1974 ANNUAL REPORT

WATER QUALITY ASSESSMENT

REGION I

ENVIRONMENTAL PROTECTION AGENCY

SURVEILLANCE & ANALYSIS DIVISION
NEEDHAM HEIGHTS, MASSACHUSETTS
JUNE 1975

PREFACE

The cooperative EPA/State water pollution control programs have, as a goal, the achievement of "water quality which provides for the protection and propagation of fish, shellfish and wildlife and provides for recreation in and on the water by July 1, 1983" [1/]. In Region I this goal is consistent with achieving water quality of Class B in terms of federally approved state water quality standards.

The programs for evaluating progress towards attaining Class B water quality are the individual state monitoring programs and the National Water Quality Surveillance System (NWQSS). In April 1975, the states evaluated and reported the water quality (conditions during 1974) in their State Water Quality Assessment - Section 305(b) Reports. These reports will be prepared every year by the states.

This report will summarize for Region I the individual state water quality assessments and will report the findings of the NWQSS, supplemented by the states' Primary Monitoring Networks (PMN), for calendar year 1974.

The NWQSS concept is to monitor a wide range of physical, chemical and biological variables in surface waters, stream bottoms, groundwaters and the ocean at locations representative of typical and unique waters in the region. At the present state of development, the system monitors waters of the states which represent one or more of the important water quality problems in each state. Also, the system monitors waters which do not receive point source discharges of pollutants (reference stations) to compare these background conditions with polluted waters.

This first report will stress the states' assessments of their status with regard to the 1983 goal of Class B or better water quality in all waters. Specific parameters will be evaluated to determine those causing non-compliance with standards. Several non-water quality standards parameters will be examined, primarily nitrogen and phosphorus forms, to determine what concentrations are present throughout the region.

As additional data is gathered it will be evaluated for developing trends in all parameters being sampled and will be related to specific point source discharges in each river and drainage basin.

It should be recognized by all reading and using this report that it is based on the first year's data from EPA/State monitoring programs and, therefore, is limited in its coverage of all water quality problem areas in the Region. Successive reports will be expanded in coverage and will provide more conclusive information.

1/ Sec. 101.(a)(2), TITLE I, Public Law 92-500

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SECTION 1

1.0 Overview

The assessment of the water quality in Region I during 1974 is presented in this report as an evaluation of the water quality during 1974 compared to the EPA goal of Class B water quality to be achieved throughout the Region in 1983. As a base level for future assessments, concentrations of water constituents which are not included in the water quality standards are presented. Lastly, water quality standards parameters and other constituents are compared between areas influenced by point source discharges and reference areas not influenced by point sources.

1.1 Summary of Water Quality Compliance Status with Class B Standards - 1974

The total stream miles, by state, which were not in compliance with Class B standards in 1974 are given in Table 1. The 2,674 miles not in compliance represent the EPA/State goal for 1983 - to improve the water quality in these streams so that it will support a balanced aquatic life and will provide for recreational usage.

In Table 2, each river basin, its main stem stream and other drainage areas are listed in order of the total river miles within the basin or area which were not in compliance with Class B standards in 1974. Also, the total number of river miles of each main stem stream are classified as being in compliance or not in compliance. There are four rivers with 100 miles or more not meeting Class B standards: the Connecticut River - 374 miles; the Penobscot River - 85 miles; the Androscoggin River - 151 miles; and the Merrimack River - 110 miles. Ten river basins and drainage areas have 100 miles or more not in compliance.

The source of the data for Tables 1 and 2 is the 1974 State Water Quality Assessment - Section 305(b) reports.

In order to further understand the nature of the water quality problems resulting in non-compliance with Class B standards, the National Water Quality Surveillance System (NWQSS) and Primary Monitoring Networks (PMN) were used to determine what the water quality standards violations were and how frequently they occurred in each drainage basin and area. This data is summarized in Table 3.

The water quality standards parameters for Class B waters common to all states are temperature, pH, dissolved oxygen, and coliform bacteria. All states except New Hampshire and Massachusetts have a standard for fecal coliform bacteria. In addition, New Hampshire has standards for phenols and turbidity; Maine a standard for turbidity; and Vermont standards for color and turbidity. Page 4 shows the ranges of numerical criteria for these parameters for all states.

Of those parameters common to all states, 64% of the violations were attributable to the total coliform bacteria standards, 48% to the fecal coliform bacteria standards, 14% to the pH standards, 8% to the dissolved oxygen standard, and 0% to the temperature standard. In New Hampshire 75% of the phenol measurements exceeded the standard; in Maine 0.5% of the turbidity values exceeded the standard; and in Vermont no color values exceeded standards. It is important to note that reference stations also reported violations of Class B standards criteria: 38% of total coliform bacteria values, 25% of fecal coliform bacteria values, and 28% of pH values. These violations are either naturally occurring in the stream or due to non-point sources.

The NWQSS and PMN stations reporting data for the water quality standards violations analysis are pinpointed on the individual basin maps in Section 3 of this report. The Saco River basin in Maine does not have 1974 data available for analysis.

1.2 Summary of Seasonal Variations for Nitrogen and Phosphorus in Drainage Basins - Region I - 1974

A complete water quality assessment must include examination of water constituents other than those in water quality standards. In this first annual assessment report various forms of nutrients - nitrogen and phosphorus are reported. Table 4 presents seasonal variations in nitrogen and phosphorus concentrations for the largest drainage basins and other areas where they are measured. Also, the seasonal variations in these parameters at all reference stations are given as one set of values. The seasonal comparisons were done to reflect any variations due to differences in stream flow and biological activity.

This evaluation points out that phosphorus and nitrogen are found in higher concentrations in areas receiving point source discharges than in areas with no point sources. Also, it is indicated that rivers receiving discharges from large metropolitan areas, such as the Connecticut, Merrimack and Housatonic Rivers, contain higher phosphorus levels than those rivers receiving primarily industrial wastes such as the Androscoggin and Kennebec Rivers. Nitrogen levels are similar in all rivers except the Kennebec which has very low concentrations.

EXPLANATIONS PERTINENT TO TABLES 1, 2 AND 3

SUMMARY OF "CLASS B" WATER QUALITY STANDARDS

FOR THE NEW ENGLAND STATES

Parameter	Criteria Range	
Temperature	28.3 - 29.4° C	- maximum
Dissolved oxygen	5.0 - 6.0 mg/l	- minimum
Dissolved oxygen (percent saturation)	75%	- minimum
Total coliform bacteria	240 - 1000 per 100 ml	- maximum
* Fecal coliform bacteria	60 - 200 per 100 ml	- maximum
pH	6.0 - 8.5	
Turbidity	25 units (Maine, Vt., N.H.)	- maximum
Phenols	1.0 ug/l (N.H.)	- maximum
Color	25 units (Vt.)	- maximum

Note: Water quality standards do not apply when conditions are due to natural causes.

* Does not apply to Massachusetts and New Hampshire

TABLE 1

REGION I - STATE

1974 WATER QUALITY STATUS

WITH

1983 (CLASS B) STANDARDS

STATE	TOTAL STREAM MILES NOT IN COMPLIANCE	TOTAL STREAM MILES IN COMPLIANCE	TOTAL STREAM MILES ASSESSED
Connecticut	485 (54%)	411 (46%)	896
Maine	616 (44%)	796 (56%)	1,412
Massachusetts	620 (71%)	254 (29%)	874
New Hampshire	608 (54%)	510 (46%)	1,118
Rhode Island	82 (27%)	217 (73%)	299
Vermont	263 (3%)	7,713 (97%)	7,976
TOTALS	2,674 (21%)	9,901 (79%)	12,575

1/ Vermont has assessed all streams within the state, including intermittent streams; the remaining states assessed only streams known to be receiving point source discharges now, or known to have received point source discharges since inception of water quality standards, that is, essentially river miles other than Class A and B at the time of standards inception.

2/ Streams forming the border between two states are assigned to one state only, i.e., Connecticut River is assigned to New Hampshire

3/ (%) = Percent of total miles assessed in the state

TABLE 2

NEW ENGLAND RIVER DRAINAGE BASINS

1974 AMBIENT WATER QUALITY STATUS

with

1983 (CLASS B) STANDARDS

DRAINAGE BASIN	MAIN STEM STREAM	MAIN STEM MILES NOT IN COMPLIANCE	TOTAL BASIN MILES NOT IN COMPLIANCE	MAIN STEM MILES IN COMPLIANCE	TOTAL BASIN MILES IN COMPLIANCE	TOTAL BASIN MILES ASSESSED
Connecticut	Connecticut	374	770	20	287	1057
Merrimack	Merrimack	110	359	0	230	589
Penobscot	Penobscot	85	94	2	127	221
Kennebec	Kennebec	70	159	60	171	330
Thames	Thames	18	157	0	157	314
Androscoggin	Androscoggin	151	171	47	127	298
Housatonic	Housatonic	52	151	65	122	273
L.Champlain	1/	-	136	-	-	136
Narragansett Bay	Blackstone	39	118	15	98	216
Mass. Coastal	1/	-	115	-	120	235
St. John	St. John	35	85	115	175	260
Western Conn. Coast	1/	-	48	-	109	157
Pawcatuck	Pawcatuck	16	36	74	79	115
Upper Hudson	Hoosic	33	33	13	13	46
Piscataqua	Piscataqua	22	92	17	73	165
Memphremagog	1/	-	19	-	-	19
Saco	Saco	0	16	155	176	192
St. Croix	St. Croix	10	10	67	67	77
Presumpscot	Presumpscot	5	5	10	65	70
		1020	2574	660	2196	4770

1/ These drainage areas do not have one main stream, but several tributaries of similar size.

TABLE 3

SUMMARY

of

CLASS B - WATER QUALITY STANDARDS VIOLATIONS FOR 1974

NATIONAL WATER QUALITY SURVEILLANCE SYSTEM & PRIMARY MONITORING NETWORK

DRAINAGE BASIN	MAIN STEM STREAM	NO. PARAS./ NO.STATIONS	NO. of VALUES	NO. of VIOLATIONS	PERCENT VIOLATIONS	NO. of 1/ REFERENCE STATIONS	NO. of PARAMETERS MEASURED	NO. of VALUES	NO. of VIOLA-TIONS	% VIOLA-TIONS
Connecticut	Connecticut	8/09	392	95	24%	2	8	119	16	13%
Merrimack	Merrimack	7/10	249	66	26%	2	7	27	5	18%
Penobscot	Penobscot	6/1	53	20	38%	0	-	-	-	-
Kennebec	Kennebec	6/2	74	9	12%	1	6	36	3	8%
Thames	Thames	8/1	96	36	38%	0	-	-	-	-
Androscoggin	Androscoggin	6/5	269	98	36%	1	6	32	4	12%
Housatonic	Housatonic	8/8	672	86	13%	2	8	144	12	8%
L.Champlain	L.Champlain	6/1	10	2	20%	0	-	-	-	-
Narragansett Bay	Blackstone	6/3	48	6	12%	0	-	-	-	-
Mass. Coast	-	3/2	5	2	40%	0	-	-	-	-
St. John	St. John	5/2	60	11	18%	0	-	-	-	-
Western Conn.	-	5/2	59	14	24%	0	-	-	-	-
Pawcatuck	Pawcatuck	8/4	149	32	21%	0	-	-	-	-
Upper Hudson	Hoosic	-	-	-	-	0	-	-	-	-
Piscataqua	Piscataqua	5/2	36	9	25%	0	-	-	-	-
Memphremagog	-	6/1	36	3	8%	0	-	-	-	-
Saco	Saco	-	-	-	-	0	-	-	-	-
St. Croix	St. Croix	6/1	86	27	31%	0	-	-	-	-
Presumpscot	Presumpscot	5/3	103	46	45%	1	6	20	8	40%
Quinnipiac	Quinnipiac	8/3	192	76	40%	0	-	-	-	-

1/ Reference stations are located at points which do not receive point source discharges upstream; they are in essence "clean water" stations.

TABLE 4

1974 SEASONAL VARIATIONS OF SELECTED PARAMETERS

FOR MAJOR DRAINAGE BASINS

MEASURED AT

NATIONAL WATER QUALITY SURVEILLANCE SYSTEM STATIONS

AND

PRIMARY MONITORING NETWORK STATIONS

DRAINAGE BASIN	MEAN SUMMER VALUE / MEAN WINTER VALUE*				
	TOTAL ORGANIC NITROGEN (Mg/l as N)	TOTAL AMMONIA NITROGEN (Mg/l as N)	TOTAL NITRITE PLUS NITRATE (Mg/l as N)	ORTHO PHOSPHATE (Mg/l as PO_4)	TOTAL PHOSPHORUS (Mg/l as P)
Connecticut River	.244/.102	-/.31	.33/.45	-/.08	.128/.092
Merrimack River	-	-	.24/.30	.0585/.003	.235/.096
Kennebec River	-	.01/.02	.05/.07	-	.025/.018
Androscoggin River	.36/.10	.25/.25	-	-	.06/.053
Housatonic River	.278/.317	-	.19/.312	-	.093/.078
Narragansett Bay	-	.258/.032	-	-	-
Pawcatuck River	.245/.42	-	.016/.135	-	.091/.112
Quinnipiac River	.693/.396	-	1.66/1.5	/.963	.644/.549
Reference Stations (All combined)	.085/.124	.10/.10	.094/.184	.001/0.0	.02/.0115

* Summer = April through September
Winter = October through March

SECTION II

2.0 BACKGROUND

Section 104 (a)(5) of the Federal Water Pollution Control Act Amendments of 1972 (P.L. 92-500) requires the Administrator to establish national programs for the prevention, reduction and elimination of pollution and as part of such programs shall - "in cooperation with the states and their political subdivisions and other Federal agencies establish, equip and maintain a water quality surveillance system for the purpose of monitoring the quality of the navigable waters and ground waters and the contiguous zone and the oceans and the Administrator shall, to the extent practicable, conduct such surveillance by utilizing the resources of NASA, NOAA, the Geological Survey, and the Coast Guard, and shall report on such quality.....".

The above provision is the legislative direction to EPA to determine what is happening to the waters of the nation in terms of physical condition, including appearance, chemical quality and of supporting a balanced population of shellfish, fish and wildlife and recreation in and on the water.

Further, the Act in Sections 106 (e)(1) and 305(b) directs the states through EPA to - "establish and operate appropriate devices, methods, systems and procedures necessary to monitor and to complete and analyze data on (including classification according to eutrophic condition), the quality of navigable waters and to the extent practicable groundwaters.....". Utilizing this analysis, the states are to "identify specifically those navigable waters, the quality of which -

a. is adequate to provide for the protection and propagation of a balanced population of shellfish, fish, and wildlife and allow recreational activities in and on the water;

b. can reasonably be expected to attain such a level by 1977 or 1983; and

c. can reasonably be expected to attain such a level at any later date".

In Region I the cooperative monitoring program between EPA and other agencies at the Federal and State level consists of the National Water Quality Surveillance System (NWQSS) and the individual states' programs comprised of Primary Monitoring Network (PMN) sampling, intensive surveys, lake study surveys and biological studies. The findings of the state programs are presented in state Water Quality Assessment reports, pursuant to Sec. 305(b) of P.L. 92-500, by the individual states, submitted to EPA in April every year as part of the State Program Grant process.

The objective of the NWQSS is to develop a system of monitoring and reporting on the quality of the hydrosphere and its resident biota at representative locations throughout Region I for input to the water pollution control program. A wide range of physical, chemical and biological parameters are measured at locations chosen to conform to these site characteristics:

- o Most critical stream areas in terms of water use and natural resources
- o Upstream and downstream of major municipal and industrial land use areas
- o High water quality use areas
- o Within each state - cover waters in mountain piedmont and coastal land areas

The system will record trends in the traditional pollutants; will uncover new emerging pollutants; and will track levels of exotic pollutants.

SECTION III

3.0 INDIVIDUAL DRAINAGE BASIN ASSESSMENTS

This section of the report explains the origin of and displays the data which is summarized in Part 1. Each drainage area or river basin is presented with the following:

a. Discussion of results from first year of monitoring,

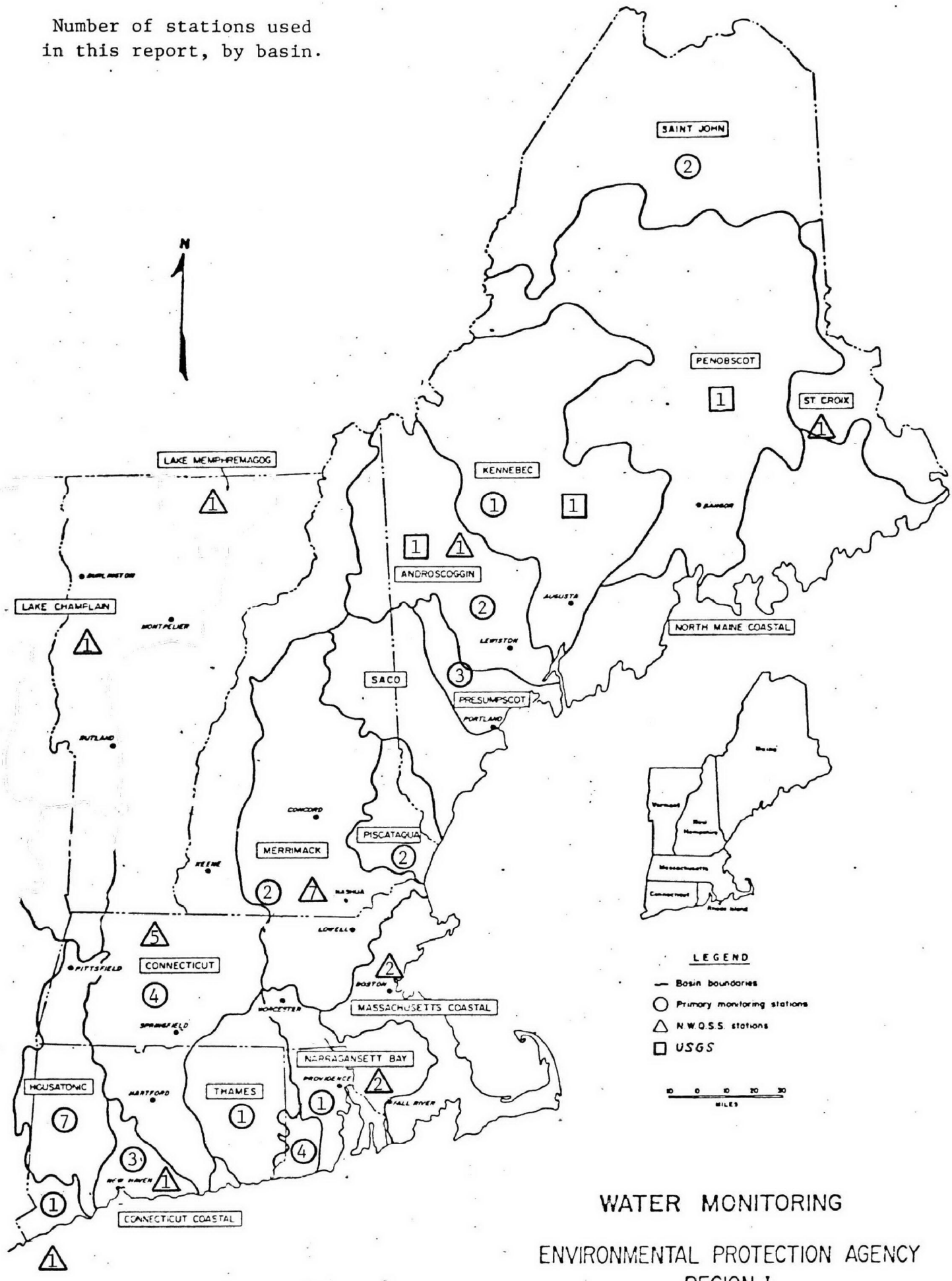
b. River basin or drainage area map with NWQSS and PMN monitoring station locations,

c. Summary of Water Quality Standards Violations during 1974,

d. Plots of seasonal variations for water quality standards and other parameters for river basins with multiple stations.

The following map of New England shows the distribution of the monitoring stations which contributed data included in this report.

Number of stations used in this report, by basin.

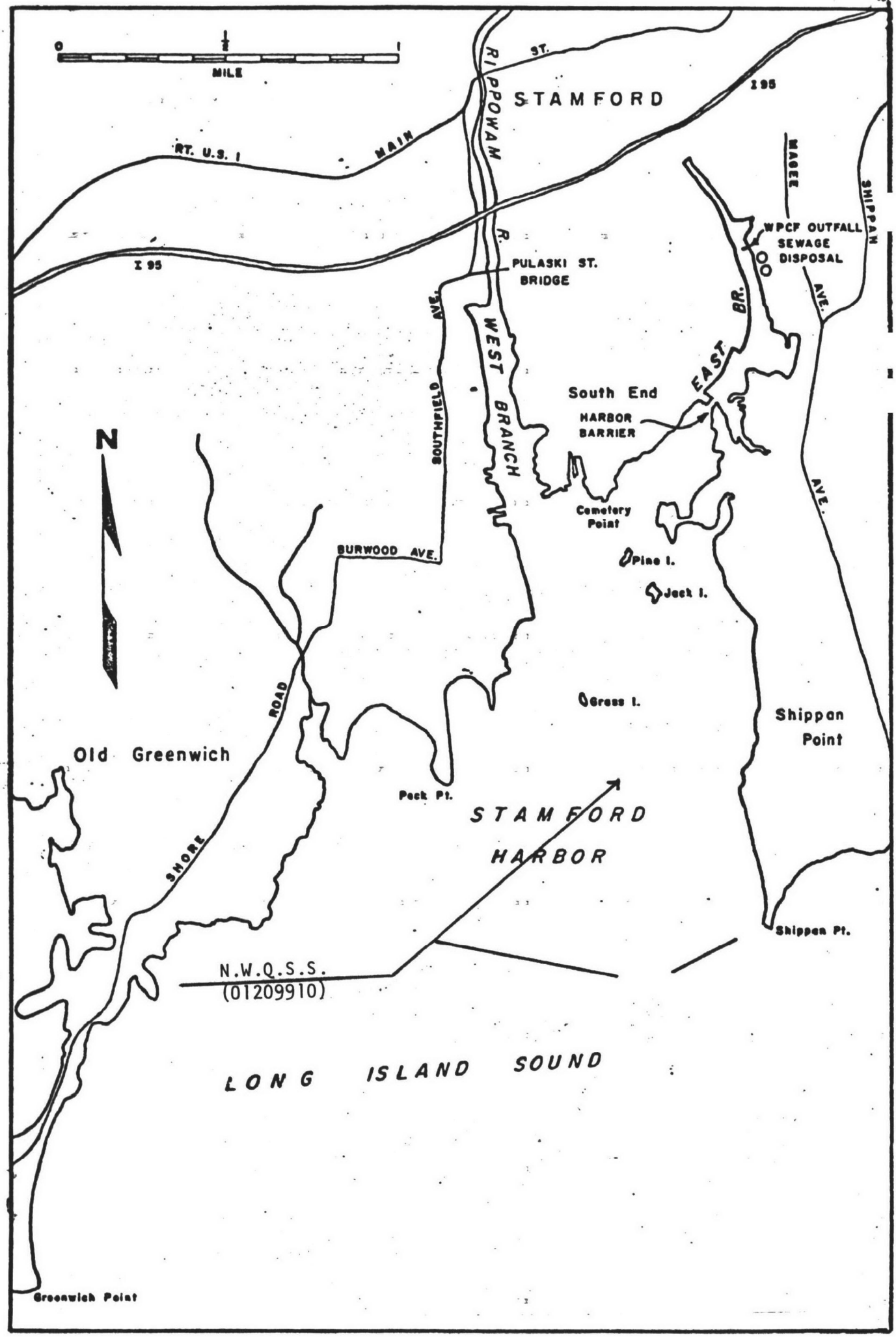


3.1 WESTERN CONNECTICUT COASTAL DRAINAGE AREA

The two stations from which data was obtained for this drainage area are located at New Haven and Stamford Harbors.

Municipal discharges and combined sewer overflows are responsible for the high percentage of coliform bacteria standards violations at New Haven Harbor. Also, dissolved oxygen levels occasionally do not meet standards.

Inadequate sewage treatment is responsible for the coliform bacteria standards violations which occur in Stamford Harbor.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DISPOSAL
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EAST BR.
AVE.
SOUTHFIELD AVE.
South End
HARBOR
BARRIER
N
Cemetery
Point
BURWOOD AVE.
Pine I.
Jack I.
Grass I.
Shippan
Point
ROAD
Old Greenwich
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HARBOR
SHORE
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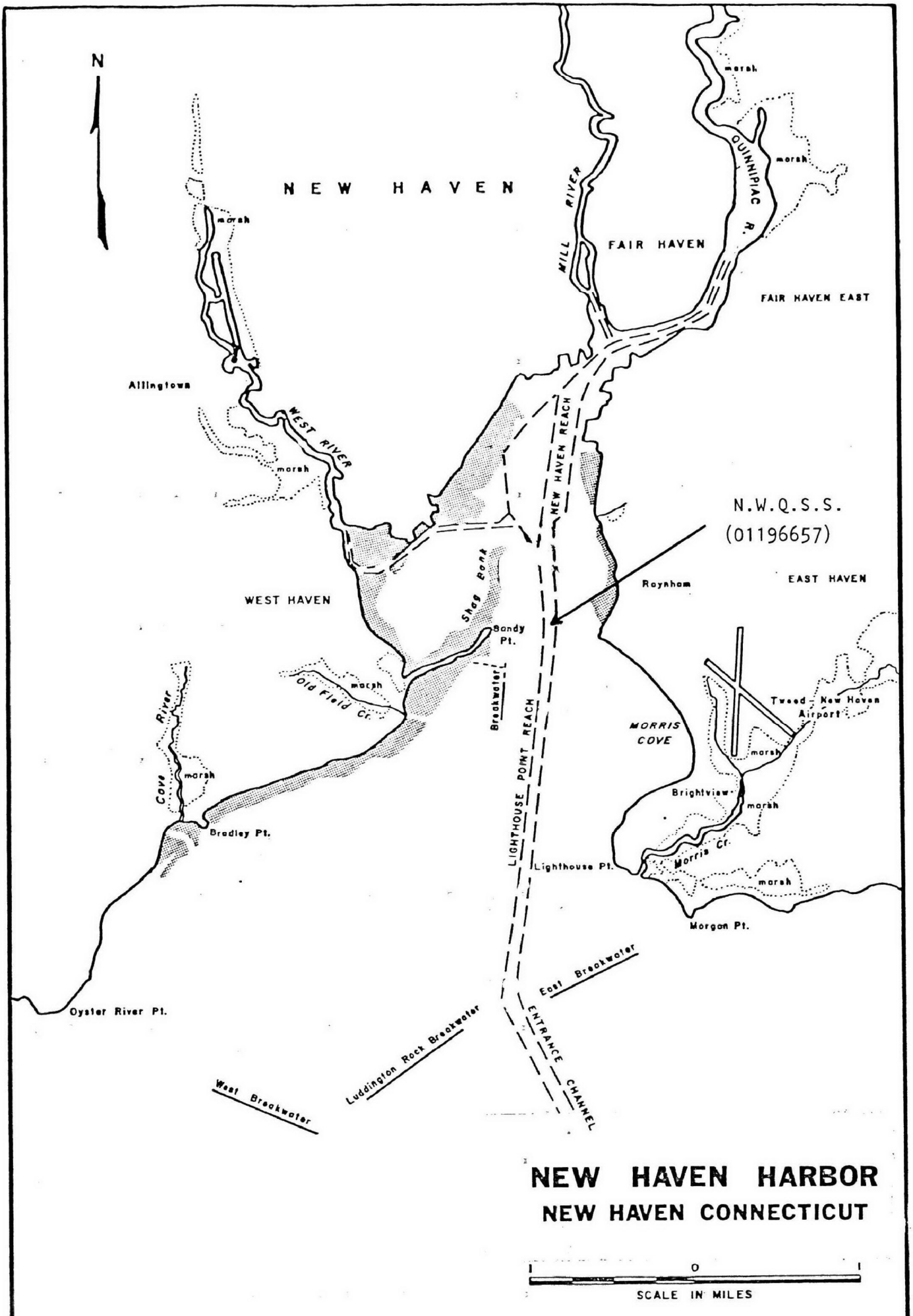
(01209910)
LONG ISLAND SOUND
Greenwich Point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FAIR HAVEN
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EAST HAVEN
WEST HAVEN
Allingtown
Roynham
MORRIS COVE
marsh
MILL RIVER
QUINNIPIAC R.
WEST RIVER
NEW HAVEN REACH
LIGHTHOUSE POINT REACH
N.W.Q.S.S.
(01196657)
Shag Pond
Sandy Pt.
Old Field Cr.
Breakwater
Oyster River
Cove
Bradley Pt.
Tweed - New Haven Airport
Brightview
Morris Cr.
Lighthouse Pt.
Morgan Pt.
East Breakwater
ENTRANCE CHANNEL
Luddington Rock Breakwater
West Breakwater
NEW HAVEN HARBOR
NEW HAVEN CONNECTICUT
0
1
SCALE IN MILES

TABLE 5.1
1974

SUMMARY OF WATER QUALITY VIOLATIONS

asin Name State) No. of Stations Sampled)	Water Quality Parameter	Class B Standards *		Number of Violations	Number of Values	Percent Violations
		Maximum	Minimum			
Western Connecticut Coastal (Connecticut) (2)	Water Temperature °C	28.29°		0	12	0%
	Dissolved Oxygen		5.0 mg/l	1	12	8%
	Total Coliform	2300/100 ml		7	11	64%
	Fecal Coliform	500/100 ml		6	12	50%
	pH	8.5	6.8	0	12	0%
	Totals for Basin			14	59	24%

* In marine waters criteria are for Class SB standard.

3.2 HOUSATONIC RIVER BASIN

The Housatonic River Basin drains a large part of western Massachusetts, a small portion of east central New York, most of western Connecticut and empties into Long Island Sound at Stratford, Connecticut. The Housatonic River, though flowing through rural land for most of its length, drains highly industrialized areas along its upper and lower reaches.

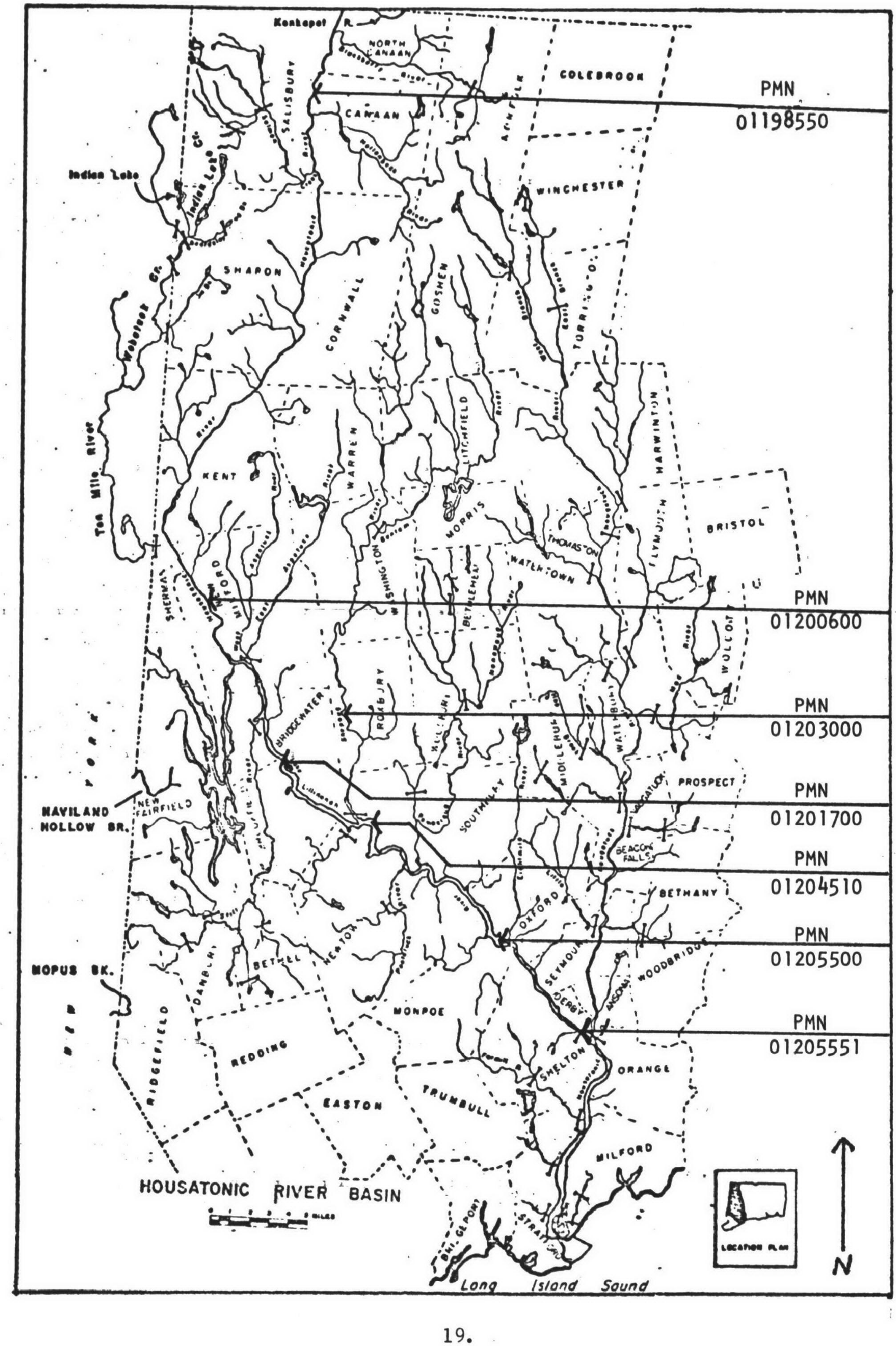
Paper industry and domestic sewage discharges enter the river in Pittsfield, Massachusetts causing coliform bacteria violations and some of the higher nitrogen and phosphorus levels observed near Canaan, Connecticut (Plot Station No. 1). These levels remain approximately constant through New Milford, Connecticut (Plot Station No. 2).

Lake Lillinonah (Plot Station No. 3) shows an increase in nutrients, primarily organic nitrogen. This is probably due to upstream waste water treatment facility discharges at Pittsfield, New Milford and Danbury.

Lake Zoar (Plot Station No. 4) and the Housatonic River at Stevenson, Connecticut (Plot Station No. 5) show dissolved oxygen standard violations.

Coliform standards violations are numerous at Shelton, Connecticut (Plot Station No. 6). This is due to municipal and combined sewer discharges at Derby, Connecticut.

Nutrient levels for the Housatonic are high compared to those found at reference stations and increase proceeding downstream with the highest values being found at Shelton, Connecticut (Plot Station No. 6).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PMN 01203000
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PMN 01205551
Konkapot R.
NORTH CANAAN
CANAAN
SALISBURY
COLEBROOK
WINCHESTER
Indian Lake
SHARON
CORNWALL
GOSHEN
LITCHFIELD
HARWINTON
KENT
WARREN
MORRIS
THOMASTON
BRISTOL
WATERTOWN
WASHINGTON
BETHLEHEM
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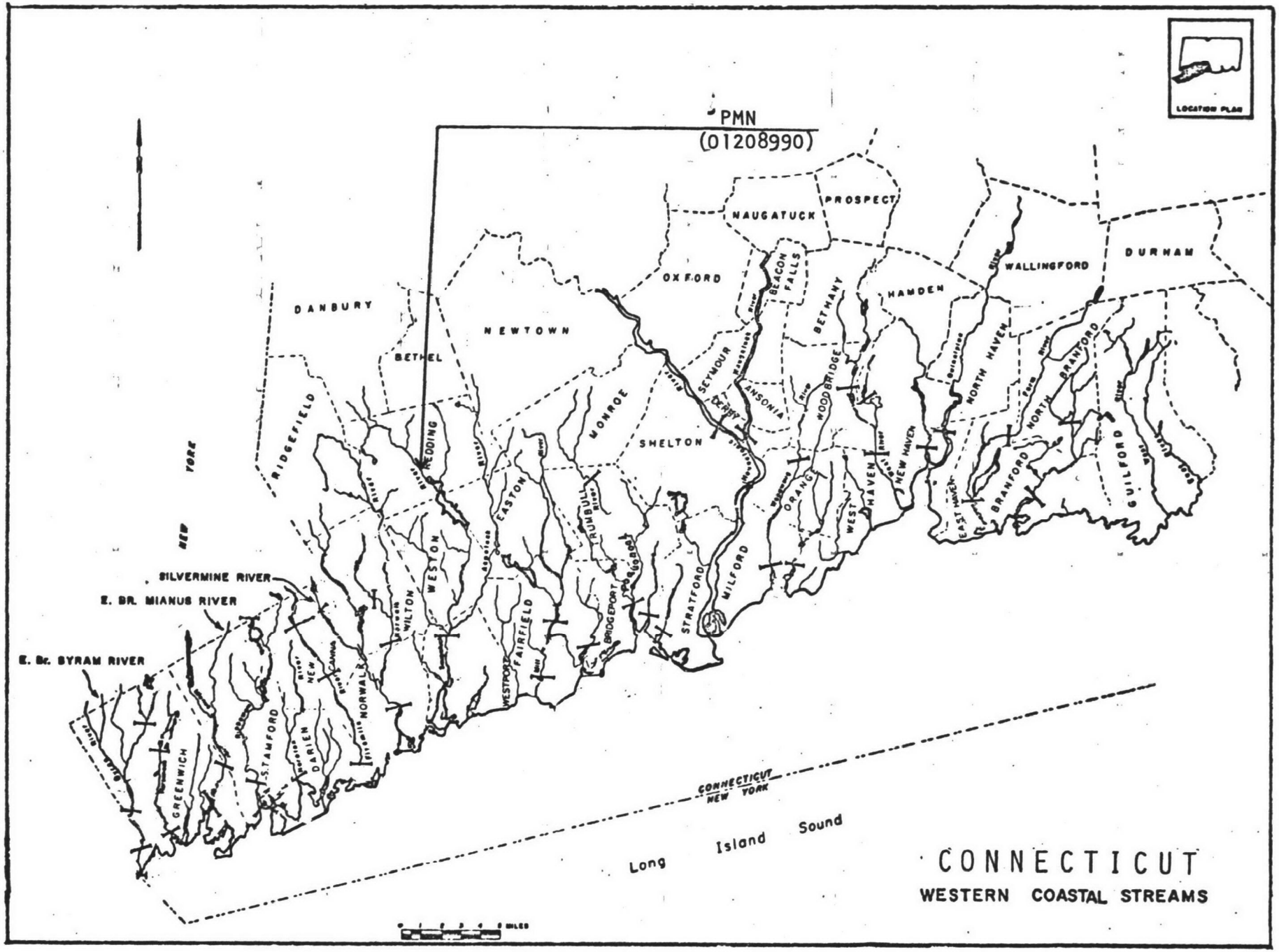
BRIDGEWATER
NEW FAIRFIELD
HAVILAND HOLLOW BR.
SOUTHBURY
MIDDLEBURY
WATERBURY
PROSPECT
BEACON FALLS
BETHANY
OXFORD
SEYMOUR
DERBY
ANSONIA
WOODBRIDGE
BETHEL
NEWTOWN
HOPUS BK.
RIDGEFIELD
REDDING
EASTON
TRUMBULL
SHELTON
ORANGE
MILFORD
Long Island Sound
N
Ten Mile River
LOCATION PLAN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NEWTOWN
MONROE
SHELTON
DERBY
ANSONIA
WOODBRIDGE
NORTH HAVEN
BRANFORD
NORTH BRANFORD
GUILFORD
RIDGEFIELD
REDDING
EASTON
TRUMBULL
BRIDGEPORT
STRATFORD
MILFORD
ORANGE
WEST HAVEN
NEW HAVEN
EAST HAVEN
WESTPORT
FAIRFIELD
WESTON
WILTON
NORWALK
DARIEN
NEW CANAAN
STAMFORD
GREENWICH
NEW YORK
SILVERMINE RIVER
E. BR. MIANUS RIVER
E. Br. BYRAM RIVER
CONNECTICUT
NEW YORK
Long Island Sound
CONNECTICUT
WESTERN COASTAL STREAMS

TABLE 3.2

1974

SUMMARY OF WATER QUALITY VIOLATIONS

Basin Name (State) (No. of Stations Sampled)	Water Quality Parameter	Class B Standards *		Number of Violations	Number of Values	Percent Violations
		Maximum	Minimum			
Housatonic River	Water Temperature	29.39°		0	60	0%
(Connecticut) (8)	Dissolved Oxygen		5.0 mg/1	3	60	5%
	Dissolved Oxygen Saturation Percent		75%	10	60	17%
	Turbidity	25 JTU		0	60	0%
	Total Coliform	2400/100 ml		8	60	13%
	Fecal Coliform	500/100 ml		8	60	13%
	pH	8.0	6.5	9	60	15%
Totals for Basin				38	420	9%

* marine inter... criteria ... from Cl... CP... shall ...

HOUSATONIC RIVER STATIONS

in

DOWNSTREAM ORDER

Plot Station Number	Station Location	Map Station Number
1.	Housatonic River near Canaan, Conn.	PMN 01198550
2.	Housatonic River near New Milford, Conn.	PMN 01200600
3.	Lake Lillinonah-Housatonic River near Brookfield, Conn.	PMN 01201700
4.	Lake Zoar-Housatonic River near Riverside, Conn.	PMN 01204510
5.	Housatonic River near Stevenson, Conn.	PMN 01205500
6.	Housatonic River near Shelton, Conn.	PMN 01205551
	REFERENCE STATIONS	
7.	Shepaug River near Roxbury, Conn.	PMN 01203000
8.	Saugatuck River near Redding, Conn.	PMN 01208990

PLOT LEGEND

Left Axis ——— = April to September

Right Axis — — — — = October to March

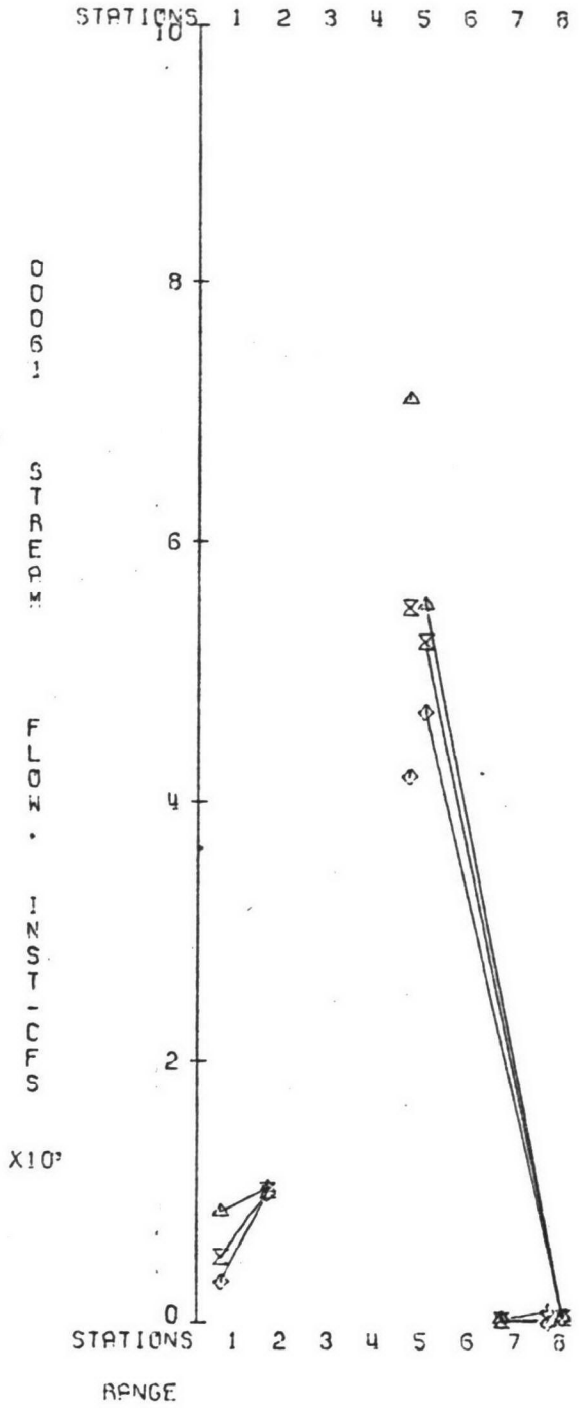
⧖ = Mean Values

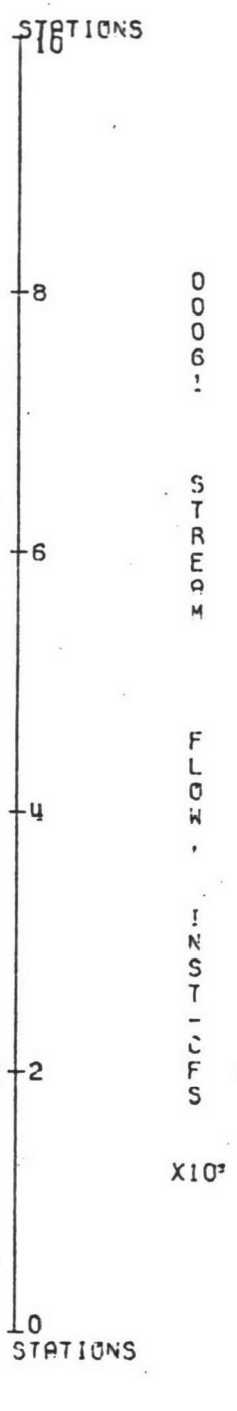
⧗ = Mean Values

△ = Maximum Values

◇ = Minimum Values

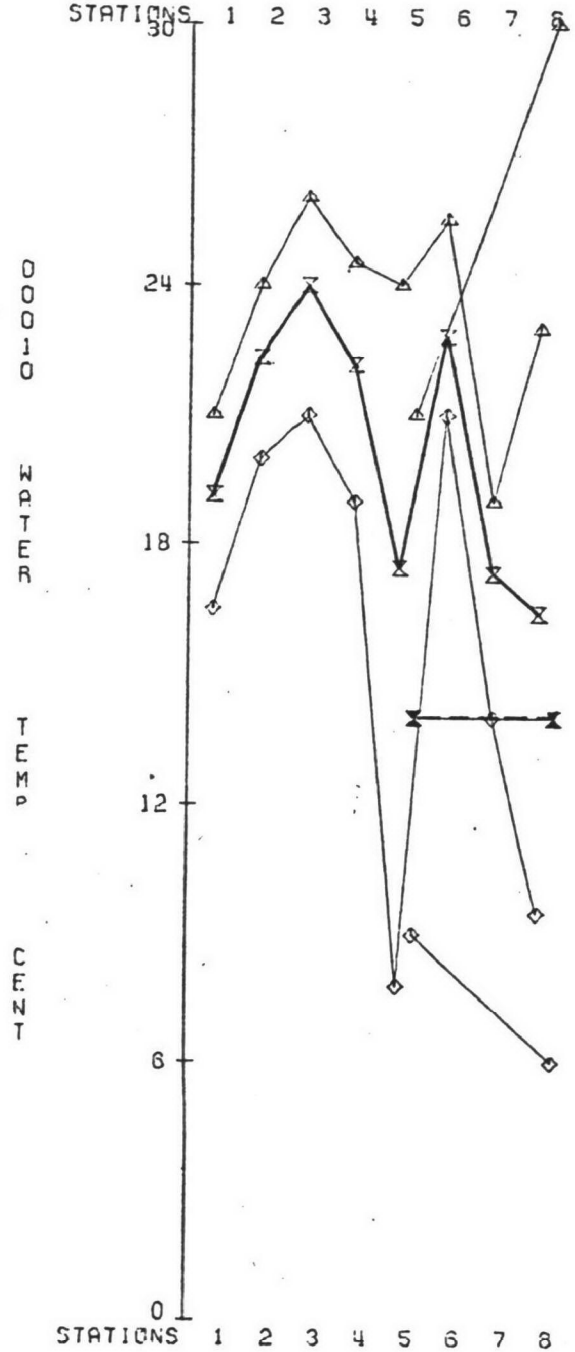
MU E ON (M
FROM 740115 TO 740917

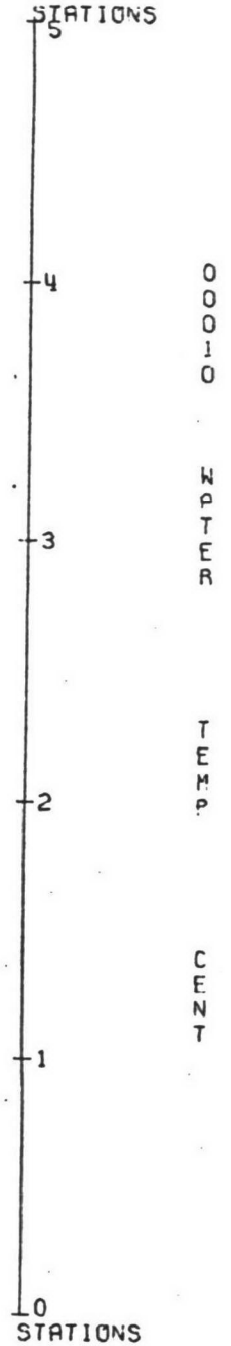




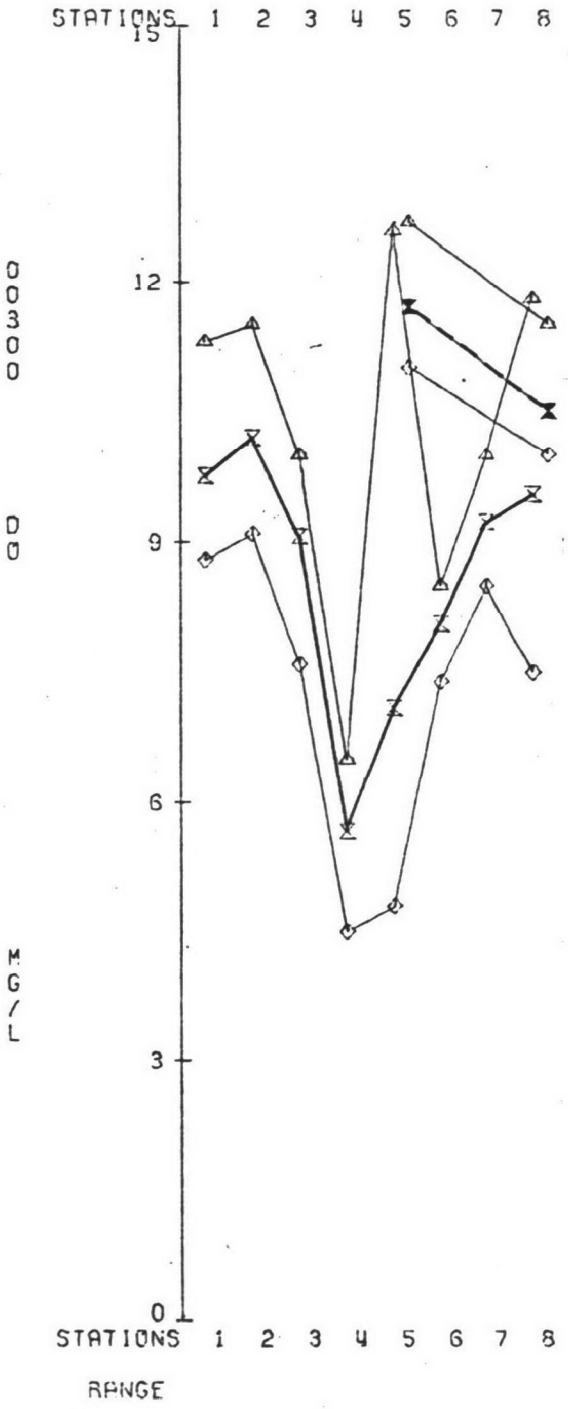
STORET SYSTEM 06/11/75

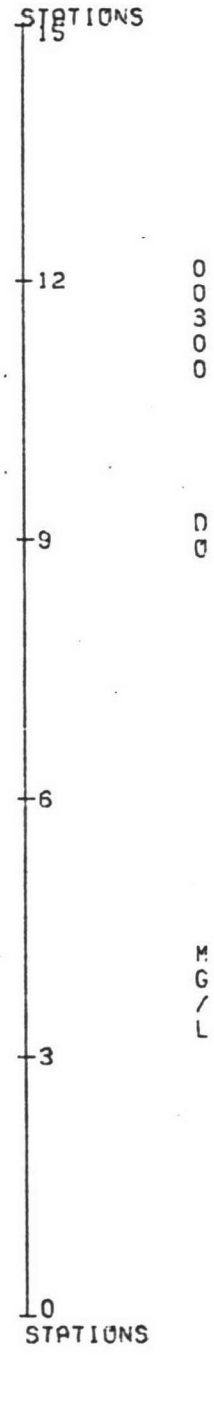
MULTIPLE STATION PLOT (MSP)
FROM 740115 TO 740918

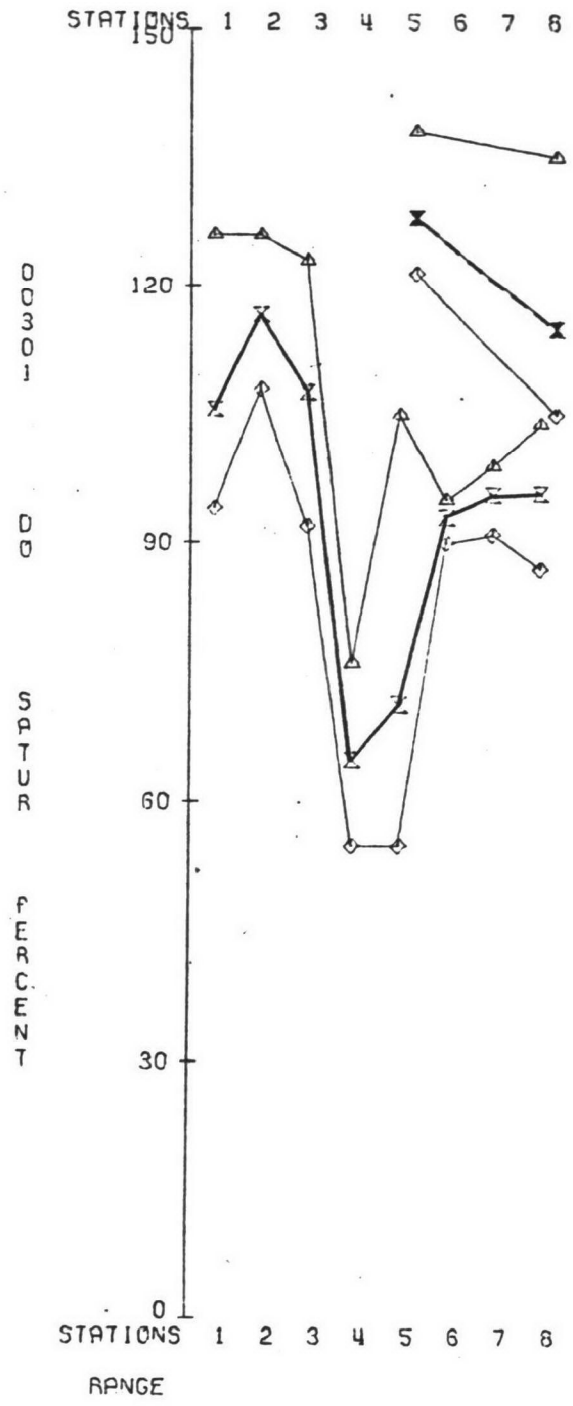


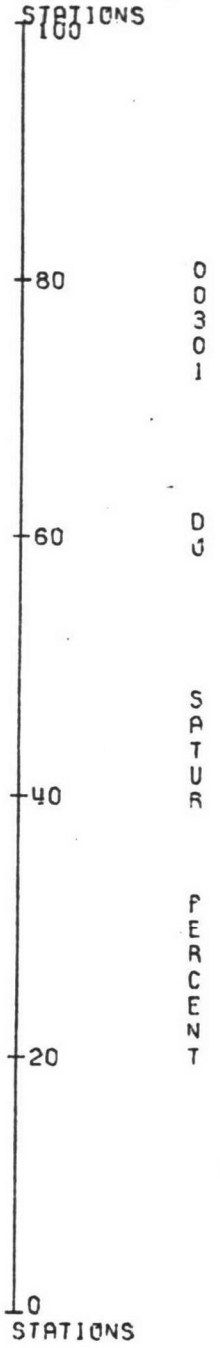


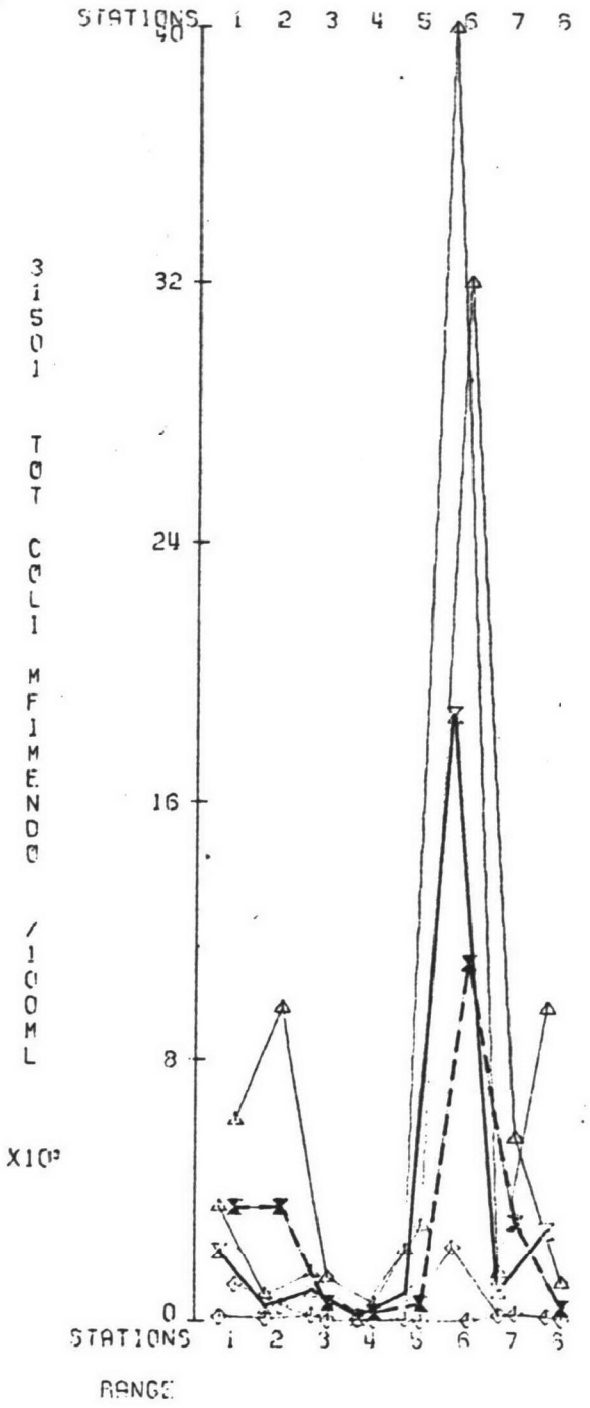
MULTIPLE STATION PLOT (MSP)
FROM 740115 TO 740918

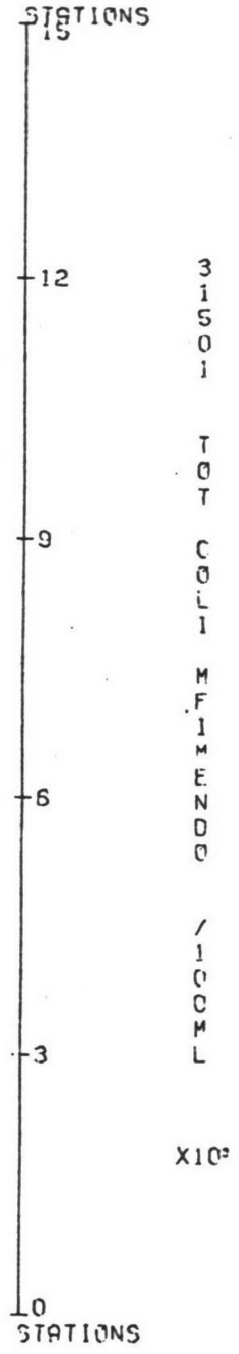





STATIONS 1 2 3 4 5 6 7 8
150
120
90
60
30
0
00301 DO SATUR PERCENT
STATIONS 1 2 3 4 5 6 7 8
RANGE

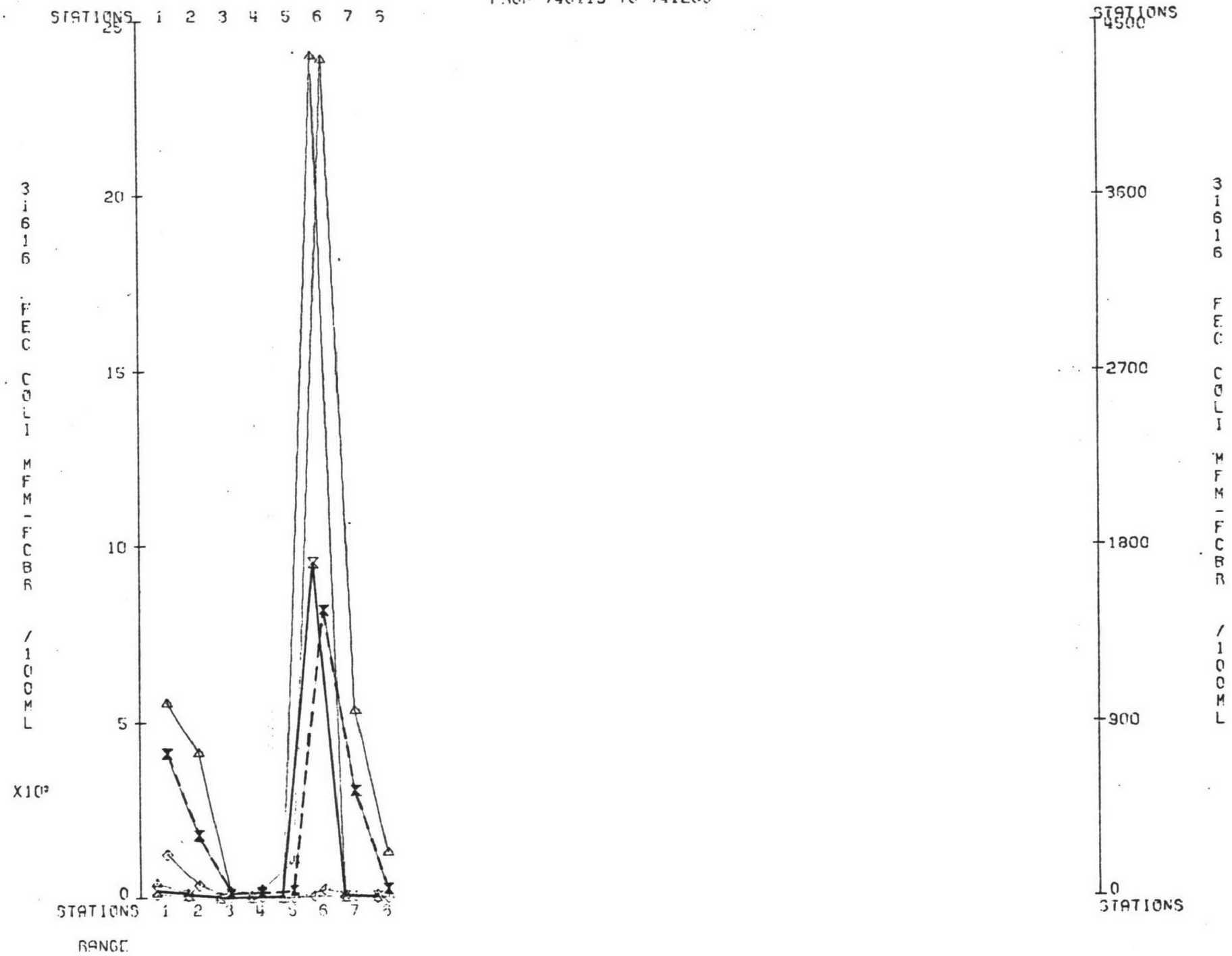

STATIONS
100
80
60
40
20
0
STATIONS
00301 DO SATUR PERCENT

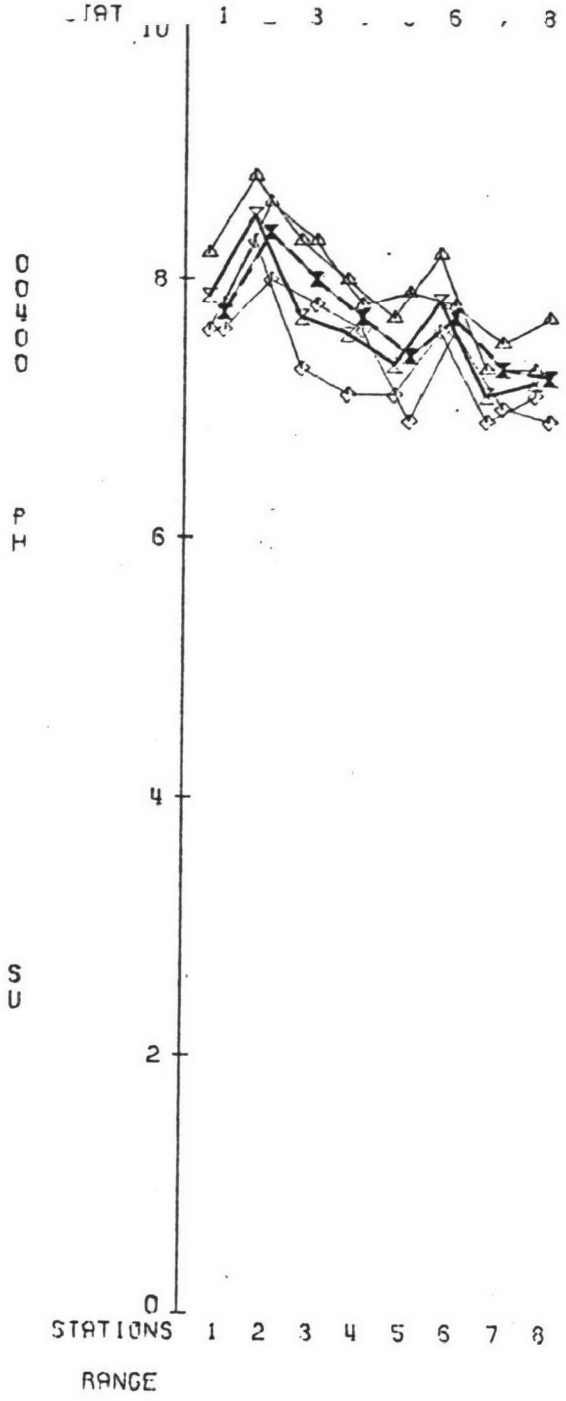

MU E ' ON (M
FROM 740115 TO 741209
STATIONS 1 2 3 4 5 6 7 8
40
32
24
16
8
0
STATIONS 1 2 3 4 5 6 7 8
3150 TOT COLI MFIMEND0 /100ML
X10²
RANGE

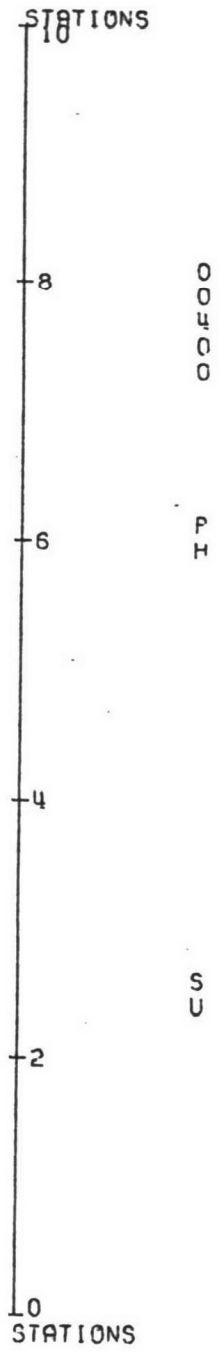

STATIONS
15
12
9
6
3
0
STATIONS
3150 TOT COLI MFIMEND0 /100ML
X10²

STREET SYSTEM 06/12/75

ILT STS PL SPJ
FROM 740115 TO 741209

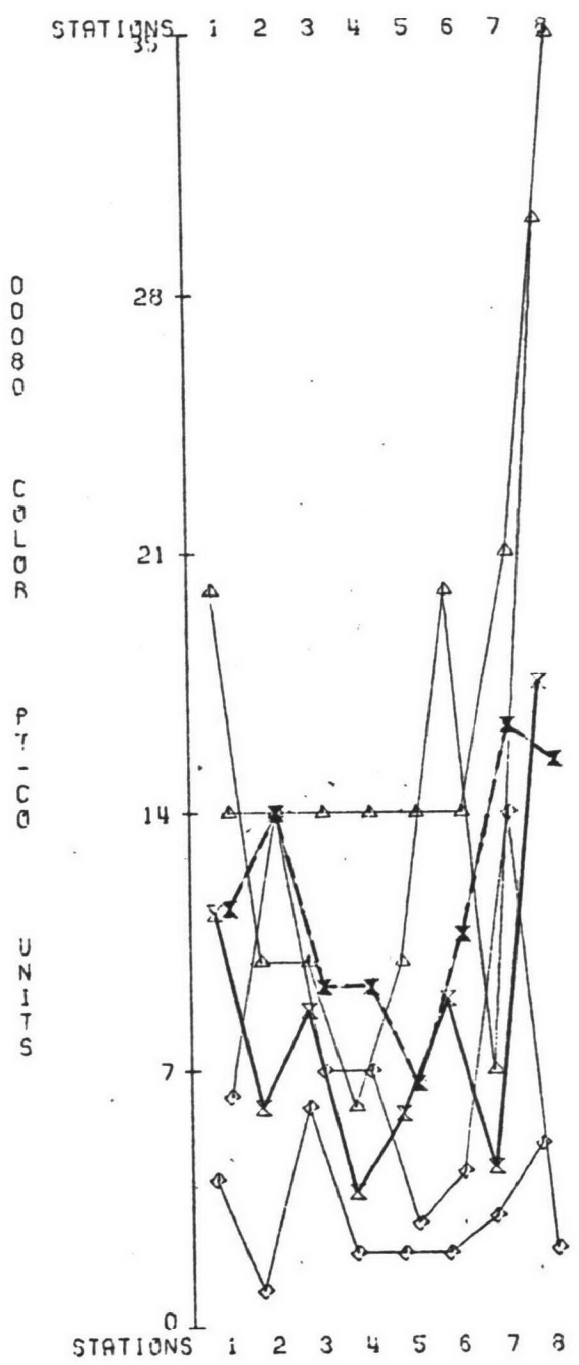


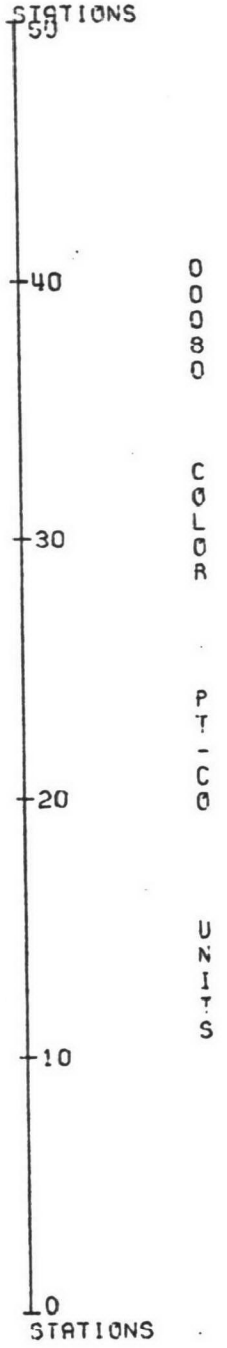

STAT 1 2 3 4 5 6 7 8
10
8
6
4
2
0
00400
PH
SU
STATIONS 1 2 3 4 5 6 7 8
RANGE

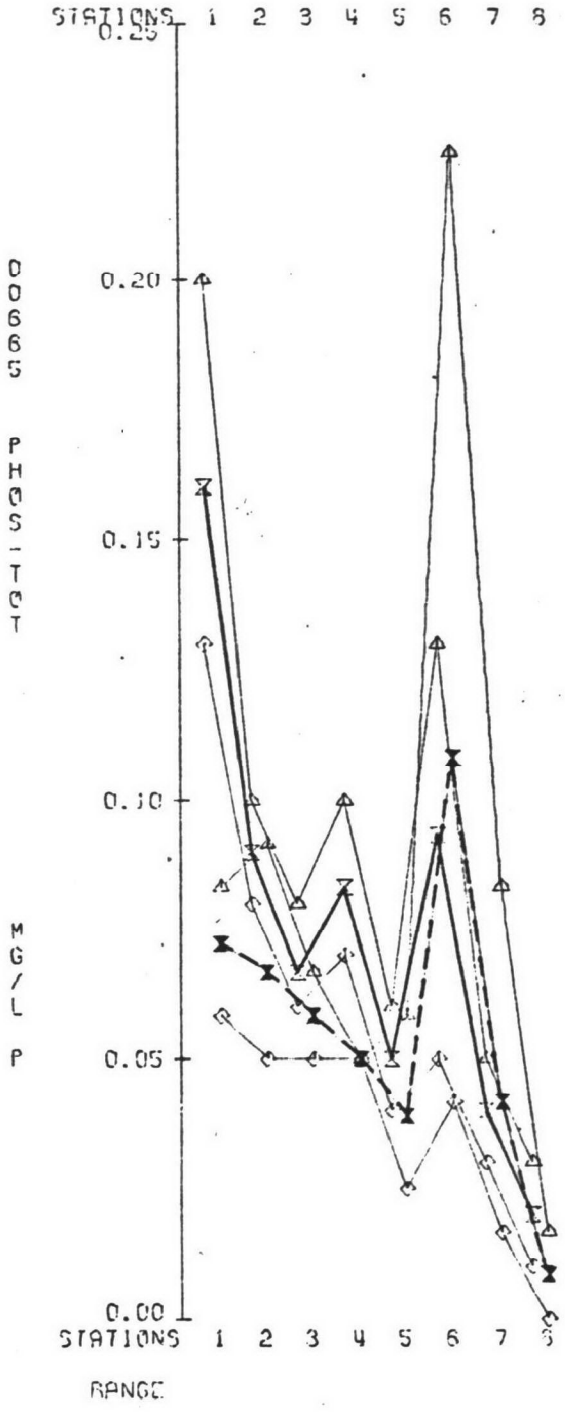

STATIONS
10
8
6
4
2
0
00400
PH
SU
STATIONS

STORET SYSTEM 06/13/75

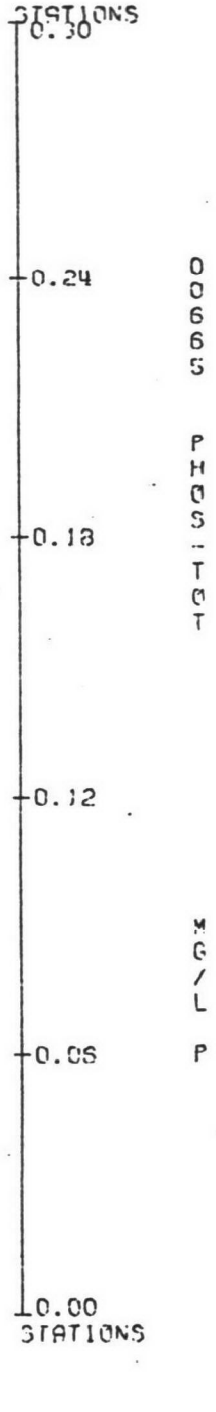
MULTIPLE STATION PLOT (MSP)
FROM 740115 TO 741209

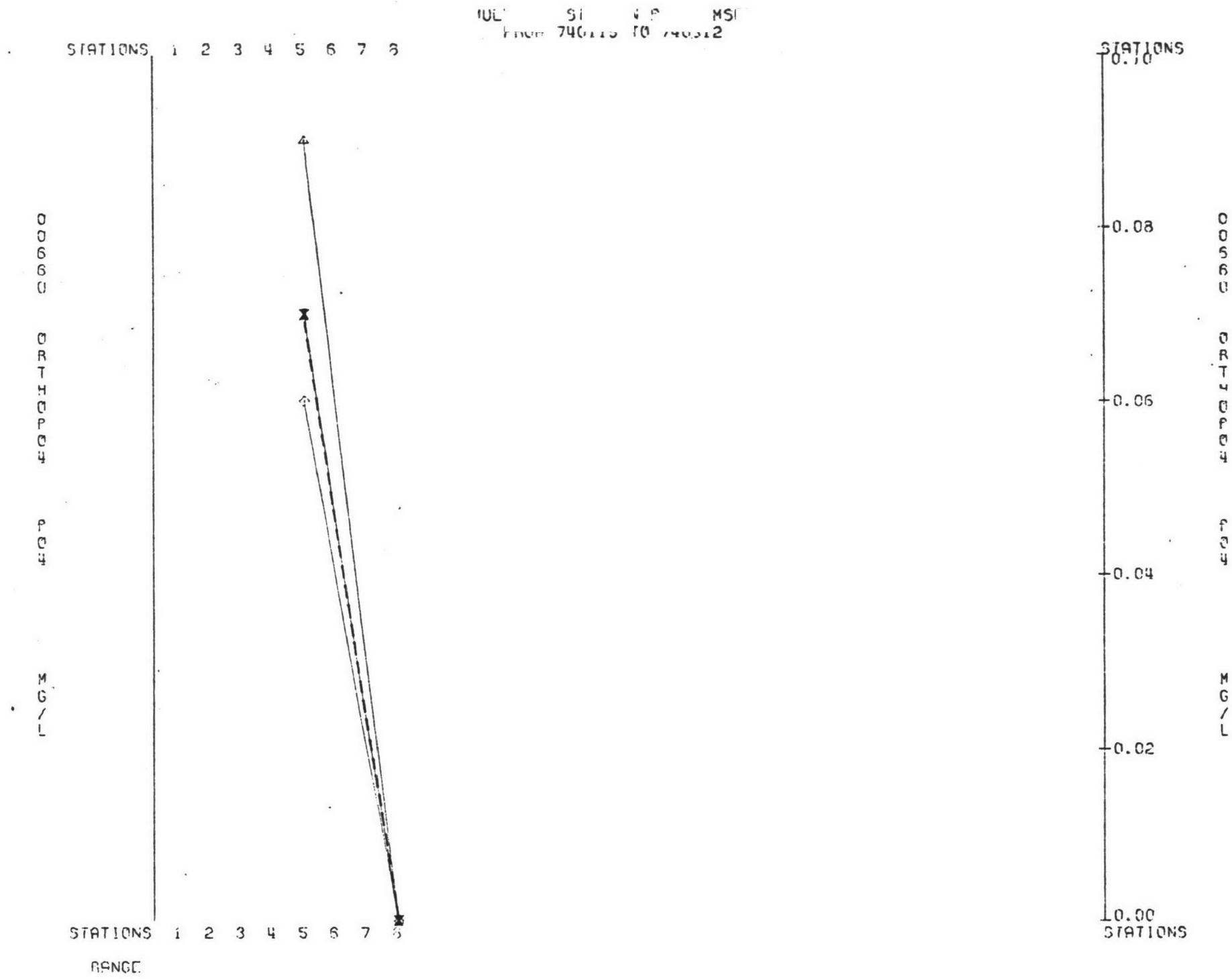


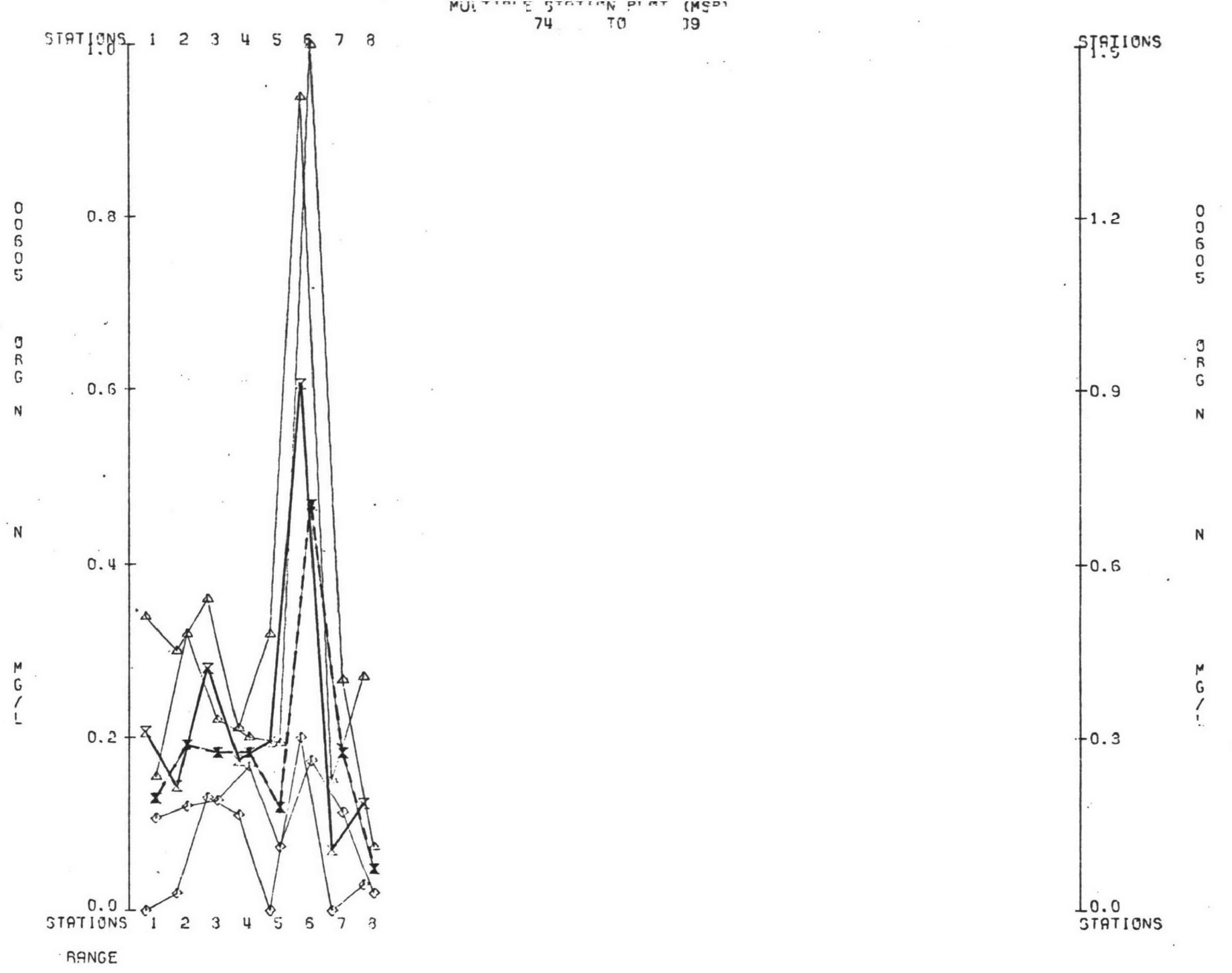


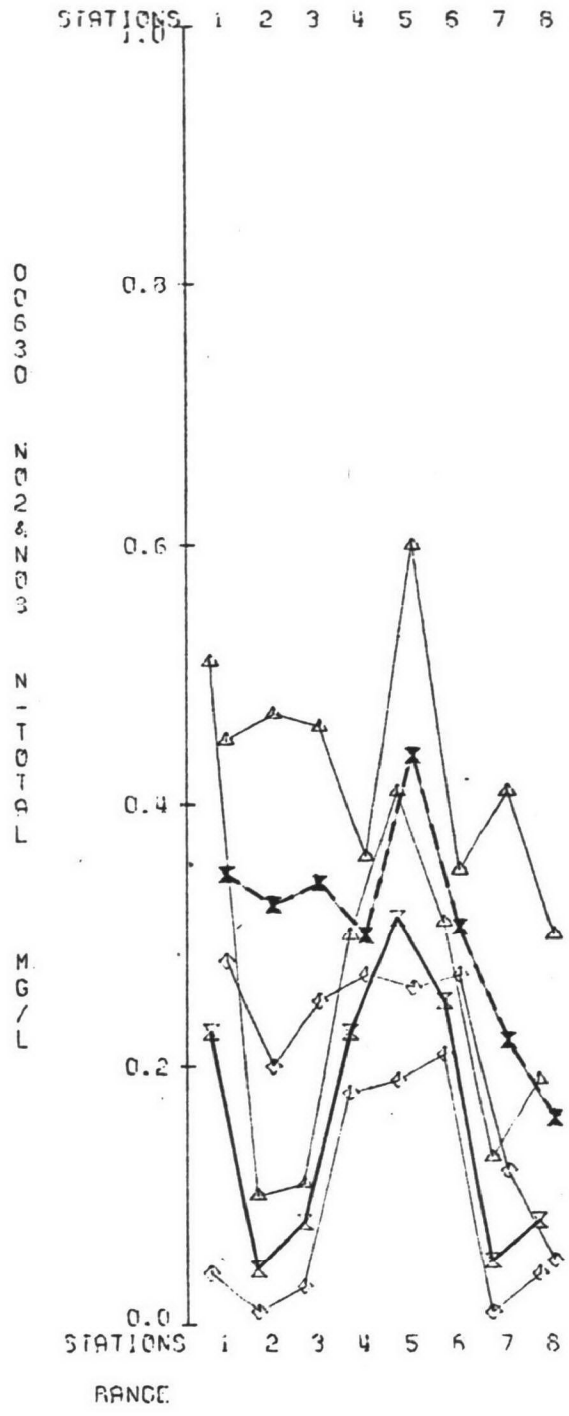

STATIONS 1 2 3 4 5 6 7 8
0.25
0.20
0.15
0.10
0.05
0.00
STATIONS 1 2 3 4 5 6 7 8
00665 PHOS-TOT MG/L P

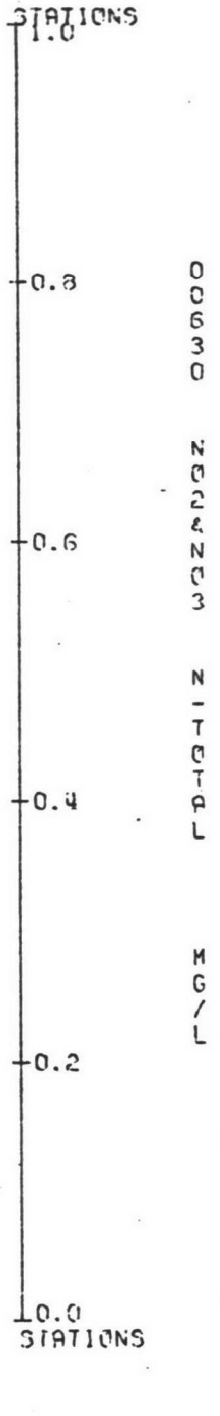
RANGE


STATIONS
0.30
0.24
0.18
0.12
0.06
0.00
STATIONS
00665 PHOS-TOT MG/L P


STATIONS 1 2 3 4 5 6 7 8
00660 ORTHOPO4 P04 MG/L
STATIONS 1 2 3 4 5 6 7 8
RANGE
STATIONS
0.10
0.08
0.06
0.04
0.02
0.00
STATIONS
00660 ORTHOPO4 P04 MG/L


MULTIPLE STATION PLOT (MSP)
74 TO 09
STATIONS 1 2 3 4 5 6 7 8
1.0
0.8
0.6
0.4
0.2
0.0
00605 ORGN N MG/L
STATIONS 1 2 3 4 5 6 7 8
RANGE
STATIONS
1.5
1.2
0.9
0.6
0.3
0.0
00605 ORGN N MG/L
STATIONS


STATIONS 1 2 3 4 5 6 7 8
1.0
0.8
0.6
0.4
0.2
0.0
00630 NO2&NO3 N-TOTAL MG/L
STATIONS 1 2 3 4 5 6 7 8
RANGE


STATIONS
1.0
0.8
0.6
0.4
0.2
0.0
00630 NO2&NO3 N-TOTAL MG/L
STATIONS

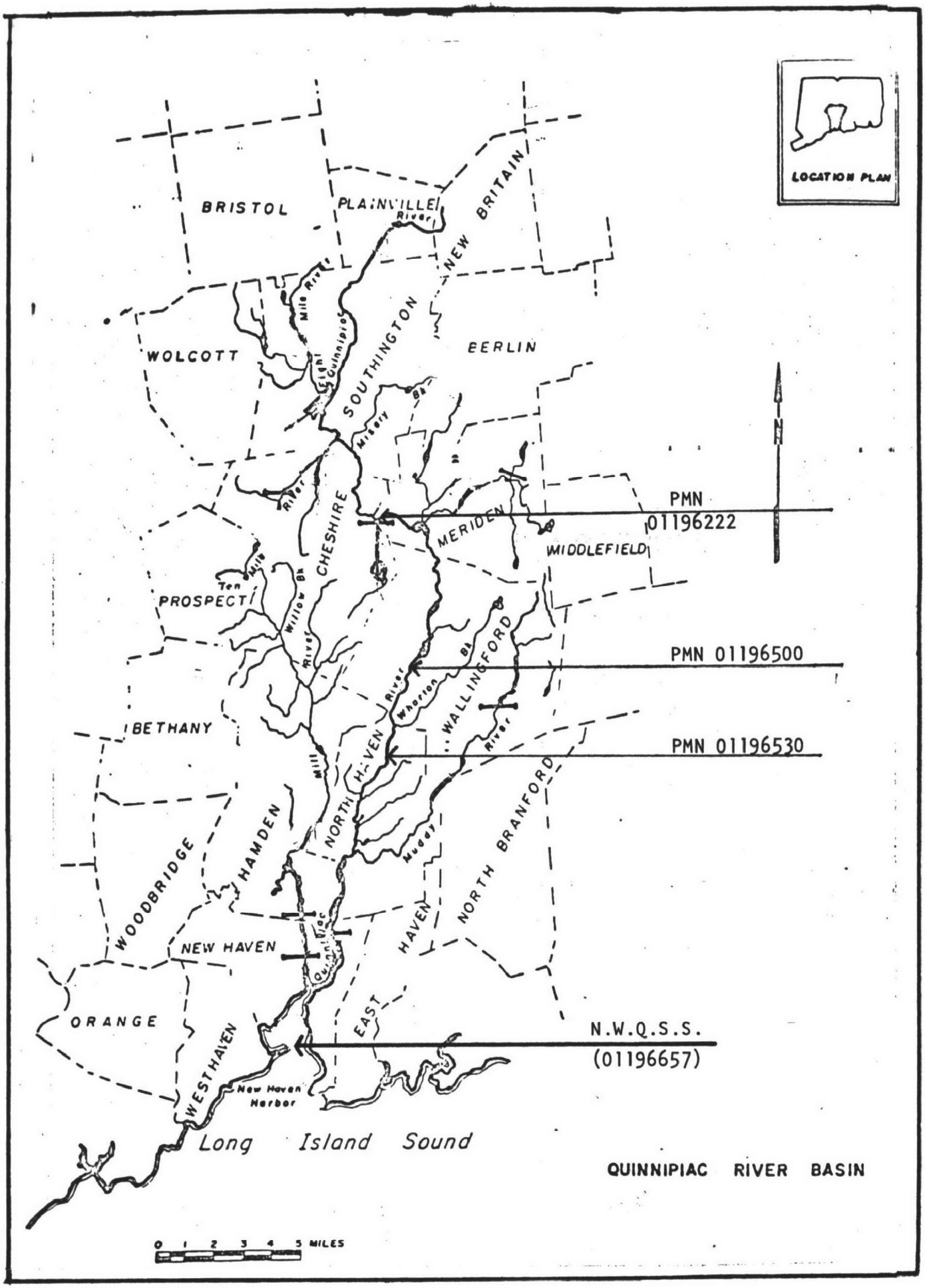
3.3 QUINNIPIAC RIVER, PAWCATUCK RIVER AND EASTERN CONNECTICUT COAST DRAINAGE AREA

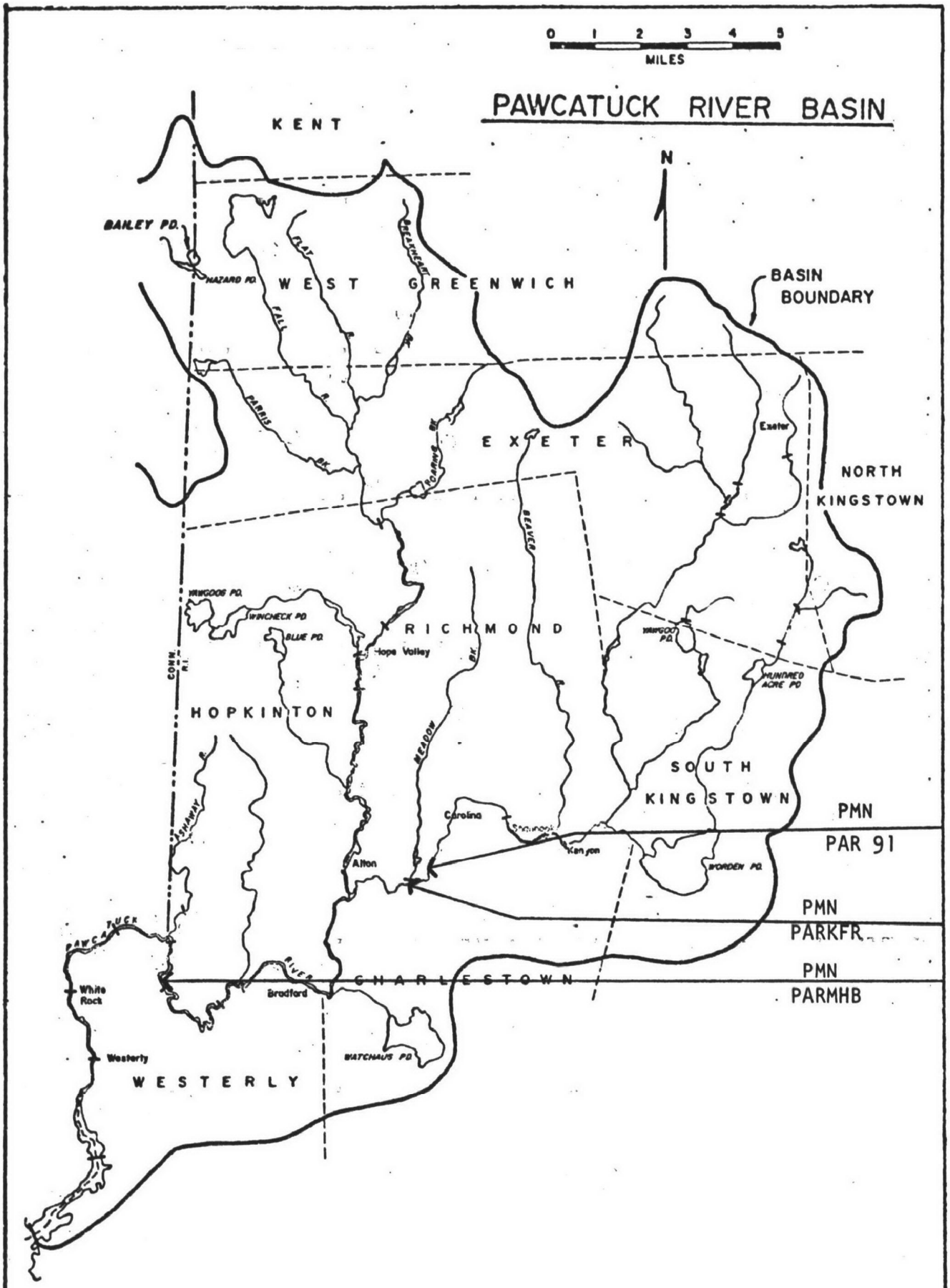
The Quinnipiac River Basin lies between the Housatonic and Connecticut River basins and drains an area of south central Connecticut. The mainstem of the Quinnipiac River flows from the New Britain - Plainville, Connecticut area to New Haven Harbor and into Long Island Sound.

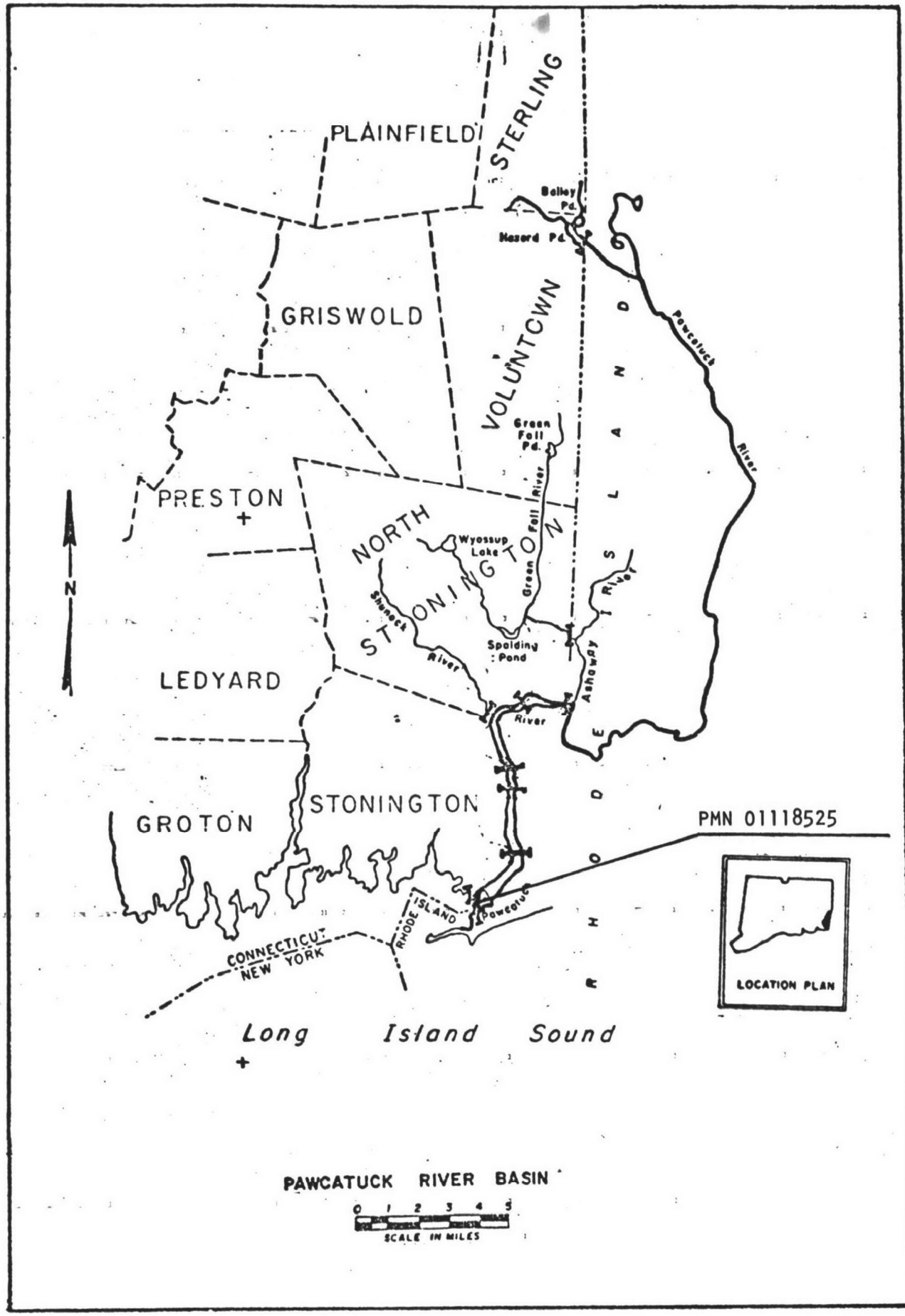
Industrial (metal, plastic and chemical), municipal and combined sewer discharges cause numerous violations of dissolved oxygen and coliform bacteria standards in the Quinnipiac River.

The Pawcatuck River Basin lies in the southwestern corner of Rhode Island with two small portions in southeastern Connecticut. Most water quality standards violations in the Pawcatuck River are with pH and coliform bacteria. Several minor violations of dissolved oxygen percent saturation were also reported. Low dissolved oxygen and high bacteria counts in the Kenyon-Bradford stretch of the Pawcatuck River are due to industrial, primarily textile finishing, discharges. The high bacteria counts in the tidal portions of the Pawcatuck are a result of the insufficient treatment of domestic sewage by Westerly, Rhode Island (primary treatment) and Pawcatuck, Connecticut (untreated). The high percentage of pH violations is not a significant problem because the state of Rhode Island has determined that these pH levels occur naturally. As more data is obtained, it will be determined what natural conditions cause these pH variations in this drainage basin.

Most of the shellfish areas of the Pawcatuck River are closed to shell fishing for market purposes due to the bacterial pollution of the river.


LOCATION PLAN
BRISTOL
PLAINVILLE
NEW BRITAIN
WOLCOTT
SOUTHINGTON
BERLIN
CHESHIRE
MERIDEN
MIDDLEFIELD
PROSPECT
WALLINGFORD
BETHANY
NORTH HAVEN
WOODBRIDGE
HAMDEN
NEW HAVEN
ORANGE
WESTHAVEN
EAST HAVEN
NORTH BRANFORD
PMN 01196222
PMN 01196500
PMN 01196530
N.W.Q.S.S. (01196657)
Long Island Sound
QUINNIPIAC RIVER BASIN
0 1 2 3 4 5 MILES


0 1 2 3 4 5
MILES
PAWCATUCK RIVER BASIN
N
KENT
BAILEY PO.
HAZARD PO.
WEST GREENWICH
BASIN BOUNDARY
EXETER
Exeter
NORTH KINGSTOWN
WINCHECK PO.
BLUE PO.
Hope Valley
RICHMOND
HUNDRED ACRE PO
HOPKINTON
SOUTH KINGSTOWN
Carolina
Kenyon
Alton
WORDEN PO.
PMN PAR 91
PMN PARKFR
PMN PARMHB
CHARLESTOWN
White Rock
Bradford
Westerly
WATCHAUG PO.
WESTERLY


PLAINFIELD
STERLING
GRISWOLD
VOLUNTOWN
PRESTON
NORTH STONINGTON
LEDYARD
GROTON
STONINGTON
Bailey Pd.
Hazard Pd.
Green Fall Pd.
Green Fall River
Wyassup Lake
Shetucket River
Spalding Pond
Ashaway River
Pawcatuck River
RHODE ISLAND
CONNECTICUT
NEW YORK
RHODE ISLAND
Pawcatuck
PMN 01118525
LOCATION PLAN
Long Island Sound
PAWCATUCK RIVER BASIN
0 1 2 3 4 5
SCALE IN MILES

SUMMARY OF WATER QUALITY VIOLATIONS

Basin Name (State) (No. of Stations Sampled)	Water Quality Parameter	Class B Standards *		Number of Violations	Number of Values	Percent Violations
		Maximum	Minimum			
Quinnipiac and Central Connecticut Coastal (Connecticut) (3)	Water Temperature °C	29.39°		0	24	0
	Dissolved Oxygen		5.0 mg/l	4	24	17%
	Dissolved Oxygen Saturation Percent		75%	10	24	42%
	Turbidity	25 JTU		0	24	0%
	Total Coliform	2400/100 ml		22	24	92%
	Fecal Coliform	500/100 ml		16	24	66%
	pH	8.0	6.5	0	24	0%
	Totals for Basin			52	168	31%

* In marine waters criteria are for Class SB standard.

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SUMMARY OF WATER QUALITY VIOLATIONS

Basin Name (State) (No. of Stations Sampled)	Water Quality Parameter	Class B Standards *		Number of Violations	Number of Values	Percent Violations
		Maximum	Minimum			
Pawcatuck River and Eastern Connecticut Coastal (Rhode Island) (3) (Connecticut) (1)	Water Temperature °C	29.39° - Ct. 28.29° - RI		0	24	0%
	Dissolved Oxygen		5.0 mg/l	0	23	0%
	Dissolved Oxygen Saturation Percent		75 %	2	21	9.5%
	Turbidity	25.0 JTU		0	12	0%
	Total Coliform	2400/100 ml		2	16	12.5%
	Fecal Coliform	500/100 ml		2	17	12%
	pH	8.0	6.5	14	24	58%
	Totals for Basin			20	127	16%

* In marine waters criteria are for Class SB standard.

3.4 CONNECTICUT RIVER BASIN

The Connecticut River flows from its source in northwestern New Hampshire, along the New Hampshire-Vermont border, through Massachusetts and Connecticut into Long Island Sound. For its entire distance through New Hampshire and Vermont the river receives its largest pollution loads from tributary streams carrying wastes from domestic and various industrial sources. This results in non-compliance with coliform bacteria standards for almost this entire distance and dissolved oxygen levels being below the seventy-five percent saturation standard at several locations during the summer months.

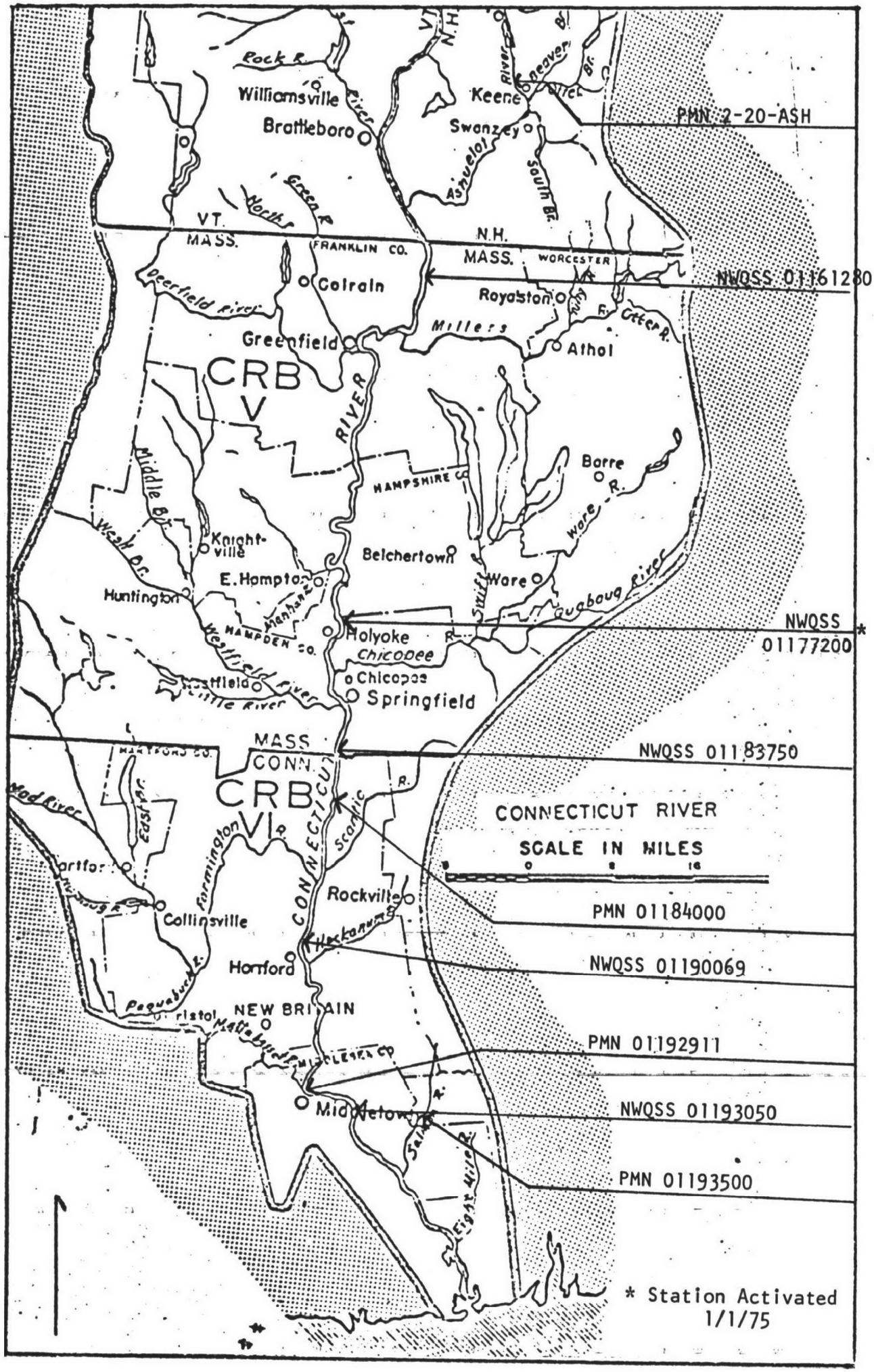
Within Massachusetts and Connecticut, the river receives large pollution loads directly from point sources as well as from tributary streams. As indicated by the locations of the monitoring stations, this stretch of the river receives the most extensive monitoring. Between Holyoke and Long Island Sound the water quality of the river is not in compliance with Class B standards for coliform bacteria (both total and fecal). Occasionally, standards for pH and dissolved oxygen are outside acceptable limits.

Proceeding from Northfield, Massachusetts (Plot Station No. 1) downstream through Chicopee and Springfield, Massachusetts to the Massachusetts-Connecticut state border (Plot Station No. 3), the levels of turbidity, color, coliform bacteria, suspended solids, ammonia nitrogen, and total phosphorus are seen to increase through the metropolitan Springfield area and then decrease. These increases in levels are attributable to discharges from four area-wide waste treatment facilities, combined sewer overflows, discharges from paper, textile, chemical and metal forging industries

entering the Connecticut River directly, or through the Chicopee and Westfield Rivers.

Similarly, turbidity, color, coliform bacteria, nitrogen and phosphorus are seen to increase again as the river flows between Hartford and Middletown, Connecticut (Plot Station Nos. 3 - 5). Also, dissolved oxygen concentrations are seen to reach a minimum at Middle Haddam, Connecticut (Plot Station No. 6). These increases are attributable primarily to the residual substances carried downstream from the Springfield area and combined municipal and industrial discharges to the Farmington, Hockanum and Mattabassett Rivers, combined sewer overflows in Hartford and Middletown and runoff from agricultural areas.

Concentrations of the various water constituents in the Connecticut River are distinct when compared to those in streams within the Basin at locations which do not receive point source discharges - Reference stations (Plot Station Nos. 7 & 8).


PMN 2-20-ASH
NWQSS 01161280
NWQSS 01177200 *
NWQSS 01183750
PMN 01184000
NWQSS 01190069
PMN 01192911
NWQSS 01193050
PMN 01193500
CONNECTICUT RIVER
SCALE IN MILES
0 8 16
CRB V
CRB VI
MASS.
CONN.
VT.
N.H.
Williamsville
Brattleboro
Keene
Swanzey
Colrain
Greenfield
Royalston
Athol
Orange
Belchertown
Ware
Holyoke
Chicopee
Springfield
Rockville
Collinsville
Hartford
NEW BRITAIN
Middletown
* Station Activated 1/1/75

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1974

SUMMARY OF WATER QUALITY VIOLATIONS

Basin Name (State) (No. of Stations Sampled)	Water Quality Parameter	Class B Standards *		Number of Violations	Number of Values	Percent Violations
		Maximum	Minimum			
Connecticut River (Connecticut) (5) (Massachusetts) (3) (New Hampshire) (1)	Water Temperature °C	28.29°-Ma. 29.39°-Ct.		0	56	0%
	Dissolved Oxygen		5.0 mg/l	0	59	0%
	Dissolved Oxygen Saturation Percent		75%	11	54	20%
	Turbidity	25.0 JTU		0	54	0%
	Total Coliform	2400/100 ml		46	60	77%
	Fecal Coliform	500/100 ml		31	48	64%
	pH	8.0	6.5	7	61	11%
Totals for Basin				95	392	24%

* In marine waters criteria are for Class SB standard.

CONNECTICUT RIVER STATIONS

in

DOWNSTREAM ORDER

Plot Station Number	Station Location	Map Station Number
1.	Connecticut River at Northfield, Ma.	NWQSS 01161280
2.	Connecticut River at Agawam, Ma.	NWQSS 01183750
3.	Connecticut River at Thompsonville, Connecticut	PMN 01184000
4.	Connecticut River at Hartford, Conn.	NWQSS 01190069
5.	Connecticut River at Middletown, Conn.	PMN 01192911
6.	Connecticut River at Middle Haddam, Conn.	NWQSS 01193050

REFERENCE STATIONS

7.	Salmon River at East Hampton, Conn.	PMN 01193500
8.	Ashuelot River above Keene, New Hampshire	PMN 2-20-ASH

PLOT LEGEND

Left Axis ——— = April to September

Right Axis — — — = October to March

⧖ = Mean Values

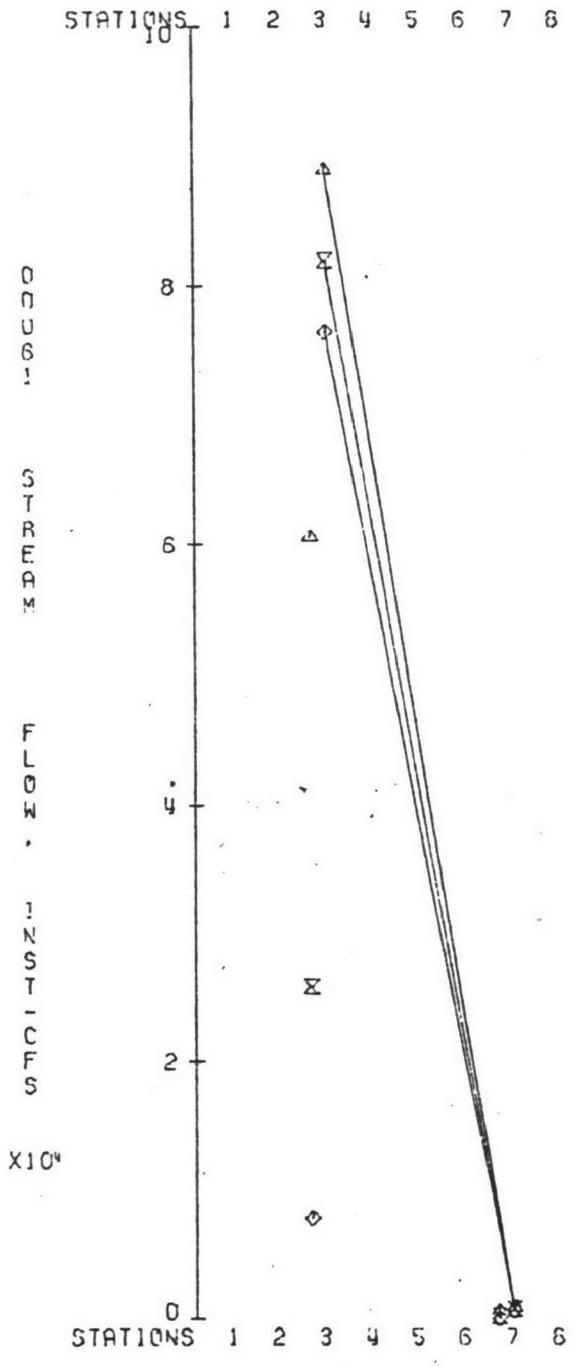
⧗ = Mean Values

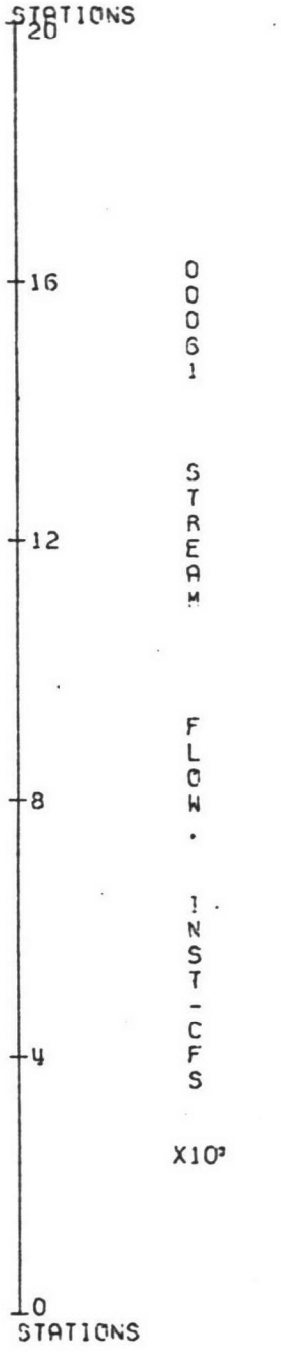
△ = Maximum Values

◇ = Minimum Values

STORET SYSTEM 06/11/75

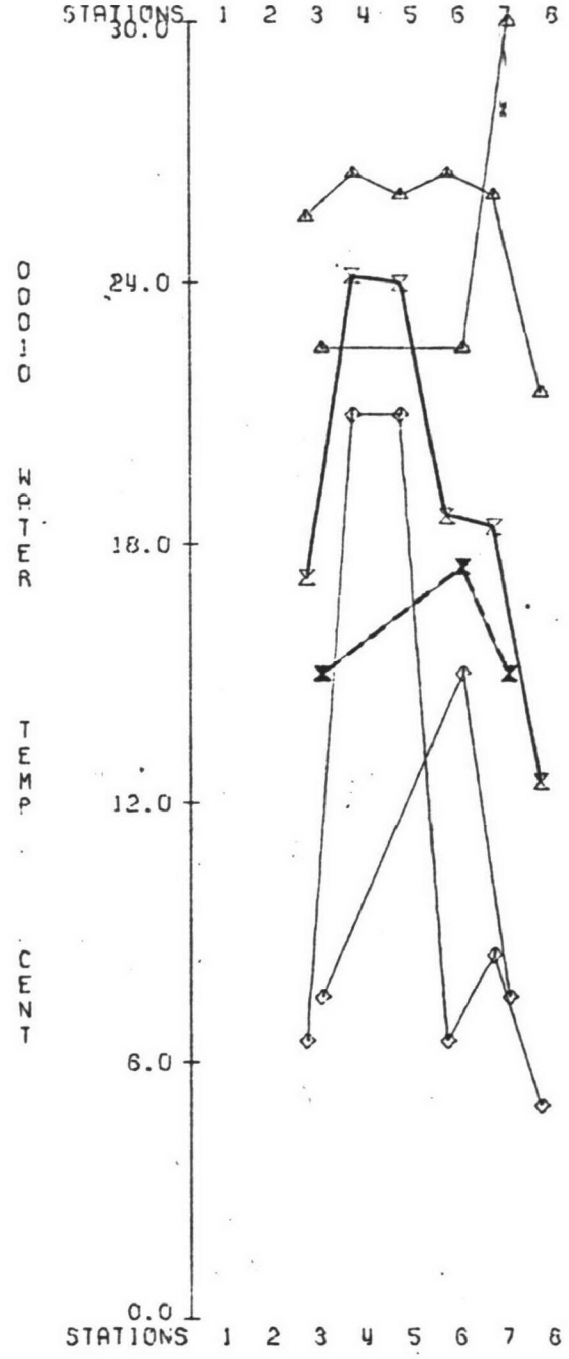
MULTIPLE STATION PLOT (MSP)
FROM 740114 TO 740911



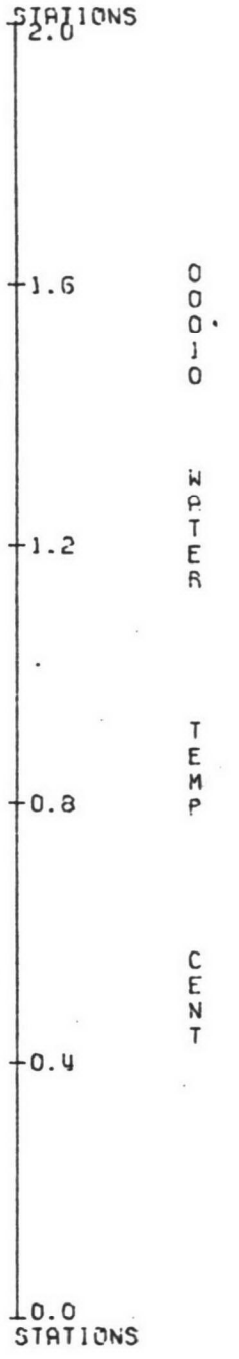


STORET SYSTEM 06/11/75

MULTIPLE STATION PLOT (MSP)
FROM 740114 TO 740911

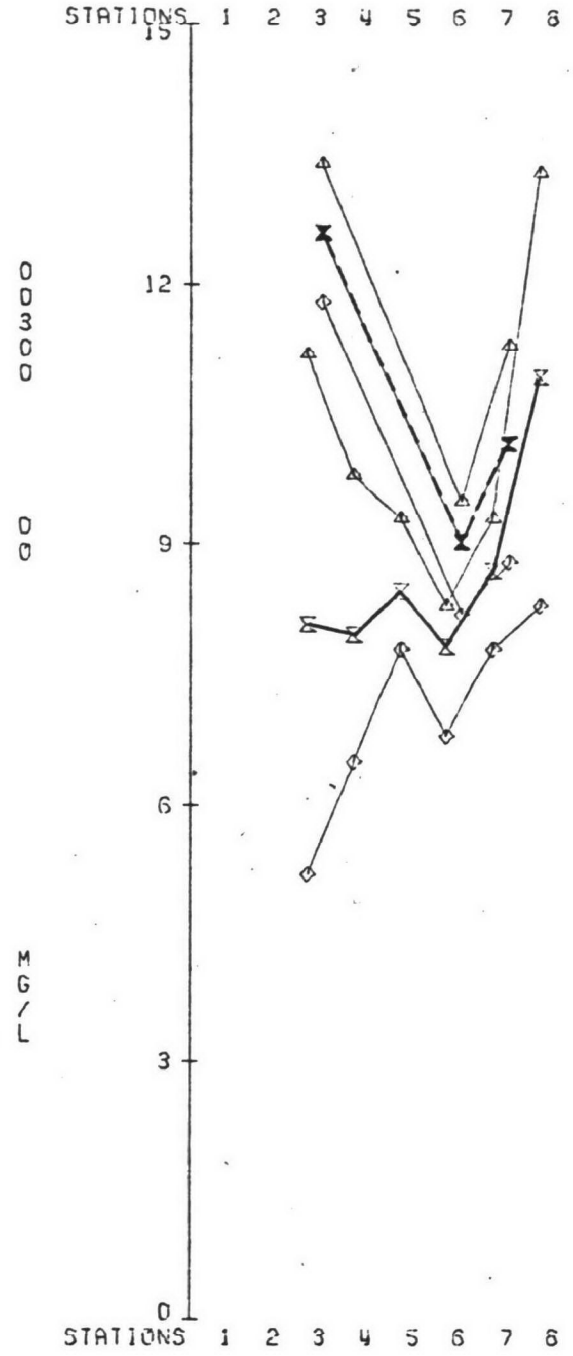


RANGE



STORET SYSTEM 06/11/75

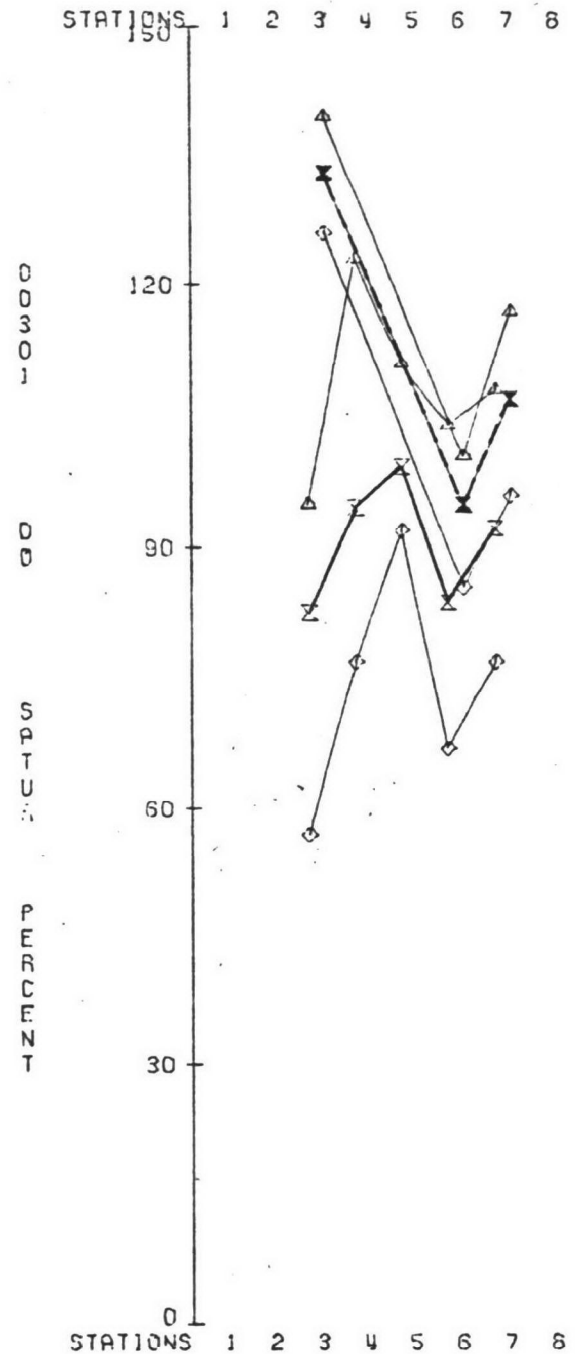
MULTIPLE STATION PLOT (MSP)
FROM 740114 TO 740911

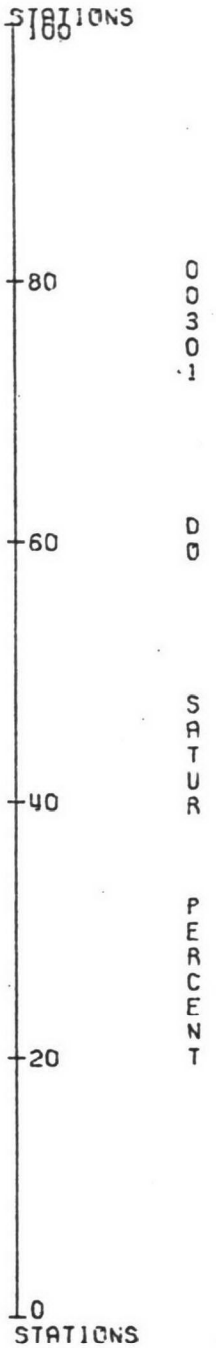


STATIONS
15
12
9
6
3
0
00300
00
MG/L
STATIONS

STORET SYSTEM 06/11/75

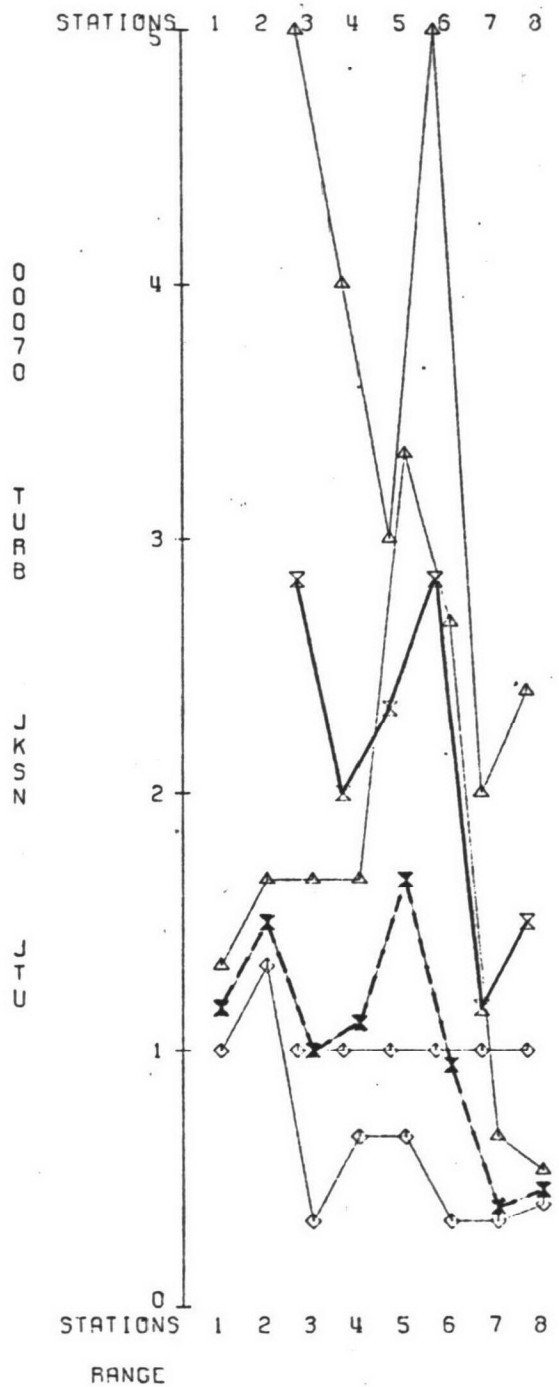
MULTIPLE STATION PLOT (MSP)
FROM 740114 TO 740911

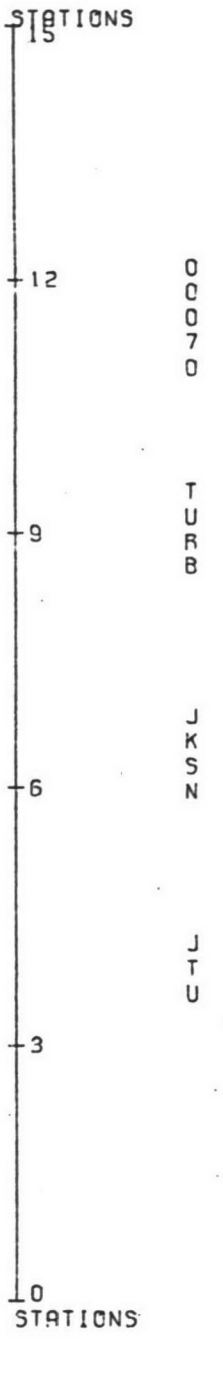




STREET SYSTEM 0[illegible]75

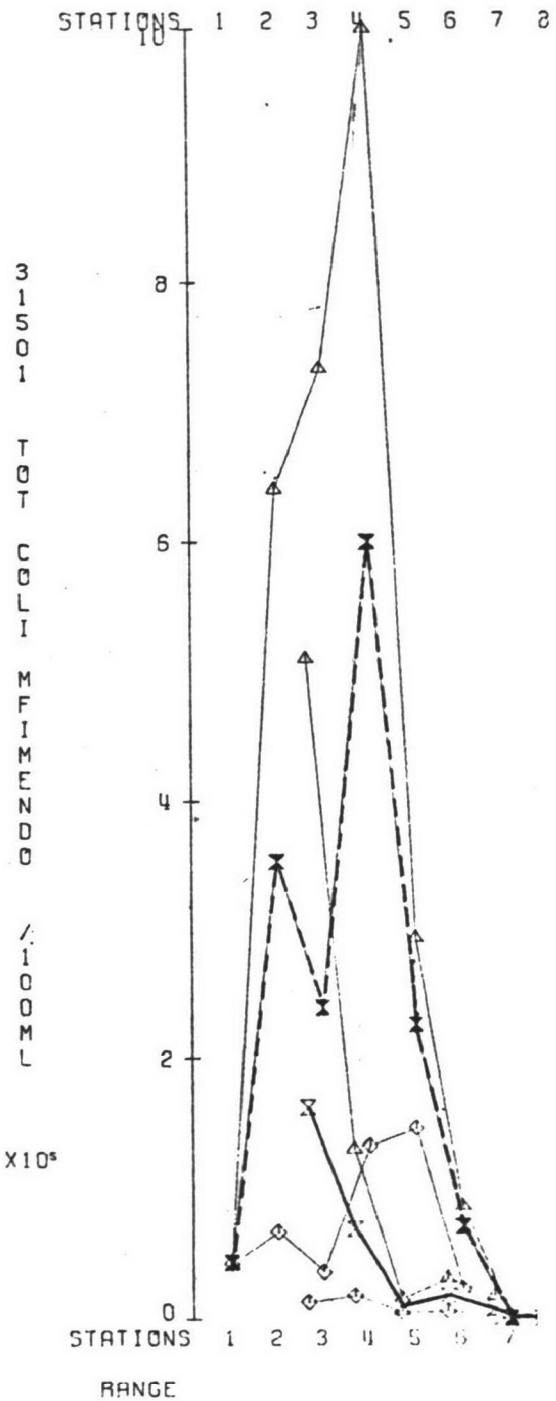
MULTIPLE STATION PLOT (MSP)
FROM 740114 TO 741211

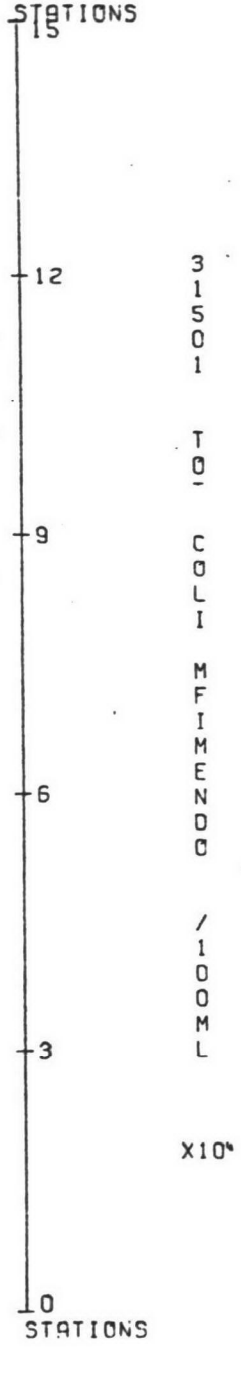




'OR STE)6/

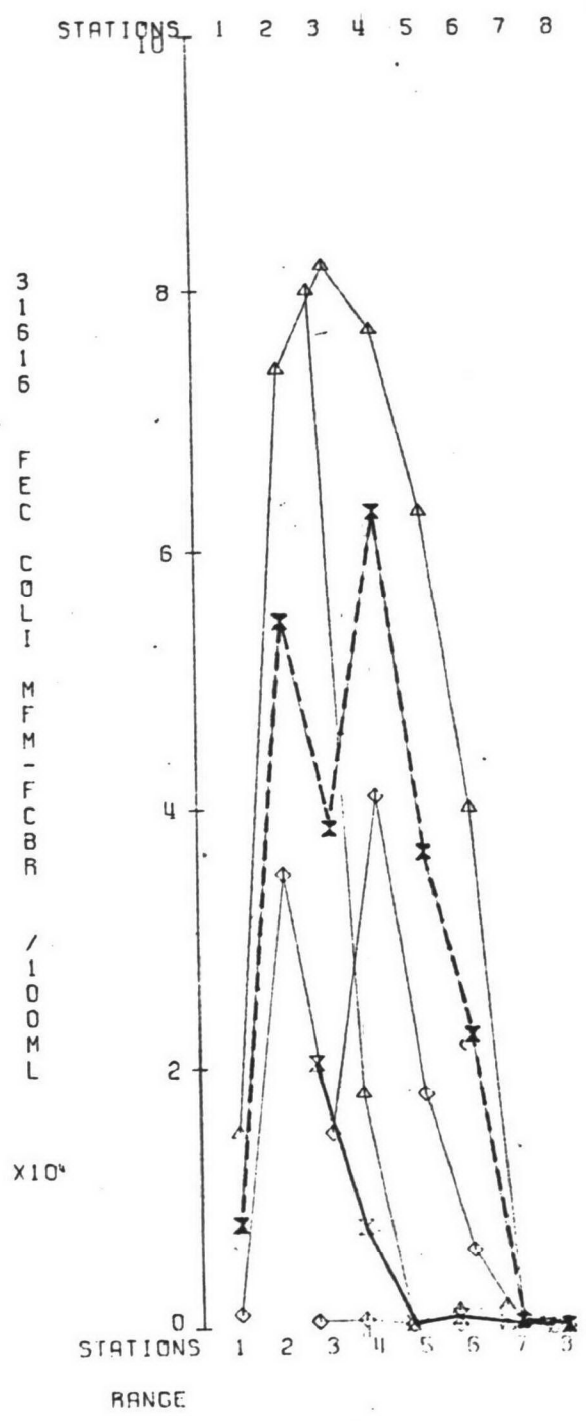
MULTIPLE STATION PLOT (MSP)
FROM 740114 TO 741211

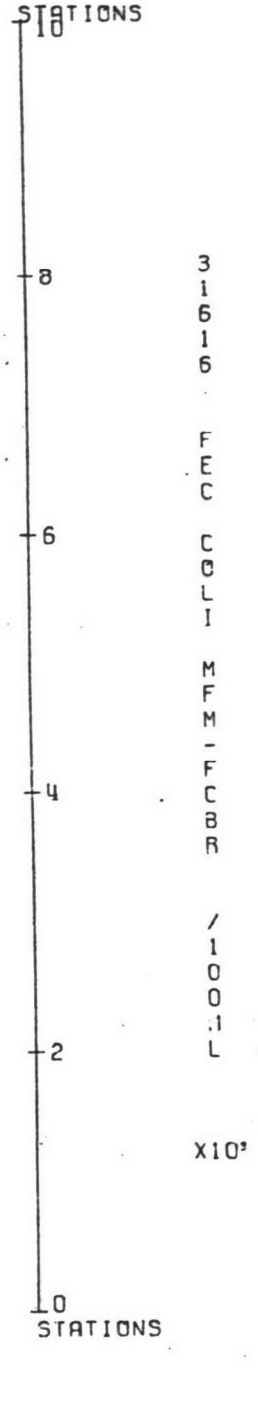




STORET SYSTEM 06/13/75

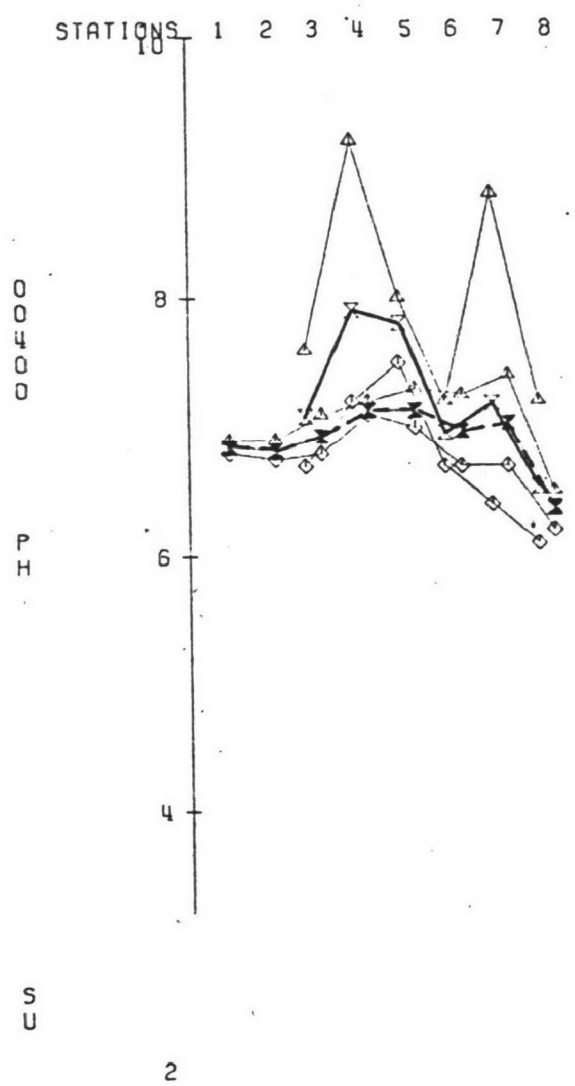
IUL S1 P MSf
FROM 740114 TO 741211

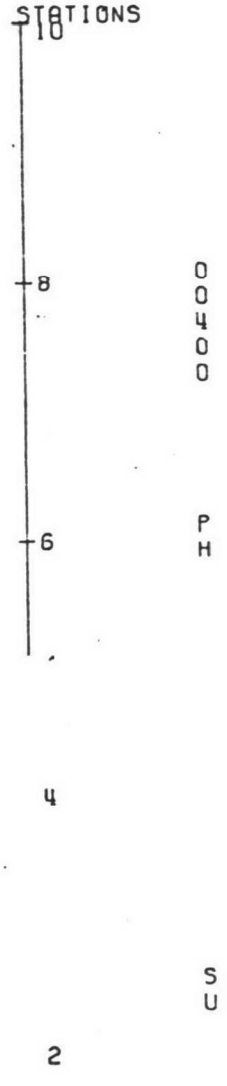




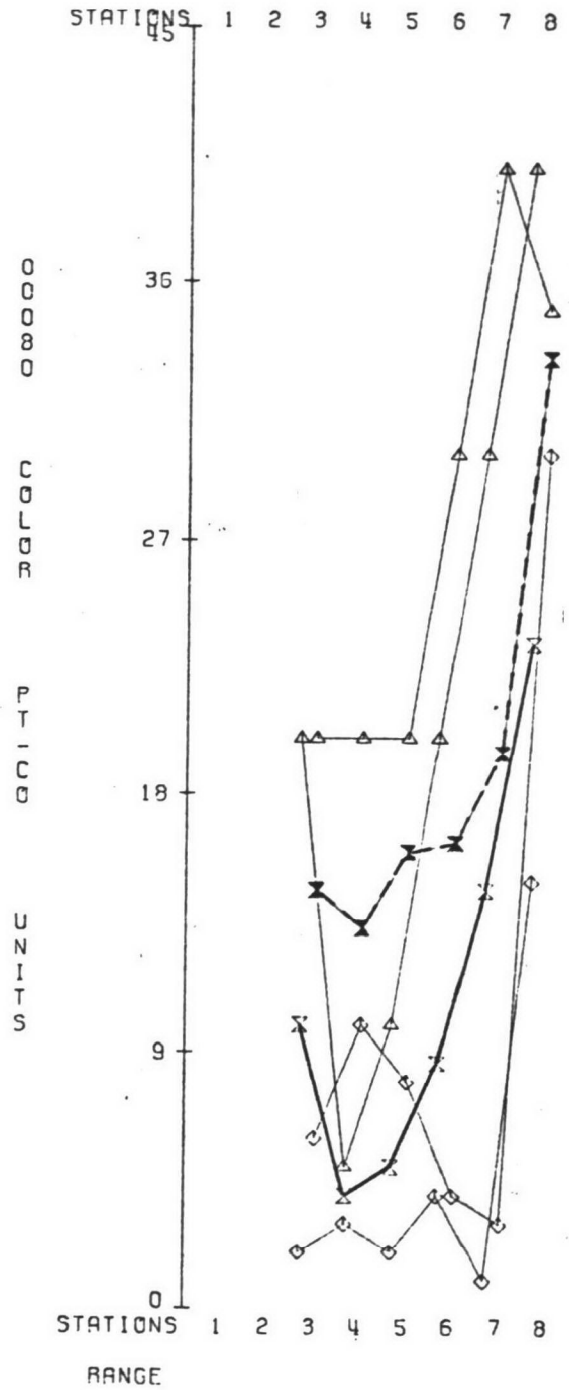
STORET SYSTEM 06/13/75

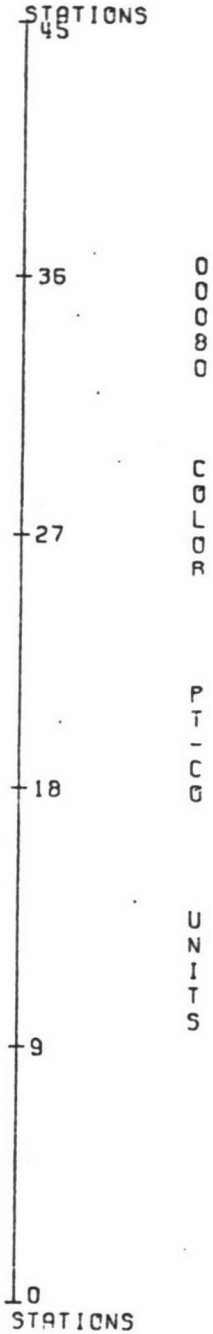
MULTIPLE STATION PLOT (MSP)
FROM 740114 TO 741211





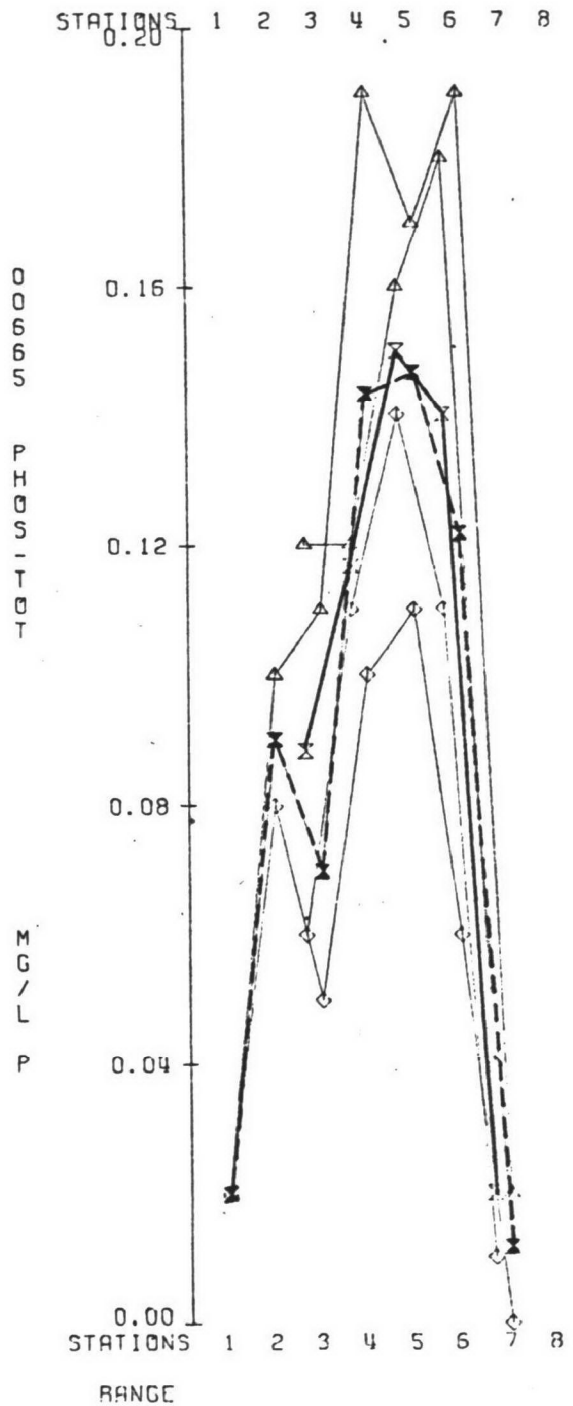
TIF TAT 'LO P)
FRO.. 741211

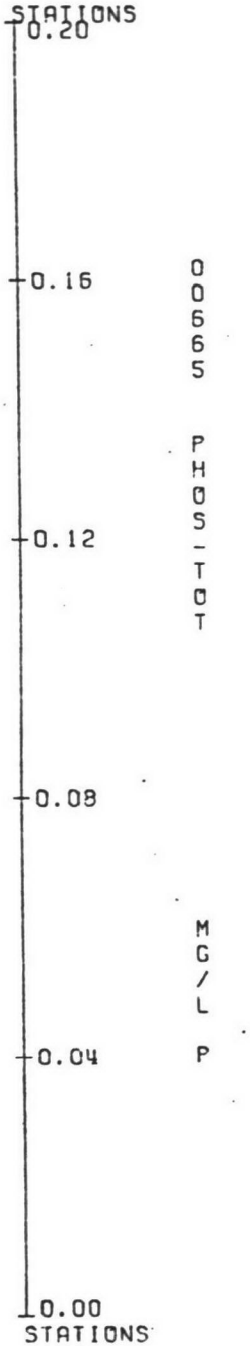




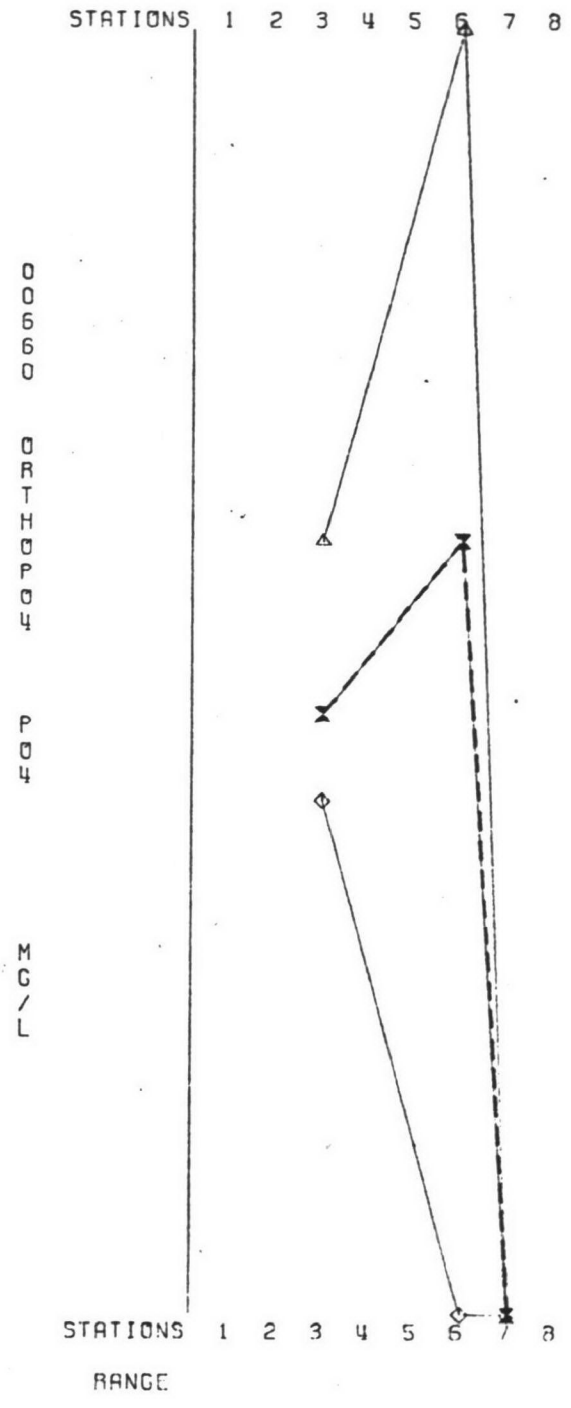
ORI STE)6/

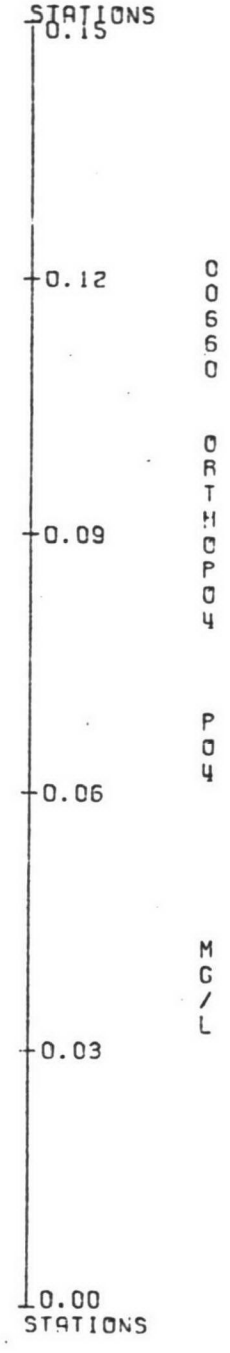
MULTIPLE STATION PLOT (MSP)
FROM 740114 TO 741211





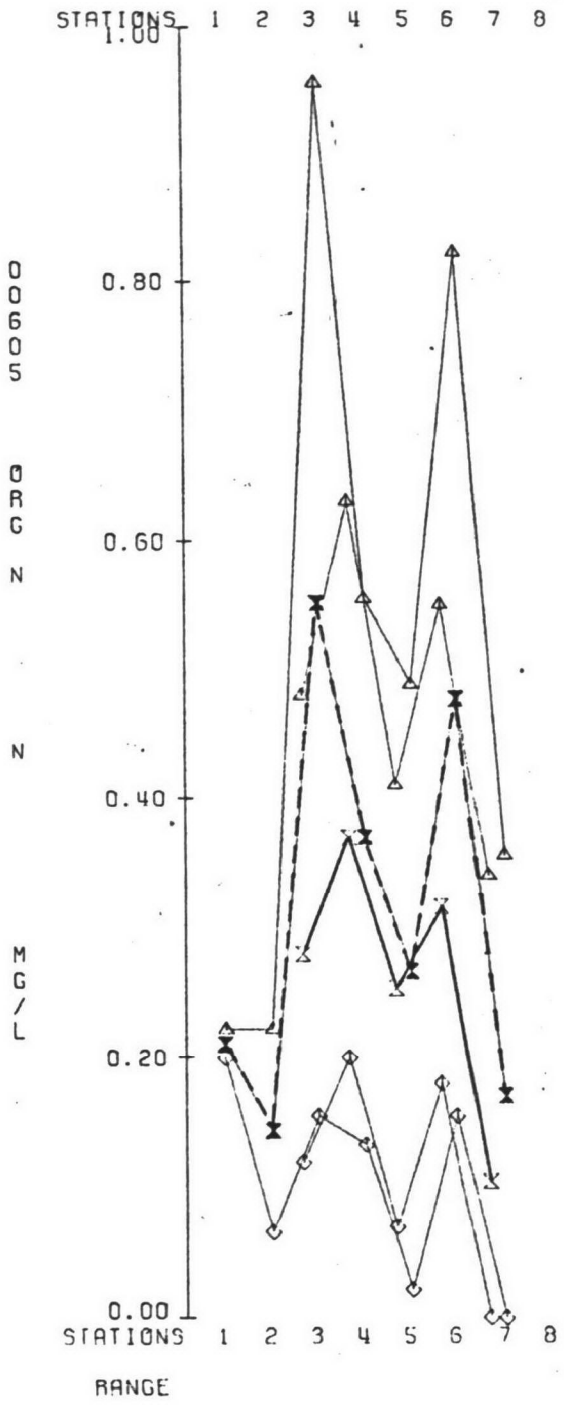
PLI TIC IT
FROM 740114 TO 740314

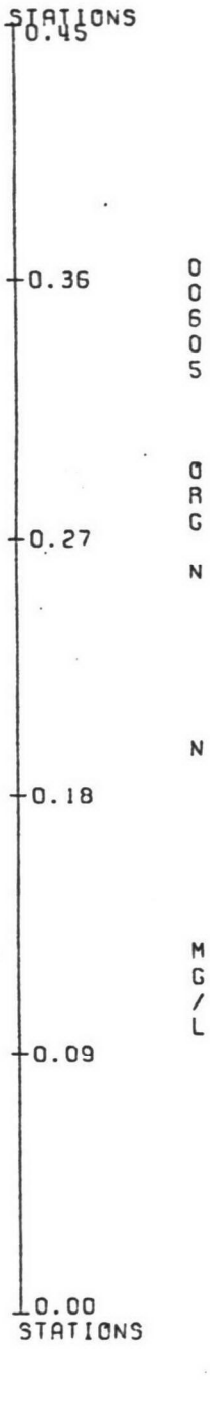




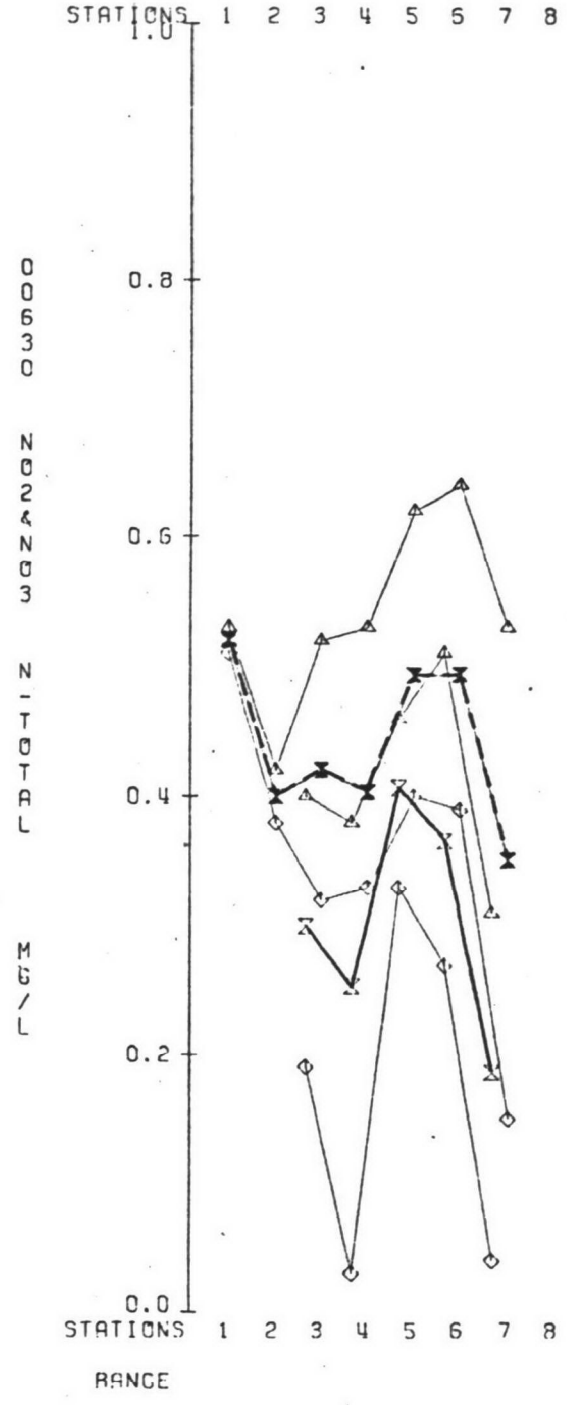
TOI YS1 06 5

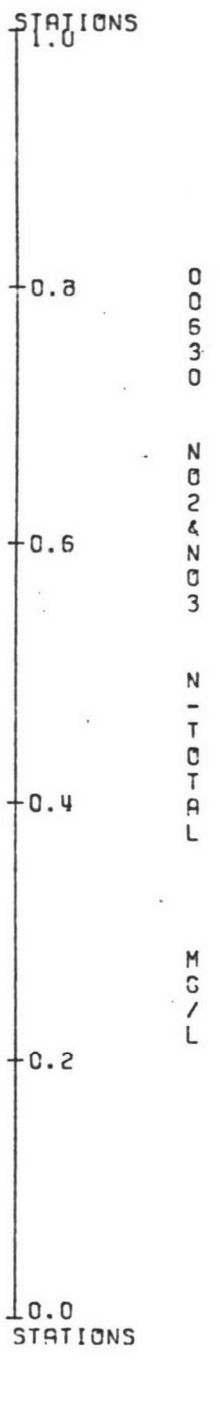
MULTIPLE STATION PLOT (MSP)
FROM 740114 TO 741211



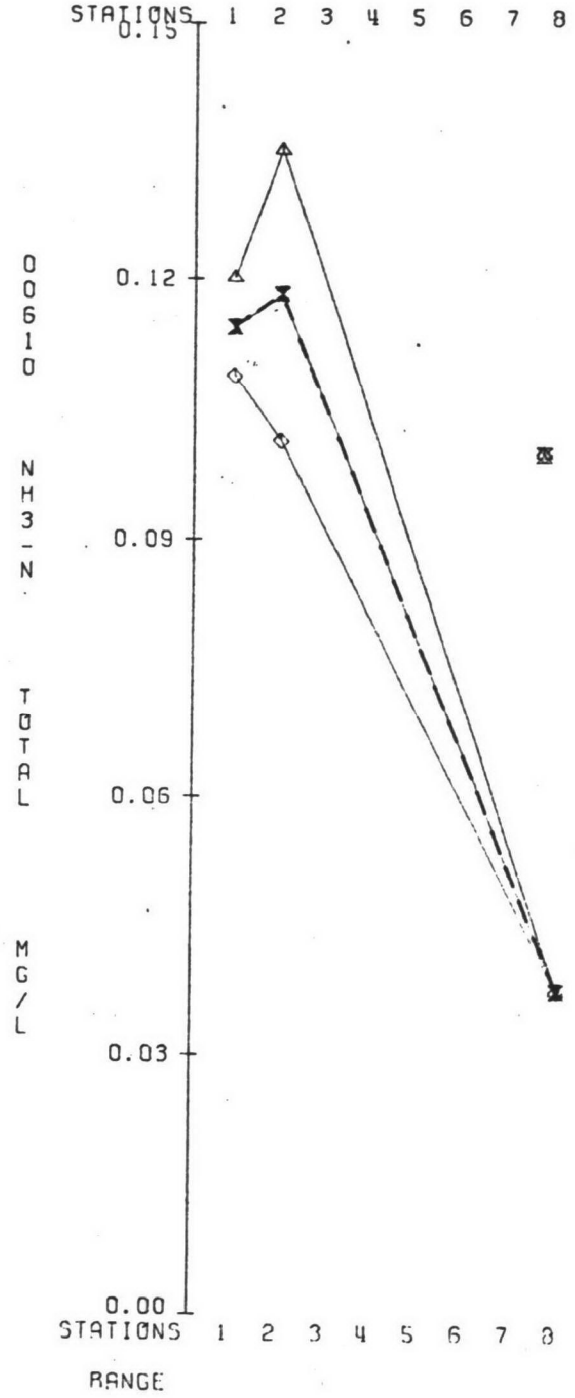


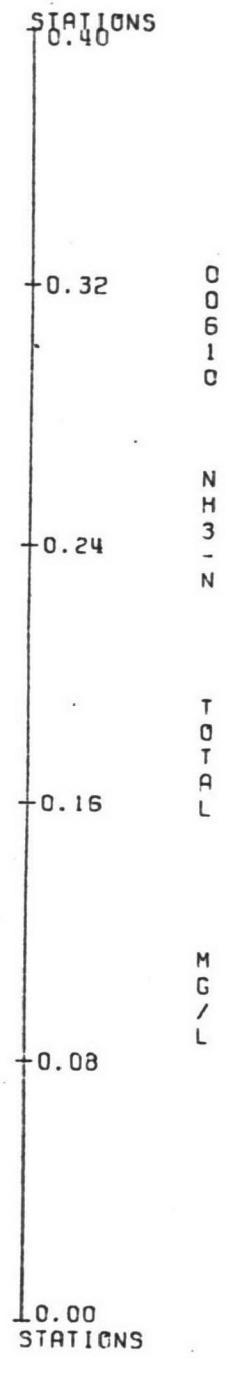
FROM 740114 TO 741211





MULTIPLE STATION PLOT (MSP)
FROM 740411 TO 741119

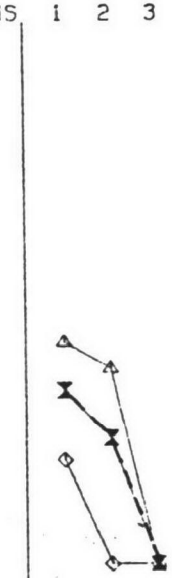




STORET SYSTEM 06/13/75

MULTIPLE STATION PLOT (MSP)
FROM 740314 TO 741212

STATIONS 1 2 3 4 5 6 7 8



00515 RESIDUE DISS-105 C MG/L

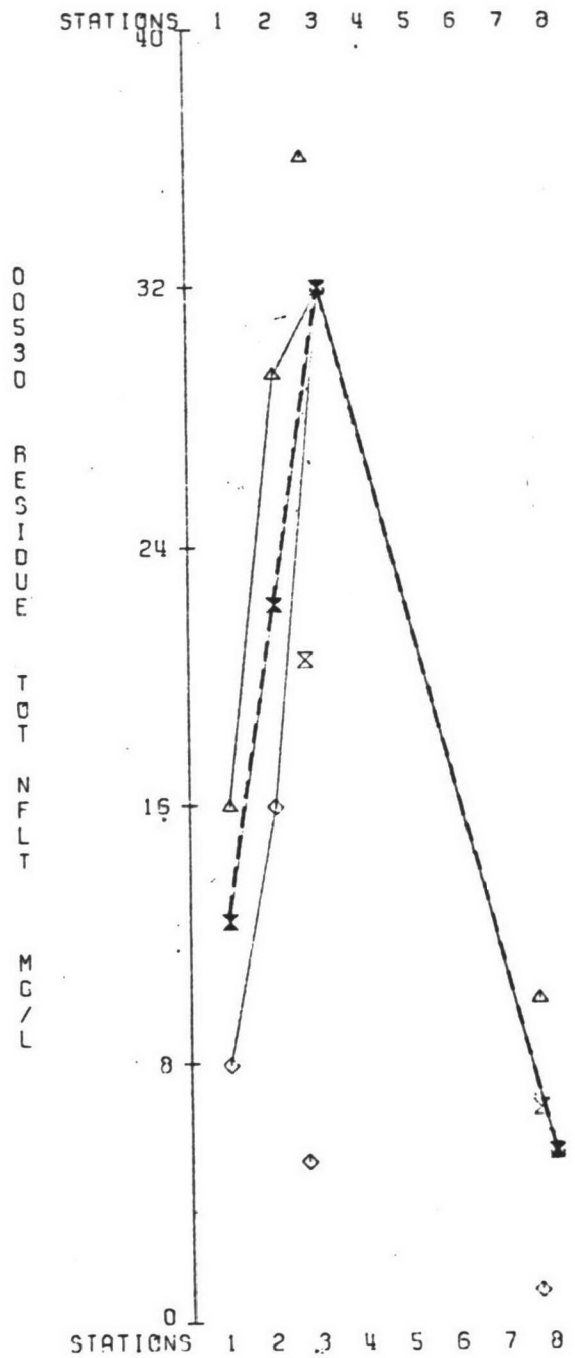
STATIONS
100
80
60
40
20

00515 RESIDUE DISS-105 C MG/L

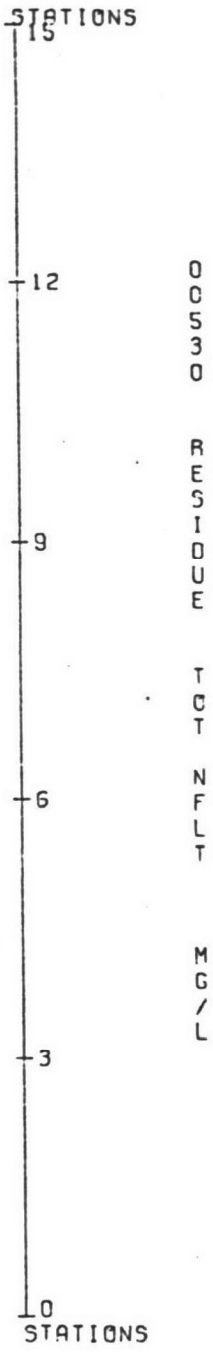
60.

ST SYS 0 75

MULTIPLE STATION PLOT (MSP)
FROM 740314 TO 741212



RANGE



3.5 THAMES RIVER BASIN

The Thames River Basin drains a small portion of south central Massachusetts and a large area of eastern Connecticut. The main stem of the Thames River is formed by the confluence of the Quinebaug, Shetucket and Yantic Rivers.

The station monitored was at Mohegan, Connecticut, just below Norwich, Connecticut. This station reports Class B standards violations in dissolved oxygen, coliform-bacteria and pH.

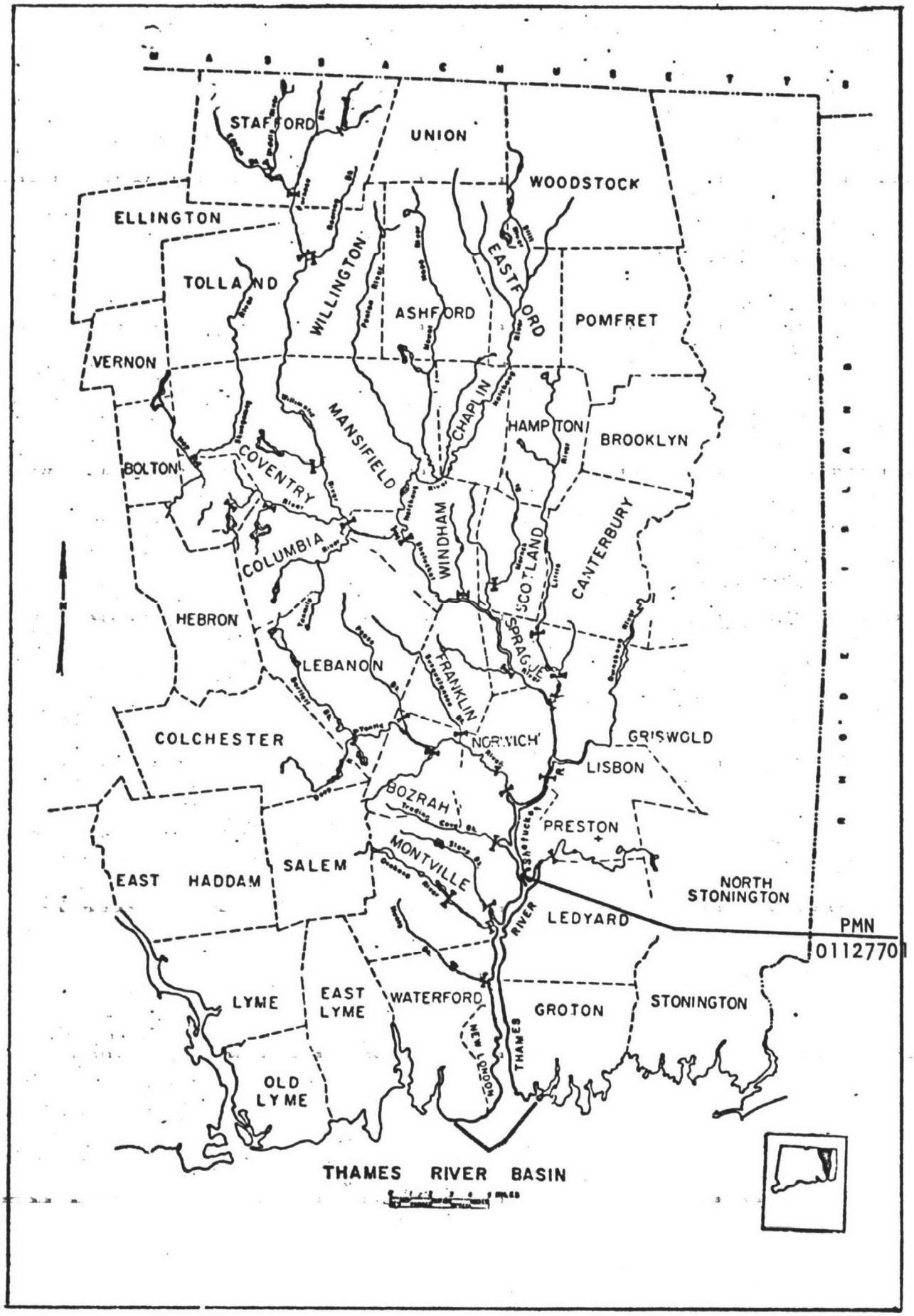

MASSACHUSETTS
STAFFORD
UNION
WOODSTOCK
ELLINGTON
TOLLAND
WILLINGTON
ASHFORD
EASTFORD
POMFRET
VERNON
MANSFIELD
CHAPLIN
HAMPTON
BROOKLYN
BOLTON
COVENTRY
COLUMBIA
WINDHAM
SCOTLAND
CANTERBURY
HEBRON
LEBANON
FRANKLIN
SPRAGUE
COLCHESTER
NORWICH
GRISWOLD
LISBON
BOZRAH
PRESTON
MONTVILLE
EAST HADDAM
SALEM
NORTH STONINGTON
LEDYARD
PMN
0112770
LYME
EAST LYME
WATERFORD
GROTON
STONINGTON
OLD LYME
NEW LONDON
THAMES
THAMES RIVER BASIN

TABLE 3.3

SUMMARY OF WATER QUALITY VIOLATIONS

Basin Name (State) No. of Stations Sampled)	Water Quality Parameter	Class B Standards *		Number of Violations	Number of Values	Percent Violations
		Maximum	Minimum			
Thames River (Connecticut) (1)	Water Temperature °C	29.39°		0	12	0%
	Dissolved Oxygen		5.0 mg/l	4	12	33%
	Dissolved Oxygen Saturation Percent		75%	5	12	42%
	Turbidity	25.0 JTU		0	12	0%
	Total Coliform	2400/100 ml		7	12	58%
	Fecal Coliform	500/100 ml		6	12	50%
	pH	8.0	6.5	2	12	17%
	Totals for Basin			24	84	28.5%

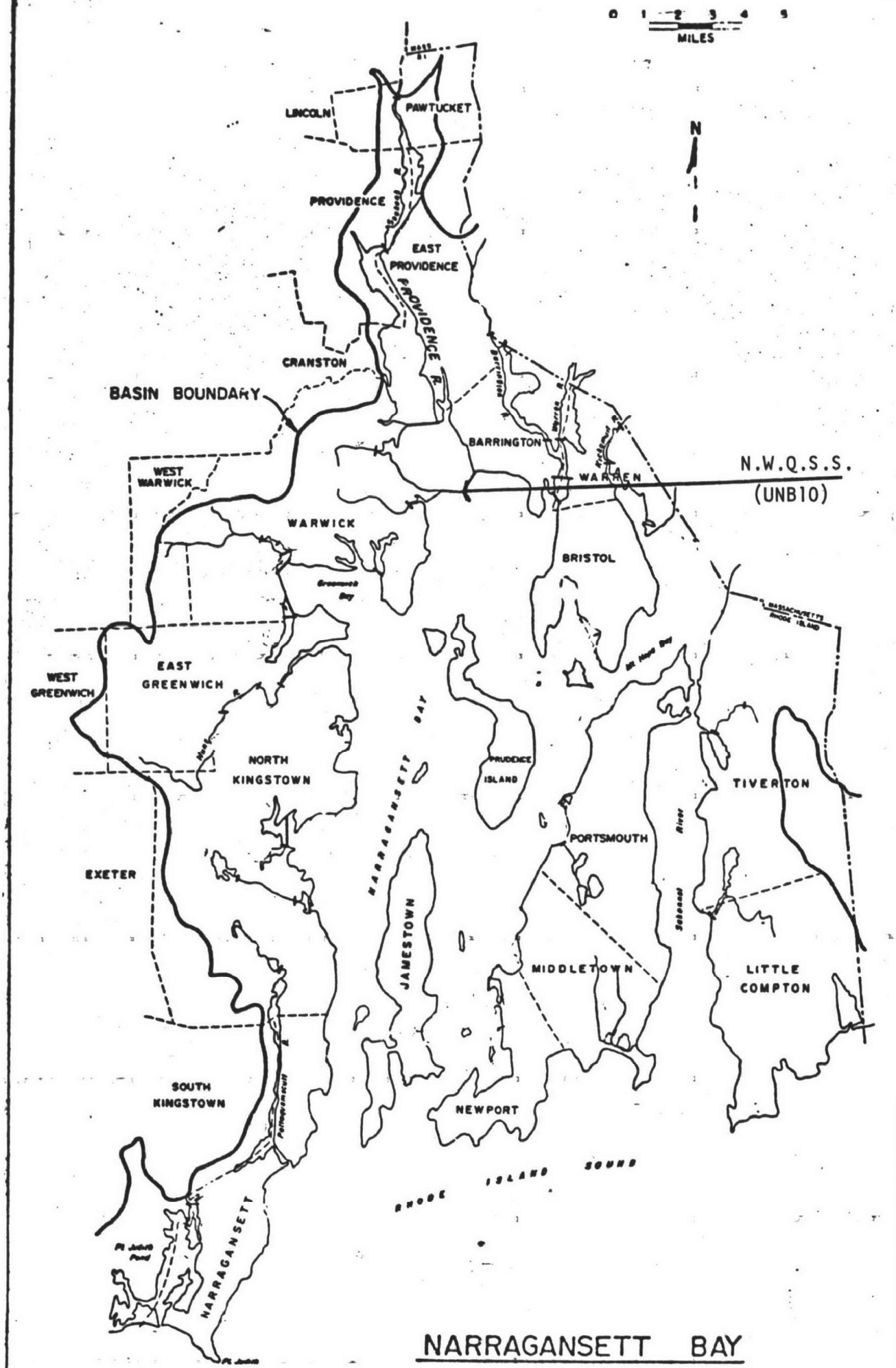
* In marine waters criteria are for Class SB standard.

3.6 BLACKSTONE RIVER AND NARRAGANSETT BAY DRAINAGE AREA

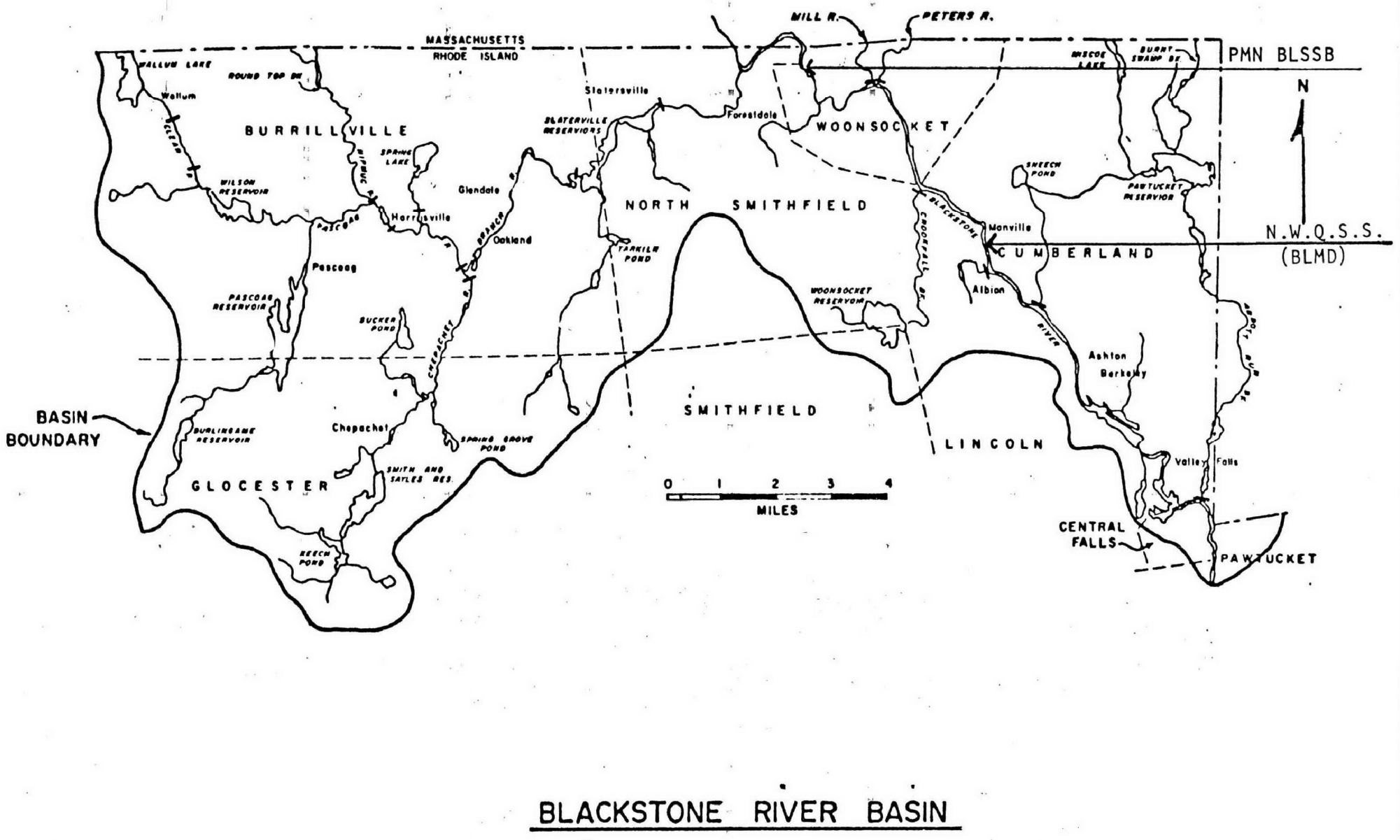
In the Blackstone River and the Narragansett Bay Drainage area the most prevalent water quality standards violations are low dissolved oxygen and high coliform bacteria counts. The Blackstone River receives large combined, partially treated, industrial and municipal waste loads from Worcester, Massachusetts and Woonsocket, Rhode Island. Within Rhode Island the river is characterized by increasing turbidity, suspended solids, and biochemical oxygen demand proceeding downstream from the northern limit of the city of Woonsocket to Cumberland, Rhode Island (Plot Station No. 1 to No. 2). Also, dissolved oxygen levels are seen to decrease between these locations.

Narragansett Bay receives waste loadings from its tributaries and directly from inadequately treated municipal wastes and combined sewer overflows from Providence, Rhode Island. As in the Blackstone River, the water quality standards parameters most frequently in non-compliance are dissolved oxygen and coliform bacteria. When compared to the Blackstone River, the Bay is seen to have less turbidity, higher dissolved oxygen, and higher ammonia nitrogen than the reach of the Blackstone River below Woonsocket.

The combined sewer overflows into the Bay cause periodic closing of shellfish beds because of bacterial contamination.



NARRAGANSETT BAY



BLACKSTONE RIVER BASIN

TABLE 5.6

-97-

SUMMARY OF WATER QUALITY VIOLATIONS

Basin Name (State) (No. of Stations Sampled)	Water Quality Parameter	Class B Standards *		Number of Violations	Number of Values	Percent Violations
		Maximum	Minimum			
Narragansett Bay (Rhode Island) (3)	Water Temperature °C	28.3°C		0	9	0%
	Dissolved Oxygen		5.0 mg/l	1	9	11%
	Dissolved Oxygen Saturation Percent		75%	1	6	17%
	Total Coliform	2400/100 ml		3	9	33%
	Fecal Coliform	500/100 ml		1	6	17%
	pH	8.0	6.5	0	9	0%
	Totals for Basin			6	48	12.5%

* In marine waters criteria are for Class SB standard.

NARRAGANSETT BAY STATIONS

in

DOWNSTREAM ORDER

Plot Station Number	Station Location	Map Station Number
1.	Blackstone River at Singleton Street Bridge	PMN BLSSB
2.	Blackstone River at Manville Dam	NWQSS BLMD
3.	Upper Narragansett Bay Station No. 10	NWQSS UNB10

Plot Legend

Left Axis ——— = April to September

Right Axis — — — = October to March

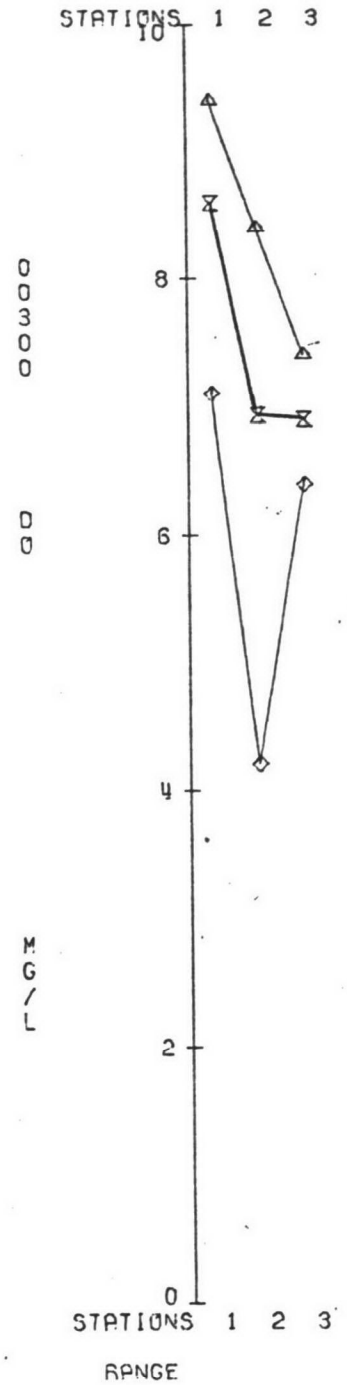
⧖ = Mean Values

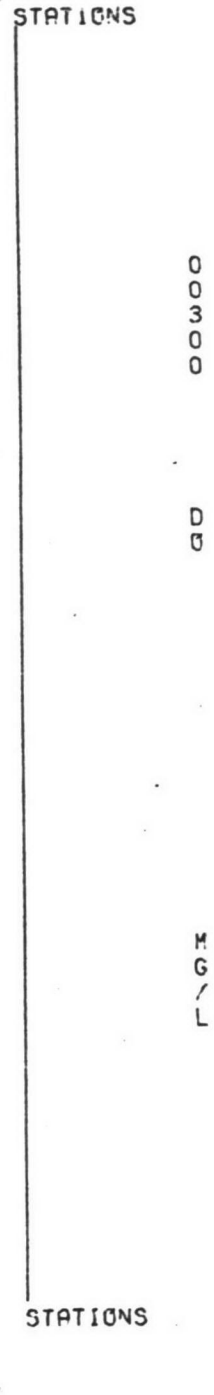
⧗ = Mean Values

△ = Maximum Values

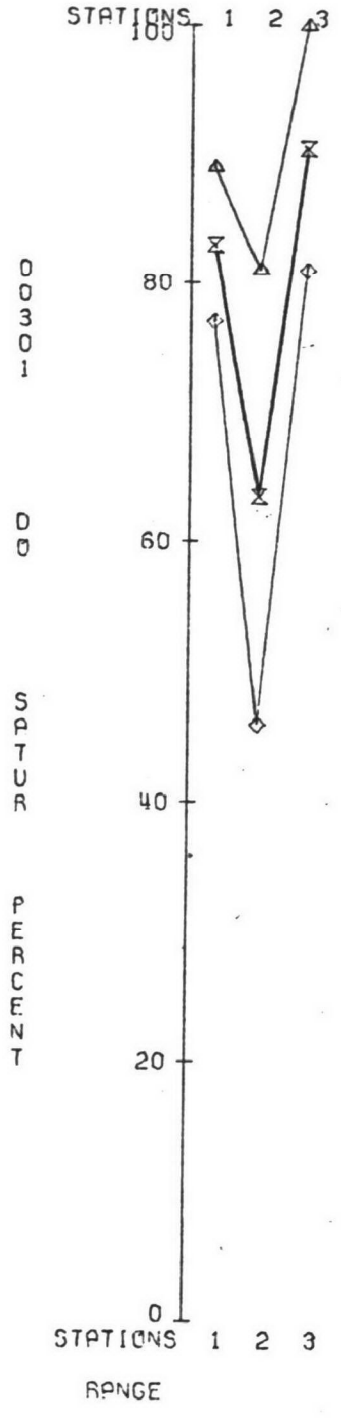
◇ = Minimum Values

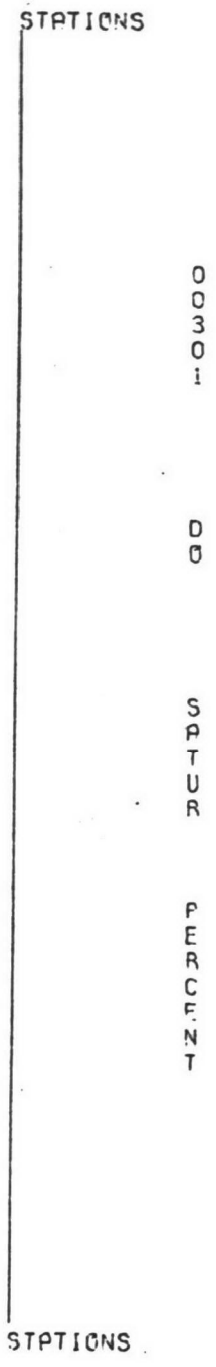
MU E S)N (MS
FROM 740430 TO 740926



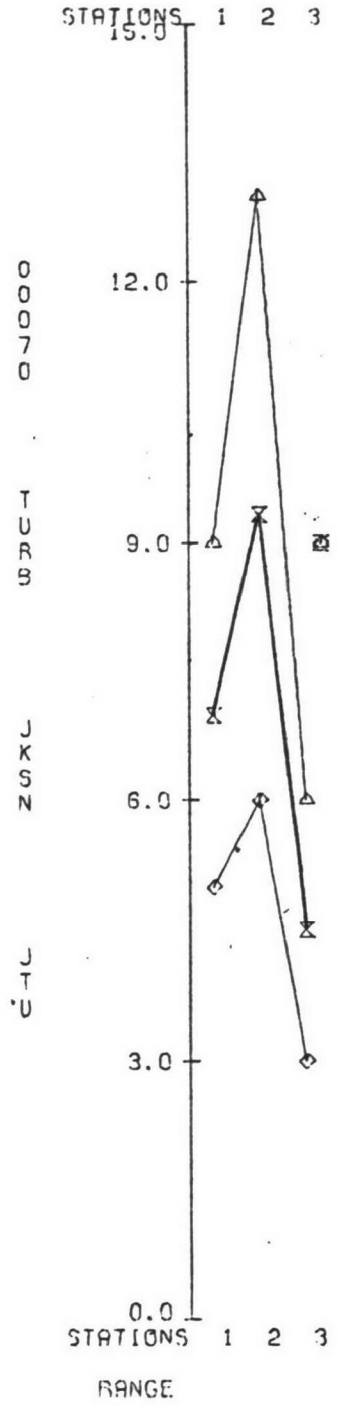


MI LE ON (M
FROM 740625 TO 740926

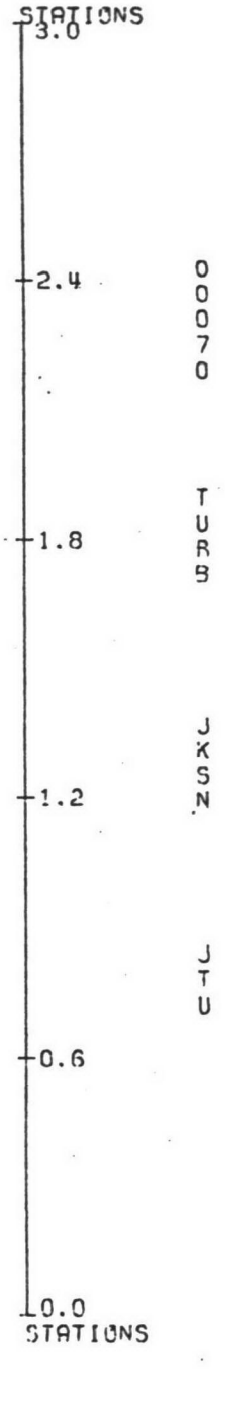


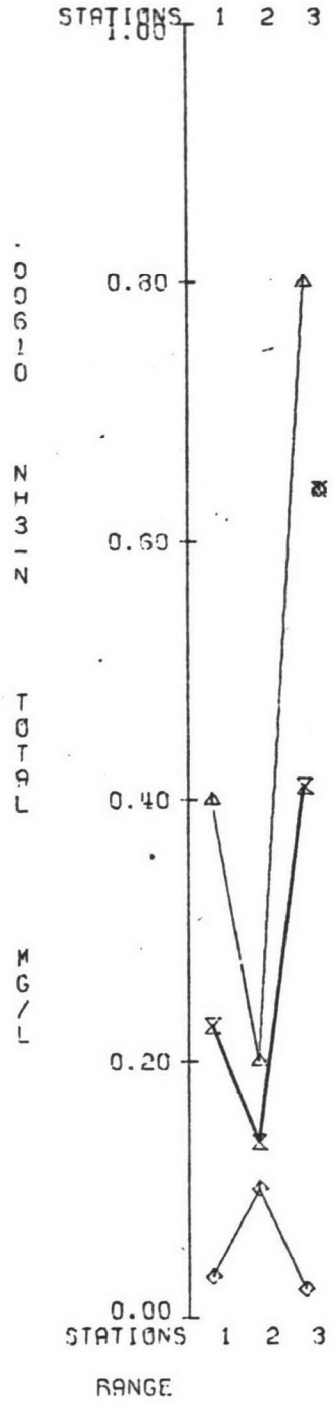


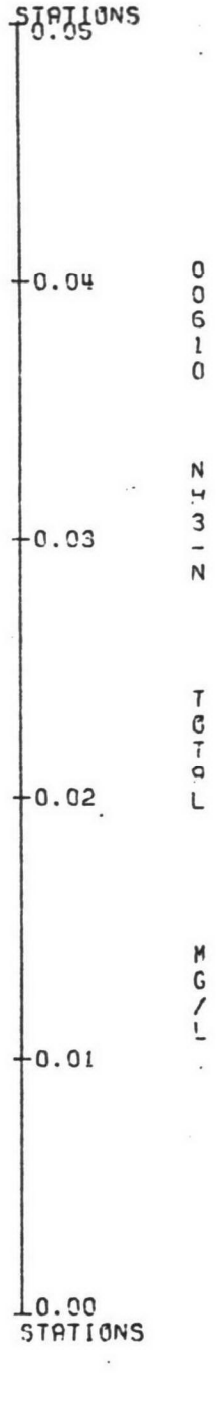
.TI TA1 PL0 P1
FROM 740430 TO 741119



RANGE

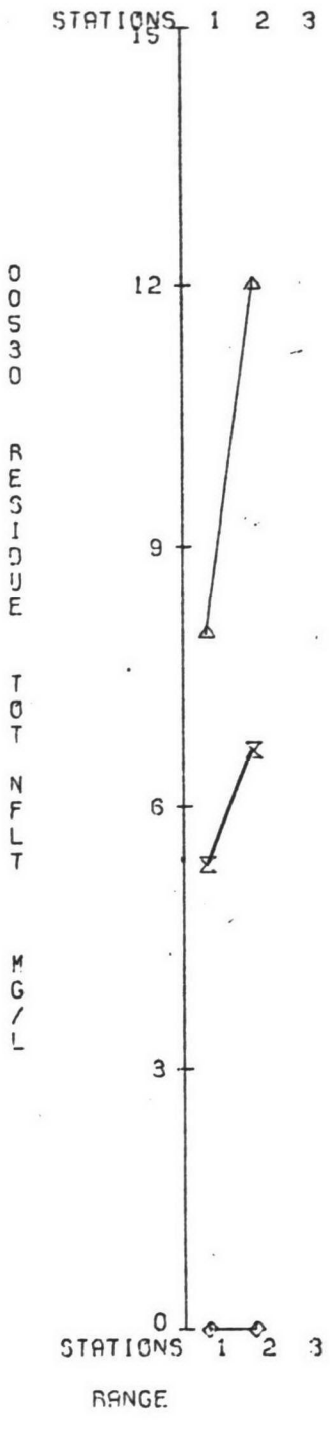


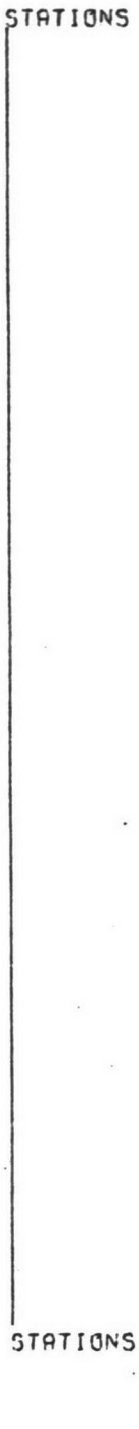

STATIONS 1 2 3
1.00
0.80
0.60
0.40
0.20
0.00
00610 NH3-N TOTAL MG/L
STATIONS 1 2 3
RANGE


STATIONS
0.05
0.04
0.03
0.02
0.01
0.00
00610 NH3-N TOTAL MG/L
STATIONS

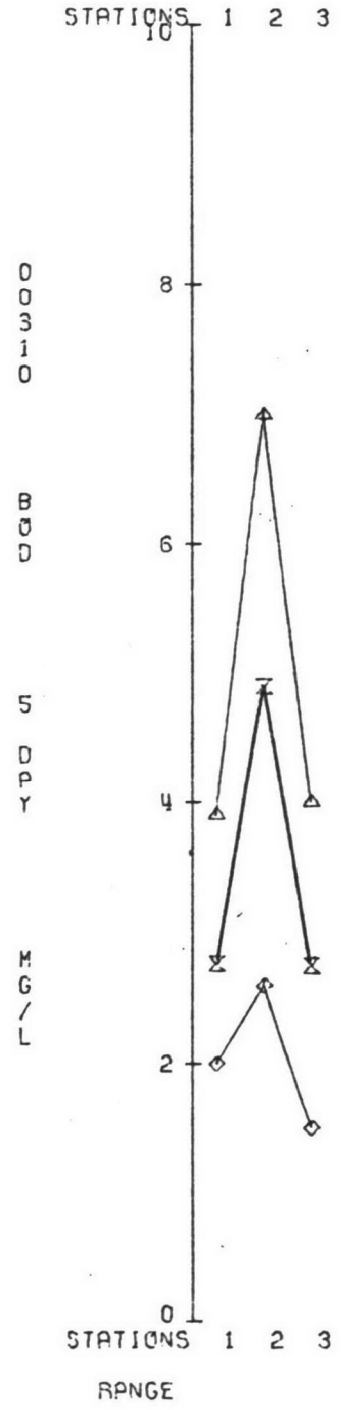
STORE E S S

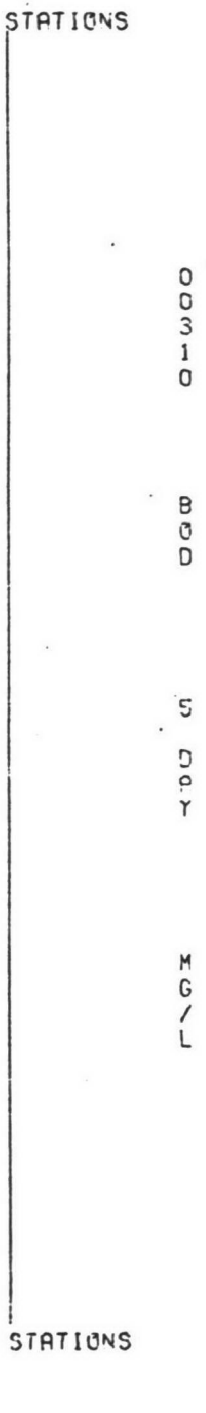
MU E : 3N (M
FROM 740430 TO 740925





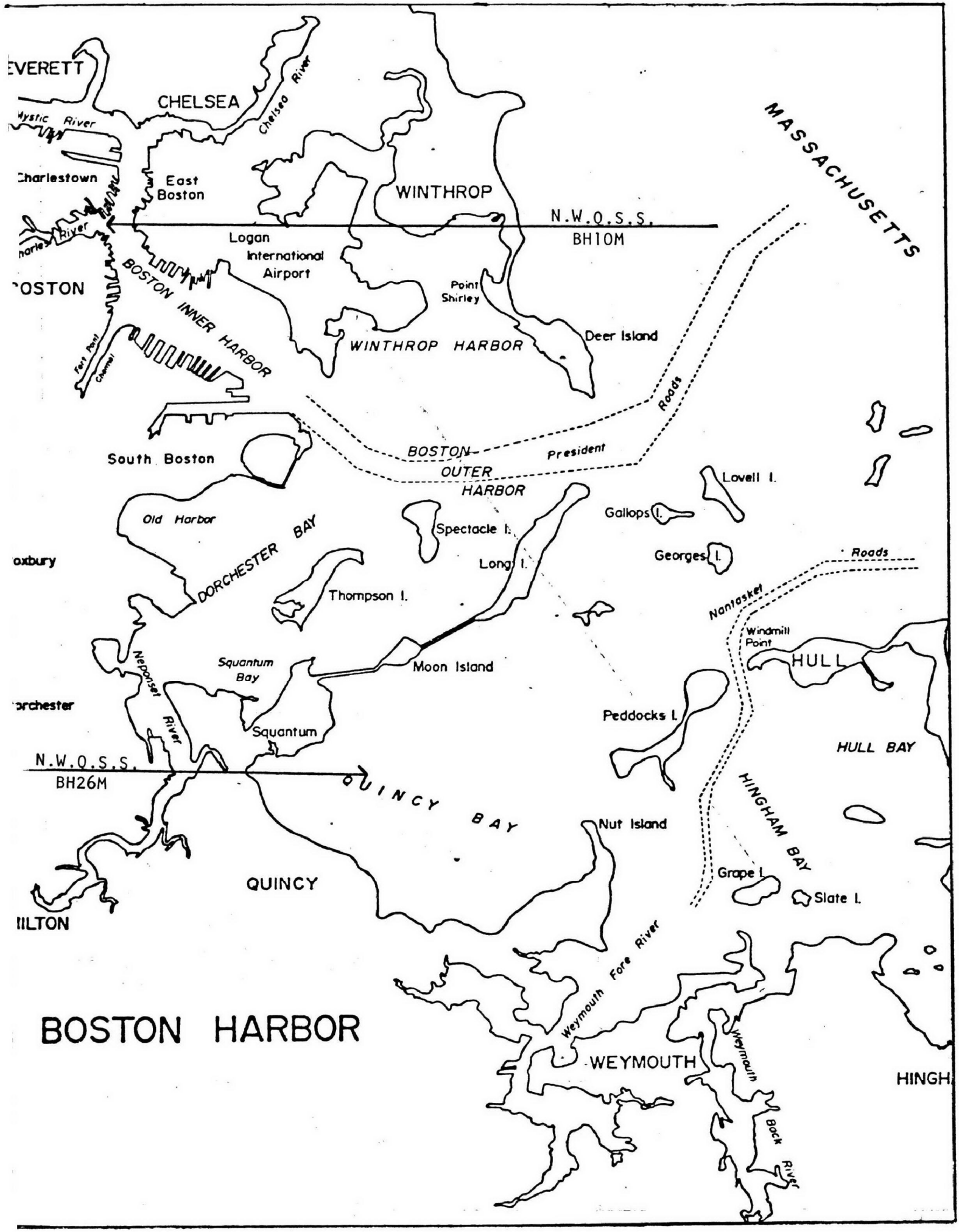
FROM 740430 TO 740926





3.7 MASSACHUSETTS COASTAL DRAINAGE AREA

High coliform bacteria levels and low dissolved oxygen in Boston Harbor are the major water quality problems in this drainage area. The greatest source of pollution in the harbor is the discharge of municipal waste through the Metropolitan District Commission sewerage system. Raw or partially treated sewage and sludge is discharged by the Nut Island and Deer Island sewage treatment plants (both primary treatment) and over ninety combined sewer overflows which empty directly into the Charles River and Boston Harbor. Restriction of shellfish harvesting, recreational bathing, boating and sport fishing as well as aesthetic value are the results of the discharges to the waters of Boston Harbor.


EVERETT
CHELSEA
Mystic River
Chelsea River
Charlestown
East Boston
WINTHROP
MASSACHUSETTS
N.W.O.S.S.
BH10M
Logan International Airport
BOSTON INNER HARBOR
Point Shirley
Deer Island
WINTHROP HARBOR
Fort Point Channel
Roads
BOSTON OUTER HARBOR
President
South Boston
Lovell I.
Gallops I.
Old Harbor
Spectacle I.
DORCHESTER BAY
Georges I.
Long I.
Thompson I.
Nantasket Roads
Windmill Point
HULL
Moon Island
Squantum Bay
Neponset River
Squantum
Peddocks I.
HULL BAY
N.W.O.S.S.
BH26M
QUINCY BAY
HINGHAM BAY
Nut Island
Grape I.
Slate I.
QUINCY
Weymouth Fore River
WEYMOUTH
Weymouth Back River
BOSTON HARBOR

T 5.
1974

SUMMARY OF WATER QUALITY VIOLATIONS

Basin Name (State) (No. of Stations Sampled)	Water Quality Parameter	Class B Standards *		Number of Violations	Number of Values	Percent Violations
		Maximum	Minimum			
Massachusetts Coastal (Massachusetts) (2)	Dissolved Oxygen		5.0 mg/l	1	1	100%
	Total Coliform	2300/100ml		1	4	25%
	Totals for Basin			2	5	40%

* In marine waters criteria are for Class SB standard.

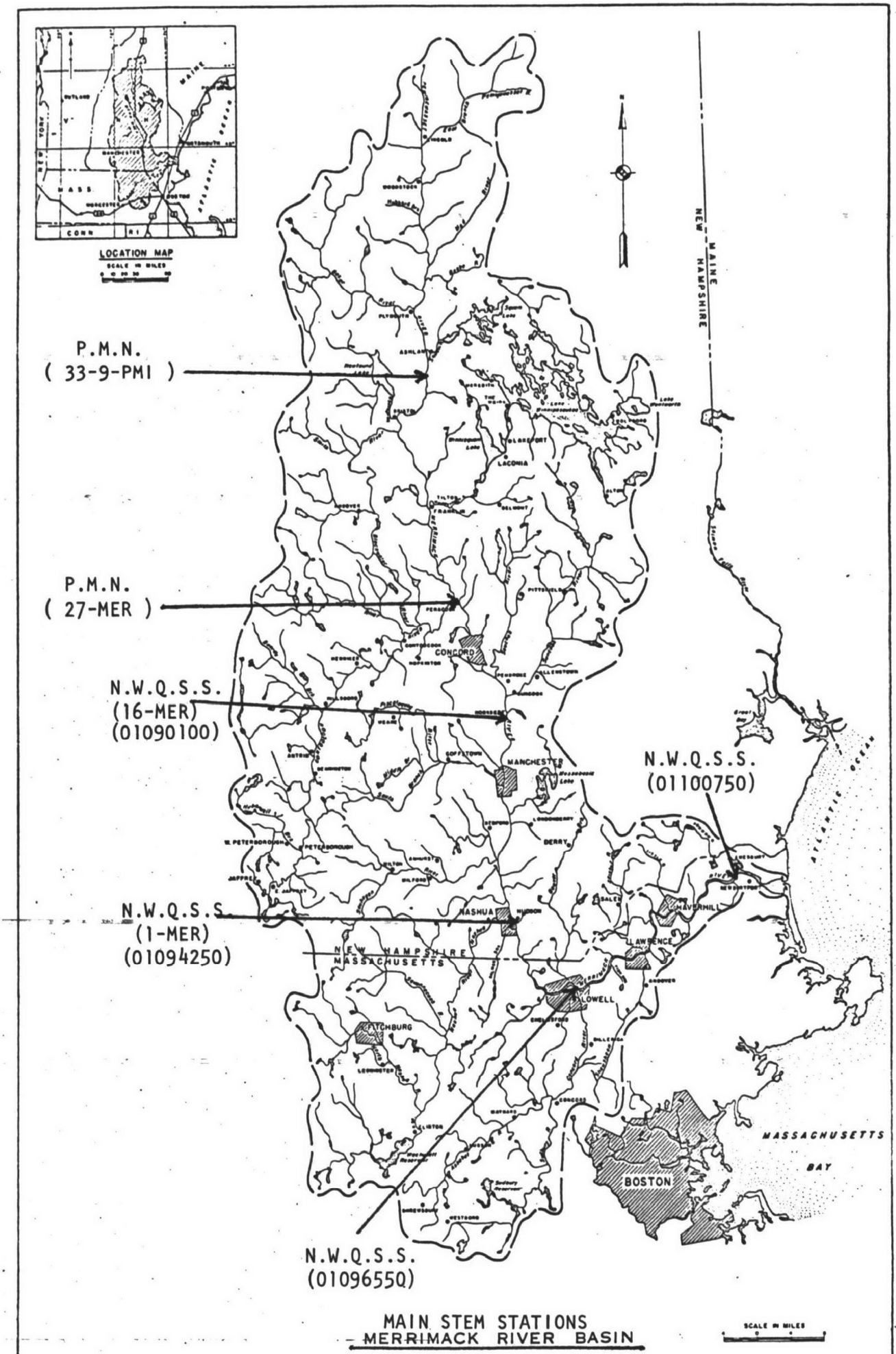
3.8 MERRIMACK AND NASHUA RIVER BASINS

The Merrimack River is formed at the confluence of the Pemigewasset and Winnipesaukee Rivers at Franklin, New Hampshire. Upstream of this location, water quality is in compliance with Class B standards. For the remainder of the stream's entire length through New Hampshire, the Merrimack River is of less than Class B quality because of standards violations for dissolved oxygen, coliform bacteria, pH and phenols.

Progressive degradation in water quality is observed proceeding downstream from Penacook (Plot Station No. 2) to Nashua, New Hampshire (Plot Station No 3) with increasing concentrations of coliform bacteria, suspended solids, biochemical oxygen demand, nitrogen and phosphorus. Untreated domestic sewage, industrial wastes, and combined sewer overflows in Concord and Manchester contribute to this lowering of water quality.

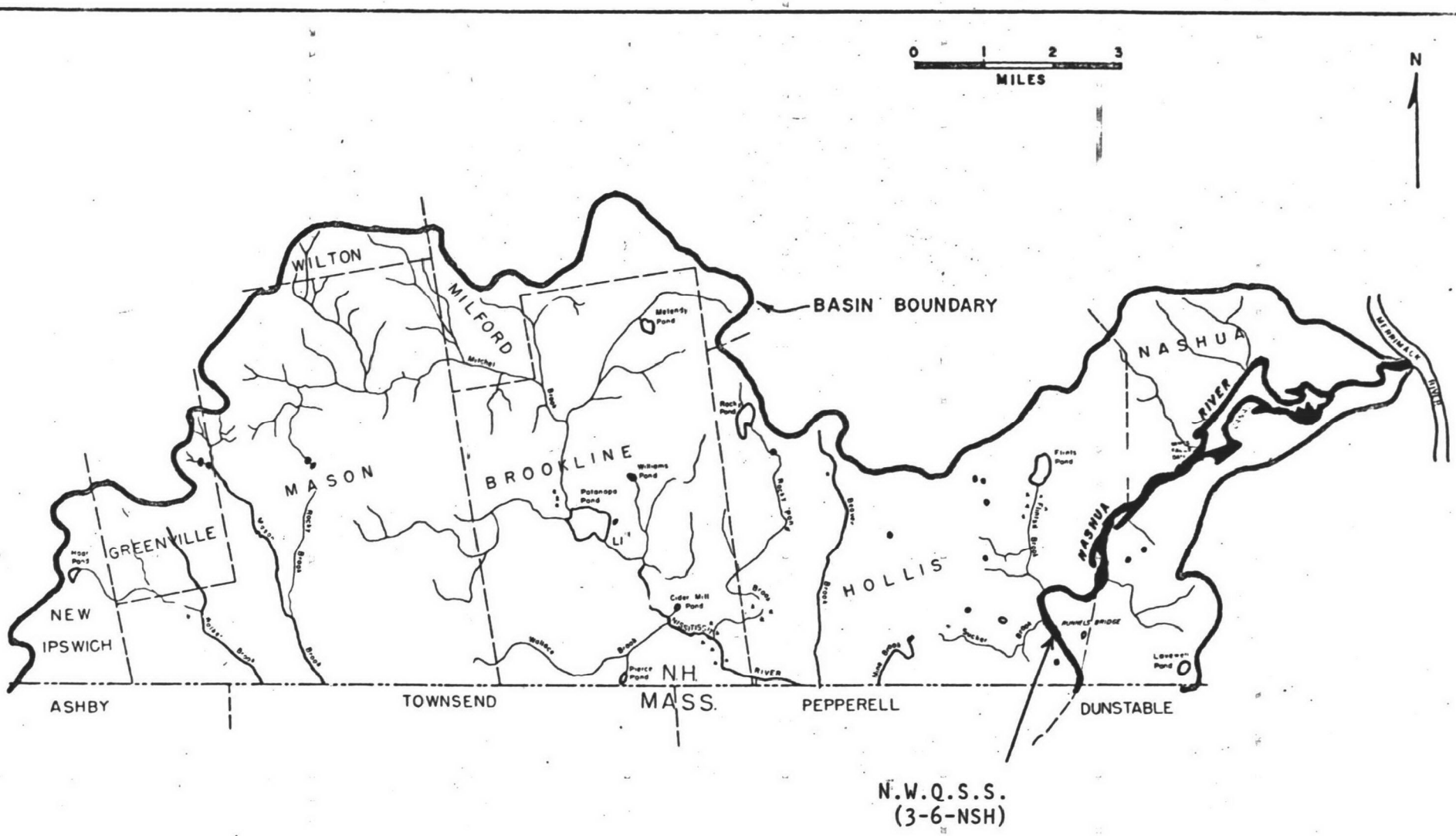
Within Massachusetts, the Merrimack flows through the metropolitan areas of Lowell, Lawrence and Haverhill receiving partially treated domestic sewage and industrial wastes as well as combined sewer overflows. These cause violations of Class B standards for dissolved oxygen, coliform bacteria and pH. In-stream levels of coliform bacteria, suspended solids, nitrogen and phosphorus are observed to increase as the river passes through this reach from Lowell to below Haverhill (Plot Stations 4 to 5).

A significant contributor to the degradation of the Merrimack River is the Nashua River. The water quality flowing into the Merrimack from the Nashua is indicated on the plots at stations 7 and 8. Deterioration of water quality of the Nashua itself is shown by comparison of Plot Stations 6 - 8 indicating conditions between Westminister, Massachusetts, an unpolluted location on the North Nashua River and the main stem just downstream of the Massachusetts - New Hampshire state border.

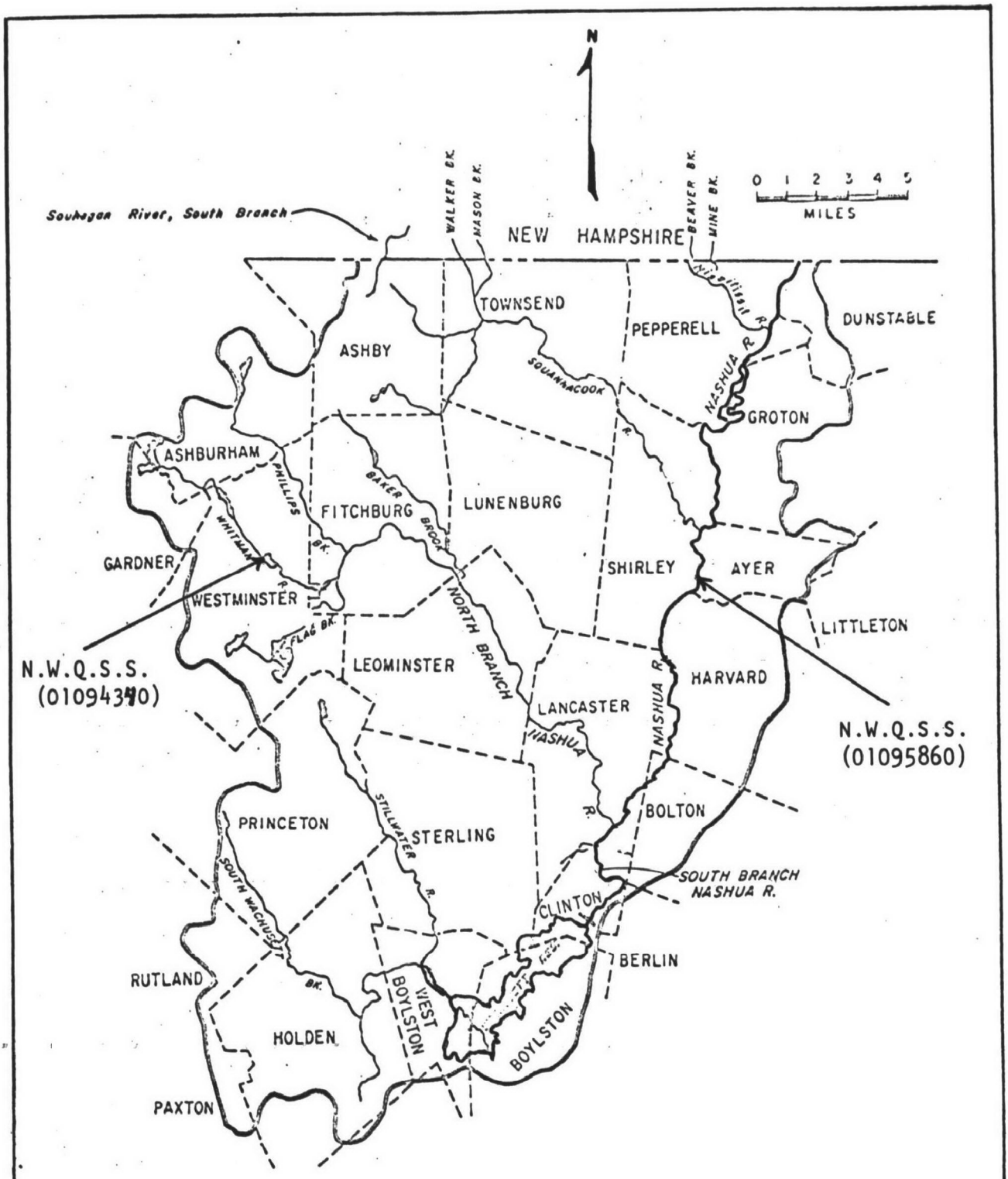


MAIN STEM STATIONS
MERRIMACK RIVER BASIN

FIGURE 1



NASHUA RIVER BASIN
IN
NEW HAMPSHIRE



NASHUA RIVER BASIN

IN

MASSACHUSETTS

TABLE 5 [illegible]

1974

SUMMARY OF WATER QUALITY VIOLATIONS

Basin Name (State) (No. of Stations Sampled)	Water Quality Parameter	Class B Standards * Maximum	Class B Standards * Minimum	Number of Violations	Number of Values	Percent Violations
Merrimack River	Dissolved Oxygen		6.0 mg/l	3	49	16%
(New Hampshire) (7)	Turbidity J.T.U.	25		1	53	2%
	Total Coliform	240/100 ml		27	31	87%
	pH	8.0	6.5	7	47	14%
	Phenols	1 ug/l		12	17	70%
(Massachusetts) (3)	Total Coliform	2400/100 ml		9	11	81%
	Dissolved Oxygen		5.0 mg/l	0	13	0%
	pH	8.0	6.5	2	10	20%
	Water Temperature	28.2°C		0	14	0%
	Dissolved Oxygen Saturation Percent			Not Run		
(Massachusetts) (1)	Dissolved Oxygen		5.0 mg/l	1	3	33%
	Total Coliform	2300/100 ml		1	1	100%
	pH	8.5	6.7	3	3	100%
	Fecal Coliform			Not Run		
Totals for Basin				66	252	26%

* In marine waters criteria are for Class SB standard.

MERRIMACK RIVER STATIONS

in

DOWNSTREAM ORDER

Plot Station Number	Station Location	Map Station Number
1.	Merrimack River at Penacook, N.H.	PMN 27-MER
2.	Merrimack River at Hooksett, N.H.	NWQSS 16-MER
3.	Merrimack River below Nashua, N.H.	NWQSS 1-MER
4.	Merrimack River above Lowell, Ma.	NWQSS 01096550
5.	Merrimack River at West Newbury, Ma.	NWQSS 01100750
7.	Nashua River at Fort Devens, Ma.	NWQSS 01095860
8.	Nashua River at Hollis Depot, N.H.	NWQSS 3-6-NSH
	REFERENCE STATIONS	
6.	Whitman River near Westminster, Ma.	NWQSS 01094340
9.	Pemigewasset River at New Hampton, N.H.	PMN 33-9-PM1

PLOT LEGEND

Left Axis ———————— = April to September

Right Axis — — — — — — = October to March

⧖ = Mean Values

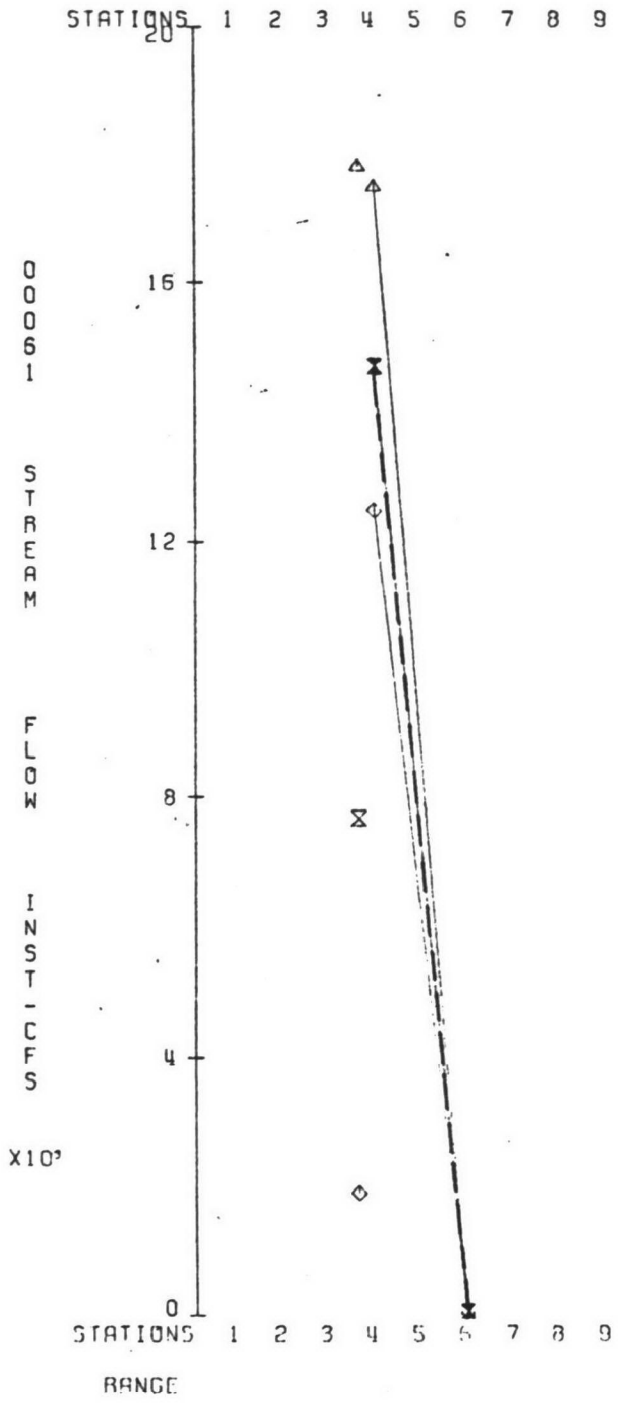
⧗ = Mean Values

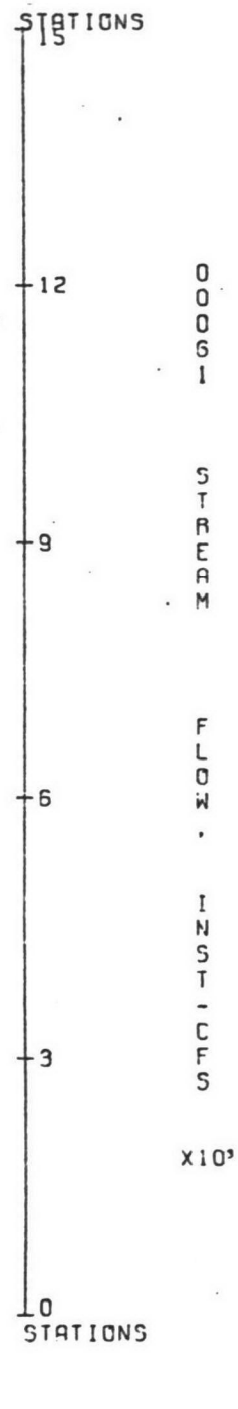
△ = Maximum Values

◇ = Minimum Values

TOI YST 06 5

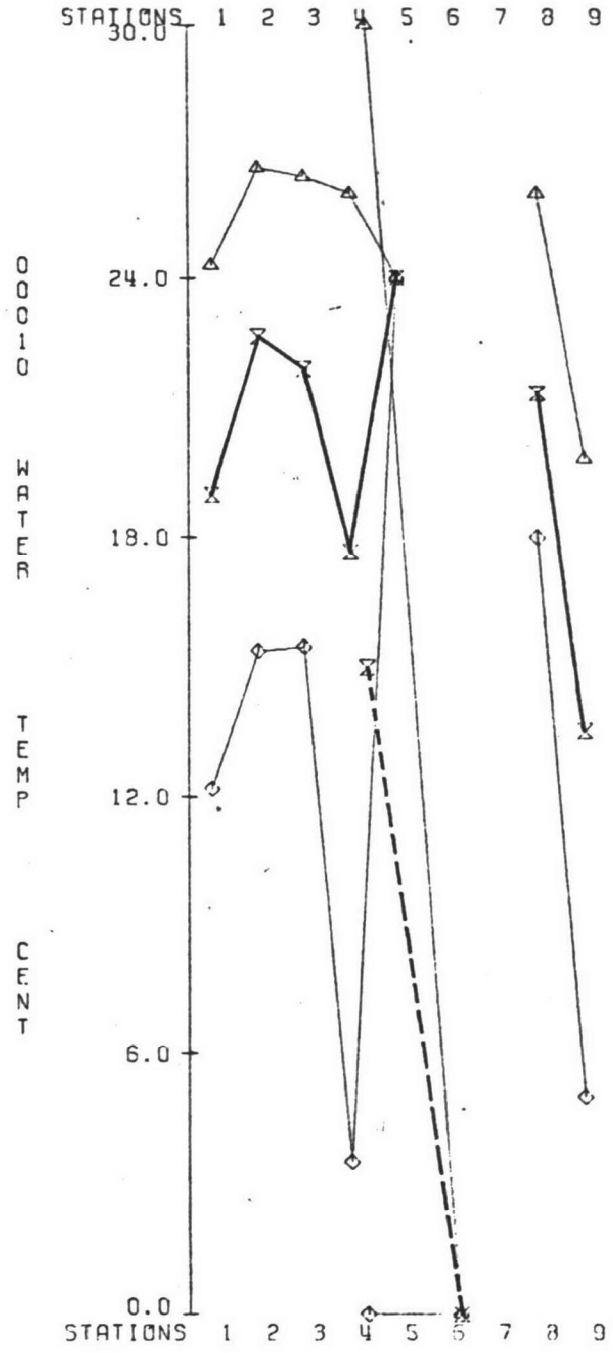
MULTIPLE STATION PLOT (MSP)
FROM 740108 TO 740925



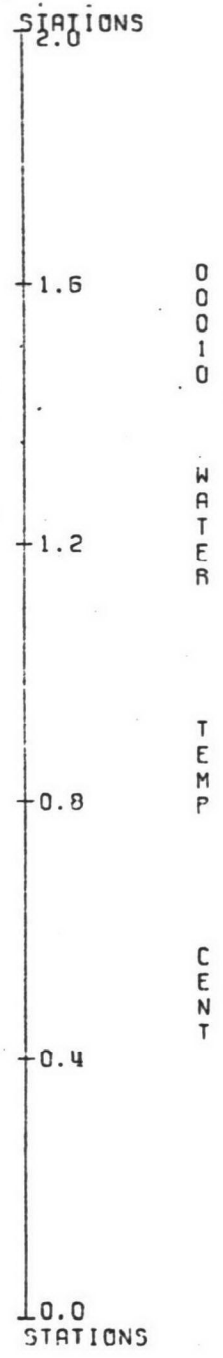


RET ... ITEM ...

MULTIPLE STATION PLOT (MSP)
FROM 740108 TO 740925

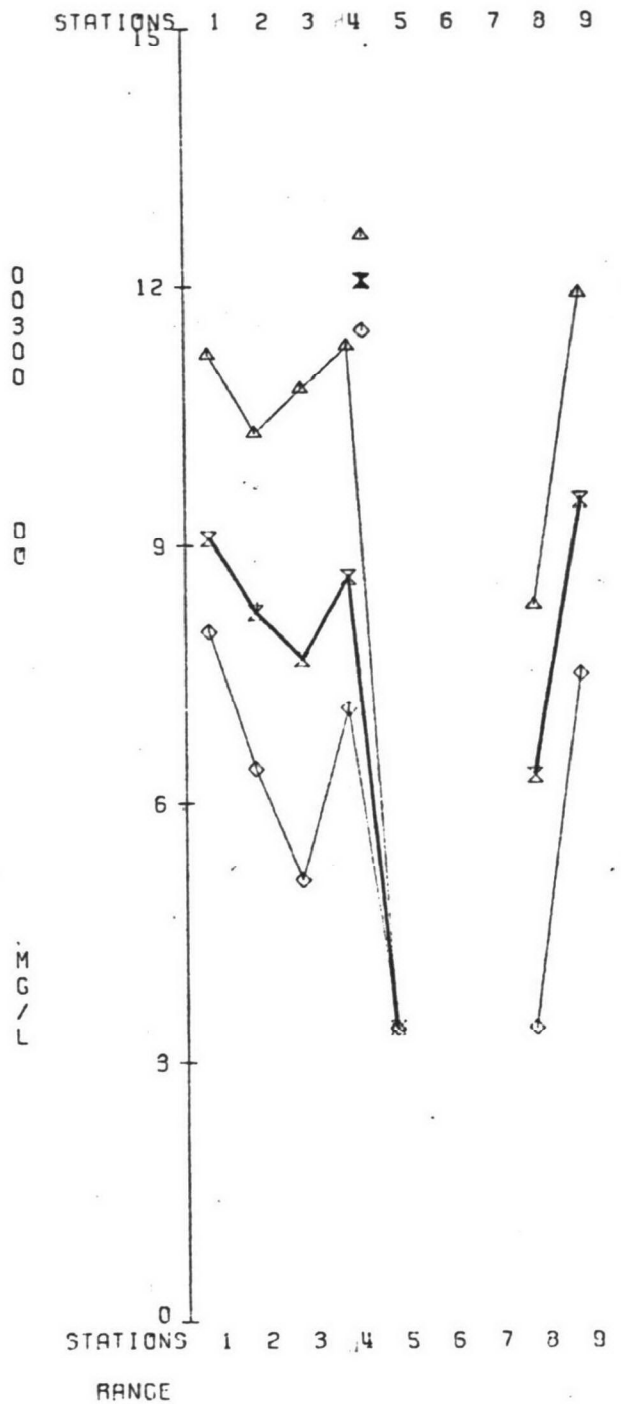


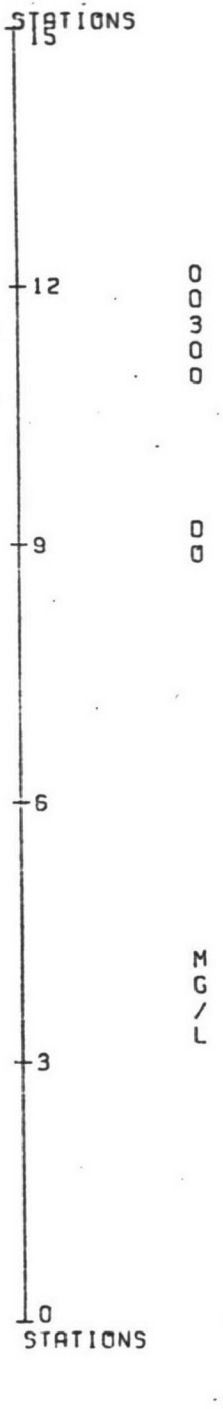
RANGE



STORET SYSTEM 06/11/75

MULTIPLE STATION PLOT (MSP)
FROM 740204 TO 740925





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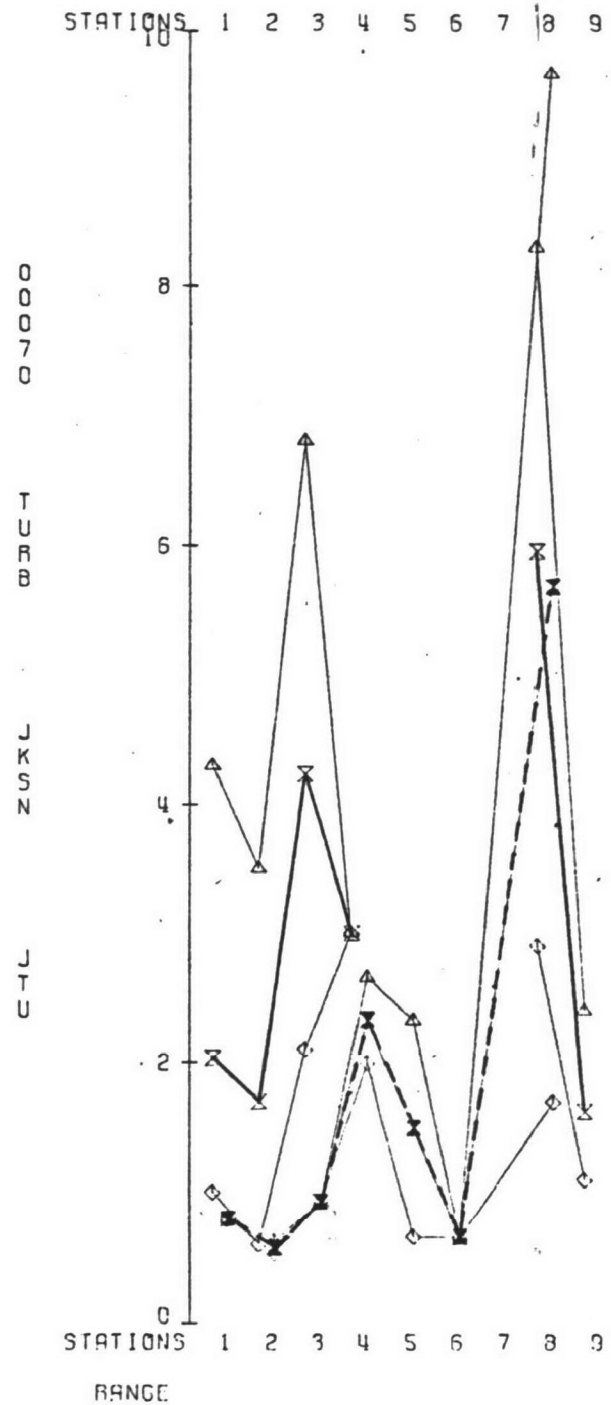
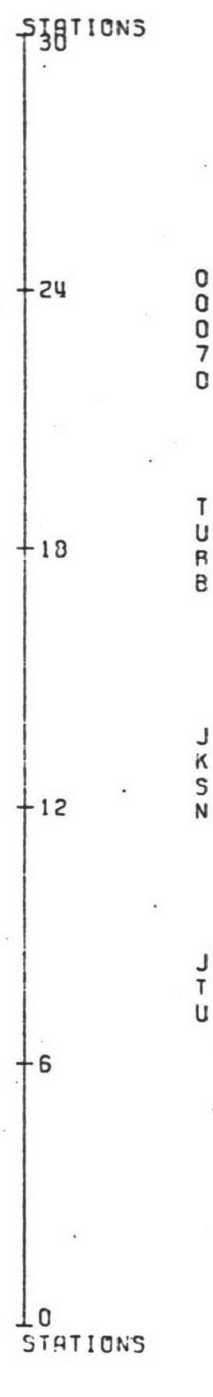
MULTIPLE STATION PLOT (MSP)
FROM 740509 TO 741230

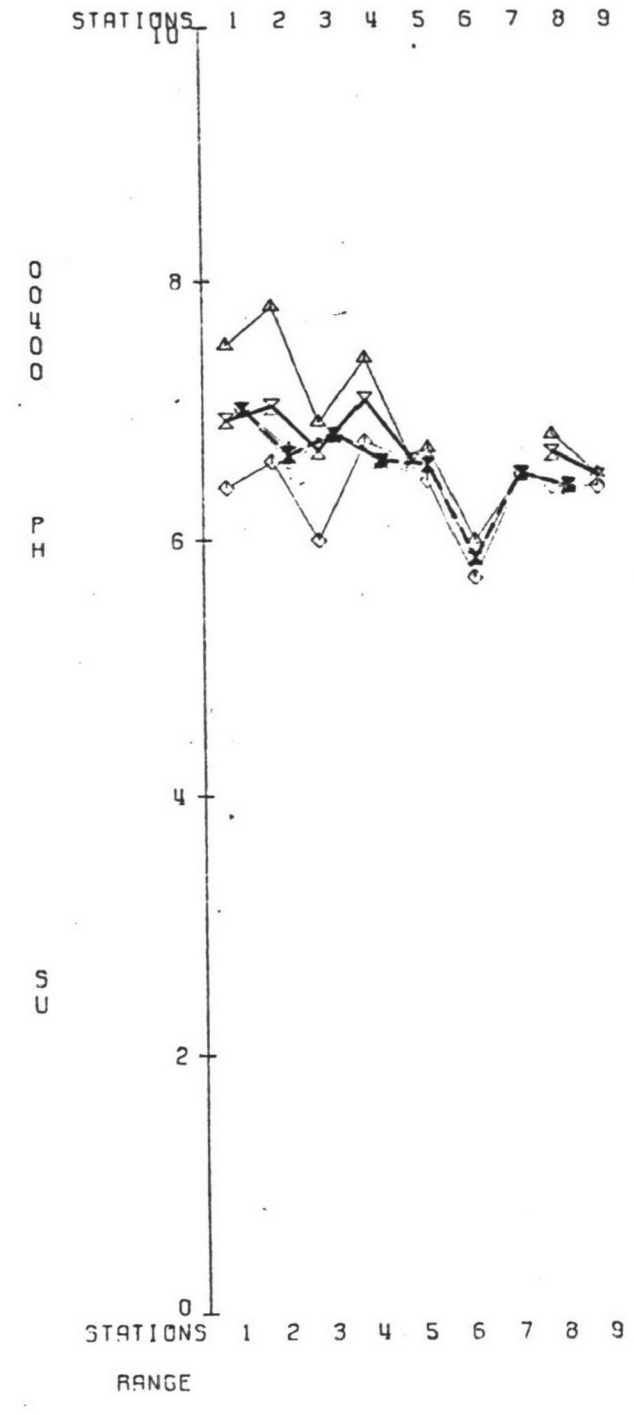


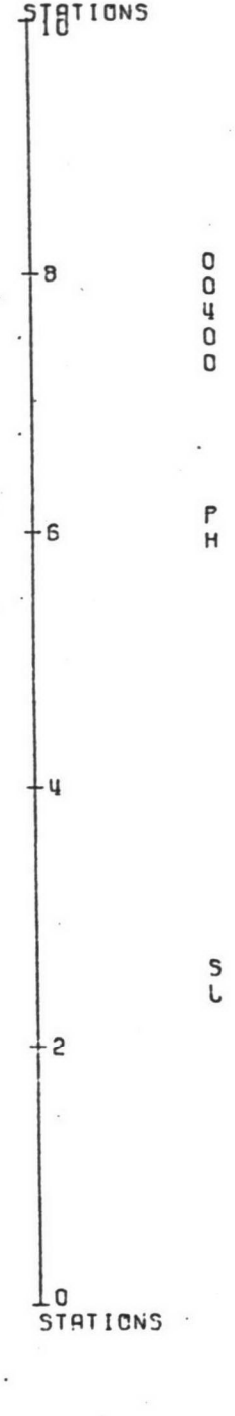


RANGE

RET ITEM /1

MULTIPLE STATION PLOT (MSP)
FROM 740108 TO 741230





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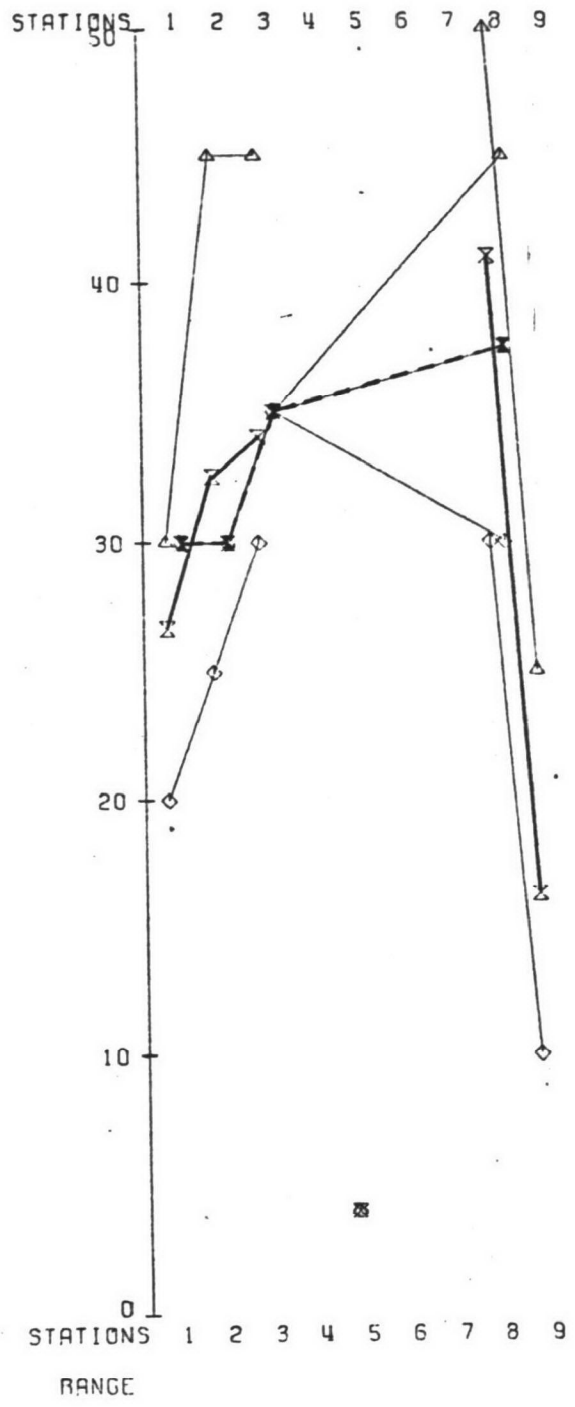
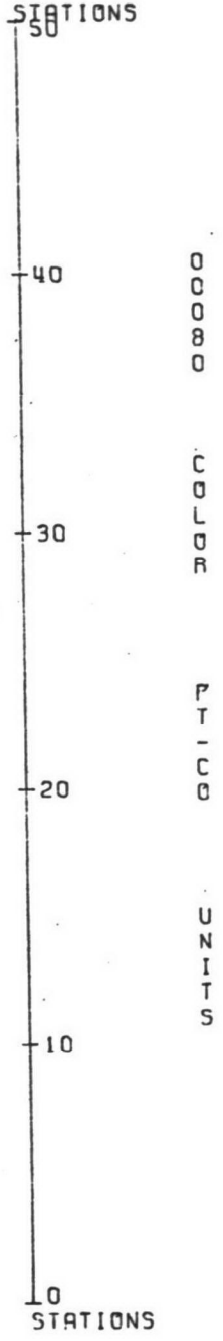
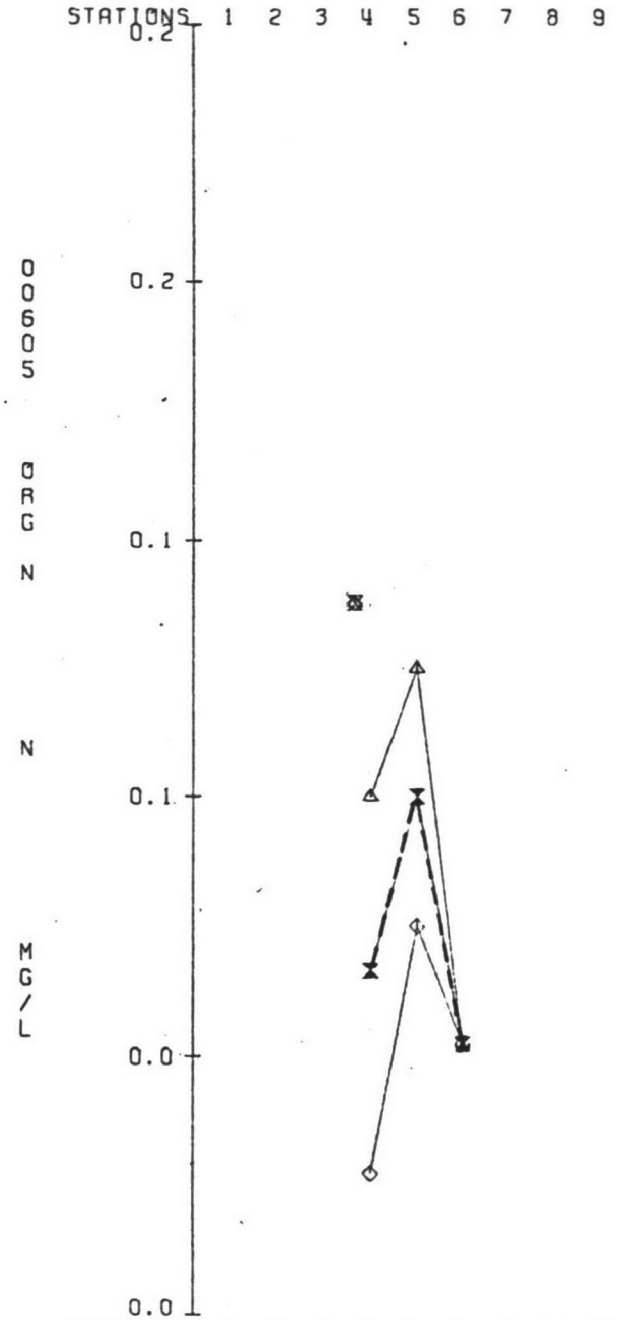
MULTIPLE STATION PLOT (MSP)
FROM 740509 TO 741114

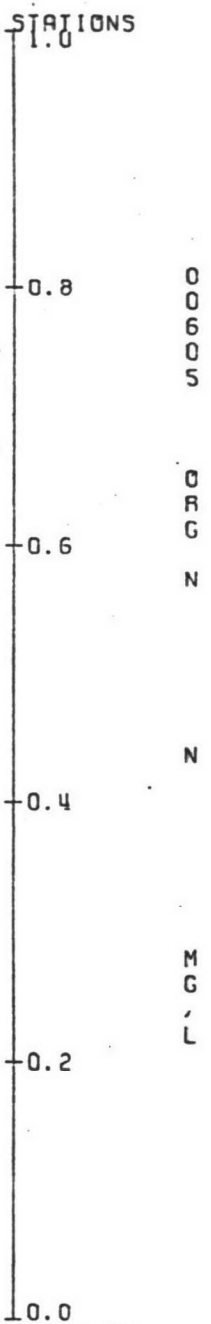




ORE ITE 5/1

MULTIPLE STATION PLOT (MSP)
FROM 740204 TO 741230





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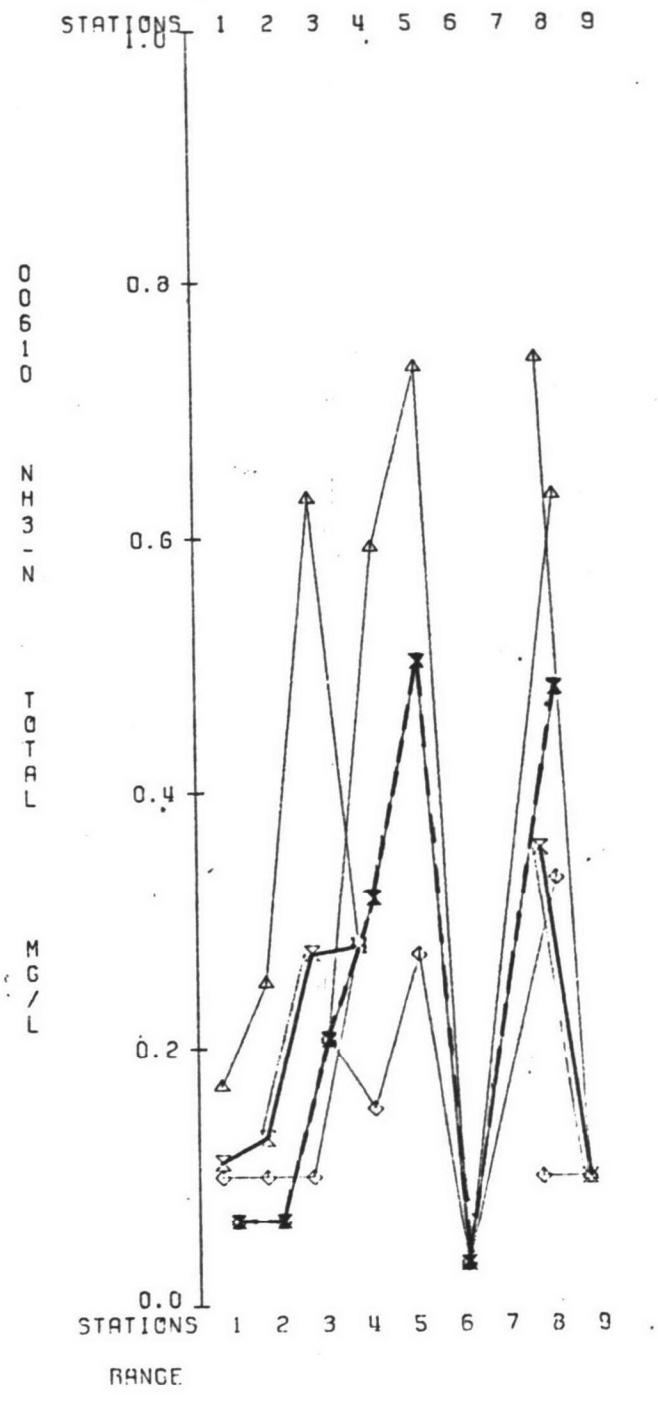
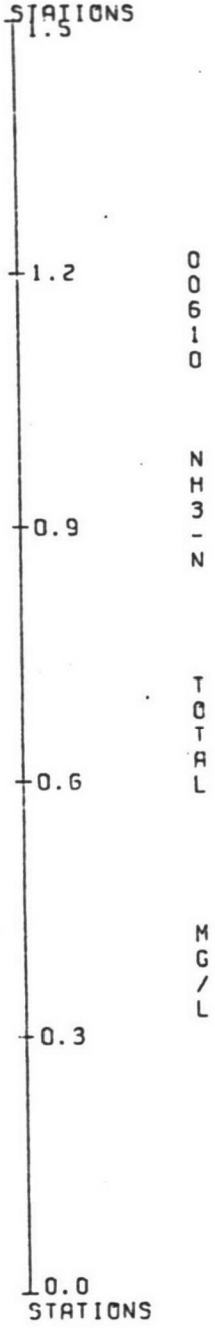
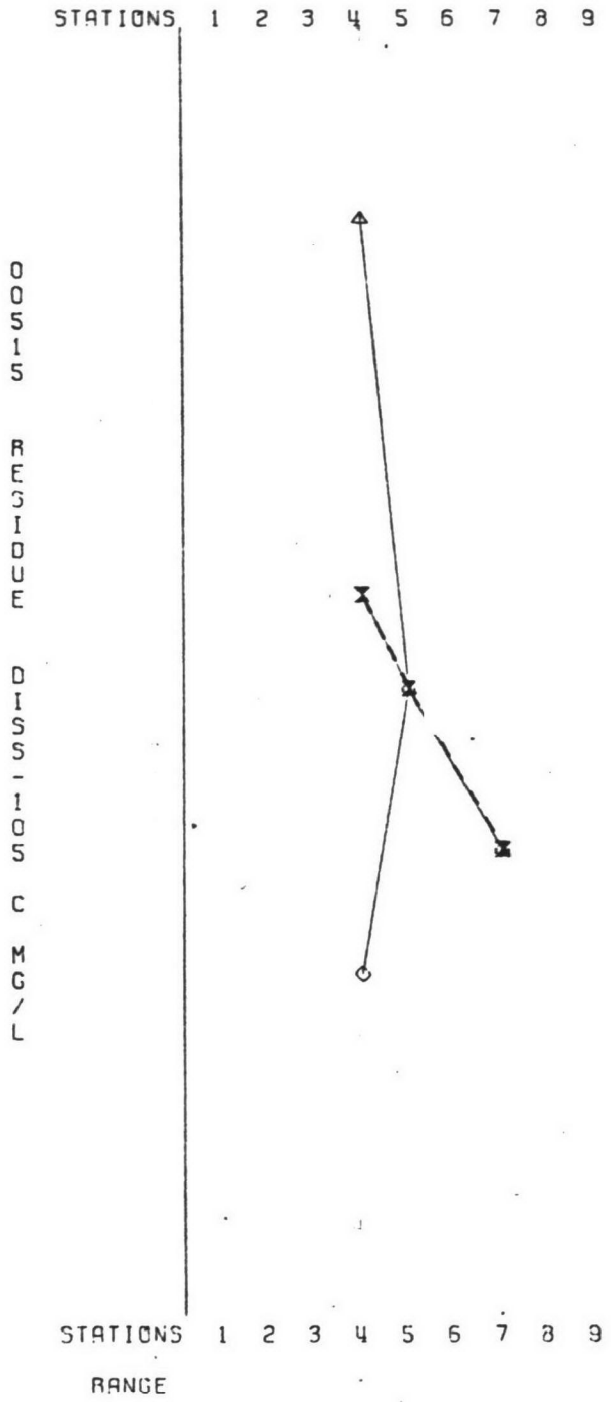
MULTIPLE ...ATION ...OT O...
FROM 740204 TO 741230

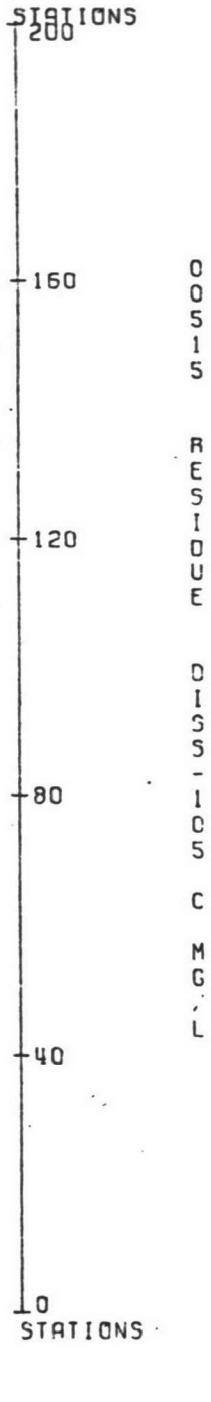




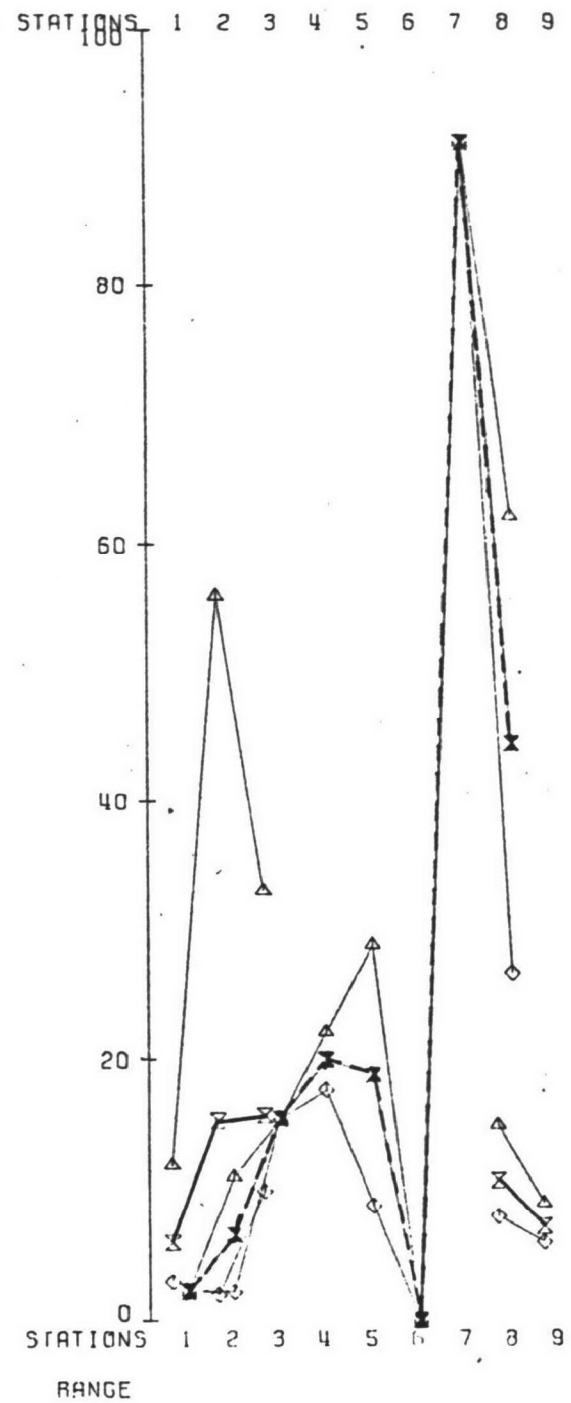
ORE STE 16/

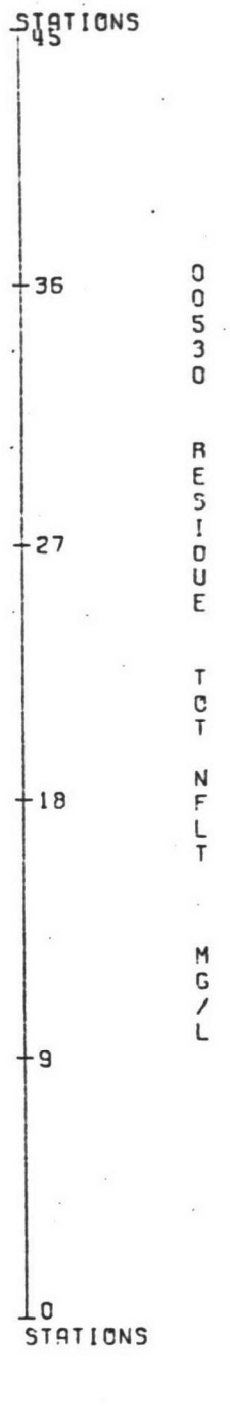
MULTIPLE STATION PLOT (MSP)
FROM 741104 TO 741211





MULTIPLE STATION PLOT (MSP)
FROM 740509 TO 741230





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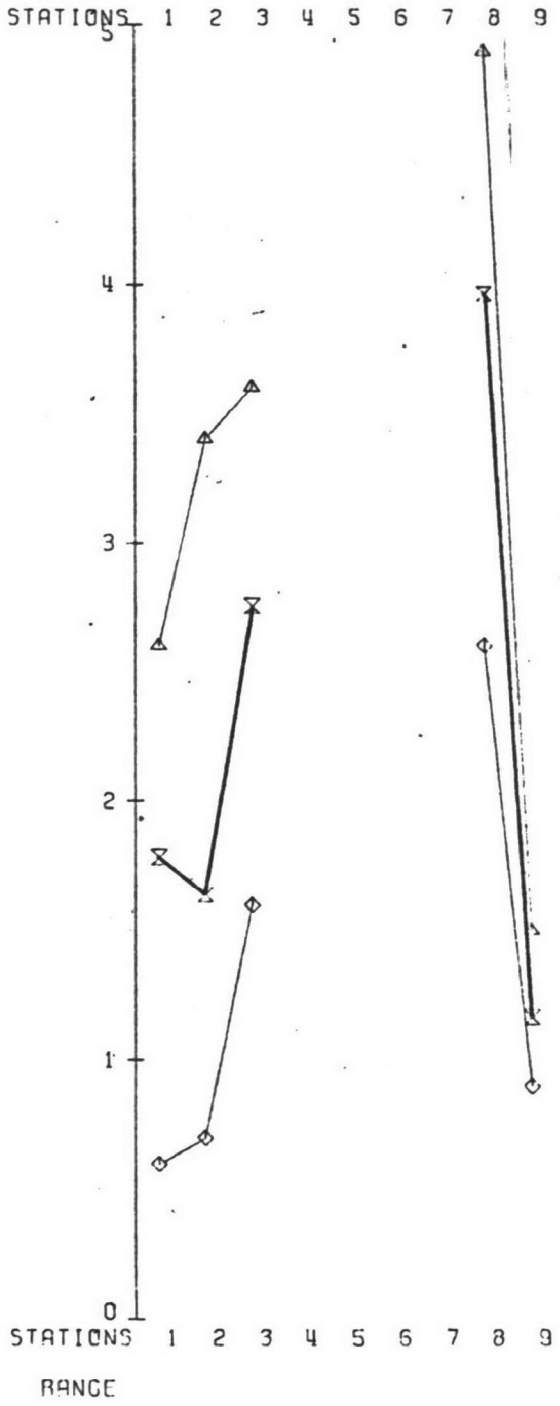
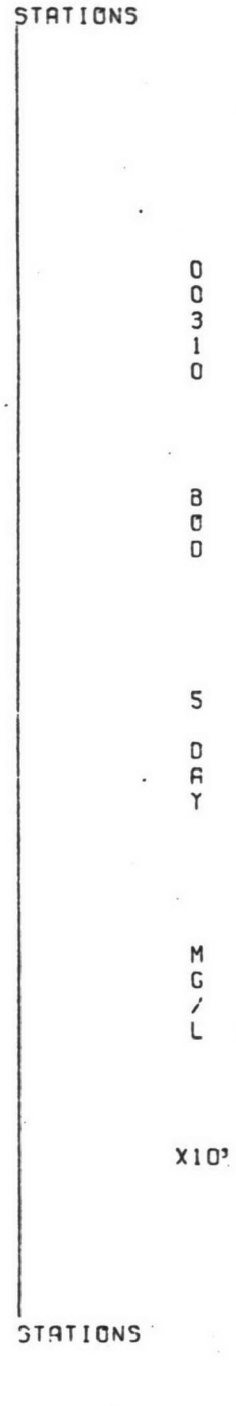
MULTIPLE STATION PLOT (MSP)
FROM 740509 TO 740925





MERRIMACK RIVER STATIONS

in

DOWNSTREAM ORDER

(For Plots With Only 8 Stations Plotted)

Plot Station Number	Station Location	Map Station Number
1.	Merrimack River at Penacook, N. H.	PMN 27-MER
2.	Merrimack River at Hooksett, N. H.	NWQSS 16-MER
3.	Merrimack River below Nashua, N. H.	NWQSS 1-MER
4.	Merrimack River above Lowell, Mass.	NWQSS 01096550
5.	Merrimack River at West Newbury, Mass.	NWQSS 01100750
7.	Nashua River at Hollis Depot, N. H.	NWQSS 3-6-NSH

REFERENCE STATIONS

6.	Whitman River near Westminster, Mass.	NWQSS 01094340
8.	Pemigewasset River at New Hampton, N.H.	PMN 33-9-PM1

PLOT LEGEND

Left Axis ——————→ = April to September

Right Axis — — — — — → = October to March

⧖ = Mean Values

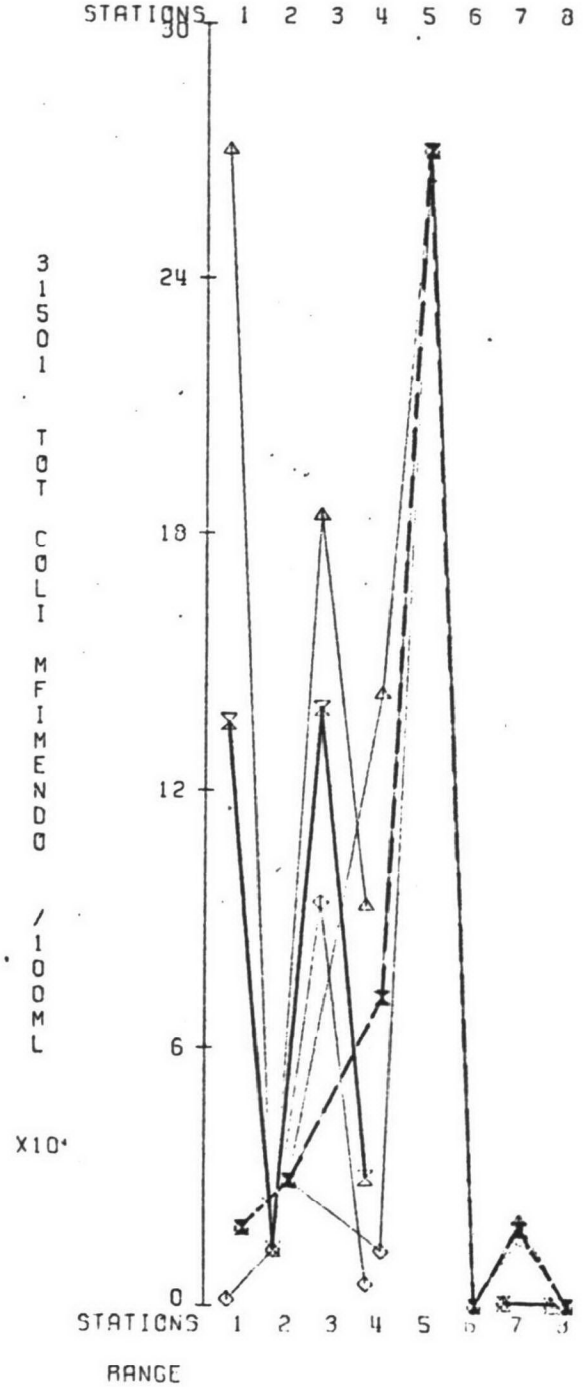
⧗ = Mean Values

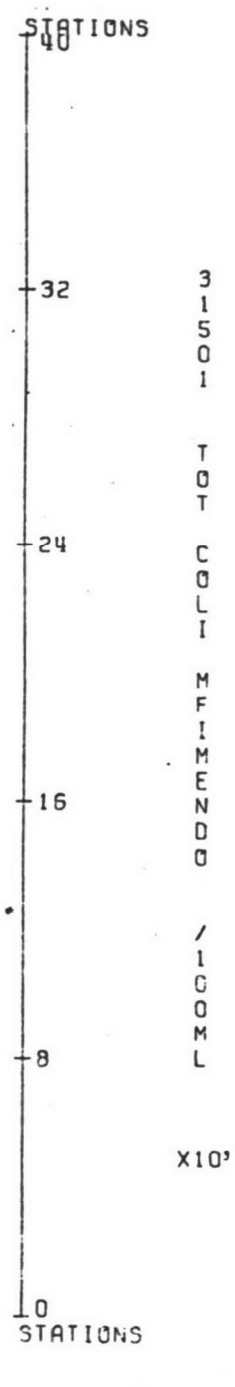
△ = Maximum Values

◇ = Minimum Values

ORI STE)6/

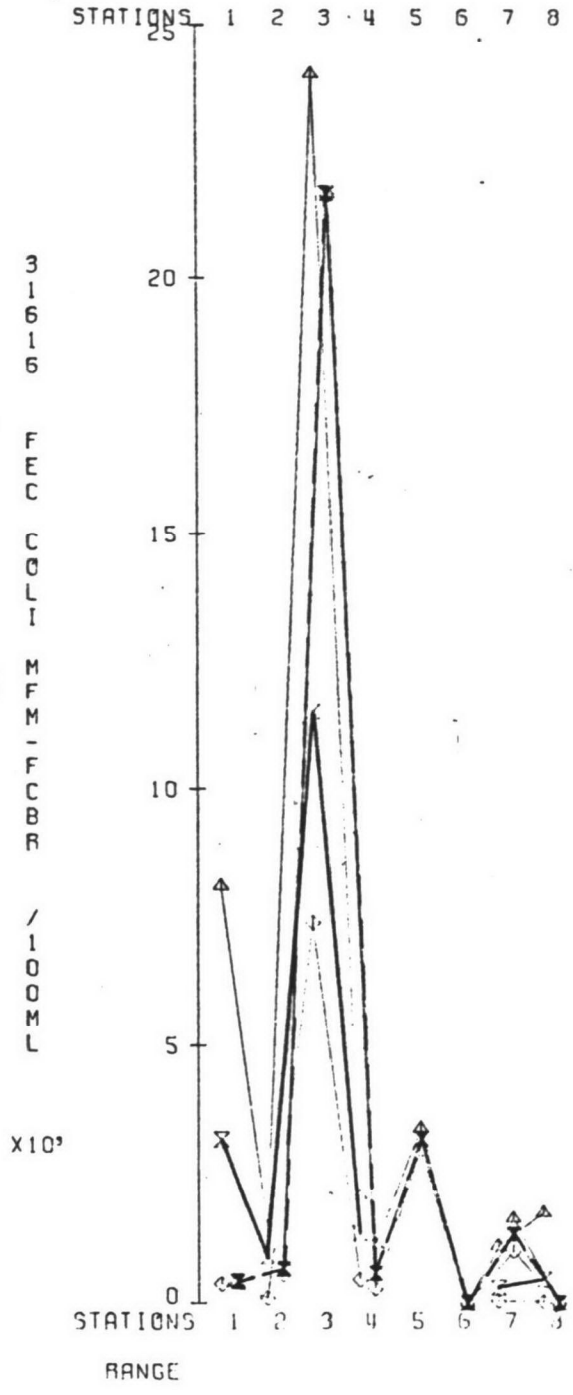
MULTIPLE STATION PLOT (MSP)
FROM 740204 TO 741230

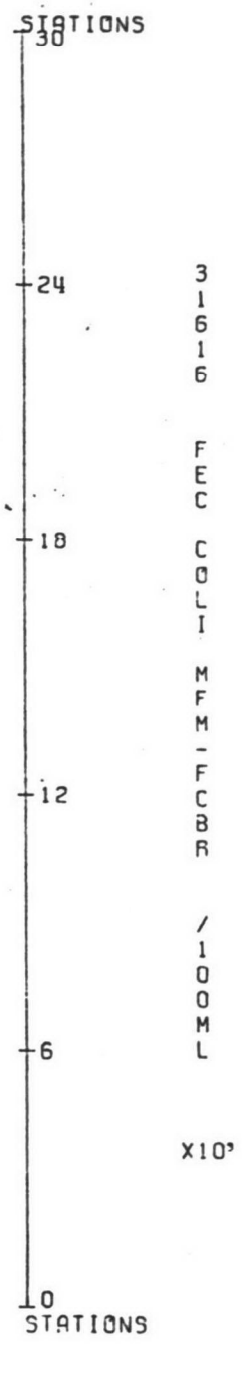




ST Sr C /75

MULTIPLE STATION PLOT (MSP)
FROM 740204 TO 741230





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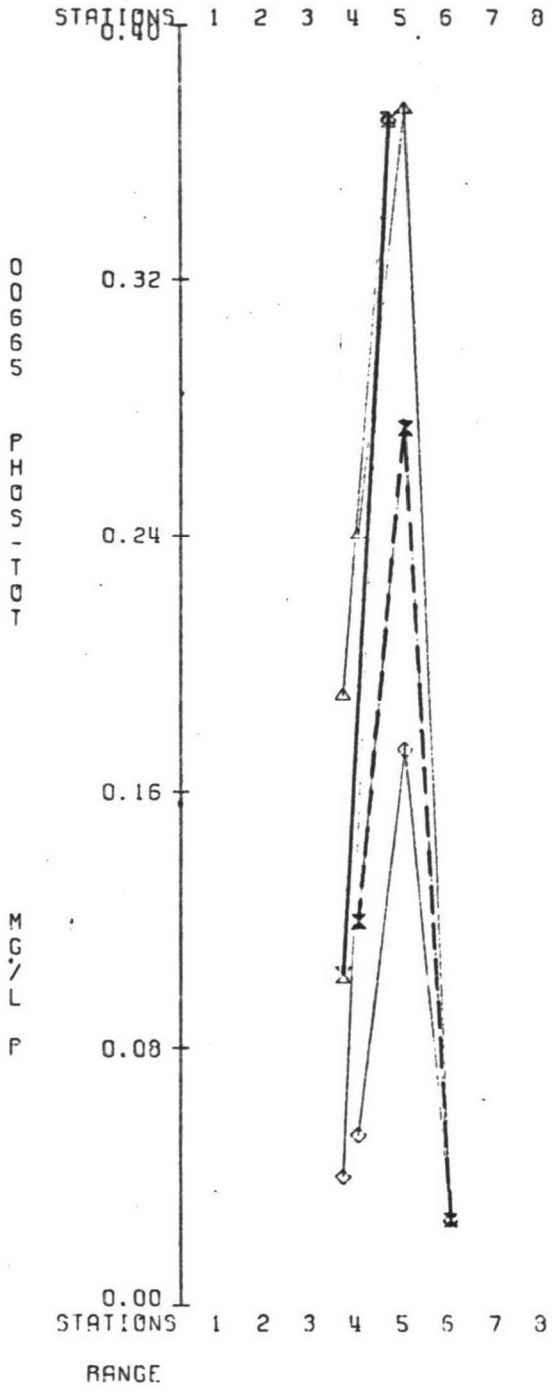
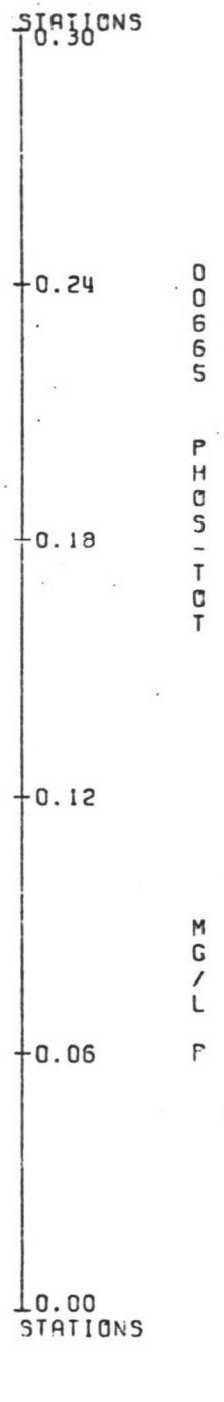
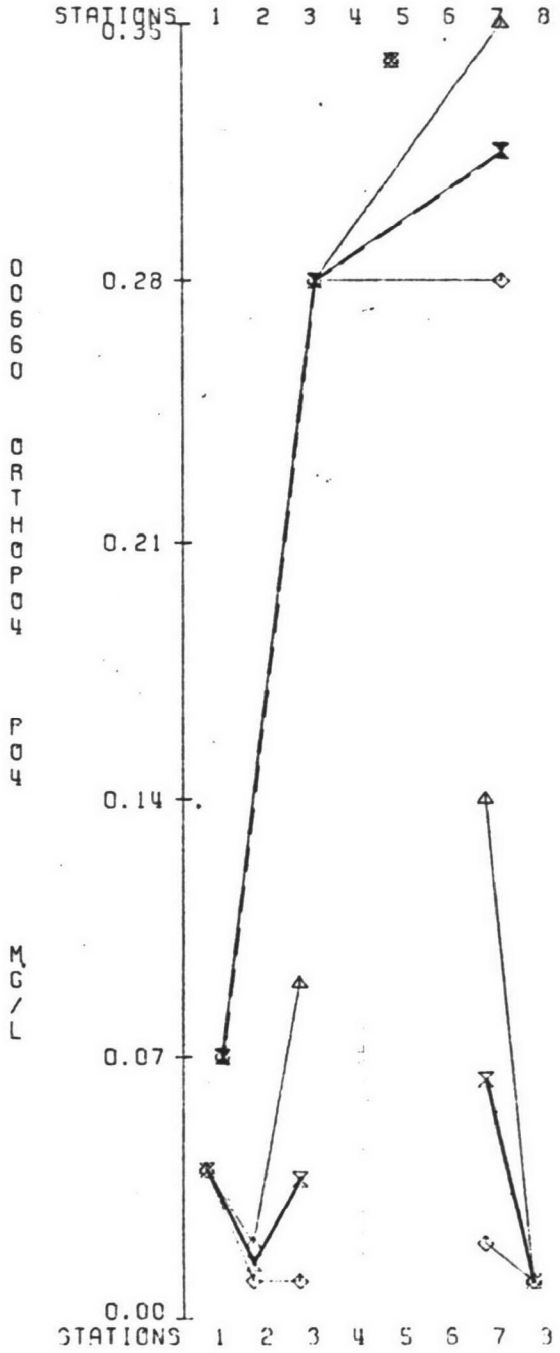
MULTIPLE STATION PLOT (MSP)
FROM 740204 TO 741230

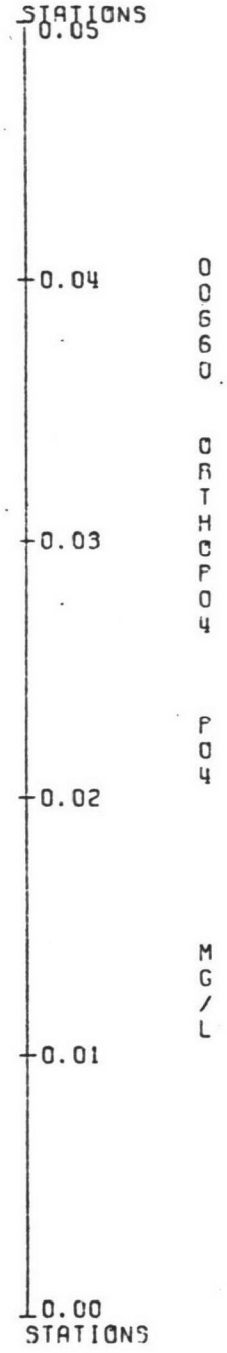




STORET SYSTEM 06/12/73

MULTIPLE STATION PLOT (MSP)
FROM 740521 TO 741114





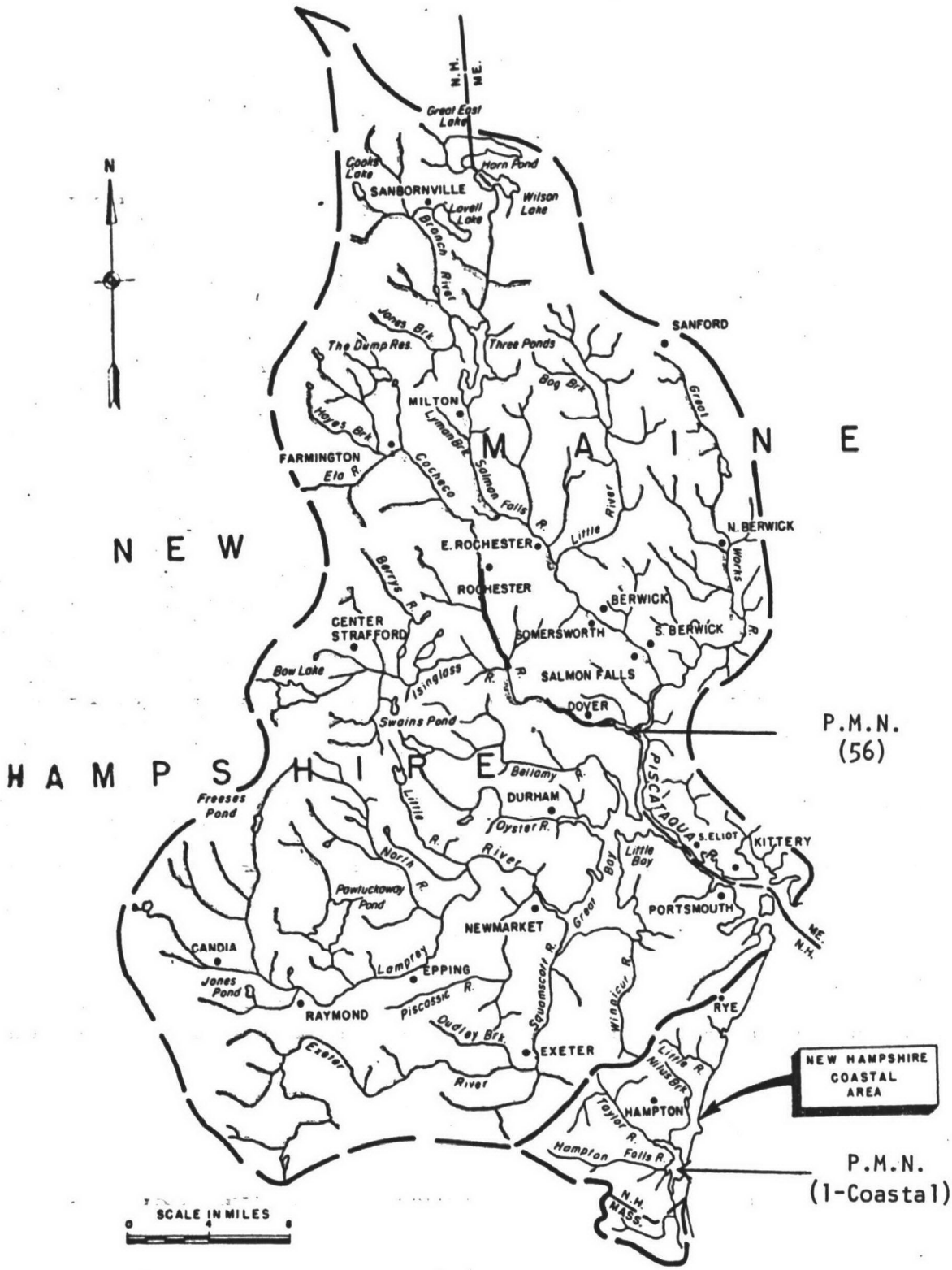
RANGE

3.9 PISCATAQUA RIVER AND NEW HAMPSHIRE COASTAL DRAINAGE AREA

The Salmon Falls River drains Great East Lake and flows thirty-seven miles to the head of the tide at Dover, New Hampshire. The last twelve miles of tidal estuary is the Piscataqua River connecting Great Bay with the ocean at New Castle, New Hampshire. These two rivers form the border between Maine and New Hampshire. At Dover, New Hampshire the Cocheco River also joins the Piscataqua River.

New Hampshire operates a Primary Monitoring Network Station on the tidal portion of the Cocheco River. All of the New Hampshire water quality standards, with the exception of water temperature, are violated at this station. Municipal and industrial wastes enter the river at Dover, Rochester and Farmington, New Hampshire. The only major industrial discharger is a metal plating and polishing company located in Dover, New Hampshire.

New Hampshire operates another Primary Monitoring Network Station in this basin in Hampton Harbor. There are no violations of the state standards at this station.



PISCATAQUA R. AND N. H. COASTAL BASIN

SUMMARY OF WATER QUALITY VIOLATIONS

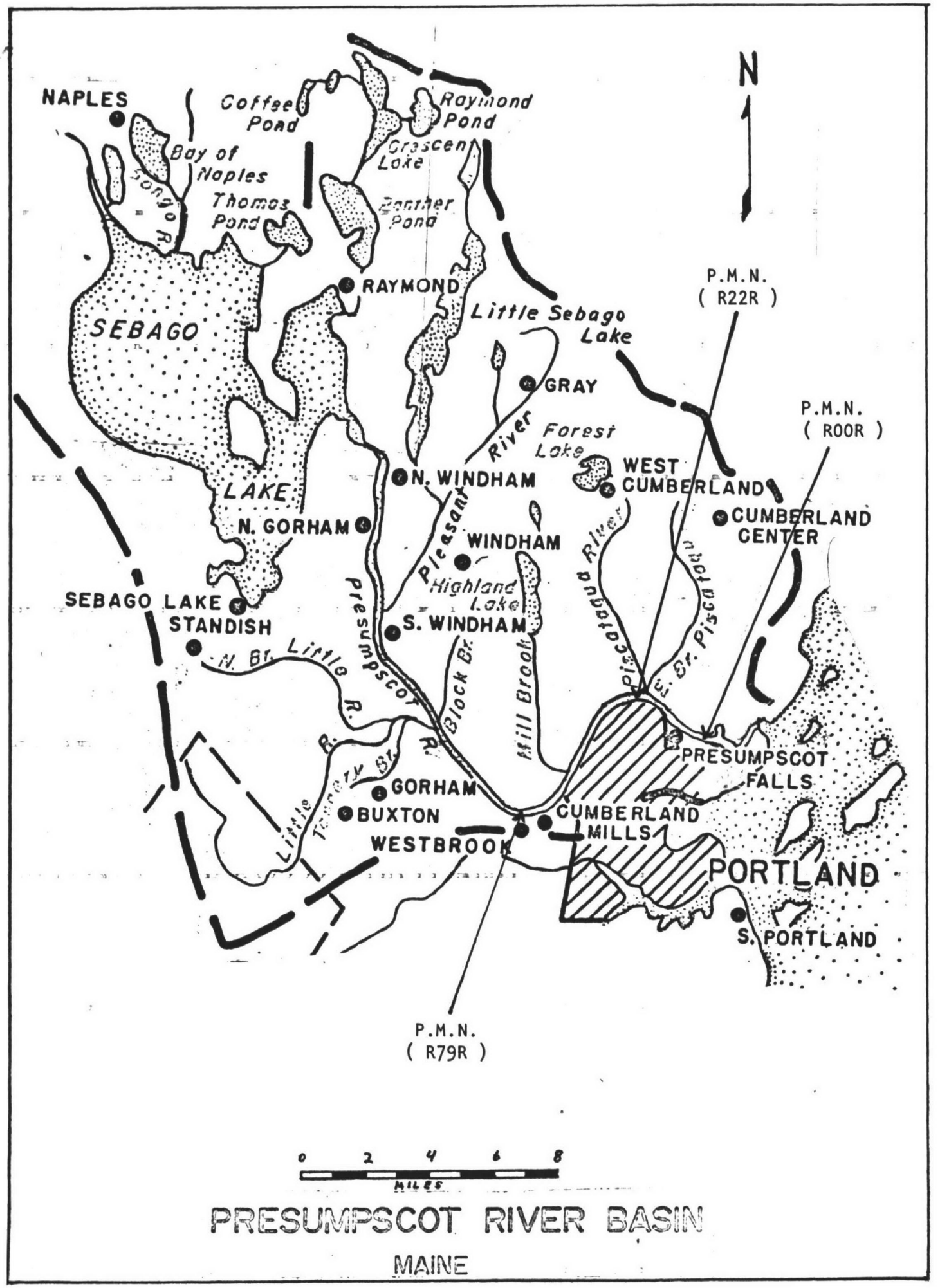
Basin Name (State) (No. of Stations Sampled)	Water Quality Parameter	Class B Standards *		Number of Violations	Number of Values	Percent Violations
		Maximum	Minimum			
Piscataqua River and	Dissolved Oxygen		75%	2	10	20%
New Hampshire Coastal	Turbidity S.T.U.	25		0	10	0%
(New Hampshire) (2)	Total Coliform	70/100 ml		9	12	75%
	pH	8.0	6.5	1	13	7%
	Phenols	1.0		3	3	100%
Totals for Basin				15	48	31%

* In marine waters criteria are for Class SB standard.

3.10 PRESUMPSCOT RIVER BASIN

Water quality in the Presumpscot River varies from Class A at its origin in Sebago Lake to a severely degraded condition downstream of Westbrook, Maine. Between Westbrook (Plot Station No. 2) the river receives wastewater from the S. D. Warren Company and the city of Westbrook. These discharges cause water quality standards violations for dissolved oxygen percent saturation and coliform bacteria. These conditions extend to the tidal portion of the river (Plot Station No. 3).

Turbidity, biochemical oxygen demand, coliform bacteria, nitrogen, and phosphorus are all seen to increase dramatically within the stream between Westbrook and Presumpscot Falls.



PRESUMPSCOT RIVER BASIN

MAINE

1974

SUMMARY OF WATER QUALITY VIOLATIONS

Basin Name (State) (No. of Stations Sampled)	Water Quality Parameter	Class B Standards *		Number of Violations	Number of Values	Percent Violations
		Maximum	Minimum			
Presumpscot River and Casco Bay (Maine) (2)	Water Temperature	28.7 °C		0	8	0%
	Dissolved Oxygen		5.0 mg/l	0	8	0%
	Dissolved Oxygen Saturation Percent		75%	1	8	12%
	Total Coliform	300/100 ml		8	8	100%
	Fecal Coliform	60/100 ml		8	8	100%
	pH	8.5	6.0	0	8	0%
(Maine) (1)	Water Temperature	29.4 °C		0	11	0%
	Dissolved Oxygen		6.0 mg/l	2	11	18%
	Total Coliform	500/100 ml		11	11	100%
	Fecal Coliform	150/100 ml		10	11	91%
	pH	8.5	6.7	6	11	54%
Totals for Basin				46	103	45%

* In marine waters criteria are for Class SB standard.

PRESUMPSCOT RIVER STATIONS

in

DOWNSTREAM ORDER

Plot Station Number	Station Location	Map Station Number
2.	Presumpscot River above Falmouth, Maine	PMN (R22R)
3.	Presumpscot River below Presumpscot Falls, Maine	PMN (R00R)

REFERENCE STATION

1.	Presumpscot River at Westbrook, Maine	PMN (R79R)

PLOT LEGEND

Left Axis ——————— = April to September

Right Axis — — — — — — = October to March

⧖ = Mean Values

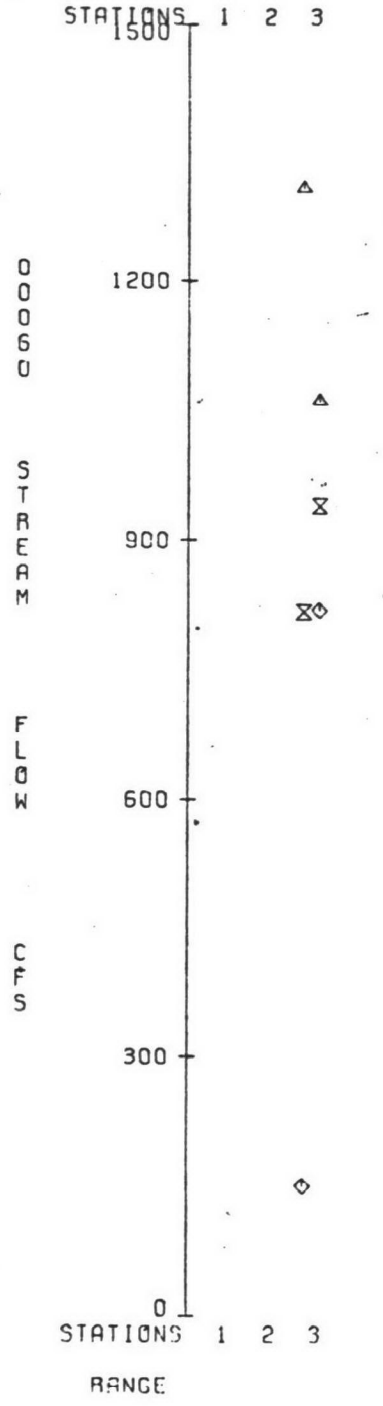
⧗ = Mean Values

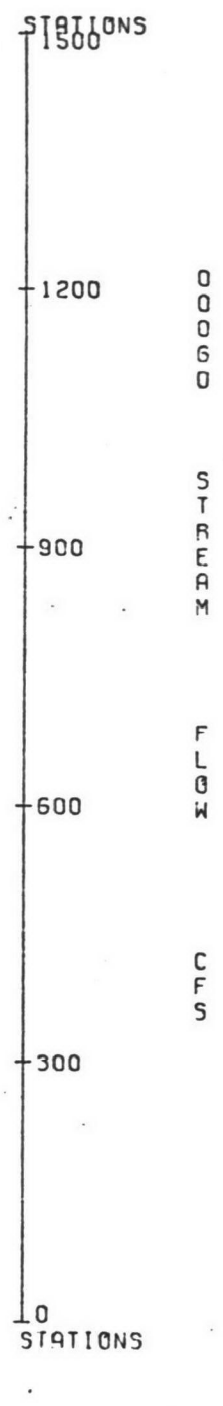
△ = Maximum Values

◇ = Minimum Values

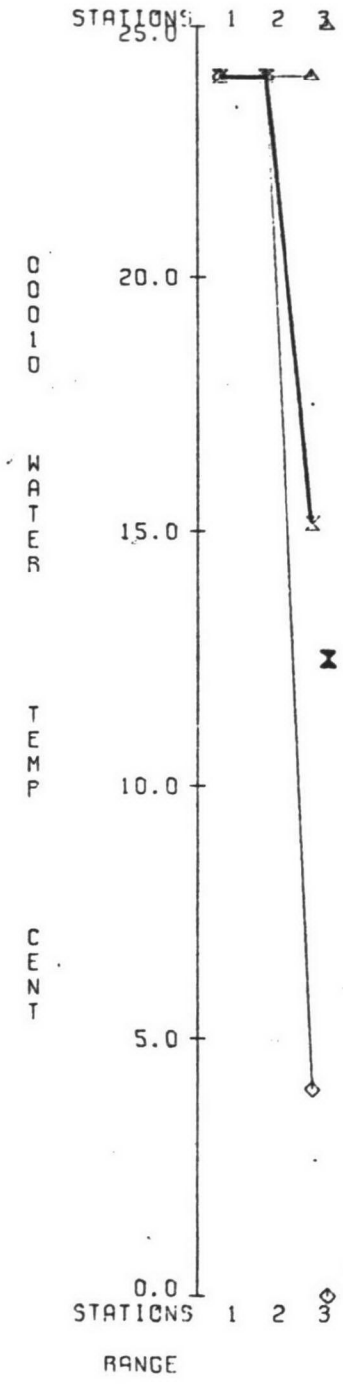
TOR 'ST 06/ 3

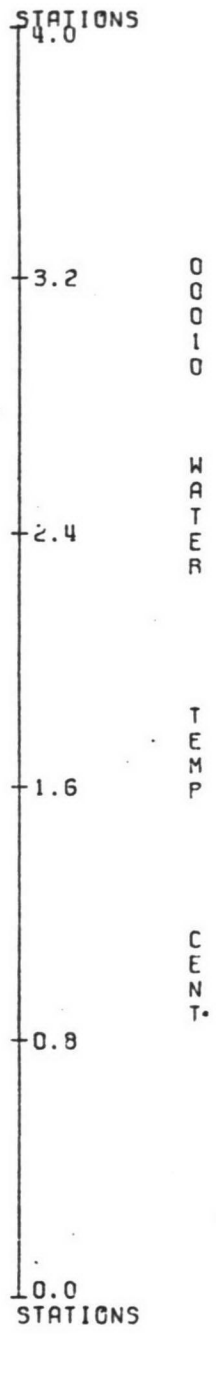
MULTIPLE STATION PLOT (MSP)
FROM 740211 TO 740910





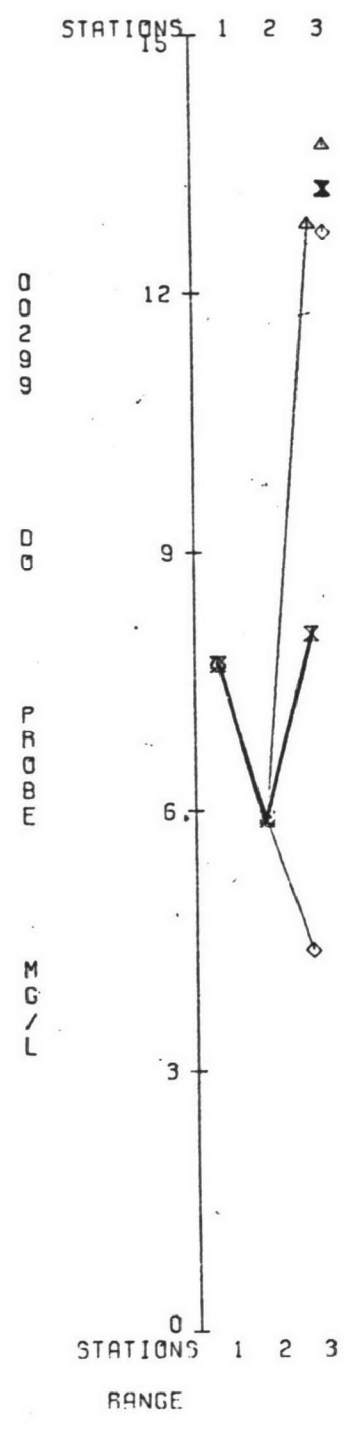
MU E S IN (M
FROM 740211 TO 740910

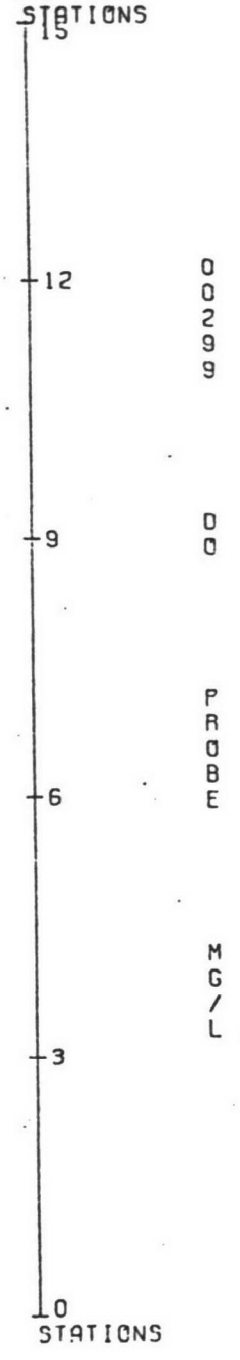




STORET SYSTEM 06/..../..75

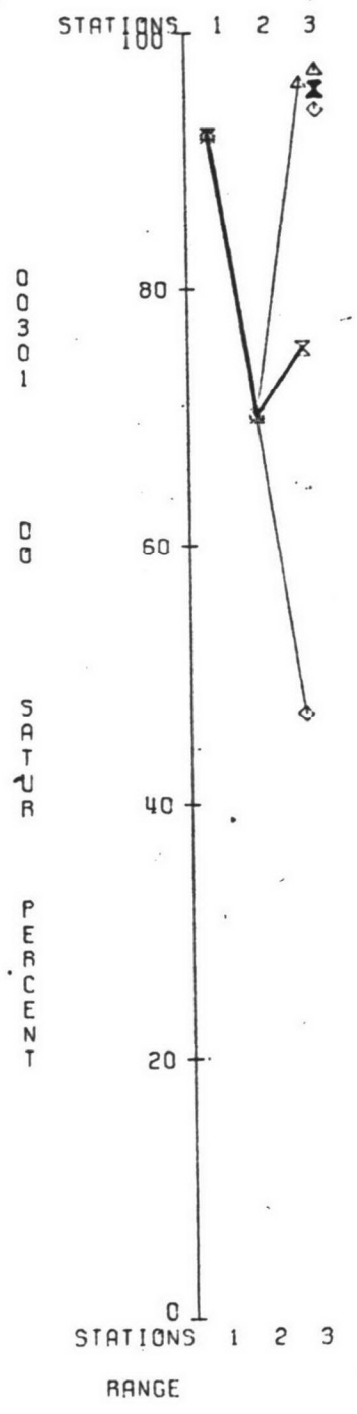
MULTIPLE STATION PLOT (MSP)
FROM 740211 TO 740910

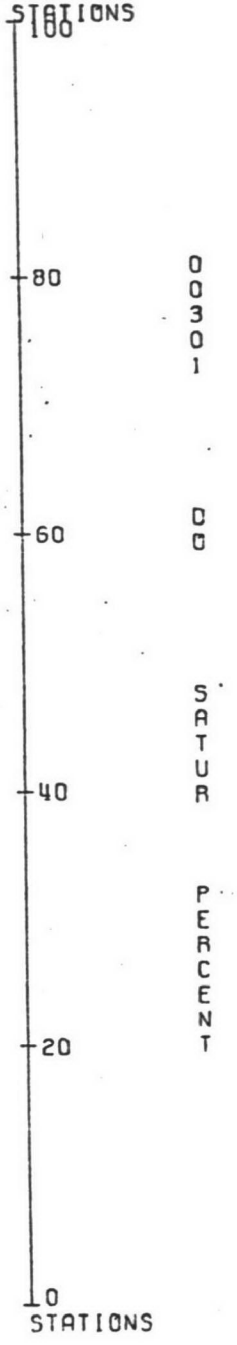


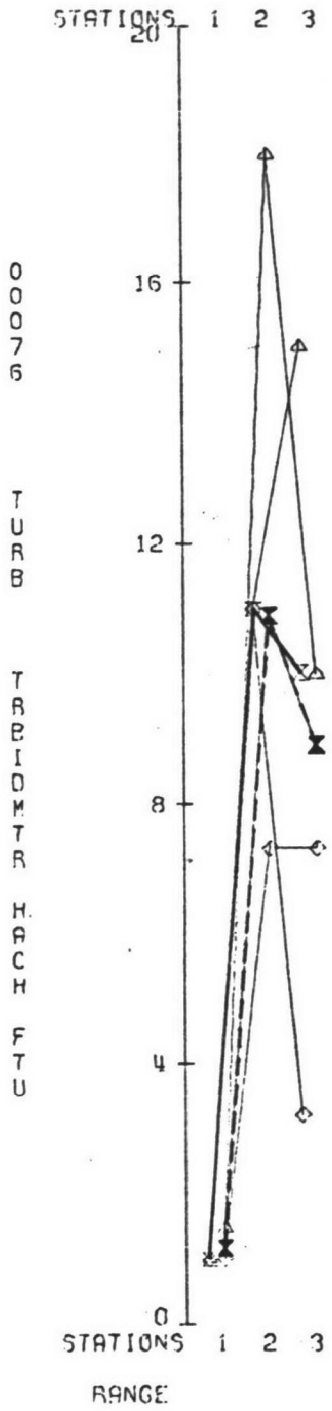


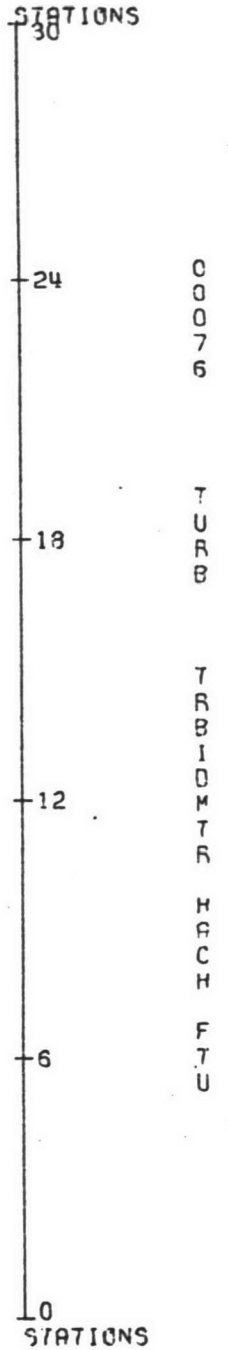
ET EM '11

MULTIPLE STATION PLOT (MSP)
FROM 740211 TO 740910



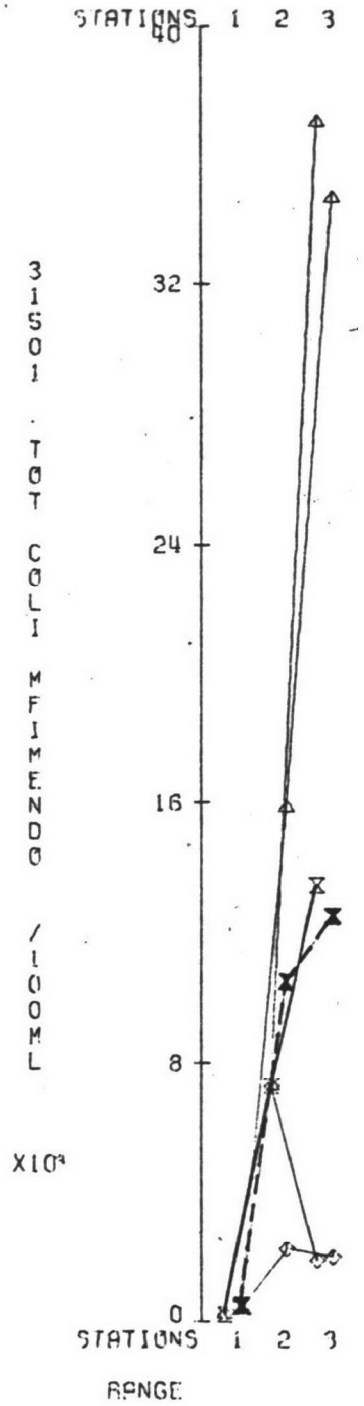


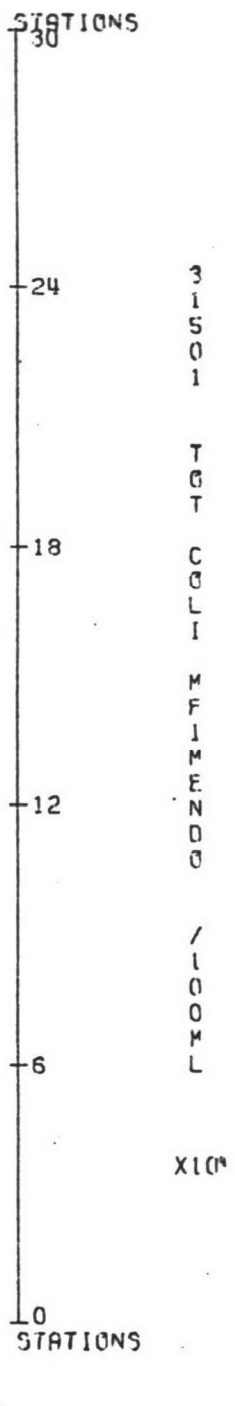

STATIONS 1 2 3
20
16
12
8
4
0
00076 TURB TRBIDMTR HACH FTU
STATIONS 1 2 3
RANGE

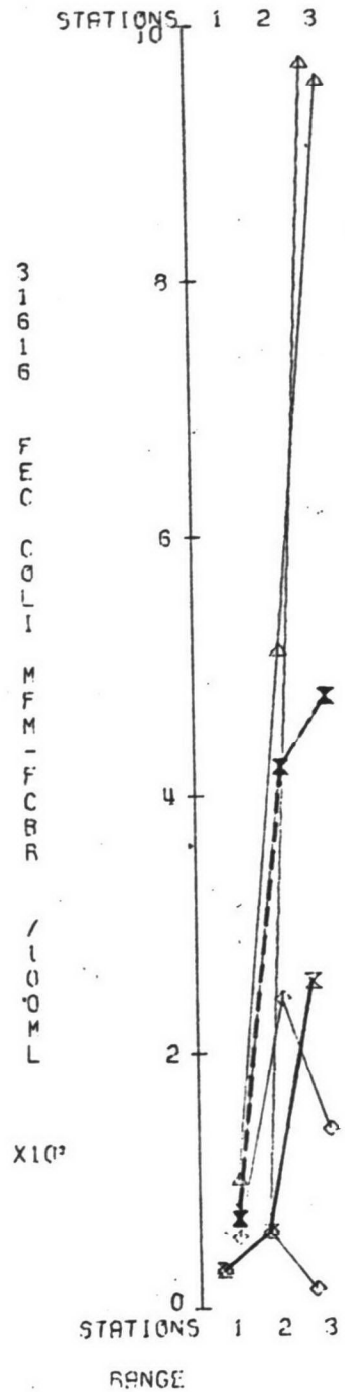

STATIONS
30
24
18
12
6
0
00076 TURB TRBIDMTR HACH FTU
STATIONS

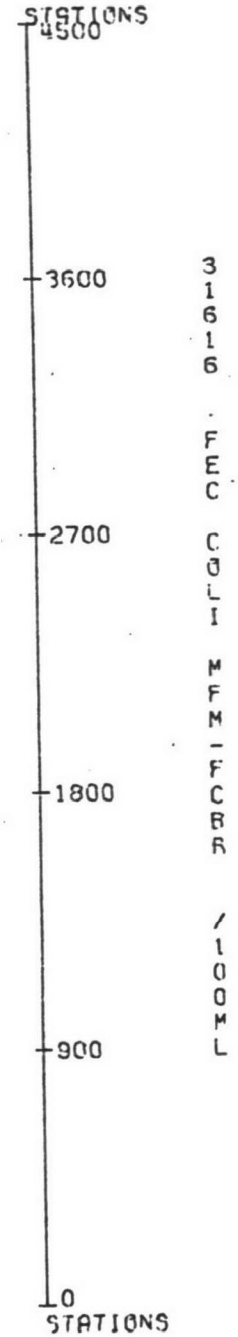
STREET SYSTEM 06/12/75

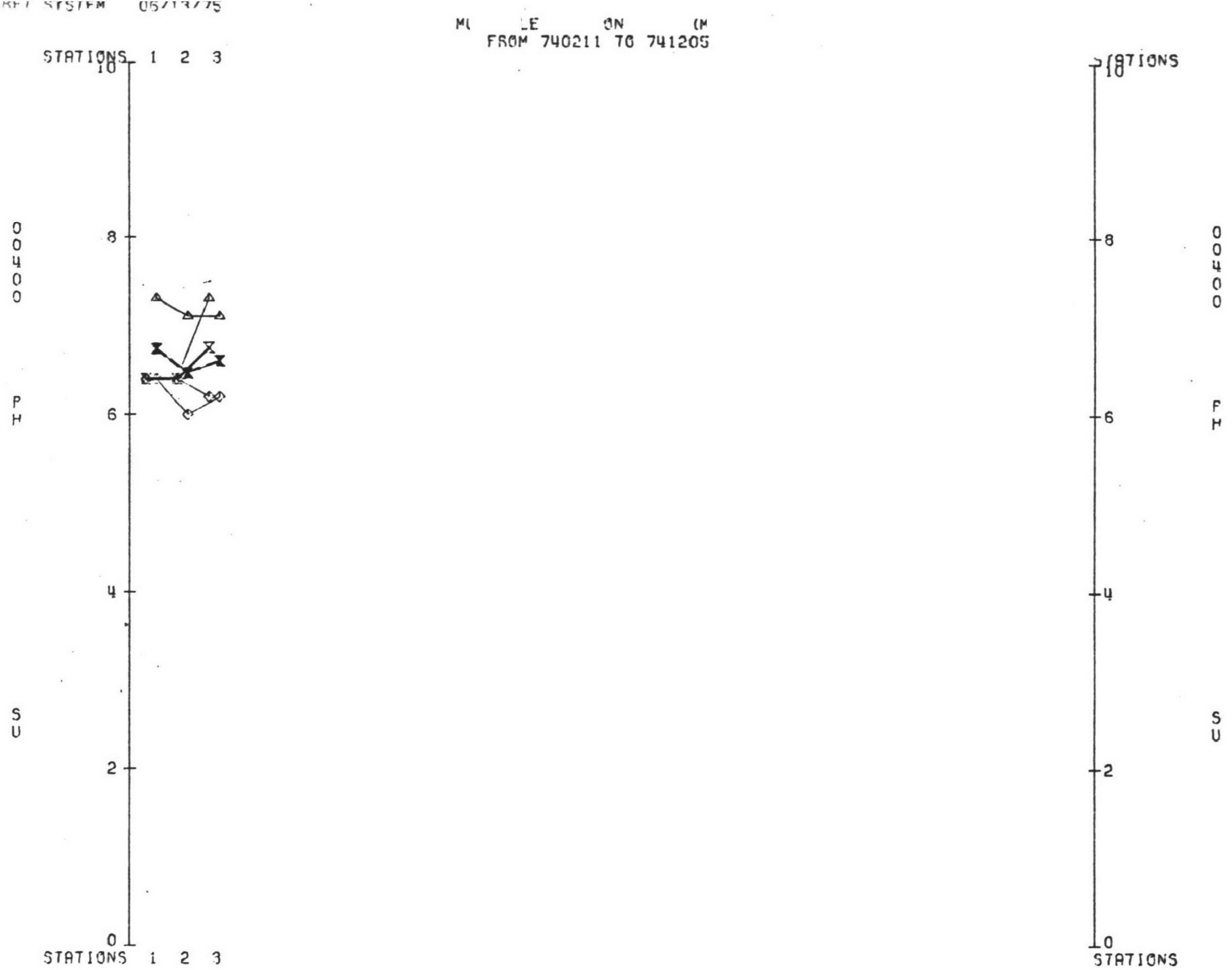
M LE ION (
FROM 740211 TO 741205

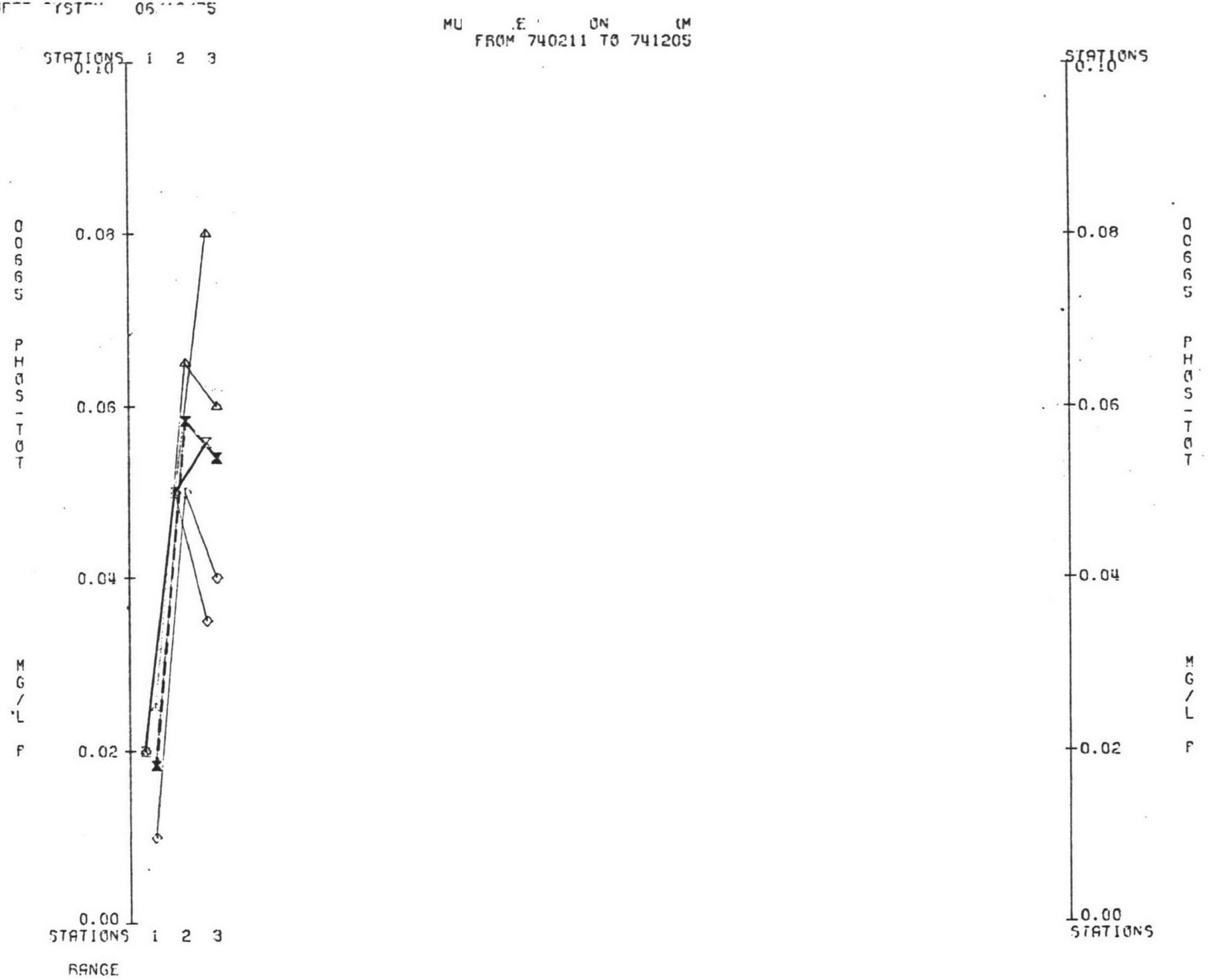


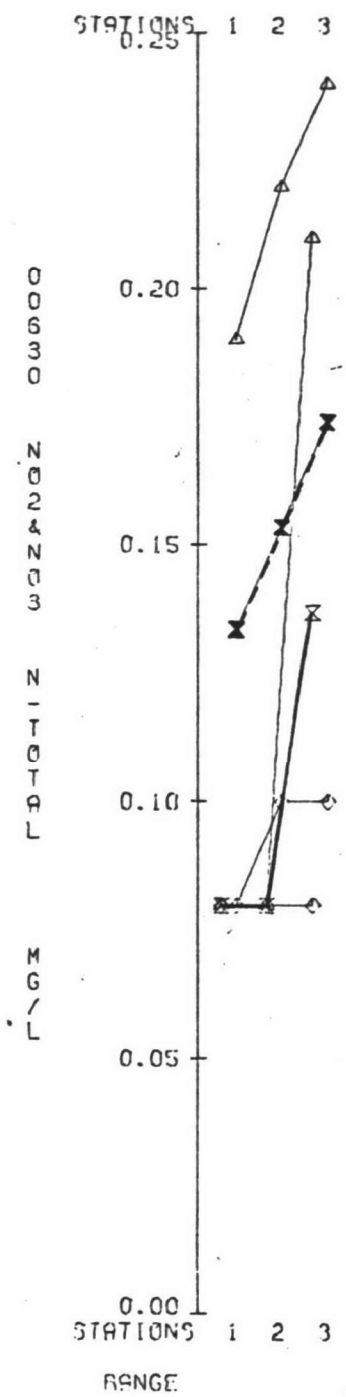



STATIONS 1 2 3
10
8
6
4
2
0
STATIONS 1 2 3
RANGE
3616 FEC COLI MFM-FCBR /100ML
X10³


STATIONS
4500
3600
2700
1800
900
0
STATIONS
3616 FEC COLI MFM-FCBR /100ML


STATIONS 1 2 3
10
8
6
4
2
0
00400
PH
SU
STATIONS 1 2 3
RANGE
STATIONS
10
8
6
4
2
0
00400
PH
SU
STATIONS

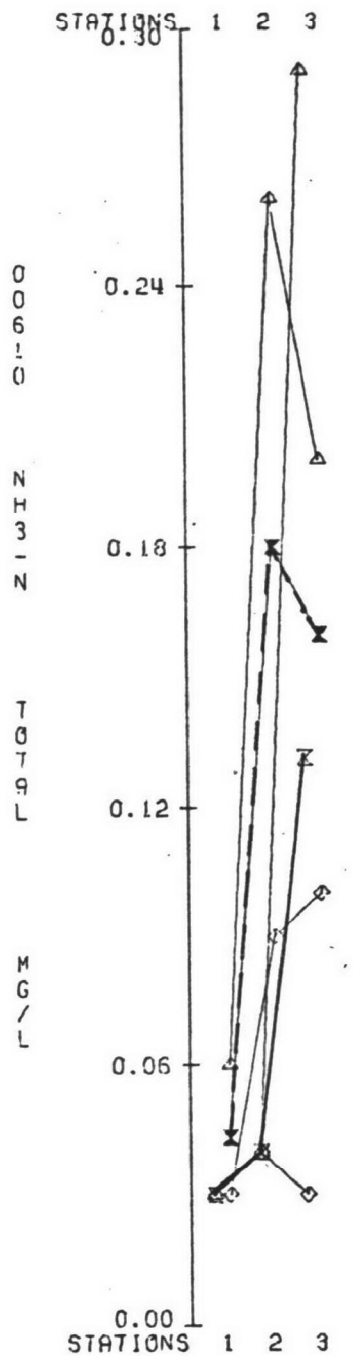

STATIONS 1 2 3
0.10
0.08
0.06
0.04
0.02
0.00
00665 PHOS-TOT MG/L P
STATIONS 1 2 3
RANGE
FROM 740211 TO 741205
STATIONS
0.10
0.08
0.06
0.04
0.02
0.00
00665 PHOS-TOT MG/L P
STATIONS

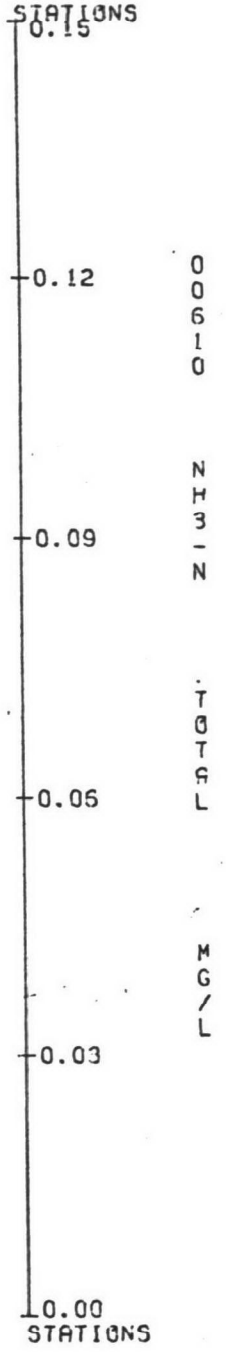


0.25
0.20
0.15
0.10
0.05
0.00
00630 NO2&NO3 NITGTAL MG/L
STATIONS

STORET SYSTEM 06/13/75

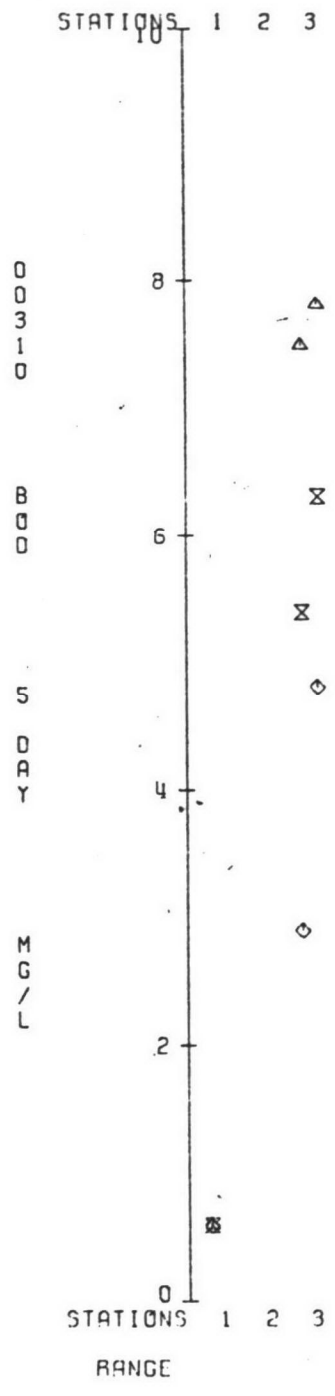
MULTIPLE STATION PLOT (MSP)
FROM 740211 TO 741205

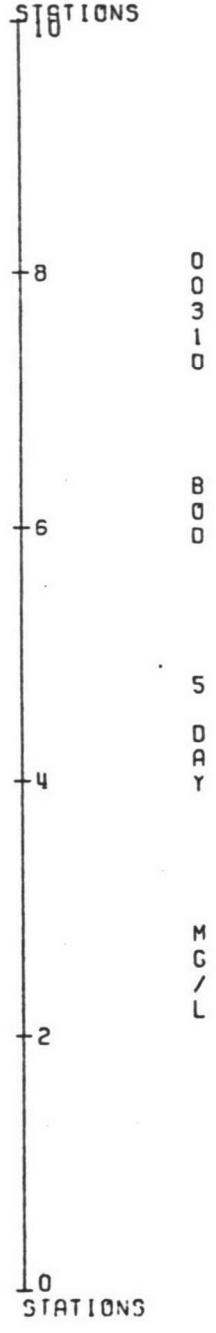




ST SY C /75

MULTIPLE STATION PLOT (MSP)
FROM 740211 TO 740910





3.11 ANDROSCOGGIN RIVER BASIN

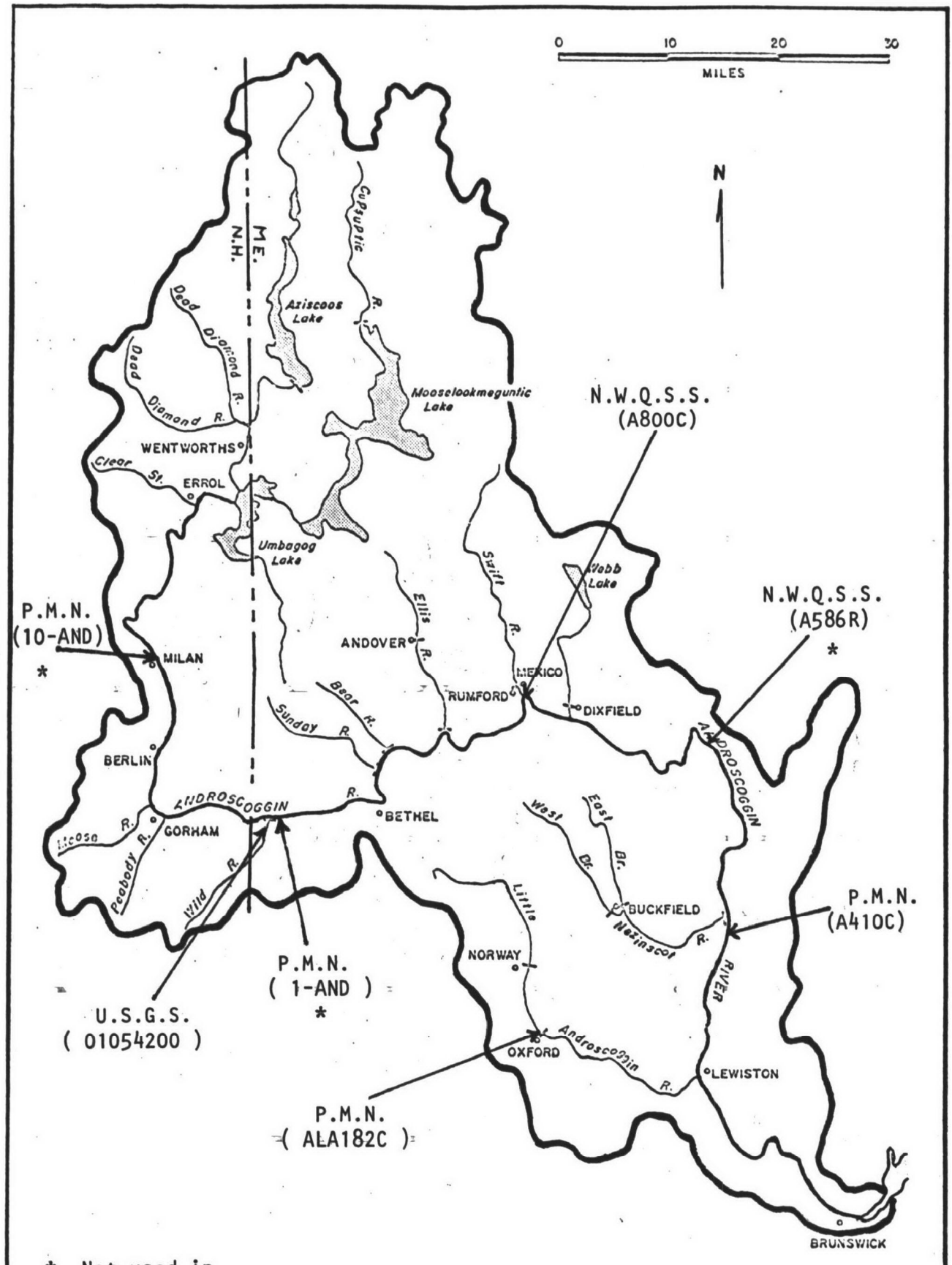
Downstream of Berlin, New Hampshire, the Androscoggin River is severely degraded by paper mill and untreated domestic sewage discharges in both New Hampshire and Maine. Class B standards for dissolved oxygen-percent saturation and coliform bacteria are being violated.

In New Hampshire, the Brown Paper Company and communities of Berlin and Gorham all discharge untreated wastes at the present time. Proceeding downstream through Maine, the river receives untreated paper production wastes from Oxford Paper Company and treated wastewater from International and Pejepscot Paper companies. Untreated or inadequately treated domestic sewage is discharged from the towns of Bethel, Rumford, Mexico, Livermore Falls, Jay, Lewiston, Auburn and Lisbon.

The Little Androscoggin River is the largest tributary of the Androscoggin. Major discharges of wastewater from domestic and industrial sources enter this stream in South Paris, Oxford and Mechanic Falls causing violations of Class B standards for dissolved oxygen and coliform bacteria.

The plotted monitoring data compares water quality of the Little Androscoggin River near Oxford (Plot Station No. 1) and the Wild River near Gilead, Maine (Plot Station No. 4) with water quality of the Androscoggin River at Rumford (Plot Station No. 2) and at Turner (Plot Station No. 3). This comparison is indicative of water quality at locations with major point source discharges upstream and a location of pristine quality (Station No. 4).

Coliform bacteria, nitrogen and phosphorus are seen to vary distinctly between the natural area at Gilead and those stream reaches receiving point source waste loads. Also, it is noteworthy that limits of Class B standards for total coliform bacteria were exceeded at Gilead as well as at other stations.



ANDROSCOGGIN RIVER BASIN

N. H. - MAINE

1974

SUMMARY OF WATER QUALITY VIOLATIONS

Basin Name (State) (No. of Stations Sampled)	Water Quality Parameter	Class B Standards *		Number of Violations	Number of Values	Percent Violations
		Maximum	Minimum			
Androscoggin River (Maine) (4)	Water Temperature	28.79°		0	52	0%
	Dissolved Oxygen		5.0 mg/l	3	42	7%
	Dissolved Oxygen Saturation Percent		75%	10	27	37%
	Total Coliform	300/100 ml		44	48	91%
	Fecal Coliform	60/100 ml		38	48	79%
	pH	8.5	6.0	3	52	6%
Totals for Basin				98	269	36%

* In marine waters criteria are for Class SB standard.

ANDROSCOGGIN RIVER STATIONS

in

DOWNSTREAM ORDER

Plot Station Number	Station Location	Map Station Number
1.	Little Androscoggin River at Oxford, Maine	PMN ALA182C
2.	Androscoggin River at Rumford, Maine	NWQSS A800C
3.	Androscoggin River at Turner, Maine	PMN A410C
	REFERENCE STATION	
4.	Wild River at Gilead, Maine	USGS 01054200

PLOT LEGEND

Left Axis ——————— = April to September

Right Axis — — — — — — = October to March

⧖ = Mean Values

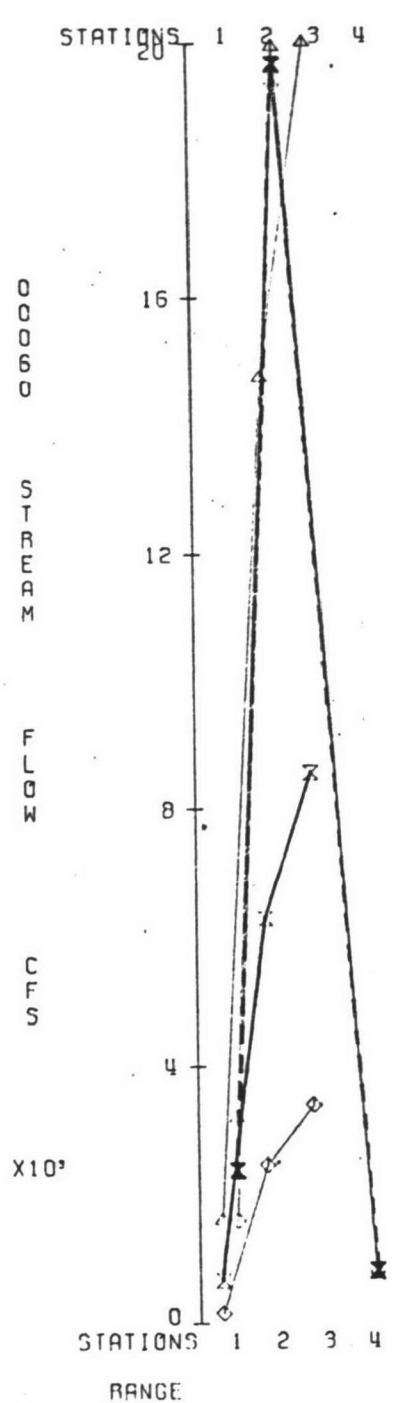
⧗ = Mean Values

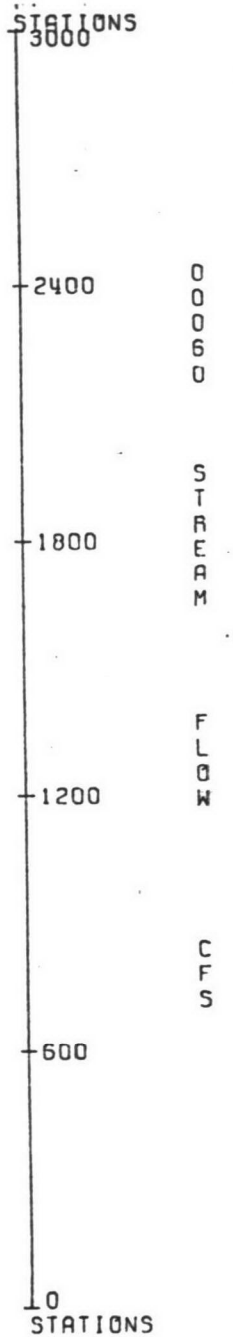
△ = Maximum Values

◈ = Minimum Values

TOR 'ST 067 5

MULTIPLE STATION PLOT (MSP)
FROM 740213 TO 740911





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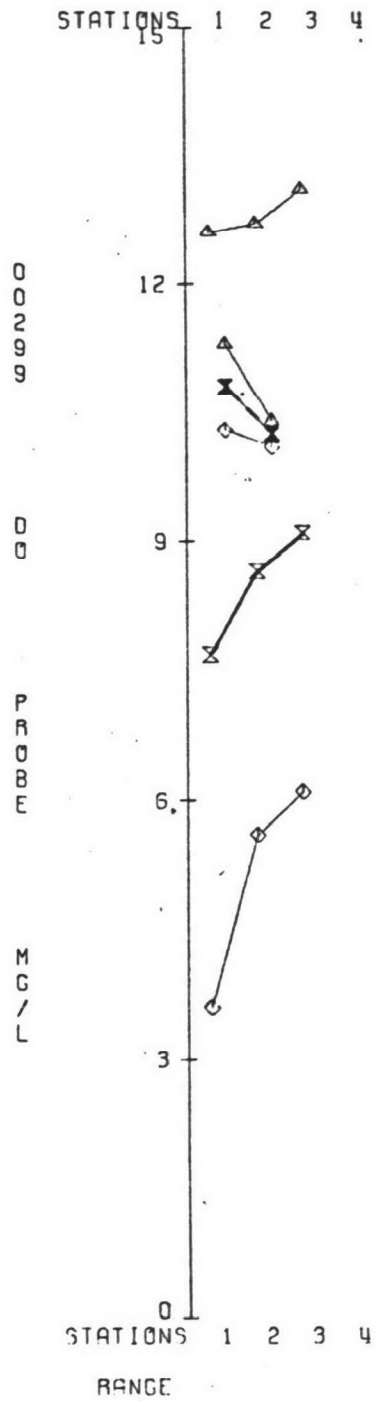
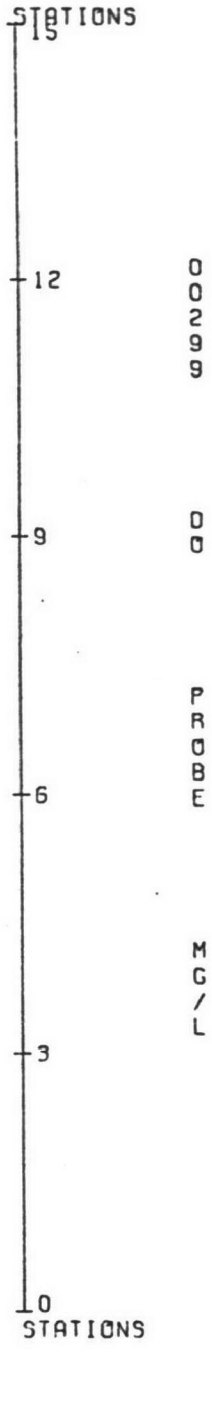
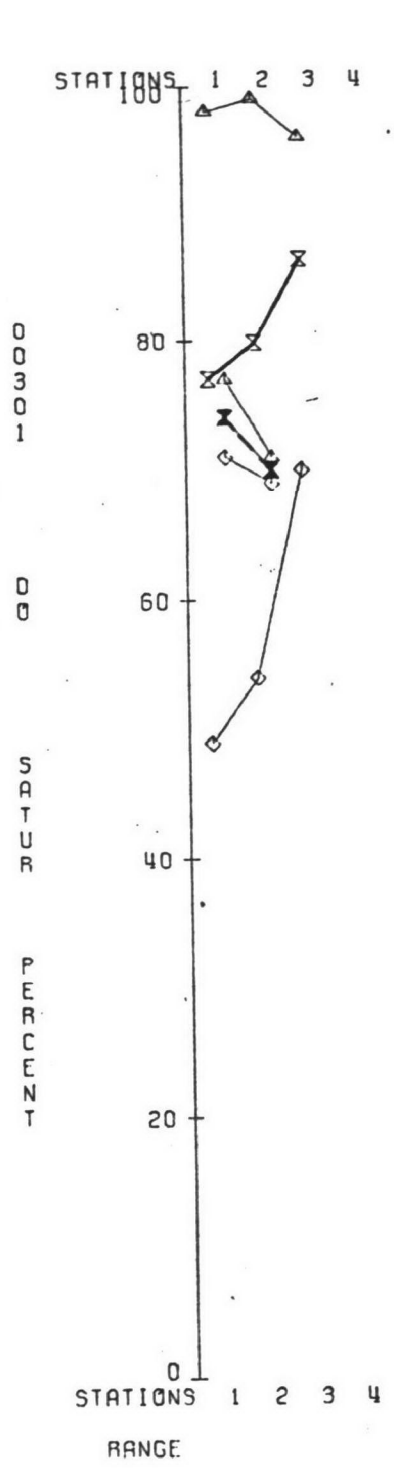
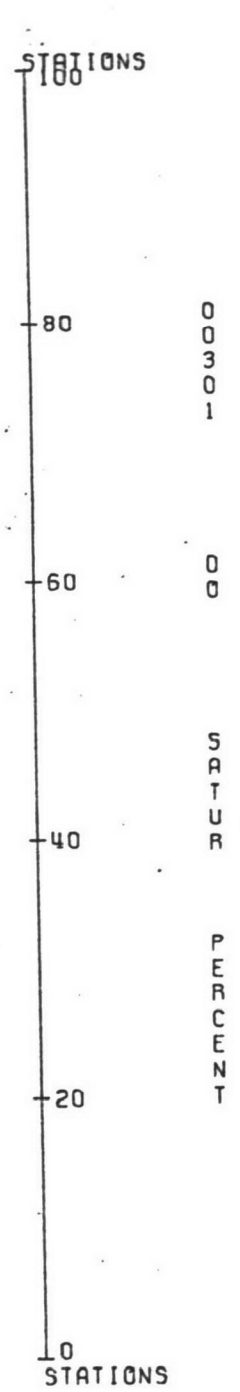
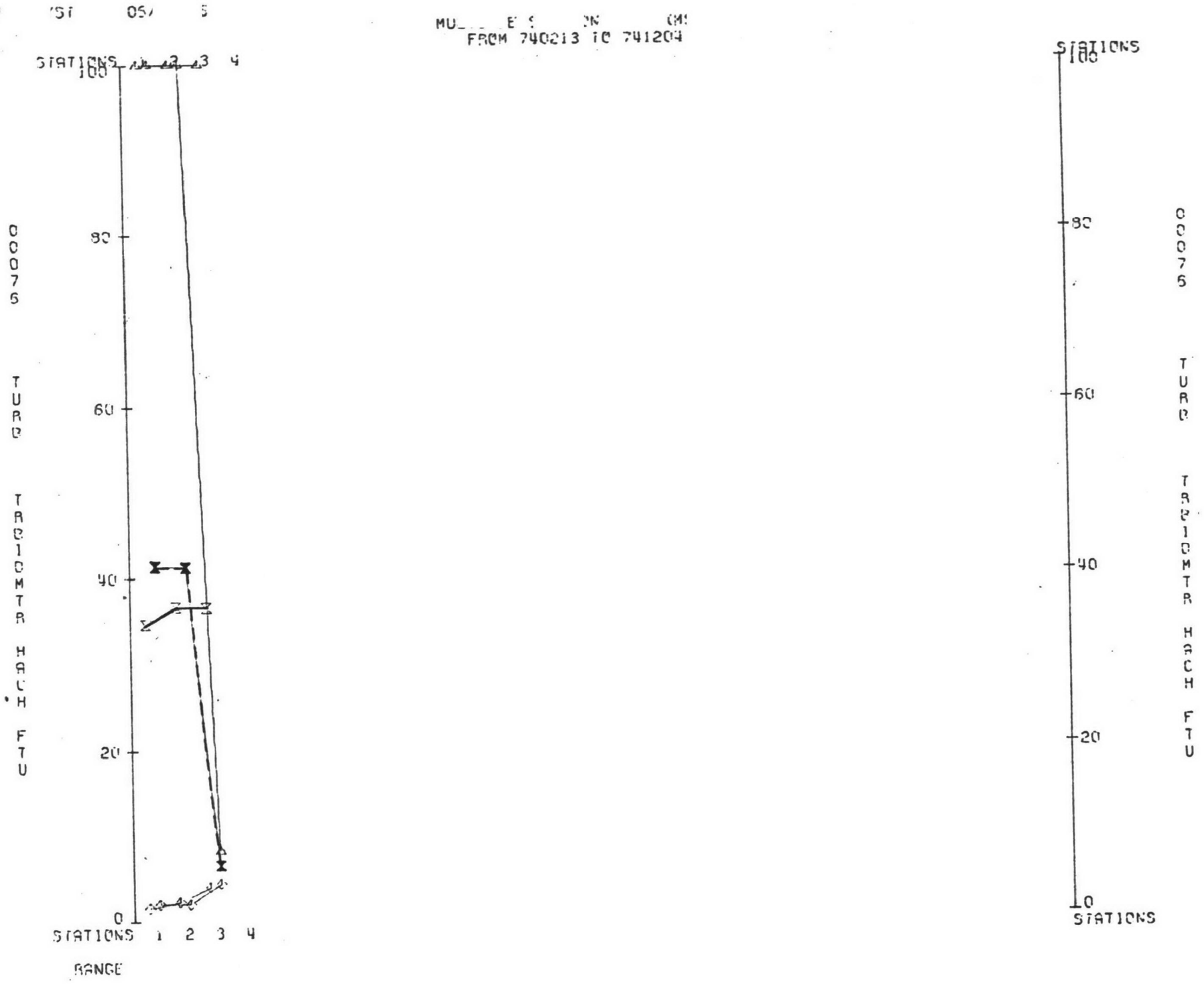
MULTIPLE STATION PLOT (MSP)
FROM 740213 TO 740911

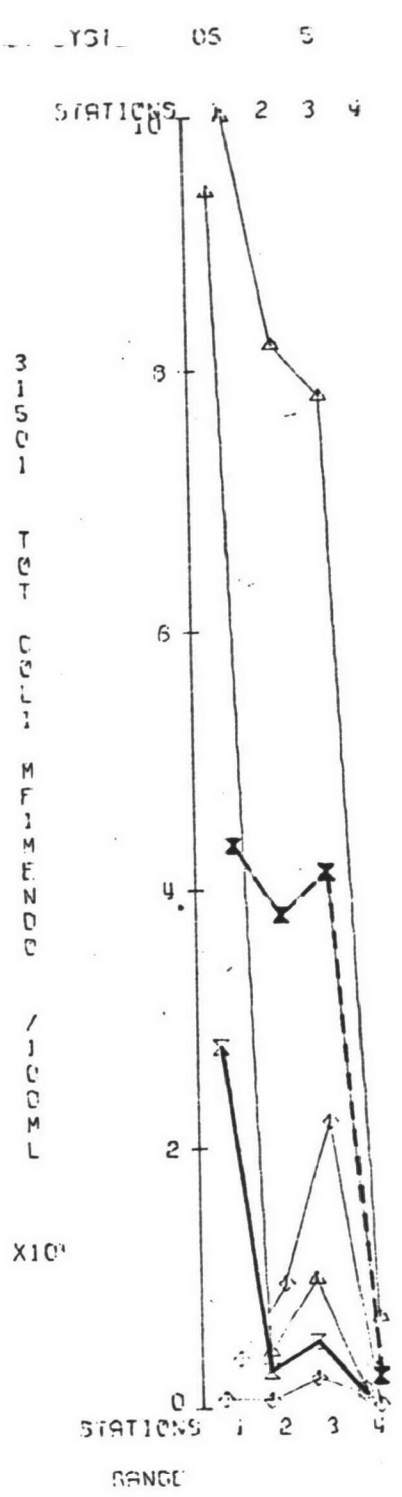




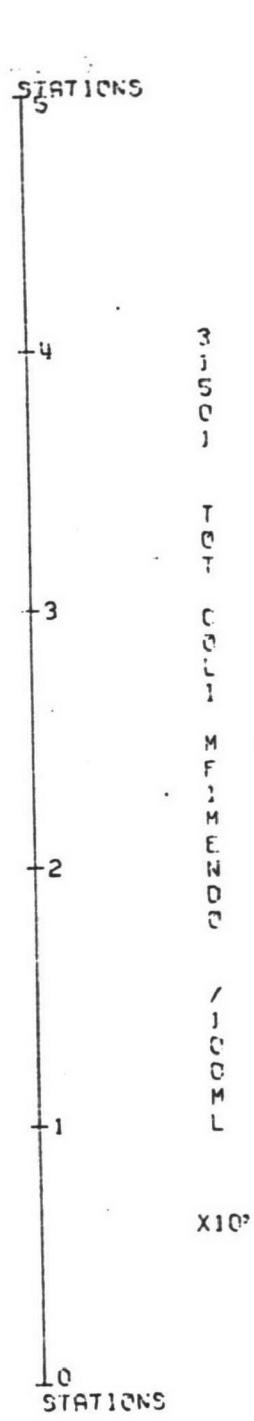

STATIONS 1 2 3 4
100
80
60
40
20
0
00301
0 0
SATUR PERCENT
STATIONS 1 2 3 4
RANGE


STATIONS
100
80
60
40
20
0
00301
0 0
SATUR PERCENT
STATIONS


TOP ST OS/ S
MU_ _ E S ON (MI
FROM 740213 TO 741204
STATIONS 1 2 3 4
100
80
60
40
20
0
0076 TURB TRBIDMTR HACH FTU
STATIONS 1 2 3 4
RANGE
STATIONS
100
80
60
40
20
0
STATIONS
0076 TURB TRBIDMTR HACH FTU



MULTIPLE STATION [illegible] (MSF)
FROM 740130 TO 741204



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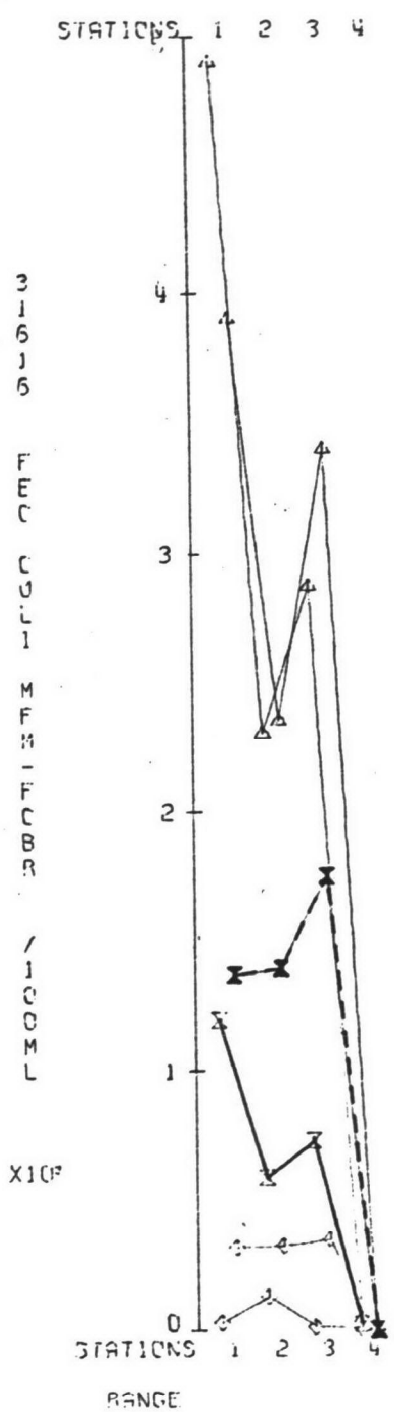
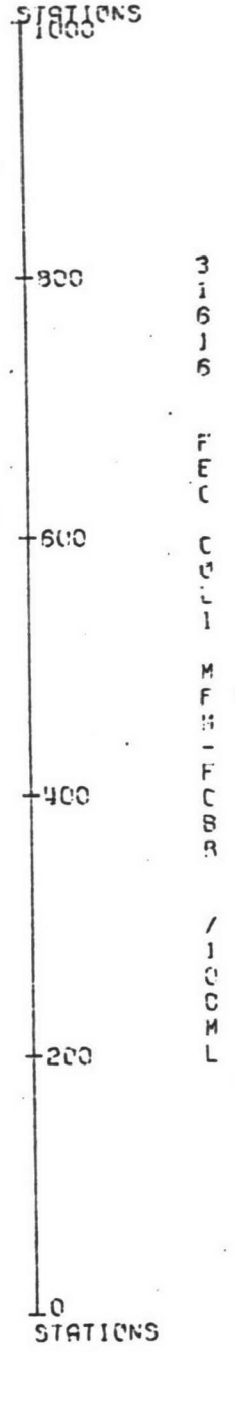
MULTIPLE STATION PLOT (MSP)
FROM 740130 TO 741204





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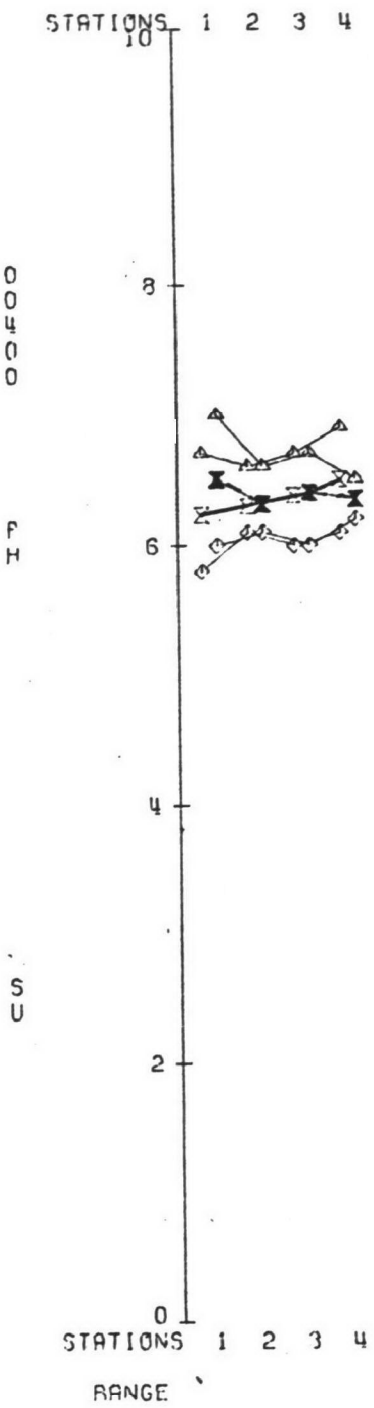
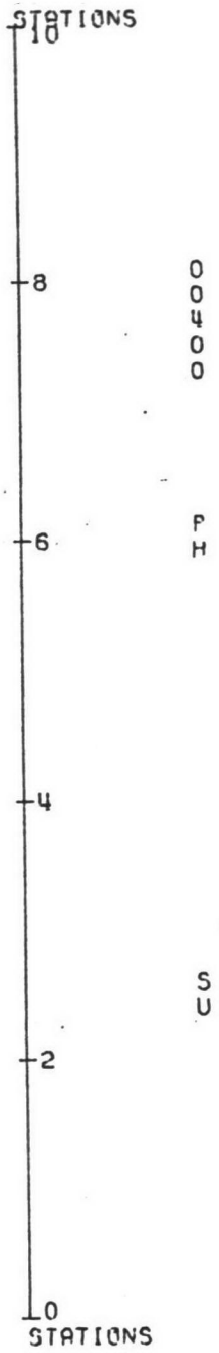
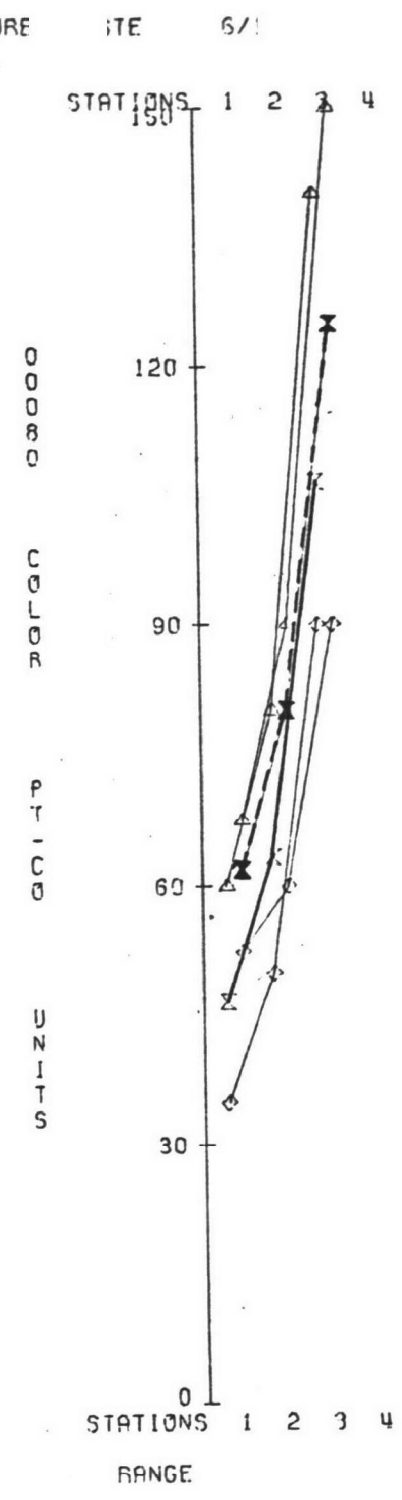
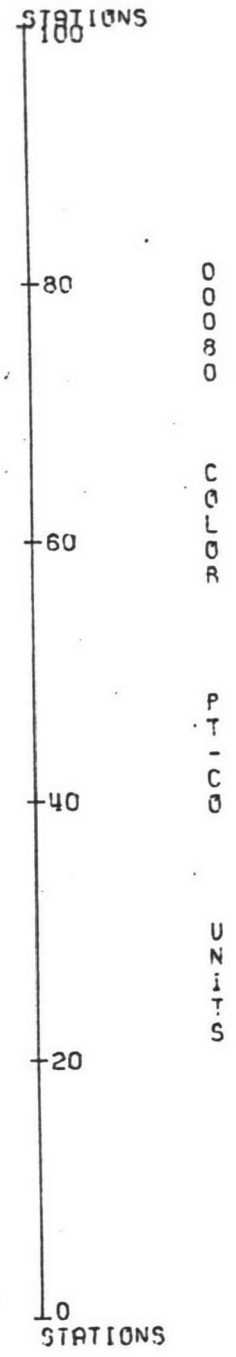
MULTIPLE STATION TEST (MS..
FROM 740130 TO 741204



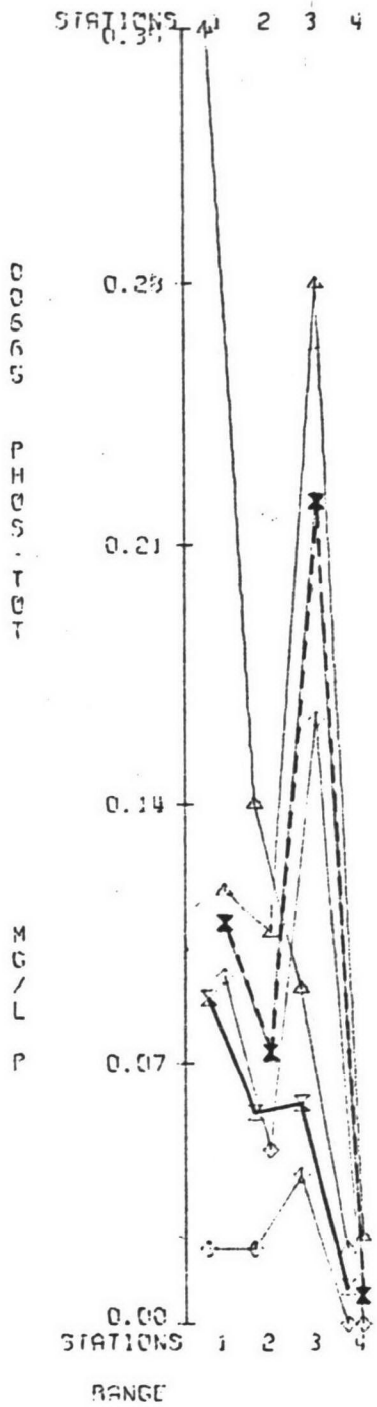


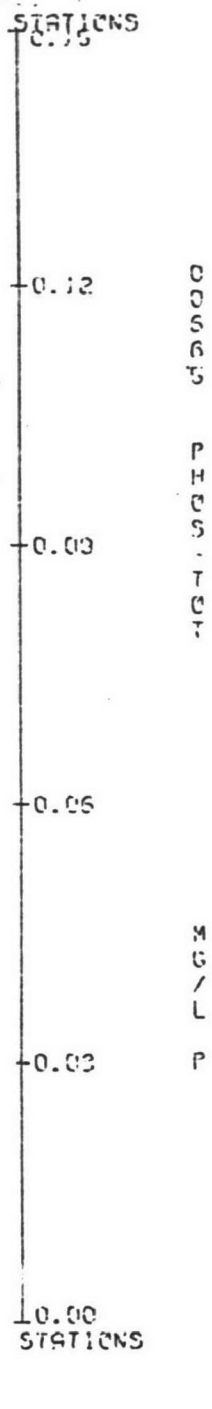

ORE STE 67
FROM 740213 TO 741204
STATIONS 1 2 3 4
150
120
90
60
30
0
00080 COLOR PT-CO UNITS
STATIONS 1 2 3 4
RANGE

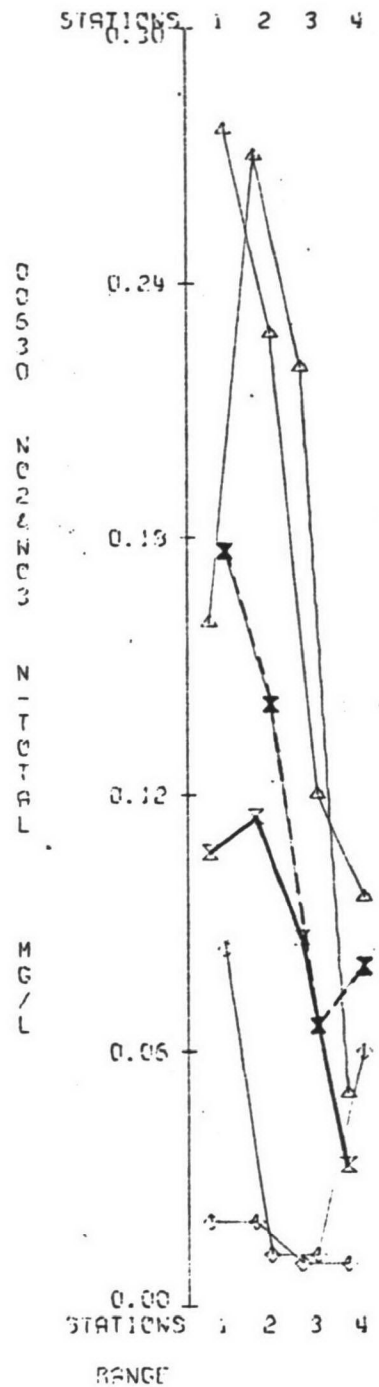

STATIONS
100
80
60
40
20
0
00080 COLOR PT-CO UNITS
STATIONS

S S1 75

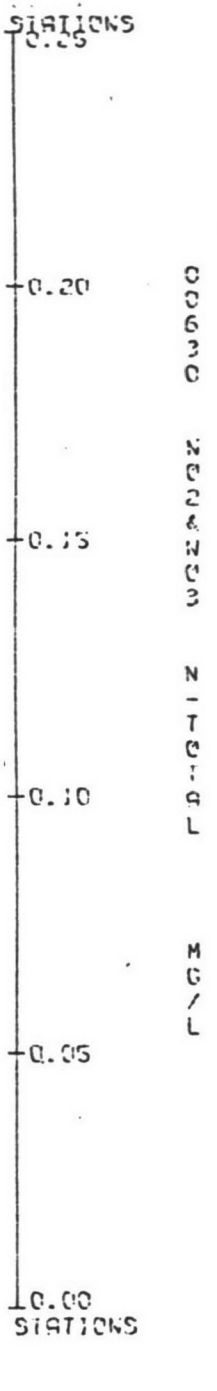
FROM 740130 TO 741204



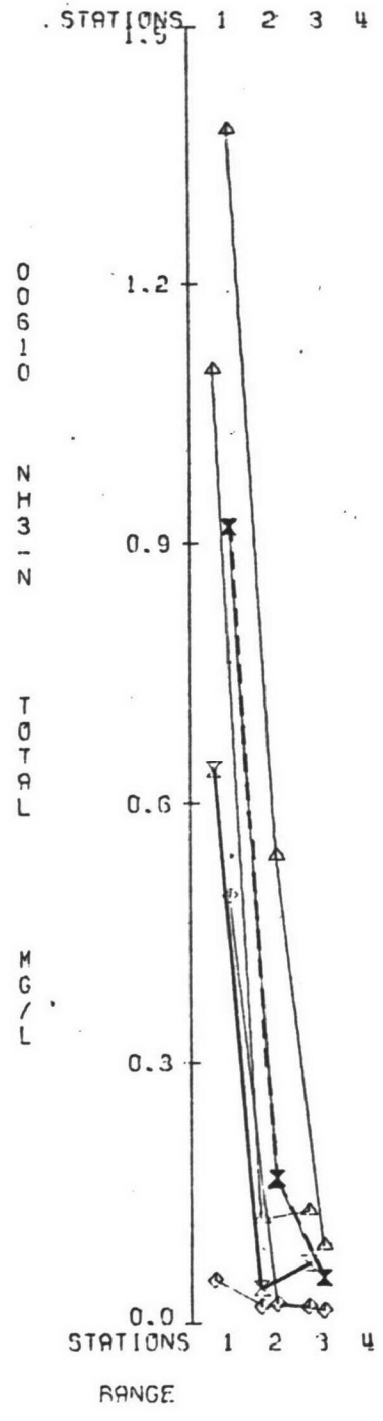


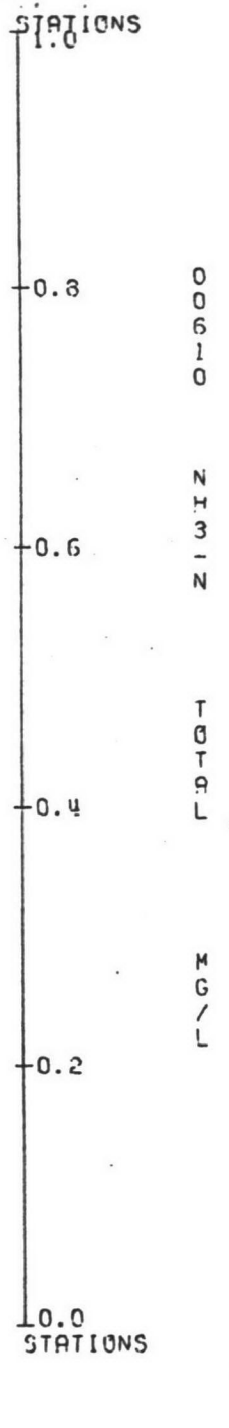


PL TIC DT
FROM 740130 TO 741204

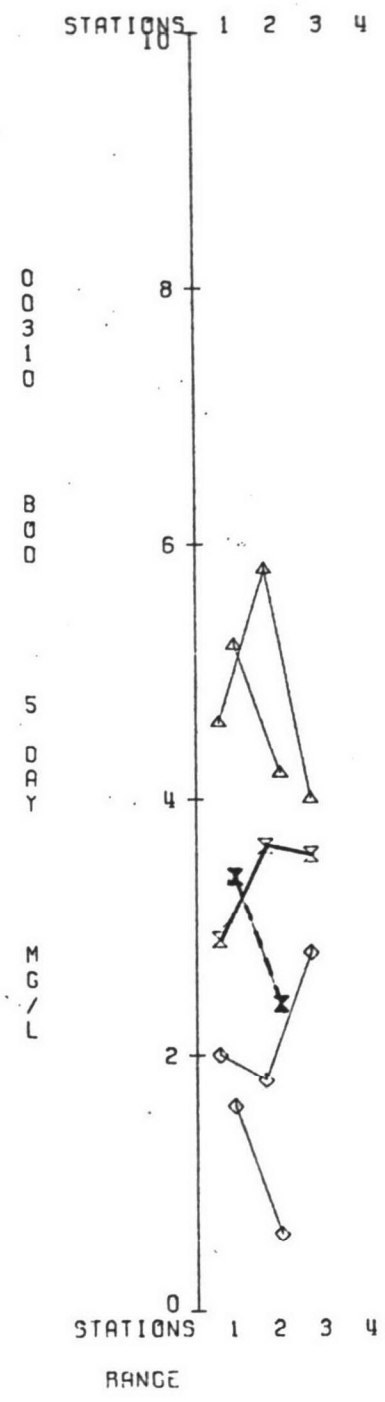


LTI ITA PLC SP)
FROM 740213 TO 741204

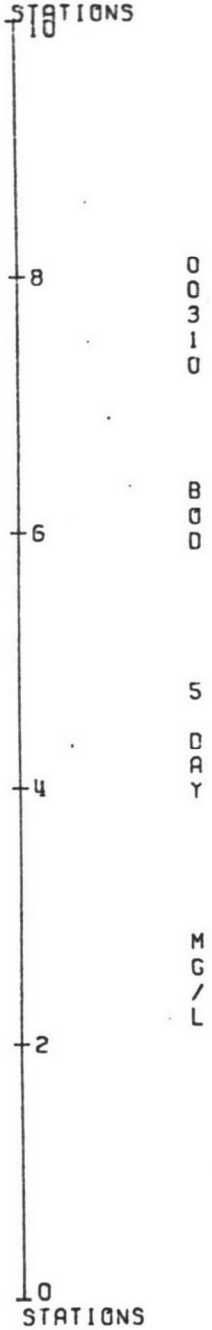




PLE TIO IT
FROM 740213 TO 740911



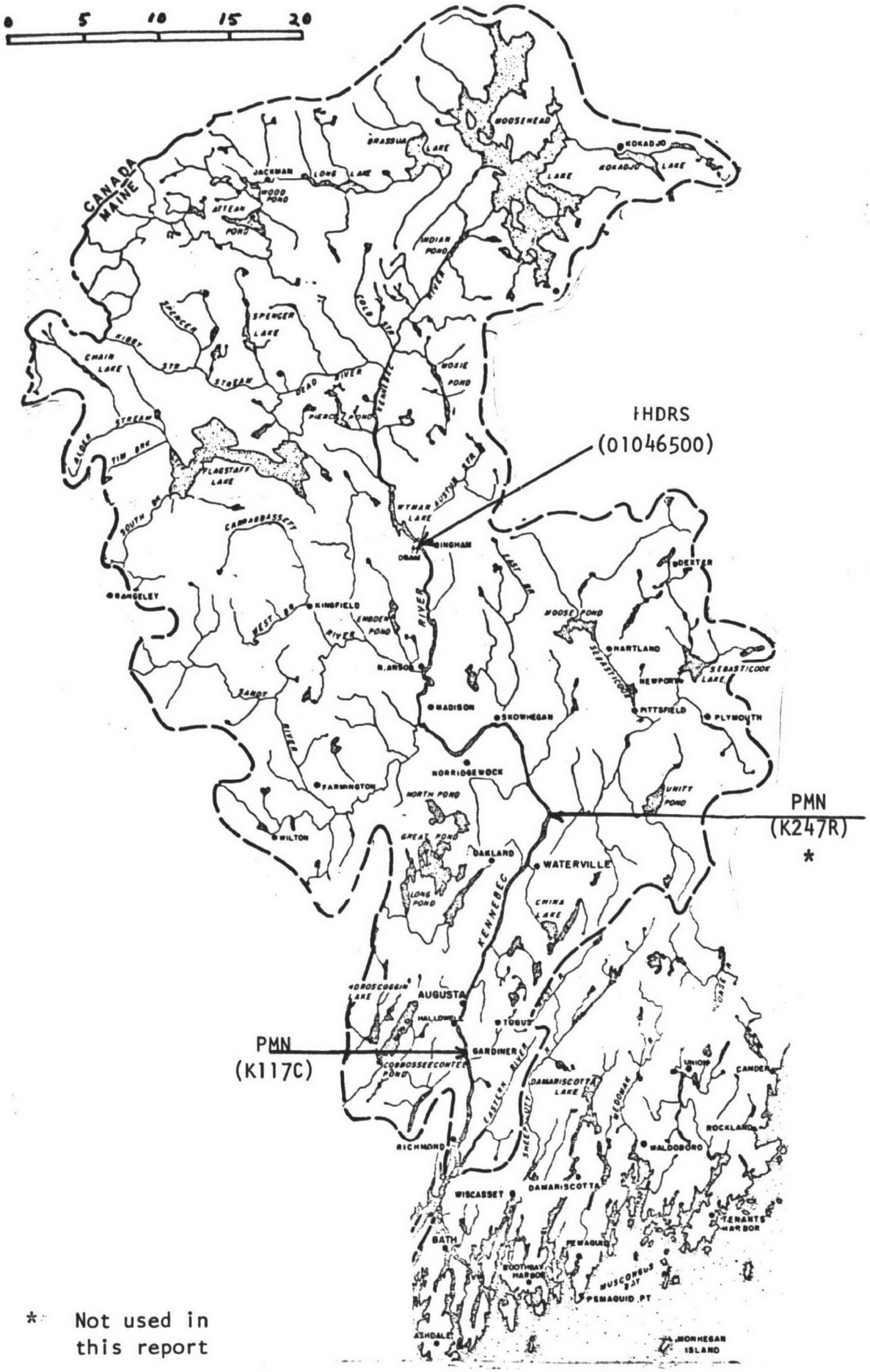
RANGE



3.12 KENNEBEC RIVER BASIN (MAINE)

The headwaters of the Kennebec River are of pristine quality and become gradually poorer in quality as they flow along the main stem river through Waterville and Augusta. Coliform bacteria and pH are the only water quality standards for which monitoring data has indicated violations. These are attributable to insufficiently treated pulp and paper production wastewaters and domestic sewage discharges in both Waterville and Augusta.

A wide range of concentrations of coliform bacteria and phosphorus between the relatively clean waters of the Kennebec River at Bingham (Plot Station No. 2) and at Gardiner (Plot Station No. 1) is evident.



* Not used in this report

KENNEBEC RIVER BASIN

MAINE

SUMMARY OF WATER QUALITY VIOLATIONS

Basin Name (State) (No. of Stations Sampled)	Water Quality Parameter	Class B Standards *		Number of Violations	Number of Values	Percent Violations
		Maximum	Minimum			
Kennebec River (Maine) (2)	Water Temperature	28.79°C		0	17	
	Dissolved Oxygen		5.0 mg/l	0	11	
	Dissolved Oxygen Saturation Percent		75%	NOT RUN		
	Total Coliforms	300/100 ml		2	12	16%
	Fecal Coliforms	60/100 ml		6	17	35%
	pH	8.5	6.0	1	17	6%
Total for Basin				9	74	12%

* In marine waters criteria are for Class SB standard.

KENNEBEC RIVER STATIONS

Plot Station Number	Station Location	Map Station Number
1.	Kennebec River at Gardiner, Maine	PMN K-117C
	REFERENCE STATION	
2.	Kennebec River at Bingham, Maine	I.H.D.R.S. 01046500

PLOT LEGEND

Left Axis ——————— = April to September

Right Axis — — — — — = October to March

⧖ = Mean Values

⧗ = Mean Values

△ = Maximum Values

◇ = Minimum Values

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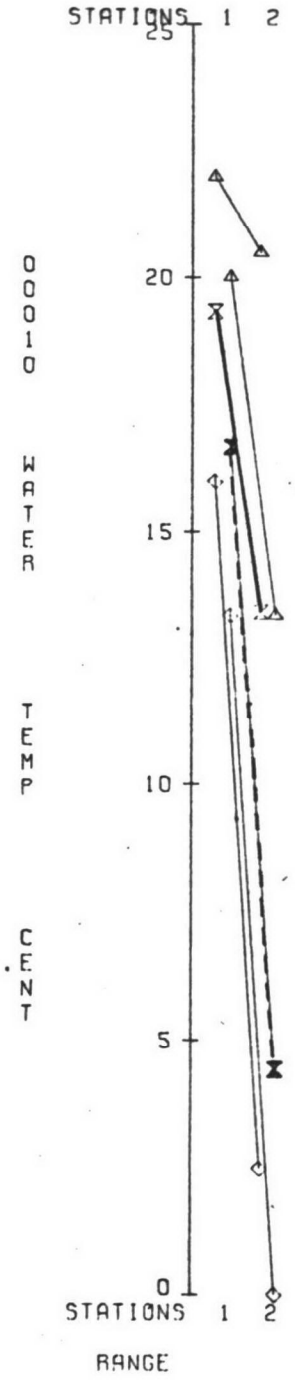
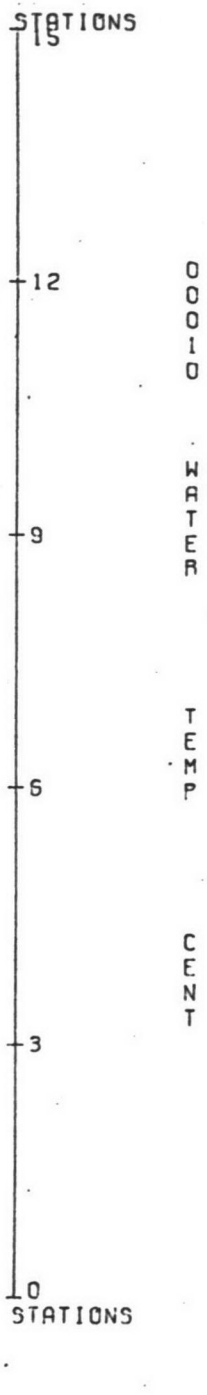
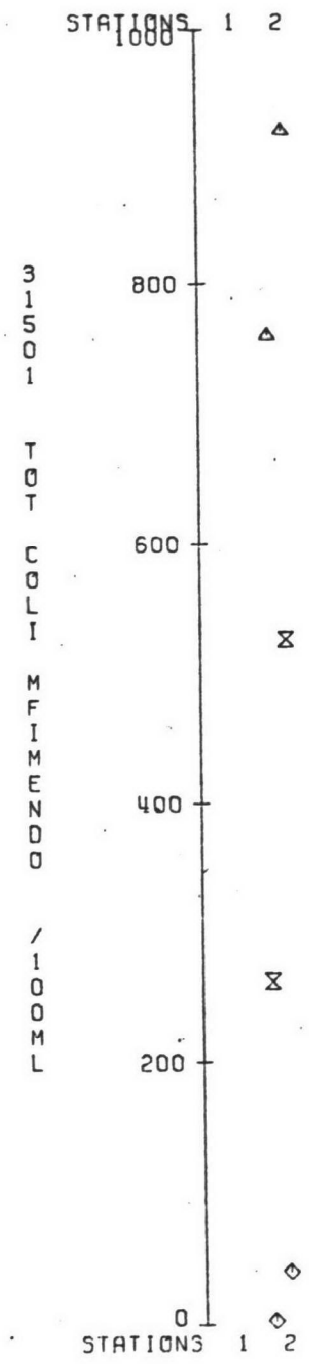
MULTIPLE STATION PLOT (MSP)
FROM 740123 TO 741218



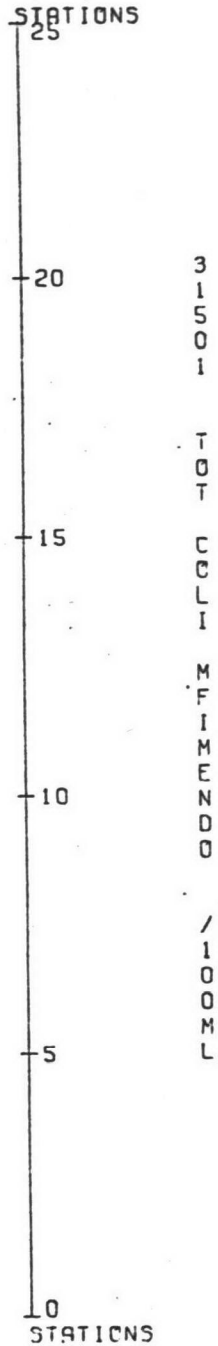


STORET SYSTEM 06/12/75

MULTIPLE STATION PLOT (MSP)
FROM 740123 TO 741218



RANGE



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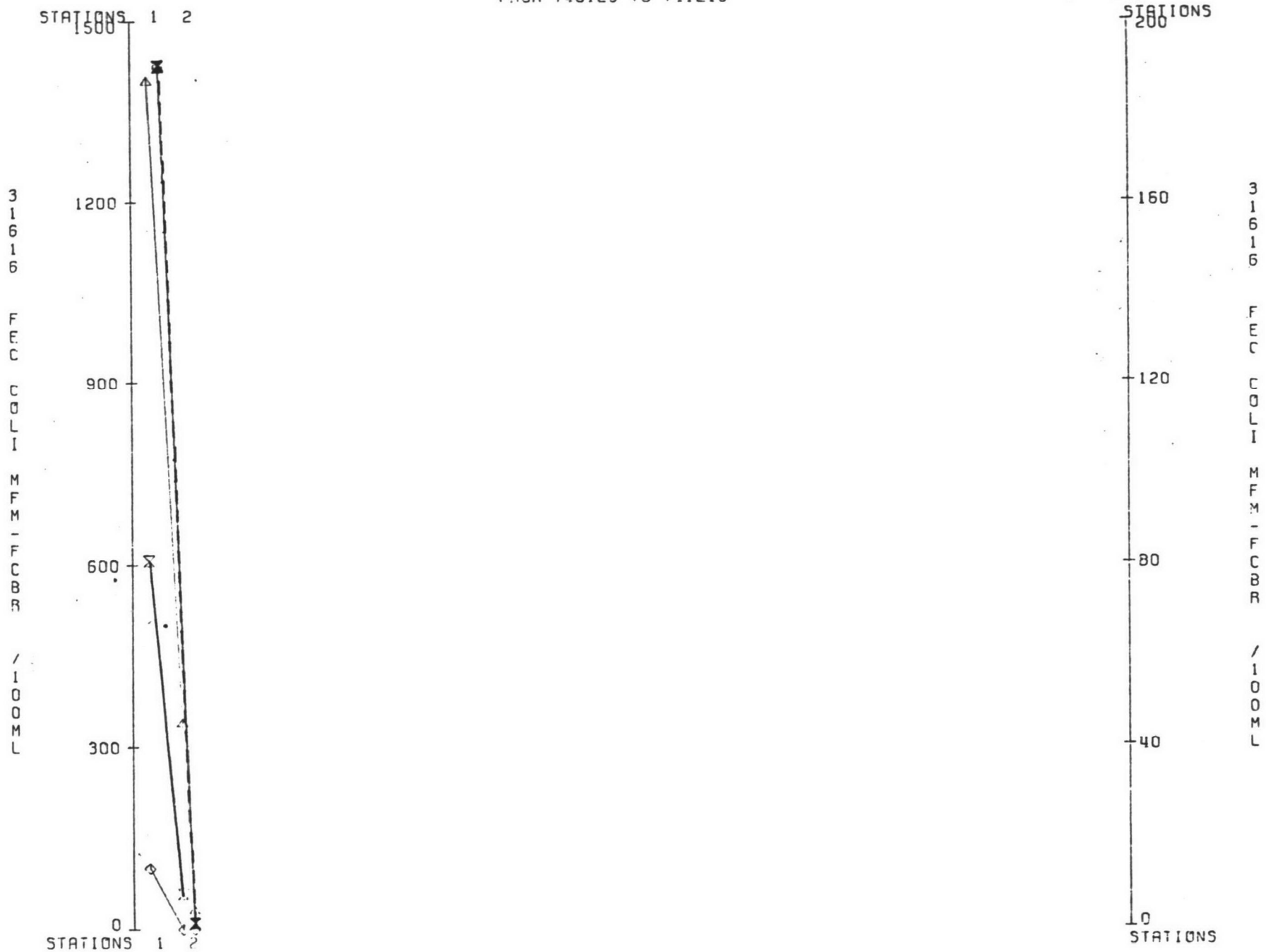
MULTIPLE STATION PLOT (MSP)
FROM 740123 TO 741218



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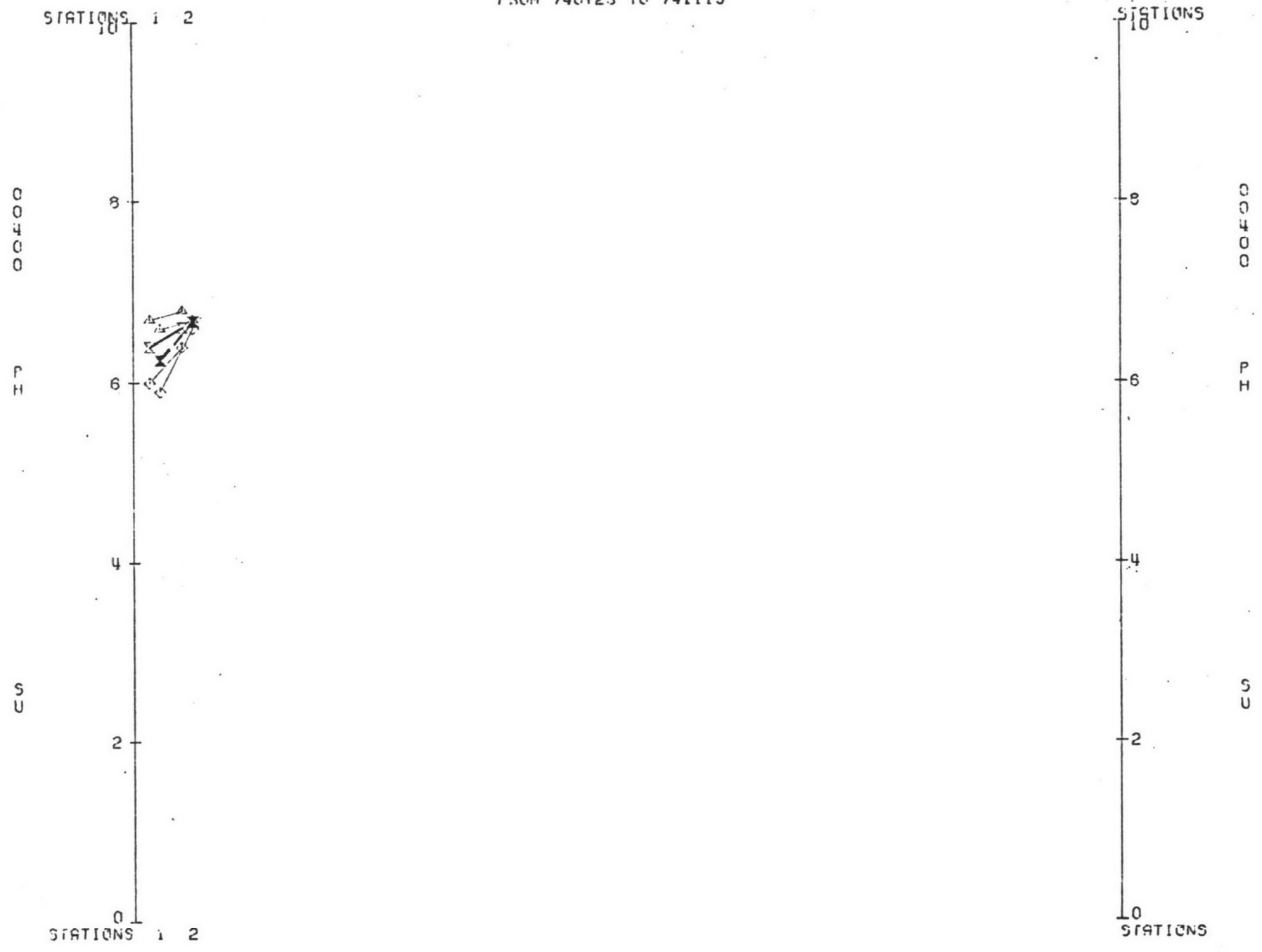
MULTIPLE STATION PLOT (MSP)
FROM 740123 TO 741119



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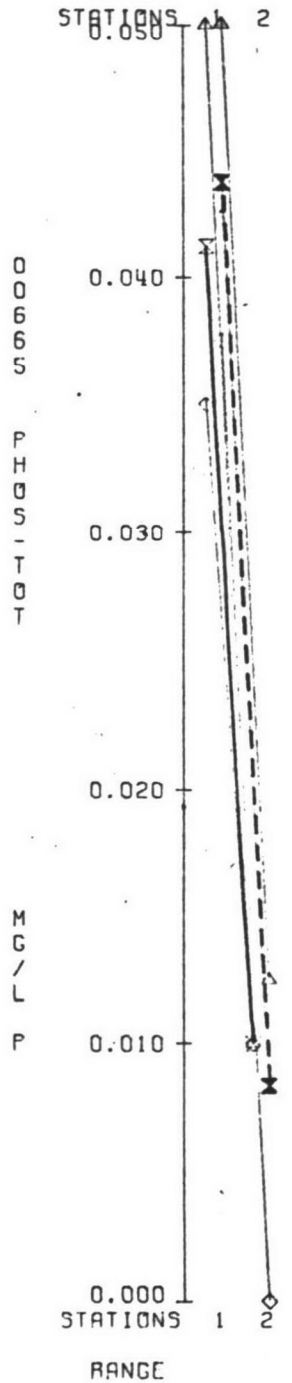
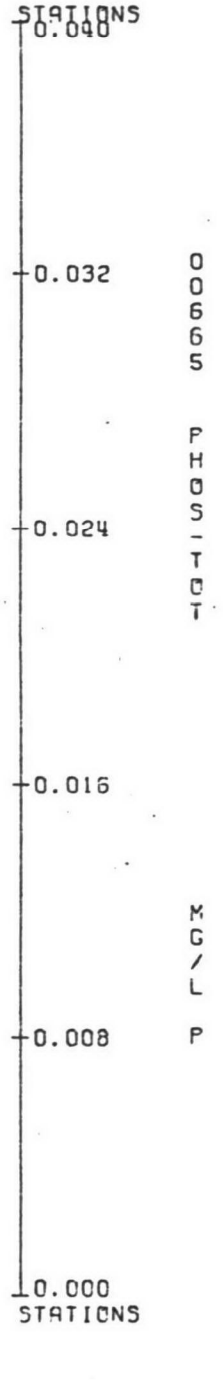
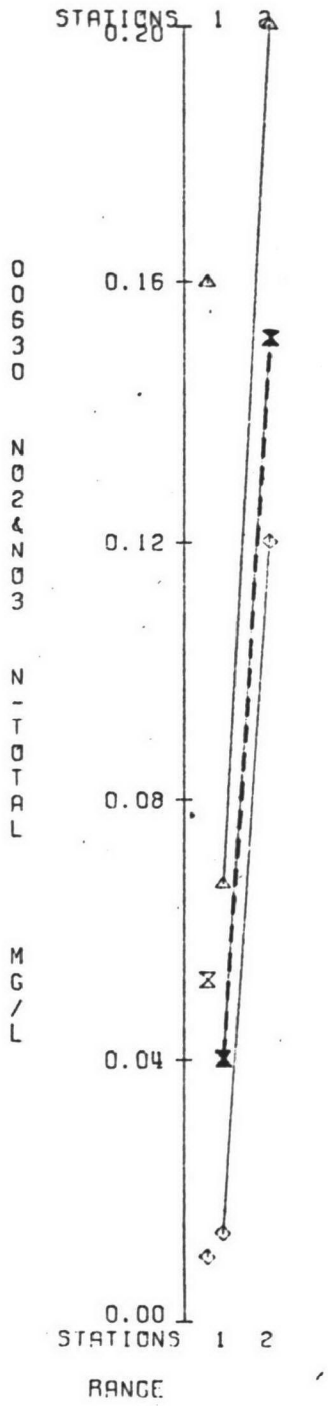
MULTIPLE STATION PLOT (MSP)
FROM 740220 TO 741119

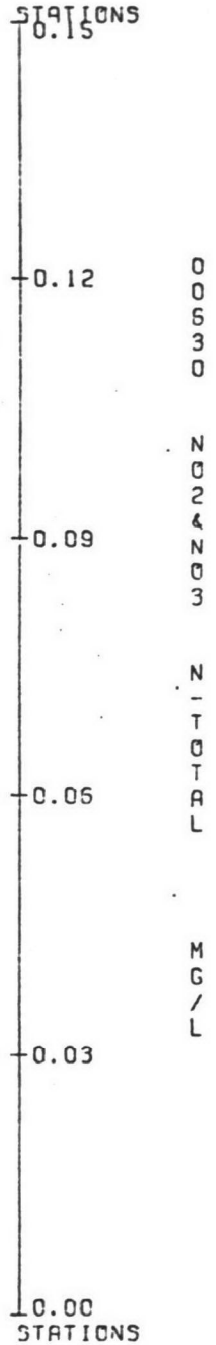




RANGE

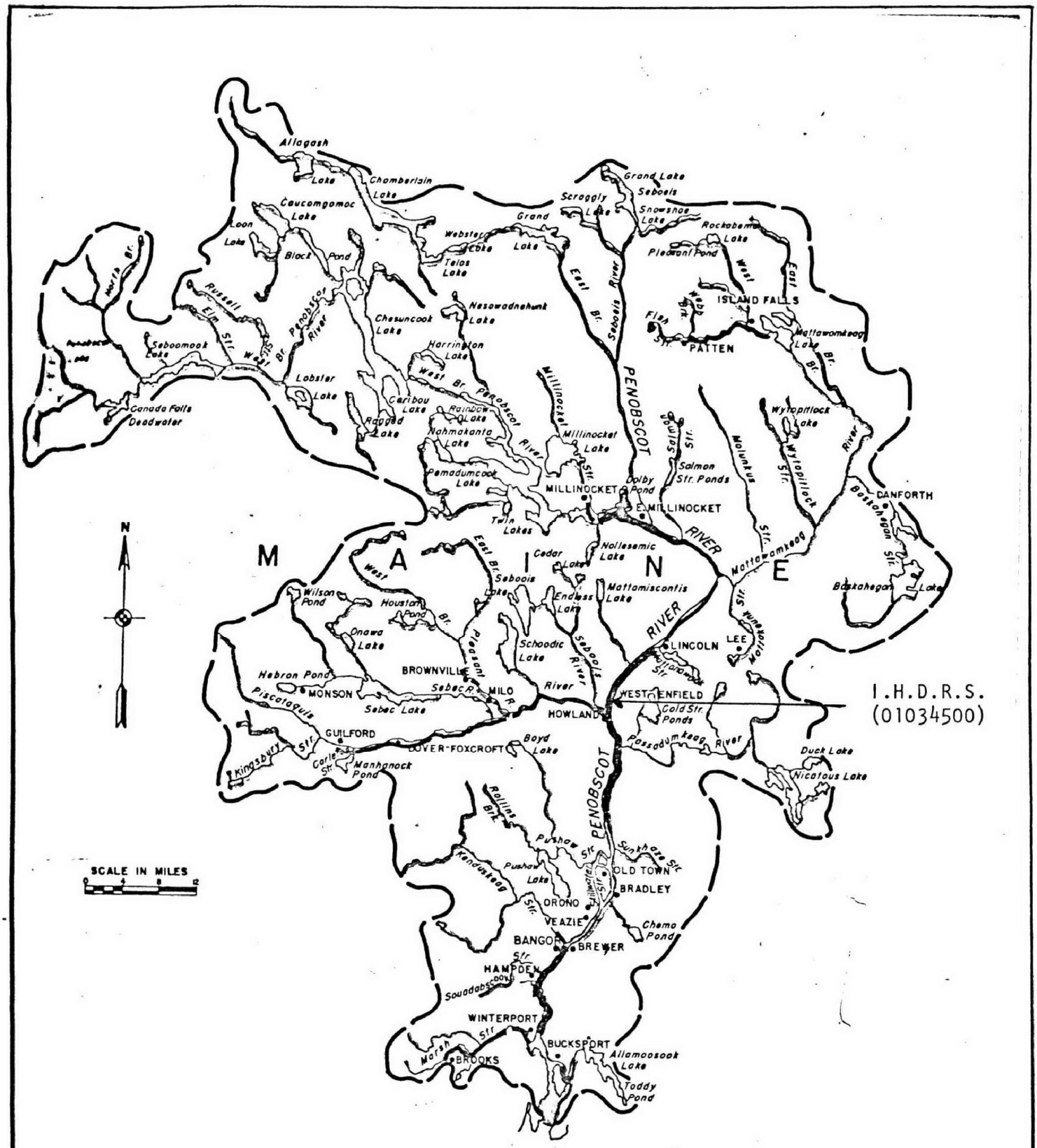
MULTIPLE STATION PLOT (MSP)
FROM 740220 TO 741119





3.13 PENOBSCOT RIVER BASIN

The Penobscot River drains a complex network of lakes in northern Maine and runs 74 miles to the ocean at Penobscot Bay. The only Class "B" standards violations at this station are for total and fecal coliforms. These violations are caused by untreated municipal and pulp and paper mill discharges.



PENOBSCOT RIVER

BASIN

MAINE

SUMMARY OF WATER QUALITY VIOLATIONS

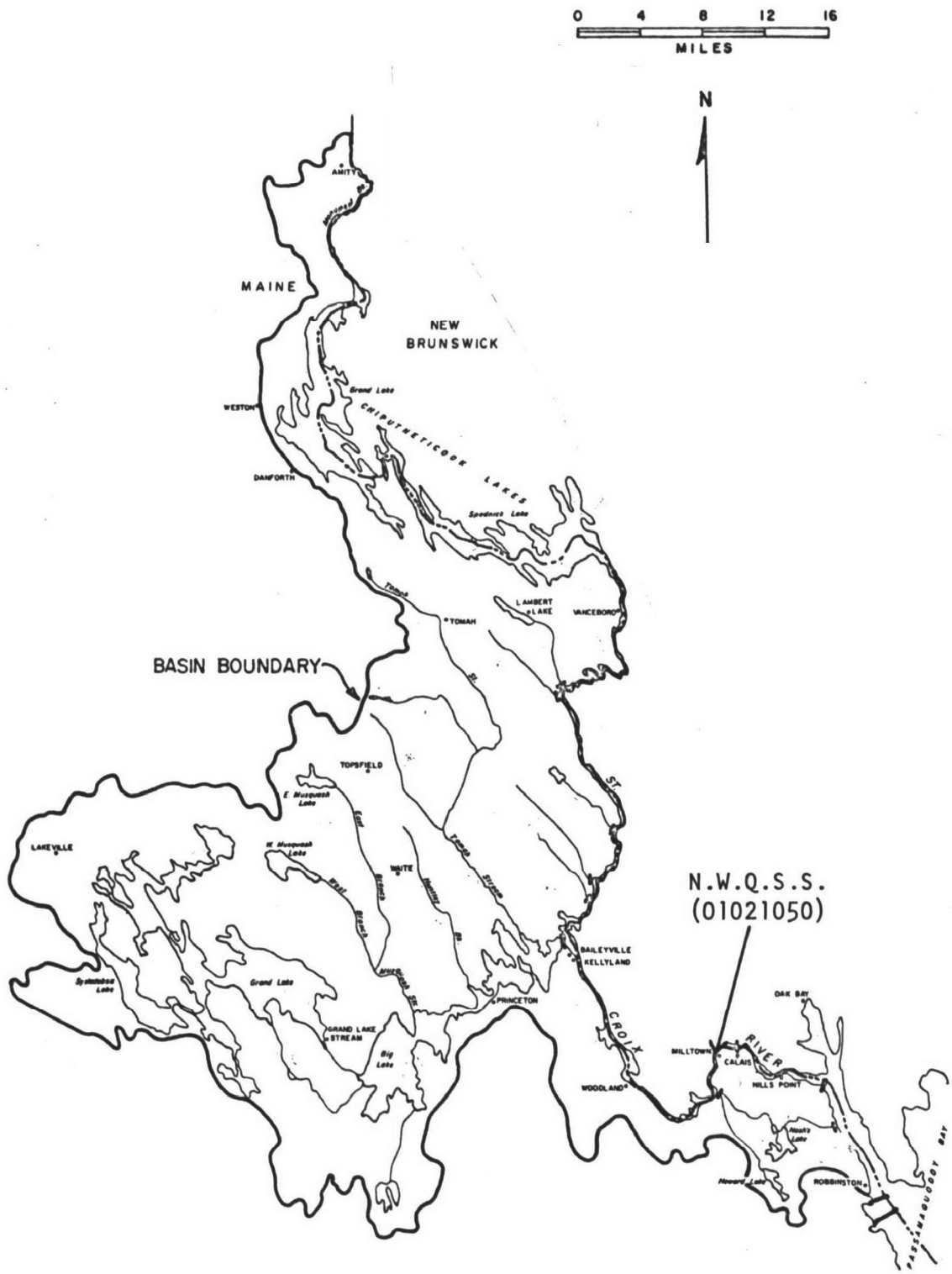
Basin Name (State) (No. of Stations Sampled)	Water Quality Parameter	Class B Standards *		Number of Violations	Number of Values	Percent Violations
		Maximum	Minimum			
Penobscot River (Maine) (1)	Water Temperature	28.7 °C		0	9	0%
	Dissolved Oxygen		5.0 mg/l	0	9	0%
	Dissolved Oxygen Saturation Percent		75%	0	0	0%
	Total Coliform	300/100 ml		12	12	100%
	Fecal Coliform	60/100 ml		8	12	73%
	pH	8.5	6.0	0	11	0%
Totals for Basin				20	53	38%

* In marine waters criteria are for Class SB standard.

3.14 ST. CROIX RIVER BASIN

The St. Croix River drains the Chiputneticook Lakes and forms the Maine - Canadian border for 77 miles before it meets the ocean at Calais, Maine.

The Georgia - Pacific Company paper mill in Woodland, Maine, the basin's only major industrial discharger, has traditionally had an enormous negative impact on water quality in the lower segment of the river. Color, turbidity, and biochemical oxygen demand levels are high due to log storage and process waste discharge. Dissolved oxygen standards are violated in the summer when river flow rates are low. Total and fecal coliform standards are violated by the discharges of the mill and combined sewer overflows in Milltown, Maine.



SAINT CROIX RIVER BASIN

MAINE

TABLE 5.14

1974

SUMMARY OF WATER QUALITY VIOLATIONS

Basin Name (State) (No. of Stations Sampled)	Water Quality Parameter	Class B Standards *		Number of Violations	Number of Values	Percent Violations
		Maximum	Minimum			
St. Croix River	Water Temperature	28.79°C		0	17	0%
(Maine) (1)	Dissolved Oxygen		5.0 mg/l	5	17	29%
	Dissolved Oxygen Saturation Percent		75%	NOT	RUN	
	Total Coliforms	300/100 ml		18	18	100%
	Fecal Coliforms	60/100 ml		4	17	23%
	pH	8.5	6.0	0	17	0%
Totals for Basin				27	86	31%

* In marine waters criteria are for Class SB standard

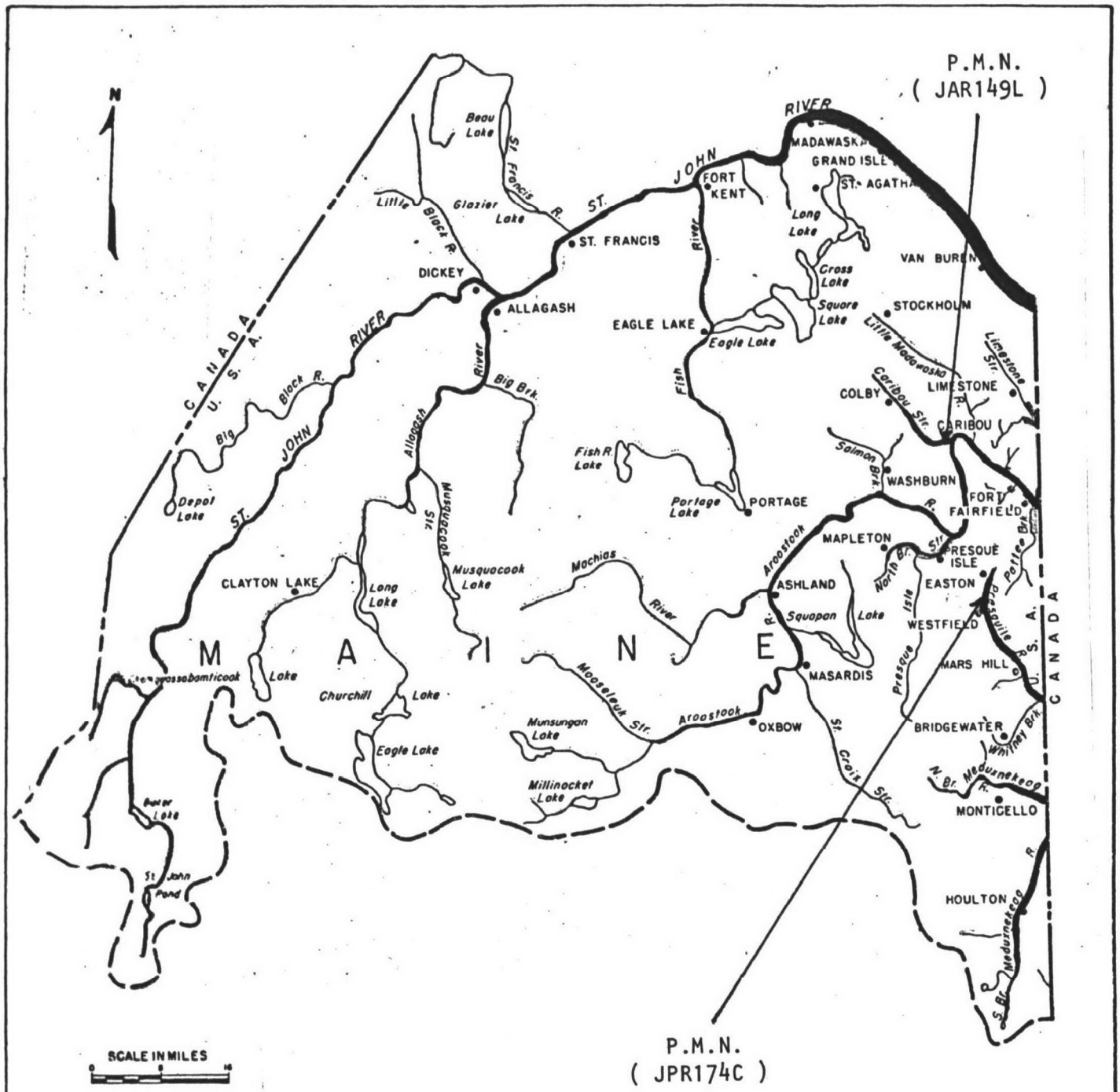
3.15 ST. JOHN RIVER DRAINAGE AREA

The northern tip of Maine is drained by the St. John River Basin. The St. John River and the Aroostook River both originate in Maine and flow eastward into Canada. The basin's industry is predominately logging and potato and starch processing.

The water quality of the main stem of the St. John River is good above Edmundston and Madawaska. There the river receives wastes from two paper mills, one of which is a major industrial discharger, and raw domestic waste discharges.

On the Aroostook River the major industry causing water quality problems is potato processing. The station on the Aroostook River at Caribou shows the total coliform levels violating Class B Standards 100% of the time and fecal coliforms 33% of the time.

At a station on the Prestile Stream there are total coliform, fecal coliform and pH violations 17% of the time reflecting both municipal sewage discharges and the potato processing waste discharges.



SAINT JOHN RIVER BASIN
MAINE

1974

SUMMARY OF WATER QUALITY VIOLATIONS

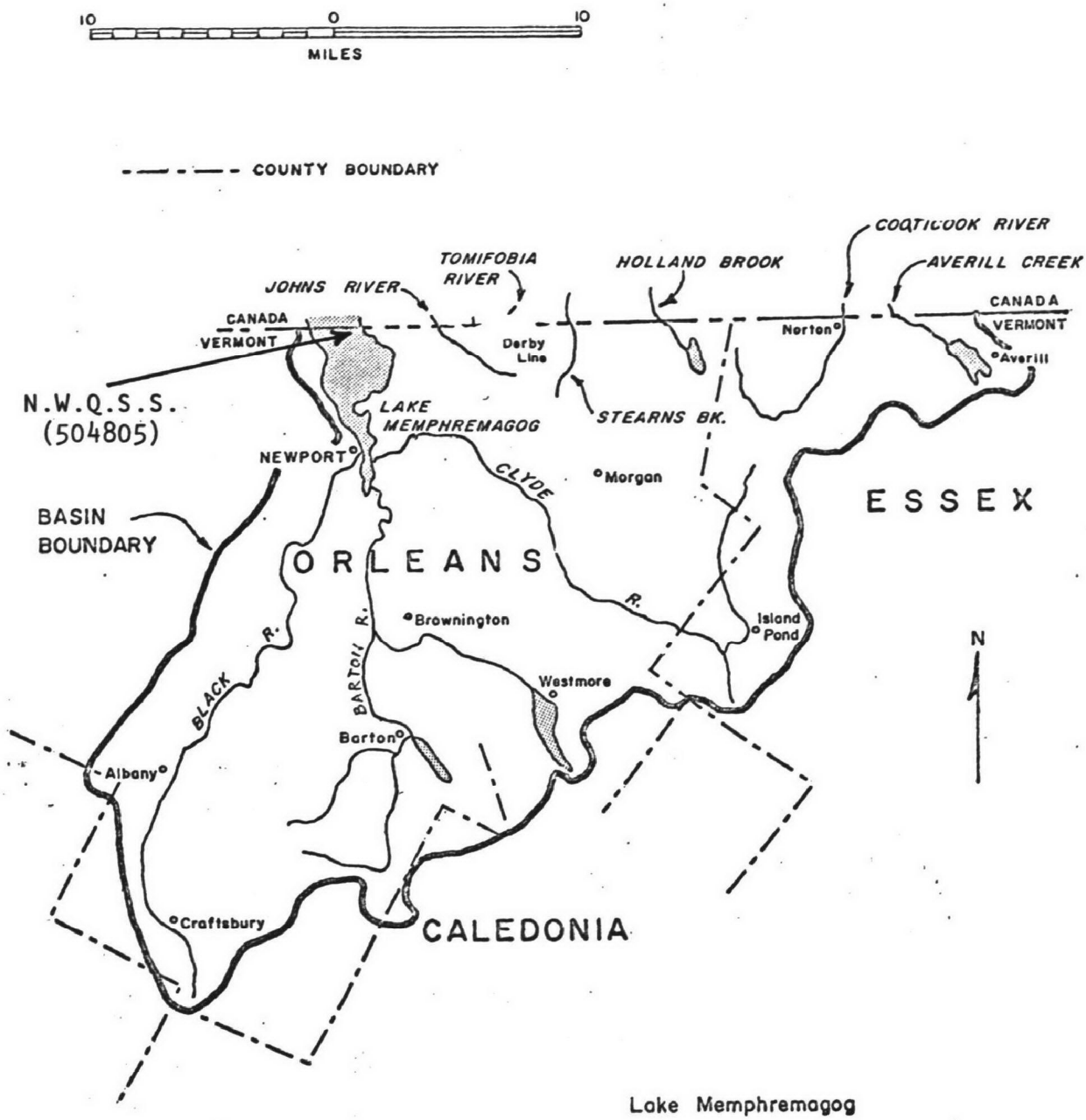
Basin Name (State) (No. of Stations Sampled)	Water Quality Parameter	Class B Standards * Maximum	Class B Standards * Minimum	Number of Violations	Number of Values	Percent Violations
St. John River	Water Temperature	28.7°C		0	12	0%
(Maine) (2)	Dissolved Oxygen		5.0 mg/l	0	12	0%
	Dissolved Oxygen Saturation Percent		75%	NOT	RUN	
	Total Coliforms	300/100 ml		7	12	58%
	Fecal Coliforms	60/100 ml		3	12	25%
	pH	8.5	6.0	1	12	8%
Total for Basin				11	60	18%

* In marine waters criteria are for Class SB standard.

3.16 LAKE MEMPHREMAGOG DRAINAGE AREA

Lake Memphremagog is located on the border between Vermont and Canada. It has a surface area of 36.4 square miles, a mean depth of 51 Feet, and a drainage area of 650.5 square miles. Within the United States, however, the surface area is 9.7 square miles with a mean depth of 21 feet and a drainage area of 477.1 square miles. Its major tributaries in the United States are the Black, Barton and Clyde Rivers, all of which are Class B waters.

The water quality problems in the lake are color and nutrients. Color is a state standard and is violated 100% of the time. This is due to high turbidity from land runoff and from excessive algal growth. Algal growths have been a result of the high levels of nutrients (from rural runoff) present in the lake. It has been estimated by the Vermont Department of Water Resources that the annual input to the lake is 95,070 pounds of phosporous and 2,038,210 pounds of nitrogen.



LAKE MEMPHREMAGOG

VERMONT

TABLE 3.13

1974

SUMMARY OF WATER QUALITY VIOLATIONS

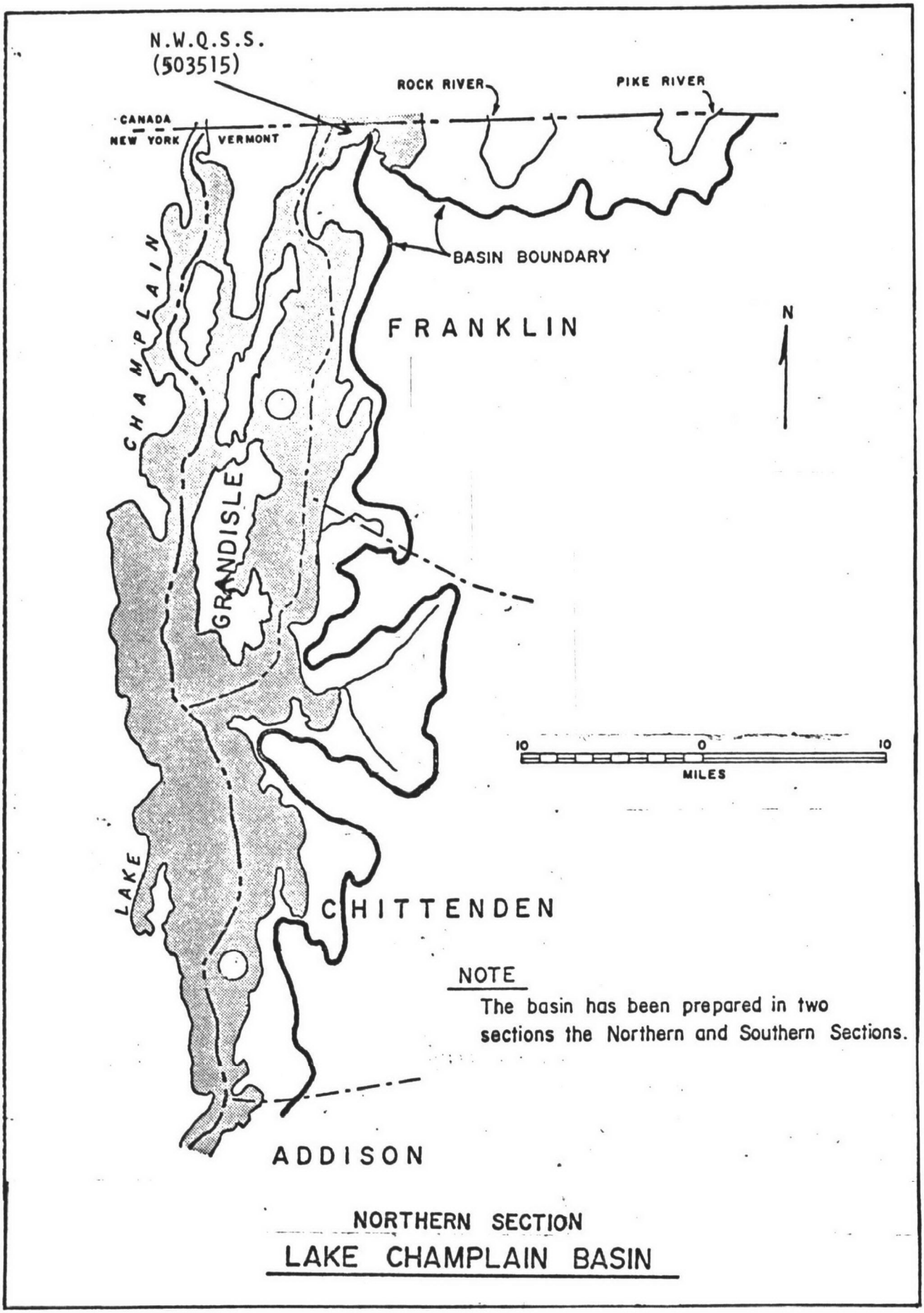
Basin Name (State) (No. of Stations Sampled)	Water Quality Parameter	Class B Standards *		Number of Violations	Number of Values	Percent Violations
		Maximum	Minimum			
Lake Memphremagog	Dissolved Oxygen		6.0 mg/l	1	17	6%
(Vermont) (1)	Turbidity J.T.U.	25		0	4	0%
	pH	8.0	6.5	0	8	0%
	Color	25		2	2	100%
	Total Coliform	500		0	3	0%
	Fecal Coliform	200		0	2	0%
Totals for Basin				3	36	8%

* In marine waters criteria are for Class SB standard

3.17 LAKE CHAMPLAIN DRAINAGE AREA

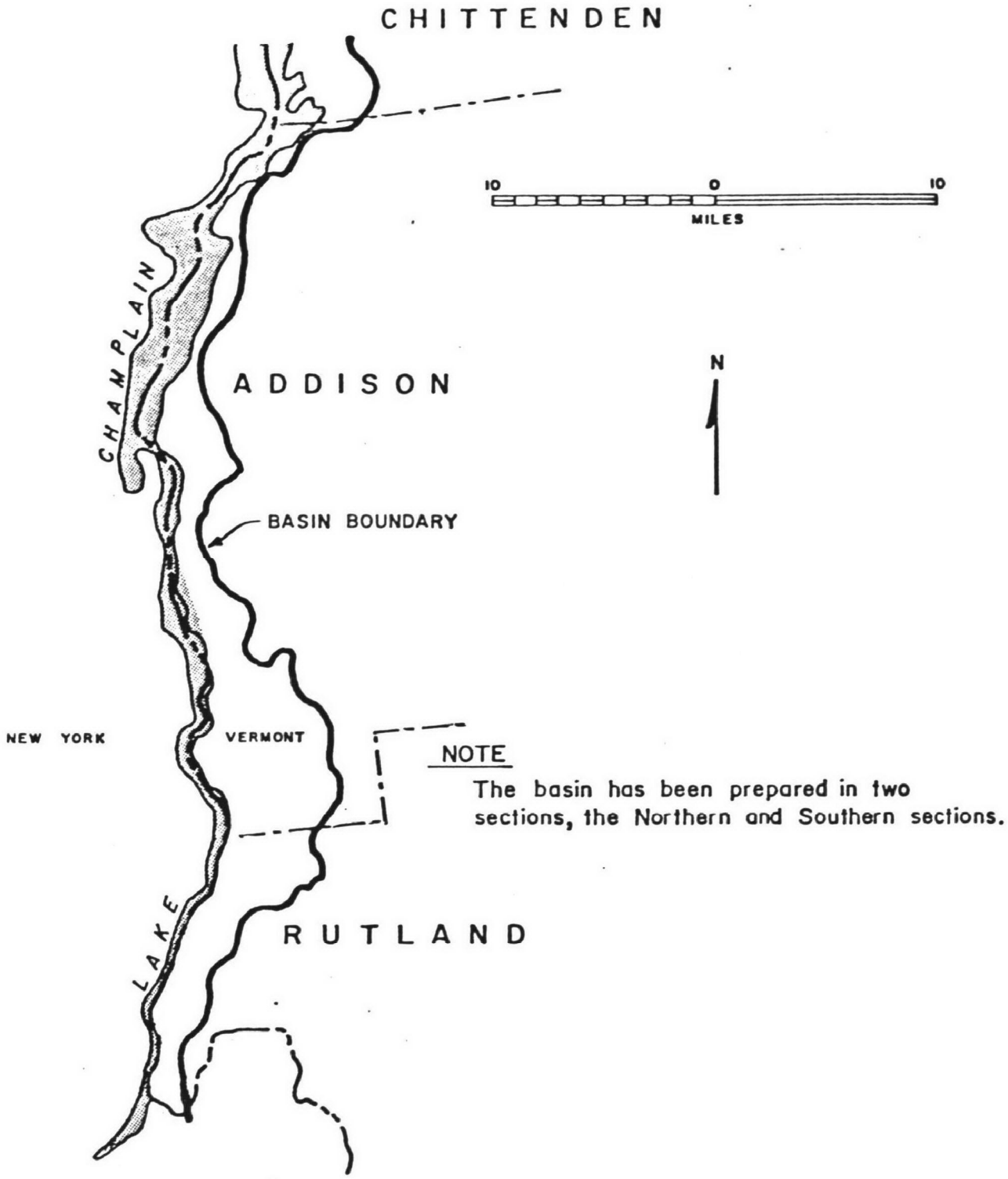
The N.W.Q.S.S. Station on Lake Champlain is in Missioquoi Bay on the northern end of the lake. The Missioquoi River is the major tributary to the bay.

Sediments and algal blooms, caused by nutrients from municipal discharges and rural runoff, are responsible for violations of the state's color standard.



NORTHERN SECTION

LAKE CHAMPLAIN BASIN



SOUTHERN SECTION

LAKE CHAMPLAIN BASIN CLASSIFICATION

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1974

SUMMARY OF WATER QUALITY VIOLATIONS

Basin Name (State) (No. of Stations Sampled)	Water Quality Parameter	Class B Standards *		Number of Violations	Number of Values	Percent Violation
		Maximum	Minimum			
Lake Champlain	Dissolved Oxygen		5.0 mg/l	1	3	33%
(Vermont) (1)	Turbidity J.T.U.	25		0	3	0%
	pH	8.0	6.5	0	3	0%
	Color	25		1	1	100%
	Total Coliform	500		Not Run		
	Fecal Coliform	200		Not Run		
Totals for Basin				2	10	20%

* In marine waters criteria are for Class SB standard.