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BridgET – Bridging the Gap between Land and Sea: the Lachea Island case study

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The BridgET Erasmus+ project (2021-1-IT02-KA220-HED-000027612) aims at filling the gap of information in the so-called white ribbon area, focusing on 3D geological mapping for a reliable integration of onshore and offshore multiscale geospatial datasets in selected coastal areas. The programme has been designed to develop innovative and inclusive learning and teaching activities through the organization of dedicated summer schools. Specifically, one of the main foci is the application of geospatial data acquisition and processing methods in order to generate seamless 3D models for coastal geohazard assessment. The second BridgET summer school was held in Catania and nearby areas from September 30th to October 11th, 2023. Here, we present preliminary results of an integrated multi-sensor dataset of Lachea Island. The result of this case study will be a seamless model, showing the island's geomorphological variability from above to below the water surface. Offshore data was collected by Multibeam Echosounder (MBES) survey, covering a total area of about 0.33 km^2 and obtaining a georeferenced point cloud with a resolution of about 580 points/m^2 and a derived Digital Elevation Model of 1 m resolution. Near-surface remote sensing data was collected by Uncrewed Aerial Systems (UAS) in the form of both, structure-from-motion photogrammetry and LiDAR surveys, obtaining point clouds at a resolution of 225 and 50 points/m^2, respectively.
Lachea Island is part of the Cyclopean Archipelago. The "Lachea Island and Archipelago Integral Nature Reserve" was established in 1988, to conserve and protect fauna and flora from the supralittoral to the infralittoral zones. Due to its morphological setting, the area is subject to rockfalls and slope instability processes, which limit the accessibility for tourists. Geohazard characterization is therefore highly important, particularly in the view of risk assessment and mitigation measures.

Keywords: Geomorphology, UAS, LiDAR, Multibeam Echosounder, White ribbon, Multi-scale data, Geohazards