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# New Views of the Gulf of Alaska Margin Mapped for UNCLOS Applications

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New Views of the Gulf of Alaska Margin Mapped for UNCLOS Applications.  
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Article 76 of the UN Convention on the Law of the Sea (UNCLOS) outlines a series of criteria that may allow a coastal state to extend its legal jurisdiction beyond the EEZ. The mapping required to support an UNCLOS submission generates datasets useful to a wide spectrum of disciplines; the new maps will provide a new framework for the next generation of continental-margin studies.

As part of an ongoing U.S. UNCLOS effort,  $>162,000 \text{ km}^2$  of the Gulf of Alaska (GOA) margin between the 1 and 4.5 km isobaths was mapped in 2005 with a 12-kHz multibeam echosounder (MBES) that provides bathymetry and co-registered backscatter. The data have a spatial resolution of 100 m.

The north and east GOA shelf is truncated by the strike-slip Queen Charlotte-Fairweather and Transition Faults. The margin is draped by overlapping submarine-fans modified by incised channel-levee systems. The Baranof Fan is composed of several fans. The southern-most mapped fan is a small feature from which springs the upper reaches of Mukluk Channel. Horizon channel-levee complex traverses SW across the margin. The two channels meet  $\sim 80 \text{ km}$  down slope at a  $90^\circ$  junction where Mukluk Channel is captured by Horizon Channel. Chatham Fan covers more than  $3000 \text{ km}^2$  and is incised by an unnamed meandering channel and built by an associated levee complex. The levee is incised by a meandering channel-levee complex. The sediments of this fan have high backscatter. Vast zones of rotational sliding occupy the northern flanks of the levees. The slides typically are retrogressive and shear-dominated with limited down slope movement.

The next fan complex to the north, Kruzofi fan, buries more than  $7500 \text{ km}^2$  of the margin. This fan developed between the levee of Chatham fan and a curving depositional ridge. Gravity data implies that this ridge may be structurally controlled. The growth of Kruzofi fan to the east appears to have been so rapid that the channels have been deflected to the NW so that they trend sub-parallel to the margin for 60 km or more.

The margin west of  $137^\circ 30' \text{W}$ , where the shelf is broader, lacks distinct large fan complexes and is offset by the Transition Fault. Sediment is delivered to the abyssal plain through the main branch of the Surveyor Submarine Channel, an incised branch whose origin is near the Alsek Valley, off the Alsek River. A branch of Surveyor Channel has its origin off Yakutat but does not connect to the Yakutat Valley, suggesting

that this branch may be inactive or that the style of sediment bypassing in this region is different than for the main branch. Both branches run relatively straight; the main western branch captures the eastern branch approximately 200 km from the shelf break and runs towards the Aleutian Trench.

In addition to the remarkable depiction of sediment delivery processes in the Gulf of Alaska, the survey also mapped several exposed and buried seamounts, north of, but not parallel to, the Pratt-Welker seamount chain.

All data MBES data collected by the University of New Hampshire as well as 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 three formats (ASCII xyz, SD and ESRI grid) so that they can easily be used in a wide variety of GIS packages.