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# Sediment waves in the Irish Sea: reconstructing the (palaeo-) hydrodynamic environment

K.J.J. Van Landeghem (1,2), A.J. Wheeler (1) and **N.C. Mitchell** (3)

1 Geology Department & Environmental Research Institute, University College Cork, Cork, Ireland (katrien.vanlandeghem@gmail.com / Tel.: 00353 (0)214901947)

2 School of Earth, Ocean and Planetary Sciences, Cardiff University, Cardiff, UK

3 University of Manchester, School of Earth, Atmospheric and Environmental Sciences, Manchester, UK

High resolution multibeam echosounder data has been collected in the Irish Sea through the auspices of many different projects in the last 7 years revealing enormous sediment waves scattered all over the Irish Sea. These bedforms are usually straight crested and symmetrical in shape with heights reaching up to 35 meters making up over a third of the water column. Pebbly gravel and mobile sand was found on top of the ridges with a coarse gravel lag in the troughs and in the deep scour marks around the edges. From repetitive multibeam bathymetry data, it is clear that these huge bedforms do not migrate on an annual scale. In shallow seismic data, different sets were distinguished, interpreted to represent the long-term changes in the dominant tidal directions in the Irish Sea. These changes can be compared with the palaeo-hydrodynamic environments of the Irish Sea generated from a two-dimensional palaeo-tidal model for the NW European shelf seas during the last 20 ka, compiled by Uehara *et al.* (2006). Ongoing work in cooperation with these authors will put the formation mechanism of the enormous bedforms in a wider hydrodynamic setting, which in turn could provide valuable information to fine-tune the palaeo-tidal model.

Smaller sand waves preserved in the Irish Sea seem more closely related to the present day hydrodynamic regime. Their asymmetry is a proxy for current directions in the

Irish Sea and their mobility has been described tentatively in some areas by comparing profiles from repetitive seabed topography data. Profiles over sand waves during different phases in the tidal cycle were compared to study the response to bidirectional tides with the potential creation-destruction mechanisms involved.

It is apparent from analyses of several swath bathymetry datasets that, despite the considerable sand transport during peak tidal events observed on video imagery, the detailed seabed topography changed very little in the Irish Sea in the last decade. The residual tidal currents seem responsible for both asymmetry and mobility of most medium to large sand waves.

Uehara, K., Scourse, J.D., Horsburgh, K.J., Lambeck, K., and Purcell, A.P. 2006. Tidal evolution of the northwest European shelf seas from the Last Glacial Maximum to the present. *Journal of Geophysical Research* 111, 1-15.