Talk Abstracts for Monday, 9/12

8:30 AM

Veerle Huvenne, National Oceanography Centre, University of Southampton

From pixel to polyp: using novel robotic technology to achieve an integrated multi-resolution 3D characterisation of cold-water coral habitats in submarine canyons

Many submarine canyons are known to host important cold-water coral (CWC) habitats. However, these are challenging to observe: the steep and irregular terrain, large depth range and strong currents limit the use of traditional sampling and surveying techniques. In order to characterise all CWC settings and understand the canyon processes driving their distribution, a unified, 3-dimensional habitat mapping approach was developed under the CODEMAP project (ERC Starting Grant no 258482), based on the latest advances in marine robotics. In a first for the UK science community, three different deep-sea robotic systems were deployed simultaneously, during the recent CODEMAP2015 expedition in Whittard Canyon, NE Atlantic. A nested bathymetric mapping scheme used multibeam data collected by the research vessel (~50m pixel size), AUV Autosub6000 (~1m pixel) and ROV ISIS (~20cm pixel) to provide increasing detail on the terrain morphology of the CWC habitats. The AUV and ROV also carried new adaptations to enable sideways mapping of cliffs and overhangs. The acoustic data were complemented by ROV-based HD video and precision sampling, while a 21-day continuous deployment of a Seaglider provided insights into the water column structure and current regime, illustrating the presence of 80m high internal waves. The observations revealed three different types of habitat for framework-building CWCs: small mounds, near-vertical "hanging" reefs, and small coral patches. The integrated, nested approach enabled us to observe all canyon processes at the scale they occur, and detailed analysis will now determine which processes and scales are critical in driving the habitat distribution.

9:00 AM

Andy Wheeler, University College Cork, Ireland

Coral mounds on the Irish margin revisited: a critical assessment of critical habitat

The Irish margin features a variety of coral provinces at comparable latitudes containing patch reefs, coral "gardens," giant carbonate mounds (both colonised by contemporary coral and not). Each province has differing environmental conditions and correspondingly differing status of contemporary cold-water coral reef development and stature. Exploration over the last 15 years allows a characterisation of the different provinces and a re-evaluation of the critical environmental controls typifying each provinces. With many variable similar in adjacent provinces, the individual impact of substrate, current speed, sediment supply and water masses on defining critical thresholds in coral occurrence and the resultant morphologies of reef forms can be evaluated. Using recent high resolution studies, this talk explores the control of these individual variables and limiting parameters on development within a relative restricted area. We present new data from the Moira Mounds in the Porcupine Seabight that shows a transition along an environmental gradient of varying current speed and bedload transport. We present new data from the Porcupine Bank Canyon where substrate controls and nutrient flux have a more dominant control of coral build-ups and compare this to flourishing reefs on the Rockall Bank where sediment supply is limited. The influence of water mass on coral limits is also considered.