

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

MAGNETIC TAPES OF DIGITAL SONOBUOY-REFRACTION DATA OBTAINED
OVER NORTON BASIN, ALASKA

By

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Open-File Report

83-178

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In 1978, sonobuoy-refraction data were collected in Norton basin (Fig. 1) during cruise L4-78-BS aboard the U.S. Geological Survey research vessel S.P. Lee. The navigation system during the cruise integrated doppler sonar, speed log, and gyrocompass with a satellite navigation system to determine ship's position. Shallow water over the basin and generally calm weather provided good conditions for the navigation system; fixes are probably accurate to within 50 or 100 m.

The energy source used to obtain the sonobuoy data was an array of five airguns that totaled 21.7 liters (1326 in³). Shots were fired every 50 m (about every 18 s), on command from the navigation system.

Field data were obtained from 35 unreversed sonobuoys, using SSQ-41B sonobuoys provided by the U.S. Navy. These buoys broadcast a frequency-modulated (FM) signal to an Aquatronics STR-70 crystal-controlled receiver aboard the ship. High-cut and low-cut field filters were set at 62 Hz and 5 Hz respectively. These data were recorded in analog form on magnetic tape by a Hewlett-Packard 3968-A, 8-track, instrumentation tape drive, which also records a synchronizing signal on tape to ensure accurate record and playback speeds. Five different types of data were recorded on FM channels: (1) single channel seismic reflection data, (2) sonobuoy data that were filtered with a narrower passband than the field filter, (3) sonobuoy data filtered with the field filters, (4) seismic monitor, which is raw sonobuoy data that

was amplified to range between +1 and -1 volt, (5) the recorder synchronizing signal, (6) waterbreak, and (7) the airgun trigger. Amplitude-modulated voice annotation and clock ticks were recorded on the eighth tape channel. For interpretation, the sonobuoy data were displayed on analog recorders.

In 1982, Standard Oil Company (Ohio) offered to convert the data on analog tape to digital format and to provide a copy of the digital tapes to the U.S. Geological Survey. The analog field tapes were sent to Dataplex, Inc. of Houston, Texas, to be converted from analog to digital data. This conversion cost about \$56,000 for 28 of 35 of the sonobuoys. Various problems in the analog-to-digital conversion prevented the digitization of data from sonobuoys numbered 4,11,17,20,22,27,and 31 (Fig. 1). Data from the successfully digitized sonobuoys have a 4 ms sample rate and a 10 s record length, and these data are written on 9-track tapes, in SEG-Y format, at a density of 1600 bpi. Data channels are on digital tape in the same order as on the field tapes.

The data being made public are the tapes of digital data that are stored at a commercial tape repository, and copies can be obtained directly through this repository for the cost of the tape, the tape duplication, and shipping and handling. The address of this repository is:

Arcus Inc.

2975 Whipple Rd.

Union City, California 94587

(415) 489-5100

At Arcus, digital tapes are stored and referred to by slot number; these numbers for the sonobuoy tapes are 1717 to 1776.

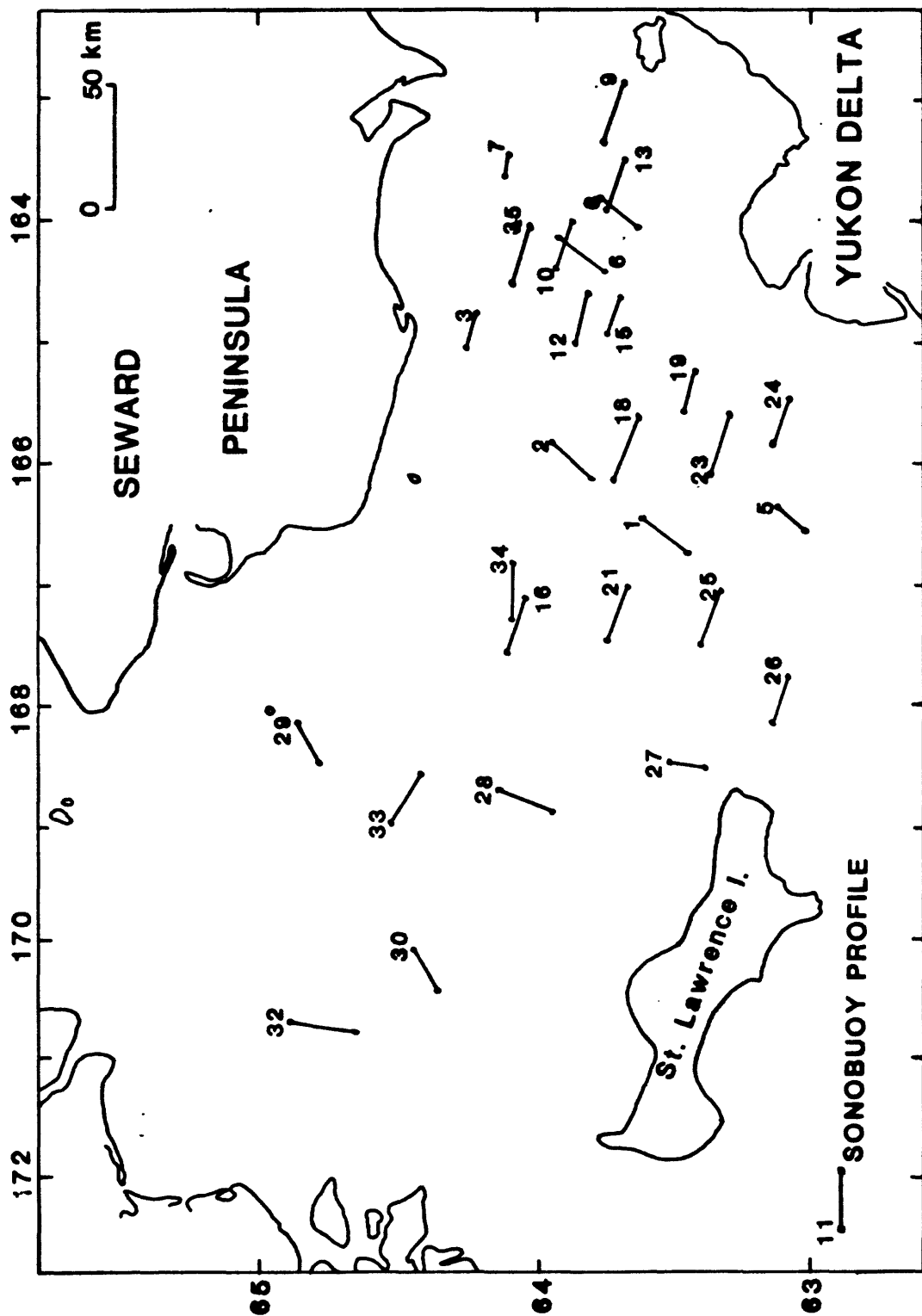


Figure 1. Location of sonobuoy profiles near Norton basin.