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CRUISE REPORT

R/V OCEANUS 77

13-20 December, 1979

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

79035

Vessel: OCEANUS

Cruise No.: 77

Dates of Operation: 13 December - 20 December, 1980 79

Personnel:

Paul Howland, Master
Brad Butman, USGS
Janet Burke, USGS
Andy Elisason, Elisason Data Service
Jeff Kerns, USGS
John Larson, USGS
Nick Lefteriou, USGS
Marlene Noble, USGS
Carol Parmenter, USGS
Rick Rendigs, USGS
Polly Shoukimas, USGS
Bill Strahle, USGS

Equipment:

12 KHZ
Navigation: Northstar 6000 Loran C
CTD: Plessey
Side-scan: Klein
Grab Sampler: Smith-MacIntyre
Buoy equipment: AMF, tripod, current meter

Objectives:

The objectives of the OCEANUS Cruise were to:

1. Deploy 5 tripod and current moorings (Sta. K, N, R, Q and B)

2. Recover 3 tripods and current moorings (Sta. K, Q, B)

3. Conduct cross-shelf and alongshelf CTD sections

4. Obtain bottom grab samples at station locations

5. Repair and replace buoys and lamps where necessary

6. Conduct bathymatric and sidescan survey in the Great South Channel at mooring location N.

Narrative:

Dec. 13	0915	Depart Woods Hole
	1915	Arrive mooring Station R
	1948	Deploy surface buoy I
	2022	Deploy surface buoy C
	2121	Deploy Tripod (mooring185)
	2241	Deploy current mooring (mooring 190)
	2340	Grab sample. Cable parted, sampler lost
Dec. 14	0015	Underway, CTD transect to station N
	0155	CTD winch power failure
	0245	Recover CTD by hand
	0300	XBT section instead of CTD
	0800	Complete section, arrive station N Rig side-scan; failure in side-scan cable
	1200	Start depth survey at N
	1455	Complete depth survey
	1552	Deploy surface buoy D
	1639	Deploy surface buoy K
	1734	Deploy Tripod (mooring 184)
	1900	Deploy subsurface current mooring (mooring 189)
	2000	Underway to Sta. K; XBT transect
Dec. 15	1045	At Station K, release tripod mooring 176
	1115	Tripod 176 onboard
	1235	Subsurface current mooring (1822) recovered
	1415	Surface current mooring (1821) recovered
	1503	Deploy surface buoy N
	1530	Recover surface buoy L
	1713	Deploy surface buoy L with VACM (mooring 1881)

Dec. 15	1820	Deploy Tripod (mooring 183)
	1956	Deploy subsurface current mooring (1882) Work on CTD
	2155	CTD, start CTD transect underway to Sta. Q
Dec. 16	1210	Arrive Station Q
	1300	Subsurface current mooring recovered (181)
	1345	Tripod mooring (178) not located, and would not enable or release. Begin search for tripod with AMF gear in 4 mi. square. Repair sidescan
	1716	Finish search, Rig side-scan to start side-scan Finish search. No obvious target
	2030	Start grappling at location instrument deployed
Dec. 17	0050	Terminate grappling (A few snags, but no tripod)
	0153	Deploy tripod mooring (186)
	0200	Side-scan known target to check side-scan operation
	0430	Complete side-scan Gale warnings. Underway to west along shelf
	0900	NW gale. Seas 10-20'. Ship low on lube oil. Return to Woods Hole
	1510	Arrive Woods Hole - Load side-scan winch with heavy cable
	2230	Depart Woods Hole, Underway to mid-Atlantic Sta. F
Dec. 18	1610	Arrive MAB
	1820	All four buoys in place. Neither tripod or subsurface current mooring would release, or enable. Underway to Sta. F.
	2000	Arrive MAF, Release deep water tripod (1791). Would not surface. Range circles to determine precise location with respect to surface buoy
	2200	Prepare to drag for deep tripod
	2354	Tripod surfaced
	0010	Tripod on deck (1792)
Dec. 19	0108	Recover surface buoy F with current meter (1791)
	0140	CTD. Underway back to Sta. B. XBT section

Dec. 19	0315	Start 4 mi. square search around Sta. B for two moorings
	0619	Complete search with no luck. Prepare to side-scan
	0740	Locate possible targets
	0815	Begin dragging
	1010	Tripod enabled and released. Float up. Float recovery missed and float lost. Resumed dragging. Several snags but no catch.
	1350	Range to tripod for exact position since moved by dragging and tipped over
	1530	Still grappling. Mooring 180 enabled (somehow)
	1745	Terminate grappling. No time left Decision to leave subsurface, surface, and tripod moorings and deploy new equipment Recover surface buoy S
	1851	Deploy surface buoy S with current meter (mooring 1921)
	1856	Prepare tripod
	1920	Deploy tripod (mooring 187)
	2027	Deploy subsurface current mooring and sediment trap. (mooring 1922) Check mooring upright and disable. Unable to disable old tripod (178 or 180) No time left to recover surface buoy with VACM
	2105	Underway to Woods Hole
Dec. 20	1730	Arrive Woods Hole

Tabulated Information

Moorings deployed: 9

Station	Latitude	Longitude	Number	Type
K	41°02'N	67°33'W	183	Tripod
K	41°02'N	67°33'W	188	CM (Surface & subsurface)
N	40°51.3'N	69°01.2'W	184	Tripod
N	40°51.3'N	69°01.2'W	189	CM (Subsurface 1 VACM)
R	40°29.9'N	69°06.9'W	185	Tripod
R	40°29.9'N	69°06.9'W	192	CM (Subsurface, 1 VACM)
Q	40°29.7'W	70°12.2'W	186	Tripod
B	38°42.4'W	73°39.3'W	187	Tripod
B	38°42.5'N	75°38.9'W	192	CM (Subsurface, surface 2 VACM)

Moorings Recovered : 4

Station	Latitude	Longitude	Number	Type
K	41°02.4'N	67°32.9'W	176	Tripod
K	41°02.4'N	67°32.9'W	182	CM (2 VACM's)
Q	40°29.7'N	70°12.3'W	181	CM (2 VACM's)
F	38°39.7'N	73°14.5'W	179	Tripod and VACM

Days at sea: 8

CTD Stations: 10

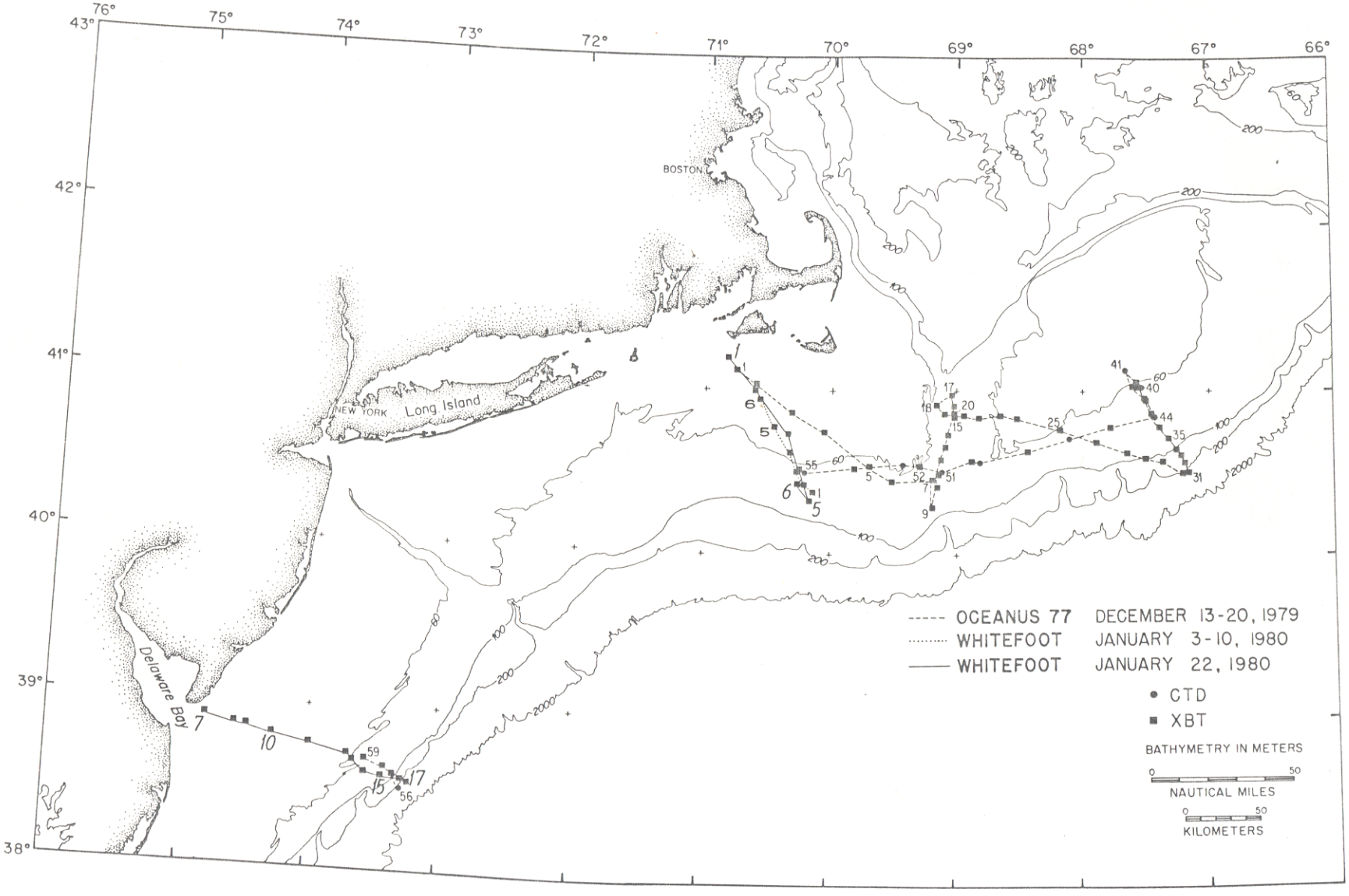
XBT Stations: 49

Surface Salinity Samples: 57

Hydrographic Stations 58

Engineering Note:

The two tripod and one current mooring which we were unable to recover on OCEANUS were recovered in January, 1980 with the TUG WHITEFOOT (see cruise report). The release receiver batteries were found to be defective, and thus we could not communicate with the releases. One VACM was lost; because of the extensive grappling and search operations, we did not have time to recover a buoy with current meter underneath at Sta. B. Christmas and ship deadlines precluded another few hours of shiptime. We elected to deploy the new equipment, and recover the instrument later. On return to the site in January, the buoy was missing.


BOSTON
NEW YORK
Long Island
Delaware Bay
OCEANUS 77 DECEMBER 13-20, 1979
WHITEFOOT JANUARY 3-10, 1980
WHITEFOOT JANUARY 22, 1980
CTD
XBT
BATHYMETRY IN METERS
NAUTICAL MILES
KILOMETERS

APPENDIX I

Station List

OCEANUS 77

13-20 December, 1979

Station List

OCEANUS 77

13-20 Dec., 1979

Station No.	DEPTH m)	Latitude	Longitude	XBT	CTD	Surface Salinity	Date	Time
1	36	41°07.8'N	70°45.9'W	✓		✓	12/13/79	1139
2	47	41°01.8'N	70°35.6'W	✓		✓		1229
3	45	40°52.9'N	70°19.1'W	✓		✓		1345
4	37	40°44.1'N	70°03.1'W	✓		✓		1500
5	67	40°32.4'N	69°41.0'W	✓		✓		1638
6	65	40°26.7'N	69°29.8'W	✓		✓		1732
7	79	40°27.9'N	69°10.3'W	✓		✓		1845
8					✓		12/14/79	
9	92	40°17.3'N	69°11.3'W	✓		✓		0255
10	83	40°25.0'N	69°09.2'W	✓		✓		0344
11	83	40°29.9'N	69°08.7'W	✓		✓		0412
12a	77	40°34.2'N	69°07.1'W	✓		✓		0436
12b	80	40°35.0'N	69°06.8'W	✓		✓		0441
13a	78	40°39.1'N	69°05.2'W	✓		✓		0505
14	87	40°44.4'N	69°03.5'W	✓		✓		0535
15	81	40°50.5'N	69°01.4'W	✓		✓		0610
16	86	40°55.0'N	69°01.3'W	✓		✓		0635
17b	87	40°59.3'N	69°01.3'W	✓		✓		0700
18a	61	40°52.4'N	69°10.2'W	✓		✓		0800
18b	61	40°52.1'N	69°09.0'W	✓				0804
19		40°51.7'N	69°06.1'W	✓		✓		0810
20	81	40°51.2'N	69°01.1'W	✓		✓		2002
21	69	40°51.0'N	68°56.2'W	✓		✓		2020

Station No.	Depth (m)	Latitude	Longitude	XBT	CTD	Surface Salinity	Date	Time
22	72	40°50.8'N	68°49.1'W	✓		✓		0950
23	64	40°50.4'N	68°38.3'W	✓		✓		2135
24	64	40°50.0'N	68°30.9'W	✓		✓		2204
25	68	40°45.4'N	68°10.2'W	✓		✓		2330
26	80	40°41.4'N	67°52.3'W	✓		✓	12/15/79	0049
27	82	40°37.9'N	67°37.7'W	✓		✓		0155
28	97	40°35.9'N	67°29.2'W	✓		✓		0233
29	125	40°34.0'N	67°21.2'W	✓		✓		0310
30	205	40°31.0'N	67°10.3'W	✓		✓		0359
31	255	40°30.9'N	67°08.9'W	✓		✓		0407
32	87	40°33.3'N	67°10.8'W	✓		✓		0424
33	117	40°36.1'N	67°12.9'W	✓		✓		0443
34	103	40°38.5'N	67°14.3'W	✓		✓		0459
35	100	40°42.7'N	67°18.2'W	✓		✓	12/15/79	0528
36	92	40°46.8'N	67°22.3'W	✓		✓		0557
37	83	40°51.7'N	67°25.7'W	✓		✓		0630
38	72	40°57.6'N	67°29.8'W	✓		✓		0705
39	62	41°02.6'N	67°33.5'W	✓		✓		0743
40	65	41°01.9'N	67°33.1'W	✓	✓			2155
41	53	41°07.9'N	67°38.9'W		✓	✓		2248
42	58	41°02.0'N	67°33.8'W	✓		✓		2333
43	73	40°57.2'N	67°29.6'W	✓		✓		2358
44	85	40°50.8'N	67°24.8'W		✓	✓	12/16/79	0033
45	68	40°46.7'N	67°46.1'W	✓		✓		0209
46	80	40°42.6'N	68°05.9'W		✓	✓		0318
47	70	40°38.6'N	68°25.2'W	✓				0441
48	68	40°34.6'N	68°48.3'W		✓	✓		0611

Station No.	Depth (m)	Latitude	Longitude	XBT	CTD	Surface Salinity	Date	Time
49	90	40°34.2'N	68°51.5'W	✓		✓		0639
51	79	40°30.1'N	69°06.8'W		✓	✓		0741
52	58	40°32.8'N	69°17.1'W	✓		✓		0830
53	58	40°32.7'N	69°25.8'W		✓	✓		0907
54	68	40°31.8'N	69°48.0'W	✓		✓		1038
55	65	40°29.8'N	70°12.2'W		✓	✓	12/17/79	0205
56	270	38°30.6'N	73°16.5'W		✓	✓	12/19/79	0112
57	95	38°35.5'N	73°20.8'W	✓		✓		0210
58	78	38°38.0'N	73°76.3'W	✓		✓		0233

APPENDIX II

Bridge Log

OCEANUS 77

December 13-20, 1979

Vessel OCEANUS

Cruise # 77

LORAN LOG

Page # 1

Date	Time	~~Sta.~~	+/-.	Reading	Latitude	Longitude	Remarks
	+5	GMT			N	W	DEC. 13, 1979
	0930	1430	DEPARTURE W. H. Buoy # 122				
	0957	1457	Var Ce & Spds				
	~~1057~~	~~1557~~	Robinson Hole Buoy → cl/by				
	1023	1523	Devils Br. Buoy ϕ 090°T. .25 mi dist				
	1110	1610	Sw Shoal Buoy ϕ 090°T 1.8 mi dist				
			c/c 133° G - 210 RPM				
	1010	1610			41-12.0	70-52.3	
	1124	1624	Radar		41-10.0	70-50	

Vessel OCEANUS

Cruise #77

LORAN LOG

Date	Time	Sta.	+/-.	Reading	Latitude	Longitude	Remarks
	+5	GMT			NORTH	WEST	THURS DEC 13, 1979
	1200	1700	LC		41.05.40	70.42.00	C/C 123° g
	1300	1800	LC		40.58.12	70.28.44	C/C 125° g
	1400	1900	Sat	18 3	40.51.166	70.15632	
	1400	1900	LC	14 - - - 43 - - -	40.51.05	70.15.77	SIMULPIX
	1400	1900	LC	14145.9 25189.9			
				43650.3 60107.1			
	1500	2000	LC		40.44.09	70.02.83	
	1544	2044	SAT	60°/03	40-39.001	69-53.883	
	1600	2100	LC		40-37.3	69-50.3	
	1700	2200	LC		40-30.3	69-37.1	
	1731	2231	LC		40-26.6	69-30.1	C/C 090G.
	1800	2300	LC		40-26.9	69-22.3	1841 C/C 045° g
	1902	2402	LC		40-30	69-07	H.T.
	1910	0010	SAT	27°/04	40-29.852	69-07.247	
	1949	0049	LC	13861.8 43450.7	40-29.97	69-06.98	SGT BUOY "1"

Vessel OCEANUS

Cruise

LORAN LOG

Date	Time	~~Spd.~~	+/-.	Reading	Latitude	Longitude	Remarks
	+5	GMT			N	W	
	2023	0123		13860.2 25040.6			Let go anchor 2nd
				43450.5	40-29.94	69-06.62	surface mooring #2
				13861.8			
	2118	0218		25041.2 43450.4	40 29.90	69-06.92	Launch Tripod #1 away
							East Surface Mooring.
							∅093°-T - .2 mi dist
				13861.6			
	2241			25041.0 43450.2	40-29.88	69-06.83	Launch sub surface mooring
							Eastern surface mooring
							∅080° - .13 mi dist

Vessel OCEANUS

Cruise 77

LORAN LOG

Date	Time	Sta.	+/-.	Reading	Latitude	Longitude	Remarks
	+5	GMT			NORTH	WEST	FRIDAY DECEMBER 14,
							1979
	0002	0502	LC		40·27.80	69·07.94	
	0042	0542	LC		40·20.20	69·10.21	0042 H.T. CTD #1
							0055 - WINCH PROBLEMS:
	0112	0612	Sat	11^8	40·19.412	69·10.094	STAND BY AT STA #1
	0112	0612	LC	13 - - - 43 - - -	40·19.76	69·10.31	SIMULFIX
	0112	0612	LC	13914.9 25070.6			LC BEARS
				43387.1 60063.0			334.7° T 0.386
							FROM SAT
	0150	0650	Sat	21^3	40·18.517	69·10.412	(T.I. 58 RHUMBLINE NAV PAC)
	0150	0650	LC	13 - - - 43 - - -	40·18.82	69·10.72	SIMULFIX
	0150	0650	LC	13920.2 25073.7			L.C. BEARS
				43381.3 60061.0			321.8° T 0.384 mi
							FROM SAT
							(T.I. 58 RHUMBLINE NAV PAC)
	0250	0750	LC		40·17.38	69·11.20	0250 - ABORT CTD STA
							#1 0258 S/C 013° g -190 RPM
	0300	0800	LC		40·17.25	69·11.17	0300 C/C 015° g
							0338 R/S 180 RPM
	0334	0834	Sat	69^3	40·23.035	69·09.912	
	0334	0834	LC	13 - - - 43 - - -	40·23.14	69·09.49	
	0334	0834	LC	13898.9 25060.6			
				43408.6 60070.8			

Vessel OCEANUS

Cruise #77

LORAN LOG

Page 5

Date	Time	GMT ~~Sea.~~	+/-.	Reading	N Latitude	W Longitude	Remarks
14 Dec	0400	0900	LC		40-27.9	69-09.3	
							0430 C/C ~~[illegible]~~ G. 019° G.
	0500	1000	LC		40-38.1	69-05.4	0500 C/C 013° G
	0600	1100	LC		40-48.7	69-02	
	0611	1111	LC		40-50.7	69-01.3	C/C 000 G.
	0703	1203			41-00	69-01.3	C/C 225 G.
	0708	1208	SAT	25°/03	40-59.38	69-01.947	
	0756	1258	LC		40-52.71	69-10.8	C/C 098
	0839	1339			40-50.77	69-00.63	H-T
	0946	1446	LC		40 50.18	69-00.62	C/C 332-G slow speed
							Towing side scan sona
	1030	1530	LC		40-50.44	69-01.64	1040- haul side scan
	1115	1615	LC		40-50.38	69-01.66	Cmc depth survey
							S/C 090-G @ 5 kt
	1122	1622			40 50.21	69-01.01	C/C 000-G
	1148	1648			40-51.59	69 00.97	C/C 180-G

Vessel OCEANUS

Cruise 77

LORAN LOG

Date	Time	Sta.	+/-.	Reading	Latitude	Longitude	Remarks
	1208	1708	LC		40·49.91	69·01.36	C/C 045° g - CONTINUE SURVEY
	1220	1720	LC		40·49·90	69·01.13	C/C 000° g
	1259	1759	LC		40.51.68	69.00.95	C/C 160° g
	1315	1815	LC		40.49.85	69·00.83	C/C 000° g
	1347	1847	LC		40.51.72	69.00.60	C/C 330
	1404	1904	LC		40.52 41	69·01.91	C/C 160
	1501	2001	LC		40.50.92	69.01.15	END SURVEY AND H.T. PREPARE FOR BUOY DEPLOYMENT
	1554	2054	LC		40.51.13	69.01.12	ANCHOR AWAY BUOY "D"
	~~16~~ 1 1645	~~21~~ 7 2145	LC		" "	" "	SET 2ND BUOY 330°T 0.13 MI. FROM "D"
	1740	2240			"	"	SET TRIPOD 152°T 0.12 FROM 2ND BUOY
	1902	0002			"	"	SET SUBSURFACE BUOY 350°, 0.13 MI. FROM BUOY "D"
	2000	0100			40-51.22	69-01.27	S/C ~~092°G~~ 088°G - @ 175 RPM

Vessel OCEANUS

Cruise VOYAGE #77

LORAN LOG

Date	Time	Sym.	+/-.	Reading	Latitude	Longitude	Remarks
	+5	GMT			N	W	14-DEC., 1979
	2112	0212	LC		40-50.64	68-43.92	
	2207	0307	LC		40-49.93	68-30 00	c/c 100-G
	2234	0334	Sat	55°/3	40-48.6	68-23.4	
	2300	0400	LC		40-47.11	68- 17.25	

Vessel OCEANUS

Cruise 77

LORAN LOG

Date	Time	Sta.	+/-.	Reading	Latitude	Longitude	Remarks
	+5	GMT			NORTH	WEST	SATURDAY DEC 15, 1979
	0000	0500	LC		40·43·67	68·02.99	C/C 104° g
	0046	0546	Sat		40·41.522	67·53.505	
	0100	0600	LC		40·40.88	67·49.61	
	0202	0702	LC		40·37·45	6736.03	
	0228	0728	Sat	47³	40·36.066	67.30.854	
	0300	0800	LC		40·34.44	67·22.85	0300 C/C 108° g
	0400	0900	LC		40-31	67-10.4	
	0405	0905	LC		40-30.7	67-09.1	C/C 328G.
	0412	0912	SAT	29°/03	40-31.584	67-09.93	
	0500	1000	LC		40-38.6	67 14.4	
	0600	1100	LC		40-47.1	67 22.6	
	0700	1200	LC		40-56.4	67-28.8	
	0800	1300	LC		40-05.0	67-35.5	Var Co and spd back to buoy site

Vessel OCEANUS

Cruise 77

LORAN LOG

Date	Time	Sta.	+/-.	Reading	Latitude	Longitude	Remarks
	+5	GMT			NORTH	WEST	SATURDAY DEC 15. 1979
	0835	1335	LC		41 02.33	67 32.9	H-T at buoy site
	1102	1602	LC		41-02.07	67-33 24	Hauling back tripod
	1205	1705	LC		41. 02 21	67.33 31	SUBSURFACE MOORING "K" AT SURFACE
	1235	1735	LC		41.01.51	67.33.55	SUBSURFACE MOORING
							ON DECK 1315-
	1500	2000	LC		41.02.27	67 33,59	1320-1500 RETRIEVE-
					RESET		-SERVICE & RESET
							BUOY "N"
	1518	2018	LC		41.02.22	67.33.19	BUOY "L" ON
	1700	2200	SAT	p°/02	41-01.908	67-34.223	DECK
	1714	2214					RESET BUOY "L"
	1820	2320					SET TRIPOD 088°, 0.11MI FROM WESTERN BUOY
	1912	0012	SAT	37°/05	41-02.713	67-33.290	
	1950	0050					SET SUBSURFACE MOORING
	2040				41 02.14	67 33.2	
	2155	0255	LC		41-01.95	67-33.11	CTD Station

Vessel OCEANUS

Cruise #77

LORAN LOG

Date	Time	~~Sec.~~	+/-.	Reading	Latitude	Longitude	Remarks
	+6	GMT			N	W	15-DEC., 1979
	2208	0308			41 01.89	67-33.17	S/C 325-6 - 4
							END Station
	2248	0348			41-07.92	67-38.9	- H-T CTD Sta
	2302				41 07.76	67 38.86	END-Sta S/C 145-6 4

Vessel OCEANUS

Cruise 77

LORAN LOG

Date	Time	Sta.	+/-.	Reading	Latitude	Longitude	Remarks
	+5	GMT			NORTH	WEST	SUNDAY DEC 16, 1979
	0000	0500	LC		40 56.74	67.29.21	
							0028 H.T. CTD #44
	0029	0529	LC		40.51.11	67.24.51	0052 -END CTD STA
							S/C 257° g -200 RPM
	0100	0600	LC		40.50.42	67.27.31	
	0120	0620	Sat	69	40.49.172	67.32.548	LOW SAT
	0200	0700	LC		40.47.07	67.44.19	0245 C/C 251° g
	0300	0800	LC		40.43.84	68 00.50	
	0319	0819	LC		4042.58	68.05.53	0319 H.T. CTD #45
							0333 -END CTD STA
							S/C 253° g -210 RPM
	0400	0900	LC		40-40.8	68-13.1	
	0454	0954	SAT	15°/07	40-37.916	68-29.314	
	0500	1000	LC		40-37.6	68-30.9	C/C 250 G
	0600	1100	LC		40-34.3	68-48.1	H.T. CTD STA #46
	0627	1127	LC		40-34.8	68-48.6	FIN STA S/C 245 G, FA.
	0700	1200	LC		40-32.7	68-57.0	

Vessel OCEANUS

Cruise #77

LORAN LOG

Date	Time	GMT	+/-.	Reading	N Latitude	W Longitude	Remarks
16 DEC.	0710	1210	SAT		40-31.877	68-59.61	
	0737	1237	LC		40-30.1	69-06.8	H.T. CTD # 47
	0750	1250	LC		40-30.3	69-06.6	FIN SIA S/C 3154, FM
	0803	1303	LC		40.32.6	69-09.3	C/C 270.6
	0906				40-32.7	69-25.8	H-T-CTD
	0919				40 32.8	69 25.6	S/C 268 6 H
	1001				40-32.4	69-37.5	
	1100				40 31.49	69-54.5	

Vessel OCEANUS

Cruise 77

LORAN LOG

Date	Time	Sta.	+/-.	Reading	Latitude	Longitude	Remarks
	+5	GMT			NORTH	WEST	SUNDAY DEC 16, 1979
	1201	1701	LC		46.30.46	70.12.28	C/C 180°
	1210	1710	LC		4029.59	70.12.42	H.T
							1245 - SUB SURFACE
							MOORING AT BUOY SITE
							"P" & "G" ABD
							1300 - COMMENCE
							ACCOUSTIC SURVEY
							FOR DISABLED OR
							MISSING TRIPOD AT
							SITE "P" & "G"
	1730	2230					FW SURVEY, V's AROUND
							BUOYS TOWING SIDE SCAN.
	1826	2326	SAT	13°/03	40-28.943	70-09.986	
							2100 Cmc dragging
							for bottom mooring
	2400	0500	LC		40 29.79	70 11.86	-
							0250
	TRIPOD	SET	Ø251°	T ~ .11	MI		TRIPOD SET
	FROM	WESTERN	BUOY	@	0250		
							17 DEC
	0440	0940			40-29.5	70-12	DSTART SIA S/C 290G, ~~180~~ 190 RPM
	0500	1000	LC		40-31.2	70-17.3	

Vessel OCEANUS

Cruise # 77

LORAN LOG

Date	Time	GMT ~~Sta.~~	+/-.	Reading	N Latitude	W Longitude	Remarks
	0532	1032	SAT	06/12	40-33.142	70-24.693	17 DEC '79
	0600	1100	LC		40-35.1	70-31.6	C/C 280G
							0620 C/S 170 RPM
	0706	1206	LC		40-36.8	70-43.2	0640-0706 V C/S
							0730 C/S 150 RPM
	0800	1300			40 37.5	70-51.6	
	0926	1426			40-37.7	71 03.0	C/C 004-G
							160 RPM
	1022	1522			40-45.5	71-01.7	
	1100	1600			40-51.0	71-00.8	180 RPM
	1130	1630			40-56.3	70-59.6	200 RPM

Vessel OCEANUS

Cruise 77

LORAN LOG

Date	Time	Sta.	+/-.	Reading	Latitude	Longitude	Remarks
	+5	GMT			NORTH	WEST	MONDAY DEC 17, 1979
	1200	1700	LC		41.02.11	70.58 35	
	1230	1730	SOT				BD
	1300	1800	LC				C/C 015°
	1340	1840	RA	ABEAM	DEVILS	BRIDGE	
				C/C 048°			
	1412	1912	RA	ABEAM	ROBINSONS	HOLE	BLOY
				V C/C	TO WN #1 & #2		
	1455	1955	ARRIVAL		WH #1 & #2		
	1505	2005	DOCKSIDE		WH01		
	~~2B~~						

Vessel OCEANUS

Cruise #77

LORAN LOG

Date	Time	Sta.	+/-.	Reading	Latitude	Longitude	Remarks
	+5				N	W	
	2234		DEPARTURE WN #1&2 L/C TO				
		V.S. B&W BUOY					
	2313	Robinsons Hole Buoy → cl/by					
	2330	Fairway Buoy "NA" → .7 mi					
	0003	0503	LC		41.18.98	70.57.28	
	0015	0515	LC		41.16 97	70.59.66	C/C 212° g R/S 190 RPM
							0028 C/C 216° g
	0100	0600	LC		41 09.91	71 05.70	
	0128	0628	Sat	12 4	41.05.585	71.09.840	0140 R/S 180 RPM
	0200	0700	LC		41.00.20	71.14.35	
	0234	0734	Sat	51 4	40.55.072	71.19.226	
	0300	0800	LC		40.51.10	71.22.47	
	0400	0900	LC		46-47.4	71-30.5	C/C 212° G.
	0420	0920	Sat	28 0/03	40-39.138	71-32.977	
	0500	1000	LC		40-32.8	71-38.0	

Vessel OCEANUS

Cruise #77

LORAN LOG

Date	Time	GMT ~~Star~~	+/-.	Reading	N Latitude	W Longitude	Remarks
	0600	1100	LC		40-23.4	71-45.3	18 Dec '79 4C215G
	0700	1200	LC		40-13.7	71-53.3	
	0800	1300	LC		40-03.7	72 01.4	215 RPM
	0902	1402	LC		39-52.0	72-11.3	
	1002	1502	LC		39-40.7	72-21.0	
	1102	1602	LC		39-29.4	72 31.0	
	1149	1649	LC		39 20.3	72-39.0	c/c 232°G

Vessel OCEANUS

Cruise 77

LORAN LOG

Date	Time	Sta.	+/-.	Reading	Latitude	Longitude	Remarks
	+5	GMT			NORTH	WEST	TUESDAY, DEC 18, 1979
	1203	1703	LC		39.18.17	72.42.02	
	1303	1803	LC		39.09.07	72.55 62	
	1330	1830	Sat	6 3	39.04.979	73.02.532	
	1400	1900	LC		39.00.88	73.08.26	
	1507	2007	LC		38 51.39	73.23.94	
	1530	2030	Sat	79.6	38.48.222	73.28.329	
	1600	2100	LC		38- 44.2	73- 30.8	
	1613	2113	LC		38- 42.3	73- 38.9	H.T. AT BUOY STA
	1800	2300			"	"	S/C 1235, F.A.
							1807 H.T.
	1807	2307	LC		38- 41.4	73- 36.8	1820 S/C 1235, F.A.
	1913				38-36	73-26.9	SHIFT TO STA X+Y
	1958	0058	LC		38-30.9	73 - 16.6	H.T. ON BUOY STA
	2227				38 30.9	73-16.44	Cmo dragging for subsurface mooring

Vessel OCEANUS

Cruise 77

LORAN LOG

Date	Time	Sta.	+/-.	Reading	Latitude	Longitude	Remarks
	+5	6M			NORTH	WEST	WED DEC 19 1979
	0040	0540	LC		38.30.68	73.16.27	BUOY "F" ABD &
							GEAR ON DECK
							0100 - 0142
	0200	0700	LC		38.33.40	73.19.71	CTD STA
							0142 S/C 307° g C#
	0310	0810	LC		38 41.6	73.34.2	1ST LISTENING STA
							V/C TO 2ND STA
	0340	0840	LC		38.44.6	73.35.4	2ND " "
							V/C TO 3RD STA
	0355	0855	LC		38-45.2	73- 36.7	STOP TO LISTEN
	0416	0916	LC		38-45.8	73- 39.5	" "
	0440	0940	LC		38-43.1	73-40.3	" "
	0500	1000	LC		38-40.5	73-41.5	" "
	0523	1023	LC		38-39.6	73-38.2	" "
	0542	1042	LC		38-35.1	73-39	" "
	1150				38-42.38	73-39.01	0615 HIT CLOSBY BUOYS
							0650 START SIDE SCAN SURVEY
							0745 FIN SURVEY

Vessel OCGANUS

Cruise #77

LORAN LOG

Date	Time	GMT ~~Sta.~~	+/-.	Reading	Latitude	Longitude	Remarks
							19 DEC
	1700	2200					FIN DRAGING FOR MOORING
	1850	2250					PICK UP BUOY 'S'
	1845	2345					RESET " "
	1915	0015					SET TRIPOD @ 150°, 0.1 MI
							FROM NW BUOY
	1930	0030	E		38-42.4	73-39.4	
	2030						2030 Set Sub Surface
	2105	0205			38 42.55	73-39.47	END STA. S/C 040-6-
	2204				38-	73	
	2300				38-02.3	73-18.9	2315 - 200 RPM
							2340 - 190 RPM

Vessel OCEANUS

Cruise 77

LORAN LOG

Date	Time	Sta.	+/-.	Reading	Latitude	Longitude	Remarks
	+5	6mT			NORTH	WEST	THURSDAY DEC 20, 19
	0000	0500	LC		39.10.96	73.10.03	
	0100	0600	LC		39.18.62	73.02.35	0130 R/S 180RP
	0200	0700	LC		39.26.08	72.55.06	0200 C/C 044°g
	0206	0706	Sat	31 3	39.26.503	72.54.095	
	0300	0800	LC		39.32.97	72.47.11	0250 R/S 170R
							0300 C/C 042°g
	0350	0850	SAT	43°/03	39-37.613	72-42.586	
	0400	0900	LC		39-38.8	72-41.1	
	0500	1000	LC		39-45.8	72-34.3	
	0600	1100	LC		39-52.7	72-27	
							0635 C/S 180 RPM
	0700	1200	LC		39-59.8	72-19.1	0650 C/S 190 RPM
							0720 C/S 180 RPM
	0716	1216	LC	35°/03	40-01.969	72-16.87	
	0800	1300	LC		40 07.46	72 10.68	
	0909	1409	LC		40-16.28	72.007	200RPM - C/C 040
	1010	1510	LC		40-25.5	71.51.0	210 RPM
	1100	1600	LC		40 33.3	71-42.8	
	1148	1648	LC		40-40.509	71 35.146	

Vessel OCEANUS

Cruise 77

LORAN LOG

Date	Time	Sta.	+/-.	Reading	Latitude	Longitude	Remarks
	+5	GMT			NORTH	WEST	THURSDAY DEC 20, 7
	1200	1700	LC		40.42.29	71.33.11	
	1300	1800	LC		40.51.62	71.23.16	
	1310	1810	sat	9 2	40.53.010	71.21.443	
	1400	1900	LC		41.01.05	71.13.18	C/C 036° Z
	1500	2000	LC		41.10.93	71.03.69	C/C 039° Z
	1604	2104	LC		41-21.8	71-52.6	DEVILS BRIDGE BUOY ∅090 0.6 MI C/C 045° C
	1632	2132	LC		41-26.2	71-46.8	ROBINSON'S BUOY ← CLOBY
	1715	2215	ARRIVAL		WN#1 & #2		
	1727	2227	DOCKSIDE		WOODS HOLE	OCEANOGRAPHIC	