Geophysical Research Abstracts
Vol. 19, EGU2017-3595-1, 2017
EGU General Assembly 2017

Understanding tidal notch development: examples from tropical and Mediterranean coasts.

Cherith Moses (1), Stefano Furlani (2), and Miklos Kazmer (3)

(1) University of Sussex, School of Global Studies, Geography, Brighton, United Kingdom (c.moses@sussex.ac.uk), (2) University of Trieste, Dept. of Mathematics and Geosciences, Trieste, Italy, (3) Eotvos University, Department of Palaeontology, Budapest, Hungary

It has been suggested that tropical rock coasts exhibit morphological features that are different compared to other climatic regimes. But tidal notches, recesses extending along marine cliffs, are common to both tropical and Mediterranean coasts, and develop because of higher erosion rates in the intertidal zone compared to the supratidal or subtidal zone. They are widely used as geomorphological indicators of sea level change and tectonic movement. For this purpose their formation is usually associated with wave erosion, although the role of bioerosion and weathering, e.g. solution, are sometimes given more importance. In some cases wave erosion may simply remove weathered materials rather than directly eroding the rock e.g. on granite and sandstone coasts. Rock type is also thought to be important in the development of tidal notches, with those developed on limestone coasts said to provide more reliable indicators than other rock types. As well as indicating the vertical position of former sea levels, tidal notches have also been used to estimate the duration of stillstands (e.g. on harder limestones) and to calculate the periodicity of cliff-falls (e.g. on softer limestones). Despite their importance, the genesis, rate of development and global variations in morphology of tidal notches are still not fully understood.

We assess present understanding of the roles of climate, tidal range, wave conditions and rock type by reviewing studies of morphology, rates and modes of tidal notch development on Mediterranean and tropical coasts. There is a dearth of quantitative data and so we present notch erosion rates directly measured using the Micro Erosion Meter (MEM) and Traversing MEM (TMEM) on limestone on the Northern Adriatic and Andaman Sea coasts: the former collected over > 10 years on the Trieste and Istrian coasts and > 3 years on an experimental vertical slab in the Gulf of Trieste; the latter over a 10 year period at Krabi in Southern Thailand. We relate these rates to models developed in the context of both tropical and Mediterranean coasts to help assess understanding and conclude by suggesting potential research to improve understanding of controls on tidal notch development.