



## **Imaging fossil deep-sea coral mounds by integrated geophysical techniques.**

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Side-scan sonar imaging and high-resolution seismic reflection profiles were collected in the North-Eastern Tyrrhenian Sea, between Gorgona and Capraia islands, to estimate setting and extent of deep sea coral mounds. We found that these feature: 1) are made of patch reefs mainly build by scleratinian *Madrepora oculata* in association with the solitary coral *Desmophyllum dianthus* and the colonial coral *Lophelia pertusa*; 2) are fossil, since no living organism have been collected; 3) lay between 355 and 410 m of depth, along the continental slope, in a mud-dominated environment. Radioisotopes dating of a specimen provided an age of  $1.1 \pm 0.1$  ka, suggesting that these deep sea corals where living during the last glacial maximum. Preliminary bathymetric survey suggested that these mounds are partially buried by fine grained hemipelagic deposits that hamper their mapping only on the basis of surface data, such as morphobathymetry or side-scan sonar imagery. However, the high density/velocity contrast between fine grained surrounding sediments and bioconstructional features was successfully used to map the distribution of the colonies, by integrating morphological data with a tight grid of high-resolution seismic reflection profiles. Reflectivity maps of the sea bottom, and of the shallow sub-bottom, compiled using side-scan and seismic reflection data enabled us to map the distribution of the coral mounds and discriminate between features “in situ” and coral rubbles displaced by the fishing nets that are ubiquitous in the area.