NUTRIENT REGIME OF NEW BEDFORD OUTER HARBOR

RELATING TO POTENTIAL INPUTS AND PHYTOPLANKTON DYNAMICS

Final Report

Submitted to

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INTRODUCTION

In order to predict potential environmental effects of discharge from sites for the future New Bedford Secondary Sewage Treatment Facility, a multi-component water column-sediment study was undertaken in 1987. The purpose of the overall study is to provide environmental data on New Bedford Outer Harbor to assist managers in choosing an environmentally acceptable site within the outer harbor/Buzzards Bay for a New Bedford outfall. The environmental studies focussed upon two sites (Figure 1):

1) inshore, off of Clark's Point where New Bedford has been discharging wastewater since the 1920's and primary treated sewage since 1974; and

2) 7 km offshore at the proposed 301(h) site located at the border of the outer harbor and Buzzards Bay proper.

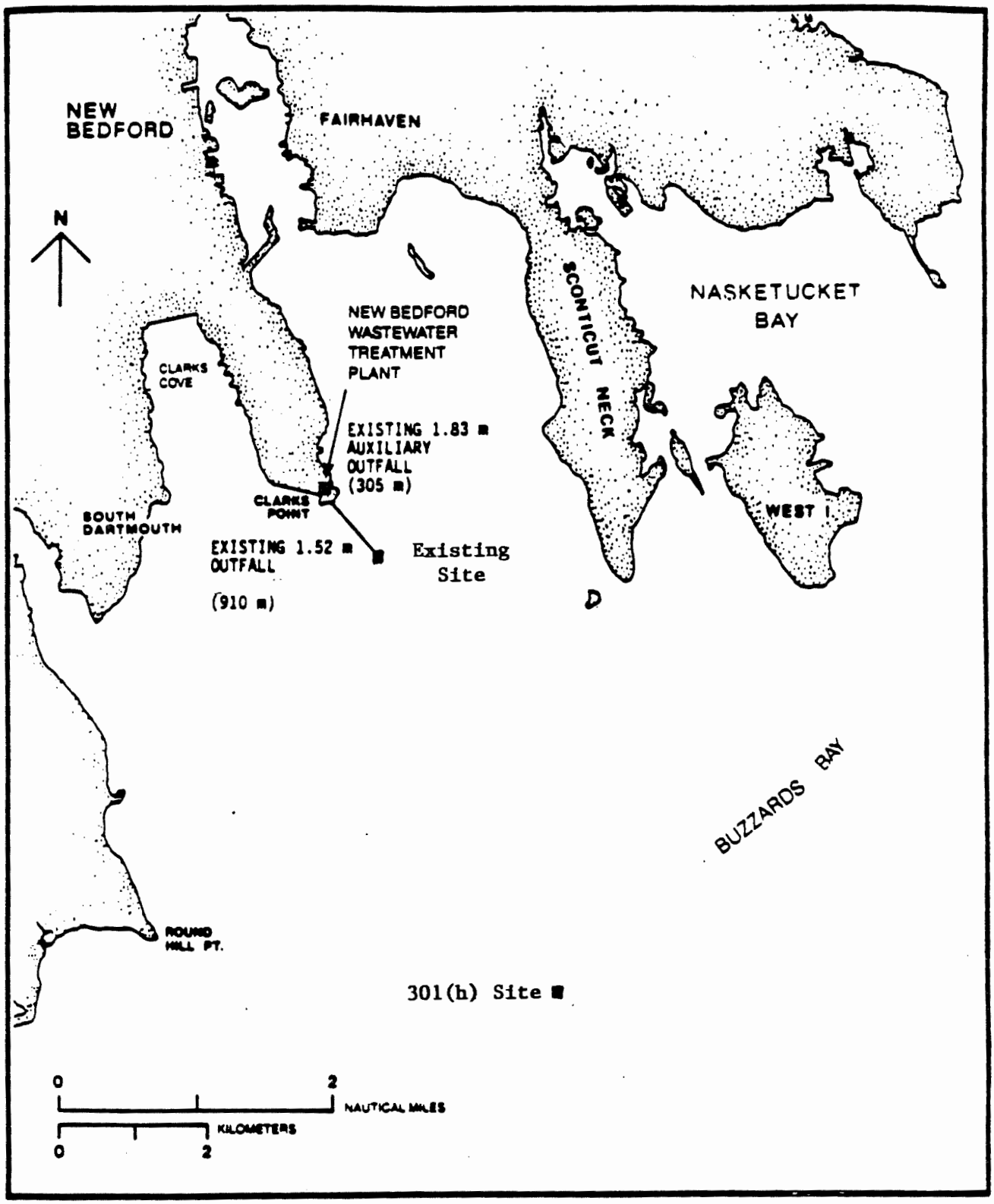


Figure 1. Map showing position of New Bedford Wastewater Treatment Plant (1988) and candidate outfall sites for the future secondary treatment plant.

At present the water column portion of the multidisciplinary study is complete; the sediment study because of its later implementation is still underway. The water column program consisted of three parts:

1) hydrodynamics, relating to the circulation of water in the outer harbor (Geyer, WHOI);

2) phytoplankton dynamics, measurements of photosynthesis, species composition, chlorophyll and effects of nutrient enrichment (Smayda, U.R.I.);

3) water column nutrients, measurements of nitrogen and phosphorus compounds, silicate plus oxygen, temperature, light, and salinity (Howes-Taylor, WHOI).

This report details the results of the nutrient sampling portion of the water column program. This study was designed to achieve three specific goals. The first objective was to assess the nutrient regime of New Bedford Outer Harbor as it relates to the existing sewage outfall. This data, coupled with the hydrographic study, should allow resource managers to put limits on potential impacts on the water column nutrient regime of changing effluent composition from primary to secondary treatment. Second, detailed nutrient, light and temperature measurements were made in order to support the photosynthesis measurements and to interpret the measured rates of photosynthesis under "natural" conditions and after nutrient addition (Smayda, URI). Third, the nutrient program also served as the field sampling program for the phytoplankton project maximizing the efficiency of collection and allowing coordination of the phytoplankton and nutrient data. This combined field program allows for a more powerful synthesis of the data from the two studies. In addition, results from the overall water column study will form

an essential component of the nutrient balance of the harbor when combined with the water column-sediment exchange measurements currently underway in the sediment study.

Overall results indicated: 1) that the nutrient concentrations inshore in the outer harbor are higher than offshore, as expected due to the existing outfall; 2) that the outer harbor is a source of particulate organic carbon and nitrogen (most likely phytoplankton) to Buzzards Bay; 3) that inorganic nitrogen is the most likely nutrient to limit phytoplankton production at both inshore and offshore stations; 4) that except in the immediate vicinity of the existing outfall all of the inshore stations exhibited sufficient water clarity for the euphotic zone to reach the bottom, whereas offshore, due to greater depth, light penetrated to the bottom on only about half of the sampling dates; 5) inorganic nutrients from the existing outfall appear to be rapidly assimilated by phytoplankton resulting in limited elevation of inorganic nitrogen concentrations within the outer harbor; and 6) that the sediments appear to be both a significant source of nutrients and oxygen demand within the outer harbor system.

METHODOLOGY

A) Site Description:

New Bedford Outer Harbor encompasses an area of 24.3 square km, averaging 7.4 km in width and 6.6 m in depth (Figure 2). The City of New Bedford (Bristol County) is the largest city in southeastern Massachusetts, maintaining a population slightly over 100,000. From the 1920's to 1973, raw

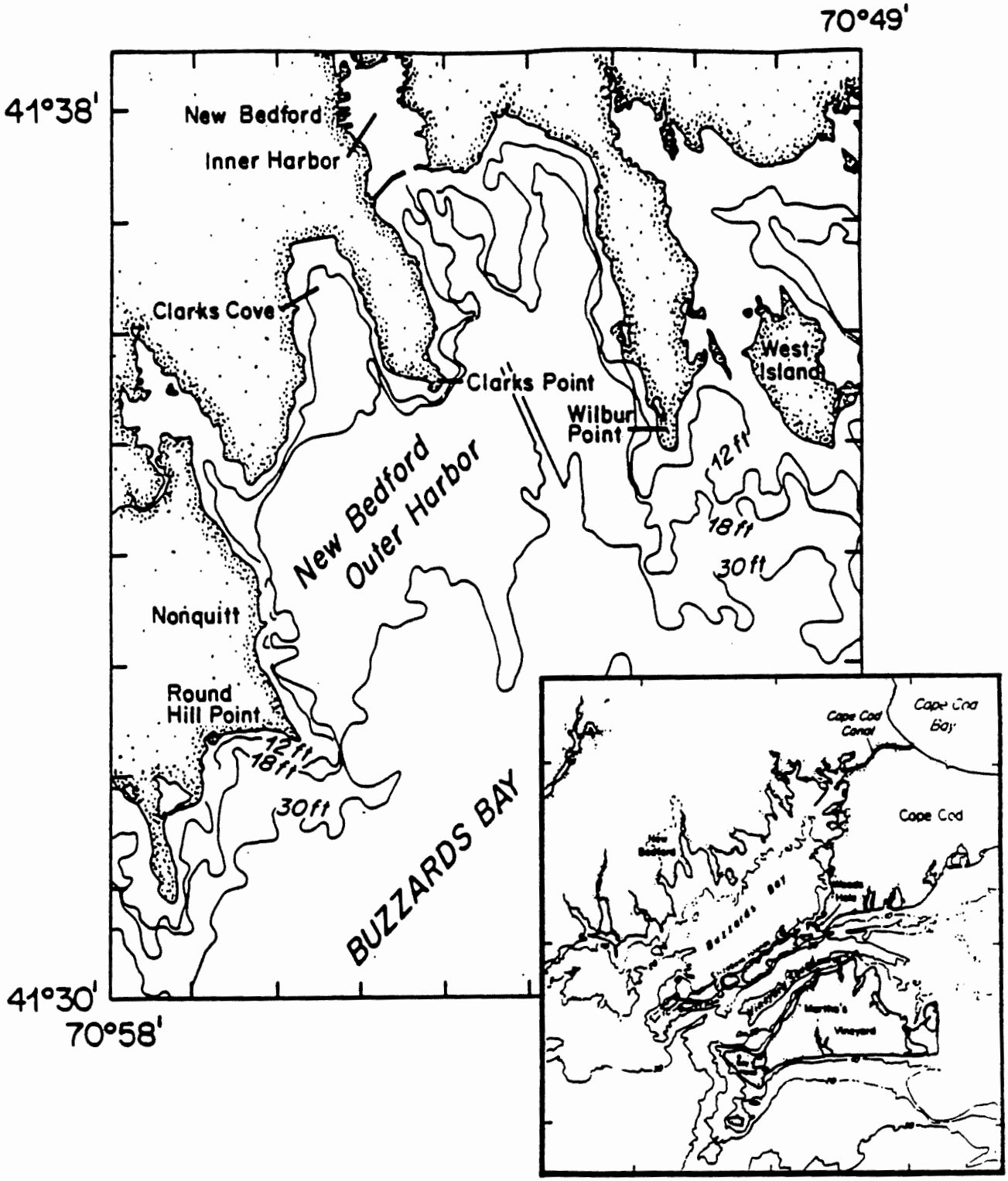


Figure 2. New Bedford Harbor, Massachusetts. Inset at lower right shows surrounding area of Buzzards Bay and Vineyard Sound (From Geyer and Dragos, 1988)

wastewater was discharged through a 60" (910 m long, terminus at 9m depth) outfall sewer to New Bedford Outer Harbor. In early 1974, the current primary wastewater treatment plant serving this population was placed into operation at Clarks Point. An auxillary 72-inch (305m, terminus at 7.3m depth) outfall sewer was also constructed for discharge of flows in excess of those that could be discharged through the 60-inch outfall pipe. The New Bedford Outer Harbor ecosystem, therefore, has been receiving wastewater effluent for over 60 years.

Based on 1982 annual averages of plant operating records and assuming 60 percent removal of suspended solids and 40 percent removal of BOD_5, effluent flow rates were calculated at 23.0 mgd with an average BOD_5 of 102 mg/1, dissolved oxygen of 9 mg/1, and suspended solids 108 mg/1 with a pH range of 6-9. The five year flow average 1983-1987 was equal to 24.6 mgd; 1987 flow averaged 26.4 mgd and projected flow for 1990 is estimated at 30.0 mgd (CDM 1983), the capacity identified for the existing and proposed treatment plant. Current estimates of nutrient loading from the outfall are 19.3 mg/1 TKN (Total Kjeldahl Nitrogen) with a CBOD (Chemical Biological Oxygen Demand) of 15 mg/1 under average conditions (calculated using an average flow of 30 mgd). Weekly measured effluent concentrations for 1988 averaged (mean $\pm$ SD) 8.63 $\pm$ 2.34 mg/1, NH_4; 18.68 $\pm$ 4.28 mg/1, TKN; and 5.56 $\pm$ 2.87 mg/1, total P (New Bedford Waste Treatment Records, 1988).

B) <u>Field Sampling</u>:

Sample collection for this project required voyage from Woods Hole to New Bedford Harbor with a compliment of ship's crew and three members of the research team for each sampling. Fourteen cruises were undertaken from August

1987 through August 1988 using the Ocean Arks research vessel R.V. Aquaria (five cruises, August - October 1987) and the Woods Hole Oceanographic Institution research vessel R.V. Asterias (nine cruises, December 1987 - August 1988). Frequency of sample collection was concentrated during late summer and early fall as this is the period of maximum phytoplankton activity with the potential for maximum stratification and oxygen depletion. Sampling dates were as follows: 18 August, 2 September, 15 September, 30 September, 13 October, 8 December (1987), 11 January, 1 February, 7 March, 11 April, 9 May, 6 June, 18 July, 15 August (1988). Seven sampling stations were selected within the harbor, their individual locations chosen in order to generate an overall picture of the nutrient concentrations and distribution at and around the two proposed outfall sites, and to coordinate with physical oceanography measurements by Geyer. Sampling stations are shown in Figure 3. Stations 1 and 2 were at the two proposed outfall sites (Station 2 being at the existing outfall, Station 1 being the 301(h) site). Stations 3 and 6 were chosen to assess nutrient concentrations around the existing outfall and were in alignment with the circulation pattern around the existing outfall. Station 5 was chosen not only to complete an inshore/offshore transect, but also to capture water column variability around the 301(h) site. Station 4 was chosen to assess the quality of water exchanging with New Bedford inner harbor since the inner harbor is a possible source of nutrients to the outer harbor. Nutrient measurements were also made on surface water samples collected from an inner harbor station on the June, July and August 1988 cruises. Station 7 was chosen to assess existing conditions in one of the potentially more biologically sensitive receiving areas, one with predictably lower rates of exchange than other areas within the outer harbor.

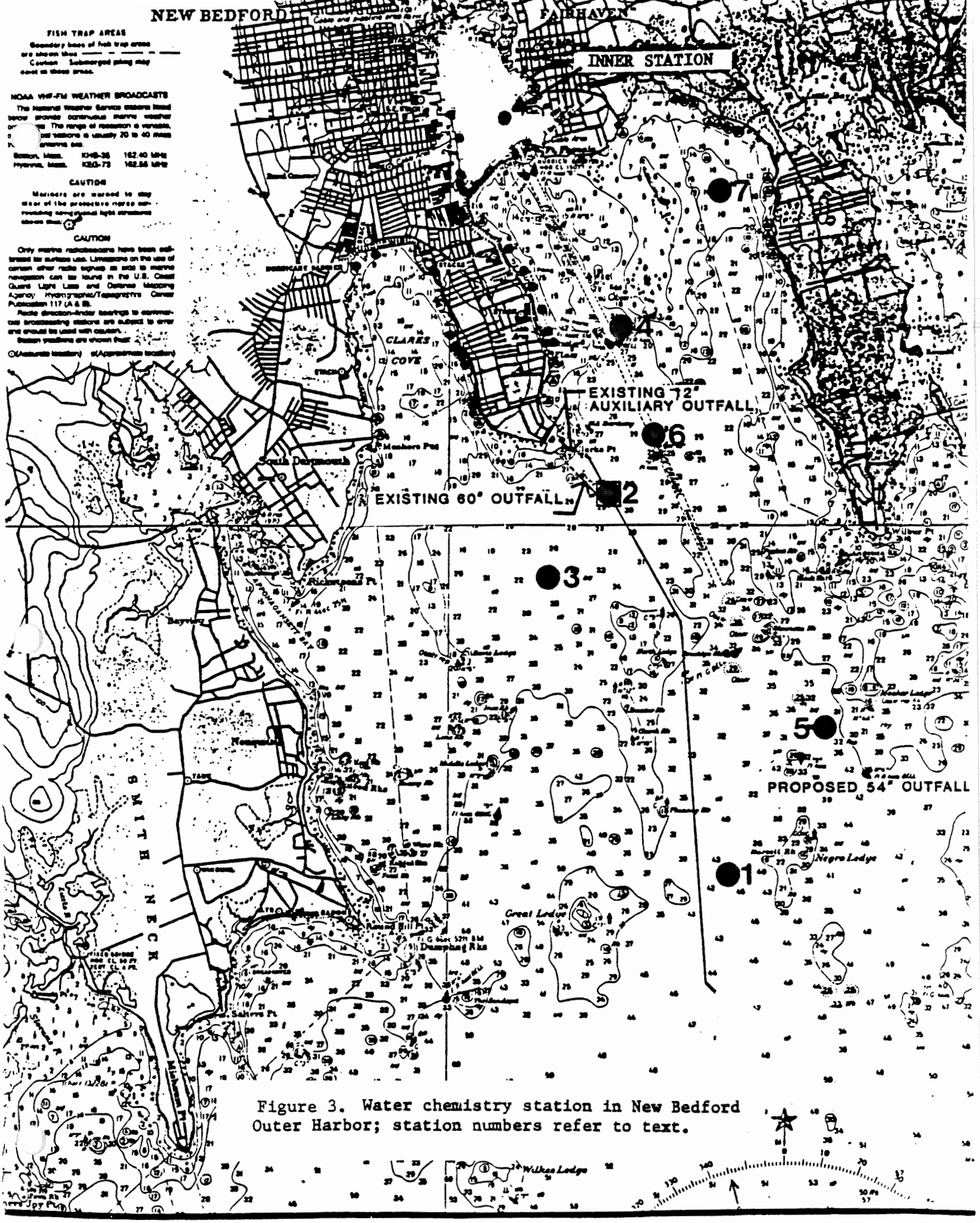


Figure 3. Water chemistry station in New Bedford Outer Harbor; station numbers refer to text.

An attempt was made to co-ordinate sampling between the nutrient, phytoplankton, and hydrodynamic portions of the overall outer harbor project (parallel studies under separate contract from CDM). Photosynthesis, chlorophyll concentration, and phytoplankton community structure (Smayda, U.R.I.) were determined at nutrient Stations 1 and 2. As the nutrient and phytoplankton samples were collected simultaneously, the stations and times were identical. Phytoplankton sample transfer time was minimized by docking the ship at Fairhaven to offload samples for immediate transport to Dr. Smayda's laboratory at U.R.I. Concommittant with sample transfer in Fairhaven, U.R.I. researchers were supplied with field data on the light, temperature, oxygen and secchi depth for the photosynthesis stations (1 and 2) to provide information necessary for conduct of the laboratory incubations. Stations 1, 3 and 4 were identified as mooring and CTD profiling sites for the physical oceanography work of Geyer. The remaining nutrient stations were located at or near other CTD stations occupied by Geyer.

Stations 1-5 were sampled on every cruise with alternate sampling of Stations 6 and 7 for a total of six stations per cruise (Table 1). At each station (located by LORAN), depth profiles of light, temperature, and dissolved oxygen were determined in the field by lowering a combination sensor package. A shipboard high volume peristaltic pump was used for collection of water samples for particulate and dissolved nutrients (Howes/Taylor), and for phytoplankton and chlorophyll samples (Smayda). Close interval sampling (0.5 m, surface to bottom) was used for light and temperature measurements, and standard interval sampling (1.5 m, surface to bottom) for water samples and oxygen measurements. Each water sample was collected only after first flushing the pumping system with five system volumes of water. 2 l water

Table 1. Sampling Regime for New Bedford Outer Harbor

Cruise #	Date	Station # 1	2	3	4	5	6	7
1	08/18/87	ABC	ABC	AB	AB	AB		AB
2	09/02/87	ABC	ABC	AB	AB	AB		AB
3	09/15/87	ABC	ABC	AB	AB	AB	AB	
4	09/30/87	ABC	ABC	AB	AB	AB		AB
5	10/13/87	ABC	ABC	AB	AB	AB	AB	
6	12/08/87	ABC	ABC	AB	AB	AB		AB
7	01/11/88	ABC	ABC	AB	AB	AB	AB	
8	02/01/88	ABC	ABC	AB	AB	AB		AB
9	03/07/88	ABC	ABC	AB	AB	AB	AB	
10	04/11/88	ABC	ABC	AB	AB	AB		AB
11	05/09/88	ABC	ABC	AB	AB	AB	AB	
12	06/06/88	ABC	ABC	AB	AB	AB		AB
13	07/18/88	ABC	ABC	AB	AB	AB	AB	
14	08/15/88	ABC	ABC	AB	AB	AB		AB

A) Electrode Array - In Situ Sampling (surface - bottom):
Light (0.5m) Dissolved Oxygen (1.5m)
Temperature (0.5m) Secchi Disk

B) Standard Interval Pump Sampling (1.5 m, surface - bottom):

NO_3+NO_2	DON	Chlorophyll (Smayda, U.R.I.)
NH_4	DOP	
PO_4	PON	
SiO_4	POC	
$^o/_{oo}$	Cl^-	

C) Light Intensity Derived Sampling:
100%, 60%, 25%, 10%, 3%, and 1% of surface light levels, at the thermocline, and just above the bottom collected for total suite of analyses as described in B above and composited for phytoplankton/photosynthesis measurements by Smayda, U.R.I..

samples were collected in acid leached (10% HCl; distilled water rinsed) high density polyethylene containers rinsed twice with sample before collection. Upon completion of profiling, a 125 ml subsample from each 2 l bottle was filtered (0.45 um Millipore) into acid leached (10% HCL; distilled water rinsed) high density polyethylene containers and saved for nutrient analyses. The remaining unfiltered water was saved for particulate analysis. All water samples were stored immediately after collection in the dark on ice for return to the laboratory, whereupon nutrient analyses were immediately performed. At Stations 1 and 2 where phytoplankton sampling was conducted, additional samples were collected at depths corresponding to 100%, 60%, 25%, 10%, 3%, and 1% of surface light intensity, as well as at the thermocline, and just above the bottom. The complete suite of nutrient analyses were run on these samples as well and a composite sample made for the photosynthesis, phytoplankton speciation, chlorophyll, and nutrient spike studies (Smayda, U.R.I.).

C) Analytical:

Nutrient analysis was performed immediately upon return to the laboratory. Aliquots of the filtered sample were analyzed for nitrate + nitrite (Cd reduction, azo dye), orthophosphate (ascorbic acid - molybdenum blue), silicate (silico-molybdic/ascorbic acid), and ammonium (indophenol) using a Technicon Autoanalyzer II. Dissolved organic nitrogen (DON) and dissolved organic phosphorus (DOP) were analysed via the persulfate digestion technique of D'Elia et al. (1977). 10 ml aliquots of field filtered sample were pipetted into pre-oxidized 50 ml screw cap test tubes, digested and analysed for NO_3 and PO_4 as above. Several mls of sample were removed for measurement of salinity (by refractive index, American Optical Temperature

Compensated Refractometer), and chloride (by titration, Buchler-Cotlov Chloridometer). Comparisons of refractometer salinity and salinity calculated from chloride were used as an analytical check. The remaining filtered sample was frozen (-20°C) and archived.

After shaking to insure adequate mixing and particulate suspension, a 500-1000 ml subsample was removed from each original unfiltered sample and vacuum filtered through a pre-combusted (overnight, at 470°C) Whatman GF/F glass fiber filter for particulate organic carbon and particulate organic nitrogen analyses. Filters were dried at 60°C, weighed, and held dry until analyses were performed on a Perkin Elmer elemental analyzer. Analytical techniques and references are outlined in Table 2.

RESULTS AND DISCUSSION:

Complete interpretation of the nutrient portion of the overall outer harbor water column study requires synthesis of the hydrodynamics (Geyer) and phytoplankton (Smayda) studies coupled with the ongoing sediment work. However, certain conclusions can be made based on the present data. Data from the nutrient study are presented as water column weighted averages for each station and cruise in Appendix I with the raw data compiled in Appendix II.

Physical Regime During the Study Period:

The study was designed to examine water column properties relating to nutrient loading and phytoplankton dynamics within the outer harbor. Annual measurements were conducted at 7 stations to capture both seasonal and spatial

Table 2. Analytical Methods

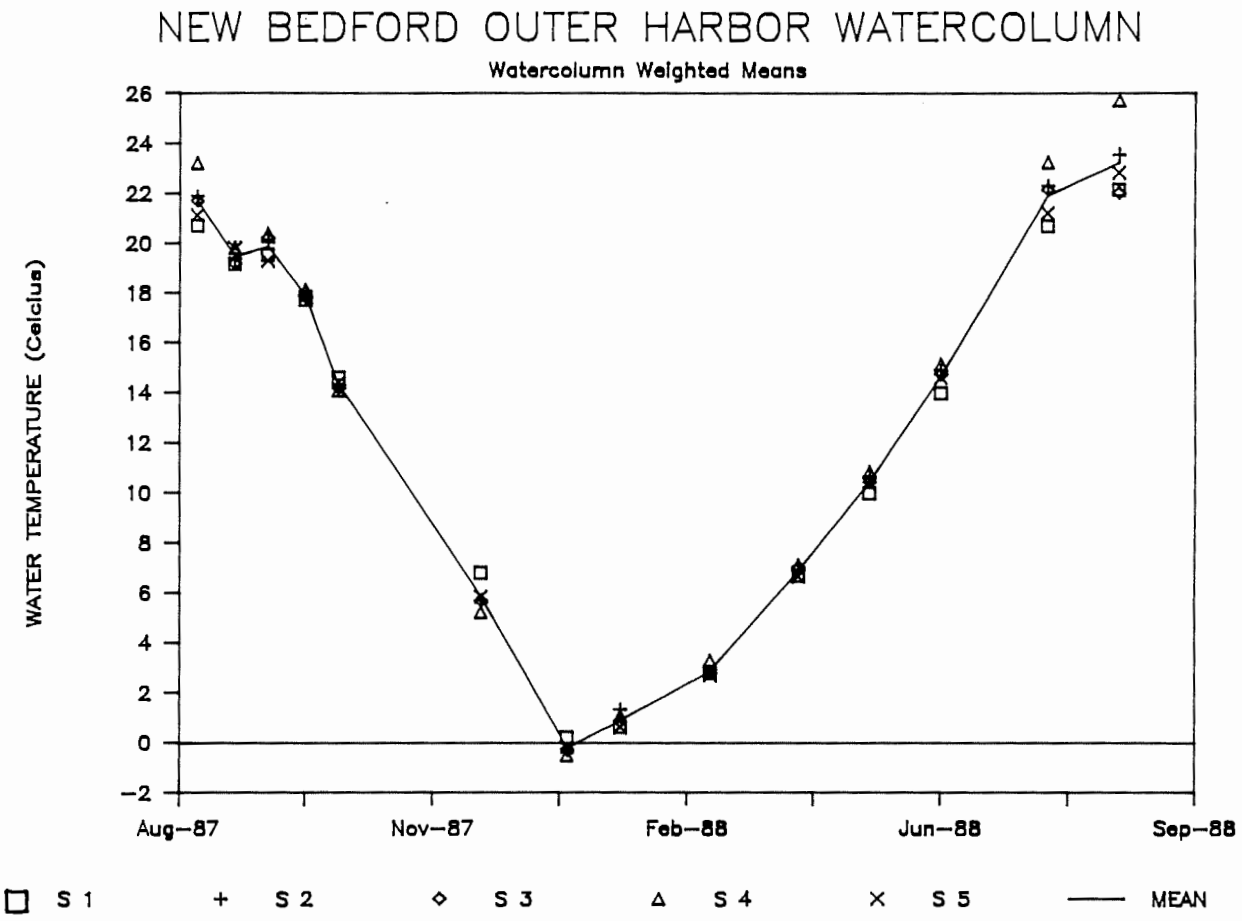
PARAMETER	METHOD	REFERENCE
Field:		
1) Dissolved O_2 and Temperature	YSI Model 58 O_2 Meter with Electrode	
2) Light Penetration	LiCor Underwater Quantum Sensor with 10 second integration	
Laboratory:		
1) Nitrate & Nitrite	Cd reduction, azo dye	a
2) Ammonium	Indophenol	a
3) Phosphate	Ascorbic Acid-Molybdenum Blue	a
4) Silicate	Silico-Molybdic Method (Ascorbic Acid)	a
5) DON 6) DOP	Persulfate digestion	b
7) Particulate Organic Nitrogen, Carbon	Combustion and elemental analysis	c
8) Chloride	Potentiometric	d
9) Salinity	Refractive index	e

a - Technicon Autoanalyzer II. Industrial Method 1983 and Wood, Armstrong and Richards, 1967, J. Mar. Biol. UK 47: 23.
b - D'Elia, Corwin and Steudler, Limnol. Oceanogr. 22: 760-764.
c - Perkin Elmer CHN Analyzer
d - Buchler-Cotlov Chloridometer
e - Temperature Compensated American Optical Refractometer

variation in the physical, chemical, and biological components of the ecosystem. During the 12 months of the study the average water temperature ranged from 0-23°C (Figure 4). Although the salinity of the entire harbor was always close to seawater concentrations, in line with the lack of large surface freshwater inputs in the area, a weak seasonal trend in chloride concentration was found (Figure 5, A, B, C). Samples from the inner harbor (summer 1988) had chlorinities only about 1% lower than the outer harbor, suggesting the inner harbor is only a weak source of freshwater to the outer harbor system. The chloride depression was greatest in late winter and spring, possibly due to melt related inputs. The inshore stations (3 and 4) generally showed a slightly lower chlorinity than the offshore stations (1 and 5) also suggesting inshore freshwater inputs (Figure 5, C and D; difference in Cl concentration between average of inshore Stations 3 and 4 and average of offshore stations 1 and 5). This is in general agreement with the detailed conductivity measurements made by Geyer (1988).

From our measurements of chlorinity and temperature over depth, it is possible to calculate water density (sigma t) to determine the degree of water column stratification (Figures 6-12). The profiles of sigma t show a large degree of variability. In general, however, there is an indication of slight stratification at some stations on some cruises during May through September, although there is a lot of variability in these profiles. Analytical precision does not account for all of the observed "noise" in the profiles. It appears that collection of discrete depth samples (1.5 m interval) over a period of 0.5 - 1 hour may result in the sampling of various water parcels moving through the sampling station during that interval. This is supported

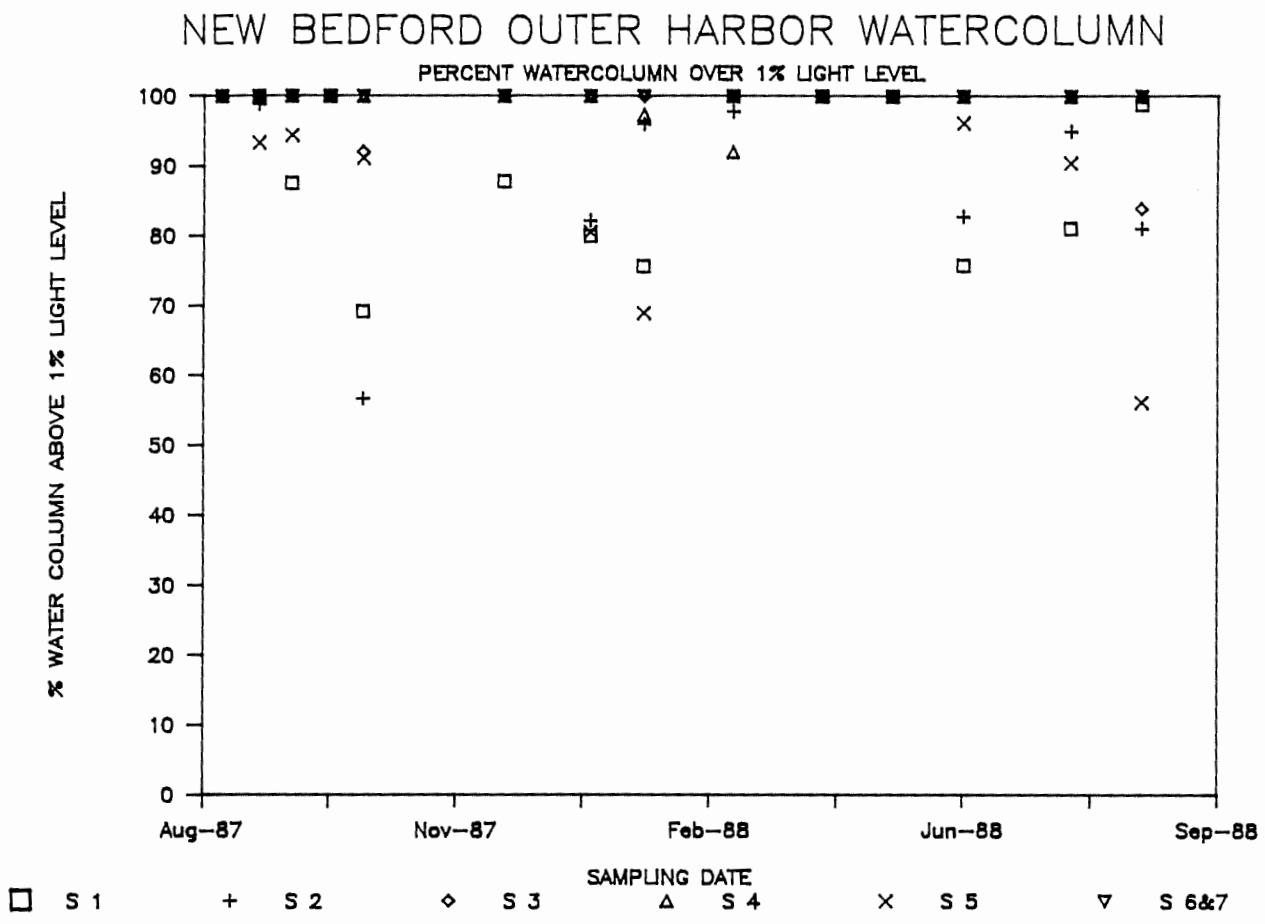
Figure 4.


NEW BEDFORD OUTER HARBOR WATERCOLUMN
Watercolumn Weighted Means
WATER TEMPERATURE (Celcius)
26
24
22
20
18
16
14
12
10
8
6
4
2
0
−2
Aug−87
Nov−87
Feb−88
Jun−88
Sep−88
S 1
S 2
S 3
S 4
S 5
MEAN

by the much larger station to station variation found during the "stratification period" versus during winter when the water column was vertically and horizontally mixed. The station to station variations in sigma t were greatest in the summer and fall and minimal in winter and spring. Detailed profiles of water temperature at Stations 1 and 2 are given in Figures 6-12 (top). These data indicate that a thermally unmixed water column occasionally exists during the warmer seasons (see Cruise 13 for example).

The depth of the euphotic zone is one of the more important parameters controlling system primary production in coastal environments. Light profiles were determined for each of the six stations during each cruise. Station to station differences in terms of absolute light values (extreme values, Figures 6-12, top) were due more to variations in cloud cover coupled with the time of day a station was sampled than to variations in water clarity. A more important evaluation of water column light is based on the percent attenuation of surface light. Except for within the visible plume of the existing outfall, all of the stations had similar light penetration. More ecologically significant was the finding that at all of the inshore stations (except the outfall) the euphotic zone reached the bottom on over 80% of the measurements (Figure 13). In addition to the implications for phytoplankton production, this finding presents the possibility of primary production by epibenthic diatoms, as well as seagrass and macroalgae in inshore areas within the outer harbor. In contrast, at the offshore stations (1 and 5) the euphotic zone reached the sediment surface in only about half of the samples most likely preventing benthic associated primary production in these areas. The major cause of this inshore/offshore difference appears to be more a function of differences in water depth than water clarity.

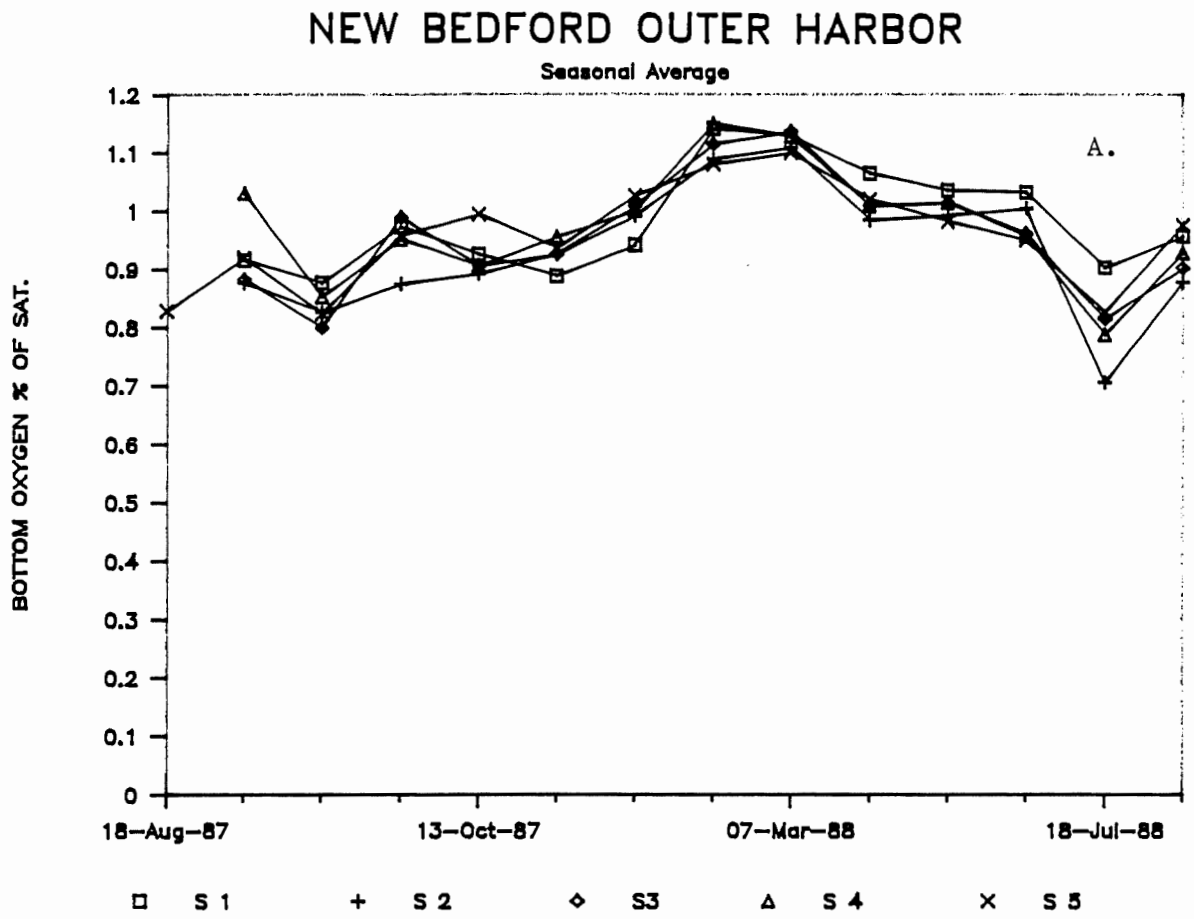
Figure 13.

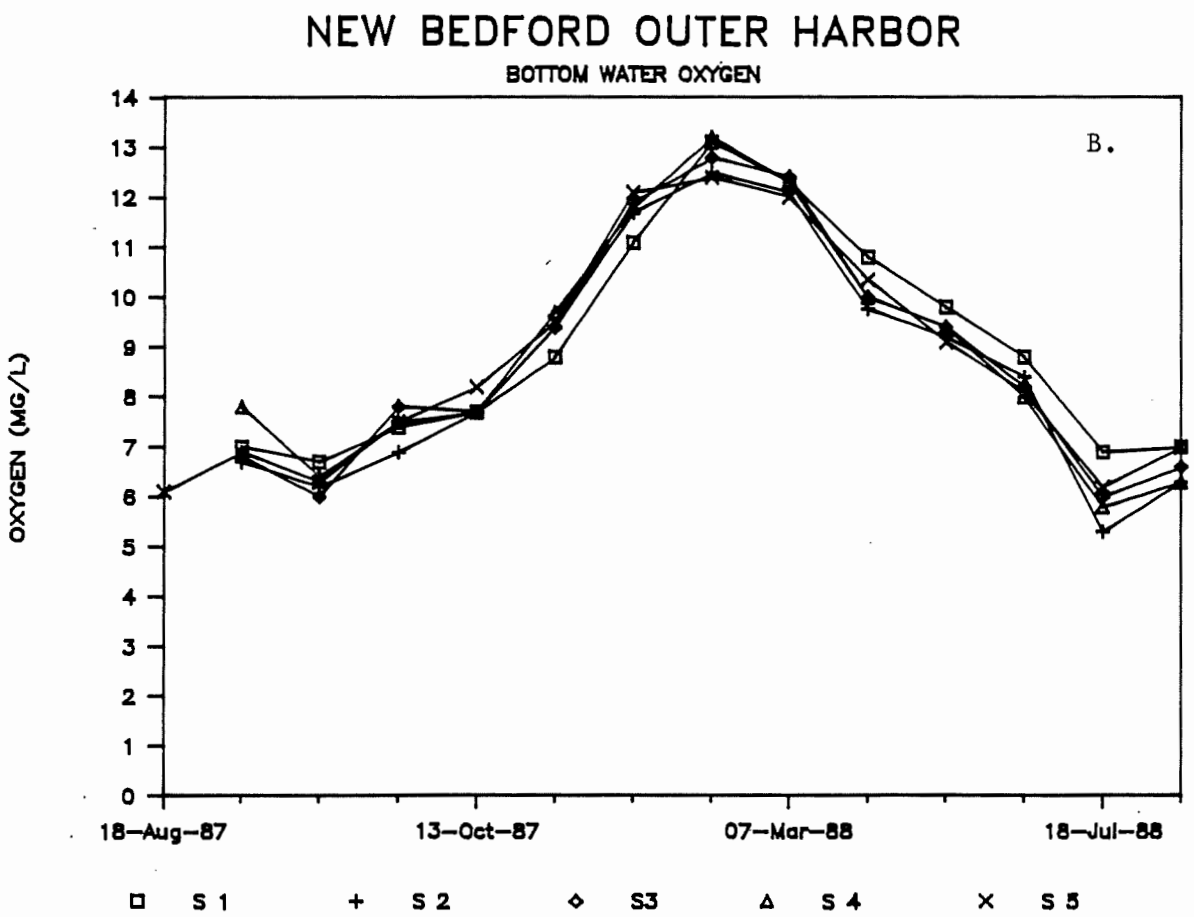

NEW BEDFORD OUTER HARBOR WATERCOLUMN
PERCENT WATERCOLUMN OVER 1% LIGHT LEVEL
% WATER COLUMN ABOVE 1% LIGHT LEVEL
100
90
80
70
60
50
40
30
20
10
0
Aug-87
Nov-87
Feb-88
Jun-88
Sep-88
SAMPLING DATE
S 1
S 2
S 3
S 4
S 5
S 6&7

Dissolved oxygen was determined by in situ electrode measurements. Equipment was calibrated before and after each profile determination. Since oxygen depletion was greatest in the bottom waters, due to their close association with the oxygen consuming sediments and distance from the atmosphere, we focussed on the bottom water D.O. (complete data set Appendix II). Dissolved oxygen shows a pronounced seasonal cycle in absolute value (Figure 14 B) resulting from changing solubility caused by the seasonal fluctuations in water temperature (Figure 4). Maximum oxygen concentrations are found when the water is coldest while minimum oxygen concentrations are found in the warmer months. However, the seasonal variation is due to more than just solubility. Measured oxygen values as a percentage of atmospheric equilibration and corrected for temperature and salinity (Figure 14 A), reveal a depletion of oxygen during the warmer periods when biological activity is highest, sediment oxygen demand greatest, and the potential for stratification maximal.

Oxygen depletion, although significant, was not severe during the course of this study. Except for directly adjacent to the existing outfall (Station 2), the depletion was less than 20%. Also of importance was the finding of significant, although less severe, oxygen depletion in the offshore stations. It is not clear at present how much of this depletion is attributable to exchange of bottom waters from inshore and how much is the result of offshore in situ respiration. Exchange of bottom waters is unlikely as net estuarine circulation is inshore in this region. In addition, from measurements of benthic processes it appears that offshore in situ processes play a major role in controlling the offshore bottom water oxygen depletion (Howes and Taylor, in progress). Any contribution of the inshore waters to offshore O_2 depletion probably results from the delivery of particulate organic matter to

Figure 14.


NEW BEDFORD OUTER HARBOR
Seasonal Average
A.
BOTTOM OXYGEN % OF SAT.
1.2
1.1
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
18-Aug-87
13-Oct-87
07-Mar-88
18-Jul-88
S 1
S 2
S3
S 4
S 5


NEW BEDFORD OUTER HARBOR
BOTTOM WATER OXYGEN
B.
OXYGEN (MG/L)
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
18-Aug-87
13-Oct-87
07-Mar-88
18-Jul-88
S 1
S 2
S3
S 4
S 5

the offshore sediments, thus fueling sediment oxygen demand offshore. It appears from our measurements that the inshore areas of the harbor may indeed export particulate organic matter offshore, but the distribution of delivery to offshore sediments is unclear at present (see below).

Nutrient Regime:

Inorganic Nitrogen + Phosphorus:

At most stations and times, depth profiles of inorganic N and P (nitrate, ammonium, and phosphate) exhibited little vertical structure (Figures 15-28). This is to be expected given the generally vertically mixed nature of New Bedford Outer Harbor waters. However, there were several significant exceptions. The present outfall station (2) on 13 of the 14 samplings exhibited a distinct surface maximum in inorganic N and P. This appears to be due to the rise of the discharge water followed by spreading and mixing laterally in the surface waters, thus giving a mushroom shaped distribution of nutrients around the present discharge site. The vertical profiles we observed would be expected, since we were sampling at a distance of a few hundred meters from the discharge point (Figure 3). As expected, the concentrations at Station 2 were the highest of all stations sampled for both inorganic nitrogen and phosphorus. On at least three occasions during the periods of greatest potential stratification, summer and early fall, profiles of inorganic N indicated a strong sediment source with bottom water concentrations reaching levels greater than 10 times mid and surface water values. This "sediment effect" was seen at all stations for these cruises regardless of inshore or offshore location. The role of the sediments was much less evident in the water column phosphate concentrations, most likely due to the sequestering of phosphate in the aerobic surface sediments.

Concentrations of NO_3^- and NH_4^+ measured in this study agreed

moderately well with data collected by Camp, Dresser & McKee, Inc. in 1980 (CDM, 1983) after considering the less sensitive analytical procedures apparently used in the earlier work. Overall, the nitrate concentrations tended to be higher in mid summer in 1980 and ammonium levels about equal in July through October samplings (Appendix III). Both studies also showed a surface maximum at the existing outfall site.

Seasonal comparison of inshore versus offshore inorganic N + P concentrations have been made in Figures 29 and 30. Weighted averages take account of the uneven sampling interval at Stations 1 and 2, making direct comparison with Stations 3 - 5 possible. The water column average for dissolved inorganic nitrogen concentration (DIN = NO_3^- + NH_4^+) was generally higher at the existing outfall site than at all of the other stations with concentration levels often 4 - 5 times higher (Figure 29a). Greater differences can be found at discrete near surface depths due to the surface plume effect. There was an indication of a weak seasonal cycle in DIN concentration with a minimum in August - October, the period of maximum photosynthesis (Smayda, URI). Comparisons of the two candidate outfall sites (Figure 29b) reinforce the influence of the existing discharge of inorganic nitrogen at Station 2. A more important analysis is the comparison of inshore versus offshore DIN concentration. To make this comparison, inshore Stations 3 and 4 were averaged and compared to the offshore averages of Stations 1 and 5; Station 2 was considered separately.

Inshore stations frequently exhibited signficantly higher DIN concentrations than offshore stations (Figure 29, C and D). However, inshore concentrations were much closer to offshore concentrations than to the existing outfall site (Station 2). These findings suggest that: 1) dilution and uptake by phytoplankton of DIN from present discharge keeps the

concentration of DIN in the inshore areas relatively low, i.e. close to offshore concentrations; and 2) phytoplankton production in the general inshore region (not just Station 2) is probably being stimulated relative to offshore rates. It is possible that nutrient and particulate conditions within the immediate vicinity of the existing outfall (Station 2) are creating conditions where light or some other factor is limiting production, but at all other stations nutrient limitation is probably the case. It is interesting to note that when phytoplankton production is highest and DIN lowest the difference between inshore and offshore DIN concentration disappears (Figure 29), suggesting that the uptake capacity of overall inshore phytoplankton populations may not be saturated during this period.

In contrast to DIN, ortho-phosphate (PO_4^{3-}) exhibited a more pronounced seasonal trend (opposite to DIN) with higher concentrations in summer, and showed a much lower relative enhancement at the existing outfall over the other stations (Figure 30). The levels of phosphate were still significantly higher at the existing outfall site (2) versus the offshore site (1), but other inshore stations showed equally high phosphate levels (Figure 30 A-C). Whether this is due to a much lower PO_4 concentration difference in the effluent versus receiving waters or a lower relative uptake by phytoplankton is unclear from the available data. In agreement with the DIN distribution, PO_4 concentrations were generally higher inshore (Figure 30 D), nutrient enrichment from the existing outfall, and other inshore areas in general.

Evidence that the effluent input of PO_4 is relatively less than that of DIN in comparison to the receiving waters comes from looking at ratio of DIN (also called TIN = NO_3 + NH_4, i.e. Total Inorganic dissolved Nitrogen) to PO_4 (TIN/PHOS). In all but one of the samplings, the surface water from the

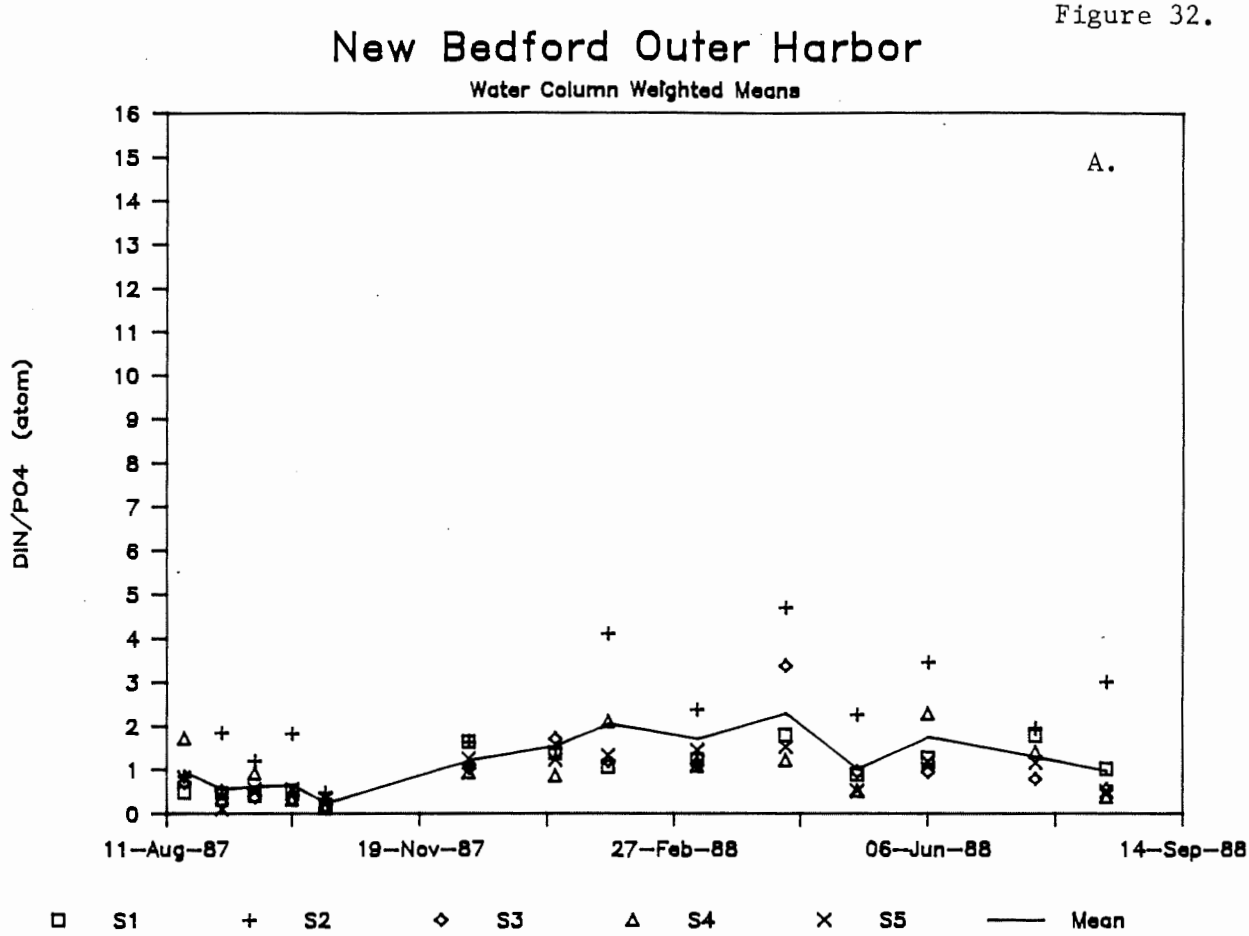
existing outfall site (2) exhibited a generally 5-10 fold higher TIN/PO_4 ratio (Figure 31 A-N) compared to the other sites. This is strong evidence that the amount of dissolved inorganic nitrogen in the effluent itself is much greater than the amount of dissolved PO_4, a relation very different than the receiving waters where the amount of inorganic nitrogen is often less than the PO_4 pool.

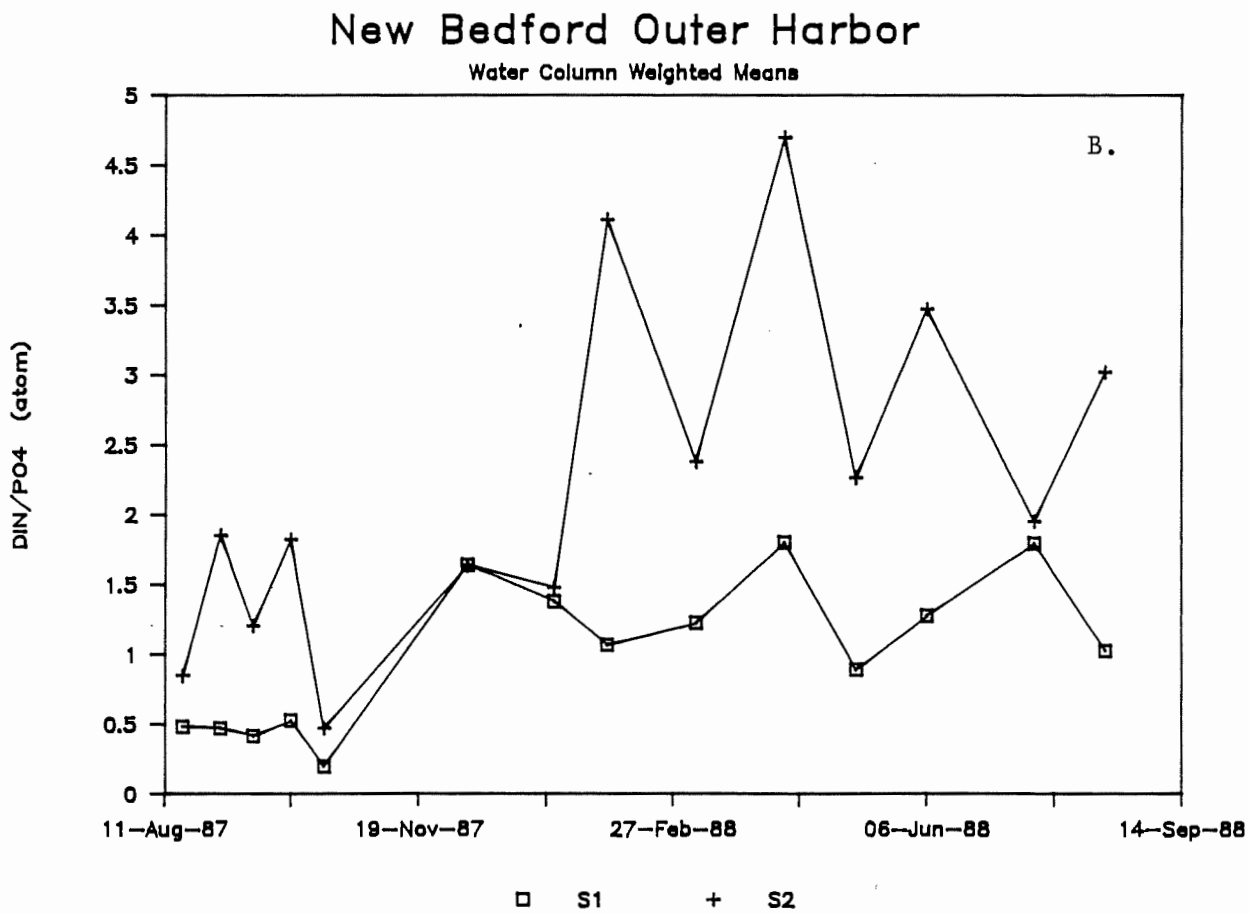
The ratio of TIN to PO_4 can also be used to indicate whether N or P may be limiting phytoplankton production in coastal waters. Values less than the Redfield ratio of 16 suggests N limitation. In only 1 sample out of 750 was the value of 16 approached, and this was a surface water sample from Station 2 (Figure 31 K). Although this method is only approximate, the fact that except within the obvious effluent plume the ratio frequently was less than 1 (Figures 31 and 32) never exceeded 7 leads us to conclude that the nutrient most likely limiting phytoplankton production within the outer harbor is inorganic N.

Another important point emerges from examination of the TIN/PO_4 ratio, providing additional evidence of a significant sediment source of inorganic nitrogen to the water column. Data from cruises 1, 3, and 13 exhibited a several fold increase in TIN/PO_4 ratios approaching the sediment surface (Figure 31, A, C, M). In coastal environments, this is almost always the result of the release of NH_4 and NO_3 from the sediments in excess of PO_4. The release of these dissolved constituents appears large enough to significantly raise the water column TIN/PO_4 ratio.

There was a weak seasonal cycle in TIN/PHOS ratio with lower values during the most active periods of photosynthesis. The lower ratio during late summer is expected if the phytoplankton are nitrogen limited, as they will take up N selectively over PO_4.

Figure 32.


New Bedford Outer Harbor
Water Column Weighted Means
A.
DIN/PO4 (atom)
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
11-Aug-87
19-Nov-87
27-Feb-88
06-Jun-88
14-Sep-88
S1
S2
S3
S4
S5
Mean


New Bedford Outer Harbor
Water Column Weighted Means
B.
DIN/PO4 (atom)
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
11-Aug-87
19-Nov-87
27-Feb-88
06-Jun-88
14-Sep-88
S1
S2

Silicate:

Silicate was measured because it is required for diatom growth and occasionally can be limiting to diatom growth in coastal or upwelling regions. However, actual determination of silicate limitation requires spike experiments which were not under the perview of this study.

The profiles of silicate, as for inorganic nitrogen and phosphate, indicated both a significant source in the effluent and from the sediments (Figure 33, A-N). In the case of silicate, however, the sediments appear to be the stronger (and more widespread) source (cf. Figure 33, cruise 13). Whether the increased diatom abundance found by Smayda (parallel study) was in any way a result of the higher silicate levels occasionally found at Station 2 is unclear, but most likely the higher diatom numbers are the result of the N + P inputs.

Average water column silicate concentrations (Figure 34) suggest no real difference between stations (except possibly Station 2) and no significant inshore versus offshore difference in concentrations (Figure 34 D). However, there was a striking seasonal cycle. Silicate concentrations were generally between 2 to 10 fold higher from May - October than the uniformly low concentrations from December - April. This cycle in part results from the concentration of silicate within the harbor during potentially more stratified periods yielding higher measured concentrations during these periods. How this seasonal availability of silicate relates to diatom abundance will be examined when the diatom data is completed.

Overall, the inorganic nutrient data suggest: 1) nitrogen is the nutrient limiting phytoplankton production within the outer harbor; 2) the levels of inorganic N and P are higher inshore versus offshore, but with the possible exception of Station 2, levels are potentially low enough to be stimulated by

nutrient additions; 3) the ratio of inorganic N/P in the effluent is probably much higher than the receiving waters; 4) natural processes of dilution and uptake by phytoplankton result in a rapid lowering of water column inorganic nutrient levels, even at the outfall station, approaching offshore levels at nearby inshore stations 3 and 4; and 5) the sediments appear to be a significant source of inorganic N and silicate to the water column at all stations. During cruises where weak stratification occurred, significant increases in DIN and silicate were found and the largest bottom water oxygen depletions were observed. It appears that the interactions between hydrodynamic and sediment processes play an important role in the water quality of both inshore and offshore regions of New Bedford Outer Harbor.

Total Nitrogen:

Total water column nitrogen was fractionated into three basic pools: DIN (NO_3 + NH_4), DON (Dissolved Organic Nitrogen), and PON (Particulate Organic Nitrogen). In almost all cases, DON represented the largest pool of N in the water column except for the existing outfall site where PON was frequently of the same magnitude (Figure 35-48). This finding is generally true of marine systems and partially results from DON being the least consumable of the three N fractions due to its dissolved nature and the fact that a significant fraction of the DON is composed of refractory compounds. DIN is the smallest N pool, but since it is continually being depleted by phytoplankton uptake and replenished by decompositional processes in the water column and underlying sediments it usually has the highest turnover rate of the N pools. Most of the PON pool in the outer harbor probably consists of living or dead phytoplankton and zooplankton with the possible exception of around the existing outfall where some of the PON will be from the outfall discharge. Comparison of the PON and pigment data will help to clarify the

portion of PON that is phytoplankton. Station 2 in general had the highest levels of DIN, DON and PON of all of the stations.

Since nitrogen is continuously cycling between the various nitrogen pools, it is useful to compare the total N pool (in addition to the individual pools) in making inter-station comparisons (Figure 49). As with the individual fractions, Station 2 generally exhibited the highest total N concentrations (Figure 49 A and B). The lack of seasonality in total N is most likely due to the large proportion of the N pool represented by DON. This tends to obscure seasonal changes in the smaller pools. As with DIN and PO_4, there are significantly higher levels of PON (Figure 50) and total N (Figure 49 D) in the inshore region than offshore. This concentration difference strongly suggests that nitrogen, especially PON, is being exported from the inner regions of the outer harbor, out towards Buzzards Bay, and that while inorganic nitrogen is being released in high concentration from the present discharge it is leaving the harbor primarily as DON and PON due to the activity of phytoplankton and associated grazers.

No evident seasonal cycle was found in PON (Figure 50) or POC (Figure 51). The reason for this is unclear given preliminary reports of a strong seasonal cycle in primary productivity. One explanation would be that the removal from the outer harbor water column laterally through flushing of the harbor or vertically due to grazing also varies seasonally in a manner that results in a relatively constant PON-POC pool, even as the inputs to the pool change.

The elevated POC values in the inshore region versus offshore (Figure 51 C and D) are significant. It is largely this POC that drives sediment oxygen demand and benthic regenerative processes in coastal systems. The higher rates of sediment respiration in the inshore versus offshore regions of New

Bedford Outer Harbor (Howes and Taylor, in progress) are best explained by the difference in photosynthesis (Smayda, U.R.I.) and resulting water column carbon load.

An additional important fact concerning the water column particulate matter involves its POC/PON ratio. In many systems, it is possible to investigate the source of the particulates using this ratio. In New Bedford, however, there was no general trend in C/N ratio either with depth (Figure 52) or between stations (Figure 53 A, B, C). This is in spite of the nutrient enriched conditions in the inshore areas and the particulate matter in the effluent. These findings suggests two conclusions: 1) that the C/N ratio of the particulate matter in the effluent is close to that of phytoplankton (about 8-10); and 2) that the phytoplankton while in a nutrient enriched environment around the outfall are still nitrogen limited in the bulk of the inshore region. This latter point is supported by the DIN/Phosphate ratio shown above (Figures 31 and 32).

CONCLUSIONS

Complete interpretation of the watercolumn data summarized in this report requires integration with the hydrodynamics (Geyer, 1988) and phytoplankton studies (Smayda), and the sediment regeneration study (Howes and Taylor, currently underway). It is important to recognise that plant nutrients cycle between water column pools of DIN, DON and PON due to the activities of phytoplankton and their grazers, and between the water column and sediments due to settling of particulate matter and subsequent decomposition and regeneration of nutrients by infauna and microorganisms. All of these pools can also be exported to adjacent waters due to water movement. In order to understand the impacts of changing nutrient inputs, all of these factors must be incorporated and their relative roles in the nutrient balance determined. The New Bedford Outer Harbor studies should provide this necessary information, and when all of the various components are assembled, should allow for a reasonable data base from which to base the required management decisions can be made.

Some of the conclusions possible from this component of the project will be subject to adjustment when all of the components are assembled, but the major conclusions which follow are clear.

1) The results of all analyses, including light, at all sites showed significantly lower water quality at the current outfall site (Station 2). The increased particulate matter in the water column at station 2 yielded a significantly higher extinction coefficient than did the other stations, for example the 301(h) outfall site, Station 1. This difference seemed to persist year round. As might be expected, the inorganic

nutrients at the current outfall (2) were also higher than at all other stations. The current outfall site (Station 2) was generally 4-5 fold higher in orthophosphate and 10 fold higher in concentrations of inorganic nitrogen. The differences were both qualitative and quantitative with Station 2 generally demonstrating a much higher TIN/PO_4^{3-} ratio (at the shallower depths) than the other sites.

2) Nutrient concentrations at the outfall site showed a surface maximum. Our best working model is that as the effluent is discharged, a portion rises to and spreads along the surface (observable as a visible surface film). Since our samples were not collected directly over the discharge pipe there was effluent enriched water overlying less impacted (lower nutrient) water entering from the perimeter of the area at depth. Evidence that this may be occurring was found in all of the nutrient measurements and the lower choride concentration of the surface water of Station 2 versus at depth.

3) During the study period, strong vertical stratification of the water column was not apparent although evidence for weak stratification was found on some of the late summer/early fall cruises temperature profiles (1, 3, 13). Weak stratification was suggested by the slight increase in sigma t with depth, the finding of increases in DIN and silicate with depth, and measured O_2 depletion in the bottom waters on these cruises. However, as expected the water column was typically vertically mixed in winter.

4) Oxygen depletion was less than 20% of saturation in the bottom waters (except Station 2). Similar oxygen depletions were always found in both inshore and offshore stations for any given sampling round. Given the correlation with nitrogen and silicate profiles it is clear that the sediments are the major source of the observed O_2 depletion, and that it

is the combination of hydrodynamic and benthic processes which control the O_2 and nutrient levels in the bottom waters of the outer harbor regions.

5) Based on inorganic N to P ratios, N appears to be the limiting nutrient to phytoplankton production in the outer harbor with the possible exception of within the effluent plume from the existing facility where light or some other nutrient may be limiting due to the high particulate and high nutrient conditions at this station.

6) The euphotic zone reached the bottom at the inshore sites for over 80% of the measurements, while offshore the 1% light level only reached bottom on about 50% of the dates. The inshore-offshore difference appeared to be more a function of water depth than extinction coefficient. This suggests that primary production by benthic algae, macroalgae, and seagrasses is likely to be occurring in some of the inshore areas but probably is not a concern in the more offshore areas.

7) Chlorinity measurements suggest the outer harbor receives relatively low freshwater input, leaving tidal and wind driven circulation as the dominant flushing mechanism.

8) Concentrations of DIN, DON, PON, PO_4, POC indicate that the inshore regions of the outer harbor are nutrient rich and have higher levels of primary production than the offshore regions. More importantly, the inshore areas are most likely exporting these constituents to offshore waters through water exchange.

9) Silicate exhibited a strong seasonal cycle. There was little difference between inshore versus offshore concentrations and the existing outfall appeared to be only a weak source. The sediments, however, appeared to be a major source and the seasonal cycle may reflect seasonal variation of removal of sediment regenerated silicate by flushing and uptake by diatoms.

10) The sediments appear to be playing a significant role in nutrient cycling in the outer harbor. While it is difficult to determine rates or even sources from pool measurements, there are two lines of evidence which support the importance of sediment inputs. First, despite the fact that the water column is generally mixed with occasional periods of weak stratification, elevated nitrate+ nitrite, phosphate, silicate and especially ammonium concentrations were frequently found overlying the sediment surface. Second, there is frequently a substantial increase in the ratio of TIN/PO_4 in the bottom waters indicative of nitrogen release from sediments. In addition, the greatest depletion in O_2 concentration was found in the bottom waters.

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APPENDIX I

Water Column Weighed Averages
All Stations, Cruises 1-14

Headings	Description
uM	Micromolar
mg/l	milligrams per liter
$Si-SiO_2$	Silicate Concentration (uM)
$N-NO_3$	Nitrate + Nitrite Concentration (uM)
$N-NH_3$	Ammonium Concentration (uM)
N-TIN	Sum of Inorganic N (Nitrate + Nitrite + Ammonium)
N-DON	Dissolved Organic Nitrogen Concentration (uM)
N-TDISS	Total Dissolved Nitrogen (Inorganic + Organic)
$P-PO_4$	Orthophosphate
P-TDISS	Total Dissolved Phosphate
P-DOP	Dissolved Organic Phosphorus
TIN/PO_4	Ratio: Total Inorganic N to Orthophosphate
Total N	Sum of Nitrate, Nitrite, Ammonium, Dissolved Organic N and Particulate Organic N
POC	Particulate Organic Carbon
PON	Particulate Organic Nitrogen
C/N	Ratio: POC/PON (Atom)
Oxygen	Dissolved Oxygen
Cl	Chloride
Temp	Water Temperature
Sp Grav	Calculated Density from Temp and Chloride

APPENDIX II

Water Column Raw Data
All Stations, Cruises 1-14

Headings	Description
uM	Micromolar
mg/l	milligrams per liter
$Si-SiO_2$	Silicate Concentration
$N-NO_3$	Nitrate + Nitrite Concentration
$N-NH_3$	Ammonium Concentration
N-TIN	Sum of Inorganic N (Nitrate + Nitrite + Ammonium)
N-TDISS	Total Dissolved Nitrogen (Inorganic + Organic)
N-DON	Dissolved Organic Nitrogen Concentration
$P-PO_4$	Orthophosphate
P-TDISS	Total Dissolved Phosphate
P-DOP	Dissolved Organic Phosphorus
TIN/PO_4	Ratio: Total Inorganic N to Orthophosphate
POC	Particulate Organic Carbon
PON	Particulate Organic Nitrogen
C/N	Ratio: POC/PON (Atom)
Oxygen	Dissolved Oxygen
Cl	Chloride
Temp	Water Temperature
Sp Grav	Calculated Density from Temp and Chloride

CRUISE # 1 NEW BEDFORD HARBOR BUZZARDS BAY AUGUST 18,1987

STATION #	DEPTH (m)	LIGHT INT (%)	Si-SiO2 (uM)	N-NO3 (uM)	N-NH3 (uM)	N-TIN (uM)	N-TDISS (uM)	N-DON (uM)	P-PO4 (uM)	P-TDISS (uM)	P-DOP (uM)	TIN/PO4
1	0.0	100	1.39	0.08	0.03	0.11	6.12	6.01	1.01	2.30	1.29	0.11
	1.4	60	0.89	0.04	0.19	0.23	7.45	7.22	0.59	2.68	2.09	0.39
	1.5		2.86	0.10	0.49	0.59	6.19	5.60	0.98	2.66	1.68	0.60
	3.0		0.81	0.05	0.49	0.54	7.12	6.58	0.52	2.52	2.00	1.04
	4.5		1.86	0.10	0.24	0.34	2.88	2.54	1.68	2.15	0.47	0.20
	4.7	25	0.29	0.01	0.08	0.09	6.85	6.76	0.53	2.63	2.10	0.17
	6.0		1.96	0.08	0.00	0.08	3.54	3.46	1.17	2.47	1.30	0.07
	7.5		1.51	0.10	0.24	0.34	5.50	5.20	0.89	2.60	1.25	0.38
	8.4	10	1.33	0.04	0.33	0.37	10.36	9.99	0.87	3.50	2.63	0.43
	9.0		2.59	0.18	0.45	0.63	6.85	6.22	1.34	2.46	1.12	0.47
	10.5		2.33	0.08	0.17	0.25	7.18	6.93	0.68	2.87	2.19	0.37
	11.4	3	2.51	0.05	0.37	0.42	6.72	6.30	0.66	2.49	1.83	0.64
	12.0		4.75	0.25	0.44	0.69	8.57	7.88	1.38	2.91	1.53	0.50
	13.0	1	8.41	0.38	1.23	1.61	12.35	10.74	1.43	2.85	1.42	1.13
2	0.0	100	3.02	0.22	3.78	4.00	21.02	17.02	4.25	5.04	0.79	0.94
	1.1	60	1.65	0.16	0.46	0.62	13.41	12.79	2.09	3.28	1.19	0.30
	1.5		8.15	0.01	0.16	0.17	9.50	9.33	1.23	3.57	2.34	0.14
	3.0		5.00	0.08	0.79	0.87	10.16	9.29	0.91	2.70	1.79	0.96
	3.5	25	0.87	0.16	0.54	0.70	7.45	6.75	2.72	7.80	5.08	0.26
	4.5		1.15	0.10	0.50	0.60	7.98	7.38	1.71	2.70	0.99	0.35
	5.0	10	0.81	0.12	0.57	0.69	6.65	5.96	0.59	1.18	0.59	1.17
	6.0		1.86	0.10	0.43	0.53	7.45	6.92	1.10	2.97	1.87	0.48
	7.5		3.97	0.16	0.54	0.70	7.91	7.21	1.80	2.65	0.85	0.39
	8.3	3	2.04	1.35	0.51	1.86	6.85	4.99	1.35	2.82	1.47	1.38
	9.0	1	28.51	2.24	10.34	12.58	13.54	0.96	2.24	3.68	1.44	5.62
3	0.0		1.35	0.19	0.25	0.44	7.78	7.34	2.77	3.50	0.73	0.16
	1.5		0.93	0.28	0.86	1.14	15.00	13.86	1.11	1.71	0.60	1.03
	3.0		0.87	0.04	0.30	0.34	3.94	3.60	0.67	2.17	1.50	0.51
	4.5		0.50	0.13	0.75	0.88	11.42	10.54	0.70	2.62	1.92	1.26
	6.0		1.84	0.19	0.66	0.85	10.49	9.64	1.08	2.43	1.35	0.79
	7.5		2.55	0.10	0.35	0.45	9.57	9.12	0.86	2.70	1.84	0.52
4	0.0		1.50	0.04	0.23	0.27	9.91	9.64	2.29	2.93	0.64	0.12
	1.5		1.68	0.07	0.41	0.48	10.11	9.63	1.65	3.25	1.60	0.29
	3.0		1.39	0.18	0.84	1.02	8.78	7.76	1.80	2.70	0.90	0.57
	4.5		0.71	0.05	0.29	0.34	8.05	7.71	1.05	2.65	1.60	0.32
	6.0		1.84	0.30	2.42	2.72	9.25	6.53	1.32	2.69	1.37	2.06
	7.5		14.19	1.15	10.22	11.37	14.68	3.31	1.63	2.78	1.15	6.98
5	0.0		0.92	0.05	0.47	0.52	7.98	7.46	0.71	2.36	1.65	0.73
	1.5		0.81	0.02	0.30	0.32	6.45	6.13	0.96	2.36	1.40	0.33
	3.0		2.41	0.01	0.49	0.50	7.25	6.75	1.07	2.22	1.15	0.47
	4.5		2.27	0.00	0.49	0.49	4.80	4.31	0.69	2.17	1.48	0.71
	6.0		1.57	0.02	0.43	0.45	NA	NA	0.68	NA	NA	
	7.5		4.55	0.30	0.88	1.18	8.51	7.33	1.30	2.30	1.00	0.91
	9.0		8.52	0.55	1.90	2.45	5.86	3.41	1.48	2.12	0.64	1.66
	10.5		8.62	0.59	2.10	2.69	9.76	7.07	2.29	3.07	0.78	1.17
7	0.0		0.61	0.08	0.43	0.51	11.95	11.44	1.03	2.16	1.13	0.50
	1.5		2.67	0.01	0.25	0.26	7.98	7.72	1.14	2.43	1.29	0.23
	3.0		1.32	0.05	0.39	0.44	8.11	7.67	1.49	2.47	0.98	0.30
	4.5		20.98	1.07	10.68	11.75	16.65	4.90	2.93	3.51	0.58	4.01

CRUISE # 1 NEW BEDFORD HARBOR BUZZARDS BAY AUGUST 18,1987

STATION #	DEPTH (m)	LIGHT INT (%)	POC (uM)	PON (uM)	C/N (atom)	OXYGEN (mg/l)	Cl (mM)	TEMP (Celsius)	SP. GRAV. (Sigma t)	LIGHT (uE/s/m)
1	0.0	100	24.75	1.91	12.98	7.4	644.6	21.3	29.18	1000
	1.4	60	23.32	1.78	13.08	NA	505.4	21.2	22.45	NA
	1.5		21.09	1.83	11.53	7.7	500.5	21.2	22.22	550
	3.0		31.31	2.39	13.10	7.6	497.5	21.1	22.10	400
	4.5		25.49	2.47	10.33	7.5	510.1	21.1	22.71	270
	4.7	25	22.08	2.06	10.74	NA	499.1	21.1	22.17	NA
	6.0		27.90	3.15	8.87	NA	497.5	20.8	22.18	200
	7.5		21.94	2.44	8.97	NA	514.6	20.6	23.06	145
	8.4	10	38.70	4.78	8.09	NA	503.5	20.4	22.59	NA
	9.0		43.18	4.81	8.99	NA	505.6	20.2	22.73	90
	10.5		51.94	4.87	10.66	NA	508.4	20.1	22.89	54
	11.4	3	38.53	4.82	7.99	NA	509.2	20.3	22.87	NA
	12.0		38.95	4.73	8.23	NA	513.3	20.5	23.02	36
	13.0	1	52.65	6.95	7.58	NA	508.1	20.4	22.80	30
2	0.0	100	53.73	8.02	6.70	NA	481.4	24.8	20.28	1000
	1.1	60	49.50	5.56	8.91	NA	512.7	24.6	21.84	600
	1.5		42.19	5.14	8.21	NA	498.1	24.2	21.26	500
	3.0		63.61	8.96	7.10	NA	514.5	21.4	22.84	270
	3.5	25	59.63	7.61	7.84	NA	507.4	21.4	22.50	250
	4.5		54.31	6.02	9.02	NA	517.5	21.3	23.01	140
	5.0	10	46.17	5.48	8.43	NA	517.9	21.2	23.06	110
	6.0		47.83	6.60	7.25	NA	482.8	21.1	21.38	80
	7.5		45.18	5.79	7.81	NA	505.4	20.7	22.59	42
	8.3	3	45.67	6.41	7.13	NA	515.7	20.6	23.11	30
	9.0	1	123.65	13.38	9.24	NA	513.8	20.0	23.18	13
3	0.0		73.13	9.41	7.77	NA	501.2	24.8	21.23	1200
	1.5		44.43	4.55	9.77	NA	509.9	22.4	22.34	580
	3.0		42.79	4.86	8.81	NA	521.2	20.9	23.30	320
	4.5		45.36	5.05	8.98	NA	508.3	20.8	22.70	130
	6.0		45.69	5.16	8.86	NA	506.6	20.7	22.64	64
	7.5		49.19	5.42	9.08	NA	525.1	20.6	23.57	28
4	0.0		46.13	5.52	8.36	NA	507.6	25.7	21.26	1150
	1.5		48.75	6.25	7.81	NA	514.8	25.7	21.61	470
	3.0		53.45	6.71	7.96	NA	503.9	23.5	21.74	250
	4.5		NA	NA	NA	NA	502.3	22.9	21.84	115
	6.0		56.18	8.99	6.25	NA	512.7	20.9	22.89	61
	7.5		29.73	3.71	8.02	NA	518.7	20.6	23.26	30
5	0.0		38.37	5.00	7.67	6.8	509.9	21.5	22.59	650
	1.5		52.69	6.76	7.79	7.1	513.5	21.4	22.79	280
	3.0		51.16	7.15	7.15	7.0	507.4	21.4	22.50	145
	4.5		52.90	7.93	6.67	7.1	507.9	21.3	22.55	75
	6.0		43.39	6.04	7.19	6.8	508.5	21.2	22.60	41
	7.5		50.39	6.76	7.45	6.2	520.2	20.8	23.28	22
	9.0		41.10	5.16	7.97	6.0	520.7	20.7	23.33	12
	10.5		37.71	4.59	8.22	6.1	504.4	20.7	22.54	12
7	0.0		54.88	6.48	8.47	NA	504.4	26.8	20.76	1100
	1.5		60.12	6.33	9.50	NA	507.0	26.8	20.89	430
	3.0		47.50	5.01	9.48	NA	507.7	24.4	21.66	180
	4.5		31.33	3.27	9.60	NA	512.5	21.8	22.64	105

CRUISE # 2 NEW BEDFORD HARBOR BUZZARDS BAY SEPTEMBER 2,1987

STATION #	DEPTH (m)	LIGHT INT (%)	Si-SiO2 (uM)	N-NO3 (uM)	N-NH3 (uM)	N -TIN (uM)	N-TDISS (uM)	N-DON (uM)	P-PO4 (uM)	P-TDISS (uM)	P-DOP (uM)	TIN/PO4
1	0.0	100	0.46	0.08	0.07	0.15	25.32	25.17	0.44	0.92	0.48	0.35
	1.5	60	0.52	0.26	0.40	0.66	19.03	18.37	0.49	0.77	0.28	1.35
	3.0		3.95	0.10	0.10	0.20	8.28	8.08	0.41	0.56	0.15	0.50
	3.5	25	0.76	0.04	0.00	0.04	8.51	8.47	0.48	0.63	0.14	0.07
	4.5		0.58	0.05	0.00	0.05	8.39	8.34	0.43	0.59	0.15	0.12
	6.0	10	0.51	0.19	0.19	0.38	9.24	8.86	0.46	0.58	0.13	0.84
	7.5		0.78	0.03	0.00	0.03	7.81	7.78	0.95	1.00	0.05	0.04
	9.0		1.00	0.06	0.08	0.14	7.87	7.72	0.53	0.65	0.11	0.27
	10.0	3	1.36	0.17	0.14	0.31	8.32	8.01	0.59	0.68	0.09	0.53
	10.5		1.40	0.10	0.09	0.18	11.35	11.16	0.66	0.74	0.08	0.28
	11.5		1.65	0.25	0.14	0.40	9.34	8.95	0.83	0.88	0.05	0.48
	12.0	1	1.49	0.11	0.07	0.19	13.11	12.92	0.70	0.80	0.10	0.27
2	0.0	100	3.75	0.99	14.07	15.06	28.13	13.08	1.95	2.26	0.31	7.73
	0.5	60	5.84	0.17	24.78	24.95	43.85	18.89	2.43	3.20	0.77	10.26
	1.5	25	1.37	0.21	0.35	0.56	12.36	11.80	0.81	4.17	3.36	0.69
	2.3	10	0.94	0.10	0.19	0.29	10.01	9.72	1.59	2.32	0.73	0.18
	3.0		0.79	0.19	0.15	0.33	10.06	9.73	0.65	0.92	0.28	0.52
	4.5		1.28	0.00	0.16	0.16	7.20	7.04	0.64	0.82	0.18	0.25
	6.0	3	1.27	1.80	0.20	2.00	10.63	8.63	0.60	0.71	0.11	3.33
	7.5		3.80	0.12	0.08	0.20	7.31	7.11	0.58	5.75	5.18	0.35
	8.0	>1	1.93	0.17	0.18	0.35	7.76	7.41	0.71	1.05	0.34	0.50
3	0.0		0.41	0.21	0.45	0.67	10.50	9.84	0.53	0.91	0.38	1.26
	1.5		0.48	0.06	0.03	0.09	3.81	3.72	0.47	0.76	0.29	0.20
	3.0		0.61	0.05	0.07	0.12	6.73	6.61	0.50	0.65	0.15	0.24
	4.5		0.58	0.13	0.15	0.28	6.21	5.93	0.49	1.42	0.92	0.57
	6.0		1.62	0.17	0.14	0.31	12.72	12.41	0.71	0.79	0.07	0.44
	7.5		1.56	0.10	0.09	0.20	9.40	9.20	0.60	0.82	0.22	0.33
4	0.0		0.90	0.08	0.06	0.13	11.45	11.32	0.47	0.74	0.28	0.28
	1.5		1.05	0.23	0.18	0.41	14.99	14.58	0.50	0.70	0.20	0.81
	3.0		0.81	0.14	0.09	0.24	9.73	9.49	0.51	0.74	0.22	0.47
	4.5		0.89	0.06	0.03	0.09	10.07	9.98	0.52	0.70	0.18	0.17
	6.0		0.86	0.06	0.02	0.08	9.27	9.19	0.59	0.83	0.24	0.14
	7.5		1.01	0.05	0.04	0.09	16.64	16.54	0.74	1.00	0.27	0.13
5	0.0		0.71	0.05	0.00	0.05	9.78	9.73	0.79	0.96	0.17	0.06
	1.5		0.55	0.14	0.17	0.32	11.26	10.94	0.98	1.17	0.19	0.32
	3.0		0.99	0.04	0.00	0.04	14.06	14.02	1.75	1.76	0.01	0.02
	4.5		0.59	0.04	0.00	0.04	10.34	10.30	1.01	1.20	0.18	0.04
	6.0		1.77	0.06	0.04	0.10	10.33	10.23	0.78	1.09	0.31	0.13
	7.5		0.58	0.05	0.00	0.05	7.76	7.71	0.78	0.91	0.13	0.06
	9.0		2.38	0.09	0.01	0.10	9.30	9.19	0.74	0.84	0.09	0.14
7	0.0		0.60	0.08	0.00	0.08	12.84	12.76	1.41	1.70	0.30	0.05
	1.5		0.52	0.08	0.00	0.08	12.84	12.76	2.98	3.34	0.36	0.03
	3.0		0.67	0.08	0.10	0.18	14.83	14.65	1.30	1.73	0.43	0.14
	4.5		0.82	0.05	0.00	0.05	8.54	8.49	0.76	1.17	0.41	0.07

CRUISE # 2 NEW BEDFORD HARBOR BUZZARDS BAY SEPTEMBER 2,1987

STATION #	DEPTH (m)	LIGHT INT (%)	POC (uM)	PON (uM)	C/N (atom)	OXYGEN (mg/l)	Cl (mM)	TEMP (Celsius)	SP. GRAV. (Sigma t)	LIGHT (uE/s/m)
1	0.0	100	32.74	3.11	10.53	7.6	487.1	19.0	22.13	1200
	1.5	60	30.69	3.42	8.98	7.5	528.6	19.0	24.15	550
	3.0		40.69	3.93	10.35	7.7	505.2	19.5	22.88	310
	3.5	25	29.28	3.16	9.27	7.7	489.2	19.6	22.08	240
	4.5		35.69	NA	NA	7.7	508.8	19.6	23.03	170
	6.0	10	40.00	5.13	7.79	7.6	492.2	19.6	22.23	95
	7.5		26.08	2.83	9.23	7.6	498.7	19.1	22.67	60
	9.0		32.65	3.85	8.47	7.6	501.6	19.2	22.78	35
	10.0	3	42.75	5.34	8.00	7.4	500.0	18.9	22.78	26
	10.5		35.58	4.14	8.60	7.3	503.8	18.7	23.01	22
	11.5		43.05	5.61	7.67	7.1	501.9	18.5	22.97	15
	12.0	1	39.16	4.86	8.07	7.0	510.4	18.5	23.39	12
2	0.0	100	116.63	11.34	10.29	7.0	480.0	19.6	21.63	1300
	0.5	60	142.59	12.73	11.20	6.9	480.4	19.6	21.65	780
	1.5	25	49.63	5.18	9.59	6.8	482.1	19.6	21.73	325
	2.3	10	39.99	11.97	3.34	7.0	482.0	19.4	21.78	130
	3.0		40.74	4.43	9.20	7.1	492.1	19.5	22.25	75
	4.5		42.46	4.21	10.08	7.0	492.0	19.4	22.27	63
	6.0	3	45.18	4.51	10.02	6.4	492.5	19.6	22.24	39
	7.5		77.25	7.11	10.86	6.7	487.3	18.9	22.16	17
	8.0	>1	103.27	9.73	10.61	6.7	499.9	19.1	22.73	12
3	0.0		54.68	4.08	13.40	7.9	502.1	19.4	22.76	1300
	1.5		46.46	4.56	10.19	7.8	493.4	19.4	22.33	630
	3.0		38.73	4.08	9.48	7.9	499.9	19.7	22.58	300
	4.5		44.38	4.73	9.39	7.7	483.8	19.2	21.92	120
	6.0		51.96	5.68	9.14	7.0	500.8	18.7	22.87	48
	7.5		65.59	6.68	9.83	6.8	487.2	18.7	22.20	22
4	0.0		49.63	4.87	10.19	7.9	483.8	19.8	21.77	1200
	1.5		46.68	4.87	9.58	7.8	486.5	19.7	21.92	620
	3.0		47.64	5.16	9.23	7.9	489.0	19.9	21.99	270
	4.5		47.88	4.97	9.63	7.9	487.8	19.9	21.94	140
	6.0		45.91	4.90	9.37	7.8	491.7	19.8	22.15	72
	7.5		45.90	4.93	9.31	7.8	488.7	19.8	22.01	40
5	0.0		54.37	5.01	10.85	8.1	488.7	19.3	22.13	950
	1.5		60.57	5.55	10.92	7.9	493.4	19.3	22.36	370
	3.0		65.02	5.63	11.56	7.8	488.9	19.3	22.14	140
	4.5		48.51	5.09	9.54	7.6	499.0	19.2	22.66	67
	6.0		55.22	5.90	9.36	7.6	494.3	22.2	21.64	33
	7.5		46.23	5.11	9.04	6.9	500.8	19.6	22.65	15
	9.0		51.11	5.68	9.00		506.0		26.04	6
7	0.0		68.99	7.70	8.96	8.7	500.9	20.0	22.55	1300
	1.5		72.46	9.74	7.44	8.7	517.5	19.9	23.38	520
	3.0		80.85	8.78	9.21	8.8	520.1	20.0	23.48	250
	4.5		85.05	8.21	10.36	8.8	502.7	19.8	22.69	110

CRUISE # 3 NEW BEDFORD HARBOR BUZZARDS BAY SEPTEMBER 15,1987

STATION #	DEPTH (m)	LIGHT INT %	Si-SiO2 (uM)	N-NO3+NO2 (uM)	N-NH3 (uM)	N-TIN (uM)	N-TDISS (uM)	N-DON (uM)	P-PO4 (uM)	P-TDISS (uM)	P-DOP (uM)	TIN/PO4
1	0.0	100	2.00	0.09	0.12	0.21	10.07	9.86	0.53	0.74	0.21	0.40
	1.0	60	2.05	0.04	0.13	0.17	8.62	8.45	0.68	0.71	0.03	0.25
	1.5		2.12	0.03	0.15	0.18	7.36	7.18	0.51	0.60	0.09	0.35
	3.0	25	2.71	0.05	0.07	0.12	8.00	7.88	2.53	2.85	0.32	0.05
	4.5	10	2.19	0.06	0.17	0.23	7.24	7.01	1.70	1.86	0.16	0.14
	6.0		2.27	0.04	0.10	0.14	9.40	9.26	1.22	17.54	16.32	0.11
	7.5	3	2.84	0.10	0.21	0.31	5.72	5.41	0.64	1.12	0.48	0.48
	9.0		3.22	0.16	0.35	0.51	14.36	13.85	0.74	0.98	0.24	0.69
	10.5		4.57	0.30	1.13	1.43	17.77	16.34	3.35	3.66	0.31	0.43
	12.0		5.92	0.38	1.16	1.54	9.82	8.28	0.84	0.92	0.08	1.83
2	0.0	100	3.99	0.34	5.86	6.20	18.13	11.93	2.07	2.84	0.77	3.00
	0.5	60	3.54	0.22	5.47	5.69	19.38	13.69	2.91	3.61	0.70	1.96
	1.5		1.40	0.37	1.77	2.14	20.94	18.80	0.95	1.49	0.54	2.25
	2.3	25	1.71	0.05	0.00	0.05	21.87	21.82	0.98	1.40	0.42	0.05
	3.0		1.70	0.05	0.05	0.10	14.45	14.35	1.29	2.64	1.35	0.08
	3.8	10	3.49	0.08	0.19	0.27	20.90	20.63	0.93	2.82	1.89	0.29
	4.5		3.27	0.25	0.67	0.92	18.77	17.85	1.36	1.60	0.24	0.68
	6.0		4.38	0.18	0.89	1.07	10.33	9.26	1.02	1.38	0.36	1.05
	6.7	3	4.99	0.26	1.16	1.42	17.23	15.81	1.01	1.06	0.05	1.41
	7.5		5.75	0.21	0.97	1.18	11.51	10.33	0.97	1.78	0.81	1.22
	8.2	>1	6.25	0.19	1.18	1.37	12.16	10.79	0.69	1.72	1.03	1.99
3	0.0		1.30	0.02	0.08	0.10	12.45	12.35	1.09	1.73	0.64	0.09
	1.5		1.11	0.02	0.00	0.02	11.80	11.78	0.84	1.29	0.45	0.02
	3.0		1.39	0.02	0.00	0.02	12.12	12.10	1.26	1.28	0.02	0.02
	4.5		1.36	0.00	0.00	0.00	12.98	12.98	0.86	1.32	0.46	0.00
	6.0		5.83	0.20	0.66	0.86	11.25	10.39	0.96	1.26	0.30	0.90
	7.5		6.39	0.25	0.90	1.15	10.48	9.33	0.98	1.12	0.14	1.17
4	0.0		3.24	0.08	0.10	0.18	11.56	11.38	1.10	1.51	0.41	0.16
	1.5		3.19	0.08	0.00	0.08	15.45	15.37	1.30	1.45	0.15	0.06
	3.0		3.38	0.05	0.05	0.10	12.09	11.99	1.27	1.69	0.42	0.08
	4.5		3.78	0.08	0.18	0.26	11.11	10.85	1.07	1.48	0.41	0.24
	6.0		5.70	0.21	1.55	1.76	15.22	13.46	1.00	1.34	0.34	1.76
	7.5		6.19	0.27	2.35	2.62	15.10	12.48	0.81	1.58	0.77	3.23
5	0.0		2.48	0.02	0.03	0.05	9.91	9.86	0.72	0.84	0.12	0.07
	1.5		2.48	0.09	0.20	0.29	9.47	9.18	0.69	1.27	0.58	0.42
	3.0		2.47	0.01	0.00	0.01	8.60	8.59	0.70	1.02	0.32	0.01
	4.5		3.10	0.06	0.00	0.06	6.55	6.49	1.13	2.02	0.89	0.05
	6.0		3.62	0.20	0.37	0.57	17.89	17.32	1.47	1.88	0.41	0.39
	7.5		5.31	0.32	0.60	0.92	8.91	7.99	0.73	1.07	0.34	1.26
	9.0		5.30	0.33	0.68	1.01	7.83	6.82	0.60	1.00	0.40	1.68
6	0.0		2.32	0.09	0.00	0.09	6.04	5.95	0.97	1.62	0.65	0.09
	1.5		2.13	0.12	0.09	0.21	8.90	8.69	1.12	2.40	1.28	0.19
	3.0		1.93	0.05	0.00	0.05	8.25	8.20	0.95	1.20	0.25	0.05
	4.5		2.10	0.06	0.00	0.06	11.70	11.64	1.06	1.52	0.46	0.06
	6.0		2.57	0.05	0.00	0.05	7.70	7.65	0.81	1.23	0.42	0.06
	7.5		7.41	0.19	1.05	1.24	8.45	7.21	0.81	1.39	0.58	1.53

CRUISE # 3 NEW BEDFORD HARBOR BUZZARDS BAY SEPTEMBER 15,1987

STATION #	DEPTH (m)	LIGHT INT (%)	POC (uM)	PON (uM)	C/N (atoms)	OXYGEN (mg/l)	Cl (mM)	- TEMP (Celsius)	Sp. Grav. sigma t	LIGHT (uE/s/m)
1	0.0	100	34.47	3.49	9.87	7.0	512.5	19.4	23.27	1020
	1.0	60	42.03	3.39	12.38	7.0	515.1	19.4	23.39	623
	1.5		32.17	3.61	8.91	7.0	515.3	19.9	23.28	411
	3.0	25	33.32	3.30	10.11	7.1	502.3	19.7	22.69	186
	4.5	10	32.82	3.30	9.96	7.1	511.5	19.7	23.14	101
	6.0		139.61	23.01	6.07	7.1	502.8	19.8	22.69	52
	7.5	3	31.67	3.10	10.22	7.1	508.0	19.5	23.02	30
	9.0		28.72	3.69	7.78	7.1	517.6	19.5	23.49	17
	10.5	1	33.81	3.18	10.64	6.9	NA	19.1	NA	10
	12.0		35.45	3.06	11.59	6.7	513.3	19.0	23.40	5
2	0.0	100	80.00	8.27	9.68	6.5	498.8	20.4	22.34	1430
	0.5	60	87.72	7.99	10.98	6.5	458.1	20.3	20.39	1000
	1.5		49.26	5.11	9.64	6.5	347.2	20.4	14.97	377
	2.3	25	51.56	5.47	9.43	6.7	512.9	20.4	23.03	358
	3.0		42.36	5.23	8.10	6.8	488.1	20.2	21.87	229
	3.8	10	40.39	4.12	9.79	6.7	522.1	20.2	23.53	143
	4.5		46.63	5.58	8.35	6.6	492.7	20.2	22.10	97
	6.0		30.52	3.02	10.11	6.2	511.9	20.0	23.08	53
	6.7	3	30.85	2.43	12.71	6.2	521.4	19.9	23.59	43
	7.5		29.87	2.51	11.92	6.2	524.0	19.5	23.80	30
	8.2	>1	25.10	1.72	14.62	6.2	510.7	19.5	23.15	23
3	0.0		39.56	3.37	11.72	6.9	514.1	21.1	22.90	1360
	1.5		44.82	4.08	10.97	6.9	511.0	20.4	22.94	675
	3.0		39.23	4.68	8.39	6.8	512.2	20.2	23.05	256
	4.5		36.93	4.12	8.95	6.7	509.0	20.2	22.89	116
	6.0		38.74	3.81	10.17	6.0	509.6	19.8	23.02	47
	7.5		38.91	3.77	10.32	6.0	508.9	19.7	23.01	24
4	0.0		NA	NA	NA	6.9	505.7	21.1	22.50	1350
	1.5		45.65	4.91	9.29	6.7	507.2	20.9	22.62	646
	3.0		39.07	4.52	8.65	7.1	513.0	20.5	23.01	362
	4.5		40.06	3.89	10.30	7.0	513.4	20.2	23.11	184
	6.0		40.83	4.25	9.60	6.4	508.1	19.8	22.95	81
	7.5		27.64	2.50	11.06	6.4	508.4	19.8	22.96	47
5	0.0		42.31	NA	NA	6.7	484.1	19.6	21.83	680
	1.5		41.16	4.33	9.50	6.5	483.5	19.6	21.80	247
	3.0		42.15	3.94	10.69	6.4	476.2	19.6	21.45	93
	4.5		35.22	4.29	8.20	6.4	494.4	19.5	22.36	41
	6.0		37.53	3.98	9.43	6.5	497.2	19.1	22.59	18
	7.5		34.56	3.98	8.68	6.5	498.7	18.9	22.72	10
	9.0		39.18	4.25	9.21	6.3	501.7	18.8	22.89	5
6	0.0		37.53	4.06	9.24	7.1	479.0	20.5	21.35	1440
	1.5		36.21	4.22	8.59	6.7	513.5	20.4	23.06	754
	3.0		49.56	7.57	6.54	6.9	508.0	20.2	22.84	382
	4.5		43.46	5.50	7.90	6.8	498.9	20.1	22.43	185
	6.0		33.57	4.29	7.82	6.8	506.2	20.0	22.81	90
	7.5		34.56	3.63	9.52	6.3	483.5	19.6	21.80	39

CRUISE # 4 NEW BEDFORD HARBOR BUZZARDS BAY SEPTEMBER 30,1987

STATION #	DEPTH (m)	LIGHT INT %	Si-SiO2 (uM)	N-NO3 (uM)	N-NH3 (uM)	N-TIN (uM)	N-TDISS (uM)	N-DON (uM)	P-PO4 (uM)	P-TDISS (uM)	P-DOP (uM)	TIN/PO4
1	0.0	100	8.23	0.16	0.17	0.33	12.71	12.38	0.81	1.73	0.92	0.41
	1.5	60	8.29	0.13	0.11	0.24	13.28	13.04	0.67	1.02	0.35	0.36
	3.0		8.33	0.16	0.11	0.27	11.79	11.52	0.63	1.01	0.39	0.43
	4.5	25	8.28	0.15	0.11	0.26	13.25	12.99	0.63	1.05	0.42	0.41
	6.0		8.32	0.16	0.10	0.26	11.47	11.21	0.63	1.05	0.42	0.41
	7.5		8.27	0.18	0.15	0.33	18.23	17.90	0.63	1.42	0.78	0.52
	8.5	10	8.18	0.09	0.17	0.26	15.43	15.17	1.05	1.23	0.18	0.25
	9.0		8.25	0.36	0.22	0.58	13.56	12.97	0.66	1.04	0.38	0.88
	10.5		8.15	0.34	0.20	0.54	12.60	12.06	0.65	1.03	0.38	0.83
	11.5	3	8.22	0.19	0.44	0.63	11.97	11.34	0.65	1.02	0.37	0.96
	12.0	1	8.13	0.17	0.09	0.26	12.70	12.44	0.62	1.07	0.45	0.42
2	0.0	100	13.64	1.91	14.45	16.37	34.63	18.26	2.20	3.13	0.93	7.45
	1.0	60	12.24	1.36	8.86	10.22	27.07	16.85	1.77	2.72	0.95	5.76
	1.5		11.12	1.50	4.63	6.13	27.30	21.17	1.54	2.71	1.17	3.97
	2.0	25	10.33	0.25	0.54	0.79	18.72	17.93	1.22	1.94	0.72	0.65
	3.0	10	10.15	0.21	0.36	0.57	15.21	14.64	1.18	1.75	0.57	0.48
	4.5		9.92	0.20	0.34	0.54	15.78	15.24	1.23	1.79	0.56	0.44
	6.0		10.93	0.28	0.94	1.22	15.65	14.42	1.26	1.95	0.70	0.97
	7.5	3	11.42	0.27	0.71	0.98	13.21	12.23	1.10	1.57	0.47	0.89
	9.0	1	13.58	0.39	1.69	2.08	16.91	14.83	1.07	1.65	0.59	1.95
3	0.0		12.16	0.17	0.19	0.36	15.03	14.67	1.43	2.26	0.83	0.25
	1.5		12.09	0.17	0.12	0.29	15.67	15.37	0.88	1.92	1.05	0.33
	3.0		12.02	0.17	0.17	0.34	13.94	13.60	3.79	6.57	2.78	0.09
	4.5		11.89	0.18	0.17	0.35	12.39	12.04	0.82	4.00	3.18	0.43
	6.0		11.98	0.18	0.13	0.30	12.02	11.72	0.84	1.25	0.41	0.36
	7.5		12.15	0.19	0.20	0.39	12.59	12.20	0.81	1.53	0.72	0.48
4	0.0		7.38	0.21	0.19	0.41	15.23	14.82	1.03	4.81	3.78	0.39
	1.5		7.50	0.17	0.14	0.30	15.04	14.73	1.03	1.65	0.61	0.29
	3.0		7.43	0.22	0.20	0.43	17.20	16.77	1.04	3.26	2.22	0.41
	4.5		7.44	0.19	0.15	0.34	15.53	15.20	1.03	2.22	1.19	0.33
	6.0		7.53	0.17	0.13	0.30	17.99	17.70	1.00	1.88	0.88	0.30
	7.5		7.70	0.15	0.10	0.26	15.85	15.60	1.01	1.67	0.66	0.25
5	0.0		11.12	0.16	0.08	0.24	14.07	13.83	0.75	1.33	0.59	0.32
	1.5		11.01	0.20	0.13	0.33	18.18	17.84	0.66	1.45	0.79	0.50
	3.0		10.97	0.18	0.10	0.27	11.97	11.70	0.73	1.08	0.35	0.38
	4.5		10.94	0.15	0.27	0.42	12.90	12.48	0.77	1.15	0.38	0.54
	6.0		10.93	0.15	0.27	0.42	10.59	10.17	0.76	1.11	0.35	0.55
	7.5		10.89	0.23	0.39	0.62	12.81	12.19	0.78	1.06	0.29	0.80
	9.0		11.01	0.21	0.39	0.60	11.50	10.89	0.75	0.85	0.10	0.80
7	0.0		6.34	0.18	0.36	0.54	12.48	11.94	1.00	1.43	0.42	0.53
	1.5		5.89	0.14	0.23	0.37	13.41	13.04	0.99	2.13	1.14	0.37
	3.0		5.88	0.12	0.12	0.24	13.27	13.03	0.97	1.46	0.49	0.25
	4.5		5.82	0.16	0.12	0.28	13.61	13.33	0.93	1.41	0.49	0.30

CRUISE # 4 NEW BEDFORD HARBOR BUZZARDS BAY SEPTEMBER 30,1987

STATION #	DEPTH (m)	LIGHT INT (%)	POC (uM)	PON (uM)	C/N (atoms)	OXYGEN (mg/l)	Cl (mM)	TEMP (Celsius)	Sp. Grav. sigma t	LIGHT (uE/s/m)
1	0.0	100	34.70	4.39	7.91	7.8	480.4	17.8	22.08	83
	1.5	60	33.37	4.15	8.04	7.7	496.9	17.8	22.89	52
	3.0		37.69	4.74	7.95	7.7	487.7	17.7	22.46	22
	4.5	25	33.20	3.99	8.32	7.7	491.7	17.7	22.66	21
	6.0		27.88	3.79	7.35	7.3	496.2	17.7	22.88	18
	7.5		37.30	4.61	8.10	7.4	502.5	17.7	23.19	11
	8.5	10	36.35	3.96	9.17	7.4	502.0	17.7	23.16	8
	9.0		34.68	4.14	8.37	7.4	495.2	17.7	22.83	6
	10.5		35.53	4.35	8.17	7.4	503.7	17.7	23.25	4
	11.5	3	37.98	4.12	9.23	7.4	492.4	17.8	22.67	3
	12.0	1	32.71	4.03	8.13	7.4	506.0	17.7	23.36	3
2	0.0	100	133.97	14.15	9.47	7.5	460.8	18.0	21.08	197
	1.0	60	146.11	15.70	9.31	7.4	470.6	17.9	21.58	141
	1.5		104.25	12.74	8.18	7.3	473.1	17.9	21.70	94
	2.0	25	64.70	7.95	8.13	7.3	466.6	17.9	21.38	48
	3.0	10	82.25	9.19	8.95	7.3	491.7	17.8	22.64	20
	4.5		54.87	7.21	7.61	7.3	493.4	17.8	22.72	14
	6.0		53.89	7.60	7.09	7.3	492.9	17.8	22.70	10
	7.5	3	54.55	7.49	7.29	7.2	484.6	17.8	22.29	6
	9.0	1	44.05	4.47	9.86	6.9	473.3	17.8	21.74	5
3	0.0		34.05	4.81	7.07	7.8	480.6	17.9	22.07	269
	1.5		39.62	4.89	8.10	7.7	493.9	17.9	22.72	175
	3.0		37.49	4.70	7.98	7.8	489.9	17.9	22.53	139
	4.5		35.36	4.43	7.99	7.7	486.9	17.8	22.40	74
	6.0		49.79	4.54	10.96	7.7	481.8	17.8	22.15	35
	7.5		34.71	4.23	8.20	7.8	484.9	17.7	22.33	16
4	0.0		56.84	6.75	8.42	7.8	478.4	18.2	21.89	458
	1.5		62.09	6.67	9.31	7.8	478.9	18.1	21.94	168
	3.0		66.19	7.29	9.08	7.7	485.2	18.1	22.25	80
	4.5		60.12	6.36	9.45	7.6	488.2	18.1	22.40	48
	6.0		64.05	5.94	10.79	7.6	478.4	18.1	21.92	24
	7.5		65.69	6.17	10.65	7.5	478.9	18.0	21.96	14
5	0.0		38.80	4.43	8.76	7.8	484.4	17.8	22.28	344
	1.5		67.17	4.39	15.31	7.7	484.9	17.9	22.28	134
	3.0		40.28	4.62	8.72	7.8	487.4	17.8	22.43	68
	4.5		34.87	4.77	7.30	7.6	501.2	17.9	23.08	38
	6.0		48.48	4.27	11.35	7.6	491.7	17.9	22.61	22
	7.5		38.31	4.89	7.83	7.6	493.4	17.8	22.72	13
	9.0		41.43	4.97	8.34	7.5	497.7	17.8	22.93	8
7	0.0		65.53	6.13	10.69	8.1	486.4	18.4	22.24	1120
	1.5		65.04	6.09	10.68	8.1	487.7	18.3	22.32	568
	3.0		66.68	6.52	10.23	8.0	476.6	18.2	21.80	228
	4.5		66.35	6.92	9.59	7.8	469.8	18.0	21.52	94

CRUISE # 5 NEW BEDFORD HARBOR BUZZARDS BAY OCTOBER 13,1987

STATION #	DEPTH (m)	LIGHT INT (%)	Si-SiO2 (uM)	N-NO3 (uM)	N-NH3 (uM)	N-TIN (uM)	N-TDISS (uM)	N-DON (uM)	P-PO4 (uM)	P-TDISS (uM)	P-DOP (uM)	TIN/PO4
1	0.0	100	0.94	0.16	0.00	0.16	5.07	4.91	0.63	2.21	1.58	0.26
	0.5	60	0.96	0.13	0.00	0.13	10.29	10.16	0.62	1.27	0.65	0.20
	1.5	25	0.92	0.15	0.00	0.15	4.84	4.69	0.68	2.34	1.66	0.22
	3.0		0.98	0.11	0.00	0.11	12.03	11.92	0.61	2.02	1.41	0.18
	3.5	10	0.91	0.12	0.00	0.12	10.92	10.81	0.61	1.29	0.68	0.19
	4.5		0.93	0.11	0.00	0.11	12.51	12.39	0.61	1.44	0.83	0.19
	6.0	3	0.91	0.11	0.00	0.11	12.49	12.39	0.62	1.27	0.65	0.18
	7.5		0.93	0.11	0.00	0.11	9.85	9.74	0.61	1.25	0.64	0.18
	8.5	1	0.90	0.10	0.00	0.10	10.43	10.32	0.61	1.98	1.38	0.17
	9.0		0.92	0.11	0.00	0.11	13.12	13.01	0.63	1.71	1.09	0.17
	10.5		0.90	0.10	0.00	0.10	15.36	15.26	0.66	4.73	4.07	0.15
	12.0		0.91	0.10	0.11	0.22	10.68	10.46	0.60	1.18	0.58	0.36
2	0.0	100	1.16	0.16	0.65	0.81	14.61	13.80	0.85	1.89	1.04	0.95
	1.0	60	1.08	0.14	0.56	0.70	13.40	12.70	0.83	1.70	0.87	0.85
	1.5		1.07	0.15	0.53	0.68	14.76	14.08	0.84	1.57	0.73	0.81
	2.0	25	1.21	0.18	0.56	0.75	13.23	12.48	0.85	1.79	0.94	0.87
	3.0	10	1.12	0.16	0.35	0.51	12.33	11.82	0.83	1.54	0.72	0.62
	3.5	3	1.18	0.15	0.25	0.39	11.87	11.48	0.83	1.74	0.90	0.47
	4.5		1.11	0.14	0.17	0.31	11.67	11.37	0.83	1.71	0.88	0.37
	5.0	1	1.12	0.14	0.00	0.14	11.77	11.64	0.80	1.92	1.12	0.17
	6.0		1.16	0.14	0.17	0.30	10.21	9.91	0.82	1.28	0.46	0.37
	7.5		1.13	0.12	0.00	0.12	12.08	11.96	0.79	1.86	1.07	0.15
	9.0		1.09	0.12	0.00	0.12	12.77	12.65	0.76	1.99	1.23	0.15
3	0.0		0.99	0.10	0.00	0.10	13.86	13.76	0.76	1.50	0.74	0.13
	1.5		0.99	0.10	0.00	0.10	11.77	11.67	0.83	1.62	0.80	0.12
	3.0		1.03	0.10	0.00	0.10	14.39	14.29	0.75	1.77	1.02	0.13
	4.5		0.97	0.09	0.00	0.09	8.86	8.77	0.75	1.22	0.47	0.13
	6.0		1.02	0.09	0.00	0.09	14.38	14.29	0.76	1.65	0.89	0.12
	7.5		1.05	0.09	0.00	0.09	13.75	13.66	0.74	1.41	0.67	0.12
4	0.0		0.99	0.11	0.00	0.11	16.30	16.19	0.85	1.44	0.59	0.13
	1.5		1.80	0.11	0.00	0.11	13.01	12.90	0.85	1.54	0.69	0.13
	3.0		1.81	0.10	0.00	0.10	11.25	11.14	0.85	1.21	0.36	0.12
	4.5		1.81	0.10	0.00	0.10	11.59	11.48	0.85	1.24	0.39	0.12
	6.0		1.77	0.12	0.00	0.12	12.13	12.00	0.84	1.29	0.44	0.15
	7.5		1.83	0.11	0.00	0.11	10.68	10.57	0.84	1.01	0.17	0.13
5	0.0		0.57	0.12	0.00	0.12	9.35	9.23	0.57	0.94	0.37	0.20
	1.5		0.55	0.12	0.00	0.12	9.59	9.48	0.56	2.41	1.85	0.21
	3.0		1.12	0.10	0.00	0.10	9.31	9.21	0.58	0.93	0.34	0.18
	4.5		0.53	0.10	0.00	0.10	9.90	9.80	0.57	0.78	0.22	0.17
	6.0		0.56	0.39	0.49	0.89	11.34	10.46	0.67	0.85	0.18	1.32
	7.5		0.57	0.11	0.00	0.11	8.76	8.66	0.59	0.82	0.23	0.18
	9.0		0.61	0.10	0.00	0.10	9.57	9.47	0.56	0.94	0.38	0.17
6	0.0		0.65	0.11	0.00	0.11	9.17	9.07	0.64	0.88	0.24	0.16
	1.5		0.76	0.10	0.00	0.10	18.22	18.12	0.66	0.89	0.23	0.16
	3.0		0.72	0.10	0.00	0.10	10.75	10.65	0.63	0.94	0.31	0.15
	4.5		0.78	0.09	0.00	0.09	12.01	11.92	0.65	0.93	0.27	0.14
	6.0		0.95	0.10	0.00	0.10	12.38	12.28	0.65	0.75	0.10	0.15
	7.5		0.68	0.09	0.00	0.09	13.68	13.59	0.65	1.00	0.35	0.14

CRUISE # 5 NEW BEDFORD HARBOR BUZZARDS BAY OCTOBER 13,1987

STATION #	DEPTH (m)	LIGHT INT (%)	POC (uM)	PON (uM)	C/N (atoms)	OXYGEN (mg/l)	Cl (mM)	TEMP (Celsius)	Sp. Grav. sigma t	LIGHT (uE/s/m)
1	0.0	100	42.02	5.40	7.78	7.4	501.5	14.5	23.84	554.0
	0.5	60	38.37	4.39	8.73	7.4	506.5	14.6	24.07	131.0
	1.5	25	38.37	5.01	7.65	7.4	502.2	14.5	23.87	160.0
	3.0		37.54	4.01	9.37	7.4	501.0	14.5	23.82	74.0
	3.5	10	39.86	4.36	9.15	7.4	489.9	14.5	23.27	57.0
	4.5		35.38	4.70	7.52	7.4	497.4	14.6	23.62	37.0
	6.0	3	53.15	8.11	6.56	7.6	498.9	14.6	23.69	16.0
	7.5		32.06	4.32	7.43	7.5	502.0	14.6	23.84	8.0
	8.5	1	36.04	4.20	8.58	7.6	491.9	14.6	23.35	5.0
	9.0		37.04	4.67	7.94	7.6	483.9	14.6	22.95	4.0
	10.5		40.19	4.43	9.07	7.7	480.9	14.7	22.78	2.6
	12.0		57.63	4.28	13.47	7.7	488.2	14.7	23.14	1.0
2	0.0	100	51.32	6.10	8.42	7.9	466.6	14.3	22.16	1170.0
	1.0	60	54.64	6.52	8.38	7.9	496.4	14.3	23.63	741.0
	1.5		61.29	7.45	8.22	7.9	485.9	14.3	23.11	556.0
	2.0	25	56.64	7.49	7.56	7.9	495.9	14.3	23.60	337.0
	3.0	10	52.32	6.29	8.32	7.9	478.9	14.3	22.76	55.0
	3.5	3	55.81	6.83	8.17	7.9	484.9	14.3	23.06	32.0
	4.5		50.66	6.14	8.26	7.8	474.9	14.3	22.57	17.0
	5.0	1	54.31	5.83	9.32	7.8	489.4	14.3	23.28	12.0
	6.0		55.31	7.07	7.83	7.8	484.9	14.3	23.06	7.3
	7.5		50.66	6.52	7.77	7.8	484.6	14.3	23.05	4.1
	9.0		51.99	6.52	7.97	7.7	471.6	14.3	22.40	2.0
3	0.0		53.81	7.03	7.66	7.9	499.2	14.1	23.81	1050.0
	1.5		55.97	7.65	7.32	7.8	491.9	14.2	23.43	160.0
	3.0		46.67	5.71	8.17	7.8	499.7	14.2	23.81	50.2
	4.5		51.99	6.60	7.87	7.8	488.2	14.2	23.24	19.0
	6.0		59.13	6.72	8.80	7.8	488.2	14.2	23.24	22.0
	7.5		45.51	6.25	7.28	7.7	482.9	14.2	22.98	3.3
4	0.0		51.13	4.65	11.00	7.8	504.2	14.1	24.05	141.0
	1.5		39.64	4.07	9.75	7.7	487.7	14.1	23.24	88.4
	3.0		41.77	4.88	8.56	7.6	498.7	14.1	23.78	124.0
	4.5		42.75	4.41	9.69	7.7	484.9	14.1	23.10	94.7
	6.0		48.33	5.11	9.46	7.6	490.4	14.1	23.37	60.8
	7.5		39.96	4.14	9.65	7.7	473.1	14.1	22.52	31.4
5	0.0		43.08	4.57	9.43	8.2	494.4	14.4	23.51	987.0
	1.5		40.13	4.57	8.78	8.1	498.7	14.4	23.72	350.0
	3.0		47.68	4.92	9.70	8.1	498.9	14.4	23.73	130.0
	4.5		46.53	4.57	10.18	8.1	485.6	14.4	23.07	63.0
	6.0		79.85	7.47	10.69	8.1	375.2	14.4	17.62	29.0
	7.5		42.59	4.61	9.24	8.1	493.2	14.4	23.45	13.0
	9.0		45.05	4.84	9.31	8.2	496.9	14.5	23.61	6.1
6	0.0		43.74	4.88	8.97	8.2	496.2	14.2	23.64	213.0
	1.5		43.58	4.80	9.08	8.1	491.9	14.2	23.43	109.0
	3.0		50.14	5.15	9.74	8.1	496.4	14.2	23.65	44.0
	4.5		57.36	6.31	9.09	8.1	486.4	14.2	23.15	23.0
	6.0		47.51	5.46	8.70	8.1	483.4	14.2	23.01	13.0
	7.5		44.72	4.92	9.10	8.1	473.8	14.2	22.53	18.0

CRUISE # 6 NEW BEDFORD HARBOR BUZZARDS BAY DECEMBER 8,1987

STATION #	DEPTH (m)	LIGHT INT (%)	Si-SiO2 (uM)	N-NO3 (uM)	N-NH3 (uM)	N-TIN (uM)	N-TDISS (uM)	N-DON (uM)	P-PO4 (uM)	P-TDISS (uM)	P-DOP (uM)	TIN/PO4
1	0.0	100	1.12	0.10	0.68	0.78	11.96	11.18	0.60	0.59	-0.01	1.30
	0.8	60	1.05	0.05	0.53	0.58	8.99	8.41	0.59	0.90	0.31	0.98
	1.5		1.14	0.10	0.98	1.08	10.95	9.87	0.62	0.83	0.21	1.74
	3.0	25	1.05	0.09	1.94	2.03	9.88	7.86	0.59	0.73	0.14	3.42
	4.5		1.15	0.00	2.34	2.34	8.81	6.47	0.58	0.76	0.19	4.07
	5.0	10	1.05	0.04	0.84	0.88	7.93	7.04	0.58	0.80	0.22	1.51
	6.0		1.15	0.06	0.60	0.67	8.12	7.45	0.59	1.22	0.63	1.13
	7.5		1.22	0.06	0.57	0.64	8.31	7.68	0.99	1.15	0.15	0.64
	8.5	3	1.15	0.06	0.50	0.56	10.09	9.53	0.60	0.76	0.16	0.93
	9.0		1.16	0.06	0.78	0.85	9.71	8.86	0.65	0.94	0.29	1.31
	10.5		1.25	0.06	0.54	0.61	10.54	9.93	0.58	0.80	0.22	1.05
	12.0	1	1.18	0.06	0.44	0.50	9.97	9.47	0.61	0.97	0.37	0.82
	13.5		1.27	0.06	0.56	0.62	9.09	8.47	0.61	0.76	0.16	1.02
2	0.0	100	2.48	0.70	4.68	5.37	20.55	15.17	1.12	1.36	0.24	4.82
	0.8	60	2.95	0.91	6.36	7.27	17.07	9.80	1.24	1.60	0.36	5.88
	1.5		1.89	0.51	3.87	4.39	16.06	11.67	0.98	1.36	0.38	4.48
	2.0	25	0.51	0.01	0.59	0.60	8.47	7.87	0.63	1.04	0.41	0.95
	3.0		0.53	0.01	0.28	0.30	10.75	10.45	0.64	0.94	0.30	0.46
	4.5	10	0.56	0.01	0.42	0.43	7.71	7.28	0.68	1.08	0.40	0.63
	6.0		0.55	0.04	0.57	0.61	8.35	7.74	0.61	0.90	0.30	1.00
	7.5	3	0.83	0.01	0.44	0.45	8.23	7.78	0.59	1.08	0.49	0.76
	9.0	2	0.83	0.01	0.37	0.39	7.91	7.53	0.97	1.18	0.21	0.40
3	0.0		0.45	0.01	0.42	0.43	8.49	8.05	0.87	1.25	0.38	0.49
	1.5		0.38	0.10	0.48	0.58	8.36	7.78	0.83	1.07	0.24	0.71
	3.0		0.49	0.09	0.50	0.59	8.37	7.78	0.76	1.11	0.35	0.77
	4.5		0.31	0.06	1.59	1.65	7.74	6.08	0.90	1.36	0.46	1.84
	6.0		0.39	0.06	0.47	0.53	9.51	8.98	0.62	1.08	0.45	0.85
	7.5		0.20	0.06	0.47	0.53	11.22	10.69	0.62	1.04	0.42	0.85
	9.0		0.40	0.09	0.95	1.04	7.75	6.70	0.58	0.90	0.32	1.78
4	0.0		0.68	0.20	0.47	0.66	9.01	8.35	0.77	1.15	0.38	0.86
	1.5		0.67	0.25	0.50	0.74	11.04	10.30	0.76	1.18	0.42	0.98
	3.0		0.67	0.22	0.37	0.60	9.53	8.93	0.76	1.15	0.39	0.78
	4.5		0.60	0.20	0.56	0.75	12.82	12.07	0.78	1.11	0.33	0.96
	6.0		0.44	0.26	0.45	0.71	10.29	9.58	0.82	1.29	0.47	0.87
	7.5		0.67	0.27	0.71	0.98	17.38	16.40	0.76	1.11	0.35	1.29
5	0.0		0.26	0.10	0.63	0.74	12.89	12.16	0.80	1.29	0.49	0.92
	1.5		0.16	0.09	0.68	0.77	10.49	9.72	0.60	0.97	0.37	1.28
	3.0		0.23	0.24	0.95	1.19	12.90	11.71	0.82	1.11	0.30	1.45
	4.5		0.22	0.06	0.42	0.48	10.63	10.14	1.37	1.63	0.26	0.35
	6.0		0.37	0.09	1.51	1.60	8.98	7.38	0.69	1.04	0.35	2.33
	7.5		0.29	0.09	0.40	0.50	11.14	10.64	0.58	0.97	0.39	0.85
	9.0		0.26	0.18	0.87	1.06	14.87	13.82	0.58	1.01	0.42	1.81
	10.5		0.38	0.13	0.53	0.66	13.99	13.34	0.59	0.94	0.35	1.11
7	0.0		0.38	0.16	0.45	0.61	14.12	13.52	0.74	4.07	3.33	0.81
	1.5		0.37	0.16	0.53	0.68	13.62	12.94	0.75	1.32	0.57	0.91
	3.0		0.39	0.13	0.45	0.58	13.05	12.47	0.74	1.18	0.44	0.78
	4.0		0.39	0.10	0.34	0.45	14.64	14.19	0.74	1.22	0.47	0.60

CRUISE # 6 NEW BEDFORD HARBOR BUZZARDS BAY DECEMBER 8,1987

STATION #	DEPTH (m)	LIGHT INT (%)	POC (uM)	PON (uM)	C/N (atoms)	OXYGEN (mg/l)	Cl (mM)	TEMP (Celsius)	Sp. Grav. sigma t	LIGHT (uE/s/m)
1	0.0	100	27.52	2.74	10.06	8.5	480.9	6.4	24.14	222
	0.8	60	24.75	2.76	8.96	8.5	493.4	6.7	24.73	133
	1.5		31.13	3.38	9.21	8.5	481.6	6.7	24.14	91
	3.0	25	26.86	3.02	8.89	8.6	500.5	6.7	25.09	47
	4.5		31.68	3.33	9.51	8.7	481.4	6.8	24.12	28
	5.0	10	24.20	2.58	9.38	8.7	491.4	6.8	24.62	23
	6.0		38.79	3.64	10.66	8.7	489.7	6.8	24.54	16
	7.5		28.06	3.15	8.91	8.7	476.1	6.9	23.84	9
	8.5	3	32.29	2.76	11.68	8.7	500.7	6.9	25.08	6
	9.0		25.22	2.68	9.40	8.7	489.2	6.9	24.50	5
	10.5		26.31	2.61	10.10	8.9	473.9	6.9	23.73	4
	12.0	1	23.69	2.63	9.00	8.9	489.9	6.9	24.53	2
	13.5		28.94	2.81	10.29	8.8	478.4	6.9	23.95	2
2	0.0	100	79.88	5.72	13.97	10.0	480.9	5.4	24.26	520
	0.8	60	79.22	6.50	12.18	9.9	481.6	5.3	24.32	312
	1.5		65.30	5.60	11.66	9.9	488.2	5.2	24.66	170
	2.0	25	47.77	4.38	10.90	9.9	485.1	5.2	24.50	130
	3.0		43.84	4.38	10.01	9.8	493.4	5.6	24.87	95
	4.5	10	40.40	4.30	9.39	9.7	484.6	5.6	24.43	50
	6.0		10.59	4.30	2.46	9.6	484.4	5.8	24.39	30
	7.5	3	36.96	3.83	9.65	9.4	484.1	6.2	24.33	16
	9.0	2	46.30	4.30	10.76	9.4	488.7	6.3	24.55	10
3	0.0		38.76	3.91	9.91	9.8	492.9	5.2	24.89	600
	1.5		37.78	3.99	9.47	9.8	486.4	5.4	24.54	280
	3.0		38.11	4.15	9.19	9.7	491.2	5.7	24.75	150
	4.5		39.58	4.19	9.46	9.7	487.9	5.8	24.57	61
	6.0		40.24	4.11	9.80	9.6	488.4	5.8	24.60	31
	7.5		31.23	3.44	9.08	9.5	488.2	5.8	24.58	19
	9.0		38.93	3.75	10.37	9.4	488.4	6.2	24.55	10
4	0.0		40.47	4.96	8.15	10.2	481.1	5.1	24.31	670
	1.5		39.05	4.57	8.54	10.2	488.2	5.1	24.67	310
	3.0		36.98	4.65	7.95	10.2	485.9	5.1	24.55	92
	4.5		36.98	4.57	8.09	10.1	479.1	5.2	24.20	41
	6.0		32.83	4.28	7.66	10.1	487.2	5.3	24.59	27
	7.5		30.76	3.63	8.48	9.7	488.7	5.6	24.63	17
5	0.0		36.74	3.78	9.71	9.9	492.2	5.6	24.81	600
	1.5		32.57	3.45	9.44	9.8	468.6	5.7	23.61	240
	3.0		39.61	4.25	9.31	9.8	482.9	5.7	24.33	100
	4.5		29.05	3.13	9.27	9.7	489.9	5.7	24.68	47
	6.0		41.90	4.10	10.23	9.6	480.1	5.7	24.19	28
	7.5		20.05	4.13	4.86	9.6	485.7	5.7	24.47	17
	9.0		27.81	3.29	8.46	9.5	473.3	6.3	23.77	10
	10.5		28.14	3.42	8.23	9.5	494.8	6.4	24.84	7
7	0.0		39.38	5.28	7.46	9.8	482.5	5.3	24.36	650
	1.5		36.00	4.47	8.06	9.8	489.3	5.3	24.70	350
	3.0		30.76	3.94	7.80	9.8	476.2	5.4	24.03	140
	4.0		40.26	5.10	7.90	9.7	485.8	5.6	24.49	110

CRUISE # 7 NEW BEDFORD HARBOR BUZZARDS BAY JANUARY 11,1988

STATION #	DEPTH (m)	LIGHT INT (%)	Si-SiO2 (uM)	N-NO3 (uM)	N-NH3 (uM)	N-TIN (uM)	N-TDISS (uM)	N-DON (uM)	P-PO4 (uM)	P-TDISS (uM)	P-DOP (uM)	TIN/PO4
1	0.00	100	0.39	0.09	0.89	0.98	10.94	9.96	1.25	1.35	0.10	0.78
	0.60	60	0.36	0.08	0.83	0.91	7.06	6.16	0.46	1.25	0.79	1.97
	1.00	25	0.31	0.04	0.72	0.76	4.08	3.32	0.45	1.08	0.63	1.69
	1.50		0.32	0.07	0.64	0.71	8.21	7.49	0.54	0.78	0.25	1.32
	2.50	10	0.29	0.06	0.71	0.77	7.06	6.30	0.50	0.82	0.32	1.53
	3.00		0.35	0.04	0.72	0.76	7.00	6.24	0.50	0.78	0.28	1.52
	4.50		0.32	0.06	0.70	0.75	6.94	6.18	0.55	0.91	0.36	1.38
	6.00	3	0.33	0.04	0.71	0.75	6.62	5.87	0.49	0.91	0.42	1.53
	7.50		0.33	0.04	0.65	0.69	7.13	6.44	0.58	0.91	0.33	1.19
	9.00	1	0.33	0.04	0.66	0.70	4.46	3.76	0.51	0.84	0.33	1.37
	10.50		0.34	0.08	0.72	0.80	7.63	6.83	0.50	0.81	0.31	1.60
	12.00		0.39	0.09	0.66	0.75	7.82	7.07	1.23	2.25	1.02	0.61
2	0.00	100	1.47	0.44	4.34	4.78	10.30	5.52	1.03	1.40	0.37	4.65
	0.75	60	0.92	0.28	2.74	3.02	12.46	9.44	0.86	1.26	0.41	3.52
	1.50		0.37	0.09	0.74	0.84	7.89	7.05	0.63	0.97	0.34	1.34
	1.75	25	0.35	0.08	0.72	0.80	7.89	7.08	0.99	1.23	0.24	0.81
	3.00		0.33	0.06	0.68	0.73	4.90	4.17	0.52	1.26	0.74	1.42
	3.25	10	0.30	0.06	0.64	0.70	8.08	7.38	1.80	2.08	0.28	0.39
	4.50		0.28	0.06	0.71	0.76	9.28	8.52	0.57	0.93	0.36	1.34
	5.75	3	0.34	0.06	0.70	0.76	7.25	6.49	0.55	0.93	0.38	1.39
	6.00		0.31	0.04	0.67	0.71	7.82	7.11	0.63	1.19	0.55	1.12
	7.50	1	0.47	0.07	0.69	0.76	7.25	6.49	0.86	1.29	0.43	0.89
	9.00		0.58	0.07	0.67	0.74	8.08	7.34	0.52	1.19	0.67	1.44
3	0.00		0.51	0.17	1.63	1.79	9.92	8.13	0.71	1.09	0.38	2.54
	1.50		0.51	0.16	1.65	1.81	9.09	7.29	0.96	2.04	1.08	1.88
	3.00		0.51	0.16	1.60	1.76	9.54	7.78	1.04	1.77	0.74	1.69
	4.50		0.46	0.12	1.25	1.37	6.49	5.12	0.55	1.74	1.19	2.51
	6.00		0.46	0.09	0.92	1.01	9.09	8.08	0.74	1.15	0.41	1.37
	7.50		0.44	0.07	0.70	0.77	7.63	6.87	0.70	1.01	0.31	1.10
	9.00		0.55	0.07	0.70	0.76	6.81	6.05	0.82	1.08	0.26	0.94
4	0.00		0.21	0.13	0.66	0.79	10.24	9.45	0.71	1.24	0.53	1.12
	1.50		0.21	0.08	0.67	0.75	8.59	7.84	0.71	1.21	0.50	1.06
	3.00		0.27	0.08	0.64	0.72	10.43	9.71	1.22	1.47	0.25	0.59
	4.50		0.25	0.07	0.70	0.77	8.84	8.07	1.04	1.63	0.59	0.74
	6.00		0.30	0.06	0.67	0.73	11.06	10.34	0.61	0.91	0.29	1.19
	7.50		0.41	0.06	0.64	0.69	9.54	8.85	1.31	1.33	0.03	0.53
5	0.00		0.25	0.04	0.66	0.70	9.28	8.58	0.48	0.90	0.43	1.47
	1.50		0.26	0.07	0.74	0.81	8.78	7.97	0.51	1.13	0.62	1.59
	3.00		0.26	0.06	0.74	0.79	10.81	10.02	0.54	1.03	0.49	1.46
	4.50		0.29	0.04	0.62	0.66	8.02	7.36	0.74	1.00	0.25	0.88
	6.00		0.29	0.04	0.61	0.65	8.27	7.62	0.54	0.86	0.32	1.21
	7.50		0.29	0.04	0.72	0.76	9.41	8.65	0.82	1.52	0.70	0.93
	9.00		0.30	0.04	0.77	0.81	8.97	8.15	0.60	0.96	0.36	1.35
	10.50		0.33	0.04	0.65	0.69	7.63	6.94	0.71	1.62	0.91	0.99
6	0.00		1.56	0.51	4.22	4.72	16.52	11.80	1.00	1.42	0.42	4.73
	1.50		1.78	0.59	4.90	5.49	16.90	11.41	1.01	1.35	0.34	5.46
	3.00		0.26	0.08	0.72	0.80	10.94	10.13	0.63	0.89	0.26	1.28
	4.50		0.21	0.08	0.89	0.97	10.05	9.08	0.59	0.92	0.32	1.63
	6.00		0.26	0.07	0.84	0.91	16.71	15.81	0.59	0.89	0.30	1.55
	7.50		0.55	0.06	0.76	0.82	13.92	13.10	0.53	1.15	0.62	1.54

CRUISE # 7 NEW BEDFORD HARBOR BUZZARDS BAY JANUARY 11,1988

STATION #	DEPTH (m)	LIGHT INT (%)	POC (uM)	PON (uM)	C/N (atoms)	OXYGEN (mg/l)	Cl (mM)	TEMP (Celsius)	Sp. Grav. sigma t	LIGHT (uE/s/m)
1	0.00	100	42.92	4.31	9.95	11.1	478.5	-0.1	24.63	161
	0.60	60	42.60	4.63	9.20	11.1	471.7	-0.1	24.29	97
	1.00	25	43.40	4.43	9.80	11.1	472.2	0.0	24.31	42
	1.50		41.00	4.51	9.09	11.1	476.7	0.0	24.54	27
	2.50	10	51.87	4.93	10.52	11.1	482.8	0.0	24.85	16
	3.00		45.63	4.51	10.11	11.1	469.7	0.0	24.18	13
	4.50		38.28	4.43	8.64	11.0	470.7	0.1	24.22	7
	6.00	3	43.88	4.54	9.66	10.9	469.2	0.3	24.13	5
	7.50		41.48	4.85	8.55	10.9	478.7	0.4	24.61	3
	9.00	1	40.05	4.77	8.39	11.1	475.7	0.4	24.46	2
	10.50		42.43	4.77	8.89	11.6	468.5	0.4	24.09	1
	12.00		44.20	4.81	9.18	11.1	474.5	0.4	24.40	1
2	0.00	100	110.83	12.17	9.11	11.1	477.2	-0.1	24.57	803
	0.75	60	54.78	5.97	9.17	11.3	489.8	-0.3	25.22	482
	1.50		96.63	11.49	8.41	11.5	486.3	-0.3	25.05	302
	1.75	25	46.90	5.70	8.23	11.6	470.0	-0.3	24.21	200
	3.00		108.93	10.51	10.36	11.6	473.7	-0.4	24.41	101
	3.25	10	32.22	3.76	8.57	11.6	475.0	-0.4	24.47	80
	4.50		45.15	4.54	9.94	11.7	470.2	-0.3	24.22	48
	5.75	3	55.10	6.11	9.01	11.8	468.2	-0.3	24.12	24
	6.00		57.62	6.31	9.12	11.8	473.2	-0.3	24.38	21
	7.50	1	NA	NA	NA	11.7	484.5	-0.2	24.95	7
	9.00		189.00	18.86	10.02	11.7	475.2	0.1	24.45	3
3	0.00		43.10	5.74	7.50	11.1	462.4	-0.3	23.82	703
	1.50		46.73	6.31	7.40	11.6	491.3	-0.4	25.31	263
	3.00		45.00	5.80	7.76	11.7	480.8	-0.5	24.78	119
	4.50		50.12	5.87	8.54	11.7	485.3	-0.5	25.01	60
	6.00		51.87	5.94	8.73	11.9	465.4	-0.5	23.99	25
	7.50		47.08	5.73	8.22	11.9	474.5	0.0	24.42	13
	9.00		85.58	8.73	9.80	11.9	480.0	0.2	24.69	6
4	0.00		44.68	5.91	7.56	11.6	463.9	-0.5	23.91	650
	1.50		53.63	7.01	7.65	11.8	472.5	-0.6	24.36	197
	3.00		55.07	6.87	8.01	12.0	473.8	-0.6	24.42	80
	4.50		55.87	6.60	8.46	12.0	488.0	-0.6	25.15	37
	6.00		62.73	7.24	8.66	11.9	476.8	-0.5	24.57	10
	7.50		58.42	7.36	7.94	11.8	492.1	-0.2	25.34	8
5	0.00		55.55	6.19	8.98	10.2	494.6	-0.1	25.46	585
	1.50		38.77	4.66	8.32	10.2	498.7	-0.2	25.68	222
	3.00		64.33	5.64	11.40	10.2	479.1	-0.2	24.67	91
	4.50		53.78	5.07	10.61	10.2	487.8	-0.3	25.12	40
	6.00		52.35	5.57	9.40	10.4	477.3	-0.3	24.59	19
	7.50		46.43	5.00	9.29	10.6	491.1	-0.1	25.28	9
	9.00		44.03	5.57	7.90	12.1	489.0	-0.1	25.17	4
	10.50		45.48	6.03	7.54	12.1	485.5	-0.1	24.99	2
6	0.00		59.82	6.94	8.62	12.4	470.0	-0.4	24.22	723
	1.50		59.93	6.23	9.62	12.8	480.1	-0.5	24.74	266
	3.00		50.34	5.54	9.08	12.7	492.1	-0.6	25.36	113
	4.50		48.74	5.80	8.41	12.7	483.9	-0.6	24.94	35
	6.00		47.68	5.77	8.26	12.7	469.5	-0.6	24.20	23
	7.50		71.20	8.50	8.38	12.7	472.8	-0.2	24.35	11

CRUISE # 8 NEW BEDFORD HARBOR BUZZARDS BAY FEBRUARY 1,1988

STATION #	DEPTH (m)	LIGHT INT (%)	Si-SiO2 (uM)	N-NO3 (uM)	N-NH3 (uM)	N-TIN (uM)	N-TDISS (uM)	N-DON (uM)	P-PO4 (uM)	P-TDISS (uM)	P-DOP (uM)	TIN/PO4
1	0.00	100	0.43	0.13	0.45	0.58	10.70	10.12	0.47	1.01	0.54	1.24
	1.00	60	0.47	0.08	0.43	0.50	9.64	9.13	0.48	0.85	0.37	1.05
	1.50		0.39	0.08	0.49	0.57	11.81	11.24	0.68	1.51	0.84	0.84
	2.75	25	0.31	0.06	0.40	0.46	11.69	11.24	0.50	1.39	0.88	0.91
	3.00		0.95	0.09	0.46	0.55	9.09	8.54	0.53	0.82	0.29	1.04
	4.50		0.34	0.11	0.45	0.56	8.66	8.10	0.52	1.01	0.50	1.09
	5.00	10	0.32	0.06	0.38	0.43	7.59	7.16	0.50	0.81	0.31	0.87
	6.00		0.28	0.07	0.42	0.49	6.58	6.08	0.48	1.20	0.71	1.02
	7.50		0.35	0.07	0.38	0.45	NA	NA	NA	NA	NA	NA
	8.00	3	0.29	0.05	0.38	0.43	10.81	10.38	0.49	1.10	0.61	0.89
	9.00		0.29	0.07	0.52	0.60	10.12	9.52	0.56	1.09	0.53	1.07
	10.50	1	0.29	0.10	0.54	0.65	8.26	7.61	0.47	1.09	0.62	1.38
	12.00		0.34	0.07	0.39	0.46	4.80	4.34	0.46	0.76	0.30	1.01
	13.50		0.34	0.06	0.52	0.58	21.40	20.82	0.47	1.66	1.20	1.24
2	0.00	100	4.51	2.99	11.68	14.67	NA	NA	NA	NA	NA	NA
	1.00	60	1.43	0.70	3.38	4.08	35.98	31.90	0.79	3.12	2.33	5.17
	1.50		5.51	3.12	16.80	19.91	23.30	3.38	2.22	2.24	0.02	8.99
	1.75	25	3.06	1.65	8.17	9.82	22.23	12.41	1.44	1.95	0.51	6.80
	2.75	10	3.02	1.63	8.18	9.81	12.57	2.76	1.28	1.31	0.03	7.67
	3.00		1.12	0.48	2.42	2.91	9.12	6.21	0.74	0.98	0.24	3.94
	4.50		0.47	0.12	0.63	0.75	10.49	9.74	0.46	1.01	0.55	1.61
	5.00	3	0.43	0.07	0.52	0.59	8.47	7.88	0.55	1.01	0.46	1.07
	6.00		0.35	0.11	0.68	0.79	8.25	7.46	0.47	1.04	0.57	1.69
	7.50	1	0.37	0.08	0.57	0.65	7.93	7.28	0.47	0.48	0.01	1.38
3	0.00		0.33	0.09	0.63	0.73	8.82	8.10	0.46	1.02	0.56	1.57
	1.50		0.34	0.08	0.57	0.66	8.02	7.37	0.77	1.01	0.25	0.86
	3.00		0.28	0.07	0.58	0.65	7.91	7.26	1.42	1.44	0.03	0.46
	4.50		0.34	0.06	0.64	0.70	9.66	8.95	0.48	1.00	0.52	1.46
	6.00		0.28	0.08	0.60	0.68	9.07	8.39	0.47	0.83	0.37	1.46
	7.50		0.35	0.07	0.57	0.64	7.68	7.04	0.48	0.82	0.35	1.34
4	0.00		0.61	0.30	1.36	1.66	11.39	9.73	0.66	1.21	0.55	2.51
	1.50		0.76	0.15	0.59	0.74	14.94	14.20	0.82	5.57	4.75	0.91
	3.00		0.63	0.33	1.52	1.85	13.82	11.97	0.79	1.51	0.72	2.34
	4.50		0.62	0.33	1.42	1.75	11.91	10.16	0.75	1.35	0.60	2.34
	6.00		0.68	0.34	1.39	1.73	11.79	10.06	0.76	1.38	0.62	2.28
	7.50		0.64	0.34	1.45	1.80	11.21	9.41	0.76	1.25	0.49	2.37
5	0.00		0.22	0.10	0.69	0.79	7.59	6.80	0.50	0.93	0.43	1.60
	1.50		0.33	0.08	0.68	0.76	8.38	7.62	0.51	0.96	0.45	1.49
	3.00		0.23	0.09	0.65	0.74	0.95	0.21	0.52	0.58	0.06	1.44
	4.50		0.59	0.08	0.61	0.69	8.80	8.11	0.91	0.94	0.03	0.75
	6.00		0.28	0.13	0.80	0.93	10.22	9.29	1.36	2.96	1.60	0.69
	7.50		0.30	0.11	0.77	0.88	9.58	8.70	0.51	0.97	0.45	1.72
	9.00		0.24	0.09	0.77	0.86	8.52	7.65	0.53	0.92	0.39	1.62
7	0.00		0.29	0.09	0.73	0.82	10.47	9.65	0.52	1.31	0.79	1.59
	1.50		0.25	0.08	0.63	0.72	9.94	9.22	0.57	1.22	0.65	1.25
	3.00		0.25	0.08	0.62	0.71	8.23	7.53	0.54	1.01	0.47	1.30
	4.00		0.38	0.60	2.84	3.44	20.11	16.67	0.59	0.97	0.38	5.88

CRUISE # 8 NEW BEDFORD HARBOR BUZZARDS BAY FEBRUARY 1,1988

STATION #	DEPTH (m)	LIGHT INT (%)	POC (uM)	PON (uM)	C/N (atoms)	OXYGEN (mg/l)	Cl (mM)	TEMP (Celsius)	Sp. Grav. sigma t	LIGHT (uE/s/m)
1	0.00	100	35.85	4.17	8.59	12.6	495.6	0.8	25.45	147
	1.00	60	39.32	4.29	9.17	12.7	488.5	0.7	25.09	86
	1.50		33.00	3.87	8.52	12.8	476.3	0.7	24.47	68
	2.75	25	37.42	4.06	9.22	12.8	487.8	0.6	25.06	37
	3.00		37.90	4.39	8.64	12.8	490.6	0.6	25.21	32
	4.50		39.00	4.54	8.58	12.9	479.9	0.6	24.66	19
	5.00	10	39.80	4.13	9.64	13.0	482.4	0.6	24.79	14
	6.00		37.90	4.70	8.06	13.0	479.6	0.6	24.64	10
	7.50		37.90	4.46	8.49	13.0	486.2	0.6	24.98	6
	8.00	3	34.12	4.17	8.18	13.0	483.9	0.6	24.86	5
	9.00		37.75	4.28	8.82	13.1	478.6	0.6	24.59	3
	10.50	1	42.17	4.96	8.51	13.1	490.6	0.7	25.20	1
	12.00		51.15	5.81	8.80	13.1	488.5	0.7	25.09	1
	13.50		54.93	5.97	9.20	13.1	482.9	0.7	24.81	0
2	0.00	100	113.11	10.14	11.15	12.4	475.8	1.6	24.37	758
	1.00	60	71.83	7.57	9.49	12.5	486.0	1.6	24.90	434
	1.50		125.22	11.14	11.24	12.6	458.8	1.6	23.51	240
	1.75	25	85.63	8.13	10.54	12.6	481.1	1.6	24.65	190
	2.75	10	90.75	8.73	10.39	12.6	470.0	1.6	24.08	76
	3.00		65.53	6.95	9.43	12.6	490.8	1.6	25.14	60
	4.50		54.50	5.50	9.91	12.6	483.9	1.2	24.82	27
	5.00	3	68.42	7.13	9.59	12.6	473.8	1.1	24.31	22
	6.00		58.17	6.57	8.85	12.6	474.5	1.0	24.35	14
	7.50	1	92.61	10.83	8.55	12.5	485.7	0.9	24.93	6
3	0.00		45.41	5.14	8.83	12.7	476.1	0.9	24.44	706
	1.50		37.43	4.81	7.79	12.8	480.1	0.9	24.65	290
	3.00		38.06	5.11	7.45	12.8	477.8	0.8	24.54	108
	4.50		43.11	5.26	8.20	12.8	472.8	0.8	24.28	54
	6.00		40.11	4.66	8.61	12.8	476.1	0.8	24.45	26
	7.50		36.32	4.61	7.87	12.8	474.8	0.9	24.38	14
4	0.00		61.09	8.30	7.36	12.9	475.0	1.2	24.36	314
	1.50		61.09	8.18	7.46	13.0	491.3	1.1	25.21	228
	3.00		63.30	7.79	8.13	13.1	496.1	1.1	25.45	45
	4.50		62.83	8.07	7.78	13.1	470.2	1.1	24.13	23
	6.00		62.04	8.33	7.44	13.1	468.2	1.0	24.03	11
	7.50		61.25	8.56	7.16	13.2	469.5	1.0	24.10	2
5	0.00		49.73	6.31	7.88	11.9	477.3	0.7	24.52	560
	1.50		51.47	6.46	7.97	12.3	472.5	0.7	24.27	177
	3.00		54.78	6.61	8.29	12.3	470.7	0.6	24.19	58
	4.50		51.63	6.35	8.14	12.3	485.2	0.6	24.93	22
	6.00		50.21	6.53	7.68	12.3	465.9	0.6	23.94	6
	7.50		52.73	6.53	8.07	12.3	474.8	0.6	24.40	3
	9.00		51.63	6.50	7.95	12.4	475.3	0.6	24.42	1
7	0.00		80.02	11.38	7.03	12.4	479.9	1.9	24.56	820
	1.50		78.76	10.78	7.31	12.6	481.7	1.8	24.66	174
	3.00		81.60	11.53	7.08	12.6	472.2	1.8	24.18	41
	4.00		NA	NA	NA	12.6	415.1	1.8	21.26	12

CRUISE # 9 NEW BEDFORD HARBOR BUZZARDS BAY MARCH 7,1988

STATION #	DEPTH (m)	LIGHT INT (%)	Si-SiO2 (uM)	N-NO3 (uM)	N-NH3 (uM)	N-TIN (uM)	N-TDISS (uM)	N-DON (uM)	P-PO4 (uM)	P-TDIS (uM)	P-DOP (uM)	TIN/PO4
1	0.00	100	0.41	0.14	0.52	0.66	8.83	8.17	0.44	0.99	0.55	1.51
	0.75	60	0.37	0.08	0.65	0.73	7.33	6.60	0.46	0.64	0.18	1.59
	1.50		0.39	0.08	0.69	0.77	8.47	7.70	0.43	0.78	0.35	1.77
	2.75	25	0.34	0.08	0.51	0.59	7.80	7.21	0.42	0.63	0.21	1.39
	3.00		0.36	0.11	0.55	0.67	9.00	8.34	0.59	1.11	0.51	1.13
	4.50		0.34	0.07	0.48	0.55	12.26	11.71	1.91	1.92	0.01	0.29
	6.00	10	0.34	0.07	0.57	0.63	8.46	7.83	0.47	0.81	0.34	1.34
	7.50		0.34	0.07	0.34	0.41	8.52	8.11	0.44	1.18	0.73	0.92
	9.00		0.34	0.05	0.71	0.76	8.53	7.76	0.43	0.61	0.17	1.76
	10.50	3	0.31	0.05	0.38	0.43	7.16	6.73	0.42	0.65	0.22	1.02
	12.00		0.38	0.08	0.53	0.60	10.36	9.75	0.44	0.68	0.25	1.38
	13.50	1	0.42	0.05	0.57	0.62	7.81	7.19	0.43	0.72	0.29	1.45
2	0.00	100	0.82	0.62	2.66	3.28	13.37	10.09	0.65	0.92	0.27	5.06
	1.50		0.82	0.61	2.63	3.24	13.42	10.18	0.64	0.95	0.32	5.09
	1.75	60	0.22	0.11	0.47	0.58	8.96	8.39	0.46	0.57	0.11	1.26
	3.00		0.41	0.27	1.34	1.61	10.04	8.43	0.52	0.75	0.22	3.07
	3.75	25	0.22	0.13	0.48	0.61	17.85	17.23	0.48	0.61	0.12	1.27
	4.50		0.22	0.07	0.46	0.53	8.80	8.27	0.47	0.66	0.20	1.14
	5.50	10	0.22	0.08	0.45	0.54	8.78	8.24	0.46	0.69	0.23	1.18
	6.00		0.22	0.07	0.45	0.52	9.09	8.57	0.44	0.66	0.22	1.19
	7.00	3	0.19	0.07	0.79	0.86	10.97	10.10	0.41	0.68	0.27	2.10
	7.50		0.30	0.07	0.68	0.75	9.32	8.57	0.45	0.70	0.25	1.68
	9.00	1	0.21	0.06	0.48	0.54	10.21	9.67	0.46	0.74	0.28	1.17
3	0.00		0.21	0.06	0.48	0.53	9.96	9.42	NA	NA	NA	NA
	1.50		0.21	0.06	0.56	0.62	9.60	8.98	0.53	0.56	0.02	1.16
	3.00		0.21	0.05	0.49	0.53	11.20	10.66	0.40	0.59	0.19	1.34
	4.50		0.19	0.04	0.46	0.51	8.88	8.37	0.55	0.63	0.08	0.92
	6.00		0.19	0.04	0.50	0.55	8.94	8.39	0.40	0.59	0.19	1.36
	7.50		0.21	0.03	0.43	0.47	8.34	7.88	0.41	0.59	0.18	1.14
	9.00		0.25	0.04	0.41	0.45	8.93	8.48	0.40	0.58	0.19	1.14
4	0.00		0.05	0.04	0.40	0.45	11.95	11.50	0.39	0.62	0.23	1.16
	1.50		0.12	0.04	0.46	0.51	12.78	12.27	0.43	0.66	0.23	1.18
	3.00		0.09	0.04	0.40	0.44	11.06	10.62	0.39	0.66	0.27	1.12
	4.50		0.07	0.04	0.46	0.50	9.81	9.31	0.39	0.69	0.31	1.29
	6.00		0.09	0.04	0.65	0.69	13.12	12.43	NA	NA	NA	NA
	7.50		0.15	0.03	0.43	0.46	9.63	9.17	0.62	0.85	0.23	0.74
5	0.00		0.20	0.05	0.42	0.48	12.23	11.75	0.39	0.89	0.49	1.21
	1.50		0.24	0.04	0.53	0.57	9.44	8.87	0.38	0.64	0.26	1.51
	3.00		0.22	0.03	0.48	0.51	9.14	8.64	0.37	0.56	0.18	1.36
	4.50		0.26	0.04	0.59	0.62	8.13	7.51	0.37	0.55	0.18	1.68
	6.00		0.26	0.05	0.56	0.61	16.29	15.68	0.38	0.75	0.37	1.59
	7.50		0.21	0.04	0.56	0.59	8.59	8.00	0.40	0.71	0.30	1.47
	9.00		0.19	0.04	0.46	0.50	8.11	7.61	0.38	0.87	0.49	1.32
	10.50		0.19	0.05	0.53	0.57	6.39	5.82	0.38	0.66	0.29	1.53
6	0.00		0.44	0.39	1.77	2.16	16.87	14.72	0.58	1.11	0.53	3.71
	1.50		0.46	0.39	1.85	2.24	11.66	9.42	0.59	0.94	0.35	3.82
	3.00		0.46	0.38	1.67	2.05	15.27	13.22	0.86	1.27	0.40	2.38
	4.50		0.40	0.33	2.10	2.44	11.42	8.98	0.59	1.02	0.43	4.13
	6.00		0.42	0.27	1.47	1.74	9.46	7.72	NA	1.38	NA	NA
	7.50		0.22	0.15	0.74	0.89	7.91	7.02	0.55	0.69	0.13	1.62

CRUISE # 9 NEW BEDFORD HARBOR BUZZARDS BAY MARCH 7,1988

STATION #	DEPTH (m)	LIGHT INT (%)	POC (uM)	PON (uM)	C/N (atoms)	OXYGEN (mg/l)	Cl (mM)	TEMP (Cels)	Sp. Grav sigma t	LIGHT (uE/s/m)
1	0.00	100	28.88	3.41	8.48	10.4	478.0	2.9	24.38	567
	0.75	60	29.33	3.08	9.51	10.4	477.5	2.8	24.36	340
	1.50		28.88	3.46	8.35	10.4	477.2	2.8	24.34	230
	2.75	25	30.56	3.84	7.97	10.6	481.5	2.8	24.56	142
	3.00		25.27	2.82	8.97	10.6	481.3	2.8	24.55	133
	4.50		28.42	3.35	8.48	11.1	480.8	2.8	24.53	87
	6.00	10	26.17	3.08	8.49	11.5	482.0	2.8	24.59	54
	7.50		33.83	4.05	8.35	11.7	483.5	2.8	24.66	35
	9.00		25.49	3.46	7.37	11.9	483.5	2.8	24.66	24
	10.50	3	26.06	3.22	8.10	12.1	481.5	2.8	24.56	16
	12.00		24.93	3.51	7.10	12.2	483.0	2.8	24.64	11
	13.50	1	25.95	3.59	7.22	12.3	482.5	2.8	24.61	8
2	0.00	100	62.04	7.32	8.47	11.7	476.7	3.1	24.29	601
	1.50		57.30	6.72	8.53	11.7	475.2	2.9	24.23	580
	1.75	60	48.79	6.68	7.30	11.7	476.5	2.9	24.30	361
	3.00		43.11	5.78	7.46	11.8	479.2	2.8	24.45	191
	3.75	25	48.00	6.08	7.89	11.9	473.7	2.8	24.17	150
	4.50		52.26	7.21	7.25	12.0	475.0	2.8	24.23	86
	5.50	10	44.53	5.67	7.86	12.1	475.7	2.8	24.27	53
	6.00		52.41	6.87	7.63	12.1	475.0	2.8	24.23	28
	7.00	3	63.74	7.46	8.54	12.1	476.7	2.8	24.32	18
	7.50		67.83	8.68	7.81	12.1	475.7	2.8	24.27	14
	9.00	1	108.84	13.05	8.34	12.1	475.2	2.8	24.24	5
3	0.00		36.42	4.64	7.85	12.0	479.5	3.0	24.44	1150
	1.50		35.75	4.72	7.57	12.1	478.2	2.9	24.39	581
	3.00		42.96	4.99	8.61	12.1	479.0	2.8	24.44	272
	4.50		33.04	3.62	9.13	12.3	476.2	2.7	24.30	146
	6.00		31.69	3.81	8.32	12.4	479.7	2.7	24.48	84
	7.50		42.76	4.69	9.11	12.4	478.7	2.7	24.43	46
	9.00		38.55	4.60	8.38	12.4	478.0	2.7	24.39	27
4	0.00		87.12	10.17	8.56	12.5	469.4	3.5	23.88	1150
	1.50		130.74	9.89	13.23	12.5	470.7	3.5	23.95	426
	3.00		135.47	9.51	14.24	12.5	469.9	3.5	23.91	136
	4.50		96.56	10.32	9.35	12.5	471.7	3.3	24.02	55
	6.00		109.44	14.14	7.74	12.5	478.2	3.2	24.36	20
	7.50		85.78	10.76	7.97	12.3	475.5	2.8	24.26	6
5	0.00		30.64	3.38	9.07	11.1	475.7	2.7	24.28	787
	1.50		35.38	3.23	10.96	11.3	478.2	2.7	24.40	430
	3.00		33.01	3.64	9.06	11.4	476.7	2.7	24.33	232
	4.50		28.75	3.53	8.15	11.5	476.7	2.7	24.33	143
	6.00		31.35	3.78	8.29	11.7	475.7	2.7	24.28	84
	7.50		28.76	3.84	7.50	11.8	476.0	2.7	24.29	50
	9.00		27.86	3.27	8.52	11.9	475.2	2.7	24.25	32
	10.50		30.23	3.49	8.67	12.0	461.4	2.7	23.55	20
6	0.00		68.82	8.64	7.97	12.0	474.5	3.4	24.15	1100
	1.50		72.76	9.16	7.94	12.1	477.0	3.2	24.30	493
	3.00		83.65	10.66	7.84	12.1	471.5	3.0	24.04	196
	4.50		69.14	9.12	7.58	12.2	475.2	2.9	24.23	82
	6.00		65.82	8.94	7.37	12.2	472.2	2.9	24.08	37
	7.50		51.63	7.25	7.12	12.1	469.4	2.8	23.95	17

CRUISE # 10 NEW BEDFORD HARBOR BUZZARDS BAY APRIL 11,1988

STATION #	DEPTH (m)	LIGHT INT (%)	Si-SiO2 (uM)	N-NO3 (uM)	N-NH3 (uM)	N-TIN (uM)	N-TDISS (uM)	N-DON (uM)	P-PO4 (uM)	P-TDISS (uM)	P-DOP (uM)	TIN/PO4
1	0.0	100	1.07	0.15	0.46	0.61	14.55	13.94	0.26	0.37	0.11	2.35
	1.5	60	1.08	0.16	0.46	0.61	58.60	57.99	0.35	1.04	0.70	1.78
	3.0		1.08	0.16	0.43	0.58	40.29	39.70	0.34	0.97	0.63	1.74
	4.5		1.03	0.11	0.42	0.53	13.16	12.63	0.29	0.96	0.67	1.81
	5.5	25	1.04	0.12	0.41	0.53	14.35	13.81	0.29	0.92	0.63	1.84
	6.0		1.06	0.13	0.40	0.53	27.91	27.39	0.30	0.51	0.21	1.75
	7.5		1.01	0.13	0.50	0.63	14.05	13.42	0.29	0.84	0.55	2.16
	9.0	10	0.94	0.14	0.39	0.52	50.19	49.67	0.29	0.84	0.55	1.81
	10.5		0.94	0.11	0.40	0.51	25.93	25.42	0.31	0.49	0.19	1.67
	12.0		0.95	0.10	0.39	0.50	37.62	37.12	0.34	0.59	0.25	1.46
	13.0	3	0.91	0.12	0.38	0.50	14.35	13.85	0.33	0.48	0.15	1.52
	13.5	1	0.98	0.12	0.42	0.54	65.14	64.60	0.31	1.59	1.29	1.75
2	0.0	100	2.46	1.26	8.96	10.22	53.16	42.94	1.07	1.69	0.62	9.57
	1.5	60	2.19	1.12	8.00	9.13	29.20	20.07	1.00	1.58	0.58	9.15
	3.0		1.37	0.64	4.29	4.94	21.28	16.34	0.71	1.37	0.66	6.94
	4.5	25	0.67	0.23	1.27	1.50	11.18	9.68	0.45	0.86	0.41	3.37
	6.0		0.58	0.14	0.86	1.00	31.48	30.47	0.47	0.92	0.45	2.14
	7.5		0.54	0.13	0.55	0.68	8.21	7.53	0.48	0.54	0.06	1.41
	8.5	10	0.53	0.14	0.52	0.66	52.27	51.61	0.80	1.28	0.48	0.82
3	0.0		0.73	0.26	2.07	2.33	54.45	52.12	0.59	0.90	0.31	3.95
	1.5		0.72	0.27	2.09	2.36	34.65	32.29	1.05	1.30	0.25	2.24
	3.0		0.72	0.26	2.03	2.29	24.84	22.55	0.59	0.86	0.27	3.91
	4.5		0.69	0.25	1.92	2.16	30.39	28.23	0.54	0.69	0.15	4.03
	6.0		0.60	0.21	1.45	1.66	11.48	9.82	0.49	0.68	0.19	3.36
	7.0		0.57	0.20	1.48	1.68	54.64	52.96	0.60	1.08	0.48	2.80
4	0.0		0.39	0.16	0.75	0.90	10.19	9.29	0.64	0.84	0.20	1.41
	1.5		0.36	0.12	0.39	0.51	10.09	9.58	0.40	0.66	0.26	1.27
	3.0		0.39	0.12	0.44	0.57	7.72	7.15	0.47	0.72	0.25	1.21
	4.5		0.47	0.12	0.39	0.51	9.89	9.38	0.43	0.55	0.12	1.21
	6.0		0.50	0.11	0.36	0.47	13.16	12.69	0.45	0.65	0.19	1.05
5	0.0		1.03	0.12	0.42	0.54	9.20	8.66	0.50	0.54	0.04	1.09
	1.5		1.02	0.11	0.41	0.52	8.51	7.98	0.29	0.36	0.07	1.81
	3.0		1.06	0.14	0.40	0.54	13.16	12.62	0.46	1.34	0.88	1.17
	4.5		1.05	0.11	0.51	0.62	10.88	10.26	0.45	0.49	0.04	1.38
	6.0		1.04	0.12	0.39	0.51	11.97	11.46	0.40	0.52	0.12	1.28
	7.5		1.02	0.13	0.45	0.57	11.08	10.51	0.43	0.44	0.01	1.33
	9.0		1.01	0.11	0.44	0.55	5.44	4.89	0.21	0.27	0.06	2.63
	10.0		1.01	0.13	0.43	0.56	11.18	10.63	0.36	0.60	0.24	1.54
7	0.0		0.43	0.11	0.47	0.58	11.48	10.90	1.20	1.81	0.61	0.48
	1.5		0.40	0.14	0.46	0.60	24.74	24.15	0.39	1.20	0.81	1.53
	3.0		0.40	0.13	0.45	0.58	10.39	9.81	0.42	0.55	0.13	1.36
	4.0		0.41	0.13	0.44	0.57	26.92	26.35	0.51	1.49	0.98	1.12

CRUISE # 10 NEW BEDFORD HARBOR BUZZARDS BAY APRIL 11,1988

STATION #	DEPTH (m)	LIGHT INT (%)	POC (uM)	PON (uM)	C/N (atoms)	OXYGEN (mg/l)	Cl (mM)	TEMP (Celsius)	Sp. Grav. sigma t	LIGHT (uE/s/m)
1	0.0	100	26.79	2.71	9.87	9.60	469.35	7.20	23.46	121.00
	1.5	60	23.15	2.84	8.16	9.60	474.06	7.00	23.72	79.00
	3.0		20.66	2.59	7.98	9.60	475.79	6.80	23.83	54.50
	4.5		33.75	2.81	12.00	9.60	479.26	6.70	24.02	36.60
	5.5	25	28.04	2.59	10.83	9.66	476.28	6.70	23.87	30.30
	6.0		30.12	2.84	10.61	9.70	474.30	6.80	23.76	25.80
	7.5		23.67	2.39	9.90	9.70	478.27	6.70	23.97	18.20
	9.0	10	25.54	3.14	8.14	10.10	481.73	6.70	24.15	12.70
	10.5		27.00	3.04	8.89	10.60	474.30	6.60	23.79	8.90
	12.0		26.37	3.16	8.34	10.80	475.79	6.30	23.90	5.60
	13.0	3	27.21	3.19	8.54	10.80	485.94	6.30	24.41	4.30
	13.5	1	59.05	6.13	9.64	10.80	482.23	6.30	24.22	3.00
2	0.0	100	59.64	6.08	9.82	8.90	471.33	7.00	23.58	118.00
	1.5	60	53.40	5.68	9.41	8.90	471.83	7.00	23.61	71.30
	3.0		41.86	4.58	9.14	9.00	475.29	7.00	23.78	28.60
	4.5	25	36.98	3.86	9.58	9.60	478.51	6.90	23.96	28.20
	6.0		29.08	3.61	8.05	9.70	479.26	6.90	24.00	18.60
	7.5		30.43	3.66	8.31	9.70	477.28	6.90	23.90	16.40
	8.5	10	30.95	3.64	8.51	9.76	479.75	6.90	24.02	12.10
3	0.0		40.72	5.20	7.83	9.80	476.04	7.10	23.81	180.00
	1.5		42.28	5.23	8.09	9.90	474.55	7.10	23.73	88.70
	3.0		43.63	5.68	7.68	9.90	474.80	7.10	23.75	41.50
	4.5		40.30	5.03	8.01	9.90	474.55	7.00	23.75	27.60
	6.0		40.93	5.45	7.51	10.00	475.05	7.00	23.77	20.70
	7.0		40.61	5.65	7.19	10.00	473.07	7.00	23.67	16.30
4	0.0		36.98	4.43	8.34	9.60	475.79	7.20	23.78	268.00
	1.5		32.92	4.43	7.43	9.80	479.50	7.10	23.98	183.00
	3.0		36.66	4.51	8.14	9.90	477.28	7.10	23.87	129.00
	4.5		37.70	4.73	7.97	9.90	482.72	7.10	24.14	104.00
	6.0		38.22	5.13	7.45	10.00	482.97	7.10	24.16	73.50
5	0.0		26.79	3.74	7.17	9.30	474.30	6.90	23.75	234.00
	1.5		27.91	3.44	8.12	9.30	474.55	6.90	23.76	110.00
	3.0		26.17	3.31	7.90	9.30	475.05	6.80	23.80	93.70
	4.5		23.78	2.91	8.16	9.50	476.04	6.80	23.85	67.70
	6.0		23.05	2.86	8.05	9.90	481.24	6.70	24.12	41.10
	7.5		25.75	3.19	8.08	10.10	480.99	6.60	24.12	30.10
	9.0		26.68	3.83	6.96	10.30	482.72	6.30	24.25	20.40
	10.0		31.88	3.59	8.89	10.35	482.97	6.30	24.26	16.20
7	0.0		31.26	4.56	6.86	10.00	478.02	7.20	23.89	199.00
	1.5		31.36	4.51	6.96	10.10	472.32	7.10	23.62	94.00
	3.0		31.16	4.43	7.03	10.10	477.03	7.10	23.86	71.70
	4.0		33.55	4.58	7.32	10.10	475.79	7.10	23.80	76.70

CRUISE # 11 NEW BEDFORD HARBOR BUZZARDS BAY MAY 9,1988

STATION #	DEPTH (m)	LIGHT INT (%)	Si-SiO2 (uM)	N-NO3 (uM)	N-NH3 (uM)	N-TIN (uM)	N-TDISS (uM)	N-DON (uM)	P-PO4 (uM)	P-TDISS (uM)	P-DOP (uM)	TIN/PO4
1	0.0	100	4.51	0.14	0.27	0.41	18.03	17.62	0.45	0.75	0.30	0.91
	1.0	60	4.49	0.07	0.32	0.39	11.59	11.20	0.46	0.80	0.33	0.85
	1.5		4.62	0.29	0.39	0.69	10.97	8.95	0.30	0.81	0.37	2.30
	3.0	25	4.25	0.11	0.24	0.35	10.56	10.21	0.63	0.72	0.09	0.55
	4.5		4.10	0.03	0.24	0.27	11.38	11.11	0.45	0.78	0.33	0.60
	6.0	10	3.62	0.09	0.27	0.36	11.32	10.95	0.45	0.86	0.41	0.80
	7.5		3.50	0.06	0.33	0.39	10.07	9.69	0.47	0.77	0.31	0.83
	9.0		3.12	0.07	0.44	0.51	12.56	12.05	0.51	0.86	0.35	1.00
	10.5		2.71	0.04	0.30	0.34	8.28	7.93	0.55	0.81	0.26	0.62
	11.0	3	2.42	0.07	0.36	0.43	9.59	9.16	0.54	0.82	0.28	0.79
	12.0		2.17	0.05	0.24	0.29	8.97	8.68	0.54	0.67	0.13	0.53
	13.0	1	1.90	0.05	0.47	0.52	9.24	8.73	0.52	0.79	0.26	0.99
	13.5		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2	0.0	100	4.34	0.91	9.49	10.40	21.26	9.85	0.67	1.63	0.35	15.52
	1.25	60	2.86	0.09	2.37	2.46	16.08	13.62	0.84	1.03	0.19	2.94
	1.5		2.85	0.34	2.29	2.63	11.87	8.20	0.67	1.08	0.29	3.93
	3.0		2.34	0.08	0.32	0.41	12.28	11.88	0.71	1.06	0.35	0.57
	3.75	25	2.34	0.05	0.32	0.37	10.14	9.77	0.63	0.77	0.14	0.59
	4.5		2.24	0.14	0.90	1.04	9.11	8.07	0.65	0.82	0.17	1.60
	6.0		2.30	0.02	0.33	0.35	9.24	8.89	0.61	0.77	0.15	0.58
	6.5	10	2.16	0.03	0.39	0.42	17.88	17.45	0.80	0.85	0.05	0.53
	7.5		2.68	0.07	0.70	0.77	9.52	8.75	0.72	0.76	0.04	1.07
	8.25	3	2.81	0.04	0.81	0.85	8.55	7.70	0.72	0.95	0.23	1.18
	8.25	1	2.81	0.07	0.79	0.86	8.62	7.76	0.70	0.87	0.17	1.23
3	0.0		2.81	0.07	2.73	2.80	12.77	9.97	2.20	2.33	0.13	1.27
	1.5		2.52	0.05	1.03	1.09	10.69	9.61	1.00	1.04	0.04	1.09
	3.0		2.58	0.24	0.33	0.57	10.83	10.17	0.44	0.74	0.23	1.30
	4.5		2.58	0.03	0.19	0.23	10.00	9.78	0.46	0.80	0.33	0.49
	6.0		2.40	0.05	0.29	0.33	14.01	13.67	0.47	0.88	0.41	0.72
	7.0		2.67	0.08	0.37	0.45	10.28	9.83	0.52	0.90	0.38	0.87
	7.5		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4	0.0		3.01	0.06	0.31	0.37	11.11	10.73	0.88	1.16	0.28	0.42
	1.5		2.69	0.05	0.19	0.24	9.45	9.21	0.61	0.93	0.32	0.39
	3.0		2.31	0.20	0.43	0.63	12.63	10.83	1.05	1.12	0.02	0.60
	4.5		2.82	0.10	0.51	0.62	11.45	10.84	0.81	1.41	0.60	0.76
	6.0		2.89	0.04	0.37	0.42	11.11	10.69	1.20	1.26	0.06	0.35
	7.5		2.99	0.03	0.47	0.50	9.52	9.02	0.73	1.07	0.33	0.68
5	0.0		4.26	0.04	0.17	0.21	9.38	9.17	0.46	0.77	0.32	0.47
	1.5		3.97	0.04	0.15	0.19	8.00	7.81	0.40	0.65	0.25	0.47
	3.0		3.95	0.02	0.25	0.27	9.04	8.77	0.53	0.67	0.14	0.51
	4.5		3.76	0.03	0.22	0.26	8.76	8.50	0.64	0.82	0.18	0.40
	6.0		3.25	0.21	0.26	0.47	9.59	8.92	0.69	0.70	0.25	0.68
	7.5		3.10	0.04	0.20	0.24	10.69	10.45	0.53	0.89	0.35	0.45
	9.0		4.44	0.16	1.27	1.42	8.83	7.41	2.20	2.39	0.19	0.65
6	0.0		2.44	0.03	0.21	0.24	11.73	11.49	1.06	1.09	0.04	0.23
	1.5		2.44	0.01	0.25	0.26	10.14	9.88	0.59	1.21	0.62	0.44
	3.0		2.10	0.02	0.32	0.35	8.48	8.14	0.63	0.89	0.25	0.55
	4.5		2.00	0.01	0.36	0.37	8.69	8.33	0.57	0.90	0.33	0.64
	6.0		2.09	0.02	0.28	0.30	8.76	8.46	0.59	0.95	0.36	0.50
	7.0		2.29	0.03	0.43	0.46	11.32	10.85	0.63	1.00	0.38	0.74
	7.5		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

CRUISE # 11 NEW BEDFORD HARBOR BUZZARDS BAY MAY 9,1988

STATION #	DEPTH (m)	LIGHT INT (%)	POC (uM)	PON (uM)	C/N (atoms)	OXYGEN (mg/l)	Cl (mM)	TEMP (Celsius)	Sp. Grav. sigma t	LIGHT (uE/s/m)
1	0.0	100	26.05	2.16	12.06	8.5	477.15	10.0	23.44	617.0
	1.0	60	30.34	2.40	12.64	8.6	477.65	10.4	23.41	373.0
	1.5		26.81	2.24	11.97	8.6	477.65	10.4	23.41	326.0
	3.0	25	24.95	2.66	9.38	8.7	478.89	10.3	23.48	155.0
	4.5		27.81	2.91	9.56	8.7	480.87	10.3	23.58	102.0
	6.0	10	27.37	3.09	8.85	8.7	482.60	10.2	23.68	64.5
	7.5		24.62	3.09	7.96	8.8	479.88	10.1	23.57	43.5
	9.0		25.61	3.01	8.50	8.9	487.56	10.0	23.96	30.7
	10.5		23.41	2.72	8.60	9.5	485.33	9.6	23.92	20.3
	11.0	3	27.26	3.07	8.89	9.6	485.33	9.4	23.95	18.8
	12.0		26.71	3.76	7.10	9.7	485.82	9.3	23.99	14.6
	13.0	1	27.48	3.25	8.44	9.8	485.82	9.3	23.99	11.5
	13.5		NA	NA	NA	9.8	NA	9.3	NA	10.5
2	0.0	100	55.88	6.16	9.07	9.1	473.44	11.2	23.06	1456.0
	1.25	60	37.55	4.56	8.24	9.0	479.38	11.1	23.38	874.0
	1.5		38.01	4.44	8.55	9.0	479.88	11.0	23.42	771.0
	3.0		33.98	3.74	9.10	9.0	479.63	10.7	23.46	442.0
	3.75	25	32.57	3.64	8.94	9.2	484.83	10.6	23.73	364.0
	4.5		33.73	3.46	9.76	9.4	483.59	10.6	23.67	254.0
	6.0		34.24	3.74	9.17	9.4	488.05	10.5	23.91	161.0
	6.5	10	40.15	3.83	10.49	9.3	484.34	10.5	23.72	139.0
	7.5		44.77	5.35	8.36	9.2	483.34	10.4	23.69	100.0
	8.25	3	31.42	3.49	9.01	9.2	483.59	10.4	23.70	NA
	8.25	1	32.83	3.83	8.57	9.2	481.11	10.4	23.58	NA
3	0.0		35.08	3.55	9.89	9.0	480.37	10.7	23.49	1165.0
	1.5		35.40	3.02	11.72	9.2	480.12	10.9	23.45	710.0
	3.0		26.67	2.74	9.74	9.3	479.88	10.4	23.52	424.0
	4.5		24.74	2.93	8.46	9.5	481.61	10.4	23.60	244.0
	6.0		30.45	3.09	9.84	9.5	487.06	10.3	23.89	154.0
	7.0		28.36	3.42	8.30	9.4	482.35	10.2	23.67	116.0
	7.5		NA	NA	NA	9.4	NA	10.2	NA	99.1
4	0.0		47.25	5.12	9.24	9.7	470.71	11.5	22.88	1687.0
	1.5		47.40	6.20	7.65	9.8	478.64	11.6	23.25	767.0
	3.0		42.94	5.45	7.87	9.5	477.40	10.8	23.33	483.0
	4.5		48.02	6.91	6.95	9.4	473.68	10.4	23.21	279.0
	6.0		48.33	6.91	6.99	9.4	473.19	10.4	23.18	123.0
	7.5		58.34	6.16	9.47	9.4	481.12	10.4	23.58	85.3
5	0.0		25.90	2.40	10.81	8.3	473.44	10.4	23.20	939.0
	1.5		26.54	2.93	9.07	8.4	478.89	10.6	23.43	550.0
	3.0		24.10	2.80	8.60	8.5	476.16	10.5	23.31	248.0
	4.5		23.72	2.58	9.18	8.5	474.92	10.5	23.25	163.0
	6.0		27.69	3.61	7.67	9.0	469.97	10.3	23.04	99.9
	7.5		27.82	3.77	7.39	9.1	471.70	10.3	23.12	60.5
	9.0		29.11	4.05	7.19	9.1	474.18	9.7	23.34	32.5
6	0.0		33.23	4.15	8.02	9.3	478.14	11.3	23.28	1526.0
	1.5		35.85	4.63	7.74	9.2	477.65	11.0	23.31	922.0
	3.0		41.94	5.12	8.20	9.5	473.13	11.0	23.08	537.0
	4.5		43.86	5.64	7.78	9.5	481.86	10.6	23.58	319.0
	6.0		38.78	5.23	7.42	9.4	482.85	10.4	23.67	186.0
	7.0		43.71	5.75	7.60	9.4	480.12	10.4	23.53	117.0
	7.5		NA	NA	NA	9.4	NA	10.4	NA	86.0

CRUISE # 12 NEW BEDFORD HARBOR BUZZARDS BAY JUNE 6,1988

STATION #	DEPTH (m)	LIGHT INT (%)	Si-SiO2 (uM)	N-NO3 (uM)	N-NH3 (uM)	N-TIN (uM)	N-TDISS (uM)	N-DON (uM)	P-PO4 (uM)	P-TDISS (uM)	P-DOP (uM)	TIN/PO4
1	0.00	100	7.11	0.22	0.56	0.77	10.94	10.17	0.47	0.47	0.00	1.65
	1.25	60	7.20	0.17	0.64	0.81	12.67	11.86	0.54	0.86	0.32	1.50
	1.50		9.19	0.14	0.81	0.95	12.53	11.58	0.60	0.79	0.19	1.58
	2.50	25	7.21	0.13	0.66	0.79	7.69	6.91	0.57	0.70	0.13	1.37
	3.00		7.85	0.15	0.68	0.84	13.45	10.94	0.80	1.60	4.72	1.05
	4.00	10	7.18	0.11	0.42	0.53	9.86	13.73	0.87	0.96	2.88	0.61
	4.50		7.15	0.10	0.54	0.64	9.97	9.34	0.76	1.09	0.34	0.84
	6.00		7.18	0.10	0.52	0.62	9.97	9.35	0.80	0.79	0.00	0.77
	6.50	3	7.61	0.11	0.59	0.70	11.08	10.38	0.80	0.83	0.03	0.87
	7.50		7.42	0.11	0.92	1.03	11.84	10.81	0.63	0.74	0.10	1.62
	9.00	1	7.64	0.12	0.99	1.11	15.64	14.54	0.57	0.75	0.18	1.94
	10.50		7.12	0.08	0.58	0.66	16.54	15.89	0.56	1.27	0.71	1.18
	12.00		7.19	0.10	0.63	0.73	11.56	10.83	0.56	0.96	0.40	1.31
2	0.00	100	9.54	0.66	14.46	15.11	28.16	13.05	1.71	1.89	0.19	8.85
	1.00	60	10.09	0.72	11.86	12.59	21.94	9.35	1.57	1.83	0.26	8.01
	1.50		9.57	0.62	12.58	13.20	24.36	11.16	1.75	2.08	0.33	7.53
	1.75	25	9.55	0.47	10.04	10.51	24.43	13.92	1.52	1.91	0.40	6.92
	3.00		9.22	0.47	9.94	10.41	22.14	11.74	1.58	1.82	0.24	6.58
	3.50	10	8.43	0.15	0.89	1.04	15.78	14.74	0.85	1.35	0.50	1.23
	4.50		8.46	0.08	0.81	0.89	12.32	11.44	0.80	1.12	0.31	1.10
	5.00	3	8.53	0.10	0.88	0.98	15.44	14.46	1.66	1.67	0.01	0.59
	6.00		8.64	0.11	0.67	0.78	14.68	13.89	1.01	1.20	0.19	0.78
	7.50	1	8.62	0.14	0.87	1.01	13.50	12.49	1.02	1.10	0.08	0.99
	9.00		8.59	0.08	0.73	0.82	11.56	10.75	0.80	1.07	0.27	1.02
3	0.00		9.14	0.15	0.73	0.88	12.88	12.00	1.13	1.90	0.77	0.78
	1.50		8.68	0.11	0.70	0.81	11.22	10.41	0.77	1.09	0.32	1.05
	3.00		8.44	0.12	0.76	0.89	15.09	14.20	0.92	1.16	0.25	0.97
	4.50		8.23	0.08	0.53	0.61	15.58	14.96	0.73	1.03	0.30	0.84
	6.00		7.97	0.10	0.62	0.73	18.89	18.17	0.70	1.01	0.31	1.05
	7.50		8.04	0.08	0.65	0.72	11.91	11.19	0.70	0.91	0.21	1.03
4	0.00		8.93	0.27	1.79	2.06	15.37	13.31	0.88	1.09	0.20	2.33
	1.50		10.22	0.21	1.92	2.14	14.95	12.82	0.99	1.30	0.31	2.16
	3.00		8.91	0.21	1.90	2.11	11.70	9.59	0.86	1.14	0.28	2.46
	4.50		8.98	0.46	1.86	2.32	16.89	14.57	0.91	1.35	0.44	2.56
	6.00		9.54	0.20	1.98	2.18	14.12	11.94	0.93	1.35	0.42	2.34
	7.50		9.00	0.19	1.61	1.80	20.07	18.27	0.91	1.26	0.35	1.98
5	0.00		7.34	0.20	0.89	1.10	11.69	45.11	0.75	1.01	0.24	1.46
	1.50		7.36	0.24	1.00	1.24	11.74	25.19	0.87	1.20	0.46	1.43
	3.00		7.60	0.10	0.69	0.79	12.26	11.47	0.74	1.04	0.30	1.07
	4.50		7.50	0.10	0.55	0.65	15.78	15.13	0.71	0.94	0.23	0.92
	6.00		7.39	0.10	0.57	0.67	9.49	8.82	0.71	0.95	0.24	0.95
	7.50		7.41	0.10	0.68	0.78	12.26	11.48	0.68	0.79	0.11	1.14
	9.00		8.31	0.11	0.84	0.95	16.54	15.60	0.71	0.79	0.09	1.34
7	0.00		8.14	0.27	1.45	1.72	22.28	20.56	0.83	1.21	0.38	2.07
	1.50		8.02	0.26	1.05	1.31	17.93	16.62	0.73	1.05	0.31	1.79
	3.00		8.24	0.09	0.65	0.75	12.22	47.12	0.77	1.05	0.42	0.97
	4.50		8.35	0.10	0.73	0.84	14.26	13.42	1.10	1.27	0.17	0.76
	INNER HARBOR		11.47	0.71	3.56	4.27	24.70	20.43	0.89	1.07	0.18	4.80

CRUISE # 12 NEW BEDFORD HARBOR BUZZARDS BAY JUNE 6,1988

STATION #	DEPTH (m)	LIGHT INT (%)	POC (uM)	PON (uM)	C/N (atoms)	OXYGEN (mg/l)	Cl (mM)	TEMP (Celsius)	Sp. Grav. sigma t	LIGHT (uE/s/m)
1	0.00	100	35.49	4.05	8.76	8.5	491.66	14.0	23.45	815.0
	1.25	60	39.71	4.41	9.00	8.5	490.42	14.0	23.39	489.0
	1.50		37.68	4.45	8.47	8.5	488.68	14.0	23.31	323.0
	2.50	25	41.12	4.30	9.55	8.5	489.18	14.0	23.33	196.0
	3.00		37.99	5.24	7.24	8.5	488.43	14.0	23.29	152.0
	4.00	10	41.28	6.22	6.64	8.5	487.19	14.0	23.23	84.7
	4.50		68.98	6.26	11.02	8.5	484.96	14.0	23.12	65.1
	6.00		52.70	4.63	11.38	8.5	487.19	14.0	23.23	32.2
	6.50	3	53.33	4.63	11.52	8.5	485.95	14.0	23.17	26.6
	7.50		48.63	4.59	10.59	8.5	486.70	14.0	23.21	17.3
	9.00	1	76.80	4.23	18.15	8.7	486.95	14.0	23.22	8.4
	10.50		40.49	4.34	9.33	8.8	489.18	13.9	23.35	4.6
	12.00		40.18	4.38	9.18	8.8	489.92	13.9	23.39	2.5
2	0.00	100	85.56	10.24	8.36	7.9	478.76	15.2	22.57	1592.0
	1.00	60	80.56	15.12	5.33	7.9	482.23	15.0	22.79	907.0
	1.50		75.24	10.27	7.32	7.9	481.24	15.0	22.74	590.0
	1.75	25	72.73	9.58	7.59	8.0	487.69	15.0	23.06	398.0
	3.00		81.49	10.67	7.64	8.0	482.73	15.0	22.81	197.0
	3.50	10	46.28	7.96	5.82	8.0	485.46	15.0	22.95	137.0
	4.50		44.09	6.22	7.09	8.0	485.71	14.9	22.98	66.4
	5.00	3	44.09	6.58	6.70	8.1	486.70	14.9	23.03	47.0
	6.00		51.29	7.20	7.13	8.1	485.71	14.8	23.00	33.5
	7.50	1	48.16	6.37	7.57	8.2	487.19	14.7	23.09	15.1
	9.00		43.31	5.79	7.48	8.4	488.43	14.7	23.15	6.0
3	0.00		41.43	5.79	7.16	7.7	489.18	15.0	23.13	1438.0
	1.50		40.34	5.24	7.69	7.7	489.64	14.9	23.17	574.0
	3.00		54.89	9.73	5.64	7.7	486.92	14.8	23.06	251.0
	4.50		45.66	8.50	5.37	7.7	469.37	14.7	22.21	126.0
	6.00		45.19	7.88	5.73	8.0	483.96	14.6	22.95	52.1
	7.50		42.06	10.09	4.17	8.2	475.80	14.4	22.59	29.7
4	0.00		56.46	8.10	6.97	7.8	458.24	15.3	21.54	1667.0
	1.50		53.64	7.78	6.90	7.7	458.49	15.2	21.57	700.0
	3.00		55.67	8.46	6.58	7.6	479.01	15.2	22.59	420.0
	4.50		56.30	8.23	6.84	7.7	482.47	15.1	22.78	179.0
	6.00		58.18	11.19	5.20	7.7	477.77	15.1	22.55	56.9
	7.50		71.79	12.91	5.56	8.0	477.03	15.0	22.53	40.4
5	0.00		42.53	6.87	6.19	7.8	489.15	14.7	23.19	1220.0
	1.50		45.19	6.29	7.18	7.8	487.17	14.7	23.09	490.0
	3.00		50.43	7.09	7.11	7.8	487.91	14.7	23.13	225.0
	4.50		55.99	7.41	7.55	7.8	488.90	14.7	23.18	105.0
	6.00		50.35	6.91	7.29	7.8	484.70	14.6	22.99	44.4
	7.50		53.48	7.74	6.91	7.8	487.67	14.5	23.16	21.8
	9.00		50.20	6.04	8.31	8.1	483.96	14.4	22.99	9.3
7	0.00		74.77	10.67	7.01	8.2	481.98	15.8	22.61	1701.0
	1.50		63.50	10.24	6.20	8.2	483.96	15.8	22.70	743.0
	3.00		81.03	13.92	5.82	8.5	468.28	15.7	21.95	225.0
	4.50		81.65	13.64	5.99	8.6	465.66	15.6	21.84	92.2
	INNER HARBOR		62.56	9.98	6.27	NA	479.01	NA	NA	NA

CRUISE # 13 NEW BEDFORD HARBOR BUZZARDS BAY JULY 18,1988

STATION #	DEPTH (m)	LIGHT INT (%)	Si-SIO2 (uM)	N-NO3 (uM)	N-NH3 (uM)	N-TIN (uM)	N-TDISS (uM)	N-DON (uM)	P-PO4 (uM)	P-TDISS (uM)	P-DOP (uM)	TIN/PO4
1	0.00	100	3.42	0.42	0.89	1.31	12.33	11.02	0.53	1.15	0.62	2.46
	1.50	60	3.55	0.51	1.22	1.73	12.03	10.30	1.00	1.21	0.21	1.74
	3.00		3.71	0.29	0.64	0.93	10.51	9.57	0.51	1.26	0.75	1.83
	3.75	25	3.80	0.28	0.52	0.80	13.34	12.55	0.81	1.71	0.89	0.98
	4.50		4.04	0.26	0.60	0.86	14.39	13.54	0.51	1.80	1.29	1.69
	6.00	10	6.96	0.50	1.09	1.59	12.52	10.93	0.43	0.93	0.50	3.69
	7.50		7.67	0.26	0.63	0.89	8.00	7.11	0.48	1.02	0.55	1.87
	9.00		10.96	0.35	0.63	0.98	9.12	8.14	NA	NA	NA	NA
	9.50	3	10.92	0.30	0.61	0.91	10.10	9.19	1.36	4.93	3.57	0.67
	10.50		10.44	0.30	0.56	0.85	8.51	7.65	0.62	1.31	0.69	1.38
	11.00	1	10.24	0.29	0.51	0.80	8.92	8.12	0.60	1.33	0.73	1.33
	12.00		10.93	0.30	0.66	0.96	9.04	8.07	0.61	1.23	0.62	1.58
	13.00		11.21	0.33	0.58	0.92	5.16	4.25	1.30	2.14	0.84	0.70
	13.50		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2	0.00	100	4.71	0.39	12.74	13.14	25.14	12.01	2.20	3.16	0.96	5.97
	1.00	60	3.76	0.28	5.69	5.97	19.05	13.08	1.53	2.29	0.76	3.90
	1.50		4.29	0.45	10.25	10.70	23.10	12.40	1.93	2.73	0.80	5.55
	2.50	25	2.46	0.37	0.89	1.25	13.44	12.18	1.02	1.71	0.69	1.23
	3.00		2.89	0.07	0.68	0.75	13.20	12.45	0.85	1.57	0.72	0.88
	4.00	10	4.44	0.00	0.61	0.61	14.18	13.58	0.68	1.32	0.63	0.89
	4.50		5.89	0.05	0.68	0.73	11.59	10.86	1.21	1.41	0.20	0.60
	6.00		7.25	0.00	0.37	0.37	10.29	9.91	0.78	1.27	0.50	0.48
	6.50	3	7.69	0.00	0.34	0.34	11.77	11.43	0.77	1.21	0.44	0.44
	7.50		13.96	0.02	0.55	0.57	14.96	14.39	1.16	1.58	0.43	0.49
	8.50	1	16.97	0.77	4.19	4.96	11.37	6.41	1.26	1.64	0.38	3.94
	9.00		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	0.00		3.03	0.00	0.38	0.38	10.28	9.90	1.15	1.38	0.24	0.33
	1.50		3.05	0.14	0.41	0.55	10.76	10.20	0.76	1.40	0.65	0.73
	3.00		3.07	0.00	0.33	0.33	10.45	10.12	0.72	1.46	0.74	0.46
	4.50		4.87	0.06	0.45	0.51	11.15	10.64	0.62	1.01	0.40	0.83
	6.00		7.75	0.02	0.36	0.38	14.27	13.89	0.99	1.15	0.15	0.38
	7.50		10.45	0.40	1.43	1.83	14.10	12.28	0.91	1.24	0.33	2.00
	8.00		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4	0.00		2.18	0.02	0.60	0.62	12.73	12.11	1.48	1.96	0.48	0.42
	1.50		2.80	0.03	0.42	0.46	11.92	11.46	1.56	1.97	0.42	0.29
	3.00		2.34	0.14	0.53	0.67	11.47	10.80	1.23	1.41	0.18	0.54
	4.50		6.86	0.30	1.47	1.77	13.02	11.25	1.43	1.66	0.23	1.24
	6.00		11.74	0.41	3.13	3.54	13.50	9.97	1.35	1.52	0.17	2.62
	7.50		15.87	0.41	3.82	4.22	16.41	12.19	1.23	1.77	0.54	3.43
	9.00		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	0.00		2.72	0.04	0.35	0.39	12.75	12.36	0.72	1.17	0.46	0.54
	1.50		2.72	0.00	0.24	0.24	11.02	10.78	0.70	1.23	0.53	0.34
	3.00		3.26	0.12	0.50	0.62	11.00	10.38	0.63	1.13	0.50	0.98
	4.50		3.99	0.02	0.30	0.32	11.55	11.23	0.58	1.07	0.49	0.54
	6.00		10.10	0.05	0.36	0.41	8.45	8.04	0.60	0.90	0.30	0.69
	7.50		12.76	0.17	0.65	0.82	9.58	8.76	0.71	0.88	0.16	1.15
	9.00		14.10	0.48	1.38	1.85	12.56	10.71	0.72	1.09	0.37	2.57
	10.00		17.79	0.56	2.27	2.83	11.04	8.20	1.13	1.26	0.13	2.50
	10.50		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
6	0.00		1.41	0.11	0.47	0.58	13.09	12.51	1.19	1.70	0.52	0.49
	1.50		1.39	0.13	0.52	0.65	13.57	12.92	1.26	4.16	2.90	0.52
	3.00		8.06	0.04	0.32	0.36	11.69	11.33	1.10	1.62	0.52	0.33
	4.50		4.56	0.09	0.32	0.41	17.53	17.12	1.03	1.83	0.81	0.40
	6.00		9.03	0.10	0.54	0.64	10.94	10.30	0.93	1.27	0.34	0.69
	7.50		11.41	0.21	0.85	1.05	58.07	57.02	0.80	1.13	0.33	1.32
	INNER HARBOR		1.36	0.32	0.65	0.97	21.18	20.21	1.36	2.04	0.68	0.72

CRUISE # 13 NEW BEDFORD HARBOR BUZZARDS BAY JULY 18,1988

STATION #	DEPTH (m)	LIGHT INT (%)	POC (uM)	PON (uM)	C/N (atoms)	OXYGEN (mg/l)	Cl (mM)	TEMP (Celsius)	Sp. Grav. sigma t	LIGHT (uE/s/m)
1	0.00	100	45.14	5.32	8.48	7.1	507.09	22.2	22.26	306.0
	1.50	60	38.48	4.60	8.37	7.1	506.32	22.2	22.23	182.0
	3.00		64.95	4.56	14.24	7.1	506.84	22.2	22.25	110.0
	3.75	25	46.27	5.48	8.45	7.1	506.06	22.2	22.21	NA
	4.50		57.15	6.54	8.73	7.1	509.16	22.1	22.39	53.8
	6.00	10	37.34	4.14	9.01	7.0	511.48	21.3	22.72	28.8
	7.50		46.76	5.29	8.85	6.9	508.39	19.8	22.96	22.4
	9.00		41.57	4.52	9.19	6.7	507.35	19.6	22.96	12.2
	9.50	3	42.86	4.37	9.81	6.8	507.35	19.5	22.99	NA
	10.50		40.79	4.61	8.85	6.8	506.84	19.4	22.99	4.8
	11.00	1	43.03	4.94	8.71	6.8	506.58	19.3	23.00	2.8
	12.00		39.78	5.32	7.48	6.8	508.13	19.2	23.10	1.9
	13.00		42.22	6.37	6.63	6.9	508.13	19.1	23.13	1.7
	13.50		NA	NA	NA	6.9	NA	19.1	NA	1.1
2	0.00	100	86.38	12.07	7.16	6.7	508.39	23.2	22.05	1485.0
	1.00	60	85.93	10.11	8.50	6.6	505.03	23.2	21.88	840.0
	1.50		99.95	12.06	8.29	6.5	483.61	23.1	20.88	614.0
	2.50	25	77.35	10.82	7.15	6.6	483.61	23.0	20.91	343.0
	3.00		70.18	8.58	8.18	6.6	506.58	22.8	22.07	270.0
	4.00	10	59.81	7.33	8.16	6.5	507.10	22.5	22.18	157.0
	4.50		59.21	6.91	8.57	6.4	497.55	22.4	21.75	123.0
	6.00		65.66	6.31	10.41	6.2	509.16	22.2	22.36	59.5
	6.50	3	64.79	8.48	7.64	NA	508.65	22.1	22.37	47.5
	7.50		66.79	7.58	8.81	5.3	509.42	21.5	22.57	28.6
	8.50	1	44.08	4.64	9.50	5.3	506.84	20.5	22.71	15.1
	9.00		NA	NA	NA	5.3	NA	20.3	NA	10.4
3	0.00		46.12	5.68	8.11	7.0	508.39	22.9	22.13	1414.0
	1.50		56.94	6.33	9.00	7.0	507.10	22.8	22.10	669.0
	3.00		58.13	5.68	10.23	6.9	509.42	22.6	22.27	366.0
	4.50		48.91	5.18	9.44	6.7	509.42	22.3	22.35	162.0
	6.00		57.42	5.15	11.14	6.4	507.87	21.7	22.44	85.1
	7.50		57.62	5.02	11.47	6.0	509.16	20.7	22.77	25.1
	8.00		NA	NA	NA	NA	NA	20.7	NA	16.1
4.0	0.00		55.98	5.27	10.63	7.1	507.61	25.2	21.42	369.0
	1.50		65.39	5.99	10.92	6.3	507.87	24.7	21.58	108.0
	3.00		80.22	6.74	11.90	6.4	506.58	23.8	21.79	53.6
	4.50		82.62	7.73	10.69	5.3	507.61	22.7	22.15	27.5
	6.00		60.77	4.85	12.53	5.2	506.58	22.2	22.24	12.7
	7.50		60.29	3.79	15.91	5.1	504.52	21.0	22.46	7.6
	9.00		NA	NA	NA	5.8	NA	20.6	NA	NA
5	0.00		54.89	5.49	9.99	6.8	505.03	22.5	22.08	1074.0
	1.50		54.09	5.27	10.26	6.8	507.10	22.5	22.18	436.0
	3.00		49.84	5.12	9.74	6.8	506.84	22.2	22.25	237.0
	4.50		61.40	6.88	8.92	6.8	506.84	22.1	22.28	120.0
	6.00		50.77	5.34	9.51	6.6	507.35	20.6	22.71	64.0
	7.50		40.80	3.92	10.42	6.2	506.84	20.3	22.76	34.1
	9.00		40.83	4.21	9.71	6.1	505.29	20.0	22.76	14.5
	10.00		51.20	6.21	8.24	NA	507.61	19.7	22.95	7.0
	10.50		NA	NA	NA	6.2	NA	19.7	NA	NA
6	0.00		56.62	5.94	9.54	7.2	508.65	24.4	21.71	1733.0
	1.50		74.30	8.08	9.19	7.0	507.35	23.9	21.79	210.0
	3.00		62.04	6.93	8.95	6.8	505.03	23.4	21.83	80.4
	4.50		59.94	7.07	8.47	7.0	505.81	22.7	22.06	45.4
	6.00		43.67	10.31	4.24	6.6	507.10	22.2	22.26	22.1
	7.50		51.67	4.66	11.08	7.2	506.84	20.4	22.73	10.5
	INNER HARBOR		50.17	18.55	2.71	NA	499.61	NA	NA	NA

CRUISE #14 - NEW BEDFORD HARBOR - BUZZARDS BAY - AUGUST 15,1988

STATION #	DEPTH (m)	LIGHT INT (%)	Si-SiO2 (uM)	N-NO3 (uM)	N-NH3 (uM)	N-TIN (uM)	N-TDISS (uM)	N-DON (uM)	P-PO4 (uM)	P-TDISS (uM)	P-DOP (uM)	TIN/PO4
1	0.0	100	0.42	0.24	0.55	0.79	21.23	20.43	0.62	2.05	1.43	1.28
	1.00	60	0.41	0.12	0.26	0.38	9.23	8.85	0.63	1.16	0.53	0.60
	1.50		0.77	0.15	0.42	0.57	12.22	11.65	0.60	1.45	0.85	0.95
	3.00	25	0.35	0.16	0.27	0.43	11.63	11.20	0.60	1.14	0.54	0.72
	4.50		0.82	0.32	0.55	0.87	10.02	9.15	0.62	1.13	0.51	1.40
	5.50	10	0.41	0.16	0.33	0.49	8.83	8.34	0.64	1.49	0.85	0.77
	6.00		0.35	0.15	0.86	1.01	6.21	5.20	0.60	0.82	0.22	1.69
	7.50		0.50	0.31	0.71	1.02	10.75	9.73	0.62	1.50	0.88	1.63
	9.00		0.62	0.13	0.32	0.45	6.99	6.54	0.63	1.10	0.47	0.72
	10.00	3	0.64	0.11	0.30	0.41	7.71	7.30	0.61	1.26	0.64	0.67
	10.50		1.55	0.16	0.44	0.59	6.82	6.23	0.62	0.76	0.14	0.96
	12.00		0.67	0.14	0.40	0.55	5.81	5.26	0.63	0.85	0.22	0.87
	13.00	1	2.17	0.16	0.45	0.61	7.60	7.00	1.96	2.02	0.06	0.31
2	0.00	100	3.19	0.12	23.40	23.51	26.06	2.54	2.21	2.84	0.63	10.66
	0.75	60	2.19	0.10	11.00	11.11	19.13	8.03	1.53	2.30	0.77	7.25
	1.50		1.69	0.11	7.84	7.95	13.23	5.28	1.26	1.87	0.61	6.31
	2.00	25	1.97	0.09	5.21	5.31	13.05	7.75	1.15	1.60	0.45	4.62
	3.00		1.36	0.09	4.69	4.78	12.34	7.56	1.07	1.79	0.71	4.45
	3.50	10	1.33	0.10	4.29	4.39	11.51	7.12	1.12	2.01	0.89	3.91
	4.50		0.83	0.11	0.94	1.05	11.04	9.98	0.86	1.44	0.58	1.23
	5.50	3	0.83	0.10	0.26	0.35	7.46	7.10	0.77	1.04	0.27	0.46
	6.00		2.12	0.10	0.30	0.40	7.10	6.70	0.77	1.29	0.53	0.52
	7.50	1	1.90	0.10	0.24	0.34	8.48	8.14	0.83	1.38	0.55	0.41
	9.00		2.34	0.12	0.40	0.52	6.45	5.94	0.85	1.18	0.33	0.61
3	0.00		1.61	0.13	0.30	0.43	7.35	6.92	0.82	1.20	0.38	0.52
	1.50		1.66	0.15	0.38	0.53	10.10	9.58	0.83	0.97	0.14	0.64
	3.00		1.73	0.13	0.30	0.43	9.21	8.78	0.81	1.32	0.51	0.53
	4.50		1.65	0.12	0.34	0.46	6.83	6.37	0.82	1.28	0.46	0.57
	6.00		1.64	0.11	0.30	0.40	6.42	6.01	0.80	0.91	0.10	0.50
	7.50		2.15	0.12	0.36	0.49	10.12	9.63	0.81	1.03	0.22	0.60
4	0.00		1.16	0.12	0.33	0.45	13.83	13.37	1.10	2.31	1.20	0.41
	1.50		1.61	0.13	0.27	0.40	10.07	9.67	0.97	1.41	0.44	0.41
	3.00		1.24	0.13	0.32	0.44	9.18	8.74	1.42	3.94	2.52	0.31
	4.50		1.47	0.11	0.23	0.35	10.79	10.45	0.99	1.59	0.60	0.35
	6.00		1.38	0.10	0.22	0.32	6.80	6.48	0.90	1.32	0.42	0.36
	7.50		1.65	0.12	0.34	0.45	8.23	7.78	0.97	1.28	0.31	0.47
5	0.00		1.24	0.12	0.21	0.33	6.69	6.36	0.71	0.78	0.07	0.46
	1.50		1.94	0.15	0.25	0.40	6.45	6.05	0.69	0.84	0.14	0.58
	3.00		1.31	0.11	0.21	0.31	8.90	8.59	0.69	0.80	0.10	0.45
	4.50		1.47	0.12	0.26	0.38	13.27	12.88	0.70	0.75	0.06	0.55
	6.00		1.20	0.11	0.24	0.35	6.64	6.30	0.70	0.98	0.28	0.50
	7.50		1.18	0.11	0.32	0.43	5.87	5.44	0.72	0.97	0.25	0.60
	9.00		1.27	0.11	0.20	0.31	7.43	7.11	0.69	0.93	0.23	0.45
	10.50		1.70	0.11	0.23	0.34	5.76	5.42	0.71	0.92	0.21	0.47
7	0.00		2.76	0.14	0.25	0.39	13.70	13.32	1.54	1.93	0.39	0.25
	1.50		2.76	0.11	0.25	0.36	10.72	10.36	1.58	1.73	0.15	0.23
	3.00		2.92	0.10	0.33	0.43	9.59	9.16	1.63	1.88	0.25	0.26
	4.00		2.78	0.10	0.34	0.44	9.60	9.16	1.64	1.81	0.17	0.27
	INNER HARBOR		2.68	0.23	0.42	0.65	18.38	17.73	1.77	1.80	0.03	0.37

CRUISE #14 - NEW BEDFORD HARBOR - BUZZARDS BAY - AUGUST 15,1988

STATION #	DEPTH (m)	LIGHT INT (%)	POC (uM)	PON (uM)	C/N (atoms)	OXYGEN (mg/l)	Cl (mM)	TEMP (Celsius)	Sp. Grav. sigma t	LIGHT (uE/s/m)
1	0.00	100	27.8	3.6	7.65	6.6	480.50	22.3	20.95	325.0
	1.00	60	35.0	3.4	10.24	6.6	480.00	22.3	20.93	200.0
	1.50		35.8	4.9	7.33	6.6	485.94	22.3	21.21	168.0
	3.00	25	34.6	3.6	9.64	6.6	485.45	22.3	21.19	75.1
	4.50		27.7	3.0	9.20	6.7	485.45	22.3	21.19	52.8
	5.50	10	30.7	3.3	9.20	6.7	483.72	22.2	21.13	33.6
	6.00		33.9	3.6	9.30	6.7	484.21	22.2	21.16	28.3
	7.50		30.8	3.5	8.87	6.7	481.24	22.2	21.01	19.4
	9.00		30.8	4.2	7.28	6.8	480.74	22.2	20.99	12.6
	10.00	3	29.5	3.6	8.22	6.9	481.49	22.2	21.02	10.1
	10.50		38.7	4.2	9.14	6.9	481.24	22.2	21.01	9.3
	12.00		37.0	5.2	7.13	7.1	481.49	21.8	21.13	5.8
	13.00	1	47.6	6.5	7.32	NA	480.74	21.6	21.15	2.7
2	0.00	100	114.7	12.9	8.90	6.5	471.83	24.2	19.99	699.0
	0.75	60	94.9	12.1	7.83	6.5	471.83	24.2	19.99	NA
	1.50		75.1	9.4	7.98	6.5	481.98	24.2	20.48	239.0
	2.00	25	66.8	13.8	4.86	6.5	484.21	24.2	20.59	167.0
	3.00		NA	NA	NA	6.4	484.46	23.9	20.69	116.0
	3.50	10	68.8	9.5	7.23	6.4	483.47	23.8	20.67	59.2
	4.50		67.4	8.4	8.01	6.3	486.69	23.6	20.88	28.3
	5.50	3	52.2	6.8	7.73	6.4	484.46	23.3	20.86	21.6
	6.00		59.1	7.8	7.57	6.4	482.97	23.2	20.82	17.8
	7.50	1	53.1	5.7	9.35	6.3	487.93	22.9	21.14	5.5
	9.00		142.0	11.9	11.98	6.3	484.46	22.8	21.00	0.7
3	0.00		58.0	5.8	9.95	6.5	487.18	22.1	21.33	726.0
	1.50		52.2	4.7	11.08	6.5	484.95	22.1	21.22	254.0
	3.00		63.1	5.3	11.98	6.6	485.20	22.0	21.26	88.2
	4.50		62.1	5.5	11.25	6.6	487.93	22.0	21.39	35.8
	6.00		52.0	4.8	10.72	6.6	483.72	22.0	21.19	8.5
	7.50		92.1	7.9	11.69	6.6	484.21	22.0	21.21	2.0
4	0.00		60.7	6.8	8.97	6.4	480.74	25.7	19.97	1400.0
	1.50		61.4	6.0	10.16	6.3	479.50	25.7	19.92	429.0
	3.00		56.2	6.3	8.85	6.4	480.50	25.7	19.96	257.0
	4.50		61.4	6.4	9.55	6.3	481.73	25.8	19.99	85.2
	6.00		52.1	5.0	10.52	6.3	480.00	25.7	19.94	66.6
	7.50		57.8	8.6	6.72	6.3	480.00	25.7	19.94	46.4
5	0.00		65.1	6.9	9.40	6.5	482.23	22.9	20.87	838.0
	1.50		54.6	6.2	8.80	6.5	481.73	22.9	20.84	245.0
	3.00		53.4	6.1	8.81	6.5	480.99	22.9	20.81	79.2
	4.50		52.9	6.4	8.29	6.6	480.74	22.8	20.82	19.3
	6.00		60.1	6.4	9.31	6.5	484.95	22.8	21.03	7.7
	7.50		57.5	6.8	8.47	6.5	482.23	22.8	20.89	2.9
	9.00		59.0	7.0	8.41	6.6	482.48	22.8	20.91	0.8
	10.50		82.7	8.5	9.78	7.0	481.24	22.8	20.85	0.2
7	0.00		74.1	8.5	8.70	5.7	479.01	26.4	19.68	1678.0
	1.50		78.7	9.3	8.42	5.6	480.50	26.4	19.75	1148.0
	3.00		89.4	10.0	8.94	5.6	479.26	26.3	19.72	1063.0
	4.00		96.0	11.8	8.17	5.5	480.74	26.1	19.85	884.0
	INNER HARBOR		88.5	9.0	9.86	NA	474.80	NA	NA	