

Paper Number: 3141

Bedform distribution and sediment pathways on a high-energy, mixed wave- and tide-influenced shelf, north Coast, Northern Ireland

Cooper, J.A.G.^{1,2}, Lawlor, D.P.³ and Kelley, J.T.⁴

¹Ulster University, Coleraine, Northern Ireland, U.K. jag.cooper@ulster.ac.uk

²University of KwaZulu-Natal, Durban, South Africa

³Loughs Agency, Londonderry, Northern Ireland, U.K.

⁴University of Maine, Orono, USA

The continental shelf off the north coast of Northern Ireland is characterised by high wave energy derived from refracted North Atlantic swell and periodic low-pressure systems, together with strong reversing tidal currents associated with water entry and exit to and from the Irish Sea. Contemporary bedform and sediment distribution on the shelf is influenced both by these processes and the inherited (deglacial and postglacial) distribution of shelf sediment. Sand and gravel are the most abundant sediment types (mud is virtually absent), while bedrock and relict glacial outcrops are locally extensive. On the mid-shelf a diversity of bedform types is present that reflect tidal current velocity and sediment availability following the model of Stride [1]. The Inner shelf and shoreface is dominated by wave processes and associated bedforms including rippled scour depressions [2].

The nature of the shelf bedforms is described using historical sidescan sonar and recent multibeam bathymetry, and a depositional model is presented in which source, transport and sink locations are identified. A net easterly transport regime is evident from bedform orientation and sediment abundance. Westerly source areas tend to be sediment-poor, while a mid-shelf depocentre is characterised by sandwave fields and climbing bedforms. Downcurrent of the depocentre is a sediment-poor and scoured shelf sector.

References:

[1] Stride AH (1982) *Offshore Tidal Sands*: Chapman and Hall

[2] Cooper JAG et al. (2002) *Mar Geol* 186:369-387

