FINAL REPORT

FOR

AGREEMENT NO. 01-4400-456-29-00022

SEDIMENT-WATER FLUX MEASUREMENTS IN THE PECONIC BAY ESTUARINE ECOSYSTEM: JULY AND OCTOBER 1989

SUBMITTED TO:

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PREFACE

This document is submitted in accordance with the terms of Agreement No. 01-4400-456-29-00022 between the County of Suffolk, NY, and Jonathan H. Garber, Ph.D.. It contains hard-copy of all data collected during determinations of sediment-water fluxes in the Peconic Bay system made in July and October 1989. These determinations were carried out in conjunction with the Brown Tide Comprehensive Assessment and Management Program through the Department of Health Services, Bureau of Marine Resources, Suffolk County, New York.

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INTRODUCTION

The importance of sediment-water exchanges of organic matter, oxygen, and inorganic nutrients in modeling the eutrophication of coastal systems has become increasingly clear in recent years. Near-coastal benthic communities, including their commercially important shellfish and fin-fish resources, are nourished by organic matter produced in the overlying water. At the same time, productivity at the base of estuarine food webs, the phytoplankton, depends on the release of fertilizing nutrients from the bottom sediments. In addition, oxygen consumption and nutrient transformations in sediment communities are important terms in the oxygen and nutrient mass balance budgets of estuarine ecosystems.

Exchanges of nutrients and energy between the waters and bottom sediments of estuarine ecosystems influence water and benthic habitat quality through the dependence of aquatic plant production on inorganic nutrients and the decomposition of organic matter in bottom sediments. These ecosystem processes contribute to the high productivity of estuarine systems. However, they contribute to positive feed-backs between the nutrient loading of estuarine systems, primary productivity in the water column, and nutrient release and oxygen consumption by the sediment. When the balance between autotrophy (the production of organic matter) and heterotrophy (the consumption of organic matter) shifts, the potential exists for the onset of eutrophication and its well-described effects: algal blooms, species replacements, anoxic waters, loss of benthic habitat.

Nutrients and organic matter enter shallow bays and estuaries from a variety of sources, including various point sources, sewage effluent, river water, non-point drainage, groundwater, and rainfall. Dissolved nutrients can be rapidly incorporated into particulate forms by biological uptake, chemical precipitation, flocculation, and physical sorption onto particles. Particulate matter formed in coastal systems by either biological or physico-chemical mechanisms sinks rapidly to the interface between bay waters and sediment. In the sediment organic matter is consumed and respired by bacteria and other benthic organisms. As organic matter is decomposed, remineralized nutrients in the sediments are released back into the overlying water where they may be transported upwards into the sunlit portions of the water column and support additional plant growth. These features of estuarine biogeochemistry result in the coupling of benthic and pelagic communities through flows of energy and nutrient elements. These processes are also central to understanding the process of estuarine eutrophication, the deleterious effects of which include noxious phytoplankton blooms.

Although understanding estuarine processes has improved during the last two decades of research, our ability to build accurate predictive models of these processes is limited. One fundamental failing of nearly all water quality models is their inability to accurately simulate nutrient cycling processes that lead to benthic-pelagic linkages: phytoplankton production, particle sinking, benthic community metabolism and nutrient remineralization. There is perhaps no better demonstration of the need for quantifying these exchanges than the sensitivity of the steady-state water quality model for Chesapeake Bay to benthic exchange parameters (Hydroqual, Inc., 1989), and the subsequent level of effort directed at building more accurate sediment processes models. The lesson from the Chesapeake experience is clear: models of estuarine water quality require simulation of sediment-water exchanges.

The work reported here was carried out in connection with the Brown Tide Comprehensive Assessment and Management Program of Suffolk County, New York.

The objective of the this component of the study was to provide two sets of benthic flux measurements in the Peconic Bay system that would be used to calibrate a water quality model being developed by Dr. Andrew Stoddard and his associates at Creative Enterprises, Inc. (Hamilton, Virginia).

METHODS

Field Sampling

Sediment-water cores for sediment flux determinations and ancillary supporting data were collected at ten sampling stations in the Peconic Bay system (Fig. 1) during two sampling periods in 1989: July 24-28 and October 23-27. Descriptions and locations of the stations are given in Table 1. Transport and support on station were provided by the Suffolk County Research Vessel (no name) and crew.

Water Column Profiles and Sampling. Water column characteristics were established at each sampling station prior to sediment sampling. A Hydrolab Model Surveyor II submersible instrument package was used to determine vertical depth profiles of water temperature, salinity, dissolved oxygen concentration, and pH were obtained at discrete intervals of 1 to 2 meters from the water surface to approximately 0.5 meter off the bottom. In July, samples of near-bottom water were collected for nutrient analyses using the boat engine's centrifugal pump. Air leaks in this arrangement aerated the samples. This was not a serious problem since oxygen levels were generally high throughout the bay). In October, we used a 12-volt submersible pump and hose system to collect water. These pumps were also used to fill three 20-liter and one 10 liter collapsible sample containers ("cubitainers") with bottom water for flushing the core chambers and providing replacement water during core incubations. While on station, bottom water samples were immediately filtered through Whatman GF/F glass fiber filters into clean, thoroughly rinsed polystyrene autoanalyzer cups. These were capped and kept on ice. After returning to the laboratory these samples, and all subsequent water samples, were frozen until analyses for ammonium (NH_4^+), nitrate+nitrite ($NO_3^- + NO_2^-$), nitrite (NO_2^-), dissolved (reactive) inorganic phosphorus (DIP, PO_4^{-3}) and dissolved reactive silicate (DSi) were carried out at the Analytical Services Laboratory at Chesapeake Biological Laboratory (CBL), Solomons, MD. Time-in-storage before analyses was 1 to 3 weeks. Methods and precision of the water column and bottom water nutrient analyses are given in Table 2.

Sediment Cores. At each station SCUBA divers used 35 cm lengths of 13.3 cm i.d. lexan core tubing to collect two intact cores of sediment for benthic flux determinations. Care was taken during the coring to obtain cores that were as undisturbed as possible. Cores that showed signs of disruption of near surface structure were discarded. Depth of sediment in the core tube (about 15 cm) was sufficient to allow a volume of about 2 liters of overlying water above the sediment. While on the bottom, the divers capped the core tubes with top and bottom seals and filled one additional tube with bottom water (no sediment) to provide a bottom water control. The top sealing plate contained ports for an oxygen probe and water sampling tubes (Fig. 2). The sealed core tubes were hoisted on board, checked for leaks, and transported to the field laboratory along with the cubitainers of bottom water. Care was taken to maintain the cores at near in situ temperature during transport.

In Situ Sediment Characteristics. While on the bottom the divers used a 30 ml syringe corer to obtain a sample of surficial sediment. On shipboard the topmost 0.5-1.0 cm of this sediment core was transferred to a plastic sample container. These samples were on ice for transport to Riverhead, then frozen for transport to CBL where they were analyzed for total particulate carbon (PC), particulate nitrogen (PN), and particulate phosphorus (PP).

Benthic Flux Determinations. Benthic fluxes of oxygen and dissolved nutrients were determined using a modification of the shipboard (or laboratory) intact core incubation procedure developed and currently used by Boynton et al. (1989) for the Ecosystem Processes Component of the Maryland Chesapeake Bay Monitoring Program. Sealed sediment core tubes (Fig. 2) served as the chambers for determinations of net sediment-water exchanges. Two intact sediment-water chambers and one bottom water control chamber were used to estimate the net exchanges of oxygen and nutrients between sediments and water for each Peconic Bay station.

After returning to the laboratory at the County Center in Riverhead, New York, the overlying water in each sediment chamber and control was flushed with approximately 20 liters of bottom water from the appropriate station. This procedure established uniform initial conditions in the cores and blanks. The core chambers were then fitted with Orbisphere System 2610 self-stirring polarographic oxygen and temperature probes and low-volume valved tubes that allowed sampling and simultaneous replacement of the water overlying the sediment cores. Replacement water was provided by a collapsible reservoir of bottom water fed to the cores through a system of gang valves. Gentle but thorough circulation of the overlying water was provided by the stirring rods attached to the oxygen probes. Both the probes and sampling ports were sealed with gas-tight o-rings or stoppers. The cores were placed in darkened temperature-controlled water baths set to maintain the cores at field temperature and allowed sufficient time (usually about 1 hour) to reach thermal equilibrium. Temperatures and dissolved oxygen concentrations of the overlying water were then recorded every 45 minutes and a 35 ml water samples were withdrawn from the overlying water of each chamber every 90 minutes during a 4.5-hour incubation period. The water samples were immediately filtered through pre-ashed Whatman GF/F glass fiber filters into sample-rinsed autoanalyzer cups. The cups were capped and immediately frozen for nutrient analyses (ammonium, nitrate+nitrite, nitrite, phosphate, and silicate) at CBL. At the end of the incubation the total volume of water overlying each sediment core was siphoned off and measured in a volumetric cylinder. The data record for each incubation therefore consisted of 7 measurements of dissolved oxygen, 4 measurements of each nutrient in the overlying water of replicate cores and one bottom water control made over a 270 minute incubation, and the volume of overlying water.

The net sediment-water exchange rate (i.e., the flux) of each constituent was calculated from rate of change of the concentration of constituent in the overlying water during the incubation. The rate of change in constituent concentration was calculated as the least squares linear predictive regression coefficient (slope) of the regression of the constituent concentration (in mg/l or micromoles) on time (minutes). The units of the regression coefficient are therefore given in mg $l^{-1}min^{-1}$ (for oxygen) and µg-at $l^{-1}min^{-1}$ for the other nutrients. This volumetric rate of change is then converted to area-based flux by multiplying the rate by the volume of overlying water (liters), dividing by the surface area of the sediment core ($meters^2$), and applying appropriate conversion factors for time and concentrations. Algorithms for all calculations are reported in Boynton and Rohland (1990) and will be provided upon request.

Analytical Chemistry. Methods for determinations of dissolved and particulate nutrients followed well-established standard procedures employed by the USEPA-Certified Analytical Services Laboratory at the Chesapeake Biological Laboratory, Solomons, Maryland. A summary of our analytical methods and precision of the data reported here are provided in Table 2. In brief, automated colorimetric procedures were used to determine concentrations of ammonium, nitrate+nitrite, nitrite, and phosphate following or modified from the procedures in EPA (1979). Silicate was determined using Technicon Industrial System (1977) method. Particulate phosphorus were obtained by acid digestion procedure (Aspila et al. 1976). Particulate carbon and particulate nitrogen were determined using Perkin Elmer Model 240-XA Elemental Analyzer. Strict quality control and quality assurance procedures are followed throughout the sample handling, analysis, recording, and reporting sequence. The data files contained in this report have been proofed twice against original laboratory notebook records.

RESULTS AND DISCUSSION

Water Column Profiles

Complete listings of water column profile data obtained at the ten sediment flux stations in July and October 1989 are provided by station and date in Appendix A.

Waters of the Peconic System during both sediment sampling periods were generally characterized by little vertical and horizontal structure (Fig. 3 and Table 3). In July, surface water temperature decreased along the main axis of the bay from 26°C near the Peconic River mouth, to about 23°C in mid-Gardiners Bay. Surface water salinity increased along the same transect from 20.8 parts per thousand (ppt) in the southwest to 28.4 ppt in Gardiners Bay.

Bottom water salinity increased by less than 2.5 ppt between Flanders Bay and Gardiners Bay. Water temperatures were about 10°C cooler in October, ranging from 14.1°C to 12.6°C, with salinities of ranging from 26.5 ppt to 29.8 ppt between the Peconic River mouth and mid-Gardiners Bay. With the exception of the area south and west of Station SJ during July, oxygen concentrations were generally high throughout the system and, with the exception noted, generally in excess of the 5 mg/l oxygen standard that has been suggested as a DO standard for estuarine waters. pH values ranged between 7.5 and 7.9. Dissolved nutrients in bottom waters at sediment flux stations at the time of sediment sampling are given in Table 4 and Appendix B. The notable features of these two surveys of dissolved nutrients in the Peconic system are: (1) generally low concentrations of dissolved inorganic nitrogen; (2) generally low abundance of inorganic nitrogen relative to inorganic phosphorus; (3) strong gradients of dissolved silicate from the mouth of the Peconic River seaward; and (4) relatively high concentrations of nitrite (NO_2^-) in the outer reaches of the system in October.

Water Depth and Sediment Composition

Water depths at the sediment flux stations (Fig. 3) ranged from about 2 meters at the mouths of the Peconic River (PR) and Shinnicock Canal (SC) to about 10 meters in Little Peconic Bay off Nassau Point (BT-3). Total carbon, nitrogen, and phosphorus content of surficial sediments at the sediment flux stations are reported in Table 5, and shown in Fig. 4. Total particulate carbon content of the 0-1 cm layer of surficial sediments ranged from less than 0.2-0.4% C in the sandy sediments near the mouths of Peconic River, Shinnicock Canal and Northwest Harbor to nearly over 2.5% C in the dark muds of mid-Peconic, Little Peconic, and Noyack Bays. Along the same depth gradient particulate nitrogen (PN) ranged from <0.05% to >0.25% PN and particulate phosphorus ranged from <0.01% to <0.06% PP. All three constituents gave significant positive correlations with water depth (r>0.70, significant with 99% confidence). Regression of PC on PN, PN on PP, and PC on PP also yielded significant correlations (r>0.90, 18 d.f.) which suggests a relatively constant stoichiometry of C, N, and P in these sediment samples of 33% C:3.4%:1% P (by weight) or about 120 C:10 N:1 P (by atoms).

<u>Benthic Fluxes of Dissolved Oxygen and Nutrients</u>

Concentrations of oxygen and dissolved nutrients in the sediment-water flux chambers during the course of the benthic flux incubations are provided in Appendix C. Regression slopes and correlation coefficients used to determine the net rates of change and significance of the changes, respectively, for DO and nutrients in the water phase of the flux chambers are given along with the calculated net sediment water fluxes in Appendix D. Following established convention, positive (+) fluxes represent a net exchange of constituent from the sediment to the overlying water; negative (-) fluxes indicate a net exchange from the water to the sediment. The net flux data for each station as the average of duplicate determinations and date are summarized in Table 6. Spatial and temporal trends in the flux data are illustrated in Figs. 5 through 11.

<u>Dissolved Oxygen.</u> In July, highest rates of benthic oxygen flux, also called "sediment oxygen consumption" (SOC) or "sediment oxygen demand" (SOD) in other reports, were found in mid-Noyack Bay (-3.5 $gO_2m^{-2}day^{-1}$) and near the head of the estuary (Stations PR and BT-1). With the exception of high rates noted in Noyack Bay, sediment oxygen consumption rates decreased along a seaward gradient from highs in excess of -2.5 $gO_2m^{-2}day^{-1}$ near the head of the

estuary to rates of 0.7-0.8 $gO_2m^{-2}day^{-1}$ downbay. By October, although water temperatures had cooled about 10°C and SOC rates decreased by an average of about 0.6 $gO_2m^{-2}day^{-1}$, the downbay gradient of oxygen fluxes and "hot spot" of higher rates in Noyack Bay was still apparent (Fig. 5).

Dissolved Inorganic Nitrogen. Sediment-water exchanges of dissolved nutrients in the Peconic System were consistent with other temperate estuarine systems in that, with the exclusion of the possibility of significant fluxes of dinitrogen gas (N_2) gas, the flux of inorganic nitrogen was dominated by the release of ammonium from the sediment to the overlying water (see e.g. Nixon et al. 1976, Boynton et al. 1989, Garber 1987, and others). Averaged over all stations, ammonium flux accounted for about 75% of the net sediment water exchange of dissolved inorganic nitrogen. The spatial and temporal patterns of ammonium flux (Fig. 6) generally paralleled that of oxygen consumption rates. In July, ammonium flux rates decreased from nearly 300 µg-at $Nm^{-2}hr^{-1}$ near the mouth of the Peconic River to about 50 µg-at $Nm^{-2}hr^{-1}$ in Gardiners Bay. The hot spot of oxygen consumption in Noyack Bay was accompanied by rates of ammonium release (>600 µg-at N $m^{-2}hr^{-1}$) that rank among the highest in our experience. The high rates of oxygen consumption and ammonium release in Noyack Bay strongly suggest the region characterized by station NB as an area of active organic matter decomposition and nitrogen remineralization. In contrast, ammonium flux from the sandy near-shore sediments at Shinnicock Canal (Station SC) and Northwest Harbor (BT-8) were undetectable in July and October. By October, ammonium release at stations along with main axis of the bay system decreased by an average of about 120 µg-at N $m^{-2}hr^{-1}$, the most significant decrease (some 570 µg-at N $m^{-2}hr^{-1}$) occurred in Noyack Bay.

In July and October, sediments along the main axis of the bay system from station BT-1 seaward were characterized by net release of oxidized forms of inorganic nitrogen, nitrate and nitrite, at rates averaging 5 to 16 µg-at N $m^{-2}hr^{-1}$ (Figs. 7,8,9). Nitrate and nitrite fluxes at stations located along the bay's margins (SC, BT-8) were generally smaller and more variable. The only sediments exhibiting significant uptake of nitrate were located near the mouth of the Peconic River (Station PR). However, in October, nitrate flux at Station PR reversed direction and was, at >20 µg-at N $m^{-2}hr^{-1}$, the highest release rate of nitrate found during the two surveys. The mouth of the Peconic River therefore appears to be a region of active nitrogen cycling activity where ammonification of organic matter, nitrification, and denitrification produced strong fluxes of ammonium out and nitrate into the sediment in mid-summer. In October, the relative rates of sediment-associated nitrification and denitrification shifted to produce a net flux of nitrate from the sediment to the overlying water.

We were surprised by the number and magnitude of significant fluxes of nitrite (Fig. 9) from the sediment to the overlying water. Nitrite is generally a short-lived intermediate in nitrogen cycle transformations, and rarely occurs in concentrations above 1 µg-at N l^{-1} in natural waters. Nevertheless, mid-bay regions of the Peconic system (Stations BT-1, BT-2, BT-3) appear to be characterized by the net release of nitrite in summer and fall. The source and ecological significance of these fluxes are not clear: they may reflect incomplete conversion of ammonium to nitrate during nitrification, or conversely, incomplete conversion of nitrate to N_2 during denitrification, or finally, incomplete conversion of nitrate to ammonium via dissimulatory nitrate metabolism. The significance of nitrite and other more reduced forms of nitrogen in the onset of nuisance tides is also not clear.

Some evidence from culture experiments (R. Steele, USEPA, Narragansett RI, pers. comm.) suggests that shifts in the relative abundance of oxidized and reduced forms of inorganic nitrogen can trigger blooms of brown tide phytoplankton. If so, the benthic release of nitrite may be a key piece of the brown tide puzzle.

Dissolved Inorganic Phosphate. With the exception of the Stations in the Peconic River mouth (PR) and mid-Noyack Bay (NB), fluxes of inorganic phosphorus (DIP) were generally low (<5 µg-at P $m^{-2}hr^{-1}$) throughout the bay system during both sampling periods (Fig. 10). Between July and October, fluxes of DIP throughout the system decreased by an average of 3.2 µg-at P $m^{-2}hr^{-1}$ with the largest declines associated with the larger fluxes at PR and NB.

Dissolved Silicate. Benthic fluxes of dissolved silicate followed a fairly typical estuarine pattern of increase in the seaward direction at most BT stations (Fig. 11) associated with the production, sinking and remineralization of diatoms (D'Elia et al. 1983). The largest fluxes, nearly 1 mg-at Si $m^{-2}hr^{-1}$ (note units) coincided with other strong benthic fluxes in Noyack Bay in July. Smallest net silicate fluxes occurred in the sandy nearshore sediments near Shinnicock Canal, Northwest Harbor and Orient Harbor. At the other locations, net Si fluxes in July averaged between 100-350 µg-at Si $m^{-2}hr^{-1}$. Between July and October the net sediment-water flux of silicate throughout the Peconic system decreased by an average of 143 µg-at Si $m^{-2}hr^{-1}$.

Stoichiometry of Benthic Nutrient Fluxes.

The carbon, nitrogen, phosphorus and silicon content of marine and estuarine organic matter tends to be relatively constant and consistent with elemental ratios described by Redfield et al. (1963) and others (e.g. Nixon and Pilson 1982). If the formation and decomposition of estuarine organic matter follows Redfield-like stoichiometries, then their biogeochemical cycles do not contain significant sources or sinks (of differing elemental composition) that could fractionate the relative abundance of these elements in an ecosystem. In some estuaries, Narragansett Bay, for example, the benthic flux of recycled nutrient tends to be low in nitrogen relative to phosphorus (Nixon et al. 1976). This fact suggested that denitrification may result in the loss of considerable fixed inorganic nitrogen from estuarine systems (Seitzinger et al. 1984). This appears to be the case for some well mixed estuaries (Seitzinger 1988).

Scatter plots showing the relationships between benthic oxygen, DIN, and DIP fluxes in the Peconic system (Figs. 12,13,14) show that there appears to be some consistency in the elemental composition of sediment-water exchanges in the Peconic River system. Regressions of DO flux on DIN flux, DO on DIP, and DIN and DIP all yielded correlation coefficients (between 0.7 and 0.88, 38 degrees of freedom) that were highly significant. The stoichiometric relationships can therefore be estimated from the regression coefficients. These indicate that the elemental composition of benthic fluxes in the Peconic system followed molar O_2/N ratio of 7.3, molar O_2/P ratio of 142, and DIN/DIP ratio of 14.6 and the overall composition of the benthic nutrient flux estimated to be 220 O : 15 N : 1 P, by atoms. These ratios are very consistent with described by Redfield et al. (1963) of 212 O : 16 N : 1P for marine plankton. These ratios also suggest that, at least for the sampling periods represented by the measurements reported here, there is little net loss of fixed nitrogen in the Peconic Bay system through the process of denitrification in bay sediments.

Temperature Effects on Benthic Fluxes. Work in Narragansett Bay (Nixon et al. 1976), Chesapeake Bay (Boynton and Kemp 1985, Boynton et al. 1989, Garber et al. 1989) and elsewhere (Garber 1987) has shown that sediment-water exchanges of oxygen and inorganic nutrients follow strong seasonal patterns with maximum rates occurring in mid- to late-summer and minimum rates in winter. These annual patterns suggest a strong relationship between sediment flux rates and temperature of the sediment and overlying water that reflects the influence of temperature on the metabolic reactions of organisms that mediate the decomposition of organic matter and release of remineralized nutrients in estuarine sediments. Other factors, including rates of organic matter deposition, water oxygen content, benthic animal activities, and sediment disturbance also undoubtedly influence benthic fluxes and contribute to between-site variations.

The data set collected here allows an preliminary estimate of the effect of temperature on benthic flux rates in the Peconic System. It would have been better to have several measurements of flux rates at each station during the warming of the bay system in the spring and summer, however, it is possible to calculate Q10 values to estimate the effect of the approximately 10°C difference between July and October water temperatures on benthic flux rates. The results of these calculations are given in Table 7. Averaged over the 10 stations sampled in the survey, Q10's for DO, nitrate, nitrite, phosphate, and silicate were 1.6, 1.2, 2.2, 3.3, and 1.7, respectively. There values are consistent with most biological reaction systems. They suggest that within the normal temperature range of 0-30°C the rate of these exchanges will approximately double for a 10°C rise in water temperature. The influence of temperature on ammonium release from the sediment is, however, dramatically greater. The Q10 for ammonium release averaged 7.0, more than double that of the other nutrients. This suggests that for the 10°C drop in temperature, the rate of ammonium flux from the sediments decreased by a factor of about 7, substantially more than would be expected for enzymatically-driven biological reactions. Annual data from seasonally-anoxic region of mainstem Chesapeake Bay (Garber et al. 1989, Garber unpub. data) gave a Q10 for ammonium release of about 3. The high Q10 for ammonium flux in the Peconic system may be an artifact of the limited data set. On the other hand, it may reflect very strong temperature dependent benthic-pelagic coupling in the system.

Other Environmental Correlations.

Simple pair-wise correlation analysis was conducted to identify possible relationships between water column measurements, sediment characteristics, and benthic fluxes for the data collected at the ten stations in Peconic Bay. The results of the analysis are given as the level of significance among the various parameters in Table 8. This analysis: (1) reiterates the relationship described earlier between water depth and the carbon, nitrogen, and phosphorus content of the sediment as well as the stoichiometry of C, N, and P in the sediment; (2) corroborates expected correlations among physical descriptors of water column characteristics such as water temperature, salinity, and DO; (3) indicates the stoichiometric relationships, also described above, among benthic oxygen, DIN, DIP and silicate fluxes. With the exception of silicate flux, which showed weak correlations with sediment PC, PN, and PP, other benthic fluxes did not co-vary in any simple way with the measured characteristics of the sediment. This finding is consistent with results from Chesapeake Bay and elsewhere. There is no simple relationship between the easily-measured sediment components (such as organic content, PC, PN, PP, etc.) and benthic oxygen and nutrient fluxes.

SUMMARY AND CONCLUSION

1. Net sediment-water exchanges (benthic fluxes) of dissolved oxygen and inorganic nutrients (ammonium, nitrate, nitrite, phosphate, and silicate) were determined, along with supporting water column and sediment analyses, at ten stations in the Peconic Bay estuarine system during summer (July) and fall (October) 1989. Water temperatures during these two sampling periods differed by about 10°C.

2. Waters of the Peconic system during the sampling periods were partially-mixed to well-mixed at the sampling stations. Dissolved nutrient concentrations were moderate to low and dissolved oxygen concentrations generally high throughout the system.

3. Peconic Bay sediments exhibited significant net fluxes of dissolved oxygen and inorganic nutrient during both sampling periods. Spatial and temporal variability in the flux data corresponded to seasonal water temperatures and location of sampling stations. In general, the coarser sands and gravel of nearshore margin sediments exhibited low fluxes; higher fluxes corresponded with deeper depositional areas of the bay system. Two "hot spots" sediment-water exchanges were identified: one near the mouth of the Peconic River (Station PR) and the other in mid-Noyack Bay (Station NB).

4. Ratios of carbon, nitrogen, and phosphorus in Peconic Bay sediments, and the ratios of oxygen, nitrogen, phosphorus, and silicon flux in benthic fluxes suggest that the biogeochemical cycle of organic matter in the

Peconic system follow Redfield-like stoichiometries. No evidence of nitrogen loss, relative to phosphorus, was apparent in the benthic fluxes of these elements.

5. Temperature coefficients, expressed as Q10 values, were calculated for the rates of net sediment-water exchanges of oxygen and nutrients in the Peconic system. With the exception of ammonium flux, Q10's derived from the two sampling periods ranged between 1.2 and 3.3. The Q10 for ammonium, 7.0, was significantly higher. The reason for the strong influence of temperature on ammonium flux is not known.

6. Benthic fluxes in the Peconic system are of magnitudes sufficient to exert significant influence on water quality both directly, via uptake of oxygen by the sediments, and indirectly via fertilization of the phytoplankton with recycled nutrients. Additional data on annual rates of phytoplankton productivity, nutrient inputs, and benthic fluxes would be needed to better quantify the impact of benthic fluxes on Peconic Bay system productivity and water quality.

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FIGURES

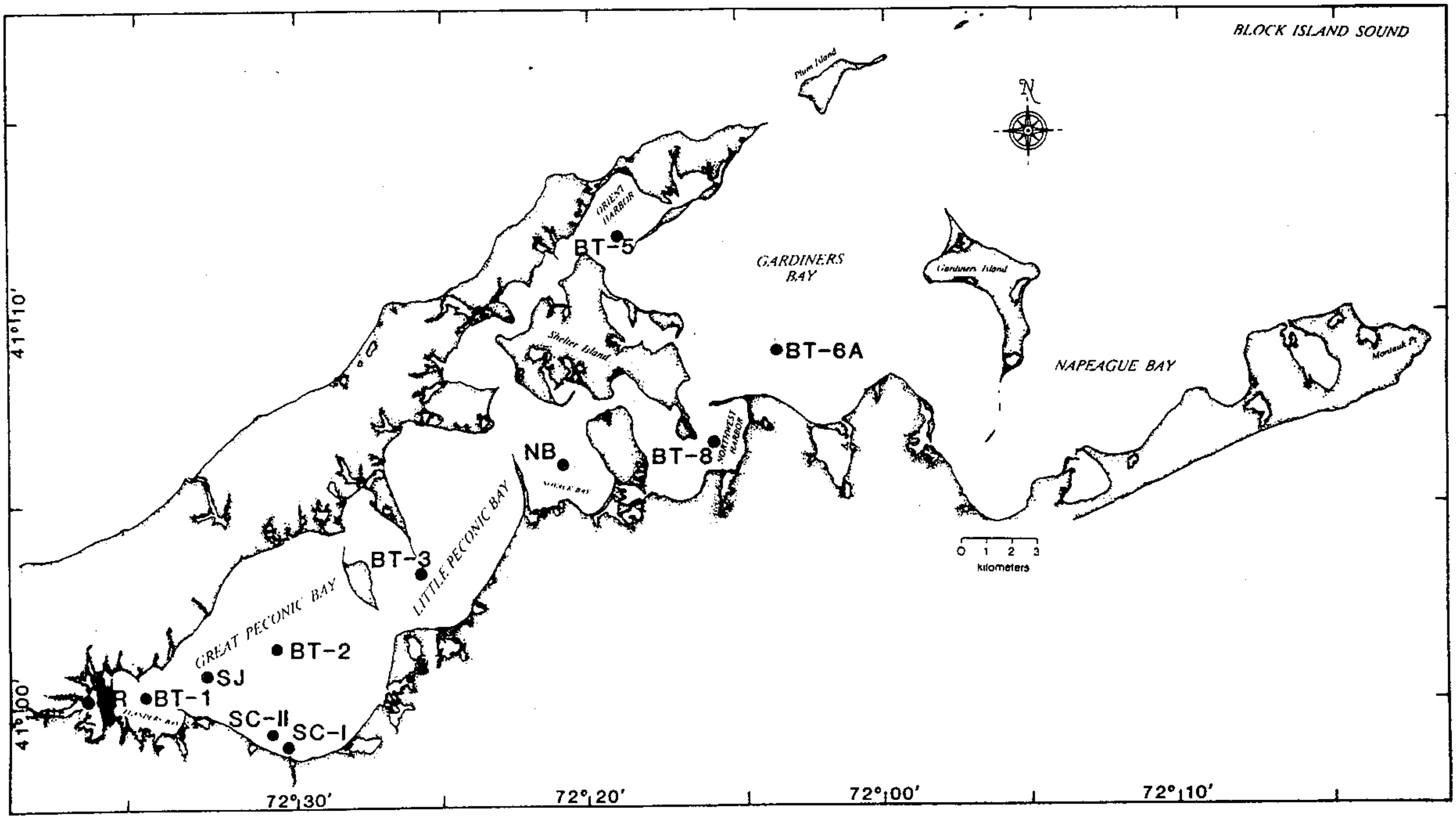

Figure 1. Location map of the Peconic Bay estuarine system showing positions of sediment flux sampling stations.

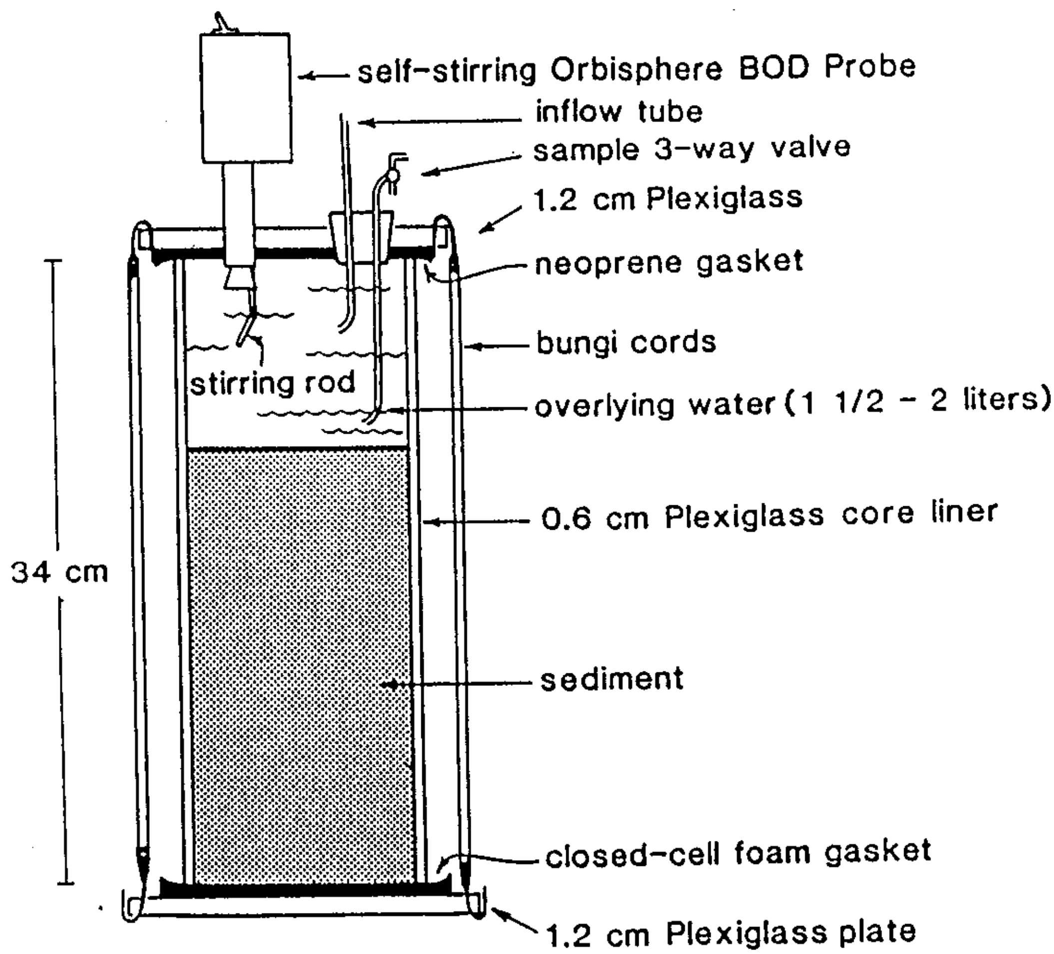

Figure 2. Diagram of intact core sampler and benthic flux chamber apparatus.

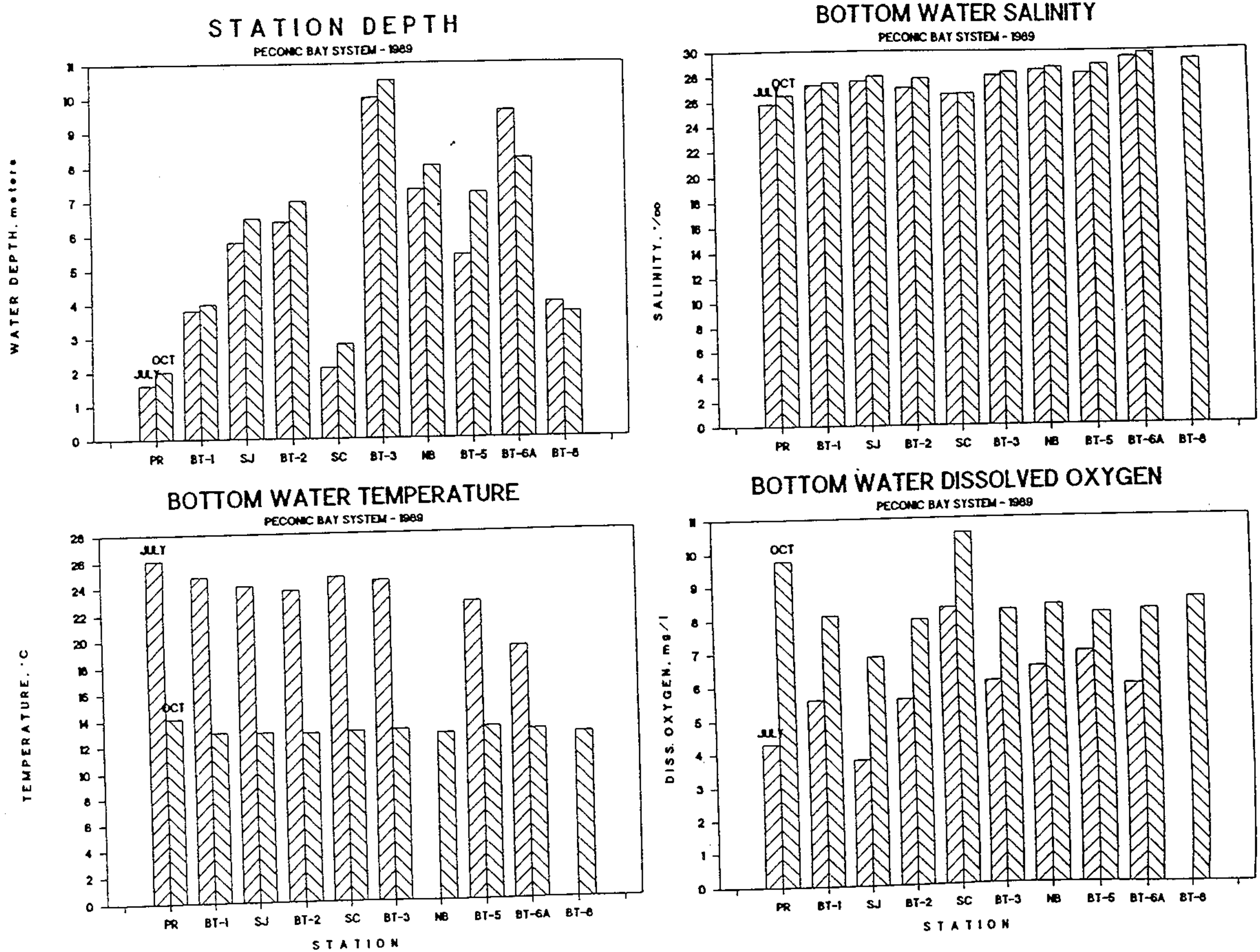

Figure 3. Water depths and bottom water characteristics (temperature, salinity, and dissolved oxygen concentration) at sediment flux sampling stations in the Peconic system, July and October 1989.

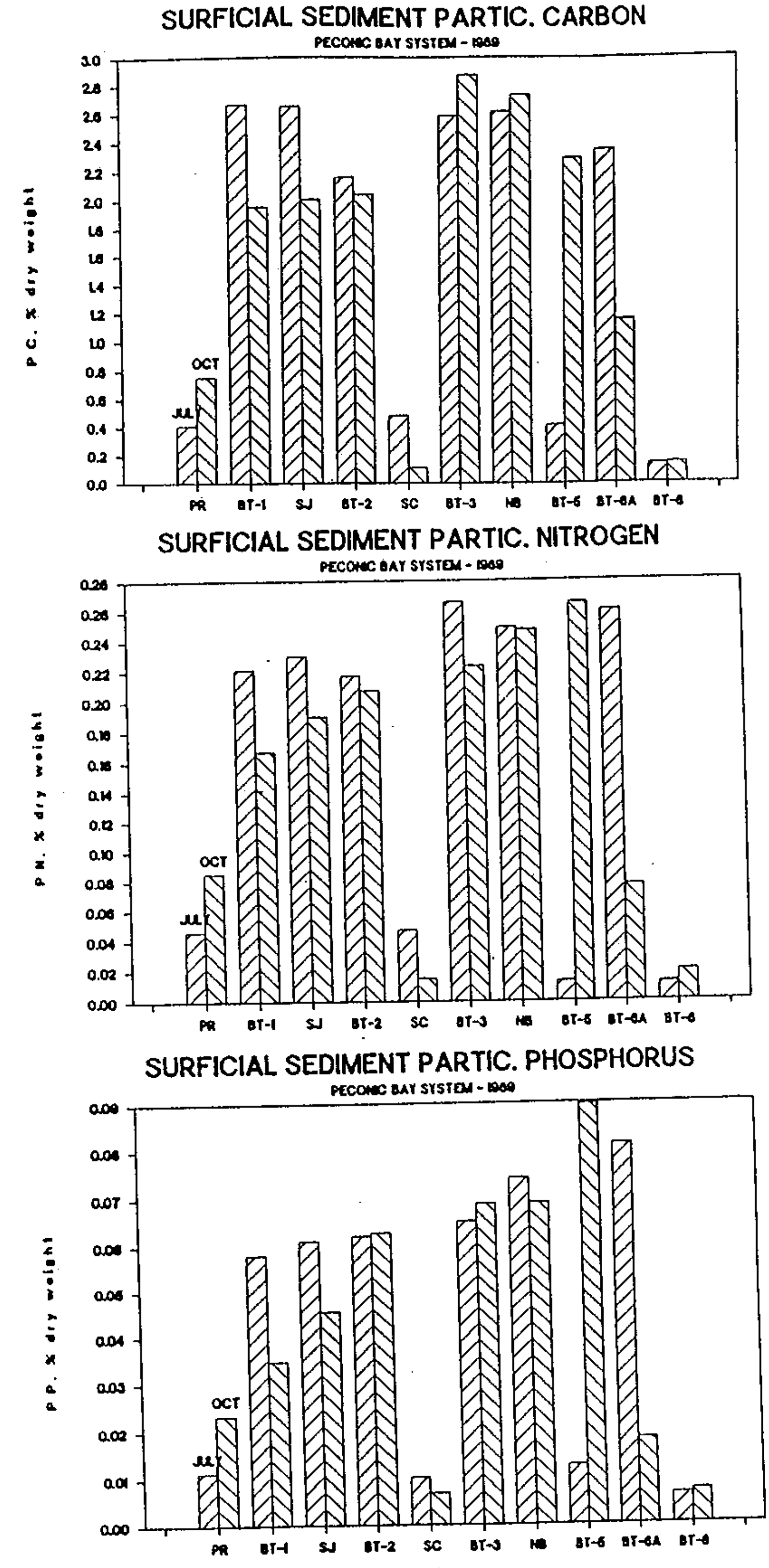

Figure 4. Concentrations of total particulate carbon (PC), particulate nitrogen (PN), and particulate phosphorus (PP) in surficial sediments at sediment flux stations in the Peconic system, July and October 1989.

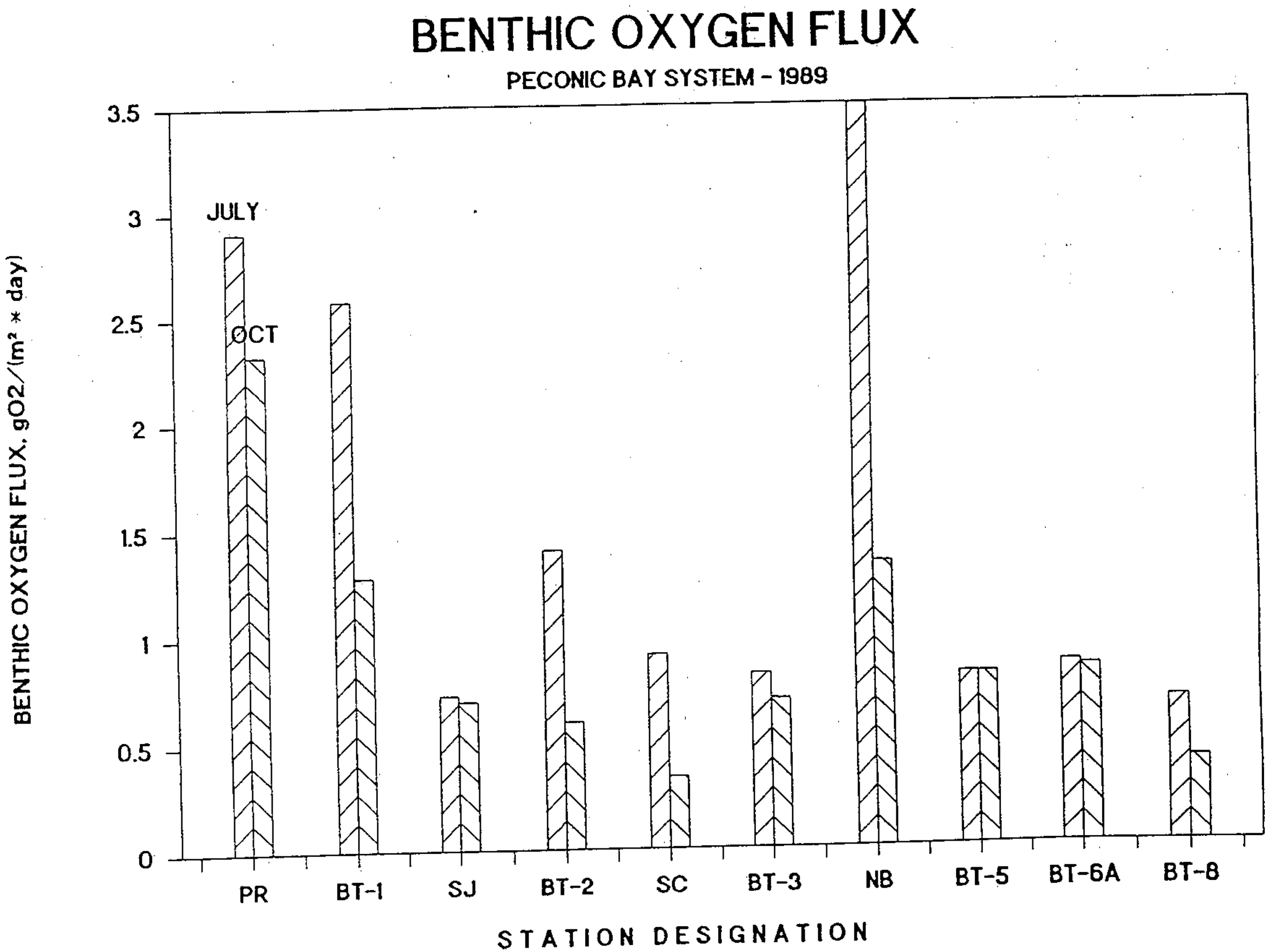

Figure 5. Benthic flux rates of dissolved oxygen at sampling stations in the Peconic system, July and October 1989.

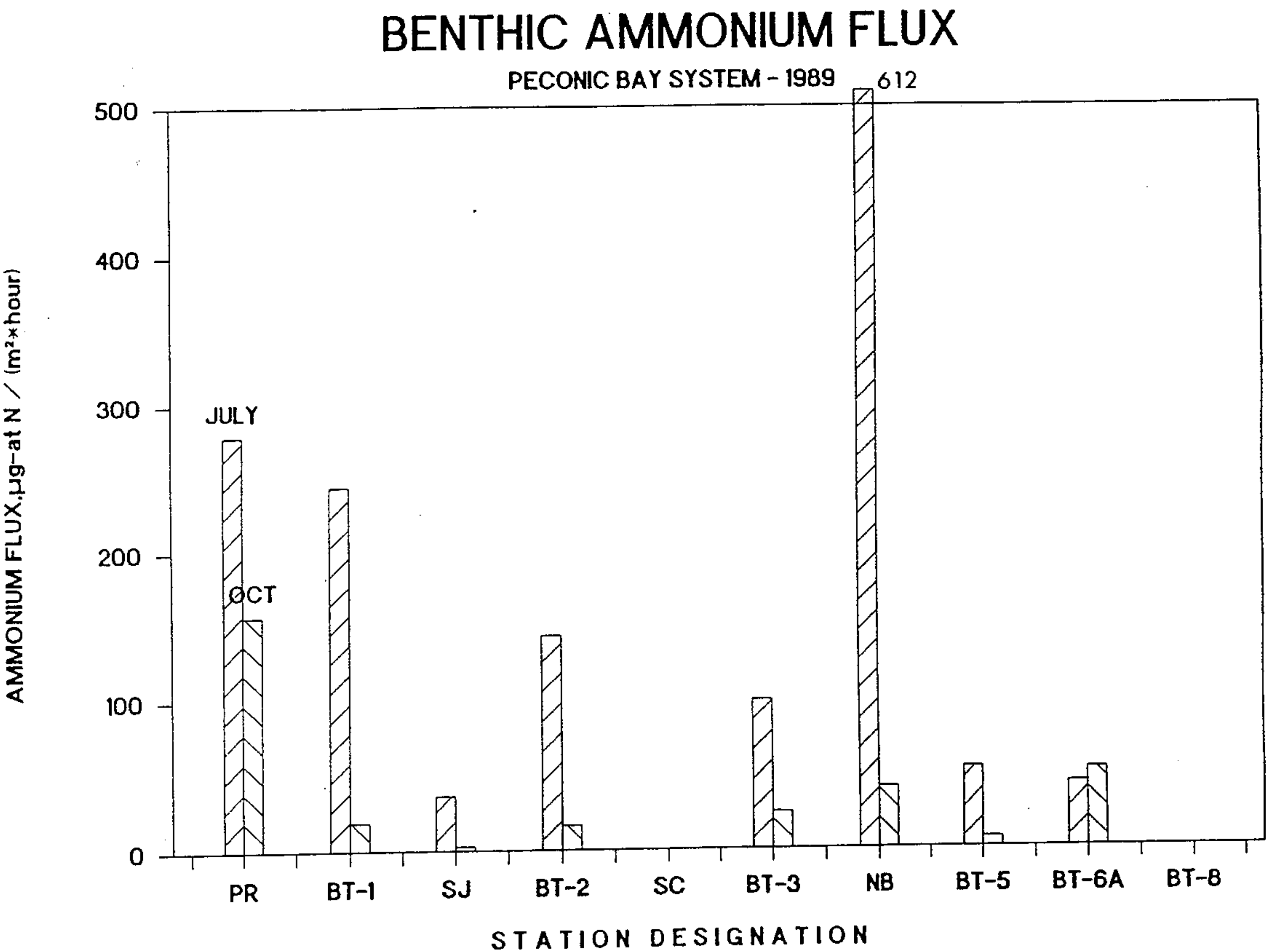

Figure 6. Benthic flux rates of ammonium-N at sampling stations in the Peconic system, July and October 1989.

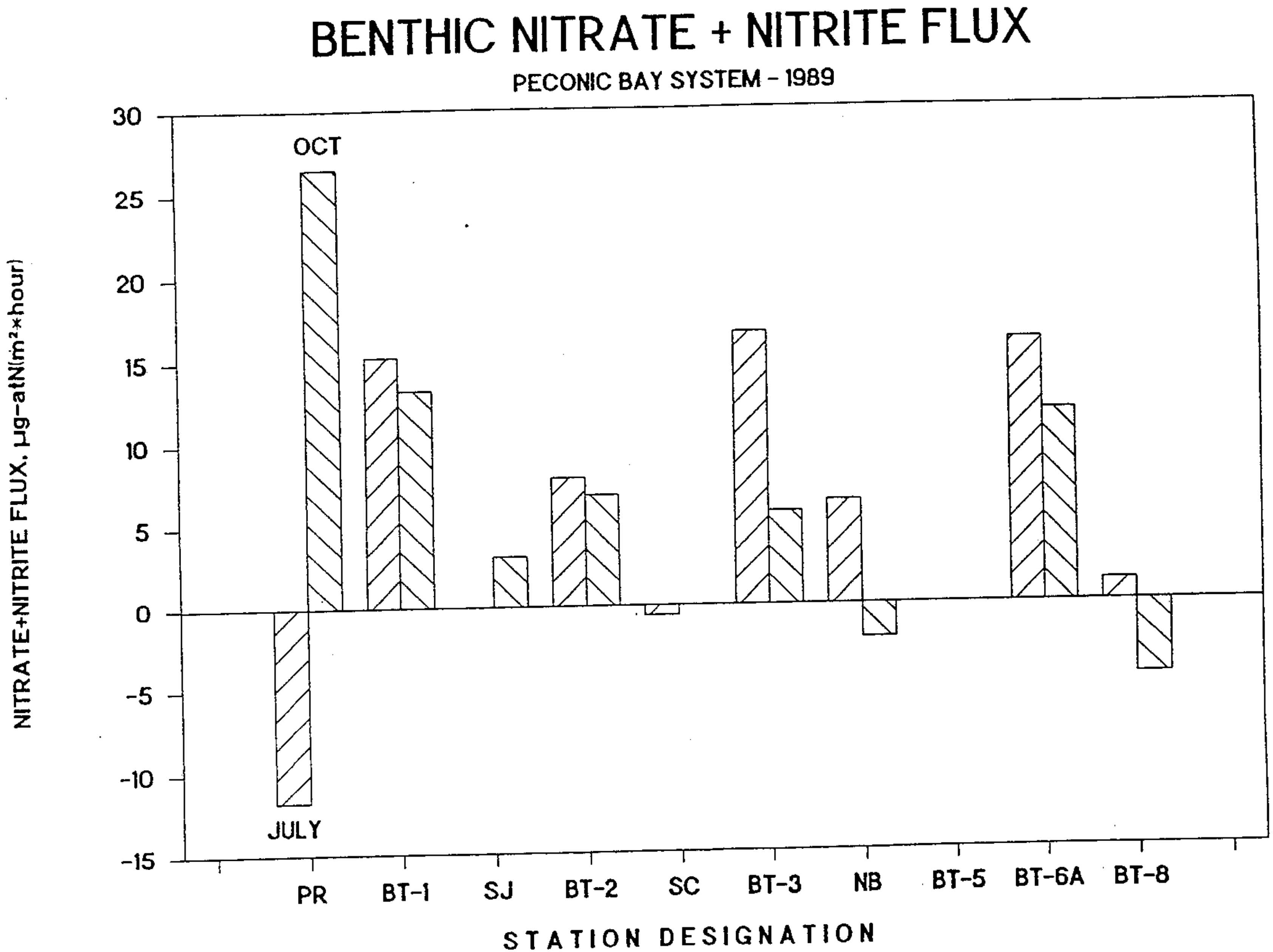

Figure 7. Benthic flux rates of nitrate+nitrite at sampling stations in the Peconic system, July and October 1989.

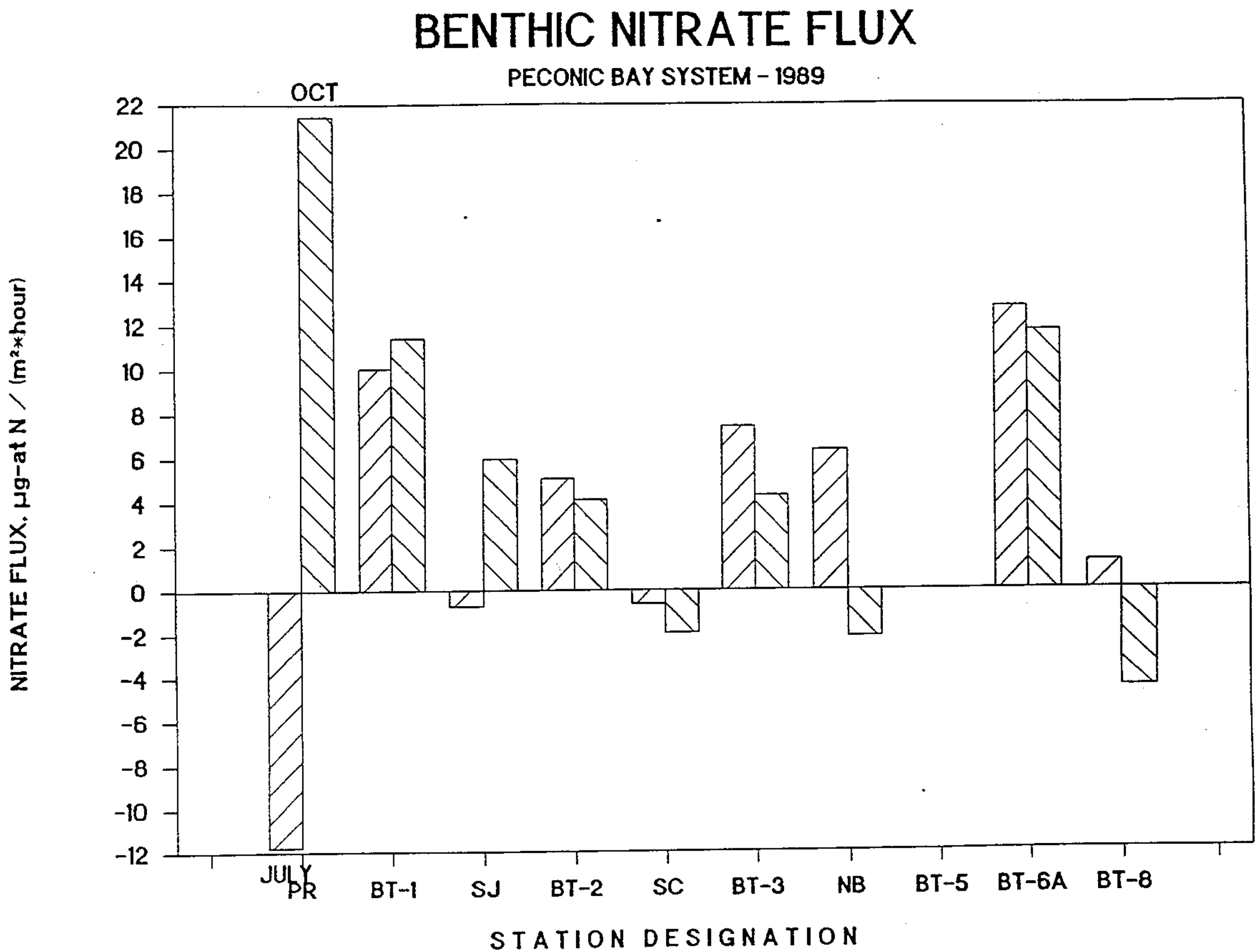

Figure 8. Benthic flux rates of nitrate at sampling stations in the Peconic system, July and October 1989.

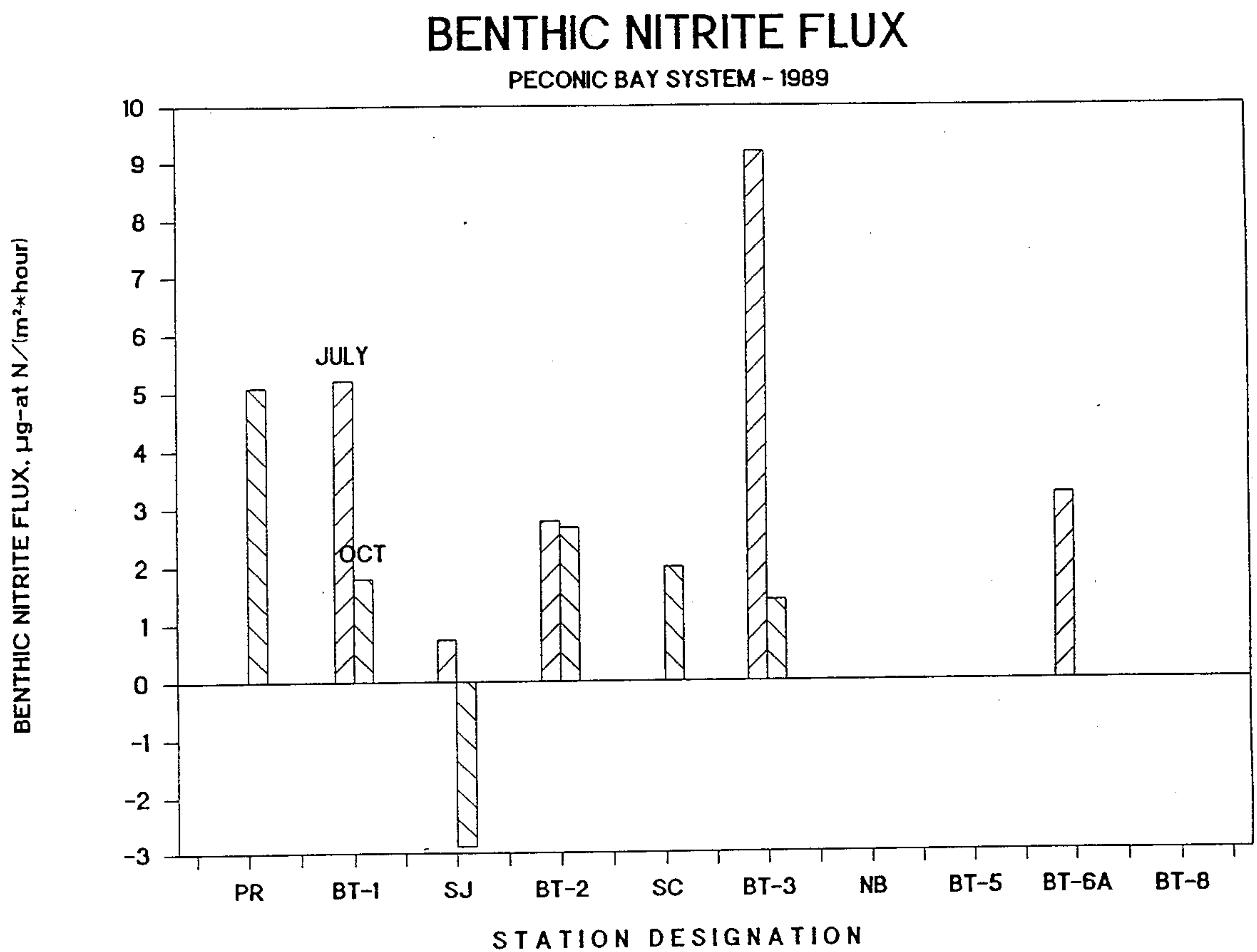

Figure 9. Benthic flux rates of nitrite at sampling stations in the Peconic system, July and October 1989.

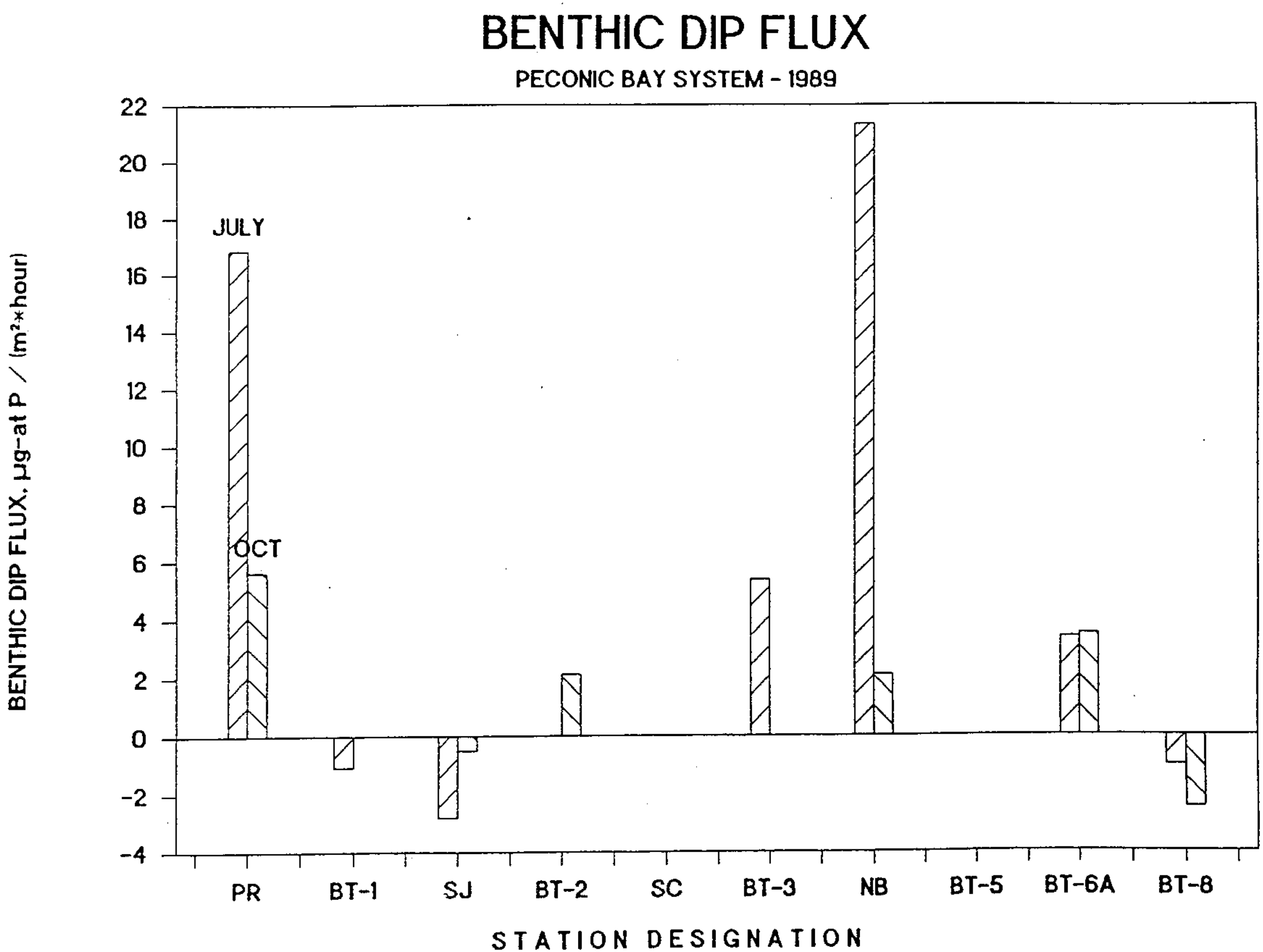

Fig. 10. Benthic flux rates of dissolved inorganic phosphate (DIP) at sampling stations in the Peconic system, July and October 1989.

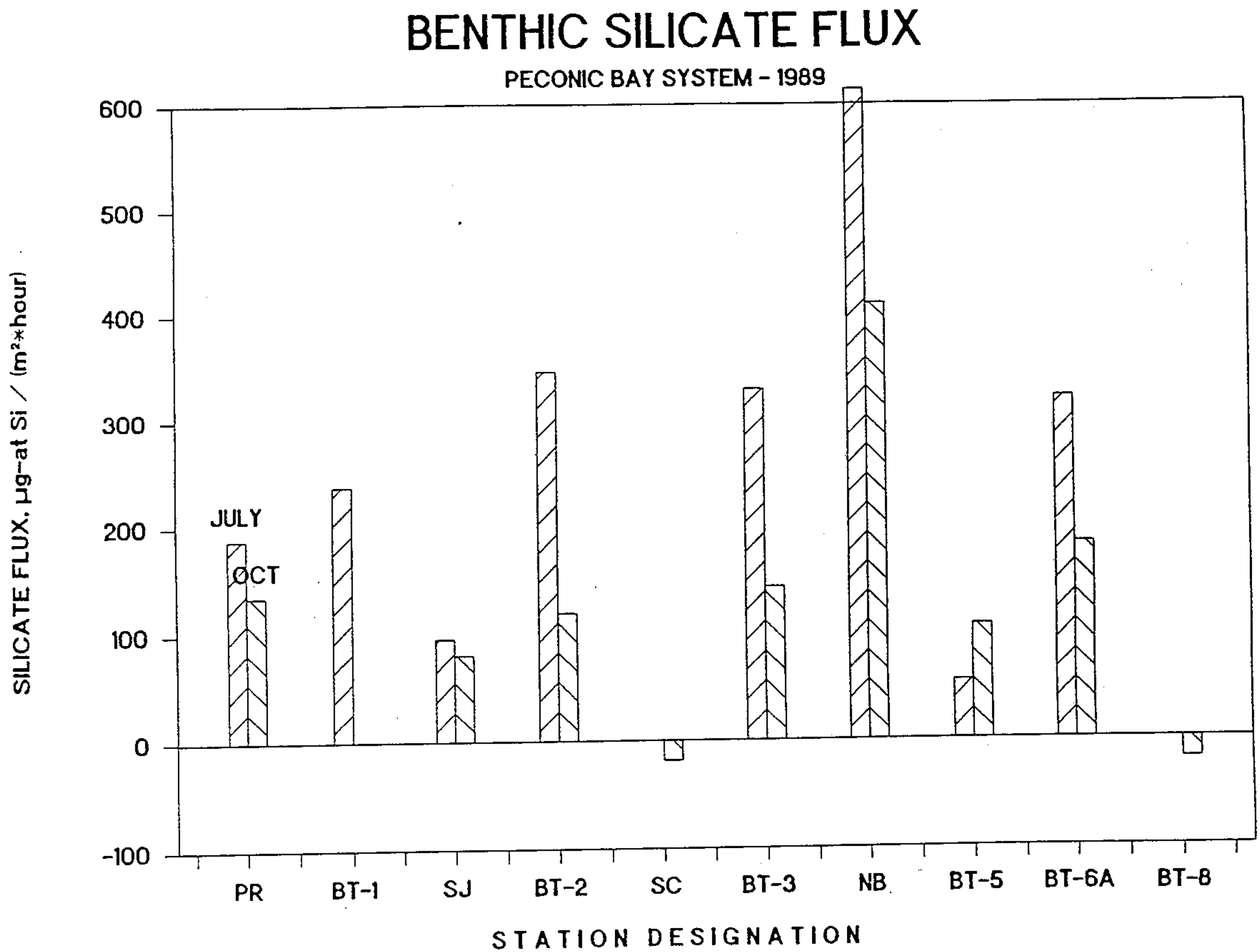

Fig. 11. Benthic flux rates of dissolved reactive silicate at sampling stations in the Peconic system, July and October 1989.

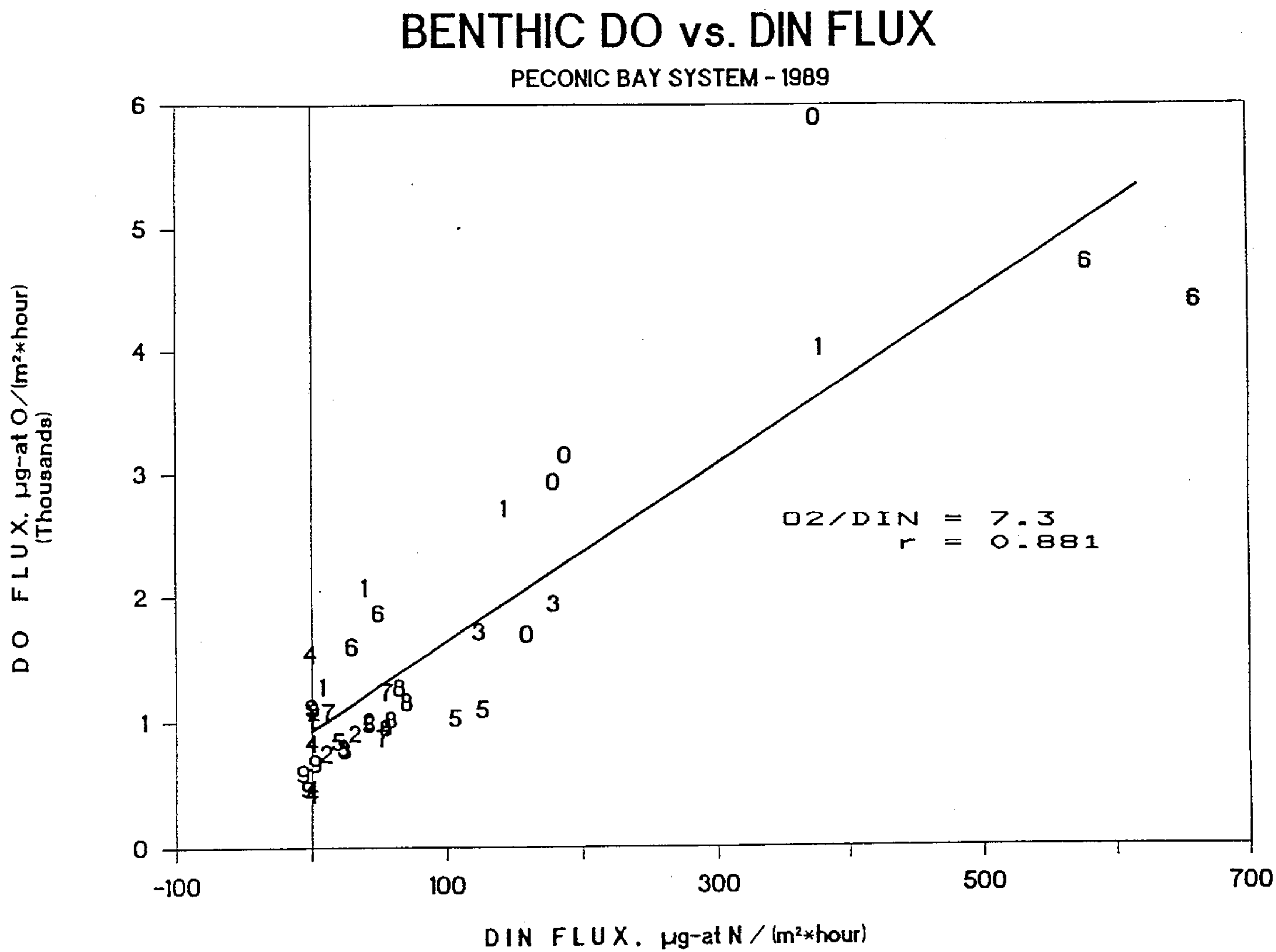

Fig. 12. Scatter plots showing the relationship between fluxes of dissolved oxygen and dissolved inorganic nitrogen at benthic flux station in the Peconic system, July and October 1989. Data are coded for stations in the order given in Table 1, 0=PR, 1=BT-1, etc. Linear regression line of DO on DIN is shown.

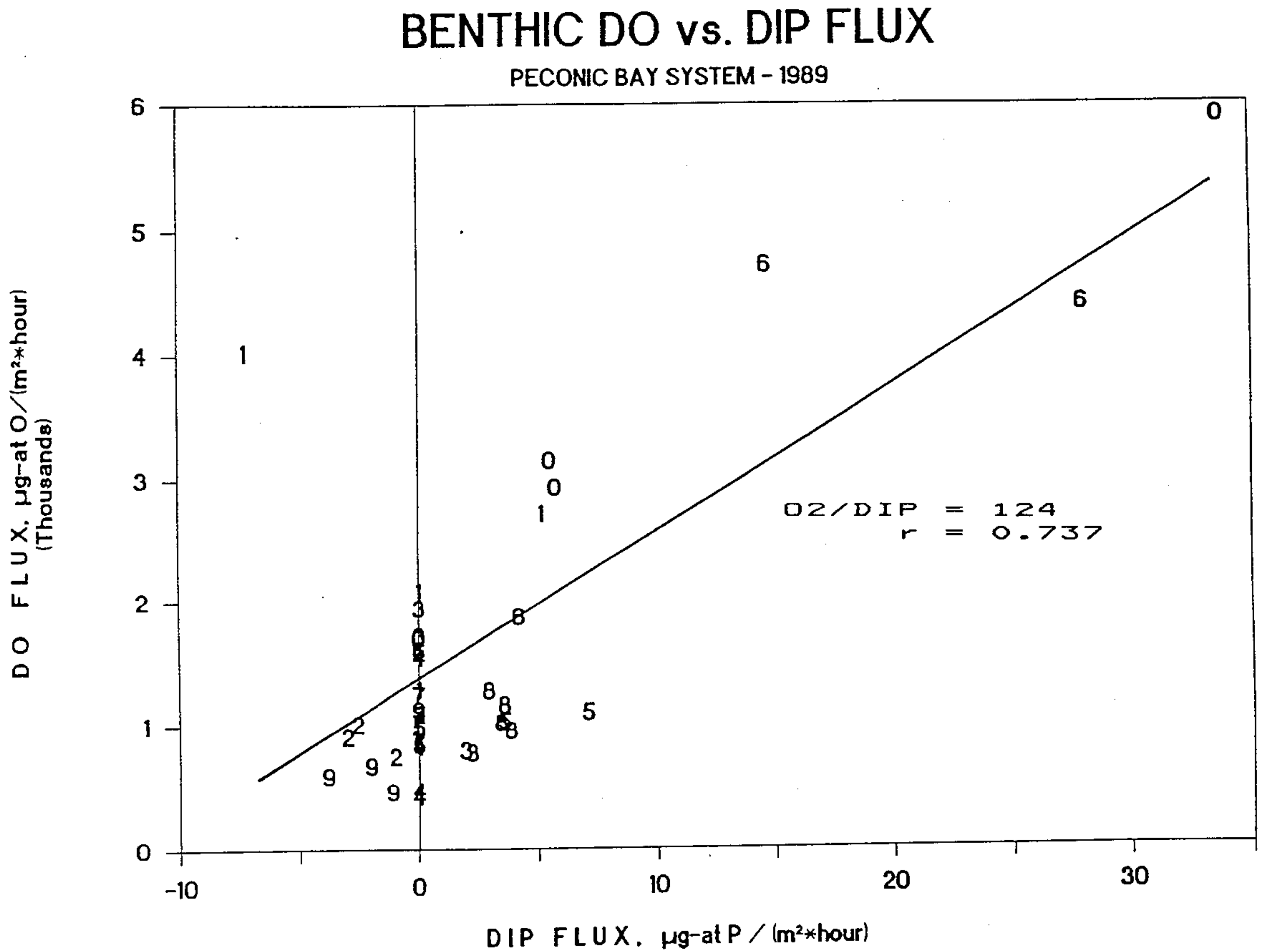

Fig. 13. Scatter plots showing the relationship between fluxes of dissolved oxygen and dissolved inorganic phosphorus at benthic flux station in the Peconic system, July and October 1989. Data are coded for stations in the order given in Table 1, 0=PR, 1=BT-1, etc. Linear regression line of DO on DIP is shown.

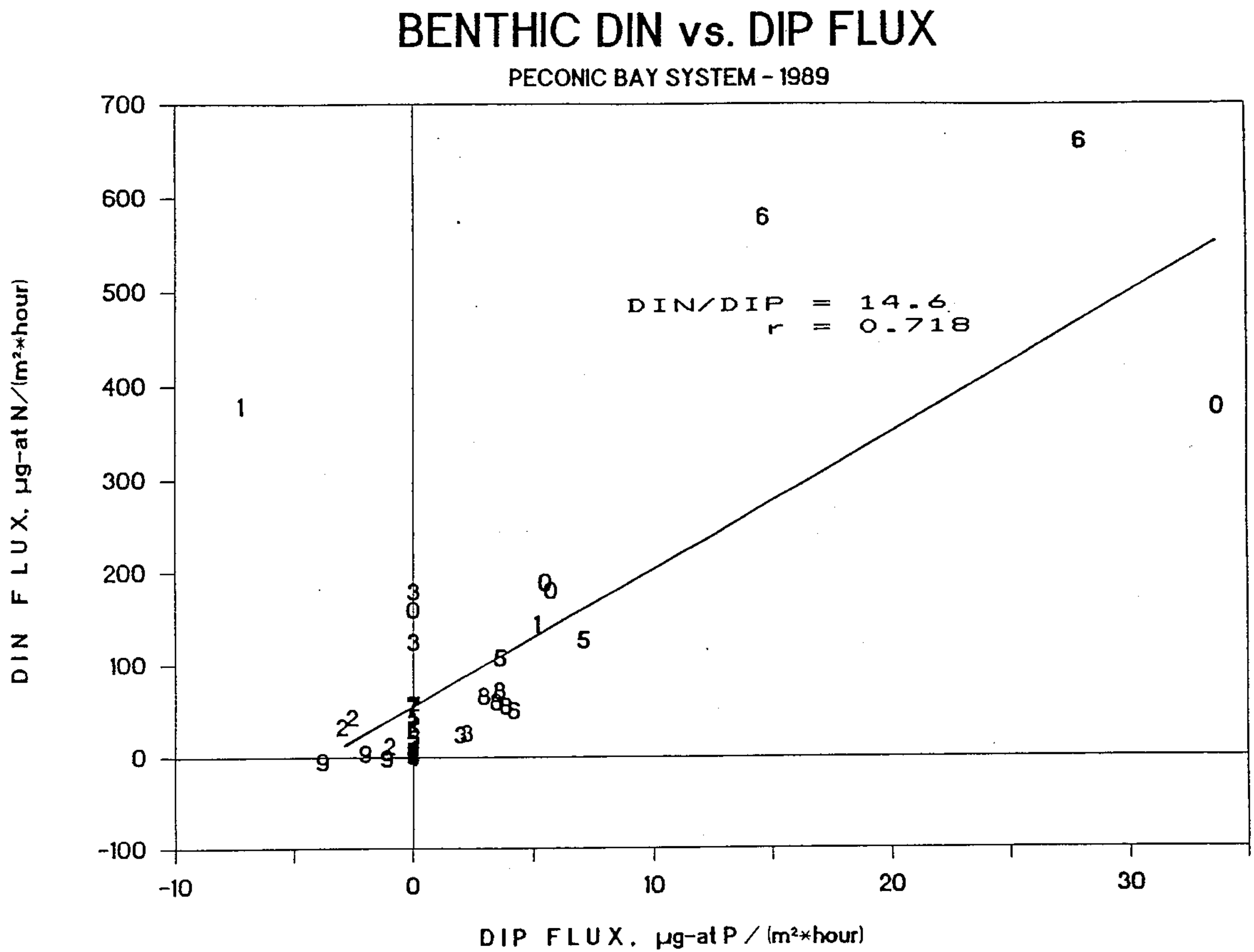

Fig. 14. Scatter plots showing the relationship between fluxes of dissolved inorganic nitrogen and dissolved inorganic phosphorus at benthic flux station in the Peconic system, July and October 1989. Data are coded for stations in the order given in Table 1, 0=PR, 1=BT-1, etc. Linear regression line of DIN on DIP is shown.

TABLES

Table 1.

Location and general description of sampling locations in the Peconic Bay occupied in July and October 1989 for determinations of benthic oxygen and nutrient fluxes.

STATION CODE	PLOTTING CODE	GENERAL LOCATION	LATITUDE	LONGITUDE	LORAN C TD1	LORAN C TD2	DEPTH ft	DEPTH m	SEDIMENT DISCRIPTION (visual)
PR	0	PECONIC RIVER MOUTH	40°55.14'N	72°37.14'W	14974.1	43859.3	5	1.5	brown floc and shell over black organic muck
BT-1	1	FLANDERS BAY	40°55.15'N	72°35.29'W	14962.5	43856.8	12	3.7	surface shell over sand
SJ	2	SOUTH JAMESPORT	40°55.45'N	72°32.55'W	14944.8	43855.4	19	5.8	grey sand with clay admixed
BT-2	3	GREAT PECONIC BAY	40°56.29'N	72°30.39'W	14929.3	43859.6	22	6.7	soft black clayey mud
SC-I	4	SHINNICOCK CANAL APPROACH	40°54.00'N	72°30.38'W	14935.1	43838.6	11	3.4	steep sand slope
SC-II	4	SHINNICOCK CANAL APPROACH	40°54.12'N	72°31.40'W	14973.8	46859.2	8	2.8	sand
BT-3	5	LITTLE PECONIC BAY	40°58.25'N	72°25.66'W	14895.1	43868.4	32	9.8	fine mud with shell
NB	6	NOYACK BAY	40°00.93'N	72°20.96'W	14859.1	43883.1	22	6.7	soft dark mud
BT-5	7	ORIENT HARBOR	41°06.75'N	72°19.07'W	14832.0	43926.2	18	5.5	coarse sand and gravel
BT-6A	8	GARDINERS BAY	41°04.94'N	72°14.14'W	14805.7	43904.9	31	9.4	sandy mud
BT-8	9	NORTHWEST HARBOR	41°01.65'N	72°15.65'W	14824.0	43880.9	11	3.4	sand

Table 2.

Summary of methods, precision of measurements, and technique references.

Analyte	Analytical Precision	Instrument	Ref. No.
Water Column Profiles			
Temperature	± 0.1 °C	Hydrolab Surveyor II	7
Salinity	± 0.5 ppt	Hydrolab Surveyor II	7
Dissolved Oxygen	± 0.3 mg/l	Hydrolab Surveyor II	7
pH	± 0.05 unit	Hydrolab Surveyor II	7
Sediment Particulates			
Particulate carbon	± 0.13 %	Perkin-Elmer 240-XA	3,5
Particulate nitrogen	± 0.008 %	Perkin-Elmer 240-XA	3,5
Particulate phosphorus	± N/A %	Perkin-Elmer 240-XA	1,3,5
Bottom Water and Flux Chambers			
Dissolved oxygen	± 0.05 mg/l	Oxygen electrode	8
Ammonium-N	± 0.2 uM	Automated colorimetry	4,5,9,10
Nitrate+Nitrite-N	± 0.01 uM	Automated colorimetry	4,5,10
Nitrate-N	± 0.01 uM	Difference	
Nitrite-N	± 0.01 uM	Automated colorimetry	5,9,10
Phosphate-P	± 0.02 uM	Automated colorimetry	5,9
Silicate-Si	± 0.21 uM	Automated colorimetry	5,9,10
Sediment Fluxes			
Dissolved oxygen	± 0.2 gO2/(m²*day)	Intact core incubation	2
Ammonium-N	± 20 ug-at N/(m²*h)	Intact core incubation	2
Nitrate+Nitrite-N	± 2 ug-at N/(m²*h)	Intact core incubation	2
Nitrate-N	± 2 ug-at N/(m²*h)	Intact core incubation	2
Nitrite-N	± NA	Intact core incubation	2
Phosphate-P	± 3.3 ug-at P/(m²*h)	Intact core incubation	2
Silicate-Si	± 50 ug-at Si/(m²*h)	Intact core incubation	2

References

1 Aspila et al. 1976
2 Boynton et al. 1988
3 CEC 1986
4 Clesceri et al. 1989
5 D'Elia et al. 1988
6 Garber et al. 1987
7 Hydrolab 1985
8 Orbisphere (no date)
9 Technicon 1978
10 USEPA 1979

Table 3.

Differences between surface and bottom water characteristics at at sediment flux stations in the Peconic Bay System, July and October 1989.

STATION #	STATION LOCATION	DATE	TOTAL DEPTH (m)	DELTA TEMP (°C)	DELTA SALINITY (ppt)	DELTA DO (mg/l)	DELTA pH
PR	Mouth of	28-JUL-89	1.6	-0.20	-5.02	1.94	0.0
	Peconic River	27-OCT-89	2.0	0.00	-0.10	0.41	0.0
BT-1	Flanders Bay	28-JUL-89	3.8	0.20	-0.36	0.35	0.1
		26-OCT-89	4.0	-0.13	-1.20	1.38	0.1
SJ	South	27-JUL-89	5.8	2.27	-0.72	3.41	0.4
	Jamesport	26-OCT-89	6.5	0.06	-1.20	2.73	0.2
BT-2	Great Peconic	24-JUL-89	6.4	1.35	-0.50	2.58	0.2
	Bay	25-OCT-89	7.0	0.12	-0.30	1.45	0.1
SC	Shinnecock	24-JUL-89	2.1	1.49	-0.43	0.20	0.0
SC-2	Canal Approach	27-OCT-89	2.8	-0.11	-0.90	0.12	0.0
BT-3	Little Peconic	27-JUL-89	10.0	0.95	-0.58	0.72	0.1
	Bay-Nassau Pt.	25-OCT-89	10.5	-0.19	-0.30	0.83	0.0
NB	Noyack Bay	27-JUL-89	7.3	0.97	-0.36	0.66	0.1
		24-OCT-89	8.0	0.19	-0.20	0.27	0.1
BT-5	Orient Harbor	25-JUL-89	5.4	0.14	-0.07	0.05	0.0
		23-OCT-89	7.2	0.01	0.00	0.20	0.0
BT-6A	Gardiners Bay	25-JUL-89	9.6	3.66	-1.16	1.36	0.1
	West	23-OCT-89	8.2	0.71	0.40	-0.27	0.0
BT-8	Northwest	26-JUL-89	3.4				
		24-OCT-89	3.7	-0.09	-0.10	0.15	0.0

Table 4.

Concentrations of dissolved inorganic nutrients in bottom water samples at Sediment-Flux Stations in July and October 1989.

STATION	STATION LOCATION	DATE	TIME	TOTAL DEPTH (m)	DISSOLVED NUTRIENTS NH4 (uM)	NO2 (uM)	NO3+NO2 (uM)	DIP (uM)	DSi (uM)
PR	Mouth of Peconic River	28-JUL-89	925	1.6	BLD	0.08	1.57	1.00	54.3
		27-OCT-89	918	2.0	0.6	0.07	0.88	0.32	12.2
BT-1	Flanders Bay	28-JUL-89	817	3.8	BLD	0.02	0.16	0.97	33.7
		26-OCT-89	913	4.0	0.3	0.07	0.38	0.55	14.7
SJ	South Jamesport	27-JUL-89	1122	5.8	BLD	BLD	0.11	1.17	34.9
		26-OCT-89	1043	6.5	2.1	0.14	0.69	0.81	20.4
BT-2	Great Peconic Bay	24-JUL-89	1350	6.4	1.0	0.10	0.22	1.24	30.2
		25-OCT-89	1055	7.0	0.3	0.03	0.25	0.67	13.5
SC	Shinnecock Canal Approach	24-JUL-89	1525	2.1	BLD	BLD	0.37	0.72	29.6
		27-OCT-89	1042	2.8	BLD	BLD	0.13	0.22	11.1
BT-3	Little Peconic Bay-Nassau Pt.	27-JUL-89	835	10.0	0.5	BLD	0.21	0.96	27.8
		25-OCT-89	925	10.5	0.5	0.07	0.79	0.84	9.82
NB	Noyack Bay	26-JUL-89	1010	7.3	BLD	BLD	0.08	0.83	14.1
		24-OCT-89	1030	8.0	0.3	0.08	0.64	0.78	7.26
BT-5	Orient Harbor	25-JUL-89	1100	5.4	BLD	BLD	0.10	0.84	7.7
		23-OCT-89	1255	7.2	1.0	0.45	1.31	0.82	7.72
BT-6A	Gardiners Bay	25-JUL-89	935	9.6	BLD	0.04	0.28	0.93	9.1
		23-OCT-89	1115	8.2	0.7	0.46	1.10	0.80	7.88
BT-8	Northwest Harbor	26-JUL-89		4.0	BLD	BLD	0.13	0.83	4.2
		24-OCT-89	900	3.7	0.2	0.37	0.69	0.76	5.96

BLD = BELOW LIMITS OF DETECTION: NH4, <0.2 uM; NO2, <0.01 uM

Table 5.

Concentrations total C, N, and P in surficial sediments at Sediment-Flux Stations in July and October 1989.

STATION #	STATION LOCATION	DATE	TIME	TOTAL DEPTH (m)	SEDIMENT ANALYSES PC (wt.%)	PN (wt.%)	PP (wt.%)
PR	Mouth of	28-JUL-89	925	1.6	0.413	0.046	0.011
	Peconic River	27-OCT-89	918	2.0	0.756	0.085	0.023
BT-1	Flanders Bay	28-JUL-89	817	3.8	2.670	0.221	0.058
		26-OCT-89	913	4.0	1.960	0.167	0.035
SJ	South	27-JUL-89	1122	5.8	2.660	0.230	0.061
	Jamesport	26-OCT-89	1043	6.5	2.010	0.190	0.046
BT-2	Great Peconic	24-JUL-89	1350	6.4	2.160	0.217	0.062
	Bay	25-OCT-89	1055	7.0	2.040	0.207	0.063
SC	Shinnecock	24-JUL-89	1525	2.1	0.483	0.047	0.010
	Canal Approach	27-OCT-89	1042	2.8	0.111	0.015	0.007
BT-3	Little Peconic	27-JUL-89	835	10.0	2.580	0.266	0.065
	Bay-Nassau Pt.	25-OCT-89	925	10.5	2.870	0.223	0.069
NB	Noyack Bay	26-JUL-89	1010	7.3	2.610	0.249	0.074
		24-OCT-89	1030	8.0	2.730	0.247	0.069
BT-5	Orient Harbor	25-JUL-89	1100	5.4	0.418	0.013	0.013
		23-OCT-89	1255	7.2	2.290	0.265	0.090
BT-6A	Gardiners Bay	25-JUL-89	935	9.6	2.350	0.260	0.081
		23-OCT-89	1115	8.2	1.150	0.077	0.018
BT-8	Northwest	26-JUL-89		4.0	0.135	0.012	0.007
	Harbor	24-OCT-89	900	3.7	0.145	0.020	0.007

Table 6.
Summary of net benthic fluxes of dissolved oxygen and nutrients.

Part 1 of 3

STATION	DATE	BOTTOM WATER TEMP (C)	CORE WATER TEMP (C)	AVG CORE TEMP (C)	CORE NO.	DISSOLVED OXYGEN NET SED-WAT FLUX gO2/(m²*day)	DISSOLVED OXYGEN AVG. NET SED-WAT FLUX gO2/(m²*day)	AMMONIUM - N NET SED-WAT FLUX ug-atN/(m2*hr)	AMMONIUM - N AVG. NET SED-WAT FLUX ug-atN/(m2*hr)
PR	28-JUL-89	26.1	24.5	24.6	1	-1.30	-2.91	168	279
PR	28-JUL-89	26.1	24.8		2	-4.52		389	
PR	27-OCT-90	14.10	13.8	13.8	1	-2.24	-2.32	154	156
PR	27-OCT-90	14.10	13.8		2	-2.41		159	
BT-1	28-JUL-89	24.8	23.8	23.6	1	-3.09	-2.58	361	244
BT-1	28-JUL-89	24.8	23.5		2	-2.08		127	
BT-1	26-OCT-90	13.03	13.0	13.2	1	-0.98	-1.28		19
BT-1	26-OCT-90	13.03	13.5		2	-1.59		19	
SJ	27-JUL-89	24.1	24.2	24.4	1	-0.77	-0.73	42	37
SJ	27-JUL-89	24.1	24.6		2	-0.69		31	
SJ	26-OCT-90	12.96	12.9	13.1	1	-0.57	-0.70	6	3
SJ	26-OCT-90	12.96	13.4		2	-0.82		0	
BT-2	24-JUL-89	23.7	25.1	25.0	1	-1.31	-1.40	120	143
BT-2	24-JUL-89	23.7	25.0		2	-1.48		165	
BT-2	25-OCT-90	12.88	12.8	12.9	1	-0.60	-0.59	18	16
BT-2	25-OCT-90	12.88	13.0		2	-0.59		15	
SC	24-JUL-89	24.7	25.0	25.1	1	-0.63	-0.90	0	0
SC	24-JUL-89	24.7	25.4		2	-1.18		0	
SC-2	27-OCT-90	13.00	13.1	13.1	1	-0.35	-0.34	0	0
SC-2	27-OCT-90	13.00	13.2		2	-0.32		0	
BT-3	27-JUL-89	24.4	24.8	24.6	1	-0.84	-0.81	111	99
BT-3	27-JUL-89	24.4	24.5		2	-0.78		88	
BT-3	25-OCT-90	13.06	13.0	13.0	1	-0.64	-0.69	10	25
BT-3	25-OCT-90	13.06	13.0		2	-0.75		39	
NB	26-JUL-89	ND	24.1	23.9	1	-3.62	-3.50	572	612
NB	26-JUL-89	ND	23.8		2	-3.38		653	
NB	24-OCT-90	12.74	12.8	12.9	1	-1.22	-1.32	31	41
NB	24-OCT-90	12.74	13.1		2	-1.43		51	
BT-5	25-JUL-89	22.7	23.2	23.3	1	-0.94	-0.80	55	54
BT-5	25-JUL-89	22.7	23.5		2	-0.66		52	
BT-5	23-OCT-90	13.18	14.5	14.5	1	-0.77	-0.80	1	6
BT-5	23-OCT-90	13.18	14.6		2	-0.82		12	
BT-6A	25-JUL-89	19.2	23.7	23.5	1	-0.73	-0.85	36	44
BT-6A	25-JUL-89	19.2	23.3		2	-0.97		51	
BT-6A	23-OCT-90	12.90	14.1	14.2	1	-0.88	-0.83	59	53
BT-6A	23-OCT-90	12.90	14.5		2	-0.77		46	
BT-8	26-JUL-89	ND	23.3	23.4	1	-0.51	-0.68	0	0
BT-8	26-JUL-89	ND	23.6		2	-0.85		0	
BT-8	24-OCT-90	12.62	13.0	13.1	1	-0.45	-0.40	0	0
BT-8	24-OCT-90	12.62	13.2		2	-0.35		0	

Table 6.
Summary of net benthic fluxes of dissolved oxygen and nutrients.

Part 2 of 3

STATION	DATE	BOTTOM WATER TEMP (C)	CORE WATER TEMP (C)	AVG CORE TEMP (C)	CORE NO.	NITRATE+NITRITE-N NET SED-WAT FLUX ug-atN/(m2*hr)	NITRATE+NITRITE-N AVG. NET SED-WAT FLUX ug-atN/(m2*hr)	NITRITE - N NET SED-WAT FLUX ug-atN/(m2*hr)	NITRITE - N AVG. NET SED-WAT FLUX ug-atN/(m2*hr)
PR	28-JUL-89	26.1	24.5	24.6	1	-10.2	-11.8	0.0	0.0
PR	28-JUL-89	26.1	24.8		2	-13.4		0.0	
PR	27-OCT-90	14.10	13.8	13.8	1	24.6	26.5	5.53	5.10
PR	27-OCT-90	14.10	13.8		2	28.5		4.67	
BT-1	28-JUL-89	24.8	23.8	23.6	1	16.4	15.3	4.8	5.2
BT-1	28-JUL-89	24.8	23.5		2	14.2		5.6	
BT-1	26-OCT-90	13.03	13.0	13.2	1	7.3	13.2	0.87	1.80
BT-1	26-OCT-90	13.03	13.5		2	19.2		2.72	
SJ	27-JUL-89	24.1	24.2	24.4	1	0.0	0.0	1.5	0.7
SJ	27-JUL-89	24.1	24.6		2	0.0		0.0	
SJ	26-OCT-90	12.96	12.9	13.1	1	4.5	3.1	-1.08	-2.88
SJ	26-OCT-90	12.96	13.4		2	1.7		-4.69	
BT-2	24-JUL-89	23.7	25.1	25.0	1	3.0	7.9	0.0	2.8
BT-2	24-JUL-89	23.7	25.0		2	12.8		5.6	
BT-2	25-OCT-90	12.88	12.8	12.9	1	4.6	6.8	3.70	2.67
BT-2	25-OCT-90	12.88	13.0		2	9.0		1.65	
SC	24-JUL-89	24.7	25.0	25.1	1	0.0	-0.7	0.0	0.0
SC	24-JUL-89	24.7	25.4		2	-1.3		0.0	
SC-2	27-OCT-90	13.00	13.1	13.1	1	0.0	0.0	2.25	1.98
SC-2	27-OCT-90	13.00	13.2		2	0.0		1.70	
BT-3	27-JUL-89	24.4	24.8	24.6	1	14.8	16.6	8.5	9.2
BT-3	27-JUL-89	24.4	24.5		2	18.3		9.9	
BT-3	25-OCT-90	13.06	13.0	13.0	1	8.7	5.7	2.82	1.41
BT-3	25-OCT-90	13.06	13.0		2	2.7		0.00	
NB	26-JUL-89	ND	24.1	23.9	1	6.7	6.3	0.0	0.0
NB	26-JUL-89	ND	23.8		2	6.0		0.0	
NB	24-OCT-90	12.74	12.8	12.9	1	-2.1	-2.2	0.00	0.00
NB	24-OCT-90	12.74	13.1		2	-2.3		0.00	
BT-5	25-JUL-89	22.7	23.2	23.3	1	0.0	0.0	0.0	0.0
BT-5	25-JUL-89	22.7	23.5		2	0.0		0.0	
BT-5	23-OCT-90	13.18	14.5	14.5	1	0.0	0.0	0.00	0.00
BT-5	23-OCT-90	13.18	14.6		2	0.0		0.00	
BT-6A	25-JUL-89	19.2	23.7	23.5	1	18.6	16.0	2.6	3.2
BT-6A	25-JUL-89	19.2	23.3		2	13.4		3.8	
BT-6A	23-OCT-90	12.90	14.1	14.2	1	11.2	11.7	0.00	0.00
BT-6A	23-OCT-90	12.90	14.5		2	12.2		0.00	
BT-8	26-JUL-89	ND	23.3	23.4	1	2.5	1.2	0.0	0.0
BT-8	26-JUL-89	ND	23.6		2	0.0		0.0	
BT-8	24-OCT-90	12.62	13.0	13.1	1	-6.2	-4.6	0.00	0.00
BT-8	24-OCT-90	12.62	13.2		2	-2.9		0.00	

Table 6.
Summary of net benthic fluxes of dissolved oxygen and nutrients.

Part 3 of 3

STATION	DATE	BOTTOM WATER TEMP (C)	CORE WATER TEMP (C)	AVG CORE TEMP (C)	CORE NO.	PHOSPHATE NET SED-WAT FLUX ug-atP/(m2*hr)	PHOSPHATE AVG. NET SED-WAT FLUX ug-atP/(m2*hr)	SILICATE NET SED-WAT FLUX ug-atSi/(m2*hr)	SILICATE AVG. NET SED-WAT FLUX ug-atSi/(m2*hr)
PR	28-JUL-89	26.1	24.5	24.6	1	0.0	16.9	82	188
PR	28-JUL-89	26.1	24.8		2	33.7		294	
PR	27-OCT-90	14.10	13.8	13.8	1	5.7	5.6	95	134
PR	27-OCT-90	14.10	13.8		2	5.5		174	
BT-1	28-JUL-89	24.8	23.8	23.6	1	-7.3	-1.1	231	238
BT-1	28-JUL-89	24.8	23.5		2	5.2		244	
BT-1	26-OCT-90	13.03	13.0	13.2	1	0.0	0.0	0	0
BT-1	26-OCT-90	13.03	13.5		2	0.0		0	
SJ	27-JUL-89	24.1	24.2	24.4	1	-2.6	-2.8	120	95
SJ	27-JUL-89	24.1	24.6		2	-3.0		71	
SJ	26-OCT-90	12.96	12.9	13.1	1	-1.0	-0.5	83	80
SJ	26-OCT-90	12.96	13.4		2	0.0		77	
BT-2	24-JUL-89	23.7	25.1	25.0	1	0.0	0.0	250	346
BT-2	24-JUL-89	23.7	25.0		2	0.0		443	
BT-2	25-OCT-90	12.88	12.8	12.9	1	2.0	2.1	113	119
BT-2	25-OCT-90	12.88	13.0		2	2.2		125	
SC	24-JUL-89	24.7	25.0	25.1	1	0.0	0.0	0	0
SC	24-JUL-89	24.7	25.4		2	0.0		0	
SC-2	27-OCT-90	13.00	13.1	13.1	1	0.0	0.0	0	-19
SC-2	27-OCT-90	13.00	13.2		2	0.0		-37	
BT-3	27-JUL-89	24.4	24.8	24.6	1	7.1	5.3	410	329
BT-3	27-JUL-89	24.4	24.5		2	3.6		248	
BT-3	25-OCT-90	13.06	13.0	13.0	1	0.0	0.0	122	142
BT-3	25-OCT-90	13.06	13.0		2	0.0		162	
NB	26-JUL-89	ND	24.1	23.9	1	14.7	21.3	1029	994
NB	26-JUL-89	ND	23.8		2	28.0		959	
NB	24-OCT-90	12.74	12.8	12.9	1	0.0	2.1	349	409
NB	24-OCT-90	12.74	13.1		2	4.2		470	
BT-5	25-JUL-89	22.7	23.2	23.3	1	0.0	0.0	54	54
BT-5	25-JUL-89	22.7	23.5		2	0.0		54	
BT-5	23-OCT-90	13.18	14.5	14.5	1	0.0	0.0	132	106
BT-5	23-OCT-90	13.18	14.6		2	0.0		80	
BT-6A	25-JUL-89	19.2	23.7	23.5	1	3.9	3.4	351	320
BT-6A	25-JUL-89	19.2	23.3		2	2.9		290	
BT-6A	23-OCT-90	12.90	14.1	14.2	1	3.6	3.5	213	182
BT-6A	23-OCT-90	12.90	14.5		2	3.4		152	
BT-8	26-JUL-89	ND	23.3	23.4	1	-2.0	-1.0	0	0
BT-8	26-JUL-89	ND	23.6		2	0.0		0	
BT-8	24-OCT-90	12.62	13.0	13.1	1	-3.8	-2.5	-27	-19
BT-8	24-OCT-90	12.62	13.2		2	-1.1		-12	

Table 7.

Effect of bottom water temperature on benthic fluxes in the Peconic Bay system expressed as Q10 values. Q10's were calculated from the van't Hoff equation: Q10= (k2/k1)exp[(10/(t2-t1)], where k2 and k1 are flux rates (means of duplicates) for each temperature and station, at temperatures t2 and t1. Blanks in Table are due to fluxes of zero or of opposite sign.

STATION	DO Q10	NH4 Q10	N+N Q10	NO2 Q10	DIP Q10	DSi Q10	DIN Q10
PR	1.2	1.7		0.0	2.8	1.4	1.4
BT-1	2.0	11.5	1.1	2.8			10.3
SJ	1.0	9.5	0.0		4.6	1.2	5.0
BT-2	2.0	6.0	1.1	1.0	0.0	2.4	4.7
SC	2.3						
BT-3	1.1	3.3	2.5	5.0		2.1	3.2
NB	2.4	11.6			8.2	2.2	12.3
BT-5	1.0	11.4				0.5	11.4
BT-6A	1.0	0.8	1.4		1.0	1.8	0.9
BT-8	1.7						
AVERAGE	1.6	7.0	1.2	2.2	3.3	1.7	6.1

Table 8.

Correlation matrix showing the significance of relationships between measured water column characteristics, sediment composition, and benthic fluxes in the Peconic system. Data for July and October 1989 were combined for correlation analysis. Asterisks indicate level of significance: * = .95, ** = .99, *** = .999.

	WATER DEPTH	WATER TEMP	CORE TEMP	WATER SAL	WATER DO	SED PC	SED PN	SED PP	DO FLUX	AMM FLUX	N+N FLUX	NO2 FLUX	DIN FLUX	DIP FLUX	SI FLUX
DEPTH	-------	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX
TEMP		-------	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX
CORE TEMP		***	-------	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX
SALINITY	***	*		-------	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX
DO		***	***		-------	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX
PC	***				*	-------	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX
PN	***					***	-------	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX
PP	**					***	***	-------	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX
DO FLUX		*							-------	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX
NH4 FLUX		**	*						***	-------	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX
N+N FLUX											-------	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX
NO2 FLUX												-------	XXXXXXX	XXXXXXX	XXXXXXX
DIN FLUX											***		-------	XXXXXXX	XXXXXXX
DIP FLUX									***	***				-------	XXXXXXX
SI FLUX	*					*	*	*	**	**				*	-------

APPENDIX A

WATER COLUMN PROFILE DATA FILES

==
SEDIMENT-WATER FLUX MEASUREMENTS IN THE PECONIC BAY SYSTEM
SUFFOLK COUNTY, NY
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FILENAME: PB2_PROF.WK1
CONTENTS: Vertical profiles of temperature, salinity, dissolved oxygen, and pH at Sediment Flux stations.
REVISION: 8-JUN-90

STATION	STATION LOCATION	DATE	TIME	TOTAL DEPTH (m)	SAMPLE DEPTH (m)	TEMP (oC)	COND (x200k)	SALINITY (ppt)	DISSOLVED OXYGEN (mg/l)	pH
PR	Mouth of Peconic River	27-OCT-89	918	2.0	0.5	14.10		26.4	10.18	7.8
					1.0	14.13		26.5	10.00	7.8
					1.8	14.10		26.5	9.77	7.8
BT-1	Flanders Bay	26-OCT-89	913	4.0	0.5	12.90		26.3	9.50	7.8
					1.0	12.95		26.6	9.44	7.8
					2.0	12.99		27.0	9.06	7.8
					3.0	13.03		27.4	8.20	7.7
					3.9	13.03		27.5	8.12	7.7
SJ	South Jamesport	26-OCT-89	1043	6.5	0.5	13.02		26.8	9.59	7.8
					1.0	12.94		26.9	9.62	7.8
					2.0	12.74		27.1	9.72	7.8
					3.0	12.83		27.3	9.83	7.8
					4.0	12.94		27.8	7.10	7.6
					5.0	12.94		27.9	6.90	7.6
					6.0	12.96		27.9	6.86	7.6
					6.3	12.96		28.0	6.86	7.6
BT-2	Great Peconic Bay	25-OCT-89	1055	7.0	0.5	13.00		27.5	9.42	7.6
					1.0	12.98		27.5	9.37	7.6
					2.0	12.90		27.5	9.34	7.6
					3.0	12.97		27.6	8.90	7.6
					4.0	12.98		27.7	8.80	7.6
					5.0	12.90		27.7	8.40	7.5
					6.0	12.87		27.8	8.08	7.5
					7.0	12.87		27.8	8.00	7.5
					7.3	12.88		27.8	7.97	7.5
SC-2	Off Shinnecock Canal-west of SC	27-OCT-89	1042	2.8	0.5	12.89		25.7	10.68	7.9
					1.0	12.75		26.2	10.67	7.9
					2.0	12.62		26.4	10.66	7.9
					2.6	13.00		26.6	10.56	7.9
BT-3	Little Peconic Bay-Nassau Pt.	25-OCT-89	925	10.5	0.5	12.87		28.0	9.05	7.5
					2.0	12.90		28.0	8.71	7.5
					4.0	12.94		28.0	8.50	7.5
					6.0	12.91		28.1	8.48	7.5
					8.0	13.02		28.2	8.28	7.5
					10.0	13.06		28.2	8.24	7.5
					10.3	13.06		28.3	8.22	7.5

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SEDIMENT-WATER FLUX MEASUREMENTS IN THE PECONIC BAY SYSTEM
SUFFOLK COUNTY, NY
==

FILENAME: PB2_PROF.WK1
CONTENTS: Vertical profiles of temperature, salinity, dissolved oxygen, and pH at Sediment Flux stations..
REVISION: 8-JUN-90

STATION	STATION LOCATION	DATE	TIME	TOTAL DEPTH (m)	SAMPLE DEPTH (m)	TEMP (oC)	COND (x200k)	SALINITY (ppt)	DISSOLVED OXYGEN (mg/l)	pH
NB	Noyack Bay	24-OCT-89	1030	8.0	0.5	12.93		28.5	8.62	7.6
					1.0	12.83		28.6	8.49	7.5
					2.0	12.80		28.7	8.45	7.5
					3.0	12.78		28.6	8.40	7.5
					4.0	12.77		28.7	8.38	7.5
					5.0	12.74		28.7	8.38	7.5
					6.0	12.74		28.7	8.38	7.5
					7.0	12.74		28.7	8.36	7.5
					7.7	12.74		28.7	8.35	7.5
BT-5	Orient Harbor	23-OCT-89	1255	7.2	0.5	13.19		28.9	8.30	7.5
					2.0	13.19		28.9	8.17	7.5
					3.0	13.18		28.9	8.13	7.5
					4.0	13.18		28.9	8.10	7.5
					5.0	13.18		28.9	8.10	7.5
					6.0	13.18		28.9	8.10	7.5
					7.0	13.18		28.9	8.10	7.5
BT-6A	Gardiners Bay West	23-OCT-89	1115	8.2	0.5	13.30		29.6	8.34	7.5
					2.0	13.15		29.6	8.37	7.5
					3.0	13.04		29.7	8.44	7.5
					4.0	12.99		29.8	8.39	7.5
					5.0	12.94		29.8	8.34	7.5
					6.0	12.93		29.8	8.30	7.5
					7.0	12.91		29.8	8.24	7.5
					8.0	12.90		29.8	8.21	7.5
BT-8	Northwest Harbor	24-OCT-89	900	3.7	0.5	12.53		29.1	8.67	7.5
					1.0	12.59		29.2	8.61	7.5
					2.0	12.62		29.2	8.52	7.5
					3.0	12.62		29.3	8.52	7.5
					3.5	12.62		29.2	8.52	7.5

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SEDIMENT-WATER FLUX MEASUREMENTS IN THE PECONIC BAY SYSTEM
SUFFOLK COUNTY, NY
==

FILENAME: PB1_PROF.WK1
CONTENTS: Vertical profiles of temperature, salinity, dissolved oxygen, and pH at Sediment Flux stations.
REVISION: 19-FEB-90

STATION #	STATION LOCATION	DATE	TIME	TOTAL DEPTH (m)	SAMPLE DEPTH (m)	TEMP (oC)	COND (x200k)	SALINITY (ppt)	DISSOLVED OXYGEN (mg/l)	pH
PR	Mouth of Peconic River	28-JUL-89	925	1.6	0.5	25.90	333	20.78	6.23	7.5
					1.0	26.08	399	25.44	4.99	7.5
					1.5	26.10	404	25.80	4.29	7.5
BT-1	Flanders Bay	28-JUL-89	817	3.8	0.5	24.99	420	26.95	5.94	7.7
					1.0	24.90	422	27.09	5.82	7.7
					2.0	24.80	425	27.31	5.68	7.6
					3.0	24.79	425	27.31	5.62	7.6
					3.7	24.79	425	27.31	5.59	7.6
SJ	South Jamesport	27-JUL-89	1122	5.8	0.5	26.41	419	26.87	7.20	7.9
					1.0	25.75	420	26.95	7.47	7.9
					2.0	25.34	421	27.02	7.85	7.9
					3.0	25.15	423	27.16	7.09	7.8
					4.0	24.53	428	27.52	5.05	7.7
					5.0	24.25	428	27.52	4.14	7.5
					5.7	24.14	429	27.59	3.79	7.5
BT-2	Great Peconic Bay	24-JUL-89	1350	6.4	0.5	25.03	414	26.52	8.15	7.8
					1.0	24.89	414	26.52	8.09	7.8
					2.0	24.61	419	26.87	7.56	7.8
					3.0	24.07	420	26.95	7.12	7.7
					4.0	23.80	421	27.02	6.70	7.7
					5.0	23.74	422	27.09	5.91	7.6
					6.0	23.69	422	27.09	5.65	7.6
					6.7	23.68	421	27.02	5.57	7.6
SC	Shinnecock Canal Approach	24-JUL-89	1525	2.1	0.5	26.23	408	26.08	8.51	7.9
					1.0	25.72	409	26.16	8.58	7.9
					2.0	24.74	414	26.52	8.31	7.9
BT-3	Little Peconic Bay-Nassau Pt.	27-JUL-89	835	10.0	0.5	25.35	427	27.45	6.81	7.8
					1.0	25.18	428	27.52	6.79	7.8
					2.0	25.04	430	27.67	6.81	7.8
					3.0	24.97	430	27.67	6.88	7.8
					4.0	24.91	431	27.74	6.85	7.8
					5.0	24.84	431	27.74	6.83	7.8
					6.0	24.78	432	27.81	6.62	7.7
					7.0	24.75	433	27.88	6.56	7.7
					8.0	24.59	434	27.95	6.33	7.7
					9.0	24.44	435	28.03	6.31	7.7
					9.9	24.40	435	28.03	6.09	7.7

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SEDIMENT-WATER FLUX MEASUREMENTS IN THE PECONIC BAY SYSTEM
SUFFOLK COUNTY, NY
==

FILENAME: PB1_PROF.WK1
CONTENTS: Vertical profiles of temperature, salinity, dissolved oxygen, and pH at Sediment Flux stations.
REVISION: 19-FEB-90

STATION #	STATION LOCATION	DATE	TIME	TOTAL DEPTH (m)	SAMPLE DEPTH (m)	TEMP (oC)	COND (x200k)	SALINITY (ppt)	DISSOLVED OXYGEN (mg/l)	pH
NB	Noyack Bay	27-JUL-89	1010	7.3	0.5	25.09	437	28.17	7.16	7.8
					1.0	25.06	437	28.17	7.14	7.8
					2.0	24.75	437	28.17	7.12	7.8
					3.0	24.57	438	28.24	7.09	7.8
					4.0	24.18	442	28.53	6.77	7.8
					5.0	24.12	442	28.53	6.64	7.8
					6.0	24.12	442	28.53	6.55	7.8
					7.0	24.12	442	28.53	6.50	7.8
BT-5	Orient Harbor	25-JUL-89	1100	5.4	0.5	22.87	437	28.17	6.98	7.8
					1.0	22.86	437	28.17	6.96	7.8
					2.0	22.81	438	28.24	6.96	7.8
					3.0	22.78	438	28.24	6.97	7.8
					4.0	22.75	439	28.32	6.95	7.8
					5.0	22.73	438	28.24	6.94	7.8
					5.3	22.73	438	28.24	6.93	7.8
BT-6A	Gardiners Bay West	25-JUL-89	935	9.6	0.5	22.90	440	28.39	7.31	7.8
					1.0	22.69	440	28.39	7.32	7.8
					2.0	22.42	441	28.46	7.36	7.8
					3.0	22.21	442	28.53	7.41	7.8
					4.0	21.58	445	28.75	7.29	7.8
					5.0	20.60	449	29.04	6.84	7.7
					6.0	19.54	453	29.33	5.95	7.7
					7.0	19.30	457	29.62	6.09	7.7
					8.0	19.27	456	29.55	6.10	7.7
					9.0	19.24	456	29.55	6.11	7.7
					9.5	19.24	456	29.55	5.95	7.7
BT-8	Northwest Harbor	26-JUL-89		3.4	Hydrolab Failure - No Data					

APPENDIX B

BOTTOM WATER NUTRIENTS AND SEDIMENT COMPOSITION DATA

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SEDIMENT-WATER FLUX MEASUREMENTS IN THE PECONIC BAY SYSTEM
SUFFOLK COUNTY, NY

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FILENAME: PB1&2_WS.WK1
CONTENTS: Concentrations of dissolved inorganic nutrients in bottom water samples and concentrations of total C, N, and P in surficial sediments at Sediment-Flux Stations.
REVISION: 11-Jun-90

STATION #	STATION LOCATION	DATE	TIME	TOTAL DEPTH (m)	AA VIAL #	DISSOLVED NUTRIENTS NH4 (uM)	NO2 (uM)	NO3+NO2 (uM)	DIP (uM)	SI(OH)4 (uM)	SEDIMENT ANALYSES PC (wt.%)	PN (wt.%)	PP (wt.%)
PR	Peconic River	28-JUL-89	925	1.6	106	BLD	0.08	1.57	1.00	54.3	0.413	0.046	0.011
PR	Peconic River	27-OCT-89	918	2.0	87	0.6	0.07	0.88	0.32	12.2	0.756	0.085	0.023
BT-1	Flanders Bay	28-JUL-89	817	3.8	105	BLD	0.02	0.16	0.97	33.7	2.670	0.221	0.058
BT-1	Flanders Bay	26-OCT-89	913	4.0	55	0.3	0.07	0.38	0.55	14.7	1.960	0.167	0.035
SJ	S. Jamesport	27-JUL-89	1122	5.8	80	BLD	BLD	0.11	1.17	34.9	2.660	0.230	0.061
SJ	S. Jamesport	26-OCT-89	1043	6.5	56	2.1	0.14	0.69	0.81	20.4	2.010	0.190	0.046
BT-2	Gt. Peconic Bay	24-JUL-89	1350	6.4	11	1.0	0.10	0.22	1.24	30.2	2.160	0.217	0.062
BT-2	Gt. Peconic Bay	25-OCT-89	1055	7.0	36	0.3	0.03	0.25	0.67	13.5	2.040	0.207	0.063
SC	Shinnecock	24-JUL-89	1525	2.1	4	BLD	BLD	0.37	0.72	29.6	0.483	0.047	0.010
SC-2	Shinnecock	27-OCT-89	1042	2.8	88	BLD	BLD	0.13	0.22	11.1	0.111	0.015	0.007
BT-3	Little Peconic	27-JUL-89	835	10.0	79	0.5	BLD	0.21	0.96	27.8	2.580	0.266	0.065
BT-3	Little Peconic	25-OCT-89	925	10.5	35	0.5	0.07	0.79	0.84	9.82	2.870	0.223	0.069
NB	Noyack Bay	26-JUL-89	1010	7.3	54	BLD	BLD	0.08	0.83	14.1	2.610	0.249	0.074
NB	Noyack Bay	24-OCT-89	1030	8.0	10	0.3	0.08	0.64	0.78	7.26	2.730	0.247	0.069
BT-5	Orient Harbor	25-JUL-89	1100	5.4	28	BLD	BLD	0.10	0.84	7.7	0.418	0.013	0.013
BT-5	Orient Harbor	23-OCT-89	1255	7.2	2	1.0	0.45	1.31	0.82	7.72	2.290	0.265	0.090
BT-6A	Gardiners Bay	25-JUL-89	935	9.6	27	BLD	0.04	0.28	0.93	9.1	2.350	0.260	0.081
BT-6A	Gardiners Bay	23-OCT-89	1115	8.2	1	0.7	0.46	1.10	0.80	7.88	1.150	0.077	0.018
BT-8	NW Harbor	26-JUL-89		4.0	53	BLD	BLD	0.13	0.83	4.2	0.135	0.012	0.007
BT-8	NW Harbor	24-OCT-89	900	3.7	9	0.2	0.37	0.69	0.76	5.96	0.145	0.020	0.007

BLD = BELOW LIMITS OF DETECTION: NH4, <0.2 uM; NO2, <0.01 uM

APPENDIX C

DISSOLVED OXYGEN AND NUTRIENT CONCENTRATIONS IN SEDIMENT-WATER CHAMBERS

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SEDIMENT-WATER FLUX MEASUREMENTS IN THE PECONIC BAY SYSTEM
SUFFOLK COUNTY, NY

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FILENAME: PB1_CDAT.WK1
CONTENTS: Dissolved oxygen and nutrient concentrations in water phase of sediment flux chambers.
REVISION: 21-FEB-90

STATION #	DATE	CORE NO.	OW VOL ml	TIME SUM min	TIME OF SAMPLE hr	min	DELTA TIME min	DO mg/l	AA VIAL NO.	NH4 uM	NO3+NO2 uM	NO2 uM	DIP uM	SI(OH)4 uM
PR	28-JUL-89	8		0	15	0	0	8.39	107	0.6	1.40	0.08	1.08	53.6
				45	15	45	45	8.18						
				90	16	30	45	7.98	113	0.9	1.39	0.19	1.05	51.4
				135	17	15	45	7.85						
				180	18	0	45	7.69	119	0.5	1.74	0.12	1.17	48.3
				225	18	45	45	7.60						
				270	19	30	45	7.51	125	1.1	1.31	0.35	1.19	48.4
		1	1680	0	15	0	0	7.82	108	2.4	1.46	0.14	1.15	53.2
				45	15	45	45	7.05						
				90	16	30	45	6.50	114	4.9	1.21	0.11	1.13	51.2
				135	17	15	45	6.07						
				180	18	0	45	5.61	120	7.2	1.17	0.14	1.19	51.4
				225	18	45	45	5.26						
				270	19	30	45	4.82	126	8.6	1.05	0.13	1.19	50.3
		2	1920	0	15	0	0	7.30	109	3.2	1.42	0.24	1.17	53.5
				45	15	45	45	6.37						
				90	16	30	45	4.67	115	8.3	1.21	0.38	1.72	54.5
				135	17	15	45	3.05						
				180	18	0	45	1.65	121	13.3	1.08	0.20	2.20	56.0
				225	18	45	45	1.21						
				270	19	30	45	0.84	127	15.6	0.98	0.19	2.23	57.4

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SEDIMENT-WATER FLUX MEASUREMENTS IN THE PECONIC BAY SYSTEM
SUFFOLK COUNTY, NY
==

FILENAME: PB1_CDAT.WK1
CONTENTS: Dissolved oxygen and nutrient concentrations in water phase of sediment flux chambers.
REVISION: 21-FEB-90

STATION #	DATE	CORE NO.	OW VOL ml	TIME SUM min	TIME OF SAMPLE hr	TIME OF SAMPLE min	DELTA TIME min	DO mg/l	AA VIAL NO.	NH4 uM	NO3+NO2 uM	NO2 uM	DIP uM	SI(OH)4 uM
BT-1	28-JUL-89	B		0	15	10	0	8.33	110	< 0.2	0.09	< 0.01	1.04	35.0
				45	15	55	45	8.33						
				90	16	40	45	8.22	116	< 0.2	0.09	< 0.01	1.04	33.8
				135	17	25	45	8.12						
				180	18	10	45	8.04	122	< 0.2	0.11	< 0.01	1.03	33.7
				225	18	55	45	7.98						
				270	19	40	45	7.90	128	0.08	0.12	< 0.01	1.06	33.9
		1	1740	0	15	10	0	6.86	111	3.1	0.21	0.13	0.88	36.2
				45	15	55	45	5.60						
				90	16	40	45	4.61	117	7.5	0.47	0.15	0.72	37.7
				135	17	25	45	3.82						
				180	18	10	45	2.96	123	12.7	0.68	0.22	0.60	40.8
				225	18	55	45	2.32						
				270	19	40	45	1.68	129	15.8	0.83	0.30	0.63	44.4
		2	1820	0	15	10	0	7.40	112	0.9	0.26	0.05	1.07	38.2
				45	15	55	45	6.45						
				90	16	40	45	5.77	118	2.1	0.41	0.14	1.10	37.3
				135	17	25	45	5.26						
				180	18	10	45	4.74	124	3.5	0.62	0.18	1.12	42.2
				225	18	55	45	4.31						
				270	19	40	45	3.82	130	5.3	0.77	0.25	1.26	45.9

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SEDIMENT-WATER FLUX MEASUREMENTS IN THE PECONIC BAY SYSTEM
SUFFOLK COUNTY, NY
==

FILENAME: PB1_CDAT.WK1
CONTENTS: Dissolved oxygen and nutrient concentrations in water phase of sediment flux chambers.
REVISION: 21-FEB-90

STATION #	DATE	CORE NO.	OW VOL ml	TIME SUM min	TIME OF SAMPLE hr	TIME OF SAMPLE min	DELTA TIME min	DO mg/l	AA VIAL NO.	NH4 uM	NO3+NO2 uM	NO2 uM	DIP uM	SI(OH)4 uM
SJ	27-JUL-89	B		0	16	45	0	7.40	81	< 0.2	0.16	< 0.01	1.11	32.8
				45	17	30	45	7.31						
				90	18	15	45	7.23	90	< 0.2	0.17	< 0.01	1.13	32.8
				135	19	0	45	7.19						
				180	19	45	45	7.14	96	< 0.2	0.13	< 0.01	1.14	32.8
				225	20	30	45	7.09						
				270	21	15	45	7.05	102	< 0.2	0.17	< 0.01	1.12	32.8
		1	1540	0	16	45	0	6.74	82	0.4	0.15	0.01	1.08	34.2
				45	17	30	45	6.29						
				90	18	15	45	5.95	91	1.2	0.26	0.03	1.11	43.2
				135	19	0	45	5.72						
				180	19	45	45	5.46	97	1.8	0.23	0.05	1.06	37.7
				225	20	30	45	5.28						
				270	21	15	45	5.03	103	2.1	0.26	0.07	0.98	39.0
		2	2180	0	16	45	0	6.89	83	0.2	0.12	0.02	1.13	34.5
				45	17	30	45	6.55						
				90	18	15	45	6.29	92	0.7	0.22	0.02	1.12	36.5
				135	19	0	45	6.14						
				180	19	45	45	5.98	98	1.0	0.20	0.04	1.07	36.1
				225	20	30	45	5.84						
				270	21	15	45	5.66	104	1.1	0.17	0.03	1.05	36.9

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SEDIMENT-WATER FLUX MEASUREMENTS IN THE PECONIC BAY SYSTEM
SUFFOLK COUNTY, NY
==

FILENAME: PB1_CDAT.WK1
CONTENTS: Dissolved oxygen and nutrient concentrations in water phase of sediment flux chambers.
REVISION: 21-FEB-90

STATION #	DATE	CORE NO.	OW VOL ml	TIME SUM min	TIME OF SAMPLE hr	TIME OF SAMPLE min	DELTA TIME min	DO mg/l	AA VIAL NO.	NH4 uM	NO3+NO2 uM	NO2 uM	DIP uM	SI(OH)4 uM
BT-2	24-JUL-89	8		0	22	0	0	7.34	5	1.6	0.25	0.07	1.28	30.7
				50	22	50	50	7.33						
				90	23	30	40	7.31	12	1.0	0.25	0.09	1.28	30.9
				135	24	15	45	7.30						
				180	25	0	45	7.28	18	0.9	0.28	0.05	1.27	34.3
				225	25	45	45	7.28						
				270	26	30	45	7.25	24	0.5	0.25	0.07	1.27	30.5
		1	2370	0	22	0	0	7.25	6	2.3	0.30	< 0.01	1.41	38.2
				50	22	50	50	6.82						
				90	23	30	40	6.56	13	2.7	0.35	0.11	1.42	39.0
				135	24	15	45	6.32						
				180	25	0	45	6.07	19	4.2	0.37	0.32	1.40	47.1
				225	25	45	45	5.87						
				270	26	30	45	5.69	25	4.2	0.38	0.18	1.42	44.5
		2	1970	0	22	0	0	7.02	7	2.3	0.44	0.12	1.38	36.2
				50	22	50	50	6.51						
				90	23	30	40	6.11	14	3.9	0.57	0.20	1.35	37.7
				135	24	15	45	5.80						
				180	25	0	45	5.48	20	5.4	0.72	0.25	1.41	45.0
				225	25	45	45	5.23						
				270	26	30	45	4.92	26	6.5	0.84	0.30	1.44	49.4

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SEDIMENT-WATER FLUX MEASUREMENTS IN THE PECONIC BAY SYSTEM
SUFFOLK COUNTY, NY
==

FILENAME: PB1_CDAT.WK1
CONTENTS: Dissolved oxygen and nutrient concentrations in water phase of sediment flux chambers.
REVISION: 21-FEB-90

STATION #	DATE	CORE NO.	OW VOL ml	TIME SUM min	TIME OF SAMPLE hr	min	DELTA TIME min	DO mg/l	AA VIAL NO.	NH4 uM	NO3+NO2 uM	NO2 uM	DIP uM	SI(OH)4 uM
SC	24-JUL-89	B		0	20	45	0	8.98	1	< 0.2	0.21	0.03	0.82	34.1
				90	22	15	90	8.88	8	0.3	0.21	< 0.01	0.62	27.7
				135	23	0	45	8.91						
				180	23	45	45	8.88	15	0.4	0.21	< 0.01	0.88	27.6
				225	24	30	45	8.87						
				270	25	15	45	8.85	21	0.2		0.02	0.90	29.8
				315	26	0	45	8.84						
		1	1320	0	20	45	0	9.60	2	0.4	0.11	0.02	0.69	26.5
				90	22	15	90	8.88	9	< 0.2	0.11	0.02	0.68	28.6
				135	23	0	45	8.64						
				180	23	45	45	8.42	16	< 0.2	0.10	0.16	0.62	26.1
				225	24	30	45	8.29						
				270	25	15	45	8.09	22	< 0.2	0.11	< 0.01	0.62	25.9
				315	26	0	45	7.98						
		2	1810	0	20	45	0	9.43	3	< 0.2	0.14	< 0.01	0.72	26.8
				90	22	15	90	8.66	10	< 0.2	0.13	< 0.01	0.73	27.1
				135	23	0	45	8.44						
				180	23	45	45	8.24	17	< 0.2	0.11	< 0.01	0.66	26.4
				225	24	30	45							
				270	25	15	45		23	0.2		< 0.01	0.77	26.5
				315	26	0	45							

SEDIMENT-WATER FLUX MEASUREMENTS IN THE PECONIC BAY SYSTEM
SUFFOLK COUNTY, NY

FILENAME: PB1_CDAT.WK1
CONTENTS: Dissolved oxygen and nutrient concentrations in water phase of sediment flux chambers.
REVISION: 21-FEB-90

STATION #	DATE	CORE NO.	OW VOL ml	TIME SUM min	TIME OF SAMPLE hr	min	DELTA TIME min	DO mg/l	AA VIAL NO.	NH4 uM	NO3+NO2 uM	NO2 uM	DIP uM	SI(OH)4 uM
BT-3	27-JUL-89	B		0	16	15	0	8.62	84	0.2	0.19	0.01	1.01	22.2
				49	17	4	49	8.36						
				90	17	45	41	8.20	87	0.2	0.19	< 0.01	0.98	25.5
				135	18	30	45	8.07						
				180	19	15	45	8.00	93	0.2	0.18	< 0.01	1.03	22.2
				225	20	0	45	7.92						
				270	20	45	45	7.85	99	0.2	0.36	< 0.01	0.99	22.6
		1	1720	0	16	15	0	7.65	85	1.2	0.29	0.10	1.07	26.7
				49	17	4	49	7.13						
				90	17	45	41	6.76	88	2.6	0.50	0.22	1.15	31.5
				135	18	30	45	6.47						
				180	19	15	45	6.14	94	4.3	0.65	0.32	1.26	36.5
				225	20	0	45	5.88						
				270	20	45	45	5.60	100	5.1	0.84	0.41	1.32	41.6
		2	1560	0	16	15	0	7.79	86	1.5	0.40	0.14	1.07	25.7
				49	17	4	49	7.12						
				90	17	45	41	6.72	89	2.8	0.61	0.28	1.13	32.0
				135	18	30	45	6.41						
				180	19	15	45	6.13	95	4.0	0.90	0.40	1.19	32.8
				225	20	0	45	5.90						
				270	20	45	45	5.65	101	5.0	1.12	0.54	1.21	36.5

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SEDIMENT-WATER FLUX MEASUREMENTS IN THE PECONIC BAY SYSTEM
SUFFOLK COUNTY, NY
==

FILENAME: PB1_CDAT.WK1
CONTENTS: Dissolved oxygen and nutrient concentrations in water phase of sediment flux chambers.
REVISION: 21-FEB-90

STATION #	DATE	CORE NO.	OW VOL ml	TIME SUM min	TIME OF SAMPLE hr	TIME OF SAMPLE min	DELTA TIME min	DO mg/l	AA VIAL NO.	NH4 uM	NO3+NO2 uM	NO2 uM	DIP uM	SI(OH)4 uM
NB	26-JUL-89	8		0	17	10	0	9.04	58	< 0.2	0.08	< 0.01	0.88	11.6
				45	17	55	45	8.86						
				90	18	40	45	8.74	64	< 0.2	0.08	< 0.01	0.88	11.4
				135	19	25	45	8.64						
				180	20	10	45	8.56	70	0.6	0.22	< 0.01	0.92	11.8
				225	20	55	45	8.49						
				270	21	40	45	8.45	76	< 0.2	0.11	< 0.01	0.87	11.5
		1	2010	0	17	10	0	7.22	59	3.7	0.11	< 0.01	1.17	21.1
				45	17	55	45	6.22						
				90	18	40	45	5.15	65	8.3	0.10	< 0.01	1.45	32.8
				135	19	25	45	4.26						
				180	20	10	45	3.41	71	13.3	0.13	0.04	1.62	44.1
				225	20	55	45	2.68						
				270	21	40	45	1.97	77	21.8	0.33	< 0.01	1.62	52.9
		2	1650	0	17	10	0	6.90	60	4.5	0.10	< 0.01	1.41	22.3
				45	17	55	45	5.67						
				90	18	40	45	4.55	66	11.1	0.12	0.03	1.87	35.2
				135	19	25	45	3.61						
				180	20	10	45	2.52	72	21.9	0.25	< 0.01	2.26	47.8
				225	20	55	45	1.69						
				270	21	40	45	1.04	78	28.4	0.31	< 0.01	2.46	58.5

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SEDIMENT-WATER FLUX MEASUREMENTS IN THE PECONIC BAY SYSTEM

SUFFOLK COUNTY, NY

==

FILENAME: PB1_CDAT.WK1

CONTENTS: Dissolved oxygen and nutrient concentrations in water phase of sediment flux chambers.

REVISION: 21-FEB-90

STATION #	DATE	CORE NO.	OW VOL ml	TIME SUM min	TIME OF SAMPLE hr	TIME OF SAMPLE min	DELTA TIME min	DO mg/l	AA VIAL NO.	NH4 uM	NO3+NO2 uM	NO2 uM	DIP uM	SI(OH)4 uM
BT-5	25-JUL-89	B		0	19	0	0	8.93	29	< 0.2	0.14	< 0.01	1.02	8.2
				45	19	45	45	8.82						
				90	20	30	45	8.73	35	< 0.2	0.29	< 0.01	1.02	8.3
				135	21	15	45	8.72						
				180	22	0	45	8.72	41	< 0.2	0.14	< 0.01	1.01	11.1
				225	22	45	45	8.68						
				270	23	30	45	8.68	47	< 0.2	0.15	< 0.01	1.03	7.9
		1	2030	0	19	0	0	8.42	30	0.3	0.34	< 0.01	1.05	8.6
				45	19	45	45	8.06						
				90	20	30	45	7.80	36	0.9	0.61	0.03	1.16	8.8
				135	21	15	45	7.65						
				180	22	0	45	7.46	42	1.2	0.80	0.03	1.17	9.8
				225	22	45	45	7.33						
				270	23	30	45	7.14	48	2.1	0.41	0.03	1.14	10.1
		2	1560	0	19	0	0	8.46	31	< 0.2	0.16	0.01	1.01	8.0
				45	19	45	45	8.17						
				90	20	30	45	7.91	37	0.5	0.16	0.01	1.02	8.3
				135	21	15	45	7.77						
				180	22	0	45	7.59	43	1.6	0.29	< 0.01	1.01	9.2
				225	22	45	45	7.48						
				270	23	30	45	7.31	49	0.3	0.22	0.02	1.01	10.1

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SEDIMENT-WATER FLUX MEASUREMENTS IN THE PECONIC BAY SYSTEM
SUFFOLK COUNTY, NY
==

FILENAME: PB1_COAT.WK1
CONTENTS: Dissolved oxygen and nutrient concentrations in water phase of sediment flux chambers.
REVISION: 21-FEB-90

STATION #	DATE	CORE NO.	OW VOL ml	TIME SUM min	TIME OF SAMPLE hr	TIME OF SAMPLE min	DELTA TIME min	DO mg/l	AA VIAL NO.	NH4 uM	NO3+NO2 uM	NO2 uM	DIP uM	SI(OH)4 uM
BT-6A	25-JUL-89	B		0	19	15	0	7.62	32	< 0.2	0.26	0.02	0.97	9.1
				45	20	0	45	7.52						
				90	20	45	45	7.46	38	< 0.2	0.26	< 0.01	0.97	11.2
				135	21	30	45	7.42						
				180	22	15	45	7.38	44	< 0.2	0.25	0.01	0.96	8.6
				225	23	0	45	7.33						
				270	23	45	45	7.31	50	< 0.2	0.28	0.03	0.99	9.2
		1	1960	0	19	15	0	7.38	33	0.5	0.41	0.16	1.00	12.1
				45	20	0	45	6.95						
				90	20	45	45	6.71	39	1.2	0.71	0.15	1.10	15.6
				135	21	30	45	6.55						
				180	22	15	45	6.35	45	1.4	0.80	0.19	1.09	22.0
				225	23	0	45	6.21						
				270	23	45	45	6.03	51	1.7	1.04	0.24	1.14	22.4
		2	2100	0	19	15	0	7.47	34	0.8	0.36	0.08	1.06	13.7
				45	20	0	45	7.12						
				90	20	45	45	6.80	40	1.1	0.48	0.13	1.11	15.9
				135	21	30	45	6.54						
				180	22	15	45	6.32	46	2.0	0.58	0.15	1.13	18.6
				225	23	0	45	6.14						
				270	23	45	45	5.95	52	2.2	0.77	0.20	1.15	22.4

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SEDIMENT-WATER FLUX MEASUREMENTS IN THE PECONIC BAY SYSTEM
SUFFOLK COUNTY, NY
==

FILENAME: PB1_CDAT.WK1
CONTENTS: Dissolved oxygen and nutrient concentrations in water phase of sediment flux chambers.
REVISION: 21-FEB-90

STATION #	DATE	CORE NO.	OW VOL ml	TIME SUM min	TIME OF SAMPLE hr	min	DELTA TIME min	DO mg/l	AA VIAL NO.	NH4 uM	NO3+NO2 uM	NO2 uM	DIP uM	SI(OH)4 uM
BT-8	26-JUL-89	B		0	17	0	0	8.93	55		0.10		0.88	4.5
				50	17	50	50	8.58						
				90	18	30	40	8.45	61	< 0.2	0.10	0.02	0.86	4.4
				135	19	15	45	8.42						
				180	20	0	45	8.37	67	< 0.2	0.07	0.02	0.86	4.3
				225	20	45	45	8.61						
				270	21	30	45	8.88	73	< 0.2	0.10	< 0.01	0.86	5.0
		1	1240	0	17	0	0	8.22	56	< 0.2	0.09	0.03	0.92	4.5
				50	17	50	50	7.88						
				90	18	30	40	7.70	62	< 0.2	0.08	< 0.01	0.87	4.2
				135	19	15	45	7.56						
				180	20	0	45	7.39	68	< 0.2	0.17	< 0.01	0.83	5.0
				225	20	45	45	7.26						
				270	21	30	45	7.09	74	< 0.2	0.20	< 0.01	0.82	4.3
		2	1610	0	17	0	0	8.38	57	< 0.2	0.08	0.01	0.90	4.5
				50	17	50	50	7.92						
				90	18	30	40	7.68	63	< 0.2	0.08	0.01	0.93	4.5
				135	19	15	45	7.48						
				180	20	0	45	7.28	69	< 0.2	0.21	< 0.01	0.86	5.5
				225	20	45	45	7.13						
				270	21	30	45	6.92	75	< 0.2	0.12	< 0.01	0.87	5.1

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SEDIMENT-WATER FLUX MEASUREMENTS IN THE PECONIC BAY SYSTEM
SUFFOLK COUNTY, NY
==

FILENAME: PB2_CDAT.WK1
CONTENTS: Dissolved oxygen and nutrient concentrations in water phase of sediment flux chambers.
REVISION: 03-Jun-90

STATION #	DATE	CORE NO.	OW VOL ml	TIME SUM min	TIME OF SAMPLE hr	TIME OF SAMPLE min	DELTA TIME min	DO mg/l	AA VIAL NO.	NH4 uM	NO3+NO2 uM	NO2 uM	DIP uM	SI(OH)4 uM
PR	27-OCT-89	8		0	14	15	0	11.32	110	0.4	0.60	0.05	0.29	12.10
				45	15	0	45	11.30						
				90	15	45	45	11.28	116	0.6	0.57	0.13	0.29	12.10
				135	16	30	45	11.26						
				180	17	15	45	11.23	122	1.7	0.61	0.09	0.25	12.00
				225	18	0	45	11.22						
				270	18	45	45	11.18	128	0.5	0.58	0.15	0.26	12.20
		1	1440	0	14	15	0	9.76	111	2.9	1.23	0.11	0.51	13.60
				45	15	0	45	8.97						
				90	15	45	45	8.27	117	5.6	1.44	0.20	0.65	15.00
				135	16	30	45	7.50						
				180	17	15	45	6.82	123	7.8	1.85	0.31	0.70	16.40
				225	18	0	45	6.20						
				270	18	45	45	5.57	129	9.6	2.28	0.34	0.77	17.70
		2	1160	0	14	15	0	9.23	112	3.4	1.12	0.16	0.47	15.40
				45	15	0	45	8.06						
				90	15	45	45	7.05	118	6.7	1.65	0.26	0.58	18.20
				135	16	30	45	6.13						
				180	17	15	45	5.26	124	9.4	2.21	0.41	0.70	21.30
				225	18	0	45	4.49						
				270	18	45	45	3.58	130	12.0	2.64	0.39	0.76	24.80

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SEDIMENT-WATER FLUX MEASUREMENTS IN THE PECONIC BAY SYSTEM
SUFFOLK COUNTY, NY
==

FILENAME: PB2_CDAT.WK1
CONTENTS: Dissolved oxygen and nutrient concentrations in water phase of sediment flux chambers.
REVISION: 03-Jun-90

STATION #	DATE	CORE NO.	OW VOL ml	TIME SUM min	TIME OF SAMPLE hr	TIME OF SAMPLE min	DELTA TIME min	DO mg/l	AA VIAL NO.	NH4 uM	NO3+NO2 uM	NO2 uM	DIP uM	SI(OH)4 uM
BT-1	26-OCT-89	8		0	15	45	0	9.53	84	0.3	0.40	0.09	0.53	14.60
				45	16	30	45	9.48						
				90	17	15	45	9.49	92	0.5	0.38	0.08	0.52	14.30
				135	18	0	45	9.47						
				180	18	45	45	9.46	98	0.3	0.40	0.06	0.53	14.30
				225	19	30	45	9.46						
				270	20	15	45	9.45	104	0.2	0.39	0.08	0.52	14.50
		1	1210	0	15	45	0	8.43	85	1.3	0.50	0.10	0.49	15.10
				45	16	30	45	8.02						
				90	17	15	45	7.53	93	1.1	0.55	0.11	0.46	23.40
				135	18	0	45	7.22						
				180	18	45	45	6.80	99	1.3	0.75	0.14	0.50	15.20
				225	19	30	45	6.59						
				270	20	15	45	6.25	105	1.2	0.66	0.14	0.42	14.80
		2	1670	0	15	45	0	7.80	86	1.8	0.80	0.15	0.57	14.70
				45	16	30	45	7.28						
				90	17	15	45	6.75	94	2.0	1.07	0.22	0.56	14.40
				135	18	0	45	6.40						
				180	18	45	45	5.93	100	2.3	1.31	0.23	0.55	17.70
				225	19	30	45	5.63						
				270	20	15	45	5.22	106	2.5	1.52	0.26	0.59	14.40

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SEDIMENT-WATER FLUX MEASUREMENTS IN THE PECONIC BAY SYSTEM
SUFFOLK COUNTY, NY
==

FILENAME: PB2_CDAT.WK1
CONTENTS: Dissolved oxygen and nutrient concentrations in water phase of sediment flux chambers.
REVISION: 03-Jun-90

STATION #	DATE	CORE NO.	OW VOL ml	TIME SUM min	TIME OF SAMPLE hr	TIME OF SAMPLE min	DELTA TIME min	DO mg/l	AA VIAL NO.	NH4 uM	NO3+NO2 uM	NO2 uM	DIP uM	SI(OH)4 uM
SJ	26-OCT-89	B		0	15	30	0	8.06	81	2.0	0.70	0.20	0.79	21.20
				45	16	15	45	8.02						
				90	17	0	45	8.01	89	2.1	0.70	0.19	0.76	20.90
				135	17	45	45	8.00						
				180	18	30	45	7.99	95	2.1	0.80	0.24	0.79	20.80
				225	19	15	45	8.05						
				270	20	0	45	8.06	101	1.9	0.73	0.37	0.77	20.40
		1	1740	0	15	30	0	7.63	82	2.3	0.78	0.21	0.75	21.60
				45	16	15	45	7.46						
				90	17	0	45	7.31	90	2.5	0.80	0.25	0.72	22.60
				135	17	45	45	7.15						
				180	18	30	45	7.03	96	2.6	0.86	0.29	0.72	23.10
				225	19	15	45	6.89						
				270	20	0	45	6.78	102	2.5	0.94	0.34	0.71	22.20
		2	1745	0	15	30	0	7.57	83	2.4	0.66	0.33	0.71	22.90
				45	16	15	45	7.36						
				90	17	0	45	7.13	91	2.5	0.73	0.26	0.75	23.50
				135	17	45	45	6.86						
				180	18	30	45	6.66	97	2.5	0.72	0.25	0.73	24.20
				225	19	15	45	6.46						
				270	20	0	45	6.41	103	2.4	0.73	0.29	0.73	24.90

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SEDIMENT-WATER FLUX MEASUREMENTS IN THE PECONIC BAY SYSTEM
SUFFOLK COUNTY, NY
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FILENAME: PB2_COAT.WK1
CONTENTS: Dissolved oxygen and nutrient concentrations in water phase of sediment flux chambers.
REVISION: 03-Jun-90

STATION #	DATE	CORE NO.	OW VOL ml	TIME SUM min	TIME OF SAMPLE hr	min	DELTA TIME min	DO mg/l	AA VIAL NO.	NH4 uM	NO3+NO2 uM	NO2 uM	DIP uM	SI(OH)4 uM
BT-2	25-OCT-89	B		0	15	15	0	9.66	57	0.6	0.26	0.14	0.66	13.80
				45	16	0	45	9.65						
				90	16	45	45	9.64	63	0.2	0.28	0.03	0.66	13.70
				135	17	30	45	9.62						
				180	18	15	45	9.62	69	0.2	0.27	0.07	0.67	13.60
				225	19	0	45	9.61						
				270	19	45	45	9.61	75	0.3	0.33	0.05	0.66	13.50
		1	1880	0	15	15	0	9.18	58	0.5	0.29	0.05	0.72	15.40
				45	16	0	45	9.00						
				90	16	45	45	8.85	64	0.8	0.42	0.08	0.75	16.60
				135	17	30	45	8.72						
				180	18	15	45	8.57	70	1.0	0.42	0.13	0.79	17.90
				225	19	0	45	8.44						
				270	19	45	45	8.27	76	1.1	0.46	0.17	0.78	18.80
		2	1720	0	15	15	0	9.27	59	0.5	0.35	0.05	0.69	15.30
				45	16	0	45	9.16						
				90	16	45	45	8.99	65	0.5	0.44	0.06	0.71	16.90
				135	17	30	45	8.83						
				180	18	15	45	8.66	71	0.8	0.48	0.11	0.74	18.10
				225	19	0	45	8.52						
				270	19	45	45	8.34	77	1.0	0.70	0.10	0.77	19.60

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SEDIMENT-WATER FLUX MEASUREMENTS IN THE PECONIC BAY SYSTEM
SUFFOLK COUNTY, NY
==

FILENAME: PB2_CDAT.WK1
CONTENTS: Dissolved oxygen and nutrient concentrations in water phase of sediment flux chambers.
REVISION: 03-Jun-90

STATION #	DATE	CORE NO.	OW VOL ml	TIME SUM min	TIME OF SAMPLE hr	min	DELTA TIME min	DO mg/l	AA VIAL NO.	NH4 uM	NO3+NO2 uM	NO2 uM	DIP uM	SI(OH)4 uM
SC-2	27-OCT-89	B		0	14	0	0	12.34	107	< 0.2	0.13	0.01	0.22	10.90
				45	14	45	45	12.30						
				90	15	30	45	12.27	113	< 0.2	0.10	0.07	0.23	10.90
				135	16	15	45	12.24						
				180	17	0	45	12.23	119	< 0.2	0.15	0.05	0.24	10.90
				225	17	45	45	12.21						
				270	18	30	45	12.20	125	0.6	0.12	0.11	0.22	14.50
		1	1620	0	14	0	0	11.93	108	< 0.2	0.13	0.01	0.19	10.80
				45	14	45	45	11.83						
				90	15	30	45	11.71	114	< 0.2	0.22	0.03	0.22	10.60
				135	16	15	45	11.59						
				180	17	0	45	11.45	120	< 0.2	0.13	0.05	0.19	12.20
				225	17	45	45	11.36						
				270	18	30	45	11.23	126	0.2	0.16	0.10	0.17	10.60
		2	1420	0	14	0	0	12.14	109	< 0.2	0.10	0.01	0.23	11.60
				45	14	45	45	12.06						
				90	15	30	45	11.92	115	< 0.2	0.15	0.05	0.28	10.30
				135	16	15	45	11.79						
				180	17	0	45	11.66	121	< 0.2	0.13	0.06	0.21	10.10
				225	17	45	45	11.57						
				270	18	30	45	11.43	127	0.2	0.14	0.09	0.23	9.84

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SEDIMENT-WATER FLUX MEASUREMENTS IN THE PECONIC BAY SYSTEM
SUFFOLK COUNTY, NY
==

FILENAME: PB2_CDAT.WK1
CONTENTS: Dissolved oxygen and nutrient concentrations in water phase of sediment flux chambers.
REVISION: 03-Jun-90

STATION #	DATE	CORE NO.	OW VOL ml	TIME SUM min	TIME OF SAMPLE hr	TIME OF SAMPLE min	DELTA TIME min	DO mg/l	AA VIAL NO.	NH4 uM	NO3+NO2 uM	NO2 uM	DIP uM	SI(OH)4 uM
BT-3	25-OCT-89	B		0	15	30	0	9.79	60	0.3	0.67	0.09	0.76	10.10
				45	16	15	45	9.78						
				90	17	0	45	9.77	66	0.3	0.69	0.05	0.78	10.20
				135	17	45	45	9.76						
				180	18	30	45	9.75	72	0.3	0.68	0.09	0.78	9.86
				225	19	15	45	9.74						
				270	20	0	45	9.74	78	0.4	0.76	0.07	0.78	9.99
		1	2100	0	15	30	0	9.43	61	0.6	0.75	0.10	0.78	12.00
				45	16	15	45	9.28						
				90	17	0	45	9.12	67	0.7	0.98	0.13	0.80	13.30
				135	17	45	45	8.98						
				180	18	30	45	8.83	73	0.8	0.91	0.17	0.77	14.00
				225	19	15	45	8.72						
				270	20	0	45	8.58	79	0.9	1.06	0.18	0.82	15.80
		2	1945	0	15	30	0		62	0.9	0.83	0.17	0.75	12.20
				45	16	15	45	8.96						
				90	17	0	45	8.79	68	1.5	0.83	0.16	0.80	13.70
				135	17	45	45	8.61						
				180	18	30	45	8.41	74	1.8	0.85	0.21	0.79	15.20
				225	19	15	45	8.22						
				270	20	0	45	8.11	80	2.2	0.92	0.15	0.79	17.50

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SEDIMENT-WATER FLUX MEASUREMENTS IN THE PECONIC BAY SYSTEM
SUFFOLK COUNTY, NY
==

FILENAME: PB2_CDAT.WK1
CONTENTS: Dissolved oxygen and nutrient concentrations in water phase of sediment flux chambers.
REVISION: 03-Jun-90

STATION #	DATE	CORE NO.	OW VOL ml	TIME SUM min	TIME OF SAMPLE hr	min	DELTA TIME min	DO mg/l	AA VIAL NO.	NH4 uM	NO3+NO2 uM	NO2 uM	DIP uM	SI(OH)4 uM
NB	24-OCT-89	8		0	15	20	0	10.09	29	0.2	0.68	0.08	0.75	7.78
				45	16	5	45	10.06						
				90	16	50	45	10.05	37	0.3	0.72	0.08	0.77	7.58
				135	17	35	45	10.01						
				180	18	20	45	9.99	43	0.3	0.75	0.07	0.77	7.76
				225	19	5	45	9.95						
				270	19	50	45	9.82	49	0.3	0.75	0.07	0.76	7.76
		1	1790	0	15	20	0	9.26	30	0.7	0.74	0.08	0.75	10.60
				45	16	5	45	8.95						
				90	16	50	45	8.62	38	1.0	0.76	0.07	0.72	14.40
				135	17	35	45	8.31						
				180	18	20	45	7.93	44	1.3	0.80	0.12	0.73	18.40
				225	19	5	45	7.60						
				270	19	50	45	7.26	50	1.8	0.72	0.08	0.74	22.80
		2	1980	0	15	20	0	9.42	31	0.7	0.64	0.07	0.76	10.80
				45	16	5	45	9.12						
				90	16	50	45	8.80	39	0.9	0.69	0.10	0.74	14.60
				135	17	35	45	8.47						
				180	18	20	45	8.11	45	1.5	0.67	0.09	0.79	19.70
				225	19	5	45	7.73						
				270	19	50	45	7.29	51	2.3	0.65	0.06	0.89	25.60

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SEDIMENT-WATER FLUX MEASUREMENTS IN THE PECONIC BAY SYSTEM
SUFFOLK COUNTY, NY
==

FILENAME: PB2_CDAT.WK1
CONTENTS: Dissolved oxygen and nutrient concentrations in water phase of sediment flux chambers.
REVISION: 03-Jun-90

STATION #	DATE	CORE NO.	OW VOL ml	TIME SUM min	TIME OF SAMPLE hr	TIME OF SAMPLE min	DELTA TIME min	DO mg/l	AA VIAL NO.	NH4 uM	NO3+NO2 uM	NO2 uM	DIP uM	SI(OH)4 uM
BT-5	23-OCT-89	B		0	18	15	0	9.61	6	0.9	1.25	0.27	0.85	7.94
				45	19	0	45	9.65						
				90	19	45	45	9.63	14	0.8	1.26	0.45	0.83	7.69
				135	20	30	45	9.61						
				180	21	15	45	9.58	20	0.9	1.20	0.19	0.83	8.74
				225	22	0	45	9.61						
				270	22	45	45	9.60	26	0.9	1.19	0.22	0.82	8.00
		1	1700	0	18	15	0	9.31	7	1.6	1.26	0.39	0.85	7.95
				45	19	0	45	9.15						
				90	19	45	45	8.95	15	1.1	1.25	0.20	0.85	9.40
				135	20	30	45	8.78						
				180	21	15	45	8.54	21	1.3	1.34	0.24	0.90	10.50
				225	22	0	45	8.37						
				270	22	45	45	8.12	27	1.4	1.32	0.19	0.87	13.00
		2	1720	0	18	15	0	9.29	8	0.9	1.23	0.20	0.82	11.70
				45	19	0	45	9.13						
				90	19	45	45	8.94	16	1.0	1.21	0.19	0.82	8.37
				135	20	30	45	8.73						
				180	21	15	45	8.45	22	1.2	1.20	0.21	0.80	9.24
				225	22	0	45	8.28						
				270	22	45	45	8.08	28	1.3	1.21	0.19	0.80	10.30

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SEDIMENT-WATER FLUX MEASUREMENTS IN THE PECONIC BAY SYSTEM
SUFFOLK COUNTY, NY
==

FILENAME: PB2_CDAT.WK1
CONTENTS: Dissolved oxygen and nutrient concentrations in water phase of sediment flux chambers.
REVISION: 03-Jun-90

STATION #	DATE	CORE NO.	OW VOL ml	TIME SUM min	TIME OF SAMPLE hr	TIME OF SAMPLE min	DELTA TIME min	DO mg/l	AA VIAL NO.	NH4 uM	NO3+NO2 uM	NO2 uM	DIP uM	SI(OH)4 uM
BT-6A	23-OCT-89	B		0	18	0	0	9.91	3	0.6	1.13	0.28	0.80	6.66
				55	18	55	55	9.88						
				90	19	30	35	9.87	11	0.6	1.07	0.20	0.80	6.45
				135	20	15	45	9.85						
				180	21	0	45	9.84	17	0.6	1.03	0.26	0.79	6.80
				225	21	45	45	9.84						
				270	22	30	45	9.83	23	0.6	1.11	0.20	0.78	6.90
		1	1730	0	18	0	0	9.44	4	1.1	1.14	0.28	0.83	8.52
				55	18	55	55	9.14						
				90	19	30	35	8.96	12	1.7	1.32	0.45	0.84	10.60
				135	20	15	45	8.71						
				180	21	0	45	8.49	18	2.5	1.47	0.48	0.91	14.70
				225	21	45	45	8.26						
				270	22	30	45	8.03	24	3.2	1.54	0.45	0.95	15.70
		2	1790	0	18	0	0	9.46	5	0.7	1.24	0.56	0.81	7.78
				55	18	55	55	9.18						
				90	19	30	35	9.03	13	1.3	1.31	0.38	0.89	9.56
				135	20	15	45	8.82						
				180	21	0	45	8.62	19	1.9	1.50	0.49	0.90	11.30
				225	21	45	45	8.44						
				270	22	30	45	8.25	25	2.3	1.65	0.50	0.94	13.10

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SEDIMENT-WATER FLUX MEASUREMENTS IN THE PECONIC BAY SYSTEM
SUFFOLK COUNTY, NY
==

FILENAME: PB2_COAT.WK1
CONTENTS: Dissolved oxygen and nutrient concentrations in water phase of sediment flux chambers.
REVISION: 03-Jun-90

STATION #	DATE	CORE NO.	OW VOL ml	TIME SUM min	TIME OF SAMPLE hr	TIME OF SAMPLE min	DELTA TIME min	DO mg/l	AA VIAL NO.	NH4 uM	NO3+NO2 uM	NO2 uM	DIP uM	SI(OH)4 uM
BT-8	24-OCT-89	B		0	15	35	0	10.31	32	0.2	0.71	0.14	0.74	6.25
				45	16	20	45	10.24						
				90	17	5	45	10.22	40	0.2	0.72	0.11	0.76	6.33
				135	17	50	45	10.20						
				180	18	35	45	10.16	46	0.2	0.75	0.12	0.77	6.37
				225	19	20	45	10.15						
				270	20	5	45	10.14	52	0.4	0.70	0.13	0.78	6.22
		1	1900	0	15	35	0	10.29	33	0.2	0.64	0.09	0.77	5.99
				45	16	20	45	10.21						
				90	17	5	45	10.10	41	0.2	0.59	0.05	0.71	5.94
				135	17	50	45	9.98						
				180	18	35	45	9.78	47	0.2	0.51	0.08	0.69	5.52
				225	19	20	45	9.68						
				270	20	5	45	9.55	53	< 0.2	0.44	0.06	0.68	5.16
		2	1790	0	15	35	0	9.89	34	0.2	0.62	0.12	0.72	6.07
				45	16	20	45	9.80						
				90	17	5	45	9.69	42	0.2	0.61	0.09	0.74	5.97
				135	17	50	45	9.64						
				180	18	35	45	9.47	48	< 0.2	0.54	0.08	0.72	5.88
				225	19	20	45	9.18						
				270	20	5	45	9.34	54	0.2	0.53	0.09	0.72	5.62

APPENDIX D

RATES OF DISSOLVED CONSTITUENT CHANGE AND CALCULATED NET SEDIMENT-WATER FLUXES

SEDIMENT-WATER FLUX MEASUREMENTS IN THE PECONIC BAY SYSTEM
SUFFOLK COUNTY, NY

FILENAME: PB1_FLUX.WK1 PART 1 OF 3
CONTENTS: Net sediment-water fluxes of dissolved constituents at Sediment Flux Stations. Table includes least squares linear regression slope and correlation coefficient for the net rate of change of dissolved constitiuents for each sediment-water flux calculation. Mean fluxes are the average of duplicate determinations. By standard convention, positive (no sign) flux is from the sediment into the overlying water; negative fluxes (-) are from the overlying water into the sediment. N/A, not applicable.
REVISION: 19-FEB-90

STATION	DATE	BOTTOM WATER TEMP (C)	CORE WATER TEMP (C)	CORE NO.	CORE VOL ml	DISSOLVED OXYGEN LS REGRESS. RATE OF CHANGE mgO2/(l*min)	DISSOLVED OXYGEN CORR. COEF. (r)	DISSOLVED OXYGEN NET SED-WAT FLUX gO2/(m2*day)	DISSOLVED OXYGEN AVG. NET SED-WAT FLUX gO2/(m2*day)	AMMONIUM - N LS REGRESS. RATE OF CHANGE umol/(l*min)	AMMONIUM - N CORR. COEF. (r)	AMMONIUM - N NET SED-WAT FLUX ug-atN/(m2*hr)	AMMONIUM - N AVG. NET SED-WAT FLUX ug-atN/(m2*hr)
PR	28-JUL-89	26.1	24.5	B	N/A	-0.003246	0.988			0.000000	0.516		
			24.5	1	1680	-0.010690	0.992	-1.3	-2.9	0.023222	0.993	168.4	278.5
			24.8	2	1920	-0.025968	0.978	-4.5		0.046889	0.987	388.6	
BT-1	28-JUL-89	24.8	23.5	B	N/A	-0.001722	0.990			0.000000	0.775		
			23.8	1	1740	-0.018849	0.993	-3.1	-2.6	0.048111	0.996	361.4	244.4
			23.5	2	1820	-0.012738	0.990	-2.1		0.016222	0.996	127.4	
SJ	27-JUL-89	24.1	24.3	B	N/A	-0.001254	0.988			0.000000	0.000		
			24.2	1	1540	-0.006063	0.990	-0.8	-0.7	0.006333	0.981	42.1	36.7
			24.6	2	2180	-0.004302	0.986	-0.7		0.003333	0.958	31.4	
BT-2	24-JUL-89	23.7	24.8	B	N/A	-0.000320	0.984			-0.003778	0.966		
			25.1	1	2370	-0.005659	0.992	-1.3	-1.4	0.008000	0.934	120.5	142.9
			25.0	2	1970	-0.007593	0.994	-1.5		0.015667	0.997	165.3	
SC	24-JUL-89	24.7	24.9	B	N/A	-0.000393	0.907			0.000000	0.135		
			25.0	1	1320	-0.004994	0.978	-0.6	-0.9	0.000000	0.775	0.0	0.0
			25.4	2	1810	-0.006686	0.987	-1.2		0.000000	0.000	0.0	
BT-3	27-JUL-89	24.4	24.6	B	N/A	-0.002709	0.967			0.000000	0.000		
			24.8	1	1720	-0.007406	0.994	-0.8	-0.8	0.014889	0.991	110.5	99.0
			24.5	2	1560	-0.007553	0.981	-0.8		0.013000	0.998	87.5	
NB	26-JUL-89	NO	23.9	B	N/A	-0.002135	0.977			0.000000	0.258		
		DATA	24.1	1	2010	-0.019500	0.997	-3.6	-3.5	0.065889	0.988	571.7	612.3
			23.8	2	1650	-0.021881	0.996	-3.4		0.091667	0.995	652.9	
BT-5	25-JUL-89	22.7	23.2	B	N/A	0.000000	0.886			0.000000	0.000		
			23.2	1	2030	-0.004476	0.986	-0.9	-0.8	0.006333	0.981	55.5	53.9
			23.5	2	1560	-0.004087	0.988	-0.7		0.007778	0.949	52.4	
BT-6A	25-JUL-89	19.2	23.4	B	N/A	-0.001103	0.979			0.000000	0.000		
			23.7	1	1960	-0.004675	0.982	-0.7	-0.8	0.004222	0.962	35.7	43.5
			23.3	2	2100	-0.005556	0.991	-1.0		0.005667	0.968	51.4	
BT-8	26-JUL-89	NO	23.2	B	N/A	0.000000	0.061			0.000000	0.000		
		DATA	23.3	1	1240	-0.003956	0.989	-0.5	-0.7	0.000000	0.000	0.0	0.0
			23.6	2	1610	-0.005093	0.985	-0.8		0.000000	0.000	0.0	

SEDIMENT-WATER FLUX MEASUREMENTS IN THE PECONIC BAY SYSTEM
SUFFOLK COUNTY, NY

FILENAME: PB1_FLUX.WK1 PART 2 OF 3

CONTENTS: Net sediment-water fluxes of dissolved constituents at Sediment Flux Stations. Table includes least squares linear regression slope and correlation coefficient for the net rate of change of dissolved constitiuents for each sediment-water flux calculation. Mean fluxes are the average of duplicate determinations. By standard convention, positive (no sign) flux is from the sediment into the overlying water; negative fluxes (-) are from the overlying water into the sediment. N/A, not applicable.

REVISION: 19-FEB-90

						NITRATE + NITRITE - N				NITRITE - N			
STATION	DATE	BOTTOM WATER TEMP (C)	CORE WATER TEMP (C)	CORE NO.	CORE VOL ml	LS REGRESS. RATE OF CHANGE umol/(l*min)	CORR. COEF. (r)	NET SED-WAT FLUX ug-atN/(m2*hr)	AVG. NET SED-WAT FLUX ug-atN/(m2*hr)	LS REGRESS. RATE OF CHANGE umol/(l*min)	CORR. COEF. (r)	NET SED-WAT FLUX ug-atN/(m2*hr)	AVG. NET SED-WAT FLUX ug-atN/(m2*hr)
PR	28-JUL-89	26.1	24.5	B	N/A	0.000000	0.054			0.000000	0.803		
			24.5	1	1680	-0.001411	0.952	-10.2	-11.8	0.000000	0.000	0.0	0.0
			24.8	2	1920	-0.001611	0.985	-13.4		0.000000	0.486	0.0	
BT-1	28-JUL-89	24.8	23.5	B	N/A	0.000122	0.947			0.000000	0.000		
			23.8	1	1740	0.002300	0.993	16.4	15.3	0.000644	0.972	4.8	5.2
			23.5	2	1820	0.001933	0.998	14.2		0.000711	0.990	5.6	
SJ	27-JUL-89	24.1	24.3	B	N/A	0.000000	0.068			0.000000	0.000		
			24.2	1	1540	0.000000	0.745	0.0	0.0	0.000222	1.000	1.5	0.7
			24.6	2	2180	0.000000	0.386	0.0		0.000000	0.674	0.0	
BT-2	24-JUL-89	23.7	24.8	B	N/A	0.000000	0.258			0.000000	0.316		
			25.1	1	2370	0.000289	0.943	3.0	7.9	0.000000	0.714	0.0	2.8
			25.0	2	1970	0.001500	0.999	12.8		0.000656	0.992	5.6	
SC	24-JUL-89	24.7	24.9	B	N/A	0.000000	0.000			0.000000	0.405		
			25.0	1	1320	0.000000	0.258	0.0	-0.7	0.000000	0.198	0.0	0.0
			25.4	2	1810	-0.000167	0.982	-1.3		0.000000	0.000	0.0	
BT-3	27-JUL-89	24.4	24.6	B	N/A	0.000000	0.744			0.000000	0.000		
			24.8	1	1720	0.002000	0.998	14.8	16.6	0.001144	0.998	8.5	9.2
			24.5	2	1560	0.002722	0.998	18.3		0.001467	1.000	9.9	
NB	26-JUL-89	NO	23.9	B	N/A	0.000000	0.446			0.000000	0.000		
		DATA	24.1	1	2010	0.000767	0.817	6.7	6.3	0.000000	0.258	0.0	0.0
			23.8	2	1650	0.000844	0.967	6.0		0.000000	0.258	0.0	
BT-5	25-JUL-89	22.7	23.2	B	N/A	0.000000	0.211			0.000000	0.000		
			23.2	1	2030	0.000000	0.249	0.0	0.0	0.000000	0.775	0.0	0.0
			23.5	2	1560	0.000000	0.647	0.0		0.000000	0.775	0.0	
BT-6A	25-JUL-89	19.2	23.4	B	N/A	0.000000	0.513			0.000000	0.405		
			23.7	1	1960	0.002200	0.982	18.6	16.0	0.000311	0.894	2.6	3.2
			23.3	2	2100	0.001478	0.990	13.4		0.000422	0.988	3.8	
BT-8	26-JUL-89	NO	23.2	B	N/A	0.000000	0.258			0.000000	0.000		
		DATA	23.3	1	1240	0.000467	0.917	2.5	1.2	0.000000	0.775	0.0	0.0
			23.6	2	1610	0.000000	0.526	0.0		0.000000	0.000	0.0	

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SEDIMENT-WATER FLUX MEASUREMENTS IN THE PECONIC BAY SYSTEM
SUFFOLK COUNTY, NY

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FILENAME: PB1_FLUX.WK1 PART 3 OF 3

CONTENTS: Net sediment-water fluxes of dissolved constituents at Sediment Flux Stations. Table includes least squares linear regression slope and correlation coefficient for the net rate of change of dissolved constitiuents for each sediment-water flux calculation. Mean fluxes are the average of duplicate determinations. By standard convention, positive (no sign) flux is from the sediment into the overlying water; negative fluxes (-) are from the overlying water into the sediment. N/A, not applicable.

REVISION: 19-FEB-90

						DISS. INORG. PHOS. - P				DISS. REACTIVE SILICATE - Si			
STATION	DATE	BOTTOM WATER TEMP (C)	CORE WATER TEMP (C)	CORE NO.	CORE VOL ml	LS REGRESS. RATE OF CHANGE umol/(l*min)	CORR. COEF. (r)	NET SED-WAT FLUX ug-atP/(m2*hr)	AVG. NET SED-WAT FLUX ug-atP/(m2*hr)	LS REGRESS. RATE OF CHANGE umol/(l*min)	CORR. COEF. (r)	NET SED-WAT FLUX ug-atSi/(m2*hr)	AVG. NET SED-WAT FLUX ug-atSi/(m2*hr)
PR	28-JUL-89	26.1	24.5	B	N/A	0.000000	0.854			-0.020778	0.943		
			24.5	1	1680	0.000000	0.775	0.0	16.9	-0.009444	0.903	82.2	188.0
			24.8	2	1920	0.004067	0.948	33.7		0.014667	0.997	293.8	
BT-1	28-JUL-89	24.8	23.5	B	N/A	0.000000	0.513			0.000000	0.725		
			23.8	1	1740	-0.000967	0.893	-7.3	-1.1	0.030778	0.985	231.2	237.8
			23.5	2	1820	0.000656	0.904	5.2		0.031111	0.914	244.4	
SJ	27-JUL-89	24.1	24.3	B	N/A	0.000000	0.400			0.000000	0.000		
			24.2	1	1540	-0.000389	0.813	-2.6	-2.8	0.018016	0.998	119.8	95.4
			24.6	2	2180	-0.000322	0.969	-3.0		0.007556	0.834	71.1	
BT-2	24-JUL-89	23.7	24.8	B	N/A	0.000000	0.894			0.000000	0.200		
			25.1	1	2370	0.000000	0.135	0.0	0.0	0.024400	0.977	249.6	346.4
			25.0	2	1970	0.000000	0.800	0.0		0.052111	0.974	443.1	
SC	24-JUL-89	24.7	24.9	B	N/A	0.000000	0.498			0.000000	0.552		
			25.0	1	1320	0.000000	0.923	0.0	0.0	0.000000	0.447	0.0	0.0
			25.4	2	1810	0.000000	0.227	0.0		0.000000	0.653	0.0	
BT-3	27-JUL-89	24.4	24.6	B	N/A	0.000000	0.058			0.000000	0.170		
			24.8	1	1720	0.000956	0.994	7.1	5.3	0.055222	1.000	410.0	329.2
			24.5	2	1560	0.000533	0.980	3.6		0.036889	0.956	248.4	
NB	26-JUL-89	NO	23.9	B	N/A	0.000000	0.058			0.000000	0.076		
		DATA	24.1	1	2010	0.001689	0.924	14.7	21.3	0.118556	0.998	1028.6	993.9
			23.8	2	1650	0.003933	0.986	28.0		0.134667	0.999	959.1	
BT-5	25-JUL-89	22.7	23.2	B	N/A	0.000000	0.316			0.000000	0.164		
			23.2	1	2030	0.000000	0.660	0.0	0.0	0.006111	0.964	53.5	53.7
			23.5	2	1560	0.000000	0.258	0.0		0.008000	0.980	53.9	
BT-6A	25-JUL-89	19.2	23.4	B	N/A	0.000000	0.513			0.000000	0.259		
			23.7	1	1960	0.000456	0.896	3.9	3.4	0.041444	0.957	350.6	320.4
			23.3	2	2100	0.000322	0.969	2.9		0.032000	0.992	290.1	
BT-8	26-JUL-89	NO	23.2	B	N/A	0.000000	0.775			0.000000	0.581		
		DATA	23.3	1	1240	-0.000378	0.966	-2.0	-1.0	0.000000	0.073	0.0	0.0
			23.6	2	1610	0.000000	0.653	0.0		0.000000	0.738	0.0	

SEDIMENT-WATER FLUX MEASUREMENTS IN THE PECONIC BAY SYSTEM
SUFFOLK COUNTY, NY

FILENAME: PB2_FLUX.WK1 PART 1 OF 3

CONTENTS: Net sediment-water fluxes of dissolved constituents at Sediment Flux Stations. Table includes least squares linear regression slope and correlation coefficient for the net rate of change of dissolved constitiuents for each sediment-water flux calculation. Mean fluxes are the average of duplicate determinations. By standard convention, positive (no sign) flux is from the sediment into the overlying water; negative fluxes (-) are from the overlying water into the sediment. N/A, not applicable.

REVISION: 11-Jun-90

STATION	DATE	BOTTOM WATER TEMP (C)	CORE WATER TEMP (C)	CORE NO.	CORE VOL ml	DISSOLVED OXYGEN LS REGRESS. RATE OF CHANGE mgO2/(l*min)	DISSOLVED OXYGEN CORR. COEF. (r)	DISSOLVED OXYGEN NET SED-WAT FLUX gO2/(m2*day)	DISSOLVED OXYGEN AVG. NET SED-WAT FLUX gO2/(m2*day)	AMMONIUM - N LS REGRESS. RATE OF CHANGE umol/(l*min)	AMMONIUM - N CORR. COEF. (r)	AMMONIUM - N NET SED-WAT FLUX ug-atN/(m2*hr)	AMMONIUM - N AVG. NET SED-WAT FLUX ug-atN/(m2*hr)
PR	27-OCT-90	14.10	13.9	B	N/A	-0.000500	0.993			0.000000	0.298		
			13.8	1	1440	-0.015524	0.999	-2.24	-2.32	0.024778	0.996	154.0	156.3
			13.8	2	1160	-0.020540	0.998	-2.41		0.031667	0.998	158.6	
BT-1	26-OCT-90	13.03	13.0	B	N/A	-0.000246	0.889			0.000000	0.513		
			13.0	1	1210	-0.008040	0.995	-0.98	-1.28		0.135		19.2
			13.5	2	1670	-0.009413	0.997	-1.59		0.002667	0.997	19.2	
SJ	26-OCT-90	12.96	13.0	B	N/A	0.000000	0.105			0.000000	0.405		
			12.9	1	1740	-0.003151	0.998	-0.57	-0.70	0.000778	0.718	5.8	2.9
			13.4	2	1745	-0.004563	0.991	-0.82		0.000000	0.000	0.0	
BT-2	25-OCT-90	12.88	12.9	B	N/A	-0.000198	0.964			0.000000	0.614		
			12.8	1	1880	-0.003278	0.999	-0.60	-0.59	0.002222	0.976	18.0	16.4
			13.0	2	1720	-0.003492	0.999	-0.59		0.002000	0.949	14.8	
SC-2	27-OCT-90	13.00	13.0	B	N/A	-0.000508	0.976			0.000000	0.775		
			13.1	1	1620	-0.002619	0.999	-0.35	-0.34	0.000000	0.000	0.0	0.0
			13.2	2	1420	-0.002675	0.998	-0.32		0.000000	0.000	0.0	
BT-3	25-OCT-90	13.06	13.1	B	N/A	-0.000198	0.988			0.000000	0.775		
			13.0	1	2100	-0.003143	0.999	-0.64	-0.69	0.001111	1.000	10.1	24.6
			13.0	2	1945	-0.003911	0.998	-0.75		0.004667	0.990	39.2	
NB	24-OCT-90	12.74	12.8	B	N/A	-0.000865	0.929			0.000000	0.775		
			12.8	1	1790	-0.007452	1.000	-1.22	-1.32	0.004000	0.991	30.9	41.1
			13.1	2	1980	-0.007825	0.998	-1.43		0.006000	0.970	51.3	
BT-5	23-OCT-90	13.18	14.5	B	N/A	0.000000	0.557			0.000000	0.258		
			14.5	1	1700	-0.004397	0.998	-0.77	-0.80	0.000167	0.982	1.2	6.4
			14.6	2	1720	-0.004619	0.998	-0.82		0.001556	0.990	11.5	
BT-6A	23-OCT-90	12.90	14.0	B	N/A	-0.000283	0.957			0.000000	0.000		
			14.1	1	1730	-0.005210	1.000	-0.88	-0.83	0.007889	0.999	58.9	52.6
			14.5	2	1790	-0.004454	0.999	-0.77		0.006000	0.996	46.4	
BT-8	24-OCT-90	12.62	13.1	B	N/A	-0.000595	0.961			0.000000	0.775		
			13.0	1	1900	-0.002857	0.995	-0.45	-0.40	0.000000	0.000	0.0	0.0
			13.2	2	1790	-0.002468	0.942	-0.35		0.000000	0.000	0.0	

SEDIMENT-WATER FLUX MEASUREMENTS IN THE PECONIC BAY SYSTEM
SUFFOLK COUNTY, NY

FILENAME: PB2_FLUX.WK1 PART 2 OF 3

CONTENTS: Net sediment-water fluxes of dissolved constituents at Sediment Flux Stations. Table includes least squares linear regression slope and correlation coefficient for the net rate of change of dissolved constitiuents for each sediment-water flux calculation. Mean fluxes are the average of duplicate determinations. By standard convention, positive (no sign) flux is from the sediment into the overlying water; negative fluxes (-) are from the overlying water into the sediment. N/A, not applicable.

REVISION: 11-Jun-90

STATION	DATE	BOTTOM WATER TEMP (C)	CORE WATER TEMP (C)	CORE NO.	CORE VOL ml	NITRATE + NITRITE - N: LS REGRESS. RATE OF CHANGE umol/(l*min)	NITRATE + NITRITE - N: CORR. COEF. (r)	NITRATE + NITRITE - N: NET SED-WAT FLUX ug-atN/(m2*hr)	NITRATE + NITRITE - N: AVG. NET SED-WAT FLUX ug-atN/(m2*hr)	NITRITE - N: LS REGRESS. RATE OF CHANGE umol/(l*min)	NITRITE - N: CORR. COEF. (r)	NITRITE - N: NET SED-WAT FLUX ug-atN/(m2*hr)	NITRITE - N: AVG. NET SED-WAT FLUX ug-atN/(m2*hr)
PR	27-OCT-90	14.10	13.9	B	N/A	0.000000	0.141			0.000000	0.757		
			13.8	1	1440	0.003956	0.989	24.6	26.5	0.000889	0.979	5.53	5.10
			13.8	2	1160	0.005689	0.999	28.5		0.000933	0.924	4.67	
BT-1	26-OCT-90	13.03	13.0	B	N/A	0.000000	0.135			0.000000	0.513		
			13.0	1	1210	0.001389	0.945	7.3	13.2	0.000167	0.939	0.87	1.80
			13.5	2	1670	0.002667	0.998	19.2		0.000378	0.943	2.72	
SJ	26-OCT-90	12.96	13.0	B	N/A	0.000000	0.520			0.000622	0.872		
			12.9	1	1740	0.000600	0.970	4.5	3.1	0.000478	0.998	-1.08	-2.88
			13.4	2	1745	0.000222	0.767	1.7		0.000000	0.467	-4.69	
BT-2	25-OCT-90	12.88	12.9	B	N/A	0.000000	0.830			0.000000	0.620		
			12.8	1	1880	0.000567	0.888	4.6	6.8	0.000456	0.996	3.70	2.67
			13.0	2	1720	0.001211	0.947	9.0		0.000222	0.877	1.65	
SC-2	27-OCT-90	13.00	13.0	B	N/A	0.000000	0.124			0.000000	0.868		
			13.1	1	1620	0.000000	0.000	0.0	0.0	0.000322	0.969	2.25	1.98
			13.2	2	1420	0.000000	0.598	0.0		0.000278	0.977	1.70	
BT-3	25-OCT-90	13.06	13.1	B	N/A	0.000000	0.822			0.000000	0.135		
			13.0	1	2100	0.000956	0.842	8.7	5.7	0.000311	0.978	2.82	1.41
			13.0	2	1945	0.000322	0.876	2.7		0.000000	0.049	0.00	
NB	24-OCT-90	12.74	12.8	B	N/A	0.000267	0.934			0.000000	0.894		
			12.8	1	1790	0.000000	0.076	-2.1	-2.2	0.000000	0.291	0.00	0.00
			13.1	2	1980	0.000000	0.058	-2.3		0.000000	0.283	0.00	
BT-5	23-OCT-90	13.18	14.5	B	N/A	0.000000	0.882			0.000000	0.455		
			14.5	1	1700	0.000000	0.788	0.0	0.0	0.000000	0.781	0.00	0.00
			14.6	2	1720	0.000000	0.718	0.0		0.000000	0.135	0.00	
BT-6A	23-OCT-90	12.90	14.0	B	N/A	0.000000	0.291			0.000000	0.564		
			14.1	1	1730	0.001500	0.983	11.2	11.7	0.000000	0.765	0.00	0.00
			14.5	2	1790	0.001578	0.986	12.2		0.000000	0.120	0.00	
BT-8	24-OCT-90	12.62	13.1	B	N/A	0.000000	0.000			0.000000	0.200		
			13.0	1	1900	-0.000756	0.996	-6.2	-4.6	0.000000	0.424	0.00	0.00
			13.2	2	1790	-0.000378	0.943	-2.9		0.000000	0.745	0.00	

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SEDIMENT-WATER FLUX MEASUREMENTS IN THE PECONIC BAY SYSTEM
SUFFOLK COUNTY, NY
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FILENAME: PB2_FLUX.WK1 PART 3 OF 3

CONTENTS: Net sediment-water fluxes of dissolved constituents at Sediment Flux Stations. Table includes least squares linear regression slope and correlation coefficient for the net rate of change of dissolved constitiuents for each sediment-water flux calculation. Mean fluxes are the average of duplicate determinations. By standard convention, positive (no sign) flux is from the sediment into the overlying water; negative fluxes (-) are from the overlying water into the sediment. N/A, not applicable.

REVISION: 11-Jun-90

						DISS. INORG. PHOS. - P				DISS. REACTIVE SILICATE - Si			
STATION	DATE	BOTTOM WATER TEMP (C)	CORE WATER TEMP (C)	CORE NO.	CORE VOL ml	LS REGRESS. RATE OF CHANGE umol/(l*min)	CORR. COEF. (r)	NET SED-WAT FLUX ug-atP/(m2*hr)	AVG. NET SED-WAT FLUX ug-atP/(m2*hr)	LS REGRESS. RATE OF CHANGE umol/(l*min)	CORR. COEF. (r)	NET SED-WAT FLUX ug-atSi/(m2*hr)	AVG. NET SED-WAT FLUX ug-atSi/(m2*hr)
PR	27-OCT-90	14.10	13.9	8	N/A	0.000000	0.814			0.000000	0.316		
			13.8	1	1440	0.000922	0.974	5.7	5.6	0.015222	1.000	94.6	134.4
			13.8	2	1160	0.001100	0.991	5.5		0.034778	0.999	174.1	
BT-1	26-OCT-90	13.03	13.0	8	N/A	0.000000	0.447			0.000000	0.258		
			13.0	1	1210	0.000000	0.611	0.0	0.0	0.000000	0.281	0.0	0.0
			13.5	2	1670	0.000000	0.378	0.0		0.000000	0.193	0.0	
SJ	26-OCT-90	12.96	13.0	8	N/A	0.000000	0.258			-0.002778	0.977		
			12.9	1	1740	-0.000133	0.894	-1.0	-0.5	0.008333	0.982	83.5	80.2
			13.4	2	1745	0.000000	0.316	0.0		0.007444	0.999	77.0	
BT-2	25-OCT-90	12.88	12.9	8	N/A	0.000000	0.258			-0.001111	1.000		
			12.8	1	1880	0.000244	0.898	2.0	2.1	0.012778	0.997	112.7	118.6
			13.0	2	1720	0.000300	0.996	2.2		0.015667	0.999	124.6	
SC-2	27-OCT-90	13.00	13.0	8	N/A	0.000000	0.135			0.000000	0.775		
			13.1	1	1620	0.000000	0.564	0.0	0.0	0.000000	0.167	0.0	-18.7
			13.2	2	1420	0.000000	0.303	0.0		-0.006089	0.904	-37.3	
BT-3	25-OCT-90	13.06	13.1	8	N/A	0.000000	0.775			0.000000	0.592		
			13.0	1	2100	0.000000	0.524	0.0	0.0	0.013444	0.986	121.9	142.1
			13.0	2	1945	0.000000	0.640	0.0		0.019333	0.994	162.3	
NB	24-OCT-90	12.74	12.8	8	N/A	0.000000	0.405			0.000000	0.165		
			12.8	1	1790	0.000000	0.200	0.0	2.1	0.045111	0.999	348.6	409.3
			13.1	2	1980	0.000489	0.853	4.2		0.055000	0.995	470.1	
BT-5	23-OCT-90	13.18	14.5	8	N/A	0.000000	0.923			0.000000	0.351		
			14.5	1	1700	0.000000	0.601	0.0	0.0	0.018056	0.984	132.5	106.2
			14.6	2	1720	0.000000	0.894	0.0		0.010772	0.998	80.0	
BT-6A	23-OCT-90	12.90	14.0	8	N/A	0.000000	0.944			0.000000	0.708		
			14.1	1	1730	0.000478	0.968	3.6	3.5	0.028489	0.976	212.7	182.4
			14.5	2	1790	0.000444	0.948	3.4		0.019667	1.000	152.0	
BT-8	24-OCT-90	12.62	13.1	8	N/A	0.000144	0.983			0.000000	0.093		
			13.0	1	1900	-0.000322	0.929	-3.8	-2.5	-0.003233	0.963	-26.5	-19.4
			13.2	2	1790	0.000000	0.258	-1.1		-0.001600	0.963	-12.4	