X-ray CT data of core samples from Challenger Mound area in the Porcupine Seabight off western Ireland

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During Integrated Ocean Drilling Program (IODP) Expedition 307, three sites were drilled on Challenger Mound in the Porcupine Seabight off western Ireland in May 2005 [http://iodp.tamu.edu/publications/PR/307PR/307PR.html]. The aim of this Expedition was to understand the origin and evolution of the cold-water coral banks in Porcupine Seabight. High resolution seismic profiling, multibeam bathymetry, and side-scan sonar imaging have shed light on the stratigraphic, structural, and morphological setting. The mounds are rooting on a strongly erosive unconformity and are seated partly on an enigmatic sequence of sigmoidal units and partly on a semitransparent layer. Three sites have been drilled on and near Challenger mound, and core sections penetrating a thick coral reef body were recovered. Drilling revealed that the mound itself consisted of repeated sequences unstratified the Pleistocene coral (Lophelia pertusa) floatstone-rudstone with fine-grained matrix of clay, bioclasts, and calcareous nannofossils on a sharp erosional boundary.

Non-destructive, three-dimensional imaging of cores was performed by a medical X-ray CT-scanner. We used cores from two sites, U1316 and U1318, immediately downslope of Challenger Mound and an upslope site. The X-ray CT images were measured by a medical X-ray CT scanner (Hitachi CT-W2000) of Geological Survey of Japan, AIST. The resolution of CT scanning is 0.313 X 0.313 mm2/pixel. We took contiguous two-dimensional CT images at intervals of 1 mm. These data were used to reconstruct the three-dimensional images. Laminae appear in CT number variations from 500 mm long sample of site U1318. Three-dimensional distribution of corals within bulk sediments was mapped using U1316 sample.