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Characterization of Holocene NE Atlantic climatic variations using the cold-water coral *Lophelia pertusa*

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North Atlantic climate was subjected to dramatic changes over the Pleistocene. On the contrary, it has been demonstrated that the Holocene displays relatively stable climatic and oceanographic conditions, with the exception of the "8.2 ky BP event". The 8.2 ky climatic crisis is thought to have been associated with strong North Atlantic thermohaline circulation disruption caused by glacial melting and drainage of large lakes from North America.

Cold-water corals (CWC) have previously been used to study climatic variations throughout the Pleistocene by absolute dating of skeletons and by using general coral richness as a proxy for colony health. Occurrence of CWC, such as *Lophelia pertusa*, are indeed linked to physicochemical parameters, such as temperature, hydrodynamics and nutrient supply.

This study describes a fossil Holocene *L. pertusa* colony, and associated sediments, from the Porcupine Seabight (370 m water depth), Irish Atlantic Margin. Two sediment cores (ca. 5 m length) were collected and describe the internal structure of a low mound (ca. 2 m high) from base to top. Sediments have been described by particle size analysis and by scanning the core for physical, whereas coral occurrence is temporally constrained by radiocarbon and U-Th dating. Specifically in relation to the Holocene, we discuss (1) local hydrodynamic conditions from sediment particles size that drastically change from before to since CWC development, (2) regional ^{14}C reservoir value at this water depth and (3) link periods of coral growth and quiescence to oceanographic conditions in the NE Atlantic.

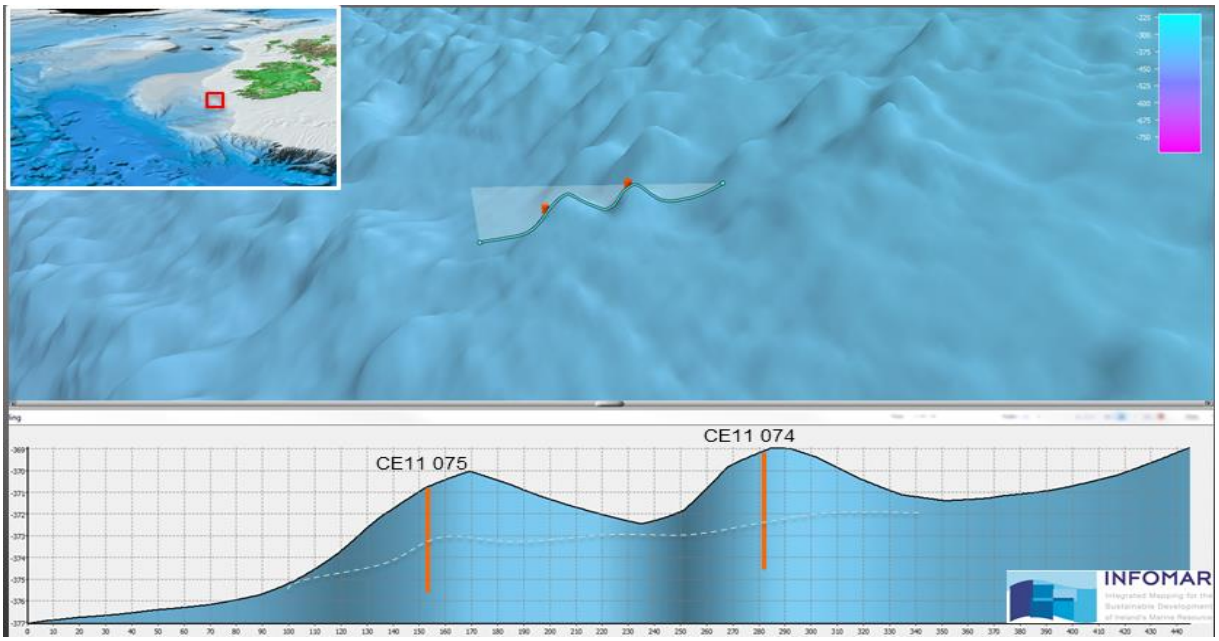

Figure: 3D visualization of the Mound Province sited in the upper slope of the Porcupine Seabight, Irish Atlantic Margin, and localization of the cores collected for the study.