

76029

CRUISE REPORT

SIDE SCAN SONAR

EASTERN RHODE ISLAND SOUND

AND

VINEYARD SOUND

MASSACHUSETTS

RESEARCH VESSEL - A. E. VERRILL

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Introduction

The U.S. Geological Survey in cooperation with the New England Division of the U.S. Army Corps of Engineers conducted a side scan sonar survey of the proposed Browns Ledge Dredge Spoil Dump Site located in Eastern Rhode Island Sound. Also, available ship time permitted acquisition of sonograph data of the sea floor beneath Vineyard Sound. The surveys were carried out aboard the Marine Biological Laboratory research vessel A. E. Verrill under Captain Derek Von Arx. Woods Hole, Massachusetts served as port of operation during the investigation.

Background

As part of the proposed Federal Harbor improvement and maintenance dredging of Fall River and Mt. Hope Bay under the jurisdiction of the U.S. Army Corps of Engineers, the disposal of the resultant dredge spoil is planned for an ocean dump site located 2 miles southeast of Browns Ledge in eastern Rhode Island Sound. In addition, the proposed site is being considered as a "regional" disposal grounds to be utilized by state and private organizations performing dredging work authorized by the Corps.

This survey is part of a continuing program of study to determine the suitability and potential environmental impact of ocean dumping of dredge spoil material at the proposed site.

Objectives

Browns Ledge Dredge Spoil Dump Site

The detailed side scan sonar study is intended to provide information on the morphology of the sea floor at the proposed dump site. The observed micro relief and related bedforms will be correlated with the geology and sediment textures deduced from seismic profiling and vibracore sampling.

These data will help to delineate areas of the sea floor undergoing erosion and/or deposition at present. Stability of bottom sediments and the occurrence, distribution and possible mobility of bedforms associated with bottom current activity are important factors to consider at any proposed ocean disposal site.

Vineyard Sound

High-resolution seismic profiling data from a regional investigation have delineated a massive beach and shoal complex underlying most of Vineyard Sound. Additional ship time provided an opportunity to examine these deposits for evidence of activity in the present and to define areas of outcropping of older sediments as possible sites for bottom grab sampling and coring.

Personnel

The following personnel participated during the course of the investigation:

Charles J. O'Hara	Scientist-in-charge
Robert N. Oldale	Geologist - U.S.G.S., Woods Hole
Wayne M. Ferrebee	Geologist - U.S.G.S., Woods Hole
Harley J. Knebel	Geologist - U.S.G.S., Woods Hole
Charles E. Franks	GFA - U.S.G.S., Woods Hole
David Forrier	Student - U.S.G.S./Northeastern Coop, Woods Hole
Charles Finkelstein	Engineer - Klein Associates, Inc., Salem, New Hampshire
Scott Briggs	Student - WHOI/M.I.T. joint program, Woods Hole
David Johnson	Assoc. Scientist - WHOI, Woods Hole
David Twichell	Student - U.S.G.S./U.R.I., Rhode Island

Steve Yokubaitis

Student - U.R.I., Rhode Island

Shigeaki Kubo

Geologist - Sanyo Hydrologic Survey Co., Ltd.
Tokyo, Japan

Tadahiko Katsura

Geologist - Japan Hydrologic Office, Tokyo,
Japan

Shipboard Systems

The following systems were in operation during the survey:

Klein Side Scan Towfish - Model 402A-001A

Klein Three Channel Recorder - Model 431

Epsco LORAN-C Receiver

Epsco LORAN-C Repeater

Operational Procedures

Ship tracks were pre-plotted on LORAN-C navigation lines of position. Cape Race, Newfoundland and Dana, Indiana LORAN-C transmitters were monitored and resultant positional data were logged at 15-minute intervals. Ship speed over the bottom was maintained at 4 knots.

The Klein side scan fish was towed 10 meters astern of the survey vessel and at a depth below sea level of about 15 meters. The recorder sweep rate was set to scan 150 meters of the sea floor on each side of the vessel. Return signals from the starboard and port scans were automatically tuned, texture enhanced, and then printed on 2 channels of the 3-channel recorder. In addition, and for comparison of technique only, incoming signals from the starboard scan were recorded on the 3rd channel using the manual tuning mode. Of the 3 recorder scan rates available, ie. 75 m, -150 m, -300 m, the 150 m scan provided the best compromise between resolution and sea floor coverage.

In eastern Rhode Island Sound at the proposed dump site, 8 traverses were made in a NW-SE orientation and 7 traverses were made in a SW-NE orienta-

tion. Track lines were spaced 0.4 nautical miles apart. In Vineyard Sound, the tracklines were similarly orientated, but with random spacing.

Statistics

Scheduled ship time - 5 days

Working days at sea - 5 days

Actual survey time at sea - 5 days

Ship tracks - Side Scan Sonar

Eastern Rhode Island Sound - 56 nm (104 km)

Vineyard Sound - 65 nm (120 km)

Total 121 nm (224 km)

Figure 1 shows areas of investigation and side scan sonar coverage.

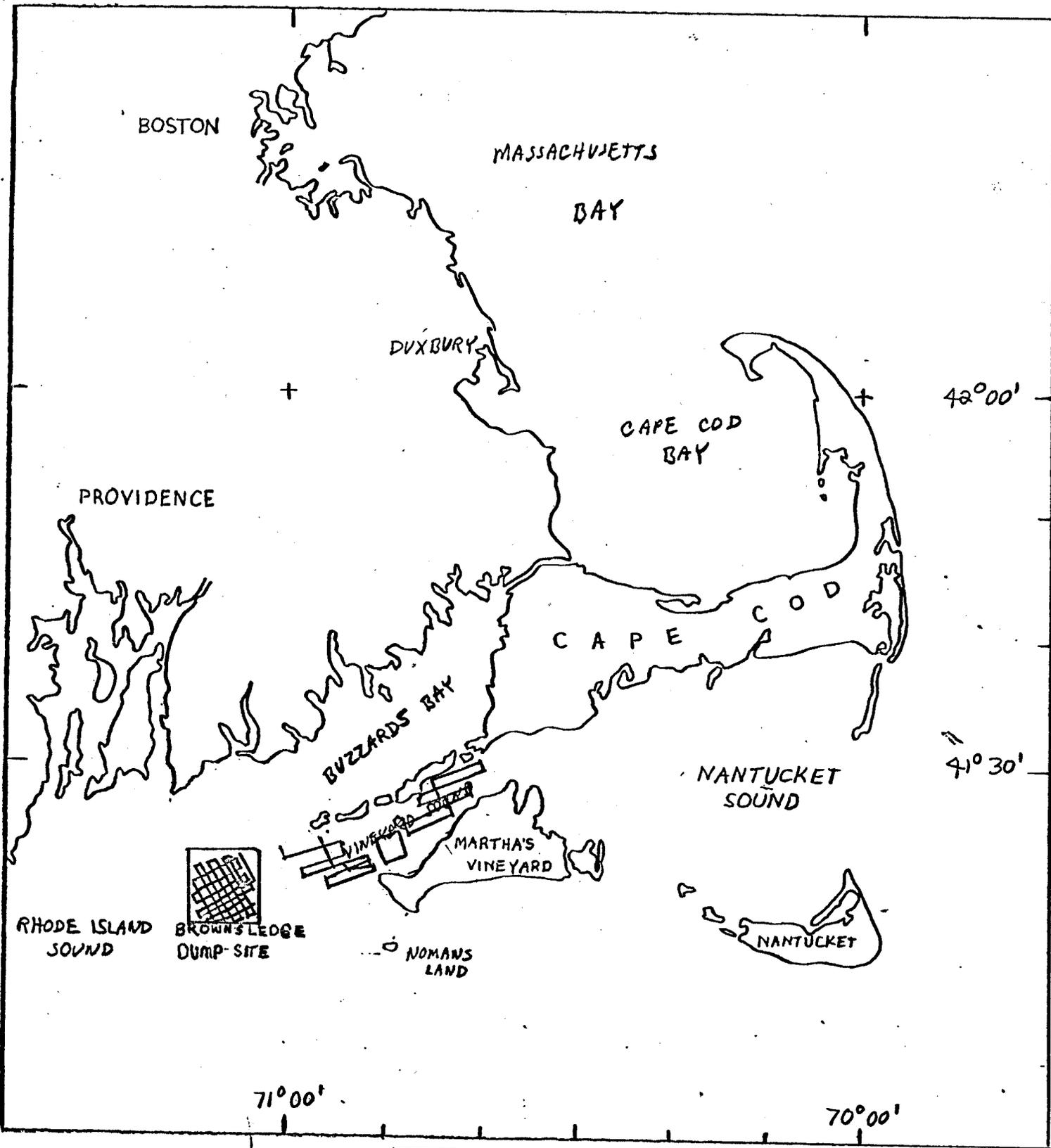


FIGURE 1

