

1 July 2008

CRUISE RESULTS
NOAA Fisheries Research Vessel HENRY B. BIGELOW
Cruise No. HB 08-04
Northeast Shelf Ecosystem Monitoring Late Spring Gear Testing

CRUISE PERIOD AND AREA

The cruise period was 9 – 13 June 2008. The NOAA fisheries research vessel HENRY B. BIGELOW sampled at a total of 44 stations. All of these were located in the Southern New England (SNE) area (Figure 1).

OBJECTIVES

Due to a change in the vessel schedule reducing the number of available days to 5, the primary objective of this cruise was changed from the traditional assessment of biological and physical properties of the northeast continental shelf ecosystem to an evaluation and comparison of data obtained from bongo nets versus that obtained by a video plankton recorder. Secondary objectives of this cruise included:

- Deploying and testing a vessel-dedicated Seabird 911 CTD unit mounted on a rosette Niskin bottle sampler. Vertical casts to within 5 meters of the bottom were carried to evaluate this system.
- Deployment and testing of a MOC-1 meter sampling array equipped with a video plankton recorder (VPR).
- Collection of zooplankton for the Census of Marine Zooplankton Project (CMarZ) for Ann Bucklin based at University of Connecticut, Avery Point.
- Collection of near-surface water samples for detection of *Alexandrium* dinoflagellates as part of the Harmful Algal Bloom Project (HAB) of the Woods Hole Oceanographic Institution (WHOI).

METHODS

The survey consisted of 44 stations at which the vessel stopped to lower instruments over the side (Figure 1). All stations sampled were at randomly stratified locations except for the last 14 stations located along a transect running from slope water to the inshore waters of Southern New England.

Plankton and hydrographic sampling was conducted at stations 1 – 30 by making two double oblique tows: one using the 61-cm bongo sampler and a Seabird CTD, followed by a tow with a 61-cm bongo sampler and a VPR. On these combined bongo-VPR tows, the bongo was mounted on the towing wire approximately one meter above the VPR. The tows were made to approximately 5 m above the bottom,

or to a maximum depth of 200 m. All plankton tows were conducted at a ship speed of 1.5 – 2.0 knots. Plankton sampling gear consisted of a 61-cm diameter aluminum bongo frame with two 335-micron nylon mesh nets. At the randomly designated CMarZ stations a 20-cm diameter PVC bongo frame fitted with paired 165-micron nylon mesh nets was put on the towing wire one half meter above the Seabird CTD with a wire stop (Figure 2.). A 45-kg lead weight was attached by an 80-cm length of 3/8-inch diameter chain below the aluminum bongo frame to depress the sampler. A digital flowmeter was suspended within the mouth of each sampler to determine the amount of water filtered by each net. No flowmeters were used in the 20-cm bongos. The plankton sampling gear was deployed off the starboard side of the vessel using an A-frame and winch located on the deck above the work area. After retrieval, the bongo frames were placed on a small wooden table for wash down of the nets to obtain the plankton samples. This work space, located in the starboard side sampling station, allowed for easy removal of the samples, particularly during inclement weather. The 61-cm bongo zooplankton samples were preserved in a 5% solution of formalin in seawater. The 61-cm ichthyoplankton samples were preserved in 95% denatured ethanol, which was changed once at the end of the cruise. The zooplankton Census Project samples from the 20-cm diameter bongos were preserved in 95% ethanol, which was changed once at 24 hours after the initial preservation. Tow depth was monitored in real time with a Seabird CTD profiler mounted above the bongos on a bongo only tow, and a Seabird CTD profiler mounted on the VPR unit on the combined bongo-VPR tows. The Seabird CTD profiler was hard-wired to the conductive towing cable, providing simultaneous depth, temperature, and salinity for each plankton tow.

A thermosalinograph continuously monitored seawater temperature and salinity at a depth of 5 meters along the entire cruise track. Chlorophyll measurements were not taken on this cruise due to plumbing problems. The Scientific Computer System (SCS) recorded the output from the thermosalinograph at 10-second intervals. The data records were given a time-date stamp by the GPS unit.

Census of Marine Zooplankton samples were collected using the 20-cm diameter bongos described above at five randomly designated stations in the SNE region.

Seawater sample collections were made at 5 random stations in the Southern New England area to test for the presence of *Alexandrium*, an armored dinoflagellate, which can cause paralytic shellfish poisoning. The *Alexandrium* samples were collected by filtering two liters of the seawater from the flow-through system discharge through a 20 micron mesh filter and then placing the filtered material into a 15-ml centrifuge tube with 0.75 ml of concentrated formaldehyde as a preservative and refrigerated at 8^o C..

Water sampling and vertical casts were conducted at stations 31 – 44 using a Seabird 911 CTD mounted on a Niskin bottle rosette sampler. Fourteen salinity samples and four chlorophyll samples were collected for calibration of the CTD salinometer and fluorometer mounted on the array.

RESULTS

A summary of routine survey activities is presented in Table 1. Areal coverage for the cruise is shown in Figure 1. The HENRY B. BIGELOW sailed at 1400 hours EDT on Monday, 9 June 2008, from the Newport Naval Station under sunny and calm conditions and proceeded south to sample inshore stations off Martha's Vineyard. The plan was to sample 30 randomly placed stations working from inshore to offshore, then head back towards Narragansett Bay along a transect of 17 stations from slope to inshore waters. The vessel spent the first 3 days working its way south and offshore, doing 2 tows at every station: one with a 61-cm bongo sampler and another with a 61-cm bongo sampler and a VPR attached to

the towing wire simultaneously. Following completion of sampling at the 30 randomly placed stations, work on 14 of the scheduled 17 transect stations commenced, using a vessel-dedicated Seabird 911 CTD mounted on a Niskin bottle rosette (Figure 4.). The three offshore transect stations were dropped due to time constraints. At the first transect station, the vessel SCS system was not receiving data from the Seabird 911 due to a too high baud rate on the Seabird 911. Once this baud rate was lowered, the problem was solved and the system functioned properly on the remaining stations. One cast was made using a MOC 1 net equipped with a VPR, but the VPR did not function properly and no further casts were made with this unit. Sampling was completed on Thursday, 12 June 2008 at the 14th transect station located approximately 33 nautical miles south of Newport, RI. With sampling operations completed the HENRY B. BIGELOW returned to Newport, docking at the Newport Naval Station at 1000 hours EDT on Friday, 13 June 2008.

DISPOSITION OF SAMPLES AND DATA

The Seabird CTD data was retrieved by Maureen Taylor of the Fisheries Oceanography Investigation. The Ecosystem Monitoring Investigation samples and associated data and log sheets were delivered to the Narragansett Laboratory of the NEFSC, Narragansett, RI, for quality control processing and further analysis. Salinity calibration samples from the CTD were also delivered to Narragansett for analysis. CMarZ and GOMTOX2008 samples were delivered to Nancy Copley and Bruce Keafer of the Woods Hole Oceanographic Institute.

SCIENTIFIC PERSONNEL

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Table 1. STATION OPERATION REPORT FOR CRUISE HB0804

CAST	STA.	Date(GMT)		TIME(GMT)		LAT	LONG	DEPTH	OPERATION	
		mm	dd	yy	hr					min
									B=bongo W=water Z=zoogen V=vertical cast (CTD only) CO=Calanus observed / vol HAB=WHOI HAB sample N=nitrogen isotope VPR=video plank recorder	
1	1	6	9	2008	23	11	4116.9	7101.9	41	B
2	1	6	9	2008	23	41	4117	7101.5	41	B, VPR
3	2	6	10	2008	0	19	4114.7	7100	38	B, VPR
4	2	6	10	2008	0	42	4113.9	7059.5	36	B
5	3	6	10	2008	1	29	4111.8	7055.6	34	B
6	3	6	10	2008	1	47	4111.2	7055.2	32	B, VPR
7	4	6	10	2008	2	37	4105.6	7101.4	39	B, VPR
8	4	6	10	2008	2	51	4105.3	7101.7	38	B
9	5	6	10	2008	5	19	4104.1	7137	42	B, N1
10	5	6	10	2008	5	46	4103.8	7137.1	42	B, VPR
11	6	6	10	2008	6	38	4059.4	7131.1	52	B, VPR
12	6	6	10	2008	6	58	4059	7130.8	52	B
13	7	6	10	2008	8	1	4054.1	7119.7	57	B
14	7	6	10	2008	8	21	4053.8	7119.6	56	B, VPR
15	8	6	10	2008	8	55	4052.8	7117.8	57	B, VPR
16	8	6	10	2008	9	21	4052.7	7117.5	57	B
17	9	6	10	2008	10	41	4047.1	7119.4	60	B
18	9	6	10	2008	11	0	4047	7119.3	60	B, VPR
19	10	6	10	2008	13	47	4044.3	7159.6	46	B, VPR
20	10	6	10	2008	14	6	4044.3	7159.3	47	B
21	11	6	10	2008	15	43	4036.8	7211.9	51	B
22	11	6	10	2008	16	2	4036.6	7211.4	51	B, VPR
23	12	6	10	2008	17	18	4038.3	7201.8	53	B, VPR
24	12	6	10	2008	17	38	4038.3	7201.4	53	B
25	13	6	10	2008	18	48	4032.4	7151.4	67	B
26	13	6	10	2008	19	15	4032.2	7150.7	69	B, VPR
27	14	6	10	2008	21	54	4044.8	7113.8	61	B, VPR
28	14	6	10	2008	22	17	4044.8	7113.8	61	B
29	14	6	10	2008	22	54	4044.9	7114.5	61	B
30	15	6	10	2008	23	41	4043.4	7106.3	61	B
31	15	6	10	2008	23	55	4043.4	7105.9	60	B, VPR
32	16	6	11	2008	1	40	4035.8	7043.3	68	B, VPR

Table 1. (cont.) STATION OPERATION REPORT FOR CRUISE HB0804

CAST	STA.	Date (GMT)		TIME (GMT)		LAT	LONG	DEPTH	OPERATION	
		mm	did	yy	hr					min
33	16	6	11	2008	1	57	4035.8	7042.7	68	B
34	17	6	11	2008	4	23	4034.8	7117.3	67	B
35	17	6	11	2008	4	47	4034.3	7116.8	68	B, VPR
36	18	6	11	2008	6	5	4026.8	7129.2	76	B, VPR, HAB1
37	18	6	11	2008	6	23	4026.1	7128.3	76	B, Z1
38	19	6	11	2008	7	32	4022.8	7139.6	82	B
39	19	6	11	2008	7	59	4022.6	7139.7	82	B, VPR
40	20	6	11	2008	10	19	4023.8	7113.3	83	B, VPR
41	20	6	11	2008	11	4	4024.2	7112.3	83	B, Z2
42	21	6	11	2008	12	51	4019.6	7059.4	98	B
43	21	6	11	2008	13	21	4018.9	7059.3	101	B, VPR
44	22	6	11	2008	16	29	4020.9	7042.8	98	B, VPR
45	22	6	11	2008	17	3	4021.2	7042.9	98	B, HAB2, Z3
46	23	6	11	2008	17	58	4014.9	7041.5	122	B
47	23	6	11	2008	18	36	4015.2	7041.2	122	B, VPR
48	24	6	11	2008	19	36	4011.3	7049.2	133	B, VPR
49	24	6	11	2008	20	24	4011.7	7048.1	131	B
50	25	6	12	2008	0	0	4012.2	7142.7	82	B
51	25	6	12	2008	0	24	4011.8	7143.4	82	B, VPR
52	26	6	12	2008	1	10	4011.4	7138.2	86	B, VPR
53	26	6	12	2008	1	39	4010.4	7138.2	86	B
54	27	6	12	2008	3	9	4003.9	7121	109	B
55	27	6	12	2008	3	34	4003.4	7121.6	108	B, VPR
56	28	6	12	2008	5	28	3959.3	7057.4	328	B, VPR
57	28	6	12	2008	6	16	3959.6	7057.3	310	B, Z4
58	29	6	12	2008	7	45	3959.2	7045	314	B, HAB3, N2
59	29	6	12	2008	8	30	3959.6	7046.7	302	B, VPR
60	30	6	12	2008	10	9	4002.2	7034.4	256	B, VPR
61	30	6	12	2008	11	12	3959.9	7036.1	260	B, Z5
62	TEST	6	13	2008	9	59	4121.5	7124.2	34	V
64	TEST	6	13	2008	10	21	4121.2	7124.6	33	V (Note: Test cast 63 failed)

SEABIRD 911 + ROSETTE CASTS

1	31	6	12	2008	17	25	4009.5	7100.9	142	W1
2	32	6	12	2008	18	19	4014	7102.6	122	W2, HAB4
3	33	6	12	2008	19	11	4019.4	7103.9	96	W3
4	34	6	12	2008	19	55	4023.9	7104.9	87	W4
5	35	6	12	2008	20	43	4028.6	7106.3	81	W5
6	36	6	12	2008	22	16	4033.5	7108.2	73	W6
7	37	6	12	2008	23	04	4038.6	7109.4	65	W7
8	38	6	13	2008	00	03	4043.2	7110.6	61	W8
9	39	6	13	2008	00	47	4047.5	7111.6	60	W9
10	40	6	13	2008	01	39	4052.9	7113.7	55	W10, HAB5
11	41	6	13	2008	02	25	4057.6	7115.0	54	W11
12	42	6	13	2008	03	22	4103.1	7116.4	43	W12
13	43	6	13	2008	04	52	4112.8	7119.6	36	W13
14	44	6	13	2008	06	11	4122.1	7122.8	35	W14

TOTALS:	CTD Casts	=	63
	Bongo Casts	=	30
	Bongo/VPR Casts	=	30
	CTD/rosette Casts	=	14
	Bongo 6B3Z Samples	=	57
	Bongo 6B3I Samples	=	56
	Water Samples	=	14
	Vertical Casts	=	2
	CMarZ (Zoogen) samples	=	5
	GOMTOX2008 (HAB) samples	=	5
	Nitrogen isotope samples	=	2

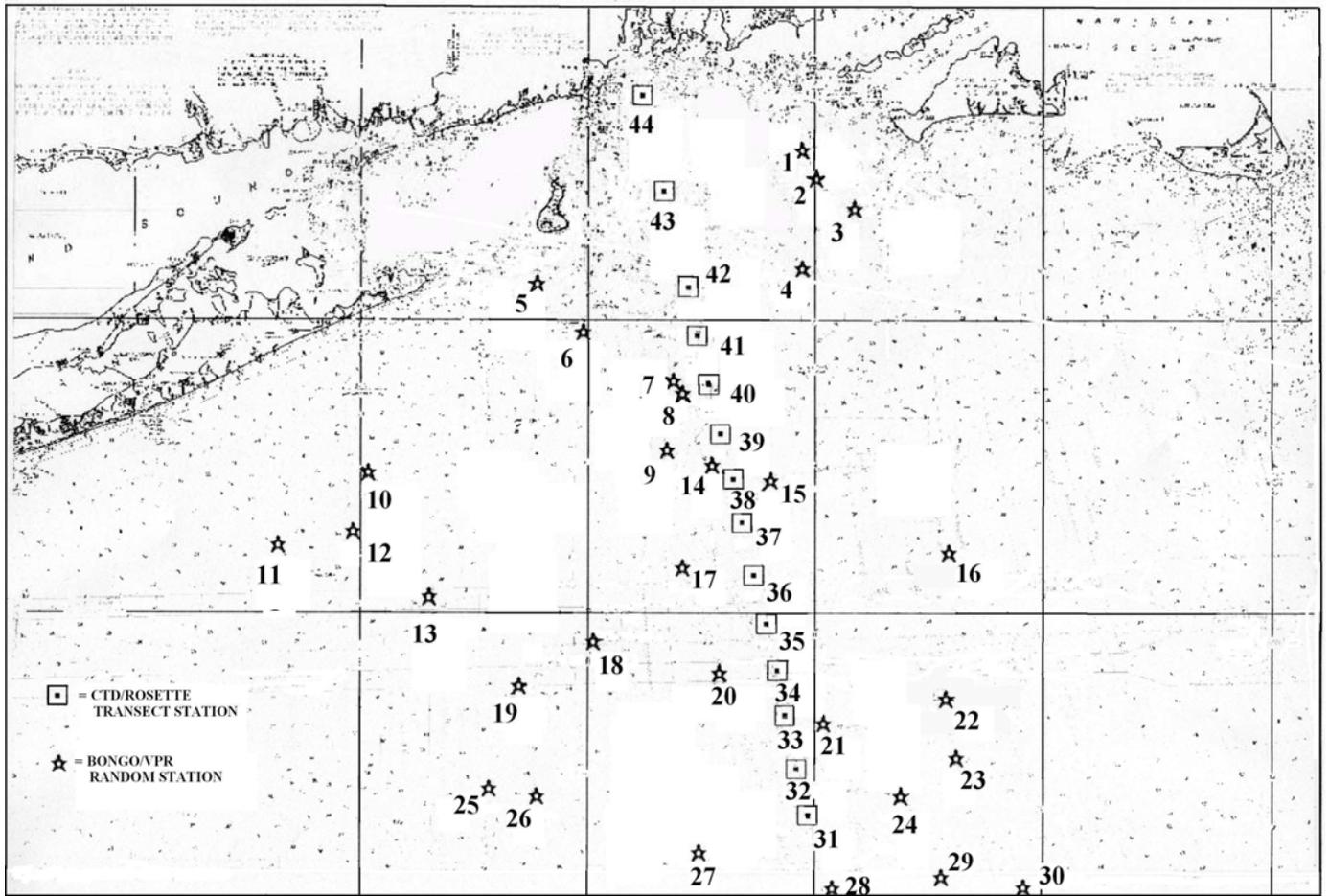


Figure 1. Station locations numbered consecutively for Late Spring Ecosystem Monitoring Gear Testing Cruise HB0804, 9 - 13 June 2008.



Figure 2. Bongo nets mounted above Video Plankton Recorder for simultaneous deployment on HB0804 cruise.

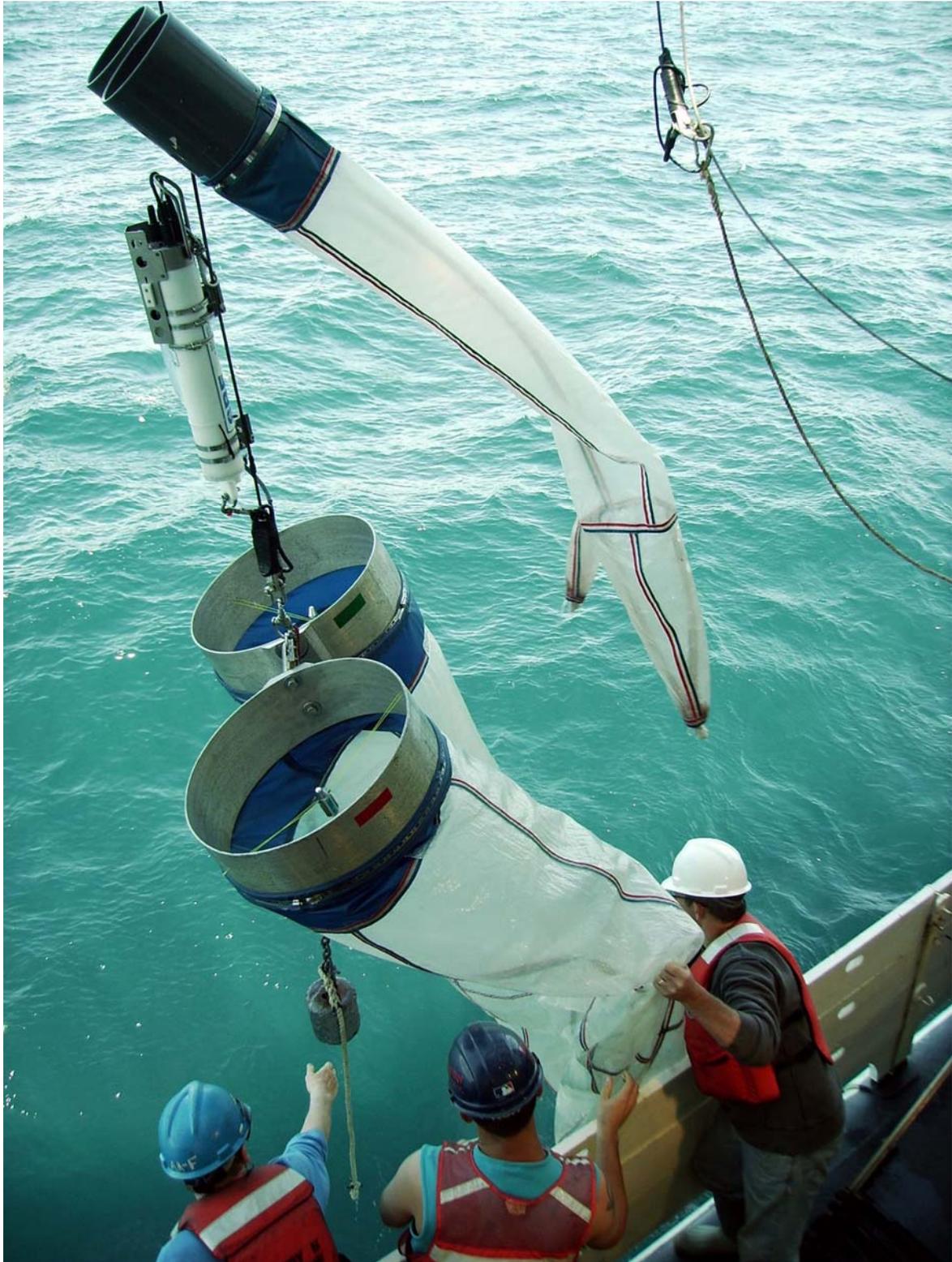


Figure 3. 20-cm and 61-cm bongo samplers mounted together on towing wire aboard HB0804 cruise.



Figure 4. Vessel-dedicated Seabird 911 mounted on Niskin bottle rosette being deployed aboard HB0804 cruise.

Appendix A.

Hydrographic data from HB0804 Ecosystem Monitoring Gear Testing Cruise

Areal average surface and bottom temperature/salinity and temperature/salinity anomalies for the HB0804 Gear Testing Cruise															
SURFACE								BOTTOM							
CRUISE	CD	#obs	T/S	Anomaly	SDV1	SDV2	Flag	#obs	T/S	Anomaly	SDV1	SDV2	Flag	Purpose	
								MAB North							
HB0804	163	50	16.45	2.11	0.18	1.03	1	41	8.73	1.13	0.20	1.66	1	70	
HB0804	163	50	31.79	-0.66	0.12	0.39	1	41	33.28	0.09	0.12	0.59	1	70	

CRUISE, the code name for a cruise.

CD, the calendar mid-date of all the stations within a region for a cruise.

#obs, the number of observations include in each average.

T/S, the areal average temp/salt.

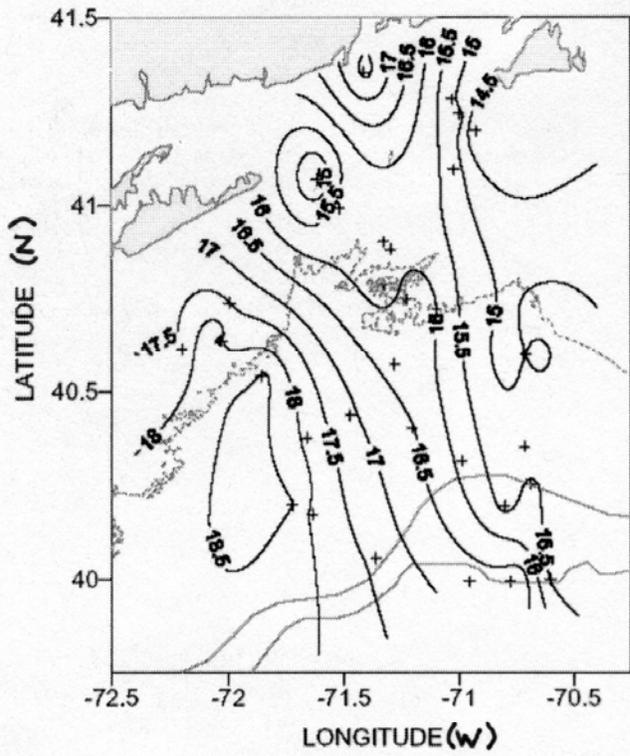
Anomaly, the areal average temp/salt anomaly.

SDV1, the standard deviation associated with the average temp/salt anomaly.

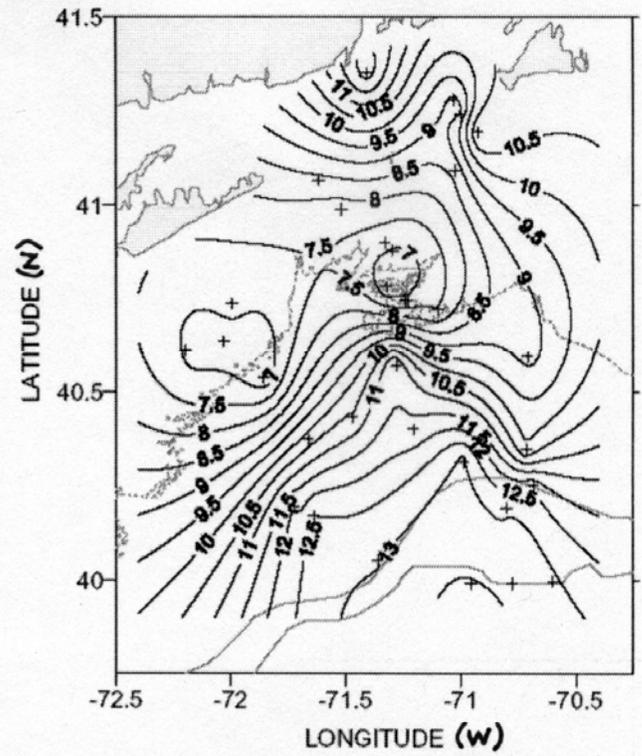
SDV2, the standard deviation of the individual anomalies from which the average anomaly was derived.

Flag, a value of "1" indicates that a true areal average could not be calculated due to poor station coverage. The areal averages listed were derived from a simple average of the observations within the region.

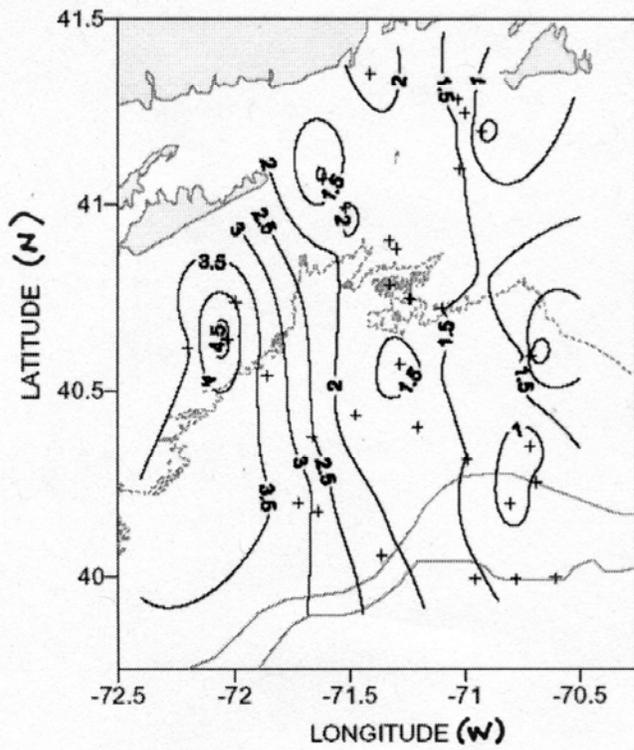
Purpose, 2 digit code assigned by DMS to identify a unique NEFSC program survey.



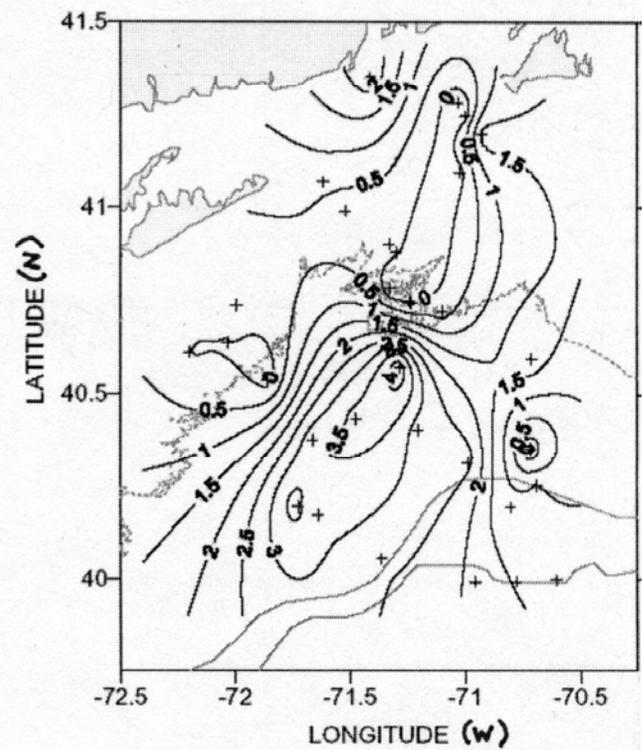
Surface Temperature (deg C)



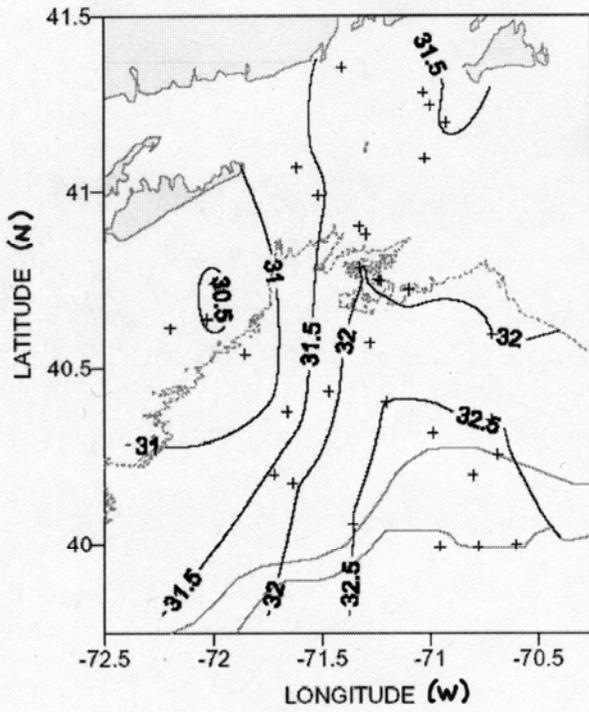
Bottom Temperature (deg C)



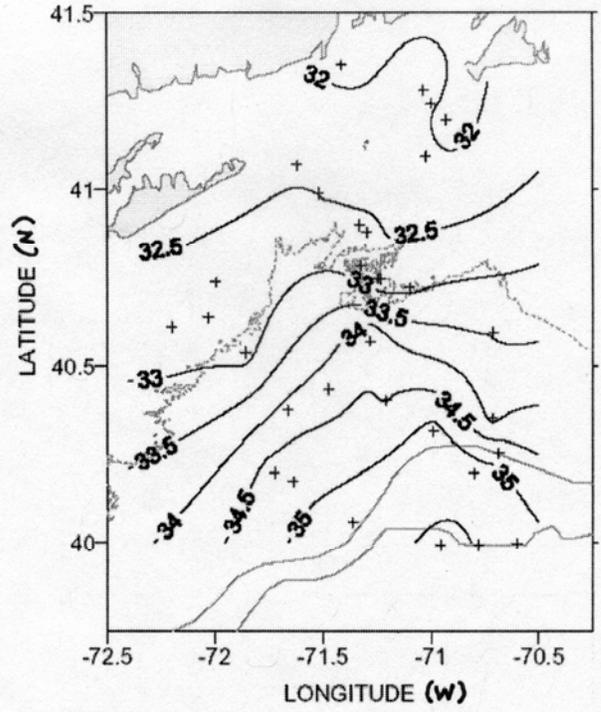
Surface Temperature Anomaly



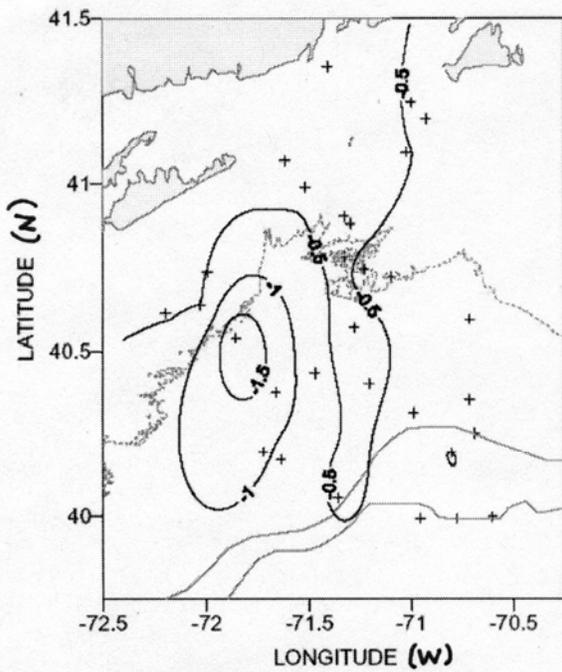
Bottom Temperature Anomaly



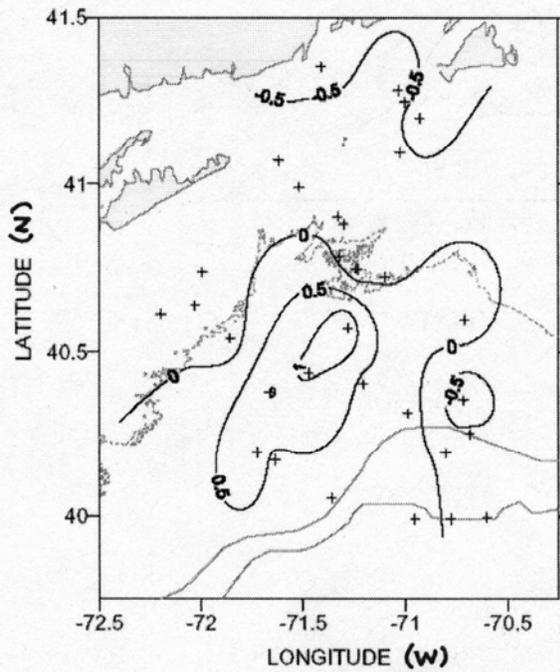
Surface Salinity (PSU)



Bottom Salinity (PSU)



Surface Salinity Anomaly



Bottom Salinity Anomaly

HB0804 Gear Test Cruise
9 - 13 June, 2008

Cast #	Sta #	Lat	Long	Day	Mo	Year	Time (GMT)	Btm Depth	Sfc Temp	Sfc Salt	Btm Temp	Btm Salt	Meters from Bottom
1	1	4116.9	7101.9	9	6	2008	23:10	41	15.05	31.56	8.86	32.19	5
2	1	4117.0	7101.5	9	6	2008	23:40	41	15.06	31.57	8.80	32.23	3
3	2	4114.7	7100.0	10	6	2008	0:19	38	15.05	31.56	8.88	32.18	3
4	2	4113.9	7059.5	10	6	2008	0:41	36	15.13	31.55	9.64	31.99	5
5	3	4111.8	7055.6	10	6	2008	1:28	34	14.05	31.45	10.87	31.84	3
6	3	4111.2	7055.2	10	6	2008	1:46	32	13.99	31.45	11.07	31.80	3
7	4	4105.6	7101.4	10	6	2008	2:37	39	15.28	31.69	8.64	32.14	5
8	4	4105.3	7101.7	10	6	2008	2:50	38	15.31	31.69	8.59	32.14	4
9	5	4104.1	7137.0	10	6	2008	5:19	42	14.40	31.45	8.40	32.39	5
10	5	4103.8	7137.1	10	6	2008	5:46	42	14.56	31.41	8.27	32.43	3
11	6	4059.4	7131.1	10	6	2008	6:37	52	15.77	31.42	7.75	32.50	4
12	6	4059.0	7130.8	10	6	2008	6:58	52	15.76	31.45	7.76	32.49	3
13	7	4054.1	7119.7	10	6	2008	8:01	57	15.63	31.82	7.20	32.58	4
14	7	4053.8	7119.6	10	6	2008	8:21	56	15.51	31.85	7.19	32.59	3
15	8	4052.8	7117.8	10	6	2008	8:55	57	15.89	31.92	6.96	32.63	3
16	8	4052.7	7117.5	10	6	2008	9:21	57	15.80	31.97	6.95	32.63	3
17	9	4047.1	7119.4	10	6	2008	10:40	60	15.72	31.99	6.60	32.72	3
18	9	4047.0	7119.3	10	6	2008	11:00	60	15.76	32.00	6.59	32.72	1
19	10	4044.3	7159.6	10	6	2008	13:46	46	17.48	30.43	7.15	32.68	3
20	10	4044.3	7159.3	10	6	2008	14:06	47	17.71	30.43	7.14	32.68	5
21	11	4036.8	7211.9	10	6	2008	15:43	51	17.43	30.76	6.97	32.66	4
22	11	4036.6	7211.4	10	6	2008	16:01	51	17.72	30.77	6.79	32.70	3
23	12	4038.3	7201.8	10	6	2008	17:17	53	18.67	30.45	6.87	32.75	4
24	12	4038.3	7201.4	10	6	2008	17:37	53	17.75	30.45	6.89	32.74	5
25	13	4032.4	7151.4	10	6	2008	18:47	67	18.52	30.60	6.69	32.82	3
26	13	4032.2	7150.7	10	6	2008	19:15	69	18.63	30.60	6.64	32.85	3
27	14	4044.8	7113.8	10	6	2008	21:53	61	16.35	31.93	7.09	32.66	4
28	14	4044.8	7113.8	10	6	2008	22:16	61	16.30	31.92	7.11	32.67	2
29	14	4044.9	7114.5	10	6	2008	22:53	61	16.11	31.94	7.10	32.68	4
30	15	4043.4	7106.3	10	6	2008	23:40	61	16.21	31.87	7.57	32.92	4
31	15	4043.4	7105.9	10	6	2008	23:55	60	15.91	31.90	7.53	32.91	5
32	16	4035.8	7043.3	11	6	2008	1:40	68	14.57	32.08	8.89	33.47	4

HB0804 Gear Test Cruise
9 - 13 June, 2008

Cast #	Sta #	Lat	Long	Day	Mo	Year	Time (GMT)	Btm Depth	Sfc Temp	Sfc Salt	Btm Temp	Btm Salt	Meters from Bottom
33	16	4035.8	7042.7	11	6	2008	1:57	68	15.81	31.87	8.80	33.43	4
34	17	4034.8	7117.3	11	6	2008	4:22	67	16.34	32.26	11.44	34.44	3
35	17	4034.3	7116.8	11	6	2008	4:46	68	16.34	32.29	11.42	34.44	3
36	18	4026.8	7129.2	11	6	2008	6:04	76	17.16	31.81	10.49	34.17	3
37	18	4026.1	7128.3	11	6	2008	6:22	76	17.08	31.83	10.47	34.16	3
38	19	4022.8	7139.6	11	6	2008	7:31	82	17.84	31.14	10.26	34.14	3
39	19	4022.6	7139.7	11	6	2008	7:58	82	17.83	31.14	10.20	34.13	5
40	20	4023.8	7113.3	11	6	2008	10:19	83	16.56	32.49	11.63	34.48	4
41	20	4024.2	7112.3	11	6	2008	11:04	83	16.33	32.67	10.29	33.39	55
42	21	4019.6	7059.4	11	6	2008	12:51	98	15.87	32.58	13.09	35.08	4
43	21	4018.9	7059.3	11	6	2008	13:21	101	15.87	32.58	13.04	35.10	4
44	22	4020.9	7042.8	11	6	2008	16:28	98	15.05	32.56	10.15	33.92	4
45	22	4021.2	7042.9	11	6	2008	17:02	98	15.06	32.56	10.08	33.89	4
46	23	4014.9	7041.5	11	6	2008	17:58	122	15.62	32.53	12.44	34.88	4
47	23	4015.2	7041.2	11	6	2008	18:36	122	15.34	32.52	12.39	34.87	6
48	24	4011.3	7049.2	11	6	2008	19:36	133	15.47	32.50	12.82	35.30	6
49	24	4011.7	7048.1	11	6	2008	20:23	131	15.35	32.50	12.95	35.19	5
50	25	4012.2	7142.7	12	6	2008	0:00	82	18.49	31.58	11.71	34.62	4
51	25	4011.8	7143.4	12	6	2008	0:24	82	18.51	31.57	12.11	34.76	4
52	26	4011.4	7138.2	12	6	2008	1:10	86	17.94	31.93	12.42	34.82	4
53	26	4010.4	7138.2	12	6	2008	1:38	86	17.90	31.92	12.48	34.81	4
54	27	4003.9	7121.0	12	6	2008	3:09	109	17.25	32.53	12.98	35.19	4
55	27	4003.4	7121.6	12	6	2008	3:34	108	17.39	32.47	12.92	35.22	2
56	28	3959.3	7057.4	12	6	2008	5:28	328	16.78	32.84	11.01	35.33	127
57	28	3959.6	7057.3	12	6	2008	6:16	310	16.71	32.84	11.05	35.36	103
58	29	3959.2	7045.0	12	6	2008	7:45	314	17.03	32.90	11.34	35.40	111
59	29	3959.6	7046.7	12	6	2008	8:30	302	16.70	32.77	10.61	35.33	99
60	30	4002.2	7034.4	12	6	2008	10:08	256	15.10	32.55	10.71	35.34	53
61	30	3959.9	7036.1	12	6	2008	11:11	260	15.44	32.57	10.40	35.30	53
62	44	4121.5	7124.2	13	6	2008	9:58	34	17.67	31.54	12.25	31.86	6
64	44	4121.2	7124.6	13	6	2008	10:21	33	17.60	31.62	12.21	31.92	7