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Cruise Report

Coastal, Estuarine and Lacustrine Studies

Project: 9450-02421

Uniboom Seismic and Side-Scan Sonar

Western Rhode Island Sound

Research Vessel - NEECHO

Cruise NEE-80-1

Leg 1: 09 July - 17 July, 1980
Leg 2: 29 September - 03 October, 1980

C.J. O'Hara
U.S. Geological Survey
Office of Marine Geology
Woods Hole, MA 02543

RESEARCH VESSEL: NEECHO

CRUISE NUMBER: NEE-80-1

CRUISE DATES: 09 July - 17 July, 1980 (Leg 1)
29 September - 03 October, 1980 (Leg 2)

AREA OF STUDY: Western Rhode Island Sound (eastern Narragansett Bay to Block Island, R.I.)

BASE OF OPERATIONS: University of Rhode Island Narragansett Bay Campus

SCIENTIFIC OBJECTIVES:

1. To define the geology and shallow structure of western Rhode Island Sound.

2. To identify and map potential geologic hazards.

3. To determine the geologic framework and Quaternary development of this part of the Atlantic Inner Continental Shelf.

4. To select sites for possible coring during summer 1981.

5. To complement similiar data and findings obtained by this office in eastern Rhode Island Sound.

PERSONNEL:

Charles J. O'Hara, Chief Scientist, U.S.G.S.

Sally Wood-Needell, Geologist, U.S.G.S. (Leg 1 only)

Frank Jennings, Electronic Technician, U.S.G.S.

Paul Loud, Boat Operator, U.S.G.S.

Rusty Tirey, Marine Operations, U.S.G.S. (Leg 2 only)

Sandra Conley, Geologist, U.S.G.S. (Leg 2 only)

SHIPBOARD SYSTEMS:

1. EG&G Uniboom Seismic Profiling System (EPC Graphic Recorder)
2. EDO Western Side-Scan Sonar System (EDO Graphic Recorder).
3. Northstar 6000 Loran-C Navigator and Repeater.
4. Texas Instruments Silent 700 ASP Terminal (Navigation Log Leg 1 only).
5. Hewlett-Packard Instrumentation Recorder (Uniboom Seismic, Leg 1 only).
6. Teledyne Exploration Seismic Amplifier.
7. Krohn-Hite Band Pass Filter.
8. Del Norte and EG&G Hydrophone Streamers.

OPERATIONAL PROCEDURES:

Seismic sound source/receiver position - 10m astern of vessel

Seismic sound source/receiver separation - 10m

Seismic recorder sweep rate - 0.25 sec.

Seismic sound source trigger interval - 0.50 sec.

Band pass filter setting-low 400 Hz, high 4 kHz

Side-scan sonar fish - off starboard beam, 1.5m below sea surface.

Side-scan slant range - 100m each side of vessel.

Loran-C master transmitter - Seneca, New York (9960 Northeast Chain).

Loran-C slave transmitters - W - Caribou, Maine and Y- Carolina Beach, North Carolina (9960 Northeast Chain).

Positional data - logged at 2 minute intervals (Leg 1).
- logged at 5 minute intervals (Leg 2).

Average ship's speed over the bottom-5 knots.

CRUISE NARRATIVE:

LEG 1-

09 July 80 (Wednesday) - NEECHO depart Cataumet Marina on route to western Rhode Island Sound.

09 July 80 (Wednesday afternoon) thru 15 July 80 (Tuesday) - conducted marine investigation of western Rhode Island Sound as weather permitted.

16 July 80 (Wednesday) - Uniboom power supply failure, transformer burned out, spent the day tracking down replacement transformer or back up power supply - neither available.

17 July 80 (Thursday) - NEECHO returns to Cataumet.

LEG 2-

29 Sept. 80 (Monday) - NEECHO depart Cataumet Marina on route to western Rhode Island Sound.

29 Sept. 80 (Monday afternoon) thru 02 Oct. 80 (Thursday) -conducted marine investigation of western Rhode Island Sound as weather permitted.

03 Oct. 80 (Friday) - Survey completed, NEECHO returns to Cataumet.

STATISTICS:

Total working days at sea - 11 days

Down-time

Inclement weather - 2 days

Equipment malfunction - 1 day

Actual survey time at sea - 8 days

Ship tracks

Line kilometers of high-resolution subbottom profiles 580 (313 nautical miles)

Line kilometers of side-scan sonographs - 580 (313 nautical miles)

Figure 1: Index map showing study area

Figure 2: Map showing trackline coverage

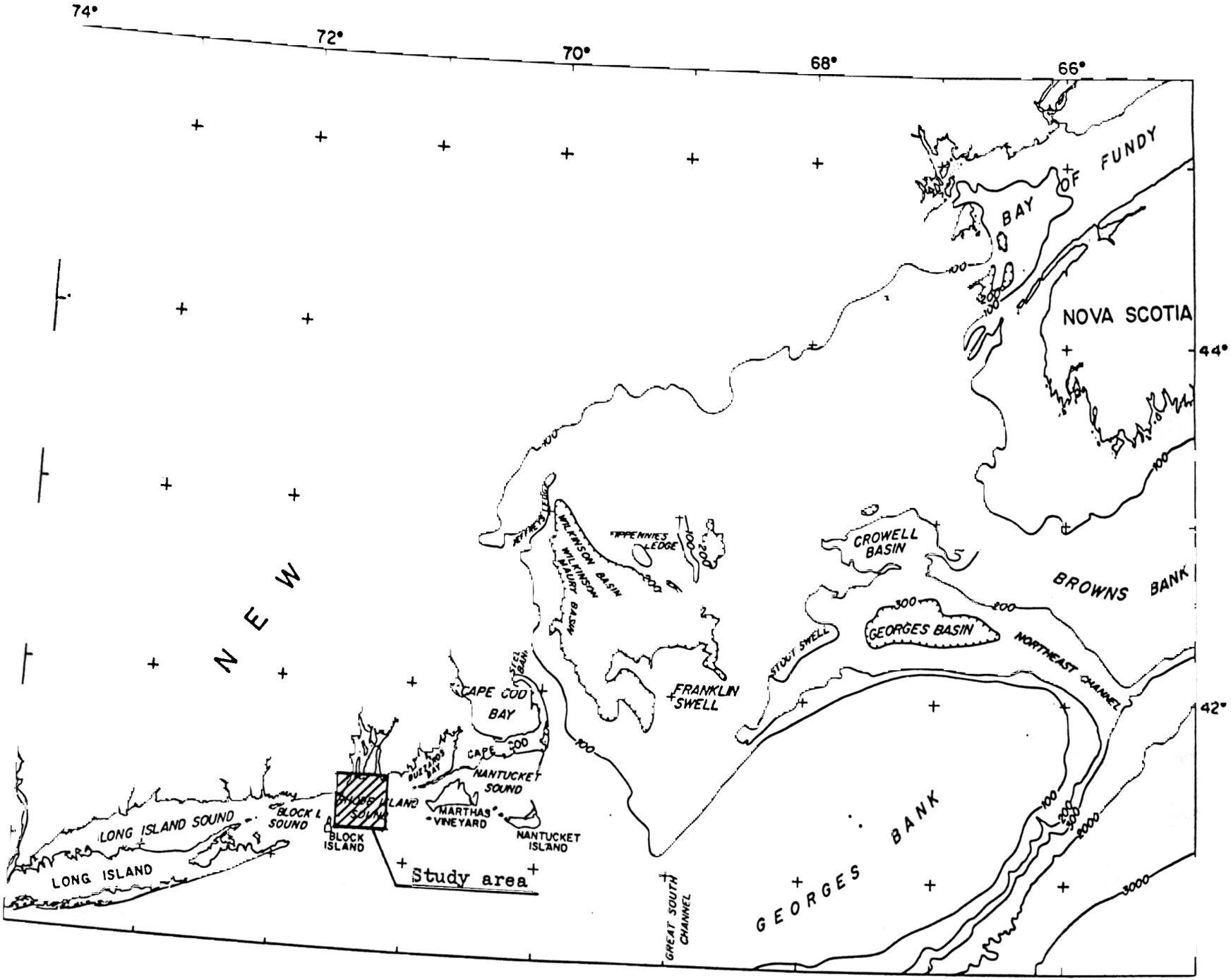
74°
72°
70°
68°
66°
44°
42°
BAY OF FUNDY
NOVA SCOTIA
NEW
CROWELL BASIN
BROWNS BANK
GEORGES BASIN
NORTHEAST CHANNEL
STUART SWELL
FRANKLIN SWELL
WILKINSON BASIN
WILKINSON BASIN
TYPENNIES LEDGE
CAPE COD BAY
CAPE
NANTUCKET SOUND
MARTHAS VINEYARD
NANTUCKET ISLAND
BLOCK ISLAND
BLOCK ISLAND SOUND
LONG ISLAND SOUND
LONG ISLAND
Study area
GREAT SOUTH CHANNEL
GEORGES BANK
100
200
300
2000
3000

FIGURE 1

TRACKCHART — R/V NEECHO — CRUISE NEE-80-1, LEG 1 (JULY 80) AND LEG 2 (SEPT.-OCT. 80)

UNIBOOM SEISMICS AND SIDE-SCAN SONAR

WESTERN RHODE ISLAND SOUND

NAVIGATION BY LORAN-C

C. O'HARA - CHIEF SCIENTIST
S. NEEDELL
F. JENNINGS
P. LOUD

U.S GEOLOGICAL SURVEY
OFFICE OF MARINE GEOLOGY
WOODS HOLE, MASS. 02543

580 KILOMETERS (313 NAUTICAL MILES)

BASE FROM NOS CHART 13218 (SCALE 1:80,000)

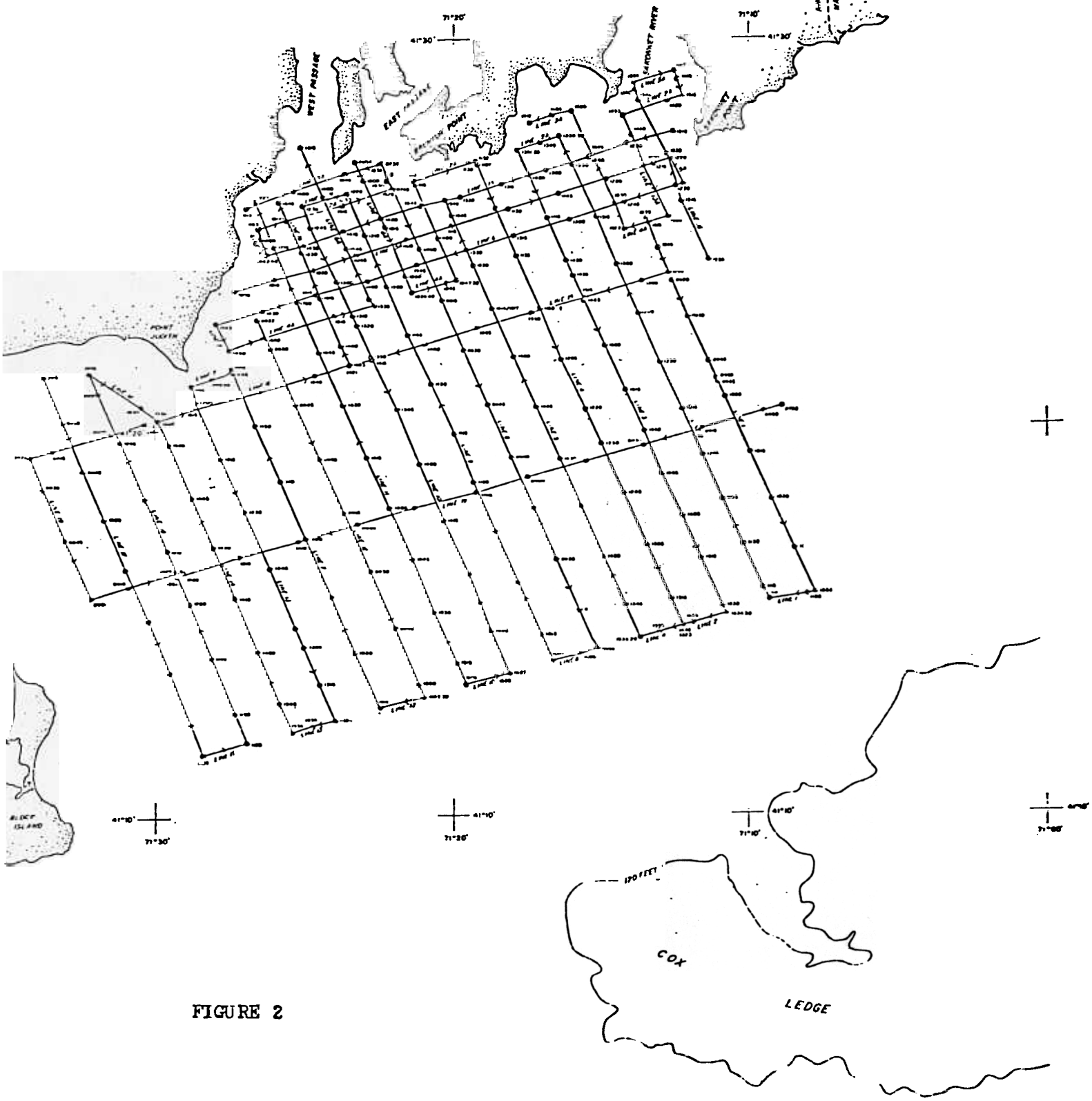

FIGURE 2