



Post-glacial stratigraphy for the Malin Basin (NW Ireland)

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The Irish National Seabed Survey mapped the Malin Shelf (NW Ireland) between 2003 and 2005 using multibeam and shallow seismic techniques. A total of 5 shallow cores limited to 6m length were taken between 2006 and 2008 in the deepest part of the Malin Basin.

The region's bathymetry exhibits a strong glacial imprint from the last British-Irish Ice Sheet characterised by a variety of glacial morphologies. The shallow stratigraphy shows a pronounced LGM ice erosional surface cutting out the Stanton Formation, ranging from several meters around the basin's edges up to 50 m in the central part. Two distinct pre-LGM units are present in the records: the Jura and the Barra formations. The Barra Formation lies unconformably just above the LGM erosional surface thinning towards the west. The Jura Formation lies conformably above the Barra FM. Paleogene Igneous intrusions are present throughout the region influencing the basin geometry.

Radiocarbon dating was performed on foraminifera assemblages extracted from one of the 3 m long cores. Dating indicates that the entire length consists of Holocene record. The sand on the surface of the core (0.1 mbsf) is 3 ka cal BP years old and the entire sandy unit (0.55 mbsf) accumulated over 4.6 ka cal BP. Change of lithology is coupled with drastic change in sedimentation rates. Nearly 40 cm of sediment accumulated over a period of only 300 years (4.9 ka cal BP at 1.0 mbsf). However, high sedimentation rates in this part of the shelf are not uncommon. The dating of 71/9 BGS borehole west of the Malin Shelf showed sedimentation rates of 0.75 m/ky in the first 6 meters (10 ky) followed by 3.5 m/ky in the next 30 m.