What limits the height of mountains?

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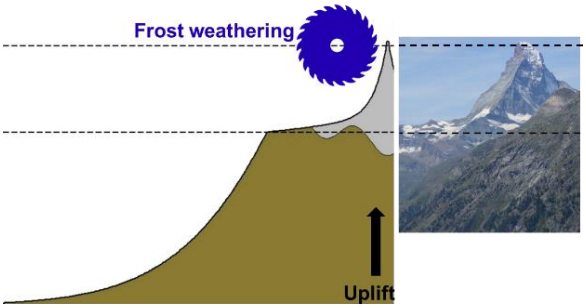
Project description

Tectonic processes uplift the Earth surface to mountains. As a mountain is uplifted, it reaches elevations where temperatures occur that are cold enough to enhance frost weathering processes. Increasing frost weathering activity breaks down mountains into small rock crumbles that are eroded by rockfall processes. Frost weathering acts as a *buzzsaw* that constantly cuts off mountain peaks and therefore limits the height mountain can achieve.



In this project, the following activities are foreseen. 1) Collect published erosion rates from mountain ranges all over the world to get insights about erosion activity. We already collected more than 200 articles and started a global erosion database to evaluate erosion differences in space and elevation. 2) Assess frost weathering activity, you will reconstruct mountain temperature using remote sensing products such as ASTER AG100v0003 global emissivity and land surface temperatures and use these temperatures to run a frost weathering model coded in MATLAB with our support. Therefore, you can quantify how frost weathering magnitude differs between elevation and relate frost weathering activity to erosion activity. 3) Write a short report or publication on the project.

Job requirements

You should be enthusiastic about mountains, landscape evolution and have a basic understanding of weathering and rockfall processes. You should be interested in literature research and be able to elaborate key (erosion) data from papers. To reconstruct land surface temperatures, you should bring in an affinity in using remote sensing products as IDL/Envi or Google Earth Engine (GEE) and an understanding of coding in Python or Matlab to manage big data sets.