Geophysical Research Abstracts,
Vol. 12, EGU2010-7, 2010
EGU General Assembly 2010

DEM-based determination of knickpoints in South Central Alborz Drainage Basin, N Iran

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Stream gradients of Karaj River and its tributaries in south central Alborz were examined using GIS and 30-m digital elevation models to discuss the distribution of knickpoints. In order to discriminate values at the index related to rock resistance, different levels of average rock strength were defined (by rock type and field observation) from very low strength (alluvial deposits), low strength (slope deposits), moderate strength (siltstone, shale), high strength (sandstone, conglomerate, limestone, and tuff), and very high strength (quartzite, and monzodiorit-monzogabbro). The observed SL index anomalies were then plotted on the map of the relative strength of materials and their relation to rock strength were analyzed utilizing GIS applications. Based upon the quantitative SL indices linked to relative rock resistance described above with field observations suggest that there are three knickzones. The identified knickzones occur widely in the study area and indicate that the knickzone is one of the common landforms in Karaj drainage basin. Although there is most resistance rock around the Amir-Kabir dam the knickpoints are more abundant there.