11:30 AM

Claudio Lo Iacono, National Oceanography Centre (NOC), University of Southampton

Living reefs and CWC mounds in the Alboran Sea (Western Mediterranean). Holocene evolution and present-day conditions

We present recent insights on early Holocene to present spatio-temporal evolution of Cold-Water Coral (CWC) Mounds in the Moroccan Alboran Sea (Western Mediterranean). Despite most Alboran CWC mounds nowadays being inactive, new findings revealed the existence of living extensive reefs of *Lophelia pertusa* and *Madrepora oculata*. The West Melilla region consists of two clusters of elliptical mounds, ~45 m high, at 400-460m depth. Cabliers is a 25 km long, 140m tall CWC ridge, at 250-710m depth. Stratigraphic analysis, species composition, X-Ray CT scans and radiocarbon dating of gravity cores reveal intense coral growth 13.9-9.8ky BP. The demise of suitable conditions for CWCs in the Alboran Sea roughly coincides with the end of the Organic Rich Layer 1, ~9.2ky BP, as also confirmed by preliminary geochemical analyses. Nevertheless, the northern Cabliers Mound displays constantly high accretion rates until the present, corroborated by ROV footage revealing exceptional dense and thriving reefs distributed over at least 2 km along the top of Cabliers. The mixed Mediterranean-Atlantic ecological signature of the reefs is evident in the co-existence of large *Madrepora* and *Lophelia* colonies and their associated fauna. The advection of chlorophyll-rich Atlantic Waters (AW) in the Mediterranean controls the particularly suitable conditions along the reefs, as confirmed by 35 surface CODE drifters (Medess-Gib experiment) transported to Cabliers following the Eastern Alboran Gyre, suggesting enriched food delivery. This work challenges the traditional notions of environmental factors controlling CWC proliferation, specifically in the Mediterranean, with relevant implications for the conservation of deep-sea natural resources.

11:45 AM

Jürgen Titschack, Center for Marine Environmental Sciences, Germany

Mediterranean cold-water corals – an important regional carbonate factory?

Cold-water coral ecosystems and deposits, dominated by *Lophelia pertusa* and *Madrepora oculata*, are wide spread in the Mediterranean Sea, which resulted in their description as independent benthic community, called white coral community. To evaluate their role as carbonate factories, we investigated aggradation rates and carbonate accumulation rates from three different cold-water coral sites that differ in their regional and geomorphological settings: (i) a cold-water coral ridge (eastern Melilla coral province, Alboran Sea), (ii) a cold-water coral rubble talus deposit at the base of a submarine cliff (Urania Bank, Strait of Sicily) and (iii) a cold-water coral deposit rooted on a predefined topographic high overgrown by cold-water corals (Santa Maria di Leuca coral province, Ionian Sea). The mean aggradation rates of the respective cold-water coral deposits vary between 10 and 530 cm kyr^{-1} and the mean carbonate accumulation rates range between 8 and 396 g cm^{-2} kyr^{-1}. The studied cold-water coral sites reveal significantly higher carbonate accumulation rates than other deep-water depositional environments. Furthermore, the observed rates were even in the range of the highest productive shallow-water Mediterranean carbonate factories (e.g., *Cladocora caespitosa* coral reefs). This clearly indicates the potential of cold-water corals as important carbonate factories and regional carbonate sinks within the Mediterranean Sea.

12:00 PM

WRAP UP