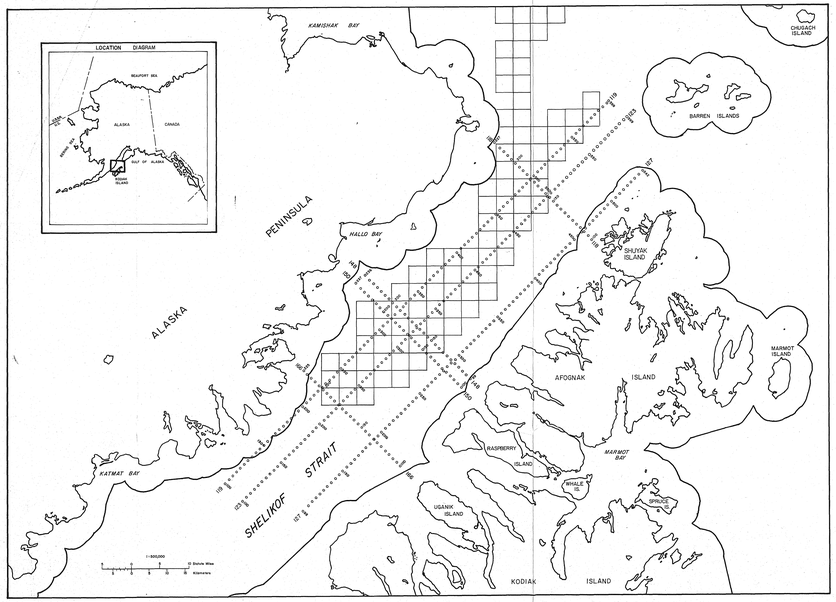
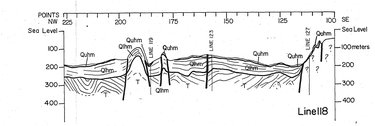
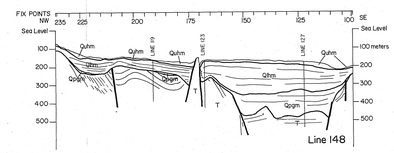
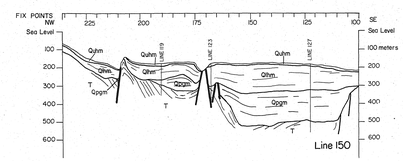
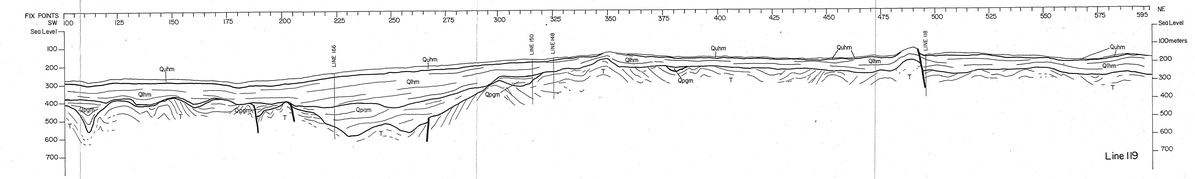


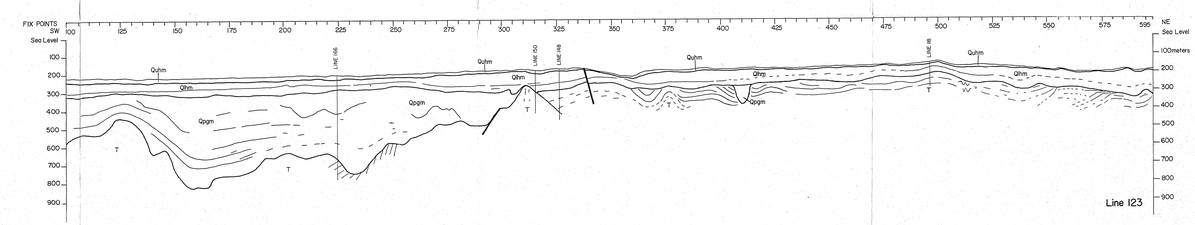
Vertical Scale= 1:10,000
Horizontal Scale = 1:250,000
Vertical Exaggeration = 25:1
Assumed Velocities
Water 1.48 km/sec
Quhm 1.60 km/sec
Avg. to base of Qlhm 1.70 km/sec
Avg. to base of Qpgm 1.80 km/sec

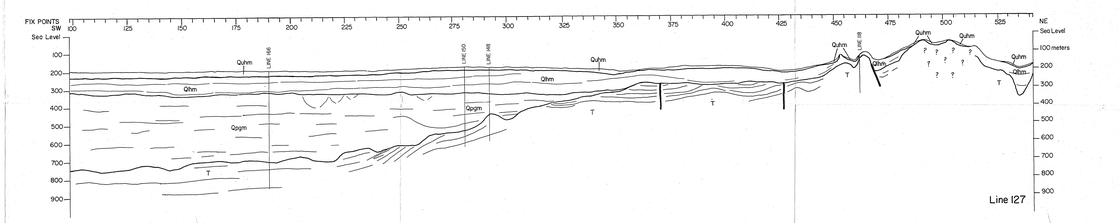


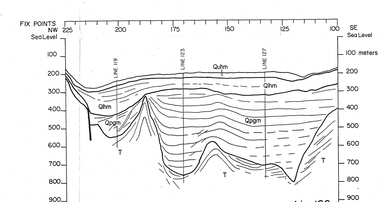












OPEN-FILE REPORT SERIES ON SHELIKOF STRAIT, ALASKA, 1980

This report is one of six (5 maps and 7 cross sections) on the surface and near-surface geologic environment of Shelikof Strait, Alaska. This series was developed in preparation for Oil and Gas Lease Sale 60 of the Outer Continental Shelf of Lower Cook Inlet, scheduled for September 1981. The publications in this series are:

Bathymetric map of the Outer Continental Shelf of Shelikof Strait, Alaska, by John Whitney and K. D. Holden: U.S. Geological Survey Open-File Report 80-2031, scale 1:250,000, 1 sheet.
Isopach map of upper Holocene marine sediments, Outer Continental Shelf, Shelikof Strait, Alaska, by K. D. Holden: U.S. Geological Survey Open-File Report 80-2032, scale 1:250,000, 1 sheet.
Isopach map of Holocene marine sediments, Outer Continental Shelf, Shelikof Strait, Alaska, by Peter J. Hoose, K. D. Holden, and Lynn Lybeck: U.S. Geological Survey Open-File Report 80-2033, scale 1:250,000, 1 sheet.
Isopach map of Quaternary glacial-marine sediments, Outer Continental Shelf, Alaska, by John Whitney, K. D. Holden, and Lynn Lybeck: U.S. Geological Survey Open-File Report 80-2034, scale 1:250,000, 1 sheet.
Map showing selected geologic features on the Outer Continental Shelf, Shelikof Strait, Alaska, by Peter J. Hoose and John Whitney: U.S. Geological Survey Open-File Report 80-2035, scale 1:250,000, 1 sheet.
Geologic cross sections of the Outer Continental Shelf, Shelikof Strait, Alaska, by John Whitney, Peter J. Hoose, Laura Me Smith, and Lynn Lybeck: U.S. Geological Survey Open-File Report 80-2036, 1 sheet.

The information presented in these six reports was interpreted from 2557 kilometers of multi-sensored high-resolution geophysical data collected in 1979 by Nekton, Inc., for the U.S. Geological Survey. The acoustic systems used included a 16-kilojoule (kJ) sparker with both sixfold common-depth-point (CDP) processing and analog format, a low-energy (1-3 kJ) sparker, an electromechanical boomer, a 3.5-kHz piezoelectric profiler, a fathometer, and side-scan sonar. The traclines along which data were collected are shown on each map. This survey was performed under an exclusive contract with the U.S. Geological Survey; the data are available to the public as Sale 60, Data Set AK-18248 from the National Geophysical and Solar-Terrestrial Data Center (address: NOAA/EDS/NGSDC, Code D-621, Boulder, CO 80302).

The 4.8 km X 4.8 km grid superimposed on each map represents the tract boundaries from the Bureau of Land Management Protraction Diagrams.

GEOLOGIC CROSS SECTIONS

These seven cross sections are representative of the geology of Shelikof Strait.

Four acoustically distinct geologic units were recognized in the high-resolution geophysical data. The chronology and lithology of those units are interpreted as follows:

Quhm- Probable upper Holocene marine sediments as much as 40 meters thick. This unit was mapped as that part of the section down to the first major acoustic reflector below the mudline. Generally, the unit is acoustically transparent and may have gas trapped at its base or within the unit, particularly in the northeastern half of Shelikof Strait. Acoustic properties are the main basis for the designation as marine.

Qlhm- Probable lower Holocene stratified marine sediment occurring up to 200 meters below mudline. In the southwestern half of Shelikof Strait, the base of this unit rests on an intra-Quaternary unconformity, whereas in the northeastern half, the unit rests directly on the Quaternary-Tertiary angular unconformity.

Qpgm- Poorly stratified, mildly folded, probable Pleistocene glacial-marine sediments occurring to 680 meters below mudline and primarily in the southwestern half of Shelikof Strait. Angular unconformities at the top and at the base of the unit further delineate it. The irregular upper and lower surfaces as well as a lack of coherent internal reflectors and stratigraphic position indicate that this unit is a glacial-marine deposit.

T- Undifferentiated Tertiary(?) section, stratified, lithified, mildly folded, faulted, and glacially truncated.

The cross sections are displayed at a 25:1 vertical exaggeration; the slope distortion diagram can be used to determine true slope angles.

The map reference shows the actual location of the cross-section lines as well as actual positions along individual lines. Also shown on the map are the locations of the lease blocks in the southern part of Oil and Gas Lease Sale 60.

GEOLOGIC CROSS SECTIONS OF THE OUTER CONTINENTAL SHELF OF SHELIKOF STRAIT, ALASKA

JOHN WHITNEY, PETER J. HOOSE, LAURA ME´ SMITH, AND LYNN LYBECK

1980

This report has not been edited for conformity with Geologic Survey editorial standards or stratigraphic nomenclature.