



## **The Eugen Seibold coral mounds offshore western Morocco: oceanographic and bathymetric steering of a newly discovered cold-water coral province**

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This study presents new seafloor bathymetric and sidescan sonar data identifying a previously unknown cold-water coral (CWC) province on the Atlantic margin off western Morocco (ca. 31°N). Applying the concept of seawater density as a predictive tool for living CWC reef occurrence during research cruise 32 aboard RV Maria S. Merian in October 2013 CTD casts revealed potential sites. Direct sampling retrieved living coral patches within an extensive field of carbonate mounds, covering an area of ~410 km<sup>2</sup> on the upper slope ~40 nautical miles north of Agadir Canyon. Individual mounds are up to 12 m high and are mainly composed of dead cold-water corals *Lophelia pertusa* thickets at present-day water depths of 678–863 m. Living CWCs represent only a thin veneer and were sampled by box coring in the shallower parts of the mound field between 678 and 719 m. CTD measurements in these shallower areas revealed that the occurrence of these living CWC reefs coincides with the deeper part of the North Atlantic Central Water (NACW) mass exhibiting conservative temperatures  $\Theta$  of 9.78–9.94°C, absolute salinity  $S_A$  of 35.632 g/kg, and a sea water density  $\sigma_\Theta$  of 27.31–27.33 kg/m<sup>3</sup>). This is in good agreement with observations from the Renard Ridge (35°N, Gulf of Cadiz) to the north and sites off Mauretania (17°N–18°N) to the south, —with the exception of sparse live corals in the latter region, the CWC reefs of both regions consist of a dead fabric in the deeper layer of the NACW slightly above the Mediterranean Outflow Water. The bathymetric and oceanographic settings of this newly discovered CWC site, with its thin veneer of living corals and much larger accumulations of coral rubble, are consistent with published evidence that, over the past three glacial–interglacial cycles, active CWC reef growth south of 50°N was more favourable during glacial times (possibly up to the very early Holocene) in this sector of the northeast Atlantic Ocean. The newly discovered province is here named the *Eugen Seibold coral mounds* in honour of the pioneering marine geologist Eugen Seibold (1918–2013).