INTERSTATE SANITATION COMMISSION

A TRI-STATE ENVIRONMENTAL AGENCY

1980

ANNUAL REPORT

NEW YORK NEW JERSEY CONNECTICUT

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R E P O R T

OF THE

INTERSTATE SANITATION COMMISSION

ON THE
WATER POLLUTION CONTROL ACTIVITIES
AND THE
INTERSTATE AIR POLLUTION PROGRAM

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10 COLUMBUS CIRCLE • NEW YORK, N.Y. 10019

AREA CODE 212-582-0380

January 23, 1981

To His Excellency, Brendan T. Byrne
His Excellency, Hugh L. Carey
His Excellency, William A. O'Neill
and the Legislatures of the States of New Jersey,
New York, and Connecticut

Your Excellencies:

The Interstate Sanitation Commission respectfully submits its report for the year 1980.

The members of the Commission are confident that with the continued support of the Governors and the members of the Legislatures, the Commission will maintain active and effective water and air pollution abatement programs.

Respectfully submitted,

For the State of New York — Chairman

For the State of Connecticut — Vice Chairman

For the State of New Jersey — Vice Chairman

* Resigned

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C O N T E N T S

I L L U S T R A T I O N S

I. SUMMARY OF ACTIVITIES

In 1936, the Interstate Sanitation Commission was formed by a compact between the States of New York and New Jersey for the abatement of existing water pollution and the control of future water pollution in tidal waters of the New York Metropolitan Area. The State of Connecticut joined the Commission in 1941. In 1962, air pollution was added to the scope of the Commission's activities. In 1970, the Commission was designated as the official planning and coordinating agency for the New Jersey-New York-Connecticut Air Quality Control Region.

This report, which is prepared each year, provides a record of the water and air pollution activities of the Interstate Sanitation Commission on technical assistance, planning, laboratory analysis, monitoring and coordination of interstate problems to promote the construction of water pollution control projects within the Interstate Sanitation District.

WATER POLLUTION

The Commission's water pollution abatement program focused on providing assistance to effectively coordinate approaches on a regional basis. Attention was given to projects relating to minimizing the effects of combined sewers, pretreatment of industrial wastes, enforcement, thermal pollution, and removal of oil from District waters.

It is estimated that more than $3.16 billion has been allocated by municipalities in the District for planning and construction on projects for the abatement of pollution from municipal and industrial wastewaters discharging into District waters.

The Commission continued its water quality boat survey program in the District. This program is intensified during the critical summer months when two surveys per month are conducted. In conjunction with the boat surveys, biological sampling programs were conducted. The Commission also continued operation of its remote automatic water quality monitoring system. This system is made up of both Commission owned equipment and equipment leased from the U.S. Environmental Protection Agency. This report contains graphs showing the monthly minimum, maximum, and average values for temperature, conductivity, dissolved oxygen, and pH for each monitor location. The data obtained from the Commission's sampling activities indicate that there was little change over the previous 12 months. District waters are still degraded by low dissolved oxygen values, high bacterial contamination and high temperatures. The waters are also fouled by oil and grease and heavy metals.

As part of an ongoing program, the Commission continued to cooperate with the states and other enforcement agencies. The Commission worked with the 208 agencies throughout the region by suppling these agencies with technical assistance and data. Other areas of cooperation included: monitoring municipal and industrial plants to check compliance with N/SPDES permits, performing laboratory analyses for state and federal agencies, and assisting the states in certifying discharges into District waters.

The Commission was awarded a contract by NOAA and work commenced in the latter part of 1980. The purpose of the project is to provide a description and analysis of present water quality in the Hudson-Raritan Estuary and to suggest the water quality management measures necessary to place and maintain the Estuary waters in satisfactory condition.

AIR POLLUTION

The Commission continued to coordinate the Air Pollution Warning System in the New Jersey-New York-Connecticut Air Quality Control Region. Other air pollution activities included the continued monitoring of ambient benzene over the metropolitan area and working with state personnel to reduce the incidents of odor complaints.

An effort to alleviate the causes of odors in the Region resulted in the Comission conducting a special 24 hour-a-day surveillance during June. The Commission worked closely with state and local officials having enforcement jurisdiction not only during the special survey but throughout the year.

Due to the concern of much of the region over the potential health effects of benzene in the atmosphere, the Commission in cooperation with the Environmental and Health Departments of its member states continued a study to determine the levels of benzene in the ambient atmosphere within the region. Twelve sampling sites in the study area yielded benzene values ranging from 0.0 to 23.3 ppb with 90% of the values less than 4.5 ppb. Details of the study (including the data collected) are presented in this report.

II. WATER POLLUTION

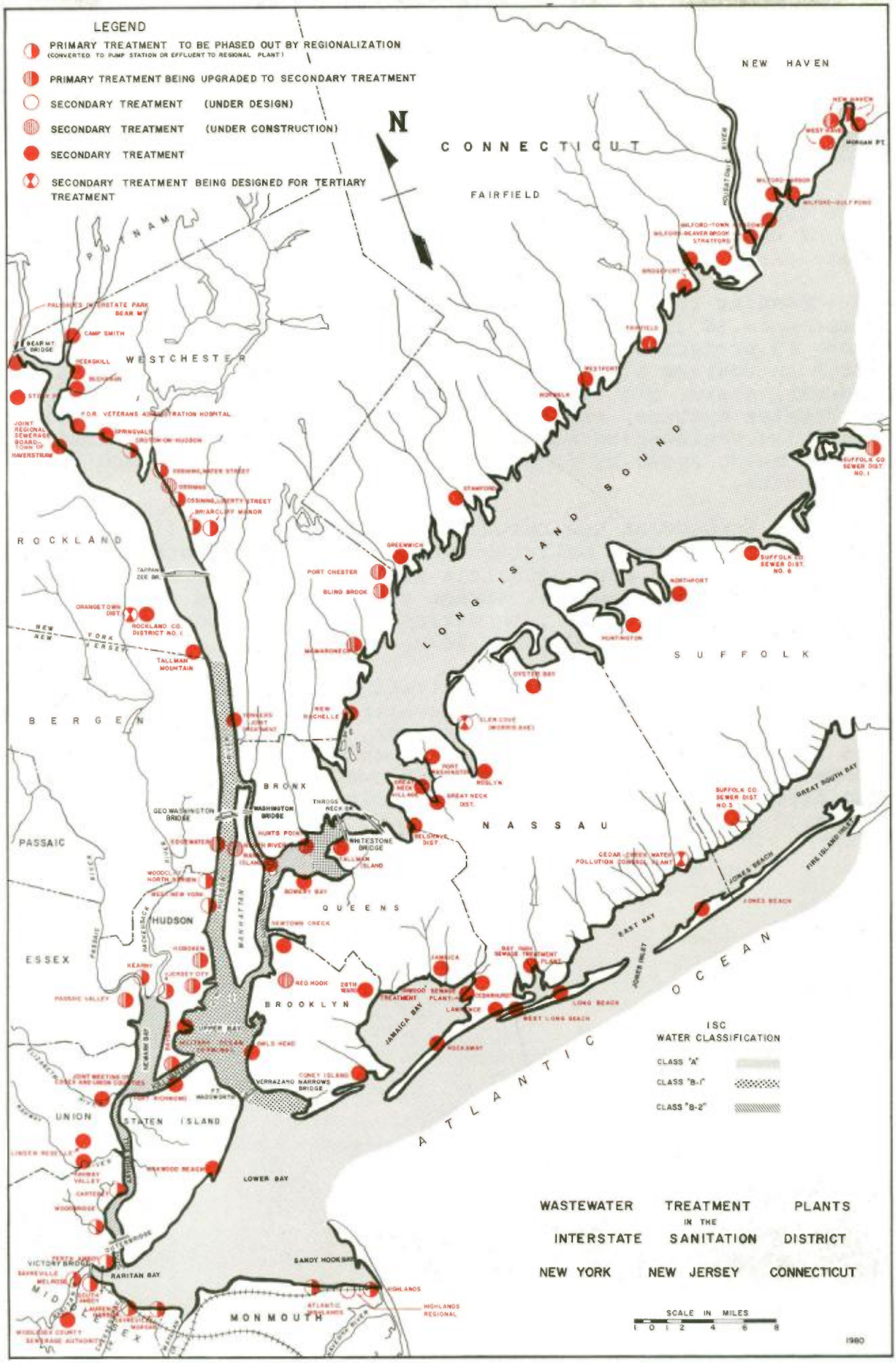
GENERAL

During 1980, a total of 119 water pollution control projects were completed, continued, or planned for the expansion of capacity or upgrading of treatment within the Interstate Sanitation District.

Funding for these projects totaled more than $3.16 billion. There were 36 projects completed this year at a cost of $730 million, 49 projects in progress costing $1.37 billion and 34 future projects costing at least $1.06 billion. These expenditures of federal, state, and local funds are for construction of new wastewater systems, expansion and upgrading of exisiting facilities, and engineering studies. These statistics do not include monies being spend by industries for in-plant changes and treatment units.

The Commission has obtained the technical and fiscal information for the water pollution control projects described in the following section from officials within respective state and local government agencies, sewage authorities, and consulting engineering firms. The information in this section is that which was available through October 1979.

A map of the Interstate Sanitation District on the following page shows the locations of wastewater treatment plants which discharge into the District waterways, the type of treatment and and status of each plant, and the Commission's water classifications. Information pertaining to flows, tributary population, and dates of construction for these plants is contained in Appendix A.


LEGEND
PRIMARY TREATMENT TO BE PHASED OUT BY REGIONALIZATION
(CONVERTED TO PUMP STATION OR EFFLUENT TO REGIONAL PLANT)
PRIMARY TREATMENT BEING UPGRADED TO SECONDARY TREATMENT
SECONDARY TREATMENT (UNDER DESIGN)
SECONDARY TREATMENT (UNDER CONSTRUCTION)
SECONDARY TREATMENT
SECONDARY TREATMENT BEING DESIGNED FOR TERTIARY TREATMENT
N
CONNECTICUT
NEW HAVEN
FAIRFIELD
WESTCHESTER
ROCKLAND
BERGEN
PASSAIC
HUDSON
ESSEX
UNION
MIDDLESEX
MONMOUTH
BRONX
QUEENS
BROOKLYN
STATEN ISLAND
NASSAU
SUFFOLK
LONG ISLAND SOUND
ATLANTIC OCEAN
HUDSON RIVER
EAST RIVER
JAMAICA BAY
RARITAN BAY
LOWER BAY
ISC
WATER CLASSIFICATION
CLASS "A"
CLASS "B-1"
CLASS "B-2"
WASTEWATER TREATMENT PLANTS
IN THE
INTERSTATE SANITATION DISTRICT
NEW YORK NEW JERSEY CONNECTICUT
SCALE IN MILES
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1980

CONNECTICUT WATER POLLUTION CONTROL PLANTS

Bridgeport - East Side Plant, Connecticut

Projects in Progress

Comments found under engineering studies for the West Side Plant also apply to this plant.

Bridgeport - West Side Plant, Connecticut

Completed Project

The Trumbull interceptor has been completed and is in service.

Projects in Progress

Laterals to the Trumbull interceptor continue to be installed. The cost of both interceptor and laterals is $20 million.

The 201 engineering study will identify and recommend remedies to problems in Bridgeport which have existed since the 1973 upgrading. The study will also include an evaluation of the present sewer system.

Fairfield, Connecticut

Completed Project

A major sewering project which has expanded the plant's drainage basin was completed. It consisted of the installation of three interceptors totaling 6 miles and 29 miles of laterals at a cost of $18 million.

Project in Progress

A 201 Step I grant of $250,000 has been allocated for a three part engineering study. This study will include the investigation of a digested sludge handling facility with methods of sludge disposal, an infiltration/inflow study, and an examination of the integrity of the plant outfall line.

Future Project

Construction of a building and all equipment necessary for digested sludge dewatering will be installed at an estimated cost of $650,000.

Greenwich Central, Connecticut

Completed Project

Phase IIA of the 201 study which consisted of smoke testing and flow analysis of the sewer system was completed at a cost of $535,000.

Engineering studies and designs for the North Mianus sewer project have been completed.

Project in Progress

The Byram Shore Road sewer project which started in the spring of 1979 is now 55% complete and is expected to cost $3.1 million.

Future Projects

Phase IIB of the 201 study will commence when funding becomes available. It will consist of television inspections and rehabilitation of sewer lines at an estimated cost of $900,000.

The North Mianus sewer project consists of sewering residential and industrial properties and the construction of two tunnels (600 feet and 900 feet). The project is expected to cost $5.5 million and will begin when funded.

Milford - Beaver Brook, Connecticut

Future Project

The 201 study completed in 1978 recommended that the plant be upgraded to 3.2 MGD and include scum decanting facilities and other modifications. The anticipated cost for this project is $500,000.

Milford - Gulf Pond, Connecticut

Future Projects

All existing Milford plants, except Beaver Brook, are to be phased out. A new $16.3 million plant is to be constructed on the Housatonic River to receive the flows of the three phased out plants.

A grant has been awarded for construction of a collection system for the Housatonic River plant. The collection system will consist of 19,000 feet of interceptor lines and 38,000 feet of force main at an estimated cost of $14.7

million.

Milford - Harborside, Connecticut

Future Project

Refer to description of project at Milford - Gulf Pond.

Milford - Town Meadows, Connecticut

Future Project

Refer to description of project at Milford - Gulf Pond.

New Haven - Boulevard, Connecticut

Future Project

Plans to phase out the Boulevard and East Street plants were submitted to and approved by both the U. S. Environmental Protection Agency and the State of Connecticut Department of Environmental Protection. Pump stations will be constructed at these sites and their flows will be diverted to the East Shore plant.

New Haven - East Shore, Connecticut

Completed Project

The 40 MGD secondary activated sludge plant was completed and is operational. The plant is designed for 95% removal of BOD and TSS and was built at a cost of $33 million.

New Haven - East Street, Connecticut

Refer to New Haven - Boulevard discussion.

Norwalk, Connecticut

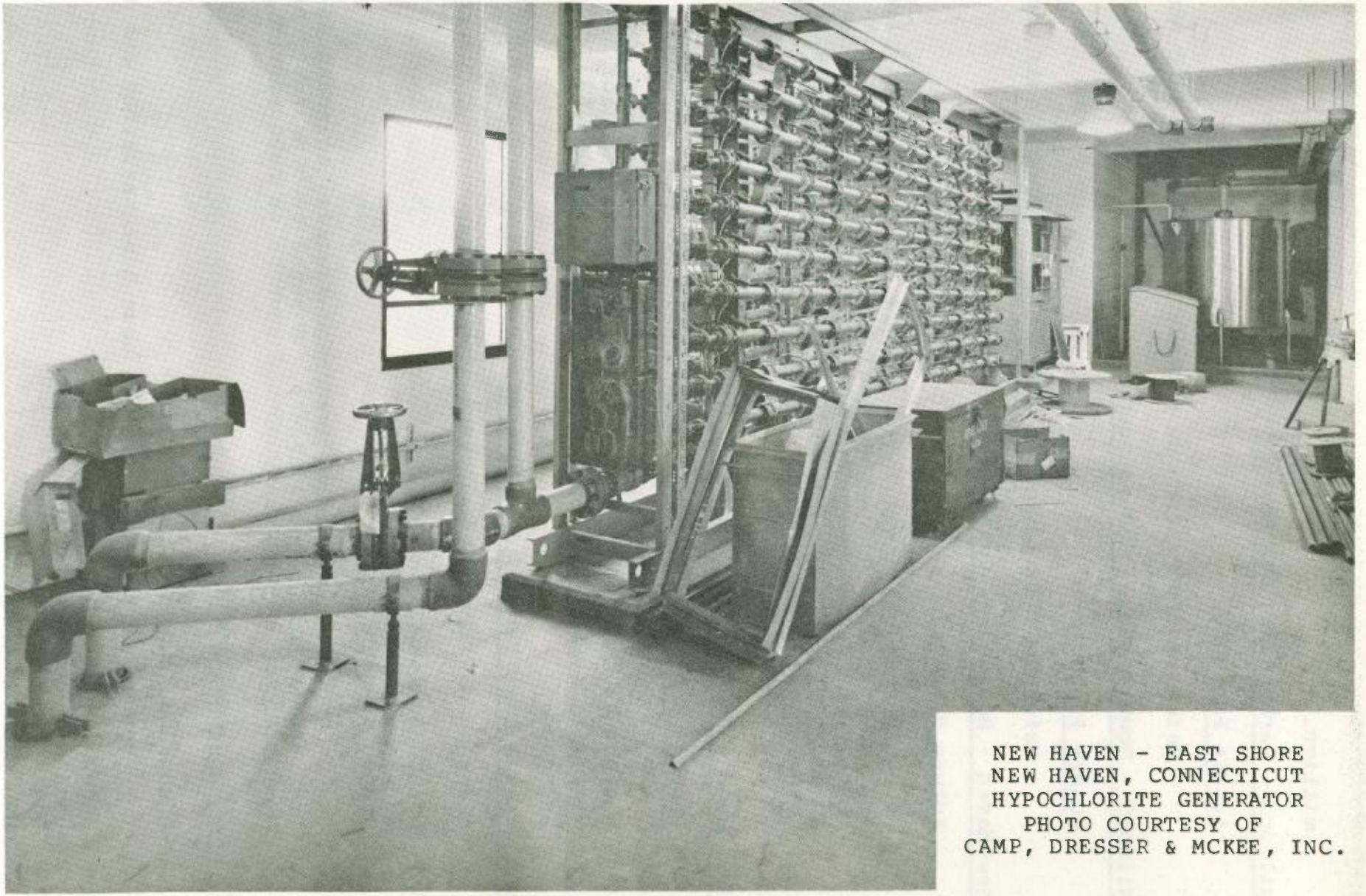
Project in Progress

A 75 MGD supplemental treatment facility to treat excess stormwater is 99% complete. Several on-line tests have been made and the facility should soon be in full service.

Stamford, Connecticut

Completed Project

Two belt dewatering presses have been installed and are



NEW HAVEN - EAST SHORE
NEW HAVEN, CONNECTICUT
HYPOCHLORITE GENERATOR
PHOTO COURTESY OF
CAMP, DRESSER & MCKEE, INC.

operating. These units dewater sludge prior to incineration.

Project in Progress

Upgrading of one pump station has begun and several others are in the design phase for upgrading and rebuilding.

Future Project

The Rippowom River interceptor project has been postponed and will resume at a later date.

Stratford, Connecticut

Completed Project

Two new pump stations at Short Beach and Oak Bluff and the Lordship interceptor and associated pump stations were completed at a cost of $3.8 million.

Project in Progress

Construction of a forced aeration static pile sludge composting facility began in the fall of 1980. It will include a concrete pad, screener, forced feed loader, shredder and associated equipment. The estimated cost for this project is $990,000.

Future Projects

Installation of a new gravity thickener, screw press dewatering facility and modifications at the plant await approval and funding. The estimated cost is $1.7 million.

Work will begin shortly on the refurbishment of two pump stations at a cost of $720,000.

West Haven, Connecticut

Projects in Progress

Engineering studies are in progress for outfall line upgrading with an extension tc Long Island Sound and plant expansion for anticipated flow from the Town of Orange.

Westport, Connecticut

Completed Project

A sewer system evaluation study was completed.

Future Project

Funding is being requested for upgrading sewer lines and four pump stations.

NEW JERSEY WATER POLLUTION CONTROL PLANTS

Atlantic Highlands, New Jersey (Monmouth County)

Refer to Atlantic Highlands/Highlands Regional Sewerage Authority.

Atlantic Highlands/Highlands Regional Sewerage Authority, New Jersey (Monmouth County)

Completed Project

An Environmental Impact Statement is 99% complete and its report will be issued soon. This EIS and a 201 Facilities Plan will determine alternatives for new plant sites, design and community tie-ins. The other communities involved in these studies are Highlands and Atlantic Highlands.

Future Projects

It is proposed that the primary plant in the Highlands community will be eventually phased out. The diverted flows will be treated by the Regional Sewerage Authority.

At Atlantic Highlands, applications for plant rehabilitation have been submitted to the State for approval. The cost of this project is estimated to be $1.5 million. The start of construction is scheduled to be during the spring of 1982. Like the Highlands community, Atlantic Highlands will eventually divert their flows to the Regional Sewerage Authority.

Bayonne, New Jersey (Hudson County)

Future Projects

A contract grant has been awarded for the upgrading and expansion design for this facility. An estimate of $30 million has been made in order to upgrade this primary plant to a secondary activated sludge plant and expand from 10 MGD to 11 MGD. An additional estimate of $1.5 million will be needed in order to rehabilitate regulators and tide gates. This facility is part of the Hudson County Regional Sewerage Authority.

Carteret, New Jersey (Middlesex County)

Completed Project

A Step I 201 Facilities Plan study has been completed.

As a result of this study, an application is pending for a Step II, CSO study.

Future Projects

An estimate of $750,000 has been made to rehabilitate the diversion chambers. The funds will be dependent upon the findings of the aforementioned Step II grant.

Eventually, this facility will be abandoned and converted to a pump station. At that time, the flow will be diverted to the Middlesex County Sewerage Authority treatment plant. An estimate of $15.1 million has been made for this project.

Edgewater, New Jersey (Bergen County)

Project in Progress

Federal monies in the sum of $470,000 have been awarded to fund a Phase I 201 Facilities Plan study. The project is about 60% complete.

Future Project

An estimate of $8 million has been made for upgrading this primary plant to a secondary plant with rotating biological contactors. It has been determined that an additional $800,000 will be needed for existing pump station rehabilitation.

Highlands, New Jersey (Monmouth County)

Refer to Atlantic Highlands/Highlands Regional Sewerage Authority.

Hoboken, New Jersey (Hudson County)

Future Project

This primary plant is to be upgraded to secondary treatment. It will incorporate a deep trickling filter system and will serve portions of West New York and North Bergen as well as Hoboken. Hoboken is located in Area III of the Hudson County Regional Sewerage Authority.

Hudson County Regional Sewerage Authority, New Jersey (Hudson County)

Completed Project

A Step I 201 Facilities Plan has been completed and a report has been issued.

Projects in Progress

Several engineering studies are underway which include a Step II design project, a sludge disposal study and an industrial waste pretreatment study.

Future Projects

There are three drainage basins regulated by the Authority. All the major facilities will be upgraded to secondary treatment: Jersey City - East (Area I), Bayonne (Area II), and Hoboken (Area III). The Secaucus facility (Area I) which presently utilizes a secondary treatment system, calls for minor repair work. The other communities under the Authority's district are Jersey City - West, western North Bergen, Kearny Point, and the western slope of Union City in Area I; and Weehawken, eastern Union City, and West New York in Area III. Total construction costs are expected to be about $250 million. This work is expected to begin in late 1981.

Jersey City - East, New Jersey (Hudson County)

Projects in Progress

Funds have been awarded to determine alternatives for upgrading this facility from primary to secondary treatment. It is planned that the upgraded plant will service Jersey City, sections of Union City, North Bergen, and Secaucus. This plant is part of the Hudson County Regional Sewerage Authority.

Jersey City - West, New Jersey (Hudson County)

Projects in Progress

Funds have been awarded to determine alternatives for upgrading this facility from primary to secondary treatment. This plant is part of the Hudson County Regional Sewerage Authority.

Joint Meeting of Essex and Union Counties, New Jersey (Union County)

Project in Progress

An engineering study to determine the sludge dewatering and solids handling requirements of this plant is underway.

Kearny, New Jersey (Hudson County)

Completed Project

A Facilities Design study has been completed for this sewage treatment plant. The study recommended that flows should be diverted to the Passaic Valley Sewerage Commissioners' treatment plant.

Future Project

As a result of the approval of the Kearny Facilities Design study by the Hudson County Regional Sewerage Authority and the Passaic Valley Sewerage Commissioners, this plant will be converted to a pump station so that flows may be treated by Passaic Valley. An estimate of $8 million has been made to complete all construction (pump station and force main).

Linden Roselle Sewerage Authority, New Jersey (Union County)

Completed Project

Upgrading and expansion to a 17 MGD secondary activated sludge plant was completed at a cost of $26 million. The newly installed units include primary tanks, roughing filters, secondary aeration tanks, final clarifiers, sludge thickeners and digesters.

Middlesex County Sewerage Authority, New Jersey (Middlesex County)

Projects in Progress

An engineering study to determine alternatives for sludge dispcsal is underway. Concurrently, a sewer system evaluation survey is being conducted.

Future Project

Pending design and construction grants by the federal and State governments, several Middlesex County communities will tie into this facility. The estimated cost of this

sewering project is $84.5 million.

Military Ocean Terminal, New Jersey (Hudson County)

Project in Progress

Construction to establish a flow equalization basin and ships' waste disposal collection system is underway. The project is 40% complete with an estimated final cost of $950,000. The new units to be installed include a force main, ship connections at dockside, and a flow equalization basin. Concurrently, an engineering study is underway to determine the feasibility of joining this facility with the Hudson County Regional Sewerage Authority.

Old Bridge Township, New Jersey (Middlesex County)

Project in Progress

A Step II 201 study is in the final stages of completion. The final report is expected to be issued early in 1981.

Future Project

This primary treatment plant will be phased out and converted to a pump station. The diverted flows will be treated by the Middlesex County Sewerage Authority. An estimate of $8 million has been made to complete construction (pump station and force main).

Passaic Valley Sewerage Commissioners, New Jersey (Essex County)

Project in Progress

Passaic Valley Sewerage Commissioners are in the midst of a major construction program to enlarge and upgrade their waste treatment plant. As of September 1, 1980, construction valued at approximately $324 million was underway. This first phase of the construction program, which is about 76% complete, includes the secondary portion of a pure oxygen activated sludge plant, a wet air oxidation sludge treatment system and a new main pumping station. The secondary phase of the plant will be placed into operation in 1981, at which time the existing primary settling basins are to be demolished and new primary clarifiers are to be constructed by mid-1984. It is expected that the total cost of the program will approximate $400 million.

Future Project

Work is continuing on the development of an effective land based sludge management program in order to meet the federal requirement to eliminate ocean disposal of sludge by December 31, 1981. The contracts for the construction of sludge filter presses are on schedule. In addition, a proposal for the construction of a fluidized bed incinerator with energy recovery is currently pending before the federal and State regulatory agencies.

Perth Amboy, New Jersey (Middlesex County)

Completed Project

A Step I 201 Facilities Plan study has recently been completed. The Step II phase of the study is awaiting contract funding.

Future Project

This primary treatment plant will be converted to a pump station and the flows will be treated by the Middlesex County Sewerage Authority. It is estimated that $6.25 million will be necessary to complete construction (pump station and force main).

Rahway Valley Sewerage Authority, New Jersey (Middlesex County)

Completed Project

A 201 Facilities Plan study has recently been completed and a report on the findings will be issued shortly.

Project in Progress

An infiltration/inflow study is currently underway. This study will weigh alternatives on how to reduce plant flow.

Future Project

Plans are being made for a $12 million sludge dewatering system. Construction aspects of this project will include six belt filter presses, a collection system, meter rehabilitation and supervisory office facilities.

Sayreville - Melrose and Morgan Plants, New Jersey (Middlesex County)

Project in Progress

An engineering study is underway to determine the best alternatives for a sewer collection system.

Future Project

Both primary plants will be converted into pump stations and the flows will be treated by the Middlesex County Sewerage Authority. The total cost for all the necessary construction is expected to be $4 million.

South Amboy, New Jersey (Middlesex County)

Future Project

It is proposed that this primary plant be converted to a pump station with its flows diverted to the Middlesex County Sewerage Authority. The total cost for all necessary construction is expected to be $25 million. This estimate also includes construction for the Woodbridge phase of this project.

West New York, New Jersey (Hudson County)

Completed Project

A 201 Facilities Plan study was completed in May 1980 and approved by the Hudson County Regional Sewerage Authority.

Project in Progress

Construction is underway for general plant rehabilitation and improvement.

Future Project

It is proposed that the flows from this plant will be diverted to the Hoboken facility. This interim step will be followed by combined flows of both plants to be treated by the Hudson County Regional Sewerage Authority plant in Hoboken. Total construction costs will be about $35 million.

Woodbridge, New Jersey (Middlesex County)

Project in Progress

A 201 Facilities Plan study is in progress.

Future Project

It is proposed that this primary plant be converted to a pump station and a new interceptor built to divert flows to the Middlesex County Sewerage Authority. The total cost for all necessary construction is expected to be $25 million. This estimate includes construction for the South Amboy phase of this project.

Woodcliff - North Bergen, New Jersey (Hudson County)

Project in Progress

Engineering studies are being conducted to assess all regulator conditions, locate and identify discharges and monitor plant flows. Concurrently, an O & M study is underway.

Future Project

It is proposed that the flow from this facility will be treated in part by the Hoboken and Jersey City - East plants. This plant is part of the Hudson County Regional Sewerage Authority.

NEW YORK WATER POLLUTION CONTROL PLANTS

Bay Park Sewage Treatment Plant - Disposal District No. 2, New York (Nassau County)

Completed Project

The sludge flotation building updating was completed.

Prcjects in Progress

Construction of a new digester, two storage tanks, and rehabilitation of existing tanks began and is about 25% complete. New digester covers are being fabricated on site. The cost of the project is estimated at $12 million.

The following studies are in progress: the 201 study, a sludge management plan and an ocean outfall route selection report.

Future Projects

A $90 million plant expansion to 70 MGD is proposed. The project includes the addition of secondary treatment units, a fluidized bed unit and an ocean outfall.

A proposed sewer rehabilitation project is estimated to cost $6.5 million.

Blind Brook, New York (Westchester County)

Completed Project

The sludge force main connecting the Blind Brook and Port Chester plants is approximately 99% complete. The cost of this project was $2.6 million.

Project in Progress

Construction for upgrading this primary plant to a secondary activated sludge plant is about 85% complete. The estimated cost for this project is $14 million.

Future Project

Bids are expected shortly for construction of a new outfall line which will handle the increased flow. The estimated cost for this project is $6 million.

Bowery Bay, New York (Queens County)

Completed Project

While awaiting approval of a Step I 201 Facilities Plan application, remedial corrections have been made by New York City plant personnel that have enabled this plant to operate in the step aeration mode.

Future Project

A plan of study has been submitted for approval prior to submission of a Step I 201 Facilities Plan application to correct some plant operational deficiencies.

Briarcliff Manor - River Road and Scarborough Dock Plants, New York (Westchester County)

Future Project

The septic tanks at River Road and Scarborough Dock will be abandoned. The flows from these locations will be diverted to the new regional plant being constructed in Ossining by the Westchester County Department of Public Works.

Cedar Creek Water Pollution Control Plant - Disposal District No. 3, New York (Nassau County)

Completed Project

The tertiary wastewater treatment pilot plant was completed and provides 99% removal of BOD and TSS for 5.5 MGD of the present secondary effluent.

Project in Progress

An $8 million project to upgrade the sludge handling facilities includes new polymer feeders, belt filter presses, and conveyors. This project is 11% complete.

Future Project

Construction of a sludge composting (aerated pile method) facility costing $10 million is proposed.

Clevepak Corporation, New York (Rockland County)

Project in Progress

A study is underway to investigate methods for re-

ducing wastewater volume and increasing plant efficiency.

Coney Island, New York (Kings County)

Project in Progress

The infiltration/inflow study and the Step I 201 Facilities Report are substantially complete.

Future Project

Based upon the results of the infiltration/inflow study and the Step I 201 Facilities Report an upgraded plant will be designed to provide 90% removals of BOD and suspended solids. Consulting engineers have been selected and a contract is being negotiated. An application for Step II Design has been submitted for approval.

Conrail - Harmon Shops, New York (Westchester County)

Projects in Progress

A study to evaluate treatment and recommend additional facilities to eliminate oil spills is underway.

Two sludge drying beds are being installed and a flow meter is being added.

Croton-on-Hudson, New York (Westchester County)

Future Project

Upon completion of the Westchester County Regional plant currently under construction in Ossining, this plant will be converted to a 1.5 MGD pumping station and its flow diverted to the new plant.

Freeport, New York (Nassau County)

Completed Project

On January 15, 1980, this plant was closed and its flow diverted to the Nassau County Disposal District No. 3 Plant at Cedar Creek.

Gateway National Park (Floyd Bennett Field), New York (Kings County)

Future Projects

Repiping of the digester and the installation of a new

boiler and laboratory facilities are proposed.

Glen Cove, New York (Nassau County)

Project in Progress

Construction continues for the upgrading and expansion of this plant to an 8 MGD activated sludge plant. Work is about 90% complete and is expected to be finished in the spring of 1981 at a cost of $23 million.

Great Neck District, New York (Nassau County)

Project in Progress

This plant is presently converting from the use of gas chlorination to sodium hypochlorite at an estimated cost of $122,000.

Great Neck Village, New York (Nassau County)

Completed Project

Several pump stations serving this plant have been rehabilitated and pumps were replaced. The cost for this project was $111,000.

Project in Progress

An inflow/infiltration study is being conducted under a 201 study grant.

Hunts Point, New York (Bronx County)

Completed Project

While awaiting approval of a Step I 201 Facilities Plan application, plant personnel have rehabilitiated the mechanical mixers in the digestion tanks and have increased the capture of grit which was being deposited in the thickeners and digesters and was hindering normal plant operation.

Projects in Progress

Several programs were started to improve the technical level of plant personnel, the work environment and operating logistics.

Future Project

A plan of study has been submitted for approval prior to submission of a Step I 201 Facilities Plan application to correct some plant deficiencies and improve reliability.

Jamaica, New York (Queens County)

Completed Project

The upgrading to step aeration of this 100 MGD plant is substantially complete (99+%). Only a few small items remain to complete this project.

The cost of this upgrading and expansion was $32 million.

Jones Beach, New York (Nassau County)

Completed Project

An aluminum cover was installed over the trickling filter at a cost of $51,000.

Future Projects

It is proposed to rehabilitate the digester, digester building, trickling filter and clarifiers and to replace the main sewer pumps at an estimated cost of $317,000.

Long Island Lighting Company, Glenwood Landing, New York, (Nassau County)

Completed Project

A holding tank has been installed to retain all sanitary waste. The discharge of sanitary wastes to the adjacent waterway has ceased.

Mamaroneck, New York (Westchester County)

Project in Progress

Alternate methods for a secondary activated sludge plant are being considered. The existing primary plant is under orders to upgrade to secondary treatment.

New Rochelle, New York (Westchester County)

Completed Project

Construction to upgrade the current primary plant to a a secondary activated sludge (pure oxygen) plant is approximately 99% complete. New treatment units include final settling tanks and sludge processing facilities. The cost for this project was $22 million.

Project in Progress

A sewer system evaluation survey is underway.

Newtown Creek, New York (Kings County)

Project in Progress

The Step I 201 Facilities Plan is approximately 95% complete at a cost of $3.2 million.

Future Projects

The study will recommend methods for upgrading the existing plant and for modifying the Manhattan Pump Station tc conserve energy and eliminate excessive heat from the station.

An application has been submitted under Section 301(h) requesting a modification of the discharge requirements specified under the Clean Water Act.

North River, New York (New York County)

Completed Project

The Step I 201 Facilities Plan work for the superstructure of this new 170 MGD plant and the rooftop park are complete at a cost of $3.8 million and $360,000, respectively.

The construction of the sludge storage tank is 98% complete at a cost of $1.6 million.

Projects in Progress

The Step II Design grant for $20 million is approved and work has begun by the design consultant.

The Step III prepurchase of material grant for $72

million is approved and contract documents are being bid.

Future Projects

The Step III digester tank construction grant application for $18 million has been submitted for approval of State and federal funding and construction is expected to commence in late 1980 or early 1981.

The Step II Design grant application for the rooftop park is being prepared for submission pending a determination on State and federal funding participation.

North Tarrytown, New York (Westchester County)

Refer to Tarrytown Plant.

Oakwood Beach, New York (Richmond County)

Completed Projects

The upgrading and expansion of this plant from 15 MGD to 40 MGD including the outfall is 99% complete. The nine mile sludge force main connecting the plant with the Port Richmond plant is 98% complete. Two main plant interceptors are also 98% complete. The cost for the above completed projects was $123 million.

Project in Progress

The Richmond Hill Road to Eltingville interceptor is nearing 75% completion at a cost of $6.3 million. The structures for the pumping stations at Eltingville and Richmond Hill Road are under contract at a cost of $4 million and are 40% complete.

Future Projects

The Step II design grant applications, for $356,000, for the completion of the interiors of the Eltingville and Richmond Hill Road pumping stations has been submitted for approval of federal and State funding.

The Step III construction grant application for the Fresh Kills interceptors, for $25 million, has been submitted for approval of federal and State funding.

The Step II design grant application for the Warsaw and Mayflower Avenue pumping stations on the Fresh Kills interceptor, for $433,000, has been submitted for approval of federal and State funding.

The final design West Branch interceptor to Tottenville, which will complete the Oakwood Beach Water Pollution Control Project, has been addressed in a federal environmental impact survey. The City's recommended solution, currently being reviewed by the US EPA, is for the construction of this interceptor by tunneling.

Orange & Rockland Utilities, New York (Rockland County)

Projects in Progress

A new wastewater treatment facility for industrial waste and expansion of the present activated sludge sewage treatment plant are under design.

Orangetown Sewer District, New York (Rockland County)

Projects in Progress

Engineering studies, specifically an I/I analysis and a 201 Facilities Plan study, are in progress to determine the future needs of the plant. The pump station requirements will also be included in the study. Final cost estimates for these studies are expected to be about $540,000.

Ossining - Liberty Street, New York (Westchester County)

Refer to Ossining Regional Plant.

Ossining Correctional Facility, New York (Westchester County)

Refer to Ossining Regional Plant.

Ossining Regional, New York (Westchester County)

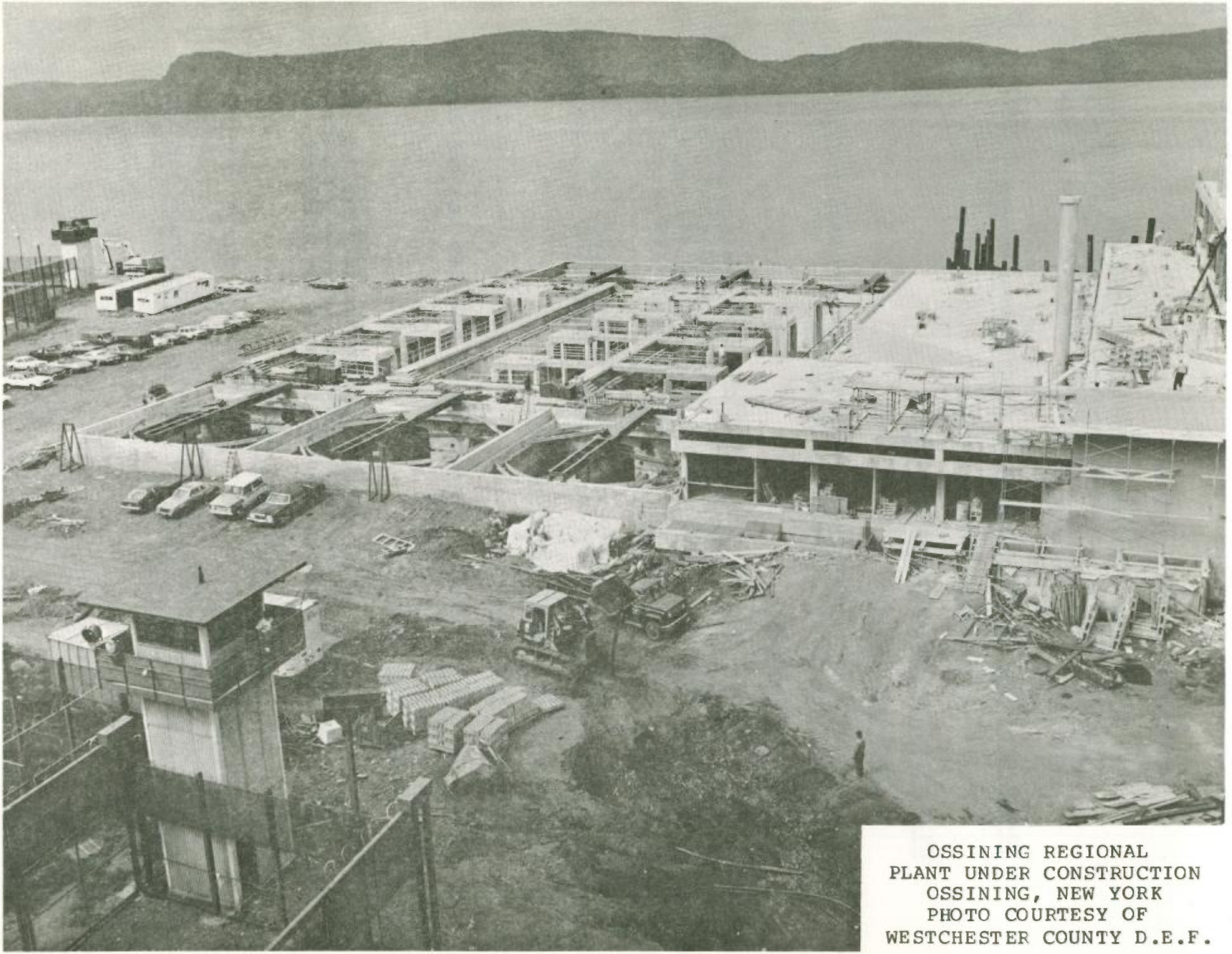
Completed Project

A 201 Facilities Plan study is complete and its report has recently been issued.

Projects in Progress

Construction of this new secondary treatment plant is 70% complete. Among the units to be installed are screens, pumps, primary clarifiers, an activated sludge system, secondary clarifiers and chlorinators. The final cost of this project is expected to be $25.7 million.

The proposed drainage basin for this plant will require three pump stations and two interceptor sewers. This phase of the construction is 50% complete and has an estimated



OSSINING REGIONAL
PLANT UNDER CONSTRUCTION
OSSINING, NEW YORK
PHOTO COURTESY OF
WESTCHESTER COUNTY D.E.F.

final cost of $6.9 million.

Eventually, the new plant will treat the sewage presently treated at the three Ossining plants (Correctional Facility, Water Street and Liberty Street), from Briarcliff Manor and Croton-on-Hudson.

Ossining - Water Street, New York (Westchester County)

Refer to Ossining Regional Plant.

Owls Head, New York (Kings County)

Completed Project

The infiltration/inflow study and the Step I 201 Facilities Report are substantially complete.

Future Projects

Based upon the results of the infiltration/inflow study and the Step I 201 Facilities Report, an upgraded plant will be designed to provide 90% removals of BOD and suspended solids. Consulting engineers have been selected and a contract is being negotiated.

An application for a Step II design grant for the design of an uncovered plant has been submitted for approval.

Oyster Bay, New York (Nassau County)

Completed Project

A 201 Facilities Plan study is complete and the report has been issued recently.

Projects in Progress

Presently, there are several engineering studies underway in the Oyster Bay Sewer District: an Environmental and Engineering Data Report, an SSES and an I/I analysis.

Peekskill, New York (Westchester County)

Completed Project

A 201 Facilities Plan study is complete and the report has been issued recently.

Projects in Progress

Upgrading of this primary plant to secondary treatment is about 99% complete. Final costs for this construction are expected to be $17.5 million.

Construction of the area's sewer system is about 75% complete and has a final cost estimated at $12.6 million.

Port Chester, New York (Westchester County)

Completed Projects

A 201 Facilities Plan and Value Engineering studies have been completed and their respective reports issued. The Value Engineering study evaluated the original proposed plant upgrading which was done in 1971.

Projects in Progress

Presently, a Feasibility Study is evaluating the results of the aforementioned Value Engineering study.

A sludge force main which is to serve both the Port Chester and Blind Brook Plants is 90% complete. Final costs are expected to be $2.6 million.

Future Project

This primary facility will be upgraded to secondary treatment. A final determination as to which process, activated sludge or rotating disc, has not yet been made. An estimate for total plant construction costs has been determined to be $20 million. Among the proposed facilities is a common outfall which is to be shared with the Blind Brook Treatment Plant at a cost of $6 million.

Port Richmond, New York (Richmond County)

Completed Projects

The upgrading and expansion of the Port Richmond Plant to 60 MGD is about 98% complete at a cost of $165 million.

The Nautilus Court Pumping Station was placed into operation eliminating a raw discharge of 1 MGD.

Project in Progress

Construction started on the rehabilitation of sludge docking facilities (Phase I) at a cost of $186,000.

Port Washington, New York (Nassau County)

Project in Progress

The future needs of this plant will be determined by the Port Washington Peninsula, Nassau County 201 Study. This 201 study is about 15% complete. It encompasses the following operating areas: Belgrave Sewer District, Great Neck Sewer District, Great Neck Village, Port Washington Water Pollution Control District, and the Village of Roslyn. An expected completion date for this project is 1982.

Red Hook, New York (Kings County)

Completed Projects

Three interceptor contracts and one pumping station have been substantially completed at a cost of approximately $18 million.

A Step I 201 Facilities Plan for the superstructure was completed at a cost of approximately $1.7 million.

Projects in Progress

Construction on the foundation of this new 60 MGD step aeration plant is about 65% complete. Construction of a tunneled interceptor is approximately 95% complete at a cost of $62 million. Step II, Final Design of the superstructure (Plans and Specifications) is in progress. A Step I 201 Facilities Plan for the Gowanus Pump Station is in progress.

Future Projects

A grant for $33 million has been approved by the US EPA for the prepurchase of material and equipment for the superstructure. Bids on two contracts for reinforcing steel and welded pipe railings are being reviewed. A plan of study for the 201 Facilities Plan for the Gowanus Water Quality Study has been submitted for approval prior to the submittal of a Step I application.

The total estimated cost for completion of these projects is approximately $350 million.

Rockaway, New York (Queens County)

Completed Project

The upgrading to step aeration of this 45 MGD plant

is substantially complete (99+%). Only a few small items asscciated with the electrical contract remain to complete this project.

The cost of this upgrading and expansion was $50.015 million.

Rockland County Sewer District #1, New York (Rockland County)

Projects in Progress

The construction that began in 1978 tc rehabilitate portions of this secondary plant is 90% complete. The scope of this project includes work on the mechanical bar screens, prechlorination system and digester heater. The final cost is expected to be $6.5 million.

There are several engineering studies in progress: Facilities Design (grant received 10/1/80), SSES and Pre-treatment Evaluation (grant received 10/80).

Future Project

As a result of the 201 study, upgrading and expansion of this plant is about to commence. It is expected tc cost $105 million to upgrade this secondary wastewater treatment plant from an activated sludge process to a rotating disc system. This construction is proposed to start in 1981.

Roslyn, New York (Nassau County)

Project in Progress

The Village of Roslyn is included in the 201 Facilities Plan study being conducted by Nassau County for the Port Washington Peninsula. This 5 MGD secondary plant will probably be phased out and the flow diverted to the Nassau County Cedar Creek Plant.

Stony Point, New York (Rockland County)

Completed Projects

Both 201 Facilities Plan and Wastewater Facilities reports have been issued. These reports address alternatives for additional sewage treatment capacity for the anticipated population growth. This 1 MGD plant treats sewage by the activated sludge process.

Suffolk County Sewer District #1, Port Jefferson, New York (Suffolk County)

Project in Progress

The 201 Facilities Plan study has been completed and the report will be issued shortly. Plans for plant expansion and/or upgrading will depend on the results.

Future Project

An emergency work request to upgrade the existing pump station #1 is currently under consideration by the U.S. EPA.

Suffolk County (Southwest) Sewer District #3, New York (Suffolk County)

Projects in Progress

The construction on this secondary activated sludge plant and the outfall are essentially complete. The project is waiting for final testing and takeover by the County. This system incorporates eleven pumping stations of which the main station is complete and construction of the others is to commence shortly. Additionally, the new trunk and lateral sewers are 95% complete.

The total cost for both the plant and the outfall is approximately $116 million. The sewering project is expected to cost $550 million.

Suffolk County Sewer District #6, Kings Park, New York (Suffolk County)

Project in Progress

The 201 study is approximately 99% complete and a report is expected to be issued shortly.

Tallman Island, New York (Queens County)

Completed Project

The upgrading and expansion of the plant is substantially complete (99+%) with only a few minor items remaining to be finished. The cost of this upgrading was approximately $43 million.

Tarrytown, New York (Westchester County)

Completed Project

The pump station completed in 1979 at this plant is now conveying flows from both the North Tarrytown and Tarrytown plants to the Yonkers Joint Treatment Plant.

26th Ward, New York (Kings County)

Completed Project

The upgrading to step aeration of this 85 MGD plant is substantially complete (99+%). Only a few small items remain to complete this project.

The cost of this upgrading and expansion was $48.6 million.

Wards Island, New York (New York County)

Completed Project

The expansion and upgrading of the Wards Island Plant is substantially complete (99+%) with only minor items remaining. The cost of this project was approximately $117 million.

West Long Beach, New York (Nassau County)

Future Project

Plans are being made for a $2 million rehabilitation program. Construction will entail replacement of existing anaerobic digestion system equipment, replacement of a generator and repairs to pumping stations.

Yonkers Joint Treatment Plant, New York (Westchester County)

Projects in Progress

Presently, an engineering study is underway to ascertain alternatives for sludge disposal. Concurrently, an infiltration/inflow investigation is being performed.

WATER QUALITY AND EFFLUENT MONITORING

The quality of the Interstate Sanitation District waters is routinely checked by sampling effluents discharging into District waters and by sampling the District waters themselves. Effluent samples of both municipal wastewater treatment plants and industrial facilities are taken both routinely and to check compliance with their N/SPDES permits.

Water quality monitoring is accomplished with remote automatic water quality monitors and by boat survey sampling. These data have been and continue to be used for statistical comparisons, the development of baseline conditions and as input to the water quality models developed by the 208 agencies throughout the District.

At the request of and in cooperation with the states, the Commission collected and analyzed samples for pesticides and PCB's from the site of the fire at the Chemical Control Corporation in Elizabeth, New Jersey.

Analyses of water quality and effluent data show that District waters are plagued by low dissolved oxygen content and contamination due to heavy metals, coliform bacteria, toxics and oil and grease.

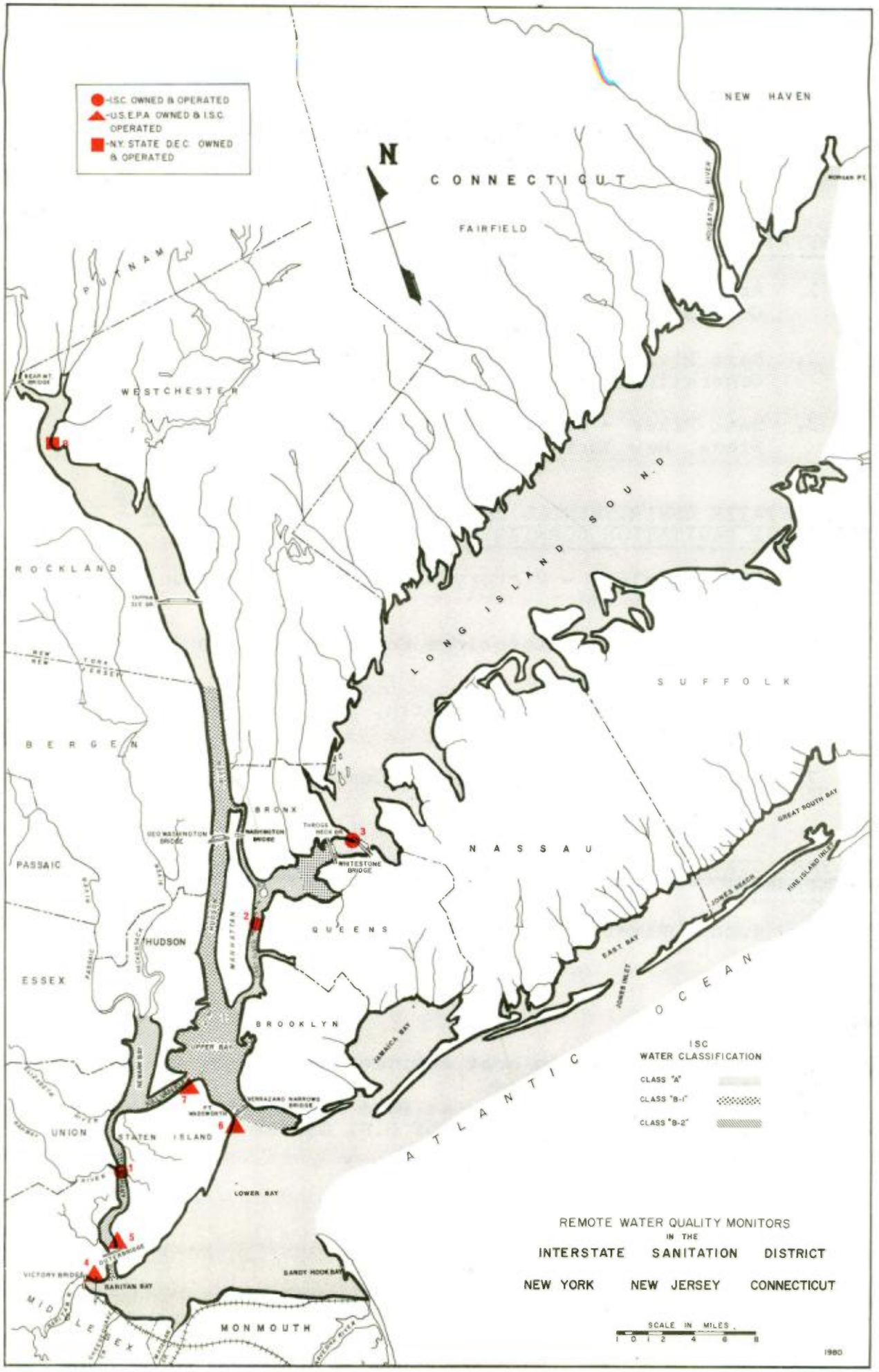
Effluent Monitoring

Compliance with the Commission's regulations are determined by analyses of samples taken at all municipal wastewater treatment plants and many industrial facilities discharging into District waters. At the request of the U.S. EPA and the state environmental departments, sewage treatment plants and industrial facilities are sampled for compliance with their N/SPDES permit limitations. Depending upon an industry's production schedule, compliance sampling is done either for a 24 hour period or for a full day's production, if less than 24 hours.

Remote Automatic Water Quality Monitoring

The Commission's remote automatic water quality monitors continuously measure District waters for temperature, conductivity, dissolved oxygen and pH. The data are transmitted hourly and recorded by a central receiver at the Commission's office. Daily summaries and the hourly readings are sent to the appropriate state and federal agencies and also are entered into STORET. Shown on the following pages are a map and listing of the monitor locations.

Graphs for the past five years showing the monthly maximum, minimum and average values for each parameter at each station are


I.S.C. OWNED & OPERATED
U.S.E.P.A. OWNED & I.S.C. OPERATED
N.Y. STATE D.E.C. OWNED & OPERATED
N
NEW HAVEN
CONNECTICUT
FAIRFIELD
PUTNAM
WESTCHESTER
ROCKLAND
BERGEN
PASSAIC
HUDSON
ESSEX
UNION
BRONX
QUEENS
BROOKLYN
STATEN ISLAND
NASSAU
SUFFOLK
LONG ISLAND SOUND
ATLANTIC OCEAN
GREAT SOUTH BAY
FIRE ISLAND INLET
JONES BEACH
EAST BAY
JONES INLET
JAMAICA BAY
UPPER BAY
LOWER BAY
RARITAN BAY
SANDY HOOK BAY
MONMOUTH
MIDDLESEX
GEO WASHINGTON BRIDGE
WASHINGTON BRIDGE
THROGS NECK BRIDGE
WHITESTONE BRIDGE
VERRAZANO NARROWS BRIDGE
VICTORY BRIDGE
ISC WATER CLASSIFICATION
CLASS "A"
CLASS "B-1"
CLASS "B-2"
REMOTE WATER QUALITY MONITORS IN THE
INTERSTATE SANITATION DISTRICT
NEW YORK NEW JERSEY CONNECTICUT
SCALE IN MILES
0 1 2 4 6 8
1980

REMOTE AUTOMATIC WATER QUALITY MONITORING STATIONS
IN THE
INTERSTATE SANITATION DISTRICT

INTERSTATE SANITATION COMMISSION OWNED AND OPERATED

1. Arthur Kill - Consolidated Edison Arthur Kill Generating Station, Staten Island, New York

2. East River - Consolidated Edison Ravenswood Generating Station, Long Island City, New York

3. East River - Throgs Neck Bridge, Fort Schuyler, Bronx, New York

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY OWNED AND INTERSTATE SANITATION COMMISSION OPERATED

4. Raritan River - Victory Bridge, Perth Amboy, New Jersey (1)

5. Arthur Kill - Outerbridge Crossing, Staten Island, New York (2)

6. The Narrows - Fort Wadsworth, Staten Island, New York (3)

7. Kill Van Kull - U.S. Gypsum Company, Staten Island, New York (4)

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION OWNED AND OPERATED

8. Hudson River - Verplanck, New York

Notes:

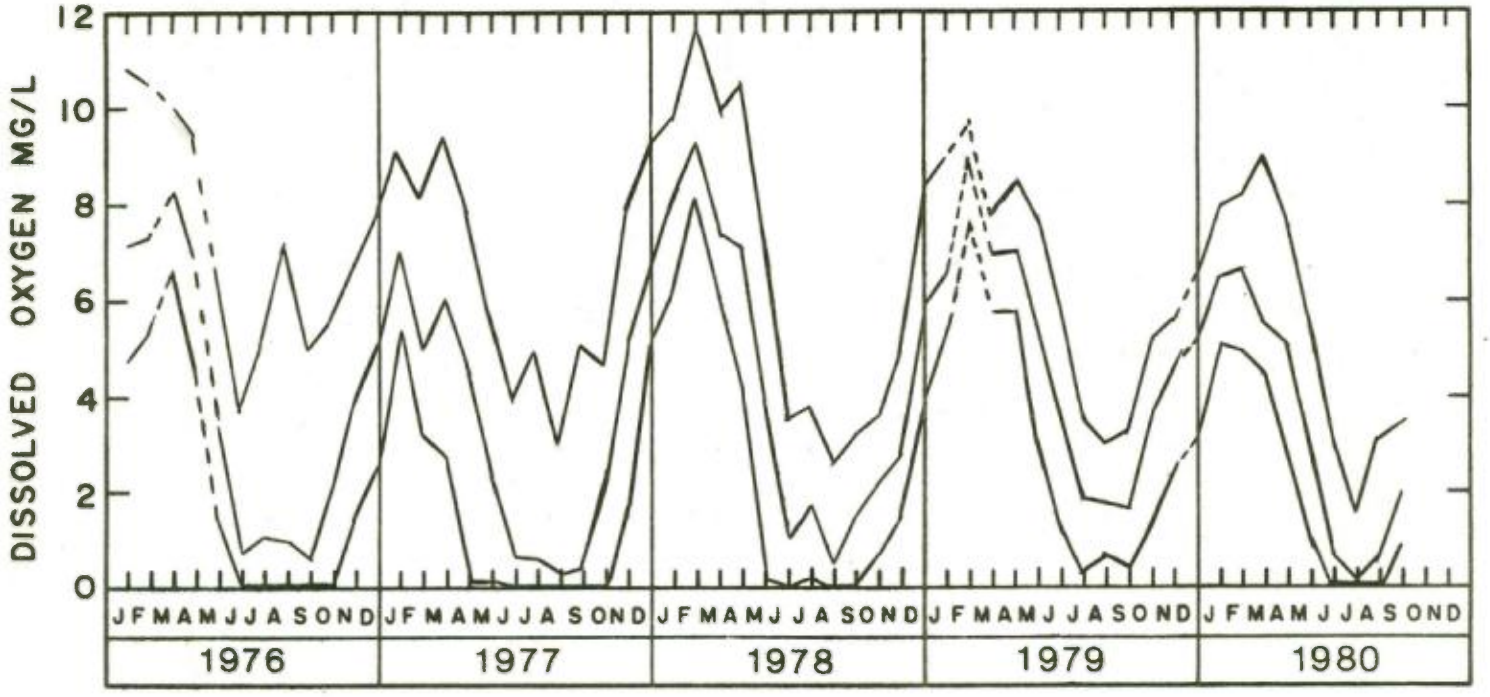
(1) Out of service due to boat accident at Victory Bridge pier.
(2) Not presently in service.
(3) Out of service due to fire at Fort Wadsworth pier.
(4) Approximately 150 feet east of U.S. Gypsum Plant

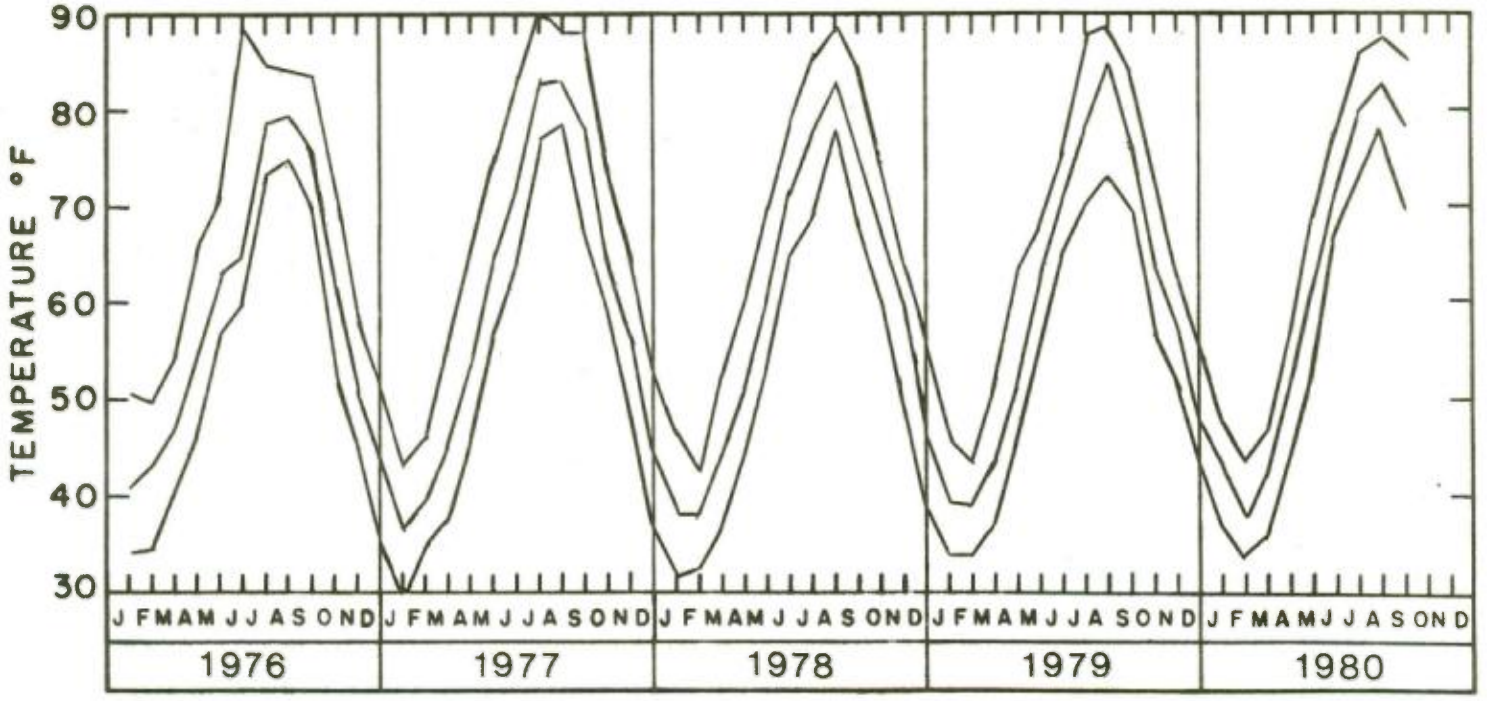
also included. The monthly maximum and minimum represent the single highest value and the single lowest value for the month, respectively. The monthly average is the average of the daily average values for the month. Dotted lines indicate a month for which less than ten days of data were available.

Following the graphs is a table showing the percent of time that the dissolved oxygen met Commission requirements at each remote automatic water quality monitoring station for the period October 1, 1979 through September 30, 1980.

From the graphs and the dissolved oxygen chart it may be seen that there is little overall change in the quality of District waters. Dissolved oxygen values in many locations were, in fact, worse than those recorded during the summer of 1979. For the months of June, July and August 1980, Commission dissolved oxygen requirements in the Arthur Kill were met only 0.8, 0.0 and 4.5 percent of the time, respectively. In September 1980, the requirements at the confluence of the East River and Long Island Sound at the Throgs Neck Bridge were met only 12.2 percent of the time.

ARTHUR KILL — CON ED. (station no. 1)





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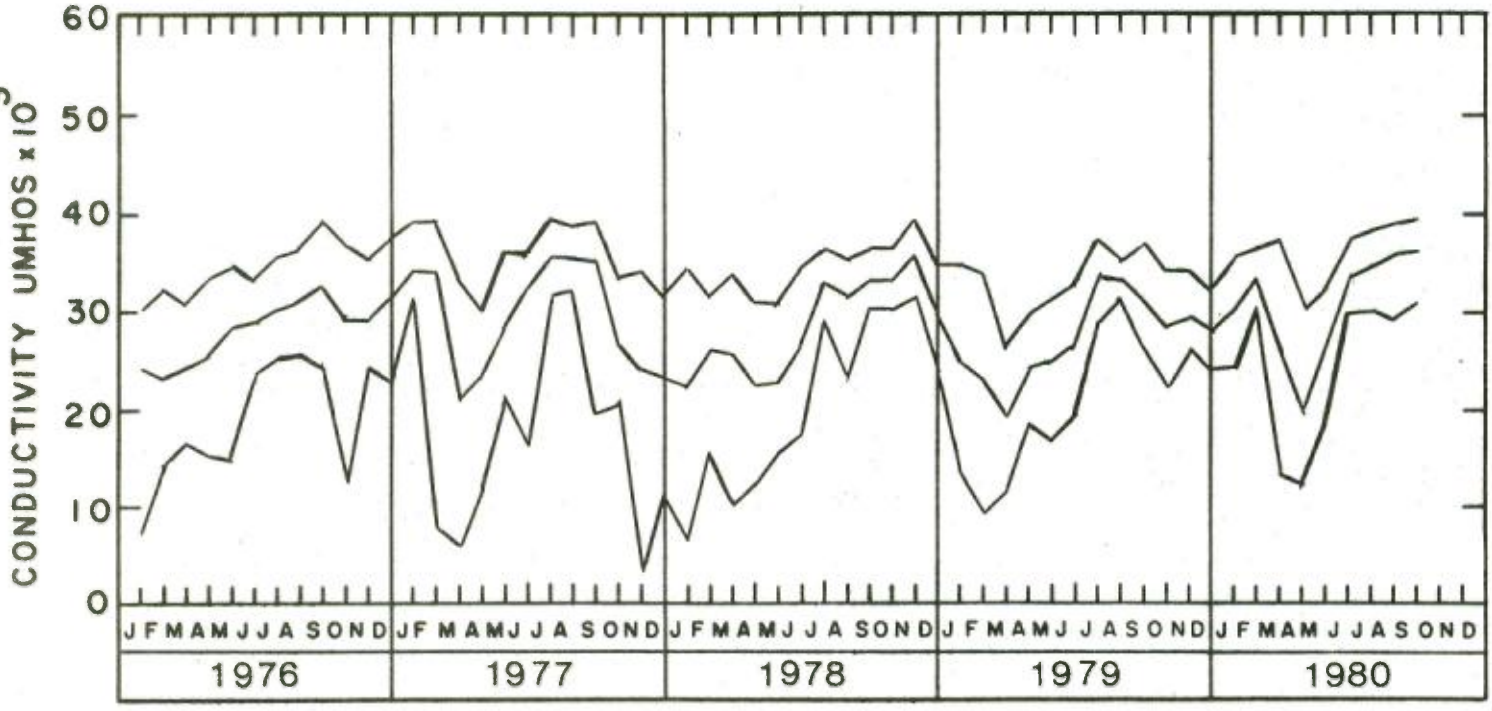
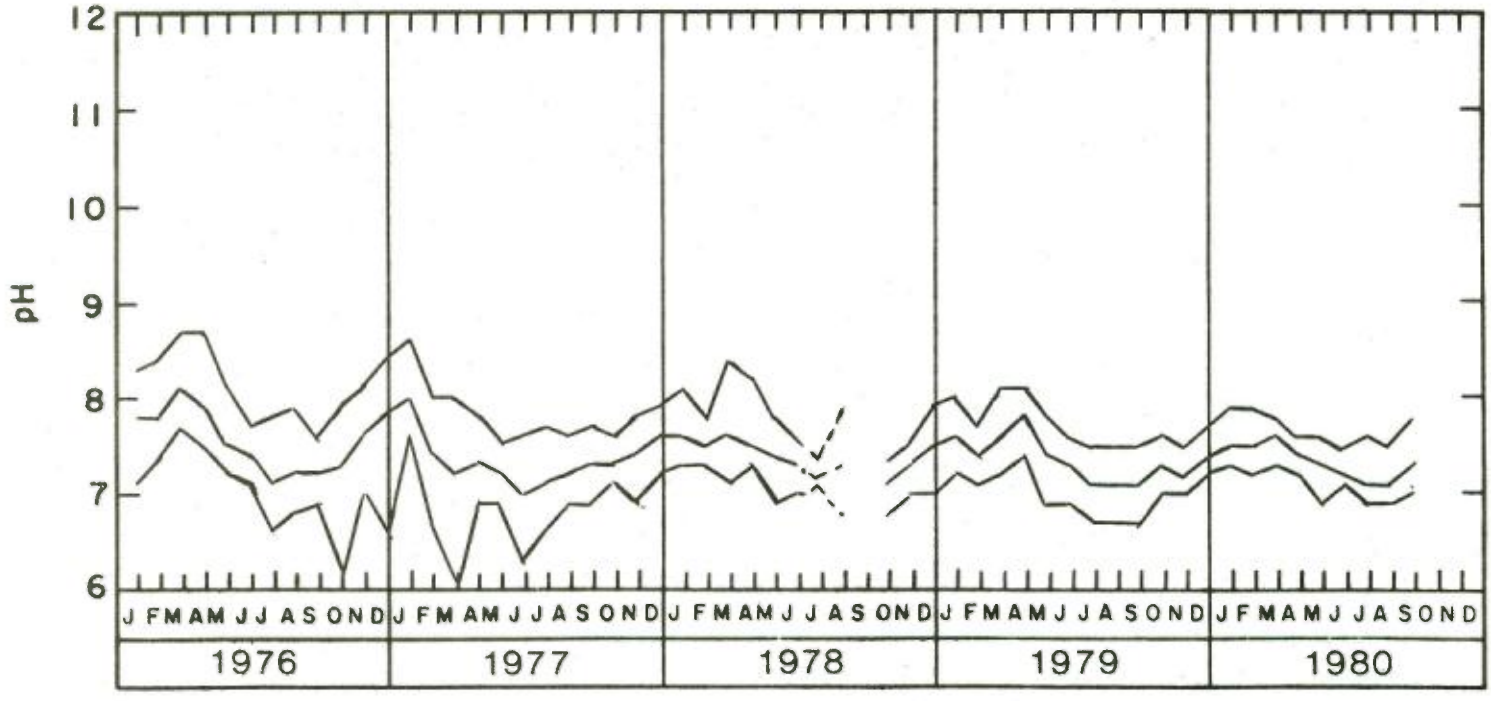
ARTHUR KILL — CON ED. (station no. 1)





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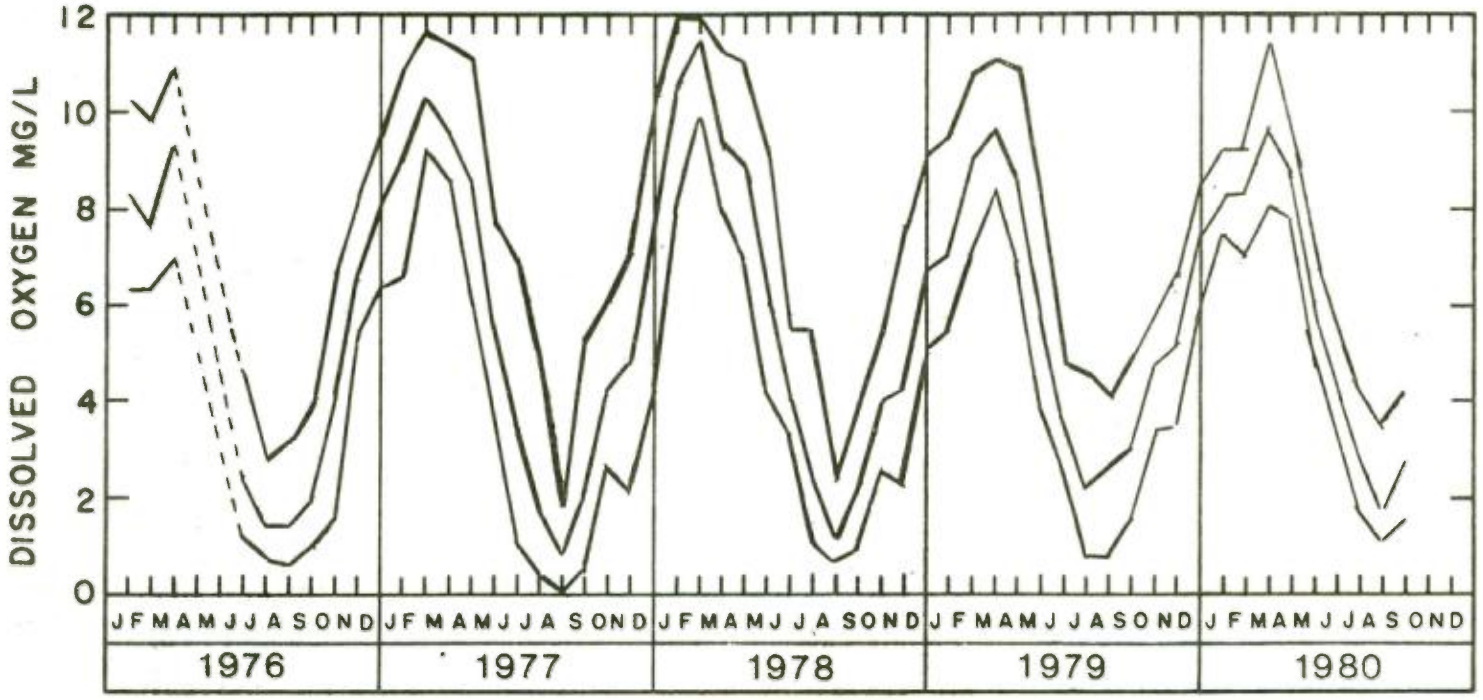
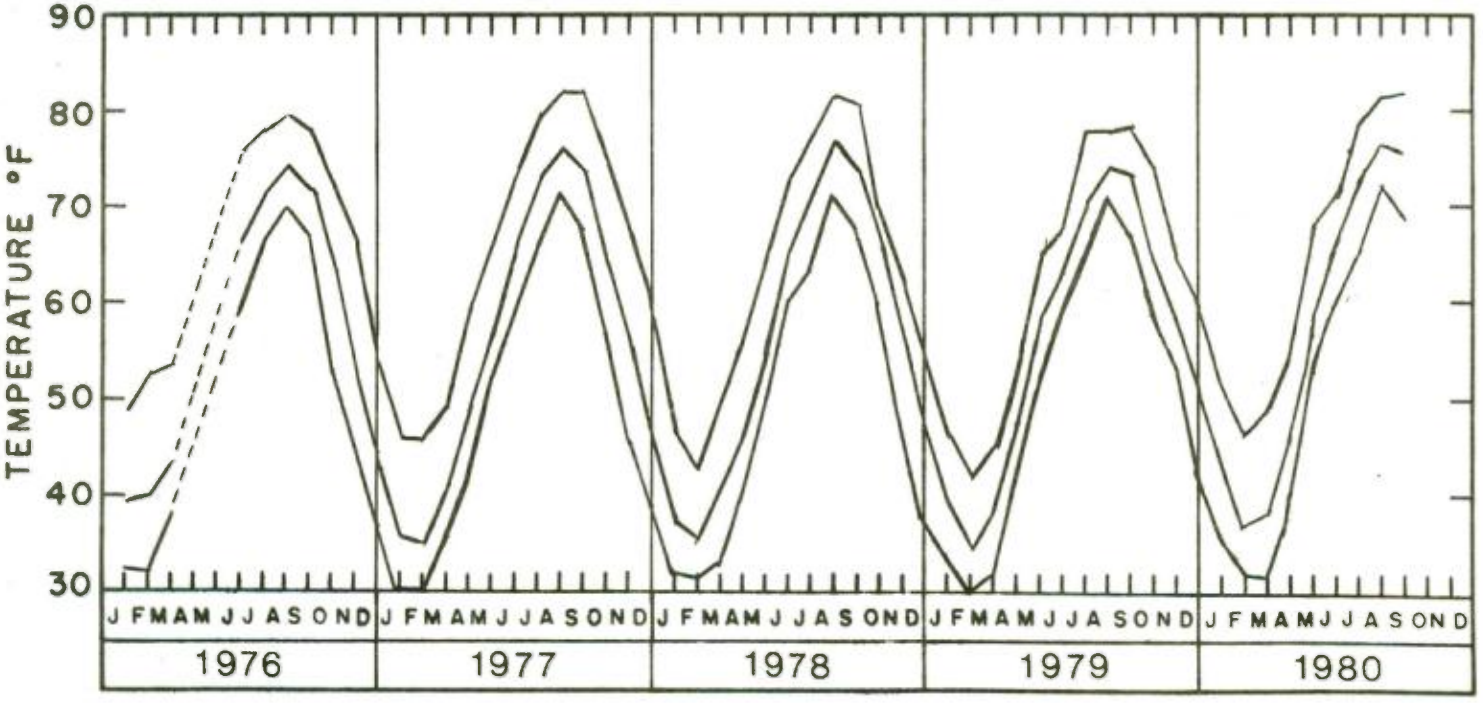
EAST RIVER — CON ED. (station no. 2)





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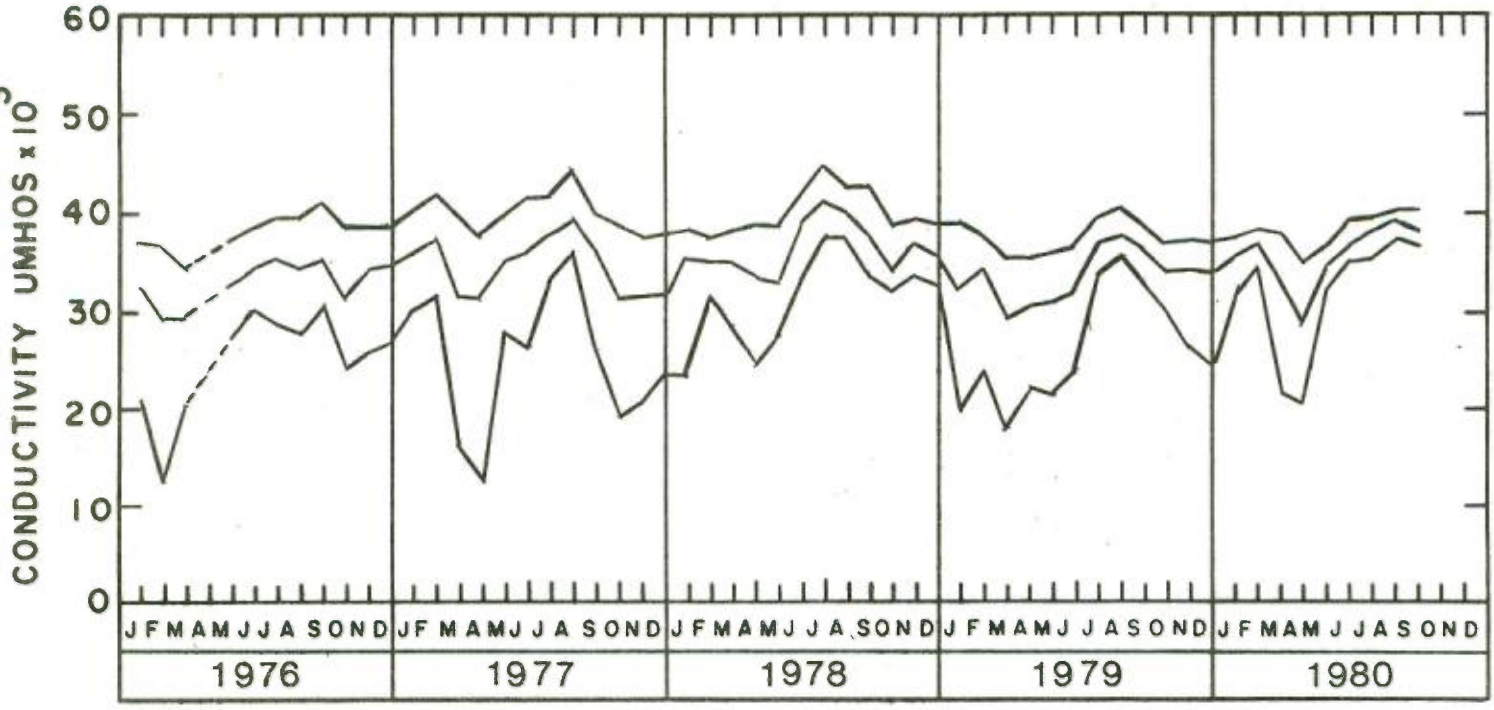
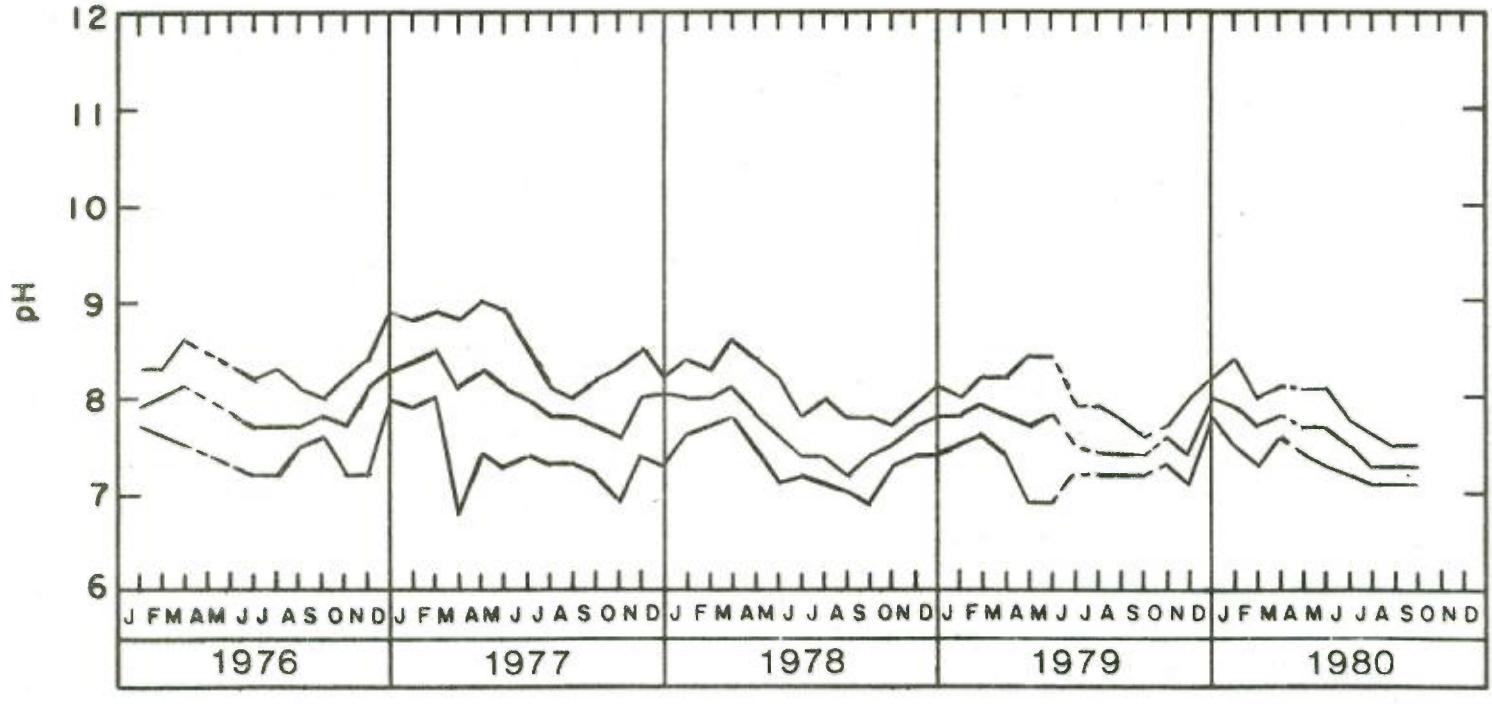
EAST RIVER — CON ED. (station no. 2)





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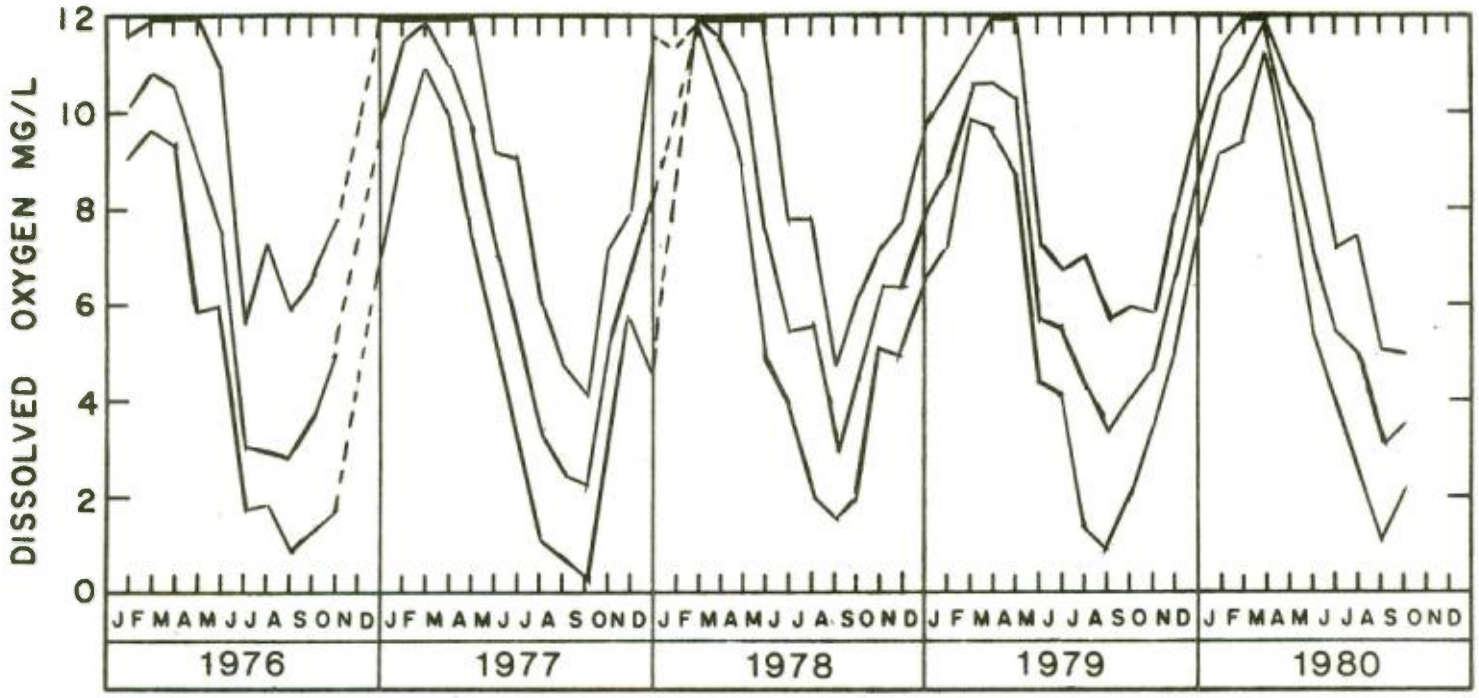
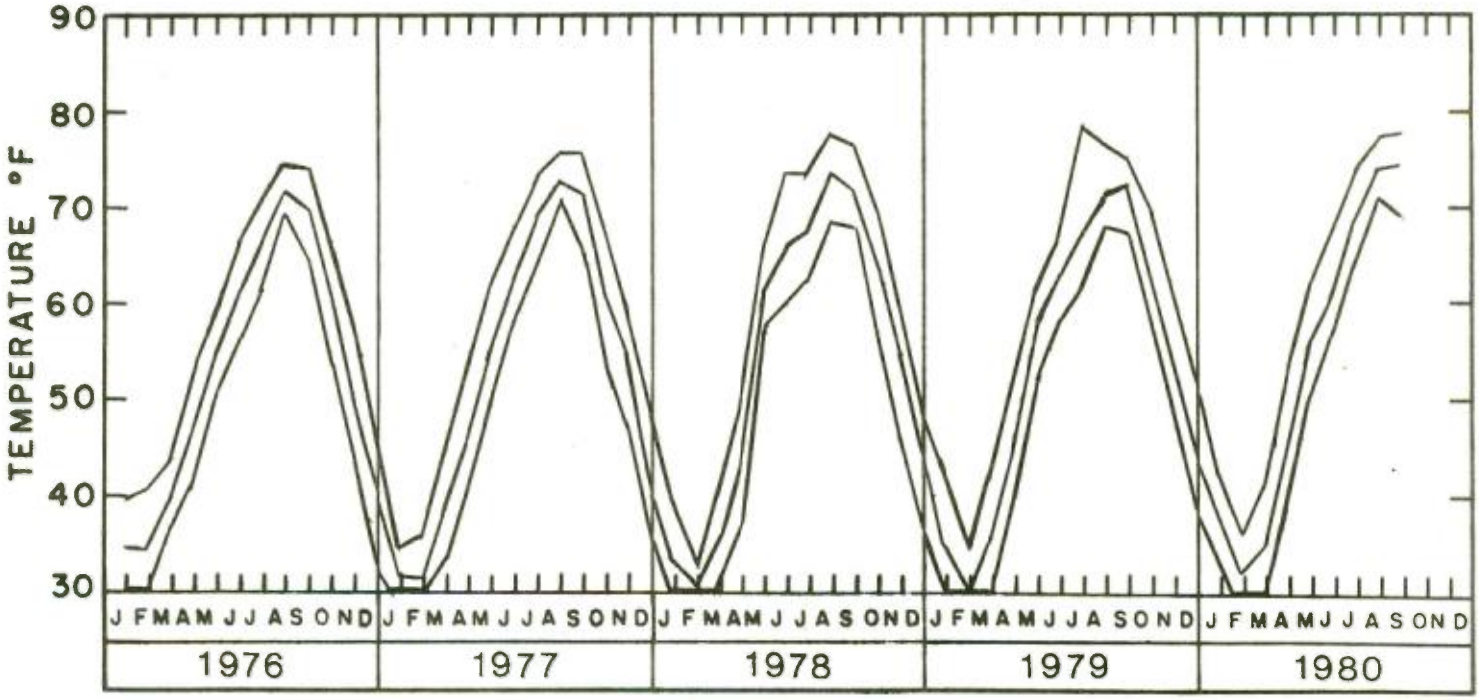
EAST RIVER — THROGS NECK (station no. 3)





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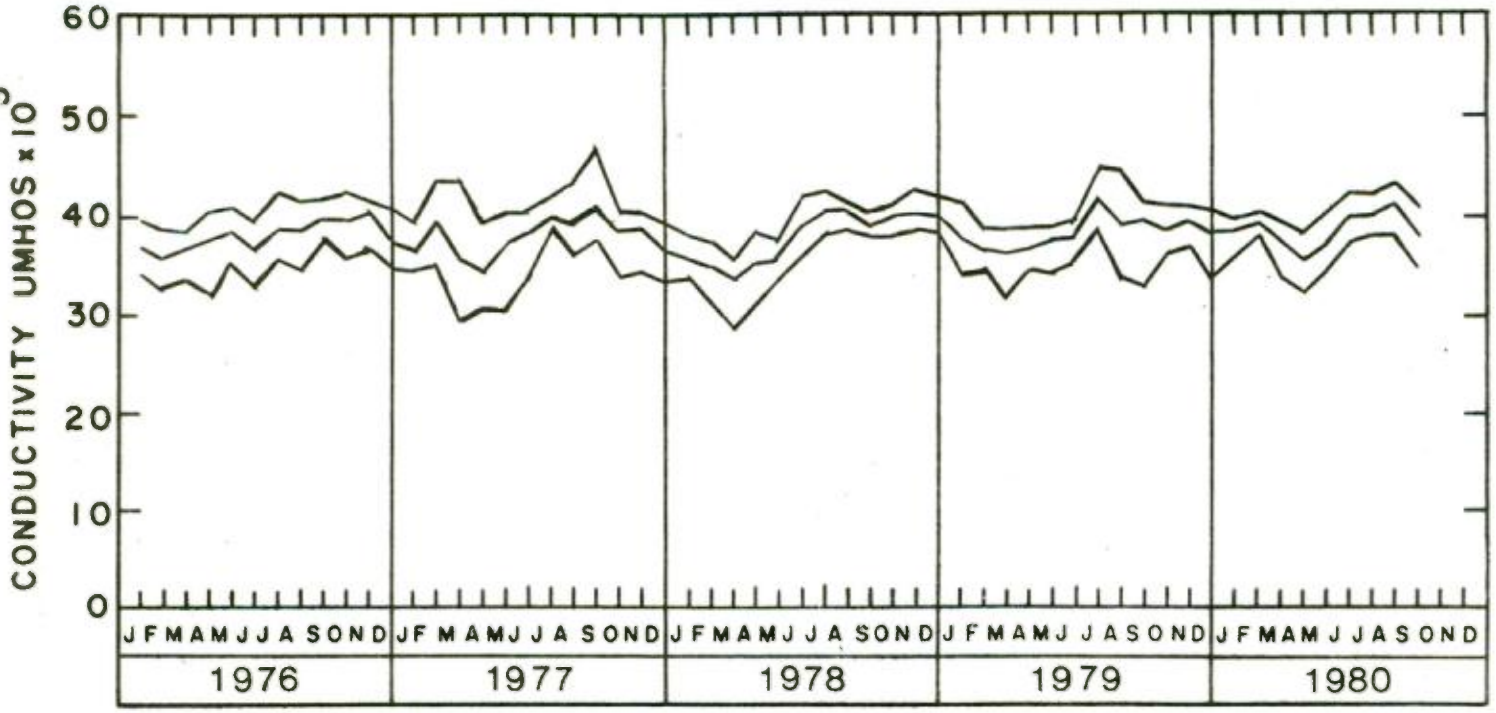
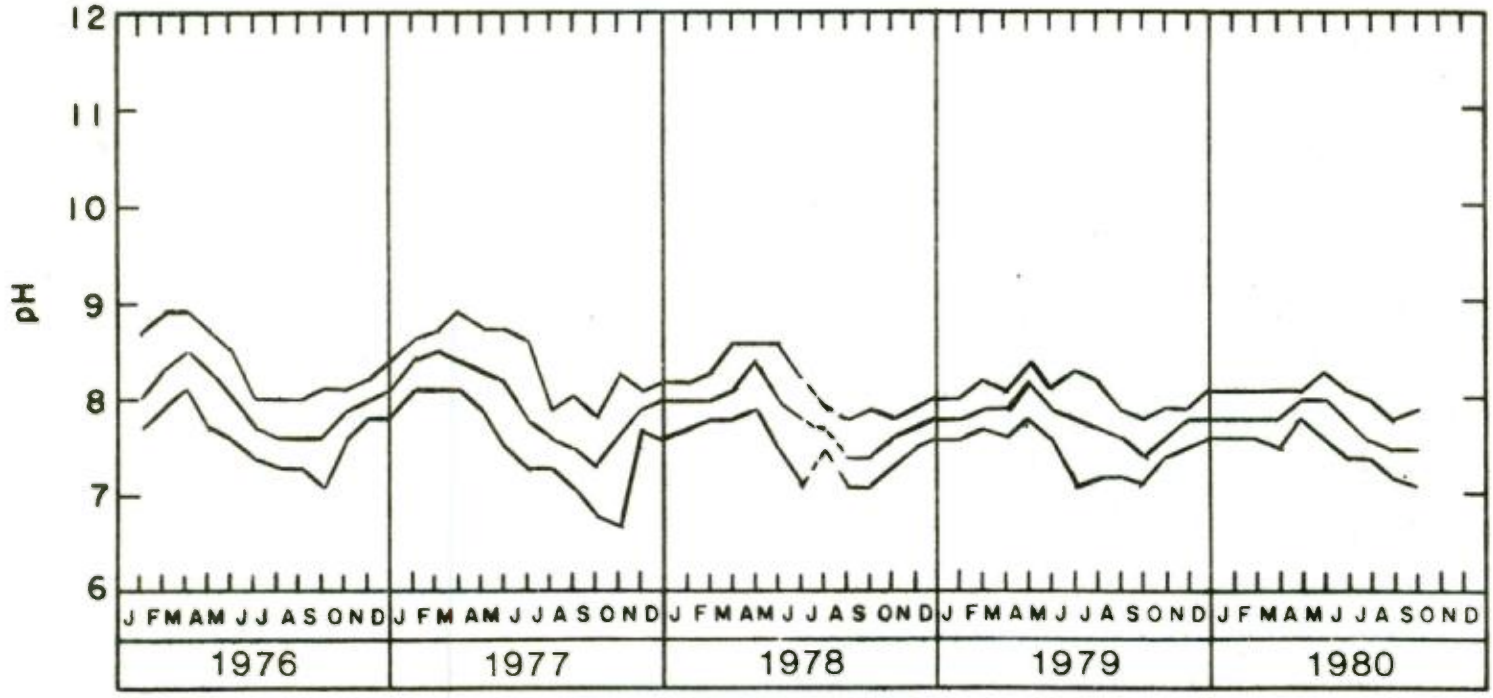
EAST RIVER — THROGS NECK (station no. 3)





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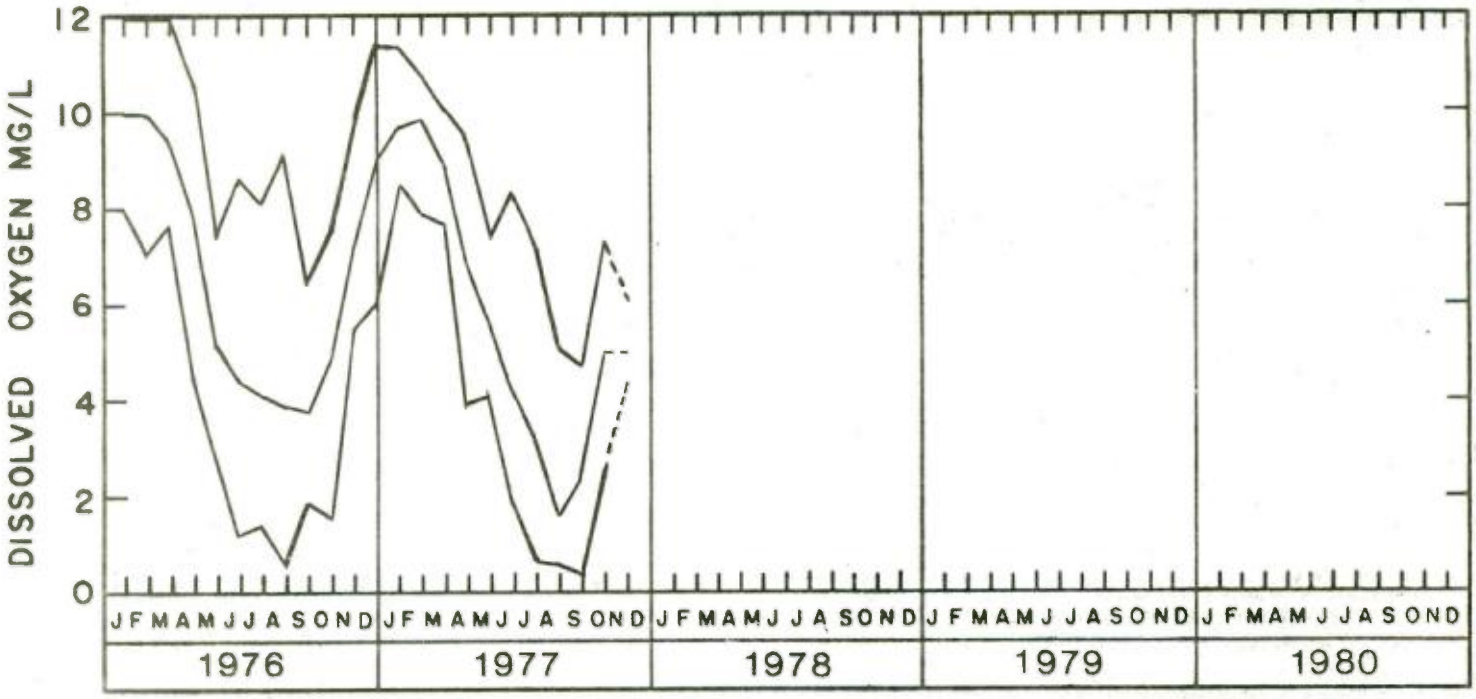
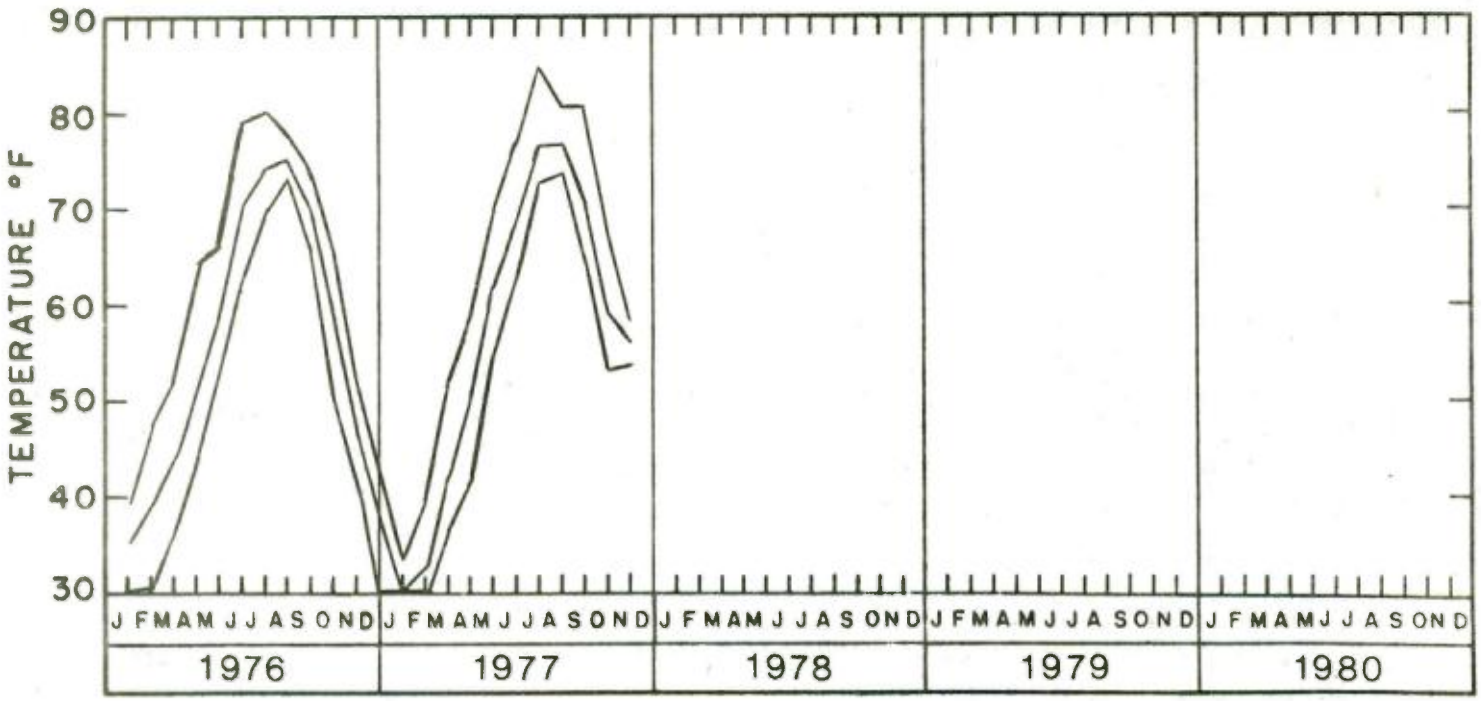
RARITAN RIVER—VICTORY BRIDGE (station no. 4)





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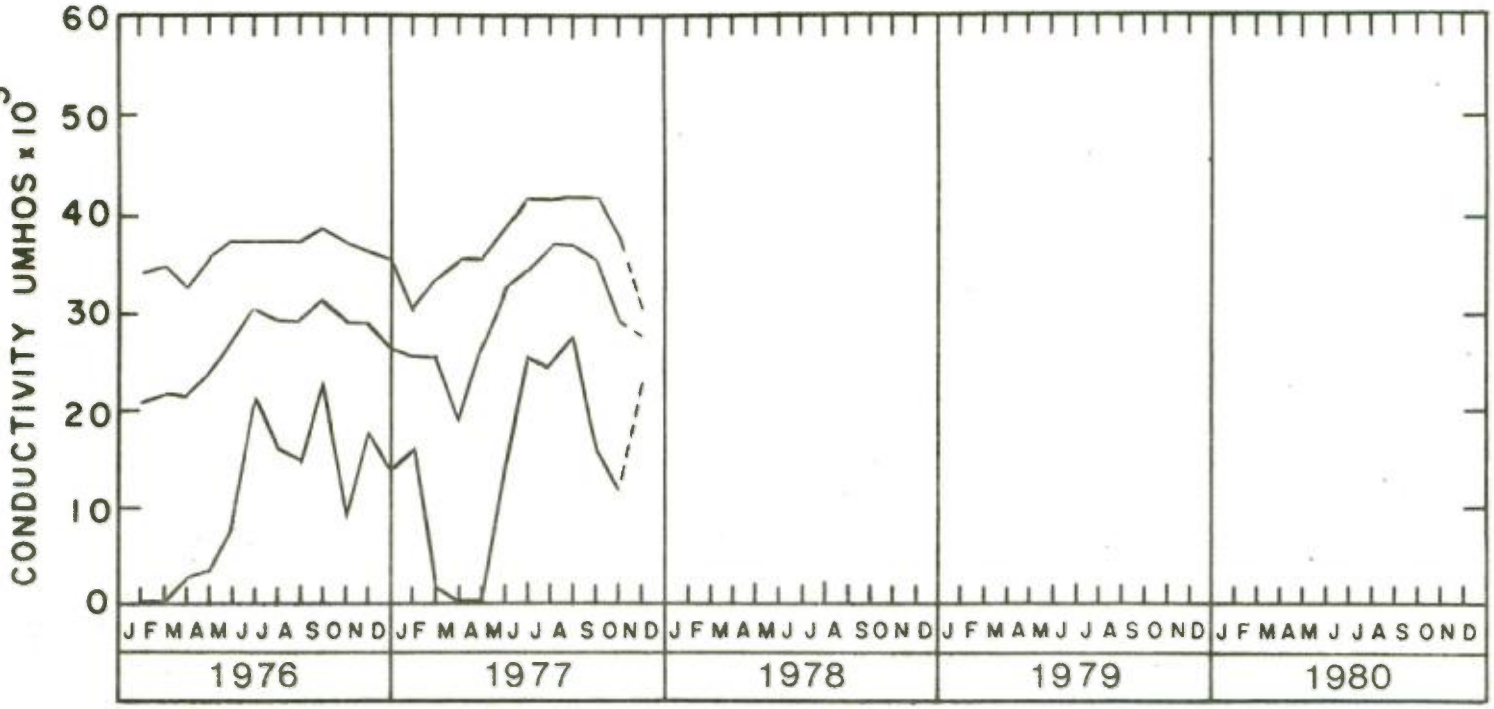
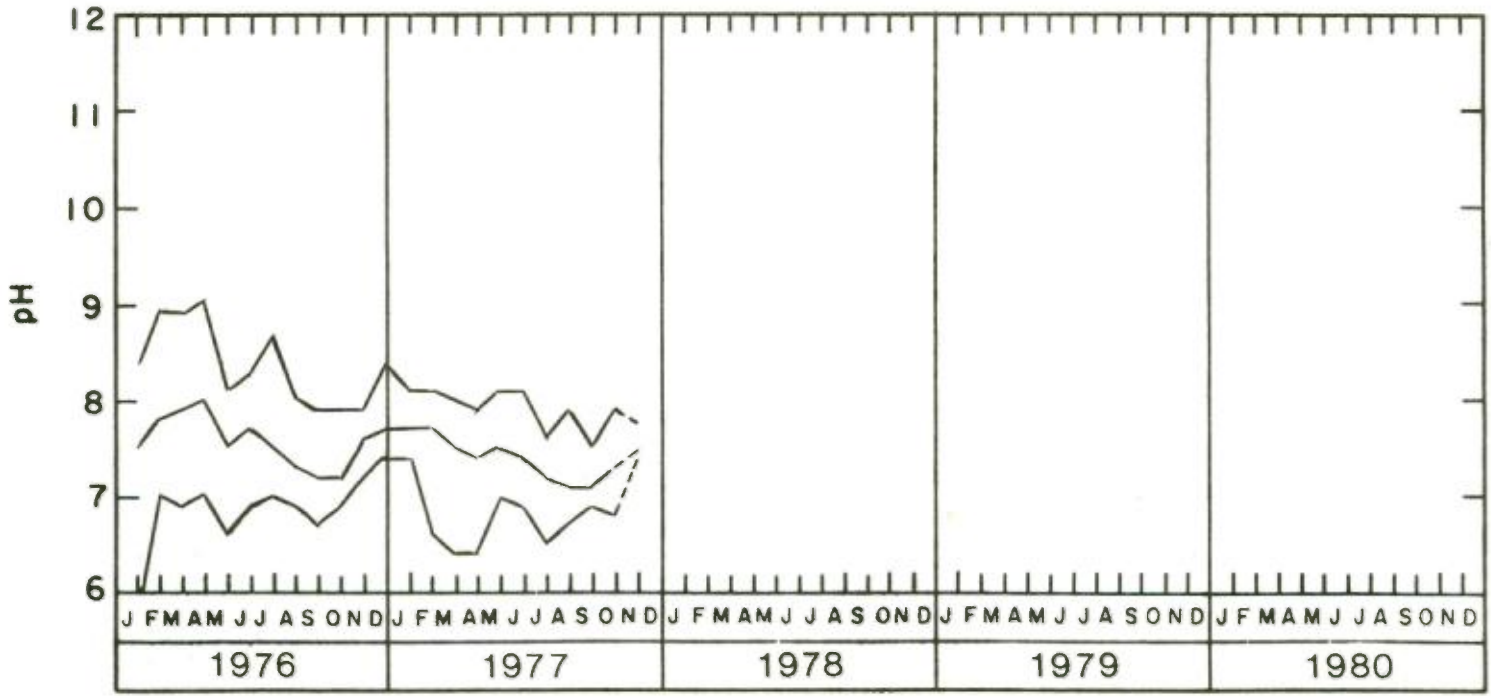
RARITAN RIVER—VICTORY BRIDGE (station no.4)





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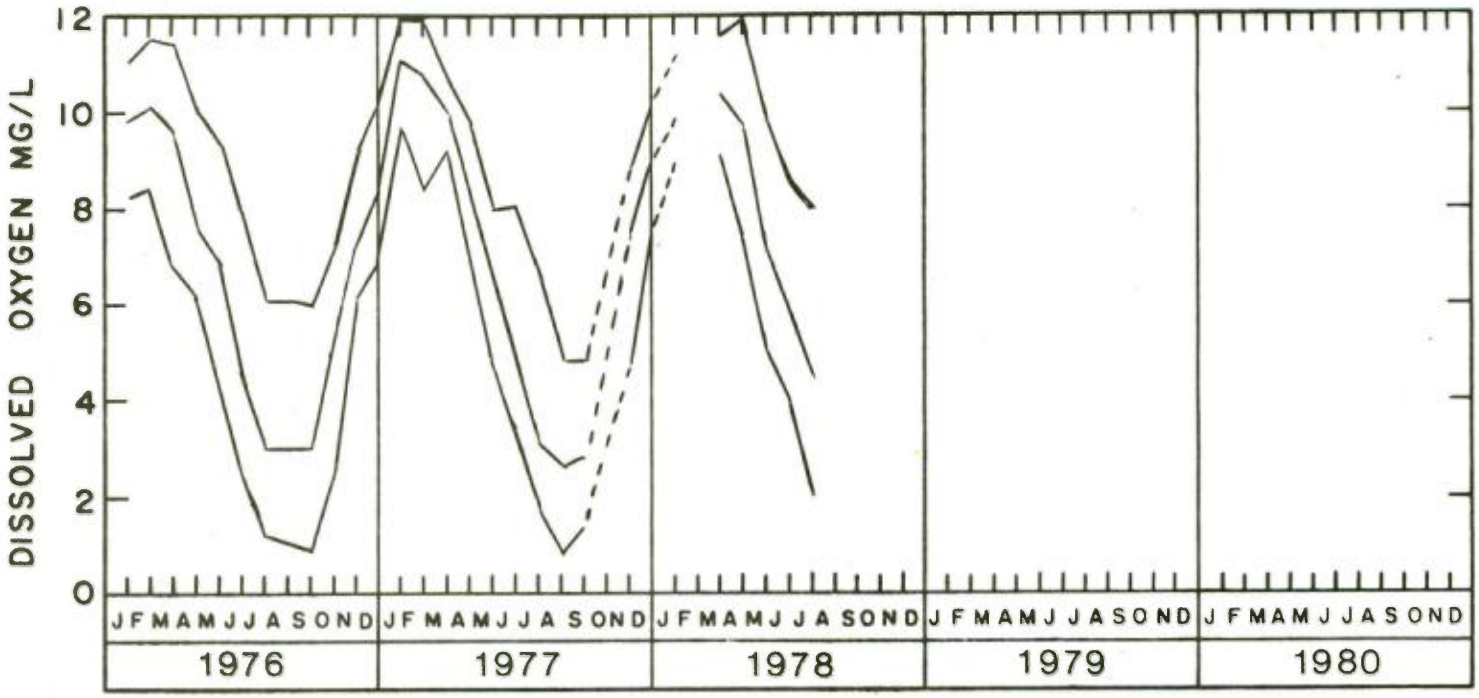
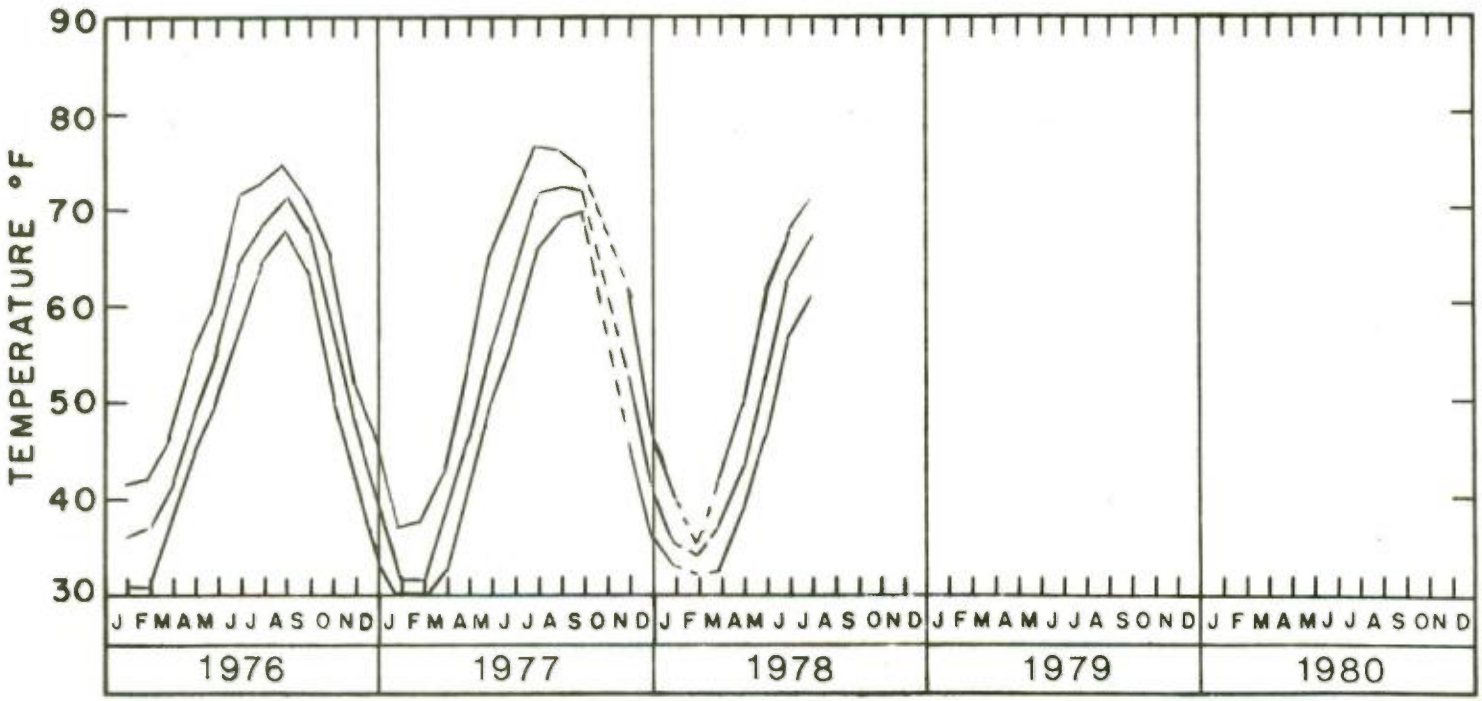
THE NARROWS — FT. WADSWORTH (station no. 6)





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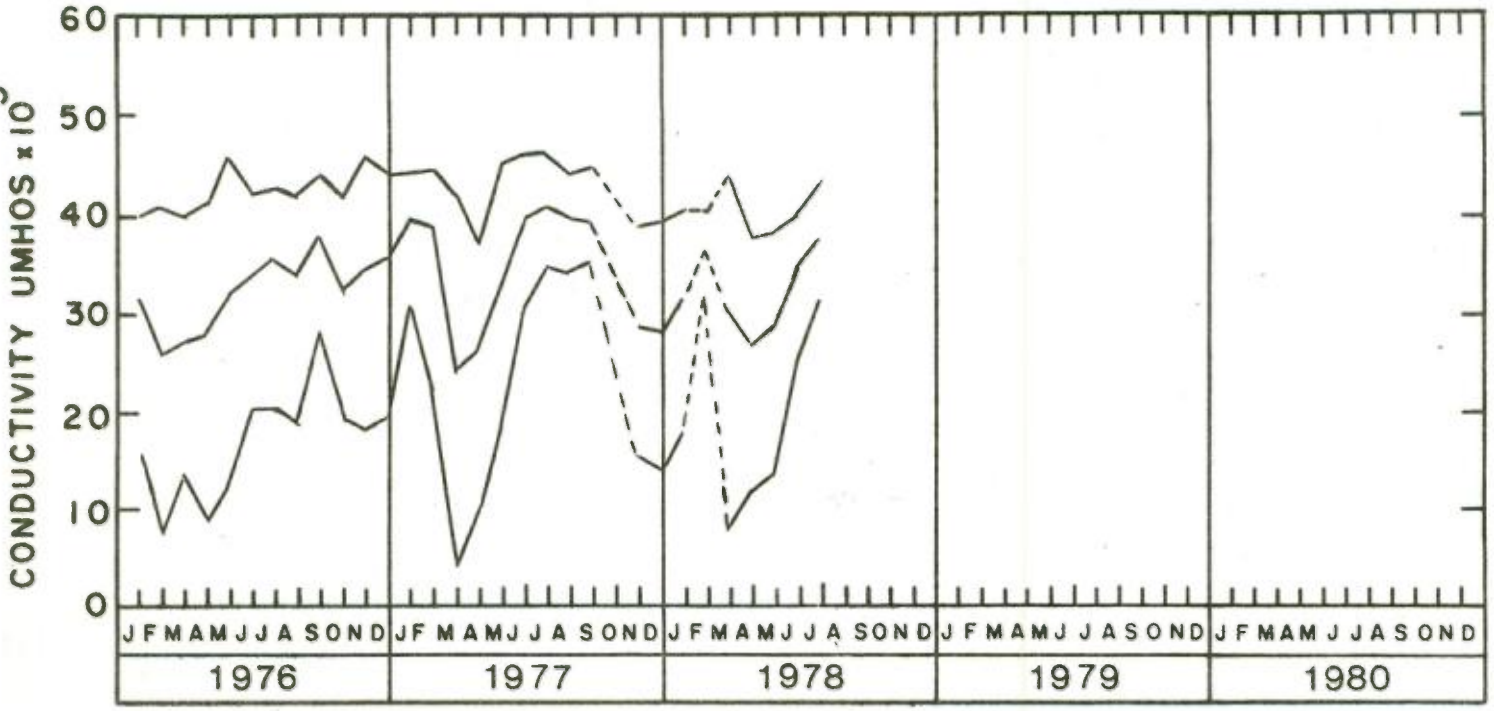
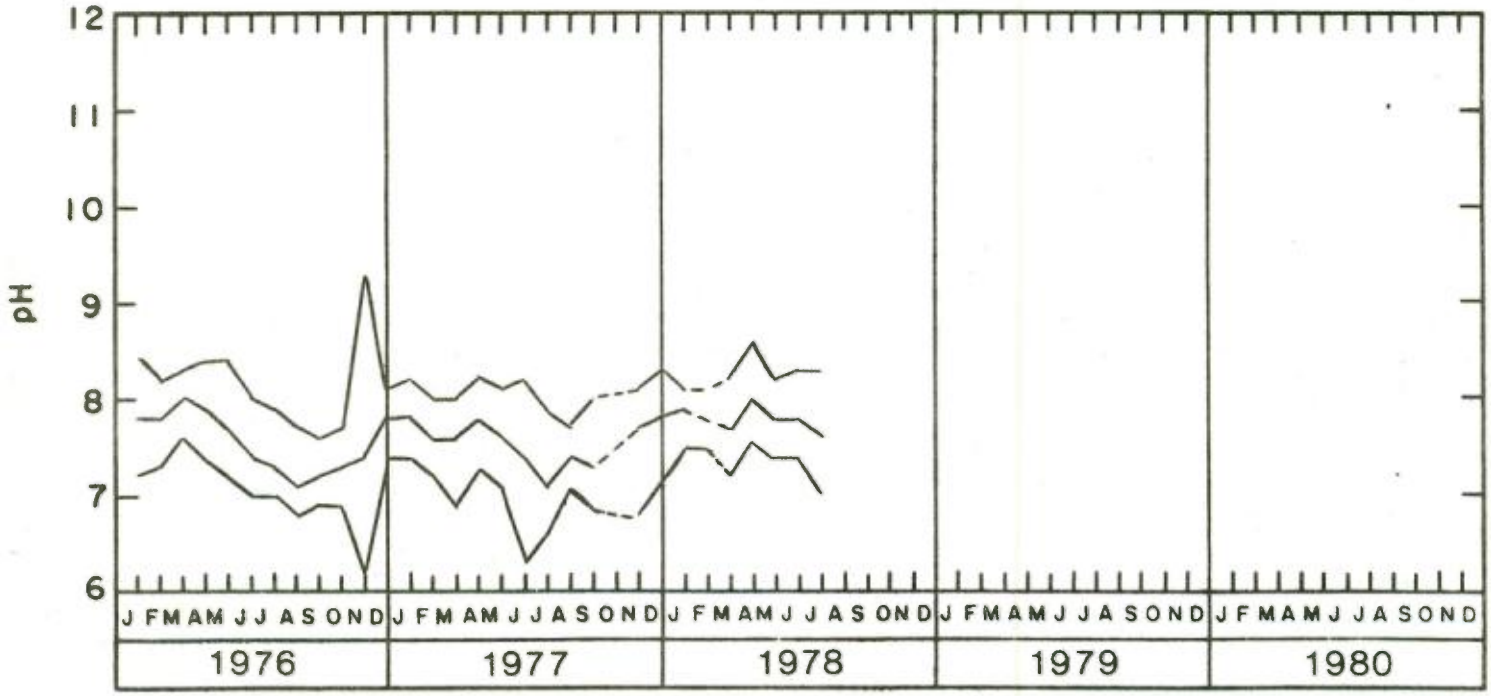
THE NARROWS — FT. WADSWORTH (station no. 6)





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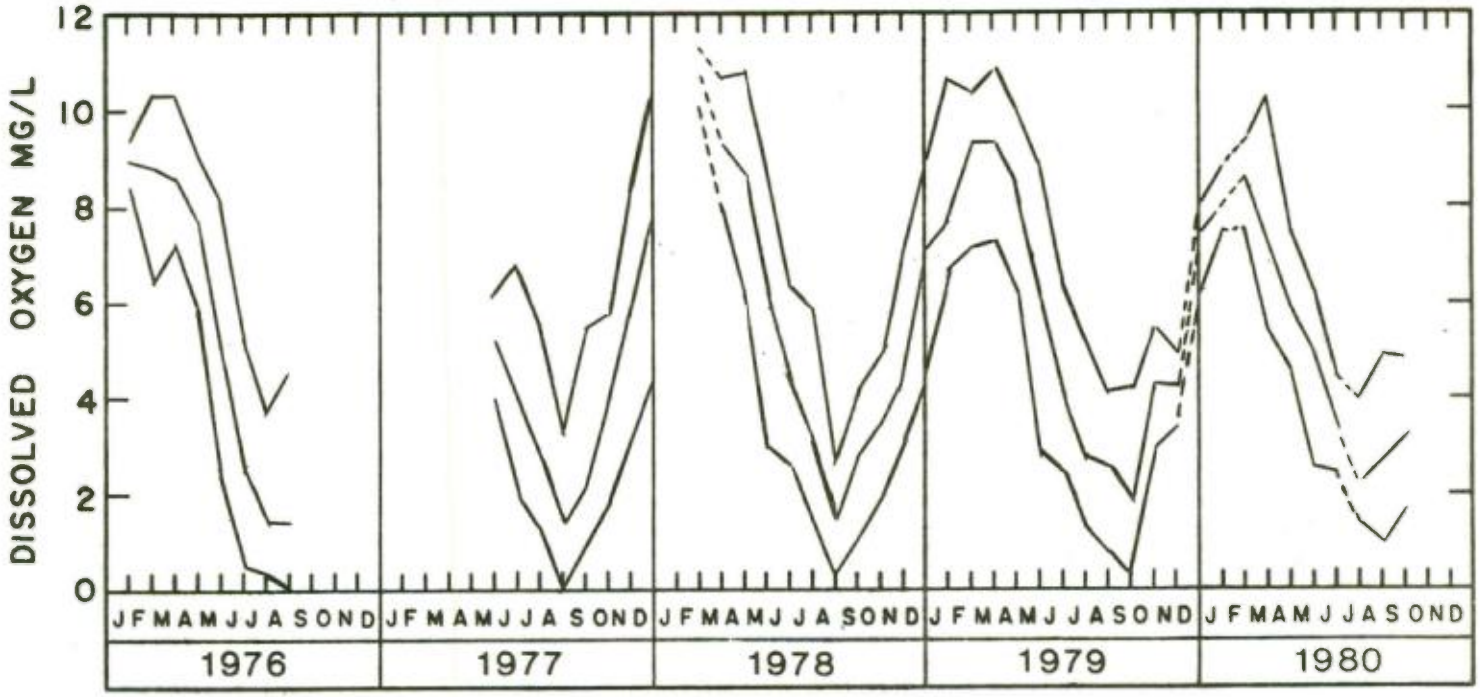
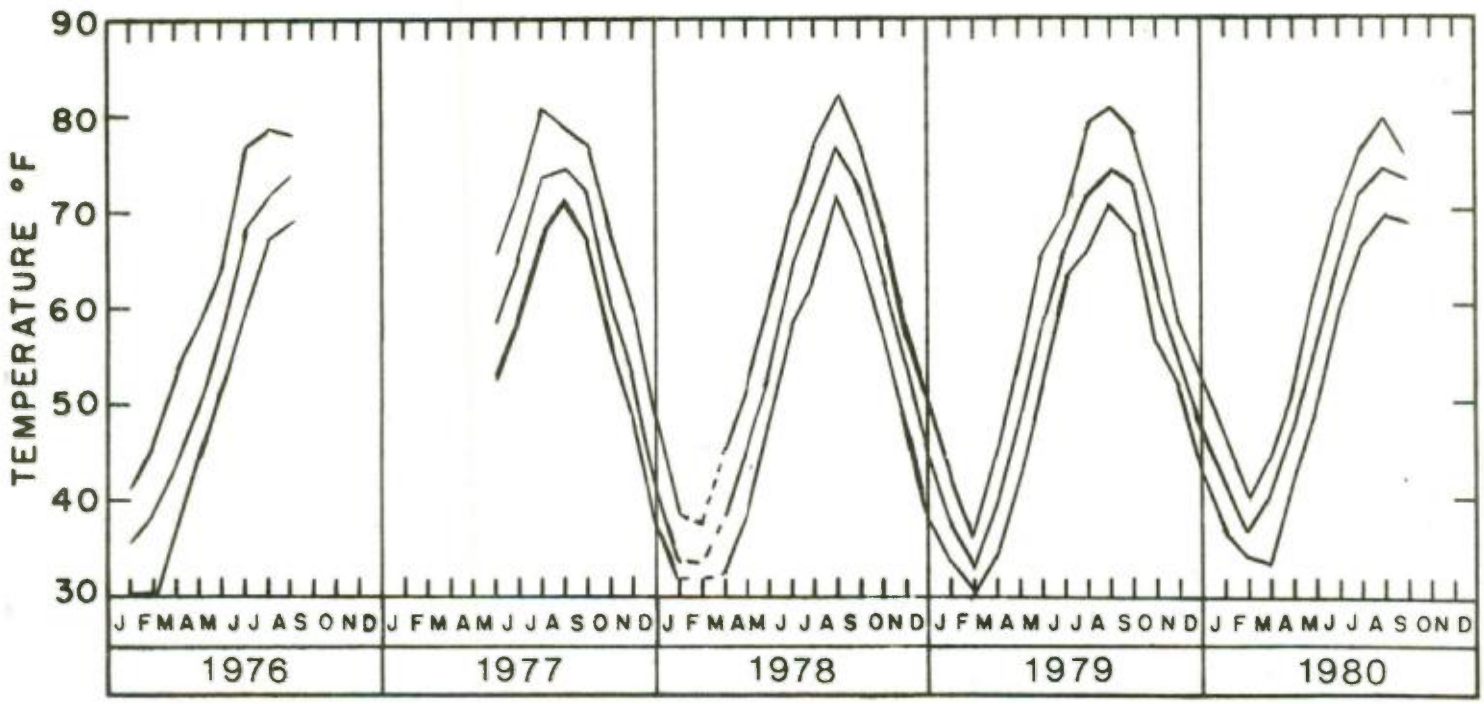
KILL VAN KULL — U.S. GYPSUM (station no. 7)





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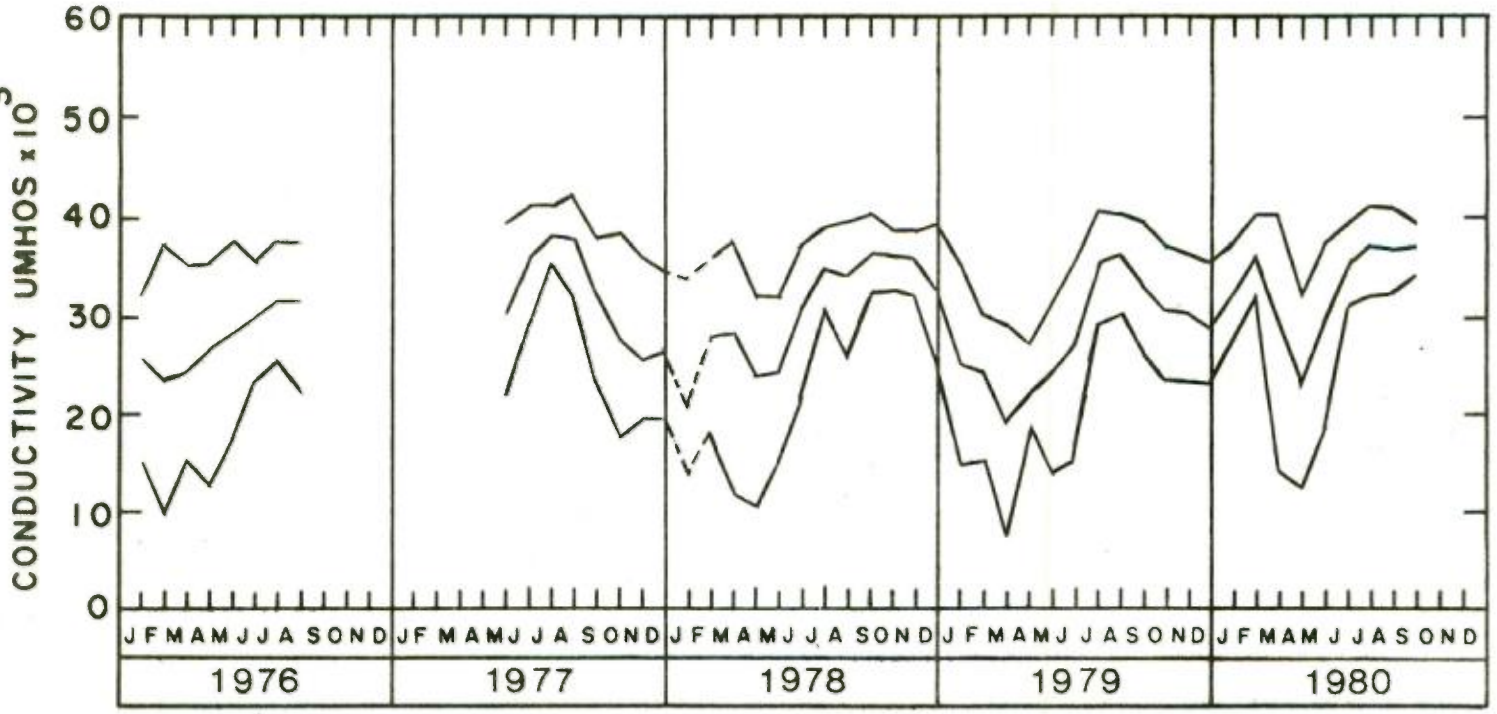
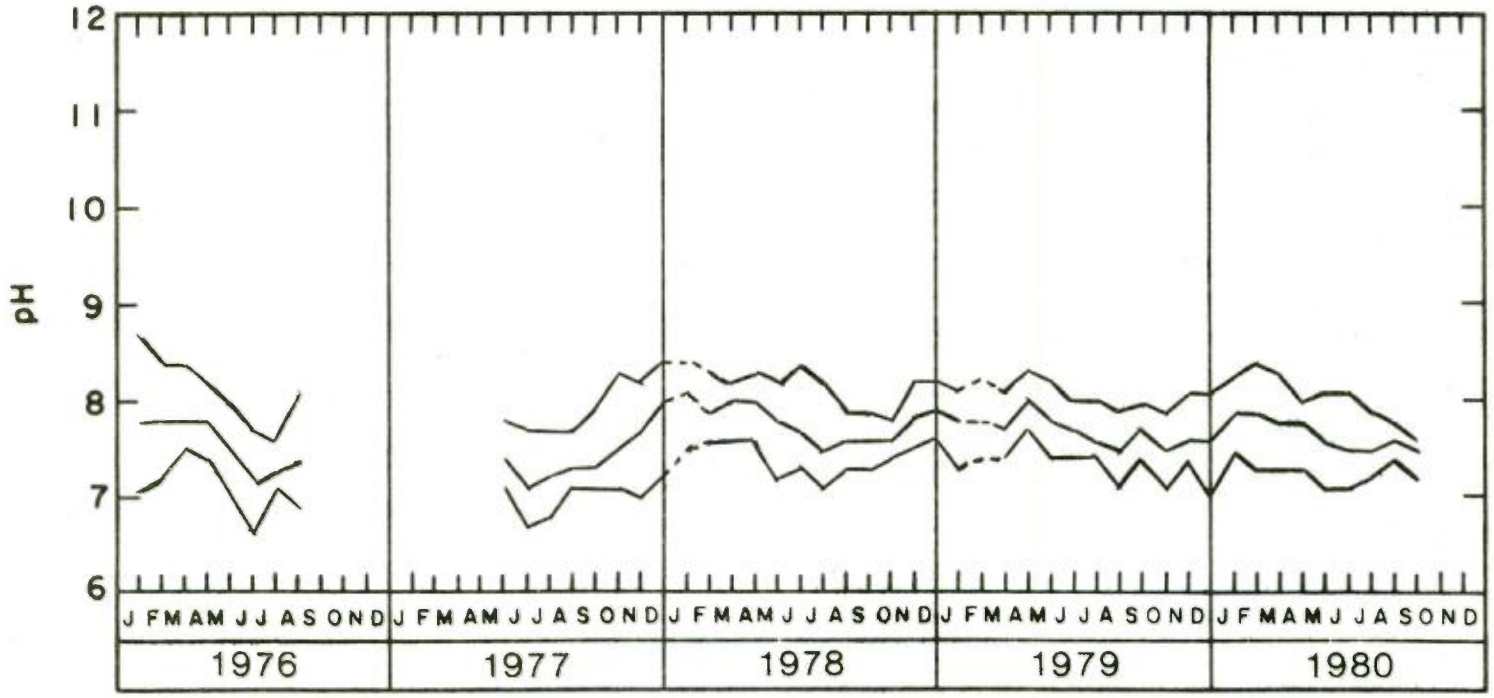
CENTER LINE — average of the daily average values
BOTTOM LINE — minimum monthly value

KILL VAN KULL — U.S. GYPSUM (station no. 7)





TOP LINE — maximum monthly value
CENTER LINE — average of the daily average values
BOTTOM LINE — minimum monthly value

PERCENT OF TIME INTERSTATE SANITATION COMMISSION DISSOLVED OXYGEN REQUIREMENTS WERE MET AT I.S.C. REMOTE AUTOMATIC WATER QUALITY MONITORING STATIONS FOR THE PERIOD OF OCTOBER 1, 1979 THROUGH SEPTEMBER 30,1980

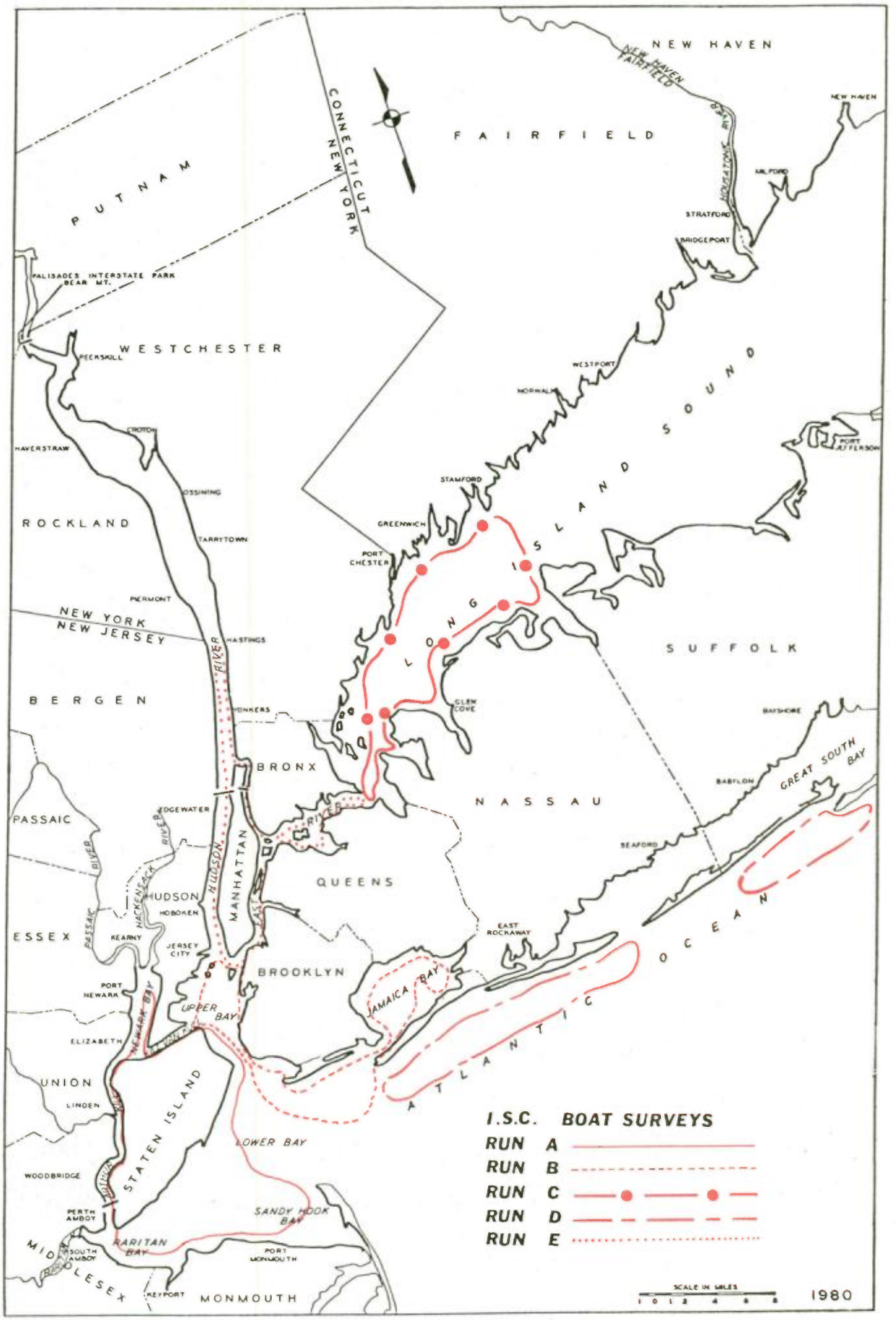
MONTH	STATION 1 AK/CE	STATION 2 ER/CE	STATION 3 ER/TN	STATION 7 KVK/USG
October 1979	97.6	100.0	99.1	100.0
November 1979	100.0	100.0	100.0	100.0
December 1979	100.0	100.0	100.0	100.0
January 1980	100.0	100.0	100.0	100.0
February 1980	100.0	100.0	100.0	100.0
March 1980	100.0	100.0	100.0	100.0
April 1980	100.0	100.0	100.0	100.0
May 1980	86.0	100.0	100.0	100.0
June 1980	0.8	100.0	100.0	100.0
July 1980	0.0	97.2	73.7	35.5
August 1980	4.5	39.8	23.2	68.2
September 1980	63.1	98.2	12.2	96.0

Boat Surveys

Boat surveys are conducted throughout the year in order to determine the quality of District waters. During the summer months when dissolved oxygen requirements are not being met, the boat surveys are conducted twice a month. This year the NYS DEC did not request that the Commission sample the eastern part of Boat Run D. A map and tables of the boat survey routes and station locations are shown on the following pages.

Due to construction, the Passaic Valley Sewerage Commissioners' (PVSC) sewage treatment plant was forced to discharge into Newark Bay, rather than Upper New York Bay. Since this discharge was occurring during the critical summer months, the Commission performed a special Newark Bay boat survey during July. The survey included six stations in Newark Bay, one station at the confluence of Newark Bay and the Passaic River, one station at the confluence of Newark Bay and the Hackensack River, one station in the northern end of the Arthur Kill and one station near the eastern end of the Kill Van Kull. The data showed that Newark Bay, especially near the PVSC outfall, contained low dissolved oxygen and very high amounts of coliforms, heavy metals and oil and grease.

Water samples for biological analyses were taken on the boat surveys. The biological analyses consisted of chlorophyll determinations and phytoplankton counts and identifications. All stations were sampled for chlorophyll during the months of November 1979, and May, July and August of 1980. Phytoplankton samples were taken at one half of the stations during January and July. In general, the chlorophyll concentrations were low in November and reached a peak during the summer months of July and August. The data indicates a considerable increase in algal activity during the month of July in Raritan Bay. Microscopic examination of samples taken from this area revealed various algal genera, with numerous Scenedesmus spp. These samples also contained large numbers of non-planktonic unicellular organisms which have not as yet been identified.


NEW HAVEN
NEW HAVEN
FAIRFIELD
FAIRFIELD
NEW HAVEN
MILFORD
STRATFORD
BRIDGEPORT
PUTNAM
CONNECTICUT
NEW YORK
PALISADES INTERSTATE PARK
BEAR MT.
WESTCHESTER
PEEKSKILL
WESTPORT
NORWALK
LONG ISLAND SOUND
PORT JEFFERSON
HAVERSTRAW
CROTON
OSSINING
STAMFORD
ROCKLAND
TARRYTOWN
GREENWICH
PORT CHESTER
PIERMONT
NEW YORK
NEW JERSEY
HASTINGS
SUFFOLK
BERGEN
YONKERS
GLEN COVE
BAYSHORE
BRONX
GREAT SOUTH BAY
BABYLON
NASSAU
PASSAIC
EDGEWATER
HUDSON
MANHATTAN
QUEENS
SEAFORD
HOBOKEN
ESSEX
KEARNY
JERSEY CITY
EAST ROCKAWAY
BROOKLYN
PORT NEWARK
UPPER BAY
JAMAICA BAY
ATLANTIC OCEAN
ELIZABETH
UNION
LINDEN
STATEN ISLAND
LOWER BAY
WOODBRIDGE
SANDY HOOK BAY
PERTH AMBOY
RARITAN BAY
SOUTH AMBOY
PORT MONMOUTH
MIDDLESEX
KEYPORT
MONMOUTH
I.S.C. BOAT SURVEYS
RUN A
RUN B
RUN C
RUN D
RUN E
SCALE IN MILES
1 0 1 2 4 6 8
1980

INTERSTATE SANITATION COMMISSION
SAMPLING STATIONS - BOAT RUN "A"

STATION	LATITUDE NORTH D M S	LONGITUDE WEST D M S	D E S C R I P T I O N
AK-03	40-38-18	74-11-45	At the center of & on the northside of the B&O R.R. Bridge
AK-07	40-35-35	74-12-22	Middle of mouth of Rahway River & in line with shoreline along Tremley Reach
AK-13	40-33-02	74-15-00	Mid-channel between Flashing Red Buoy #12 & Flashing Green, Black Buoy #1
AK-18	40-30-24	74-15-34	Mid-channel of Ward Point Bend (west) and opposite Perth Amboy Ferry Slip
LB-01	40-30-44	74-06-03	500 feet from Old Orchard Light in line with the beacon at Old Orchard Shore
LB-02	40-33-45	74-04-20	B.W. Bell off Midland Beach
NB-03	40-39-20	74-08-45	Northside of C.R.N.J. Bridge over the Newark Bay South Reach Channel (mid-channel)
NB-05	40-38-47	74-09-10	Midway between Flashing Red Buoy #14 and Buoy N "2A"
NB-12	40-41-57	74-07-10	Newark Bay North Reach at mid-channel northside of LVRR Bridge
RB-07	40-27-39	74-02-47	Flashing Red Buoy R "4" off the tip of Leonardo (U.S.N.) Pier
RB-08	40-27-08	74-06-22	E-W: Line of Nun Buoy N "2" at channel entrance to Compton Creek & standpipe on Point Comfort. N-S: Approximately 200 yards west of Pews Creek.
RB-10	40-29-04	74-15-38	Qk Fl G "3" Buoy
RB-14	40-28-01	74-11-18	Buoy C "3" off Conaskonk Point at channel entrance to Keyport Harbor
RB-15	40-27-23	74-08-56	Private Fl G Buoy "1" on Belvedere Beach Point Comfort
UH-11	40-39-05	74-05-10	Located in the Kill Van Kull, in mid-channel & directly opposite Fl G & Black Buoy #3
UH-13	40-36-26	74-02-45	Middle of channel in Narrows under Verrazano Bridge

INTERSTATE SANITATION COMMISSION
SAMPLING STATIONS - BOAT RUN "B"

STATION	LATITUDE NORTH D M S	LONGITUDE WEST D M S	D E S C R I P T I O N
AO-01	40-31-47	73-56-37	Flashing Red R "2" Gong (4 sec.)
HR-01	40-42-20	74-01-36	Mid-channel of Hudson River N-S: Line of black buoys E-W: Fire Boat Pier (NY) and railroad pier (NJ)
JB-02	40-36-27	73-53-09	Mill Basin at east end of channel
JB-03	40-37-37	73-53-00	In channel 400 feet south of the end of Canarsie Pier
JB-05	40-35-45	73-48-40	At center pier of bridge over Beach Channel - Hammels
JB-07	40-38-52	73-49-20	At mouth of Bergen Basin, southeast of the sludge storage tank
JB-08	40-36-20	73-48-56	Under center of R.R. trestle
LB-03	40-34-03	73-59-00	200 feet south of Steeplechase Pier at Coney Island - N "2S"
LB-04	40-35-00	74-00-51	1/4 mile northeast of Norton Point, near the White Nun Buoy
RI-01	40-34-00	73-55-51	As near the outfall structure of the Coney Island plant as safety permits
RI-02	40-34-24	73-53-08	Under center of bridge from Barran Island to Rockaway
UH-03	40-39-14	74-03-35	Passaic Valley Outfalls E-W: Robbins Reef Light and forward water tower on Naval Dock N-S: Statue of Liberty and Black Bell Buoy #1-G
UH-13	40-36-26	74-02-45	Middle of channel in Narrows under Verrazano Bridge
UH-21	40-40-23	74-02-28	Main ship channel 10 yards to the west of Fl R Bell Buoy #30
UH-22	40-38-25	74-02-50	In mid-channel of Bay Ridge Channel E-W: Flashing Red Beacon on 69th St Ferry Dock (Brooklyn) N-S: Fl G Bell Buoy #3 and Fl R Gong Buoy #22
UH-29	40-42-17	75-59-54	Mid-channel of East River in line with Pier #11 (Manhattan) and Pier #1 (Brooklyn)

INTERSTATE SANITATION COMMISSION
SAMPLING STATIONS - BOAT RUN "C"

STATION	LATITUDE NORTH D M S	LONGITUDE WEST D M S	D E S C R I P T I O N
LI-15	40-47-58	73-47-38	Middle of Throgs Neck Bridge
LI-17	40-49-43	73-46-46	500 yards off Stepping Stone, north of Fl G "12" M Horn
LI-19	40-51-33	73-45-03	Off Bell "27" at Gang Way Rock
LI-24	40-53-57	73-44-27	At New Rochelle outfall approximately 500 yards south of R "2"
LI-25	40-55-25	73-42-01	Mamaroneck Fl 4 sec. Bell R "42"
LI-26	40-58-47	73-38-59	Port Chester off N "2"
LI-27	41-00-08	73-36-04	Captain's Harbor - Newfoundland Reef Fl R "4"
LI-28	40-59-42	73-33-58	Greenwich Point R N "34"
LI-29	41-00-54	73-32-14	Stamford between E int G 8M Horn & Fl R
LI-30	40-59-26	73-30-49	Stamford - N-S: "32" Fl 4 sec. Bell and Fl 4 sec. "15" Bell E-W: "32A" whistle R N "28"
LI-31	40-53-29	73-30-11	Oyster Bay Gong "1"
LI-32	40-54-39	73-38-07	Matinecock Pt. "21" Fl G 4 sec. Bell
LI-33	40-51-42	73-40-07	Hempstead Harbor midway between R 6 Bell and Fl 4 sec. "1"
LI-34	40-50-00	73-44-02	Manhasset Bay Fl G 4 sec. "1"

INTERSTATE SANITATION COMMISSION
SAMPLING STATIONS - BOAT RUN "D" (EASTERN RUN)

STATION	LATITUDE NORTH D M S	LONGITUDE WEST D M S	D E S C R I P T I O N
E-01	40-37-44	73-18-40	Mid-channel of entrance to Fire Island Inlet
E-02	40-36-55	73-20-40	Atlantic Ocean in open waters approximately 1 mile south of Cedar Island Beach
E-03	40-35-20	73-27-29	Atlantic Ocean in open waters approximately 3/4 mile south of Tobay Beach
E-04	40-33-40	73-26-48	Atlantic Ocean in open waters approximately 2 1/2 miles south of Tobay Beach
E-05	40-34-54	73-20-30	Atlantic Ocean in open waters approximately 3 miles south of Cedar Island Beach
E-06	40-37-14	73-11-06	Atlantic Ocean in open waters approximately 1 mile south of Saltaire on Fire Island
E-07	40-36-12	73-17-23	Atlantic Ocean in open waters approximately 1 1/4 miles south of Robert Moses State Park on Fire Island

INTERSTATE SANITATION COMMISSION
SAMPLING STATIONS - BOAT RUN "D" (WESTERN RUN)

STATION	LATITUDE NORTH D M S	LONGITUDE WEST D M S	D E S C R I P T I O N
W-01	40-35-03	73-34-33	100 feet east of Red Buoy #6 at entrance to Jones Inlet
W-02	40-33-51	73-35-42	1 mile south of water tower and building on shore and 1/2 mile and 100 feet out from tip of jetty
W-03	40-34-05	73-33-30	1/2 mile east of jetty and 1 mile from shore on a line with the Coast Guard Station
W-04	40-31-12	73-39-12	3 miles off shore south of point W-10
W-05	40-31-18	73-48-15	A heading of 112 degrees east of point W-06 opposite 7 high apartment buildings on shore and approximately 2 1/2 miles out
W-06	40-32-36	73-51-54	South of main building with twin towers at Riis Park and approximately 1 1/2 miles from shore
W-08	40-35-18	73-45-27	50 feet west of Red Buoy #6 and 1/2 mile from shore
W-09	40-34-24	73-44-18	Gas tank on shore and Red Gong Buoy R4 off jetty about 1/2 mile west
W-10	40-33-54	73-39-12	1 mile off shore on a line with edge of apartment building and gas tank. High water tower to East

INTERSTATE SANITATION COMMISSION
SAMPLING STATIONS - BOAT RUN "E"

STATION	LATITUDE NORTH D M S	LONGITUDE WEST D M S	D E S C R I P T I O N
ER-01	40-42-24	73-59-27	Under Manhattan Bridge - mid-channel
ER-02	40-42-48	73-58-20	Under Williamsburg Bridge - mid-channel
ER-03	40-44-05	73-58-05	Mid-channel of East River E-W: Pier #73 (School Slip) Manhattan with open pier, foot of Greene Street, Brooklyn N-S: Poorhouse Flats Range
ER-04	40-45-22	73-57-11	Under Queensboro Bridge in the East Channel
ER-09	40-47-26	73-54-53	Mid-channel of East River E-W: Fl R Bell Beacon on Wards Island with tall stack on Con Edison's Astoria Plant
ER-11	40-47-50	73-52-02	Mid-channel of East River E-W: Fl R Beacon (College Point) with stack on Rikers Island N-S: Line from center of Sanitation Pier (Hunts Point) with Fl R #4 Buoy (Station approximately 250 yards SE of #4 Buoy)
HA-01	40-48-40	73-56-02	Third bridge after Triboro Bridge
HA-02	40-50-44	73-55-45	Hamilton Bridge (middle bridge of 3)
HR-01	40-42-20	74-01-36	Mid-channel of Hudson River N-S: Line of black buoys E-W: Fire Boat Pier (NY) and railroad pier (NJ)
HR-02	40-45-17	74-00-58	Mid-channel of Hudson River E-W: Heliport (NY) and Seatrain pier (NJ)
HR-03	40-47-41	73-59-09	Mid-channel of Hudson River E-W: Soldiers & Sailors Monument (NY) and circular apartment buildings (NJ)
HR-04	40-51-04	73-57-04	Mid-channel of Hudson River under George Washington Bridge
HR-05	40-52-40	73-55-02	Mid-channel of Spuyten Duyvil Creek under Henry Hudson Bridge
HR-07	40-56-51	73-54-27	Mid-channel of Hudson River E-W: Opposite Phelps Dodge (Yonkers)

LABORATORY

The Commission laboratory during 1980 has continued its sampling programs throughout the Interstate Sanitation District. Analyses were performed on samples from wastewater treatment plants, industries, and boat surveys. The laboratory also analyzed samples submitted by the New York State Department of Environmental Conservation. Samples collected at the time of the fire at the Chemical Control Corporation of Elizabeth, New Jersey were analyzed for pesticides and PCB's. Compliance sampling and analyses were done for N/SPDES permit requirements at the request of the U.S. EPA and state environmental departments.

The Commission's ambient benzene study produced approximately 300 samples which were analyzed in the laboratory. Details of the sampling and analysis techniques are given elsewhere in this report.

The laboratory has continued to participate in the U.S. EPA's Water Pollution Performance Evaluation Testing program. The laboratory also participated in a pilot study, "Coliform Analyses for Drinking Water Laboratories", for the U.S. EPA and continued in the New York State Department of Health program for water bacteriology proficiency samples.

HUDSON-RARITAN ESTUARY PROJECT

The Commission was awarded a contract by the National Oceanic and Atmospheric Administration to perform one work unit of its project relating to water quality in the Hudson-Raritan Estuary. The contract is to run from September 1, 1980 through September 30, 1981.

The purpose of the work unit to be performed by the Commission is to provide a comprehensive description and analysis of present water quality in the subject area by assembling and analyzing existing data. Using data and other information relating to factors which are likely to affect contaminant inputs to the waters in the near and medium range future, it is also the purpose of this work unit to suggest the water quality management measures necessary to place and maintain the Estuary waters in satisfactory condition for their legitimate uses. Thus, the descriptions and analyses for water quality are intended to be water use oriented and are not designed to emphasize the historical record for its own sake.

III. AIR POLLUTION

GENERAL

During 1980, the Interstate Sanitation Commission continued assisting the States of New York, New Jersey, and Connecticut by participating in and providing coordination for various projects related to understanding and controlling air pollution. These activities focused primarily on air pollution problems common to all three states, particularly those of an interstate nature.

The Commission's study on monitoring benzene in ambient air, which began in 1979, continued in 1980. A method was developed for the collection and analysis of benzene in ambient air. A portable sampling kit was constructed for collecting the samples in stainless steel traps packed with an absorbent. The samples were brought to the Commission laboratory where the organic vapors were desorbed from the sample traps, concentrated and then analyzed on a gas chromatograph. Two hundred and seventy two samples were collected and analyzed from October 1979 through August 1980. Twelve locations in the New York-New Jersey Metropolitan Area were selected as sampling sites and were found to have benzene levels ranging from 0.0 to 23.3 ppb, with the highest concentrations usually occurring when the wind direction was variable and the wind speed less than 2 mph. A review of the literature showed that the benzene concentrations measured in this study were similar to those obtained in other urban areas. A paper on the Commission's ambient benzene project was presented at the APCA International Technical Conference on Toxic Air Contaminants, Health Effects, Monitoring and Control which was held in Niagara Falls, New York during October 1980.

During 1980, the Commission continued to work with state and local air pollution enforcement personnel concerning the large number of odor complaints received by the Commission's 24 hour-a-day answering service. Because of a high incidence of complaints during the beginning of June, the Commission conducted a special 24 hour-a-day surveillance on Staten Island and the Arthur Kill shoreline of New Jersey from June 10-27, 1980.

REGIONAL AIR POLLUTION WARNING SYSTEM

The Interstate Sanitation Commission coordinates the New Jersey-New York-Connecticut Air Quality Control Regional Air Pollution Warning System. The Commission may activate this system on the basis of National Weather Service forecasts and/or existing pollutant levels. Activation of the Air Pollution Warning System results in notifying the participating federal, state, and New York City agencies that a watch is in effect and requesting hourly air quality data in a uniform format, via teleprinter, from each agency in the Region. Moving 4, 6, or 24 hour averages of all pollutants are computed hourly and transmitted to all participating agencies. Conditions during the past year did not warrant activation of the system.

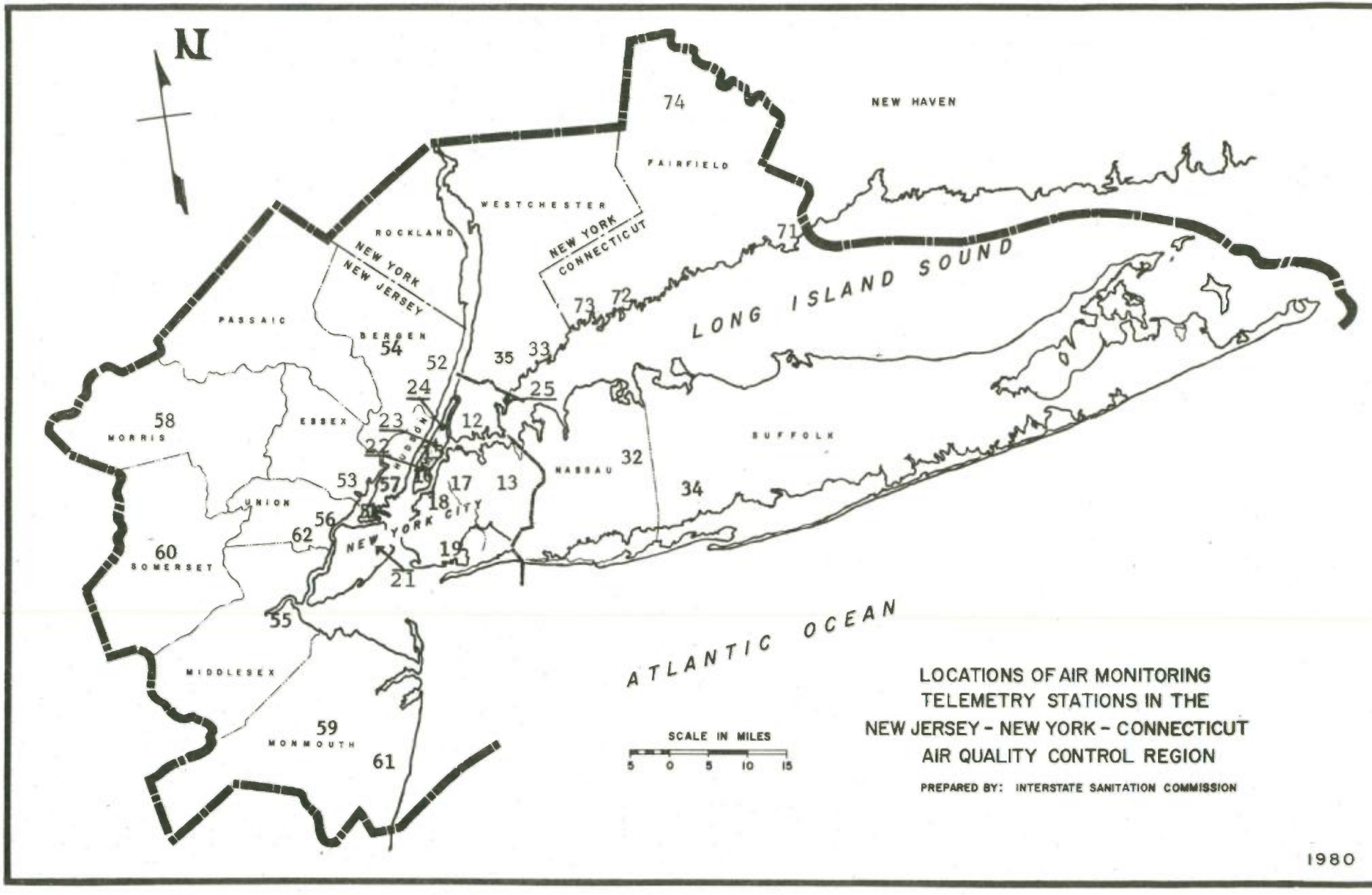
Telemetry stations for the measurement of air pollution parameters operated by various state and local agencies in the New York-New Jersey-Connecticut Air Quality Control Region are shown on the map and list on the following pages.

AIR POLLUTION COMPLAINTS

The Commission receives and responds to air pollution complaints 24 hours-a-day, seven days a week throughout the District. Since the majority of the complaints received are from Staten Island residents reporting obnoxious odors, the Commission switched to a Staten Island answering service in January 1980, thus providing a toll free number for Staten Islanders calling the Commission. When similar complaints are received within a short period of time the problem is investigated by the Commission. Complaints are followed up with a visit or call to the complainant. Whenever appropriate, complaints are referred to the state or local officials having enforcement jurisidiction.

From January through May 1980, the Commission received 235 odor complaints. However, because 47 complaints were received during the beginning of June, the Commission conducted 24-hour-a-day surveillance on Staten Island and the Arthur Kill shoreline of New Jersey from June 10, 1980 through June 27, 1980. Commission inspectors patrolled the area from 0000 hours on Mondays until 2400 hours on Fridays and the ISC answering service was instructed to immediately contact Commission personnel who were on standby on the weekends.

During the study period the Commission received approximately 100 complaints. Complainants were either visited or called by the ISC inspector on duty. When a source was either known or suspected, the authorities having enforcement jurisidction were contacted to do a follow-up and take any necessary action. The Commission worked closely with and had the support of authorities


N
74
NEW HAVEN
FAIRFIELD
WESTCHESTER
ROCKLAND
NEW YORK
CONNECTICUT
NEW YORK
NEW JERSEY
71
LONG ISLAND SOUND
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72
PASSAIC
BERGEN
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52
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MORRIS
ESSEX
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12
HUDSON
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SUFFOLK
NASSAU
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53
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16
17
13
34
UNION
18
56
NEW YORK CITY
62
60
SOMERSET
19
21
55
ATLANTIC OCEAN
MIDDLESEX
59
MONMOUTH
61
SCALE IN MILES
5 0 5 10 15
LOCATIONS OF AIR MONITORING
TELEMETRY STATIONS IN THE
NEW JERSEY - NEW YORK - CONNECTICUT
AIR QUALITY CONTROL REGION
PREPARED BY: INTERSTATE SANITATION COMMISSION
1980

AIR MONITORING TELEMETRY STATIONS
IN THE
NEW JERSEY-NEW YORK-CONNECTICUT
AIR QUALITY CONTROL REGION

ISC NO.	CITY	COUNTY	STATE
12	New York	Bronx	New York
13	New York	Queens	New York
15	New York	New York	New York
16	New York	New York	New York
17	New York	Kings	New York
18	New York	Kings	New York
19	New York	Kings	New York
21	New York	Richmond	New York
22	New York	New York	New York
23	New York	New York	New York
24	New York	New York	New York
25	New York	Bronx	New York
32	Hempstead	Nassau	New York
33	Mamaroneck	Westchester	New York
34	Bablyon	Suffolk	New York
35	White Plains	Westchester	New York
51	Bayonne T *	Hudson	New Jersey
52	Hackensack	Bergen	New Jersey
53	Newark T *	Essex	New Jersey
54	Paterson	Passaic	New Jersey
55	Perth Amboy	Middlesex	New Jersey
56	Elizabeth	Union	New Jersey
57	Jersey City	Hudson	New Jersey
58	Morristown	Morris	New Jersey
59	Freehold	Monmouth	New Jersey
60	Somerville	Somerset	New Jersey
61	Asbury Park	Monmouth	New Jersey
62	Elizabeth T *	Union	New Jersey
71	Bridgeport	Fairfield	Connecticut
72	Stamford	Fairfield	Connecticut
73	Greenwich	Fairfield	Connecticut
74	Danbury	Fairfield	Connecticut

* T represents comprehensive laboratory trailers.
Other stations are fixed in buildings.

in New Jersey, New York State, and New York City. Complaints were categorized as to known sources, suspected sources or unknown sources. It was determined that during the study period 70% of the odors were known or suspected to come from Staten Island sources, 25% were known or suspected to come from New Jersey sources and 5% were from indeterminable sources.

AMBIENT BENZENE STUDY

General

At the request of the New York State Department of Environmental Conservation, the Commission initiated a sampling program to determine ambient benzene concentrations. While there has been increasing public concern about atmospheric levels of known carcinogenic trace organic compounds, sufficient data about benzene, one of these compcunds, are not available in this bistate area.

In 1979 the Commission held an organizational meeting with representatives from the State of New Jersey, Department of Environmental Protection; the State of New York, Department of Environmental Conservation; and the New York and New Jersey Health Departments. It was agreed that procuring ambient benzene data for Staten Island and the surrounding areas were the first considerations of the study.

In this study, a method for the collection and analysis of benzene in the ambient air was developed with a lower detection limit of 0.1 ppb in a 10 liter sample volume.

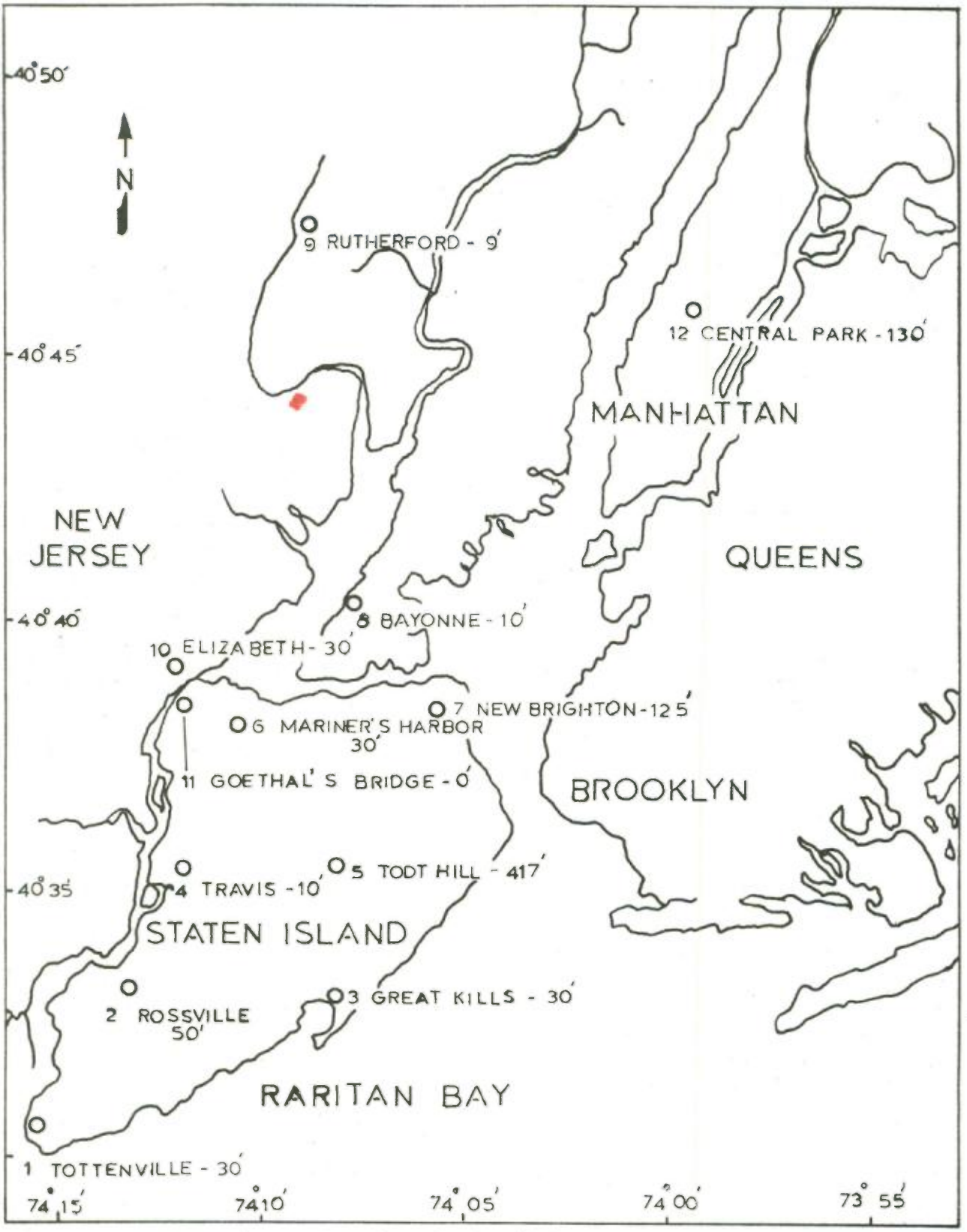
Experimental Methods

From October 1979 to August 1980, hourly samples were collected from 12 sites in the New York-New Jersey Metropolitan Area. These samples were collected weekdays during the hours of 7:00 a.m. to 5:00 p.m. The sites for sampling were selected so as not to be directly influenced by known sources of benzene. Descriptions of the sample sites and their gecgraphical locations are shown in the accompanying table and figure.

A number of methods have been utilized for sampling ambient air. These have included grab sampling in stainless steel or glass bulbs, cold trap or solution trapping, and bag sampling. These methods have some disadvantages, such as surface adsorption of pollutants, water or solvent interferences, poor sensitivity resulting from an inability to concentrate pollutants and inconvenience.

Site Descriptions

Site	Location	Description
1	Tottenville, SI	Western edge of a densely populated residential area. Site faces the New Jersey industrial complex across the southern end of the Arthur Kill.
2	Rossville, SI	In the South Shore Golf Course on the side of a grassy hill.
3	Great Kills, SI	South of a densely populated area, located within Gateway National Recreation Area.
4	Travis, SI	100 feet off a dead end street, Melvin Avenue, on the border of a residential area and within one mile of the West Shore Expressway.
5	Todt Hill, SI	On the border of a wooded area on the highest point in Staten Island.
6	Mariner's Harbor, SI	On a grassy ball field in a residential area bordering a light to moderate industrial area.
7	New Brighton, SI	Residential area within 1/2 mile of the Kill Van Kull.
8	Bayonne, NJ	Outer border of a residential and light industrial area. Site overlooks Elizabeth, NJ.
9	Rutherford, NJ	Residential area at the end of Pierrepont Avenue.
10	Elizabeth, NJ	Near New Jersey Turnpike Exit 13.
11	Goethal's Bridge, SI	One mile south of Goethal's Bridge.
12	Central Park, NY	On an open field south of the lake of Central Park, Manhattan.



Location and elevation of monitoring sites.

Tenax GC has proven to be an excellent material for trapping volatile organic compounds from air for subsequent analysis because of its good adsorption characteristics and thermal stability. Tenax GC, 60-80 mesh, was purified before use by Soxhlet extraction with three successive solvents (hexane, cyclohexane, and acetone) for 8 hours each, then dried overnight in an oven at 275 C.

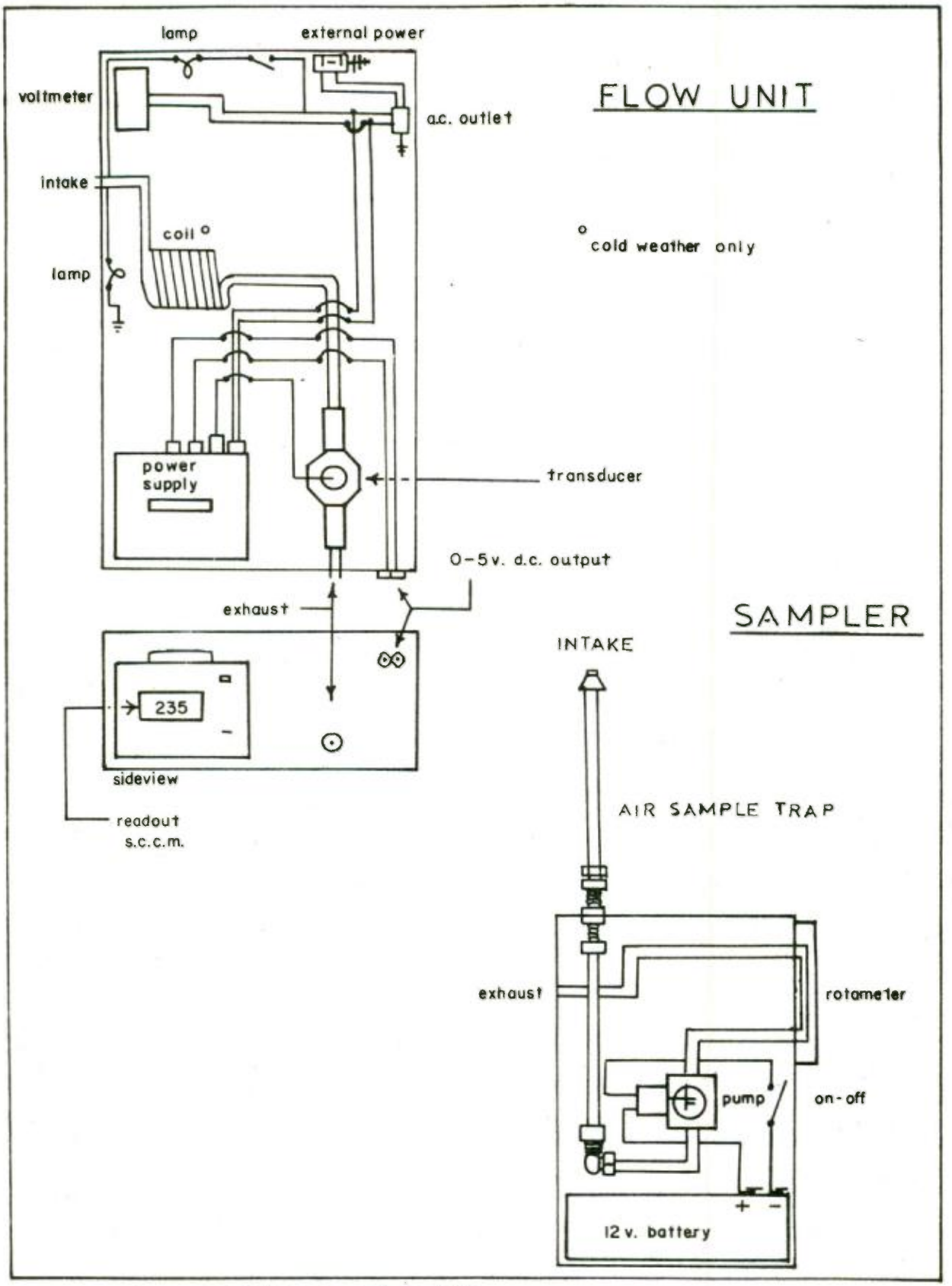
The Tenax was packed in a 1/4 in. OD x 12 in. stainless steel tubing with Swagelok connecting fittings. About one gram of Tenax was held in place with plugs of silanized glass wool. Studies were conducted by using two 1/4 in. OD x 6 in. traps connected in series downstream of the 12 in. trap to see if any breakthrough occurred. It was found that 1/4 in. OD x 12 in. traps were suitable for sampling at a 100-300 ml/min. flow rate with sample volumes less than 20 liters and benzene concentrations below 30 ppb.

The packed traps were conditioned overnight before use by heating to 275 C with a flow of nitrogen at approximately 50 ml/min. The nitrogen was purified by an activated charcoal trap to ensure no contamination. Conditioned traps were cooled to room temperature under continuous nitrogen flow and then sealed with stainless steel caps. After sample collection, desorption, concentration and GC analysis, the traps were reconditioned with a nitrogen flow in the opposite direction to the air sampling flow and heated overnight at 275 C.

The flow measurement unit is shown in the figure. It consists of a Hastings mass flowmeter, Hastings transducer, and a power supply with digital flow rate readout which are all contained in a 12 in. x 18 in. x 7 in. metal box. The volume readings are calibrated at 25 C and 760 mm Hg pressure. Ambient temperature effects are less than 0.5% for most gases, from 0 to 40 C, and less than 2% from -20 to 100 C. Two lamps and a coil were provided during cold weather samplings to insure stability. The sampler, as shown in the figure, was developed to sample ambient air in the field. The pump, a 12 volt battery and a rotameter are all mounted in a 7 in. x 4 in. x 10 in. metal box.

To operate the sampler, the exhaust air from the sampler was connected to the intake of the measurement unit. The flow rate was controlled by setting the pump which was normally preset before going out into the field.

On each day of sampling at each site, 2 to 3 samples were taken simultaneously, with identical sampling systems, 90% of the time. Single samples were taken only 10% of the time. When triplicate samples were taken, the third sample was usually spiked with a benzene standard in the laboratory or run on a dif-



Layout of flow unit and sampler.

ferent GC column for confirmation purposes. The samples were collected for approximately a one hour period at a flow rate of 200 ml/min. The flow rates were recorded at 15 minute intervals, and actual air volume was calculated. All samples were anaylzed within 24 hours.

Analytical Methodology

The principle of this method is the use of a modified Tekmar Liquid Sample Concentrator (TLSC) for desorption and concentration of benzene before it is transferred to a gas chromatograph for analysis. The TLSC has semi-automated purge and desorb and bake time settings. After the air sample is collected in the sample trap, one end is connected to the purge line of the TLSC. The outlet end of the trap is connected to the TLSC sample inlet plug as shown in the figure. A diagram of the purge mode and sample desorb mode is included.

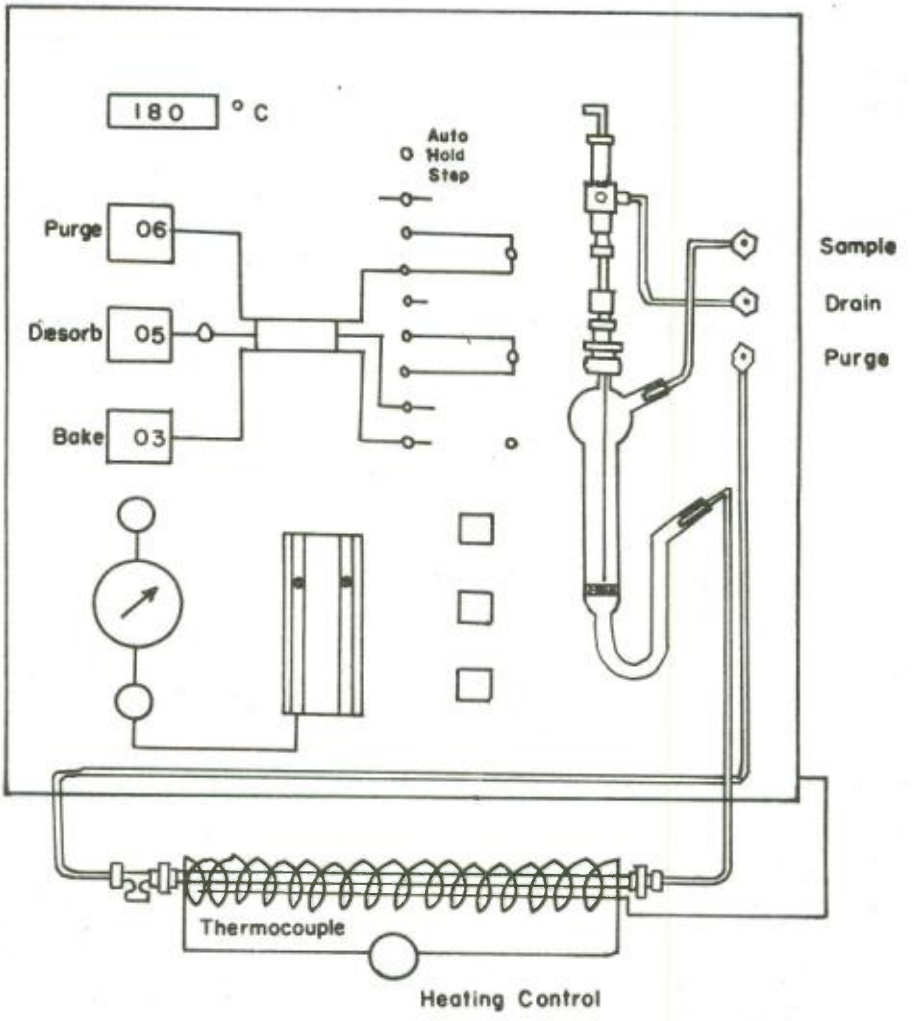
The external thermocouple, which was designed to check GC column temperatures, was removed and attached to the sample trap during thermal desorption. Therefore, the trap temperature will be indicated on the TLSC temperature digital readout.

The maximum recovery compared to purge time and trap heating temperature was studied. A figure showing these results is included. At a purge time of 6 minutes, a desorb time of 5 minutes, and a trap heating temperature of 180 C, approximately 100% of the benzene could be recovered from the trap and the TLSC.

The desorbed samples were analyzed by a Perkin-Elmer 900 gas chromatograph with dual flame ionization detectors. All peaks were recorded by a Spectra-Physics Minigrator. The GC columns and operating conditions are shown in the table. GC Column 1 was used for the initial analysis and GC Column 2 was used for confirmation purposes.

The benzene standard was prepared by injecting 2.0 µl of benzene in 50 ml of distilled water. The reasons for using water are: 1. water gives a lower GC background than organic solvents, 2. using a liquid standard is easier than a gas standard which needs tedious gas dilution techniques, and 3. the effect of water on Tenax is also insignificant.

The solubility of benzene in water is 1/1430, therefore 2.0 µl of benzene in 50 ml of water is well below the solubility limit. The benzene standard was kept in a vial with no air space and sealed with Teflon-lined silicone rubber. Although the benzene concentration is stable for more than one week, the standards were prepared weekly. The standard concentration was also checked with a benzene gas standard of 1 ppm benzene in nitrogen having an analyzed accuracy of $\pm$2%. This was done by injecting



Thermal desorption of sample from Tenax - GC trap to Tekmar liquid sample concentrator Model LSC-2

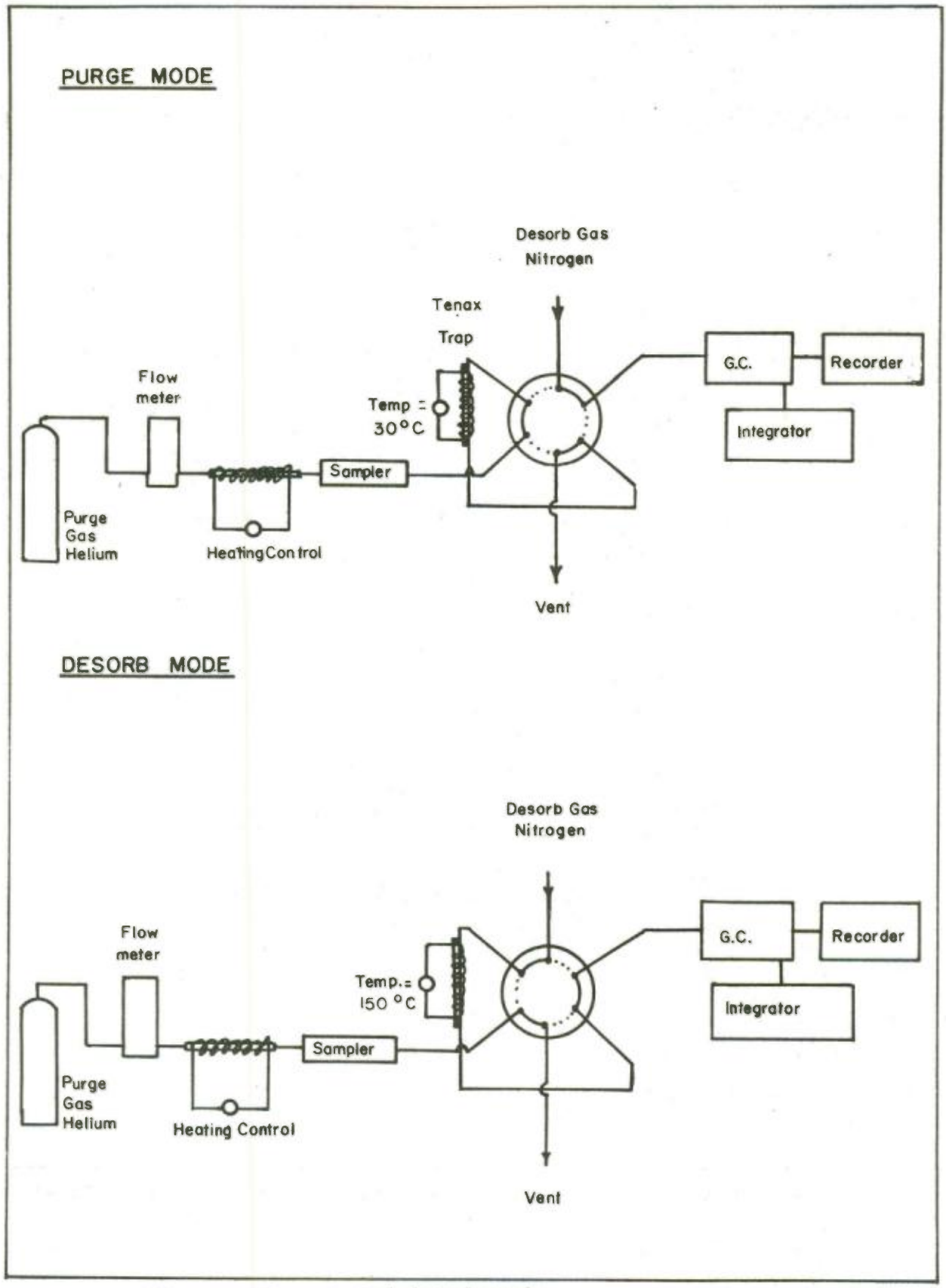
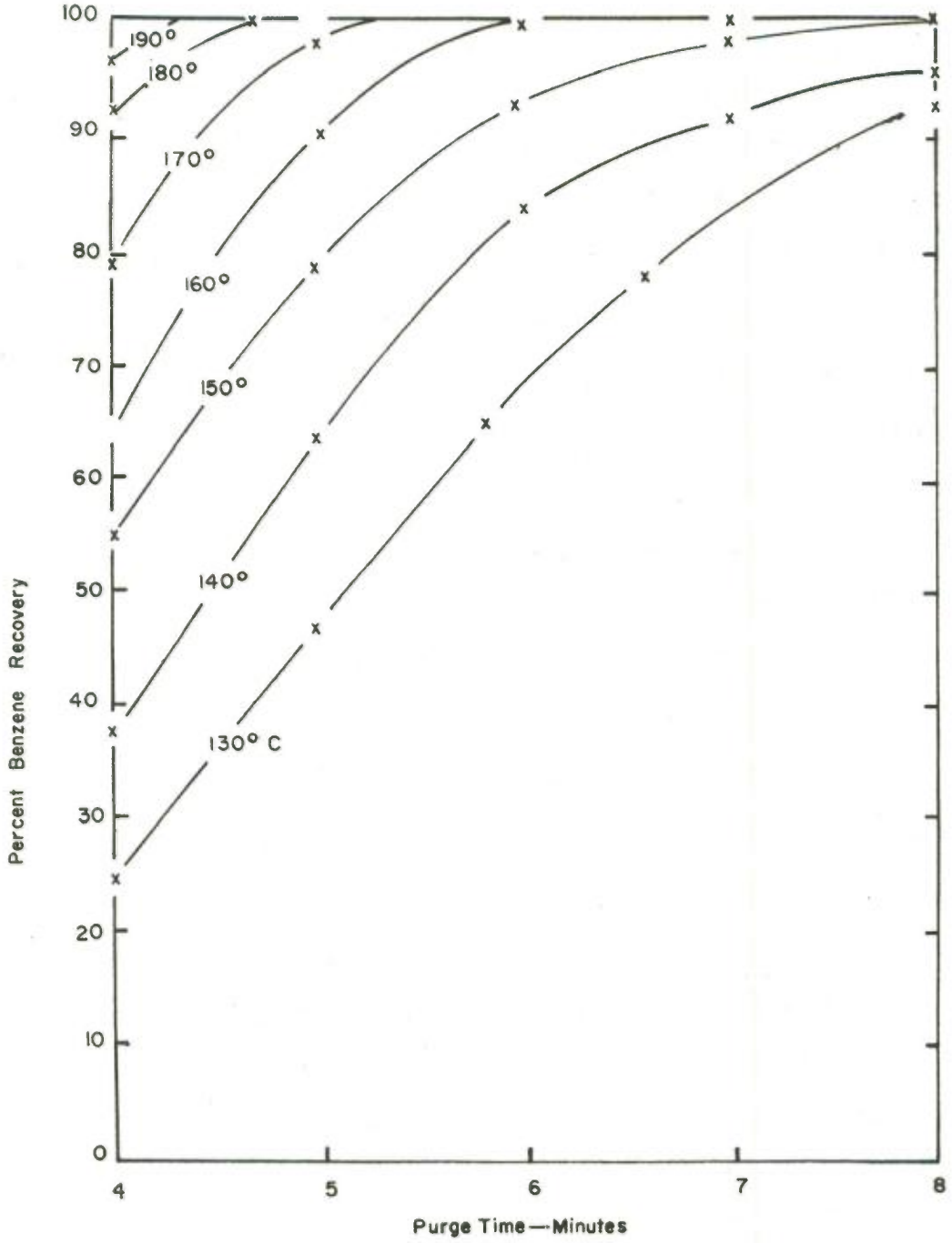


Diagram of purge and desorb mode.



Percent benzene recovery from Tenax - GC trap as functions of temperature and purge time.

GC Columns and Operating Conditions

Helium gas purge flow ---------- 80 ml/min

Nitrogen gas flow ---------- 60 ml/min

Hydrogen gas flow ---------- 30 ml/min

Air flow ---------- 30 ml/min

GC Column 1

1/8 in. OD x 10 ft. s.s. column packed with 20% SP-2100/0.1% Carbowax 1500 on 100/120 mesh Supelcoport

Initial time ---------- 6 minutes
Initial temperature -------- 40 C
Temperature program rate --- 16 C/min
Final temperature ---------- 160 C
Final holding time --------- 4 minutes

GC Column 2

1/8 in. OD x 6 ft. s.s. column packed with 0.1% SP-1000 on 80/100 mesh Carbopack C

Initial time ---------- 6 minutes
Initial temperature -------- 80 C
Temperature program rate --- 16 C/min
Final temperature ---------- 200 C
Final holding time --------- 4 minutes

a gas standard into the Tenax trap. The results were within a +10% range. The typical gas chromatogram of the Tenax blank, benzene standard, and analyzed samples are shown in the figures. When triplicate samples were taken, 1 of the 3 was spiked with a known amount of benzene approximately 10% of the time.

Results

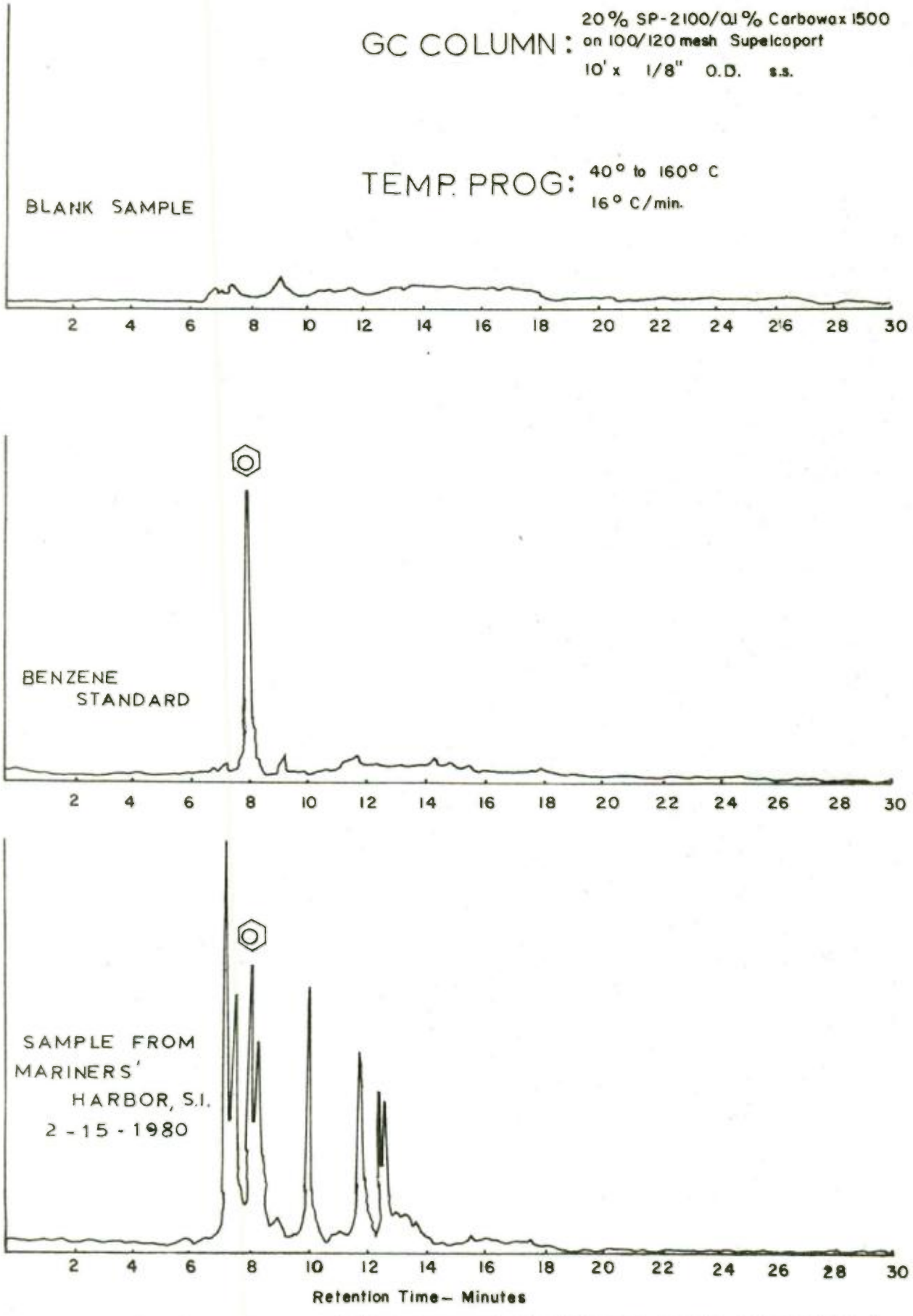
A total of 272 samples were taken at 12 sites and analyzed. Ninety percent of the samples were taken in duplicate or triplicate. The values obtained for duplicate or triplicate samples were averaged to represent the benzene concentration at a sampling site. The averages from the duplicate and triplicate samples and the 10% of the values that were taken as single samples yielded 120 data points. Because of the lower detection limit of the gas chromatograph all values less than 0.1 ppb were reported as 0.0 ppb.

In order to determine the precision of the data, that is, its reproducibility, an analysis was done on the duplicate and triplicate sample data. For each value reported from duplicate and triplicate data, the difference between the reported value and each observed value was calculated. The average difference was 0.15 ppb and 95.7% of the differences were less than 0.5 ppb. Spiked samples were used to determine the percent recoveries, that is, the accuracy of the data. The percent recoveries range from 77% to 114% with an average recovery of 90.6%.

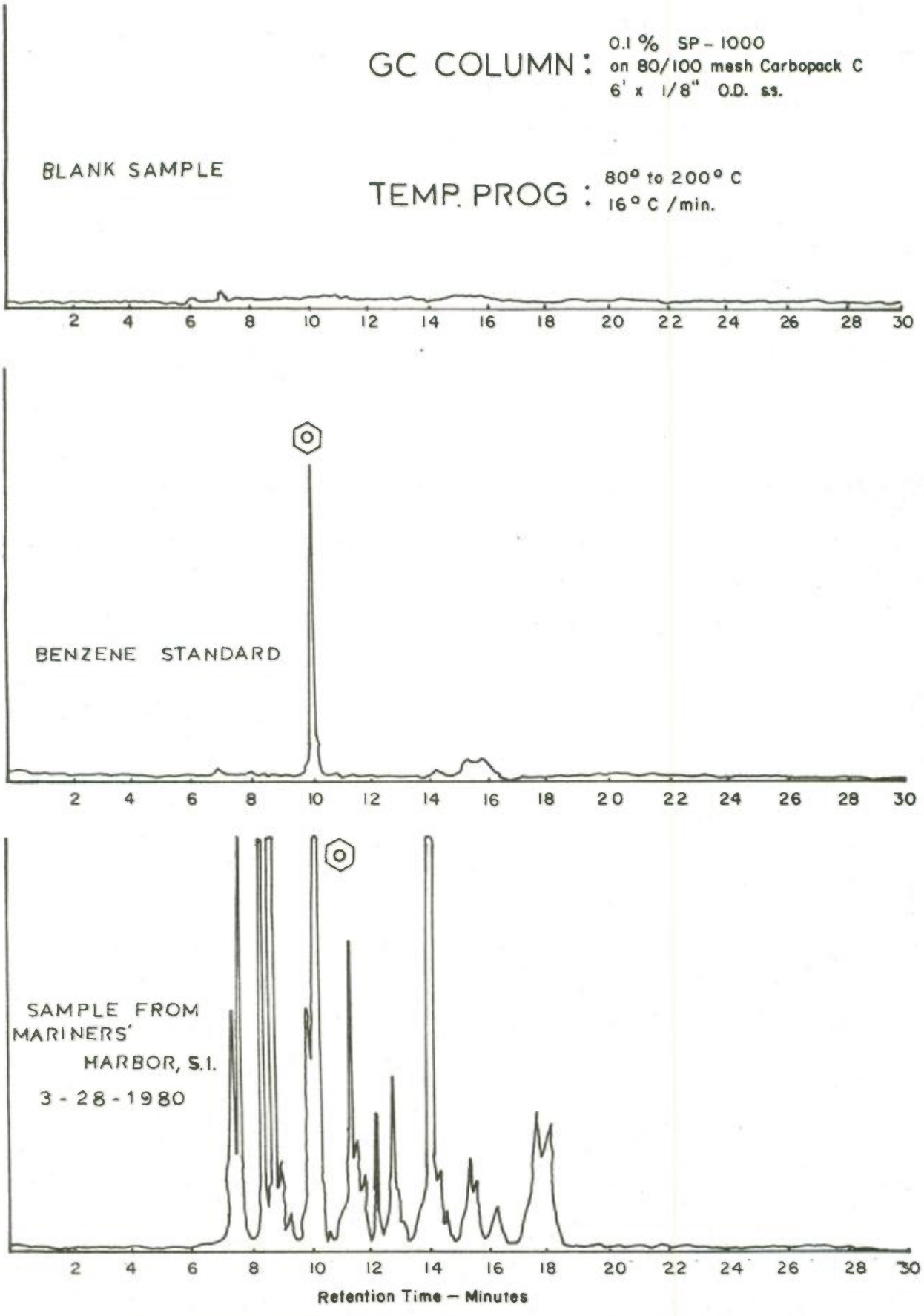
The 120 pieces of data are presented both graphically and in chart form. The histograms show the frequency and the cumulative frequency expressed in terms of benzene concentrations. The tables summarize the data by station and by wind direction.

It can be seen from the graphs that approximately 43% of the values had benzene concentrations between 1 and 2 ppb and approximately 90% of the values had benzene concentrations less than 4.5 ppb. Only three values, or 2.5% of the observations were greater than 10 ppb. The table giving results by sampling site shows that the highest concentrations of benzene were found in the north and northwestern parts of Staten Island and the adjacent areas in New Jersey. Although only 6 values were taken, the average benzene concentration in Central Park in Manhattan was also higher than most of the other stations. Except for the aforementioned stations, there seems to be little difference in the average benzene concentration from station to station.

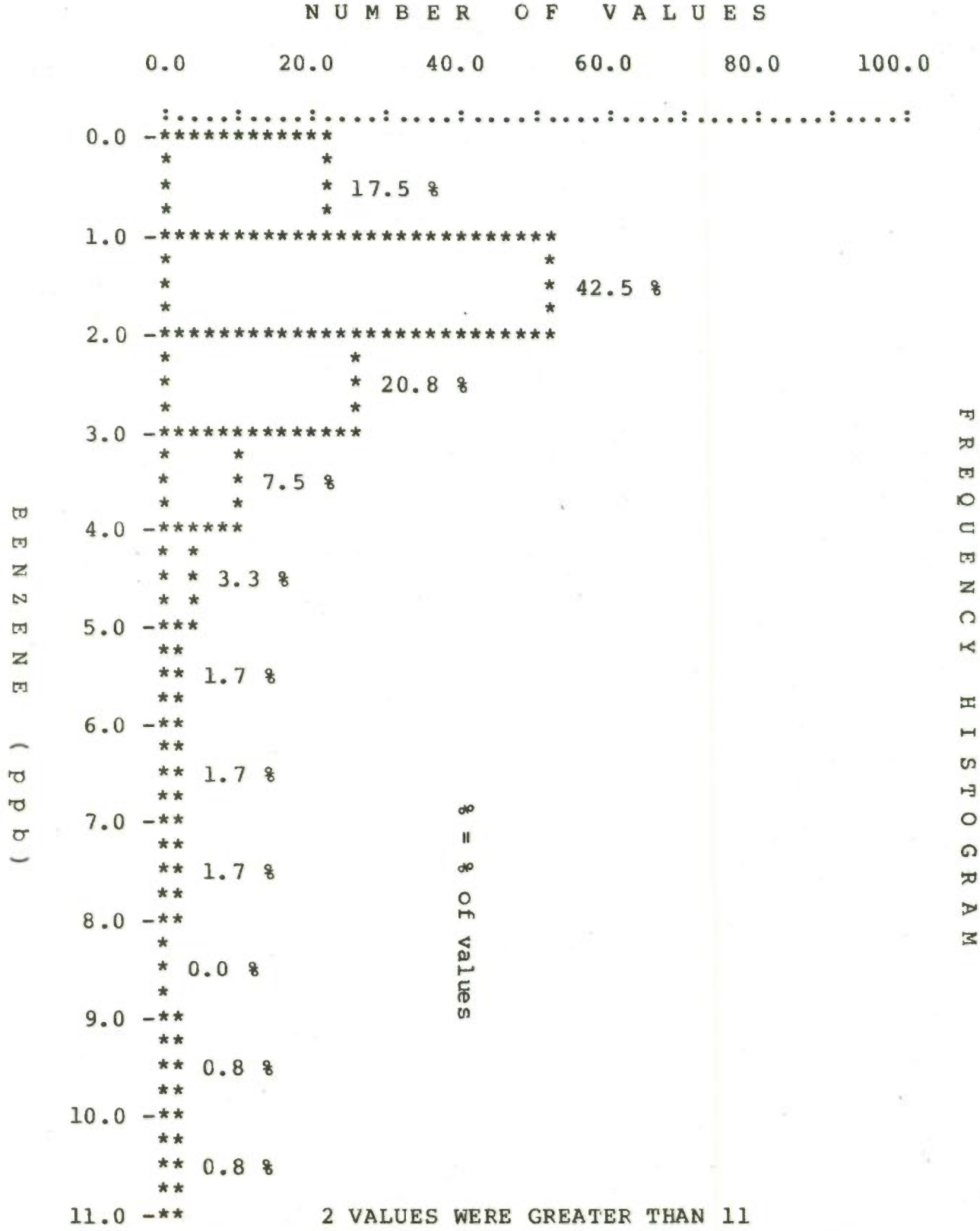
From the table it can be seen that the benzene concentration is little influenced by wind direction. However, the highest benzene concentrations were found when the winds were variable (the wind speed was less than 2 mph).

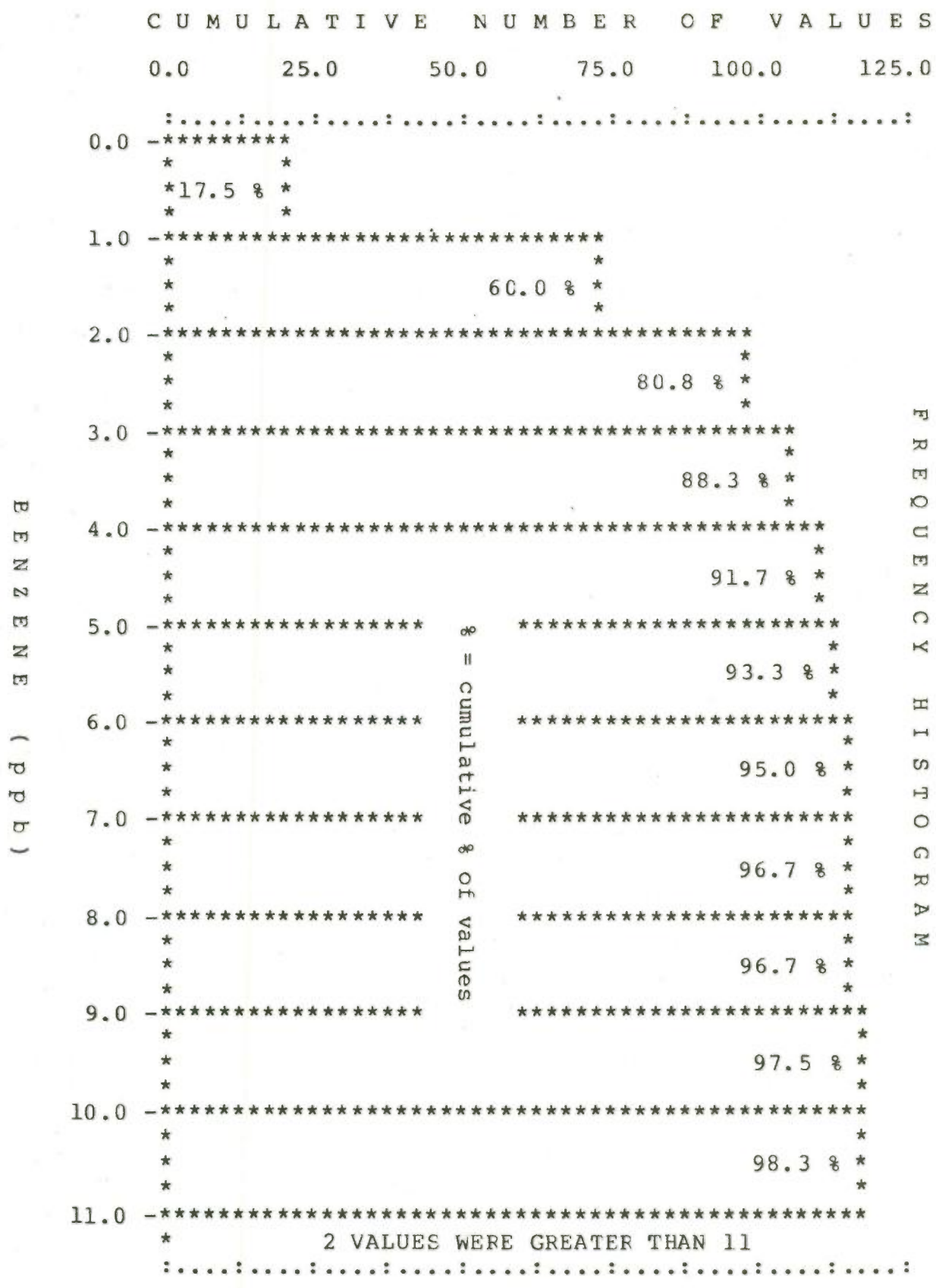


Gas chromatogram of blank, benzene standard and sample using column I.



Gas chromatogram of blank, benzene standard and sample using column 2.


NUMBER OF VALUES
0.0
20.0
40.0
60.0
80.0
100.0
0.0
17.5 %
1.0
42.5 %
2.0
20.8 %
3.0
7.5 %
4.0
3.3 %
5.0
1.7 %
6.0
1.7 %
7.0
1.7 %
8.0
0.0 %
9.0
0.8 %
10.0
0.8 %
11.0
2 VALUES WERE GREATER THAN 11
BENZENE (ppb)
% = % of values
FREQUENCY HISTOGRAM


CUMULATIVE NUMBER OF VALUES
0.0
25.0
50.0
75.0
100.0
125.0
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0
10.0
11.0
17.5 %
60.0 %
80.8 %
88.3 %
91.7 %
93.3 %
95.0 %
96.7 %
96.7 %
97.5 %
98.3 %
% = cumulative % of values
2 VALUES WERE GREATER THAN 11
BENZENE (ppb)
CUMULATIVE FREQUENCY HISTOGRAM

Results of Benzene Analysis by Sampling Site

Sampling Site	Number of Samples	Benzene Concentration ppb(v/v) Range	Average
Tottenville, SI	10	0.00 - 2.30	1.01
Rossville, SI	9	0.75 - 2.20	1.26
Great Kills, SI	9	0.55 - 1.90	1.20
Travis, SI	11	0.00 - 4.45	2.14
Todt Hill, SI	6	0.40 - 3.15	1.63
Mariner's Harbor, SI	16	0.60 - 10.50	3.16
New Brighton, SI	14	1.15 - 23.30	5.40
Bayonne, NJ	11	0.55 - 7.45	2.78
Rutherford, NJ	7	1.07 - 2.05	1.56
Elizabeth, NJ	12	1.33 - 4.93	2.38
Goethals Bridge, SI	9	0.00 - 6.00	1.74
Central Park, NY	6	1.10 - 7.97	3.46

Results of Benzene Analysis by Wind Direction

Wind Direction	Number of Samples	Benzene Concentration ppb(v/v) Range	Average
NW - NE	19	0.45 - 4.50	1.83
N - E	12	0.45 - 4.50	2.08
NE - SE	9	0.55 - 3.50	1.69
E - S	15	0.55 - 6.00	2.46
SE - SW	26	1.07 - 7.97	3.15
S - W	40	0.00 - 7.97	2.31
SW - NW	57	0.00 - 9.30	1.67
W - N	44	0.00 - 9.30	1.65
Variable	9	2.05 - 23.30	7.75

Although not formerly presented, the data were analyzed on a seasonal basis and there seemed to be no difference in the benzene concentrations based on the seasons of the year.

Conclusions

1. The system developed in this study is an accurate method for the measurement of benzene in ambient air for concentrations ranging from 0.1 ppb to 30 ppb.

2. The benzene concentrations found in the study area within the bistate New York-New Jersey region were below 4.5 ppb 90% of the time.

3. Higher benzene concentrations seemed to occur with light and variable winds.

4. A review of the literature showed that the benzene concentrations measured in this study were similar to those obtained in other urban areas.

IV. LEGAL ACTIVITIES

The legal activities at the Commission fall into two general categories - internal management and administration on a day-to-day basis and direct contributions to environmental programs. A few of the major items which occupied Counsel during 1980 are treated under separate captions below. Day-to-day management and administrative activities do not merit exposition in this report. However, the following matter has called for more than routine effort and warrants special mention.

It has been found that an inequity exists in the New York State Public Employees' Retirement System (of which Commission employees are members) for Commission employees hired after June 19, 1976. The inequity results in those employees receiving lower retirement benefits than those received by older Commission employees and by New York State employees with similar earnings records. The Commission is presently devising means to overcome this difficulty.

POWER PLANT SITING

In each of the past several years, the Commission has participated in the siting proceedings for a new 700 megawatt fossil fueled power plant. The Power Authority of the State of New York (PASNY) has had such an application pending and is desirous of installing the facility on the Arthur Kill, although several other locations received slight attention in earlier phases of the proceeding.

The hearings and related activities continued through the major part of 1980. As in earlier parts of the proceeding, the Commission's position has been that, if the power plant is licensed for construction and operation within the Interstate Sanitation District, all effluent discharges must meet the requirements in force pursuant to the Tri-State Compact and its implementing regulations. The recommended decision filed by the hearing examiners on August 13, 1980 and the accompanying draft effluent discharge permit specifically embody the Commission's requirements. Although formerly indicated for the fall of 1980, the actual decision of the Siting Board in now expected in 1981.

HAZARDOUS SUBSTANCES

The Commission has continued to keep abreast of developments affecting the discharge or emission (regular and accidental) of hazardous wastes and other hazardous substances into the environment. It assisted the states in considering manifest system

needs and the effects of the Federal Resource Conservation and Recovery Act on state administration of environmental laws. The Commission also contributed expert knowledge and advice on compacts to efforts of state and federal governments. More particularly, the purpose of this work is to examine the role of compacts and other intergovernmental cooperative mechanisms in the disposal of low level nuclear wastes.

WASTEWATER TREATMENT PLANTS
Discharging into the
INTERSTATE SANITATION DISTRICT WATERS
1 9 8 0

Plant	ISC Receiving Water Classification	Date of Const.	Flow MGD Average	Flow MGD Design	Type of Treatment	Estimated Population Served (1970-80)
CONNECTICUT						
Fairfield County						
Bridgeport - East Side	B-1	1973+	-	24.0	Secondary (AS)	100,000
- West Side	B-1	1973+	22.7	60.0	Secondary (AS)	175,000
Fairfield	A	1973+	6.5	9.0	Secondary (AS)	46,000
Greenwich - Central	A	1964+	7.7	8.5	Secondary (AS)	45,000
*Handy & Harmon	A	1973	-	0.25	Physical/Chemical	Industrial
Norwalk	B-1	1980+	8.9	15.0	Secondary (AS)	58,000
Stamford	B-1	1976+	19.4	20.0	Secondary (AS)	80,000
Stratford	A	1973+	9.8	11.5	Secondary (AS)	51,000
Westport	A	1974+	1.4	2.9	Secondary (AS)	10,000
New Haven County						
Milford - Beaver Brook	A	1969	1.3	3.1	Secondary (AS)	10,000
- Gulf Pond	A	1976+	2.9	2.9	Secondary (AS)	15,000
- Harborside	A	1955+	0.6	0.5	Secondary (AS)	4,000
- Town Meadows	A	1953	1.8	1.2	Secondary (AS)	6,000
New Haven - Boulevard	B-1	1969+	12.9	13.5	Primary	81,000
- East Shore	B-1	1980+	10.0**	40.0	Secondary (AS)	67,000
- East Street	B-1	1968+	13.3	22.5	Primary	61,000
West Haven	B-1	1973+	11.3	23.5	Secondary (AS)	52,000
NEW JERSEY						
Bergen County						
Edgewater	B-1	1958+	2.8	3.0	Primary	25,000
Hudson County						
Bayonne	B-2	1953	12.3	10.0	Primary	70,000
Hoboken	B-1	1958+	15.5	20.0	Primary	90,000
Jersey City - East Side	B-1	1967+	34.5	46.6	Primary	166,000
- West Side	B-2	1967+	19.8	36.0	Primary	66,000
Kearny	B-2	1955	2.9	4.0	Primary	30,000
West New York	B-1	1954	10.6	10.0	Primary	60,000
Woodcliff - North Bergen	B-1	1962	2.3	4.4	Primary	17,000
Middlesex County						
Carteret	B-2	1950	3.4	3.0	Primary	24,000
Middlesex County Sewerage Authority	A	1978+	87.1	120.0	Secondary (AS)	525,000
Old Bride Township Sewerage Authority (Laurence Harbor)	A	1962	0.7	1.4	Primary	8,000
Perth Amboy	A	1978+	4.0	10.0	Primary	39,000
Rahway Valley Sewerage Authority	B-2	1973+	31.3	35.0	Secondary (AS)	215,000
Sayreville - Melrose	A	1949	0.06	0.15	Primary	3,000
- Morgan	A	1952	0.2	0.3	Primary	8,000
South Amboy	A	1939	0.6	1.0	Primary	11,000
Woodbridge	B-2	1952	3.5	10.0	Primary	50,000
Monmouth County						
Atlantic Highlands	A	1927	0.6	0.6	Primary	5,000
Highlands	A	1928	0.5	1.2	Primary	5,000
Union County						
*Exxon Company (Bayway Refinery)	B-2	1970	10.4	15.0	Intermediate (AS)	Industrial
Joint Meeting of Essex & Union Counties	B-2	1978+	76.1	75.0	Secondary (AS)	500,000
Linden-Roselle Sewerage Authority	B-2	1979+	10.7	17.0	Secondary (AS)	64,000
Essex County						
Passaic Valley	B-1	1937+	250.0**		Primary	2,900,000

WASTEWATER TREATMENT PLANTS
Discharging into the
INTERSTATE SANITATION DISTRICT WATERS
1 9 8 0

Plant	ISC Receiving Water Classification	Date of Const.	Flow MGD Average	Flow MGD Design	Type of Treatment	Estimated Population Served (1970-80)
NEW YORK						
Nassau County						
Bay Park	A	1960+	63.3	60.0	Secondary (AS)	558,000
Belgrave Sewer District	A	1973+	1.6	1.5	Secondary (TF)	13,000
Cedar Creek	A	1977+	25.6	45.0	Secondary (AS)	620,000
Cedarhurst	A	1968+	1.0	1.0	Secondary (TF)	7,000
*Cold Spring Harbor Laboratory	A	1975	0.04	0.075	Physical/Chemical	100 - 400
Glen-Cove - Morris Avenue	A	1964+	5.4	4.0	Secondary (TF)	26,000
Great Neck Sewer District	A	1976+	2.8	2.7	Secondary (TF)	18,000
Great Neck Village	A	1967+	0.9	1.5	Secondary (TF)	11,000
Inwood	A	1961+	1.8	2.5	Secondary (TF)	8,000
Jones Beach	A	1952	0.1	2.5	Secondary (TF)	Seasonal
Lawrence	A	1966+	1.0	1.5	Secondary (TF)	7,000
Long Beach	A	1976+	6.6	7.0	Secondary (TF)	36,000
Oyster Bay Sewer District	A	1965+	1.8	1.2	Secondary (TF)	7,500
Port Washington Sewer District	A	1969+	3.0	3.0	Secondary (TF)	30,000
Roslyn	A	1965+	0.4	0.5	Secondary (TF)	4,500
West Long Beach Sewer District	A	1950+	0.7	0.67	Secondary (TF)	3,700
NEW YORK CITY						
Bronx County						
Hunts Point	B-2	1978+	143.0	200.0	Secondary (AS)	770,000
Kings County (Brooklyn)						
Coney Island	A	1965+	96.1	110.0	Secondary (AS)	535,000
Newtown Creek	B-2	1967	283.0	310.0	Intermediate (AS)	2,500,000
Owls Head	B-1	1952	98.0	160.0	Intermediate (AS)	750,000
26th Ward	A	1975+	90.5	85.0	Secondary (AS)	385,000
New York County (Manhattan)						
Wards Island	B-2	1979+	346.0	290.0	Secondary (AS)	1,470,000
Queens County						
Bowery Bay	B-2	1978+	125.0	150.0	Secondary (AS)	1,000,000
Jamaica	A	1978+	100.5	100.0	Secondary (AS)	415,000
Rockaway	A	1978+	22.8	45.0	Secondary (AS)	90,000
Tallman Island	B-1	1979+	66.9	80.0	Secondary (AS)	251,000
Richmond County (Staten Island)						
*Arthur Kill Correctional Facility	B-2	1969	-	0.1	Secondary (AS)	1,000
*Elmwood Homes	B-2	1978+	0.63	1.0	Extended Aeration	9,000
*Elmwood Park Condominiums	B-2	1976	0.27	2.0	Secondary (RD)	2,000
*Heartland Village	B-2	1978+	0.5	1.0	Extended Aeration	7,000
*IS-7	A	1965	0.008	0.13	Extended Aeration w/ Sand Filtration	2,000
*Mount Loretto Home - Plant #1	A	1962	-	-	Septic Tank	500
- Plant #2	A	1962	-	-	Septic Tank	200
*Nassau Smelting & Refining	B-2	1973	-	0.43	Physical/Chemical	Industrial
Oakwood Beach	A	1979+	24.7	40.0	Secondary (AS)	85,000
Port Richmond	B-2	1979+	43.4	60.0	Secondary (AS)	60,000
*Richmond Valley Hospital	A	1936	-	-	Septic Tank	-
*Saint Joseph's School	A	1963	-	0.02	Septic Tank with Sand Filtration	1,000
*Village Green	B-2	1970	0.2	0.3	Extended Aeration	4,500
Rockland County						
*Clevepak Corporation	A	1976+	0.6	3.0	Secondary	Industrial
Joint Regional Sewerage Board-Town of Haverstraw	A	1978+	4.5	8.0	Secondary (AS)	40,000
*Kay-Fries Chemicals, Inc.	A	1972	-	0.5	Extended Aeration	Industrial
*Orange & Rockland Utilities	A	1964	0.003	0.28	Secondary (AS)	Industrial
Orangetown Sewer District	A	1968+	6.9	8.5	Secondary (TF)	70,000

WASTEWATER TREATMENT PLANTS
Discharging into the
INTERSTATE SANITATION DISTRICT WATERS
1 9 8 0

Plant	ISC Receiving Water Classification	Date of Const.	Flow MGD Average	Flow MGD Design	Type of Treatment	Estimated Population Served (1970-80)
NEW YORK (Continued)						
Rockland County (Continued)						
Palisades Insterstate Park						
(Bear Mountain Plant)	A	1967+	0.13	0.25	Secondary (TF)	Seasonal
(Tallman Mountain Plant)	A	1969	0.01	0.01	Secondary (AS)	Seasonal
Rockland County Sewer District #1	A	1968+	15.3	10.0	Secondary (AS)	125,000
Stony Point	A	1969	0.9	1.0	Secondary (AS)	10,000
Suffolk County						
*Harbor Club Apartments	A	1967	0.08	0.1	Extended Aeration	400
Huntington Sewer District	A	1957+	2.2	2.0	Secondary (TF)	20,000
Northport	A	1973+	0.3	0.3	Secondary (AS)	3,000
***Suffolk County Sewer District #1	A	1972+	0.9	2.5	Primary	21,000
Suffolk County Sewer District #6	A	1973+	0.7	1.2	Secondary (AS)	8,000
Westchester County						
Briarcliff Manor - River Road	A	1977+	0.04	0.04	Septic Tank	200
- Scarborough Dock	A	1977+	0.11	0.11	Imhoff Tank	1,000
Buchanan	A	1962	0.12	0.55	Secondary (AS)	2,500
*Conrail Harmon Shop (Croton)	A	1980+	0.16	0.25	Physical/Chemical	Industrial
Croton-on-Hudson	A	1949	0.8	0.75	Primary	6,500
Kings Ferry Sewer Association	A	1971	0.02	0.05	Secondary (AS)	600
Ossining - Liberty Street	A	1939	0.8	1.0	Imhoff Tank	7,000
- Water Street	A	1939	1.7	2.0	Primary	16,000
*Ossining Correctional Facility	A	1950+	0.6	0.6	Primary	1,800
*Springvale Apartments Company	A	1972	0.1	0.1	Secondary (TF)	1,000
Westchester County D.P.W.						
Blind Brook (Rye)	A	1963+	2.9	5.0	Primary	20,000
Mamaroneck	A	1965+	13.6	17.0	Primary	77,000
New Rochelle	A	1964	15.3	14.5	Primary	80,000
Peekskill	A	1979+	3.7	4.0	Secondary (AS)	35,000
Port Chester	B-1	1965+	6.7	6.0	Primary	27,000
Yonkers Joint Treatment	B-1	1977+	77.3	92.0	Secondary (AS)	500,000
FEDERAL & MILITARY						
Camp Smith - (Westchester Co.)	A	1965	0.07	0.24	Secondary (TF)	Seasonal
FDR Veterans Administration Health Care Facility (Westchester Co.)	A	1979+	0.22	0.4	Secondary (TF)	3,000
Gateway National Park (Floyd Bennett Field, Kings Co.)	A	1942	0.13	0.4	Secondary (TF)	500
Military Ocean Terminal (Hudson Co.)	B-1	1972+	0.38	0.18	Secondary (AS)	2,500

\+ Year of major additions or reconstruction

* Private, institutional or industrial sewage treatment plants

** Estimated Flows

*** Includes flows from SUNY at Stony Brook

(AS) Activated Sludge

(TF) Trickling Filter

(RD) Rotating Disc

G L O S S A R Y

APCA	Air Pollution Control Association
BOD	biochemical oxygen demand
C	degrees Centigrade
CSO	combined sewer overflow
DEC	Department of Environmental Conservation
DEP	Department of Environmental Protection
EIS	environmental impact statement
EPA	Environmental Protection Agency
GC	gas chromatograph
GPD	gallons per day
I/I	infiltration/inflow
ISC	Interstate Sanitation Commission
MGD	million gallons per day
mg/l	milligrams per liter
ml	milliliters
mph	miles per hour
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
O & M	operation and maintenance
OD	outside diameter
PCB's	polychlorinated biphenols
ppb	parts per billion
ppm	parts per million
SPDES	State Pollutant Discharge Elimination System
SSES	sewer system evaluation study
STP	sewage treatment plant
TSS	total suspended solids
ul	microliters
VES	value engineering study
WPCP	water pollution control plant
>	greater than
<	less than