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Phytoplankton Community Structure in Northeastern Coastal Waters of the United States.

I. October 1978

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Northeast Fisheries Center
Woods Hole, Massachusetts

August 1981

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The phytoplankton populations observed in eastern coastal waters between the Delaware Bay and Nova Scotia during an October 1978 cruise are described and discussed. A total of 368 phytoplankton species were observed with their concentrations noted for near and far shore stations. A major population maximum was recorded outside lower New York Bay dominated by the diatom Skeletonema costatum. The nearshore populations consisted mainly of diatoms, with ultraplanktonic components common. Composition changes and reduced concentrations occurred seaward along the transects. Guinardia flaccida and the dinoflagellate Prorocentrum micans were common throughout the area. (Author)

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Phytoplankton Community Structure in Northeastern Coastal Waters of the United States. I. October 1978

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INTRODUCTION

This paper is the first of a series of reports on phytoplankton community structure in northeastern United States coastal and continental shelf waters. This report presents results of collections from October 5 to November 2, 1978. Following papers will discuss data obtained from seven subsequent cruises of the National Oceanic and Atmospheric Administration (NOAA) made between November 1978 and February 1980. The series of reports will delineate seasonal and geographic changes in the phytoplankton and will provide a synoptic overview of phytoplankton species composition.

There is little information about the broad scale composition and distribution patterns of phytoplankton in the United States northeastern waters of the continental shelf. Marshall (1976) listed 609 species from the phytoplankton populations in this region between 1964 and 1973. Marshall (1978) also presented seasonal assemblages for the shelf waters north of Cape Hatteras and indicated the characteristic neritic and pelagic species. More spatially limited investigations have been conducted by Holmes (1956), in the Labrador Current and Bigelow (1922), Gran and Braarud (1935), Lillick (1938, 1940), and Hulburt and Corwin (1970) in the Gulf of Maine. In addition, the phytoplankton in waters near Woods Hole, Massachusetts and in the vicinity of Georges Bank have been described by Fish (1925), Lillick (1937), Sears (1941), Riley and Bumpus (1946), and Hulburt (1965). Smayda (1958) and Pratt (1959) reported on the phytoplankton of Narragansett Bay and Conover (1956) on those of Long Island Sound. Nuzzi (1973) studied the distribution of phytoplankton in the New York Bight in 1971, and Martin (1929) reported on the dinoflagellates in New Jersey coastal waters. Olsen and Cohn (1979) examined the total phytoplankton community of lower New York Bay and adjacent

New Jersey coastal areas. Phytoplankton composition off the Virginia coast has been reported by Mulford and Norcross (1971), Marshall et al. (1976), and Marshall and Bowker (1976). In recent years there have been major revisions in several phytoplankton taxa. These changes have modified many of the previously used taxonomic groupings, in some cases resulting in new or revised genera and the rearrangement of species in these taxa. Marshall (1980) has incorporated these modifications in a revised checklist of phytoplankton for the northeastern coastal waters which includes past results and results from seven additional cruises between 1974 and 1979.

It is the goal of this series to investigate phytoplankton dyanmics over coastal and shelf waters of the northeastern United States during a 17-month period. We will assess the standing stock, community structure and identify seasonal norms of distribution, noting dominant species of particular regions. Our investigation will provide baseline information on phytoplankton composition at selected stations in or near areas of significant estuarine and coastal fishery production. Some of these stations reflect the influence of estuarine washout where phytoplankton blooms originate. Due to their brief life span, reproductive potential, and responsiveness to existing ecological conditions, phytoplankton represent an excellent community index to changes in productivity and water quality within the ecosystem. With phytoplankton as the initial autotrophic stage of major oceanic food webs, relationships between these populations and changing variables in relation to man-made perturbations or natural phenomena have significant value. Knowledge of phytoplankton species distribution and seasonal succession will aid in the understanding of relationships between phytoplankton composition and fish recruitment and abundance. To aid in detecting such change, this study is made concurrently

with investigations on chlorophyll concentrations[3], primary productivity[4], nutrients, zooplankton and ichthyoplankton abundance. All are a part of the NOAA Northeast Monitoring Program (NEMP), designed to provide a comprehensive survey of the area.

METHODS

Collections were made at stations placed along transects that extend across the continental shelf and beyond (Fig. 1). Coordinates for these stations are given in Table 1. The inshore stations designated with a circle were analyzed at the Sandy Hook Laboratory (New Jersey); the stations designated by squares were analyzed at Old Dominion University (Virginia). Those with a combined symbol were used as control stations for intercalibration purposes. These predetermined station locations and the cruise track followed were designed for a synoptic coverage of the survey area. The area sampled includes the Middle Atlantic Bight, Nantucket Shoals, Georges Bank, and the Gulf of Maine. A total of 65 surface samples was collected for the phytoplankton analysis. The vessel used for the cruise was the Soviet research ship Belogorsk (cruise 78-03).

At each station, observations on cloud type and cover, wind, barometric pressure, wave height, and air and sea surface temperatures were recorded (Table 1). Niskin bottle casts were made to obtain water temperatures and collect water samples for phytoplankton and salinity analysis. A 500 ml surface sample, preserved with 20 ml of buffered formalin, was collected at each station and stored in polyethylene bottles for the examination of phytoplankton. After a settling period of several weeks, a siphoning procedure was followed to obtain a concentrate of 10 to 25 ml. The total concentrate

was transferred to a Zeiss 25 cm^3 cylindrical settling chamber and examined with an inverted phase contrast microscope, usually using between 312 and 400 X magnification. The Shannon-Weaver index procedures were used to determine species diversity at each station (Table 1).

The National Oceanographic Data Center (NODC) Taxonomic Code[5] was followed to list the species under their respective genera and station locations. The classifications followed are encoded in conformance with VanLandingham (1976-1979) and Hendey (1974) for the diatoms and Parke and Dixon (1976) for other categories.

RESULTS AND DISCUSSION

A total of 368 phytoplankton was identified in this study, with representation from the Bacillariophyceae (185), Pyrrhophyceae (147), Haptophyceae (14), Cyanophyceae (4), Chrysophyceae (7), Cryptophyceae (5), Chlorophyceae (3), and Euglenophyceae (3). A species list is given in Table 2 with the average concentrations of the species at stations over the continental shelf. Station locations are grouped into nearshore stations, located within 35 km of the shore, and those located seaward beyond this distance which are referred to as farshore stations. Although this division was made primarily on the basis of cruise track restrictions, the intent was to group those stations more closely associated with the coastal and estuarine effluents from those farther out. The composition and concentrations of phytoplankton at each station are given in Appendix I.

A dominant phytoplankter at seven nearshore stations during this cruise was Skeletonema costatum. Highest concentrations for this species

were found outside of the lower New York Bay near Sandy Hook, New Jersey, where cell counts were 1-3 million cells/l. Small diatoms, including single cell and short chain forming and colonial types, predominated at the nearshore stations. These included Leptocylindrus danicus, Asterionella glacialis, Chaetoceros simplex, and Rhizosolenia delicatula. Prominent in the majority of the nearshore stations were unidentified ultraplankters. These were cells, round to irregularly shaped forms, green in apparent color, and 5 to 10 μm in size. The size range for the ultraplankton category in this report is based on the size classes suggested by Strickland (1960). He described plankton cells that were between 0.5 and 10 μm as ultraplankton, and those between 10 and 50 μm as nanoplankton. The presence and importance of these small fractions in the Chesapeake Bay has been noted by McCarthy et al. (1974) and VanValkenburg and Flemer (1974). Marshall[6] also noted significant concentrations of these cells in the Chesapeake Bay plume and Virginia coastal waters, where they appeared to consist mainly of cyanophyceans. The importance of ultraplankton (nanoplankton) chlorophytes in the lower New York Bay and the New Jersey coastal area has been reported by Olsen and Cohn (1979). They found the chlorophytes (cell sizes 1.5 to 5 μm) ubiquitous in their study, but decreasing in cell density south of Sandy Hook. Malone (1977) has also identified Nannochloris atomus as a major nanoplankton component in the Raritan and lower Hudson River estuaries and in the New York Bight apex. The ultraplankton component in this study, appears to be represented by a variety of taxa, including cyanophyceans and chlorophyceans.

In the Gulf of Maine, a variety of phytoplankton was observed and included the diatoms Skeletonema costatum, Rhizosolenia spp., Chaetoceros spp., and Asterionella glacialis. Other dominants occurred

at several of the more central locations within this region. These were Leptocylindrus danicus and Nitzschia pungens, also found in high concentrations at Georges Bank. We found the largest cell concentrations outside lower New York Bay (station #55), where counts reached over 2 million cells/l. The two dominant diatoms were Skeletonema costatum and Asterionella glacialis. High phytoplankton concentrations and similar dominants were found at stations directly south and east of station 55. Along the transect eastward and over the shelf (stations #57-63), there was a marked decrease in the concentrations of phytoplankton, a shift in the diatom composition, and a decrease in the number of species found at the seaward stations. The species diversity was lower within the Hudson River plume waters at stations 54, 55, and 56 in contrast to higher values at the more distant stations over the shelf (Table 1). Seaward the composition included a more prominent influence by Chaetoceros spp. and Rhizosolenia spp. South of Sandy Hook (station #54), the dominant phytoplankton were Skeletonema costatum and Asterionella costatum. Further southward the cell concentrations of these species and total phytoplankton decreased. Ultraplankton comprised the most abundant such group.

A transition of species composition occurred along the transects. Phytoplankton prominent at nearshore stations, but decreasing in numbers seaward included the diatoms Skeletonema costatum, Asterionella glacialis, Chaetoceros simplex, C. sociale, Corethron criophilum, Leptocylindrus danicus, and Stephanopyxis turris. A similar trend occurred with Heterocapsa triquetra, Prorocentrum scutellum, Protoperidinium steinii, Pyramimonas grassii, Nannochloris atomus, and several Cryptomonas spp. In contrast, higher concentrations were noted offshore for the diatoms Cerataulina pelagica, Guinardia flaccida, Nitzschia pungens, Rhizosolenia imbricata, and Rhizosolenia styliformis. Other plankters in this category included

Ceratium furca, C. fusus, C. trichoceros, C. tripos v. atlanticum, Prorocentrum aporum, P. compressum, P. micans, Emiliania huxleyia, Nostoc commune, Oscillatoria erythraea, Dictyocha fibula, and Distephanus speculum. Species averaging significant concentrations throughout shelf waters included the diatoms Skeletonema costatum, Hemiaulus sinensis, Leptocylindrus danicus, Nitzschia delicatissima, N. pungens, Rhizosolenia delicatula, R. stollerfothii, and Thalassionema nitzschioides. Phytoflagellates common over the shelf included Ceratium lineatum, C. trichoceros, Dinophysis fortii, Prorocentrum micans, Pyramimonas grassii, and Emiliania huxleyi. In general, higher cell concentrations of diatoms occurred nearshore, with 81% of the total diatoms found nearshore. In the pyrrhophyceans there was a slight increase seaward, with 74% of the species recorded found nearshore in contrast to 78% at farshore stations. Offshore concentrations, however, were generally well below those nearshore. Nearshore ultraplankton contained large concentrations of Nannochloris atomus along the New York-New Jersey coastline, as well as unidentified components. These other forms were mainly between 2 and 5 μm, round to slightly irregularly shaped and appeared as isolated cells. Based on their general morphology, we believe they included several cyanophycean and chlorophycean representatives. Further investigation is underway to identify members of this small sized, but important group.

In summary, the phytoplankton of the northeastern shelf waters in October 1978 contained large concentrations of Skeletonema costatum. The nearshore waters contained a greater variety of species, with the diatoms and unidentified ultraplankton components the dominant forms present. Other common species included Asterionella glacialis, Leptocylindrus danicus, Nannochloris atomus, Chaetoceros simplex, and Rhizosolenia delicatula. In these collections the

small sized, chain forming diatoms, often characteristic of rapid growth, were prevalent. Seaward, there was a shift in the composition, with other diatoms and various phytoflagellates more characteristic of the phytoplankton assemblage.

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FOOTNOTES

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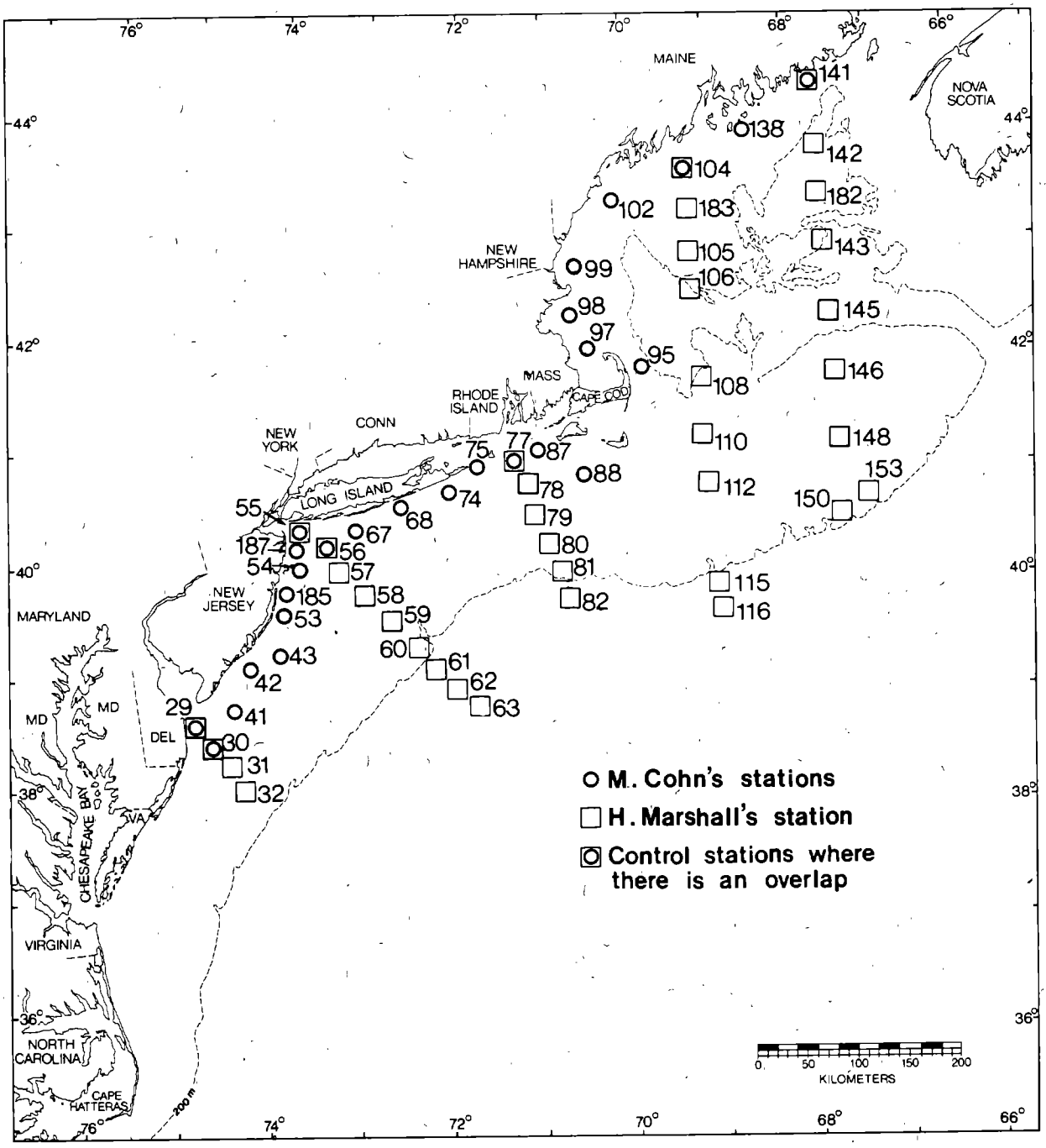

Fig. 1. Phytoplankton community structure station locations for cruise BEL-78-03.

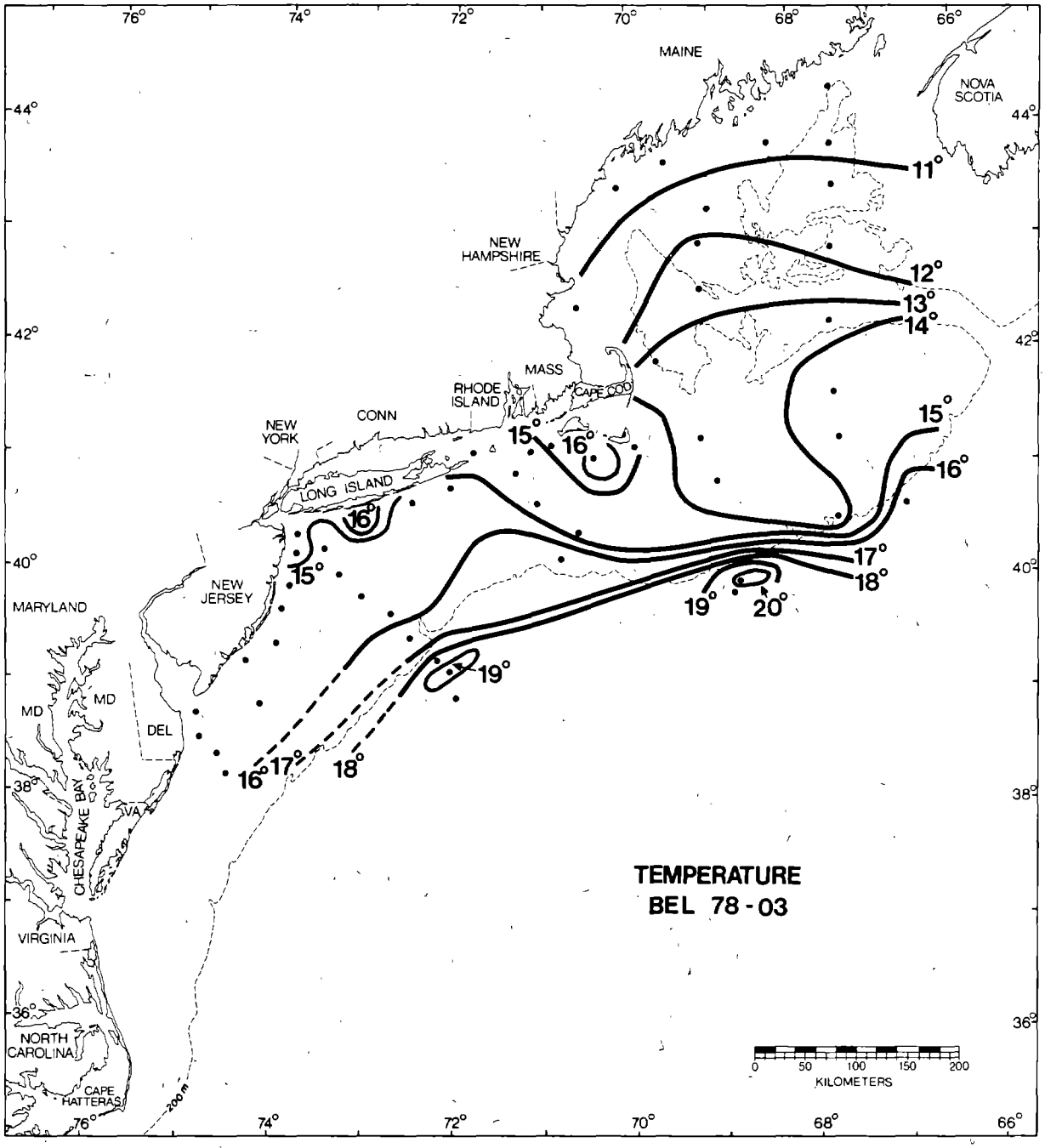

Fig. 2. Seawater surface temperatures (°C) measured on cruise BEL-78-03.

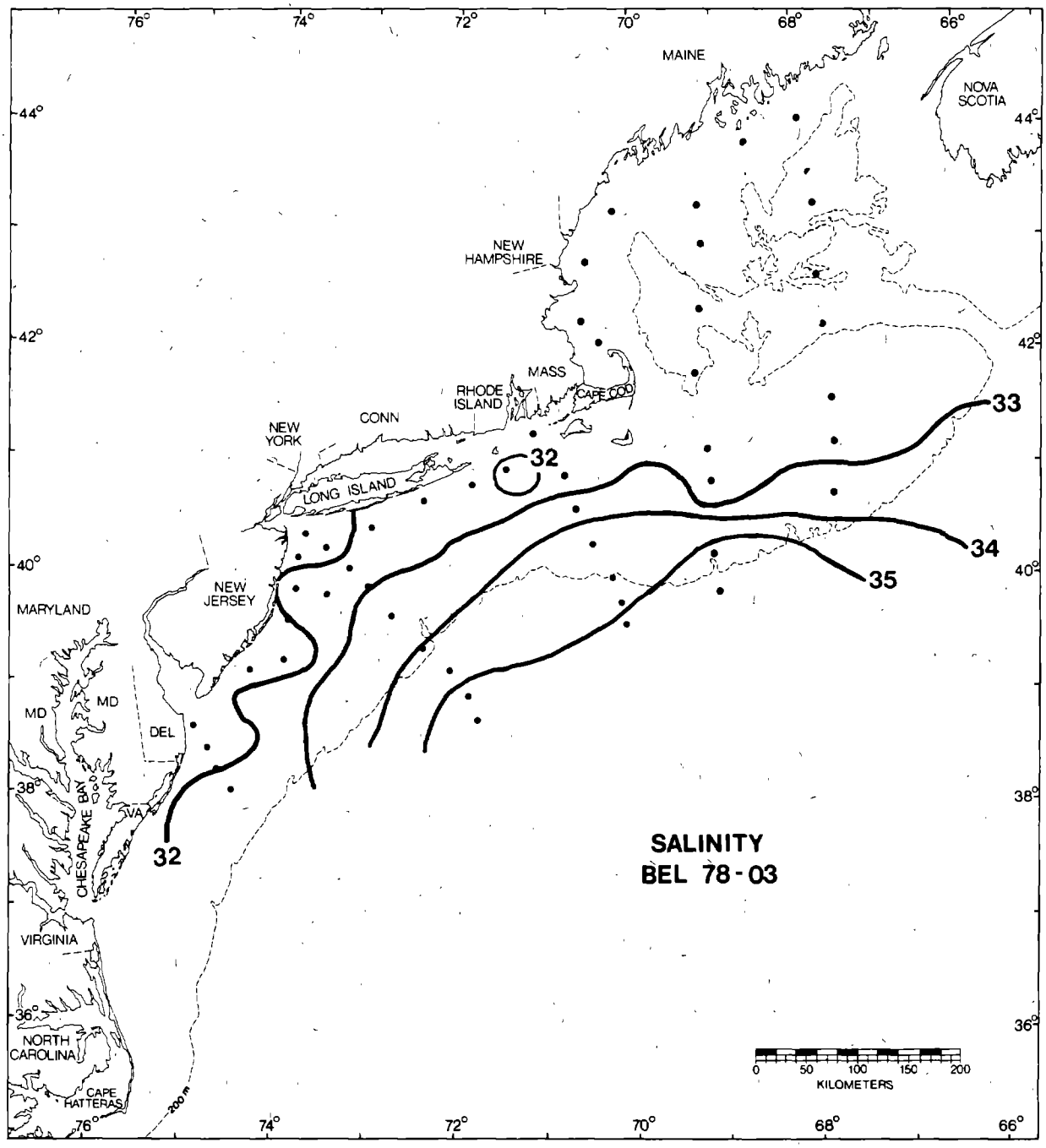

Fig. 3. Salinity (in parts per thousand) measured on cruise BEL-78-03.

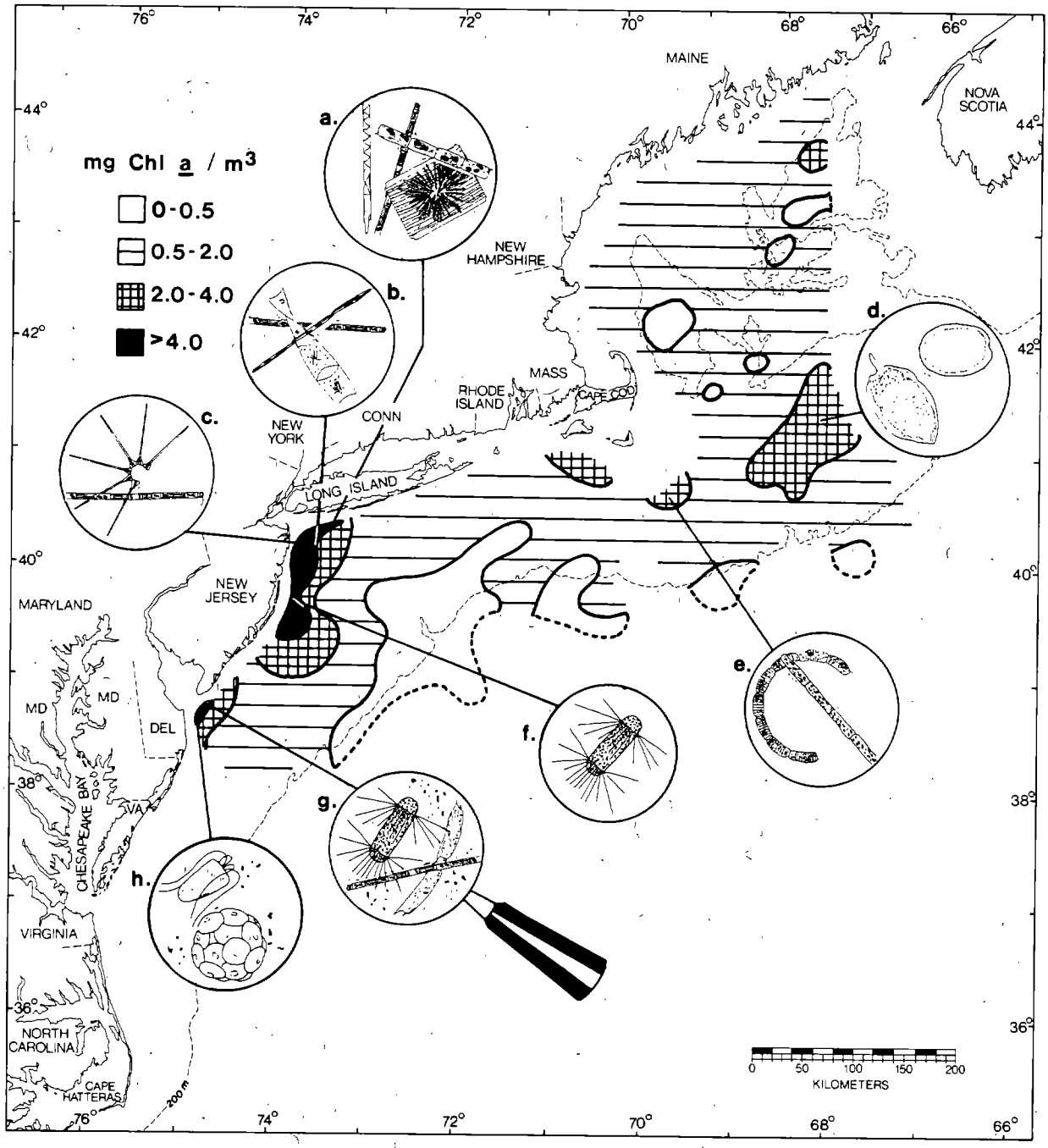

Fig. 4. Some phytoplankters identified in areas of high chlorophyll a determined by Christine Evans, NMFS. a. Rhizosolenia spp., Skeletonema costatum, Striatella unipunctata; b. S. costatum, Nitzschia serrata, Streptotheca thamesis; c. Asterionella glacialis, S. costatum; d. Prorocentrum spp.; e. Rhizosolenia spp.; f. Corethron criophilum; g. C. criophilum, S. costatum, Hemiaulus sinensis; h. Coccolithophores, Pyramimonas sp.

Table 1. Various observations and measurements for stations on cruise Belogorsk 78-03.

Sta. #	Wind Speed (kts)	Wind Direction (°)	Air Temp. (°C)	Surf. Temp. (°C)	Wave Height (ft)	Barometric Pressure (mb)	Salinity (ppt)	Species Diversity Index	Latitude (N)	Longitude (W)
29	6	40	14.8	15.6	0.7	1028	30.96	2.356	38°44'	74°55'
30	14	40	15.2	15.7	1.5	1028	31.74	2.730	38°35'	74°48'
31	15	40	15.0	15.7	2.0	1032	32.28	2.565	38°25'	74°39'
41	6	310	15.0	15.1	0.2	1024	32.16	0.787	38°55'	74°29'
42	16	205	15.6	15.7	2.2	1017	31.70	0.462	39°10'	74°23'
43	20	195	16.8	15.9	2.0	1019	31.74	0.904	39°21'	74°06'
53	21	195	16.8	15.7	3.0	1019	32.02	0.925	39°42'	73°58'
54	8	210	13.0	15.2	0.7	1024	32.27	0.326	40°02'	73°44'
55	5	230	20.2	15.7	0.5	1011	31.36	0.912	40°26'	73°46'
56	8	220	17.8	15.5	0.7	1010	31.60	0.789	40°16'	73°36'
57	19	290	19.2	15.8	1.0	1012	32.34	1.734	40°06'	73°23'
58	26	360	12.8	15.2	2.2	1016	32.12	2.173	39°52'	73°05'
59	30	10	12.8	15.8	2.5	1016	33.55	2.891	39°39'	72°46'
60	30	360	10.4	16.8	3.5	1017	33.95	2.879	39°28'	72°33'
61	24	10	9.8	18.0	5.0	1014	35.15	2.161	39°18'	72°19'
62	17	20	10.0	19.3	4.7	1015	35.44	2.528	39°10'	72°09'
63	13	10	10.4	18.9	3.5	1022	35.52	2.075	39°02'	71°57'
67	8	230	18.6	16.1	0.6	1014	32.03	1.021	40°28'	73°13'
68	12	240	17.4	15.4	1.5	1017	32.01	1.514	40°42'	72°38'
74	17	240	16.7	15.0	1.3	1022	32.27	1.803	40°49'	72°08'
75	15	240	15.4	14.5	1.0	1022	31.68	0.463	41°03'	71°42'
77	10	340	11.2	14.5	1.2	1012	32.24	1.141	41°09'	71°15'
78	13	360	12.6	14.6	1.0	1015	32.34	2.553	40°57'	71°10'
79	8	360	14.6	14.0	1.3	1017	32.35	1.960	40°41'	71°02'
80	8	360	11.6	14.8	1.0	1019	33.48	2.616	40°21'	70°52'
81	9	360	11.8	16.3	1.0	1019	34.06	2.733	40°10'	70°46'
82	15	340	12.8	16.7	0.7	1022	34.34	2.486	39°59'	70°40'
87	21	120	16.0	15.2	3.5	1012	32.17	0.864	41°10'	71°00'
88	8	200	16.5	0.0	1.5	1010	31.93	2.771	41°04'	70°38'
95	14	300	11.4	13.1	1.5	1011	32.46	1.007	41°58'	69°50'
97	17	230	10.4	11.5	1.2	1024	32.68	0.471	42°06'	70°21'
98	8	170	11.2	11.9	0.4	1027	32.41	3.109	42°26'	70°38'
99	7	270	6.4	11.2	0.4	1031	32.46	3.185	42°48'	70°32'
102	8	5	6.0	10.6	0.5	1032	32.55	2.321	43°23'	70°16'
104	11	360	7.8	10.5	0.7	1031	32.84	1.436	43°40'	69°22'
105	12	360	6.8	12.1	0.7	1033	32.49	0.370	42°58'	69°17'
106	11	10	6.6	12.5	0.9	1030	32.38	2.237	42°35'	69°14'
108	12	290	12.4	13.9	1.5	1016	31.96	2.568	41°59'	69°12'
110	12	290	11.2	13.8	1.5	1018	32.09	2.381	41°20'	69°07'
112	18	315	10.2	13.6	2.0	1019	32.63	2.649	40°55'	69°06'
115	14	300	10.0	20.8	2.5	1027	35.59	2.921	40°04'	69°03'
116	16	290	11.6	19.8	2.5	1027	34.94	2.067	39°52'	69°00'
138	13	280	6.8	10.5	1.5	1016	32.72	0.585	43°56'	68°33'
141	20	330	6.2	10.3	2.0	1008	32.72	2.712	44°20'	67°43'
142	2	200	11.0	9.9	2.0	1008	32.99	1.251	43°49'	67°43'
143	9	240	15.4	11.9	2.5	1005	32.74	2.630	42°58'	67°42'
145	18	140	16.4	13.4	1.9	1014	32.55	2.587	42°14'	67°52'
146	20	160	17.0	14.8	1.0	1019	32.38	1.091	41°41'	67°38'
148	7	140	17.2	14.5	1.8	1021	32.29	0.997	41°16'	67°41'
150	6	190	17.0	13.8	1.0	1022	32.38	1.500	40°36'	67°41'
153	8	90	16.0	16.6	0.8	1024	33.53	1.776	40°37'	67°04'
182	9	200	15.0	11.6	2.0	1007	32.93	1.914	43°24'	67°43'
183	10	360	5.6	1.8	0.7	1031	32.61	2.304	43°16'	69°19'
185	16	200	15.8	15.6	1.0	1020	32.03	0.875	39°55'	73°53'
187	11	210	14.0	14.7	1.2	1023	31.63	1.179	40°15'	73°51'

Table 2. Phytoplankton composition observed at near and far shore stations between the Delaware Bay and the Gulf of Maine in October 1978. Numbers refer to average station concentrations in cells per liter.

	Near Shore	Far Shore
Bacillariophyceae		
Achnanthes longipes Agardh	1.2	0.8
Actinoptychus sp.	---	4.0
Actinoptychus senarius Ehrenberg	6.6	134.9
Amphiprora sp.	0.4	---
Amphiprora surirelloides Hendey	0.4	---
Amphora sp.	0.4	0.8
Amphora arenaria Donkin	4.0	---
Amphora bigibba Grunow	---	0.8
Amphora crassa Gregory	0.4	---
Amphora ostrearia Brebisson	0.8	---
Amphora ovalis Kutzing	0.4	---
Anaulus mediterraneus var. *intermedia* Grunow	---	6.4
Asterionella glacialis Castracane	3159.3	189.6
Asteromphalus heptactis (Brebisson) Ralfs	0.8	---
Bacillaria paxillifer (Muller) Hendey	12.0	---
Bacteriastrum hyalinum Lauder	---	1.9
Bacteriastrum hyalinum var. *princeps* Lauder	1.2	---
Bacteriastrum varians Lauder	0.4	---
Bellerochea malleus (Brightwell) VanHeurck	0.8	---
Biddulphia sp.	20.4	6.4
Biddulphia alternans (Bailey) VanHeurck	3.2	---
Biddulphia aurita (Lyngbye) Brebisson	6.4	4.8
Biddulphia mobiliensis (Bailey) Grunow	0.8	---
Biddulphia sinensis Greville	---	0.8
Cerataulina pelagica (Cleve) Hendey	36.4	106.9
Chaetoceros sp.	5.4	65.6

	Near Shore	Far Shore
Chaetoceros affine Lauder	28.4	14.8
Chaetoceros atlanticum Cleve	83.6	159.4
Chaetoceros breve Schutt	0.8	---
Chaetoceros crinitum Schutt	1.6	---
Chaetoceros coarctatum Lauder	7.4	31.2
Chaetoceros compressum Lauder	6.4	12.0
Chaetoceros costatum Pavillard	---	3.0
Chaetoceros curvisetum Cleve	18.0	10.2
Chaetoceros danicum Cleve	34.6	32.9
Chaetoceros debile Cleve	18.4	5.6
Chaetoceros decipiens Cleve	46.0	46.4
Chaetoceros densum Cleve	---	5.6
Chaetoceros didymum Ehrenberg	36.4	2.0
Chaetoceros diversum Cleve	---	0.8
Chaetoceros externum Gran	---	1.2
Chaetoceros gracile Schutt	9.3	4.1
Chaetoceros pelagicum Cleve	6.0	---
Chaetoceros peruvianum Brightwell	---	16.2
Chaetoceros simplex Ostenfeld	1009.6	---
Chaetoceros sociale Lauder	110.0	1.8
Chaetoceros tortissimum Gran	5.6	---
Climacodium biconcavum Cleve	---	105.6
Climacodium frauenfeldianum Grunow	---	2.2
Climacosphenia moniligera Ehrenberg	0.4	---
Cocconeis scutellum Ehrenberg	2.0	---
Corethron criophilum Castracane	1772.4	142.2
Coscinodiscus sp.	24.0	4.6
Coscinodiscus asteromphalus Ehrenberg	---	2.2
Coscinodiscus centralis Ehrenberg	2.4	20.2

	Near Shore	Far Shore
Coscinodiscus concinnus W. Smith	1.2	11.2
Coscinodiscus gigas Ehrenberg	6.2	9.2
Coscinodiscus granulosus Grunow	4.1	23.9
Coscinodiscus kuetzingii Schmidt	---	0.4
Coscinodiscus lineatus Ehrenberg	11.4	50.1
Coscinodiscus marginatus Ehrenberg	12.8	2.8
Coscinodiscus nitidus Gregory	16.2	50.1
Coscinodiscus perforatus Ehrenberg	2.8	---
Coscinodiscus radiatus Ehrenberg	3.6	27.2
Coscinodiscus stellaris Roper	---	7.2
Coscinodiscus sub-bulliens Jorgenson	0.4	---
Coscinodiscus wailesii Gran and Angst	---	52.4
Coscinosira polychorda (Gran) Gran	3.6	33.2
Cyclotella sp.	0.4	---
Cyclotella caspia Grunow	---	4.0
Cyclotella meneghiniana Kutzing	10.0	---
Cylindrotheca closterium (Ehrenberg) Reimann and Lewin	36.2	132.0
Cymatosira belgica Grunow	---	0.6
Dactyliosolen antarcticus Castracane	0.4	---
Dimerogramma sp.	---	1.0
Diploneis crabro Ehrenberg	0.8	2.0
Diploneis lineata (Donkin) Cleve	0.4	---
Diploneis smithii (Brebisson) Cleve	0.4	---
Ditylum brightwellii (West) Grunow	69.8	82.0
Eucampia cornuta (Cleve) Grunow	1.6	---
Eucampia zoodiacus Ehrenberg	4.8	17.0
Eunotogramma sp.	0.4	---
Fragilaria sp.	0.8	0.4
Fragilaria crotonensis Kitton	1.2	---

	Near Shore	Far Shore
Fragilaria pinnata Ehrenberg	---	5.2
Grammatophora sp.	---	5.6
Grammatophora marina (Lymgbye) Kutzing	57.0	0.2
Guinardia flaccida (Castracane) Peragallo	55.0	232.5
Gyrosigma sp.	---	0.5
Gyrosigma fasciola (Ehrenberg) Cleve	0.4	0.1
Hemiaulus hauckii Grunow	44.8	38.2
Hemiaulus membranaceus Cleve	31.8	20.1
Hemiaulus sinensis Greville	340.7	444.0
Hemidiscus cuneiformis Wallich	---	1.2
Isthmia nervosa Kutzing	1.2	---
Lauderia borealis Gran	14.4	---
Leptocylindrus danicus Cleve	39761.0	8034.7
Leptocylindrus minimus Gran	64.4	115.6
Licmophora sp.	0.4	10.2
Lithodesmium undulatum Ehrenberg	3.2	5.2
Mastogloia sp.	0.4	---
Mastogloia braunii Grunow	0.4	---
Melosira sp.	1.6	---
Melosira granulata (Ehrenberg) Ralfs	---	0.8
Melosira hummii Hustedt	1.6	---
Melosira moniliformis (Muller) Agardh	---	2.4
Melosira nummuloides (Dillwyn) Agardh	6.0	4.8
Navicula sp.	7.8	10.0
Navicula abrupta (Gregory) Cleve	0.8	---
Navicula arenaria Donkin	---	4.8
Navicula directa (Smith) Ralfs	1.2	---
Navicula forcipata Greville	2.0	---
Navicula hennedyii Smith	2.0	---

	Near Shore	Far Shore
Navicula lyra Ehrenberg	---	0.4
Navicula pavillardi Hustedt	0.4	---
Navicula pelagica Cleve	0.8	---
Navicula salinarum Grunow	4.0	---
Nitzschia sp.	11.6	5.2
Nitzschia angularis var. *affinis* (Gran) Hustedt	---	0.2
Nitzschia bilobata Smith	0.8	---
Nitzschia delicatissima Cleve	332.8	352.0
Nitzschia hybridaeformis Hustedt	0.8	---
Nitzschia lorenziana var. *incurva* Grunow	0.4	---
Nitzschia microcephala Grunow	0.4	---
Nitzschia obtusa Smith	0.4	---
Nitzschia proxima Hustedt	3.6	---
Nitzschia pungens Grunow	580.0	2295.1
Nitzschia seriata Cleve	347.7	106.2
Nitzschia sigma (Kutzing) Smith	8.4	6.4
Nitzschia sigma var. *rigida* Grunow	---	5.8
Paralia sulcata (Ehrenberg) Cleve	87.8	229.2
Phaeodactylum tricornutum Bohlin	2.0	8.0
Pinnularia cruciformis (Donkin) Cleve	0.4	---
Plagiogramma staurophorum (Gregory) Heilberg	---	19.0
Plagiogramma vanheurckii Grunow	2.4	2.0
Pleurosigma sp.	---	13.8
Pleurosigma angulatum (Quekett) Smith	3.0	11.8
Pleurosigma elongatum Smith	0.2	2.6
Pleurosigma hamuliferum Grum	---	2.2
Pleurosigma nicobaricum (Grunow) Grunow	4.8	2.4
Pleurosigma normanii Ralfs	6.0	---

	Near Shore	Far Shore
Pleurosigma rigidum Smith	---	6.8
Podosira sp.	0.8	0.4
Rhabdonema arcuatum (Lyngbye) Kutzing	1.6	---
Rhaphoneis amphiceros Ehrenberg	0.4	4.4
Rhizosolenia sp.	3.6	100.3
Rhizosolenia acuminata (Peragallo) Gran	4.0	---
Rhizosolenia alata Brightwell	229.5	---
Rhizosolenia alata f. *gracillima* (Cleve) Grunow	7.1	39.4
Rhizosolenia alata f. *indica* (Peragallo) Gran	5.6	7.1
Rhizosolenia bergonii Peragallo	0.8	0.3
Rhizosolenia calcar-avis Schultze	15.8	21.7
Rhizosolenia cylindrus Cleve	---	42.9
Rhizosolenia delicatula Cleve	832.8	996.0
Rhizosolenia fragilissima Bergon	34.4	---
Rhizosolenia hebetata f. *hiemalis* Gran	19.2	11.8
Rhizosolenia hebetata f. *semispina* (Hensen) Gran	13.2	19.6
Rhizosolenia imbricata Brightwell	62.6	3593.5
Rhizosolenia imbricata var. *shrubsolei* (Cleve) VanHeurck	53.2	---
Rhizosolenia setigera Brightwell	18.0	80.9
Rhizosolenia stolterfothii Pergallo	293.5	538.2
Rhizosolenia styliformis Brightwell	2.4	51.8
Schroederella delicatula (Peragallo) Pavillard	199.2	---
Scoliopleura sp.	4.8	---
Skeletonema costatum (Greville) Cleve	73231.0	28341.5
Stephanopyxis palmeriana (Greville) Grunow	12.4	34.4
Stephanopyxis turris (Greville) Ralfs	85.4	2.4
Streptotheca thamesis Shrubsole	5.2	---
Striatella unipunctata (Lyngbye) Agardh	645.6	---
Surirella robusta Ehrenberg	0.4	---

	Near Shore	Far Shore
Synedra sp.	1.2	87.3
Synedra tabulata var. *fasciculata* (Lyngbye) Hustedt	1.2	22.0
Synedra undulata Bailey	3.2	---
Tabellaria fenestrata (Lyngbye) Kutzing	---	42.4
Tabellaria fenestrata var. *asterionelloides* Grunow	270.8	11.0
Thalassionema nitzschioides Hustedt	212.4	344.0
Thalassiosira aestivalis Gran and Angst	4.0	13.6
Thalassiosira baltica (Grunow) Ostenfeld	3.6	---
Thalassiosira decipiens (Grunow) Jorgensen	4.4	0.8
Thalassiosira eccentrica (Ehrenberg) Cleve	6.8	7.8
Thalassiosira gravida Cleve	2.8	10.7
Thalassiosira nordenskioldii Cleve	40.0	148.4
Thalassiosira rotula Meunier	5.8	8.8
Thalassiothrix longissima Cleve and Grunow	2.0	14.8
Thalassiothrix frauenfeldii Grunow	9.2	121.2
Unknown Diatoms	0.4	0.2
Pyrrhophyceae		
Amphidinium sp.	0.8	0.8
Amphidinium acutissimum Schiller	---	43.7
Amphidinium acutum Lohmann	---	25.0
Amphidinium carterae Hulburt	12.4	---
Amphidinium crassum Lohmann	6.8	3.2
Amphidinium fusiforme Martin	3.6	---
Amphidinium glaucum Conrad	---	2.2
Amphidinium klebsii Kofoid and Swezy	8.0	---
Amphidinium operculatum Claparede and Lachmann	0.4	---
Amphidinium schroederi Schiller	---	17.3

	Near Shore	Far Shore
Amphidoma sp.	0.4	0.2
Amphidoma caudatum Halldall	0.4	0.8
Amphidoma steinii Schiller	5.2	---
Amphisolenia globifera Stein	---	2.8
Ceratium belone Cleve	---	0.4
Ceratium candelabrum (Ehrenberg) Stein	---	0.8
Ceratium contortum (Gourret) Cleve	---	4.2
Ceratium extensum (Gourret) Cleve	2.3	11.2
Ceratium falcatiformes Jorgensen	0.4	---
Ceratium furca (Ehrenberg) Claparede and Lachmann	8.3	24.8
Ceratium fusus (Ehrenberg) DuJardin	7.2	25.5
Ceratium geniculatum (Lemmermann) Cleve	0.4	---
Ceratium lineatum (Ehrenberg) Cleve	33.6	43.8
Ceratium longipes (Bailey) Gran	0.4	---
Ceratium macroceros (Ehrenberg) VanHoffen	0.8	0.4
Ceratium massiliense (Gourret) Jorgensen	2.4	---
Ceratium minutum Jorgensen	5.6	29.4
Ceratium pavillardii Jorgensen	0.8	---
Ceratium pentagonum Gourret	---	0.9
Ceratium ranipes Cleve	1.0	---
Ceratium teres Kofoid	---	0.4
Ceratium trichoceros (Ehrenberg) Kofoid	25.7	72.1
Ceratium tripos (Muller) Nitzsch	1.8	2.6
Ceratium tripos var. *atlanticum* (Ostenfeld) Paulsen	3.4	57.9
Cochlodinium sp.	0.4	---
Cochlodinium helicoides Lebour	0.4	---
Cochlodinium kofoidii Kofoidii	0.4	---
Cochlodinium pellucidum Lohmann	0.4	---
Dinophysis sp.	0.4	0.6

	Near Shore	Far Shore
Dinophysis acuminata Claparede and Lachmann	3.6	0.2
Dinophysis acuta Ehrenberg	0.6	0.8
Dinophysis caudata Kent	1.2	2.0
Dinophysis exigua Kofoid and Skogsberg	---	0.2
Dinophysis fortii Pavillard	29.2	28.9
Dinophysis hastata Stein	---	0.4
Dinophysis norvegica Claparede and Lachmann	---	0.8
Dinophysis ovum Schutt	2.6	1.0
Dinophysis schuettii Murray and Whitting	---	0.8
Dinophysis tripos Gourrey	---	2.3
Diplopsalis sp.	2.0	---
Diplopsalis lenticula Bergh	2.0	---
Dissodium asymmetricum (Mangin) Loeblich	---	4.0
Glenodinium danicum Paulsen	4.4	2.8
Glenodinium foliaceum Paulsen	0.4	---
Glenodinium rotundatum Ehrenberg	4.4	---
Goniaulax sp.	0.4	2.6
Goniaulax birostris Stein	---	0.4
Goniaulax catenata (Lev) Kofoid	0.8	---
Goniaulax conjuncta Wood	0.8	---
Goniaulax diacantha (Meunier) Schiller	6.8	2.0
Goniaulax diegensis Kofoid	4.8	4.0
Goniaulax digitalis (Pouchet) Kofoid	---	4.1
Goniaulax excavata (Braaud) Balech	3.2	1.2
Goniaulax minima Matzenauer	1.6	---
Goniaulax minuta Kofoid and Michener	0.4	1.8
Goniaulax orientalis Lindermann	---	0.4
Goniaulax polyedra Stein	0.4	2.2
Goniaulax polygramma Stein	1.2	0.8

	Near Shore	Far Shore
Goniaulax scrippsae Kofoid	1.6	---
Goniaulax spinifera (Claparede & Lachmann) Diesing	5.2	0.8
Goniaulax tricantha Jorgensen	0.4	1.2
Goniaulax unicornis Lebour	1.2	---
Goniodoma sp.	0.4	---
Gymnodinium sp.	53.5	18.2
Gymnodinium arcticum Wulff	---	153.4
Gymnodinium grammaticum (Pouchet) Kofoid and Swezy	---	0.3
Gymnodinium nelsoni Martin	6.0	5.2
Gymnodinium punctatum Pouchet	0.8	0.8
Gymnodinium simplex (Lohmann) Kofoid and Swezy	0.4	---
Gymnodinium splendens Lebour	3.2	---
Gymnodinium stellatum Hulburt	1.6	---
Gymnodinium variabile Herdman	1.0	2.6
Gyrodinium sp.	1.2	64.6
Gyrodinium aureolum Hulburt	8.4	3.2
Gyrodinium aureum (Conrad) Schiller	2.8	1.2
Gyrodinium estuariale Hulburt	0.4	---
Gyrodinium glaebum Hulburt	1.6	---
Gyrodinium metum Hulburt	0.8	---
Gyrodinium pellucidum (Wulff) Martin	2.4	---
Gyrodinium pinque (Schutt) Kofoid and Swezy	---	4.0
Gyrodinium spirale (Berghman) Kofoid and Swezy	2.8	---
Gyrodinium uncatenum Hulburt	6.4	6.8
Heterocapsa triquetra (Ehrenberg) Stein	20.4	4.4
Katodinium assymmetricum (Massart) Loeblich	1.2	---
Katodinium rotundatum (Lohmann) Loeblich	14.0	---

	Near Shore	Far Shore
Noctiluca miliaris Suriray	1.2	9.0
Oxyrrhis marina DuJardin	0.4	4.0
Oxytoxum sp.	0.4	0.3
Oxytoxum constrictum (Stein) Butschli	0.4	0.4
Oxytoxum gladiolus Stein	0.4	---
Oxytoxum graate Stein	0.8	---
Oxytoxum milneri Murray and Whitting	---	0.1
Oxytoxum mitra (Stein) Schiller	---	0.4
Oxytoxum parvum Schiller	0.4	---
Oxytoxum reticulatum (Stein) Butschli	0.8	---
Oxytoxum sceptum (Stein) Schroder	---	2.0
Oxytoxum scolopax Stein	0.8	2.0
Oxytoxum sphaeroideum Stein	1.6	---
Oxytoxum turbo Kofoid	---	4.3
Oxytoxum viride Schiller	0.4	---
Podolampas palmipes Stein	---	6.5
Polykrikos kofoidii Chatton	0.4	0.4
Prorocentrum sp.	---	41.0
Prorocentrum aporum (Schiller) Dodge	3.6	64.6
Prorocentrum balticum (Lohmann) Loeblish	7.6	0.4
Prorocentrum compressum (Bailey) Abe	13.6	325.6
Prorocentrum dentatum Stein	---	9.6
Prorocentrum gracile Schutt	---	0.4
Prorocentrum lima (Ehrenberg) Dodge	8.8	1.6
Prorocentrum maximum (Gourret) Schiller	0.4	---
Prorocentrum micans Ehrenberg	269.6	1321.5
Prorocentrum rostratum Stein	---	0.6
Prorocentrum scutellum Schroder	367.6	1.9

	Near Shore	Far Shore
Protoperidinium sp.	4.4	---
Protoperidinium breve (Paulsen) Balech	7.6	---
Protoperidinium brevipes (Paulsen) Balech	7.6	0.4
Protoperidinium cerasus (Paulsen) Balech	8.8	1.0
Protoperidinium claudicans (Paulsen) Balech	0.8	2.0
Protoperidinium conicoides (Paulsen) Balech	---	32.4
Protoperidinium conicum (Gran) Balech	0.8	---
Protoperidinium depressum (Bailey) Balech	2.8	---
Protoperidinium excavatum (Martin) Balech	7.2	---
Protoperidinium globulum (Stein) Balech	---	0.4
Protoperidinium granii (Ostenfeld) Balech	0.2	1.0
Protoperidinium leonis (Pavillard) Balech	1.2	---
Protoperidinium nipponicum (Abe) Balech	---	0.8
Protoperidinium pallidum (Ostenfeld) Balech	---	2.0
Protoperidinium pellucidum Bergh	0.4	---
Protoperidinium pentagonum (Gran) Balech	3.2	0.4
Protoperidinium steinii (Jorgensen) Balech	89.6	1.4
Pyramimonas amylifer Conrad	---	26.8
Pyramimonas grossii Parke	568.8	59.8
Pyrocystis fusiformis (Wyville-Thomson) Murray	0.4	---
Pyrocystis lunula Schutt	---	0.4
Pyrophacus horologium Stein	2.4	0.4
Scrippsiella trochoidea (Stein) Loeblich	32.0	3.2
Unknown Pyrrhophyceans	1.2	0.4
Haptophyceae		
Calciosolenia murrayi Gran	---	0.8
Coccolithus pelagicus (Wallich) Schiller	10.0	---
Cyclococcolithus leptoporus (Murray & Blackman) Kamptner	4.8	6.6

	Near Shore	Far Shore
Discosphaera tubifer (Murray & Blackman) Ostenfeld	0.8	1.4
Emiliania huxleyi (Lohmann) Hay and Mohler	76.4	209.2
Gephyrocapsa oceanica Kamptner	4.8	2.0
Helicosphaera carteri (Wallach) Kamptner	7.6	4.8
Hymenomonas carterae (Braarud & Fagerland) Braarud	1.6	---
Hymenomonas roseola Stein	11.6	0.4
Pontosphaera syracusana Lohmann	2.8	0.4
Rhabdosphaera clavigera Murray and Blackman	1.2	3.3
Scyphosphaera apsteinii Lohmann	3.2	---
Syracosphaera sp.	---	2.0
Syracosphaera pulchra Lohmann	0.8	0.8
Unknown Coccolithophores	98.4	111.6
Euglenophyceae		
Euglena sp.	6.0	74.2
Euglena proxima Dangeard	21.2	---
Eutreptia sp.	0.4	---
Cyanophyceae		
Anacystis sp.	3.2	---
Gomphosphaeria aponina Kutzing	9.6	9.6
Nostoc commune Vaucher (filaments)	27.4	114.0
Oscillatoria erythraea (Ehrenberg) Kutzing (filaments)	6.4	170.7
Chlorophyceae		
Arthrodesmus sp.	12.8	---
Chlorella sp.	2.7	---
Nannochloris atomus Butcher	5009.7	6.4

	Near Shore	Far Shore
Chrysophyceae		
Calycomonas ovalis Wulff	10.8	3.6
Calycomonas wulffii Conrad and Kufferath	10.8	1.6
Dictyocha fibula Ehrenberg	36.0	217.8
Distephanus speculum (Ehrenberg) Haeckel	23.5	135.6
Ebria tripartita (Schumann) Lemermann	0.8	1.6
Mallomonas sp.	3.2	0.4
Olisthodiscus luteus Carter	10.0	---
Unknown Silicoflagellates	---	0.6
Cryptophyceae		
Chilomonas sp.	12.0	5.2
Chroomonas salina (Wislouch) Butcher	3.2	5.6
Chroomonas vectensis Carter	4.8	---
Cryptomonas pseudobaltica Butcher	40.1	10.7
Cryptomonas stigmatica Wislouch	9.2	1.6
Unknown ultraplankton and nanoplankton	10019.5	381.6

	Near Shore	Far Shore
Chrysophyceae		
Calycomonas ovalis Wulff	10.8	3.6
Calycomonas wulffii Conrad and Kufferath	10.8	1.6
Dictyocha fibula Ehrenberg	36.0	217.8
Distephanus speculum (Ehrenberg) Haeckel	23.5	135.6
Ebria tripartita (Schumann) Lemermann	0.8	1.6
Mallomonas sp.	3.2	0.4
Olisthodiscus luteus Carter	10.0	---
Unknown Silicoflagellates	---	0.6
Cryptophyceae		
Chilomonas sp.	12.0	5.2
Chroomonas salina (Wislouch) Butcher	3.2	5.6
Chroomonas vectensis Carter	4.8	---
Cryptomonas pseudobaltica Butcher	40.1	10.7
Cryptomonas stigmatica Wislouch	9.2	1.6
Unknown ultraplankton	10019.5	381.6

APPENDIX I

Station 29	Cells/ Liter
Nanoplankton	6600
Calycomonas gracilis	16
Dityocha fibula	48
Distephanus speculum	20
Haptophyceae prymnesiales	184
Pontosphaera syracusana	16
Unidentified coccolithophores	136
Cyclococcolithus leptoporus	88
Gephyrocapsa oceanica	8
Helicosphaera carteri	16
Paralia sulcata	32
Stephanopyxis turris	1124
Corethron criophilum	1496
Schroederella delicatula	248
Leptocylindrus danicus	200
Skeletonema costatum	1272
Cyclotella sp.	8
Cyclotella meneghiniana	176
Thalassiosira nordenskioldii	64
Lauderia borealis	216
Coscinodiscus nitidus	8
Coscinodiscus radiatus	8
Biddulphia sp.	8
Biddulphia alternans	64
Biddulphia aurita	56
Biddulphia mobiliensis	16
Isthmia nervosa	24
Hemiaulus hauckii	24
Hemiaulus membranaceus	80
Hemiaulus sinensis	80
Cerataulina pelagica	16
Chaetoceros compressum	56
Chaetoceros curvisetum	160
Chaetoceros danicum	304
Chaetoceros didymum	96
Chaetoceros sociale	320
Rhizosolenia alata	264
Rhizosolenia alata f. indica	48
Rhizosolenia calcar-avis	16
Rhizosolenia delicatula	32
Rhizosolenia hebetata f. hemiaulus	120
Rhizosolenia hebetata f. semispina	264
Rhizosolenia imbricata v. shrubsolei	1064
Rhizosolenia setigera	40
Rhizosolenia stolterfothii	1156
Guinardia flaccida	8
Lithodesmium undulatum	32
Ditylum brightwellii	104
Unidentified pennate diatom	16
Asterionella glacialis	764
Thalassiothrix frauenfeldii	24
Thalassionema nitzschioides	32
Rhaphoneis amphiceros	8
Grammatophora marina	8
Navicula sp.	92
Navicula salinarum	8
Navicula abrupta	16
Diploneis crabro	8
Pleurosigma angulatum	40
Pleurosigma normani	24
Amphora arenaria	8
Nitzschia sp.	232
Bacillaria paxillifer	224
Nitzschia seriata	264
Pyramimonas grossi	11376
Prorocentrum compressum	8
Dinophysis acuminata	8
Amphidinium crassum	40
Gymnodinium sp.	16
Katodinium rotundatum	24
Protoperidinum sp.	16
Protoperidinum depressum	8
Gonyaulax diegensis	8
Ceratium furca	14
Ceratium macroceros	8
Ceratium tripos	4
Ceratium minutum	8
Oxytoxum sp.	8
Chroomonas vectensis	40
Cryptomonas stigmatica	24
Unidentified	8

Station 30	Cells/ Liter
Nanoplankton	6544
Mallomonas sp.	8
Dictyocha fibula	52
Unidentified coccolithophores	120
Coccolithus pelagicus	8
Helicosphaera carteri	8
Melosira nummuloides	32
Paralia sulcata	352
Stephanopyxis palmeriana	96
Stephanopyxis turris	160
Corethron criophilum	1088
Schroederella delicatula	208
Leptocylindrus danicus	712
Leptocylindrus minimus	8
Skeletonema costatum	456
Thalassiosira nordenskioldii	40
Thalassiosira rotula	32
Lauderia borealis	64
Coscinodiscus concinus	16
Coscinodiscus lineatus	8
Coscinodiscus marginatus	16
Coscinodiscus nitidus	16
Coscinodiscus radiatus	32

Station 30 (conti.)	Cells/ Liter
Coscinodiscus granulosus	82
Actinoptychus senarius	24
Biddulphia sp.	32
Biddulphia alternans	169
Eucampia zoodiacus	8
Hemiaulus hauckii	481
Hemiaulus membranaceus	44
Hemiaulus sinensis	5522
Cerataulina pelagica	40
Chaetoceros affine	80
Chaetoceros coarctatum	44
Chaetoceros gracile	82
Chaetoceros sociale	48
Rhizosolenia sp.	8
Rhizosolenia alata	184
Rhizosolenia alata f. gracillima	82
Rhizosolenia alata f. indica	64
Rhizosolenia calcar-avis	164
Rhizosolenia delicatula	16
Rhizosolenia fragilissima	360
Rhizosolenia imbricata	680
Rhizosolenia setigera	8
Rhizosolenia stolterfothii	80
Guinardia flaccida	92
Ditylum brightwellii	104
Asterionella glacialis	24
Thalassionema nitzschioides	24
Navicula salinarum	8
Diploneis crabro	8
Pleurosigma nicobaricum	96
Pleurosigma normanii	48
Amphora arenaria	16
Nitzschia pungens	80
Nitzschia seriata	64
Chlorella sp.	64
Anacystis sp.	80
Cylindrotheca closterium	8
Prorocentrum micans	28
Prorocentrum scutellum	80
Prorocentrum compressum	256
Prorocentrum lima	8
Dinophysis acuminata	8
Dinophysis caudata	8
Dinophysis fortii	72
Unidentified dinophyceans	8
Amphidinium crassum	40
Cochlodinium sp.	8
Gymnodinium sp.	462
Gyrodinium pellucidum	48
Gyrodinium uncatenum	24
Diplopsalis lenticula	16
Glenodinium danicum	24
Heterocapsa triquetra	64
Protoperidinium cerasus	48
Protoperidinium conicum	16
Scripsiella trochoidea	224
Protoperidinium excavatum	48
Protoperidinium breve	72
Gonyaulax spinifera	32
Gonyaulax tricantha	8
Ceratium furca	32
Ceratium fusus	80
Ceratium lineatum	64
Ceratium tripos	8
Ceratium massiliense	32
Ceratium trichoceros	306
Ceratium minutum	64
Ceratium falcatiforme	8
Ceratium extensum	45
Oxytoxum sphaeroideum	32
Cryptomonas pseudobaltica	802

Station 31	Cells/ Liter
Oscillatoria erythraea	64
Dictyocha fibula	200
Distephanus speculum	16
Paralia sulcata	992
Corethron criophilum	424
Leptocylindrus danicus	104
Skeletonema costatum	64
Coscinodiscus sp.	40
Coscinodiscus nitidus	72
Coscinodiscus radiatus	16
Coscinodiscus wailesii	32
Actinoptychus senarius	24
Biddulphia alternans	16
Hemiaulus sinensis	3056
Cerataulina pelagica	176
Chaetoceros sp.	64
Chaetoceros affine	32
Chaetoceros coarctatum	56
Rhizosolenia alata	184
Rhizosolenia calcar-avis	8
Rhizosolenia imbricata	344
Rhizosolenia setigera	64
Guinardia flaccida	168
Synedra sp.	8
Asterionella glacialis	8
Thalassionema nitzschioides	32
Navicula sp.	88
Navicula lyra	8
Pleurosigma sp.	136
Pleurosigma elongatum	48

Station 31 (conti.)	Cells/ Liter
Pleurosigma nicobaricum	48
Nitzschia pungens	144
Cylindrotheca closterium	64
Pyramimonas amylifer	16
Prorocentrum micans	48
Dinophysis sp.	8
Dinophysis norvegica	8
Dinophysis caudata	16
Dinophysis tripos	40
Dinophysis fortii	128
Protoperidinium claudicans	8
Protoperidinium steinii	8
Gonyaulax sp.	16
Gonyaulax diegensis	16
Gonyaulax birostris	8
Ceratium lineatum	24
Ceratium tripos var. atlanticum	120
Ceratium trichoceros	584
Ceratium candelabrum	16
Ceratium belone	8
Ceratium teres	8
Ceratium extensum	104

Station 32	
Oscillatoria erythraea	24
Dictyocha fibula	88
Paralia sulcata	1720
Corethron criophilum	32
Leptocylindrus danicus	962
Leptocylindrus minimus	1284
Coscinodiscus asteromphalus	16
Coscinodiscus nitidus	40
Coscinodiscus radiatus	40
Coscinodiscus wailesii	564
Actinoptychus senarius	1528
Hemiaulus hauckii	40
Hemiaulus membranaceus	160
Hemiaulus sinensis	2824
Cerataulina pelagica	48
Chaetoceros atlanticum	32
Chaetoceros coarctatum	152
Rhizosolenia alata	64
Rhizosolenia alata f. gracillima	16
Rhizosolenia alata f. indica	16
Rhizosolenia calcar-avis	48
Rhizosolenia hebetata f. semispina	162
Rhizosolenia imbricata	128
Rhizosolenia setigera	16
Rhizosolenia stolterfothii	482
Guinardia flaccida	264
Ditylum brightwellii	82
Synedra tabulata v. fasciculata	84
Licmophora sp.	200
Grammatophora sp.	112
Diploneis crabro	8
Pleurosigma sp.	72
Nitzschia pungens	5260
Cylindrotheca closterium	24
Euglena sp.	1442
Prorocentrum compressum	48
Dinophysis caudata	8
Dinophysis fortii	40
Protoperidinium claudicans	8
Ceratium fusus	8
Ceratium lineatum	164
Ceratium tripos var. atlanticum	244
Ceratium trichoceros	504
Ceratium contortum	8
Ceratium extensum	16

Station 41	
Nanoplankton	25024
Mallomonas sp.	8
Dictyocha fibula	24
Unidentified haptophyceans	24
Pontosphaera syracusana	16
Syracosphaera apsteini	8
Unidentified coccolithophores	56
Coccolithus pelagicus	16
Discosphaera tubifera	8
Gephyrocapsa oceanica	40
Helicosphaera carteri	24
Stephanopyxis turris	32
Corethron criophilum	448
Schroederella delicatula	24
Leptocylindrus danicus	112
Skeletonema costatum	1472
Coscinodiscus marginatus	24
Coscinodiscus perforatus	8
Actinoptychus senarius	8
Biddulphia sp.	8
Hemiaulus sinensis	72
Cerataulina pelagica	152
Chaetoceros sp.	24
Chaetoceros didymum	64
Chaetoceros sociale	48
Rhizosolenia sp.	16
Rhizosolenia alata	16
Rhizosolenia delicatula	400
Rhizosolenia setigera	8
Rhizosolenia stolterfothii	40
Ditylum brightwellii	8
Synedra tabulata v. fasciculata	8
Asterionella glacialis	136

	Cells/ Liter
Station 41 (conti.)	
Thalassiothrix longissima	8
Thalassionema nitzschioides	8
Navicula pelagica	16
Navicula forcipita	40
Nitzschia seriata	160
Nitzschia proxima	16
Prorocentrum micans	32
Prorocentrum balticum	8
Dinophysis ovum	24
Dinophysis caudata	16
Amphidinium fusiforme	40
Amphidinium klebsii	40
Gymnodinium sp.	16
Gyrodinium aureolum	56
Gyrodinium metum	8
Katodinium rotundatum	8
Nematodinium armatum	8
Glenodinium foliaceum	8
Heterocapsa triquetra	8
Protoperidinium brevipes	96
Scrippsiella trochoidea	32
Gonyaulax spinifera	40
Gonyaulax diegensis	8
Ceratium trichoceros	32
Station 42	
Nanoplankton	100112
Calycomonas ovalis	24
Unidentified coccolithophores	152
Coccolithus pelagicus	8
Helicosphaera carteri	24
Paralia sulcata	48
Stephanopyxis palmeriana	152
Stephanopyxis turris	208
Corethron criophilum	88
Schroederella delicatula	3416
Skeletonema costatum	128
Thalassiosira decipiens	32
Thalassiosira rotula	16
Coscinodiscus sp.	120
Coscinodiscus marginatus	16
Coscinodiscus nitidus	8
Coscinodiscus radiatus	8
Biddulphia sp.	8
Biddulphia alternans	40
Streptotheca thamesis	64
Hemiaulus sinensis	280
Cerataulina pelagica	120
Chaetoceros didymum	24
Rhizosolenia alata	1336
Rhizosolenia calcar-avis	96
Rhizosolenia delicatula	16
Rhizosolenia fragilissima	168
Rhizosolenia stolterfothii	160
Rhizosolenia styliformis	32
Guinardia flaccida	48
Asterionella glacialis	56
Cocconeis scutellum	8
Navicula sp.	8
Navicula salinarum	16
Navicula hennedyii	24
Amphiprora sp.	8
Amphora ostrearia	8
Phaeodactylum tricornutum	8
Nitzschia seriata	456
Surirella robusta	8
Prorocentrum micans	32
Prorocentrum apora	16
Prorocentrum lima	8
Dinophysis sp.	8
Dinophysis acuminata	16
Amphidinium operculatum	8
Amphidinium crassum	16
Amphidinium klebsii	24
Gymnodinium nelsoni	8
Gymnodinium minutum	8
Gyrodinium aureolum	8
Gyrodinium uncatenum	16
Heterocapsa triquetra	176
Protoperidinium cerasus	24
Protoperidinium depressum	32
Scrippsiella trochoidea	96
Protoperidinium breve	40
Amphidoma steinii	16
Gonyaulax diacantha	32
Gonyaulax polygramma	8
Gonyaulax unicornis	24
Gonyaulax minima	32
Gonyaulax excavata	8
Ceratium fusus	8
Ceratium trichoceros	24
Ceratium minutum	40
Ceratium pavillardi	16
Oxytoxum reticulatum	16
Oxytoxum constictum	8
Cryptomonas stigmatica	56
Unidentified	8
Station 43	
Nanoplankton	10200
Calycomonas ovalis	8
Unidentified haptophyceans	56
Paralia sulcata	32
Melosira hummii	16
Stephanopyxis turris	48
Schroederella delicatula	8

	Cells/ Liter
Station 43 (conti.)	
Skeletonema costatum	32
Thalassiosira eccentrica	112
Actinoptychus senarius	8
Biddulphia sp.	24
Biddulphia alternans	48
Hemiaulus sinensis	56
Cerataulina pelagica	48
Rhizosolenia acuminata	16
Rhizosolenia alata	568
Rhizosolenia delicatula	16
Rhizosolenia hebetata f. hemiaulus	24
Rhizosolenia setigera	72
Guinardia flaccida	8
Synedra tabulata v. fasciculata	8
Thalassionema nitzschioides	80
Rhabdonema arcuatum	16
Achnanthes longipes	24
Navicula salinarum	8
Navicula pavillardi	8
Pleurosigma normani	8
Amphora ovalis	8
Amphora arenaria	24
Bacillaria paxillifer	16
Nitzschia seriata	416
Eutreptia sp.	8
Prorocentrum micans	40
Prorocentrum maximum	8
Gyrodinium glaebum	32
Gyrodinium aureolum	16
Katodinium rotundatum	32
Noctiluca miliaris	8
Protoperidinium sp.	24
Scrippsiella trochoidea	8
Gonyaulax diacantha	16
Gonyaulax excavata	8
Ceratium fusus	8
Station 53	
Nanoplankton	8408
Mallomonas sp.	24
Calycomonas wulffii	8
Olisthodiscus luteus	32
Hymenomonas roseola	8
Syracosphaera pulchra	8
Unidentified coccolithophores	16
Paralia sulcata	64
Corethron criophilum	5640
Skeletonema costatum	24
Thalassiosira aestivalis	32
Coscinodiscus nitidus	16
Hemiaulus sinensis	56
Chaetoceros affine	16
Chaetoceros compressum	48
Rhizosolenia alata f. gracillima	32
Guinardia flaccida	8
Amphora arenaria	8
Prorocentrum lima	16
Gyrodinium aureum	16
Heterocapsa triquetra	8
Protoperidinium brevipes	8
Scrippsiella trochoidea	8
Gonyaulax diacantha	8
Oxytoxum graate	8
Chilomonas sp.	24
Chroomonas vectensis	16
Cryptomonas stigmatica	16
Unknown	24
Station 54	
Nanoplankton	208
Mallomonas sp.	8
Unidentified haptophyceans	8
Hymenomonas roseola	8
Pontosphaera syracusana	8
Syracosphaera pulchra	16
Unidentified coccolithophores	216
Cyclococcolithus leptoporus	8
Gephyrocapsa oceanica	8
Helicosphaera carteri	24
Rhabdosphaera claviger	16
Melosira moniliformis	48
Corethron criophilum	616
Skeletonema costatum	99472
Thalassiosira decipiens	16
Coscinodiscus kuetzingii	8
Coscinodiscus marginatus	16
Coscinodiscus nitidus	8
Biddulphia alternans	48
Biddulphia sinensis	16
Eucampia zoodiacus	32
Hemiaulus sinensis	320
Chaetoceros affine	232
Chaetoceros curvisetum	136
Chaetoceros debile	112
Rhizosolenia alata	88
Rhizosolenia delicatula	32
Rhizosolenia setigera	8
Guinardia flaccida	56
Lithodesmium undulatum	40
Ditylum brightwellii	48
Fragilaria crotonensis	8
Asterionella glacialis	2552
Nitzschia seriata	184
Prorocentrum micans	72
Prorocentrum lima	32
Unidentified dinophyceans	8

Station 54 (conti.)	Cells/ Liter
Amphidinium crassum	40
Gymnodinium nelsoni	8
Gyrodinium aureum	24
Noctiluca miliaris	8
Pyrophacus horologicum	8
Heterocapsa triquetra	16
Protoperidinium claudicans	24
Amphidoma caudatum	16
Gonyaulax spinifera	16
Oxytoxum constictum	8
Chilomonas sp.	16
Chroomonas salina	24
Cryptomonas stigmatica	16
Unknown	8

Station 55	
Nanoplankton	4352
Calycomonas wulffii	16
Dictyocha fibula	512
Distephanus speculum	8
Olisthodiscus luteus	40
Unidentified haptophyceans	16
Unidentified coccolithophores	168
Coccolithus pelagicus	24
Gephyrocapsa oceanica	24
Helicosphaera carteri	8
Paralia sulcata	1024
Corethron criophilum	1280
Schroederella delicatula	40
Leptocylindrus danicus	793600
Leptocylindrus minimus	1280
Skeletonema costatum	1324692
Thalassiosira eccentrica	16
Coscinodiscus nitidus	132
Hemiaulus membranaceus	512
Hemiaulus sinensis	388
Chaetoceros affine	40
Chaetoceros atlanticum	1536
Chaetoceros danicum	32
Chaetoceros sociale	1536
Rhizosolenia sp.	24
Rhizosolenia alata	16
Rhizosolenia delicatula	88
Asterionella glacialis	51598
Thalassiothrix longissima	16
Thalassionema nitzschioides	24
Tabellaria fenestrata v. asterionelloides	5376
Navicula directa	16
Phaeodactylum tricornutum	8
Nitzschia delicatissima	6656
Nitzschia pungens	11520
Cylindrotheca closterium	256
Arthrodesmus sp.	256
Prorocentrum micans	4520
Prorocentrum scutellum	7168
Prorocentrum balticum	40
Dinophysis ovum	8
Dinophysis fortii	512
Gymnodinium sp.	512
Gymnodinium nelsoni	8
Gyrodinium aureolum	48
Katodinium rotundatum	8
Protoperidinium cerasus	24
Scrippsiella trochoidea	40
Protoperidinium steinii	1792
Gonyaulax scrippsae	16
Ceratium lineatum	512
Ceratium macroceros	8
Ceratium trichoceros	136
Oxytoxum scolpax	8
Chilomonas sp.	16
Chroomonas vectensis	8
Cryptomonas stigmatica	48
Unknown	8

Station 56	
Gomphosphaeria aponina	192
Nanoplankton	1584
Nannochloris atomus	128
Calycomonas wulffii	32
Dictyocha fibula	132
Distephanus speculum	160
Ebria tripartita	32
Unidentified haptophyceans	40
Syracosphaera sp.	40
Unidentified coccolithophores	384
Cyclococcolithus leptoporus	24
Rhabdosphaera claviger	24
Paralia sulcata	640
Stephanopyxis palmeriana	192
Stephanopyxis turris	48
Podosira sp.	8
Corethron criophilum	852
Leptocylindrus danicus	7072
Leptocylindrus minimus	320
Skeletonema costatum	209328
Coscinodiscus nitidus	20
Coscinodiscus granulosus	32
Hemidiscus cuneiformis	24
Eucampia zoodiacus	256
Climacodium frauenfeldianum	32
Climacodium biconcavum	2112
Hemiaulus hauckii	468
Hemiaulus membranaceus	112
Cerataulina pelagica	128
Chaetoceros sp.	1056
Chaetoceros affine	32

Station 56 (conti.)	Cells/ Liter
Chaetoceros curvisetum	32
Chaetoceros didymum	40
Chaetoceros externum	24
Bacteriastrum hyalinum	8
Rhizosolenia alata	388
Rhizosolenia alata f. gracillima	64
Rhizosolenia calcar-avis	24
Rhizosolenia delicatula	389
Rhizosoelenia hebetata f. hemiaulus	24
Rhizosolenia imbricata	160
Rhizosolenia setigera	120
Rhizosolenia stolterfothii	24
Rhizosolenia styliformis	64
Guinardia flaccida	32
Lithodesmium undulatum	24
Ditylum brightwellii	80
Asterionella glacialis	592
Thalassiothrix frauenfeldii	192
Grammatophora marina	24
Tabellaria fenestrata	832
Pleurosigma angulatum	128
Pleurosigma normani	8
Nitzschia delicatissima	7040
Nitzschia seriata	1036
Cylindrotheca closterium	1056
Prorocentrum sp.	800
Prorocentrum micans	1384
Prorocentrum scutellum	16
Prorocentrum apora	16
Prorocentrum balticum	8
Amphisolenia globifera	8
Dinophysis norvegica	8
Dinophysis fortii	128
Amphidinium crassum	24
Amphidinium gloucum	40
Gymnodinium sp.	32
Gymnodinium nelsoni	96
Gymnodinium arcticum	64
Gyrodinium sp.	88
Gyrodinium aureolum	64
Gyrodinium pingue	80
Gyrodinium uncatenum	64
Polykrikos kofoidi	8
Noctiluca miliaria	16
Glenodinium danicum	56
Heterocapsa triquetra	24
Protoperidinium brevipes	8
Protoperidinium pallidum	40
Scrippsiella trochoidea	64
Protoperidinium pentagonum	8
Gonyaulax sp.	32
Gonyaulax diacantha	40
Gonyaulax orientalis	8
Gonyaulax polyedra	8
Gonyaulax tricantha	24
Gonyaulax excavata	24
Ceratium fusus	24
Ceratium lineatum	8
Ceratium tripos var. atlanticum	96
Ceratium trichoceros	96
Ceratium contortum	64
Ceratium extensum	16
Oxytoxum mitra	8
Chilomonas sp.	32
Chroomonas salina	88
Cryptomonas stigmatica	16
Unknown	24

Station 57	Cells/ Liter
Oscillatoria erythraea	4
Dictyocha fibula	70
Paralia sulcata	30
Leptocylindrus danicus	14
Leptocylindrus minimus	6
Skeletonema costatum	800
Thalassiosira gravida	116
Coscinodiscus lineatus	6
Coscinodiscus granulosus	10
Actinoptychus senarius	8
Climacodium frauenfeldianum	12
Hemiaulus membranaceus	130
Hemiaulus sinensis	2038
Chaetoceros sp.	20
Chaetoceros coarctatum	2
Chaetoceros gracile	2
Rhizosolenia alata	70
Rhizosolenia alata f. gracillima	28
Rhizosolenia calcar-avis	26
Rhizosolenia delicatula	20
Rhizosolenia imbricata	46
Rhizosolenia stolterfothii	6
Guinardia flaccida	102
Ditylum brightwellii	14
Plagiogramma staurophorum	4
Pleurosigma angulatum	4
Nitzschia pungens	34
Cylindrotheca closterium	10
Prorocentrum micans	14
Dinophysis tripos	6
Dinophysis fortii	8
Protoperidinium granii	10
Ceratium fusus	20
Ceratium lineatum	2
Ceratium trichoceros	90

Station 58	Cells/ Liter
Dictyocha fibula	2
Paralia sulcata	6

	Cells/ Liter
Station 58 (conti.)	
Leptocylindrus danicus	12
Coscinodiscus nitidus	20
Hemiaulus sinensis	130
Rhizosolenia alata	50
Rhizosolenia alata f. gracillima	24
Rhizosolenia calcar-avis	34
Rhizosolenia hebetata f. hemiaulus	12
Rhizosolenia imbricata	38
Rhizosolenia stolterfothii	120
Guinardia flaccida	186
Thalassiothrix frauenfeldii	18
Thalassionema nitzschioides	32
Noctiluca miliaris	4
Ceratium fusus	2
Station 59	
Dictyocha fibula	16
Leptocylindrus danicus	54
Leptocylindrus minimus	38
Thalassiosira gravida	6
Coscinodiscus nitidus	13
Coscinodiscus granulosus	8
Actinoptychus senarius	4
Hemiaulus sinensis	84
Chaetoceros atlanticum	81
Rhizosolenia alata	61
Rhizosolenia alata f. gracillima	56
Rhizosolenia calcar-avis	16
Rhizosolenia delicatula	34
Rhizosolenia imbricata	54
Rhizosolenia setigera	26
Rhizosolenia stolterfothii	168
Guinardia flaccida	76
Thalassionema nitzschioides	44
Dimerogramma sp.	20
Nitzschia pungens	54
Cylindrotheca closterium	30
Prorocentrum micans	2
Amphidinium atutum	8
Ceratium fusus	8
Ceratium lineatum	10
Ceratium tripos var. atlanticum	2
Ceratium trichoceros	16
Oxytoxum milneri	2
Station 60	
Dictyocha fibula	144
Unidentified coccolithophores	40
Corethron criophilum	44
Leptocylindrus danicus	160
Coscinodiscus nitidus	16
Coscinodiscus radiatus	100
Coscinodiscus wailesii	8
Actinoptychus senarius	48
Eucampia zoodiacus	16
Hemiaulus sinensis	172
Chaetoceros atlanticum	108
Chaetoceros coarctatum	164
Chaetoceros curvisetum	36
Chaetoceros danicum	160
Chaetoceros densum	112
Chaetoceros peruvianum	12
Rhizosolenia alata	28
Rhizosolenia alata f. gracillima	32
Rhizosolenia calcar-avis	104
Rhizosolenia cylindrus	12
Rhizosolenia imbricata	128
Rhizosolenia setigera	48
Rhizosolenia stolterfothii	404
Rhizosolenia styliformis	54
Guinardia flaccida	16
Synedra tabulata v. fasciculata	240
Cylindrotheca closterium	80
Pyramimonas grossi	596
Gyrodinium sp.	8
Ceratium trichoceros	16
Ceratium extensum	8
Station 61	
Oscillatoria erythraea	2908
Dictyocha fibula	64
Distephanus speculum	12
Leptocylindrus danicus	720
Leptocylindrus minimus	168
Skeletonema costatum	68
Coscinodiscus nitidus	20
Coscinodiscus radiatus	24
Chaetoceros atlanticum	2408
Chaetoceros danicum	60
Chaetoceros peruvianum	288
Rhizosolenia alata	160
Rhizosolenia alata f. indica	72
Rhizosolenia calcar-avis	28
Rhizosolenia cylindrus	24
Rhizosolenia imbricata	448
Rhizosolenia setigera	28
Rhizosolenia styliformis	488
Guinardia flaccida	168
Synedra sp.	80
Thalassiothrix frauenfeldii	16
Rhaphoneis amphiceros	88
Plagiogramma staurophorum	12

Station 61 (conti.)	Cells/ Liter
Tabellaria fenestrata asterionelloides	76
Gyrosigma sp.	10
Nitzschia pungens	3006
Cylindrotheca closterium	128
Prorocentrum micans	82
Prorocentrum apora	8
Amphidinium acutum	20
Amphidinium acutissimum	28
Ceratium fusus	12
Ceratium minutum	4
Cryptomonas pseudobaltica	8
Discosphaera tubifer	36

Station 62	Cells/ Liter
Oscillatoria erythraea	26
Dictyocha fibula	70
Rhabdosphaera claviger	1
Corethron criophilum	8
Leptocylindrus danicus	58
Skeletonema costatum	42
Coscinodiscus granulosus	6
Eucampia zoodiacus	36
Chaetoceros atlanticum	150
Chaetoceros danicum	94
Chaetoceros peruvianum	24
Chaetoceros sociale	36
Bacteriastrum hyalinum	30
Rhizosolenia alata	12
Rhizosolenia alata f. indica	14
Rhizosolenia bergonii	6
Rhizosolenia calcar-avis	22
Rhizosolenia cylindrus	16
Rhizosolenia delicatula	18
Rhizosolenia hebetata f. semispina	182
Rhizosolenia imbricata	28
Rhizosolenia setigera	6
Rhizosolenia stolterfothii	648
Rhizosolenia styliformis	2
Guinardia flaccida	12
Emiliania huxleyi	740
Thalassiothrix frauenfeldii	90
Cymatosira belgica	12
Plagiogramma staurophorum	4
Tabellaria fenestrata v. asterionelloides	8
Gyrosigma fasciola	2
Cylindrotheca closterium	246
Pyramimonas grossi	72
Prorocentrum scutellum	2
Amphidinium acutissimum	4
Gymnodinium variable	4
Gymnodinium arcticum	4
Gyrodinium sp.	4
Noctiluca miliaris	4
Protoperidinium granii	2
Ceratium fusus	12
Ceratium pentagonum	12
Oxytoxum sp.	6
Cryptomonas pseudobaltica	18
Synedra sp.	740

Station 63	Cells/ Liter
Corethron criophilum	16
Leptocylindrus danicus	144
Coscinodiscus stellaris	144
Chaetoceros sp.	64
Chaetoceros compressum	240
Rhizosolenia alata	80
Rhizosolenia alata f. indica	32
Rhizosolenia stolterfothii	180
Rhizosolenia styliformis	64
Thalassionema nitzschioides	296
Cylindrotheca closterium	8
Pyramimonas grossi	528

Station 67	Cells/ Liter
Nanoplankton	48
Calycomonas wulffii	24
Distephanus speculum	24
Ebria tripartita	8
Unidentified haptophyceans	24
Hymenomonas roseola	16
Unidentified coccolithophores	128
Paralia sulcata	56
Stephanopyxis turris	32
Corethron criophilum	192
Schroederella delicatula	40
Leptocylindrus danicus	208
Skeletonema costatum	66232
Coscinodiscus nitidus	8
Hemiaulus hauckii	96
Hemiaulus sinensis	328
Cerataulina pelagica	48
Chaetoceros sp.	24
Chaetoceros affine	16
Chaetoceros decipiens	120
Bacteriastrum varians	8
Rhizosolenia alata	480
Rhizosolenia alata f. gracillima	24
Rhizosolenia bergonii	16
Rhizosolenia delicatula	14232

Station 67 (conti.)	Cells/ Liter
Rhizosolenia fragilissima	64
Rhizosolenia hebetata f. hemiaulus	128
Guinardia flaccida	16
Ditylum brightwellii	40
Thalassionema nitzschioides	104
Striatella unipunctata	12760
Grammatophora marina	8
Rhabdonema arcuatum	8
Diploneis lineata	8
Pinnularia cruciformis	8
Pleurosigma normani	32
Amphiprora surirelloides	8
Amphora ostrearia	8
Nitzschia seriata	336
Prorocentrum micans	24
Prorocentrum scutellum	72
Prorocentrum apora	32
Amphidinium fusiforme	16
Gymnodinium simplex	8
Gyrodinium aureum	8
Katodinium rotundatum	16
Glenodinium rotundatum	48
Protoperidinium breve	40
Amphidoma caudatum	8
Gonyaulax spinifera	8
Gonyaulax diacantha	32
Gonyaulax minuta	8
Ceratium lineatum	8
Ceratium geniculatum	8
Chilomonas sp.	16
Unknown	8

Station 68	Cells/ Liter
Nanoplankton	14536
Mallomonas sp.	16
Calycomonas ovalis	16
Dictyocha fibula	40
Distephanus speculum	16
Unidentified haptophyceans	8
Pontosphaera syracusana	8
Unidentified coccolithophores	88
Coccolithus pelagicus	8
Discosphaera tubifera	8
Gephyrocapsa oceanica	8
Helicosphaera carteri	8
Rhabdosphaera claviger	16
Paralia sulcata	48
Stephanopyxis turris	88
Corethron criophilum	224
Skeletonema costatum	21184
Thalassiosira aestivalis	32
Thalassiosira decipiens	56
Thalassiosira nordenskioldii	152
Thalassiosira rotula	56
Coscinosira polychorda	64
Coscinodiscus perforatus	8
Bellerochea malleus	16
Streptotheca thamesis	24
Eucampia zoodiacus	24
Hemiaulus hauckii	240
Hemiaulus sinensis	16
Cerataulina pelagica	112
Chaetoceros breve	16
Chaetoceros curvisetum	80
Chaetoceros danicum	248
Chaetoceros debile	72
Chaetoceros decipiens	216
Chaetoceros didymum	144
Chaetoceros gracile	48
Chaetoceros tortissimum	112
Rhizosolenia alata	600
Rhizosolenia calcar-avis	40
Rhizosolenia delicatula	872
Rhizosolenia setigera	128
Rhizosolenia styliformis	8
Guinardia flaccida	32
Ditylum brightwellii	96
Fragilaria sp.	16
Asterionella glacialis	144
Thalassiothrix frauenfeldii	24
Thalassionema nitzschioides	80
Cocconeis scutellum	8
Navicula sp.	8
Navicula hennedyii	8
Mastogloia brauni	8
Amphora sp.	8
Amphora crassa	8
Nitzschia obtusa	8
Nitzschia sigma	168
Nitzschia microcephala	8
Nitzschia proxima	48
Prorocentrum micans	344
Prorocentrum scutellum	16
Prorocentrum balticum	8
Prorocentrum compressum	8
Dinophysis acuminata	8
Amphidinium klebsii	72
Gymnodinium nelsoni	104
Gymnodinium stellatum	16
Gyrodinium spirale	48
Gyrodinium uncatenum	48
Katodinium rotundatum	24
Diplopsalis lenticula	24
Glenodinium danicum	40
Heterocapsa triquetra	32
Protoperidinium cerasus	24
Scrippsiella trochoidea	184
Protoperidinium excavatum	80

Station 68 (conti.)	Cells/ Liter
Protoperidinium pentagonum	40
Amphidoma steinii	32
Gonyaulax catenata	16
Gonyaulax spinifera	8
Gonyaulax diacantha	24
Gonyaulax diegensis	24
Gonyaulax polyedra	8
Gonyaulax polygramma	8
Ceratium fusus	32
Ceratium lineatum	16
Ceratium tripos	8
Ceratium massiliense	8
Goniodoma sp.	8
Oxytoxum gladiolus	8
Chroomonas salina	24

Station 74	
Nanoplankton	5992
Calycomonas wulffii	16
Olisthodiscus luteus	8
Unidentified haptophyceans	32
Hymenomonas carteri	16
Pontosphaera syracusana	8
Unidentified coccolithophores	168
Rhabdosphaera claviger	8
Melosira nummuloides	88
Paralia sulcata	48
Corethron criophilum	24
Dactyliosolen antarcticus	8
Skeletonema costatum	448
Cyclotella meneghiniana	24
Thalassiosira nordenskioldii	64
Lauderia borealis	8
Streptotheca thamesis	16
Hemiaulus hauckii	56
Chaetoceros sp.	16
Chaetoceros affine	32
Chaetoceros danicum	16
Bacteriastrum hyalinum v. princips	24
Rhizosolenia acuminata	48
Rhizosolenia alata	448
Rhizosolenia delicatula	504
Rhizosolenia fragilissima	80
Rhizosolenia hebetata f. hemiaulus	32
Rhizosolenia setigera	24
Rhizosolenia stolterfothii	520
Guinardia flaccida	88
Lithodesmium undulatum	16
Asterionella glacialis	176
Thalassiothrix frauenfeldii	24
Thalassionema nitzschioides	24
Nitzschia seriata	4720
Nitzschia lorenziana var. incurva	8
Nitzschia proxima	8
Dinophysis acuta	8
Amphidinium crassum	16
Gymnodinium sp.	32
Gymnodinium splendens	16
Gymnodinium stellatum	16
Gyrodinium uncatenum	8
Katodinium rotundatum	32
Katodinium assymmetricum	24
Oxyrrhis marina	8
Glenodinium danicum	16
Heterocapsa triquetra	48
Scrippsiella trochoidea	16
Amphidoma steinii	8
Ceratium massiliense	8
Chilomonas sp.	64
Chroomonas vectensis	8
Unknown	8

Station 75	
Nanoplankton	7840
Calycomonas ovalis	16
Dictyocha fibula	16
Olisthodiscus luteus	24
Unidentified haptophyceans	16
Hymenomonas roseola	40
Unidentified coccolithophores	152
Coccolithus pelagicus	32
Coscinodiscus nitidus	8
Biddulphia alternans	8
Chaetoceros atlanticum	24
Rhizosolenia stolterfothii	24
Guinardia flaccida	8
Thalassionema nitzschioides	16
Euglena sp.	48
Prorocentrum apora	8
Dinophysis acuminata	8
Cochlodinium kofoidii	8
Gyrodinium aureolum	16
Protoperidinium sp.	32
Protoperidinium brevipes	24
Protoperidinium claudicans	16
Protoperidinium leonis	24
Amphidoma steinii	16
Gonyaulax diegensis	16
Chilomonas sp.	8

Station 77	
Nanoplankton	15824
Nostoc commune	548
Calycomonas wulffii	16

Station 77 (conti.)	Cells/ Liter
Dictyocha fibula	12
Distephanus speculum	8
Hymenomonas roseola	40
Hymenomonas carteri	8
Unidentified coccolithophores	32
Coccolithus pelagicus	16
Paralia sulcata	12
Corethron criophilum	56
Leptocylindrus danicus	260
Skeletonema costatum	80
Coscinodiscus marginatus	32
Coscinodiscus nitidus	8
Actinoptychus senarius	60
Asteromphalus heptactis	8
Eucampia cornuta	32
Chaetoceros sp.	44
Chaetoceros coarctatum	32
Chaetoceros danicum	48
Chaetoceros gracile	16
Chaetoceros sociale	64
Rhizosolenia alata	166
Rhizosolenia alata f. gracillima	4
Rhizosolenia delicatula	184
Rhizosolenia fragilissima	16
Rhizosolenia hebetata f. hemiaulus	40
Rhizosolenia imbricata	572
Rhizosolenia setigera	16
Rhizosolenia stolterfothii	698
Rhizosolenia styliformis	8
Guinardia flaccida	208
Synedra sp.	24
Asterionella glacialis	8
Thalassiothrix frauenfeldii	104
Thalassionema nitzschioides	72
Striatella unipunctata	152
Grammatophora marina	12
Tabellaria fenestrata v. asterionelloides	32
Pleurosigma elongatum	4
Pleurosigma normani	8
Phaeodactylum tricornutum	24
Nitzschia bilobata	8
Nitzschia seriata	48
Cylindrotheca closterium	140
Prorocentrum micans	4
Prorocentrum apora	8
Dinophysis acuminata	8
Amphidinium crassum	8
Gyrodinium uncatenum	8
Katodinium rotundatum	16
Noctiluca miliaris	8
Protoperidinium brevipes	16
Protoperidinium cerasus	16
Protoperidinium granii	4
Ceratium fusus	8
Ceratium tripos var. atlanticum	4
Ceratium trichoceros	16

Station 78	Cells/ Liter
Nostoc commune	16
Dictyocha fibula	36
Distephanus speculum	68
Corethron criophilum	8
Leptocylindrus danicus	160
Leptocylindrus minimus	32
Thalassiosira gravida	56
Thalassiosira eccentrica	76
Coscinodiscus lineatus	4
Coscinodiscus nitidus	16
Coscinodiscus radiatus	4
Chaetoceros atlanticum	60
Chaetoceros danicum	60
Rhizosolenia alata	200
Rhizosolenia imbricata	380
Rhizosolenia stolterfothii	780
Guinardia flaccida	180
Thalassionema nitzschioides	48
Licmophora sp.	4
Tabellaria fenestrata v. asterionelloides	136
Pleurosigma sp.	28
Cylindrotheca closterium	124
Prorocentrum micans	8
Dinophysis fortii	4
Amphidinium sp.	12
Noctiluca miliaris	54
Ceratium fusus	4
Ceratium tripos var. atlanticum	4
Ceratium trichoceros	4
Cryptomonas pseudobaltica	140

Station 79	Cells/ Liter
Nostoc commune	2240
Dictyocha fibula	204
Distephanus speculum	140
Paralia sulcata	48
Leptocylindrus minimus	52
Coscinodiscus lineatus	108
Coscinodiscus marginatus	28
Actinoptychus senarius	108
Rhizosolenia imbricata	220
Rhizosolenia setigera	204
Rhizosolenia stolterfothii	440
Guinardia flaccida	48

	Cells/ Liter
Station 79 (conti.)	
Thalassionema nitzschioides	460
Cylindrotheca closterium	24
Prorocentrum micans	124
Dinophysis fortii	48
Ceratium lineatum	16
Ceratium tripos var. atlanticum	104
Emiliania huxleyi	220
Station 80	
Dictyocha fibula	216
Distephanus speculum	416
Unidentified coccolithophores	12
Thalassiosira gravida	16
Coscinodiscus nitidus	28
Coscinodiscus radiatus	80
Coscinodiscus wailesii	28
Actinoptychus senarius	48
Chaetoceros atlanticum	44
Chaetoceros costatum	48
Rhizosolenia alata	268
Rhizosolenia delicatula	8
Rhizosolenia imbricata	328
Rhizosolenia setigera	12
Rhizosolenia stolterfothii	388
Guinardia flaccida	500
Synedra sp.	152
Thalassiothrix frauenfeldii	400
Plagiogramma staurophorum	16
Cylindrotheca closterium	16
Prorocentrum micans	24
Amphidinium acutum	16
Gymnodinium variable	12
Gymnodinium arcticum	64
Ceratium furca	8
Ceratium tripos var. atlanticum	104
Ceratium extensum	16
Emiliania huxleyi	500
Station 81	
Dictyocha fibula	132
Distephanus speculum	60
Calciosolenia murrayi	16
Unidentified coccolithophores	340
Leptocylindrus minimus	28
Skeletonema costatum	16
Coscinodiscus sp.	16
Coscinodiscus nitidus	12
Coscinodiscus radiatus	40
Coscinodiscus wailesii	20
Actinoptychus senarius	76
Chaetoceros atlanticum	8
Rhizosolenia alata	100
Rhizosolenia alata f. gracillima	44
Rhizosolenia alata f. indica	8
Rhizosolenia calcar-avis	24
Rhizosolenia delicatula	168
Rhizosolenia imbricata	312
Rhizosolenia setigera	44
Rhizosolenia stolterfothii	200
Rhizosolenia styliformis	4
Guinardia flaccida	288
Synedra sp.	4
Thalassiothrix frauenfeldii	956
Pleurosigma hamuliferum	36
Nitzschia pungens	48
Nitzschia angularis v. affinis	4
Cylindrotheca closterium	100
Euglena sp.	8
Prorocentrum micans	24
Prorocentrum rostratum	4
Prorocentrum dentatum	16
Amphidinium acutum	36
Amphidinium acutissimum	12
Gymnodinium grammaticum	6
Gymnodinium arcticum	4
Emiliania huxleyi	960
Protoperidinium globum	4
Gonyaulax polyedra	4
Ceratium fusus	8
Ceratium tripos var. atlanticum	32
Ceratium minutum	4
Ceratium contortum	12
Oxytoxum scolpax	8
Cryptomona pseudobaltica	12
Gyrodinium sp.	35
Station 82	
Dictyocha fibula	70
Distephanus speculum	100
Leptocylindrus danicus	10
Coscinodiscus lineatus	32
Coscinodiscus nitidus	6
Coscinodiscus granulosus	10
Rhizosolenia delicatula	44
Rhizosolenia imbricata	16
Rhizosolenia setigera	10
Guinardia flaccida	2
Tabellaria fenestrata	16
Cylindrotheca closterium	78
Euglena sp.	10
Prorocentrum micans	54
Dinophysis fortii	2
Dinophysis exigua	4
Amphidinium acutissimum	62

Station 82 (conti.)	Cells/ Liter
Amphidinium gloucum	4
Ceratium fusus	4
Ceratium pentagonum	6
Ceratium tripos	4
Emiliania huxleyi	96

Station 87	Cells/ Liter
Nanoplankton	9896
Calycomonas ovalis	32
Hymenomonas carteri	8
Syracosphaera pulchra	8
Unidentified coccolithophores	48
Stephanopyxis turris	16
Coscinodiscus marginatus	8
Coscinodiscus nitidus	16
Hemiaulus sinensis	16
Chaetoceros danicum	40
Rhizosolenia alata	88
Rhizosolenia stolterfothii	3040
Guinardia flaccida	264
Synedra fasciculata	8
Thalassionema nitzschioides	16
Nitzschia hybridiformis	16
Prorocentrum lima	16
Amphidinium fusiforme	16
Amphidinium crassum	8
Amphidinium klebsii	16
Gymnodinium punctatum	16
Gyrodinium aureolum	24
Gyrodinium spirale	8
Gonyaulax spinifera	16
Gonyaulax excavata	24
Unknown	8

Station 88	Cells/ Liter
Nanoplankton	5840
Calycomonas ovalis .	72
Dictyocha fibula	80
Unidentified haptophyceans	152
Unidentified coccolithophores	1240
Gephyrocapsa oceanica	32
Helicosphaera carteri	72
Rhabdosphaera claviger	24
Paralia sulcata	168
Corethron criophilum	96
Cyclotella caspia	80
Thalassiosira aestivalis	272
Thalassiosira nordenskioldii	2968
Thalassiosira rotula	176
Coscinosira polychorda	664
Coscinodiscus centralis	400
Coscinodiscus concinnus	224
Coscinodiscus lineatus	312
Coscinodiscus nitidus	512
Coscinodiscus wailesii	328
Actinoptychus senarius	112
Biddulphia sp.	96
Anaulus mediterraneus var. intermedia	128
Chaetoceros coarctatum	88
Rhizosolenia hebetata f. hemiaulus	200
Rhizosolenia setigera	240
Rhizosolenia stolterfothii	1144
Guinardia flaccida	400
Lithodesmium undulatum	40
Fragilaria pinnata	104
Thalassiothrix longissima	296
Thalassionema nitzschioides	3104
Plagiogramma vanheurckii	40
Achnanthes longipes	16
Navicula arenaria	96
Pleurosigma normani	128
Amphora bigibba	16
Phaeodactylum tricornutum	16
Nitzschia sp.	104
Nitzschia seriata	264
Nitzschia sigma	128
Prorocentrum micans	264
Prorocentrum apora	88
Gyrodinium uncatenum	72
Oxyrrhis marina	80
Dissodium asymmetricum	80
Heterocapsa triquetra	48
Protoperidinium conicoides	648
Ceratium tripos	16
Chilomonas sp.	56

Station 95	Cells/ Liter
Nanoplankton	4832
Calycomonas ovalis	24
Unidentified chrysophyceans	24
Distephanus speculum	8
Hymenomonas roseola	80
Unidentified coccolithophores	200
Coccolithus pelagicus	48
Melosira hummii	48
Stephanopyxis turris	8
Coscinodiscus nitidus	16
Biddulphia alternans	104
Biddulphia aurita	32
Cerataulina pelagica	48
Rhizosolenia alata	24
Rhizosolenia imbricata v. shrubsolei	8
Thalassionema nitzschioides	192
Campylosira cymbelliformis	24

	Cells/ Liter
Station 95 (conti.)	
Grammatophora marina	48
Navicula directa	16
Phaeodactylum tricornutum	8
Nitzschia seriata	64
Prorocentrum triestinum	16
Prorocentrum balticum	8
Katodinium rotundatum	24
Chroomonas vectensis	64
Station 97	
Nanoplankton	3744
Unidentified haptophyceans	16
Unidentified coccolithophores	48
Coccolithus pelagicus	24
Melosira hummii	16
Corethron criophilum	8
Coscinodiscus nitidus	16
Asteromphalus heptactis	8
Biddulphia sp.	8
Rhizosolenia hebetata f. hemiaulus	8
Guinardia flaccida	8
Thalassiothrix longissima	8
Nitzschia bilobata	8
Prorocentrum micans	16
Prorocentrum balticum	8
Cochlodinium helicoides	8
Gyrodinium sp.	24
Gyrodinium estuariale	8
Heterocapsa triquetra	8
Protoperidinium sp.	8
Protoperidinium depressum	16
Scrippsiella trochoidea	24
Station 98	
Calycomonas wulffii	48
Calycomonas ovalis	56
Dictyocha fibula	96
Distephanus speculum	352
Unidentified haptophyceans	72
Chrysochromulina minor	48
Pontosphaera syracusana	24
Syracosphaera pulchra	8
Unidentified coccolithophores	584
Helicosphaera claviger	120
Corethron criophilum	24
Thalassiosira gravida	128
Coscinosira polychorda	56
Coscinodiscus centralis	104
Coscinodiscus nitidus	104
Coscinodiscus perforatus	40
Actinoptychus senarius	200
Asterolampra marylandica	40
Hemidiscus cuneiformis	16
Biddulphia aurita	24
Eucampia zoodiacus	96
Cerataulina pelagica	128
Chaetoceros atlanticum	216
Rhizosolenia alata	48
Rhizosolenia delicatula	1192
Rhizosolenia setigera	792
Rhizosolenia stolterfothii	48
Thalassiothrix longissima	120
Thalassionema nitzschioides	424
Navicula hennedyii	80
Pleurosigma normani	104
Amphora ostrearia	32
Helicosphaera sp.	24
Euglena proxima	272
Prorocentrum balticum	680
Dinophysis sp.	48
Gyrodinium uncatenum	104
Katodinium rotundatum	112
Gonyaulax diacantha	184
Ceratium tripos	24
Oxytoxum graate	72
Station 99	
Nannochloris atomus	96
Calycomonas gracilis	56
Distephanus speculum	232
Ebria tripartita	168
Chrysochromulina minor	1544
Hymenomonas roseola	320
Unidentified coccolithophores	24
Coccolithus pelagicus	40
Helicosphaera carteri	8
Rhabdosphaera claviger	128
Paralia sulcata	64
Skeletonema costatum	552
Lauderia borealis	200
Coscinodiscus marginatus	160
Coscinodiscus perforatus	120
Eucampia zoodiacus	296
Cerataulina pelagica	160
Chaetoceros affine	488
Chaetoceros coarctatum	888
Chaetoceros crinitus	840
Rhizosolenia delicatula	696
Rhizosolenia hebetata f. hemiaulus	1224
Rhizosolenia stolterfothii	1384
Thalassionema nitzschioides	352
Grammatophora marina	248

Station 99 (conti.)	Cells/ Liter
Navicula hennedyii	416
Surirella gemma	24
Euglena sp.	96
Prorocentrum apora	72
Prorocentrum balticum	104
Dinophysis norvegica	160
Amphidinium carterae	72
Gyrodinium spirale	648
Katodinium rotundatum	48
Heterocapsa triquetra	224
Protoperidinium cerasus	208
Amphidoma sp.	16
Gonyaulax polyedra	32
Ceratium horridum	16
Oxytoxum scolpax	72
Chilomonas marina	312
Chroomonas vectensis	336
Cryptomonas stigmatica	8

Station 102	Cells/ Liter
Nanoplankton	2112
Mallomonas sp.	8
Calycomonas wulffii	64
Calycomonas ovalis	40
Dictyocha fibula	8
Distephanus speculum	128
Ebria tripartita	8
Olisthodiscus luteus	16
Unidentified haptophyceans	96
Hymenomonas roseola	96
Unidentified coccolithophores	240
Coccolithus pelagicus	56
Emiliana huxleyi	1512
Helicosphaera carteri	40
Thalassiosira aestivalis	16
Thalassiosira nordenskioldii	216
Thalassiosira rotula	8
Coscinosira polychorda	8
Coscinodiscus sp.	328
Coscinodiscus centralis	24
Coscinodiscus marginatus	80
Rhizosolenia hebetata f. hemiaulus	32
Rhizosolenia stolterfothii	16
Guinardia flaccida	296
Synedra undulata	64
Thalassionema nitzschioides	3448
Plagiogramma vanheurckii	48
Grammatophora marina	1064
Cocconeis scutellum	24
Scoliopleura sp.	96
Euglena proxima	344
Prorocentrum lima	128
Dinophysis acuminata	16
Amphidinium sp.	16
Gymnodinium splendens	32
Gyrodinium aureum	32
Katodinium rotundatum	8
Heterocapsa triquetra	32
Protoperidinium pentagonum	16
Gonyaulax diegensis	32
Oxytoxum scolpax	8
Chilomonas sp.	80
Cryptomonas stigmatica	16

Station 104	Cells/ Liter
Nanoplankton	7024
Calycomonas wulffii	24
Distephanus speculum	74
Hymenomonas roseola	24
Unidentified coccolithophores	88
Melosira sp.	32
Coscinodiscus sp.	32
Coscinodiscus centralis	16
Coscinodiscus lineatus	204
Coscinodiscus marginatus	64
Coscinodiscus nitidus	88
Coscinodiscus perforatus	40
Coscinodiscus gigas	124
Biddulphia sp.	40
Biddulphia alternans	80
Eunotogramma sp.	8
Cerataulina pelagica	24
Chaetoceros danicum	4
Rhizosolenia acuminata	16
Rhizosolenia delicatula	216
Guinardia flaccida	16
Ditylum brightwellii	4
Thalassionema nitzschioides	24
Grammatophora marina	16
Tabellaria fenestrata v. asterionelloides	8
Climacosphenia moniligera	8
Navicula sp.	16
Mastogloia sp.	8
Pleurosigma angulatum	20
Gyrosigma fasciola	8
Amphora arenaria	8
Nitzschia seriata	42
Euglena sp.	56
Euglena proxima	48
Prorocentrum micans	112
Prorocentrum apora	8
Protocentrum balticum	48
Dinophysis acuta	4
Dinophysis ovum	4
Amphidinium carterae	248

Station 104 (conti.)	Cells/ Liter
Gymnodinium sp.	32
Gymnodinium variable	20
Katodinium rotundatum	32
Pyrophacus horologicum	48
Glenodinium danicum	8
Protoperidinium sp.	8
Amphidoma steinii	16
Gonyaulax sp.	8
Ceratium furca	120
Ceratium lineatum	64
Ceratium tripos	16
Ceratium tripos var. atlanticum	64
Ceratium ranipes	20
Cryptomonas stigmatica	16

Station 105	
Dictyocha fibula	384
Paralia sulcata	256
Stephanopyxis palmeriana	256
Skeletonema costatum	256000
Coscinodiscus lineatus	64
Biddulphia alternans	64
Hemiaulus hauckii	256
Hemiaulus sinensis	256
Rhizosolenia imbricata	128
Asterionella glacialis	640
Nitzschia pungens	6464
Prorocentrum micans	2880
Prorocentrum compressum	6336
Dinophysis fortii	128
Gymnodinium arcticum	192
Gonyaulax diegensis	64
Ceratium fusus	256
Ceratium trichoceros	64
Ceratium minutum	128
Ceratium extensum	64
Emiliania huxleyi	2814

Station 106	
Corethron criophilum	4
Coscinodiscus radiatus	8
Chaetoceros sp.	84
Chaetoceros atlanticum	12
Rhizosolenia alata	40
Rhizosolenia imbricata	4
Rhizosolenia setigera	116
Thalassiothrix frauenfeldii	8
Grammatophora marina	16
Pleurosigma elongatum	4
Cylindrotheca closterium	28
Prorocentrum micans	44
Dinophysis acuminata	4
Emiliania huxleyi	112
Amphidinium actutum	52
Gyrodinium sp.	8
Ceratium tripos var. atlanticum	4
Amphidinium sp.	4

Station 108	
Dictyocha fibula	152
Distephanus speculum	104
Corethron criophilum	8
Leptocylindrus minimus	56
Coscinodiscus nitidus	8
Coscinodiscus gigas	8
Actinoptychus senarius	8
Rhizosolenia calcar-avis	16
Rhizosolenia delicatula	256
Rhizosolenia imbricata	48
Rhizosolenia setigera	400
Guinardia flaccida	16
Thalassionema nitzschioides	552
Nitzschia pungens	392
Cylindrotheca closterium	16
Prorocentrum micans	184
Prorocentrum apora	8
Dinophysis fortii	8
Amphidinium acutissimum	216
Gymnodinium sp.	48
Gymnodinium arcticum	24
Gyrodinium sp.	416
Noctiluca miliaris	88
Protoperidinium granii	8
Ceratium tripos var. atlanticum	32
Ceratium minutum	80

Station 110	
Dictyocha fibula	56
Distephanus speculum	60
Leptocylindrus danicus	24
Thalassiosira gravida	4
Coscinodiscus radiatus	8
Chaetoceros atlanticum	24
Rhizosolenia delicatula	28
Rhizosolenia hebetata f. semispina	16
Rhizosolenia imbricata	4
Rhizosolenia setigera	8
Rhizosolenia styliformis	12
Guinardia flaccida	12
Nitzschia pungens	264
Nitzschia sigma v. rigida	116
Cylindrotheca closterium	20

Station 110 (conti.)

	Cells/ Liter
Prorocentrum micans	616
Prorocentrum scutellum	16
Dinophysis fortii	4
Amphidinium acutum	56
Gymnodinium sp.	88
Gymnodinium arcticum	144
Gyrodinium sp.	108
Noctiluca miliaris	8
Gonyaulax sp.	4
Ceratium tripos	16
Ceratium minutum	80
Pyrocystis lunula	8

Station 112

	Cells/ Liter
Unknown silicoflagellates	4
Dictyocha fibula	32
Distephanus speculum	80
Paralia sulcata	92
Coscinodiscus sp.	36
Coscinodiscus lineatus	8
Coscinodiscus marginatus	8
Coscinodiscus nitidus	16
Coscinodiscus gigas	144
Actinoptychus senarius	16
Cerataulina pelagica	24
Chaetoceros atlanticum	72
Chaetoceros danicum	36
Rhizosolenia alata	76
Rhizosolenia imbricata	504
Rhizosolenia setigera	16
Rhizosolenia stolterfothii	20
Guinardia flaccida	320
Synedra sp.	36
Thalassionema nitzschioides	116
Plagiogramma staurophorum	16
Pleurosigma hamuliferum	8
Prorocentrum micans	224
Dinophysis sp.	4
Dinophysis fortii	12
Ceratium fusus	16
Ceratium lineatum	20
Ceratium tripos var. atlanticum	64
Ceratium minutum	12
Cryptomona pseudobaltica	28

Station 115

	Cells/ Liter
Oscillatoria erythraea	368
Distephanus speculum	8
Paralia sulcata	24
Corethron criophilum	32
Coscinodiscus nitidus	8
Coscinodiscus wailesii	16
Chaetoceros sp.	8
Chaetoceros atlanticum	40
Chaetoceros diversum	16
Rhizosolenia alata f. gracillima	8
Rhizosolenia setigera	8
Synedra sp.	72
Navicula sp.	56
Amphora sp.	16
Nitzschia pungens	48
Cylindrotheca closterium	208
Pyramimonas amylifer	8
Emiliania huxleyi	2081
Prorocentrum micans	64
Prorocentrum rostratum	8
Prorocentrum dentatum	40
Amphidinium schroederi	242
Amphidinium acutissimum	56
Gymnodinium sp.	8
Gymnodinium punctatum	16
Gymnodinium arcticum	8
Gyrodinium sp.	112
Protoperidinium nipponicum	16
Gonyaulax digitalis	82
Gonyaulax minuta	24
Ceratium fusus	40
Ceratium macroceros	8
Ceratium trichoceros	56
Oxytoxum turbo	86
Podolampas palmipes	82
Euglena sp.	8

Station 116

	Cells/ Liter
Oscillatoria erythraea	4
Dictyocha fibula	12
Actinoptychus senarius	16
Rhizosolenia alata f. gracillima	484
Rhizosolenia calcar-avis	84
Rhizosolenia setigera	8
Rhizosolenia styliformis	8
Synedra sp.	16
Synedra tabulata v. fasciculata	4
Thalassionema nitzschioides	4
Euglena sp.	8
Prorocentrum micans	56
Prorocentrum gracile	8
Prorocentrum apora	4
Dinophysis ovum	4
Amphidinium acutum	40
Amphidinium acutissimum	16
Gymnodinium variable	12
Gymnodinium arcticum	20
Protoperidinium globum	4

	Cells/ Liter
Station 116 (conti.)	
Amphidoma sp.	4
Gonyaulax polygramma	16
Gonyaulax minuta	12
Ceratium fusus	52
Ceratium lineatum	12
Ceratium trichoceros	4
Oxytoxum sceptrum	4
Oxytoxum scolpax	24
Station 138	
Nanoplankton	2568
Unidentified coccolithophores	8
Thalassiosira nordenskioldii	8
Thalassiosira eccentrica	8
Chaetoceros atlanticum	56
Chaetoceros compressum	24
Chaetoceros decipiens	480
Chaetoceros didymum	384
Chaetoceros simplex	20192
Ditylum brightwellii	48
Rhabdonema arcuatum	8
Navicula directa	8
Prorocentrum micans	8
Gymnodinium sp.	16
Gonyaulax sp.	16
Station 141	
Nanoplankton	152
Oscillatoria erythraea	128
Dictyocha fibula	8
Distephanus speculum	192
Hymenomonas roseola	8
Unidentified coccolithophores	32
Coccolithus pelagicus	8
Leptocylindrus danicus	128
Thalassiosira gravida	32
Thalassiosira nordenskioldii	112
Coscinodiscus radiatus	24
Actinoptychus senarius	32
Biddulphia aurita	8
Cerataulina pelagica	168
Chaetoceros atlanticum	56
Chaetoceros coarctatum	72
Chaetoceros decipiens	104
Chaetoceros gracile	8
Rhizosolenia alata	16
Rhizosolenia delicatula	48
Ditylum brightwellii	968
Fragilaria crotonensis	16
Asterionella glacialis	72
Thalassiothrix frauenfeldii	8
Thalassiothrix longissima	8
Licmophora sp.	8
Navicula sp.	32
Cylindrotheca closterium	320
Euglena proxima	8
Prorocentrum micans	40
Dinophysis ovum	8
Amphidinium crassum	8
Gyrodinium uncatenum	16
Noctiluca miliaris	8
Glenodinium rotundatum	16
Heterocapsa triquetra	16
Protoperidinium cerasus	16
Amphidoma steinii	8
Gonyaulax diegensis	8
Ceratium lineatum	8
Chroomonas vectensis	8
Cryptomonas stigmatica	8
Unknown	40
Station 142	
Distephanus speculum	56
Melosira nummuloides	96
Corethron criophilum	16
Thalassiosira gravida	16
Coscinodiscus nitidus	16
Coscinodiscus gigas	16
Chaetoceros atlanticum	64
Chaetoceros danicum	248
Chaetoceros gracile	80
Rhizosolenia cylindrus	646
Rhizosolenia delicatula	16856
Rhizosolenia hebetata f. semispina	32
Rhizosolenia imbricata	408
Rhizosolenia styliformis	208
Ditylum brightwellii	1400
Pleurosigma sp.	16
Nitzschia pungens	2136
Cylindrotheca closterium	64
Prorocentrum micans	16
Dinophysis schuettii	16
Amphidinium acutissimum	16
Gymnodinium arcticum	1366
Gyrodinium sp.	32
Protoperidinium steinii	16
Gonyaulax polyedra	32
Ceratium lineatum	192
Ceratium tripos var. atlanticum	32
Station 143	
Nostoc commune	24
Dictyocha fibula	16
Distephanus speculum	56

Station 143 (conti.)	Cells/ Liter
Leptocylindrus danicus	32
Leptocylindrus minimus	152
Coscinodiscus lineatus	128
Coscinodiscus nitidus	24
Chaetoceros atlanticum	8
Rhizosolenia delicatula	64
Rhizosolenia imbricata	264
Rhizosolenia styliformis	56
Synedra sp.	8
Thalassiothrix frauenfeldii	16
Plagiogramma staurophorum	16
Navicula sp.	8
Pleurosigma angulatum	16
Nitzschia pungens	472
Cylindrotheca closterium	136
Euglena sp.	8
Prorocentrum micans	72
Amphidinium actutum	64
Amphidinium acutissimum	136
Gyrodinium sp.	136
Ceratium tripos var. atlanticum	16
Ceratium minutum	24
Cryptomona pseudobaltica	8

Station 145	
Dictyocha fibula	64
Distephanus speculum	40
Coscinodiscus radiatus	24
Actinoptychus senarius	16
Chaetoceros atlanticum	64
Rhizosolenia alata	24
Rhizosolenia delicatula	8
Rhizosolenia imbricata	224
Rhizosolenia setigera	144
Rhizosolenia stolterfothii	8
Rhizosolenia styliformis	24
Thalassiothrix frauenfeldii	56
Nitzschia pungens	326
Cylindrotheca closterium	48
Prorocentrum micans	128
Amphidinium schroederi	8
Amphidinium acutum	208
Gymnodinium variable	16
Gymnodinium arcticum	32
Gyrodinium sp.	246
Ceratium lineatum	8
Ceratium tripos var. atlanticum	48
Ceratium minutum	16

Station 146	Cells/ Liter
Distephanus speculum	16
Paralia sulcata	80
Stephanopyxis palmeriana	240
Corethron criophilum	32
Leptocylindrus danicus	5040
Skeletonema costatum	368
Thalassiosira eccentrica	48
Coscinodiscus lineatus	304
Coscinodiscus gigas	16
Actinoptychus sp.	80
Chaetoceros decipiens	928
Rhizosolenia alata f. gracillima	16
Rhizosolenia delicatula	80
Rhizosolenia imbricata	61984
Rhizosolenia stolterfothii	1936
Guinardia flaccida	640
Synedra tabulata v. fasciculata	96
Thalassiothrix frauenfeldii	640
Thalassionema nitzschioides	2160
Navicula sp.	32
Diploneis crabro	32
Pleurosigma angulatum	32
Prorocentrum sp.	32
Prorocentrum micans	10976
Dinophysis actuta	16
Dinophysis ovum	16
Ceratium lineatum	112
Ceratium tripos var. atlanticum	48

Station 148	
Dictyocha fibula	32
Distephanus speculum	32
Melosira granulata	16
Paralia sulcata	320
Corethron criophilum	608
Leptocylindrus danicus	146096
Leptocylindrus minimus	176
Skeletonema costatum	640
Thalassiosira eccentrica	32
Coscinodiscus nitidus	96
Coscinodiscus radiatus	192
Coscinodiscus granulosus	352
Actinoptychus senarius	672
Cerataulina pelagica	1762
Rhizosolenia alata	96
Rhizosolenia cylindrus	160
Rhizosolenia delicatula	1520
Rhizosolenia imbricata	5568

	Cells/ Liter
Station 148 (conti.)	
Rhizosolenia setigera	56
Rhizosolenia stolterfothii	3616
Guinardia flaccida	1152
Synedra tabulata v. fasciculata	16
Thalassiothrix frauenfeldii	32
Plagiogramma staurophorum	312
Pleurosigma angulatum	32
Nitzschia pungens	26880
Pyramimonas amylifer	512
Prorocentrum micans	576
Prorocentrum compressum	128
Dinophysis caudata	16
Gymnodinium sp.	128
Gymnodinium arcticum	928
Gyrodinium sp.	64
Ceratium furca	480
Ceratium lineatum	32
Ceratium tripos var. atlanticum	16
Ceratium minutum	224
Station 150	
Dictyocha fibula	932
Distephanus speculum	1258
Corethron criophilum	32
Coscinodiscus lineatus	36
Coscinodiscus radiatus	8
Coscinodiscus wailesii	26
Chaetoceros coarctatum	136
Chaetoceros costatum	12
Rhizosolenia delicatula	16
Rhizosolenia imbricata	8
Guinardia flaccida	12
Pleurosigma angulatum	24
Cylindrotheca closterium	24
Prorocentrum micans	3396
Prorocentrum dentatum	72
Dinophysis fortii	48
Gymnodinium sp.	24
Gyrodinium sp.	36
Protoperidinium cerasus	20
Protoperidinium steinii	4
Ceratium furca	8
Ceratium fusus	28
Ceratium lineatum	12
Ceratium tripos var. atlanticum	116
Ceratium trichoceros	8
Oxytoxum scolpax	8
Station 153	
Oscillatoria erythraea	16
Dictyocha fibula	1152
Paralia sulcata	208
Corethron criophilum	16
Leptocylindrus danicus	32
Coscinodiscus nitidus	32
Coscinodiscus wailesii	16
Chaetoceros sp.	16
Rhizosolenia alata	16
Rhizosolenia alata f. gracillima	16
Rhizosolenia delicatula	32
Rhizosolenia imbricata	80
Rhizosolenia setigera	32
Ditylum brightwellii	16
Synedra sp.	64
Thalassionema nitzschioides	32
Navicula sp.	16
Nitzschia pungens	352
Cylindrotheca closterium	64
Prorocentrum micans	5056
Prorocentrum dentatum	64
Prorocentrum apora	1168
Amphisolenia globifera	48
Dinophysis fortii	16
Amphidinium schroederi	96
Amphidinium acutissimum	320
Gymnodinium sp.	32
Gymnodinium arcticum	138
Ceratium fusus	16
Ceratium lineatum	144
Ceratium tripos	16
Podolampas palmipes	48
Station 182	
Unknown silicoflagellates	8
Coscinodiscus asteromphalus	28
Coscinodiscus marginatus	4
Coscinodiscus nitidus	8
Coscinodiscus granulosus	60
Rhizosolenia delicatula	348
Rhizosolenia imbricata	16
Rhizosolenia setigera	4
Rhizosolenia styliformis	52
Synedra sp.	567
Pleurosigma rigidum	28
Nitzschia seriata	640
Cylindrotheca closterium	44
Prorocentrum scutellum	4
Dinosphsis hastata	8
Dinophysis fortii	4
Amphidinium acutissimum	8
Gymnodinium variable	8
Gymnodinium arcticum	28
Ceratium lineatum	120
Ceratium tripos var. atlanticum	32

Station 183	Cells/ Liter
Distephanus speculum	30
Coscinodiscus nitidus	12
Actinoptychus senarius	14
Chaetoceros atlanticum	14
Chaetoceros coarctatum	26
Pleurosigma sp.	24
Nitzschia pungens	22
Prorocentrum micans	42
Gymnodinium sp.	4
Gymnodinium arcticum	62
Ceratium tripos var. atlanticum	44
Ceratium minutum	16

Station 185	
Nanoplankton	27584
Calycomonas wulfii	32
Calycomonas ovalis	64
Olisthodiscus luteus	24
Unidentified haptophyceans	8
Unidentified coccolithophores	168
Cyclococcolithus leptoporus	8
Gephyrocapsa oceanica	16
Paralia sulcata	40
Corethron criophilum	24624
Skeletonema costatum	136
Thalassiosira nordenskioldii	24
Coscinodiscus centralis	8
Coscinodiscus sub-bulliens	8
Eucampia zoodiacus	40
Rhizosolenia alata	408
Rhizosolenia setigera	8
Lithodesmium undulatum	8
Ditylum brightwellii	8
Fragilaria crotonensis	8
Asterionella glacialis	32
Thalassionema nitzschioides	40
Grammatophora marina	32
Navicula salinarum	40
Amphora arenaria	8
Euglena proxima	24
Prorocentrum micans	48
Katodinium rotundatum	56
Protoperidinium pentagonum	8
Amphidoma steinii	8
Oxytoxum graate	8
Chilomonas sp.	32
Chroomonas salina	40
Chroomonas vectensis	16
Unknown	24

Station 187	Cells/ Liter
Nanoplankton	42064
Calycomonas ovalis	16
Olisthodiscus luteus	56
Unidentified haptophyceans	8
Syracosphaera apsteini	56
Unidentified coccolithophores	120
Emiliana huxleyi	16
Helicosphaera carteri	24
Podosira sp.	16
Corethron criophilum	280
Skeletonema costatum	48464
Thalassiosira baltica	72
Thalassiosira gravida	24
Thalassiosira nordenskioldii	120
Coscinodiscus concinnus	8
Coscinodiscus lineatus	16
Coscinodiscus marginatus	16
Eucampia zoodiacus	24
Chaetoceros affine	384
Chaetoceros curvisetum	120
Chaetoceros debile	296
Chaetoceros didymum	16
Chaetoceros gracile	32
Chaetoceros pelagicum	120
Chaetoceros sociale	176
Chaetoceros crinitus	32
Rhizosolenia sp.	24
Rhizosolenia delicatula	32
Rhizosolenia setigera	56
Rhizosolenia stolterfothii	136
Lithodesmium undulatum	8
Ditylum brightwellii	16
Asterionella glacialis	10176
Thalassionema nitzschioides	256
Navicula hennedyii	8
Diploneis smithii	8
Amphora arenaria	8
Nitzschia seriata	448
Euglena sp.	16
Prorocentrum micans	144
Prorocentrum scutellum	16
Prorocentrum balticum	40
Dinophysis ovum	8
Amphidinium klebsii	8
Cochlodinium pellucidum	8
Gymnodinium splendens	16
Gyrodinium metum	8
Gyrodinium uncatenum	8
Katodinium rotundatum	24
Polykrikos kofoidi	8
Diplopsalis sp.	40

Station 187 (conti.)	Cells/ Liter
Glenodinium rotundatum	24
Heterocapsa triquetra	16
Protoperidinium brevipes	8
Protoperidinium cerasus	24
Protoperidinium pellucidum	8
Scripsiella trochoidea	8
Protoperidinium excavatum	16
Gonyaulax diacantha	24
Gonyaulax polygramma	8
Gonyaulax conjuncta	16
Gonyaulax excavata	8
Ceratium fusus	8
Ceratium longipes	8
Pyrocystis fusiform	8
Unknown	16

NOTE:

The nanoplankton category was originally listed as *Nannochloris atomus*. It was later agreed that other unidentified forms were also included in this listing and that they composed approximately 50% of the counts originally attributed to *Nannochloris atomus*. To assure recognition of this species, yet not exaggerate its presence, a 30% value of the original concentration was attributed to *Nannochloris atomus*.

☆ U.S. GOVERNMENT PRINTING OFFICE: 1981 701-766/131

(continued from inside front cover)

5. *The Status of the Marine Fishery Resources of the Northeastern United States.* By Margaret M. McBride and Bradford E. Brown. December 1980. viii + 13 p., 4 figs., 3 tables.

6. *Economic and Biological Data Needs for Fisheries Management, With Particular Reference to the New England and Mid-Atlantic Areas.* By Guy D. Marchesseault, Joseph J. Mueller, and Ivar E. Strand, Jr. December 1980. vi + 10 p., 1 fig., 3 tables.

7. *Methodology for Identification and Analysis of Fishery Management Options.* By Brian J. Rothschild, Richard C. Hennemuth, Jacob J. Dykstra, Leo C. Murphy, Jr., John C. Bryson, and James D. Ackert. December 1980. vi + 10 p., 5 figs., 1 app.