

83011

CRUISE REPORT

R/V OCEANUS 140

October 17-24, 1983

Brad Butman
U.S. Geological Survey
Woods Hole, MA 02543

Vessel: OCEANUS 140

Departure: Woods Hole, MA

Dates: October 17-24, 1983

Area of operation: Southern New England Shelf and Slope, Georges Bank

Objectives:

1. Recover 5 subsurface moorings deployed on the Continental Slope and upper rise (stations SA, SB, SC, SD, SE, figure 1).
2. Deploy 3 subsurface current moorings and 1 bottom tripod (stations SA, SE, SF, T, figure 2).
3. Deploy 4 surface marker buoys (stations SF, T)
4. Conduct a detailed hydrographic survey along the edge of the Continental Shelf from Lydonia to Atlantis Canyons.
5. Obtain surface grab samples and hydrostatically damped cores.

Personnel:

| | |
|-----------------|--------------------------|
| Paul Howland | Master, OCEANUS |
| Brad Butman | USGS |
| Mike Bothner | USGS |
| John Larson | USGS |
| John Moody | USGS |
| Cathy O'Dell | USGS |
| Carol Parmenter | USGS |
| Rick Rendigs | USGS |
| Polly Shoukimas | USGS |
| Nancy Soderberg | USGS |
| Bill Strahle | USGS |
| Andy Eliason | Eliason Data Services |
| Eiji Imamura | Consultant, formerly MMS |

Narrative:

October 17 2130 Depart Woods Hole. Cruise delayed from 0900 departure because trawl winch had been removed from the ship for maintenance and was still being installed and tested. Steam to station T.

October 18 0620 Arrive station T. Beautiful day. Prepare to launch surface buoys.

0738 Deploy buoy J (eastern buoy).

0830 Deploy buoy A (western buoy).

0929 Deploy tripod (mooring 273).

0947 Underway to station SF.

1100 Arrive station SF.

1130 Deploy surface buoy L (eastern buoy).

October 18 (Cont.)

1208 Deploy surface buoy X (western buoy).
 1418 Deploy subsurface mooring (mooring 275).
 1440 Underway to station SE.
 1515 Arrive SE. No reply from transponder. Conduct 2-mile square box survey. Try other transducers. Assume mooring dragged or release failed.
 1925 Begin CTD and grab samples.

October 19

0020 CTD and grabs. Underway to station SA.
 0730 Arrive SA.
 0825 Release subsurface mooring 271.
 0920 Mooring 271 on deck. Underway to station SB.
 1025 Start recovery of mooring 267.
 1215 Underway to station SC.
 1415 No reply from release at SC. Assume release failed, start to drag for SC. (check release batteries from recovered releases and found low batteries - assume release at SC failed.) Made several passes and hung up on bottom.
 2015 Search for mooring.
 2130 Terminate search. Radio indicates possible beacon (could have cut mooring and it is on surface).
 2230 Start XBT transect.

October 20

0235 Terminate XBT survey.
 0700 On station SC. Start to drag again for SC.
 1200 Still dragging.
 1500 Grappling hook hung up on something - broke free with ship. Terminate grappling.
 1530 Underway to SA.
 1630 Arrive SA.
 1930 Deploy subsurface mooring 276.
 2000 Start radio search for mooring at SC (mooring 268). Radio signal heard October 19 after dragging at SC may have been the mooring which was cut by trawl wire while dragging. Plan to steam southwest along shelf.
 2200 Heard radio. Fix position by using ship as antenna and spinning ship.

October 21

0027 Buoy located.
 0220 Mooring 268 recovered. Only upper 2 instruments recovered. Other instruments either still on bottom or adrift. (Lucky to find upper half adrift). Search for rest of mooring on surface. Dark and quite rough so glass balls almost impossible to see.
 0310 Underway to station SD.
 1110 Arrive at station SD. Release will not reply. By now we have determined that release batteries are bad. Rig to drag immediately without search.
 1400 First pass.
 1505 Float spotted on surface.
 1540 Mooring recovered. Severed mooring wire with trawl wire just above release.
 1600 Steam to start CTD sections.
 1700 Start CTD transect.
 2000 Continue CTD.

October 22 0000 Continue CTD survey.
 0800 Continue CTD survey.
 1600 Continue CTD survey.

October 23 0000 Continue CTD survey.
 0830 Arrive station SE. Start dragging for subsurface mooring
 270.
 1020 Recovery complete. Cut mooring just above release.
 1230 Start deployment of subsurface mooring 274.
 1355 Mooring 274 aweigh.
 Continue CTD transect.

October 24 0025 Complete CTD transect. Start Hydraulic Damped Coring.
 (HDC).
 0140 HDC complete. Underway to Woods Hole.
 0700 Arrive Woods Hole.

Cruise summary

Purpose

The moorings deployed and recovered are part of a continuing series of field experiments designed to investigate the currents and sediment movement on the Continental Shelf and Slope. The data recovered are the first long-term current data obtained along the Continental Slope.

Highlights

All work planned for OC140 was completed. Considerable time was spent dragging for 3 subsurface moorings. The releases failed on these moorings, apparently because of marginal batteries (see below). Dragging for the subsurface moorings was difficult in deep water. A major problem was determining if the mooring had been cut or not. The instruments often surfaced 1 to 2 miles astern and were difficult to spot in rough seas. In addition, there was generally no indication by wire tension that the subsurface mooring was cut.

All current meters were recovered at SA, SB, SD, and SE. The near-bottom sediment traps and releases at SD and SE were lost when the mooring was cut by grappling. There may be as many as 3 current meters plus sediment traps remaining at SC. ALVIN may be able to dive at this site on one of her training/certification dives, probably in January 1984.

Preliminary data processing indicates all but 1 VACM functioned properly. The weather on OC140 on the first and last day of the cruise was nice, otherwise it was marginal.

Relationship to SEEP, MMS, and WHOI studies

A Department of Energy (DOE) project called SEEP (for Shelf Edge Exchange Processes) is being conducted by investigators at WHOI, LDGO, Yale, and Brookhaven Labs. The major objective of SEEP is to examine transport of organic and inorganic material from the shelf to the slope. This is also a major objective of the USGS experiments. The instrument arrays were designed

to complement each other. There are essentially two cross-shelf/slope transects of instruments. Additional transects will be deployed off the Delaware and New Jersey coasts in January 1984 as part of the MMS Mid-Atlantic Physical Oceanography Study conducted by SAI. Finally, WHOI (H. Bryden, principal investigator) deployed a mooring in the Gulf Stream about 100 km to the south of Slope Array I. These observations should help to determine the low-frequency fluctuations on the slope driven by meanders of the Gulf Stream.

Release Problems

Considerable time was spent dragging for 3 of the subsurface moorings which would not release on command. All releases which failed were powered by batteries manufactured in 6/82. One release which was recovered was also powered by batteries manufactured in 6/82; on recovery the battery voltage was extremely low (10 v for a normal 17 v battery). We concluded that the 6/82 batteries were marginal. The other releases which we did recover were powered with batteries manufactured in 2/82.

The moorings were deployed for approximately 11 months, a maximum length of time for the batteries normally used in the acoustic releases. The batteries manufactured in 6/82 were marginal, and thus failed. Plans are now underway to add additional power to the releases for these long deployments, and/or to replace the mercury batteries with more reliable alkaline batteries. (The mercury batteries seem to occasionally not deliver the rated power. A similar battery failure occurred in 1979). Substitution of alkaline batteries would require adding an internal timer to the release which would cycle the release on and off.

We have also decided to initiate a quality control/testing procedure for each manufacture date of batteries used in the releases. This should provide some early warning of battery failure.

Three of the four moorings deployed on OC140 were also powered by batteries manufactured in 6/82. Other users of these batteries have indicated no failures in deployments of 6-7 months. We do not anticipate any recovery problems on our March 1984 recovery cruise.

| | | |
|-------------------------------|---------------------|---------------------|
| <u>Tabulated information:</u> | Days at sea: | 8 |
| | Moorings: | |
| | Deployed | 4 ✓ |
| | Recovered | 5 ✓ (3 by dragging) |
| | Surface buoys: | |
| | Deployed | 4 ✓ |
| | Hydrography: | |
| | CTD | 32 ✓ |
| | XBT | 31 ✓ |
| | Salinity | 69 ✓ |
| | Nutrients | 48 ✓ |
| | Suspended sediments | |
| | Oxygen | 9 ✓ |

Table 1. Moorings deployed and/or recovered on OCEANUS 140

| Station | Latitude (°N.) | Longitude (°W.) | Moorings | | | | Surface buoy |
|---------|-------------------|--------------------|----------------|------|---------------|------|--------------|
| | | | recover no. | type | deploy no. | type | |
| SA | 40°04.8' | 68°33.6' | 271 | SS | 276 | SS | |
| | 40°04.8' | 68°33.5' | | | | | |
| SB | 40°01.1' | 68°32.4' | 267 | SS | | | |
| SC | 39°58.5' | 68°31.4' | 268 | SS | | | |
| SD | 40°16.8' | 67°46.6' | 269 | SS | | | |
| SE | 39°53.9' | 70°03.9' | 270 | SS | 274 | SS | |
| | 39°53.8' | 70°03.7' | | | | | |
| SF | 39°57.7' | 70°00.9' | | | 275 | SS | 2 |
| T | 40°11.0' | 69°58.3' | | | 273 | T | 2 |

Table 2. Hydrographic stations OC140, October 17-24, 1983

| Station | Date | Time ¹ | Latitude ² (N.) | Longitude (W.) | Water depth (m) | CTD | XBT | Salinity | | Samples ³ Nutrients | | Susp. sed. (m) | O ₂ (m) |
|---------|-------|-------------------|-------------------------------|-------------------|-----------------------|-----|-----|--------------|-------------|-----------------------------------|-------------|----------------------|-----------------------|
| | | | | | | | | surf. (m) | deep (m) | surf. (m) | deep (m) | | |
| 1 | 10/18 | 2015 | 39°54.2' | 70°04.0' | 480 | X | | X | | X | | X | |
| 2 | 10/18 | 2110 | 39°56.4' | 70°02.9' | 285 | X | | X | | X | | X | |
| 3 | 10/18 | 2222 | 39°58.1' | 70°00.6' | 173 | X | | X | | X | | X | |
| 4 | 10/18 | 2324 | 40°05.3' | 69°59.3' | 140 | | X | X | | X | | X | |
| 5 | 10/19 | 0016 | 40°10.9' | 69°58.1' | 101 | X | | X | | | | | |
| 6 | 10/19 | 2034 | 39°50.3' | 68°28.4' | | | X | X | | | | | |
| 7 | 10/19 | 2309 | 39°53.8' | 68°33.5' | | | X | X | | | | | |
| 8 | 10/19 | 2350 | 39°58.7' | 68°35.6' | | | X | X | | | | | |
| 9 | 10/20 | 0034 | 40°05.0' | 68°37.0' | 475 | | X | X | | | | | |
| 10 | 10/20 | 0104 | 40°08.4' | 68°37.4' | 180 | | X | X | | | | | |
| 11 | 10/20 | 0144 | 40°14.0' | 68°38.1' | 130 | | X | X | | | | | |
| 12 | 10/20 | 0227 | 40°18.9' | 68°39.3' | 102 | | X | X | | | | | |
| 13 | 10/21 | 1703 | 40°07.1' | 67°43.8' | 2,105 | X | | X | | X | | | |
| 14 | 10/21 | 1852 | 40°11.5' | 67°45.2' | | | X | X | | | | | |
| 15 | 10/21 | 1935 | 40°16.5' | 67°46.4' | 575 | X | | X | | X | | | |
| 16 | 10/21 | 2040 | 40°21.1' | 67°47.9' | 187 | X | | X | | X | | | |
| 17 | 10/21 | 2130 | 40°26.0' | 67°49.6' | 137 | | X | X | | | | | |
| 18 | 10/21 | 2223 | 40°32.6' | 67°50.9' | 99 | X | | X | | X | | | |
| 19 | 10/21 | 2337 | 40°32.1' | 68°04.3' | 105 | | X | X | | | | | |
| 20 | 10/22 | 0005 | 40°31.8' | 67°11.6' | 105 | | X | X | | X | | | |
| 21 | 10/22 | 0212 | 40°30.0' | 68°43.7' | 73 | X | | X | | X | | | |
| 22 | 10/22 | 0253 | 40°25.9' | 68°43.0' | 85 | | X | X | | X | | | |
| 23 | 10/22 | 0335 | 40°19.4' | 68°40.2' | 101 | X | | X | | X | | | |
| 24 | 10/22 | 0428 | 40°13.6' | 68°36.2' | 160 | | X | X | | | | | |
| 25 | 10/22 | 0533 | 40°08.6' | 68°36.5' | 285 | X | | X | | X | | | |
| 26 | 10/22 | 0650 | 40°05.0' | 68°35.5' | 755 | X | | X | | X | | | |
| 27 | 10/22 | 0738 | 40°01.6' | 68°34.5' | 1,550 | X | | X | | X | | | |
| 28 | 10/22 | 0932 | 39°58.5' | 68°32.9' | 1,920 | X | | X | | X | | | |
| 29 | 10/22 | 1150 | 39°54.1' | 68°34.5' | | | X | X | | | | | |
| 30 | 10/22 | 1233 | 39°49.0' | 68°30.0' | 2,500 | X | | X | | X | | | |
| 31 | 10/22 | 1416 | 39°51.9' | 68°40.2' | 2,300 | | X | X | | | | | |
| 32 | 10/22 | 1447 | 39°52.9' | 68°48.1' | 2,000 | | X | X | | | | | |

¹Time is EDT.

²All latitude and longitude from Northstar-6000 5101 algorithm.

³Sample depths are from CTD pressures. Not corrected for deck offset (subtract about 7.5 m).

Table 2. Hydrographic stations OCL140, October 17-24, 1983 (Cont.)

| Station | Date | Time ¹ | Latitude ² (N.) | Longitude (W.) | Water depth (m) | CTD | XBT | Salinity surf. deep (m) | Samples ³ Nutrients surf. deep (m) | Susp. sed. (m) | O ₂ (m) |
|---------|-------|-------------------|-------------------------------|-------------------|-----------------------|-----|-----|-------------------------------|--|----------------------|-----------------------|
| 33 | 10/22 | 1521 | 39°50.1' | 68°55.7' | 2,000 | | X | X | | | |
| 34 | 10/22 | 1552 | 39°53.2' | 68°58.5' | | | X | X | | | |
| 35 | 10/22 | 1627 | 39°58.6' | 69°00.1' | 1,600 | | X | X | | | |
| 36 | 10/22 | 1704 | 40°04.5' | 69°02.0' | 435 | X | | 427 | 427 | | 427 |
| 37 | 10/22 | 1748 | 40°09.0' | 69°03.3' | 145 | X | | 138 | 138 | | 138 |
| 38 | 10/22 | 1851 | 40°11.5' | 69°04.4' | 99 | X | | 98 | 98 | | 98 |
| 39 | 10/22 | 1945 | 40°16.2' | 69°06.5' | 90 | X | | | | 82 | |
| 40 | 10/22 | 2041 | 40°20.1' | 69°08.4' | 86 | X | | | | | |
| 41 | 10/22 | 2110 | 40°23.2' | 69°09.1' | 77 | | X | | | | |
| 42 | 10/22 | 2216 | 40°23.4' | 69°20.1' | 70 | | X | | | | |
| 43 | 10/22 | 2256 | 40°23.0' | 69°30.2' | 72 | | X | | | | |
| 44 | 10/22 | 2344 | 40°22.6' | 69°42.0' | | | | | | 77 | 77 |
| 45 | 10/23 | 0032 | 40°22.8' | 69°52.9' | 80 | X | | | | | |
| 46 | 10/23 | 0138 | 40°17.0' | 69°55.6' | 88 | | X | | | 98 | 98 |
| 47 | 10/23 | 0218 | 40°11.1' | 69°57.3' | 98 | X | | | | 143 | 143 |
| 48 | 10/23 | 0315 | 40°04.6' | 69°59.8' | 145 | | | | | | |
| 49 | 10/23 | 0417 | 39°57.7' | 70°01.4' | 212 | X | | | | | |
| 50 | 10/23 | 0527 | 39°49.5' | 70°05.2' | 1,050 | | X | | | | |
| 51 | 10/23 | 0557 | 39°44.5' | 70°07.4' | 2,000 | X | | | | 250 | 250 |
| 52 | 10/23 | 1126 | 39°54.1' | 70°04.5' | 455 | X | | | | 467 | 467 |
| 53 | 10/23 | 1434 | 39°56.6' | 70°14.8' | 740 | | X | | | | |
| 54 | 10/23 | 1526 | 40°00.1' | 70°11.7' | 485 | X | | | | | |
| 55 | 10/23 | 1619 | 40°03.5' | 70°11.2' | 267 | X | | | | | |
| 56 | 10/23 | 1653 | 40°04.6' | 70°08.9' | 168 | X | | | | | |
| 57 | 10/23 | 2033 | 40°01.5' | 70°46.5' | 230 | | | | | | |
| 58 | 10/23 | 2124 | 40°07.5' | 70°48.4' | 140 | X | | | | | |
| 59 | 10/23 | 2144 | 40°12.2' | 70°50.2' | 130 | X | | | | | |
| 60 | 10/23 | 2230 | 40°16.1' | 70°52.6' | 120 | X | | | | | |
| 61 | 10/23 | 2251 | 40°20.0' | 70°54.9' | 100 | X | | | | | |
| 62 | 10/23 | 2337 | 40°24.9' | 70°57.5' | 87 | X | | | | | |
| 63 | 10/23 | 2358 | 40°30.1' | 71°00.6' | 80 | X | | | | | |
| 64 | 10/23 | | | | | | | | | 79 | 79 |
| 65 | 10/23 | | | | | | | | | 93 | 93 |
| 66 | 10/23 | | | | | | | | | 250 | 250 |
| 67 | 10/23 | | | | | | | | | 467 | 467 |

¹Time is EDT.

²All latitude and longitude from Northstar-6000 5101 algorithm.

³Sample depths are from CTD pressures. Not corrected for deck offset (subtract about 7.5 m).

Table 3. Sediment samples

| Station | Date | Water depth (m) | Latitude (N.) | Longitude (W.) | Equipment | Purpose |
|----------|-------|-----------------|---------------|----------------|----------------------------|---------------------|
| OC140-1 | 10/18 | 475 | 39°54.1' | 70°03.8' | .1 m ² Van Veen | Texture, station SE |
| OC140-2 | 10/18 | 275 | 39°56.7' | 70°03.1' | .1 m ² Van Veen | Texture |
| OC140-3 | 10/18 | 180 | 39°57.9' | 70°00.6' | .1 m ² Van Veen | Texture, station SF |
| OC140-4 | 10/19 | 101 | 40°10.9' | 69°58.2' | .1 m ² Van Veen | Texture, station T |
| OC140-5 | 10/19 | 101 | 40°07.6' | 69°44.8' | .1 m ² Van Veen | Texture |
| OC140-6 | 10/22 | | 40°16.3' | 69°06.8' | .1 m ² Van Veen | Texture |
| OC140-7 | 10/22 | 85 | 40°23.1' | 69°09.0' | .1 m ² Van Veen | Texture |
| OC140-8A | 10/23 | 79 | 40°29.9' | 71°00.6' | HDC | Ba profile |
| OC140-8B | 10/23 | 79 | 40°30.2' | 71°00.8' | HDC | Ba profile |

Table 4. Slope Array - Deployment II

| Station | Mooring no. | Water depth (m) | Latitude(N.)/ Longitude(W.) | Mooring type | Inst. type | Inst. depth (m) | Inst. S.N. | Deploy (YrMoDy) | Recover (YrMoDy) |
|---------|-------------|-----------------|--------------------------------|--------------|------------|-----------------|------------|-----------------|------------------|
| SA | 276 | 485 | 40°04.8' 68°33.5' | SS | ST | 178 | 701 | 831020 | |
| | | | | | V | 185 | 542 | | |
| | | | | | ST | 385 | 702T | | |
| | | | | | ST | 434 | 704T | | |
| | | | | | ST | 435 | 703 | | |
| | | | | | ST | 460 | 705T | | |
| | | | | | ST | 477 | 706T | | |
| | | | | | V | 479 | 548 | | |
| | | | | | ST | 480 | 707 | | |
| | | | | | ST | 482 | 708 | | |
| SE | 274 | 510 | 39°53.8' 70°03.7' | SS | ST | 153 | 709T | 831023 | |
| | | | | | VTCT | 160 | 322 | | |
| | | | | | ST | 185 | 710T | | |
| | | | | | ST | 210 | 711 | | |
| | | | | | ST | 235 | 712T | | |
| | | | | | VTCT | 260 | 477 | | |
| | | | | | ST | 367 | 713T | | |
| | | | | | ST | 395 | 714T | | |
| | | | | | ST | 396 | 715 | | |
| | | | | | ST | 399 | 716T | | |
| | | | | | ST | 400 | 717 | | |
| | | | | | ST | 403 | 718T | | |
| | | | | | ST | 404 | 719 | | |
| | | | | | ST | 407 | 720T | | |
| | | | | | V | 410 | 549 | | |
| | | | | | ST | 460 | 721T | | |
| | | | | | ST | 485 | 722T | | |
| | | | | | ST | 502 | 723T | | |
| VTCT | 504 | 628 | | | | | | | |
| ST | 505 | 724 | | | | | | | |
| ST | 507 | 725T | | | | | | | |
| SF | 275 | 202 | 39°57.7' 70°00.9' | SS | VTCT | 127 | 334 | 831018 | |
| | | | | | ST | 129 | 726 | | |
| | | | | | ST | 152 | 727T | | |
| | | | | | ST | 177 | 728T | | |
| | | | | | ST | 194 | 729T | | |
| | | | | | VTCT | 196 | 516 | | |
| | | | | | ST | 197 | 730 | | |
| ST | 199 | 731T | | | | | | | |
| T | 273 | 101 | 40°11.0' 69°58.3' | T | T | 100 | SD1 | 831018 | |

Key: TDR = Temperature-depth recorder.
TCT = VACM modified for transmission and conductivity.
ST = Sediment trap (tube trap or Anderson trap).

Table 5. Slope Array - Deployment I

| Station | Mooring no. | Water depth (m) | Latitude(N.)/ Longitude(W.) | Mooring type | Inst. type | Inst. depth (m) | Inst. S.N. | Deploy (YrMoDy) | Recover (YrMoDy) |
|---------|-------------|-----------------|--------------------------------|--------------|------------|-----------------|------------|----------------------|------------------|
| SA | 271 | 475 | 40°04.8' 68°33.6' | SS | TDR | 154 | 162 | 821115 | 831019 |
| | | | | | TCT | 167 | 321 | | |
| | | | | | ST | 363 | 600T | | |
| | | | | | ST | 365 | | | |
| | | | | | ST | 368 | 601T | | |
| | | | | | V | 372 | 443 | | |
| | | | | | ST | 422 | 602T | | |
| | | | | | ST | 466 | 603T | | |
| | | | | | ST | 468 | 604 | | |
| | | | | | SB | 267 | 1,560 | 40°01.1' 68°32.4' | SS |
| TP | 660 | 77 | | | | | | | |
| ST | 951 | 605T | | | | | | | |
| ST | 953 | 606 | | | | | | | |
| V | 960 | 541 | | | | | | | |
| ST | 1,451 | 607T | | | | | | | |
| ST | 1,453 | 608 | | | | | | | |
| V | 1,460 | 624 | | | | | | | |
| ST | 1,510 | 609T | | | | | | | |
| ST | 1,535 | 610T | | | | | | | |
| ST | 1,554 | 611T | | | | | | | |
| ST | 1,555 | 612 | | | | | | | |
| ST | 1,558 | 613T | | | | | | | |
| SC | 268 | 2,095 | 39°58.5' 68°31.4' | SS | TDR | 95 | 163 | 821110 | 831021 |
| | | | | | TCT | 109 | 518 | | |
| | | | | | TCT | 409 | 626 | | |
| | | | | | TP | 709 | 83 | | |
| | | | | | ST | 1,000 | 614T | | lost |
| ST | 1,002 | 620 | | lost | | | | | |

Key: TDR = Temperature-depth recorder.
TCT = VACM modified for transmission and conductivity.
ST = Sediment trap (tube trap or Anderson trap).

Table 5. Slope Array - Deployment I (continued)

| Station | Mooring no. | Water depth (m) | Latitude(N.) / Longitude(W.) | Mooring type | Inst. type | Inst. depth (m) | Inst. S.N. | Deploy (YrMoDy) | Recover (YrMoDy) |
|-------------------|-------------|-----------------|------------------------------|--------------|------------|-----------------|------------|-----------------|------------------|
| SC (continued) | 268 | 2,095 | 39°58.5' / 68°31.4' | SS | V | 1,009 | 473 | 821110 | lost |
| | | | | | V | 1,509 | 485 | | lost |
| | | | | | ST | 2,000 | 616T | | lost |
| | | | | | ST | 2,002 | 617 | | lost |
| | | | | | V | 2,009 | 487 | | lost |
| | | | | | ST | 2,045 | 618T | | lost |
| | | | | | ST | 2,070 | 619T | | lost |
| SD | 269 | 485 | 40°16.8' / 67°46.6' | SS | ST | 376 | 621T | 821112 | 831021 |
| | | | | | ST | 378 | 625 | | |
| | | | | | V | 385 | 442 | | |
| | | | | | ST | 435 | 623T | | |
| | | | | | ST | 478 | 624T | | lost |
| SE | 270 | 500 | 39°53.9' / 70°03.9' | SS | ST | 480 | 622 | | lost |
| | | | | | ST | 391 | 626T | 821109 | 831023 |
| | | | | | ST | 393 | 627 | | |
| | | | | | V | 400 | 585 | | |
| | | | | | ST | 450 | 628T | | |
| | | | | | ST | 493 | 629T | | lost |
| ST | 495 | 630 | | lost | | | | | |

Key: TDR = Temperature-depth recorder.

TCT = VACM modified for transmission and conductivity.

ST = Sediment trap (tube trap or Anderson trap).

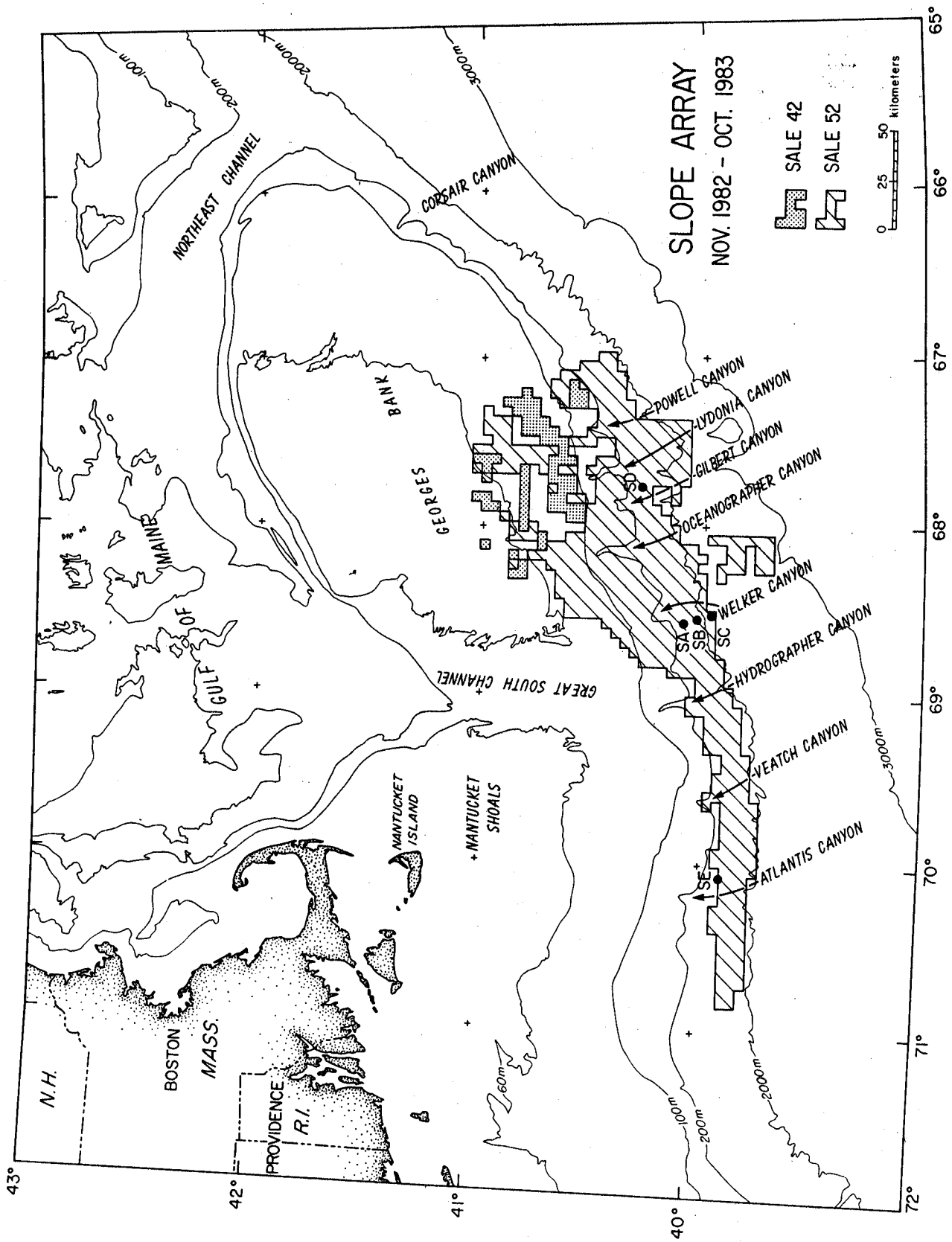


Figure 1a. Location of stations SA, SB, SC, SD and SE where moorings were recovered on OCEANUS 140 (Slope Array I).

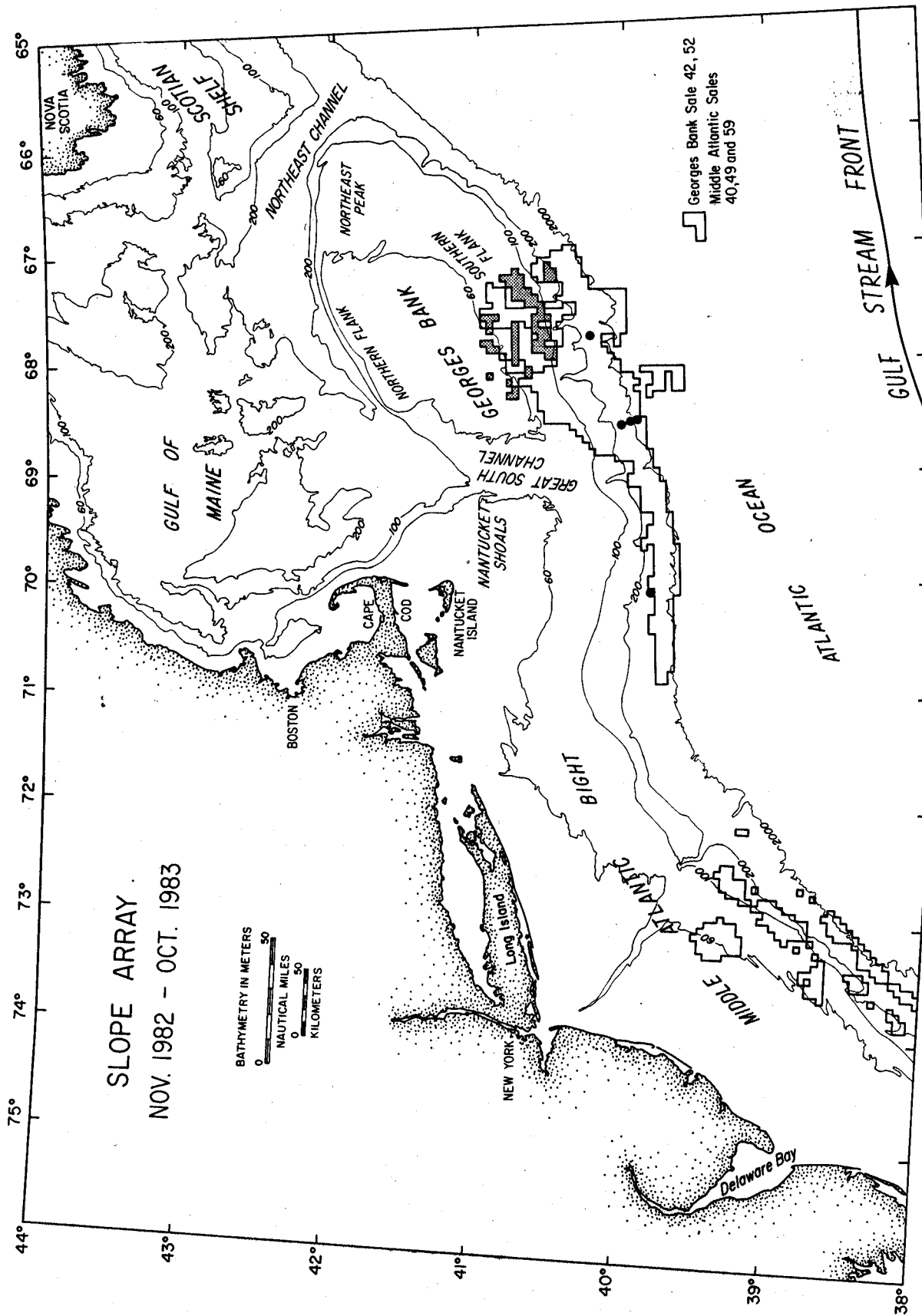


Figure 1b. Location of stations in Slope Array I and WHOI mooring in the Gulf Stream.

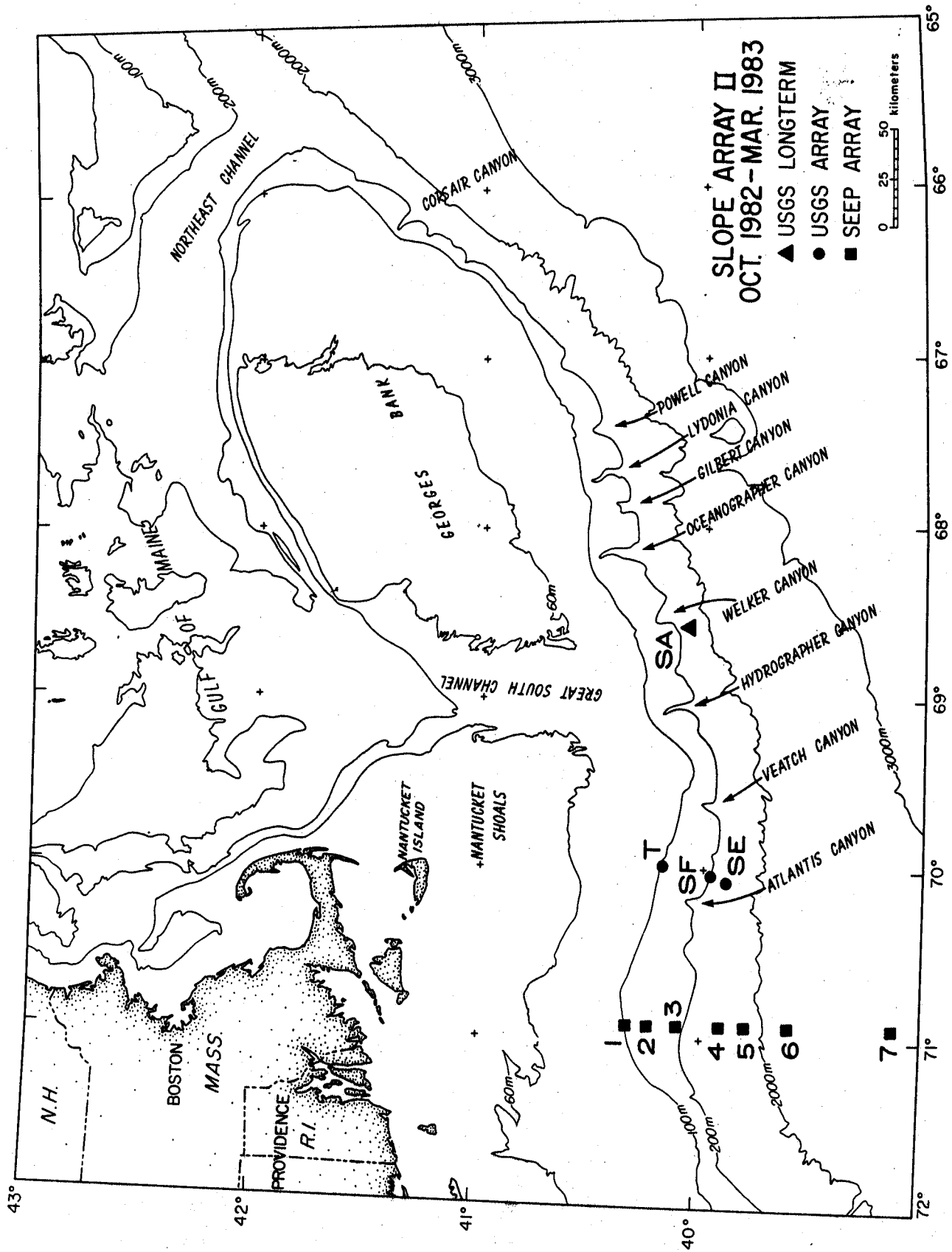


Figure 2. Location of stations SA, SE, SF, and T where moorings were deployed on OCEANUS 140 (SlopeArray II). Also shown is location of SEEP moorings 1-6.

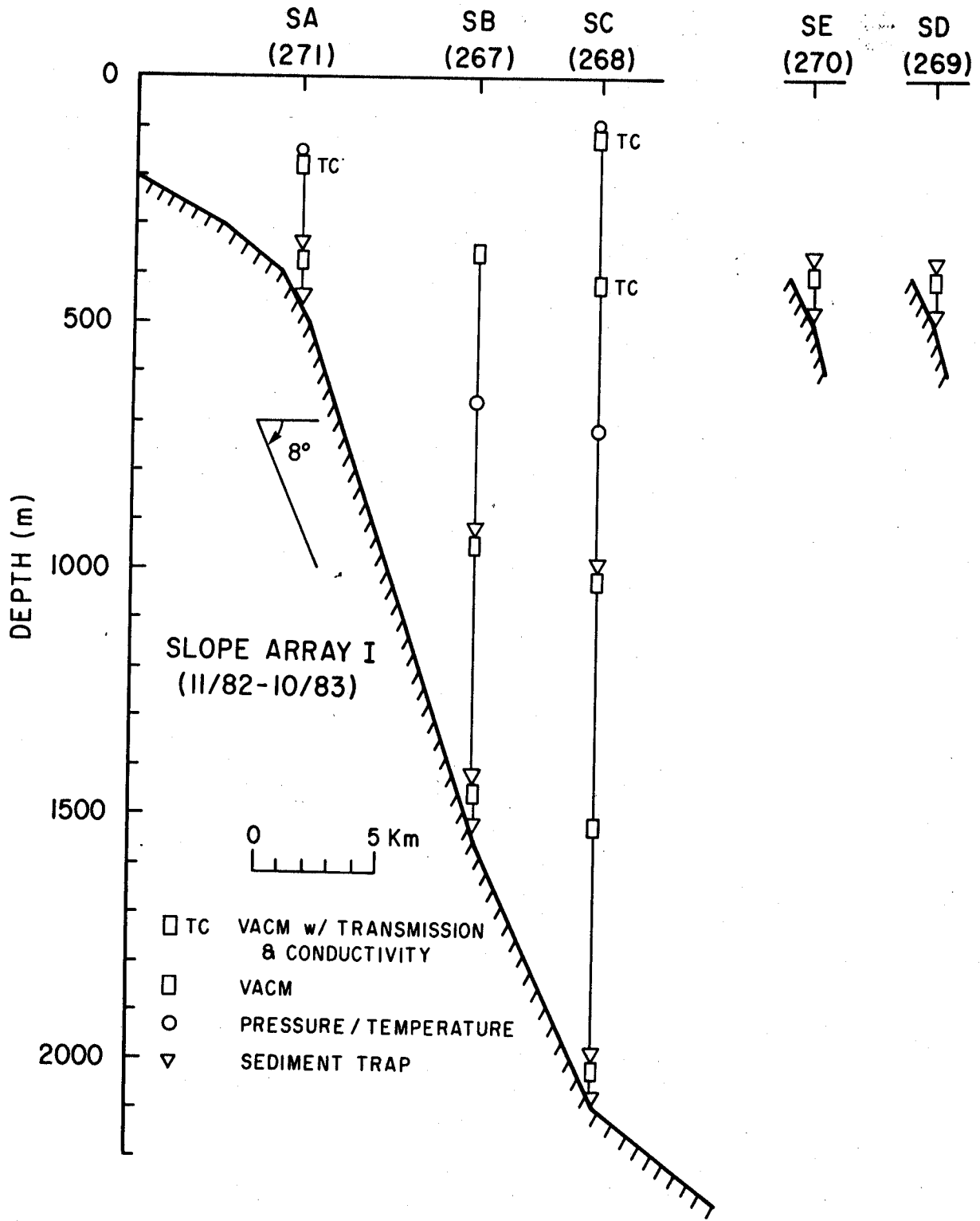


Figure 3. Schematic cross section showing vertical position of instruments deployed on Slope Array I. Additional tube sediment traps were deployed, but are not shown in the schematic. At station SC, instruments below the P/T recorder were not recovered.

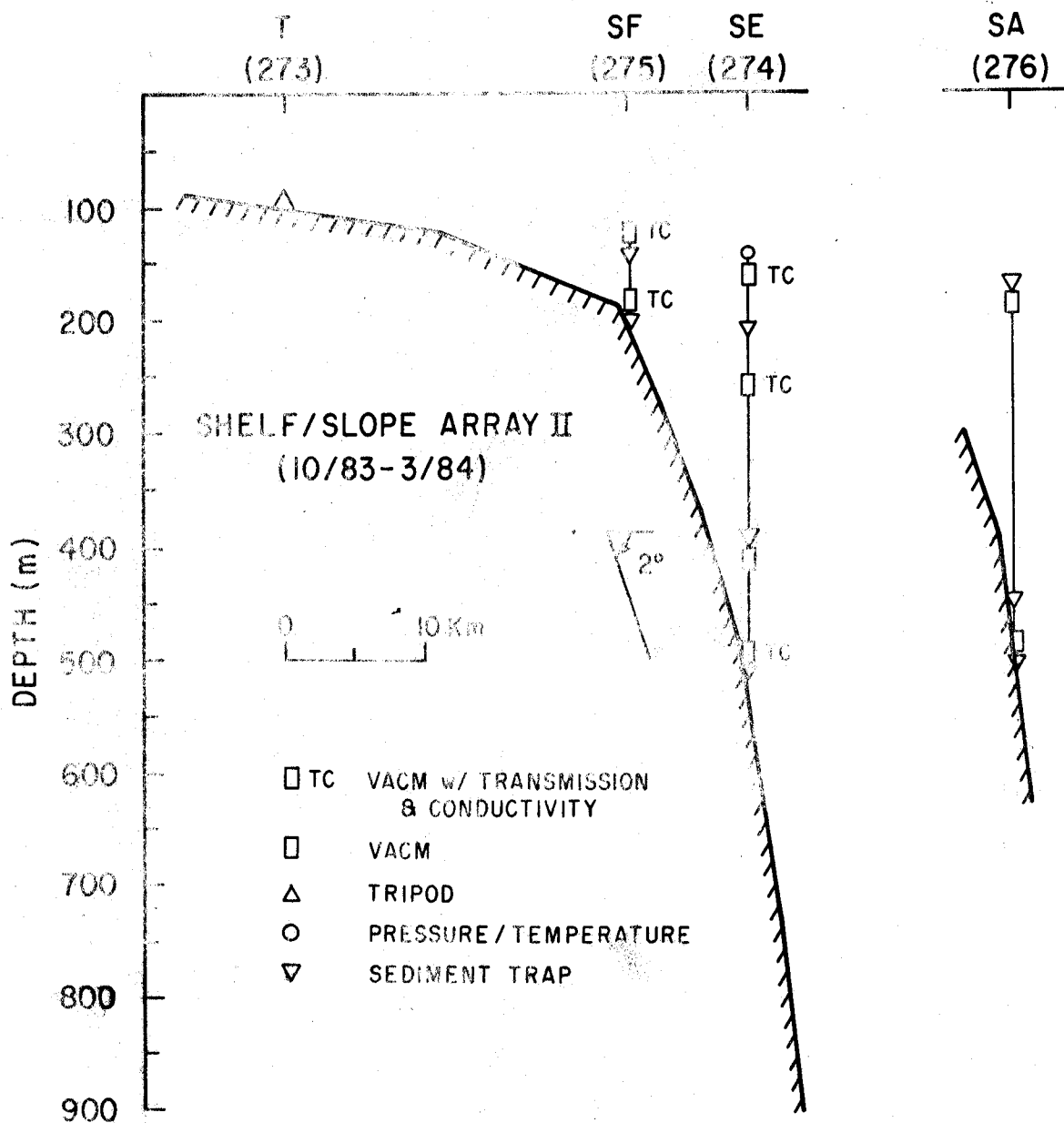


Figure 4. Schematic cross section showing vertical position of instruments deployed in Slope Array II. Additional tube sediment traps were deployed, but are not shown in the schematic.

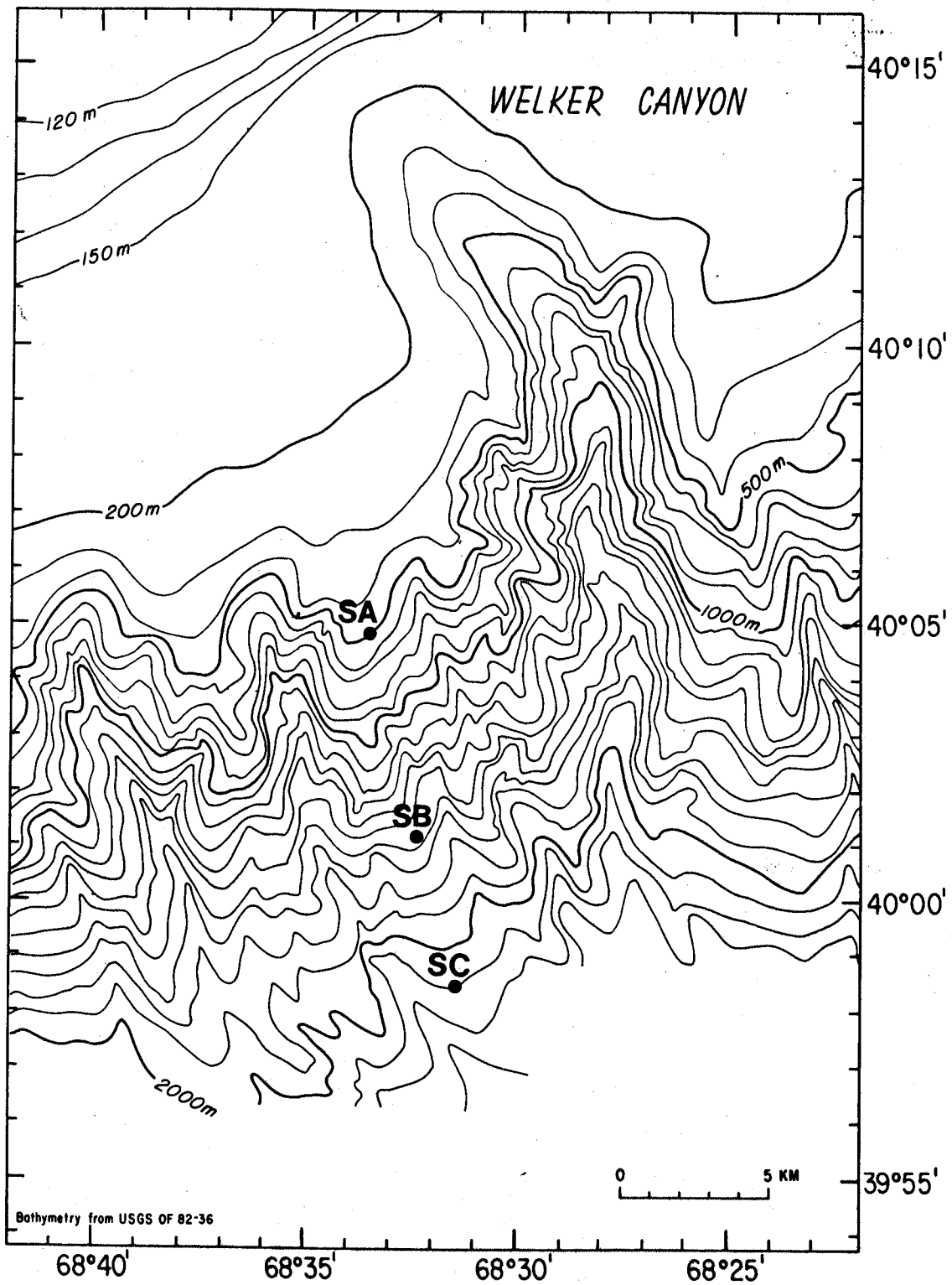


Figure 5a. Detailed bathymetry around stations SA, SB, and SC.

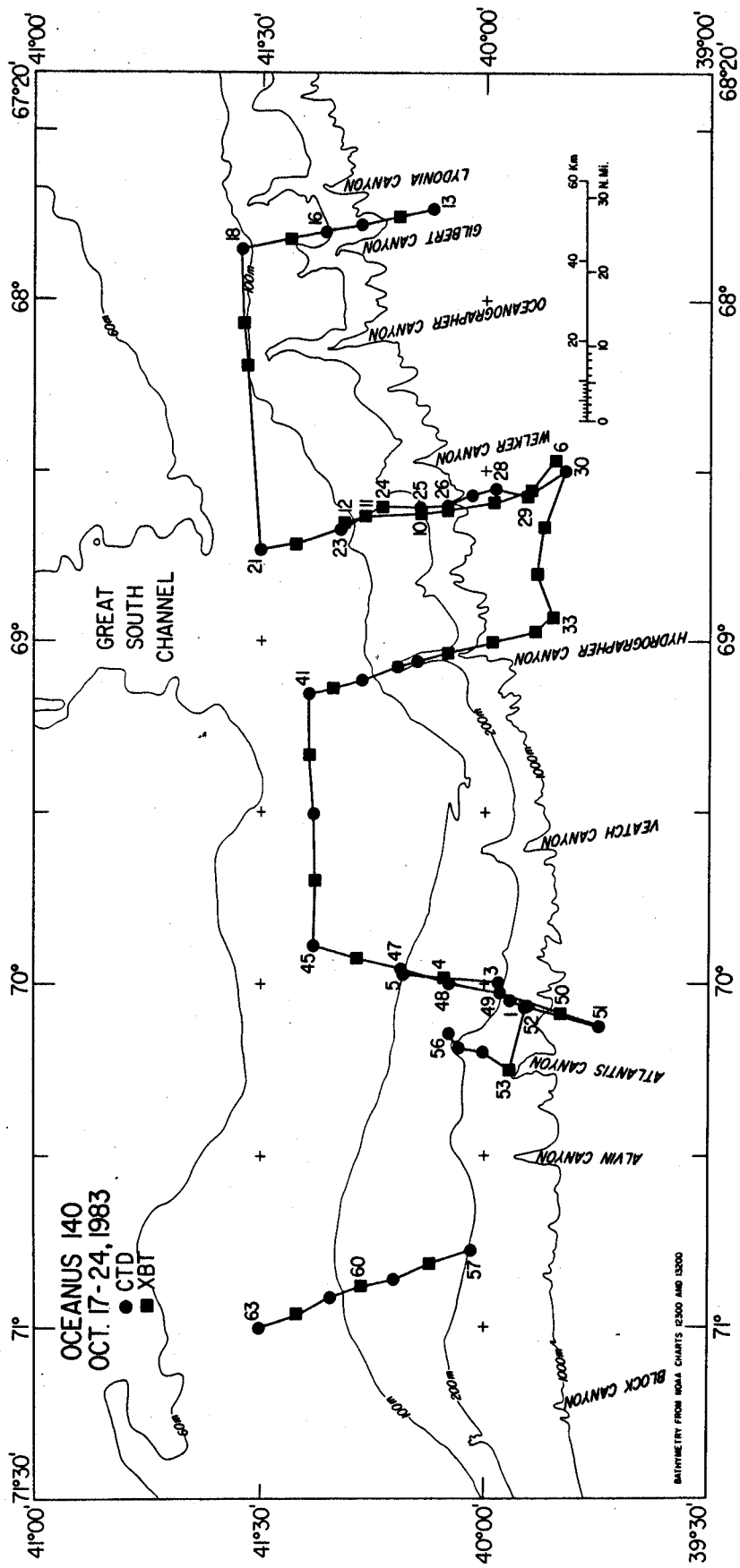


Figure 6. Location of hydrographic stations.

Vessel R/V OCEANUS

Page 1

Cruise 140

LORAN LOG

| Date | Time | Z Sta. | +/- | Reading | Latitude | | Longitude | Remarks |
|------|------|-----------|-----|---------------|-------------|-------------|-----------|-----------------------|
| | | | | | N | W | | |
| | | | | | | | | Monday - Oct 17, 1963 |
| | 2142 | 0142 | | DEPARTURE | WH. #1 & #2 | | | |
| | 2250 | 0250 | | Devil Bn Buoy | φ 090° T | dist 1.1 mi | | c/c 180° G - 170 RPM |
| | 2338 | 0338 | | SW Swail Buoy | φ 090° T | dist 2.2 mi | | c/c 146° G |
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LORAN LOG

Cruise 140


| Date | ⁺⁴ Time | ^Z Sta. | +/- | Reading | Latitude | Longitude | Remarks |
|------|-----------------------|----------------------|-----------------|--------------------------|-------------|-----------|---|
| | | | | | N | W | Tuesday Oct 17, 1984 |
| | 0003 | 0403 | LC ⁷ | | 41-07.93 | 70-50.09 | |
| | 0100 | 0500 | LC ⁷ | | 40-58.27 | 70-42.27 | 0130 c/c 141° |
| | 0200 | 0600 | LC ⁷ | | 40-49.25 | 70-34.26 | |
| | 0300 | 0700 | LC ⁷ | | 40-40.20 | 70-25.51 | |
| | 0400 | 0800 | LC | | 40-31.17 | 70-16.74 | |
| | 0441 | 0841 | SAT | 13 ² | 40-25.03 | 70-09.78 | |
| } | 0500 | 0900 | LC | | 40-22.66 | 70-07.34 | } |
| | 0500 | 0900 | Ω | | 40-22.07 | 70-06.66 | |
| | 0600 | 1000 | LC | | 40-13.82 | 69-58.60 | c/c 170 G. |
| | 0618 | 1018 | LC | | 40-10.53 | 69-57.91 | HOUE TO |
| | 0725 | | | | | | V ⁴ s TO LAUNCH |
| | | | | | | | SURFACE BUOY 'J' |
| | | | | LORAN '7000' SET ON 9960 | X+Y (25+43) | | |
| | 0735 | 1135 | LC | 25235 43357.5 | 40-10.92 | 69-58.35 | ANCHOR OVER ON BUOY 'J' |
| | 0847 | 1247 | LC | 25236.0 43358.0 | 40-10.97 | 69-58.64 | Anchor away Buoy "A" • 23 mi dist from J |
| | 0929 | 1329 | LC | 25236.6 43357.9 | 40-10.95 | 69-58.53 | Launch Tripod - H-T |
| | 0945 | 1345 END | OPS | at site | "T" S/C | 193-G @ | 170 RPM |
| | 1045 | | | | | | V ⁴ s c/c |
| | 1113 | | | | 39-57.44 | 70-00.49 | H-T. Side SF |
| | 1128 | 1528 | | 25287.6 43264.9 | 37-57.64 | 70-00.98 | Launch Buoy "L" |
| | | | | | | | |
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Vessel OCEANUS

Page 3

Cruise 140

LORAN LOG

| Date | Time | Sta. | +/- | Reading | Latitude | Longitude | Remarks |
|------|------|------|-----------------|--------------------|----------|-----------|---|
| | +4 | 6MT | | | NORTH | WEST | TUESDAY OCT 18, 1983 |
| | 1208 | 1608 | LC ⁷ | 25288.4 43264.9 | 39.57.64 | 70.01.19 | 1208 LAUNCH BUOY "X" @ SLOPE "F" MOORING # 275 IS PREPARED |
| | 1417 | 1817 | LC ⁷ | 25288.5 43264.4 | 39 57.58 | 70 01.14 | 1417  OVER # 275 ^{MOORING} ALL STOP 1439 S/C |
| | | | | | | | V/C TO SITE "SE" 1512 HT. |
| | 1600 | 2000 | | | | | V/S attempting to change on mooring. |
| | 1834 | 2234 | | | 38-54.51 | 70-04 | H-T Grab Site |
| | 1926 | 2326 | LC | 25310.4 43239.6 | 39-53.94 | 70-03.71 | CMC MUD GRABS |
| | 2026 | 0026 | LC | | 39-54.26 | 70-04.21 | 2010 - 2048 CTD |
| | 2121 | 0121 | " | | 39-56.46 | 70-03.13 | 2110 - 2127 CTD |
| | 2232 | 0232 | " | | 39-58.13 | 70-00.88 | 2222 - 2244 CTD |
| | 2304 | 0304 | | | 40-01.37 | 70-00.3 | HT GRAB SITE |
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Vessel OCEANUSPage 4Cruise 170LORAN LOG

| Date | Time | Sta. | +/- | Reading | Latitude | Longitude | Remarks |
|------|------|------|-----------------|-----------------|----------------|-----------|--|
| | +4 | GMT | | | NORTH | WEST | WED OCT 19 1983 |
| | 0021 | 0421 | LC ⁷ | | 40.10.86 | 69.58.20 | 0016 - 0031 CTD |
| | 0100 | 0500 | LC ⁷ | | 40.08.91 | 69.50.97 | 0035 $\frac{1}{2}$ C 105°g - 170 RPM |
| | 0128 | 0528 | LC ⁷ | | 40.07.53 | 69.44.94 | 0128 H.T. GRAB SITE |
| | 0134 | 0534 | LC ⁷ | | 40.07.52 | 69.44.91 | 0134 MUD GRAB |
| | 0151 | 0551 | LC ⁷ | | 40.07.42 | 69.44.61 | 0151 END STA $\frac{1}{2}$ C 093°g |
| | 0200 | 0600 | LC ⁷ | | 40.07.23 | 69.42.76 | 170 RPM |
| | 0300 | 0700 | LC ⁷ | | 40.06.62 | 69.28.44 | |
| | 0400 | 0800 | LC | | 40-06.10 | 69-14.46 | |
| | 0438 | 0838 | SAT | 17 ² | 40-06.55 | 69-03.75 | |
| | 0500 | 0900 | LC | | 40-05.98 | 69-00.44 | |
| | 0539 | 0939 | SAT | 46 ² | 40-05.64 | 68-51.20 | |
| | 0600 | 1000 | LC | | 40-05.39 | 68-46.16 | $\frac{1}{2}$ C 092 G. |
| | 0630 | | | | | | $\frac{1}{2}$ C 097 G. |
| | 0657 | | | | 40-07.09 | 68-33.69 | HOUSTO AT SITE 'SA' |
| | 0837 | | | | 40-04.7 | 68-33.83 | Come hauling moving "SA" |
| | 1114 | | | | 40-00.62 | 68-33.72 | 0918 - Moving abrd Va $\frac{1}{2}$ C/pl |
| | | | | | | | Hauling moving |
| | | | | | 3 ⁵ | | |

Vessel OCEANUS

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Cruise 140

LORAN LOG

| Date | Time | Sta. | +/- | Reading | Latitude | Longitude | Remarks |
|------|------|------|-----------------|---------|----------|-----------|---------------------------------------|
| | +4 | 6MT | | | NORTH | WEST | WED OCT 19, 1983 |
| | 1213 | 1613 | LC ⁷ | | 39 59.90 | 68.35.38 | MOORING AT SITE 'SA' |
| | | | | | | | ABD S/C 122° 4' |
| | | | | | | | TO SITE 'SC' |
| | 1402 | 1802 | LC | | 39.58.39 | 68.31.58 | 1402 HT @ 'SC' |
| | | | | | | | STANDBY TO STANDBY |
| | | | | | | | 1525 CME DRAGGING |
| | | | | | | | FOR MOORING ARRAY |
| | | | | | | | AT 'SC' |
| | 1613 | 2013 | | | | | APPROX 4000M WIRE OUT |
| | | | | | | | V/C @ 2KN. |
| | 1718 | 2118 | | | | | CUC HAULING BACK |
| | 2002 | 0002 | LC | | 39-57.2 | 68-32.62 | Cme Sensed for surface float. Van Co. |
| | 2138 | 0138 | " | | 39-57.98 | 68-31.38 | % 163-G - 170RPM |
| | 2229 | 0229 | " | | 39-49.97 | 68-27.92 | % 308-G XBT SURVEY |
| | 2301 | 0301 | " | | 39-52.62 | 68-33.21 | e/c 353-G - 165RPM |
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Vessel OCEANUSPage 6Cruise 146LORAN LOG

| Date | Time | Sta. | +/- | Reading | Latitude | Longitude | Remarks |
|------|-----------------|-----------------|-----------------|---------|---------------------|---------------------|---|
| | +4 | 6MT | | | NORTH | WEST | THURSDAY OCT 20, 83 |
| | 0000 | 0400 | LC ⁷ | | 40.00.28 | 68.36.36 | c/c 359° g |
| | 0100 | 0500 | LC | | 40.08.48 | 68.33.54 | NC |
| | 0200 | 0600 | LC ⁷ | | 40 15.86 | 68.38.53 | 0200 c/c 354° g |
| | 0300 | 0700 | LC ⁷ | | 40.23.28 | 68.40.81 | |
| | 0310 | 0710 | LC ⁷ | | 40.24.53 | 68.41.09 | 0310 END TRANSECT |
| | | | | | | | RETURN TO SITE 'SC' |
| | | | | | | | c/c |
| | 0400 | 0800 | LC | | 40-17.85 | 68-39.80 | |
| | 0500 | 0900 | LC | | 40-09.25 | 68-35.85 | |
| | 0600 | 1000 | LC | | 40-00.71 | 68-32.03 | |
| | 0618 | 1018 | LC | | 39-58.03 | 68-31.62 | H.I. AT SITE 'SC' |
| | 0904 | 1204 | LC | | 39-58.82 | 68-32.77 | 0904- Cone Trawling for failed morning |

Vessel OCEANUSPage 7Cruise 140LORAN LOG

| Date | Time | Sta. | +/- | Reading | Latitude | Longitude | Remarks |
|------|------|------|-----------------|-------------------------------|----------|-----------|---|
| | +4 | 6MT | | | NORTH | WEST | THURS OCT 20, 1953 |
| | 1200 | 1600 | LC ⁷ | | 39-58.73 | 68-31.61 | DRAWING FOR MOORING CONTINUES |
| | 1506 | 2006 | LC ⁷ | 13808.4 25005.1 43223.3 | 39-57.24 | 68-30.73 | 1506N TRAWL WIRE NETS THIS POSIT. |
| | 1552 | 1952 | LC | | 39-57.39 | 68-30.74 | 5/2 3425, 9/A |
| | 1627 | 2027 | LC | | 40-02.03 | 68-34.50 | H-T, V ₄ s TO LAUNCH MOORING AT SITE 'SA' |
| | 1730 | 2130 | LC | | 40-02.64 | 68-34.68 | CMC MOORING ^{#273} LAUNCH |
| | 1929 | 2329 | LC | 13792.4 43271.9 | 40-04.74 | 68-33.59 | ANCHOR OVER MOORING ^{#273} AT SITE 'SA' |
| | 1933 | 2333 | | | | | HOUVE TO |
| | 1955 | 2355 | | | | | 5/2 2255, 170 RPM |
| | 2008 | 0008 | | | 40-02.96 | 68-36.9 | c/c 218.6 |
| | 2102 | 0102 | | | 39-55.0 | 68-46.5 | c/c 251 |
| | 2128 | 0128 | | | 39-53.45 | 68-53.17 | RADIO SIGNAL FROM "SA" |
| | 2146 | | | | | | H-T |
| | 2218 | | | | 39-52.0 | 68-58.36 | c/c 205.6 @ 170 RPM |
| | 2243 | | | | | | H-T |
| | 2304 | | | | 39-47.63 | 69-01.63 | c/c 180.6 @ 170 RPM |
| | 2333 | | | | | | H-T |
| | 1144 | 0844 | | | 39-41.75 | 69-02.27 | 5/2 020.6 @ 175 RPM |

Vessel OCEANUSPage 8LORAN LOGCruise 140

| Date | Time | Sta. | +/- | Reading | Latitude | Longitude | Remarks |
|------|------|------|-----------------|-----------------|-----------|-----------|---|
| | +4 | 6M | | | NORTH | WEST | FRI OCT 21 1983 |
| | 0045 | 0445 | LC ⁷ | | 39-46.66 | 69-00.04 | 0045 CME HAULING |
| | 0220 | 0620 | LC ⁷ | | 39-45.24 | 69-01.53 | 0220 LOST MOORING ABD APPX 2/3 OF ARRAY RECDV. |
| | 0305 | 0705 | LC ⁷ | | 39-46.67 | 68-59.96 | 0305 CONCLUDE RECOVERY OF 'SC' BUOY ARRAY S/C OSC ^g ~1500PM |
| | 0400 | 0800 | LC | | 39-49.35' | 68-52.57' | C/S 1530PM |
| | 0439 | 0839 | SAT | 21 ² | 39-51.56 | 68-46.75' | |
| | 0500 | 0900 | LC ⁷ | | 39-53.13 | 68-43.81 | |
| | 0545 | 0945 | SAT | 62 ² | 39-56.04 | 68-36.73 | |
| | 0600 | 1000 | LC | | 39-57.03 | 68-34.88 | |
| | 0700 | 1100 | LC | | 40-01.11 | 68-25.99 | C/O 060 G. |
| | 0802 | 1202 | LC | | 40-04.81 | 68-16.0 | |
| | 1000 | | | | 40-12.09 | 67-57.7 | C/O 057. G |
| | 1109 | | | | 40-16.8 | 67-46.56 | H-T PREPARE TO DRAG FOR LOST ARRAY |
| | | | | | | | |
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Vessel OCEANUS

Page 9

Cruise 140

LORAN LOG

| Date | Time | Sta. | +/- | Reading | Latitude | Longitude | Remarks |
|------|------|-------------------------|-----------------|---------|----------|-----------|-----------------------|
| | +4 | GNT | | | NORTH | WEST | FRIDAY OCT 21, 83 |
| | 1200 | 1600 | LC ⁷ | | 40-16.08 | 67-47.65 | |
| | 1530 | 1930 | LC ⁷ | | 40-16.19 | 67-47.57 | 1530 ARRAY ON DECK |
| | 1602 | 2002 | | | 11 | 11 | S/C 165' G, 170 RPM |
| | 1654 | 2054 | LC | | 40-06.99 | 67-43.97 | H-T CTD STA |
| | 1810 | 1810 2210 | | | 40-07.16 | 67-44.43 | FIN CTD |
| | 1819 | 2219 | | | | | S/C 350 G, |
| | 1851 | 2251 | LC | | 40-11.55 | 67-45.40 | S/A XBT |
| | 1931 | 2331 | LC | | 40-16.43 | 67-46.52 | H-T CTD STA |
| | 2012 | | | | 40-16.65 | 67-47.33 | S/C 354-C 170 RPM |
| | 2041 | | | | 40-21.02 | 67-48.03 | H-T CTD |
| | 2104 | | | | 40-21.21 | 67-48.6 | S/C 351-C 170 RPM |
| | 2229 | | | | 40-32.53 | 67-51.19 | 2220-M-T -CTD |
| | 2245 | | | | 40-32.37 | 67-51.52 | S/C 267- 170 RPM |
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Vessel OCEANUSPage 10Cruise 140LORAN LOG

| Date | Time | Sta. | +/- | Reading | Latitude | Longitude | Remarks |
|------|------|------|-----------------|---------|----------|-----------|---|
| | +4 | 6MT | | | NORTH | WEST | SATURDAY OCT 22, 83 |
| | 0000 | 0400 | LC ⁷ | | 40-31.78 | 68-10.96 | |
| | 0100 | 0500 | LC ⁷ | | 40-31.37 | 68-24.75 | |
| | 0209 | 0609 | LC ⁷ | | 40-30.05 | 68-43.84 | 0209 - 0222 CTD |
| | | | | | | | 0222 END STA S/C 153g-160 ^g |
| | 0333 | 0733 | LC ⁷ | | 40-19.3 | 68-40.35 | 0333-0347 CTD |
| | | | | | | | 0347 S/C 143 ^g -160 ^{RPM} |
| | 0501 | 0901 | LC | | 40-08.03 | 68-31.74 | 0501 H.T. CTD STA |
| | 0511 | 0911 | | | | | ABORT STA, WRONG POSN, S/C 275-G, 170RPM |
| | 0529 | 0929 | LC | | 40-08.48 | 68-36.48 | 0529 H.T., CTD STA |
| | 0553 | 0953 | LC | | 40-08.45 | 68-36.82 | FW STA S/C 165-G, 170RPM |
| | 0613 | 1013 | LC | | 40-05.02 | 68-35.48 | H.T. CTD STA |
| | 0709 | 1109 | LC | | 40-05.01 | 68-36.40 | FIN STA S/C 157-G, 170RPM |
| | 0730 | 1130 | LC | | 40-01.45 | 68-34.59 | H.T. CTD STA |
| | 0902 | 1302 | LC | | 40-01.53 | 68-35.85 | S/C 144-G - 170RPM |
| | 0928 | 1328 | LC | | 39-58.49 | 68-32.92 | H.T. CTD STA |
| | 1040 | 1440 | " | | 39-57.52 | 68-34.83 | H.T. on sta |
| | 1132 | 1532 | " | | 39-56.83 | 68-36.2 | S/C 149-G - 170RPM |
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Vessel OCEANUSPage 11Cruise 140LORAN LOG

| Date | Time | Sta. | +/- | Reading | Latitude | Longitude | Remarks |
|------|------|------|-----------------|---------|----------|-----------|--|
| | +4 | 6MT | | | NORTH | WEST | SATURDAY OCT 22, 83 |
| | 1200 | 1600 | LC ⁷ | | 39.59.89 | 68.33.44 | |
| | 1227 | 1627 | LC ⁷ | | 39.48.86 | 68.30.04 | 1227 H.T. CTD STA |
| | 1332 | 1732 | LC ⁷ | | 39.49.99 | 68.31.24 | 1332 END STA $\frac{1}{2}$ C IN |
| | 1400 | 1800 | R | | 39.50.68 | 68.38.09 | HVY WX |
| | 1525 | 1925 | LC ⁷ | | 39.49.37 | 68.56.71 | 1525 C/C 348 ^g |
| | 1600 | 2000 | LC | | 39-54.60 | 68-59.02 | |
| | 1700 | 2100 | LC | | 40-04.10 | 69-02.02 | C/C 352 G |
| | 1730 | 2130 | LC | | 40-08.98 | 69-03.02 | H.T., CTD STA. |
| | 1818 | 2248 | LC | | -08.94 | -03.85 | FIN STA $\frac{7}{8}$ C 349 G, 130 RPM |
| | 1847 | 2247 | LC | | 40-11.48 | 69-04.5 | H.T. CTD STA |
| | 1910 | 2310 | LC | | 40-11.49 | 69-04.72 | FIN STA $\frac{5}{8}$ C 345 G, 160 RPM |
| | 1940 | 2340 | LC | | 40-16.18 | 69-06.49 | H.T., CTD STA |
| | 2007 | 0007 | LC | | 40-16.34 | 69-07.32 | S/C 350-G @ 130 RPM |
| | 2056 | 0056 | LC | | 40-23.04 | 69-09.0 | H.T. CTD STA |
| | 2133 | 0133 | LC | | 40-23.68 | 69-09.76 | S/C 266-G @ 170 RPM |
| | 2300 | 0300 | LC | | 40-22.91 | 69-31.6 | |

Vessel OCEANUS

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Cruise 140

LORAN LOG

| Date | Time | Sta. | +/- | Reading | Latitude | Longitude | Remarks |
|------|------|------|-----------------|---------|----------|-----------|---|
| | +4 | 0mT | | | NORTH | WEST | SUNDAY OCT 23, 83 |
| | 0032 | 0432 | LC ⁷ | | 40-22.75 | 69-53.06 | 0032-0100 CTD STA 0100 S/C 188 ^g |
| | 0215 | 0615 | LC ⁷ | | 40-11.04 | 69-57.48 | 0215-0230 CTD STA 0230 S/C 190 ^g |
| | 0312 | 0712 | LC ⁷ | | 40-04.60 | 69-59.88 | 0312-0328 CTD 0328 S/C 190 ^g 160 RPM |
| | 0412 | 0812 | LC | | 39-57.65 | 70-01.60 | H.T., CTD STA. |
| | 0440 | 0840 | LC | | -57.64 | -01.86 | FIN STA S/C 195 ^g , 170 RPM |
| | 0500 | 0900 | LC | | 39-54.15 | 70-03.24 | |
| | 0553 | 0953 | LC | | 39-44.49 | 70-07.53 | H.T., CTD STA |
| | 0700 | 1100 | LC | | 39-44.59 | 70-08.47 | FIN STA, S/C 0215, 170 RPM |
| | 0747 | 1147 | LC | | 39-52.89 | 70-04.49 | H.T. |
| | 0830 | | | | 39-53.72 | 70-04.1 | Come dragging for SE morning |
| | 1013 | 1413 | LC | | 39-53.85 | 70-04.61 | Trawl wire abt Come hauling back morning 1018- Morning abt. |
| | 1127 | 1527 | LC | | 39-54.12 | 70-04.24 | CTD STA |
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| Date | Time | Sta. | +/- | Reading | Latitude | Longitude | Remarks |
|------|------|------|-----------------|-----------------|----------|-----------|------------------------------------|
| | +4 | 6MT | | | NORTH | WEST | SUNDAY OCT 23, 83 |
| | 1200 | 1600 | LC ⁷ | | 39-54.65 | 70-05.20 | |
| | 1345 | 1745 | LC ⁷ | | 39-53.77 | 70-03.92 | ↓ #2741 @ SWPE 'E' ↓ OVER SIDE |
| | | | | | | | 1346 S/C 342 g 4 |
| | | | | | | | 1420 C/C 249 g - TO NEW STATION |
| | 1456 | 1958 | LL ⁷ | | 39-56.42 | 70-15.73 | 1456 XBT POINT C/C 041 g |
| | 1523 | 1923 | LC ⁷ | | 39-59.96 | 70-11.79 | 1523 HT CTD STA |
| | 1555 | | | | | | FW STA S/C 011 G, 170 RPM |
| | 1613 | 2013 | LC ⁷ | | 40-03.31 | 70-11.19 | H-T CTD STA |
| | 1638 | 2038 | | | | | FW STA S/C 006 G, 170 RPM |
| | 1652 | 2052 | LC | | 40-04.51 | 70-08.97 | H-T CTD STA. |
| | 1720 | 2120 | | | | | FW STA, S/C 354 G, 205 RPM |
| | 1800 | 2200 | LC | | 40-13.65 | 70-10.49 | |
| | 1818 | 2218 | LC | | 40-17.75 | 70-11.29 | C/C 240 G. |
| | 1835 | 2235 | SAT | 14 ³ | 40-17.73 | 70-15.82 | |
| | 1900 | 2300 | LC | | 40-13.43 | 70-23.13 | C/C 235 G. |
| | 1922 | 2322 | SAT | 19 ² | 40-10.33 | 70-28.08 | |
| | 2035 | | | | 40-01.38 | 70-46.53 | H-T CTD |
| | 2057 | | | | 40-01.75 | 70-46.81 | S/C 345-C @ 210 RPM |
| | 2144 | | | | 40-12.09 | 70-50.2 | H-T CTD STA |
| | 2210 | | | | 40-12.5 | 70-50.6 | S/C 335-C @ 210 RPM |
| | 2249 | | | | 40-19.96 | 70-55.0 | H-T CTD STA |
| | 2302 | | | | 40-20.09 | 70-55.18 | S/C 338-G @ 210 RPM |
| | 2357 | 0357 | | | 40-30.11 | 71-00.59 | H-T CTD and CTD STA |

Vessel OCEANUSPage 14Cruise 140LORAN LOG

| Date | Time | Sta. | +/- | Reading | Latitude | Longitude | Remarks |
|------|-------|------|-----------------|-------------------------------|----------|-----------|---|
| | +4 | 675 | | | NORTH | WEST | MONDAY OCT 24 1983 |
| | | | | | | | 0025 CTD ASD |
| | 0028 | 0428 | LC ⁷ | 14463.9 25555.5 43544.7 | 40.30.05 | 71.00.54 | 0028 MUD GRAB ON BOTTOM - NI GOOD |
| | 0051 | 0451 | LC ⁷ | 14464.9 25556.3 43543.5 | 40.29.90 | 71.00.64 | 0051 MUD GRAB ON BOTTOM - NO GOOD |
| | 0123 | 0523 | LC ⁷ | 14465.2 25557.2 43545.1 | 40.30.09 | 71.00.77 | ABOXT |
| | 0134 | 0534 | LC ⁷ | 14465.5 25557.8 43545.7 | 40.30.17 | 71.00.88 | 0134 MUD GRAB ON BOTTOM |
| | 0300 | | | | 40.48.46 | 70.58.59 | 0138 END STA S/C 004 225 RPM |
| | 0400 | 0800 | LC | | 41-02.33 | 70-56.42 | 1/5 200 RPM |
| | 0500 | 0900 | LC | | 41-15' | 70-54.5' | |
| | 0505' | | | | | | 1/5 225 RPM TO RUN INFO UNYARO SOUND |
| | 0655 | 1055 | V.B | ARRIVAL WH #1 & #2 | | | |
| | 0705 | 1105 | - | DOCKSIDE WH 01 CONCLUDE #140 | | | |
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