



Celtic Sea linear sediment ridges: a basis for testing the tidal hypothesis

James Scourse and Sophie Ward

Bangor University, Ocean Sciences, Menai Bridge, United Kingdom (j.scourse@bangor.ac.uk)

The linear sediment ridges (LSR) of the Celtic Sea constitute the largest examples of their bedform type on Earth. Published sedimentological and seismic stratigraphic interpretation, supported by simulated bed stress vectors derived from numerical palaeotidal models suggests, that the LSR are moribund tidally remobilised sediments representing the transgressive systems tract. Recently this interpretation has been challenged by the hypothesis that these ridges may be subglacial bedforms linked to extension of the Last Glacial Maximum Irish Sea Ice Stream to the shelf break. We address the tidal hypothesis using data from a new palaeotidal simulation of the Celtic shelf to test predictions of ridge axis orientations deriving from dynamical theory. Theoretically ridge axes should evolve at a set offset to the tidal ellipse rotation. As the palaeotidal simulations generate tidal ellipses for each timestep, the ridge axis orientations and their evolution through time can be therefore be predicted. These predictions provide a basis for comparison with observations of ridge orientations from multi-beam swath bathymetry. If consistent with the observed axes of ridge growth and degradation this will provide support for the tidal hypothesis.