



How to explain variations in sea cliff erosion rate?

Melody Prémaillon (1), Vincent Regard (1), and Thomas Dewez (2)

(1) GET, Université de Toulouse, UPS (OMP), CNRS, IRD, 14 avenue Edouard Belin, 31400 Toulouse, France
(melody.premaillon@get.omp.eu), (2) BRGM, Direction of Risks and Mitigation, 3 avenue C. Guillemin, F-45060 Orléans-La Source, France

Every rocky coast of the world is eroding at different rate (cliff retreat rates). Erosion is caused by a complex interaction of multiple sea weather factors. While numerous local studies exist and explain erosion processes on specific sites, global studies lack. We started to compile many of those local studies and analyse their results with a global point of view in order to quantify the various parameters influencing erosion rates. In other words: is erosion more important in energetic seas? Are chalk cliff eroding faster in rainy environment? etc. In order to do this, we built a database based on literature and national erosion databases. It now contains 80 publications which represents 2500 cliffs studied and more than 3500 erosion rate estimates. A statistical analysis was conducted on this database. On a first approximation, cliff lithology is the only clear signal explaining erosion rate variation: hard lithologies are eroding at 1cm/y or less, whereas unconsolidated lithologies commonly erode faster than 10cm/y. No clear statistical relation were found between erosion rate and external parameters such as sea energy (swell, tide) or weather condition, even on cliff with similar lithology.