sand coming from river beds will provide past to actual erosion rates along the Kızılırmak River as well as present erosion rate from small rivers flowing to the river. The goals of this study are to constrain, 1/ the origin of the terraces (climatic or tectonic), 2/ the slip rate of the NAF integrated over more than 20 000 years, 3/ the evolution of the Kızılırmak River incision rate, 4/ the influence of the vertical motion in the NAF convex arc region on the present incision rate of small rivers flowing toward the Kızılırmak.
DE: [1150] GEOCHRONOLOGY / Cosmogenic-nuclide exposure dating
SC: Earth and Planetary Surface Processes (EP)
MN: 2010 Fall Meeting

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