



Enigmatic sediment ridges in the German Bight - glacial vs post-glacial morphologies?

Vikram Unnithan (1), Angelo Pio Rossi (1), and Daniel Praeg (2)

(1) Jacobs University Bremen, Campus Ring 1, 28759 Bremen, GERMANY, (2) OGS (Istituto Nazionale di Oceanografia e di Geofisica Sperimentale), Borgo Grotta Gigante 42C, 34010 Trieste, ITALY

The German Wadden Sea extends over 1000 km from the Dutch coast to that of Sweden and consists of a long chain of barrier islands and ephemeral sand banks punctuated by estuaries and rivers. The sedimentary environment is currently shaped and characterised by storm surges, high tidal and wave energy levels. However, this part of the North Sea has been repeatedly covered by continental ice sheets, and it remains unclear how glacial to interglacial sedimentary processes may have influenced seabed morphology in the region. The study area is situated approximately 70 km north of Cuxhaven, and 5 km due east of the islands of Helgoland and Dune. It covers an approximate area of 5 km square with water depths ranging from 50 m in the south to about 20 m in the north. High resolution multibeam (Simrad EM710) and parametric echosounder (Innomar SES2000) data were acquired during graduate and undergraduate teaching excursions on the RV Heincke in Spring 2010 (HE-324) and 2011 (HE-349). The seabed swath bathymetric data reveal distinctive linear seabed ridges. The ridges trend NNW-SSE, are 1-5 m in height, have wavelengths on the order of 100 m and crest lengths ranging from 100-2500 m. The ridge crests are broadly anastomosing. They bifurcate towards the north to form more subdued structures, while they converge and disappear to the south. Profiles across the ridges show an asymmetric structure, with steeper slopes trending west in the western part of the study area but trending east in the eastern part. These enigmatic sedimentary structures have not been previously mapped in the Wadden Sea, and their origin remains uncertain. Possible interpretations to be tested include sub-crop structural control on seabed morphology, relict glacial or glaciofluvial landforms and post-glacial marine bedforms linked to processes of sediment redistribution.