

New Views of the U.S. Atlantic Margin Mapped for UNCLOS Applications.

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Article 76 of the UN Convention on the Law of the Sea (UNCLOS) present an opportunity to map continental margins. Although mapping the required 2500-m isobath is relatively straight forward, locating the geomorphic foot of the slope is, in many areas, equivocal and requires mapping large areas of the lower slope. The large-area mapping required to support an UNCLOS submission, generates a dataset useful to a wide spectrum of disciplines and the new bathymetric maps will represent roadmaps for the next generation of continental-margin studies.

As part of the U.S. UNCLOS effort, the entire U.S. Atlantic margin between the 1 and 5 km isobaths was mapped in 2004 and 2005. A 12-kHz multibeam echosounder was used to provide bathymetry and co-registered backscatter, 3.5-kHz CHIRP profiler and gravity data were also collected. The bathymetric data cover $> \$ 600,000 \text{ km}^2$ with a spatial resolution of 100 m.

Eight New England Seamounts were mapped in their entirety. Talus piles, moats and sediment banks are common features around the seamounts. The northern seamounts fall along two trends; Balanus, Picket and Retriever Seamounts trend 118° whereas Retriever, Physalia and Bear Seamounts trend 94° . The change in trends occurred about 100 my ago. Mytilus Seamount and two other unnamed seamounts are offset 70 km to the SE and trend 108° . The trends and changes in trend suggest that the relationship of the seamounts to a single hotspot trend is too simplistic.

Submarine canyon –channel systems (CCS) dominate the northern third of the Atlantic lower slope and rise, are less ubiquitous in the middle third and are rare in the southern third. The northern CCSs are composed of canyon channels distributed along the upper slope that are captured down slope by a single channel. Channel capture has resulted in hanging valleys of 10 to 100 m high. In the northern area, a CCS is composed of a broad channel plain incised by a narrow channel. This rejuvenation of channel cutting suggests a change has occurred in its equilibrium profile.

The CCSs of the middle third of the margin are single-channel systems. Hudson Canyon has 6 90° bends at mid channel where it is incised as much as 550 m. Other nearby channels head on the upper continental rise and are not connected to channels farther upslope.

Failures are common in the northern 80% of the margin. Some failures are translated slide blocks 10s of kms in size. Other failures are incompetent mass failures that have traversed down slope more than 100 km.

The top of the western Blake-Bahama Outer Ridge (BBOR) is dish-shaped with up to 150 m of relief. The top of BBOR is grooved with curvilinear furrows as much as 130 km long and the flanks are covered by fields of large bedforms as much as 100 m high.

All the U.S. UNCLOS MBES data collected by the University of New Hampshire and derivative maps and images are publicly available at <http://www.ccom.unh.edu/unclos/html/index.htm> within about a month of the completion of each cruise. The MBES data are in two formats (ASCII xyz, SD and ESRI grid) so that they can easily be used in a variety of GIS packages.