



## **Geological-geomechanical mapping and characterization of coastal cliffs from bathymetric and TLS coupled surveys**

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Geological and geomechanical characterization of coastal cliffs is fundamental for a more comprehensive understanding of coastal evolution, stability and hazard. In this contribution, both bathymetric and subaerial topographic data were used to reach a complete characterization. We performed simultaneous multibeam and TLS surveys along a vertical to overhanging rocky cliff. Macro to meso scale observations allowed the mapping of lithological contacts, the description of layer thickness and the identification of persistent discontinuities as well as their role in controlling slope cliff stability. Bathymetric observations facilitate the analysis of submerged morphologies, the description of rock mass conditions and the mapping of deposits and coastal platform remains. Furthermore, they make possible to relate deposits with more unstable cliff sectors, their orientation and the possible wave action. This detailed description of the vertical cliff is fundamental for the analysis of the cliff evolution. This can be achieved by multiple surveys, and the modelling of the cliff stability by means of numerical models

In this research we investigated a sector (total length 500 m) of the Apulian coast (Italy) in Polignano a Mare (BA) of extreme cultural and natural interest because of the vicinity to historical buildings and the exceptional landscape features (e.g. Grotta Palazzese).