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High resolution mapping of coralligenous bioconstructions offshore South-Eastern Sicily as a baseline for (bio)geomorphological studies in marine setting

Varzi A.G.¹, Fallati L.¹, Savini A.¹, Bracchi V.¹, Bazzicalupo P.¹, Rosso A.², Sanfilippo R.², Basso D.¹

¹ Department of Earth and Environmental Sciences (DISAT), University of Milano-Bicocca, Milano, Italy

² Department of Biological, Geological and Environmental Sciences, University of Catania, Catania, Italy

Coralligenous Bioconstructions (CB) include calcareous build-ups of biogenic origin that typify selected regions of the Mediterranean continental shelves, where they formed since the Holocene transgression. They can be from few to tens of meters large, displaying variable lateral continuity and thickness. Offshore Marzamemi (south-eastern Sicily, Ionian Sea) the occurrence of peculiar columnar-shaped CB have been documented in 2002, but their actual extension and distribution across the shelf was not known until recent time. The project "CresciBluReef: New technologies for knowledge and conservation of Mediterranean reefs" produced a new 17 km² high-resolution bathymetric map using a R2Sonic2022 MBES, ground-truthed by ROV observations, that generated a good knowledge of the extension of CB in the region. The bioconstructions are preferentially distributed along

selected depth ranges (from 30 to 40 m, and from 85 and 95 m of w.d.), with a good lateral continuity. The coupling of documented uplift rate (ca. 0.2 mm/yr since the Tyrrhenian time) and evidences reported in literature for Holocene relative sea-level curves, shows a good correlation between the distribution of CB and local and short stasis associated to the rapid Flandrian transgression. However, as revealed by the geomorphological map obtained by our study, a more in-depth investigation is needed to understand (1) the role of the inherited continental shelf landscape, shaped by previous low-stand periods, in creating favourable substrate for the settlement and growth of CB during the Holocene, and (2) the extent to which CB can in turn affect the evolution of present-day continental shelf landforms and landscapes.

Keywords: Coralligenous, marine bioconstructions, submarine geomorphology, seascape, marine DTM, sea-level changes, biogeomorphology