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OCEANUS 181

February 5 - 15, 1987

CRUISE REPORT

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

Vessel: RV OCEANUS

Parts: Woods Hole, MA to Portsmouth, NH

Dates: February 5-15, 1987

Area of Operation: Gulf of Maine and Massachusetts Bay.

Objectives: The OCEANUS cruise was part of a continuing study of the hydrography, circulation and sediment transport in the Gulf of Maine. The specific objectives of the cruise were to:

1. Conduct a detailed hydrographic survey of the Gulf of Maine;
2. Recover 2 moorings in Northeast Channel;
3. Deploy 1 subsurface mooring in Rodgers Pass;
4. Deploy instrumentation (3 tripods, 1 subsurface mooring and 3 surface buoys) in Massachusetts Bay.

<u>Personnel:</u>	Brad Butman	U.S. Geological Survey (USGS)
	John Moody	"
	Rick Rendigs	"
	Polly Shoukimas	"
	Bill Strahle	"
	Wendell Brown	Univ. of New Hampshire (UNH)
	Karen Garrison	"
	Dan Howard	"
	Charlie Flagg	Brookhaven National Lab (BNL)
	Bill Behrens	"
	Andy Eliason	Eliason Data Services
	Dana Wiese	Woods Hole Oceanographic Inst.

Summary:

The objectives of the RV OCEANUS cruise were to make a large-scale hydrographic survey in the Gulf of Maine and to service, recover and deploy various long-term current and hydrographic moorings. A major winter storm occurred February 9-10 which forced interruption of the CTD survey; OCEANUS anchored off Provincetown, MA to avoid the heavy winds and seas. The storm provided a unique opportunity to observe winter cooling and near-bottom sediment resuspension. The hydrographic section from Boston to Georges Basin was occupied just before and after the storm (Pre-storm Stations 33-50, Post-storm Stations 51-65).

UNH buoys in Wilkinson and Georges Basin were observed and in good shape (near CTD stations 27 and 86 respectively, see Fig 1). The buoy in Jordan basin (near CTD station 71) was adrift and not located; the bottom portion of

the mooring was recovered. The UNH buoy and Brookhaven Acoustic Doppler Current Profiler (ADCP) in the Northeast channel (station 79) were recovered. A mooring in Rodgers Pass was deployed on February 8 and released accidentally and recovered on February 14 as we tried to release an adjacent recalcitrant mooring moved by fishermen. The mooring was not redeployed.

In addition to the work in the Gulf of Maine, moorings were deployed in western Massachusetts Bay as part of a study of currents and sediment transport. The study is designed to aid in the location of the new sewer outfall for effluent from the Boston metropolitan area. Three bottom tripod systems, 3 surface buoys with current meter of 8 m below the surface, and 1 subsurface mooring were deployed.

The study of the seasonal circulation and hydrography of the Gulf of Maine is conducted primarily by Wendell Brown and Jim Irish at the University of New Hampshire. Collaborators include Brad Butman (USGS), Charlie Flagg (BNL), Dave Brooks (TAMU), and Ron Schlitz (NMFS). Final results from OCEANUS cruise 181 should be published in 2-3 years.

Narrative:

2/5/87	0940	Depart Woods Hole, MA
	1410	Start CTD casts
2/6/87	1130	Arrive Rodgers Pass. Talk to mooring 314. Will not release.
	1245	Continue CTD casts
	2210	Arrive Wilkinson Basin
2/7/87	0420	Complete CTD section. Underway to Boston Harbor.
	0800	Mud grabs
	0912	Deploy surface buoy at site C (mooring 321)
	0950	Deploy tripod at site C (mooring 318)
	1015	Deploy marker buoy
	1215	Deploy surface buoy at station A (mooring 320)
	1236	Deploy tripod at station A (mooring 317)
	1355	Deploy subsurface mooring at station A (mooring 320)
		Underway to Station B
		Deploy surface buoy at station B (mooring 322)
		Deploy tripod at station B (mooring 318)
	1420	Grab samples around station B
	1900	Continue CTD sections
2/8/87	1245	Deploy subsurface mooring at Rodgers Pass (mooring 323)
		Continue CTD transect
	1735	Forecast for major winter storm. Head for sheltered anchorage near Provincetown, MA.
2/9/87	0240	Anchored in Cape Cod Bay
		Major winter storm
2/10/87	1200	Underway to Cape Cod Canal
	1345	Arrive Cape Cod Canal Dock for radar repair.
	2015	Depart Cape Cod Canal.
2/11/87	0100	Begin CTD transect
	0945	Arrive Wilkinson Basin Buoy

	1915	CTD terminated due to rough seas. Jog to weather; seas 15'-20', wind 30-40 kts.
2/12/87	0845	Resume CTD Section to Jordan Basin.
	1600	Arrive Jordan Basin. UNH buoy not on location and adrift.
	1645	Recover lower half of mooring.
	1710	Continue CTD transect.
2/13/87	0300	Break CTD transect. Underway to Northeast Channel
	0845	Arrive at station N1, Northeast Channel
	0945	Brookhaven instrument package onboard
	1045	Surface buoy N1 recovered
	1130	Continue CTD stations. Search for Jordan Basin Buoy.
2/14/87	0745	Arrive station G1
		Continue CTD transect
	2100	Arrive Rodgers Pass. Attempt release of mooring 314; accidentally release mooring just set (mooring 323).
	2200	Recover Mooring
		Continue CTD's
2/15/87	0945	Complete CTD station 95. Underway to Portsmouth, NH
	1300	Arrive Portsmouth.

Tabulated Information:

Days at Sea: 11
 CTD stations: 95
 Moorings deployed: 8
 Moorings recovered: 4
 Suspended sediment Samples: 282
 Oxygen samples: 92

Figure 1: Hydrographic stations occupied on R/V OCEANUS cruise 181, February 5-15, 1987.

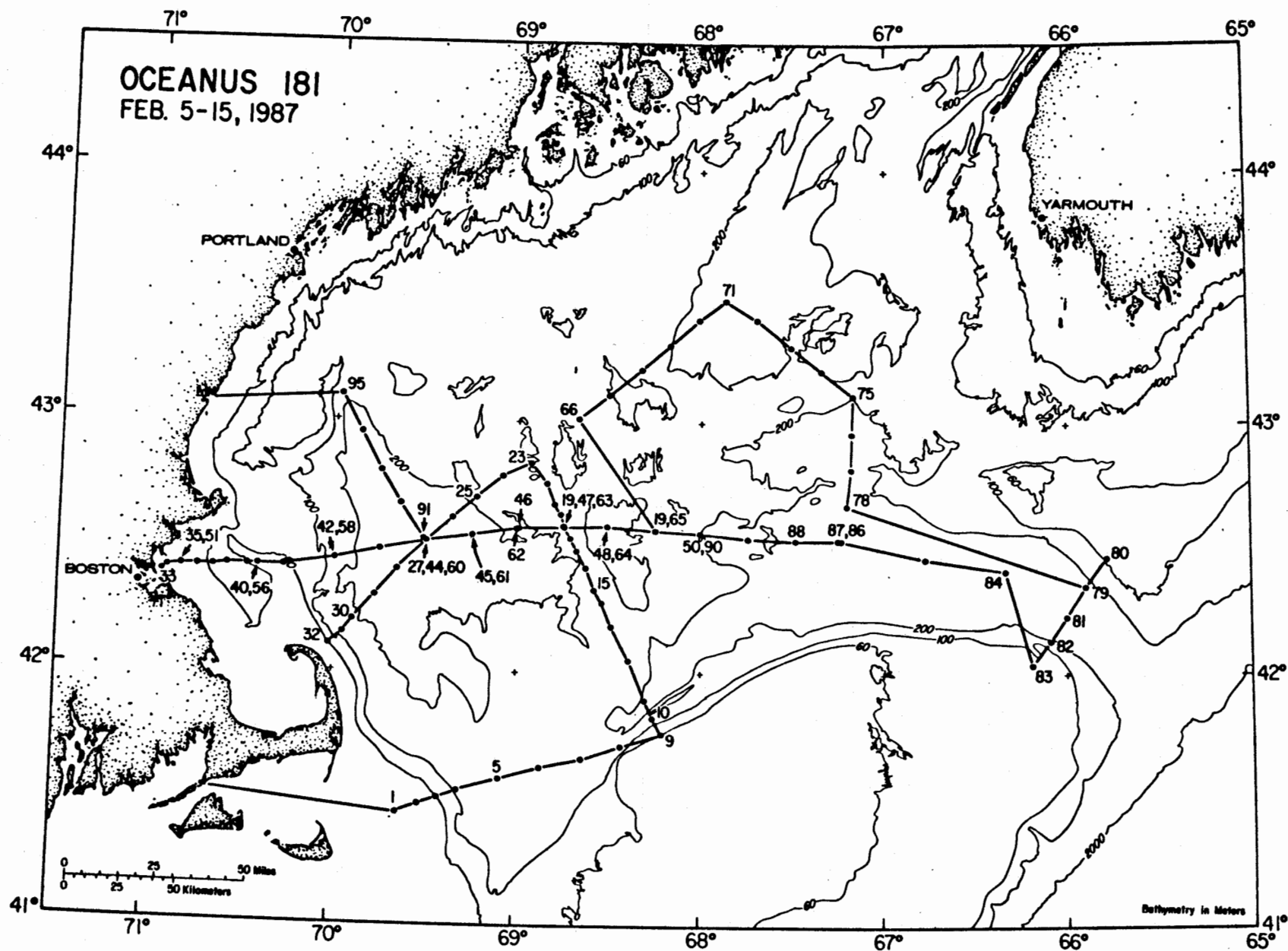


Table 1: Locations of Hydrographic stations occupied on OCEANUS cruise 181, February 5-15, 1987. Latitude and Longitude determined from Northstar 7000 algorithm. All times are Eastern Standard. Three positions indicate start, bottom, and end of cast.

Sta	Date	Time	Depth (M)	Latitude (°N)	Longitude (°W)	Lorans		
1	2/05	14:12	26	41 26.47	69 37.87	13795.74	43835.87	25043.78
		14:15		41 26.52	69 37.83	13795.26	43836.18	25044.03
		14:18		41 26.57	69 37.80			
2	2/05	15:10	38	41 29.08	69 31.00	13746.90	43843.32	25052.77
		15:14		41 29.12	69 30.92	13746.31	43843.50	25052.94
		15:17		41 29.16	69 30.86			
3	2/05	15:56	60	41 30.03	69 25.09	13710.80	43841.80	25054.17
		16:03		41 30.10	69 24.98	13709.80	43842.07	25054.43
		16:11		41 30.15	69 24.91			
4	2/05	17:13	125	41 31.69	69 17.59	13663.19	43842.59	25058.49
		17:27		41 31.77	69 17.56	13662.71	43842.98	25058.83
		17:39		41 31.68	69 17.55			
5	2/05	18:44	164	41 34.05	69 5.02	13586.24	43841.30	25064.17
		19:01		41 33.90	69 5.22	13587.96	43840.62	25063.64
		19:15		41 33.77	69 5.39			
6	2/05	20:28	126	41 37.05	68 52.01	13506.51	43844.57	25073.26
		20:33		41 36.99	68 52.08	13507.17	43844.33	25073.06
		20:41		41 36.91	68 52.28	13508.51	43844.11	25072.81
7	2/05	21:57	150	41 39.05	68 38.94	13431.29	43840.88	60217.58
		22:02		41 39.06	68 39.02	13431.63	43840.91	25077.67
		22:08		41 39.02	68 39.15	13432.44	43840.94	25077.67
8	2/05	23:24	170	41 42.12	68 25.96	13352.98	43843.53	25086.12
		23:30		41 42.09	68 26.00	13353.32	43843.53	25086.14
		23:36		41 42.11	68 26.09	13353.68	43843.60	25086.12
9	2/06	0:50	62	41 45.20	68 11.80			
		0:56		41 45.35	68 11.85			
		1:01		41 45.44	68 11.92			
10	2/06	1:33	142	41 49.06	68 15.07			
		1:44		41 49.29	68 15.30			
		1:54		41 49.32	68 15.49			
11	2/06	2:30	212	41 54.08	68 17.87			
		2:44		41 53.84	68 16.93			
		2:58		41 53.71	68 17.07			
12	2/06	4:16	189	42 2.97	68 23.19	13234.54	43951.27	25167.12
		4:23	188	42 2.93	68 23.47			
		4:44		42 2.78	68 23.74			
13	2/06	5:59	166	42 11.52	68 29.07	13217.44	44002.73	25210.88
		6:11	161	42 11.45	68 29.19	13218.38	44002.53	25210.65
		6:27		42 11.32	68 29.30			

Table 1: Locations of Hydrographic stations occupied on OCEANUS cruise 181
(continued)

Sta	Date	Time	Depth (M)	Latitude (°N)	Longitude (°W)	Lorans		
14	2/06	7:21	180	42 16.97	68 32.11	13203.21	44034.68	25240.74
		7:26		42 16.93	68 32.12	13203.48	44034.40	25240.49
		7:39		42 16.78	68 32.17	13204.52	44033.86	25249.90
15	2/06	8:17	170	42 20.49	68 34.57	13196.41	44055.86	25261.56
		8:23		42 20.42	68 34.64	13197.15	44055.57	25261.31
		8:28		42 20.34	68 34.65	13197.67	44055.25	25261.00
16	2/06	9:17	200	42 25.02	68 37.59	13186.77	44082.92	25289.52
		9:23		42 25.04	68 37.66	13187.09	44083.11	25289.69
		9:30		42 25.07	68 37.72	13187.15	44083.27	25289.88
17	2/06	10:10	173	42 29.57	68 41.22	13179.95	44110.85	25319.72
		10:15		42 29.65	68 41.28	13179.82	44111.25	25320.25
		10:19		42 29.66	68 41.37	13180.21	44111.47	25320.47
18	2/06	10:47	198	42 32.51	68 43.15	13173.22	44128.10	25339.08
		10:53		42 32.52	68 43.23	13173.67	44128.30	25339.27
		10:59		42 32.51	68 43.30	13174.06	44128.33	25339.36
19	2/06	12:56	198	42 34.95	68 44.53	13166.54	44142.13	25355.03
		13:03		42 34.90	68 44.45	13166.41	44141.84	25354.65
		13:14		42 34.86	68 44.33	13166.00	44141.38	25354.18
20	2/06	13:45	181	42 38.01	68 45.96	13156.45	44159.28	25374.71
		13:57		42 38.14	68 46.12	13156.52	44160.14	25375.83
		14:03		42 38.20	68 46.28	13156.98	44160.61	25376.39
21	2/06	14:28	167	42 40.10	68 47.99	13154.89	44172.45	25390.46
		14:35		42 40.20	68 48.12	13155.06	44173.12	25391.35
		14:42		42 40.27	68 48.23	13155.25	44173.66	25392.07
22	2/06	15:31	145	42 45.59	68 51.54			
		15:43	156	42 45.74	68 51.86	13141.70	44205.13	25430.18
		15:51		42 45.77	68 52.00	13142.24	44205.51	25430.66
23	2/06	16:56	97	42 50.51	68 56.00	13136.22	44234.64	25467.73
		17:10	91	42 50.68	68 56.27	13136.66	44235.91	25469.39
		17:18		42 50.75	68 56.39	13136.88	44236.37	25470.03
24	2/06	18:16	178	42 46.99	69 5.14	13206.14	44231.75	25471.27
		18:27		42 47.03	69 5.16	13206.09	44231.94	25471.59
		18:43		42 47.09	69 5.08	13205.25	44232.12	25471.66
25	2/06	19:38	166	42 41.97	69 13.59	13281.58	44220.25	25465.14
		19:46		42 41.97	69 13.56			
		19:57		42 41.93	69 13.50	13281.41	44219.96	25464.63
26	2/06	20:56	235	42 36.48	69 22.02	13359.61	44205.87	25456.59
		21:02		42 36.45	69 21.97	13359.56	44205.67	25456.26
		21:08		42 36.43	69 21.98	13359.65	44205.57	25456.10

Table 1: Locations of Hydrographic stations occupied on OCEANUS cruise 181
(continued)

Sta	Date	Time	Depth (M)	Latitude (°N)		Longitude (°W)		Lorans		
27	2/06	22:21	275	42	30.80	69	29.93	13435.53	44189.05	25445.50
		22:28		42	30.83	69	29.94	13435.24	44189.13	25445.53
		22:36		42	30.85	69	29.91	13434.93	44189.25	25445.71
28	2/06	23:40	253	42	24.49	69	39.05	13520.93	44170.01	25434.93
		23:46		42	24.52	69	39.02	13520.55	44170.08	25435.02
		23:53		42	24.58	69	38.99	13520.18	44170.41	25435.35
29	2/06	0:57	247	42	18.03	69	46.89			
		1:10		42	18.07	69	46.82			
		1:20		42	18.16	69	46.84	13599.31	44148.26	25421.17
30	2/07	2:12	173	42	12.03	69	53.90			
		2:23	169	42	12.10	69	53.83			
		2:31		42	12.17	69	53.84			
31	2/07	3:02	137	42	9.05	69	57.45			
		3:12	139	42	9.15	69	57.43			
		3:18		42	9.27	69	57.46			
32	2/07	3:53	62	42	6.00	70	1.40			
		3:58		42	6.03	70	1.39			
		4:02		42	6.05	70	1.41			
33	2/07	19:06	17	42	23.00	70	56.07			
		19:20		42	22.88	70	56.09			
		19:21		42	22.86	70	56.09	14001.10	44294.00	25841.80
34	2/07	19:40	25	42	23.47	70	54.40	13986.98	44294.37	25833.55
		19:48		42	23.46	70	54.37	13986.87	44294.23	25833.18
		19:54		42	23.42	70	54.33			
35	2/07	20:19	36	42	23.47	70	50.09	13959.25	44286.32	25803.92
		20:21		42	23.47	70	50.13	13959.53	44286.44	25804.07
		20:22		42	23.45	70	50.11			
36	2/07	20:52	47	42	23.45	70	44.92	13926.64	44276.93	25769.72
		20:54		42	23.44	70	44.92	13926.49	44276.82	25769.45
		20:58		42	23.42	70	44.88	13926.50	44276.67	25769.13
37	2/07	21:25	76	42	23.47	70	39.92	13894.86	44268.00	25737.45
		21:27		42	23.46	70	39.90	13894.77	44267.94	25737.23
		21:30		42	23.45	70	39.86	13894.62	44267.85	25737.03
38	2/07	22:00	89	42	23.43	70	34.95	13863.70	44258.68	25705.68
		22:02		42	23.44	70	34.91	13863.45	44258.72	25705.50
		22:08		42	23.44	70	34.85	13863.05	44258.63	25705.23
39	2/07	22:39	91	42	23.44	70	29.85	13831.74	44249.57	25674.29
		22:41		42	23.40	70	29.83	13831.78	44249.37	25674.03
		22:47		42	23.37	70	29.80	13831.86	44249.16	25673.75

Table 1: Locations of Hydrographic stations occupied on OCEANUS cruise 181
(continued)

Sta	Date	Time	Depth (M)	Latitude (°N)	Longitude (°W)	Lorans		
40	2/07	23:17	31	42 23.45	70 24.82	13800.34	44240.08	25644.41
		23:19		42 23.45	70 24.79	13800.20	44240.79	25644.21
		23:21		42 23.43	70 24.74	13799.05	44240.52	25643.68
41	2/08	0:14	67	42 24.60	70 16.38	13726.69	44230.42	25594.57
		0:18		42 24.91	70 14.14	13727.03	44230.21	25594.54
		0:21		42 24.88	70 14.18			
42	2/08	1:34	191	42 26.99	70 0.07	13630.93	44217.50	25538.51
		1:41		42 26.93	70 0.13	13631.57	44217.29	25538.50
		1:49		42 26.86	70 0.18	13632.19	44216.98	25538.20
43	2/08	3:03	277	42 29.03	69 45.03	13531.15	44203.51	25487.87
		3:15	279	42 29.08	69 45.23	13532.07	44204.18	25489.27
		3:27		42 29.19	69 45.42	13532.59	44205.06	25490.47
44	2/08	4:53	281	42 31.14	69 29.59	13430.64	44189.47	25445.24
		5:02		42 31.19	69 29.47	13430.68	44190.31	25446.39
		5:22		42 31.41	69 29.70	13430.70	44191.80	25448.57
45	2/08	6:38	231	42 33.05	69 14.97	13339.65	44177.52	25414.46
		6:47		42 33.13	69 15.03	13339.53	44178.12	25415.20
		7:01		42 33.30	69 15.14			
46	2/08	9:06	205	42 34.44	68 58.98	13245.47	44160.67	25382.60
		9:12		42 34.34	68 59.03	13246.13	44160.27	25382.17
		9:15		42 34.30	68 59.08	13246.59	44160.18	25382.07
47	2/08	10:33	195	42 35.45	68 45.05	13166.31	44145.33	25358.87
		10:36		42 35.42	68 45.11		44145.33	25358.85
		10:43		42 35.39	68 45.22	13167.57	44145.29	25358.83
48	2/08	13:57	221	42 35.11	68 30.15	13092.77	44122.73	25330.51
		14:07		42 35.20	68 30.36	13093.21	44123.42	25331.26
		14:15	220	42 35.28	68 30.51	13093.47	44124.05	25331.95
49	2/08	15:30	195	42 34.60	68 14.94	13021.14	44099.53	25305.50
		15:39	192	42 34.74	68 14.93	13020.33	44100.15	25306.12
		15:48	191	42 34.87	68 15.00	13019.87	44100.86	25306.82
50	2/08	16:57	207	42 33.47	68 0.03	12957.51	44074.60	25282.09
		17:11		42 33.38	67 59.88	12957.22	44073.89	25281.46
		17:30		42 33.33	67 59.64	12956.48	44073.36	25281.01
51	2/11	1:00	35	42 23.51	70 50.07	13959.38	44286.63	25804.49
		1:06		42 23.55	70 50.20	13959.84	44287.20	25805.48
		1:09		42 23.56	70 50.24	13960.05	44287.25	25805.74
52	2/11	1:41	43	42 23.62	70 45.08	13926.88	44287.24	25771.91
		1:45		42 23.64	70 45.12	13927.11	44278.48	25772.33
		1:47		42 23.63	70 45.18	13927.61	44278.49	25772.59

Table 1: Locations of Hydrographic stations occupied on OCEANUS cruise 181
(continued)

Sta	Date	Time	Depth (M)	Latitude (°N)		Longitude (°W)		Lorans		
53	2/11	2:16	70	42	23.53	70	40.08	13895.68	44268.68	25739.03
		2:18		42	23.53	70	40.08	13895.68	44268.68	25739.03
		2:24		42	23.54	70	40.24	13269.03	25739.87	60271.99
54	2/11	2:56	88	42	23.50	70	35.05	13864.04	44259.45	25707.07
		3:01		42	23.48	70	35.18	13864.89	44259.54	25707.73
		3:04		42	23.46	70	35.27			
55	2/11	3:35	90	42	23.55	70	30.00	13832.06	44250.65	25676.05
		3:39		42	23.61	70	30.05	13832.16	44250.94	25676.74
		3:43		42	23.61	70	30.13	13832.63	44251.09	25677.18
56	2/11	4:16	31	42	23.52	70	25.11	13801.75	44241.73	25646.39
		4:22		42	23.42	70	25.18			
57	2/11	5:27	68	42	25.03	70	14.26	13727.12	44231.12	25595.82
		5:31		42	25.01	70	14.31	13727.58	44231.08	25596.05
		5:33		42	25.01	70	14.36	13727.85	44231.17	25596.30
58	2/11	6:43	190	42	27.10	70	0.08	13630.30	44218.05	25539.15
		6:54		42	27.03	70	0.18	13631.39	44217.88	25539.17
		7:00		42	26.96	70	0.26	13632.22	44217.62	25539.14
59	2/11	8:14	277	42	29.03	69	44.90	13530.48	44203.41	25487.31
		8:22		42	29.03	69	44.80	13529.83	44203.15	25486.79
		8:26		42	29.02	69	44.76	13529.65	44203.06	25486.60
60	2/11	9:55	278	42	30.69	69	29.13	13431.29	44187.11	25441.91
		10:04		42	30.70	69	29.10	13431.15	44187.08	25441.92
		10:09		42	30.65	69	29.11	13431.53	44186.91	25441.70
61	2/11	11:30	230	42	33.01	69	14.90	13339.47	44177.28	25414.14
		11:38		42	33.01	69	14.93	13339.73	44177.37	25414.26
		11:41		42	32.97	69	14.97	13340.10	44177.20	25414.11
62	2/11	13:12	197	42	34.47	69	0.05			
		13:24	195	42	34.49	69	0.10	13251.00	44162.58	25385.49
		13:29	196	42	34.42	69	0.22	13252.04	44162.41	25385.41
63	2/11	14:59	197	42	35.53	68	44.97			
		15:11	194	42	35.63	68	44.95			
		15:16		42	35.63	68	44.97			
64	2/11	16:47	220	42	35.06	68	29.92	13091.82	44122.16	25329.82
		16:59		42	35.03	68	30.09	13092.81	44122.17	25329.85
		17:09		42	35.08	68	30.19			
65	2/11	18:43	194	42	34.50	68	14.92			
		18:59		42	34.46	68	15.19			
		19:03		42	34.48	68	15.31	13023.66	44099.42	25305.18

Table 1: Locations of Hydrographic stations occupied on OCEANUS cruise 181
(continued)

Sta	Date	Time	Depth (M)	Latitude (°N)		Longitude (°W)		Lorans		
66	2/12	8:48	188	43	0.10	68	41.06	13000.05	44256.89	25484.50
		8:54		43	0.17	68	41.11	12999.81	44257.32	25484.97
		8:57		43	0.17	68	41.05	12999.56	44257.18	25484.87
67	2/12	10:13	197	43	5.99	68	29.95	12907.18	44267.04	25490.71
		10:19	205	43	5.93	68	29.94	12907.52	44266.75	25490.49
		10:22		43	5.93	68	29.91	12907.39	44266.75	25490.42
68	2/12	11:37	191	43	12.50	68	20.03	12817.22	44281.26	25502.87
		11:43		43	12.41	68	20.05	12817.87	44280.86	25502.42
		11:45		43	12.38	68	20.03	12817.95	44280.72	25502.24
69	2/12	13:01	206	43	18.51	68	10.16	12731.09	44292.55	25512.08
		13:12		43	18.53	68	10.31	12731.66	44292.85	25512.49
		13:19		43	18.56	68	10.42	12731.97	44293.08	25512.76
70	2/12	14:44	242	43	24.45	68	1.17	12650.47	44304.69	25522.88
		14:54		43	24.47	68	1.20	12650.54	44304.88	25523.06
		15:01		43	24.47	68	1.36	12651.20	44305.04	25523.36
71	2/12	17:12	286	43	29.39	67	52.36	12578.57	44312.68	25529.28
		17:20		43	29.38	67	52.52	12579.32	44312.86	25529.55
		17:36		43	29.47	67	52.84	12580.16	44313.66	25530.48
72	2/12	19:06	252	43	24.63	67	42.14	12564.97	44278.69	25489.53
		19:18		43	24.84	67	42.32			
		19:32		43	25.00	67	42.62	12564.62	44280.86	25491.85
73	2/12	20:52	200	43	18.18	67	31.45	12561.06	44237.12	25443.97
		20:58	202	43	18.20	67	31.45	12561.02	44237.21	25444.08
		21:04		43	18.24	67	31.51	12560.98	44237.55	25444.38
74	2/12	22:06	200	43	11.97	67	20.86	12556.83	44197.03	25402.96
		22:11		43	11.97	67	20.81	12556.65	44197.00	25403.01
		22:18		43	12.07	67	20.91	12556.45	44197.54	25403.34
75	2/12	23:19	213	43	5.93	67	9.92	12550.66	44157.43	25365.13
		23:24		43	5.88	67	9.88	12550.80	44157.13	25364.87
		23:32		43	5.86	67	9.84	12550.78	44157.02	25364.68
76	2/13	0:36	267	42	57.28	67	10.66			
		0:47	233	42	57.10	67	10.43			
		0:59	246	42	56.97	67	10.27			
77	2/13	1:48	225	42	48.78	67	11.04	12657.94	44084.20	25298.34
		1:54	220	42	48.72	67	10.90	12657.67	44083.71	25297.93
		2:03	217	42	48.61	67	10.71			
78	2/13	2:55	265	42	40.01	67	12.08	12712.96	44046.11	25265.52
		3:06		42	39.98	67	12.11	12713.28	44045.97	25265.48
		3:15		42	39.98	67	12.13			

Table 1: Locations of hydrographic stations occupied on OCEANUS cruise 181
(continued)

Sta	Date	Time	Depth (M)	Latitude (°N)		Longitude (°W)		Lorans		
79	2/13	8:53	226	42	20.65	65	54.54	12540.79	43878.44	25170.55
		9:00	228	42	20.62	65	54.64	12541.25	43878.37	25170.48
		9:07		42	20.68	65	54.79	12541.49	43878.79	25170.70
80	2/13	12:26	103	42	28.01	65	47.58	12480.18	43904.19	25188.43
		12:30		42	28.00	65	47.56	12480.19	43904.20	25188.45
		12:34		42	28.00	65	47.53	12480.10	43904.08	25188.42
81	2/13	14:22	246	42	13.99	66	0.02			
		14:36		42	13.91	65	59.83	12593.14	43853.20	25154.09
		14:42		42	13.88	65	59.74	12592.89	43852.97	25154.01
82	2/13	15:43	211	42	8.10	66	5.19	12640.86	43831.73	25140.23
		15:52		42	8.06	66	5.11	12640.79	43831.47	25140.06
		16:06		42	8.05	66	5.24	12641.27	43831.53	25140.10
83	2/13	17:00	93	42	1.95	66	11.03	12692.14	43808.58	25125.82
		17:15		42	1.81	66	11.60	12694.83	43808.50	25125.54
		17:19		42	1.84	66	11.76			
84	2/13	20:53	260	42	24.49	66	20.17	12605.87	43919.89	25187.76
		20:59		42	24.54	66	20.40	12606.37	43920.43	25187.89
		21:07		42	24.55	66	20.56	12606.86	43920.55	25187.97
85	2/14	0:30	335	42	27.54	66	46.68	12684.65	43960.82	25206.62
		0:51		42	27.60	66	46.98	12685.47	43961.53	25207.04
		1:02		42	27.55	66	47.13	12686.36	43961.42	25206.99
86	2/14	8:09	328	42	31.65	67	13.88	12767.82	44009.85	25235.33
		8:17		42	31.76	67	14.09	12768.07	44010.57	25235.89
		8:25		42	31.84	67	14.32	12768.48	44011.23	25236.29
87	2/14	8:50	322	42	32.17	67	14.76	12768.49	44013.27	25237.85
		8:58		42	32.31	67	14.97	12768.44	44014.15	25238.47
		9:04		42	32.36	67	15.08	12768.63	44014.45	25238.72
88	2/14	11:26	280	42	32.10	67	29.02	12827.98	44029.69	44029.69
		11:34		42	32.17	67	28.99	12827.48	44029.94	25247.82
		11:41		42	32.16	67	28.99	12827.56	44029.88	25247.77
89	2/14	13:56	235	42	32.46	67	44.91	12894.81	44050.67	25262.34
		14:10	233	42	32.43	67	44.77	12894.33	44050.36	25262.10
		14:19		42	32.42	67	44.68		4050.21	5261.94
90	2/14	16:03	208	42	33.47	67	59.96	12957.07	44074.47	25281.84
		16:15		42	33.37	68		12957.86	44074.04	25281.47
		16:30		42	33.22	68	0.04	12958.96	44073.34	25280.80
91	2/15	2:17	282	42	31.02	69	30.93	13440.02	44191.78	25450.23
		2:39		42	31.28	69	31.27	13440.22	44193.49	25452.73
		2:49		42	31.38	69	31.40	13440.37	44194.25	25453.92

Table 1: Locations of Hydrographic stations occupied on OCEANUS cruise 181
(continued)

Sta	Date	Time	Depth (M)	Latitude (°N)	Longitude (°W)	Lorans		
92	2/15	4:15	283	42 40.00	69 37.97	13430.39	44249.08	25532.87
		4:53		42 40.10	69 38.47	13432.87	44250.50	25535.53
		5:09		42 40.10	69 38.69			
93	2/15	6:27	261	42 48.04	69 45.31	13428.64	44302.13	25613.18
		6:36		42 48.11	69 45.58	13429.88	44303.01	25614.80
		6:52		42 48.16	69 45.92	13431.57	44303.81	25616.54
94	2/15	8:07	231	42 56.90	69 52.04	13415.59	44357.19	25696.37
		8:13		42 56.92	69 52.08	13415.71	44357.42	25696.78
		8:20		42 56.94	69 52.17	13416.12	44357.56	25697.10
95	2/15	9:19	157	43 5.43	69 58.38	13403.72	44409.26	25776.24
		9:23		43 5.43	69 58.46	13403.99	44409.43	25776.55
		9:30		43 5.45	69 58.55	13404.40	44409.61	25776.93

Table 2. Meteorological observations for R/V OCEANUS cruise 181 obtained from the ship's deck log (see Table 3 for key to meteorological observations)

Date	Time EST	Wind		Sea			Air		Weather
		Dir	Force	Dir	Swell	Height	Pressure (mb)	Temp (°c)	
Feb 5	1200	NW	5	--	--	3	1026	-4.4	bc
	1600	NW	6	NW	1	4	1025	-1.1	bc
	2000	WNW	6	NW	3	4-5	1026	-2.2	bc
	2400	WxN	4-5	NW	1	3	1023	0.0	bc
Feb 6	0400	W	5	--	--	3	1020	0.0	c
	0800	WxN	5-6	W	3	4	1020	-0.6	c
	1200	WxN	5	NW	1	3	1020	--	c
	1600	WNW	5	NW	1	3	1019	-0.6	bc
	2000	Var	1-2	NW	1	2-3	1020	0.6	b
	2400	SSW	4	--	--	3	1020	2.2	bc
Feb 7	0400	S	5-6	--	--	2	1016	1.1	bc
	0800	SxW	4	E	1	2	1012	2.8	o
	1200	Lt	airs	--	--	calm	1008	3.3	bc
	1600	ESE	1	--	0	0	1006	7.2	bc
	2000	NW	2	--	--	1-2	1007	3.3	c
	2400	NNW	3	--	--	3	1004	3.9	o
Feb 8	0400	NE	2-3	--	--	1	1003	4.4	c
	0800	NE	4	NE	1	2	1004	2.8	o
	1200	ESE	3	NE	1	2-3	1004	3.3	o
	1600	SE	3-4	NE	1	2	1003	3.3	o
	2000	S	4	S	1	3	1002	4.4	o
	2400	SE	3	--	--	3	1000	4.4	o
Feb 9	0400	ENE	5	anchored		2	998	3.3	or
	0800	NE	5-6	in		--	999	2.8	or
	1200	NNE	8-9	Province-			996	0.6	os
	1600	N	9+	town		3	994	0.0	su
	2000	N	8-10	outer		3	995	--	os
	2400	NNW	8-10	harbor		3	996	--	os
Feb 10	0400	NW	7-8	anchored		2-3	1000	-5.0	s
	0800	NW	7	anchored		2-3	1003	-8.3	c
	1200	NW	6	NW	3	4	1002	-5.0	bc
	1600	W	4	moored		--	1006	-1.1	c
	2000	W	3-4	moored		--	1008	-2.2	bc
	2400	WNW	6-7	WNW	1-3	4	1009	-3.9	bc

Table 2. Meteorological observations for R/V OCEANUS cruise 181 (continued)

Date	Time EST	Wind		Sea			Air		Weather
		Dir	Force	Dir	Swell	Height	Pressure (mb)	Temp (°c)	
Feb 11	0400	W	7	WNW	1	3	1010	-3.3	b
	0800	W	7-8	WNW	3	4	1007	-1.7	bc
	1200	NW	8	NW	4	5	1005	0.0	bc
	1600	WNW	8	WNW	4	5	1003	-1.1	bc
	2000	WxN	8-9	WNW	4	5-6	1002	-2.8	bc
	2400	NWxW	8-9	WxN	4-7	6	1004	-6.1	bc
Feb 12	0400	NW	7-8	NW	4	5-6	1004	-5.6	bc
	0800	NW	6-7	NW	3	5	1004	-3.9	bc
	1200	WNW	5-6	NW	3	4	1001	-3.3	bc
	1600	WNW	6-7	WNW	3	3	1001	-2.2	bc
	2000	NWxW	6-7	WNW	3	4	997	-3.9	bc
	2400	NWxW	5	WNW	1	4	998	-3.9	bc
Feb 13	0400	WNW	6	WNW	1	3-4	997	-1.1	c
	0800	WNW	5-6	WNW	1	3	995	-1.1	o
	1200	NW	6-7	NW	3	3	995	-3.9	os
	1600	NW	6	NW	1	4	998	-5.0	os
	2000	NW	7	NW	3	4-5	998	-4.4	os
	2400	NW	7	NW	3	4	1002	-5.6	os
Feb 14	0400	NW	7	NW	1	4-5	1005	-10.0	os
	0800	NW	6-7	NW	3	4-5	1007	-11.1	os
	1200	WxN	4	NW	1	4	1008	-7.8	os
	1600	WNW	4-5	NW	1	3-4	1008	-7.8	os
	2000	WNW	4-5	NW	1	3	----	-6.7	c
	2400	NWxW	4-5	NW	1	2	1010	-5.6	c
Feb 15	0400	NW	5-6	NW	1	3	1012	-11.1	os
	0800	WNW	5-6	NW	1	3	1012	-13.9	os
	1200	NW	5-6	NW	1	3	----	-13.9	bc
	1600	NW	4	--	--	--	1011	-7.8	--
	2000	NW	4	--	--	--	1014	-13.3	bc
	2400	WNW	2	--	--	--	1017	-16.7	bc

Table 3. - Key to meteorological observations.

Swell	Sea height
0 No swell	0 Calm
1 Low, short or average	1 Smooth, less than 1'
2 Low, long	2 Slight 1-3'
3 Moderate, short	3 Moderate 3-5'
4 Moderate, average	4 Rough 5-8'
5 Moderate, long	5 Very rough 8-12'
6 Heavy, short	6 High 12-20'
7 Heavy, average	7 Very high 20-40'
8 Heavy, long	8 Mountainous 40' and higher
9 Confused	9 Confused

Weather	Wind	knots	mph
bc scattered clouds	1	1-3	1-3
d drizzle	2	4-6	4-7
f fog	3	7-10	8-12
h hail	4	11-16	13-18
l lightening	5	17-21	19-24
o overcast	6	22-27	25-31
c mostly cloudy	7	28-33	32-38
p passing rain showers	8	34-40	39-46
q squalls	9	41-47	47-54
r rain	10	48-55	55-63
s snow	11	36-63	64-72
t thunder	12	64-71	73-82

AUG 11 1987

AUG 12 1987

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START

END

COMMENTS AND OBSERVATIONS

PAGE _____

OC 181

Feb. 5-15, 1987

Brad Butman, Chief Scientist

Activities Log

GMT				LINE #	SHIPS		FIX TIME	NAVIGATION		TYPE	AL.
DAY	MO	YR	TIME		COURSE	SPD		LATITUDE ± DEGREES ± MINUTES	LONGITUDE ± DEGREES ± MINUTES		
05	02	87	0940					.	.		
05	02	87	1410					.	.		
05	02	87	2355					.	.		
06	02	87	0800					.	.		
06	02	87	1130				42	35.0	68	44.6	
			1245					.	.		
			0210					.	.		
07	02	87	0420					.	.		
			0800					.	.		
			0835				42	03.6	70	39.6	
			0950					.	.		
			0912				42	25.5	70	29.7	
			0950					.	.		
			1015				42	23.7	70	29.7	
			1215				42	23.6	70	54.5	
			1236					.	.		
			1306					.	.		
			1355				42	03.7	70	54.5	
								.	.		
			→ 1410					.	.		
								.	.		
								.	.		
			1420					.	.		
								.	.		
			1900					.	.		
08	02	87	0000					.	.		
			0800					.	.		
			1045				42	35.3	68	45.4	
			1045					.	.		
			1735					.	.		

START
END

Depest Woods Hole

Start CTD Casts

And the CTD's go on

And on ...

Arrive Rogers Pass. Try to talk to morning first (314)

VACM located; will not release. CTD section resumed.

Arrive at station 97. Stop to talk to UUN morning

Complete CTD section 1. Underway to Boston Harbor

Prepare to do first grab at Stellwagen Basin

Prepare for 2nd grab at Boston Harbor site C

Prepare to launch surface buoy

Surface buoy awaigh. Prepare to launch tripod

Tripod on bottom

Radar reflector awaigh. Under way to site A.

Surface buoy at BH awaigh.

Tripod on bottom. Note: Bridge & leg stressors not locked in same lines

Delay deploying subsurface mooring - can't get travel wind operational

Subsurface deployed

Tripod & subsurface turned off. Underway to BH-B

NOTE: Bridge spans on 13-25. Ours set to 13-43.4 ft
moorings set to 40 ftBuoys at Boston Harbor site B all deployed. Reposition
to do grab samples in immediate vicinity

Grab samples completed. Start CTD section

The CTD's continue

With use of the same.

Complete CTD at Rogers Pass. Prepare to launch subsurface

Subsurface awaigh. Continue CTD transect.

Due to storm, heading back to Provincetown.

GMT				LINE #	SHIPS		FIX TIME	NAVIGATION				TYPE	CAL.
DAY	MO	YR	TIME		COURSE	SPD		LATITUDE		LONGITUDE			
								± DEGREES ±	MINUTES	± DEGREES ±	MINUTES		
09	02	87	0800						.		.		
10	02	87	0800					42	01.5	70	09.0		
									.		.		
			N 1300						.		.		
			2015						.		.		
11	02	87	0100					42	03.5	70	50.0		
									.		.		
			0945						.		.		
			1915						.		.		
12	02	87	0745					43	00.0	68	41.1		
			1600					43	29.3	67	50.5		
									.		.		
			N 1640						.		.		
			1710						.		.		
13	02	87	0000						.		.		
			0300						.		.		
									.		.		
			0845					42	00.7	65	54.5		
			0914						.		.		
			0945						.		.		
			1015						.		.		
			1045						.		.		
									.		.		
			→ 1130						.		.		
14	02	87	0745					423	.	67	12.8		
									.		.		
									.		.		
			2100						.		.		
			2200						.		.		
									.		.		

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END

COMMENTS AND OBSERVATIONS

PAGE _____

Sitting in Cape Cod Bay waiting out storm.

Still in look at P'town. Storm has passed but there are still storm warnings out in the Banks.

Arrive Canal Electric to work on ship's radar

Depart Cape Cod Canal

Resume CTD transect starting back at beginning so as to get pre- and post-storm readings.

Arrive at buoy site. Stop for picture, before doing CTD

Captain tells CTD transect due to high waves.

Resume CTD's on track leading up to Jordan Basin buoy

Arrive Jordan Basin. Delay while trying to locate buoy.

Surface buoy gone. Rest of package released.

Mooring on surface

Start CTD's

And continue CTD's.

Back off CTD transect & high-tail it to the Northeast Passage

Arrive at N.E. Do CTD

Buoy released.

On board. Go for 1 remaining surface buoy

Buoy on surface

" " board. Start making way (slowly) to next CTD station

Deck work complete. Pick up speed

Arrive G-1. Do 2 CTD casts because transmissometer too cold on first one. Stick around to talk to mooring. Weather not nice! (still)

Arrive Roger's Pass. Try to talk to 314. Release 323

Buoy on board.

GMT

DAY	MO	YR	TIME
15	02	87	2345

LINE
#

SHIPS

COURSE SPD

FIX
TIME

NAVIGATION

LATITUDE

LONGITUDE

± DEGREES ±	MINUTES	± DEGREES ±	MINUTES	TYPE
43	05.5	69	57.6	

AL.

1350

TAPE

#

START
END

COMMENTS AND OBSERVATIONS

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Complete station 95. Start steam in to Portsmouth.
Arrive Portsmouth.