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Breaking rocks made easy: subcritical processes and tectonic predesign

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In geomorphic studies, to change in landforms, e.g. by rock slope failure, fluvial or glacial erosion, a threshold is commonly assumed, which is crossed either by an increase in external driving or a decrease of internal resisting forces, respectively. If the threshold is crossed, bedrock breaks and slope fails, rivers incise and glaciers plug and sew their bed.
Here we put forward a focus on the decrease of the resisting forces, as an increase in the driving forces, to match the strength of bedrock, is not that likely. We suggest that the degradation of resisting forces of bedrock can be better explained by subcritical processes like creep, fatigue and stress corrosion interplaying with tectonic predesign. Both concepts, subcritical processes and tectonic predesign have been issued in the last century, but have not been widely accepted nor have their assumptions been explicitly stressed in recent case studies. Moreover both concepts profit especially on scale issues if merged.
Subcritical crack growth, includes different mechanisms promoting fractures well below the ultimate strength. Single infinitesimal but irreversible damage and deformations are induced in the material over time. They interact with inherent microstructural flaws and low applied stresses, limiting local strength and macroscopic behavior of bedrock. This reissues the concept of tectonic predesigned, as proposed by A.E. Scheidegger, which not only encompasses structural features that determine the routing of drainage patterns and shear planes, e.g. joints, faults and foliations, but also the (neo)tectonic stress-field and the (in-situ) strain state of bedrocks and mountains.
Combining subcritical processes and tectonic predesign we can better explain, why and where we see a dissected, eroded and geomorphic divers' landscape. In this conceptual framework actual magnitudes of the driving forces are accounted for and so is the nature of the bedrock material, to better understand the trajectories of the forms we study, and break rocks easily.