



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

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In May 2005, IODP Expedition 307 recovered a continuous sediment succession through a contourite drift sequence from the eastern slope of the Porcupine Seabight. The contourite drift lies adjacent to the Belgica Mound Province of which one cold-water coral carbonate mound (Challenger Mound) was also drilled.

Grain size analysis of 95m of a decalcified Pleistocene succession from IODP Core 1318B with a 10cm resolution provides a detailed record of grain size distribution and variability for the last ca. 560kyr. Data generated from the 897 samples is used to interpret the climatic history via the changing sedimentological, hydrodynamic and palaeoenvironmental conditions within the Belgica Mound province. This data, in conjunction with other analyses provides important regional information on palaeoclimatic forcing of sedimentary systems on the NE Atlantic from the Lower Pleistocene to ca. 9ka. So far, End-Member Modelling and mean sortable silt analysis in conjunction with SEM studies of grain surface textures have identified significant changes in the sedimentary processes acting over time. Correlations with the abundance of ice rafted detritus highlight changes in the climate condition as the main factor for changes in the slope sedimentary system. This body of data details the complex linkages between climate and processes and ultimately their effects on the nature of seabed sedimentation.

Results indicate periods with a coarse sediment input alternating with prolonged finer grained sedimentation reflecting sporadic periods of along-slope contourite deposi-

tion, down-slope terrigenous components and ice-rafted debris linked to ice mass dynamics.

Given the proximity of the study area to the Belgica cold-water coral carbonate mounds, this information provides the regional hydrodynamic and paleoenvironmental context for a segment of the mound story and helps to elucidate carbonate mound growth versus sediment input throughout the last 560kyr. 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 Pleistocene sediments will be examined and the depth of borehole recovery promises to provide answers on the interplay of sedimentology, climate and oceanography in this area throughout the Pleistocene.