Geophysical Research Abstracts
Vol. 13, EGU2011-8290, 2011
EGU General Assembly 2011

Analysis of Channel Profiles as an Indicator for Uplift in Sinai, Egypt

Angela Oswald and Kurt Stüwe
University of Graz, Department of Earth Sciences, Graz, Austria (angela.oswald@uni-graz.at)

The morphological analysis of drainages in eroding mountain belts has proven to be a useful tool to decipher neotectonic processes on time and length scales that are comparable to the eroding channel network. One region where an actively eroding channel network interacts with young uplift in a rift setting is Sinai in Egypt. Sinai has tilted northward in response to the pure-shear opening of the Gulf of Suez and the strike-slip dominated opening of the Gulf of Aquaba since the Mid Miocene. In the process the Mesozoic cover sequence has eroded in a northward retreating scarp fashion, exposing Precambrian rocks of the Arabian Nubian Shield in its wake in much of southern Sinai.

In this project we use analysis of the digital elevation model of Sinai to compare channels in the Mesozoic cover sequence in central Sinai with those in the crystalline basement of southern Sinai. Cosmogenic isotope work is envisaged to trace the retreat of the scarp as a proxy for the rate of tilting. We also investigate geometry of drainage networks within the crystalline basement. In general, rivers in the west drain into the Gulf of Suez in a more linear fashion than those in the east, which drain into the Gulf of Aquaba. Many river profiles deviate from equilibrium channel profiles, which can be quantified by concavity and steepness index. Overall the river profiles tend to be more concave towards the south. This contribution presents a progress report on our numerical work on the channel networks and observations from a first field season.