



IODP Expedition 307: A high resolution record of contourite deposition and palaeoclimatic forcing on the eastern Porcupine Seabight (Irish continental margin)

R. O'Donnell, B. Dorschel, A.J. Wheeler, IODP Expedition 307 scientific party

Department of Geology, University College Cork, Ireland (rdjod47@hotmail.com)

During the spring of 2005, IODP Expedition 307 drilled continuous recovery boreholes through a contourite drift sequence from the eastern slope of the Porcupine Seabight. The contourite drift occurs within a province of cold-water coral carbonate mounds (Belgica mound province) of which one mound, the Challenger Mound, was also drilled (see poster abstract Wheeler et al., this meeting).

Examination and sample analysis from these boreholes are ongoing with the view to provide a high-resolution history of the changing sedimentological, hydrodynamic and palaeoenvironmental conditions within the Belgica Mound province throughout the Pleistocene and late Tertiary. This dataset, in combination with other studies will provide important regional information on palaeoclimatic forcing of sedimentary systems on the NE Atlantic margin during this period.

Studies will focus on the use of particle size analysis as a means of differentiating sedimentary components and the reconstruction of the hydrodynamic regime. Provenance studies will identify sedimentary component sources area and, in conjunction with a derived chronostratigraphy (see below), will also allow an appraisal of variation in sedimentary flux from the various sources and their controls. Preliminary studies suggest that the hydrodynamic regime in the study area is variable in response to palaeoclimate-linked fluctuations in intermediate water mass circulation. Anticipated sedimentary components include pelagic carbonate microfossil fractions reflecting surface productivity, along-slope contourite deposition reflecting the rigour of ocean circulation, down-slope terrigenous components and ice rafted debris linked to ice mass dynamics. Special focus will be centred on the role of British-Irish Ice Sheet dynamics on the evolution of the Irish continental margin.

The development of a robust chronostratigraphy for the boreholes will facilitate bore-hole correlation and flux studies and will be based on coccolith and foraminiferal biostratigraphy independently supplemented by extensive AMS ^{14}C and U/Th datings.

Given the proximity of the study area to the Belgica cold-water coral carbonate mounds, this information will provide a regional hydrodynamics and paleoenvironmental context to the mound story and help elucidate carbonate mound growth throughout the Quaternary and into the late Tertiary.

Although much effort has been invested in the study of the Irish offshore in recent years, this project is unique in the detail at which the Quaternary sediments will be examined and the depth of borehole recovery promising to provide answers on the interplay of sedimentology, climate and oceanography in this area.