



## **Bedrock lowering and sea cliff retreat along the Southwestern Adriatic rock coasts**

Stefano Furlani (1), Fabrizio Antonioli (2), Giuseppe Mastronuzzi (3), and Giovanni Scicchitano (4)

(1) Department of Mathematics and Geosciences, University of Trieste, Trieste, Italy (sfurlani@units.it), (2) ENEA, Climate & Impact Modeling Laboratory, Rome, Italy, (3) Department of Earth and Geoenvironmental Sciences, University of Bari, Italy, (4) Studio Geologi Associati T.S.T., Catania, Italy

The Adriatic Sea is mainly surrounded by carbonate rock coasts. Their behavior with respect to sea cliff retreat depend on lithological and textural characteristics of rocks and the structural settings. We present micro erosion meter and UAV data collected in the southwesternmost sector of the basin, the Apulian shoreline and we discuss the interplay between sea cliff retreat, boulder movements at the cliff toe and bedrock lowerings.

The Adriatic Sea is SE-NW elongated and generally shallow basin, but the southern part, at the border with the Ionian Sea, can experience more exposed conditions because of longer fetch and deeper seabed than the northern part.

Four sites were chosen for this study. In particular, the occurrence of erosional landforms due to abrasion and mechanical erosion related to high wave energy processes at the cliff toe, such as the potholes, has been assessed at four sites (Peschici, Polignano A Mare, Porto Badisco, Castro) from the northernmost part of Apulia to the southernmost headland. Each site was surveyed with an UAV (Unmanned Aerial Vehicle) equipped with digital camera. Flights have been performed following the shorelines at different heights ranging between 20 m and 60 m. The collected pictures underwent a photogrammetric processing to reconstruct clouds of points with a resolution up to 10 cm grid, that have been used to reconstruct DEMs of the surveyed area. Applying a filter for vegetation coverage we obtained the DTM that represent the base for the extraction of orthophotos with resolution ranging between 2 cm/pixel and 5 cm/pixel.

In the same sites, we set 11 micro erosion meter stations in order to measure the mean lowering rates in the supratidal zone. The lower stations are often upper stations are seldom sprayed by waves, mainly during storms, while the lower ones often can be covered by normal waves. The stations are located on vertical or near-vertical sea cliffs, and their elevation above the sea level was measured with an invar rod and corrected with local tidal gauges.

Bedrock lowerings range between 0 to 0.48 mm/yr. Values decrease with increasing elevations above the sea level in all the studied sites, showing a quasi-linear relation between bedrock lowering and marine processes with respect to the elevation. Differences are related to abrasion processes, biological processes and subaerial weathering, together with subaerial gravity-induced processes.