

The role of climate in mountain evolution - what about vegetation?

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Basically it is well understood that there is an intensive interaction between mountain evolution and climate. Climate change influences weathering, erosion as well as sedimentation; it may thus influence the mountain relief and stimulate differential uplift. On the other hand, mountains have significant effects on the local, regional and – if the mountains are large enough – on the global climate; in fact, considerable parts of the Cenozoic cooling are linked to mountain uplift. Many working groups are focusing on this climate-mountain interactions. The vegetation, however, is still largely neglected in studies of mountain evolution, although the vegetation plays a major role not only in weathering, erosion and sedimentation processes but also in the climate system: it controls many geochemical cycles, including those of water and carbon, and influences the albedo, the aerosol production as well as the wind pattern and the momentum exchange between atmosphere and surface. Obviously, the vegetation may also induce non-linear reactions of mountains as well as of the climate system to external forcings. My presentation explores the potential impact of vegetation change on the Cenozoic evolution of mountains and in particular of the Tibetan Plateau.