



A new insight into the North Atlantic Ocean seafloor topography

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This paper demonstrates a new analysis of the North Atlantic seafloor topography with the particular emphasis on the Mid-Atlantic Ridge. The approach comprises a large-scale investigation of North Atlantic and the global ocean seafloor morphology as well as local-scale investigations on two representative transects across the Mid-Atlantic Ridge at 54°N and 49°N. The large-scale analysis is based on the General Bathymetric Chart of the Oceans (GEBCO), whereas the local-scale analysis is from multi-beam data collected during the ECOMAR cruise of the RRS James Cook (JC011) in 2007, processed and filtered using MB System software. Various Geographic Information System (GIS) techniques and standard statistical measures are employed. The bathyal zone (depth of 800-3500 m) of the North Atlantic is divided into three groups: ocean margin bathyal zone, Mid-Atlantic Ridge bathyal zone, and sea mounts bathyal zone. The Mid-Atlantic Ridge accounts for a large fraction of the total available bathyal habitat for marine organisms in the North Atlantic Ocean. This fraction increases with depth so that from approximately 2600m, 0.5 and 0.6 of available area is on the ridge. GIS-based analysis of the two transects across the ridge using high-resolution multi-beam charts allows the identification of different kinds of habitats including extensive flat areas covered with soft sediments, steep rocky escarpments and intermediate areas with different slope characteristics. We hypothesise that topography of the Mid Atlantic Ridge makes a major contribution to abundance and biodiversity of bathyal life in the North Atlantic Ocean.