

MARINE GEOLOGIC STUDIES IN THE BEAUFORT SEA, ALASKA, 1980;
LOCATION, DATA TYPE, AND RECORDS OBTAINED

by

Ed Kempema
Erk Reimnitz
Peter Barnes

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U.S. Geological Survey, Menlo Park, California

The U.S.G.S. R/V KARLUK ran approximately 1500 km of trackline surveys on the inner shelf of the Beaufort Sea, Alaska, from July through September, 1980. In addition to the trackline surveys, 6 areas were investigated by SCUBA divers, 18 sites were studied using closed circuit television, and 80 sediment grab samples were collected. Six maps (plates 1 through 6) show the locations of tracklines, dive sites, underwater television runs, and sampling stations. Partial funding for this work was provided by the Bureau of Land Management; Outer Continental Shelf Environmental Assessment Program.

Ice and weather conditions were fair this year, and several important areas were studied in detail:

- 1) Emphasis was placed on gathering data in Harrison Bay (Plates 1 and 2) this season, and many lines were run in this area. Lines were run both nearshore and offshore. The offshore geophysical lines were run over a series of shoals in order to define shoal morphology and map the effects of the shoals on ice gouging and ice zonation. In conjunction with these surveys approximately 40 grab samples were collected to study the sediment distribution around the shoals and throughout Harrison Bay.

- 2) Detailed bathymetric surveys were run off Pingok (plate 2), Reindeer, Cross, and Stump Islands (plate 3) to gather data on arctic nearshore environments and processes and to study the roll of ice in the nearshore zone.

3) Geophysical lines were run in the Camden Bay and Barter Island area (plates 5 and 6). Lines were run offshore to gather ice gouging and geophysical data, and nearshore underwater television runs were made to search for additional boulder patches (Reimnitz and Ross, 1979).

On most survey lines positions were plotted using a Motorola Miniranger range-range navigation system with a distance measuring accuracy of ± 3 meters. On lines close to shore in zones where there was no Miniranger coverage, radar ranges were taken from available targets, and positions are accurate to ± 100 m. For offshore lines beyond the range of the Miniranger system, a combination of satellite navigation and dead reckoning were used. The satellite navigation system was a Magnavox model MX 1242, which provides position accuracies within 1/4 mile at best. Dead reckoning positions are accurate to within ± 1 mile. The ship's log included with this report contains navigational information for each particular line.

Bathymetry was recorded on a Raytheon RTT 1000 dry paper recorder using either a hull-mounted 200 kHz transducer with an 8° beam width, or a towed 200 kHz transducer with a 4° beam width (narrow beam). All records were corrected for draft of vessel or tow depth. A 7 kHz transducer used in conjunction with the RTT 1000 recorded subbottom reflectors up to 10 m below the sea floor. Deeper penetration high-resolution seismic data were recorded on an EPC Model 1400 recorder using 1/4 second sweep and firing rate with a 200 Joule EG&G Model 234 Uniboom as a sound source. The signal was filtered to approximately 600-1600 kHz.

The side-scan sonar records were taken using a Model 259-3 EG&G system and a Model 272 sonar fish operated with a 105 kHz 1/10 second pulse at a 20° beam angle depression.

Data acquired consist of approximately 1500 km of bathymetry and 7 kHz subbottom profiles, 950 km of side-scan sonar, and 830 km of high-resolution seismic records. The data is in the form of 46 rolls of bathymetry, 25 rolls of side-scan sonar, 14 rolls of high-resolution seismic records, 3 rolls of Simrad fathometer records, and the ship's log. The ship's log contains important information on systems in use on each line, systems settings (scale, filters, etc.), navigational data used in plotting the lines and information on unique observations or system difficulties. All data are available for inspection at the U.S. Geological Survey, Rm. B-164, Deer Creek Facility, 3475 Deer Creek Road, Palo Alto, California 94304. Copies of this 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 based on the above data and data from previous years.

References

- Reimnitz, Erk, and Ross, Robin, 1979, Lag deposits of boulders in Stefansson Sound; Beaufort Sea, Alaska, U.S. Geological Survey Open-File Report no. 79-1205, 26 p.