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Multichannel seismic-reflection profiles collected in 1980 from the southern Bering Sea, Alaska

by

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In 1980, a geophysical survey (USGS cruise identifier L6-BS-80) in the southern Bering Sea was conducted by the U. S. Geological Survey aboard the R/V S. P. Lee (Figure 1). This survey yielded approximately 1300 km of 24-fold multichannel seismic reflection data, 1300 km of single channel seismic reflection data, and other geophysical profile data including gravity, magnetic gradiometer, 3.5 and 12 kHz high-resolution echo-sounding, and sonobuoy refraction profiles.

With the publication of this open-file report, the following data are being released:

1. Analog (variable area/ wiggle trace) sections of the stacked, multichannel seismic reflection profiles at a horizontal scale of 1 km/in and a two-way travel-time scale of 1.75 in/sec with stacking velocities displayed across the top of the section;

2. Magnetic tapes of digital multichannel seismic reflection data, unstacked (CDP sorted) and stacked, in SEG-Y format;

3. Trackline chart (Figure 1) with bathymetry and shotpoint locations.

Multichannel seismic reflection profiles

The multichannel seismic reflection data were collected along 20 lines (lines 1-7 and lines 9-21). Lines 9-21 have been previously released as Open File Report 82-1090. Lines 1-7 are being released with this report. The survey conditions for this cruise were excellent, and wave-induced noise was minimal.

The source and receiver equipment, and recording parameters are shown in Table 1. The seismic source consisted of a tuned, 5 airgun array totaling 1213 cubic inches, pressurized to 2000 psi, towed at a depth of approximately 10.5 m. Individual gun volumes were normally 95, 148, 195, 309, and 466 cubic inches; the array was modified temporarily at times during the survey for repair. The receiver consisted of a 24 channel hydrophone streamer, with 100 meter group lengths containing 60 hydrophones in each group.

The near channel offset from the airguns was 297 m, and far channel offset 2611 m. The streamer was towed at a depth of approximately 12.5 m. The data were recorded with a GUS Model HDDR-4200 recording system. Recording problems contributing to skipped or unreadable records occurred at various times throughout the survey.

The basic processing steps are shown in Table 2. Particular attention was devoted to accurate velocity estimation, through the use of standard semblance plots and constant velocity stacks. The semblance velocity analyses were performed every 2.5 km (50 CDP's) along each line, using a summation of 3 to 5 adjacent CDP gathers for each analysis.

Data availability

Analog reproductions of the stacked multichannel seismic records may be obtained from the National Geophysical Data Center (NGDC). Instructions for ordering data from these sources may be obtained by contacting:

National Geophysical Data Center
NOAA/EDIS/Code D64
325 Broadway
Boulder, Colorado 80302

The CDP sorted (unstacked) and stacked data can be obtained on SEG-Y format magnetic tapes at the requester's expense by contacting:

Data Curator
Branch of Pacific Marine Geology
345 Middlefield Rd. MS 999
Menlo Park, California 94025

Additional copies of this report may be obtained by contacting:

Open File Service Section
U. S. Geological Survey
P. O. Box 25425
Federal Center
Denver, Colorado, 80225
Telephone: (303) 236-7476

TABLE 1. RECORDING PARAMETERS

SOURCE:	BOLT AIR GUNS
AIR GUNS IN ARRAY:	5
NET VOLUME:	1213 CU. IN.
MANIFOLD PRESSURE:	2000 PSI
GUN DEPTH:	8.5 M
SHOT SPACING:	50 M
STREAMER:	SEI MULTIDYNE, CHARGE COUPLED
GROUP INTERVAL:	100 M
GROUP LENGTH:	100 M
PHONES/GROUP:	60
AVERAGE DEPTH:	12 M
DEPTH CONTROLLERS:	SEI VARIABLE WING BIRDS
RECORDING:	GUS HDDR 4200, BINARY GAIN
SAMPLE INTERVAL:	2 MS
RECORD LENGTH:	10 S
GUS RECORDING FILTER:	5-110 HZ
NUMBER OF CHANNELS:	24
NAVIGATION:	MAGNAVOX INTEGRATED SYSTEM
SHOT ON:	DISTANCE
PRIMARY NAVIGATION:	SATELLITE

TABLE 2. PROCESSING SEQUENCE

1 DEMULTIPLEX:	
DESAMPLE:	4 MS
GAIN RECOVERY:	
REFORMAT:	PHOENIX I
2 TRACE SHOT EDIT:	
3 STATIC CORRECTIONS:	
RECORDING STATICS:	289 MS
DATUM:	SEA LEVEL
4 CDP SORT:	
5 VELOCITY ANALYSIS:	DISCO VELEX
WINDOW LENGTH:	100 MS
BAND PASS FILTER:	5-10-40-45 HZ
6 NMO CORRECTION:	
7 24-FOLD STACK:	NORMALIZED WEIGHTING
8 BANDPASS FILTER:	
TAPER:	HANNING
FILTER POINTS:	101
TIME WINDOW:	0.0 - 10.0 S
FREQUENCY:	5-10-40-45 HZ
9 AGC WINDOW:	500 MS

Figure 1: Shotpoint Locations