Semiannual water column monitoring report

February - June 2002

Massachusetts Water Resources Authority

Environmental Quality Department
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SEMIANNUAL WATER COLUMN MONITORING REPORT

February – June 2002

Submitted to

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EXECUTIVE SUMMARY

The Massachusetts Water Resources Authority (MWRA) has collected water quality data in Massachusetts and Cape Cod Bays for the Harbor and Outfall Monitoring (HOM) Program since 1992. This monitoring is in support of the HOM Program mission to assess the environmental effects of the relocation of effluent discharge from Boston Harbor to Massachusetts Bay. The data from 1992 through September 5, 2000 were collected to establish baseline water quality conditions and to provide the means to detect significant departure from the baseline after the outfall becomes operational. The surveys have been designed to evaluate water quality on both a high-frequency basis for a limited area in the vicinity of the outfall site (nearfield surveys) and a low-frequency basis over an extended area throughout Boston Harbor, Massachusetts Bay, and Cape Cod Bay (farfield). This semi-annual report summarizes water column monitoring results for the seven surveys conducted from February to June 2002.

Over the course of the HOM program, a general trend in water quality events has emerged from the data collected in Massachusetts and Cape Cod Bays. The trends are evident even though the timing and year-to-year manifestations of these events are variable. The winter to spring transition in Massachusetts and Cape Cod Bays is usually characterized by a series of physical, biological, and chemical events: seasonal stratification, the winter/spring phytoplankton bloom, and nutrient depletion. This was generally the case in 2002. There was a winter/spring bloom of centric diatoms that was most prominent in Boston Harbor, coastal waters, and off of Cape Ann in February. A minor bloom of *Phaeocystis pouchetii* was observed throughout most of Massachusetts and Cape Cod Bays in April. Even with these blooms, surface waters across much of the region were not depleted with respect to nutrients until June.

The water column was weakly stratified at the deeper offshore and boundary stations during the April combined survey. In the nearfield, the water column did not begin to stratify until early May at the deeper eastern nearfield stations and remained well mixed further inshore. This is somewhat late for the onset of stratification. Stratification throughout the entire nearfield area did not set up until later in May. It was not until June that a strong pycnocline was established throughout the farfield. Freshwater input to surface waters typically drives the establishment of stratified conditions in March and April. In 2002, low precipitation and river flow resulted in a very weak salinity gradient and in turn a delay in the establishment of seasonal stratification.

The nutrient data for February to June 2002 generally followed the "typical" progress of seasonal events in Massachusetts and Cape Cod Bays. Maximum nutrient concentrations were observed in early February when the water column was well mixed and biological uptake of nutrients was limited. Nutrient concentrations in Cape Cod Bay surface waters were reduced by the winter/spring 'diatom bloom' in February and remained relatively low throughout the report period. Massachusetts Bay surface water nutrient concentrations decreased from early February through April. An exception to this was in the harbor and at nearshore stations along the entire coast where nutrients increased in April from the late February/early March levels. In the nearfield, nutrient levels decreased in the surface waters as stratification was developing. Nutrient concentrations in the surface waters were depleted throughout much of the nearfield region by mid April. Nutrient concentrations in the surface waters were depleted throughout the entire study area by June. Ammonium in the water column continues to be an excellent tracer, albeit not a conservative tracer, of the effluent plume in the nearfield.

Chlorophyll concentrations in the nearfield were relatively high in the first half of 2002, but the nearfield mean areal chlorophyll for winter/spring 2002 of 112 mg m^{-2} was well below the caution threshold of 182 mg m^{-2}. The 2002 winter/spring areal chlorophyll mean was almost double that observed in 2001 (69 mg m^{-2}). Although this was a substantial increase from 2001, it was still much

lower than the very high areal chlorophyll values seen winter/spring 1999 (176 mg m^{-2}) and 2000 (191 mg m^{-2}). These high winter/spring chlorophyll concentrations were coincident with substantial region-wide winter/spring diatom and *Phaeocystis* blooms of 1999 and 2000, respectively. Although the lack of a major region-wide bloom in 2002 resulted in lower chlorophyll concentrations in the nearfield in comparison to these two years, the 2002 winter/spring mean chlorophyll concentration was higher than the values observed during 1992 to 1998 of the baseline monitoring period.

Chlorophyll concentrations were high in the harbor, coastal waters, and Cape Cod Bay in February during the winter/spring diatom bloom. This coincided with peak production at harbor station F23 and elevated production at the nearfield stations. During the baseline period, Boston Harbor exhibited a gradual pattern of increasing areal production from winter through summer rather than the distinct winter/spring peaks observed at the nearfield sites. A shift in the seasonal cycle at station F23 was first observed in March 2001, but only as a slight winter/spring peak. In 2002, the peak areal production observed in Boston Harbor was of similar magnitude to baseline peaks, but occurred in February rather than June-July.

In late February, the highest chlorophyll concentrations were found at boundary stations F26 and F27 off of Cape Ann. These stations also had the highest abundance of phytoplankton observed for the entire February to June period, and the phytoplankton community was dominated by *Skeletonema costatum*. The SeaWiFS images for this time period suggest that these elevated chlorophyll values were due to entrainment of waters from the Gulf of Maine into northeastern Massachusetts Bay.

Nearfield chlorophyll concentrations peaked in early April coincident with the *Phaeocystis pouchetii* bloom. The April elevated chlorophyll and phytoplankton abundance coincided with the seasonal maxima in nearfield production with rates of 3500 and 4500 mg C m^{-2} d^{-1} at stations N04 and N18, respectively. These winter/spring bloom nearfield peaks are higher than production values measured from 1995 to 2001. However, these peak values are less than the highest calculated potential productivity values over the same period.

DO concentrations in 2002 were within the range of values observed during previous years and followed typical trends. Maximum concentrations occurred in February when the water column was well mixed. There was a small decrease in April, and DO concentrations reached minima for this time period in June throughout Massachusetts and Cape Cod Bays. The lowest DO %saturation values were observed in the bottom waters in Cape Cod Bay and at the deeper offshore and boundary stations where the survey mean values in June were only 86%. The lack of a major winter/spring bloom suggests that there may not be a problem with bottom water DO in 2002, although the presence of survey mean DO %saturation values of close to 85% suggests that other factors may be contributing to a regional decrease in DO during the first half of 2002.

Whole-water phytoplankton assemblages were dominated by several species of centric diatoms and unidentified microflagellates as is typical for the first half of the year. Blooms of centric diatoms (February) and *Phaeocystis pouchetii* (April) were observed over most of Massachusetts and Cape Cod Bays. Other than the April bloom of *Phaeocystis pouchetii,* there were no blooms of harmful or nuisance phytoplankton species in Massachusetts and Cape Cod Bays during this time period. While the dinoflagellate *Alexandrium tamarense* and the diatom *Pseudo-nitzschia pungens* were recorded, they were present in very low abundance. Total zooplankton abundance generally increased from February through June as typically observed, and zooplankton assemblages during the first half of 2002 were comprised of taxa recorded for the same time of year in previous years.

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1.0 INTRODUCTION

1.1 Program Overview

The Massachusetts Water Resources Authority (MWRA) has implemented a long-term Harbor and Outfall Monitoring (HOM) Program for Massachusetts and Cape Cod Bays. The objective of the HOM Program is to (1) test for compliance with NPDES permit requirements; (2) test whether the impact of the discharge on the environment is within the bounds projected by the SEIS; and (3) test whether change within the system exceeds the Contingency Plan thresholds. A detailed description of the monitoring and its rationale is provided in the Effluent Outfall Monitoring Plan developed for the baseline period and the post discharge monitoring plan (MWRA, 1997).

To monitor water quality conditions with respect to nutrients, water properties, phytoplankton and zooplankton, and water-column respiration and productivity, the MWRA conducts ambient water quality surveys in Massachusetts and Cape Cod Bays. The surveys have been designed to evaluate water quality on both a high-frequency basis for a limited area (nearfield) and a low-frequency basis for an extended area (farfield). The nearfield stations are located in the vicinity of the Massachusetts Bay outfall site (**Figure** 1-1) and the farfield stations are located throughout Boston Harbor, Massachusetts Bay, and Cape Cod Bay (**Figure** 1-2). The stations for the farfield surveys have been further separated into regional groupings according to geographic location to simplify regional data comparisons. This semiannual report summarizes water column monitoring results for the seven surveys conducted from February through June 2002 (**Table** 1-1).

Table 1-1. Water Quality Surveys for WF021-WF027 February to June 2002

Survey #	Type of Survey	Survey Dates
WF021	Nearfield/Farfield	February 5-9
WF022	Nearfield/Farfield	February 26-28, March 1
WN023	Nearfield	March 25
WF024	Nearfield/Farfield	April 5, 10-12
WN025	Nearfield	May 1
WN026	Nearfield	May 22
WF027	Nearfield/Farfield	June 10, 11, 14, 18

The bay outfall became operational on September 6, 2000. The seven surveys conducted during this semiannual period are the second set of winter/spring surveys conducted after discharge of secondary treated effluent from the outfall began. The data evaluated and discussed in this report focus on characterization of spatial and temporal trends for February to June 2002. Preliminary comparisons against baseline data are discussed and appropriate threshold values presented. A detailed evaluation of 2002 versus the baseline period (1992-2000) will be presented in the 2002 annual water column report.

Initial data summaries, along with specific field information, are available in individual survey reports submitted immediately following each survey. In addition, nutrient data reports (including calibration information, sensor and water chemistry data, and QC plots), plankton data reports, and productivity and respiration data reports are each submitted four times annually. Raw data summarized within this or any of the other reports are available from MWRA in hard copy and electronic formats.

1.2 Organization of the Semiannual Report

The scope of the semiannual report is focused primarily towards providing an initial compilation of the water column data collected during the reporting period. Secondarily, integrated physical and biological results are discussed for key water column events and potential areas for expanded discussion in the annual water column report are recommended. The report first provides a summary of the survey and laboratory methods (Section 2). The bulk of the report, as discussed in further detail below, presents results of water column data from the first seven surveys of 2002 (Sections 3-5). Finally, the major findings of the semiannual period are summarized in Section 6.

Section 3 includes data summary tables that present the major numeric results of water column surveys in the semiannual period by parameter. A description of data selection, integration information, and summary statistics are included with that section.

Sections 4 (Results of Water Column Measurements) and 5 (Productivity, Respiration, and Plankton Results) include preliminary interpretation of the data with selected graphic representations of the horizontal and vertical distribution of water column parameters in both the farfield and nearfield. The horizontal distribution of physical parameters is presented through regional contour plots. The vertical distribution of water column parameters is presented using time-series plots of averaged surface and bottom water column parameters and along vertical transects in the survey area (**Figure** 1-3). The time-series plots utilize average values of the surface water sample (the "A" depth, as described in Section 3), and the bottom water collection depth (the "E" depth). Examining data trends along four farfield transects (Boston-Nearfield, Cohassett, Marshfield and Nearfield-Marshfield), and one nearfield transect, allows three-dimensional presentation of water column conditions during each survey. One offshore transect (Boundary) enables analysis of results in the outermost boundary of the survey area during farfield surveys.

Results of water column physical, nutrient, chlorophyll, and dissolved oxygen data are provided in Section 4. Survey results were organized according to the physical characteristics of the water column during the semiannual period. The timing of water column vertical stratification, and the physical and biological status of the water column during stratification, significantly affects the temporal response of the water quality parameters, which provide a major focus for assessing effects of the outfall. This report describes the horizontal and vertical characterization of the water column during pre-stratification stage (WF021 – WN023), the early stratification stage (WF024 – WN025), and once seasonal stratification was established (WN026 – WF027). Time-series data are commonly provided for the entire semiannual period for clarity and context of the data presentation.

Productivity, respiration, and plankton measurements, along with corresponding discussion of chlorophyll and dissolved oxygen results, are provided in Section 5. Discussion of the biological processes and trends during the semiannual period is included in this section. A summary of the major water column events and unusual features of the semiannual period is presented in Section 6. References are provided in Section 7.

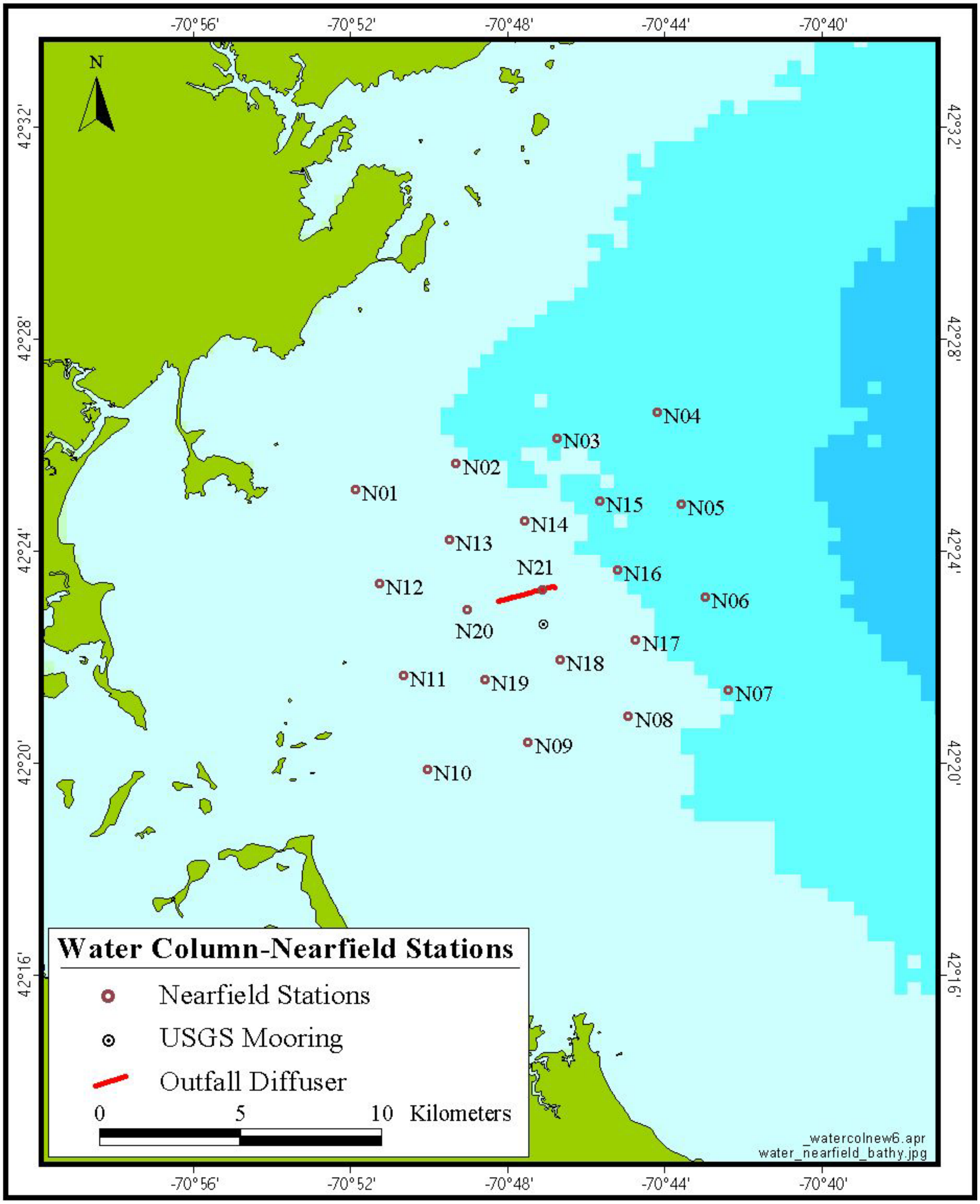


Figure 1-1. Locations of MWRA offshore outfall, nearfield stations and USGS mooring

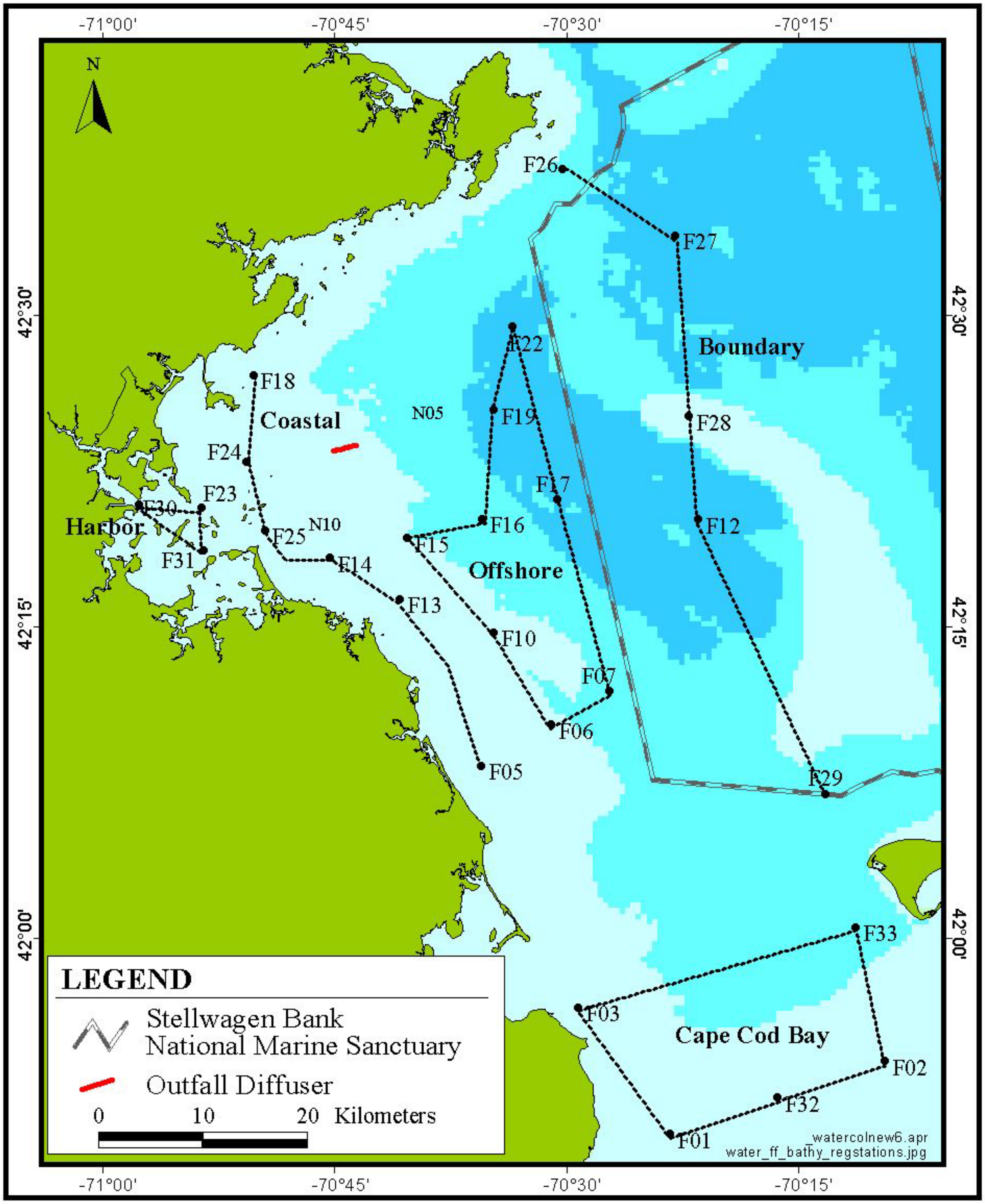


Figure 1-2. Locations of farfield stations and regional station groupings

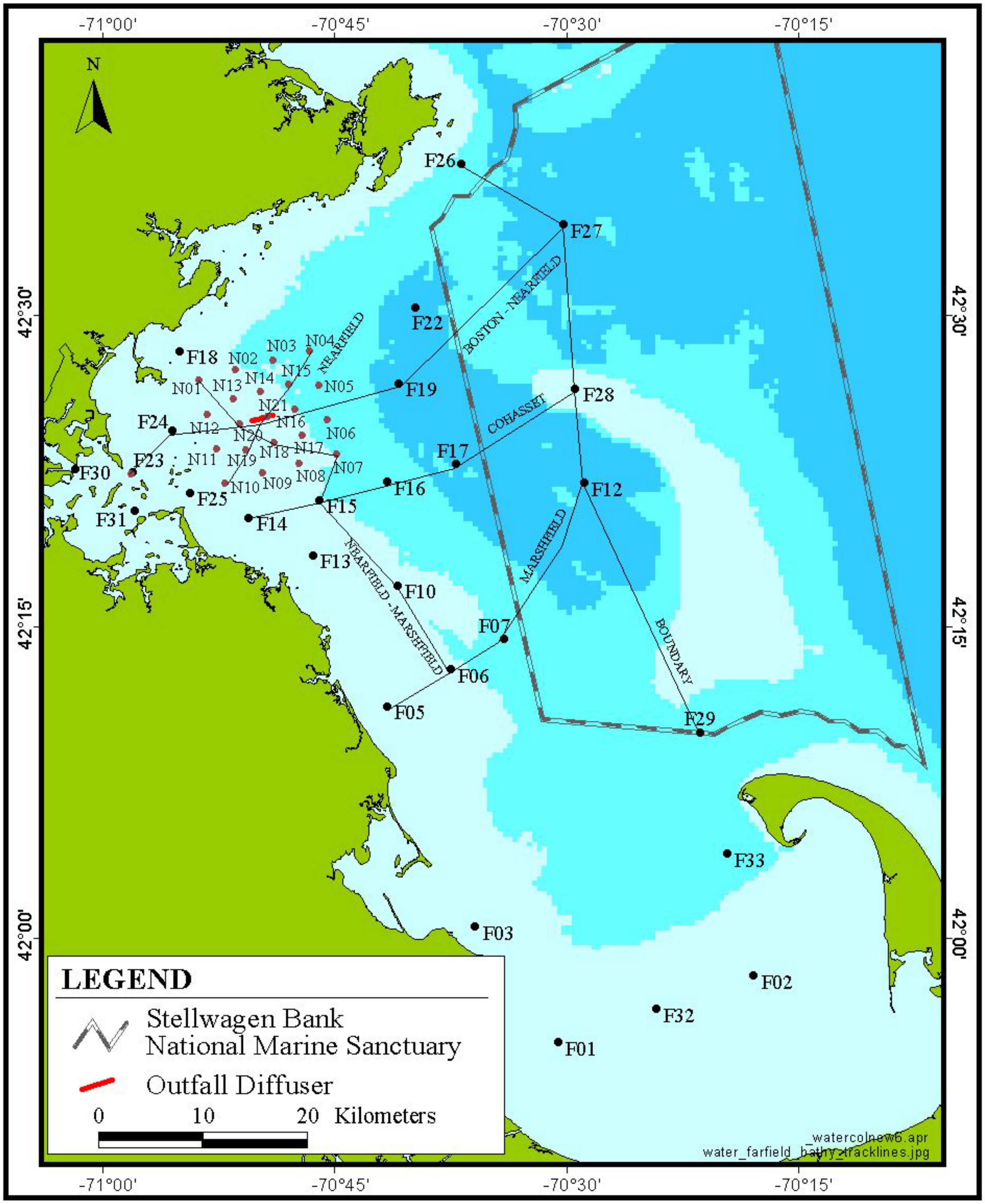


Figure 1-3. Locations of stations and selected transects

2.0 METHODS

This section describes general methods of data collection and sampling for the first seven water column monitoring surveys of 2002. Section 2.1 describes data collection methods, including survey dates, sampling platforms, and analyses performed. Section 2.2 describes the sampling schema undertaken, and Section 2.3 details specific operations for the first 2002 semi-annual period. Specific details of field sampling and analytical procedures, laboratory sample processing and analysis, sample handling and custody, calibration and preventative maintenance, documentation, data evaluation, and data quality procedures are discussed in the Water Quality Monitoring CW/QAPP (Libby *et al.,* 2002).

2.1 Data Collection

The farfield and nearfield water quality surveys for 2002 represent a continuation of the water quality monitoring conducted from 1992 - 2001. On September 6, 2000, the offshore outfall went online and began discharging effluent. The baseline monitoring period includes surveys from February 1992 to September 1, 2000. The last 5 fall 2000 surveys represented the beginning of the outfall discharge monitoring period, which continued in 2001 and 2002. The data collected during outfall discharge monitoring are evaluated internally and against baseline data. Data collection methods and schema have not changed from the baseline to the outfall discharge water quality monitoring periods.

Water quality data for this report were collected from the sampling platforms *R/V Aquamonitor* and *F/V Isabel S.* Continuous vertical profiles of the water column and discrete water samples were collected using a CTD/Go-Flo Bottle Rosette system. This system includes a deck unit to control the system, display *in situ* data, and store the data, and an underwater unit comprised of several environmental sensors, including conductivity, temperature, depth, dissolved oxygen, transmissometry, irradiance, and fluorescence. These measurements were obtained at each station by deploying the CTD; in general, one cast was made at each station. Water column profile data were collected during the downcast, and water samples were collected during the upcast by closing the Go-Flo bottles at selected depths, as discussed below.

Water samples were collected at five depths at each station, except at stations F30, F31, F32, and F33. Stations F30 and F31 are shallow and require only three depths while only zooplankton samples are collected at F32 and F33. These depths were selected during CTD deployment based on positions relative to the pycnocline or subsurface chlorophyll maximum. The bottom depth (within 5 meters of the sea floor) and the surface depth (within 3 meters of the water surface) of each cast remained constant and the mid-bottom, middle and mid-surface depths were selected to represent any variability in the water column. In general, the selected middle depth corresponded with the chlorophyll maximum and or pycnocline. When the chlorophyll maximum occurred significantly below or above the middle depth, the mid-bottom or mid-surface sampling event was substituted with the mid-depth sampling event and the "mid-depth" sample was collected within the maximum. In essence, the "mid-depth" sample in these instances was not collected from the middle depth, but shallower or deeper in the water column in order to capture the chlorophyll maximum layer. These nomenclature semantics result from a combination of field logistics and scientific relevance. In the field, the switching of the "mid-depth" sample with the mid-surface or mid-bottom was transparent to everyone except the NavSam© operator who observed the subsurface chlorophyll structure and marked the events. The samples were processed in a consistent manner and a more comprehensive set of analyses was conducted for the surface, mid-depth/chlorophyll maximum, and bottom samples.

Samples from each depth at each station were collected by subsampling from the Go-Flo bottles into the appropriate sample container. Analyses performed on the water samples are summarized in **Table** 2-1. Samples for dissolved inorganic nutrients (DIN), dissolved organic carbon (DOC), total dissolved nitrogen (TDN) and phosphorus (TDP), particulate organic carbon (POC) and nitrogen

(PON), biogenic silica, particulate phosphorus (PP), chlorophyll *a* and phaeopigments, total suspended solids (TSS), urea, and phytoplankton (screened and rapid assessment) were filtered and preserved immediately after obtaining water from the appropriate Go-Flo bottles. Whole water phytoplankton samples (unfiltered) were obtained directly from the Go-Flo bottles and immediately preserved. Zooplankton samples were obtained by deploying a zooplankton net overboard and making an oblique tow of the upper two-thirds of the water column but with a maximum tow depth of 30 meters. Productivity samples were collected from the Go-Flo bottles, stored on ice and transferred to University of Rhode Island (URI) employees. Incubation was started no more that six hours after initial water collection at URI's laboratory. Respiration samples were collected from the Go-Flo bottles at four stations (F19, F23, N04, and N18). Incubations of the dark bottles were started within 30 minutes of sample collection. The dark bottle samples were maintained at a temperature within 2°C of the collection temperature for 7±2 days until analysis.

2.2 Sampling Schema

A synopsis of the sampling schema for the analyses described above is outlined in **Tables** 2-1, 2-2, and 2-3. Station designations were assigned according to the type of analyses performed at that station (see **Table** 2-1). Productivity and respiration analyses were also conducted at certain stations and represented by the letters P and R, respectively. **Table** 2-1 lists the different analyses performed at each station. **Tables** 2-2 (nearfield stations) and 2-3 (farfield stations) provide the station name and type, and show the analyses performed at each depth. Station N16 is considered both a nearfield station (where it is designated as type A) and a farfield station (where it is designated a type D). Stations F32 and F33 are occupied during the first three farfield surveys of each year and collect zooplankton samples and hydrocast data only (designated as type Z).

Table 2-1. Station types and numbers (five depths collected unless otherwise noted)

Station Type	A	D	E	F	G[1]	P	R[4]	Z
Number of Stations	6	10	24	2	2	3	1	2
Analysis Type								
Dissolved inorganic nutrients	•	•	•	•	•	•		
Other nutrients (DOC, TDN, TDP, PC, PN, PP,	•	•			•	•		
Chlorophyll [1]	•	•			•	•		
Total suspended solids [1]	•	•			•	•		
Dissolved oxygen	•	•		•	•	•		
Phytoplankton, urea [2]		•			•	•		
Zooplankton[3]		•			•	•		•
Respiration [1]						•	•	
Productivity, DIN						•		

[1]Samples collected at three depths (bottom, mid-depth, and surface)
[2]Samples collected at two depths (mid-depth and surface)
[3]Vertical tow samples collected
[4]Respiration samples collected at type A station F19

2.3 Operations Summary

Field operations for water column sampling and analysis during the first semi-annual period were conducted as described above. Deviations from the CW/QAPP for surveys WF021, WF022, WN023, WF024, WN025, WN026, and WF027 had no effect on the data or data interpretation. For additional information about a specific survey, the individual survey reports may be consulted.

Table 2-2. Nearfield water column sampling plan (3 pages)

Nearfield Water Column Sampling Plan

StationID	Depth (m)	Station Type	Depths	Total Volume at Depth (L)	Number of 9-L GoFlos	Dissolved Inorganic Nutrients	Dissolved Organic Carbon	Total Dissolved Nitrogen and Phosphorous	Particulate Organic Carbon and Nitrogen	Particulate Phosphorous	Biogenic silica	Chlorophyll a	Total Suspended Solids	Dissolved Oxygen	Rapid Analysis Phytoplankton	Whole Water Phytoplankton	Screened Water Phytoplankton	Zooplankton	Urea	Respiration	Photosynthesis by carbon-14	Dissolved Inorganic Carbon
			Protocol Code			IN	OC	NP	PC	PP	BS	CH	TS	DO	RP	WW	SW	ZO	UR	RE	AP	IC
			Volume (L)			1	0.1	0.1	1	0.6	0.3	0.5	1	1	4	1	4	1	0.1	1	1	1
			1_Bottom	8.5	2	1	1	1	2	2	2	1	2	1								
			2_Mid-Bottom	2.5	1	1						1		1								
N01	30	A	3_Mid-Depth	10	2	2	1	1	2	2	2	2	2	1								
			4_Mid-Surface	2.5	1	1						1		1								
			5_Surface	8.5	2	1	1	1	2	2	2	1	2	1								
			1_Bottom	1	1	1																
			2_Mid-Bottom	1	1	1																
N02	40	E	3_Mid-Depth	1	1	1																
			4_Mid-Surface	1	1	1																
			5_Surface	1	1	1																
			1_Bottom	1	1	1																
			2_Mid-Bottom	1	1	1																
N03	44	E	3_Mid-Depth	1	1	1																
			4_Mid-Surface	1	1	1																
			5_Surface	1	1	1																
			1_Bottom	15.5	2	1	1	1	2	2	2	1	2							6	1	1
			2_Mid-Bottom	4.5	1	1						1		1							1	1
N04	50	D+	3_Mid-Depth	22.1	2	2	1	1	2	2	2	2	2			1	1		1	6	1	1
		R+	4_Mid-Surface	4.5	1	1						1		1							1	1
		P	5_Surface	20.6	2	1	1	1	2	2	2	1	2			1	1		1	6	1	1
			6_Net Tow															1				
			1_Bottom	1	1	1																
			2_Mid-Bottom	1	1	1																
N05	55	E	3_Mid-Depth	1	1	1																
			4_Mid-Surface	1	1	1																
			5_Surface	1	1	1																
			1_Bottom	1	1	1																
			2_Mid-Bottom	1	1	1																
N06	52	E	3_Mid-Depth	1	1	1																
			4_Mid-Surface	1	1	1																
			5_Surface	1	1	1																
			1_Bottom	10.5	2	1	1	1	2	2	2	1	2	3								
			2_Mid-Bottom	2.5	1	1						1		1								
N07	52	A	3_Mid-Depth	10	2	2	1	1	2	2	2	2	2	1								
			4_Mid-Surface	2.5	1	1						1		1								
			5_Surface	10.5	2	1	1	1	2	2	2	1	2	3								
			1_Bottom	1	1	1																
			2_Mid-Bottom	1	1	1																
N08	35	E	3_Mid-Depth	1	1	1																
			4_Mid-Surface	1	1	1																
			5_Surface	1	1	1																
			1_Bottom	1	1	1																

Nearfield Water Column Sampling Plan

StationID	Depth (m)	Station Type	Depths	Total Volume at Depth (L)	Number of 9-L GoFlos	Dissolved Inorganic Nutrients	Dissolved Organic Carbon	Total Dissolved Nitrogen and Phosphorous	Particulate Organic Carbon and Nitrogen	Particulate Phosphorous	Biogenic silica	Chlorophyll a	Total Suspended Solids	Dissolved Oxygen	Rapid Analysis Phytoplankton	Whole Water Phytoplankton	Screened Water Phytoplankton	Zooplankton	Urea	Respiration	Photosynthesis by carbon-14	Dissolved Inorganic Carbon
			Protocol Code			IN	OC	NP	PC	PP	BS	CH	TS	DO	RP	WW	SW	ZO	UR	RE	AP	IC
			2_Mid-Bottom	1	1	1																
N09	32	E	3_Mid-Depth	1	1	1																
			4_Mid-Surface	1	1	1																
			5_Surface	1	1	1																
			1_Bottom	8.5	2	1	1	1	2	2	2	1	2	1								
			2_Mid-Bottom	2.5	1	1						1		1								
N10	25	A	3_Mid-Depth	10	2	2	1	1	2	2	2	2	2	1								
			4_Mid-Surface	2.5	1	1						1		1								
			5_Surface	8.5	2	1	1	1	2	2	2	1	2	1								
			1_Bottom	1	1	1																
			2_Mid-Bottom	1	1	1																
N11	32	E	3_Mid-Depth	1	1	1																
			4_Mid-Surface	1	1	1																
			5_Surface	1	1	1																
			1_Bottom	1	1	1																
			2_Mid-Bottom	1	1	1																
N12	26	E	3_Mid-Depth	1	1	1																
			4_Mid-Surface	1	1	1																
			5_Surface	1	1	1																
			1_Bottom	1	1	1																
			2_Mid-Bottom	1	1	1																
N13	32	E	3_Mid-Depth	1	1	1																
			4_Mid-Surface	1	1	1																
			5_Surface	1	1	1																
			1_Bottom	1	1	1																
			2_Mid-Bottom	1	1	1																
N14	34	E	3_Mid-Depth	1	1	1																
			4_Mid-Surface	1	1	1																
			5_Surface	1	1	1																
			1_Bottom	1	1	1																
			2_Mid-Bottom	1	1	1																
N15	42	E	3_Mid-Depth	1	1	1																
			4_Mid-Surface	1	1	1																
			5_Surface	1	1	1																
			1_Bottom	8.5	2	1	1	1	2	2	2	1	2	1								
			2_Mid-Bottom	2.5	1	1						1		1								
N16	40	A	3_Mid-Depth	10.2	2	2	2	2	2	2	2	2	2	1								
			4_Mid-Surface	2.5	1	1						1		1								
			5_Surface	8.5	2	1	1	1	2	2	2	1	2	1								
			1_Bottom	1	1	1																
			2_Mid-Bottom	1	1	1																
N17	36	E	3_Mid-Depth	1	1	1																
			4_Mid-Surface	1	1	1																
			5_Surface	1	1	1																
			1_Bottom	15.5	2	1	1	1	2	2	2	1	2							6	1	1

Nearfield Water Column Sampling Plan

StationID	Depth (m)	Station Type	Depths	Total Volume at Depth (L)	Number of 9-L GoFlos	Dissolved Inorganic Nutrients	Dissolved Organic Carbon	Total Dissolved Nitrogen and Phosphorous	Particulate Organic Carbon and Nitrogen	Particulate Phosphorous	Biogenic silica	Chlorophyll a	Total Suspended Solids	Dissolved Oxygen	Rapid Analysis Phytoplankton	Whole Water Phytoplankton	Screened Water Phytoplankton	Zooplankton	Urea	Respiration	Photosynthesis by carbon-14	Dissolved Inorganic Carbon
			Protocol Code			IN	OC	NP	PC	PP	BS	CH	TS	DO	RP	WW	SW	ZO	UR	RE	AP	IC
		D+	2_Mid-Bottom	4.5	1	1						1		1							1	1
N18	30	R+	3_Mid-Depth	26.1	3	1	1	1	2	2	2	2	2		1	1	1		1	6	1	2
		P	4_Mid-Surface	4.5	1	1						1		1							1	1
			5_Surface	20.6	2	1	1	1	2	2	2	1	2			1	1		1	6	1	1
			6_Net Tow															1				
			1_Bottom	1	1	1																
			2_Mid-Bottom	1	1	1																
N19	24	E	3_Mid-Depth	1	1	1																
			4_Mid-Surface	1	1	1																
			5_Surface	1	1	1																
			1_Bottom	8.5	2	1	1	1	2	2	2	1	2	1								
			2_Mid-Bottom	2.5	1	1						1		1								
N20	32	A	3_Mid-Depth	10	2	2	1	1	2	2	2	2	2	1								
			4_Mid-Surface	2.5	1	1						1		1								
			5_Surface	8.5	2	1	1	1	2	2	2	1	2	1								
			1_Bottom	1	1	1																
			2_Mid-Bottom	1	1	1																
N21	34	E	3_Mid-Depth	1	1	1																
			4_Mid-Surface	1	1	1																
			5_Surface	1	1	1																
				Totals		111	22	22	42	42	42	42	42	33	1	4	4	2	4	36	10	11
Blanks A									1	1	1	1	1									

Table 2-3. Farfield water column sampling plan (3 pages)

Farfield Water Column Sampling Plan

StationID	Depth (m)	Station Type	Depths	Total Volume at Depth (L)	Number of 9-L GoFlos	Dissolved Inorganic Nutrients	Dissolved Organic Carbon	Total Dissolved Nitrogen and	Particulate Organic Carbon	Particulate Phosphorous	Biogenic silica	Chlorophyll a	Total Suspended Solids	Dissolved Oxygen	Secchi Disk Reading	Whole Water Phytoplankton	Screened Water Phytoplankton	Zooplankton	Urea	Respiration	Photosynthesis by carbon-14	Dissolved Inorganic Carbon
			Protocol Code			IN	OC	NP	PC	PP	BS	CH	TS	DO	SE	WW	SW	ZO	UR	RE	AP	IC
			Volume (L)			1	0.1	0.1	1	0.3	0.3	0.5	1	1	0	1	4	1	0.1	1	1	1
			1_Bottom	7.9	2	1	1	1	2	2	2	1	2	3								
			2_Mid-Bottom	2.5	1	1						1		1								
F01	27	D	3_Mid-Depth	14	2	1	1	1	2	2	2	2	2	1		1	1		1			
			4_Mid-Surface	2.5	1	1						1		1								
			5_Surface	13	2	1	1	1	2	2	2	1	2	3	1	1	1		1			
			6_Net Tow															1				
			1_Bottom	7.9	2	1	1	1	2	2	2	1	2	1								
			2_Mid-Bottom	2.5	1	1						1		1								
F02	33	D	3_Mid-Depth	15	2	2	1	1	2	2	2	2	2	1		1	1		1			
			4_Mid-Surface	2.5	1	1						1		1								
			5_Surface	13	2	1	1	1	2	2	2	1	2	1	1	1	1		1			
			6_Net Tow															1				
			1_Bottom	1	1	1																
			2_Mid-Bottom	1	1	1																
F03	17	E	3_Mid-Depth	1	1	1																
			4_Mid-Surface	1	1	1																
			5_Surface	1	1	1									1							
			1_Bottom	1	1	1																
			2_Mid-Bottom	1	1	1																
F05	18	E	3_Mid-Depth	1	1	1																
			4_Mid-Surface	1	1	1																
			5_Surface	1	1	1									1							
			1_Bottom	7.9	2	1	1	1	2	2	2	1	2	3								
			2_Mid-Bottom	2.5	1	1						1		1								
F06	35	D	3_Mid-Depth	15	2	2	1	1	2	2	2	2	2	1		1	1		1			
			4_Mid-Surface	2.5	1	1						1		1								
			5_Surface	13	2	1	1	1	2	2	2	1	2	3	1	1	1		1			
			6_Net Tow															1				
			1_Bottom	1	1	1																
			2_Mid-Bottom	1	1	1																
F07	54	E	3_Mid-Depth	1	1	1																
			4_Mid-Surface	1	1	1																
			5_Surface	1	1	1									1							
			1_Bottom	1	1	1																
			2_Mid-Bottom	1	1	1																
F10	30	E	3_Mid-Depth	1	1	1																
			4_Mid-Surface	1	1	1																
			5_Surface	1	1	1									1							
			1_Bottom	4	1	1								1								
			2_Mid-Bottom	2	1	1								1								
F12	90	F	3_Mid-Depth	2	1	1								1								
			4_Mid-Surface	2	1	1								1								
			5_Surface	4	1	1								1	1							
			1_Bottom	7.9	2	1	1	1	2	2	2	1	2	1								
			2_Mid-Bottom	2.5	1	1						1		1								
F13	25	D	3_Mid-Depth	15	2	2	1	1	2	2	2	2	2	1		1	1		1			
			4_Mid-Surface	2.5	1	1						1		1								
			5_Surface	13	2	1	1	1	2	2	2	1	2	1	1	1	1		1			
			6_Net Tow															1				

Farfield Water Column Sampling Plan

StationID	Depth (m)	Station Type	Depths	Total Volume at Depth (L)	Number of 9-L GoFlos	Dissolved Inorganic Nutrients	Dissolved Organic Carbon	Total Dissolved Nitrogen and	Particulate Organic Carbon	Particulate Phosphorous	Biogenic silica	Chlorophyll a	Total Suspended Solids	Dissolved Oxygen	Secchi Disk Reading	Whole Water Phytoplankton	Screened Water Phytoplankton	Zooplankton	Urea	Respiration	Photosynthesis by carbon-14	Dissolved Inorganic Carbon
			Protocol Code			IN	OC	NP	PC	PP	BS	CH	TS	DO	SE	WW	SW	ZO	UR	RE	AP	IC
			1_Bottom	1	1	1																
			2_Mid-Bottom	1	1	1																
F14	20	E	3_Mid-Depth	1	1	1																
			4_Mid-Surface	1	1	1																
			5_Surface	1	1	1									1							
			1_Bottom	1	1	1																
			2_Mid-Bottom	1	1	1																
F15	39	E	3_Mid-Depth	1	1	1																
			4_Mid-Surface	1	1	1																
			5_Surface	1	1	1									1							
			1_Bottom	1	1	1																
			2_Mid-Bottom	1	1	1																
F16	60	E	3_Mid-Depth	1	1	1																
			4_Mid-Surface	1	1	1																
			5_Surface	1	1	1									1							
			1_Bottom	1	1	1																
			2_Mid-Bottom	1	1	1																
F17	78	E	3_Mid-Depth	1	1	1																
			4_Mid-Surface	1	1	1																
			5_Surface	1	1	1									1							
			1_Bottom	1	1	1																
			2_Mid-Bottom	1	1	1																
F18	24	E	3_Mid-Depth	1	1	1																
			4_Mid-Surface	1	1	1																
			5_Surface	1	1	1									1							
			1_Bottom	7	2	1	1	1	2	2	2	1	2							6		
			2_Mid-Bottom	2	1	1						1		1								
F19	81	A	3_Mid-Depth	7	2	1	1	1	2	2	2	2	2							6		
		+R	4_Mid-Surface	2	1	1						1		1								
			5_Surface	7	2	1	1	1	2	2	2	1	2		1					6		
			1_Bottom	7.9	2	1	1	1	2	2	2	1	2	3								
			2_Mid-Bottom	2.5	1	1						1		1								
F22	80	D	3_Mid-Depth	14	2	1	1	1	2	2	2	2	2	1		1	1		1			
			4_Mid-Surface	2.5	1	1						1		1								
			5_Surface	13	2	1	1	1	2	2	2	1	2	3	1	1	1		1			
			6_Net Tow															1				
			1_Bottom	18	3	1	1	1	2	2	2	1	2							6	1	1
		D	2_Mid-Bottom	8.5	1	1						1		1							1	2
F23	25	+R	3_Mid-Depth	24	3	1	1	1	2	2	2	2	2			1	1		1	6	1	1
		+P	4_Mid-Surface	7.5	1	1						1		1							1	1
			5_Surface	23	3	1	1	1	2	2	2	1	2		1	1	1		1	6	1	1
			6_Net Tow															1				
			1_Bottom	7.9	2	1	1	1	2	2	2	1	2	3								
			2_Mid-Bottom	2.5	1	1						1		1								
F24	20	D	3_Mid-Depth	14	2	1	1	1	2	2	2	2	2	1		1	1		1			
			4_Mid-Surface	2.5	1	1						1		1								
			5_Surface	13	2	1	1	1	2	2	2	1	2	3	1	1	1		1			
			6_Net Tow															1				
			1_Bottom	9.9	2	1	1	1	2	2	2	1	2	1								
			2_Mid-Bottom	2.5	1	1						1		1								
F25	15	D	3_Mid-Depth	15	2	2	1	1	2	2	2	2	2	1		1	1		1			
			4_Mid-Surface	2.5	1	1						1		1								

Farfield Water Column Sampling Plan

StationID	Depth (m)	Station Type	Depths	Total Volume at Depth (L)	Number of 9-L GoFlos	Dissolved Inorganic Nutrients	Dissolved Organic Carbon	Total Dissolved Nitrogen and	Particulate Organic Carbon	Particulate Phosphorous	Biogenic silica	Chlorophyll a	Total Suspended Solids	Dissolved Oxygen	Secchi Disk Reading	Whole Water Phytoplankton	Screened Water Phytoplankton	Zooplankton	Urea	Respiration	Photosynthesis by carbon-14	Dissolved Inorganic Carbon
			Protocol Code			IN	OC	NP	PC	PP	BS	CH	TS	DO	SE	WW	SW	ZO	UR	RE	AP	IC
			5_Surface	15	2	1	1	1	2	2	2	1	2	3	1	1	1		1			
			6_Net Tow															1				
			1_Bottom	7.9	2	1	1	1	2	2	2	1	2	1								
			2_Mid-Bottom	2.5	1	1						1		1								
F26	56	D	3_Mid-Depth	15	2	1	1	1	2	2	2	2	2	1		1	1		1			
			4_Mid-Surface	2.5	1	1						1		1								
			5_Surface	13	2	1	1	1	2	2	2	1	2	1	1	1	1		1			
			6_Net Tow															1				
			1_Bottom	7.9	2	1	1	1	2	2	2	1	2	1								
			2_Mid-Bottom	2.5	1	1						1		1								
F27	108	D	3_Mid-Depth	15	2	2	1	1	2	2	2	2	2	1		1	1		1			
			4_Mid-Surface	2.5	1	1						1		1								
			5_Surface	13	2	1	1	1	2	2	2	1	2	1	1	1	1		1			
			6_Net Tow															1				
			1_Bottom	1	1	1																
			2_Mid-Bottom	1	1	1																
F28	33	E	3_Mid-Depth	1	1	1																
			4_Mid-Surface	1	1	1																
			5_Surface	1	1	1									1							
			1_Bottom	2	1	1								1								
			2_Mid-Bottom	2	1	1								1								
F29	66	F	3_Mid-Depth	2	1	1								1								
			4_Mid-Surface	2	1	1								1								
			5_Surface	2	1	1								1	1							
			1_Bottom	9.9	2	1	1	1	2	2	2	1	2	3								
			3_Mid-Depth	14	2	1	1	1	2	2	2	2	2	1		1	1		1			
F30	15	G	5_Surface	15	2	1	1	1	2	2	2	1	2	3	1	1	1		1			
			6_Net Tow															1				
			1_Bottom	9.9	2	1	1	1	2	2	2	1	2	3								
			3_Mid-Depth	14	2	1	1	1	2	2	2	2	2	1		1	1		1			
F31	15	G	5_Surface	15	2	1	1	1	2	2	2	1	2	3	1	1	1		1			
			6_Net Tow															1				
F32	30	Z	5_Surface												1							
			6_Net Tow															1				
F33	30	Z	5_Surface												1							
			6_Net Tow															1				
			1_Bottom	8.1	2	1	2	2	2	2	2	1	2	1								
			2_Mid-Bottom	2.5	1	1						1		1								
N16	40	D	3_Mid-Depth	15	2	2	2	2	2	2	2	2	2	1		1	1		1			
			4_Mid-Surface	2.5	1	1						1		1								
			5_Surface	13	2	1	1	1	2	2	2	1	2	1	1	1	1		1			
			6_Net Tow															1				
					otals	132	44	44	84	84	84	80	84	96	28	26	26	15	26	36	5	6
			Blanks B						1	1	1	1	1									
			Blanks C						1	1	1	1	1									
			Blanks D						1	1	1	1	1									

3.0 DATA SUMMARY PRESENTATION

Data from each survey were compiled from the final HOM Program 2002 database and organized to facilitate regional comparisons between surveys, and to allow a quick evaluation of results for evaluating monitoring thresholds (**Table** 3-1 Method Detection Limits, Data **Tables** 3-2 through 3-8). Each data table provides summary data for each parameter over the course of the seven surveys. The nearfield data are presented separately and in combination with data from other farfield areas for surveys WF021, WF022, WF024, and WF027. A discussion of which parameters were selected, how the data were grouped and integrated, and the assumptions behind the calculation of statistical values (average, minimum, and maximum) is provided below. Individual data summarized in this report are available from MWRA either in hard copy or electronic format.

The spatial pattern of data summary follows the sample design over major geographic areas of interest in Massachusetts Bay, Cape Cod Bay, and Boston Harbor (Section 3.1). Compilation of data both horizontally by region and vertically over the entire water column was conducted to provide an efficient way of assessing the status of the regions during a particular survey. Maximum and minimum values are provided because of the need to assess extremes of pre-outfall conditions relative to criteria being developed for contingency planning purposes (MWRA, 2001). Regional mean values for nutrient and biological water column data are calculated by averaging all samples collected at stations within each region. The "All" data summaries provide means based on the survey or regional mean values. Detailed considerations for individual data sets are provided in the sections below.

3.1 Defined Geographic Areas

The primary partitioning of data is between the nearfield and farfield stations (**Figures** 1-1 and 1-2). Farfield data were additionally segmented into five geographic areas: stations in Boston Harbor (F23, F30, and F31), coastal stations (F05, F13, F14, F18, F24, F25), offshore stations (F06, F07, F10, F15, F16, F17, F19, and F22), boundary region stations (F12, F26, F27, F28, F29), and Cape Cod Bay stations (F01, F02, and F03; and F32 and F33 as appropriate). These regions are shown in **Figure** 1-2.

The data summary tables include data derived from all of the station data collected in each region. Average, maximum, and minimum values are reported from the cumulative horizontal and vertical dataset as described for each data type below.

3.2 Sensor Data

Six CTD profile parameters provided in the data summary **Tables** 3-2 to 3-4 include temperature, salinity, density (σ_t), fluorescence (chlorophyll a), transmissivity, and dissolved oxygen (DO) concentration. Statistical parameters (maximum, minimum, and average) were calculated from the sensor readings collected at five depths through the water column (defined as A-E). These depths were sampled on the upcast of the hydrographic profile. The five depth values, rather than the entire set of profile data, were selected to reduce the statistical weighting of deep-water data at the offshore and boundary stations. Generally, the samples were collected in an even depth-distributed pattern. The mid-depth sample (C) was typically located at the subsurface fluorescence (chlorophyll) peak in the water column, depending on the relative depth of the chlorophyll maximum. Details of the collection, calibration, and processing of CTD data are available in the Water Column Monitoring CW/QAPP (Libby *et al.,* 2002), and are summarized in Section 2.

Following standard oceanographic practice, patterns of variability in water density are described using the derived parameter sigma-t ($\sigma_{t,}$), which is calculated by subtracting 1,000 kg/m^3 from the recorded density. During this semi-annual period, density varied from 1021.8 to 1026.1, meaning σ_t varied from 21.8 to 26.1.

Fluorescence data were calibrated using concomitant extracted (*in vitro*) chlorophyll *a* data from discrete water samples collected at a subset of the stations (see CW/QAPP or **Tables** 2-1, 2-2, 2-3). The calibrated fluorescence sensor values are used for all discussions of chlorophyll in this report except in the productivity section (5.1) where *in vitro* chlorophyll is presented. The concentrations of extracted chlorophyll and phaeopigments are also included in the summary data **Table** 3-4 along with *in situ* fluorescence for direct comparison.

In addition to DO concentration, the derived percent saturation is also presented. Percent saturation was calculated prior to averaging station visits from the potential saturation value of the water (a function of the physical properties of the water) and the calibrated DO concentration (see CW/QAPP).

Finally, the beam attenuation coefficient from the transmissometer ("transmittance") is presented in the summary tables. Beam attenuation is calculated from the natural logarithm of the ratio of light transmission relative to the initial light incidence, over the transmissometer path length, and is provided in units of m^{-1}.

3.3 Nutrients

Analytical results for dissolved and particulate nutrient concentrations were extracted from the HOM database, and include: ammonia (NH_4), nitrite (NO_2), nitrate + nitrite (NO_3+NO_2), phosphate (PO_4), silicate (SiO_4), biogenic silica (BSI), dissolved and particulate organic carbon (DOC and POC), total dissolved and particulate organic nitrogen (TDN and PON), total dissolved and particulate phosphorous (TDP and PP), and urea. These data are presented in **Tables** 3-5 to 3-9. Total suspended solids (TSS) data are provided as a baseline for total particulate matter in the water column. Dissolved inorganic nutrients (NH_4, NO_2, NO_3+NO_2, PO_4, and SiO_4) were measured from water samples collected from each of the five (A-E) depths during CTD casts. The dissolved organic and particulate constituents were measured from water samples collected from the surface (A), mid-depth (C), and bottom (E) sampling depths (see **Tables** 2-1, 2-2, and 2-3 for specific sampling depths and stations).

3.4 Biological Water Column Parameters

Four productivity parameters have been presented in the data summary **Tables** 3-10 and 3-11. The parameters α ($gC[gChla]^{-1}h^{-1}[\mu Em^{-2}s^{-1}]^{-1}$) and Pmax ($gC[gChla]^{-1}h^{-1}$) that are derived from the photosynthesis-irradiance curves (Appendix C) are presented in **Table** 3-10. Areal production, which is determined by integrating the measured productivity over the photic zone, and depth-averaged chlorophyll-specific production are included for the productivity stations (F23 representing the harbor, and N04 and N18, representing the nearfield). Because areal production is already depth-integrated, averages were calculated only among productivity stations for the two regions sampled.

Respiration rates were averaged over the respiration stations [the same harbor and nearfield stations as productivity, and additionally one offshore station (F19)] and over the three water column depths sampled (surface, mid- and bottom). The respiration samples were collected concurrently with the productivity samples. Detailed methods of sample collection, processing, and analysis are available in the CW/QAPP (Libby *et al.,* 2002).

3.5 Plankton

Plankton results were extracted from the HOM database and include whole water phytoplankton, screened phytoplankton, and zooplankton. Phytoplankton samples were collected for whole-water and screened measurements during the water column CTD casts at the surface (A) and mid-depth (C) sampling events. As discussed in Section 2.1, when a subsurface chlorophyll maximum is observed, the mid-depth sampling event is associated with this layer. The screened phytoplankton samples were filtered through 20-µm Nitex mesh to retain and concentrate larger dinoflagellate species. Zooplankton samples were collected by oblique tows using a 102-µm mesh at all plankton stations. Detailed methods of sample collection, processing, and analysis are available in the CW/QAPP (Libby *et al.,* 2002).

Final plankton values were derived from each station by first averaging analytical replicates, then averaging station visits. Regional results were summarized for total phytoplankton, total centric diatoms, nuisance algae (*Alexandrium tamarense, Phaeocystis pouchetii,* and *Pseudo-nitzschia pungens*), and total zooplankton (**Tables** 3-12 and 3-13).

Results for total phytoplankton and centric diatoms reported in **Table** 3-12 are restricted to whole water surface samples. Results of the nuisance species *Phaeocystis pouchetii* and *Pseudo-nitzschia pungens* include the maximum of both whole water and screened analyses, at both the surface and mid-depth. Although the size and shape of both taxa might allow them to pass through the Nitex screen, both have colonial forms that in low densities might be overlooked in the whole-water samples. For *Alexandrium tamarense*, only the screened samples were reported.

3.6 Additional Data

Two additional data sources were utilized during interpretation of HOM Program semi-annual water column data. Temperature and chlorophyll *a* satellite images collected near survey dates were preliminarily interpreted for evidence of surface water events, including intrusions of surface water masses from the Gulf of Maine and upwelling (Appendix D). U.S. Geological Service continuous *in situ* temperature and salinity data were collected from a mooring located between nearfield stations N21 and N18 (see **Figure** 1-1). Daily averaged temperature and salinity data are available from mid-surface (6 m), mid-depth (13 m), mid-bottom (20 m), and near-bottom (1 m above bottom). Chlorophyll *a* data (as measured by *in situ* fluorescence) from the MWRA WETStar sensor mounted at mid-depth (13 m) on the nearfield USGS mooring are also available. In section 4, the mooring data is presented along with data from stations N18 and N21 for comparison.

Data from the 10-meter above bottom (~20m depth) array are not available for the October 2001 to February 2002 deployment due to sensor problems. The 13-m array had a number of problems during the February to May 2002 deployment. The SeaCat CTD failed on April 15th and the WETStar sensor did not provide any useable data for the February to May deployment. Data for late May and June 2002 is not yet available, but will be included in the annual report.

Table 3-1. Method detection limits

Analysis	MDL
Dissolved ammonia (NH_4)	0.02 µM
Dissolved inorganic nitrate (NO_3)	0.01 µM
Dissolved inorganic nitrite (NO_2)	0.01 µM
Dissolved inorganic phosphorus (PO_4)	0.01 µM
Dissolved inorganic silicate (SIO_4)	0.02 µM
Dissolved organic carbon (DOC)	20 µM
Total dissolved nitrogen (TDN)	1.43 µM
Total dissolved phosphorus (TDP)	0.04 µM
Particulate carbon (POC)	5.27 µM
Particulate nitrogen (PON)	0.75 µM
Particulate phosphorus (PARTP)	0.04 µM
Biogenic silica (BIOSI)	0.32 µM
Urea	0.2 µM
Chlorophyll *a* and phaeophytin	0.036 µg L^{-1}
Total suspended solids (TSS)	0.1 mg L^{-1}

Table 3-2. Summary of *in situ* temperature, salinity, and density data for February - June 2002.

			Temperature (°C)			Salinity (PSU)			Sigma T		
Region	**Survey**	**Dates**	**Min**	**Max**	**Mean**	**Min**	**Max**	**Mean**	**Min**	**Max**	**Mean**
Nearfield	WF021	2/8	3.35	5.32	4.55	31.9	32.7	32.3	25.4	25.8	25.6
Nearfield	WF022	2/28	4.34	5.25	4.58	32.1	32.8	32.4	25.5	25.9	25.7
Nearfield	WN023	3/25	4.57	5.37	4.91	32.0	32.9	32.7	25.3	26.0	25.8
Nearfield	WF024	4/12	4.87	7.93	6.00	32.1	32.8	32.4	25.1	26.0	25.5
Nearfield	WN025	5/1	5.48	8.48	7.57	31.0	32.6	31.6	24.2	25.7	24.7
Nearfield	WN026	5/22	6.10	10.79	8.60	30.5	32.3	31.3	23.3	25.4	24.3
Nearfield	WF027	6/18	5.61	15.53	11.09	30.6	32.5	31.3	22.5	25.6	23.9
Nearfield	All		3.35	15.53	6.76	30.5	32.9	32.0	22.5	26.0	25.1
Boundary	WF021	2/5-9	4.62	5.96	5.18	32.5	33.0	32.7	25.7	26.0	25.8
Cape Cod Bay	WF021	2/5-9	3.70	4.03	3.84	31.0	32.1	31.9	24.6	25.5	25.3
Coastal	WF021	2/5-9	3.20	4.52	3.72	31.1	32.4	32.0	24.7	25.7	25.4
Harbor	WF021	2/5-9	2.84	3.36	3.16	29.4	32.0	31.2	23.4	25.5	24.9
Nearfield	WF021	2/5-9	3.35	5.32	4.55	31.9	32.7	32.3	25.4	25.8	25.6
Offshore	WF021	2/5-9	4.25	5.48	4.88	32.2	32.8	32.5	25.6	25.9	25.7
All	WF021		2.84	5.96	4.22	29.4	33.0	32.1	23.4	26.0	25.5
Boundary	WF022	2/26-3/1	4.76	5.93	5.11	32.4	33.1	32.7	25.7	26.1	25.9
Cape Cod Bay	WF022	2/26-3/1	3.67	4.20	3.93	31.6	32.2	32.0	25.1	25.6	25.4
Coastal	WF022	2/26-3/1	4.06	4.74	4.45	32.1	32.5	32.2	25.4	25.7	25.5
Harbor	WF022	2/26-3/1	3.91	4.89	4.24	29.8	31.9	31.5	23.6	25.3	25.0
Nearfield	WF022	2/26-3/1	4.34	5.25	4.58	32.1	32.8	32.4	25.5	25.9	25.7
Offshore	WF022	2/26-3/1	4.27	5.59	4.63	32.1	32.9	32.5	25.4	26.0	25.7
All	WF022		3.67	5.93	4.49	29.8	33.1	32.2	23.6	26.1	25.5
Boundary	WF024	4/5-12	4.96	6.32	5.52	32.1	33.1	32.6	25.3	26.1	25.7
Cape Cod Bay	WF024	4/5-12	5.26	6.57	5.68	31.5	32.3	31.9	24.7	25.5	25.2
Coastal	WF024	4/5-12	5.38	7.17	6.36	31.6	32.6	32.2	24.7	25.7	25.3
Harbor	WF024	4/5-12	7.03	8.10	7.37	29.2	32.1	31.4	22.7	25.1	24.5
Nearfield	WF024	4/5-12	4.87	7.93	6.00	32.1	32.8	32.4	25.1	26.0	25.5
Offshore	WF024	4/5-12	4.88	6.76	5.66	32.0	33.0	32.5	25.1	26.1	25.6
All	WF024	4/5-12	4.87	8.10	6.10	29.2	33.1	32.2	22.7	26.1	25.3
Boundary	WF027	6/10-18	5.39	12.69	9.18	30.4	32.8	31.9	23.0	25.9	24.6
Cape Cod Bay	WF027	6/10-18	7.08	13.78	11.59	30.8	32.2	31.4	23.0	25.2	23.8
Coastal	WF027	6/10-18	6.53	13.13	10.73	31.2	32.3	31.7	23.5	25.4	24.2
Harbor	WF027	6/10-18	11.98	13.76	13.15	29.3	31.4	30.6	21.8	23.8	23.0
Nearfield	WF027	6/10-18	5.61	15.53	11.09	30.6	32.5	31.3	22.5	25.6	23.9
Offshore	WF027	6/10-18	5.41	14.06	8.89	31.3	32.7	32.0	23.5	25.8	24.8
All	WF027	6/10-18	5.39	15.53	10.77	29.3	32.8	31.5	21.8	25.9	24.0

Table 3-3. Summary of *in situ* beam attenuation, dissolved oxygen concentration, and dissolved oxygen %saturation data for February - June 2002.

			Beam (m^{-1})			DO (mgL^{-1})			DO % Saturation		
Region	**Survey**	**Dates**	**Min**	**Max**	**Mean**	**Min**	**Max**	**Mean**	**Min**	**Max**	**Mean**
Nearfield	WF021	2/8	0.64	1.33	0.86	9.79	12.71	10.94	95.4	118.0	105.0
Nearfield	WF022	2/28	0.65	1.34	0.86	9.36	11.31	10.61	91.5	108.8	101.9
Nearfield	WN023	3/25	0.69	1.63	0.85	8.52	12.75	10.75	82.5	122.1	104.3
Nearfield	WF024	4/12	0.59	1.47	0.96	9.62	13.61	11.30	93.9	137.9	112.4
Nearfield	WN025	5/1	0.46	1.16	0.67	9.14	11.21	10.46	94.0	113.5	107.3
Nearfield	WN026	5/22	0.51	1.86	0.72	8.49	10.45	9.82	86.0	111.5	103.0
Nearfield	WF027	6/18	0.60	2.09	0.97	8.53	10.06	9.39	87.0	116.5	104.1
Nearfield	All		0.46	2.09	0.84	8.49	13.61	10.47	82.5	137.9	105.4
Boundary	WF021	2/5-9	0.60	0.97	0.67	9.47	10.59	10.05	94.3	102.8	98.1
Cape Cod Bay	WF021	2/5-9	0.87	1.59	1.13	10.88	11.68	11.23	102.2	108.9	105.6
Coastal	WF021	2/5-9	0.84	1.68	1.31	10.22	12.10	11.47	98.0	111.9	107.3
Harbor	WF021	2/5-9	1.42	1.98	1.59	11.59	12.54	12.03	107.7	115.3	110.7
Nearfield	WF021	2/5-9	0.64	1.33	0.86	9.79	12.71	10.94	95.4	118.0	105.0
Offshore	WF021	2/5-9	0.60	0.80	0.69	9.46	11.56	10.72	93.1	110.1	103.8
All	WF021		0.60	1.98	1.04	9.46	12.71	11.07	93.1	118.0	105.1
Boundary	WF022	2/26-3/1	0.55	1.76	0.85	9.49	12.64	10.89	94.6	123.6	106.2
Cape Cod Bay	WF022	2/26-3/1	0.71	0.91	0.78	10.50	11.18	10.96	99.5	105.0	103.3
Coastal	WF022	2/26-3/1	1.00	1.64	1.29	10.34	11.87	11.06	99.2	114.3	105.8
Harbor	WF022	2/26-3/1	1.60	2.32	1.91	11.09	12.01	11.44	105.0	114.3	108.3
Nearfield	WF022	2/26-3/1	0.65	1.34	0.86	9.36	11.31	10.61	91.5	108.8	101.9
Offshore	WF022	2/26-3/1	0.56	1.20	0.77	9.52	11.60	10.71	93.3	113.0	103.0
All	WF022		0.55	2.32	1.08	9.36	12.64	10.94	91.5	123.6	104.7
Boundary	WF024	4/5-12	0.58	1.10	0.76	9.40	12.03	10.54	91.5	120.4	103.7
Cape Cod Bay	WF024	4/5-12	0.89	1.43	1.24	10.18	12.03	10.95	99.3	118.1	107.6
Coastal	WF024	4/5-12	0.79	1.19	0.96	9.82	11.58	10.66	96.7	117.7	106.7
Harbor	WF024	4/5-12	1.27	1.78	1.40	9.21	10.85	10.51	93.3	110.5	107.2
Nearfield	WF024	4/5-12	0.59	1.47	0.96	9.62	13.61	11.30	93.9	137.9	112.4
Offshore	WF024	4/5-12	0.54	1.40	0.83	9.42	12.67	10.60	91.8	126.4	104.7
All	WF024	4/5-12	0.54	1.78	1.02	9.21	13.61	10.76	91.5	137.9	107.1
Boundary	WF027	6/10-18	0.53	1.08	0.76	8.32	10.03	9.42	81.8	112.4	100.7
Cape Cod Bay	WF027	6/10-18	0.67	1.62	1.04	7.06	9.63	9.11	72.7	110.7	102.3
Coastal	WF027	6/10-18	0.79	1.94	1.26	8.24	10.37	9.34	83.1	120.0	103.1
Harbor	WF027	6/10-18	1.58	2.66	2.27	8.46	9.42	8.76	97.7	110.1	101.0
Nearfield	WF027	6/10-18	0.60	2.09	0.97	8.53	10.06	9.39	87.0	116.5	104.1
Offshore	WF027	6/10-18	0.46	1.19	0.77	8.36	10.37	9.38	83.3	117.8	99.7
All	WF027	6/10-18	0.46	2.66	1.18	7.06	10.37	9.23	72.7	120.0	101.8

Table 3-4. Summary of *in situ* fluorescence, chlorophyll *a*, and phaeophytin data for February - June 2002.

			Fluorescence (μgL⁻¹)			Chlorophyll *a* (μgL⁻¹)			Phaeophytin (μgL⁻¹)		
Region	**Survey**	**Dates**	**Min**	**Max**	**Mean**	**Min**	**Max**	**Mean**	**Min**	**Max**	**Mean**
Nearfield	WF021	2/8	0.65	16.33	5.29	1.21	13.71	6.23	0.04	2.76	0.94
Nearfield	WF022	2/28	0.52	4.04	1.69	0.43	4.47	1.88	0.33	1.77	0.81
Nearfield	WN023	3/25	0.49	5.33	1.76	0.69	4.89	1.93	0.60	1.39	0.84
Nearfield	WF024	4/12	0.02	19.29	4.41	0.13	12.82	4.66	0.33	3.54	1.22
Nearfield	WN025	5/1	0.07	6.60	1.44	0.22	3.57	1.69	0.23	2.19	0.59
Nearfield	WN026	5/22	0.06	3.50	0.97	0.14	2.96	1.10	0.28	1.39	0.61
Nearfield	WF027	6/18	0.01	4.56	1.20	0.11	4.10	1.24	0.32	1.58	0.73
Nearfield	All		0.01	19.29	2.39	0.11	13.71	2.68	0.04	3.54	0.82
Boundary	WF021	2/5-9	0.13	3.13	1.40	0.35	1.50	0.85	0.22	1.05	0.49
Cape Cod Bay	WF021	2/5-9	2.55	12.45	6.50	3.16	4.71	3.87	0.33	0.99	0.58
Coastal	WF021	2/5-9	4.16	17.17	9.10	6.29	15.98	10.11	0.59	2.67	1.39
Harbor	WF021	2/5-9	11.71	19.51	14.89	9.20	18.16	13.33	0.95	5.88	2.52
Nearfield	WF021	2/5-9	0.65	16.33	5.29	1.21	13.71	6.23	0.04	2.76	0.94
Offshore	WF021	2/5-9	0.02	6.09	2.71	0.60	6.71	2.49	0.28	1.33	0.55
All	WF021		0.02	19.51	6.65	0.35	18.16	6.15	0.04	5.88	1.08
Boundary	WF022	2/26-3/1	0.47	16.61	3.82	0.25	9.82	4.28	0.17	3.11	1.53
Cape Cod Bay	WF022	2/26-3/1	0.31	1.83	1.07	0.36	1.52	0.99	0.20	0.49	0.33
Coastal	WF022	2/26-3/1	1.30	6.05	4.27	4.07	7.53	5.75	1.18	2.46	1.69
Harbor	WF022	2/26-3/1	6.08	10.03	7.22	5.38	11.20	7.22	1.49	2.67	1.90
Nearfield	WF022	2/26-3/1	0.52	4.04	1.69	0.43	4.47	1.88	0.33	1.77	0.81
Offshore	WF022	2/26-3/1	0.66	7.75	1.89	0.55	6.60	1.63	0.42	1.91	0.73
All	WF022		0.31	16.61	3.33	0.25	11.20	3.63	0.17	3.11	1.17
Boundary	WF024	4/5-12	0.02	8.94	1.99	0.15	3.26	0.97	0.19	1.61	0.60
Cape Cod Bay	WF024	4/5-12	0.02	11.41	6.70	2.73	8.78	5.10	0.49	2.51	1.37
Coastal	WF024	4/5-12	0.02	5.79	2.05	0.66	3.54	2.13	0.42	2.45	1.06
Harbor	WF024	4/5-12	0.79	3.96	2.48	1.92	3.21	2.47	0.94	1.68	1.28
Nearfield	WF024	4/5-12	0.02	19.29	4.41	0.13	12.82	4.66	0.33	3.54	1.22
Offshore	WF024	4/5-12	0.02	10.70	2.23	0.17	9.17	2.83	0.17	1.83	0.84
All	WF024	4/5-12	0.02	19.29	3.31	0.13	12.82	3.03	0.17	3.54	1.06
Boundary	WF027	6/10-18	0.02	3.09	1.03	0.06	2.40	1.27	0.19	1.16	0.67
Cape Cod Bay	WF027	6/10-18	0.17	4.75	1.84	0.32	1.36	0.80	0.25	0.67	0.45
Coastal	WF027	6/10-18	0.22	5.99	1.84	0.37	5.01	2.14	0.47	2.46	1.36
Harbor	WF027	6/10-18	1.44	5.13	2.70	1.73	4.13	2.90	1.61	3.19	2.10
Nearfield	WF027	6/10-18	0.01	4.56	1.20	0.11	4.10	1.24	0.32	1.58	0.73
Offshore	WF027	6/10-18	0.02	3.53	0.78	0.07	1.76	0.82	0.19	1.03	0.50
All	WF027	6/10-18	0.01	5.99	1.56	0.06	5.01	1.53	0.19	3.19	0.97

Table 3-5. Summary of ammonium, nitrite, and nitrite+nitrate data for February - June 2002.

Region	Survey	Dates	NH_4 (µM) Min	NH_4 (µM) Max	NH_4 (µM) Mean	NO_2 (µM) Min	NO_2 (µM) Max	NO_2 (µM) Mean	$NO_2 + NO_3$ (µM) Min	$NO_2 + NO_3$ (µM) Max	$NO_2 + NO_3$ (µM) Mean
Nearfield	WF021	2/8	0.27	7.49	1.87	0.17	0.32	0.25	2.80	10.98	7.48
Nearfield	WF022	2/28	0.56	6.80	1.70	0.15	0.23	0.19	3.40	11.15	5.96
Nearfield	WN023	3/25	0.49	10.43	2.64	0.07	0.25	0.14	1.29	6.92	4.61
Nearfield	WF024	4/12	0.09	18.79	2.17	0.02	0.29	0.16	0.11	10.00	4.83
Nearfield	WN025	5/1	0.25	14.24	3.70	0.02	0.21	0.09	0.11	4.34	0.60
Nearfield	WN026	5/22	0.42	10.28	3.32	0.06	0.22	0.12	0.30	3.41	1.05
Nearfield	WF027	6/18	0.13	23.02	2.07	0.02	0.21	0.09	0.04	6.82	1.17
Nearfield	All		0.09	23.02	2.49	0.02	0.32	0.15	0.04	11.15	3.67
Boundary	WF021	2/5-9	0.31	0.88	0.54	0.03	0.22	0.14	7.61	11.65	9.95
Cape Cod Bay	WF021	2/5-9	0.30	0.97	0.58	0.05	0.09	0.07	0.18	0.71	0.37
Coastal	WF021	2/5-9	0.44	2.25	0.94	0.22	0.29	0.25	3.08	8.32	6.12
Harbor	WF021	2/5-9	0.48	0.77	0.57	0.19	0.23	0.21	2.47	4.19	3.38
Nearfield	WF021	2/5-9	0.27	7.49	1.87	0.17	0.32	0.25	2.80	10.98	7.48
Offshore	WF021	2/5-9	0.33	0.86	0.53	0.12	0.27	0.19	5.64	11.16	8.24
All	WF021		0.27	7.49	0.84	0.03	0.32	0.18	0.18	11.65	5.92
Boundary	WF022	2/26-3/1	0.31	1.09	0.59	0.03	0.26	0.15	2.91	12.22	8.14
Cape Cod Bay	WF022	2/26-3/1	0.96	1.51	1.24	0.04	0.22	0.14	0.40	2.03	0.98
Coastal	WF022	2/26-3/1	0.50	1.75	1.02	0.07	0.23	0.15	1.01	5.87	2.89
Harbor	WF022	2/26-3/1	0.14	0.55	0.34	0.03	0.19	0.11	0.55	1.66	1.25
Nearfield	WF022	2/26-3/1	0.56	6.80	1.70	0.15	0.23	0.19	3.40	11.15	5.96
Offshore	WF022	2/26-3/1	0.30	2.49	0.89	0.04	0.29	0.21	1.06	12.17	6.03
All	WF022		0.14	6.80	0.96	0.03	0.29	0.16	0.40	12.22	4.21
Boundary	WF024	4/5-12	0.21	3.04	0.95	0.01	0.29	0.17	0.11	11.34	6.34
Cape Cod Bay	WF024	4/5-12	0.16	1.14	0.47	0.05	0.11	0.08	0.08	0.30	0.20
Coastal	WF024	4/5-12	0.03	2.93	1.32	0.13	0.25	0.21	2.06	6.36	4.45
Harbor	WF024	4/5-12	0.75	2.69	1.37	0.14	0.26	0.20	2.96	6.47	3.85
Nearfield	WF024	4/5-12	0.09	18.79	2.17	0.02	0.29	0.16	0.11	10.00	4.83
Offshore	WF024	4/5-12	0.03	3.34	1.17	0.03	0.27	0.19	0.38	10.73	5.98
All	WF024	4/5-12	0.03	18.79	1.24	0.01	0.29	0.17	0.08	11.34	4.28
Boundary	WF027	6/10-18	0.17	3.57	1.21	0.01	0.20	0.10	0.06	10.45	2.87
Cape Cod Bay	WF027	6/10-18	0.16	3.87	0.87	0.01	0.22	0.04	0.01	3.67	0.68
Coastal	WF027	6/10-18	0.12	4.69	1.25	0.01	0.27	0.09	0.01	4.79	1.47
Harbor	WF027	6/10-18	0.72	4.19	2.42	0.18	0.23	0.20	0.75	2.22	1.40
Nearfield	WF027	6/10-18	0.13	23.02	2.07	0.02	0.21	0.09	0.04	6.82	1.17
Offshore	WF027	6/10-18	0.04	4.05	1.43	0.01	0.18	0.07	0.01	10.14	3.31
All	WF027	6/10-18	0.04	23.02	1.54	0.01	0.27	0.10	0.01	10.45	1.82

Table 3-6. Summary of phosphate, silicate, and biogenic silica data for February - June 2002.

			PO_4 (µM)			SiO_4 (µM)			BioSi (µM)		
Region	**Survey**	**Dates**	**Min**	**Max**	**Mean**	**Min**	**Max**	**Mean**	**Min**	**Max**	**Mean**
Nearfield	WF021	2/8	0.60	1.17	0.94	5.32	10.77	6.96	1.25	2.61	1.73
Nearfield	WF022	2/28	0.56	1.13	0.80	5.47	12.04	7.41	1.80	4.80	2.55
Nearfield	WN023	3/25	0.37	1.08	0.72	0.66	5.10	2.63	2.30	4.10	2.92
Nearfield	WF024	4/12	0.19	1.62	0.71	1.47	13.08	6.27	1.40	9.36	4.42
Nearfield	WN025	5/1	0.08	0.61	0.27	0.67	2.76	1.39	0.60	8.80	2.08
Nearfield	WN026	5/22	0.25	0.83	0.44	1.24	6.08	3.69	0.84	4.03	1.85
Nearfield	WF027	6/18	0.16	1.47	0.47	0.93	8.05	3.39	0.56	4.29	1.74
Nearfield	All		0.08	1.62	0.62	0.66	13.08	4.53	0.56	9.36	2.47
Boundary	WF021	2/5-9	0.84	1.12	1.03	6.04	12.62	9.67	1.04	2.40	1.84
Cape Cod Bay	WF021	2/5-9	0.53	0.74	0.63	1.80	5.93	2.62	1.30	2.56	1.73
Coastal	WF021	2/5-9	0.51	1.11	0.85	5.56	7.04	6.09	2.97	4.81	3.79
Harbor	WF021	2/5-9	0.41	0.97	0.69	5.75	7.84	6.24	2.69	5.19	3.89
Nearfield	WF021	2/5-9	0.60	1.17	0.94	5.32	10.77	6.96	1.25	2.61	1.73
Offshore	WF021	2/5-9	0.76	1.37	1.00	5.38	11.16	7.48	1.30	2.04	1.64
All	WF021		0.41	1.37	0.86	1.80	12.62	6.51	1.04	5.19	2.44
Boundary	WF022	2/26-3/1	0.68	1.19	0.95	1.13	12.09	7.57	2.00	10.60	7.05
Cape Cod Bay	WF022	2/26-3/1	0.60	1.00	0.76	3.14	5.58	4.57	1.40	2.00	1.67
Coastal	WF022	2/26-3/1	0.50	0.89	0.64	3.46	8.49	5.22	4.20	7.20	5.42
Harbor	WF022	2/26-3/1	0.22	0.44	0.33	3.03	6.83	4.41	4.10	7.40	6.36
Nearfield	WF022	2/26-3/1	0.56	1.13	0.80	5.47	12.04	7.41	1.80	4.80	2.55
Offshore	WF022	2/26-3/1	0.51	1.18	0.87	3.65	13.54	7.04	1.30	7.80	2.84
All	WF022		0.22	1.19	0.72	1.13	13.54	6.04	1.30	10.60	4.32
Boundary	WF024	4/5-12	0.53	1.08	0.84	1.14	12.09	7.11	0.97	3.33	2.03
Cape Cod Bay	WF024	4/5-12	0.52	0.65	0.59	1.26	2.88	1.89	2.27	4.37	3.65
Coastal	WF024	4/5-12	0.48	0.93	0.68	2.88	6.88	4.42	2.12	3.14	2.43
Harbor	WF024	4/5-12	0.49	0.63	0.55	4.08	8.81	5.15	2.88	3.68	3.22
Nearfield	WF024	4/5-12	0.19	1.62	0.71	1.47	13.08	6.27	1.40	9.36	4.42
Offshore	WF024	4/5-12	0.34	1.10	0.80	2.65	12.69	6.10	1.68	6.15	3.17
All	WF024	4/5-12	0.19	1.62	0.70	1.14	13.08	5.16	0.97	9.36	3.15
Boundary	WF027	6/10-18	0.24	1.14	0.59	1.99	10.19	4.62	0.16	2.21	1.16
Cape Cod Bay	WF027	6/10-18	0.20	0.95	0.44	2.26	12.34	4.50	0.16	3.19	1.07
Coastal	WF027	6/10-18	0.19	0.94	0.47	0.72	7.64	3.39	2.42	6.04	4.41
Harbor	WF027	6/10-18	0.33	0.47	0.39	2.01	3.29	2.71	5.62	8.00	6.68
Nearfield	WF027	6/10-18	0.16	1.47	0.47	0.93	8.05	3.39	0.56	4.29	1.74
Offshore	WF027	6/10-18	0.14	1.19	0.62	0.47	14.64	4.98	0.16	20.00	2.97
All	WF027	6/10-18	0.14	1.47	0.50	0.47	14.64	3.93	0.16	20.00	3.01

Table 3-7. Summary of particulate carbon, nitrogen, and phosphorous data for February - June 2002.

Region	Survey	Dates	POC (µM) Min	POC (µM) Max	POC (µM) Mean	PON (µM) Min	PON (µM) Max	PON (µM) Mean	PartP (µM) Min	PartP (µM) Max	PartP (µM) Mean
Nearfield	WF021	2/8	10.1	48.3	25.8	1.63	7.36	4.12	0.10	0.60	0.28
Nearfield	WF022	2/28	8.4	44.7	23.1	1.36	6.36	3.53	0.14	0.55	0.29
Nearfield	WN023	3/25	11.5	32.4	21.3	2.04	5.35	3.58	0.14	0.39	0.24
Nearfield	WF024	4/12	5.8	103.0	38.0	1.25	14.60	6.20	0.07	0.89	0.38
Nearfield	WN025	5/1	14.7	43.3	25.7	2.25	6.52	4.07	0.11	0.41	0.23
Nearfield	WN026	5/22	7.8	35.8	19.2	1.36	6.41	3.49	0.09	0.38	0.22
Nearfield	WF027	6/18	7.6	41.7	21.4	1.32	6.64	3.58	0.07	0.42	0.20
Nearfield	All		5.8	103.0	24.9	1.25	14.60	4.08	0.07	0.89	0.26
Boundary	WF021	2/5-9	5.9	13.9	8.8	1.16	2.54	1.61	0.06	0.13	0.10
Cape Cod Bay	WF021	2/5-9	23.0	29.8	26.8	3.67	4.38	4.07	0.24	0.31	0.28
Coastal	WF021	2/5-9	35.4	66.6	44.1	4.95	13.14	7.00	0.37	0.66	0.50
Harbor	WF021	2/5-9	45.6	64.5	53.0	7.71	10.43	8.58	0.61	0.72	0.66
Nearfield	WF021	2/5-9	10.1	48.3	25.8	1.63	7.36	4.12	0.10	0.60	0.28
Offshore	WF021	2/5-9	7.6	29.5	17.0	1.30	5.56	2.61	0.08	0.27	0.14
All	WF021		5.9	66.6	29.2	1.16	13.14	4.66	0.06	0.72	0.33
Boundary	WF022	2/26-3/1	11.8	66.9	39.8	1.77	9.71	5.93	0.08	0.58	0.34
Cape Cod Bay	WF022	2/26-3/1	18.4	28.8	23.3	2.99	4.88	3.76	0.20	0.38	0.27
Coastal	WF022	2/26-3/1	45.1	57.7	52.9	6.36	8.57	7.34	0.45	0.72	0.57
Harbor	WF022	2/26-3/1	60.3	95.8	74.3	8.43	11.90	10.22	0.73	1.16	0.89
Nearfield	WF022	2/26-3/1	8.4	44.7	23.1	1.36	6.36	3.53	0.14	0.55	0.29
Offshore	WF022	2/26-3/1	9.6	30.3	17.3	1.46	4.94	2.83	0.10	0.32	0.20
All	WF022		8.4	95.8	38.4	1.36	11.90	5.60	0.08	1.16	0.43
Boundary	WF024	4/5-12	2.6	24.5	12.4	1.00	4.88	2.38	0.05	0.26	0.13
Cape Cod Bay	WF024	4/5-12	28.0	45.8	37.4	3.37	7.14	5.25	0.23	0.39	0.32
Coastal	WF024	4/5-12	13.2	63.9	27.3	2.58	11.80	5.06	0.14	0.30	0.24
Harbor	WF024	4/5-12	25.0	30.6	27.9	4.41	5.49	4.97	0.31	0.37	0.33
Nearfield	WF024	4/5-12	5.8	103.0	38.0	1.25	14.60	6.20	0.07	0.89	0.38
Offshore	WF024	4/5-12	6.1	54.6	23.3	1.13	9.36	4.01	0.07	0.52	0.23
All	WF024	4/5-12	2.6	103.0	27.7	1.00	14.60	4.64	0.05	0.89	0.27
Boundary	WF027	6/10-18	2.6	32.3	18.7	0.89	5.71	3.33	0.06	0.32	0.18
Cape Cod Bay	WF027	6/10-18	13.4	68.6	28.3	2.29	6.80	4.03	0.12	0.20	0.14
Coastal	WF027	6/10-18	12.0	60.8	35.3	1.93	12.07	5.96	0.10	0.82	0.40
Harbor	WF027	6/10-18	35.8	52.8	42.8	5.91	8.81	7.18	0.42	0.51	0.46
Nearfield	WF027	6/10-18	7.6	41.7	21.4	1.32	6.64	3.58	0.07	0.42	0.20
Offshore	WF027	6/10-18	7.2	37.4	21.5	1.16	5.46	3.30	0.07	0.51	0.17
All	WF027	6/10-18	2.6	68.6	28.0	0.89	12.07	4.56	0.06	0.82	0.26

Table 3-8. Summary of dissolved organic carbon, nitrogen, and phosphorous data for February - June 2002.

			DOC (µM)			TDN (µM)			TDP (µM)		
Region	**Survey**	**Dates**	**Min**	**Max**	**Mean**	**Min**	**Max**	**Mean**	**Min**	**Max**	**Mean**
Nearfield	WF021	2/8	110.1	233.0	156.9	15.0	23.2	20.6	0.83	1.33	1.18
Nearfield	WF022	2/28	100.1	150.2	118.8	15.3	23.9	18.2	0.93	1.38	1.13
Nearfield	WN023	3/25	96.4	130.7	113.4	11.9	21.3	15.6	0.70	1.30	1.01
Nearfield	WF024	4/12	103.0	148.0	120.6	11.1	28.2	18.4	0.51	1.28	0.91
Nearfield	WN025	5/1	101.7	121.2	113.5	8.1	18.8	12.6	0.31	0.85	0.59
Nearfield	WN026	5/22	117.7	170.4	146.7	10.2	22.1	13.9	0.49	0.97	0.65
Nearfield	WF027	6/18	128.0	166.7	143.9	11.0	32.8	16.5	0.38	1.43	0.69
Nearfield	All		96.4	233.0	130.6	8.1	32.8	16.5	0.31	1.43	0.88
Boundary	WF021	2/5-9	142.6	150.6	146.6	21.8	24.1	23.0	1.24	1.32	1.27
Cape Cod Bay	WF021	2/5-9	142.8	268.4	205.6	15.8	15.8	15.8	0.81	0.81	0.81
Coastal	WF021	2/5-9	155.7	253.7	191.2	18.6	18.6	18.6	1.01	1.01	1.01
Harbor	WF021	2/5-9	126.2	271.4	178.4	15.6	16.3	15.9	0.67	0.80	0.75
Nearfield	WF021	2/5-9	110.1	233.0	156.9	15.0	23.2	20.6	0.83	1.33	1.18
Offshore	WF021	2/5-9	142.9	195.6	160.5	17.4	30.4	21.9	1.03	1.24	1.15
All	WF021		110.1	271.4	173.2	15.0	30.4	19.3	0.67	1.33	1.03
Boundary	WF022	2/26-3/1	107.8	131.6	118.6	12.2	22.4	17.0	0.74	1.42	1.02
Cape Cod Bay	WF022	2/26-3/1	124.4	143.7	133.7	11.5	13.9	13.0	0.84	0.97	0.92
Coastal	WF022	2/26-3/1	122.5	134.9	130.1	11.6	14.4	13.6	0.70	1.19	0.84
Harbor	WF022	2/26-3/1	124.9	165.0	148.7	10.3	13.8	12.4	0.46	0.68	0.59
Nearfield	WF022	2/26-3/1	100.1	150.2	118.8	15.3	23.9	18.2	0.93	1.38	1.13
Offshore	WF022	2/26-3/1	112.2	129.0	118.1	12.6	23.1	17.0	0.99	1.36	1.11
All	WF022		100.1	165.0	128.0	10.3	23.9	15.2	0.46	1.42	0.93
Boundary	WF024	4/5-12	110.6	129.5	117.9	13.6	20.8	17.2	0.75	1.21	1.01
Cape Cod Bay	WF024	4/5-12	131.2	172.4	149.3	10.8	24.0	16.8	0.66	0.86	0.76
Coastal	WF024	4/5-12	118.7	141.7	131.8	13.8	19.0	16.6	0.70	1.10	0.88
Harbor	WF024	4/5-12	112.0	156.2	136.6	15.3	23.0	18.5	0.74	1.21	0.82
Nearfield	WF024	4/5-12	103.0	148.0	120.6	11.1	28.2	18.4	0.51	1.28	0.91
Offshore	WF024	4/5-12	109.7	147.6	134.3	9.1	20.4	16.4	0.51	1.17	0.89
All	WF024	4/5-12	103.0	172.4	131.7	9.1	28.2	17.3	0.51	1.28	0.88
Boundary	WF027	6/10-18	132.2	157.1	143.9	11.3	32.0	20.0	0.38	1.21	0.70
Cape Cod Bay	WF027	6/10-18	140.8	163.4	152.1	11.1	25.0	16.9	0.48	1.13	0.71
Coastal	WF027	6/10-18	136.6	175.0	156.4	13.9	40.1	21.4	0.51	1.19	0.78
Harbor	WF027	6/10-18	159.1	192.6	170.3	13.8	27.7	20.2	0.63	0.85	0.72
Nearfield	WF027	6/10-18	128.0	166.7	143.9	11.0	32.8	16.5	0.38	1.43	0.69
Offshore	WF027	6/10-18	124.5	161.3	145.6	12.4	34.3	20.1	0.39	1.33	0.75
All	WF027	6/10-18	124.5	192.6	152.0	11.0	40.1	19.2	0.38	1.43	0.73

Table 3-9. Summary of urea and total suspended solids data for February - June 2002.

			Urea (μM)			TSS (mgL^{-1})		
Region	**Survey**	**Dates**	**Min**	**Max**	**Mean**	**Min**	**Max**	**Mean**
Nearfield	WF021	2/8	0.10	0.30	0.13	0.44	4.16	0.97
Nearfield	WF022	2/28	0.10	0.32	0.19	0.45	2.38	0.91
Nearfield	WN023	3/25	0.20	0.24	0.23	0.51	2.05	0.91
Nearfield	WF024	4/12	0.10	0.24	0.12	0.33	2.01	0.99
Nearfield	WN025	5/1	0.10	0.34	0.16	0.05	2.21	0.57
Nearfield	WN026	5/22	0.10	0.10	0.10	0.08	1.87	0.48
Nearfield	WF027	6/18	0.10	0.28	0.20	0.21	2.23	0.72
Nearfield	All		0.10	0.34	0.16	0.05	4.16	0.79
Boundary	WF021	2/5-9	0.10	0.30	0.15	0.42	1.10	0.79
Cape Cod Bay	WF021	2/5-9	0.10	0.63	0.27	0.54	0.93	0.77
Coastal	WF021	2/5-9	0.10	0.23	0.12	2.24	3.29	2.85
Harbor	WF021	2/5-9	0.10	0.23	0.14	1.77	3.32	2.38
Nearfield	WF021	2/5-9	0.10	0.30	0.13	0.44	4.16	0.97
Offshore	WF021	2/5-9	0.10	0.10	0.10	0.42	1.02	0.75
All	WF021		0.10	0.63	0.15	0.42	4.16	1.42
Boundary	WF022	2/26-3/1	0.10	0.10	0.10	0.75	1.83	1.39
Cape Cod Bay	WF022	2/26-3/1	0.10	0.32	0.23	0.64	1.05	0.77
Coastal	WF022	2/26-3/1	0.10	0.25	0.15	1.20	4.05	2.68
Harbor	WF022	2/26-3/1	0.10	0.39	0.15	2.94	3.99	3.47
Nearfield	WF022	2/26-3/1	0.10	0.32	0.19	0.45	2.38	0.91
Offshore	WF022	2/26-3/1	0.10	0.10	0.10	0.36	1.16	0.70
All	WF022		0.10	0.39	0.15	0.36	4.05	1.65
Boundary	WF024	4/5-12	0.10	0.54	0.34	0.21	0.64	0.39
Cape Cod Bay	WF024	4/5-12	0.10	0.31	0.15	0.56	1.51	1.14
Coastal	WF024	4/5-12	0.10	0.31	0.14	0.19	0.84	0.56
Harbor	WF024	4/5-12	0.10	1.90	0.56	1.40	2.61	1.85
Nearfield	WF024	4/5-12	0.10	0.24	0.12	0.33	2.01	0.99
Offshore	WF024	4/5-12	0.10	0.62	0.28	0.05	1.21	0.62
All	WF024	4/5-12	0.10	1.90	0.26	0.05	2.61	0.92
Boundary	WF027	6/10-18	0.21	0.25	0.22	0.32	0.71	0.50
Cape Cod Bay	WF027	6/10-18	0.10	0.36	0.24	0.14	0.73	0.37
Coastal	WF027	6/10-18	0.10	0.36	0.22	0.46	2.96	1.58
Harbor	WF027	6/10-18	0.10	0.36	0.27	2.41	5.10	3.36
Nearfield	WF027	6/10-18	0.10	0.28	0.20	0.21	2.23	0.72
Offshore	WF027	6/10-18	0.10	0.21	0.13	0.08	10.04	1.47
All	WF027	6/10-18	0.10	0.36	0.21	0.08	10.04	1.33

Table 3-10. Summary of production parameters alpha and Pmax data for February - June 2002. Production is only measured in nearfield and Boston Harbor (stations N04, N18, and F23).

			Alpha $[mgCm^{-3}h^{-1}(\mu Em^{-2}s^{-1})^{-1}]$			Pmax $(mgCm^{-3}h^{-1})$		
Region	**Survey**	**Dates**	**Min**	**Max**	**Mean**	**Min**	**Max**	**Mean**
Nearfield	WF021	2/8	0.035	0.204	0.112	2.70	26.97	13.56
Nearfield	WF022	2/28	0.008	0.046	0.030	1.08	5.08	3.24
Nearfield	WN023	3/25	0.017	0.100	0.068	1.94	9.27	6.94
Nearfield	WF024	4/12	0.014	0.441	0.208	1.11	50.98	22.00
Nearfield	WN025	5/1	0.011	0.071	0.042	1.49	6.73	4.46
Nearfield	WN026	5/22	0.004	0.047	0.026	0.35	3.17	1.88
Nearfield	WF027	6/18	0.017	0.064	0.045	1.43	8.64	4.19
Nearfield	All		0.004	0.441	0.076	0.35	50.98	8.04
Boundary	WF021	2/5-9						
Cape Cod Bay	WF021	2/5-9						
Coastal	WF021	2/5-9						
Harbor	WF021	2/5-9	0.373	0.464	0.399	43.11	50.86	45.78
Nearfield	WF021	2/5-9	0.035	0.204	0.112	2.70	26.97	13.56
Offshore	WF021	2/5-9						
All	WF021		0.035	0.464	0.255	2.70	50.86	29.67
Boundary	WF022	2/26-3/1						
Cape Cod Bay	WF022	2/26-3/1						
Coastal	WF022	2/26-3/1						
Harbor	WF022	2/26-3/1	0.118	0.205	0.169	12.72	15.70	14.01
Nearfield	WF022	2/26-3/1	0.008	0.046	0.030	1.08	5.08	3.24
Offshore	WF022	2/26-3/1						
All	WF022		0.008	0.205	0.099	1.08	15.70	8.63
Boundary	WF024	4/5-12						
Cape Cod Bay	WF024	4/5-12						
Coastal	WF024	4/5-12						
Harbor	WF024	4/5-12	0.083	0.133	0.104	8.53	9.72	9.32
Nearfield	WF024	4/5-12	0.014	0.441	0.208	1.11	50.98	22.00
Offshore	WF024	4/5-12						
All	WF024	4/5-12	0.014	0.441	0.156	1.11	50.98	15.66
Boundary	WF027	6/10-18						
Cape Cod Bay	WF027	6/10-18						
Coastal	WF027	6/10-18						
Harbor	WF027	6/10-18	0.049	0.078	0.063	8.07	10.94	8.99
Nearfield	WF027	6/10-18	0.017	0.064	0.045	1.43	8.64	4.19
Offshore	WF027	6/10-18						
All	WF027	6/10-18	0.017	0.078	0.054	1.43	10.94	6.59

Table 3-11. Summary of areal production, depth-averaged chlorophyll-specific production, and respiration data for February - June 2002. Production is only measured in nearfield and Boston Harbor (stations N04, N18, and F23). Respiration is measured at the production stations and at offshore station F19.

			Areal Production ($mgCm^{-2}d^{-1}$)			Depth-averaged Chlorophyll- specific Production ($mgCmgChl a^{-1}d^{-1}$)			Respiration (μMO_2h^{-1})		
Region	**Survey**	**Dates**	**Min**	**Max**	**Mean**	**Min**	**Max**	**Mean**	**Min**	**Max**	**Mean**
Nearfield	WF021	2/8	2277.1	2898.1	2587.6	12.5	16.0	14.2	0.027	0.072	0.047
Nearfield	WF022	2/28	411.3	529.4	470.4	7.7	11.5	9.6	0.035	0.123	0.091
Nearfield	WN023	3/25	1423.7	1653.7	1538.7	16.6	34.2	25.4	0.050	0.175	0.109
Nearfield	WF024	4/12	3540.5	4536.7	4038.6	16.6	18.4	17.5	0.016	0.248	0.120
Nearfield	WN025	5/1	962.7	1291.3	1127.0	19.5	28.6	24.1	0.017	0.078	0.051
Nearfield	WN026	5/22	406.2	565.3	485.8	12.2	25.2	18.7	0.028	0.081	0.061
Nearfield	WF027	6/18	892.6	1011.9	952.3	18.7	35.3	27.0	0.058	0.115	0.091
Nearfield	All		406.2	4536.7	1600.0	7.7	35.3	19.5	0.016	0.248	0.081
Boundary	WF021	2/5-9									
Cape Cod Bay	WF021	2/5-9									
Coastal	WF021	2/5-9									
Harbor	WF021	2/5-9	3168.7	3168.7	3168.7	10.2	10.2	10.2	0.039	0.138	0.100
Nearfield	WF021	2/5-9	2277.1	2898.1	2587.6	12.5	16.0	14.2	0.027	0.072	0.047
Offshore	WF021	2/5-9							0.004	0.040	0.026
All	WF021		2277.1	3168.7	2878.2	10.2	16.0	12.2	0.004	0.138	0.058
Boundary	WF022	2/26-3/1									
Cape Cod Bay	WF022	2/26-3/1									
Coastal	WF022	2/26-3/1									
Harbor	WF022	2/26-3/1	1068.4	1068.4	1068.4	9.9	9.9	9.9	0.198	0.278	0.247
Nearfield	WF022	2/26-3/1	411.3	529.4	470.4	7.7	11.5	9.6	0.035	0.123	0.091
Offshore	WF022	2/26-3/1							0.051	0.073	0.060
All	WF022		411.3	1068.4	769.4	7.7	11.5	9.7	0.035	0.278	0.133
Boundary	WF024	4/5-12									
Cape Cod Bay	WF024	4/5-12									
Coastal	WF024	4/5-12									
Harbor	WF024	4/5-12	1042.6	1042.6	1042.6	17.4	17.4	17.4	0.088	0.137	0.109
Nearfield	WF024	4/5-12	3540.5	4536.7	4038.6	16.6	18.4	17.5	0.016	0.248	0.120
Offshore	WF024	4/5-12							0.020	0.084	0.043
All	WF024	4/5-12	1042.6	4536.7	2540.6	16.6	18.4	17.4	0.016	0.248	0.091
Boundary	WF027	6/10-18									
Cape Cod Bay	WF027	6/10-18									
Coastal	WF027	6/10-18									
Harbor	WF027	6/10-18	517.8	517.8	517.8	12.1	12.1	12.1	0.108	0.206	0.152
Nearfield	WF027	6/10-18	892.6	1011.9	952.3	18.7	35.3	27.0	0.058	0.115	0.091
Offshore	WF027	6/10-18							0.116	0.290	0.208
All	WF027	6/10-18	517.8	1011.9	735.0	12.1	35.3	19.6	0.058	0.290	0.150

Table 3-12. Summary of total phytoplankton, centric diatoms, and total zooplankton data for February - June 2002.

			Total Phytoplankton (10^6 cells L^{-1})			Centric Diatoms (10^6 cells L^{-1})			Total Zooplankton (Individuals m^{-3})		
Region	**Survey**	**Dates**	**Min**	**Max**	**Mean**	**Min**	**Max**	**Mean**	**Min**	**Max**	**Mean**
Nearfield	WF021	2/8	0.417	0.757	0.569	0.092	0.253	0.159	16553	21620	19852
Nearfield	WF022	2/28	0.470	1.001	0.668	0.158	0.421	0.297	16613	29393	21701
Nearfield	WN023	3/25	0.947	1.418	1.283	0.052	0.093	0.077	16322	40295	28308
Nearfield	WF024	4/12	1.900	2.914	2.310	0.112	0.404	0.250	33414	53207	40201
Nearfield	WN025	5/1	0.998	1.740	1.213	0.018	0.071	0.050	21452	39338	30395
Nearfield	WN026	5/22	0.436	1.030	0.634	0.017	0.025	0.022	75393	109522	92458
Nearfield	WF027	6/18	0.532	2.279	1.271	0.005	0.025	0.015	31472	123895	65708
Nearfield	All		0.417	2.914	1.135	0.005	0.421	0.124	16322	123895	42660
Boundary	WF021	2/5-9	0.341	0.889	0.619	0.020	0.315	0.149	4223	9002	6613
Cape Cod Bay	WF021	2/5-9	0.526	0.977	0.757	0.159	0.467	0.287	25213	65408	48152
Coastal	WF021	2/5-9	0.527	1.712	1.084	0.244	0.595	0.415	6961	18315	12680
Harbor	WF021	2/5-9	1.107	1.433	1.271	0.538	0.853	0.652	9614	10801	10023
Nearfield	WF021	2/5-9	0.417	0.757	0.569	0.092	0.253	0.159	16553	21620	19852
Offshore	WF021	2/5-9	0.579	0.683	0.633	0.042	0.193	0.116	2577	12492	7535
All	WF021		0.341	1.712	0.822	0.020	0.853	0.296	2577	65408	17476
Boundary	WF022	2/26-3/1	3.255	8.603	5.030	2.896	7.660	4.355	13055	22986	18020
Cape Cod Bay	WF022	2/26-3/1	0.281	0.400	0.343	0.023	0.052	0.032	22311	81490	42193
Coastal	WF022	2/26-3/1	1.113	2.502	1.742	0.714	1.456	1.096	12356	20293	16316
Harbor	WF022	2/26-3/1	1.607	2.437	2.006	0.947	1.428	1.184	26657	53612	36478
Nearfield	WF022	2/26-3/1	0.470	1.001	0.668	0.158	0.421	0.297	16613	29393	21701
Offshore	WF022	2/26-3/1	0.739	3.761	1.642	0.153	3.204	1.027	6952	36584	21768
All	WF022		0.281	8.603	1.905	0.023	7.660	1.332	6952	81490	26079
Boundary	WF024	4/5-12	0.481	1.002	0.741	0.017	0.137	0.072	3851	12043	7947
Cape Cod Bay	WF024	4/5-12	2.109	4.336	2.924	0.213	1.556	0.732	14091	21160	17982
Coastal	WF024	4/5-12	1.317	2.005	1.755	0.131	0.297	0.195	17359	39168	31673
Harbor	WF024	4/5-12	1.752	2.217	1.972	0.027	0.323	0.163	3283	35620	21710
Nearfield	WF024	4/5-12	1.900	2.914	2.310	0.112	0.404	0.250	33414	53207	40201
Offshore	WF024	4/5-12	1.918	2.953	2.276	0.021	0.397	0.196	23921	25420	24671
All	WF024	4/5-12	0.481	4.336	1.996	0.017	1.556	0.268	3283	53207	24031
Boundary	WF027	6/10-18	1.162	2.737	1.917	0.003	0.042	0.020	32489	121284	76886
Cape Cod Bay	WF027	6/10-18	0.248	1.089	0.742	0.002	0.039	0.014	26166	33651	29908
Coastal	WF027	6/10-18	0.930	2.450	1.333	0.053	1.449	0.344	67584	88944	76502
Harbor	WF027	6/10-18	0.934	3.147	2.158	0.182	1.285	0.499	81920	97732	91231
Nearfield	WF027	6/10-18	0.532	2.279	1.271	0.005	0.025	0.015	31472	123895	65708
Offshore	WF027	6/10-18	0.977	1.823	1.339	0.001	0.052	0.027	17662	25842	21752
All	WF027	6/10-18	0.248	3.147	1.460	0.001	1.449	0.153	17662	123895	60331

Table 3-13. Summary of *Alexandrium* spp., *Phaeocystis pouchetii*, and *Pseudo-nitzschia pungens* data for February - June 2002.

			Alexandrium spp. (cells L^{-1})			Phaeocystis (10^6 cells L^{-1})			Pseudo-nitzschia pungens (10^6 cells L^{-1})		
Region	**Survey**	**Dates**	**Min**	**Max**	**Mean**	**Min**	**Max**	**Mean**	**Min**	**Max**	**Mean**
Nearfield	WF021	2/8	0	0	0	0	0.014	0.002	0	0	0
Nearfield	WF022	2/28	0	5.0	0.8	0	0.019	0.009	0	0	0
Nearfield	WN023	3/25	0	0	0	0.291	0.626	0.461	0.0019	0.0079	0.0039
Nearfield	WF024	4/12	0	7.5	2.1	0.255	1.215	0.667	0	0.0039	0.0007
Nearfield	WN025	5/1	0	0	0	0.073	0.155	0.119	0	0.0009	0.0003
Nearfield	WN026	5/22	0	0	0	0	0	0	0	0	0
Nearfield	WF027	6/18	0	0	0	0	0	0	0	0	0
Nearfield	All		0	7.5	0.4	0	1.215	0.180	0	0.0079	0.0007
Boundary	WF021	2/5-9	0	0	0	0	0	0	0	0.0002	0.0001
Cape Cod Bay	WF021	2/5-9	0	17.5	5.6	0	0	0	0	0	0
Coastal	WF021	2/5-9	0	2.6	0.4	0	0.046	0.010	0	0	0
Harbor	WF021	2/5-9	0	0	0	0	0.014	0.002	0	0.0010	0.0002
Nearfield	WF021	2/5-9	0	0	0	0	0.014	0.002	0	0	0
Offshore	WF021	2/5-9	0	2.5	0.6	0	0	0	0	0.0010	0.0003
All	WF021		0	17.5	1.1	0	0.046	0.002	0	0.0010	0.0001
Boundary	WF022	2/26-3/1	0	0	0	0	0.018	0.004	0	0.0020	0.0010
Cape Cod Bay	WF022	2/26-3/1	0	0	0	0	0	0	0	0	0
Coastal	WF022	2/26-3/1	0	7.5	1.3	0	0.045	0.012	0	0	0
Harbor	WF022	2/26-3/1	0	5.0	0.8	0	0.022	0.012	0	0	0
Nearfield	WF022	2/26-3/1	0	5.0	0.8	0	0.019	0.009	0	0	0
Offshore	WF022	2/26-3/1	0	0	0	0	0.029	0.011	0	0.0028	0.0007
All	WF022		0	7.5	0.5	0	0.045	0.008	0	0.0028	0.0003
Boundary	WF024	4/5-12	0	15.0	5.6	0	0.010	0.004	0	0	0
Cape Cod Bay	WF024	4/5-12	0	17.5	6.9	0.410	1.590	1.037	0	0	0
Coastal	WF024	4/5-12	0	15.0	2.5	0.072	0.436	0.265	0	0	0
Harbor	WF024	4/5-12	0	15.0	3.3	0.030	0.424	0.164	0	0.0014	0.0003
Nearfield	WF024	4/5-12	0	7.5	2.1	0.255	1.215	0.667	0	0.0039	0.0007
Offshore	WF024	4/5-12	0	0	0	0.116	0.645	0.370	0	0.0015	0.0004
All	WF024	4/5-12	0	17.5	3.4	0	1.590	0.418	0	0.0039	0.0002
Boundary	WF027	6/10-18	0	0	0	0	0	0	0	0	0
Cape Cod Bay	WF027	6/10-18	0	0	0	0	0	0	0	0	0
Coastal	WF027	6/10-18	0	0	0	0	0	0	0	0.0009	0.0002
Harbor	WF027	6/10-18	0	2.5	0.4	0	0	0	0	0	0
Nearfield	WF027	6/10-18	0	0	0	0	0	0	0	0	0
Offshore	WF027	6/10-18	0	2.5	0.6	0	0	0	0	0	0
All	WF027	6/10-18	0	2.5	0.2	0	0	0	0	0.0009	0.00003

4.0 RESULTS OF WATER COLUMN MEASUREMENTS

Data presented in this section are organized by type of data and survey. Physical data, including temperature, salinity, density, and beam attenuation are presented in Section 4.1. Nutrients, chlorophyll *a*, and dissolved oxygen are discussed in Section 4.2. Finally a summary of the major results of water column measurements (excepting biological measurements) is provided in Section 4.3.

Surveys conducted during the semi-annual period consisted of four combined farfield/nearfield surveys and three nearfield only surveys. The first two combined surveys were conducted in early (WF021) and late (WF022) February during winter well-mixed conditions. Early indications of stratification were seen in some areas in April (WF024), but it was not until late June (WF027) that strong pycnocline had developed.

The variation of regional surface water properties is presented using contour plots of surface water parameters derived from the surface (A) water sample. Classifying data by regions allows comparison of the horizontal distribution of water mass properties over the farfield area. The vertical distribution of water column parameters is presented in the following sections along three west/east farfield transects (Boston-Nearfield, Cohassett, and Marshfield) and two north/south transects. (Nearfield-Marshfield and Boundary) (**Figure** 1-3). Nearfield vertical data is presented across one transect which runs from the southwest corner (N10) to the northeast corner (N04). Examining data trends along transects provides a three-dimensional perspective of water column conditions during each survey. Nearfield surveys were conducted more frequently than farfield surveys allowing better temporal resolution of the changes in water column parameters and the onset of stratification. In addition to the nearfield vertical transect, vertical variability in nearfield data is examined and presented by comparing surface and bottom water concentrations (A and E depths) and by plotting individual parameters with depth in the water column. A complete set of surface contour maps and vertical transect plots are provided in Appendices A and B respectively.

4.1 Physical Characteristics

4.1.1 Temperature\Salinity\Density

The timing of the annual setup of vertical stratification in the water column is an important determinant of water quality, primarily because of the trend towards continuously decreasing dissolved oxygen in bottom water during the summer and early fall. The pycnocline, defined as a narrow water depth interval over which density increases rapidly, is caused by a combination of freshwater input during spring runoff and warming of surface water in the summer. Above the pycnocline the surface water is well mixed, and below the pycnocline density increases more gradually. For the purposes of this report, the water column is considered stratified when the difference between surface and bottom water density is greater than 1.0 sigma-t units (σ_t). Using this definition, stratification was developing in the outer nearfield by the beginning of May (WN025; **Figures** 4-1 and 4-2). This is a somewhat late onset of stratification, with nearly the same degree of stratification seen by late March in 2001. Stratification throughout the entire nearfield area did not set up until later in May (WN026), and it was not until June that a strong pycnocline was established throughout the farfield.

4.1.1.1 Horizontal Distribution

Throughout February (WF021 and WF022), surface water temperatures were cold (2.8 - 5.4°C) across Massachusetts and Cape Cod Bays (see Appendix A). There was a clear inshore to offshore temperature gradient across this area with the warmest surface waters located furthest offshore. Surface water salinity also exhibited an inshore to offshore increase during February surveys WF021 (**Figure** 4-3) and WF022. Lower salinity waters (<32 PSU) were observed in Boston Harbor and southern Cape Cod Bay, with a gradient extending out to the boundary stations F27 and F28 (~32.8 PSU). Salinities at nearshore stations were typically between 31-32 PSU, although harbor stations F23 and F30 were below 30 PSU.

By mid April (WF024), the range of surface water temperatures had increased (5.6 – 8.1°C), and the gradient had shifted so that the warmer surface temperatures were found in the shallow waters of Cape Cod Bay, Boston Harbor, and along coastal areas. Surface temperatures were particularly high (>7°C) at stations inside, and near the mouth of, the harbor. Surface salinity values remained at the levels and gradients observed in February. Freshwater inputs to the system were lower than in recent years. While both the Charles and Merrimack rivers did exhibit the typical increased flow in April, the actual flow rates were unusually low. Peak April flows were <600 cfs in the Charles River and <20,000 in the Merrimack River (**Figure** 4-4). Both precipitation and river flow were below normal levels from fall 2001 to spring 2002. Lack of snow pack to the north contributed to even lower river flow than might be predicted by the spring precipitation levels.

By June (WF027), surface water temperature had increased substantially across the survey area to 13°C ± 1°C (except for 15.5°C at N13). Surface temperatures were mostly homogeneous across the area, although Cape Cod Bay and western Massachusetts Bay stations were slightly warmer (>13°C) than the eastern stations (<13°C). Salinity in the surface waters was also homogeneous across the survey area (31 PSU ± 0.7 PSU) with only the inner harbor station F30 showing a freshwater influence (29.3 PSU). Precipitation and river flow were at or above normal levels throughout May and June. Despite the return to more normal precipitation rates, there was still a 4 to 6 inch precipitation deficit in June for the water year (beginning in October 2001) in eastern Massachusetts (Massachusetts Department of Environmental Management).

4.1.1.2 Vertical Distribution

The changes observed in surface temperatures and salinity from February to April to June are indicative of the onset of seasonal stratification. The temperature-salinity (T-S) plots show a clear change in the relationship between these two parameters from early February to late June (**Figures** 4-5 and 4-6). In early February, harbor, coastal, and Cape Cod Bay waters were <4°C and quite constant. In the nearfield, offshore, and boundary waters, there was a trend of increasing temperatures concurrent with increasing salinity. The surface waters were generally cooler yet less saline than bottom waters and thus the density gradient was not significant. These regional differences continued through the late February/early March survey period, but over a narrower temperature range as temperatures had increased nearshore. During the April survey, a weak stratification was beginning occur. Surface waters had continued to warm leading to a trend of decreasing temperature corresponding to increasing salinities. This created a slight density gradient throughout the water column. This transition to stratification was most pronounced at the deep outer stations (e.g. F19, F27, F17, F12) where salinity differences began to create the density gradient. During the May nearfield surveys, this transition continued with strong stratification observed throughout most of the nearfield area by the May 22nd survey. By June, seasonal stratified conditions had been established throughout the bays with a warmer, less saline surface layer and cooler, more saline bottom waters. These patterns have been consistently observed over the baseline monitoring period.

Farfield. As suggested previously, the density gradient ($\Delta\sigma_t$), representing the difference between the bottom and surface water σ_t, can be used as a relative indicator of a mixed or vertically stratified water column. The water column was well mixed in each of the areas during the first two surveys

(WF021 and WF022). A weak density gradient was beginning to develop by the April survey (WF024) although stratification had not yet set up. By the June farfield survey, stratified conditions ($\Delta\sigma_t \geq 1.0$) were observed at all areas except the harbor stations. The harbor stations remained fairly well mixed, with only a minor density change across depth ($\Delta\sigma_t = 0.6$). Freshwater inputs to surface waters at these stations typically drive stratification. However, with limited precipitation and river flow during the early part of 2002, a strong salinity gradient was never established and these shallow stations remained well mixed (**Figures** 4-7 and 4-8). The offshore and boundary stations exhibited more pronounced temperature and salinity gradients than the coastal and Cape Cod Bay stations, resulting in stronger stratification

The seasonal establishment of stratified conditions was also illustrated in the vertical contour plots of sigma-T, salinity, and temperature (see Appendix B). In February, there was little variation in these parameters over the water column, although there was a freshwater influence emerging from the harbor. By April (WF024), while temperature remained cool, a light salinity gradient began to set the stage for stratification. It was not until the June survey (WF027) that a strong pycnocline had developed throughout the region. The onset of stratification in the spring is usually related to a freshening of the surface waters and then, as the surface temperatures increase, the density gradient or degree of stratification increases. This was the case in 2002, although low freshwater inputs and relatively cool surface waters (<15° C) resulted in a delay in the onset and weaker stratification than seen in previous years. A complete set of farfield transect plots of physical water properties is provided in Appendix B.

Nearfield. The onset of stratification can be observed more clearly from the data collected in the nearfield area. The nearfield surveys are conducted on a more frequent basis and thus provide a more detailed picture of the physical characteristics of the water column. As illustrated in **Figure** 4-9, stratification was beginning to develop in the eastern nearfield by the beginning of May (WN025). This early stage of stratification was dominated by the salinity gradient, as temperatures were still generally homogeneous throughout the water column. The density profiles plotted over the February to June 2002 period suggest that although the pycnocline may have been developing in the nearfield by early May, strongly stratified conditions were not established in the nearfield for another few weeks (WN026, May 22). By mid June the entire nearfield area was stratified.

Higher temporal resolution salinity and temperature data are provided by USGS and presented in **Figure** 4-10. The USGS mooring is located just to the south (1 km) of the outfall, between stations N21 and N18. These mooring data are presented along with corresponding, matched-depth survey data from stations N21 and N18. From January to late March salinity was fairly consistent across depths, rarely varying more than ~0.25 PSU. At all depths there was a gradual increase in salinity of approximately 0.5 PSU over this time period. The corresponding survey data from station N18 compares well with the mooring data during this time. The station N21 survey data does not show the same degree of correlation. While the N21 data did correlate well with the mooring in early February, a dramatic departure can be seen in the late February and late March surveys. Salinity measurements at station N21 show a wide range across depths. Also, the depth/salinity characteristics varied widely from one survey to the next, with low salinities near the surface during survey WN022 but deeper stations having the lowest salinities during WN023. As station N21 is located within 20 m of the outfall, it is likely that instantaneous salinity measurements are strongly influenced by the variability in the rising effluent plume. Beginning in late March (nearly coincident with survey WN023) the mooring data show salinity beginning to decline at all depths. This trend continued through late May (WN026) and was also observed in the shipboard data. The exception to the continual decline in salinity was a substantial increase in the deeper water in early to mid May. A qualitative review of the wind data indicate that winds were predominantly from the south and west, which might be conducive to upwelling. This would account for the influx of more saline (and cooler) bottom water into the nearfield that was observed in the mooring data in early May. This will be examined in more detail in the annual report.

Water temperatures throughout the water column remained cold (4-6°C) from January through mid April. As with salinity, the survey data from station N18 corresponds well with the mooring data, while the N21 data is highly variable (**Figure** 4-10b). Beginning in mid April water temperatures at depths began to increase more rapidly. At this time, a divergence between surface and deeper water temperatures began to develop. While there was a high degree of variability, surface waters were generally warming faster than deeper waters, exceeding 8°C by late in April. Mooring data is not yet available for late May and June, but it will be presented in the annual report.

4.1.2 Transmissometer Results

Water column beam attenuation was measured along with the other *in situ* measurements at all nearfield and farfield stations. The transmissometer determines beam attenuation by measuring the percent transmission of light over a given path length in the water. The beam attenuation coefficient (m^{-1}) is indicative of the concentration of particulate matter in the water column. The two primary sources of particles in coastal waters are biogenic material (plankton or detritus) or suspended sediments. Beam attenuation data are often evaluated in conjunction with fluorescence data to ascertain the source of the particulate materials (phytoplankton versus detritus or suspended sediments).

During early February survey (WF021), surface water beam attenuation ranged from 0.62 to 1.76 m^{-1} **Figure** 4-11). The maximum value was measured in Boston Harbor at station F30 and the lowest value at offshore station F22. Elevated values were also observed in Cape Cod Bay ($\geq$0.9 m^{-1}), which corresponded to elevated chlorophyll concentrations. Beam attenuation values were 0.8 to 1.2 m^{-1} in the nearfield and coastal waters and lower offshore in Massachusetts Bay. The slightly elevated values in the nearfield corresponded with elevated fluorescence values. The highest beam attenuations values (>1.2 m^{-1}) were found at the harbor and near harbor coastal stations, extending along the coastline from Nahant to Plymouth. Vertical contour plots along the Boston-Nearfield transect show the strong correlation between beam attenuation and fluorescence during this survey, and the gradient of each extending from Boston Harbor to boundary station F27 (**Figure** 4-12)

In late February/early March, the inshore to offshore gradient in surface beam attenuation persisted at levels similar to earlier in the month except at the boundary stations off Cape Ann (F26, F27, and F28) where elevated beam attenuation values (1.0 – 1.76 m^{-1}) were observed. The boundary beam attenuation signal corresponded to elevated fluorescence in this area, with values reaching as high as 16.6 µg/L. These elevated beam attenuation and chlorophyll values were associated with a bloom of the centric diatom *Skeletonema costatum* (see Sections 4.2.2 and 5.3.1.3). Vertical contour plots along the Boston–Nearfield transect reveal a strong correspondence between high fluorescence and beam attenuation values at the boundary station (**Figure** 4-13). The highest beam attenuation values were in the harbor. However, the increase in fluorescence values near the harbor were not proportionate to the very high beam attenuation.

In early April (WF024) beam attenuation and fluorescence increased in the nearfield area and to the east at station F19 (**Figure** 4-14). In these areas surface water beam attenuation increased by 50-100% from the late February/early March levels, although actual values remained moderate (0.9 – 1.2 m^{-1}). The Cape Ann boundary stations returned to pre-bloom levels (~0.6 – 0.9 m^{-1}). The rest of the farfield area remained at approximately the same levels previously observed, with minor fluctuations including a slight increase in Cape Cod Bay and a slight decrease in Boston Harbor. These changes corresponded to changes in the fluorescence signal.

During the June survey (WF027) there was a strong beam attenuation gradient, with high values (>2 m^{-1}) in the harbor giving way to lower values in the nearfield and offshore (~1.0 and <0.8 m^{-1} respectively). Although elevated fluorescence values were recorded in the innermost stations (F30 and F31), vertical profiles reveal a disconnect between beam attenuation and fluorescence across the Boston-Nearfield transect (**Figure** 4-15). Phytoplankton enumeration from WF027 (see Section 5.3.1) also discovered a sparse phytoplankton community, supporting the low fluorescence values. Boston Harbor often exhibits an elevated beam attenuation signature, which is due to a combination of suspended sediments, detritus, and phytoplankton. The change in the relative correspondence between beam attenuation and fluorescence that was seen over the course of the four surveys from early February to June (**Figures** 4-12 to 4-15) is indicative of the relative impact that phytoplankton may have on the beam attenuation signal – high in early February and low in June.

4.2 Biological Characteristics

4.2.1 Nutrients

Nutrient data were analyzed using surface water contour maps (Appendix A) and vertical contours from select transects (Appendix B) to illustrate the spatial variability of these parameters. In addition, x/y plots of nutrient depth distribution, nutrient/nutrient relationships, and nutrient/salinity relationships were examined.

The nutrient data for February to June 2002 generally followed the typical progress of seasonal events in Massachusetts and Cape Cod Bays. Maximum nutrient concentrations were observed in early February when the water column was well mixed and biological uptake of nutrients was limited. Nutrient concentrations in Cape Cod Bay surface waters were reduced by the winter/spring 'diatom bloom' in February and remained relatively low throughout the report period. Massachusetts Bay surface water nutrient concentrations decreased from early February through April. The exception to this was in the harbor and at nearshore stations along the entire coast where nutrients increased in April (WF024) from the late February/early March levels (WF022). Nutrient concentrations in the surface waters were depleted throughout the entire study area by June (WF027). In the nearfield, nutrient levels decreased in the surface waters as stratification was developing. Nutrient concentrations in the surface waters were depleted throughout much of the nearfield region by mid April. The effluent nutrient signal was clearly evident in the nearfield, particularly as ammonium (NH_4). Nutrients associated with the discharge were able to surface in the well-mixed winter waters and even through the weak stratification in the beginning of May, well established stratification in June prevented the effluent/nutrient signal from reaching surface waters.

4.2.1.1 Horizontal Distribution

The horizontal distribution of nutrients is displayed through a series of surface contour plots in Appendix A. During this semi-annual period, the highest nutrient concentrations were typically measured at the boundary stations. However, as the season progressed and nutrients were depleted, harbor, coastal, and nearfield stations had relatively higher values. Surface water dissolved inorganic nutrients were generally highest during the first survey (WF021). As observed since the fall of 2000, nearfield NH_4 concentrations were consistently elevated with respect to farfield stations and compared to previous baseline monitoring years. Nutrient concentrations were lower in Cape Cod Bay than in Massachusetts Bay during the first two farfield surveys due to the winter/spring diatom bloom that occurred in Cape Cod Bay in February. By April (WF024), nutrient concentrations had decreased in Massachusetts Bay, except in coastal areas. By June (WF027), nutrients were generally depleted in the surface waters throughout the bays, except for stations in and near Boston Harbor.

In early February (WF021), the highest nutrient values were found at offshore and boundary stations [phosphate (PO_4) = 1.36 µM at station F22, silicate (SiO_4) = 11.89 µM at station F27, nitrate (NO_3) = 11.13 µM at station F28], with the exception of NH_4 which was highest near the outfall (7.04 µM at station N19). The lowest concentrations were observed in Cape Cod Bay (NO_3 = 0.16 µM and SiO_4 = 0.47 µM at F03), and in the inner harbor (PO_4 = 0.47 µM). For all nutrients, except NH_4, there was a general trend of higher concentrations at the northeast boundary stations decreasing to the south and west (**Figure** 4-16). Ammonium levels were highest directly around the outfall and decreased with distance from this area.

By late February/early March (WF022), nutrient concentrations in surface waters had decreased slightly throughout Massachusetts Bay while increasing slightly in Cape Cod Bay. The relative decrease in Massachusetts Bay was most pronounced at the boundary stations where nutrients were consumed by a developing diatom bloom. The highest surface nutrient concentrations were in the nearfield (PO_4 = 1.01 µM, NO_3 = 7.34 µM, SiO_4 = 8.21 µM, and NH_4 = 6.31 µM). The lowest concentrations were in Cape Cod Bay (NO_3 = 0.35), along the boundary (SiO_4 = 1.13 µM at F27), and in the inner harbor (PO_4 = 0.22 µM and NH_4 = 0.29 µM). Ammonium concentrations continued to be a very good tracer of the effluent plume, although rapid dilution in well-mixed waters and biological consumption of NH_4 limits the ability to follow it horizontally.

By April (WF024), nutrient concentrations continued to decrease slightly in Cape Cod Bay and most of Massachusetts Bay. However, two distinct areas were exceptions to this trend, with increases for all nutrients. The first area included Boston Harbor and extended from the harbor, along the coast to the south including stations F05, F06, F07 and F10 and a second smaller area was off of Cape Ann (F26 and F27). As the spring diatom bloom diminished in these areas, nutrients were replenished by increased runoff and the corresponding increase in flow from the Charles River and other tributaries to the inner harbor and the Merrimack River to the north. The highest nutrient concentrations were at boundary station F26 (NO_3 = 7.15 µM, SiO_4 = 9.15 µM) and in the effluent plume in the nearfield (PO_4 = 1.47 µM, and NH_4 = 17.0 µM).

In June (WF027), nutrients were generally depleted throughout the surface waters of Massachusetts and Cape Cod Bays. Harbor and coastal inputs continued to result in relatively higher nutrients concentrations in these areas (NO_3 = 1.99 µM at F30, NH_4 = 3.42 µM at F23, and SiO_4 = 4.87 µM at F03). The highest phosphate concentration (0.73 µM) was found in the nearfield at N06, although in general the trend was towards higher concentrations in the harbor. Low nutrient and chlorophyll concentrations were found throughout Massachusetts and Cape Cod Bays. This is typical of stratified summer conditions. Surface NH_4 concentrations were depleted even in the nearfield due to stratification, although a strong NH_4 signal was detected in deeper waters.

4.2.1.2 Vertical Distribution

Farfield. The vertical distribution of nutrients was evaluated using vertical contours of nutrient data collected along three transects in the farfield: Boston-Nearfield, Cohassett, and Marshfield (see **Figure** 1-3; Appendix B). Nitrate concentrations along the Boston-Nearfield transect are presented to highlight the vertical nutrient trends. During the first survey (WF021) the transect contours indicated that the water column was generally replete with nutrients (**Figure** 4-17) except for NH_4. The preferential and rapid uptake of NH_4 by phytoplankton tends to keep NH_4 levels low throughout all areas of the water column except in close proximity to strong inputs (*i.e.* the outfall). While nutrient levels were generally replete, they were somewhat lower in the harbor and along the coast. This corresponded to a strong fluorescence signal associated with a spring diatom bloom in harbor and coastal waters (see **Figure** 5-15).

By late February/early March (WF022), the bloom described above had continued and there was an increase in phytoplankton abundance that led to nutrients being depleted in the harbor and diminished along the coast. This decrease in nutrients was most evident for NO_3 (**Figure** 4-17). There was also a considerable decrease in nutrients in surface waters along the boundary at station F27. Silicate showed the most substantial decrease dropping to 1.1 µM from 11.9 µM at the beginning of the month. This was the result of a substantial bloom of *Skeletonema costatum* in these boundary waters off of Cape Ann (see **Figure** 5-15). Ammonium remained low throughout the farfield, and was measurable only in the immediate area of the outfall.

In April (WF024) nutrient concentrations along the northern boundary stations (F26 and F27) rebounded somewhat from late February/early March levels as the *Skeletonema* bloom subsided. An increase in PO_4 and NO_3 was also seen in the harbor and along the coastline (**Figure** 4-17). However, decreases throughout the rest of Massachusetts Bay were evident for all nutrients. Weak stratification was developing throughout the farfield by this time and reduced mixing of the water column began to result in the depletion of nutrients in surface waters. In the nearfield area, nutrients were decreasing as they were utilized by an elevated mixed diatom and *Phaeocystis* community. A strong fluorescence signal was concomitant with these areas of decreasing nutrients (see **Figure** 4-14). A clear effluent signal surfacing through the weak stratification was apparent for NH_4 and PO_4 in the nearfield.

By June (WF027), nutrient levels were depleted in the surface waters along each of the transects (**Figure** 4-17). Typical of stratified conditions, there was a strong vertical nutrient gradient with very low concentrations above the pycnocline (~20 m) and higher concentrations below. Phosphate and ammonium continued to show a strong effluent signal in the outfall area. The effluent plume was isolated below the pycnocline and high NH_4 and PO_4 concentrations were only observed in deeper waters. A weak NH_4 signal extended in subsurface waters from the outfall, south to F07 where it corresponded to a slight increase in fluorescence (see Appendix A).

Nutrient-salinity plots are often useful in distinguishing water mass characteristics and in examining regional linkages between water masses. Dissolved inorganic nitrogen (DIN) plotted as a function of salinity has been used in past reports to illustrate the transition from winter to summer conditions and back again. Typically in this region winter conditions are represented by a negative correlation between DIN and salinity as the harbor and coastal waters are a source of low salinity, nutrient rich waters and the water column is well mixed. The summer is normally characterized by a positive relationship between DIN and salinity as biological utilization and stratification reduce nutrients to low concentrations in surface waters and concentrations increase with salinity at depth. In many regions of the survey area these trends were apparent. However, just as in 2001, there was a regional mix of relationships between DIN and salinity. Also, effluent emerging from the outfall creates a wide range of DIN concentrations over a narrow salinity band in the nearfield (**Figure** 4-18).

During the February surveys (**Figure** 4-18), no apparent relationship between DIN and salinity was observed in Boston Harbor and in Cape Cod Bay, while a positive relationship was seen in most other areas. In the nearfield, while a majority of stations fell along this trend, others displayed a wide range of DIN across a narrow salinity band (~32.2 PSU). Values at these nearfield stations were driven by high NH_4 concentrations in the outfall discharge. By April (WF024), the DIN versus salinity signal exhibited an inverse relationship at the Boston Harbor and coastal stations due to increased DIN concentrations in low salinity water (<30PSU), which was likely associated with runoff (**Figure** 4-19a). Surface water concentrations became depleted in other regions, but the general trend observed in February continued with increasing concentrations with increasing depth. Elevated DIN concentrations driven by effluent NH_4 were once again observed at mid-salinity for the nearfield area. In June (WF027), a fairly strong positive DIN/salinity relationship was apparent at most areas except Boston Harbor. This relationship was established as typical summer conditions developed with depleted DIN in the surface waters and increasing concentrations at depth with increasing salinity (**Figure** 4-19b). Harbor stations exhibited a wide range of salinities (29.3 – 31.4 PSU) over a relatively narrow span of DIN concentrations (~5µM). DIN concentrations were not depleted in the harbor surface waters.

Throughout the first half of 2002, surface waters were relatively low in available DIN as compared to PO_4 and SiO_4. Cape Cod Bay stations were extremely nitrogen limited from as early as the start of February through the whole period. This is likely caused by a phytoplankton bloom that had peaked in Cape Cod Bay even before this survey period began. Harbor and coastal stations became nitrogen limited later in February as phytoplankton blooms in these areas progressed through the month.

Nearfield. The nearfield surveys are conducted more frequently and provide a high resolution of the temporal variation in nutrient concentrations over the semi-annual period. In previous sections, the transition from winter to summer physical and nutrient characteristics was considered. For the nearfield, the transition from winter to summer nutrient regimes can be demonstrated by examining contour plots of NO_3 concentrations over time at five representative nearfield stations – N01, N04, N18, N10 and N07 (**Figure** 4-20). These stations represent each of the four corners and the center of the nearfield "box". Station N10, in the southwestern portion of the nearfield is strongly influenced by conditions in the harbor. As with other harbor and coastal stations, nutrients at N10 were low at the start of the report period and continued to decline through June. At only 30 meters deep, station N10 remained fairly well mixed even into June, and nutrients were depleted throughout the entire water column. At other stations, nutrient depletion began later in the season with available NO_3 concentrations occurring throughout March at the easternmost stations. By May, NO_3 levels were depleted in the surface waters across the entire nearfield and only the deeper waters (>20m) contained any significant amounts NO_3. The distribution of SiO_4 showed a similar pattern. Phosphate and ammonium also became depleted in the surface waters in late May and June, but elevated levels in the bottom waters continued to be observed as the bay outfall provided a direct source of NH_4 and PO_4 to the nearfield.

The usefulness of NH_4 as a tracer of the effluent plume has been shown for previous monitoring periods (Libby *et al*., 2001). Although it is not a conservative tracer due to biological utilization, NH_4 does provide a natural tracer of the effluent plume in the nearfield area especially in low light conditions where biological activity is minimal (i.e. below the pycnocline during stratified conditions and during the winter). **Figure** 4-21 illustrates the use of NH_4 as a natural tracer of the plume during well-mixed and stratified conditions. This transect extends diagonally across the nearfield from the southwest to the northeast corners. The nearfield remained generally well mixed until a weak stratification developed late May. By the June survey stratification was well established throughout the nearfield. From early February to early May, the NH_4 pattern was similar to that seen during WN024 and WN025 (**Figure** 4-21). A strong NH_4 signal can be seen over the entire water column from the outfall. **Figure** 4-22 displays NH_4 concentrations at all 5 sampling depths over the entire nearfield area for survey WN025. The NH_4 signal, representing the effluent plume, can be seen rising through the water column, spreading as it ascends. This is typical of the NH_4/effluent dynamics under well-mixed conditions.

The late May nearfield survey (WN026) captured an atypical nutrient distribution that highlights the variability of the area (**Figure** 4-23). Transects of NH_4 concentrations across the nearfield typically show a strong NH_4/effluent signal rising from the outfall and surfacing, until stratification sets up and the plume is trapped below the pycnocline. During the late May survey, no strong NH_4 signal was observed in the waters over the outfall at station N21 (**Figure** 4-21). Instead, the NH_4/effluent signal was found to the northwest of the outfall (**Figure** 4-23). Phosphate showed a similar distribution, with no plume signal detected in the immediate outfall area. This was the only survey during the first half of 2002 in which this nutrient/effluent distribution occurred. Displacement of the plume to the north has been seen previously, most notably during the April 2001 plume tracking survey

(Hunt *et al*., 2002). In May 2002, Deer Island effluent flows were at typical levels during this time period and there were no apparent weather patterns they may have resulted in this northwesterly movement. It is assumed that tidal flushing or other forces driving the nearfield currents may have set up this effluent distribution. This anomaly illustrates the temporal and spatial variability in the nearfield area and the need to understand both short- and long-term trends. In June, under fully stratified conditions, the effluent plume NH_4 signal was trapped in the deeper waters under the pycnocline (**Figure** 4-24).

An examination of the nutrient-nutrient plots showed that surface waters were generally depleted in DIN relative to PO_4 in the nearfield (except in May and June in the effluent plume). In February and March, the DIN:PO_4 ratio was generally less than the Redfield value of 16 at the nearfield stations, but both were available in relatively high concentrations as shown for the late March survey in **Figure** 4-25a. By mid April, DIN was limiting relative to PO_4 in the surface waters, but present in high concentrations (DIN >20µM and PO_4 >1.5µM) in the effluent plume (**Figure** 4-25b). By early May, elevated NH_4 concentrations were observed over a wide area of the nearfield (see **Figure** 4-22) and DIN:PO_4 was higher than Redfield ratio of 16:1 for many of the samples collected (**Figure** 4-26a). By June, the DIN:PO_4 ratio was generally less than the Redfield value of 16 and nitrogen limited in the surface waters (**Figure** 4-26b), but there were still a few samples within the effluent plume that had elevated DIN concentrations and DIN:PO_4 ratios of ~16. For the first two surveys, the nearfield waters were depleted of SiO_4 versus DIN, but concentrations were not limiting. The DIN SiO_4 relationship fluctuated for most of the report period, with either nutrient being relatively more available during any given survey. By June however, nutrient levels had become scarce in many areas and portions of the nearfield were nitrogen limited.

4.2.2 Chlorophyll a

The highest chlorophyll concentrations of the semi-annual period were recorded in Boston Harbor in February. However, regional chlorophyll maxima fluctuated throughout the period and elevated chlorophyll levels were found in each of the regions at various times. Chlorophyll descriptions are derived from *in situ* fluorescence data and satellite images (SeaWiFS; Appendix D). The nearfield mean areal chlorophyll (basis for chlorophyll threshold) for the winter/spring (February through April) of 2002 was 111.8 mg m^{-2}, which is well below the seasonal caution threshold of 182 mg m^{-2}, but almost double the 2001 winter/spring mean areal chlorophyll (68.96 mg m^{-2}). Although this year showed an increase from 2001, it was still much lower than the very high areal chlorophyll values seen winter/spring 1999 (176 mg m^{-2}) and 2000 (191 mg m^{-2}). The high winter/spring chlorophyll concentrations were coincident with substantial region-wide winter/spring diatom and *Phaeocystis* blooms of 1999 and 2000, respectively. Although the lack of a major winter/spring bloom in 2002 resulted in lower chlorophyll concentrations in the nearfield in comparison to 1999 and 2000, the 2002 winter/spring seasonal mean was higher then the values observed over the rest of the baseline period (1992-1998).

4.2.2.1 Horizontal Distribution

Surface chlorophyll concentrations were relatively high across most of the region during the early February survey. Surface chlorophyll values were >3 μgL^{-1} in the nearfield, exceeded 7 μgL^{-1} along the southern coastline, and reached as high as 17 μgL^{-1} in the harbor (**Figure** 4-27). Stations in Cape Cod Bay also had elevated chlorophyll values with highest values found at the western side of the bay (7 μgL^{-1} at station F03). In each of these areas, fluorescence was generally correlated to elevated phytoplankton abundance (**Figure** 5-15). Lower concentrations were observed away from the coastlines. These fluorescence trends can be observed in the SeaWiFS images captured from late January through mid February (see Appendix D). These SeaWiFS images reveal that elevated fluorescence values associated with the spring bloom extended well into Cape Cod Bay. Fluorescence data from the MWRA WETStar sensor showed rapidly increasing chlorophyll in the nearfield in mid to late January (**Figure** 4-28). This data, combined with the SeaWiFS image from January 27 (**Figure** 4-29) indicates that the spring bloom was already established by the time the early February survey was conducted. Unfortunately, the WETStar sensor failed during the February to May deployment so no high-resolution data are available for comparison against nearfield survey data for this period.

By late February/early March (WF022), surface chlorophyll concentrations in most of Massachusetts and Cape Cod Bays had decreased from levels found at the beginning of the month (**Figure** 4-30). The decrease in chlorophyll was coincident with a decrease in productivity, although phytoplankton abundance had increased (see **Figures** 5-2 and 5-16). However, elevated chlorophyll concentrations were found in northeastern Massachusetts Bay at stations F26 and F27, with concentrations as high as 16.6 μgL^{-1}. This was coincident with a substantial increase in the numbers of diatoms observed at the boundary stations. An eight-day composite SeaWiFS image for this time period (February 26 to March 4, 2002), shows a filament of higher chlorophyll concentrations (3 to 10 mg m^{-3}) extending from the western Gulf of Maine around Cape Ann from north to south, extending over the location of boundary stations F26 and F27 (**Figure** 4-31). Except for this high chlorophyll plume south of Cape Ann, surface chlorophyll levels in Massachusetts Bay, including the nearfield area, were near 3 mg m^{-3} or less. The late February/early March 2002 survey appears to have captured a diatom bloom that was occurring in the western Gulf of Maine that extended into Massachusetts Bay in the boundary region south of Cape Ann.

The April survey (WF024) showed a fairly dramatic shift from the late February/ early March chlorophyll concentrations and distributions. Off of Cape Ann, where concentrations had been the highest, fluorescence had dropped to less than 0.1 μgL^{-1}. Chlorophyll at the harbor stations was reduced to less than 2 μgL^{-1}. An area extending from the nearfield, due east to boundary stations F28 and F12, showed somewhat higher chlorophyll levels. In this area values were typically in the 1.5 to 4.0 μgL^{-1} range, although a maximum of 8.2 μgL^{-1} was measured near the outfall (station N20). Fluorescence was inversely related to nutrient concentrations throughout the entire area with nutrients levels recovering following the spring bloom. The relatively low surface chlorophyll values in early April are surprising given the availability of nutrients, relatively high areal production at station N04 and N18 (highest of period), and the minor *Phaeocystis* bloom observed throughout Massachusetts Bay. Surface phytoplankton abundance was about 1.5 to 2 million cells L^{-1} throughout most of the survey area and reached ~3 million cells L^{-1} offshore at F06 and in Cape Cod Bay at F01, but there was not a commensurate increase in chlorophyll. This may be accounted for in the shift in phytoplankton community structure. By April the Cape Ann *Skeletonema* bloom had subsided and diatom abundance in general was greatly reduced throughout the entire area. *Phaeocystis* and microflagellates dominated the April community (see section 5.3.1 for a detailed discussion).

SeaWiFS images from late April and early May show areas of high chlorophyll outside of Massachusetts and Cape Cod Bays, while fluorescence in the survey area remained low throughout this period (see Appendix D). Surveys in early and late May found low chlorophyll across the nearfield. Plankton abundance in surface waters steadily decreased in the nearfield to less than 1 million cells L^{-1} by late May and less than 0.5 million cells L^{-1} were found in the mid-depth sample. Along with the decrease in abundance there was also a steady shift in the community structure. *Phaeocystis* decreased into early May and was completely gone by the end of the month. Microflagellates dominated the community in May. The decrease in nearfield surface chlorophyll concentrations from mid April to late May was also associated with a steady decrease in production at station N04 and N18.

By June (WF027), the phytoplankton assemblage throughout the farfield was dominated by microflagellates and crytomonads, although increased diatoms abundance (*Skeletonema* and

Thalassionema) was seen in the harbor and at coastal stations (**Figure** 5-18). Elevated chlorophyll associated with the increased phytoplankton abundance was seen in and near the harbor (5.1 μgL^{-1} at F30). While fluorescence along the south shore stations had increased from the April farfield, actual concentrations remained low (<1 μgL^{-1}). Throughout the rest of the region, chlorophyll was generally low (<1 μgL^{-1}). Satellite imagery from June agrees well with the low *in situ* fluorescence values measured on this survey.

4.2.2.2 Vertical Distribution

Farfield. The vertical distribution of chlorophyll was evaluated using vertical contours of *in situ* fluorescence data collected along three east/west transects in the farfield: Boston-Nearfield, Cohassett, and Marshfield; and 2 north/south transects inner farfield and outer farfield (Appendix B). The fluorescence contours along the Boston-Nearfield transect were presented in comparison to beam attenuation in **Figures** 4-12 to 4-15. In early February (WF021), chlorophyll concentrations along the transects exhibited a similar pattern to surface chlorophyll with elevated concentrations in the harbor, along the southern coastline, and in Cape Cod Bay. In the regions where elevated chlorophyll was observed, concentrations tended to remain high throughout the water column with a maximum at approximately 15-20m. By late February (WF022), chlorophyll concentrations were highest at the northeastern boundary stations. This area of high fluorescence is attributed to the southwestern edge of a large bloom of centric diatoms in the Gulf of Maine. The elevated chlorophyll concentration at these stations was limited to the upper 20m of the water column.

In April (WF024), surface chlorophyll concentrations had decreased substantially, but a more clearly defined subsurface chlorophyll maximum was observed along several of the transects. A strong subsurface chlorophyll maximum was seen in the nearfield. A shallow (~5m) subsurface chlorophyll maximum of greater than 7 μgL^{-1} extended from just southeast of the nearfield at station F16 east to boundary station F28. A similar subsurface fluorescence maximum was also found off the tip of Cape Cod at station F29, although it is not clear that these areas were associated since somewhat reduced chlorophyll levels were found in between at station F12.

By June (WF027), phytoplankton abundance had decreased across most of the survey area. At all depths along each of the farfield transects chlorophyll concentrations were minimal. However, these transects do not capture all of the harbor and coastal stations such as stations F30, F31, and F25 where elevated chlorophyll values were measured. At these stations fluorescence was greater than 2 μgL^{-1} throughout the water column, with maximum values found between 2-4 m deep (3.28 μgL^{-1} at F30, 4.34 μgL^{-1} at F31, and 3.27 μgL^{-1} at F25). The elevated chlorophyll concentrations in the surface and mid-depth waters in and near Boston Harbor were coincident with high phytoplankton abundance with a greater diatom component than elsewhere in the farfield. The elevated surface chlorophyll concentrations near Boston Harbor are typical of the progression to summer conditions. However, in past years, there has also been a clearly defined subsurface maxima along the pycnocline further offshore. This offshore component in June 2002 showed only a weak subsurface fluorescence signal at boundary station F29 off of Cape Cod.

Nearfield. Chlorophyll concentrations in the nearfield closely followed the trends described above for the farfield. Relatively high concentrations were observed in early February with the mean mid-depth concentration reaching 7 μgL^{-1} and surface and bottom water concentrations of 4 μgL^{-1} (**Figure** 4-32). The coastal bloom influenced chlorophyll concentrations in the nearfield (**Figure** 4-33). This resulted in elevated fluorescence predominately in the western edge of the nearfield and slightly elevated chlorophyll was measured at the outfall area where nutrient inputs may have contributed to higher localized chlorophyll concentrations. During the early and late March surveys, chlorophyll in the nearfield was low, although relatively higher concentrations associated with the elevated coastal/harbor levels continued to be found to the west (**Figure** 4-33). A similar pattern of low chlorophyll concentrations was observed in late March. Although chlorophyll remained low, phytoplankton abundance was on the rise by late March and the community structure began to shift towards dominance by *Phaeocystis*. Subsurface chlorophyll concentrations increased dramatically in April (**Figure** 4-32) as the *Phaeocystis* bloom progressed with total phytoplankton abundance often exceeding 2 million cells L^{-1} at nearfield stations. The fluorescence maximum was found between 5 and 10 m deep with the highest concentrations (>11 μgL^{-1}) found just to the southwest of the outfall at stations N18, N19, and N20 (**Figure** 4-33). From the beginning of May into June, fluorescence was low throughout the nearfield with a subsurface maximum found at most stations between 4-10 m. Typically values in this subsurface range were approximately 2 μgL^{-1} with the highest concentrations (>3.5 μgL^{-1}) measured in the southwest corner of the nearfield.

4.2.3 Dissolved Oxygen

Spatial and temporal trends in dissolved oxygen (DO) concentrations were evaluated for the entire region. Due to the relative importance of identifying low DO conditions, bottom water DO minima were examined for the water sampling events. DO concentrations were within the range of values observed during previous years. The minimum measured DO concentration was 7.06 mgL^{-1} in Cape Cod Bay in June. The nearfield minimum DO concentration of 8.53 mgL^{-1} was also observed in June. The June 2002 bottom water concentrations were fairly consistent across the survey area. This was a departure from June 2001 when DO in the bottom waters showed a gradient of low concentrations in the harbor increasing towards the offshore stations.

The DO in bottom waters was compared among areas and over the course of the February to June time period. Mean bottom water DO concentrations ranged from a high of 12 mgL^{-1} in Boston Harbor in early February to a low of 8.2 mgL^{-1} in Cape Cod Bay in June (**Figure** 4-34a). Bottom water DO concentrations were highest (9.4 to 12.3 mgL^{-1}) during the first two surveys. Lower concentrations were observed at the deeper offshore, nearfield, and boundary areas over these two surveys than in the other areas. By early April, bottom water DO concentrations had decreased throughout Massachusetts Bay except in the nearfield. Mean bottom water DO had decreased by ~1 mgL^{-1} in the harbor and coastal waters. This was likely related to the decline of the centric diatom bloom. The offshore, boundary, and Cape Cod Bay showed only slight decreases (~0.2 mgL^{-1}) over this time period. Nearfield bottom water DO concentrations increased by ~0.5 mgL^{-1} from late March to early May. From April to June, the decline in bottom water DO continued at all stations. Mean bottom water concentrations in Cape Cod Bay dropped by almost 3 mgL^{-1} to 8.2 mgL^{-1}, which was the lowest value observed in the report period. Harbor mean concentrations declined by 2 mgL^{-1} and along the coast they dropped by 1.5 mgL^{-1}. Bottom water minimum DO concentrations at boundary, offshore, and nearfield areas declined by ~1 mgL^{-1}. Excluding Cape Cod Bay, mean bottom water DO concentrations were relatively uniform across the survey area (8.8 mgL^{-1}).

Dissolved oxygen measurements throughout the area during the first half of 2002 are typical of the trend of declining bottom water DO concentrations following the establishment of stratification and the cessation of the winter/spring bloom in the bays. The trend of decreasing DO in the bottom waters was also apparent in the DO %saturation data (**Figure** 4-34b). In general, DO % saturation decreased from February to June in each of the survey areas, although there was some fluctuation. Bottom waters were generally saturated to supersaturated during the February surveys and then decreasing through April and June. DO %saturation did increase from late February to April in Cape Cod Bay and there was a relatively large increase in DO %saturation from late March to early May in the nearfield. By June, DO %saturation in the bottom waters was at a minimum for the first half of 2002 throughout the area. Harbor waters remained saturated in June, and coastal and nearfield waters were slightly under saturated (92-93%). The bottom waters in Cape Cod Bay and the deeper offshore and boundary waters were undersaturated and the survey mean values for these areas were only at

86%. Even though the lack of a major winter/spring bloom suggests that there may not be a problem with bottom water DO in 2002, the presence of survey mean DO %saturation values approaching 80% suggests that other factors may be contributing to a regional decrease in DO during the first half of 2002. This will be examined in more detail in the second semi annual report for 2002 and in the 2002 annual report.

4.3 Summary of Water Column Results

- Precipitation levels well below normal resulted in limited runoff and an atypically weak vertical salinity gradient.
- Stratification occurred late in the season. Some areas, particularly the deeper offshore and boundary stations showed signs of weak stratification in mid April.
- Portions of the nearfield showed increasing stratification through May, although a well-established pycnocline had not yet developed. It was not until the final survey of the semi-annual period in June, that seasonal stratification was well established.
- The nutrient data for February to June 2002 generally followed the "typical" progression of seasonal events in the Massachusetts and Cape Cod Bays.
  - Maximum nutrient concentrations were observed in early February when the water column was well mixed and biological uptake of nutrients was limited.
  - A winter/spring 'diatom bloom' reduced nutrient concentrations in Cape Cod Bay surface waters in February. Cape Cod Bay waters remained nitrogen limited during the majority of the period.
  - Massachusetts Bay nutrient concentrations decreased from early February through April, but did not reach depleted levels in surface waters until June.
- The harbor signal of elevated nutrient concentrations (especially NH_4) that had been observed throughout the baseline period remained absent in first half of 2002. Elevated concentrations of NO_3 and SiO_4 were still observed at the inner harbor station F30 due to riverine inputs.
- The effluent nutrient signal was clearly evident in the nearfield as elevated NH_4 and PO_4 concentrations.
- The nearfield mean areal chlorophyll for winter/spring 2002 of 111.8 mg m^{-2} well below the caution threshold of 182 mg m^{-2}, but higher than seasonal means for 1992 to 1998.
- Chlorophyll concentrations peaked in February and showed great deal of spatial and temporal variability. There was a large increase in subsurface chlorophyll associated with the minor bloom of *Phaeocystis* in the nearfield in April.
- The southwestern edge of a diatom bloom (*Skeletonema*) moved into the northern boundary of the survey area in late February/early March resulting in elevated chlorophyll at those stations.
- DO concentrations in 2002 were within the range of values observed during previous years and followed the typical trends. Although nearfield DO was quite high, DO %saturation values in Cape Cod Bay, offshore and boundary waters were relatively low (86%) in June.

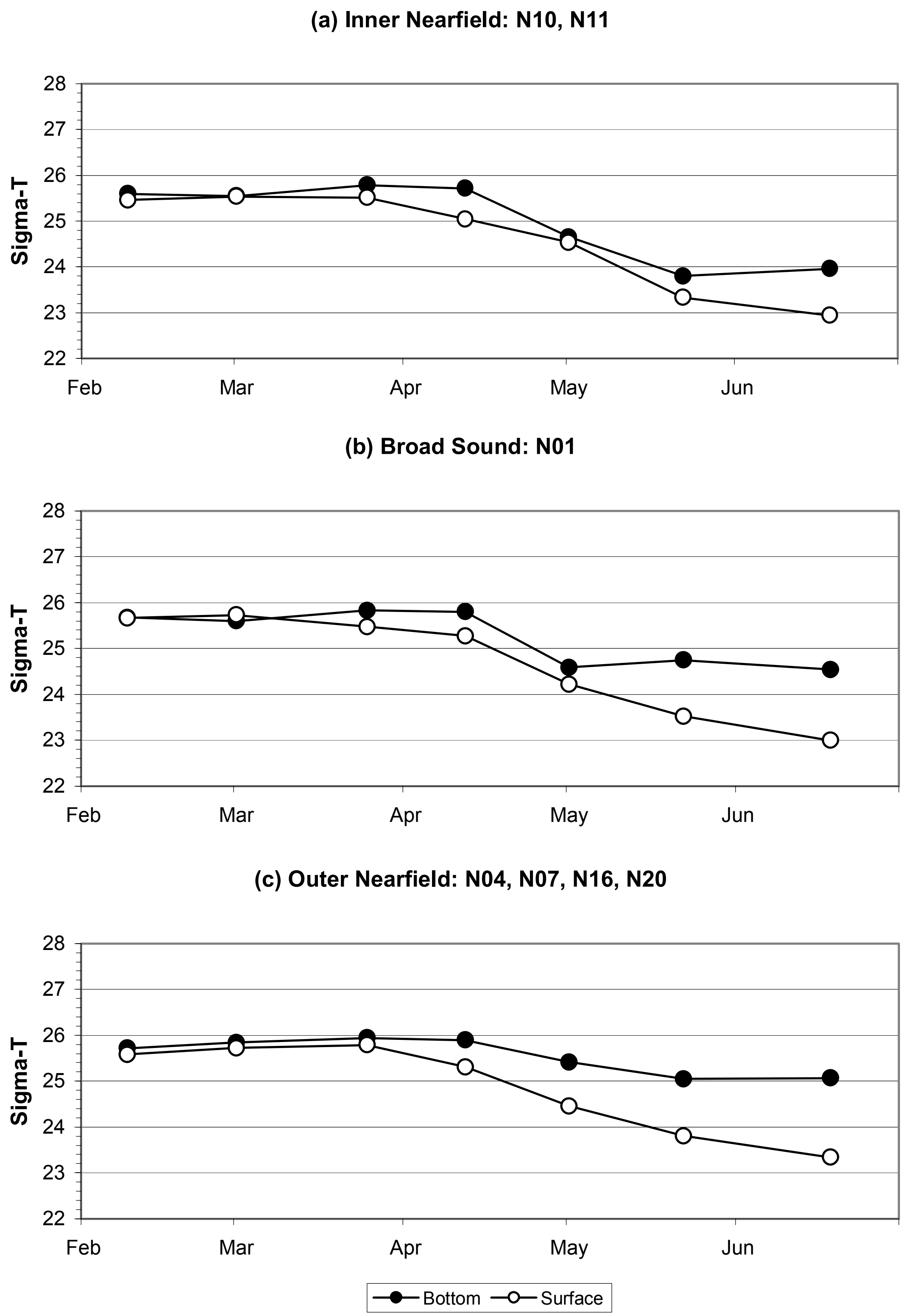


Figure 4-1. Time-series of average surface and bottom water density (σ_t) in the nearfield

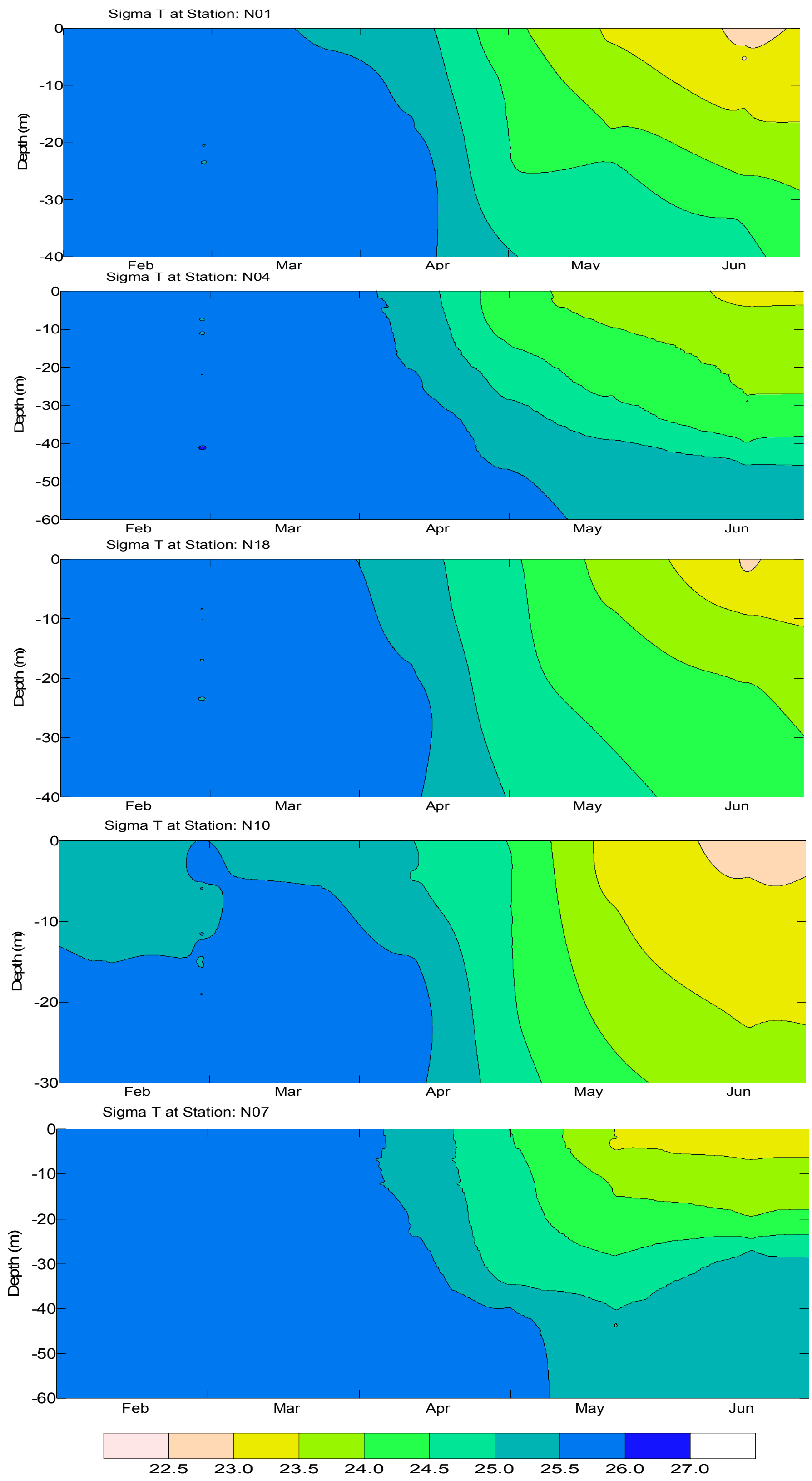


Figure 4-2. Nearfield depth vs. time contour plots of density (σ_t) for stations N01, N04, N18, N10 and N07

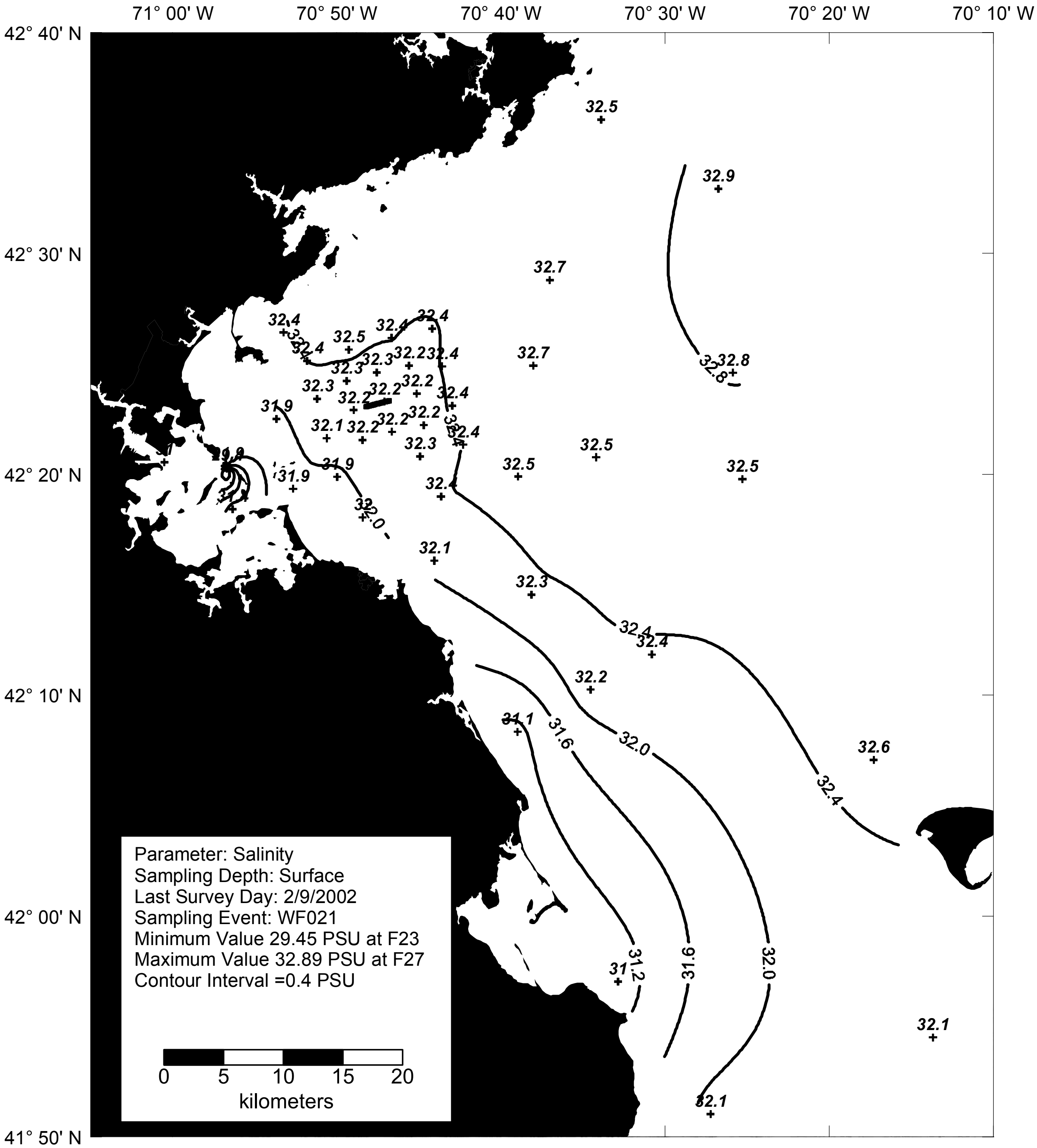


Figure 4-3. Salinity surface contour plot for farfield survey WF021 (Feb 02)

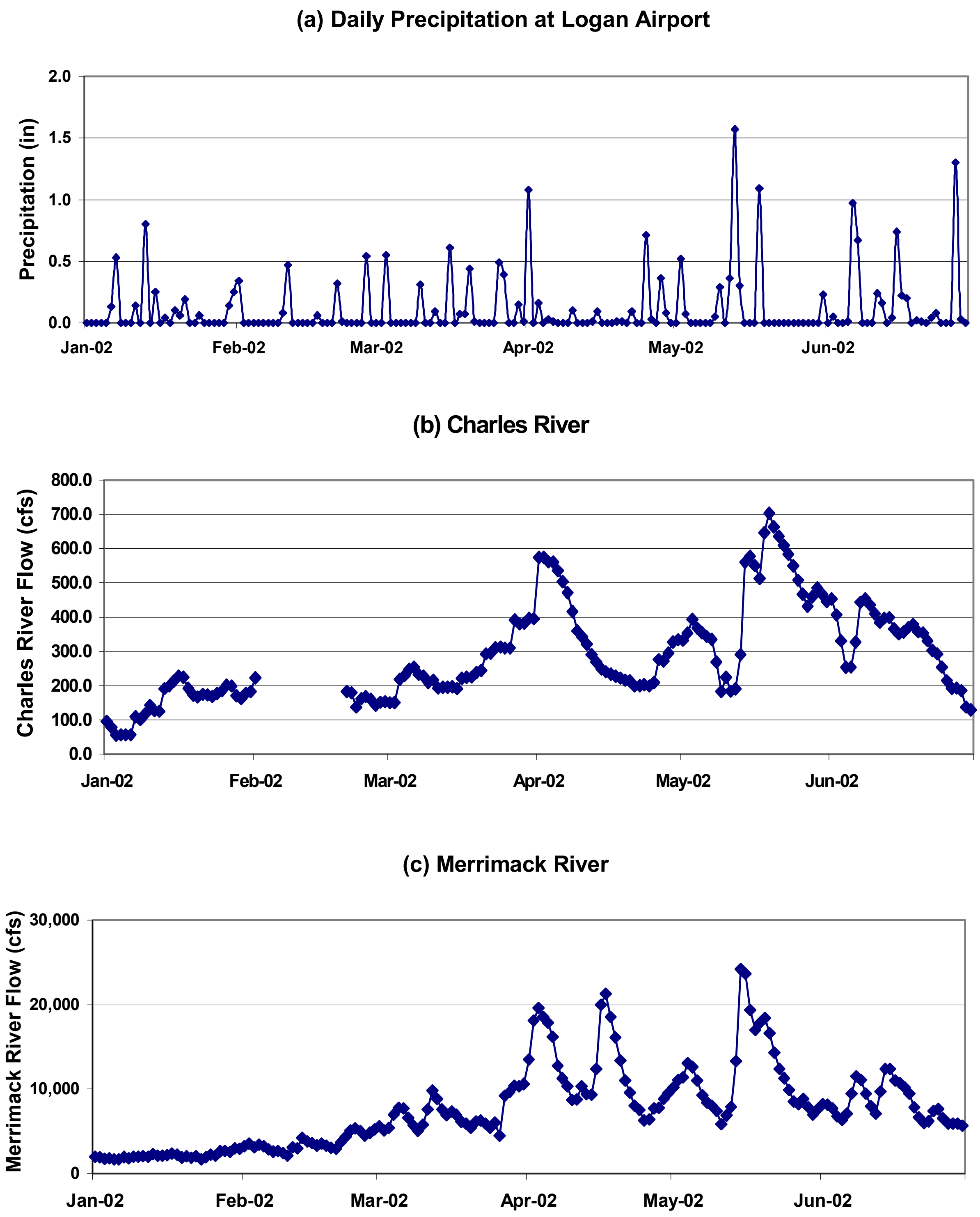
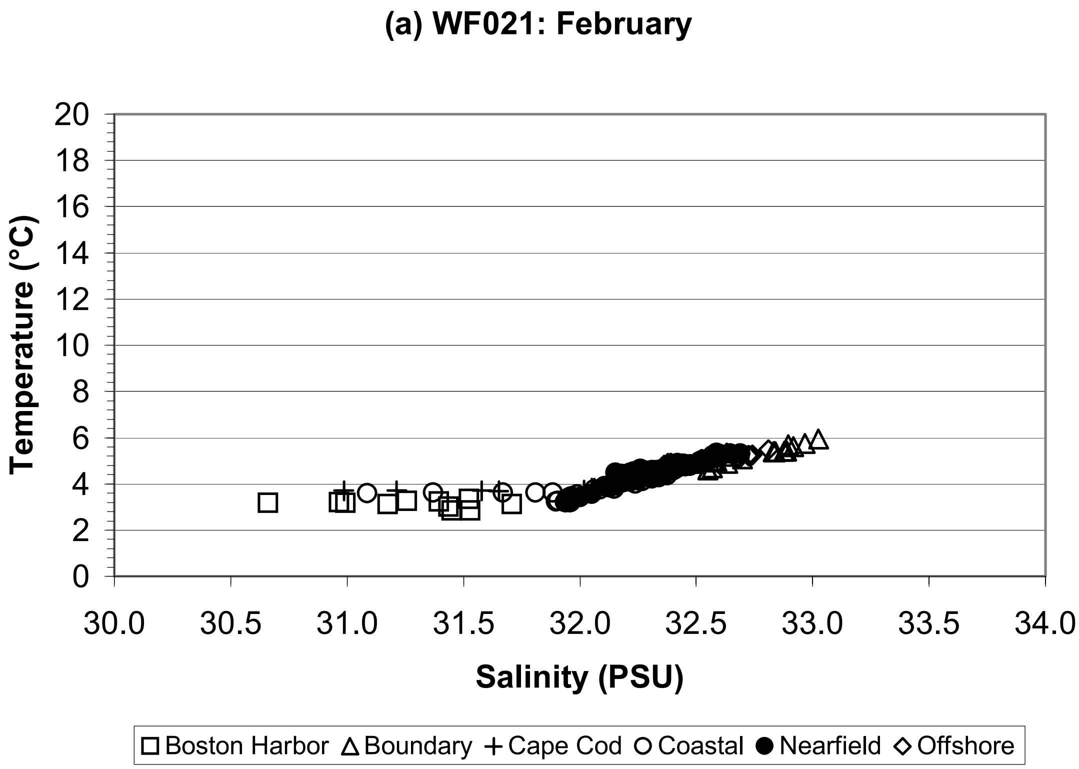


Figure 4-4. Precipitation at Logan Airport and river discharges for the Charles and Merrimack Rivers

Note: No data was available for Charles River flow from February 2 thru February 19, 2002.



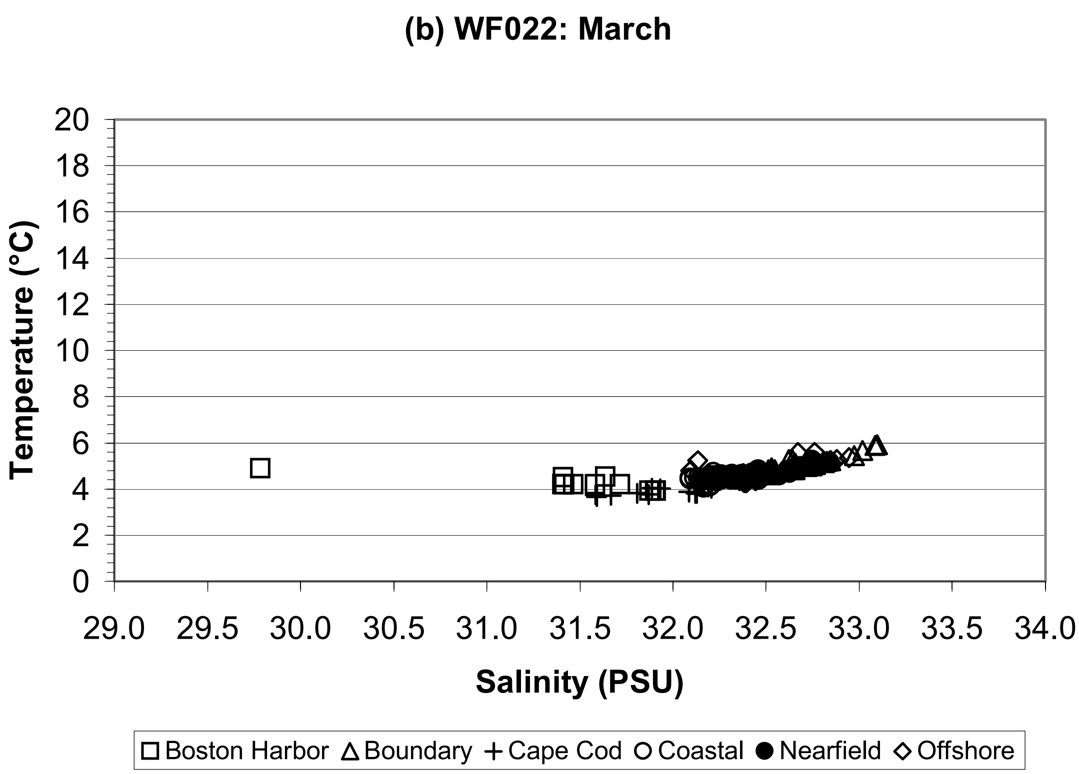


Figure 4-5. Temperature/salinity distribution for all depths during WF021 (Feb 02) and WF022 (Feb/Mar 02) surveys

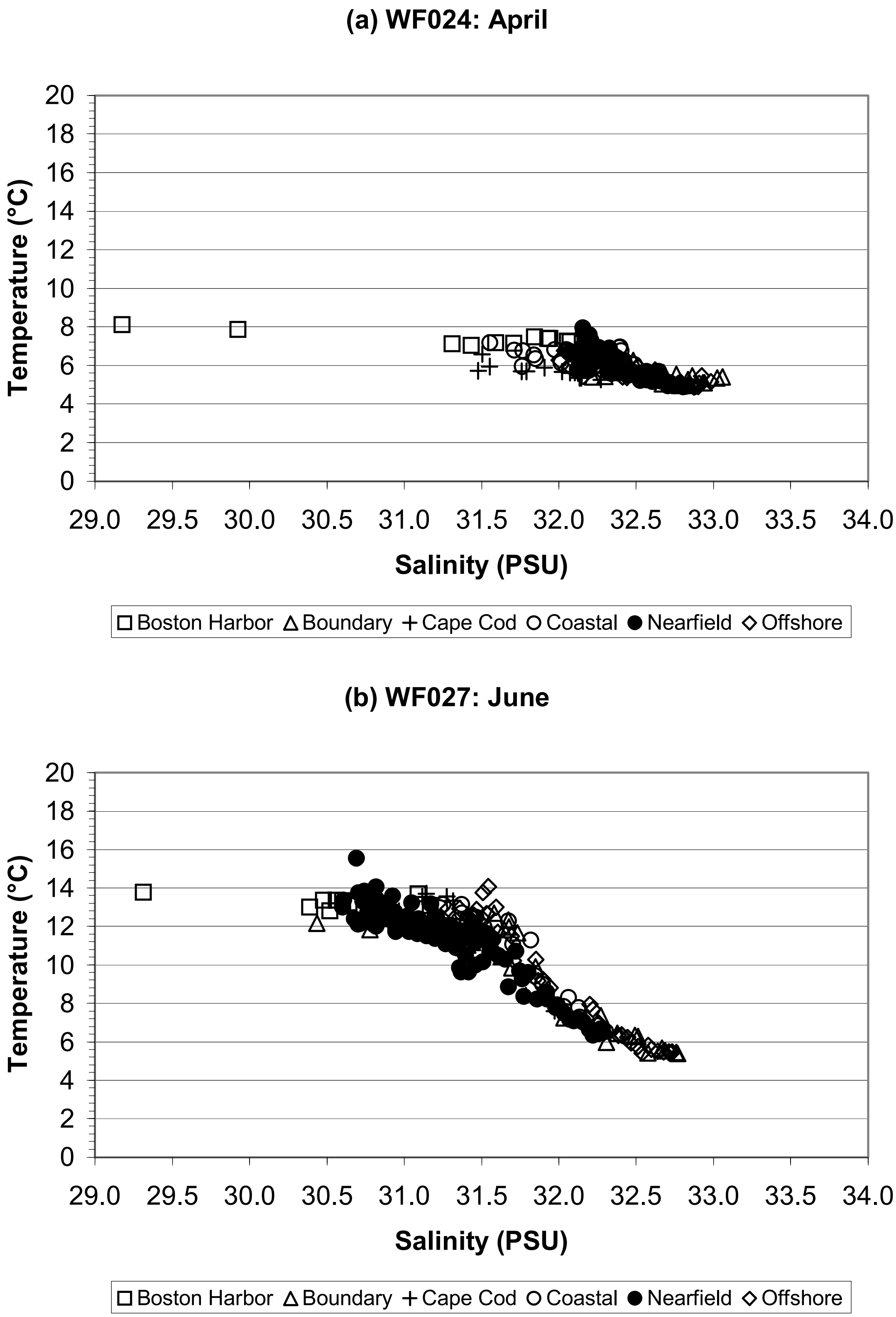


Figure 4-6. Temperature/salinity distribution for all depths during WF024 (Apr 02) and WF027 (Jun 02) surveys

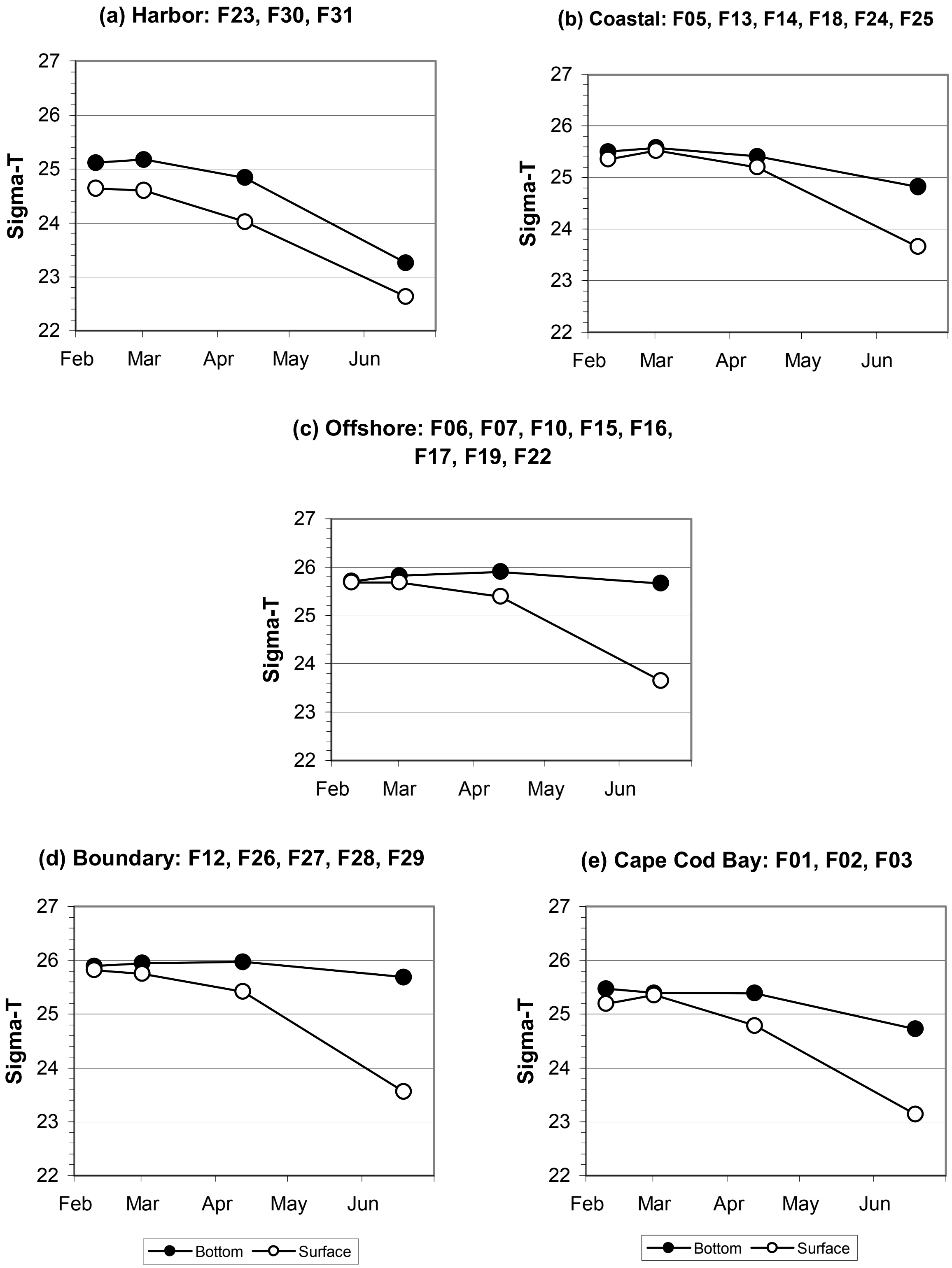


Figure 4-7. Time-series of average surface and bottom water density (σ_T) in the farfield

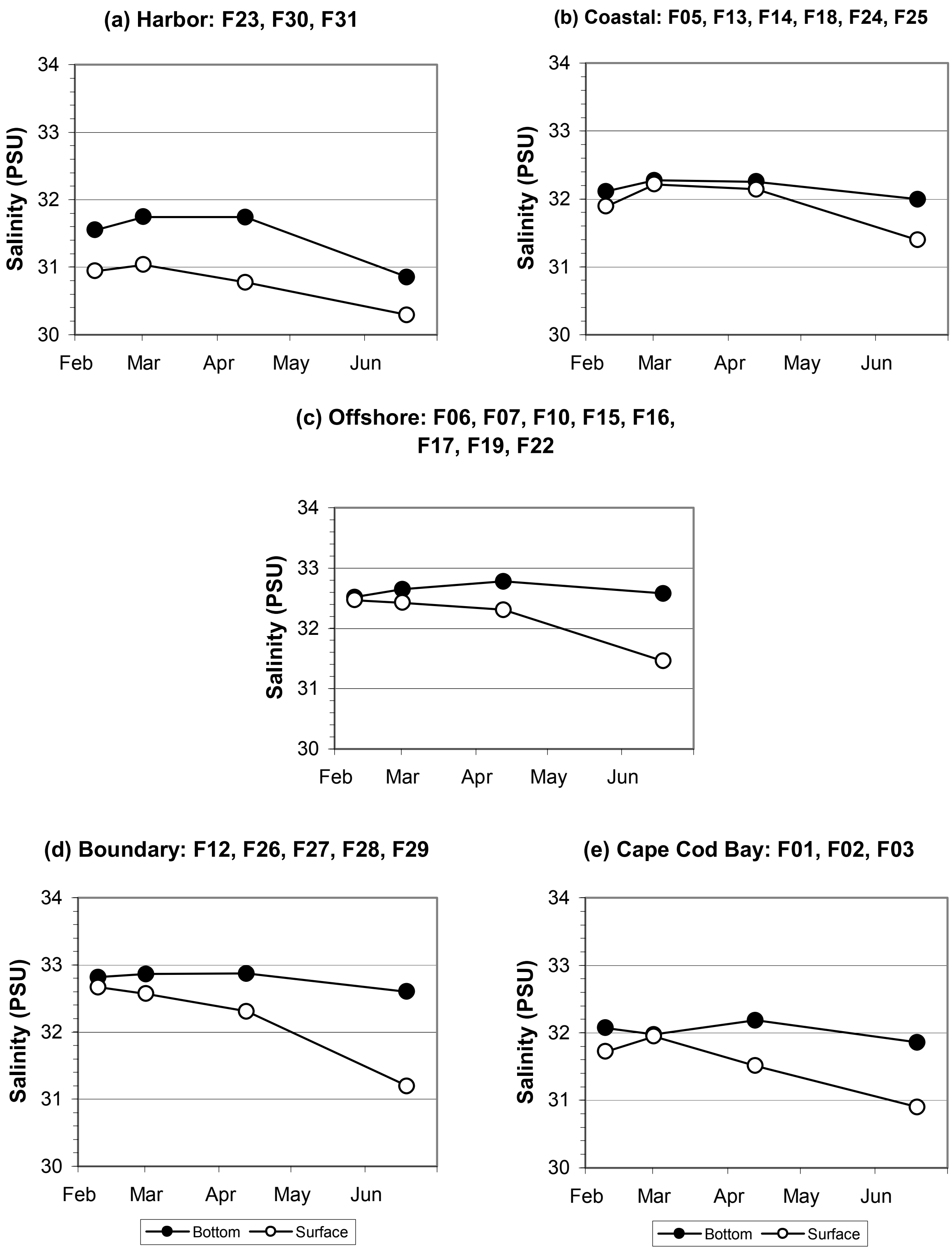


Figure 4-8. Time-series of average surface and bottom water salinity (PSU) in the farfield

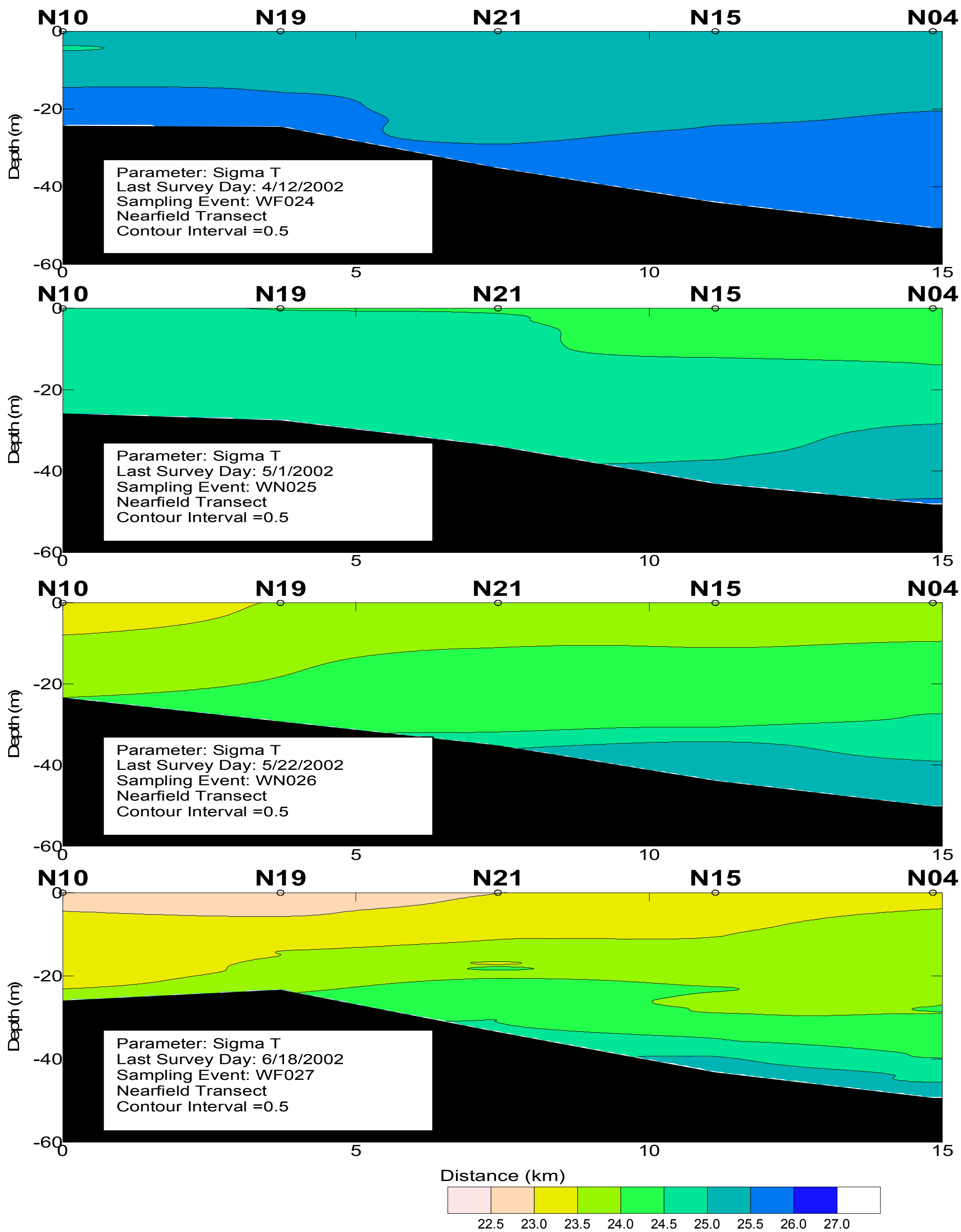
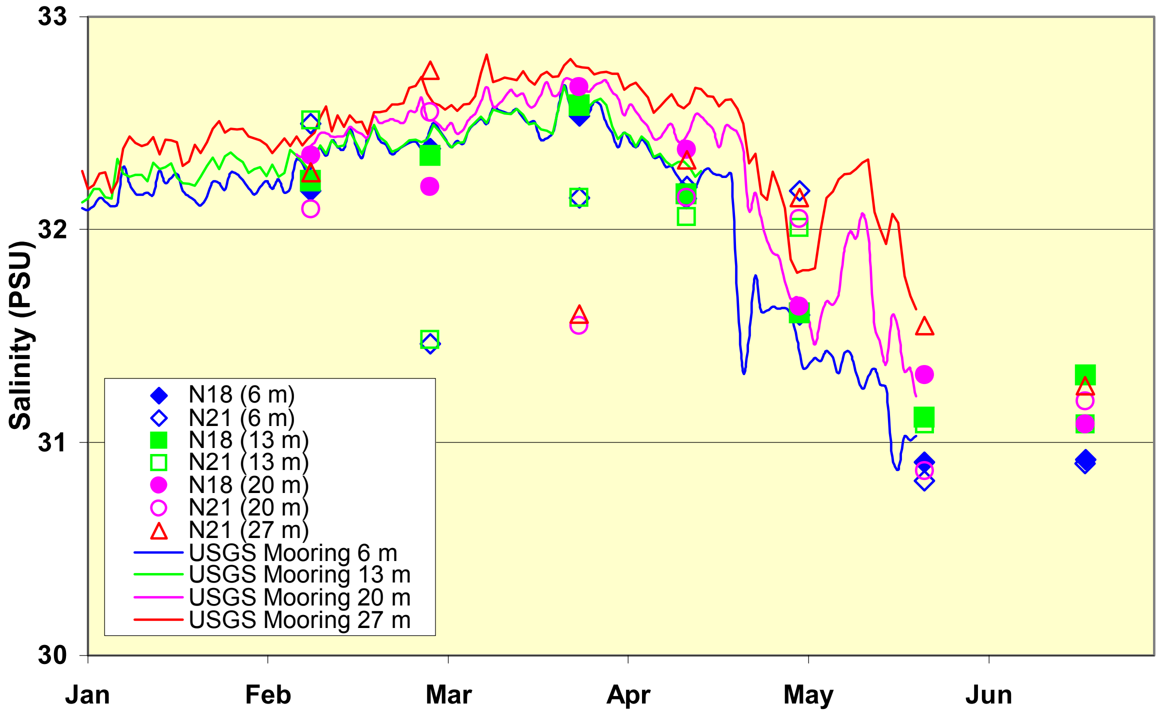


Figure 4-9. Density vertical contour plots across the nearfield transect for surveys WF024, WN025, WN026, and WF027



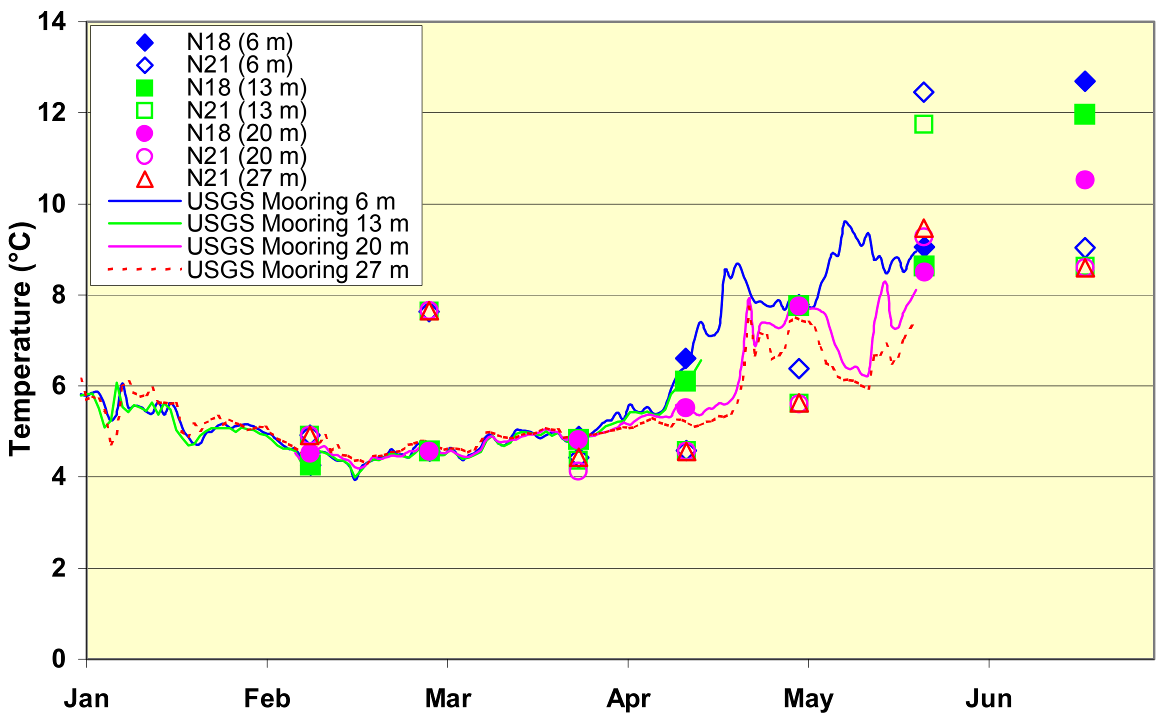


Figure 4-10. USGS salinity and temperature mooring data compared with N18 and N21 data. (Note: The 13m instrument failed on April 15, 2002. The 20m instrument failed during Oct 2001-Feb 2002 deployment.)

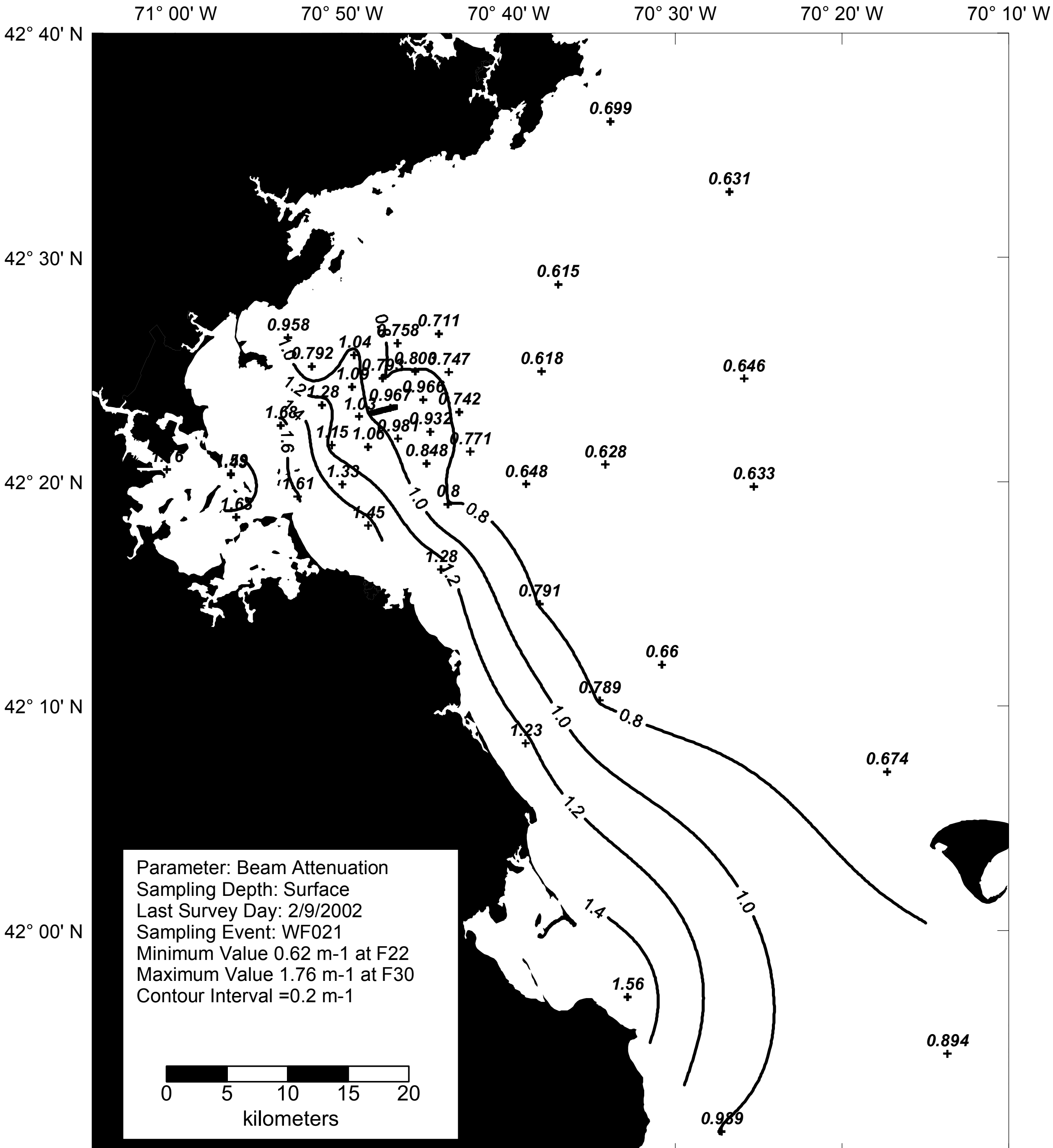


Figure 4-11. Beam attenuation surface contour plot for farfield survey WF021 (Feb 02)

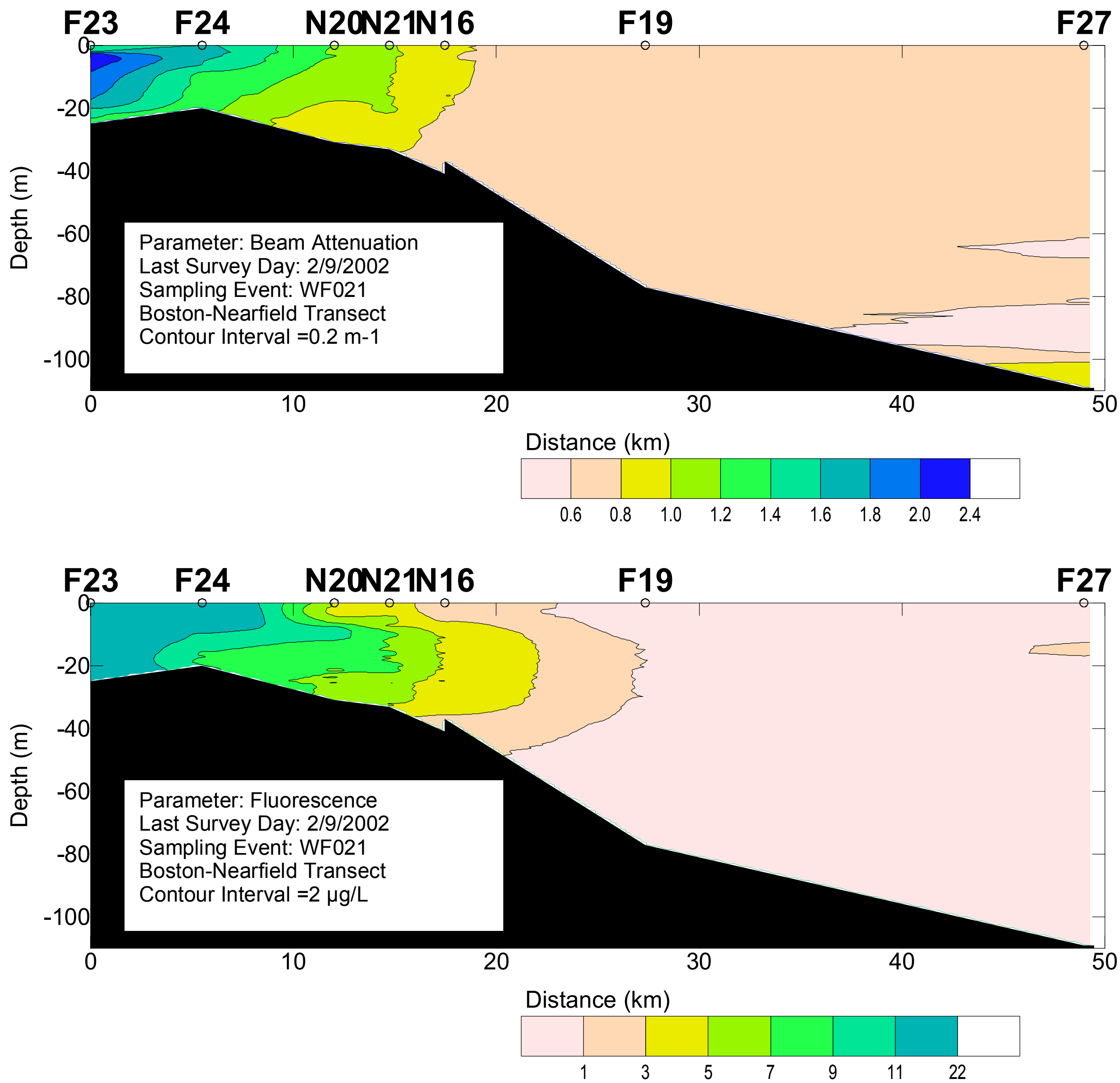


Figure 4-12. Beam attenuation and fluorescence vertical contour plots along the Boston-Nearfield transect for farfield survey WF021 (Feb 02)

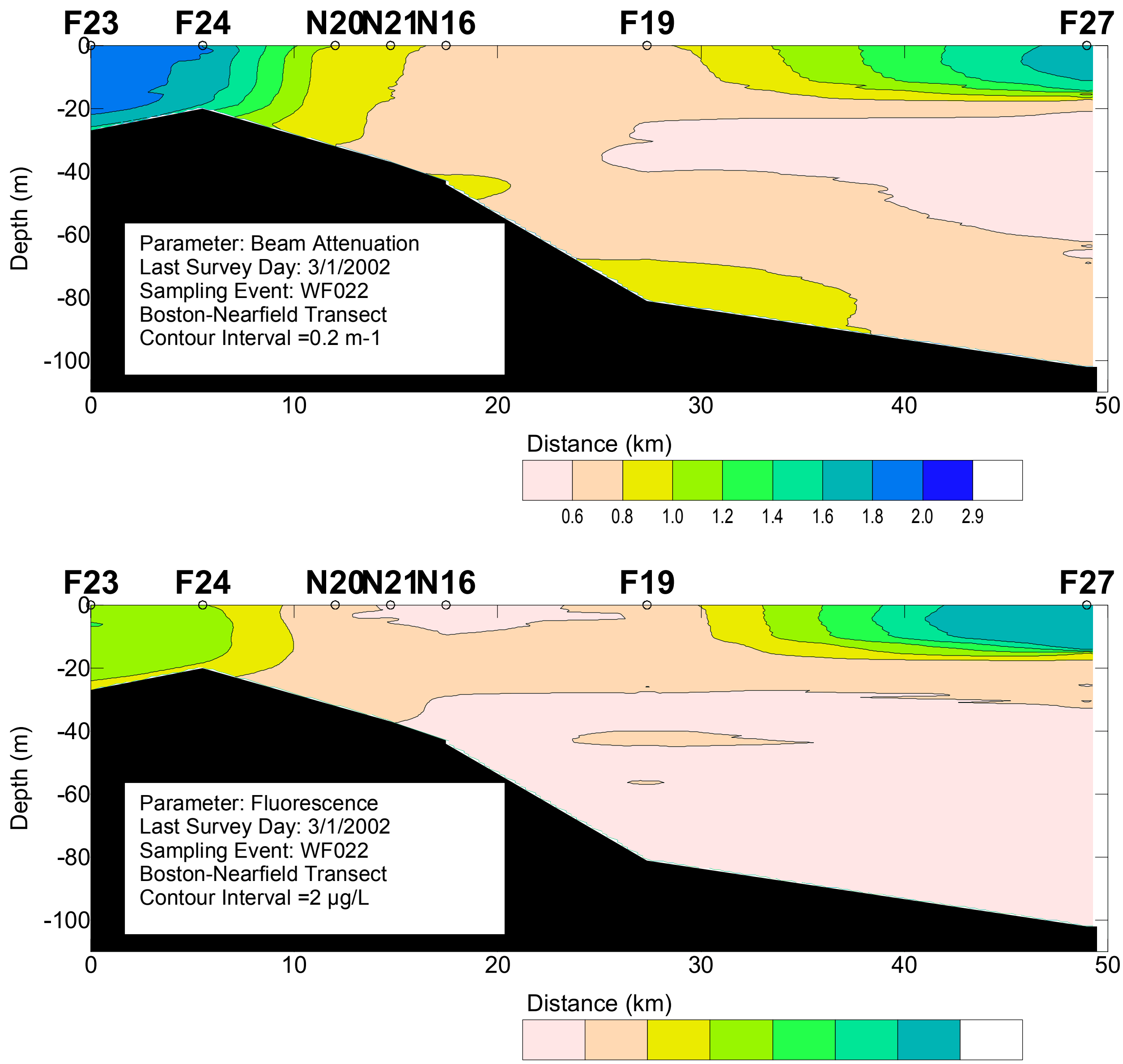
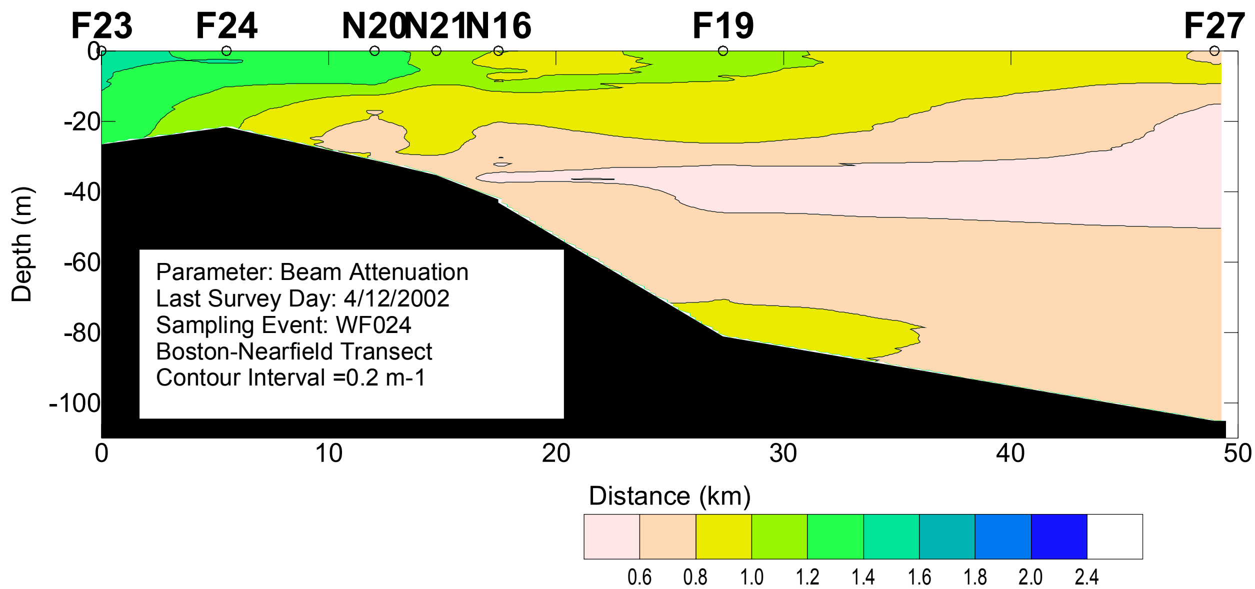


Figure 4-13. Beam attenuation and fluorescence vertical contour plots along the Boston-Nearfield transect for farfield survey WF022 (Feb/Mar 02)



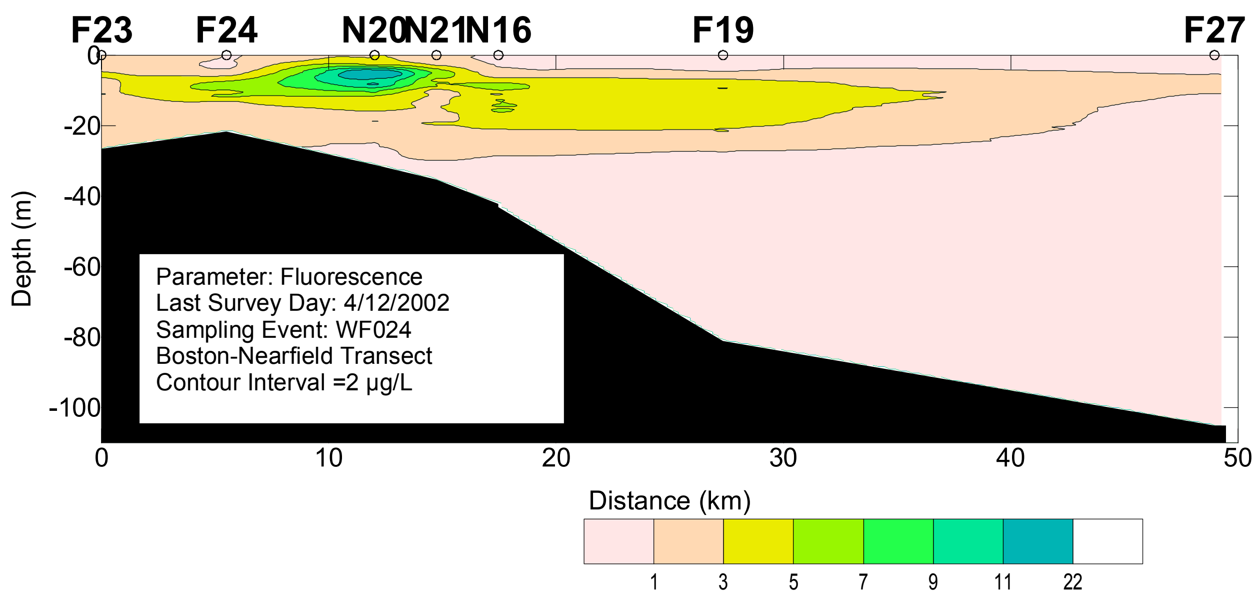


Figure 4-14. Beam attenuation and fluorescence vertical contour plots along the Boston-Nearfield transect for farfield survey WF024 (Apr 02)

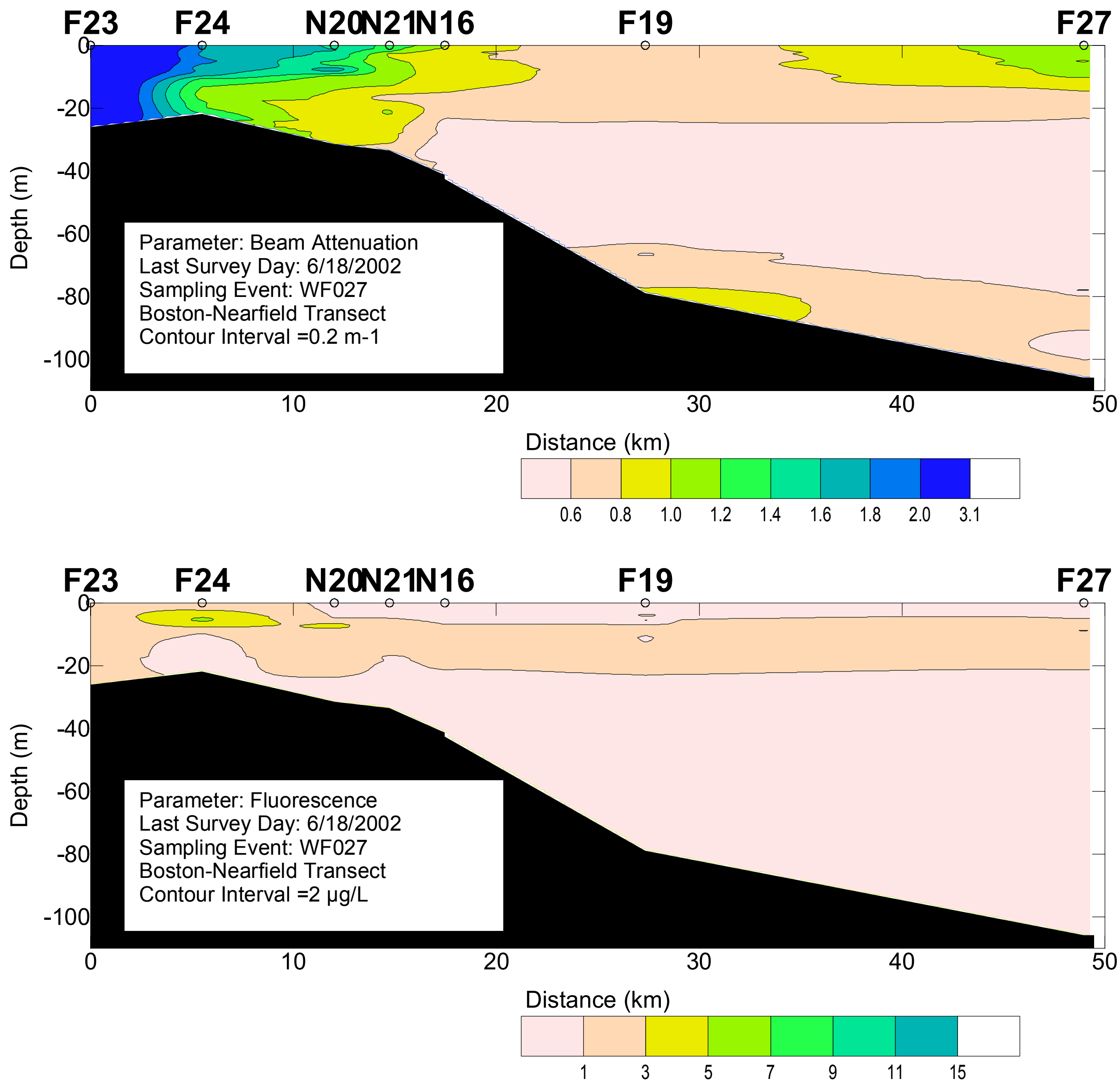


Figure 4-15. Beam attenuation and fluorescence vertical contour plots along the Boston-Nearfield transect for farfield survey WF022 (Jun 02)

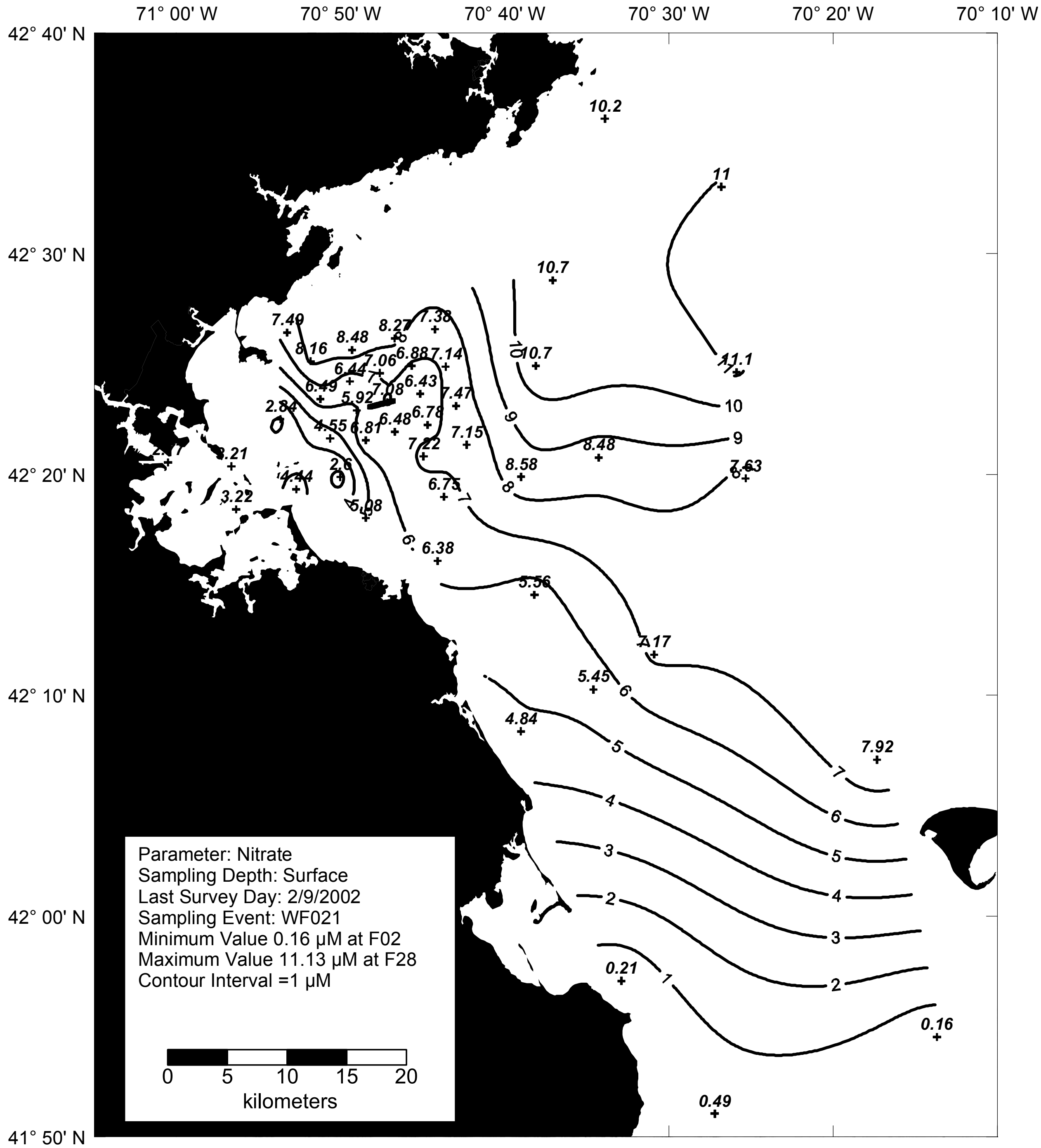


Figure 4-16. Nitrate surface contour plot for farfield survey WF021 (Feb 02)

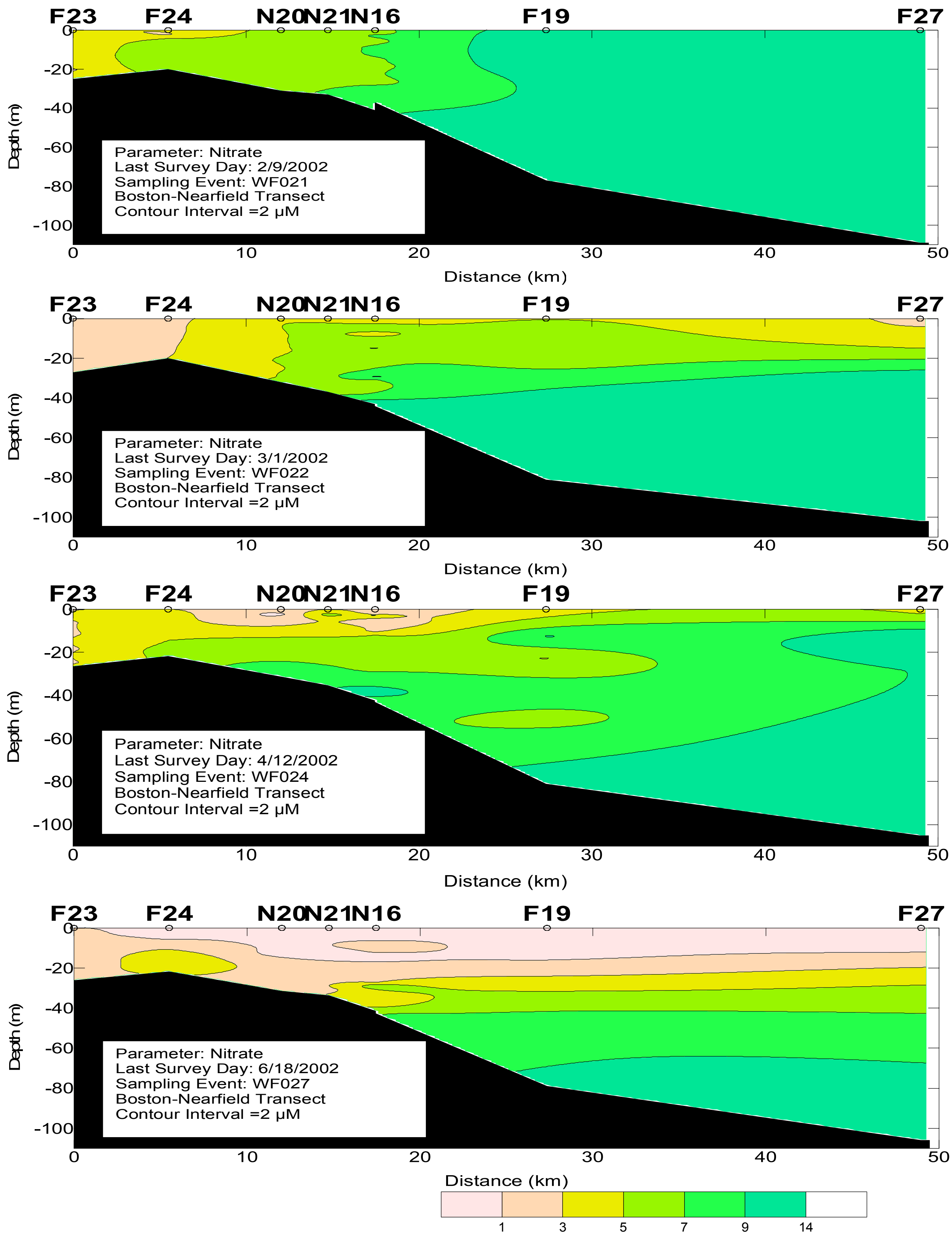


Figure 4-17. Nitrate vertical contour plots along the Boston-Nearfield transect for surveys WF021, WF022, WF024, and WF027

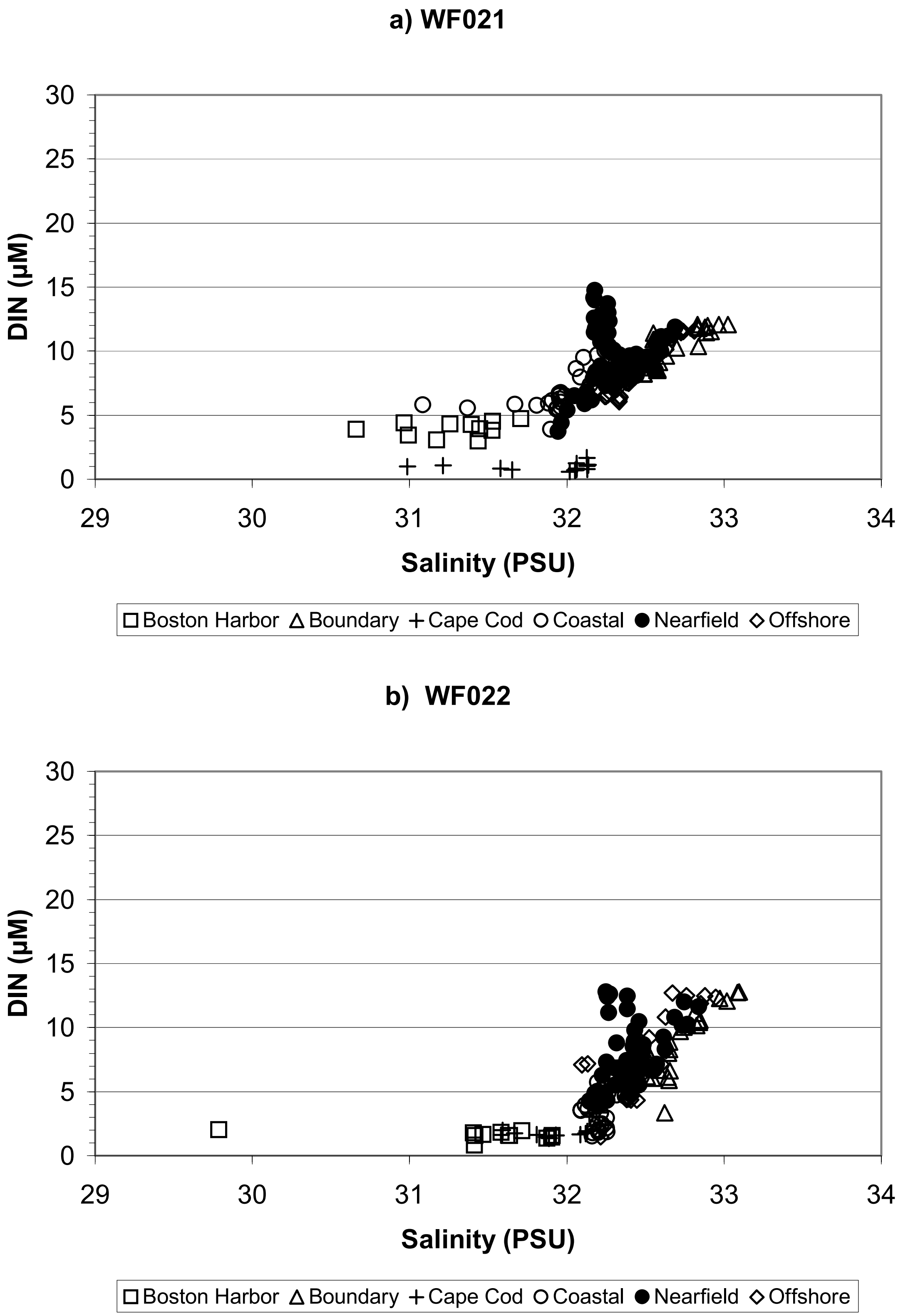
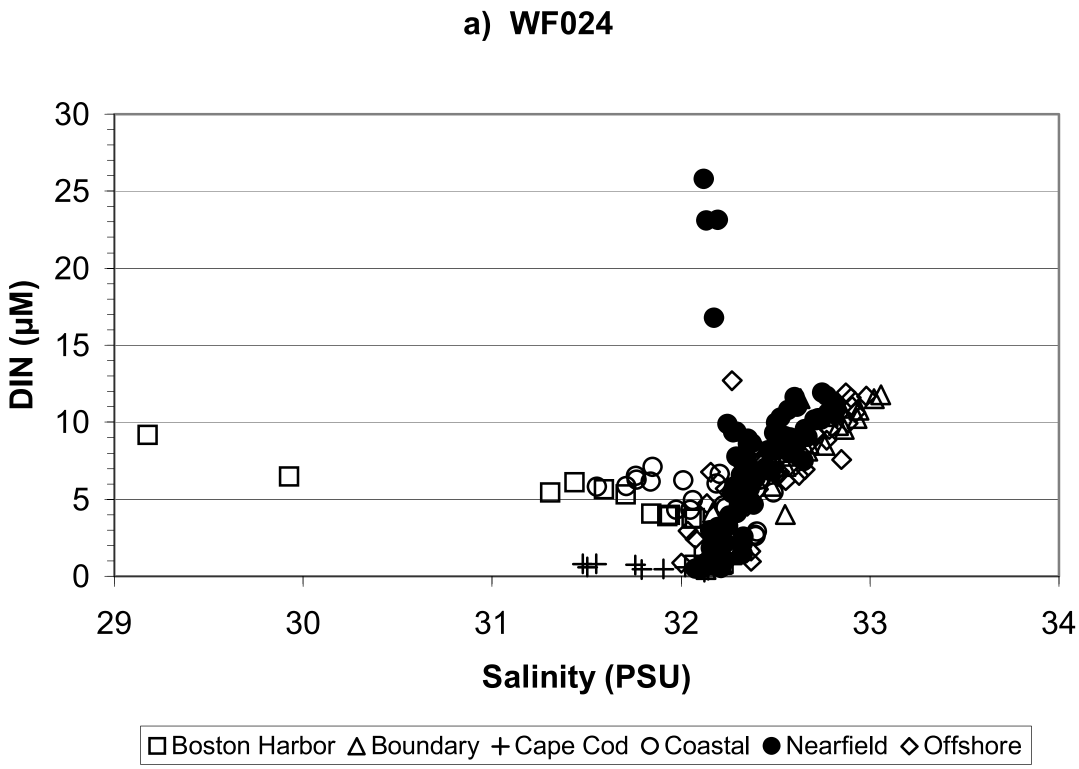


Figure 4-18. DIN vs. salinity for all depths during farfield surveys WF021 (Feb 02) and WF022 (Feb/Mar 02)



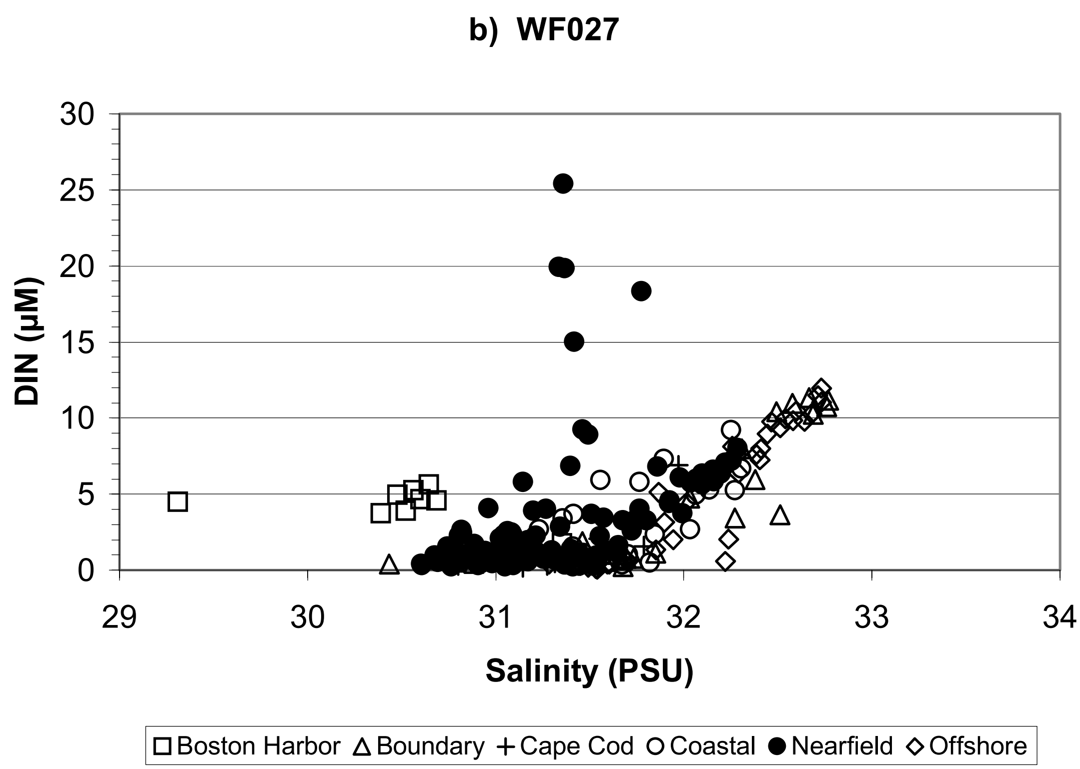


Figure 4-19. DIN vs. salinity for all depths during farfield surveys WF024 (Apr 02) and WF027 (Jun 02)

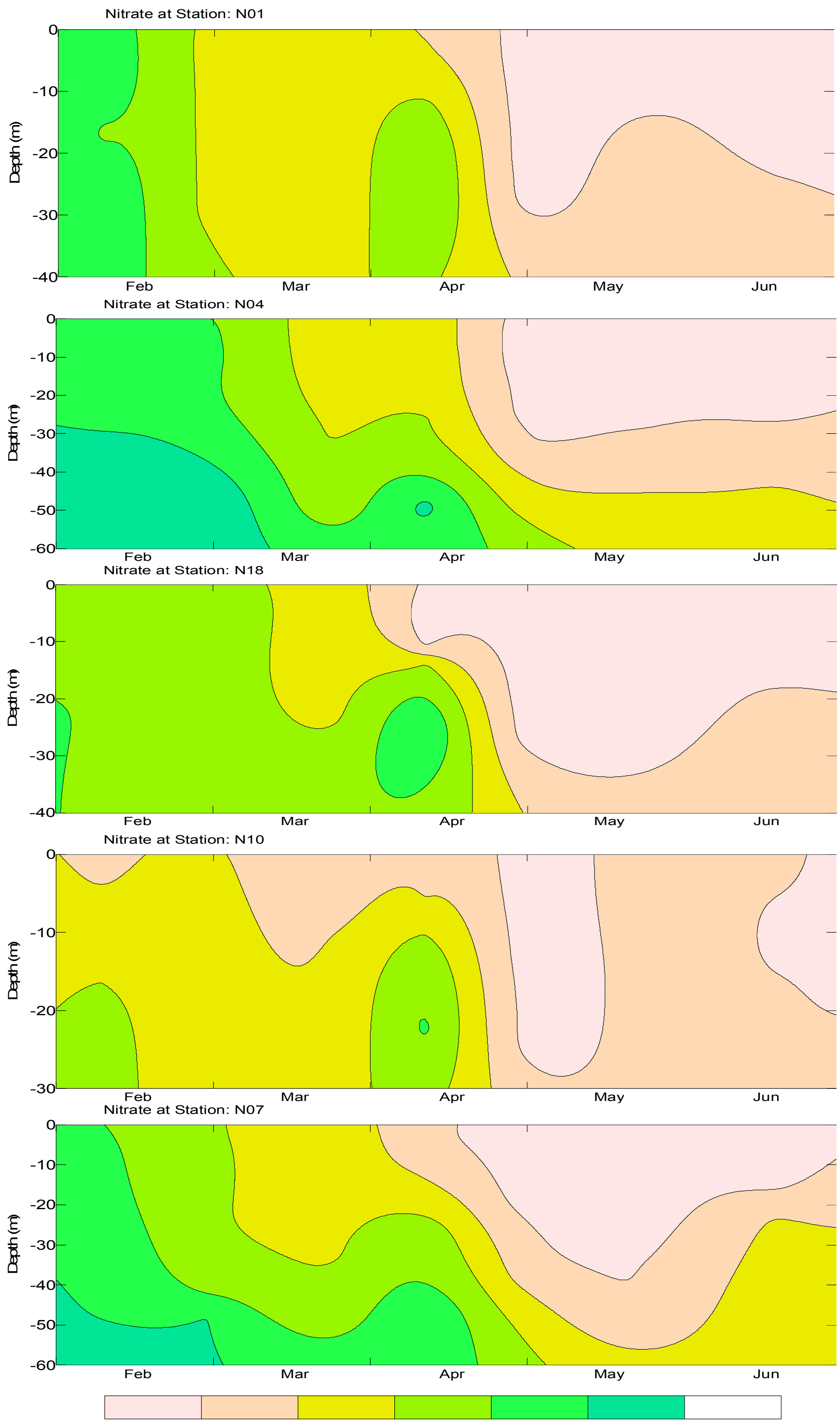


Figure 4-20. Nearfield depth vs. time contour plots of nitrate for stations N01, N04, N18, N10 and N07

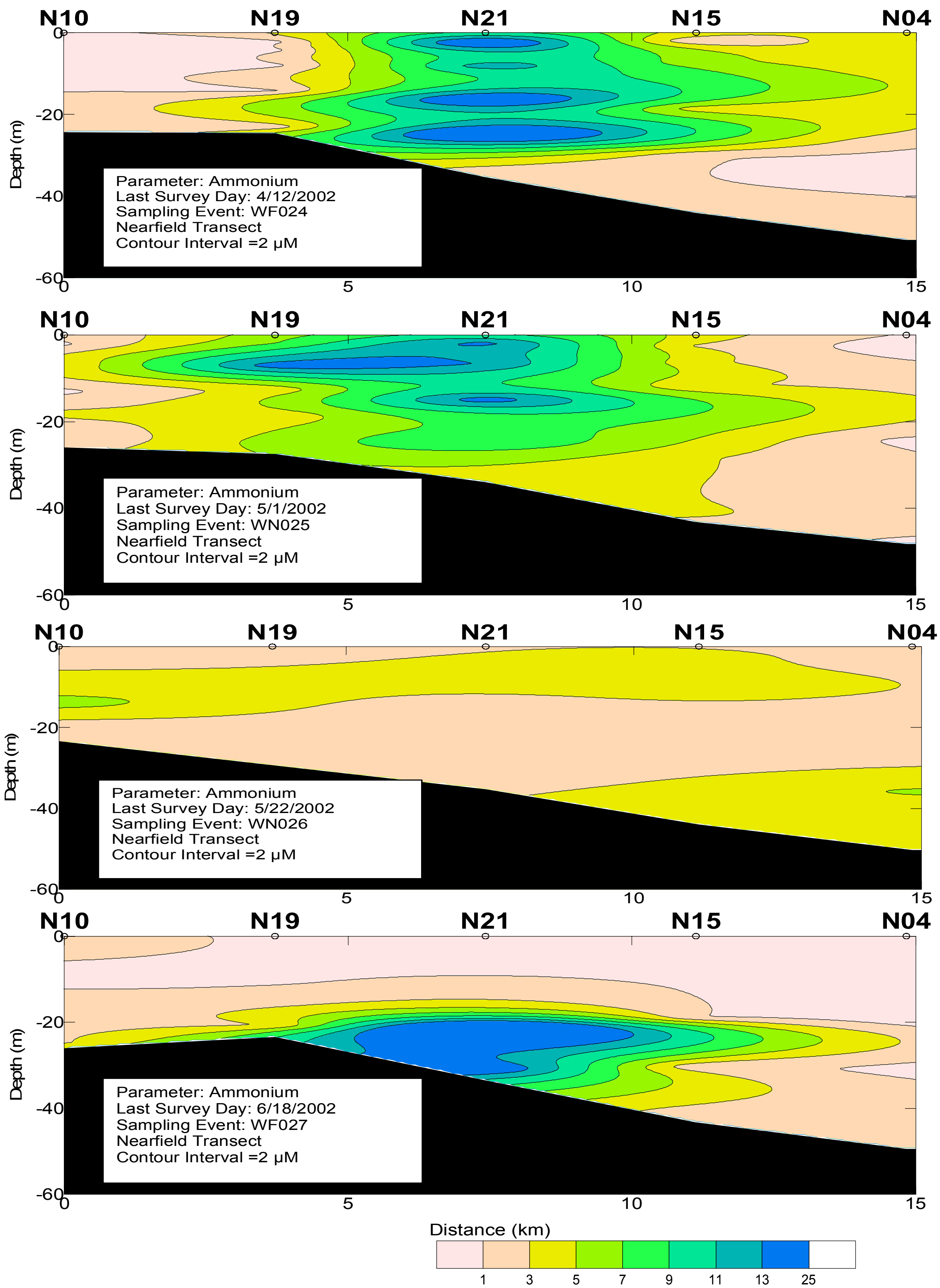


Figure 4-21. Ammonium vertical contour plots along the nearfield transect for surveys WF024, WN025, WN026, and WF027

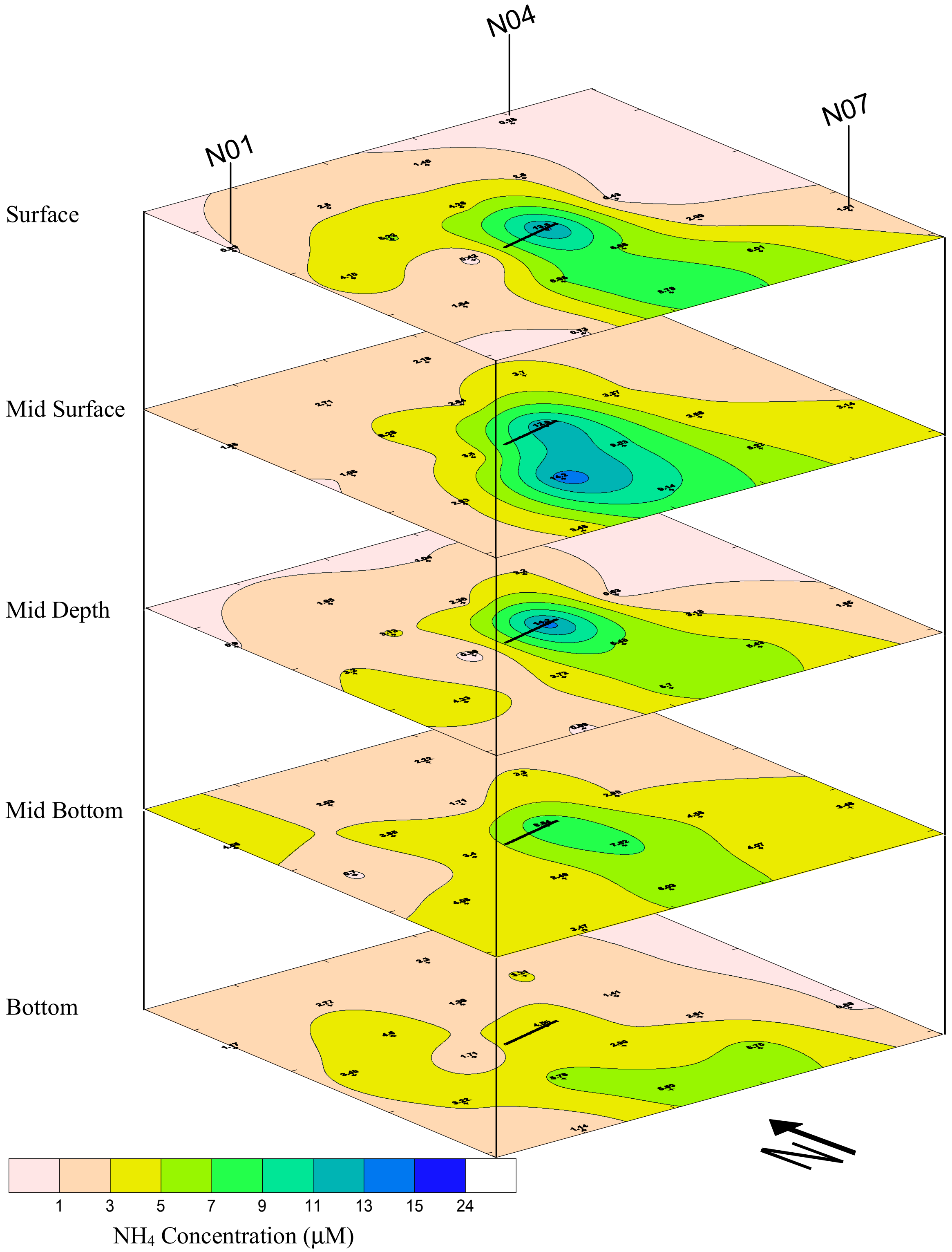


Figure 4-22. Ammonium concentrations at each of the five sampling depths for all nearfield stations during WN025 (Note: displayed depths are a representation, actual sampling depths vary for each station)

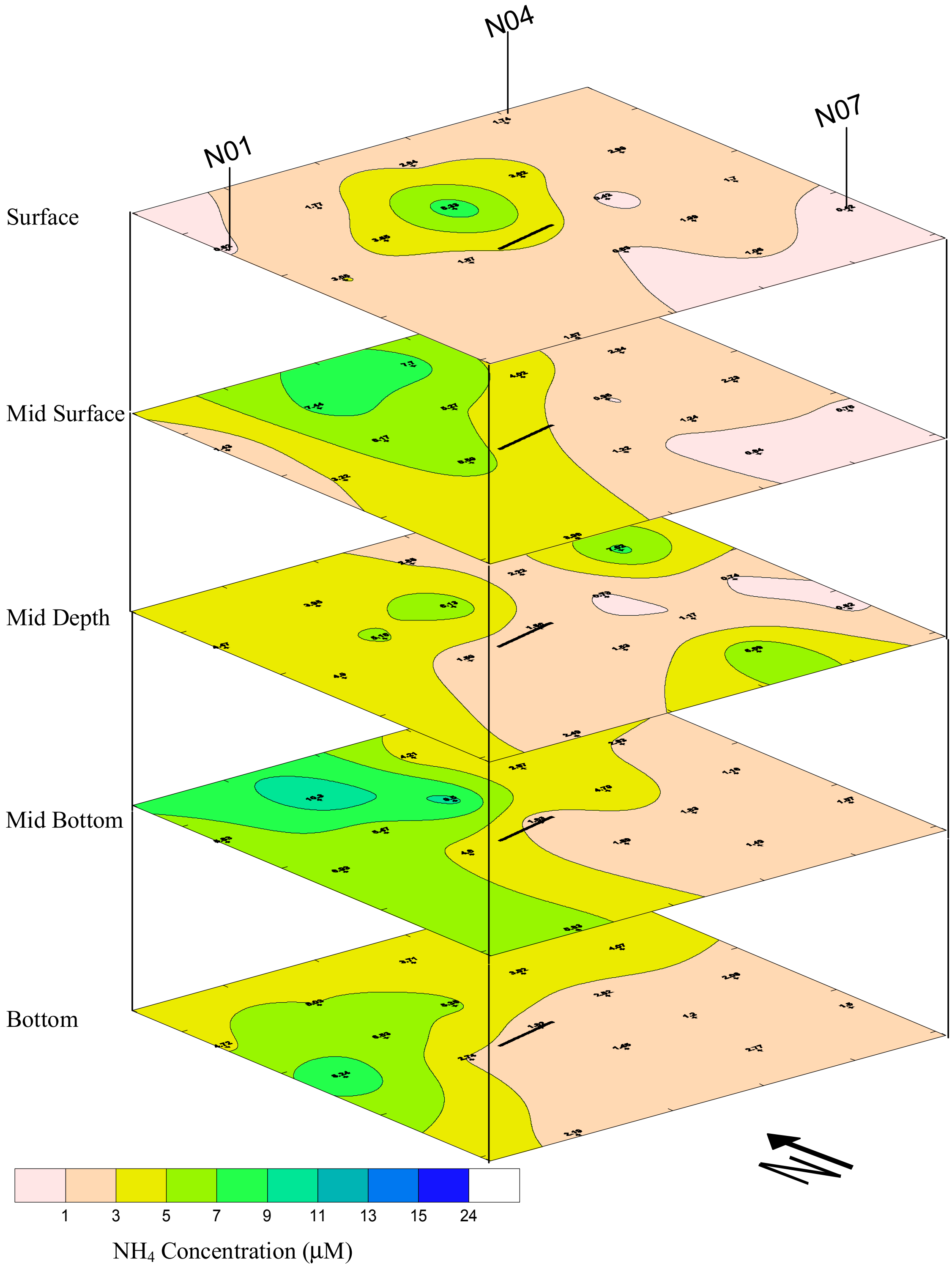


Figure 4-23. Ammonium concentrations at each of the five sampling depths for all nearfield stations during WN026 (Note: displayed depths are a representation, actual sampling depths vary for each station)

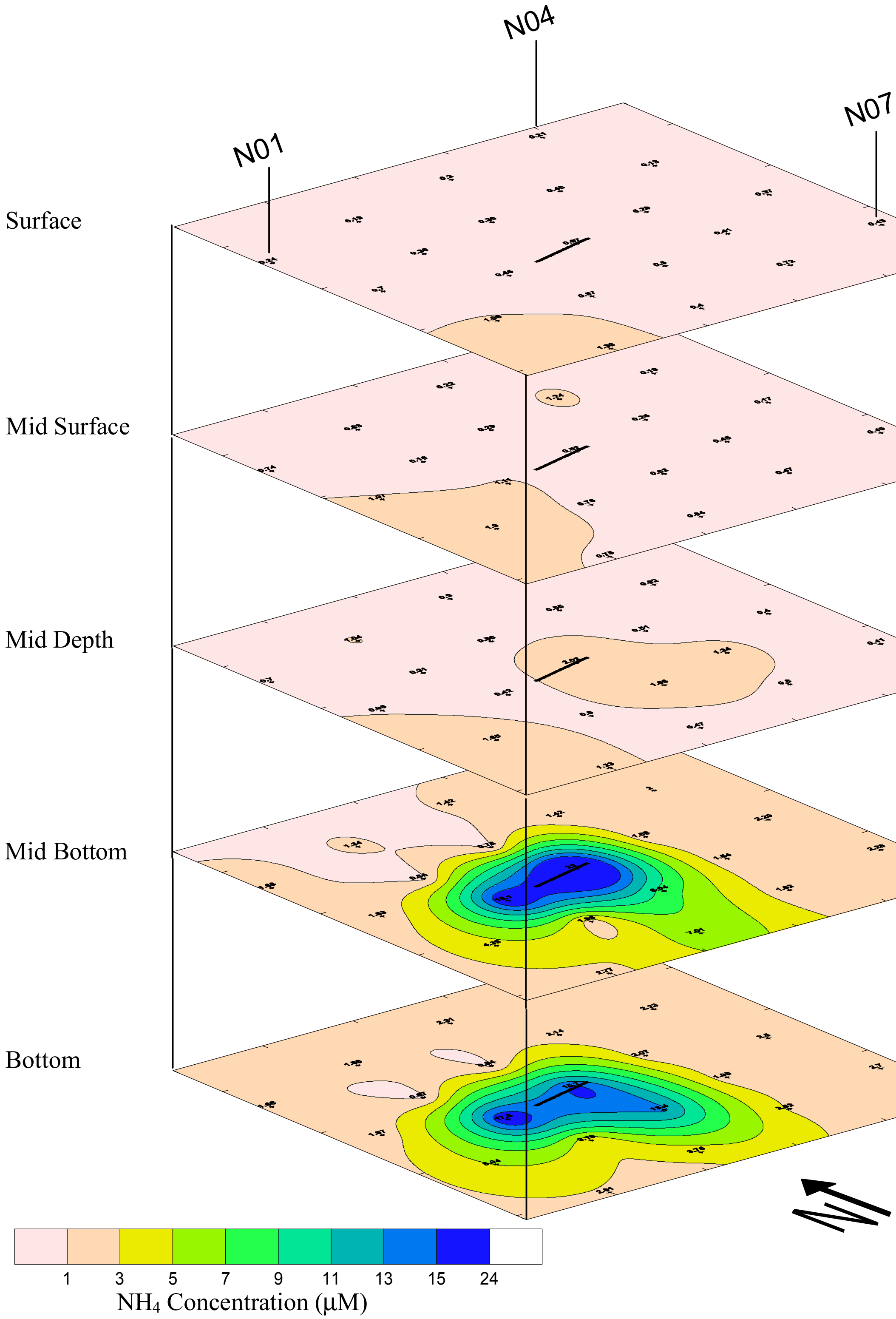
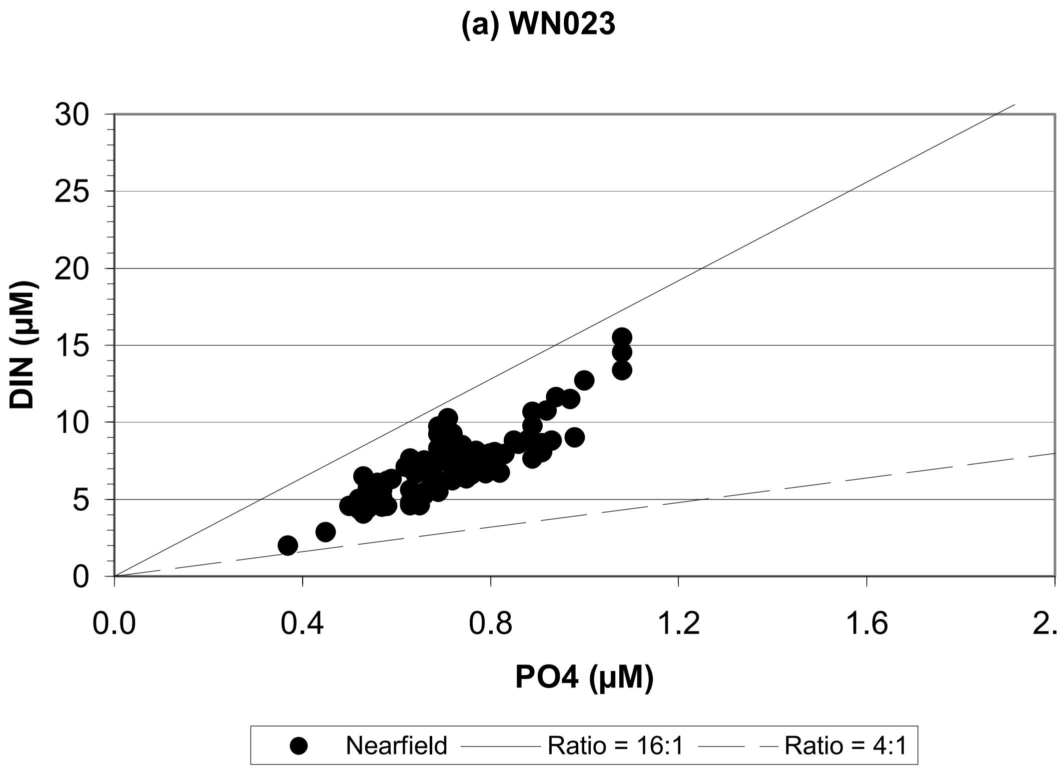


Figure 4-24. Ammonium concentrations at each of the five sampling depths for all nearfield stations during WN027 (Note: displayed depths are a representation, actual sampling depths vary for each station)



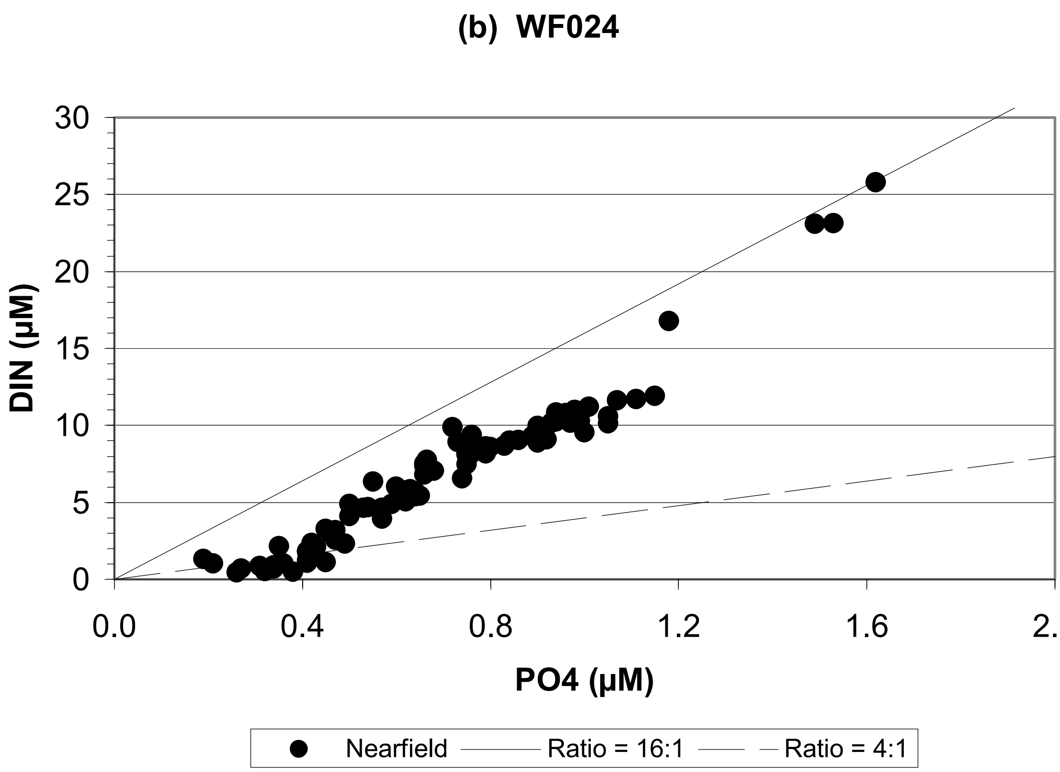
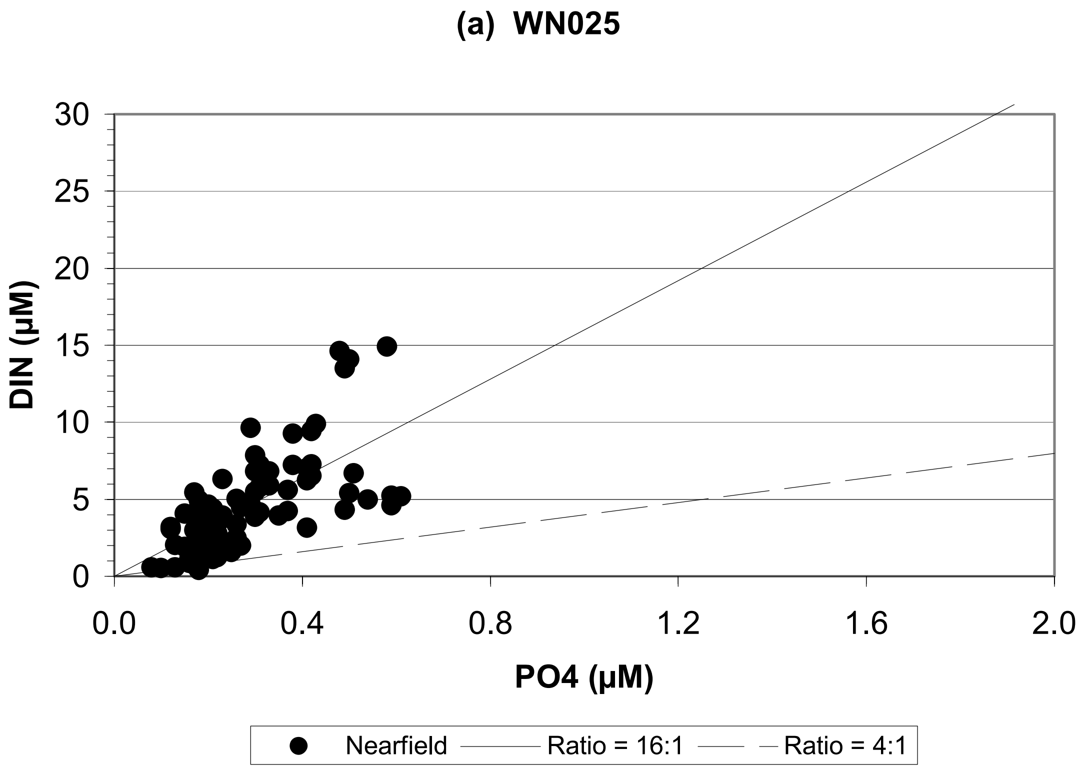


Figure 4-25. DIN vs. phosphate for all depths in the nearfield for surveys a) WN023 and b) WF024



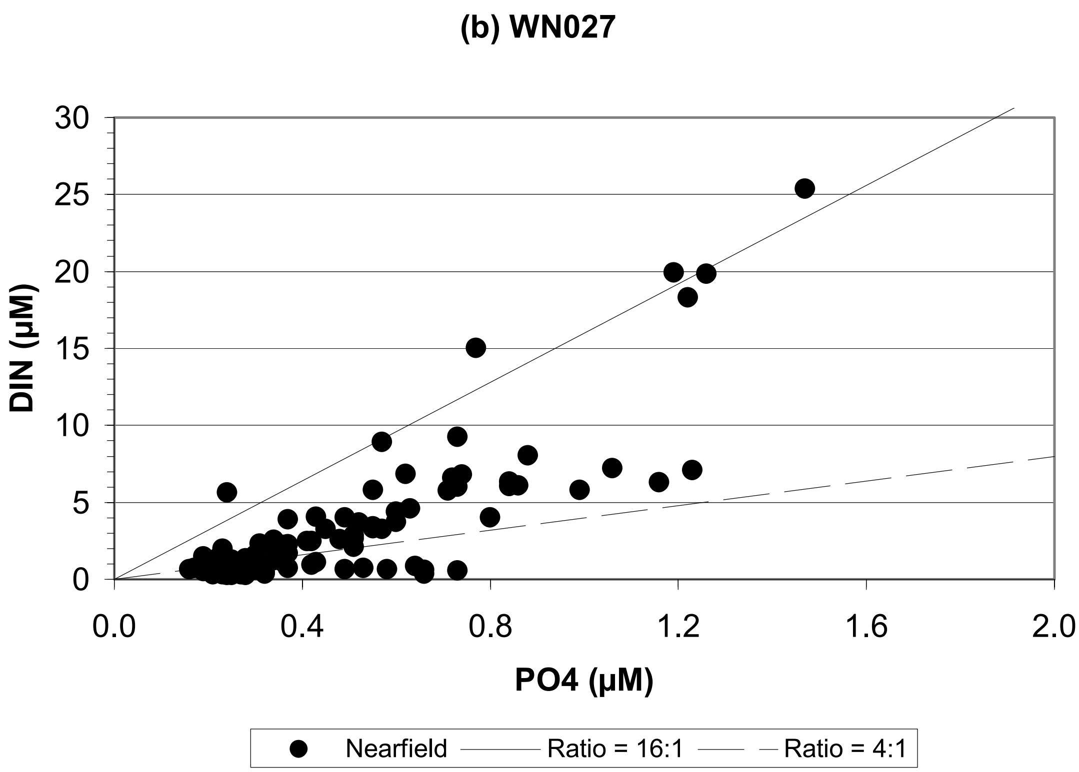


Figure 4-26. DIN vs. phosphate for all depths in the nearfield for surveys a) WN025 and b) WF027

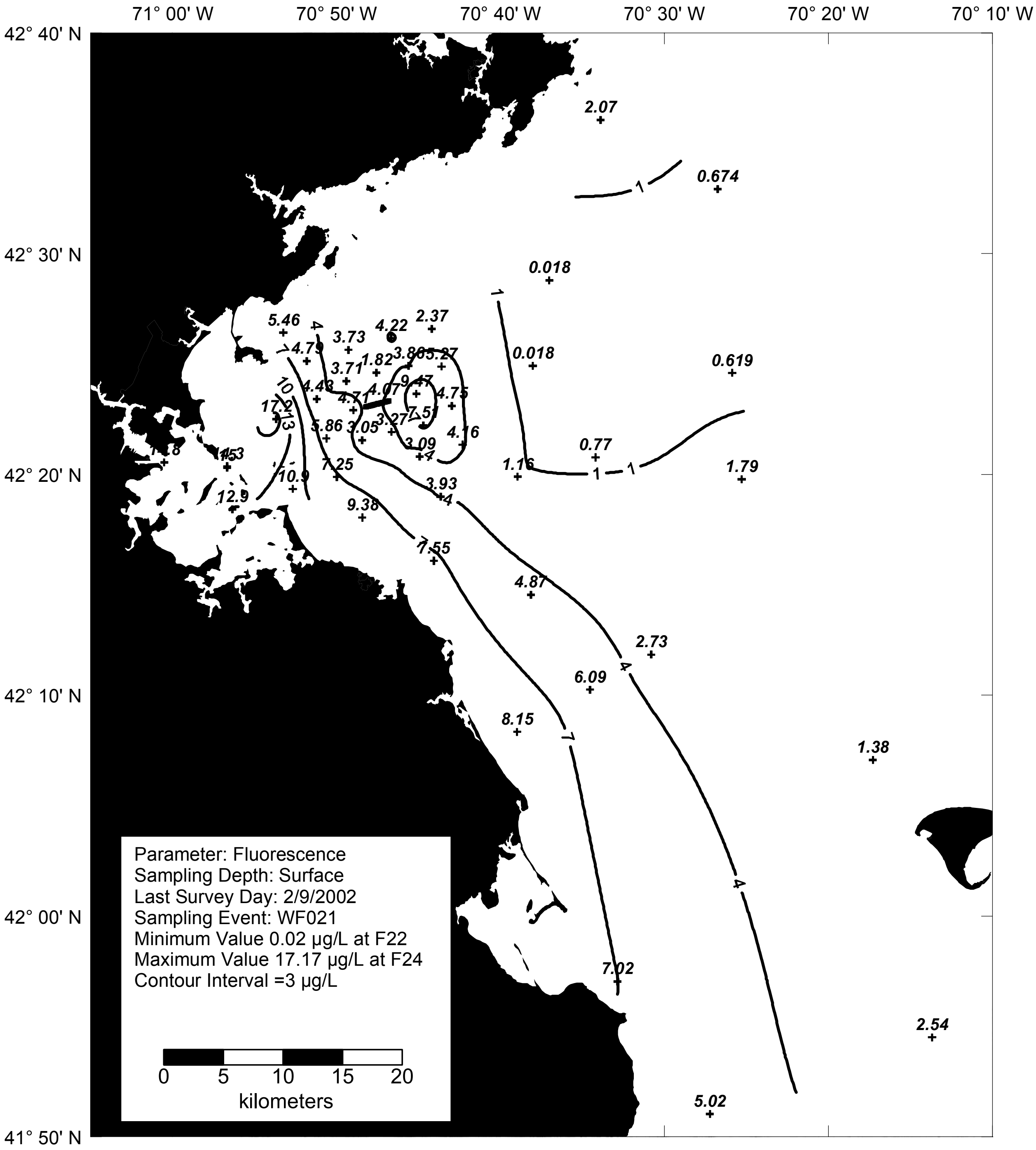


Figure 4-27. Fluorescence surface contour plot for farfield survey WF021 (Feb 02)

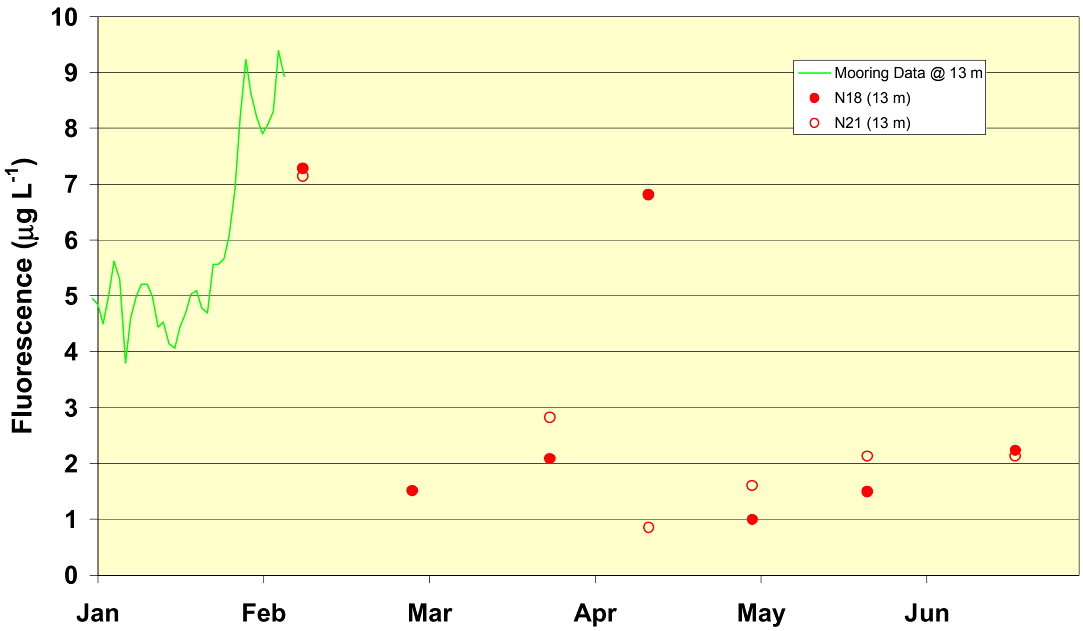


Figure 4-28. MWRA and Battelle In Situ WETStar fluorescence data (MWRA data acquired at ~13 m on USGS mooring and Battelle data acquired at 12.5 to 13.5 m at station N21)
(Note: The WETStar fluorometer failed during Feb-May 2002 deployment.)

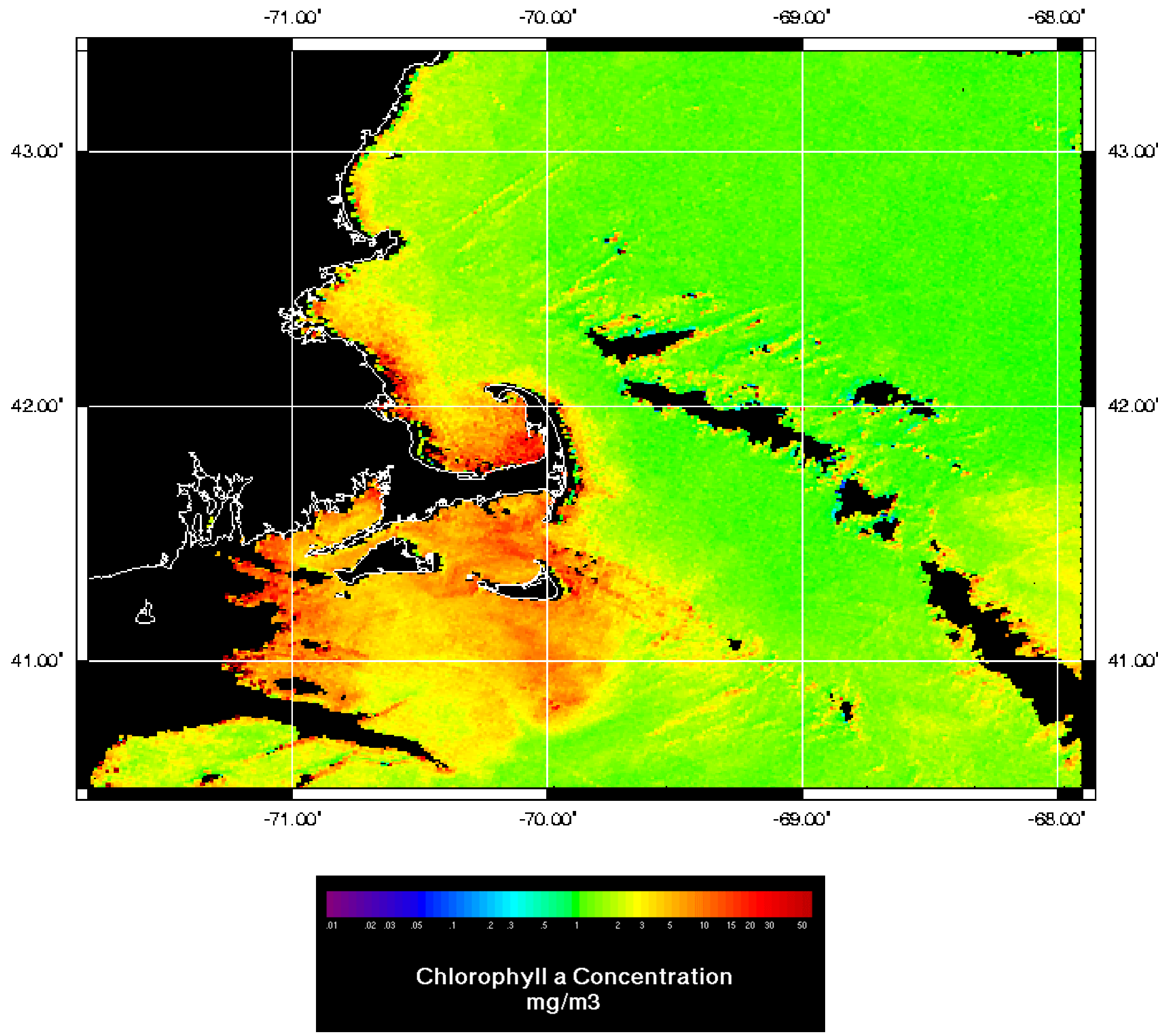


Figure 4-29. SeaWiFS chlorophyll image for southwestern Gulf of Maine for January 27, 2002

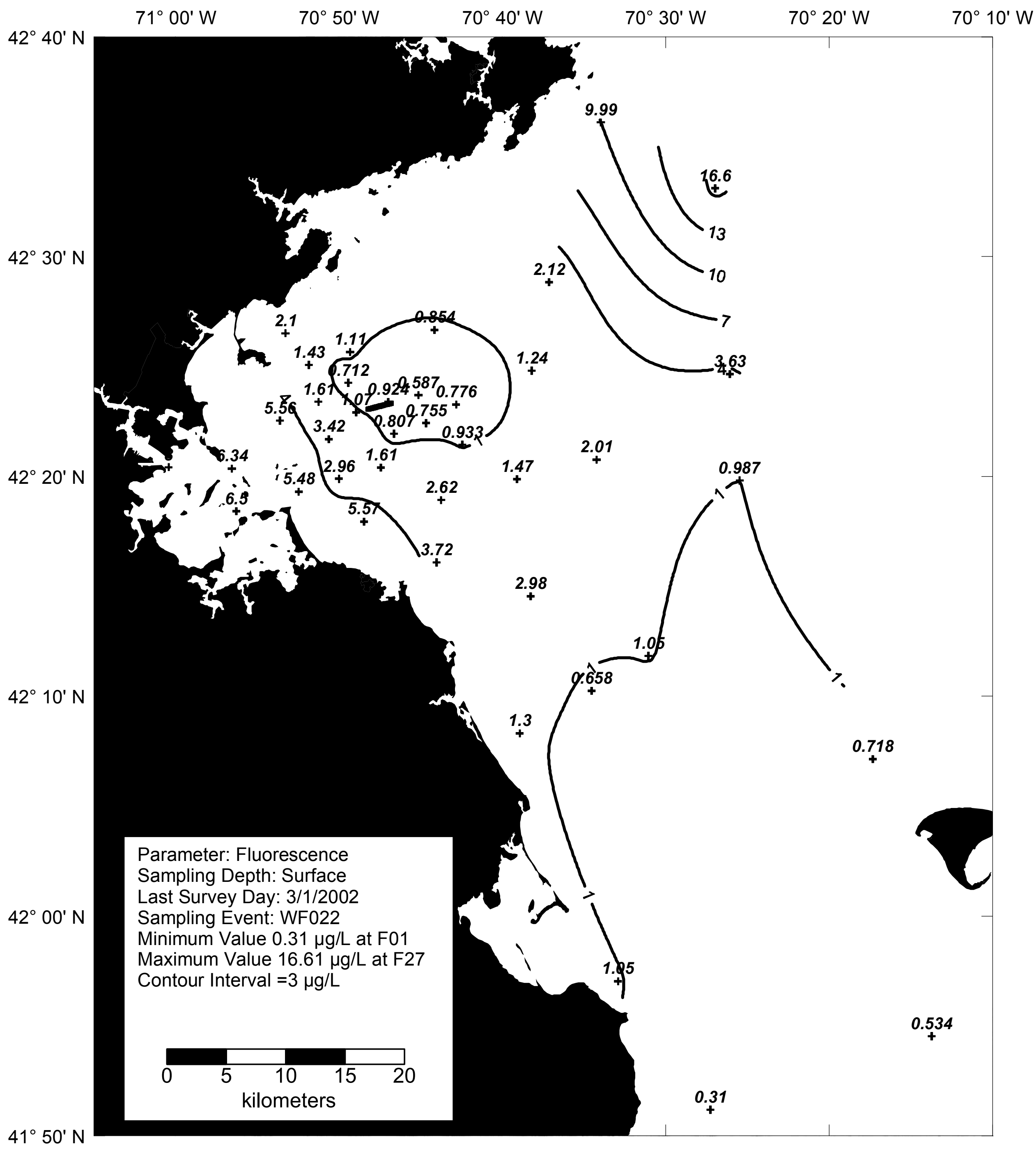


Figure 4-30. Fluorescence surface contour plot for farfield survey WF022 (Feb/Mar 02)

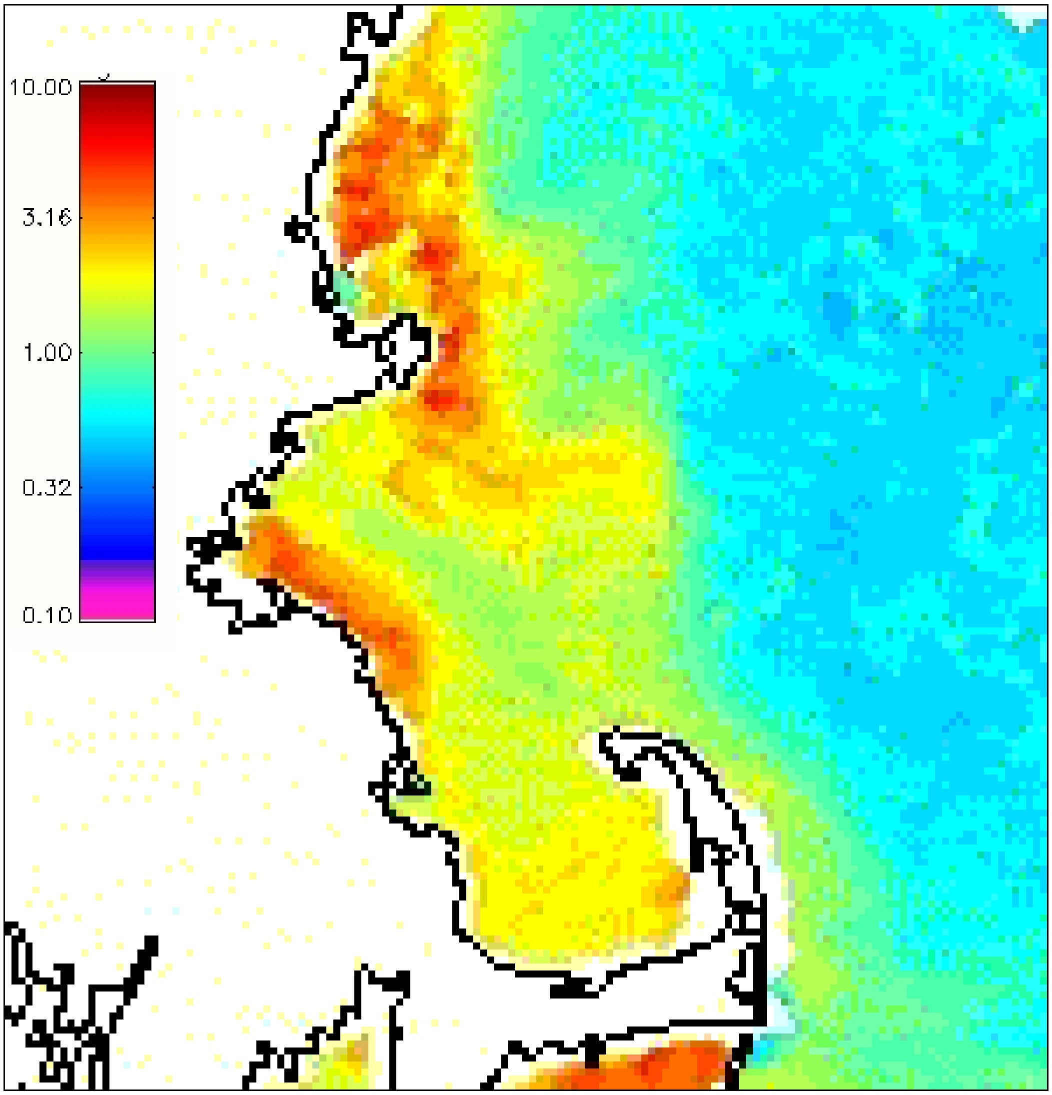


Figure 4-31. Eight-day composite of SeaWiFS chlorophyll (mg m^{-3}) images for the southwestern Gulf of Maine for February 26 to March 5 2002. [Image courtesy of Dr. Andrew Thomas, School of Marine Sciences, University of Maine]

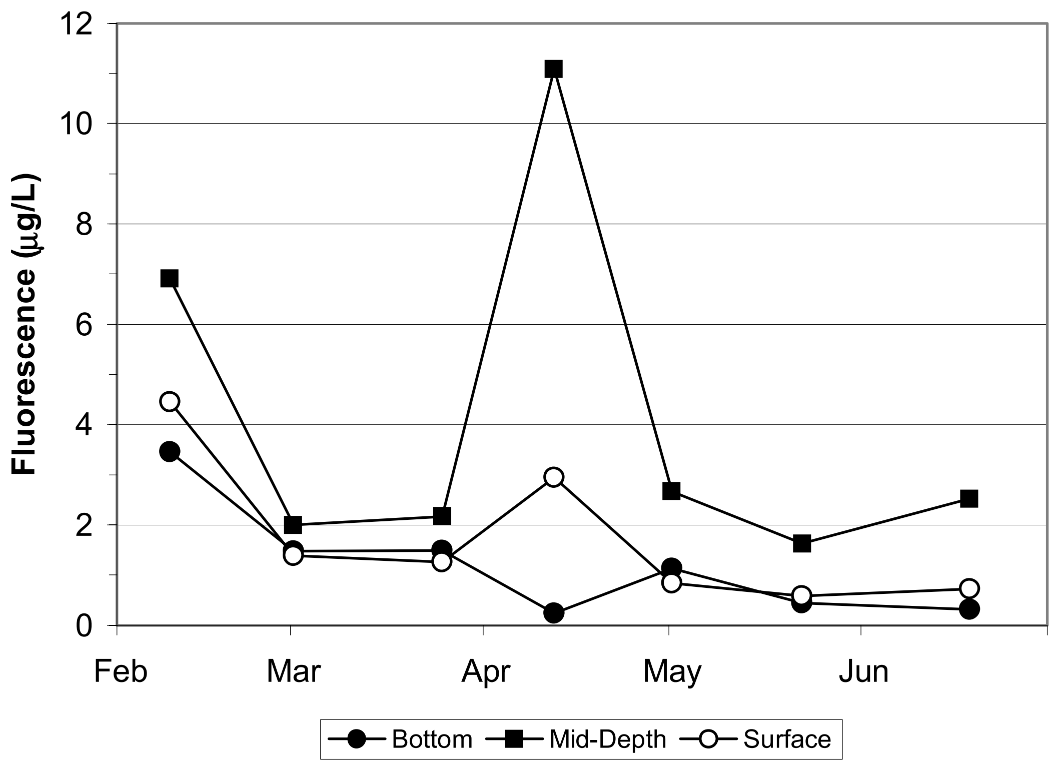


Figure 4-32. Time-series of bottom, mid-depth, and surface survey mean chlorophyll concentration in the nearfield

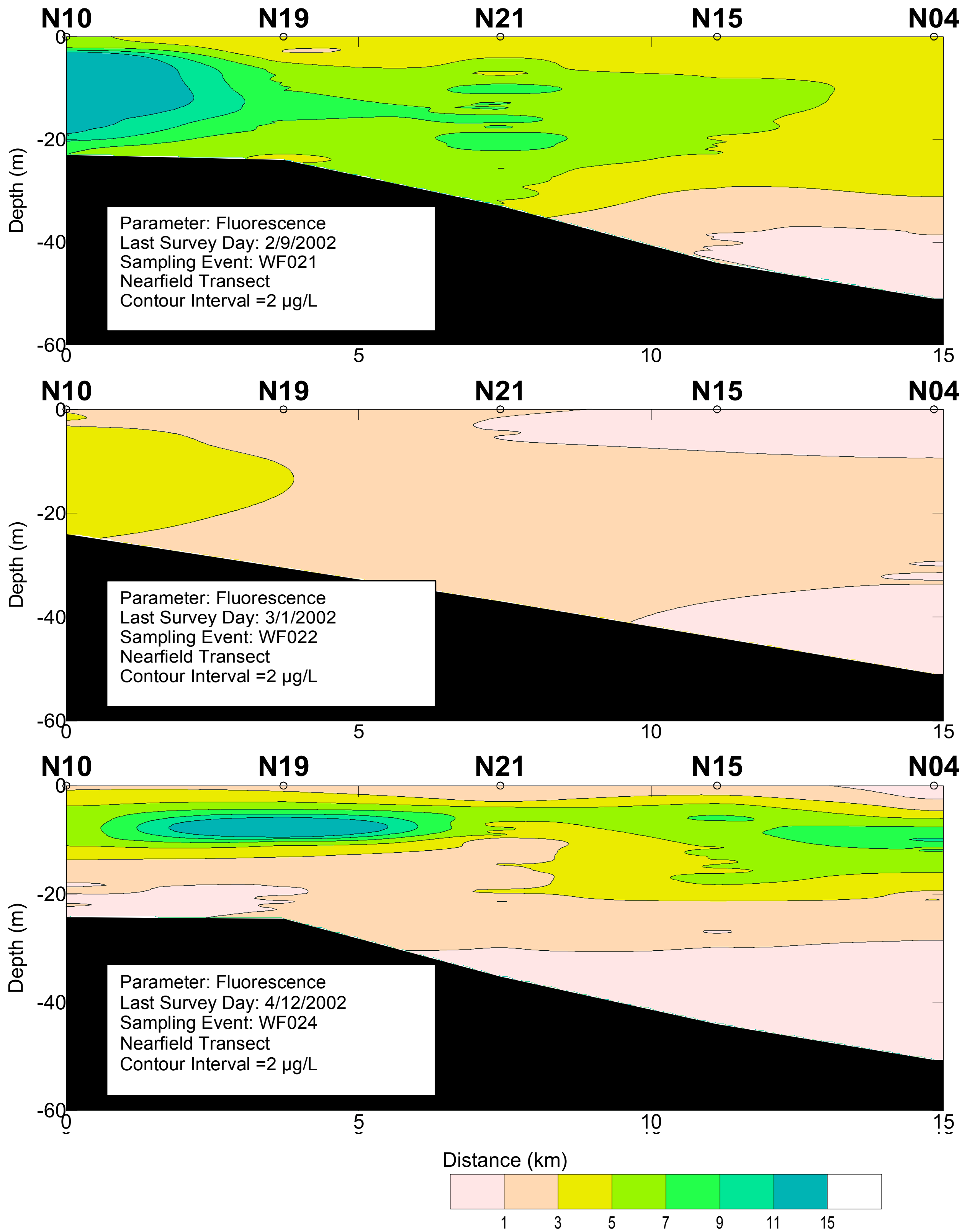


Figure 4-33. Fluorescence vertical contour plots along the nearfield transect for nearfield surveys WF021, WF022, and WF024

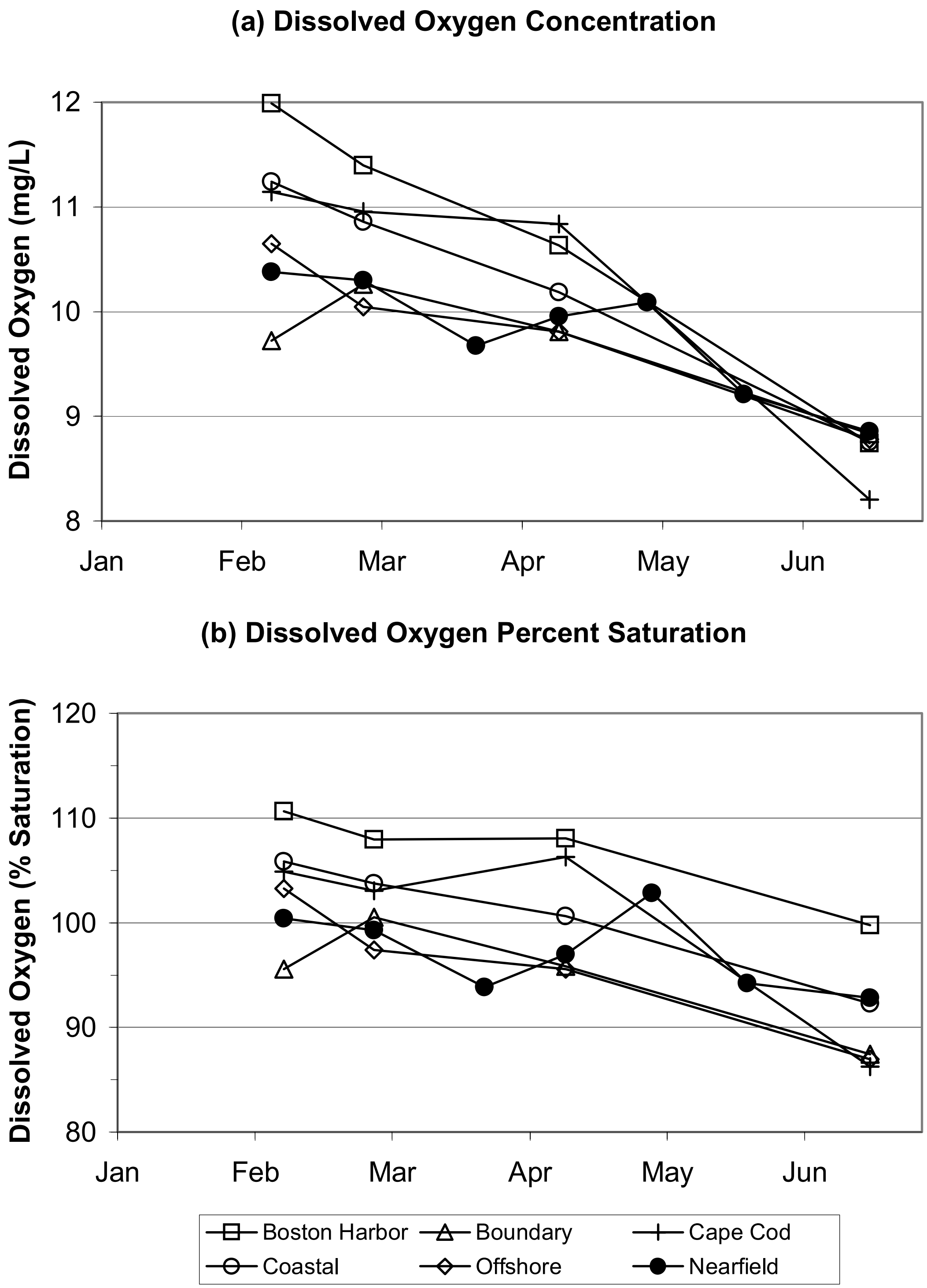


Figure 4-34. Time-series of bottom water average DO concentration and percentage saturation in Massachusetts and Cape Cod Bays

5.0 PRODUCTIVITY, RESPIRATION AND PLANKTON RESULTS

5.1 Productivity

Production measurements were taken at two nearfield stations (N04 and N18) and one farfield station (F23) near the entrance of Boston Harbor. All three stations were sampled on February 8 (WF021), February 28 (WF022), April 12 (WF024) and June 18 (WF027). N04 and N18 were additionally sampled on March 25 (WN023), May 1 (WN025), and May 22 (WN026). Samples were collected at five depths throughout the euphotic zone. Production was determined by measuring ^{14}C at varying light intensities as summarized below and in Libby *et al*., 2002.

In addition to samples collected from the water column, productivity calculations also utilized light attenuation data from a CTD-mounted 4π sensor, and incident light time-series data from a 2π irradiance sensor located on Deer Island, MA. After collection, productivity samples were returned to the Marine Ecosystems Research Laboratory (MERL) in Rhode Island and incubated in temperature controlled incubators. The resulting photosynthesis versus light intensity (P-I) curves (**Figure** 5-1 and comprehensively in Appendix C) were used, in combination with light attenuation and incident light information, to determine hourly production at 15-min intervals throughout the day for each sampling depth.

For this semi-annual report, areal production (mg C m^{-2} d^{-1}) and depth-averaged chlorophyll-specific production (mg C mg Chl^{-1} d^{-1}) are presented (**Figures** 5-2 and 5-3). Areal productions are determined by integrating measured productivity (and chlorophyll-specific productivity) over the depth interval. Chlorophyll-specific productivity for each depth was first determined by normalizing productivity by measured chlorophyll *a*. Productivity, chlorophyll-specific productivity and *in vitro* chlorophyll *a* for each depth are also presented as contour plots (**Figures** 5-4 to 5-6).

5.1.1 Areal Production

Areal production at the nearfield stations N04 and N18 was similar throughout the semi-annual sampling period (**Figure** 5-2). Areal production at the two sites was relatively high (~2275 – 2900 mg C m^{-2} d^{-1}) during the initial survey in February. Values decreased at both nearfield sites to ~410 – 530 mg C m^{-2} d^{-1} by late February. Productivity gradually increased to ~1500 mg C m^{-2} d^{-1} at both sites by late March and reached peak winter/spring bloom levels (3540 – 4537 mg C m^{-2} d^{-1}) at both stations during the April survey. Areal productivity then decreased gradually from ~1000 mg C m^{-2} d^{-1} in early May to ~500 mg C m^{-2} d^{-1} in late May and increased again to ~1000 mg C m^{-2} d^{-1} at both sites during the survey in June.

The timing and magnitude of the maximum winter/spring productivity was similar at both stations. The maximum productivity at station N04 occurred in April with a peak production of 3540 mg C m^{-2} d^{-1}. Station N18 reached its maximum seasonal value (4537 mg C m^{-2} d^{-1}) on the same date. These spring peaks at both sites were considerably higher than winter/spring bloom maxima in 2001 when values of 1722 –1836 mg C m^{-2} d^{-1} were observed. The initial productivity peaks in 2002 occurred simultaneously at both stations in early February but reached a higher level (2898mg C m^{-2} d^{-1}) at station N18 compared with N04 (2277 mg C m^{-2} d^{-1}). The minimum production at station N18 (529 mg C m^{-2} d^{-1}) was observed in late February. At station N04 the minimum seasonal level was lower (406 mg C m^{-2} d^{-1}) and observed later (May 22, 2002). Productivity at station N18 was elevated relative to station N04 during 5 of the 7 cruises thus far in 2002. During a similar period in 2001, areal productivity at N18 was greater than the values observed at N04 on only 3 occasions. The patterns observed at the nearfield sites were consistent with those observed during 2001 although the magnitude and timing of events varied. The patterns were also consistent with patterns seen in chlorophyll distributions (Section 4.2.2).

Boston Harbor displayed a slightly different productivity pattern in comparison with the nearfield sites (**Figure** 5-2). At the Boston Harbor productivity/respiration station F23, areal production exhibited a single, rather than a double peak, during the winter/spring bloom period. Productivity was elevated (~3200 mg C m^{-2} d^{-1}) during the initial February survey. Areal production decreased markedly to ~1000 mg C m^{-2} d^{-1} by late February and remained at a similar level in April. Areal production reached a minimal value of 518 mg C m^{-2} d^{-1} at station F23 during the June survey. The production data at station F23 are in general agreement with the chlorophyll data throughout the semi-annual period. Elevated chlorophyll during WF021 (mean 14.9 µg l^{-1}) was associated with increased productivity. During WF022 average chlorophyll decreased over the water column to 6.1µg l^{-1} and productivity decreased to 1068 mg C m^{-2} d^{-1}. During WF024 average chlorophyll values at station F23 were lower (2.4 µg l^{-1}), however productivity remained very similar to the level observed during WF022. The lowest observed average chlorophyll value (1.8 µg l^{-1}) was observed during WF027 at station F23 and was associated with lower phytoplankton production.

Areal production in 2002 followed patterns typically observed in prior years. Distinct winter/spring phytoplankton blooms were observed at both nearfield stations during the sampling period (**Figure** 5-2). In general, nearfield stations are characterized by the occurrence of a winter/spring bloom. The winter/spring blooms observed at nearfield stations in 1995-2001 generally reached values of 2000 to 4000 mg C m^{-2} d^{-1}, with bimodal peaks typically occurring in February - April. The bloom in 2002 reached maximum values at the nearfield sites of ~3500-4500 mg C m^{-2} d^{-1} with peaks observed in early February and mid-April. The winter/spring bloom peaks at both nearfield sites in 2002 were higher than values observed during the winter/spring period from 1995 to 2001, but not higher than calculated potential productivity over the same period.

In general over the baseline period, the Boston Harbor site exhibited a gradual pattern of increasing areal production from winter through summer rather than the distinct winter/spring peaks observed at the nearfield sites. In 2002 the pattern for station F23 did not conform to this description. Production values peaked during the winter bloom in early February, decreased in late February and mid-April before reaching the seasonal minimum in June (**Figure** 5-2). During 1995-2001, peak areal productions at station F23 ranged from 1000 to 5000 mg C m^{-2} d^{-1} in June-July. The peak areal production observed in 2002 was a similar magnitude (3200 mg C m^{-2} d^{-1}), but occurred in February. The shift in seasonal cycle in 2002 at station F23 is even more dramatic than in 2001, when a slight winter/spring peak was observed in March. This apparent shift in the production pattern in the harbor from baseline to bay outfall monitoring periods will be examined in more detail in the annual report.

5.1.2 Chlorophyll-specific Production

Depth-averaged chlorophyll-specific production was generally elevated at station N18 compared to station N04 during the semi-annual reporting period (**Figure** 5-3). Although patterns were similar, chlorophyll-specific production was also more variable at station N18 compared with N04. Values were similar and relatively low at both stations (~8-16 mg C mg Chla^{-1} d^{-1}) in February (WF021 and WF022), then increased and diverged in March to 34.2 mg C mg Chla^{-1} d^{-1} at station N18 and 16.6 mg C mg Chla^{-1} d^{-1} at station N04. During April, values were again similar and low (~17-18 mg C mg Chla^{-1} d^{-1}) at the nearfield sites. Throughout the remainder of the reporting period depth-averaged chlorophyll-specific productivity was greater at station N18, primarily as a result of the shallower water column depth at this location. The seasonal maximum was reached at station N04 in early May (19.5 mg C mg Chla^{-1} d^{-1}). At station N18 the seasonal maximum (35.3 mg C mg Chla^{-1} d^{-1}) was observed in June. By comparison, depth-averaged chlorophyll-specific rates at harbor station F23 were similar in magnitude to station N04 and did not exceed 17.5 mg C mg Chla^{-1} d^{-1} throughout the sampling cycle (**Figure** 5-3).

5.1.3 Production at Specified Depths

The spatial and temporal distribution of production, *in vitro* chlorophyll and chlorophyll-specific production on a volumetric basis are presented as contoured values over the sampling period (**Figures** 5-4 to 5-6). Chlorophyll-specific productions (daily production normalized to *in vitro* chlorophyll concentration at each depth) were calculated to compare production with chlorophyll concentrations. Chlorophyll-specific production can be used as an indicator of the optimal conditions necessary for photosynthesis.

The areal productivity peaks reported during early February and April 2002 at stations N04 and N18 were concentrated in the upper 10 m of the water column (**Figure** 5-4). At station N04, production was highest (82 –101 mg C m^{-3} d^{-1}) in the surface and mid-surface water on February 8 while a mid-surface to mid-depth productivity maximum (198 – 218 mg C m^{-3} d^{-1}) was observed on April 12. Peak production (190 mg C m^{-3} d^{-1}) at station N18 occurred in the surface water on February 8 with similar levels observed at mid-surface and mid-water depths (~180 mg C m^{-3} d^{-1}). Depth-specific production at station N18 was further characterized by a subsurface productivity maximum (494 mg C m^{-3} d^{-1}) located at mid-surface depths during the April winter/spring bloom peak. At both nearfield stations productivity tended to decrease following the spring peak values, followed by a minor increase, in surface waters, in June. The pattern at harbor station F23 was similar to the observed depth-specific productivity at the nearfield sites during February and June, but markedly different in April (**Figure** 5-4). The depth-specific productivity values during April at station F23 reflect the absence of the second winter/spring productivity peak in areal productivity noted previously. The depth-specific productivity values further emphasize the elevated productivity observed at station N18, closest to the outfall, relative to both station N04 and station F23.

The productivity pattern at specified depths observed in 2002 was similar to that observed in prior years. At station N04 productivity as high as 45 mg C m^{-3} d^{-1} occurred to depths of 18 m. At station N18 productivity >25 mg C m^{-3} d^{-1} was not observed at depths >20 m. As in most prior years, elevated productivity (>20 mg C m^{-3} d^{-1}) in the harbor was generally restricted to the upper 10 m of the water column.

Elevated production values tended to be correlated with the occurrence of the highest chlorophyll *a* measurements during the winter/spring bloom periods at stations N04 and N18 (**Figure** 5-5). However, the elevated production at both nearfield sites in June occurred during a period of lower chlorophyll *a* concentrations suggesting an increase in the efficiency of production at this time. At both nearfield sites, chlorophyll concentrations were highest in the upper portion of the water column but with values elevated at station N18 relative to station N04. At station F23, the Boston Harbor station, chlorophyll concentrations were similarly elevated during the winter period of peak productivity but decreased steadily from February through June. Additionally, the depth-specific concentration of chlorophyll *a* was constant throughout the water column at station F23, a markedly different distribution than that observed at the nearfield sites (**Figure** 5-5).

Chlorophyll-specific production at depth followed similar seasonal patterns at stations N04 and N18, although values at N18 tended to be higher and more variable (**Figure** 5-6). Additionally, chlorophyll-specific production at both sites tended to be concentrated in the upper portions of the water column. Values were somewhat elevated in early February, during the initial peak of the winter/spring bloom and then increased from late February through May at station N04, followed by a secondary peak in June. A similar trend was observed at station N18. The peak depth-specific production per unit chlorophyll *a* observed in surface water during June at station N18 was greater than levels observed throughout the sampling period at station N04 or earlier in the season at N18. The elevated chlorophyll-specific production observed in early February and April was associated with increased phytoplankton biomass as measured by chlorophyll *a*. However, the increased chlorophyll-specific production observed at stations N04 and N18 in June did not lead to elevated phytoplankton biomass (**Figures** 5-5). At station F23, chlorophyll-specific production increased over the sampling season, reaching a peak in June (**Figure** 5-6). The June peak at station F23 was also not associated with increased chlorophyll *a*. When the efficiency of photosynthesis is high but not reflected in higher phytoplankton biomass (measured as total chlorophyll *a*), it suggests that other processes (such as predation by zooplankton) are important in controlling the patterns observed. Chlorophyll-specific production is an approximate measure for the efficiency of production and frequently reflects nutrient conditions at the sampling sites. The distribution of chlorophyll-specific production indicates that the efficiency of production was higher and more variable at station N18 near the outfall site over the sampling period, perhaps reflecting an additional source of nutrients at this location.

5.2 Respiration

Respiration measurements were made at the same nearfield (N04 and N18) and farfield (F23) stations as productivity and at an additional station in Stellwagen Basin (F19). All four stations were sampled during each of the combined farfield/nearfield surveys. Stations N04 and N18 were also sampled during the three nearfield only surveys. Respiration samples were collected from three depths (surface, mid-depth, and bottom) and were incubated in the dark at *in situ* temperatures for 7±2 days.

Both respiration (in units of $\mu MO_2\ hr^{-1}$) and carbon-specific respiration ($\mu MO_2\ \mu MC^{-1}\ hr^{-1}$) rates are presented in the following sections. Carbon-specific respiration was calculated by normalizing respiration rates to the coincident particulate organic carbon (POC) concentrations. Carbon-specific respiration rates provide a relative indication of the biological availability (labile) of the particulate organic material for microbial degradation.

1.2.1 Water Column Respiration

During the surveys conducted in February (WF021 and WF022), respiration rates were low in the nearfield and farfield areas of Massachusetts Bay (≤0.10 μMO_2hr^{-1}; **Figures** 5-7 and 5-8). Higher respiration rates were measured in Boston Harbor, where they reached a seasonal maximum of 0.28 μMO_2hr^{-1} in surface and mid-depth waters in late February. Nearfield respiration rates increased from February to March at station N04 and reached a seasonal maximum of 0.25 μMO_2hr^{-1} in the surface waters at station N18 in April (**Figure** 5-7). In Boston Harbor, respiration rates had decreased to 0.09-0.14 μMO_2hr^{-1}, and rates remained low (<0.1 μMO_2hr^{-1}) at offshore station F19 in April. The respiration rates in the winter/spring of 2002 closely followed both the POC (**Figures** 5-9 and 5-10) and chlorophyll concentrations (see Section 4.3.2). The harbor and coastal waters exhibited a stronger winter/spring bloom in February than offshore Massachusetts Bay, while the *Phaeocystis* bloom was stronger in the nearfield compared to the harbor and coastal waters.

Respiration rates at nearfield stations decreased to <0.10 μMO_2hr^{-1} in late April and remained low through May. By June rates had increased slightly to 0.08-0.12 μMO_2hr^{-1} in the nearfield. In Boston Harbor, respiration rates in surface and bottom waters remained at the April levels, but increased to 0.2 μMO_2hr^{-1} at mid-depth. An increase was also observed at offshore station F19 with rates ranging from 0.11 μMO_2hr^{-1} in the surface waters to a seasonal maximum for the four respiration stations of 0.3 μMO_2hr^{-1} in the mid-depth waters. This increase was coincident with a doubling of biomass (see **Figure** 5-10b), but mid-depth POC concentrations were still relatively low (20 µM).

1.2.2 Carbon-Specific Respiration

Carbon-specific respiration accounts for the effect of variations in the size of the particulate organic carbon (POC) pool have on respiration. Differences in carbon-specific respiration result from variations in the quality of the available particulate organic material or from environmental conditions such as temperature. Particulate organic material that is more easily degraded (more labile) will result in higher carbon-specific respiration. In general, newly produced organic material is the most labile. Water temperature is the main physical characteristic that controls the rate of microbial oxidation of organic material – the lower the temperature the lower the rate of oxidation. When stratified conditions exist, the productive, warmer surface and/or mid-depth waters usually exhibit higher carbon-specific respiration rates and bottom waters have lower carbon-specific respiration rates due to both lower water temperature and lower substrate quality due to the degradation of particulate organic material during sinking.

POC concentrations were generally low (≤20 µM) in the nearfield from February to June (**Figure** 5-9). Elevated POC concentrations were measured at station N18 for mid-depth (28 µM) and surface (34 µM) waters in early February, which was associated with the coastal bloom. Nearfield POC concentrations peaked in early April during the *Phaeocystis* bloom with values of 64 and 83 µM in the surface and mid-depth waters at station N18. POC concentrations were lower at station N04 peaking at 32 and 44 µM in surface and mid-depth waters, respectively. POC concentrations decrease from early April to late May before increasing slightly in June. In Boston Harbor, POC concentrations were higher in February in conjunction with the harbor and coastal winter/spring bloom. In early February, POC concentrations ranged from 46 µM in surface and bottom waters to >60µM at mid-depth (**Figure** 5-10). By late February, POC concentrations had increased to 66-76 µM, which was the seasonal maximum at harbor station F23. This corresponded to the continued high chlorophyll in the harbor and persistence of the coastal diatom bloom. At offshore station F19, low concentrations (<20 µM) were observed during each of the three surveys from February to April. Higher concentrations (30 µM) were observed at mid-depth and surface during the February and April blooms, respectively.

The carbon-specific respiration rates were low (≤0.005 $\mu MO_2 \mu MC^{-1}hr^{-1}$) at station N18 in the nearfield from early February to June (**Figure** 5-11a). Elevated rates (~10 $\mu MO_2 \mu MC^{-1}hr^{-1}$) were observed at station N04 in late February and late March and again in June (**Figure** 5-11b). Carbon specific respiration rates remained ≤0.005 $\mu MO_2 \mu MC^{-1}hr^{-1}$ from February to June at Boston Harbor station F23 (**Figure** 5-12). At station F19, carbon specific rates were low (≤0.005 $\mu MO_2 \mu MC^{-1}hr^{-1}$) February to April, but increased to seasonal maxima in June reaching 0.03 $\mu MO_2 \mu MC^{-1}hr^{-1}$ in bottom waters. The relatively high respiration rates observed at stations N18 and F23 were concurrent with elevated POC concentrations and did not result in high carbon specific rates. At station F19, however, respiration rates were elevated in June while POC concentrations remained relatively low. The relatively low carbon specific respiration rates suggest that there were limited supplies of labile POC available during the winter/spring of 2002 even though there was a moderate winter/spring bloom in coastal waters in February and a minor *Phaeocystis* bloom in April.

5.3 Plankton Results

Plankton samples were collected on each of the seven surveys conducted during this reporting period. Phytoplankton and zooplankton samples were collected at two stations during each nearfield survey (N04 and N18) and at 13 farfield and the two nearfield stations (total = 15) during the farfield surveys. Two additional stations were sampled for zooplankton in Cape Cod Bay (F32 and F33) during the first three farfield surveys (WF021, WF022, and WF024). Phytoplankton samples included both whole-water and 20 µm-mesh screened samples, from the surface and subsurface chlorophyll maximum depths. Zooplankton samples were collected by vertical/oblique tows with 102 μm-mesh nets. Methods of sample collection and analyses are detailed in Libby *et al*. (2002).

In this section, the seasonal trends in plankton abundance and regional characteristics of the plankton assemblages are evaluated. Total abundance and relative abundances of major taxonomic groups are presented for each phytoplankton and zooplankton community. Tables submitted previously in quarterly data reports provide data on cell and animal densities and relative abundance for all dominant plankton species (>5% abundance): whole water phytoplankton, 20-μm screened phytoplankton, and zooplankton.

5.3.1 Phytoplankton

5.3.1.1 Seasonal Trends in Total Phytoplankton Abundance

Total phytoplankton abundances in nearfield whole water samples (surface and mid-depth) were variable from February through June (**Table** 5-1; **Figures** 5-13 and 5-14). Total abundances were relatively low and varied between approximately 0.42 –1.00 x 10^6 cells L^{-1} in February (WF021 and WF022). Abundances increased in March (WN023) and more than doubled in April (WF024) to levels of 0.95-2.91 x 10^6 cells L^{-1} during a bloom of *Phaeocystis pouchetii*. This bloom was declining in early May, and total abundances dropped to 1.00-1.74 x 10^6 cells L^{-1}. The *Phaeocystis* bloom was over by late May, when total phytoplankton abundance decreased to levels of 0.44-1.03 x 10^6 cells L^{-1}, increasing slightly to levels of 0.53-2.28 x 10^6 cells L^{-1} in June.

Total phytoplankton abundance in farfield whole water samples (surface and mid-depth) showed similar low abundances in early February (0.34-1.71 x 10^6 cells L^{-1}), but by late February/early March, abundances had jumped to levels of 0.28-8.60 x 10^6 cells L^{-1} with most of the increase due to the centric diatom bloom (**Table** 5-1; **Figures** 5-15 and 5-16). The highest abundances during WF021 were in Boston Harbor, but during WF022 abundance peaked at the boundary stations F26 and F27. By early April (WF024) during the *Phaeocystis* bloom, farfield abundances were 0.48-4.34 x 10^6 cells L^{-1} (**Figure** 5-17). By June (WF027) phytoplankton abundances had declined to levels of 0.25-3.15 x 10^6 cells L^{-1}, with both high and low abundance levels scattered throughout most regions of the farfield (**Figure** 5-18).

Total abundances of dinoflagellates, silicoflagellates and protozoans in 20 μm-mesh-screened water samples were considerably lower than those recorded for total phytoplankton in whole-water samples, due to the screening technique which selects for larger, albeit rarer cells. Dinoflagellates and silicoflagellates in nearfield and farfield screened phytoplankton samples were <2.15 x 10^3 cells L^{-1} from February through March, dropping to levels <0.9 x 10^3 cells L^{-1} during April, rebounding to values as high as 3.98 x 10^3 cells L^{-1} in May, declining again to levels <1.27 x 10^3 cells L^{-1} in late June (**Table** 5-2).

Table 5-1. Nearfield and farfield averages and ranges of abundance (10^6 cells L^{-1}) of whole-water phytoplankton

Survey	Dates (2002)	Nearfield Mean	Nearfield Range	Farfield Mean	Farfield Range
WF021	2/5-9	0.57	0.42-0.76	0.92	0.34-1.71
WF022	2/26-28, 3/1	0.67	0.47-1.00	2.11	0.28-8.60
WN023	3/25	1.28	0.95-1.42	–	–
WF024	4/5, 4/10-12	2.31	1.90-2.91	1.92	0.48-4.34
WN025	5/1	1.21	1.00-1.74	–	–
WN026	5/22	0.63	0.44-1.03	–	–
WF027	6/10,11,14,18	1.27	0.53-2.28	1.54	0.25-3.15

Table 5-2. Nearfield and farfield average and ranges of abundance (cells L^{-1}) for >20 µm-screened dinoflagellates

Survey	Dates (2002)	Nearfield Mean	Nearfield Range	Farfield Mean	Farfield Range
WF021	2/5-9	1048	475-1353	647	130-2147
WF022	2/27628, 3/1	1059	728-1783	733	140-1125
WN023	3/26	214	140-318	–	–
WF024	4/5, 4/10-12	222	160-280	279	95-898
WN025	5/1	229	156-360	–	–
WN026	5/22	2100	805-3976	–	–
WF027	6/10,11,14,18	171	103-320	410	85-1263

5.3.1.2 Nearfield Phytoplankton Community Structure

Whole-Water Phytoplankton – In February to early March (WF021 and WF022), nearfield whole-water phytoplankton assemblages from both depths were dominated by unidentified microflagellates <10 µm in diameter, cryptomonads, and chain-forming centric diatoms such as *Dactyliosolen fragilissimus, Skeletonema costatum*, *Guinardia delicatula* (WF021 only), and *Thalassiosira nordenskioldii* (WF022 only). A dinoflagellate of the genus *Gymnodinium* also comprised approximately 7% of total cells at one station in the nearfield during WF022. In late March (WN023) microflagellates, and to a lesser extent cryptomonads, shared dominance with the bloom of *Phaeocystis pouchetii* (27-46% of total cells) which was just beginning. This pattern continued into April (WF024), with *Phaeocystis pouchetii* comprising 11 - 42% of total cells in the nearfield (marked as "Other" in **Figures** 5-13 and 5-14). Microflagellates, cryptomonads, and at station N18 the chain-forming diatom *Stephanopyxis turris* (12-13% of total abundance) accounted for most of the remainder of cells recorded. By early May (WN025) *Phaeocystis* was in decline, comprising only 7-13% of total cells, with microflagellates comprising 72-80%. By late May, *Phaeocystis* had disappeared, with overwhelming dominance by microflagellates <10 µm in diameter and cryptomonads. In June (WF027), microflagellates dominated in the nearfield (60-89%), with the remainder of the contribution by cryptomonads.

Screened Phytoplankton - In early February (WF021), nearfield screened samples were dominated by the thecate dinoflagellates *Prorocentrum micans* (56-84%) with lesser contributions by *Ceratium tripos*, *C. fusus* and *C. lineatum*, and the silicoflagellate *Distephanus speculum.* In late February (WF022) *Prorocentrum micans* was again dominant (11-62%) with lesser contributions by the dinoflagellates *Ceratium fusus, C. lineatum,* and *Amylax triacantha*, and sporadic contributions by dinoflagellates of the genera *Gymnodinium* and *Gonyaulax*. In late March (WN023), *Prorocentrum micans* had declined to levels of only 9-41% of cells counted, and the silicoflagellate *Distephanus speculum* had increased to levels of 10-33%. The remainder of the assemblage included *Ceratium lineatum, C. tripos, Gyrodinium spirale*, species of the dinoflagellate genera *Protoperidinium* and *Gymnodinium*, and other thecate and athecate dinoflagellates. A similar assemblage, in varying proportions, was present in April (WF024) and early May (WN025).

By late May (WN026), *Prorocentrum minimum* was dominant (56-84% of cells counted), with lesser contributions by other members of the genus *Prorocentrum, Ceratium fusus, Dinophysis norvegica,* and *Gyrodinium spirale*. In June (WF027) there was a similar assemblage of *Prorocentrum minimum, P. micans, Dinophysis norvegica*, *Ceratium longipes*, species of the genera *Gymnodinium* and *Protoperidinium*, and other thecate and athecate dinoflagellates.

5.3.1.3 Regional Phytoplankton Assemblages

Whole-Water Phytoplankton - Whole-water phytoplankton assemblages at farfield stations were generally similar to those in the nearfield during the same time periods, in terms of composition, abundance, and the major *Phaeocystis* bloom in April.

During early February (WF021), most farfield station assemblages were dominated at both depths by unidentified microflagellates (33-79% of cells counted), cryptomonads, and centric diatoms such as *Dactyliosolen fragilissimus, Skeletonema costatum* and *Guinardia delicatula* (**Figure** 5-15). During late February (WF022) farfield assemblages were again similar to those in the nearfield, with unidentified microflagellates (8-81% of cells counted), cryptomonads, and centric diatoms such as *Skeletonema costatum, Dactyliosolen fragilissimus,* and *Thalassiosira nordenskioldii* comprising most of the remainder of the assemblage (**Figure** 5-16).

Abundance of centric diatoms was elevated at the boundary stations F26 and F27 during survey WF022 (**Figure** 5-16). Much of this elevated phytoplankton abundance was due to the chain-forming centric diatom *Skeletonema costatum*, which was present at 3.5 x 10^6 cells L^{-1} at the surface and 7.0 x 10^6 cells L^{-1} at the mid-depth of station F27. At boundary station F26, elevated *S. costatum* concentrations of 3 x 10^6 cells L^{-1} were encountered at both the surface and mid-depth. Levels of total phytoplankton at the surface of these boundary stations were two- to four-fold greater than the phytoplankton levels observed at nearfield and coastal stations during this survey. Further, total phytoplankton abundance at the boundary station mid-depth, led by *Skeletonema costatum*, was two- to seven-fold higher than phytoplankton levels observed at nearfield and coastal stations.

Determination of mechanisms responsible for the increased phytoplankton biomass observed at the boundary stations in late February and early March 2002 is difficult given the lack of a time series of phytoplankton observations. However, eight-day composite SeaWiFS images for the time period (26 February 2002 to 4 March 2002) coinciding with survey WF022 shows a filament of high chlorophyll concentration (3 to 10 mg m^{-3}) extending around Cape Ann from north to south, extending over the location of boundary stations F26 and F27 (see **Figure** 4-31). Beyond this high chlorophyll plume south of Cape Ann, surface chlorophyll levels in Massachusetts Bay, including the nearfield area, were reduced to near 3 mg m^{-3} or less. The late February/early March 2002 survey appears to have captured a diatom bloom, dominated by *Skeletonema costatum*, that was occurring in the western Gulf of Maine that extended into Massachusetts Bay in the boundary region south of Cape Ann. The diatom bloom was observed at lower abundance and chlorophyll concentrations in the rest of Massachusetts Bay in late February, but primarily in the harbor and coastal waters.

In April (WF024), most farfield stations had substantial levels of *Phaeocystis pouchetii* (<5-48%), but were not overwhelmingly dominated by this alga as in several previous years (**Figure** 5-17). The highest abundance of *Phaeocystis* occurred in Cape Cod Bay. The remainder of the assemblage was similar to that of the nearfield, including major contributions by unidentified microflagellates (18-89%), with much lesser contributions by cryptomonads, centric diatoms, and other taxa.

By June (WF027), assemblages at both depths at most farfield stations were dominated by the same microflagellates (28-87%) and cryptomonads that dominated the nearfield (**Figure** 5-18). Subdominant diatom taxa included the diatoms *Skeletonema costatum* and *Thalassionema nitzschoides*.

Screened Phytoplankton - Screened-water dinoflagellate assemblages at farfield stations were similar to those in the nearfield during the same time periods.

From early February (WF021) through late February (WF022) and into April (WF024), 20 µm-screened surface phytoplankton samples from the farfield were dominated by *Prorocentrum micans,* with lesser and varying contributions by the dinoflagellates *Ceratium tripos*, *C. fusus, C. lineatum, C. longipes, Amylax triacantha, Dinophysis acuminata*, unidentified species of the genera *Gymnodinium, Gyrodinium, Protoperidinium*, and *Gonyaulax*, other unidentified thecate and athecate dinoflagellates, and the silicoflagellates *Distephanus speculum* and *Dictyocha fibula*. By June (WF027) dominance had shifted from *Prorocentrum micans* to its congener *P. minimum*. There were lesser contributions by *Dinophysis norvegica* and most of the other taxa that had been present since February.

5.3.1.4 Nuisance Algae

The only bloom of harmful or nuisance phytoplankton species in Massachusetts and Cape Cod Bays during February – June, 2002 was the April bloom of *Phaeocystis pouchetii*. At cell concentrations of 0 – 1.59 x 10^6 cells L^{-1} (mean = 0.39 x 10^6 cells L^{-1} for samples where *Phaeocystis* comprised > 5% of cells counted), the 2002 *Phaeocystis pouchetii* bloom did not begin to approach the levels of 0 - 3.13 x 10^6 cells L^{-1} (mean = 0.67 x 10^6 cells L^{-1}) for the 2001 bloom, or the even higher levels of the 2000 bloom (0.233-12.258 x 10^6 cells L^{-1}; mean = 6.2 x 10^6 cells L^{-1}). Also, the occurrence of consecutive *Phaeocystis* blooms in 2000, 2001 and 2002 is a break from the pattern that had been observed during baseline monitoring of these blooms occurring in cycles of about 3 years – 1992, 1994, 1997, and 2000 (Libby *et al*, 2001).

The toxic dinoflagellate *Alexandrium tamarense* or cells of *Alexandrium* sp. that were not clearly distinguishable as *A. tamarense*, were only sporadically recorded in trace levels. A single cell of *Alexandrium* sp. was recorded for a single whole-water sample during WF024. There were additional occurrences of "*Alexandrium* spp." in screened samples that were not positively identified as *A. tamarense*. These included abundances of 2.5-17.5 cells L^{-1} from four samples in early February (WF021), 5.0-7.5 cells L^{-1} for three samples in late February (WF022), 2.5 – 15.0 cells L^{-1} for nine samples in April (WF024), and 2.5 cells L^{-1} in two samples in June (WF027). There were three occurrences of cells identified as *A. tamarense* in April at stations F01, F25, and F26 in April (2.5-15.0 cells L^{-1}). Thus, abundance of *Alexandrium tamarense* plus *Alexandrium* spp. in screened samples in 2002 was typically low, as in most previous years. Levels since 1994 have not approached those of 1993.

Potentially toxic diatoms of the *Pseudo-nitzschia delicatissima* complex, including *P. delicatissima* and *P. pseudodelicatissima*, which cannot be reliably distinguished with light microscopy, were recorded for many samples between February and June, 2002. However, these cells never comprised > 5% of cells counted in a given sample. Abundance for the *Pseudo-nitzschia delicatissima* complex ranged from <1,000 to 3,000 cells L^{-1} during most of the surveys. Slightly higher abundance was observed in April and early May when the maximum value reached 30,000 to 40,000 cells L^{-1}.

Pseudo-nitzschia pungens (which could include some toxic *P. multiseries*) were also found sporadically in low abundance, but never comprised > 5% of cells counted in a given sample. *P. pungens* was recorded for 17 of 132 samples between February and June, but never at abundances >7,900 cells L^{-1}. In summary, *Pseudo-nitzschia* spp. which could potentially produce domoic acid were routinely present in the first half of 2002, but never abundant.

Although *Phaeocystis, Alexandrium tamarense and Pseudo-nitzshia* spp. were all observed in February to June 2002, none of their abundances exceeded the caution threshold values.

5.3.2 Zooplankton

5.3.2.1 Seasonal Trends in Total Zooplankton Abundance

Total zooplankton abundance at nearfield stations generally remained low (< 40.3 x 10^3 animals m^{-3}) from February through March (**Table** 5-3; **Figure** 5-19). Values increased somewhat in April and early May, but did not increase to levels of >75.4 x 10^3 animals m^{-3} until late May. Nearfield abundance in June ranged from levels as low as 31.5 x 10^3 animals m^{-3} to as high as 123.9 x 10^3 animals m^{-3}.

Total zooplankton abundance at farfield stations in February ranged widely from 2.6-81.5 x 10^3 animals m^{-3} (**Figure** 5-20). Zooplankton abundance was maximal during WF021 in Cape Cod Bay, with the highest zooplankton abundance during WF022 also recorded for station F02 in Cape Cod Bay. It is not clear why this was the case. Since much of this abundance was due to adults and copepodites of *Oithona similis*, which likely feeds primarily on protozooplankton and microzooplankton rather than phytoplankton (Nakamura & Turner, 1997), the increased zooplankton abundance in Cape Cod Bay during this period is difficult to relate to phytoplankton patterns. Most of the remainder of the zooplankton in Cape Cod Bay during this time was copepod nauplii. Since Cape Cod Bay was not appreciably warmer than other regions in the farfield, it is similarly difficult to attribute the high abundance of nauplii during this period to temperature-induced early reproductive events. By April (WF024), total zooplankton abundance at farfield stations was 3.3-39.2 x 10^3 animals m^{-3} (**Figure** 5-21a). Zooplankton abundance increased by June (WF027) and were observed over a wide range from 20-129 x 10^3 animals m^{-3} (**Figure** 5-21b). The spatial distribution was variable with all values of >40 x 10^3 animals m^{-3} occurring at the nearfield, offshore, and boundary stations in Massachusetts Bay and in Cape Code Bay. Boston Harbor and coastal stations had zooplankton abundance ranging from 60-100 x 10^3 animals m^{-3}. Zooplankton abundance was highest (~120 x 10^3 animals m^{-3}) at nearfield station N04 and boundary station F26. The cause of this spatial distribution in zooplankton abundance is unknown and it may be within the variability of the system.

Table 5-3. Nearfield and farfield average and ranges of abundance (10^3 animals m^{-3}) for zooplankton

Survey	Dates (2002)	Nearfield Mean	Nearfield Range	Farfield Mean	Farfield Range
WF021	2/5-9	19.9	16.6-21.6	20.6	2.6-65.4
WF022	2/26-28, 3/1	21.7	16.6-29.4	29.1	7.0-81.5
WN023	3/25	28.3	16.3-40.3	–	–
WF024	4/5, 4/10-12	40.2	33.4-53.2	21.2	3.3-39.2
WN025	5/1	30.4	21.5-39.3	–	–
WN026	5/22	92.5	75.4-109.5	–	–
WF027	6/10,11,14,18	65.7	31.5-123.9	63.4	17.7-121.3

5.3.2.2 Nearfield Zooplankton Community Structure

Nearfield zooplankton assemblages (**Figure** 5-19) during early February (WF021) were dominated by copepod nauplii (40-54%), as well as females + copepodites of *Oithona similis* (25-27%) and *Pseudocalanus* spp. copepodites (6-11%). In late February (WF022), the same patterns occurred with dominance by copepod nauplii (54-61%), *Oithona similis* (9-27%) and *Pseudocalanus* spp. copepodites (up to 16%). A different assortment was found in late March (WN023) with nearfield dominance by copepod nauplii (43-76%), *Pseudocalanus* spp. copepodites (up to 24%), and *Calanus finmarchicus* copepodites (up to 7%).

At nearfield stations during early April (WF024), zooplankton assemblages were dominated by copepod nauplii (65-77%) and copepodites of *Pseudocalanus* spp. (9-12%). In early May (WN025) dominance of copepod nauplii (21-63%) was shared with copepodites of *Calanus finmarchicus* (6-10%), *Oikopleura dioica* (up to 17%) and rotifers (up to 55%) (plotted as "Other" in Fig. 5-19). In late May (WN026), nearfield zooplankton assemblages continued to be dominated by the combination of copepod nauplii (44-57%), copepodites of *Oithona similis* (up to 7%), and *Calanus* spp. copepodites (16-32%), with minor contributions (< 5%) by *Acartia* spp. copepodites. At nearfield stations during June (WF027), zooplankton assemblages were dominated by copepod nauplii (24-37%), copepodites of *Oithona similis* (13-31%), *Pseudocalanus* spp. (7-21%), *Temora longicornis* (8-15%), *Acartia* spp. (up to 13%), *Calanus finmarchicus* (up to 9%), and barnacle nauplii (up to 12%).

5.3.2.3 Regional Zooplankton Assemblages

Zooplankton assemblages at farfield stations during early February (WF021) were generally similar to those in the nearfield (**Figure** 5-20a). Abundant taxa throughout the area included copepod nauplii (14-63%) and *Oithona similis* copepodites and females (7-71% for all stations except F30 Boston Harbor). Lesser contributions at certain stations came from copepodites of *Pseudocalanus* spp. (up to 27%) and *Centropages* spp (up to 9%). *Acartia hudsonica* and *Acartia* spp. copepodites were abundant only at station F30 in Boston Harbor (26%). Barnacle nauplii comprised 6-9% of total counts in inner Boston Harbor (stations F30 & F31).

In late February (WF022; **Figure** 5-20b), copepod nauplii were dominant (46-84%), followed by *Oithona similis* copepodites and females (9-26%) throughout the study area, except for stations F24 adjacent to Boston Harbor, and stations F30, F31 and F23 in Boston Harbor. *Pseudocalanus* spp. copepodites comprised up to 17% of abundance at some stations, and *Acartia* spp. copepodites comprised 5-8% of abundance at stations F23 and F30 in Boston Harbor. Barnacle nauplii sporadically comprised up to 20% of animals counted at various stations.

In April (WF024; **Figure** 5-21a), copepod nauplii were dominant at all farfield stations (35-85%) except for station F30 in Boston Harbor, as were *Oithona similis* copepodites (<5-36%). *Calanus finmarchicus* copepodites comprised up to 8% of abundance at stations F06 and F27. There were sporadic contributions at several stations by *Pseudocalanus* spp. copepodites (up to 18%). *Acartia hudsonica* adults and *Acartia* spp. copepodites comprised 7-24% of total abundance at stations F23 and F31 in Boston Harbor, and F25 in the adjacent coastal region, and 80% of abundance at station F30 in the harbor.

During June (WF027), farfield zooplankton assemblages (**Figure** 5-21b) were again dominated by copepod nauplii (13-45%), copepodites of *Oithona similis* (<5-35%), and *Pseudocalanus* spp. (up to 16%). There were also sporadic contributions at some stations from bivalve veligers (13% at Station F26), *Calanus finmarchicus* copepodites (up to 48%), and *Acartia* spp. adults and copepodites accounted for 16-43% of total abundance at stations F23, F30, and F31 in Boston Harbor, and F25 in the adjacent coastal zone.

In summary, zooplankton assemblages during the first half of 2002 were comprised of taxa typically recorded for the same time of year in previous years.

5.4 Summary of Biological Results

- Areal production in 2002 followed patterns typically observed in prior years with distinct winter/spring phytoplankton blooms at both nearfield stations.
- Productivity at station N18 was elevated relative to station N04 during 5 of the 7 surveys in the first half of 2002.
- The winter/spring bloom peaks at both nearfield sites in 2002 were higher than values previously observed for measured production from 1995 to 2001 but not higher than calculated potential productivity over the same period.
- Unlike previous years, productivity at station F23 was characterized by a distinct winter bloom. During baseline years (1995-2000), peak areal productions at station F23 peaked in June-July and ranged from 2000 to 5000 mg C m^{-2} d^{-1}. The peak areal production observed in 2002 was comparable but occurred in early February.
- Elevated production values tended to be correlated with the occurrence of the highest chlorophyll *a* measurements.
- Chlorophyll-specific production reached higher levels and exhibited greater variability at station N18 compared with N04.
- Respiration rates in the winter/spring of 2002 closely followed both the POC and chlorophyll concentrations with elevated rates in the harbor during the winter/spring bloom in February and elevated rates in the nearfield during the April *Phaeocystis* bloom.
- Low carbon specific respiration rates suggest that there were limited supplies of labile POC available during the winter/spring of 2002 despite the February and April blooms.
- Whole-water phytoplankton assemblages were dominated by unidentified microflagellates and several species of centric diatoms except during the April *Phaeocystis* bloom. This is typical for the first half of the year in terms of taxonomic composition.
- A centric diatom bloom occurred in Massachusetts Bay in February with the highest abundance of diatoms (*Skeletonema costatum*) observed off of Cape Ann.
- The *Phaeocystis pouchetii* bloom in April 2002 was much less abundant than the bloom of this species during the same period in the previous two years. These three consecutive *Phaeocystis* blooms were a departure from the 3-year cycle for these blooms that had been observed during the baseline period (1992-2000).
- There were no blooms of harmful or nuisance phytoplankton species in Massachusetts and Cape Cod Bays during February – June, 2002, other than the April bloom of *Phaeocystis pouchetii*. While the dinoflagellate *Alexandrium tamarense* and diatoms of the genus *Pseudo-nitzschia pungens* were recorded, they were only present in very low abundance. None of the nuisance algae caution thresholds were exceeded during this period.
- Total zooplankton abundance generally increased from February through June as usual, and zooplankton assemblages during the first half of 2002 were comprised of taxa recorded for the same time of year in previous years.

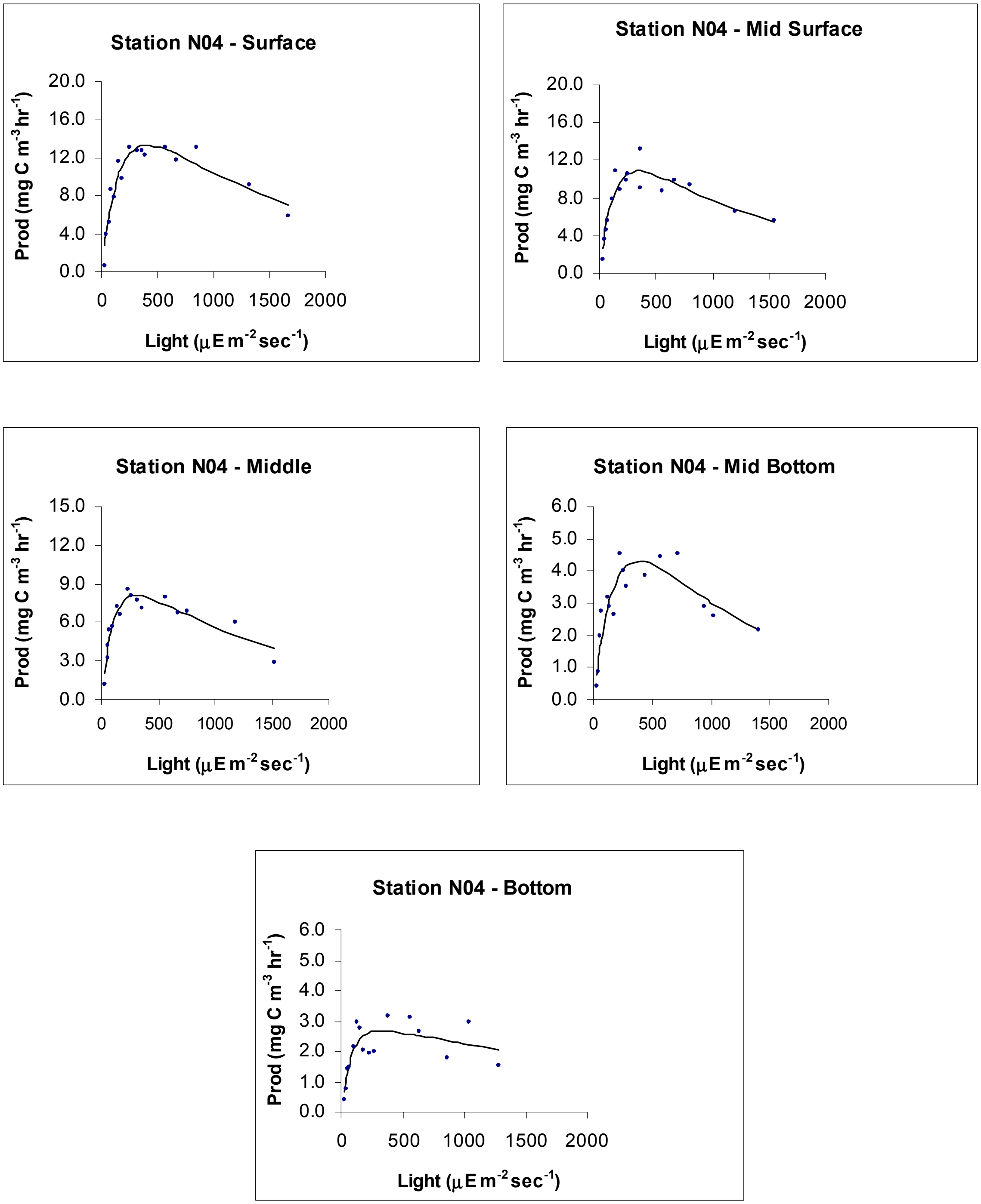


Figure 5-1. An example photosynthesis irradiance curve from station N04 collected February 2002

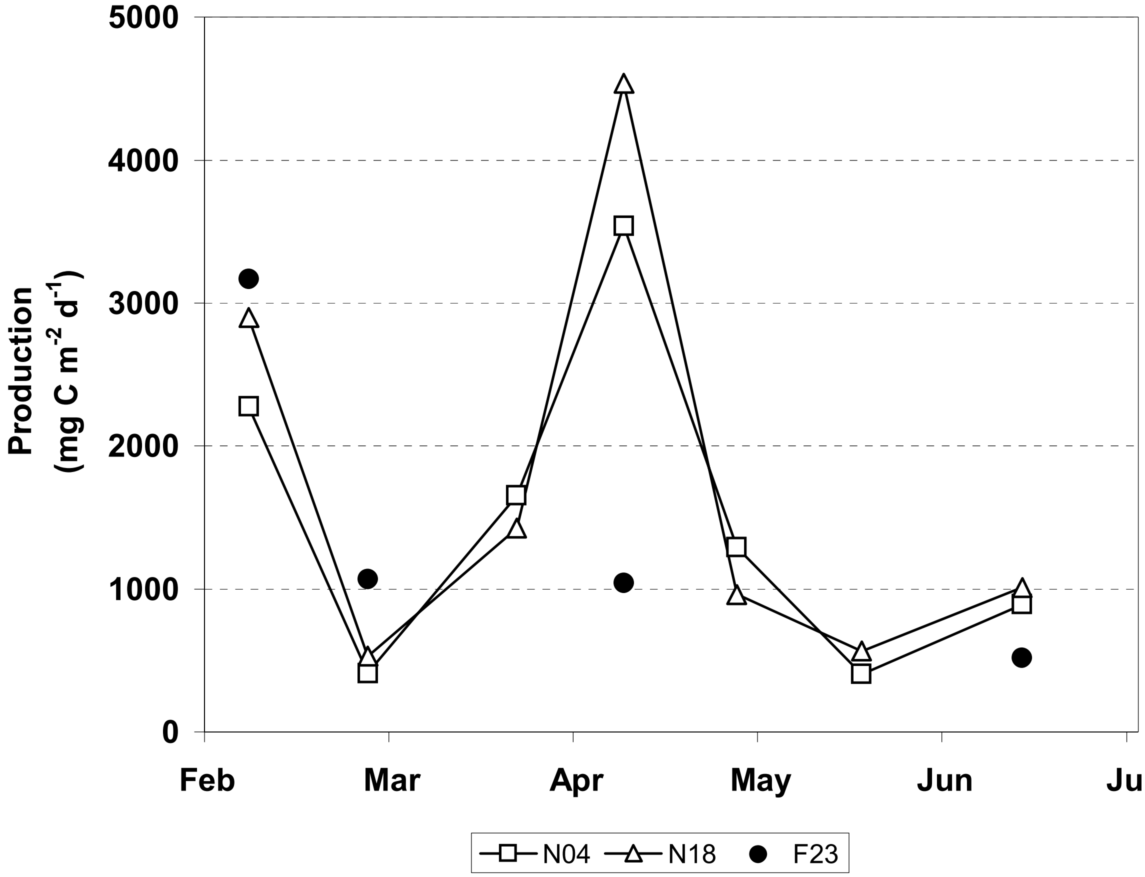


Figure 5-2. Time series of areal production (mg C m^{-2} d^{-1}) for stations N04, N18 and F23

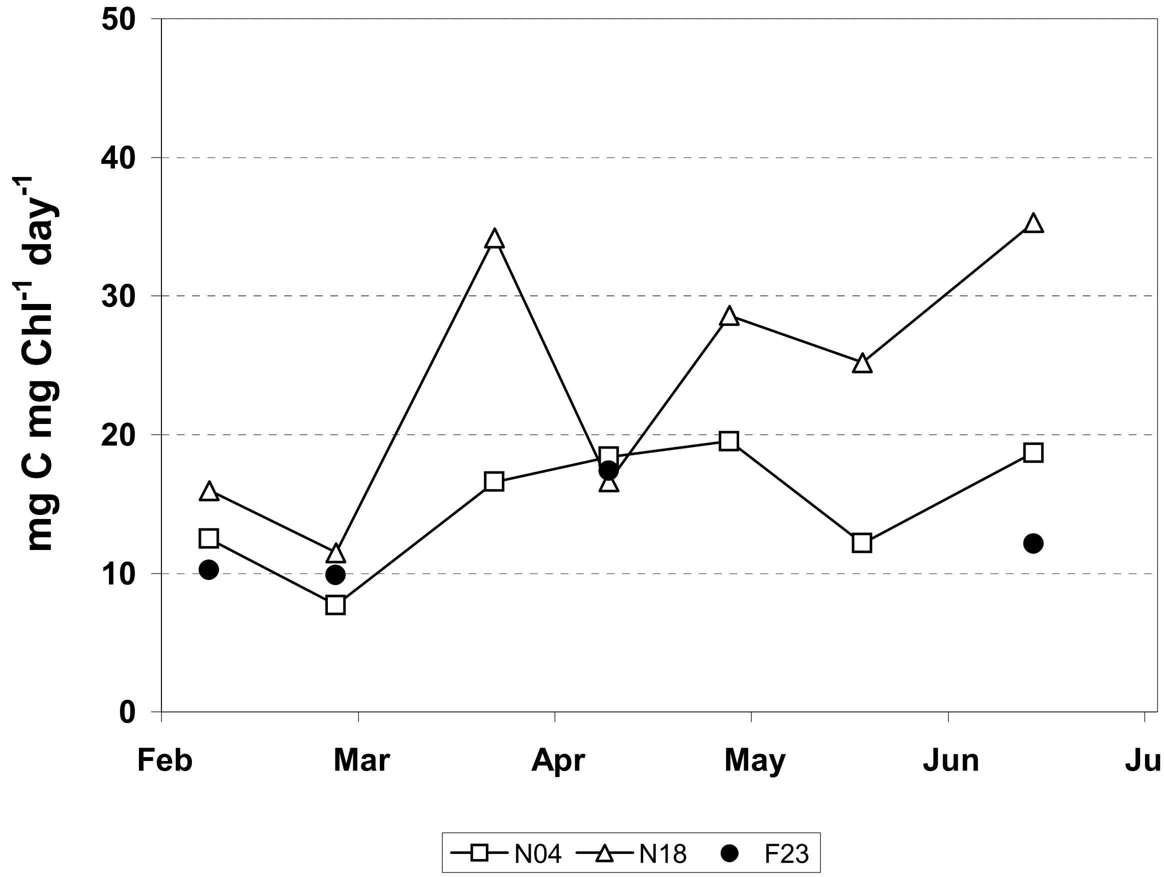


Figure 5-3. Time series of depth-averaged chlorophyll-specific production (mg C mg Chl*a*$^{-1}$ d^{-1}) for stations N04, N18 and F23

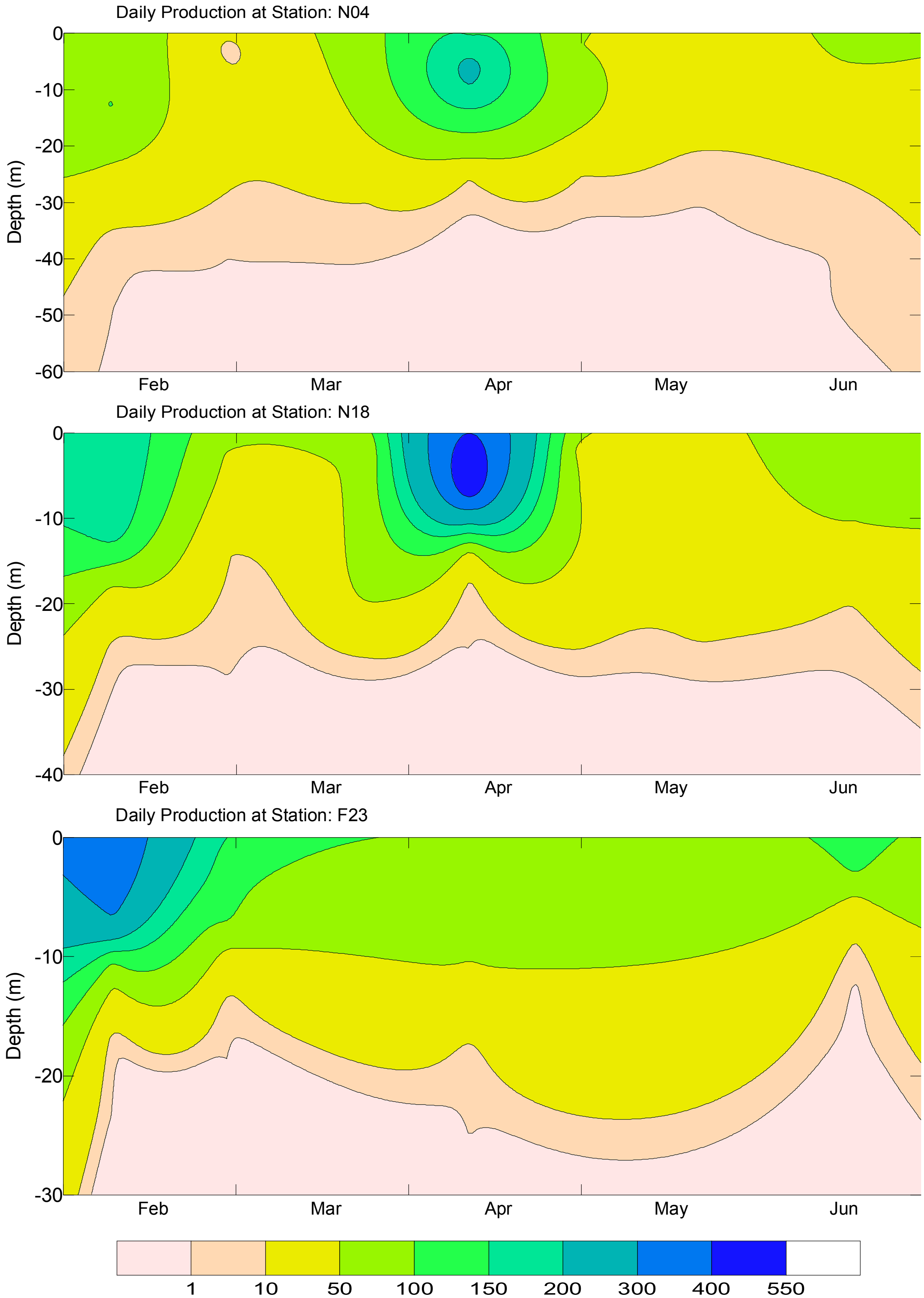


Figure 5-4. Time-series of contoured daily production ($mgCm^{-3}d^{-1}$) over depth at stations N04, N18, and F23

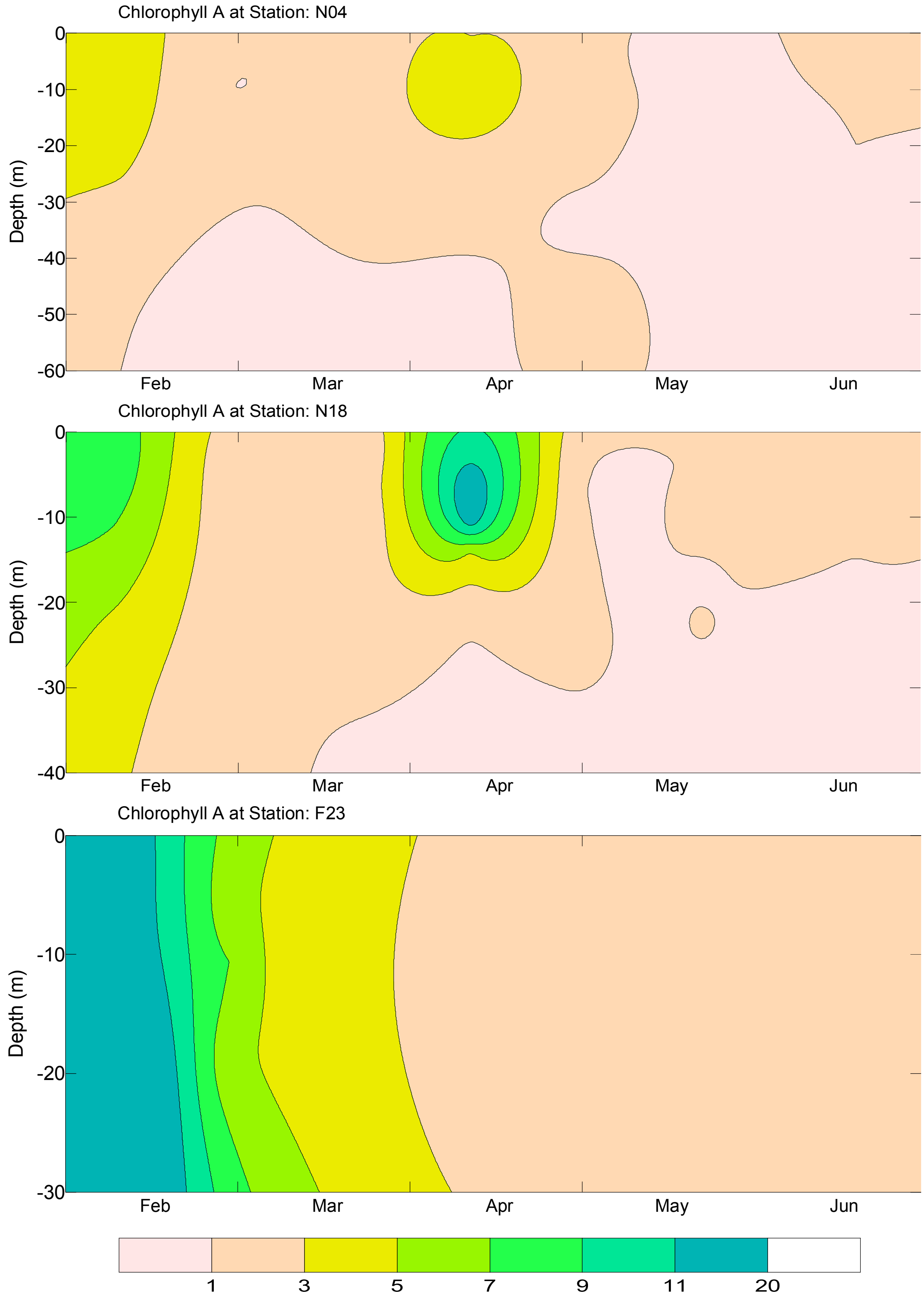


Figure 5-5. Time-series of contoured *in vitro* chlorophyll *a* concentration (μgL^{-1}) over depth at station N04, N18, and F23

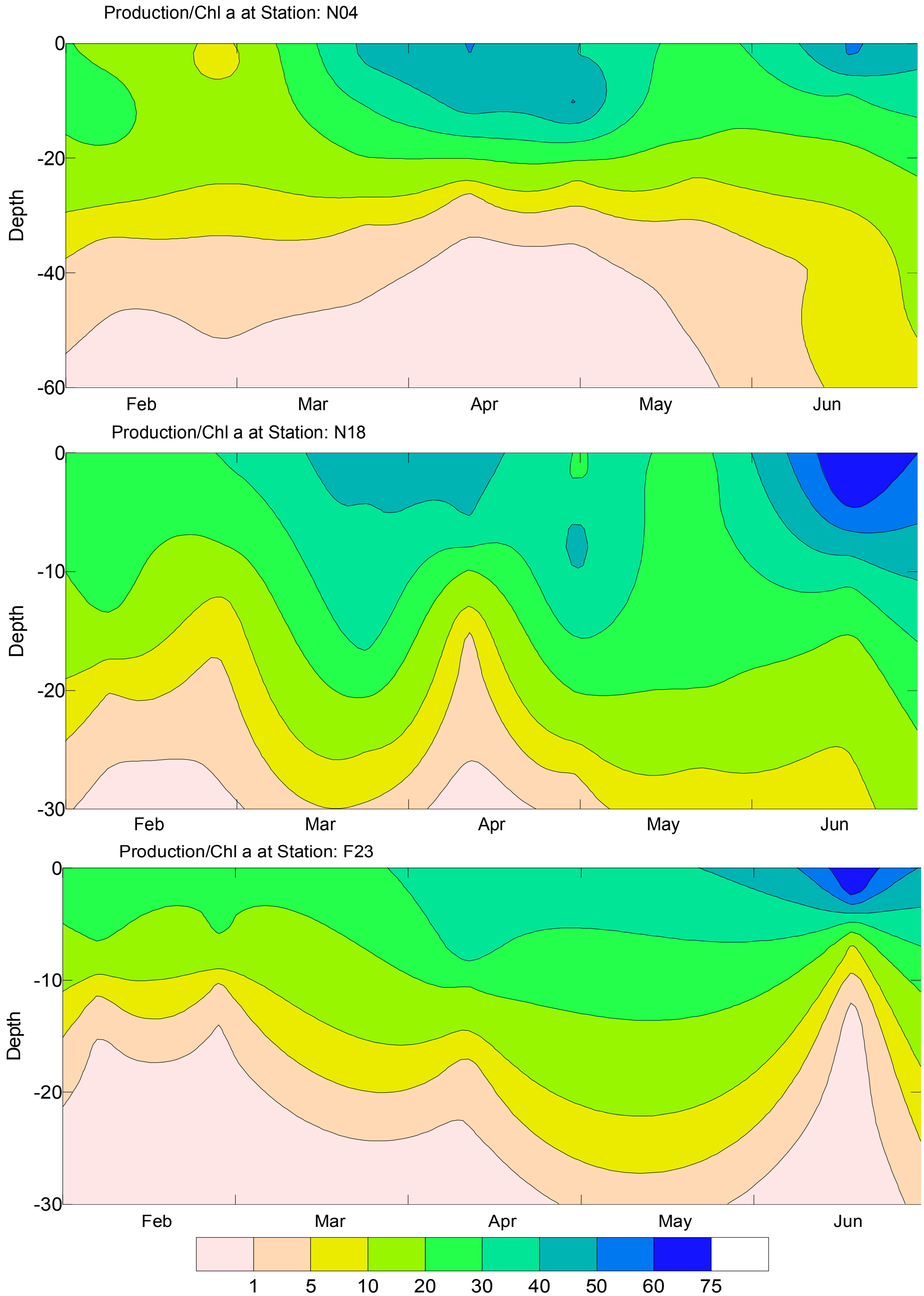
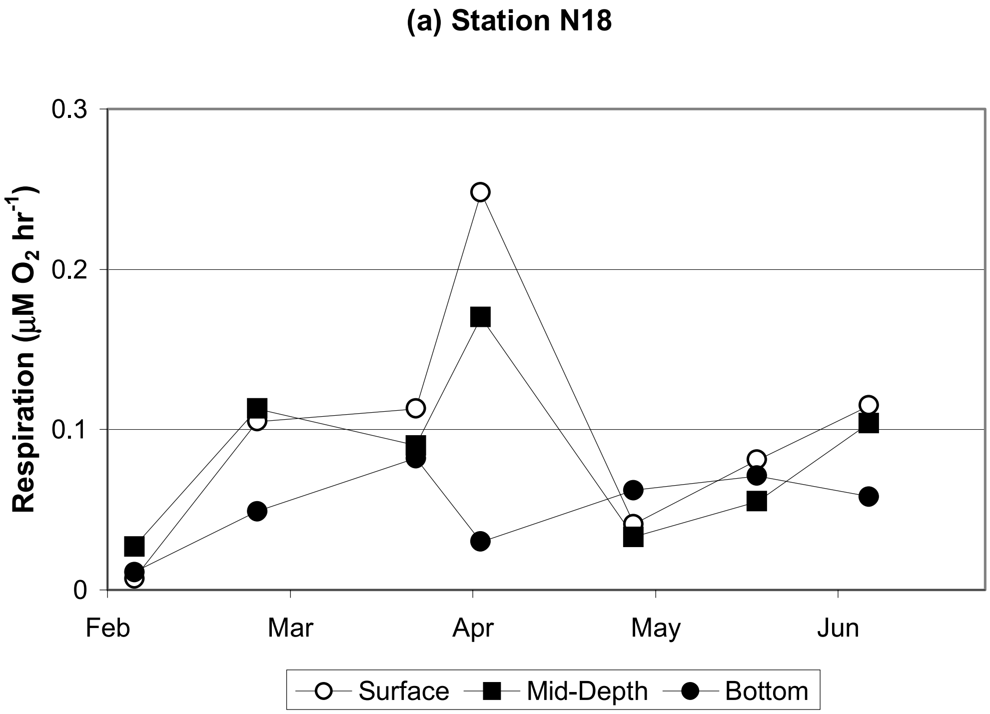


Figure 5-6. Time-series of contoured in chlorophyll-specific production ($mgCmgChl a^{-1}d^{-1}$) over depth at station N04, N18, and F23



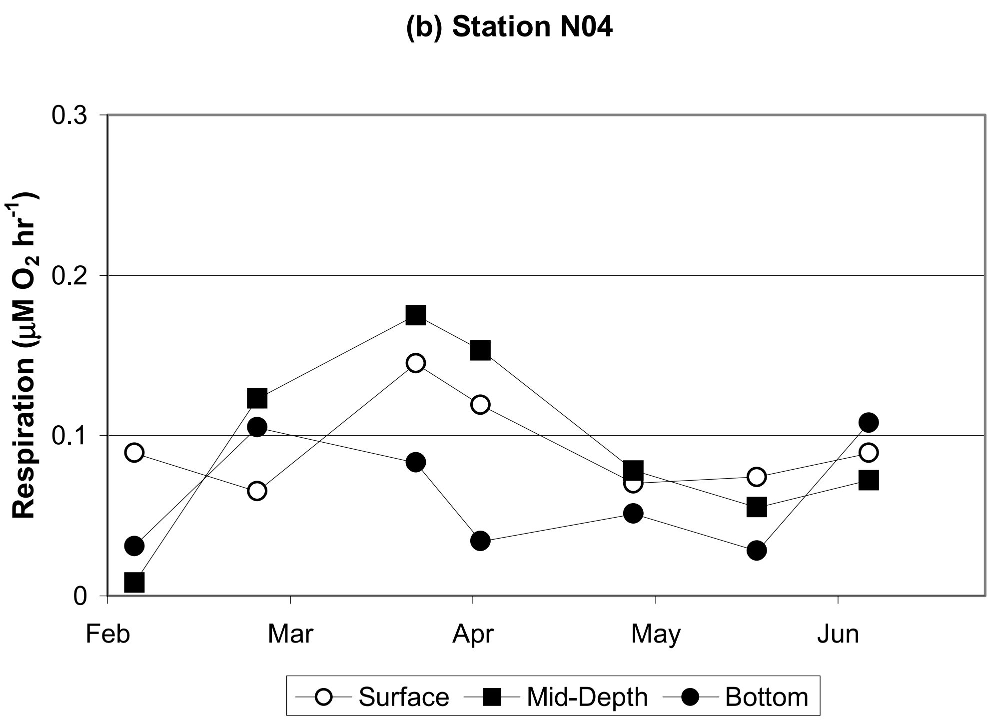


Figure 5-7. Time-series plots of respiration (μMO_2hr^{-1}) at stations N18 and N04

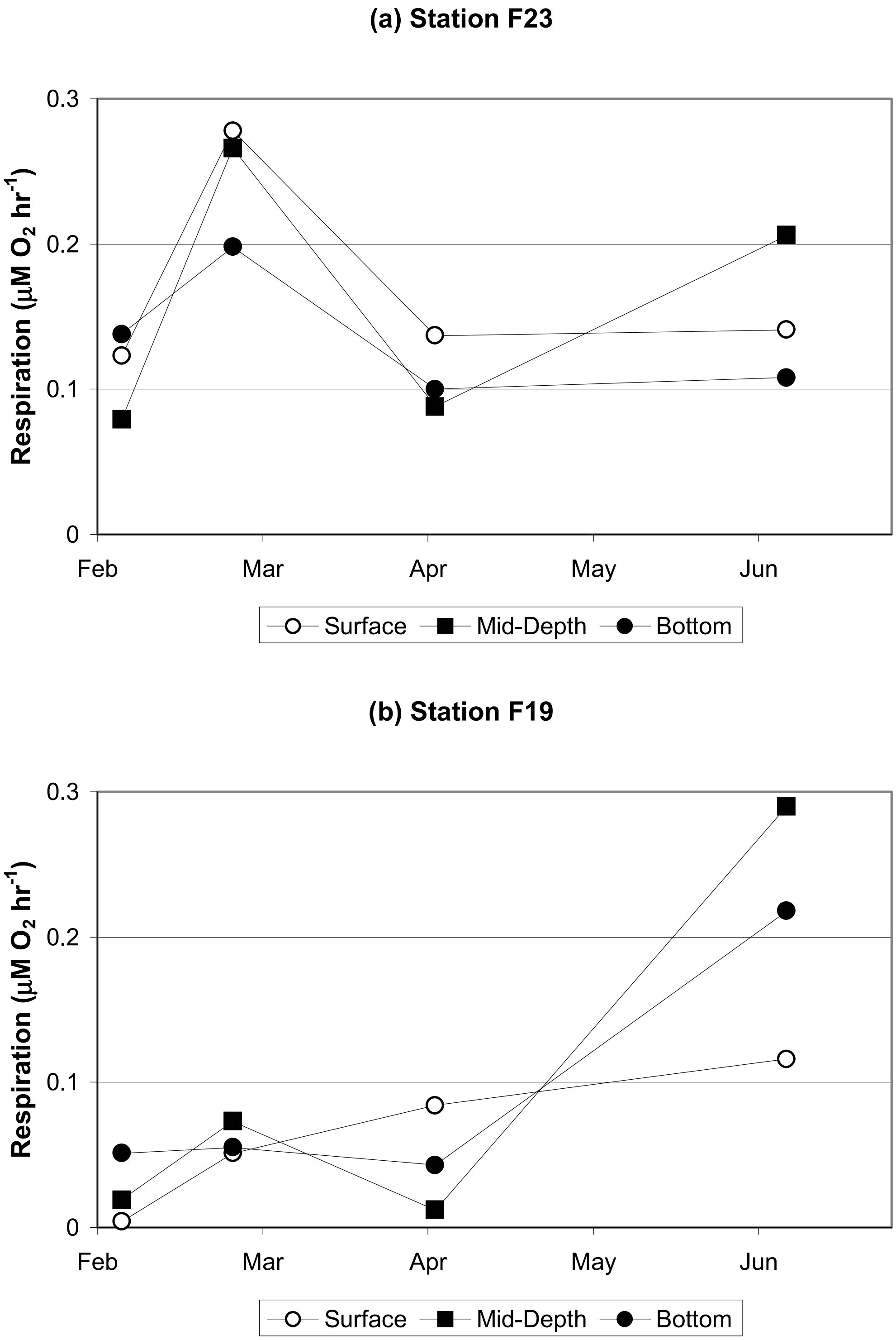


Figure 5-8. Time-series plots of respiration (μMO_2hr^{-1}) at stations F23 and F19

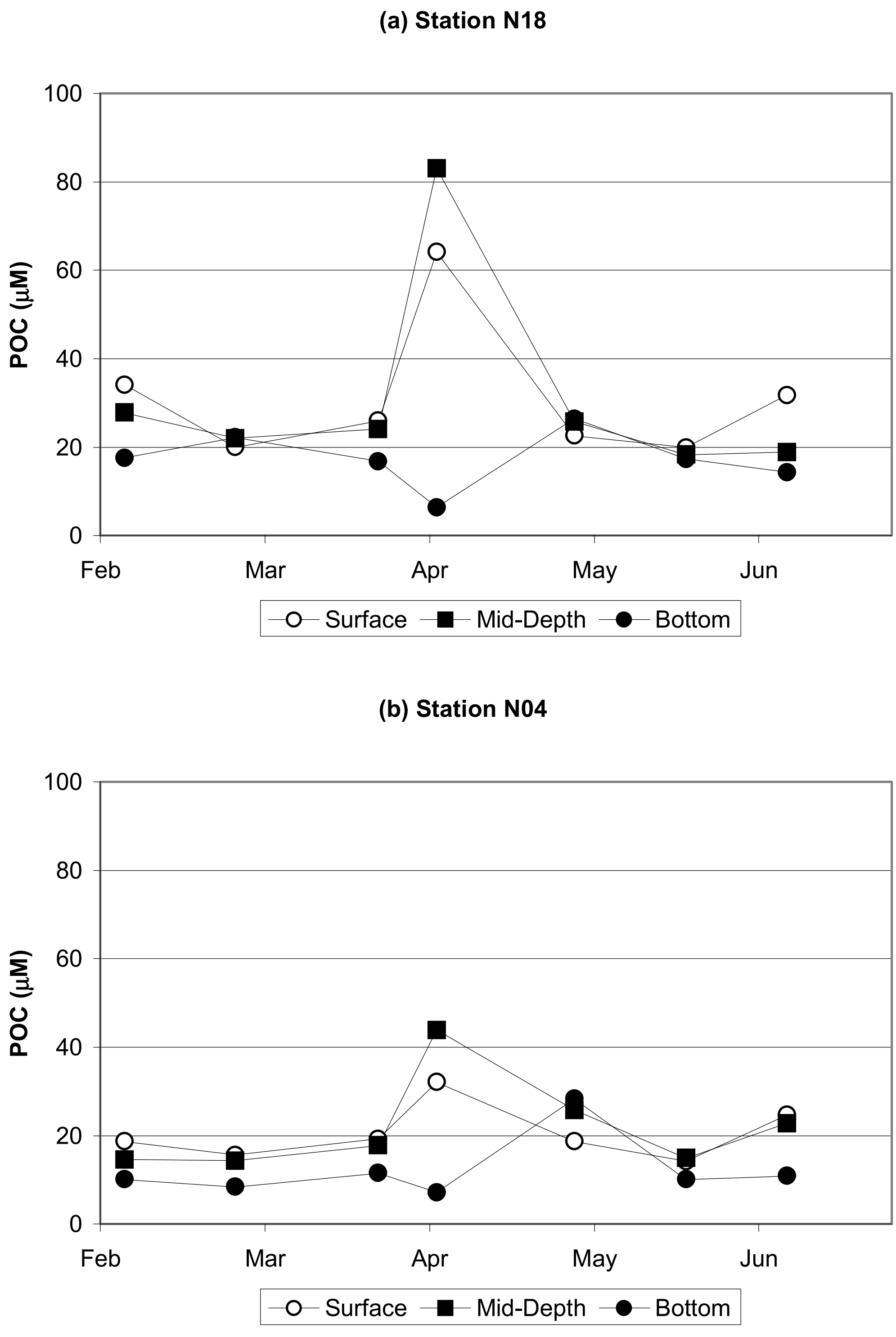


Figure 5-9. Time-series plots of POC (μM) at stations N18 and N04

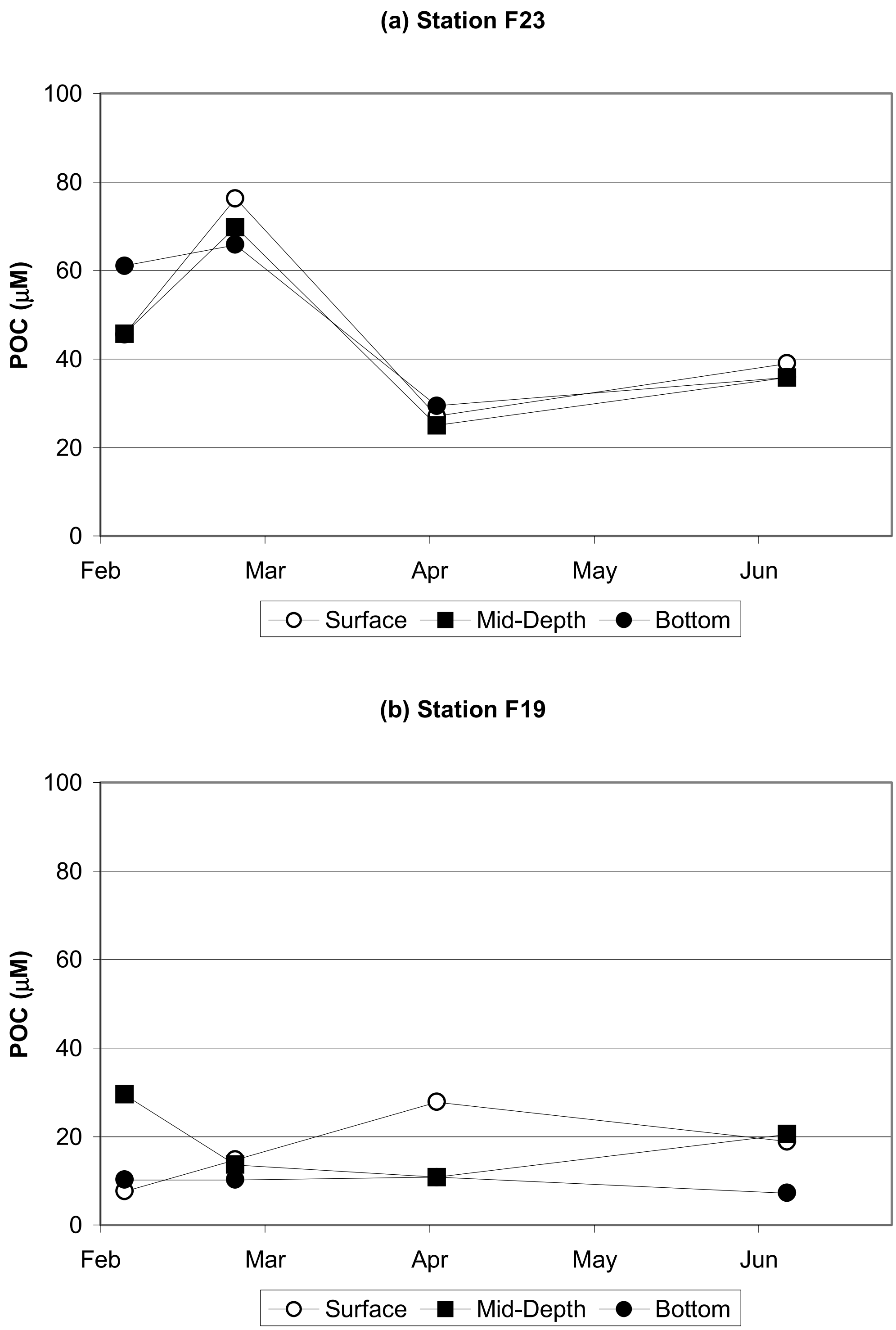
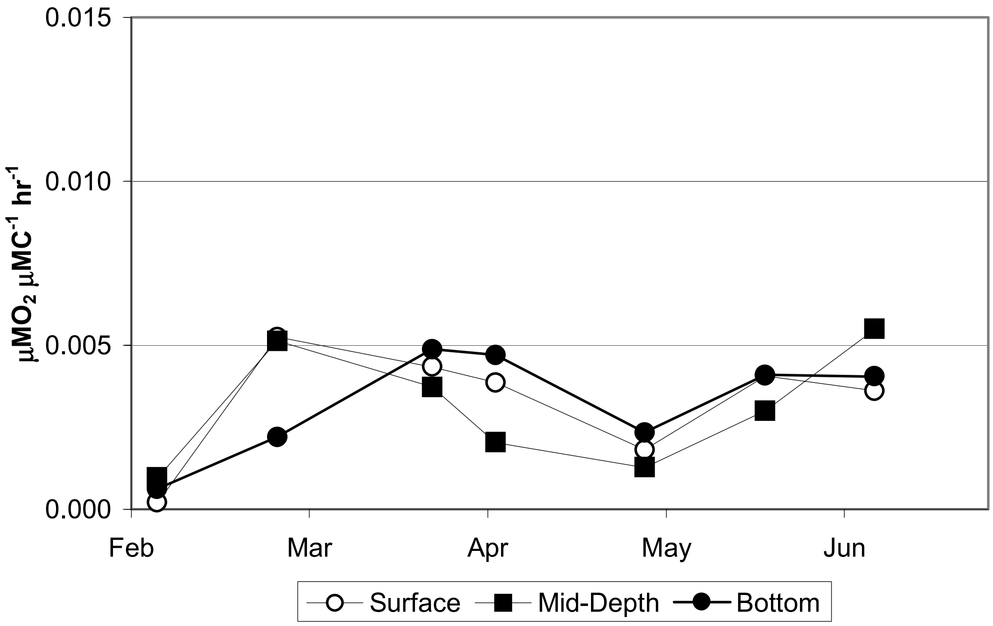


Figure 5-10. Time-series plots of POC (µM) at stations F23 and F19

(a) Station N18



(b) Station N04

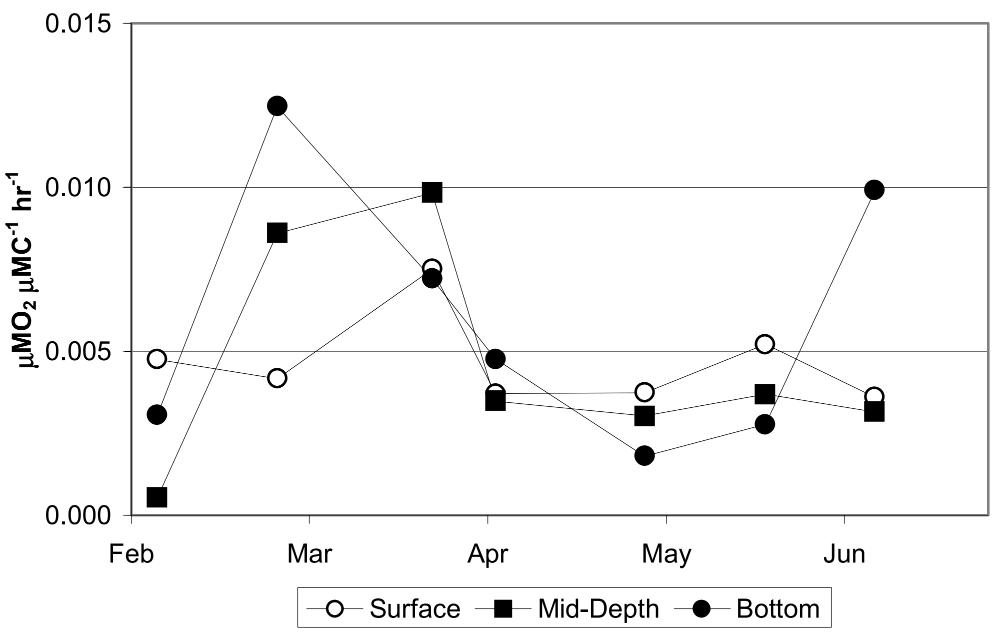
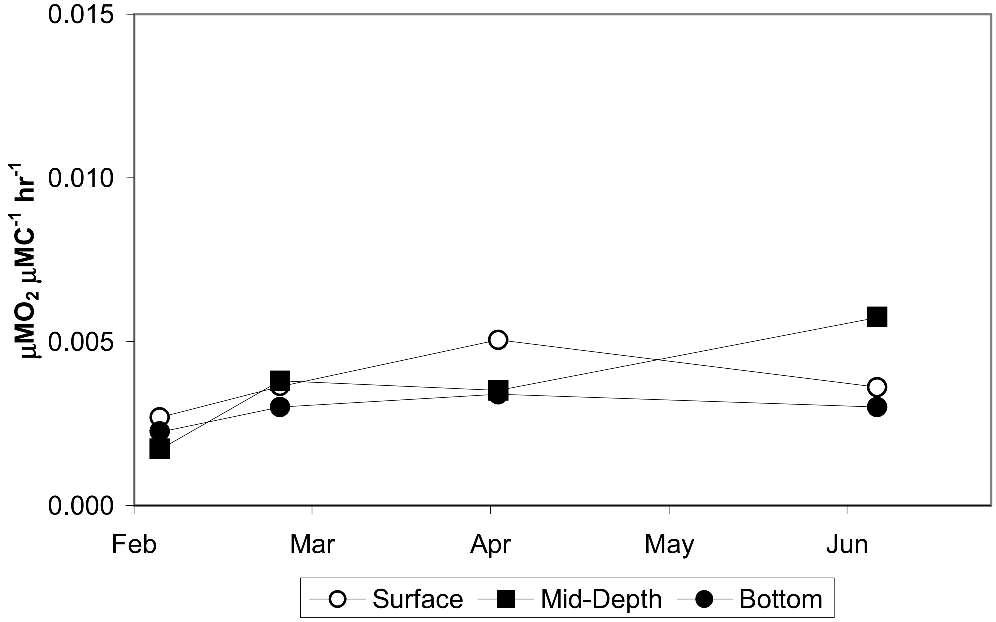


Figure 5-11. Time-series plots of carbon-specific respiration ($\mu MO_2 \mu MC^{-1} hr^{-1}$) at stations N18 and N04

(a) Station F23



(b) Station F19

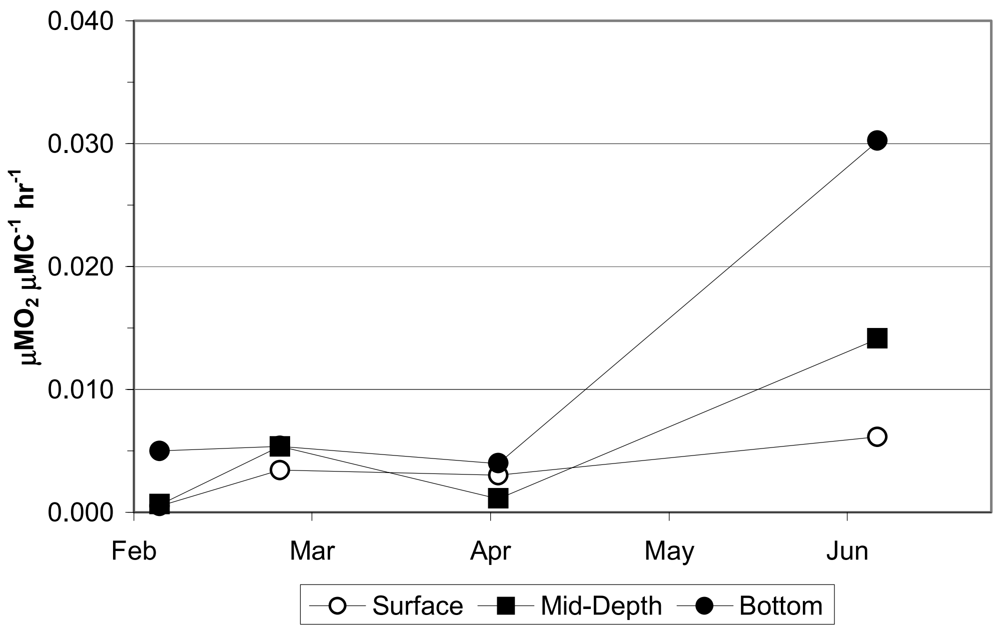


Figure 5-12. Time-series plots of carbon-specific respiration ($\mu MO_2 \mu MC^{-1} hr^{-1}$) at stations F23 and F19

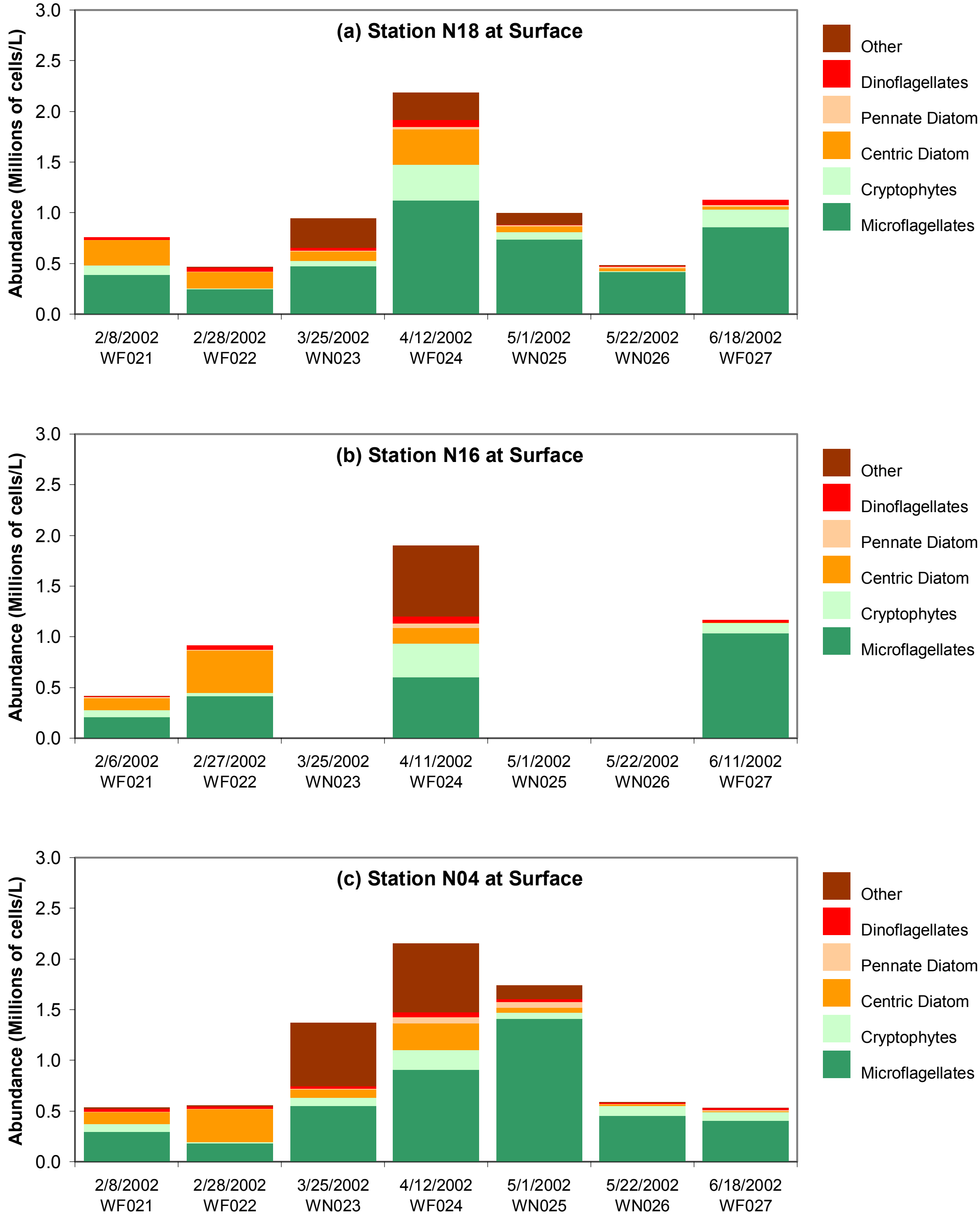


Figure 5-13. Phytoplankton abundance by major taxonomic group, nearfield surface samples

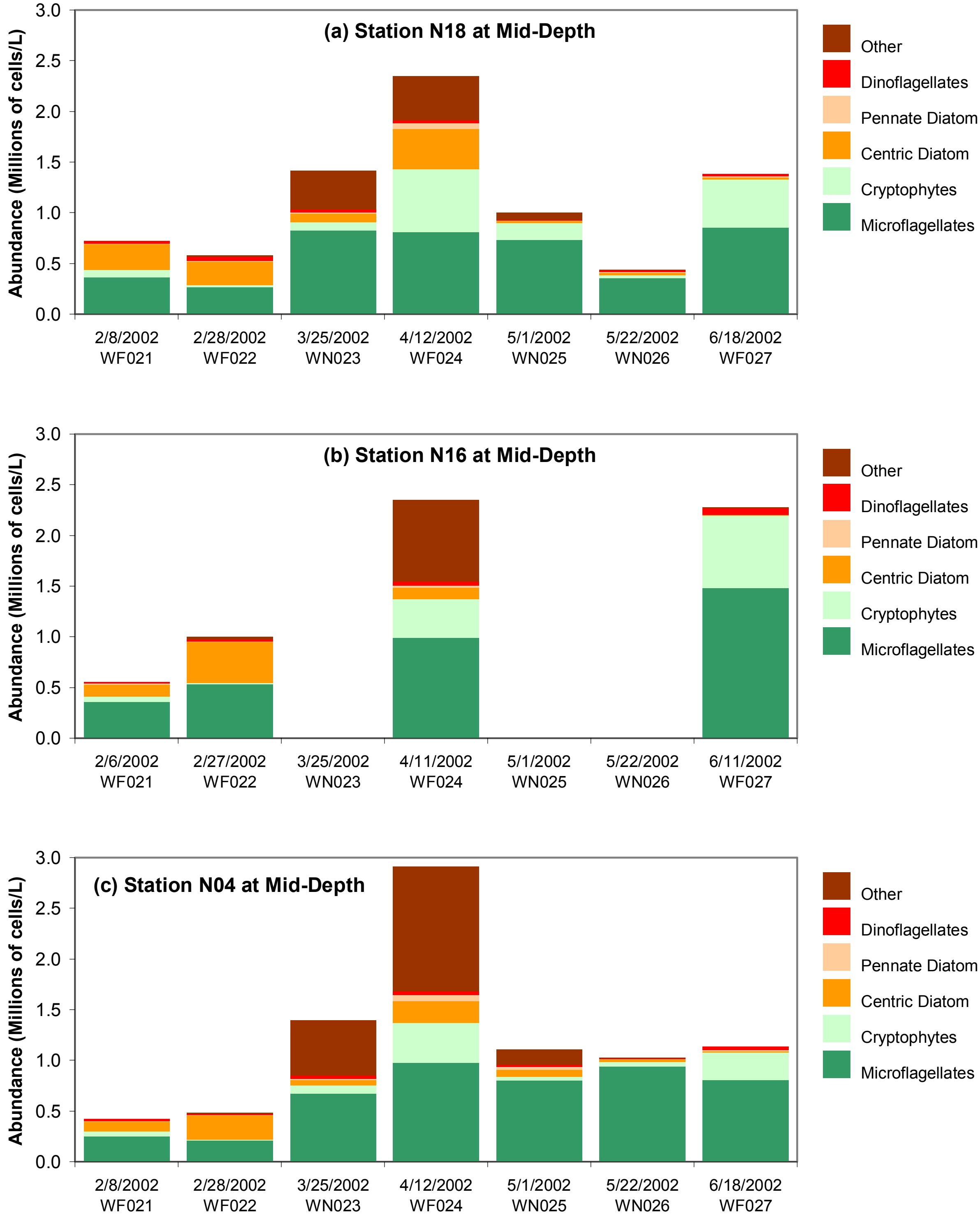
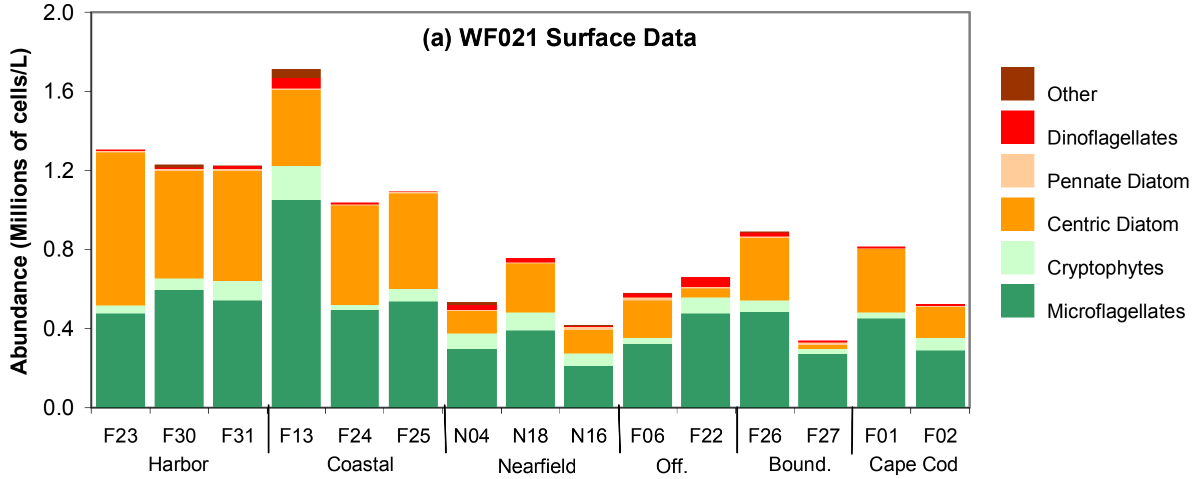


Figure 5-14. Phytoplankton abundance by major taxonomic group, nearfield mid-depth samples



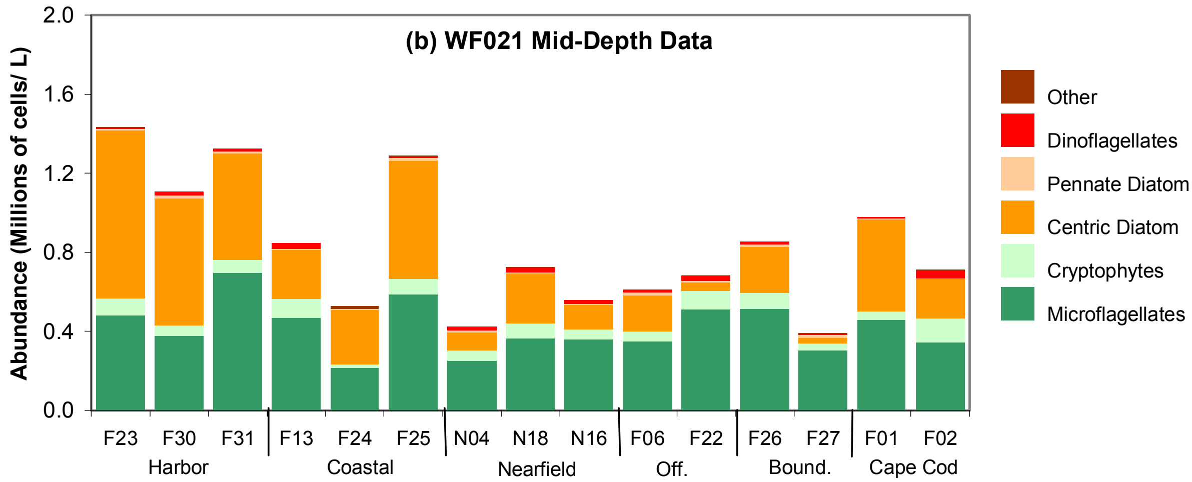


Figure 5-15. Phytoplankton abundance by major taxonomic group – WF021 farfield survey results (February 5 – 9)

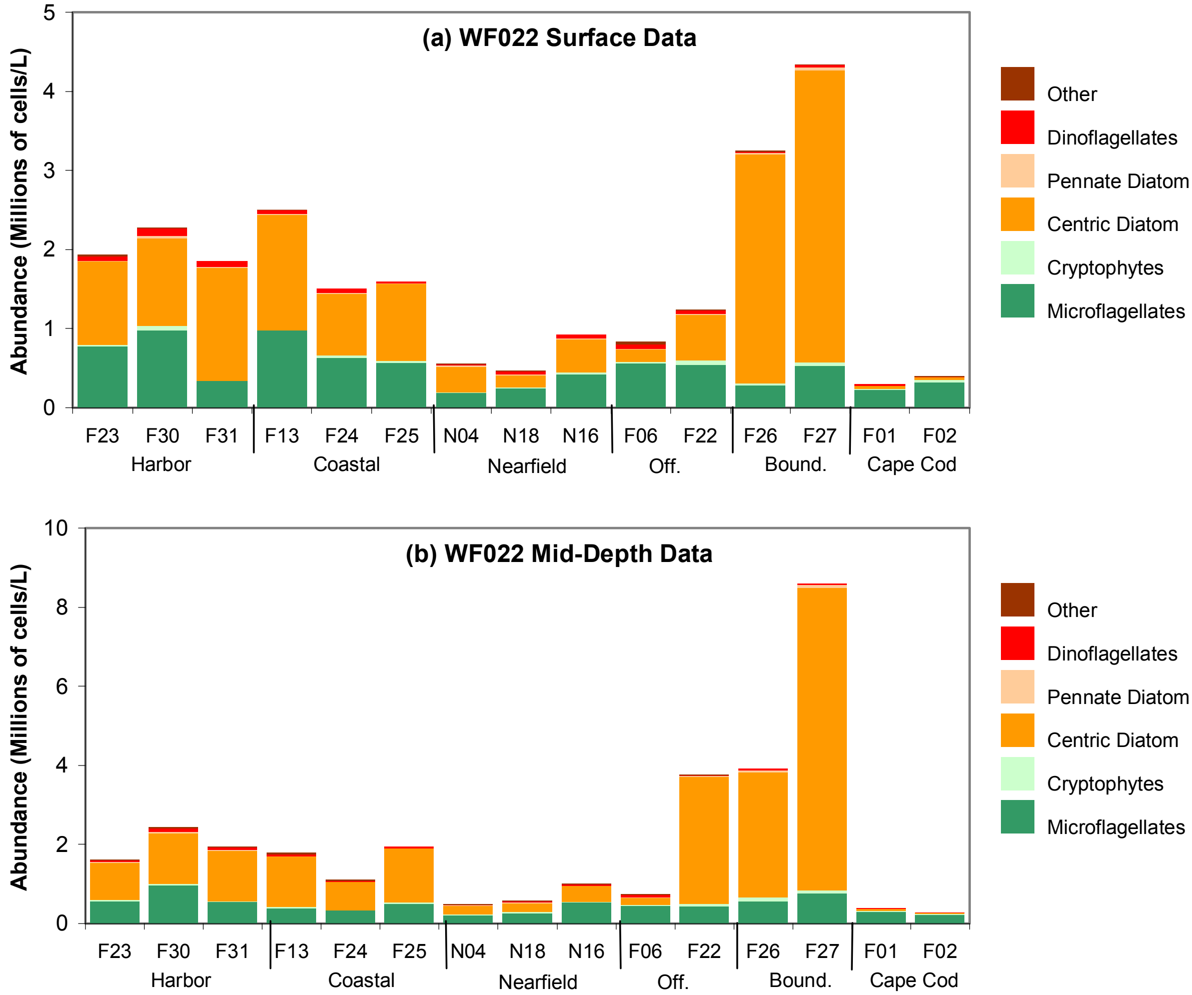


Figure 5-16. Phytoplankton abundance by major taxonomic group – WF022 farfield survey results (February 26-28, March 1)

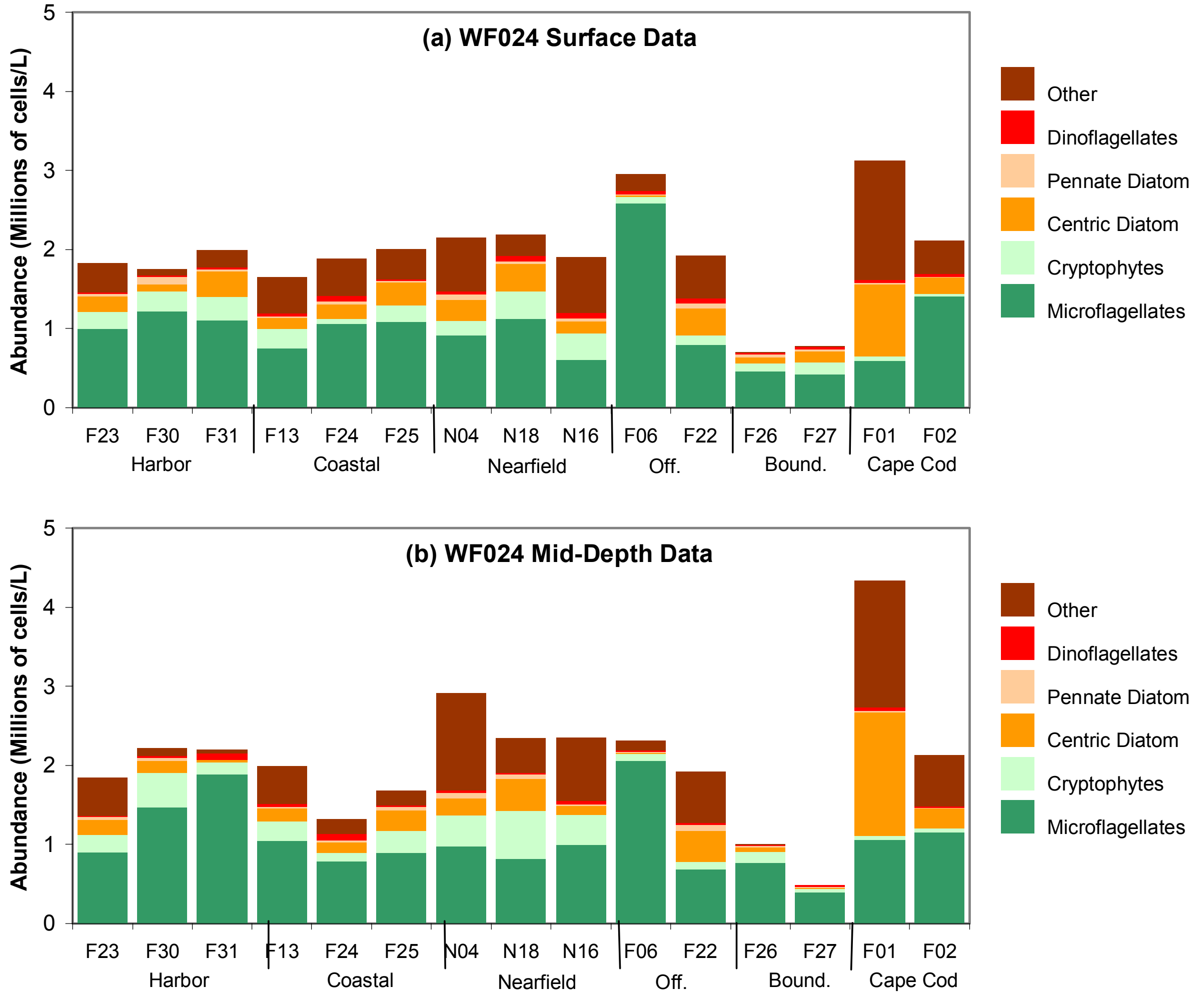


Figure 5-17. Phytoplankton abundance by major taxonomic group – WF024 farfield survey results (April 5, 10 – 12)

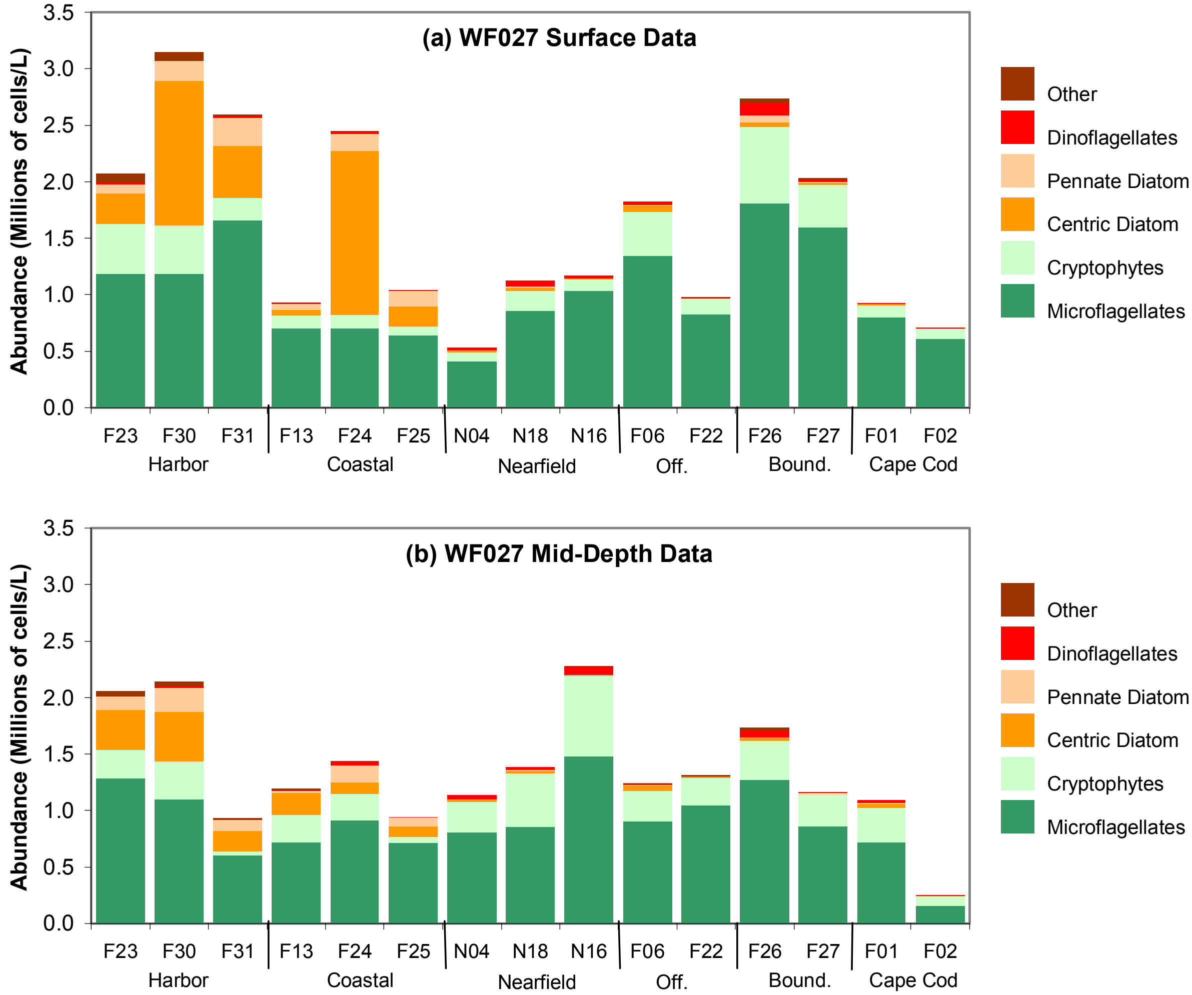


Figure 5-18. Phytoplankton abundance by major taxonomic group – WF027 farfield survey results (June 10, 11, 14, 18)

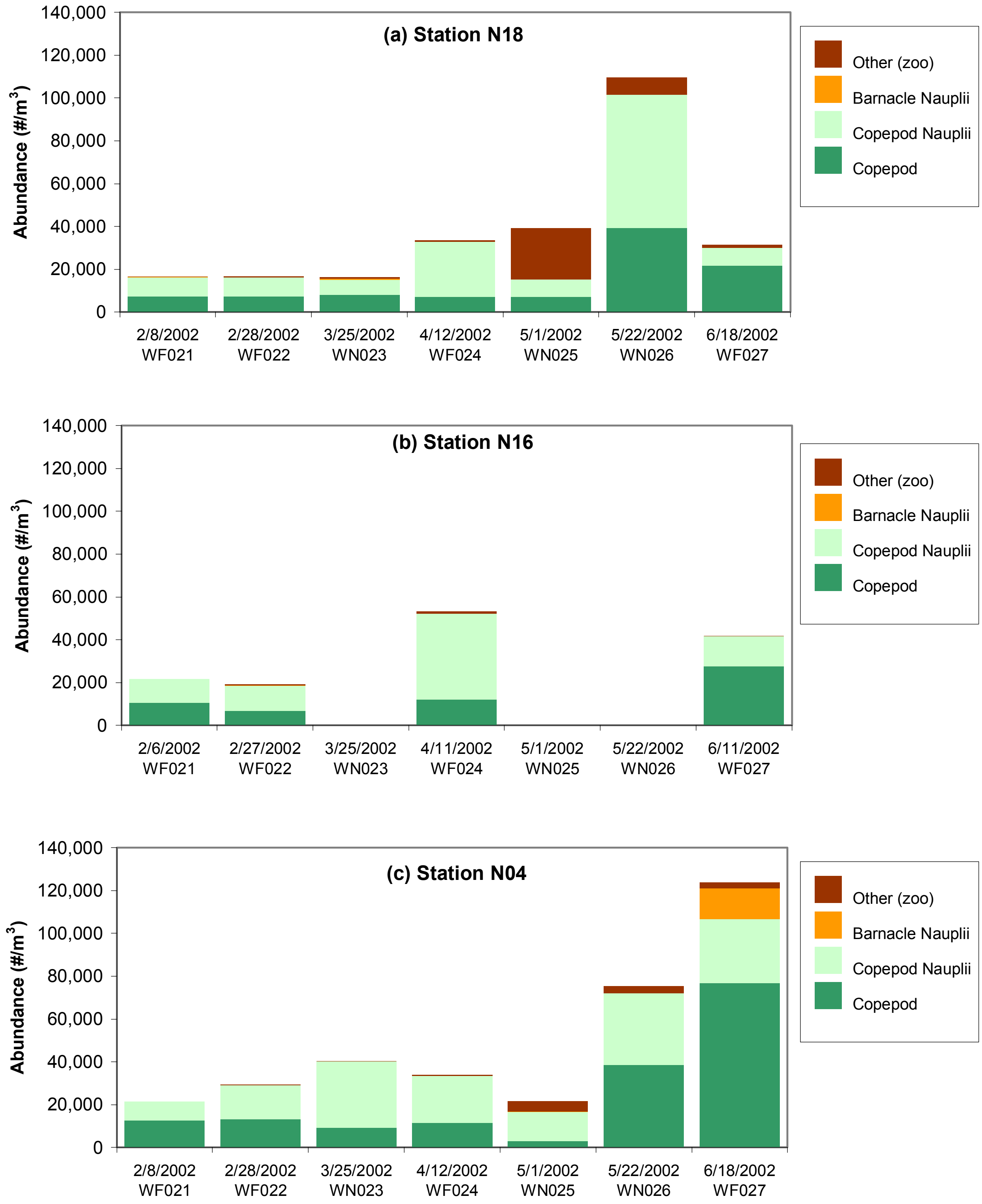


Figure 5-19. Zooplankton abundance by major taxonomic group at stations N18, N16 and N04.

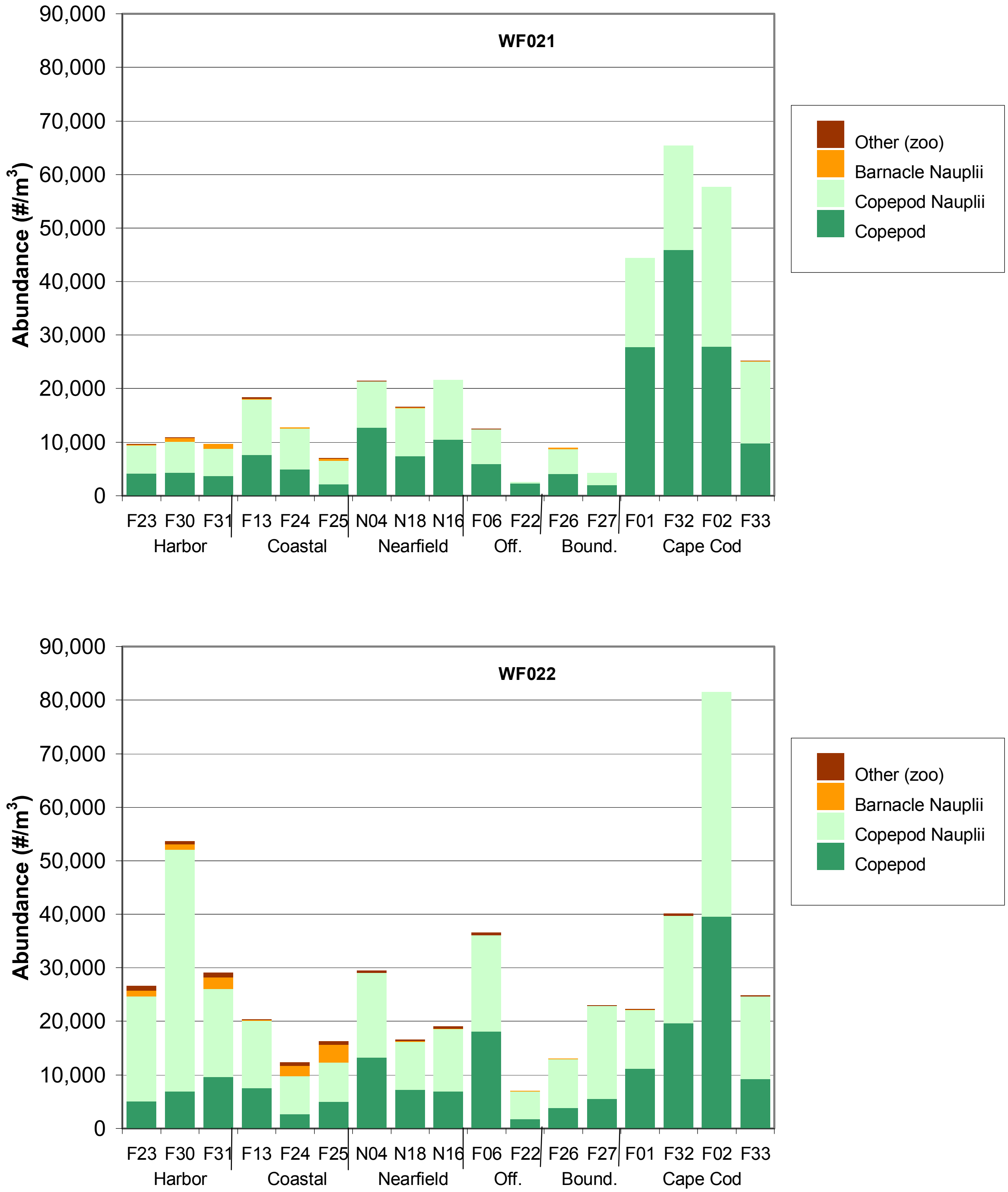
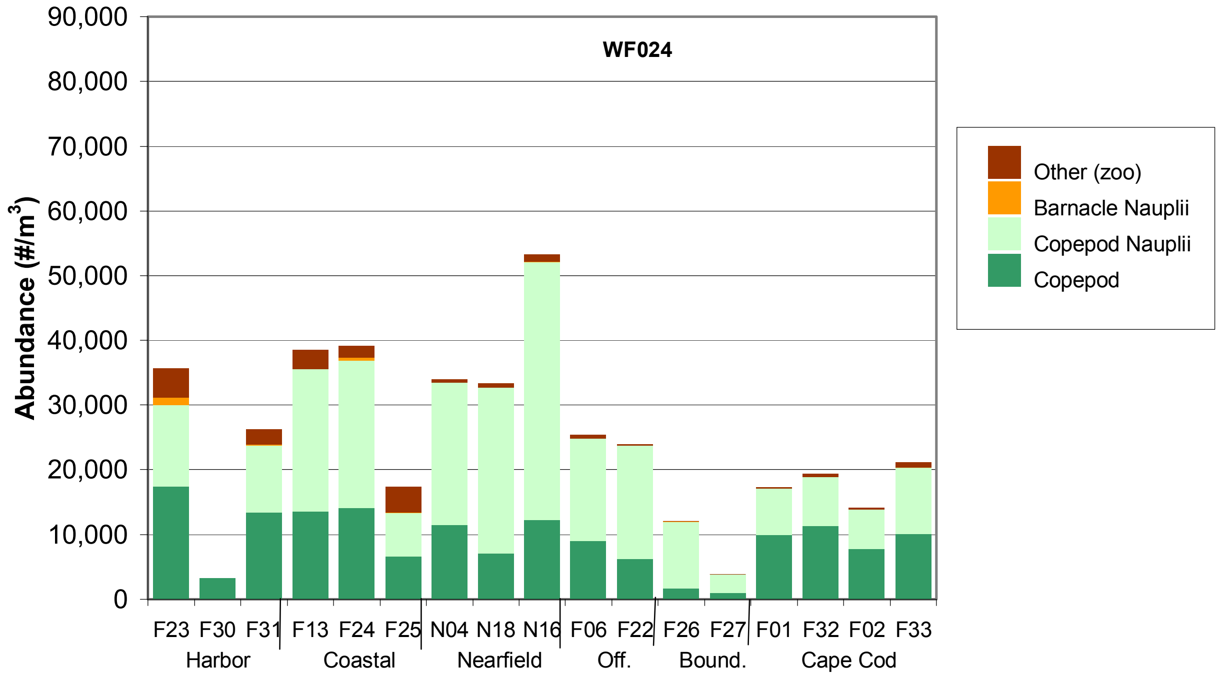


Figure 5-20. Zooplankton abundance by major taxonomic group during (a) WF021 (February 5-9) and (b) WF022 (February 26-28, March 1) farfield surveys



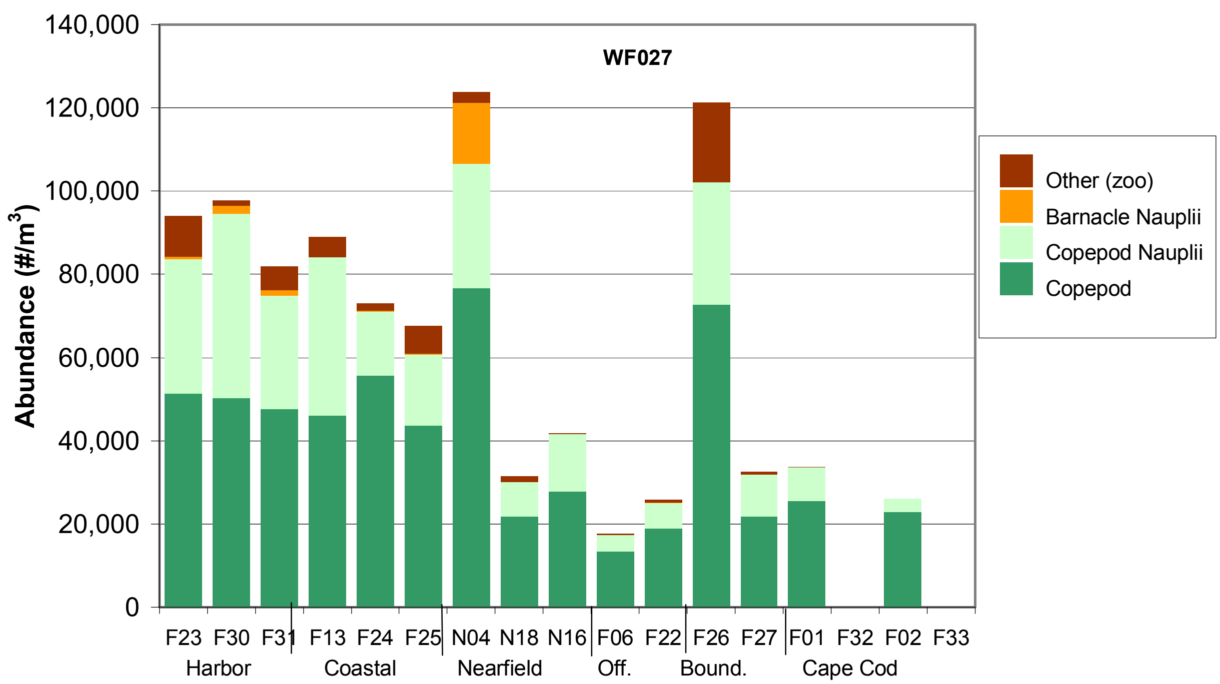


Figure 5-21. Zooplankton abundance by major taxonomic group during (a) WF024 (April 5, 10-12) and (b) WF027 (June 10, 11, 14, 18) farfield surveys

6.0 SUMMARY OF MAJOR WATER COLUMN EVENTS

The winter to spring transition in Massachusetts and Cape Cod Bays is characterized by a typical series of physical, biological, and chemical events: seasonal stratification, the winter/spring phytoplankton bloom, and nutrient depletion. This was generally the case in 2002. There was a winter/spring bloom of centric diatoms that was most prominent in Boston Harbor, coastal waters, and off of Cape Ann in February. A minor bloom of *Phaeocystis pouchetii* was observed throughout most of Massachusetts and Cape Cod Bays in April. Even with these blooms, surface waters across much of the region were not depleted with respect to nutrients until June.

The water column was weakly stratified at the deeper offshore and boundary stations during the April combined survey. In the nearfield, the water column did not begin to stratify until early May at the deeper eastern nearfield stations and remained well mixed further inshore. This is somewhat late for the onset of stratification, and stratification throughout the entire nearfield area did not set up until later in May. It was not until June that a strong pycnocline was established throughout the farfield. Freshwater input to surface waters typically drives the establishment of stratified conditions in March and April. In 2002, the low precipitation and river flow resulted in a very weak salinity gradient and in turn a delay in the establishment of seasonal stratification.

The nutrient data for February to June 2002 generally followed the "typical" progress of seasonal events in Massachusetts and Cape Cod Bays. Maximum nutrient concentrations were observed in early February when the water column was well mixed and biological uptake of nutrients was limited. Nutrient concentrations in Cape Cod Bay surface waters were reduced by the winter/spring 'diatom bloom' in February and remained relatively low throughout the report period. Massachusetts Bay surface water nutrient concentrations decreased from early February through April. The exception to this was in the harbor and at nearshore stations along the entire coast where nutrients increased in April from the late February/early March levels. In the nearfield, nutrient levels decreased in the surface waters as stratification was developing. Nutrient concentrations in the surface waters were depleted throughout much of the nearfield region by mid April. Nutrient concentrations in the surface waters were depleted throughout the entire study area by June.

Ammonium in the water column has proven to be an excellent tracer, albeit not a conservative tracer, of the effluent plume in the nearfield since the outfall came online in September 2000. The effluent plume as defined by the distribution of elevated NH_4 and PO_4 concentrations surfaced in the well-mixed waters from early February through April and even made it to the surface under weak stratification in early May. Once seasonal stratification was established, the pycnocline prevented the effluent (and elevated NH_4 and PO_4 concentrations) from reaching surface waters. In addition to illustrating the vertical extent of the plume, an atypical post diversion nutrient distribution was observed in late May that highlights the variability of currents in the area. The plume of elevated NH_4 and PO_4 was found to the northwest of the outfall rather than the normally observed location directly above or to the south of the diffuser. This was the only survey during the first half of 2002 in which this nutrient/effluent distribution occurred. It is assumed that tidal flushing or other forces driving the nearfield currents may have set up this effluent distribution much as observed in April 2001 during plume tracking study (Hunt, *et al*., 2002).

Chlorophyll concentrations in the nearfield were relatively high in 2002, but the nearfield mean areal chlorophyll for winter/spring 2002 of 112 mg m^{-2} was well below the caution threshold of 182 mg m^{-2}. The 2002 winter/spring areal chlorophyll mean was almost double that observed in 2001 (69 mg m^{-2}). Although this was a substantial increase from 2001, it was still much lower than the very high areal chlorophyll values seen winter/spring 1999 (176 mg m^{-2}) and 2000 (191 mg m^{-2}).

These high winter/spring chlorophyll concentrations were coincident with substantial region-wide winter/spring diatom and *Phaeocystis* blooms of 1999 and 2000, respectively. Although the lack of major region-wide blooms in 2002 resulted in lower chlorophyll concentrations in the nearfield in comparison to these two-year, the winter/spring mean chlorophyll concentration was higher than the values observed during 1992 to 1998 of the baseline monitoring period.

The highest chlorophyll concentrations of the semi-annual period were recorded in Boston Harbor in February. However, regional chlorophyll maxima fluctuated throughout the period and elevated chlorophyll levels were found in each of the regions at various times. Chlorophyll concentrations were high in the harbor, coastal waters, and Cape Cod Bay in February during the winter/spring diatom bloom. This coincided with peak production at harbor station F23 and elevated production at the nearfield stations. In late February, a similar distribution of elevated chlorophyll was observed that coincided with an increase in centric diatom abundance, but a decrease in productivity. Some of the highest chlorophyll concentrations during the late February survey were found at boundary stations F26 and F27 off of Cape Ann. These stations also had the highest abundance of phytoplankton observed for the entire February to June period, and the phytoplankton community was dominated by *Skeletonema costatum*. The SeaWiFS images for this time period suggest that these elevated chlorophyll values were due to entrainment of waters from the Gulf of Maine into northeastern Massachusetts Bay.

By early April, surface water chlorophyll concentrations and centric diatom abundance had decreased. Subsurface chlorophyll concentrations, however, increased dramatically as the *Phaeocystis* bloom progressed with total phytoplankton abundance exceeding 2 million cells L^{-1} at nearfield stations. This increase in chlorophyll and phytoplankton abundance coincided with the seasonal maxima in nearfield production with rates of 3500 and 4500 mg C m^{-2} d^{-1} at stations N04 and N18, respectively. These winter/spring bloom nearfield peaks are higher than previously measured production values from 1995 to 2001. However, these higher values are less than the highest calculated potential productivity values over the same period.

During the baseline period, Boston Harbor exhibited a gradual pattern of increasing areal production from winter through summer rather than the distinct winter/spring peaks observed at the nearfield sites. Harbor peak areal productions at station F23 ranged from 1000 to 5000 mg C m^{-2} d^{-1} and usually occurred in June-July. The peak areal production observed in 2002 was a similar magnitude (3200 mg C m^{-2} d^{-1}), but occurred in February. The shift in seasonal cycle in 2002 at station F23 is even more dramatic than in 2001, when a slight winter/spring peak was observed in March. This apparent shift in the production pattern in the harbor from baseline to bay outfall monitoring periods may be a sign of harbor recovery and will be the focus of more intense examination in future reports.

DO concentrations in 2002 were within the range of values observed during previous years and followed the typical trends. Maximum concentrations occurred in February when the water column was well mixed. There was a small decrease in April, and DO concentrations reached minima for this time period in June throughout Massachusetts and Cape Cod Bays. The lowest DO %saturation values were observed in the bottom waters in Cape Cod Bay and at the deeper offshore and boundary stations where the survey mean values in June were only 86%. Even though the lack of a major winter/spring bloom suggests that there may not be a problem with bottom water DO in 2002, the presence of survey mean DO %saturation values of close to 85% suggests that other factors may be contributing to a regional decrease in DO during the first half of 2002. Respiration rates were relatively low in 2002, although the highest rates were measured at offshore station F19 in June. This was coincident with a relatively low POC (30 µM) resulting in a high carbon-specific respiration rate. This indicates that the POC that was available was also more labile. The effect of the physical and biological factors on both respiration rates and bottom water DO concentrations will be evaluated in more detail in the 2002 Annual Report.

Whole-water phytoplankton assemblages were dominated by several species of centric diatoms and unidentified microflagellates. During the February diatom bloom, the phytoplankton assemblage at boundary stations F26 and F27 were dominated by *Skeletonema costatum*, which also was one of the dominant species in the harbor and coastal winter/spring diatom bloom. In late March and April, a bloom of *Phaeocystis pouchetii* was observed in the nearfield and throughout most of Massachusetts and Cape Cod Bays. This is typical for the first half of the year in terms of taxonomic composition. This was the third consecutive year that a *Phaeocystis* bloom was observed in Massachusetts Bay, and a departure from the 3-year cycle for these blooms that had been observed during the baseline period (Libby *et al*., 2001). There were no blooms of harmful or nuisance phytoplankton species in Massachusetts and Cape Cod Bays during this time period, other than the April bloom of *Phaeocystis pouchetii*. While the dinoflagellate *Alexandrium tamarense* and the diatom of *Pseudo-nitzschia pungens* were recorded, they were present in very low abundance.

Total zooplankton abundance generally increased from February through June as usual, and zooplankton assemblages during the first half of 2002 were comprised of taxa recorded for the same time of year in previous years. Two interesting spatial patterns were observed in the zooplankton abundance data. In early February, zooplankton abundance in Cape Cod Bay was on average 2 to 7 times higher than in Massachusetts Bay areas. It is not clear why this was the case. Since much of this abundance was due to adults and copepodites of *Oithona similis*, which primarily feed on protozooplankton and microzooplankton (Nakamura & Turner, 1997), the increased zooplankton abundance in Cape Cod Bay cannot be directly related to phytoplankton abundance and the winter/spring bloom. Nor was Cape Cod Bay appreciably warmer than other regions in the farfield, so it is difficult to attribute the high abundance of nauplii to temperature-induced early reproductive events. In June, an opposite pattern was observed, as zooplankton abundance was high in harbor and coastal waters and low in Cape Cod Bay and much of western Massachusetts Bay. The cause of this spatial distribution in zooplankton abundance is unknown and it may be within the variability of the system.

September 6, 2000 marked the end of the baseline period, completing the data set for MWRA to calculate the threshold values used to compare monitoring results to baseline conditions. The water quality parameters included as thresholds are dissolved oxygen concentrations and percent saturation in bottom waters of the nearfield and Stellwagen Basin, annual and seasonal chlorophyll levels in the nearfield, seasonal averages of the nuisance algae *Phaeocystis pouchetii* and *Pseudo-nitzschia pungens* in the nearfield, and individual sample counts of *Alexandrium tamarense* in the nearfield (**Table** 6-1). The DO values compared against thresholds are calculated based on the mean of bottom water values for surveys conducted from June to October. The chlorophyll values are calculated as survey means of areal chlorophyll (mg m^{-2}) and then averaged over seasonal and annual time periods. For chlorophyll and nuisance algae the seasons are defined as the following 4-month periods: winter/spring from January to April, summer from May to August, and fall from September to December. The *Phaeocystis* and *Pseudo-nitzschia* seasonal values are calculated as the mean of the nearfield station means (includes surface and mid-depth samples at stations N04 and N18, and N16 for farfield surveys). For *Alexandrium* each individual sample value is compared against the threshold of 100 cells L^{-1}.

The dissolved oxygen concentration survey mean minimum for June 2002 was well above the threshold standard for both the nearfield and Stellwagen Basin. The percent saturation values were above the caution threshold of 80% in each area, but the survey mean minimum in Stellwagen Basin (86.3%) was lower than that for the nearfield (93%) and suggests that this threshold may be approached and even exceeded later in the fall. The nearfield mean areal chlorophyll value for winter/spring 2002 was well below the threshold, but as noted earlier it was higher than all baseline values for the winter/spring period except for 1999 and 2000, which each had major region-wide blooms. Although there was a minor *Phaeocystis* bloom in March and April 2002, the nearfield mean abundance was well below the threshold. *Alexandrium* and *Pseudo-nitzschia* were observed intermittently, but at very low abundance. There were no threshold exceedances for water quality parameters in 2002.

Table 6-1. Contingency plan threshold values for water column monitoring.

Parameter	Time Period	Caution Level	Warning Level	Background	2002
Bottom Water DO concentration	Survey Mean in June-October	< 6.5 mg/l (unless background lower)	< 6.0 mg/l (unless background lower)	Nearfield - 5.75 mg/l Stellwagen - 6.2 mg/l	(June only) Nearfield - 8.85 mg/l Stellwagen - 8.78 mg/l
Bottom Water DO %saturation	Survey Mean in June-October	< 80% (unless background lower)	< 75% (unless background lower)	Nearfield - 64.3% Stellwagen - 66.3%	(June only) Nearfield - 93.0% Stellwagen - 86.3%
Chlorophyll	Annual	107 mg/m^2	143 mg/m^2	--	--
	Winter/spring	182 mg/m^2	--	--	112 mg/m^2
	Summer	80 mg/m^2	--	--	--
	Autumn	161 mg/m^2	--	--	--
Phaeocystis pouchetii	Winter/spring	2,020,000 cells l^{-1}	--	--	268,000 cells l^{-1}
	Summer	334 cells l^{-1}	--	--	--
	Autumn	2,370 cells l^{-1}	--	--	--
Pseudo-nitzschia pungens	Winter/spring	21,000 cells l^{-1}	--	--	900 cells l^{-1}
	Summer	38,000 cells l^{-1}	--	--	--
	Autumn	24,600 cells l^{-1}	--	--	--
Alexandrium tamarense	Any nearfield sample	100 cells l^{-1}	--	--	7.5 cells l^{-1}

A number of topics were called out in this report that will be discussed in greater detail in the 2002 annual water column report including the following:

- Effect of 2001-2002 drought on water quality in Massachusetts and Cape Cod Bays and the impact of other metrological conditions on physical characteristics in the bays (specifically upwelling and surface flow).
- Continued observation of elevated ammonium and phosphate concentrations in the effluent plume and the potential effect on biological processes in the nearfield. Including a closer examination of the relative distribution of the plume since September 2000.
- Examine the shift in the seasonal cycle of production in Boston Harbor from baseline to bay outfall monitoring periods. Is the shift a direct response to the diversion of effluent discharge to the bay outfall?

7.0 REFERENCES

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APPENDIX A

Surface Contour Plots – Farfield Surveys

Surface Contour Plots – Farfield Surveys

All contour plots were created using data from the surface bottle sample (A) Each plot is labeled with the survey number (WF021 through WN027), and parameter. The minimum and maximum value, and the station where the value was measured are provided for each plot, as well as the contour interval and parameter units.

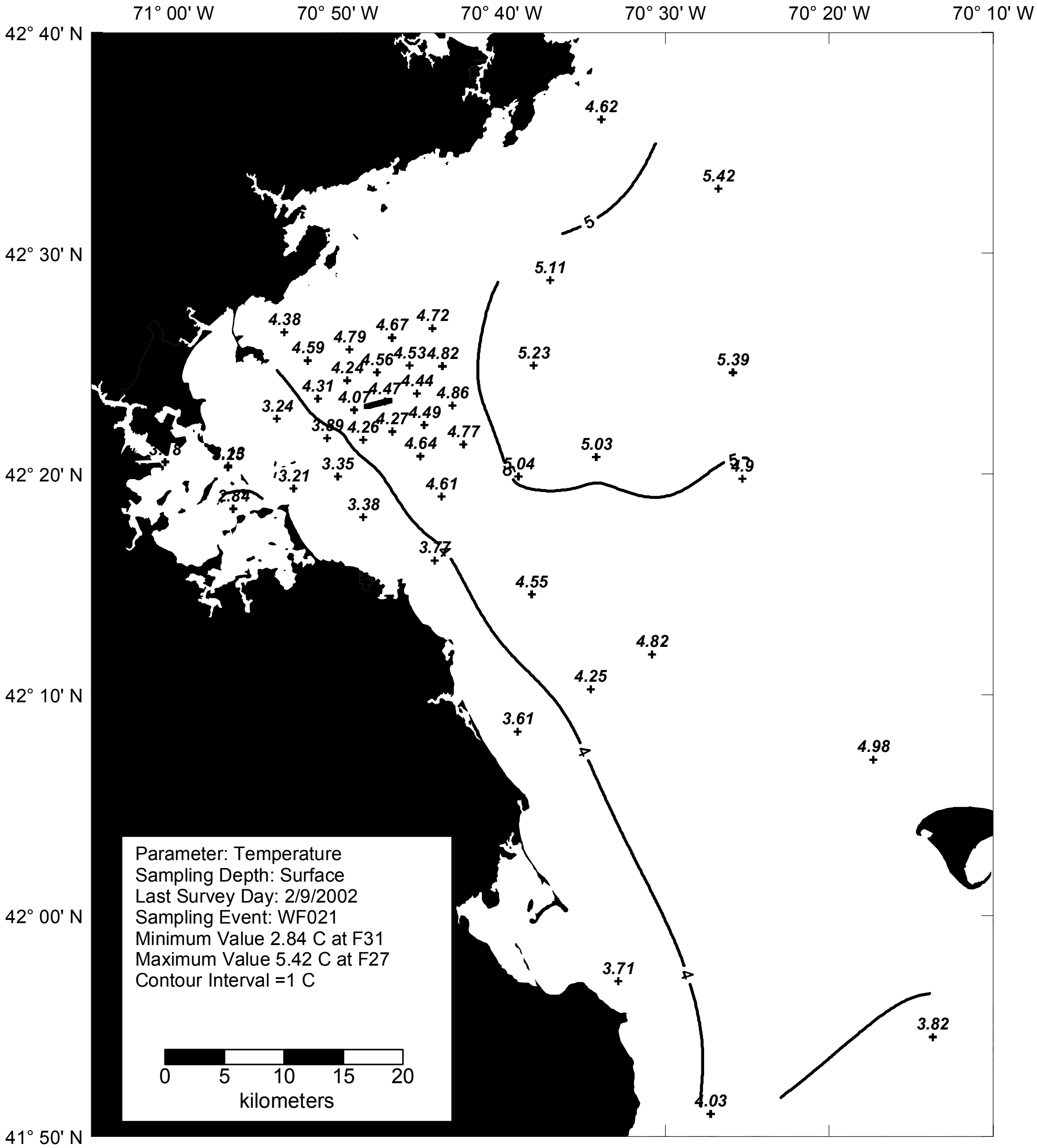


Figure A-1. Temperature Surface Contour Plot for Farfield Survey WF021 (Feb 02)

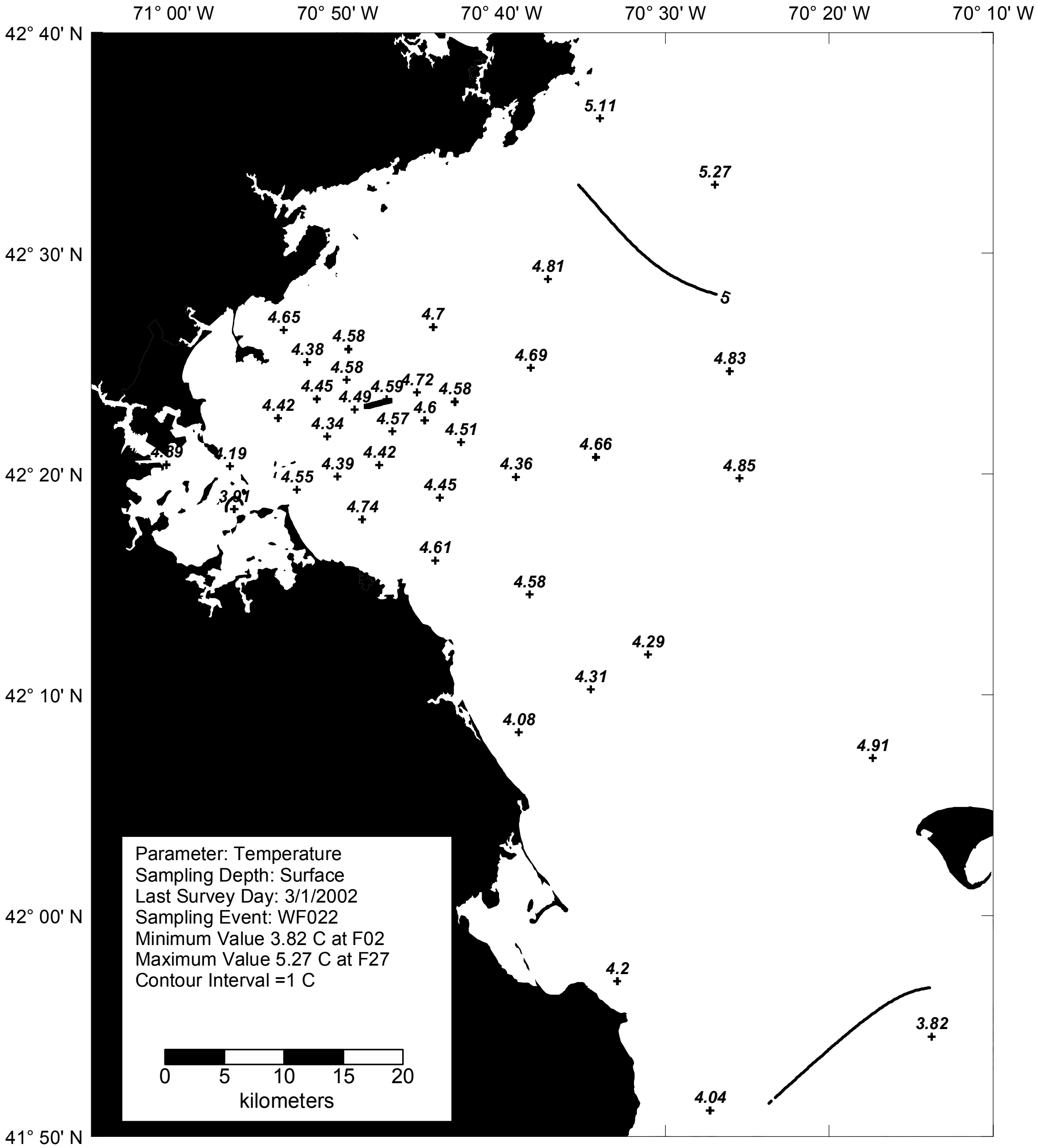


Figure A-2. Temperature Surface Contour Plot for Farfield Survey WF022 (Mar 02)

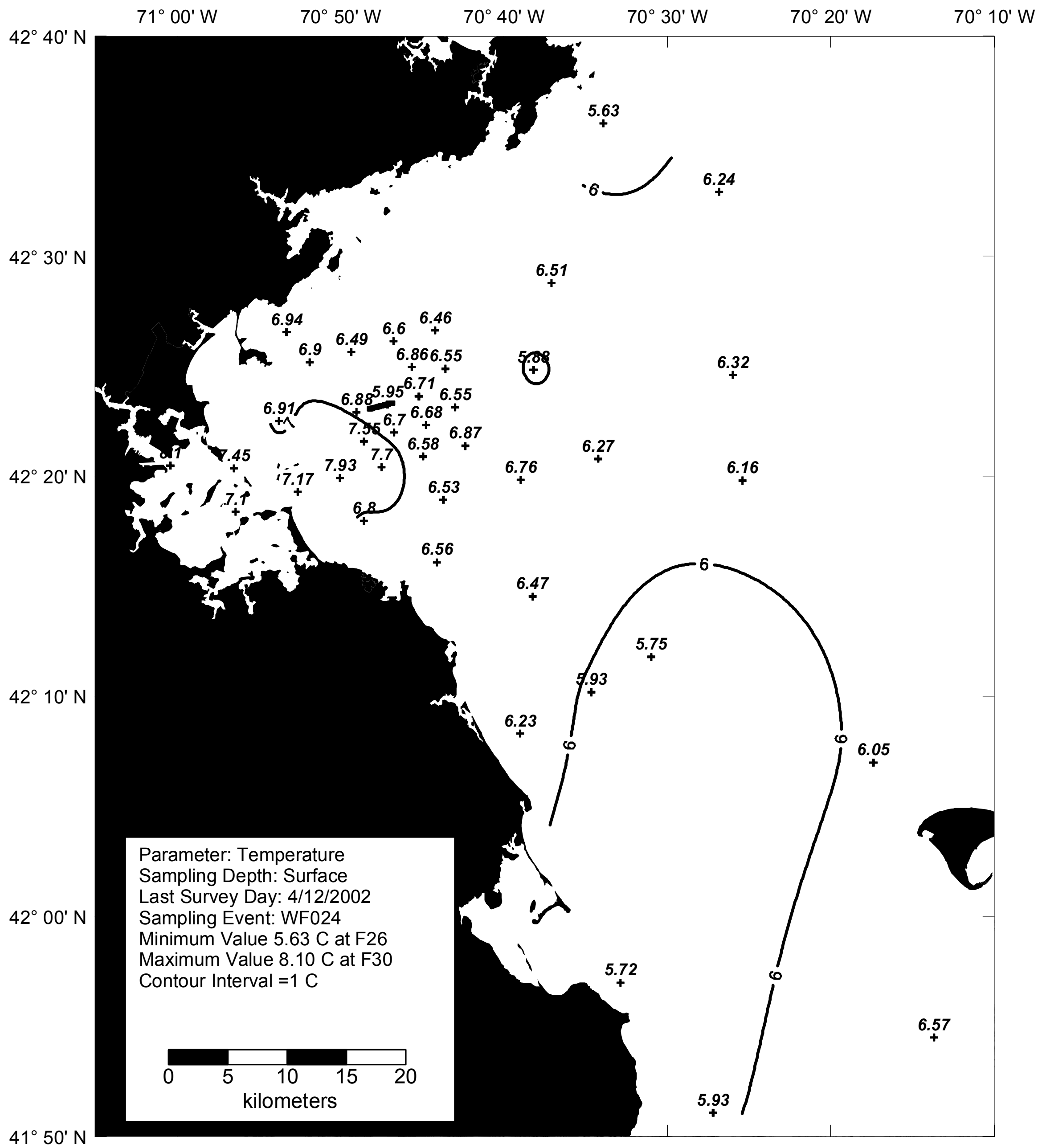


Figure A-3. Temperature Surface Contour Plot for Farfield Survey WF024 (Apr 02)

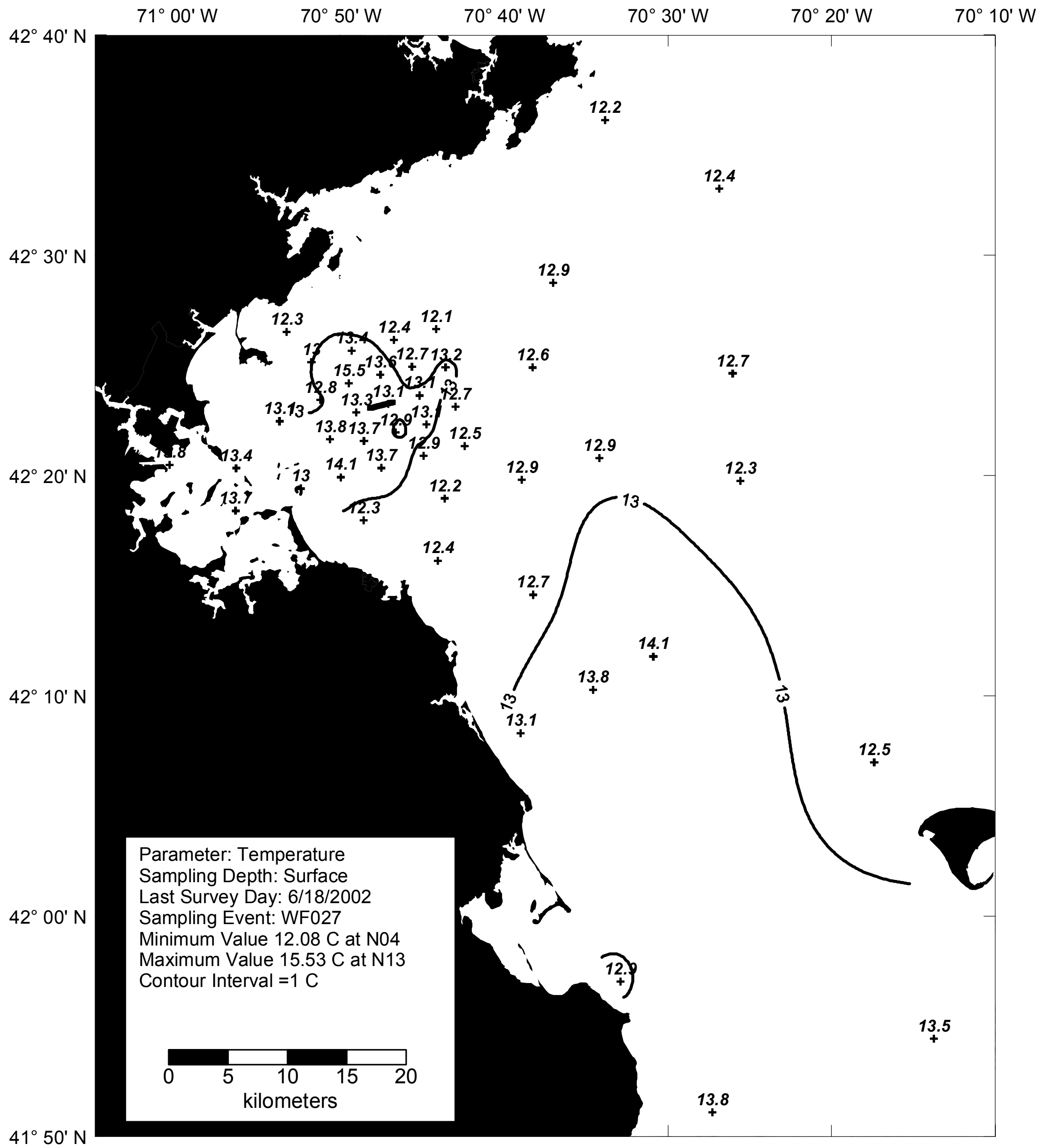


Figure A-4. Temperature Surface Contour Plot for Farfield Survey WF027 (Jun 02)

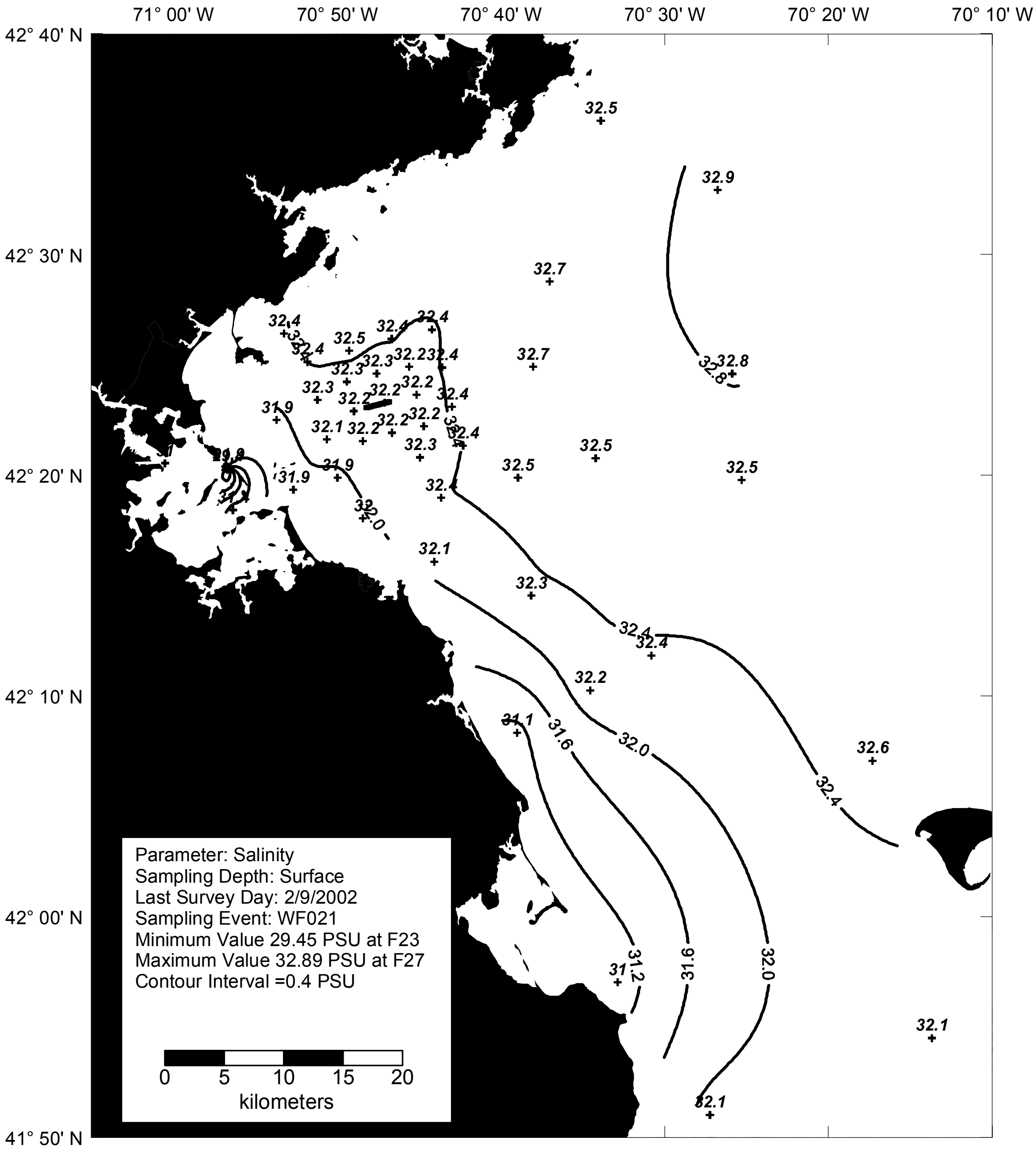


Figure A-5. Salinity Surface Contour Plot for Farfield Survey WF021 (Feb 02)

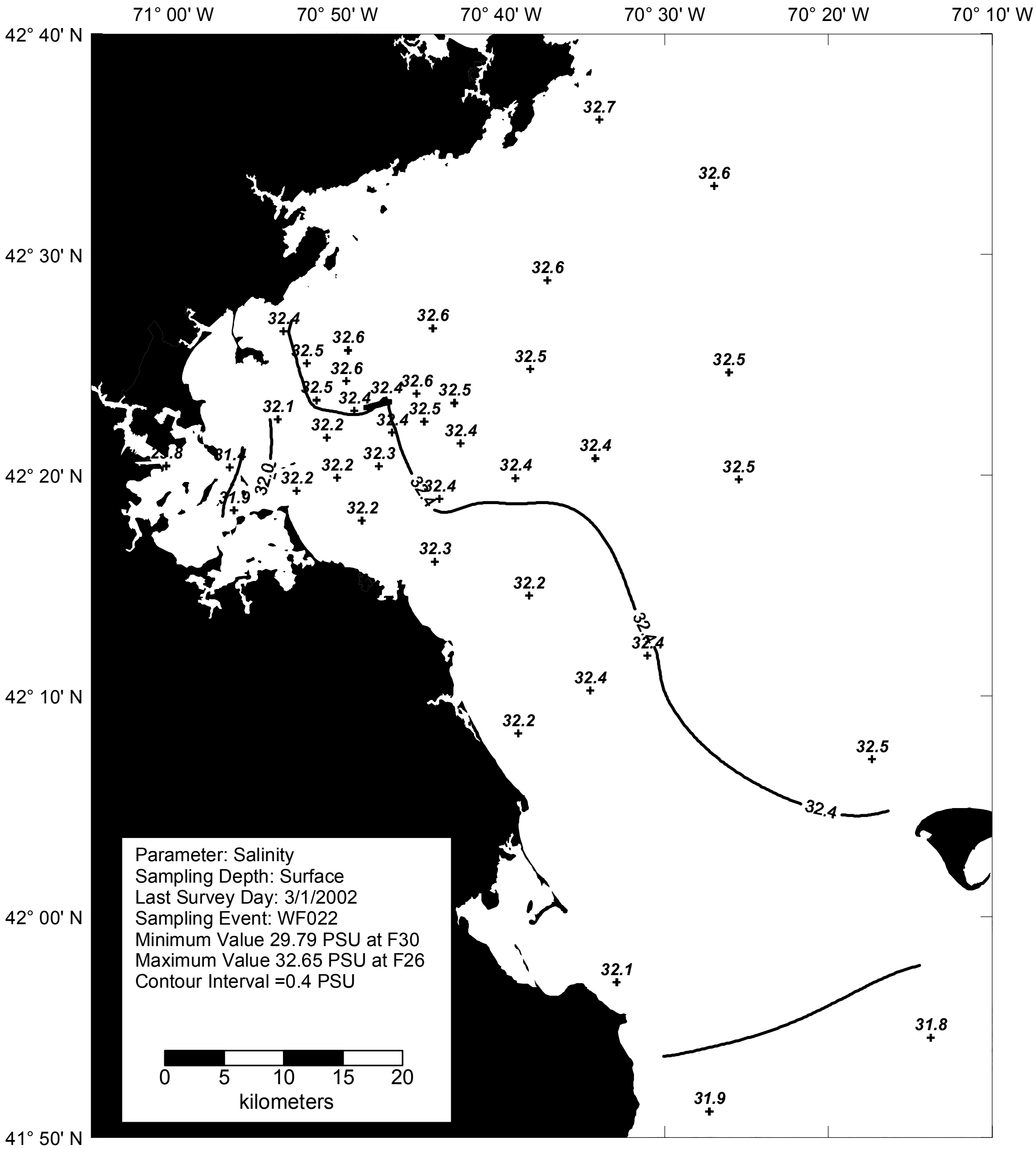


Figure A-6. Salinity Surface Contour Plot for Farfield Survey WF022 (Feb 02)

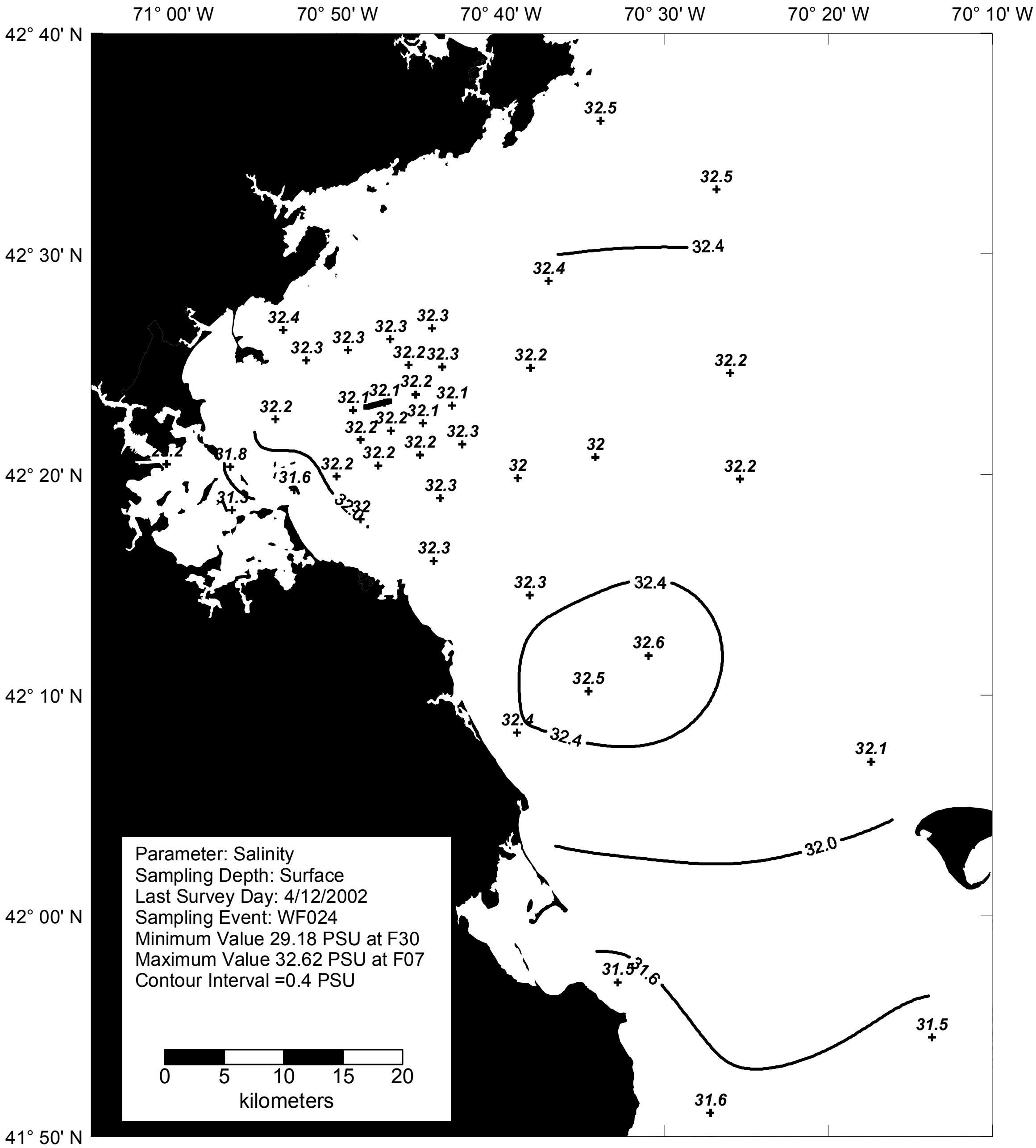


Figure A-7. Salinity Surface Contour Plot for Farfield Survey WF024 (Apr 02)

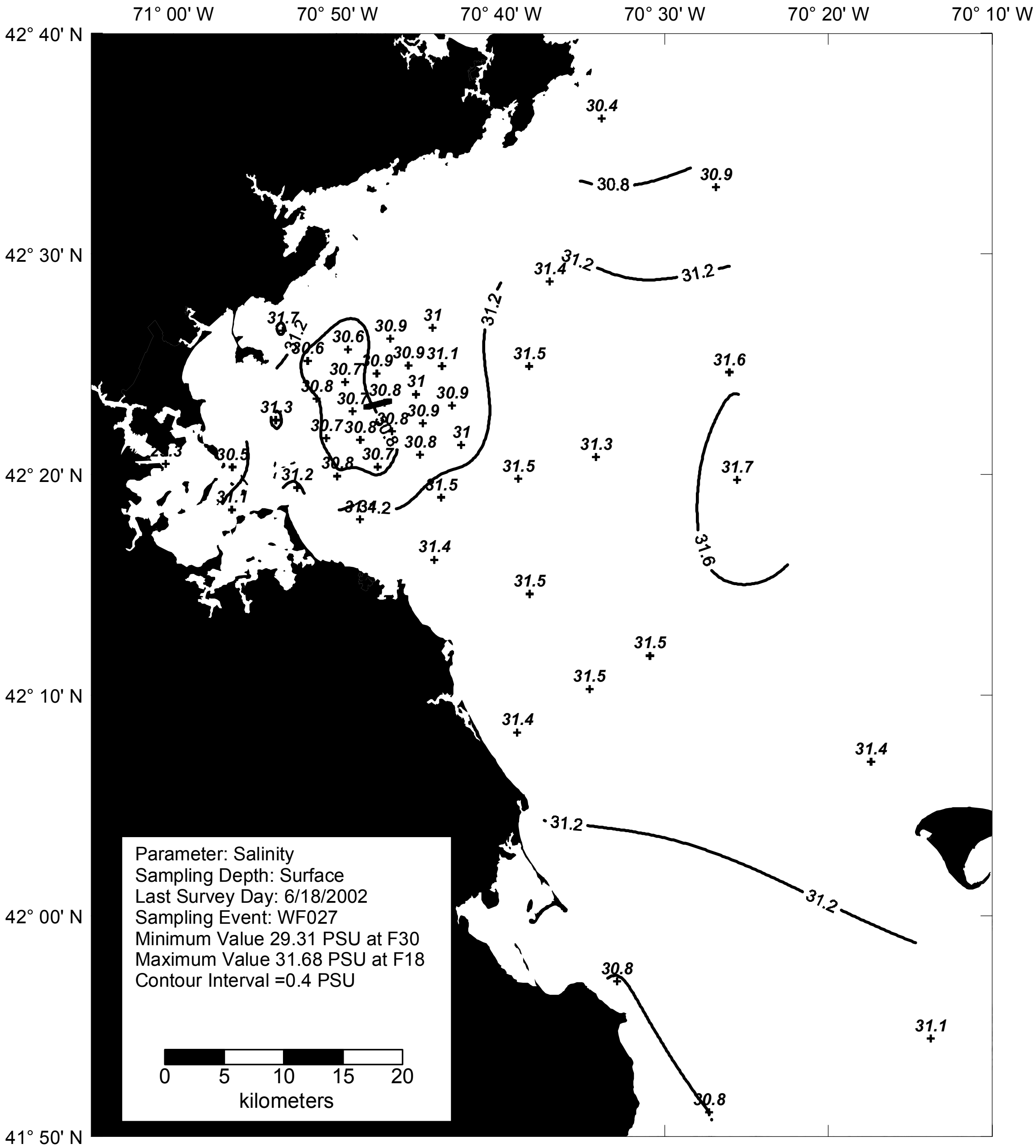


Figure A-8. Salinity Surface Contour Plot for Farfield Survey WF027 (Jun 02)

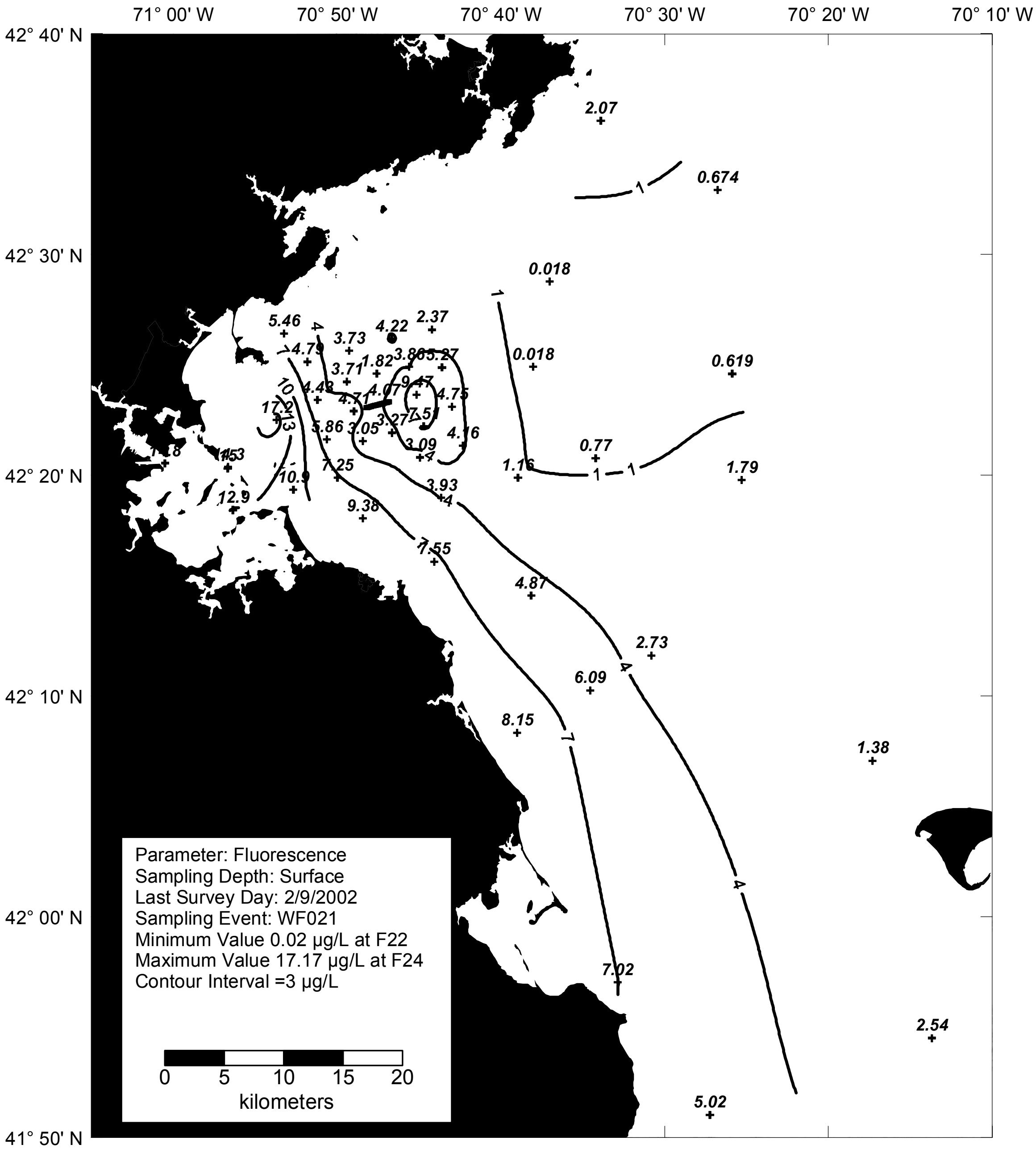


Figure A-9. Fluorescence Surface Contour Plot for Farfield Survey WF021 (Feb 02)

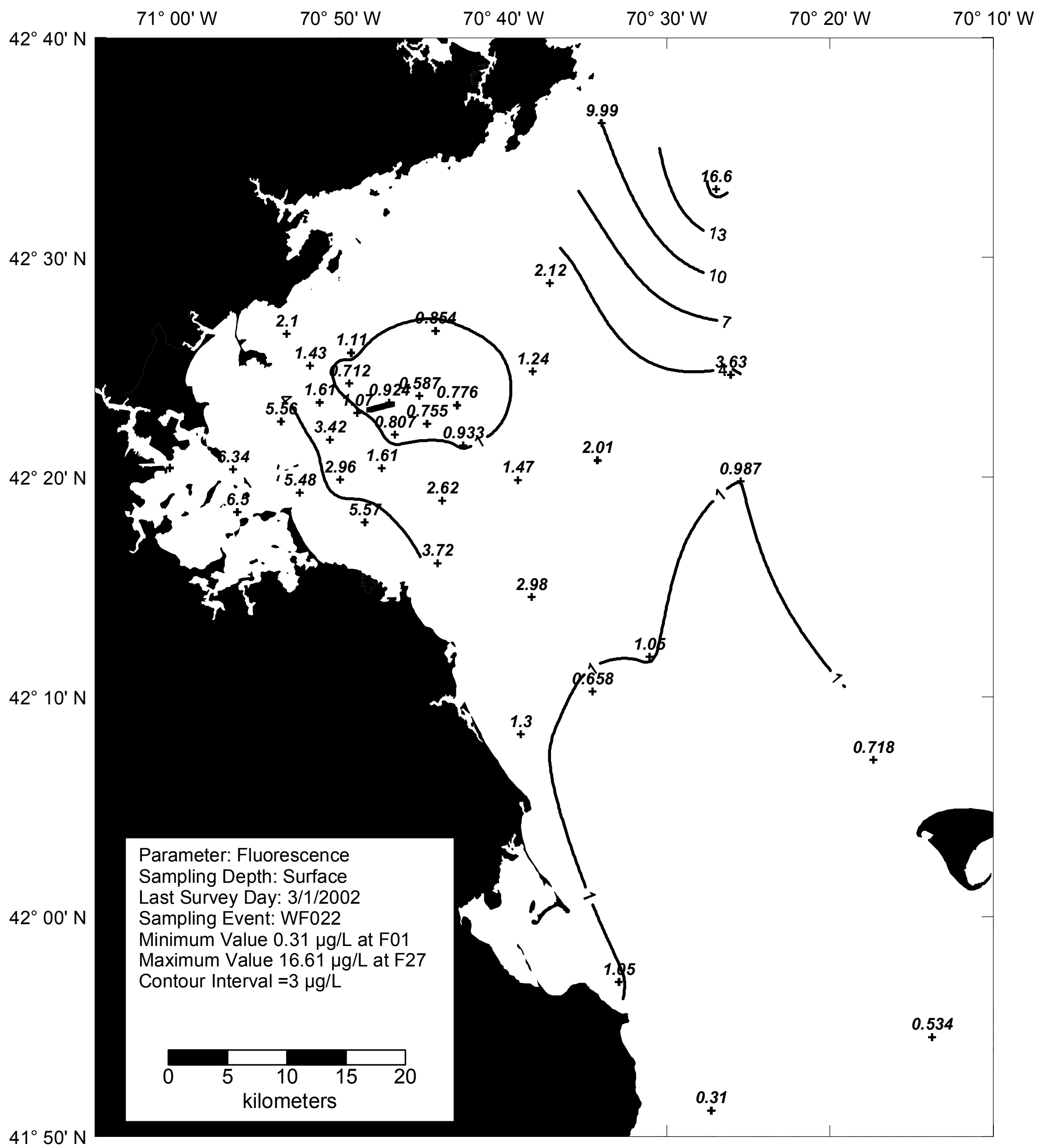


Figure A-10. Fluorescence Surface Contour Plot for Farfield Survey WF022 (Mar 02)

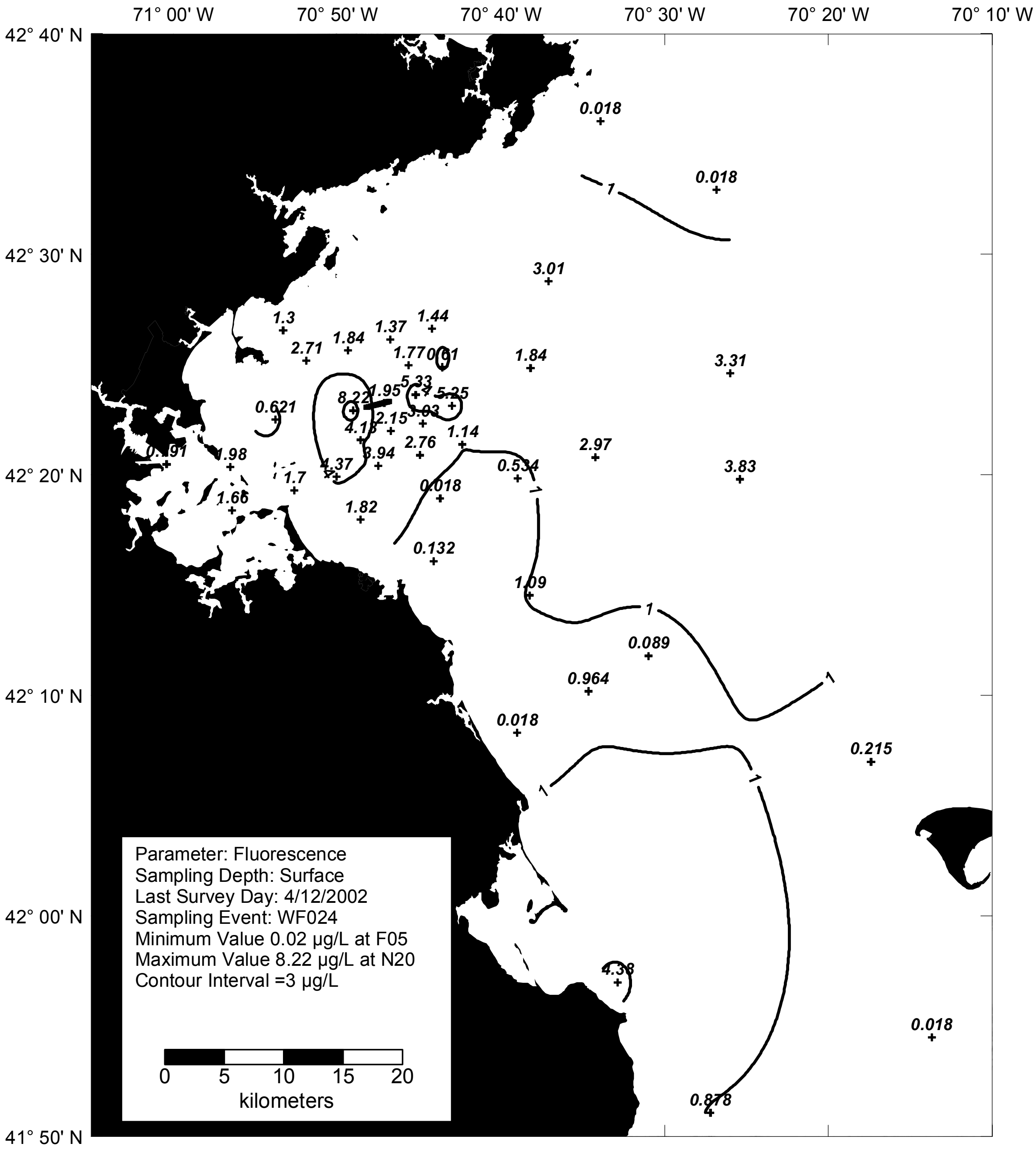


Figure A-11. Fluorescence Surface Contour Plot for Farfield Survey WF024 (Apr 02)

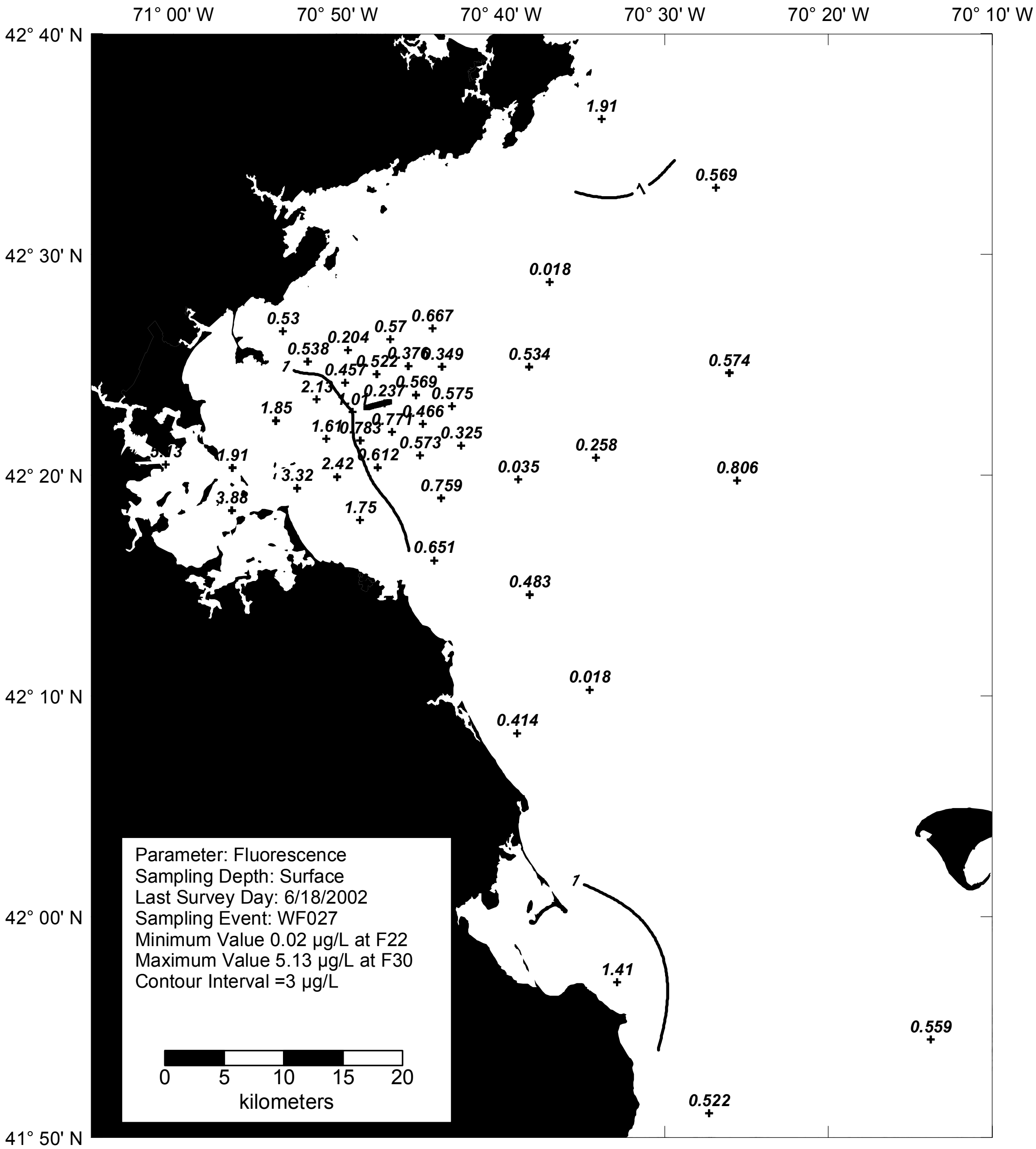


Figure A-12. Fluorescence Surface Contour Plot for Farfield Survey WF027 (Jun 02)

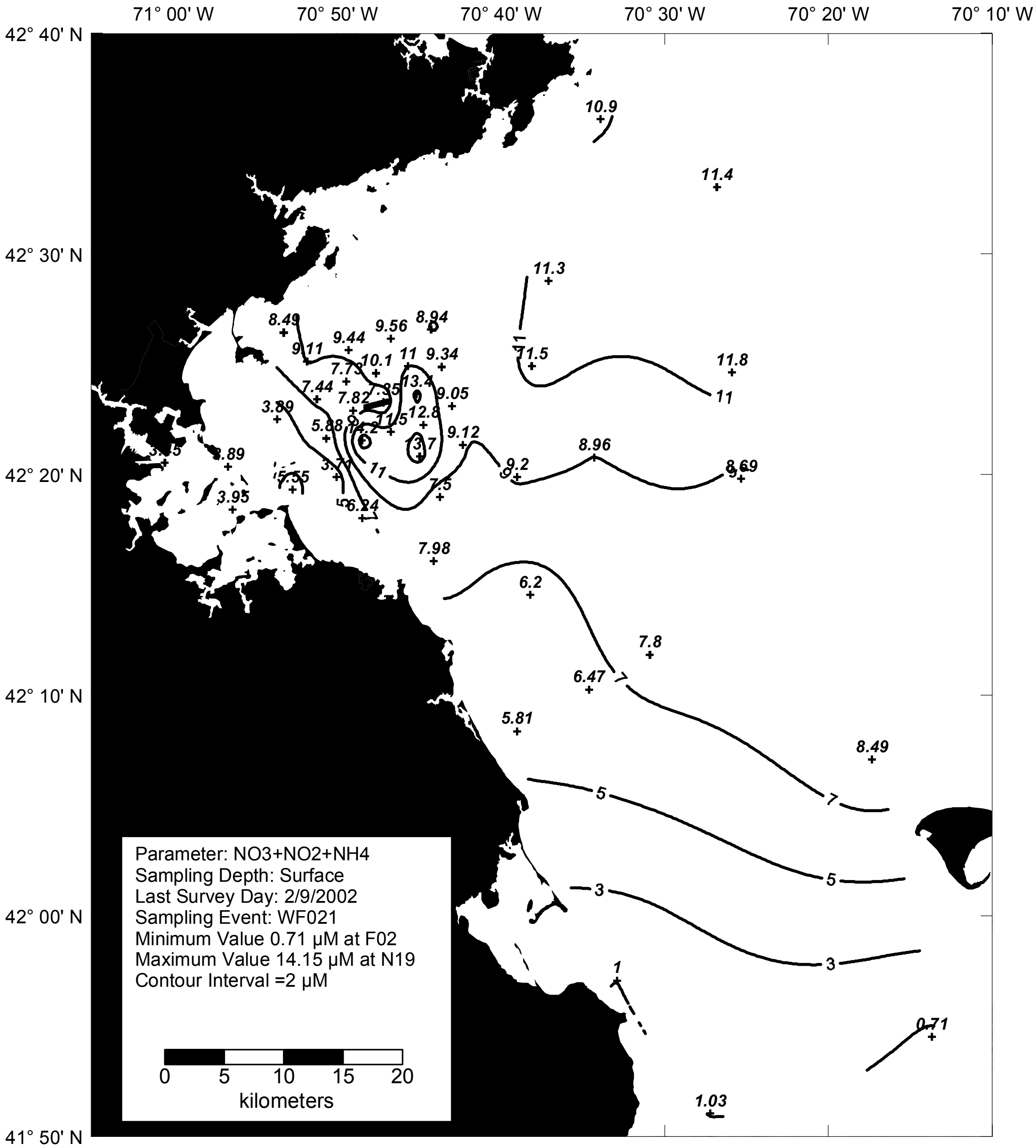


Figure A-13. DIN Surface Contour Plot for Farfield Survey WF021 (Feb 02)

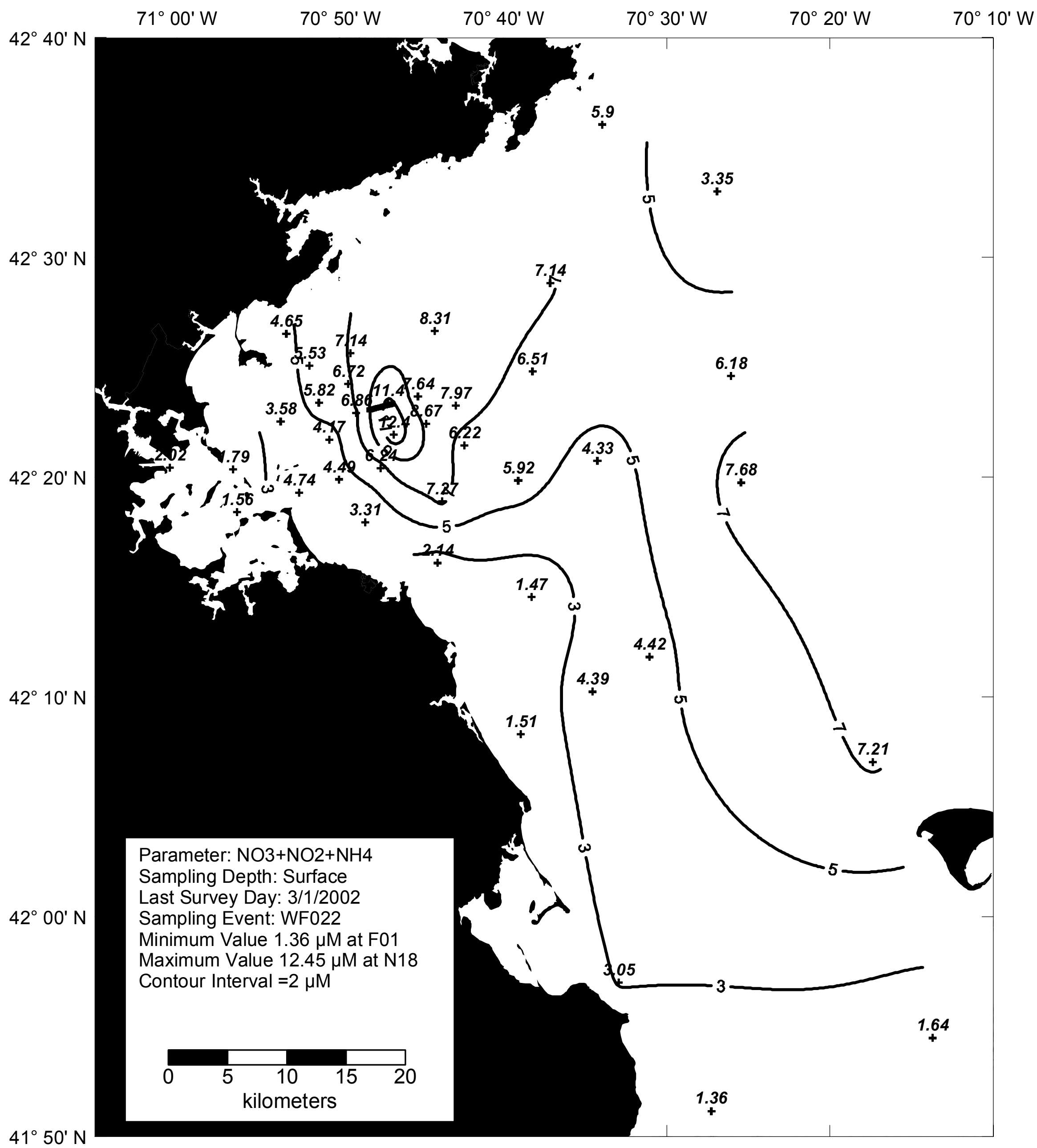


Figure A-14. DIN Surface Contour Plot for Farfield Survey WF022 (Mar 02)

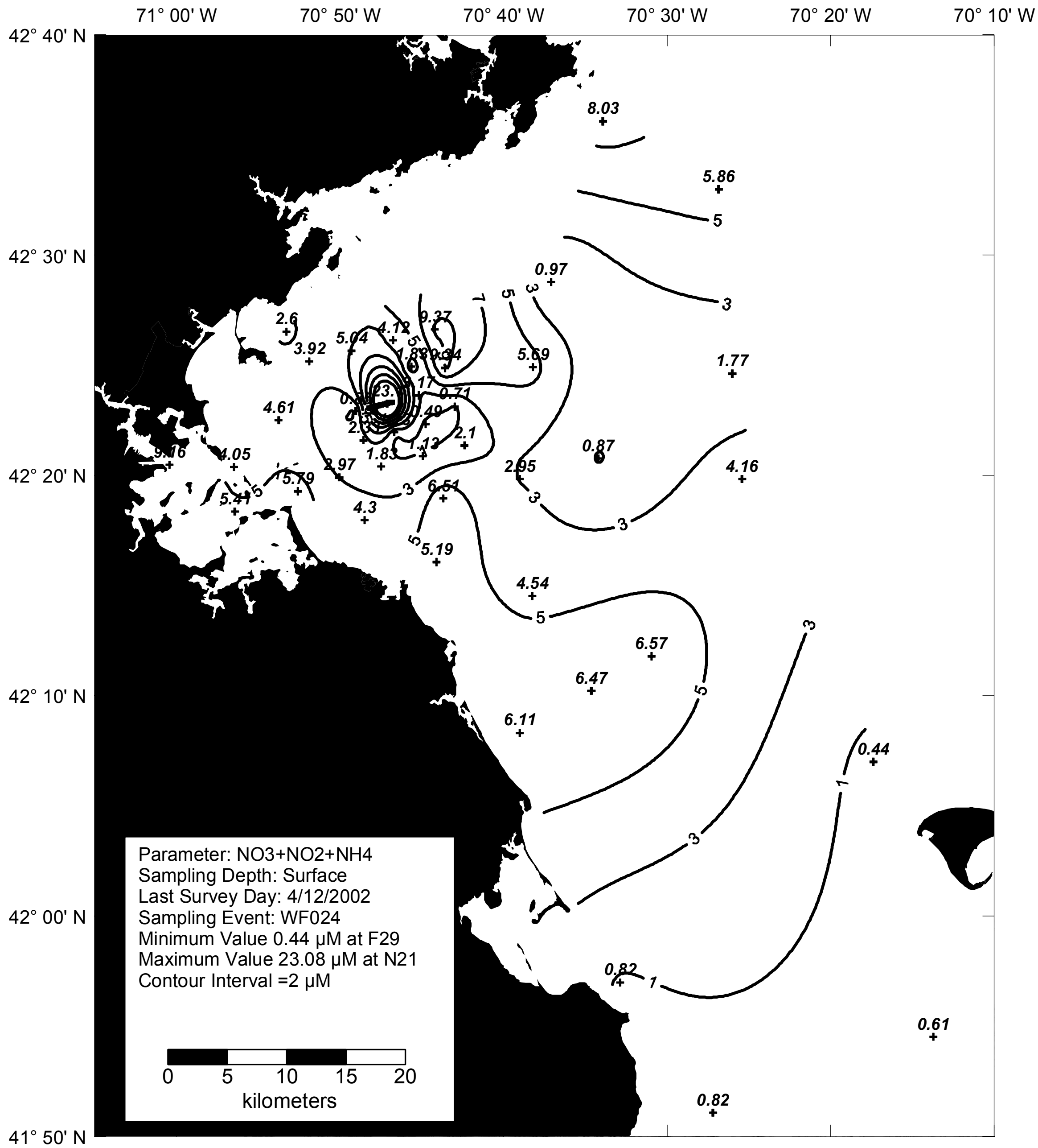


Figure A-15. DIN Surface Contour Plot for Farfield Survey WF024 (Apr 02)

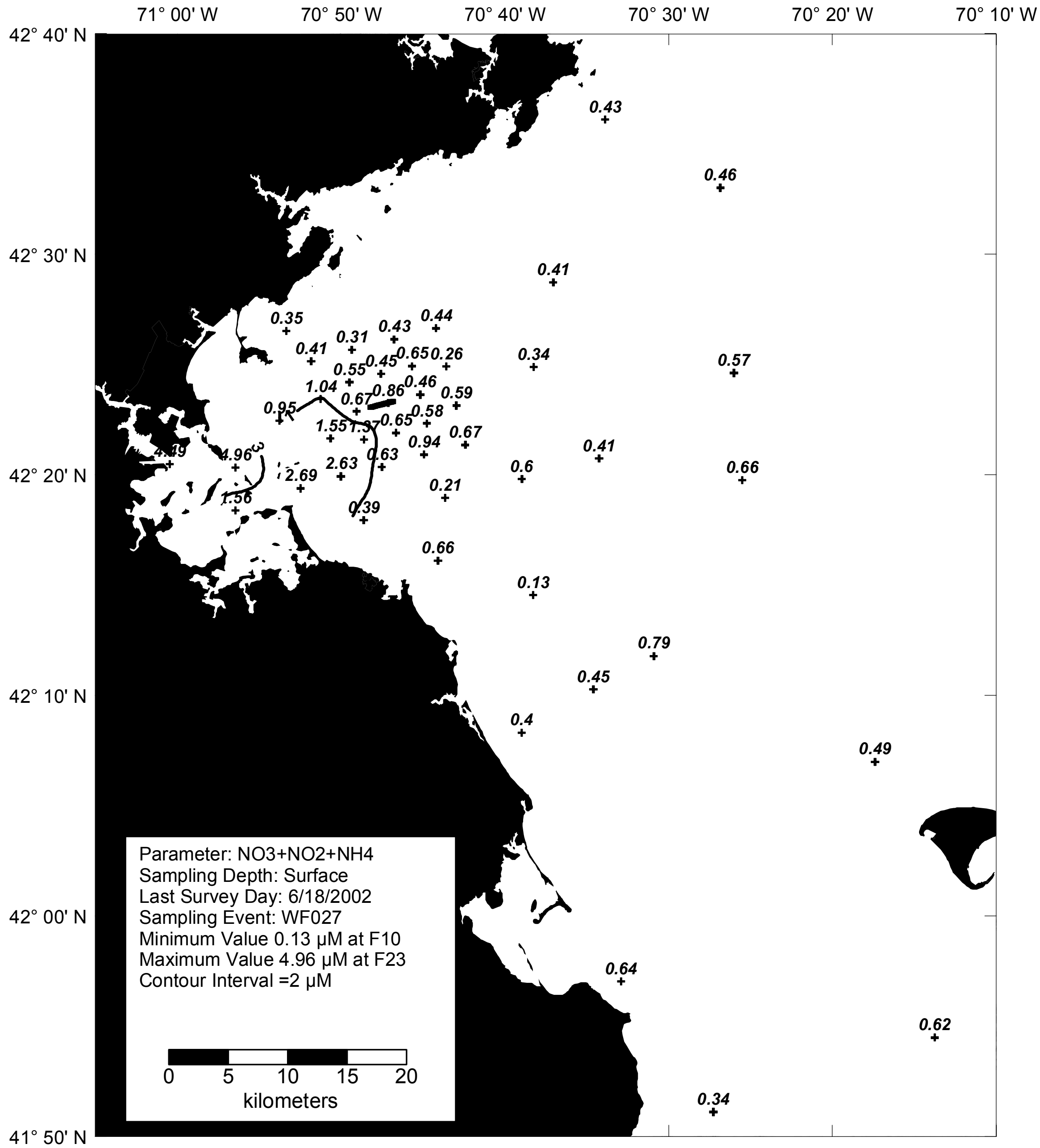


Figure A-16. DIN Surface Contour Plot for Farfield Survey WF027 (Jun 02)

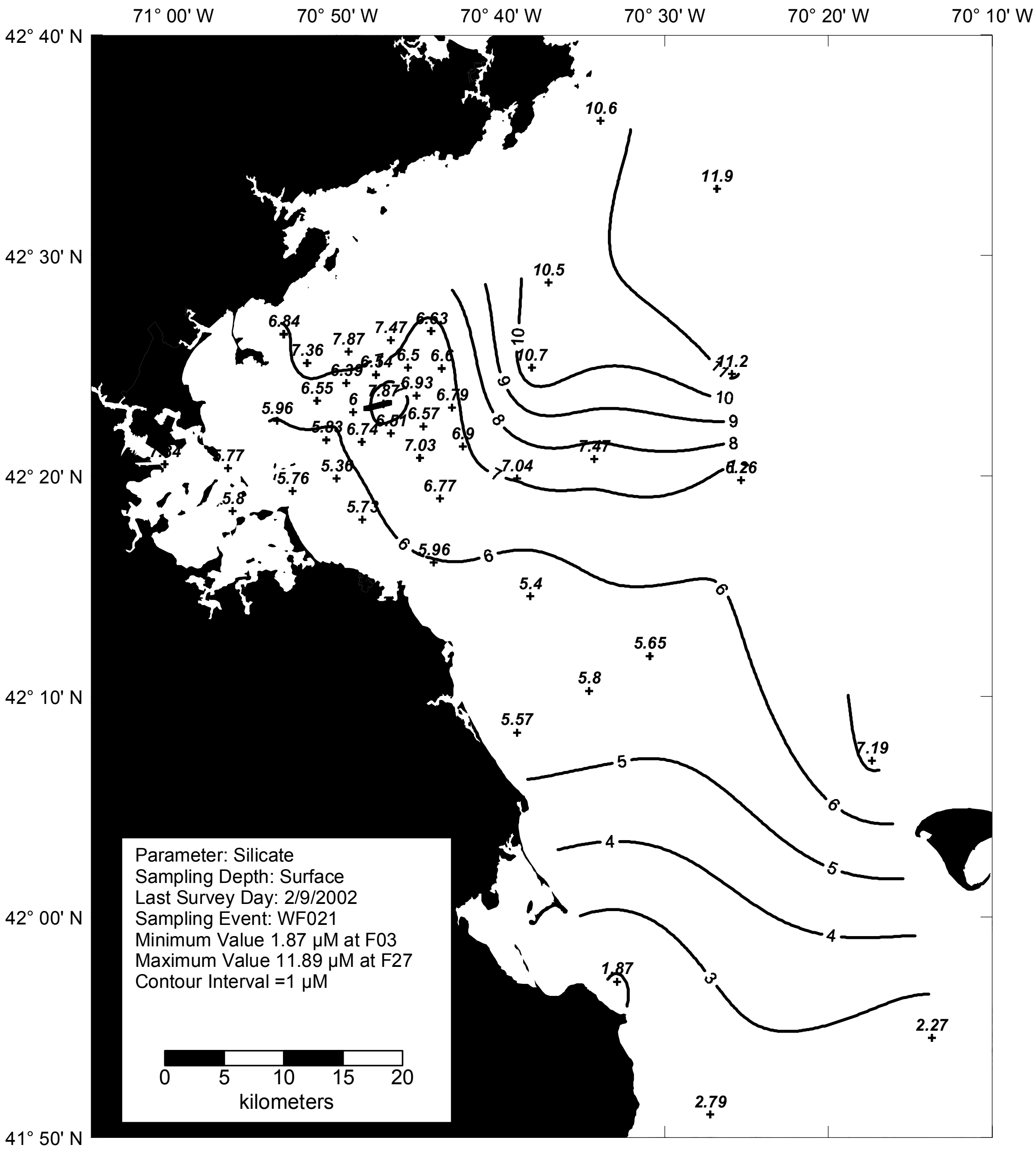


Figure A-17. Silicate Surface Contour Plot for Farfield Survey WF021 (Feb 02)

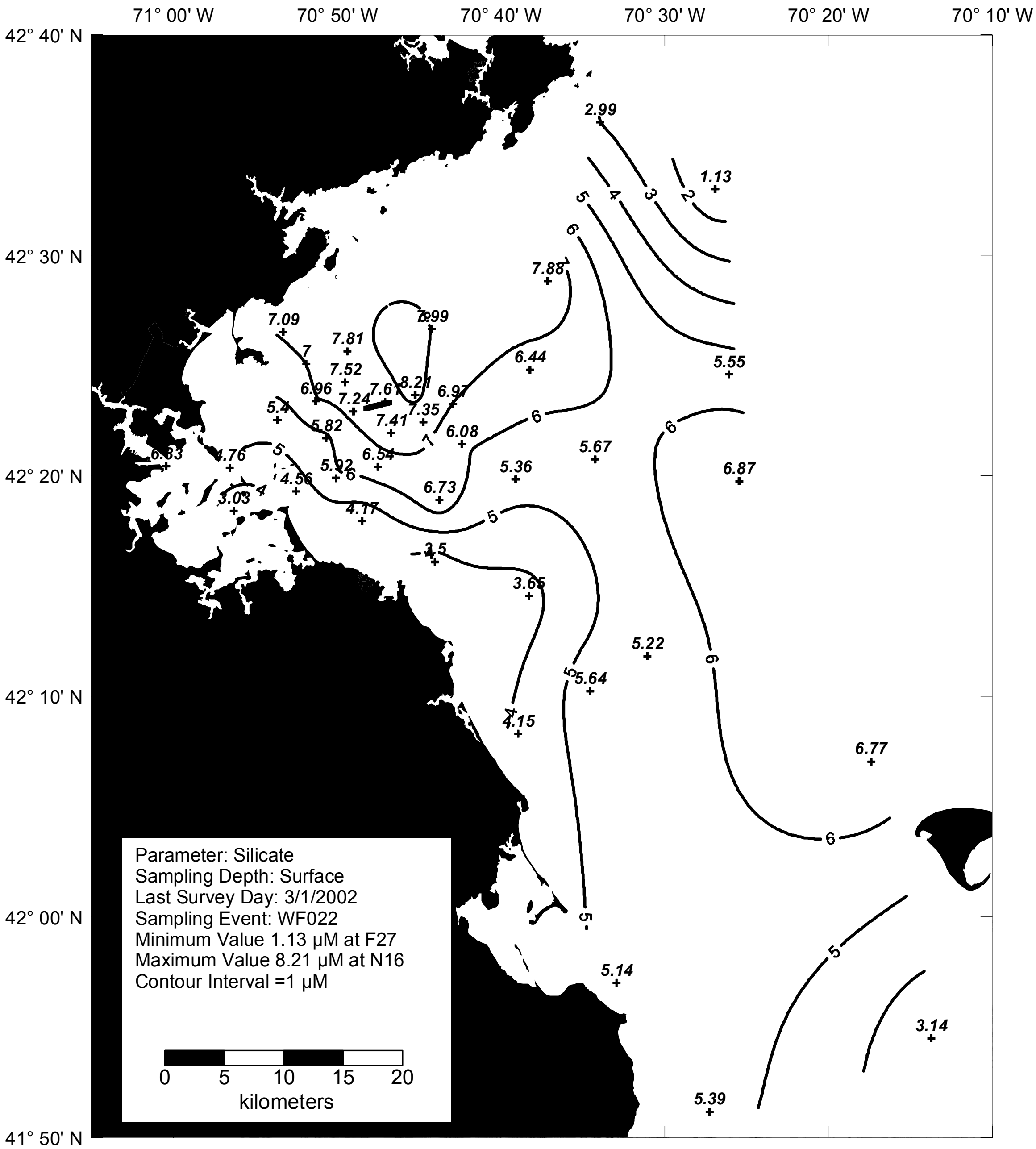


Figure A-18. Silicate Surface Contour Plot for Farfield Survey WF022 (Mar 02)

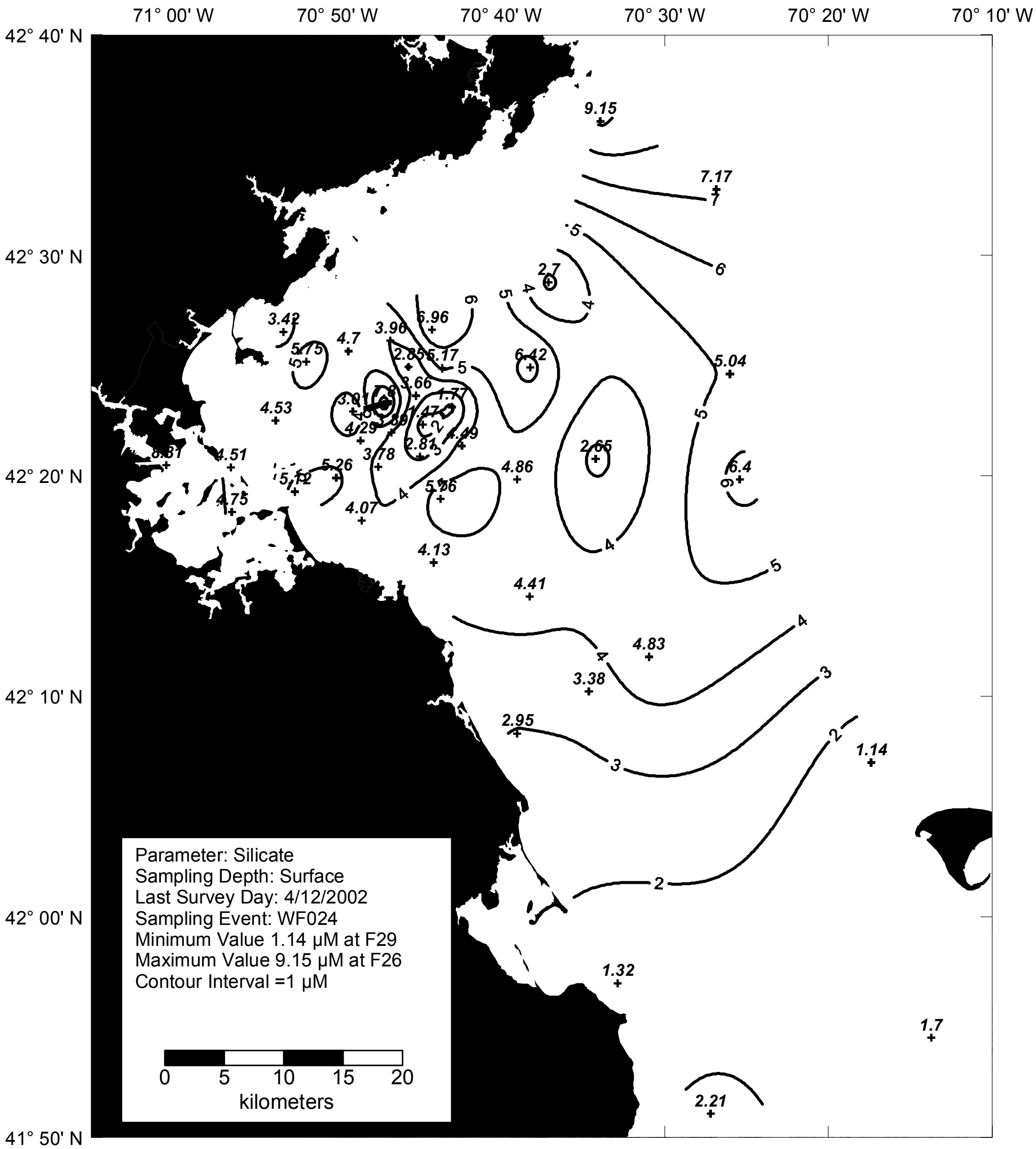


Figure A-19. Silicate Surface Contour Plot for Farfield Survey WF024 (Apr 02)

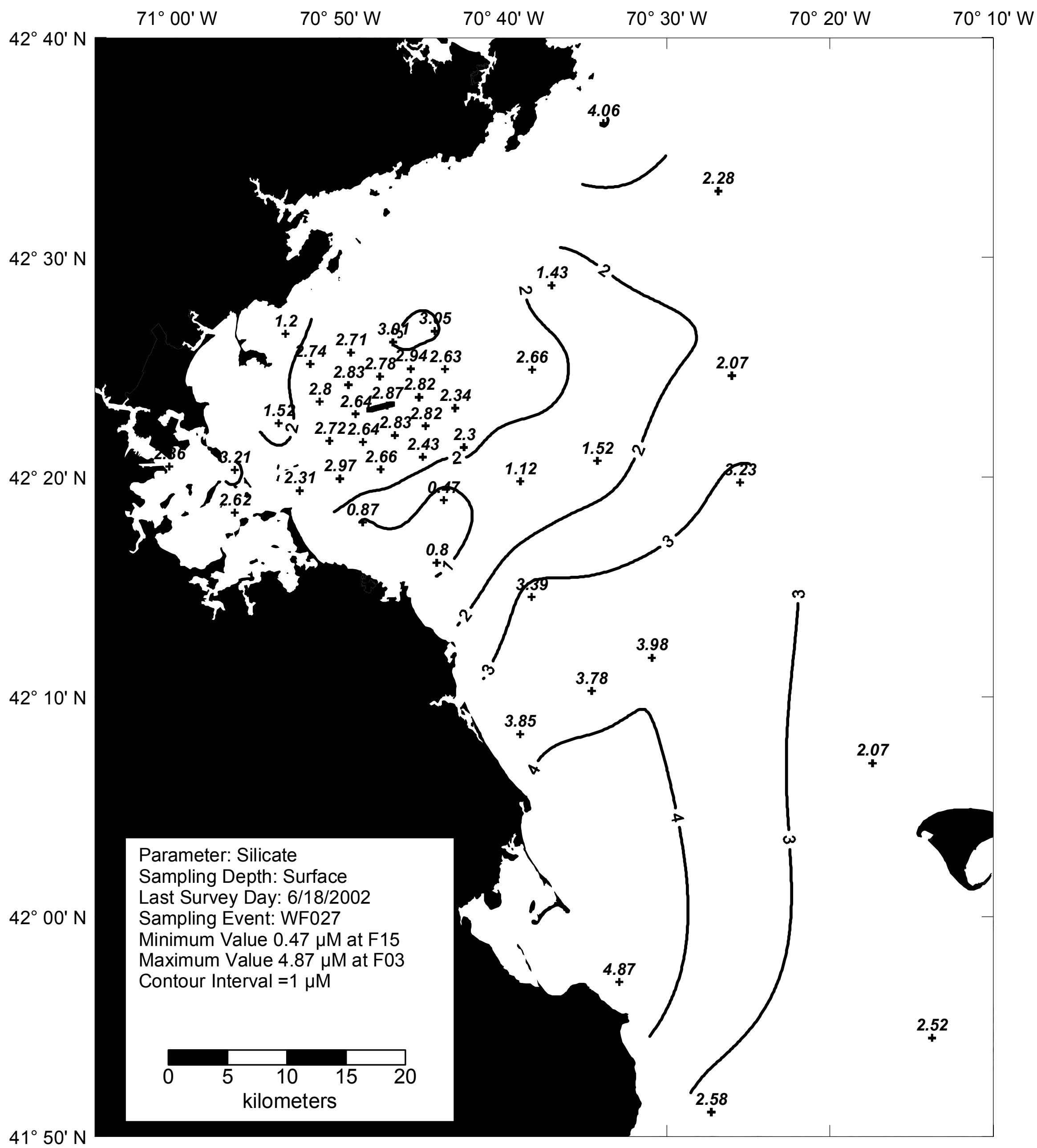


Figure A-20. Silicate Surface Contour Plot for Farfield Survey WF027 (Jun 02)

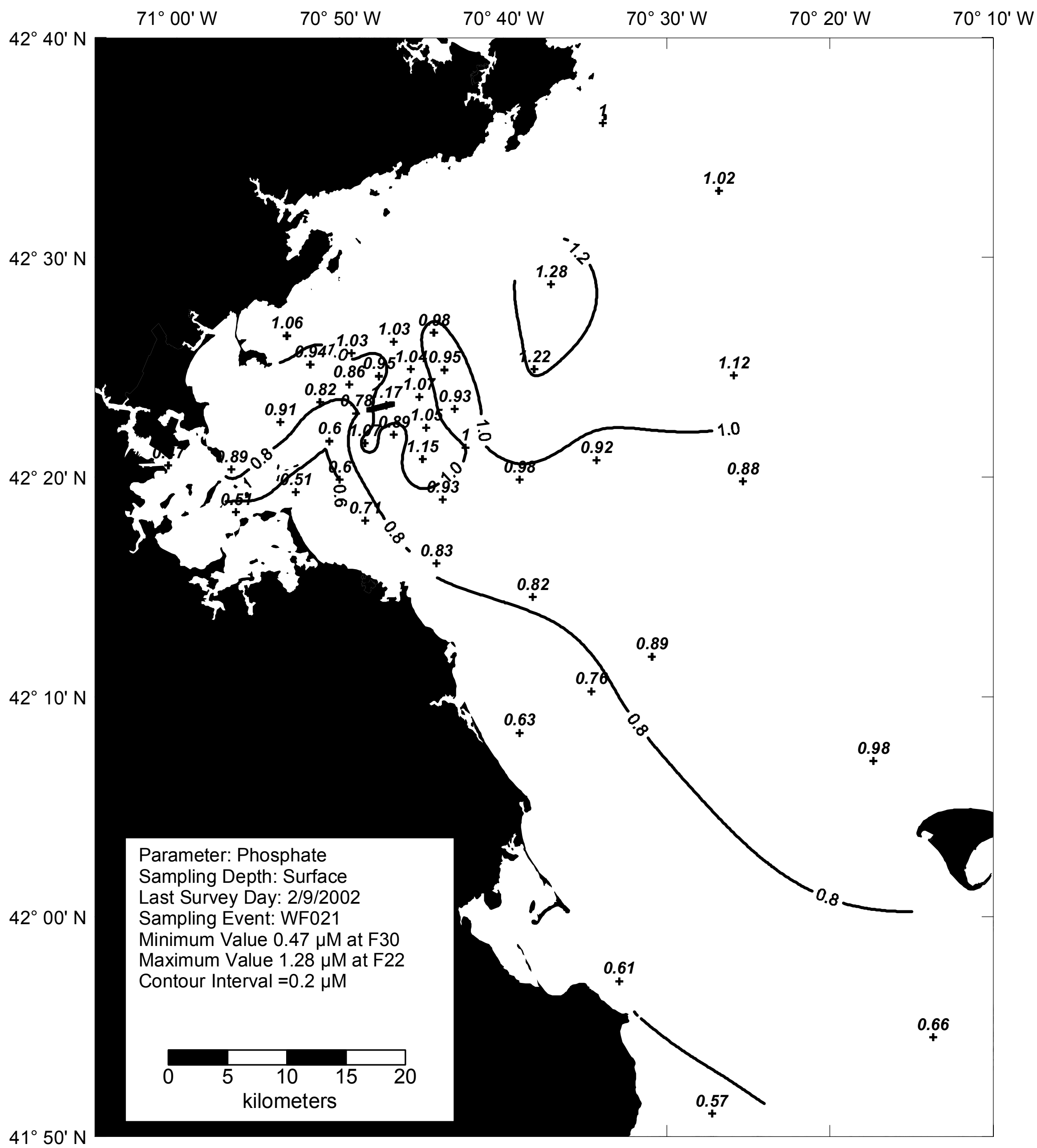


Figure A-21. Phosphate Surface Contour Plot for Farfield Survey WF021 (Feb 02)

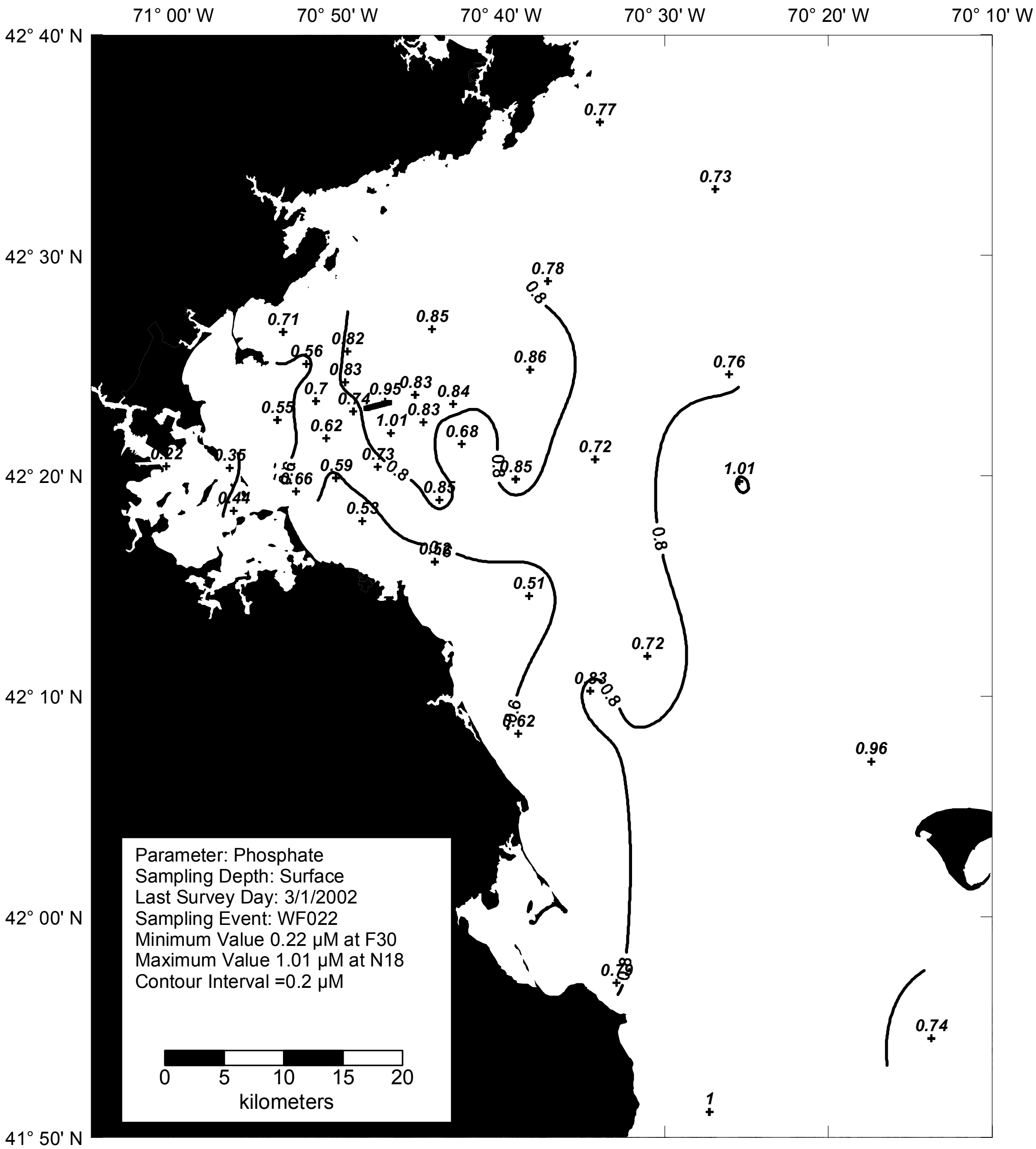


Figure A-22. Phosphate Surface Contour Plot for Farfield Survey WF022 (Mar 02)

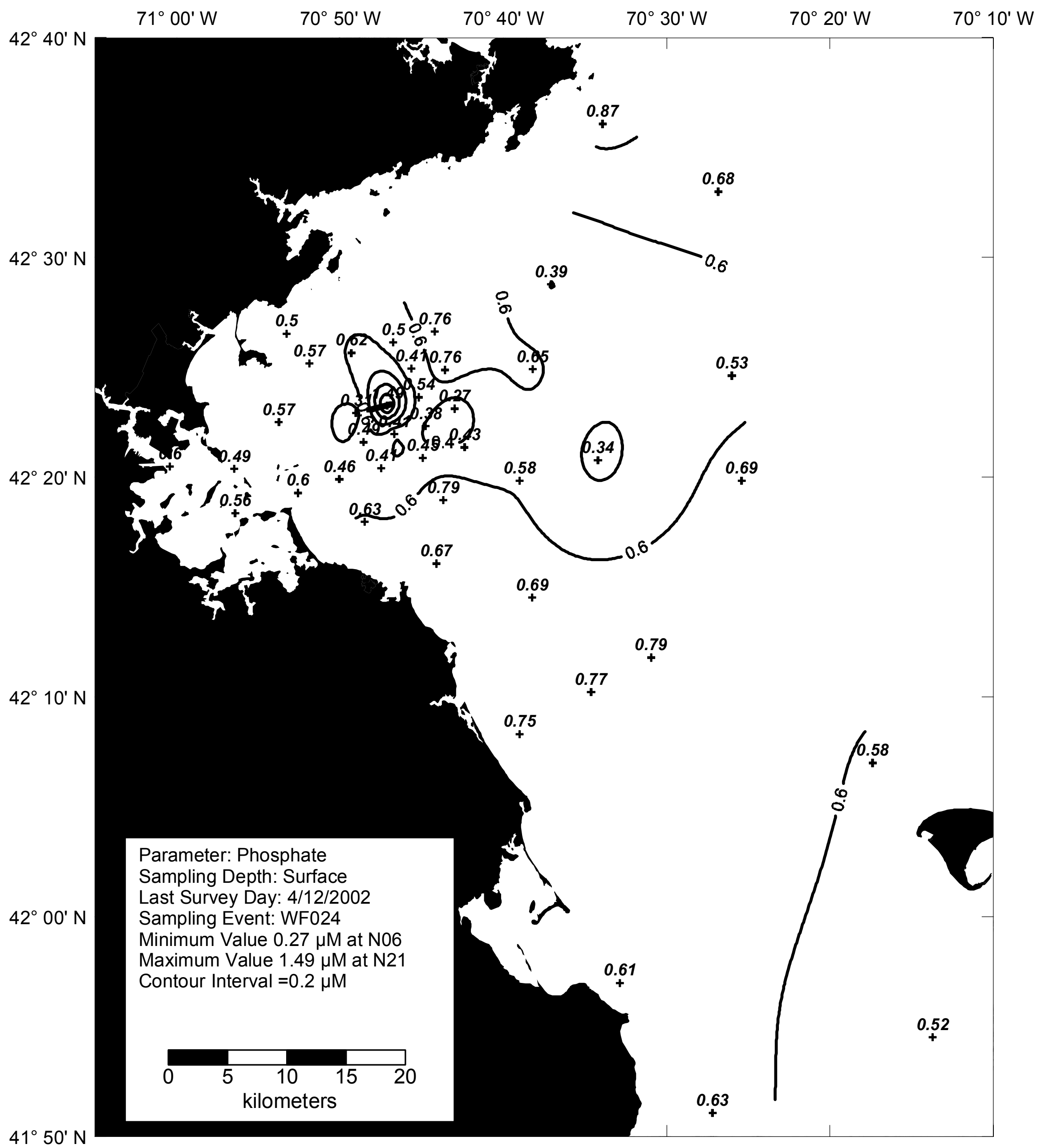


Figure A-23. Phosphate Surface Contour Plot for Farfield Survey WF024 (Apr 02)

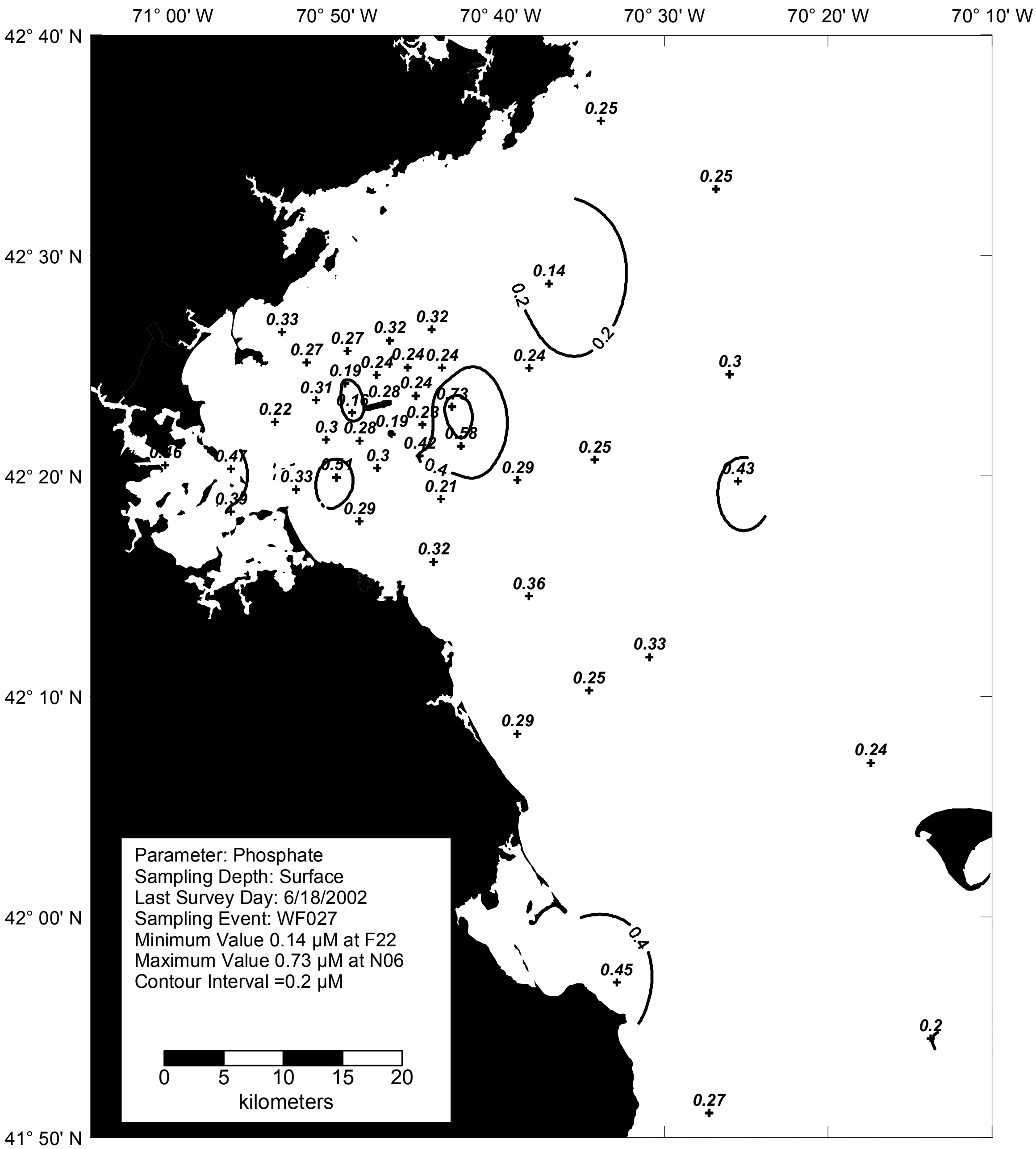


Figure A-24. Phosphate Surface Contour Plot for Farfield Survey WF027 (Jun 02)

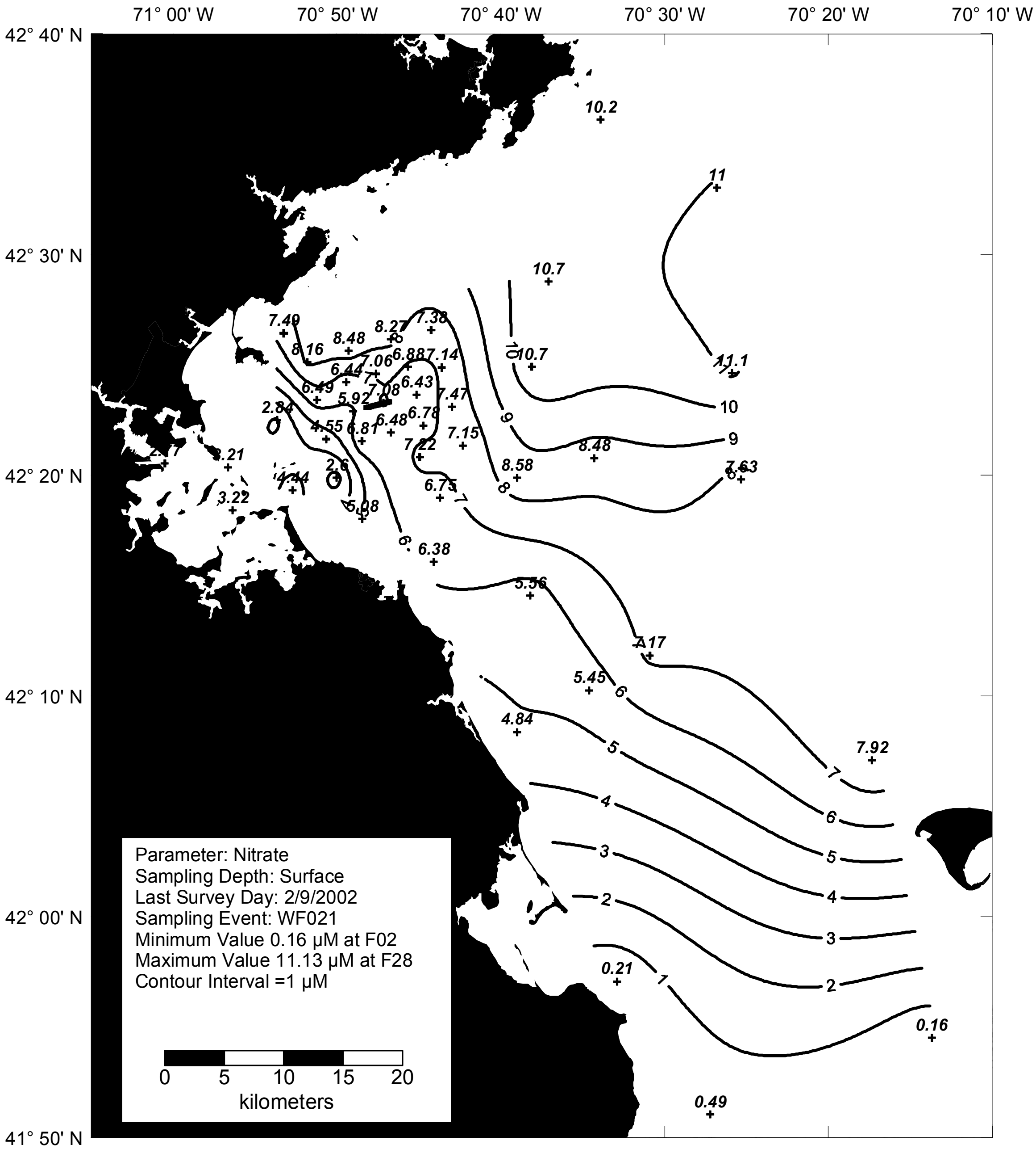


Figure A-25. Nitrate Surface Contour Plot for Farfield Survey WF021 (Feb 02)

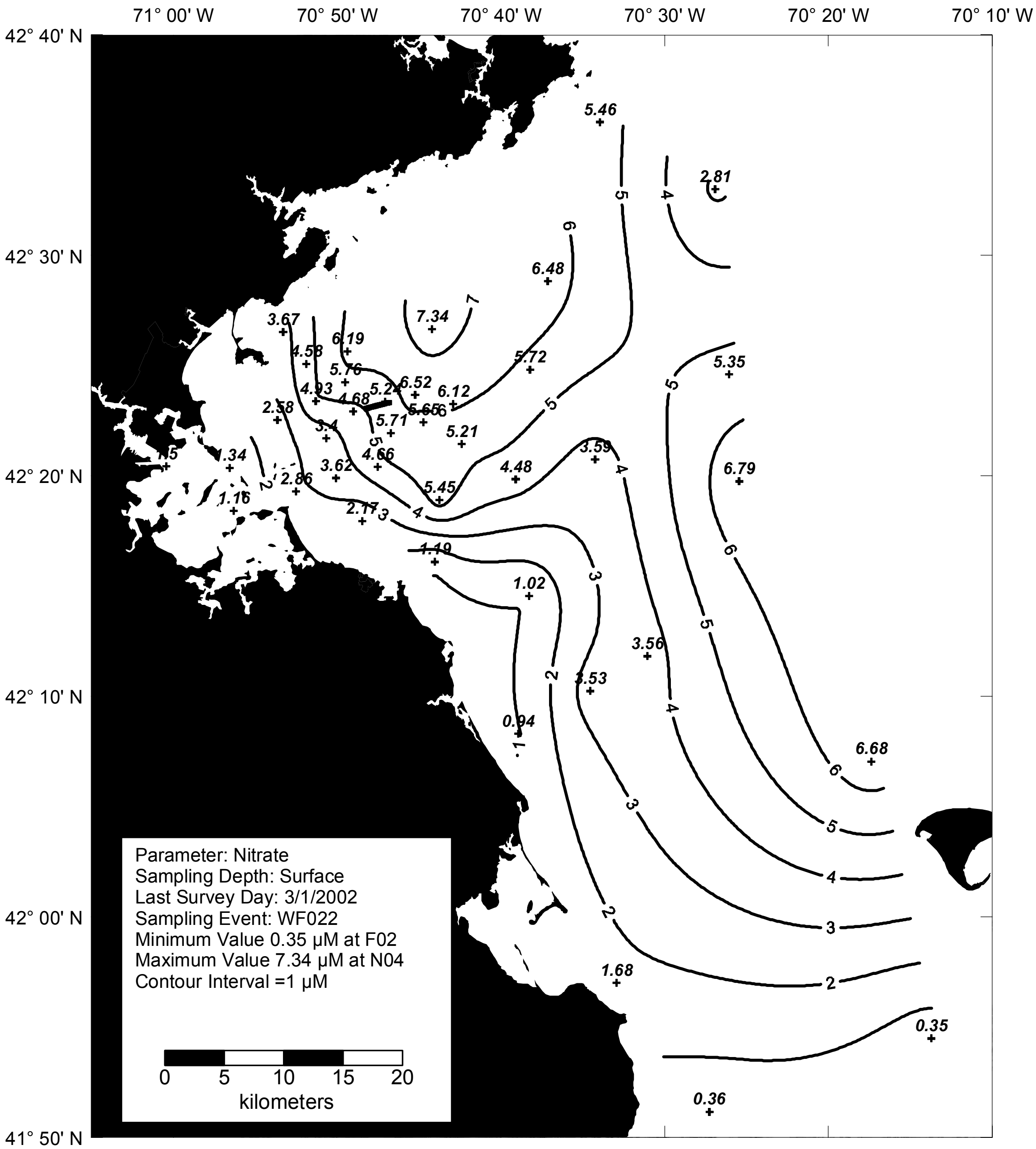


Figure A-26. Nitrate Surface Contour Plot for Farfield Survey WF022 (Mar 02)

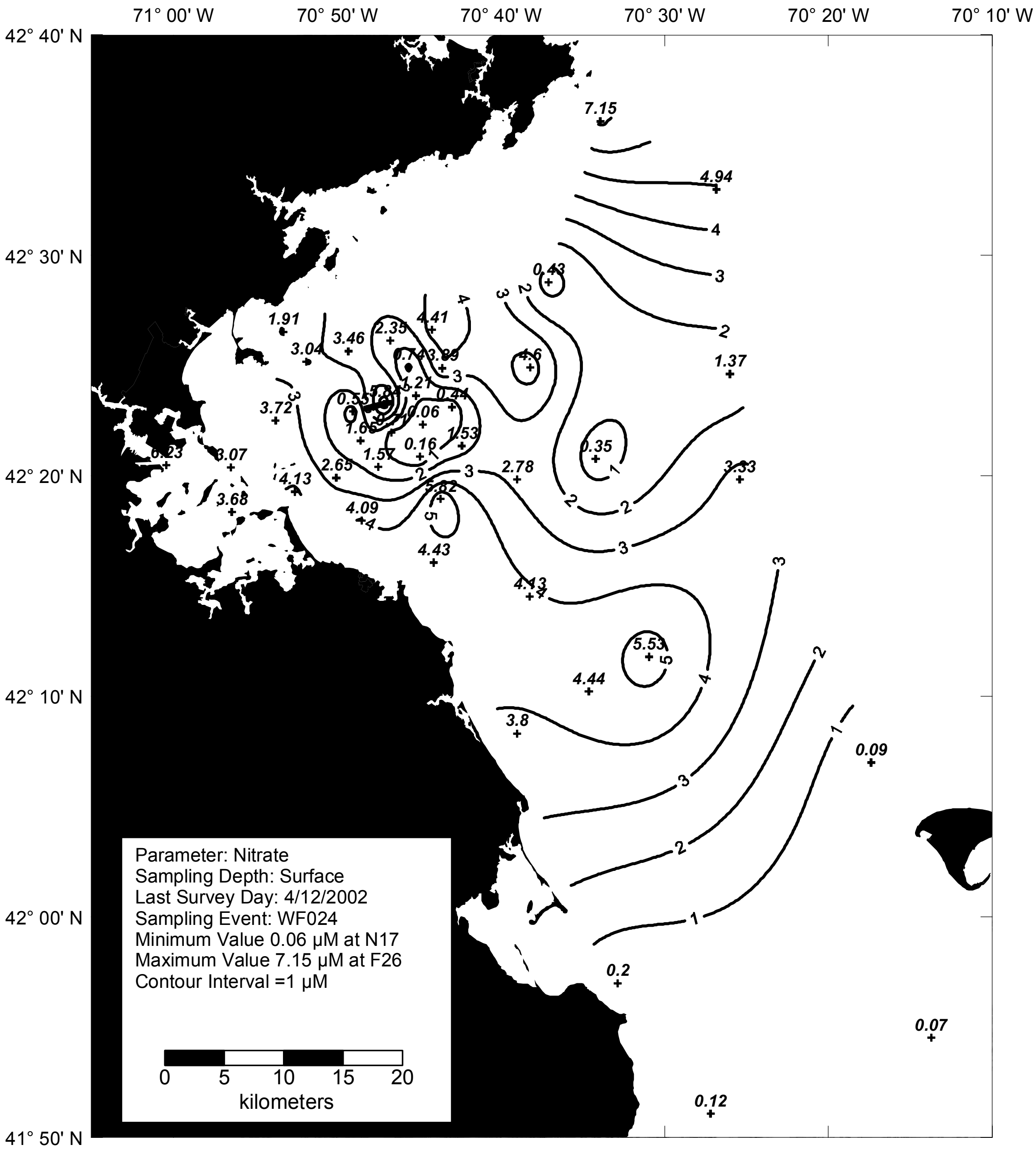


Figure A-27. Nitrate Surface Contour Plot for Farfield Survey WF024 (Apr 02)

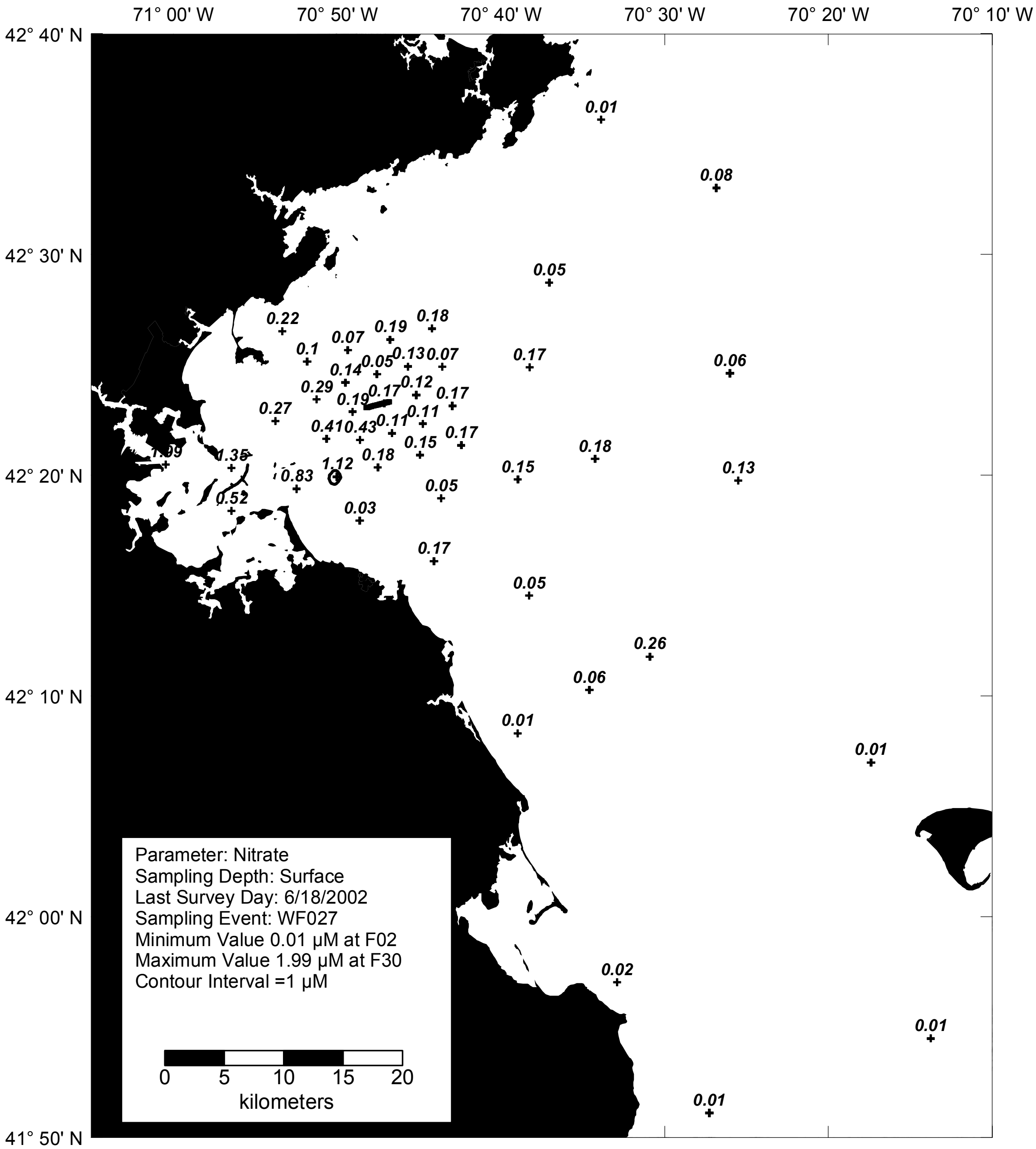


Figure A-28. Nitrate Surface Contour Plot for Farfield Survey WF027 (Jun 02)

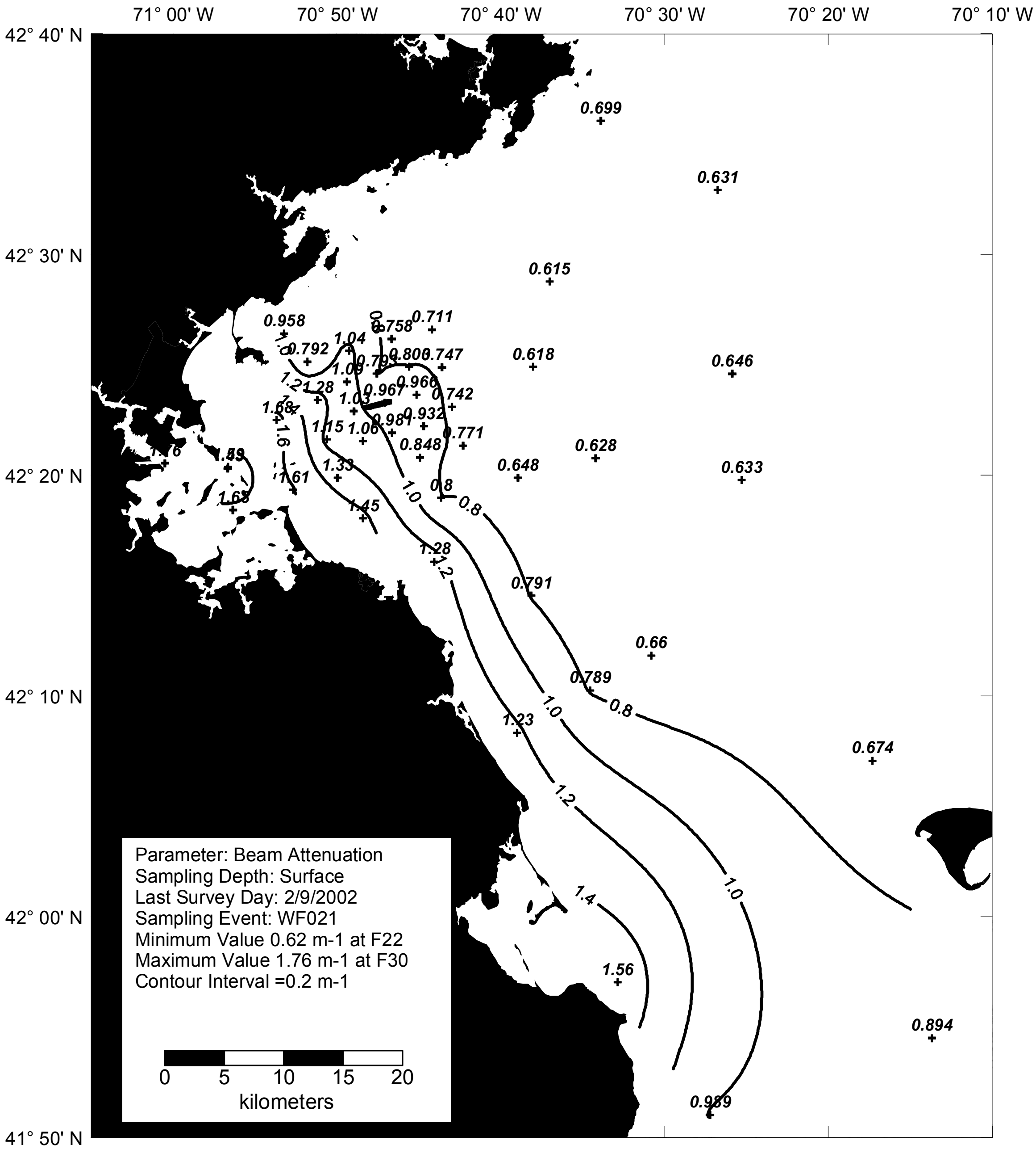


Figure A-29. Beam Attenuation Surface Contour Plot for Farfield Survey WF021 (Feb 02)

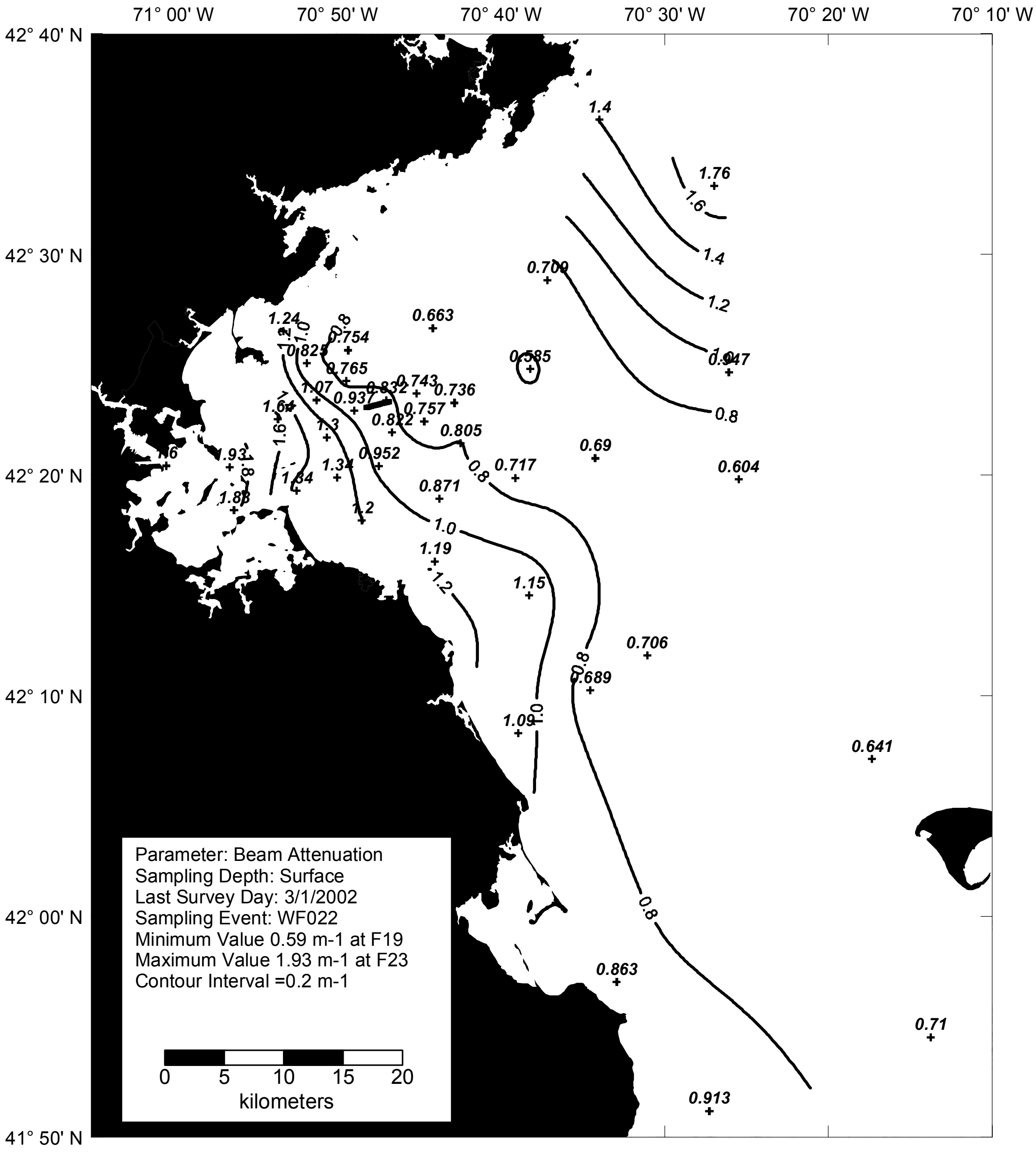


Figure A-30. Beam Attenuation Surface Contour Plot for Farfield Survey WF022 (Mar 02)

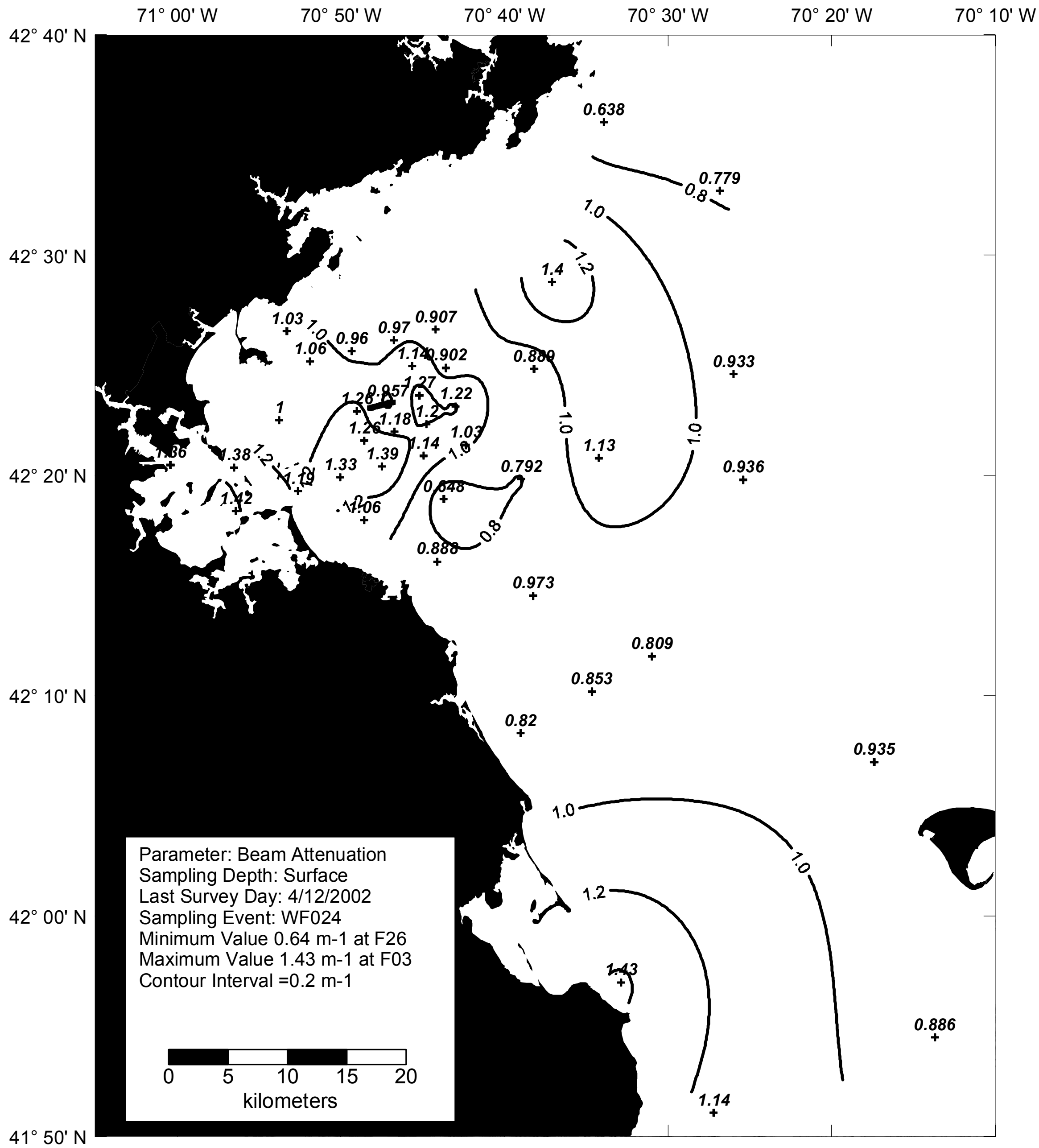


Figure A-31. Beam Attenuation Surface Contour Plot for Farfield Survey WF024 (Apr 02)

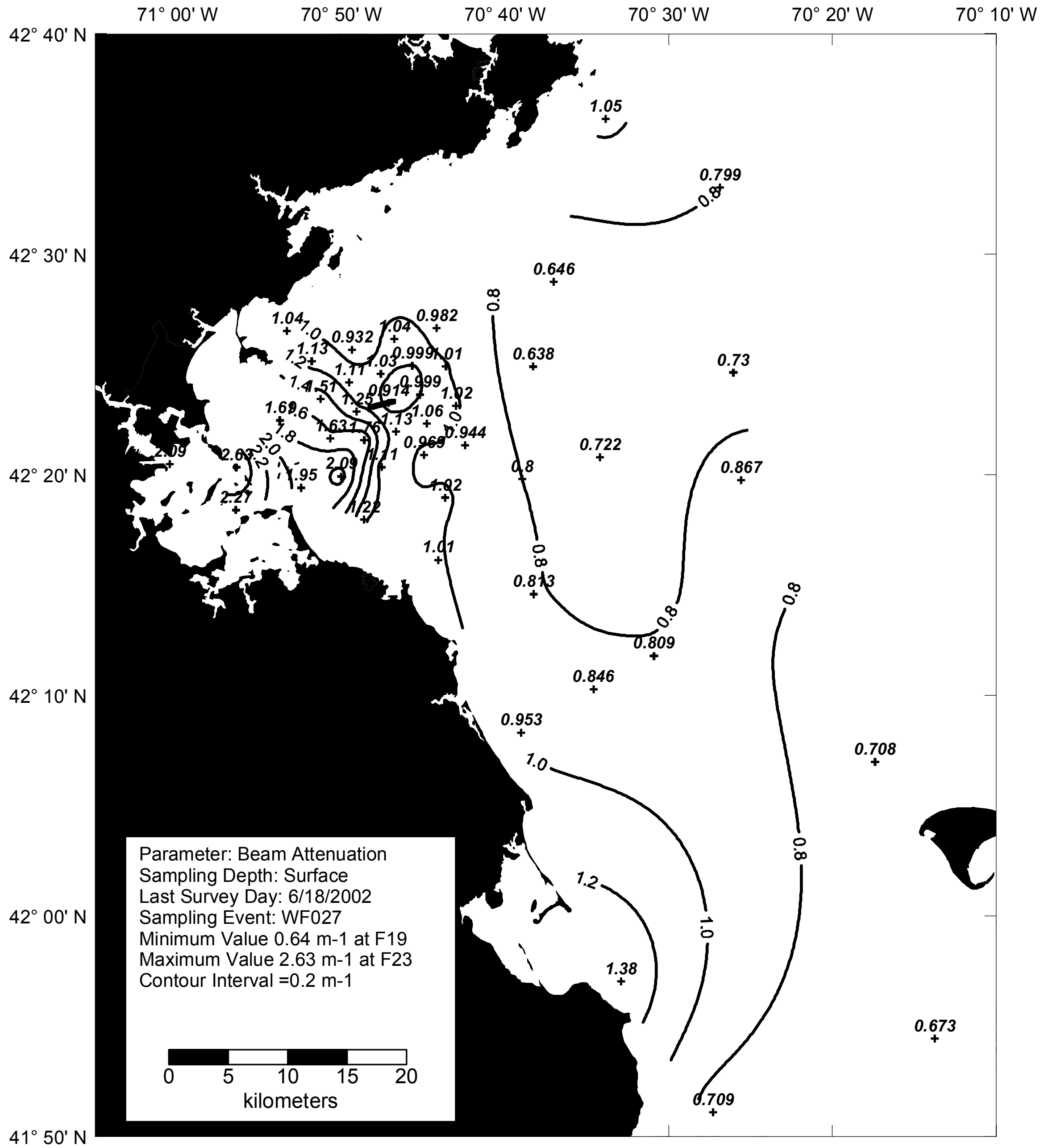


Figure A-32. Beam Attenuation Surface Contour Plot for Farfield Survey WF027 (Jun 02)

APPENDIX B

Transect Plots

Transect Plots – Farfield Surveys

Data were contoured relative to water depth and distance between stations as shown on the transects (Figure 1-3) Distances between stations and water depth at each station is shown on the transect. Water depth is labeled with negative values in meters, with zero depth at the sea surface. The depth to the seabed is shown by the solid shading at the bottom of each plot. Three transects (Boston-Nearfield, Cohasset, and Marshfield) are provided on each plot, as well as shaded contour levels on the scale bar at the bottom of the plot. Contour units are as noted on the plot. Each plot is labeled on the bottom left with the parameter, survey number, and last day of the survey date. The data used for the contours were based on high-resolution *in situ* hydrographic casts and individual data points as noted below.

Parameter	Data Used
Density (Sigma-T)	High-resolution *in situ* data
Temperature	High-resolution *in situ* data
Salinity	High-resolution *in situ* data
Transmissivity	High-resolution *in situ* data
Nitrate plus Nitrite	Individual data points based on discrete water column
Phosphate	Individual data points based on discrete water column
Silicate	Individual data points based on discrete water column
Ammonium	Individual data points based on discrete water column
Fluorescence	High-resolution *in situ* data
Dissolved Oxygen	High-resolution *in situ* data

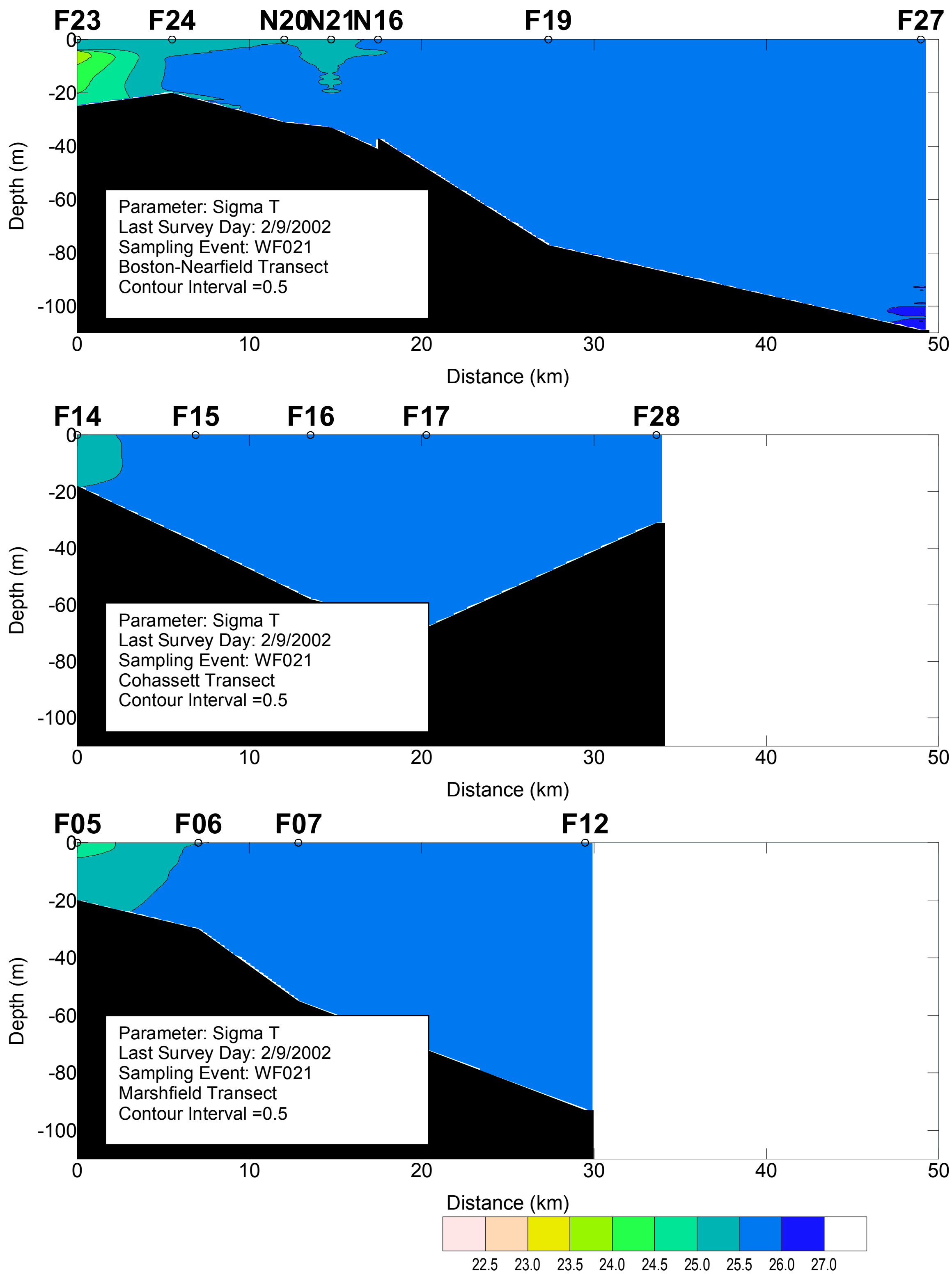


Figure B-1. Density Transect Plots (West - East) for Farfield Survey WF021 (Feb 02)

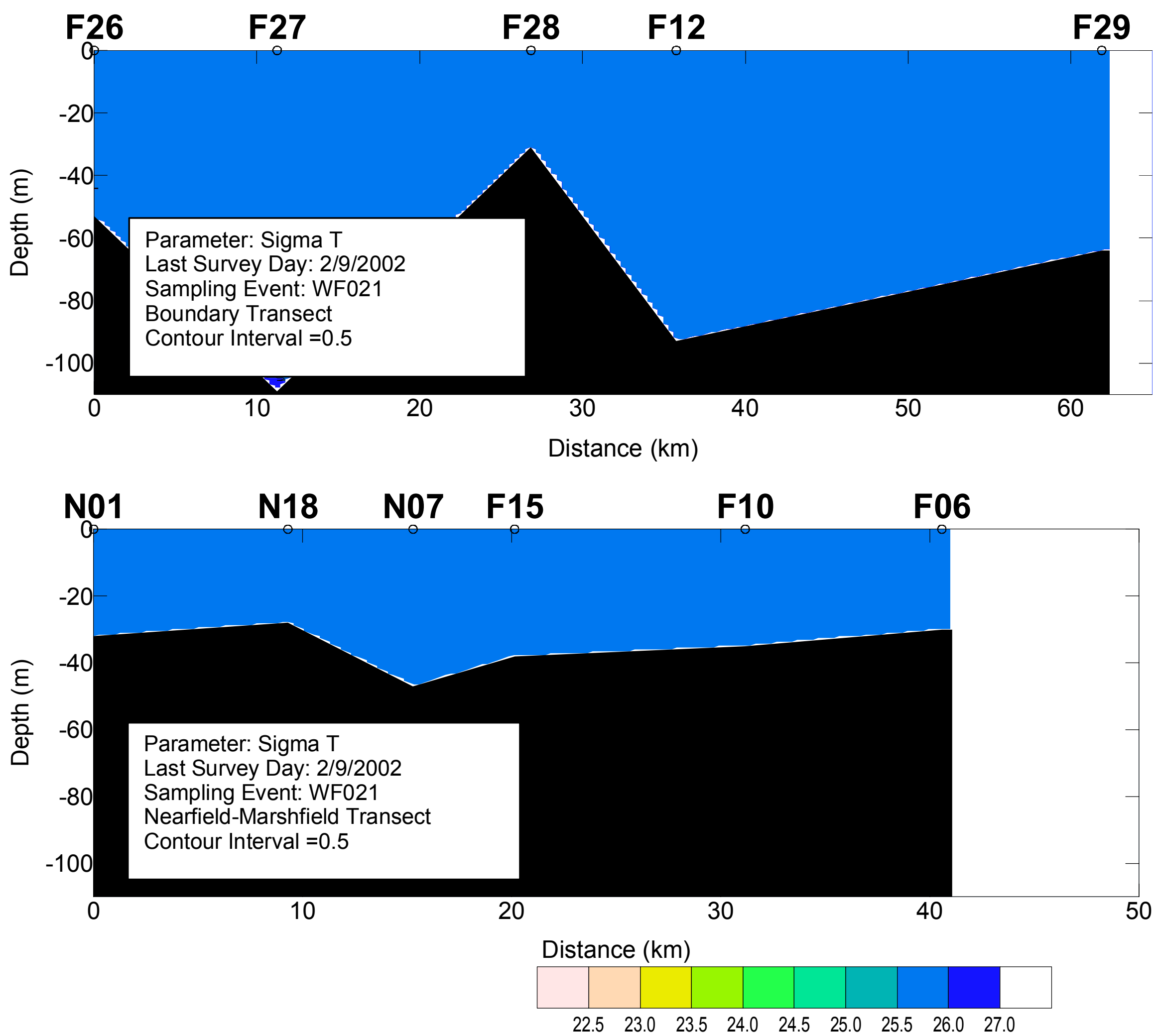


Figure B-2. Density Transect Plots (North - South) for Farfield Survey WF021 (Feb 02)

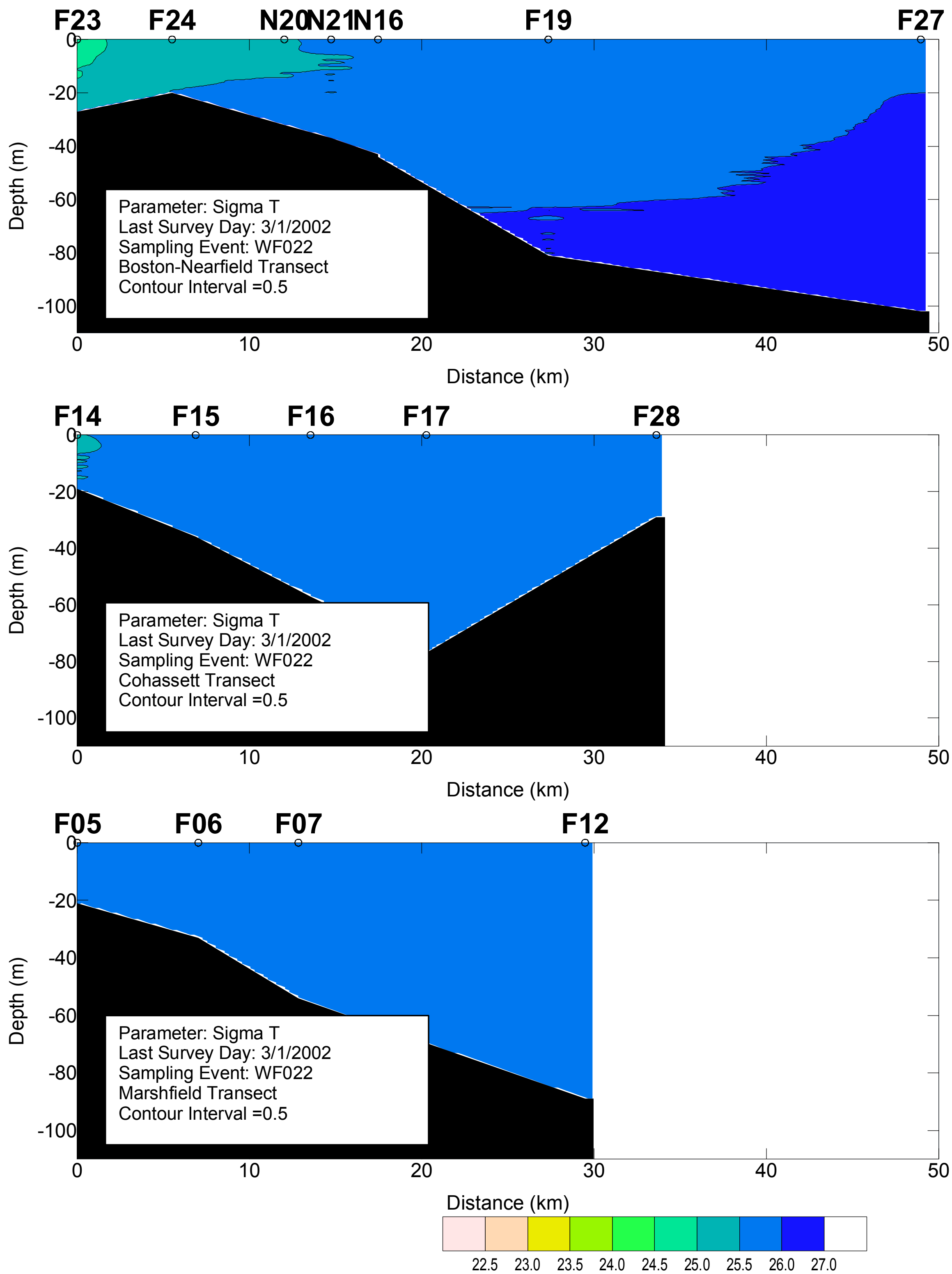


Figure B-3. Density Transect Plots (West - East) for Farfield Survey WF022 (Mar 02)

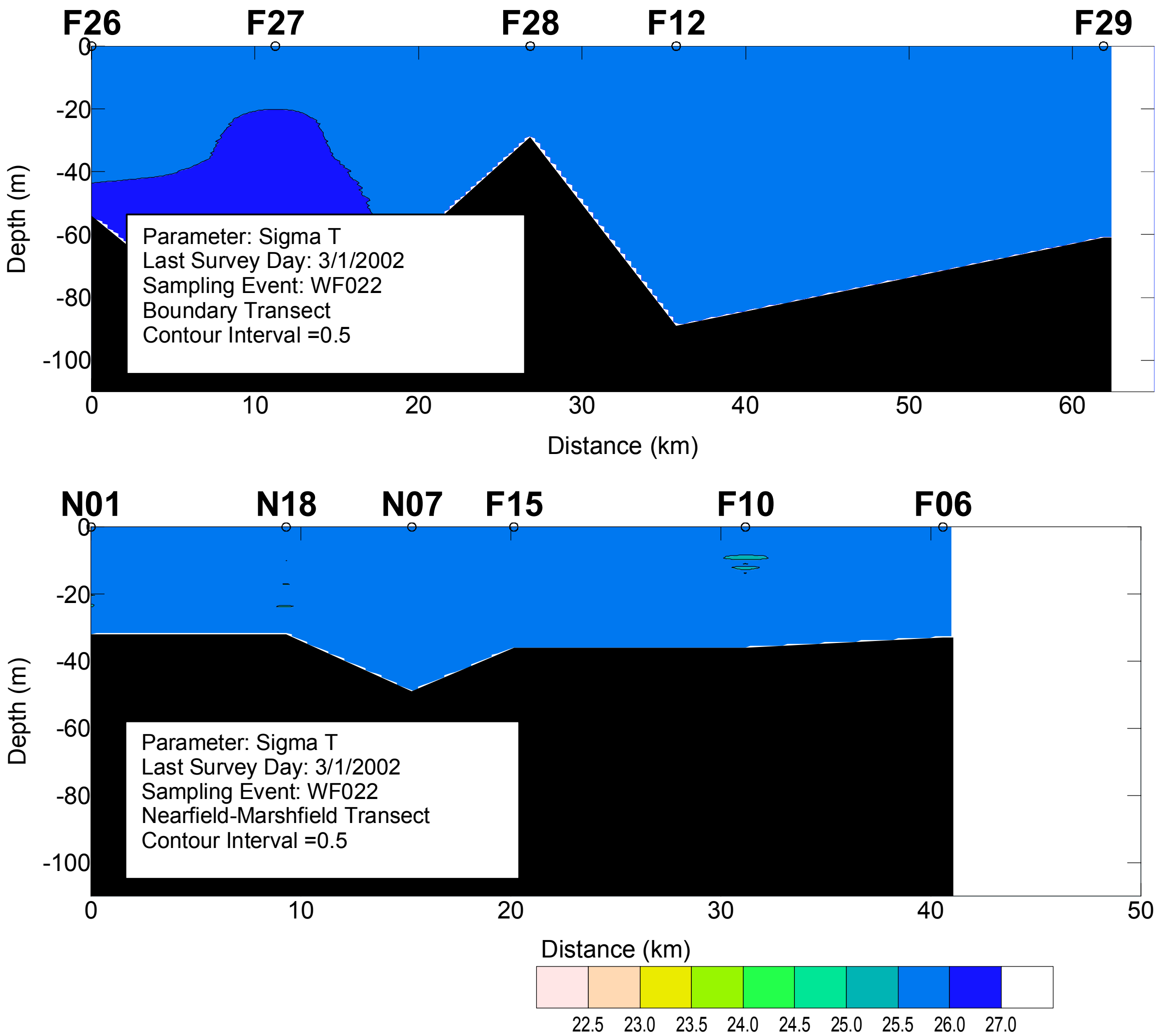


Figure B-4. Density Transect Plots (North - South) for Farfield Survey WF022 (Mar 02)

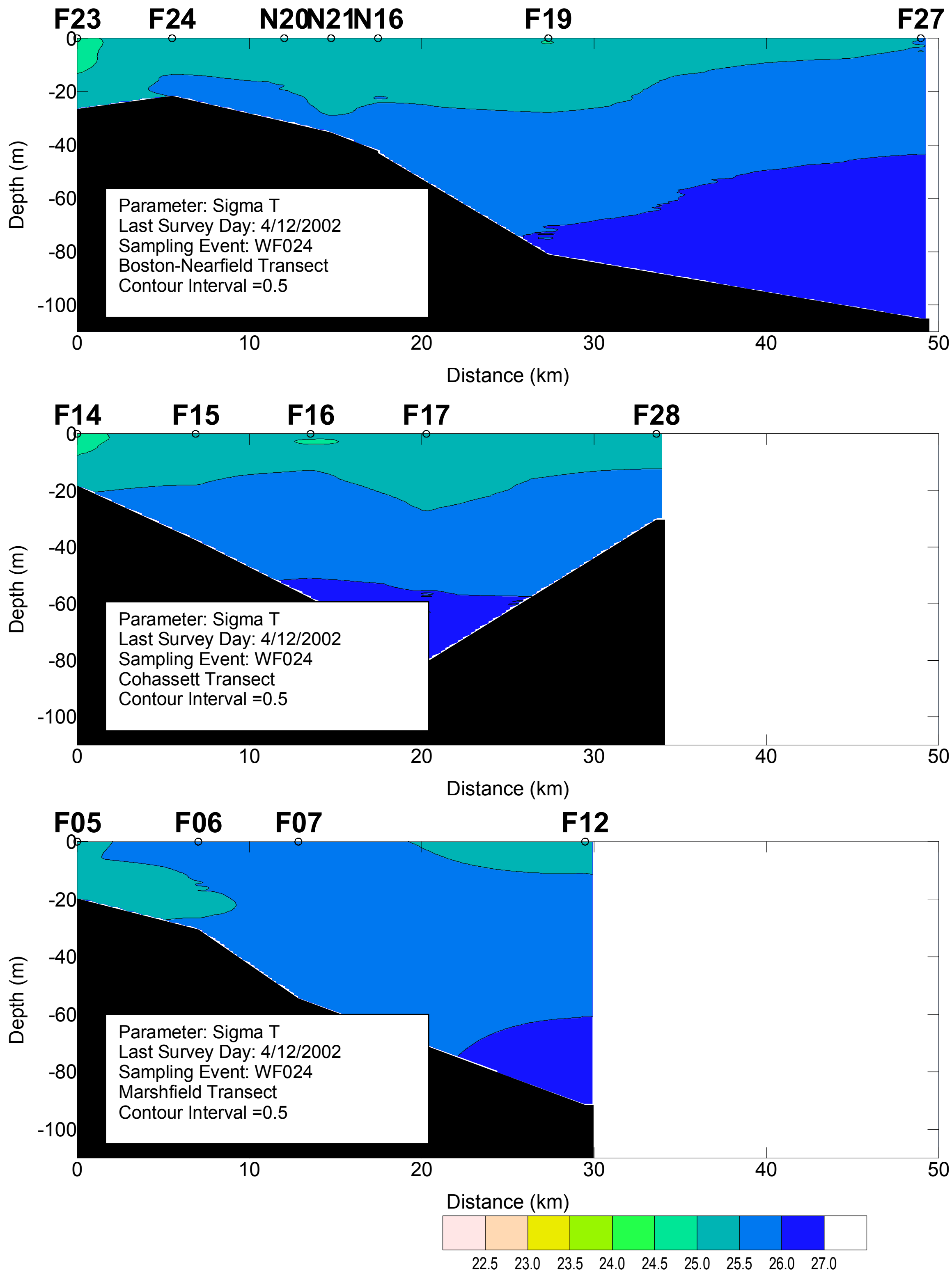


Figure B-5. Density Transect Plots (West - East) for Farfield Survey WF024 (Apr 02)

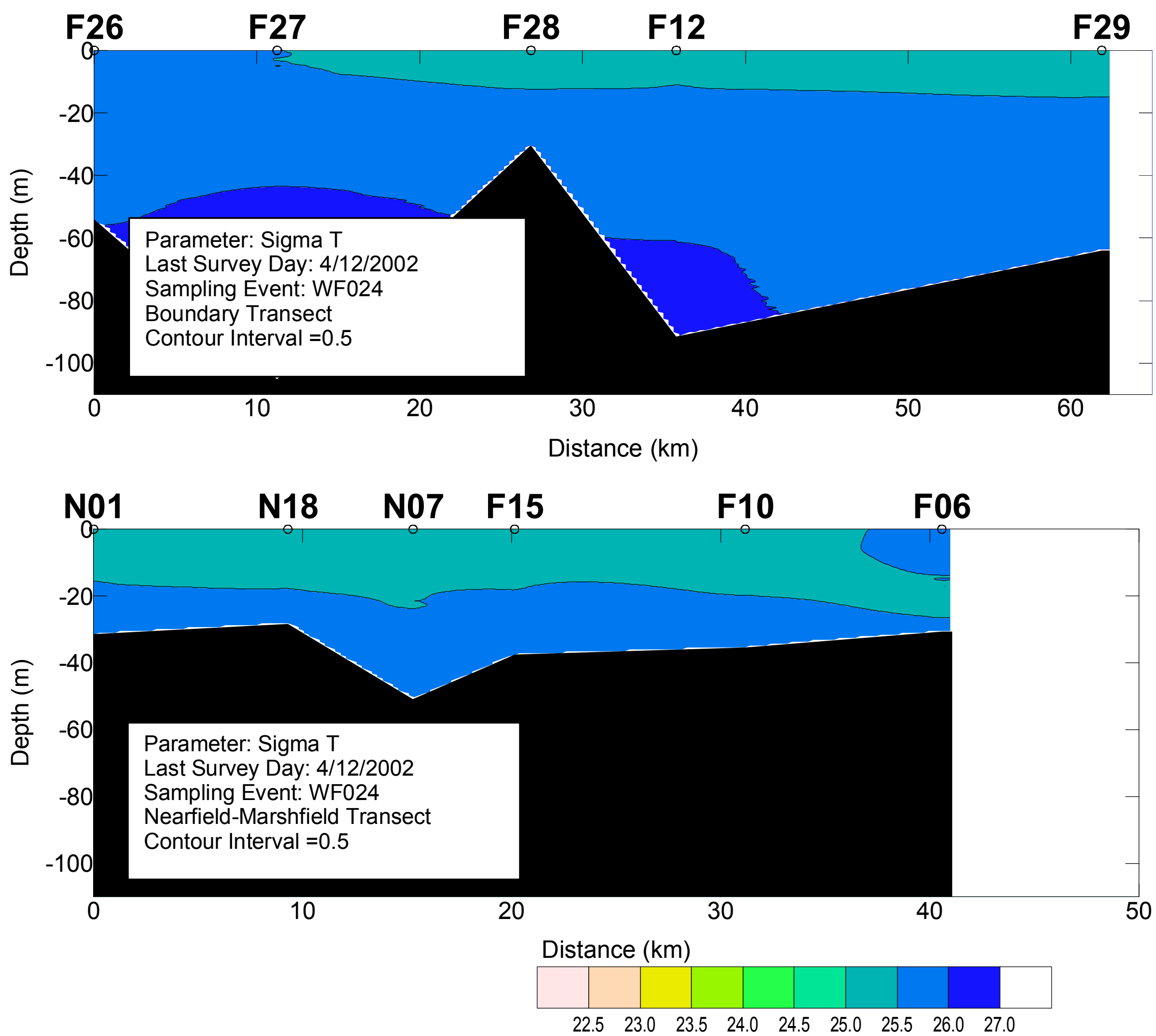


Figure B-6. Density Transect Plots (North - South) for Farfield Survey WF024 (Apr 02)

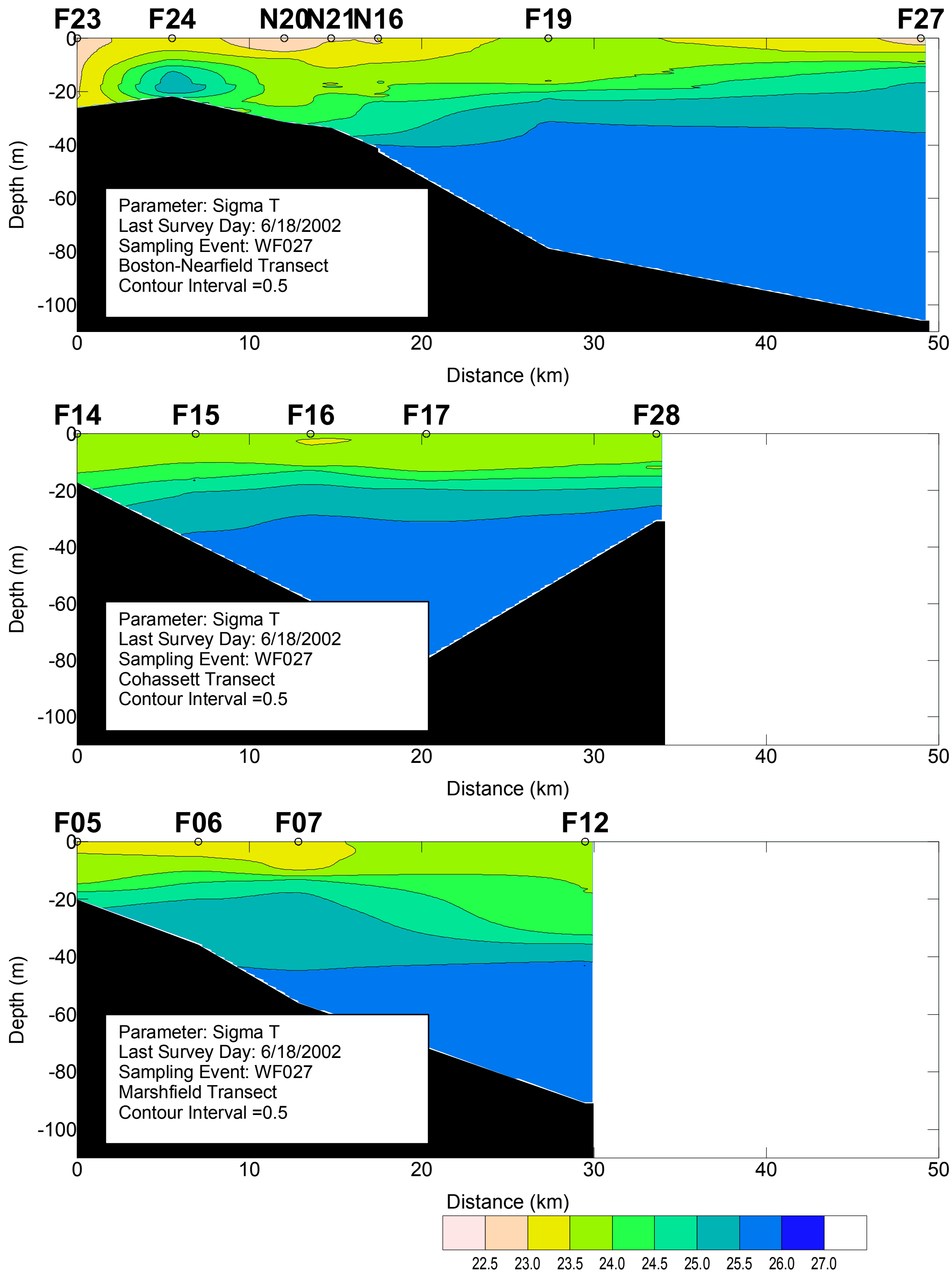


Figure B-7. Density Transect Plots (West - East) for Farfield Survey WF027 (Jun 02)

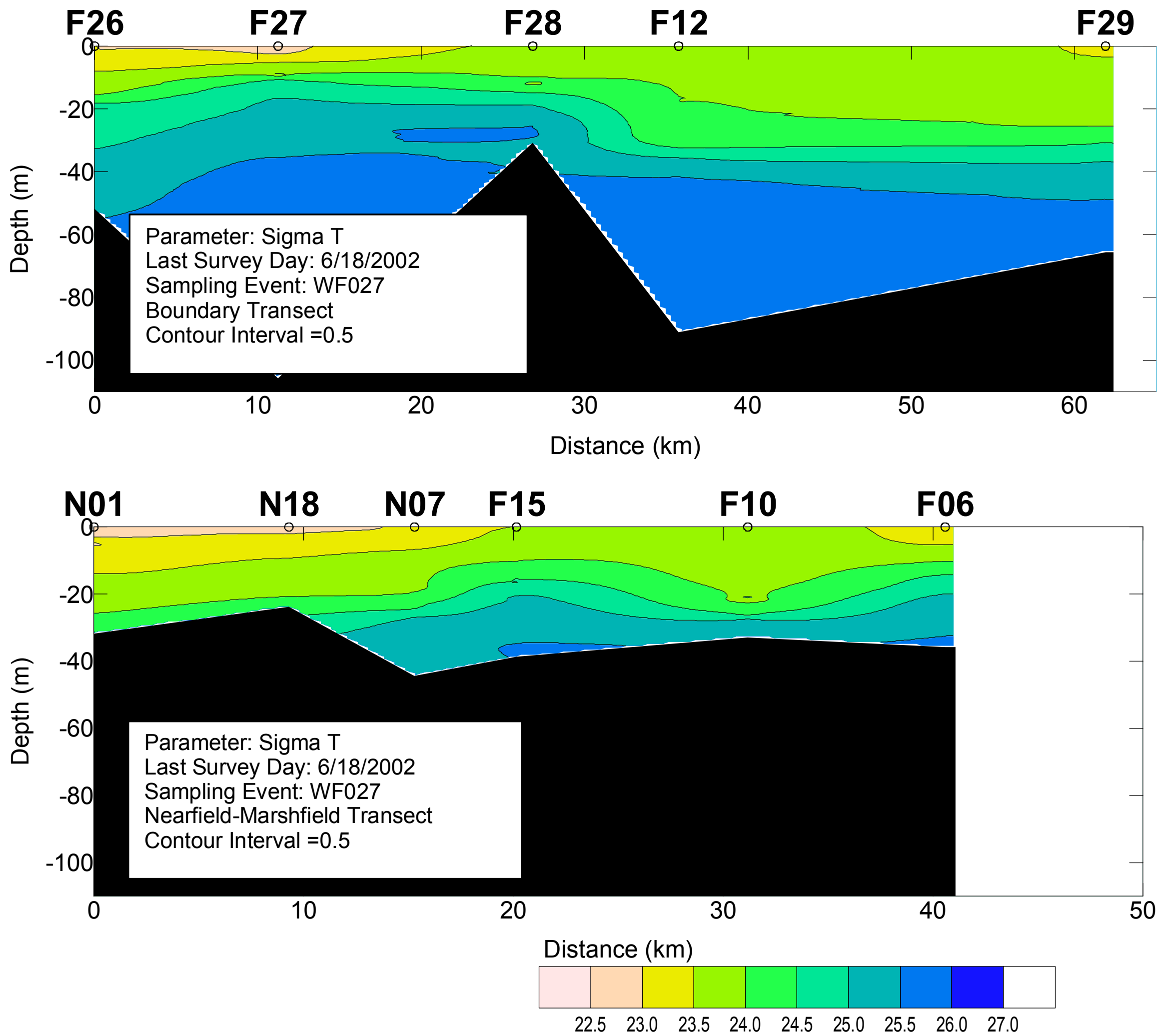


Figure B-8. Density Transect Plots (North - South) for Farfield Survey WF027 (Jun 02)

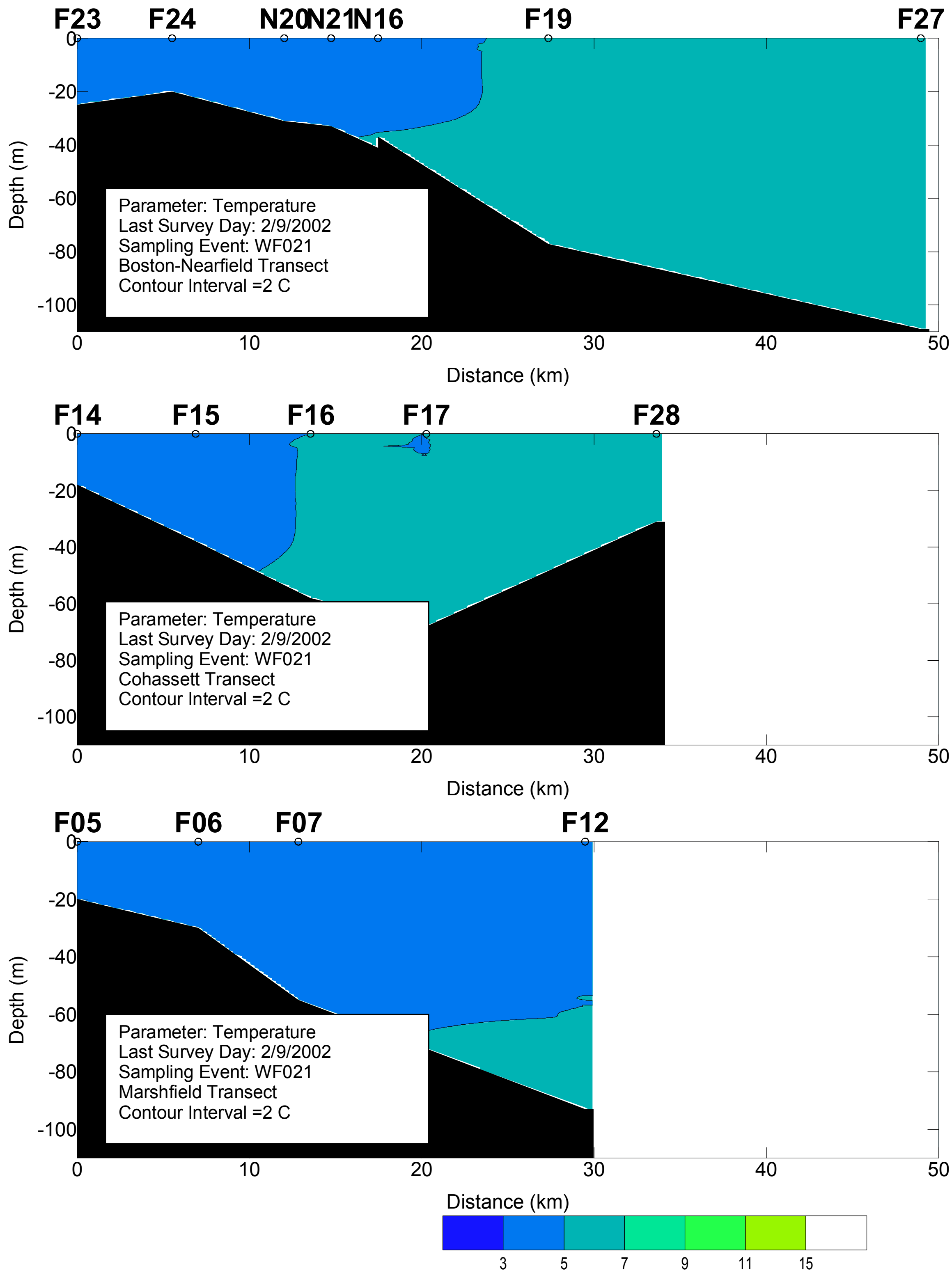


Figure B- 9. Temperature Transect Plots (West - East) for Farfield Survey WF021 (Feb 02)

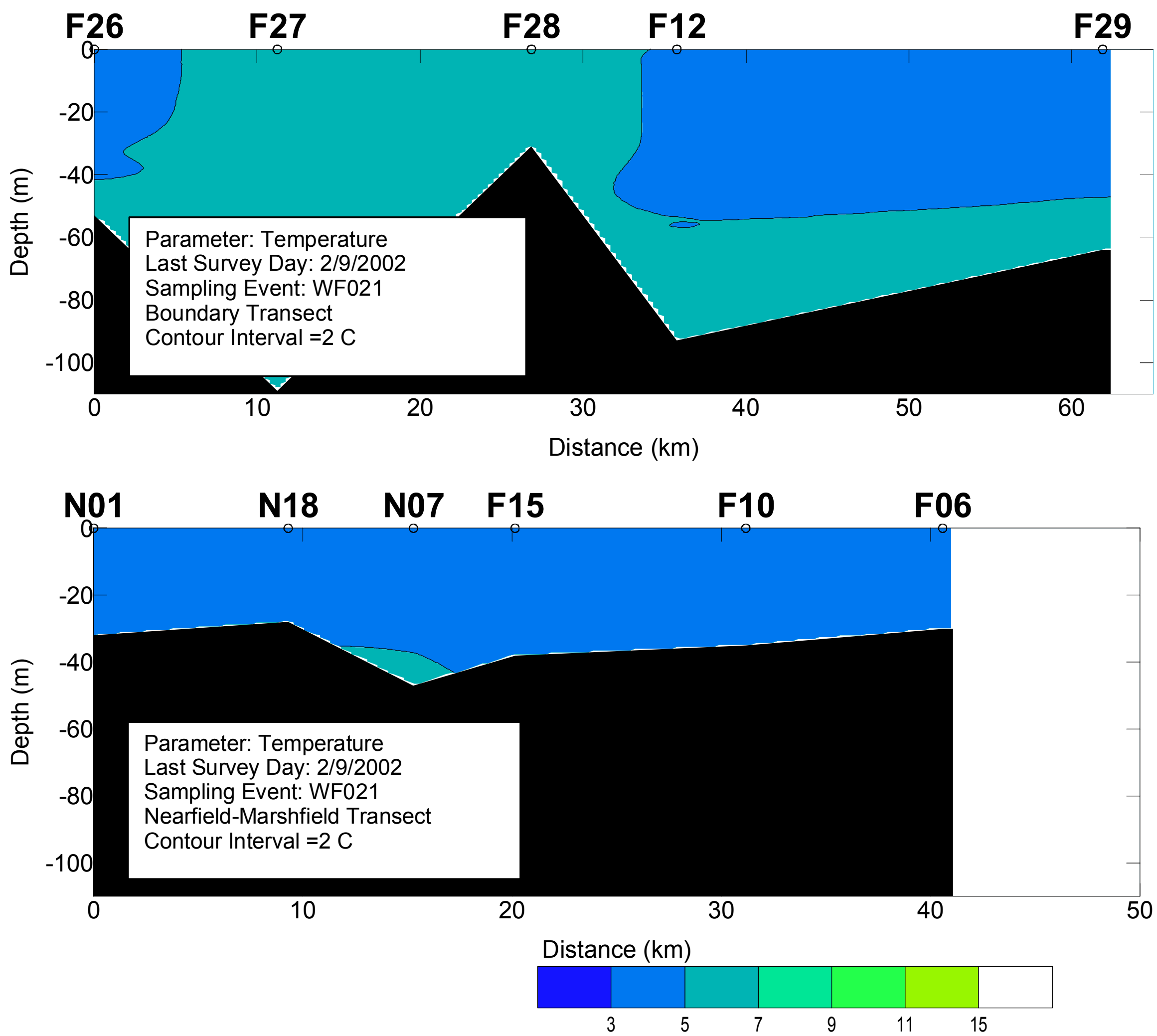


Figure B- 10. Temperature Transect Plots (North - South) for Farfield Survey WF021 (Feb 02)

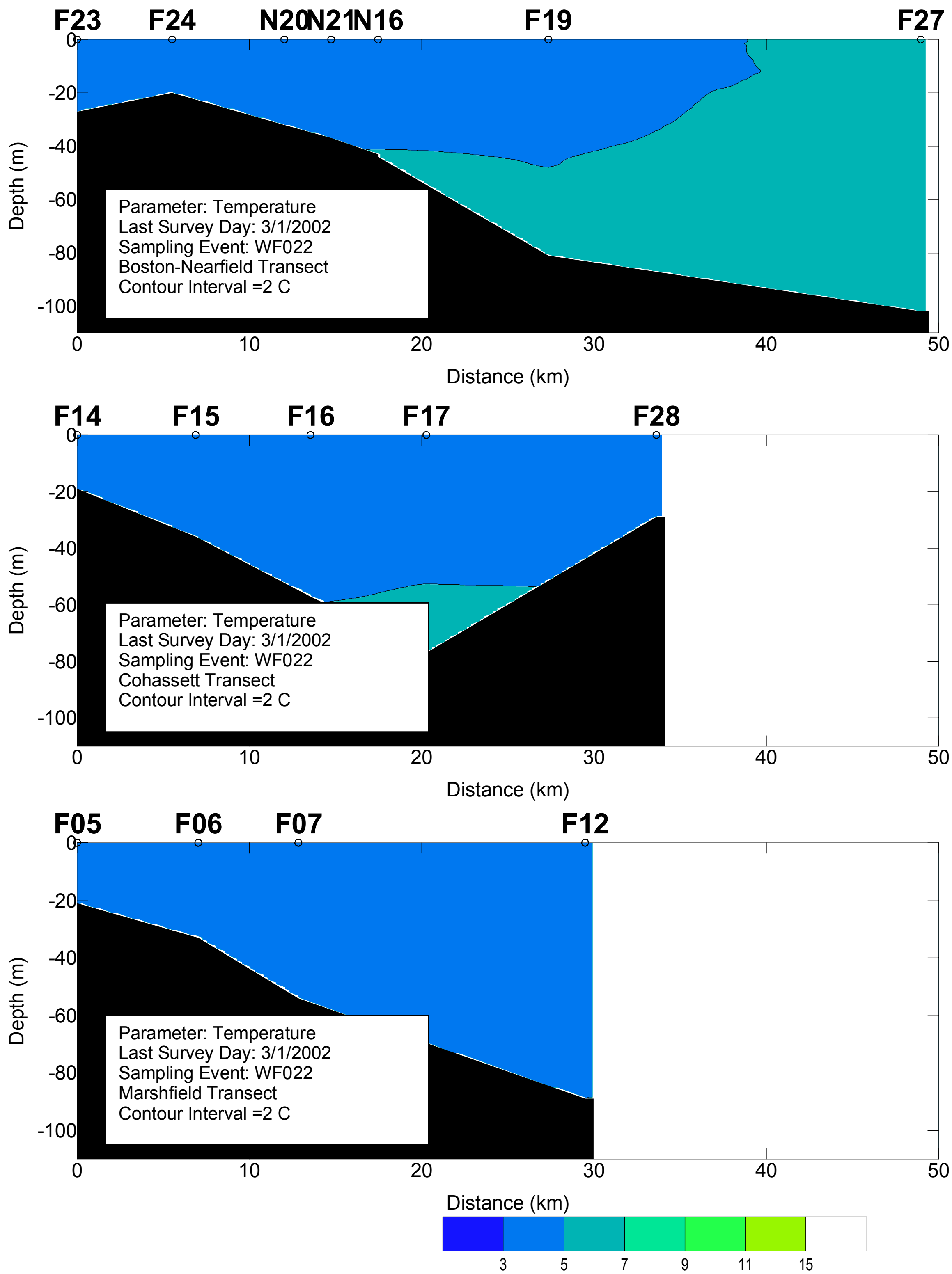


Figure B-11. Temperature Transect Plots (West – East) for Farfield Survey WF022 (Mar 02)

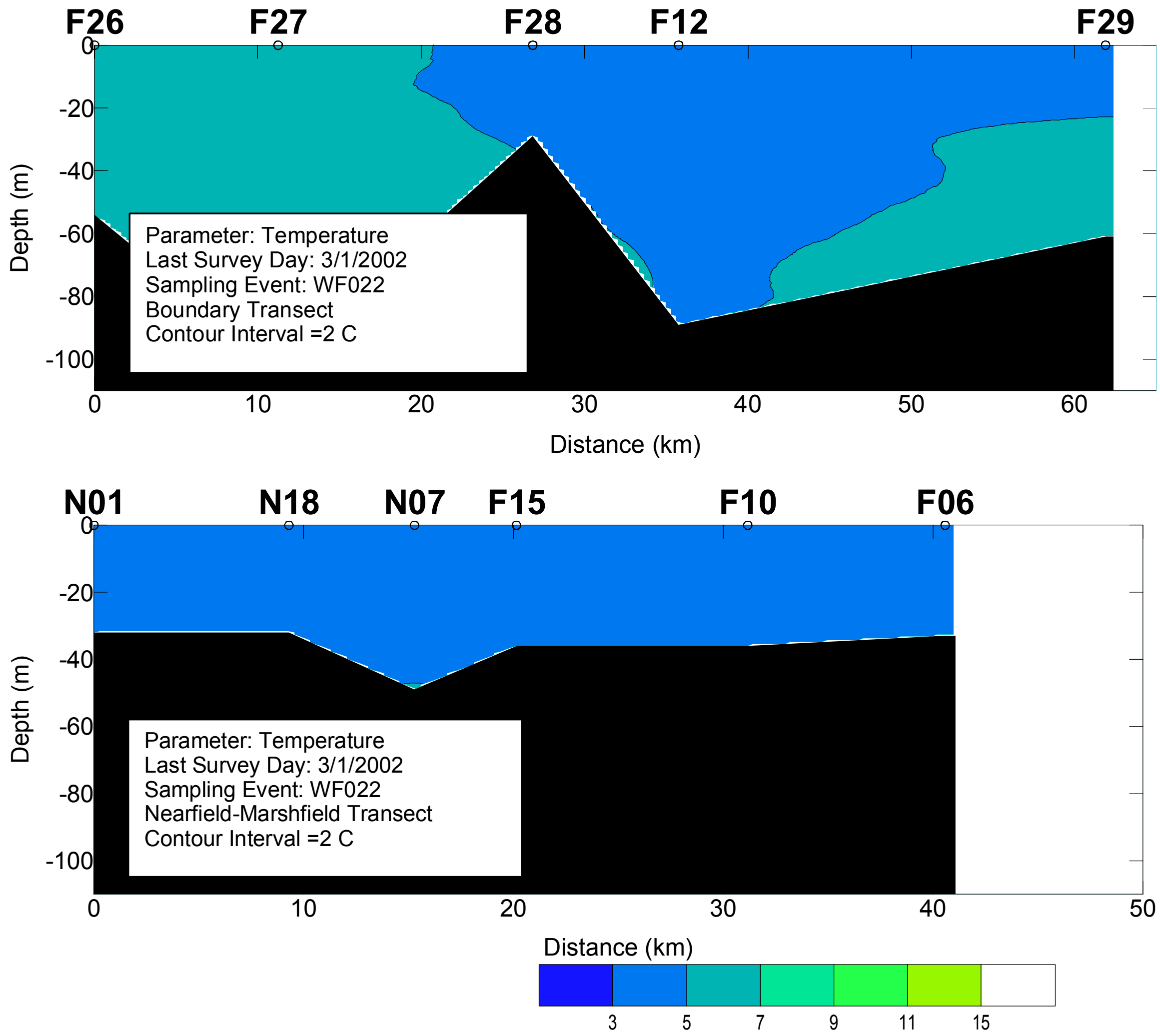


Figure B-12. Temperature Transect Plots (North - South) for Farfield Survey WF022 (Mar 02)

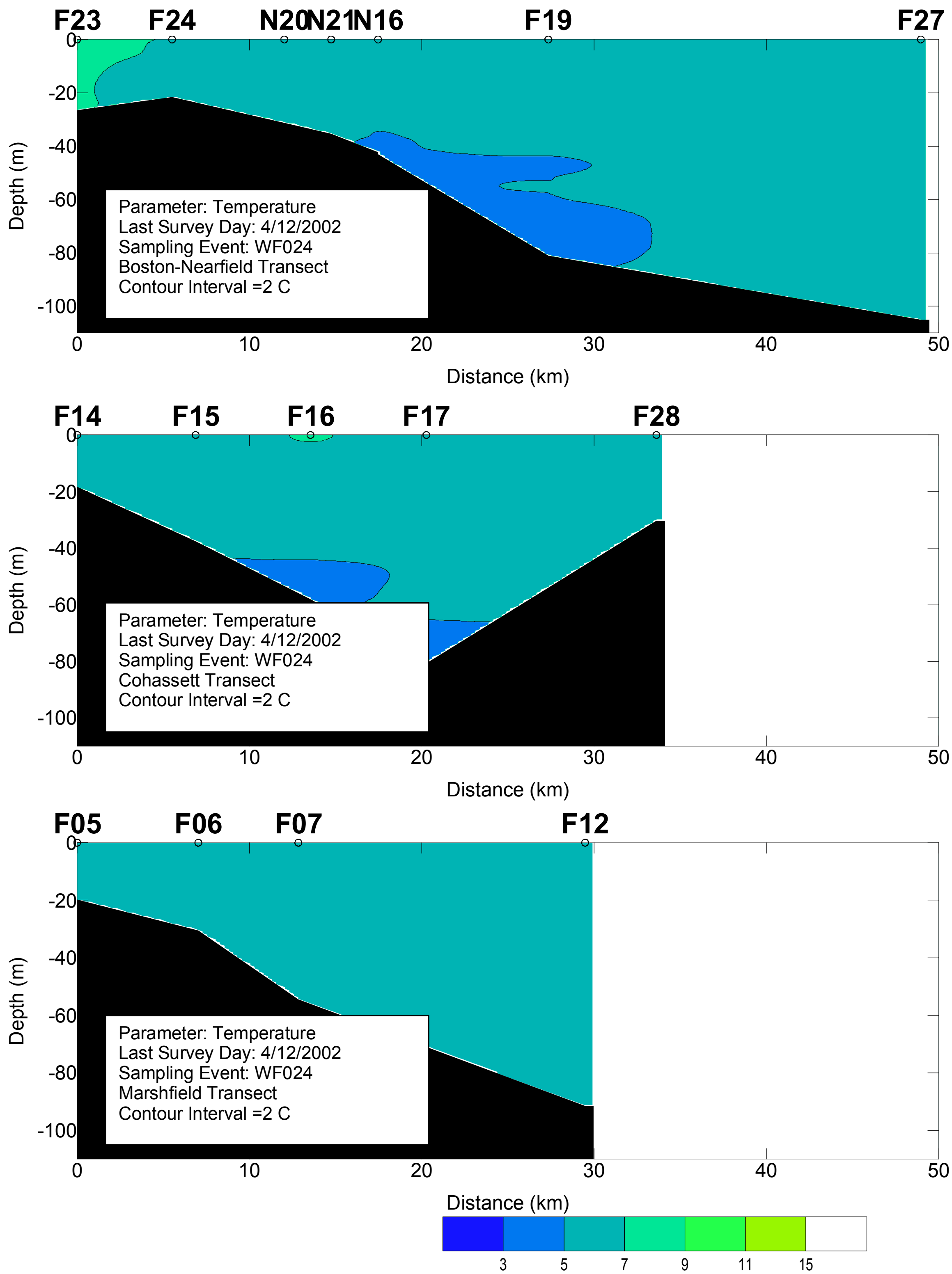


Figure B-13. Temperature Transect Plots (West – East) for Farfield Survey WF024 (Apr 02)

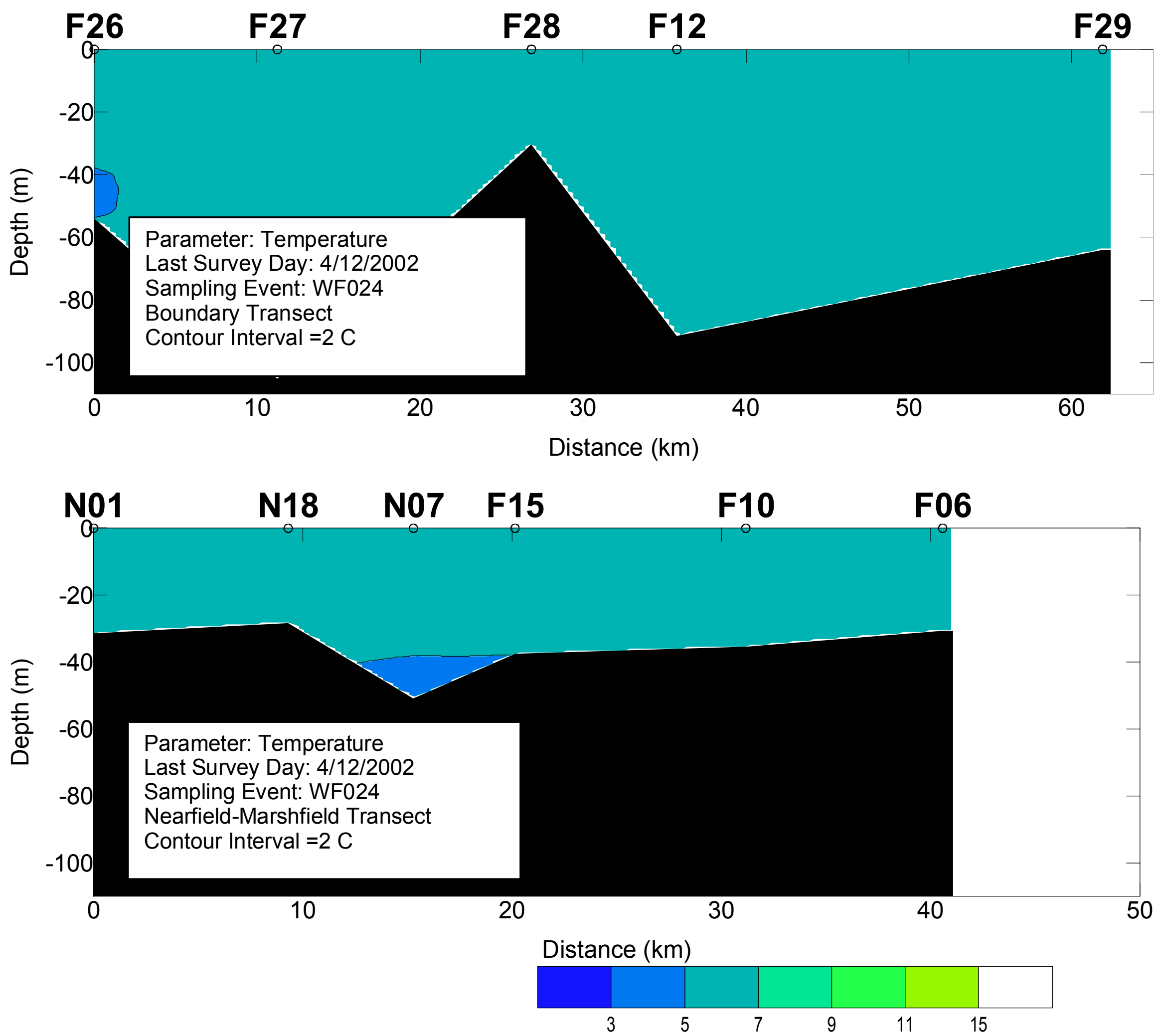


Figure B-14. Temperature Transect Plots (North - South) for Farfield Survey WF024 (Apr 02)

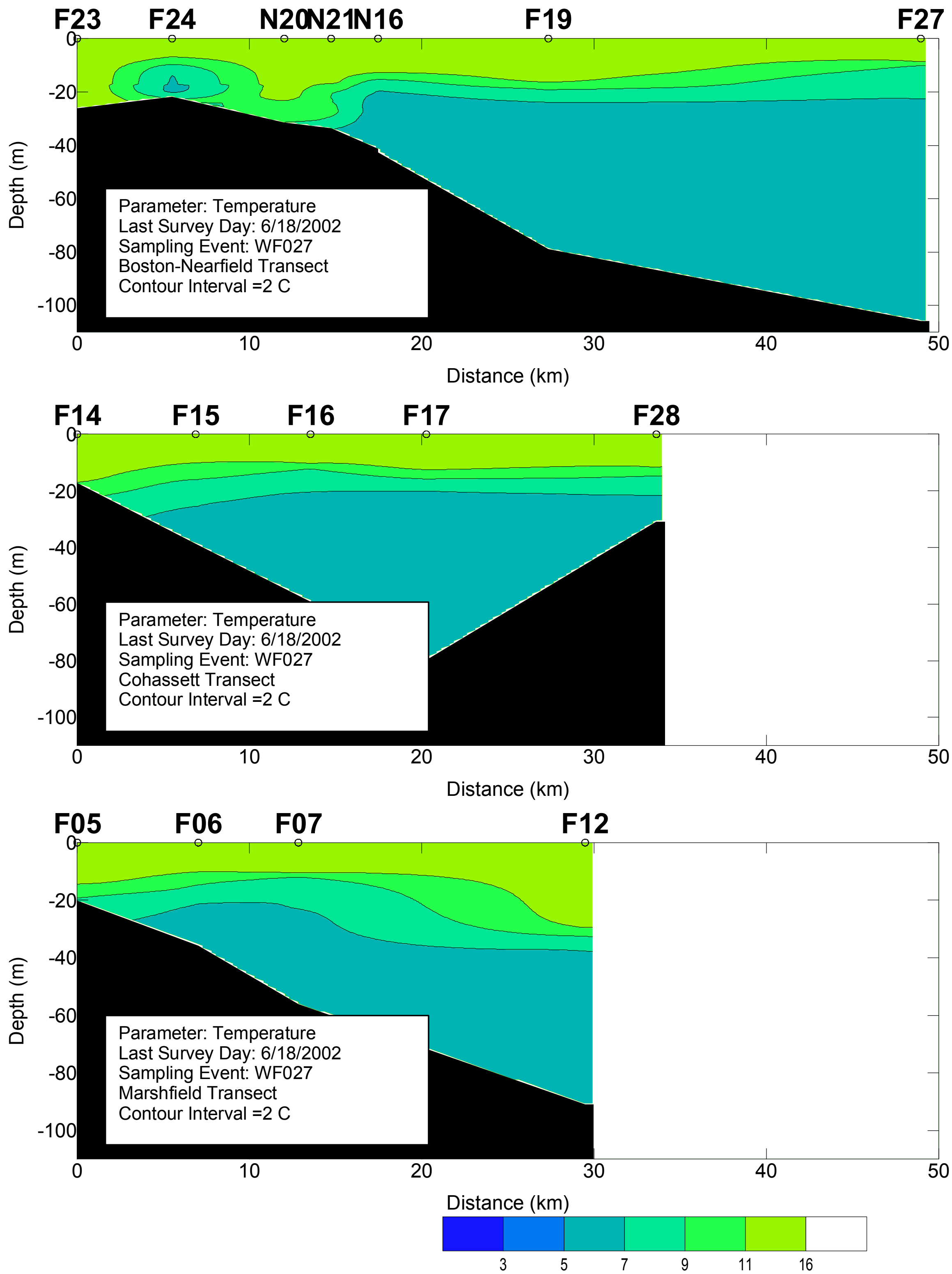


Figure B-15. Temperature Transect Plots (West – East) for Farfield Survey WF027 (Jun 02)

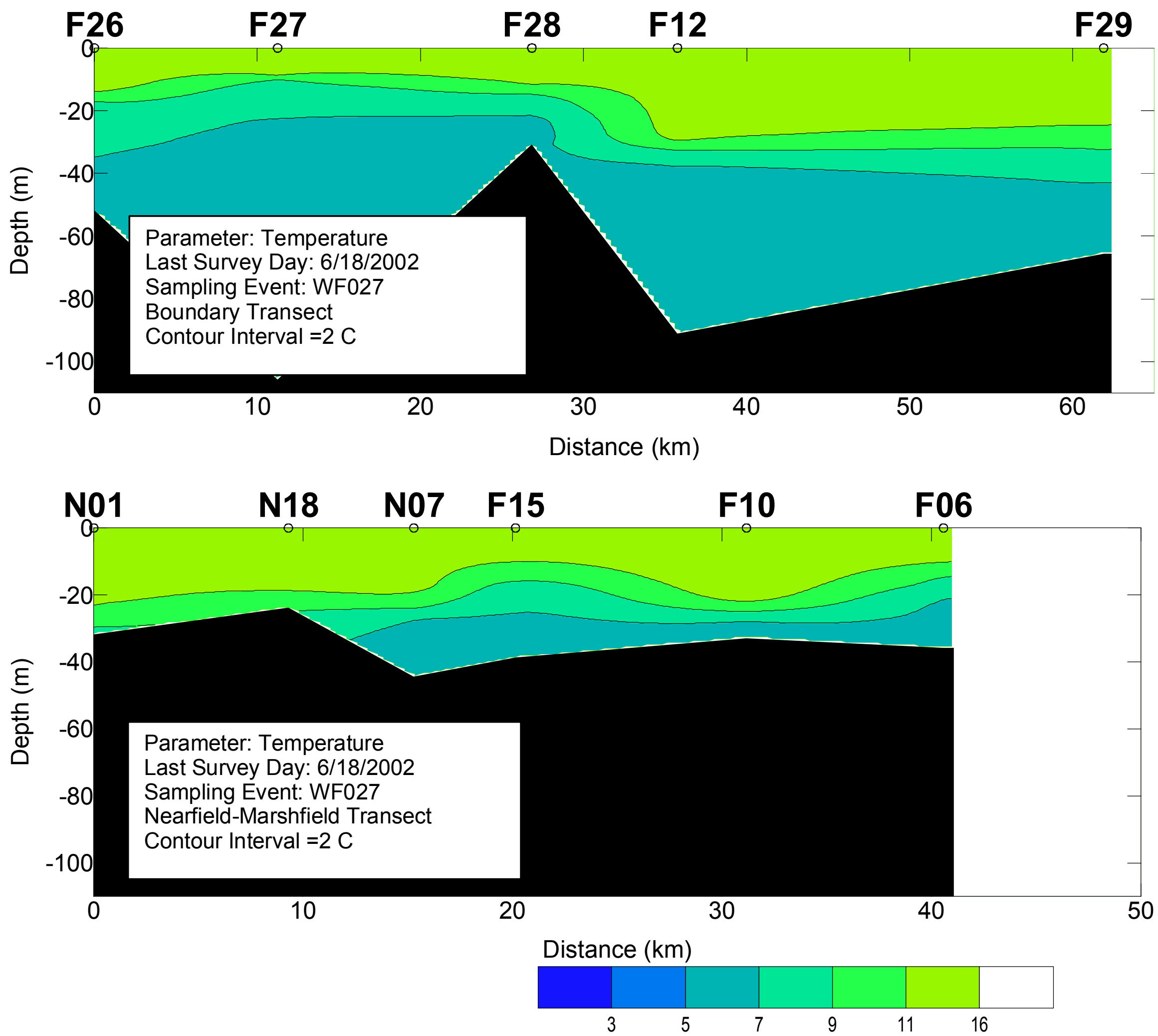


Figure B-16. Temperature Transect Plots (North - South) for Farfield Survey WF027 (Jun 02)

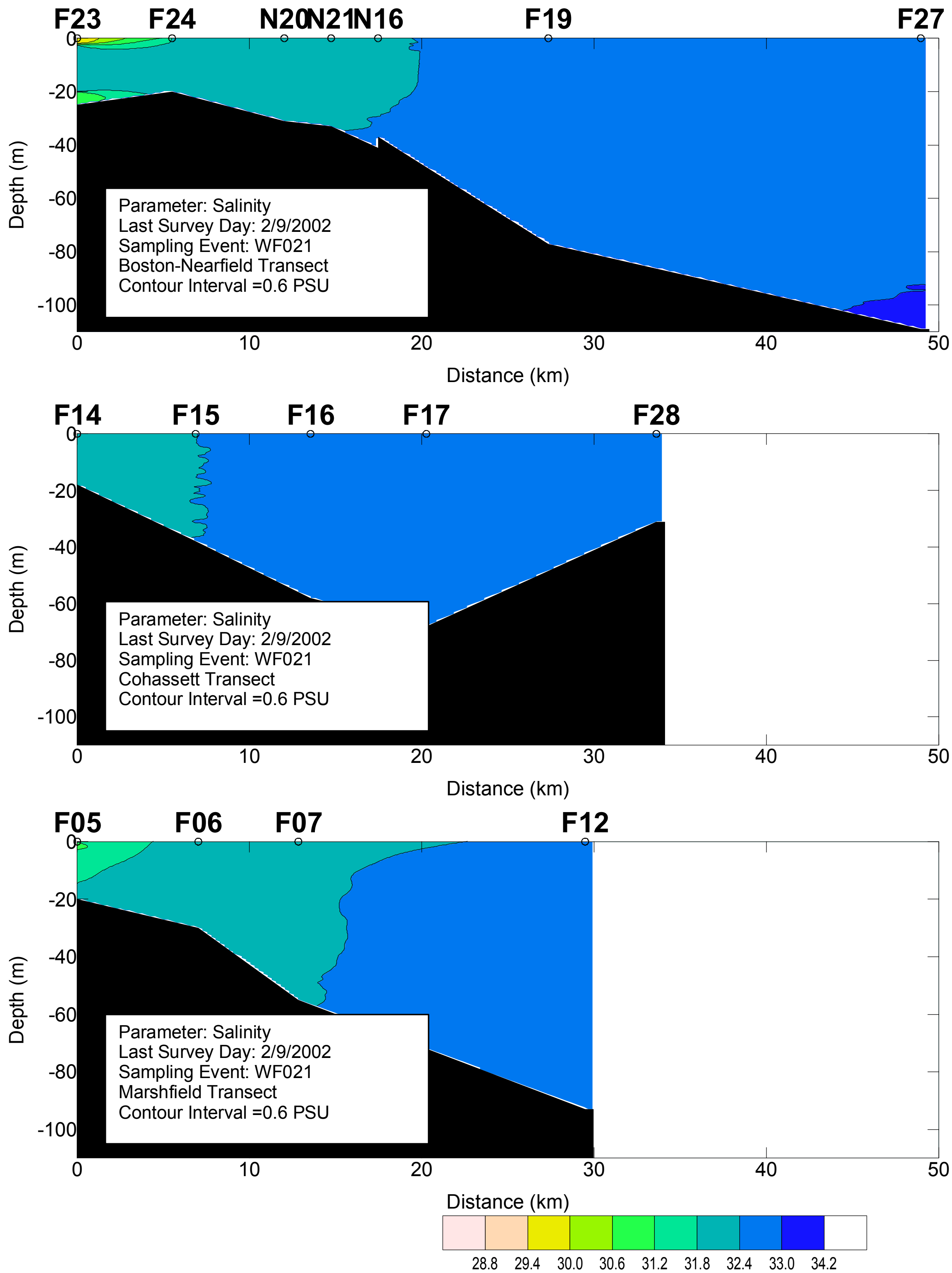


Figure B-17. Salinity Transect Plots (West - East) for Farfield Survey WF021 (Feb 02)

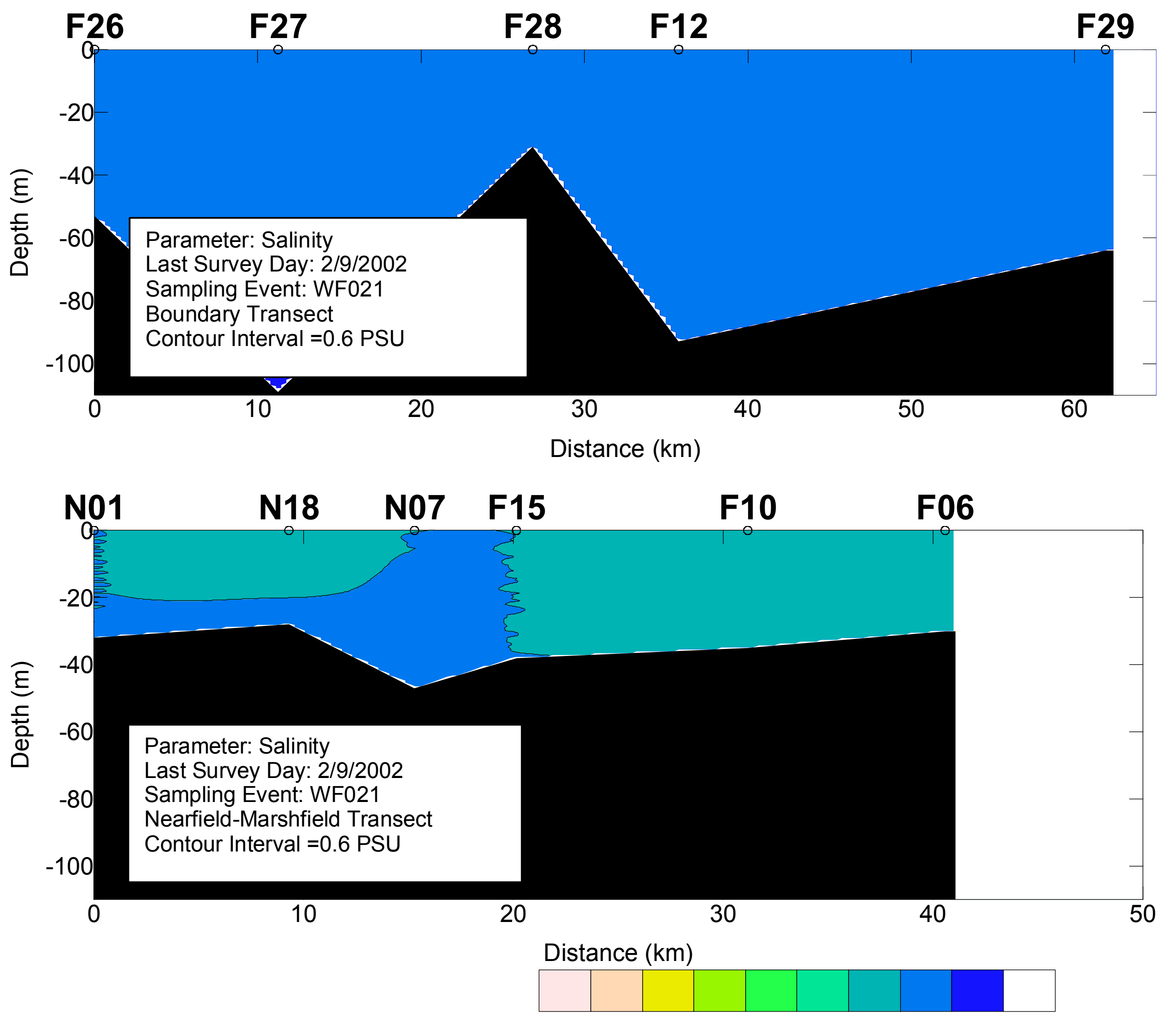


Figure B-18. Salinity Transect Plots (North - South) for Farfield Survey WF021 (Feb 02)

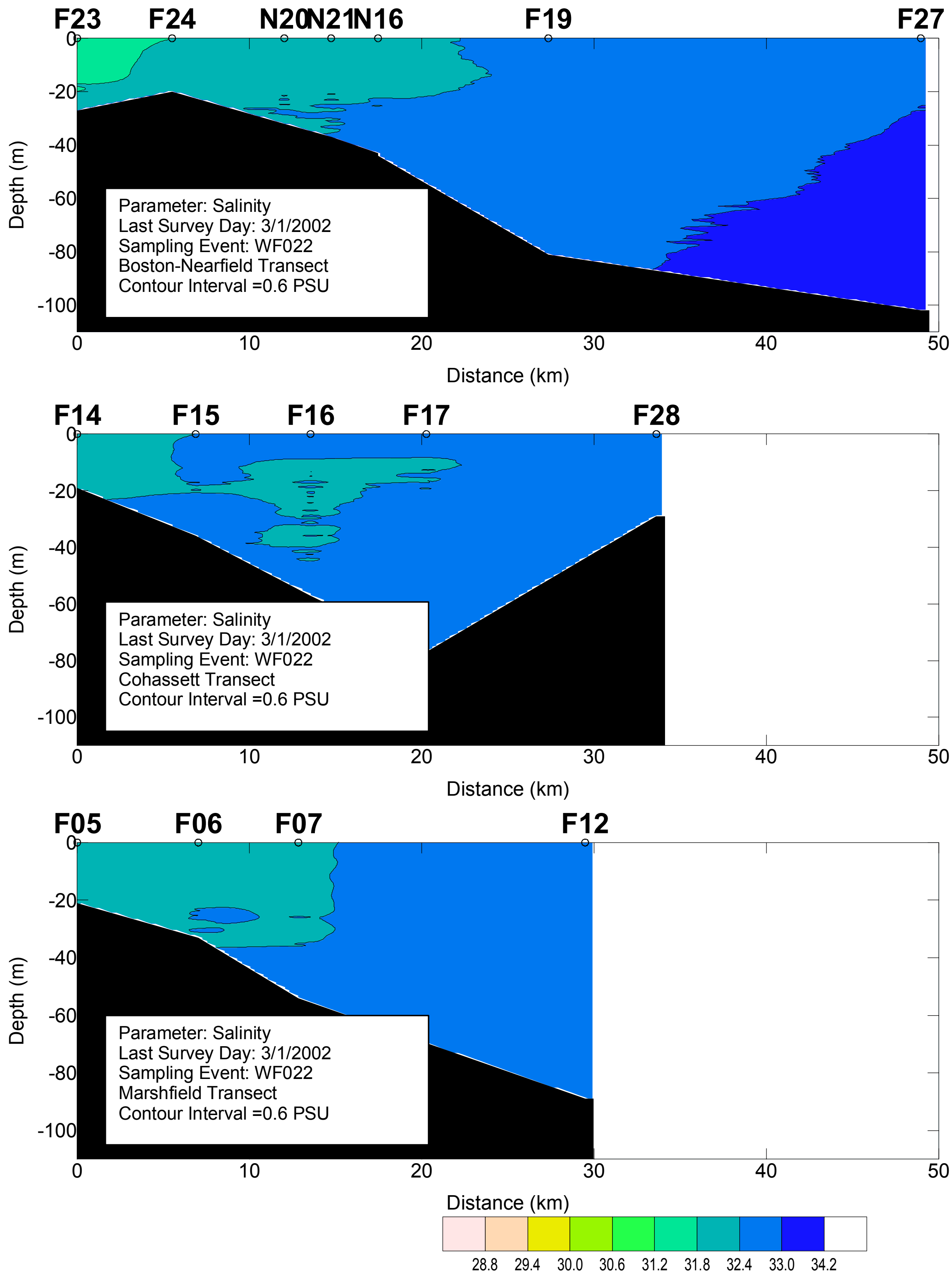


Figure B-19. Salinity Transect Plots (West - East) for Farfield Survey WF022 (Mar 02)

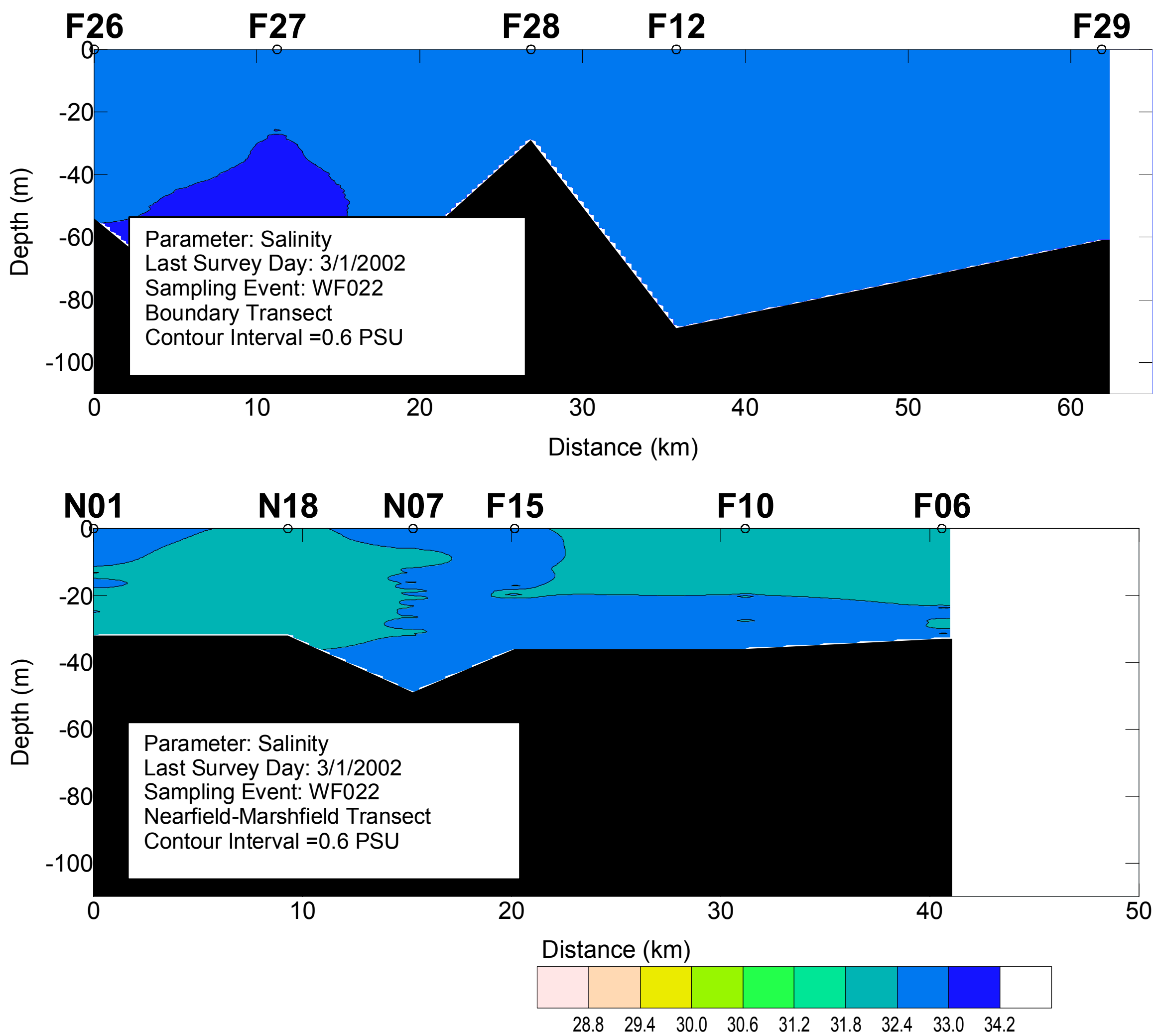


Figure B-20. Salinity Transect Plots (North - South) for Farfield Survey WF022 (Mar 02)

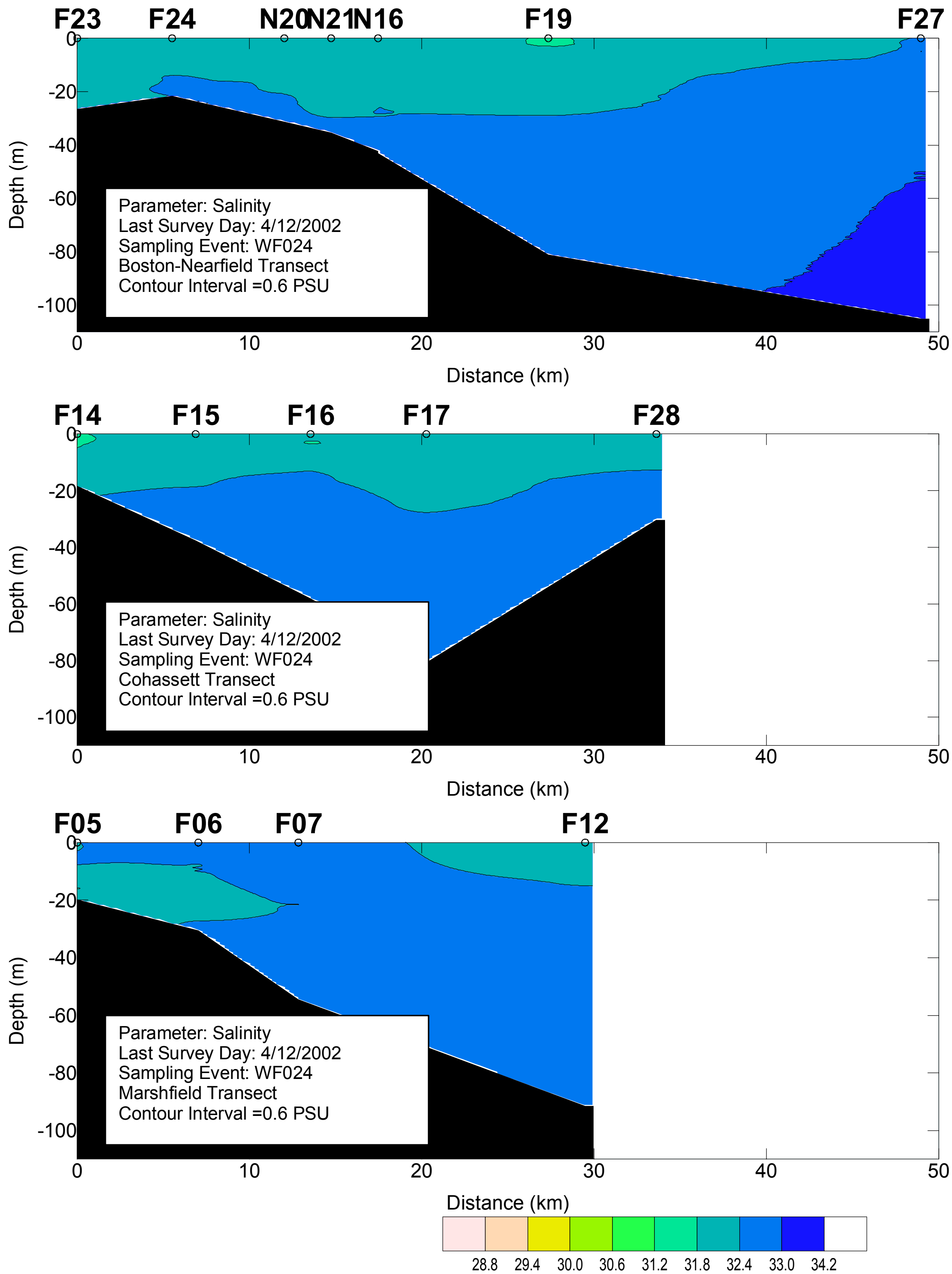


Figure B-21. Salinity Transect Plots (West - East) for Farfield Survey WF024 (Apr 02)

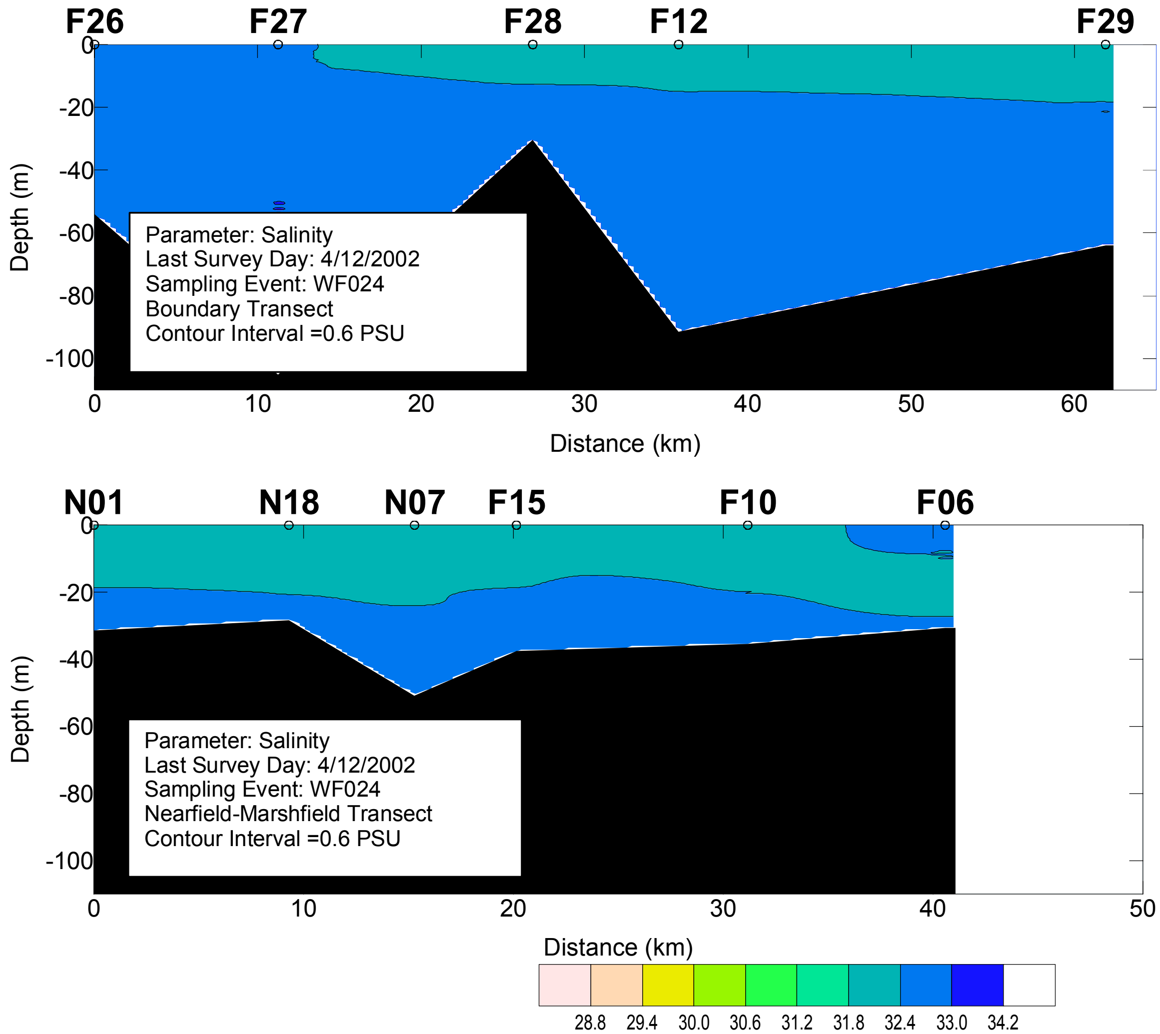


Figure B-22. Salinity Transect Plots (North - South) for Farfield Survey WF024 (Apr 02)

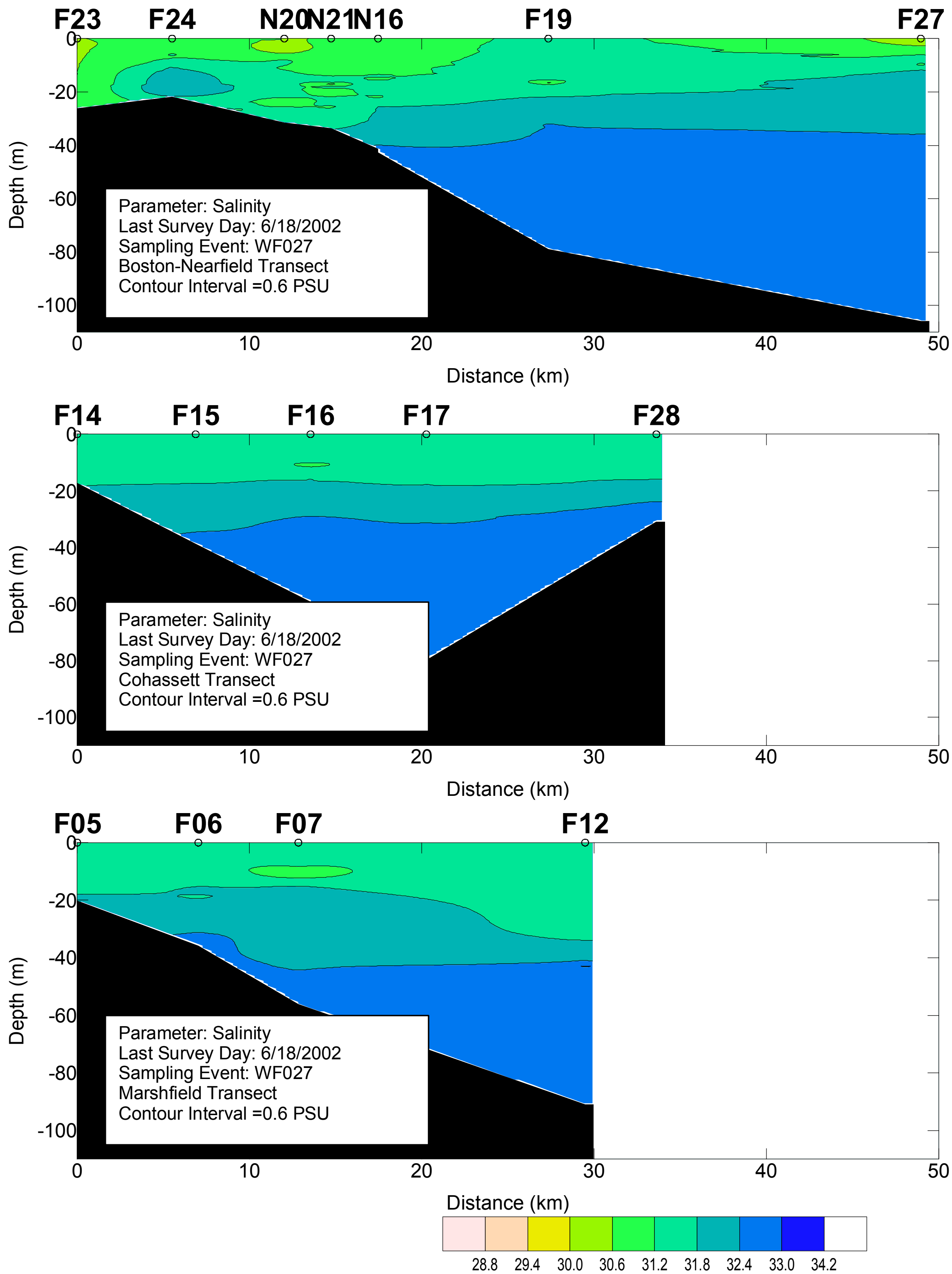


Figure B-23. Salinity Transect Plots (West - East) for Farfield Survey WF027 (Jun 02)

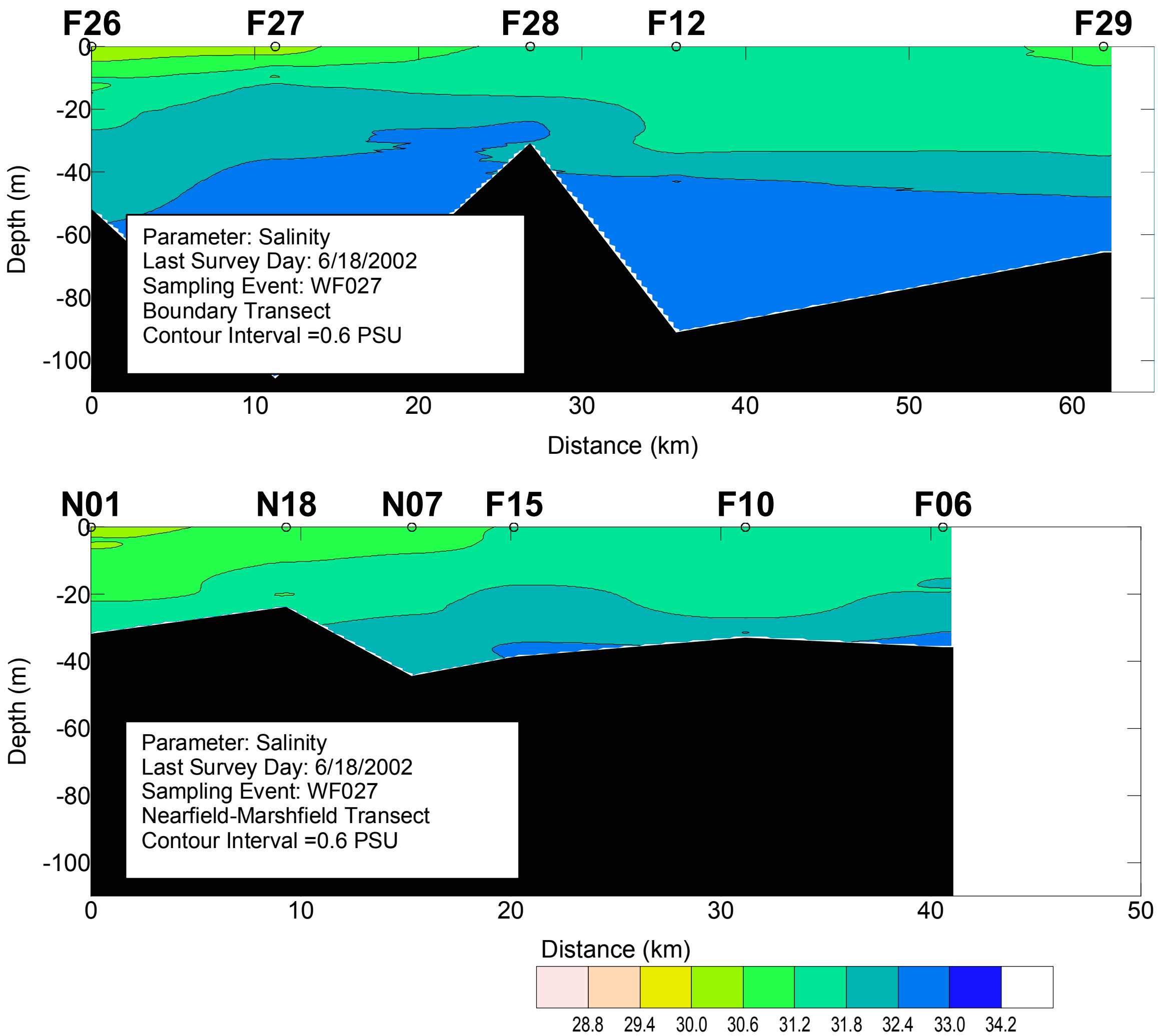


Figure B-24. Salinity Transect Plots (North - South) for Farfield Survey WF027 (Jun 02)

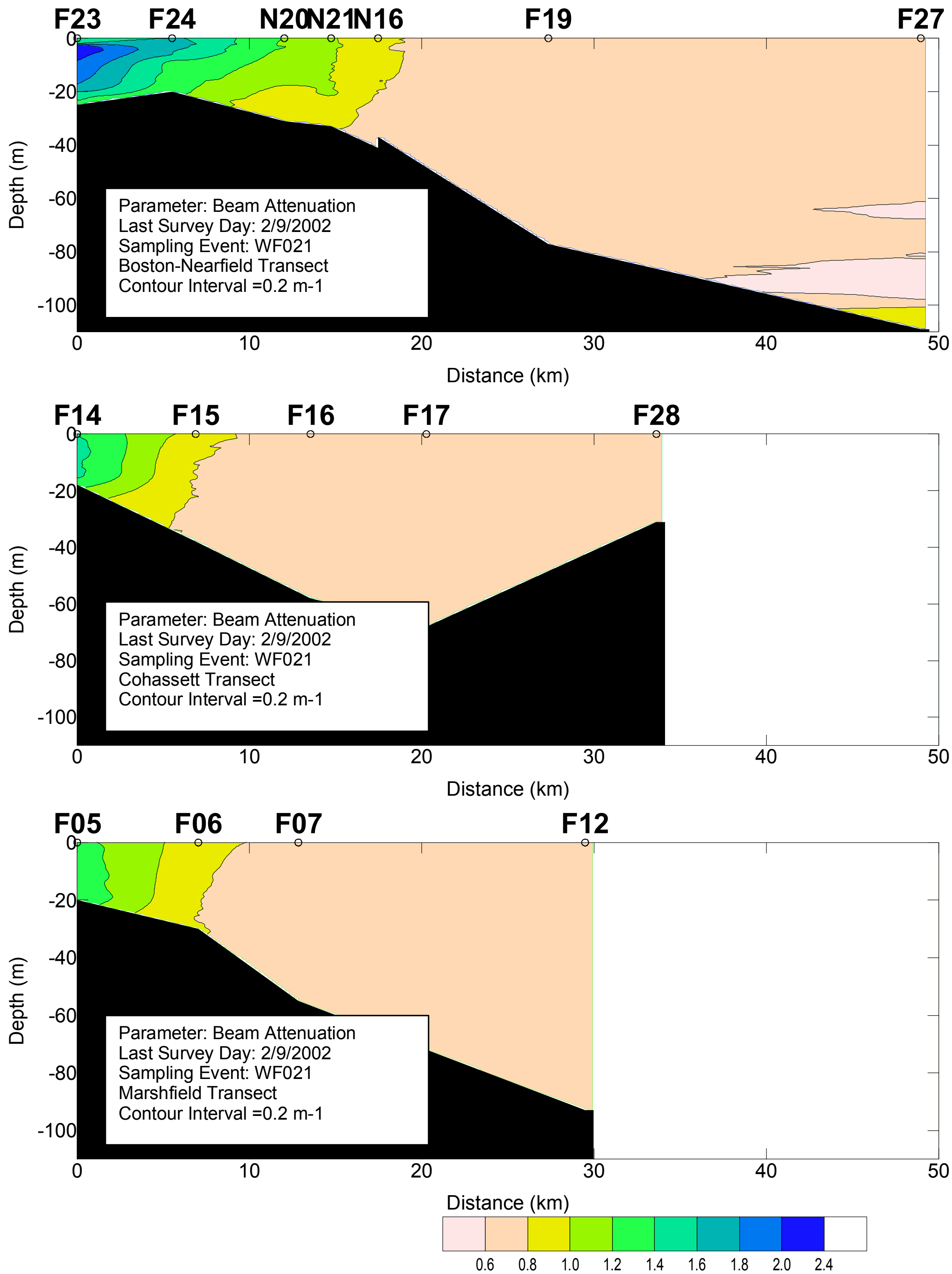


Figure B-25. Beam Attenuation Transect Plots (West - East) for Farfield Survey WF021 (Feb 02)

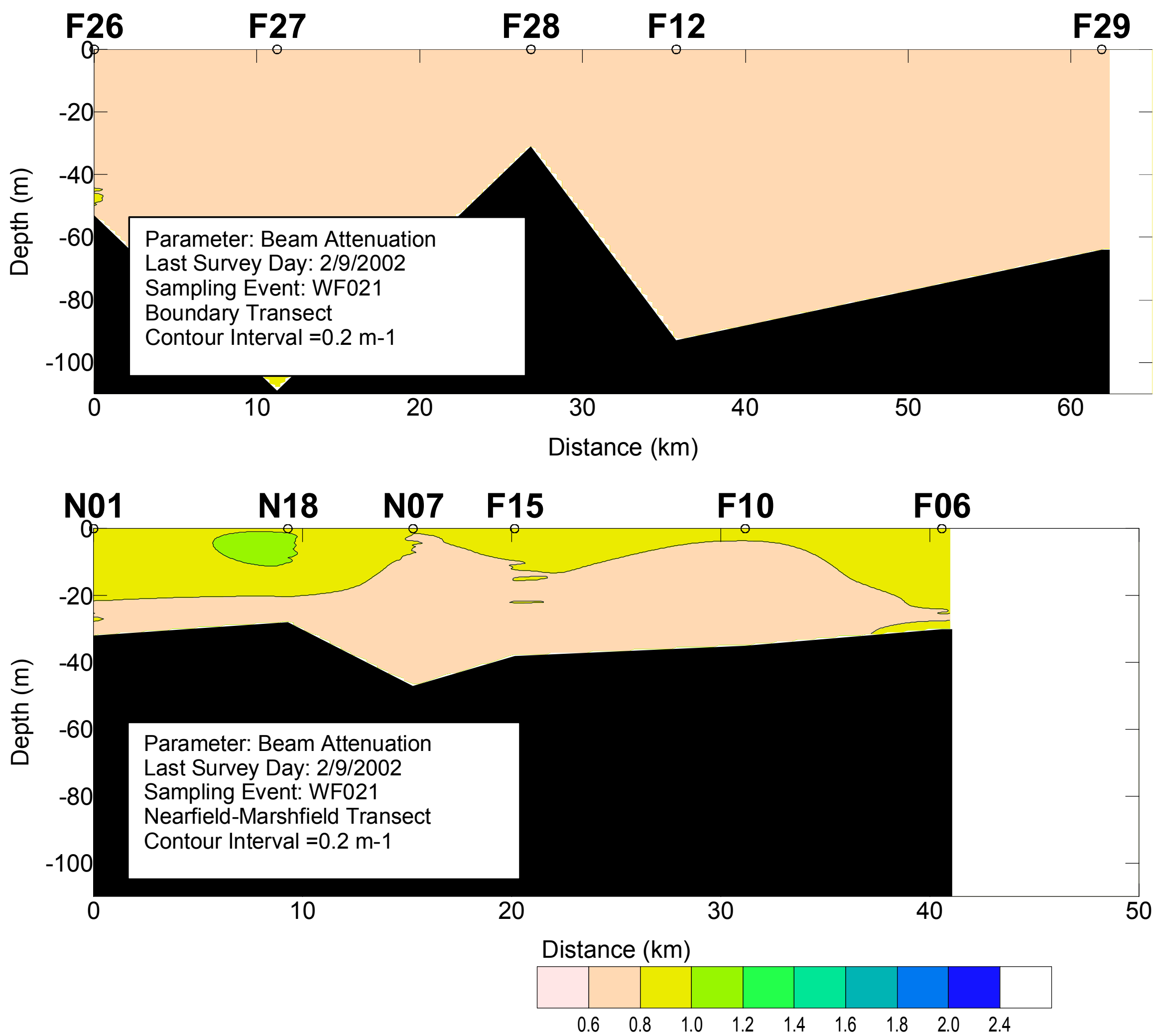


Figure B-26. Beam Attenuation Transect Plots (North - South) for Farfield Survey WF021 (Feb 02)

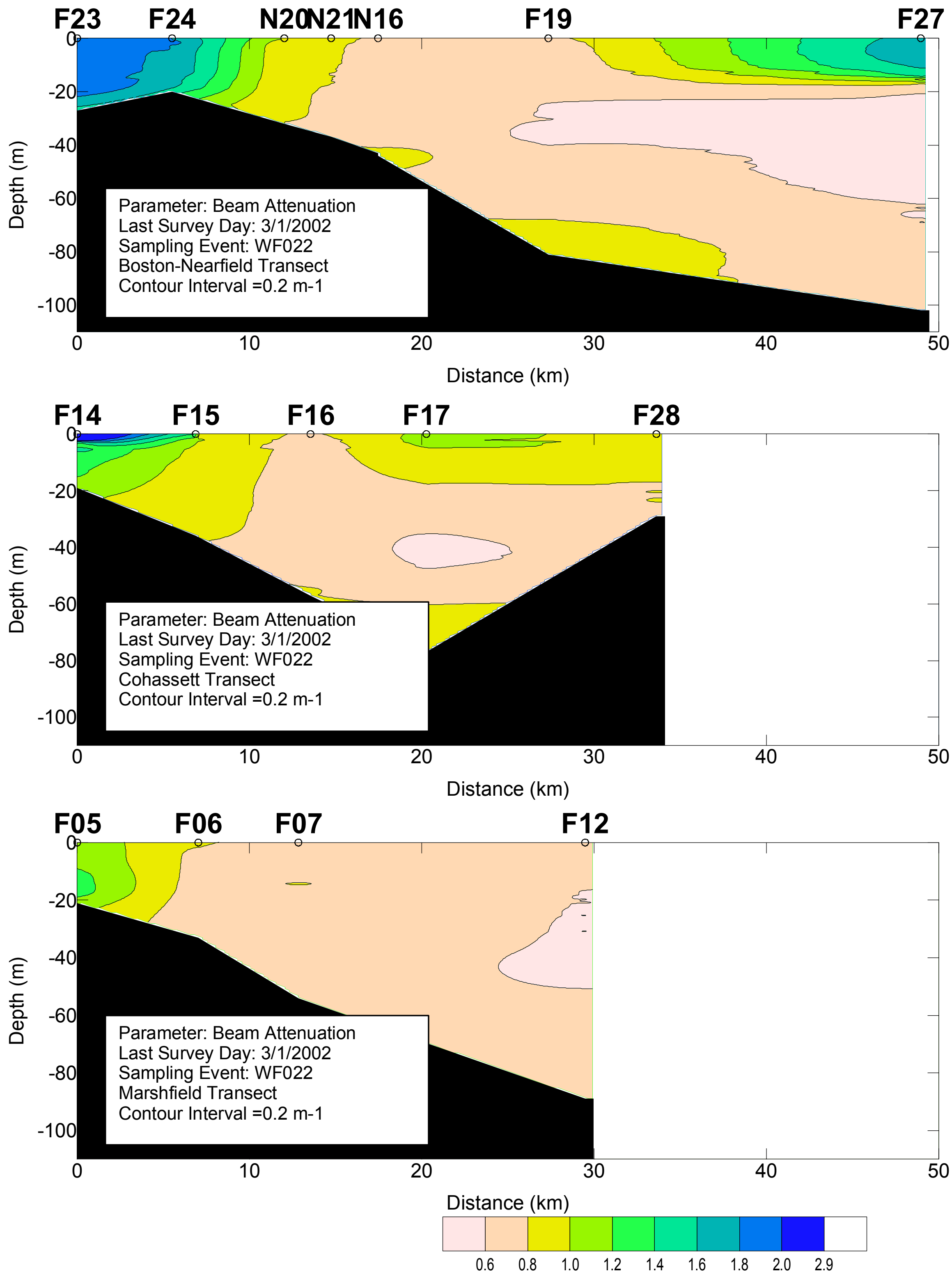


Figure B-27. Beam Attenuation Transect Plots (West - East) for Farfield Survey WF022 (Mar 02)

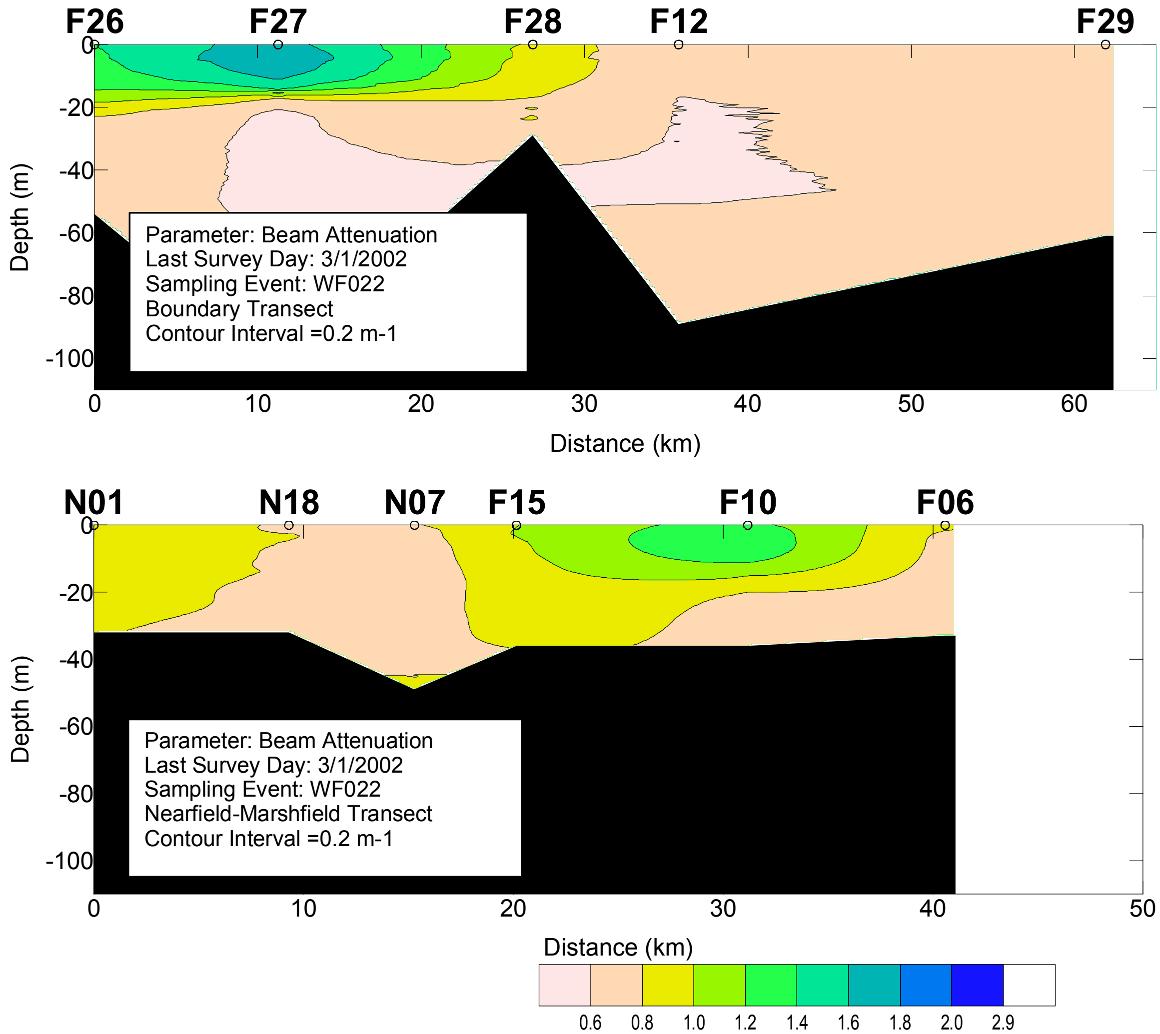


Figure B-28. Beam Attenuation Transect Plots (North - South) for Farfield Survey WF022 (Mar 02)

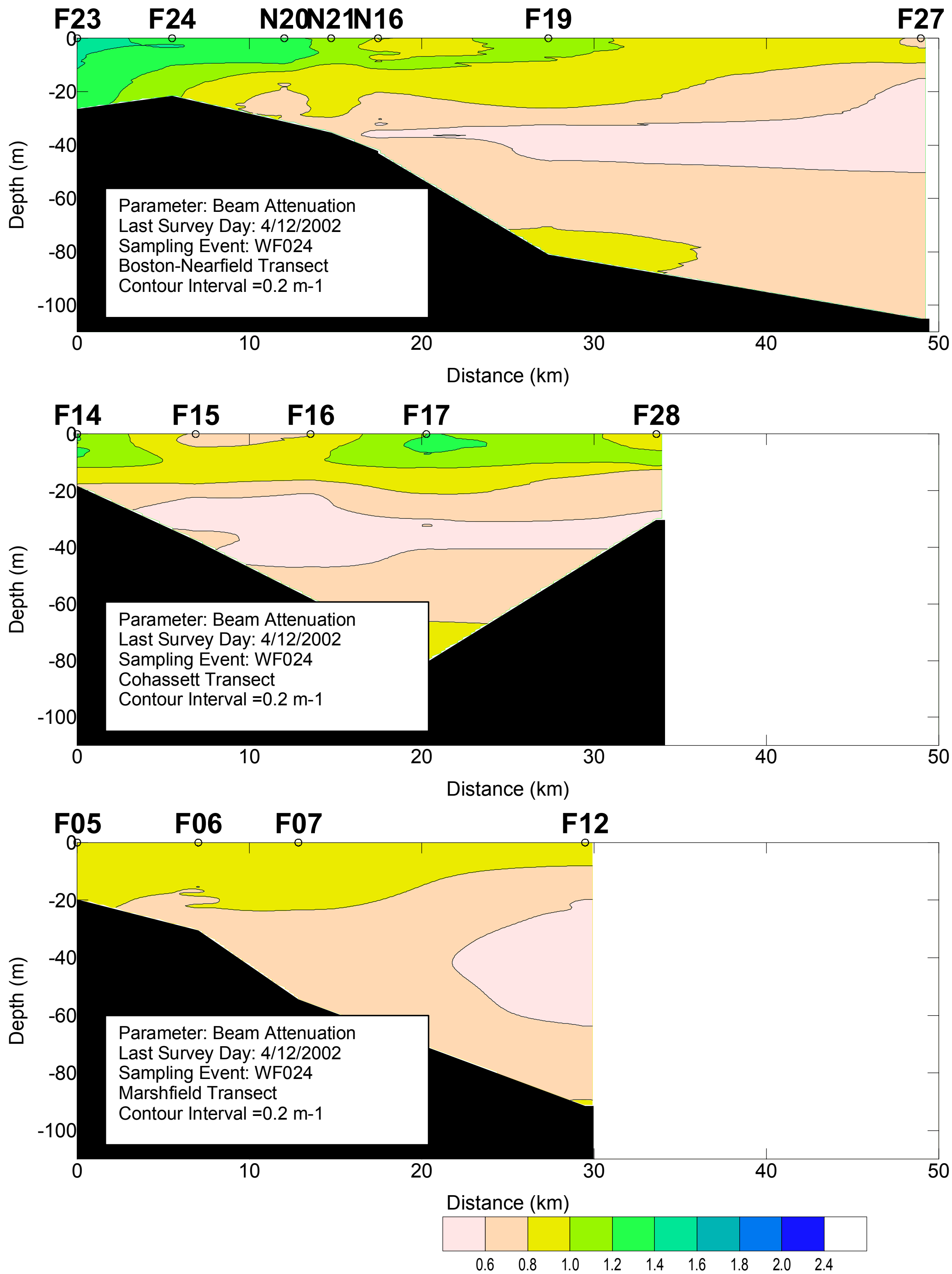


Figure B-29. Beam Attenuation Transect Plots (West - East) for Farfield Survey WF024 (Apr 02)

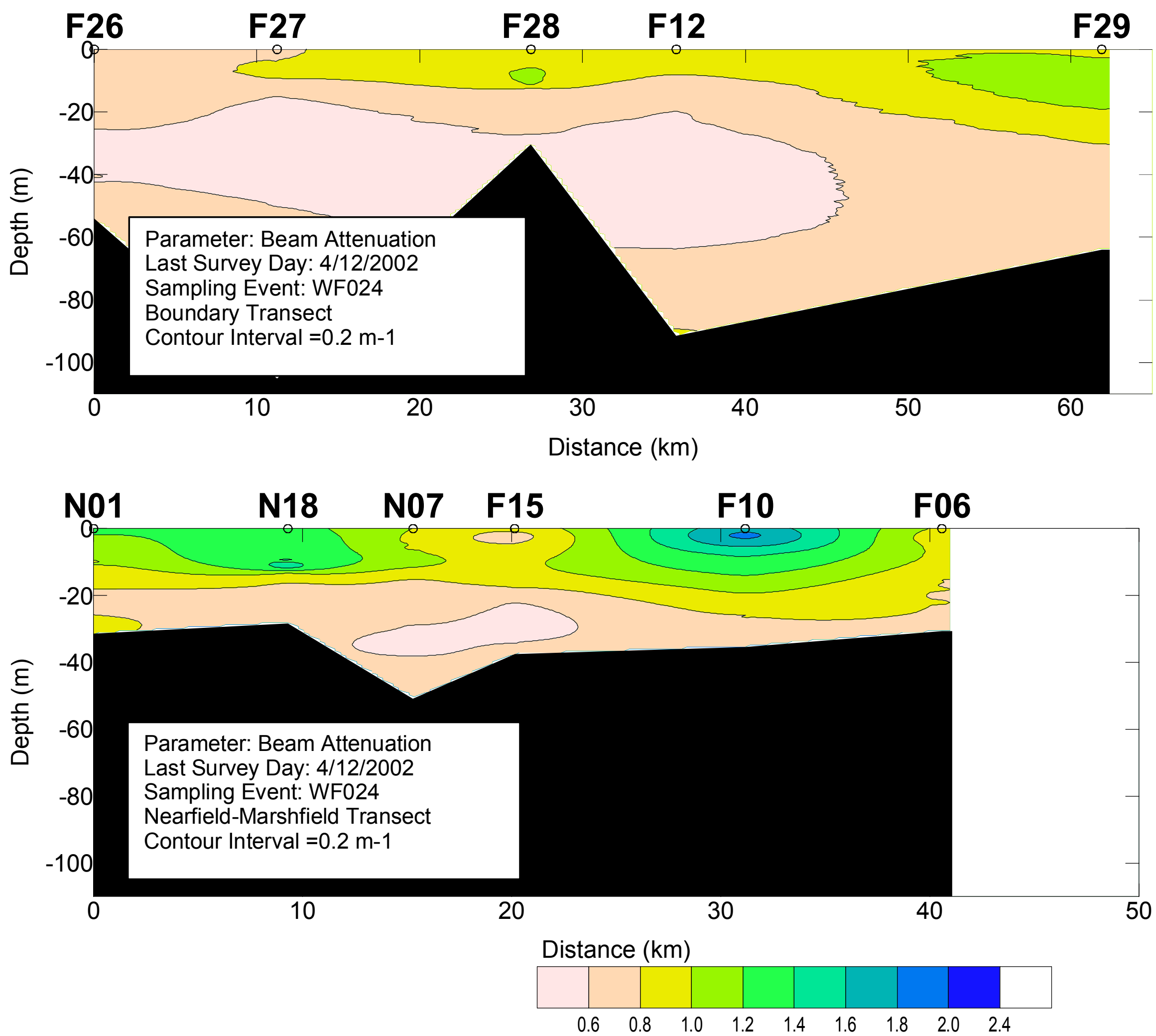


Figure B-30. Beam Attenuation Transect Plots (North - South) for Farfield Survey WF024 (Apr 02)

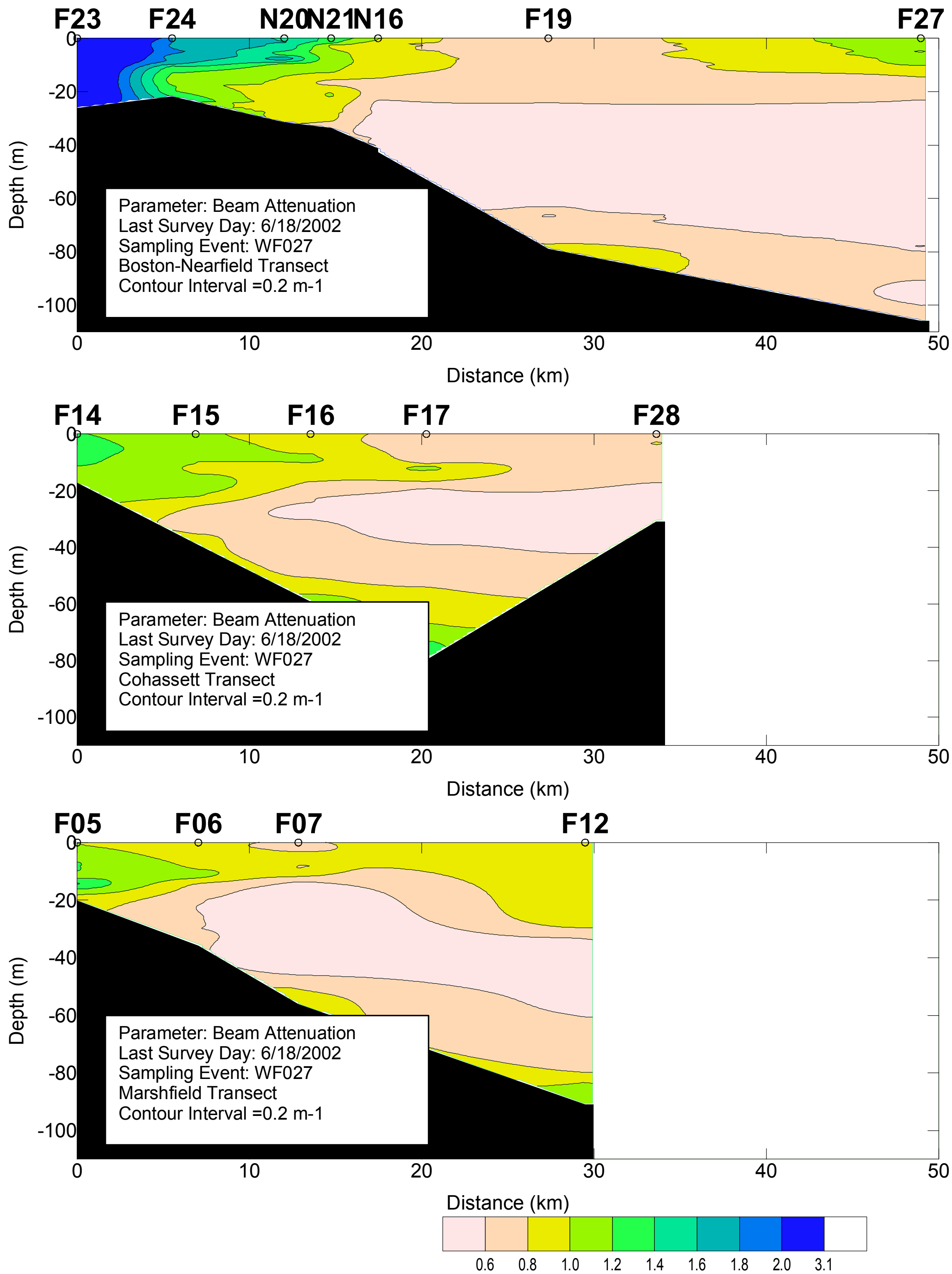
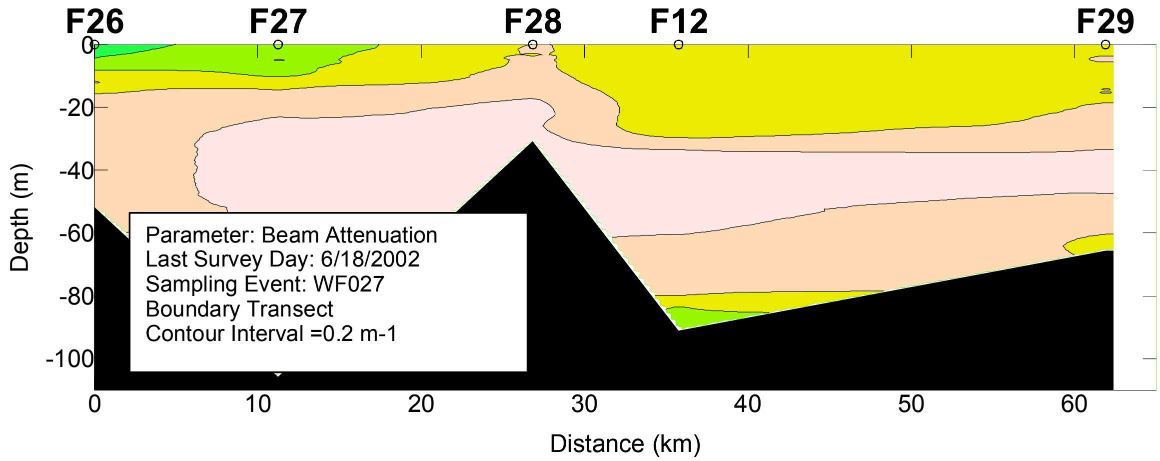


Figure B-31. Beam Attenuation Transect Plots (West - East) for Farfield Survey WF027 (Jun 02)



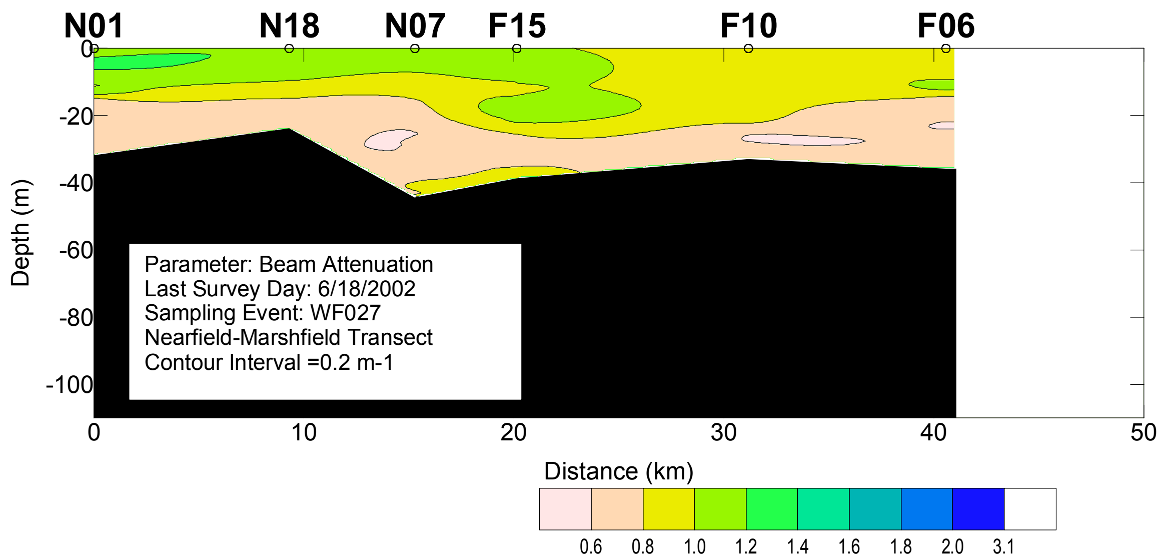


Figure B-32. Beam Attenuation Transect Plots (North - South) for Farfield Survey WF027 (Jun 02)

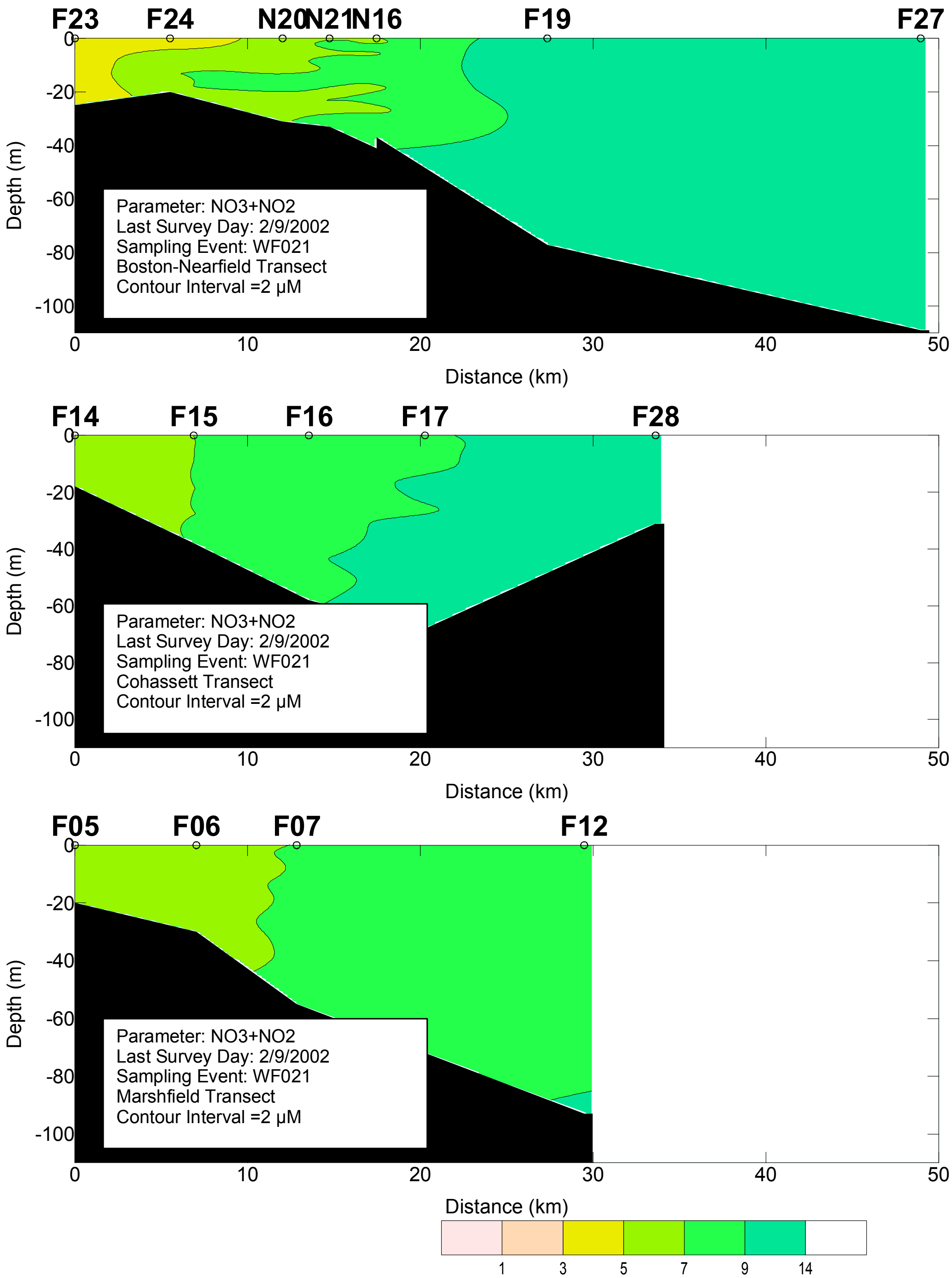


Figure B-33. Nitrate Plus Nitrite Transect Plots (West - East) for Farfield Survey WF021 (Feb 02)

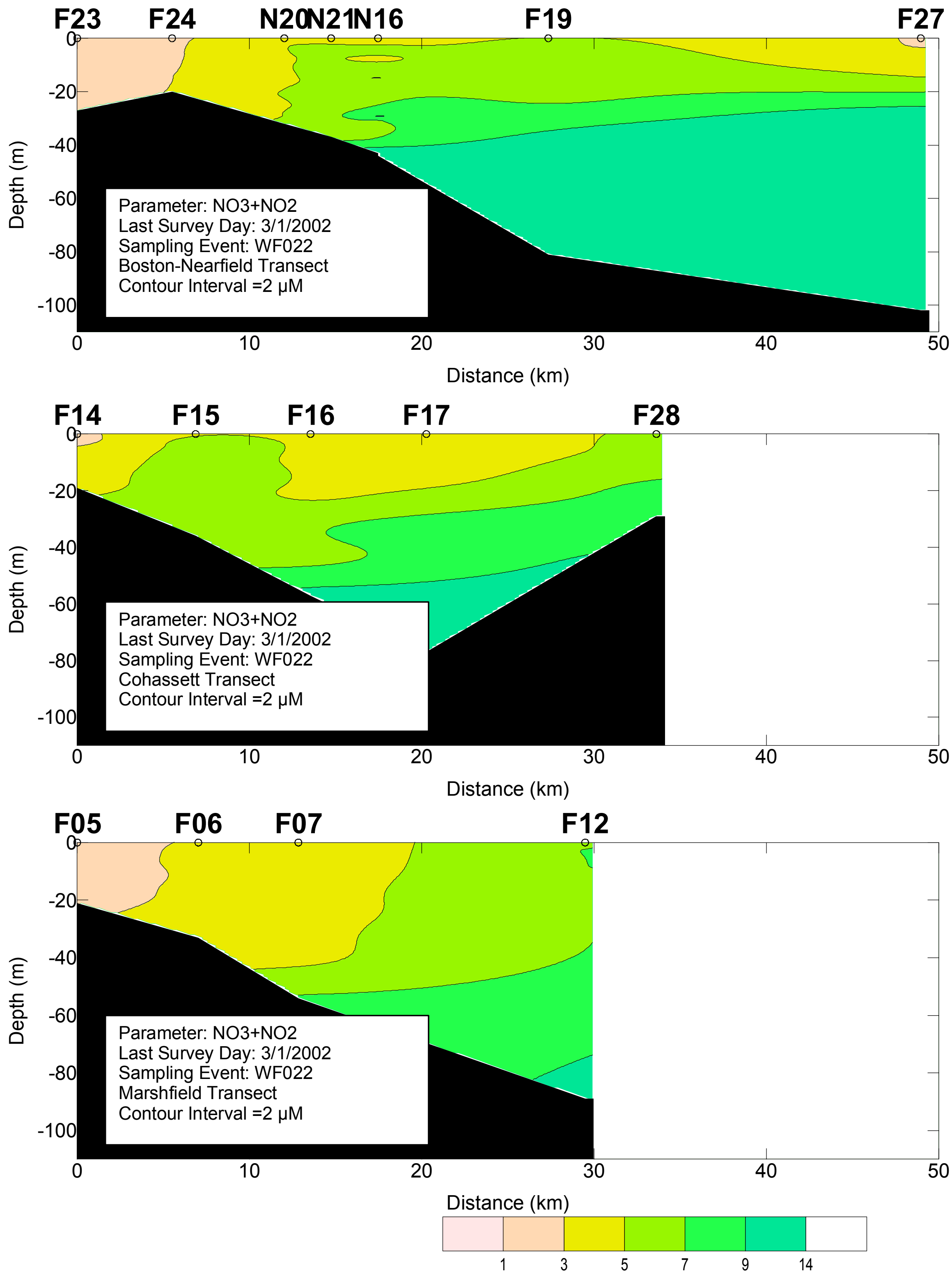


Figure B-34. Nitrate Plus Nitrite Transect Plots (West - East) for Farfield Survey WF022 (Mar 02)

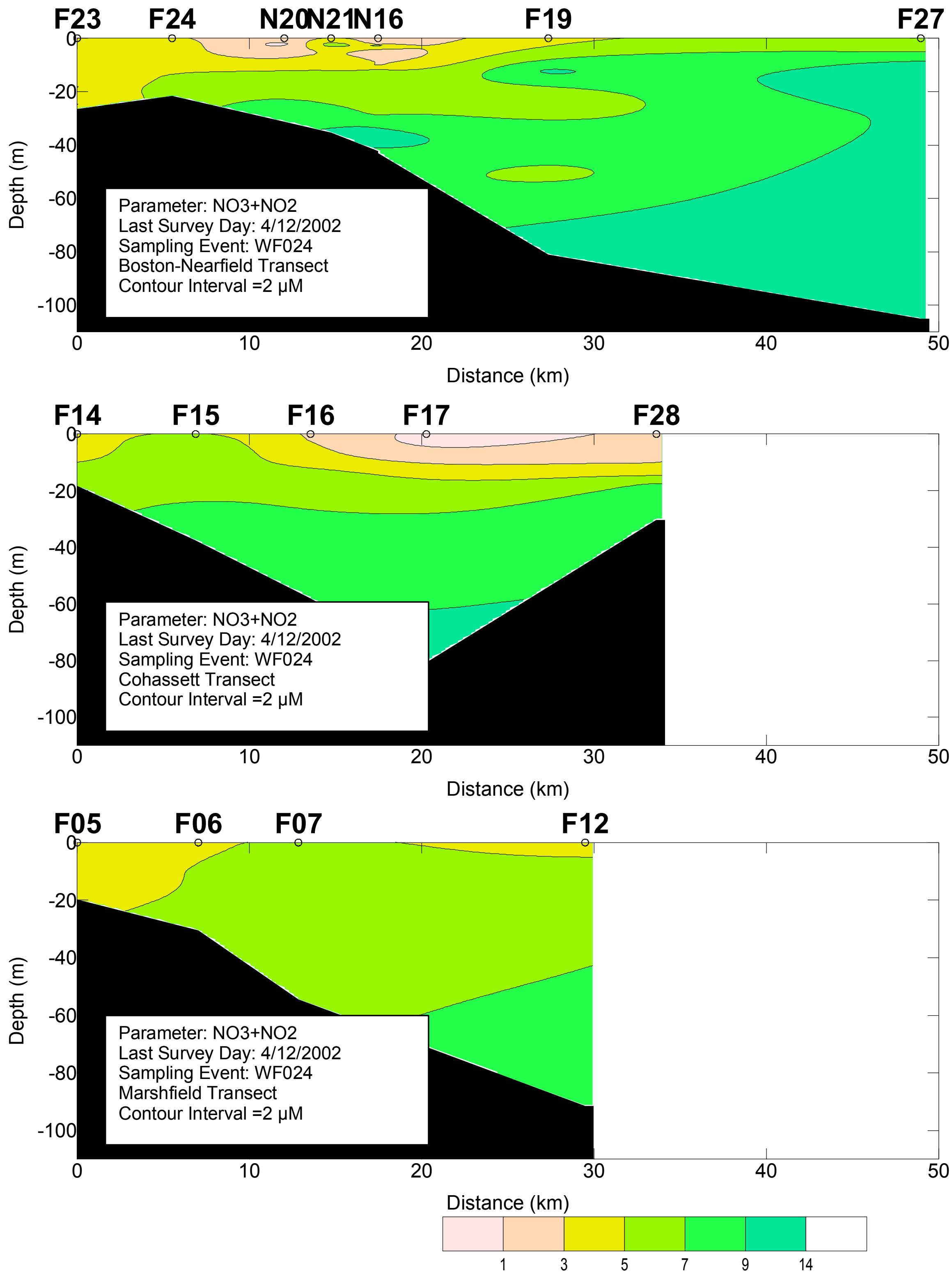


Figure B-35. Nitrate Plus Nitrite Transect Plots (West - East) for Farfield Survey WF024 (Apr 02)

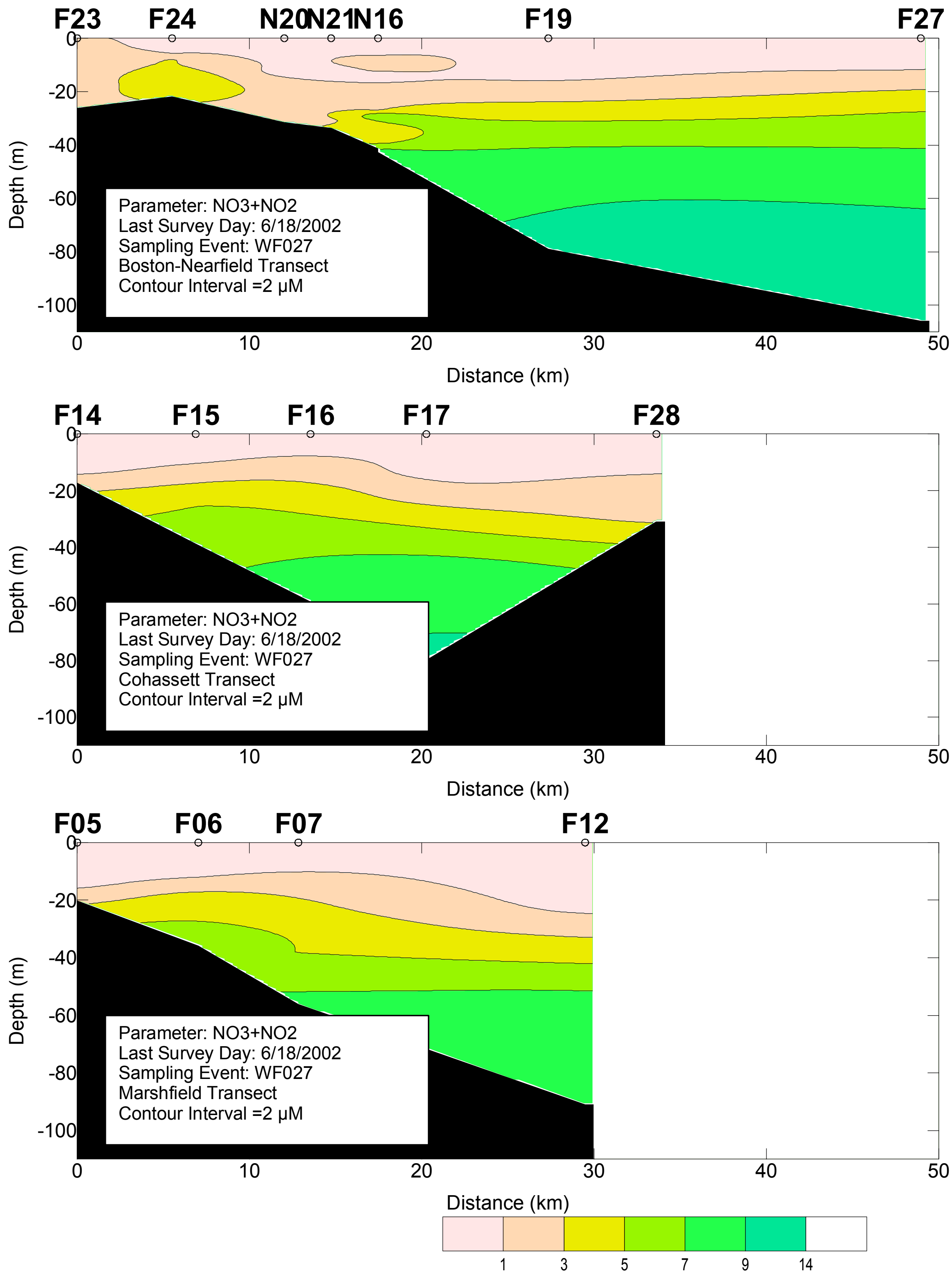


Figure B-36. Nitrate Plus Nitrite Transect Plots (West - East) for Farfield Survey WF027 (Jun 02)

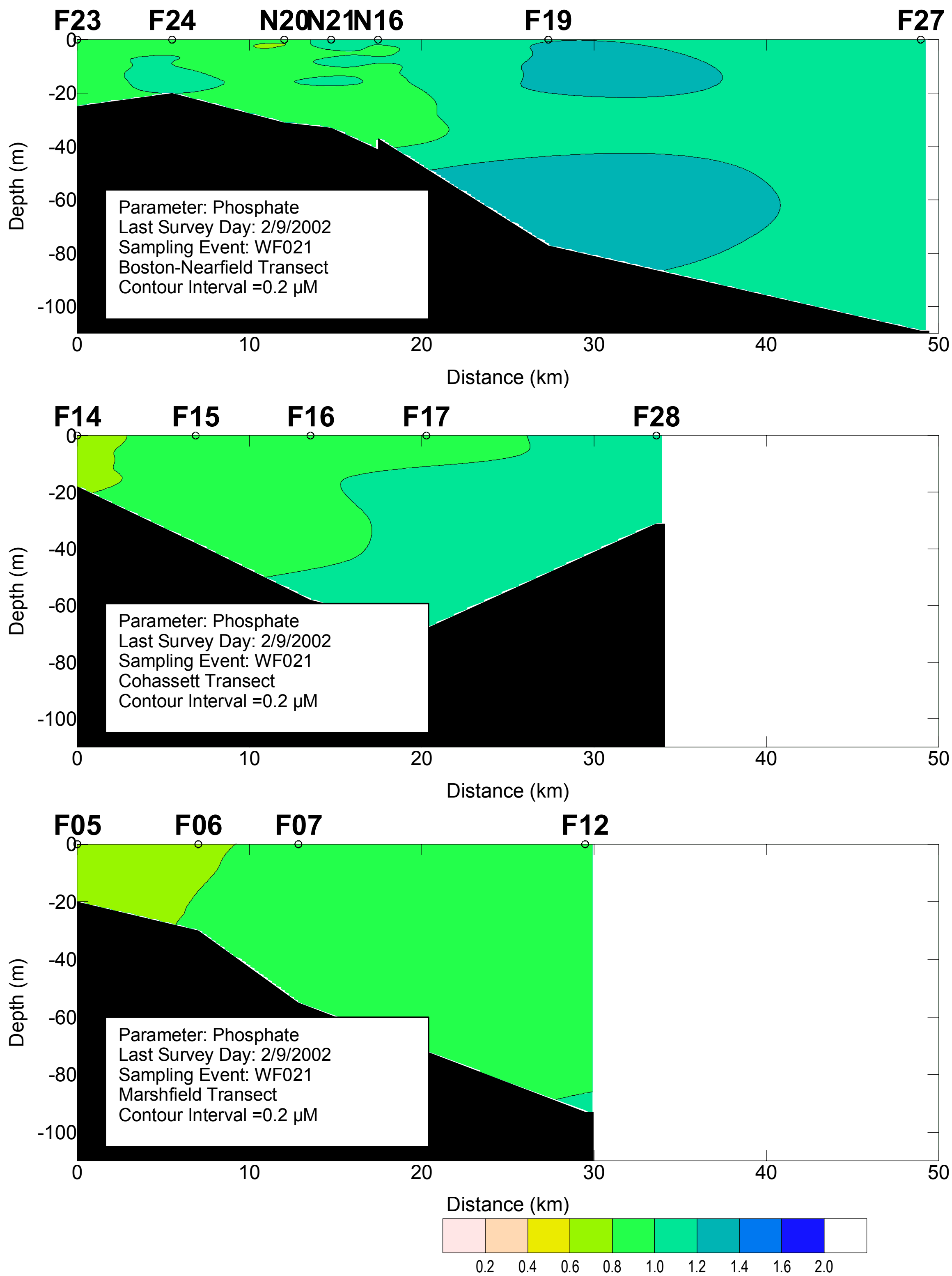


Figure B-37. Phosphate Transect Plots (West - East) for Farfield Survey WF021 (Feb 02)

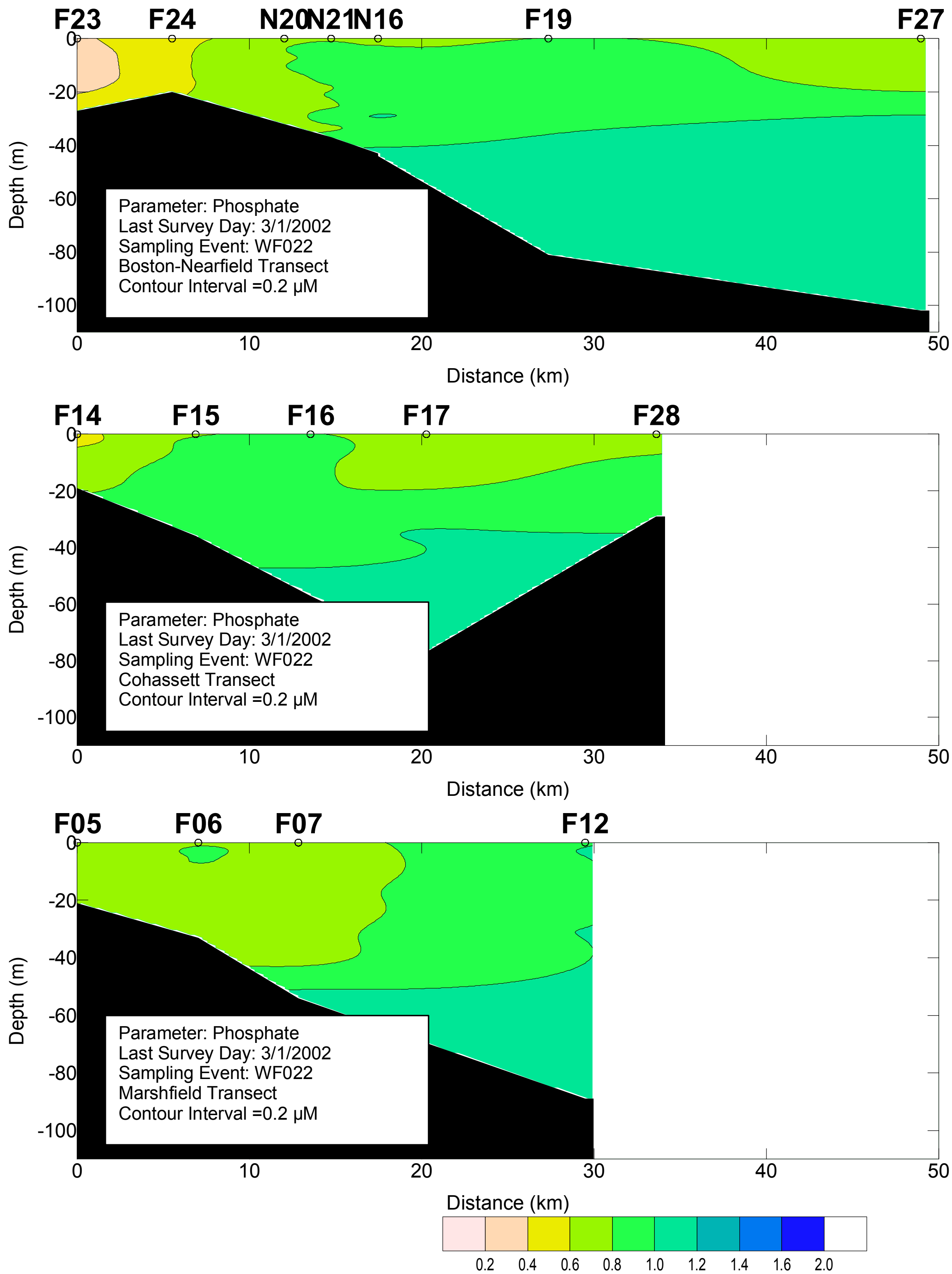


Figure B-38. Phosphate Transect Plots (West - East) for Farfield Survey WF022 (Mar 02)

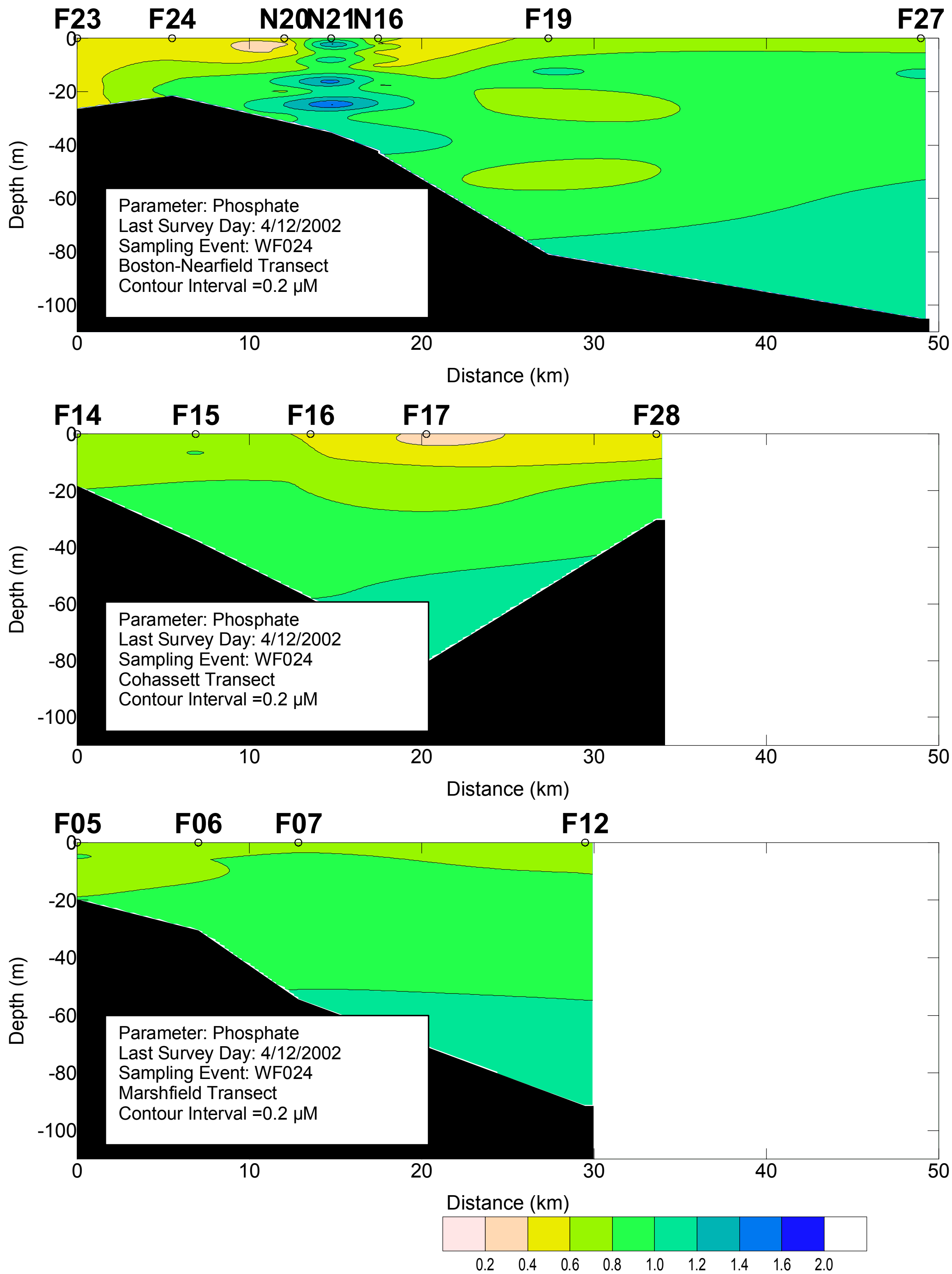


Figure B-39. Phosphate Transect Plots (West - East) for Farfield Survey WF024 (Apr 02)

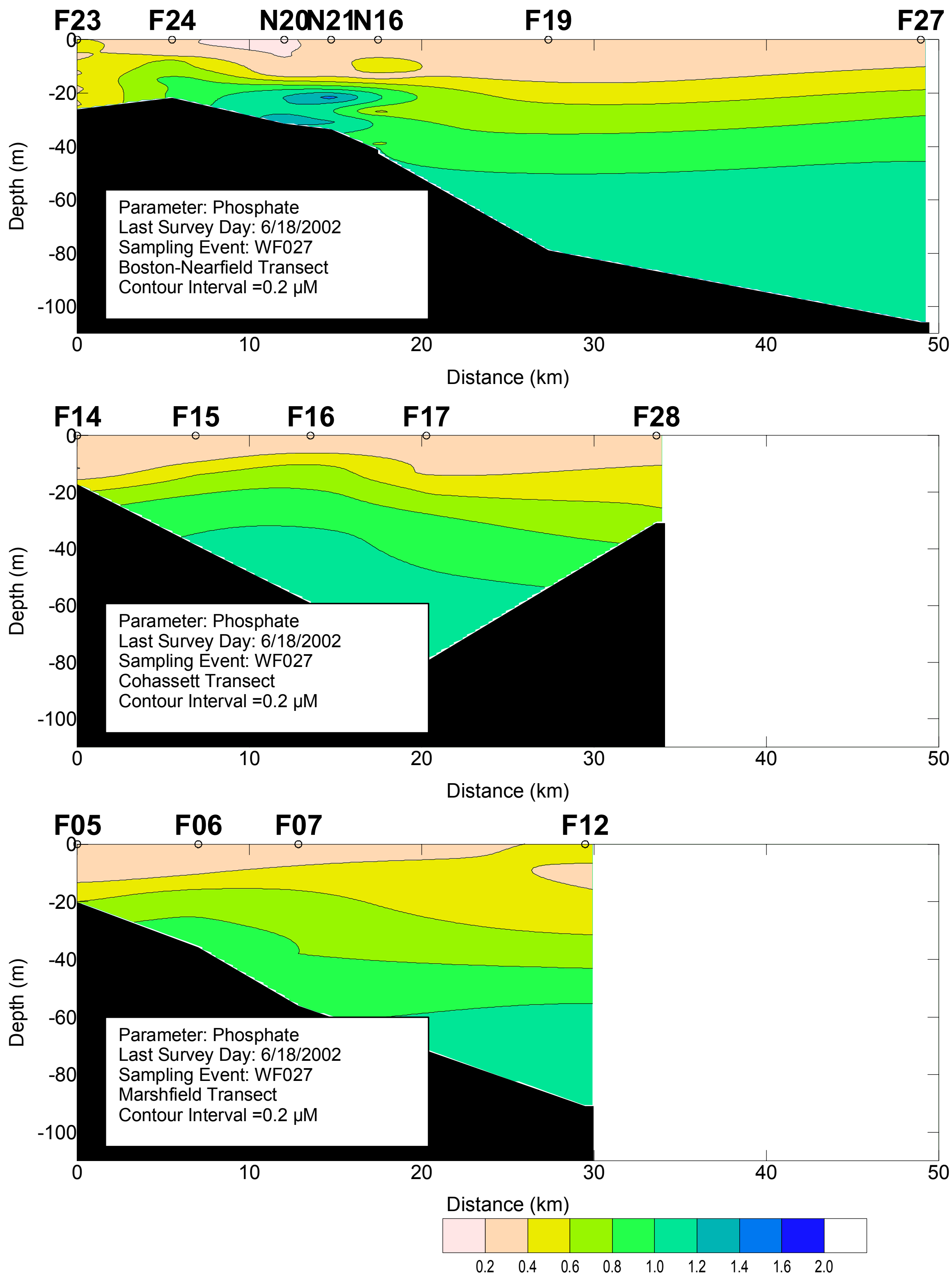


Figure B-40. Phosphate Transect Plots (West - East) for Farfield Survey WF027 (Jun 02)

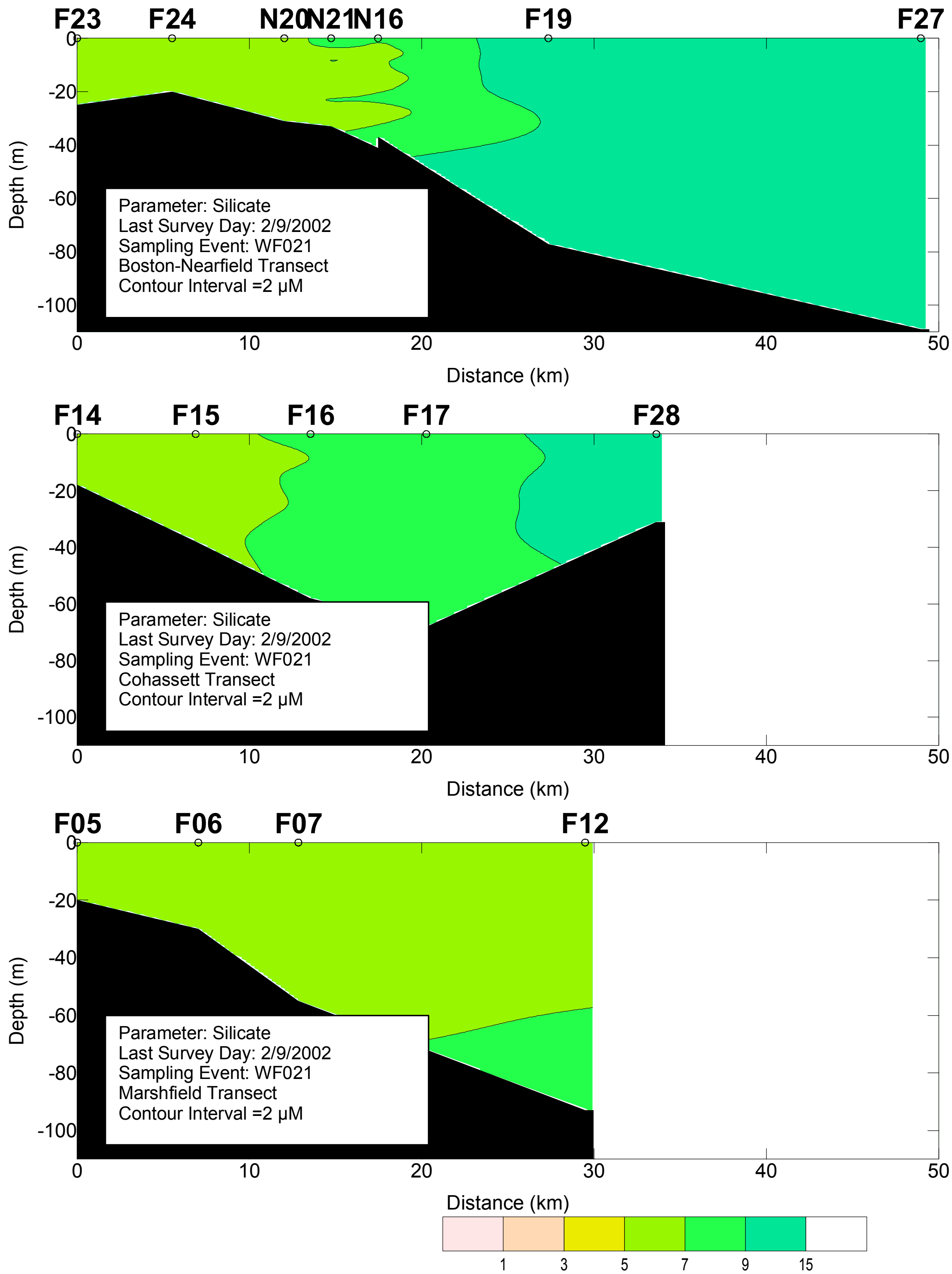


Figure B-41. Silicate Transect Plots (West - East) for Farfield Survey WF021 (Feb 02)

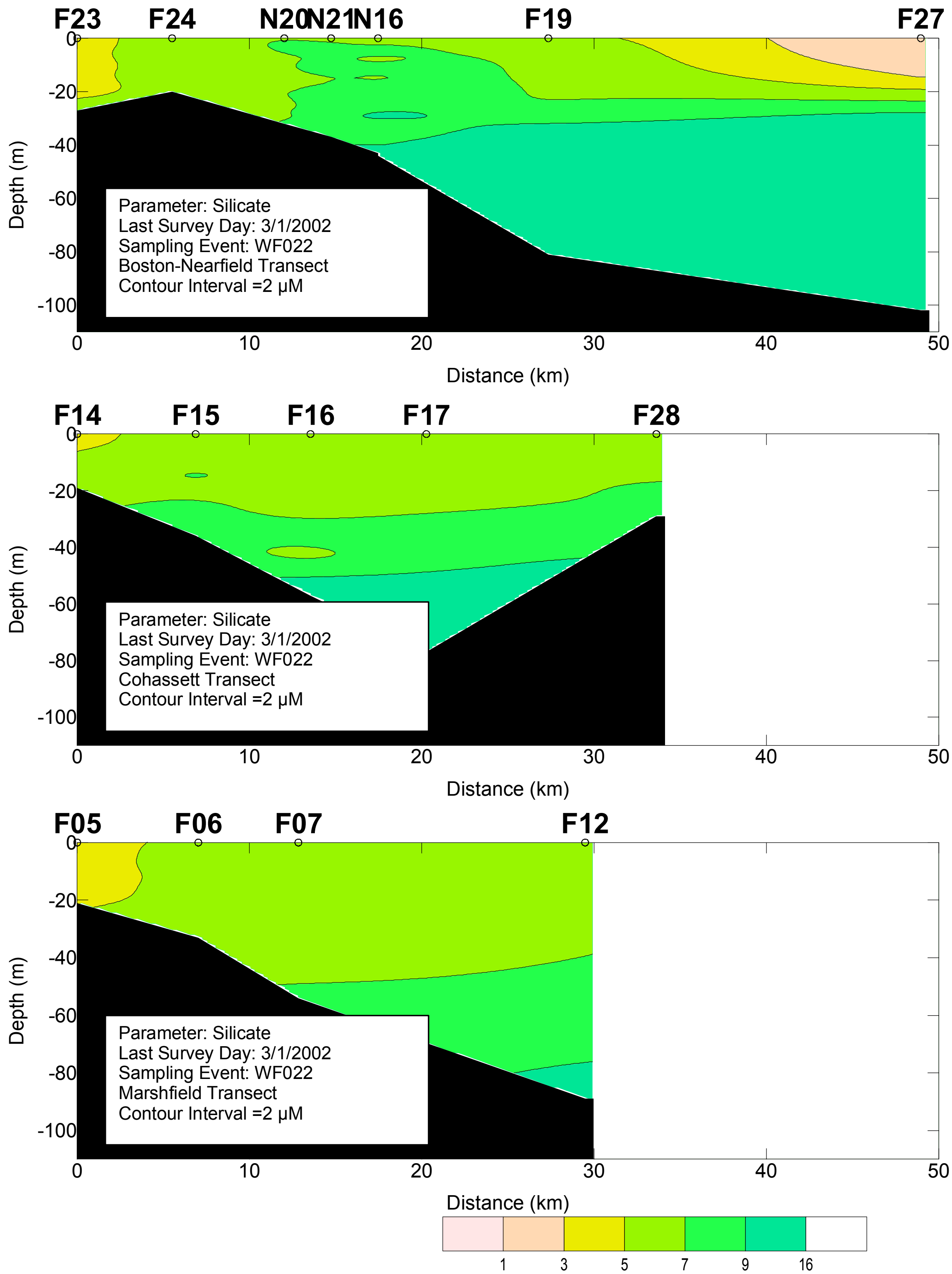


Figure B-42. Silicate Transect Plots (West - East) for Farfield Survey WF022 (Mar 02)

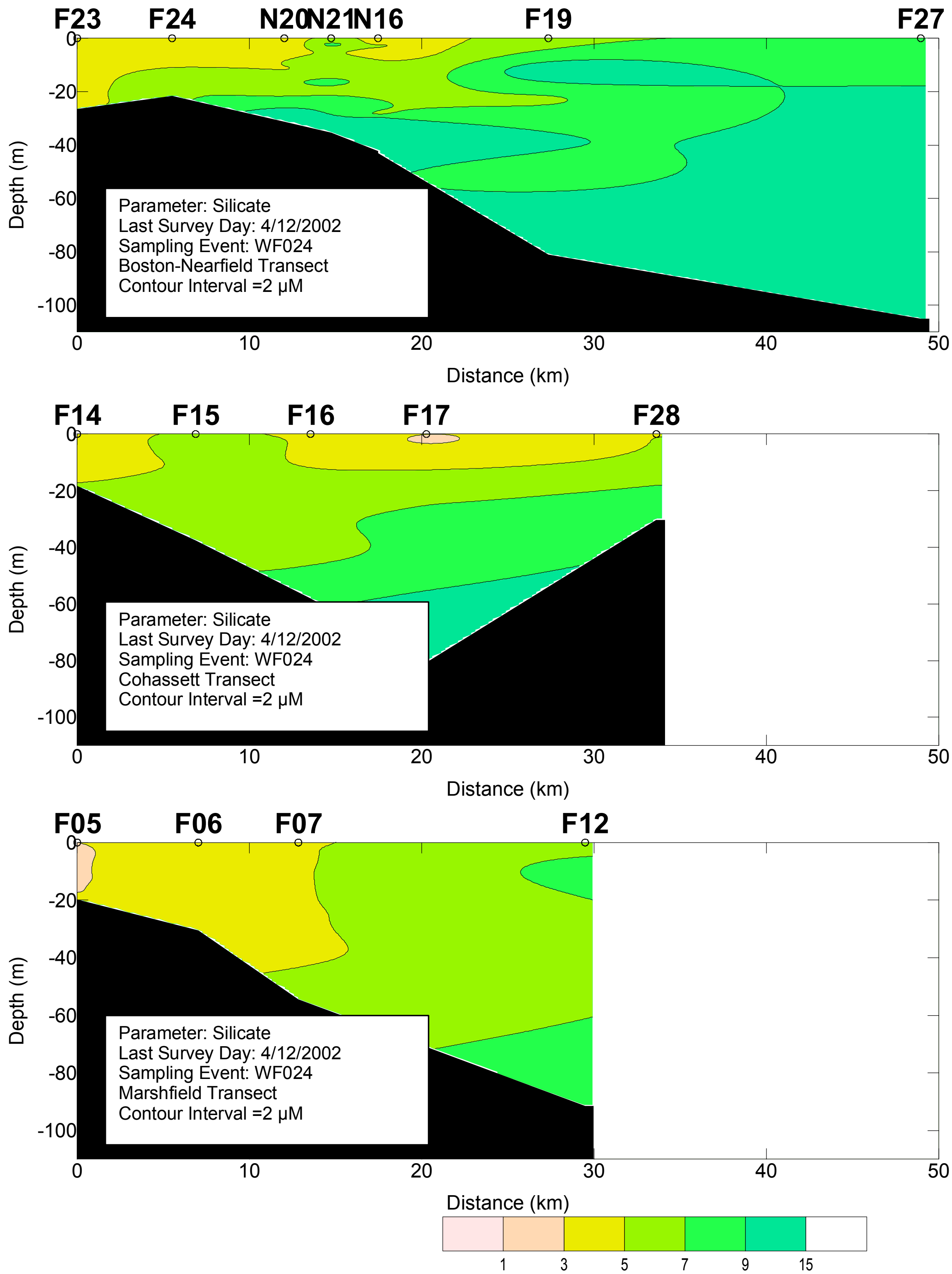


Figure B-43. Silicate Transect Plots (West - East) for Farfield Survey WF024 (Apr 02)

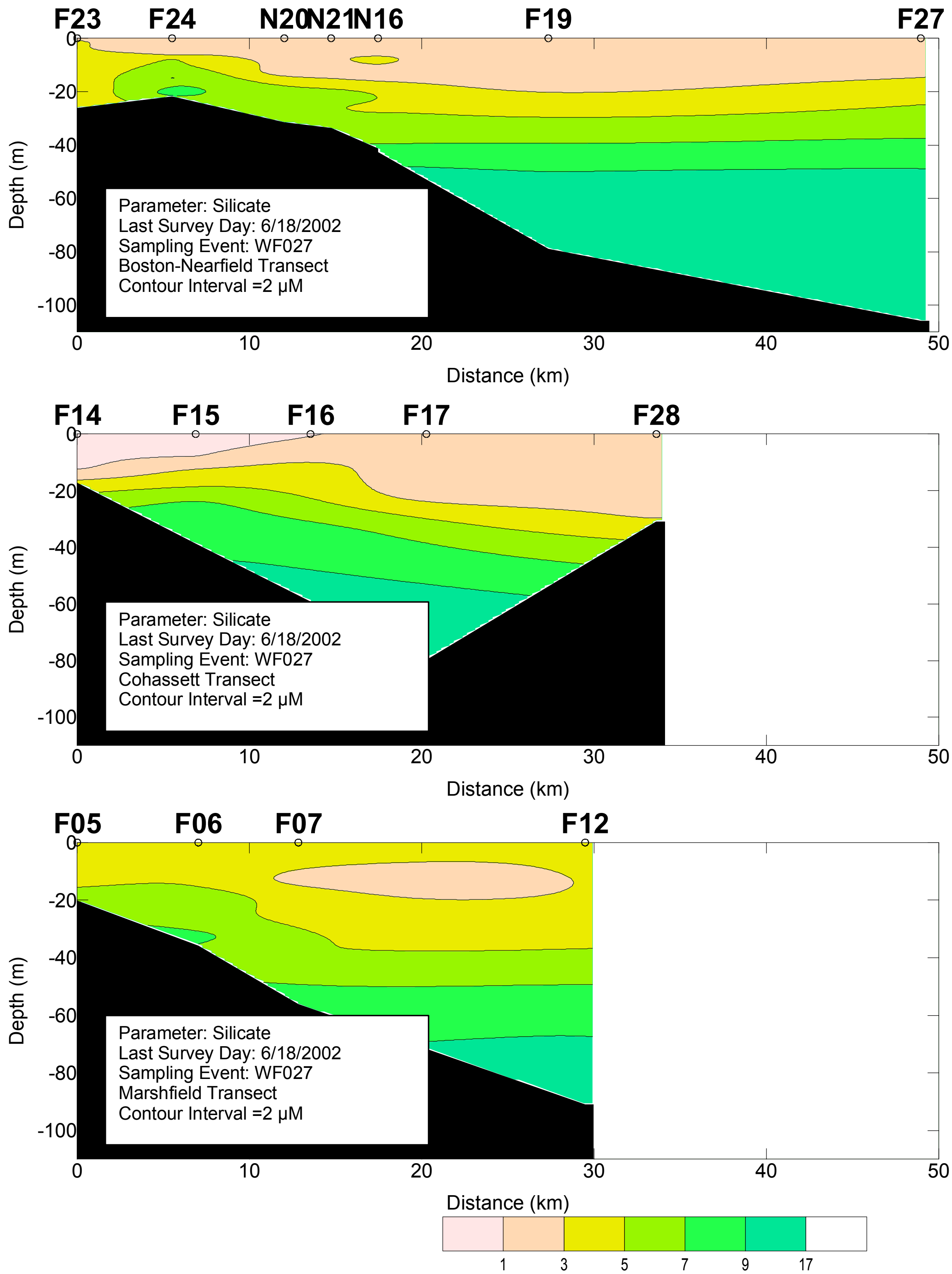


Figure B-44. Silicate Transect Plots (West - East) for Farfield Survey WF027 (Jun 02)

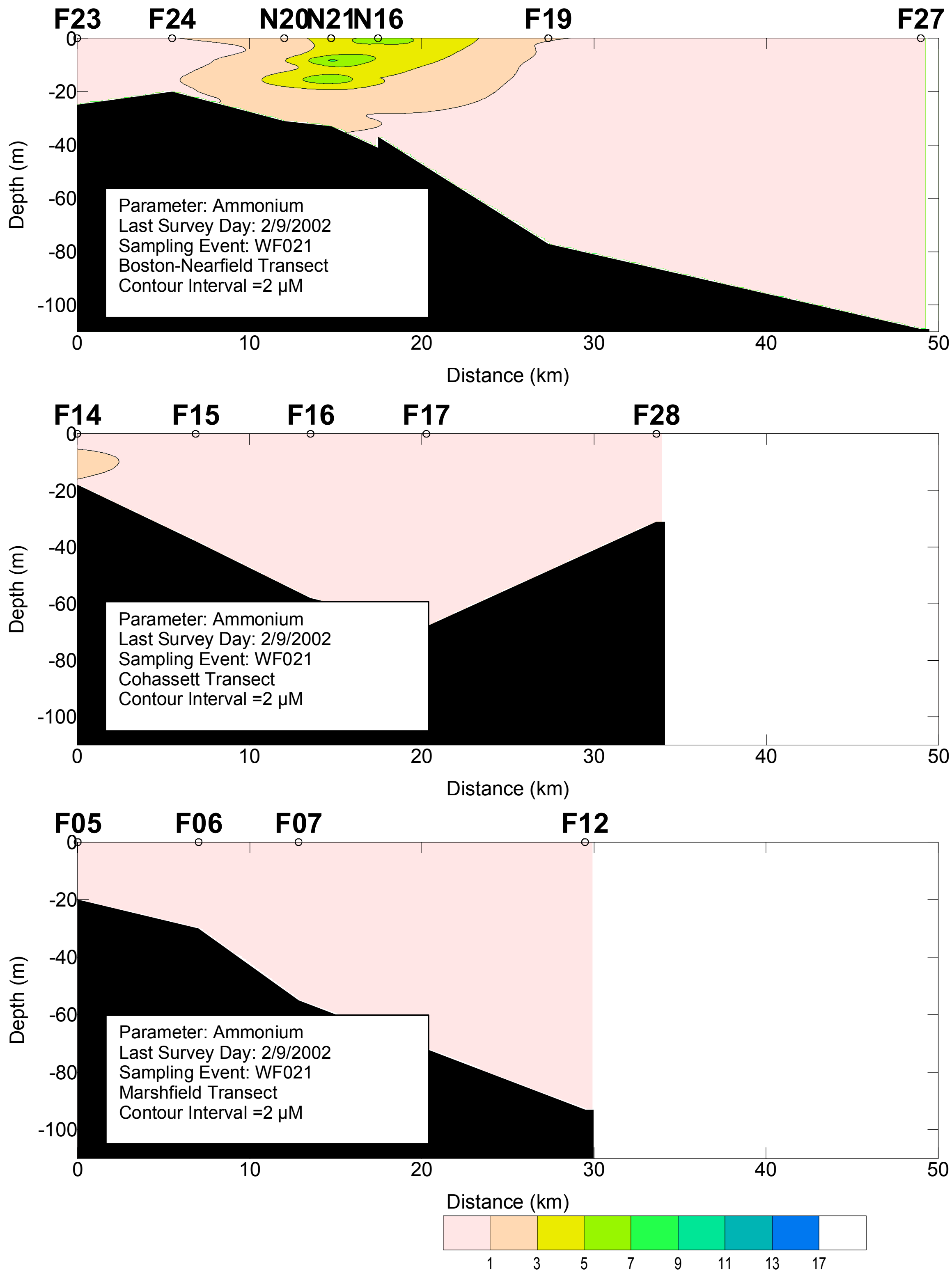


Figure B-45. Ammonium Transect Plots (West - East) for Farfield Survey WF021 (Feb 02)

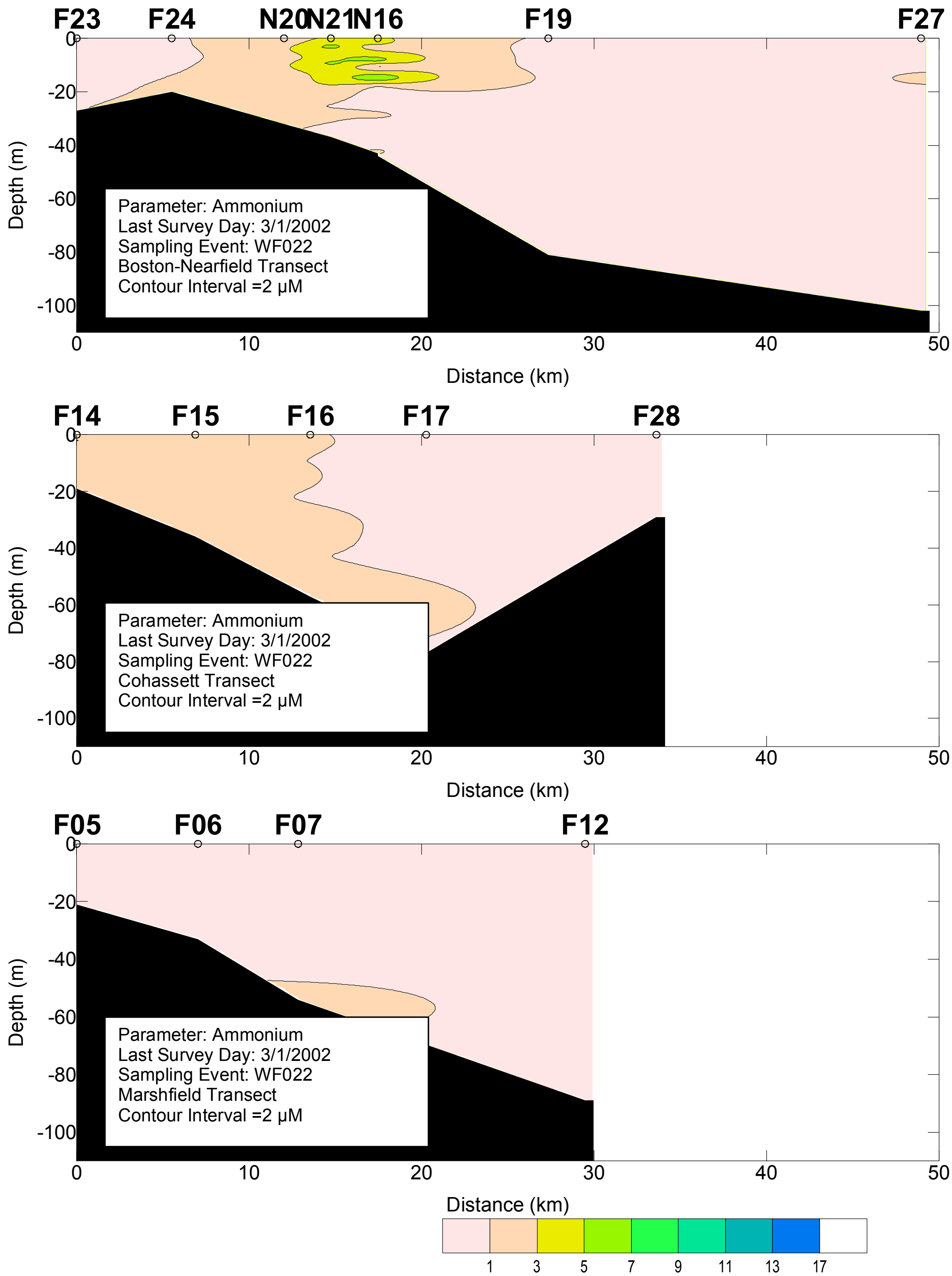


Figure B-46. Ammonium Transect Plots (West - East) for Farfield Survey WF022 (Mar 02)

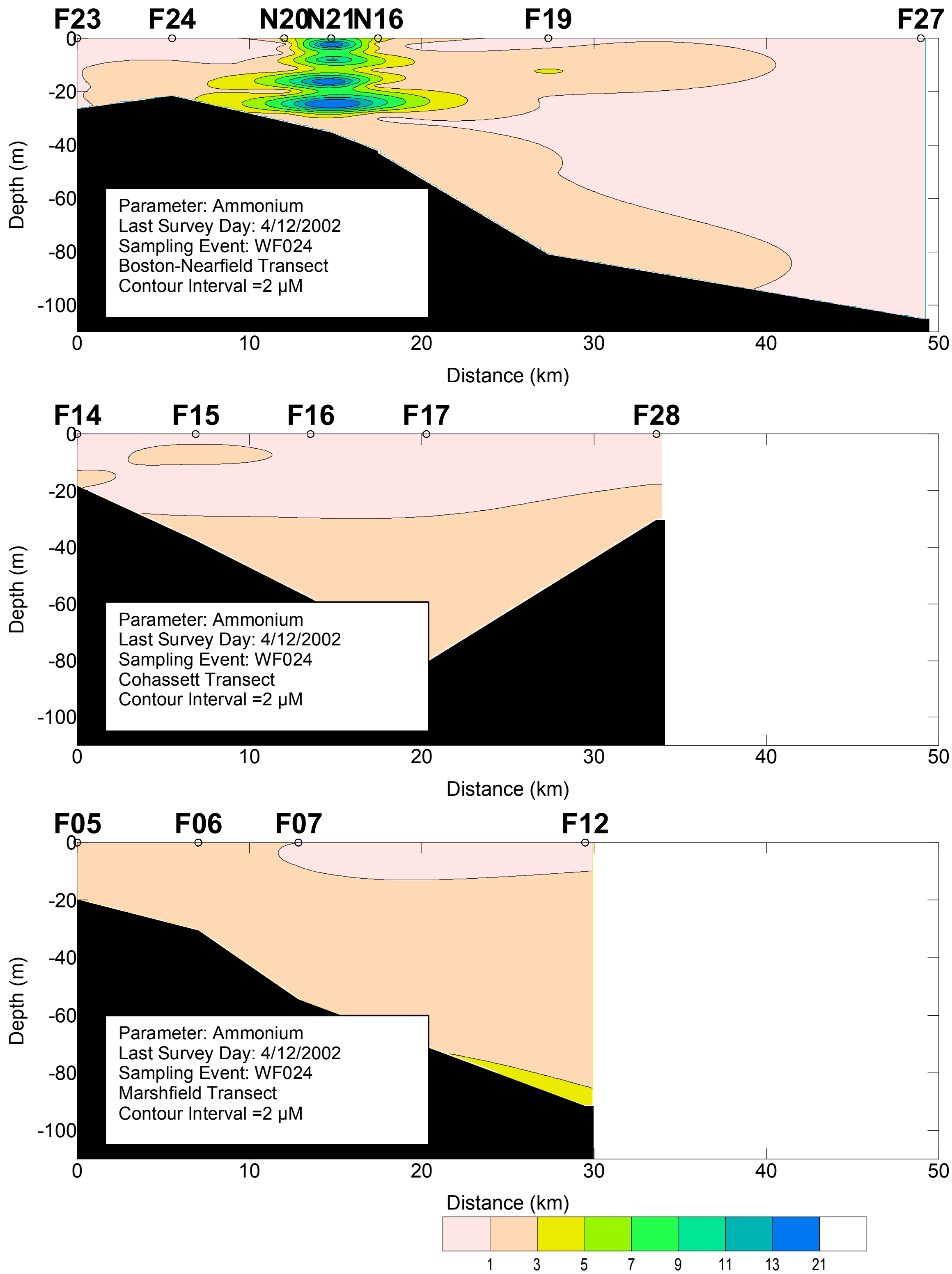


Figure B-47. Ammonium Transect Plots (West - East) for Farfield Survey WF024 (Apr 02)

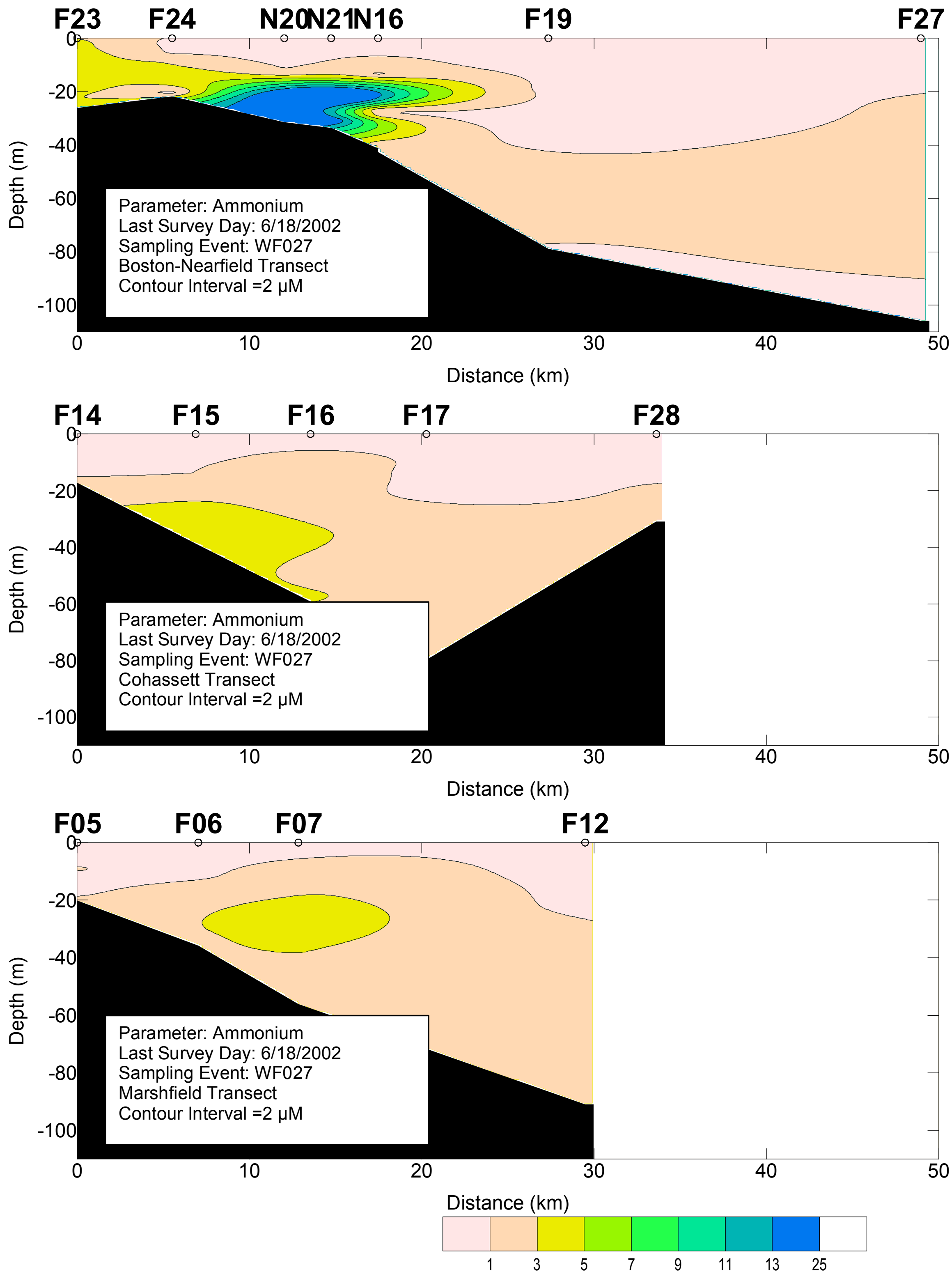


Figure B-48. Ammonium Transect Plots (West - East) for Farfield Survey WF027 (Jun 02)

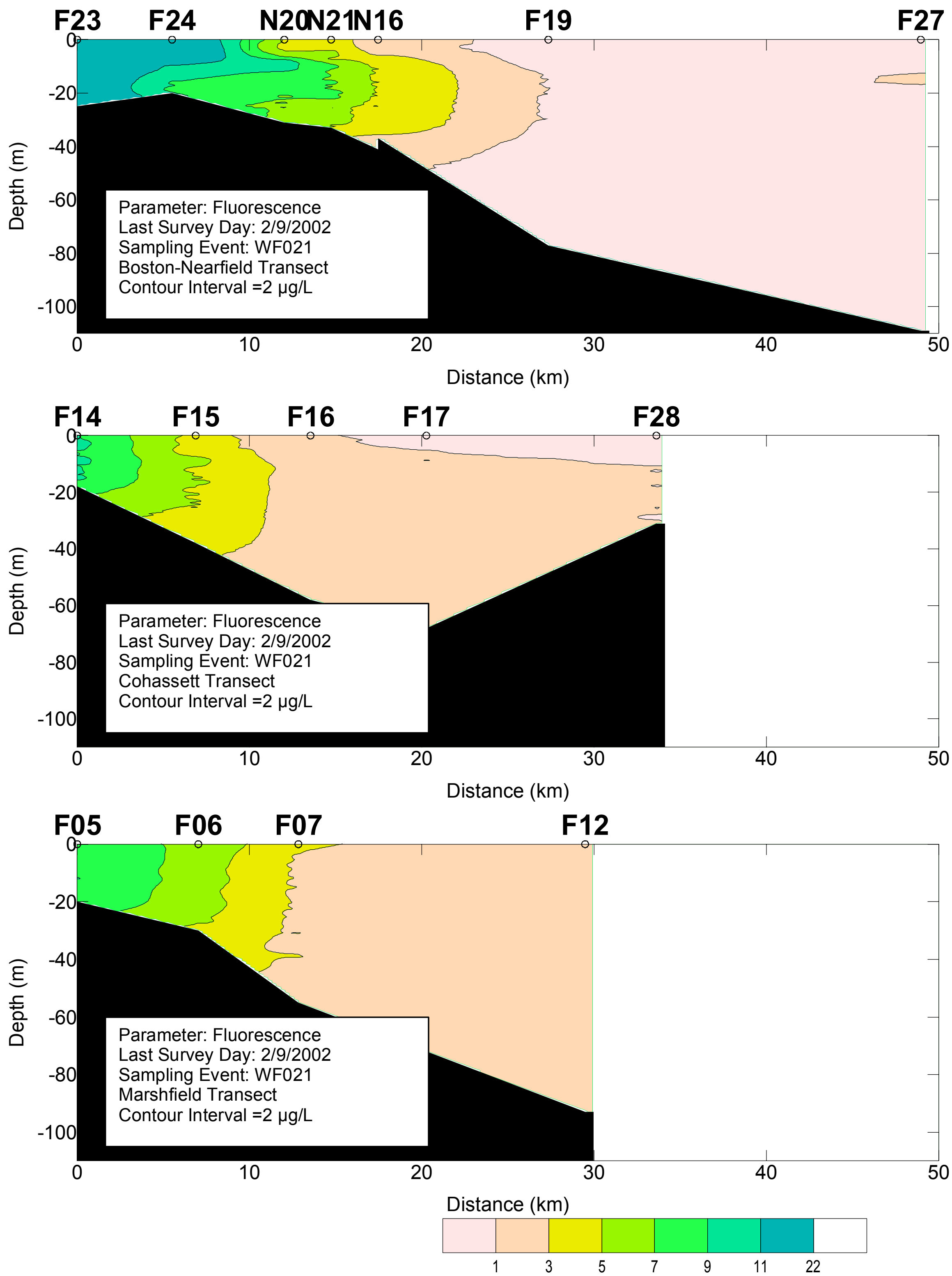


Figure B-49. Fluorescence Transect Plots for Farfield Survey WF021 (Feb 02)

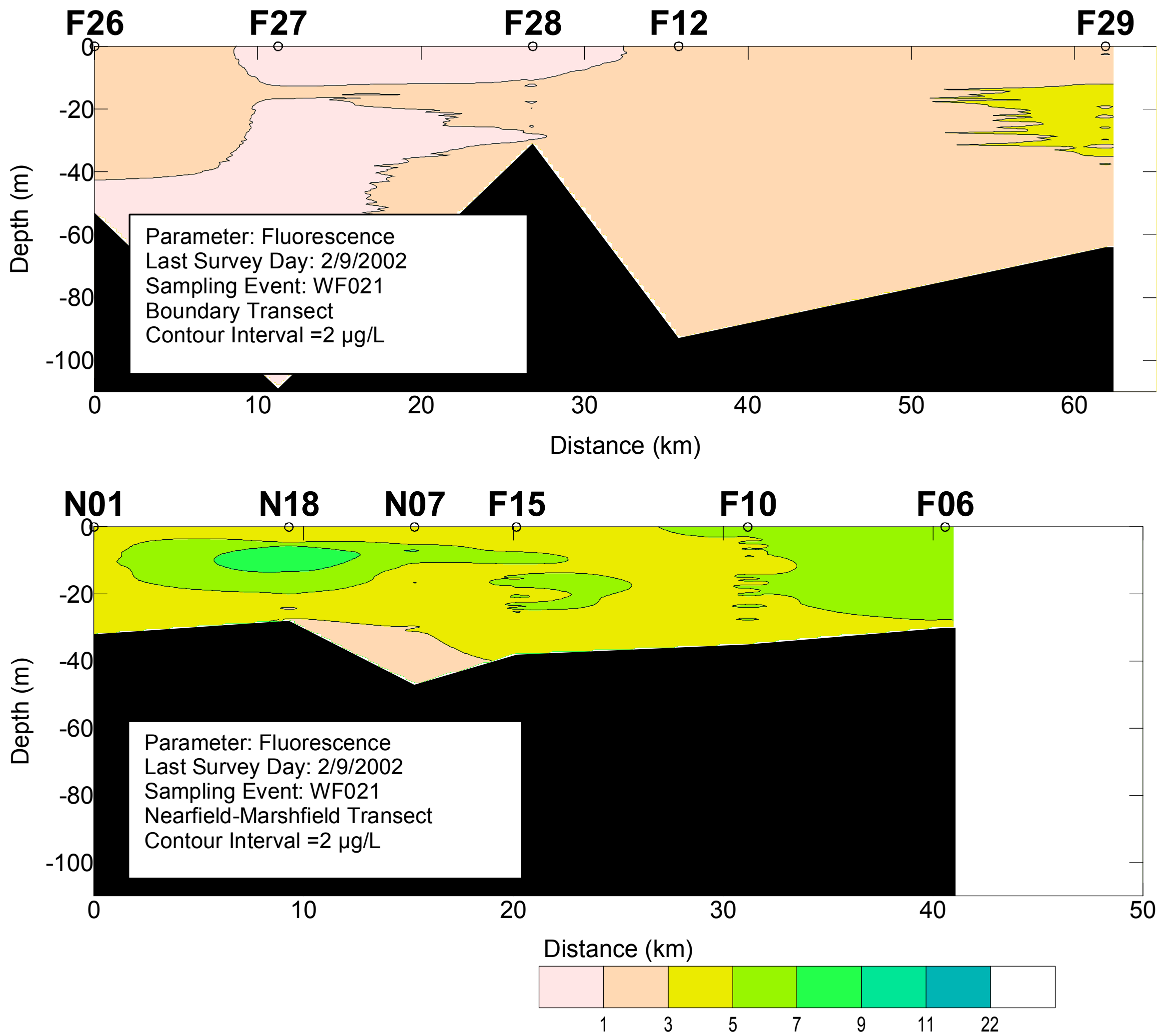


Figure B-50. Fluorescence Transect Plots (North - South) for Farfield Survey WF021 (Feb 02)

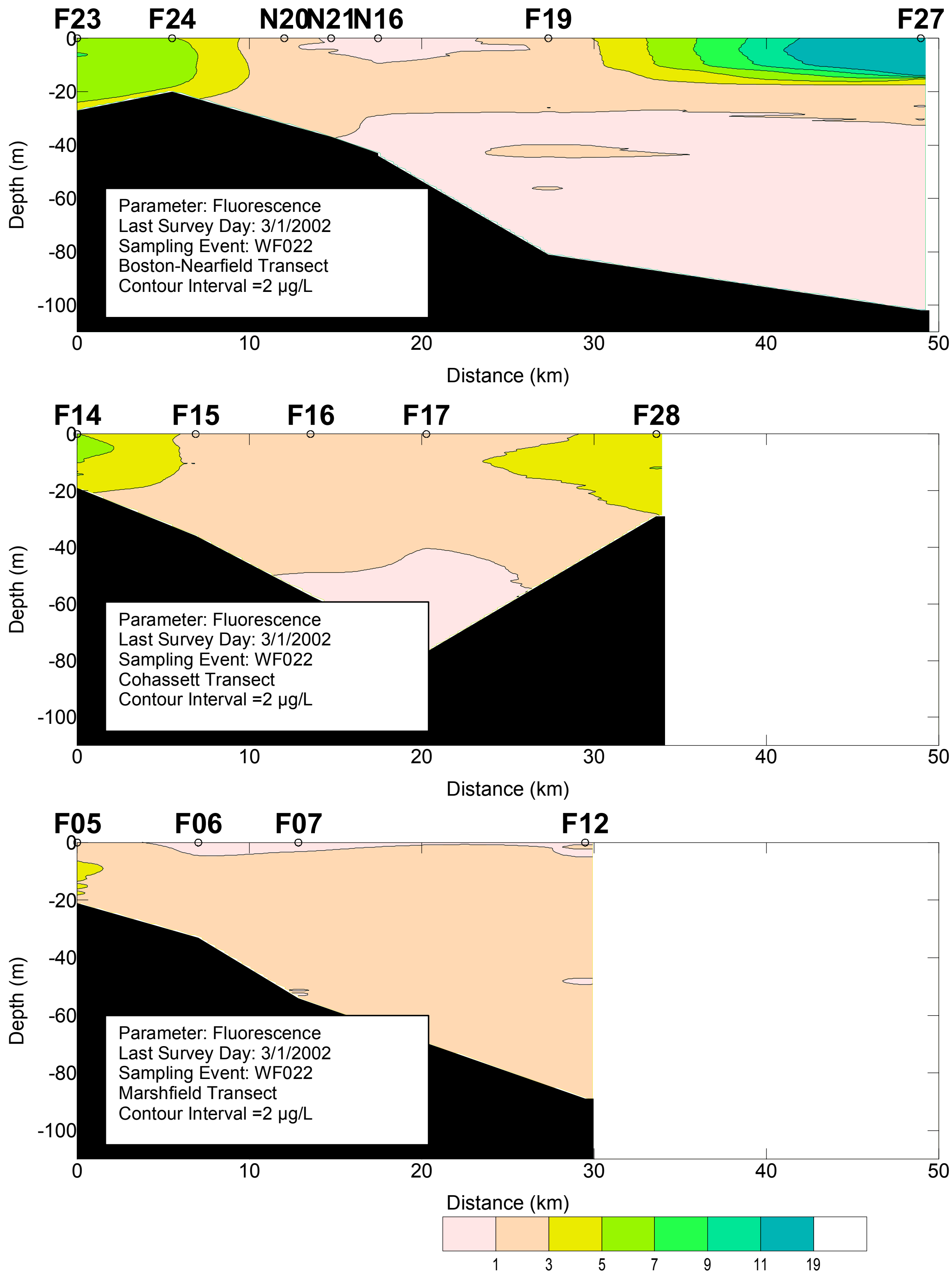


Figure B-51. Fluorescence Transect Plots (West - East) for Farfield Survey WF022 (Mar 02)

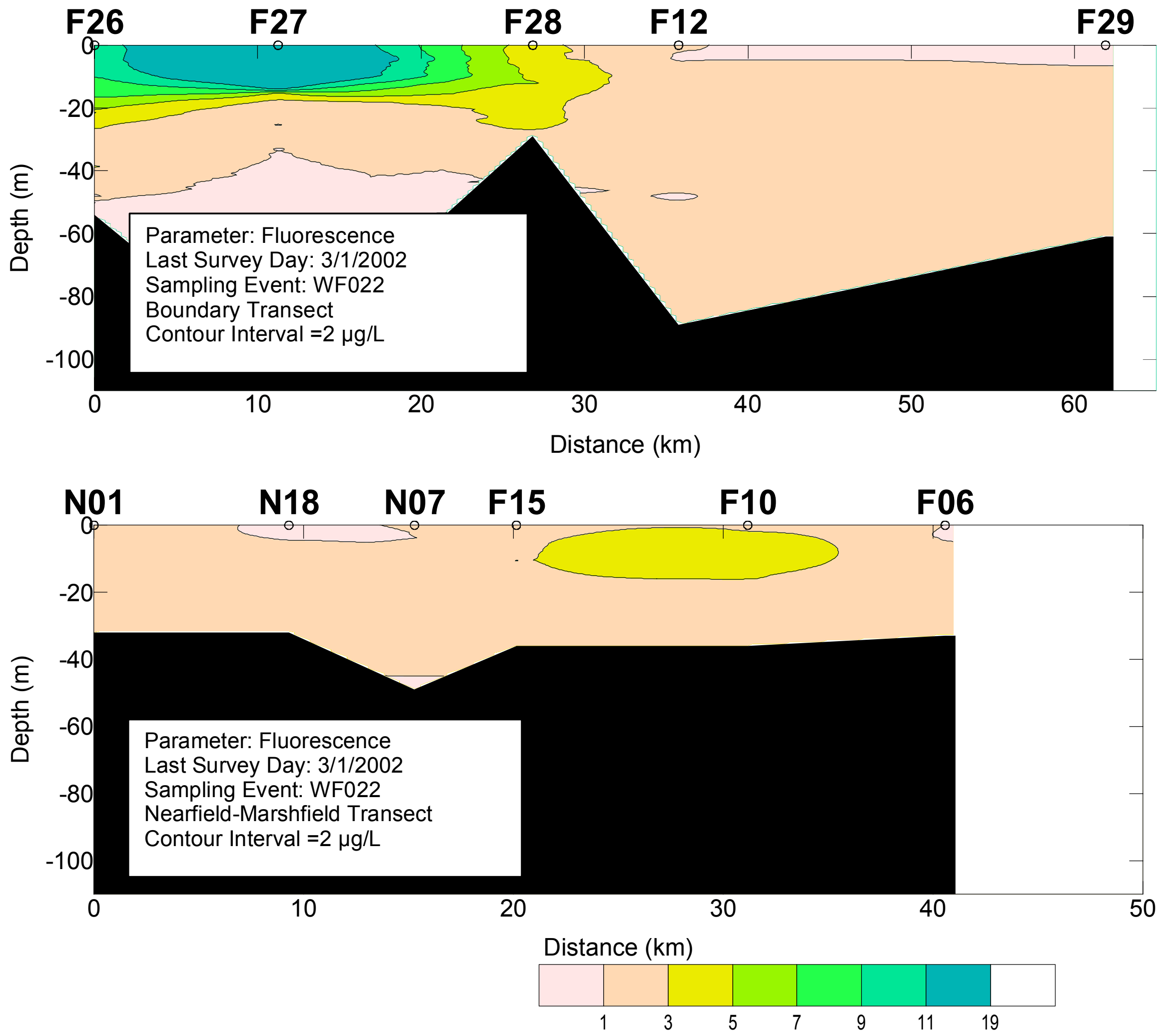


Figure B-52. Fluorescence Transect Plots (North - South) for Farfield Survey WF022 (Mar 02)

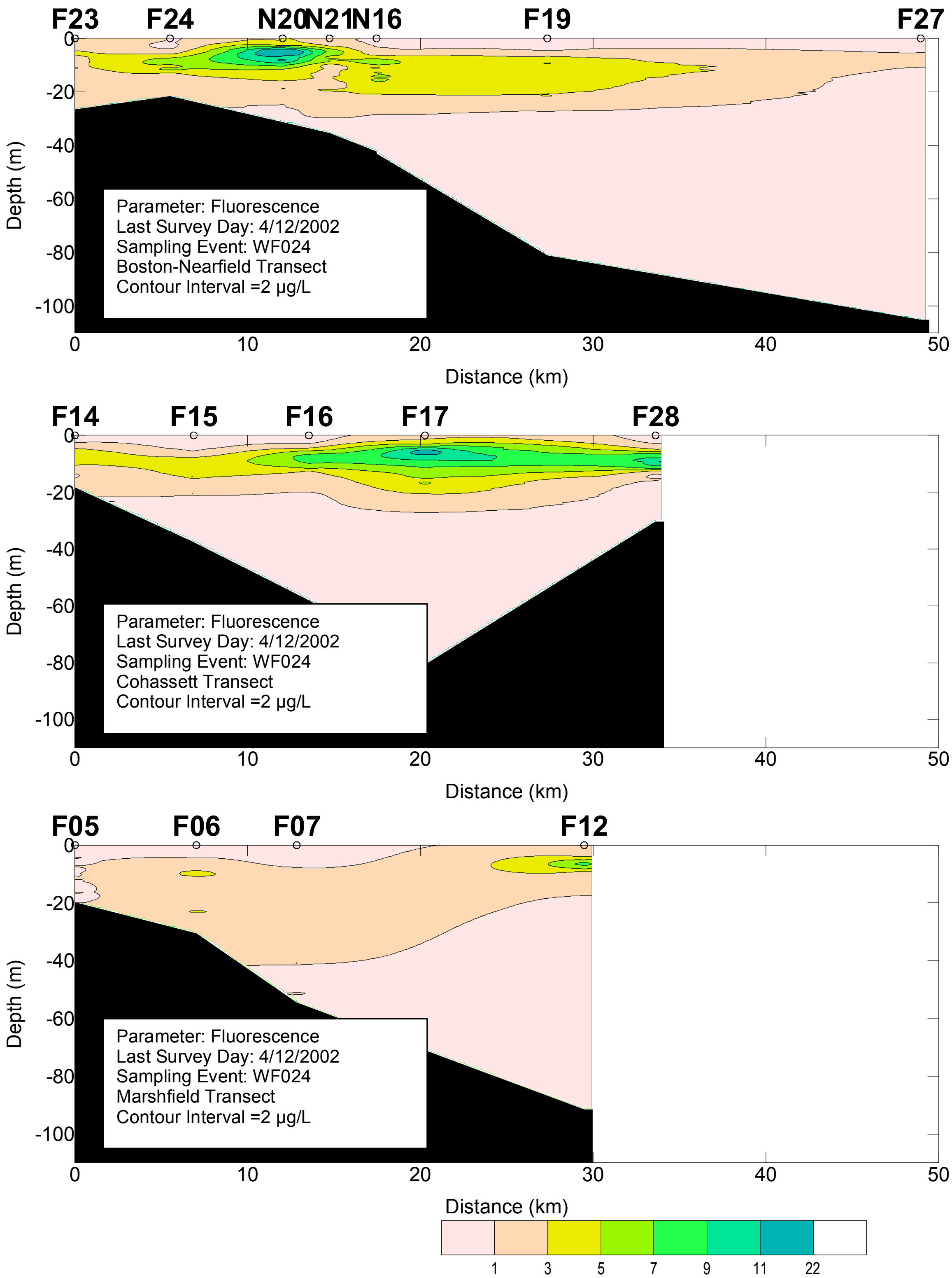


Figure B-53. Fluorescence Transect Plots (West - East) for Farfield Survey WF024 (Apr 02)

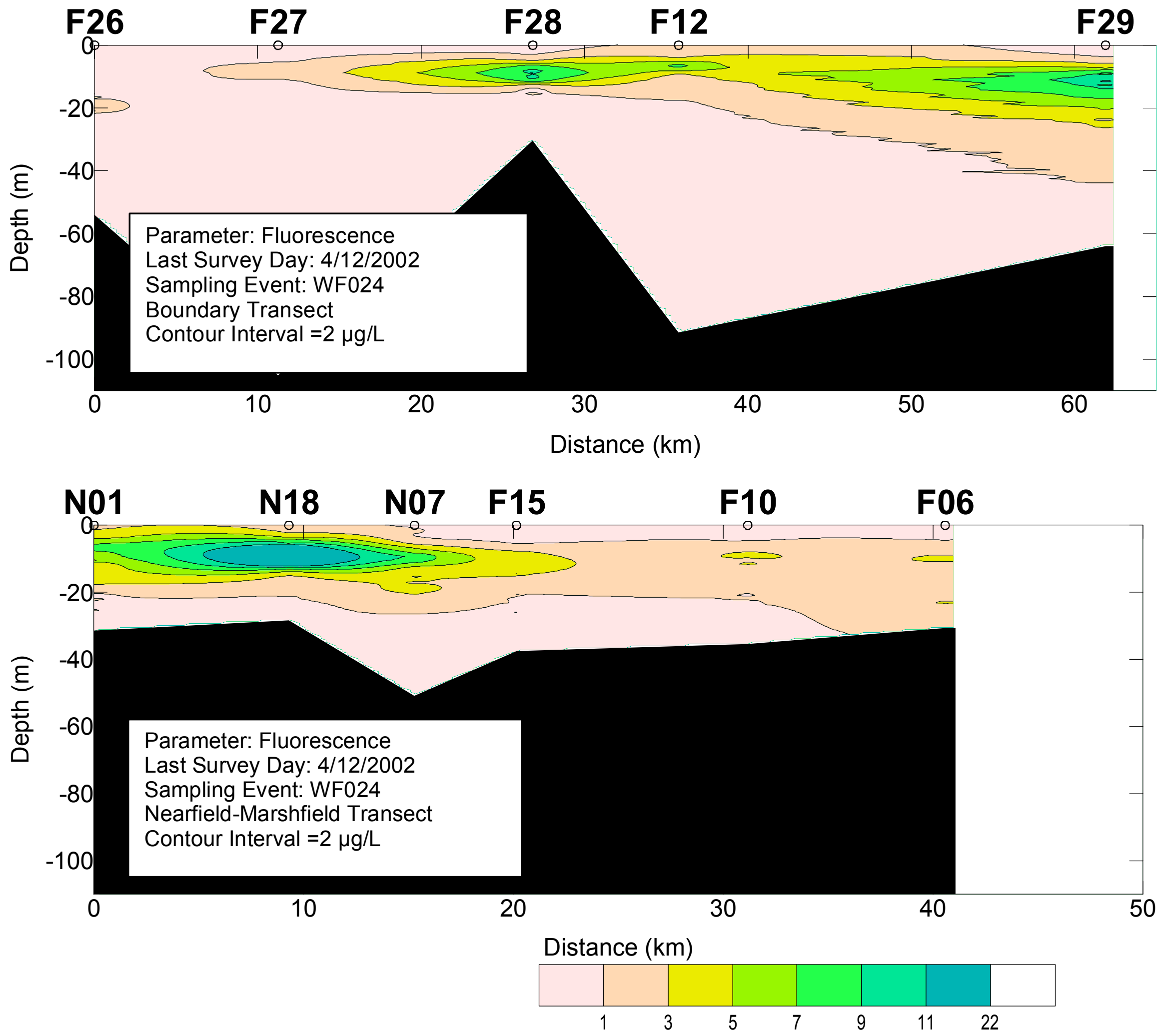


Figure B-54: Fluorescence Transect Plots (North - South) for Farfield Survey WF024 (Apr 02)

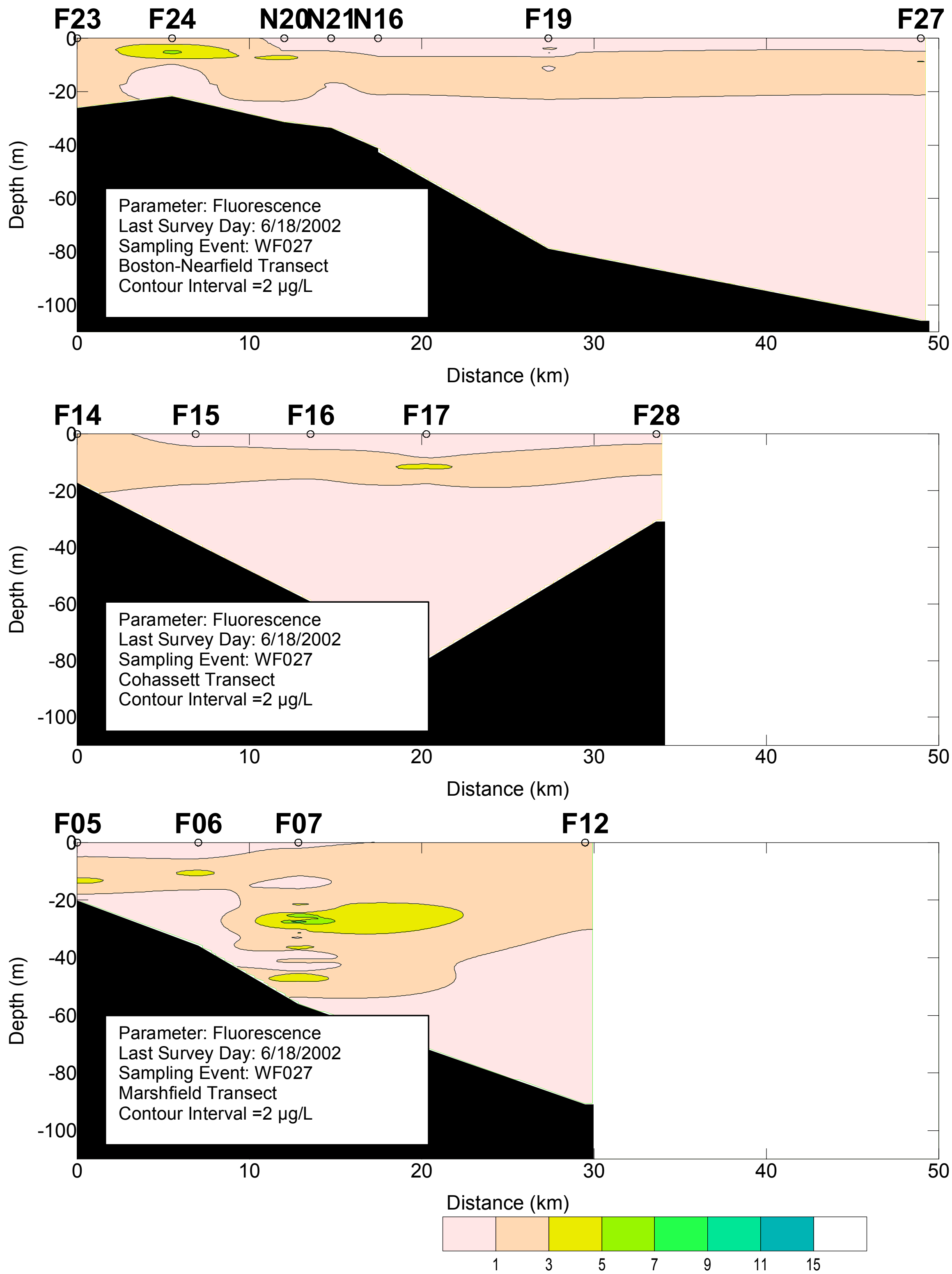


Figure B-55. Fluorescence Transect Plots (West - East) for Farfield Survey WF027 (Jun 02)

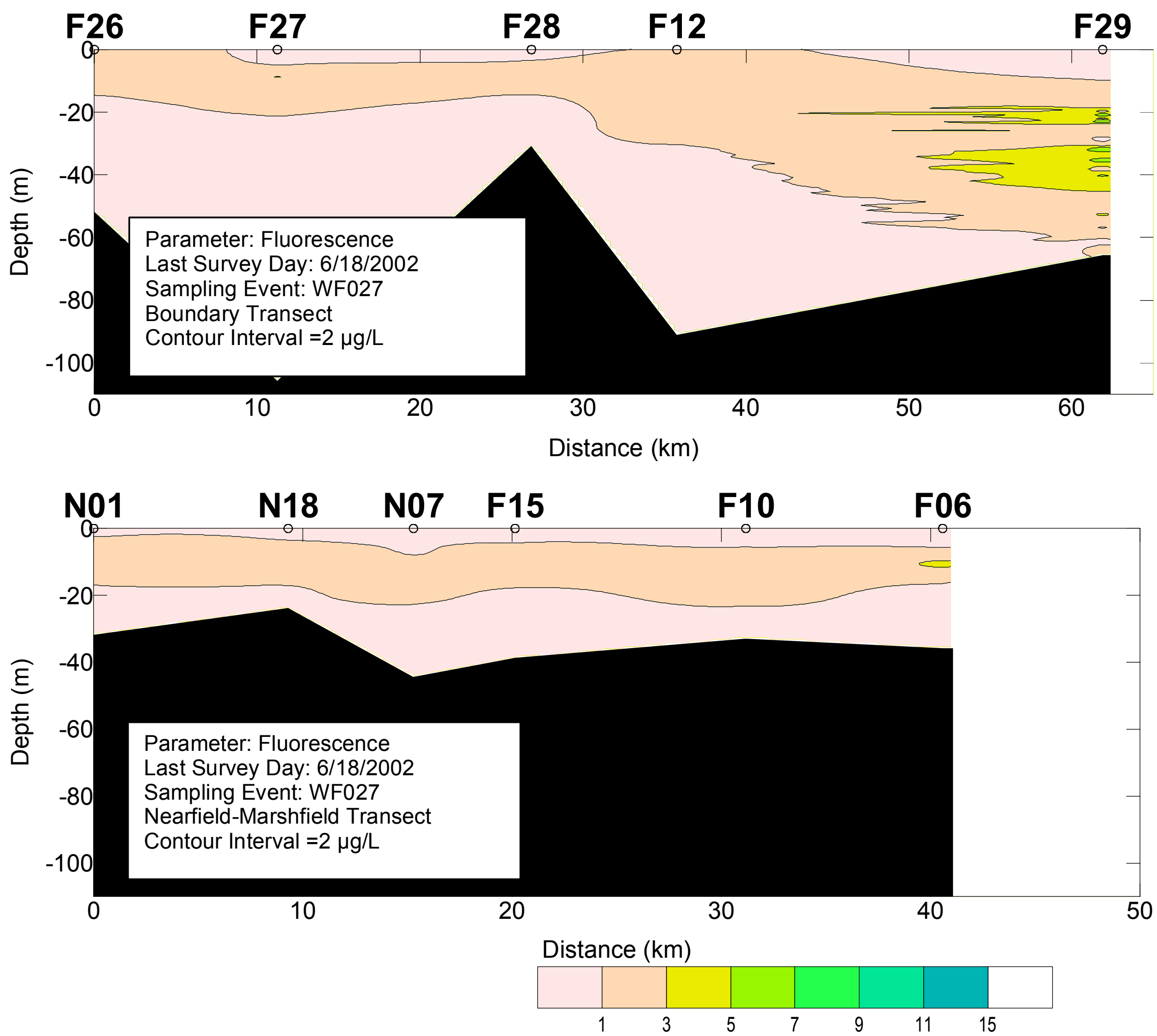


Figure B-56. Fluorescence Transect Plots (North - South) for Farfield Survey WF027 (Jun 02)

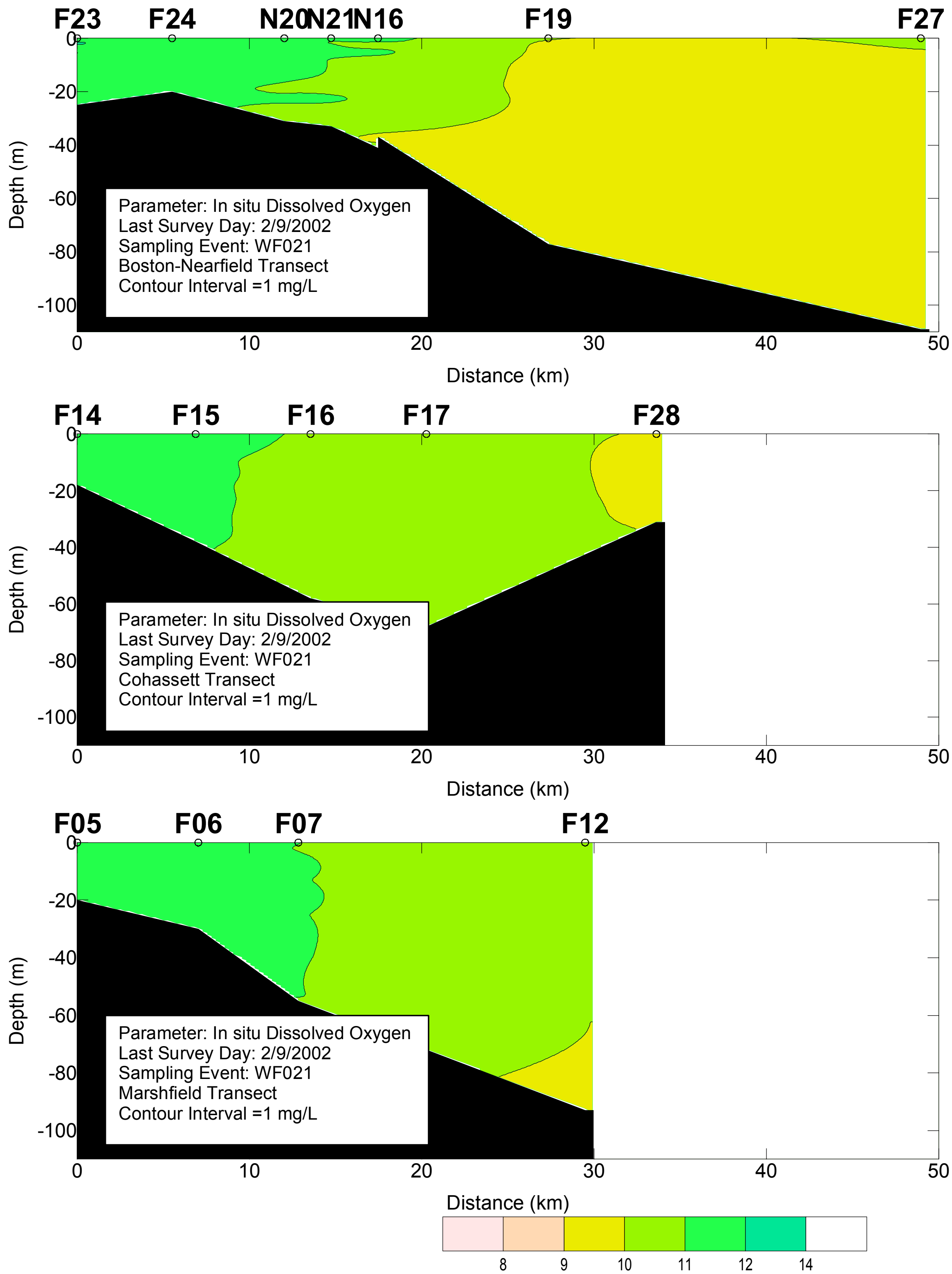


Figure B-57. Dissolved Oxygen Transect Plots (West - East) for Farfield Survey WF021 (Feb 02)

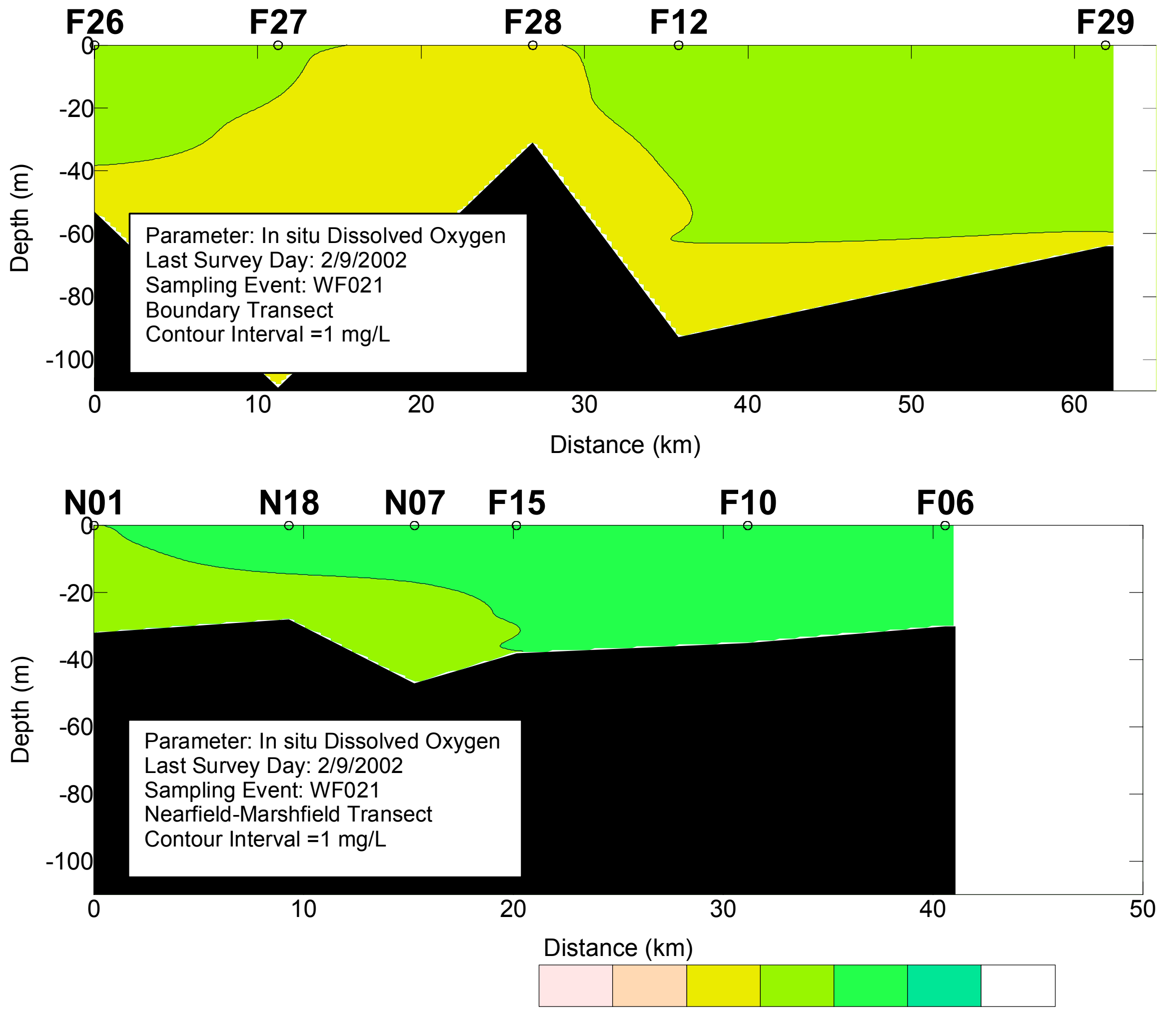


Figure B-58. Dissolved Oxygen Transect Plots (North - South) for Farfield Survey WF021 (Feb 02)

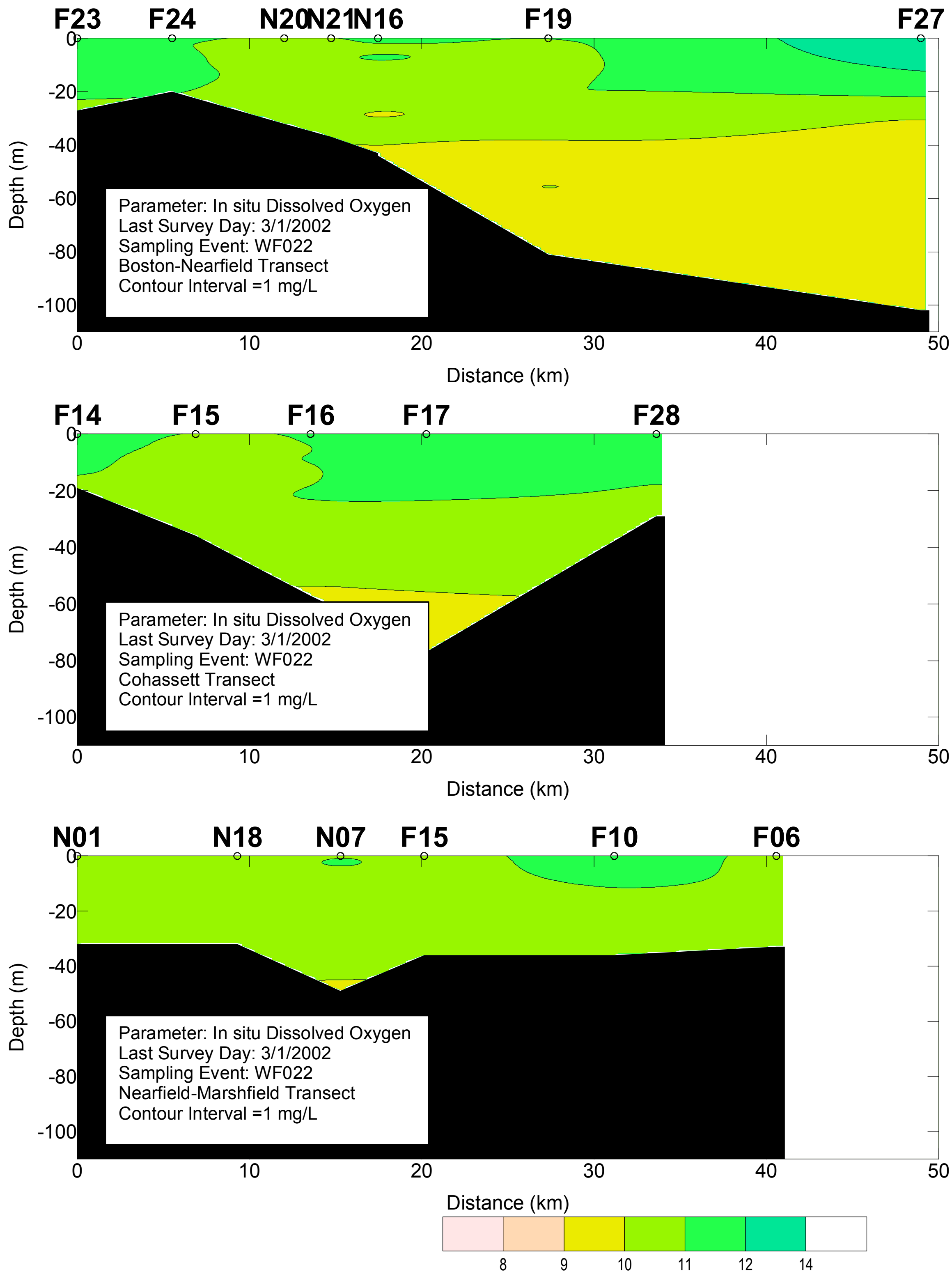


Figure B-59. Dissolved Oxygen Transect Plots (West - East) for Farfield Survey WF022 (Mar 02)

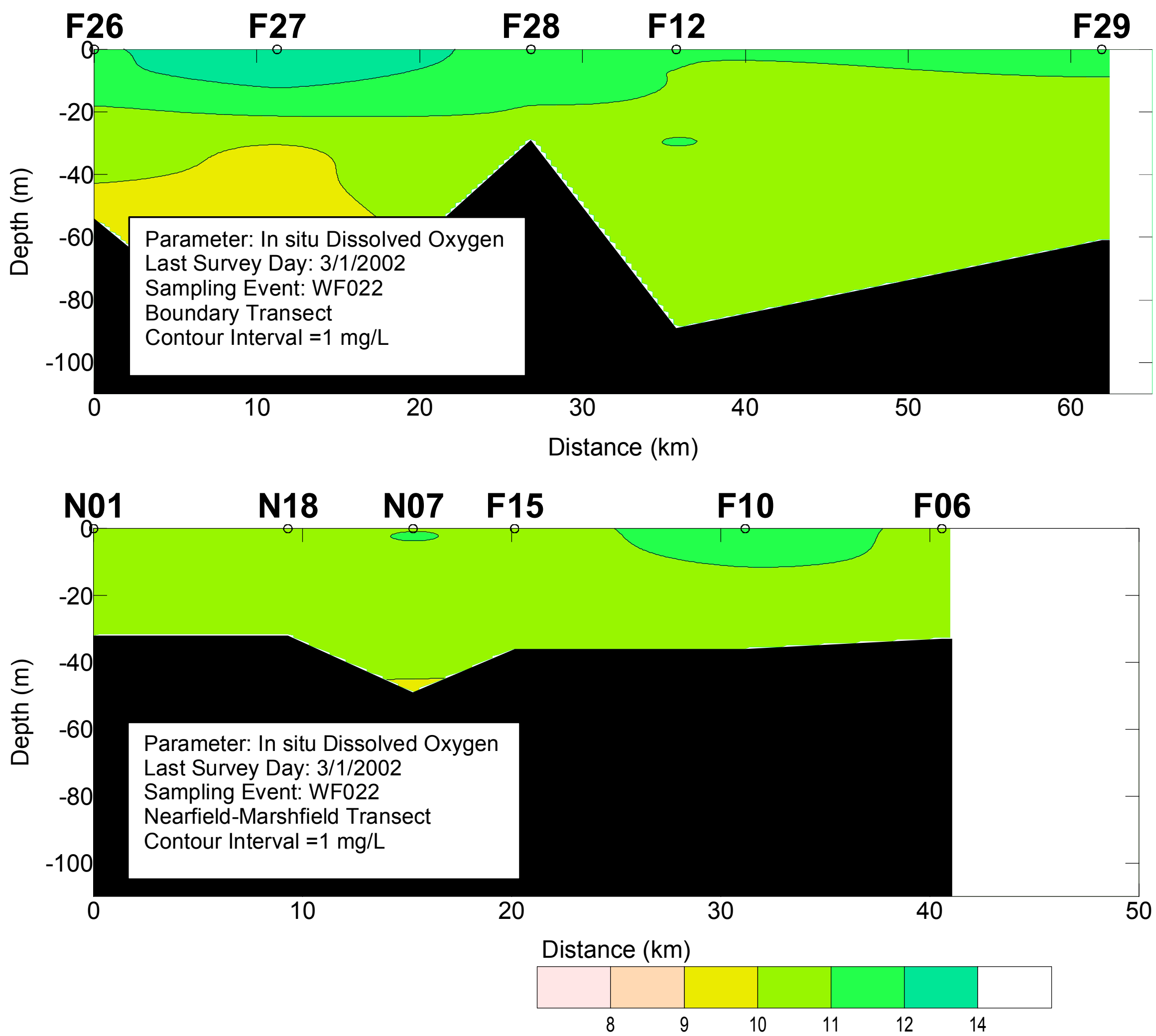


Figure B-60. Dissolved Oxygen Transect Plots (North - South) for Farfield Survey WF022 (Mar 02)

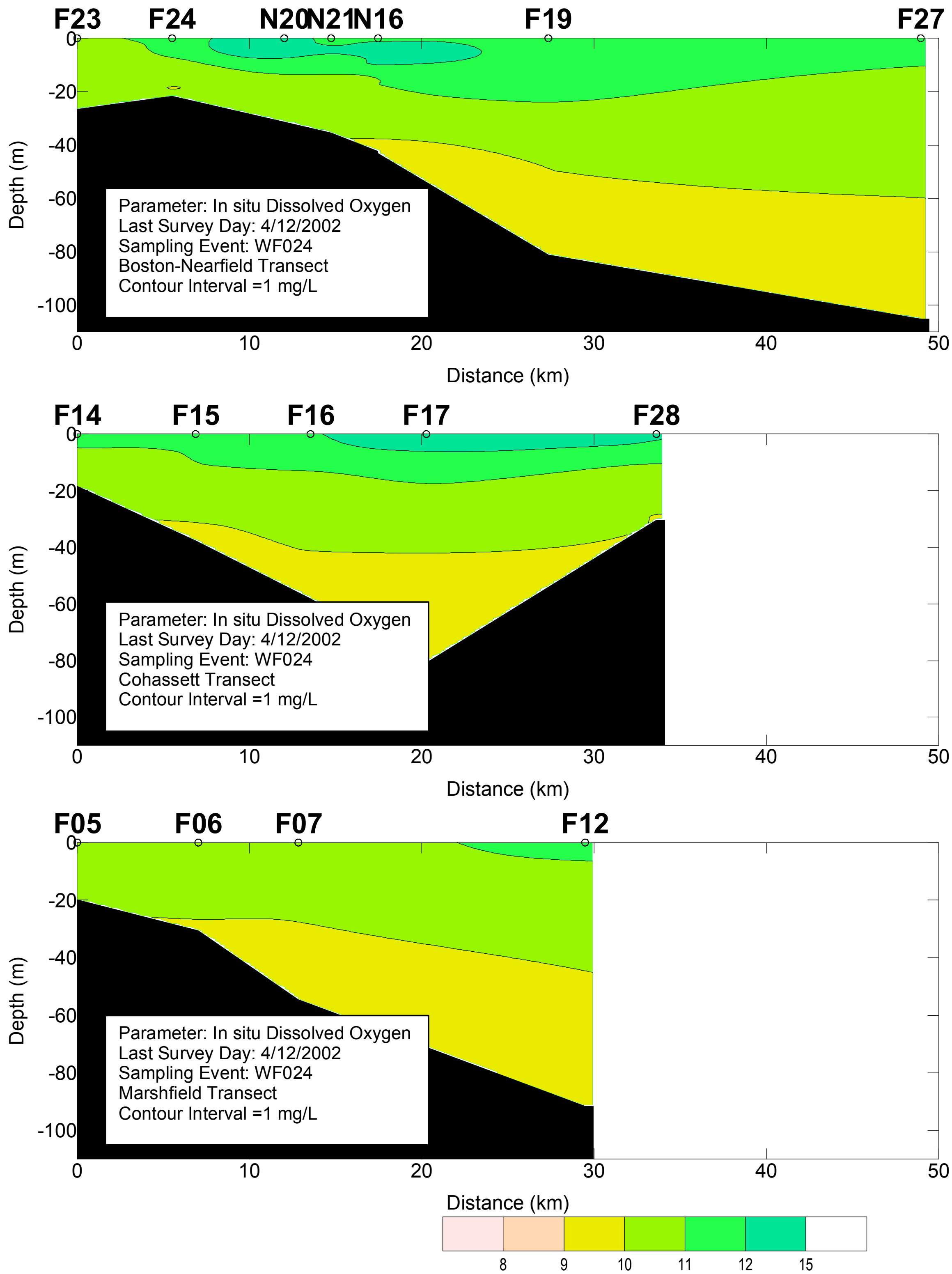


Figure B-61. Dissolved Oxygen Transect Plots (West - East) for Farfield Survey WF024 (Apr 02)

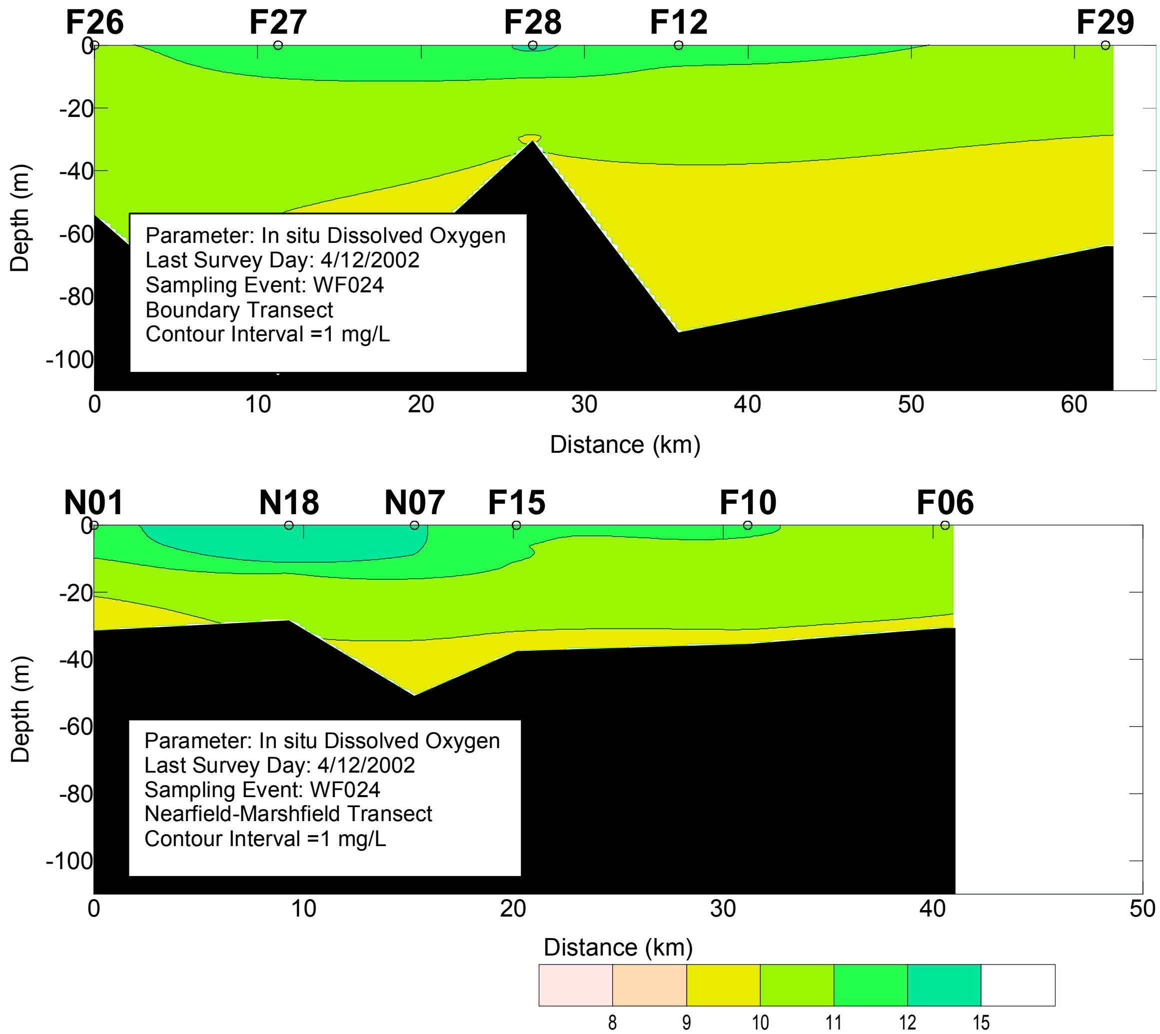


Figure B-62. Dissolved Oxygen Transect Plots (North - South) for Farfield Survey WF024 (Apr 02)

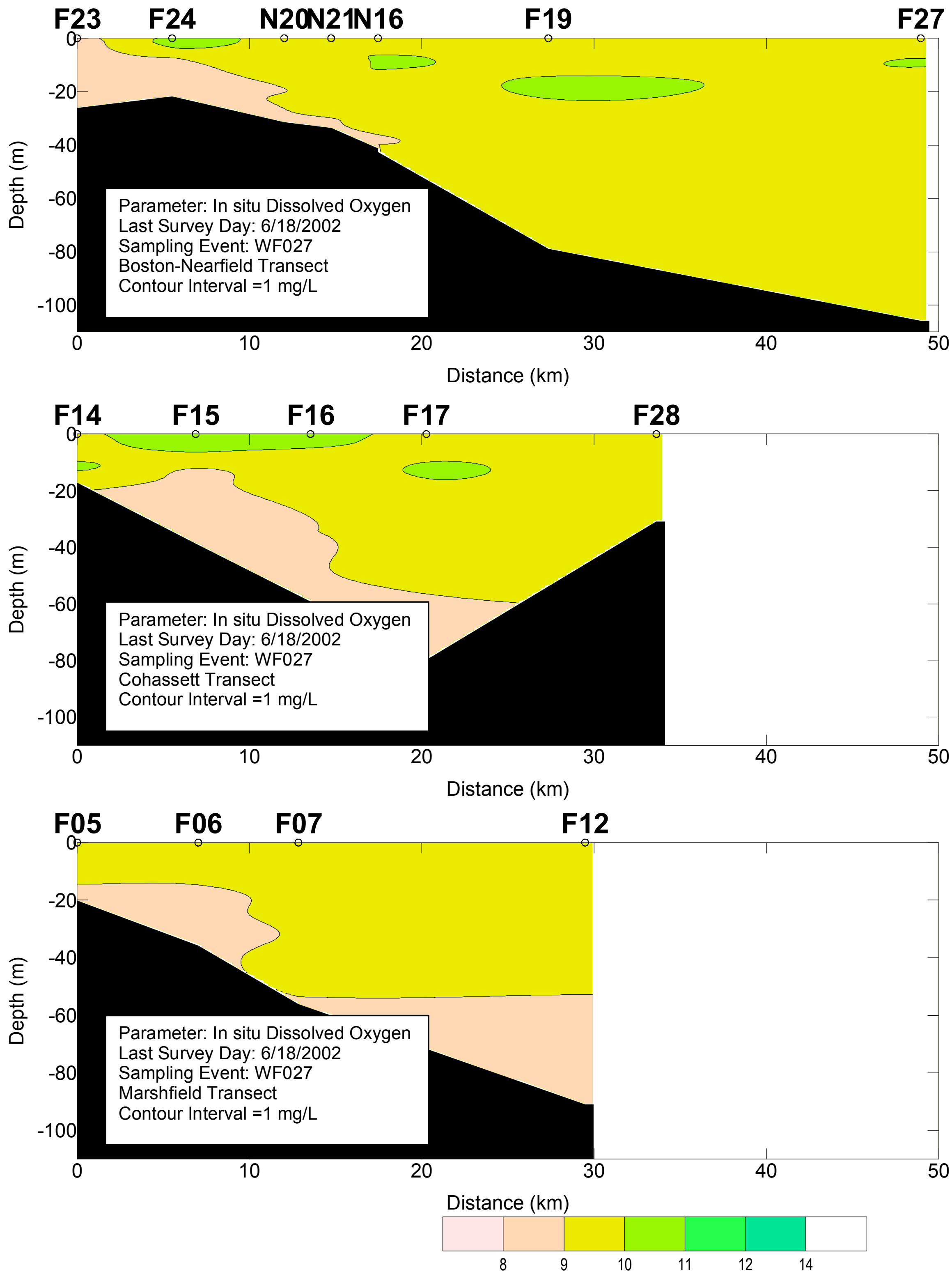


Figure B-63. Dissolved Oxygen Transect Plots (West - East) for Farfield Survey WF027 (Jun 02)

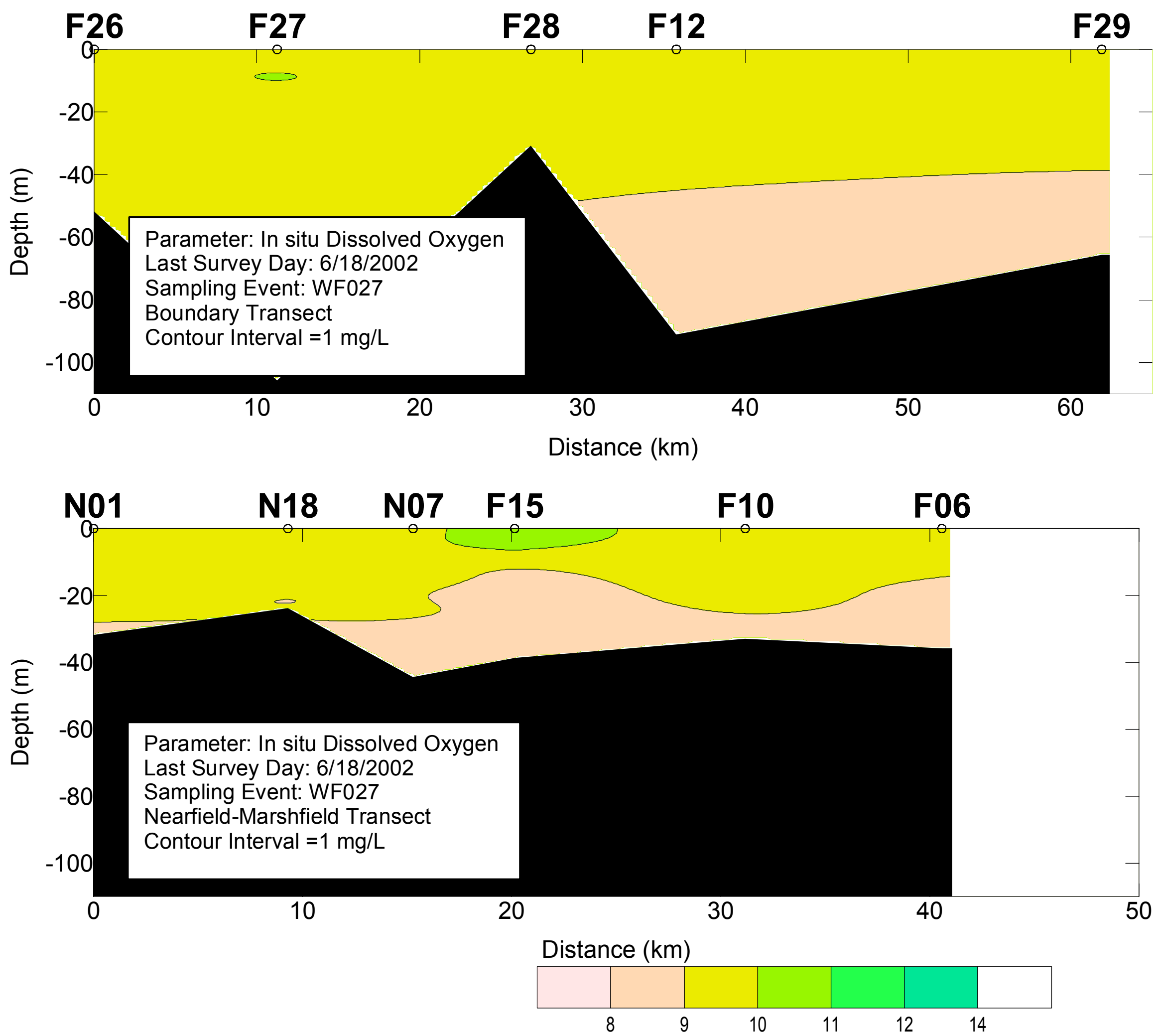


Figure B-64. Dissolved Oxygen Transect Plots (North - South) for Farfield Survey WF027 (Jun 02)

APPENDIX C

Photosynthesis-Irradiance (P-I) Curves

Photosynthesis-Irradiance (P-I) Curves

Productivity (Prod, mg C m^{-3} hr^{-1}) versus irradiance (Light, μE m^{-2} sec^{-1}) curves for the period February 8 to June 18, 2002. Comprehensive data are presented for each cruise by station (N04, N18, and F23) and by depth (surface, mid-surface, middle, mid-bottom and bottom). Productivity calculations (Libby *et al*., 2002) utilized light attenuation data from a CTD-mounted 4-π sensor and incident light time-series data from a 2-π irradiance sensor located on Deer Island, MA. After collection of the productivity samples, they were transported to the Marine Ecosystems Research Laboratory (MERL) where they were incubated in temperature controlled incubators. Hourly productivity measurements were converted to daily values by fitting the measured hourly rates and light data to one of two P-I models (with or without photoinhibition). Using the fitted parameters, the measured incident light, and the light attenuation data, production rates were calculated for each 15-minute interval over the daylight period (centered from 6 AM to 6 PM), summed for each sampling depth, then integrated over depth to give areal production for each station.

WF021 **Station N04**

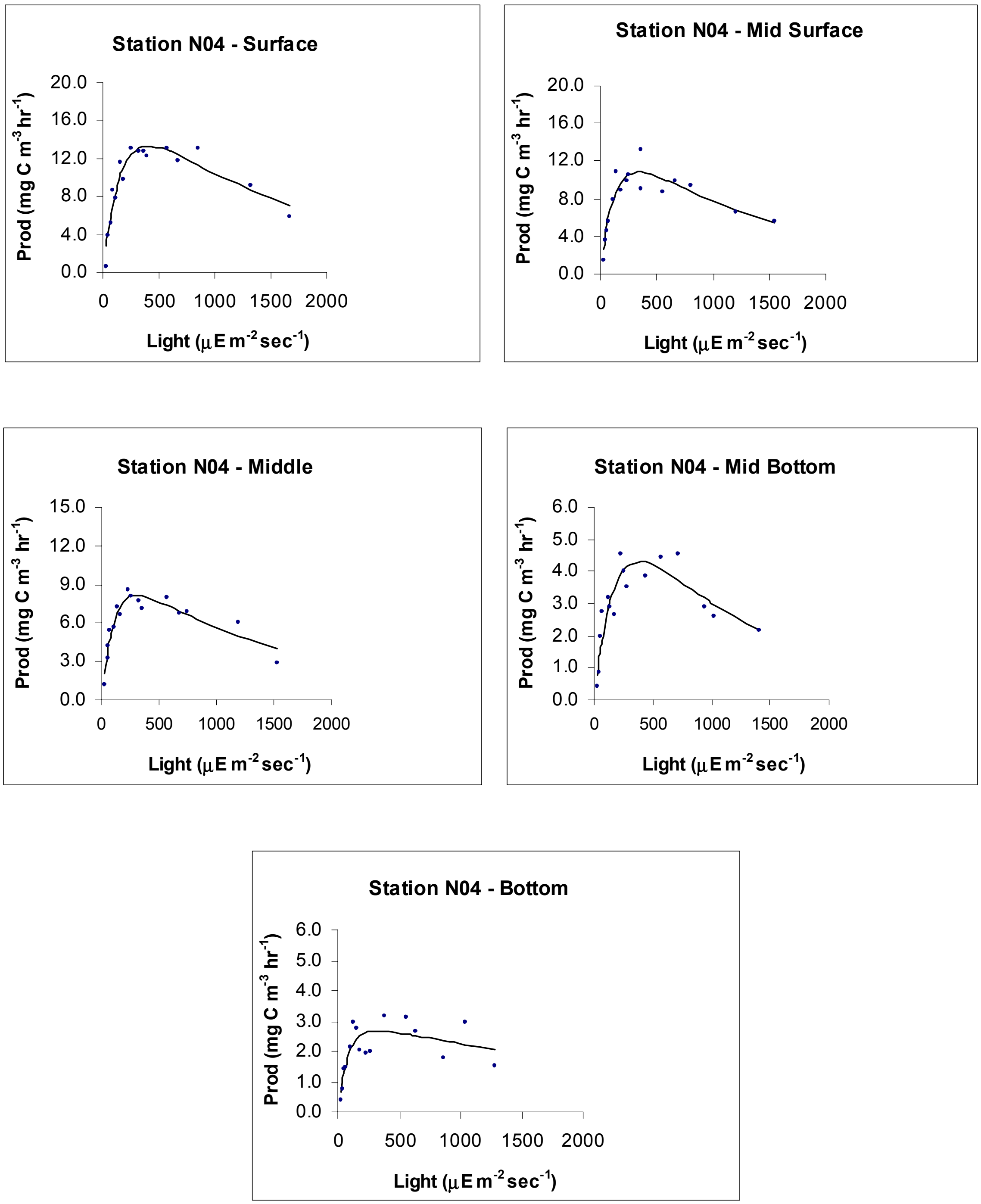


Figure C-1. Photosynthesis-Irradiance (P-I) Curves for Station N04 from Farfield Survey WF021 (Feb 02).

WF021 **Station N18**

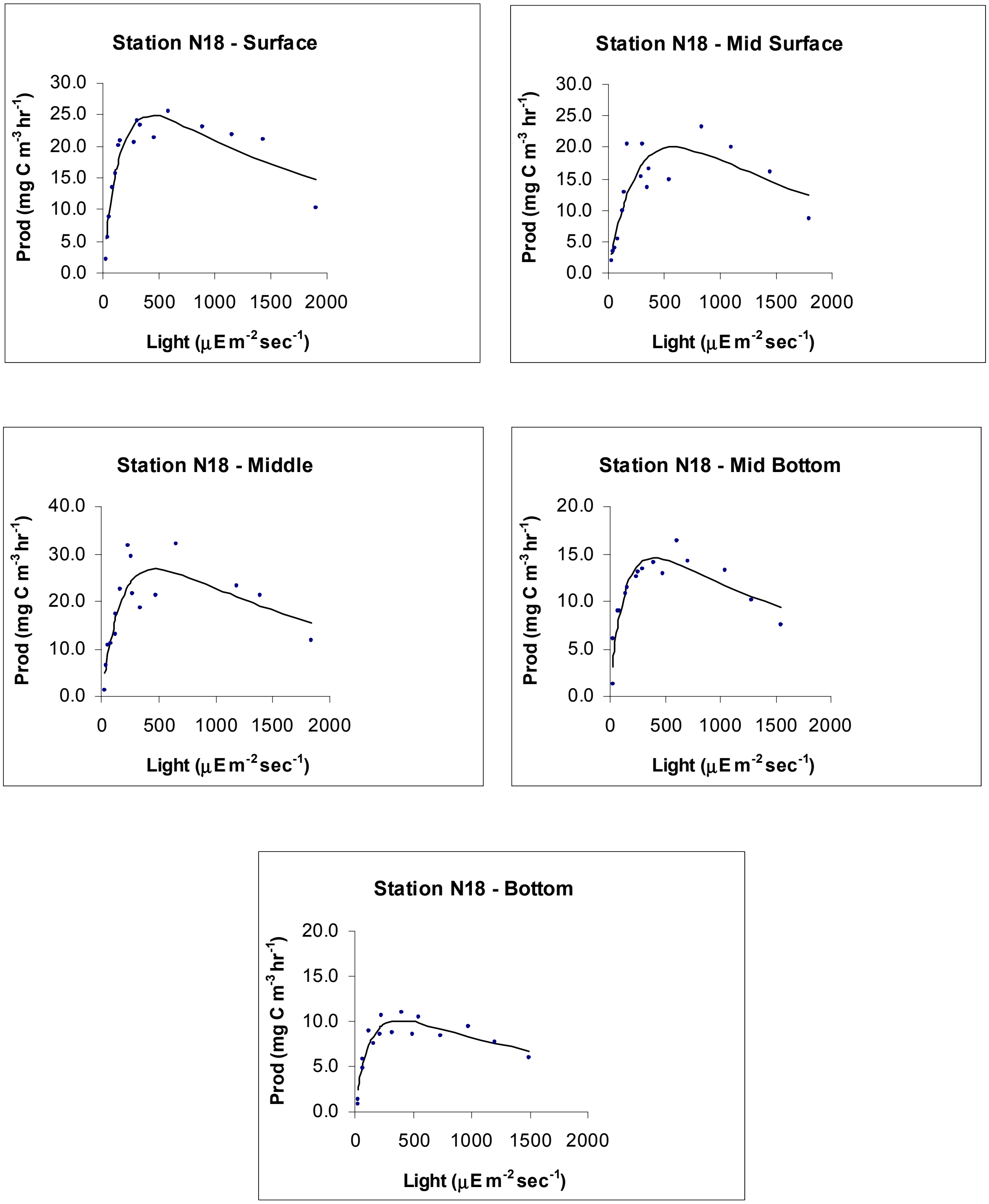


Figure C-2. Photosynthesis-Irradiance (P-I) Curves for Station N18 from Farfield Survey WF021 (Feb 02).

WF021 **Station F23**

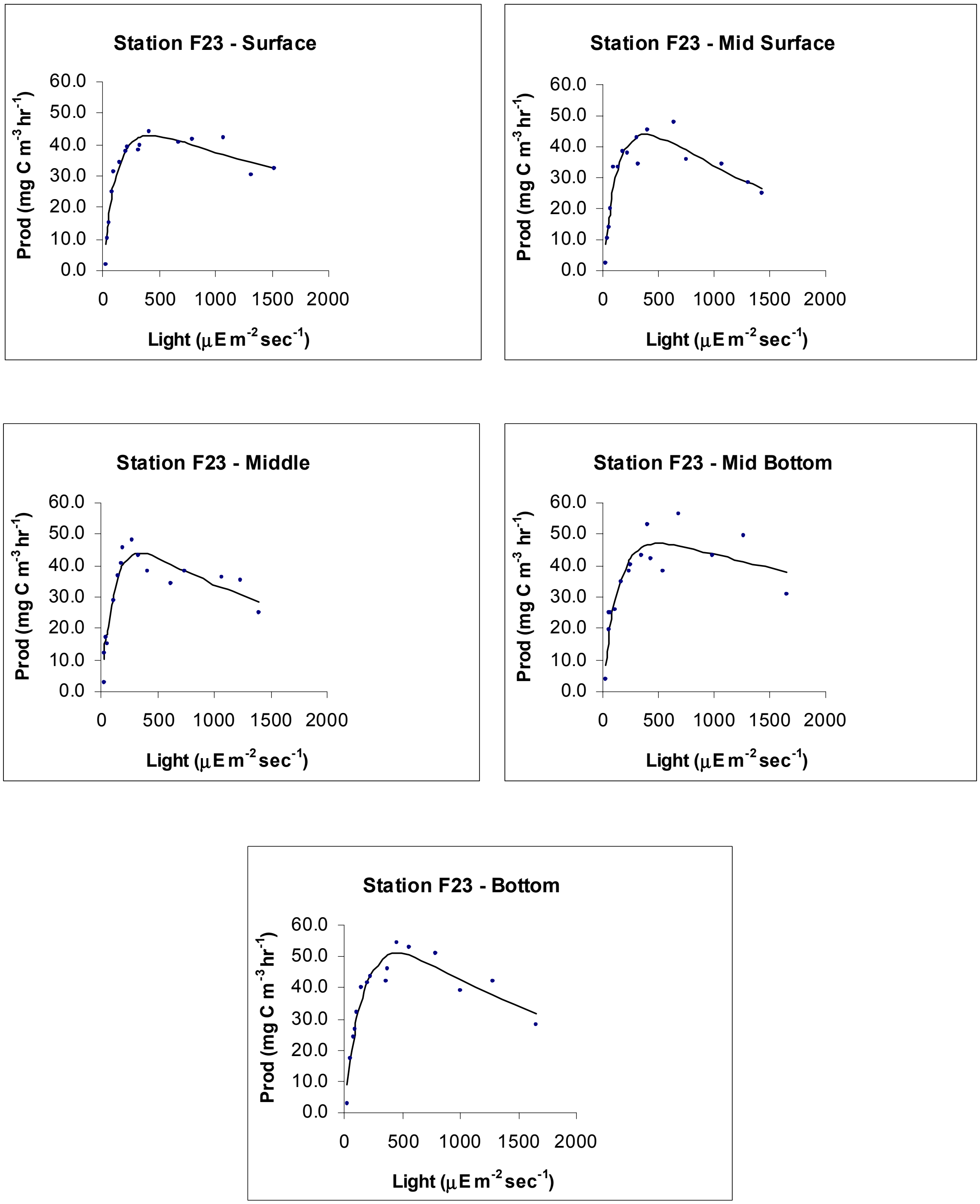


Figure C-3. Photosynthesis-Irradiance (P-I) Curves for Station F23 from Farfield Survey WF021 (Feb 02).

WF022 **Station N04**

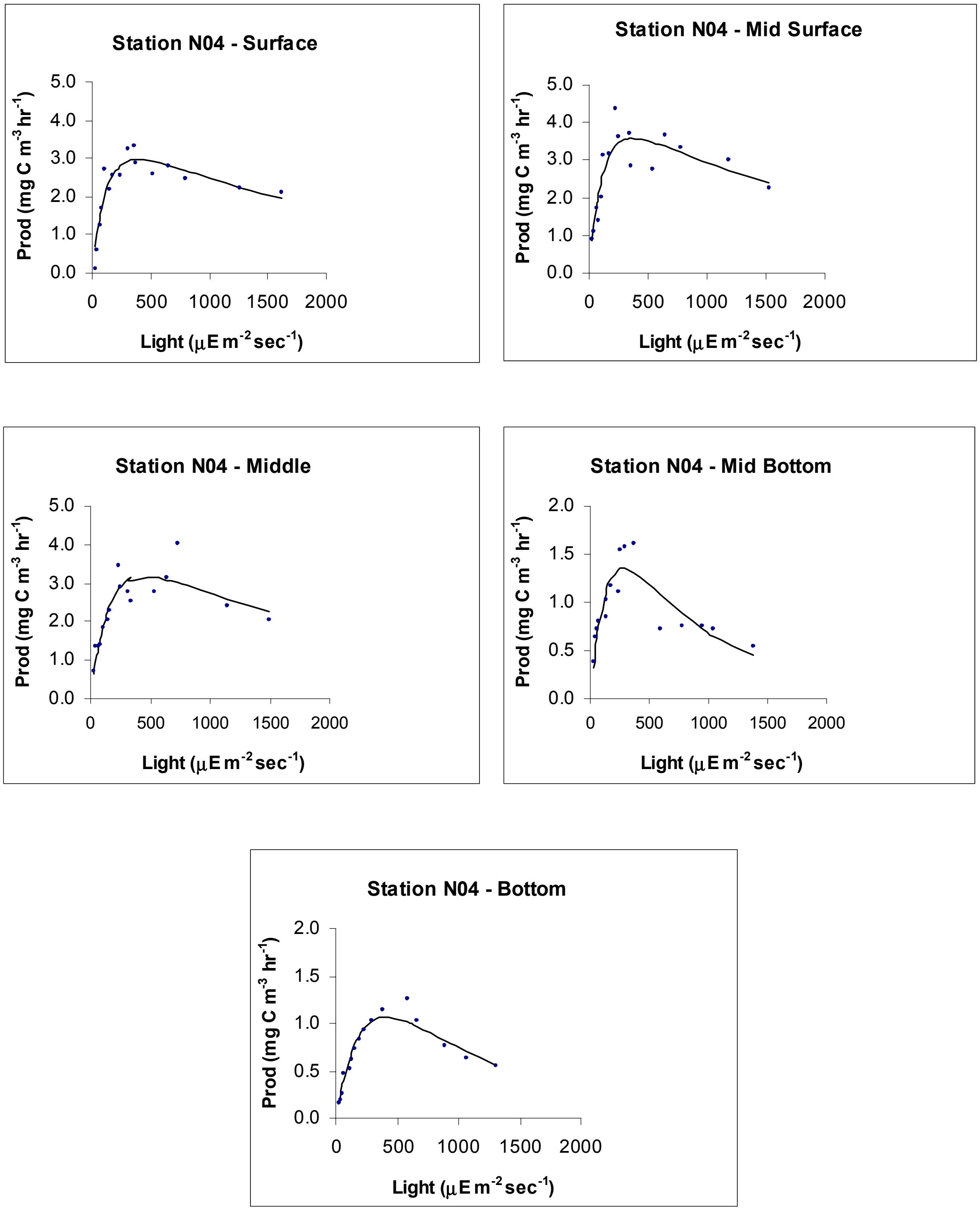
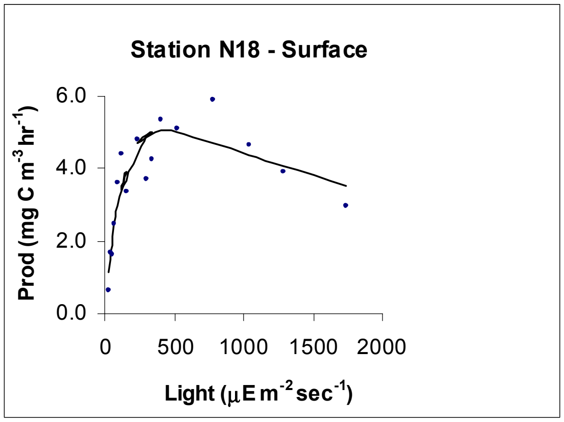
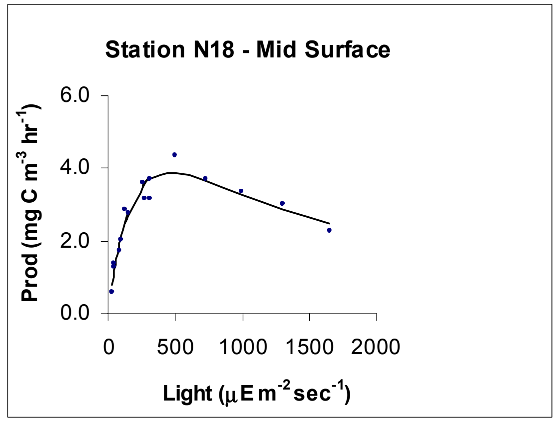
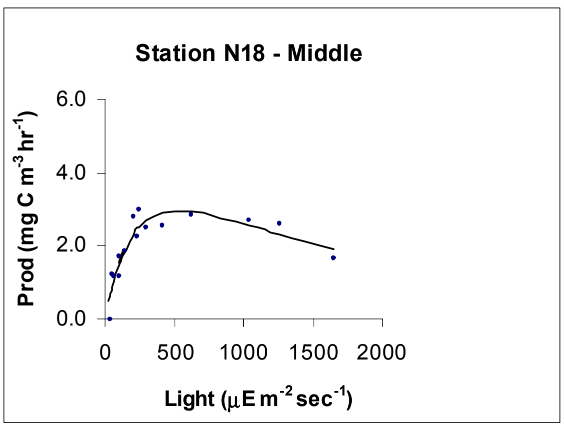


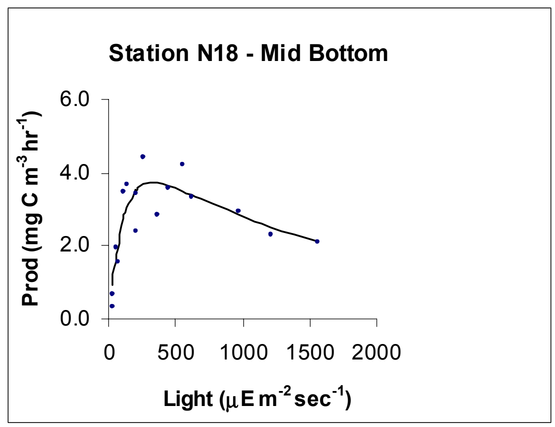
Figure C-4. Photosynthesis-Irradiance (P-I) Curves for Station N04 from Farfield Survey WF022 (Mar 02).

WF022 **Station N18**









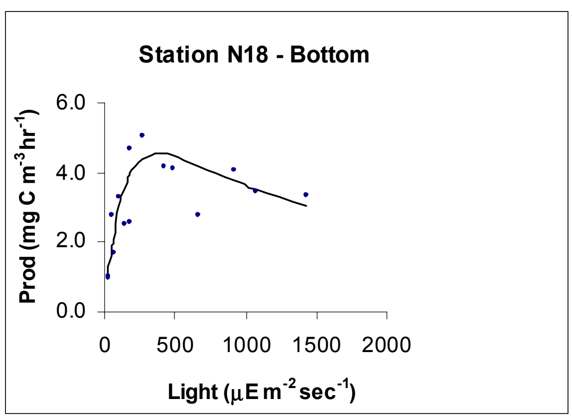


Figure C-5. Photosynthesis-Irradiance (P-I) Curves for Station N18 from Farfield Survey WF022 (Mar 02).

WF022 **Station F23**

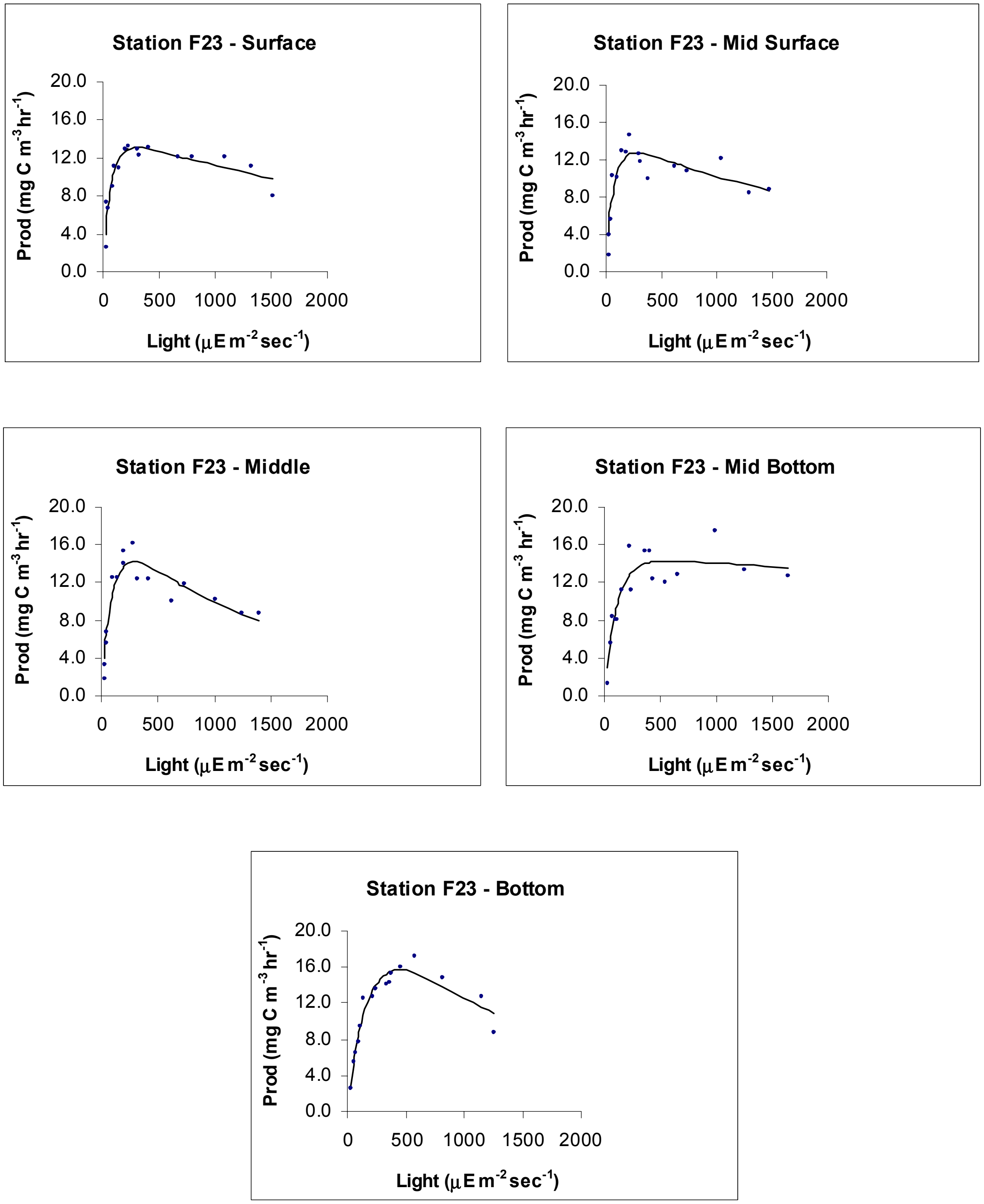


Figure C-6. Photosynthesis-Irradiance (P-I) Curves for Station F23 from Farfield Survey WF022 (Mar 02).

WN023 **Station N04**

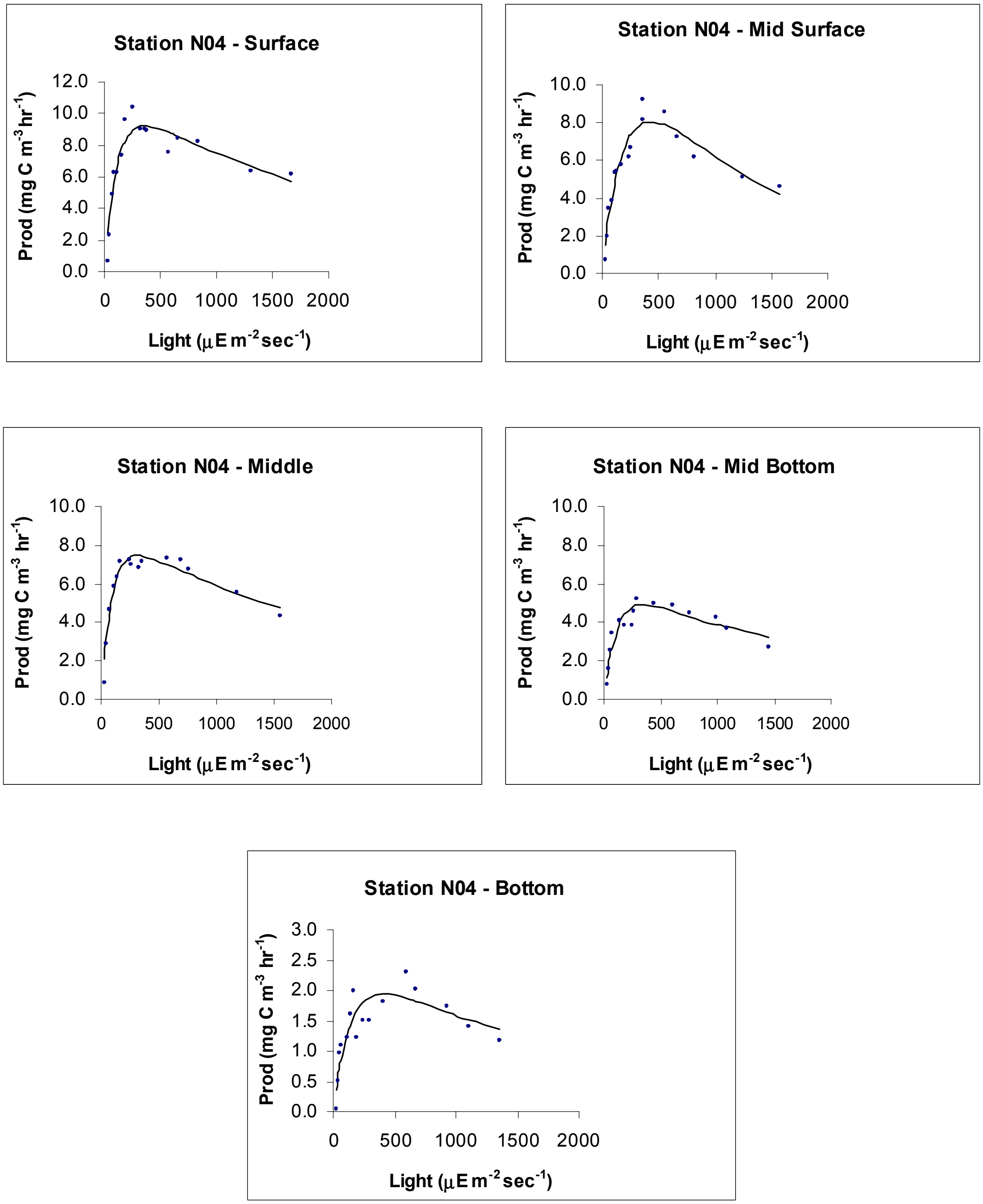


Figure C-7. Photosynthesis-Irradiance (P-I) Curves for Station N04 from Nearfield Survey WN023 (Mar 02).

WN023 **Station N18**

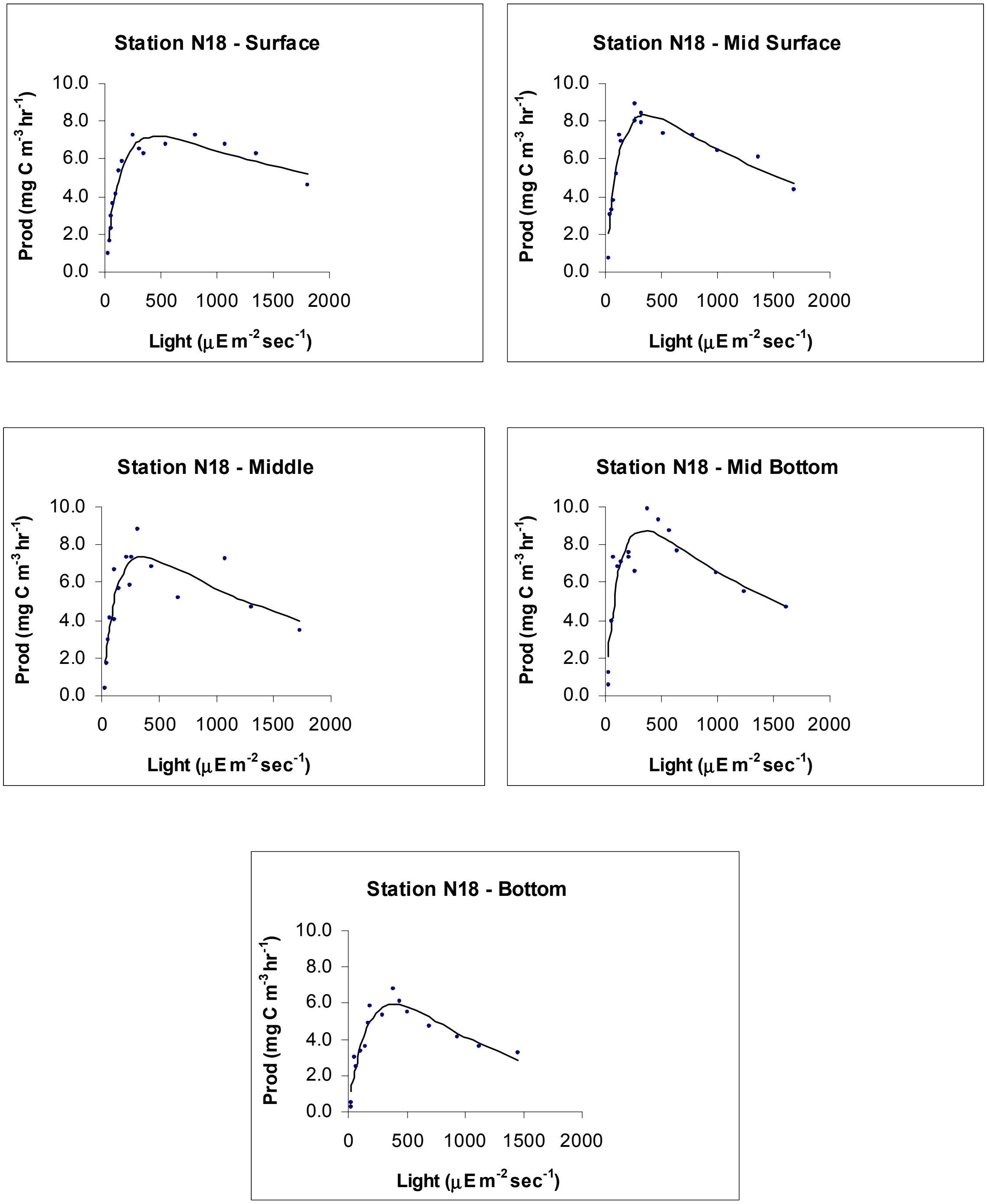
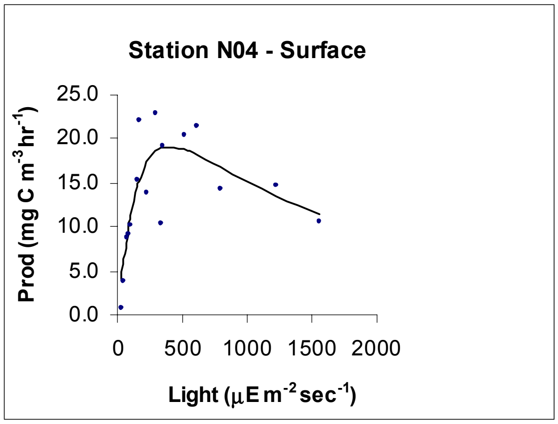
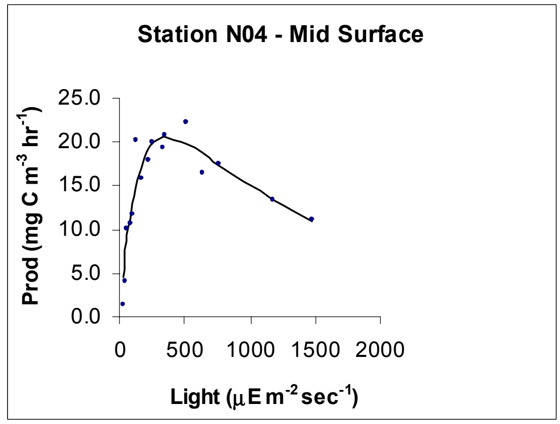
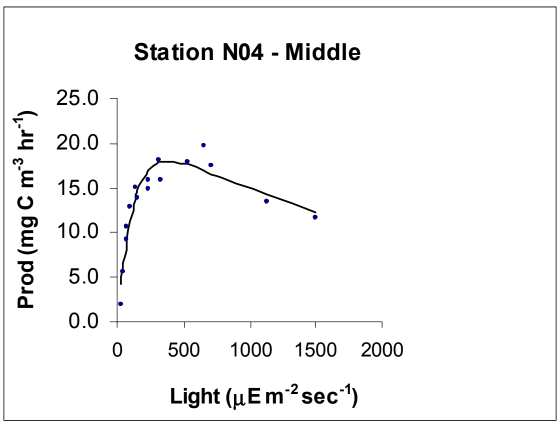


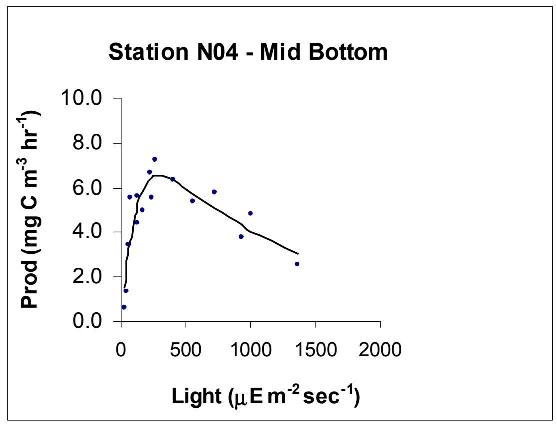
Figure C-8. Photosynthesis-Irradiance (P-I) Curves for Station N18 from Nearfield Survey WN023 (Mar 02).

WF024 **Station N04**









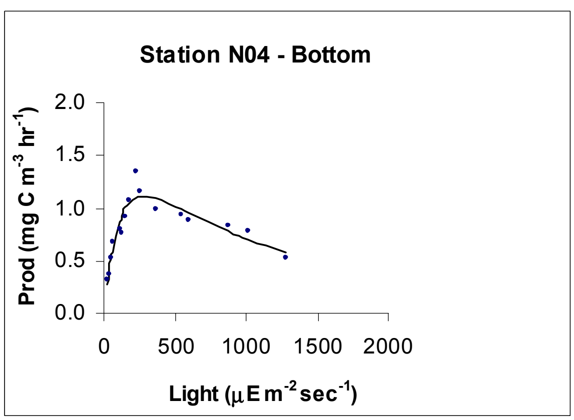


Figure C-9. Photosynthesis-Irradiance (P-I) Curves for Station N04 from Farfield Survey WF024 (Apr 02).

WF024 **Station N18**

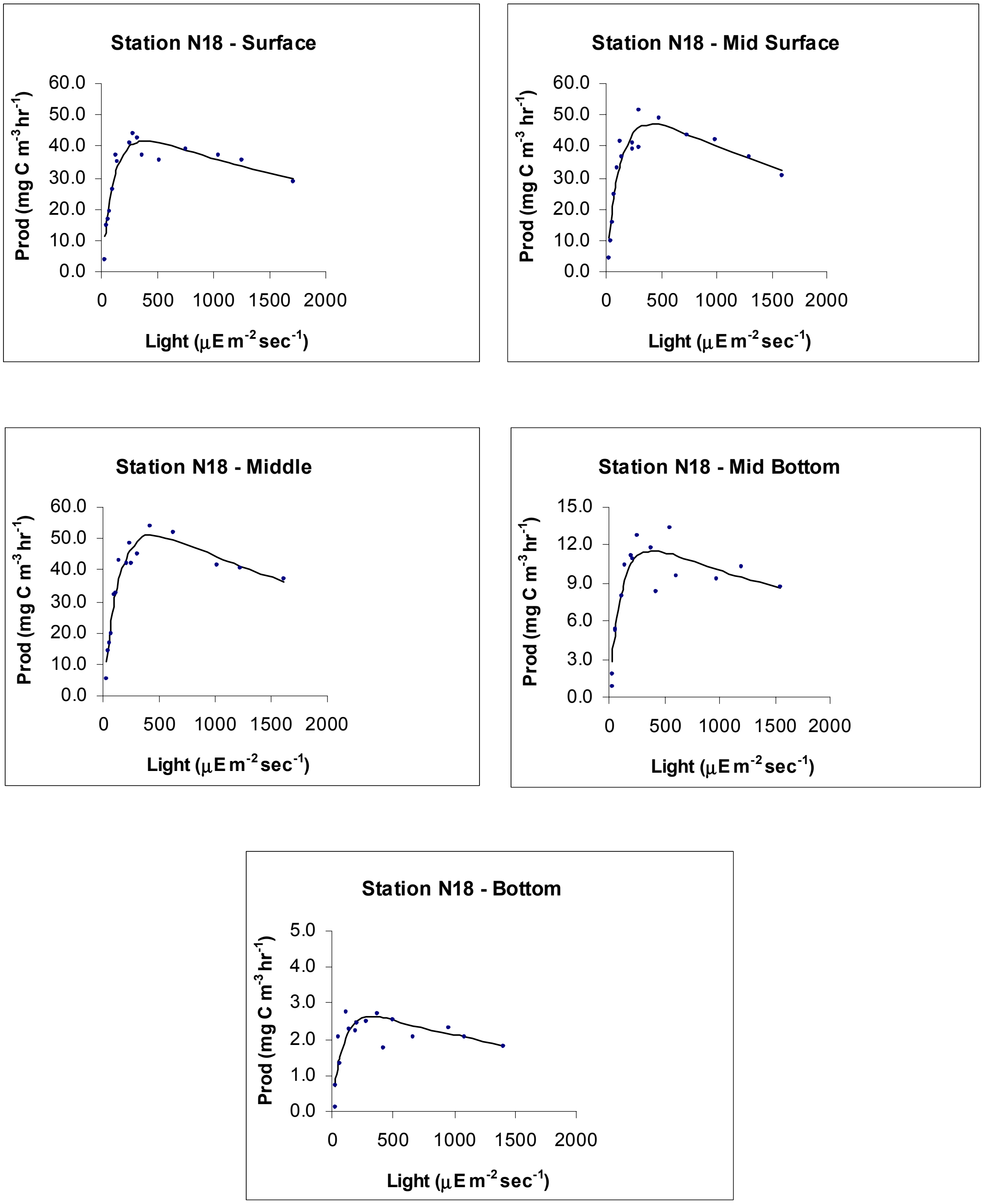


Figure C-10. Photosynthesis-Irradiance (P-I) Curves for Station N18 from Farfield Survey WF024 (Apr 02).

WF024 **Station F23**

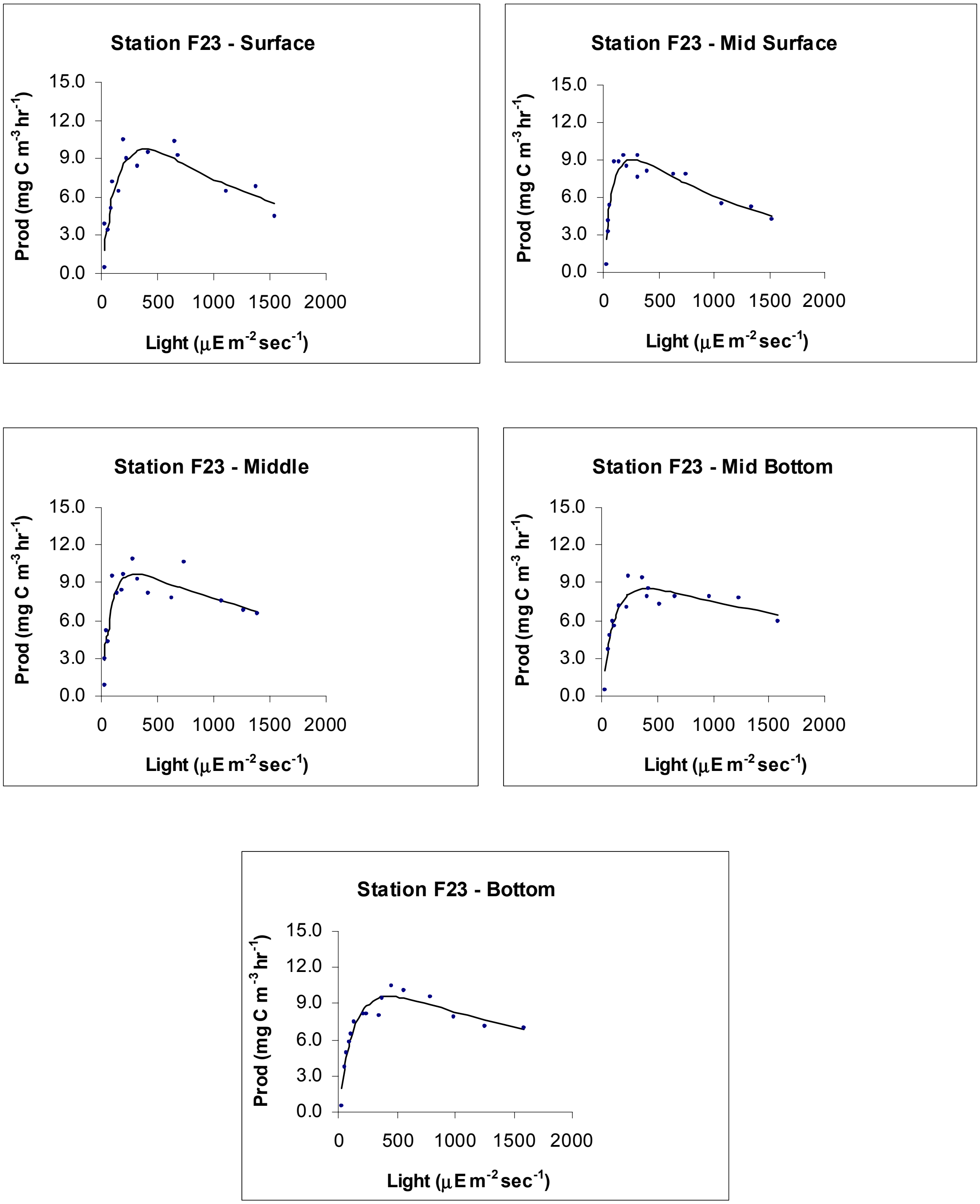


Figure C-11. Photosynthesis-Irradiance (P-I) Curves for Station F23 from Farfield Survey WF024 (Apr 02).

WN025 **Station N04**

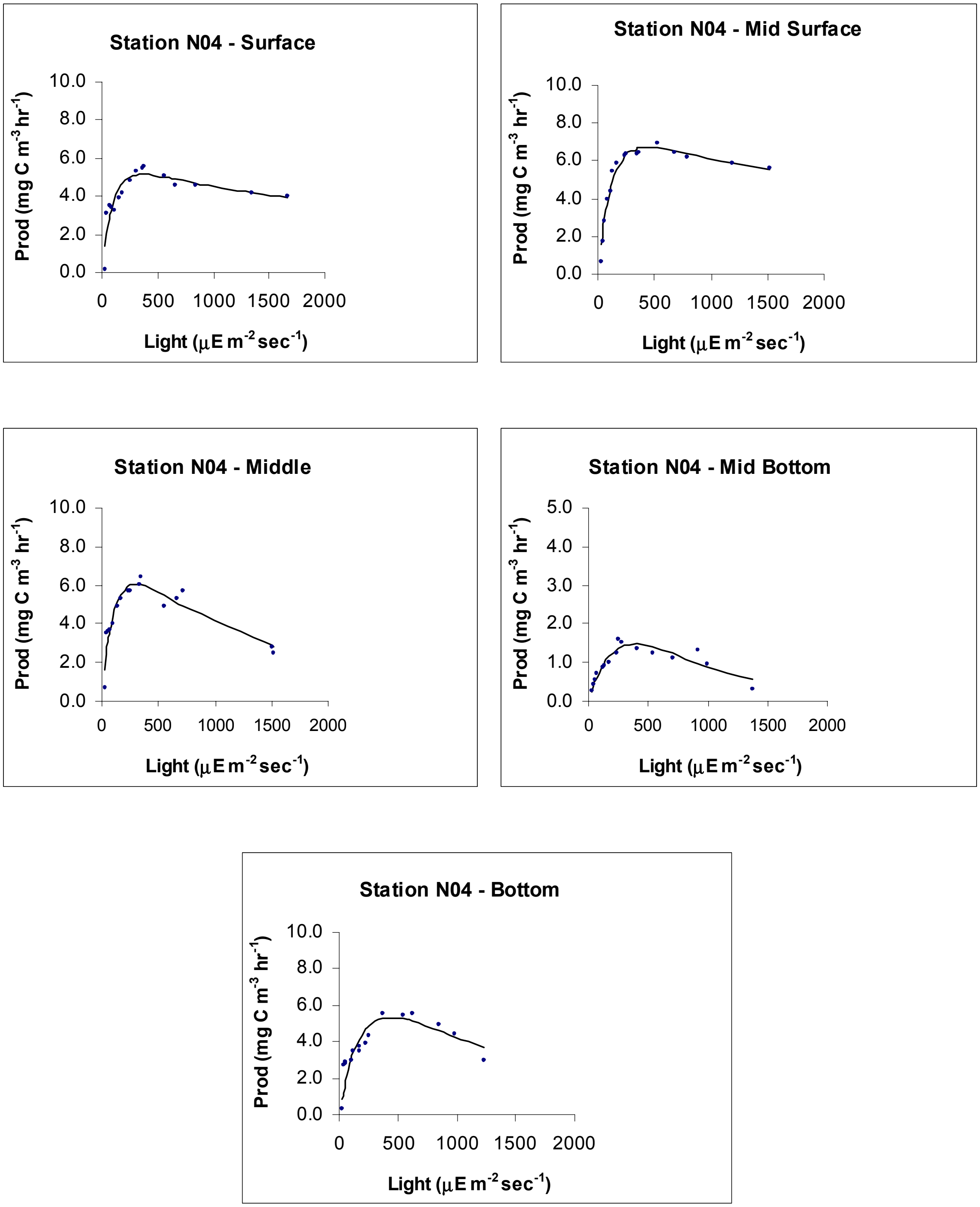


Figure C-12. Photosynthesis-Irradiance (P-I) Curves for Station N04 from Nearfield Survey WN025 (May 02).

WN025 **Station N18**

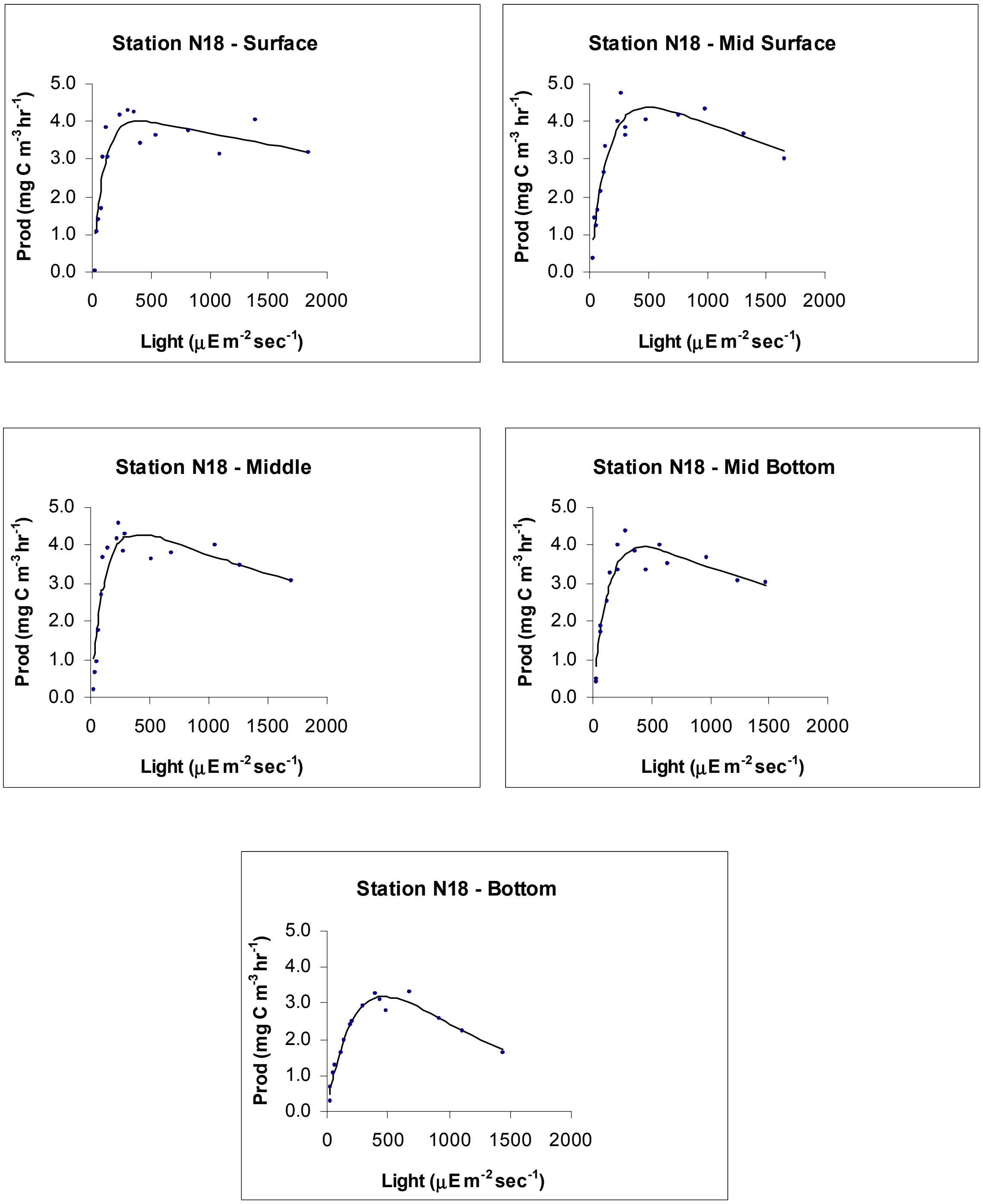


Figure C-13. Photosynthesis-Irradiance (P-I) Curves for Station N18 from Nearfield Survey WN025 (May 02).

WN026 **Station N04**

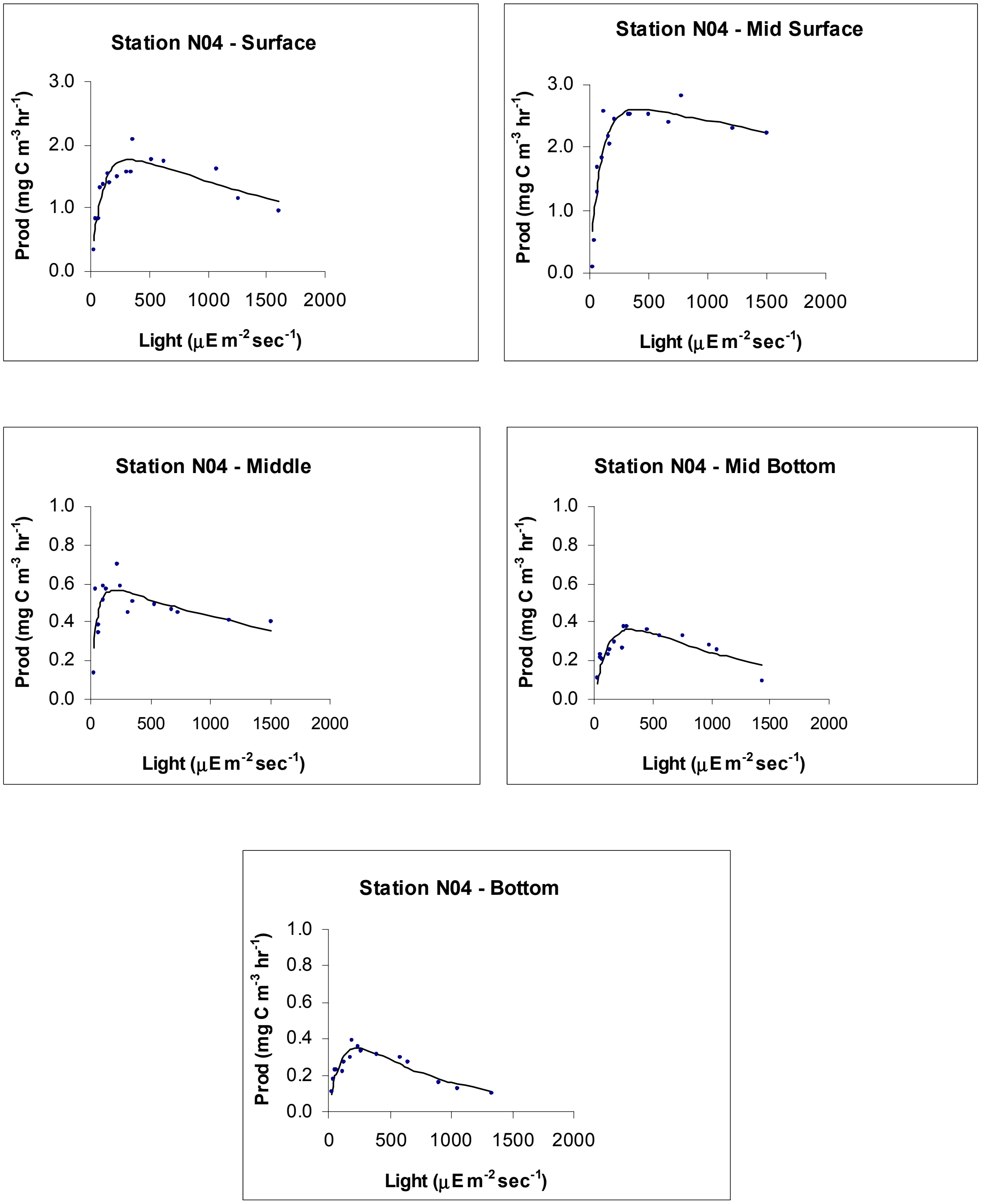


Figure C-14. Photosynthesis-Irradiance (P-I) Curves for Station N04 from Nearfield Survey WN026 (May 02).

WN026 **Station N18**

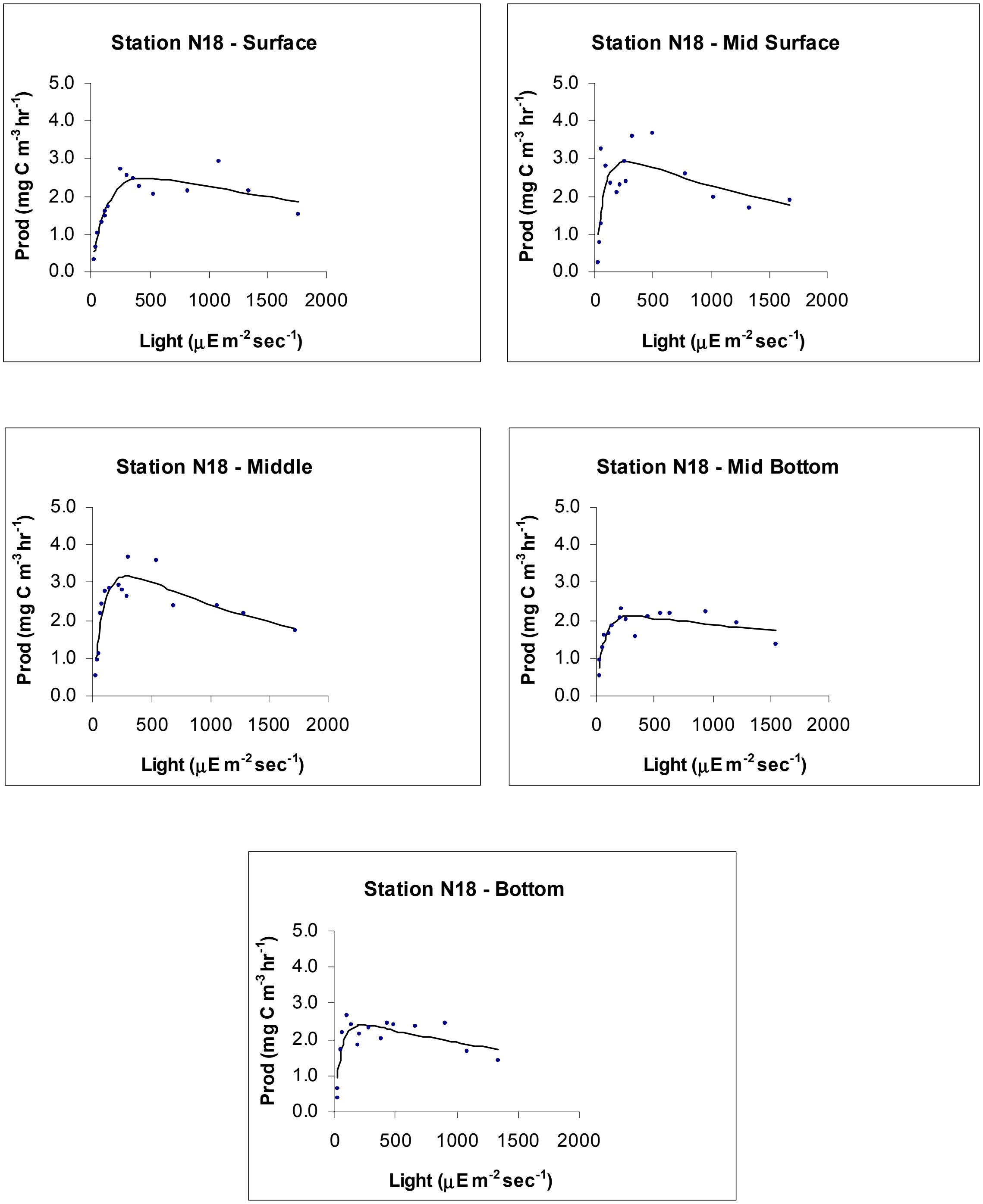


Figure C-15. Photosynthesis-Irradiance (P-I) Curves for Station N18 from Nearfield Survey WN026 (May 02).

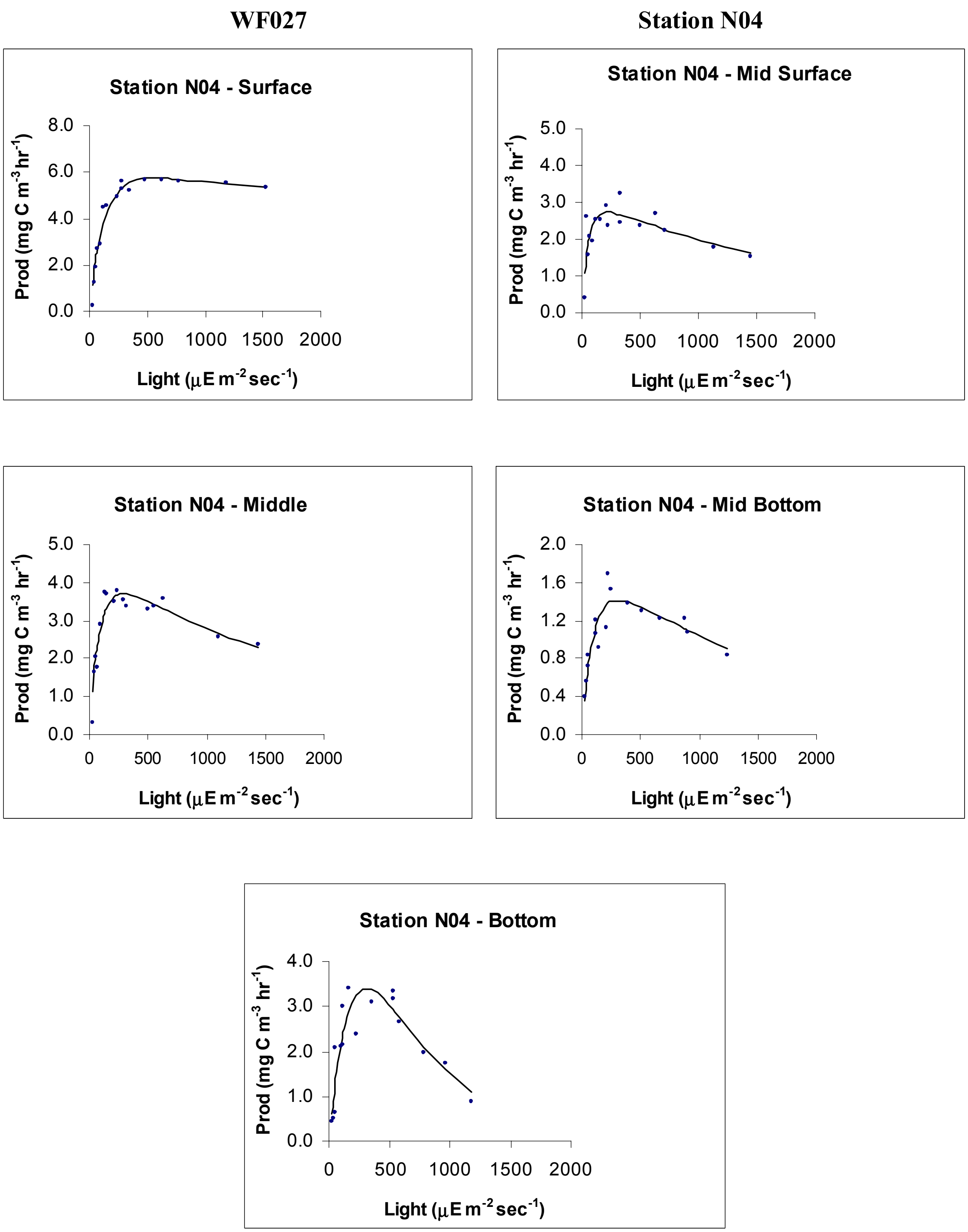


Figure C-16. Photosynthesis-Irradiance (P-I) Curves for Station N04 from Farfield Survey WF027 (Jun 02).

WF027 **Station N18**

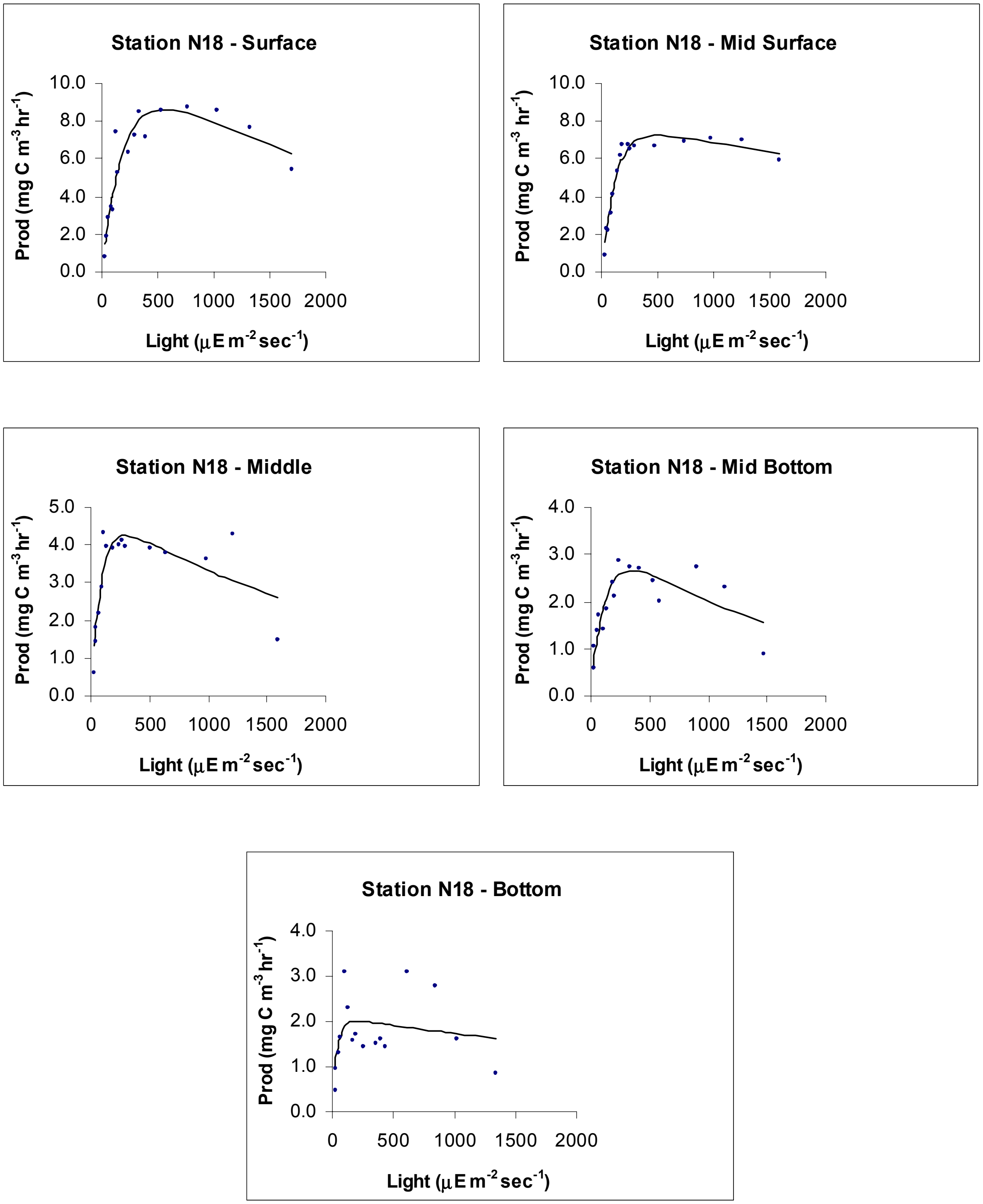
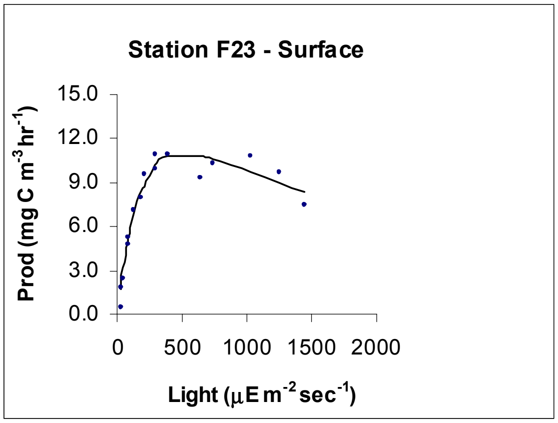
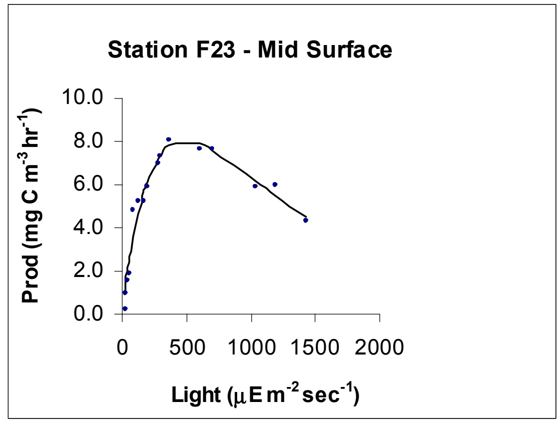
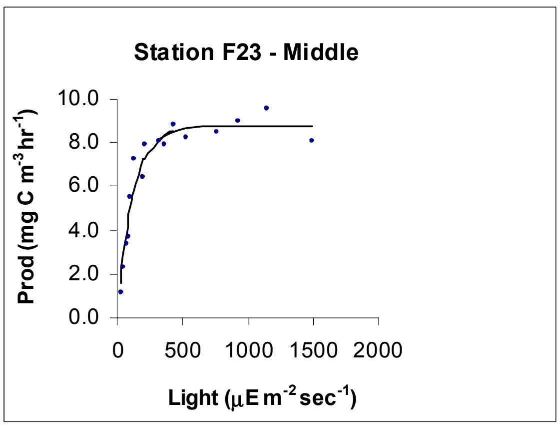
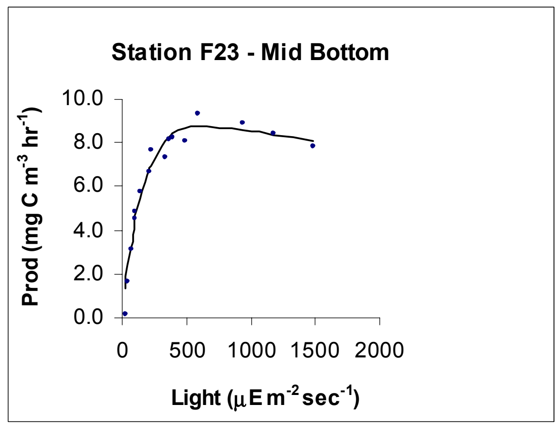


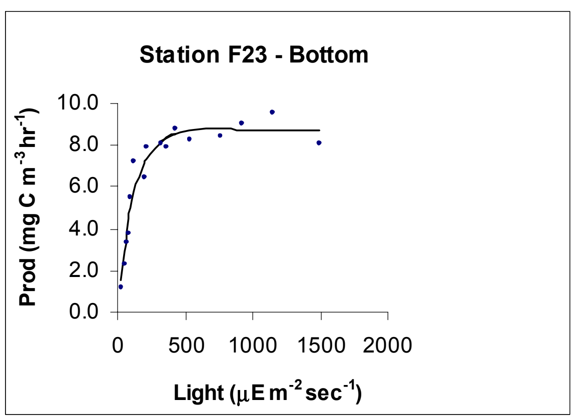
Figure C-17. Photosynthesis-Irradiance (P-I) Curves for Station N18 from Farfield Survey WF027 (Jun 02).











WF027 **Station F23**

Figure C-18. Photosynthesis-Irradiance (P-I) Curves for Station F23 from Farfield Survey WF027 (Jun 02).

APPENDIX D

Satellite Images of Chlorophyll a Concentrations and Temperature

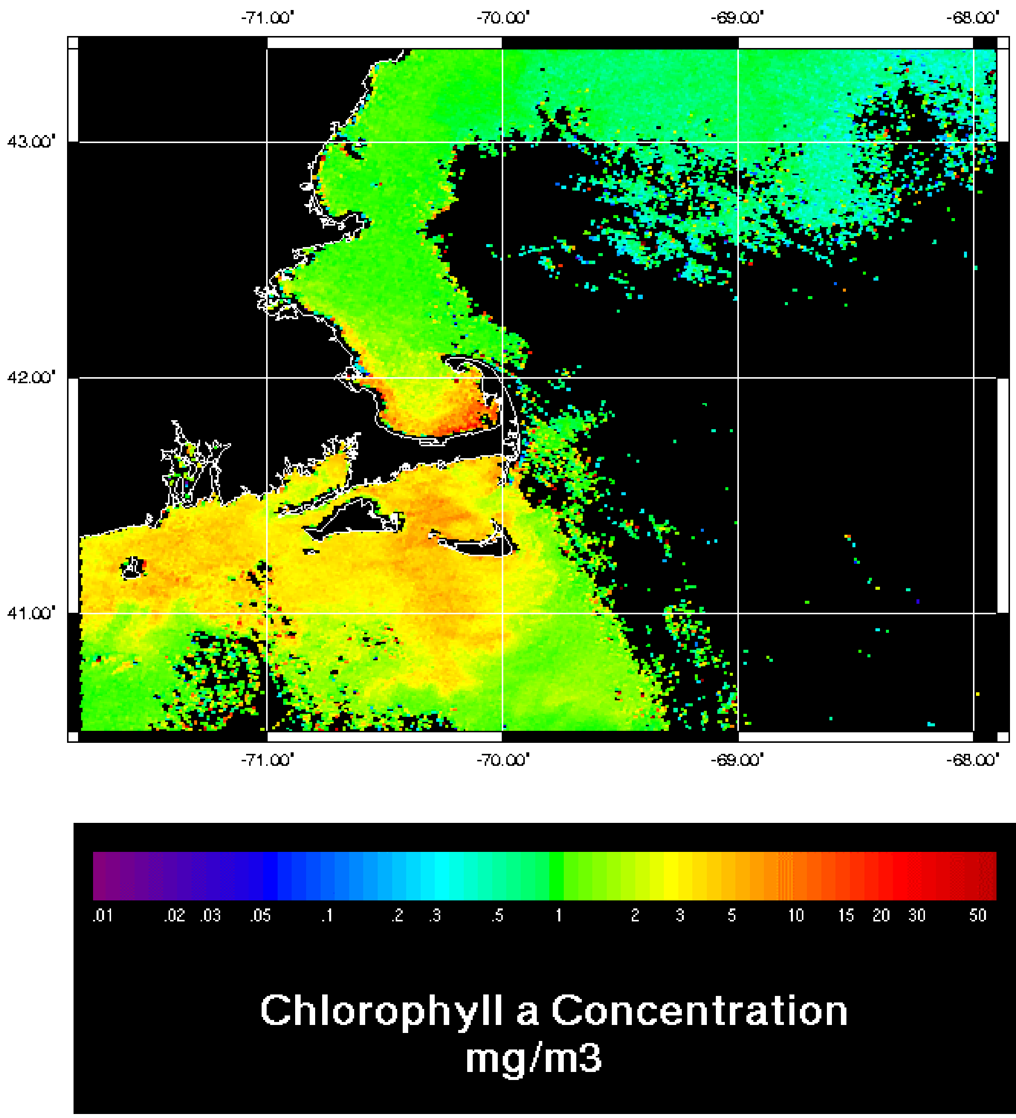


Figure D-1. Chlorophyll a Concentrations from January 20, 2002

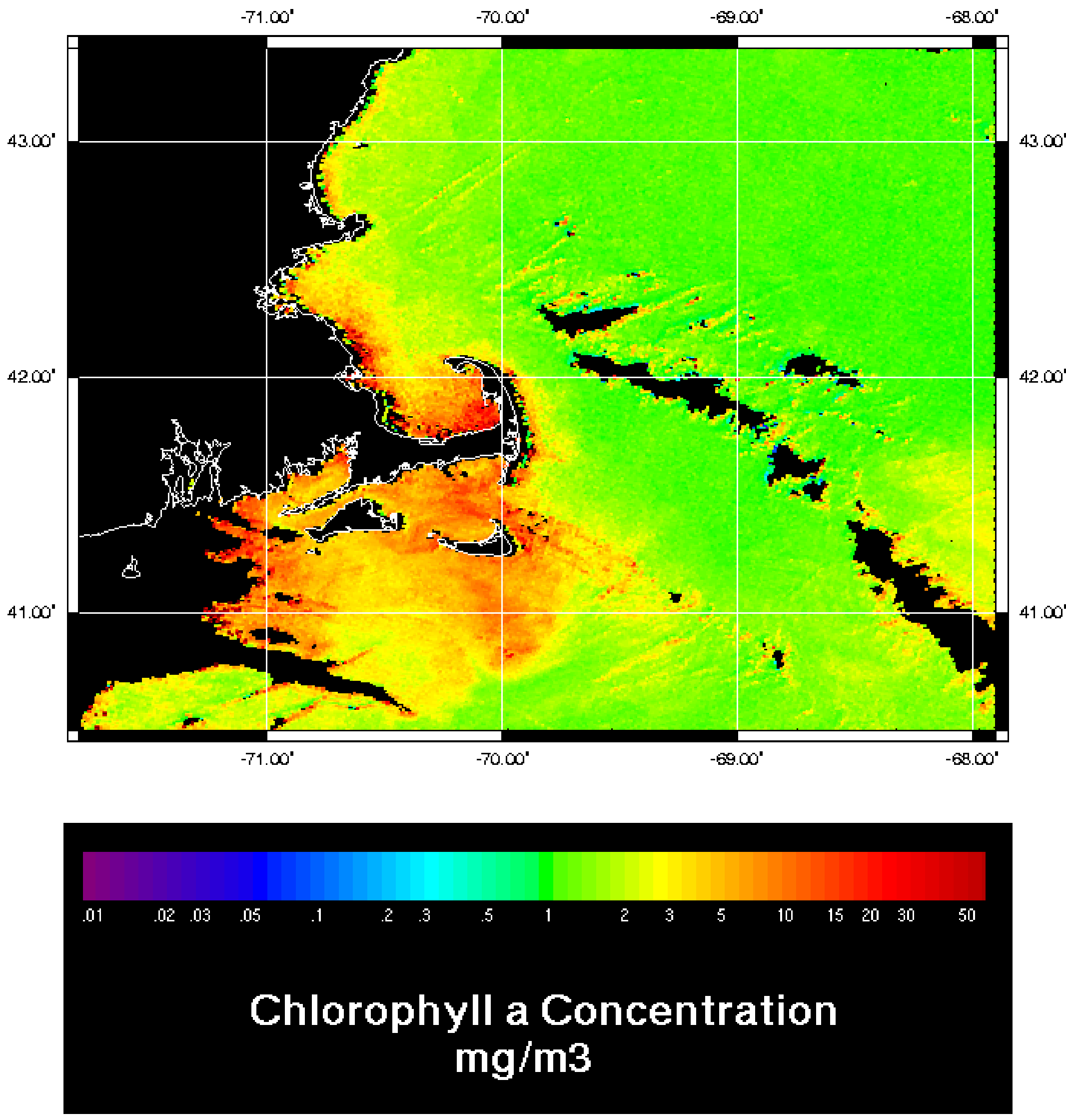


Figure D-2. Chlorophyll a Concentrations from January 27, 2002

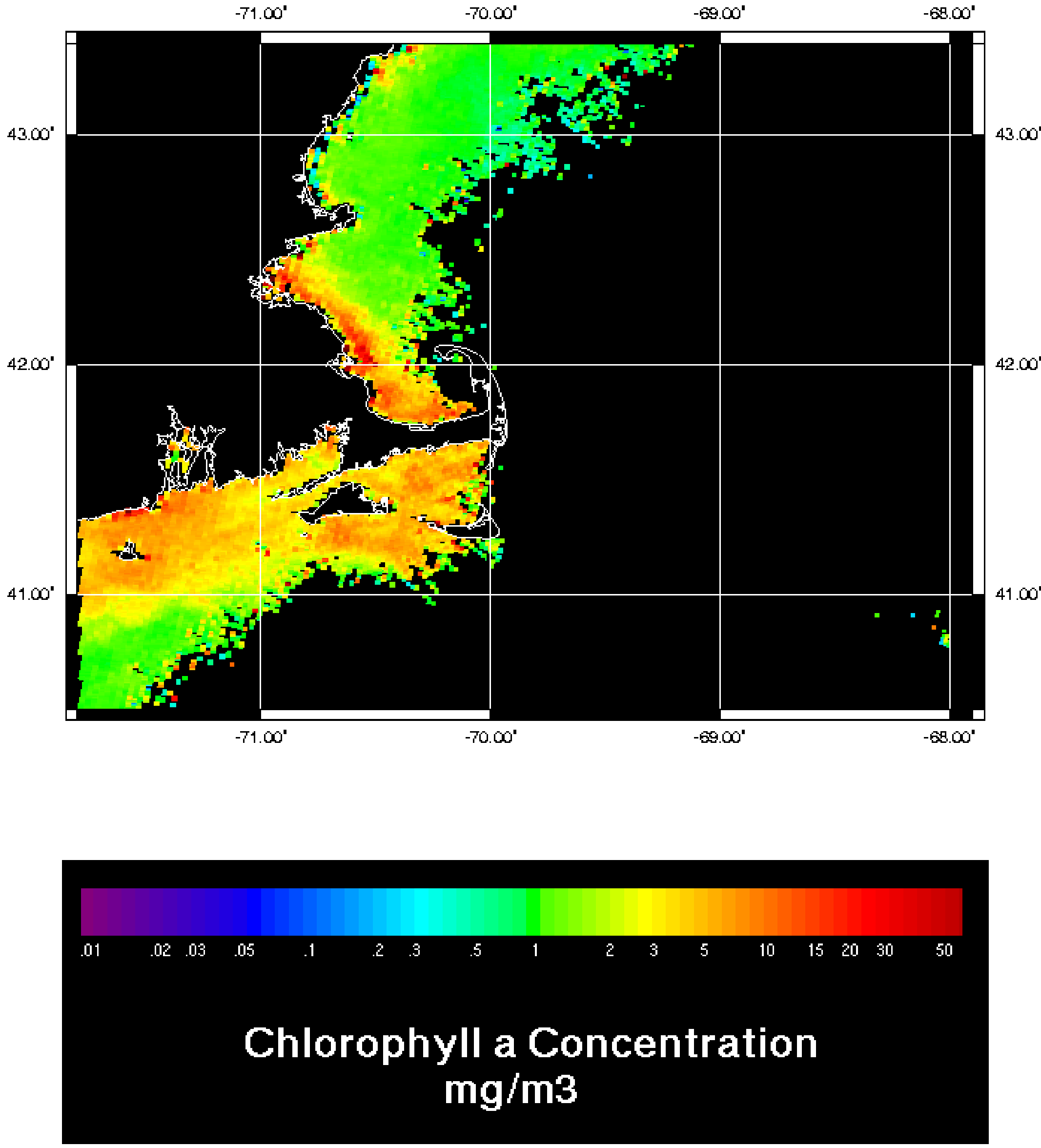


Figure D-3. Chlorophyll a Concentrations from February 5, 2002

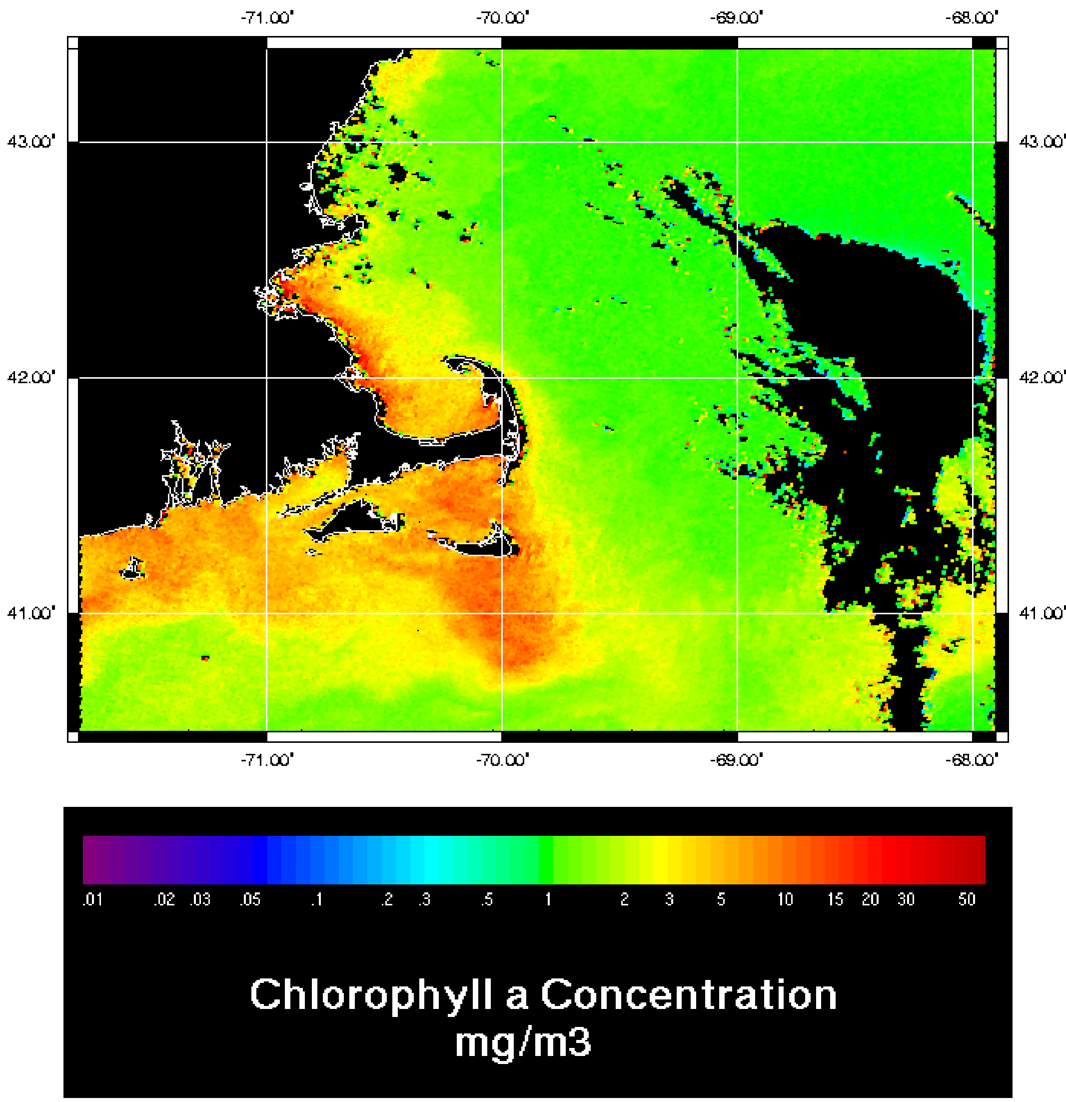


Figure D-4. Chlorophyll a Concentrations from February 8, 2001

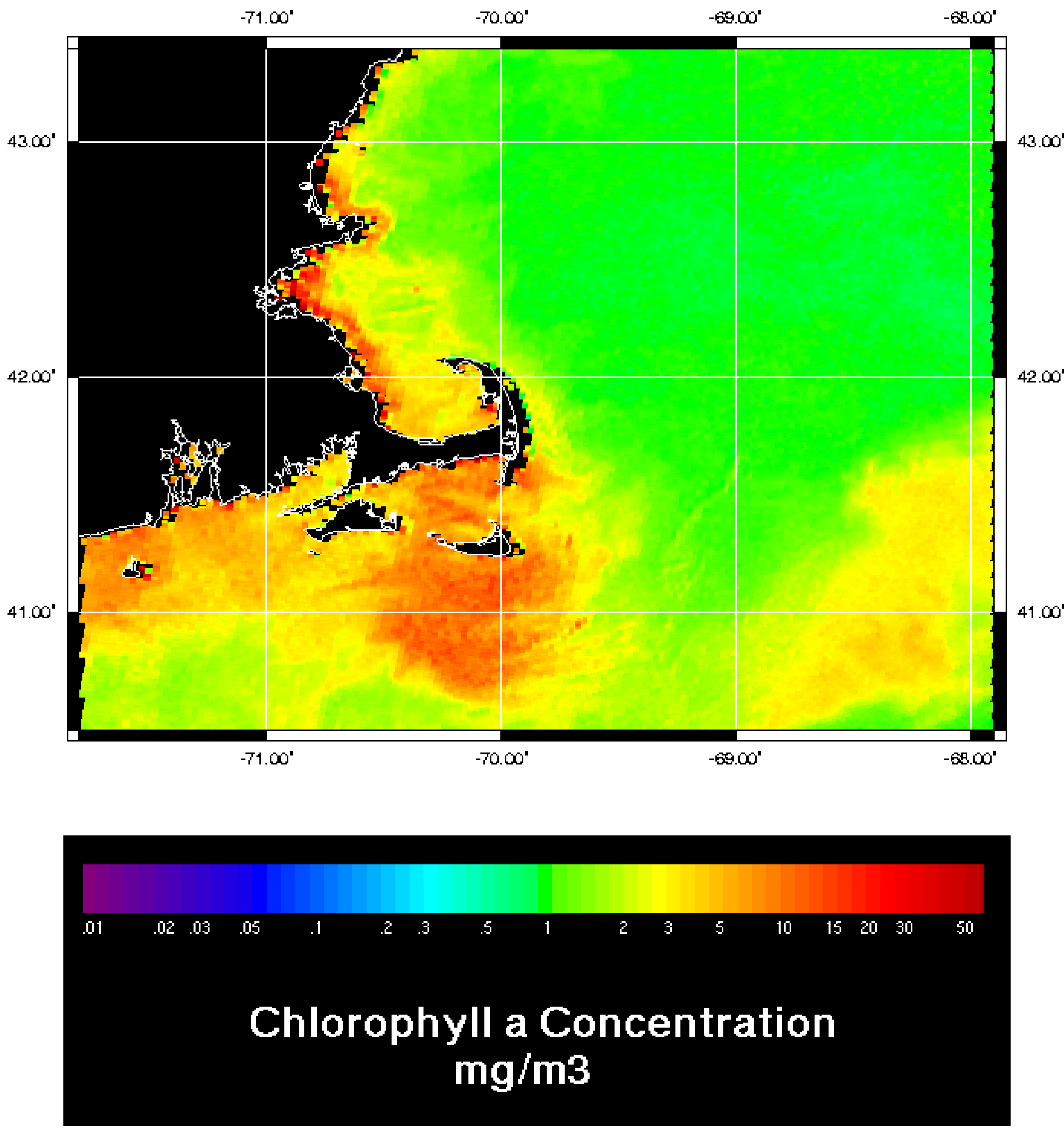


Figure D-5. Chlorophyll a Concentration from February 19, 2002

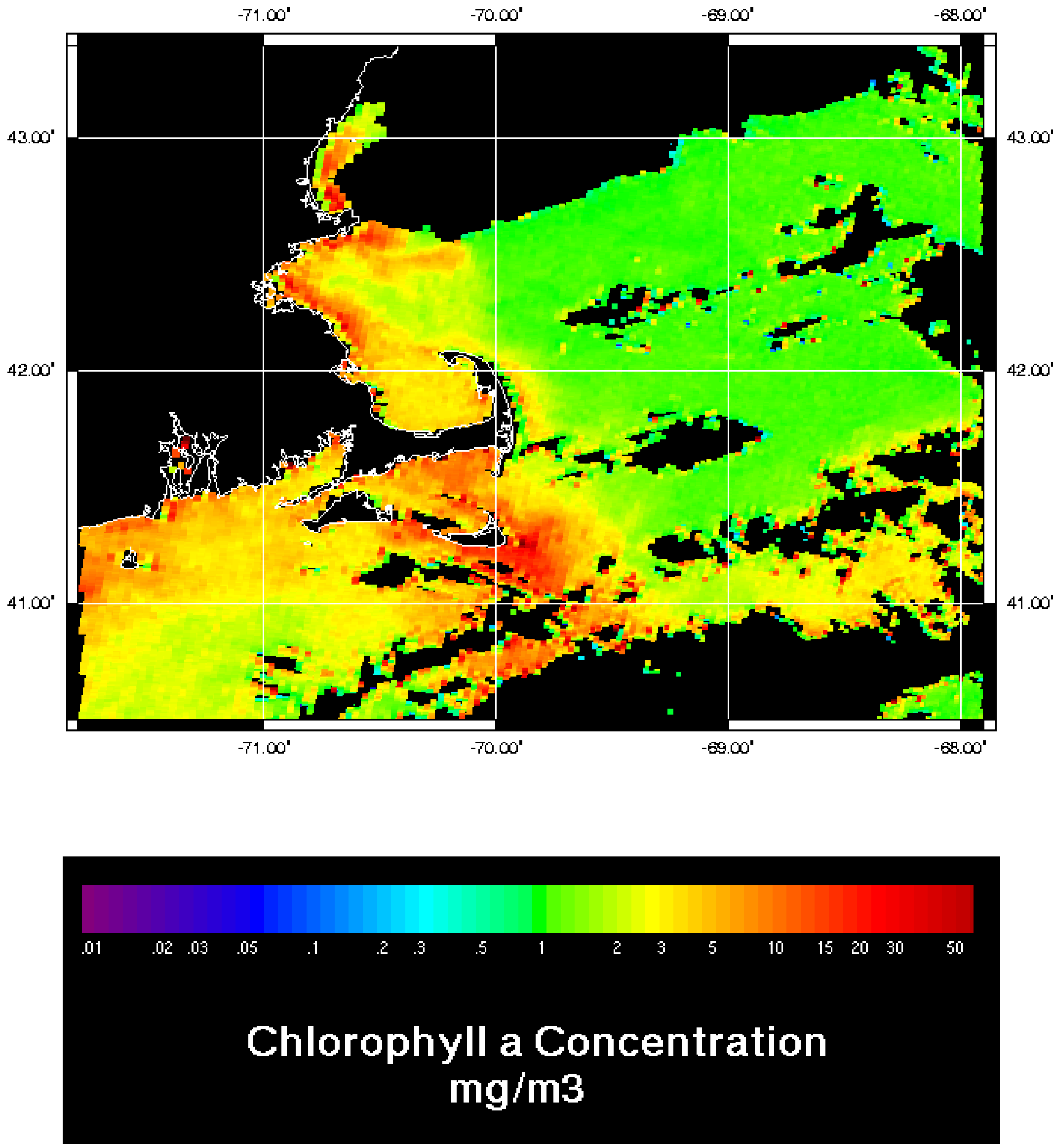


Figure D-6. Chlorophyll a Concentration from February 26, 2002

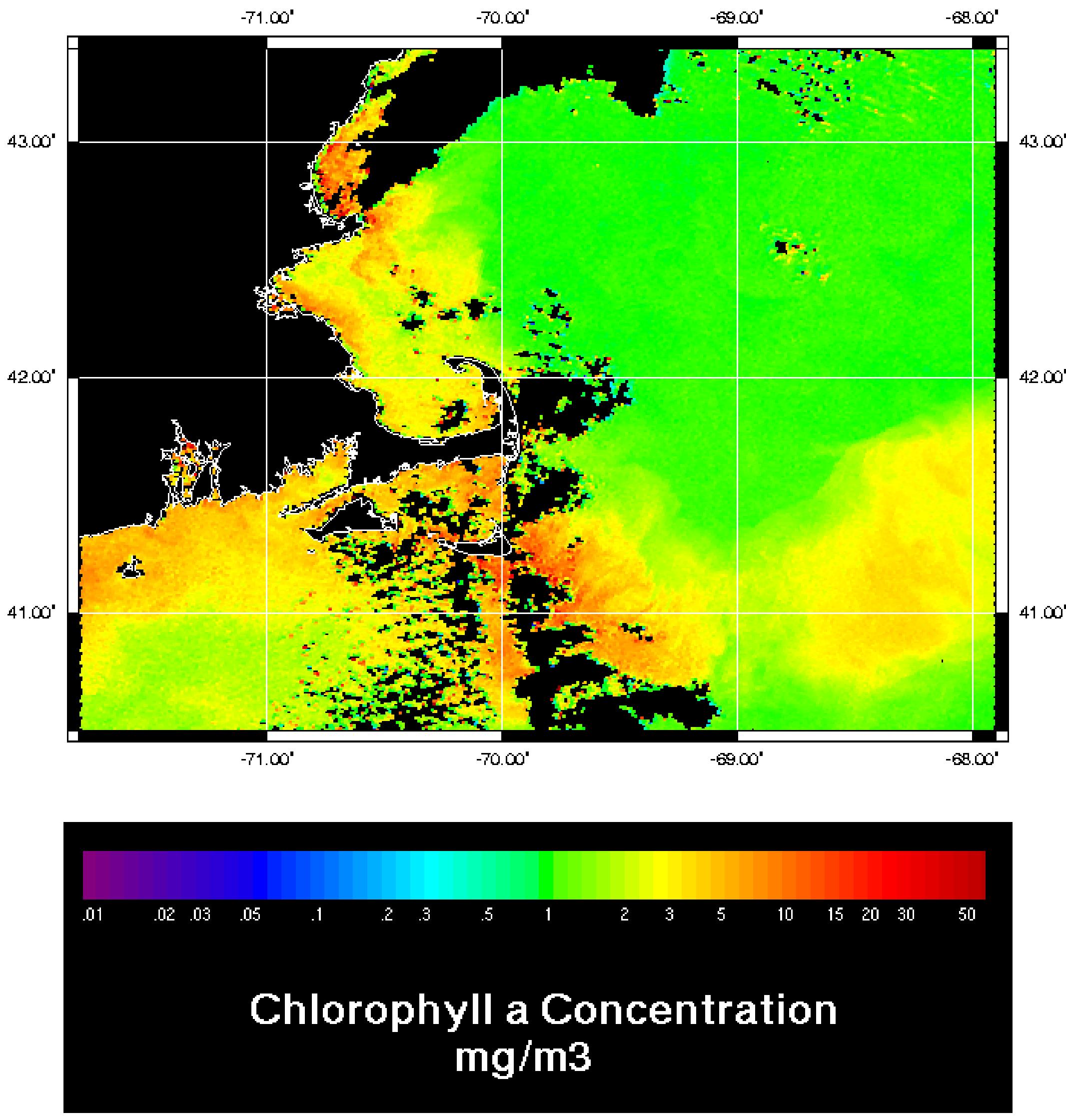


Figure D-7. Chlorophyll a Concentration from March 1, 2002

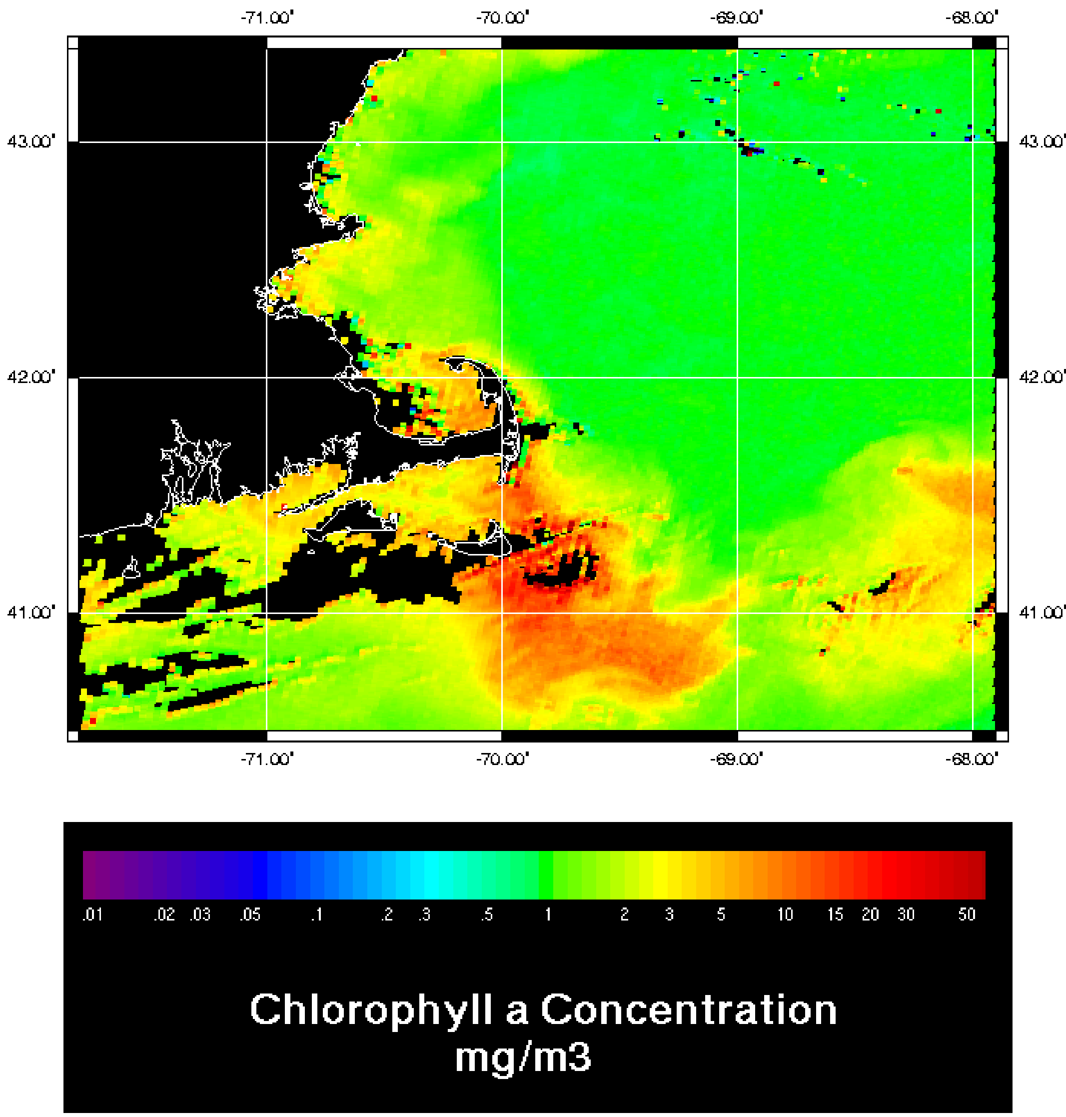


Figure D-8. Chlorophyll a Concentration from March 24, 2002

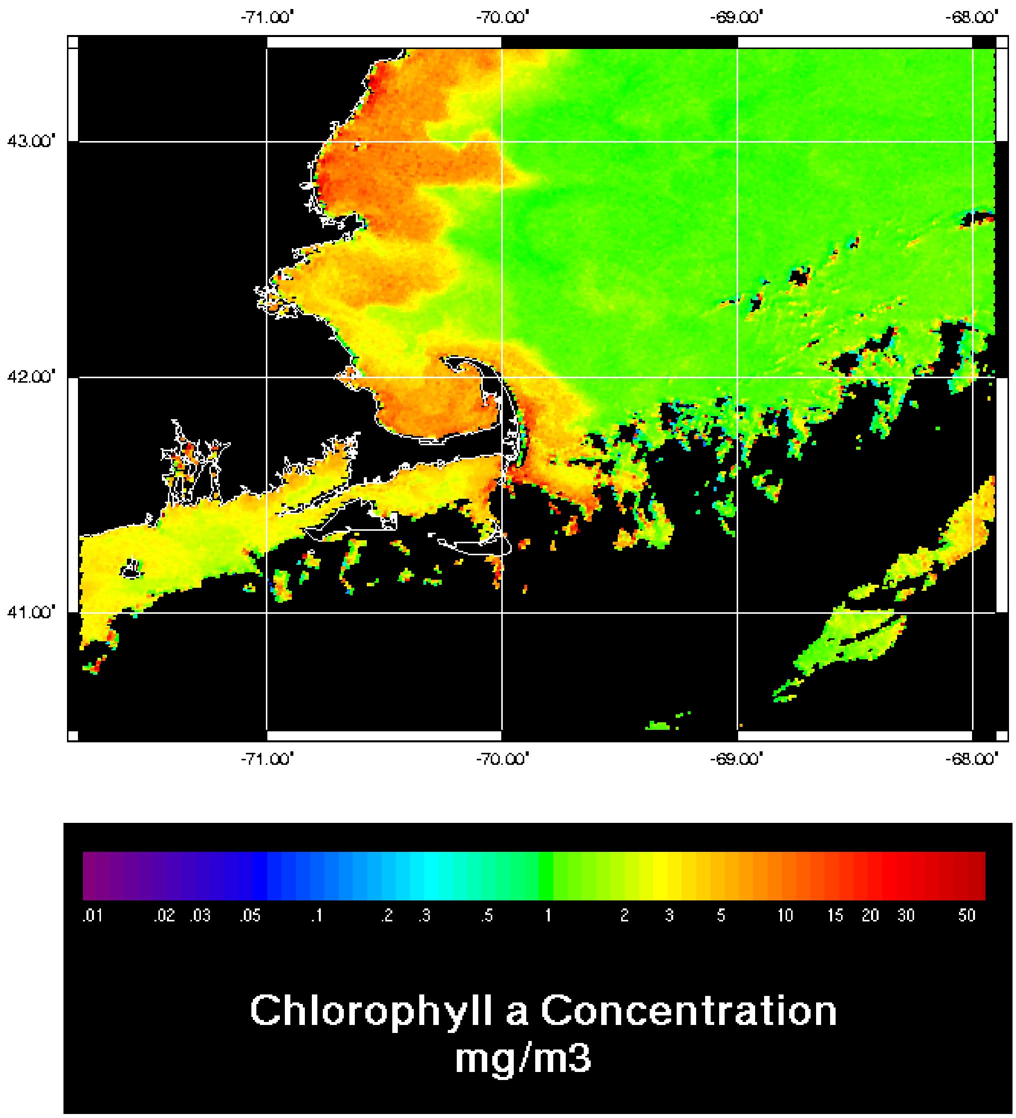


Figure D-9. Chlorophyll a Concentration from April 10, 2002

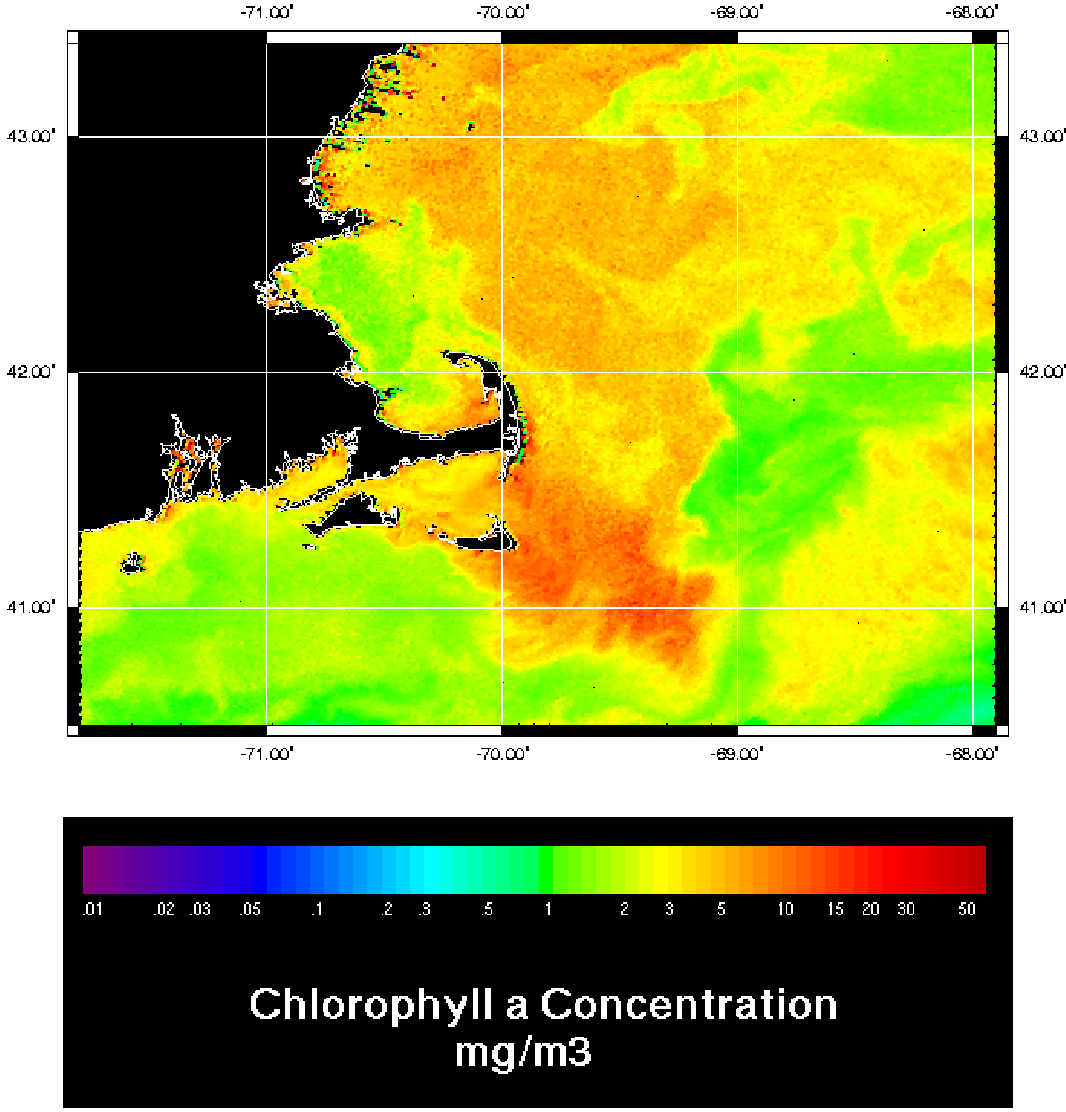


Figure D-10. Chlorophyll a Concentration from April 27, 2002

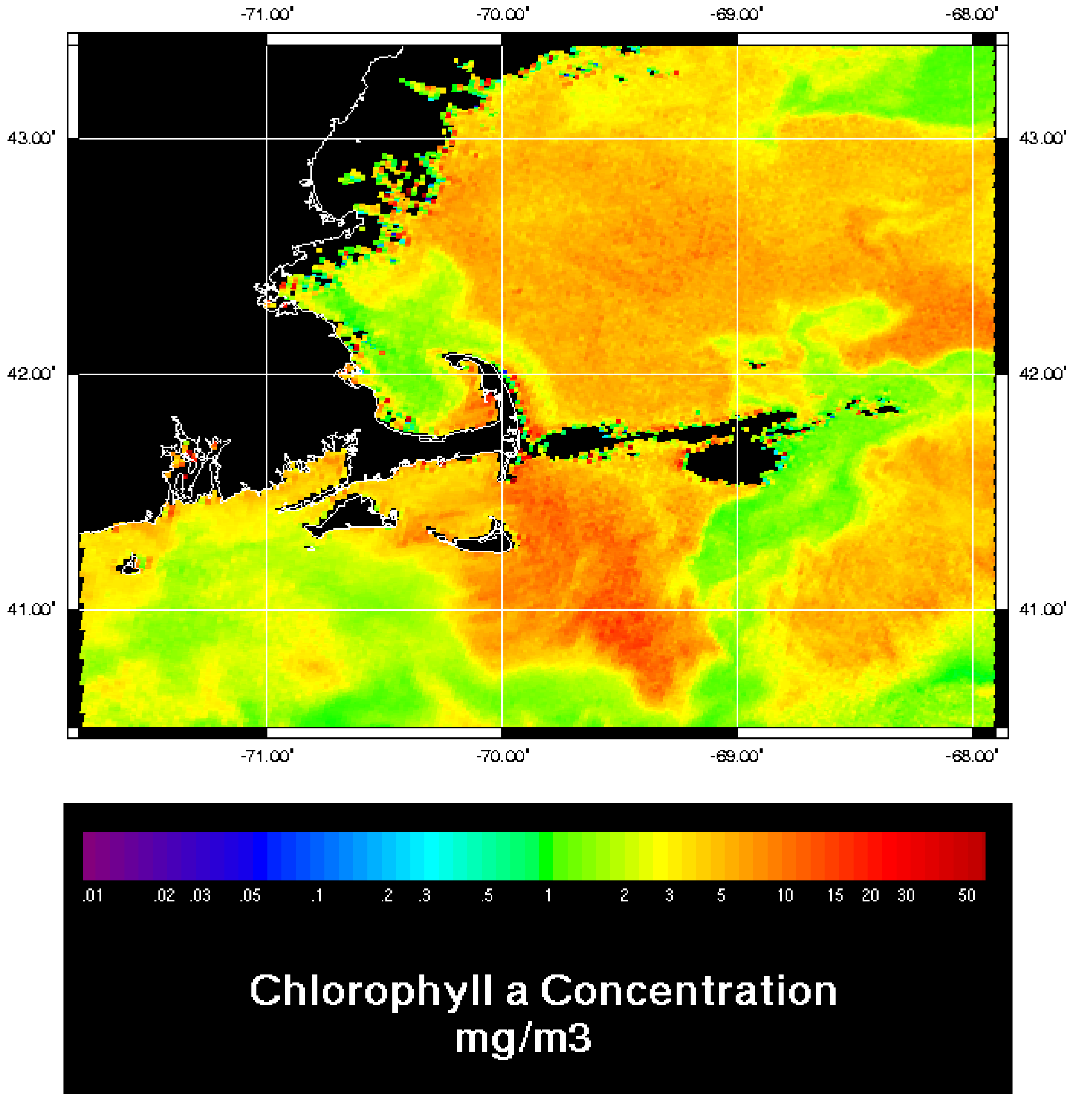


Figure D-11. Chlorophyll a Concentration from May 1, 2002

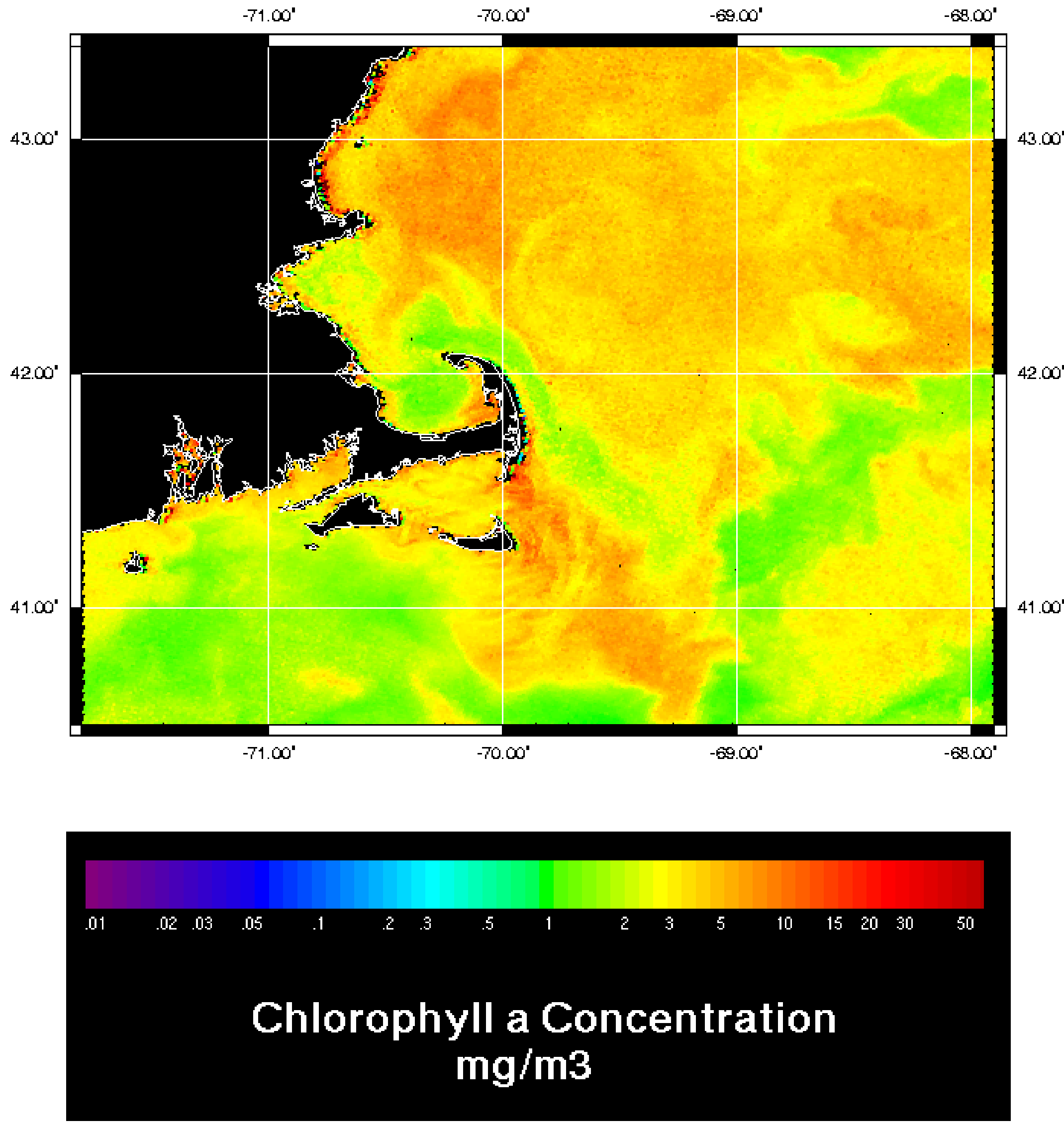


Figure D-12. Chlorophyll a Concentration from May 4, 2002

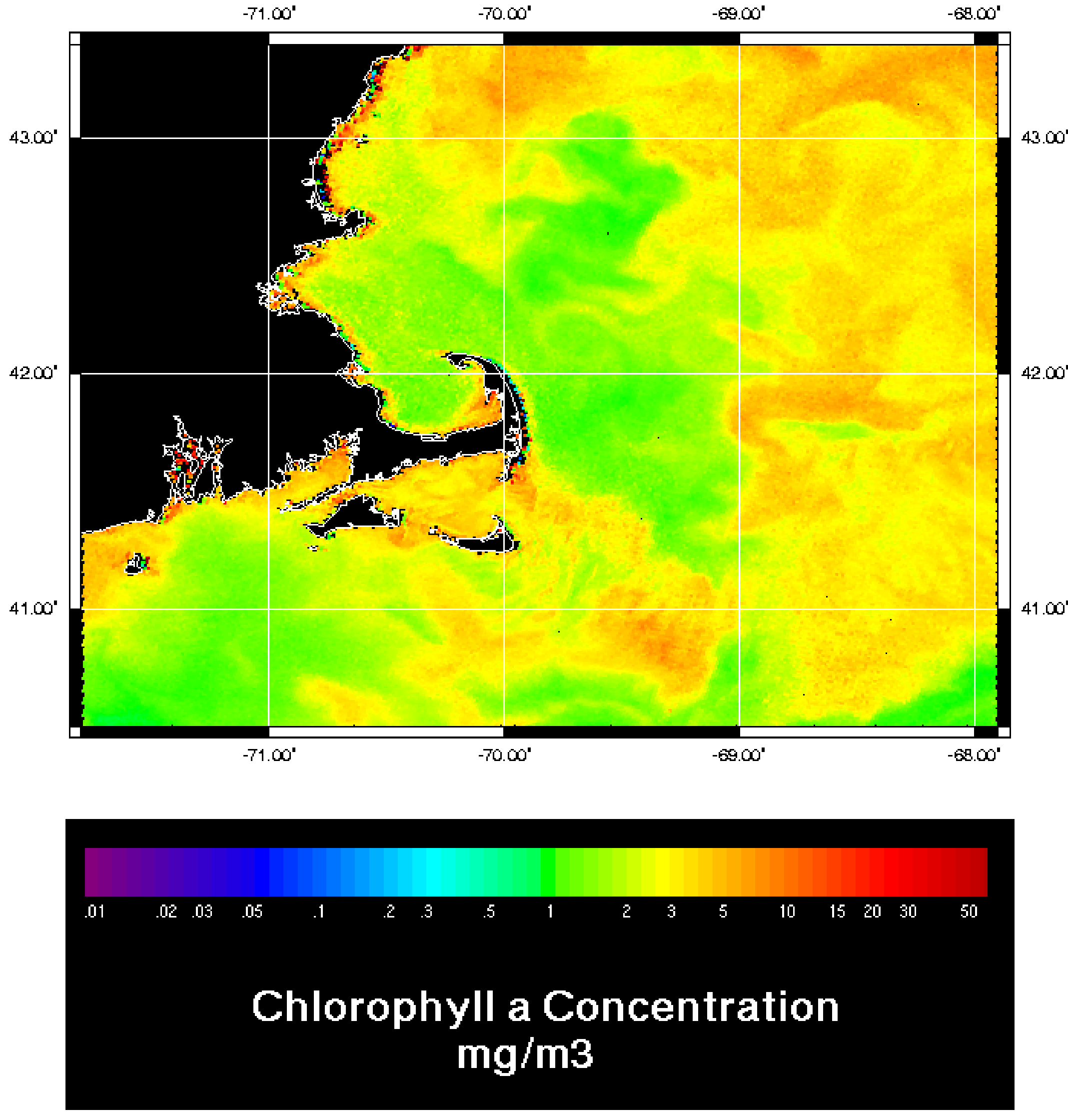


Figure D-13. Chlorophyll a Concentration from May 11, 2002

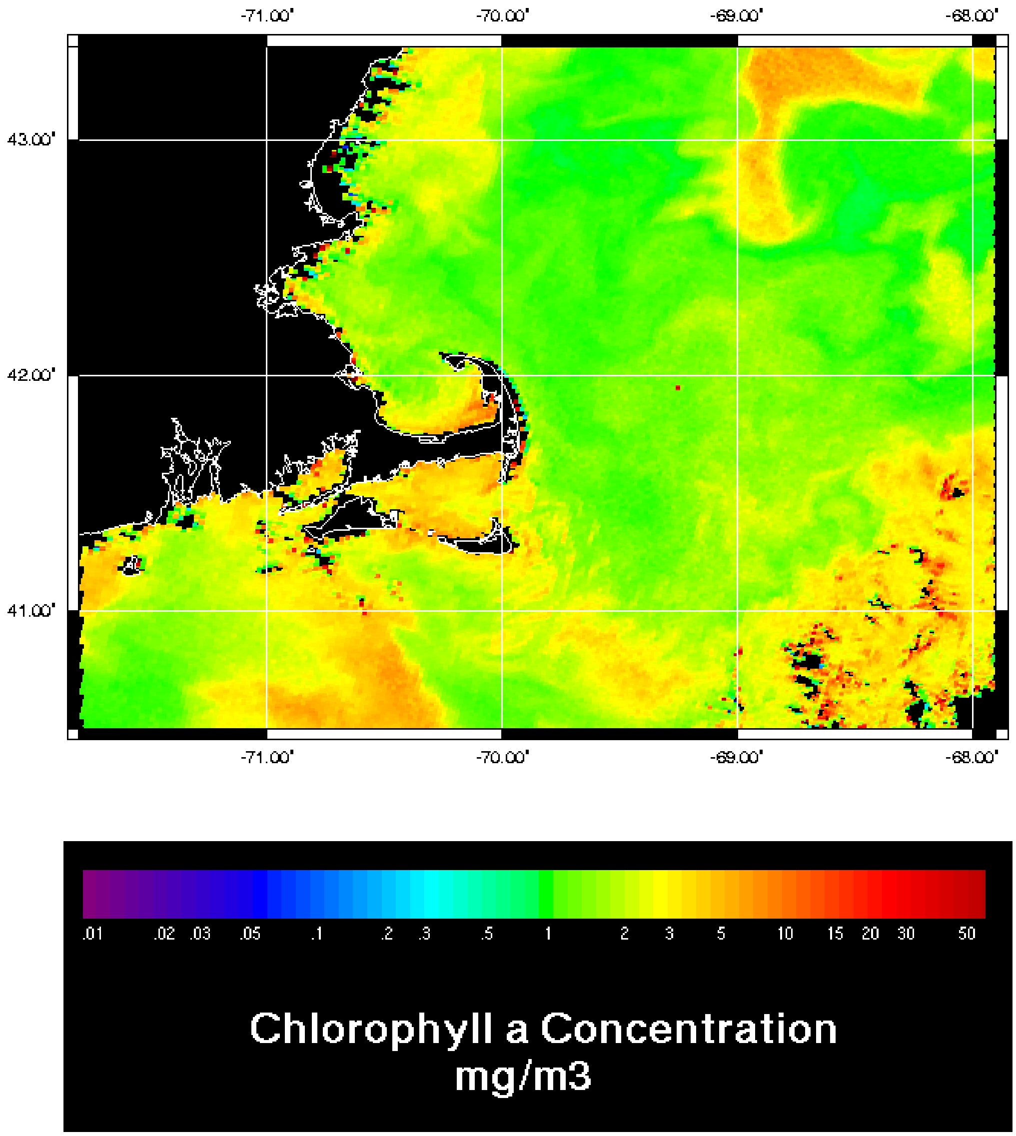


Figure D-14. Chlorophyll a Concentration from May 20, 2002

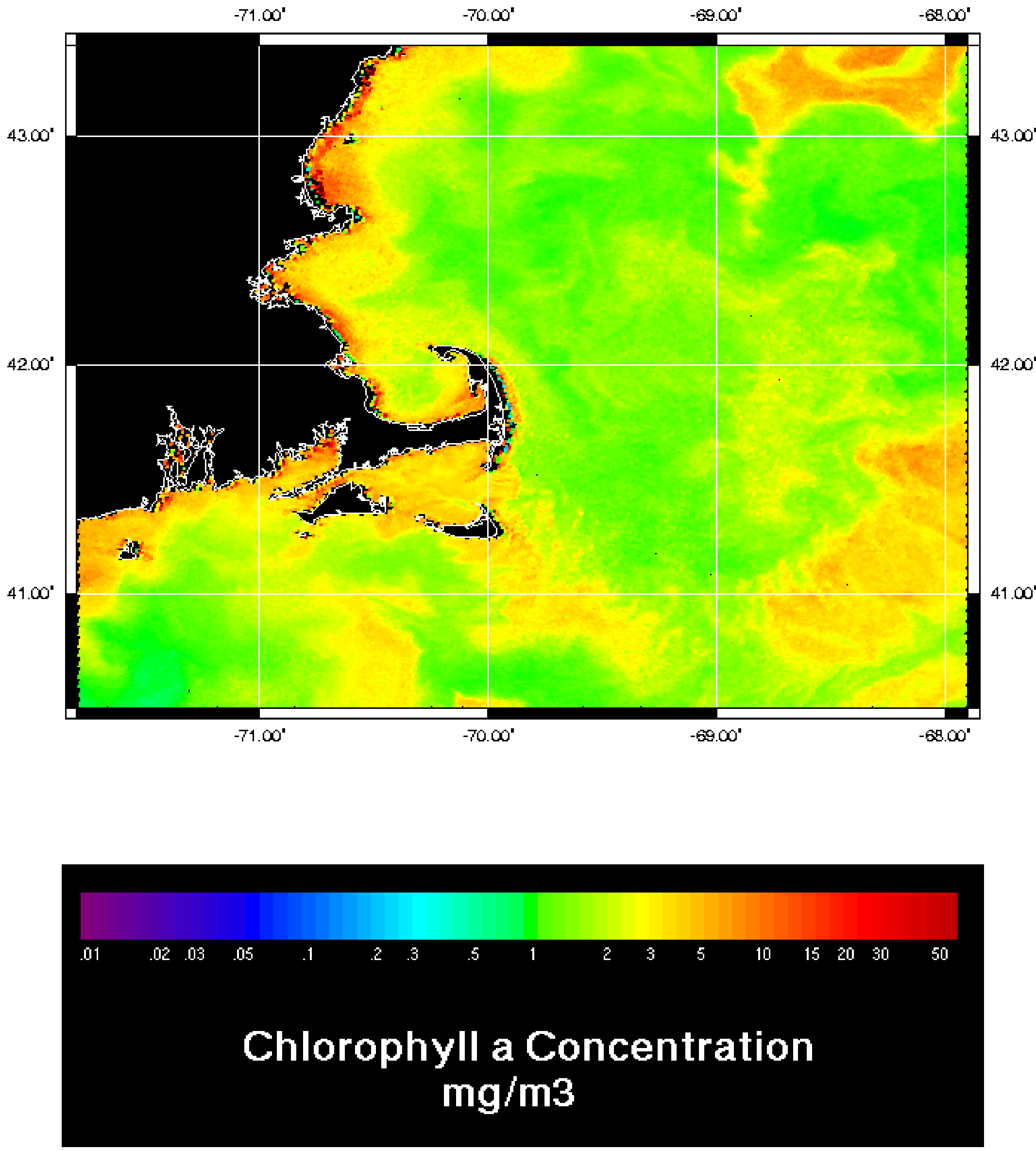


Figure D-15. Chlorophyll a Concentration from May 23, 2002

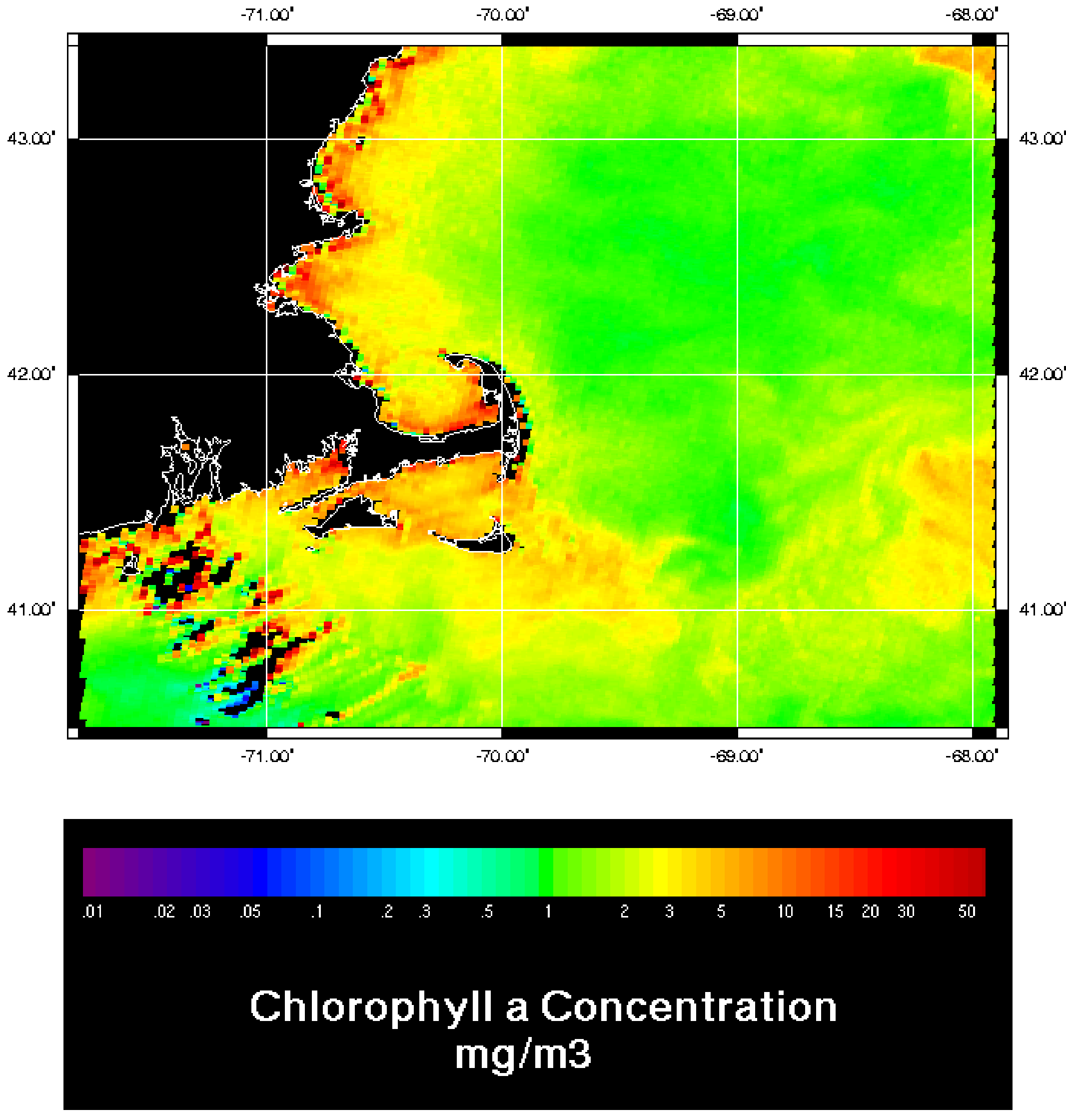


Figure D-16. Chlorophyll a Concentration from June 3, 2002

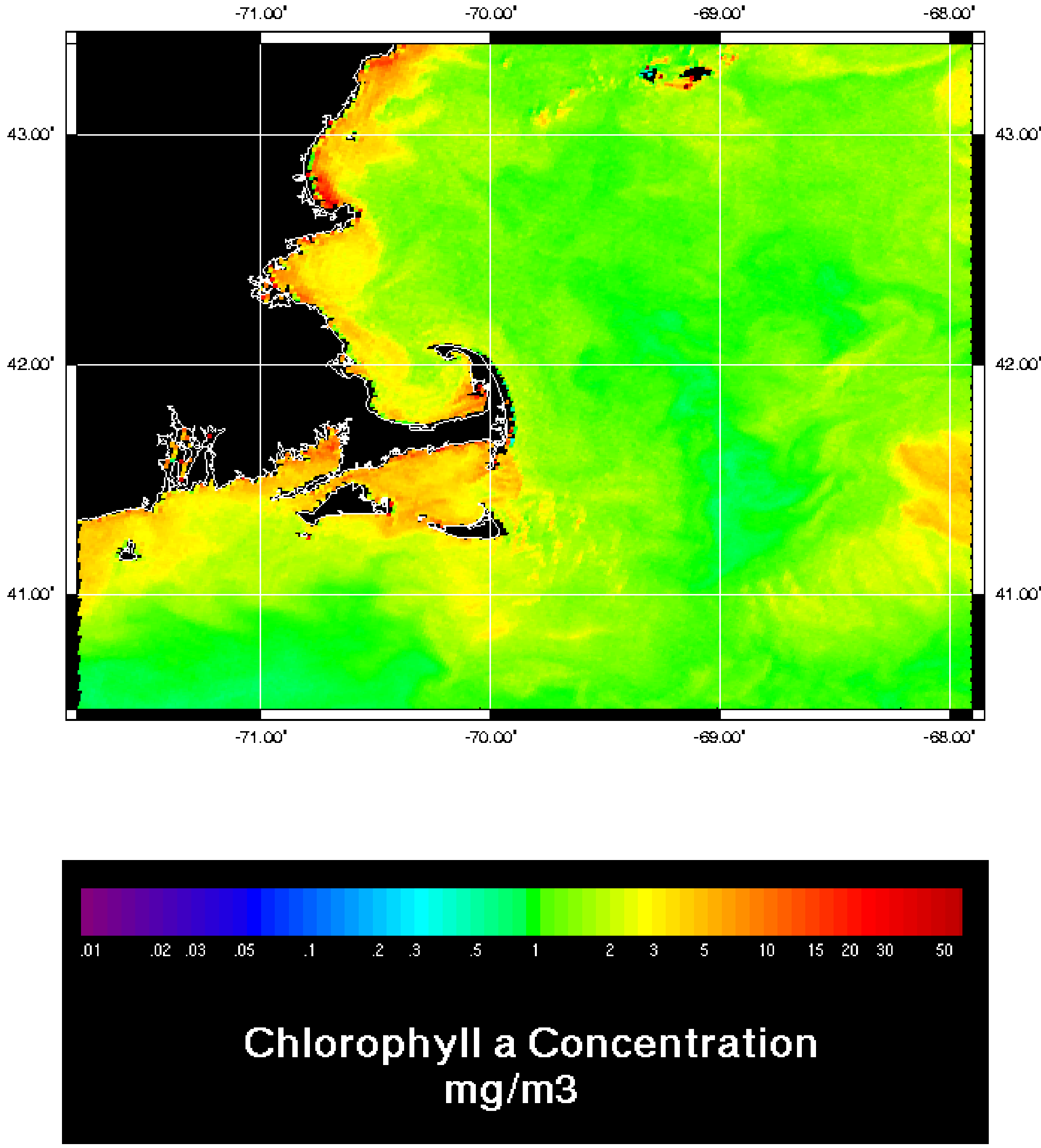


Figure D-17. **Chlorophyll a Concentration from June 20, 2002**

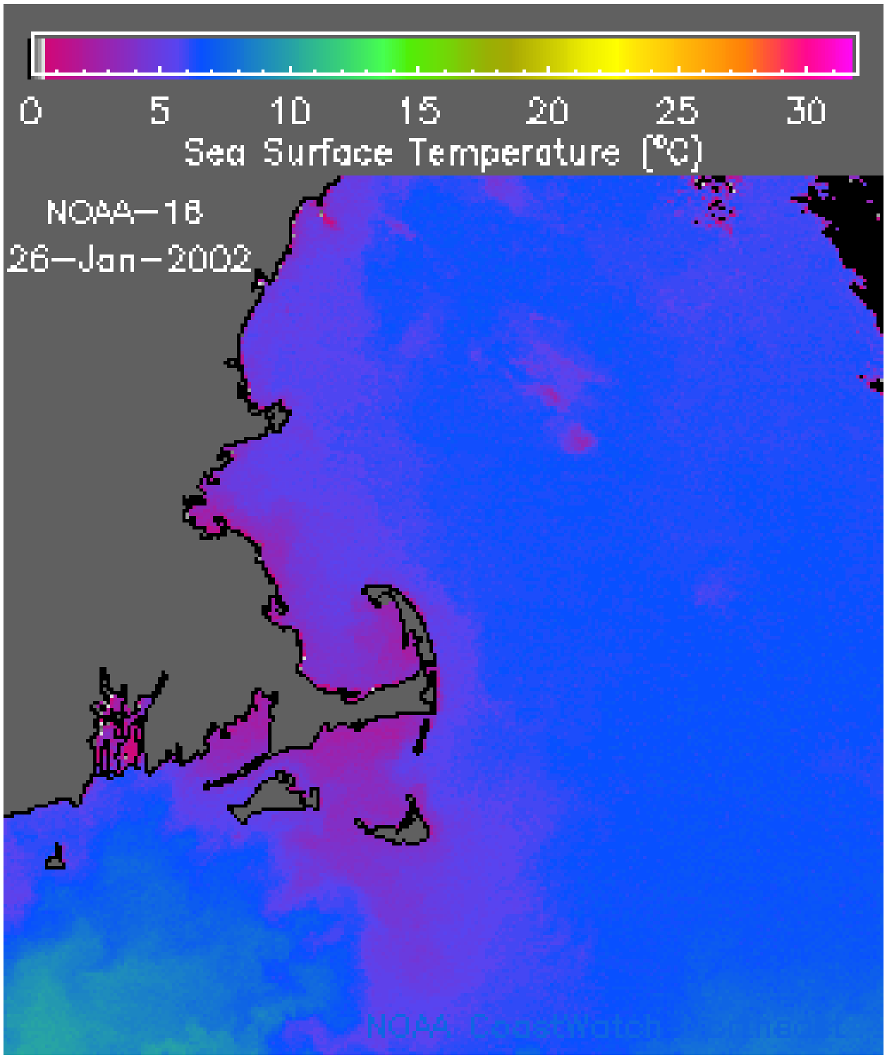


Figure D-18. Sea Surface Temperature from January 26, 2002

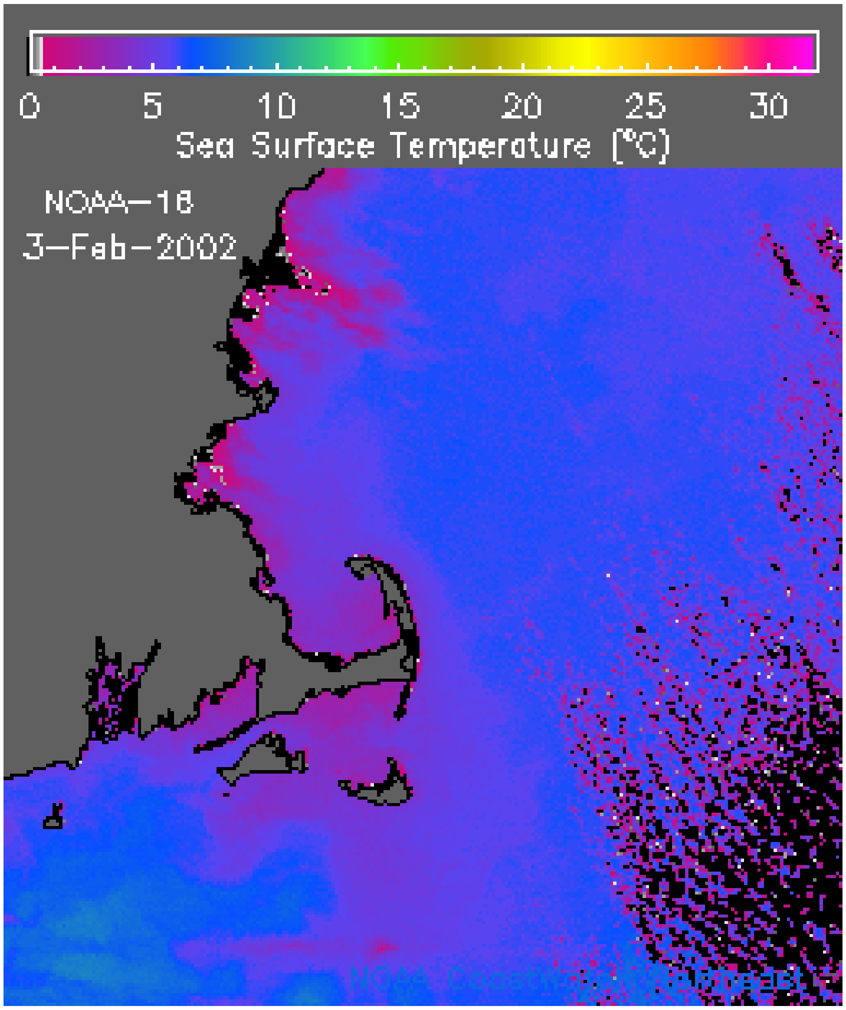


Figure D-19. **Sea Surface Temperature from February 3, 2002**

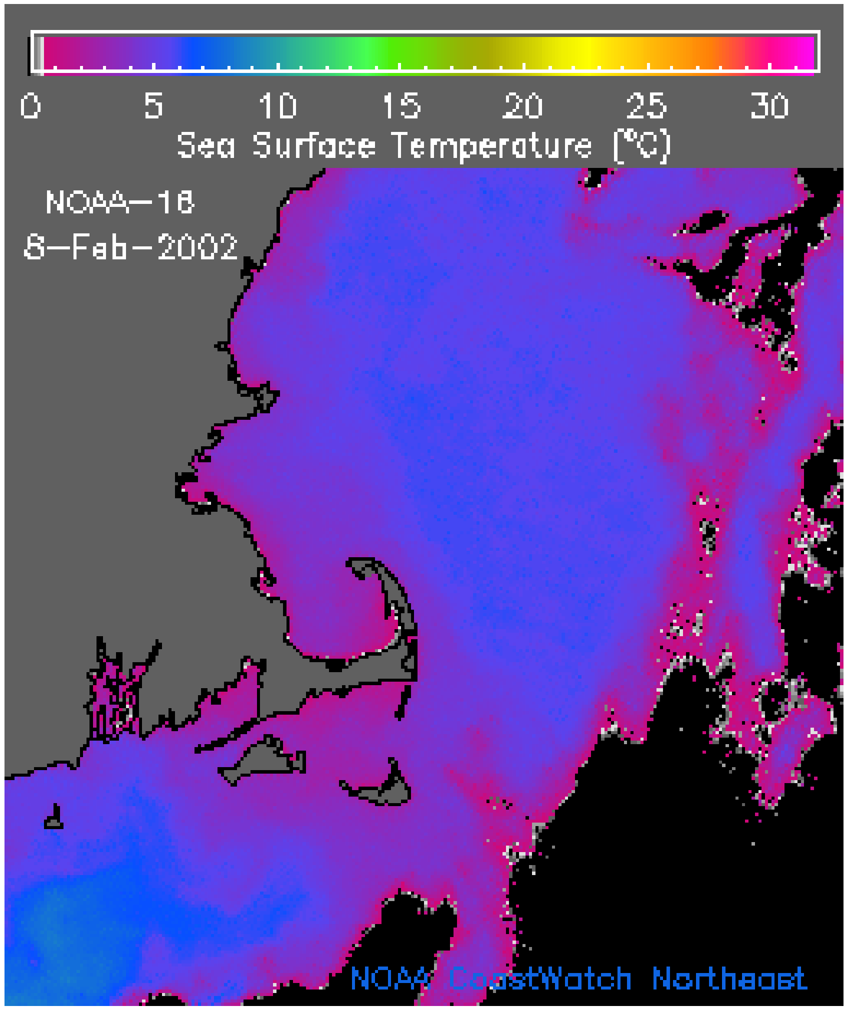


Figure D-20. **Sea Surface Temperature from February 8, 2002**

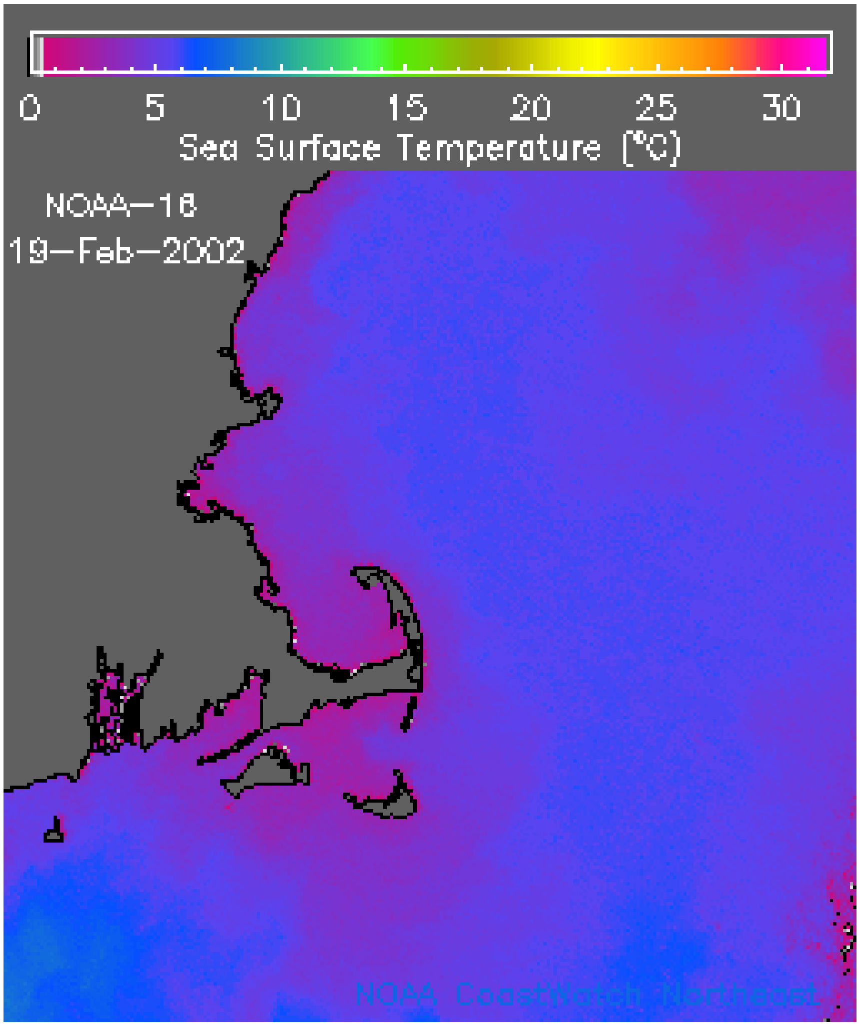


Figure D-21. Sea Surface Temperature from February 19, 2002

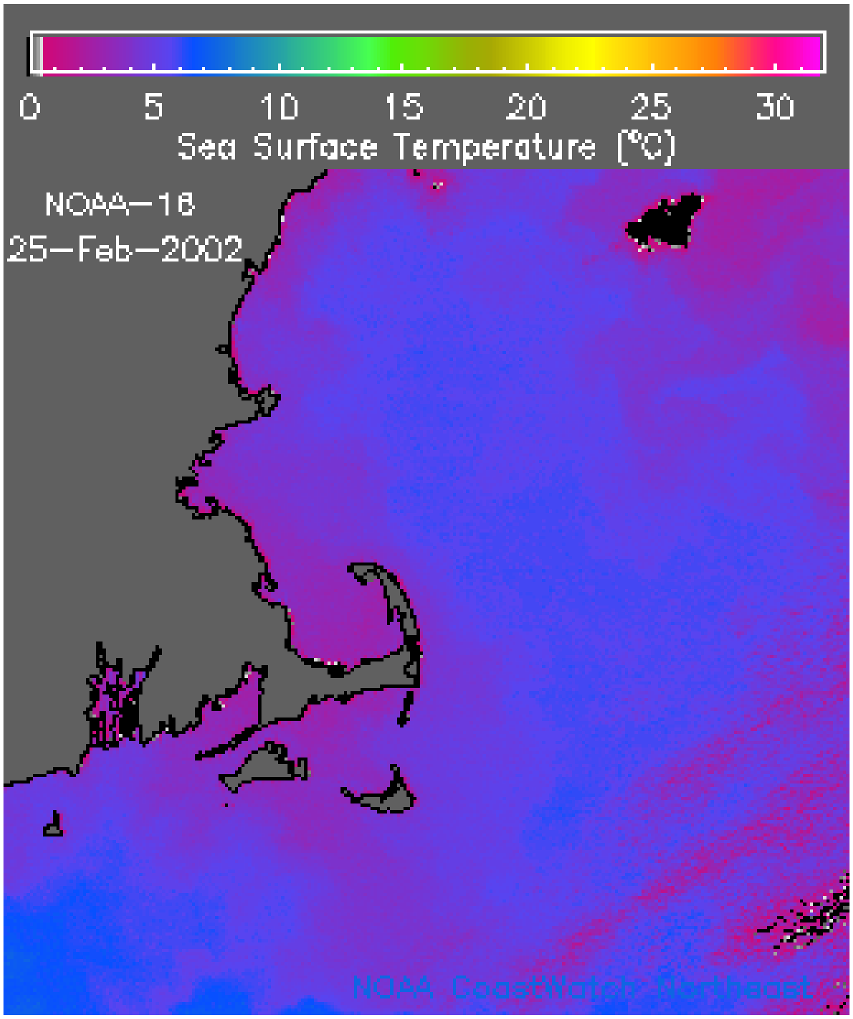


Figure D-22. Sea Surface Temperature from February 25, 2002.

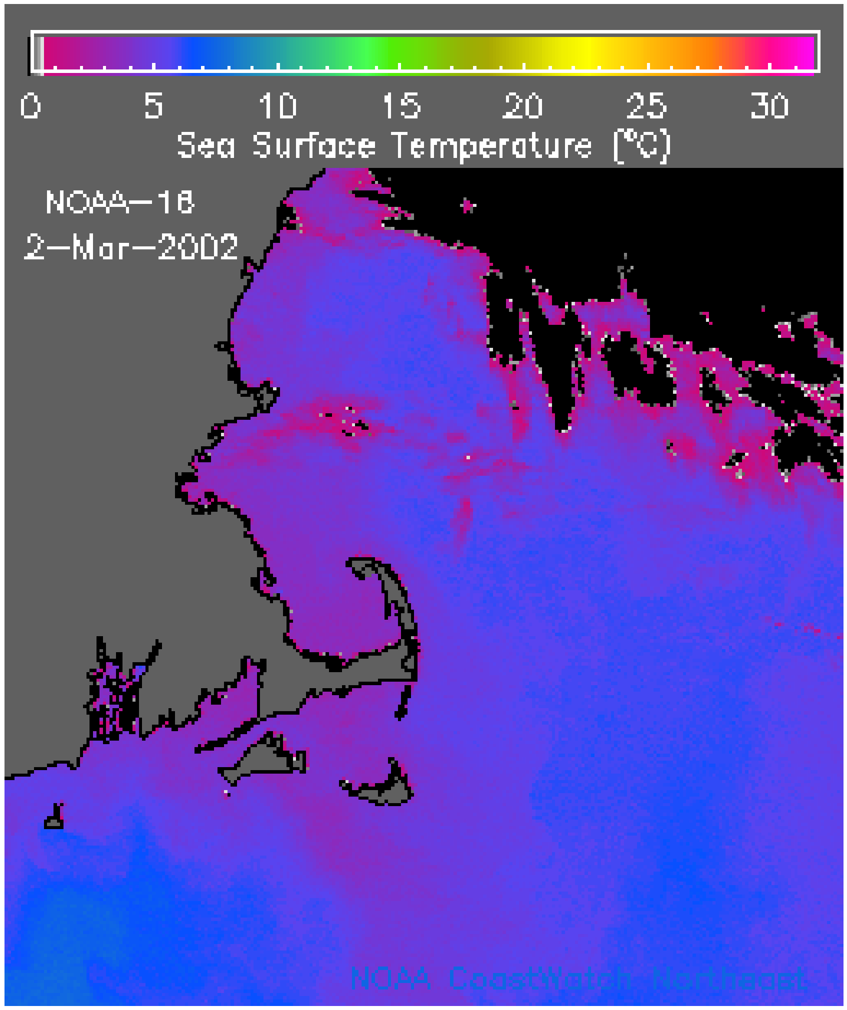


Figure D-23. Sea Surface Temperature from March 2, 2002.

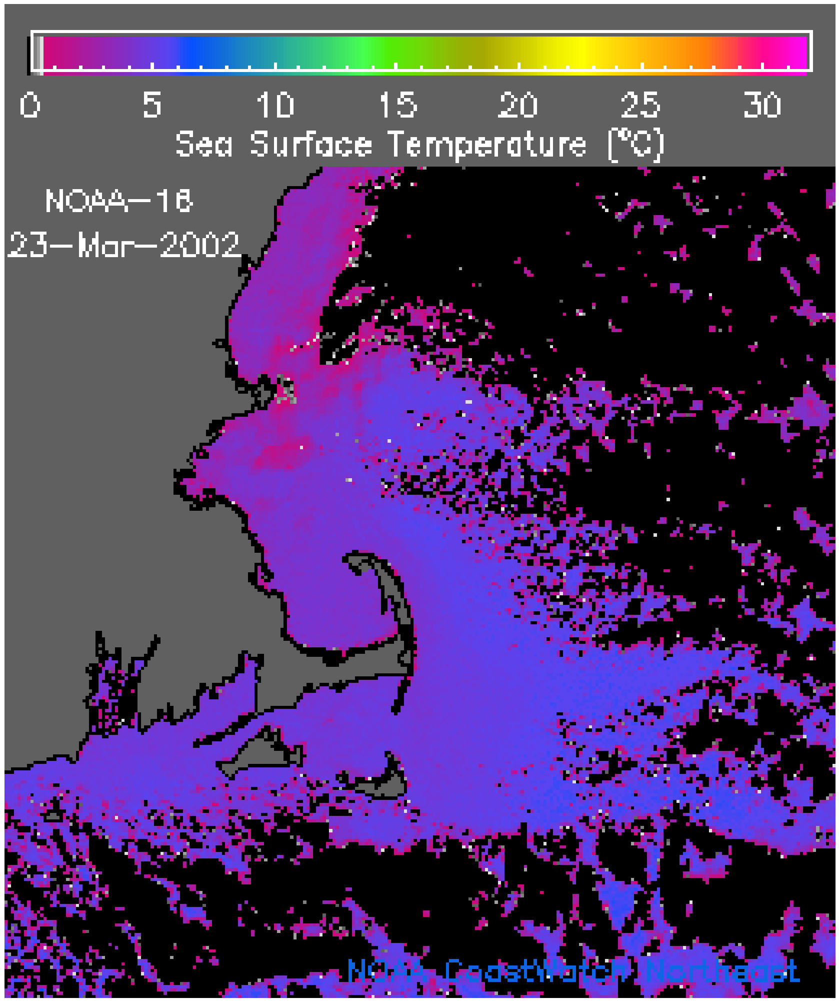


Figure D-24. Sea Surface Temperature from March 23, 2002.

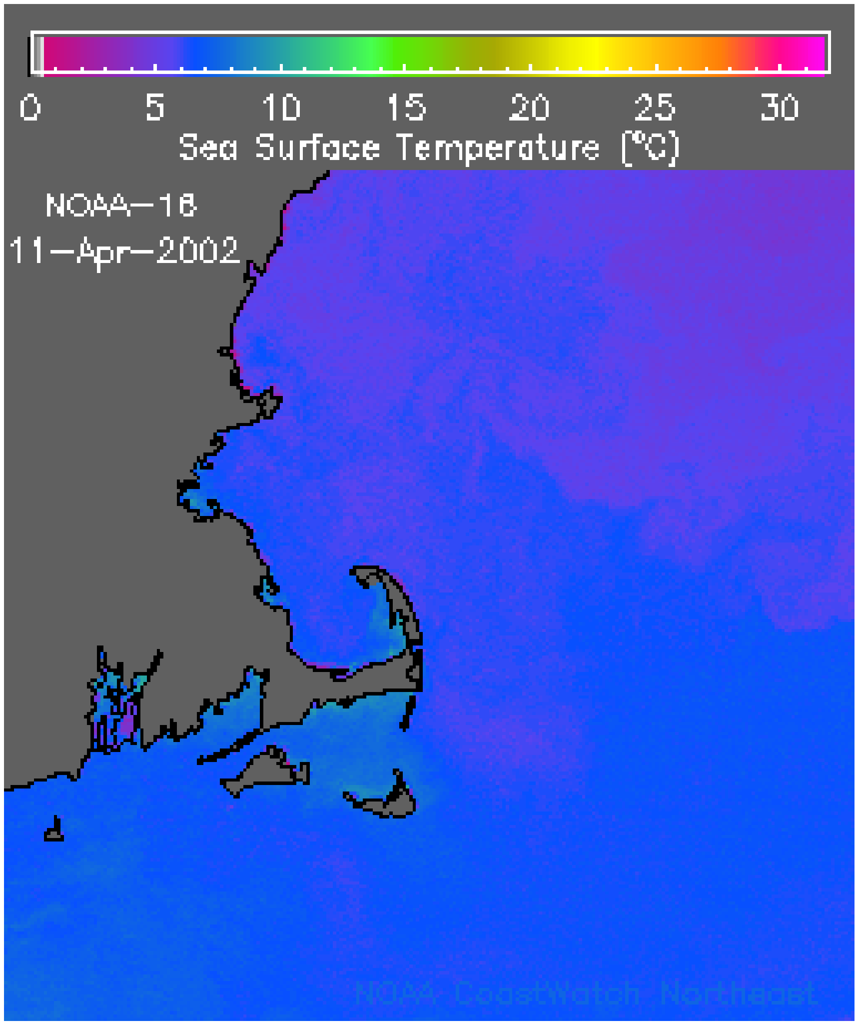


Figure D-25. Sea Surface Temperature from April 11, 2002.

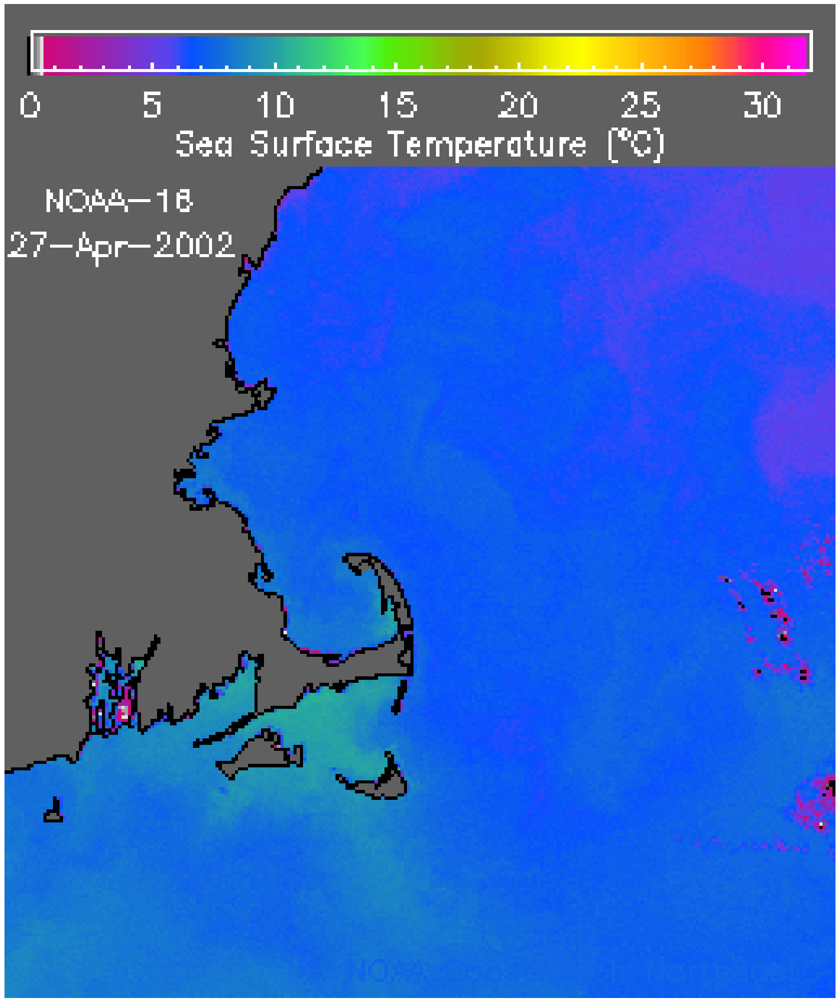


Figure D-26. Sea Surface Temperature from April 27, 2002.

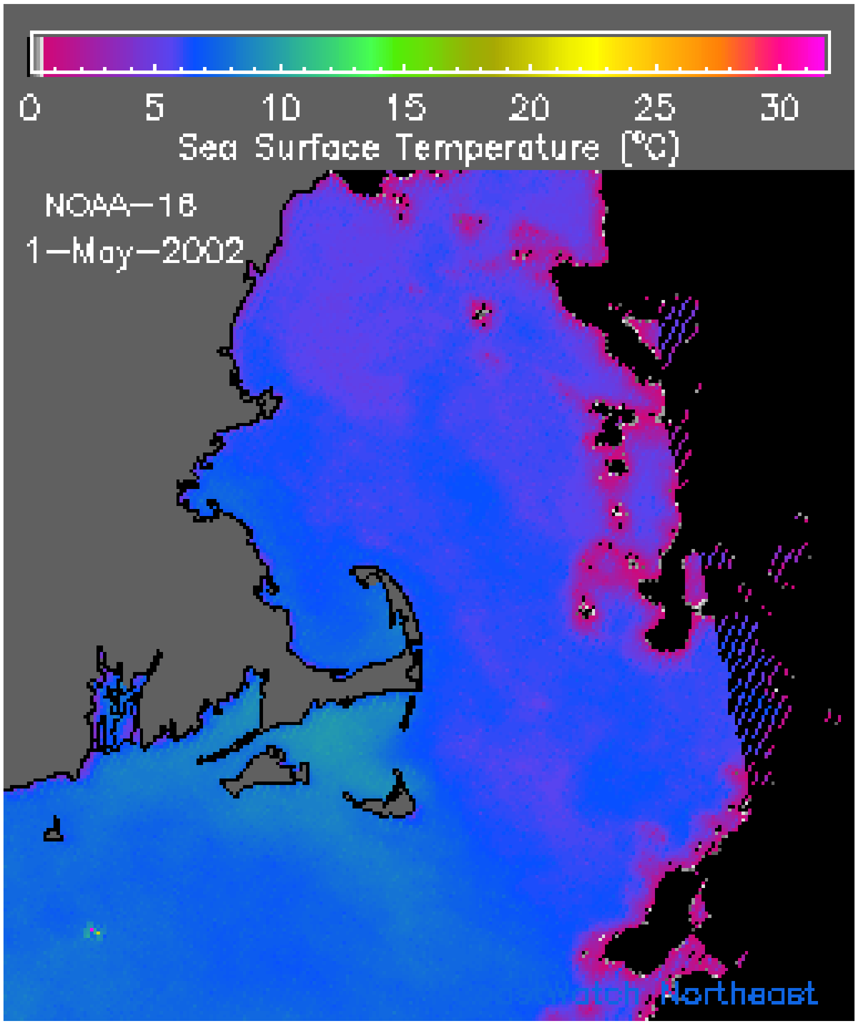


Figure D-27. Sea Surface Temperature from May 1, 2002.

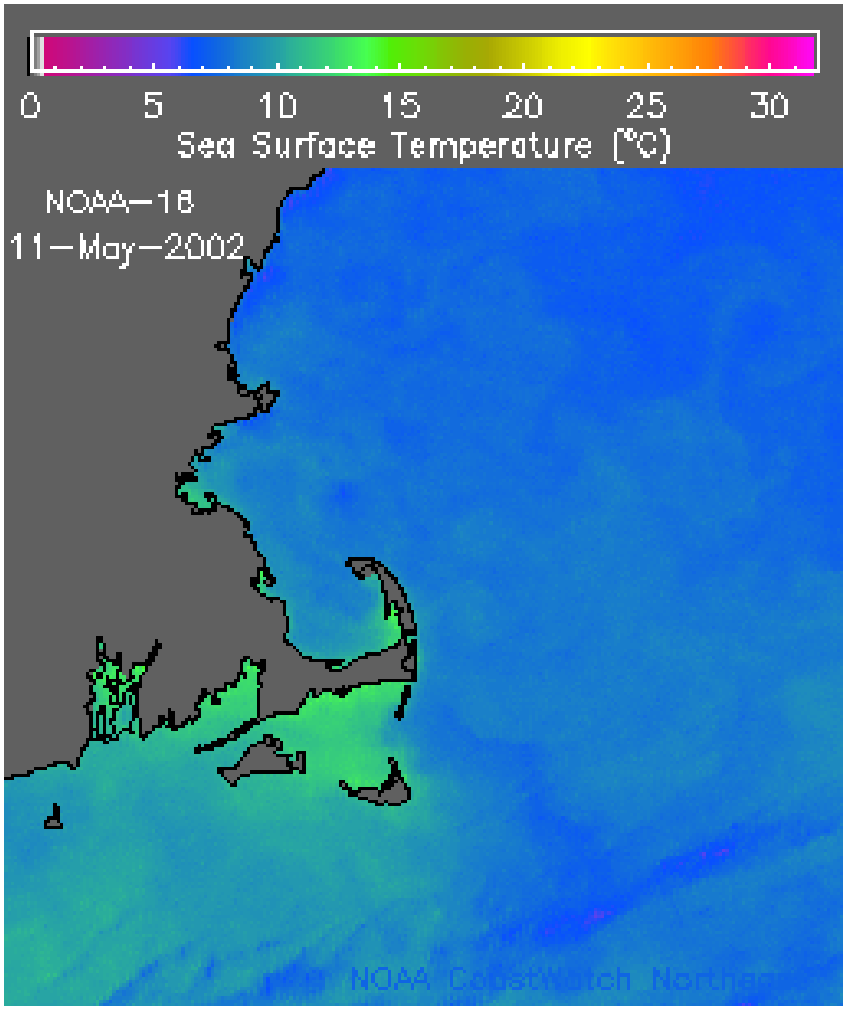


Figure D-28. Sea Surface Temperature from May 11, 2002.

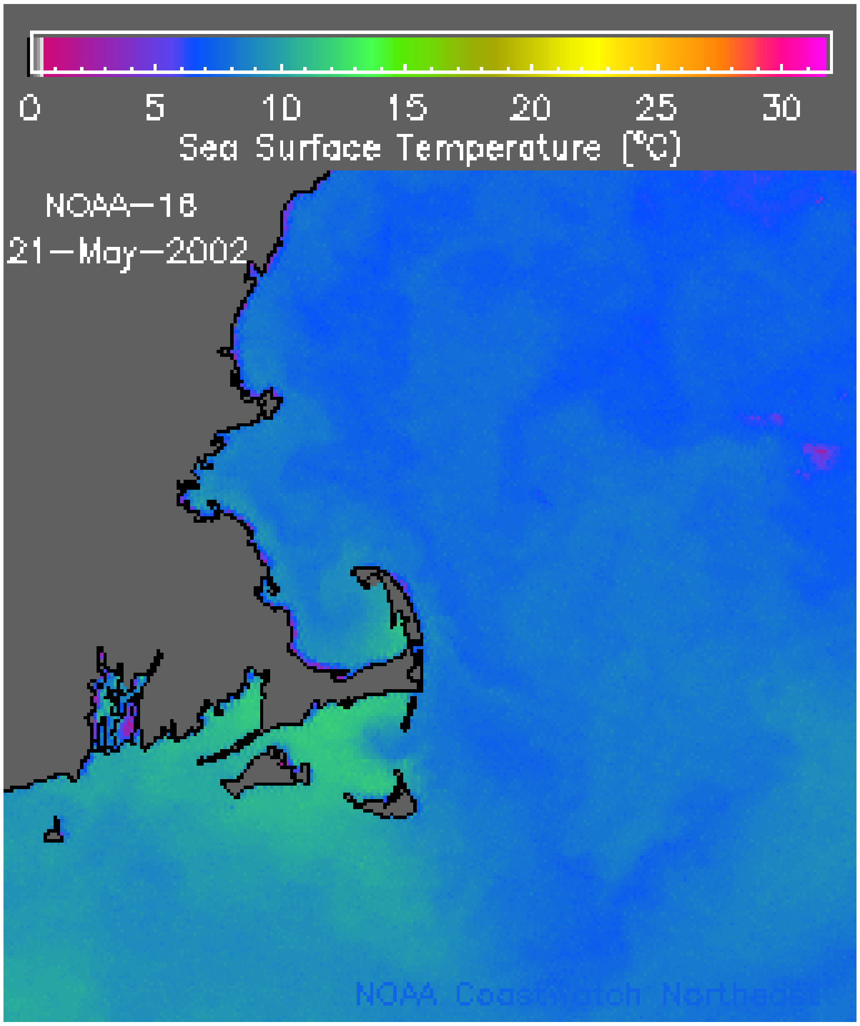


Figure D-29. Sea Surface Temperature from May 21, 2002.

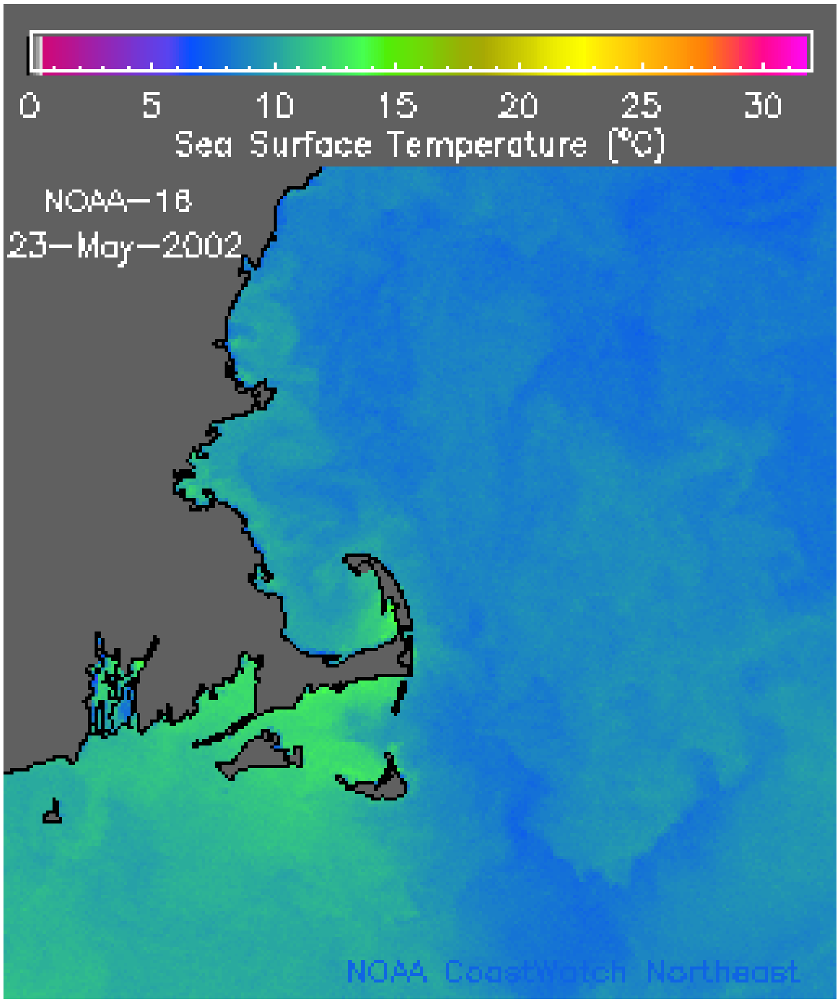


Figure D-30. Sea Surface Temperature from May 23, 2002.

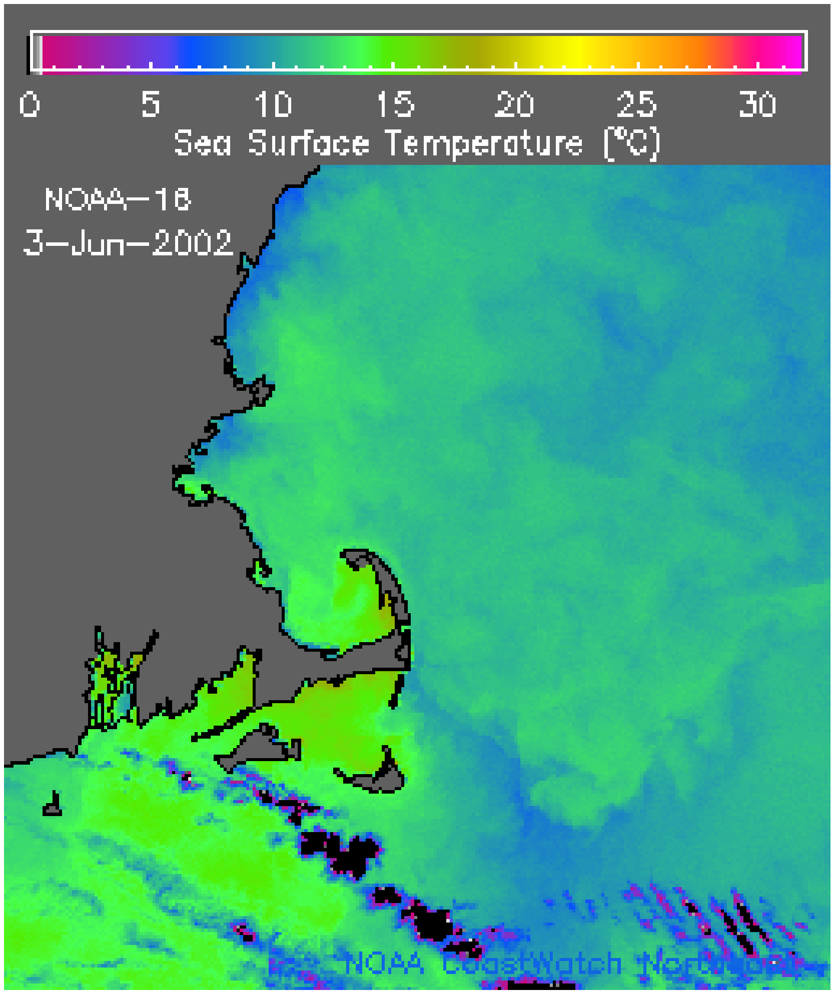


Figure D-31. Sea Surface Temperature from June 3, 2002.

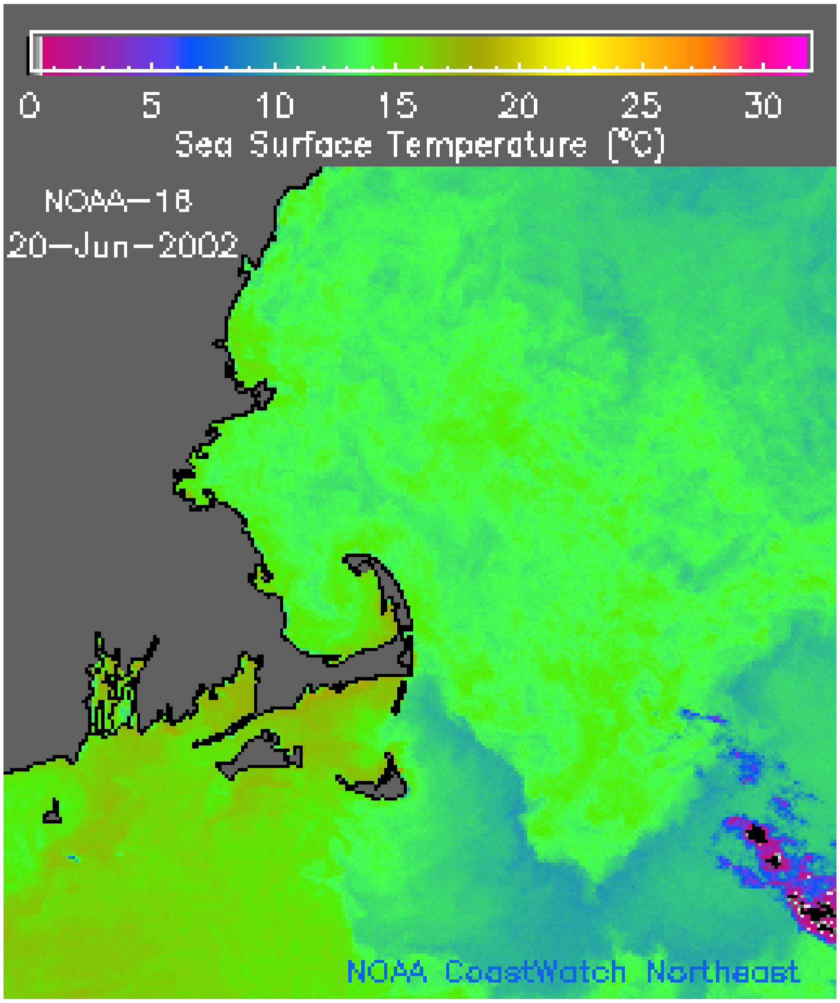


Figure D-32. Sea Surface Temperature from June 20, 2002.

APPENDIX E

Secchi Disk Data

Survey ID	Station ID	Station Arrival Date and Time	Secchi Disk Depth (m)	Qualifier
WF021	F02	2/9/2002 13:53	6.75	v
WF021	F03	2/5/2002 13:25	3.25	v
WF021	F05	2/5/2002 16:11	4.25	v
WF021	F06	2/5/2002 17:44	6.25	v
WF021	F07	2/5/2002 18:22		e
WF021	F10	2/5/2002 19:36		e
WF021	F12	2/9/2002 10:18	12.75	v
WF021	F13	2/5/2002 20:26		e
WF021	F14	2/5/2002 21:11		e
WF021	F15	2/6/2002 9:09	7.25	v
WF021	F16	2/6/2002 9:51	10.75	v
WF021	F17	2/6/2002 10:24	12.75	v
WF021	F18	2/6/2002 14:34	6.75	v
WF021	F19	2/6/2002 11:11	11.75	v
WF021	F22	2/6/2002 12:28	12.25	v
WF021	F23	2/7/2002 7:03	3.75	v
WF021	F24	2/6/2002 15:52	3.25	v
WF021	F25	2/6/2002 8:16	3.25	v
WF021	F26	2/9/2002 6:45	10.25	v
WF021	F27	2/9/2002 8:30	12.25	v
WF021	F28	2/9/2002 9:41	12.75	v
WF021	F29	2/9/2002 12:07	11.25	v
WF021	F30	2/6/2002 16:41	3.25	v
WF021	F31	2/6/2002 7:16	3.25	v
WF021	F32	2/9/2002 14:38	7.75	v
WF021	F33	2/9/2002 13:04	7.75	v
WF021	N16	2/6/2002 13:40	9.25	v
WF021	F01	2/9/2002 15:19	6.75	v
WF022	F02	2/26/2002 11:45	9.75	v
WF022	F03	3/1/2002 11:27	5.75	v
WF022	F05	3/1/2002 10:03	10.75	v
WF022	F06	3/1/2002 9:30	12.75	v
WF022	F07	3/1/2002 9:03	10.25	v
WF022	F10	2/27/2002 10:28	4.25	v
WF022	F12	2/26/2002 15:11	10.75	v
WF022	F13	2/27/2002 11:07	5.25	v

Survey ID	Station ID	Station Arrival Date and Time	Secchi Disk Depth (m)	Qualifier
WF022	F14	2/27/2002 11:44	5.25	v
WF022	F15	3/1/2002 7:24	4.75	v
WF022	F16	3/1/2002 7:53	5.25	v
WF022	F17	2/27/2002 9:22	11.75	v
WF022	F18	2/27/2002 15:22	4.75	v
WF022	F19	2/27/2002 8:20	11.25	v
WF022	F22	2/27/2002 7:07	10.75	v
WF022	F23	2/28/2002 7:13	6.75	v
WF022	F24	2/27/2002 15:58	4.75	v
WF022	F25	2/27/2002 12:15	4.75	v
WF022	F26	2/26/2002 18:02		e
WF022	F27	2/26/2002 16:59	4.25	v
WF022	F28	2/26/2002 15:59	8.75	v
WF022	F29	2/26/2002 13:26	10.75	v
WF022	F30	2/27/2002 16:54	3.75	v
WF022	F31	3/1/2002 6:16	2.75	v
WF022	F33	2/26/2002 12:40	12.25	v
WF022	N16	2/27/2002 13:25	6.75	v
WF022	F01	2/26/2002 9:54	9.25	v
WF024	F02	4/5/2002 11:37	5.75	v
WF024	F03	4/5/2002 8:59	6.25	v
WF024	F05	4/5/2002 16:13	7.75	v
WF024	F07	4/5/2002 14:49	7.75	v
WF024	F10	4/11/2002 9:08	10.75	v
WF024	F12	4/10/2002 13:13	8.75	v
WF024	F13	4/11/2002 8:27	10.75	v
WF024	F14	4/11/2002 7:53	6.85	v
WF024	F16	4/10/2002 14:09	5.75	v
WF024	F17	4/11/2002 10:02	8.75	v
WF024	F18	4/11/2002 12:41	5.75	v
WF024	F19	4/10/2002 9:40	9.75	v
WF024	F22	4/11/2002 10:58	4.75	v
WF024	F23	4/12/2002 6:53	4.25	v
WF024	F25	4/11/2002 7:22	5.75	v
WF024	F26	4/10/2002 10:59	11.25	v
WF024	F27	4/10/2002 11:47	10.25	v
WF024	F28	4/10/2002 12:38	9.75	v
WF024	F29	4/5/2002 13:24	7.75	v

Survey ID	Station ID	Station Arrival Date and Time	Secchi Disk Depth (m)	Qualifier
WF024	F30	4/10/2002 8:07	4.75	v
WF024	F31	4/10/2002 7:02	4.25	v
WF024	F32	4/5/2002 11:00	5.75	v
WF024	F33	4/5/2002 12:39	6.75	v
WF024	N16	4/11/2002 11:57	8.75	v
WF024	F01	4/5/2002 10:19	5.75	v
WF022	F32	2/26/2002 11:03	11.75	v
WF024	F06	4/5/2002 15:20	7.75	v
WF024	F15	4/10/2002 14:34	8.25	v
WF024	F24	4/11/2002 13:11	9.75	v
WF027	F02	6/10/2002 9:22	10.25	v
WF027	F03	6/10/2002 7:19	5.25	v
WF027	F05	6/10/2002 12:32	5.75	v
WF027	F06	6/10/2002 12:05	7.75	v
WF027	F07	6/10/2002 11:37	8.75	v
WF027	F10	6/11/2002 9:11	10.25	v
WF027	F12	6/14/2002 11:30	7.75	v
WF027	F13	6/11/2002 8:27	7.00	v
WF027	F14	6/11/2002 7:57	5.25	v
WF027	F15	6/10/2002 13:56	6.25	v
WF027	F16	6/10/2002 13:30	7.75	v
WF027	F17	6/11/2002 9:57	8.75	v
WF027	F18	6/11/2002 13:36	6.25	v
WF027	F19	6/14/2002 8:04	10.25	v
WF027	F22	6/11/2002 10:47	9.75	v
WF027	F23	6/18/2002 6:30	3.00	v
WF027	F24	6/11/2002 14:06	3.75	v
WF027	F25	6/11/2002 6:48	2.75	v
WF027	F26	6/14/2002 9:11	6.75	v
WF027	F27	6/14/2002 9:58	8.25	v
WF027	F28	6/14/2002 10:58	10.75	v
WF027	F29	6/10/2002 10:32	9.25	v
WF027	F30	6/14/2002 6:36	2.75	v
WF027	F31	6/10/2002 14:50	2.25	v
WF027	N16	6/11/2002 11:54	7.75	v
WF027	F01	6/10/2002 8:21	12.75	v

e-Results not reported value given is null
v-Arithmetic mean

APPENDIX F

Estimated Carbon Equivalence Data

Survey	Sta.	Sample Number	Depth (m)	Sampling Date	Plankton	Estimated Carbon Equivalence (ng Carbon/L)
WF021	F06	WF021098	16.29	2/5/2002	Centric diatom sp. group 1 diam <10 micr	108.07
WF021	F06	WF021098	16.29	2/5/2002	Ceratium lineatum	954.89
WF021	F06	WF021098	16.29	2/5/2002	Chaetoceros sp. group 2 diam 10-30 micro	678.66
WF021	F06	WF021098	16.29	2/5/2002	Choanoflagellate spp.	40.79
WF021	F06	WF021098	16.29	2/5/2002	Cryptomonas sp. group 1 length <10 micro	343.02
WF021	F06	WF021098	16.29	2/5/2002	Cylindrotheca closterium	1224.00
WF021	F06	WF021098	16.29	2/5/2002	Dactyliosolen fragilissimus	34324.78
WF021	F06	WF021098	16.29	2/5/2002	Guinardia delicatula	3388.56
WF021	F06	WF021098	16.29	2/5/2002	Guinardia flaccida	25163.48
WF021	F06	WF021098	16.29	2/5/2002	Guinardia striata	12062.34
WF021	F06	WF021098	16.29	2/5/2002	Gymnodinium sp. group 1 5-20 microns wid	966.20
WF021	F06	WF021098	16.29	2/5/2002	Heterocapsa rotundata	21.13
WF021	F06	WF021098	16.29	2/5/2002	Heterocapsa triquetra	378.08
WF021	F06	WF021098	16.29	2/5/2002	Leptocylindrus danicus	2189.15
WF021	F06	WF021098	16.29	2/5/2002	Leptocylindrus minimus	104.43
WF021	F06	WF021098	16.29	2/5/2002	Pennate diatom sp. group 2 10-30 microns	98.40
WF021	F06	WF021098	16.29	2/5/2002	Pennate diatom sp. group 3 31-60 microns	70.22
WF021	F06	WF021098	16.29	2/5/2002	Pleurosigma spp.	841.75
WF021	F06	WF021098	16.29	2/5/2002	Proboscia alata	1360.74
WF021	F06	WF021098	16.29	2/5/2002	Prorocentrum micans	617.38
WF021	F06	WF021098	16.29	2/5/2002	Protoperidinium depressum	48268.58
WF021	F06	WF021098	16.29	2/5/2002	Pseudonitzschia delicatissma complex	20.95
WF021	F06	WF021098	16.29	2/5/2002	Rhizosolenia setigera	698.29
WF021	F06	WF021098	16.29	2/5/2002	Skeletonema costatum	229.13
WF021	F06	WF021098	16.29	2/5/2002	Thalassiosira sp. group 3 10-20 microns	106.05
WF021	F06	WF021098	16.29	2/5/2002	Thecate dinoflagellate spp.	1576.49
WF021	F06	WF021098	16.29	2/5/2002	Unid. micro-phytoflag sp. group 1 length	7202.61
WF021	F06	WF021098	16.29	2/5/2002	Unid. micro-phytoflag sp. group 2 length	126.04
WF021	F06	WF02109A	2.21	2/5/2002	Centric diatom sp. group 1 diam <10 micr	55.81
WF021	F06	WF02109A	2.21	2/5/2002	Ceratium lineatum	1373.87
WF021	F06	WF02109A	2.21	2/5/2002	Ceratium tripos	5446.54
WF021	F06	WF02109A	2.21	2/5/2002	Chaetoceros decipiens	2675.41
WF021	F06	WF02109A	2.21	2/5/2002	Choanoflagellate spp.	97.82
WF021	F06	WF02109A	2.21	2/5/2002	Cryptomonas sp. group 1 length <10 micro	173.82
WF021	F06	WF02109A	2.21	2/5/2002	Cryptomonas sp. group 2 length >10 micro	159.47
WF021	F06	WF02109A	2.21	2/5/2002	Cylindrotheca closterium	440.27
WF021	F06	WF02109A	2.21	2/5/2002	Dactyliosolen fragilissimus	48431.35
WF021	F06	WF02109A	2.21	2/5/2002	Ebria tripartita	467.74
WF021	F06	WF02109A	2.21	2/5/2002	Guinardia delicatula	1300.10
WF021	F06	WF02109A	2.21	2/5/2002	Guinardia flaccida	6582.65
WF021	F06	WF02109A	2.21	2/5/2002	Guinardia striata	6064.05

Survey	Sta.	Sample Number	Depth (m)	Sampling Date	Plankton	Estimated Carbon Equivalence (ng Carbon/L)
WF021	F06	WF02109A	2.21	2/5/2002	Gymnodinium sp. group 1 5-20 microns wid	1338.65
WF021	F06	WF02109A	2.21	2/5/2002	Gyrodinium spirale	8367.20
WF021	F06	WF02109A	2.21	2/5/2002	Heterocapsa rotundata	121.59
WF021	F06	WF02109A	2.21	2/5/2002	Leptocylindrus danicus	262.03
WF021	F06	WF02109A	2.21	2/5/2002	Licmophora spp.	65.76
WF021	F06	WF02109A	2.21	2/5/2002	Pennate diatom sp. group 2 10-30 microns	125.85
WF021	F06	WF02109A	2.21	2/5/2002	Pleurosigma spp.	1813.59
WF021	F06	WF02109A	2.21	2/5/2002	Prorocentrum micans	1779.54
WF021	F06	WF02109A	2.21	2/5/2002	Rhizosolenia setigera	2683.66
WF021	F06	WF02109A	2.21	2/5/2002	Skeletonema costatum	357.14
WF021	F06	WF02109A	2.21	2/5/2002	Thalassiosira sp. group 3 10-20 microns	152.33
WF021	F06	WF02109A	2.21	2/5/2002	Unid. micro-phytoflag sp. group 1 length	6569.19
WF021	F06	WF02109A	2.21	2/5/2002	Unid. micro-phytoflag sp. group 2 length	120.90
WF021	F13	WF0210DE	11.29	2/5/2002	Centric diatom sp. group 1 diam <10 micr	87.54
WF021	F13	WF0210DE	11.29	2/5/2002	Ceratium fusus	1944.62
WF021	F13	WF0210DE	11.29	2/5/2002	Chaetoceros decipiens	979.09
WF021	F13	WF0210DE	11.29	2/5/2002	Chaetoceros sp. group 2 diam 10-30 micro	668.88
WF021	F13	WF0210DE	11.29	2/5/2002	Chaetoceros subtilis	146.76
WF021	F13	WF0210DE	11.29	2/5/2002	Choanoflagellate spp.	53.70
WF021	F13	WF0210DE	11.29	2/5/2002	Corethron criophilum	2006.05
WF021	F13	WF0210DE	11.29	2/5/2002	Cryptomonas sp. group 1 length <10 micro	579.32
WF021	F13	WF0210DE	11.29	2/5/2002	Cryptomonas sp. group 2 length >10 micro	328.27
WF021	F13	WF0210DE	11.29	2/5/2002	Cyclotella sp. group 1 diam <10 microns	16.12
WF021	F13	WF0210DE	11.29	2/5/2002	Cylindrotheca closterium	502.65
WF021	F13	WF0210DE	11.29	2/5/2002	Dactyliosolen fragilissimus	42126.79
WF021	F13	WF0210DE	11.29	2/5/2002	Eucampia cornuta	460.09
WF021	F13	WF0210DE	11.29	2/5/2002	Guinardia delicatula	1338.13
WF021	F13	WF0210DE	11.29	2/5/2002	Guinardia striata	4755.39
WF021	F13	WF0210DE	11.29	2/5/2002	Gymnodinium sp. group 1 5-20 microns wid	847.89
WF021	F13	WF0210DE	11.29	2/5/2002	Gyrodinium spirale	5731.68
WF021	F13	WF0210DE	11.29	2/5/2002	Gyrosigma spp.	553.08
WF021	F13	WF0210DE	11.29	2/5/2002	Heterocapsa rotundata	333.72
WF021	F13	WF0210DE	11.29	2/5/2002	Leptocylindrus danicus	359.60
WF021	F13	WF0210DE	11.29	2/5/2002	Leptocylindrus minimus	57.18
WF021	F13	WF0210DE	11.29	2/5/2002	Pennate diatom sp. group 2 10-30 microns	86.35
WF021	F13	WF0210DE	11.29	2/5/2002	Pleurosigma spp.	1108.02
WF021	F13	WF0210DE	11.29	2/5/2002	Prorocentrum micans	814.05
WF021	F13	WF0210DE	11.29	2/5/2002	Protoperidinium sp. group 1 10-30 micron	515.19
WF021	F13	WF0210DE	11.29	2/5/2002	Rhizosolenia setigera	1838.35
WF021	F13	WF0210DE	11.29	2/5/2002	Skeletonema costatum	1432.64
WF021	F13	WF0210DE	11.29	2/5/2002	Thalassionema nitzschioides	27.42
WF021	F13	WF0210DE	11.29	2/5/2002	Thalassiosira nordenskioldii	40.34

Survey	Sta.	Sample Number	Depth (m)	Sampling Date	Plankton	Estimated Carbon Equivalence (ng Carbon/L)
WF021	F13	WF0210DE	11.29	2/5/2002	Thalassiosira sp. group 3 10-20 microns	243.89
WF021	F13	WF0210DE	11.29	2/5/2002	Unid. micro-phytoflag sp. group 1 length	9727.60
WF021	F13	WF0210E0	1.06	2/5/2002	Centric diatom sp. group 1 diam <10 micr	86.05
WF021	F13	WF0210E0	1.06	2/5/2002	Chaetoceros decipiens	2749.85
WF021	F13	WF0210E0	1.06	2/5/2002	Chaetoceros sp. group 2 diam 10-30 micro	6021.66
WF021	F13	WF0210E0	1.06	2/5/2002	Cryptomonas sp. group 1 length <10 micro	957.10
WF021	F13	WF0210E0	1.06	2/5/2002	Cryptomonas sp. group 2 length >10 micro	860.50
WF021	F13	WF0210E0	1.06	2/5/2002	Cylindrotheca closterium	451.75
WF021	F13	WF0210E0	1.06	2/5/2002	Dactyliosolen fragilissimus	57380.56
WF021	F13	WF0210E0	1.06	2/5/2002	Grammatophora marina	71.27
WF021	F13	WF0210E0	1.06	2/5/2002	Guinardia delicatula	2171.44
WF021	F13	WF0210E0	1.06	2/5/2002	Gymnodinium sp. group 1 5-20 microns wid	871.70
WF021	F13	WF0210E0	1.06	2/5/2002	Gyrodinium sp. group 2 21-40 microns wid	2931.05
WF021	F13	WF0210E0	1.06	2/5/2002	Gyrosigma spp.	621.35
WF021	F13	WF0210E0	1.06	2/5/2002	Heterocapsa rotundata	812.31
WF021	F13	WF0210E0	1.06	2/5/2002	Leptocylindrus danicus	2827.91
WF021	F13	WF0210E0	1.06	2/5/2002	Leptocylindrus minimus	308.36
WF021	F13	WF0210E0	1.06	2/5/2002	Phaeocystis pouchetii	1426.18
WF021	F13	WF0210E0	1.06	2/5/2002	Prorocentrum micans	456.50
WF021	F13	WF0210E0	1.06	2/5/2002	Pseudonitzschia delicatissma complex	30.98
WF021	F13	WF0210E0	1.06	2/5/2002	Skeletonema costatum	2385.99
WF021	F13	WF0210E0	1.06	2/5/2002	Thalassionema nitzschioides	61.61
WF021	F13	WF0210E0	1.06	2/5/2002	Thalassiosira rotula	6525.36
WF021	F13	WF0210E0	1.06	2/5/2002	Thalassiosira sp. group 3 10-20 microns	313.14
WF021	F13	WF0210E0	1.06	2/5/2002	Thecate dinoflagellate spp.	4670.50
WF021	F13	WF0210E0	1.06	2/5/2002	Unid. micro-phytoflag sp. group 1 length	21764.30
WF021	F13	WF0210E0	1.06	2/5/2002	Unid. micro-phytoflag sp. group 2 length	931.95
WF021	F31	WF021113	6.41	2/6/2002	Calycomonas wulffii	10.84
WF021	F31	WF021113	6.41	2/6/2002	Centric diatom sp. group 1 diam <10 micr	23.92
WF021	F31	WF021113	6.41	2/6/2002	Chaetoceros decipiens	3215.89
WF021	F31	WF021113	6.41	2/6/2002	Chaetoceros sp. group 2 diam 10-30 micro	1218.50
WF021	F31	WF021113	6.41	2/6/2002	Choanoflagellate spp.	88.04
WF021	F31	WF021113	6.41	2/6/2002	Cryptomonas sp. group 1 length <10 micro	381.79
WF021	F31	WF021113	6.41	2/6/2002	Cryptomonas sp. group 2 length >10 micro	239.20
WF021	F31	WF021113	6.41	2/6/2002	Cylindrotheca closterium	880.53
WF021	F31	WF021113	6.41	2/6/2002	Dactyliosolen fragilissimus	83979.48
WF021	F31	WF021113	6.41	2/6/2002	Eucampia cornuta	502.89
WF021	F31	WF021113	6.41	2/6/2002	Guinardia delicatula	325.57
WF021	F31	WF021113	6.41	2/6/2002	Gymnodinium sp. group 1 5-20 microns wid	772.30
WF021	F31	WF021113	6.41	2/6/2002	Gyrosigma spp.	1211.10
WF021	F31	WF021113	6.41	2/6/2002	Heterocapsa rotundata	91.19
WF021	F31	WF021113	6.41	2/6/2002	Leptocylindrus danicus	262.03

Survey	Sta.	Sample Number	Depth (m)	Sampling Date	Plankton	Estimated Carbon Equivalence (ng Carbon/L)
WF021	F31	WF021113	6.41	2/6/2002	Leptocylindrus minimus	200.01
WF021	F31	WF021113	6.41	2/6/2002	Pleurosigma spp.	2418.12
WF021	F31	WF021113	6.41	2/6/2002	Protoperidinium pellucidum	8669.37
WF021	F31	WF021113	6.41	2/6/2002	Pseudonitzschia delicatissma complex	15.04
WF021	F31	WF021113	6.41	2/6/2002	Rhizosolenia setigera	7032.76
WF021	F31	WF021113	6.41	2/6/2002	Skeletonema costatum	4354.34
WF021	F31	WF021113	6.41	2/6/2002	Thalassiosira nordenskioldii	205.78
WF021	F31	WF021113	6.41	2/6/2002	Thalassiosira rotula	5290.59
WF021	F31	WF021113	6.41	2/6/2002	Thalassiosira sp. group 3 10-20 microns	457.77
WF021	F31	WF021113	6.41	2/6/2002	Unid. micro-phytoflag sp. group 1 length	14046.88
WF021	F31	WF021113	6.41	2/6/2002	Unid. micro-phytoflag sp. group 2 length	2176.14
WF021	F31	WF021114	2.2	2/6/2002	Centric diatom sp. group 1 diam <10 micr	65.14
WF021	F31	WF021114	2.2	2/6/2002	Chaetoceros decipiens	2185.87
WF021	F31	WF021114	2.2	2/6/2002	Chaetoceros sp. group 2 diam 10-30 micro	1994.43
WF021	F31	WF021114	2.2	2/6/2002	Choanoflagellate spp.	19.98
WF021	F31	WF021114	2.2	2/6/2002	Cryptomonas sp. group 1 length <10 micro	583.28
WF021	F31	WF021114	2.2	2/6/2002	Cryptomonas sp. group 2 length >10 micro	203.58
WF021	F31	WF021114	2.2	2/6/2002	Cylindrotheca closterium	449.63
WF021	F31	WF021114	2.2	2/6/2002	Dactyliosolen fragilissimus	69197.79
WF021	F31	WF021114	2.2	2/6/2002	Ebria tripartita	476.88
WF021	F31	WF021114	2.2	2/6/2002	Eucampia cornuta	684.79
WF021	F31	WF021114	2.2	2/6/2002	Guinardia delicatula	665.00
WF021	F31	WF021114	2.2	2/6/2002	Gymnodinium sp. group 1 5-20 microns wid	946.48
WF021	F31	WF021114	2.2	2/6/2002	Gyrodinium spirale	8545.22
WF021	F31	WF021114	2.2	2/6/2002	Gyrosigma spp.	824.58
WF021	F31	WF021114	2.2	2/6/2002	Heterocapsa rotundata	62.09
WF021	F31	WF021114	2.2	2/6/2002	Leptocylindrus minimus	85.25
WF021	F31	WF021114	2.2	2/6/2002	Pennate diatom sp. group 2 10-30 microns	192.79
WF021	F31	WF021114	2.2	2/6/2002	Prorocentrum micans	605.80
WF021	F31	WF021114	2.2	2/6/2002	Pseudonitzschia pungens	49.15
WF021	F31	WF021114	2.2	2/6/2002	Rhizosolenia setigera	8222.26
WF021	F31	WF021114	2.2	2/6/2002	Skeletonema costatum	5760.97
WF021	F31	WF021114	2.2	2/6/2002	Thalassiosira nordenskioldii	120.09
WF021	F31	WF021114	2.2	2/6/2002	Thalassiosira sp. group 3 10-20 microns	570.44
WF021	F31	WF021114	2.2	2/6/2002	Unid. micro-phytoflag sp. group 1 length	11276.76
WF021	F31	WF021114	2.2	2/6/2002	Unid. micro-phytoflag sp. group 2 length	123.47
WF021	F25	WF021122	6.36	2/6/2002	Centric diatom sp. group 1 diam <10 micr	128.96
WF021	F25	WF021122	6.36	2/6/2002	Chaetoceros decipiens	6935.00
WF021	F25	WF021122	6.36	2/6/2002	Chaetoceros sp. group 2 diam 10-30 micro	3158.51
WF021	F25	WF021122	6.36	2/6/2002	Chaetoceros subtilis	462.02
WF021	F25	WF021122	6.36	2/6/2002	Cryptomonas sp. group 1 length <10 micro	481.94
WF021	F25	WF021122	6.36	2/6/2002	Cryptomonas sp. group 2 length >10 micro	257.92

Survey	Sta.	Sample Number	Depth (m)	Sampling Date	Plankton	Estimated Carbon Equivalence (ng Carbon/L)
WF021	F25	WF021122	6.36	2/6/2002	Cylindrotheca closterium	1424.13
WF021	F25	WF021122	6.36	2/6/2002	Dactyliosolen fragilissimus	92093.38
WF021	F25	WF021122	6.36	2/6/2002	Ebria tripartita	755.23
WF021	F25	WF021122	6.36	2/6/2002	Eucampia cornuta	1084.47
WF021	F25	WF021122	6.36	2/6/2002	Guinardia delicatula	1752.27
WF021	F25	WF021122	6.36	2/6/2002	Guinardia flaccida	14195.34
WF021	F25	WF021122	6.36	2/6/2002	Gyrodinium sp. group 2 21-40 microns wid	3069.65
WF021	F25	WF021122	6.36	2/6/2002	Heterocapsa rotundata	131.10
WF021	F25	WF021122	6.36	2/6/2002	Leptocylindrus minimus	270.02
WF021	F25	WF021122	6.36	2/6/2002	Pennate diatom sp. group 2 10-30 microns	101.77
WF021	F25	WF021122	6.36	2/6/2002	Pleurosigma spp.	1303.66
WF021	F25	WF021122	6.36	2/6/2002	Rhizosolenia setigera	6499.71
WF021	F25	WF021122	6.36	2/6/2002	Skeletonema costatum	4413.61
WF021	F25	WF021122	6.36	2/6/2002	Thalassionema nitzschioides	64.63
WF021	F25	WF021122	6.36	2/6/2002	Thalassiosira nordenskioldii	63.40
WF021	F25	WF021122	6.36	2/6/2002	Thalassiosira sp. group 3 10-20 microns	493.58
WF021	F25	WF021122	6.36	2/6/2002	Unid. micro-phytoflag sp. group 1 length	12207.13
WF021	F25	WF021124	1.76	2/6/2002	Centric diatom sp. group 1 diam <10 micr	185.44
WF021	F25	WF021124	1.76	2/6/2002	Chaetoceros decipiens	2304.51
WF021	F25	WF021124	1.76	2/6/2002	Chaetoceros sp. group 2 diam 10-30 micro	1259.49
WF021	F25	WF021124	1.76	2/6/2002	Chaetoceros subtilis	138.18
WF021	F25	WF021124	1.76	2/6/2002	Choanoflagellate spp.	50.56
WF021	F25	WF021124	1.76	2/6/2002	Corethron criophilum	7567.47
WF021	F25	WF021124	1.76	2/6/2002	Cryptomonas sp. group 1 length <10 micro	385.01
WF021	F25	WF021124	1.76	2/6/2002	Cryptomonas sp. group 2 length >10 micro	206.04
WF021	F25	WF021124	1.76	2/6/2002	Cylindrotheca closterium	567.89
WF021	F25	WF021124	1.76	2/6/2002	Dactyliosolen fragilissimus	68021.63
WF021	F25	WF021124	1.76	2/6/2002	Eucampia cornuta	649.76
WF021	F25	WF021124	1.76	2/6/2002	Guinardia delicatula	3365.24
WF021	F25	WF021124	1.76	2/6/2002	Gyrodinium spirale	10792.69
WF021	F25	WF021124	1.76	2/6/2002	Gyrosigma spp.	520.72
WF021	F25	WF021124	1.76	2/6/2002	Leptocylindrus danicus	225.71
WF021	F25	WF021124	1.76	2/6/2002	Leptocylindrus minimus	139.98
WF021	F25	WF021124	1.76	2/6/2002	Pennate diatom sp. group 1 <10 microns l	15.94
WF021	F25	WF021124	1.76	2/6/2002	Pennate diatom sp. group 2 10-30 microns	40.58
WF021	F25	WF021124	1.76	2/6/2002	Pleurosigma spp.	1041.45
WF021	F25	WF021124	1.76	2/6/2002	Rhizosolenia setigera	2596.20
WF021	F25	WF021124	1.76	2/6/2002	Skeletonema costatum	4058.31
WF021	F25	WF021124	1.76	2/6/2002	Thalassiosira nordenskioldii	63.31
WF021	F25	WF021124	1.76	2/6/2002	Thalassiosira sp. group 3 10-20 microns	196.82
WF021	F25	WF021124	1.76	2/6/2002	Unid. micro-phytoflag sp. group 1 length	11093.38
WF021	F22	WF02117E	20.8	2/6/2002	Centric diatom sp. group 1 diam <10 micr	147.75

Survey	Sta.	Sample Number	Depth (m)	Sampling Date	Plankton	Estimated Carbon Equivalence (ng Carbon/L)
WF021	F22	WF02117E	20.8	2/6/2002	Ceratium lineatum	1888.93
WF021	F22	WF02117E	20.8	2/6/2002	Chaetoceros decipiens	2207.04
WF021	F22	WF02117E	20.8	2/6/2002	Chaetoceros sp. group 2 diam 10-30 micro	301.05
WF021	F22	WF02117E	20.8	2/6/2002	Choanoflagellate spp.	100.70
WF021	F22	WF02117E	20.8	2/6/2002	Cryptomonas sp. group 1 length <10 micro	594.34
WF021	F22	WF02117E	20.8	2/6/2002	Cryptomonas sp. group 2 length >10 micro	41.04
WF021	F22	WF02117E	20.8	2/6/2002	Cylindrotheca closterium	656.07
WF021	F22	WF02117E	20.8	2/6/2002	Dactyliosolen fragilissimus	785.93
WF021	F22	WF02117E	20.8	2/6/2002	Eucampia cornuta	345.71
WF021	F22	WF02117E	20.8	2/6/2002	Guinardia delicatula	133.84
WF021	F22	WF02117E	20.8	2/6/2002	Gymnodinium sp. group 1 5-20 microns wid	1696.07
WF021	F22	WF02117E	20.8	2/6/2002	Gymnodinium sp. group 2 21-40 microns wi	293.07
WF021	F22	WF02117E	20.8	2/6/2002	Gyrodinium sp. group 2 21-40 microns wid	293.07
WF021	F22	WF02117E	20.8	2/6/2002	Gyrodinium spirale	17227.04
WF021	F22	WF02117E	20.8	2/6/2002	Heterocapsa rotundata	104.31
WF021	F22	WF02117E	20.8	2/6/2002	Leptocylindrus minimus	34.37
WF021	F22	WF02117E	20.8	2/6/2002	Paulinella ovalis	15.23
WF021	F22	WF02117E	20.8	2/6/2002	Pennate diatom sp. group 1 <10 microns l	12.70
WF021	F22	WF02117E	20.8	2/6/2002	Pennate diatom sp. group 2 10-30 microns	32.39
WF021	F22	WF02117E	20.8	2/6/2002	Pleurosigma spp.	248.93
WF021	F22	WF02117E	20.8	2/6/2002	Prorocentrum micans	182.89
WF021	F22	WF02117E	20.8	2/6/2002	Pseudonitzschia pungens	52.02
WF021	F22	WF02117E	20.8	2/6/2002	Skeletonema costatum	203.62
WF021	F22	WF02117E	20.8	2/6/2002	Stephanopyxis spp.	4.17
WF021	F22	WF02117E	20.8	2/6/2002	Thalassionema nitzschioides	61.71
WF021	F22	WF02117E	20.8	2/6/2002	Thalassiosira rotula	543.72
WF021	F22	WF02117E	20.8	2/6/2002	Thalassiosira sp. group 3 10-20 microns	172.50
WF021	F22	WF02117E	20.8	2/6/2002	Unid. micro-phytoflag sp. group 1 length	10421.36
WF021	F22	WF02117E	20.8	2/6/2002	Unid. micro-phytoflag sp. group 2 length	746.73
WF021	F22	WF021180	2.26	2/6/2002	Amphidinium spp.	23.51
WF021	F22	WF021180	2.26	2/6/2002	Centric diatom sp. group 1 diam <10 micr	146.41
WF021	F22	WF021180	2.26	2/6/2002	Chaetoceros convolutus	440.48
WF021	F22	WF021180	2.26	2/6/2002	Chaetoceros decipiens	683.48
WF021	F22	WF021180	2.26	2/6/2002	Chaetoceros sp. group 2 diam 10-30 micro	155.64
WF021	F22	WF021180	2.26	2/6/2002	Choanoflagellate spp.	46.86
WF021	F22	WF021180	2.26	2/6/2002	Cryptomonas sp. group 1 length <10 micro	510.47
WF021	F22	WF021180	2.26	2/6/2002	Cylindrotheca closterium	859.68
WF021	F22	WF021180	2.26	2/6/2002	Dactyliosolen fragilissimus	495.21
WF021	F22	WF021180	2.26	2/6/2002	Detonula confervacea	321.73
WF021	F22	WF021180	2.26	2/6/2002	Ebria tripartita	111.84
WF021	F22	WF021180	2.26	2/6/2002	Guinardia delicatula	155.95
WF021	F22	WF021180	2.26	2/6/2002	Gymnodinium sp. group 1 5-20 microns wid	3370.52

Survey	Sta.	Sample Number	Depth (m)	Sampling Date	Plankton	Estimated Carbon Equivalence (ng Carbon/L)
WF021	F22	WF021180	2.26	2/6/2002	Gymnodinium sp. group 2 21-40 microns wi	12142.04
WF021	F22	WF021180	2.26	2/6/2002	Heterocapsa rotundata	210.31
WF021	F22	WF021180	2.26	2/6/2002	Leptocylindrus danicus	104.60
WF021	F22	WF021180	2.26	2/6/2002	Pennate diatom sp. group 1 <10 microns l	0.74
WF021	F22	WF021180	2.26	2/6/2002	Pennate diatom sp. group 2 10-30 microns	100.47
WF021	F22	WF021180	2.26	2/6/2002	Pseudonitzschia delicatissma complex	4.80
WF021	F22	WF021180	2.26	2/6/2002	Rhizosolenia setigera	160.42
WF021	F22	WF021180	2.26	2/6/2002	Skeletonema costatum	274.15
WF021	F22	WF021180	2.26	2/6/2002	Thalassionema nitzschioides	33.50
WF021	F22	WF021180	2.26	2/6/2002	Thalassiosira nordenskioldii	49.29
WF021	F22	WF021180	2.26	2/6/2002	Thalassiosira sp. group 3 10-20 microns	200.66
WF021	F22	WF021180	2.26	2/6/2002	Unid. micro-phytoflag sp. group 1 length	9803.45
WF021	F22	WF021180	2.26	2/6/2002	Unid. micro-phytoflag sp. group 2 length	289.55
WF021	N16	WF021195	18.63	2/6/2002	Ceratium lineatum	1639.71
WF021	N16	WF021195	18.63	2/6/2002	Chaetoceros decipiens	637.54
WF021	N16	WF021195	18.63	2/6/2002	Chaetoceros sp. group 2 diam 10-30 micro	290.85
WF021	N16	WF021195	18.63	2/6/2002	Choanoflagellate spp.	122.38
WF021	N16	WF021195	18.63	2/6/2002	Cryptomonas sp. group 1 length <10 micro	310.66
WF021	N16	WF021195	18.63	2/6/2002	Cryptomonas sp. group 2 length >10 micro	35.63
WF021	N16	WF021195	18.63	2/6/2002	Cylindrotheca closterium	524.57
WF021	N16	WF021195	18.63	2/6/2002	Dactyliosolen fragilissimus	28284.19
WF021	N16	WF021195	18.63	2/6/2002	Dictyocha fibula	178.72
WF021	N16	WF021195	18.63	2/6/2002	Guinardia delicatula	2909.36
WF021	N16	WF021195	18.63	2/6/2002	Guinardia flaccida	9803.95
WF021	N16	WF021195	18.63	2/6/2002	Guinardia striata	7225.25
WF021	N16	WF021195	18.63	2/6/2002	Gymnodinium sp. group 1 5-20 microns wid	920.19
WF021	N16	WF021195	18.63	2/6/2002	Heterocapsa rotundata	126.76
WF021	N16	WF021195	18.63	2/6/2002	Pennate diatom sp. group 2 10-30 microns	28.11
WF021	N16	WF021195	18.63	2/6/2002	Pleurosigma spp.	720.29
WF021	N16	WF021195	18.63	2/6/2002	Prorocentrum micans	793.78
WF021	N16	WF021195	18.63	2/6/2002	Pseudonitzschia delicatissma complex	17.95
WF021	N16	WF021195	18.63	2/6/2002	Rhizosolenia setigera	598.53
WF021	N16	WF021195	18.63	2/6/2002	Skeletonema costatum	196.73
WF021	N16	WF021195	18.63	2/6/2002	Thalassionema nitzschioides	71.54
WF021	N16	WF021195	18.63	2/6/2002	Thalassiosira nordenskioldii	52.63
WF021	N16	WF021195	18.63	2/6/2002	Thalassiosira rotula	1260.74
WF021	N16	WF021195	18.63	2/6/2002	Thalassiosira sp. group 3 10-20 microns	113.44
WF021	N16	WF021195	18.63	2/6/2002	Unid. micro-phytoflag sp. group 1 length	7351.30
WF021	N16	WF021195	18.63	2/6/2002	Unid. micro-phytoflag sp. group 2 length	108.04
WF021	N16	WF021197	2.16	2/6/2002	Ceratium longipes	7666.31
WF021	N16	WF021197	2.16	2/6/2002	Cryptomonas sp. group 1 length <10 micro	418.63
WF021	N16	WF021197	2.16	2/6/2002	Cylindrotheca closterium	596.17

Survey	Sta.	Sample Number	Depth (m)	Sampling Date	Plankton	Estimated Carbon Equivalence (ng Carbon/L)
WF021	N16	WF021197	2.16	2/6/2002	Dactyliosolen fragilissimus	31583.67
WF021	N16	WF021197	2.16	2/6/2002	Ebria tripartita	380.02
WF021	N16	WF021197	2.16	2/6/2002	Guinardia delicatula	2116.12
WF021	N16	WF021197	2.16	2/6/2002	Guinardia striata	4700.10
WF021	N16	WF021197	2.16	2/6/2002	Gymnodinium sp. group 1 5-20 microns wid	167.61
WF021	N16	WF021197	2.16	2/6/2002	Gymnodinium sp. group 2 21-40 microns wi	6188.81
WF021	N16	WF021197	2.16	2/6/2002	Heterocapsa rotundata	65.97
WF021	N16	WF021197	2.16	2/6/2002	Leptocylindrus danicus	284.34
WF021	N16	WF021197	2.16	2/6/2002	Pennate diatom sp. group 2 10-30 microns	153.63
WF021	N16	WF021197	2.16	2/6/2002	Pennate diatom sp. group 3 31-60 microns	73.09
WF021	N16	WF021197	2.16	2/6/2002	Prorocentrum micans	481.94
WF021	N16	WF021197	2.16	2/6/2002	Pseudonitzschia delicatissma complex	16.32
WF021	N16	WF021197	2.16	2/6/2002	Rhizosolenia setigera	1090.18
WF021	N16	WF021197	2.16	2/6/2002	Skeletonema costatum	134.15
WF021	N16	WF021197	2.16	2/6/2002	Thalassiosira rotula	1146.24
WF021	N16	WF021197	2.16	2/6/2002	Thalassiosira sp. group 3 10-20 microns	165.58
WF021	N16	WF021197	2.16	2/6/2002	Unid. micro-phytoflag sp. group 1 length	4354.96
WF021	F24	WF0211C1	6.53	2/6/2002	Calycomonas wulffii	10.82
WF021	F24	WF0211C1	6.53	2/6/2002	Centric diatom sp. group 1 diam <10 micr	11.94
WF021	F24	WF0211C1	6.53	2/6/2002	Chaetoceros decipiens	5873.69
WF021	F24	WF0211C1	6.53	2/6/2002	Chaetoceros sp. group 2 diam 10-30 micro	487.21
WF021	F24	WF0211C1	6.53	2/6/2002	Choanoflagellate spp.	87.86
WF021	F24	WF0211C1	6.53	2/6/2002	Cryptomonas sp. group 1 length <10 micro	92.93
WF021	F24	WF0211C1	6.53	2/6/2002	Cryptomonas sp. group 2 length >10 micro	59.68
WF021	F24	WF0211C1	6.53	2/6/2002	Cylindrotheca closterium	438.61
WF021	F24	WF0211C1	6.53	2/6/2002	Dactyliosolen fragilissimus	54521.06
WF021	F24	WF0211C1	6.53	2/6/2002	Guinardia delicatula	649.79
WF021	F24	WF0211C1	6.53	2/6/2002	Guinardia striata	5186.97
WF021	F24	WF0211C1	6.53	2/6/2002	Leptocylindrus minimus	74.97
WF021	F24	WF0211C1	6.53	2/6/2002	Pennate diatom sp. group 2 10-30 microns	47.09
WF021	F24	WF0211C1	6.53	2/6/2002	Phaeocystis pouchetii	357.34
WF021	F24	WF0211C1	6.53	2/6/2002	Pleurosigma spp.	1809.83
WF021	F24	WF0211C1	6.53	2/6/2002	Rhizosolenia setigera	2008.57
WF021	F24	WF0211C1	6.53	2/6/2002	Skeletonema costatum	1507.83
WF021	F24	WF0211C1	6.53	2/6/2002	Thalassiosira nordenskioldii	58.67
WF021	F24	WF0211C1	6.53	2/6/2002	Thalassiosira rotula	527.08
WF021	F24	WF0211C1	6.53	2/6/2002	Thalassiosira sp. group 3 10-20 microns	304.54
WF021	F24	WF0211C1	6.53	2/6/2002	Unid. micro-phytoflag sp. group 1 length	4363.73
WF021	F24	WF0211C1	6.53	2/6/2002	Unid. micro-phytoflag sp. group 2 length	180.97
WF021	F24	WF0211BE	2.5	2/6/2002	Centric diatom sp. group 1 diam <10 micr	31.05
WF021	F24	WF0211BE	2.5	2/6/2002	Chaetoceros decipiens	4166.81
WF021	F24	WF0211BE	2.5	2/6/2002	Chaetoceros sp. group 2 diam 10-30 micro	2534.59

Survey	Sta.	Sample Number	Depth (m)	Sampling Date	Plankton	Estimated Carbon Equivalence (ng Carbon/L)
WF021	F24	WF0211BE	2.5	2/6/2002	Choanoflagellate spp.	38.09
WF021	F24	WF0211BE	2.5	2/6/2002	Cryptomonas sp. group 1 length <10 micro	181.29
WF021	F24	WF0211BE	2.5	2/6/2002	Cylindrotheca closterium	571.41
WF021	F24	WF0211BE	2.5	2/6/2002	Dactyliosolen fragilissimus	96608.89
WF021	F24	WF0211BE	2.5	2/6/2002	Eucampia cornuta	653.78
WF021	F24	WF0211BE	2.5	2/6/2002	Guinardia delicatula	2957.85
WF021	F24	WF0211BE	2.5	2/6/2002	Gymnodinium sp. group 1 5-20 microns wid	601.41
WF021	F24	WF0211BE	2.5	2/6/2002	Gyrodinium spirale	16289.33
WF021	F24	WF0211BE	2.5	2/6/2002	Leptocylindrus minimus	81.12
WF021	F24	WF0211BE	2.5	2/6/2002	Licmophora spp.	170.71
WF021	F24	WF0211BE	2.5	2/6/2002	Pleurosigma spp.	1571.85
WF021	F24	WF0211BE	2.5	2/6/2002	Prorocentrum micans	576.43
WF021	F24	WF0211BE	2.5	2/6/2002	Rhizosolenia setigera	1303.95
WF021	F24	WF0211BE	2.5	2/6/2002	Skeletonema costatum	2995.05
WF021	F24	WF0211BE	2.5	2/6/2002	Thalassiosira nordenskioldii	57.23
WF021	F24	WF0211BE	2.5	2/6/2002	Thalassiosira sp. group 3 10-20 microns	693.14
WF021	F24	WF0211BE	2.5	2/6/2002	Unid. micro-phytoflag sp. group 1 length	10223.38
WF021	F30	WF0211D5	5.33	2/6/2002	Centric diatom sp. group 1 diam <10 micr	210.19
WF021	F30	WF0211D5	5.33	2/6/2002	Chaetoceros compressus	1852.89
WF021	F30	WF0211D5	5.33	2/6/2002	Chaetoceros decipiens	4701.89
WF021	F30	WF0211D5	5.33	2/6/2002	Chaetoceros sp. group 2 diam 10-30 micro	2451.49
WF021	F30	WF0211D5	5.33	2/6/2002	Chaetoceros subtilis	201.37
WF021	F30	WF0211D5	5.33	2/6/2002	Choanoflagellate spp.	36.84
WF021	F30	WF0211D5	5.33	2/6/2002	Cocconeis scutellum	278.65
WF021	F30	WF0211D5	5.33	2/6/2002	Cryptomonas sp. group 1 length <10 micro	315.61
WF021	F30	WF0211D5	5.33	2/6/2002	Cryptomonas sp. group 2 length >10 micro	150.14
WF021	F30	WF0211D5	5.33	2/6/2002	Cylindrotheca closterium	276.34
WF021	F30	WF0211D5	5.33	2/6/2002	Dactyliosolen fragilissimus	85055.62
WF021	F30	WF0211D5	5.33	2/6/2002	Eucampia cornuta	315.64
WF021	F30	WF0211D5	5.33	2/6/2002	Eutreptia/eutreptiella spp.	110.25
WF021	F30	WF0211D5	5.33	2/6/2002	Grammatophora marina	174.38
WF021	F30	WF0211D5	5.33	2/6/2002	Guinardia delicatula	1632.04
WF021	F30	WF0211D5	5.33	2/6/2002	Gymnodinium sp. group 1 5-20 microns wid	969.48
WF021	F30	WF0211D5	5.33	2/6/2002	Heterocapsa rotundata	190.79
WF021	F30	WF0211D5	5.33	2/6/2002	Leptocylindrus minimus	220.06
WF021	F30	WF0211D5	5.33	2/6/2002	Pennate diatom sp. group 1 <10 microns l	11.62
WF021	F30	WF0211D5	5.33	2/6/2002	Pennate diatom sp. group 2 10-30 microns	59.24
WF021	F30	WF0211D5	5.33	2/6/2002	Pleurosigma spp.	1517.76
WF021	F30	WF0211D5	5.33	2/6/2002	Prorocentrum micans	557.53
WF021	F30	WF0211D5	5.33	2/6/2002	Pseudonitzschia delicatissma complex	18.88
WF021	F30	WF0211D5	5.33	2/6/2002	Rhizosolenia setigera	7579.90
WF021	F30	WF0211D5	5.33	2/6/2002	Skeletonema costatum	5586.78

Survey	Sta.	Sample Number	Depth (m)	Sampling Date	Plankton	Estimated Carbon Equivalence (ng Carbon/L)
WF021	F30	WF0211D5	5.33	2/6/2002	Thalassiosira nordenskioldii	184.83
WF021	F30	WF0211D5	5.33	2/6/2002	Thalassiosira rotula	3984.83
WF021	F30	WF0211D5	5.33	2/6/2002	Thalassiosira sp. group 3 10-20 microns	382.45
WF021	F30	WF0211D5	5.33	2/6/2002	Unid. micro-phytoflag sp. group 1 length	7820.32
WF021	F30	WF0211D6	1.87	2/6/2002	Centric diatom sp. group 1 diam <10 micr	285.26
WF021	F30	WF0211D6	1.87	2/6/2002	Chaetoceros decipiens	4036.97
WF021	F30	WF0211D6	1.87	2/6/2002	Chaetoceros sp. group 1 diam <10 microns	112.25
WF021	F30	WF0211D6	1.87	2/6/2002	Chaetoceros sp. group 2 diam 10-30 micro	3064.36
WF021	F30	WF0211D6	1.87	2/6/2002	Chaetoceros subtilis	806.84
WF021	F30	WF0211D6	1.87	2/6/2002	Choanoflagellate spp.	36.84
WF021	F30	WF0211D6	1.87	2/6/2002	Cryptomonas sp. group 1 length <10 micro	385.75
WF021	F30	WF0211D6	1.87	2/6/2002	Cylindrotheca closterium	276.34
WF021	F30	WF0211D6	1.87	2/6/2002	Dactyliosolen fragilissimus	73674.94
WF021	F30	WF0211D6	1.87	2/6/2002	Eucampia cornuta	1262.57
WF021	F30	WF0211D6	1.87	2/6/2002	Guinardia delicatula	1428.03
WF021	F30	WF0211D6	1.87	2/6/2002	Gymnodinium sp. group 1 5-20 microns wid	581.69
WF021	F30	WF0211D6	1.87	2/6/2002	Gyrodinium spirale	15755.25
WF021	F30	WF0211D6	1.87	2/6/2002	Heterocapsa rotundata	38.16
WF021	F30	WF0211D6	1.87	2/6/2002	Leptocylindrus minimus	314.37
WF021	F30	WF0211D6	1.87	2/6/2002	Pennate diatom sp. group 2 10-30 microns	59.24
WF021	F30	WF0211D6	1.87	2/6/2002	Phaeocystis pouchetii	449.51
WF021	F30	WF0211D6	1.87	2/6/2002	Pleurosigma spp.	1520.31
WF021	F30	WF0211D6	1.87	2/6/2002	Pseudonitzschia delicatissma complex	18.88
WF021	F30	WF0211D6	1.87	2/6/2002	Rhizosolenia setigera	6305.97
WF021	F30	WF0211D6	1.87	2/6/2002	Skeletonema costatum	3948.68
WF021	F30	WF0211D6	1.87	2/6/2002	Thalassionema nitzschioides	150.50
WF021	F30	WF0211D6	1.87	2/6/2002	Thalassiosira nordenskioldii	129.16
WF021	F30	WF0211D6	1.87	2/6/2002	Thalassiosira rotula	1989.07
WF021	F30	WF0211D6	1.87	2/6/2002	Thalassiosira sp. group 3 10-20 microns	478.06
WF021	F30	WF0211D6	1.87	2/6/2002	Unid. micro-phytoflag sp. group 1 length	12256.85
WF021	F30	WF0211D6	1.87	2/6/2002	Unid. micro-phytoflag sp. group 2 length	455.29
WF021	F23	WF0211E6	10.88	2/7/2002	Calycomonas wulffii	8.99
WF021	F23	WF0211E6	10.88	2/7/2002	Centric diatom sp. group 1 diam <10 micr	198.49
WF021	F23	WF0211E6	10.88	2/7/2002	Chaetoceros decipiens	6216.06
WF021	F23	WF0211E6	10.88	2/7/2002	Chaetoceros sp. group 2 diam 10-30 micro	1620.48
WF021	F23	WF0211E6	10.88	2/7/2002	Chaetoceros subtilis	266.67
WF021	F23	WF0211E6	10.88	2/7/2002	Choanoflagellate spp.	48.70
WF021	F23	WF0211E6	10.88	2/7/2002	Cryptomonas sp. group 1 length <10 micro	525.43
WF021	F23	WF0211E6	10.88	2/7/2002	Cryptomonas sp. group 2 length >10 micro	49.62
WF021	F23	WF0211E6	10.88	2/7/2002	Cylindrotheca closterium	547.07
WF021	F23	WF0211E6	10.88	2/7/2002	Dactyliosolen fragilissimus	138974.26
WF021	F23	WF0211E6	10.88	2/7/2002	Guinardia delicatula	809.10

Survey	Sta.	Sample Number	Depth (m)	Sampling Date	Plankton	Estimated Carbon Equivalence (ng Carbon/L)
WF021	F23	WF0211E6	10.88	2/7/2002	Gymnodinium sp. group 1 5-20 microns wid	256.34
WF021	F23	WF0211E6	10.88	2/7/2002	Gymnodinium sp. group 2 21-40 microns wi	4732.62
WF021	F23	WF0211E6	10.88	2/7/2002	Gyrodinium spirale	10414.49
WF021	F23	WF0211E6	10.88	2/7/2002	Gyrosigma spp.	2006.53
WF021	F23	WF0211E6	10.88	2/7/2002	Heterocapsa rotundata	25.22
WF021	F23	WF0211E6	10.88	2/7/2002	Leptocylindrus minimus	41.56
WF021	F23	WF0211E6	10.88	2/7/2002	Rhizosolenia setigera	6669.37
WF021	F23	WF0211E6	10.88	2/7/2002	Skeletonema costatum	6998.38
WF021	F23	WF0211E6	10.88	2/7/2002	Thalassiosira nordenskioldii	146.61
WF021	F23	WF0211E6	10.88	2/7/2002	Thalassiosira rotula	3512.05
WF021	F23	WF0211E6	10.88	2/7/2002	Thalassiosira sp. group 3 10-20 microns	252.81
WF021	F23	WF0211E6	10.88	2/7/2002	Unid. micro-phytoflag sp. group 1 length	10015.64
WF021	F23	WF0211E8	1.74	2/7/2002	Centric diatom sp. group 1 diam <10 micr	171.00
WF021	F23	WF0211E8	1.74	2/7/2002	Chaetoceros decipiens	5108.94
WF021	F23	WF0211E8	1.74	2/7/2002	Chaetoceros sp. group 2 diam 10-30 micro	2326.84
WF021	F23	WF0211E8	1.74	2/7/2002	Chaetoceros subtilis	382.26
WF021	F23	WF0211E8	1.74	2/7/2002	Cryptomonas sp. group 1 length <10 micro	288.47
WF021	F23	WF0211E8	1.74	2/7/2002	Cryptomonas sp. group 2 length >10 micro	71.25
WF021	F23	WF0211E8	1.74	2/7/2002	Cylindrotheca closterium	261.85
WF021	F23	WF0211E8	1.74	2/7/2002	Dactyliosolen fragilissimus	119390.55
WF021	F23	WF0211E8	1.74	2/7/2002	Eucampia cornuta	599.19
WF021	F23	WF0211E8	1.74	2/7/2002	Guinardia delicatula	1936.32
WF021	F23	WF0211E8	1.74	2/7/2002	Gymnodinium sp. group 1 5-20 microns wid	368.07
WF021	F23	WF0211E8	1.74	2/7/2002	Gymnodinium sp. group 2 21-40 microns wi	1696.04
WF021	F23	WF0211E8	1.74	2/7/2002	Heterocapsa rotundata	36.22
WF021	F23	WF0211E8	1.74	2/7/2002	Leptocylindrus minimus	59.68
WF021	F23	WF0211E8	1.74	2/7/2002	Pennate diatom sp. group 1 <10 microns l	22.05
WF021	F23	WF0211E8	1.74	2/7/2002	Pennate diatom sp. group 3 31-60 microns	80.26
WF021	F23	WF0211E8	1.74	2/7/2002	Prorocentrum micans	529.19
WF021	F23	WF0211E8	1.74	2/7/2002	Pseudonitzschia delicatissma complex	17.92
WF021	F23	WF0211E8	1.74	2/7/2002	Rhizosolenia setigera	3591.20
WF021	F23	WF0211E8	1.74	2/7/2002	Skeletonema costatum	6497.45
WF021	F23	WF0211E8	1.74	2/7/2002	Thalassionema nitzschioides	35.71
WF021	F23	WF0211E8	1.74	2/7/2002	Thalassiosira nordenskioldii	245.19
WF021	F23	WF0211E8	1.74	2/7/2002	Thalassiosira sp. group 3 10-20 microns	226.88
WF021	F23	WF0211E8	1.74	2/7/2002	Unid. micro-phytoflag sp. group 1 length	9813.63
WF021	F23	WF0211E8	1.74	2/7/2002	Unid. micro-phytoflag sp. group 2 length	216.07
WF021	N04	WF021275	24.49	2/8/2002	Centric diatom sp. group 1 diam <10 micr	60.30
WF021	N04	WF021275	24.49	2/8/2002	Ceratium fusus	803.79
WF021	N04	WF021275	24.49	2/8/2002	Chaetoceros convolutus	195.61
WF021	N04	WF021275	24.49	2/8/2002	Chaetoceros decipiens	1214.08
WF021	N04	WF021275	24.49	2/8/2002	Chaetoceros sp. group 1 diam <10 microns	5.63

Survey	Sta.	Sample Number	Depth (m)	Sampling Date	Plankton	Estimated Carbon Equivalence (ng Carbon/L)
WF021	N04	WF021275	24.49	2/8/2002	Choanoflagellate spp.	36.99
WF021	N04	WF021275	24.49	2/8/2002	Cryptomonas sp. group 1 length <10 micro	322.80
WF021	N04	WF021275	24.49	2/8/2002	Cryptomonas sp. group 2 length >10 micro	37.69
WF021	N04	WF021275	24.49	2/8/2002	Cylindrotheca closterium	415.53
WF021	N04	WF021275	24.49	2/8/2002	Dactyliosolen fragilissimus	20029.06
WF021	N04	WF021275	24.49	2/8/2002	Guinardia delicatula	1843.68
WF021	N04	WF021275	24.49	2/8/2002	Guinardia flaccida	4978.61
WF021	N04	WF021275	24.49	2/8/2002	Guinardia striata	5569.17
WF021	N04	WF021275	24.49	2/8/2002	Gymnodinium sp. group 1 5-20 microns wid	1849.67
WF021	N04	WF021275	24.49	2/8/2002	Gyrodinium sp. group 2 21-40 microns wid	1076.59
WF021	N04	WF021275	24.49	2/8/2002	Gyrodinium spirale	7910.38
WF021	N04	WF021275	24.49	2/8/2002	Leptocylindrus danicus	496.29
WF021	N04	WF021275	24.49	2/8/2002	Paulinella ovalis	6.99
WF021	N04	WF021275	24.49	2/8/2002	Pennate diatom sp. group 1 <10 microns l	5.83
WF021	N04	WF021275	24.49	2/8/2002	Pennate diatom sp. group 2 10-30 microns	29.74
WF021	N04	WF021275	24.49	2/8/2002	Pleurosigma spp.	2289.95
WF021	N04	WF021275	24.49	2/8/2002	Prorocentrum micans	671.82
WF021	N04	WF021275	24.49	2/8/2002	Skeletonema costatum	51.94
WF021	N04	WF021275	24.49	2/8/2002	Thalassionema nitzschioides	34.00
WF021	N04	WF021275	24.49	2/8/2002	Thalassiosira sp. group 3 10-20 microns	144.26
WF021	N04	WF021275	24.49	2/8/2002	Unid. micro-phytoflag sp. group 1 length	5210.05
WF021	N04	WF021277	1.92	2/8/2002	Centric diatom sp. group 1 diam <10 micr	35.40
WF021	N04	WF021277	1.92	2/8/2002	Chaetoceros decipiens	3325.92
WF021	N04	WF021277	1.92	2/8/2002	Choanoflagellate spp.	121.61
WF021	N04	WF021277	1.92	2/8/2002	Cryptomonas sp. group 1 length <10 micro	501.63
WF021	N04	WF021277	1.92	2/8/2002	Cryptomonas sp. group 2 length >10 micro	35.40
WF021	N04	WF021277	1.92	2/8/2002	Cylindrotheca closterium	390.94
WF021	N04	WF021277	1.92	2/8/2002	Dactyliosolen fragilissimus	25209.92
WF021	N04	WF021277	1.92	2/8/2002	Dictyocha fibula	355.78
WF021	N04	WF021277	1.92	2/8/2002	Guinardia delicatula	1587.35
WF021	N04	WF021277	1.92	2/8/2002	Guinardia flaccida	7806.64
WF021	N04	WF021277	1.92	2/8/2002	Guinardia striata	16923.14
WF021	N04	WF021277	1.92	2/8/2002	Gymnodinium sp. group 1 5-20 microns wid	1828.72
WF021	N04	WF021277	1.92	2/8/2002	Gyrodinium spirale	14859.49
WF021	N04	WF021277	1.92	2/8/2002	Heterocapsa rotundata	107.96
WF021	N04	WF021277	1.92	2/8/2002	Leptocylindrus danicus	349.01
WF021	N04	WF021277	1.92	2/8/2002	Pennate diatom sp. group 2 10-30 microns	27.94
WF021	N04	WF021277	1.92	2/8/2002	Phaeocystis pouchetii	423.95
WF021	N04	WF021277	1.92	2/8/2002	Pleurosigma spp.	1073.60
WF021	N04	WF021277	1.92	2/8/2002	Prorocentrum micans	1053.44
WF021	N04	WF021277	1.92	2/8/2002	Rhizosolenia setigera	892.12
WF021	N04	WF021277	1.92	2/8/2002	Skeletonema costatum	60.99

Survey	Sta.	Sample Number	Depth (m)	Sampling Date	Plankton	Estimated Carbon Equivalence (ng Carbon/L)
WF021	N04	WF021277	1.92	2/8/2002	Thalassiosira sp. group 3 10-20 microns	45.16
WF021	N04	WF021277	1.92	2/8/2002	Unid. micro-phytoflag sp. group 1 length	6045.94
WF021	N04	WF021277	1.92	2/8/2002	Unid. micro-phytoflag sp. group 2 length	107.35
WF021	N18	WF0212B8	11.08	2/8/2002	Centric diatom sp. group 1 diam <10 micr	99.50
WF021	N18	WF0212B8	11.08	2/8/2002	Ceratium lineatum	2544.28
WF021	N18	WF0212B8	11.08	2/8/2002	Chaetoceros convolutus	318.77
WF021	N18	WF0212B8	11.08	2/8/2002	Chaetoceros decipiens	5276.02
WF021	N18	WF0212B8	11.08	2/8/2002	Chaetoceros sp. group 2 diam 10-30 micro	150.18
WF021	N18	WF0212B8	11.08	2/8/2002	Chaetoceros subtilis	98.86
WF021	N18	WF0212B8	11.08	2/8/2002	Choanoflagellate spp.	27.13
WF021	N18	WF0212B8	11.08	2/8/2002	Cocconeis scutellum	205.19
WF021	N18	WF0212B8	11.08	2/8/2002	Cryptomonas sp. group 1 length <10 micro	473.43
WF021	N18	WF0212B8	11.08	2/8/2002	Cryptomonas sp. group 2 length >10 micro	55.28
WF021	N18	WF0212B8	11.08	2/8/2002	Cylindrotheca closterium	541.73
WF021	N18	WF0212B8	11.08	2/8/2002	Dactyliosolen fragilissimus	50577.23
WF021	N18	WF0212B8	11.08	2/8/2002	Ebria tripartita	215.82
WF021	N18	WF0212B8	11.08	2/8/2002	Guinardia delicatula	1802.71
WF021	N18	WF0212B8	11.08	2/8/2002	Guinardia flaccida	12190.42
WF021	N18	WF0212B8	11.08	2/8/2002	Guinardia striata	4804.77
WF021	N18	WF0212B8	11.08	2/8/2002	Gymnodinium sp. group 1 5-20 microns wid	1427.82
WF021	N18	WF0212B8	11.08	2/8/2002	Gymnodinium sp. group 2 21-40 microns wi	877.22
WF021	N18	WF0212B8	11.08	2/8/2002	Gyrodinium spirale	11601.89
WF021	N18	WF0212B8	11.08	2/8/2002	Heterocapsa rotundata	84.30
WF021	N18	WF0212B8	11.08	2/8/2002	Leptocylindrus minimus	84.74
WF021	N18	WF0212B8	11.08	2/8/2002	Paulinella ovalis	20.52
WF021	N18	WF0212B8	11.08	2/8/2002	Pleurosigma spp.	1117.65
WF021	N18	WF0212B8	11.08	2/8/2002	Prorocentrum micans	821.12
WF021	N18	WF0212B8	11.08	2/8/2002	Rhizosolenia setigera	1857.44
WF021	N18	WF0212B8	11.08	2/8/2002	Skeletonema costatum	1032.73
WF021	N18	WF0212B8	11.08	2/8/2002	Thalassiosira nordenskioldii	54.44
WF021	N18	WF0212B8	11.08	2/8/2002	Thalassiosira sp. group 3 10-20 microns	70.41
WF021	N18	WF0212B8	11.08	2/8/2002	Unid. micro-phytoflag sp. group 1 length	7530.66
WF021	N18	WF0212B8	11.08	2/8/2002	Unid. micro-phytoflag sp. group 2 length	167.63
WF021	N18	WF0212BA	1.94	2/8/2002	Centric diatom sp. group 1 diam <10 micr	79.15
WF021	N18	WF0212BA	1.94	2/8/2002	Chaetoceros decipiens	4053.76
WF021	N18	WF0212BA	1.94	2/8/2002	Chaetoceros sp. group 1 diam <10 microns	56.36
WF021	N18	WF0212BA	1.94	2/8/2002	Cryptomonas sp. group 1 length <10 micro	572.23
WF021	N18	WF0212BA	1.94	2/8/2002	Cryptomonas sp. group 2 length >10 micro	113.07
WF021	N18	WF0212BA	1.94	2/8/2002	Cylindrotheca closterium	311.65
WF021	N18	WF0212BA	1.94	2/8/2002	Dactyliosolen fragilissimus	53004.84
WF021	N18	WF0212BA	1.94	2/8/2002	Eucampia cornuta	237.72
WF021	N18	WF0212BA	1.94	2/8/2002	Guinardia delicatula	1536.40

Survey	Sta.	Sample Number	Depth (m)	Sampling Date	Plankton	Estimated Carbon Equivalence (ng Carbon/L)
WF021	N18	WF0212BA	1.94	2/8/2002	Guinardia flaccida	6223.26
WF021	N18	WF0212BA	1.94	2/8/2002	Guinardia striata	4922.24
WF021	N18	WF0212BA	1.94	2/8/2002	Gymnodinium sp. group 1 5-20 microns wid	1022.19
WF021	N18	WF0212BA	1.94	2/8/2002	Gyrodinium sp. group 2 21-40 microns wid	2696.01
WF021	N18	WF0212BA	1.94	2/8/2002	Gyrodinium spirale	5922.82
WF021	N18	WF0212BA	1.94	2/8/2002	Heterocapsa rotundata	172.42
WF021	N18	WF0212BA	1.94	2/8/2002	Leptocylindrus minimus	71.03
WF021	N18	WF0212BA	1.94	2/8/2002	Pleurosigma spp.	571.53
WF021	N18	WF0212BA	1.94	2/8/2002	Prorocentrum micans	841.19
WF021	N18	WF0212BA	1.94	2/8/2002	Rhizosolenia setigera	3805.71
WF021	N18	WF0212BA	1.94	2/8/2002	Skeletonema costatum	883.06
WF021	N18	WF0212BA	1.94	2/8/2002	Thalassiosira nordenskioldii	55.68
WF021	N18	WF0212BA	1.94	2/8/2002	Thalassiosira rotula	998.67
WF021	N18	WF0212BA	1.94	2/8/2002	Thalassiosira sp. group 3 10-20 microns	144.02
WF021	N18	WF0212BA	1.94	2/8/2002	Unid. micro-phytoflag sp. group 1 length	8126.55
WF021	N18	WF0212BA	1.94	2/8/2002	Unid. micro-phytoflag sp. group 2 length	171.44
WF021	F26	WF0213A3	21.5	2/9/2002	Amphora spp.	240.49
WF021	F26	WF0213A3	21.5	2/9/2002	Centric diatom sp. group 1 diam <10 micr	122.71
WF021	F26	WF0213A3	21.5	2/9/2002	Chaetoceros convolutus	192.98
WF021	F26	WF0213A3	21.5	2/9/2002	Chaetoceros decipiens	1996.32
WF021	F26	WF0213A3	21.5	2/9/2002	Chaetoceros sp. group 2 diam 10-30 micro	454.61
WF021	F26	WF0213A3	21.5	2/9/2002	Choanoflagellate spp.	27.37
WF021	F26	WF0213A3	21.5	2/9/2002	Corethron criophilum	4097.15
WF021	F26	WF0213A3	21.5	2/9/2002	Cryptomonas sp. group 1 length <10 micro	521.12
WF021	F26	WF0213A3	21.5	2/9/2002	Cylindrotheca closterium	1270.85
WF021	F26	WF0213A3	21.5	2/9/2002	Dactyliosolen fragilissimus	4628.53
WF021	F26	WF0213A3	21.5	2/9/2002	Detonula confervacea	1059.31
WF021	F26	WF0213A3	21.5	2/9/2002	Ebria tripartita	130.66
WF021	F26	WF0213A3	21.5	2/9/2002	Eucampia cornuta	281.43
WF021	F26	WF0213A3	21.5	2/9/2002	Guinardia delicatula	242.52
WF021	F26	WF0213A3	21.5	2/9/2002	Gymnodinium sp. group 1 5-20 microns wid	1008.47
WF021	F26	WF0213A3	21.5	2/9/2002	Heterocapsa rotundata	56.70
WF021	F26	WF0213A3	21.5	2/9/2002	Licmophora spp.	24.54
WF021	F26	WF0213A3	21.5	2/9/2002	Pennate diatom sp. group 1 <10 microns l	8.63
WF021	F26	WF0213A3	21.5	2/9/2002	Pleurosigma spp.	1129.61
WF021	F26	WF0213A3	21.5	2/9/2002	Prorocentrum micans	165.70
WF021	F26	WF0213A3	21.5	2/9/2002	Pseudonitzschia delicatissma complex	28.11
WF021	F26	WF0213A3	21.5	2/9/2002	Skeletonema costatum	3443.83
WF021	F26	WF0213A3	21.5	2/9/2002	Thalassionema nitzschioides	11.18
WF021	F26	WF0213A3	21.5	2/9/2002	Thalassiosira nordenskioldii	82.40
WF021	F26	WF0213A3	21.5	2/9/2002	Thalassiosira rotula	788.21
WF021	F26	WF0213A3	21.5	2/9/2002	Thalassiosira sp. group 3 10-20 microns	170.50

Survey	Sta.	Sample Number	Depth (m)	Sampling Date	Plankton	Estimated Carbon Equivalence (ng Carbon/L)
WF021	F26	WF0213A3	21.5	2/9/2002	Unid. micro-phytoflag sp. group 1 length	10643.43
WF021	F26	WF0213A3	21.5	2/9/2002	Unid. micro-phytoflag sp. group 2 length	169.14
WF021	F26	WF0213A5	2.14	2/9/2002	Centric diatom sp. group 1 diam <10 micr	164.13
WF021	F26	WF0213A5	2.14	2/9/2002	Chaetoceros decipiens	979.09
WF021	F26	WF0213A5	2.14	2/9/2002	Chaetoceros sp. group 2 diam 10-30 micro	1340.01
WF021	F26	WF0213A5	2.14	2/9/2002	Choanoflagellate spp.	53.70
WF021	F26	WF0213A5	2.14	2/9/2002	Cryptomonas sp. group 1 length <10 micro	374.85
WF021	F26	WF0213A5	2.14	2/9/2002	Cylindrotheca closterium	1206.36
WF021	F26	WF0213A5	2.14	2/9/2002	Dactyliosolen fragilissimus	3637.89
WF021	F26	WF0213A5	2.14	2/9/2002	Detonula confervacea	2290.41
WF021	F26	WF0213A5	2.14	2/9/2002	Guinardia delicatula	198.24
WF021	F26	WF0213A5	2.14	2/9/2002	Gymnodinium sp. group 1 5-20 microns wid	1837.09
WF021	F26	WF0213A5	2.14	2/9/2002	Gyrodinium spirale	3821.12
WF021	F26	WF0213A5	2.14	2/9/2002	Paralia sulcata	349.91
WF021	F26	WF0213A5	2.14	2/9/2002	Paulinella ovalis	20.30
WF021	F26	WF0213A5	2.14	2/9/2002	Pleurosigma spp.	737.44
WF021	F26	WF0213A5	2.14	2/9/2002	Pseudonitzschia delicatissma complex	18.35
WF021	F26	WF0213A5	2.14	2/9/2002	Skeletonema costatum	4473.87
WF021	F26	WF0213A5	2.14	2/9/2002	Stephanopyxis spp.	24.71
WF021	F26	WF0213A5	2.14	2/9/2002	Thalassionema nitzschioides	18.28
WF021	F26	WF0213A5	2.14	2/9/2002	Thalassiosira nordenskioldii	323.29
WF021	F26	WF0213A5	2.14	2/9/2002	Thalassiosira punctigera	1053.41
WF021	F26	WF0213A5	2.14	2/9/2002	Thalassiosira sp. group 3 10-20 microns	278.74
WF021	F26	WF0213A5	2.14	2/9/2002	Unid. micro-phytoflag sp. group 1 length	10056.42
WF021	F27	WF0213B0	50.42	2/9/2002	Amphidinium spp.	139.41
WF021	F27	WF0213B0	50.42	2/9/2002	Centric diatom sp. group 1 diam <10 micr	62.19
WF021	F27	WF0213B0	50.42	2/9/2002	Chaetoceros convolutus	97.80
WF021	F27	WF0213B0	50.42	2/9/2002	Chaetoceros sp. group 2 diam 10-30 micro	92.16
WF021	F27	WF0213B0	50.42	2/9/2002	Choanoflagellate spp.	13.87
WF021	F27	WF0213B0	50.42	2/9/2002	Cryptomonas sp. group 1 length <10 micro	233.29
WF021	F27	WF0213B0	50.42	2/9/2002	Cylindrotheca closterium	1371.25
WF021	F27	WF0213B0	50.42	2/9/2002	Dactyliosolen fragilissimus	1217.98
WF021	F27	WF0213B0	50.42	2/9/2002	Dictyocha speculum	32.63
WF021	F27	WF0213B0	50.42	2/9/2002	Eucampia cornuta	95.09
WF021	F27	WF0213B0	50.42	2/9/2002	Guinardia delicatula	307.80
WF021	F27	WF0213B0	50.42	2/9/2002	Gymnodinium sp. group 1 5-20 microns wid	730.13
WF021	F27	WF0213B0	50.42	2/9/2002	Gymnodinium sp. group 2 21-40 microns wi	807.45
WF021	F27	WF0213B0	50.42	2/9/2002	Gyrodinium spirale	5932.78
WF021	F27	WF0213B0	50.42	2/9/2002	Heterocapsa rotundata	14.37
WF021	F27	WF0213B0	50.42	2/9/2002	Paulinella ovalis	5.25
WF021	F27	WF0213B0	50.42	2/9/2002	Pennate diatom sp. group 2 10-30 microns	26.72
WF021	F27	WF0213B0	50.42	2/9/2002	Pennate diatom sp. group 3 31-60 microns	63.79

Survey	Sta.	Sample Number	Depth (m)	Sampling Date	Plankton	Estimated Carbon Equivalence (ng Carbon/L)
WF021	F27	WF0213B0	50.42	2/9/2002	Pleurosigma spp.	457.22
WF021	F27	WF0213B0	50.42	2/9/2002	Prorocentrum micans	83.98
WF021	F27	WF0213B0	50.42	2/9/2002	Pseudonitzschia pungens	6.82
WF021	F27	WF0213B0	50.42	2/9/2002	Skeletonema costatum	207.78
WF021	F27	WF0213B0	50.42	2/9/2002	Thalassionema nitzschioides	17.00
WF021	F27	WF0213B0	50.42	2/9/2002	Thalassiosira nordenskioldii	19.45
WF021	F27	WF0213B0	50.42	2/9/2002	Thalassiosira rotula	1000.35
WF021	F27	WF0213B0	50.42	2/9/2002	Thalassiosira sp. group 3 10-20 microns	108.01
WF021	F27	WF0213B0	50.42	2/9/2002	Unid. micro-phytoflag sp. group 1 length	6243.57
WF021	F27	WF0213B0	50.42	2/9/2002	Unid. micro-phytoflag sp. group 2 length	514.33
WF021	F27	WF0213B2	2.4	2/9/2002	Amphidinium spp.	136.32
WF021	F27	WF0213B2	2.4	2/9/2002	Centric diatom sp. group 1 diam <10 micr	38.70
WF021	F27	WF0213B2	2.4	2/9/2002	Chaetoceros sp. group 2 diam 10-30 micro	225.28
WF021	F27	WF0213B2	2.4	2/9/2002	Choanoflagellate spp.	13.56
WF021	F27	WF0213B2	2.4	2/9/2002	Corethron criophilum	506.72
WF021	F27	WF0213B2	2.4	2/9/2002	Cryptomonas sp. group 1 length <10 micro	167.85
WF021	F27	WF0213B2	2.4	2/9/2002	Cylindrotheca closterium	2006.08
WF021	F27	WF0213B2	2.4	2/9/2002	Dactyliosolen fragilissimus	110.27
WF021	F27	WF0213B2	2.4	2/9/2002	Gymnodinium sp. group 1 5-20 microns wid	642.52
WF021	F27	WF0213B2	2.4	2/9/2002	Gyrodinium sp. group 2 21-40 microns wid	657.92
WF021	F27	WF0213B2	2.4	2/9/2002	Gyrodinium spirale	11601.89
WF021	F27	WF0213B2	2.4	2/9/2002	Heterocapsa rotundata	14.05
WF021	F27	WF0213B2	2.4	2/9/2002	Leptocylindrus danicus	121.32
WF021	F27	WF0213B2	2.4	2/9/2002	Paralia sulcata	110.30
WF021	F27	WF0213B2	2.4	2/9/2002	Pennate diatom sp. group 2 10-30 microns	10.89
WF021	F27	WF0213B2	2.4	2/9/2002	Pleurosigma spp.	279.41
WF021	F27	WF0213B2	2.4	2/9/2002	Pseudonitzschia delicatissma complex	3.48
WF021	F27	WF0213B2	2.4	2/9/2002	Pseudonitzschia pungens	8.34
WF021	F27	WF0213B2	2.4	2/9/2002	Skeletonema costatum	158.72
WF021	F27	WF0213B2	2.4	2/9/2002	Thalassionema nitzschioides	6.93
WF021	F27	WF0213B2	2.4	2/9/2002	Thalassiosira nordenskioldii	16.98
WF021	F27	WF0213B2	2.4	2/9/2002	Thalassiosira sp. group 3 10-20 microns	184.82
WF021	F27	WF0213B2	2.4	2/9/2002	Unid. micro-phytoflag sp. group 1 length	5620.31
WF021	F27	WF0213B2	2.4	2/9/2002	Unid. micro-phytoflag sp. group 2 length	83.82
WF021	F02	WF0213F5	15.89	2/9/2002	Centric diatom sp. group 1 diam <10 micr	54.36
WF021	F02	WF0213F5	15.89	2/9/2002	Ceratium lineatum	499.60
WF021	F02	WF0213F5	15.89	2/9/2002	Choanoflagellate spp.	26.68
WF021	F02	WF0213F5	15.89	2/9/2002	Cryptomonas sp. group 1 length <10 micro	761.89
WF021	F02	WF0213F5	15.89	2/9/2002	Cryptomonas sp. group 2 length >10 micro	108.73
WF021	F02	WF0213F5	15.89	2/9/2002	Dactyliosolen fragilissimus	8849.20
WF021	F02	WF0213F5	15.89	2/9/2002	Guinardia delicatula	29597.83
WF021	F02	WF0213F5	15.89	2/9/2002	Guinardia flaccida	125670.54

Survey	Sta.	Sample Number	Depth (m)	Sampling Date	Plankton	Estimated Carbon Equivalence (ng Carbon/L)
WF021	F02	WF0213F5	15.89	2/9/2002	Guinardia striata	9765.61
WF021	F02	WF0213F5	15.89	2/9/2002	Gymnodinium sp. group 1 5-20 microns wid	1825.46
WF021	F02	WF0213F5	15.89	2/9/2002	Gyrodinium sp. group 2 21-40 microns wid	517.63
WF021	F02	WF0213F5	15.89	2/9/2002	Heterocapsa rotundata	469.78
WF021	F02	WF0213F5	15.89	2/9/2002	Leptocylindrus danicus	190.57
WF021	F02	WF0213F5	15.89	2/9/2002	Leptocylindrus minimus	9.09
WF021	F02	WF0213F5	15.89	2/9/2002	Paulinella ovalis	20.18
WF021	F02	WF0213F5	15.89	2/9/2002	Pennate diatom sp. group 2 10-30 microns	42.90
WF021	F02	WF0213F5	15.89	2/9/2002	Pleurosigma spp.	439.66
WF021	F02	WF0213F5	15.89	2/9/2002	Rhizosolenia setigera	730.69
WF021	F02	WF0213F5	15.89	2/9/2002	Thalassiosira sp. group 3 10-20 microns	55.39
WF021	F02	WF0213F5	15.89	2/9/2002	Unid. micro-phytoflag sp. group 1 length	7106.58
WF021	F02	WF0213F5	15.89	2/9/2002	Unid. micro-phytoflag sp. group 2 length	164.86
WF021	F02	WF0213F7	2.48	2/9/2002	Centric diatom sp. group 1 diam <10 micr	47.63
WF021	F02	WF0213F7	2.48	2/9/2002	Cryptomonas sp. group 1 length <10 micro	395.60
WF021	F02	WF0213F7	2.48	2/9/2002	Dactyliosolen fragilissimus	6018.01
WF021	F02	WF0213F7	2.48	2/9/2002	Guinardia delicatula	22330.36
WF021	F02	WF0213F7	2.48	2/9/2002	Guinardia flaccida	96130.81
WF021	F02	WF0213F7	2.48	2/9/2002	Guinardia striata	6325.52
WF021	F02	WF0213F7	2.48	2/9/2002	Gymnodinium sp. group 1 5-20 microns wid	1230.37
WF021	F02	WF0213F7	2.48	2/9/2002	Gyrodinium spirale	4158.63
WF021	F02	WF0213F7	2.48	2/9/2002	Leptocylindrus minimus	33.25
WF021	F02	WF0213F7	2.48	2/9/2002	Pleurosigma spp.	401.29
WF021	F02	WF0213F7	2.48	2/9/2002	Prorocentrum micans	294.82
WF021	F02	WF0213F7	2.48	2/9/2002	Rhizosolenia setigera	666.91
WF021	F02	WF0213F7	2.48	2/9/2002	Skeletonema costatum	145.89
WF021	F02	WF0213F7	2.48	2/9/2002	Thalassionema nitzschioides	79.72
WF021	F02	WF0213F7	2.48	2/9/2002	Thalassiosira sp. group 3 10-20 microns	25.28
WF021	F02	WF0213F7	2.48	2/9/2002	Unid. micro-phytoflag sp. group 1 length	5984.29
WF021	F02	WF0213F7	2.48	2/9/2002	Unid. micro-phytoflag sp. group 2 length	361.13
WF021	F01	WF021410	11.78	2/9/2002	Ceratium fusus	2098.78
WF021	F01	WF021410	11.78	2/9/2002	Chaetoceros decipiens	2113.40
WF021	F01	WF021410	11.78	2/9/2002	Chaetoceros sp. group 2 diam 10-30 micro	2646.98
WF021	F01	WF021410	11.78	2/9/2002	Choanoflagellate spp.	28.98
WF021	F01	WF021410	11.78	2/9/2002	Cryptomonas sp. group 1 length <10 micro	257.45
WF021	F01	WF021410	11.78	2/9/2002	Cryptomonas sp. group 2 length >10 micro	59.05
WF021	F01	WF021410	11.78	2/9/2002	Dactyliosolen fragilissimus	51442.22
WF021	F01	WF021410	11.78	2/9/2002	Eucampia cornuta	496.56
WF021	F01	WF021410	11.78	2/9/2002	Guinardia delicatula	26156.32
WF021	F01	WF021410	11.78	2/9/2002	Guinardia flaccida	35749.19
WF021	F01	WF021410	11.78	2/9/2002	Guinardia striata	18818.70
WF021	F01	WF021410	11.78	2/9/2002	Heterocapsa rotundata	90.04

Survey	Sta.	Sample Number	Depth (m)	Sampling Date	Plankton	Estimated Carbon Equivalence (ng Carbon/L)
WF021	F01	WF021410	11.78	2/9/2002	Leptocylindrus danicus	258.74
WF021	F01	WF021410	11.78	2/9/2002	Pleurosigma spp.	1193.85
WF021	F01	WF021410	11.78	2/9/2002	Prorocentrum micans	878.58
WF021	F01	WF021410	11.78	2/9/2002	Protoperidinium sp. group 1 10-30 micron	556.03
WF021	F01	WF021410	11.78	2/9/2002	Rhizosolenia setigera	992.04
WF021	F01	WF021410	11.78	2/9/2002	Skeletonema costatum	2983.92
WF021	F01	WF021410	11.78	2/9/2002	Thalassiosira nordenskioldii	14.51
WF021	F01	WF021410	11.78	2/9/2002	Thalassiosira punctigera	567.50
WF021	F01	WF021410	11.78	2/9/2002	Thalassiosira sp. group 3 10-20 microns	75.33
WF021	F01	WF021410	11.78	2/9/2002	Unid. micro-phytoflag sp. group 1 length	9552.39
WF021	F01	WF021412	2.37	2/9/2002	Amphidinium crassum	96.54
WF021	F01	WF021412	2.37	2/9/2002	Centric diatom sp. group 1 diam <10 micr	83.38
WF021	F01	WF021412	2.37	2/9/2002	Chaetoceros sp. group 2 diam 10-30 micro	1698.91
WF021	F01	WF021412	2.37	2/9/2002	Choanoflagellate spp.	25.57
WF021	F01	WF021412	2.37	2/9/2002	Cryptomonas sp. group 1 length <10 micro	186.63
WF021	F01	WF021412	2.37	2/9/2002	Dactyliosolen fragilissimus	54145.11
WF021	F01	WF021412	2.37	2/9/2002	Guinardia delicatula	18410.05
WF021	F01	WF021412	2.37	2/9/2002	Guinardia flaccida	25813.02
WF021	F01	WF021412	2.37	2/9/2002	Guinardia striata	10568.60
WF021	F01	WF021412	2.37	2/9/2002	Gymnodinium sp. group 1 5-20 microns wid	538.39
WF021	F01	WF021412	2.37	2/9/2002	Gyrodinium spirale	5459.29
WF021	F01	WF021412	2.37	2/9/2002	Heterocapsa rotundata	26.49
WF021	F01	WF021412	2.37	2/9/2002	Leptocylindrus danicus	228.34
WF021	F01	WF021412	2.37	2/9/2002	Leptocylindrus minimus	43.57
WF021	F01	WF021412	2.37	2/9/2002	Pennate diatom sp. group 2 10-30 microns	20.53
WF021	F01	WF021412	2.37	2/9/2002	Pleurosigma spp.	2107.19
WF021	F01	WF021412	2.37	2/9/2002	Prorocentrum micans	387.03
WF021	F01	WF021412	2.37	2/9/2002	Rhizosolenia setigera	875.49
WF021	F01	WF021412	2.37	2/9/2002	Skeletonema costatum	754.10
WF021	F01	WF021412	2.37	2/9/2002	Thalassionema nitzschioides	26.12
WF021	F01	WF021412	2.37	2/9/2002	Thalassiosira sp. group 3 10-20 microns	99.56
WF021	F01	WF021412	2.37	2/9/2002	Unid. micro-phytoflag sp. group 1 length	9421.92
WF022	F01	WF022032	11.71	2/26/2002	Centric diatom sp. group 1 diam <10 micr	45.80
WF022	F01	WF022032	11.71	2/26/2002	Ceratium fusus	4076.98
WF022	F01	WF022032	11.71	2/26/2002	Chaetoceros compressus	2468.99
WF022	F01	WF022032	11.71	2/26/2002	Chaetoceros convolutus	220.11
WF022	F01	WF022032	11.71	2/26/2002	Chaetoceros decipiens	512.31
WF022	F01	WF022032	11.71	2/26/2002	Chaetoceros sp. group 2 diam 10-30 micro	2648.86
WF022	F01	WF022032	11.71	2/26/2002	Chaetoceros subtilis	307.69
WF022	F01	WF022032	11.71	2/26/2002	Cryptomonas sp. group 1 length <10 micro	187.23
WF022	F01	WF022032	11.71	2/26/2002	Cryptomonas sp. group 2 length >10 micro	9.53
WF022	F01	WF022032	11.71	2/26/2002	Cylindrotheca closterium	35.07

Survey	Sta.	Sample Number	Depth (m)	Sampling Date	Plankton	Estimated Carbon Equivalence (ng Carbon/L)
WF022	F01	WF022032	11.71	2/26/2002	Dactyliosolen fragilissimus	1751.26
WF022	F01	WF022032	11.71	2/26/2002	Eutreptia/eutreptiella spp.	84.09
WF022	F01	WF022032	11.71	2/26/2002	Guinardia delicatula	103.73
WF022	F01	WF022032	11.71	2/26/2002	Guinardia flaccida	7352.96
WF022	F01	WF022032	11.71	2/26/2002	Gymnodinium sp. group 1 5-20 microns wid	739.44
WF022	F01	WF022032	11.71	2/26/2002	Gymnodinium sp. group 2 21-40 microns wi	11811.67
WF022	F01	WF022032	11.71	2/26/2002	Gyrodinium spirale	43987.29
WF022	F01	WF022032	11.71	2/26/2002	Heterocapsa rotundata	29.10
WF022	F01	WF022032	11.71	2/26/2002	Leptocylindrus danicus	1256.53
WF022	F01	WF022032	11.71	2/26/2002	Leptocylindrus minimus	31.92
WF022	F01	WF022032	11.71	2/26/2002	Pleurosigma spp.	771.74
WF022	F01	WF022032	11.71	2/26/2002	Prorocentrum micans	425.24
WF022	F01	WF022032	11.71	2/26/2002	Rhizosolenia setigera	320.64
WF022	F01	WF022032	11.71	2/26/2002	Skeletonema costatum	52.61
WF022	F01	WF022032	11.71	2/26/2002	Thalassionema nitzschioides	28.70
WF022	F01	WF022032	11.71	2/26/2002	Thalassiosira nordenskioldii	84.58
WF022	F01	WF022032	11.71	2/26/2002	Unid. micro-phytoflag sp. group 1 length	5993.33
WF022	F01	WF022034	2.2	2/26/2002	Attheya septentrionalis	7.64
WF022	F01	WF022034	2.2	2/26/2002	Ceratium lineatum	458.93
WF022	F01	WF022034	2.2	2/26/2002	Chaetoceros compressus	1169.04
WF022	F01	WF022034	2.2	2/26/2002	Chaetoceros decipiens	1340.55
WF022	F01	WF022034	2.2	2/26/2002	Chaetoceros sp. group 2 diam 10-30 micro	854.77
WF022	F01	WF022034	2.2	2/26/2002	Chaetoceros subtilis	62.52
WF022	F01	WF022034	2.2	2/26/2002	Cryptomonas sp. group 1 length <10 micro	108.87
WF022	F01	WF022034	2.2	2/26/2002	Cylindrotheca closterium	36.71
WF022	F01	WF022034	2.2	2/26/2002	Dactyliosolen fragilissimus	717.26
WF022	F01	WF022034	2.2	2/26/2002	Eucampia cornuta	293.98
WF022	F01	WF022034	2.2	2/26/2002	Guinardia delicatula	407.15
WF022	F01	WF022034	2.2	2/26/2002	Guinardia flaccida	7696.10
WF022	F01	WF022034	2.2	2/26/2002	Gymnodinium sp. group 1 5-20 microns wid	2192.84
WF022	F01	WF022034	2.2	2/26/2002	Gymnodinium sp. group 2 21-40 microns wi	2852.97
WF022	F01	WF022034	2.2	2/26/2002	Gyrodinium spirale	7324.55
WF022	F01	WF022034	2.2	2/26/2002	Heterocapsa rotundata	76.15
WF022	F01	WF022034	2.2	2/26/2002	Leptocylindrus danicus	21.88
WF022	F01	WF022034	2.2	2/26/2002	Leptocylindrus minimus	14.61
WF022	F01	WF022034	2.2	2/26/2002	Pennate diatom sp. group 2 10-30 microns	3.93
WF022	F01	WF022034	2.2	2/26/2002	Pleurosigma spp.	403.88
WF022	F01	WF022034	2.2	2/26/2002	Prorocentrum micans	296.72
WF022	F01	WF022034	2.2	2/26/2002	Protoperidinium pellucidum	722.77
WF022	F01	WF022034	2.2	2/26/2002	Protoperidinium sp. group 2 31-75 micron	1327.26
WF022	F01	WF022034	2.2	2/26/2002	Skeletonema costatum	87.18
WF022	F01	WF022034	2.2	2/26/2002	Thalassionema nitzschioides	5.01

Survey	Sta.	Sample Number	Depth (m)	Sampling Date	Plankton	Estimated Carbon Equivalence (ng Carbon/L)
WF022	F01	WF022034	2.2	2/26/2002	Thalassiosira nordenskioldii	4.91
WF022	F01	WF022034	2.2	2/26/2002	Thalassiosira sp. group 3 10-20 microns	31.80
WF022	F01	WF022034	2.2	2/26/2002	Unid. micro-phytoflag sp. group 1 length	4777.30
WF022	F02	WF022058	15.75	2/26/2002	Calycomonas wulffii	17.11
WF022	F02	WF022058	15.75	2/26/2002	Centric diatom sp. group 1 diam <10 micr	47.20
WF022	F02	WF022058	15.75	2/26/2002	Ceratium lineatum	433.72
WF022	F02	WF022058	15.75	2/26/2002	Chaetoceros compressus	232.59
WF022	F02	WF022058	15.75	2/26/2002	Chaetoceros decipiens	337.84
WF022	F02	WF022058	15.75	2/26/2002	Chaetoceros sp. group 2 diam 10-30 micro	38.47
WF022	F02	WF022058	15.75	2/26/2002	Cryptomonas sp. group 1 length <10 micro	73.49
WF022	F02	WF022058	15.75	2/26/2002	Dactyliosolen fragilissimus	225.95
WF022	F02	WF022058	15.75	2/26/2002	Dictyocha fibula	47.35
WF022	F02	WF022058	15.75	2/26/2002	Eucampia cornuta	119.07
WF022	F02	WF022058	15.75	2/26/2002	Guinardia flaccida	62342.06
WF022	F02	WF022058	15.75	2/26/2002	Guinardia striata	820.44
WF022	F02	WF022058	15.75	2/26/2002	Gymnodinium sp. group 1 5-20 microns wid	487.61
WF022	F02	WF022058	15.75	2/26/2002	Heterocapsa rotundata	47.98
WF022	F02	WF022058	15.75	2/26/2002	Leptocylindrus danicus	248.16
WF022	F02	WF022058	15.75	2/26/2002	Leptocylindrus minimus	39.53
WF022	F02	WF022058	15.75	2/26/2002	Paulinella ovalis	26.27
WF022	F02	WF022058	15.75	2/26/2002	Pleurosigma spp.	286.27
WF022	F02	WF022058	15.75	2/26/2002	Prorocentrum micans	140.21
WF022	F02	WF022058	15.75	2/26/2002	Protoperidinium sp. group 2 31-75 micron	627.17
WF022	F02	WF022058	15.75	2/26/2002	Skeletonema costatum	10.84
WF022	F02	WF022058	15.75	2/26/2002	Thalassionema nitzschioides	9.46
WF022	F02	WF022058	15.75	2/26/2002	Thalassiosira sp. group 3 10-20 microns	12.02
WF022	F02	WF022058	15.75	2/26/2002	Unid. micro-phytoflag sp. group 1 length	4751.18
WF022	F02	WF022058	15.75	2/26/2002	Unid. micro-phytoflag sp. group 2 length	143.12
WF022	F02	WF02205A	2	2/26/2002	Amphidinium spp.	26.31
WF022	F02	WF02205A	2	2/26/2002	Calycomonas wulffii	19.37
WF022	F02	WF02205A	2	2/26/2002	Centric diatom sp. group 1 diam <10 micr	32.06
WF022	F02	WF02205A	2	2/26/2002	Chaetoceros compressus	65.84
WF022	F02	WF02205A	2	2/26/2002	Chaetoceros decipiens	191.26
WF022	F02	WF02205A	2	2/26/2002	Chaetoceros sp. group 2 diam 10-30 micro	43.55
WF022	F02	WF02205A	2	2/26/2002	Cryptomonas sp. group 1 length <10 micro	241.32
WF022	F02	WF02205A	2	2/26/2002	Cryptomonas sp. group 2 length >10 micro	106.88
WF022	F02	WF02205A	2	2/26/2002	Cylindrotheca closterium	39.28
WF022	F02	WF02205A	2	2/26/2002	Dactyliosolen fragilissimus	170.56
WF022	F02	WF02205A	2	2/26/2002	Dinophysis acuminata	486.11
WF022	F02	WF02205A	2	2/26/2002	Eucampia cornuta	44.94
WF022	F02	WF02205A	2	2/26/2002	Guinardia delicatula	348.54
WF022	F02	WF02205A	2	2/26/2002	Guinardia flaccida	65882.56

Survey	Sta.	Sample Number	Depth (m)	Sampling Date	Plankton	Estimated Carbon Equivalence (ng Carbon/L)
WF022	F02	WF02205A	2	2/26/2002	Gymnodinium sp. group 1 5-20 microns wid	138.03
WF022	F02	WF02205A	2	2/26/2002	Gymnodinium sp. group 2 21-40 microns wi	254.41
WF022	F02	WF02205A	2	2/26/2002	Gyrodinium spirale	2239.35
WF022	F02	WF02205A	2	2/26/2002	Leptocylindrus danicus	210.74
WF022	F02	WF02205A	2	2/26/2002	Leptocylindrus minimus	4.47
WF022	F02	WF02205A	2	2/26/2002	Paulinella ovalis	39.66
WF022	F02	WF02205A	2	2/26/2002	Pleurosigma spp.	324.13
WF022	F02	WF02205A	2	2/26/2002	Prorocentrum micans	158.76
WF022	F02	WF02205A	2	2/26/2002	Protoperidinium bipes	670.71
WF022	F02	WF02205A	2	2/26/2002	Protoperidinium sp. group 2 31-75 micron	710.13
WF022	F02	WF02205A	2	2/26/2002	Rhizosolenia setigera	179.56
WF022	F02	WF02205A	2	2/26/2002	Skeletonema costatum	98.36
WF022	F02	WF02205A	2	2/26/2002	Thalassionema nitzschioides	5.36
WF022	F02	WF02205A	2	2/26/2002	Thalassiosira sp. group 3 10-20 microns	13.61
WF022	F02	WF02205A	2	2/26/2002	Unid. micro-phytoflag sp. group 1 length	6637.58
WF022	F27	WF0220A1	14.82	2/26/2002	Centric diatom sp. group 1 diam <10 micr	236.91
WF022	F27	WF0220A1	14.82	2/26/2002	Chaetoceros decipiens	7570.84
WF022	F27	WF0220A1	14.82	2/26/2002	Chaetoceros sp. group 2 diam 10-30 micro	1724.05
WF022	F27	WF0220A1	14.82	2/26/2002	Cryptomonas sp. group 1 length <10 micro	553.37
WF022	F27	WF0220A1	14.82	2/26/2002	Cylindrotheca closterium	4508.64
WF022	F27	WF0220A1	14.82	2/26/2002	Dactyliosolen fragilissimus	3375.63
WF022	F27	WF0220A1	14.82	2/26/2002	Detonula confervacea	10108.09
WF022	F27	WF0220A1	14.82	2/26/2002	Dictyocha fibula	424.46
WF022	F27	WF0220A1	14.82	2/26/2002	Eucampia cornuta	1425.47
WF022	F27	WF0220A1	14.82	2/26/2002	Grammatophora marina	393.10
WF022	F27	WF0220A1	14.82	2/26/2002	Guinardia delicatula	229.94
WF022	F27	WF0220A1	14.82	2/26/2002	Gymnodinium sp. group 1 5-20 microns wid	4807.97
WF022	F27	WF0220A1	14.82	2/26/2002	Gymnodinium sp. group 2 21-40 microns wi	4028.08
WF022	F27	WF0220A1	14.82	2/26/2002	Gyrodinium spirale	8864.11
WF022	F27	WF0220A1	14.82	2/26/2002	Leptocylindrus minimus	35.37
WF022	F27	WF0220A1	14.82	2/26/2002	Pennate diatom sp. group 3 31-60 microns	285.92
WF022	F27	WF0220A1	14.82	2/26/2002	Pseudonitzschia delicatissma complex	42.57
WF022	F27	WF0220A1	14.82	2/26/2002	Pseudonitzschia pungens	102.14
WF022	F27	WF0220A1	14.82	2/26/2002	Skeletonema costatum	140635.28
WF022	F27	WF0220A1	14.82	2/26/2002	Thalassionema nitzschioides	424.08
WF022	F27	WF0220A1	14.82	2/26/2002	Thalassiosira anguste-lineata	12772.99
WF022	F27	WF0220A1	14.82	2/26/2002	Thalassiosira nordenskioldii	2329.28
WF022	F27	WF0220A1	14.82	2/26/2002	Thalassiosira rotula	4483.83
WF022	F27	WF0220A1	14.82	2/26/2002	Thalassiosira sp. group 3 10-20 microns	1295.38
WF022	F27	WF0220A1	14.82	2/26/2002	Unid. micro-phytoflag sp. group 1 length	15764.26
WF022	F27	WF0220A2	3.06	2/26/2002	Amphora spp.	603.45
WF022	F27	WF0220A2	3.06	2/26/2002	Centric diatom sp. group 1 diam <10 micr	246.33

Survey	Sta.	Sample Number	Depth (m)	Sampling Date	Plankton	Estimated Carbon Equivalence (ng Carbon/L)
WF022	F27	WF0220A2	3.06	2/26/2002	Chaetoceros decipiens	7513.92
WF022	F27	WF0220A2	3.06	2/26/2002	Chaetoceros sp. group 2 diam 10-30 micro	914.12
WF022	F27	WF0220A2	3.06	2/26/2002	Choanoflagellate spp.	54.95
WF022	F27	WF0220A2	3.06	2/26/2002	Cryptomonas sp. group 1 length <10 micro	296.40
WF022	F27	WF0220A2	3.06	2/26/2002	Cylindrotheca closterium	4526.18
WF022	F27	WF0220A2	3.06	2/26/2002	Dactyliosolen fragilissimus	3573.59
WF022	F27	WF0220A2	3.06	2/26/2002	Detonula confervacea	3086.80
WF022	F27	WF0220A2	3.06	2/26/2002	Dictyocha speculum	647.28
WF022	F27	WF0220A2	3.06	2/26/2002	Eucampia cornuta	470.79
WF022	F27	WF0220A2	3.06	2/26/2002	Guinardia delicatula	304.28
WF022	F27	WF0220A2	3.06	2/26/2002	Guinardia flaccida	6162.48
WF022	F27	WF0220A2	3.06	2/26/2002	Gymnodinium sp. group 1 5-20 microns wid	1446.01
WF022	F27	WF0220A2	3.06	2/26/2002	Gyrodinium spirale	23499.36
WF022	F27	WF0220A2	3.06	2/26/2002	Heterocapsa rotundata	56.91
WF022	F27	WF0220A2	3.06	2/26/2002	Paulinella ovalis	41.55
WF022	F27	WF0220A2	3.06	2/26/2002	Pleurosigma spp.	1697.83
WF022	F27	WF0220A2	3.06	2/26/2002	Prorocentrum micans	415.79
WF022	F27	WF0220A2	3.06	2/26/2002	Prorocentrum minimum	829.77
WF022	F27	WF0220A2	3.06	2/26/2002	Pseudonitzschia delicatissma complex	70.42
WF022	F27	WF0220A2	3.06	2/26/2002	Pseudonitzschia pungens	67.58
WF022	F27	WF0220A2	3.06	2/26/2002	Skeletonema costatum	67496.13
WF022	F27	WF0220A2	3.06	2/26/2002	Stephanopyxis nipponica	1479.63
WF022	F27	WF0220A2	3.06	2/26/2002	Thalassionema nitzschioides	364.77
WF022	F27	WF0220A2	3.06	2/26/2002	Thalassiosira anguste-lineata	1687.42
WF022	F27	WF0220A2	3.06	2/26/2002	Thalassiosira nordenskioldii	1321.01
WF022	F27	WF0220A2	3.06	2/26/2002	Thalassiosira rotula	988.92
WF022	F27	WF0220A2	3.06	2/26/2002	Thalassiosira sp. group 3 10-20 microns	427.83
WF022	F27	WF0220A2	3.06	2/26/2002	Unid. micro-phytoflag sp. group 1 length	10879.11
WF022	F27	WF0220A2	3.06	2/26/2002	Unid. micro-phytoflag sp. group 2 length	339.54
WF022	F26	WF0220B3	9.13	2/26/2002	Amphidinium spp.	156.61
WF022	F26	WF0220B3	9.13	2/26/2002	Centric diatom sp. group 1 diam <10 micr	203.58
WF022	F26	WF0220B3	9.13	2/26/2002	Chaetoceros debilis	320.08
WF022	F26	WF0220B3	9.13	2/26/2002	Chaetoceros decipiens	13684.65
WF022	F26	WF0220B3	9.13	2/26/2002	Chaetoceros sp. group 2 diam 10-30 micro	777.77
WF022	F26	WF0220B3	9.13	2/26/2002	Cryptomonas sp. group 1 length <10 micro	515.13
WF022	F26	WF0220B3	9.13	2/26/2002	Cylindrotheca closterium	4442.01
WF022	F26	WF0220B3	9.13	2/26/2002	Dactyliosolen fragilissimus	5837.55
WF022	F26	WF0220B3	9.13	2/26/2002	Detonula confervacea	2241.05
WF022	F26	WF0220B3	9.13	2/26/2002	Ditylum brightwellii	2648.46
WF022	F26	WF0220B3	9.13	2/26/2002	Eucampia cornuta	534.99
WF022	F26	WF0220B3	9.13	2/26/2002	Guinardia delicatula	692.71
WF022	F26	WF0220B3	9.13	2/26/2002	Gymnodinium sp. group 1 5-20 microns wid	3943.66

Survey	Sta.	Sample Number	Depth (m)	Sampling Date	Plankton	Estimated Carbon Equivalence (ng Carbon/L)
WF022	F26	WF0220B3	9.13	2/26/2002	Heterocapsa rotundata	194.02
WF022	F26	WF0220B3	9.13	2/26/2002	Leptocylindrus minimus	106.57
WF022	F26	WF0220B3	9.13	2/26/2002	Licmophora spp.	69.96
WF022	F26	WF0220B3	9.13	2/26/2002	Pennate diatom sp. group 2 10-30 microns	100.41
WF022	F26	WF0220B3	9.13	2/26/2002	Pleurosigma spp.	3215.59
WF022	F26	WF0220B3	9.13	2/26/2002	Pseudonitzschia delicatissma complex	64.12
WF022	F26	WF0220B3	9.13	2/26/2002	Skeletonema costatum	57085.99
WF022	F26	WF0220B3	9.13	2/26/2002	Stephanopyxis nipponica	6725.58
WF022	F26	WF0220B3	9.13	2/26/2002	Thalassionema nitzschioides	286.97
WF022	F26	WF0220B3	9.13	2/26/2002	Thalassiosira anguste-lineata	958.76
WF022	F26	WF0220B3	9.13	2/26/2002	Thalassiosira nordenskioldii	1594.97
WF022	F26	WF0220B3	9.13	2/26/2002	Thalassiosira rotula	3933.19
WF022	F26	WF0220B3	9.13	2/26/2002	Thalassiosira sp. group 3 10-20 microns	364.63
WF022	F26	WF0220B3	9.13	2/26/2002	Unid. micro-phytoflag sp. group 1 length	11789.10
WF022	F26	WF0220B3	9.13	2/26/2002	Unid. micro-phytoflag sp. group 2 length	771.68
WF022	F26	WF0220B4	3.2	2/26/2002	Centric diatom sp. group 1 diam <10 micr	125.64
WF022	F26	WF0220B4	3.2	2/26/2002	Ceratium fusus	1860.72
WF022	F26	WF0220B4	3.2	2/26/2002	Chaetoceros borealis	886.79
WF022	F26	WF0220B4	3.2	2/26/2002	Chaetoceros decipiens	3278.96
WF022	F26	WF0220B4	3.2	2/26/2002	Cryptomonas sp. group 1 length <10 micro	163.04
WF022	F26	WF0220B4	3.2	2/26/2002	Cylindrotheca closterium	2501.01
WF022	F26	WF0220B4	3.2	2/26/2002	Dactyliosolen fragilissimus	5012.55
WF022	F26	WF0220B4	3.2	2/26/2002	Detonula confervacea	1603.61
WF022	F26	WF0220B4	3.2	2/26/2002	Dictyocha speculum	302.13
WF022	F26	WF0220B4	3.2	2/26/2002	Eucampia cornuta	220.12
WF022	F26	WF0220B4	3.2	2/26/2002	Guinardia delicatula	284.53
WF022	F26	WF0220B4	3.2	2/26/2002	Gymnodinium sp. group 1 5-20 microns wid	1081.74
WF022	F26	WF0220B4	3.2	2/26/2002	Gyrodinium sp. group 2 21-40 microns wid	1246.13
WF022	F26	WF0220B4	3.2	2/26/2002	Gyrodinium spirale	5484.39
WF022	F26	WF0220B4	3.2	2/26/2002	Pennate diatom sp. group 2 10-30 microns	61.87
WF022	F26	WF0220B4	3.2	2/26/2002	Phaeocystis pouchetii	548.58
WF022	F26	WF0220B4	3.2	2/26/2002	Pleurosigma spp.	1058.44
WF022	F26	WF0220B4	3.2	2/26/2002	Prorocentrum micans	388.81
WF022	F26	WF0220B4	3.2	2/26/2002	Pseudonitzschia pungens	31.60
WF022	F26	WF0220B4	3.2	2/26/2002	Skeletonema costatum	53239.31
WF022	F26	WF0220B4	3.2	2/26/2002	Stephanopyxis nipponica	2767.23
WF022	F26	WF0220B4	3.2	2/26/2002	Thalassionema nitzschioides	104.95
WF022	F26	WF0220B4	3.2	2/26/2002	Thalassiosira anguste-lineata	788.96
WF022	F26	WF0220B4	3.2	2/26/2002	Thalassiosira nordenskioldii	1055.14
WF022	F26	WF0220B4	3.2	2/26/2002	Thalassiosira rotula	5086.09
WF022	F26	WF0220B4	3.2	2/26/2002	Unid. micro-phytoflag sp. group 1 length	5820.73
WF022	F22	WF0220EB	25.43	2/27/2002	Amphidinium spp.	267.05

Survey	Sta.	Sample Number	Depth (m)	Sampling Date	Plankton	Estimated Carbon Equivalence (ng Carbon/L)
WF022	F22	WF0220EB	25.43	2/27/2002	Centric diatom sp. group 1 diam <10 micr	65.09
WF022	F22	WF0220EB	25.43	2/27/2002	Chaetoceros decipiens	16500.91
WF022	F22	WF0220EB	25.43	2/27/2002	Chaetoceros sp. group 2 diam 10-30 micro	885.64
WF022	F22	WF0220EB	25.43	2/27/2002	Choanoflagellate spp.	159.70
WF022	F22	WF0220EB	25.43	2/27/2002	Cryptomonas sp. group 1 length <10 micro	439.19
WF022	F22	WF0220EB	25.43	2/27/2002	Cylindrotheca closterium	2591.23
WF022	F22	WF0220EB	25.43	2/27/2002	Dactyliosolen fragilissimus	2163.91
WF022	F22	WF0220EB	25.43	2/27/2002	Detonula confervacea	1495.31
WF022	F22	WF0220EB	25.43	2/27/2002	Guinardia delicatula	589.60
WF022	F22	WF0220EB	25.43	2/27/2002	Gymnodinium sp. group 1 5-20 microns wid	2521.72
WF022	F22	WF0220EB	25.43	2/27/2002	Gymnodinium sp. group 2 21-40 microns wi	2582.16
WF022	F22	WF0220EB	25.43	2/27/2002	Paulinella ovalis	20.13
WF022	F22	WF0220EB	25.43	2/27/2002	Pennate diatom sp. group 2 10-30 microns	85.46
WF022	F22	WF0220EB	25.43	2/27/2002	Pleurosigma spp.	1096.62
WF022	F22	WF0220EB	25.43	2/27/2002	Pseudonitzschia delicatissma complex	54.58
WF022	F22	WF0220EB	25.43	2/27/2002	Skeletonema costatum	58105.12
WF022	F22	WF0220EB	25.43	2/27/2002	Stephanopyxis nipponica	5734.11
WF022	F22	WF0220EB	25.43	2/27/2002	Thalassiosira nordenskioldii	2079.76
WF022	F22	WF0220EB	25.43	2/27/2002	Thalassiosira rotula	2874.31
WF022	F22	WF0220EB	25.43	2/27/2002	Thalassiosira sp. group 3 10-20 microns	207.25
WF022	F22	WF0220EB	25.43	2/27/2002	Unid. micro-phytoflag sp. group 1 length	8910.24
WF022	F22	WF0220ED	1.93	2/27/2002	Chaetoceros decipiens	5681.80
WF022	F22	WF0220ED	1.93	2/27/2002	Chaetoceros sp. group 2 diam 10-30 micro	517.55
WF022	F22	WF0220ED	1.93	2/27/2002	Choanoflagellate spp.	62.32
WF022	F22	WF0220ED	1.93	2/27/2002	Cryptomonas sp. group 1 length <10 micro	395.52
WF022	F22	WF0220ED	1.93	2/27/2002	Cryptomonas sp. group 2 length >10 micro	127.00
WF022	F22	WF0220ED	1.93	2/27/2002	Cylindrotheca closterium	1400.14
WF022	F22	WF0220ED	1.93	2/27/2002	Dactyliosolen fragilissimus	8106.75
WF022	F22	WF0220ED	1.93	2/27/2002	Detonula confervacea	2042.38
WF022	F22	WF0220ED	1.93	2/27/2002	Eucampia cornuta	801.00
WF022	F22	WF0220ED	1.93	2/27/2002	Eutreptia/eutreptiella spp.	186.51
WF022	F22	WF0220ED	1.93	2/27/2002	Guinardia delicatula	2070.78
WF022	F22	WF0220ED	1.93	2/27/2002	Guinardia flaccida	14003.20
WF022	F22	WF0220ED	1.93	2/27/2002	Guinardia striata	919.88
WF022	F22	WF0220ED	1.93	2/27/2002	Gymnodinium sp. group 1 5-20 microns wid	3280.29
WF022	F22	WF0220ED	1.93	2/27/2002	Gymnodinium sp. group 2 21-40 microns wi	3023.02
WF022	F22	WF0220ED	1.93	2/27/2002	Gyrodinium spirale	26654.30
WF022	F22	WF0220ED	1.93	2/27/2002	Heterocapsa rotundata	129.11
WF022	F22	WF0220ED	1.93	2/27/2002	Leptocylindrus minimus	292.02
WF022	F22	WF0220ED	1.93	2/27/2002	Pennate diatom sp. group 2 10-30 microns	100.22
WF022	F22	WF0220ED	1.93	2/27/2002	Phaeocystis pouchetii	95.06
WF022	F22	WF0220ED	1.93	2/27/2002	Prorocentrum micans	471.61

Survey	Sta.	Sample Number	Depth (m)	Sampling Date	Plankton	Estimated Carbon Equivalence (ng Carbon/L)
WF022	F22	WF0220ED	1.93	2/27/2002	Rhizosolenia setigera	4267.31
WF022	F22	WF0220ED	1.93	2/27/2002	Skeletonema costatum	8955.65
WF022	F22	WF0220ED	1.93	2/27/2002	Stephanopyxis nipponica	3356.55
WF022	F22	WF0220ED	1.93	2/27/2002	Thalassionema nitzschioides	127.30
WF022	F22	WF0220ED	1.93	2/27/2002	Thalassiosira nordenskioldii	140.47
WF022	F22	WF0220ED	1.93	2/27/2002	Thalassiosira sp. group 3 10-20 microns	324.06
WF022	F22	WF0220ED	1.93	2/27/2002	Unid. micro-phytoflag sp. group 1 length	11067.57
WF022	F22	WF0220ED	1.93	2/27/2002	Unid. micro-phytoflag sp. group 2 length	385.12
WF022	F13	WF02213B	11.73	2/27/2002	Centric diatom sp. group 1 diam <10 micr	137.13
WF022	F13	WF02213B	11.73	2/27/2002	Ceratium fusus	3481.35
WF022	F13	WF02213B	11.73	2/27/2002	Chaetoceros decipiens	7887.63
WF022	F13	WF02213B	11.73	2/27/2002	Chaetoceros sp. group 2 diam 10-30 micro	3998.25
WF022	F13	WF02213B	11.73	2/27/2002	Chaetoceros subtilis	525.48
WF022	F13	WF02213B	11.73	2/27/2002	Cryptomonas sp. group 1 length <10 micro	183.02
WF022	F13	WF02213B	11.73	2/27/2002	Dactyliosolen fragilissimus	41030.19
WF022	F13	WF02213B	11.73	2/27/2002	Eucampia cornuta	2882.87
WF022	F13	WF02213B	11.73	2/27/2002	Guinardia delicatula	4791.18
WF022	F13	WF02213B	11.73	2/27/2002	Guinardia flaccida	37735.73
WF022	F13	WF02213B	11.73	2/27/2002	Gymnodinium sp. group 1 5-20 microns wid	4806.76
WF022	F13	WF02213B	11.73	2/27/2002	Gyrodinium spirale	10261.12
WF022	F13	WF02213B	11.73	2/27/2002	Leptocylindrus minimus	163.79
WF022	F13	WF02213B	11.73	2/27/2002	Pennate diatom sp. group 2 10-30 microns	38.58
WF022	F13	WF02213B	11.73	2/27/2002	Phaeocystis pouchetii	1392.94
WF022	F13	WF02213B	11.73	2/27/2002	Prorocentrum micans	727.45
WF022	F13	WF02213B	11.73	2/27/2002	Rhizosolenia setigera	1645.55
WF022	F13	WF02213B	11.73	2/27/2002	Skeletonema costatum	19876.73
WF022	F13	WF02213B	11.73	2/27/2002	Thalassionema nitzschioides	147.27
WF022	F13	WF02213B	11.73	2/27/2002	Thalassiosira nordenskioldii	409.27
WF022	F13	WF02213B	11.73	2/27/2002	Unid. micro-phytoflag sp. group 1 length	7848.93
WF022	F13	WF02213B	11.73	2/27/2002	Unid. micro-phytoflag sp. group 2 length	1188.09
WF022	F13	WF02213F	2.01	2/27/2002	Chaetoceros sp. group 2 diam 10-30 micro	2447.65
WF022	F13	WF02213F	2.01	2/27/2002	Cylindrotheca closterium	1103.62
WF022	F13	WF02213F	2.01	2/27/2002	Dactyliosolen fragilissimus	58107.98
WF022	F13	WF02213F	2.01	2/27/2002	Eucampia cornuta	1894.08
WF022	F13	WF02213F	2.01	2/27/2002	Guinardia delicatula	4080.56
WF022	F13	WF02213F	2.01	2/27/2002	Guinardia flaccida	16528.54
WF022	F13	WF02213F	2.01	2/27/2002	Gymnodinium sp. group 1 5-20 microns wid	4654.04
WF022	F13	WF02213F	2.01	2/27/2002	Gymnodinium sp. group 2 21-40 microns wi	3574.19
WF022	F13	WF02213F	2.01	2/27/2002	Gyrodinium spirale	15730.58
WF022	F13	WF02213F	2.01	2/27/2002	Leptocylindrus minimus	376.65
WF022	F13	WF02213F	2.01	2/27/2002	Paulinella ovalis	27.86
WF022	F13	WF02213F	2.01	2/27/2002	Pennate diatom sp. group 2 10-30 microns	118.50

Survey	Sta.	Sample Number	Depth (m)	Sampling Date	Plankton	Estimated Carbon Equivalence (ng Carbon/L)
WF022	F13	WF02213F	2.01	2/27/2002	Pleurosigma spp.	1517.93
WF022	F13	WF02213F	2.01	2/27/2002	Rhizosolenia setigera	2522.68
WF022	F13	WF02213F	2.01	2/27/2002	Skeletonema costatum	22732.76
WF022	F13	WF02213F	2.01	2/27/2002	Thalassiosira nordenskioldii	664.33
WF022	F13	WF02213F	2.01	2/27/2002	Thalassiosira sp. group 3 10-20 microns	95.62
WF022	F13	WF02213F	2.01	2/27/2002	Unid. micro-phytoflag sp. group 1 length	20380.26
WF022	F13	WF02213F	2.01	2/27/2002	Unid. micro-phytoflag sp. group 2 length	455.34
WF022	F25	WF022162	7.14	2/27/2002	Centric diatom sp. group 1 diam <10 micr	283.99
WF022	F25	WF022162	7.14	2/27/2002	Chaetoceros decipiens	1411.71
WF022	F25	WF022162	7.14	2/27/2002	Chaetoceros sp. group 2 diam 10-30 micro	964.43
WF022	F25	WF022162	7.14	2/27/2002	Cryptomonas sp. group 1 length <10 micro	147.41
WF022	F25	WF022162	7.14	2/27/2002	Cylindrotheca closterium	434.85
WF022	F25	WF022162	7.14	2/27/2002	Dactyliosolen fragilissimus	42487.20
WF022	F25	WF022162	7.14	2/27/2002	Eucampia cornuta	2321.85
WF022	F25	WF022162	7.14	2/27/2002	Guinardia delicatula	2572.54
WF022	F25	WF022162	7.14	2/27/2002	Guinardia flaccida	13025.25
WF022	F25	WF022162	7.14	2/27/2002	Guinardia striata	4571.07
WF022	F25	WF022162	7.14	2/27/2002	Gymnodinium sp. group 1 5-20 microns wid	4482.62
WF022	F25	WF022162	7.14	2/27/2002	Gymnodinium sp. group 2 21-40 microns wi	3755.51
WF022	F25	WF022162	7.14	2/27/2002	Gyrodinium spirale	16528.56
WF022	F25	WF022162	7.14	2/27/2002	Leptocylindrus minimus	230.86
WF022	F25	WF022162	7.14	2/27/2002	Pennate diatom sp. group 2 10-30 microns	31.07
WF022	F25	WF022162	7.14	2/27/2002	Prorocentrum micans	585.88
WF022	F25	WF022162	7.14	2/27/2002	Rhizosolenia setigera	2650.65
WF022	F25	WF022162	7.14	2/27/2002	Skeletonema costatum	21998.30
WF022	F25	WF022162	7.14	2/27/2002	Thalassiosira nordenskioldii	155.12
WF022	F25	WF022162	7.14	2/27/2002	Thalassiosira sp. group 3 10-20 microns	351.66
WF022	F25	WF022162	7.14	2/27/2002	Unid. micro-phytoflag sp. group 1 length	10430.49
WF022	F25	WF022168	2.16	2/27/2002	Calycomonas wulffii	21.63
WF022	F25	WF022168	2.16	2/27/2002	Centric diatom sp. group 1 diam <10 micr	71.60
WF022	F25	WF022168	2.16	2/27/2002	Chaetoceros decipiens	2135.60
WF022	F25	WF022168	2.16	2/27/2002	Chaetoceros sp. group 2 diam 10-30 micro	3890.59
WF022	F25	WF022168	2.16	2/27/2002	Cryptomonas sp. group 1 length <10 micro	185.83
WF022	F25	WF022168	2.16	2/27/2002	Cylindrotheca closterium	219.28
WF022	F25	WF022168	2.16	2/27/2002	Dactyliosolen fragilissimus	54751.65
WF022	F25	WF022168	2.16	2/27/2002	Eucampia cornuta	2007.11
WF022	F25	WF022168	2.16	2/27/2002	Guinardia delicatula	2594.45
WF022	F25	WF022168	2.16	2/27/2002	Guinardia striata	5186.26
WF022	F25	WF022168	2.16	2/27/2002	Gymnodinium sp. group 1 5-20 microns wid	1849.42
WF022	F25	WF022168	2.16	2/27/2002	Gymnodinium sp. group 2 21-40 microns wi	2840.62
WF022	F25	WF022168	2.16	2/27/2002	Gyrodinium spirale	25046.10
WF022	F25	WF022168	2.16	2/27/2002	Leptocylindrus minimus	249.88

Survey	Sta.	Sample Number	Depth (m)	Sampling Date	Plankton	Estimated Carbon Equivalence (ng Carbon/L)
WF022	F25	WF022168	2.16	2/27/2002	Rhizosolenia setigera	4009.84
WF022	F25	WF022168	2.16	2/27/2002	Skeletonema costatum	13815.35
WF022	F25	WF022168	2.16	2/27/2002	Thalassionema nitzschioides	59.81
WF022	F25	WF022168	2.16	2/27/2002	Thalassiosira nordenskioldii	527.99
WF022	F25	WF022168	2.16	2/27/2002	Thalassiosira sp. group 3 10-20 microns	152.00
WF022	F25	WF022168	2.16	2/27/2002	Unid. micro-phytoflag sp. group 1 length	11714.72
WF022	N16	WF022187	14.83	2/27/2002	Amphidinium spp.	123.72
WF022	N16	WF022187	14.83	2/27/2002	Centric diatom sp. group 1 diam <10 micr	80.41
WF022	N16	WF022187	14.83	2/27/2002	Cerataulina pelagica	1438.80
WF022	N16	WF022187	14.83	2/27/2002	Ceratium fusus	1786.19
WF022	N16	WF022187	14.83	2/27/2002	Chaetoceros decipiens	899.32
WF022	N16	WF022187	14.83	2/27/2002	Chaetoceros sp. group 2 diam 10-30 micro	1228.77
WF022	N16	WF022187	14.83	2/27/2002	Choanoflagellate spp.	49.32
WF022	N16	WF022187	14.83	2/27/2002	Cryptomonas sp. group 1 length <10 micro	78.25
WF022	N16	WF022187	14.83	2/27/2002	Cylindrotheca closterium	554.04
WF022	N16	WF022187	14.83	2/27/2002	Dactyliosolen fragilissimus	20450.10
WF022	N16	WF022187	14.83	2/27/2002	Detonula confervacea	230.91
WF022	N16	WF022187	14.83	2/27/2002	Eucampia cornuta	3380.86
WF022	N16	WF022187	14.83	2/27/2002	Guinardia delicatula	3004.51
WF022	N16	WF022187	14.83	2/27/2002	Guinardia flaccida	5531.79
WF022	N16	WF022187	14.83	2/27/2002	Guinardia striata	1455.99
WF022	N16	WF022187	14.83	2/27/2002	Gymnodinium sp. group 1 5-20 microns wid	1817.22
WF022	N16	WF022187	14.83	2/27/2002	Gymnodinium sp. group 2 21-40 microns wi	2392.43
WF022	N16	WF022187	14.83	2/27/2002	Gyrodinium spirale	5264.73
WF022	N16	WF022187	14.83	2/27/2002	Leptocylindrus minimus	336.15
WF022	N16	WF022187	14.83	2/27/2002	Paulinella ovalis	18.65
WF022	N16	WF022187	14.83	2/27/2002	Phaeocystis pouchetii	601.84
WF022	N16	WF022187	14.83	2/27/2002	Pleurosigma spp.	508.02
WF022	N16	WF022187	14.83	2/27/2002	Prorocentrum micans	373.24
WF022	N16	WF022187	14.83	2/27/2002	Protoperidinium depressum	29131.45
WF022	N16	WF022187	14.83	2/27/2002	Skeletonema costatum	4732.72
WF022	N16	WF022187	14.83	2/27/2002	Thalassionema nitzschioides	100.92
WF022	N16	WF022187	14.83	2/27/2002	Thalassiosira nordenskioldii	728.78
WF022	N16	WF022187	14.83	2/27/2002	Thalassiosira rotula	443.85
WF022	N16	WF022187	14.83	2/27/2002	Unid. micro-phytoflag sp. group 1 length	11024.17
WF022	N16	WF02218B	2.47	2/27/2002	Centric diatom sp. group 1 diam <10 micr	152.76
WF022	N16	WF02218B	2.47	2/27/2002	Ceratium lineatum	1754.74
WF022	N16	WF02218B	2.47	2/27/2002	Chaetoceros decipiens	2050.25
WF022	N16	WF02218B	2.47	2/27/2002	Chaetoceros sp. group 2 diam 10-30 micro	2178.82
WF022	N16	WF02218B	2.47	2/27/2002	Cryptomonas sp. group 1 length <10 micro	190.29
WF022	N16	WF02218B	2.47	2/27/2002	Cylindrotheca closterium	562.32
WF022	N16	WF02218B	2.47	2/27/2002	Dactyliosolen fragilissimus	16454.72

Survey	Sta.	Sample Number	Depth (m)	Sampling Date	Plankton	Estimated Carbon Equivalence (ng Carbon/L)
WF022	N16	WF02218B	2.47	2/27/2002	Eucampia cornuta	1605.75
WF022	N16	WF02218B	2.47	2/27/2002	Guinardia delicatula	5604.24
WF022	N16	WF02218B	2.47	2/27/2002	Guinardia flaccida	16843.31
WF022	N16	WF02218B	2.47	2/27/2002	Gymnodinium sp. group 1 5-20 microns wid	3551.03
WF022	N16	WF02218B	2.47	2/27/2002	Heterocapsa rotundata	77.65
WF022	N16	WF02218B	2.47	2/27/2002	Leptocylindrus minimus	63.86
WF022	N16	WF02218B	2.47	2/27/2002	Pleurosigma spp.	772.12
WF022	N16	WF02218B	2.47	2/27/2002	Prorocentrum minimum	566.03
WF022	N16	WF02218B	2.47	2/27/2002	Skeletonema costatum	4807.06
WF022	N16	WF02218B	2.47	2/27/2002	Thalassionema nitzschioides	76.56
WF022	N16	WF02218B	2.47	2/27/2002	Thalassiosira nordenskioldii	1126.41
WF022	N16	WF02218B	2.47	2/27/2002	Thalassiosira sp. group 3 10-20 microns	48.64
WF022	N16	WF02218B	2.47	2/27/2002	Unid. micro-phytoflag sp. group 1 length	8721.84
WF022	F24	WF0221C7	10.38	2/27/2002	Calycomonas wulffii	12.91
WF022	F24	WF0221C7	10.38	2/27/2002	Centric diatom sp. group 1 diam <10 micr	28.50
WF022	F24	WF0221C7	10.38	2/27/2002	Chaetoceros decipiens	1912.63
WF022	F24	WF0221C7	10.38	2/27/2002	Chaetoceros sp. group 1 diam <10 microns	53.18
WF022	F24	WF0221C7	10.38	2/27/2002	Chaetoceros sp. group 2 diam 10-30 micro	1745.13
WF022	F24	WF0221C7	10.38	2/27/2002	Chaetoceros subtilis	382.91
WF022	F24	WF0221C7	10.38	2/27/2002	Cryptomonas sp. group 1 length <10 micro	33.29
WF022	F24	WF0221C7	10.38	2/27/2002	Cylindrotheca closterium	327.31
WF022	F24	WF0221C7	10.38	2/27/2002	Dactyliosolen fragilissimus	60365.21
WF022	F24	WF0221C7	10.38	2/27/2002	Eucampia cornuta	898.78
WF022	F24	WF0221C7	10.38	2/27/2002	Guinardia delicatula	3388.56
WF022	F24	WF0221C7	10.38	2/27/2002	Guinardia flaccida	7843.16
WF022	F24	WF0221C7	10.38	2/27/2002	Guinardia striata	2580.44
WF022	F24	WF0221C7	10.38	2/27/2002	Gymnodinium sp. group 1 5-20 microns wid	2392.48
WF022	F24	WF0221C7	10.38	2/27/2002	Gyrodinium spirale	7464.51
WF022	F24	WF0221C7	10.38	2/27/2002	Leptocylindrus minimus	67.02
WF022	F24	WF0221C7	10.38	2/27/2002	Phaeocystis pouchetii	906.64
WF022	F24	WF0221C7	10.38	2/27/2002	Pleurosigma spp.	1080.44
WF022	F24	WF0221C7	10.38	2/27/2002	Protoperidinium sp. group 2 31-75 micron	9484.30
WF022	F24	WF0221C7	10.38	2/27/2002	Pyramimonas sp. group 1 10-20 microns le	68.18
WF022	F24	WF0221C7	10.38	2/27/2002	Rhizosolenia setigera	2398.16
WF022	F24	WF0221C7	10.38	2/27/2002	Skeletonema costatum	8721.57
WF022	F24	WF0221C7	10.38	2/27/2002	Thalassionema nitzschioides	89.28
WF022	F24	WF0221C7	10.38	2/27/2002	Thalassiosira nordenskioldii	604.21
WF022	F24	WF0221C7	10.38	2/27/2002	Thalassiosira sp. group 3 10-20 microns	45.38
WF022	F24	WF0221C7	10.38	2/27/2002	Unid. micro-phytoflag sp. group 1 length	6887.39
WF022	F24	WF0221CB	2.53	2/27/2002	Centric diatom sp. group 1 diam <10 micr	321.76
WF022	F24	WF0221CB	2.53	2/27/2002	Chaetoceros decipiens	8651.64
WF022	F24	WF0221CB	2.53	2/27/2002	Chaetoceros sp. group 1 diam <10 microns	80.19

Survey	Sta.	Sample Number	Depth (m)	Sampling Date	Plankton	Estimated Carbon Equivalence (ng Carbon/L)
WF022	F24	WF0221CB	2.53	2/27/2002	Chaetoceros sp. group 2 diam 10-30 micro	655.62
WF022	F24	WF0221CB	2.53	2/27/2002	Cryptomonas sp. group 1 length <10 micro	200.41
WF022	F24	WF0221CB	2.53	2/27/2002	Cylindrotheca closterium	592.22
WF022	F24	WF0221CB	2.53	2/27/2002	Dactyliosolen fragilissimus	56481.98
WF022	F24	WF0221CB	2.53	2/27/2002	Detonula confervacea	1480.91
WF022	F24	WF0221CB	2.53	2/27/2002	Eucampia cornuta	2705.82
WF022	F24	WF0221CB	2.53	2/27/2002	Guinardia delicatula	6120.84
WF022	F24	WF0221CB	2.53	2/27/2002	Guinardia flaccida	8854.58
WF022	F24	WF0221CB	2.53	2/27/2002	Gymnodinium sp. group 1 5-20 microns wid	5402.01
WF022	F24	WF0221CB	2.53	2/27/2002	Gyrodinium spirale	33765.10
WF022	F24	WF0221CB	2.53	2/27/2002	Leptocylindrus minimus	134.74
WF022	F24	WF0221CB	2.53	2/27/2002	Pennate diatom sp. group 2 10-30 microns	63.37
WF022	F24	WF0221CB	2.53	2/27/2002	Pleurosigma spp.	1626.35
WF022	F24	WF0221CB	2.53	2/27/2002	Prorocentrum micans	1194.85
WF022	F24	WF0221CB	2.53	2/27/2002	Rhizosolenia setigera	8108.60
WF022	F24	WF0221CB	2.53	2/27/2002	Skeletonema costatum	8905.87
WF022	F24	WF0221CB	2.53	2/27/2002	Thalassiosira nordenskioldii	514.07
WF022	F24	WF0221CB	2.53	2/27/2002	Unid. micro-phytoflag sp. group 1 length	13133.83
WF022	F30	WF0221D6	5.9	2/27/2002	Asterionellopsis glacialis	100.55
WF022	F30	WF0221D6	5.9	2/27/2002	Centric diatom sp. group 1 diam <10 micr	229.02
WF022	F30	WF0221D6	5.9	2/27/2002	Chaetoceros decipiens	4098.50
WF022	F30	WF0221D6	5.9	2/27/2002	Chaetoceros sp. group 2 diam 10-30 micro	1399.98
WF022	F30	WF0221D6	5.9	2/27/2002	Cryptomonas sp. group 1 length <10 micro	231.81
WF022	F30	WF0221D6	5.9	2/27/2002	Cylindrotheca closterium	1264.59
WF022	F30	WF0221D6	5.9	2/27/2002	Dactyliosolen fragilissimus	170234.77
WF022	F30	WF0221D6	5.9	2/27/2002	Dinophysis acuminata	1041.66
WF022	F30	WF0221D6	5.9	2/27/2002	Eucampia cornuta	2407.45
WF022	F30	WF0221D6	5.9	2/27/2002	Guinardia delicatula	3734.33
WF022	F30	WF0221D6	5.9	2/27/2002	Guinardia flaccida	6302.54
WF022	F30	WF0221D6	5.9	2/27/2002	Gymnodinium sp. group 1 5-20 microns wid	9169.00
WF022	F30	WF0221D6	5.9	2/27/2002	Gyrodinium spirale	167951.47
WF022	F30	WF0221D6	5.9	2/27/2002	Leptocylindrus minimus	670.23
WF022	F30	WF0221D6	5.9	2/27/2002	Licmophora spp.	125.93
WF022	F30	WF0221D6	5.9	2/27/2002	Pennate diatom sp. group 3 31-60 microns	128.98
WF022	F30	WF0221D6	5.9	2/27/2002	Phaeocystis pouchetii	599.98
WF022	F30	WF0221D6	5.9	2/27/2002	Pleurosigma spp.	2319.12
WF022	F30	WF0221D6	5.9	2/27/2002	Prorocentrum micans	1703.82
WF022	F30	WF0221D6	5.9	2/27/2002	Pseudonitzschia delicatissma complex	28.81
WF022	F30	WF0221D6	5.9	2/27/2002	Rhizosolenia setigera	1923.86
WF022	F30	WF0221D6	5.9	2/27/2002	Skeletonema costatum	10907.81
WF022	F30	WF0221D6	5.9	2/27/2002	Thalassionema nitzschioides	57.39
WF022	F30	WF0221D6	5.9	2/27/2002	Thalassiosira nordenskioldii	2195.43

Survey	Sta.	Sample Number	Depth (m)	Sampling Date	Plankton	Estimated Carbon Equivalence (ng Carbon/L)
WF022	F30	WF0221D6	5.9	2/27/2002	Unid. micro-phytoflag sp. group 1 length	20015.99
WF022	F30	WF0221D7	2.35	2/27/2002	Amphidinium spp.	141.86
WF022	F30	WF0221D7	2.35	2/27/2002	Asterionella formosa	337.25
WF022	F30	WF0221D7	2.35	2/27/2002	Calycomonas wulffii	20.89
WF022	F30	WF0221D7	2.35	2/27/2002	Centric diatom sp. group 1 diam <10 micr	69.15
WF022	F30	WF0221D7	2.35	2/27/2002	Chaetoceros decipiens	5155.96
WF022	F30	WF0221D7	2.35	2/27/2002	Chaetoceros sp. group 2 diam 10-30 micro	1408.95
WF022	F30	WF0221D7	2.35	2/27/2002	Cryptomonas sp. group 1 length <10 micro	376.86
WF022	F30	WF0221D7	2.35	2/27/2002	Cylindrotheca closterium	1696.93
WF022	F30	WF0221D7	2.35	2/27/2002	Dactyliosolen fragilissimus	128033.96
WF022	F30	WF0221D7	2.35	2/27/2002	Eucampia cornuta	3149.75
WF022	F30	WF0221D7	2.35	2/27/2002	Guinardia delicatula	3914.86
WF022	F30	WF0221D7	2.35	2/27/2002	Guinardia flaccida	6342.94
WF022	F30	WF0221D7	2.35	2/27/2002	Gymnodinium sp. group 1 5-20 microns wid	7739.42
WF022	F30	WF0221D7	2.35	2/27/2002	Gyrodinium spirale	144881.21
WF022	F30	WF0221D7	2.35	2/27/2002	Leptocylindrus minimus	349.31
WF022	F30	WF0221D7	2.35	2/27/2002	Pennate diatom sp. group 2 10-30 microns	181.90
WF022	F30	WF0221D7	2.35	2/27/2002	Prorocentrum minimum	106.58
WF022	F30	WF0221D7	2.35	2/27/2002	Pseudonitzschia delicatissma complex	28.99
WF022	F30	WF0221D7	2.35	2/27/2002	Skeletonema costatum	10977.74
WF022	F30	WF0221D7	2.35	2/27/2002	Thalassionema nitzschioides	115.52
WF022	F30	WF0221D7	2.35	2/27/2002	Thalassiosira nordenskioldii	1487.17
WF022	F30	WF0221D7	2.35	2/27/2002	Unid. micro-phytoflag sp. group 1 length	20432.90
WF022	F23	WF0221FE	10.64	2/28/2002	Centric diatom sp. group 1 diam <10 micr	168.85
WF022	F23	WF0221FE	10.64	2/28/2002	Chaetoceros decipiens	2697.96
WF022	F23	WF0221FE	10.64	2/28/2002	Chaetoceros sp. group 2 diam 10-30 micro	983.02
WF022	F23	WF0221FE	10.64	2/28/2002	Chaetoceros subtilis	161.77
WF022	F23	WF0221FE	10.64	2/28/2002	Coscinodiscus sp. group 2 diam 40-100 mi	1885.06
WF022	F23	WF0221FE	10.64	2/28/2002	Cryptomonas sp. group 1 length <10 micro	150.25
WF022	F23	WF0221FE	10.64	2/28/2002	Cylindrotheca closterium	664.85
WF022	F23	WF0221FE	10.64	2/28/2002	Dactyliosolen fragilissimus	78082.12
WF022	F23	WF0221FE	10.64	2/28/2002	Detonula confervacea	184.73
WF022	F23	WF0221FE	10.64	2/28/2002	Eucampia cornuta	1774.95
WF022	F23	WF0221FE	10.64	2/28/2002	Guinardia delicatula	3933.18
WF022	F23	WF0221FE	10.64	2/28/2002	Guinardia flaccida	9957.22
WF022	F23	WF0221FE	10.64	2/28/2002	Guinardia striata	4367.98
WF022	F23	WF0221FE	10.64	2/28/2002	Gymnodinium sp. group 1 5-20 microns wid	4049.81
WF022	F23	WF0221FE	10.64	2/28/2002	Gymnodinium sp. group 2 21-40 microns wi	1435.46
WF022	F23	WF0221FE	10.64	2/28/2002	Gyrodinium spirale	37906.03
WF022	F23	WF0221FE	10.64	2/28/2002	Leptocylindrus minimus	151.27
WF022	F23	WF0221FE	10.64	2/28/2002	Pennate diatom sp. group 3 31-60 microns	135.85
WF022	F23	WF0221FE	10.64	2/28/2002	Phaeocystis pouchetii	361.10

Survey	Sta.	Sample Number	Depth (m)	Sampling Date	Plankton	Estimated Carbon Equivalence (ng Carbon/L)
WF022	F23	WF0221FE	10.64	2/28/2002	Pleurosigma spp.	609.63
WF022	F23	WF0221FE	10.64	2/28/2002	Prorocentrum micans	447.88
WF022	F23	WF0221FE	10.64	2/28/2002	Protoperidinium depressum	140066.24
WF022	F23	WF0221FE	10.64	2/28/2002	Protoperidinium pellucidum	4363.88
WF022	F23	WF0221FE	10.64	2/28/2002	Rhizosolenia setigera	3039.45
WF022	F23	WF0221FE	10.64	2/28/2002	Skeletonema costatum	11266.65
WF022	F23	WF0221FE	10.64	2/28/2002	Thalassiosira nordenskioldii	1007.94
WF022	F23	WF0221FE	10.64	2/28/2002	Thalassiosira sp. group 3 10-20 microns	153.88
WF022	F23	WF0221FE	10.64	2/28/2002	Unid. micro-phytoflag sp. group 1 length	11839.65
WF022	F23	WF0221FE	10.64	2/28/2002	Unid. micro-phytoflag sp. group 2 length	365.75
WF022	F23	WF022200	2.09	2/28/2002	Centric diatom sp. group 1 diam <10 micr	246.33
WF022	F23	WF022200	2.09	2/28/2002	Chaetoceros decipiens	4508.35
WF022	F23	WF022200	2.09	2/28/2002	Chaetoceros sp. group 2 diam 10-30 micro	10055.27
WF022	F23	WF022200	2.09	2/28/2002	Chaetoceros subtilis	150.18
WF022	F23	WF022200	2.09	2/28/2002	Cryptomonas sp. group 1 length <10 micro	104.61
WF022	F23	WF022200	2.09	2/28/2002	Cylindrotheca closterium	102.87
WF022	F23	WF022200	2.09	2/28/2002	Dactyliosolen fragilissimus	84120.79
WF022	F23	WF022200	2.09	2/28/2002	Eucampia cornuta	3530.93
WF022	F23	WF022200	2.09	2/28/2002	Guinardia delicatula	3651.34
WF022	F23	WF022200	2.09	2/28/2002	Guinardia flaccida	6162.48
WF022	F23	WF022200	2.09	2/28/2002	Guinardia striata	4865.98
WF022	F23	WF022200	2.09	2/28/2002	Gymnodinium sp. group 1 5-20 microns wid	5494.83
WF022	F23	WF022200	2.09	2/28/2002	Gymnodinium sp. group 2 21-40 microns wi	6663.00
WF022	F23	WF022200	2.09	2/28/2002	Gyrodinium spirale	11729.94
WF022	F23	WF022200	2.09	2/28/2002	Leptocylindrus minimus	245.75
WF022	F23	WF022200	2.09	2/28/2002	Pennate diatom sp. group 2 10-30 microns	22.05
WF022	F23	WF022200	2.09	2/28/2002	Phaeocystis pouchetii	670.46
WF022	F23	WF022200	2.09	2/28/2002	Pleurosigma spp.	1131.89
WF022	F23	WF022200	2.09	2/28/2002	Pseudonitzschia delicatissma complex	14.08
WF022	F23	WF022200	2.09	2/28/2002	Rhizosolenia setigera	2821.66
WF022	F23	WF022200	2.09	2/28/2002	Scrippsiella trochoidea	1895.03
WF022	F23	WF022200	2.09	2/28/2002	Skeletonema costatum	12005.04
WF022	F23	WF022200	2.09	2/28/2002	Thalassiosira nordenskioldii	1197.17
WF022	F23	WF022200	2.09	2/28/2002	Unid. micro-phytoflag sp. group 1 length	16206.51
WF022	N04	WF02222F	23	2/28/2002	Centric diatom sp. group 1 diam <10 micr	50.14
WF022	N04	WF02222F	23	2/28/2002	Ceratium fusus	4462.47
WF022	N04	WF02222F	23	2/28/2002	Chaetoceros decipiens	1495.34
WF022	N04	WF02222F	23	2/28/2002	Chaetoceros sp. group 1 diam <10 microns	62.47
WF022	N04	WF02222F	23	2/28/2002	Chaetoceros sp. group 2 diam 10-30 micro	1362.09
WF022	N04	WF02222F	23	2/28/2002	Cryptomonas sp. group 1 length <10 micro	58.55
WF022	N04	WF02222F	23	2/28/2002	Cylindrotheca closterium	460.61
WF022	N04	WF02222F	23	2/28/2002	Dactyliosolen fragilissimus	4500.44

Survey	Sta.	Sample Number	Depth (m)	Sampling Date	Plankton	Estimated Carbon Equivalence (ng Carbon/L)
WF022	N04	WF02222F	23	2/28/2002	Detonula confervacea	447.93
WF022	N04	WF02222F	23	2/28/2002	Eucampia cornuta	527.02
WF022	N04	WF02222F	23	2/28/2002	Guinardia delicatula	681.24
WF022	N04	WF02222F	23	2/28/2002	Guinardia flaccida	6910.08
WF022	N04	WF02222F	23	2/28/2002	Gymnodinium sp. group 1 5-20 microns wid	809.35
WF022	N04	WF02222F	23	2/28/2002	Gymnodinium sp. group 2 21-40 microns wi	994.50
WF022	N04	WF02222F	23	2/28/2002	Leptocylindrus minimus	34.93
WF022	N04	WF02222F	23	2/28/2002	Pennate diatom sp. group 2 10-30 microns	49.46
WF022	N04	WF02222F	23	2/28/2002	Phaeocystis pouchetii	187.63
WF022	N04	WF02222F	23	2/28/2002	Pleurosigma spp.	2534.14
WF022	N04	WF02222F	23	2/28/2002	Prorocentrum micans	932.46
WF022	N04	WF02222F	23	2/28/2002	Protoperidinium sp. group 2 31-75 micron	2775.97
WF022	N04	WF02222F	23	2/28/2002	Rhizosolenia setigera	701.92
WF022	N04	WF02222F	23	2/28/2002	Skeletonema costatum	3397.24
WF022	N04	WF02222F	23	2/28/2002	Thalassiosira nordenskioldii	359.43
WF022	N04	WF02222F	23	2/28/2002	Thalassiosira punctigera	401.54
WF022	N04	WF02222F	23	2/28/2002	Thalassiosira rotula	369.01
WF022	N04	WF02222F	23	2/28/2002	Thalassiosira sp. group 3 10-20 microns	79.95
WF022	N04	WF02222F	23	2/28/2002	Unid. micro-phytoflag sp. group 1 length	4362.88
WF022	N04	WF022231	2.56	2/28/2002	Centric diatom sp. group 1 diam <10 micr	66.37
WF022	N04	WF022231	2.56	2/28/2002	Chaetoceros decipiens	3167.35
WF022	N04	WF022231	2.56	2/28/2002	Chaetoceros sp. group 2 diam 10-30 micro	1625.60
WF022	N04	WF022231	2.56	2/28/2002	Chaetoceros subtilis	237.39
WF022	N04	WF022231	2.56	2/28/2002	Corethron criophilum	1622.40
WF022	N04	WF022231	2.56	2/28/2002	Cryptomonas sp. group 1 length <10 micro	62.01
WF022	N04	WF022231	2.56	2/28/2002	Cylindrotheca closterium	1219.56
WF022	N04	WF022231	2.56	2/28/2002	Dactyliosolen fragilissimus	6531.58
WF022	N04	WF022231	2.56	2/28/2002	Detonula confervacea	2647.47
WF022	N04	WF022231	2.56	2/28/2002	Dinophysis acuminata	603.75
WF022	N04	WF022231	2.56	2/28/2002	Eucampia cornuta	930.25
WF022	N04	WF022231	2.56	2/28/2002	Grammatophora marina	154.18
WF022	N04	WF022231	2.56	2/28/2002	Guinardia delicatula	1202.47
WF022	N04	WF022231	2.56	2/28/2002	Guinardia flaccida	14636.54
WF022	N04	WF022231	2.56	2/28/2002	Guinardia striata	1922.97
WF022	N04	WF022231	2.56	2/28/2002	Gymnodinium sp. group 1 5-20 microns wid	1542.89
WF022	N04	WF022231	2.56	2/28/2002	Gyrodinium spirale	4635.51
WF022	N04	WF022231	2.56	2/28/2002	Leptocylindrus minimus	240.48
WF022	N04	WF022231	2.56	2/28/2002	Phaeocystis pouchetii	298.07
WF022	N04	WF022231	2.56	2/28/2002	Pleurosigma spp.	894.61
WF022	N04	WF022231	2.56	2/28/2002	Prorocentrum micans	328.63
WF022	N04	WF022231	2.56	2/28/2002	Protoperidinium sp. group 2 31-75 micron	2939.96
WF022	N04	WF022231	2.56	2/28/2002	Skeletonema costatum	4116.27

Survey	Sta.	Sample Number	Depth (m)	Sampling Date	Plankton	Estimated Carbon Equivalence (ng Carbon/L)
WF022	N04	WF022231	2.56	2/28/2002	Thalassionema nitzschioides	22.18
WF022	N04	WF022231	2.56	2/28/2002	Thalassiosira anguste-lineata	666.84
WF022	N04	WF022231	2.56	2/28/2002	Thalassiosira nordenskioldii	315.40
WF022	N04	WF022231	2.56	2/28/2002	Thalassiosira punctigera	425.26
WF022	N04	WF022231	2.56	2/28/2002	Thalassiosira rotula	1954.03
WF022	N04	WF022231	2.56	2/28/2002	Unid. micro-phytoflag sp. group 1 length	3856.05
WF022	N18	WF022262	13.7	2/28/2002	Calycomonas wulffii	9.11
WF022	N18	WF022262	13.7	2/28/2002	Centric diatom sp. group 1 diam <10 micr	90.47
WF022	N18	WF022262	13.7	2/28/2002	Chaetoceros borealis	851.41
WF022	N18	WF022262	13.7	2/28/2002	Chaetoceros decipiens	3603.92
WF022	N18	WF022262	13.7	2/28/2002	Chaetoceros sp. group 2 diam 10-30 micro	614.49
WF022	N18	WF022262	13.7	2/28/2002	Cryptomonas sp. group 1 length <10 micro	140.88
WF022	N18	WF022262	13.7	2/28/2002	Cylindrotheca closterium	554.13
WF022	N18	WF022262	13.7	2/28/2002	Dactyliosolen fragilissimus	4017.22
WF022	N18	WF022262	13.7	2/28/2002	Eucampia cornuta	3387.10
WF022	N18	WF022262	13.7	2/28/2002	Guinardia delicatula	1915.49
WF022	N18	WF022262	13.7	2/28/2002	Guinardia flaccida	16625.98
WF022	N18	WF022262	13.7	2/28/2002	Guinardia striata	1456.23
WF022	N18	WF022262	13.7	2/28/2002	Gymnodinium sp. group 1 5-20 microns wid	3635.03
WF022	N18	WF022262	13.7	2/28/2002	Gyrodinium spirale	21097.74
WF022	N18	WF022262	13.7	2/28/2002	Heterocapsa triquetra	228.22
WF022	N18	WF022262	13.7	2/28/2002	Leptocylindrus minimus	157.60
WF022	N18	WF022262	13.7	2/28/2002	Paralia sulcata	482.19
WF022	N18	WF022262	13.7	2/28/2002	Paulinella ovalis	9.33
WF022	N18	WF022262	13.7	2/28/2002	Pennate diatom sp. group 2 10-30 microns	19.80
WF022	N18	WF022262	13.7	2/28/2002	Phaeocystis pouchetii	338.59
WF022	N18	WF022262	13.7	2/28/2002	Pleurosigma spp.	1524.31
WF022	N18	WF022262	13.7	2/28/2002	Prorocentrum micans	747.85
WF022	N18	WF022262	13.7	2/28/2002	Protoperidinium pellucidum	7286.55
WF022	N18	WF022262	13.7	2/28/2002	Skeletonema costatum	2620.74
WF022	N18	WF022262	13.7	2/28/2002	Thalassionema nitzschioides	125.96
WF022	N18	WF022262	13.7	2/28/2002	Thalassiosira anguste-lineata	1517.52
WF022	N18	WF022262	13.7	2/28/2002	Thalassiosira nordenskioldii	481.81
WF022	N18	WF022262	13.7	2/28/2002	Thalassiosira rotula	1778.69
WF022	N18	WF022262	13.7	2/28/2002	Unid. micro-phytoflag sp. group 1 length	5512.97
WF022	N18	WF022264	2.74	2/28/2002	Centric diatom sp. group 1 diam <10 micr	122.93
WF022	N18	WF022264	2.74	2/28/2002	Chaetoceros decipiens	1099.94
WF022	N18	WF022264	2.74	2/28/2002	Chaetoceros sp. group 2 diam 10-30 micro	627.26
WF022	N18	WF022264	2.74	2/28/2002	Cryptomonas sp. group 1 length <10 micro	83.75
WF022	N18	WF022264	2.74	2/28/2002	Cylindrotheca closterium	565.64
WF022	N18	WF022264	2.74	2/28/2002	Dactyliosolen fragilissimus	3800.85
WF022	N18	WF022264	2.74	2/28/2002	Dictyocha speculum	88.68

Survey	Sta.	Sample Number	Depth (m)	Sampling Date	Plankton	Estimated Carbon Equivalence (ng Carbon/L)
WF022	N18	WF022264	2.74	2/28/2002	Eucampia cornuta	1162.98
WF022	N18	WF022264	2.74	2/28/2002	Guinardia delicatula	1002.20
WF022	N18	WF022264	2.74	2/28/2002	Guinardia flaccida	5074.35
WF022	N18	WF022264	2.74	2/28/2002	Guinardia striata	2229.73
WF022	N18	WF022264	2.74	2/28/2002	Gymnodinium sp. group 1 5-20 microns wid	3572.04
WF022	N18	WF022264	2.74	2/28/2002	Gyrodinium spirale	32250.00
WF022	N18	WF022264	2.74	2/28/2002	Leptocylindrus minimus	12.85
WF022	N18	WF022264	2.74	2/28/2002	Phaeocystis pouchetii	230.03
WF022	N18	WF022264	2.74	2/28/2002	Pleurosigma spp.	3111.98
WF022	N18	WF022264	2.74	2/28/2002	Prorocentrum micans	1141.24
WF022	N18	WF022264	2.74	2/28/2002	Rhizosolenia setigera	2065.27
WF022	N18	WF022264	2.74	2/28/2002	Skeletonema costatum	1574.19
WF022	N18	WF022264	2.74	2/28/2002	Thalassionema nitzschioides	15.40
WF022	N18	WF022264	2.74	2/28/2002	Thalassiosira nordenskioldii	657.19
WF022	N18	WF022264	2.74	2/28/2002	Thalassiosira sp. group 3 10-20 microns	78.29
WF022	N18	WF022264	2.74	2/28/2002	Unid. micro-phytoflag sp. group 1 length	5079.36
WF022	F31	WF02230F	5.32	3/1/2002	Centric diatom sp. group 1 diam <10 micr	180.43
WF022	F31	WF02230F	5.32	3/1/2002	Chaetoceros decipiens	3459.49
WF022	F31	WF02230F	5.32	3/1/2002	Chaetoceros socialis	2759.75
WF022	F31	WF02230F	5.32	3/1/2002	Chaetoceros sp. group 1 diam <10 microns	256.52
WF022	F31	WF02230F	5.32	3/1/2002	Cryptomonas sp. group 1 length <10 micro	100.34
WF022	F31	WF02230F	5.32	3/1/2002	Cylindrotheca closterium	236.81
WF022	F31	WF02230F	5.32	3/1/2002	Dactyliosolen fragilissimus	47302.97
WF022	F31	WF02230F	5.32	3/1/2002	Detonula confervacea	394.78
WF022	F31	WF02230F	5.32	3/1/2002	Eucampia cornuta	6513.65
WF022	F31	WF02230F	5.32	3/1/2002	Guinardia delicatula	4202.79
WF022	F31	WF02230F	5.32	3/1/2002	Guinardia flaccida	14186.36
WF022	F31	WF02230F	5.32	3/1/2002	Gymnodinium sp. group 1 5-20 microns wid	6324.69
WF022	F31	WF02230F	5.32	3/1/2002	Gyrodinium spirale	13501.47
WF022	F31	WF02230F	5.32	3/1/2002	Gyrosigma spp.	2610.05
WF022	F31	WF02230F	5.32	3/1/2002	Leptocylindrus minimus	269.85
WF022	F31	WF02230F	5.32	3/1/2002	Phaeocystis pouchetii	578.78
WF022	F31	WF02230F	5.32	3/1/2002	Rhizosolenia setigera	4337.69
WF022	F31	WF02230F	5.32	3/1/2002	Skeletonema costatum	18681.14
WF022	F31	WF02230F	5.32	3/1/2002	Thalassiosira nordenskioldii	411.81
WF022	F31	WF02230F	5.32	3/1/2002	Unid. micro-phytoflag sp. group 1 length	11489.39
WF022	F31	WF022310	2.84	3/1/2002	Centric diatom sp. group 1 diam <10 micr	280.94
WF022	F31	WF022310	2.84	3/1/2002	Chaetoceros decipiens	4189.58
WF022	F31	WF022310	2.84	3/1/2002	Chaetoceros sp. group 2 diam 10-30 micro	12402.79
WF022	F31	WF022310	2.84	3/1/2002	Cryptomonas sp. group 1 length <10 micro	18.23
WF022	F31	WF022310	2.84	3/1/2002	Cylindrotheca closterium	430.17
WF022	F31	WF022310	2.84	3/1/2002	Dactyliosolen fragilissimus	58842.49

Survey	Sta.	Sample Number	Depth (m)	Sampling Date	Plankton	Estimated Carbon Equivalence (ng Carbon/L)
WF022	F31	WF022310	2.84	3/1/2002	Eucampia cornuta	4930.18
WF022	F31	WF022310	2.84	3/1/2002	Grammatophora marina	271.92
WF022	F31	WF022310	2.84	3/1/2002	Guinardia delicatula	5725.97
WF022	F31	WF022310	2.84	3/1/2002	Guinardia flaccida	25770.39
WF022	F31	WF022310	2.84	3/1/2002	Gymnodinium sp. group 1 5-20 microns wid	6349.28
WF022	F31	WF022310	2.84	3/1/2002	Gyrodinium spirale	73702.55
WF022	F31	WF022310	2.84	3/1/2002	Leptocylindrus minimus	587.25
WF022	F31	WF022310	2.84	3/1/2002	Pennate diatom sp. group 2 10-30 microns	46.11
WF022	F31	WF022310	2.84	3/1/2002	Prorocentrum minimum	216.51
WF022	F31	WF022310	2.84	3/1/2002	Protoperidinium sp. group 2 31-75 micron	7777.59
WF022	F31	WF022310	2.84	3/1/2002	Rhizosolenia setigera	3939.83
WF022	F31	WF022310	2.84	3/1/2002	Skeletonema costatum	20091.93
WF022	F31	WF022310	2.84	3/1/2002	Thalassionema nitzschioides	58.67
WF022	F31	WF022310	2.84	3/1/2002	Thalassiosira nordenskioldii	805.62
WF022	F31	WF022310	2.84	3/1/2002	Thalassiosira sp. group 3 10-20 microns	149.09
WF022	F31	WF022310	2.84	3/1/2002	Unid. micro-phytoflag sp. group 1 length	7093.85
WF022	F06	WF022354	16.35	3/1/2002	Amphidinium spp.	572.05
WF022	F06	WF022354	16.35	3/1/2002	Centric diatom sp. group 1 diam <10 micr	208.78
WF022	F06	WF022354	16.35	3/1/2002	Chaetoceros decipiens	1729.74
WF022	F06	WF022354	16.35	3/1/2002	Chaetoceros sp. group 2 diam 10-30 micro	1260.48
WF022	F06	WF022354	16.35	3/1/2002	Cryptomonas sp. group 1 length <10 micro	144.49
WF022	F06	WF022354	16.35	3/1/2002	Cylindrotheca closterium	710.42
WF022	F06	WF022354	16.35	3/1/2002	Dactyliosolen fragilissimus	3856.22
WF022	F06	WF022354	16.35	3/1/2002	Eucampia cornuta	1950.81
WF022	F06	WF022354	16.35	3/1/2002	Grammatophora marina	44.83
WF022	F06	WF022354	16.35	3/1/2002	Guinardia delicatula	840.56
WF022	F06	WF022354	16.35	3/1/2002	Guinardia flaccida	23407.50
WF022	F06	WF022354	16.35	3/1/2002	Guinardia striata	1120.17
WF022	F06	WF022354	16.35	3/1/2002	Gymnodinium sp. group 1 5-20 microns wid	5692.22
WF022	F06	WF022354	16.35	3/1/2002	Gyrodinium sp. group 2 21-40 microns wid	5531.18
WF022	F06	WF022354	16.35	3/1/2002	Gyrodinium spirale	24302.65
WF022	F06	WF022354	16.35	3/1/2002	Heterocapsa rotundata	58.96
WF022	F06	WF022354	16.35	3/1/2002	Leptocylindrus minimus	242.46
WF022	F06	WF022354	16.35	3/1/2002	Pennate diatom sp. group 1 <10 microns l	17.95
WF022	F06	WF022354	16.35	3/1/2002	Pennate diatom sp. group 2 10-30 microns	15.23
WF022	F06	WF022354	16.35	3/1/2002	Phaeocystis pouchetii	347.27
WF022	F06	WF022354	16.35	3/1/2002	Pleurosigma spp.	1172.55
WF022	F06	WF022354	16.35	3/1/2002	Prorocentrum micans	1725.80
WF022	F06	WF022354	16.35	3/1/2002	Protoperidinium sp. group 2 31-75 micron	2568.89
WF022	F06	WF022354	16.35	3/1/2002	Pseudonitzschia pungens	140.25
WF022	F06	WF022354	16.35	3/1/2002	Skeletonema costatum	1838.33
WF022	F06	WF022354	16.35	3/1/2002	Thalassionema nitzschioides	19.38

Survey	Sta.	Sample Number	Depth (m)	Sampling Date	Plankton	Estimated Carbon Equivalence (ng Carbon/L)
WF022	F06	WF022354	16.35	3/1/2002	Thalassiosira nordenskioldii	285.10
WF022	F06	WF022354	16.35	3/1/2002	Thalassiosira rotula	1707.40
WF022	F06	WF022354	16.35	3/1/2002	Unid. micro-phytoflag sp. group 1 length	9178.60
WF022	F06	WF022356	2.8	3/1/2002	Amphidinium spp.	179.58
WF022	F06	WF022356	2.8	3/1/2002	Centric diatom sp. group 1 diam <10 micr	262.61
WF022	F06	WF022356	2.8	3/1/2002	Chaetoceros borealis	823.80
WF022	F06	WF022356	2.8	3/1/2002	Chaetoceros decipiens	7845.87
WF022	F06	WF022356	2.8	3/1/2002	Chaetoceros sp. group 2 diam 10-30 micro	297.28
WF022	F06	WF022356	2.8	3/1/2002	Cryptomonas sp. group 1 length <10 micro	136.31
WF022	F06	WF022356	2.8	3/1/2002	Cylindrotheca closterium	805.59
WF022	F06	WF022356	2.8	3/1/2002	Dactyliosolen fragilissimus	1018.61
WF022	F06	WF022356	2.8	3/1/2002	Detonula confervacea	1007.24
WF022	F06	WF022356	2.8	3/1/2002	Dictyocha fibula	182.98
WF022	F06	WF022356	2.8	3/1/2002	Eucampia cornuta	613.45
WF022	F06	WF022356	2.8	3/1/2002	Guinardia delicatula	792.97
WF022	F06	WF022356	2.8	3/1/2002	Guinardia flaccida	20074.76
WF022	F06	WF022356	2.8	3/1/2002	Gymnodinium sp. group 1 5-20 microns wid	5369.94
WF022	F06	WF022356	2.8	3/1/2002	Gyrodinium spirale	38211.18
WF022	F06	WF022356	2.8	3/1/2002	Leptocylindrus minimus	76.24
WF022	F06	WF022356	2.8	3/1/2002	Paulinella ovalis	20.30
WF022	F06	WF022356	2.8	3/1/2002	Phaeocystis pouchetii	900.92
WF022	F06	WF022356	2.8	3/1/2002	Pleurosigma spp.	2949.77
WF022	F06	WF022356	2.8	3/1/2002	Prorocentrum micans	812.68
WF022	F06	WF022356	2.8	3/1/2002	Protoperidinium pellucidum	2639.41
WF022	F06	WF022356	2.8	3/1/2002	Rhizosolenia setigera	612.78
WF022	F06	WF022356	2.8	3/1/2002	Skeletonema costatum	1332.11
WF022	F06	WF022356	2.8	3/1/2002	Thalassionema nitzschioides	36.56
WF022	F06	WF022356	2.8	3/1/2002	Thalassiosira anguste-lineata	1099.38
WF022	F06	WF022356	2.8	3/1/2002	Thalassiosira nordenskioldii	242.06
WF022	F06	WF022356	2.8	3/1/2002	Unid. micro-phytoflag sp. group 1 length	11673.13
WN023	N04	WN023058	18.73	3/25/2002	Chaetoceros borealis	2034.70
WN023	N04	WN023058	18.73	3/25/2002	Chaetoceros compressus	739.95
WN023	N04	WN023058	18.73	3/25/2002	Chaetoceros decipiens	4836.50
WN023	N04	WN023058	18.73	3/25/2002	Corethron criophilum	8823.29
WN023	N04	WN023058	18.73	3/25/2002	Cryptomonas sp. group 1 length <10 micro	518.17
WN023	N04	WN023058	18.73	3/25/2002	Cylindrotheca closterium	110.36
WN023	N04	WN023058	18.73	3/25/2002	Eucampia cornuta	1011.81
WN023	N04	WN023058	18.73	3/25/2002	Gymnodinium sp. group 1 5-20 microns wid	3412.77
WN023	N04	WN023058	18.73	3/25/2002	Heterocapsa rotundata	61.06
WN023	N04	WN023058	18.73	3/25/2002	Pennate diatom sp. group 3 31-60 microns	67.65
WN023	N04	WN023058	18.73	3/25/2002	Phaeocystis pouchetii	16902.51
WN023	N04	WN023058	18.73	3/25/2002	Pleurosigma spp.	607.14

Survey	Sta.	Sample Number	Depth (m)	Sampling Date	Plankton	Estimated Carbon Equivalence (ng Carbon/L)
WN023	N04	WN023058	18.73	3/25/2002	Pseudonitzschia delicatissma complex	60.54
WN023	N04	WN023058	18.73	3/25/2002	Pseudonitzschia pungens	398.74
WN023	N04	WN023058	18.73	3/25/2002	Skeletonema costatum	289.70
WN023	N04	WN023058	18.73	3/25/2002	Stephanopyxis nipponica	23809.86
WN023	N04	WN023058	18.73	3/25/2002	Stephanopyxis turris	8346.78
WN023	N04	WN023058	18.73	3/25/2002	Thalassiosira nordenskioldii	73.81
WN023	N04	WN023058	18.73	3/25/2002	Unid. micro-phytoflag sp. group 1 length	14017.19
WN023	N04	WN02305A	2.18	3/25/2002	Amphidinium spp.	100.23
WN023	N04	WN02305A	2.18	3/25/2002	Asterionellopsis glacialis	35.75
WN023	N04	WN02305A	2.18	3/25/2002	Centric diatom sp. group 1 diam <10 micr	24.43
WN023	N04	WN02305A	2.18	3/25/2002	Chaetoceros borealis	2988.67
WN023	N04	WN02305A	2.18	3/25/2002	Chaetoceros debilis	204.85
WN023	N04	WN02305A	2.18	3/25/2002	Chaetoceros decipiens	11657.95
WN023	N04	WN02305A	2.18	3/25/2002	Chaetoceros sp. group 2 diam 10-30 micro	1327.39
WN023	N04	WN02305A	2.18	3/25/2002	Cryptomonas sp. group 1 length <10 micro	545.24
WN023	N04	WN02305A	2.18	3/25/2002	Cylindrotheca closterium	149.63
WN023	N04	WN02305A	2.18	3/25/2002	Eucampia cornuta	513.59
WN023	N04	WN02305A	2.18	3/25/2002	Gymnodinium sp. group 1 5-20 microns wid	1577.46
WN023	N04	WN02305A	2.18	3/25/2002	Gyrodinium spirale	4265.43
WN023	N04	WN02305A	2.18	3/25/2002	Heterocapsa rotundata	62.09
WN023	N04	WN02305A	2.18	3/25/2002	Pennate diatom sp. group 3 31-60 microns	91.72
WN023	N04	WN02305A	2.18	3/25/2002	Phaeocystis pouchetii	19473.69
WN023	N04	WN02305A	2.18	3/25/2002	Pleurosigma spp.	411.60
WN023	N04	WN02305A	2.18	3/25/2002	Prorocentrum minimum	75.31
WN023	N04	WN02305A	2.18	3/25/2002	Pseudonitzschia delicatissma complex	71.70
WN023	N04	WN02305A	2.18	3/25/2002	Pseudonitzschia pungens	147.69
WN023	N04	WN02305A	2.18	3/25/2002	Skeletonema costatum	93.52
WN023	N04	WN02305A	2.18	3/25/2002	Stephanopyxis nipponica	19402.25
WN023	N04	WN02305A	2.18	3/25/2002	Stephanopyxis turris	82048.59
WN023	N04	WN02305A	2.18	3/25/2002	Thalassionema nitzschioides	142.85
WN023	N04	WN02305A	2.18	3/25/2002	Thalassiosira nordenskioldii	20.02
WN023	N04	WN02305A	2.18	3/25/2002	Thalassiosira sp. group 3 10-20 microns	155.57
WN023	N04	WN02305A	2.18	3/25/2002	Unid. micro-phytoflag sp. group 1 length	11439.89
WN023	N18	WN02308D	10.36	3/25/2002	Centric diatom sp. group 1 diam <10 micr	31.55
WN023	N18	WN02308D	10.36	3/25/2002	Chaetoceros borealis	1781.70
WN023	N18	WN02308D	10.36	3/25/2002	Chaetoceros debilis	595.34
WN023	N18	WN02308D	10.36	3/25/2002	Chaetoceros decipiens	6352.67
WN023	N18	WN02308D	10.36	3/25/2002	Chaetoceros sp. group 2 diam 10-30 micro	642.95
WN023	N18	WN02308D	10.36	3/25/2002	Cryptomonas sp. group 1 length <10 micro	496.66
WN023	N18	WN02308D	10.36	3/25/2002	Cryptomonas sp. group 2 length >10 micro	157.77
WN023	N18	WN02308D	10.36	3/25/2002	Cylindrotheca closterium	580.78
WN023	N18	WN02308D	10.36	3/25/2002	Eucampia cornuta	1990.16

Survey	Sta.	Sample Number	Depth (m)	Sampling Date	Plankton	Estimated Carbon Equivalence (ng Carbon/L)
WN023	N18	WN02308D	10.36	3/25/2002	Eutreptia/eutreptiella spp.	57.83
WN023	N18	WN02308D	10.36	3/25/2002	Guinardia delicatula	428.76
WN023	N18	WN02308D	10.36	3/25/2002	Gymnodinium sp. group 1 5-20 microns wid	2852.58
WN023	N18	WN02308D	10.36	3/25/2002	Gyrodinium spirale	16528.56
WN023	N18	WN02308D	10.36	3/25/2002	Leptocylindrus minimus	98.94
WN023	N18	WN02308D	10.36	3/25/2002	Phaeocystis pouchetii	11927.25
WN023	N18	WN02308D	10.36	3/25/2002	Pleurosigma spp.	797.47
WN023	N18	WN02308D	10.36	3/25/2002	Prorocentrum minimum	584.61
WN023	N18	WN02308D	10.36	3/25/2002	Pseudonitzschia delicatissma complex	39.69
WN023	N18	WN02308D	10.36	3/25/2002	Pseudonitzschia pungens	95.22
WN023	N18	WN02308D	10.36	3/25/2002	Skeletonema costatum	308.04
WN023	N18	WN02308D	10.36	3/25/2002	Stephanopyxis spp.	26.73
WN023	N18	WN02308D	10.36	3/25/2002	Stephanopyxis turris	24667.63
WN023	N18	WN02308D	10.36	3/25/2002	Thalassiosira nordenskioldii	155.12
WN023	N18	WN02308D	10.36	3/25/2002	Thalassiosira rotula	1393.47
WN023	N18	WN02308D	10.36	3/25/2002	Thalassiosira sp. group 3 10-20 microns	805.15
WN023	N18	WN02308D	10.36	3/25/2002	Unid. micro-phytoflag sp. group 1 length	17226.11
WN023	N18	WN02308F	1.74	3/25/2002	Centric diatom sp. group 1 diam <10 micr	99.75
WN023	N18	WN02308F	1.74	3/25/2002	Chaetoceros borealis	704.06
WN023	N18	WN02308F	1.74	3/25/2002	Chaetoceros decipiens	12644.63
WN023	N18	WN02308F	1.74	3/25/2002	Chaetoceros sp. group 2 diam 10-30 micro	677.52
WN023	N18	WN02308F	1.74	3/25/2002	Corethron criophilum	1523.98
WN023	N18	WN02308F	1.74	3/25/2002	Cryptomonas sp. group 1 length <10 micro	348.91
WN023	N18	WN02308F	1.74	3/25/2002	Cylindrotheca closterium	229.11
WN023	N18	WN02308F	1.74	3/25/2002	Dactyliosolen fragilissimus	331.64
WN023	N18	WN02308F	1.74	3/25/2002	Eucampia cornuta	699.05
WN023	N18	WN02308F	1.74	3/25/2002	Eutreptia/eutreptiella spp.	60.94
WN023	N18	WN02308F	1.74	3/25/2002	Gymnodinium sp. group 1 5-20 microns wid	1932.39
WN023	N18	WN02308F	1.74	3/25/2002	Gymnodinium sp. group 2 21-40 microns wi	989.35
WN023	N18	WN02308F	1.74	3/25/2002	Gyrodinium spirale	4354.30
WN023	N18	WN02308F	1.74	3/25/2002	Leptocylindrus minimus	225.89
WN023	N18	WN02308F	1.74	3/25/2002	Oxyphysis oxytoxoides	614.96
WN023	N18	WN02308F	1.74	3/25/2002	Pennate diatom sp. group 2 10-30 microns	16.37
WN023	N18	WN02308F	1.74	3/25/2002	Phaeocystis pouchetii	9053.06
WN023	N18	WN02308F	1.74	3/25/2002	Prorocentrum micans	308.69
WN023	N18	WN02308F	1.74	3/25/2002	Prorocentrum minimum	76.88
WN023	N18	WN02308F	1.74	3/25/2002	Protoperidinium sp. group 1 10-30 micron	391.38
WN023	N18	WN02308F	1.74	3/25/2002	Pseudonitzschia delicatissma complex	20.91
WN023	N18	WN02308F	1.74	3/25/2002	Pseudonitzschia pungens	150.77
WN023	N18	WN02308F	1.74	3/25/2002	Skeletonema costatum	305.51
WN023	N18	WN02308F	1.74	3/25/2002	Stephanopyxis turris	51987.68
WN023	N18	WN02308F	1.74	3/25/2002	Thalassionema nitzschioides	187.49

Survey	Sta.	Sample Number	Depth (m)	Sampling Date	Plankton	Estimated Carbon Equivalence (ng Carbon/L)
WN023	N18	WN02308F	1.74	3/25/2002	Thalassiosira nordenskioldii	122.59
WN023	N18	WN02308F	1.74	3/25/2002	Thalassiosira sp. group 3 10-20 microns	211.75
WN023	N18	WN02308F	1.74	3/25/2002	Unid. micro-phytoflag sp. group 1 length	9804.71
WN023	N18	WN02308F	1.74	3/25/2002	Unid. micro-phytoflag sp. group 2 length	378.12
WF024	F01	WF024043	11.74	4/5/2002	Alexandrium tamarense	0.51
WF024	F01	WF024043	11.74	4/5/2002	Calycomonas wulffii	22.14
WF024	F01	WF024043	11.74	4/5/2002	Centric diatom sp. group 1 diam <10 micr	195.43
WF024	F01	WF024043	11.74	4/5/2002	Chaetoceros convolutus	4226.11
WF024	F01	WF024043	11.74	4/5/2002	Chaetoceros sp. group 2 diam 10-30 micro	26879.63
WF024	F01	WF024043	11.74	4/5/2002	Chaetoceros subtilis	327.66
WF024	F01	WF024043	11.74	4/5/2002	Cryptomonas sp. group 1 length <10 micro	361.38
WF024	F01	WF024043	11.74	4/5/2002	Cylindrotheca closterium	449.63
WF024	F01	WF024043	11.74	4/5/2002	Dactyliosolen fragilissimus	5847.70
WF024	F01	WF024043	11.74	4/5/2002	Eucampia cornuta	5144.54
WF024	F01	WF024043	11.74	4/5/2002	Guinardia delicatula	995.82
WF024	F01	WF024043	11.74	4/5/2002	Guinardia flaccida	127731.50
WF024	F01	WF024043	11.74	4/5/2002	Gymnodinium sp. group 1 5-20 microns wid	4732.39
WF024	F01	WF024043	11.74	4/5/2002	Gyrodinium spirale	25635.67
WF024	F01	WF024043	11.74	4/5/2002	Leptocylindrus minimus	280.86
WF024	F01	WF024043	11.74	4/5/2002	Paulinella ovalis	45.33
WF024	F01	WF024043	11.74	4/5/2002	Phaeocystis pouchetii	49461.34
WF024	F01	WF024043	11.74	4/5/2002	Pleurosigma spp.	3704.36
WF024	F01	WF024043	11.74	4/5/2002	Prorocentrum micans	907.18
WF024	F01	WF024043	11.74	4/5/2002	Protoperidinium pellucidum	17707.64
WF024	F01	WF024043	11.74	4/5/2002	Skeletonema costatum	25643.79
WF024	F01	WF024043	11.74	4/5/2002	Thalassionema nitzschioides	490.58
WF024	F01	WF024043	11.74	4/5/2002	Thalassiosira nordenskioldii	60.05
WF024	F01	WF024043	11.74	4/5/2002	Thalassiosira rotula	4322.53
WF024	F01	WF024043	11.74	4/5/2002	Unid. micro-phytoflag sp. group 1 length	21900.97
WF024	F01	WF024043	11.74	4/5/2002	Unid. micro-phytoflag sp. group 2 length	370.41
WF024	F01	WF024045	2.21	4/5/2002	Cerataulina pelagica	1784.98
WF024	F01	WF024045	2.21	4/5/2002	Chaetoceros convolutus	719.03
WF024	F01	WF024045	2.21	4/5/2002	Chaetoceros sp. group 2 diam 10-30 micro	22358.21
WF024	F01	WF024045	2.21	4/5/2002	Chaetoceros subtilis	668.96
WF024	F01	WF024045	2.21	4/5/2002	Choanoflagellate spp.	122.38
WF024	F01	WF024045	2.21	4/5/2002	Cryptomonas sp. group 1 length <10 micro	388.33
WF024	F01	WF024045	2.21	4/5/2002	Cylindrotheca closterium	229.11
WF024	F01	WF024045	2.21	4/5/2002	Dactyliosolen fragilissimus	497.46
WF024	F01	WF024045	2.21	4/5/2002	Dictyocha speculum	359.81
WF024	F01	WF024045	2.21	4/5/2002	Eucampia cornuta	1048.58
WF024	F01	WF024045	2.21	4/5/2002	Guinardia delicatula	3049.70
WF024	F01	WF024045	2.21	4/5/2002	Guinardia flaccida	130392.57

Survey	Sta.	Sample Number	Depth (m)	Sampling Date	Plankton	Estimated Carbon Equivalence (ng Carbon/L)
WF024	F01	WF024045	2.21	4/5/2002	Gymnodinium sp. group 2 21-40 microns wi	41622.78
WF024	F01	WF024045	2.21	4/5/2002	Gyrodinium spirale	52339.49
WF024	F01	WF024045	2.21	4/5/2002	Heterocapsa rotundata	253.52
WF024	F01	WF024045	2.21	4/5/2002	Leptocylindrus minimus	364.91
WF024	F01	WF024045	2.21	4/5/2002	Paulinella ovalis	23.14
WF024	F01	WF024045	2.21	4/5/2002	Pennate diatom sp. group 2 10-30 microns	49.12
WF024	F01	WF024045	2.21	4/5/2002	Pennate diatom sp. group 3 31-60 microns	140.45
WF024	F01	WF024045	2.21	4/5/2002	Phaeocystis pouchetii	46571.91
WF024	F01	WF024045	2.21	4/5/2002	Pleurosigma spp.	2525.26
WF024	F01	WF024045	2.21	4/5/2002	Pseudonitzschia delicatissma complex	125.68
WF024	F01	WF024045	2.21	4/5/2002	Skeletonema costatum	14578.36
WF024	F01	WF024045	2.21	4/5/2002	Thalassionema nitzschioides	250.40
WF024	F01	WF024045	2.21	4/5/2002	Thalassiosira nordenskioldii	61.40
WF024	F01	WF024045	2.21	4/5/2002	Thalassiosira sp. group 3 10-20 microns	79.41
WF024	F01	WF024045	2.21	4/5/2002	Unid. micro-phytoflag sp. group 1 length	11928.02
WF024	F01	WF024045	2.21	4/5/2002	Unid. micro-phytoflag sp. group 2 length	1134.37
WF024	F02	WF024067	16.84	4/5/2002	Asterionellopsis glacialis	53.29
WF024	F02	WF024067	16.84	4/5/2002	Attheya septentrionalis	185.96
WF024	F02	WF024067	16.84	4/5/2002	Centric diatom sp. group 1 diam <10 micr	48.55
WF024	F02	WF024067	16.84	4/5/2002	Chaetoceros compressus	1869.23
WF024	F02	WF024067	16.84	4/5/2002	Chaetoceros convolutus	874.87
WF024	F02	WF024067	16.84	4/5/2002	Chaetoceros debilis	1223.37
WF024	F02	WF024067	16.84	4/5/2002	Chaetoceros decipiens	1629.02
WF024	F02	WF024067	16.84	4/5/2002	Chaetoceros socialis	1067.47
WF024	F02	WF024067	16.84	4/5/2002	Chaetoceros sp. group 2 diam 10-30 micro	5440.83
WF024	F02	WF024067	16.84	4/5/2002	Cryptomonas sp. group 1 length <10 micro	377.99
WF024	F02	WF024067	16.84	4/5/2002	Cylindrotheca closterium	893.57
WF024	F02	WF024067	16.84	4/5/2002	Dactyliosolen fragilissimus	726.34
WF024	F02	WF024067	16.84	4/5/2002	Dinophysis norvegica	12370.40
WF024	F02	WF024067	16.84	4/5/2002	Dinophysis ovum	7447.83
WF024	F02	WF024067	16.84	4/5/2002	Guinardia delicatula	2643.15
WF024	F02	WF024067	16.84	4/5/2002	Guinardia flaccida	440890.66
WF024	F02	WF024067	16.84	4/5/2002	Gymnodinium sp. group 2 21-40 microns wi	4333.63
WF024	F02	WF024067	16.84	4/5/2002	Heterocapsa rotundata	123.39
WF024	F02	WF024067	16.84	4/5/2002	Leptocylindrus danicus	1196.62
WF024	F02	WF024067	16.84	4/5/2002	Leptocylindrus minimus	609.93
WF024	F02	WF024067	16.84	4/5/2002	Paulinella ovalis	22.52
WF024	F02	WF024067	16.84	4/5/2002	Pennate diatom sp. group 3 31-60 microns	68.36
WF024	F02	WF024067	16.84	4/5/2002	Phaeocystis pouchetii	20168.06
WF024	F02	WF024067	16.84	4/5/2002	Pleurosigma spp.	2453.94
WF024	F02	WF024067	16.84	4/5/2002	Protoperidinium bipes	380.20
WF024	F02	WF024067	16.84	4/5/2002	Protoperidinium pellucidum	4391.50

Survey	Sta.	Sample Number	Depth (m)	Sampling Date	Plankton	Estimated Carbon Equivalence (ng Carbon/L)
WF024	F02	WF024067	16.84	4/5/2002	Skeletonema costatum	641.22
WF024	F02	WF024067	16.84	4/5/2002	Unid. micro-phytoflag sp. group 1 length	23889.96
WF024	F02	WF024069	1.78	4/5/2002	Asterionellopsis glacialis	587.14
WF024	F02	WF024069	1.78	4/5/2002	Cerataulina pelagica	3981.74
WF024	F02	WF024069	1.78	4/5/2002	Chaetoceros compressus	2056.15
WF024	F02	WF024069	1.78	4/5/2002	Chaetoceros convolutus	1927.95
WF024	F02	WF024069	1.78	4/5/2002	Chaetoceros decipiens	3982.06
WF024	F02	WF024069	1.78	4/5/2002	Chaetoceros socialis	553.07
WF024	F02	WF024069	1.78	4/5/2002	Chaetoceros sp. group 2 diam 10-30 micro	9294.74
WF024	F02	WF024069	1.78	4/5/2002	Chaetoceros subtilis	149.22
WF024	F02	WF024069	1.78	4/5/2002	Choanoflagellate spp.	81.90
WF024	F02	WF024069	1.78	4/5/2002	Corethron criophilum	2039.71
WF024	F02	WF024069	1.78	4/5/2002	Cryptomonas sp. group 1 length <10 micro	207.90
WF024	F02	WF024069	1.78	4/5/2002	Cylindrotheca closterium	102.22
WF024	F02	WF024069	1.78	4/5/2002	Dactyliosolen fragilissimus	1331.62
WF024	F02	WF024069	1.78	4/5/2002	Dinophysis norvegica	2830.12
WF024	F02	WF024069	1.78	4/5/2002	Dinophysis ovum	1703.93
WF024	F02	WF024069	1.78	4/5/2002	Guinardia delicatula	453.53
WF024	F02	WF024069	1.78	4/5/2002	Guinardia flaccida	355161.92
WF024	F02	WF024069	1.78	4/5/2002	Gymnodinium sp. group 1 5-20 microns wid	2155.28
WF024	F02	WF024069	1.78	4/5/2002	Leptocylindrus danicus	1096.90
WF024	F02	WF024069	1.78	4/5/2002	Leptocylindrus minimus	139.78
WF024	F02	WF024069	1.78	4/5/2002	Paulinella ovalis	61.94
WF024	F02	WF024069	1.78	4/5/2002	Phaeocystis pouchetii	12741.31
WF024	F02	WF024069	1.78	4/5/2002	Pleurosigma spp.	562.36
WF024	F02	WF024069	1.78	4/5/2002	Prorocentrum micans	826.31
WF024	F02	WF024069	1.78	4/5/2002	Protoperidinium bipes	4189.18
WF024	F02	WF024069	1.78	4/5/2002	Protoperidinium depressum	32247.41
WF024	F02	WF024069	1.78	4/5/2002	Rhizosolenia setigera	934.60
WF024	F02	WF024069	1.78	4/5/2002	Skeletonema costatum	920.01
WF024	F02	WF024069	1.78	4/5/2002	Thalassiosira sp. group 3 10-20 microns	141.71
WF024	F02	WF024069	1.78	4/5/2002	Unid. micro-phytoflag sp. group 1 length	29170.98
WF024	F06	WF0240A5	10.27	4/5/2002	Calycomonas wulffii	20.29
WF024	F06	WF0240A5	10.27	4/5/2002	Centric diatom sp. group 1 diam <10 micr	22.39
WF024	F06	WF0240A5	10.27	4/5/2002	Chaetoceros convolutus	322.83
WF024	F06	WF0240A5	10.27	4/5/2002	Cryptomonas sp. group 1 length <10 micro	517.82
WF024	F06	WF0240A5	10.27	4/5/2002	Cylindrotheca closterium	824.33
WF024	F06	WF0240A5	10.27	4/5/2002	Dactyliosolen fragilissimus	894.90
WF024	F06	WF0240A5	10.27	4/5/2002	Eucampia cornuta	1886.33
WF024	F06	WF0240A5	10.27	4/5/2002	Gymnodinium sp. group 1 5-20 microns wid	2024.41
WF024	F06	WF0240A5	10.27	4/5/2002	Gymnodinium sp. group 2 21-40 microns wi	2665.20
WF024	F06	WF0240A5	10.27	4/5/2002	Heterocapsa rotundata	56.91

Survey	Sta.	Sample Number	Depth (m)	Sampling Date	Plankton	Estimated Carbon Equivalence (ng Carbon/L)
WF024	F06	WF0240A5	10.27	4/5/2002	Phaeocystis pouchetii	3603.70
WF024	F06	WF0240A5	10.27	4/5/2002	Pseudonitzschia delicatissma complex	112.67
WF024	F06	WF0240A5	10.27	4/5/2002	Skeletonema costatum	128.59
WF024	F06	WF0240A5	10.27	4/5/2002	Thalassionema nitzschioides	28.06
WF024	F06	WF0240A5	10.27	4/5/2002	Thalassiosira sp. group 3 10-20 microns	106.96
WF024	F06	WF0240A5	10.27	4/5/2002	Unid. micro-phytoflag sp. group 1 length	42787.44
WF024	F06	WF0240A5	10.27	4/5/2002	Unid. micro-phytoflag sp. group 2 length	339.54
WF024	F06	WF0240A8	2.21	4/5/2002	Alexandrium spp.	150.06
WF024	F06	WF0240A8	2.21	4/5/2002	Calycomonas wulffii	22.09
WF024	F06	WF0240A8	2.21	4/5/2002	Chaetoceros convolutus	351.37
WF024	F06	WF0240A8	2.21	4/5/2002	Cocconeis scutellum	112.90
WF024	F06	WF0240A8	2.21	4/5/2002	Corethron criophilum	2234.18
WF024	F06	WF0240A8	2.21	4/5/2002	Cryptomonas sp. group 1 length <10 micro	430.99
WF024	F06	WF0240A8	2.21	4/5/2002	Cryptomonas sp. group 2 length >10 micro	487.46
WF024	F06	WF0240A8	2.21	4/5/2002	Cylindrotheca closterium	448.60
WF024	F06	WF0240A8	2.21	4/5/2002	Eucampia cornuta	2053.10
WF024	F06	WF0240A8	2.21	4/5/2002	Eutreptia/eutreptiella spp.	134.00
WF024	F06	WF0240A8	2.21	4/5/2002	Gymnodinium sp. group 1 5-20 microns wid	2518.15
WF024	F06	WF0240A8	2.21	4/5/2002	Gymnodinium sp. group 2 21-40 microns wi	13053.70
WF024	F06	WF0240A8	2.21	4/5/2002	Gyrodinium spirale	6383.48
WF024	F06	WF0240A8	2.21	4/5/2002	Heterocapsa rotundata	371.67
WF024	F06	WF0240A8	2.21	4/5/2002	Leptocylindrus minimus	25.47
WF024	F06	WF0240A8	2.21	4/5/2002	Pennate diatom sp. group 1 <10 microns l	18.86
WF024	F06	WF0240A8	2.21	4/5/2002	Phaeocystis pouchetii	6293.91
WF024	F06	WF0240A8	2.21	4/5/2002	Prorocentrum minimum	225.40
WF024	F06	WF0240A8	2.21	4/5/2002	Pseudonitzschia delicatissma complex	76.64
WF024	F06	WF0240A8	2.21	4/5/2002	Pseudonitzschia pungens	73.55
WF024	F06	WF0240A8	2.21	4/5/2002	Skeletonema costatum	251.93
WF024	F06	WF0240A8	2.21	4/5/2002	Thalassiosira sp. group 3 10-20 microns	38.80
WF024	F06	WF0240A8	2.21	4/5/2002	Unid. micro-phytoflag sp. group 1 length	53711.34
WF024	F31	WF0240F2	7.46	4/10/2002	Centric diatom sp. group 1 diam <10 micr	118.57
WF024	F31	WF0240F2	7.46	4/10/2002	Chaetoceros convolutus	273.49
WF024	F31	WF0240F2	7.46	4/10/2002	Chaetoceros decipiens	424.36
WF024	F31	WF0240F2	7.46	4/10/2002	Choanoflagellate spp.	58.18
WF024	F31	WF0240F2	7.46	4/10/2002	Cryptomonas sp. group 1 length <10 micro	893.94
WF024	F31	WF0240F2	7.46	4/10/2002	Cryptomonas sp. group 2 length >10 micro	711.40
WF024	F31	WF0240F2	7.46	4/10/2002	Cylindrotheca closterium	217.86
WF024	F31	WF0240F2	7.46	4/10/2002	Dactyliosolen fragilissimus	283.82
WF024	F31	WF0240F2	7.46	4/10/2002	Eucampia cornuta	997.08
WF024	F31	WF0240F2	7.46	4/10/2002	Eutreptia/eutreptiella spp.	225.98
WF024	F31	WF0240F2	7.46	4/10/2002	Gymnodinium sp. group 1 5-20 microns wid	4287.47
WF024	F31	WF0240F2	7.46	4/10/2002	Gymnodinium sp. group 2 21-40 microns wi	564.46

Survey	Sta.	Sample Number	Depth (m)	Sampling Date	Plankton	Estimated Carbon Equivalence (ng Carbon/L)
WF024	F31	WF0240F2	7.46	4/10/2002	Heterocapsa rotundata	662.95
WF024	F31	WF0240F2	7.46	4/10/2002	Leptocylindrus minimus	29.74
WF024	F31	WF0240F2	7.46	4/10/2002	Phaeocystis pouchetii	1597.44
WF024	F31	WF0240F2	7.46	4/10/2002	Prorocentrum minimum	43.86
WF024	F31	WF0240F2	7.46	4/10/2002	Pseudonitzschia delicatissma complex	47.72
WF024	F31	WF0240F2	7.46	4/10/2002	Pseudonitzschia pungens	71.56
WF024	F31	WF0240F2	7.46	4/10/2002	Skeletonema costatum	92.60
WF024	F31	WF0240F2	7.46	4/10/2002	Thalassionema nitzschioides	23.77
WF024	F31	WF0240F2	7.46	4/10/2002	Thalassiosira sp. group 3 10-20 microns	60.41
WF024	F31	WF0240F2	7.46	4/10/2002	Unid. micro-phytoflag sp. group 1 length	39133.64
WF024	F31	WF0240F2	7.46	4/10/2002	Unid. micro-phytoflag sp. group 2 length	359.55
WF024	F31	WF0240FF	2.03	4/10/2002	Calycomonas wulffii	41.17
WF024	F31	WF0240FF	2.03	4/10/2002	Centric diatom sp. group 1 diam <10 micr	22.72
WF024	F31	WF0240FF	2.03	4/10/2002	Chaetoceros compressus	1749.34
WF024	F31	WF0240FF	2.03	4/10/2002	Chaetoceros convolutus	655.01
WF024	F31	WF0240FF	2.03	4/10/2002	Chaetoceros debilis	1142.99
WF024	F31	WF0240FF	2.03	4/10/2002	Chaetoceros decipiens	5081.83
WF024	F31	WF0240FF	2.03	4/10/2002	Chaetoceros sp. group 2 diam 10-30 micro	3703.19
WF024	F31	WF0240FF	2.03	4/10/2002	Cryptomonas sp. group 1 length <10 micro	1821.82
WF024	F31	WF0240FF	2.03	4/10/2002	Cryptomonas sp. group 2 length >10 micro	454.36
WF024	F31	WF0240FF	2.03	4/10/2002	Cylindrotheca closterium	1254.40
WF024	F31	WF0240FF	2.03	4/10/2002	Dactyliosolen fragilissimus	2265.84
WF024	F31	WF0240FF	2.03	4/10/2002	Eucampia cornuta	54925.02
WF024	F31	WF0240FF	2.03	4/10/2002	Eucampia zoodiacus	10854.52
WF024	F31	WF0240FF	2.03	4/10/2002	Eutreptia/eutreptiella spp.	7161.02
WF024	F31	WF0240FF	2.03	4/10/2002	Gymnodinium sp. group 1 5-20 microns wid	2053.73
WF024	F31	WF0240FF	2.03	4/10/2002	Gymnodinium sp. group 2 21-40 microns wi	2703.80
WF024	F31	WF0240FF	2.03	4/10/2002	Gyrodinium spirale	11899.83
WF024	F31	WF0240FF	2.03	4/10/2002	Leptocylindrus minimus	285.41
WF024	F31	WF0240FF	2.03	4/10/2002	Pennate diatom sp. group 3 31-60 microns	127.94
WF024	F31	WF0240FF	2.03	4/10/2002	Phaeocystis pouchetii	3060.75
WF024	F31	WF0240FF	2.03	4/10/2002	Pleurosigma spp.	2300.43
WF024	F31	WF0240FF	2.03	4/10/2002	Pseudonitzschia delicatissma complex	171.45
WF024	F31	WF0240FF	2.03	4/10/2002	Skeletonema costatum	1435.01
WF024	F31	WF0240FF	2.03	4/10/2002	Stephanopyxis turris	15786.31
WF024	F31	WF0240FF	2.03	4/10/2002	Thalassionema nitzschioides	56.93
WF024	F31	WF0240FF	2.03	4/10/2002	Thalassiosira sp. group 3 10-20 microns	144.67
WF024	F31	WF0240FF	2.03	4/10/2002	Unid. micro-phytoflag sp. group 1 length	22983.59
WF024	F31	WF0240FF	2.03	4/10/2002	Unid. micro-phytoflag sp. group 2 length	344.46
WF024	F30	WF02410C	5.38	4/10/2002	Asterionella formosa	317.17
WF024	F30	WF02410C	5.38	4/10/2002	Calycomonas wulffii	22.04
WF024	F30	WF02410C	5.38	4/10/2002	Centric diatom sp. group 1 diam <10 micr	145.91

Survey	Sta.	Sample Number	Depth (m)	Sampling Date	Plankton	Estimated Carbon Equivalence (ng Carbon/L)
WF024	F30	WF02410C	5.38	4/10/2002	Cerataulina pelagica	870.32
WF024	F30	WF02410C	5.38	4/10/2002	Chaetoceros convolutus	438.23
WF024	F30	WF02410C	5.38	4/10/2002	Chaetoceros debilis	2064.70
WF024	F30	WF02410C	5.38	4/10/2002	Chaetoceros decipiens	815.99
WF024	F30	WF02410C	5.38	4/10/2002	Chaetoceros socialis	139.49
WF024	F30	WF02410C	5.38	4/10/2002	Chaetoceros sp. group 2 diam 10-30 micro	1734.31
WF024	F30	WF02410C	5.38	4/10/2002	Choanoflagellate spp.	59.67
WF024	F30	WF02410C	5.38	4/10/2002	Cryptomonas sp. group 1 length <10 micro	2688.62
WF024	F30	WF02410C	5.38	4/10/2002	Cryptomonas sp. group 2 length >10 micro	851.15
WF024	F30	WF02410C	5.38	4/10/2002	Cylindrotheca closterium	167.57
WF024	F30	WF02410C	5.38	4/10/2002	Dactyliosolen fragilissimus	242.55
WF024	F30	WF02410C	5.38	4/10/2002	Dictyocha speculum	87.72
WF024	F30	WF02410C	5.38	4/10/2002	Eucampia cornuta	11119.98
WF024	F30	WF02410C	5.38	4/10/2002	Eutreptia/eutreptiella spp.	1626.72
WF024	F30	WF02410C	5.38	4/10/2002	Guinardia delicatula	1323.97
WF024	F30	WF02410C	5.38	4/10/2002	Gymnodinium sp. group 1 5-20 microns wid	2198.44
WF024	F30	WF02410C	5.38	4/10/2002	Gymnodinium sp. group 2 21-40 microns wi	1447.16
WF024	F30	WF02410C	5.38	4/10/2002	Gyrodinium spirale	6369.17
WF024	F30	WF02410C	5.38	4/10/2002	Gyrosigma spp.	307.30
WF024	F30	WF02410C	5.38	4/10/2002	Heterocapsa rotundata	185.42
WF024	F30	WF02410C	5.38	4/10/2002	Leptocylindrus minimus	560.12
WF024	F30	WF02410C	5.38	4/10/2002	Licmophora spp.	267.88
WF024	F30	WF02410C	5.38	4/10/2002	Paralia sulcata	777.67
WF024	F30	WF02410C	5.38	4/10/2002	Paulinella ovalis	22.56
WF024	F30	WF02410C	5.38	4/10/2002	Pennate diatom sp. group 3 31-60 microns	274.38
WF024	F30	WF02410C	5.38	4/10/2002	Phaeocystis pouchetii	1547.20
WF024	F30	WF02410C	5.38	4/10/2002	Pseudonitzschia delicatissma complex	114.71
WF024	F30	WF02410C	5.38	4/10/2002	Pseudonitzschia pungens	18.35
WF024	F30	WF02410C	5.38	4/10/2002	Scenedesmus spp.	569.95
WF024	F30	WF02410C	5.38	4/10/2002	Skeletonema costatum	523.68
WF024	F30	WF02410C	5.38	4/10/2002	Stephanopyxis turris	6337.01
WF024	F30	WF02410C	5.38	4/10/2002	Thalassionema nitzschioides	121.89
WF024	F30	WF02410C	5.38	4/10/2002	Thalassiosira nordenskioldii	22.42
WF024	F30	WF02410C	5.38	4/10/2002	Thalassiosira rotula	805.45
WF024	F30	WF02410C	5.38	4/10/2002	Unid. micro-phytoflag sp. group 1 length	30632.11
WF024	F30	WF02410D	2	4/10/2002	Asterionella formosa	1215.12
WF024	F30	WF02410D	2	4/10/2002	Calycomonas wulffii	28.39
WF024	F30	WF02410D	2	4/10/2002	Centric diatom sp. group 1 diam <10 micr	203.68
WF024	F30	WF02410D	2	4/10/2002	Chaetoceros compressus	1206.44
WF024	F30	WF02410D	2	4/10/2002	Chaetoceros convolutus	301.15
WF024	F30	WF02410D	2	4/10/2002	Chaetoceros debilis	394.13
WF024	F30	WF02410D	2	4/10/2002	Chaetoceros decipiens	2336.47

Survey	Sta.	Sample Number	Depth (m)	Sampling Date	Plankton	Estimated Carbon Equivalence (ng Carbon/L)
WF024	F30	WF02410D	2	4/10/2002	Chaetoceros sp. group 2 diam 10-30 micro	638.48
WF024	F30	WF02410D	2	4/10/2002	Cryptomonas sp. group 1 length <10 micro	1597.98
WF024	F30	WF02410D	2	4/10/2002	Cryptomonas sp. group 2 length >10 micro	391.69
WF024	F30	WF02410D	2	4/10/2002	Cyanophyceae (nostoc-like 4um diam)	7.06
WF024	F30	WF02410D	2	4/10/2002	Cylindrotheca closterium	527.79
WF024	F30	WF02410D	2	4/10/2002	Eucampia cornuta	8015.05
WF024	F30	WF02410D	2	4/10/2002	Eutreptia/eutreptiella spp.	1665.35
WF024	F30	WF02410D	2	4/10/2002	Gymnodinium sp. group 1 5-20 microns wid	607.01
WF024	F30	WF02410D	2	4/10/2002	Gymnodinium sp. group 2 21-40 microns wi	1243.13
WF024	F30	WF02410D	2	4/10/2002	Gyrodinium spirale	32882.35
WF024	F30	WF02410D	2	4/10/2002	Heterocapsa rotundata	318.55
WF024	F30	WF02410D	2	4/10/2002	Leptocylindrus minimus	131.00
WF024	F30	WF02410D	2	4/10/2002	Paralia sulcata	291.77
WF024	F30	WF02410D	2	4/10/2002	Pennate diatom sp. group 2 10-30 microns	10.29
WF024	F30	WF02410D	2	4/10/2002	Pennate diatom sp. group 3 31-60 microns	58.83
WF024	F30	WF02410D	2	4/10/2002	Phaeocystis pouchetii	938.16
WF024	F30	WF02410D	2	4/10/2002	Pleurosigma spp.	263.97
WF024	F30	WF02410D	2	4/10/2002	Pseudonitzschia delicatissma complex	91.96
WF024	F30	WF02410D	2	4/10/2002	Pyramimonas sp. group 1 10-20 microns le	374.81
WF024	F30	WF02410D	2	4/10/2002	Scenedesmus spp.	45.82
WF024	F30	WF02410D	2	4/10/2002	Skeletonema costatum	413.86
WF024	F30	WF02410D	2	4/10/2002	Stephanopyxis turris	5443.56
WF024	F30	WF02410D	2	4/10/2002	Thalassionema nitzschioides	196.31
WF024	F30	WF02410D	2	4/10/2002	Thalassiosira nordenskioldii	12.84
WF024	F30	WF02410D	2	4/10/2002	Unid. micro-phytoflag sp. group 1 length	25267.04
WF024	F30	WF02410D	2	4/10/2002	Unid. micro-phytoflag sp. group 2 length	237.56
WF024	F26	WF024135	20.82	4/10/2002	Calycomonas wulffii	10.58
WF024	F26	WF024135	20.82	4/10/2002	Centric diatom sp. group 1 diam <10 micr	23.35
WF024	F26	WF024135	20.82	4/10/2002	Chaetoceros compressus	154.11
WF024	F26	WF024135	20.82	4/10/2002	Chaetoceros convolutus	192.34
WF024	F26	WF024135	20.82	4/10/2002	Chaetoceros debilis	293.68
WF024	F26	WF024135	20.82	4/10/2002	Chaetoceros decipiens	895.36
WF024	F26	WF024135	20.82	4/10/2002	Chaetoceros sp. group 2 diam 10-30 micro	339.82
WF024	F26	WF024135	20.82	4/10/2002	Choanoflagellate spp.	28.64
WF024	F26	WF024135	20.82	4/10/2002	Cryptomonas sp. group 1 length <10 micro	845.31
WF024	F26	WF024135	20.82	4/10/2002	Cryptomonas sp. group 2 length >10 micro	175.11
WF024	F26	WF024135	20.82	4/10/2002	Cylindrotheca closterium	2482.19
WF024	F26	WF024135	20.82	4/10/2002	Dactyliosolen fragilissimus	66.54
WF024	F26	WF024135	20.82	4/10/2002	Dictyocha speculum	48.13
WF024	F26	WF024135	20.82	4/10/2002	Gymnodinium sp. group 1 5-20 microns wid	1356.91
WF024	F26	WF024135	20.82	4/10/2002	Gymnodinium sp. group 2 21-40 microns wi	396.98
WF024	F26	WF024135	20.82	4/10/2002	Gyrodinium sp. group 1 5-20 microns widt	21.50

Survey	Sta.	Sample Number	Depth (m)	Sampling Date	Plankton	Estimated Carbon Equivalence (ng Carbon/L)
WF024	F26	WF024135	20.82	4/10/2002	Pennate diatom sp. group 2 10-30 microns	46.06
WF024	F26	WF024135	20.82	4/10/2002	Phaeocystis pouchetii	131.07
WF024	F26	WF024135	20.82	4/10/2002	Pleurosigma spp.	168.59
WF024	F26	WF024135	20.82	4/10/2002	Pseudonitzschia delicatissma complex	71.32
WF024	F26	WF024135	20.82	4/10/2002	Pyramimonas sp. group 1 10-20 microns le	55.76
WF024	F26	WF024135	20.82	4/10/2002	Skeletonema costatum	325.62
WF024	F26	WF024135	20.82	4/10/2002	Stephanopyxis turris	70113.55
WF024	F26	WF024135	20.82	4/10/2002	Thalassionema nitzschioides	33.44
WF024	F26	WF024135	20.82	4/10/2002	Thalassiosira nordenskioldii	28.69
WF024	F26	WF024135	20.82	4/10/2002	Thalassiosira rotula	589.20
WF024	F26	WF024135	20.82	4/10/2002	Thalassiosira sp. group 3 10-20 microns	191.17
WF024	F26	WF024135	20.82	4/10/2002	Unid. micro-phytoflag sp. group 1 length	15991.45
WF024	F26	WF024137	1.77	4/10/2002	Alexandrium tamarense	3.07
WF024	F26	WF024137	1.77	4/10/2002	Centric diatom sp. group 1 diam <10 micr	51.91
WF024	F26	WF024137	1.77	4/10/2002	Chaetoceros sp. group 2 diam 10-30 micro	1057.76
WF024	F26	WF024137	1.77	4/10/2002	Choanoflagellate spp.	42.46
WF024	F26	WF024137	1.77	4/10/2002	Cryptomonas sp. group 1 length <10 micro	618.70
WF024	F26	WF024137	1.77	4/10/2002	Cryptomonas sp. group 2 length >10 micro	173.04
WF024	F26	WF024137	1.77	4/10/2002	Cylindrotheca closterium	3020.57
WF024	F26	WF024137	1.77	4/10/2002	Eucampia cornuta	727.59
WF024	F26	WF024137	1.77	4/10/2002	Eutreptia/eutreptiella spp.	127.06
WF024	F26	WF024137	1.77	4/10/2002	Gymnodinium sp. group 1 5-20 microns wid	2011.26
WF024	F26	WF024137	1.77	4/10/2002	Gyrodinium spirale	36317.20
WF024	F26	WF024137	1.77	4/10/2002	Leptocylindrus minimus	36.17
WF024	F26	WF024137	1.77	4/10/2002	Pennate diatom sp. group 2 10-30 microns	34.08
WF024	F26	WF024137	1.77	4/10/2002	Phaeocystis pouchetii	323.80
WF024	F26	WF024137	1.77	4/10/2002	Prorocentrum minimum	160.03
WF024	F26	WF024137	1.77	4/10/2002	Pseudonitzschia delicatissma complex	174.12
WF024	F26	WF024137	1.77	4/10/2002	Skeletonema costatum	576.33
WF024	F26	WF024137	1.77	4/10/2002	Stephanopyxis turris	75152.27
WF024	F26	WF024137	1.77	4/10/2002	Thalassionema nitzschioides	173.75
WF024	F26	WF024137	1.77	4/10/2002	Thalassiosira nordenskioldii	63.80
WF024	F26	WF024137	1.77	4/10/2002	Thalassiosira sp. group 3 10-20 microns	220.40
WF024	F26	WF024137	1.77	4/10/2002	Unid. micro-phytoflag sp. group 1 length	9489.91
WF024	F26	WF024137	1.77	4/10/2002	Unid. micro-phytoflag sp. group 2 length	262.37
WF024	F27	WF024148	12.19	4/10/2002	Centric diatom sp. group 1 diam <10 micr	14.82
WF024	F27	WF024148	12.19	4/10/2002	Cryptomonas sp. group 1 length <10 micro	244.86
WF024	F27	WF024148	12.19	4/10/2002	Cylindrotheca closterium	681.01
WF024	F27	WF024148	12.19	4/10/2002	Gymnodinium sp. group 1 5-20 microns wid	1148.74
WF024	F27	WF024148	12.19	4/10/2002	Gymnodinium sp. group 2 21-40 microns wi	3528.83
WF024	F27	WF024148	12.19	4/10/2002	Gyrodinium sp. group 1 5-20 microns widt	286.70
WF024	F27	WF024148	12.19	4/10/2002	Gyrodinium spirale	31114.15

Survey	Sta.	Sample Number	Depth (m)	Sampling Date	Plankton	Estimated Carbon Equivalence (ng Carbon/L)
WF024	F27	WF024148	12.19	4/10/2002	Pennate diatom sp. group 2 10-30 microns	29.20
WF024	F27	WF024148	12.19	4/10/2002	Prorocentrum micans	550.52
WF024	F27	WF024148	12.19	4/10/2002	Pseudonitzschia delicatissma complex	18.65
WF024	F27	WF024148	12.19	4/10/2002	Skeletonema costatum	136.44
WF024	F27	WF024148	12.19	4/10/2002	Stephanopyxis turris	15478.51
WF024	F27	WF024148	12.19	4/10/2002	Thalassionema nitzschioides	111.45
WF024	F27	WF024148	12.19	4/10/2002	Thalassiosira sp. group 3 10-20 microns	141.62
WF024	F27	WF024148	12.19	4/10/2002	Unid. micro-phytoflag sp. group 1 length	8241.70
WF024	F27	WF024148	12.19	4/10/2002	Unid. micro-phytoflag sp. group 2 length	224.78
WF024	F27	WF024149	1.97	4/10/2002	Asterionellopsis glacialis	117.13
WF024	F27	WF024149	1.97	4/10/2002	Attheya septentrionalis	102.02
WF024	F27	WF024149	1.97	4/10/2002	Centric diatom sp. group 1 diam <10 micr	106.54
WF024	F27	WF024149	1.97	4/10/2002	Chaetoceros compressus	683.65
WF024	F27	WF024149	1.97	4/10/2002	Chaetoceros sp. group 2 diam 10-30 micro	723.61
WF024	F27	WF024149	1.97	4/10/2002	Cryptomonas sp. group 1 length <10 micro	953.91
WF024	F27	WF024149	1.97	4/10/2002	Cryptomonas sp. group 2 length >10 micro	266.35
WF024	F27	WF024149	1.97	4/10/2002	Cylindrotheca closterium	1631.34
WF024	F27	WF024149	1.97	4/10/2002	Detonula confervacea	679.89
WF024	F27	WF024149	1.97	4/10/2002	Eutreptia/eutreptiella spp.	97.79
WF024	F27	WF024149	1.97	4/10/2002	Gymnodinium sp. group 1 5-20 microns wid	2235.83
WF024	F27	WF024149	1.97	4/10/2002	Gymnodinium sp. group 2 21-40 microns wi	2113.31
WF024	F27	WF024149	1.97	4/10/2002	Gyrodinium sp. group 2 21-40 microns wid	1056.66
WF024	F27	WF024149	1.97	4/10/2002	Gyrodinium spirale	13975.00
WF024	F27	WF024149	1.97	4/10/2002	Heterocapsa rotundata	169.23
WF024	F27	WF024149	1.97	4/10/2002	Leptocylindrus minimus	18.56
WF024	F27	WF024149	1.97	4/10/2002	Licmophora spp.	48.82
WF024	F27	WF024149	1.97	4/10/2002	Pennate diatom sp. group 2 10-30 microns	87.43
WF024	F27	WF024149	1.97	4/10/2002	Prorocentrum minimum	246.73
WF024	F27	WF024149	1.97	4/10/2002	Protoperidinium bipes	278.11
WF024	F27	WF024149	1.97	4/10/2002	Pseudonitzschia delicatissma complex	156.34
WF024	F27	WF024149	1.97	4/10/2002	Skeletonema costatum	377.27
WF024	F27	WF024149	1.97	4/10/2002	Stephanopyxis turris	239062.79
WF024	F27	WF024149	1.97	4/10/2002	Thalassionema nitzschioides	133.49
WF024	F27	WF024149	1.97	4/10/2002	Thalassiosira nordenskioldii	87.29
WF024	F27	WF024149	1.97	4/10/2002	Thalassiosira sp. group 3 10-20 microns	254.43
WF024	F27	WF024149	1.97	4/10/2002	Unid. micro-phytoflag sp. group 1 length	8704.18
WF024	F27	WF024149	1.97	4/10/2002	Unid. micro-phytoflag sp. group 2 length	403.85
WF024	F25	WF0241B5	5.6	4/11/2002	Alexandrium tamarense	3.07
WF024	F25	WF0241B5	5.6	4/11/2002	Centric diatom sp. group 1 diam <10 micr	95.67
WF024	F25	WF0241B5	5.6	4/11/2002	Chaetoceros debilis	3008.28
WF024	F25	WF0241B5	5.6	4/11/2002	Chaetoceros decipiens	9630.08
WF024	F25	WF0241B5	5.6	4/11/2002	Chaetoceros sp. group 2 diam 10-30 micro	6834.10

Survey	Sta.	Sample Number	Depth (m)	Sampling Date	Plankton	Estimated Carbon Equivalence (ng Carbon/L)
WF024	F25	WF0241B5	5.6	4/11/2002	Cryptomonas sp. group 1 length <10 micro	1787.63
WF024	F25	WF0241B5	5.6	4/11/2002	Cryptomonas sp. group 2 length >10 micro	239.17
WF024	F25	WF0241B5	5.6	4/11/2002	Cylindrotheca closterium	2641.21
WF024	F25	WF0241B5	5.6	4/11/2002	Dactyliosolen fragilissimus	955.78
WF024	F25	WF0241B5	5.6	4/11/2002	Eucampia cornuta	49276.06
WF024	F25	WF0241B5	5.6	4/11/2002	Eutreptia/eutreptiella spp.	6925.34
WF024	F25	WF0241B5	5.6	4/11/2002	Gymnodinium sp. group 1 5-20 microns wid	1544.37
WF024	F25	WF0241B5	5.6	4/11/2002	Heterocapsa rotundata	182.35
WF024	F25	WF0241B5	5.6	4/11/2002	Leptocylindrus minimus	100.16
WF024	F25	WF0241B5	5.6	4/11/2002	Phaeocystis pouchetii	2416.72
WF024	F25	WF0241B5	5.6	4/11/2002	Pseudonitzschia delicatissma complex	391.08
WF024	F25	WF0241B5	5.6	4/11/2002	Skeletonema costatum	741.64
WF024	F25	WF0241B5	5.6	4/11/2002	Stephanopyxis turris	4154.88
WF024	F25	WF0241B5	5.6	4/11/2002	Thalassionema nitzschioides	120.07
WF024	F25	WF0241B5	5.6	4/11/2002	Thalassiosira rotula	5280.94
WF024	F25	WF0241B5	5.6	4/11/2002	Thalassiosira sp. group 3 10-20 microns	228.47
WF024	F25	WF0241B5	5.6	4/11/2002	Unid. micro-phytoflag sp. group 1 length	18506.85
WF024	F25	WF0241B7	2.04	4/11/2002	Calycomonas wulffii	59.11
WF024	F25	WF0241B7	2.04	4/11/2002	Centric diatom sp. group 1 diam <10 micr	152.22
WF024	F25	WF0241B7	2.04	4/11/2002	Chaetoceros compressus	1004.71
WF024	F25	WF0241B7	2.04	4/11/2002	Chaetoceros convolutus	1253.98
WF024	F25	WF0241B7	2.04	4/11/2002	Chaetoceros debilis	547.05
WF024	F25	WF0241B7	2.04	4/11/2002	Chaetoceros decipiens	13643.37
WF024	F25	WF0241B7	2.04	4/11/2002	Chaetoceros socialis	498.93
WF024	F25	WF0241B7	2.04	4/11/2002	Chaetoceros sp. group 2 diam 10-30 micro	2658.59
WF024	F25	WF0241B7	2.04	4/11/2002	Coscinodiscus sp. group 2 diam 40-100 mi	3398.77
WF024	F25	WF0241B7	2.04	4/11/2002	Cryptomonas sp. group 1 length <10 micro	1219.03
WF024	F25	WF0241B7	2.04	4/11/2002	Cryptomonas sp. group 2 length >10 micro	869.84
WF024	F25	WF0241B7	2.04	4/11/2002	Cylindrotheca closterium	800.49
WF024	F25	WF0241B7	2.04	4/11/2002	Dictyocha speculum	313.76
WF024	F25	WF0241B7	2.04	4/11/2002	Eucampia cornuta	59433.22
WF024	F25	WF0241B7	2.04	4/11/2002	Eutreptia/eutreptiella spp.	5738.82
WF024	F25	WF0241B7	2.04	4/11/2002	Gymnodinium sp. group 1 5-20 microns wid	1685.04
WF024	F25	WF0241B7	2.04	4/11/2002	Gyrodinium spirale	22819.94
WF024	F25	WF0241B7	2.04	4/11/2002	Heterocapsa rotundata	110.54
WF024	F25	WF0241B7	2.04	4/11/2002	Leptocylindrus minimus	204.55
WF024	F25	WF0241B7	2.04	4/11/2002	Phaeocystis pouchetii	8545.31
WF024	F25	WF0241B7	2.04	4/11/2002	Pseudonitzschia delicatissma complex	109.59
WF024	F25	WF0241B7	2.04	4/11/2002	Rhizosolenia setigera	1826.72
WF024	F25	WF0241B7	2.04	4/11/2002	Skeletonema costatum	799.20
WF024	F25	WF0241B7	2.04	4/11/2002	Stephanopyxis turris	11333.28
WF024	F25	WF0241B7	2.04	4/11/2002	Thalassionema nitzschioides	272.48

Survey	Sta.	Sample Number	Depth (m)	Sampling Date	Plankton	Estimated Carbon Equivalence (ng Carbon/L)
WF024	F25	WF0241B7	2.04	4/11/2002	Thalassiosira nordenskioldii	53.45
WF024	F25	WF0241B7	2.04	4/11/2002	Unid. micro-phytoflag sp. group 1 length	22490.55
WF024	F13	WF0241D2	15.04	4/11/2002	Attheya septentrionalis	45.23
WF024	F13	WF0241D2	15.04	4/11/2002	Calycomonas wulffii	64.31
WF024	F13	WF0241D2	15.04	4/11/2002	Centric diatom sp. group 1 diam <10 micr	165.59
WF024	F13	WF0241D2	15.04	4/11/2002	Chaetoceros compressus	546.47
WF024	F13	WF0241D2	15.04	4/11/2002	Chaetoceros convolutus	511.54
WF024	F13	WF0241D2	15.04	4/11/2002	Chaetoceros debilis	1487.72
WF024	F13	WF0241D2	15.04	4/11/2002	Chaetoceros decipiens	5820.81
WF024	F13	WF0241D2	15.04	4/11/2002	Chaetoceros socialis	226.14
WF024	F13	WF0241D2	15.04	4/11/2002	Chaetoceros sp. group 2 diam 10-30 micro	3374.08
WF024	F13	WF0241D2	15.04	4/11/2002	Cryptomonas sp. group 1 length <10 micro	1565.52
WF024	F13	WF0241D2	15.04	4/11/2002	Cryptomonas sp. group 2 length >10 micro	118.28
WF024	F13	WF0241D2	15.04	4/11/2002	Cylindrotheca closterium	435.40
WF024	F13	WF0241D2	15.04	4/11/2002	Detonula confervacea	362.31
WF024	F13	WF0241D2	15.04	4/11/2002	Dictyocha fibula	296.68
WF024	F13	WF0241D2	15.04	4/11/2002	Dictyocha speculum	170.65
WF024	F13	WF0241D2	15.04	4/11/2002	Ebria tripartita	346.34
WF024	F13	WF0241D2	15.04	4/11/2002	Eucampia cornuta	16411.84
WF024	F13	WF0241D2	15.04	4/11/2002	Eutreptia/eutreptiella spp.	1647.41
WF024	F13	WF0241D2	15.04	4/11/2002	Guinardia flaccida	6509.86
WF024	F13	WF0241D2	15.04	4/11/2002	Gymnodinium sp. group 1 5-20 microns wid	1833.02
WF024	F13	WF0241D2	15.04	4/11/2002	Gyrodinium spirale	12391.16
WF024	F13	WF0241D2	15.04	4/11/2002	Heterocapsa rotundata	420.85
WF024	F13	WF0241D2	15.04	4/11/2002	Leptocylindrus minimus	74.17
WF024	F13	WF0241D2	15.04	4/11/2002	Pennate diatom sp. group 2 10-30 microns	23.30
WF024	F13	WF0241D2	15.04	4/11/2002	Phaeocystis pouchetii	13545.26
WF024	F13	WF0241D2	15.04	4/11/2002	Pseudonitzschia delicatissma complex	238.04
WF024	F13	WF0241D2	15.04	4/11/2002	Skeletonema costatum	665.62
WF024	F13	WF0241D2	15.04	4/11/2002	Stephanopyxis turris	37047.97
WF024	F13	WF0241D2	15.04	4/11/2002	Thalassionema nitzschioides	177.84
WF024	F13	WF0241D2	15.04	4/11/2002	Thalassiosira nordenskioldii	29.07
WF024	F13	WF0241D2	15.04	4/11/2002	Thalassiosira rotula	4185.67
WF024	F13	WF0241D2	15.04	4/11/2002	Unid. micro-phytoflag sp. group 1 length	21799.95
WF024	F13	WF0241D4	2.03	4/11/2002	Calycomonas wulffii	24.31
WF024	F13	WF0241D4	2.03	4/11/2002	Centric diatom sp. group 1 diam <10 micr	80.50
WF024	F13	WF0241D4	2.03	4/11/2002	Chaetoceros compressus	413.25
WF024	F13	WF0241D4	2.03	4/11/2002	Chaetoceros convolutus	1547.34
WF024	F13	WF0241D4	2.03	4/11/2002	Chaetoceros decipiens	3001.23
WF024	F13	WF0241D4	2.03	4/11/2002	Chaetoceros sp. group 1 diam <10 microns	66.76
WF024	F13	WF0241D4	2.03	4/11/2002	Chaetoceros sp. group 2 diam 10-30 micro	3280.55
WF024	F13	WF0241D4	2.03	4/11/2002	Cryptomonas sp. group 1 length <10 micro	1546.00

Survey	Sta.	Sample Number	Depth (m)	Sampling Date	Plankton	Estimated Carbon Equivalence (ng Carbon/L)
WF024	F13	WF0241D4	2.03	4/11/2002	Cryptomonas sp. group 2 length >10 micro	402.50
WF024	F13	WF0241D4	2.03	4/11/2002	Cylindrotheca closterium	1232.63
WF024	F13	WF0241D4	2.03	4/11/2002	Detonula confervacea	410.98
WF024	F13	WF0241D4	2.03	4/11/2002	Eucampia cornuta	19180.56
WF024	F13	WF0241D4	2.03	4/11/2002	Eutreptia/eutreptiella spp.	3245.64
WF024	F13	WF0241D4	2.03	4/11/2002	Grammatophora marina	311.14
WF024	F13	WF0241D4	2.03	4/11/2002	Gymnodinium sp. group 1 5-20 microns wid	1386.17
WF024	F13	WF0241D4	2.03	4/11/2002	Gyrodinium spirale	21083.46
WF024	F13	WF0241D4	2.03	4/11/2002	Heterocapsa rotundata	272.79
WF024	F13	WF0241D4	2.03	4/11/2002	Leptocylindrus minimus	28.05
WF024	F13	WF0241D4	2.03	4/11/2002	Phaeocystis pouchetii	12653.34
WF024	F13	WF0241D4	2.03	4/11/2002	Prorocentrum minimum	497.14
WF024	F13	WF0241D4	2.03	4/11/2002	Pseudonitzschia delicatissma complex	236.26
WF024	F13	WF0241D4	2.03	4/11/2002	Pyramimonas sp. group 1 10-20 microns le	128.39
WF024	F13	WF0241D4	2.03	4/11/2002	Rhizosolenia setigera	1127.03
WF024	F13	WF0241D4	2.03	4/11/2002	Skeletonema costatum	416.04
WF024	F13	WF0241D4	2.03	4/11/2002	Stephanopyxis turris	30300.09
WF024	F13	WF0241D4	2.03	4/11/2002	Thalassionema nitzschioides	134.72
WF024	F13	WF0241D4	2.03	4/11/2002	Thalassiosira nordenskioldii	49.47
WF024	F13	WF0241D4	2.03	4/11/2002	Thalassiosira sp. group 3 10-20 microns	42.72
WF024	F13	WF0241D4	2.03	4/11/2002	Unid. micro-phytoflag sp. group 1 length	15522.38
WF024	F13	WF0241D4	2.03	4/11/2002	Unid. micro-phytoflag sp. group 2 length	406.86
WF024	F22	WF024201	8.51	4/11/2002	Calycomonas wulffii	17.98
WF024	F22	WF024201	8.51	4/11/2002	Centric diatom sp. group 1 diam <10 micr	138.89
WF024	F22	WF024201	8.51	4/11/2002	Chaetoceros compressus	1222.31
WF024	F22	WF024201	8.51	4/11/2002	Chaetoceros convolutus	1430.22
WF024	F22	WF024201	8.51	4/11/2002	Chaetoceros debilis	1497.44
WF024	F22	WF024201	8.51	4/11/2002	Chaetoceros decipiens	4438.51
WF024	F22	WF024201	8.51	4/11/2002	Chaetoceros sp. group 2 diam 10-30 micro	5660.20
WF024	F22	WF024201	8.51	4/11/2002	Cryptomonas sp. group 1 length <10 micro	494.35
WF024	F22	WF024201	8.51	4/11/2002	Cryptomonas sp. group 2 length >10 micro	694.47
WF024	F22	WF024201	8.51	4/11/2002	Cylindrotheca closterium	5478.01
WF024	F22	WF024201	8.51	4/11/2002	Detonula confervacea	3038.98
WF024	F22	WF024201	8.51	4/11/2002	Eucampia cornuta	6257.22
WF024	F22	WF024201	8.51	4/11/2002	Gymnodinium sp. group 1 5-20 microns wid	2049.99
WF024	F22	WF024201	8.51	4/11/2002	Leptocylindrus minimus	62.21
WF024	F22	WF024201	8.51	4/11/2002	Paulinella ovalis	18.41
WF024	F22	WF024201	8.51	4/11/2002	Pennate diatom sp. group 2 10-30 microns	117.24
WF024	F22	WF024201	8.51	4/11/2002	Phaeocystis pouchetii	20049.63
WF024	F22	WF024201	8.51	4/11/2002	Pseudonitzschia delicatissma complex	374.36
WF024	F22	WF024201	8.51	4/11/2002	Skeletonema costatum	615.28
WF024	F22	WF024201	8.51	4/11/2002	Stephanopyxis spp.	67.22

Survey	Sta.	Sample Number	Depth (m)	Sampling Date	Plankton	Estimated Carbon Equivalence (ng Carbon/L)
WF024	F22	WF024201	8.51	4/11/2002	Stephanopyxis turris	637690.56
WF024	F22	WF024201	8.51	4/11/2002	Thalassionema nitzschioides	697.31
WF024	F22	WF024201	8.51	4/11/2002	Thalassiosira nordenskioldii	292.62
WF024	F22	WF024201	8.51	4/11/2002	Thalassiosira rotula	17524.74
WF024	F22	WF024201	8.51	4/11/2002	Thalassiosira sp. group 3 10-20 microns	63.18
WF024	F22	WF024201	8.51	4/11/2002	Unid. micro-phytoflag sp. group 1 length	14260.54
WF024	F22	WF024202	2.24	4/11/2002	Asterionellopsis glacialis	197.52
WF024	F22	WF024202	2.24	4/11/2002	Centric diatom sp. group 1 diam <10 micr	67.37
WF024	F22	WF024202	2.24	4/11/2002	Chaetoceros convolutus	647.48
WF024	F22	WF024202	2.24	4/11/2002	Chaetoceros debilis	4527.00
WF024	F22	WF024202	2.24	4/11/2002	Chaetoceros decipiens	2009.37
WF024	F22	WF024202	2.24	4/11/2002	Chaetoceros sp. group 2 diam 10-30 micro	7321.25
WF024	F22	WF024202	2.24	4/11/2002	Cryptomonas sp. group 1 length <10 micro	786.79
WF024	F22	WF024202	2.24	4/11/2002	Cylindrotheca closterium	2888.42
WF024	F22	WF024202	2.24	4/11/2002	Detonula confervacea	689.05
WF024	F22	WF024202	2.24	4/11/2002	Eucampia cornuta	1891.65
WF024	F22	WF024202	2.24	4/11/2002	Eutreptia/eutreptiella spp.	1399.28
WF024	F22	WF024202	2.24	4/11/2002	Guinardia delicatula	1222.60
WF024	F22	WF024202	2.24	4/11/2002	Guinardia flaccida	12380.55
WF024	F22	WF024202	2.24	4/11/2002	Gymnodinium sp. group 1 5-20 microns wid	1740.11
WF024	F22	WF024202	2.24	4/11/2002	Gymnodinium sp. group 2 21-40 microns wi	10690.88
WF024	F22	WF024202	2.24	4/11/2002	Heterocapsa rotundata	856.11
WF024	F22	WF024202	2.24	4/11/2002	Pennate diatom sp. group 1 <10 microns l	34.69
WF024	F22	WF024202	2.24	4/11/2002	Phaeocystis pouchetii	16052.31
WF024	F22	WF024202	2.24	4/11/2002	Protoperidinium bipes	1409.26
WF024	F22	WF024202	2.24	4/11/2002	Pseudonitzschia delicatissma complex	396.11
WF024	F22	WF024202	2.24	4/11/2002	Pyramimonas sp. group 1 10-20 microns le	107.45
WF024	F22	WF024202	2.24	4/11/2002	Skeletonema costatum	412.66
WF024	F22	WF024202	2.24	4/11/2002	Stephanopyxis turris	631996.75
WF024	F22	WF024202	2.24	4/11/2002	Thalassionema nitzschioides	675.32
WF024	F22	WF024202	2.24	4/11/2002	Thalassiosira nordenskioldii	165.59
WF024	F22	WF024202	2.24	4/11/2002	Thalassiosira rotula	1983.41
WF024	F22	WF024202	2.24	4/11/2002	Thalassiosira sp. group 3 10-20 microns	858.07
WF024	F22	WF024202	2.24	4/11/2002	Unid. micro-phytoflag sp. group 1 length	16420.96
WF024	N16	WF02421C	12.04	4/11/2002	Amphidinium spp.	618.16
WF024	N16	WF02421C	12.04	4/11/2002	Calycomonas wulffii	45.43
WF024	N16	WF02421C	12.04	4/11/2002	Centric diatom sp. group 1 diam <10 micr	150.41
WF024	N16	WF02421C	12.04	4/11/2002	Chaetoceros convolutus	3131.98
WF024	N16	WF02421C	12.04	4/11/2002	Chaetoceros debilis	420.41
WF024	N16	WF02421C	12.04	4/11/2002	Chaetoceros decipiens	3364.52
WF024	N16	WF02421C	12.04	4/11/2002	Chaetoceros sp. group 2 diam 10-30 micro	1872.88
WF024	N16	WF02421C	12.04	4/11/2002	Cryptomonas sp. group 1 length <10 micro	2439.67

Survey	Sta.	Sample Number	Depth (m)	Sampling Date	Plankton	Estimated Carbon Equivalence (ng Carbon/L)
WF024	N16	WF02421C	12.04	4/11/2002	Cryptomonas sp. group 2 length >10 micro	125.34
WF024	N16	WF02421C	12.04	4/11/2002	Cylindrotheca closterium	844.46
WF024	N16	WF02421C	12.04	4/11/2002	Eucampia cornuta	6324.20
WF024	N16	WF02421C	12.04	4/11/2002	Eutreptia/eutreptiella spp.	214.39
WF024	N16	WF02421C	12.04	4/11/2002	Gymnodinium sp. group 1 5-20 microns wid	2266.18
WF024	N16	WF02421C	12.04	4/11/2002	Gymnodinium sp. group 2 21-40 microns wi	994.50
WF024	N16	WF02421C	12.04	4/11/2002	Gyrodinium spirale	8753.90
WF024	N16	WF02421C	12.04	4/11/2002	Heterocapsa rotundata	318.55
WF024	N16	WF02421C	12.04	4/11/2002	Leptocylindrus minimus	69.87
WF024	N16	WF02421C	12.04	4/11/2002	Pennate diatom sp. group 3 31-60 microns	47.06
WF024	N16	WF02421C	12.04	4/11/2002	Phaeocystis pouchetii	24767.42
WF024	N16	WF02421C	12.04	4/11/2002	Pseudonitzschia delicatissma complex	241.74
WF024	N16	WF02421C	12.04	4/11/2002	Skeletonema costatum	335.89
WF024	N16	WF02421C	12.04	4/11/2002	Stephanopyxis turris	68225.89
WF024	N16	WF02421C	12.04	4/11/2002	Thalassionema nitzschioides	209.40
WF024	N16	WF02421C	12.04	4/11/2002	Thalassiosira nordenskioldii	20.54
WF024	N16	WF02421C	12.04	4/11/2002	Thalassiosira sp. group 3 10-20 microns	266.07
WF024	N16	WF02421C	12.04	4/11/2002	Thalassiothrix longissima	501.92
WF024	N16	WF02421C	12.04	4/11/2002	Unid. micro-phytoflag sp. group 1 length	20653.06
WF024	N16	WF02421D	2.31	4/11/2002	Amphidinium spp.	404.52
WF024	N16	WF02421D	2.31	4/11/2002	Asterionella formosa	51.35
WF024	N16	WF02421D	2.31	4/11/2002	Calycomonas wulffii	14.86
WF024	N16	WF02421D	2.31	4/11/2002	Centric diatom sp. group 1 diam <10 micr	180.45
WF024	N16	WF02421D	2.31	4/11/2002	Chaetoceros atlanticus	1852.50
WF024	N16	WF02421D	2.31	4/11/2002	Chaetoceros convolutus	4737.65
WF024	N16	WF02421D	2.31	4/11/2002	Chaetoceros debilis	1134.83
WF024	N16	WF02421D	2.31	4/11/2002	Chaetoceros decipiens	4403.40
WF024	N16	WF02421D	2.31	4/11/2002	Chaetoceros socialis	470.46
WF024	N16	WF02421D	2.31	4/11/2002	Chaetoceros sp. group 2 diam 10-30 micro	1838.38
WF024	N16	WF02421D	2.31	4/11/2002	Chaetoceros subtilis	110.01
WF024	N16	WF02421D	2.31	4/11/2002	Cryptomonas sp. group 1 length <10 micro	2056.28
WF024	N16	WF02421D	2.31	4/11/2002	Cryptomonas sp. group 2 length >10 micro	574.14
WF024	N16	WF02421D	2.31	4/11/2002	Cylindrotheca closterium	1205.68
WF024	N16	WF02421D	2.31	4/11/2002	Dictyocha speculum	118.34
WF024	N16	WF02421D	2.31	4/11/2002	Eucampia cornuta	4483.35
WF024	N16	WF02421D	2.31	4/11/2002	Eutreptia/eutreptiella spp.	1262.65
WF024	N16	WF02421D	2.31	4/11/2002	Gymnodinium sp. group 1 5-20 microns wid	1059.26
WF024	N16	WF02421D	2.31	4/11/2002	Gyrodinium spirale	34370.64
WF024	N16	WF02421D	2.31	4/11/2002	Heterocapsa rotundata	1083.97
WF024	N16	WF02421D	2.31	4/11/2002	Leptocylindrus minimus	120.02
WF024	N16	WF02421D	2.31	4/11/2002	Pennate diatom sp. group 2 10-30 microns	16.15
WF024	N16	WF02421D	2.31	4/11/2002	Phaeocystis pouchetii	21057.46

Survey	Sta.	Sample Number	Depth (m)	Sampling Date	Plankton	Estimated Carbon Equivalence (ng Carbon/L)
WF024	N16	WF02421D	2.31	4/11/2002	Prorocentrum minimum	303.92
WF024	N16	WF02421D	2.31	4/11/2002	Pseudonitzschia delicatissma complex	443.62
WF024	N16	WF02421D	2.31	4/11/2002	Pseudonitzschia pungens	198.35
WF024	N16	WF02421D	2.31	4/11/2002	Skeletonema costatum	904.32
WF024	N16	WF02421D	2.31	4/11/2002	Stephanopyxis turris	37046.82
WF024	N16	WF02421D	2.31	4/11/2002	Thalassionema nitzschioides	143.88
WF024	N16	WF02421D	2.31	4/11/2002	Thalassiosira nordenskioldii	20.16
WF024	N16	WF02421D	2.31	4/11/2002	Thalassiosira sp. group 3 10-20 microns	156.70
WF024	N16	WF02421D	2.31	4/11/2002	Unid. micro-phytoflag sp. group 1 length	12570.28
WF024	F24	WF024345	9.57	4/11/2002	Centric diatom sp. group 1 diam <10 micr	174.06
WF024	F24	WF024345	9.57	4/11/2002	Chaetoceros convolutus	1117.10
WF024	F24	WF024345	9.57	4/11/2002	Chaetoceros debilis	486.52
WF024	F24	WF024345	9.57	4/11/2002	Chaetoceros decipiens	4326.19
WF024	F24	WF024345	9.57	4/11/2002	Chaetoceros sp. group 2 diam 10-30 micro	5516.96
WF024	F24	WF024345	9.57	4/11/2002	Chaetoceros spp.	281.55
WF024	F24	WF024345	9.57	4/11/2002	Cryptomonas sp. group 1 length <10 micro	647.48
WF024	F24	WF024345	9.57	4/11/2002	Cylindrotheca closterium	533.04
WF024	F24	WF024345	9.57	4/11/2002	Eucampia cornuta	11384.57
WF024	F24	WF024345	9.57	4/11/2002	Eutreptia/eutreptiella spp.	6663.32
WF024	F24	WF024345	9.57	4/11/2002	Gymnodinium sp. group 1 5-20 microns wid	7742.71
WF024	F24	WF024345	9.57	4/11/2002	Gymnodinium sp. group 2 21-40 microns wi	11508.81
WF024	F24	WF024345	9.57	4/11/2002	Heterocapsa rotundata	147.46
WF024	F24	WF024345	9.57	4/11/2002	Leptocylindrus minimus	80.85
WF024	F24	WF024345	9.57	4/11/2002	Pennate diatom sp. group 2 10-30 microns	38.09
WF024	F24	WF024345	9.57	4/11/2002	Phaeocystis pouchetii	2243.74
WF024	F24	WF024345	9.57	4/11/2002	Pseudonitzschia delicatissma complex	340.56
WF024	F24	WF024345	9.57	4/11/2002	Skeletonema costatum	488.65
WF024	F24	WF024345	9.57	4/11/2002	Stephanopyxis turris	36957.23
WF024	F24	WF024345	9.57	4/11/2002	Thalassionema nitzschioides	194.19
WF024	F24	WF024345	9.57	4/11/2002	Thalassiosira nordenskioldii	213.91
WF024	F24	WF024345	9.57	4/11/2002	Thalassiosira sp. group 3 10-20 microns	61.58
WF024	F24	WF024345	9.57	4/11/2002	Unid. micro-phytoflag sp. group 1 length	16369.65
WF024	F24	WF024347	2.05	4/11/2002	Calycomonas wulffii	45.68
WF024	F24	WF024347	2.05	4/11/2002	Centric diatom sp. group 1 diam <10 micr	478.89
WF024	F24	WF024347	2.05	4/11/2002	Chaetoceros convolutus	1816.77
WF024	F24	WF024347	2.05	4/11/2002	Chaetoceros debilis	951.08
WF024	F24	WF024347	2.05	4/11/2002	Chaetoceros decipiens	1127.62
WF024	F24	WF024347	2.05	4/11/2002	Chaetoceros sp. group 2 diam 10-30 micro	7189.98
WF024	F24	WF024347	2.05	4/11/2002	Cryptomonas sp. group 1 length <10 micro	431.72
WF024	F24	WF024347	2.05	4/11/2002	Cylindrotheca closterium	463.90
WF024	F24	WF024347	2.05	4/11/2002	Eucampia cornuta	19076.06
WF024	F24	WF024347	2.05	4/11/2002	Eutreptia/eutreptiella spp.	8222.05

Survey	Sta.	Sample Number	Depth (m)	Sampling Date	Plankton	Estimated Carbon Equivalence (ng Carbon/L)
WF024	F24	WF024347	2.05	4/11/2002	Guinardia delicatula	342.48
WF024	F24	WF024347	2.05	4/11/2002	Gymnodinium sp. group 1 5-20 microns wid	8137.65
WF024	F24	WF024347	2.05	4/11/2002	Gymnodinium sp. group 2 21-40 microns wi	5999.54
WF024	F24	WF024347	2.05	4/11/2002	Leptocylindrus minimus	79.03
WF024	F24	WF024347	2.05	4/11/2002	Pennate diatom sp. group 2 10-30 microns	99.29
WF024	F24	WF024347	2.05	4/11/2002	Phaeocystis pouchetii	10093.05
WF024	F24	WF024347	2.05	4/11/2002	Pseudonitzschia delicatissma complex	412.13
WF024	F24	WF024347	2.05	4/11/2002	Skeletonema costatum	231.58
WF024	F24	WF024347	2.05	4/11/2002	Stephanopyxis turris	43785.91
WF024	F24	WF024347	2.05	4/11/2002	Thalassionema nitzschioides	252.65
WF024	F24	WF024347	2.05	4/11/2002	Thalassiosira rotula	2226.12
WF024	F24	WF024347	2.05	4/11/2002	Unid. micro-phytoflag sp. group 1 length	22028.03
WF024	F23	WF02436D	11.42	4/12/2002	Centric diatom sp. group 1 diam <10 micr	49.26
WF024	F23	WF02436D	11.42	4/12/2002	Chaetoceros convolutus	1420.16
WF024	F23	WF02436D	11.42	4/12/2002	Chaetoceros debilis	3407.50
WF024	F23	WF02436D	11.42	4/12/2002	Chaetoceros decipiens	6610.94
WF024	F23	WF02436D	11.42	4/12/2002	Chaetoceros sp. group 2 diam 10-30 micro	4021.31
WF024	F23	WF02436D	11.42	4/12/2002	Chaetoceros subtilis	220.21
WF024	F23	WF02436D	11.42	4/12/2002	Cryptomonas sp. group 1 length <10 micro	1399.76
WF024	F23	WF02436D	11.42	4/12/2002	Cryptomonas sp. group 2 length >10 micro	369.42
WF024	F23	WF02436D	11.42	4/12/2002	Cylindrotheca closterium	678.79
WF024	F23	WF02436D	11.42	4/12/2002	Eucampia cornuta	17604.07
WF024	F23	WF02436D	11.42	4/12/2002	Eutreptia/eutreptiella spp.	3520.49
WF024	F23	WF02436D	11.42	4/12/2002	Gymnodinium sp. group 1 5-20 microns wid	954.18
WF024	F23	WF02436D	11.42	4/12/2002	Heterocapsa rotundata	125.18
WF024	F23	WF02436D	11.42	4/12/2002	Leptocylindrus minimus	205.92
WF024	F23	WF02436D	11.42	4/12/2002	Licmophora spp.	135.42
WF024	F23	WF02436D	11.42	4/12/2002	Paulinella ovalis	22.85
WF024	F23	WF02436D	11.42	4/12/2002	Pennate diatom sp. group 1 <10 microns l	38.11
WF024	F23	WF02436D	11.42	4/12/2002	Phaeocystis pouchetii	13180.22
WF024	F23	WF02436D	11.42	4/12/2002	Protoperidinium bipes	771.46
WF024	F23	WF02436D	11.42	4/12/2002	Pseudonitzschia delicatissma complex	434.41
WF024	F23	WF02436D	11.42	4/12/2002	Skeletonema costatum	1103.11
WF024	F23	WF02436D	11.42	4/12/2002	Stephanopyxis turris	25670.46
WF024	F23	WF02436D	11.42	4/12/2002	Thalassionema nitzschioides	185.15
WF024	F23	WF02436D	11.42	4/12/2002	Thalassiosira sp. group 3 10-20 microns	313.68
WF024	F23	WF02436D	11.42	4/12/2002	Unid. micro-phytoflag sp. group 1 length	18687.06
WF024	F23	WF02436F	1.92	4/12/2002	Asterionellopsis glacialis	199.81
WF024	F23	WF02436F	1.92	4/12/2002	Calycomonas wulffii	20.59
WF024	F23	WF02436F	1.92	4/12/2002	Centric diatom sp. group 1 diam <10 micr	113.59
WF024	F23	WF02436F	1.92	4/12/2002	Chaetoceros convolutus	1312.22
WF024	F23	WF02436F	1.92	4/12/2002	Chaetoceros debilis	857.24

Survey	Sta.	Sample Number	Depth (m)	Sampling Date	Plankton	Estimated Carbon Equivalence (ng Carbon/L)
WF024	F23	WF02436F	1.92	4/12/2002	Chaetoceros decipiens	5081.83
WF024	F23	WF02436F	1.92	4/12/2002	Chaetoceros sp. group 2 diam 10-30 micro	2777.39
WF024	F23	WF02436F	1.92	4/12/2002	Cryptomonas sp. group 1 length <10 micro	1379.63
WF024	F23	WF02436F	1.92	4/12/2002	Cryptomonas sp. group 2 length >10 micro	113.59
WF024	F23	WF02436F	1.92	4/12/2002	Cylindrotheca closterium	417.43
WF024	F23	WF02436F	1.92	4/12/2002	Eucampia cornuta	36775.88
WF024	F23	WF02436F	1.92	4/12/2002	Eutreptia/eutreptiella spp.	2581.30
WF024	F23	WF02436F	1.92	4/12/2002	Gymnodinium sp. group 1 5-20 microns wid	1173.56
WF024	F23	WF02436F	1.92	4/12/2002	Heterocapsa rotundata	57.74
WF024	F23	WF02436F	1.92	4/12/2002	Leptocylindrus minimus	71.23
WF024	F23	WF02436F	1.92	4/12/2002	Phaeocystis pouchetii	10287.51
WF024	F23	WF02436F	1.92	4/12/2002	Pseudonitzschia delicatissma complex	142.87
WF024	F23	WF02436F	1.92	4/12/2002	Skeletonema costatum	913.19
WF024	F23	WF02436F	1.92	4/12/2002	Thalassionema nitzschioides	626.24
WF024	F23	WF02436F	1.92	4/12/2002	Thalassiosira sp. group 3 10-20 microns	217.01
WF024	F23	WF02436F	1.92	4/12/2002	Unid. micro-phytoflag sp. group 1 length	20707.99
WF024	N04	WF0243AC	9.69	4/12/2002	Calycomonas wulffii	40.58
WF024	N04	WF0243AC	9.69	4/12/2002	Centric diatom sp. group 1 diam <10 micr	291.11
WF024	N04	WF0243AC	9.69	4/12/2002	Chaetoceros convolutus	3880.45
WF024	N04	WF0243AC	9.69	4/12/2002	Chaetoceros debilis	4514.26
WF024	N04	WF0243AC	9.69	4/12/2002	Chaetoceros decipiens	6011.13
WF024	N04	WF0243AC	9.69	4/12/2002	Chaetoceros sp. group 2 diam 10-30 micro	4106.61
WF024	N04	WF0243AC	9.69	4/12/2002	Cryptomonas sp. group 1 length <10 micro	2249.13
WF024	N04	WF0243AC	9.69	4/12/2002	Cryptomonas sp. group 2 length >10 micro	1791.47
WF024	N04	WF0243AC	9.69	4/12/2002	Cylindrotheca closterium	2880.30
WF024	N04	WF0243AC	9.69	4/12/2002	Ebria tripartita	655.72
WF024	N04	WF0243AC	9.69	4/12/2002	Eucampia cornuta	8003.44
WF024	N04	WF0243AC	9.69	4/12/2002	Eutreptia/eutreptiella spp.	492.47
WF024	N04	WF0243AC	9.69	4/12/2002	Gymnodinium sp. group 1 5-20 microns wid	867.60
WF024	N04	WF0243AC	9.69	4/12/2002	Gymnodinium sp. group 2 21-40 microns wi	2665.20
WF024	N04	WF0243AC	9.69	4/12/2002	Gyrodinium spirale	35189.83
WF024	N04	WF0243AC	9.69	4/12/2002	Heterocapsa rotundata	455.31
WF024	N04	WF0243AC	9.69	4/12/2002	Leptocylindrus minimus	140.67
WF024	N04	WF0243AC	9.69	4/12/2002	Licmophora spp.	123.13
WF024	N04	WF0243AC	9.69	4/12/2002	Pennate diatom sp. group 1 <10 microns l	17.33
WF024	N04	WF0243AC	9.69	4/12/2002	Pennate diatom sp. group 2 10-30 microns	176.43
WF024	N04	WF0243AC	9.69	4/12/2002	Phaeocystis pouchetii	37796.94
WF024	N04	WF0243AC	9.69	4/12/2002	Pleurosigma spp.	2267.58
WF024	N04	WF0243AC	9.69	4/12/2002	Pseudonitzschia delicatissma complex	338.00
WF024	N04	WF0243AC	9.69	4/12/2002	Pyramimonas sp. group 1 10-20 microns le	107.14
WF024	N04	WF0243AC	9.69	4/12/2002	Skeletonema costatum	205.75
WF024	N04	WF0243AC	9.69	4/12/2002	Stephanopyxis turris	163389.87

Survey	Sta.	Sample Number	Depth (m)	Sampling Date	Plankton	Estimated Carbon Equivalence (ng Carbon/L)
WF024	N04	WF0243AC	9.69	4/12/2002	Thalassionema nitzschioides	505.06
WF024	N04	WF0243AC	9.69	4/12/2002	Thalassiosira nordenskioldii	220.17
WF024	N04	WF0243AC	9.69	4/12/2002	Thalassiosira sp. group 3 10-20 microns	857.09
WF024	N04	WF0243AC	9.69	4/12/2002	Unid. micro-phytoflag sp. group 1 length	20356.28
WF024	N04	WF0243AE	1.84	4/12/2002	Calycomonas wulffii	40.07
WF024	N04	WF0243AE	1.84	4/12/2002	Centric diatom sp. group 1 diam <10 micr	552.79
WF024	N04	WF0243AE	1.84	4/12/2002	Chaetoceros convolutus	318.77
WF024	N04	WF0243AE	1.84	4/12/2002	Chaetoceros debilis	1390.62
WF024	N04	WF0243AE	1.84	4/12/2002	Chaetoceros decipiens	2967.76
WF024	N04	WF0243AE	1.84	4/12/2002	Chaetoceros socialis	2282.93
WF024	N04	WF0243AE	1.84	4/12/2002	Chaetoceros sp. group 2 diam 10-30 micro	8560.46
WF024	N04	WF0243AE	1.84	4/12/2002	Cryptomonas sp. group 1 length <10 micro	1239.54
WF024	N04	WF0243AE	1.84	4/12/2002	Cylindrotheca closterium	3255.83
WF024	N04	WF0243AE	1.84	4/12/2002	Detonula confervacea	678.47
WF024	N04	WF0243AE	1.84	4/12/2002	Dictyocha speculum	639.14
WF024	N04	WF0243AE	1.84	4/12/2002	Ebria tripartita	647.47
WF024	N04	WF0243AE	1.84	4/12/2002	Eucampia cornuta	8367.63
WF024	N04	WF0243AE	1.84	4/12/2002	Eutreptia/eutreptiella spp.	2269.30
WF024	N04	WF0243AE	1.84	4/12/2002	Gymnodinium sp. group 1 5-20 microns wid	2284.51
WF024	N04	WF0243AE	1.84	4/12/2002	Gyrodinium spirale	23203.77
WF024	N04	WF0243AE	1.84	4/12/2002	Heterocapsa rotundata	393.38
WF024	N04	WF0243AE	1.84	4/12/2002	Leptocylindrus minimus	184.88
WF024	N04	WF0243AE	1.84	4/12/2002	Paulinella ovalis	20.52
WF024	N04	WF0243AE	1.84	4/12/2002	Pennate diatom sp. group 2 10-30 microns	174.21
WF024	N04	WF0243AE	1.84	4/12/2002	Phaeocystis pouchetii	19695.16
WF024	N04	WF0243AE	1.84	4/12/2002	Prorocentrum minimum	204.49
WF024	N04	WF0243AE	1.84	4/12/2002	Pseudonitzschia delicatissma complex	611.87
WF024	N04	WF0243AE	1.84	4/12/2002	Skeletonema costatum	431.72
WF024	N04	WF0243AE	1.84	4/12/2002	Stephanopyxis turris	161334.65
WF024	N04	WF0243AE	1.84	4/12/2002	Thalassionema nitzschioides	332.47
WF024	N04	WF0243AE	1.84	4/12/2002	Thalassiosira nordenskioldii	81.52
WF024	N04	WF0243AE	1.84	4/12/2002	Thalassiosira sp. group 3 10-20 microns	141.05
WF024	N04	WF0243AE	1.84	4/12/2002	Unid. micro-phytoflag sp. group 1 length	18937.40
WF024	N18	WF024406	10.11	4/12/2002	Amphidinium spp.	518.52
WF024	N18	WF024406	10.11	4/12/2002	Calycomonas wulffii	38.11
WF024	N18	WF024406	10.11	4/12/2002	Chaetoceros convolutus	2728.20
WF024	N18	WF024406	10.11	4/12/2002	Chaetoceros sp. group 2 diam 10-30 micro	1713.82
WF024	N18	WF024406	10.11	4/12/2002	Cryptomonas sp. group 1 length <10 micro	3634.46
WF024	N18	WF024406	10.11	4/12/2002	Cryptomonas sp. group 2 length >10 micro	2207.87
WF024	N18	WF024406	10.11	4/12/2002	Cylindrotheca closterium	3477.32
WF024	N18	WF024406	10.11	4/12/2002	Detonula confervacea	1288.22
WF024	N18	WF024406	10.11	4/12/2002	Eucampia cornuta	6199.39

Survey	Sta.	Sample Number	Depth (m)	Sampling Date	Plankton	Estimated Carbon Equivalence (ng Carbon/L)
WF024	N18	WF024406	10.11	4/12/2002	Eutreptia/eutreptiella spp.	308.81
WF024	N18	WF024406	10.11	4/12/2002	Guinardia delicatula	285.72
WF024	N18	WF024406	10.11	4/12/2002	Gymnodinium sp. group 1 5-20 microns wid	1357.79
WF024	N18	WF024406	10.11	4/12/2002	Gyrodinium spirale	33043.08
WF024	N18	WF024406	10.11	4/12/2002	Heterocapsa rotundata	160.32
WF024	N18	WF024406	10.11	4/12/2002	Pennate diatom sp. group 2 10-30 microns	82.83
WF024	N18	WF024406	10.11	4/12/2002	Phaeocystis pouchetii	13299.34
WF024	N18	WF024406	10.11	4/12/2002	Pseudonitzschia delicatissma complex	317.91
WF024	N18	WF024406	10.11	4/12/2002	Skeletonema costatum	193.52
WF024	N18	WF024406	10.11	4/12/2002	Stephanopyxis spp.	142.47
WF024	N18	WF024406	10.11	4/12/2002	Stephanopyxis turris	916880.91
WF024	N18	WF024406	10.11	4/12/2002	Thalassionema nitzschioides	527.83
WF024	N18	WF024406	10.11	4/12/2002	Thalassiosira nordenskioldii	129.21
WF024	N18	WF024406	10.11	4/12/2002	Thalassiosira sp. group 3 10-20 microns	1071.27
WF024	N18	WF024406	10.11	4/12/2002	Unid. micro-phytoflag sp. group 1 length	16902.86
WF024	N18	WF024408	1.7	4/12/2002	Amphidinium spp.	299.62
WF024	N18	WF024408	1.7	4/12/2002	Calycomonas wulffii	66.17
WF024	N18	WF024408	1.7	4/12/2002	Centric diatom sp. group 1 diam <10 micr	170.39
WF024	N18	WF024408	1.7	4/12/2002	Chaetoceros convolutus	1403.65
WF024	N18	WF024408	1.7	4/12/2002	Chaetoceros sp. group 2 diam 10-30 micro	1487.96
WF024	N18	WF024408	1.7	4/12/2002	Choanoflagellate spp.	59.73
WF024	N18	WF024408	1.7	4/12/2002	Cryptomonas sp. group 1 length <10 micro	2046.80
WF024	N18	WF024408	1.7	4/12/2002	Cryptomonas sp. group 2 length >10 micro	1338.79
WF024	N18	WF024408	1.7	4/12/2002	Cylindrotheca closterium	1792.08
WF024	N18	WF024408	1.7	4/12/2002	Ebria tripartita	712.76
WF024	N18	WF024408	1.7	4/12/2002	Eucampia cornuta	2558.74
WF024	N18	WF024408	1.7	4/12/2002	Eutreptia/eutreptiella spp.	357.48
WF024	N18	WF024408	1.7	4/12/2002	Guinardia delicatula	661.50
WF024	N18	WF024408	1.7	4/12/2002	Guinardia flaccida	13419.73
WF024	N18	WF024408	1.7	4/12/2002	Gymnodinium sp. group 1 5-20 microns wid	943.08
WF024	N18	WF024408	1.7	4/12/2002	Gyrodinium spirale	25500.80
WF024	N18	WF024408	1.7	4/12/2002	Heterocapsa rotundata	866.10
WF024	N18	WF024408	1.7	4/12/2002	Pennate diatom sp. group 2 10-30 microns	192.10
WF024	N18	WF024408	1.7	4/12/2002	Phaeocystis pouchetii	7925.51
WF024	N18	WF024408	1.7	4/12/2002	Prorocentrum micans	1810.88
WF024	N18	WF024408	1.7	4/12/2002	Prorocentrum minimum	450.98
WF024	N18	WF024408	1.7	4/12/2002	Protoperidinium sp. group 1 10-30 micron	2295.99
WF024	N18	WF024408	1.7	4/12/2002	Pseudonitzschia delicatissma complex	184.01
WF024	N18	WF024408	1.7	4/12/2002	Skeletonema costatum	139.78
WF024	N18	WF024408	1.7	4/12/2002	Stephanopyxis spp.	123.70
WF024	N18	WF024408	1.7	4/12/2002	Stephanopyxis turris	761160.41
WF024	N18	WF024408	1.7	4/12/2002	Thalassionema nitzschioides	122.21

Survey	Sta.	Sample Number	Depth (m)	Sampling Date	Plankton	Estimated Carbon Equivalence (ng Carbon/L)
WF024	N18	WF024408	1.7	4/12/2002	Thalassiosira nordenskioldii	269.24
WF024	N18	WF024408	1.7	4/12/2002	Thalassiosira sp. group 3 10-20 microns	852.59
WF024	N18	WF024408	1.7	4/12/2002	Unid. micro-phytoflag sp. group 1 length	23346.32
WN025	N04	WN025078	24.36	5/1/2002	Centric diatom sp. group 1 diam <10 micr	119.60
WN025	N04	WN025078	24.36	5/1/2002	Chaetoceros socialis	73.17
WN025	N04	WN025078	24.36	5/1/2002	Chaetoceros sp. group 2 diam 10-30 micro	974.80
WN025	N04	WN025078	24.36	5/1/2002	Cryptomonas sp. group 1 length <10 micro	223.49
WN025	N04	WN025078	24.36	5/1/2002	Cylindrotheca closterium	1230.67
WN025	N04	WN025078	24.36	5/1/2002	Eucampia cornuta	201.16
WN025	N04	WN025078	24.36	5/1/2002	Eutreptia/eutreptiella spp.	17.54
WN025	N04	WN025078	24.36	5/1/2002	Gymnodinium sp. group 1 5-20 microns wid	1853.52
WN025	N04	WN025078	24.36	5/1/2002	Gymnodinium sp. group 2 21-40 microns wi	569.38
WN025	N04	WN025078	24.36	5/1/2002	Gyrodinium spirale	5011.89
WN025	N04	WN025078	24.36	5/1/2002	Pennate diatom sp. group 2 10-30 microns	9.42
WN025	N04	WN025078	24.36	5/1/2002	Pennate diatom sp. group 3 31-60 microns	53.89
WN025	N04	WN025078	24.36	5/1/2002	Phaeocystis pouchetii	4834.14
WN025	N04	WN025078	24.36	5/1/2002	Pseudonitzschia delicatissma complex	258.75
WN025	N04	WN025078	24.36	5/1/2002	Skeletonema costatum	76.92
WN025	N04	WN025078	24.36	5/1/2002	Stephanopyxis turris	112197.91
WN025	N04	WN025078	24.36	5/1/2002	Thalassionema nitzschioides	263.76
WN025	N04	WN025078	24.36	5/1/2002	Thalassiosira sp. group 3 10-20 microns	502.70
WN025	N04	WN025078	24.36	5/1/2002	Unid. micro-phytoflag sp. group 1 length	16712.49
WN025	N04	WN02507A	2.17	5/1/2002	Centric diatom sp. group 1 diam <10 micr	92.79
WN025	N04	WN02507A	2.17	5/1/2002	Chaetoceros decipiens	2421.64
WN025	N04	WN02507A	2.17	5/1/2002	Chaetoceros socialis	266.12
WN025	N04	WN02507A	2.17	5/1/2002	Chaetoceros sp. group 2 diam 10-30 micro	945.36
WN025	N04	WN02507A	2.17	5/1/2002	Chaetoceros subtilis	138.28
WN025	N04	WN02507A	2.17	5/1/2002	Choanoflagellate spp.	170.76
WN025	N04	WN02507A	2.17	5/1/2002	Cryptomonas sp. group 1 length <10 micro	379.29
WN025	N04	WN02507A	2.17	5/1/2002	Cylindrotheca closterium	852.50
WN025	N04	WN02507A	2.17	5/1/2002	Eucampia cornuta	975.41
WN025	N04	WN02507A	2.17	5/1/2002	Eutreptia/eutreptiella spp.	56.69
WN025	N04	WN02507A	2.17	5/1/2002	Gymnodinium sp. group 1 5-20 microns wid	2097.13
WN025	N04	WN02507A	2.17	5/1/2002	Heterocapsa rotundata	117.92
WN025	N04	WN02507A	2.17	5/1/2002	Phaeocystis pouchetii	4167.25
WN025	N04	WN02507A	2.17	5/1/2002	Pseudonitzschia delicatissma complex	797.55
WN025	N04	WN02507A	2.17	5/1/2002	Skeletonema costatum	71.05
WN025	N04	WN02507A	2.17	5/1/2002	Stephanopyxis turris	45673.18
WN025	N04	WN02507A	2.17	5/1/2002	Thalassionema nitzschioides	582.32
WN025	N04	WN02507A	2.17	5/1/2002	Thalassiosira rotula	1365.92
WN025	N04	WN02507A	2.17	5/1/2002	Thalassiosira sp. group 3 10-20 microns	369.33
WN025	N04	WN02507A	2.17	5/1/2002	Unid. micro-phytoflag sp. group 1 length	29162.40

Survey	Sta.	Sample Number	Depth (m)	Sampling Date	Plankton	Estimated Carbon Equivalence (ng Carbon/L)
WN025	N18	WN0250A7	12.13	5/1/2002	Centric diatom sp. group 1 diam <10 micr	79.39
WN025	N18	WN0250A7	12.13	5/1/2002	Chaetoceros debilis	237.77
WN025	N18	WN0250A7	12.13	5/1/2002	Chaetoceros socialis	115.66
WN025	N18	WN0250A7	12.13	5/1/2002	Chaetoceros sp. group 2 diam 10-30 micro	1463.68
WN025	N18	WN0250A7	12.13	5/1/2002	Choanoflagellate spp.	64.94
WN025	N18	WN0250A7	12.13	5/1/2002	Cryptomonas sp. group 1 length <10 micro	1050.86
WN025	N18	WN0250A7	12.13	5/1/2002	Cryptomonas sp. group 2 length >10 micro	132.32
WN025	N18	WN0250A7	12.13	5/1/2002	Cylindrotheca closterium	173.67
WN025	N18	WN0250A7	12.13	5/1/2002	Dictyocha speculum	109.10
WN025	N18	WN0250A7	12.13	5/1/2002	Dinophysis norvegica	961.71
WN025	N18	WN0250A7	12.13	5/1/2002	Eutreptia/eutreptiella spp.	41.57
WN025	N18	WN0250A7	12.13	5/1/2002	Gymnodinium sp. group 1 5-20 microns wid	341.78
WN025	N18	WN0250A7	12.13	5/1/2002	Gymnodinium sp. group 2 21-40 microns wi	449.97
WN025	N18	WN0250A7	12.13	5/1/2002	Heterocapsa rotundata	67.26
WN025	N18	WN0250A7	12.13	5/1/2002	Phaeocystis pouchetii	2278.03
WN025	N18	WN0250A7	12.13	5/1/2002	Pseudonitzschia delicatissma complex	28.53
WN025	N18	WN0250A7	12.13	5/1/2002	Pseudonitzschia pungens	11.41
WN025	N18	WN0250A7	12.13	5/1/2002	Stephanopyxis spp.	6.40
WN025	N18	WN0250A7	12.13	5/1/2002	Stephanopyxis turris	1970.38
WN025	N18	WN0250A7	12.13	5/1/2002	Thalassionema nitzschioides	28.42
WN025	N18	WN0250A7	12.13	5/1/2002	Thalassiosira sp. group 3 10-20 microns	36.12
WN025	N18	WN0250A7	12.13	5/1/2002	Unid. micro-phytoflag sp. group 1 length	15242.99
WN025	N18	WN0250A9	1.9	5/1/2002	Attheya septentrionalis	19.07
WN025	N18	WN0250A9	1.9	5/1/2002	Centric diatom sp. group 1 diam <10 micr	299.26
WN025	N18	WN0250A9	1.9	5/1/2002	Chaetoceros debilis	1254.70
WN025	N18	WN0250A9	1.9	5/1/2002	Chaetoceros decipiens	892.56
WN025	N18	WN0250A9	1.9	5/1/2002	Chaetoceros socialis	133.51
WN025	N18	WN0250A9	1.9	5/1/2002	Chaetoceros sp. group 2 diam 10-30 micro	1117.91
WN025	N18	WN0250A9	1.9	5/1/2002	Cryptomonas sp. group 1 length <10 micro	485.41
WN025	N18	WN0250A9	1.9	5/1/2002	Cylindrotheca closterium	320.76
WN025	N18	WN0250A9	1.9	5/1/2002	Eucampia cornuta	838.86
WN025	N18	WN0250A9	1.9	5/1/2002	Gymnodinium sp. group 1 5-20 microns wid	322.07
WN025	N18	WN0250A9	1.9	5/1/2002	Gymnodinium sp. group 2 21-40 microns wi	593.61
WN025	N18	WN0250A9	1.9	5/1/2002	Gyrodinium spirale	2612.58
WN025	N18	WN0250A9	1.9	5/1/2002	Phaeocystis pouchetii	3546.56
WN025	N18	WN0250A9	1.9	5/1/2002	Pseudonitzschia delicatissma complex	106.65
WN025	N18	WN0250A9	1.9	5/1/2002	Pseudonitzschia pungens	45.15
WN025	N18	WN0250A9	1.9	5/1/2002	Skeletonema costatum	11.46
WN025	N18	WN0250A9	1.9	5/1/2002	Stephanopyxis turris	17358.39
WN025	N18	WN0250A9	1.9	5/1/2002	Thalassionema nitzschioides	62.50
WN025	N18	WN0250A9	1.9	5/1/2002	Unid. micro-phytoflag sp. group 1 length	15362.80
WN026	N04	WN026075	24.26	5/22/2002	Centric diatom sp. group 1 diam <10 micr	96.09

Survey	Sta.	Sample Number	Depth (m)	Sampling Date	Plankton	Estimated Carbon Equivalence (ng Carbon/L)
WN026	N04	WN026075	24.26	5/22/2002	Cryptomonas sp. group 1 length <10 micro	304.99
WN026	N04	WN026075	24.26	5/22/2002	Eucampia cornuta	1011.81
WN026	N04	WN026075	24.26	5/22/2002	Eutreptia/eutreptiella spp.	58.70
WN026	N04	WN026075	24.26	5/22/2002	Gymnodinium sp. group 1 5-20 microns wid	930.75
WN026	N04	WN026075	24.26	5/22/2002	Paulinella ovalis	44.58
WN026	N04	WN026075	24.26	5/22/2002	Pennate diatom sp. group 2 10-30 microns	94.79
WN026	N04	WN026075	24.26	5/22/2002	Thalassionema nitzschioides	200.68
WN026	N04	WN026075	24.26	5/22/2002	Thalassiosira sp. group 3 10-20 microns	152.99
WN026	N04	WN026075	24.26	5/22/2002	Unid. micro-phytoflag sp. group 1 length	19491.72
WN026	N04	WN026075	24.26	5/22/2002	Unid. micro-phytoflag sp. group 2 length	728.51
WN026	N04	WN026077	2.04	5/22/2002	Amphidinium spp.	302.64
WN026	N04	WN026077	2.04	5/22/2002	Centric diatom sp. group 1 diam <10 micr	110.46
WN026	N04	WN026077	2.04	5/22/2002	Chaetoceros sp. group 2 diam 10-30 micro	500.98
WN026	N04	WN026077	2.04	5/22/2002	Cryptomonas sp. group 1 length <10 micro	637.02
WN026	N04	WN026077	2.04	5/22/2002	Eucampia cornuta	172.01
WN026	N04	WN026077	2.04	5/22/2002	Gymnodinium sp. group 1 5-20 microns wid	475.49
WN026	N04	WN026077	2.04	5/22/2002	Gymnodinium sp. group 2 21-40 microns wi	973.78
WN026	N04	WN026077	2.04	5/22/2002	Heterocapsa rotundata	10.38
WN026	N04	WN026077	2.04	5/22/2002	Paulinella ovalis	56.93
WN026	N04	WN026077	2.04	5/22/2002	Pseudonitzschia delicatissma complex	10.29
WN026	N04	WN026077	2.04	5/22/2002	Thalassionema nitzschioides	225.54
WN026	N04	WN026077	2.04	5/22/2002	Thalassiosira sp. group 3 10-20 microns	234.47
WN026	N04	WN026077	2.04	5/22/2002	Unid. micro-phytoflag sp. group 1 length	9343.05
WN026	N04	WN026077	2.04	5/22/2002	Unid. micro-phytoflag sp. group 2 length	186.09
WN026	N18	WN0260AD	10.75	5/22/2002	Centric diatom sp. group 1 diam <10 micr	171.82
WN026	N18	WN0260AD	10.75	5/22/2002	Cryptomonas sp. group 1 length <10 micro	186.02
WN026	N18	WN0260AD	10.75	5/22/2002	Dactyliosolen fragilissimus	367.22
WN026	N18	WN0260AD	10.75	5/22/2002	Gymnodinium sp. group 1 5-20 microns wid	1426.48
WN026	N18	WN0260AD	10.75	5/22/2002	Gyrodinium spirale	25714.57
WN026	N18	WN0260AD	10.75	5/22/2002	Heterocapsa rotundata	62.38
WN026	N18	WN0260AD	10.75	5/22/2002	Paulinella ovalis	11.39
WN026	N18	WN0260AD	10.75	5/22/2002	Pennate diatom sp. group 3 31-60 microns	69.12
WN026	N18	WN0260AD	10.75	5/22/2002	Pseudonitzschia delicatissma complex	30.93
WN026	N18	WN0260AD	10.75	5/22/2002	Thalassionema nitzschioides	184.53
WN026	N18	WN0260AD	10.75	5/22/2002	Thalassiosira sp. group 3 10-20 microns	136.78
WN026	N18	WN0260AD	10.75	5/22/2002	Unid. micro-phytoflag sp. group 1 length	7406.83
WN026	N18	WN0260AF	2.01	5/22/2002	Calycomonas wulffii	10.81
WN026	N18	WN0260AF	2.01	5/22/2002	Centric diatom sp. group 1 diam <10 micr	131.27
WN026	N18	WN0260AF	2.01	5/22/2002	Chaetoceros decipiens	2139.19
WN026	N18	WN0260AF	2.01	5/22/2002	Chaetoceros sp. group 2 diam 10-30 micro	487.14
WN026	N18	WN0260AF	2.01	5/22/2002	Cryptomonas sp. group 1 length <10 micro	80.70
WN026	N18	WN0260AF	2.01	5/22/2002	Cryptomonas sp. group 2 length >10 micro	59.67

Survey	Sta.	Sample Number	Depth (m)	Sampling Date	Plankton	Estimated Carbon Equivalence (ng Carbon/L)
WN026	N18	WN0260AF	2.01	5/22/2002	Cylindrotheca closterium	65.78
WN026	N18	WN0260AF	2.01	5/22/2002	Gymnodinium sp. group 1 5-20 microns wid	462.36
WN026	N18	WN0260AF	2.01	5/22/2002	Gyrodinium sp. group 1 5-20 microns widt	462.36
WN026	N18	WN0260AF	2.01	5/22/2002	Gyrodinium spirale	1250.20
WN026	N18	WN0260AF	2.01	5/22/2002	Paralia sulcata	95.24
WN026	N18	WN0260AF	2.01	5/22/2002	Paulinella ovalis	22.14
WN026	N18	WN0260AF	2.01	5/22/2002	Pennate diatom sp. group 2 10-30 microns	94.18
WN026	N18	WN0260AF	2.01	5/22/2002	Pseudonitzschia delicatissma complex	3.00
WN026	N18	WN0260AF	2.01	5/22/2002	Rhizosolenia setigera	200.49
WN026	N18	WN0260AF	2.01	5/22/2002	Skeletonema costatum	27.41
WN026	N18	WN0260AF	2.01	5/22/2002	Stephanopyxis turris	2902.40
WN026	N18	WN0260AF	2.01	5/22/2002	Thalassionema nitzschioides	436.63
WN026	N18	WN0260AF	2.01	5/22/2002	Thalassiosira sp. group 3 10-20 microns	76.00
WN026	N18	WN0260AF	2.01	5/22/2002	Unid. micro-phytoflag sp. group 1 length	8606.73
WN026	N18	WN0260AF	2.01	5/22/2002	Unid. micro-phytoflag sp. group 2 length	361.89
WF027	F01	WF027045	13.55	6/10/2002	Centric diatom sp. group 1 diam <10 micr	119.11
WF027	F01	WF027045	13.55	6/10/2002	Cerataulina pelagica	2046.13
WF027	F01	WF027045	13.55	6/10/2002	Ceratium fusus	846.72
WF027	F01	WF027045	13.55	6/10/2002	Chaetoceros sp. group 1 diam <10 microns	35.56
WF027	F01	WF027045	13.55	6/10/2002	Cryptomonas sp. group 1 length <10 micro	1910.40
WF027	F01	WF027045	13.55	6/10/2002	Cryptomonas sp. group 2 length >10 micro	476.45
WF027	F01	WF027045	13.55	6/10/2002	Cyclotella sp. group 1 diam <10 microns	70.18
WF027	F01	WF027045	13.55	6/10/2002	Cylindrotheca closterium	438.46
WF027	F01	WF027045	13.55	6/10/2002	Dactyliosolen fragilissimus	2475.20
WF027	F01	WF027045	13.55	6/10/2002	Gymnodinium sp. group 1 5-20 microns wid	1538.27
WF027	F01	WF027045	13.55	6/10/2002	Gymnodinium sp. group 2 21-40 microns wi	1701.15
WF027	F01	WF027045	13.55	6/10/2002	Heterocapsa rotundata	60.54
WF027	F01	WF027045	13.55	6/10/2002	Pennate diatom sp. group 1 <10 microns l	1.84
WF027	F01	WF027045	13.55	6/10/2002	Pennate diatom sp. group 2 10-30 microns	94.00
WF027	F01	WF027045	13.55	6/10/2002	Skeletonema costatum	109.62
WF027	F01	WF027045	13.55	6/10/2002	Thalassionema nitzschioides	107.46
WF027	F01	WF027045	13.55	6/10/2002	Thalassiosira sp. group 3 10-20 microns	106.20
WF027	F01	WF027045	13.55	6/10/2002	Unid. micro-phytoflag sp. group 1 length	14854.34
WF027	F01	WF027045	13.55	6/10/2002	Unid. micro-phytoflag sp. group 2 length	361.20
WF027	F01	WF027047	2.35	6/10/2002	Centric diatom sp. group 1 diam <10 micr	87.17
WF027	F01	WF027047	2.35	6/10/2002	Ceratium longipes	2574.57
WF027	F01	WF027047	2.35	6/10/2002	Cryptomonas sp. group 1 length <10 micro	661.70
WF027	F01	WF027047	2.35	6/10/2002	Cryptomonas sp. group 2 length >10 micro	163.44
WF027	F01	WF027047	2.35	6/10/2002	Ebria tripartita	127.62
WF027	F01	WF027047	2.35	6/10/2002	Gymnodinium sp. group 1 5-20 microns wid	562.87
WF027	F01	WF027047	2.35	6/10/2002	Thalassionema nitzschioides	65.53
WF027	F01	WF027047	2.35	6/10/2002	Thalassiosira sp. group 3 10-20 microns	13.88

Survey	Sta.	Sample Number	Depth (m)	Sampling Date	Plankton	Estimated Carbon Equivalence (ng Carbon/L)
WF027	F01	WF027047	2.35	6/10/2002	Unid. micro-phytoflag sp. group 1 length	16671.65
WF027	F02	WF027055	16.31	6/10/2002	Calycomonas wulffii	7.12
WF027	F02	WF027055	16.31	6/10/2002	Centric diatom sp. group 1 diam <10 micr	7.86
WF027	F02	WF027055	16.31	6/10/2002	Cryptomonas sp. group 1 length <10 micro	532.28
WF027	F02	WF027055	16.31	6/10/2002	Cryptomonas sp. group 2 length >10 micro	78.58
WF027	F02	WF027055	16.31	6/10/2002	Dinophysis norvegica	1199.33
WF027	F02	WF027055	16.31	6/10/2002	Guinardia flaccida	6487.40
WF027	F02	WF027055	16.31	6/10/2002	Gymnodinium sp. group 1 5-20 microns wid	101.48
WF027	F02	WF027055	16.31	6/10/2002	Heterocapsa rotundata	19.97
WF027	F02	WF027055	16.31	6/10/2002	Thalassionema nitzschioides	35.45
WF027	F02	WF027055	16.31	6/10/2002	Unid. micro-phytoflag sp. group 1 length	3286.26
WF027	F02	WF027057	2.33	6/10/2002	Calycomonas wulffii	11.68
WF027	F02	WF027057	2.33	6/10/2002	Centric diatom sp. group 1 diam <10 micr	38.66
WF027	F02	WF027057	2.33	6/10/2002	Cryptomonas sp. group 1 length <10 micro	555.96
WF027	F02	WF027057	2.33	6/10/2002	Cryptomonas sp. group 2 length >10 micro	64.44
WF027	F02	WF027057	2.33	6/10/2002	Gymnodinium sp. group 1 5-20 microns wid	166.44
WF027	F02	WF027057	2.33	6/10/2002	Gymnodinium sp. group 2 21-40 microns wi	1533.86
WF027	F02	WF027057	2.33	6/10/2002	Unid. micro-phytoflag sp. group 1 length	12683.51
WF027	F02	WF027057	2.33	6/10/2002	Unid. micro-phytoflag sp. group 2 length	195.41
WF027	F06	WF027090	11.54	6/10/2002	Calycomonas wulffii	19.75
WF027	F06	WF027090	11.54	6/10/2002	Centric diatom sp. group 1 diam <10 micr	348.67
WF027	F06	WF027090	11.54	6/10/2002	Ceratium fusus	1549.12
WF027	F06	WF027090	11.54	6/10/2002	Cryptomonas sp. group 1 length <10 micro	1747.58
WF027	F06	WF027090	11.54	6/10/2002	Cryptomonas sp. group 2 length >10 micro	108.96
WF027	F06	WF027090	11.54	6/10/2002	Cylindrotheca closterium	200.21
WF027	F06	WF027090	11.54	6/10/2002	Gymnodinium sp. group 1 5-20 microns wid	844.30
WF027	F06	WF027090	11.54	6/10/2002	Heterocapsa rotundata	110.77
WF027	F06	WF027090	11.54	6/10/2002	Pennate diatom sp. group 2 10-30 microns	85.99
WF027	F06	WF027090	11.54	6/10/2002	Thalassionema nitzschioides	65.53
WF027	F06	WF027090	11.54	6/10/2002	Thalassiosira sp. group 3 10-20 microns	278.02
WF027	F06	WF027090	11.54	6/10/2002	Unid. micro-phytoflag sp. group 1 length	18663.51
WF027	F06	WF027090	11.54	6/10/2002	Unid. micro-phytoflag sp. group 2 length	660.84
WF027	F06	WF027092	2.52	6/10/2002	Centric diatom sp. group 1 diam <10 micr	318.60
WF027	F06	WF027092	2.52	6/10/2002	Cryptomonas sp. group 1 length <10 micro	2381.36
WF027	F06	WF027092	2.52	6/10/2002	Cryptomonas sp. group 2 length >10 micro	1115.11
WF027	F06	WF027092	2.52	6/10/2002	Cylindrotheca closterium	175.63
WF027	F06	WF027092	2.52	6/10/2002	Dactyliosolen fragilissimus	1273.23
WF027	F06	WF027092	2.52	6/10/2002	Dinophysis norvegica	1620.89
WF027	F06	WF027092	2.52	6/10/2002	Guinardia flaccida	17564.93
WF027	F06	WF027092	2.52	6/10/2002	Gymnodinium sp. group 1 5-20 microns wid	2880.24
WF027	F06	WF027092	2.52	6/10/2002	Leptocylindrus minimus	39.96
WF027	F06	WF027092	2.52	6/10/2002	Protoperidinium bipes	199.60

Survey	Sta.	Sample Number	Depth (m)	Sampling Date	Plankton	Estimated Carbon Equivalence (ng Carbon/L)
WF027	F06	WF027092	2.52	6/10/2002	Thalassionema nitzschioides	223.56
WF027	F06	WF027092	2.52	6/10/2002	Thalassiosira sp. group 3 10-20 microns	203.24
WF027	F06	WF027092	2.52	6/10/2002	Unid. micro-phytoflag sp. group 1 length	27845.03
WF027	F06	WF027092	2.52	6/10/2002	Unid. micro-phytoflag sp. group 2 length	483.08
WF027	F31	WF0270D1	6.19	6/10/2002	Calycomonas wulffii	20.43
WF027	F31	WF0270D1	6.19	6/10/2002	Centric diatom sp. group 1 diam <10 micr	450.99
WF027	F31	WF0270D1	6.19	6/10/2002	Chaetoceros debilis	425.45
WF027	F31	WF0270D1	6.19	6/10/2002	Chaetoceros sp. group 2 diam 10-30 micro	2067.62
WF027	F31	WF0270D1	6.19	6/10/2002	Choanoflagellate spp.	55.33
WF027	F31	WF0270D1	6.19	6/10/2002	Cryptomonas sp. group 1 length <10 micro	280.91
WF027	F31	WF0270D1	6.19	6/10/2002	Cylindrotheca closterium	4557.73
WF027	F31	WF0270D1	6.19	6/10/2002	Dictyocha speculum	162.67
WF027	F31	WF0270D1	6.19	6/10/2002	Grammatophora marina	261.91
WF027	F31	WF0270D1	6.19	6/10/2002	Gymnodinium sp. group 1 5-20 microns wid	291.22
WF027	F31	WF0270D1	6.19	6/10/2002	Paulinella ovalis	62.76
WF027	F31	WF0270D1	6.19	6/10/2002	Pennate diatom sp. group 2 10-30 microns	88.98
WF027	F31	WF0270D1	6.19	6/10/2002	Skeletonema costatum	1644.52
WF027	F31	WF0270D1	6.19	6/10/2002	Thalassionema nitzschioides	2571.18
WF027	F31	WF0270D1	6.19	6/10/2002	Thalassiosira sp. group 3 10-20 microns	1795.04
WF027	F31	WF0270D1	6.19	6/10/2002	Unid. micro-phytoflag sp. group 1 length	12366.68
WF027	F31	WF0270D2	2.62	6/10/2002	Centric diatom sp. group 1 diam <10 micr	328.96
WF027	F31	WF0270D2	2.62	6/10/2002	Chaetoceros sp. group 2 diam 10-30 micro	2513.60
WF027	F31	WF0270D2	2.62	6/10/2002	Cryptomonas sp. group 1 length <10 micro	1264.60
WF027	F31	WF0270D2	2.62	6/10/2002	Cryptomonas sp. group 2 length >10 micro	205.60
WF027	F31	WF0270D2	2.62	6/10/2002	Cylindrotheca closterium	19455.83
WF027	F31	WF0270D2	2.62	6/10/2002	Ebria tripartita	602.03
WF027	F31	WF0270D2	2.62	6/10/2002	Gymnodinium sp. group 2 21-40 microns wi	2446.99
WF027	F31	WF0270D2	2.62	6/10/2002	Heterocapsa rotundata	365.78
WF027	F31	WF0270D2	2.62	6/10/2002	Paralia sulcata	984.56
WF027	F31	WF0270D2	2.62	6/10/2002	Paulinella ovalis	57.23
WF027	F31	WF0270D2	2.62	6/10/2002	Pennate diatom sp. group 2 10-30 microns	40.50
WF027	F31	WF0270D2	2.62	6/10/2002	Pennate diatom sp. group 3 31-60 microns	115.79
WF027	F31	WF0270D2	2.62	6/10/2002	Skeletonema costatum	5832.41
WF027	F31	WF0270D2	2.62	6/10/2002	Thalassionema nitzschioides	4997.80
WF027	F31	WF0270D2	2.62	6/10/2002	Thalassiosira sp. group 3 10-20 microns	5237.34
WF027	F31	WF0270D2	2.62	6/10/2002	Unid. micro-phytoflag sp. group 1 length	34393.14
WF027	F31	WF0270D2	2.62	6/10/2002	Unid. micro-phytoflag sp. group 2 length	935.22
WF027	F25	WF0270F2	6.76	6/11/2002	Centric diatom sp. group 1 diam <10 micr	413.23
WF027	F25	WF0270F2	6.76	6/11/2002	Chaetoceros sp. group 1 diam <10 microns	54.20
WF027	F25	WF0270F2	6.76	6/11/2002	Chaetoceros sp. group 2 diam 10-30 micro	886.32
WF027	F25	WF0270F2	6.76	6/11/2002	Cocconeis scutellum	100.74
WF027	F25	WF0270F2	6.76	6/11/2002	Cryptomonas sp. group 1 length <10 micro	338.67

Survey	Sta.	Sample Number	Depth (m)	Sampling Date	Plankton	Estimated Carbon Equivalence (ng Carbon/L)
WF027	F25	WF0270F2	6.76	6/11/2002	Cryptomonas sp. group 2 length >10 micro	108.74
WF027	F25	WF0270F2	6.76	6/11/2002	Cylindrotheca closterium	899.17
WF027	F25	WF0270F2	6.76	6/11/2002	Dactyliosolen fragilissimus	6953.18
WF027	F25	WF0270F2	6.76	6/11/2002	Ebria tripartita	318.42
WF027	F25	WF0270F2	6.76	6/11/2002	Grammatophora marina	63.05
WF027	F25	WF0270F2	6.76	6/11/2002	Gymnodinium sp. group 2 21-40 microns wi	1294.25
WF027	F25	WF0270F2	6.76	6/11/2002	Pennate diatom sp. group 2 10-30 microns	85.82
WF027	F25	WF0270F2	6.76	6/11/2002	Pennate diatom sp. group 3 31-60 microns	245.39
WF027	F25	WF0270F2	6.76	6/11/2002	Skeletonema costatum	212.32
WF027	F25	WF0270F2	6.76	6/11/2002	Thalassionema nitzschioides	2752.41
WF027	F25	WF0270F2	6.76	6/11/2002	Thalassiosira sp. group 3 10-20 microns	346.26
WF027	F25	WF0270F2	6.76	6/11/2002	Unid. micro-phytoflag sp. group 1 length	14814.22
WF027	F25	WF0270F6	2.33	6/11/2002	Centric diatom sp. group 1 diam <10 micr	174.34
WF027	F25	WF0270F6	2.33	6/11/2002	Chaetoceros sp. group 2 diam 10-30 micro	1184.09
WF027	F25	WF0270F6	2.33	6/11/2002	Cryptomonas sp. group 1 length <10 micro	520.31
WF027	F25	WF0270F6	2.33	6/11/2002	Cylindrotheca closterium	5472.39
WF027	F25	WF0270F6	2.33	6/11/2002	Dactyliosolen fragilissimus	3477.61
WF027	F25	WF0270F6	2.33	6/11/2002	Ebria tripartita	425.40
WF027	F25	WF0270F6	2.33	6/11/2002	Grammatophora marina	84.23
WF027	F25	WF0270F6	2.33	6/11/2002	Heterocapsa rotundata	73.85
WF027	F25	WF0270F6	2.33	6/11/2002	Skeletonema costatum	2135.71
WF027	F25	WF0270F6	2.33	6/11/2002	Thalassionema nitzschioides	4405.28
WF027	F25	WF0270F6	2.33	6/11/2002	Thalassiosira sp. group 3 10-20 microns	1434.05
WF027	F25	WF0270F6	2.33	6/11/2002	Unid. micro-phytoflag sp. group 1 length	13315.49
WF027	F13	WF027124	10.58	6/11/2002	Centric diatom sp. group 1 diam <10 micr	235.07
WF027	F13	WF027124	10.58	6/11/2002	Chaetoceros sp. group 2 diam 10-30 micro	3265.72
WF027	F13	WF027124	10.58	6/11/2002	Cryptomonas sp. group 1 length <10 micro	1530.69
WF027	F13	WF027124	10.58	6/11/2002	Cryptomonas sp. group 2 length >10 micro	213.70
WF027	F13	WF027124	10.58	6/11/2002	Cylindrotheca closterium	3337.60
WF027	F13	WF027124	10.58	6/11/2002	Dactyliosolen fragilissimus	4902.18
WF027	F13	WF027124	10.58	6/11/2002	Dictyocha speculum	154.16
WF027	F13	WF027124	10.58	6/11/2002	Ebria tripartita	312.87
WF027	F13	WF027124	10.58	6/11/2002	Gymnodinium sp. group 1 5-20 microns wid	827.94
WF027	F13	WF027124	10.58	6/11/2002	Gymnodinium sp. group 2 21-40 microns wi	3815.02
WF027	F13	WF027124	10.58	6/11/2002	Paulinella ovalis	59.48
WF027	F13	WF027124	10.58	6/11/2002	Prorocentrum minimum	98.81
WF027	F13	WF027124	10.58	6/11/2002	Skeletonema costatum	2491.09
WF027	F13	WF027124	10.58	6/11/2002	Thalassiosira sp. group 3 10-20 microns	340.22
WF027	F13	WF027124	10.58	6/11/2002	Unid. micro-phytoflag sp. group 1 length	15037.46
WF027	F13	WF027126	2.13	6/11/2002	Calycomonas wulffii	19.71
WF027	F13	WF027126	2.13	6/11/2002	Centric diatom sp. group 1 diam <10 micr	87.00
WF027	F13	WF027126	2.13	6/11/2002	Chaetoceros sp. group 2 diam 10-30 micro	738.60

Survey	Sta.	Sample Number	Depth (m)	Sampling Date	Plankton	Estimated Carbon Equivalence (ng Carbon/L)
WF027	F13	WF027126	2.13	6/11/2002	Cryptomonas sp. group 1 length <10 micro	728.13
WF027	F13	WF027126	2.13	6/11/2002	Cryptomonas sp. group 2 length >10 micro	108.74
WF027	F13	WF027126	2.13	6/11/2002	Cylindrotheca closterium	399.63
WF027	F13	WF027126	2.13	6/11/2002	Dactyliosolen fragilissimus	8966.11
WF027	F13	WF027126	2.13	6/11/2002	Ebria tripartita	212.28
WF027	F13	WF027126	2.13	6/11/2002	Guinardia delicatula	394.03
WF027	F13	WF027126	2.13	6/11/2002	Gymnodinium sp. group 1 5-20 microns wid	842.64
WF027	F13	WF027126	2.13	6/11/2002	Heterocapsa rotundata	55.28
WF027	F13	WF027126	2.13	6/11/2002	Licmophora spp.	239.58
WF027	F13	WF027126	2.13	6/11/2002	Protoperidinium bipes	227.09
WF027	F13	WF027126	2.13	6/11/2002	Skeletonema costatum	183.18
WF027	F13	WF027126	2.13	6/11/2002	Thalassionema nitzschioides	1725.93
WF027	F13	WF027126	2.13	6/11/2002	Thalassiosira sp. group 3 10-20 microns	115.42
WF027	F13	WF027126	2.13	6/11/2002	Unid. micro-phytoflag sp. group 1 length	14541.90
WF027	F13	WF027126	2.13	6/11/2002	Unid. micro-phytoflag sp. group 2 length	329.77
WF027	F22	WF027159	18.85	6/11/2002	Calycomonas wulffii	45.41
WF027	F22	WF027159	18.85	6/11/2002	Centric diatom sp. group 1 diam <10 micr	75.18
WF027	F22	WF027159	18.85	6/11/2002	Ceratium longipes	1480.25
WF027	F22	WF027159	18.85	6/11/2002	Cryptomonas sp. group 1 length <10 micro	1541.30
WF027	F22	WF027159	18.85	6/11/2002	Cryptomonas sp. group 2 length >10 micro	125.29
WF027	F22	WF027159	18.85	6/11/2002	Dinophysis norvegica	3187.12
WF027	F22	WF027159	18.85	6/11/2002	Gymnodinium sp. group 1 5-20 microns wid	323.62
WF027	F22	WF027159	18.85	6/11/2002	Paulinella ovalis	23.25
WF027	F22	WF027159	18.85	6/11/2002	Thalassionema nitzschioides	18.84
WF027	F22	WF027159	18.85	6/11/2002	Unid. micro-phytoflag sp. group 1 length	21837.71
WF027	F22	WF02715B	2.02	6/11/2002	Centric diatom sp. group 1 diam <10 micr	11.35
WF027	F22	WF02715B	2.02	6/11/2002	Cryptomonas sp. group 1 length <10 micro	865.81
WF027	F22	WF02715B	2.02	6/11/2002	Cryptomonas sp. group 2 length >10 micro	56.74
WF027	F22	WF02715B	2.02	6/11/2002	Eutreptia/eutreptiella spp.	8.32
WF027	F22	WF02715B	2.02	6/11/2002	Gymnodinium sp. group 1 5-20 microns wid	732.73
WF027	F22	WF02715B	2.02	6/11/2002	Paulinella ovalis	31.58
WF027	F22	WF02715B	2.02	6/11/2002	Pennate diatom sp. group 1 <10 microns l	8.78
WF027	F22	WF02715B	2.02	6/11/2002	Thalassionema nitzschioides	22.75
WF027	F22	WF02715B	2.02	6/11/2002	Unid. micro-phytoflag sp. group 1 length	17220.11
WF027	N16	WF02719D	12.22	6/11/2002	Centric diatom sp. group 1 diam <10 micr	22.46
WF027	N16	WF02719D	12.22	6/11/2002	Cryptomonas sp. group 1 length <10 micro	4406.34
WF027	N16	WF02719D	12.22	6/11/2002	Cryptomonas sp. group 2 length >10 micro	1459.78
WF027	N16	WF02719D	12.22	6/11/2002	Cylindrotheca closterium	20.63
WF027	N16	WF02719D	12.22	6/11/2002	Ebria tripartita	197.28
WF027	N16	WF02719D	12.22	6/11/2002	Gymnodinium sp. group 1 5-20 microns wid	580.08
WF027	N16	WF02719D	12.22	6/11/2002	Heterocapsa rotundata	1255.71
WF027	N16	WF02719D	12.22	6/11/2002	Paulinella ovalis	62.51

Survey	Sta.	Sample Number	Depth (m)	Sampling Date	Plankton	Estimated Carbon Equivalence (ng Carbon/L)
WF027	N16	WF02719D	12.22	6/11/2002	Thalassionema nitzschioides	196.98
WF027	N16	WF02719D	12.22	6/11/2002	Thalassiosira sp. group 3 10-20 microns	164.47
WF027	N16	WF02719D	12.22	6/11/2002	Thecate dinoflagellate spp.	425.92
WF027	N16	WF02719D	12.22	6/11/2002	Unid. micro-phytoflag sp. group 1 length	30763.30
WF027	N16	WF02719F	1.85	6/11/2002	Centric diatom sp. group 1 diam <10 micr	39.71
WF027	N16	WF02719F	1.85	6/11/2002	Cryptomonas sp. group 1 length <10 micro	669.82
WF027	N16	WF02719F	1.85	6/11/2002	Dactyliosolen fragilissimus	105.61
WF027	N16	WF02719F	1.85	6/11/2002	Ebria tripartita	77.51
WF027	N16	WF02719F	1.85	6/11/2002	Gymnodinium sp. group 1 5-20 microns wid	1538.39
WF027	N16	WF02719F	1.85	6/11/2002	Gymnodinium sp. group 2 21-40 microns wi	1260.21
WF027	N16	WF02719F	1.85	6/11/2002	Heterocapsa rotundata	134.55
WF027	N16	WF02719F	1.85	6/11/2002	Pennate diatom sp. group 2 10-30 microns	5.21
WF027	N16	WF02719F	1.85	6/11/2002	Protoperidinium pellucidum	9593.90
WF027	N16	WF02719F	1.85	6/11/2002	Thalassionema nitzschioides	72.97
WF027	N16	WF02719F	1.85	6/11/2002	Unid. micro-phytoflag sp. group 1 length	21544.10
WF027	F24	WF0271DC	5.49	6/11/2002	Centric diatom sp. group 1 diam <10 micr	335.88
WF027	F24	WF0271DC	5.49	6/11/2002	Chaetoceros sp. group 2 diam 10-30 micro	2105.84
WF027	F24	WF0271DC	5.49	6/11/2002	Cryptomonas sp. group 1 length <10 micro	1488.61
WF027	F24	WF0271DC	5.49	6/11/2002	Cryptomonas sp. group 2 length >10 micro	387.56
WF027	F24	WF0271DC	5.49	6/11/2002	Cylindrotheca closterium	1186.87
WF027	F24	WF0271DC	5.49	6/11/2002	Dactyliosolen fragilissimus	1032.52
WF027	F24	WF0271DC	5.49	6/11/2002	Dictyocha fibula	648.07
WF027	F24	WF0271DC	5.49	6/11/2002	Dinophysis norvegica	6572.29
WF027	F24	WF0271DC	5.49	6/11/2002	Ebria tripartita	2269.67
WF027	F24	WF0271DC	5.49	6/11/2002	Gymnodinium sp. group 1 5-20 microns wid	1001.03
WF027	F24	WF0271DC	5.49	6/11/2002	Heterocapsa rotundata	459.66
WF027	F24	WF0271DC	5.49	6/11/2002	Thalassionema nitzschioides	5762.59
WF027	F24	WF0271DC	5.49	6/11/2002	Thalassiosira sp. group 3 10-20 microns	2879.45
WF027	F24	WF0271DC	5.49	6/11/2002	Unid. micro-phytoflag sp. group 1 length	18892.91
WF027	F24	WF0271DC	5.49	6/11/2002	Unid. micro-phytoflag sp. group 2 length	391.75
WF027	F24	WF0271DD	1.73	6/11/2002	Centric diatom sp. group 1 diam <10 micr	453.89
WF027	F24	WF0271DD	1.73	6/11/2002	Chaetoceros debilis	3049.98
WF027	F24	WF0271DD	1.73	6/11/2002	Chaetoceros decipiens	1353.77
WF027	F24	WF0271DD	1.73	6/11/2002	Chaetoceros sp. group 2 diam 10-30 micro	6165.68
WF027	F24	WF0271DD	1.73	6/11/2002	Cryptomonas sp. group 1 length <10 micro	753.90
WF027	F24	WF0271DD	1.73	6/11/2002	Cryptomonas sp. group 2 length >10 micro	151.30
WF027	F24	WF0271DD	1.73	6/11/2002	Cylindrotheca closterium	5977.06
WF027	F24	WF0271DD	1.73	6/11/2002	Dactyliosolen fragilissimus	1509.02
WF027	F24	WF0271DD	1.73	6/11/2002	Ebria tripartita	443.02
WF027	F24	WF0271DD	1.73	6/11/2002	Guinardia delicatula	205.58
WF027	F24	WF0271DD	1.73	6/11/2002	Gymnodinium sp. group 1 5-20 microns wid	1172.36
WF027	F24	WF0271DD	1.73	6/11/2002	Heterocapsa rotundata	230.71

Survey	Sta.	Sample Number	Depth (m)	Sampling Date	Plankton	Estimated Carbon Equivalence (ng Carbon/L)
WF027	F24	WF0271DD	1.73	6/11/2002	Paulinella ovalis	28.07
WF027	F24	WF0271DD	1.73	6/11/2002	Pennate diatom sp. group 2 10-30 microns	119.40
WF027	F24	WF0271DD	1.73	6/11/2002	Pseudonitzschia pungens	45.66
WF027	F24	WF0271DD	1.73	6/11/2002	Skeletonema costatum	24158.91
WF027	F24	WF0271DD	1.73	6/11/2002	Thalassionema nitzschioides	4511.92
WF027	F24	WF0271DD	1.73	6/11/2002	Thalassiosira sp. group 3 10-20 microns	4817.56
WF027	F24	WF0271DD	1.73	6/11/2002	Unid. micro-phytoflag sp. group 1 length	14624.78
WF027	F30	WF027204	4.65	6/14/2002	Amylax triacantha	1974.18
WF027	F30	WF027204	4.65	6/14/2002	Centric diatom sp. group 1 diam <10 micr	269.15
WF027	F30	WF027204	4.65	6/14/2002	Chaetoceros sp. group 2 diam 10-30 micro	2746.72
WF027	F30	WF027204	4.65	6/14/2002	Cocconeis scutellum	416.28
WF027	F30	WF027204	4.65	6/14/2002	Cryptomonas sp. group 1 length <10 micro	2130.47
WF027	F30	WF027204	4.65	6/14/2002	Cryptomonas sp. group 2 length >10 micro	336.44
WF027	F30	WF027204	4.65	6/14/2002	Cylindrotheca closterium	12775.94
WF027	F30	WF027204	4.65	6/14/2002	Ebria tripartita	656.76
WF027	F30	WF027204	4.65	6/14/2002	Gymnodinium sp. group 1 5-20 microns wid	1737.98
WF027	F30	WF027204	4.65	6/14/2002	Paulinella ovalis	312.15
WF027	F30	WF027204	4.65	6/14/2002	Pennate diatom sp. group 2 10-30 microns	44.18
WF027	F30	WF027204	4.65	6/14/2002	Skeletonema costatum	6620.22
WF027	F30	WF027204	4.65	6/14/2002	Thalassionema nitzschioides	5171.11
WF027	F30	WF027204	4.65	6/14/2002	Thalassiosira sp. group 3 10-20 microns	2642.48
WF027	F30	WF027204	4.65	6/14/2002	Unid. micro-phytoflag sp. group 1 length	22860.11
WF027	F30	WF027205	1.96	6/14/2002	Calycomonas wulffii	66.05
WF027	F30	WF027205	1.96	6/14/2002	Centric diatom sp. group 1 diam <10 micr	607.46
WF027	F30	WF027205	1.96	6/14/2002	Chaetoceros sp. group 1 diam <10 microns	60.45
WF027	F30	WF027205	1.96	6/14/2002	Choanoflagellate spp.	59.62
WF027	F30	WF027205	1.96	6/14/2002	Cryptomonas sp. group 1 length <10 micro	2629.62
WF027	F30	WF027205	1.96	6/14/2002	Cryptomonas sp. group 2 length >10 micro	971.93
WF027	F30	WF027205	1.96	6/14/2002	Cylindrotheca closterium	4464.71
WF027	F30	WF027205	1.96	6/14/2002	Dactyliosolen fragilissimus	971.02
WF027	F30	WF027205	1.96	6/14/2002	Dinophysis norvegica	6180.83
WF027	F30	WF027205	1.96	6/14/2002	Ebria tripartita	2845.97
WF027	F30	WF027205	1.96	6/14/2002	Eutreptia/eutreptiella spp.	89.06
WF027	F30	WF027205	1.96	6/14/2002	Gymnodinium sp. group 1 5-20 microns wid	627.60
WF027	F30	WF027205	1.96	6/14/2002	Melosira sp. group 1 diam <20 microns	527.65
WF027	F30	WF027205	1.96	6/14/2002	Paulinella ovalis	157.81
WF027	F30	WF027205	1.96	6/14/2002	Pediastrum spp.	1585.42
WF027	F30	WF027205	1.96	6/14/2002	Pennate diatom sp. group 2 10-30 microns	47.86
WF027	F30	WF027205	1.96	6/14/2002	Skeletonema costatum	21747.60
WF027	F30	WF027205	1.96	6/14/2002	Thalassionema nitzschioides	5845.60
WF027	F30	WF027205	1.96	6/14/2002	Thalassiosira sp. group 3 10-20 microns	3017.42
WF027	F30	WF027205	1.96	6/14/2002	Unid. micro-phytoflag sp. group 1 length	24460.88

Survey	Sta.	Sample Number	Depth (m)	Sampling Date	Plankton	Estimated Carbon Equivalence (ng Carbon/L)
WF027	F30	WF027205	1.96	6/14/2002	Unid. micro-phytoflag sp. group 2 length	368.42
WF027	F26	WF027223	13.49	6/14/2002	Centric diatom sp. group 1 diam <10 micr	103.40
WF027	F26	WF027223	13.49	6/14/2002	Cocconeis scutellum	47.90
WF027	F26	WF027223	13.49	6/14/2002	Cryptomonas sp. group 1 length <10 micro	2234.13
WF027	F26	WF027223	13.49	6/14/2002	Dinophysis norvegica	6575.87
WF027	F26	WF027223	13.49	6/14/2002	Ebria tripartita	1516.48
WF027	F26	WF027223	13.49	6/14/2002	Gymnodinium sp. group 1 5-20 microns wid	667.71
WF027	F26	WF027223	13.49	6/14/2002	Heterocapsa rotundata	1116.92
WF027	F26	WF027223	13.49	6/14/2002	Paulinella ovalis	167.89
WF027	F26	WF027223	13.49	6/14/2002	Pennate diatom sp. group 2 10-30 microns	102.01
WF027	F26	WF027223	13.49	6/14/2002	Pennate diatom sp. group 3 31-60 microns	29.12
WF027	F26	WF027223	13.49	6/14/2002	Protoperidinium depressum	14985.56
WF027	F26	WF027223	13.49	6/14/2002	Thalassionema nitzschioides	259.13
WF027	F26	WF027223	13.49	6/14/2002	Thalassiosira sp. group 3 10-20 microns	329.26
WF027	F26	WF027223	13.49	6/14/2002	Unid. micro-phytoflag sp. group 1 length	26477.43
WF027	F26	WF027223	13.49	6/14/2002	Unid. micro-phytoflag sp. group 2 length	391.97
WF027	F26	WF027225	2.1	6/14/2002	Calycomonas wulffii	142.27
WF027	F26	WF027225	2.1	6/14/2002	Centric diatom sp. group 1 diam <10 micr	246.72
WF027	F26	WF027225	2.1	6/14/2002	Cocconeis scutellum	103.89
WF027	F26	WF027225	2.1	6/14/2002	Cryptomonas sp. group 1 length <10 micro	4260.94
WF027	F26	WF027225	2.1	6/14/2002	Cryptomonas sp. group 2 length >10 micro	897.17
WF027	F26	WF027225	2.1	6/14/2002	Ebria tripartita	328.38
WF027	F26	WF027225	2.1	6/14/2002	Gymnodinium sp. group 1 5-20 microns wid	1737.98
WF027	F26	WF027225	2.1	6/14/2002	Gyrodinium sp. group 1 5-20 microns widt	289.66
WF027	F26	WF027225	2.1	6/14/2002	Heterocapsa rotundata	1824.13
WF027	F26	WF027225	2.1	6/14/2002	Paulinella ovalis	145.67
WF027	F26	WF027225	2.1	6/14/2002	Pyramimonas sp. group 1 10-20 microns le	107.31
WF027	F26	WF027225	2.1	6/14/2002	Skeletonema costatum	103.21
WF027	F26	WF027225	2.1	6/14/2002	Thalassionema nitzschioides	2585.55
WF027	F26	WF027225	2.1	6/14/2002	Thalassiosira sp. group 3 10-20 microns	392.80
WF027	F26	WF027225	2.1	6/14/2002	Unid. micro-phytoflag sp. group 1 length	37295.11
WF027	F26	WF027225	2.1	6/14/2002	Unid. micro-phytoflag sp. group 2 length	1700.40
WF027	F27	WF027236	9.3	6/14/2002	Cryptomonas sp. group 1 length <10 micro	1822.94
WF027	F27	WF027236	9.3	6/14/2002	Cylindrotheca closterium	81.95
WF027	F27	WF027236	9.3	6/14/2002	Dictyocha speculum	64.35
WF027	F27	WF027236	9.3	6/14/2002	Gyrodinium spirale	2336.07
WF027	F27	WF027236	9.3	6/14/2002	Heterocapsa rotundata	170.02
WF027	F27	WF027236	9.3	6/14/2002	Leptocylindrus minimus	27.97
WF027	F27	WF027236	9.3	6/14/2002	Skeletonema costatum	10.24
WF027	F27	WF027236	9.3	6/14/2002	Thalassionema nitzschioides	245.88
WF027	F27	WF027236	9.3	6/14/2002	Thalassiosira sp. group 3 10-20 microns	71.00
WF027	F27	WF027236	9.3	6/14/2002	Unid. micro-phytoflag sp. group 1 length	17924.89

Survey	Sta.	Sample Number	Depth (m)	Sampling Date	Plankton	Estimated Carbon Equivalence (ng Carbon/L)
WF027	F27	WF027237	1.94	6/14/2002	Calycomonas wulffii	45.73
WF027	F27	WF027237	1.94	6/14/2002	Centric diatom sp. group 1 diam <10 micr	75.70
WF027	F27	WF027237	1.94	6/14/2002	Cryptomonas sp. group 1 length <10 micro	2436.07
WF027	F27	WF027237	1.94	6/14/2002	Ebria tripartita	147.77
WF027	F27	WF027237	1.94	6/14/2002	Gymnodinium sp. group 1 5-20 microns wid	1955.22
WF027	F27	WF027237	1.94	6/14/2002	Gymnodinium sp. group 2 21-40 microns wi	600.63
WF027	F27	WF027237	1.94	6/14/2002	Leptocylindrus minimus	10.55
WF027	F27	WF027237	1.94	6/14/2002	Paulinella ovalis	70.23
WF027	F27	WF027237	1.94	6/14/2002	Pseudonitzschia delicatissma complex	6.35
WF027	F27	WF027237	1.94	6/14/2002	Skeletonema costatum	116.11
WF027	F27	WF027237	1.94	6/14/2002	Thalassionema nitzschioides	341.46
WF027	F27	WF027237	1.94	6/14/2002	Unid. micro-phytoflag sp. group 1 length	33173.84
WF027	F27	WF027237	1.94	6/14/2002	Unid. micro-phytoflag sp. group 2 length	382.59
WF027	F23	WF0272A1	12.58	6/18/2002	Centric diatom sp. group 1 diam <10 micr	315.79
WF027	F23	WF0272A1	12.58	6/18/2002	Cocconeis scutellum	488.41
WF027	F23	WF0272A1	12.58	6/18/2002	Cryptomonas sp. group 1 length <10 micro	1598.13
WF027	F23	WF0272A1	12.58	6/18/2002	Cylindrotheca closterium	6769.56
WF027	F23	WF0272A1	12.58	6/18/2002	Dactyliosolen fragilissimus	3154.93
WF027	F23	WF0272A1	12.58	6/18/2002	Ebria tripartita	3087.45
WF027	F23	WF0272A1	12.58	6/18/2002	Paulinella ovalis	268.57
WF027	F23	WF0272A1	12.58	6/18/2002	Pennate diatom sp. group 3 31-60 microns	296.91
WF027	F23	WF0272A1	12.58	6/18/2002	Pseudonitzschia delicatissma complex	33.10
WF027	F23	WF0272A1	12.58	6/18/2002	Skeletonema costatum	5802.86
WF027	F23	WF0272A1	12.58	6/18/2002	Thalassionema nitzschioides	2835.73
WF027	F23	WF0272A1	12.58	6/18/2002	Thalassiosira sp. group 3 10-20 microns	418.97
WF027	F23	WF0272A1	12.58	6/18/2002	Unid. micro-phytoflag sp. group 1 length	26689.47
WF027	F23	WF0272A1	12.58	6/18/2002	Unid. micro-phytoflag sp. group 2 length	399.01
WF027	F23	WF0272A3	1.77	6/18/2002	Calycomonas wulffii	82.75
WF027	F23	WF0272A3	1.77	6/18/2002	Centric diatom sp. group 1 diam <10 micr	342.45
WF027	F23	WF0272A3	1.77	6/18/2002	Cryptomonas sp. group 1 length <10 micro	2826.18
WF027	F23	WF0272A3	1.77	6/18/2002	Cryptomonas sp. group 2 length >10 micro	114.15
WF027	F23	WF0272A3	1.77	6/18/2002	Cylindrotheca closterium	4614.35
WF027	F23	WF0272A3	1.77	6/18/2002	Dactyliosolen fragilissimus	4561.68
WF027	F23	WF0272A3	1.77	6/18/2002	Ebria tripartita	334.25
WF027	F23	WF0272A3	1.77	6/18/2002	Eutreptia/eutreptiella spp.	41.84
WF027	F23	WF0272A3	1.77	6/18/2002	Gymnodinium sp. group 1 5-20 microns wid	2358.68
WF027	F23	WF0272A3	1.77	6/18/2002	Paulinella ovalis	508.35
WF027	F23	WF0272A3	1.77	6/18/2002	Pennate diatom sp. group 2 10-30 microns	90.08
WF027	F23	WF0272A3	1.77	6/18/2002	Pseudonitzschia delicatissma complex	14.36
WF027	F23	WF0272A3	1.77	6/18/2002	Skeletonema costatum	4142.70
WF027	F23	WF0272A3	1.77	6/18/2002	Thalassionema nitzschioides	1744.95
WF027	F23	WF0272A3	1.77	6/18/2002	Thalassiosira sp. group 3 10-20 microns	218.08

Survey	Sta.	Sample Number	Depth (m)	Sampling Date	Plankton	Estimated Carbon Equivalence (ng Carbon/L)
WF027	F23	WF0272A3	1.77	6/18/2002	Unid. micro-phytoflag sp. group 1 length	24640.41
WF027	N04	WF0272E6	8.59	6/18/2002	Centric diatom sp. group 1 diam <10 micr	115.16
WF027	N04	WF0272E6	8.59	6/18/2002	Corethron criophilum	2412.75
WF027	N04	WF0272E6	8.59	6/18/2002	Cryptomonas sp. group 1 length <10 micro	1729.11
WF027	N04	WF0272E6	8.59	6/18/2002	Cryptomonas sp. group 2 length >10 micro	82.25
WF027	N04	WF0272E6	8.59	6/18/2002	Cylindrotheca closterium	60.46
WF027	N04	WF0272E6	8.59	6/18/2002	Dactyliosolen fragilissimus	131.26
WF027	N04	WF0272E6	8.59	6/18/2002	Dinophysis norvegica	1673.86
WF027	N04	WF0272E6	8.59	6/18/2002	Gymnodinium sp. group 1 5-20 microns wid	212.45
WF027	N04	WF0272E6	8.59	6/18/2002	Heterocapsa rotundata	710.77
WF027	N04	WF0272E6	8.59	6/18/2002	Skeletonema costatum	15.11
WF027	N04	WF0272E6	8.59	6/18/2002	Thalassionema nitzschioides	329.81
WF027	N04	WF0272E6	8.59	6/18/2002	Unid. micro-phytoflag sp. group 1 length	16766.88
WF027	N04	WF0272E6	8.59	6/18/2002	Unid. micro-phytoflag sp. group 2 length	249.43
WF027	N04	WF0272E7	2.34	6/18/2002	Centric diatom sp. group 1 diam <10 micr	115.63
WF027	N04	WF0272E7	2.34	6/18/2002	Cryptomonas sp. group 1 length <10 micro	517.64
WF027	N04	WF0272E7	2.34	6/18/2002	Cryptomonas sp. group 2 length >10 micro	96.35
WF027	N04	WF0272E7	2.34	6/18/2002	Dactyliosolen fragilissimus	385.06
WF027	N04	WF0272E7	2.34	6/18/2002	Gymnodinium sp. group 1 5-20 microns wid	1617.69
WF027	N04	WF0272E7	2.34	6/18/2002	Gymnodinium sp. group 2 21-40 microns wi	458.71
WF027	N04	WF0272E7	2.34	6/18/2002	Paulinella ovalis	8.94
WF027	N04	WF0272E7	2.34	6/18/2002	Prorocentrum minimum	535.55
WF027	N04	WF0272E7	2.34	6/18/2002	Skeletonema costatum	8.85
WF027	N04	WF0272E7	2.34	6/18/2002	Stephanopyxis turris	669.56
WF027	N04	WF0272E7	2.34	6/18/2002	Thalassionema nitzschioides	386.35
WF027	N04	WF0272E7	2.34	6/18/2002	Unid. micro-phytoflag sp. group 1 length	8421.11
WF027	N18	WF027323	10.28	6/18/2002	Centric diatom sp. group 1 diam <10 micr	164.71
WF027	N18	WF027323	10.28	6/18/2002	Chaetoceros sp. group 2 diam 10-30 micro	191.78
WF027	N18	WF027323	10.28	6/18/2002	Corethron criophilum	862.75
WF027	N18	WF027323	10.28	6/18/2002	Cryptomonas sp. group 1 length <10 micro	3022.79
WF027	N18	WF027323	10.28	6/18/2002	Cryptomonas sp. group 2 length >10 micro	470.60
WF027	N18	WF027323	10.28	6/18/2002	Dinophysis norvegica	1197.08
WF027	N18	WF027323	10.28	6/18/2002	Gymnodinium sp. group 2 21-40 microns wi	560.09
WF027	N18	WF027323	10.28	6/18/2002	Heterocapsa rotundata	478.41
WF027	N18	WF027323	10.28	6/18/2002	Pennate diatom sp. group 2 10-30 microns	92.85
WF027	N18	WF027323	10.28	6/18/2002	Skeletonema costatum	21.62
WF027	N18	WF027323	10.28	6/18/2002	Thalassionema nitzschioides	153.31
WF027	N18	WF027323	10.28	6/18/2002	Unid. micro-phytoflag sp. group 1 length	17441.51
WF027	N18	WF027323	10.28	6/18/2002	Unid. micro-phytoflag sp. group 2 length	1783.86
WF027	N18	WF027325	2.41	6/18/2002	Centric diatom sp. group 1 diam <10 micr	200.24
WF027	N18	WF027325	2.41	6/18/2002	Cryptomonas sp. group 1 length <10 micro	1151.29
WF027	N18	WF027325	2.41	6/18/2002	Cryptomonas sp. group 2 length >10 micro	77.02

Survey	Sta.	Sample Number	Depth (m)	Sampling Date	Plankton	Estimated Carbon Equivalence (ng Carbon/L)
WF027	N18	WF027325	2.41	6/18/2002	Cylindrotheca closterium	113.21
WF027	N18	WF027325	2.41	6/18/2002	Dactyliosolen fragilissimus	245.81
WF027	N18	WF027325	2.41	6/18/2002	Ebria tripartita	180.41
WF027	N18	WF027325	2.41	6/18/2002	Eutreptia/eutreptiella spp.	22.58
WF027	N18	WF027325	2.41	6/18/2002	Gymnodinium sp. group 1 5-20 microns wid	4177.42
WF027	N18	WF027325	2.41	6/18/2002	Gymnodinium sp. group 2 21-40 microns wi	733.29
WF027	N18	WF027325	2.41	6/18/2002	Heterocapsa rotundata	156.59
WF027	N18	WF027325	2.41	6/18/2002	Thalassionema nitzschioides	679.37
WF027	N18	WF027325	2.41	6/18/2002	Thalassiosira sp. group 3 10-20 microns	19.62
WF027	N18	WF027325	2.41	6/18/2002	Unid. micro-phytoflag sp. group 1 length	17589.18
WF027	N18	WF027325	2.41	6/18/2002	Unid. micro-phytoflag sp. group 2 length	1401.30

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