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Biophysical and biochemical weathering of coastal escarpments, Morocco

Michael J Duane

Department of Earth and Environmental Sciences, Kuwait University, PO Box 5969, Safat 13060, Kuwait. phytokarst@hotmail.com

A combination of weathering agents is denuding the coastal escarpments of Morocco. Increased human construction, diversion of natural drainage, de-afforestation, Atlantic storms, neotectonics, and microbial weathering. The first 4 aspects have been dealth with elsewhere, but the impact of biokarsting and biomineralization is totally underestimated and may be a future hazard for the authorities.

The purpose of this paper is to readdress the lack of observations and to expose the processes down to nano-level observations. There is a rich landform preserved in the coastal landscape and opportunities exist for studying the interactions and determining driving mechanisms over a wide range of spatial (eastern Atlantic to beach head in Morocco) and temporal (millennia to years) scales. This work has 2 dimensions: the vertical weathering of escarpments and the lateral dimensions of changing coastline positions. These weathering changes results from external forces (climate change, human interference) and internal forces (vadose stream diversion, and biogenic biomineralization), both of which must be addressed through hypothesis testing and model building. One of the aims of this research is to establish, through local, regional and national case studies, the degree of penetration by microbal consortia and their weathering rates. A model is presented which illustrates the pervasiveness of the biogenic weathering and consequences for coastal planning in Morocco.