

I 19.78.  
79-780

24012

Marine Geologic Studies in the Beaufort Sea, Alaska, 1978; Data Type,  
Location, Records Obtained, and Their Availability

MEG 06120001

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Open File Report 79-384  
766

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SEP 9 1983

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The U.S.G.S. vessel R/V KARLUK ran approximately 1150 km of trackline surveys on the inner shelf of the Beaufort Sea, Alaska in August and September, 1978. A portion of this program was funded under the Bureau of Land Management, Outer Continental Shelf Environmental Assessment Program. Five maps (plates 1 through 5) show the locations of the tracklines.

Ice conditions prevented the KARLUK from working seaward of the island chain stretching from Cross- to Flaxman Islands, where major data gaps exist. Therefore available time was used to run several detailed bathymetric surveys for studies of rates of changes in several different environments:

- 1) The seaward slope of Cross Island, close inshore, where storms of the previous summer had brought about major changes.
- 2) The Egg Island tidal entrance, where catastrophic events during spring river overflow may reshape the channel.
- 3) The nearshore bars off Pingok Island, which, according to previous studies, are migrating westward.
- 4) The shoal west of Spy Island, which should be receiving much of the sediment passing westward along the chain of barrier islands of Simpson Lagoon.

A major effort was made to determine the extent of the "Boulder Patch" in Steffansson Sound. The ship's fathometer (Simrad system) works better than any of the other survey systems carried by the KARLUK, and produced good data even at relatively high ship speeds, whereas at

these high speeds, side-scan sonar and sub-bottom data deteriorate. The Simrad bottom record therefore is included in this data package.

Navigation was controlled using a Del Norte range-range system accurate to  $\pm 5$  m and limited to line-of-sight distances. In areas not covered by the Del Norte system, radar ranges were taken from available targets usually with an accuracy of  $\pm 200$  m. Partial dead reckoning, probably accurate to  $\pm 500$  km was used on the distant portion of line #11, where only one shore station could be received.

Bathymetry was recorded on a Raytheon RTT 1000 dry paper recorder using a hull-mounted 200 kHz transducer with an  $8^\circ$  beam width, and on some lines a 200 kHz narrow beam ( $4^\circ$ ) transducer was towed below the surface. All records are corrected for draft of vessel and tow depth. A 7 kHz transducer used in conjunction with the RTT 1000 recorded sub-bottom reflectors up to 20 m below the sea floor. Deeper penetration high-resolution seismic data were recorded on an EPC Model 1-100 recorder at 1/4 second sweep, the signal filtered to 600 - 1600 Hz. The sound source was an EG&G Model 234 Uniboom activated at 200 joules. The side-scan sonar records were taken using a Model 259-3 E&G System and a Model 272 sonar fish operated with a 105 kHz, 1/10 milli-second pulse at a  $20^\circ$  beam angle depression.

Data acquired consist of approximately 1140 km of bathymetry, 480 km of side-scan sonar, and 70 km of high-resolution seismic records. About 840 km of the bathymetric data also includes 7 kHz sub-bottom data. The data is in the form of 24 rolls of bathymetry, 12 rolls of side-scan sonar, 2 rolls of high-resolution seismic records, 1 roll of Simrad fathometer records, and the ship's log. The ship's log contains information on systems in use on each line, system settings (scale,

filters, etc.), and navigational data used in plotting the lines. In addition to this data, 8 observational SCUBA dives were made, and 4 sediment samples were collected with a grab sampler for gas analysis. All data are available for inspection at U.S. Geologic Survey, Rm. B-164, Deer Creek Facility, 345 Middlefield Road, Menlo Park, California 94025. Copies of the report and the data are available from National Geophysical and Solar-Terrestrial Data Center, NOAA, Boulder, CO 80302.

The data presented here are currently being studied by the authors as part of a long-term study of the Beaufort Sea. The authors may be contacted for a bibliography of publications using the above data and data from previous years.