## POSTER 48

**Robert Sherrell,** Rutgers University

***Experimental paleo-proxy calibration in cold water corals***

Cold-water corals (CWCs) display an almost cosmopolitan distribution over a wide range of depths. Similar to their tropical counterparts, they provide continuous, high-resolution (annual to seasonal) records of up to a century or more. Several CWC elemental and isotopic ratios have been suggested as useful proxies, but robust calibrations under controlled conditions in aquaria are needed. Whereas a few experimental proxy calibrations have been performed for tropical corals, they are still pending for CWCs. This reflects the technical challenges involved in maintaining these slow-growing creatures alive in aquaria during the long-term experiments required to achieve sufficient skeletal growth for geochemical analyses. In this presentation we will show details of the set up and initial results of a long-term experiment being run at the ICM aquaria facilities in Barcelona, where live specimens (>150) of the CWC *Desmophyllum dianthus*, are kept under controlled and manipulated chemistry (pH, phosphate, barium) and feeding conditions. With this set-up, we aim to experimentally calibrate specific elemental ratios including P/Ca, Ba/Ca, B/Ca and U/Ca as proxies of nutrient dynamics, pH, and carbonate ion concentration. We present preliminary results using Laser Ablation Inductively Coupled Plasma Mass Spectrometry (LA-ICPMS), which allows quantitative analyses on spot sizes of tens of microns. We will also attempt measurements using NanoSIMS, to resolve nano-scale details in relative composition. Preliminary data obtained from these techniques will be presented, together with monitoring parameters regarding coral growth and physiology including skeletal growth, coral calcification and respiration.

## POSTER 50

**Lissette Victorero,** National Oceanography Centre
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***Reconstruction of the formation history of the Darwin Mounds, N Rockall Trough: how the dynamics of a sandy contourite affected cold-water corals***

Cold-water coral (CWC) mounds, formed through a feed-back process of CWC growth and sediment baffling, have been studied all along the NE Atlantic continental margin. They have been identified as important recorders of paleo-environmental signals in areas where the surrounding sediment record is too compressed or has been eroded. Understanding CWCs response to past environmental changes can aid in identifying current and future threats to these habitats. However, major questions remain concerning their initiation and early development in relation to the surrounding sediment dynamics. For the first time, two small mounds have been cored through the mound base enabling a reconstruction of their development using a multidisciplinary approach based on CT-scanning, grain-size analysis and radioactive dating. The Darwin Mounds, located in the Rockall Trough, formed during the early Holocene (~10ka BP) through sediment baffling by *Lophelia pertusa*. The initiation of both mounds corresponded to increased current velocities resulting in coarser sediment deposition and a relatively high coral density. The mound growth was rapid between ~10-9.7ka BP with further vibrant growth periods around ~ 8.8, 6.5 and 3.4ka BP. The demise of the mounds ca. ~3ka BP was likely caused by an intensification in bottom current velocities causing a hostile environment for coral growth in the contourite setting. In a wider context, the development of the Darwin Mounds appears to have responded to the relative strength and position of the Subpolar Gyre, which affected food supply to the corals, sedimentation rates, current speeds and other water mass properties in the area.