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Site: NEW BEDFORD
Break: 11.12.5
Other:

Selected Studies of PCB Transport in New Bedford Harbor

Submitted to:

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Executive Summary

Applied Science Associates, Inc. (ASA) has performed selected studies on the transport and fate of PCB's and other materials in the Acushnet River estuary and New Bedford inner and outer harbors. Studies described here include (1) a continuous dye release from the upper harbor to determine the dispersion characteristics (dilution versus distance) and flushing time of the estuary, (2) estimates of the diffusive flux of PCBs from the sediments in the upper estuary (north of Coggeshall Street Bridge) into the water column, (3) assessment of the total PCB mass in the sediments and water column, (4) simulations of the vertically averaged wind driven circulation in the estuary in response to local and nonlocal wind forcing and (5) model simulation of a continuous release from the Cornell Dubilier site. The work reported here is an extension of earlier studies performed by ASA (1986) on modeling the circulation and pollutant transport dynamics in the region.

The results of the studies are summarized below:

(1) Dye Release

A continuous dye release study was performed to determine the dilution for a conservative substance (no growth or decay) released in the upper estuary near the Aerovox facility. Also of interest are the dispersion characteristics of the dye as it is transported toward the harbor mouth and the flushing rate of the entire estuary (north of the hurricane barrier). If we assume that PCBs suspended in the water column, either in dissolved or particulate form, can be treated as a conservative substance, then the dye release experiment presented here is a reasonable analog to the

expected water column transport and dispersion of PCBs in the system.

Rhodamine WT dye was released at a discharge rate of 29.1 mg/s (100% Rhodamine WT by weight) to the Acushnet River estuary, approximately 50 m eastward of the Aerovox facility mean low water property boundary. The dye was mixed with freshwater (1580 cm^3/s) to approximate the receiving water surface density.

The release began at 0700 EST on December 15, 1986 and continued for a period of 8 days until 1300 EST December 23, 1986. The duration of the release was selected to ensure that the dye concentrations within the estuary reached approximate steady state conditions.

Fluorescence levels in the estuary, from the Aerovox facility to just south of the hurricane barrier, (45 stations) were measured using a Turner Design Model III flow-through fluorometer. Measurements were made at standard vertical depths (0., 0.61, 1.26, 2.44, 3.66, 6.1 and 7.32 m, referenced to the surface).

Daily measurements were generally made at low tide ($\pm$ 2.5 hrs) from 15-29 December 1986. Fluorescence measurements were converted to dye concentrations using laboratory calibration curves and were subsequently corrected for background fluorescence levels, taken on December 12, 1986, before the release was initiated. Background concentrations were generally low (0.02 - 0.04 ppb) in the lower harbor (south of Route 6 bridge) but were substantial, (0.27 - 0.44 ppb) north of Coggeshall Street Bridge.

By 21 December 1986 dye concentrations within the estuary achieved steady state conditions with the estuary average concentration varying by not more than 10% from the mean value. The day to day variability at any one station however was considerably higher. The concentrations showed a

the lower estuary the Cornell Dubilier discharge is significant and in the outer harbor (just south of the hurricane barrier) clearly dominates.

Model predictions and observed PCB and dye concentrations are in good agreement in most of New Bedford Harbor. The role of the Cornell Dubilier discharge to PCB concentration in the lower harbor is much more uncertain since we have extremely limited data on the observed concentrations in the area. We also do not have direct estimates or calculations of the observed source strengths. The analysis here relies on only one data station (Station 11) where both particulate and dissolved observations were simultaneously available (Cruise #3). The data base is clearly inadequate to draw firm conclusions.

Estimates of the PCB source strengths for discharges from the upper estuary, Cornell Dubilier and the New Bedford sewage treatment plant were made. The estimates for the upper estuary (150-200 kg/yr), although variable, are consistent no matter which technique is used to perform the determination. The estimate for Cornell Dubilier is more uncertain because of the limited data available. The value however is consistent with the upper estuary discharge and the fact that each facility purchased (handled) about the same amount of PCBs between 1954-1977 (Appendix B, Table B.1). The quality of the estimates for the New Bedford sewage treatment facility is unknown, the level however is consistent with the other two discharges.

(2) Diffusive Flux of PCBs from the Sediments

Assuming that the principal mechanism transporting PCBs from the sediments to the water column in the upper estuary is by diffusion, a calculation was made to determine the flux rate. Using the observed mean

PCB (Aroclor 1254) sediment concentration and a standard diffusive flux calculation (Thibodeaux, 1979), the transport was estimated at 53.5 kg/yr. Noting that the other PCB Aroclors combined (1016 and 1242) are observed to have concentrations two to three times those of Aroclor 1254 (Farrington et al, 1981; Brownawell, 1986) results in a total PCB flux from the sediments to the water column of 160.5 - 214 kg/yr. This prediction is in agreement with previous model estimates (189 kg/yr) (ASA, 1986) and simple calculations based on the observed PCB concentration levels (22.7, 112.5 and 162 kg/yr). The model further shows that the flux rate of PCBs from the sediments is primarily controlled by the pore water PCB concentrations and the thickness of the diffusive layer.

(3) PCB Mass Balance

Calculation of the amount of PCBs in the bottom sediments and water column were made based on the available data. Lower, average, and upper bound estimates were made for the PCB (Aroclor 1254) mass in the sediment for the area (1) on Aerovox property (between mean high and mean low water levels), and (2) the entire Acushnet River estuary and New Bedford Harbor (north of the hurricane barrier). The lower and upper bound estimates were made using the lower and upper values for the observed sediment concentration contour intervals. Estimates of the average PCBs were calculated using the mean of the lower and upper concentration bounds. The thickness of the bottom layer of sediments was varied between the lower, mean, and upper bound estimates based on the variability in the observations.

The PCB mass (Aroclor 1254) in the total estuary sediments ranged from 132,473 to 994,590 kg with a mean estimate of 374,248 kg. This significant uncertainty (factor of 7.5) between the lower and upper bound estimates is caused by the variability in the spatial gradients of the PCB concentration fields. No matter which estimate is used however less than 1% of the PCB mass in the upper estuary sediments is on Aerovox property.

To estimate the total PCBs (Aroclor's 1016, 1242, and 1254) in the sediments, we have explored two methods: scaling based on the sales records for the Aerovox plant and observed concentration ratios of the Aroclors in the sediments. The sales records for the Aerovox plant show that the ratio of the sum of Aroclors 1242 and 1016 to Aroclor 1254 purchased is 8.54:1. If we assume that Aroclors 1242 and 1016 were discharged into the Acushnet River in the same ratio to Aroclor 1254 as they were purchased and that thay are distributed in the sediments in the same concentration patterns, then we can estimate the total PCB mass (all Aroclors combined) in the sediments by scaling the values above. Farrington et al (1981) and Brownawell's (1986) observations of actual sediment samples suggest, however, that the ratio of Aroclor 1242 and 1016 to Aroclor 1254 is typically 2 to 3. The purchase based scaling approach is likely in error because one of the basic assumptions is violated.

Estimates of the PCB mass in the water column have been prepared using the Battelle (1985) data. For consistency in computing the total mass we have used only those data for which both dissolved and particulate concentrations were measured at the same sampling depth and stage of the tide at a particular station. All data meeting this criteria at each

station were then averaged independent of the cruise, sampling depth and time to give an average concentration.

A total of 10.29 kg of PCBs is estimated in the water column with less than 1% on Aerovox property. The particulate PCB mass is approximately 2-4 times that of the dissolved.

This analysis clearly shows that the vast majority of PCBs are located in the bottom sediments of the upper estuary; only a very small amount of which is within the confines of the Aerovox property.

(4) Wind Forced Hydrodynamics

To assess the local wind driven circulation, a vertically averaged hydrodynamics model was used to predict the response to local and non-local wind forcing. For the local forcing case, the response to constant wind (1 dyne/cm^2) for eight points of the compass was performed. The simulations showed that the time to reach steady state conditions was 2 to 3 hrs with the longer times corresponding to deeper water depths.

The steady wind forced vertically averaged hydrodynamic model predicted a major recirculation around Popes Island and minor eddies north of Palmer Island and the Coggeshall Street Bridge. The response is symmetric to wind direction. The recirculation around Popes Island is counter clockwise and strongest when the wind blows toward the northwest. As the wind shifts to the west, the recirculation strength decreases. A further change in the wind direction to the southwest reverses the direction of the circulation gyre. The strength increases as the wind has an increasing southerly component and has its maximum strength when the wind is toward the southeast. The strength decreases again as the wind

direction becomes more easterly. The gyre finally rotates counter-clockwise when the wind is toward the northeast. The maximum currents in the gyre occur to the east of Popes Island and reach 1.6 cm/s. The spatial gradients in the currents are mainly caused by the substantial depth differences between the eastern and western sides of the estuary.

The surface elevations reach a maximum value of 30 mm setup/setdown in the upper estuary for winds from the south/north, respectively. Maximum setup/setdowns for cross estuary winds (east/west) are 4 mm. The elevation contours are generally aligned normal to the wind direction with small deviations due to bottom topography.

An analysis of the predictions show that the principal momentum balances are linear (e.g. hence doubling the wind stress doubles the predicted currents and surface elevation response). For the steady state wind driven response, the estuary remains closed; no import or export of water through the hurricane barrier. Water is simply moved within the system in a series of gyres or eddies. The steady state wind driven currents are typically 5 to 10 times smaller than the tidal currents at the same location (ASA, 1986).

Non-local forcing (imposed on the harbor by wind driven flows in Buzzards Bay and the southern New England continental shelf) was investigated by driving the model with a sinusoidally varying free surface elevation amplitude of 40 cm and a period of 2 days. The current response is similar in character to the tidal flow but with approximately one fourth the magnitude.

(5) Continuous Release from Cornell Dubilier Site

A two dimensional vertically averaged hydrodynamics and dispersion

model was used to predict the circulation and dispersion of a continuous point release at the Cornell Dubilier site. The model was applied to the area extending from the shore to a line connecting Wilbur to Round Hill Points and included New Bedford Harbor and the Acushnet River estuary.

Model simulations of the M2 tidal circulation, which dominates the local currents, were in agreement with the available data (CDM, 1983; Haight, 1936) and previous model studies of the area (Spaulding and Beauchamp, 1983; Spaulding and Gordon, 1982). The currents are generally small in the region of the discharge site with maximum speeds of 6-8 cm/s.

A two dimensional vertically averaged finite element pollutant transport model was applied to the study area using the same grid as the hydrodynamic model. A unit source was continuously discharged at the Cornell Dubilier site and the simulation run until steady state conditions were achieved. The model shows the largest concentration gradients near the discharge source. The highest concentrations are observed near the western shore. The discharge plume is concentrated between the shore and the hurricane barrier to the north. The concentrations near the hurricane barrier are highest during high tide and lowest during ebb tide. The concentrations decrease gradually to the south and east. Concentration levels are reduced by a factor of two (2) by the time the material reaches the hurricane barrier. Even in the lower end of New Bedford Harbor, the concentration levels are still significant. Concentrations predicted in the lower harbor are approximately constant and then decrease up-estuary in a manner similar to salinity.

1. Introduction

Applied Science Associates, Inc. (ASA) has been retained by Ropes and Gray, Boston, Massachusetts to perform selected studies on the transport and fate of PCB's in the Acushnet River estuary and New Bedford Harbor. The work reported here is an extension of earlier studies performed by ASA (1986) on modeling the circulation and pollutant transport dynamics in the region.

Section 2 describes a continuous dye release that was performed to determine the dilution versus distance for the estuary. The dye study is meant to simulate the release of PCB's in the water column in the vicinity of the Aerovox facility and their subsequent dispersion as the material travels down estuary. Estimates are also provided for the flushing time of the estuary based on the dye removal rate. The flux rate of PCBs from the sediments into the water column is estimated in Section 3 using a simple diffusive model. To provide an assessment of the PCB mass balance, Section 4 presents calculations of the total PCB mass and concentrations in the sediments and water column. Estimates are given for the areas north of Coggeshall Street Bridge, for the entire estuary, (north of the hurricane barrier) and for the area within Aerovox's intertidal property bounds. Hydrodynamic model simulations of wind driven flow in the area are given in Section 5 addressing both local and nonlocal forcing. Section 6 presents the results of a simulation of the tidal hydrodynamics of the outer harbor and a continuous release from the Cornell Dubilier site with particular emphasis on its influence on lower New Bedford Harbor.

2. Continuous Dye Release Study in Upper Achusnet River Estuary

A continuous dye release study was performed to determine the dilution for a conservative substance (no growth or decay) released in the upper estuary. Also of interest are the dispersion characteristics of the dye as it is transported toward the harbor mouth and the flushing rate of the entire estuary (north of the hurricane barrier). If we assume that PCBs suspended in the water column, either in dissolved or particulate form, can be treated as a conservative substance then the dye release experiment presented here is a reasonable analog to the expected water column transport and dispersion of PCBs.

2.1 Study Area

The study area, shown in Figure 2.1, includes the Acushnet River estuary and New Bedford Harbor. The specific area of interest is the upper estuary, particularly the region north of the Coggeshall Street Bridge. This section of the estuary is of concern since it is suspected that the PCBs in the sediments may be transported into the water column here and ultimately move down estuary. Previous PCB water column sampling studies (Battelle, 1985) have shown high concentrations (> 1 ppb) in this region.

A detailed description of the physical oceanography of the estuary is given in ASA (1986). In summary, Achusnet River and New Bedford Harbor is a small urban estuary. Freshwater inflow at the head of the estuary is minimal with a mean annual average of 0.85 m^3/s. The circulation is primarily driven by the semi-diurnal tide with a range of 1.13 m. The system displays a standing wave behavior with maximum flood/ebb currents occurring approximately 3 hours before high/low water. Wind driven circulation is readily seen in the lower harbor (south of Rt. 6 bridge).

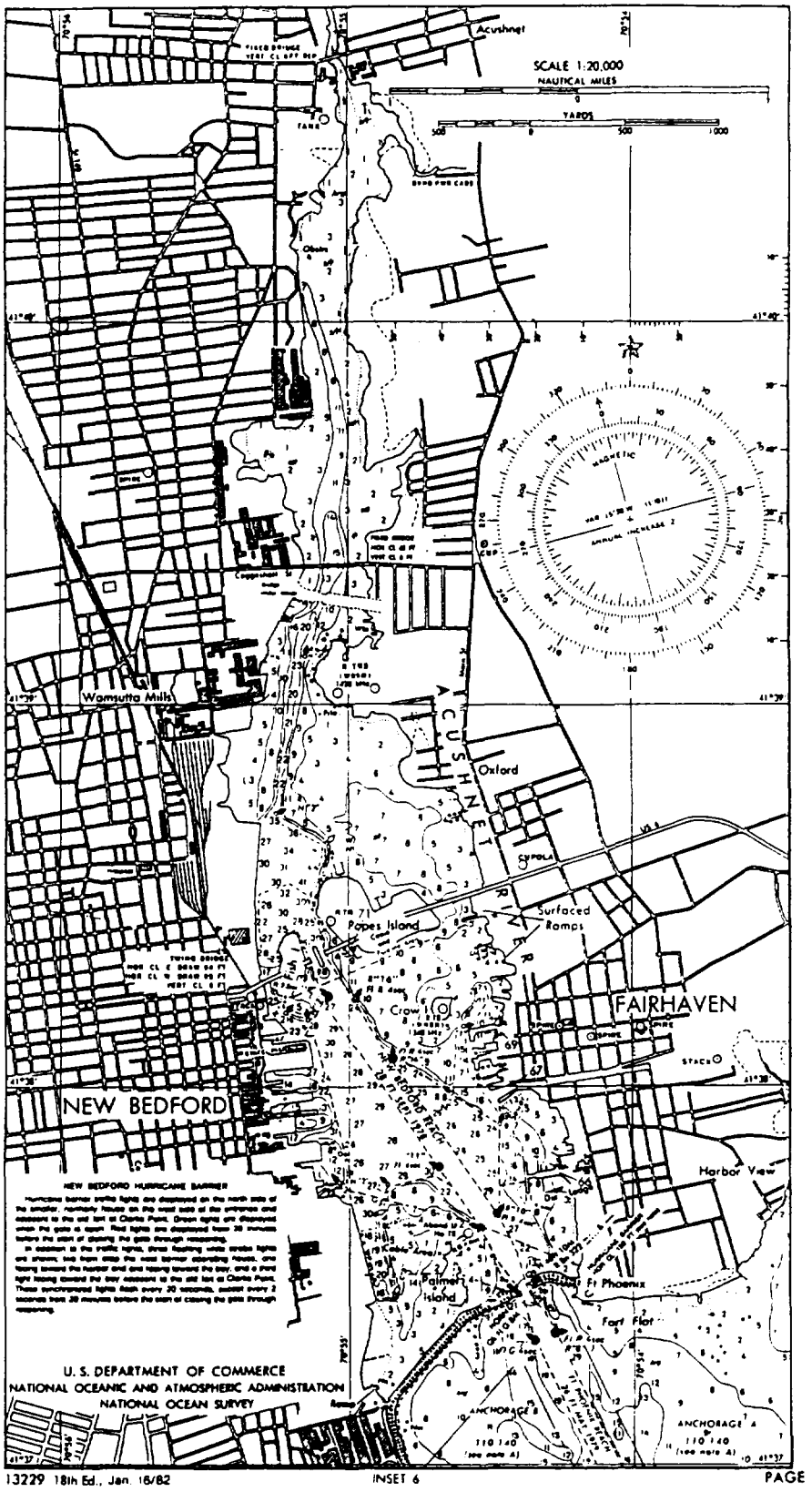


Figure 2.1 Acushnet River estuary and New Bedford Harbor study area.

Its role in driving the circulation in the upper estuary is unknown since very few measurements have been made in the area.

The tidal prism flushing time for the upper estuary (north of Coggeshall Street Bridge) is 22.5 hrs. and 45.5 hrs. for the entire system. Estimates of the total flushing time (tide and wind) have been estimated at approximately four days (Government Request to Admit 5799). The basis for this estimate is however unknown.

2.2 Field Program

A field program consisting of a continuous dye release at a point approximately 50 m offshore from the Aerovox facility and field sampling of the dye concentrations was performed. Rhodamine WT dye was selected as the tracer because it is a conservative substance for periods of at least 30 days and is widely used for studies of this kind (Rantz et al, 1982). A Turner Design Model III flow-through Fluorometer was used to measure the dye concentrations. The fluorometer has a dynamic range of four decades and a minimum sensitivity of 0.02 ppb (Rantz et al, 1982).

Initial preparations included the calibration of the fluorometer, the determination of background fluorescence levels, and preparation of the injection equipment. Calibration of the meter was conducted prior to the background fluorescence survey. Three sets of standard dye solutions were prepared in accordance with procedures given in U.S. Geological Survey Water Supply Paper 2175 (Rantz et al, 1982) for a range of dilution from 100 ppb to 10^{-2} ppb. Each of the four sensitivity ranges, or aperatures of the fluorometer, was checked at each dilution of the three standards. Meter response was determined from the average of the three readings. Temperature correction coefficients for Rhodamine WT dye fluorescence

(Rantz et al, 1982) were used to account for the variability of sample temperature. Meter response was linear at all four apertures. Prior to the dye release (December 12, 1986), measurement stations, as shown in Figure 2.2, were established by marker buoys. Measurements were made to establish background fluorescence levels. Background fluorescence levels were 0.02-0.03 ppb in the lower estuary but higher at 0.12 - 0.44 ppb in the upper estuary. The actual values are shown in Figure 2.3.

The dye was released at a discharge rate of 29.1 mg/s (100% Rhodamine by weight). The dye is normally obtained at 20% solution or a concentration of 2×10^5 ppm. A peristaltic pumping system was used to control the dye injection rate. The Rhodamine WT dye was mixed with freshwater in a mixing tank to assure that the dye solution was approximately the same density as the receiving water. The freshwater flow rate was 1580 cm^3/s. The mixture was then discharged to the estuary by a sump pump in the bottom of the mixing vessel.

The release began at 0700 EST on December 15, 1986, and continued for a period of 8 days until 1300 EST December 23, 1986. The duration of the release was selected to ensure that the dye concentrations within the estuary reached approximate steady state conditions.

Dye concentrations were measured in the field at several levels in the vertical (0.0, 0.61, 1.22, 2.44, 3.66, 6.1, and 7.32 m or 0, 2, 4, 8, 12, 20, and 24 ft.). These levels were selected based on early measurements (15 and 16 December 1986) which showed distinct surface and bottom concentrations. On several occassions no dye concentration measurements were made in the upper estuary (generally north of Coggeshall Street Bridge) because water depths were too shallow for safe small boat operation

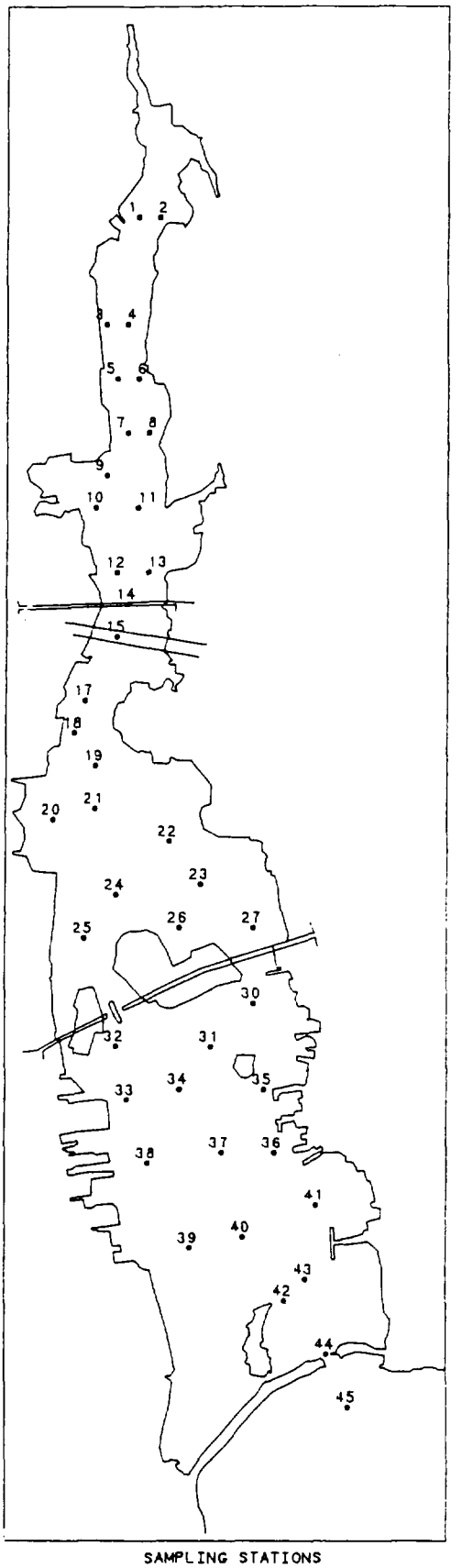
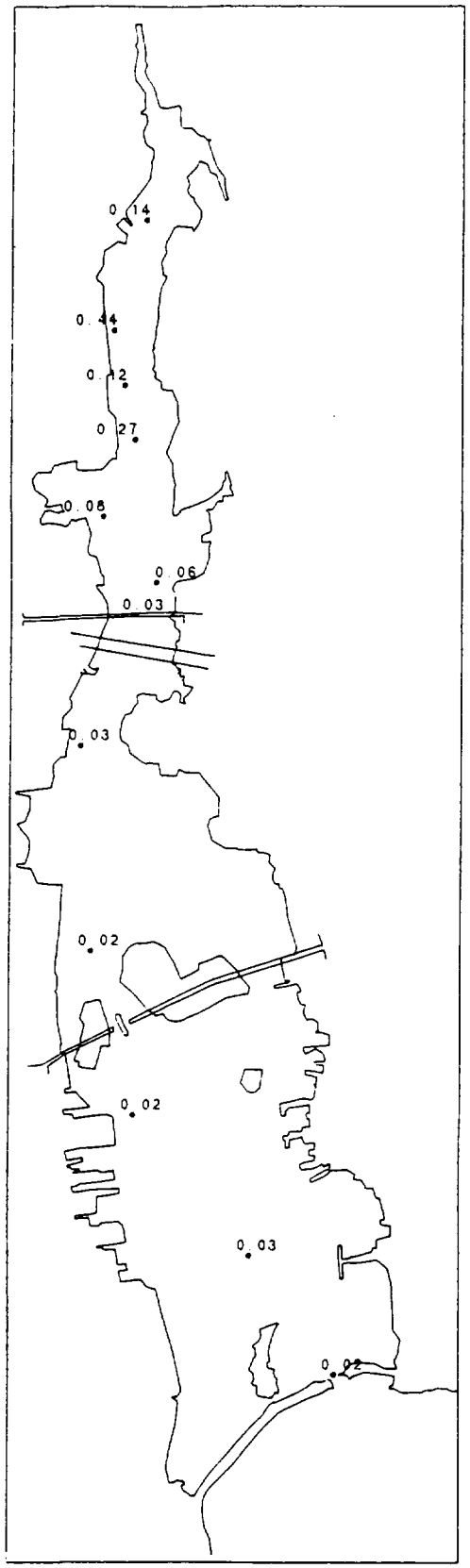


Figure 2.2 Dye experiment measurement stations in New Bedford Harbor.



BACKGROUND FLUORESCENCE LEVELS (ppb)
12-12-86

Figure 2.3 Background dye concentrations (ppb) for surface and subsurface in New Bedford Harbor, December 12, 1986.

Table 2.1 Time of dye measurements.

Date	Measurement Time (EST) Start	End	Time of Low Tide at Newport*	Note
December 15, 1986	1140	1224	1302	Dye release initiated, 0700
December 16, 1986	1205	1548	1330	
December 17, 1986	1330	1630	1402	
December 18, 1986	1300	1724	1434	
December 19, 1986	-	-**	1506	Storm
December 20, 1986	1440	1800	1543	
December 21, 1986	1430	1810	1543	
December 22, 1986	1430	1905	1705	
December 23, 1986	0535	0920	0523	Dye release terminated, 1300
December 24, 1986	0522	0955	0624	
December 25, 1986	-	-**	0730	Storm
December 26, 1986	0630	1058	0840	
December 27, 1986	0625	0940	0949	
December 28, 1986	0750	1150	1052	
December 29, 1986	1030	1345	1151	

* New Bedford low tide approximately 12 minutes later

** Data not collected due to unsafe boating conditions (storm winds)

or because of ice formation.

Concentration measurements were made on the dates and times noted in Table 2.1. In general, measurements were made every day during low tide conditions. The entire area could normally be surveyed in approximately 4 to 5 hours, depending on weather conditions. No surveys were conducted on December 19 and 25, 1986 because extremely strong winds made small boating unsafe. Surveys from the 15 to 23 December 1986 were performed to measure the increase and final stabilization of the dye concentrations in the estuary. Subsequent measurements (24 to 29 December 1986) were made to determine the flushing rate of dye from the estuary.

Supplemental information on environmental conditions was also collected. Figure 2.4 shows the wind speed and direction (vector diagram), barometric pressure, air temperature, and rainfall rate over the study period. The data was collected from the New Bedford Airport weather station, with the exception of the rainfall data which was collected from T.F. Greene Airport, Warwick, R.I. This was necessary since the New Bedford Airport station does not routinely collect rainfall information. Data at New Bedford airport is collected only 16 hrs. per day. The sea surface elevation versus time, shown at the bottom of Figure 2.4, was obtained from the permanent gauging station at the hurricane barrier.

The weather during the time period was characterized by two major rainfall events. The first, 1400 EST, 18 December to 1200 EST, 19 December deposited a total of 5.3 cm of rain on the area. The second, 2400 EST, 24 December to 0900 EST, 25 December, was a much smaller storm with a cumulative rainfall of 2.2 cm. The peak Acushnet River flows estimated for these events are 3.7 m^3/s and 1.5 m^3/s, respectively. The normal mean

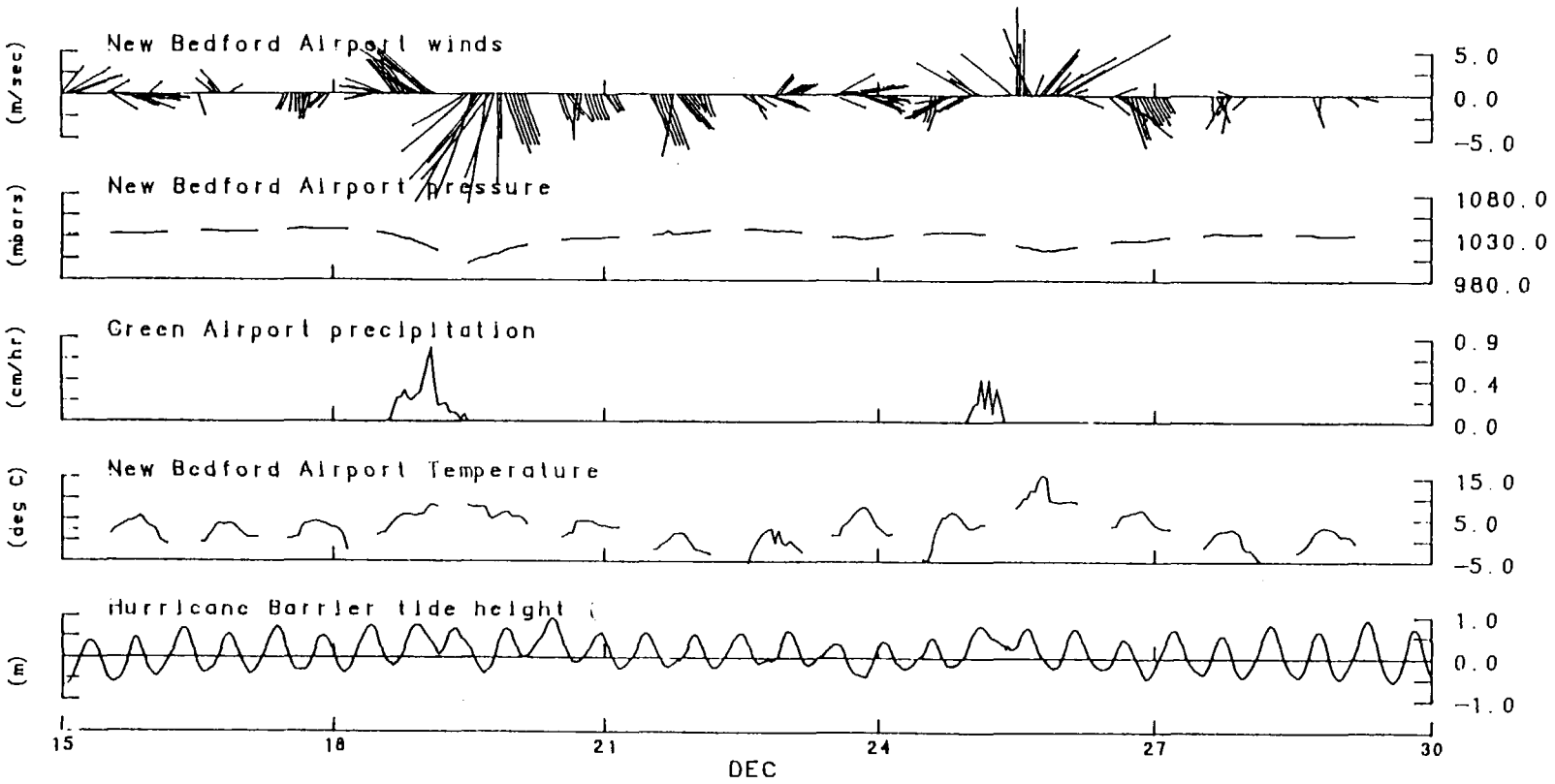


Figure 2.4 Times series of wind speed and direction, barometric pressure, air temperature, rainfall rate and tidal height from 15-29 December 1986. The meteorological data was obtained from New Bedford Airport. The tidal data is from the hurricane barrier gauging station.

yearly flow rate is 0.85 m^3/s.

The tidal range was typical for the study area at the beginning of the release, decreased to neap conditions on about 22-23 December 1986 and then increased to spring conditions at the end of the month.

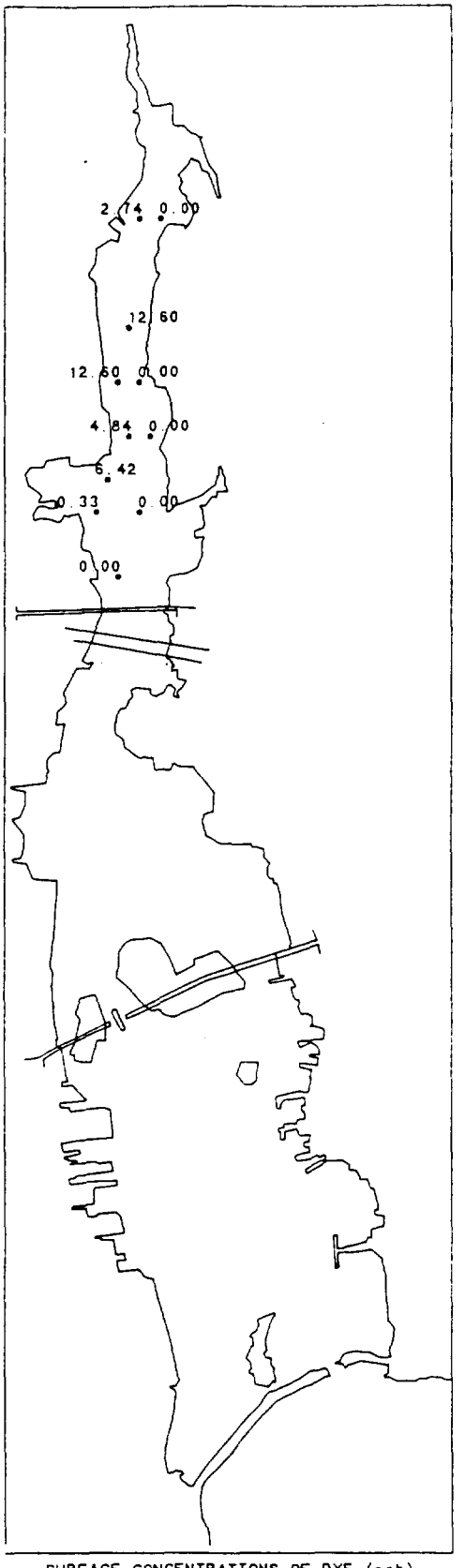
The winds during the 18-19 December storm came from the northeast and reached speeds of 10-14 m/s. Winds during the 23-24 December storm were out of the south and southwest at 8-10 m/s. They had a decided impact on the sea level causing the height to be above mean sea level even through the low tide. The winds during the remaining period were much weaker with typical values of 3-5 m/s.

2.3 Results

Figures 2.5 to 2.17 show the spatial distribution of the dye concentration in parts per billion (ppb) for each day of the survey (Table 2.1). Surface and subsurface dye concentrations are presented and represent the surface (0 m, 0.61 and 1.22 m samples) and subsurface (3.66, 6.1 and 7.32 m samples), respectively. A simple average has been used for the surface value. A depth weighted average, reflecting the unequal vertical measurement stations, has been used to give a representative subsurface value. We have chosen to present the actual concentrations in the figures. This approach was chosen to show the dye concentration variability in the cross and along estuary directions.

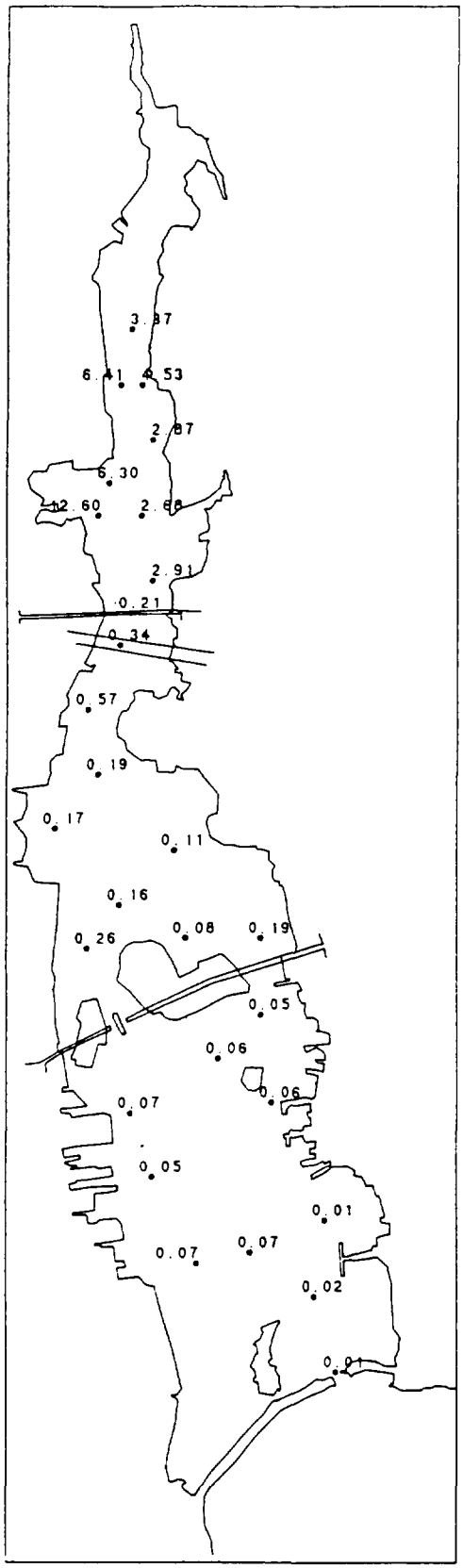
All dye concentration measurements, corrected for background levels, are provided in Appendix A. The data is presented in the following order: date, station number and depth. Also included are the time the measurement was made and any auxiliary data collected (temperature, ^{o}C or salinity, %).

The dye release began at 0700 EST on 15 December 1986. Within two

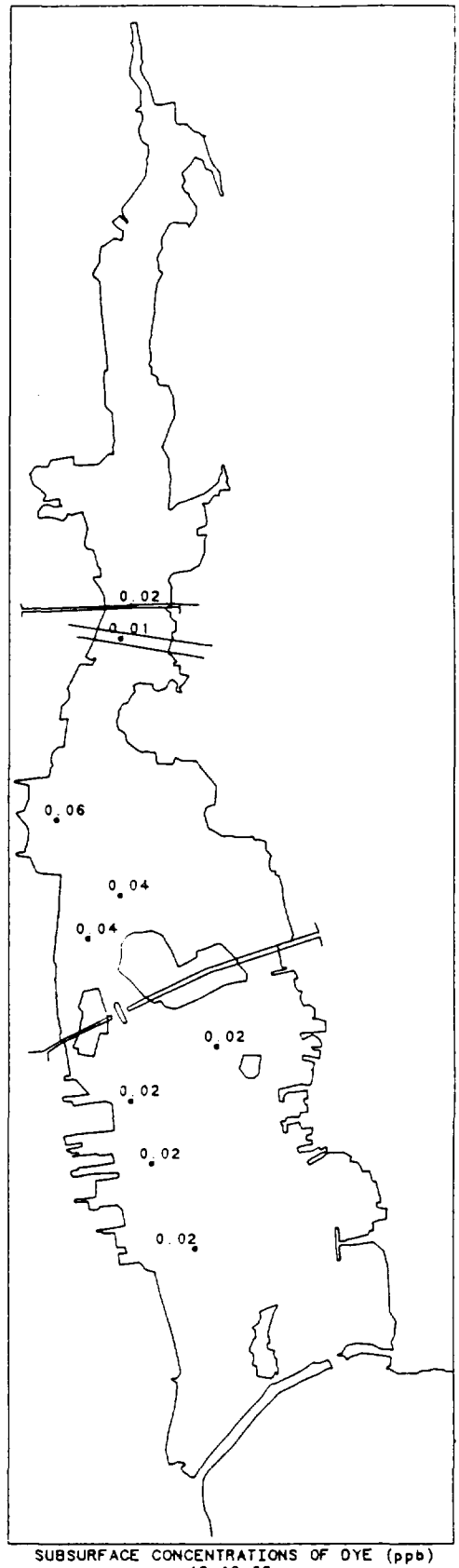


SURFACE CONCENTRATIONS OF DYE (ppb)
12-15-86

Figure 2.5 Measured dye concentrations (ppb) for the surface and subsurface, December 15, 1986.



SURFACE CONCENTRATIONS OF DYE (ppb)
12-16-86



SUBSURFACE CONCENTRATIONS OF DYE (ppb)
12-16-86

Figure 2.6 Measured dye concentrations (ppb) for the surface and subsurface, December 16, 1986.

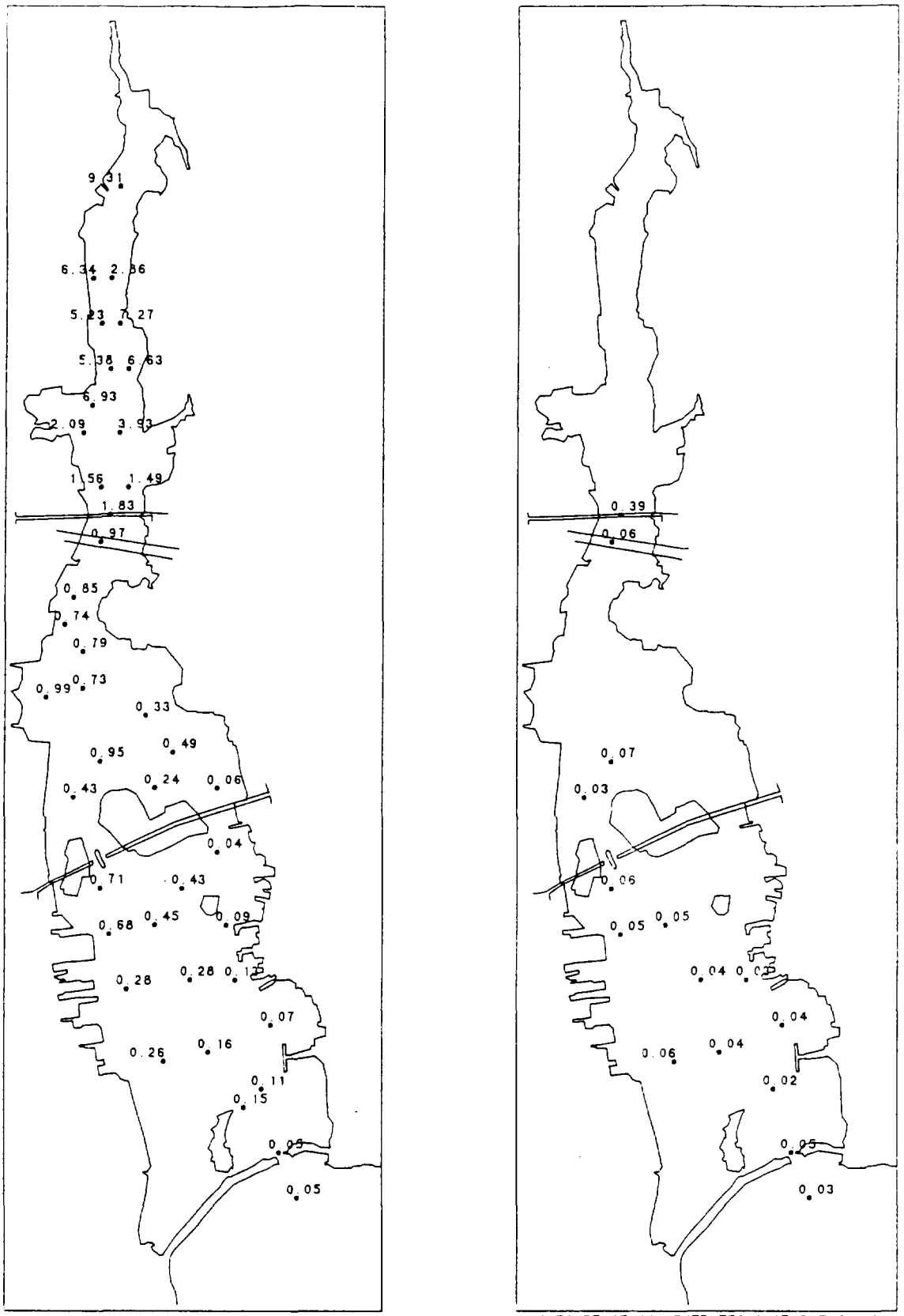
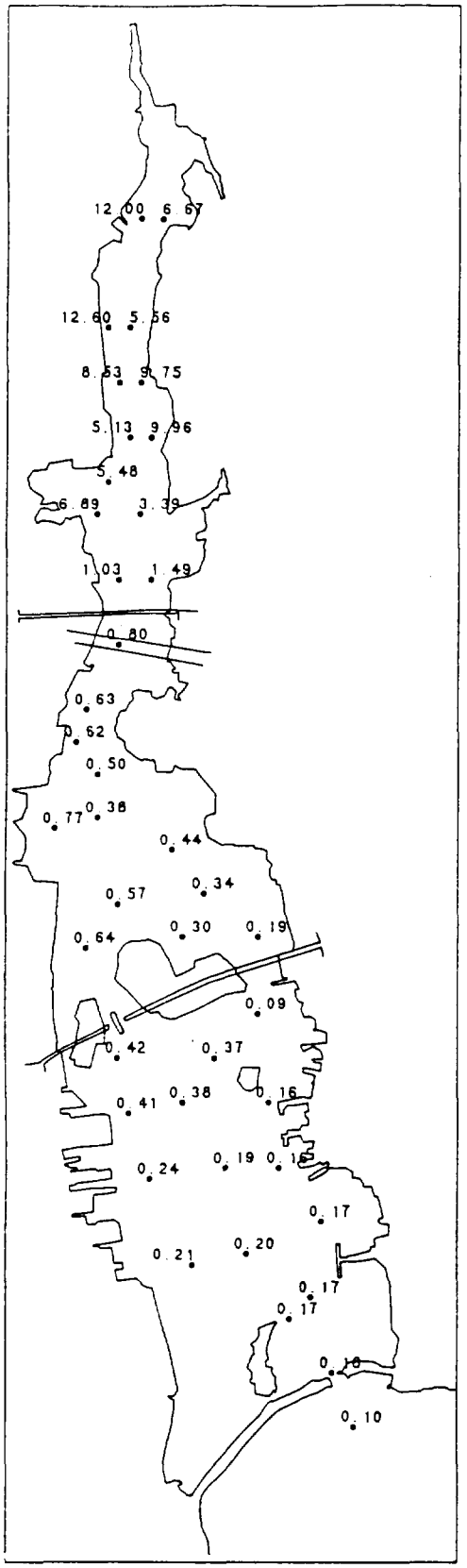
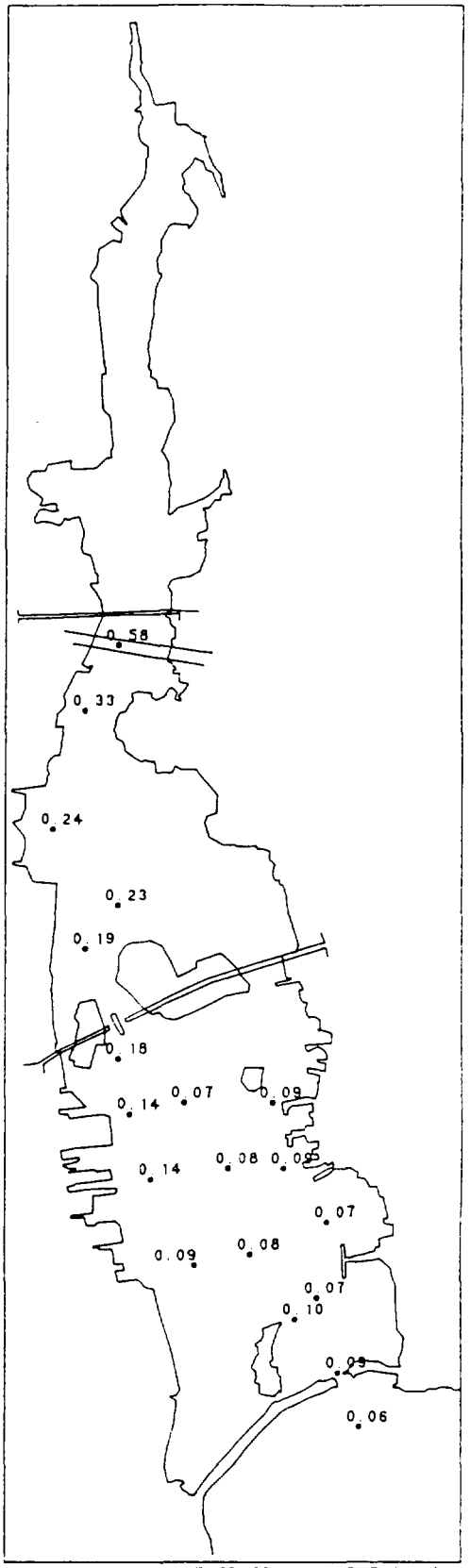


Figure 2.7 Measured dye concentrations (ppb) for the surface and subsurface, December 17, 1986.

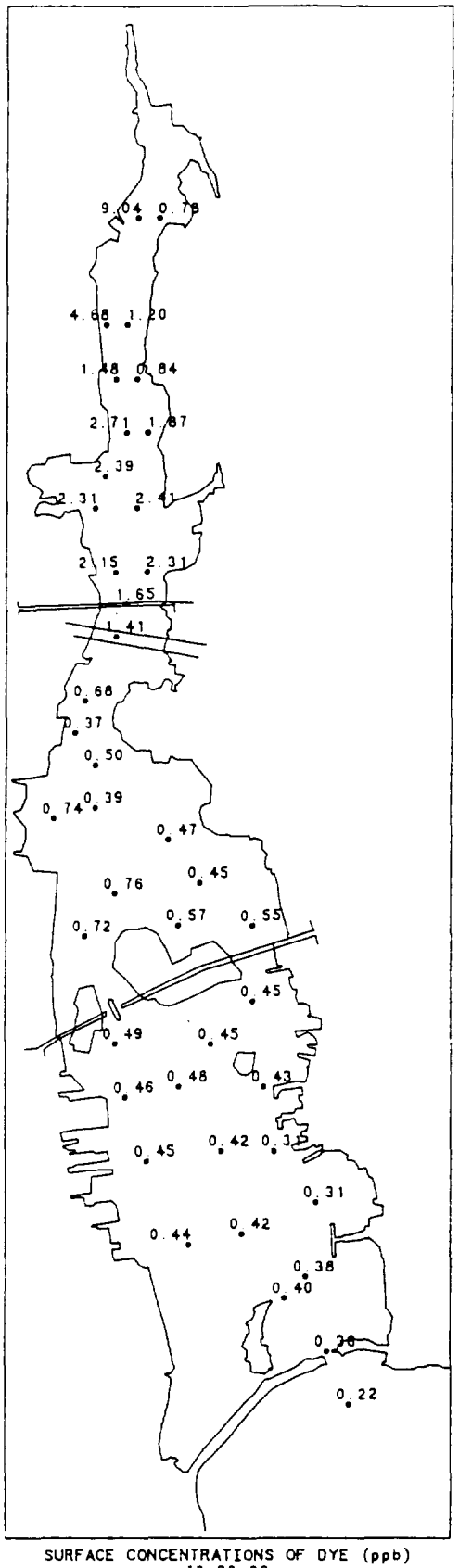


SURFACE CONCENTRATIONS OF DYE (ppb)
12-18-86

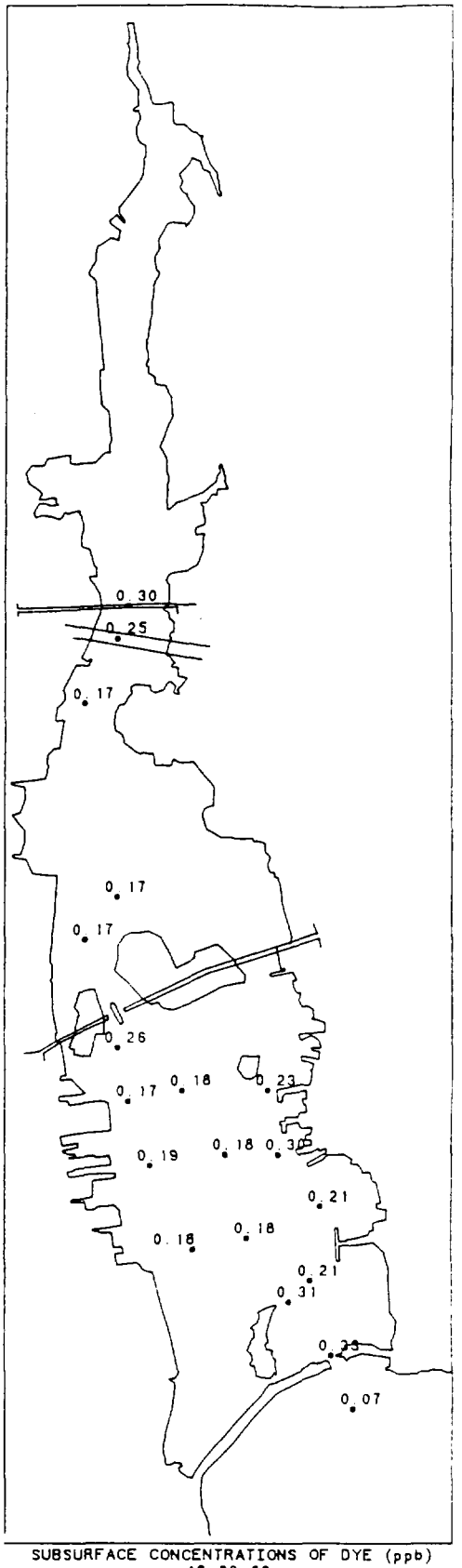


SUBSURFACE CONCENTRATIONS OF DYE (ppb)
12-18-86

Figure 2.8 Measured dye concentrations (ppb) for the surface and subsurface, December 18, 1986.

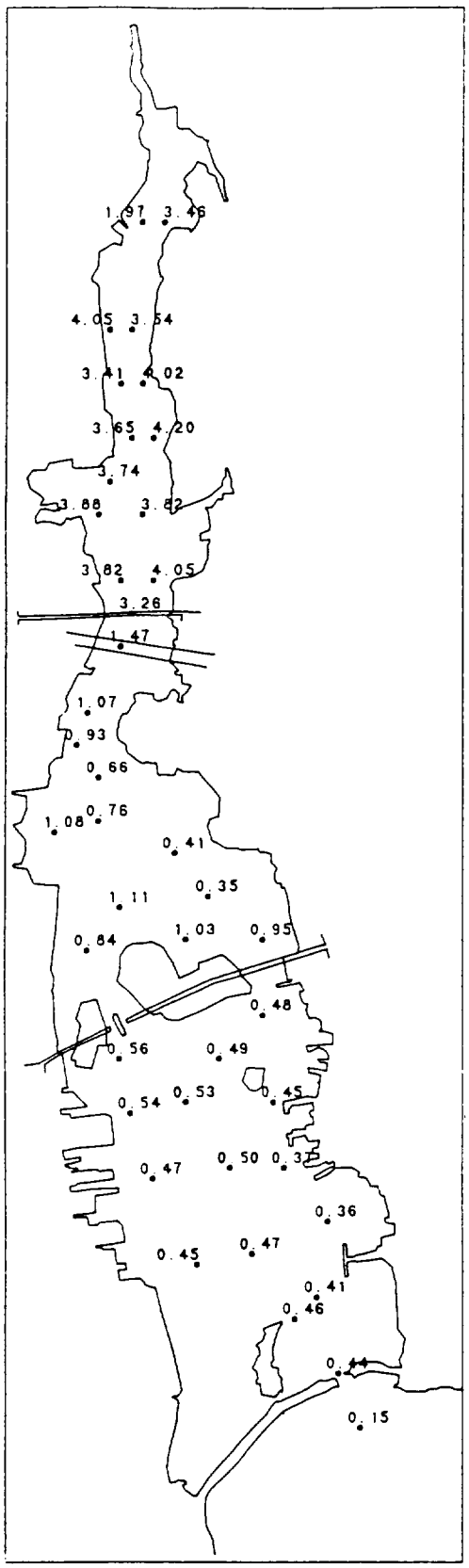


SURFACE CONCENTRATIONS OF DYE (ppb)
12-20-86

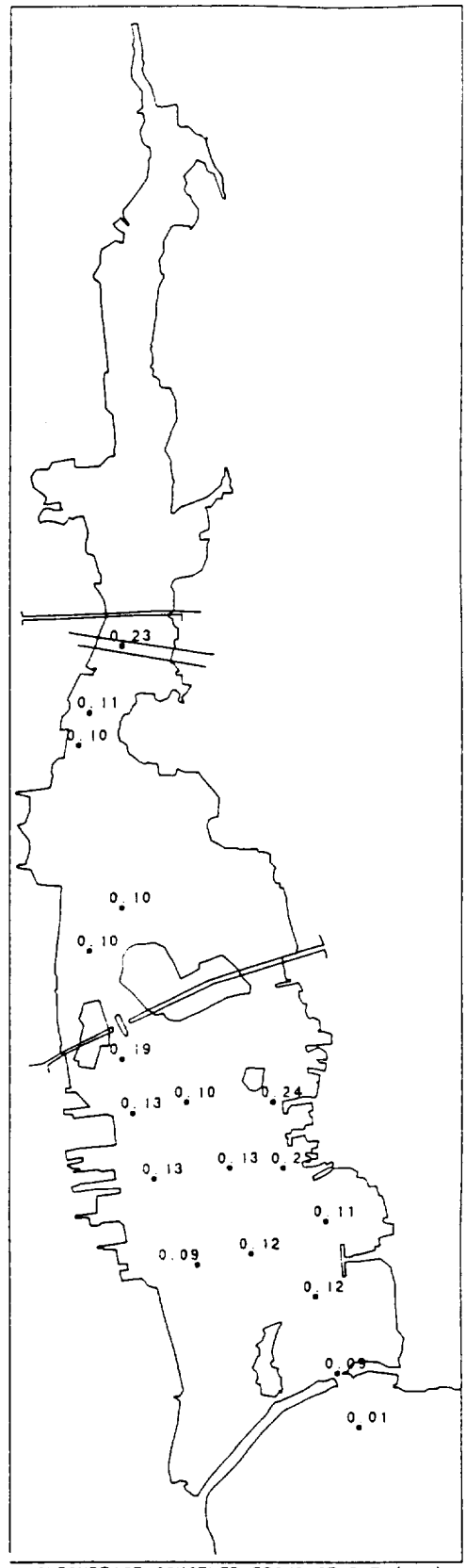


SUBSURFACE CONCENTRATIONS OF DYE (ppb)
12-20-86

Figure 2.9 Measured dye concentrations (ppb) for the surface and subsurface, December 20, 1986.



SURFACE CONCENTRATIONS OF DYE (ppb)
12-21-86



SUBSURFACE CONCENTRATIONS OF DYE (ppb)
12-21-86

Figure 2.10 Measured dye concentrations (ppb) for the surface and subsurface, December 21, 1986.

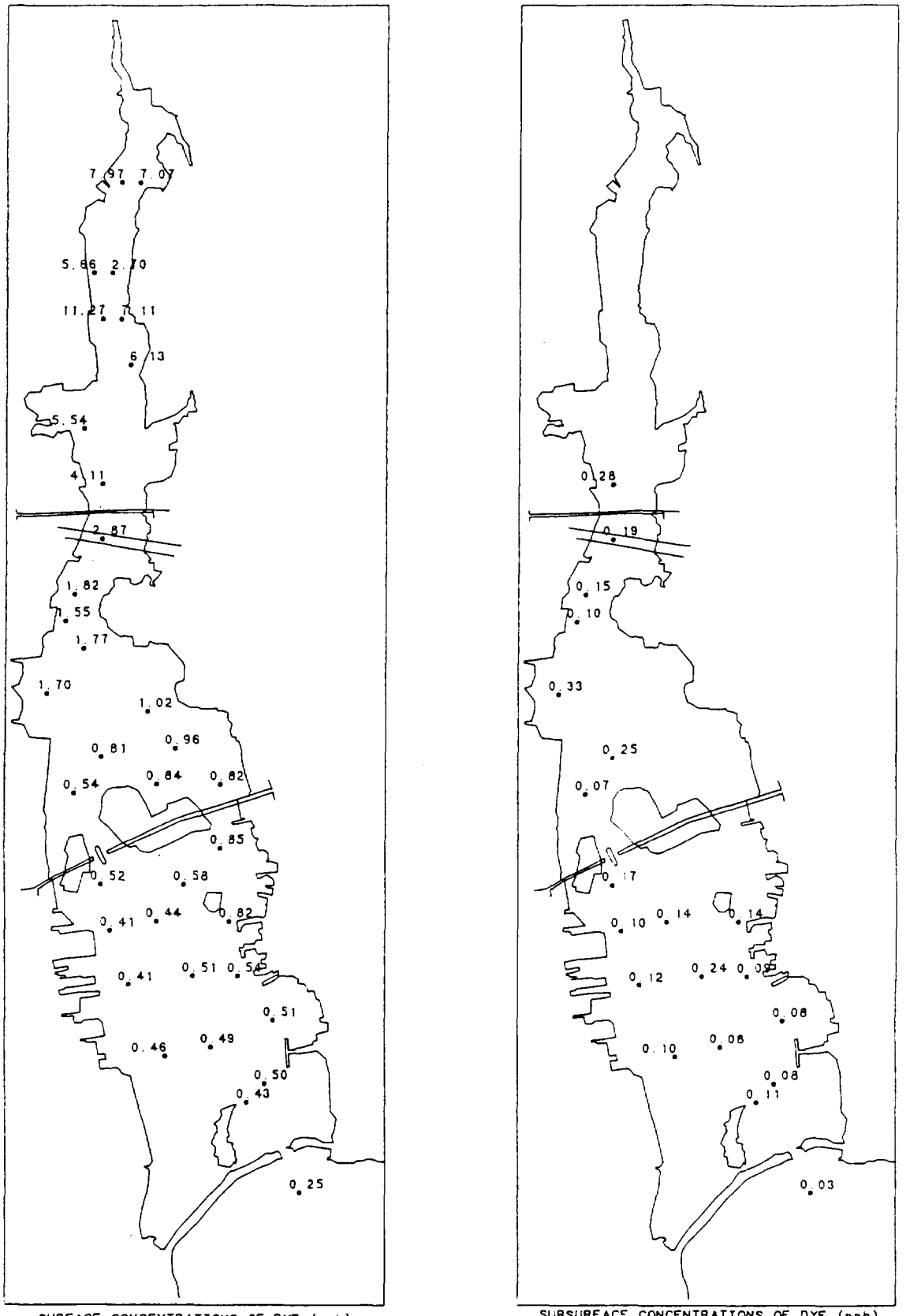
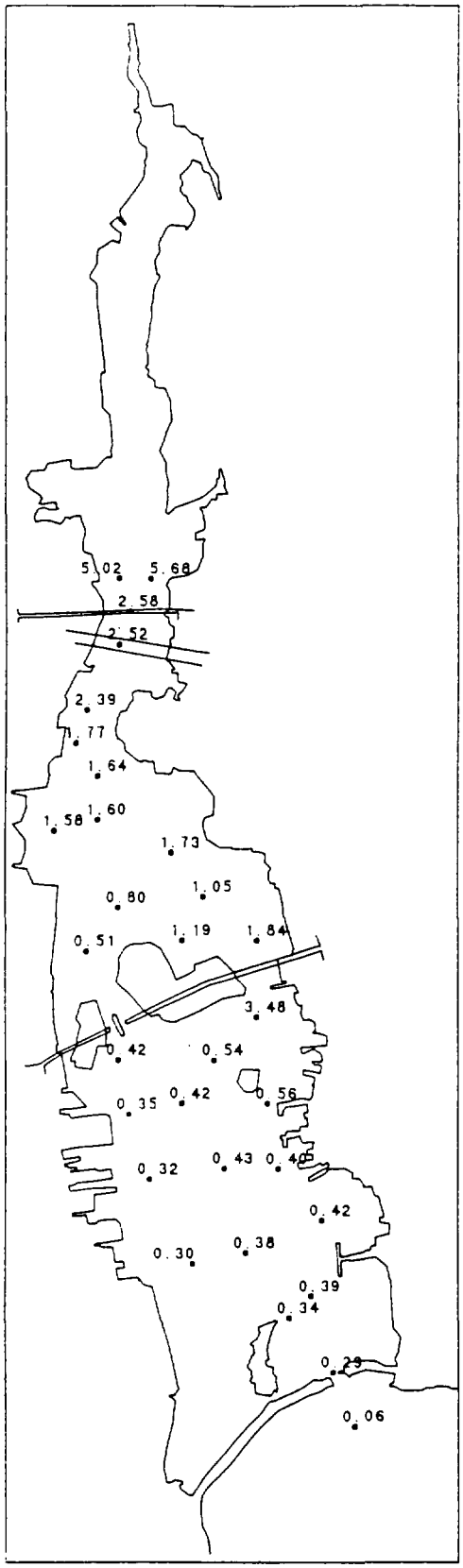
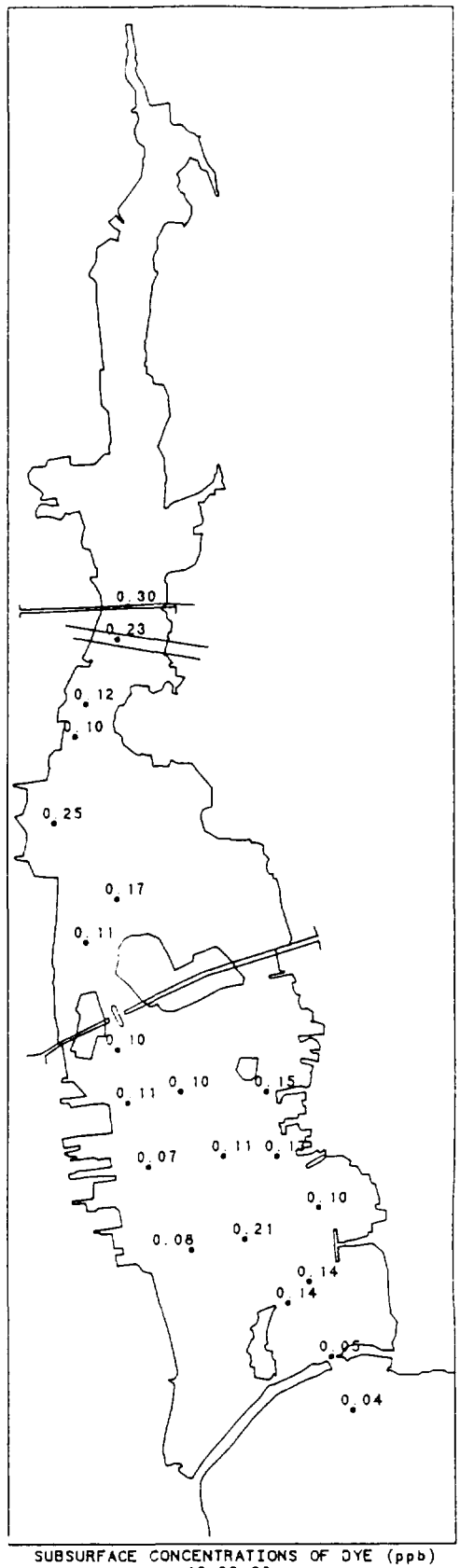


Figure 2.11 Measured dye concentrations (ppb) for the surface and subsurface, December 22, 1986.

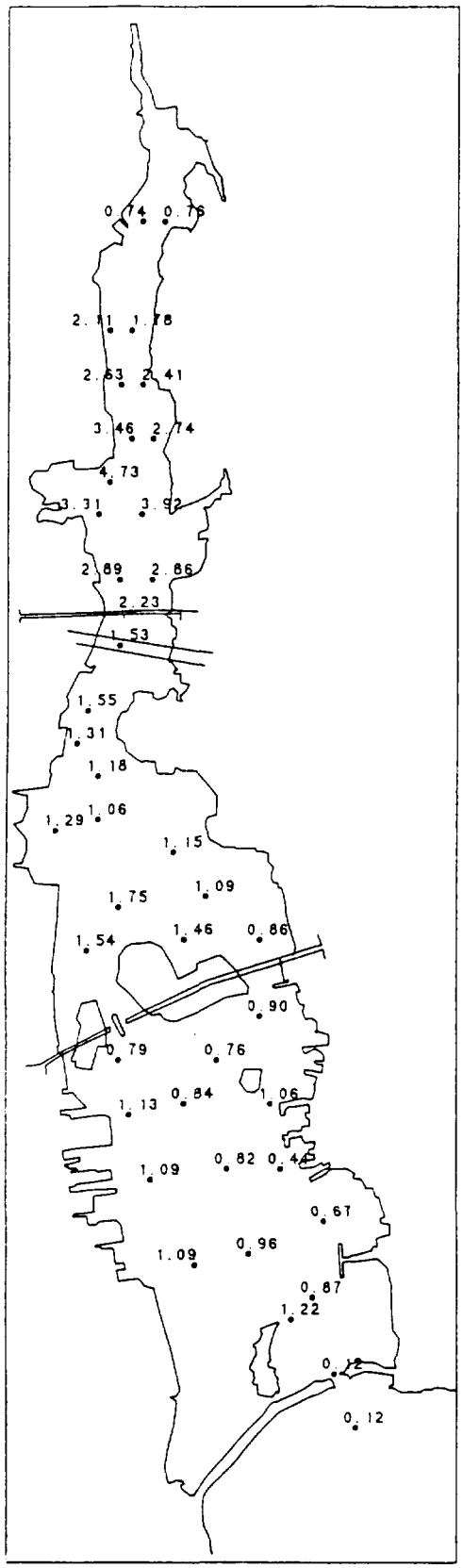


SURFACE CONCENTRATIONS OF DYE (ppb)
12-23-86

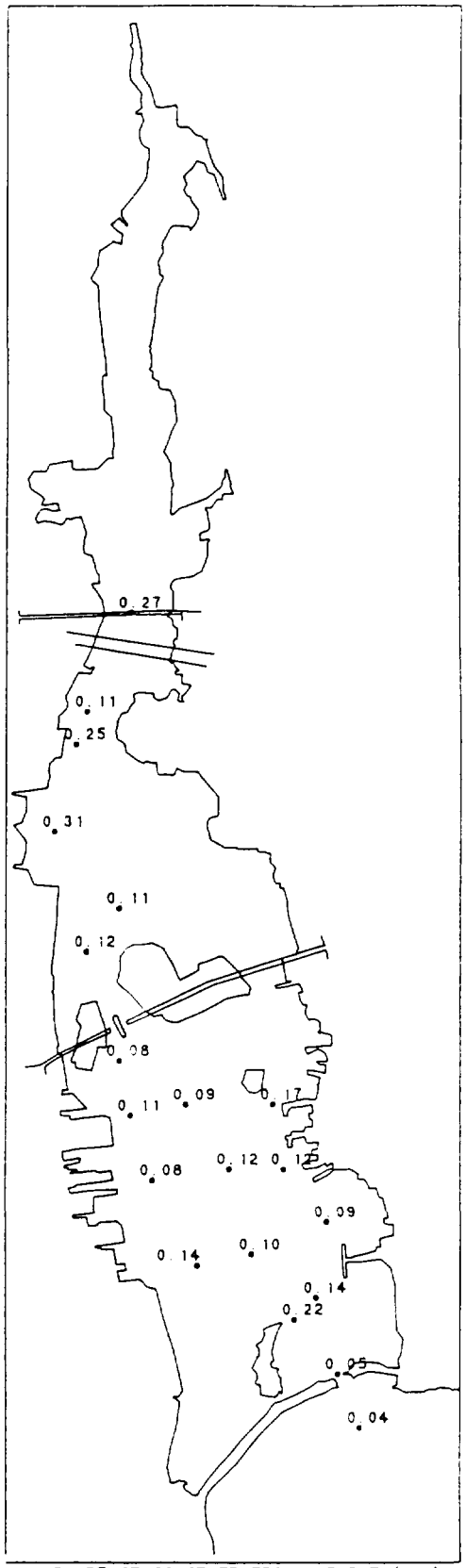


SUBSURFACE CONCENTRATIONS OF DYE (ppb)
12-23-86

Figure 2.12 Measured dye concentrations (ppb) for the surface and subsurface, December 23, 1986.



SURFACE CONCENTRATIONS OF DYE (ppb)
12-24-86



SUBSURFACE CONCENTRATIONS OF DYE (ppb)
12-24-86

Figure 2.13 Measured dye concentrations (ppb) for the surface and subsurface, December 24, 1986.

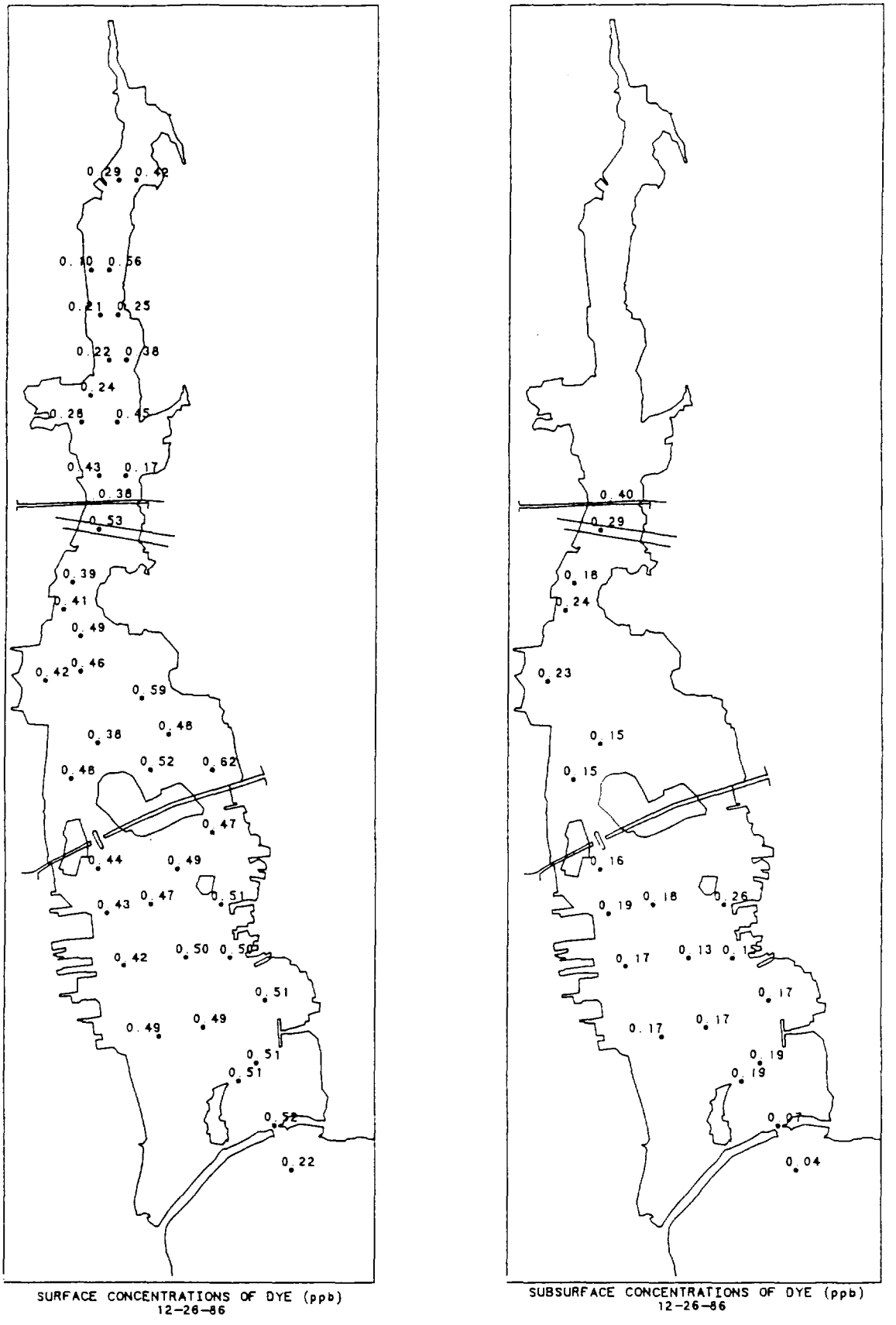


Figure 2.14 Measured dye concentations (ppb) for the surface and subsurface, December 26, 1986.

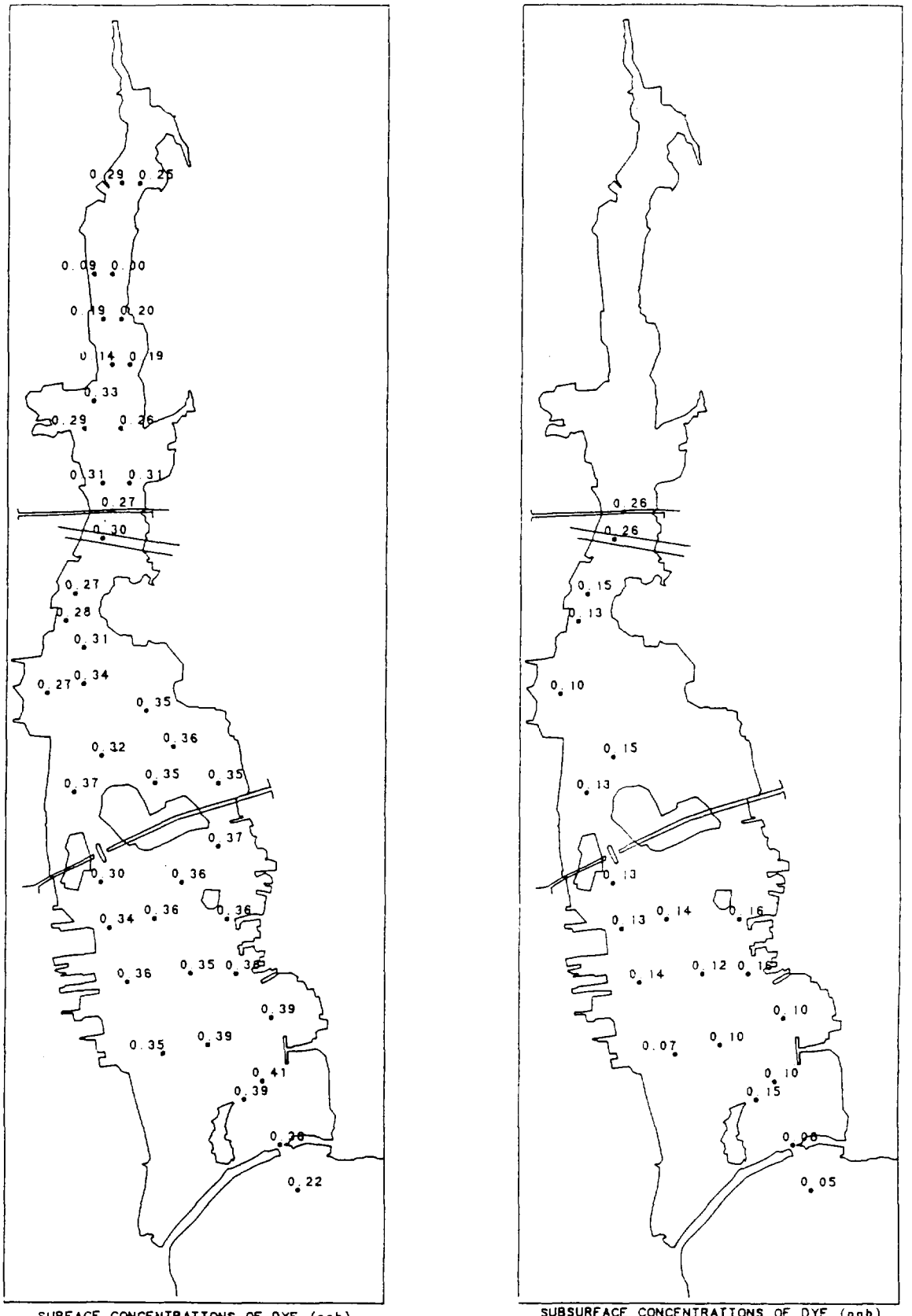
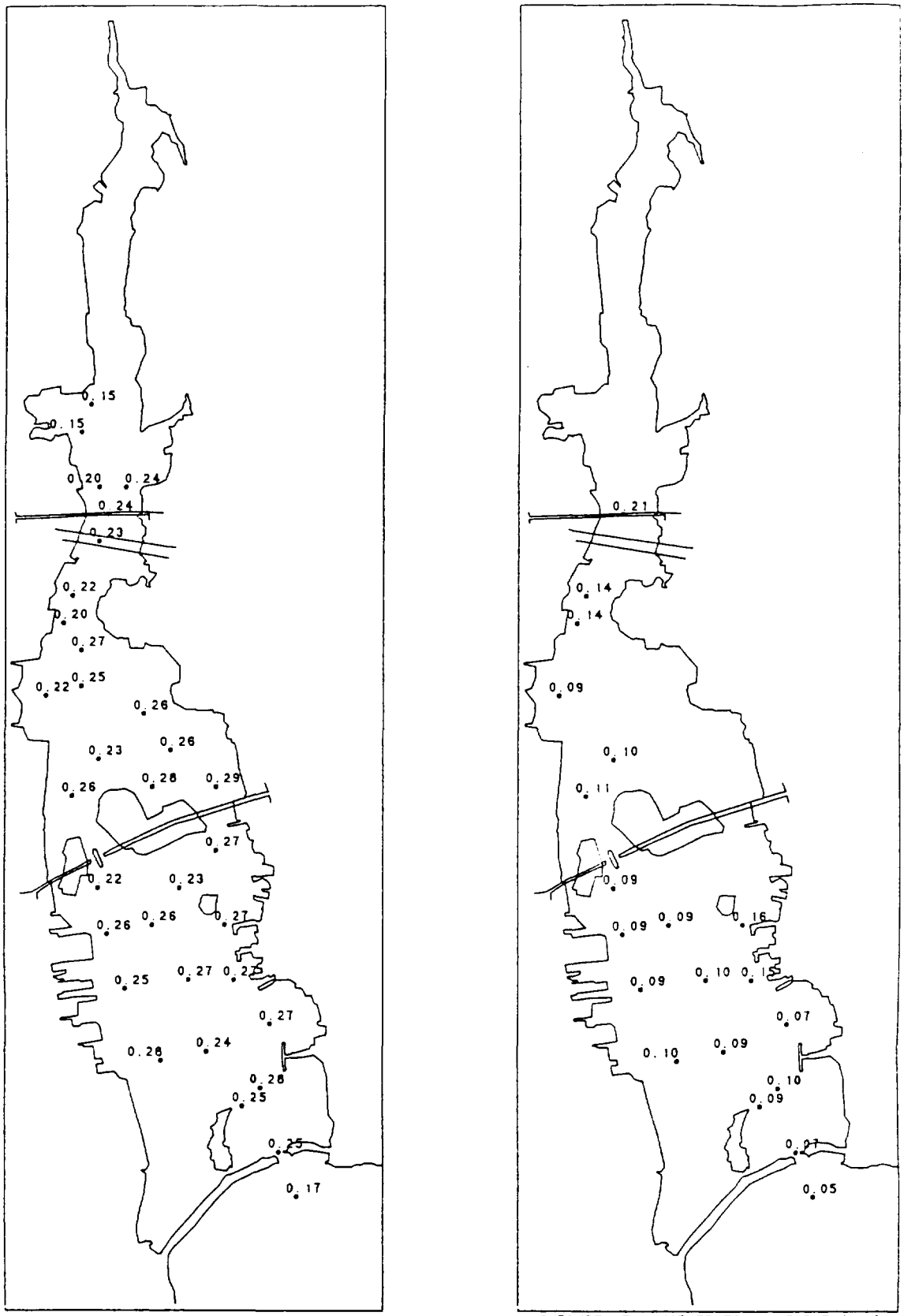


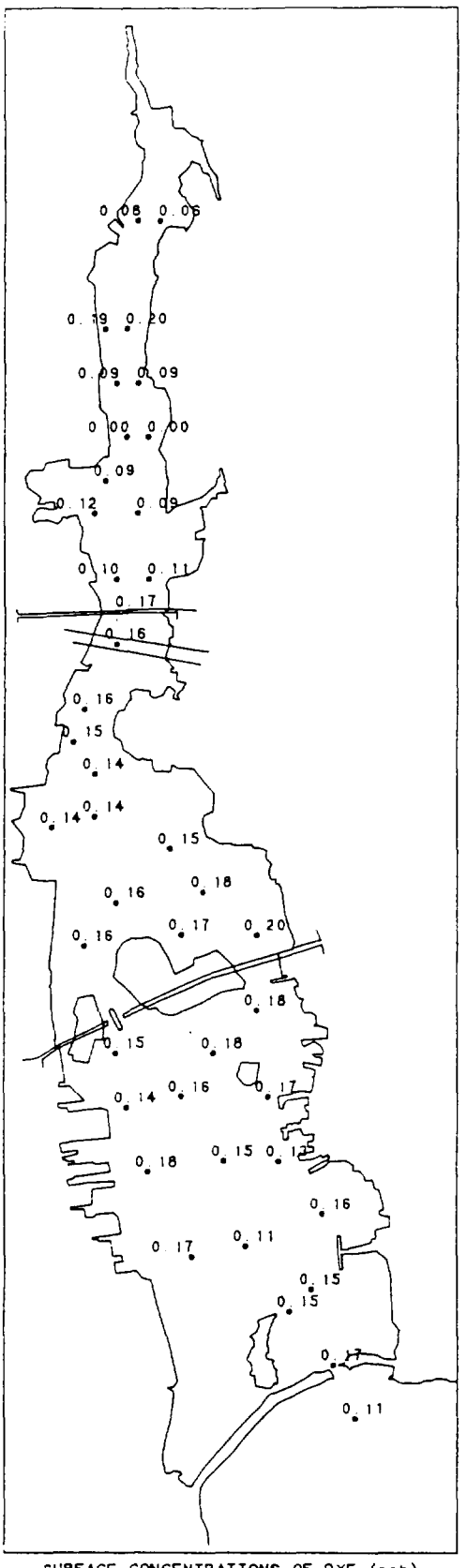
Figure 2.15 Measured dye concentrations (ppb) for the surface and subsurface, December 27, 1986.



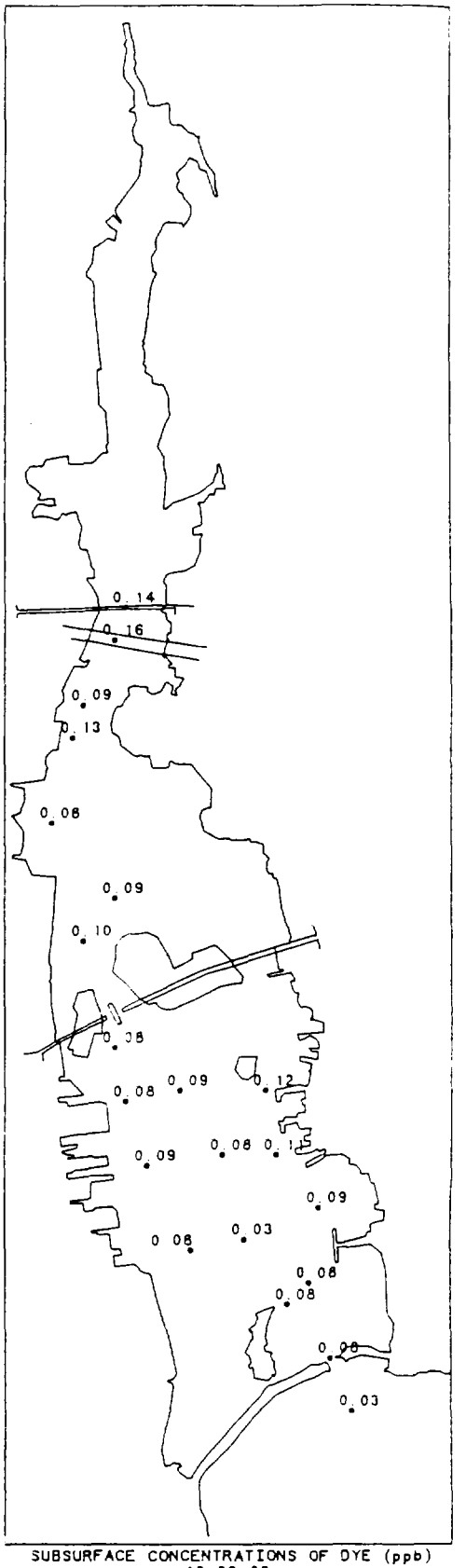
SURFACE CONCENTRATIONS OF DYE (ppb)
12-28-86

SUBSURFACE CONCENTRATIONS OF DYE (ppb)
12-28-86

Figure 2.16 Measured dye concentrations (ppb) for the surface and subsurface, December 28, 1986.



SURFACE CONCENTRATIONS OF DYE (ppb)
12-29-86



SUBSURFACE CONCENTRATIONS OF DYE (ppb)
12-29-86

Figure 2.17 Measured dye concentrations (ppb) for the surface and subsurface, December 29, 1986.

days, dye (Figure 2.7) reached the lower harbor. The concentrations show a decrease with distance down estuary and a strong gradient in the vertical. Over the next several days (Figures 2.8 - 2.10) the concentrations generally increase at all stations in the study area. By approximately December 21 (Figure 2.10), the concentrations in the estuary have reached an approximate steady state. This behavior is most clearly illustrated by plotting the average dye concentration in the lower (between the hurricane barrier and Popes Island, Stations 30-44, Figure 2.2) and the entire estuary as a function of time (Figure 2.18). The dye concentration is clearly seen to reach an approximate steady state by December 21, 1986. The lower estuary mean concentration is about 0.25 ppb while the value for the entire estuary is 0.53 ppb. The lower estuary response lags that for the entire system by 2-3 days. Once steady state is achieved, the concentration levels typically vary by not more than 10% of the mean value. The variability in the dye concentration fields over the last several days of the release is caused by changes in the tidal, wind, and river forcing of the circulation and dispersion processes (Figure 2.4).

Looking at the approximate steady state surface concentrations (Figure 2.10) levels on December 21, 1986, the values decrease by a factor of 2-2.5 in the upper pond; between the discharge site and Coggeshall Street Bridge. In the middle section of the harbor (Coggeshall Street Bridge to Rte. 6, Popes Island) the decrease is approximately a factor of 4 or 5. The lower harbor (Rte. 6 Bridge to the hurricane barrier) shows little concentration gradient with all levels typically within 10% of the mean. The concentration decreases substantially as one leaves the harbor. The concentration at the one station outside the harbor (Station 45) is quite

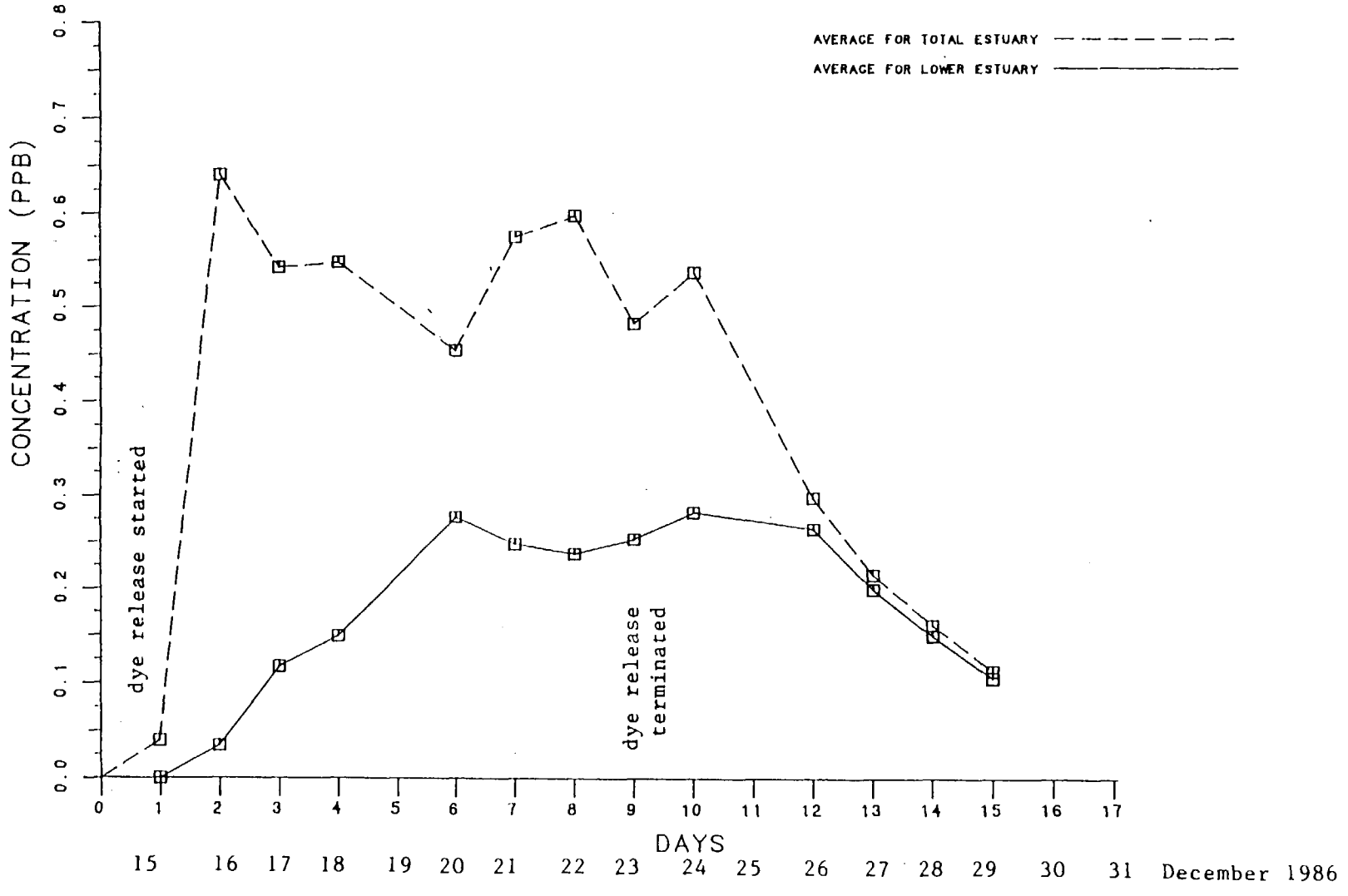


Figure 2.18 Entire estuary and lower harbor (hurricane barrier to Rte. 6 Bridge) mean dye concentrations versus time. The dye release was started on 15 December 1986 (Day 1) and terminated on 23 December 1986 (Day 9).

variable (Figures 2.10-2.12) due to the increased variability of circulation and dispersion processes in the area.

There is strong spatial variability in the upper estuary with concentration levels varying both laterally and down estuary. In the region closest to the dye release, and before extensive mixing has occurred, the dye concentrations measured are strongly subject to whether the local circulation and dispersion processes have brought dye into the vicinity of the measurement station. As one proceeds down estuary (mid and lower sections) the lateral variability decreases substantially due to increased lateral mixing. The generally lower concentrations on the western side of the mid-estuary section are caused by the more vigorous tidal currents and hence increased dispersion in the deeper dredged turning basin located to the west of Popes Island.

The subsurface levels show the same general trend of concentration gradients as the surface values; decreasing as one proceeds toward the hurricane barrier. The variability in the mid section of the estuary is mainly due to differences in water column depth. The lower harbor concentrations are approximately uniform.

Comparison of the surface to subsurface concentrations shows a factor of 4 or 5 decrease in the lower harbor and a factor of 10 in the mid-estuary section. No gradients are observed in these figures for the upper harbor or the eastern side of the estuary north of Popes Island because no data is available in what has been defined as the subsurface.

A closer inspection of the vertical gradients of concentration is provided by looking at the structure at selected stations proceeding down estuary. Concentration versus depth curves for Stations 8, 20, 40 and 45

(Figure 2.2) are shown in Figures 2.19, 20, 21, and 22, respectively. These stations were selected as being representative of the upper, mid, lower, and outer harbor. Vertical concentration profiles are shown from the initiation of the release (15 December 1986) until its termination (23 December 1986).

If we compare absolute levels between the figures we see a decrease in concentrations as one proceeds down estuary, both at the surface and bottom. The vertical concentration gradients are strongest in the upper estuary and decrease down estuary. The mixed layer depth is approximately 1 m in the upper and mid estuary, Stations 8 and 20, (Figures 2.19 and 2.20), and increases to 2-3 m in the lower estuary and outer harbor, Stations 40 and 45 (Figures 2.21 and 2.22). The time evolution of the release to steady state conditions is evident in the concentrations, particularly in Figures 2.20 and 2.21. The time to achieve steady state is consistent with the estuary mean concentration measure shown in Figure 2.18. Considerable variability is noted in the figures, particularly for the upper, lower, and outer harbor stations. The variability in the upper harbor is primarily caused by the initial mixing of the dye. That in the lower and outer harbor are likely caused by the variabilility in wind and tidal forcing.

The dye release was terminated on December 23, 1986 at 1300 EST and the dye concentrations were monitored until December 29, 1986. Figures 2.13 to 2.17 show the surface and subsurface dye concentration spatial distributions plots for each measurement day. The dye concentrations first decrease in the upper estuary with the termination of the release. Concentrations begin to decrease in the lower estuary on December 26, 1986

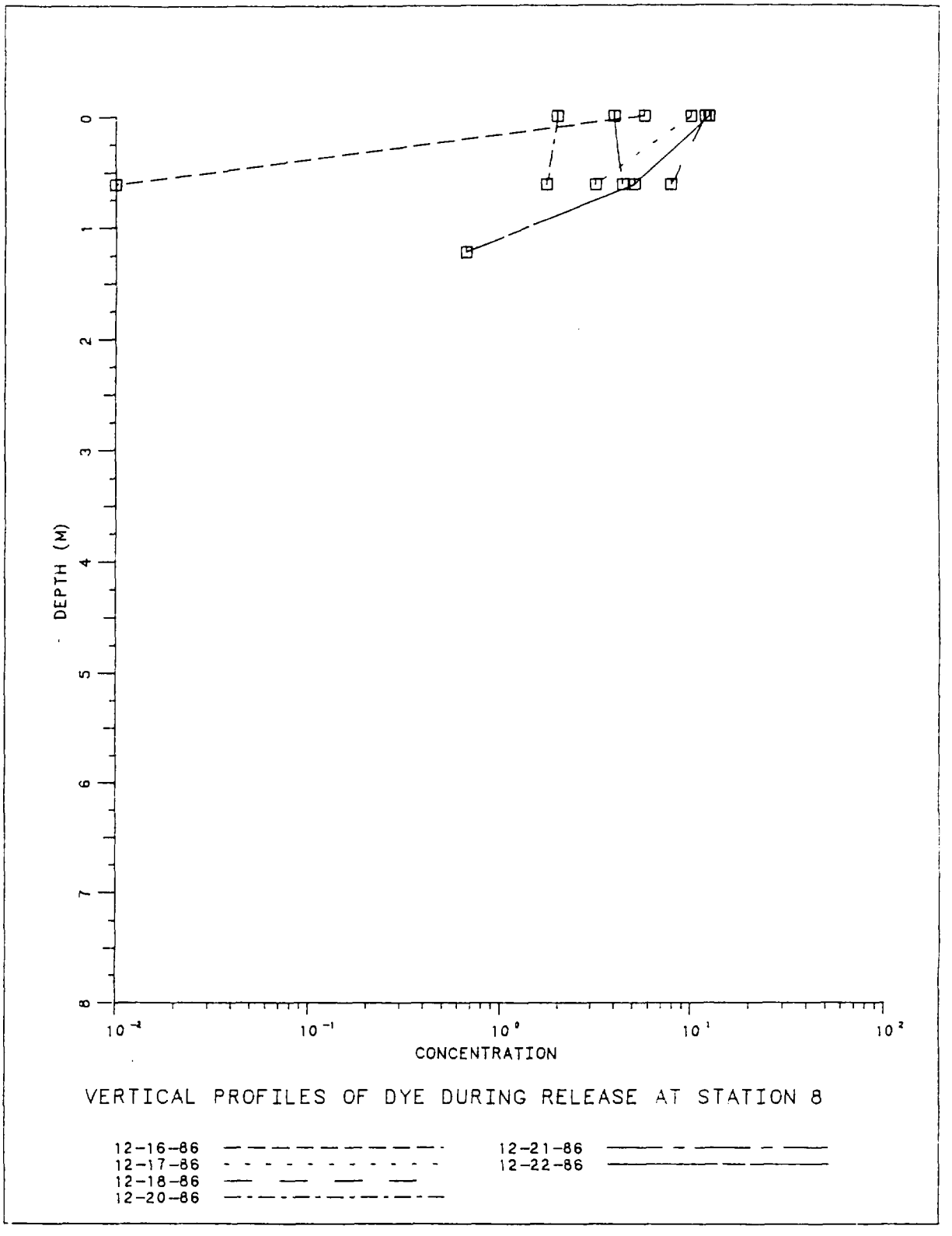


Figure 2.19 Dye concentration (ppb) versus depth (m) from 15 to 23 December 1986, Station 8 (Figure 2.2).

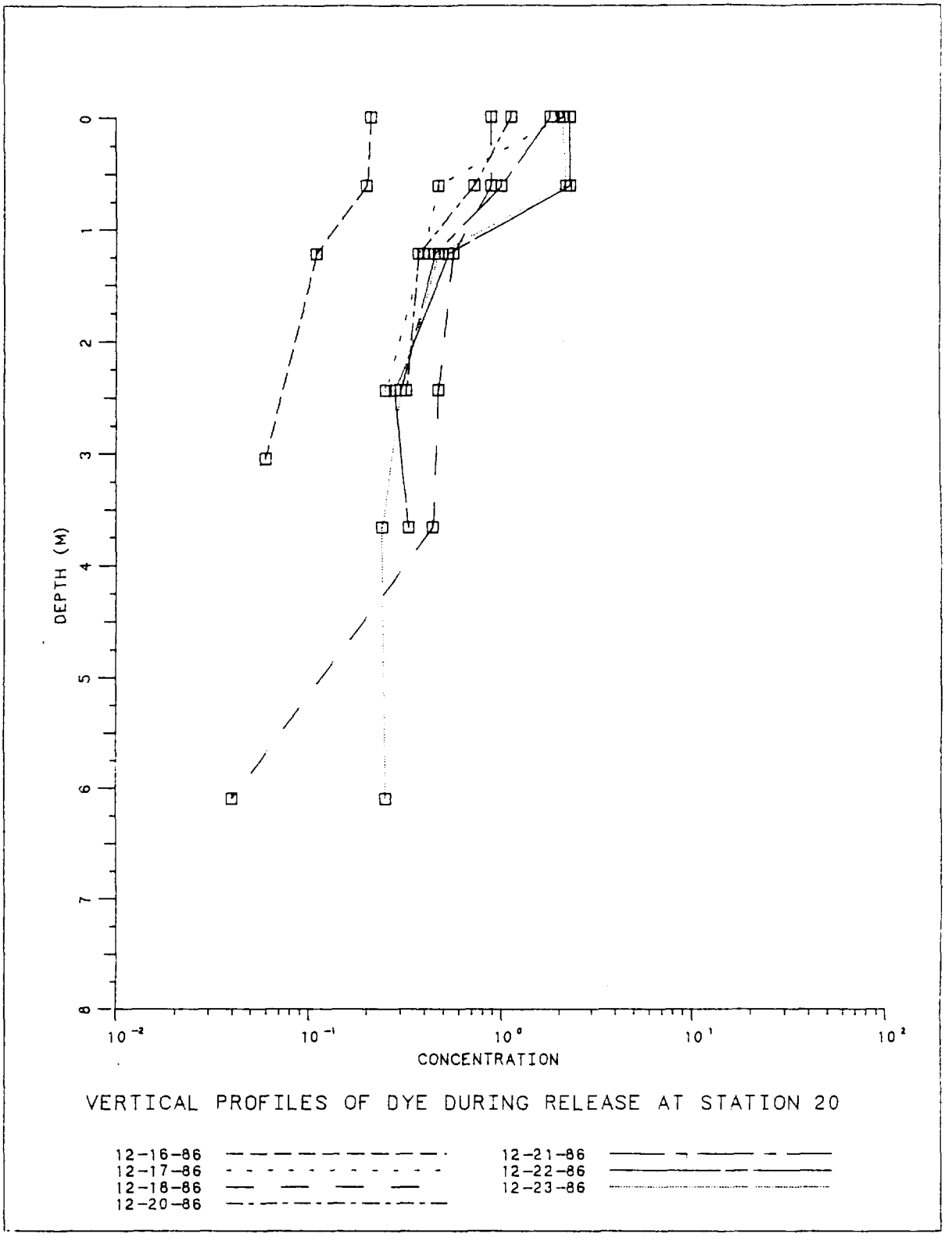


Figure 2.20 Dye concentration (ppb) versus depth (m) from 15 to 23 December 1986, Station 20 (Figure 2.2).

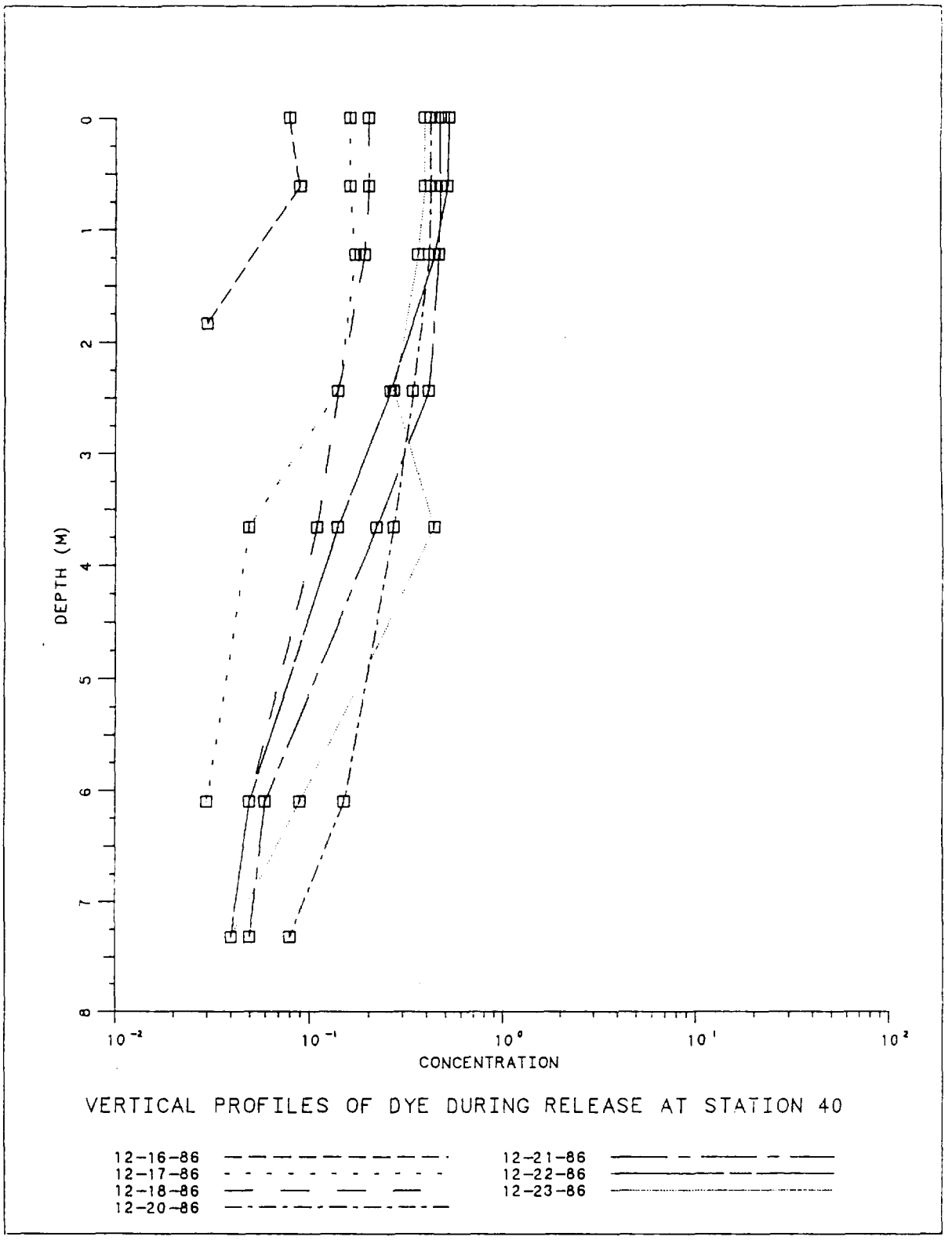


Figure 2.21 Dye concentration (ppb) versus depth (m) from 15 to 23 December 1986, Station 40 (Figure 2.2).

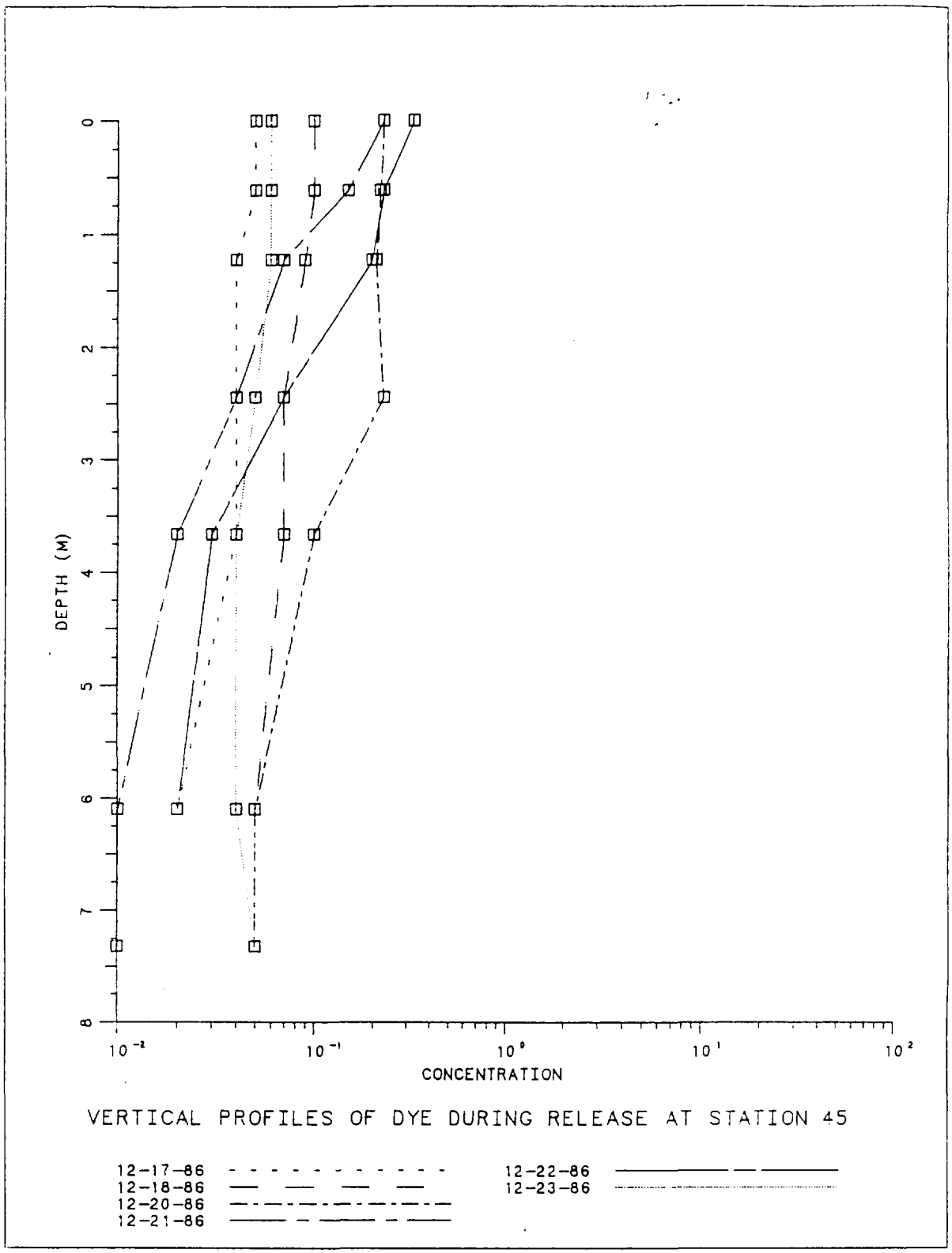


Figure 2.22 Dye concentration (ppb) versus depth (m) from 15 to 23 December 1986, Station 45 (Figure 2.2).

(Figure 2.14) and continue to decrease through the end of the measurement program. The vertical gradients tend to be maintained at their typical earlier levels; surface concentrations being 3-4 times those at the subsurface.

The flushing of dye from the estuary is clearly shown in Figure 2.18. The mean estuary and lower harbor concentration levels show a well behaved decrease in time; the lower harbor lagging the estuary mean response by approximately 2 days. Based on this concentration decrease rate, the flushing time for the estuary is estimated to be 2.4 days with a correlation coefficient (R) of 0.99988. This compares to a tidal flushing time of 1.9 days and agrees with the known theoretical result (Officer, 1976) that the tidal prism flushing is the minimum for the system (i.e. the shortest possible flushing time).

The vertical structure of the concentration field at Stations 8, 20, 40, and 45 are shown in Figures 2.23 - 2.26 and are similar in format to those presented in Figures 2.19 - 2.22 but for the post dye release time period. The vertical structure of the curves is similar to the "during dye release" profiles (Figures 2.23-2.26). The concentration levels at all stations are observed to decrease with time. The upper estuary stations show the most dramatic decreases at the earliest times. The variability is typical of the "during dye release" plots.

To further illustrate the vertical structure of the dye, Figures 2.27-2.37 show the dye concentration contours on a vertical transect along the estuary centerline. The figures represent the results of the daily dye sampling from 17-29 December 1986. The 15-16 December 1986 data sets are not presented because they are of limited interest in the present context.

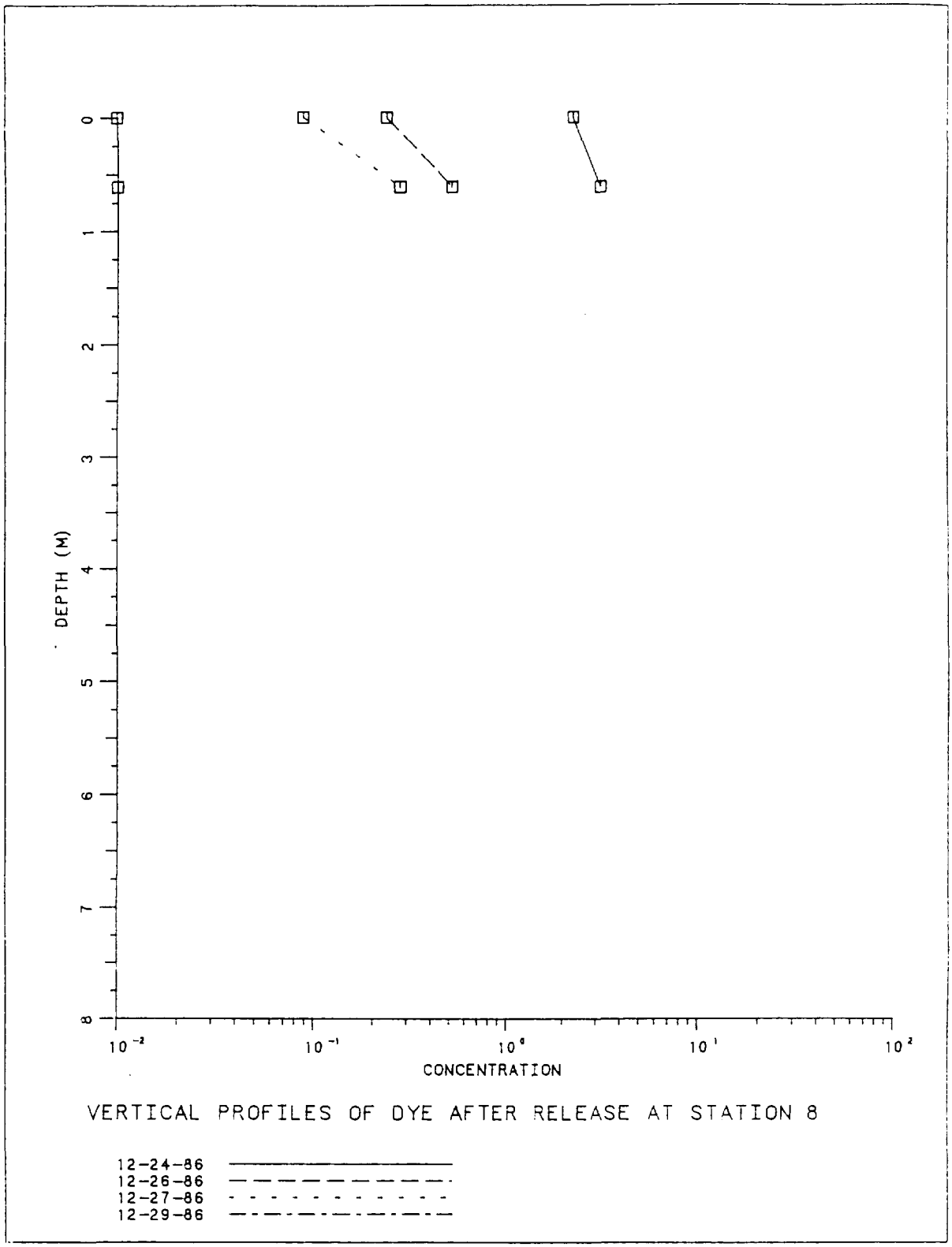


Figure 2.23 Dye concentration (ppb) versus depth (m) from 24 to 29 December 1986, Station 8 (Figure 2.2).

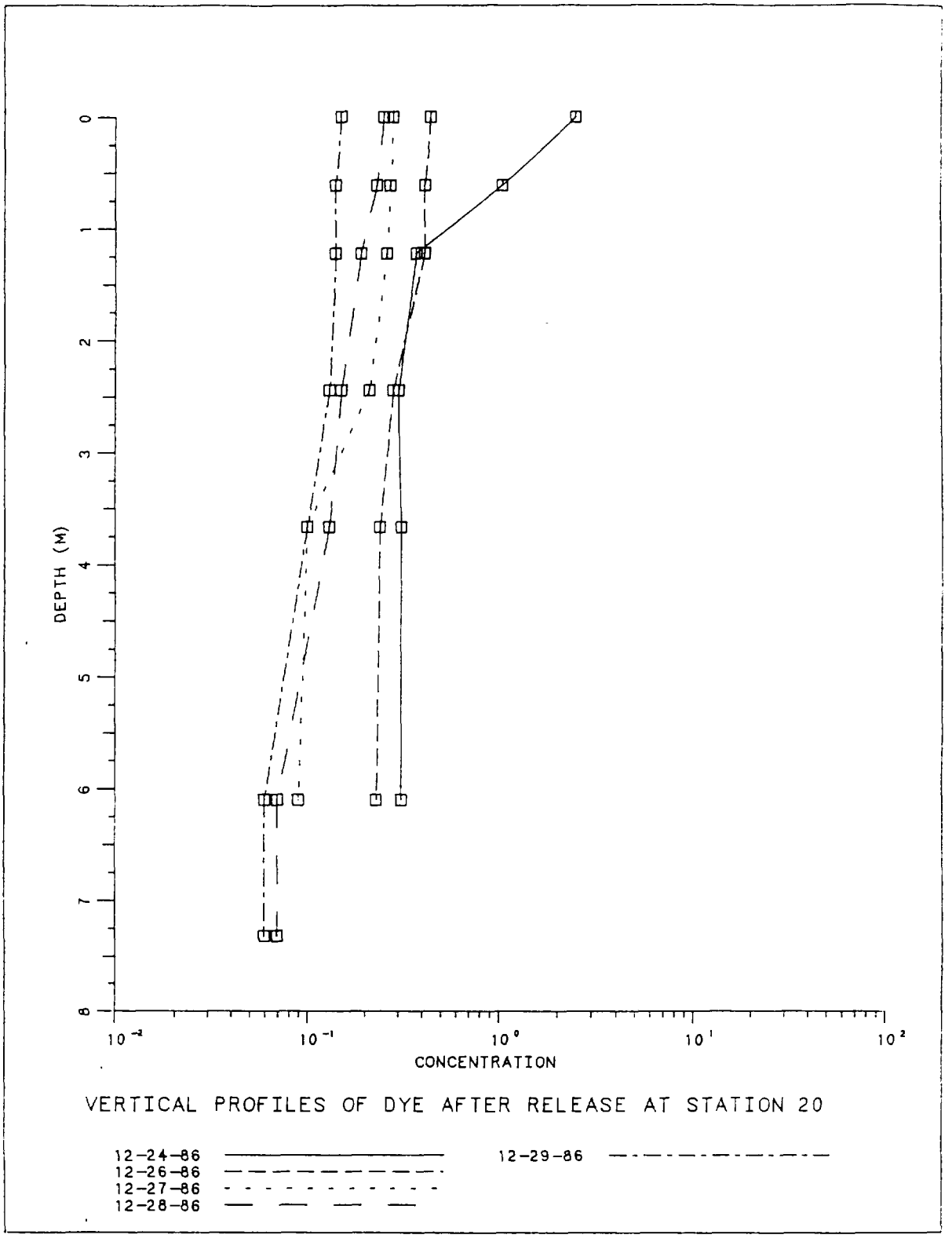


Figure 2.24 Dye concentration (ppb) versus depth (m) from 24 to 29 December 1986, Station 20 (Figure 2.2).

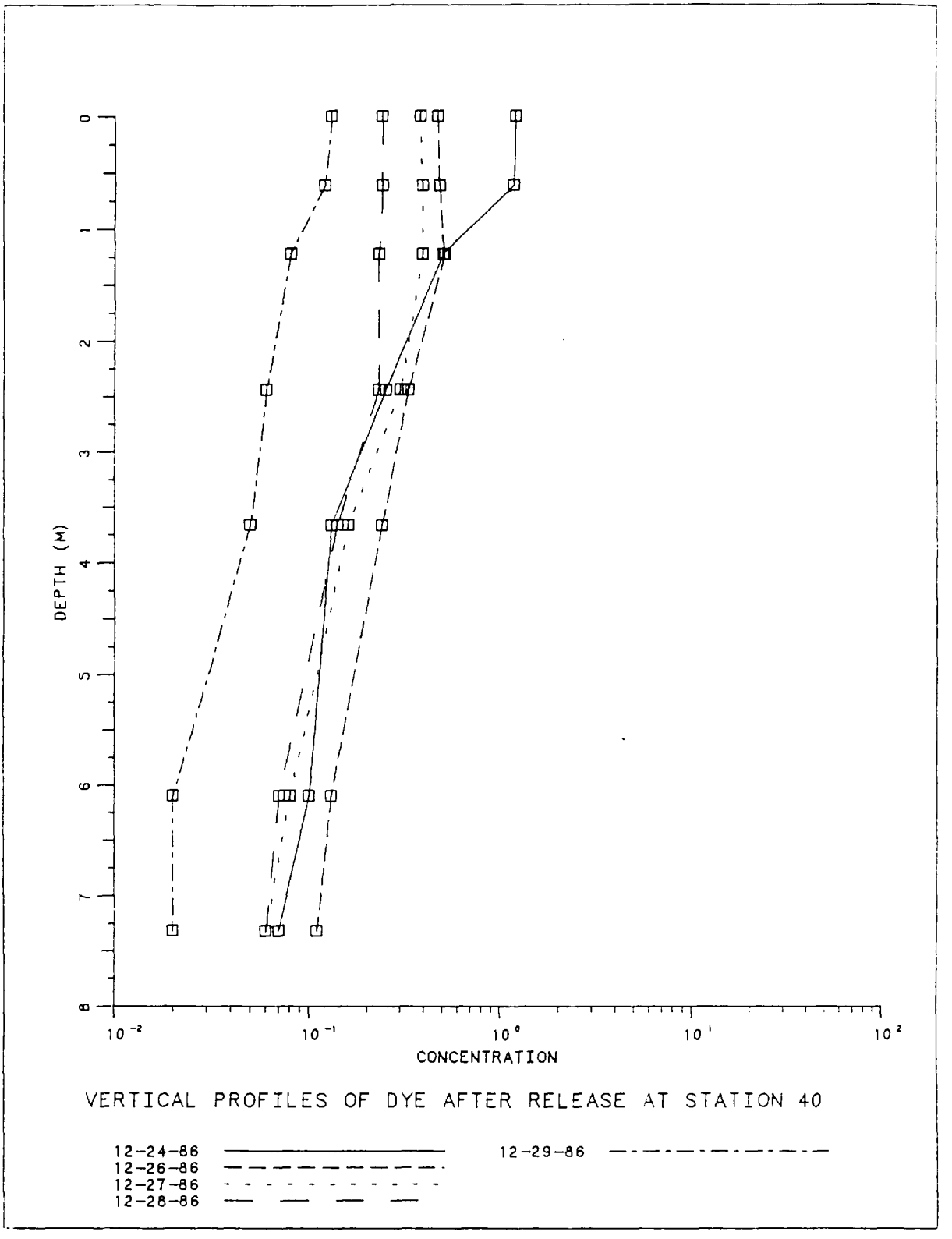


Figure 2.25 Dye concentration (ppb) versus depth (m) from 24 to 29 December 1986, Station 40 (Figure 2.2).

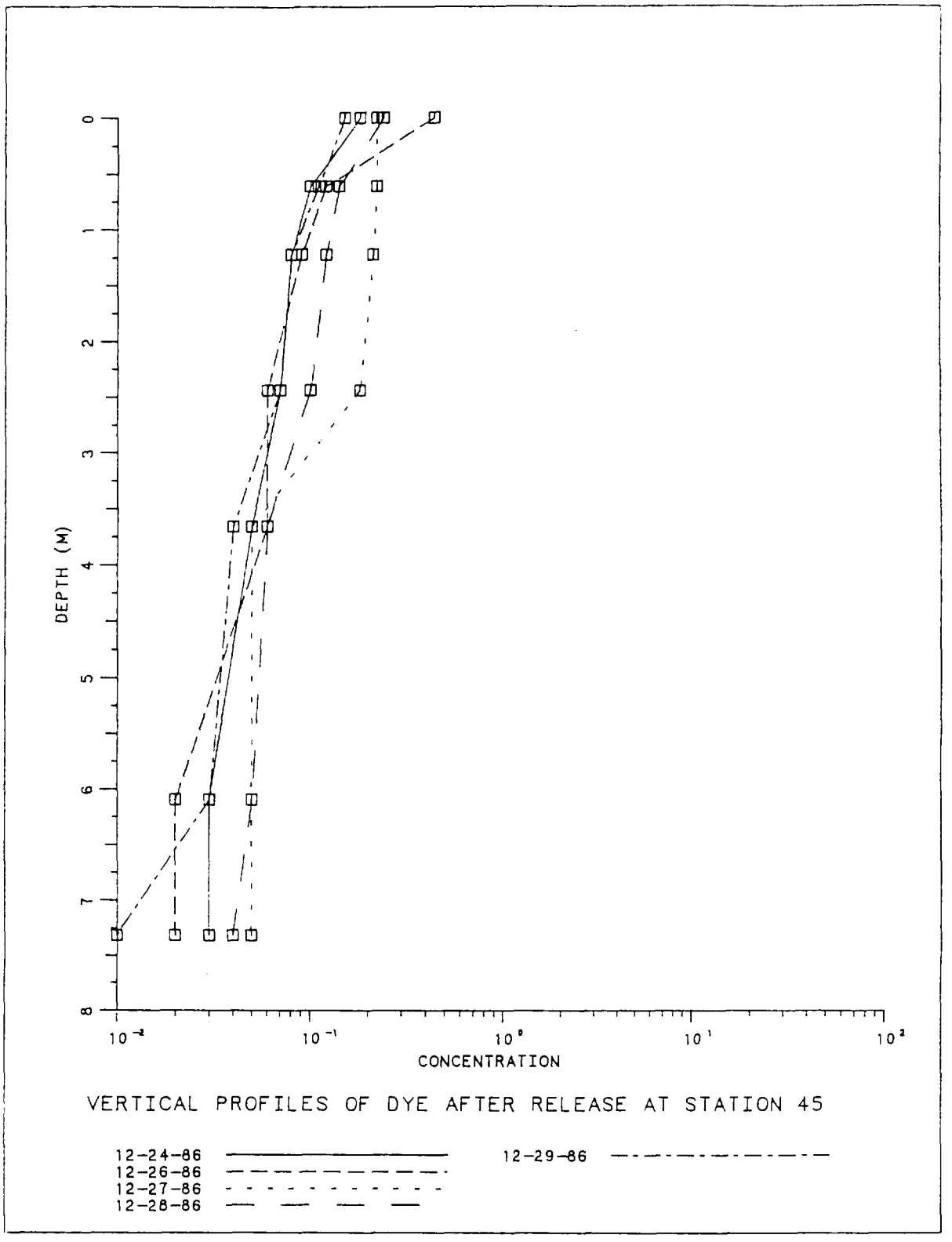


Figure 2.26 Dye concentration (ppb) versus depth (m) from 24 to 29 December 1986, Station 45 (Figure 2.2).

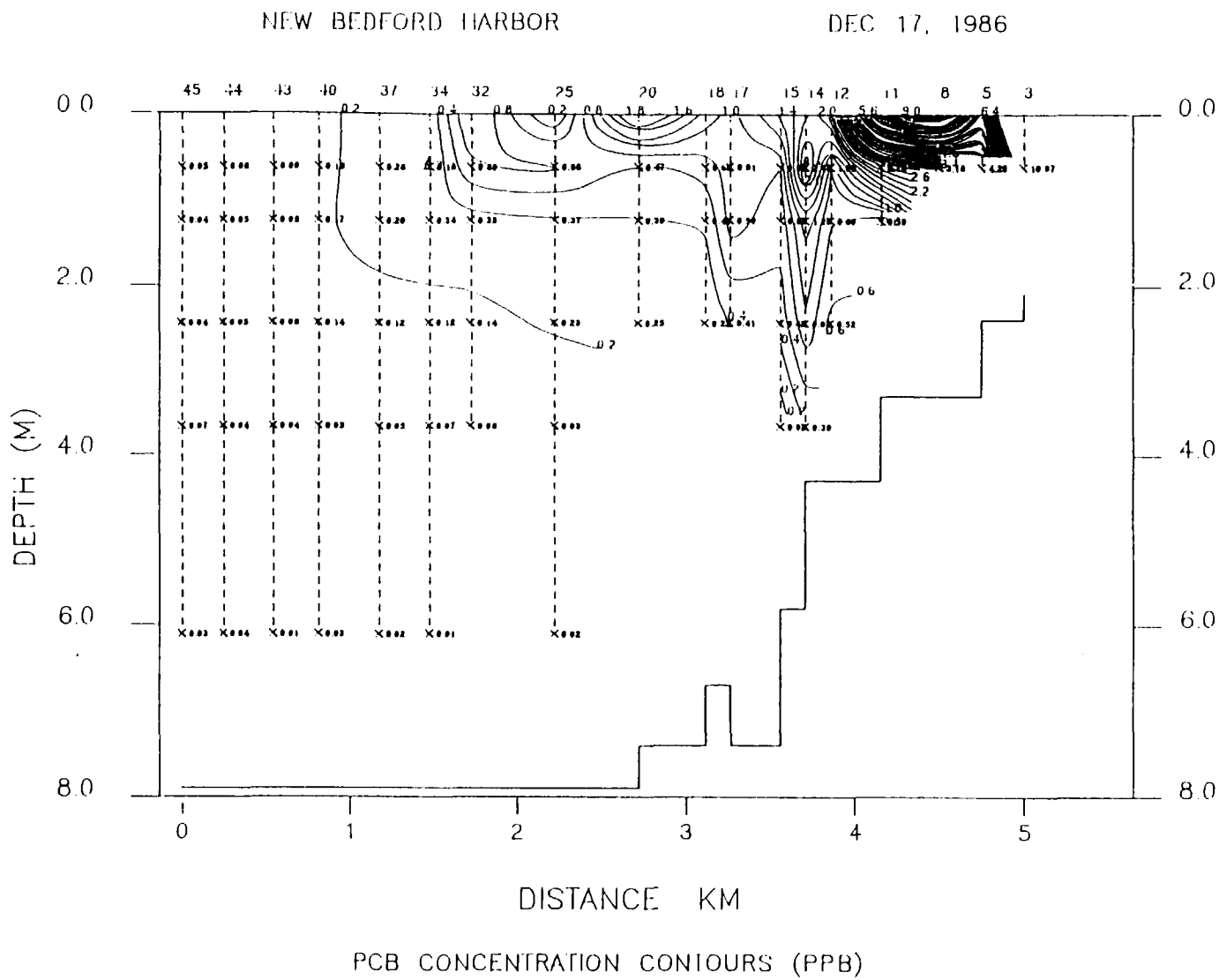


Figure 2.27. Laterally and vertically averaged observed dye concentration (ppb) versus longitudinal distance (km) from 15 to 23 December 1986.

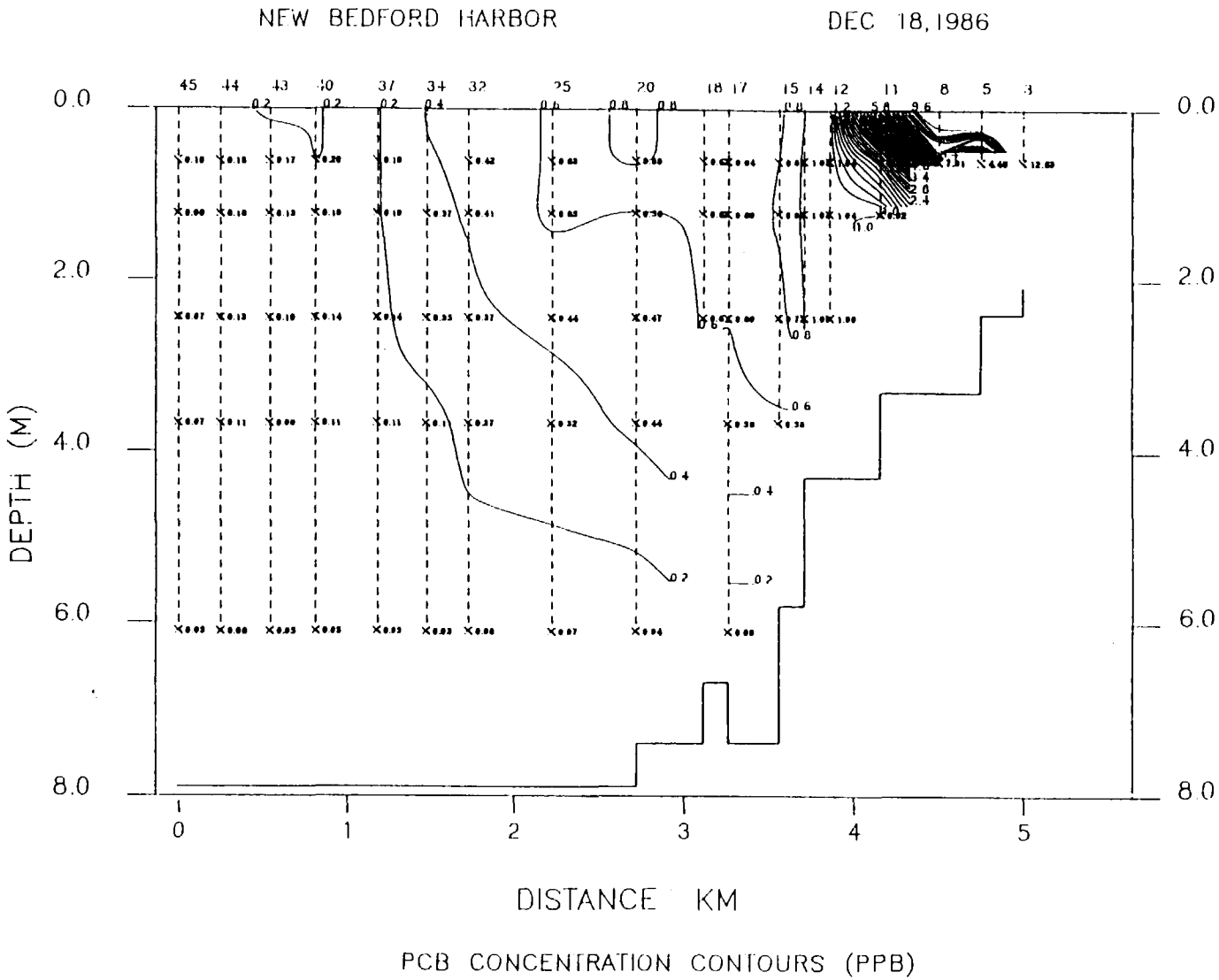


Figure 2.28. Laterally and vertically averaged observed dye concentration (ppb) versus longitudinal distance (km) from 24 to 29 December 1986.

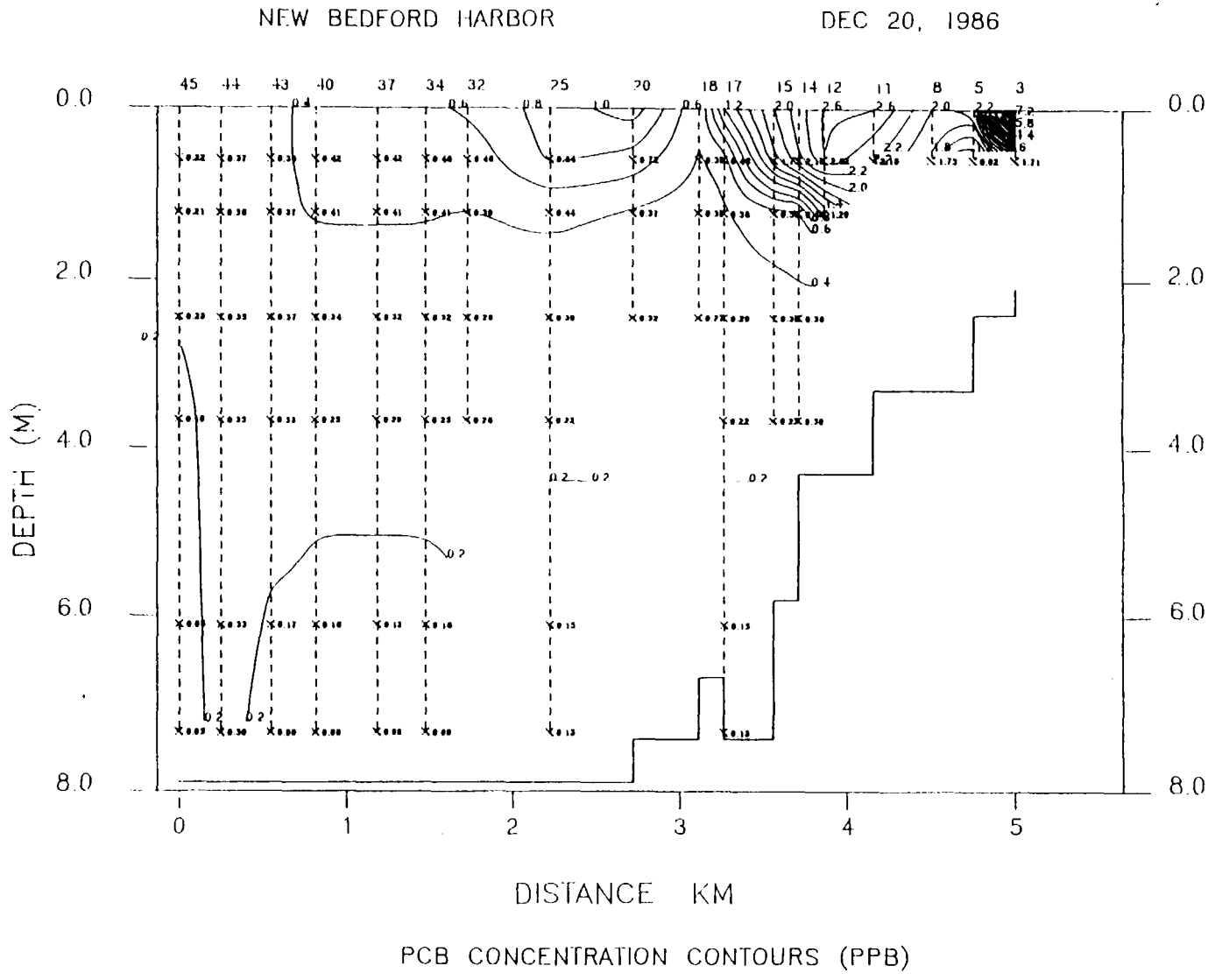


Figure 2.29. Laterally and vertically averaged observed dye concentration, dispersion model predictions (ASA, 1986) and observed PCB concentrations (ng/l) versus longitudinal distance (km).

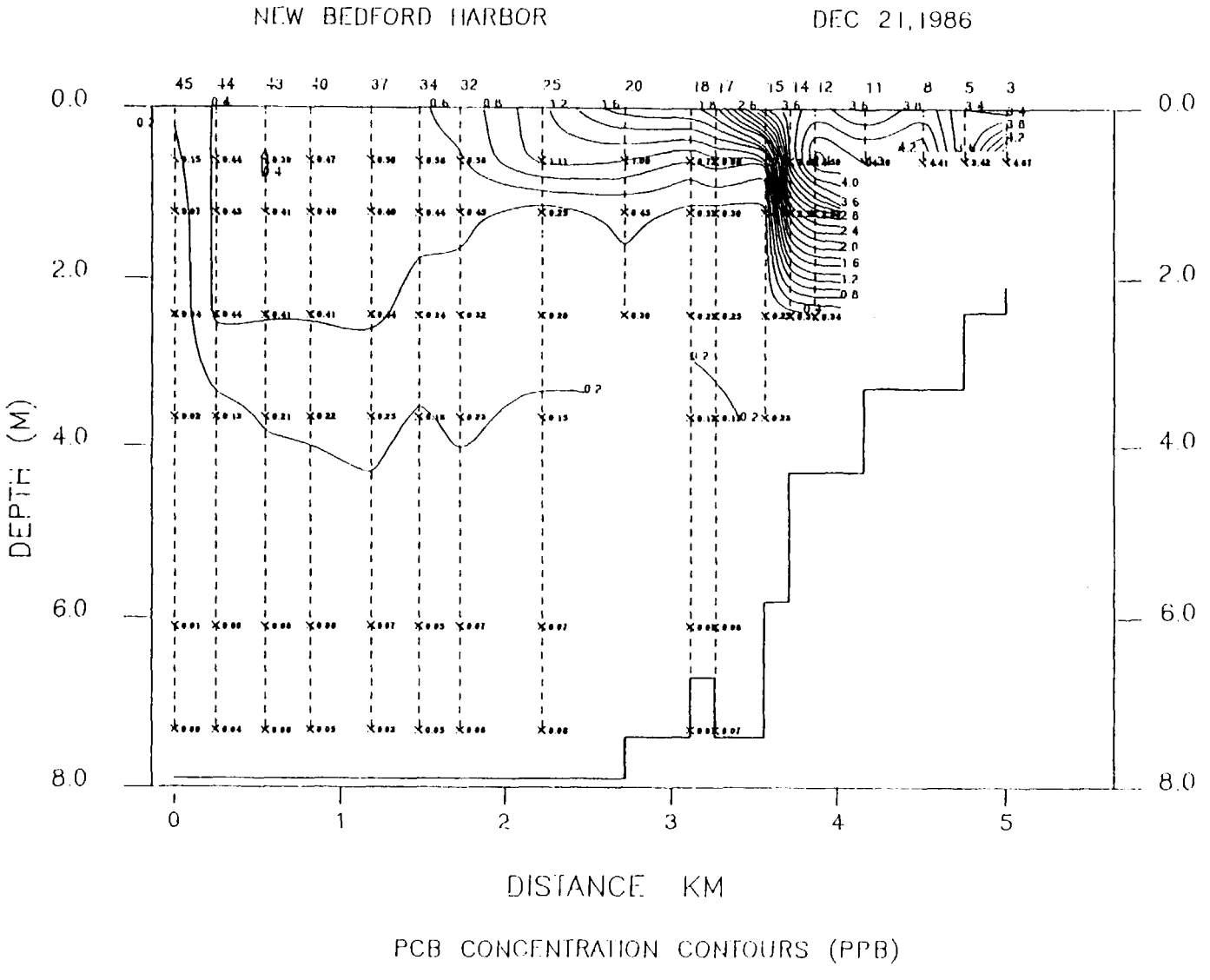


Figure 2.30 Vertical transect of dye concentration contours (ppb) versus longitudinal distance (km) along the estuary centerline, December 21, 1986. Station numbers are noted at the top of the graph. (Figure 2.2).

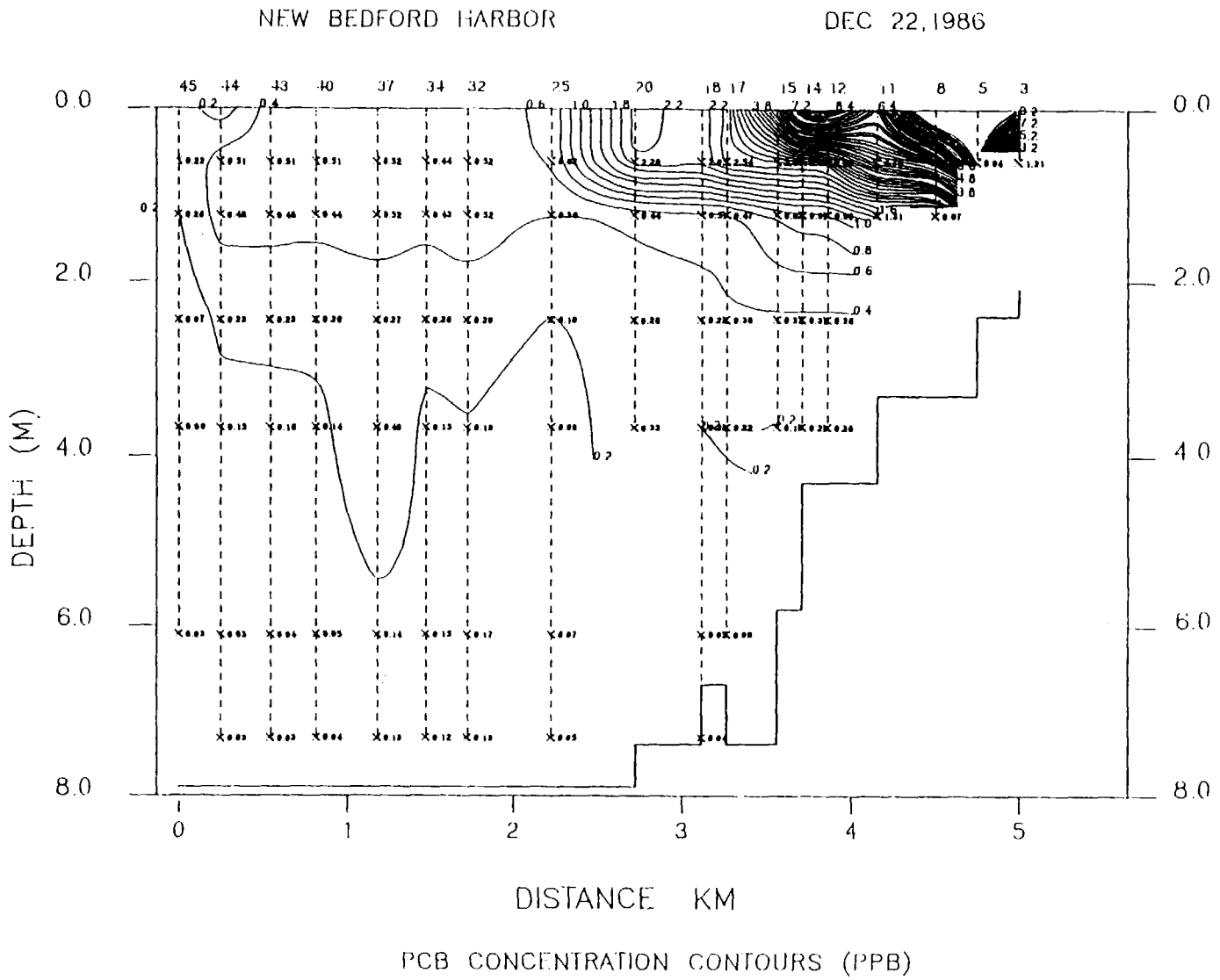


Figure 2.31 Vertical transect of dye concentration contours (ppb) versus longitudinal distance (km) along the estuary center line, December 22, 1986. Station numbers are noted at the top of the graph (Figure 2.2).

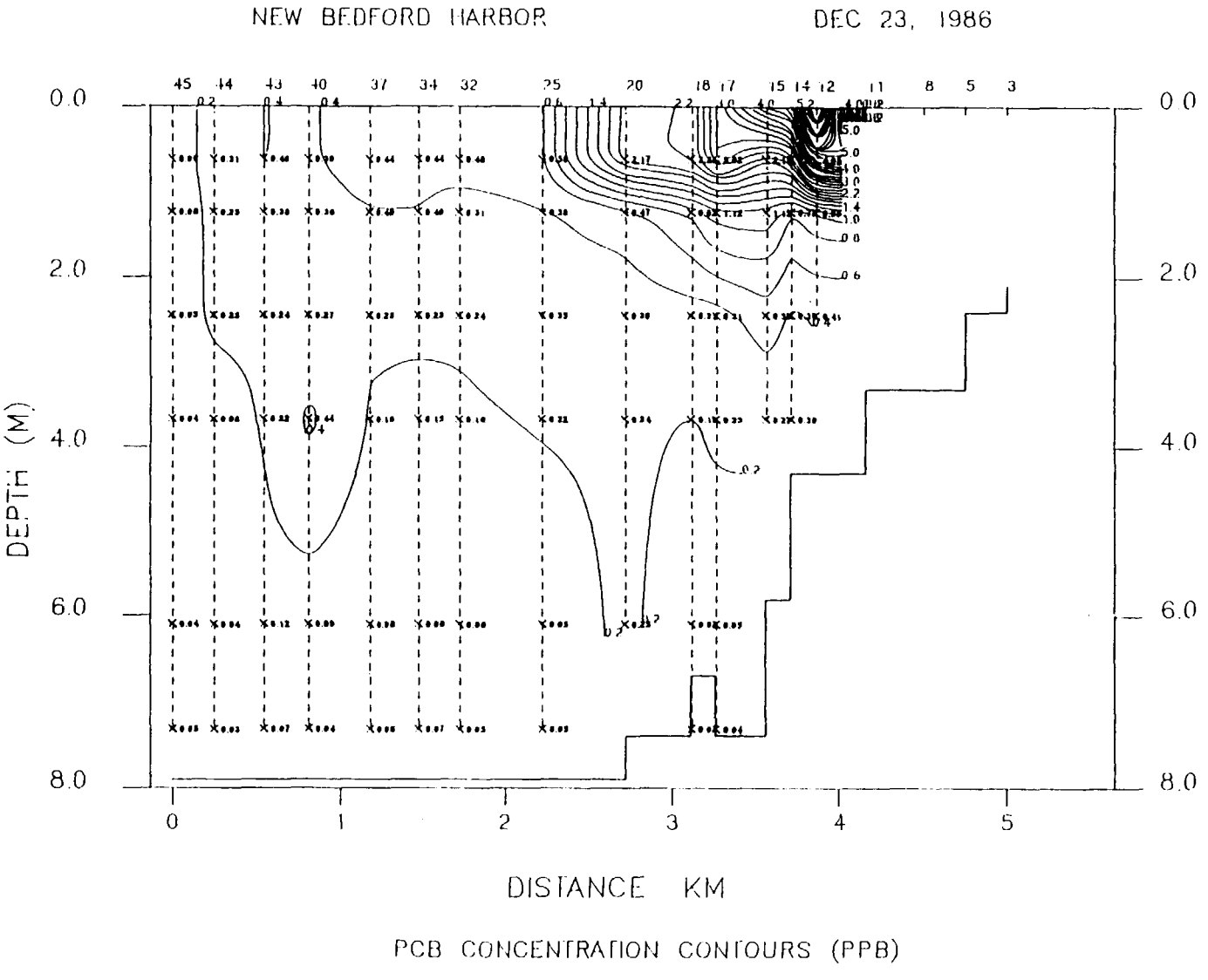


Figure 2.32 Vertical transect of dye concentration contours (ppb) versus longitudinal distance (km) along the estuary center line, December 23, 1986. Station numbers are noted at the top of the graph (Figure 2.2).

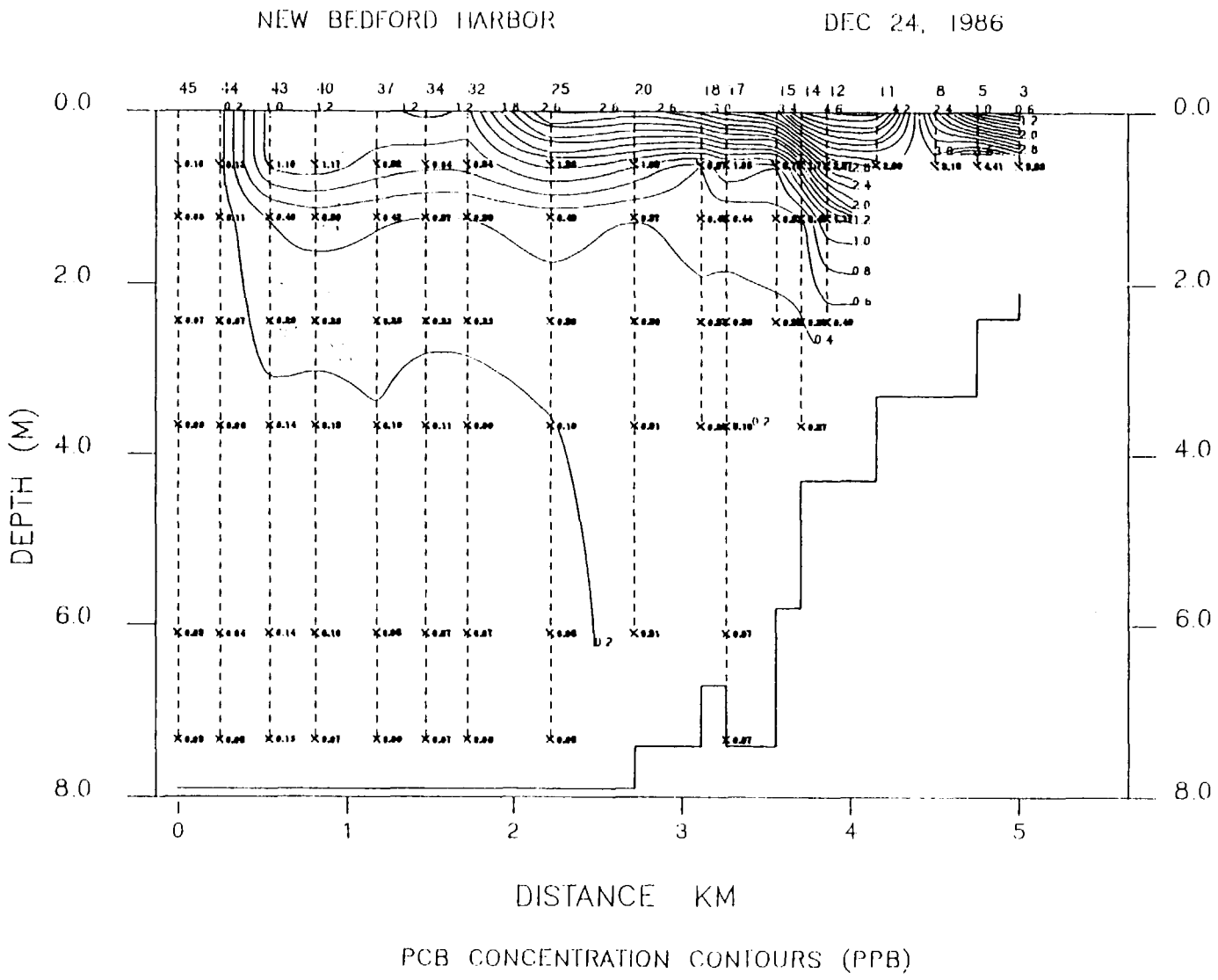


Figure 2.33 Vertical transect of dye concentration contours (ppb) versus longitudinal distance (km) along the estuary center line, December 24, 1986. Station numbers are noted at the top of the graph (Figure 2.2).

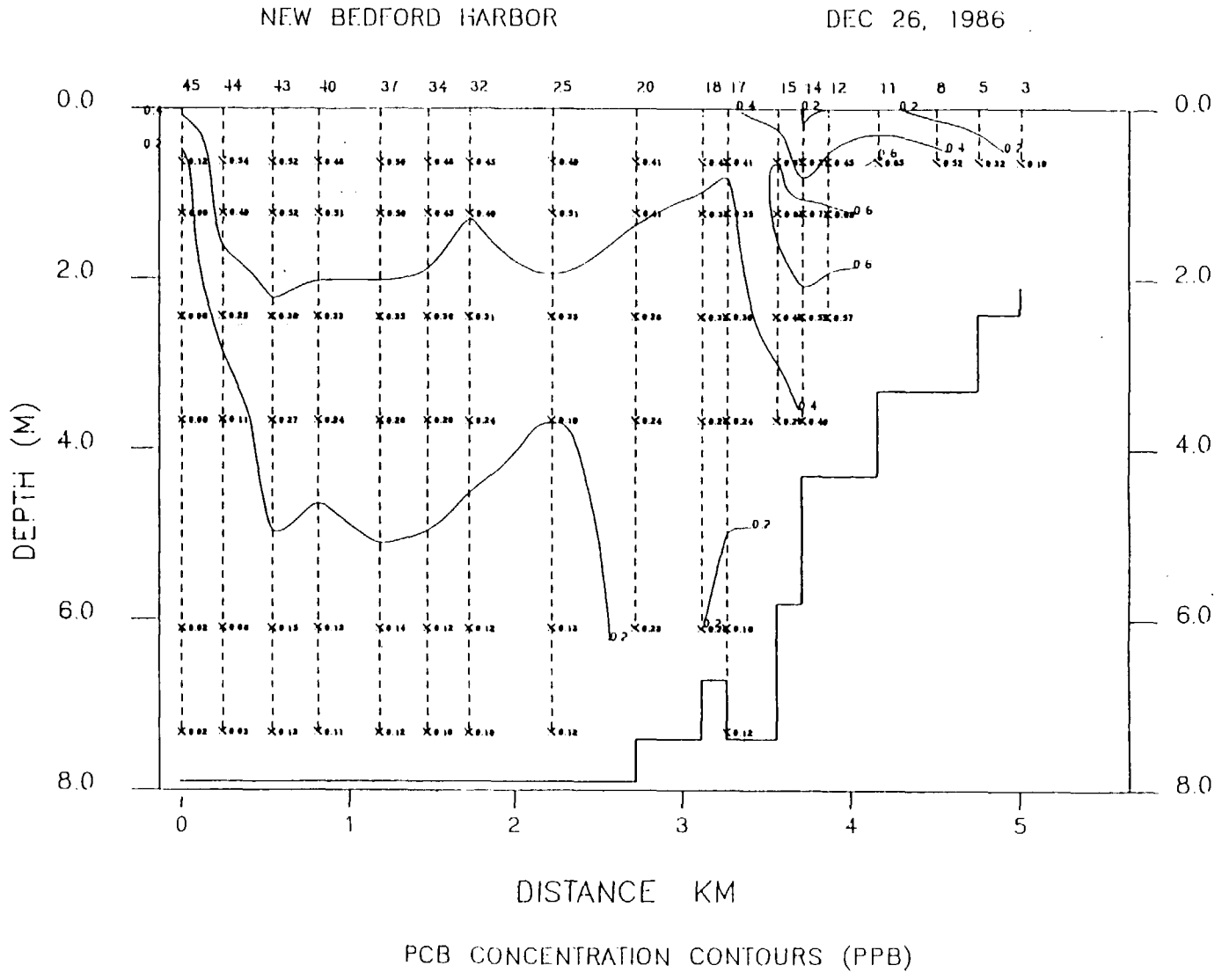


Figure 2.34 Vertical transect of dye concentration contours (ppb) versus longitudinal distance (km) along the estuary center line, December 26, 1986. Station numbers are noted at the top of the graph (Figure 2.2).

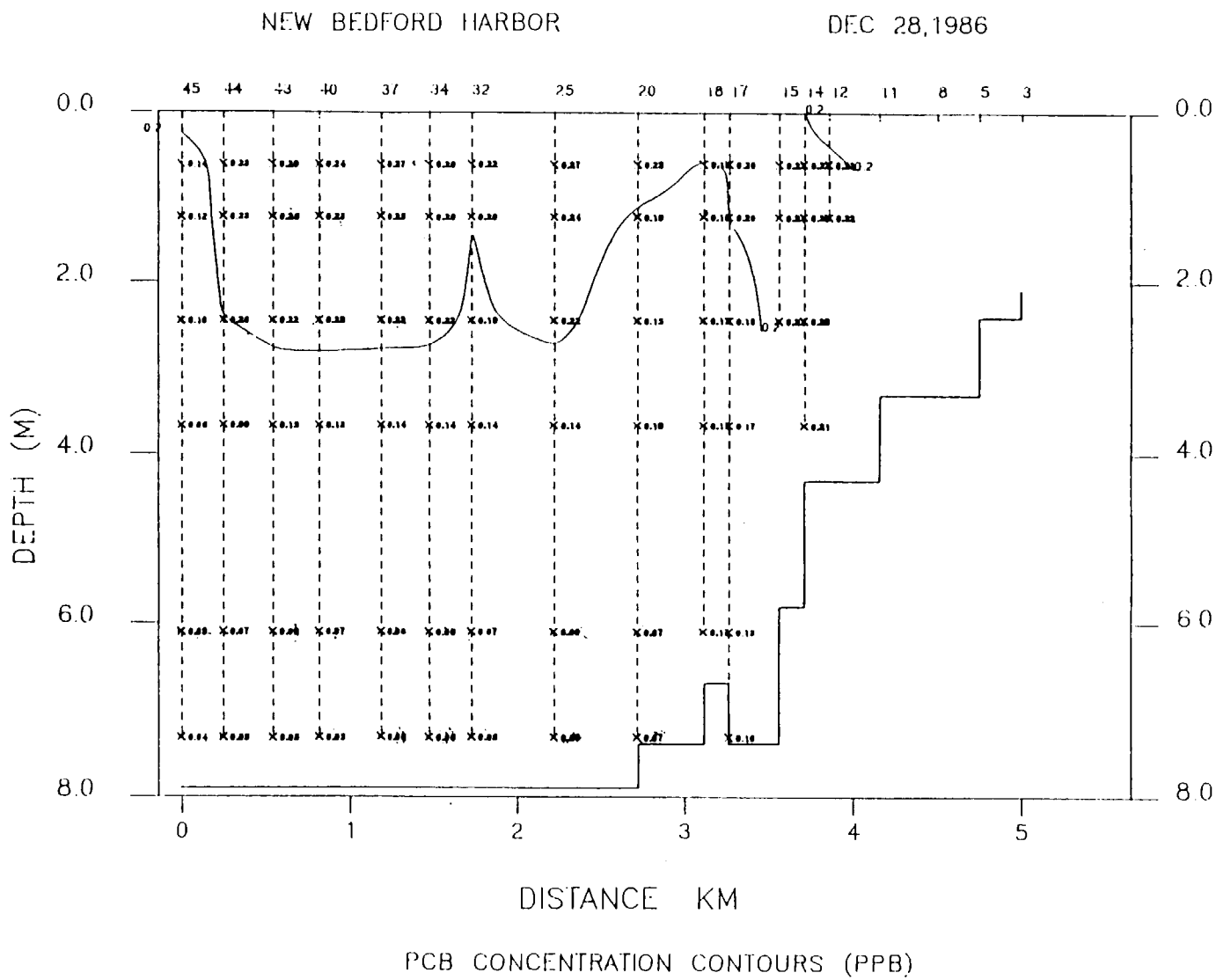


Figure 2.36 Vertical transect of dye concentration contours (ppb) versus longitudinal distance (km) along the estuary center line, December 28, 1986. Station numbers are noted at the top of the graph (Figure 2.2).

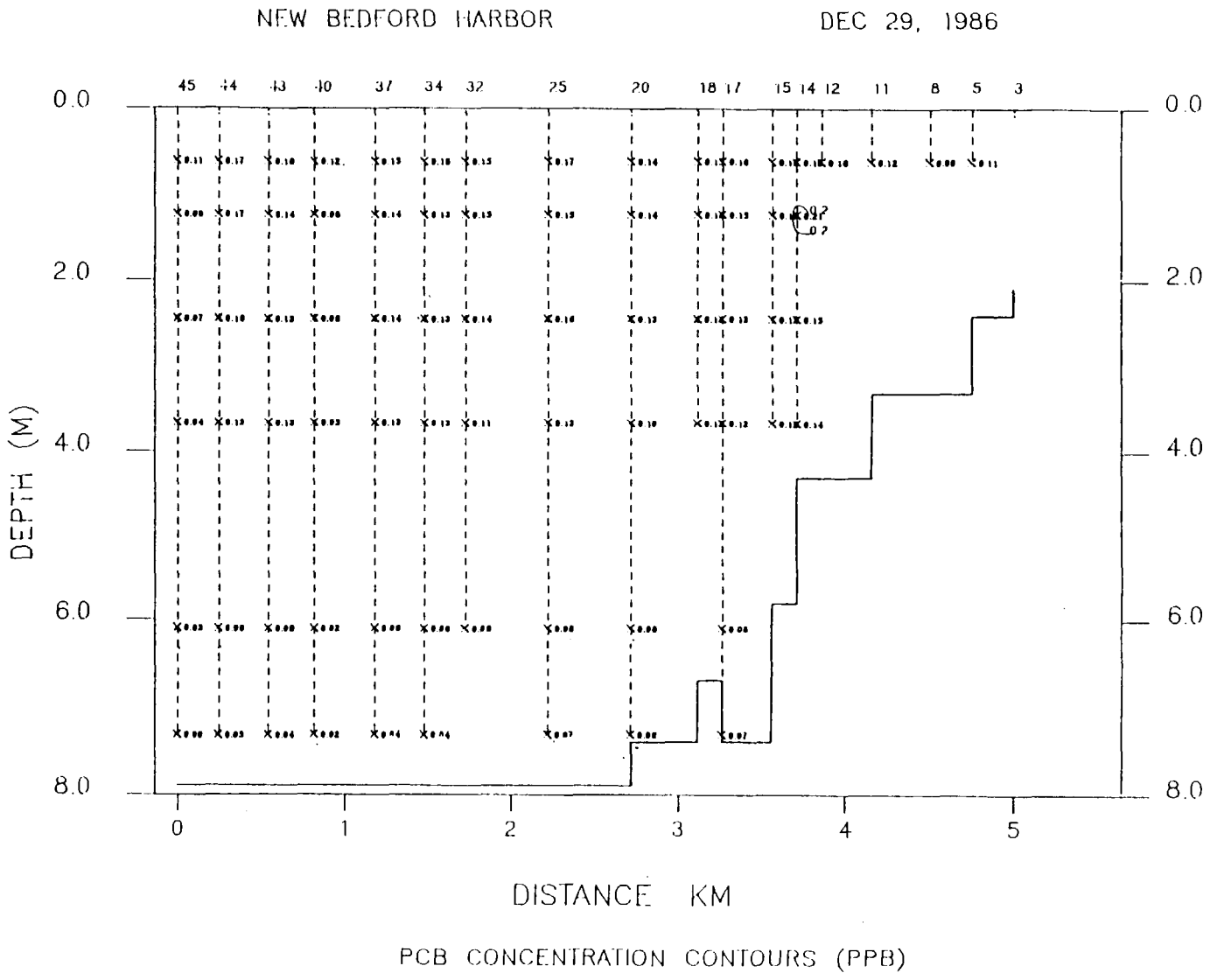


Figure 2.37 Vertical transect of dye concentration contours (ppb) versus longitudinal distance (km) along the estuary center line, December 29, 1986. Station numbers are noted at the top of the graph (Figure 2.2).

Data sets for 19 and 25 December 1986 are not available. A series of selected stations was used to describe the field. The station numbers are given at the top of the figure (see Figure 2.2 for exact station location). The approximate mean low water depth at each station, as determined from NOAA/NOS Chart 13229, is noted by the solid line near the bottom of the figure. The observed values of dye concentration are noted next to each measurement point, marked by an "X".

During the release the concentration is clearly observed to sharply increase in the upper reaches of the estuary and much less so in the lower two thirds (Figures 2.27-2.31). The concentrations north of Station 8 show strong vertical structure (Figure 2.29-2.31). Between Stations 8 and 14 the water column is generally well mixed in the upper 1 m, probably reflecting relatively strong tidal mixing caused by the restricted passage under the bridges. Between Stations 14 and 17 a strong frontal zone is observed (Figures 2.29-2.30). This area is the transition zone between the shallow sheltered upper estuary and the deeper, more strongly tidal mixed lower estuary. The cross sectional area also increases by a factor 4 in this area (between Stations 17 and 20). The mixed layer depth increases from about 1 meter at Station 17 to 2-3 m at the hurricane barrier. A second, but much weaker, frontal system is seen near the harbor entrance (Figure 2.30, Stations 43 and 44). The dye concentrations in the lower water column (below 3 m) show relatively well mixed conditions.

The dye is observed to rapidly leave the area once the release has terminated. Figure 2.33 (December 24, 1986) clearly shows the dye being transported down-estuary. By 26 December 1986 (Figure 2.34) concentrations have dropped dramatically and continue to decrease, at a slower rate,

through the end of the measurement period (Figures 2.35-2.37).

To obtain a global sense of the response of the estuary Figure 2.38 shows the vertically and laterally averaged dye concentrations versus down-estuary distance. The concentration levels are presented for each day that data was collected starting from the initiation of the release until its termination. Figure 2.39 shows a similar plot for the post release time period.

The buildup of concentration in the system (Figure 2.38) is clearly shown, reaching steady state conditions by 21 December 1986. The day to day variability, after steady state conditions are achieved, is also illustrated. The mean concentration ratio from the upper to outer harbor is on the order of 100.

For the post dye release time period (Figure 2.39) the decrease in concentrations with time is clearly observed. The concentrations first decrease in the upper estuary and finally in the mid and lower sections. The sharp decrease in concentrations between 24 and 26 December in the upper estuary is clearly evident. From the 26th to the 29th the concentration levels continue to decrease almost uniformly over the entire system, but are still above normal background levels.

2.4 Comparison of Observations to Model Predictions

The vertically and laterally averaged dye concentrations versus distance, taken after steady state conditions have been achieved (20-23 December), the pollutant model dilution curve based on a continuous point release at the Aerovox facility as calculated in our earlier study (ASA, 1986), the total average (surface and bottom) PCB concentration levels from Battelle's (1985) data and predictions of a continuous release from the

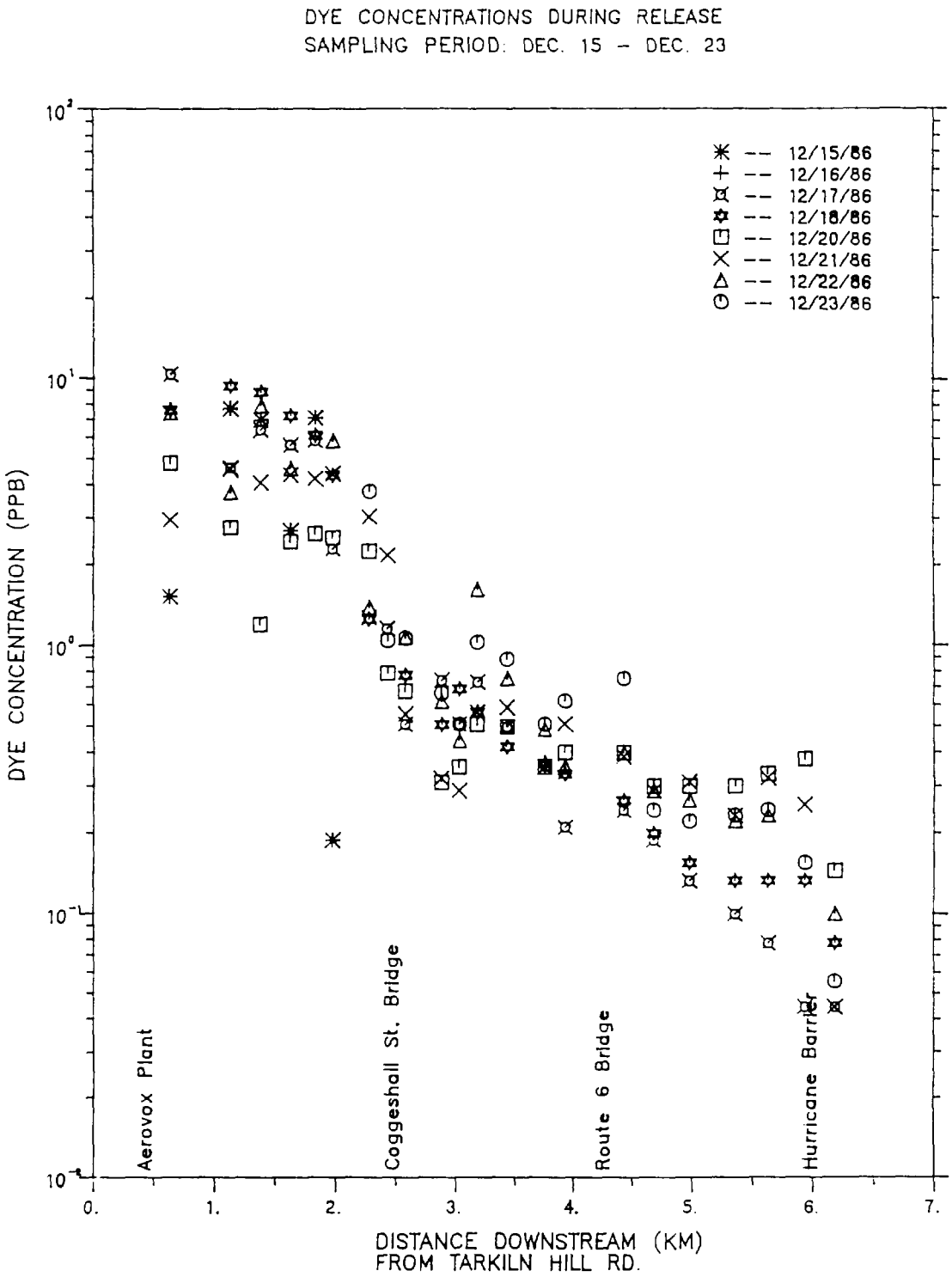


Figure 2.38 Laterally and vertically averaged observed dye concentration (ppb) versus longitudinal distance (km), 15 to 23 December 1986.

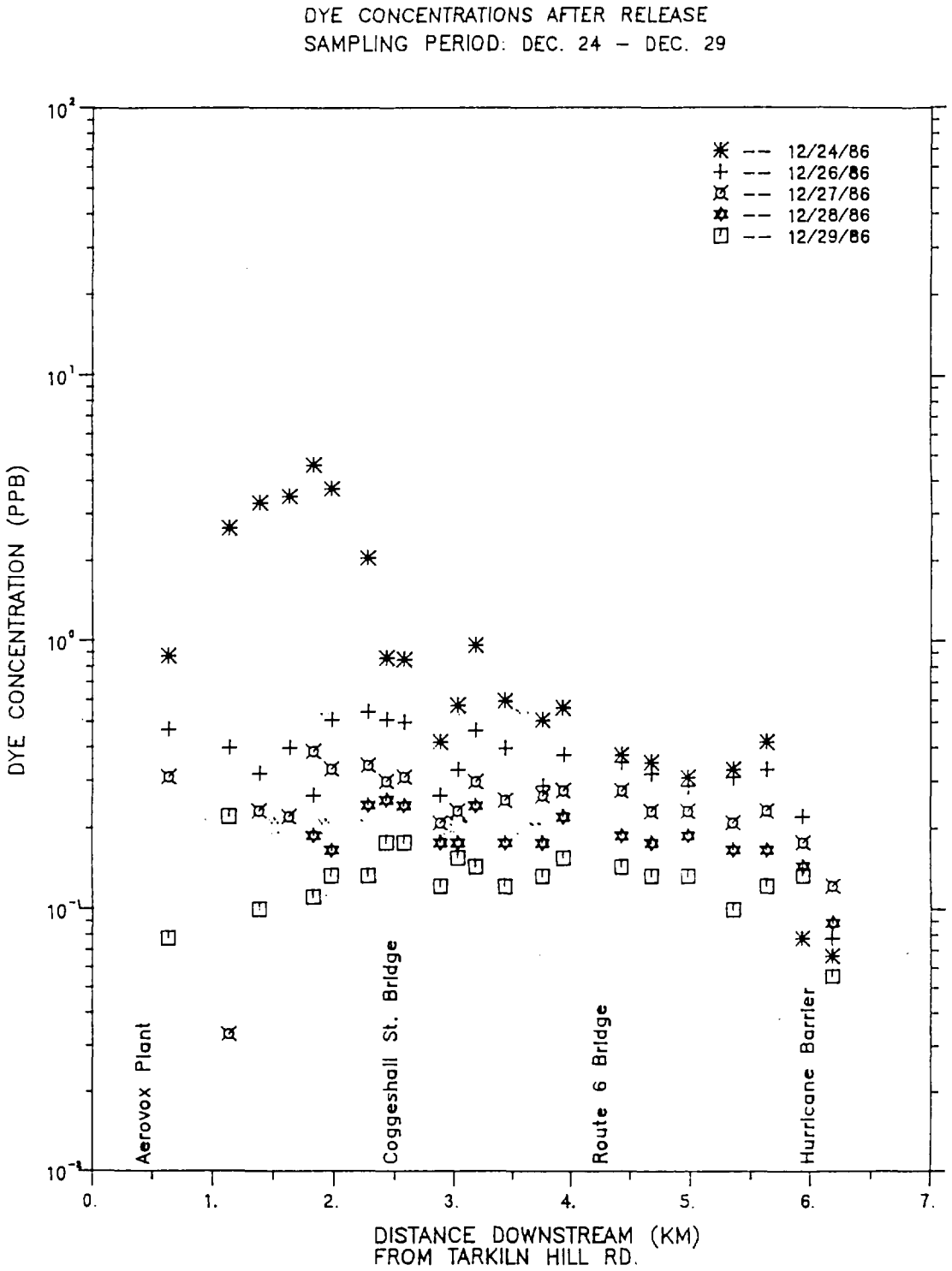


Figure 2.39 Laterally and vertically averaged observed dye concentration (ppb) versus longitudinal distance (km), 24 to 29 December 1986.

Cornell Dubilier site (Section 6) are shown in Figure 2.40. The dye release and model predicted concentrations have been scaled to give the same value as the observed PCB concentrations in the upper estuary and at the Cornell Dubilier site. Comparison of model predictions (Aerovox release site) to the dye observations shows that the model does well in reproducing the dilution versus distance curve. The one exception is near the hurricane barrier where the model predicted concentrations are considerably lower than those observed. The zero concentration boundary condition used does not accurately reflect the observed return of some portion of the ebb flux of dye into the system on the following flood tide. Correcting for this effect, (as noted in the figure) predictions are in excellent agreement with the observations. The predictions and dye concentration measurements are in generally good agreement with the PCB observations over most of the estuary indicating that the water column PCBs are readily represented as a conservative tracer.

Predictions of the model with a point release at the Cornell Dubilier site are also shown. The reference level for the model predictions have been scaled to agree with the Battelle (1985) water column concentrations at Station 11 (ASA, 1986). This station is located near the Cornell Dubilier discharge site. Model predictions are below those noted in with the Battelle data at Stations 14 and 15. The predicted concentrations are above the observed dye levels just outside the harbor but below those (and the PCB concentration) inside the harbor. This is increasingly the case as one proceeds up estuary.

The contribution of PCBs to the estuary (north of the hurricane barrier) are dominated by the upper estuary discharge with the Cornell

Dubilier source becoming more important as one proceeds down estuary. In the lower estuary the Cornell Dubilier discharge is significant and in the outer harbor (south of the hurricane barrier) clearly dominates.

Model predictions and observed PCB and dye concentrations are in good agreement in most of New Bedford Harbor. The role of the Cornell Dubilier discharge to PCB concentration in the lower harbor is much more uncertain since we have extremely limited data on the observed concentrations in the area. We also do not have direct estimates of the observed source strengths. The analysis here relies on only one data station where both particulate and dissolved observations were simultaneously available (Station 11, Cruise #3). The data base is clearly inadequate to draw firm conclusions.

Table 2.2 summarizes a series of estimates for the PCB source strengths for discharges from the upper estuary, Cornell Dubilier and the New Bedford sewage treatment plant. The estimates for the upper estuary, (150-200 kg/yr) although variable, are consistent no matter which technique is used to perform the determination. The estimate for Cornell Dubilier is more uncertain because of the limited data available. The value however is consistent with the upper estuary discharge and the fact that each facility purchased (handled) about the same volume of PCBs from 1954-1977 (Appendix B, Table B.1). The quality of the estimates for the New Bedford sewage treatment discharge are unknown since no documentation was given (Weaver, 1983). The order of magnitude however appears reasonable considering the other discharges.

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Table 2.2 Summary of estimated and total PCB source strength for the upper estuary, Cornell Dubilier, and New Bedford sewage treatment facility (Clarks Pt.) discharges.

Site	Methodology	Estimated Value (kg/yr)	Reference
Upper Estuary (North of Coggeshall Street Bridge)	Battelle (1985) PCB concentration data and Officer (1976) theory		ASA (1986)
	Cruise #2 Station #1	112.5	
	Cruise #2 Station #2	22.7	
	Cruise #3 Station #2	162.0	
	Finite element dispersion model predictions (New Bedford Harbor and Acushnet River estuary) scaled to Battelle (1985) PCB concentration data	189	ASA (1986)
	Diffusive flux calculation	160.5-214	Section 3
Cornell Dubilier	Finite element dispersion model predictions (New Bedford estuary and outer harbor area) scaled to Battelle (1985) PCB concentration data (Station 1)	244	Present Study
New Bedford Numerical Sewage Treatment Facility Discharge	Unknown	90-300	Weaver (1983)

3. Estimate of PCB Flux from the Sediments to the Water Column

Our earlier studies (ASA, 1986) have indicated that to achieve the observed PCB concentration levels in the water column a flux of rate between 23 and 189 kg/yr must be discharged into the upper estuary. The likely source for these PCB is from the bottom sediments which show high concentration levels in the upper estuary (Section 4). The purpose of this section is to provide an approximate estimate of this flux rate based on existing sediment-water fate and transport models.

The three principal physical mechanisms responsible for transporting PCBs across the sediment water interface are diffusion, resuspension (scour) and deposition. The diffusive transport is proportional to the relative differences between water column and sediment pore water concentrations. Resuspension is normally caused when shear stresses are large enough to resuspend bottom sediments. This can be caused either by currents, waves, and or some combination of the two. The last mechanism serves to deposit material on the sea bed, normally following a resuspension event. The rate of deposition depends on the settling velocities of the particulates to which the pollutant is attached.

Previous calculations and experiments (ASA, 1986) have suggested that resuspension of bottom sediments in the upper estuary is probably rare, given the weak currents and limited wave conditions found in the area. Based on this analysis it is assumed that most of the flux of PCBs from the sediments to the water column is by diffusive processes.

Following the general approach given in Schnoor et al (1982), DiToro et al (1982) and Thibodeaux (1979) the flux of PCBs from the sediments to the water column, N, is given as:

$$N = \frac{D}{\delta} (C_{wp} - C_{wr}) \tag{2.1}$$

where

- D - diffusion coefficient
- δ - thickness of the diffusive layer
- C_{wp} - pore water PCB concentration
- C_{wr} - water column PCB concentration

The diffusion coefficient is characteristically expressed as:

$$D = D_m \theta^{1.3} \tag{2.2}$$

where D_m - molecular diffusion coefficient
θ - sediment void fraction

The sediment pore water concentration is expressed as:

$$C_{wp} = \frac{C_s}{K_{sw}} \tag{2.3}$$

where C_s - bulk sediment PCB concentration
K_{sw} - sediment pore water partition coefficient

Furthermore,

$$K_{sw} = \Phi K_{oc} \tag{2.4}$$

where

- Φ - mass function of organic carbon
- K_{oc} - organic carbon partition coefficient $\approx 0.4 K_{ow}$
- K_{ow} - octanol - water partition coefficient

An alternate approach to Equation (2.4) is to use Brownawell's (1986) observed values to determine the effective K_{sw} (or K_d' in his notation) based on measurements at a station just north of Popes Island (Station 84,

Figure 4.2). This approach accounts for the three phase partitioning process proposed by Brownawell (1986).

To calculate the thickness of the diffusive sediment layer, we have used the formulation given by Thibodeaux (1979)

$$\delta = \frac{26\ \nu}{U^* \ S_c^{1/3}} \qquad (2.5)$$

where

ν - kinematic viscosity (cm^2/s)
U^* - friction velocity (cm/sec)
S_c - Schmidt number

The friction velocity was calculated as

$$V^* = (\tau/\rho)^{1/2} \qquad (2.6)$$

where τ - bottom stress ($gm/cm \cdot s^2$)
ρ - water density (gm/cm^3)

The bottom stress was calculated using an equation given in Ippen (1966) (p. 510).

$$\tau = \frac{1}{2}(0.043)\ (Uh/\nu)^{1/4}\ \rho\ U^2$$

where U - mean tidal velocity (cm/s)
h - mean water depth (cm)

Using the values noted in Table 3.1 and the approach above gave an estimated flux rate of 53.5 kg/yr. If this value is scaled to account for the fact that Aroclor 1254 makes up approximately one half to one third the total PCBs of the estuarine sediments (Farrington et al, 1981; Brownawell, 1986) (see also Section 4) then the total flux rate is 160.5-214 kg/yr. This calculation is in agreement with our previous estimates (ASA, 1986) based on model predictions (189 kg/yr) and simplified calculations using the available total PCB concentration data (22.7, 112.5, and 162 kg/yr).

Table 3.1 Specification of input parameters for sediment-water column diffusive PCB flux calculation.

	Parameter	Value	Reference
D_m	molecular diffusion coefficient	$0.8*10^{-5}$ cm^2/s	Thibodeaux (1979)
δ	diffuser layer thickness	0.11 cm	Equation 2.5
θ	sediment void fraction	0.59	Brownawell (1986)
D_s	sediment diffusion coefficient	$3*10^{-6}$ cm^2/s	Brownawell (1986)
C_{wr}	water column dissolved PCB concentration	693 ng/l	Battelle (1985)
C_s	bulk sediment PCB concentration	511 mg/kg	Section 4 (Table 4.2)
Φ	mass fraction of organic carbon	0.060 to 0.068	Brownawell (1986)
K_{ow}	octanol - water partition coefficient	log K_{ow} - 4.5 to 8.1 log K_{ow}: 6.03	Rapaport and Eisenreich (1984); Metcalf & Eddy (1983)
K_d'	apparent distribution coefficient, also K_{sw}	6×10^4 l/kg	Brownawell (1986)
ν	kinematic viscosity of sea water	1.6×10^{-2} cm^2/s	Thibodeaux (1979)
ρ	density of water	1.0 gm/cm^3	Thibodeaux (1979)
U	tidal current speed	7.5 cm/s	ASA (1986)
h	water column depth	91.4 cm	ASA (1986) NOAA/NOS Chart 13229

A careful examination of the diffusive flux calculations show that the upper estuary acts as reservoir for PCBs (i.e., the PCB concentration in the water column has little effect on the diffusive flux rate). The primary factors controlling the transport are the pore water PCB concentrations (K_{sw}) and the thickness of the diffusive layer (δ).

4. PCB Mass Balance - A Partial Analysis

To determine the approximate amount of PCBs in selected environmental compartments, estimates for the sediments and the water column were calculated based on the available data. These estimates are at best only approximate since the data is in general fairly sparse and the concentration variability is typically high.

Sediment Mass

Numerous sediment samples have been collected in the upper Acushnet River estuary and New Bedford Harbor (Figure 4.1 and 4.2). Based on these data and a depositional environments map (Figure 4.3) PCB (Aroclor 1254) sediment concentration contour maps were prepared for the surface (0-4 cm), shallow subsurface (4-8 cm) and deeper subsurface (>8 cm), as shown in Figures 4.4, 4.5, and 4.6, respectively. These maps were used to determine estimates of the total PCB mass.

The areas inside each concentration contour were determined using a planimeter. The total volume of sediment within the contour was then determined for each sediment layer. For depths >8 cm we have assumed a maximum depth of contamination of 61 cm (2 ft.) following Malcolm Pirnie, Inc. (1981). Other researchers have used a maximum depth of 50 cm (Farrington, 1982) for similar calculations and data indicate contamination is unlikely at depths greater than 1 m (Geotechnical Engineers, 1982).

For the 0-4 cm and 4-8 cm layers, we have assumed the PCB concentration remains constant from the surface to the bottom of the layer. For the >8 cm layer, we have assumed the concentration decreases linearly from the concentrations shown in Figure 4.6 at the surface to zero at 25, 35 and 61 cm for the lower, mean and upper bound estimates, respectively. This

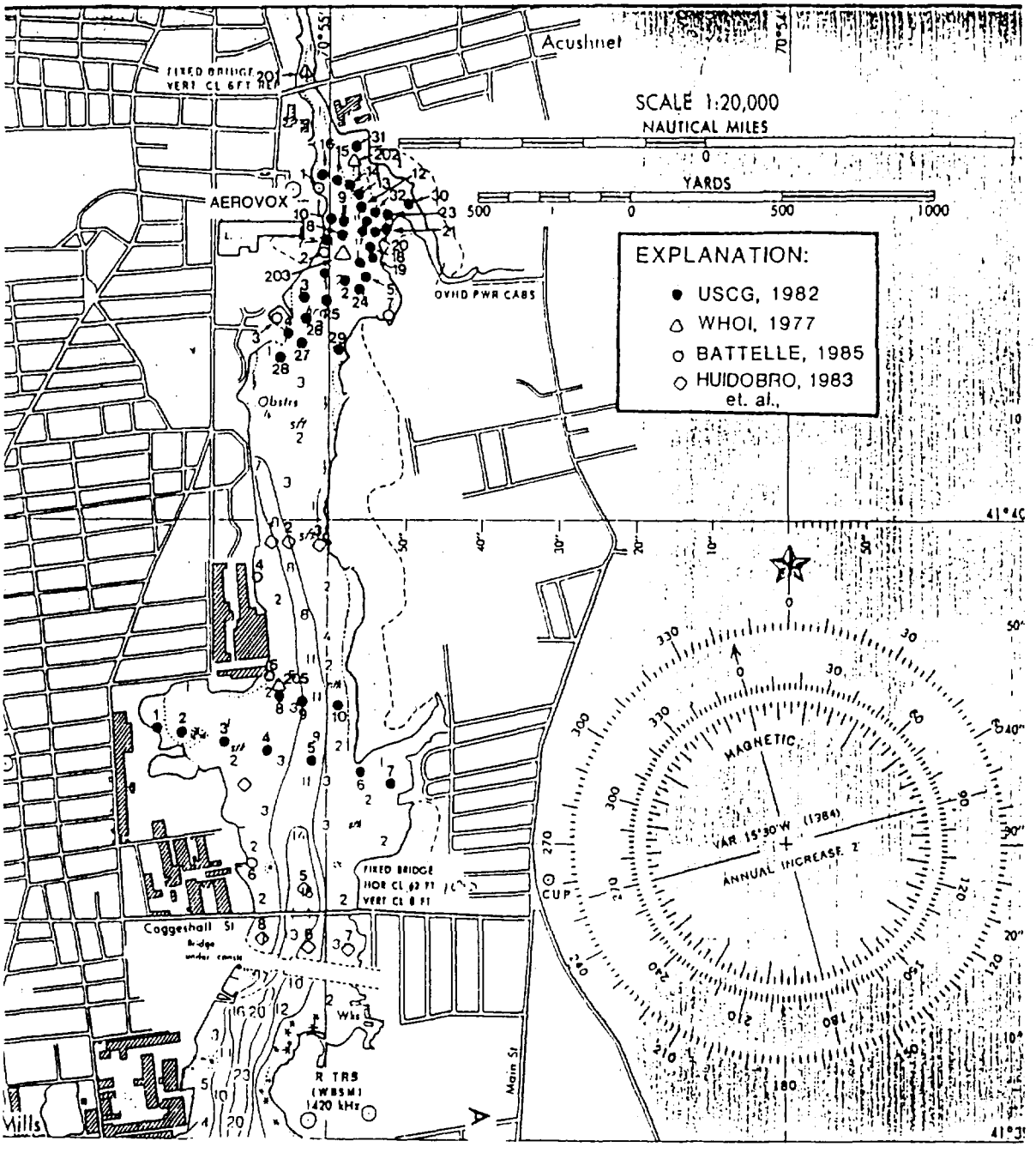


Figure 4.1 Sediment sample locations, upper Acushnet River estuary.

Figure 4.2 Sediment sample locations, New Bedford Harbor.

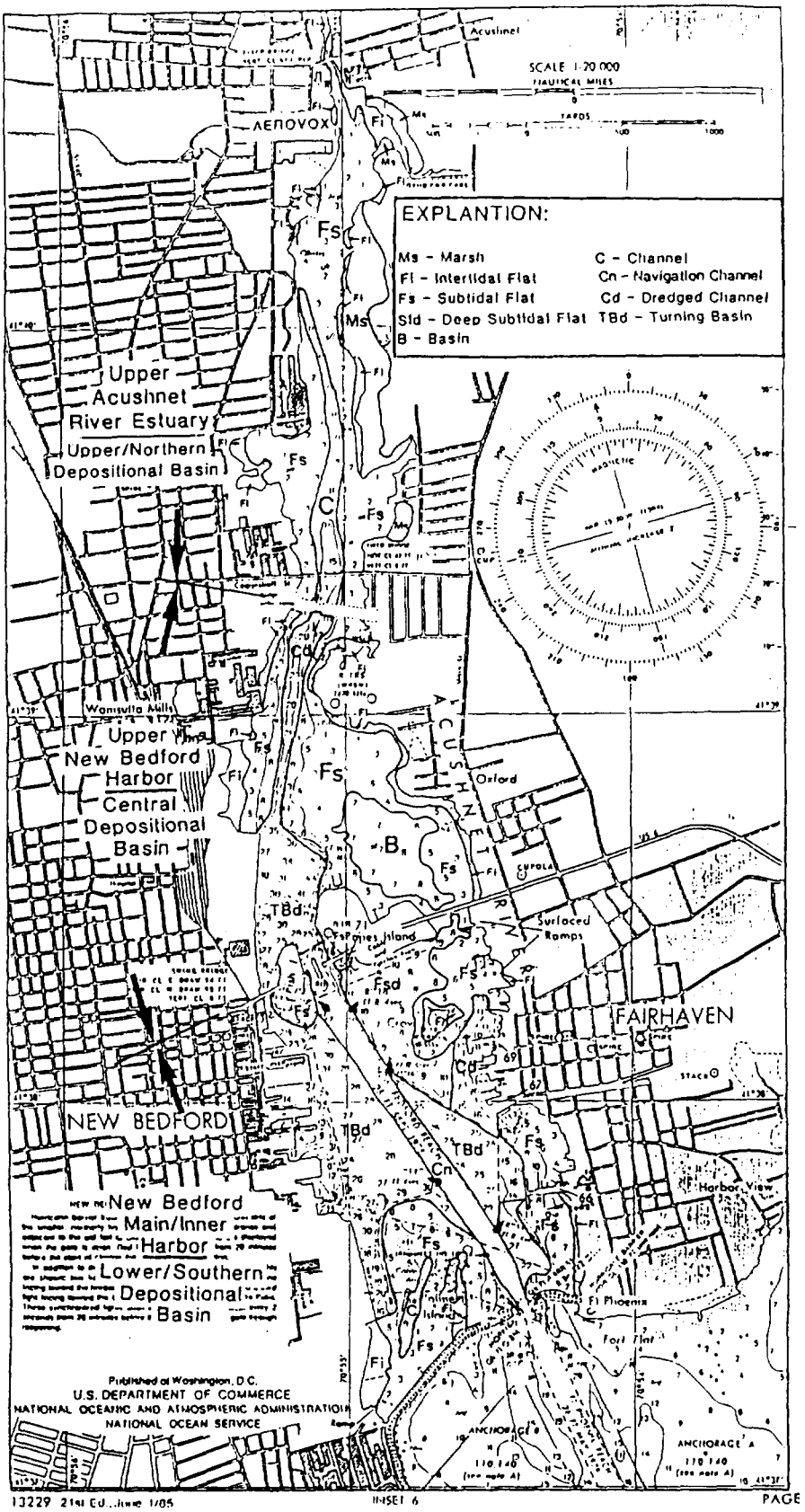


Figure 4.3 Depositional environments and location map.

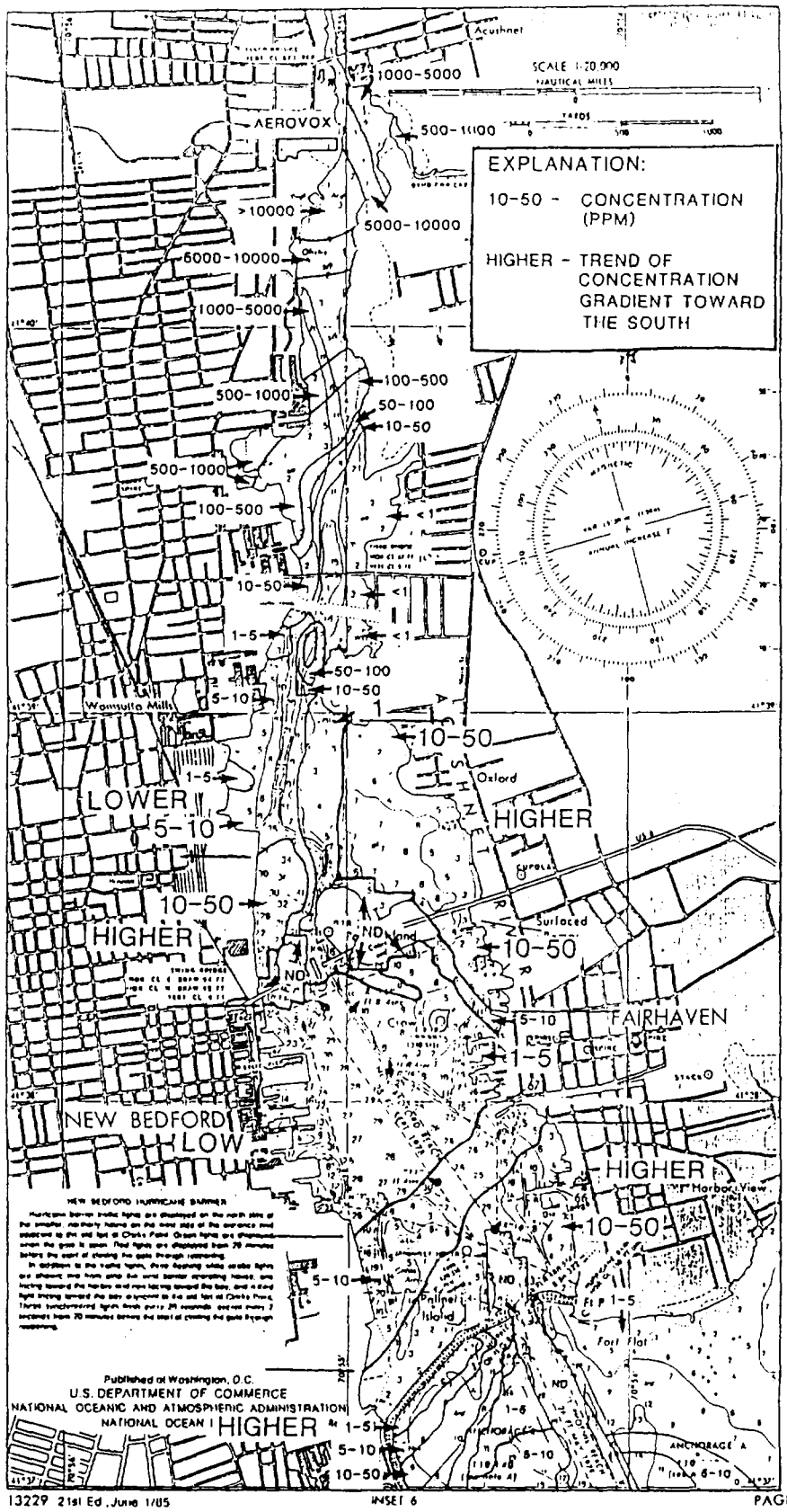


Figure 4.5 Contour maps of PCBs (Aroclor 1254 in shallow subsurface sediment (4-8 cm).

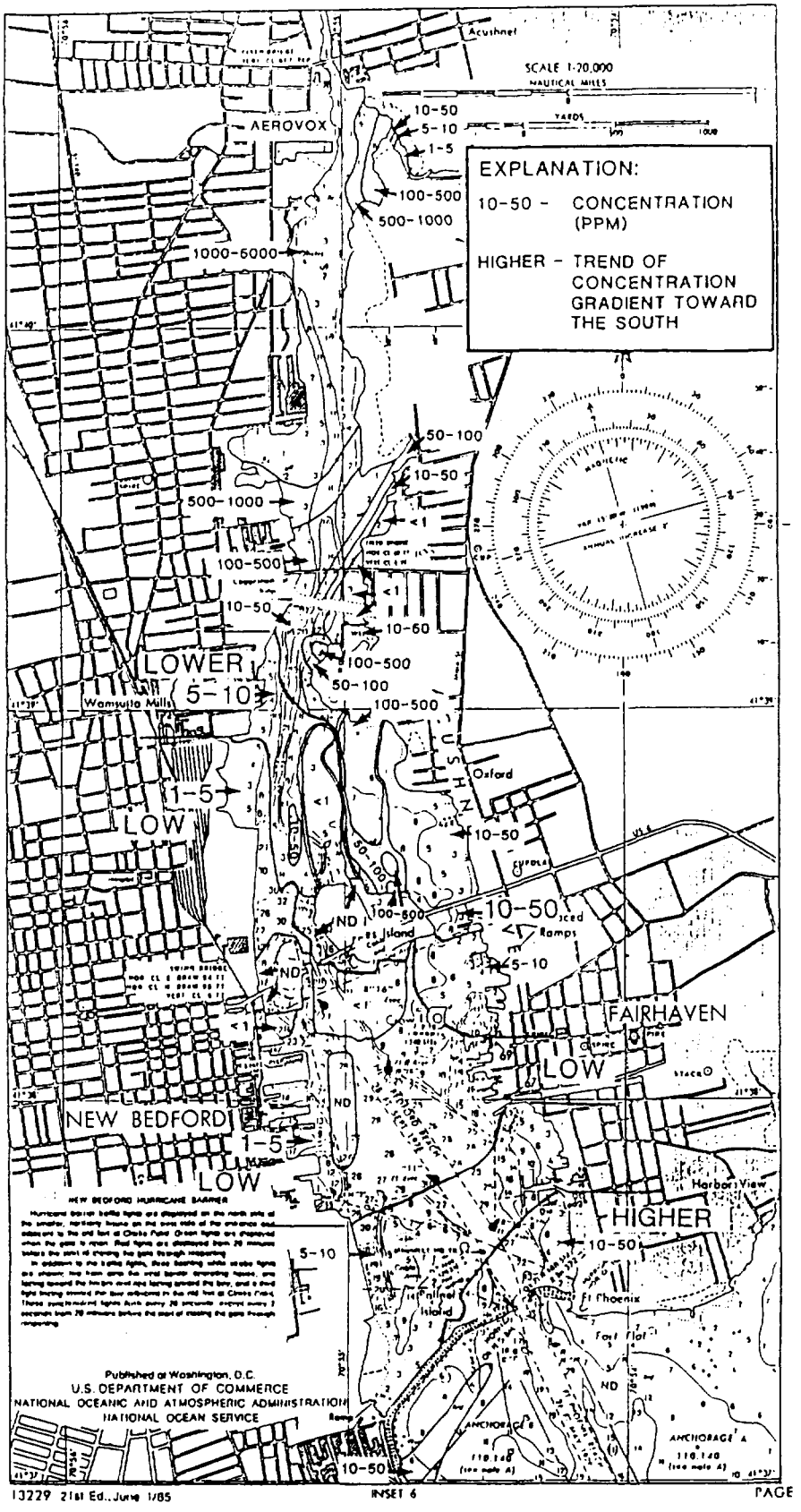


Figure 4.6 Contour maps of PCBs (Aroclor 1254) in deeper subsurface sediments (> 8 cm).

assumption is supported by the raw data which show concentration decreasing with depth in a roughly linear fashion (USCG, 1982; Brownawell, 1986; Summerhayes et al, 1977).

Lower, average, and upper bound estimates were made for the PCB mass in the sediments for the areas (1) on Aerovox property (Figure 4.7, between mean high and mean low water levels), (2) the entire Achusnet River estuary and New Bedford Harbor (north of the hurricane barrier). The lower and upper bound estimates were made using the lower and upper values for the concentration contour intervals (Figures 4.4, 4.5, and 4.6). Estimates of the average PCBs were calculated using the mean of the lower and upper concentration bounds.

A summary of the results of the analysis are shown in Table 4.1. Note that these estimates are for the mass of PCB Aroclor 1254 only. The PCB mass in the total estuary sediments ranges from 132,473 to 994,590 kg with a mean estimate of 374,248 kg. This significant variation (factor of 7.5) between the lower and upper bound estimates is caused by the variability in the horizontal spatial gradients of the PCB concentration fields and more importantly the assumed maximum depth of contamination. No matter which estimate is used however less than 1% of the total mass is found on Aerovox property (between the mean high and low water lines).

The mean sediment concentrations (Aroclor 1254) for three areas is given in Table 4.2. These have been calculated by dividing the sediment mass by the sediment volume. The calculation has been performed

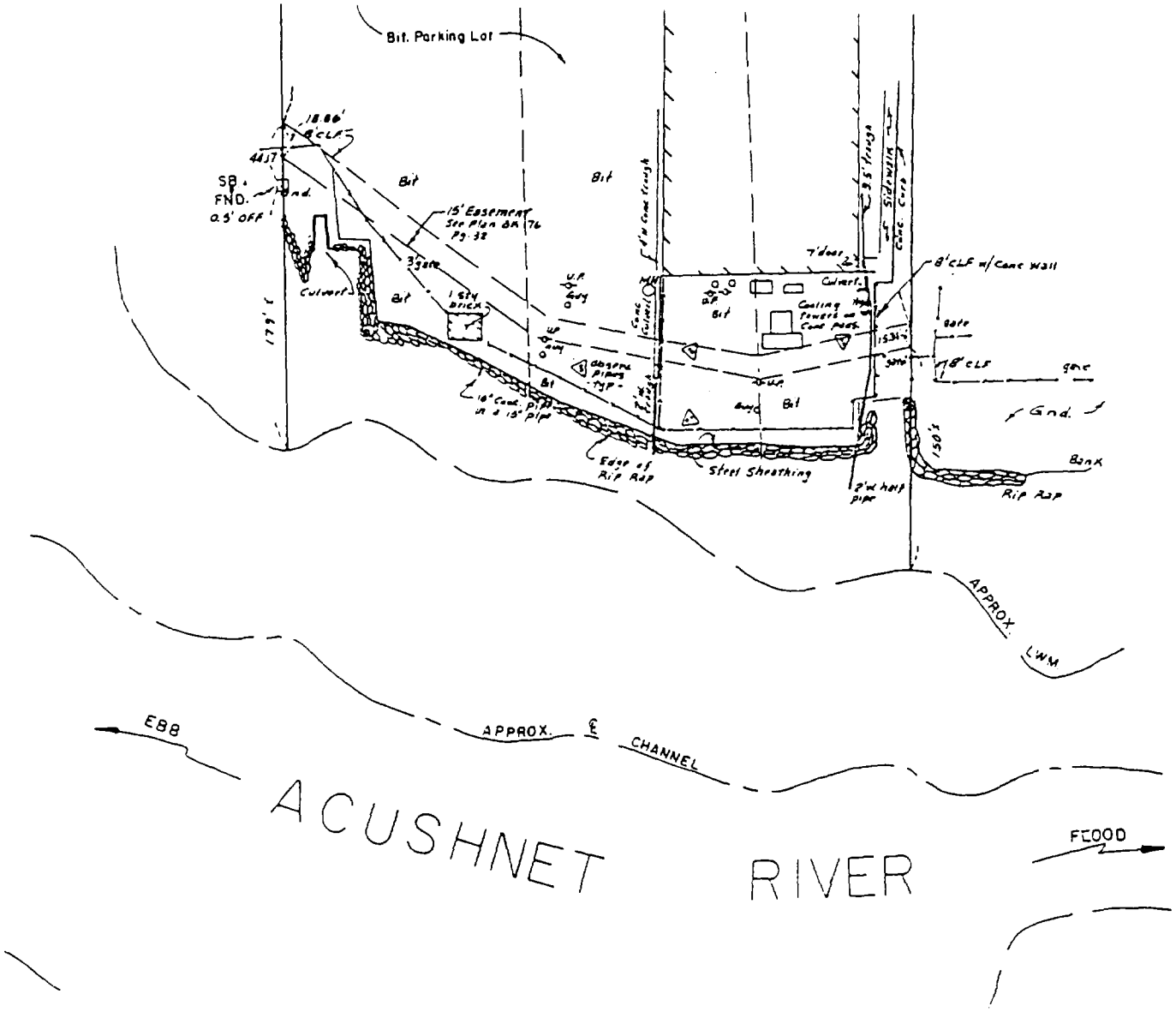


Figure 4.7 Property boundaries of RTE Aerovox, Ne Bedford, Massachusetts, June 3, 1986, Mistry Associates, Inc., Reading, Massachusetts, Job 186.01.

Table 4.1 PCB (Aroclor 1254) mass in the Acushnet River Estuary and New Bedford Harbor bottom sediments.

Area	Mass (kg) Lower Bound	Mean	Upper Bound
1. Aerovox Property	139*	391	641
	677	1001	1334
	311	1480	4842
	1108 (.84%)**	2872 (.40%)	6827 (.69%)
2. Entire Estuary (North of Hurricane Barrier)	7272	18,840	30,405
	66,716	94,541	122,365
	58,482	260,867	841,820
	132,473 (100%)	374,248 (100%)	994,590 (100%)

* By depth levels (0-4 cm, 4-8 cm, >8 cm, and total)

For > 8 cm we assume lower bound, 8 - 25 cm
mean, 8 - 35 cm
upper bound, 8 - 61 cm

** Percent of total estuary mass

Table 4.2 Average PCB (Aroclor 1254) concentrations in the Acushnet River Estuary and New Bedford Harbor sediments.

	Average Concentration (ppm)		
Area	Lower Bound	Mean	Upper Bound
1. Aerovox property	1000*	3000	5000
	5000	7500	10,000
	500	1500	2500
2. Upper Estuary	197	511	825
(north of Coggeshall	1910	2681	3451
St. Bridge)	344	971	1599
3. Entire Estuary	42	108	175
(North of Hurricane	373	528	684
Barrier)	70	197	324
by depth levels	0-4 cm		
	4-8 cm		
	>8 cm (8-25 cm, lower bound)		
	(8-35 cm, mean)		
	(8-61 cm, upper bound)		

* These mean concentration values are the average values for the 8-61 cm depth assuming a linear decrease in concentration from 8 cm to 0 ppm at 61 cm

for each of the three layers (0-4 cm, 4-8 cm, 8 cm to the maximum contamination depth). The estimates give PCB concentrations (Aroclor 1254) in the range of 200-10,000 ppm depending on location. A consistent trend in the analysis is that the 4-8 cm sediment layer has concentrations typically 3 to 5 times higher than at shallower or deeper depths.

Previous investigators have estimated that the sediments may contain approximately two to three times as much PCB in the form of Aroclors 1242 and 1016 based on sediment observations (Farrington, 1981; Brownawell, 1986). We have also attempted to estimate the total using sales records for Aerovox. The records for the Aerovox plant (see Appendix B) show that the ratio of the sum of Aroclors 1242 and 1016 to Aroclor 1254 purchased is 8.54:1. If we assume that Aroclors 1242 and 1016 were discharged into the Acushnet River in the same ratio to Aroclor 1254 as they were purchased and that they are distributed in the sediments in the same concentration patterns as shown in Figures 4.4-4.6, then the values given in Table 4.1 should be multiplied by 9.54 to give the total PCB mass (all Aroclors combined) in the sediments. This multiplier is substantially larger than the observed. The factor of two-three estimate is more realistic given that it is actually observed. Farrington (1982) calculates a total of 110,000 kg for the upper 50 cm of sediment. This is one third to one fourth of the present total lower bound estimate.

Water Column Mass

Estimates of the PCB mass in the water column have been prepared using the Battelle (1985) data. Data are available for PCB concentrations in both the dissolved and particulate phases. For consistency in computing

the total mass we have used only those data for which both dissolved and particulate concentrations were measured at the same sampling depth and stage of the tide at a particular station. All data meeting these criteria at each station were then averaged independent of the cruise, sampling depth and time to give an average concentration.

We have assumed the water column is well mixed in the vertical and across the estuary. Further, we assume the measurements are representative of the mean concentration in the water column from the sampling location to half way to the next sampling station both up and down estuary. This defines the volume of water over which the concentration is assumed constant (surface area times mean water depth in the area). Multiplication of the concentration by the water volume yields a total mass for each section. Summation over the sections gives the total mass.

Table 4.3 shows estimates for the dissolved, particulate and total PCB concentrations in each of the three areas of the estuary. A total of 10.29 kg of PCBs is estimated in the water column. The particulate PCB mass is approximately 2-4 times that in the dissolved phase. Less than 1% is located on Aerovox property.

This analysis clearly shows the vast majority of the PCBs are located in the bottom sediments of the upper estuary. Only a very small amount of the sediment total (< 1%) is found within the confines of the Aerovox intertidal property.

Table 4.3 Total PCB mass in the Acushnet River Estuary and New Bedford Harbor water column.

Area	Mass (kg) Particulate	Dissolved	Total	% of Estuary Total
1. Aerovox Property	0.006	0.002	0.008	0.078
2. Upper Estuary (North of Coggeshall Street Bridge)	3.82	0.93	4.75	46.16
3. Entire Estuary (North of Hurricane Barrier)	6.89	3.41	10.29	100.

5. Wind Driven Circulation in New Bedford Harbor

A two dimensional vertically averaged finite element hydrodynamic model was applied to New Bedford Harbor to predict the wind driven circulation. A description of the governing equations, solution methodology, and application to predict the tidal hydrodynamics of the study area are included in ASA (1986). The reader is referred to that report for details on the model and its application. The hydrodynamic model grid system is shown in Figure 5.1.

To assess the local wind driven circulation the model was used to predict the response to constant (spatial and temporal) wind forcing of 1 dyne/cm^2 for eight points of the compass (N, NE, E, SE, S, SW, W, NW). The convention here is that the wind blows toward the direction indicated. The sea level boundary condition at the hurricane barrier was fixed at mean sea level. The wind was increased from zero to the full value using a cosine ramp over a 2 hr. period. This ramping was performed to avoid exciting seiching modes in the current and sea elevation fields. The model simulations, with and without ramping, show spinup times, or times to reach steady state conditions, on the order of 2 to 3 hrs. with the longer times corresponding to deeper water depths.

The model predicted vertically averaged current fields and surface elevation contours, for each wind direction are shown in Figures 5.2 through 5.8. The surface elevation contours are given in millimeters (mm) and a scale has been provided for current magnitude. All simulations are for steady state wind conditions. The response to wind forcing from each direction is presented below.

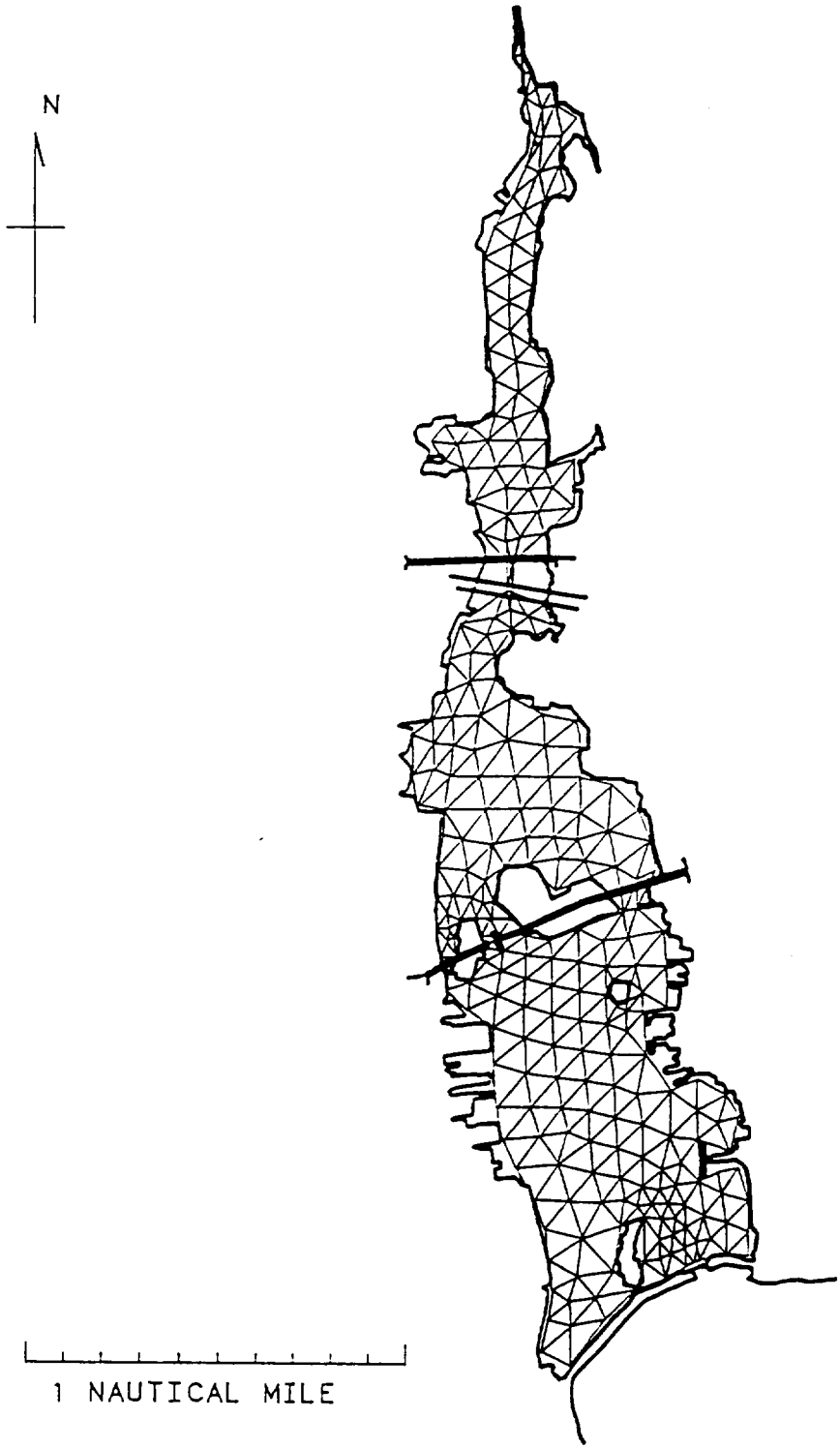


Figure 5.1 Model triangular finite element grid system.

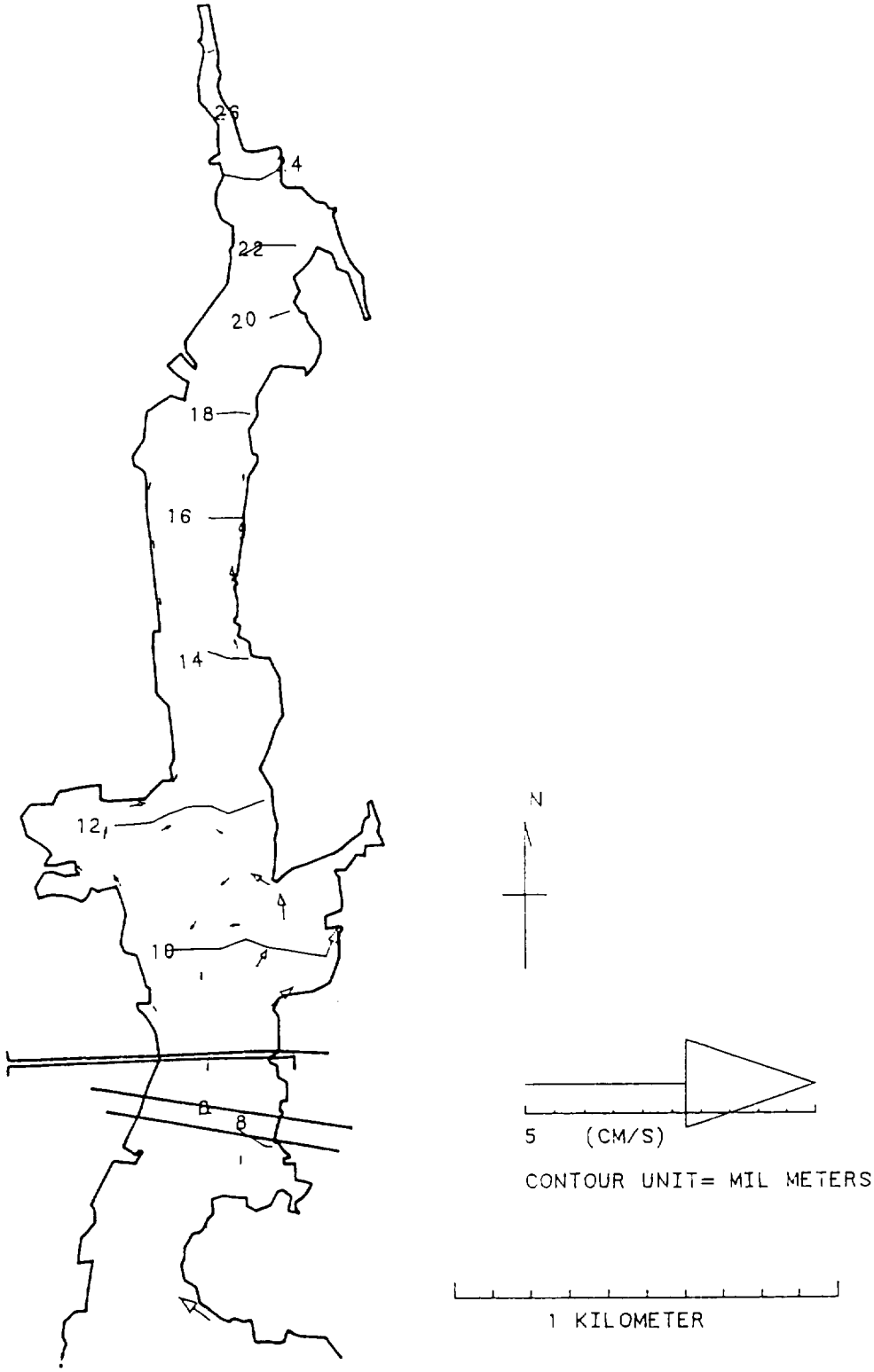


Figure 5.2 Hydrodynamic model predicted steady state, vertically averaged current field and surface elevation contours for constant wind forcing of 1 dyne/cm^2 toward the north.

Figure 5.2 Hydrodynamic model predicted steady state, vertically averaged current field and surface elevation contours for constant wind forcing of 1 dyne/cm^2 toward the north.

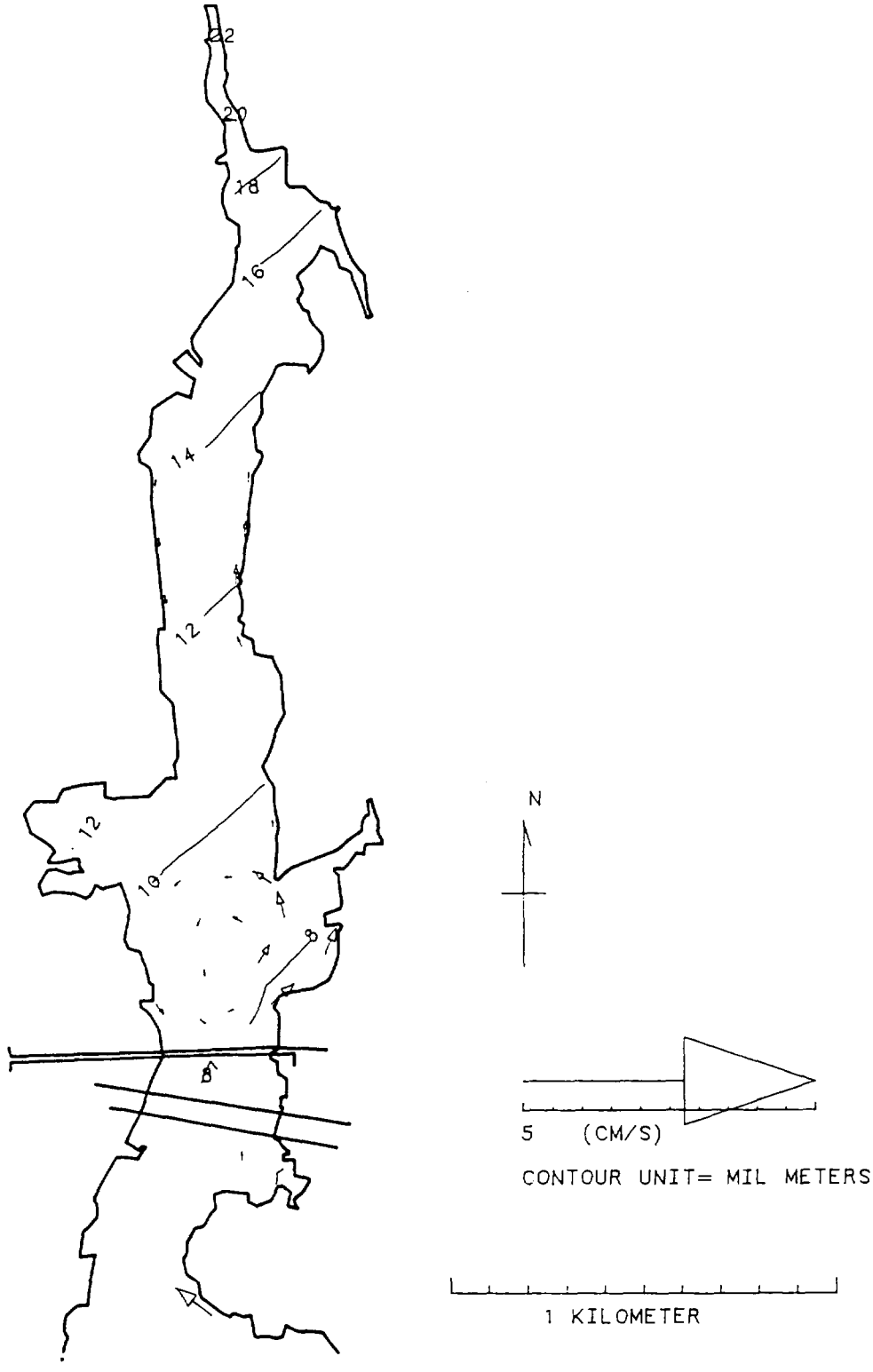


Figure 5.3 Hydrodynamic model predicted steady state, vertically averaged current field and surface elevation contours for constant wind forcing of 1 dyne/cm^2 toward the northwest.

Figure 5.3 Hydrodynamic model predicted steady state, vertically averaged current field and surface elevation contours for constant wind forcing of 1 dyne/cm^2 toward the northwest.

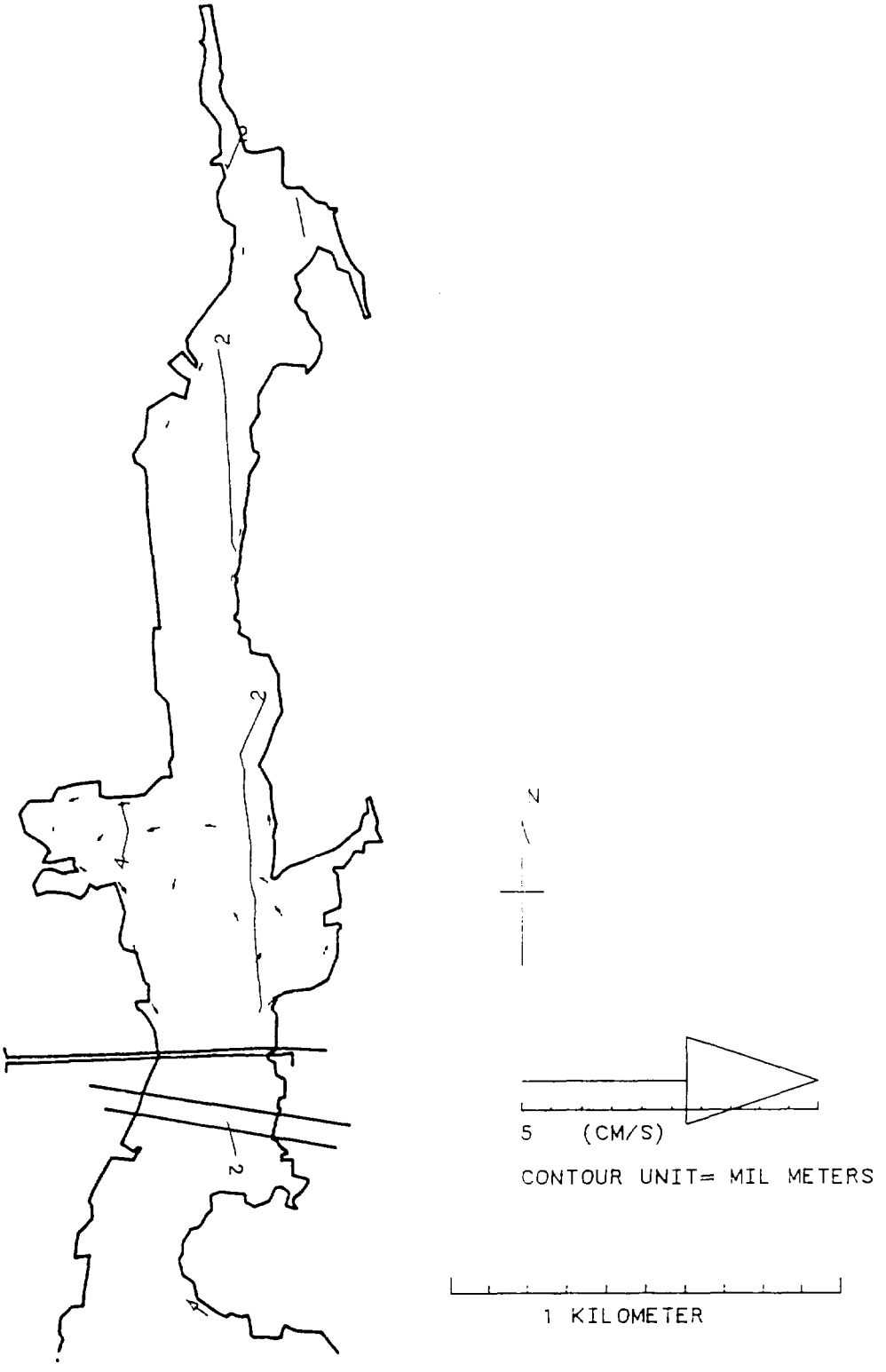


Figure 5.4 Hydrodynamic model predicted steady state, vertically averaged current field and surface elevation contours for constant wind forcing of 1 dyne/cm^2 toward the west.

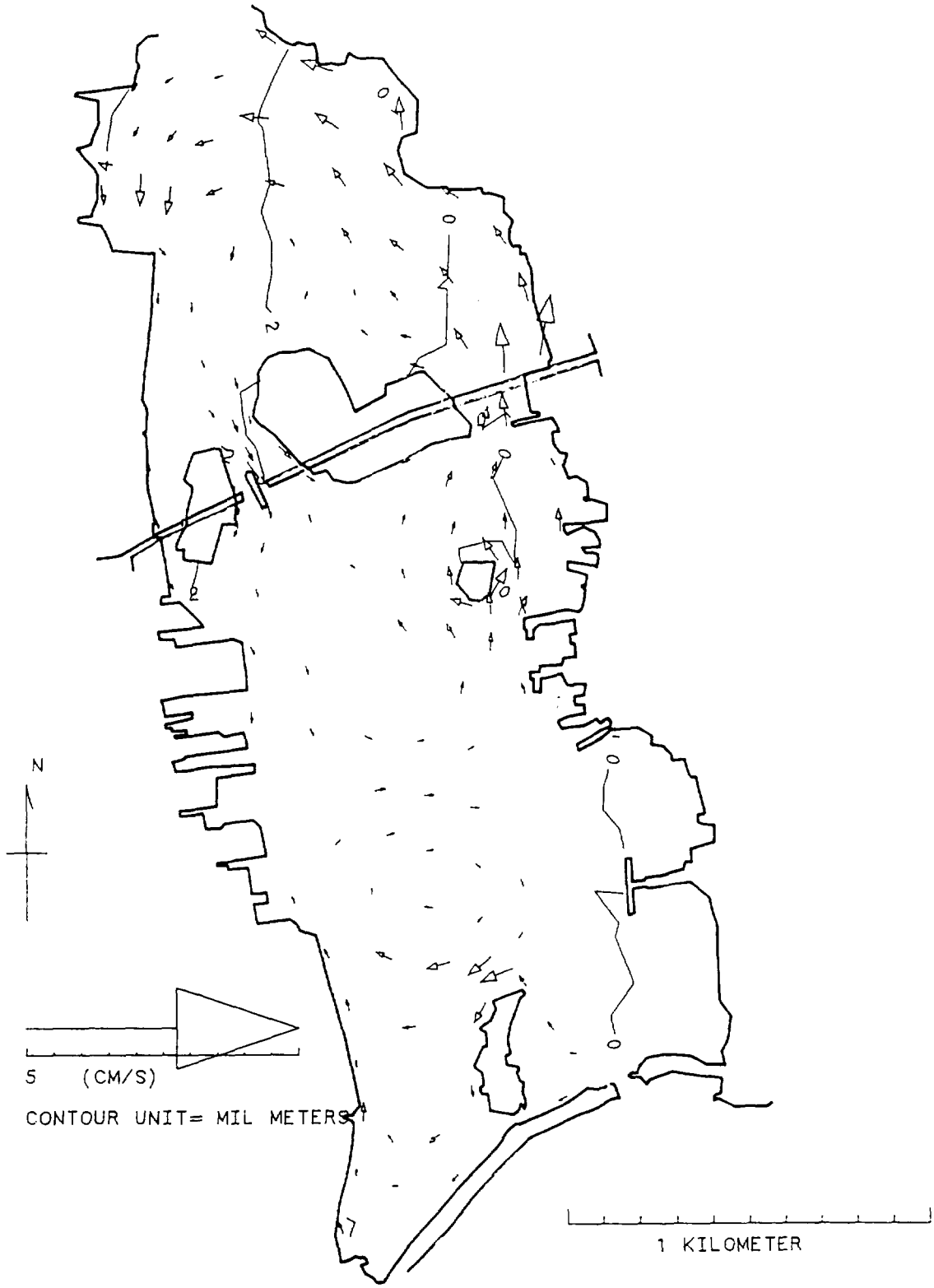


Figure 5.4 Hydrodynamic model predicted steady state, vertically averaged current field and surface elevation contours for constant wind forcing of 1 dyne/cm^2 towrd the west.

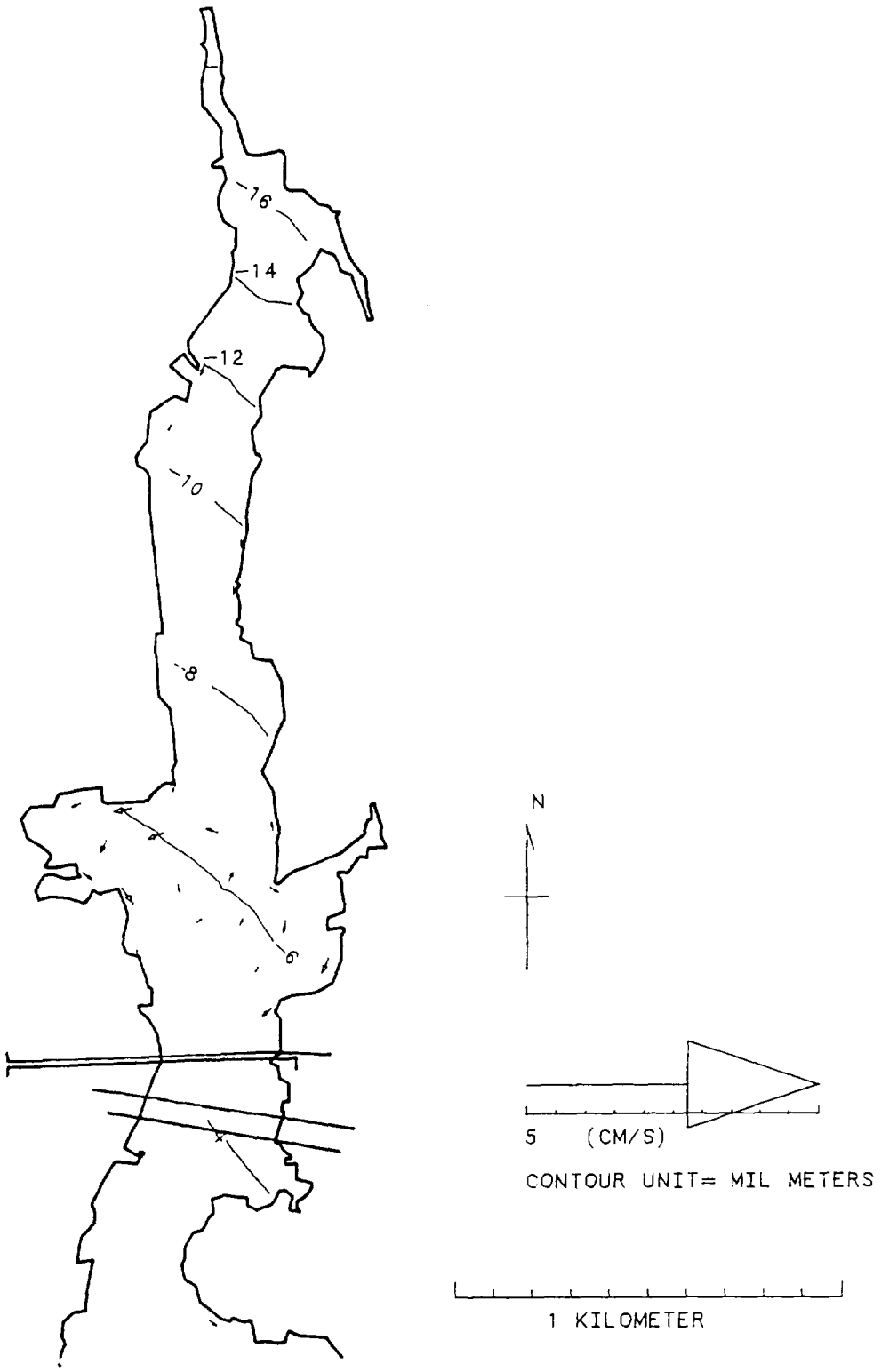


Figure 5.5 Hydrodynamic model predicted steady state, vertically averaged current field and surface elevation contours for constant wind forcing of 1 dyne/cm^2 toward the southwest.

Figure 5.5 Hydrodynamic model predicted steady state, vertically averaged current field and surface elevation contours for constant wind forcing of 1 dyne/cm^2 toward the southwest.

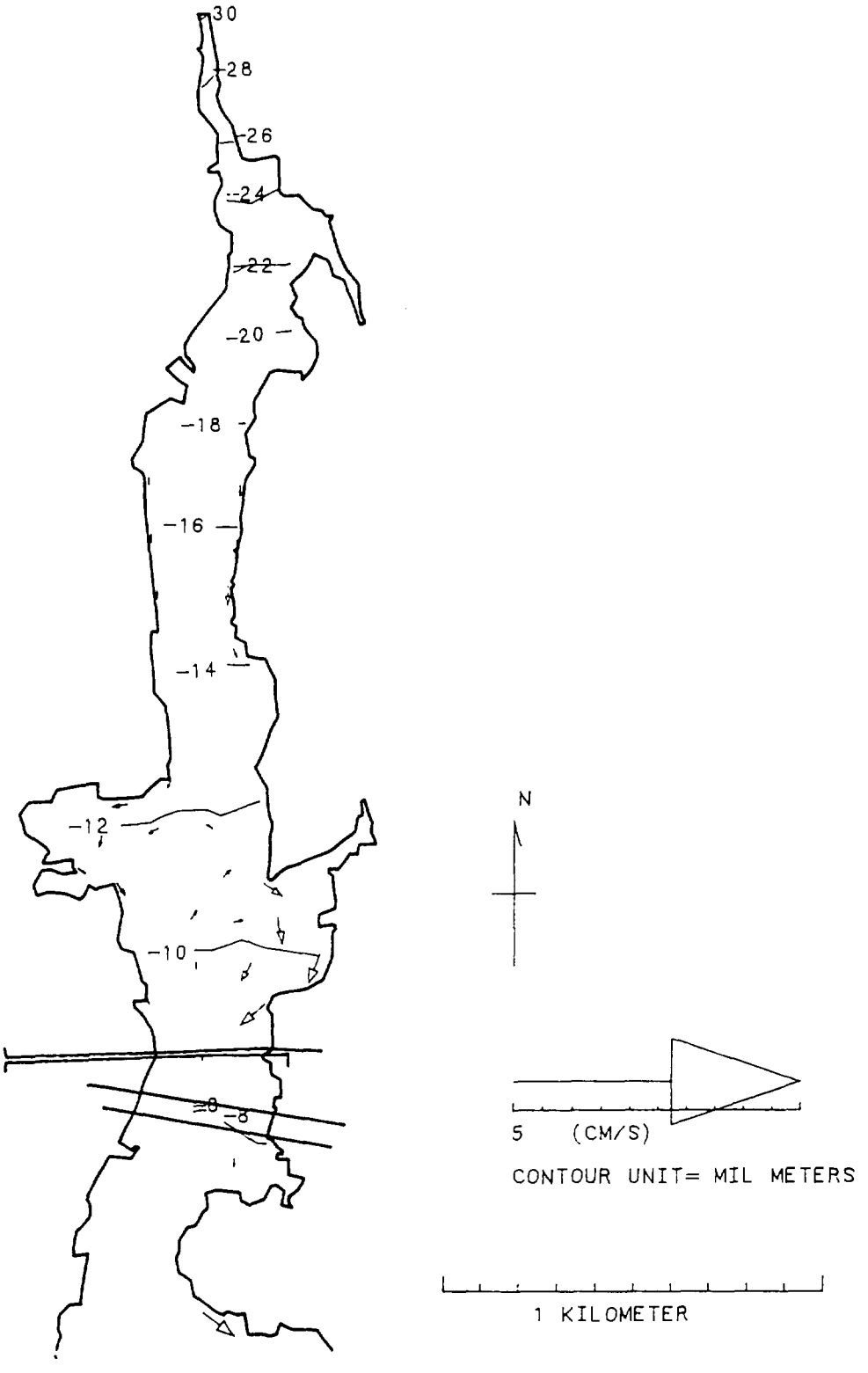


Figure 5.6 Hydrodynamic model predicted steady state, vertically averaged current field and surface elevation contours for constant wind forcing of 1 dyne/cm^2 toward the south.

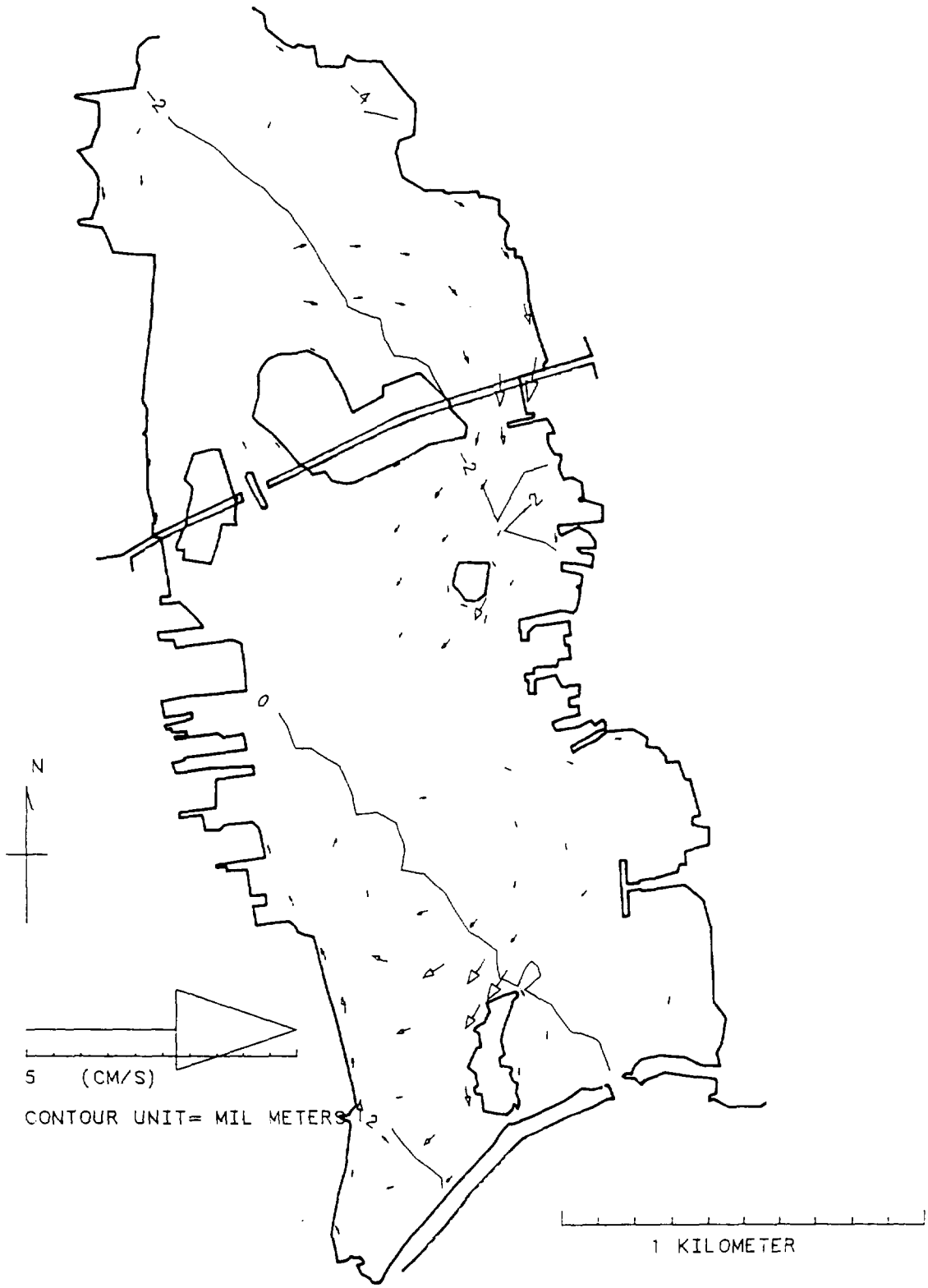


Figure 5.6 Hydrodynamic model predicted steady state, vertically averaged current field and surface elevation contours for constant wind forcing of 1 dyne/cm^2 toward the south.

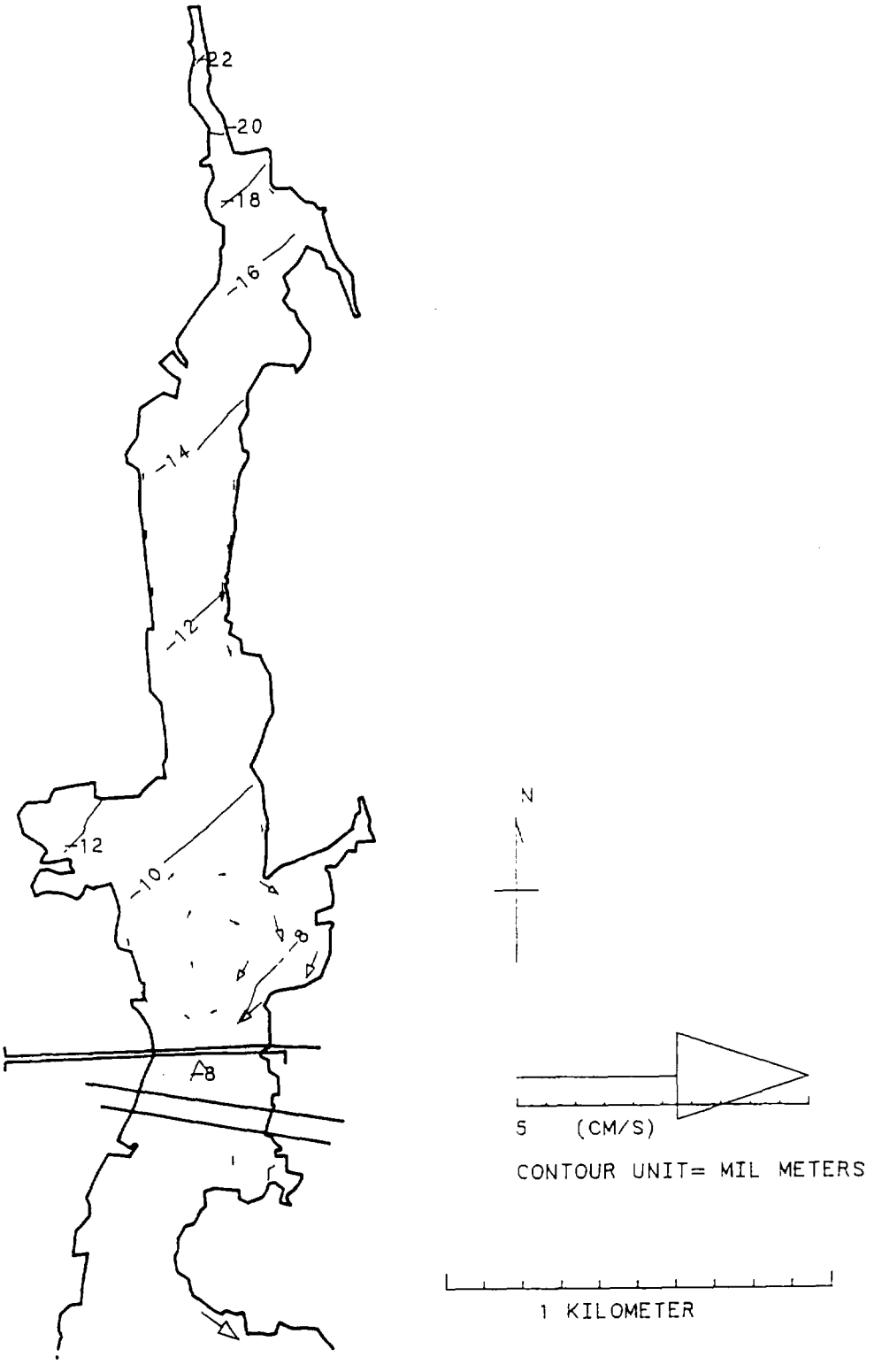


Figure 5.7 Hydrodynamic model predicted steady state, vertically averaged current field and surface elevation contours for constant wind forcing of 1 dyne/cm^2 toward the southeast.

Figure 5.7 Hydrodynamic model predicted steady state, vertically averaged current field and surface elevation contours for constant wind forcing of 1 dyne/cm^2 toward the southeast.

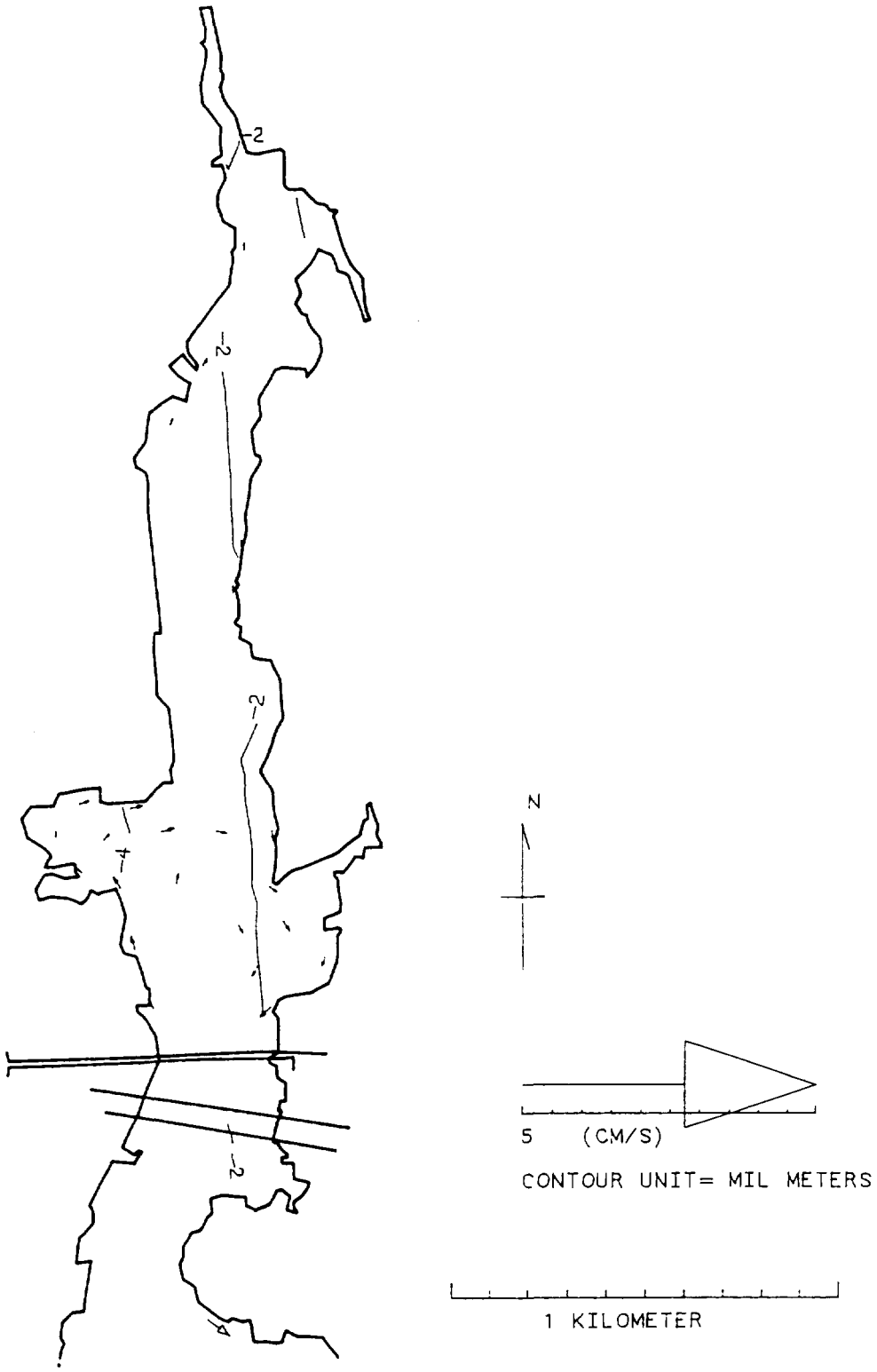


Figure 5.8 Hydrodynamic model predicted steady state, vertically averaged current field and surface elevation contours for constant wind forcing of 1 dyne/cm^2 toward the east.

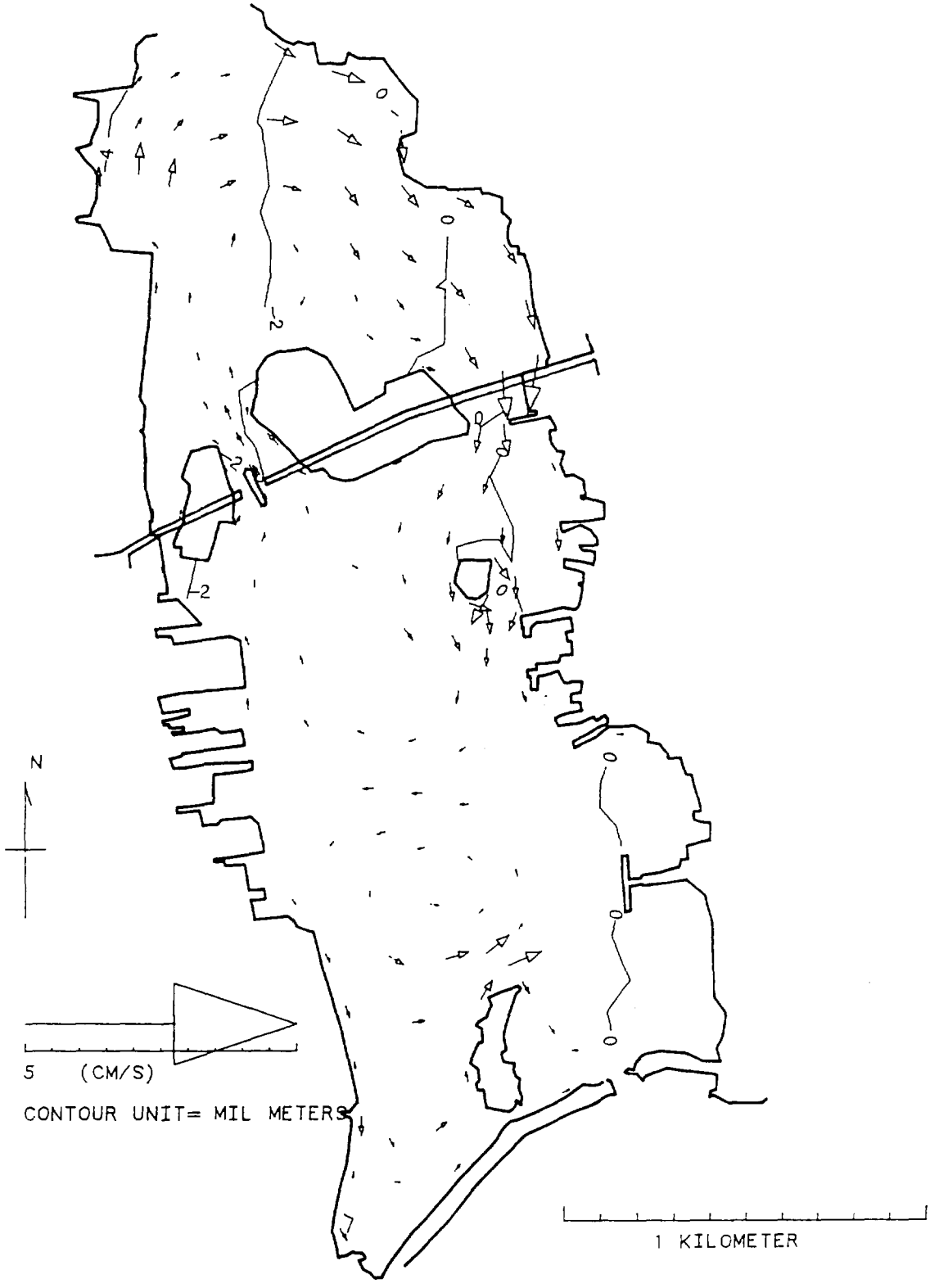


Figure 5.8 Hydrodynamic model predicted steady state, vertically averaged current field and surface elevation contours for constant wind forcing of 1 dyne/cm^2 toward the east.

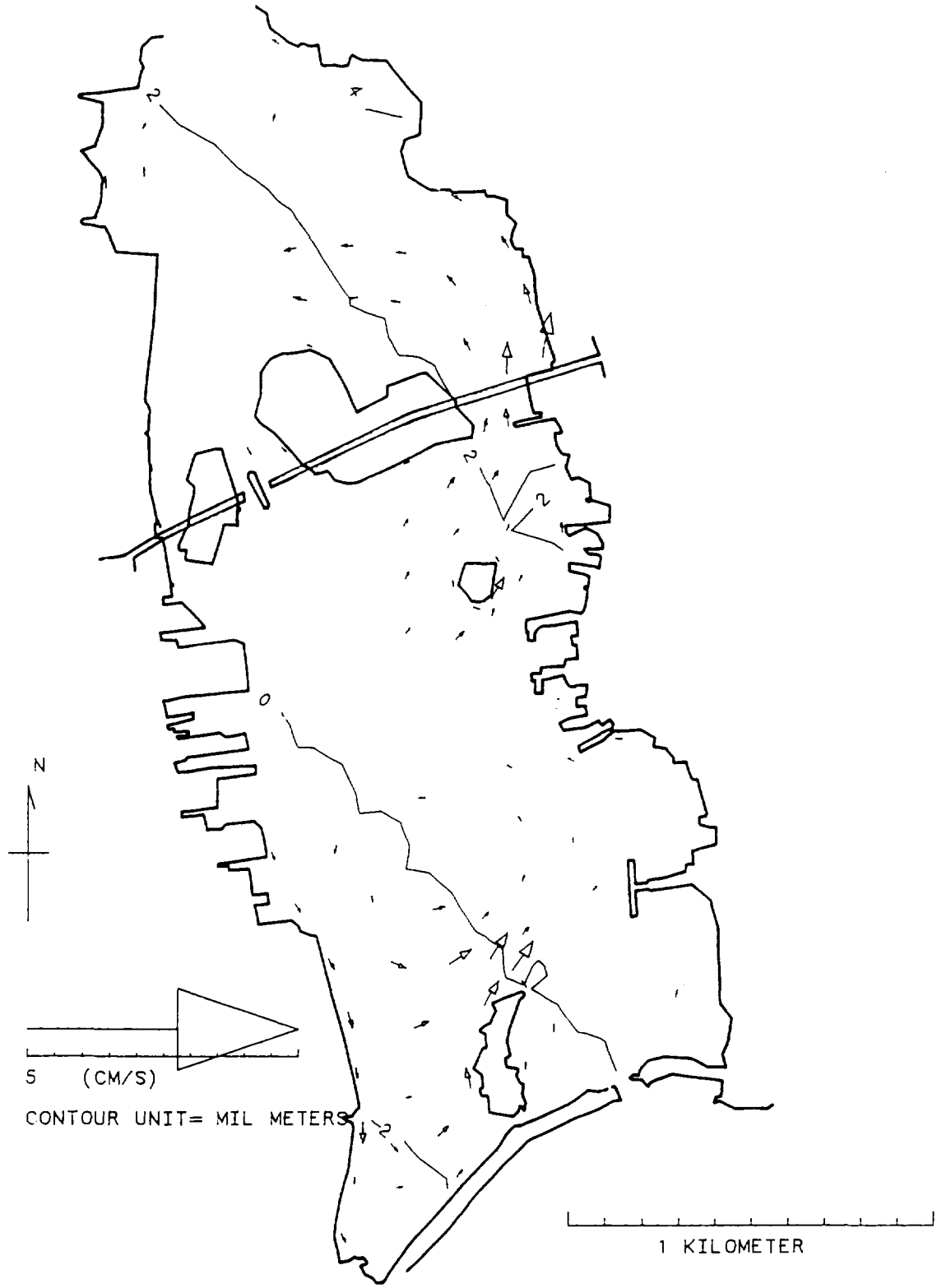


Figure 5.9. Hydrodynamic model predicted steady state, vertically averaged current field and surface elevation contours for constant wind forcing of 1 dyne/cm^2 toward the northeast.

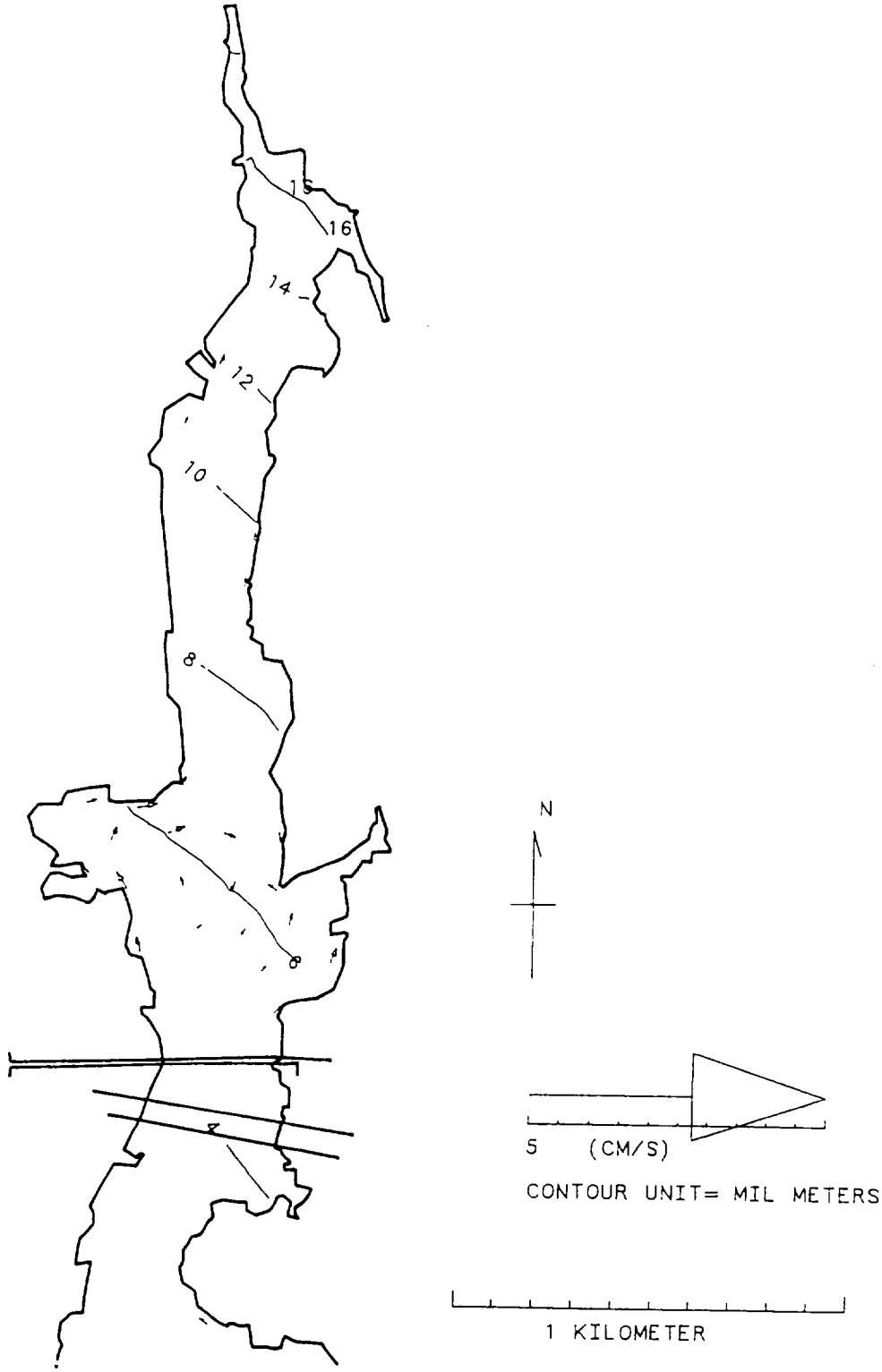


Figure 5.9. Hydrodynamic model predicted steady state, vertically averaged current field and surface elevation contours for constant wind forcing of 1 dyne/cm2 toward the northeast.

North

The steady state surface elevation contours and vertically averaged currents for a wind blowing to the north are shown in Figure 5.2. The surface elevation contours show a setup starting at zero at the hurricane barrier and proceeding to a maximum value of 28 mm in the upper estuary. The surface elevation increases sharply north of Coggeshall Street Bridge, increasing from 8 to 28 mm. The lower two thirds of the estuary accounts for approximately one third of the setup. The northward directed wind induces a counterclockwise circulation around Popes Island. The currents are strongest on the eastern side of Popes Island and reach a maximum value of 1.6 cm/s. The southward flow between Fish and Popes Island is much weaker. The differential velocities between the eastern and western side of the estuary are caused by the contrasting depths with typical values of 2-3 m and 9-11 m, respectively. Currents are relatively strong at the northern tip of Palmer Island and around Crow Island, again because of the shallow depths. A small counter clockwise eddy is observed just north of Coggeshall Street Bridge as the estuary widens. Currents here however are very weak.

Northwest

Figure 5.3 shows the model predicted contours for the northwest wind case. The surface elevation reaches a maximum value of 22 mm. The contours are oriented normal to the wind direction, at 45° to the major axis of the estuary. Most of the setup occurs in the upper estuary.

The large scale circulation gyre around Popes Island is similar to the northerly wind case but has very slightly stronger currents. The gyre also is more closed at its southern end. The eddy structure southwest of Palmer

not observed.

on contours are roughly
imum values of 4 mm on
se recirculation feature
s magnitude is reduced
maximum current east of
ature is also predicted
he estuary.

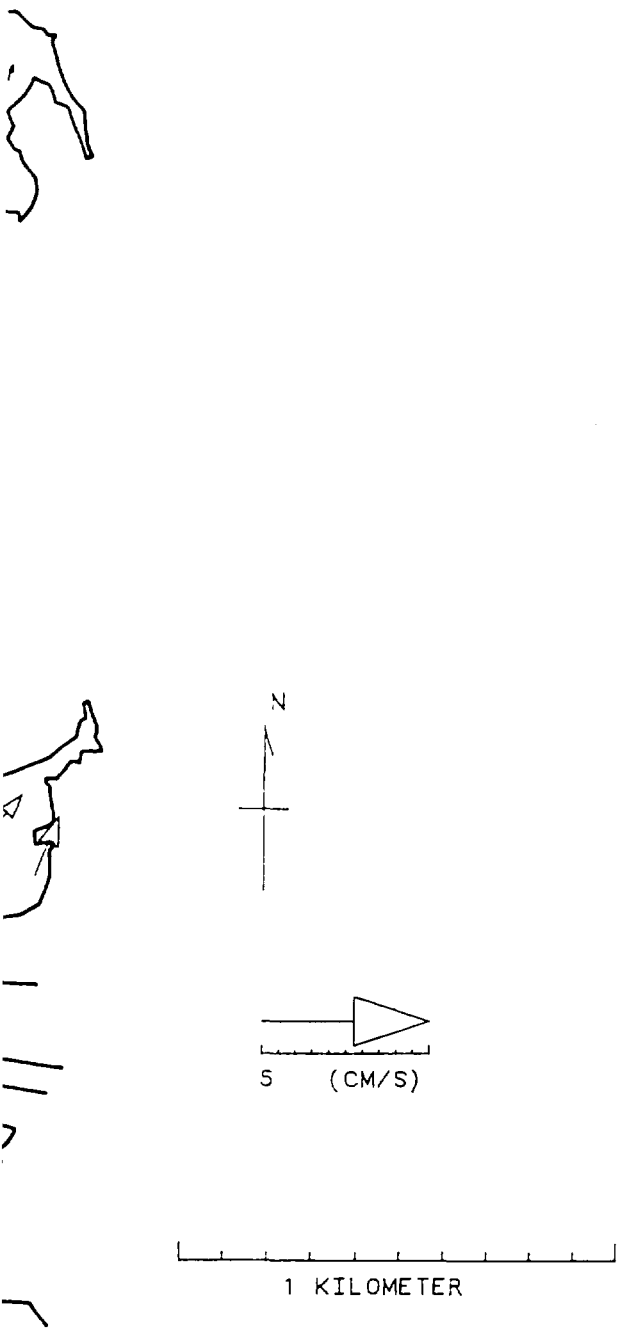
up of 2 mm southwest of
vind (Figure 5.5). The
to the wind with the
estuary.
predicted around Popes
lar weak clockwise eddy
nter-clockwise eddy is
egion where the estuary

rface elevation contour
that of the northerly
the estuary exhibits a
around Popes Island is

the southeast wind (Figure 5.7) is similar to that of
The most prominent modifications are a change to
i Popes Island and surface elevation setdowns in the

tterns for an easterly wind (Figure 5.8) are analogous
. Exceptions include: clockwise circulation around
er-clockwise eddy north of Palmer Island, a clockwise
all Street Bridge, and a setdown on the western side

response to northeast winds (Figure 5.9) are similar
southwest case (Figure 5.5). Again the major
ie recirculation directions of the eddies. The
counter-clockwise eddies north of Palmer Island and
A clockwise eddy is predicted north of Coggeshall
surface elevations show a setup in the system with a
i in the upper estuary.
steady wind forced vertically averaged hydrodynamic
r recirculation around Popes Island and minor eddies
i and the Coggeshall Street Bridge. The response is
rection. The recirculation around Popes Island is
strongest when the wind blows toward the northwest.
the west, the recirculation strength decreases. A
he wind direction to the southwest reverses the



redicted maximum inflow currents
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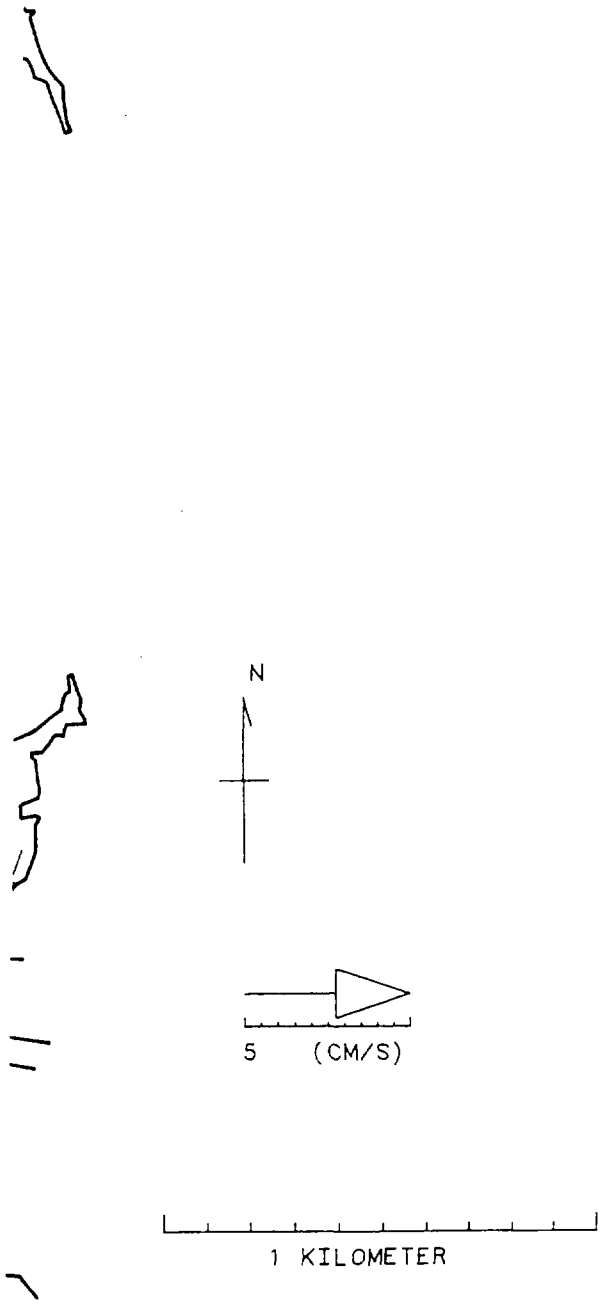
me series with an amplitude of
f 2 days.



:dicted maximum outflow currents
ıd forcing specified by sinusoidal
: series with an amplitude of
2 days.

6. Simulation of a Continuous Release from the Cornell Dubilier Site

In an earlier study simulations of the tidal circulation and dispersion of a continuous point release at the Cornell Dubilier site were made using a two dimensional vertically averaged finite difference hydrodynamic model. The model gave useful results, but the grid size selected (250 m) allowed only a coarse representation in the region around the Cornell Dubilier site and the entrance to New Bedford Harbor (through the hurricane barrier). The purpose of the present study is to perform the calculation again using a more refined grid system in this area.

The two dimensional vertically averaged finite element hydrodynamic model was applied to the study region shown in Figure 6.1. The study area is bounded by a line extending from Wilbur to Round Hill Points and the northwest shore of Buzzards Bay. The domain extends through New Bedford Harbor to the head of the Acushnet River estuary.

The triangular finite element mesh used to describe the study area is shown in Figure 6.2. The mesh was chosen to allow variable resolution throughout the study area and specifically to provide higher resolution in the area around the Cornell Dubilier site, the harbor entrance, (through the hurricane barrier), and lower New Bedford Harbor.

For each node, the mean low water (MLW) depths were determined from the NOAA/NOS (National Ocean Survey) navigation chart (13230). The study area bathymetry shallows from 8-9 m offshore to 3-4 m nearshore. A dredged channel (9.1 m) proceeds from offshore to the entrance to New Bedford Harbor and northward in the harbor until it terminates in the vicinity of Popes Island. The bathymetry of the area is shown in detail in Figure 6.1.

The most prevalent currents in the study area are produced by tidal

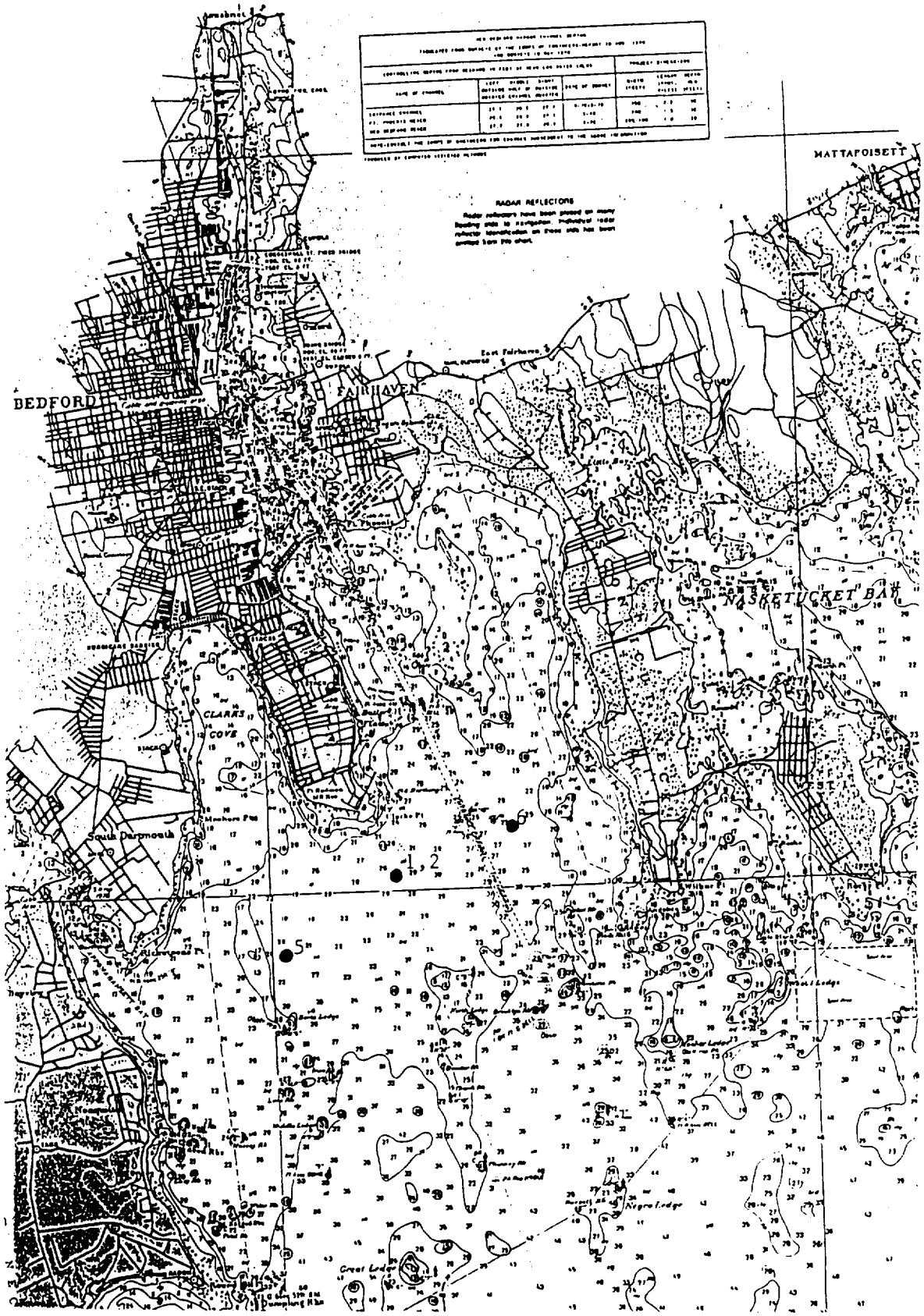


Figure 6.1 Study area including outer and inner New Bedford Harbor.

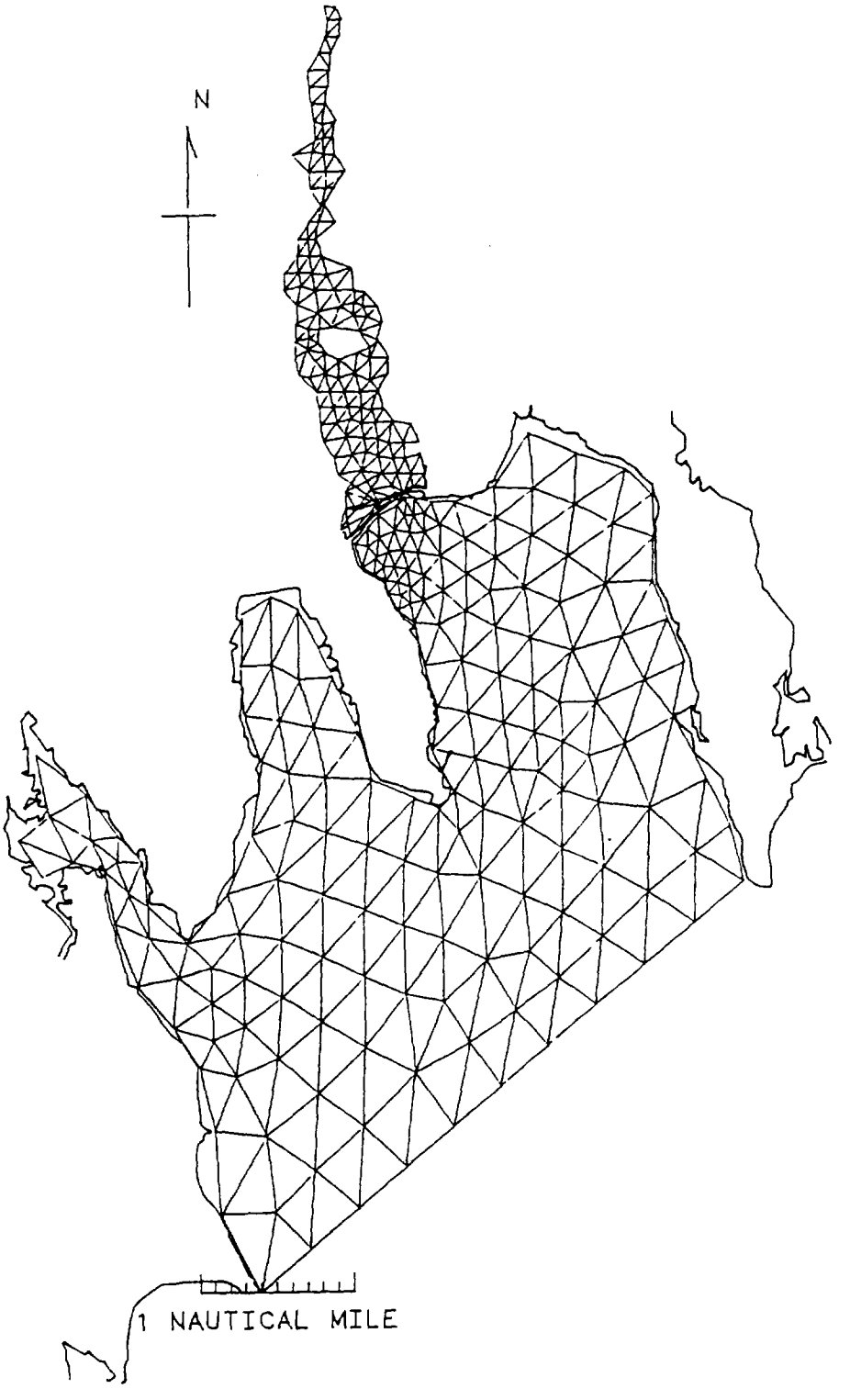


Figure 6.2 Triangular finite element grid system for outer and inner New Bedford Harbor.

forcing (Camp, Dresser, and McKee (CDM), 1983; Haight, 1936). The M2 tide (12.42 hr period) accounting for approximately 85% of the tidal energy. The hydrodynamic model was forced with an M2 tide along the open boundary. Height and phase relationships for this open boundary were derived from Spaulding and Beauchamp's (1983) and Spaulding and Gordon's (1982) tidal model of the entire southern New England coastal area, including: Long Island Sound, Block Island Sound, Rhode Island Sound, and Buzzards Bay and the NOS data for New Bedford harbor. Using a 1 nautical mile resolution, the two models gave excellent predictions of the tide throughout the area and provide an excellent source of information to describe the open boundary condition. The tide range selected was 1.13 m.

The tidal model was run for several test simulations to determine the most appropriate bottom friction coefficient. Simulation results show that a Manning factor of 0.030 gave the best fit to the available data.

Figure 6.3 and 6.4 show the model predicted vertically averaged tidal currents for maximum flood and ebb conditions, respectively. Part (a) shows the predictions near the Cornell Dubilier site and lower New Bedford Harbor and (b) for the entire outer harbor. The model results in the area outside New Bedford Harbor are in generally good agreement with the coarser grid simulations performed by Spaulding and Beauchamp (1983) and Spaulding and Gordon (1982).

Table 6.1 shows a comparison between model predictions and observations taken by CDM (1983) for three stations in the outer harbor. The station locations are given in Figure 6.1. The CDM station numbering system is used. Unfortunately the CDM data was not processed to extract the currents in the tidal frequency band but were simply given in the form

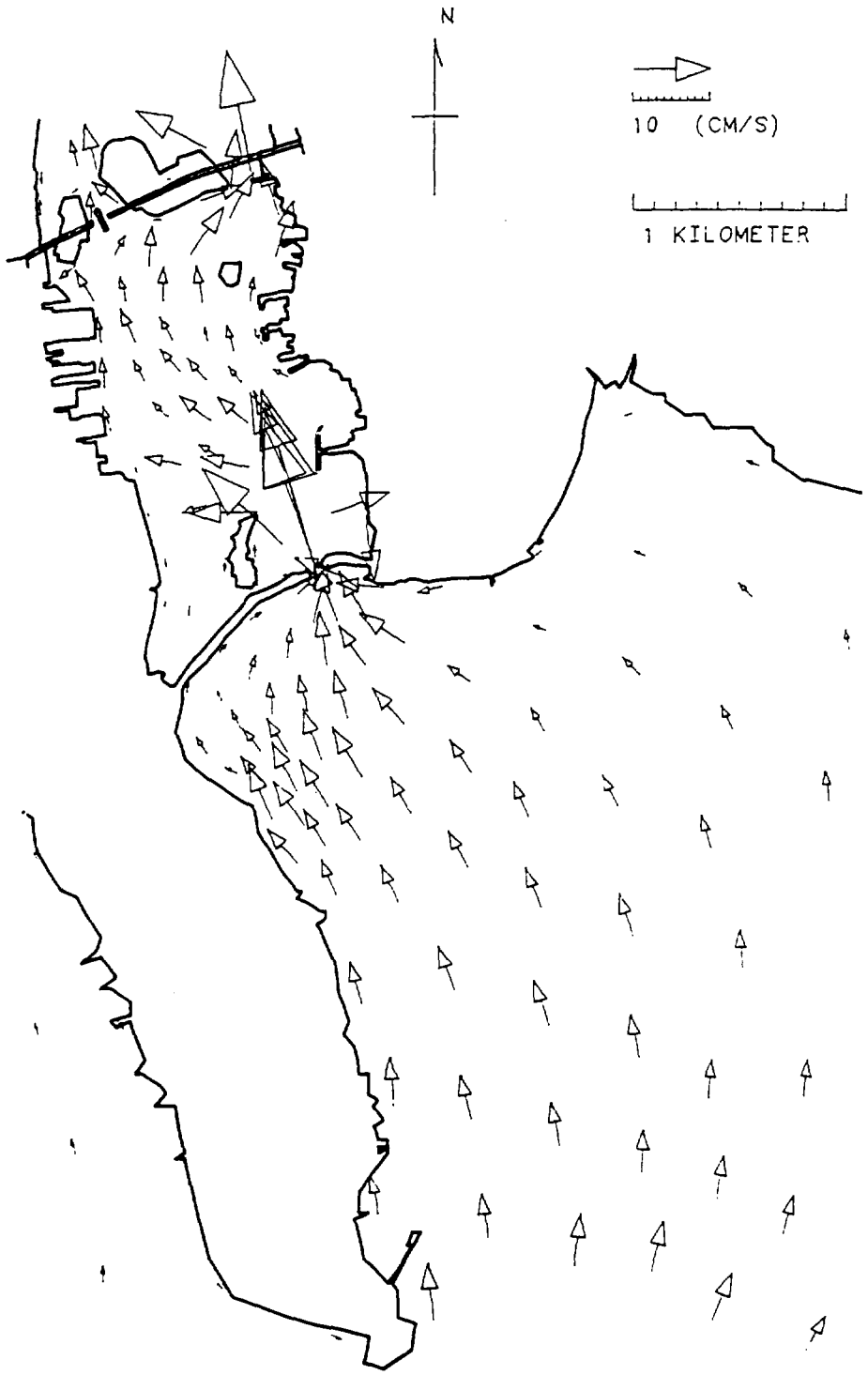


Figure 6.3a. Hydrodynamic model predicted tidal currents at maximum flood.

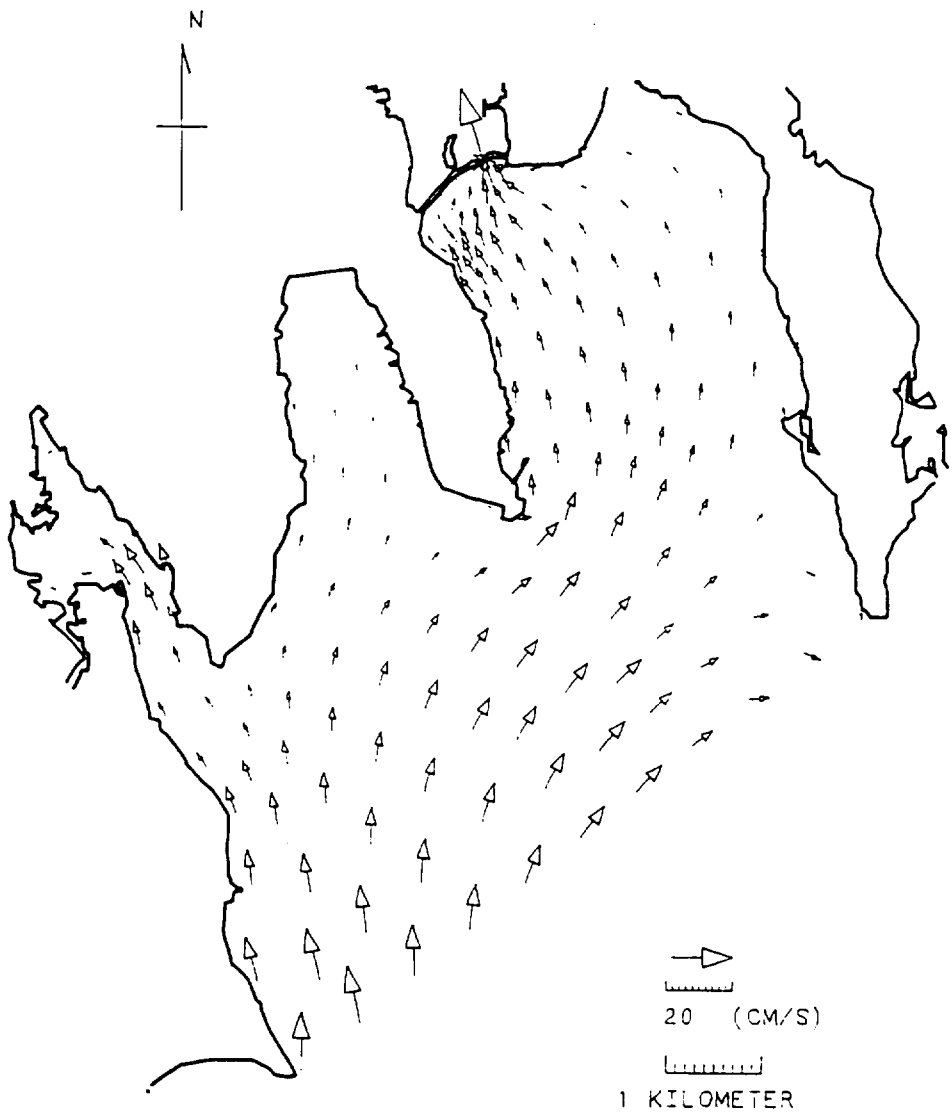


Figure 6.3b. Hydrodynamic model predicted tidal currents at maximum flood.

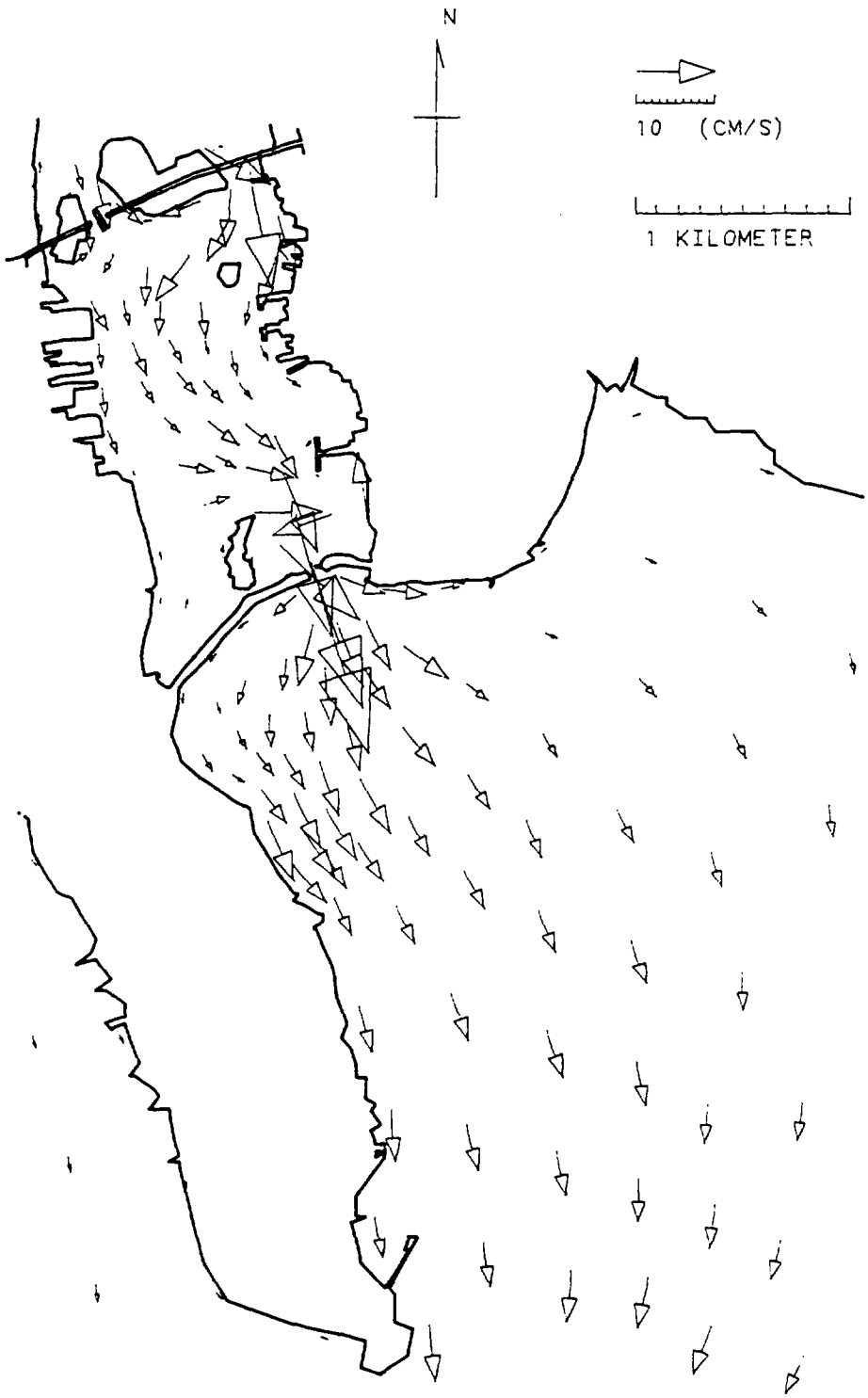


Figure 6.4a. Hydrodynamic model predicted tidal currents at maximum ebb.

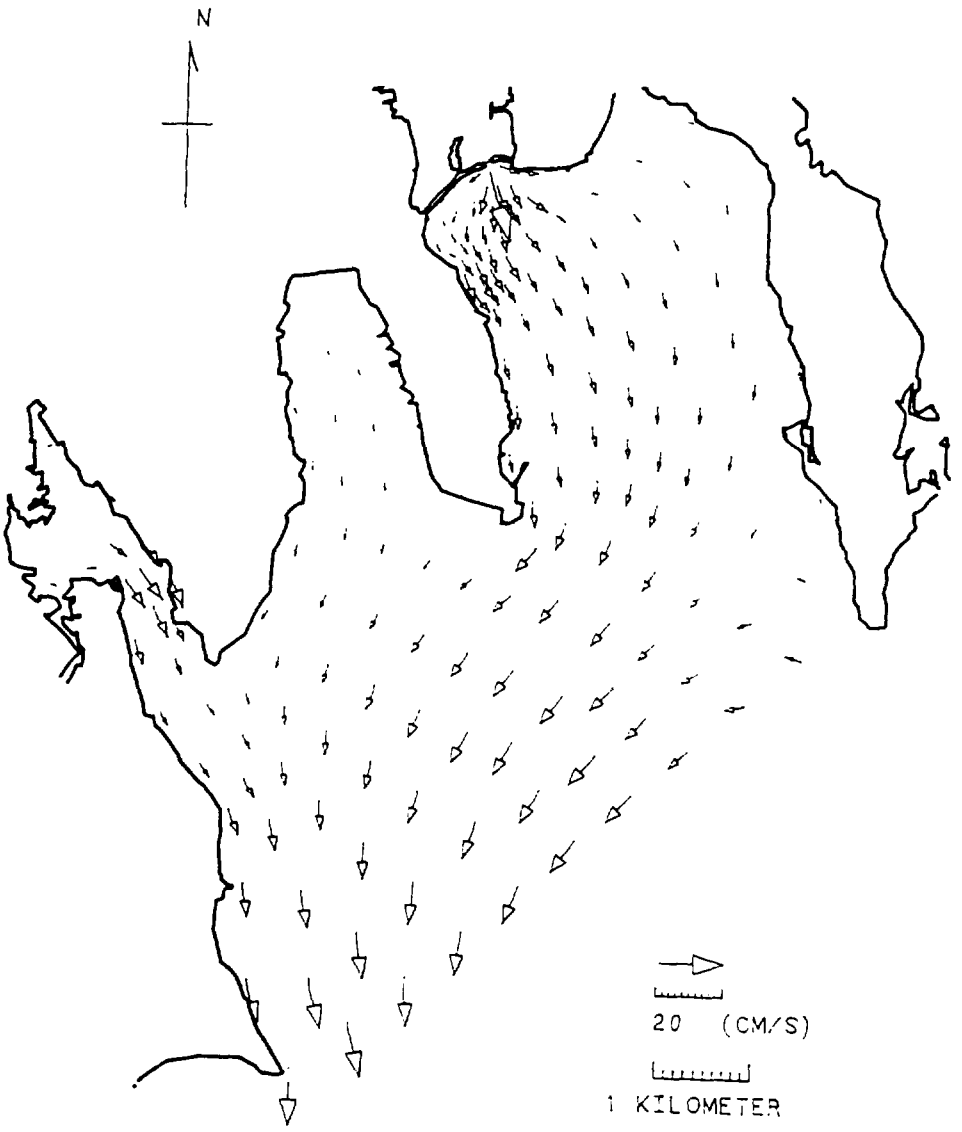


Figure 6.4b. Hydrodynamic model predicted tidal currents at maximum ebb.

of current direction/amplitude histograms. A one hour sampling time was employed for this analysis. The average values reported in Table 6.1 are therefore only an approximation to the tidal currents. With this note of caution the model (maximum and root mean square values) is seen to reasonably reproduce the major features of the tidal flow. This assessment is confirmed by comparing the model predictions to Haight's (1936) observations and the general pattern in CDM (1983) which includes stations outside the model domain.

A two dimensional vertically averaged finite element pollutant transport model was applied to the study area using the same grid as the hydrodynamic model (Figure 6.2). A unit source was continuously discharged at the Cornell Dubilier site meant to simulate the release of PCBs from sediments in this area and the simulation run until steady state conditions were achieved. The horizontal dispersion coefficients were parameterized using equations presented in ASA (1986). The boundary condition at the outer boundary was zero concentration. The pollutant is assumed as conservative and hence there is no deposition or resuspension.

The model predicted vertically averaged steady state concentration distributions are shown in Figure 6.5 and 6.6 for high and low tide conditions, respectively. The model shows the largest concentration gradients near the discharge source. The highest concentrations are observed near the western shore. The discharge plume is concentrated between the shore and the hurricane barrier to the north. The concentrations near the hurricane barrier are highest during high tide and lowest during ebb tide. The concentrations decrease gradually to the south and east. Concentration levels are reduced by a factor of two (2) by the

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Table 6.1 Comparison of model predicted flood/ebb tidal (M_2) currents to observed values at selected stations in outer new Bedford (Camp, Dresser, and McKee, 1983).

	Observation				Model Predictions		
Station Number/ Location	Mean Tidal Current Speed (cm/s)	Direction: Flood/Ebb	Meter Depth (Reference to Surface)	Measurement Dates	Tidal Currents Speed (cm/s)		Direction: Flood/Ebb
					Maximum	RMS	
1/Near existing New Bedford outfall	6.8	NE/SW	Mid Depth	17 July-17 Aug 1973	9.1	6.4	NE/SW
2/Near existing New Bedford outfall	4.6	NE/SW	Mid Depth	11 Sept-11 Oct 1973	9.1	6.4	NE/SW
5/East of Nun Buoy "10"	6.5	-	6.1 m	28 July-13 Aug 1979	6.9	4.8	NE/SW
6/East of Ricketson's Point	6.6	N/SSW	1.7 m	28 July-13 Aug 1979	9.1	6.4	NNE/SSW

Notes

1. Station locations are shown in Figure 6.1 and correspond to the numbering system used by Camp, Dresser, and McKee (1983).

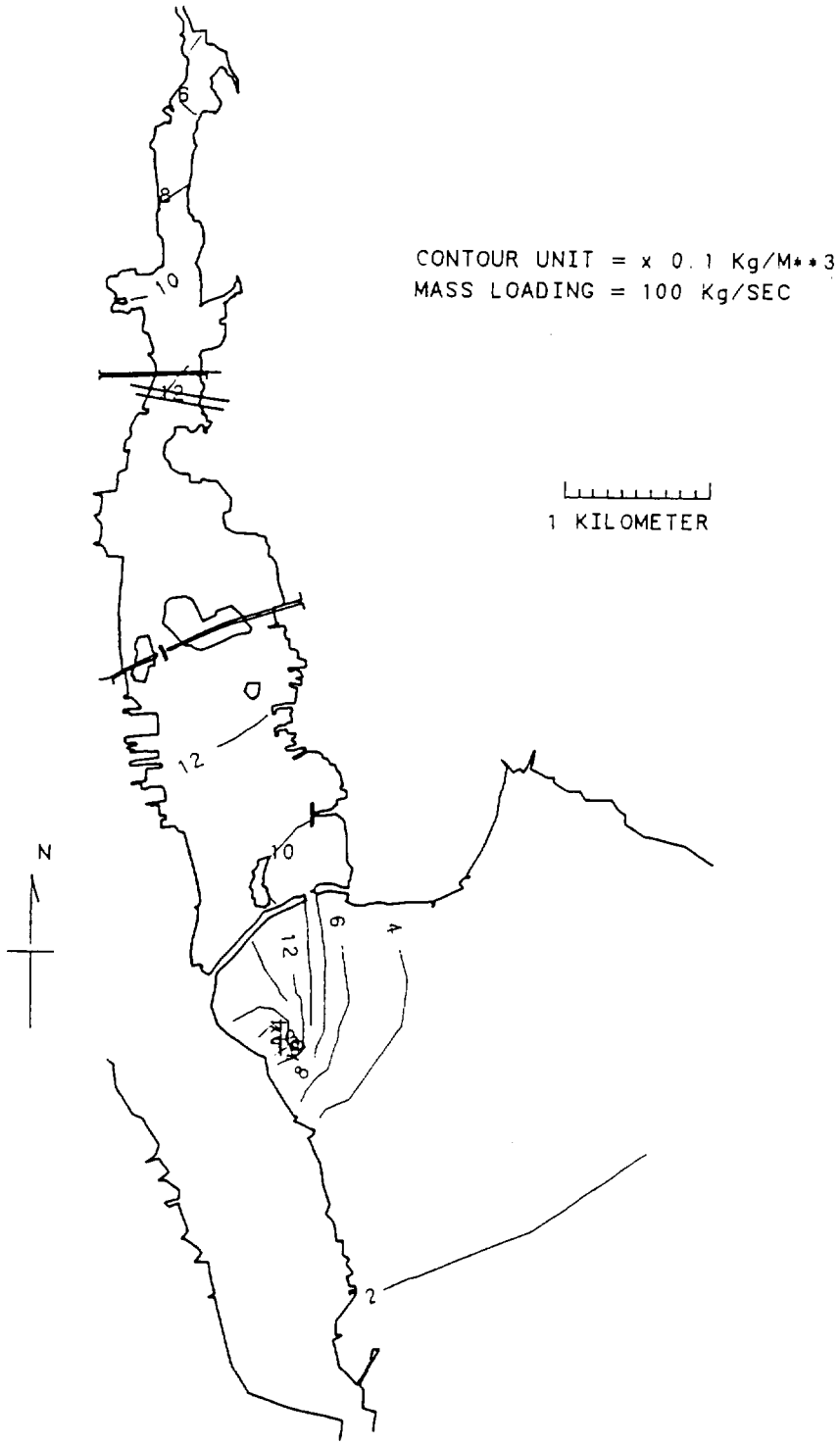

Figure 6.5 Dispersion model predicted steady state concentration distribution from a continuous point release at Cornell Dubilier, high tide.

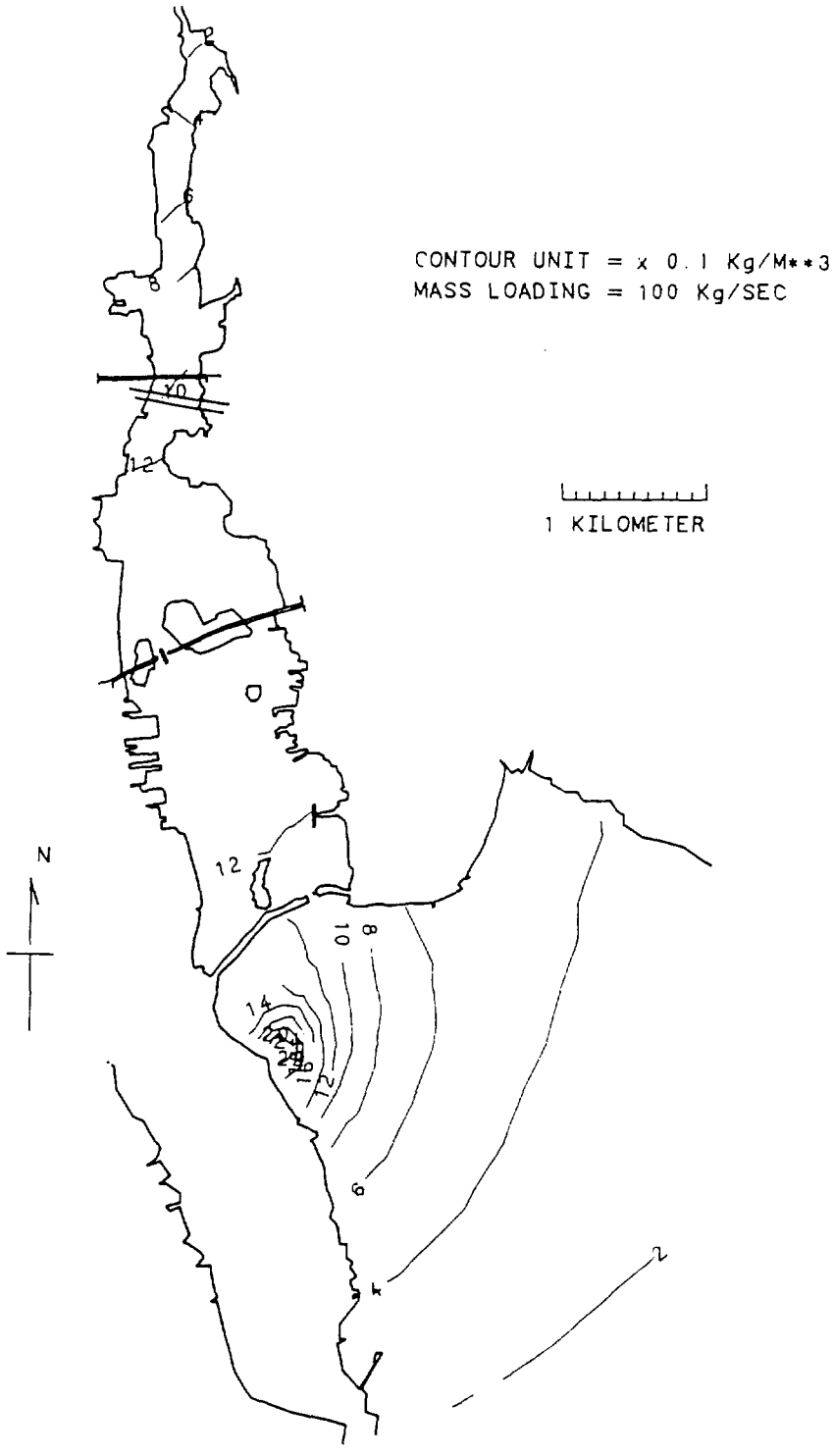

Figure 6.6 Dispersion model predicted steady state concentration distribution from a continuous point release at Cornell Dubilier, low tide.

time the material reaches the hurricane barrier. Even in the lower end of New Bedford Harbor, the concentration levels are still significant.

The concentrations predicted in the lower harbor are approximately constant and then decrease up-estuary. Being a conservative substance, the predicted concentrations decrease in approximately the same manner as salinity in the upper estuary.

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Appendix A

Appendix A Dye Concentration Measurements Collected During the Field Experiment

All dye concentration measurements collected as part of this field program are presented on the pages that follow. The data is given by date, station number, and depth. The time of collection is noted at the beginning of the entry. The dye concentrations corrected for background levels are given in parts per billion (ppb). Auxiliary data for temperature (^{o}C) and salinity (%) is also presented when available. The station number locations are given in Figure 2.1. No data is presented for Stations 16, 28 and 29. These stations were abandoned early in the field measurement program since they were too hazardous to maintain because of extensive vessel traffic. When no data is reported for the upper estuary (Stations 1-15) it was because ice conditions prevented safe boating in the area.

NEW BEDFORD HARBOR DATA FOR DECEMBER 15, 1986

STATION 1 AT 1142

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	2.74	1.5

STATION 2 AT 1140

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.00	1.5

STATION 3 NO DATA

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)

STATION 4 AT 1147

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	12.60	1.5
6.10	4.11	3.0

STATION 5 AT 1150

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	12.60	4.0

STATION 6 AT 1152

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.00	1.5

STATION 7 AT 1156

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	4.84	1.5

STATION 8 AT 1200

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.00	1.5

STATION 9 AT 1203

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	6.42	2.0

STATION 10 AT 1209

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.33	2.0

STATION 11 AT 1216

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.00	1.5

STATION 12 AT 1221

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.00	1.5

NEW BEDFORD HARBOR DATA FOR DECEMBER 15, 1986

STATION 13 AT 1224

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)

STATION 14 NO DATA

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)

STATION 15 NO DATA

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)

STATION 17 NO DATA

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)

STATION 18 NO DATA

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)

STATION 19 NO DATA

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)

STATION 20 NO DATA

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)

STATION 21 NO DATA

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)

NEW BEDFORD HARBOR DATA FOR DECEMBER 15, 1986

STATION 22 NO DATA

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)

STATION 23 NO DATA

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)

STATION 24 NO DATA

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)

STATION 25 NO DATA

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)

STATION 26 NO DATA

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)

STATION 27 NO DATA

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)

STATION 30 NO DATA

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)

STATION 31 NO DATA

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)

NEW BEDFORD HARBOR DATA FOR DECEMBER 15, 1986

STATION 32 NO DATA

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)

STATION 33 NO DATA

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)

STATION 34 NO DATA

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)

STATION 35 NO DATA

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)

STATION 36 NO DATA

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)

STATION 37 NO DATA

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)

STATION 38 NO DATA

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)

STATION 39 NO DATA

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)

NEW BEDFORD HARBOR DATA FOR DECEMBER 15, 1986

STATION 40 NO DATA

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)

STATION 41 NO DATA

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)

STATION 42 NO DATA

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)

STATION 43 NO DATA

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)

STATION 44 NO DATA

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)

STATION 45 NO DATA

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)

NEW BEDFORD HARBOR DATA FOR DECEMBER 16, 1986

STATION 1 NO DATA

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)

STATION 2 NO DATA

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)

STATION 3 NO DATA

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)

STATION 4 AT 1307

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	6.25	5.0
0.61	0.48	5.0

STATION 5 AT 1300

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	12.60	5.0
0.61	0.21	5.0

STATION 6 AT 1303

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	9.06	5.0
0.61	0.00	5.0

STATION 7 NO DATA

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)

STATION 8 AT 1255

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	5.74	5.0
0.61	0.00	5.0

STATION 9 AT 1251

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	12.60	5.0
0.61	0.00	5.0

STATION 10 AT 1248

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	12.60	5.0
2.44	0.38	5.0

STATION 11 AT 1242

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	7.91	5.0
0.61	0.10	5.0
1.22	0.04	5.0

STATION 12 AT 1232

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)

NEW BEDFORD HARBOR DATA FOR DECEMBER 16, 1986

STATION 13 AT 1237

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	8.29	5.0
0.61	0.30	5.0
1.22	0.13	5.0

STATION 14 AT 1205

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.24	4.5
0.61	0.25	4.5
1.22	0.22	4.5
1.83	0.14	4.5
2.44	0.06	4.5
3.05	0.03	4.5
4.57	0.00	4.5

STATION 15 AT 1228

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.39	5.0
0.61	0.30	5.0
2.44	0.12	5.0
3.66	0.01	5.0

STATION 17 AT 1220

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	1.55	5.0
0.61	0.32	5.0
1.22	0.23	5.0
1.83	0.18	5.0
2.44	0.11	5.0

STATION 18 NO DATA

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)

STATION 19 AT 1217

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.56	5.0
0.61	0.13	5.0
1.22	0.10	5.0
1.83	0.08	5.0
2.13	0.07	5.0

STATION 20 AT 1316

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.21	5.0
0.61	0.20	5.0
1.22	0.11	5.0
3.05	0.06	5.0

STATION 21 AT 1217

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)

NEW BEDFORD HARBOR DATA FOR DECEMBER 16, 1986

STATION 22 AT 1321

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.28	5.0
0.61	0.13	5.0
1.83	0.01	5.0
0.00	0.28	5.0
0.61	0.13	5.0
1.22	0.01	5.0

STATION 23 NO DATA

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)

STATION 24 AT 1213

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.22	4.5
0.61	0.15	4.5
1.83	0.10	4.5
3.05	0.03	4.5
4.57	0.04	4.5

STATION 25 AT 1209

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.28	4.5
0.61	0.28	5.0
1.22	0.21	5.0
3.05	0.07	5.0
4.57	0.01	5.0

STATION 26 AT 1403

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.20	5.0
0.61	0.02	5.0
1.83	0.01	5.0

STATION 27 AT 1408

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.28	5.0
0.61	0.28	5.0
1.83	0.01	5.0

STATION 30 AT 1413

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.07	5.0
0.61	0.07	5.0
1.22	0.02	5.0

STATION 31 AT 1419

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.10	5.0
0.61	0.02	5.0
3.05	0.02	5.0

NEW BEDFORD HARBOR DATA FOR DECEMBER 16, 1986

STATION 32 NO DATA

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)

STATION 33 AT 1426

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.08	4.5
0.61	0.06	5.0
3.05	0.02	5.0

STATION 34 NO DATA

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)

STATION 35 AT 1548

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.08	5.0
0.61	0.08	5.0
1.83	0.02	5.0

STATION 36 NO DATA

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)

STATION 37 NO DATA

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)

STATION 38 AT 1450

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.05	5.0
0.61	0.04	5.0
3.05	0.02	5.0

STATION 39 AT 1503

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.08	4.5
0.61	0.05	4.5
3.05	0.02	5.0

NEW BEDFORD HARBOR DATA FOR DECEMBER 16, 1986

STATION 40 AT 1515

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.08	4.5
0.61	0.09	5.0
1.83	0.03	5.0

STATION 41 AT 1534

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.01	5.0

STATION 42 NO DATA

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)

STATION 43 AT 1521

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.02	4.5
0.61	0.02	5.0
1.83	0.02	5.0

STATION 44 AT 1530

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.01	5.0

STATION 45 NO DATA

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)

NEW BEDFORD HARBOR DATA FOR DECEMBER 17, 1986

STATION 1 AT 1638

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	9.31	5.0

STATION 2 NO DATA

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)

STATION 3 AT 1634

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	10.97	5.0
0.61	1.71	5.0

STATION 4 AT 1631

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.88	5.0
0.61	4.84	5.0

STATION 5 AT 1628

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	6.25	5.0
0.61	4.20	5.0

STATION 6 AT 1626

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	9.06	5.0
0.61	5.48	5.0

STATION 7 AT 1624

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	7.53	5.0
0.61	3.22	5.0

STATION 8 AT 1622

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	10.08	5.0
0.61	3.18	5.0

STATION 9 AT 1620

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	11.87	4.0
0.61	1.99	5.0

STATION 10 AT 1618

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	4.08	5.0
0.61	1.67	5.0
1.22	0.51	5.0

STATION 11 AT 1616

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	8.42	4.5
0.61	2.78	5.0
1.22	0.59	5.0

STATION 12 AT 1612

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	2.27	4.5
0.61	1.32	5.0
1.22	1.08	5.0
2.44	0.52	5.0

NEW BEDFORD HARBOR DATA FOR DECEMBER 17, 1986

STATION 13 AT 1610

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	2.07	4.0
0.61	1.32	4.0
1.22	1.08	5.0

STATION 14 AT 1606

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	1.75	5.0
0.61	2.46	5.0
1.22	1.28	5.0
2.44	0.96	5.0
3.66	0.39	5.0

STATION 15 AT 1601

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	1.43	5.0
0.61	0.80	5.0
1.22	0.68	5.0
2.44	0.48	5.0
3.66	0.06	5.0

STATION 17 AT 1558

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.92	5.0
0.61	0.80	5.0
1.22	0.84	5.0
2.44	0.41	5.0

STATION 18 AT 1555

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	1.12	4.0
0.61	0.68	5.0
1.22	0.41	5.0
2.44	0.22	5.0

STATION 19 AT 1552

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	1.12	5.0
0.61	0.96	5.0
1.22	0.30	5.0

STATION 20 AT 1548

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	2.11	4.5
0.61	0.47	4.5
1.22	0.39	5.0
2.44	0.25	5.0

STATION 21 AT 1546

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	1.55	4.5
0.61	0.40	5.0
1.22	0.24	5.0

NEW BEDFORD HARBOR DATA FOR DECEMBER 17, 1986

STATION 22 AT 1543

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.46	4.0
0.61	0.37	5.0
1.22	0.15	5.0

STATION 23 AT 1540

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.56	4.0
0.61	0.47	4.5
1.22	0.43	5.0

STATION 24 AT 1533

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	1.67	5.0
0.61	0.80	5.0
1.22	0.37	5.0
2.44	0.26	5.0
3.66	0.13	5.0
6.10	0.01	5.0

STATION 25 AT 1526

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.68	5.0
0.61	0.37	5.0
1.22	0.23	5.0
2.44	0.68	5.0
3.66	0.03	5.0
6.10	0.02	5.0

STATION 26 AT 1520

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.32	4.5
0.61	0.37	5.0
1.22	0.04	5.0

STATION 27 AT 1515

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.08	4.5
0.61	0.05	4.5
1.22	0.05	5.0
1.83	0.03	5.0

STATION 30 AT 1511

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.05	4.5
0.61	0.04	4.5
1.22	0.04	5.0

STATION 31 AT 1508

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.68	5.0
0.61	0.41	5.0
1.22	0.19	5.0
2.44	0.08	5.0

NEW BEDFORD HARBOR DATA FOR DECEMBER 17, 1986

STATION 32 AT 1503

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	1.02	5.0
0.61	0.78	5.0
1.22	0.33	5.0
2.44	0.14	5.0
3.66	0.06	5.0

STATION 33 AT 1457

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.90	4.5
0.61	0.74	4.5
1.22	0.41	4.5
2.44	0.21	4.5
3.66	0.08	4.5
6.10	0.01	4.5

STATION 34 AT 1449

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.59	4.5
0.61	0.44	4.5
1.22	0.33	4.5
2.44	0.12	4.5
3.66	0.07	4.5
6.10	0.02	4.5

STATION 35 AT 1438

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.10	4.5
0.61	0.10	4.5
1.22	0.06	4.5
2.44	0.06	4.5

STATION 36 AT 1432

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.15	4.0
0.61	0.15	4.5
1.22	0.10	4.5
2.44	0.06	4.5
3.66	0.03	4.5

STATION 37 AT 1427

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.27	4.0
0.61	0.28	4.0
1.22	0.29	4.5
2.44	0.12	4.5
3.66	0.05	4.5
6.10	0.02	4.5

STATION 38 AT 1420

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.28	4.5
0.61	0.28	4.5
1.22	0.25	4.5
2.44	0.25	4.5
3.66	0.08	4.5
6.10	0.03	4.5

STATION 39 AT 1414

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.26	4.0
0.61	0.26	4.0
1.22	0.26	4.0
2.44	0.07	4.5
1.83	0.11	4.5
3.66	0.03	4.5

NEW BEDFORD HARBOR DATA FOR DECEMBER 17, 1986

STATION 40 AT 1403

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.16	4.5
0.61	0.16	4.5
1.22	0.17	4.5
2.44	0.14	4.5
3.66	0.05	4.5
6.10	0.03	4.5

STATION 41 AT 1358

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.06	4.5
0.61	0.07	4.5
1.22	0.08	4.5
2.44	0.05	4.5
3.66	0.04	4.5

STATION 42 AT 1353

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.17	4.5
0.61	0.17	4.5
1.22	0.12	4.5
2.44	0.04	4.5

STATION 43 AT 1346

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.15	4.5
0.61	0.09	4.5
1.22	0.09	4.5
2.44	0.06	4.5
3.66	0.03	4.5
6.10	0.01	4.5

STATION 44 AT 1337

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.06	4.5
0.61	0.05	4.5
1.22	0.04	4.5
2.44	0.04	4.5
3.66	0.05	4.5
6.10	0.04	4.5

STATION 45 AT 1330

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.05	4.5
0.61	0.05	4.5
1.22	0.04	5.0
2.44	0.04	5.0
3.66	0.04	5.0
6.10	0.02	5.0

NEW BEDFORD HARBOR DATA FOR DECEMBER 18, 1986

STATION 1 AT 1724

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	12.00	5.0

STATION 2 AT 1719

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	11.23	5.0
0.61	2.11	5.0

STATION 3 AT 1712

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	12.60	5.0
0.61	12.60	5.0

STATION 4 AT 1706

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	9.57	5.0
0.61	1.55	5.0

STATION 5 AT 1700

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	12.60	5.0
0.61	4.46	5.0

STATION 6 AT 1656

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	12.60	5.0
0.61	6.89	5.0

STATION 7 AT 1645

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	9.06	5.0
0.61	1.20	5.0

STATION 8 AT 1642

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	12.00	5.0
0.61	7.91	5.0

STATION 9 AT 1638

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	5.35	5.0
0.61	5.61	5.0

STATION 10 AT 1627

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	6.76	5.0
0.61	7.01	5.0

STATION 11 AT 1618

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	6.89	5.0
0.61	2.35	5.0
1.22	0.92	5.0

STATION 12 AT 1609

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	1.00	5.0
0.61	1.04	5.0
1.22	1.04	5.0
2.44	1.00	5.0

NEW BEDFORD HARBOR DATA FOR DECEMBER 18, 1986

STATION 13 AT 1605

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	1.47	5.0
0.61	1.51	5.0

STATION 14 NO DATA

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)

STATION 15 AT 1550

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.76	5.0
0.61	0.80	5.0
1.22	0.84	5.0
2.44	0.72	5.0
3.66	0.58	5.0

STATION 17 AT 1540

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.64	5.0
0.61	0.64	5.0
1.22	0.60	5.0
2.44	0.60	5.0
3.66	0.56	5.0
6.10	0.09	5.0

STATION 18 AT 1534

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.62	5.0
0.61	0.62	5.0
1.22	0.62	5.0
2.44	0.61	5.0

STATION 19 AT 1531

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.47	5.0
0.61	0.52	5.0
1.22	0.52	5.0
2.13	0.50	5.0

STATION 20 AT 1525

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.88	5.0
0.61	0.88	5.0
1.22	0.56	5.0
2.44	0.47	5.0
3.66	0.44	5.0
6.10	0.04	5.0

STATION 21 AT 1445

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.53	5.0
0.61	0.53	5.0
1.22	0.07	5.0

NEW BEDFORD HARBOR DATA FOR DECEMBER 18, 1986

STATION 22 AT 1447

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.44	5.0
0.61	0.44	5.0
1.22	0.44	5.0
2.44	0.21	5.0

STATION 23 AT 1451

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.34	5.0
0.61	0.35	5.0
1.22	0.33	5.0
2.44	0.09	5.0

STATION 24 AT 1440

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.56	5.0
0.61	0.57	5.0
1.22	0.58	5.0
2.44	0.46	5.0
3.66	0.42	5.0
6.10	0.04	5.0

STATION 25 AT 1435

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.63	5.0
0.61	0.65	5.0
1.22	0.65	5.0
2.44	0.44	5.0
3.66	0.32	5.0
6.10	0.07	5.0

STATION 26 AT 1430

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.30	5.0
0.61	0.30	5.0
1.22	0.30	5.0
2.13	0.27	5.0

STATION 27 AT 1426

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.19	5.0
0.61	0.20	5.0
1.22	0.18	5.0
2.44	0.10	5.0

STATION 30 AT 1421

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.09	5.0
0.61	0.08	5.0
1.22	0.10	5.0
1.52	0.08	5.0

STATION 31 AT 1415

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.42	5.0
0.61	0.41	5.0
1.22	0.29	5.0
2.44	0.16	5.0

NEW BEDFORD HARBOR DATA FOR DECEMBER 18, 1986

STATION 32 AT 1410

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.42	5.0
0.61	0.42	5.0
1.22	0.41	5.0
2.44	0.37	5.0
3.66	0.27	5.0
6.10	0.08	5.0

STATION 33 AT 1405

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.45	5.0
0.61	0.44	5.0
1.22	0.33	5.0
2.44	0.27	5.0
3.66	0.21	5.0
6.10	0.07	5.0

STATION 34 AT 1400

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.41	5.0
0.61	0.37	5.0
1.22	0.35	5.0
2.44	0.21	5.0
3.66	0.11	5.0
6.10	0.03	5.0

STATION 35 AT 1355

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.17	5.0
0.61	0.16	5.0
1.22	0.15	5.0
2.44	0.11	5.0
3.66	0.09	5.0

STATION 36 AT 1350

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.17	5.0
0.61	0.16	5.0
1.22	0.15	5.0
2.44	0.11	5.0
3.66	0.09	5.0

STATION 37 AT 1344

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.19	5.0
0.61	0.19	5.0
1.22	0.19	5.0
2.44	0.14	5.0
3.66	0.11	5.0
6.10	0.05	5.0

STATION 38 AT 1338

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.24	5.0
0.61	0.24	5.0
1.22	0.25	5.0
2.44	0.24	5.0
3.66	0.22	5.0
6.10	0.06	5.0

STATION 39 AT 1333

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.21	5.0
0.61	0.21	5.0
1.22	0.21	5.0
2.44	0.20	5.0
3.66	0.10	5.0
6.10	0.08	5.0

NEW BEDFORD HARBOR DATA FOR DECEMBER 18, 1986

STATION 40 AT 1327

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.20	5.0
0.61	0.20	5.0
1.22	0.19	5.0
2.44	0.14	5.0
3.66	0.11	5.0
6.10	0.05	5.0

STATION 41 AT 1322

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.15	5.0
0.61	0.17	5.0
1.22	0.19	5.0
2.44	0.09	5.0
3.66	0.09	5.0
6.10	0.05	5.0

STATION 42 AT 1318

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.17	5.0
0.61	0.16	5.0
1.22	0.18	5.0
2.44	0.16	5.0
3.66	0.10	5.0

STATION 43 AT 1313

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.21	5.0
0.61	0.17	5.0
1.22	0.13	5.0
2.44	0.10	5.0
3.66	0.09	5.0
6.10	0.05	5.0

STATION 44 AT 1308

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.18	5.0
0.61	0.18	5.0
1.22	0.18	5.0
2.44	0.13	5.0
3.66	0.11	5.0
6.10	0.06	5.0

STATION 45 AT 1300

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.10	5.0
0.61	0.10	5.0
1.22	0.09	5.0
2.44	0.07	5.0
3.66	0.07	5.0
6.10	0.05	5.0

NEW BEDFORD HARBOR DATA FOR DECEMBER 20, 1986

STATION 1 AT 1800

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	12.60	5.0
0.61	5.48	5.0

STATION 2 AT 1757

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.68	5.0
0.61	0.88	5.0

STATION 3 AT 1753

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	7.65	5.0
0.61	1.71	5.0

STATION 4 AT 1749

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	1.04	5.0
0.61	1.36	5.0

STATION 5 AT 1746

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	2.03	5.0
0.61	0.92	5.0

STATION 6 AT 1743

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.76	5.0
0.61	0.92	5.0

STATION 7 AT 1741

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	3.18	5.0
0.61	2.23	5.0

STATION 8 AT 1738

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	1.99	5.0
0.61	1.75	5.0

STATION 9 AT 1736

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	2.50	5.0
0.61	2.27	5.0

STATION 10 AT 1733

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	2.58	5.0
0.61	2.03	5.0

STATION 11 AT 1730

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	2.62	5.0
0.61	2.19	5.0

STATION 12 AT 1726

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	2.62	5.0
0.61	2.62	5.0
1.22	1.20	5.0

NEW BEDFORD HARBOR DATA FOR DECEMBER 20, 1986

STATION 13 AT 1724

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	2.46	5.0
0.61	2.15	5.0

STATION 14 AT 1722

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	2.31	5.0
0.61	2.19	5.0
1.22	0.44	5.0
2.44	0.38	5.0
3.66	0.30	5.0

STATION 15 AT 1718

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	1.99	5.0
0.61	1.75	5.0
1.22	0.50	5.0
2.44	0.30	5.0
3.66	0.25	5.0

STATION 17 AT 1713

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	1.20	5.0
0.61	0.46	5.0
1.22	0.38	5.0
2.44	0.29	5.0
3.66	0.22	5.0
6.10	0.15	5.0
7.32	0.13	5.0

STATION 18 AT 1710

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.42	5.0
0.61	0.39	5.0
1.22	0.30	5.0
2.44	0.27	5.0

STATION 19 AT 1708

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.65	5.0
0.61	0.46	5.0
1.22	0.39	5.0

STATION 20 AT 1705

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	1.12	5.0
0.61	0.72	5.0
1.22	0.37	5.0
2.44	0.32	5.0

STATION 21 AT 1703

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.28	5.0
0.61	0.51	5.0
1.22	0.37	5.0

NEW BEDFORD HARBOR DATA FOR DECEMBER 20, 1986

STATION 22 AT 1701

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.55	5.0
0.61	0.46	5.0
1.22	0.39	5.0

STATION 23 AT 1659

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.51	5.0
0.61	0.46	5.0
1.22	0.39	5.0
2.44	0.24	5.0

STATION 24 AT 1652

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.96	5.0
0.61	0.88	5.0
1.22	0.45	5.0
2.44	0.28	5.0
3.66	0.23	5.0
6.10	0.13	5.0
7.32	0.14	5.0

STATION 25 AT 1645

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.88	5.0
0.61	0.84	5.0
1.22	0.44	5.0
2.44	0.30	5.0
3.66	0.22	5.0
6.10	0.15	5.0
7.32	0.13	5.0

STATION 26 AT 1640

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.68	5.0
0.61	0.64	5.0
1.22	0.38	5.0
2.44	0.23	5.0

STATION 27 AT 1636

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.63	5.0
0.61	0.53	5.0
1.22	0.49	5.0

STATION 30 AT 1631

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.52	5.0
0.61	0.47	5.0
1.22	0.36	5.0

STATION 31 AT 1625

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.49	5.0
0.61	0.49	5.0
1.22	0.36	5.0
2.44	0.28	5.0

NEW BEDFORD HARBOR DATA FOR DECEMBER 20, 1986

STATION 32 AT 1618

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.63	5.0
0.61	0.46	5.0
1.22	0.39	5.0
2.44	0.28	5.0
3.66	0.26	5.0

STATION 33 AT 1608

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.56	5.0
0.61	0.42	5.0
1.22	0.39	5.0
2.44	0.31	5.0
3.66	0.25	5.0
6.10	0.13	5.0
7.32	0.12	5.0

STATION 34 AT 1557

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.56	5.0
0.61	0.46	5.0
1.22	0.41	5.0
2.44	0.32	5.0
3.66	0.25	5.0
6.10	0.16	5.0
7.32	0.09	5.0

STATION 35 AT 1550

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.46	5.0
0.61	0.46	5.0
1.22	0.37	5.0
2.44	0.30	5.0
3.66	0.23	5.0

STATION 36 AT 1544

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.31	5.0
0.61	0.31	5.0
1.22	0.32	5.0
2.44	0.31	5.0
3.66	0.30	5.0

STATION 37 AT 1534

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.42	5.0
0.61	0.42	5.0
1.22	0.41	5.0
2.44	0.32	5.0
3.66	0.29	5.0
6.10	0.13	5.0
7.32	0.08	5.0

STATION 38 AT 1528

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.47	5.0
0.61	0.47	5.0
1.22	0.42	5.0
2.44	0.35	5.0
3.66	0.25	5.0
6.10	0.16	5.0
7.32	0.13	5.0

STATION 39 AT 1519

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.44	5.0
0.61	0.45	5.0
1.22	0.44	5.0
2.44	0.41	5.0
3.66	0.25	5.0
6.10	0.16	5.0
7.32	0.12	5.0

NEW BEDFORD HARBOR DATA FOR DECEMBER 21, 1986

STATION 1 AT 1810

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	2.36	4.0
0.61	1.59	5.0

STATION 2 AT 1807

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	3.47	3.5
0.61	3.44	5.0

STATION 3 AT 1805

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	3.23	3.5
0.61	4.87	4.5

STATION 4 AT 1803

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	2.54	3.5
0.61	4.53	4.0

STATION 5 AT 1800

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	3.40	3.0
0.61	3.42	4.0

STATION 6 AT 1758

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	4.32	3.5
0.61	3.71	3.5

STATION 7 AT 1755

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	3.87	3.0
0.61	3.42	4.0

STATION 8 AT 1753

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	3.99	3.0
0.61	4.41	4.0

STATION 9 AT 1751

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	3.56	2.5
0.61	3.91	3.0

STATION 10 AT 1748

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	3.64	3.0
0.61	4.11	3.0

STATION 11 AT 1746

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	3.44	4.0
0.61	4.20	4.5

STATION 12 AT 1742

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	3.95	5.0
0.61	4.59	5.0
1.22	2.93	5.0
2.44	0.32	5.0

NEW BEDFORD HARBOR DATA FOR DECEMBER 21, 1986

STATION 13 AT 1740

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	3.95	5.0
0.61	4.16	5.0

STATION 14 AT 1736

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	3.69	5.0
0.61	3.69	5.0
1.22	2.39	5.0
2.44	0.31	5.0

STATION 15 AT 1732

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	3.44	5.0
0.61	0.68	5.0
1.22	0.30	5.0
2.44	0.25	5.0
3.66	0.23	5.0

STATION 17 NO DATA

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	1.95	5.0
0.61	0.96	5.0
1.22	0.30	5.0
2.44	0.25	5.0
3.66	0.17	5.0
6.10	0.08	4.5
7.32	0.07	4.5

STATION 18 AT 1720

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	1.75	5.0
0.61	0.72	5.0
1.22	0.33	5.0
2.44	0.25	5.0
3.66	0.13	5.0
6.10	0.08	5.0
7.32	0.07	5.0

STATION 19 AT 1717

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	1.25	5.0
0.61	0.39	5.0
1.22	0.35	5.0

STATION 20 AT 1711

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	1.79	5.0
0.61	1.00	5.0
1.22	0.45	5.0
2.44	0.30	5.0

STATION 21 AT 1706

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	1.25	4.5
0.61	0.51	4.5
1.22	0.51	4.5
2.44	0.31	4.5

NEW BEDFORD HARBOR DATA FOR DECEMBER 21, 1986

STATION 22 AT 1701

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.44	5.0
0.61	0.43	5.0
1.22	0.36	4.5

STATION 23 AT 1655

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.46	5.0
0.61	0.46	5.0
1.22	0.13	5.0

STATION 24 AT 1648

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	1.67	5.0
0.61	1.20	5.0
1.22	0.46	5.0
2.44	0.32	5.0
3.66	0.15	5.0
6.10	0.08	5.0
7.32	0.06	5.0

STATION 25 AT 1640

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	1.15	4.0
0.61	1.11	4.0
1.22	0.25	4.5
2.44	0.29	4.5
3.66	0.15	5.0
6.10	0.07	5.0
7.32	0.06	5.0

STATION 26 AT 1634

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	1.15	4.0
0.61	1.15	4.0
1.22	0.80	4.0
2.44	0.24	4.0

STATION 27 AT 1629

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	1.02	4.5
0.61	0.98	4.5
1.22	0.86	5.0

STATION 30 NO DATA

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.53	5.0
0.61	0.48	5.0
1.22	0.44	5.0

STATION 31 AT 1615

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.49	5.0
0.61	0.49	5.0
1.22	0.49	5.0
2.44	0.32	5.0

NEW BEDFORD HARBOR DATA FOR DECEMBER 21, 1986

STATION 32 AT 1605

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.66	5.0
0.61	0.58	5.0
1.22	0.45	5.0
2.44	0.32	5.0
3.66	0.23	5.0
6.10	0.23	5.0
7.32	0.07	5.0

STATION 33 AT 1558

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.57	5.0
0.61	0.58	5.0
1.22	0.48	5.0
2.44	0.27	5.0
3.66	0.23	5.0
6.10	0.08	4.5
7.32	0.06	4.5

STATION 34 AT 1550

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.58	5.0
0.61	0.56	5.0
1.22	0.44	5.0
2.44	0.34	5.0
3.66	0.18	5.0
6.10	0.05	5.0
7.32	0.05	5.0

STATION 35 AT 1535

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.46	5.0
0.61	0.46	5.0
1.22	0.42	5.0
2.44	0.32	5.0
3.66	0.24	5.0

STATION 36 AT 1623

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.38	4.5
0.61	0.35	4.5
1.22	0.37	5.0
2.44	0.36	5.0
3.66	0.25	5.0

STATION 37 AT 1527

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.50	5.0
0.61	0.50	5.0
1.22	0.49	5.0
2.44	0.44	5.0
3.66	0.25	5.0
6.10	0.07	4.5
7.32	0.03	4.5

STATION 38 AT 1521

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.47	5.0
0.61	0.48	5.0
1.22	0.47	5.0
2.44	0.46	5.0
3.66	0.18	5.0
6.10	0.08	5.0

STATION 39 AT 1514

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.47	5.0
0.61	0.46	5.0
1.22	0.42	5.0
2.44	0.16	5.0
3.66	0.08	5.0
6.10	0.12	5.0
7.32	0.05	5.0

NEW BEDFORD HARBOR DATA FOR DECEMBER 21, 1986

STATION 40 AT 1507

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.47	5.0
0.61	0.47	5.0
1.22	0.46	5.0
2.44	0.41	5.0
3.66	0.22	5.0
6.10	0.06	5.0
7.32	0.05	5.0

STATION 41 AT 1458

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.35	4.5
0.61	0.36	4.5
1.22	0.38	4.5
2.44	0.38	4.5
3.66	0.21	4.5
6.10	0.06	4.5
7.32	0.03	4.5

STATION 42 AT 1452

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.46	5.0
0.61	0.46	5.0
1.22	0.46	5.0
2.44	0.44	5.0

STATION 43 AT 1445

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.43	5.0
0.61	0.39	5.0
1.22	0.41	5.0
2.44	0.41	5.0
3.66	0.21	5.0
6.10	0.08	5.0
7.32	0.06	5.0

STATION 44 AT 1437

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.42	4.5
0.61	0.44	4.5
1.22	0.45	5.0
2.44	0.44	5.0
3.66	0.13	5.0
6.10	0.09	5.0
7.32	0.04	5.0

STATION 45 AT 1430

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.23	4.5
0.61	0.15	4.5
1.22	0.07	4.5
2.44	0.04	5.0
3.66	0.02	5.0
6.10	0.01	5.0
7.32	0.00	5.0

NEW BEDFORD HARBOR DATA FOR DECEMBER 22, 1986

STATION 1 AT 1540

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	9.95	5.0
0.61	5.99	5.0

STATION 2 AT 1524

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	9.97	4.0
0.61	4.16	4.0

STATION 3 AT 1521

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	10.01	3.0
0.61	1.31	3.0

STATION 4 AT 1516

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	3.23	3.5
0.61	2.17	3.5

STATION 5 AT 1513

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	12.60	4.0
0.61	9.94	4.0

STATION 6 AT 1510

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	11.26	4.0
0.61	9.88	4.0
1.22	0.20	4.0

STATION 7 NO DATA

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)

STATION 8 AT 1453

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	12.60	4.5
0.61	5.12	4.5
1.22	0.67	4.5

STATION 9 NO DATA

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)

STATION 10 AT 1442

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	6.38	5.0
0.61	4.70	5.0

STATION 11 NO DATA

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)

STATION 12 AT 1430

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	8.74	5.0
0.61	2.68	5.0
1.22	0.90	5.0
2.44	0.36	5.0
3.66	0.28	5.0

NEW BEDFORD HARBOR DATA FOR DECEMBER 22, 1986

STATION 13 NO DATA

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)

STATION 14 NO DATA

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)

STATION 15 AT 1905

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	5.16	3.5
0.61	2.63	4.5
1.22	0.82	5.0
2.44	0.37	5.0
3.66	0.19	5.5

STATION 17 AT 1902

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	2.46	3.5
0.61	2.54	4.0
1.22	0.47	4.0
2.44	0.38	4.5
3.66	0.22	4.5
6.10	0.09	5.0

STATION 18 AT 1859

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	2.09	3.5
0.61	2.05	4.0
1.22	0.51	4.0
2.44	0.28	4.0
3.66	0.20	4.0
6.10	0.05	4.0
7.32	0.04	5.0

STATION 19 AT 1855

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	2.39	3.5
0.61	2.43	4.5
1.22	0.50	5.0

STATION 20 AT 1849

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	2.28	3.5
0.61	2.28	3.5
1.22	0.53	4.0
2.44	0.28	4.0
3.66	0.33	5.0

STATION 21 NO DATA

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)

NEW BEDFORD HARBOR DATA FOR DECEMBER 22, 1986

STATION 22 AT 1843

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	1.27	3.5
0.61	1.27	4.5
1.22	0.53	4.5
2.44	0.19	5.5

STATION 23 AT 1837

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	1.22	4.0
0.61	1.22	4.0
1.22	0.45	4.5
2.44	0.08	5.0

STATION 24 AT 1832

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	1.04	3.5
0.61	0.97	4.0
1.22	0.42	4.0
2.44	0.34	4.0
3.66	0.23	4.0
6.10	0.27	5.0

STATION 25 AT 1824

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.63	3.5
0.61	0.62	3.5
1.22	0.36	4.0
2.44	0.19	4.0
3.66	0.08	4.0
6.10	0.07	4.0
7.32	0.05	4.5

STATION 26 AT 1817

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	1.11	4.0
0.61	1.07	4.0
1.22	0.34	4.0
2.44	0.16	4.0

STATION 27 AT 1807

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	1.06	3.0
0.61	1.09	4.0
1.22	0.32	5.0
2.44	0.23	5.0

STATION 30 AT 1801

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	1.09	3.0
0.61	1.02	4.0
1.22	0.45	4.0
2.44	0.20	5.0

STATION 31 AT 1757

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.65	3.5
0.61	0.62	4.0
1.22	0.48	4.0
2.44	0.30	4.0

NEW BEDFORD HARBOR DATA FOR DECEMBER 22, 1986

STATION 32 AT 1750

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.53	3.5
0.61	0.52	3.5
1.22	0.52	4.0
2.44	0.29	4.5
3.66	0.19	4.5
6.10	0.17	4.5
7.32	0.13	5.0

STATION 33 AT 1743

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.42	3.5
0.61	0.42	4.0
1.22	0.39	4.0
2.44	0.31	4.0
3.66	0.18	4.5
6.10	0.05	5.0
7.32	0.04	5.0

STATION 34 AT 1737

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.45	3.0
0.61	0.44	3.5
1.22	0.43	3.5
2.44	0.28	4.0
3.66	0.15	4.0
6.10	0.15	5.0
7.32	0.12	5.0

STATION 35 AT 1729

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.97	3.5
0.61	0.97	4.5
1.22	0.51	5.0
2.44	0.27	5.0
3.66	0.14	5.0

STATION 36 AT 1723

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.59	3.5
0.61	0.55	4.0
1.22	0.49	4.0
2.44	0.20	4.5
3.66	0.12	5.0
6.10	0.07	5.0
7.32	0.06	5.0

STATION 37 AT 1715

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.49	4.0
0.61	0.52	4.0
1.22	0.52	5.0
2.44	0.27	5.0
3.66	0.40	5.0
6.10	0.14	5.0
7.32	0.13	5.0

STATION 38 AT 1707

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.44	3.5
0.61	0.43	3.5
1.22	0.36	4.0
2.44	0.30	4.0
3.66	0.20	4.5
6.10	0.07	5.0
7.32	0.07	5.0

STATION 39 AT 1701

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.49	3.5
0.61	0.49	4.0
1.22	0.39	4.0
2.44	0.27	4.0
3.66	0.18	4.0
6.10	0.06	4.0
7.32	0.04	5.0

NEW BEDFORD HARBOR DATA FOR DECEMBER 22, 1986

STATION 40 AT 1653

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.52	3.5
0.61	0.51	4.0
1.22	0.44	4.0
2.44	0.26	4.0
3.66	0.14	4.5
6.10	0.05	4.5
7.32	0.04	5.0

STATION 41 AT 1645

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.51	4.0
0.61	0.53	4.0
1.22	0.50	4.5
2.44	0.25	4.5
3.66	0.14	4.5
6.10	0.04	4.5
7.32	0.04	4.5

STATION 42 AT 1638

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.46	3.0
0.61	0.46	3.5
1.22	0.37	3.5
2.44	0.25	4.5
3.66	0.18	5.0
6.10	0.04	5.0

STATION 43 AT 1630

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.50	3.5
0.61	0.51	3.5
1.22	0.48	4.5
2.44	0.23	4.5
3.66	0.15	5.0
6.10	0.03	5.0
7.32	0.03	5.0

STATION 44 NO DATA

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)

STATION 45 AT 1623

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.33	4.5
0.61	0.23	4.5
1.22	0.20	4.5
2.44	0.07	4.5
3.66	0.03	5.0
6.10	0.02	5.0

NEW BEDFORD HARBOR SALINITY DATA FOR DECEMBER 22, 1986

STATION 2 AT 1524

DEPTH (M)	SALINITY (PPM)
0.00	4.9
0.30	25.7
0.61	24.2

STATION 8 AT 1453

DEPTH (M)	SALINITY (PPM)
0.00	2.2
0.30	11.2
0.61	18.4
0.91	25.7
1.22	27.4

STATION 10 AT 1442

DEPTH (M)	SALINITY (PPM)
0.00	4.1
0.30	11.9
0.61	18.6
1.52	27.5

STATION 12 AT 1430

DEPTH (M)	SALINITY (PPM)
0.00	7.5
0.61	21.5
1.22	29.0
2.44	27.2
3.66	27.4

STATION 20 AT 1550

DEPTH (M)	SALINITY (PPM)
0.00	18.6
0.61	26.0
1.22	27.9
2.44	28.1
3.66	26.7

STATION 32 AT 1602

DEPTH (M)	SALINITY (PPM)
0.00	22.4
0.61	23.3
1.22	24.9
2.44	26.4
3.66	26.9
6.10	27.4

STATION 40 AT 1614

DEPTH (M)	SALINITY (PPM)
0.00	21.8
0.61	22.4
1.22	23.2
2.44	25.9
3.66	26.7
6.10	27.1

STATION 45 AT 1623

DEPTH (M)	SALINITY (PPM)
0.00	23.6
0.61	24.6
1.22	25.2
2.44	26.5
3.66	26.6
6.10	26.8

NEW BEDFORD HARBOR DATA FOR DECEMBER 23, 1986

STATION 1 NO DATA

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)

STATION 2 NO DATA

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)

STATION 3 NO DATA

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)

STATION 4 NO DATA

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)

STATION 5 NO DATA

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)

STATION 6 NO DATA

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)

STATION 7 NO DATA

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)

STATION 8 NO DATA

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)

STATION 9 NO DATA

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)

STATION 10 NO DATA

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)

STATION 11 NO DATA

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)

STATION 12 AT 0700

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	9.16	1.5
0.61	4.95	3.0
1.22	0.95	4.5
2.44	0.41	5.0

NEW BEDFORD HARBOR DATA FOR DECEMBER 23, 1986

STATION 13 AT 0655

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	7.72	1.5
0.61	4.73	3.0
1.22	4.58	3.0

STATION 14 AT 0648

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	4.44	3.5
0.61	2.51	4.0
1.22	0.78	4.0
2.44	0.36	5.0
3.66	0.30	5.0

STATION 15 AT 0641

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	4.27	5.0
0.61	2.16	5.0
1.22	1.12	5.0
2.44	0.50	5.0
3.66	0.23	5.0

STATION 17 AT 0635

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	3.02	3.5
0.61	3.02	3.5
1.22	1.12	4.5
2.44	0.31	4.5
3.66	0.25	5.0
6.10	0.05	5.0
7.32	0.04	5.0

STATION 18 AT 0627

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	2.24	3.5
0.61	2.24	4.0
1.22	0.82	4.0
2.44	0.31	4.5
3.66	0.19	5.0
6.10	0.04	5.0
7.32	0.04	5.0

STATION 19 AT 0619

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	2.24	3.5
0.61	2.24	4.0
1.22	0.45	4.0
2.44	0.30	5.5

STATION 20 AT 0615

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	2.09	3.5
0.61	2.17	4.0
1.22	0.47	5.0
2.44	0.30	5.5
3.66	0.24	5.5
6.10	0.25	5.5

STATION 21 AT 0612

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	2.12	3.3
0.61	2.08	4.4
1.22	0.61	5.0

NEW BEDFORD HARBOR DATA FOR DECEMBER 23, 1986

STATION 22 AT 0608

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	2.08	3.5
0.61	2.01	4.5
1.22	1.09	4.4
2.44	0.26	4.4

STATION 23 AT 0602

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.95	4.0
0.61	0.99	5.0
1.22	1.22	5.5
2.44	0.23	5.5

STATION 24 AT 0555

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.96	5.0
0.61	1.00	5.0
1.22	0.44	5.5
2.44	0.25	5.5
3.66	0.24	5.5
6.10	0.10	5.5

STATION 25 AT 0547

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.58	4.0
0.61	0.58	5.0
1.22	0.38	5.5
2.44	0.35	5.5
3.66	0.22	5.5
6.10	0.05	5.5
7.32	0.05	5.5

STATION 26 AT 0540

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	1.34	4.0
0.61	1.34	5.0
1.22	0.89	5.5
2.44	0.20	5.5

STATION 27 AT 0535

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	1.83	3.0
0.61	1.86	4.0
1.22	1.83	4.0
2.44	0.24	5.0

STATION 30 AT 0920

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	3.40	3.0
0.61	3.52	4.0
1.22	3.52	4.0
2.44	0.30	5.0

STATION 31 AT 0915

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.52	3.5
0.61	0.54	3.5
1.22	0.57	5.0
2.44	0.25	5.0

NEW BEDFORD HARBOR DATA FOR DECEMBER 23, 1986

STATION 32 AT 0902

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.48	3.5
0.61	0.48	3.5
1.22	0.31	4.0
2.44	0.24	4.0
3.66	0.16	4.5
6.10	0.06	5.0
7.32	0.05	5.0

STATION 33 AT 0909

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.37	4.5
0.61	0.35	4.5
1.22	0.33	4.5
2.44	0.25	4.5
3.66	0.18	4.5
6.10	0.07	4.5
7.32	0.05	4.5

STATION 34 AT 0857

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.43	2.5
0.61	0.44	3.5
1.22	0.40	4.0
2.44	0.23	4.0
3.66	0.15	4.5
6.10	0.06	5.0
7.32	0.07	5.0

STATION 35 AT 0842

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.55	5.0
0.61	0.57	4.0
1.22	0.56	4.0
2.44	0.32	5.0
3.66	0.15	5.0

STATION 36 AT 0833

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.40	4.0
0.61	0.41	4.0
1.22	0.39	5.0
2.44	0.33	5.0
3.66	0.20	5.0
6.10	0.06	5.0

STATION 37 AT 0825

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.44	4.0
0.61	0.44	4.0
1.22	0.40	4.5
2.44	0.23	4.5
3.66	0.18	4.5
6.10	0.06	4.5
7.32	0.06	5.0

STATION 38 AT 0850

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.32	4.0
0.61	0.32	4.0
1.22	0.33	4.5
2.44	0.31	4.5
3.66	0.11	5.0
6.10	0.05	5.0
7.32	0.05	5.0

STATION 39 AT 0818

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.33	4.0
0.61	0.29	4.5
1.22	0.27	4.5
2.44	0.15	5.0
3.66	0.10	5.0
6.10	0.07	5.0
7.32	0.05	5.0

NEW BEDFORD HARBCR DATA FOR DECEMBER 23, 1986

STATION 40 AT 0810

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.39	4.0
0.61	0.39	4.0
1.22	0.36	4.5
2.44	0.27	4.5
3.66	0.44	5.0
6.10	0.09	5.0
7.32	0.04	5.0

STATION 41 AT 0801

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.40	4.0
0.61	0.42	4.0
1.22	0.44	5.0
2.44	0.29	5.0
3.66	0.13	5.0
6.10	0.08	5.0

STATION 42 AT 0753

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.34	4.0
0.61	0.35	4.5
1.22	0.34	5.0
2.44	0.33	5.0
3.66	0.19	5.0
6.10	0.09	5.0

STATION 43 AT 0745

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.40	4.0
0.61	0.40	4.0
1.22	0.38	4.5
2.44	0.24	4.5
3.66	0.22	5.0
6.10	0.12	5.0
7.32	0.07	5.0

STATION 44 AT 0738

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.30	4.5
0.61	0.31	4.5
1.22	0.25	5.0
2.44	0.25	5.0
3.66	0.08	5.0
6.10	0.04	5.0
7.32	0.03	5.0

STATION 45 AT 0720

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.06	4.5
0.61	0.06	4.5
1.22	0.06	4.5
2.44	0.05	4.5
3.66	0.04	5.0
6.10	0.04	5.0
7.32	0.05	5.0

NEW BEDFORD HARBOR DATA FOR DECEMBER 24, 1986

STATION 1 AT 0746

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.58	1.5
0.61	0.89	3.5

STATION 2 AT 0743

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.67	1.5
0.61	0.84	3.0

STATION 3 AT 0739

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.67	1.5
0.61	3.55	4.0

STATION 4 AT 0736

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.50	1.5
0.61	3.06	4.0

STATION 5 AT 0730

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.84	1.5
0.61	4.41	4.0

STATION 6 AT 0727

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	1.39	1.5
0.61	3.42	4.0

STATION 7 AT 0712

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	3.62	1.5
0.61	3.30	4.0

STATION 8 AT 0718

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	2.30	1.5
0.61	3.18	4.0

STATION 9 AT 0712

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	6.50	1.5
0.61	2.96	1.5

STATION 10 AT 0709

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	3.80	1.5
0.61	2.81	3.0

STATION 11 AT 0707

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	4.84	1.5
0.61	2.99	3.5

STATION 12 AT 0700

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	4.62	1.5
0.61	2.87	3.5
1.22	1.17	4.5
2.44	0.49	5.0

NEW BEDFORD HARBOR DATA FOR DECEMBER 24, 1986

STATION 13 AT 0655

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	4.62	1.5
0.61	2.75	4.0
1.22	1.20	5.0

STATION 14 AT 0649

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	4.48	2.5
0.61	1.71	2.5
1.22	0.49	5.0
2.44	0.39	5.0
3.66	0.27	5.0

STATION 15 AT 0647

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	3.33	3.0
0.61	0.73	4.0
1.22	0.52	5.0
2.44	0.35	5.0

STATION 17 AT 0644

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	3.16	3.0
0.61	1.05	4.5
1.22	0.44	5.0
2.44	0.35	5.0
3.66	0.18	5.0
6.10	0.07	5.0
7.32	0.07	5.0

STATION 18 AT 0629

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	2.87	2.5
0.61	0.57	4.0
1.22	0.48	5.0
2.44	0.34	5.0
3.66	0.25	5.0

STATION 19 AT 0624

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	2.26	3.0
0.61	0.87	4.0
1.22	0.41	5.0

STATION 20 AT 0614

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	2.46	2.0
0.61	1.03	4.0
1.22	0.37	5.0
2.44	0.30	5.0
3.66	0.31	5.0
6.10	0.31	5.0

STATION 21 AT 0607

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	1.95	2.0
0.61	0.94	2.0
1.22	0.29	4.0
2.44	0.28	5.0

NEW BEDFORD HARBOR DATA FOR DECEMBER 24, 1986

STATION 22 AT 0603

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	1.99	2.0
0.61	1.11	2.0
1.22	0.35	3.5
2.44	0.25	5.0

STATION 23 AT 0558

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	2.43	2.5
0.61	0.49	3.0
1.22	0.34	5.0
2.44	0.22	5.0

STATION 24 AT 0549

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	2.36	2.5
0.61	2.43	3.0
1.22	0.45	5.0
2.44	0.25	5.0
3.66	0.16	5.0
6.10	0.09	5.0
7.32	0.05	5.0

STATION 25 AT 0542

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	2.79	2.5
0.61	1.35	3.0
1.22	0.49	5.0
2.44	0.30	5.0
3.66	0.19	5.0
6.10	0.08	5.0
7.32	0.08	5.0

STATION 26 AT 0536

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	2.68	2.5
0.61	1.24	3.0
1.22	0.46	5.0
2.44	0.27	5.0

STATION 27 AT 0522

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.61	1.22	4.0
1.22	0.50	5.0
2.44	0.28	5.0

STATION 30 AT 0915

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	1.83	3.0
0.61	0.54	4.0
1.22	0.32	5.0
2.44	0.26	5.0

STATION 31 AT 0955

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	1.45	4.0
0.61	0.50	4.0
1.22	0.33	4.5
2.44	0.24	4.5

NEW BEDFORD HARBOR DATA FOR DECEMBER 24, 1986

STATION 32 AT 0951

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	1.15	4.0
0.61	0.84	4.0
1.22	0.38	4.0
2.44	0.25	5.0
3.66	0.09	5.0
6.10	0.07	5.0
7.32	0.06	5.0

STATION 33 AT 0942

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	1.41	4.0
0.61	1.60	4.0
1.22	0.39	5.0
2.44	0.09	5.0
3.66	0.19	5.0
6.10	0.07	5.0
7.32	0.07	5.0

STATION 34 AT 0947

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	1.30	4.0
0.61	0.84	4.0
1.22	0.37	5.0
2.44	0.23	5.0
3.66	0.11	5.0
6.10	0.07	5.0
7.32	0.07	5.0

STATION 35 AT 0920

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	1.38	3.5
0.61	1.42	3.5
1.22	0.38	4.5
2.44	0.26	4.5
3.66	0.17	5.0

STATION 36 AT 0928

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.60	4.0
0.61	0.33	4.0
1.22	0.38	4.5
2.44	0.23	5.0
3.66	0.16	5.0
6.10	0.08	5.0

STATION 37 AT 0933

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	1.11	4.0
0.61	0.92	4.0
1.22	0.42	4.0
2.44	0.25	4.0
3.66	0.19	5.0
6.10	0.08	3.0
7.32	0.06	6.0

STATION 38 AT 0938

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	1.37	4.0
0.61	1.30	4.0
1.22	0.59	5.0
2.44	0.25	5.0
3.66	0.08	5.0
7.32	0.07	5.0

STATION 39 AT 0840

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	1.42	3.0
0.61	1.53	3.5
1.22	0.33	4.0
2.44	0.23	5.0
3.66	0.19	5.0
6.10	0.08	5.0

NEW BEDFORD HARBOR DATA FOR DECEMBER 24, 1986

STATION 40 AT 0834

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	1.20	3.0
0.61	1.17	3.0
1.22	0.50	3.5
2.44	0.25	3.5
3.66	0.13	4.5
6.10	0.10	4.5
7.32	0.07	4.5

STATION 41 AT 0828

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.85	2.5
0.61	0.84	3.0
1.22	0.31	4.0
2.44	0.24	4.5
3.66	0.12	4.5
6.10	0.06	4.5

STATION 42 AT 0815

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	1.20	3.0
0.61	1.28	3.0
1.22	1.17	3.0
2.44	0.28	4.5
3.66	0.26	4.5
6.10	0.20	4.5
7.32	0.18	5.0

STATION 43 AT 0813

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	1.10	2.5
0.61	1.10	3.0
1.22	0.40	4.5
2.44	0.29	5.0
3.66	0.14	5.0
6.10	0.14	5.0
7.32	0.15	5.0

STATION 44 AT 0812

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.12	4.0
0.61	0.13	4.0
1.22	0.11	4.5
2.44	0.07	4.5
3.66	0.06	4.5
6.10	0.04	5.0
7.32	0.03	5.0

STATION 45 AT 0805

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.18	4.5
0.61	0.10	4.5
1.22	0.08	4.5
2.44	0.07	4.5
3.66	0.05	4.5
6.10	0.03	5.0
7.32	0.03	5.0

NEW BEDFORD HARBOR DATA FOR DECEMBER 26, 1986

STATION 1 AT 0831

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.06	5.5
0.61	0.53	5.5

STATION 2 AT 0829

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.27	5.0
0.61	0.56	6.0

STATION 3 AT 0825

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.00	5.0
0.61	0.19	5.5

STATION 4 AT 0823

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.46	5.5
0.61	0.66	5.5

STATION 5 AT 0820

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.10	5.0
0.61	0.32	6.0

STATION 6 AT 0817

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.00	5.5
0.61	0.49	6.0

STATION 7 AT 0813

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.00	5.0
0.61	0.44	5.5

STATION 8 AT 0810

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.24	5.5
0.61	0.52	5.5

STATION 9 AT 0807

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.24	5.5

STATION 10 AT 0803

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.28	6.0

STATION 11 AT 0755

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.25	5.5
0.61	0.65	5.5

STATION 12 AT 0743

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.20	5.5
0.61	0.45	5.5
1.22	0.63	6.0
2.44	0.57	6.0

NEW BEDFORD HARBOR DATA FOR DECEMBER 26, 1986

STATION 13 AT 0740

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.17	5.5

STATION 14 AT 0731

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.19	5.5
0.61	0.21	5.5
1.22	0.74	6.5
2.44	0.55	6.0
3.66	0.40	5.5

STATION 15 AT 0729

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.30	6.0
0.61	0.65	6.0
1.22	0.64	6.0
2.44	0.49	6.0
3.66	0.29	6.0

STATION 17 AT 0723

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.42	5.0
0.61	0.41	5.0
1.22	0.35	5.0
2.44	0.30	5.0
3.66	0.24	5.0
6.10	0.16	5.0
7.32	0.12	5.0

STATION 18 AT 0717

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.41	5.0
0.61	0.43	5.0
1.22	0.38	5.0
2.44	0.32	5.0
3.66	0.28	5.0
6.10	0.20	5.0

STATION 19 AT 0715

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.44	5.0
0.61	0.54	5.0
1.22	0.48	5.0
2.44	0.30	5.0

STATION 20 AT 0706

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.44	5.5
0.61	0.41	5.5
1.22	0.41	5.0
2.44	0.28	5.0
3.66	0.24	5.0
6.10	0.23	5.0

STATION 21 AT 0702

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.49	5.0
0.61	0.53	5.0
1.22	0.37	5.0

NEW BEDFORD HARBOR DATA FOR DECEMBER 26, 1986

STATION 22 AT 0659

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.68	5.0
0.61	0.68	5.0
1.22	0.41	5.0

STATION 23 AT 0655

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.51	5.0
0.61	0.53	5.0
1.22	0.39	5.0
2.44	0.18	5.0

STATION 24 AT 0649

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.42	5.0
0.61	0.39	5.0
1.22	0.32	5.0
2.44	0.26	5.0
3.66	0.18	5.0
6.10	0.12	5.0

STATION 25 AT 0641

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.45	5.0
0.61	0.49	5.0
1.22	0.51	5.0
2.44	0.35	5.0
3.66	0.19	5.0
6.10	0.13	5.0
7.32	0.12	5.0

STATION 26 AT 0637

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.44	5.0
0.61	0.51	5.5
1.22	0.61	5.5
2.44	0.24	5.0

STATION 27 AT 0630

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.80	5.0
0.61	0.53	5.5
1.22	0.53	5.5
1.83	0.32	5.5

STATION 30 AT 1038

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.49	5.5
0.61	0.48	5.5
1.22	0.44	5.5

STATION 31 AT 1035

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.52	5.5
0.61	0.51	5.5
1.22	0.43	5.5
2.44	0.34	5.5

NEW BEDFORD HARBOR DATA FOR DECEMBER 26, 1986

STATION 32 AT 1027

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.46	5.5
0.61	0.45	5.5
1.22	0.40	5.5
2.44	0.31	5.5
3.66	0.24	5.5
6.10	0.12	5.5
7.32	0.10	5.5

STATION 33 AT 1022

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.46	5.5
0.61	0.46	5.5
1.22	0.36	5.5
2.44	0.31	5.5
3.66	0.24	5.5
6.10	0.17	5.5
7.32	0.15	5.5

STATION 34 AT 1015

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.48	5.5
0.61	0.48	5.5
1.22	0.45	5.5
2.44	0.36	5.5
3.66	0.29	5.5
6.10	0.12	5.0
7.32	0.10	5.0

STATION 35 AT 1009

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.54	5.5
0.61	0.54	5.5
1.22	0.46	5.5
2.44	0.39	5.5
3.66	0.26	5.5

STATION 36 AT 1003

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.52	5.5
0.61	0.51	5.5
1.22	0.46	5.5
2.44	0.42	5.5
3.66	0.24	5.5
6.10	0.12	5.5
7.32	0.05	5.5

STATION 37 AT 0958

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.51	5.5
0.61	0.50	5.5
1.22	0.50	5.5
2.44	0.35	5.5
3.66	0.14	5.5
6.10	0.12	5.5

STATION 38 AT 0952

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.43	5.5
0.61	0.43	5.5
1.22	0.41	5.5
2.44	0.33	5.5
3.66	0.25	5.5
6.10	0.12	5.5
7.32	0.11	5.5

STATION 39 AT 0949

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.49	5.5
0.61	0.49	5.5
1.22	0.49	5.5
2.44	0.38	5.5
3.66	0.22	5.5
6.10	0.17	5.5
7.32	0.11	5.5

NEW BEDFORD HARBOR DATA FOR DECEMBER 26, 1986

STATION 40 AT 0944

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.47	5.5
0.61	0.48	5.5
1.22	0.51	5.5
2.44	0.33	5.5
3.66	0.24	5.5
6.10	0.13	5.5
7.32	0.11	5.5

STATION 41 AT 0938

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.54	5.5
0.61	0.53	5.5
1.22	0.47	5.5
2.44	0.38	5.5
3.66	0.18	5.5
6.10	0.16	5.5

STATION 42 AT 0930

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.52	5.5
0.61	0.52	5.5
1.22	0.50	5.5
2.44	0.47	5.5
3.66	0.30	5.5
6.10	0.13	5.5
7.32	0.12	5.5

STATION 43 AT 0926

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.50	5.5
0.61	0.52	5.5
1.22	0.52	5.5
2.44	0.38	5.5
3.66	0.27	5.5
6.10	0.15	5.5
7.32	0.13	5.5

STATION 44 AT 0849

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.52	5.5
0.61	0.54	5.5
1.22	0.49	5.5
2.44	0.25	5.5
3.66	0.11	5.5
6.10	0.06	5.5
7.32	0.03	5.5

STATION 45 AT 0846

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.44	5.5
0.61	0.12	5.5
1.22	0.09	5.5
2.44	0.06	5.5
3.66	0.06	5.5
6.10	0.02	5.5
7.32	0.02	5.5

NEW BEDFORD HARBOR DATA FOR DECEMBER 27, 1986

STATION 1 AT 0758

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.28	5.0
0.61	0.30	5.0

STATION 2 AT 0756

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.21	5.0
0.61	0.28	5.0

STATION 3 AT 0752

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.18	3.0
0.61	0.00	5.0

STATION 4 AT 0750

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.00	5.0
0.61	0.00	5.0

STATION 5 AT 0747

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.11	3.0
0.61	0.27	5.5

STATION 6 AT 0745

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.15	4.0
0.61	0.24	5.0

STATION 7 AT 0741

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.02	3.5
0.61	0.25	5.0

STATION 8 AT 0738

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.09	4.0
0.61	0.28	5.0

STATION 9 AT 0735

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.26	3.0
0.61	0.40	4.5

STATION 10 AT 0732

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.22	3.0
0.61	0.35	4.5
1.22	0.31	4.5

STATION 11 AT 0729

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.13	3.5
0.61	0.38	5.0
1.22	0.28	5.0

STATION 12 AT 0725

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.35	3.0
0.61	0.30	4.0
1.22	0.27	5.0

NEW BEDFORD HARBOR DATA FOR DECEMBER 27, 1986

STATION 13 AT 0723

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.21	3.5
0.61	0.41	3.5

STATION 14 AT 0718

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.23	3.0
0.61	0.29	4.0
1.22	0.28	5.0
2.44	0.27	5.0
3.66	0.26	5.0

STATION 15 AT 0715

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.30	3.5
0.61	0.32	4.0
1.22	0.28	4.0
2.44	0.27	4.0
3.66	0.26	5.0

STATION 17 AT 0710

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.31	4.5
0.61	0.27	5.0
1.22	0.24	5.0
2.44	0.24	5.0
3.66	0.22	5.0
6.10	0.12	5.0
7.32	0.10	5.0

STATION 18 AT 0705

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.29	5.0
0.61	0.28	5.0
1.22	0.27	5.0
2.44	0.23	5.0
3.66	0.13	5.0

STATION 19 AT 0700

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.31	4.5
0.61	0.33	5.0
1.22	0.28	5.0
2.44	0.21	5.0

STATION 20 AT 0653

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.28	4.5
0.61	0.27	5.0
1.22	0.26	5.0
2.44	0.21	5.0
3.66	0.10	5.0
6.10	0.09	5.0

STATION 21 AT 0650

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.38	3.5
0.61	0.32	4.5
1.22	0.31	4.5

NEW BEDFORD HARBOR DATA FOR DECEMBER 27, 1986

STATION 22 AT 0647

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.37	4.5
0.61	0.36	5.0
1.22	0.31	5.0
2.44	0.25	5.0

STATION 23 AT 0643

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.39	3.5
0.61	0.37	4.5
1.22	0.31	5.0
2.44	0.24	5.0

STATION 24 AT 0637

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.33	5.0
0.61	0.32	5.0
1.22	0.32	5.0
2.44	0.30	0.5
3.66	0.22	5.0
6.10	0.12	5.0
7.32	0.10	5.0

STATION 25 AT 0632

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.34	4.0
0.61	0.39	5.0
1.22	0.38	5.0
2.44	0.27	5.0
3.66	0.18	5.0
6.10	0.11	5.0
7.32	0.09	5.0

STATION 26 AT 0628

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.38	3.5
0.91	0.39	4.5
1.22	0.32	5.0
2.44	0.26	5.5

STATION 27 AT 0625

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.38	3.5
0.61	0.38	4.5
1.22	0.30	5.0
2.44	0.28	5.0

STATION 30 AT 0940

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.39	4.5
0.61	0.38	4.5
1.22	0.34	5.0

STATION 31 AT 0929

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.37	4.5
0.61	0.37	4.5
1.22	0.35	5.0
2.44	0.23	5.0

NEW BEDFORD HARBOR DATA FOR DECEMBER 27, 1986

STATION 32 AT 0925

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.29	5.0
0.61	0.29	5.0
1.22	0.31	5.0
2.44	0.32	5.0
3.66	0.22	5.0
6.10	0.08	5.0
7.32	0.07	5.0

STATION 33 AT 0912

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.33	4.5
0.61	0.34	5.0
1.22	0.34	5.0
2.44	0.25	5.0
3.66	0.20	5.0
6.10	0.09	5.0
7.32	0.07	5.0

STATION 34 AT 0916

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.38	4.5
0.61	0.35	4.5
1.22	0.35	5.0
2.44	0.24	5.0
3.66	0.23	5.0
6.10	0.09	5.0
7.32	0.09	5.0

STATION 35 AT 0912

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.38	4.5
0.61	0.37	4.5
1.22	0.33	4.5
2.44	0.28	5.0
3.66	0.16	5.0

STATION 36 AT 0906

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.40	4.5
0.61	0.39	4.5
1.22	0.36	5.0
2.44	0.24	5.0
3.66	0.16	5.0

STATION 37 AT 0902

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.33	5.0
0.61	0.36	5.0
1.22	0.35	5.0
2.44	0.26	5.0
3.66	0.18	5.0
6.10	0.10	5.0
7.32	0.06	5.0

STATION 38 AT 0855

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.37	4.5
0.61	0.37	4.5
1.22	0.33	4.5
2.44	0.25	5.0
3.66	0.21	5.0
6.10	0.09	5.0
7.32	0.09	5.0

STATION 39 AT 0849

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.37	4.5
0.61	0.39	4.5
1.22	0.30	4.5
2.44	0.16	5.0
3.66	0.08	5.0
6.10	0.06	5.0

NEW BEDFORD HARBOR DATA FOR DECEMBER 27, 1986

STATION 40 AT 0843

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.38	4.5
0.61	0.39	4.5
1.22	0.39	5.0
2.44	0.30	5.0
3.66	0.16	5.0
6.10	0.08	5.0
7.32	0.06	5.0

STATION 41 AT 0838

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.42	4.5
0.61	0.41	4.5
1.22	0.35	4.5
2.44	0.26	5.0
3.66	0.13	5.0
6.10	0.08	5.0

STATION 42 AT 0833

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.41	4.5
0.61	0.40	4.5
1.22	0.36	4.5
2.44	0.26	5.0
3.66	0.19	5.0
6.10	0.18	5.0
7.32	0.05	5.0

STATION 43 AT 0824

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.40	4.5
0.61	0.41	4.5
1.22	0.41	4.5
2.44	0.24	5.0
3.66	0.17	5.0
6.10	0.06	5.0
7.32	0.04	5.0

STATION 44 AT 0819

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.40	4.5
0.61	0.40	4.5
1.22	0.28	4.5
2.44	0.22	5.0
3.66	0.10	5.0
6.10	0.07	5.0
7.32	0.06	5.0

STATION 45 AT 0812

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.22	5.0
0.61	0.22	5.0
1.22	0.21	5.0
2.44	0.18	5.0
3.66	0.05	5.0
6.10	0.05	5.0
7.32	0.05	5.0

NEW BEDFORD HARBOR DATA FOR DECEMBER 28, 1986

STATION 1 NO DATA

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)

STATION 2 NO DATA

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)

STATION 3 NO DATA

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)

STATION 4 NO DATA

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)

STATION 5 NO DATA

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)

STATION 6 NO DATA

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)

STATION 7 NO DATA

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)

STATION 8 NO DATA

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)

STATION 9 AT 1009

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.10	2.0
0.61	0.20	3.0

STATION 10 AT 1006

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.15	2.0

STATION 11 NO DATA

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)

STATION 12 AT 1000

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.16	2.0
0.61	0.22	4.5
1.22	0.22	5.0

NEW BEDFORD HARBOR DATA FOR DECEMBER 28, 1986

STATION 13 AT 0923

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.20	2.0
0.61	0.28	5.0

STATION 14 AT 0921

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.20	1.5
0.61	0.22	2.5
1.22	0.30	4.0
2.44	0.23	5.0
3.66	0.21	5.0

STATION 15 AT 0850

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.25	3.5
0.61	0.22	3.5
1.22	0.21	5.0
2.44	0.21	5.0

STATION 17 AT 0844

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.27	4.5
0.61	0.20	5.0
1.22	0.20	5.0
2.44	0.18	5.0
3.66	0.17	5.0
6.10	0.13	5.0
7.32	0.10	5.0

STATION 18 AT 0838

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.24	4.5
0.61	0.19	5.0
1.22	0.17	5.0
2.44	0.14	5.0
3.66	0.14	5.0

STATION 19 AT 0835

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.26	4.5
0.61	0.28	5.0
1.22	0.28	5.0
2.44	0.14	5.0

STATION 20 AT 0825

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.25	4.5
0.61	0.23	5.0
1.22	0.19	5.0
2.44	0.15	5.0
3.66	0.13	5.0
6.10	0.07	5.0
7.32	0.07	5.0

STATION 21 AT 0818

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.26	3.5
0.61	0.25	5.0
1.22	0.23	5.0

NEW BEDFORD HARBOR DATA FOR DECEMBER 28, 1986

STATION 22 AT 0821

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.29	4.0
0.61	0.26	5.0
1.22	0.24	5.0
2.44	0.14	5.0

STATION 23 AT 0813

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.26	3.5
0.61	0.27	5.0
1.22	0.25	5.0
2.44	0.12	5.0

STATION 24 AT 0806

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.26	4.0
0.61	0.23	5.0
1.22	0.21	5.0
2.44	0.17	5.0
3.66	0.14	5.0
6.10	0.07	5.0
7.32	0.07	5.0

STATION 25 AT 0800

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.27	3.5
0.61	0.27	3.5
1.22	0.24	3.5
2.44	0.22	5.0
3.66	0.14	5.0
6.10	0.09	5.0
7.32	0.08	5.0

STATION 26 AT 0755

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.29	3.0
0.61	0.29	3.0
1.22	0.25	4.0
2.44	0.18	5.0

STATION 27 AT 0750

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.29	1.5
0.61	0.30	3.0
1.22	0.28	5.0
2.44	0.20	5.0

STATION 30 AT 1147

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.27	4.5
0.61	0.28	5.0
1.22	0.26	5.0

STATION 31 AT 1143

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.27	4.5
0.61	0.25	4.5
1.22	0.18	5.0

NEW BEDFORD HARBOR DATA FOR DECEMBER 28, 1986

STATION 32 AT 1138

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.25	5.0
0.61	0.22	5.0
1.22	0.20	5.0
2.44	0.19	5.0
3.66	0.14	5.0
6.10	0.07	5.0
7.32	0.05	5.0

STATION 33 AT 1133

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.27	4.5
0.61	0.26	4.5
1.22	0.26	5.0
2.44	0.20	5.0
3.66	0.15	5.0
6.10	0.06	5.0
7.32	0.06	5.0

STATION 34 AT 1128

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.28	4.5
0.61	0.25	5.0
1.22	0.25	5.0
2.44	0.22	5.0
3.66	0.14	5.0
6.10	0.06	5.0
7.32	0.06	5.0

STATION 35 AT 1100

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.27	4.5
1.22	0.27	5.0
2.44	0.25	5.0
3.66	0.21	5.0
6.10	0.11	5.0

STATION 36 AT 1055

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.28	4.5
0.61	0.28	4.5
1.22	0.24	5.0
2.44	0.25	5.0
3.66	0.15	5.0

STATION 37 AT 1105

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.28	4.5
0.61	0.27	4.5
1.22	0.25	5.0
2.44	0.22	5.0
3.66	0.14	5.0
6.10	0.08	5.0
7.32	0.06	5.0

STATION 38 AT 1122

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.25	4.5
0.61	0.25	4.5
1.22	0.24	5.0
2.44	0.20	5.0
3.66	0.13	5.0
6.10	0.08	5.0
7.32	0.06	5.0

STATION 39 AT 1116

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.29	3.0
0.61	0.30	3.0
1.22	0.26	4.5
2.44	0.20	5.0
3.66	0.15	5.0
6.10	0.08	5.0
7.32	0.06	5.0

NEW BEDFORD HARBOR DATA FOR DECEMBER 28, 1986

STATION 40 AT 1109

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.24	4.5
0.61	0.24	4.5
1.22	0.23	5.0
2.44	0.23	5.0
3.66	0.14	5.0
6.10	0.07	5.0
7.32	0.06	5.0

STATION 41 AT 1049

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.29	4.0
0.61	0.29	4.0
1.22	0.22	5.0
2.44	0.20	5.0
3.66	0.11	5.0
6.10	0.05	5.0
7.32	0.04	5.0

STATION 42 AT 1041

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.29	3.5
0.61	0.27	4.0
1.22	0.20	5.0
2.44	0.20	5.0
3.66	0.14	5.0
6.10	0.07	5.0
7.32	0.05	5.0

STATION 43 AT 1035

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.28	3.5
0.61	0.29	4.0
1.22	0.26	5.0
2.44	0.22	5.0
3.66	0.15	5.0
6.10	0.08	5.0
7.32	0.05	5.0

STATION 44 AT 1029

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.28	4.5
0.61	0.23	3.5
1.22	0.23	5.0
2.44	0.20	5.0
3.66	0.09	5.0
6.10	0.07	5.0
7.32	0.05	5.0

STATION 45 AT 1024

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.24	4.5
0.61	0.14	5.0
1.22	0.12	5.0
2.44	0.10	5.0
3.66	0.06	5.0
6.10	0.05	5.0
7.32	0.04	5.0

NEW BEDFORD HARBOR DATA FOR DECEMBER 29, 1986

STATION 1 AT 1152

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.08	5.0

STATION 2 AT 1150

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.06	5.0

STATION 3 AT 1146

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.19	5.0

STATION 4 AT 1144

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.20	5.0

STATION 5 AT 1142

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.07	4.5
0.61	0.11	4.5

STATION 6 AT 1140

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.08	3.0
0.61	0.09	5.0

STATION 7 AT 1138

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.00	2.5
0.61	0.00	4.5

STATION 8 AT 1135

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.00	3.5
0.61	0.00	4.5

STATION 9 AT 1121

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.05	2.0
0.61	0.13	4.0

STATION 10 AT 1113

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.10	2.5
0.61	0.15	3.5

STATION 11 AT 1128

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.06	2.5
0.61	0.12	3.5

STATION 12 AT 1124

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.08	2.0
0.61	0.12	4.0

NEW BEDFORD HARBOR DATA FOR DECEMBER 29, 1986

STATION 13 AT 1122

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.06	2.0
0.61	0.16	4.5

STATION 14 AT 1117

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.11	3.5
0.61	0.18	3.5
1.22	0.21	4.0
2.44	0.15	5.0
3.66	0.14	5.0

STATION 15 AT 1113

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.13	2.5
0.61	0.16	3.0
1.22	0.18	4.5
2.44	0.15	5.0
3.66	0.16	5.0

STATION 17 AT 1109

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.17	4.0
0.61	0.16	4.0
1.22	0.15	5.0
2.44	0.13	5.0
3.66	0.12	5.0
6.10	0.08	5.0
7.32	0.07	5.0

STATION 18 AT 1105

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.16	4.5
0.61	0.15	4.5
1.22	0.14	5.0
2.44	0.14	5.0
3.66	0.13	5.0

STATION 19 AT 1059

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.14	4.5
0.61	0.14	5.0
1.22	0.13	5.0
2.44	0.13	5.0

STATION 20 AT 1056

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.15	5.0
0.61	0.14	4.5
1.22	0.14	5.0
2.44	0.13	5.0
3.66	0.10	5.0
6.10	0.06	5.0
7.32	0.06	5.0

STATION 21 AT 1054

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.15	5.0
0.61	0.16	5.0
1.22	0.10	5.0

NEW BEDFORD HARBOR DATA FOR DECEMBER 29, 1986

STATION 22 AT 1051

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.15	5.0
0.61	0.16	5.0
1.22	0.14	5.0

STATION 23 AT 1047

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.19	5.0
0.61	0.18	5.0
1.22	0.16	5.0
2.44	0.08	5.0

STATION 24 AT 1042

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.19	5.0
0.61	0.14	5.0
1.22	0.14	5.0
2.44	0.17	5.0
3.66	0.14	5.0
6.10	0.07	5.0
7.32	0.06	5.5

STATION 25 AT 1038

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.15	5.0
0.61	0.17	5.0
1.22	0.15	5.0
2.44	0.16	5.0
3.66	0.13	5.5
6.10	0.08	5.5
7.32	0.07	5.5

STATION 26 AT 1034

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.17	5.0
0.61	0.16	5.0
1.22	0.18	5.0
2.44	0.09	5.5

STATION 27 AT 1030

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.20	4.0
0.61	0.19	4.5
1.22	0.20	5.0

STATION 30 AT 1301

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.20	4.5
0.61	0.19	5.0
1.22	0.15	5.0

STATION 31 AT 1304

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.18	5.0
0.61	0.18	5.0
1.22	0.17	5.0
2.44	0.12	5.0

NEW BEDFORD HARBOR DATA FOR DECEMBER 29, 1986

STATION 32 AT 1308

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.16	5.0
0.61	0.15	5.0
1.22	0.15	5.0
2.44	0.14	5.0
3.66	0.11	5.0
6.10	0.06	5.0
7.32	0.06	5.0

STATION 33 AT 1314

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.14	5.0
0.61	0.14	5.0
1.22	0.15	5.0
2.44	0.14	5.0
3.66	0.12	5.0
6.10	0.05	5.0
7.32	0.05	5.0

STATION 34 AT 1320

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.18	4.5
0.61	0.18	5.0
1.22	0.13	5.0
2.44	0.13	5.0
3.66	0.12	5.0
6.10	0.06	5.0

STATION 35 AT 1335

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.18	5.0
0.61	0.17	5.0
1.22	0.16	5.0
2.44	0.14	5.0
3.66	0.12	5.0

STATION 36 AT 1331

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.13	5.0
0.61	0.14	5.0
1.22	0.13	5.0
2.44	0.12	5.0
3.66	0.11	5.0

STATION 37 AT 1325

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.16	5.0
0.61	0.15	5.0
1.22	0.14	5.0
2.44	0.14	5.0
3.66	0.13	5.0
6.10	0.06	5.0
7.32	0.04	5.0

STATION 38 AT 1345

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.18	5.0
0.61	0.18	5.0
1.22	0.17	5.0
2.44	0.17	5.0
3.66	0.12	5.0
6.10	0.08	5.0
7.32	0.06	5.0

STATION 39 AT 1341

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.19	4.5
0.61	0.17	5.0
1.22	0.15	5.0
2.44	0.13	5.0
3.66	0.12	5.0
6.10	0.06	5.0
7.32	0.04	5.0

NEW BEDFORD HARBOR DATA FOR DECEMBER 29, 1986

STATION 40 AT 1237

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.13	5.0
0.61	0.12	5.0
1.22	0.08	5.0
2.44	0.06	5.0
3.66	0.05	5.0
6.10	0.02	5.0
7.32	0.02	5.0

STATION 41 AT 1233

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.15	5.0
0.61	0.16	5.0
1.22	0.16	5.0
2.44	0.14	5.0
3.66	0.14	5.0
6.10	0.03	5.0

STATION 42 AT 1226

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.11	4.5
0.61	0.17	4.5
1.22	0.16	5.0
2.44	0.15	5.0
3.66	0.13	5.0
6.10	0.06	5.0
7.32	0.03	5.0

STATION 43 AT 1220

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.16	5.0
0.61	0.16	5.0
1.22	0.14	5.0
2.44	0.15	5.0
3.66	0.13	5.0
6.10	0.06	5.0
7.32	0.04	5.5

STATION 44 AT 1215

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.17	4.5
0.61	0.17	4.5
1.22	0.17	5.0
2.44	0.16	5.0
3.66	0.13	5.0
6.10	0.06	5.0
7.32	0.05	5.0

STATION 45 AT 1210

DEPTH (M)	CONC. (PPB)	TEMP. (DEG. C)
0.00	0.15	4.5
0.61	0.11	5.0
1.22	0.08	5.0
2.44	0.07	5.0
3.66	0.04	5.0
6.10	0.03	5.0
7.32	0.00	5.0

Appendix B

Appendix B.

Sales Summary Search

Aerovox Corporation

All Massachusetts Locations

1954 - 1977

1954 - 1957

Sales Summary books are incomplete for these years	0 lbs

1958

Aerovox Corporation - New Bedford

11 1040 240 Aroclor Dist 1242	364,400 lbs
11 1040 280 Aroclor Dist 1254 GE CP	643,500 lbs
11 1050 120 Aroclor Pyranol 1481	0 lbs

1959

Aerovox Corporation - New Bedford

11 1040 240 Aroclor Dist 1242	597,200 lbs
11 1040 280 Aroclor Dist 1254 GE CP	695,200 lbs

*1960

Aerovox Corporation - New Bedford

16 1040 240 Aroclor Dist 1242	498,000 lbs
16 1040 280 Aroclor Dist 1254 GE CP	718,000 lbs

*1961

Aerovox Corporation - New Bedford

16 1040 240 Aroclor Dist 1242	587,000 lbs
16 1040 280 Aroclor Dist 1254 GE CP	707,000 lbs

1962

Aerovox Corporation - New Bedford

16 1040 240 Aroclor Dist 1242	1,222,340 lbs
16 1040 280 Aroclor Dist 1254 GE CP	122,200 lbs

1963

Aerovox Corporation - New Bedford

16 1040 240 Aroclor Dist 1242	1,118,860 lbs
16 1040 280 Aroclor Dist 1254 GE CP	1,200 lbs

*1964

Aerovox Corporation - New Bedford

16 1040 240 Aroclor Dist 1242	1,450,000 lbs
16 1040 280 Aroclor Dist 1254 GE CP	40,000 lbs

1965

Aerovox Corporation – New Bedford

16 1040 280 Aroclor Dist 1254	27,600 lbs
16 1040 240 Aroclor Dist 1242	1,714,800 lbs

1966

Aerovox Corporation - New Bedford

16 1040 240 Aroclor Dist 1242	1,789,840 lbs
16 1040 280 Aroclor Dist 1254	36,600 lbs

1967

Aerovox Corporation - New Bedford

16 1040 240 Aroclor Dist 1242	1,576,440 lbs
16 1040 280 Aroclor Dist 1254	28,200 lbs

1968

Aerovox Corporation - New Bedford

16 1040 240 Aroclor Dist 1242	1,338,660 lbs
16 1040 280 Aroclor Dist 1254	23,400 lbs

1969

Aerovox Corporation - New Bedford

1040 240 16 Aroclor 1242	1,256,980 lbs
1040 280 16 Aroclor 1254	4,949 lbs

1970

Aerovox Corporation - New Bedford

1040 240 16 Aroclor 1242	1,863,880 lbs
1040 280 16 Aroclor 1254	34,200 lbs

1971

Aerovox Corporation - New Bedford

1040 016 16 Aroclor 1016	284,000 lbs
1040 280 16 Aroclor 1254	90,600 lbs
1040 280 17 Aroclor 1254	3,600 lbs

1040 240 16 Aroclor 1242	568,000 lbs

1972

Aerovox Corporation - New Bedford

1040 016 16 Aroclor 1016	1,663,000 lbs

1973

Aerovox-Belleville - New Bedford

1040 280 16 Aroclor 1254	7,200 lbs
1040 016 16 Aroclor 1016	1,839,800 lbs

1974

Aerovox-Belleville - New Bedford

1040 016 16 Aroclor 1016	1,914,500 lbs
1040 280 16 Aroclor 1254	16,800 lbs

1975

Aerovox-Belleville - New Bedford

1040 016 16 Aroclor 1016	999,000 lbs
1040 280 16 Aroclor 1254	3,600 lbs

1976

Aerovox-Belleville - New Bedford

1040 016 16 Aroclor 1016	1,958,000 lbs

1977

Aerovox-Belleville - New Bedford

1040 016 16 Aroclor 1016	2,756,000 lbs

Sales Summary Search

Cornell Dubilier Electric

All Massachusetts Locations

1954 - 1977

1954 - 1957

Sales Summary books are incomplete for these years	0 lbs

1958

Cornell Dublier Electric - New Bedford

11 1040 240 Aroclor Dist 1242	600 lbs
11 1040 240 Aroclor Dist 1242	672,900 lbs
11 1040 280 Aroclor Dist 1254 GE CP	894,600 lbs
11 1050 120 Aroclor Pyranol 1481	126,600 lbs

1959

Cornell Dublilier Electric - New Bedford

04 1040 240 Aroclor Dist 1234	43,200 lbs
11 1040 240 Aroclor Dist 1242	427,800 lbs
11 1040 280 Aroclor Dist 1234 GE CP	849,600 lbs
11 1040 280 Aroclor Dist 1234 GE CP	90,000 lbs
11 1050 110 Aroclor Pyranol 1481	149,400 lbs

*1960

Cornell Dublilier Electric - New Bedford

16 1040 240 Aroclor Dist 1242	2,000 lbs
16 1040 240 Aroclor Dist 1248	461,000 lbs
16 1040 280 Aroclor Dist 1254 GE CP	1,033,000 lbs
16 1040 280 Aroclor Dist 1234 GE CP	60,000 lbs
16 1050 120 Aroclor Pyranol 1481	191,000 lbs

*1961

Cornell Dublilier Electric - New Bedford

16 1040 240 Aroclor Dist 1242	26,000 lbs
16 1040 240 Aroclor Dist 1254 GE CP	285,000 lbs
16 1040 280 Aroclor Dist 1254 GE CP	901,000 lbs
16 1040 280 Aroclor Dist 1234 GE CP	30,000 lbs
16 1050 120 Aroclor Pyranol 1481	173,000 lbs

1968

Cornell Dublilier Electric - New Bedford

Table B.1 Summary of total PCB purchases Aerovox and Cornell Dublilier, 1958-1977

	Total Purchased (kg)				
Purchaser	Aroclor 1242	Aroclor 1254	Aroclor 1016	Aroclor Pyrenol 1481	Total
Aerovox	7,233,305 (57.6%)*	145,327 (1.2%)	5,177,539 (41.2%)	-	12,556,171
Cornell Dublilier	6,538,254 (48.7%)	3,036,761 (22.6%)	3,491,132 (26.0%)	354,171 (2.7%)	13,420,318

* % of total