NIAGARA MOHAWK POWER CORPORATION

POWER AUTHORITY OF THE STATE OF NEW YORK

1975

NINE MILE POINT AQUATIC ECOLOGY STUDIES

LMS Project Nos. 191-031, 032, 033

MAY 1976

LMSE-76/0081&191-033

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May 28, 1976
File: 191-31,32,33

Mr. G.K. Rhode
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Niagara Mohawk Power Corporation
300 Erie Boulevard West
Syracuse, New York 13202

Mr. George T. Berry
General Manager and Chief Engineer
Power Authority of the
State of New York
10 Columbus Circle
New York, New York 10019

Dear Messrs. Rhode and Berry:

In accordance with Niagara Mohawk Power Corporation and the Power Authority of the State of New York's authorization and the Environmental Technical Specifications for Nine Mile Point Nuclear Station Unit 1 (Docket 50-220) and the James A. FitzPatrick Nuclear Power Plant (Docket 50-333), we submit herein a report on the results of the ecological investigations conducted at Nine Mile Point during 1975.

Mr. Thomas E. Pease served as Project Manager for these investigations and Dr. Edythe Humphries as Project Biologist. The report was prepared by our Biological Sciences Section under the direction of Dr. T. Cosper. The field and laboratory studies were conducted by our Oswego Laboratory under the direction of Mr. Robert Williams.

Very truly yours,

Michael J. Skelly

Michael J. Skelly, PH.D

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I. ABSTRACT

Ecological studies conducted in the Nine Mile Point vicinity during 1975 represent the continuing efforts of the Power Authority of the State of New York and Niagara Mohawk Power Corporation to evaluate the effects of thermal discharges from Nine Mile Point power stations on the near-field aquatic ecosystem of Lake Ontario.

The water quality parameters monitored in the lake during 1975 did not fluctuate significantly from the values recorded during 1973 and 1974. Increased chlorides observed at the site are attributed to the Oswego River. Temperature effects of the power station were observed intermittently shoreward of the 60 ft depth contour.

The phytoplankton abundance, species composition, biomass, and chlorophyll *a* data indicate spatial variability and temporal seasonal cycles among which power station impacts are not evident. Similarly, microzooplankton abundance and species composition show no power station impacts. Cluster analyses of the microzooplankton data indicate no consistent dissimilarity between the plume area and the site vicinity.

The macrozooplankton community was dominated by *Leptodora kindtii*, Hydroida, *Gammarus fasciatus*, and various Diptera as sampled at the Nine Mile Point Nuclear Station and James A. FitzPatrick Nuclear Power Plant intakes. The ichthyoplankton community sampled at the intakes consisted mainly of rainbow smelt in spring and alewife in early summer. Fall collections included only a few ichthyoplankters. The benthic and periphytic community was sampled in alternate months and the abundance by species is reported.

The nekton community in the Nine Mile Point vicinity showed lower abundance in 1975 than in 1974. The lake and impingement collections were dominated by alewife; threespine stickleback were second in abundance in impingement collections, while spottail shiner were second in abundance in lake collections.

II. SUMMARY OF FINDINGS AND CONCLUSIONS

A. WATER QUALITY

Water quality parameters analyzed during 1975 showed similar patterns to those values recorded in 1973 and 1974. Exceptions were reductions in the concentrations of copper, iron, potassium, sodium, zinc, silver, aluminum, chromium, mercury, and lead, and an increased value for specific conductance, attributed to the influence to the Oswego River.

The effect of the discharges of the Nine Mile Point Nuclear Station and the James A. FitzPatrick Nuclear Power Plant was evident only in terms of heat additions shoreward of the 60 ft depth contour. Biological activity was the major factor influencing the concentration of the water quality parameters in the Nine Mile Point vicinity. Thermoclines at the 100 ft depth contour were depicted in 16 of the 35 thermal profiles, occurring primarily during the summer months. The relative position and stability of the thermal gradient fluctuated with season and meteorological conditions.

B. PLANKTON

1. Phytoplankton

In the Nine Mile Point vicinity during 1975 the phytoplankton community, defined by phytoplankton abundance and biomass and chlorophyll *a* concentration, was variable in species composition and temporal/spatial distribution, both of which were dependent upon water temperature, solar radiation, and circulation patterns. The lack of a definable spatial pattern in chlorophyll *a* and phytoplankton biomass over the sampling period indicates that there is an interaction of a complex of factors (e.g., hydrodynamic processes, phytoplankton cropping, phytoplankton species composition, stream discharges, etc.), among which power plant effects are not evident.

The chlorophyll *a* data from selected light transmittance levels (50, 25, and 1%) were similar in temporal and spatial patterns to the composite chlorophyll *a* data for the same light levels.

2. Microzooplankton

The species composition and abundance of the microzooplankton community in the Nine Mile Point vicinity varied seasonally during 1975, with rotifers being consistently the numerically abundant taxon. There was no consistently recurring spatial distribution pattern for the cladoceran *Bosmina longirostris*, total rotifers, total copepods or total microzooplankton throughout the 1975 sampling period, suggesting that the microzooplankton community is affected by a number of factors among which power plant effects are not discernible.

3. Macrozooplankton

The entrainment of macrozooplankton at Nine Mile Point Nuclear Station Unit 1 showed seasonal trends similar to those observed in the lake and from previous entrainment collections. Four taxa accounted for the majority of entrained macrozooplankton: Leptodora kindtii, Hydroida (Hydra sp. and Cordylophora caspia), Gammarus fasciatus, and various species of the order Diptera.

The same taxa composed the majority of the macrozooplankton collected from the James A. FitzPatrick Nuclear Power Plant from October to December. Both Gammarus and Leptodora were collected more frequently at night than during the day.

4. Ichthyoplankton

Seventeen species of ichthyoplankton were present in entrainment collections at Nine Mile Point Nuclear Station Unit 1 in 1975. Nine of these species were not collected during 1974. Alewife eggs and larvae were the species most frequently collected in the Nine Mile Point entrainment program; rainbow smelt were the second most numerous ichthyoplankters, repeating the pattern observed in 1974.

Entrainment sampling at the James A. FitzPatrick Nuclear Power Plant began late in the year after the majority of fish had spawned; therefore, few eggs and larvae were found in the entrainment collections.

C. BENTHOS

Cladophora exhibited a unimodal seasonal pattern of growth in 1974, with the peak period of production in June. The late August/September secondary peak, characteristic of Cladophora growth in Lake Ontario, was not observed due to the sampling schedule. Cladophora biomass decreased rapidly with increasing depth, with the alga prevalent at the 10 ft depth contour.

The low correlation observed between chlorophyll a and biomass for both buoy and botom periphyton indicated that factors other than chlorophyll a were important in the distribution of biomass; these factors would include detritus and heterotrophic organisms.

D. NEKTON

The alewife remains the most frequently collected species in both impingement and lake samples. Alewife and rainbow smelt were the two most abundant species in lake impingement collections in 1973 and 1974, but during 1975 the threespine stickleback replaced the rainbow smelt as the second most frequently collected species in

impingement, and the spottail shiner was the second most frequently collected species from the lake. The percent composition represented by spottail shiners in lake collections increased from 0.05% in 1973 to 5.6% in 1974 and 11.1% in 1975.

Fewer fish were collected from Lake Ontario in the vicinity of Nine Mile Point during 1975 than during 1974. In all, 10% fewer fish were collected from the lake in the vicinity of Nine Mile Point during 1975 than during 1974 with approximately the same amount of fishing effort. Concomitantly 62% fewer fish were estimated to have been impinged at Nine Mile Point during 1975 than during 1974, attributable primarily to a decrease in the number of alewives.

The estimated annual number of fish impinged at Nine Mile Point during 1975 was one million fish. Impingement sampling at the James A. FitzPatrick Nuclear Power Plant began in September 1975; the alewife accounted for 70% of the FitzPatrick impingement collections. A significant correlation was found between the number of fish impinged on a day and the number sampled in the preceding day's gill net collections.

Fewer white perch were present in impingement collections in 1975 (1571 fish) than in 1974 (6,714 fish), and their percent composition decreased from 0.5% in 1974 to 0.3% in 1975. On the other hand, lake collections yielded more white perch in terms of both total numbers and percent composition in 1975 than in 1974. Yellow perch were also less abundant in both impingement and lake collections in 1975 than in 1974. The smallmouth bass was collected from the lake in greater numbers during 1975 than during 1974 while its abundance in impingement catches declined over the two years. The number of salmonids collected from the vicinity of Nine Mile Point has increased over the past three years and may represent the success of the New York State stocking program.

III. INTRODUCTION

A. OBJECTIVES OF STUDY

Ecological studies in the Nine Mile Point vicinity during 1975 represent the continuing efforts of the Power Authority of the State of New York (PASNY) and Niagara Mohawk Power Corporation (NMPC) to evaluate the impact of existing and proposed power station operations at the site on the near-field aquatic ecosystem of Lake Ontario. Ecological studies began at the site in 1963 and have increased in scope and diversity since that time.

This annual report fulfills the utilities' commitment to assess aquatic impacts of power stations, and relevant conclusions from the previous studies are referred to as appropriate within its chapters. The studies also fulfill monitoring requirements imposed by the Nuclear Regulatory Commission (NRC) in their licenses issued to the Nine Mile Point Nuclear Station Unit 1 (Docket #50-220) and the James A. FitzPatrick Nuclear Power Plant (Docket #50-333). Certain aspects of these studies have been extended beyond the NRC requirements to provide a fuller understanding of potential impacts.

The program is designed to provide the following information in addition to fulfilling the requirements noted above:

- postoperational data relating to the aquatic ecology in the vicinity of Nine Mile Point Nuclear Station Unit 1,
- preoperational and postoperational data in the vicinity of the James A. FitzPatrick Nuclear Power Plant,
- analyses of the field data for both stations for use in regulatory submissions such as NPDES Permit applications and requests for alternative effluent limitations,
- analyses to support recommended levels at which the monitoring of the aquatic environment should be continued in order to assure the protection of the ecosystem over the life of the stations.

B. NUCLEAR STATION DESCRIPTION

There are two nuclear electric generating stations located on the Nine Mile Point promontory on the south shore of Lake Ontario: Nine Mile Point Nuclear Station Unit 1 which has been operating since December 1969, and James A. FitzPatrick Nuclear Power Plant which underwent initial testing during 1974 and continued testing during 1975. A third nuclear station is under construction at this site (Nine Mile Point Nuclear Station Unit 2). Figure III-1 contains a map of the

NINE MILE POINT ECOLOGICAL STUDY AREA

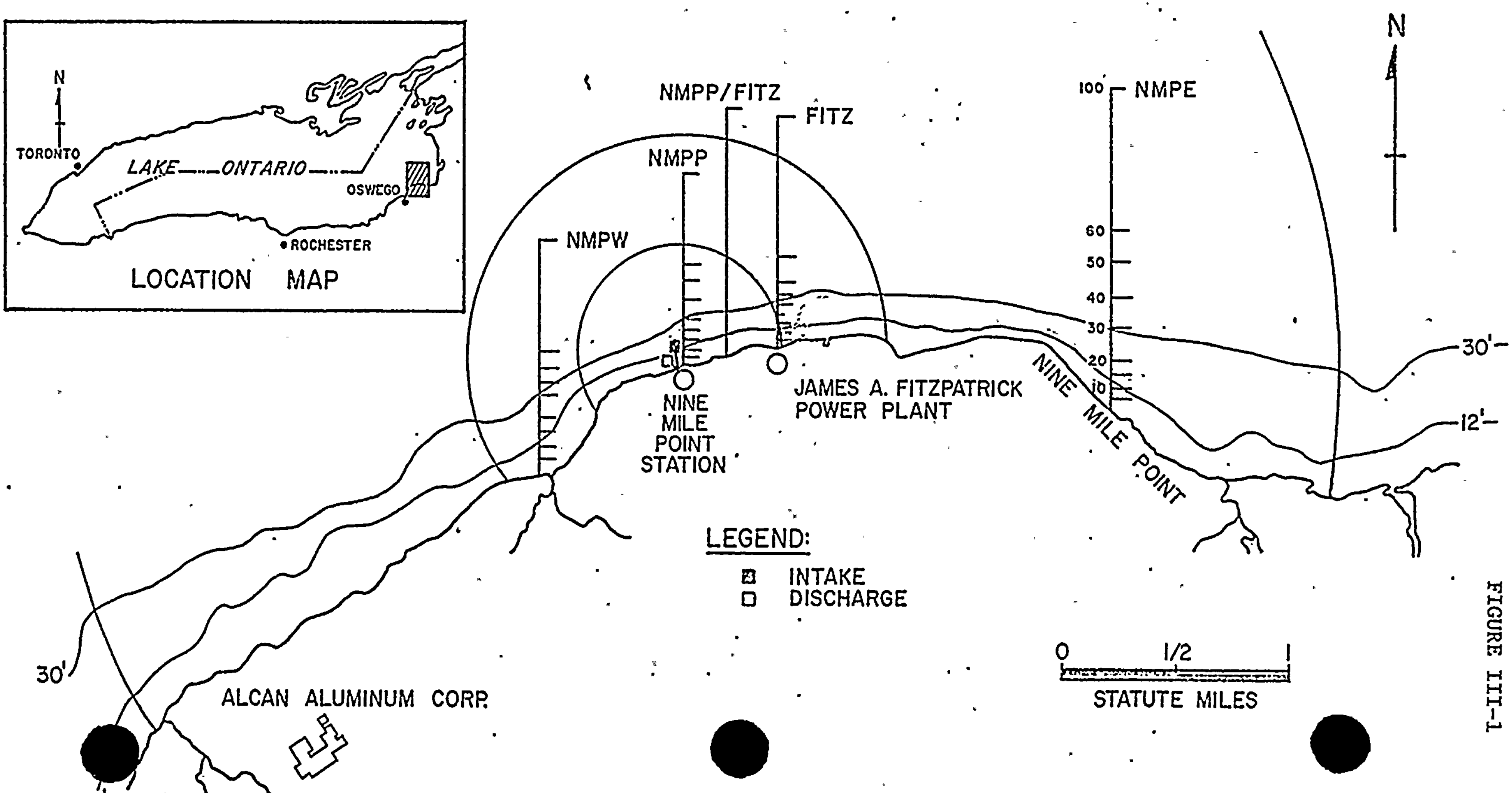


FIGURE III-1

area indicating the generating stations, the intake and discharge structures of the Nine Mile Point Nuclear Station, and the sampling transect locations.

The operating station, Nine Mile Point Nuclear Station Unit 1, and the proposed station, Nine Mile Point Nuclear Station Unit 2, are owned and operated by Niagara Mohawk Power Corporation. Both stations will occupy the same 900-acre site in the Town of Scriba, Oswego County, New York. Immediately adjacent to this site is the 702-acre site owned by the Power Authority of the State of New York. This is the site of the James A. FitzPatrick Nuclear Power Plant. Operating, intake, and discharge characteristics of the Nine Mile Point and FitzPatrick nuclear stations are presented in Table III-1.

For the purpose of this study, the "vicinity" of Nine Mile Point is defined as the area within a three-mile radius of the generating station.

C. ORGANIZATION OF THE REPORT

The studies at Nine Mile Point included an analysis of virtually all aspects of the aquatic community and have involved the full-time efforts of approximately 40 aquatic biologists. Table III-2 summarizes the extent of the program and the intensity of the various sampling efforts. Table III-3 summarizes the lake and in-plant collections by date. Data from each sampling program have been evaluated in this report and used to expand, confirm, or refute the results of the 1974 and earlier studies as to the community composition, diurnal patterns, seasonal patterns, and spatial distribution of organisms (offshore, alongshore, or in-depth).

The report chapters are organized according to broad sampling programs which encompass various aspects of the ecosystem (receiving water body characteristics and quality, plankton, benthos and nekton) and plant effects (entrainment and impingement). Each chapter presents the analysis of data from a specific sampling program, and is organized according to the following format:

Introduction: Defines organisms or parameters studied; summarizes pertinent results of the 1974 sampling program.

Materials and Methods: Describes field and laboratory procedures followed during 1975; details modifications from the 1974 sampling program procedures. Illustrates sampling station locations and indicates frequency of sampling efforts.

TABLE III-1

NINE MILE POINT AND JAMES A. FITZPATRICK NUCLEAR STATIONS CHARACTERISTICS

OPERATING CHARACTERISTICS	Nine Mile Point UNIT 1	James A. FitzPatrick
Generating capacity (MWe)	610	821
Cooling water flow (gpm)		
Condenser	250000	352300
Sevice water	18000	17900
Heat rejection (BTU/hr)	4.0×10^9	5.7×10^9
Cooling water temperature Rise (°F)	31.2	31.5

STRUCTURAL CHARACTERISTICS	Nine Mile Point Intake	Nine Mile Point Discharge	James A. FitzPatrick Intake	James A. FitzPatrick Discharge
Length of main tunnel from existing shoreline	850 ft	335 ft	900 ft	1260 ft
Number of openings	6	6	4	12
Size of opening	5.5 ft high x 10.3 ft wide	3.5 ft high x 7.3 ft wide	8 ft x 17.7 ft wide	2.5 ft (inside diameter)
Other dimensions	3 ft sill 6 in roof	3 ft sill 6 in roof	3 ft sill 2 ft roof	5-6 ft above lake bed Double ports at 150 ft spacing
Velocity through openings	1.8 fps	4 fps	1.2 fps	14 fps
Tunnel velocity	8 fps	8 fps	1.4 fps (maximum)	4.7 fps
Tunnel cross-section	78 ft^2	78 ft^2	117 ft^2	117 ft^2
Water velocity at screens	0.85 fps	-	1.4 fps	-
Water depth at structure	24.5 ft (LWD)	17 ft (LWD)	24 ft (LWD)	30 ft (LWD) (aver.)
Water depth to top of structure	15.3 ft (LWD)	10.0 ft (LWD)	10 ft (LWD)	23 ft (LWD) (aver.)

TABLE III-2

FREQUENCY OF SAMPLING FOR ECOLOGICAL STUDIES[a] IN NINE MILE POINT AREA OF LAKE ONTARIO - 1975

STUDY		FREQUENCY[b]	PERIOD[b]
A. GENERAL ECOLOGICAL SURVEY			
Fish -	Trawls	Twice monthly (D/N)	April-December
	Seines (transects)	Twice monthly	April-December
	(5 random locations)	Monthly	April-December
	Gill nets (general ecol.)	Twice monthly (48-hour period: 12-hour retrievals)	April-December
	Gut content (gut content analysis)	Alternate months	April-December
Benthos -	Community (pump) / Bottom sediment	Alternate months	April-December
	Substrate elevation	Monthly	April-December
	Bottom quality	Annually	April-December
Water Quality	Monthly	Monthly	April-December
	Bimonthly	Twice monthly	April-December
	Thermal stratification	Weekly	April-December
	C-14	Monthly	April-December
Periphyton	Bottom	Monthly	April-December
	Buoy	Monthly	April-December
Phytoplankton	Transects (enumeration/(chlorophyll a)	Monthly	April, September-December
		Twice monthly	May-August
	Windrow[c]	Monthly	April, September-December
		Twice monthly	May-August
icrozooplankton		Monthly	April, September-December
		Twice monthly	May-August
Ichthyoplankton		Weekly (D)	April, May, mid-September-December
		Weekly (D/N)	June-mid-September
Macrozooplankton		Monthly (D)	April, May, September-December
		Monthly (D/N)	June-August
B. NINE MILE POINT NUCLEAR STATION UNIT 1			
Ichthyoplankton[d]		Twice Monthly (D/N)[e]	April-October
Macrozooplankton[d]		Monthly (D/N)[e]	April-October
Impingement		Three times/week[f]	January-December
C. JAMES A. FITZPATRICK NUCLEAR POWER PLANT			
Ichthyoplankton		Twice monthly (D/N)[g]	15 October-December
Macrozooplankton		Monthly (D/N)	15 October-December
Impingement		Three times/week[f]	10 September-December

[a] Radiological sampling program not included

[b] Sampling was not conducted during inclement weather; lake and plant sampling conducted on same day wherever possible

[c] No windrows located, therefore, random samples collected

[d] Two intake forebays only, no discharge sample, sampling date the same for Nine Mile Point and FitzPatrick Nuclear Stations

[e] Day: 1100, 1400, 0500, 0800 hours; Night: 1700, 2000, 2300, 0200 hours

[f] Monday and Friday: 24-hr composite sample; Wednesday: 24-hr hourly sample; Frequency increased during periods of high impingement

[g] Day: 0630, 0930, 1230, 1530 hours; Night: 1830, 2130, 0030, 0330 (15 OCT and 5 NOV only - see footnote e for 19 NOV and 3 DEC)

TABLE III- 3

1975 NINE MILE POINT/FITZPATRICK SAMPLING PROGRAM

During January, February, and March, only impingement sampling was conducted at the Nine Mile Point Nuclear Station according to the schedule described in Chapter IX, i.e., Monday, Wednesday, and Friday.

The following terms and abbreviations are used in the calendar which describes field collections made from March through December 1975:

BIM-WQ	- Bimonthly Water Quality
BOTTOM	- Bottom periphyton
BUOY	- Buoy periphyton
BUOY-S	- Buoy periphyton and sediment elevation
C-14	- Carbon-14
F-IMP	- FitzPatrick impingement
F-IMP/ENT	- FitzPatrick impingement and entrainment
GILL	- Gill nets (date in parenthesis indicates final collection for the set)
IMP	- Nine Mile Point impingement
IMP/ENT	- Nine Mile Point impingement and entrainment
LARVAE	- Ichthyoplankton
MACRO-A	- Macrozooplankton analysis from ichthyoplankton collection
M-WQ	- Monthly Water Quality
PLANK	- Microzooplankton, Phytoplankton, and Chlorophyll a
RANDOM	- Windrow Phytoplankton program
SED-CH	- Sediment (chemical)
STOMACH	- Fish for stomach analysis
THERMAL	- Thermal profiles

APRIL-JUNE

1975 NINE MILE POINT/FITZPATRICK SAMPLING PROGRAM

		APRIL 1 THERMAL LARVAE	2 IMP	3	4 IMP	5
6	7 IMP	8	9 IMP/ENT MACRO-A	10 LARVAE	11 THERMAL IMP BIM-WQ	12
13	14 IMP	15 THERMAL TRAWL M-WQ	16 IMP BENTHOS ←→	17 LARVAE MACRO-A BENTHOS	18 IMP	19
20	21 IMP	22 IMP GILL(-27)	23 THERMAL BIM-WQ IMP/ENT BENTHOS ←→	24 TRAWL IMP BENTHOS	25 LARVAE IMP	26 IMP TRAWL
27 IMP	28 IMP	29 RANDOM SEINE PLANK C-14 THERMAL	30 IMP LARVAE	MAY 1	2 IMP	3
4	5 THERMAL IMP BIM-WQ SEINE	6 PLANK TRAWL C-14	7 IMP/ENT LARVAE	8 GILL(-10)	9 IMP	10
11	12 THERMAL IMP M-WQ	13	14 IMP LARVAE BUOY	15 BOTTOM	16 IMP RANDOM	17
18	19 THERMAL IMP SEINE	20 PLANK TRAWL C-14	21 IMP/ENT LARVAE GILL (-23) MACRO-A	22 BIM-WQ	23 IMP	24
25	26 IMP	27	28 IMP LARVAE	29 THERMAL BUOY	30 IMP	31
JUNE 1	2 IMP	3 TRAWL IMP/ENT M-WQ THERMAL	4 IMP/ENT LARVAE ←→	5 BIM-WQ LARVAE	6 IMP	7
8	9 IMP	10 THERMAL PLANK GILL(-12) C-14	11 LARVAE ←→ IMP SEINE	12 LARVAE BUOY	13 RANDOM IMP BOTTOM	14
15	16 IMP STOMACH	17 BENTHOS ←→ TRAWL	18 MACRO-A BENTHOS IMP/ENT LARVAE ←→ BIM-WQ	19 THERMAL LARVAE	20 IMP	21
22	23 IMP	24 THERMAL PLANK ←→ C-14 GILL	25 LARVAE PLANK IMP	26 LARVAE SEINE	27 LARVAE IMP BUOY-S RANDOM	28 LARVAE
29	30 IMP					

JULY-SEPTEMBER 1975 NINE MILE POINT/FITZPATRICK SAMPLING PROGRAM

		JULY 1 TRAWL	2 IMP/ENT TRAWL LARVAE	3 LARVAE	4 IMP	5
6	7 THERMAL IMP TRAWL BIM-WQ	8 GILL (-10) PLANK C-14	9 IMP	10 M-WQ LARVAE	11 IMP LARVAE	12
13	14 IMP BUOY	15 RANDOM BOTTOM TRAWL	16 IMP/ENT BOTTOM LARVAE MACRO-A	17 THERMAL SEINE LARVAE	18 IMP	19
20	21 IMP	22	23 IMP GILL (-27) LARVAE	24 LARVAE	25 IMP	26
27	28 IMP	29 THERMAL C-14 PLANK	30 BUOY IMP LARVAE (-31)	31 BIM-WQ RANDOM	AUGUST 1 IMP SEINE	2
3	4 PLANK IMP BENTHOS C-14	5 TRAWL GILL (-7) BENTHOS	6 IMP/ENT	7 TRAWL LARVAE	8 THERMAL IMP LARVAE	9
10	11 IMP M-WQ	12 THERMAL BIM-WQ	13 BUOY-S IMP LARVAE MACRO-A	14 RANDOM IMP	15 BOTTOM SEINE LARVAE	16 BOTTOM
17	18 IMP	19	20 IMP/ENT TRAWL MACRO-A	21 LARVAE GILL (-23)	22 LARVAE IMP	23
24 C-14 THERMAL PLANK	25 SEINE IMP BIM-WQ	26 STOMACH	27 IMP	28 LARVAE STOMACH	29 THERMAL LARVAE BUOY-S IMP RANDOM	30
31	SEPT 1 IMP	2 TRAWL	3 IMP/ENT TRAWL	4 LARVAE (-6)	5 THERMAL IMP	6
7	8 IMP SEINE	9	10 LARVAE BIM-WQ IMP F-IMP GILL (-12)	11 THERMAL M-WQ	12 IMP F-IMP	13
14	15 IMP F-IMP BUOY-S THERMAL	16 TRAWL BOTTOM	17 IMP/ENT F-IMP MACRO-A	18 BOTTOM LARVAE C-14 PLANK MACRO-A	19 IMP F-IMP	20
21	22 IMP F-IMP	23 THERMAL GILL (-25) BIM-WQ SEINE	24 IMP F-IMP	25	26 LARVAE IMP F-IMP SEINE	27
28	29 THERMAL RANDOM IMP F-IMP SED-CH	30				

OCTOBER-DECEMBER 1975 NINE MILE POINT/FITZPATRICK SAMPLING PROGRAM

			OCT 1 LARVAE IMP/ENT F-IMP	2	3 IMP F-IMP	4
5	6 THERMAL IMP F-IMP	7 BIM-WQ GILL(-9) TRAWL	8 LARVAE IMP F-IMP	9 M-WQ	10 IMP F-IMP	11
12	13 BUOY-S IMP F-IMP	14 THERMAL	15 MACRO-A LARVAE IMP/ENT F-IMP/ENT BOTTOM	16	17 IMP F-IMP	18
19	20 THERMAL IMP F-IMP BENTHOS	21	22 IMP F-IMP GILL(-24)	23 LARVAE BIM-WQ SEINE TRAWL	24 IMP F-IMP	25 BENTHOS
26	27 RANDOM STOMACH C-14 IMP THERMAL F-IMP PLANK	28 STOMACH BENTHOS	29 IMP F-IMP	30	31 IMP F-IMP BENTHOS	NOV 1
2 LARVAE	3 IMP F-IMP	4	5 IMP F-IMP/ENT GILL(-7)	6 THERMAL M-WQ	7 IMP LARVAE F-IMP	8
9	10 IMP F-IMP	11	12 THERMAL BIM-WQ IMP F-IMP LARVAE TRAWL MACRO-A	13	14 IMP F-IMP	15
16	17 F-IMP C-14 IMP PLANK	18 THERMAL BUOY-S TRAWL GILL(-20)	19 IMP LARVAE F-IMP/ENT MACRO-A	20 BIM-WQ BOTTOM	21 IMP F-IMP	22
23 TRAWL	24 THERMAL F-IMP IMP RANDOM TRAWL SEINE	25 IMP F-IMP	26 BUOY-S LARVAE	27	28 IMP F-IMP	29
30	DEC 1 IMP F-IMP	2 M-WQ	3 IMP F-IMP/ENT MACRO-A	4 THERMAL BIM-WQ LARVAE GILL	5 IMP F-IMP	6
7	8 TRAWL IMP F-IMP	9	10 IMP F-IMP	11	12 THERMAL C-14 RANDOM BOTTOM F-IMP BUOY-S IMP PLANK	13 LARVAE SEINE MACRO-A
14	15 IMP F-IMP	16	17 IMP	18	19 IMP	20
21	22 IMP	23 IMP	24	25	26 IMP F-IMP	27
28	29 IMP F-IMP	30 IMP F-IMP/ENT	31			

Results and Discussion: Presents a species inventory in taxonomic order (Pennak)*, and includes all figures and tables, including summaries of statistical analyses, essential to the understanding of the text.

Data are presented in either graphic or tabular form, but do not necessarily represent all the data analyzed. The taxonomic level for data interpretation varied with sampling program (e.g., nekton at species level, phytoplankton at class level). Species information was retrieved from the ranking series by date or from the original data sheets.

Data were compared within and between sampling programs wherever such comparisons were biologically meaningful; parameters monitored in the water quality program were also discussed where appropriate. Statistical tests (e.g., analysis of variance) were conducted, using both original and replicate samples in order to increase the sensitivity of the test, and to determine levels of significance for spatial/temporal distribution patterns.

Conclusions: Presents a synopsis of the chapter findings and, where appropriate, estimates the potential effect of the Nine Mile Point and James A. FitzPatrick nuclear stations on the lake ecosystem.

Appendix: Presents tables containing supplementary data not contained in the main body of the chapter; e.g., statistical analyses, ranking of most abundant taxa, and abundance of taxa by transect and/or depth contour.

D. STATISTICAL ANALYSES

1. Cluster Analysis

During the study of biological communities, the data often become too unwieldy for simple visual analysis. Data matrices increase in complexity so that readily sorting out natural associations which occur in a temporal or spatial framework becomes impossible. In recent years, powerful new tools have become available which allow massed data to be rapidly screened, and often suggest new and rewarding directions for further analysis. One such tool is called the hierarchical cluster analysis, a technique which has been put to frequent use in pollution biology.

In a typical cluster analysis, the first step is to decide what type of data are to be compared (numbers, weight, presence or absence) since the same analysis of different data types from the same samples may result in different associations (Stephenson, Williams and Cook, 1971). There

*Pennak, R.W. 1953. Freshwater invertebrates of the United States. The Ronald Press Co., New York. ix + 769 p.

is, at present, no agreement on the "truest" or best type of data. Data may then be analyzed as species associations between stations or station associations between species, depending upon the needs of the investigator. An appropriate measure of association or dissimilarity is then chosen, and these associations are then grouped by a sorting strategy. A wide variety of these strategies are available, each with certain characteristics, advantages, and shortcomings. Data are generally presented by the computer as a dendrogram and are easily interpreted.

In our particular studies, two measures of association were chosen, Gower's similarity coefficient (Sneath and Sokal, 1973) for quantitative data:

$$S_G = \sum_{i=1}^{n} S_{ijk} = \sum_{i=1}^{n} \left[1 - \left[(|X_{ij} - X_{ik}|)/R_i\right]\right] \text{ where}$$

X_{ij} and X_{ik} are the number of individuals of species i in samples j and k, respectively, and R_i is the total number of individuals of species i

and the Per Cent Similarity (PS) measure given by Haedrich (1975):

$$PS = 100 \sum \min/P_{ia}, P_{ib}/ \text{ where}$$

P_{ia} and P_{ib} are the proportions of the number of individuals of species i in samples a and b, respectively. Comparisons might then be made in the future to distinguish which of these measures or any others are most suitable to our needs.

The clustering strategy chosen was the group-average, also known as the unweighted pair-group average (Sneath and Sokal, 1973). This strategy has proved generally satisfactory in many ecological studies and since it gives only moderately sharp clustering (i.e., it is a relatively conservative strategy) it has the advantage of being relatively immune to misclassification and is generally not group-size dependent (Clifford and Stephenson, 1975).

2. <u>A-Posteriori Multiple Comparisons</u>

A statistically significant result in a multiple degree of freedom F test leads to the decision that the set of means being compared differ; however, it does not indicate where the differences lie. A-posteriori procedures are required to examine this detail.

In an a-posteriori procedure, several tests of hypotheses are made. In order that these remain within the framework of the F test, the probability of making any Type I errors (rejecting the null hypothesis falsely) must not exceed the specified significance level α. If these test statistics are stochastically independent, then an exact test at the given α is available: to perform each comparison test at a lower significance level ($\alpha^* = 1 - (1 - \alpha)\ 1/K$, where K is the number of comparisons to be made). In the more frequent situation, these comparisons are not independent, creating a more complex situation in which an exact test criterion is not usually available.

An exact α-level test is available where several means are to be compared against a control mean, but not against one another. This test was devised by Dunnett (1955). Several conservative tests (tests where the true significance level does not exceed α) are available. Some of these are Scheffe's Method (1953), Tukey's T Method (1953) and Fisher Significant Difference (also known as Bonferrone t-tests). As all of these tests are conservative, one would generally choose the procedure with the least stringent significance criteria. This will be dependent on the numbers and types of comparisons to be made. Two excellent references are Miller (1966) and O'Neill & Wethorill (1971). Several multiple range procedures, such as the Student-Newman-Keuls and the Duncan (1955) procedure are in common use. However, there is some controversy regarding the significance levels of such procedures.

REFERENCES CITED

Clifford, H.T. and W. Stephenson. 1975. An introduction to numerical classification. Academic Press, N.Y.

Duncan, D.B. 1955. Multiple range and multiple F tests. Biometrics 11:1-42.

Dunnett, C.W. 1955. A multiple comparison procedure for comparing several treatments with a control. J. Amer. Statist. Assoc. 50:1096-1121.

Haedrich, R.L. 1975. Diversity and overlap as measures of environmental quality. Water Res. 9:945-952.

Miller, R.G. 1966. Simultaneous statistical inference. McGraw-Hill, New York.

O'Neill, R. and G.B. Wetherill. 1971. The present state of multiple comparison methods. J. Roy. Stat. Soc., Ser. B, 33:218-241.

Scheffé, H. 1953. A method of judging all contrasts in the analysis of variance. Biometrika 40:87-104.

Sneath, P.H.A. and R.R. Sokal. 1973. Numerical taxonomy: the principles and practice of numerical classification. W.H. Freeman and Co., San Francisco. 573p.

Stephenson, W., S.D. Cook, and W.T. Williams. 1971. Computer analyses of Petersen's original data on bottom communities. Ecol. Mono. 42(4):387-408.

Tukey, J.W. 1953. The problem of multiple comparisons. Princeton Univ., N.J. [unpublished notes].

IV. RECEIVING WATER BODY CHARACTERISTICS AND QUALITY

A. INTRODUCTION

1. Objectives of the 1975 Study

The physical, chemical, and biological characteristics of Lake Ontario in the vicinity of Nine Mile Point are dependent upon complex interactions between the geomorphological and hydrological conditions of the lake, meteorological conditions, and human activity. The objectives of the water quality studies conducted during 1975 were:

a. to summarize general water body characteristics and water quality in 1975;

b. to compare 1975 water quality data to data obtained in previous studies, to New York State water quality standards and to the proposed water quality criteria of the U.S. Environmental Protection Agency (EPA);

c. to describe the spatial and temporal relationships between water characteristics, plant operation, and biological processes.

2. Summary of Trends Noted in Previous Studies

In both the 1973 and 1974 water quality studies it was concluded that vertical temperature variations and algal growth, which are influenced by regular seasonal temperature variations and by irregular hydrodynamic phenomena, were the primary factors affecting the water quality of the Nine Mile Point vicinity (QLM, 1974; LMS, 1975).

Thermal gradients observed during the summers of both 1973 and 1974 were transient and unstable and moved into the deeper portions of the lake as the summer months proceeded (QLM, 1974; LMS, 1975). Thermal gradients, possibly attributable to the operation of Nine Mile Point Nuclear Station Unit 1, were observed at the 20 ft depth contour depth of the NMPP/FITZ transect when isothermal conditions were recorded at other shallow water stations and when thermal stratification had moved offshore (LMS, 1975).

B. MATERIALS AND METHODS

1. Field Collection

a. Thermal Profiles

Temperature measurements, to determine the movement and timing of natural lake thermal stratification, were taken weekly from April through December (Table IV-1) at the 100 ft contour depths at three transects; NMPW, NMPP/FITZ, and NMPE (see Figure IV-1). The 50 ft thermal profile stations of the 1974 program were eliminated in 1975.

b. Water Quality Parameters

Bimonthly surface and bottom water quality samples were taken along three transects (NMPW, NMPP/FITZ, NMPE) at three depth contours (20, 40, and 60 ft) from April through December (Table III-1). In December of 1975 weather conditions limited the usual bimonthly sampling efforts to only one day (4 December). The 1975 bimonthly water quality sampling program included a 40 ft depth contour station at each transect; this had not been a part of the 1974 program.

Monthly surface and bottom water quality sampling was conducted at the 25 and 45 ft depth contours along the NMPP/FITZ transect only. Samples were collected approximately thirty days apart from April through December (Table IV-1).

Temperature and carbon dioxide (CO_2) measurements were made in the field and samples for dissolved oxygen measurements were fixed in the field after collection. Water samples were also collected for subsequent analyses of additional parameters in the laboratory.

Figure IV-1 shows the location of both the bimonthly and monthly water quality sampling stations. Table IV-1 lists the sampling dates for the monthly and bimonthly water quality sampling programs and for the thermal stratification measurement program.

c. Sediment Chemical Program

Sediment samples were collected by scuba divers once per year at the 20 and 40 ft depth contours along NMPW, NMPP, FITZ, and NMPE transects (Figure IV-1). Two 1-gallon plastic containers were filled with sediment at each site.

TABLE IV-1

WATER QUALITY SAMPLING PROGRAM*

NINE MILE POINT VICINITY - 1975

1975 SAMPLING DATE	SAMPLING PROGRAM MONTHLY	BIMONTHLY	THERMAL
1 APR			X
11 APR		X	X
15 APR	X		X
23 APR		X	X
29 APR*			X
5 MAY		X	X
12 MAY*	X		X
19 MAY*			X
22 MAY		X	
29 MAY			X
3 JUN*	X		X
5 JUN		X	
10 JUN			X
18 JUN		X	
19 JUN*			X
24 JUN*			X
7 JUL*		X	X
10 JUL	X		
17 JUL*			X
29 JUL*			X
31 JUL		X	
8 AUG*			X
11 AUG	X		
12 AUG*		X	X
24 AUG*			X
25 AUG		X	
29 AUG*			X
5 SEP*			X
10 SEP		X	
11 SEP	X		X
15 SEP			X
23 SEP		X	X
29 SEP*			X
6 OCT			X
7 OCT		X	
9 OCT	X		
14 OCT			X
20 OCT*			X
23 OCT		X	
27 OCT			X
6 NOV	X		X
12 NOV		X	X
18 NOV			X
20 NOV		X	
24 NOV			X
2 DEC	X		
4 DEC		X	X
12 DEC			X

*Sample dates on which one or more thermal survey stations showed a thermocline are indicated with an asterisk and are shown in Figure IV-5.

WATER QUALITY AND SEDIMENT SAMPLING STATIONS

NINE MILE POINT VICINITY - 1975

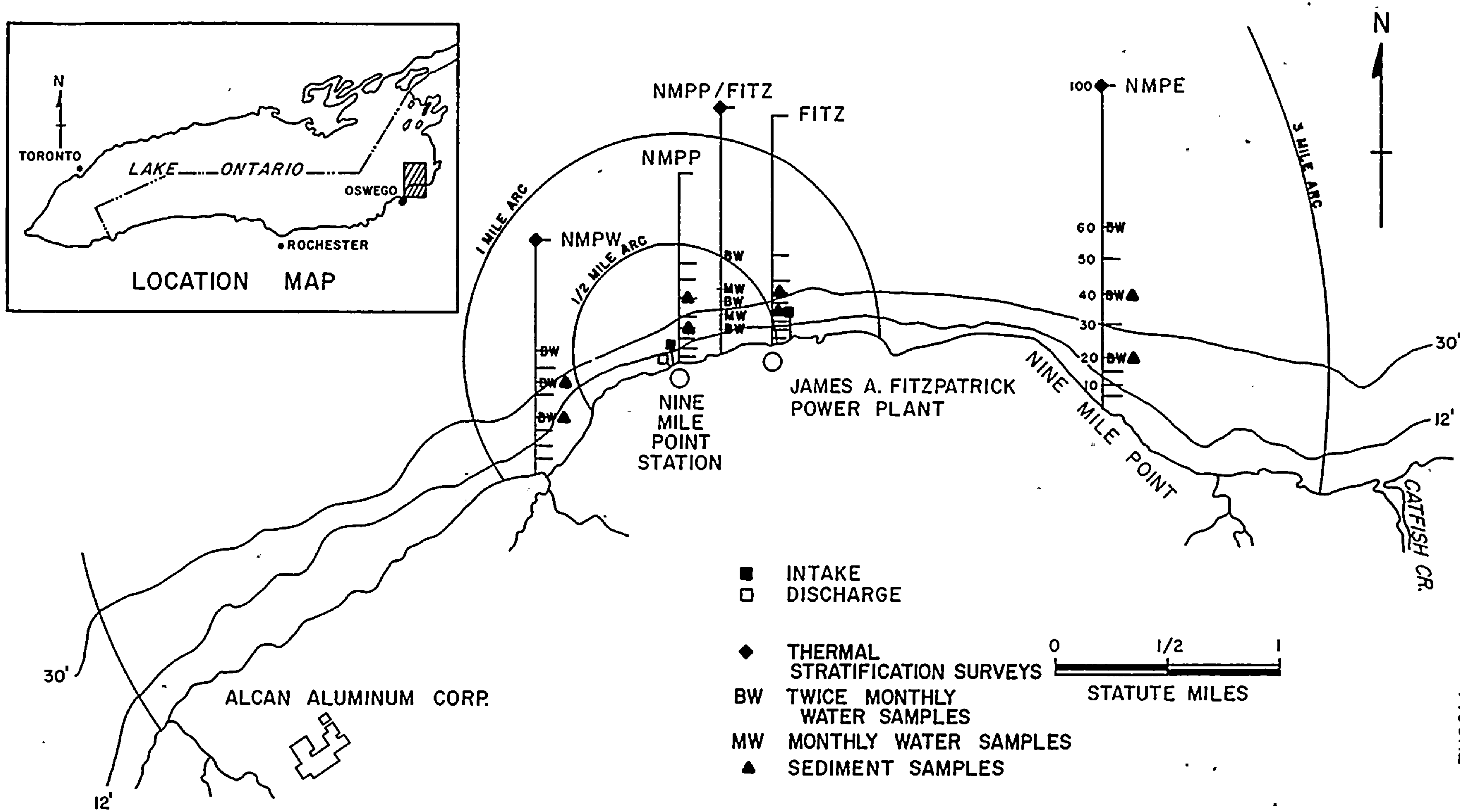


FIGURE IV-1

2. Laboratory Analyses

a. Water Quality

Water samples for chemical analyses, including chlorophyll a and ^{14}C determinations, were transported to the Oswego laboratory immediately after collection. The samples were aliquoted and either preserved for subsequent analysis at the LMS laboratory facilities in Nyack, New York or analyzed immediately at the Oswego facilities depending on the parameter in question. The sample holding times recommended by the EPA were adhered to and samples were analyzed in strict compliance with the provisions set forth by the EPA in 40 CFR part 136.

Twenty-one water quality parameters were analyzed from the bimonthly water quality samples; 47 parameters were analyzed from the monthly water quality samples. The parameters measured in the 1975 water quality program were the same as those analyzed in the 1974 water quality program. Table IV-2 lists the parameters analyzed for both the monthly and bimonthly water quality program.

b. Sediment Characteristics

Sediment samples were transported on ice to the Nyack laboratory facilities for chemical analyses of the soluble fraction of the sediment.

C. RESULTS AND DISCUSSION

1. Temperature Patterns

a. Surface Temperatures

Surface water temperatures were measured in the Nine Mile Point vicinity during 1975 for the thermal profile program and as a part of the monthly and bimonthly water quality programs. Temperatures recorded ranged from 0.9°C, in April at the 100 ft depth contour of NMPW, to 24.5°C, in July at the NMPP/FITZ-20 ft station. Time series plots of the surface temperatures for the 20, 40, and 60 ft depth contours of NMPW, NMPP/FITZ and NMPE are shown in Figures IV-2 through IV-4; these plots were generated based on surface temperature measurements made in conjuction with the bimonthly water quality programs. They show a tendency toward slightly higher temperatures, on the order of 0.0-2.3°C at the NMPP/FITZ transect, shoreward of the 60 ft depth contour, especially during the summer months. Plant discharge effects on surface water temperatures at the NMPP/FITZ transect are particularly apparent at the 20 ft depth contour, become minimal by the 60 ft depth contour, and are absent at the 100 ft depth contour.

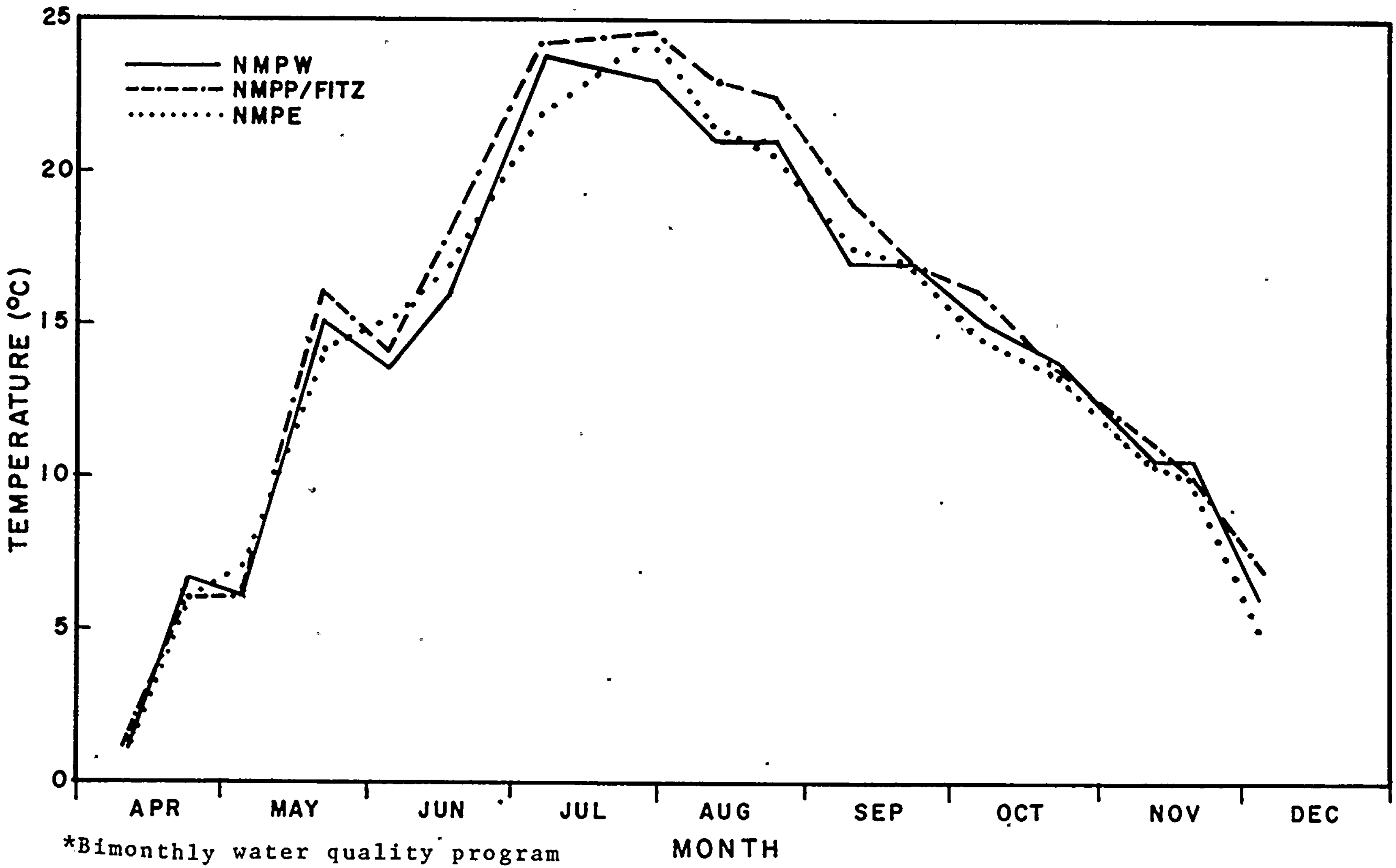
TABLE IV-2

WATER QUALITY PARAMETERS MEASURED
IN THE MONTHLY AND BIMONTHLY SAMPLING PROGRAMS

NINE MILE POINT VICINITY - 1975

PARAMETER	SAMPLING PROGRAM MONTHLY	BIMONTHLY
pH	X	X
Temperature	X	X
Specific Conductance	X	X
Turbidity	X	X
Color	X	
Alkalinity	X	
Carbon dioxide		X
Dissolved oxygen	X	X
Biological oxygen demand	X	X
Chemical oxygen demand	X	X
Chlorophyll *a*		X
Total solids	X	X
Total dissolved solids	X	
Total suspended solids	X	X
Total volatile solids	X	
Settleable solids	X	
Total coliforms	X	
Fecal coliforms	X	
Phenols	X	
Surfactants	X	
Nitrate nitrogen	X	X
Ammonia nitrogen	X	X
Total Kjeldahl nitrogen	X	X
Orthophosphate	X	X
Total phosphorus	X	X
Silicate	X	X
Sulfate	X	X
Aluminum	X	
Arsenic	X	
Barium	X	
Beryllium	X	
Cadmium	X	
Calcium	X	X
Chloride	X	
Chromium	X	X
Copper	X	
Cyanide	X	
Fluoride	X	
Iron	X	
Lead	X	
Magnesium	X	
Manganese	X	
Mercury	X	
Nickel	X	
Potassium	X	
Silver	X	
Sodium	X	X
Vanadium	X	
Zinc	X	

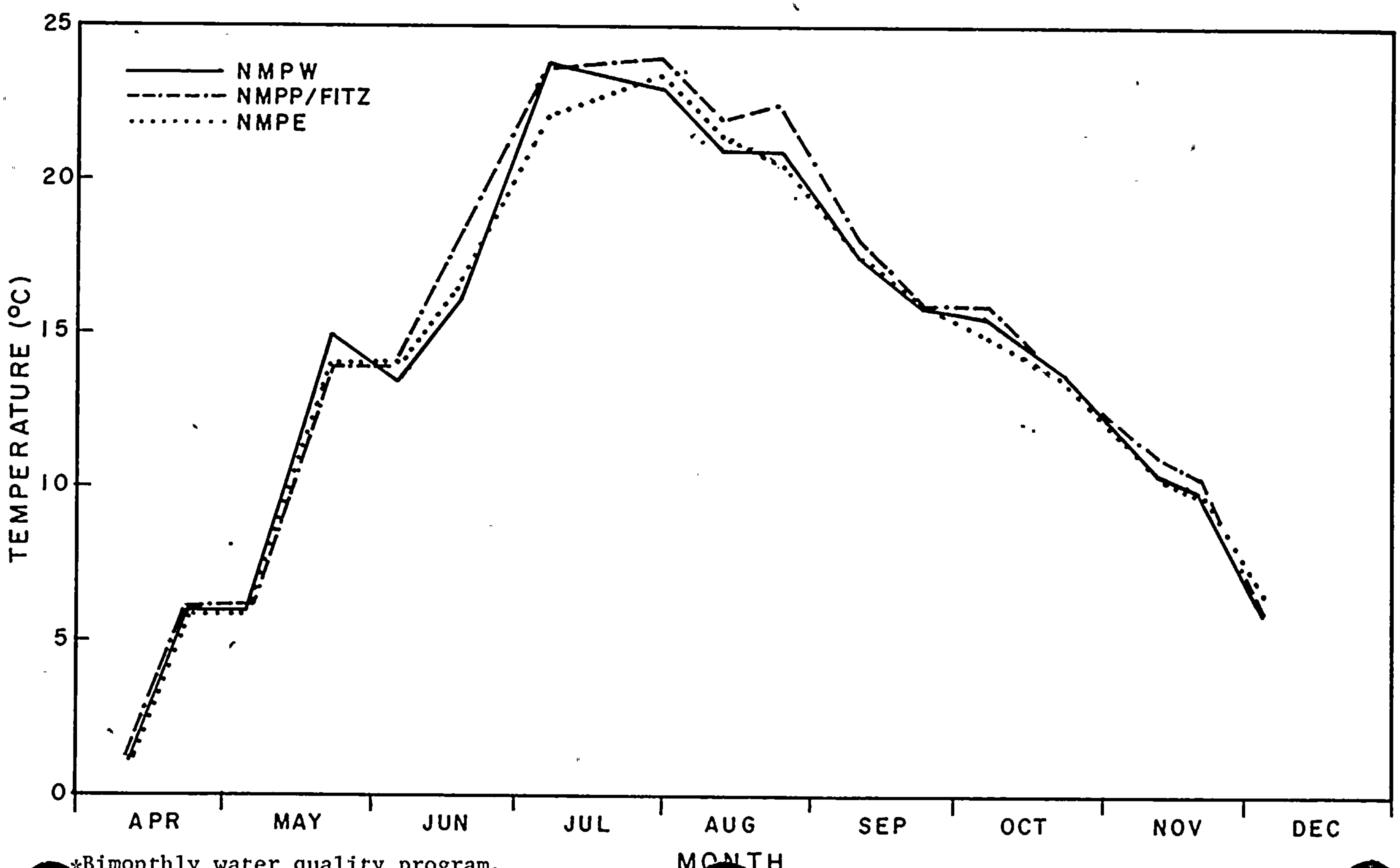
SURFACE TEMPERATURES* 20 FT DEPTH CONTOUR
NINE MILE POINT VICINITY–1975



*Bimonthly water quality program

FIGURE IV-2

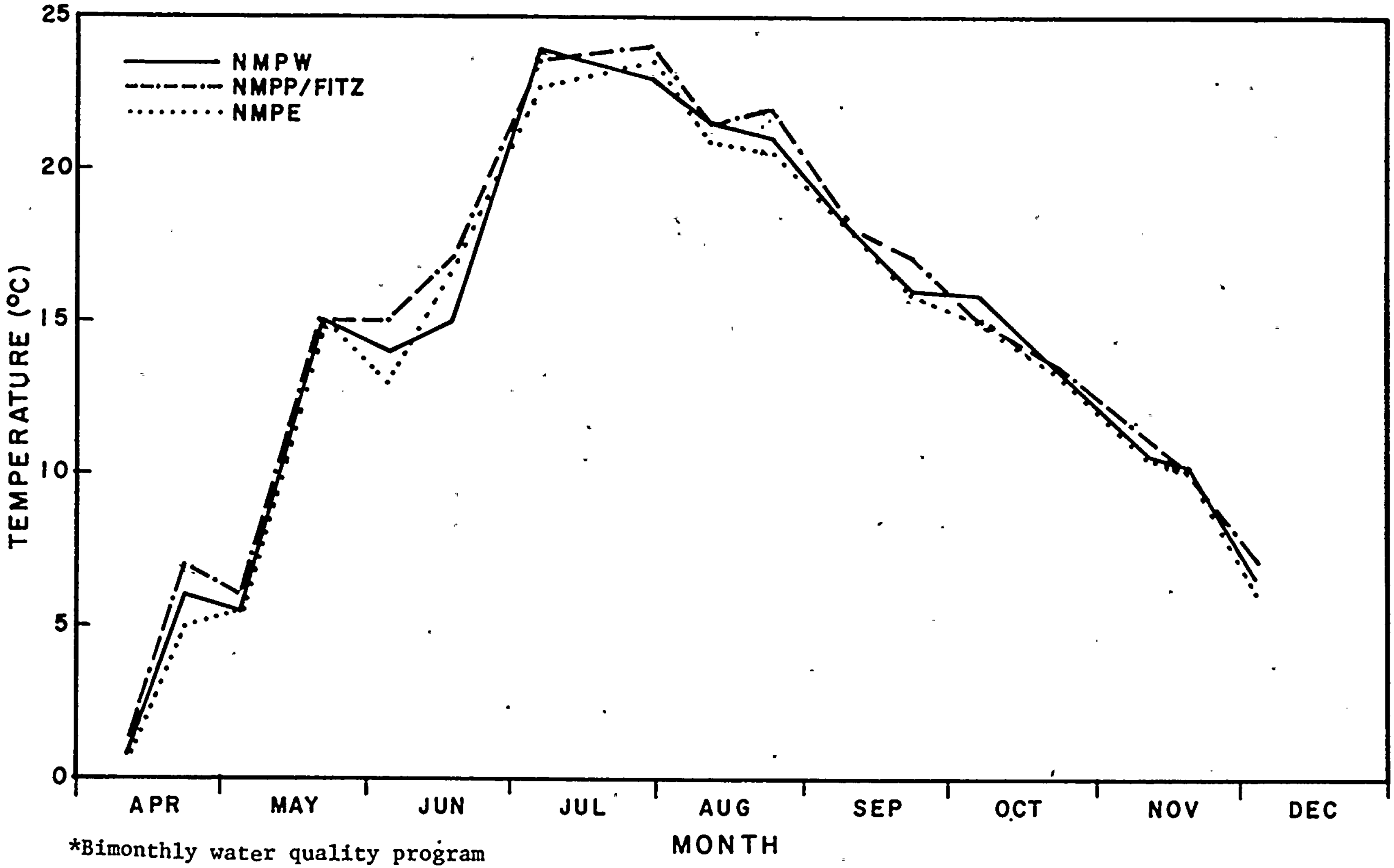
SURFACE TEMPERATURES* AT 40 FT DEPTH CONTOUR
NINE MILE POINT VICINITY–1975



*Bimonthly water quality program.

FIGURE IV-3

SURFACE TEMPERATURES* 60 FT DEPTH CONTOUR
NINE MILE POINT VICINITY-1975



*Bimonthly water quality program

FIGURE IV-4

b. Thermal Stratification

Of the 35 weeks during which the thermal profiles were monitored at the 100 ft depth contour stations, vertical thermal gradients, or thermoclines (i.e., a change of ≥1°C per meter of depth), occurred at one or more stations during 16 weeks, and simultaneously at all three stations during 10 weeks. Figure IV-5 shows the location of the thermocline in the water column at the three monitoring stations on those dates when a thermocline was present at one or more stations.

As in 1973 (QLM, 1974) and 1974 (LMS, 1975), thermal stratification occurred primarily during the summer months. Early spring thermal gradients tended to occur within ten meters of the water's surface. During summer, the thermocline appeared at greater depths of up to 30 meters and then rose again as the fall season began.

As noted in the 1973 and 1974 thermal profile studies (QLM, 1974; LMS, 1975), thermal stratification at the 100 ft depth contour stations was unstable, transient, and entirely dependent upon meteorological conditions for development as well as for dissipation. This relationship of meteorological conditions to surface and bottom water temperatures and thermal stratification is seen in Figure IV-6, in which the surface and bottom temperatures recorded at the 100 ft depth contour are plotted against time. Large (i.e., >2°C) differences in temperature between the surface and bottom waters begin to occur at all three stations in May, coinciding with the early incidents of thermal stratification. The largest differences between surface and bottom temperatures occurred during the summer months, again corresponding to the major occurrence of thermal stratification periods.

The effects of meteorological conditions upon thermal stratification are particularly apparent during the period from 10 July to 24 August. As seen in Figure IV-6, on 17 July bottom temperatures were close to 4°C and thermal gradients were present at all three stations. By 29 July, a date when bottom temperatures were approximately 11°C at NMPW, 17°C at NMPE, and 23°C at NMPP/FITZ, only the NMPW and NMPE transects exhibited thermal gradients. On 8 August, however, bottom temperatures at all three stations were again less than or equal to 4°C and thermal gradients existed at all stations. Nevertheless, within two weeks, on 24 August, bottom temperatures at all three stations were at least 16°C and only the NMPW transect showed some thermal stratification. Examination of the meteorological conditions (Table IV-3) during the period from 10 July to 24 August reveals that for the week prior to the two dates with low bottom temperatures (17 July and 8 August) the majority of recorded wind speeds were less

TABLE IV-3

SELECTED WIND SPEED DATA*

NINE MILE POINT VICINITY - 1975

	10-16 JULY	22-28 JULY	1-7 AUGUST	17-23 AUGUST
Hours with Wind Speeds <5 mph	87	21	97	14
Hours with Wind Speeds 5-10 mph	62	72	46	9
Hours with Wind Speeds >10 mph	7	74	25	1
Hours with No Data on Wind Speed	12	1	0	144
Mean Wind Speed (mph) Per Day	5	10	5	Not calculated since >75% of sample dates had no data

*Based on Smith-Singer Meteorologists, Inc., 1975. Computer print-out of Nine Mile Point Site Tower meteorological data for 1975. (unpublished); wind speeds measured at a height of 30 ft.

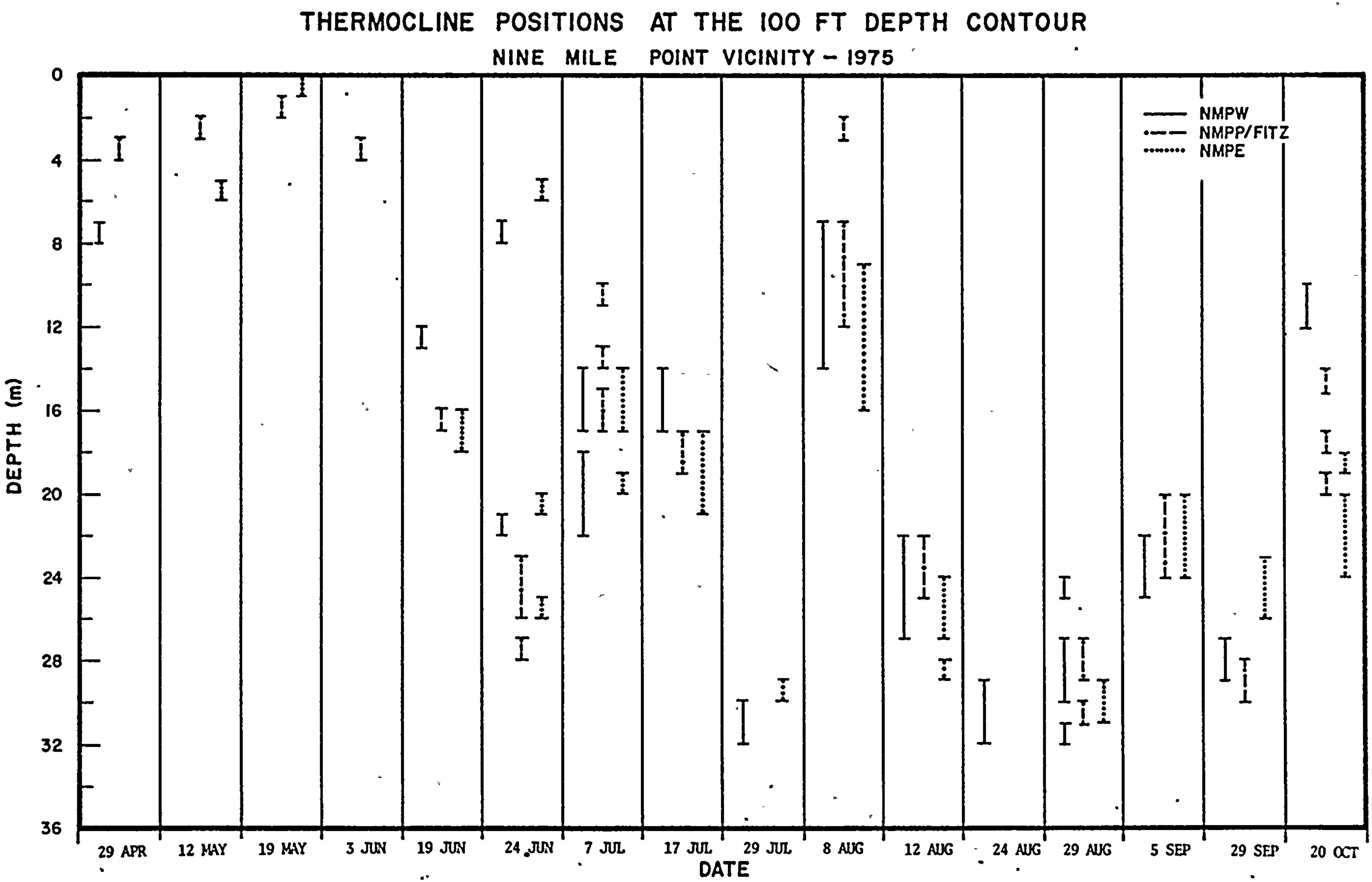
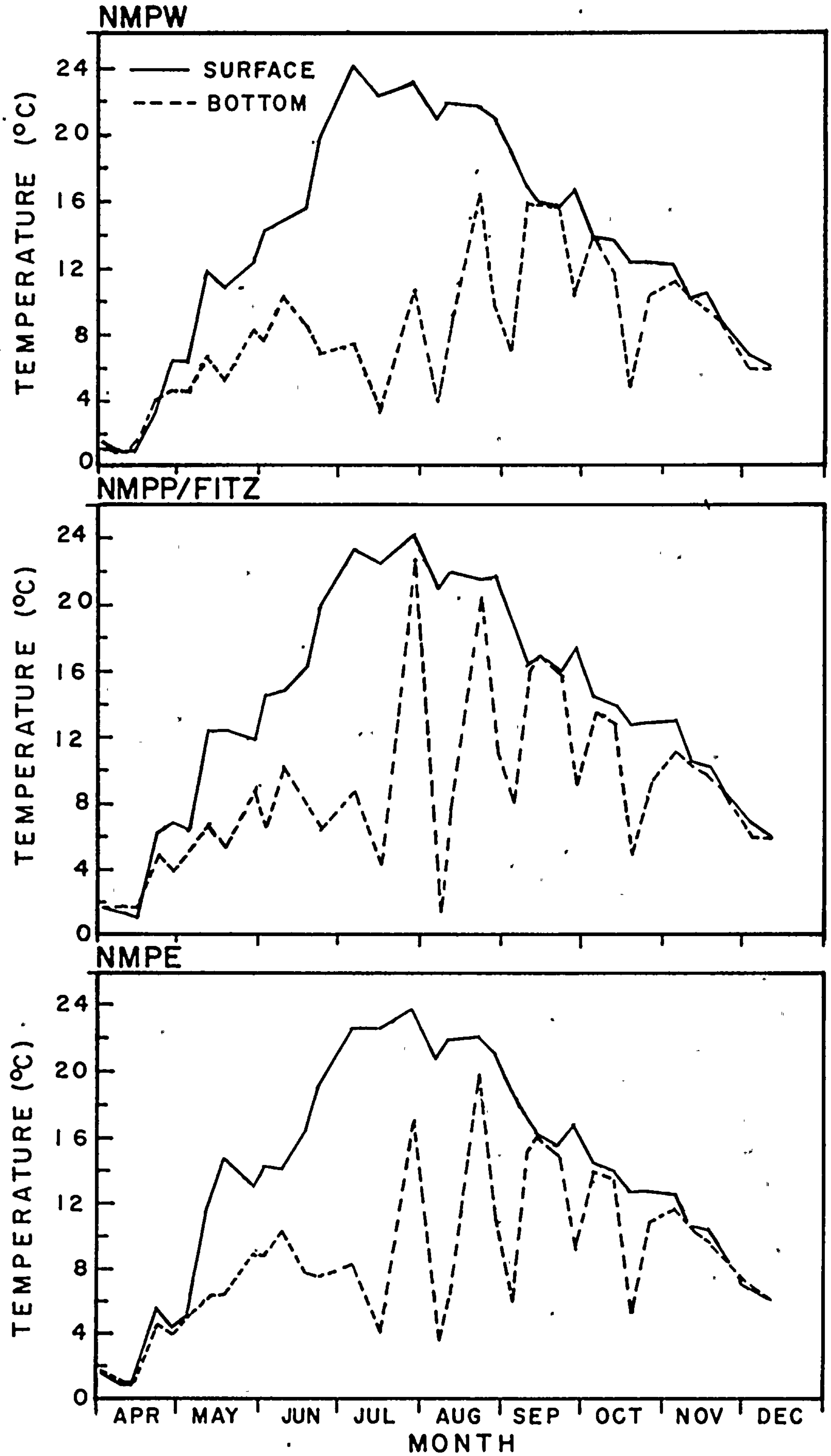

THERMOCLINE POSITIONS AT THE 100 FT DEPTH CONTOUR
NINE MILE POINT VICINITY - 1975
DEPTH (m)
0
4
8
12
16
20
24
28
32
36
NMPW
NMPP/FITZ
NMPE
29 APR
12 MAY
19 MAY
3 JUN
19 JUN
24 JUN
7 JUL
17 JUL
29 JUL
8 AUG
12 AUG
24 AUG
29 AUG
5 SEP
29 SEP
20 OCT
DATE

FIGURE IV-5

SURFACE AND BOTTOM TEMPERATURES AT 100 FT DEPTH CONTOUR
NINE MILE POINT VICINITY-1975



than five miles per hour (mph). On the other hand, the majority of recorded wind speeds prior to 29 July with high bottom temperatures were greater than 10 mph. Although only a few hours' (24 hours on 17 August) wind speed data is available for the week prior to 24 August, when bottom temperatures were again high, it is probable that the ocurrence of high wind speeds (>10 mph) influenced bottom temperatures. Apparently, strong winds advected warm water onshore and depressed the isotherms in the site vicinity out to the 100 ft depth contour by 29 July and 24 August, creating an internal seiche.

2. Water Quality

a. Effects of Oswego River

Storr (1964), noting that the Oswego River had a higher average chloride concentration than Lake Ontario, used chloride concentrations to trace the movement of waters which originated from the Oswego River and passed the Nine Mile Point vicinity. A summary of the chloride concentrations and conductivity, measured by the NYSDEC on the Oswego River at the City of Oswego, is given in Table IV-4, where it is compared with the 1975 water quality data collected in the Nine Mile Point vicinity.

Using specific conductance values obtained in the 1975 bimonthly water quality surveys, a four-way analysis of variance was conducted to test the hypothesis that the Oswego River did not affect the specific conductance of the water in the Nine Mile Point vicinity. The results of the ANOVA and Student-Newman-Keuls tests suggested that the river did affect the chlorides at the site (Appendix IV-1). The NMPW transect had significantly higher specific conductance values than the NMPP/FITZ or NMPE transects. In addition, these values were significantly higher at the 20 ft depth contour than at the 40 ft depth contour, which, in turn, had significantly higher values than the 60 ft depth contour.

b. Comprehensive Water Chemistry

Summaries of the monthly and bimonthly water quality sampling programs for 1975 are presented in Table IV-5 and Table IV-6, respectively, which include the minimum value, maximum value, mean, and standard deviation of each parameter. The overall water chemistry data are similar to the results of the 1974 water quality studies (LMS, 1975), with slightly better water quality observed in 1975 than in previous years. Such parameters as copper, iron, potassium, sodium, zinc, silver, aluminum, chromium, mercury, and lead showed large reductions in overall concentrations from 1974 to 1975. Specific conductance was the only parameter

TABLE IV-4

CHLORIDE CONCENTRATIONS AND CONDUCTIVITY

LAKE ONTARIO

	OSWEGO RIVER* 1964-1974	NINE MILE POINT VICINITY (1975)
CHLORIDE CONCENTRATION (mg/1)		
Mean	236	33
Maximum	600	59
Minimum	88	24
No. of Samples	79	36
CONDUCTIVITY (μmho/cm at 25°C)		
Mean	1006	323
Maximum	1930	440
Minimum	437	259
No. of Samples	80	342

*New York State Department of Environmental Conservation, 1976.

TABLE IV-5

MONTHLY WATER QUALITY VALUES AT NMPP/FITZ TRANSECT

NINE MILE POINT VICINITY - 1975

PARAMETER	COMPUTER ABBREVIATION	UNITS	NO. OF SAMPLES	MAXIMUM	MINIMUM	MEAN*	STANDARD DEVIATION
SILVER	AG	mg/l	36	<0.002	<0.002	0.000	0.000
ALUMINUM	AL	mg/l	36	1.66	<0.02	<0.13	0.29
ALKALINITY	ALK	mg/l.$CACO_3$	36	106.0	78.0	89.1	0.4
ARSENIC	AS	mg/l	36	<0.028	<0.028	0.000	0.000
BARIUM	BA	mg/l	36	<0.50	<0.50	0.00	0.00
BERYLLIUM	BE	mg/l	36	0.005	<0.005	0.000	0.000
CALCIUM	CA	mg/l	36	111.800	34.200	43.017	12.681
CADMIUM	CD	mg/l	36	<0.020	<0.020	0.000	0.000
CHLORIDE	CL	mg/l	36	59	24	33	8
CYANIDE	CN	mg/l	36	0.00	0.00	0.00	0.00
COLOR	COL	color units	36	20	5	9	4
CHROMIUM	CR	mg/l	36	<0.10	<0.10	0.00	0.00
COPPER	CU	mg/l	36	0.05	<0.03	0.00	0.00
DISSOLVED OXYGEN	DO	mg/l	36	13.8	8.2	10.5	1.5
FLUORIDE	F	mg/l	36	0.2	<0.2	0.0	0.0
FECAL COLIFORMS	FCOL	cts/100 ml	36	76	0	6	13
IRON	FE	mg/l	36	0.47	<0.02	<0.08	0.12
MERCURY	HG	mg/l	32	0.006	<0.002	0.000	0.000
POTASSIUM	K	mg/l	36	3.500	1.700	2.313	0.476
MAGNESIUM	MG	mg/l	36	11.200	6.690	7.843	1.068
MANGANESE	MN	mg/l	36	0.08	<0.02	0.00	0.00
SODIUM	NA	mg/l	36	27.800	10.800	15.815	4.454
AMMONIA NITROGEN	NH3N	mg/l-N	36	0.5	0.1	0.1	0.1
NICKEL	NI	mg/l	36	0.05	<0.05	0.00	0.0[illegible]
NITRATE NITROGEN	NO3N	mg/l-N	36	0.48	0.01	0.17	0.[illegible]
ORTHOPHOSPHATE	OP	mg/l-P	36	0.020	0.000	0.004	0.0[illegible]
LEAD	PB	mg/l	36	<0.08	<0.08	0.00	0.00
pH	PH	units	36	8.7	8.0	8.3	0.2
PHENOLS	PHL	mg/l	36	0.050	0.000	0.002	0.008
SETTLEABLE SOLIDS	SETR	ml/l	36	0.0	0.0	0.0	0.0
SILICATE	SIO2	mg/l	36	2.0	<0.1	<0.7	0.5
SULFATE	SO4	mg/l	36	74	22	30	8
SPECIFIC CONDUCTANCE	SPC	µmho/cm at 25°C	36	440	296	331	37
SURFACTANTS	SURF	mg/l	36	0.160	0.001	0.023	0.027
TEMPERATURE	T	°C	36	24.5	2.3	13.6	0.4
BIOLOGICAL OXYGEN DEMAND (BOD_5)	TBOD	mg/l	36	4	1	2	1
CHEMICAL OXYGEN DEMAND	TCOD	mg/l	36	19	2	9	4
TOTAL COLIFORMS	TCOL	cts/100 ml	36	121	0	19	26
TOTAL DISSOLVED SOLIDS	TDS	mg/l	36	297	179	209	28
TOTAL KJELDAHL NITROGEN	TKN	mg/l-N	36	0.90	0.19	0.40	0.19
TOTAL PHOSPHORUS	TP	mg/l-P	36	0.070	0.000	0.024	0.016
TOTAL SOLIDS	TS	mg/l	36	301	185	214	28
TOTAL SUSPENDED SOLIDS	TSS	mg/l	36	26	1	5	5
TURBIDITY	TUR	FTU	36	8	1	3	1
TOTAL VOLATILE SOLIDS	TVS	mg/l	36	101	34	65	15
VANADIUM	V	mg/l	36	<0.2	<0.2	0.0	0.0
ZINC	ZN	mg/l	36	0.091	<0.010	<0.017	0.023

*Mean parameter value was not calculated and was recorded as 0 where >75% of sample data were below detection limit.

TABLE IV-6

BIMONTHLY WATER QUALITY VALUES

NINE MILE POINT VICINITY - 1975

COMPUTER ABBREVIATION	UNITS	NO. OF SAMPLES	MAXIMUM	MINIMUM	MEAN[a]	STANDARD DEVIATION
CA	mg/l	306	68.500	32.100	41.591	4.497
CHLA[b]	μg/l	306	21.2	0.0	5.0	3.1
CO2[c]	mg/l	306	3.0	0.0	0.9	0.8
CR	mg/l	306	0.10	<0.10	0.00	0.00
DO	mg/l	304	14.7	7.1	10.6	1.5
NA	mg/l	306	41.800	9.200	17.339	6.260
NH3N	mg/l-N	305	0.9	0.0	0.2	0.1
NO3N	mg/l-N	306	0.69	0.01	0.18	0.15
OP	mg/l-P	306	0.200	0.000	0.005	0.01
PH	units	306	8.9	7.6	8.4	0.2
SIO2	mg/l	306	3.3	0.0	0.7	0.5
SO4	mg/l	306	41	22	29	4
SPC	μmho/cm at 25°C	306	429	259	322	27
T	°C	306	24.5	0.8	13.5	6.2
TBOD	mg/l	306	4	0	2	1
TCOD	mg/l	306	48	0	12	7
TKN	mg/l-N	306	5.10	0.05	0.44	0.34
TP	mg/l-P	306	0.440	0.000	0.024	0.027
TS	mg/l	306	594	181	216	33
TSS	mg/l	306	493[d]	1	8	33
TUR	FTU	306	400[d]	0	6	26

[a] Mean parameter value was not calculated and was recorded as 0 where >75% of sample data were below detection limit.

[b] CHLA = Chlorophyll *a*

[c] CO2 = Carbon dioxide

[d] Maximum value for NMPE-60 ft bottom sample on 23 Oct was probably due to sediment entering sample. Two other high values (162 FTU) recorded in NMPW-60 ft bottom samples on both 18 Jun and 7 Oct may have been due to settling of surface detrital material. TSS data follow a similar pattern.

which showed a major increase between the two years. Values for the remaining water quality parameters during 1975 were approximately equal to those recorded in previous years. A combined summary of the concentrations measured in both the monthly and bimonthly water quality programs is presented in Appendix IV-2.

Certain water quality parameters, recorded in the Nine Mile Point vicinity are compared with applicable NYSDEC water quality standards (State of New York, 1972) proposed EPA water quality criteria (USEPA, 1973), and values characteristic of mixed offshore conditions in Lake Ontario (LMS, 1974) in Table IV-7.

Except for two parameters, pH and total dissolved solids, the chemical quality of the lake in the Nine Mile Point vicinity meets the Class A-Special (International Boundary Waters) standards of the NYSDEC. Total dissolved solids, however, are slightly higher than the applicable standard of 200 mg/l, and are probably reflective of the higher specific conductance in the Nine Mile Point vicinity resulting from the long term average easterly flow of the Oswego River. The pH values recorded in the Nine Mile Point vicinity are also slightly higher than the maximum allowable of 8.5 units; this is probably attributable to the Oswego River's effect on chlorides, specific conductance, and total dissolved solids in this area.

Although, the EPA proposed criteria are not yet legally effective, they do provide a second and generally more stringent model with which to evaluate the observed water quality in the Nine Mile Point vicinity. Of the 16 parameters examined in Table IV-4 for which there are applicable EPA criteria, the concentration of eight parameters measured in 1975, including ammonia nitrogen (NH_3N), total suspended solids (TSS), total phosphorus (TP), phenols (PHL), chromium (Cr), iron (Fe), cadmium (Cd) and zinc (Zn), exceeded the proposed EPA criteria at some time. Of the eight parameters which exceeded criteria, five (NH_3N, TP, PHL, Cr, Cd) have detection limits above the proposed criteria which precludes comparison of the data with the criteria.

The most significant difference between observed water quality in the Nine Mile Point vicinity and the proposed EPA criteria is found in the NH_3N parameter. The mean NH_3N value in the Nine Mile vicinity as measured in 1975 is 0.2 mg/l as compared to the proposed maximum allowable NH_3N concentration of 0.016 mg/l. The mean total phosphorus concentration of 0.024 mg/l in the Nine Mile Point vicinity is very close to the proposed EPA maximum of 0.025 mg/l (if the range of total phosphorus is

T[illegible]V-7

WATER QUALITY CHARACTERISTICS

PARAMETER	UNIT	VALUES CHARACTERISTIC OF MIXED OFFSHORE CONDITIONS[a]	NYSDEC STANDARDS CLASS A - SPECIAL (INTERNATIONAL BOUNDARY WATERS)[b]	PROPOSED EPA WATER QUALITY CRITERIA[c]	1975 NINE MILE POINT VICINITY RANGE	1975 NINE MILE POINT VICINITY MEAN
DISSOLVED OXYGEN	mg/l	-	≥ 6.0	°C — DO Min. FW 27.5-36 — 5.8 21 — 6.2 16 — 6.5 1.5-7.7 — 6.8	14.7-7.1	10.6
pH	units	8.0	6.7-8.5	FW 6.0-9.0 PS, R 5.0-9.0	8.9-7.6	8.4
AMMONIA-NITROGEN	mg/l	0.03	≤ 1.6 (at pH 8.0 or above)	FW < 0.016 PS ≲ 0.5	0.9-0.0	0.2
NITRATE-NITROGEN	mg/l	0.20	-	PS ≤ 10.0	0.69-0.01	0.18
TOTAL DISSOLVED SOLIDS	mg/l	200	≤ 200	-	297-179	209
TOTAL SUSPENDED SOLIDS	mg/l	3.0	-	FW ≤ 80	493-1	8
ORTHOPHOSPHATE	mg/l-P	0.015	-	-	0.20-0.00	0.01
TOTAL PHOSPHORUS	mg/l-P	0.025	-	R ≤ 0.025 mg/l (in lakes where P is limiting nutrient)	0.440-0.000	0.024
SULFATE	mg/l	30.0	-	PS ≤ 250	74-22	29
CALCIUM	mg/l	40.0	-	-	111.800-32.100	41.741
SODIUM	mg/l	12.0	-	-	41.800-9.200	17.179
SPECIFIC CONDUCTANCE	mho/cm at 25°C	300	-	-	440-259	323
PHENOL	mg/l	0.002	-	PS ≤ 0.001	0.050-0.000	0.002
SILICATE	mg/l	0.5	-	-	3.3-<0.1	<0.7
CHROMIUM	mg/l	0.001	-	PS ≤ 0.05	0.10<0.10	0.00
IRON	mg/l	0.01	≤ 0.3	PS ≤ 0.3	0.47-<0.02	<0.08
CYANIDE	mg/l	-	≤ 0.1	PS ≤ 0.2	0.00	0.00
COPPER	mg/l	0.01	≤ 0.2	PS ≤ 1.0	0.05-< 0.03	~0.00
CADMIUM	mg/l	0.0001	≤ 0.3	PS < 0.01 FW { < 0.03 in hard water < 0.004 in soft water	<0.020	<0.020
ZINC	mg/l	0.01	≤ 0.3	PS ≤ 5	0.091-<0.010	<0.017
TOTAL KJELDAHL NITROGEN	mg/l	0.2	-	-	5.10-0.50	0.43
TOTAL COLIFORM	cts/100 ml	1	< 1000 (geometric mean)	FW < 2000	121-0	19
FECAL COLIFORM	cts/100 ml	-	≤ 200 (geometric mean)	R < 2000 (average) R ≲ 4000 (maximum)	76-0	6

- No applicable data available

[a] QLM, 1974
[b] NYSDEC, 1974
[c] Environmental Protection Agency, 1973

FW = Propagation of freshwater aquatic life
PS = Uses of water for public supply after normal treatment

considered, the 0.025 mg/l criteria is exceeded at some time). The important relationships between nitrogen and phosphorus in terms of algal nutrients are discussed in Chapter V.

A comparison of water quality characteristics of the Nine Mile Point vicinity with mixed offshore conditions (Table IV-4) indicates that, except for ammonia nitrogen values, the concentrations of constituents in the Nine Mile Point vicinity closely parallel the concentrations found in mixed offshore conditions. The concentration of NH_3N in mixed offshore conditions is approximately 0.03 mg/l (QLM, 1974) as compared to a mean of 0.2 mg/l found in the Nine Mile Point vicinity in 1975.

c. Biologically Significant Water Quality Parameters

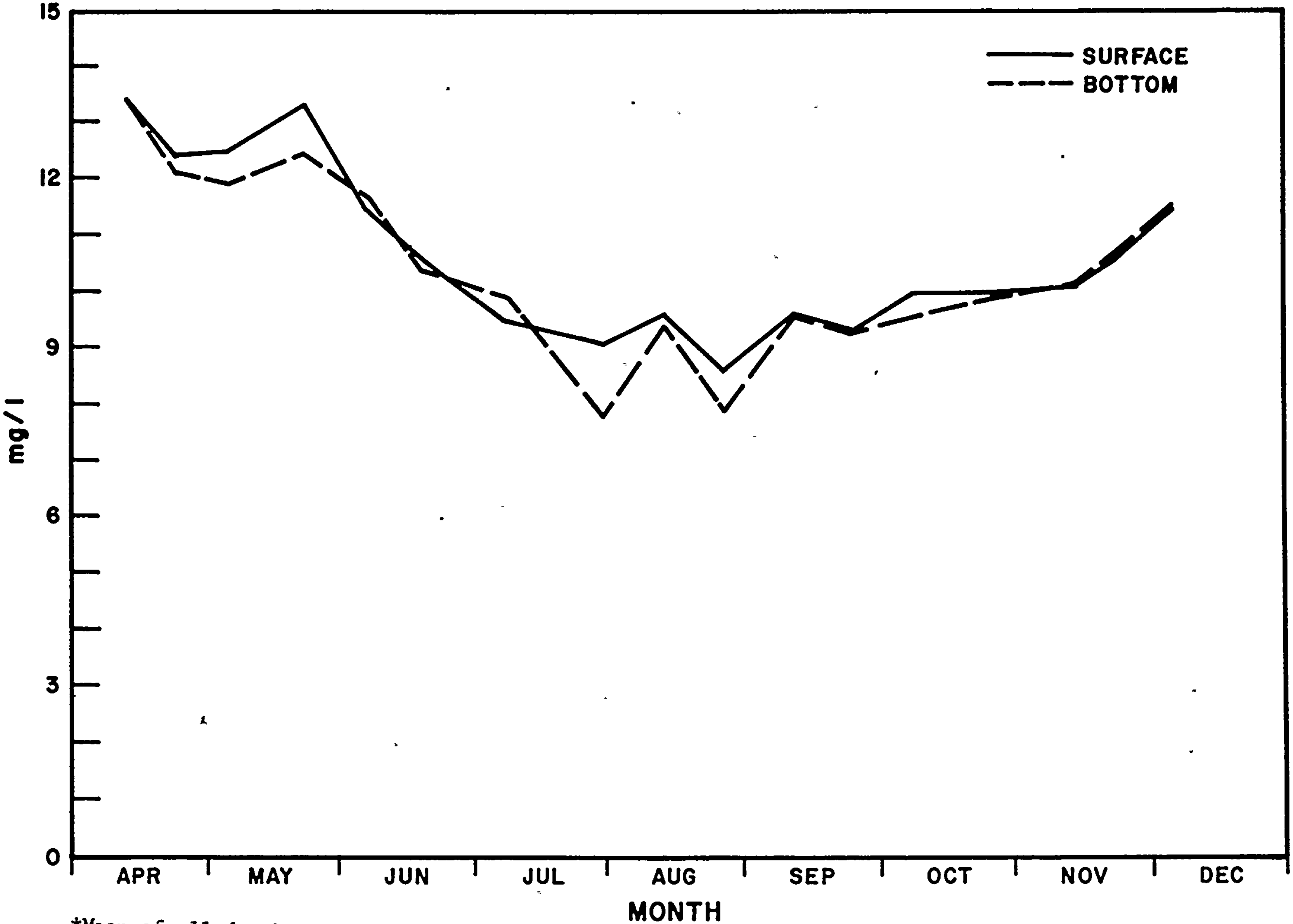
Since a dynamic relationship exists between water chemistry and aquatic biology, an analysis of certain chemical patterns in the Nine Mile Point vicinity is essential to the understanding of the biological patterns described in the following chapters. Thirteen water quality parameters [dissolved oxygen (DO), total solids (TS), total dissolved solids (TDS), total suspended solids (TSS), chlorophyll a (CHLA), silicate (SiO_2), nitrate-nitrogen (NO_3N), ammonia-nitrogen (NH_3N), sodium (Na), calcium (Ca), sulfate ($SO_4^=$), total phosphorus (TP), and orthophosphate (OP)] are discussed in the following paragraphs. These parameters were selected for analysis because of their particular relevancy to the various biological communities, such as phytoplankton, zooplankton, benthos, and nekton in the Nine Mile Point vicinity.

A time series plot of surface and bottom dissolved oxygen concentrations, averaged over depth contour and transect, is shown in Figure IV-7. DO concentrations were highest during the spring and lowest during the summer months when water temperatures and biological activity were high. However, even the lowest mean DO concentration, 7.1 mg/l recorded in the bottom waters, is well above the minimum EPA criteria for protection of aquatic life (USEPA, 1973). With the decline of biological activity and drop in temperature in the fall, the DO concentration increased.

The mean percent dissolved oxygen saturation in the Nine Mile Point vicinity during 1975 was 108% in surface waters and 104% in bottom waters, it never fell below 74% and was as high as 144% (Appendix IV-3).

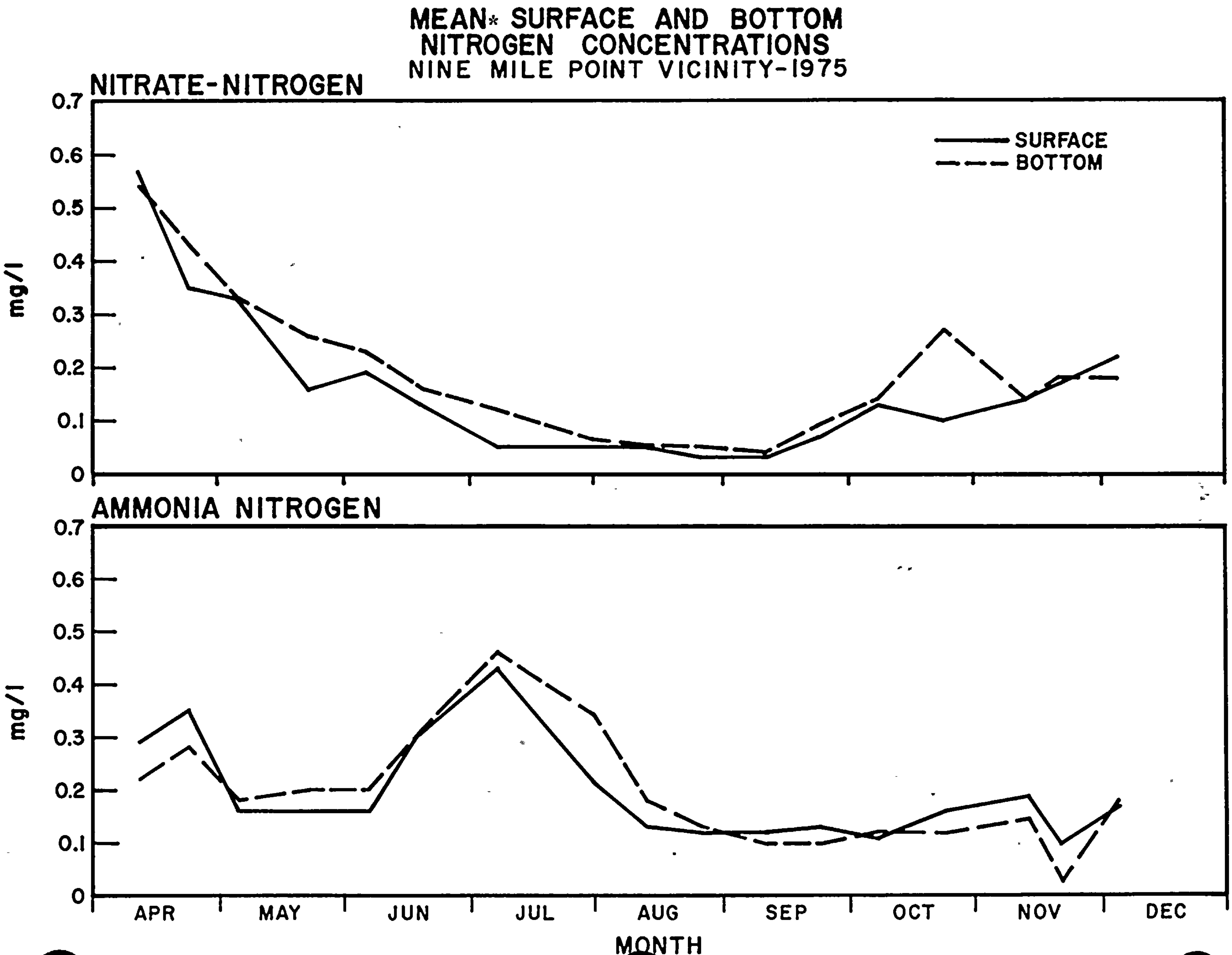
Ammonia-nitrogen and nitrate-nitrogen are utilized by phytoplankton populations as nutrients for growth. Figure IV-8 presents time

MEAN* SURFACE AND BOTTOM DISSOLVED OXYGEN CONCENTRATIONS NINE MILE POINT VICINITY-1975



*Mean of all depth contours and transects; bimonthly water quality program.

FIGURE IV-7



*Mean of all depth contours and transects from [monthly] collections.

FIGURE IV-8

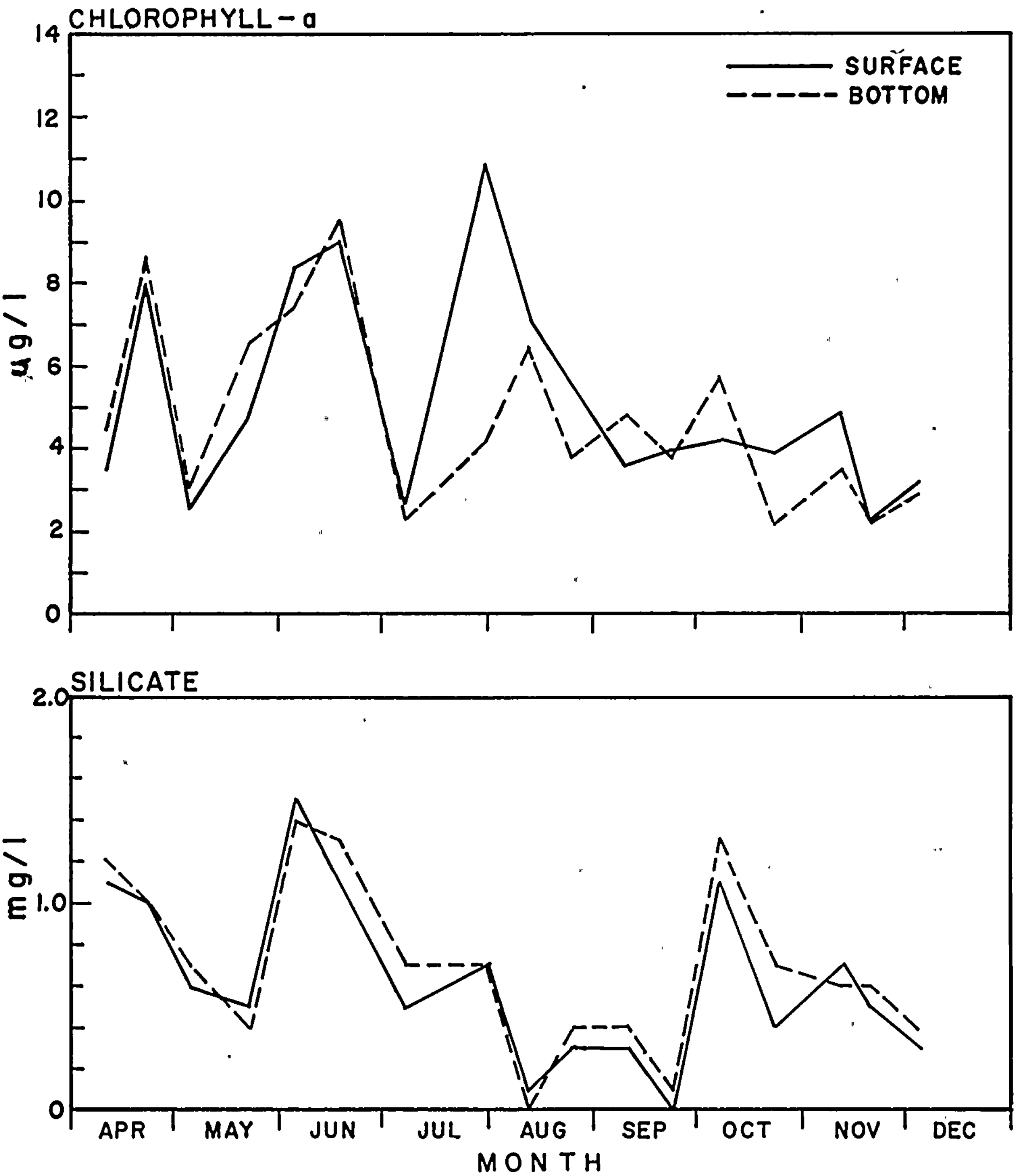
series plots of soluble NH_3N and NO_3N. Concentrations of both NO_3N and NH_3N declined from early spring to late spring/early summer, possibly in relation to increased biological activity in the late spring. Concentrations of NO_3N continued to decline throughout the summer and gradually increased again in the fall. Nitrate-nitrogen peaks in early spring and early fall generally correspond to periods of mixing in the Nine Mile Point vicinity; during these times nitrates in the water column are replenished from bottom sediments and mixing with offshore lake water. Ammonia-nitrogen exhibited substantially increased concentrations during June and July, possibly due to waste excretion of an increased zooplankton population (Chapter V).

Phosphorus, particularly soluble orthophosphate, is also an important phytoplankton nutrient. The mean total phosphorus and orthophosphate concentrations for Nine Mile Point vicinity in 1975 were approximately 0.02 and 0.01 mg/l, respectively. There were no discernible seasonal variations in the concentrations of either TP or OP. The maximum concentrations for TP (0.44 and 0.13 mg/l), and OP (0.20 and 0.06 mg/l) recorded for bottom samples at the 60-ft depth contour of NMPW and NMPE are not characteristic of Nine Mile Point waters. These high values for TP and OP are actually measuring the results of disturbances of the sediment during sampling of the bottom waters; these also resulted in uncharacteristically high TS, TSS and TUR values.

Two other water quality parameters, chlorophyll a and soluble silicate, are also measurements of the extent of phytoplankton activity (Figure IV-9). Chlorophyll a concentrations showed three distinct peaks, in late April, June, and late July/early August, the significance of which is discussed in Chapter V. Soluble silicate however, is a measure of unincorporated silica and its concentration peaks during 1975 roughly corresponded to either a diatom dieoff or a release of silica from bottom sediments during periods of mixing.

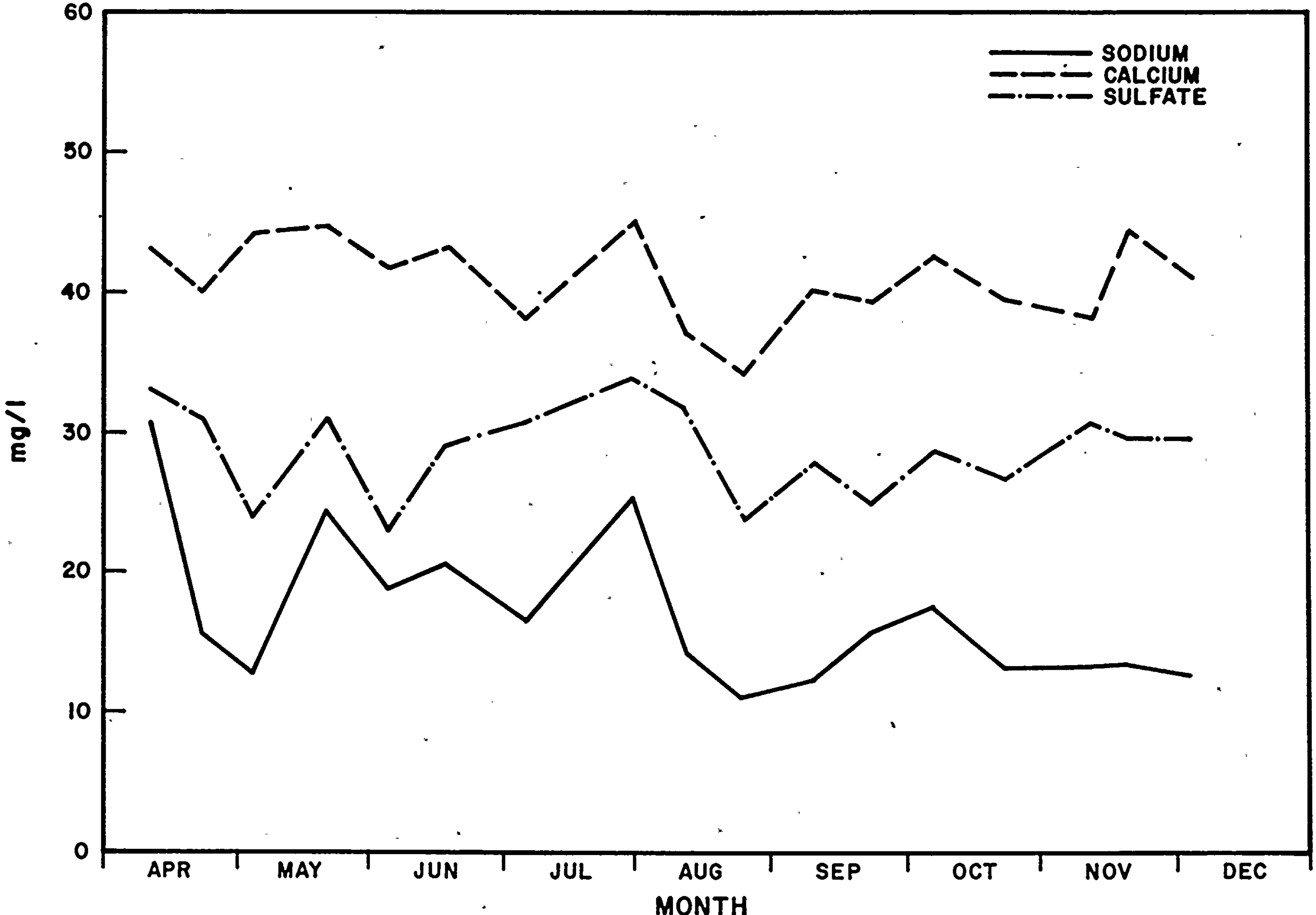
Seasonal variations in surface concentrations of three major ion forms (Na, Ca, and SO_4) are graphed in Figure IV-10. Sodium and calcium showed no distinct seasonal variation and fluctuated about means of 17.2 and 41.7 mg/l, respectively. Compared with Na and Ca values characteristic of mixed offshore conditions (QLM, 1974), these means indicate that the near-shore waters in the Nine Mile Point vicinity have higher concentrations of Na and Ca than deeper waters. Sulfate concentrations show greater variation than Na and Ca, probably due to its utilization as

MEAN* SURFACE AND BOTTOM CONCENTRATIONS OF CHLOROPHYLL a AND SILICATE
NINE MILE POINT VICINITY-1975



*Mean of all depth contours and transects from bimonthly collections.

MEAN* SURFACE CONCENTRATIONS OF CALCIUM, SODIUM, AND SULFATE
NINE MILE POINT VICINITY-1975



*Mean of all depth contours and transects from bimonthly collections.

FIGURE IV-10

a nutrient, although its mean concentration of 29 mg/l is approximately equal to concentrations which are characteristic of mixed offshore conditions (QLM, 1974).

Figure IV-11 indicates the seasonal variations in concentrations of total solids (TS), total dissolved solids (TDS), and total suspended solids (TSS) measured in the Nine Mile Point vicinity in 1975. TDS is a measure of dissolved salts and is calculated by subtraction of measured TSS values from measured TS values. TDS remained fairly stable during 1975, fluctuating around a concentration of 210 mg/l. The maximum allowable concentration under New York State standards is 200 mg/l (New York, 1974), even though mixed offshore concentrations are also approximately 200 mg/l (QLM, 1974). TSS represents the non-filterable solids in the water column. The high concentrations of suspended solids occurring in spring (April) and fall (October) are probably caused by the resuspension of sediments during wave mixing periods in the Nine Mile Point vicinity. Increases in TSS in June, July and August may be influenced by increasing algal activity during these months (ILEWPB and ILO-SLRWPB, 1969). TS concentrations include both the dissolved (filtrable residue) and suspended (nonfiltrable residue) solids fractions.

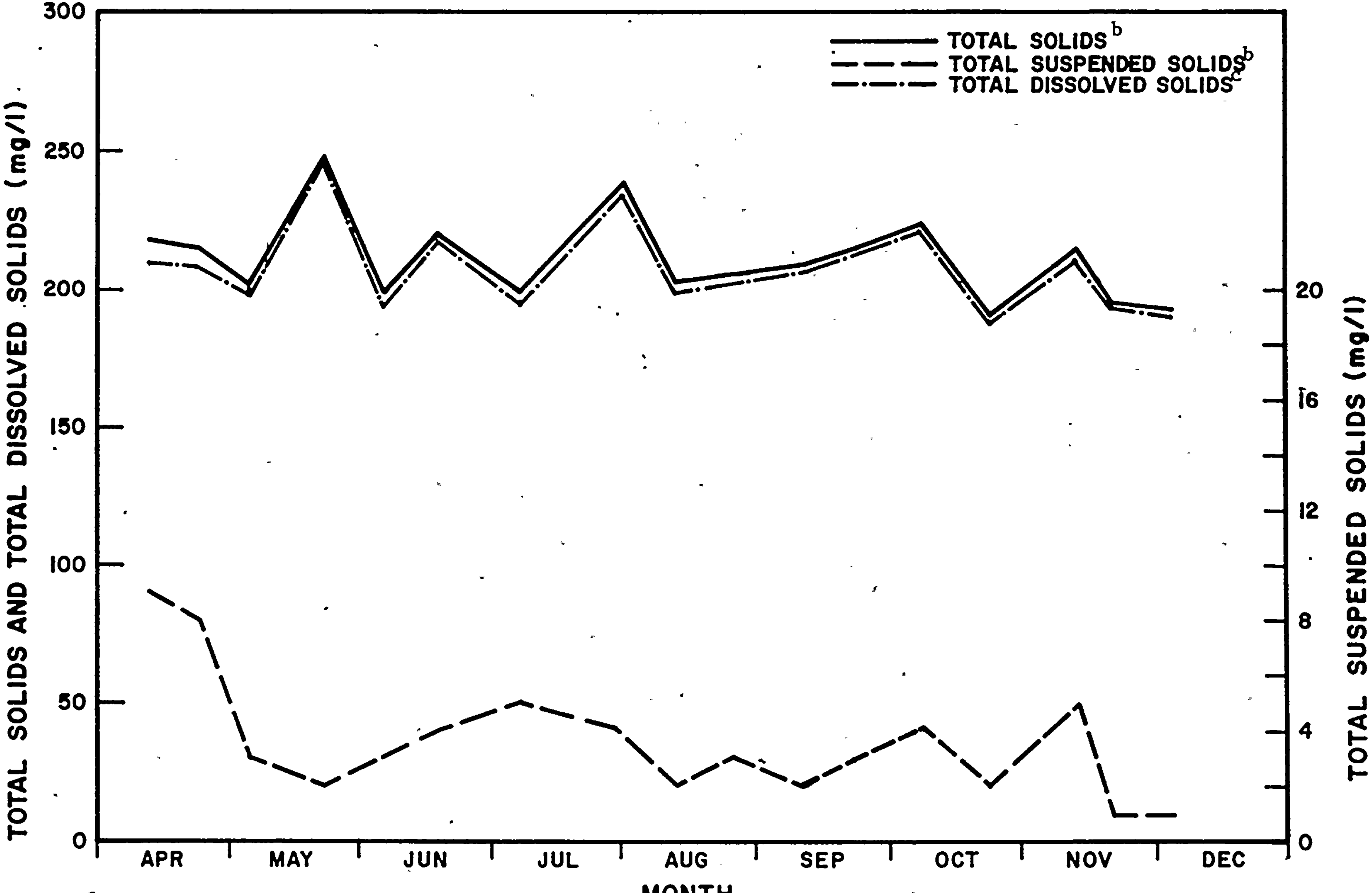
D. CONCLUSIONS

The major effect of the discharge of Nine Mile Point Nuclear Station Unit 1 on water quality was in terms of heat addition to waters shoreward of the 60 ft depth contour. Thermal influences upon near-shore stratification were most apparent at the 20 ft depth contour, were minimal at the 60 ft depth contour, and were absent by the 100 ft depth contour. Meteorological conditions influenced water temperatures and other water quality characteristics in the Nine Mile Point vicinity.

Water quality parameters in the Nine Mile Point vicinity were also affected by the Oswego River, with the river's effects being strongest at the west transect (NMPW) and in near-shore waters, with diminishing effects at the more eastern transects (NMPP/FITZ and NMPE) and at greater depths. Such parameters as specific conductance, chlorides, dissolved solids, pH, sodium, calcium, and sulfate are particularly affected by the Oswego River flow.

Water quality in the Nine Mile Point vicinity met all New York State standards except those for pH and TDS. However, these violations were not caused by the operation of the Nine Mile Point or FitzPatrick power plants but were simply reflections of the general near-shore water quality of Lake Ontario in the Nine Mile Point area.

MEAN[a] SURFACE CONCENTRATIONS OF SOLIDS
NINE MILE POINT VICINITY-1975



[a] Mean of all depth contours and transects.
[b] Measured in bimonthly water quality program.
[c] Measured in monthly water quality program.

FIGURE IV-11

Such biologically important water quality parameters as DO, NO_3N, OP, SiO_2, CHLA, and TSS show no trends indicative of power plant impact and reflect the normal, naturally occurring biological processes of near-shore waters of Lake Ontario in the Nine Mile Point vicinity.

REFERENCES CITED

International Lake Erie Water Pollution Board and the International Lake Ontario-St. Lawrence River Water Pollution Board. 1969. Pollution of Lake Erie, Lake Ontario and the international section of the St. Lawrence River. III. Lake Ontario and the international section of the St. Lawrence River. 329 p. [p. 113] Report to International Joint Commission.

Lawler, Matusky and Skelly Engineers. 1974. 1973 Oswego Steam Station aquatic ecology studies. Prepared for Niagara Mohawk Power Corp.

Lawler, Matusky and Skelly Engineers. 1975. 1974 Nine Mile Point aquatic ecology studies. Prepared for Niagara Mohawk Power Corp. and Power Authority of the State of New York.

New York State Department of Environmental Conservation. 1974. Classification and standards governing the quality and purity of waters of New York State. (Parts 700, 701, and 702: Title 6, official compilation of codes, rules, and regulations). 26 p.

New York State Department of Environmental Conservation. 1976. Letter to Mr. John Matousek, Lawler, Matusky & Skelly Engineers, 3 February 1976. Ronald E. Maylath, P.E., Chief, Monitoring & Surveillance, Division of Pur Waters.

Quirk, Lawler and Matusky Engineers. 1974. 1973 Nine Mile Point aquatic ecology studies - Nine Mile Point Generating Station. Prepared for Niagara Mohawk Power Corp.

Smith-Singer Meteorologists, Inc. 1975. Computer print-out of Nine Mile Point Site Tower meteorological data for 1975 (unpublished).

State of New York. 1972. Official compilation of codes, rules and regulations of the State of New York: 6 Conservation (A). Title 6, Environmental conservation. Part 650. Chapter 10. Division of water resources. Dept of State. Albany, N.Y. (Lenz and Riecker, Inc., New York).

Storr, J.F. [Niagara Mohawk Power Corp.]. 1964. Limnology - Nine Mile Point, Lake Ontario, p. B1-B82. In Preliminary summary hazards report. U.S. AEC Docket No. 50-220, Appendix B, Vol. II.

U.S. Environmental Protection Agency. 1973. Proposed criteria for water quality. I. U.S. EPA 546-315/216 1-3, Washington, D.C. 425 p.

APPENDIX IV-1

STATISTICAL ANALYIS OF SPECIFIC CONDUCTANCE

NINE MILE POINT VICINITY - 1975

FOUR-WAY ANALYSIS OF VARIANCE

SOURCE	DF	SS	F
DATES	16	129557.56	30.76 *
TRANSECTS	2	5056.94	9.60 *
DEPTH CONTOURS	2	7513.90	14.27 *
SAMPLE DEPTHS	1	469.42	1.78
DATE X TRANSECT	32	17373.50	2.06 *
DATE X DEPTH CONTOUR	32	21514.54	2.55 *
DATE X SAMPLE DEPTH	16	7690.19	1.83 *
TRANSECT X DEPTH CONTOUR	4	2044.98	1.94
TRANSECT X SAMPLE DEPTH	2	894.85	1.70
DEPTH CONTOUR X SAMPLE DEPTH	2	456.31	0.87
ERROR	196	51598.31	
TOTAL	305	244170.50	

* Significant at $\alpha = 0.05$

STUDENT-NEWMAN-KEULS TEST - TRANSECTS ($\alpha = 0.05$)
Largest: NMPW NMPP/FITZ NMPE: Smallest

STUDENT-NEWMAN-KUELS TEST - DEPTH CONTOURS ($\alpha = 0.05$)
Largest: 20 FT 40 FT 60 FT: Smallest

STUDENT-NEWMAN-KUELS TEST - DATES ($\alpha = 0.05$)

	22	31	23	7	12	18	23	5	20	4	12	10	25	7	23	5	11
Largest:	MAY	JUL	APR	OCT	NOV	JUN	SEP	MAY	NOV	DEC	AUG	SEP	AUG	JUL	OCT	JUN	APR: Smallest

APPENDIX IV-2

SUMMARY OF MONTHLY AND BIMONTHLY WATER QUALITY PARAMETERS AT NINE MILE POINT VICINITY -- 1975*

ABBREV.	UNITS	NO. OF SAMPLES	MAXIMUM	MINIMUM	MEAN	STANDARD DEVIATION
AG	MG/L	36	<0.002	<0.002	0.000	0.000
AL	MG/L	36	1.660	<0.020	<0.135	0.294
ALK	MG/L CACO3	36	106.000	78.000	89.056	6.446
AS	MG/L	36	<0.028	<0.028	0.000	0.000
BA	MG/L	36	<0.500	<0.500	0.000	0.000
BE	MG/L	36	0.005	<0.005	0.000	0.000
CA	MG/L	342	111.800	32.100	41.741	5.934
CD	MG/L	36	<0.020	<0.020	0.000	0.000
CHLA	U-G/L	314	21.200	0.000	4.888	3.143
CL	MG/L	36	59.000	24.000	32.528	8.190
CN	MG/L	36	0.000	0.000	0.000	0.000
COL	COLOUR UNITS	36	20.000	5.000	9.444	4.213
CO2	MG/L	314	3.000	0.000	0.855	0.854
CR	MG/L	342	0.100	<0.100	0.000	0.000
CU	MG/L	36	0.050	<0.030	0.000	0.000
DO	MG/L	340	14.700	7.100	10.571	1.54
F	MG/L	36	0.200	<0.200	0.000	0.000
FCOL	CTS/100 ML.	36	76.000	0.000	5.917	13.479
FE	MG/L	36	0.470	<0.020	<0.077	0.121
HG	MG/L	32	0.006	<0.002	0.000	0.000
K	MG/L	36	3.500	1.700	2.313	0.476
MG	MG/L	36	11.200	6.690	7.843	1.068
MN	MG/L	36	0.080	<0.020	0.000	0.000
NA	MG/L	342	41.800	9.200	17.179	6.113
NH3N	MG/L N	341	0.900	0.000	0.187	0.130
NI	MG/L	36	0.050	<0.050	0.000	0.000
NO3N	MG/L N	342	0.690	0.010	0.176	0.146
OP	MG/L P	342	0.200	0.000	0.005	0.000
PB	MG/L	36	< 0.080	<0.080	0.000	0.000
PH	UNITS	342	8.900	7.600	8.386	0.220
PHL	MG/L	36	0.050	0.000	0.002	0.008
SETR	MG/L	36	0.000	0.000	0.000	0.000
SIO2	MG/L	342	3.300	<0.100	<0.660	0.531
SO4	MG/L	342	74.000	22.000	29.129	4.423
SPC	U-MHO/CM AT 25° C.	342	440.000	259.000	322.515	28.765
SURF	MG/L	36	0.160	0.001	0.023	0.027
T	°C	342	24.500	0.800	13.485	6.247
TBOD	MG/L	342	4.000	0.000	1.819	0.873
TCOD	MG/L	342	48.000	0.000	11.974	6.606
TCOL	CTS/100 ML.	36	121.000	0.000	18.556	25.830
TDS	MG/L	36	297.000	179.000	208.778	27.586
TKN	MG/L N	342	5.100	0.050	0.434	0.329
TP	MG/L P	342	0.440	0.000	0.024	0.026
TS	MG/L	342	594.000	181.000	215.409	32.400
TSS	MG/L	342	493.000	1.000	7.512	31.016
TUR	FTU	342	400.000	0.000	5.436	24.699
TVS	MG/L	36	101.000	34.000	64.833	14.932
V	MG/L	36	<0.200	<0.200	0.000	0.000
ZN	MG/L	36	0.091	<0.010	<0.017	0.023

*M[illegible]ameter value was not calculated and was recorded as 0 where >75[illegible]mple data were below detection limit.

APPENDIX IV-3

BIMONTHLY TEMPERATURE AND DISSOLVED OXYGEN
BY STATION AND SAMPLE DEPTH

NINE MILE POINT VICINITY - 1975

I. NMPW

DATE	SAMPLE DEPTH	20 FT TEMP (°C)	20 FT DO (mg/l)	20 FT % SATURATION	40 FT TEMP (°C)	40 FT DO (mg/l)	40 FT % SATURATION	60 FT TEMP (°C)	60 FT DO (mg/l)	60 FT % SATURATION
	S	1.1	13.0	92	1.1	13.1	92	1.0	13.5	95
11 APR	B	0.9	13.7	96	1.0	13.5	95	0.9	13.2	93
	S	6.5	11.8	97	6.0	12.5	100	6.0	12.4	99
23 APR	B	6.5	12.6	103	6.5	11.8	97	6.0	11.8	94
	S	6.0	12.4	99	6.0	12.8	102	5.5	12.4	99
5 MAY	B	6.0	9.2	74	6.0	12.7	102	6.0	12.6	101
	S	15.0	13.1	128	15.0	12.0	118	15.0	14.7	144
22 MAY	B	17.0	12.9	133	10.0	12.4	110	6.0	12.1	97
	S	12.5	11.3	107	13.5	11.2	108	14.0	12.2	117
5 JUN	B	13.5	11.6	112	13.5	11.3	109	12.5	11.5	108
	S	16.0	9.9	99	16.0	10.5	105	16.0	11.4	114
18 JUN	B	15.5	10.7	107	15.0	11.3	111	14.5	9.8	96
	S	23.3	9.3	107	23.9	9.6	113	24.0	10.0	118
7 JUL	B	21.9	9.6	109	21.8	9.2	105	13.6	9.9	95
	S	23.0	9.0	103	23.0	9.1	105	23.0	8.9	102
31 JUL	B	22.0	8.2	93	22.0	7.7	88	21.0	7.6	84
	S	21.0	11.2	124	21.0	9.6	107	21.5	9.3	106
12 AUG	B	21.5	10.4	118	21.0	9.0	100	21.0	9.2	102
	S	21.0	9.3	103	21.0	8.8	98	21.0	8.8	98
25 AUG	B	21.0	7.7	86	21.0	7.7	86	20.5	7.1	79
	S	17.0	9.7	100	17.5	9.2	97	18.0	9.7	100
10 SEP	B	16.0	10.3	103	16.5	9.8	101	16.0	10.2	102
	S	17.0	9.5	98	16.0	9.4	94	16.0	9.5	95
23 SEP	B	17.0	9.5	98	16.0	8.8	88	16.0	9.5	95
	S	15.1	10.1	99	15.6	9.8	98	15.8	10.1	101
7 OCT	B	15.0	9.7	95	14.9	9.6	94	13.0	9.3	88
	S	13.7	10.1	97	13.7	10.1	97	13.5	10.1	97
23 OCT	B	11.5	10.2	94	9.0	10.1	87	8.0	10.1	85
	S	10.5	10.2	92	10.5	10.3	93	10.5	10.2	92
12 NOV	B	10.5	10.2	92	10.5	10.2	92	10.5	10.2	92
	S	10.5	11.0	99	10.0	10.5	93	10.3	10.6	94
20 NOV	B	10.0	11.1	98	10.0	10.8	96	10.0	10.6	94
	S	6.0	11.8	94	6.0	11.5	92	6.5	11.6	95
4 DEC	B	5.5	11.8	94	5.5	11.5	92	6.0	NA	-

APPENDIX IV-3
(Continued)

BIMONTHLY TEMPERATURE AND DISSOLVED OXYGEN

II. NMPP/FITZ

DATE	SAMPLE DEPTH	20 FT TEMP (°C)	20 FT DO (mg/l)	20 FT % SATURATION	40 FT TEMP (°C)	40 FT DO (mg/l)	40 FT % SATURATION	60 FT TEMP (°C)	60 FT DO (mg/l)	60 FT % SATURATION
11 APR	S	1.3	13.8	97	1.4	14.1	99	1.3	14.2	100
	B	2.9	14.1	104	1.9	13.4	97	1.8	13.1	95
23 APR	S	6.0	12.1	97	6.0	12.7	102	7.0	12.4	102
	B	6.0	12.2	98	6.0	12.2	98	6.5	11.6	95
5 MAY	S	6.0	12.3	98	6.0	12.5	100	6.0	12.6	101
	B	6.0	10.1	81	5.5	12.5	100	5.5	12.5	100
22 MAY	S	16.0	12.5	125	14.0	12.8	123	15.0	13.3	130
	B	12.0	12.9	119	17.0	12.7	131	12.0	11.7	108
5 JUN	S	14.0	11.8	113	14.0	11.9	114	13.0	11.1	105
	B	13.5	11.8	113	13.0	11.9	112	15.0	11.6	114
18 JUN	S	18.0	10.0	105	18.0	9.3	98	17.0	10.6	109
	B	16.0	11.2	112	17.5	10.5	111	16.0	10.2	102
7 JUL	S	24.2	9.4	111	23.7	9.5	112	23.6	9.3	109
	B	21.9	10.0	114	22.2	9.6	109	9.3	10.4	90
31 JUL	S	24.5	9.3	111	24.0	9.3	109	24.0	9.3	109
	B	22.0	7.9	90	22.0	7.4	84	22.0	7.1	81
12 AUG	S	23.0	9.4	108	22.0	9.3	106	21.5	9.1	103
	B	21.0	10.2	113	20.0	9.3	101	19.5	8.7	95
25 AUG	S	22.5	8.7	100	22.5	8.7	100	22.0	7.3	83
	B	21.0	8.3	92	21.5	8.4	95	20.5	8.6	96
10 SEP	S	19.0	9.7	103	18.0	9.6	101	18.0	9.8	103
	B	17.0	9.2	95	16.0	9.7	97	16.5	9.2	95
23 SEP	S	17.0	9.1	94	16.0	9.2	92	17.0	9.2	95
	B	17.0	9.3	96	16.0	NA	-	17.0	9.2	95
7 OCT	S	16.0	10.1	101	16.0	9.8	98	15.0	10.1	99
	B	15.0	9.6	94	15.0	9.7	95	14.5	9.6	94
23 OCT	S	13.5	10.1	97	13.5	10.4	100	13.5	9.9	95
	B	11.5	9.1	84	9.0	10.0	86	8.0	9.8	82
12 NOV	S	11.0	10.1	91	11.0	10.6	95	11.0	10.3	93
	B	11.0	10.6	95	11.0	10.0	90	11.0	10.1	91
20 NOV	S	10.0	10.5	93	10.5	10.7	96	10.0	10.6	94
	B	10.0	10.6	94	10.0	10.6	94	10.0	10.5	93
4 DEC	S	7.0	11.4	93	6.0	11.4	91	7.0	11.5	94
	B	6.5	11.6	95	7.0	11.4	93	6.5	11.3	93

APPENDIX IV-3
(Continued)

BIMONTHLY TEMPERATURE AND DISSOLVED OXYGEN

III. NMPE

DATE	SAMPLE DEPTH	20 FT TEMP (°C)	20 FT DO (mg/l)	20 FT % SATURATION	40 FT TEMP (°C)	40 FT DO (mg/l)	40 FT % SATURATION	60 FT TEMP (°C)	60 FT DO (mg/l)	60 FT % SATURATION
11 APR	S	1.1	13.5	95	1.1	13.3	94	0.8	12.6	89
	B	1.3	12.6	89	1.3	13.0	92	1.2	14.0	99
23 APR	S	6.0	12.5	100	6.0	12.6	101	5.0	13.0	102
	B	6.0	12.1	97	6.0	12.2	98	5.0	12.4	97
5 MAY	S	7.0	12.4	102	6.0	12.5	100	5.5	12.6	101
	B	7.0	12.1	99	6.0	12.9	103	5.5	12.6	101
22 MAY	S	14.0	13.5	130	14.0	14.3	138	15.0	13.0	127
	B	14.0	11.9	114	14.0	12.9	124	9.0	11.8	102
5 JUN	S	15.0	11.3	111	14.0	11.1	107	13.0	11.4	108
	B	12.5	12.3	116	12.5	11.7	110	12.0	11.5	106
18 JUN	S	17.0	11.1	114	16.5	11.4	118	16.5	11.3	116
	B	16.0	10.4	104	14.5	10.1	99	12.0	9.7	90
7 JUL	S	21.9	9.6	109	22.2	9.3	106	22.7	9.2	106
	B	21.0	9.5	106	18.2	9.6	101	10.8	9.9	89
31 JUL	S	24.0	8.7	102	23.5	9.1	107	23.5	9.4	111
	B	22.5	7.4	85	22.0	8.0	91	22.0	8.3	94
12 AUG	S	21.5	9.6	109	21.5	9.8	111	21.0	9.5	106
	B	21.5	9.9	113	21.0	9.1	101	20.0	9.2	100
25 AUG	S	20.5	9.2	102	20.5	8.8	98	20.5	8.0	89
	B	20.5	8.3	92	20.5	8.0	89	20.5	7.3	81
10 SEP	S	17.5	9.4	99	17.5	9.6	101	18.0	9.7	102
	B	17.0	9.4	97	17.0	9.4	97	17.5	9.3	98
23 SEP	S	17.0	9.1	94	16.0	9.2	92	16.0	9.5	95
	B	17.0	9.3	96	16.0	9.3	93	16.0	9.2	92
7 OCT	S	14.5	9.8	96	14.9	10.1	99	15.0	9.9	97
	B	13.9	9.8	94	15.0	9.6	94	14.5	9.9	97
23 OCT	S	13.5	9.9	95	13.5	10.0	96	13.5	9.6	92
	B	13.2	10.0	94	13.2	9.5	90	7.0	10.3	84
12 NOV	S	10.5	10.8	97	10.5	10.2	92	10.5	10.1	91
	B	10.5	10.3	93	10.5	10.2	92	10.5	10.3	93
20 NOV	S	10.0	10.6	94	10.0	10.7	95	10.0	10.6	94
	B	10.0	10.5	93	10.5	10.1	91	10.0	10.4	92
4 DEC	S	5.0	11.9	93	6.5	11.2	92	6.0	11.3	90
	B	5.0	12.1	95	7.0	11.4	93	6.0	11.3	90

S = Surface
B = Bottom
NA = Not available
\- = Not applicable

APPENDIX IV-4

SURFACE WATER QUALITY PARAMETERS AT
NMPW TRANSECT BY DEPTH CONTOUR

NINE MILE POINT VICINITY - 1975

DATE	SAMPLE DEPTH	TEMPERATURE(°C) 20FT	40FT	60FT	100FT
11APR	S	1.1	1.1	1.0	0.9
23APR	S	6.5	6.0	6.0	3.5
5MAY	S	6.0	6.0	5.5	6.4
22MAY	S	15.0	15.0	15.0	NA
5JUN	S	13.5	13.5	14.0	NA
18JUN	S	16.0	16.0	16.0	NA[a]
7JUL	S	23.3	23.9	24.0	24.2
31JUL	S	23.0	23.0	23.0	NA
12AUG	S	21.0	21.0	21.5	22.0
25AUG	S	21.0	21.0	21.0	NA[b]
10SEP	S	17.0	17.5	18.0	NA[c]
23SEP	S	17.0	16.0	16.0	15.8
7OCT	S	15.1	15.6	15.8	NA[d]
23OCT	S	13.7	13.7	13.5	NA
12NOV	S	10.5	10.5	10.5	10.3
20NOV	S	10.5	10.0	10.2	NA
4DEC	S	6.0	6.0	6.5	6.8

NA = not available

[a] 19 JUN 24.2°

[b] 24 AUG 21.8°

[c] 11 SEP 16.9°

[d] 6 OCT 14°

APPENDIX IV-4 (continued)

BOTTOM WATER QUALITY PARAMETERS AT NMPW TRANSECT BY DEPTH CONTOUR

NINE MILE POINT VICINITY - 1975

DATE	SAMPLE DEPTH	TEMPERATURE(°C) 20FT	40FT	60FT	100FT
11APR	B	0.9	1.0	0.9	0.9
23APR	B	6.5	6.5	6.0	4.1
5MAY	B	6.0	6.0	6.0	4.6
22MAY	B	17.0	10.0	6.0	NA
5JUN	B	13.5	13.0	12.5	NA
18JUN	B	15.5	15.0	14.5	NA[a]
7JUL	B	21.9	21.8	13.6	7.6
31JUL	B	22.0	22.0	21.0	NA
12AUG	B	21.5	21.0	21.0	8.0
25AUG	B	21.0	21.0	20.5	NA[b]
10SEP	B	16.0	16.5	16.0	NA[c]
23SEP	B	17.0	16.0	16.0	15.8
7OCT	B	15.0	14.9	13.0	NA[d]
23OCT	B	11.5	9.0	8.0	NA
12NOV	B	10.5	10.5	10.5	10.3
20NOV	B	10.0	10.0	10.0	NA
4DEC	B	5.5	5.5	6.0	6.1

NA = not available

[a] 19 JUN 8.7°

[b] 24 AUG 16.6°

[c] 11 SEP 16.0°

[d] 6 OCT 15.8°

APPENDIX IV-4 (continued)

SURFACE WATER QUALITY PARAMETERS AT NMPP/FITZ TRANSECT BY DEPTH CONTOUR

NINE MILE POINT VICINITY - 1975

DATE	*SAMPLE DEPTH*	*TEMPERATURE(°C)* 20FT	25FT	40FT	45FT	60FT	100FT
11APR	S	1.30		1.40		1.30	1.2
15APR	S		2.30		2.30		0.9
23APR	S	6.00		6.00		7.00	6.3
5MAY	S	6.00		6.00		6.00	6.4
12MAY	S		15.50		13.10		12.4
22MAY	S	16.00		14.00		15.00	NA
3JUN	S		16.10		15.50		14.6
5JUN	S	14.00		14.00		15.00	NA
18JUN	S	18.00		18.00		17.00	NA[a]
7JUL	S	24.20		23.70		23.60	23.4
10JUL	S		24.50		24.50		NA
31JUL	S	24.50		24.00		24.00	NA
11AUG	S		23.00		23.00		NA
12AUG	S	23.00		22.00		21.50	22.0
25AUG	S	22.50		22.50		22.00	NA[b]
10SEP	S	19.00		18.00		18.00	NA
11SEP	S		17.00		17.50		16.5
23SEP	S	17.00		16.00		17.00	16.0
7OCT	S	16.00		16.00		15.00	NA
9OCT	S		13.40		14.00		NA
23OCT	S	13.50		13.50		13.50	NA
6NOV	S		13.00		13.00		13.1
12NOV	S	11.00		11.00		11.00	10.5
20NOV	S	10.00		10.50		10.00	NA
2DEC	S		6.00		5.00		NA
4DEC	S	7.00		6.00		7.00	6.9

NA = not available

[a] 19 JUN 16.4°

[b] 24 AUG 21.6°

APPENDIX IV-4 (continued)

BOTTOM WATER QUALITY PARAMETERS AT
NMPP/FITZ TRANSECT BY DEPTH CONTOUR

NINE MILE POINT VICINITY - 1975

DATE	SAMPLE DEPTH	TEMPERATURE(°C) 20FT	25FT	40FT	45FT	60FT	100FT
11APR	B	2.90		1.90		1.80	1.7
15APR	B		2.90		3.50		1.6
23APR	B	6.00		6.00		6.50	4.8
5MAY	B	6.00		5.50		5.50	5.3
12MAY	B		10.80		7.80		6.7
22MAY	B	12.00		17.00		12.00	NA
3JUN	B		12.60		12.40		6.4
5JUN	B	13.50		13.00		12.50	NA
18JUN	B	16.00		17.50		16.00	NA[a]
7JUL	B	21.90		22.20		9.30	8.8
10JUL	B		23.00		22.00		NA
31JUL	B	22.00		22.00		22.00	NA
11AUG	B		21.00		19.00		NA
12AUG	B	21.00		20.00		19.50	7.4
25AUG	B	21.00		21.50		20.50	NA[b]
10SEP	B	17.00		16.00		16.50	NA
11SEP	B		16.00		17.00		16.0
23SEP	B	17.00		16.00		17.00	15.8
7OCT	B	15.00		15.00		14.50	NA[c]
9OCT	B		13.50		12.00		NA
23OCT	B	11.50		9.00		8.00	NA
6NOV	B		12.00		12.00		11.2
12NOV	B	11.00		11.00		11.00	10.3
20NOV	B	10.00		10.00		10.00	NA
2DEC	B		6.50		5.50		NA
4DEC	B	6.50		7.00		6.50	6.2

NA = not available

[a] 19 JUN 7.7°

[b] 24 AUG 20.7°

[c] 6 OCT 13.5°

APPENDIX IV-4 (continued)

SURFACE WATER QUALITY PARAMETERS AT NMPE TRANSECT BY DEPTH CONTOUR

NINE MILE POINT VICINITY - 1975

DATE	SAMPLE DEPTH	TEMPERATURE(°C) 20FT	40FT	60FT	100FT
11APR	S	1.1	1.1	0.8	0.8
23APR	S	6.0	6.0	5.0	5.5
5MAY	S	7.0	6.0	5.5	5.0
22MAY	S	14.0	14.0	15.0	NA
5JUN	S	15.0	14.0	13.0	NA
18JUN	S	17.0	16.5	16.5	NA[a]
7JUL	S	21.9	22.2	22.7	22.6
31JUL	S	24.0	23.5	23.5	NA
12AUG	S	21.5	21.5	21.0	21.8
25AUG	S	20.5	20.5	20.5	NA[b]
10SEP	S	17.5	17.5	18.0	NA[c]
23SEP	S	17.0	16.0	16.0	15.6
7OCT	S	14.5	14.9	15.0	NA[d]
23OCT	S	13.5	13.5	13.5	NA
12NOV	S	10.5	10.5	10.5	10.5
20NOV	S	10.0	10.0	10.0	NA
4DEC	S	5.0	6.5	6.0	6.8

NA = not available

[a] 19 JUN 16.4°

[b] 24 AUG 22.1°

[c] 11 SEP 17.2°

[d] 6 OCT 14.5°

APPENDIX IV-4 (continued)

BOTTOM WATER QUALITY PARAMETERS AT NMPE TRANSECT BY DEPTH CONTOUR

NINE MILE POINT VICINITY - 1975

DATE	SAMPLE DEPTH	TEMPERATURE (°C) 20FT	40FT	60FT	100FT
11APR	B	1.3	1.3	1.2	0.9
23APR	B	6.0	6.0	5.0	4.6
5MAY	B	7.0	6.0	5.5	5.0
22MAY	B	14.0	14.0	9.0	NA
5JUN	B	12.5	12.5	12.0	NA
18JUN	B	16.0	14.5	12.0	NA[a]
7JUL	B	21.0	18.2	10.8	8.2
31JUL	B	22.5	22.0	22.0	NA
12AUG	B	21.5	21.0	20.0	6.0
25AUG	B	20.5	20.5	20.5	NA[b]
10SEP	B	17.0	17.0	17.5	NA[c]
23SEP	B	17.0	16.0	16.0	15.0
7OCT	B	13.9	15.0	14.5	NA[d]
23OCT	B	13.2	13.2	7.0	NA
12NOV	B	10.5	10.5	10.5	10.5
20NOV	B	10.0	10.5	10.0	NA
4DEC	B	5.0	7.0	6.0	6.9

NA = not available

[a] 19 JUN 7.6°

[b] 24 AUG 19.8°

[c] 11 SEP 15.0°

[d] 6 OCT 14.0°

APPENDIX IV-5

SURFACE BIWEEKLY WATER QUALITY PARAMETERS[a] AT NMPN TRANSECT BY DEPTH CONTOUR[a]
NINE MILE POINT VICINITY - 1975

	CHLA[b]				NO3N				NH3N			
DATE	20FT	40FT	60FT	X	20FT	40FT	60FT	X	20FT	40FT	60FT	X
11APR	5.2	4.6	3.6	4.5	0.60	0.62	0.61	0.61	0.50	0.50	0.40	0.47
23APR	9.0	5.7	6.6	7.1	0.39	0.36	0.23	0.33	0.40	0.50	0.40	0.43
5MAY	1.9	1.8	2.9	2.2	0.25	0.45	0.38	0.36	0.10	0.10	0.20	0.13
22MAY	3.0	2.4	1.8	2.4	0.15	0.09	0.19	0.14	0.20	0.10	0.10	0.13
5JUN	8.7	9.0	10.1	9.3	0.21	0.20	0.20	0.20	0.10	0.10	0.10	0.10
18JUN	8.2	7.6	8.7	8.2	0.14	0.13	0.13	0.13	0.30	0.30	0.40	0.33
7JUL	1.5	2.0	2.0	1.8	0.02	0.17	0.07	0.09	0.50	0.50	0.50	0.50
31JUL	10.9	8.2	5.7	8.3	0.04	0.10	0.04	0.06	0.20	0.10	0.10	0.13
12AUG	12.3	10.6	6.6	9.8	0.04	0.04	0.04	0.04	0.10	0.10	0.20	0.13
25AUG	10.9	5.5	6.0	7.5	0.02	0.03	0.02	0.02	0.20	0.10	0.10	0.13
10SEP	2.2	4.6	5.5	4.1	0.02	0.02	0.02	0.02	0.10	0.10	0.10	0.10
23SEP	4.1	3.8	2.7	3.5	0.08	0.06	0.07	0.07	0.10	0.20	0.20	0.17
7OCT	4.4	3.5	4.4	4.1	0.15	0.14	0.13	0.14	0.10	0.10	0.10	0.10
23OCT	3.0	3.8	4.6	3.8	0.11	0.10	0.08	0.10	0.10	0.20	0.20	0.17
12NOV	7.4	4.4	4.1	5.3	0.05	0.13	0.12	0.10	0.30	0.20	0.20	0.23
20NOV	3.3	3.0	1.9	2.7	0.18	0.18	0.18	0.18	0.00	0.10	0.10	0.10
4DEC	3.0	2.5	2.7	2.7	0.20	0.19	0.16	0.18	0.20	0.20	0.20	0.20

APPENDIX IV-5 (continued)

SURFACE BIMONTHLY WATER QUALITY PARAMETERS[a] AT [illegible] BY DEPTH CONTOUR

NINE MILE POINT VICINITY - 1975

	OP				SIO2				SC				TSS			
DATE	20FT	40FT	60FT	X	20FT	40FT	60FT	X	20FT	40FT	60FT	X	20FT	40FT	60FT	X
11APR	0.01	0.01	0.01	0.01	1.1	0.9	0.8	0.9	215	216	213	214.7	10	9	11	10.0
23APR	0.01	0.01	0.00	0.01	1.0	0.8	1.0	0.9	227	214	207	216.0	8	6	6	6.7
8MAY	0.00	0.00	0.02	0.02	0.4	0.4	0.5	0.4	209	214	205	209.3	3	3	3	3.0
22MAY	0.00	0.00	0.00	0.00	0.6	0.4	0.4	0.5	277	266	207	250.0	3	3	2	2.7
5JUN	0.00	0.00	0.00	0.00	1.9	1.2	1.4	1.5	195	197	192	194.7	2	2	2	2.0
17JUN	0.00	0.00	0.00	0.00	3.3	0.4	0.5	1.4	219	217	209	215.0	4	4	4	4.0
7JUL	0.00	0.00	0.01	0.01	0.4	0.4	0.6	0.5	199	196	195	196.7	3	3	5	3.7
21JUL	0.00	0.00	0.00	0.00	0.9	0.2	0.1	0.4	274	221	209	234.7	5	3	4	4.0
12AUG	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.0	222	219	207	216.0	3	2	2	2.3
25AUG	0.00	0.00	0.00	0.00	0.2	0.0	0.2	0.2	220	217	210	215.7	5	5	3	4.3
10SEP	0.00	0.00	0.00	0.00	0.4	0.2	0.0	0.3	214	207	211	210.7	2	2	2	2.0
23SEP	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.0	221	196	217	211.3	3	2	2	2.3
7OCT	0.01	0.01	0.01	0.01	0.0	0.6	0.1	0.4	230	237	218	228.3	7	4	3	4.7
23OCT	0.01	0.00	0.00	0.01	0.3	0.3	0.8	0.5	197	184	196	192.3	2	2	2	2.0
12NOV	0.01	0.01	0.01	0.01	0.4	0.4	0.6	0.5	219	219	214	217.3	4	7	4	5.0
26NOV	0.00	0.00	0.00	0.00	0.4	0.6	0.7	0.6	204	192	196	197.3	2	1	1	1.3
4DEC	0.01	0.01	0.00	0.01	0.3	0.2	0.2	0.2	186	201	204	197.0	1	1	1	1.0

APPENDIX IV-5 (continued)

SURFACE BIMONTHLY WATER QUALITY PARAMETERS[a] AT NMPP/FITZ TRANSECT BY DEPTH CONTOUR

NINE MILE POINT VICINITY - 1975

	CHLA[b]				NO3N				NH3N			
DATE	20FT	40FT	60FT	X	20FT	40FT	60FT	X	20FT	40FT	60FT	X
11APR	4.4	2.7	3.6	3.6	0.57	0.48	0.57	0.54	0.20	0.20	0.20	0.20
23APR	7.9	8.2	6.3	7.5	0.34	0.25	0.36	0.32	0.20	0.30	0.50	0.33
5MAY	2.7	2.7	2.4	2.6	0.37	0.32	0.33	0.34	0.10	0.30	0.10	0.17
22MAY	6.6	4.3	4.9	5.3	0.18	0.22	0.05	0.15	0.20	0.10	0.20	0.17
5JUN	8.2	7.9	9.0	8.4	0.20	0.19	0.22	0.20	0.20	0.10	0.10	0.13
18JUN	7.6	6.3	10.6	8.2	0.16	0.13	0.14	0.14	0.40	0.40	0.50	0.43
7JUL	2.2	2.2	3.2	2.5	0.02	0.01	0.02	0.02	0.50	0.90	0.50	0.63
21JUL	12.6	12.0	11.5	12.0	0.03	0.04	0.04	0.04	0.30	0.20	0.30	0.27
12AUG	6.0	7.1	6.0	6.4	0.04	0.03	0.04	0.04	0.10	0.20	0.20	0.17
25AUG	3.3	4.6	5.5	4.5	0.03	0.03	0.04	0.03	0.10	0.10	0.20	0.13
10SEP	1.9	1.9	4.4	2.7	0.02	0.02	0.02	0.02	0.10	0.10	0.10	0.10
23SEP	4.6	4.4	3.3	4.1	0.09	0.08	0.08	0.08	0.10	0.10	0.10	0.10
7OCT	4.6	3.3	3.8	3.9	0.14	0.15	0.14	0.14	0.10	0.10	0.10	0.10
23OCT	3.8	3.5	3.3	3.5	0.10	0.09	0.11	0.10	0.10	0.10	0.10	0.10
12NOV	3.5	11.5	3.8	6.3	0.16	0.15	0.14	0.15	0.20	0.10	0.10	0.13
20NOV	2.2	1.1	1.9	1.7	0.16	0.16	0.16	0.16	0.10	0.00	0.10	0.10
4DEC	3.3	2.7	2.2	2.7	0.22	0.24	0.20	0.22	0.20	0.10	0.10	0.13

APPENDIX IV-5 (continued)

SURFACE DISSOLVED WATER QUALITY PARAMETERS[a] AT
NMP2/FITZ TRANSECT BY DEPTH CONTOURS

NINE MILE POINT VICINITY - 1975

	OP				SIO2				[illegible]				[illegible]			
DATE	20FT	40FT	60FT	X̄	20FT	40FT	60FT	X̄	20FT	40FT	60FT	X̄	20FT	40FT	60FT	X̄
11APR	0.01	0.00	0.01	0.01	1.6	0.8	0.9	1.1	227	224	218	223.0	11	9	8	9.3
23APR	0.02	0.01	0.01	0.01	1.1	1.3	0.6	1.0	214	203	207	210.0	8	8	7	7.7
5MAY	0.01	0.00	0.00	0.01	0.7	0.7	0.7	0.7	206	194	201	200.3	3	2	2	2.3
22MAY	0.00	0.00	0.00	0.00	0.4	0.4	0.4	0.4	240	241	247	242.7	2	2	2	2.0
5JUN	0.00	0.00	0.00	0.00	1.4	1.2	1.9	1.5	201	197	194	197.3	9	3	2	4.7
17JUN	0.00	0.00	0.00	0.00	1.6	1.1	0.4	1.0	225	220	223	222.7	4	4	3	3.7
7JUL	0.00	0.00	0.00	0.00	0.4	0.4	0.6	0.5	202	195	196	197.7	4	5	4	4.3
31JUL	0.00	0.00	0.00	0.00	1.1	0.7	0.7	0.8	266	261	209	245.3	5	5	4	4.7
12AUG	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.0	209	205	191	201.7	2	2	2	2.0
25AUG	0.00	0.00	0.00	0.00	0.4	0.2	0.0	0.3	196	210	205	203.7	3	2	4	3.0
10SEP	0.00	0.00	0.00	0.00	0.4	0.4	0.4	0.4	208	204	214	208.7	2	1	2	[illegible]
22SEP	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.0	228	224	215	222.3	3	2	2	2.3
7OCT	0.02	0.01	0.01	0.01	1.6	1.4	1.1	1.4	248	238	227	237.7	4	7	4	5.0
23OCT	0.01	0.00	0.00	0.01	0.8	0.3	0.2	0.4	199	194	194	195.7	2	2	2	2.0
12NOV	0.01	0.01	0.01	0.01	0.8	0.9	0.6	0.8	206	225	240	223.7	5	6	4	5.0
20NOV	0.00	0.00	0.00	0.00	0.3	0.4	0.5	0.4	199	194	191	194.7	1	1	1	1.0
4DEC	0.01	0.01	0.01	0.01	0.4	0.5	0.4	0.4	188	189	196	187.7	1	1	1	1.0

APPENDIX IV-5 (continued)

SURFACE BIMONTHLY WATER QUALITY PARAMETERS[a] AS MEAN TRANSECT BY DEPTH CONTOUR

NINE MILE POINT VICINITY - 1975

DATE	CHLA[b] 20FT	40FT	60FT	X̄	NO3N 20FT	40FT	60FT	X̄	NH3N 20FT	40FT	60FT	X̄
11APR	2.2	2.7	1.9	2.3	0.53	0.64	0.60	0.59	0.20	0.20	0.20	0.20
23APR	12.0	11.7	4.6	9.4	0.42	0.45	0.33	0.40	0.30	0.30	0.30	0.30
5MAY	1.9	2.5	3.3	2.7	0.30	0.23	0.31	0.28	0.20	0.20	0.10	0.17
22MAY	4.9	7.3	7.4	6.5	0.15	0.13	0.25	0.18	0.20	0.20	0.10	0.17
5JUN	6.9	3.5	7.6	7.0	0.16	0.17	0.13	0.17	0.20	0.20	0.30	0.23
19JUN	11.2	12.3	8.2	10.6	0.13	0.12	0.13	0.13	0.20	0.20	0.10	0.17
7JUL	4.0	3.1	3.7	3.6	0.06	0.03	0.02	0.04	0.10	0.20	0.20	0.17
21JUL	15.0	14.5	3.7	12.7	0.07	0.04	0.05	0.05	0.30	0.20	0.20	0.23
12AUG	5.2	5.2	6.3	5.6	0.09	0.04	0.04	0.06	0.10	0.10	0.10	0.10
25AUG	5.2	5.2	4.1	4.8	0.06	0.04	0.03	0.04	0.10	0.10	0.10	0.10
10SEP	2.5	5.7	3.5	3.9	0.03	0.03	0.02	0.04	0.20	0.10	0.20	0.17
23SEP	4.1	4.6	4.9	4.5	0.09	0.06	0.06	0.07	0.20	0.10	0.10	0.13
7OCT	4.6	5.5	4.1	4.7	0.14	0.11	0.10	0.12	0.20	0.10	0.10	0.13
20OCT	4.9	4.1	4.4	4.5	0.11	0.11	0.09	0.10	0.30	0.20	0.10	0.20
12NOV	3.5	3.0	2.7	3.1	0.19	0.13	0.18	0.17	0.30	0.10	0.20	0.20
26NOV	4.1	2.7	0.5	2.4	0.15	0.16	0.13	0.16	0.10	0.10	0.10	0.10
4DEC	4.6	3.5	4.1	4.1	0.30	0.22	0.23	0.25	0.30	0.10	0.10	0.17

APPENDIX IV-5 (continued)

[illegible][a] [illegible]

[illegible]

[illegible] - 1975

DATE	OP 20FT	OP 40FT	OP 60FT	OP X	SIO2 20FT	SIO2 40FT	SIO2 60FT	SIO2 X	[illegible] 20FT	[illegible] 40FT	[illegible] 60FT	[illegible] X	[illegible] 20FT	[illegible] 40FT	[illegible] 60FT	[illegible] X
11APR	0.00	0.01	0.01	0.01	1.4	1.0	1.6	1.3	218	212	[illegible]	[illegible]	6	6	[illegible]	[illegible]
23APR	0.01	0.01	0.00	0.01	0.9	0.9	1.1	1.0	229	227	201	219.0	11	11	5	[illegible]
5MAY	0.00	0.01	0.01	0.01	0.7	0.7	0.9	0.8	196	197	[illegible]	197.7	3	2	2	2.3
12MAY	0.00	0.00	0.00	0.00	0.6	0.4	0.4	0.5	252	250	257	253.0	2	3	2	2.3
5JUN	0.00	0.00	0.01	0.01	1.4	1.5	1.6	1.5	207	200	210	205.7	2	2	2	2.0
12JUN	0.00	0.00	0.00	0.00	1.1	0.7	1.1	1.0	218	226	229	223.0	3	5	6	4.7
7JUL	0.00	0.00	0.01	0.01	0.4	0.4	0.5	0.4	203	201	200	201.3	6	6	6	[illegible]
31JUL	0.00	0.01	0.00	0.01	0.9	0.7	0.7	0.8	251	231	218	233.3	4	4	4	[illegible]
12AUG	0.00	0.00	0.00	0.00	0.2	0.0	0.0	0.2	194	[illegible]	189	191.0	2	2	2	[illegible]
25AUG	0.00	0.00	0.00	0.00	0.7	0.4	0.4	0.5	197	201	196	198.0	3	2	3	2.7
10SEP	0.00	0.00	0.00	0.00	0.4	0.2	0.4	0.3	209	202	211	207.3	2	2	1	1.7
23SEP	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.0	220	217	200	212.3	5	3	2	3.3
7OCT	0.01	0.00	0.01	0.01	1.5	1.3	1.5	1.4	199	208	211	206.0	4	4	3	3.7
23OCT	0.00	0.00	0.00	0.00	0.4	0.3	0.6	0.4	187	188	181	185.3	2	2	2	2.0
12NOV	0.02	0.01	0.01	0.01	0.8	0.7	0.3	0.6	227	193	193	204.3	4	4	4	4.0
25NOV	0.00	0.01	0.01	0.01	0.4	0.5	0.4	0.4	195	196	194	195.0	2	2	1	1.7
4DEC	0.01	0.01	0.01	0.01	0.4	0.1	0.2	0.2	[illegible]	191	[illegible]	196.7	1	1	1	[illegible]

X = mean

a = all units in mg/l unless otherwise noted; parameters specifically selected for relevance to microzooplankton and phytoplankton
b = µg/l

APPENDIX IV-6

BIMONTHLY WATER QUALITY PARAMETERS AT NMPW -20FT STATION[a]

NINE MILE POINT VICINITY - 1975

DATE	SAMPLE DEPT.	PH[b]	SPC[c]	TSS	NO3N	TP	SIO2	SO4	CA	CHLA[d]
22MAY	S	8.80	429.00	3.00	0.15	0.03	0.60	33.00	44.60	3.00
	B	8.80	408.00	3.00	0.14	0.03	0.40	31.00	46.40	11.70
	X	8.80	418.50	3.00	0.15	0.03	0.50	32.00	45.50	7.35
18JUN	S	8.70	336.00	4.00	0.14	0.02	3.30	29.00	51.60	8.20
	B	8.60	327.00	4.00	0.15	0.02	0.40	27.00	44.90	9.60
	X	8.65	331.50	4.00	0.15	0.02	1.85	28.00	48.25	8.90
12AUG	S	8.70	355.00	3.00	0.04	0.02	0.00	32.00	41.20	12.30
	B	8.60	339.00	3.00	0.04	0.03	0.00	33.00	41.70	9.60
	X	8.65	347.00	3.00	0.04	0.03	0.00	32.50	41.45	10.95
12NOV	S	8.20	336.00	4.00	0.05	0.02	0.40	31.00	40.50	7.40
	B	8.20	337.00	5.00	0.07	0.02	0.40	32.00	44.20	4.90
	X	8.20	336.50	4.50	0.06	0.02	0.40	31.50	42.35	6.15

BIMONTHLY WATER QUALITY PARAMETERS AT NMPW -40FT STATION[a]

NINE MILE POINT VICINITY - 1975

DATE	SAMPLE DEPT.	PH[b]	SPC[c]	TSS	NO3N	TP	SIO2	SO4	CA	CHLA[d]
22MAY	S	8.90	406.00	3.00	0.09	0.03	0.40	30.00	47.20	2.40
	B	8.50	427.00	4.00	0.27	0.03	0.40	26.00	39.20	4.10
	X	8.70	416.50	3.50	0.18	0.03	0.40	28.00	43.20	3.25
18JUN	S	8.60	333.00	4.00	0.13	0.01	0.40	27.00	40.90	7.60
	B	8.00	327.00	5.00	0.14	0.01	0.40	25.00	42.30	9.60
	X	8.30	330.00	4.50	0.14	0.01	0.40	26.00	41.60	8.60
12AUG	S	8.70	333.00	2.00	0.04	0.02	0.00	31.00	39.20	10.60
	B	8.60	364.00	3.00	0.04	0.02	0.00	33.00	41.70	8.20
	X	8.65	348.50	2.50	0.04	0.02	0.00	32.00	40.45	9.40
12NOV	S	8.20	318.00	7.00	0.13	0.02	0.40	30.00	39.50	4.40
	B	8.30	318.00	4.00	0.12	0.02	0.60	30.00	38.40	4.10
	X	8.25	318.00	5.50	0.13	0.02	0.50	30.00	38.95	4.25

APPENDIX IV-6 (continued)

BIMONTHLY WATER QUALITY PARAMETERS AT
NMPW -60FT STATION [a]

NINE MILE POINT VICINITY - 1975

DATE	SAMPLE DEPT.	PH [b]	SPC [c]	TSS	NO3N	TP	SIO2	SO4	CA	CHLA [d]
22MAY	S	8.90	325.00	2.00	0.19	0.02	0.40	32.00	39.80	1.80
	B	8.20	309.00	1.00	0.38	0.02	0.60	23.00	38.90	1.90
	X	8.55	317.00	1.50	0.29	0.02	0.50	27.50	39.35	1.85
18JUN	S	8.70	315.00	4.00	0.13	0.01	0.40	29.00	46.10	8.70
	B	8.70	302.00	275.00	0.12	0.05	0.40	29.00	38.20	21.20
	X	8.70	308.50	139.50	0.13	0.03	0.40	29.00	42.15	14.95
12AUG	S	8.60	296.00	2.00	0.04	0.02	0.00	32.00	36.10	6.60
	B	8.60	312.00	2.00	0.04	0.02	0.10	32.00	39.90	7.60
	X	8.60	304.00	2.00	0.04	0.02	0.05	32.00	38.00	7.10
12NOV	S	8.30	318.00	4.00	0.12	0.01	0.60	31.00	39.90	4.10
	B	8.30	318.00	6.00	0.13	0.02	0.70	33.00	38.30	2.70
	X	8.30	318.00	5.00	0.13	0.02	0.65	32.00	39.10	3.40

BIMONTHLY WATER QUALITY PARAMETERS AT
NMPP/FITZ -20FT STATION [a]

NINE MILE POINT VICINITY - 1975

DATE	SAMPLE DEPT.	PH [b]	SPC [c]	TSS	NO3N	TP	SIO2	SO4	CA	CHLA [d]
22MAY	S	8.90	375.00	2.00	0.18	0.04	0.40	30.00	44.80	6.60
	B	8.80	382.00	2.00	0.31	0.02	0.40	30.00	50.30	9.30
	X	8.85	378.50	2.00	0.25	0.03	0.40	30.00	47.55	7.95
18JUN	S	8.70	339.00	4.00	0.16	0.02	1.60	28.00	41.30	7.60
	B	8.60	335.00	4.00	0.16	0.01	1.60	27.00	42.80	8.20
	X	8.65	337.00	4.00	0.16	0.02	1.60	27.50	42.05	7.90
12AUG	S	8.60	322.00	2.00	0.04	0.02	0.00	33.00	37.80	6.00
	B	8.70	322.00	2.00	0.04	0.02	0.00	32.00	37.70	6.80
	X	8.65	322.00	2.00	0.04	0.02	0.00	32.50	37.75	6.40
12NOV	S	8.30	324.00	5.00	0.16	0.02	0.80	31.00	34.30	3.50
	B	8.20	343.00	7.00	0.18	0.03	0.80	31.00	44.80	3.30
	X	8.25	333.50	6.00	0.17	0.03	0.80	31.00	39.55	3.40

BIMONTHLY WATER QUALITY PARAMETERS AT
NMPP/FITZ -40FT STATION [a]

NINE MILE POINT VICINITY - 1975

DATE	SAMPLE DEPT.	PH [b]	SPC [c]	TSS	NO3N	TP	SIO2	SO4	CA	CHLA [d]
22MAY	S	8.90	381.00	2.00	0.22	0.02	0.40	29.00	48.70	4.30
	B	8.70	312.00	1.00	0.11	0.02	0.40	25.00	38.90	6.00
	X	8.80	346.50	1.50	0.17	0.02	0.40	27.00	43.80	5.15
18JUN	S	8.70	337.00	4.00	0.13	0.02	1.10	31.00	41.70	6.30
	B	8.60	332.00	4.00	0.14	0.03	0.90	28.00	44.70	7.60
	X	8.65	334.50	4.00	0.14	0.03	1.00	29.50	43.20	6.95
12AUG	S	8.70	312.00	2.00	0.03	0.02	0.00	33.00	40.50	7.10
	B	8.60	312.00	3.00	0.04	0.02	0.00	33.00	37.50	6.30
	X	8.65	312.00	2.50	0.04	0.02	0.00	33.00	39.00	6.70
12NOV	S	8.20	356.00	6.00	0.15	0.02	0.90	33.00	45.40	11.50
	B	8.20	353.00	13.00	0.15	0.02	0.90	32.00	40.00	3.30
	X	8.20	354.50	9.50	0.15	0.02	0.90	32.50	42.70	7.40

BIMONTHLY WATER QUALITY PARAMETERS AT
NMPP/FITZ -60FT STATION [a]

NINE MILE POINT VICINITY - 1975

DATE	SAMPLE DEPT.	PH [b]	SPC [c]	TSS	NO3N	TP	SIO2	SO4	CA	CHLA [d]
22MAY	S	8.90	383.00	2.00	0.05	0.03	0.40	29.00	43.90	4.90
	B	8.40	309.00	1.00	0.31	0.03	0.40	22.00	40.30	3.00
	X	8.65	346.00	1.50	0.18	0.03	0.40	25.50	42.10	3.95
18JUN	S	8.10	330.00	3.00	0.14	0.01	0.40	29.00	40.80	10.60
	B	8.60	321.00	10.00	0.14	0.02	0.40	28.00	40.50	7.40
	X	8.35	325.50	6.50	0.14	0.02	0.40	28.50	40.65	9.00
12AUG	S	8.60	291.00	2.00	0.04	0.02	0.00	34.00	38.00	6.00
	B	8.30	307.00	2.00	0.06	0.02	0.10	33.00	39.60	3.80
	X	8.45	299.00	2.00	0.05	0.02	0.05	33.50	38.80	4.90
12NOV	S	8.20	349.00	4.00	0.14	0.02	0.60	32.00	41.40	3.80
	B	8.20	345.00	5.00	0.09	0.03	0.40	31.00	43.60	8.50
	X	8.20	347.00	4.50	0.12	0.03	0.50	31.50	42.50	6.15

APPENDIX IV-6 (continued)

BIMONTHLY WATER QUALITY PARAMETERS AT NMPE -20FT STATION[a]

NINE MILE POINT VICINITY - 1975

DATE	SAMPLE DEPT.	PH[b]	SPC[c]	TSS	NO3N	TP	SIO2	SO4	CA	CHLA[d]
22MAY	S	8.80	387.00	2.00	0.15	0.03	0.60	31.00	46.90	4.90
	B	8.80	367.00	2.00	0.23	0.03	0.20	31.00	48.40	9.60
	X	8.80	377.00	2.00	0.19	0.03	0.40	31.00	47.65	7.25
18JUN	S	8.70	315.00	3.00	0.13	0.02	1.10	28.00	40.30	11.20
	B	8.30	310.00	18.00	0.18	0.02	3.30	28.00	48.10	9.80
	X	8.50	312.50	10.50	0.16	0.02	2.20	28.00	44.20	10.50
12AUG	S	8.80	307.00	2.00	0.09	0.02	0.20	31.00	32.10	5.20
	B	8.70	302.00	2.00	0.05	0.02	0.00	33.00	34.50	5.20
	X	8.75	304.50	2.00	0.07	0.02	0.10	32.00	33.30	5.20
12NOV	S	8.20	368.00	4.00	0.19	0.03	0.80	32.00	46.20	3.50
	B	8.30	343.00	5.00	0.23	0.02	0.80	32.00	45.50	3.00
	X	8.25	355.50	4.50	0.21	0.03	0.80	32.00	45.85	3.25

BIMONTHLY WATER QUALITY PARAMETERS AT NMPE -40FT STATION[a]

NINE MILE POINT VICINITY - 1975

DATE	SAMPLE DEPT.	PH[b]	SPC[c]	TSS	NO3N	TP	SIO2	SO4	CA	CHLA[d]
22MAY	S	8.90	381.00	3.00	0.13	0.03	0.40	34.00	44.40	7.30
	B	8.90	332.00	2.00	0.15	0.03	0.50	30.00	41.40	8.70
	X	8.90	356.50	2.50	0.14	0.03	0.45	32.00	42.90	8.00
18JUN	S	8.80	330.00	5.00	0.12	0.02	0.70	30.00	43.90	12.30
	B	8.10	312.00	7.00	0.18	0.02	2.00	24.00	40.80	8.50
	X	8.45	321.00	6.00	0.15	0.02	1.35	27.00	42.35	10.40
12AUG	S	8.70	296.00	2.00	0.04	0.02	0.00	33.00	34.50	5.20
	B	8.70	291.00	2.00	0.04	0.02	0.00	33.00	36.70	5.50
	X	8.70	293.50	2.00	0.04	0.02	0.00	33.00	35.60	5.35
12NOV	S	8.20	307.00	4.00	0.13	0.02	0.70	30.00	46.10	3.00
	B	8.20	307.00	4.00	0.12	0.01	0.40	29.00	40.80	2.50
	X	8.20	307.00	4.00	0.13	0.02	0.55	29.50	43.45	2.75

APPENDIX IV-6 (continued)

BIMONTHLY WATER QUALITY PARAMETERS AT
NMPE -60FT STATION [a]

NINE MILE POINT VICINITY - 1975

DATE	SAMPLE DEPT.	PH [b]	SPC [c]	TSS	NO3N	TP	SIO2	SO4	CA	CHLA [d]
22MAY	S	8.90	375.00	2.00	0.25	0.04	0.40	35.00	43.10	7.40
	B	8.40	309.00	1.00	0.42	0.03	0.40	23.00	38.70	3.50
	X	8.65	342.00	1.50	0.34	0.04	0.40	29.00	40.90	5.45
18JUN	S	8.70	341.00	6.00	0.13	0.02	1.10	31.00	43.80	8.20
	B	8.20	308.00	2.00	0.19	0.01	1.80	27.00	40.10	4.10
	X	8.45	324.50	4.00	0.16	0.02	1.45	29.00	41.95	6.15
12AUG	S	8.70	302.00	2.00	0.04	0.02	0.00	33.00	34.70	6.30
	B	8.40	307.00	2.00	0.06	0.01	0.20	33.00	36.30	4.40
	X	8.55	304.50	2.00	0.05	0.02	0.10	33.00	35.50	5.35
12NOV	S	8.30	312.00	4.00	0.18	0.01	0.80	30.00	40.20	2.70
	B	8.30	315.00	4.00	0.13	0.02	0.50	30.00	39.90	1.90
	X	8.30	313.50	4.00	0.16	0.02	0.65	30.00	40.05	2.30

X = mean

a = all units mg/l unless otherwise stated; selected stations relevant to macrozooplankton
b = units
c = µmho/cm at 25°C
d = µg/l

APPENDIX IV-7

BIMONTHLY WATER QUALITY PARAMETERS AT NMPW TRANSECT BY DEPTH CONTOUR AND SAMPLE DEPTH[a]

NINE MILE POINT VICINITY - 1975

DATE	SAMPLE DEPTH	TUR (FTU) 20FT	TUR (FTU) 40FT	TUR (FTU) 60FT	TUR (FTU) X̄	BOD 20FT	BOD 40FT	BOD 60FT	BOD X̄	COD 20FT	COD 40FT	COD 60FT	COD X̄
14APR	S	9	8	8	8.33	3	2	3	2.67	1	4	8	4.33
	B	10	11	9	10.00	3	3	4	3.33	18	4	18	13.33
28APR	S	5	4	3	4.00	3	3	3	3.00	9	15	9	11.00
	B	6	5	3	4.67	3	2	3	2.67	13	16	6	11.67
5MAY	S	2	2	2	2.00	1	2	2	1.67	4	8	6	6.00
	B	2	3	2	2.33	1	2	2	1.67	8	10	11	9.67
22MAY	S	2	2	1	1.67	4	4	3	3.67	23	12	25	20.00
	B	2	2	1	1.67	3	2	2	2.33	15	6	12	11.00
5JUN	S	1	2	1	1.33	2	3	3	2.67	11	14	13	12.67
	B	2	2	1	1.67	2	3	2	2.33	11	9	7	9.00
18JUN	S	1	1	0	1.00	2	1	1	1.33	17	16	12	15.00
	B	1	1	160[b]	54.00	1	2	2	1.67	17	16	17	16.67
7JUL	S	1	1	1	1.00	1	2	2	1.67	16	12	13	13.67
	B	2	12	1	5.00	1	2	2	1.67	23	43	14	26.67
21JUL	S	3	3	1	2.33	1	3	2	2.00	7	13	8	9.33
	B	1	1	4	2.00	1	0	1	1.00	14	16	10	13.33
11AUG	S	3	3	3	3.00	1	1	1	1.00	10	10	10	10.00
	B	3	3	4	3.33	1	1	1	1.00	11	12	10	11.00
25AUG	S	5	2	2	3.00	2	2	2	2.00	19	12	22	17.67
	B	20	2	3	8.33	2	1	2	1.67	15	27	12	18.33
10SEP	S	3	4	2	3.00	2	2	2	2.00	7	11	11	9.67
	B	7	4	3	4.67	2	2	2	2.00	11	8	11	10.00
26SEP	S	2	5	2	3.00	1	1	1	1.00	6	9	8	7.67
	B	3	3	3	3.00	1	1	1	1.00	6	15	11	10.67
7OCT	S	4	4	5	4.33	2	1	2	1.67	8	8	9	8.33
	B	10	22	150[b]	60.67	1	1	1	1.00	12	13	33	19.33
23OCT	S	2	2	4	2.67	1	2	1	1.33	38	6	38	27.33
	B	2	3	3	2.67	1	2	1	1.33	4	8	7	6.33
12NOV	S	7	4	4	5.00	2	2	2	2.00	13	6	11	10.00
	B	5	6	5	5.33	2	2	1	1.67	7	4	4	5.00
20NOV	S	1	1	1	1.00	1	1	2	1.33	3	4	9	5.33
	B	1	1	2	1.33	1	1	1	1.00	2	2	9	4.33
4DEC	S	1	3	1	1.67	2	2	2	2.00	12	9	11	10.67
	B	1	2	3	2.00	2	2	2	2.00	8	8	12	9.33

APPENDIX IV-7 (continued)

BIMONTHLY WATER QUALITY PARAMETERS AT NMPW TRANSECT BY DEPTH CONTOUR AND SAMPLE DEPTH[a]

NINE MILE POINT VICINITY - 1975

		NO3N				TKN				CHLA (μg/l)			
DATE	SAMPLE DEPTH	20FT	40FT	60FT	X	20FT	40FT	60FT	X	20FT	40FT	60FT	X
11APR	S	0.59	0.32	0.61	0.61	0.25	0.45	0.30	0.33	5.2	4.6	3.6	4.5
	B	0.69	0.47	0.57	0.57	0.40	0.35	0.30	0.35	6.8	4.6	4.4	5.3
23APR	S	0.39	0.36	0.23	0.33	0.33	0.65	0.50	0.48	9.0	5.7	6.6	7.1
	B	0.52	0.35	0.45	0.44	0.40	0.45	0.30	0.38	12.5	7.9	7.6	9.4
5MAY	S	0.25	0.45	0.30	0.30	0.39	0.30	0.70	0.43	1.9	1.8	2.9	2.2
	B	0.38	0.41	0.30	0.30	0.70	0.30	0.40	0.47	3.5	2.7	3.0	3.1
22MAY	S	0.15	0.09	0.10	0.14	0.35	0.20	0.20	0.25	3.0	2.4	1.3	2.4
	B	0.14	0.27	0.30	0.23	0.20	0.20	0.20	0.20	11.7	4.1	1.9	5.9
5JUN	S	0.21	0.2[illegible]	0.2[illegible]	0.2[illegible]	0.20	0.75	0.50	0.48	8.7	9.0	10.1	9.3
	B	0.27	0.21	0.24	0.25	1.50	0.47	0.90	0.96	9.0	7.9	7.4	8.1
19JUN	S	0.14	0.13	0.13	0.13	5.10	0.40	0.60	2.03	8.2	7.6	8.7	8.2
	B	0.15	0.14	0.12	0.14	0.30	0.60	0.50	0.47	9.6	9.6	21.2	13.5
7JUL	S	0.02	0.17	0.07	0.[illegible]	[illegible].15	0.05	0.05	0.00	1.5	2.0	2.0	1.8
	B	0.01	0.06	0.12	0.08	0.65	0.25	0.35	0.42	1.5	2.6	0.9	1.7
21JUL	S	0.04	0.10	0.04	0.06	0.50	0.50	0.50	0.50	10.9	8.2	5.7	8.3
	B	0.06	0.05	0.06	0.06	0.50	0.60	0.55	0.55	6.0	3.8	1.6	3.8
12AUG	S	0.04	0.[illegible]	0.04	0.[illegible]	0.30	0.40	0.30	0.33	12.3	10.6	6.6	9.8
	B	0.04	0.04	0.04	0.07	0.40	0.30	0.50	0.40	9.6	8.2	7.6	8.5
25AUG	S	0.02	0.03	0.02	0.02	0.40	0.20	0.20	0.27	10.9	5.5	6.0	7.5
	B	0.03	0.04	0.04	0.04	0.40	0.20	0.40	0.33	4.1	2.7	2.5	3.1
10SEP	S	0.02	0.02	0.02	0.02	0.65	0.25	0.50	0.47	2.2	4.6	5.5	4.1
	B	0.04	0.05	0.05	0.05	0.35	0.70	0.60	0.55	10.1	2.5	3.5	5.4
23SEP	S	0.05	0.06	0.07	0.07	0.35	0.65	0.35	0.45	4.1	3.8	2.7	3.5
	B	0.12	0.17	0.12	0.14	0.45	0.55	0.35	0.45	4.6	3.5	4.4	4.2
7OCT	S	0.15	0.14	0.13	0.14	0.54	0.65	0.74	0.64	4.4	3.5	4.4	4.1
	B	0.14	0.14	0.19	0.15	0.40	0.20	0.60	0.40	7.0	5.5	13.1	8.5
23OCT	S	0.11	0.10	0.[illegible]	0.10	0.30	0.40	0.80	0.50	3.0	3.8	4.6	3.8
	B	0.25	0.33	0.3	0.2[illegible]	0.35	0.39	0.50	0.48	1.6	2.7	0.9	1.7
12NOV	S	0.35	0.13	0.12	0.10	0.36	0.54	0.55	0.55	7.4	4.4	4.1	5.3
	B	0.07	0.12	0.13	0.11	0.40	0.33	0.67	0.49	4.9	4.1	2.7	3.9
20NOV	S	0.13	0.12	0.12	0.13	0.50	0.62	0.94	0.71	3.3	3.0	1.9	2.7
	B	0.20	0.12	0.13	0.12	0.75	0.72	0.85	0.71	3.5	1.6	1.4	2.2
4DEC	S	0.20	0.19	[illegible]	[illegible]	[illegible]	[illegible].17	0.17	0.21	3.0	2.5	2.7	2.7
	B	0.15	0.16	[illegible].1[illegible]	0.17	[illegible].31	0.30	0.23	0.32	3.0	3.0	2.5	2.8

APPENDIX IV-7 (continued)

BIMONTHLY WATER QUALITY PARAMETERS AT NMPP/FITZ TRANSECT BY DEPTH CONTOUR AND SAMPLE DEPTH[a]

NINE MILE POINT VICINITY - 1975

DATE	SAMPLE DEPTH	TUR (FTU) 20FT	40FT	60FT	X̄	TPO4 20FT	40FT	60FT	X̄	TCOD 20FT	40FT	60FT	X̄
11APR	S	8	10	8	8.67	4	4	3	3.67	16	12	12	13.33
	B	[illegible]	7	[illegible]	6.00	4	3	4	3.67	8	0	9	8.50
23APR	S	5	5	4	4.67	3	3	2	2.67	10	13	13	12.00
	B	5	6	7	6.00	3	2	2	2.33	16	13	11	13.33
5MAY	S	1	2	2	1.67	2	2	2	2.00	15	11	9	11.67
	B	2	2	2	2.00	2	2	2	2.00	18	9	5	10.67
22MAY	S	1	1	2	1.33	4	3	4	3.67	18	9	24	17.00
	B	2	1	1	1.33	3	3	2	2.67	10	13	18	13.67
5JUN	S	2	1	1	1.33	2	3	2	2.33	24	19	12	18.33
	B	2	1	1	1.33	4	2	2	2.67	19	13	15	15.67
19JUN	S	1	1	1	1.00	2	1	1	1.33	16	15	16	15.67
	B	2	1	3	2.00	2	1	2	1.67	23	17	13	17.67
7JUL	S	2	2	2	2.00	2	2	2	2.00	9	8	12	9.67
	B	3	2	1	2.00	2	1	1	1.33	12	19	17	16.00
31JUL	S	2	2	2	2.00	2	2	2	2.00	10	9	18	12.33
	B	1	5	4	3.33	1	1	1	1.00	8	3	15	8.67
12AUG	S	4	2	2	2.67	1	1	1	1.00	12	8	12	10.67
	B	2	2	2	2.00	1	1	1	1.00	10	6	8	8.00
25AUG	S	3	2	2	2.33	1	1	1	1.00	22	11	16	16.33
	B	3	20	7	10.00	1	2	1	1.33	13	16	12	13.67
10SEP	S	2	1	1	1.33	1	1	1	1.00	11	12	7	10.00
	B	2	4	2	2.67	1	1	1	1.00	11	10	8	9.67
23SEP	S	2	4	2	2.67	1	1	1	1.00	4	7	10	7.00
	B	3	2	2	2.33	1	1	1	1.00	3	13	7	7.67
7OCT	S	3	5	3	3.67	1	1	1	1.00	4	12	6	7.33
	B	7	4	7	6.00	1	1	1	1.00	4	7	7	6.00
23OCT	S	4	2	2	2.67	1	1	1	1.00	31	34	21	28.67
	B	5	2	3	3.33	1	1	1	1.00	17	22	21	20.00
12NOV	S	5	5	6	5.33	2	2	2	2.00	10	10	6	8.67
	B	12	6	6	8.00	2	2	1	1.67	12	15	10	12.33
23NOV	S	3	1	1	1.67	2	1	2	1.67	2	8	7	5.67
	B	2	1	4	2.33	2	1	1	1.33	3	11	14	9.33
4DEC	S	1	3	1	1.67	2	2	2	2.00	5	5	8	6.00
	B	3	2	2	2.33	2	2	2	2.00	2	3	7	4.00

APPENDIX IV-7 (continued)

BIMONTHLY WATER QUALITY PARAMETERS AT NMPP/FITZ TRANSECT BY DEPTH CONTOUR AND SAMPLE DEPTH[a]

NINE MILE POINT VICINITY - 1975

		NO3N				[illegible]				CHLA (µg/l)			
DATE	SAMPLE DEPT.	20FT	40FT	60FT	X	20FT	40FT	60FT	X	20FT	40FT	60FT	X
11APR	S	0.57	0.48	0.57	0.54	0.30	0.30	0.40	0.33	4.4	2.7	3.6	3.6
	B	0.54	0.59	0.40	0.51	0.25	0.35	0.35	0.32	3.6	4.1	3.6	3.8
23APR	S	0.34	0.25	0.36	0.32	0.45	0.55	0.30	0.43	7.9	3.2	6.3	7.5
	B	0.31	0.25	0.36	0.34	0.60	0.40	0.30	0.43	7.4	[illegible]	7.4	7.2
5MAY	S	0.37	0.32	0.33	0.34	0.70	0.50	0.30	0.50	2.7	2.7	2.4	2.6
	B	0.22	0.27	0.21	0.23	0.50	0.30	0.30	0.53	2.2	3.0	2.5	2.6
22MAY	S	0.18	0.22	0.05	0.15	0.20	0.20	0.30	0.23	6.6	4.3	4.9	5.3
	B	0.31	0.11	0.31	0.24	0.20	0.30	0.20	0.23	9.3	6.0	3.0	6.1
5JUN	S	0.20	0.19	0.22	0.20	0.30	0.40	0.40	0.37	8.2	7.9	9.0	8.4
	B	0.20	0.22	0.23	0.22	0.40	0.50	0.30	0.40	6.6	7.9	7.1	7.2
18JUN	S	0.16	0.13	0.14	0.14	0.50	0.60	0.70	0.60	7.6	6.3	10.6	8.2
	B	0.15	0.14	0.14	0.15	0.77	0.60	0.50	[illegible]	[illegible]	7.6	7.4	7.7
7JUL	S	0.02	0.01	0.03	0.02	0.25	0.25	0.25	0.18	2.2	[illegible]	3.2	2.5
	B	0.02	0.09	0.30	0.14	0.25	0.15	0.15	0.18	3.7	2.9	2.6	3.1
31JUL	S	0.03	0.04	0.04	0.04	0.45	0.30	0.50	0.42	12.6	12.0	11.5	12.0
	B	0.05	0.07	0.06	0.12	0.25	0.30	0.60	0.38	3.3	2.7	16.0	7.3
12AUG	S	0.04	0.03	0.08	[illegible]	0.27	0.25	[illegible]	0.27	6.6	7.1	6.0	6.4
	B	0.04	0.04	0.30	[illegible]	0.24	[illegible]	0.20	0.23	3.3	6.3	3.8	5.6
25AUG	S	0.03	0.03	0.04	0.03	0.60	0.50	0.70	0.63	3.3	4.6	5.5	4.5
	B	0.03	0.04	0.03	[illegible]	0.70	0.60	0.40	0.57	5.5	6.3	0.8	4.2
10SEP	S	0.02	0.02	[illegible]	[illegible]	0.25	0.90	0.30	0.48	1.9	1.9	4.4	2.7
	B	0.04	0.05	0.05	0.05	0.30	0.25	0.50	0.45	3.5	4.1	3.0	3.5
23SEP	S	0.09	0.08	0.08	[illegible]	0.15	0.45	0.25	0.28	4.6	4.4	3.3	4.1
	B	0.08	0.07	0.06	0.07	0.35	0.25	0.45	0.35	5.7	4.0	4.1	4.6
7OCT	S	0.14	0.15	0.14	0.14	[illegible]	[illegible]	0.36	0.43	[illegible]	3.3	3.8	3.9
	B	0.15	0.16	0.12	0.14	0.30	0.52	0.77	0.52	6.6	2.5	5.2	4.8
23OCT	S	0.10	0.09	0.11	0.10	0.54	0.34	0.40	0.39	3.3	3.5	3.3	3.5
	B	0.19	0.20	0.36	0.28	0.56	0.65	0.25	0.49	2.7	0.8	0.5	1.3
12NOV	S	0.16	0.15	0.14	0.15	[illegible]	0.71	0.52	0.62	3.5	11.5	3.8	6.3
	B	0.18	0.15	[illegible]	0.14	0.34	[illegible]	[illegible]	0.66	3.3	3.3	3.5	5.0
20NOV	S	0.16	0.16	0.16	[illegible]	0.75	0.59	0.65	0.66	[illegible]	1.1	1.9	1.7
	B	0.17	0.17	0.19	0.18	[illegible]	[illegible]	0.22	0.49	0.8	1.9	2.2	1.6
4DEC	S	0.22	0.24	0.20	0.22	0.29	[illegible]	0.22	0.24	3.3	2.7	2.2	2.7
	B	0.03	0.20	[illegible]	[illegible]	[illegible]	0.21	0.17	0.21	2.7	1.9	1.6	2.1

APPENDIX IV-7 (continued)

BIMONTHLY WATER QUALITY PARAMETERS AT NMPE TRANSECT BY DEPTH CONTOUR AND SAMPLE DEPTH[a]

NINE MILE POINT VICINITY - 1975

DATE	SAMPLE DEPT.	TUR (FTU) 20FT	40FT	60FT	X̄	[illegible] 20FT	40FT	60FT	X̄	TCOL 20FT	40FT	60FT	X̄
11APR	S	9	9	11	9.67	3	4	3	3.33	8	8	4	6.67
	B	9	10	9	9.33	3	4	4	3.67	11	23	25	19.67
23APR	S	5	5	3	4.33	3	3	2	2.67	13	11	12	12.00
	B	6	5	3	4.67	2	3	2	2.33	8	10	10	9.33
5MAY	S	2	2	2	2.00	2	1	2	1.67	15	22	11	16.00
	B	1	2	2	1.67	2	2	2	2.00	12	9	17	12.67
22MAY	S	2	1	1	1.33	4	4	3	3.67	15	16	15	15.33
	B	1	1	2	1.33	3	4	2	3.00	12	10	8	10.00
5JUN	S	1	1	1	1.00	3	3	3	3.00	21	25	19	21.67
	B	1	1	20	7.33	3	1	3	2.33	15	19	24	19.33
18JUN	S	1	1	1	1.00	2	3	3	2.67	26	28	15	23.00
	B	2	1	1	1.33	3	2	1	2.00	48	22	13	27.67
7JUL	S	2	2	2	2.00	2	2	2	2.00	20	25	20	21.67
	B	25	3	1	9.67	2	1	2	1.67	19	12	13	14.67
31JUL	S	3	2	1	2.00	2	2	2	2.00	19	18	13	16.67
	B	4	2	1	2.33	0	1	0	1.00	16	17	14	15.67
12AUG	S	1	1	1	1.00	1	2	1	1.33	12	16	12	13.33
	B	1	1	1	1.00	2	1	1	1.33	14	10	10	11.33
25AUG	S	2	3	2	2.33	1	1	1	1.00	15	17	17	16.33
	B	3	12	20	11.67	1	1	1	1.00	15	14	17	15.33
10SEP	S	1	1	1	1.00	1	1	1	1.00	11	10	8	9.67
	B	2	1	2	1.67	1	1	1	1.00	10	10	6	8.67
23SEP	S	3	3	2	2.67	1	1	1	1.00	3	4	3	3.33
	B	4	3	2	3.00	1	1	0	1.00	8	8	6	7.33
7OCT	S	3	3	2	2.67	2	1	2	1.67	10	11	4	8.33
	B	6	3	5	4.67	1	1	1	1.00	8	6	8	7.33
23OCT	S	3	1	2	2.00	1	1	1	1.00	20	21	17	19.33
	B	1	7	400[b]	136.00	1	1	2	1.33	14	17	25	18.67
12NOV	S	4	3	3	3.33	2	2	2	2.00	4	4	11	6.33
	B	4	4	6	4.67	2	1	2	1.67	2	11	7	6.67
20NOV	S	2	3	1	2.00	2	2	1	1.67	12	4	7	7.67
	B	2	1	1	1.33	2	2	1	1.67	8	6	7	7.00
4DEC	S	1	2	2	1.67	3	2	2	2.33	6	13	8	9.00
	B	2	1	2	1.67	2	2	2	2.00	17	11	6	11.33

APPENDIX IV-7 (continued)

BIMONTHLY WATER QUALITY PARAMETERS AT NMPE TRANSECT BY DEPTH CONTOUR AND SAMPLE DEPTH[a]

NINE MILE POINT VICINITY - 1975

DATE	SAMPLE DEPTH	NO3N 20FT	NO3N 40FT	NO3N 60FT	NO3N X	[illegible] 20FT	[illegible] 40FT	[illegible] 60FT	[illegible] X	CHLA (mg/l) 20FT	CHLA 40FT	CHLA 60FT	CHLA X
11APR	S	0.43	0.66	0.60	0.57	0.30	0.25	0.35	0.30	2.2	2.7	1.9	2.3
	B	0.63	0.49	0.41	0.53	0.20	0.25	0.25	0.23	4.1	4.6	4.4	4.4
23APR	S	0.42	0.45	0.33	0.40	0.50	0.30	0.40	0.40	12.0	11.7	4.6	9.4
	B	0.52	0.66	0.42	0.53	0.55	0.60	0.40	0.50	13.1	9.6	4.9	9.2
5MAY	S	0.30	0.23	0.31	0.28	0.67	0.50	0.30	0.49	1.9	2.5	3.8	2.7
	B	0.38	0.36	0.41	0.38	0.45	0.40	0.50	0.45	3.5	3.8	2.7	3.3
22MAY	S	0.15	0.13	0.25	0.18	0.20	0.30	0.40	0.30	4.9	7.3	7.4	6.5
	B	0.23	0.15	0.42	0.27	0.30	0.40	0.20	0.30	9.6	8.7	3.5	7.3
5JUN	S	0.16	0.17	0.18	0.17	0.20	0.20	0.20	0.20	6.3	8.5	7.6	7.6
	B	0.20	0.22	0.23	0.22	0.20	0.30	0.30	0.27	6.0	3.3	11.3	6.9
18JUN	S	0.13	0.12	0.13	0.13	0.40	0.60	0.60	0.53	11.2	12.3	8.2	10.6
	B	0.18	0.18	0.19	0.19	1.90	0.50	0.40	0.93	9.0	8.5	4.1	7.5
7JUL	S	0.06	0.03	0.02	0.04	0.05	0.30	0.30	0.22	4.0	3.1	3.7	3.6
	B	0.06	0.07	0.26	0.13	0.15	0.25	0.35	0.25	2.4	1.5	3.5	2.5
31JUL	S	0.07	0.04	0.05	0.05	0.60	0.50	0.40	0.50	15.0	14.5	8.7	12.7
	B	0.03	0.06	0.05	0.05	0.70	0.30	0.40	0.47	0.0	4.1	0.5	2.3
12AUG	S	0.03	0.04	0.04	0.05	0.40	0.20	0.10	0.23	5.2	5.2	6.3	5.6
	B	0.05	0.04	0.06	0.05	0.30	0.20	0.20	0.23	5.2	5.5	4.4	5.0
25AUG	S	0.06	0.04	0.03	0.04	0.80	0.80	0.70	0.77	5.2	5.2	4.1	4.8
	B	0.04	0.08	0.09	0.06	0.70	0.40	0.50	0.53	5.2	2.7	3.3	3.7
10SEP	S	0.08	0.03	0.12	0.08	0.20	0.70	0.45	0.45	2.5	5.7	3.5	3.9
	B	0.04	0.33	0.12	0.16	0.7	0.35	0.31	0.45	4.6	6.6	4.9	5.4
23SEP	S	0.49	0.06	0.05	0.17	0.35	0.35	0.35	0.38	4.1	4.6	4.9	4.5
	B	0.07	0.07	0.07	0.07	0.45	0.55	0.35	0.45	3.3	2.7	3.0	3.0
7OCT	S	0.14	0.11	0.10	0.12	0.30	0.10	0.20	0.20	4.6	5.5	4.1	4.7
	B	0.11	0.09	0.12	0.11	0.42	0.74	0.93	0.70	4.9	3.3	3.0	3.7
23OCT	S	0.11	0.11	0.10	0.10	0.40	0.55	0.40	0.45	4.9	4.1	4.4	4.5
	B	0.10	0.14	0.41	0.22	0.25	0.30	0.51	0.38	4.1	3.0	4.4	3.8
12NOV	S	0.17	0.13	0.18	0.17	0.24	0.33	0.56	0.57	3.5	3.0	2.7	3.1
	B	0.23	0.12	0.10	0.2	0.41	0.55	0.33	0.51	3.1	2.5	1.9	2.5
25NOV	S	0.15	0.16	0.14	0.15	0.78	0.26	0.21	0.25	4.1	2.7	0.5	2.4
	B	0.16	0.18	0.16	.17	0.19	0.25	0.76	0.40	3.3	2.7	3.5	3.2
4DEC	S	0.30	0.22	0.23	0.25	0.26	0.14	0.17	0.19	4.6	3.5	4.1	4.1
	B	0.22	0.16	0.2	0.21	0.2	0.13	0.23	0.33	4.1	3.0	4.4	3.3

X = mean

a = all units in mg/l unless otherwise stated ; parameters selected for relevance to nekton.

b = see notation in Table IV-6 regarding reasons for unusually high parameter values.

V. PLANKTON

A. PHYTOPLANKTON

1. Introduction

Phytoplankton are microscopic plants distributed throughout the water column. They contain chlorophyll pigments which, through the process of photosynthesis, convert inorganic to organic matter by utilizing the sun's energy. This primary production of organic matter provides a food source for planktonic and benthic invertebrates and constitutes part of the base of the Lake Ontario food web.

The primary productivity of a lake is a function of the standing crop of the phytoplankton and its respective growth rate. Major factors influencing growth rate include temperature, nutrient availability, and light. Standing crop at a particular site may be affected by water circulation phenomena (e.g., upwelling, downwelling, advection) which dilute or disperse the phytoplankton, by sinking of the phytoplankton, grazing by zooplankton, epibenthic invertebrates, and fish larvae, and by variations in phytoplankton growth rate. The effects of these and other factors on Lake Ontario phytoplankton are reviewed in LMS (1975a).

The present study is part of a continuing program (LMS, 1975b; QLM, 1974) which is examining the ecology of a near-shore area of Lake Ontario. The specific objective of the program is to evaluate the environmental impact of the Nine Mile Point Nuclear Station and James A. FitzPatrick Nuclear Power Plant.

This report dealing with 1975 data will focus on:

a) determining the factors affecting phytoplankton primary production (e.g., light, water circulation, nutrients and zooplankton grazing);

b) examining phytoplankton temporal and spatial distribution patterns.

2. Materials and Methods

Phytoplankton sampling stations were located at the 10, 20, 40, and 60 ft depth contours on four transects: NMPW, NMPP, FITZ, and NMPE (Figure VA-1). Table VA-1 describes the sampling program and includes station, depth, and frequency. In addition, samples were collected as part of the windrow phytoplankton study. Since no windrows were observed, random samples were collected; these were not analyzed.

PLANKTON SAMPLING STATIONS
NINE MILE POINT VICINITY - 1975

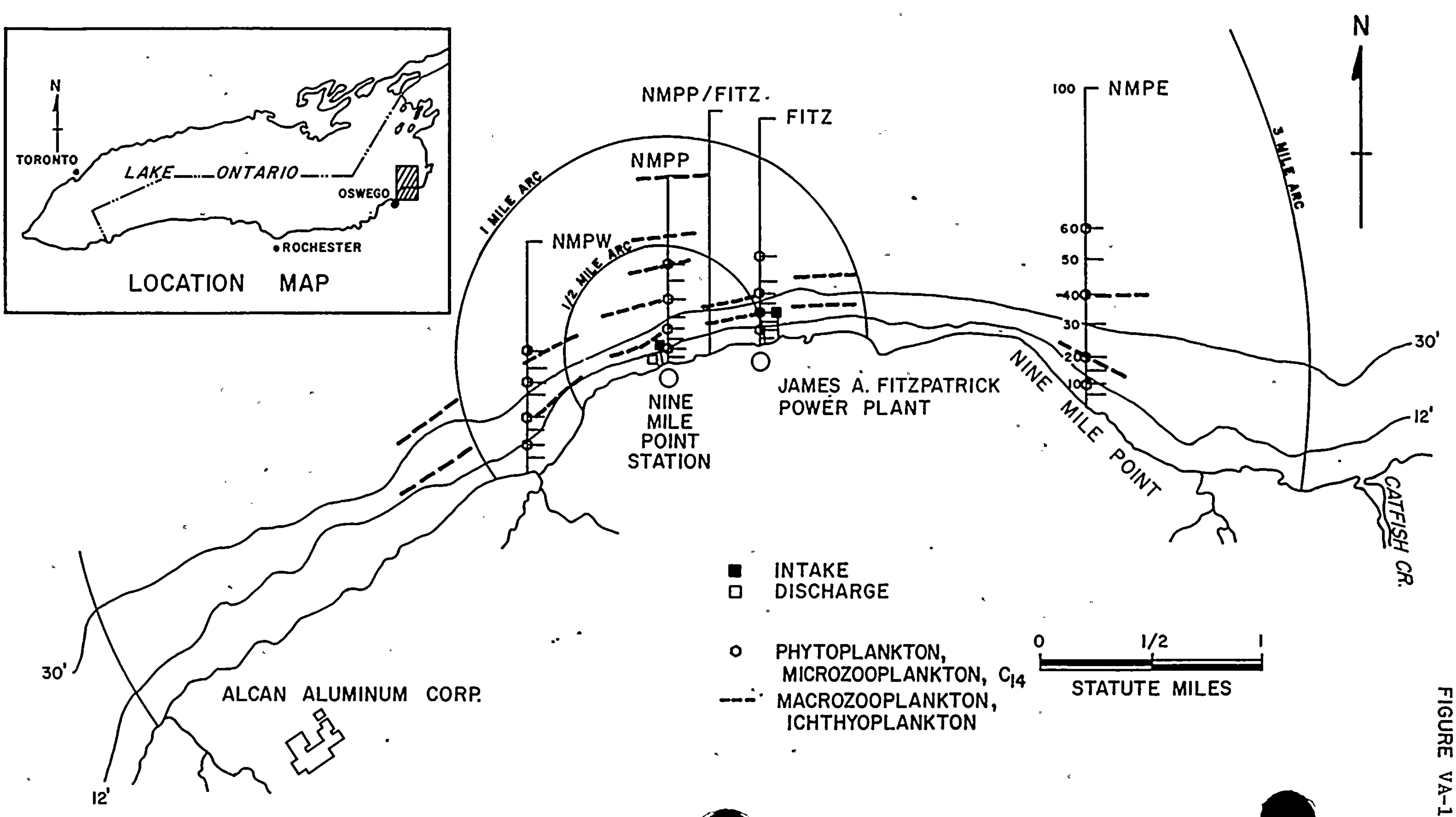


FIGURE VA-1

TAB[illegible]-1

PHYTOPLANKTON SAMPLING PROGRAM

NINE MILE POINT VICINITY - 1975

STUDY	STATION	SAMPLE DEPTH	FREQUENCY
Chlorophyll *a* and Phytoplankton Identification and Enumeration	all	surface (50% light transmittance level)	once/month: APR, SEP-DEC twice/month: MAY-AUG
Chlorophyll *a** and Phytoplankton Identification and Enumeration	20 ft depth contour at all transects	composite from 50%, 25%, and 1% light transmittance levels	once/month: APR, SEP-DEC twice/month: MAY-AUG
Chlorophyll *a**	20 ft depth contour at all transects	separate samples from 25% and 1% light transmittance levels	once/month: APR-DEC in conjunction with ^{14}C uptake studies
Chlorophyll *a** and Phytoplankton Identification and Enumeration	NMPE-40 ft	separate samples from 25% and 1% light levels	once/month: APR, SEP-DEC twice/month: MAY-AUG
^{14}C Phytoplankton Production	all	surface (50% light transmittance level)	Lake: once/month: APR-DEC
^{14}C Phytoplankton Production*	20 ft depth contour at all transects	separate samples from 25 and 1% light levels	once/month: APR-DEC
^{14}C Phytoplankton Production*	NMPE-40 ft	separate samples from 25 and 1% light levels	once/month: APR-DEC

All = NMPW, NMPP, FITZ, NMPE; 10, 20, 40, 60 ft depth contours.
* If light penetration at bottom was greater than 1%, then samples were collected 1 m off bottom.

Two whole water samples were collected with a Van Dorn sampler and composited. A 1-liter subsample was withdrawn and preserved with Lugol's solution for phytoplankton species identification and enumeration using the Utermohl (1958) method; 2 liters of the sample, which were intended for chlorophyll a determinations (measured spectrophotometrically according to Golterman, 1971), were withdrawn into a 2-liter bottle and stored in a black plastic bag in ice water. Phytoplankton biovolume was estimated by calculating an average cell volume for the individual species (Findenegg, 1969). In order to facilitate these estimates, each species was represented by a specific geometric shape (e.g., cylinders and spheres). Cell volume was converted to biomass or fresh weight assuming a specific gravity of 1.

The depths of specific light transmittance levels in the water column were determined with a Whitney Photometer; incident solar radiation (cal/cm^2) was continually measured with an Eppley Black and White Pyranometer (Model 8-48).

Phytoplankton primary production was measured by the ^{14}C method (Vollenweider, 1974). A whole water sample was collected from depths corresponding to specified light transmittance levels and used to fill two light bottles and one dark bottle; a 500-ml subsample was withdrawn for Total Inorganic Carbon analysis. The light and dark bottles were injected with 1 ml of $NaH^{14}CO_3$ (activity of approximately 1 μ curie/ml), hooked to plexiglass plates designed to hold the bottles horizontally, and suspended at their respective collection depths and locations for four hours, usually from 1000 to 1400 hrs.

3. Results and Discussion

a. Species Inventory

A list of the species identified during 1975 is presented in Table VA-2. A total of 254 species were observed, including 34 Myxophyceae (Cyanophyceae), 122 Chlorophyceae, 3 Euglenophyceae, 17 Chrysophyceae, 47 Bacillariophyceae, 18 Cryptophyceae, and 13 Dinophyceae.

Seasonal shifts in the species composition of the phytoplankton were observed during 1975. Among the Myxophyceae, *Oscillatoria limnetica* was numerically important during April and May and *Aphanocapsa delicatissima*, *Chroococcus dispersus*, *Coelosphaerium kuetzingia*, and *Gomphosphaeria lacustris* being numerically important during the summer and fall months. There was an increase in the number of Cyanophyceae species during the summer.

TABLE VA-2

OCCURRENCE OF PHYTOPLANKTON BY DATE
NINE MILE POINT VICINITY - 1975

TAXA	29APR	06MAY	20MAY	10JUNE	24JUNE	08JULY	29JULY	04AUG	24AUG	18SEP	27OCT	17NOV	12DEC
MYXOPHYCEAE													
UNIDENTIFIED CHROOCOCCALES								X					
ANACYSTIS SP.							X						
ANACYSTIS AERUGINOSA				X		X	D	D	X	X	X	X	
ANACYSTIS INCERTA					D		X	D	D	X			
APHANOCAPSA RIVULARIS								X					
APHANOCAPSA DELICATISSIMA				X	D	D	D	D	D	X	X		X
APHANOCAPSA ELACHISTA							X						
APHANOTHECE SP.							X						
APHANOTHECE NIDULANS							X	X	X				
APHANOTHECE SAXICOLA							X						
CHROOCOCCUS LIMNETICUS							X		X	X	X	X	X
CHROOCOCCUS DISPERSUS						X	X	X	X	X	X	X	X
CHROOCOCCUS DISPERSUS VAR. MIN			X	D	X	D	D	D	D	D	D	D	D
COELOSPHAERIUM DUBIUM						X	X	X	X	X			
COELOSPHAERIUM KUETZINGIA							D	X	D	D	D		X
COELOSPHAERIUM NAEGELIANU			X			X	X	X		D	X	X	D
COELOSPHAERIUM PALLIDUM								X	X				
GLOEOCAPSA SP.										X			
GOMPHOSPHAERIA LACUSTRIS					X	X	D	D	D	X	X		D
MERISMOPEDIA GLAUCA					X								
MERISMOPEDIA TENUISSIMA				X	X	X	X	D	D		X		
RHABDODERMA LINEARE						X							
RHABDODERMA MINIMA						X							
LYNGBYA LIMNETICA										X			
OSCILLATORIA AGARDHII	X	X	X	X	X	X	X	X	D	X	X	X	X
OSCILLATORIA LIMNETICA	D	D	D	X	X	X	D	X	X	X	D	X	D
OSCILLATORIA TENUIS		X											
OSCILLATORIA GEMINATA	X	D	D	X		X	X	X	X	X	X		
OSCILLATORIA MINIMA	X	X	X					X					X
PHORMIDIUM SP.			X	X		X							
RHAPHIDIOPSIS SP.							X	X	D	X	X		
ANABAENA SP.				X	X	X	X	D	X	X	X	X	X
APHANIZOMENON FLOS-AQUAE					X	X	X	X	D	D	D	D	D
PLECTONEMA SP.							X						
CHLOROPHYCEAE													
UNIDENTIFIED CHLOROPHYCEAE	X	X	X		X	X		X					
CARTERIA SP.						X	X	X	X		X		
CARTERIA CORDIFORMIS	X	X	X			X	X	X	X	X	X	X	
CARTERIA KLEBSII					X		X	X					
CHLAMYDOMONAS SP.	X	X	X	X	X	X	X	X	D	X	X	X	X
CHLAMYDOMONAS GLOBOSA	X	X	X	X	X	X		X					
CHLAMYDOMONAS PSEUDOPERTYI	X	X											
EUDORINA ELEGANS	X	X				X	X	X	D	X	X	X	X
PANDORINA MORUM						X	X	X	X		X	X	X
PEDINOMONAS MINUTISSIMA			X	X	X	X	X	X	D	X	X	X	X
PHACOTUS LENTICULARIS					X	X		X					
LOBOMONAS SP.				X	X	X	X	X	X				

TABLE VA-2 (Continued)

TAXA	29APR	06MAY	20MAY	10JUNE	24JUNE	08JULY	29JULY	04AUG	24AUG	18SEP	27OCT	17NOV	12DEC
LOBOMONAS AMPLA						X		X					
CHLOROGONIUM SP.							X	X					
POLYTOMA SP.								X		X	X	X	D
ASTEROCOCCUS LIMNETICUS					X	X							
ELAKATOTHRIX GELATINOSA	X		X				X						
GLOEOCYSTIS SP.								X					
GLOEOCYSTIS GIGAS	X	X		X	X	X	X	X	X	X	X	X	D
GLOEOCYSTIS PLANKTONICA							X			X			
GLOEOCYSTIS VESICULOSA			X		X	X	X	X	X	X			
SPHAEROCYSTIS SCHROETERI			X	X	X	X	X	X	X	X	X	X	X
TETRASPORA LACUSTRIS	X	X	X	X			X	X	X	X	X		
DISPORA CRUCIGENIOIDES			X				X						
ULOTHRIX SP.										X			
ULOTHRIX SUBCONSTRICTA			X										
GLOEOTILA CURTA	X	X	X	X	X								
OEDOGONIUM SP.	X			X			X		D	X	X	X	D
MOUGEOTIA SP.	X	X	X	X	X	X	X	X	D	X	X	X	X
CLOSTERIUM SP.	X	X	X				X	X	X	X	X	X	D
CLOSTERIUM ACICULARE			X	X	X	X	X	X	D	X	X	X	D
CLOSTERIUM MONOLIFERUM						X							
CLOSTERIUM VENUS			X										
COSMARIUM SP.		X	X	X			X	X	X	X	X	X	X
STAURASTRUM SP.				X			X	X	X	X	D	X	X
ACTINASTRUM GRACILLIMUM			X	X		X	X	X					
ACTINASTRUM HANTZSCHII			X	X			X	X	D	X			X
ANKISTRODESMUS FALCATUS	X	X	D	X	X	X	X	X	D	X	X	X	D
ANKISTRODESMUS SPIROTAENIA	X	X	X	X	X	X	X		X	X	D	X	X
ANKISTRODESMUS FALCATUS VAR. T			X										
ANKISTRODESMUS NANNOSELENE							X	X	D	X	D	X	D
CHODATELLA SP.						X							
CHODATELLA CILIATA			X		X		X	X	D	X	X	X	
CHODATELLA CITRIFORMIS							X			X			
CHODATELLA SUBSALSA					X	X	X	X	D	X	X	X	
CHODATELLA QUADRISETA	X	X	X	X	X	X	X	X	X	X	X	X	X
CHODATELLA WRATISLAWIENSIS							X						
CHLORELLA SP.				X	X	X	X	X	D	X	D	X	D
COELASTRUM CAMBRICUM						X	X	X	X	X	X		
COELASTRUM MICROPORUM	X		X	X	X	X	D	D	D	X	D	X	X
COELASTRUM RETICULATUM							X	X	X	X	X		
CRUCIGENIA CRUCIFERA							X						
CRUCIGENIA RECTANGULARIS			X				X	X		X			
CRUCIGENIA LAUTERBORNII								X					
CRUCIGENIA TETRAPEDIA			X	X	X	X	X	X			X		X
CRUCIGENIA QUADRATA			X		X			X					
CRUCIGENIA APICULATA								X					
DICTYOSPHAERIUM EHRENBERGIANUM	X	X				X	X	X	X	X	X	X	
DICTYOSPHAERIUM PULCHELLUM	X	X	X	X	X	X	D	X	D	X	X	X	X
ECHINOSPHAERELLA LIMNETICA							X	X		X	X	X	X
ERRERELLA BORNHEMIENSIS						X	X	X	X	X			
FRANCEIA DROESCHERI			X		X	X	X	X	D	X	X	[illegible]	X
FR[illegible]A TUBERCULATA							X						
G[illegible]NIA PAUCISPINA						X							
G[illegible]NIA RADIATA			X	X	X	X	X	X	D	X	X	X	X

TABL -2 (Continued)

TAXA	29APR	06MAY	20MAY	10JUNE	24JUNE	06JULY	29JULY	04AUG	24AUG	18SEP	27OCT	17NO	2DEC
KIRCHNERIELLA CONTORTA			X	X	X	X	X	X	X		D	X	X
KIRCHNERIELLA LUNARIS		X	X				X	X					
KIRCHNERIELLA OBESA					X		X			X	D		
KIRCHNERIELLA SUBSOLITARIA				X	X	X	X	X	X				
MICRACTINIUM PUSILLUM	X	X	X	X	X	X	X	X	D	X	X		
NEPHROCYTIUM AGARDIANUM				X	X	X	X	X			X		
OOCYSTIS SP.			X	X		X	X	X	D	X	X	X	X
OOCYSTIS BORGEI			X	X	X	X	X	X	D	X	X	X	X
OOCYSTIS LACUSTRIS							X				X	X	D
OOCYSTIS PARVA		X				X	X	X	X	X	X	X	
OOCYSTIS PUSILLA			X	X	X	X	X	X	D	X	D	X	D
OOCYSTIS SOLITARIA								X	D	X	X	X	X
OOCYSTIS SUBMARINA									X				
PEDIASTRUM BORYANUM			X	X	X	X	X	X	X	X		X	X
PEDIASTRUM DUPLEX			X	X	X	X	X	X	D	X	D	X	
PEDIASTRUM SIMPLEX					X	X	X	X	X	X	D	X	X
PEDIASTRUM TETRAS				X	X	X	X	X	X				
POLYEDRIOPSIS SPINULOSA							X						
QUADRIGULA SP.							X	X	X				
QUADRIGULA CHODATII		X	X			X		X	X		X		
QUADRIGULA LACUSTRIS													X
QUADRIGULA CLOSTERIOIDES										X			
SCENEDESMUS SP.			X		X	X	X	X					
SCENEDESMUS ABUNDANS			X	X	X	X	X	X	X	X	D		D
SCENEDESMUS ACUMINATUS			X			X			X	X	X		
SCENEDESMUS ACUTIFORMIS			X				X			X			
SCENEDESMUS ARCUATIS											X		
SCENEDESMUS BIJUGA	D	X	D	X	X	X	X	X	D	X	D	X	D
SCENEDESMUS BRASILIENSIS									X	X	X	X	D
SCENEDESMUS DENTICULATUS				X	X	X	X	X	D	X	X	X	
SCENEDESMUS DIMORPHUS	X		X	X	X	X	X	X	D	X	X	X	D
SCENEDESMUS INCRASSATULUS			X		X		X				X	X	X
SCENEDESMUS LONGUS				X			X	X					
SCENEDESMUS OBLIQUUS					X		X	X					
SCENEDESMUS OPOLIENSIS			X				X						X
SCENEDESMUS QUADRICAUDA	X	X	X	X	X	X	X	X	X	X	D	X	X
SCENEDESMUS BIJUGATUS				X	X	X	X	X	X	X	X		
SCENEDESMUS INTERMEDIUS						X	X	X	X	X	D	X	X
SCHROEDERIA JUDAYI						X	X	X	X	X	D	X	X
SCHROEDERIA SETIGERA							X	X					
SELENASTRUM MINUTUM		X	X	X	X	X	X	X	D	X	X	X	X
SELENASTRUM WESTII							X						
TETRADESMUS SP.								X					
TETRAEDRON CAUDATUM			X	X	X	X	X	X		X			
TETRAEDRON MINIMUM	X		X	X	X	X	X	X	X	X	X	X	D
TETRAEDRON MUTICUM				X	X	X	X	X	X	X	X		
TETRAEDRON REGULARE					X				X		X		
TETRAEDRON TRIGONUM							X						
TETRASTRUM HETERACANTHUM							X		X		X		
TETRASTRUM STAUROGENIAEFORME	X	X	X	X	X	X	X	X	X	X	X		D
TETRASTRUM ELEGANS				X			X	X					
TREUBARIA SETIGERUM				X	X	X	X	X	X	X	X		X
TREUBARIA TRIAPPENDICULATA			X				X	X	X	X	X	X	D

TABLE VA-2 (Continued)

TAXA	29APR	06MAY	20MAY	10JUNE	24JUNE	06JULY	29JULY	04AUG	24AUG	18SEP	27OCT	17NOV	12DEC
TROCHISCIA SP.			X										
WESTELLA LINEARIS					X		X						
CORONASTRUM AESTIVALE						X	X	X	D	X	X		
RADIOCOCCUS NIMBATUS							X						
EUGLENOPHYCEAE													
EUGLENA SP.	X	X	X	X								X	D
PHACUS SP.	X	X	X						X				X
TRACHELOMONAS SP.	X				X						X		
CHRYSOPHYCEAE													
UNIDENTIFIED CHRYSOMONADALES	X	X	X	X	X	X	X	X	X	X			
DINOBRYON SP.				X	X		X	X	D	X	X	X	D
DINOBRYON BAVARICUM				X	X								
DINOBRYON DIVERGENS						X							
DINOBRYON SOCIALE		X			X	X				X			X
DINOBRYON SOCIALE VAR. AMERICA	X	X	X	X	X	X							
MALLOMONAS SP.	X	X		X	X	X	X	X	X	X	X	X	X
CHRYSOCHROMULINA PARVA	D	D	X	X	X	X	X	X	D	X	X	X	D
CHROMULINA SP.	X	X	X	X		X							
STELEXMONAS SP.	X	X	X	X									X
CHRYSOSPHAERELLA LONGISPINA						X		X					
KEPHYRION SP.							X						
RHIZOCHRYSIS SP.		X	X	X	X	X	X	X	X	X			X
CHRYSARACHNION INSIDIANS							X						
CHRYSAMOEBA SP.				X			X			X			
OCHROMONAS SP.	X	X	D	X	D	X	X	D	D	X	D	X	X
UROGLENA SP.								X					
BACILLARIOPHYCEAE													
COSCINODISCUS LACUSTRIS			X	X	X		X		X				
COSCINODISCUS ROTHII						X	X	X	D	X	X		
CYCLOTELLA ATOMUS			X	X	X	X	D	X	D	X	D	X	X
CYCLOTELLA GLOMERATA				X	X	X				X	X	X	
CYCLOTELLA MENEGHINIANA			X	X	X	X	X	X	D	X	D	X	X
CYCLOTELLA STELLIGERA							X						
CYCLOTELLA PSEUDOSTELLIGERA							X						
MELOSIRA SP.				X									
MELOSIRA BINDERANA	D	X	X	X	X		X			X	X	X	D
MELOSIRA GRANULATA	X		X	X	X		X	X		X	X		
MELOSIRA ISLANDICA	X	X	X	X	X		X	X	X		X	X	X
MELOSIRA ITALICA							X	X	X	X	X	X	
MELOSIRA ITALICA VAR. SUBARCTI			D	X	X	X	X	X	X	X	D	X	X
MELOSIRA GRANULATA VAR. ANGUST							X				X		
STEPHANODISCUS ASTREA	X		X				X				X	X	X
STEPHANODISCUS HANTZSCHII	D	D	D	X	X	X	X	X	D	X	D	X	X
STEPHANODISCUS NIAGARAE	X	X	X		X	X	X					X	X
STEPHANODISCUS ASTREA VAR. MIN	X	X	X	X			X	X		X	X	X	D
AMPHORA OVALIS												X	
ASTERIONELLA FORMOSA	D	X	D	X	X				D	X	X	X	D
COCCONEIS SP.				X				X			X		X
CYMBELLA SP.													X
DI[illegible] ELONGATUM	X	X	X	X	X	X			X	X	X		

TABLE VA-2 (Continued)

TAXA	29APR	06MAY	20MAY	10JUNE	24JUNE	08JULY	29JULY	04AUG	24AUG	18SEP	27OCT	17NOV	12DEC
DIATOMA VULGARE			X				X						
EUNOTIA CURVATA	X												
FRAGILARIA CAPUCINA	X	X	X	X	X		X		X	X	X	X	X
FRAGILARIA CROTONENSIS	X	X	X	X	X		X	X	X	X	D	X	X
FRAGILARIA VAUCHERIAE	X	X	X	X	X		X	X	X	X	X	X	X
GOMPHONEMA OLIVACEUM								X					
GYROSIGMA SP.		X	X								X	X	X
GYROSIGMA ATTENUATUM													X
NAVICULA SP.	X		X				X		X	X		X	X
NAVICULA CRYTOCEPHALA							X						X
NAVICULA TRIPUNCTATA			X									X	X
NITZSCHIA SP.		X	X				X	X	X	X	X	X	X
NITZSCHIA ACICULARIS	X	X	X	X		X	X	X	X	X	X	X	X
NITZSCHIA DISSIPATA			X				X				X	X	D
NITZSCHIA GRACILIS	X	X	X	X									
NITZSCHIA HOLSATICA	X	X	X	X	X		X	X	X	X			
NITZSCHIA PALEA			X		X	X	X	X	X	X	X	X	X
RHOICOSPHENIA CURVATA	X		X		X							X	X
SYNEDRA SP.			X	X		X	X	X	X	X	X	X	D
SYNEDRA ACUS	X	X	X	X	X		X	X	X				X
SYNEDRA ULNA		X	X	X							X		X
SYNEDRA RUMPENS											X		
TABELLARIA FENESTRATA	X	X	X	X			X			X	X	X	X
TABELLARIA FLOCCULOSA			X										
CRYPTOPHYCEAE													
CRYPTOMONAS SP.	X	X	X	X	X	X	X	X	D	X	X		
CRYPTOMONAS EROSA	X	X	X	X	X	X	X	X	D	X	D	X	D
CRYPTOMONAS OVATA	X	X	X	X	X	X	X	X	X	X	X	X	D
CRYPTOMONAS EROSA VAR. REFLEXA	X	X	X	X	X	X	X	X	X		D	X	X
CRYPTOMONAS MARSSONII		X		X	X	X	X	X	D	X	X	X	X
CRYPTOMONAS OBOVATA	X	X		X		X							
CRYPTOMONAS PHASEOLUS	X	X	X		X	X	X	X	X	X			
CRYPTOMONAS PUSILLA						X	X	X	X	X	D	X	X
CRYPTOMONAS REFLEXA									X		X	X	D
CRYPTOMONAS ROSTRATA	X	X	X	X	X	X	X	X	X	X	X	X	X
CRYPTOMONAS PLATYURIS						X							
KATABLEPHARIS OVALIS	X	X	X	X	X	X	X	X	D	X	D	X	X
RHODOMONAS MINUTA	X	X	X	X	X	X	X	X	X	X	X	X	D
RHODOMONAS MINUTA VAR. NANNOPL	X					X							
SENNIA PARVULA				X	X	X	X	X	D	X	X	X	X
CRYPTAULAX RHOMBOIDEA													X
CHROOMONAS SP.											X	X	X
CHROOMONAS ACUTA	X	D	X	X	X	X	D	D	D	D	D	D	D
DINOPHYCEAE													
GYMNODINIUM SP.	X	X	X	X	X	X	X	X	X	X		X	X
GYMNODINIUM HELVETICUM	X	X								X	X	X	X
GYMNODINIUM VARIANS	X	X	X	X	X	X	X	X	X	X	D	X	X
GYMNODINIUM ORDINATUM													D
AMPHIDINIUM SP.				X		X	X	X					
CERATIUM HIRUNDINELLA				X	X	X	X	X	D	X			
GLENODINIUM SP.	X	X	X	X		X	X	X		X	X	X	X

TABLE VA-2 (Continued)

TAXA	29APR	06MAY	20MAY	10JUNE	24JUNE	08JULY	29JULY	04AUG	24AUG	18SEP	27OCT	17NOV	12DEC
GLENODINIUM PULVISCULUS		X				X	X	X	D	X	D	X	D
PERIDINIUM SP.			X			X	X	X	X	X			X
PERIDINIUM ACICULIFERUM	X	X	X	X	X	X	X	X					
PERIDINIUM CINCTUM					X	X	X	X	D	X	X		
PERIDINIUM INCONSPICUUM						X	X						
PERIDINIUM CUNNINGTONII								X	X				
OTHER													

(Column headings are grouped under DATES.)

D = Presence at 15% of total phytoplankton abundance at one or more stations
X = Presence at one or more stations

Among the Chlorophyceae there were a few species whose abundances were occasionally great. Scenedesmus bijuga was the only chlorophyte which frequently composed greater than 15% of the total phytoplankton.

Among the remaining algal groups, the following species frequently composed greater than 15% of the total phytoplankton (Table VA-2): the chrysophyte Ochromonas sp., the bacillariophytes Cyclotella atomus, Stephanodiscus hantzschii and Asterionella formosa, and the cryptophyte Chroomonas acuta.

b. Phytoplankton Standing Crop

The supporting data for this section is included, in part, in Appendices VA-1 to VA-3.

(i) Chlorophyll a

Surface water chlorophyll a concentrations were spatially and temporally variable (Figure VA-2). The lowest values were observed in November and December (0.2-3.0 mg/m^3); the highest were observed on 24 June (5.9-15.4 mg/m^3) and 29 July (4.0-21.6 mg/m^3). Two additional dates having "peaks" of chlorophyll a were 29 April (4.5-9.8 mg/m^3) and 24 October (3.5-7 mg/m^3).

The temporal fluctuations in chlorophyll a from April through June reflected shifts in the phytoplankton species composition; e.g., the diatom Melosira binderana composed 12-36% of the biomass on 29 April and, with the exception of the FITZ 60 ft station, the chryosphyte Ochromonas sp. composed greater than 40% of the biomass at all stations on 24 June (Appendix V-3); the July-August chlorophyll a value was associated with the increased biomass of the diatom Coscinodiscus rothii and the dinoflagellate Glenodinium pulvisculus; the October "peak" reflected an increase in biomass of a mixed group of algae including chryptophytes (principally Cryptomonas erosa), the green alga Oedogonium sp., and the diatoms Stephanodiscus astrea and Melosira binderana.

Although there were temporal fluctuations in chlorophyll a concentration, these were small in comparison to the temporal variation in photosynthetic rate. Standing crop of chlorophyll a did not increase to levels expected from the high photosynthetic rates, suggesting that the cropping (removal) of phytoplankton was high.

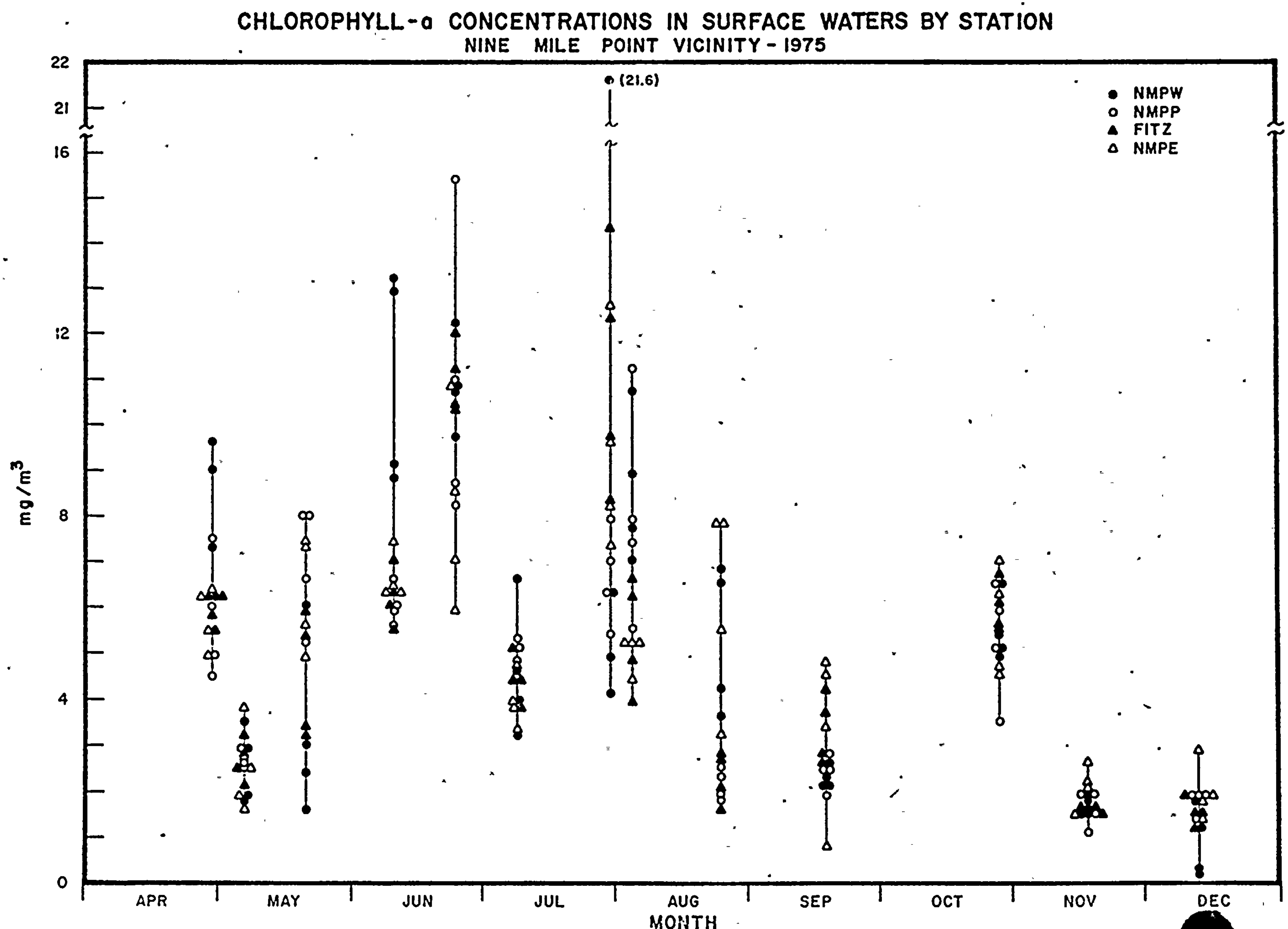

CHLOROPHYLL-a CONCENTRATIONS IN SURFACE WATERS BY STATION
NINE MILE POINT VICINITY - 1975
mg/m3
(21.6)
NMPW
NMPP
FITZ
NMPE
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
MONTH
0
4
8
12
16
21
22

FIGURE VA-2

One approach to evaluating possible power plant effects is to examine the spatial distribution of phytoplankton chlorophyll a for a consistently recurring pattern which might indicate the presence of a plant effect. For these analyses the NMPP and FITZ transects and in particular the NMPP-20 ft station were compared to other transects and stations with regard to their chlorophyll a content. There was no continually recognizable pattern in the spatial distribution of chlorophyll a (Figure VA-2). However, certain observations are worth noting.

1) Chlorophyll a concentrations were occasionally much higher at stations on the NMPW transect (29 April and 10 June). The highest chlorophyll concentration observed at any station was at NMPW-10 ft on 29 July. However, there were times (20 May) when chlorophyll a values at NMPW were lower than at other transects. These high values suggest that NMPW transect may be receiving water from sources frequently rich in algae. The major source is probably the Oswego River, which influenced the NMPW transect to a greater extent than other transects as documented by chloride distribution in the Nine Mile Point vicinity (see section IV.A.2 on Water Quality). In addition, a stream discharges into Lake Ontario in the immediate vicinity of only the NMPW transect and is a source of periphytic algae during periods of high runoff (e.g., 29 July).

2) Noticeable clusters of depth contours within a transect as a result of similar chlorophyll a concentrations were observed for the NMPP transect on 8 May, 10 June, 6 July, 24 August, 18 September; at the NMPW transect on 20 May, 10 June, 18 September; at the FITZ transect on 29 April, 24 June; at the NMPE transect on 10 June and 4 August. On 17 November and 12 December, chlorophyll a concentration was homogeneously distributed throughout the Nine Mile Point vicinity.

These observations indicate that the spatial distribution of chlorophyll a is affected by a complex of abiotic and biotic factors among which any effect of the Nine Mile Point and FitzPatrick power plants cannot be differentiated. Some of these factors include hydrodynamics processes, variable zooplankton grazing and variable phytoplankton production rates.

The apparent clustering of stations within a transect on certain dates suggests that the distribution of chlorophyll a was relatively homogenous over a localized area. In addition,

the chlorophyll a concentration and homogeneity at stations within a transect often differed from that at other transects. Since the major currents in the Nine Mile Point vicinity are long shore, these observations could indicate that, at times, "patches" of phytoplankton are being transported through the Nine Mile Point vicinity parallel to shore. An examination of the chlorophyll a data (Figure VA-2) indicated that stations on the NMPE transect had more variable chlorophyll a concentrations than did stations within other transects. The NMPE transect is located in Mexico Bay, in which water masses of different regional origin meet and mix.

Light wind (5-12 mph) can produce a water surface circulation phenomenon known as Langmuir Circulation which results in microzones of upwelling and downwelling water parallel to the wind direction. Depending on their buoyancy, the phytoplankton accumulate along lines of water divergences and convergences, resulting in parallel streaks or windrows between which the water is relatively devoid of phytoplankton. Wind data for the Nine Mile Point vicinity were examined for each plankton sampling date and for two days preceeding that date. Light winds prevailed prior to almost every sampling date.

Stronger winds (greater than 15 mph) result in mass water movements, turbulence, and mixing which can result in dilution and redistribution of the phytoplankton. The effects of strong winds may obscure phytoplankton distribution patterns which have developed as a result of other abiotic and biotic factors. Strong winds were observed on or before the 29 July, 17 November and 12 December sampling dates. The two latter dates were characterized by homogeneous chlorophyll a concentrations among the stations, suggesting that the water mass in the Nine Mile Point vicinity was well mixed on these dates.

- Chlorophyll a throughout the Euphotic Zone

Separate samples and composite samples of chlorophyll a were collected from the 50% (surface), 25%, and 1% light levels at the 20-ft stations of NMPW, NMPP, FITZ, and NMPE transects and only separate samples were collected at NMPE-40 ft station.

Chlorophyll a data for the separate samples are presented in Appendix VA-2. On 29 April, 24 August, 18 September, 27 October, and 17 November, chlorophyll a concentrations were homogeneously distributed throughout the euphotic zone; this is indicative of a well mixed water column. However, on 20 May, the chlorophyll a concentration at the 1% light level depth

..as over twice the concentration at the 50% and 25% light depths. This was attributed to a heterogeneous vertical distribution of the phytoplankton population since there were no apparent differences in the vertical distribution of species. Therefore, the higher chlorophyll a concentration at the lower level may have been due to sinking of the phytoplankton or to intensive zooplankton grazing at the 50% and 25% levels.

Composite chlorophyll a samples are useful for estimating the average chlorophyll a concentration throughout the water column. The data are presented in Table VA-3. The same general temporal and spatial patterns observed for the separate 50%, 25%, and 1% light levels were observed.

(ii) Phytoplankton Abundance

The cell abundance data for diatoms (Bacillariophyceae), green algae (Chlorophyceae), and blue-green algae (Cyanophyceae) were examined for spatial and temporal distribution patterns (Figures VA-3 to VA-5). The data were examined to determine whether stations near the power plant's discharges had consistently higher or lower phytoplankton abundances. Two general observations were made with regard to all three algal groups: first, temporal variations were more pronounced than spatial variation within a single date, and second, there was no consistently recurring pattern of spatial distribution. This suggests that phytoplankton abundance is affected primarily by such abiotic factors as temperature solar radiation, and shifts in weather conditions.

Spatial variation indicates the presence of small-scale factors (e.g., zooplankton grazing, local upwelling, micro-circulation patterns). The power plants may also be included in the group of factors which affect spatial distribution patterns. However, the lack of a definable spatial pattern indicates the presence of a mosaic of continually changing factors, from which possible power plant effects are not evident.

(iii) Phytoplankton Biomass

Phytoplankton cell size varies greatly among species. Therefore, estimates of cell abundance do not necessarily provide information on the amount of organic matter present as phytoplankton are available to higher trophic levels (e.g., herbivorous zooplankton). In order to determine this, an estimate of phytoplankton biomass is required.

TABLE VA-3

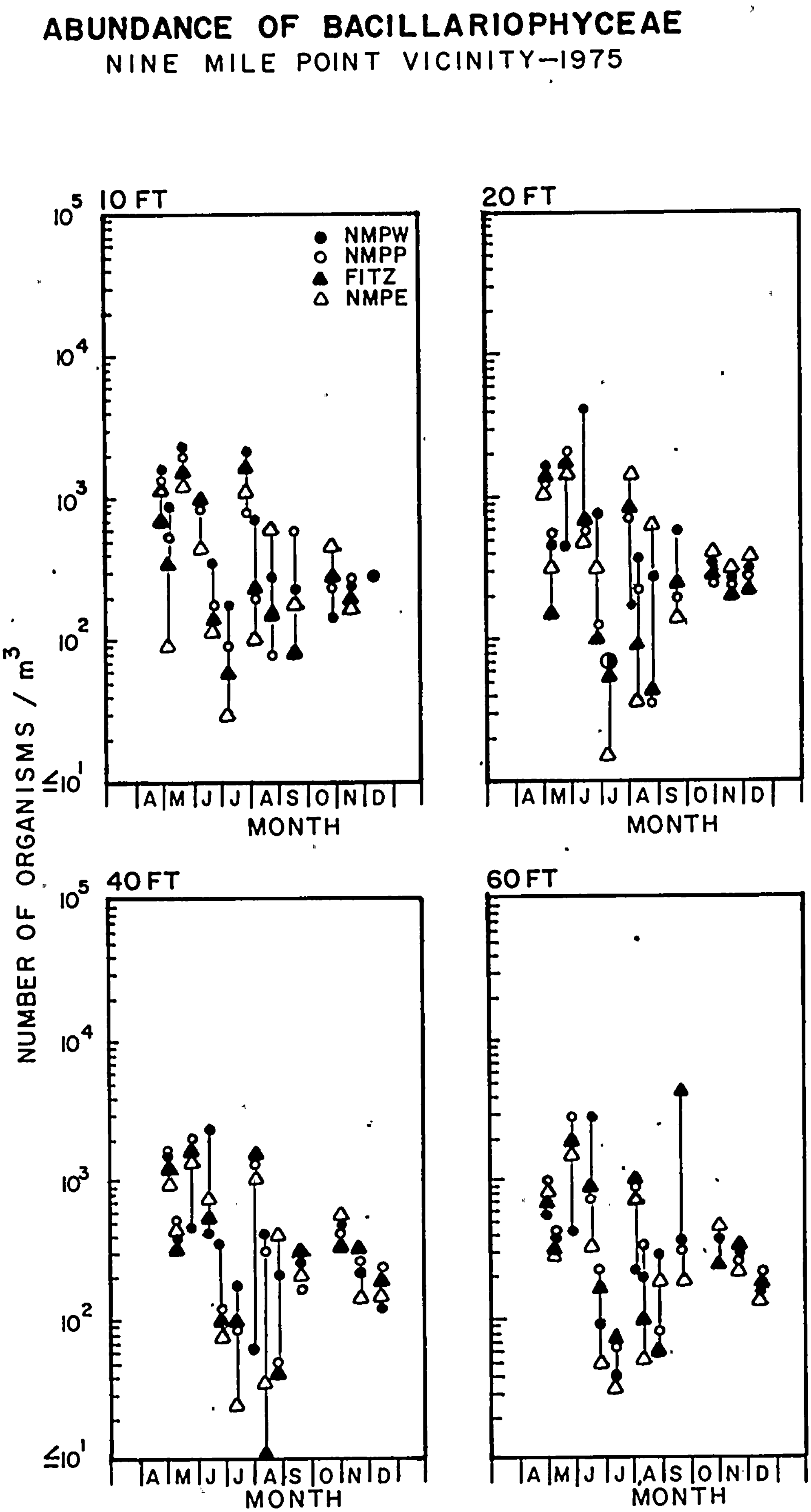
MEAN CHLOROPHYLL-A CONCENTRATIONS*

NINE MILE POINT VICINITY - 1975

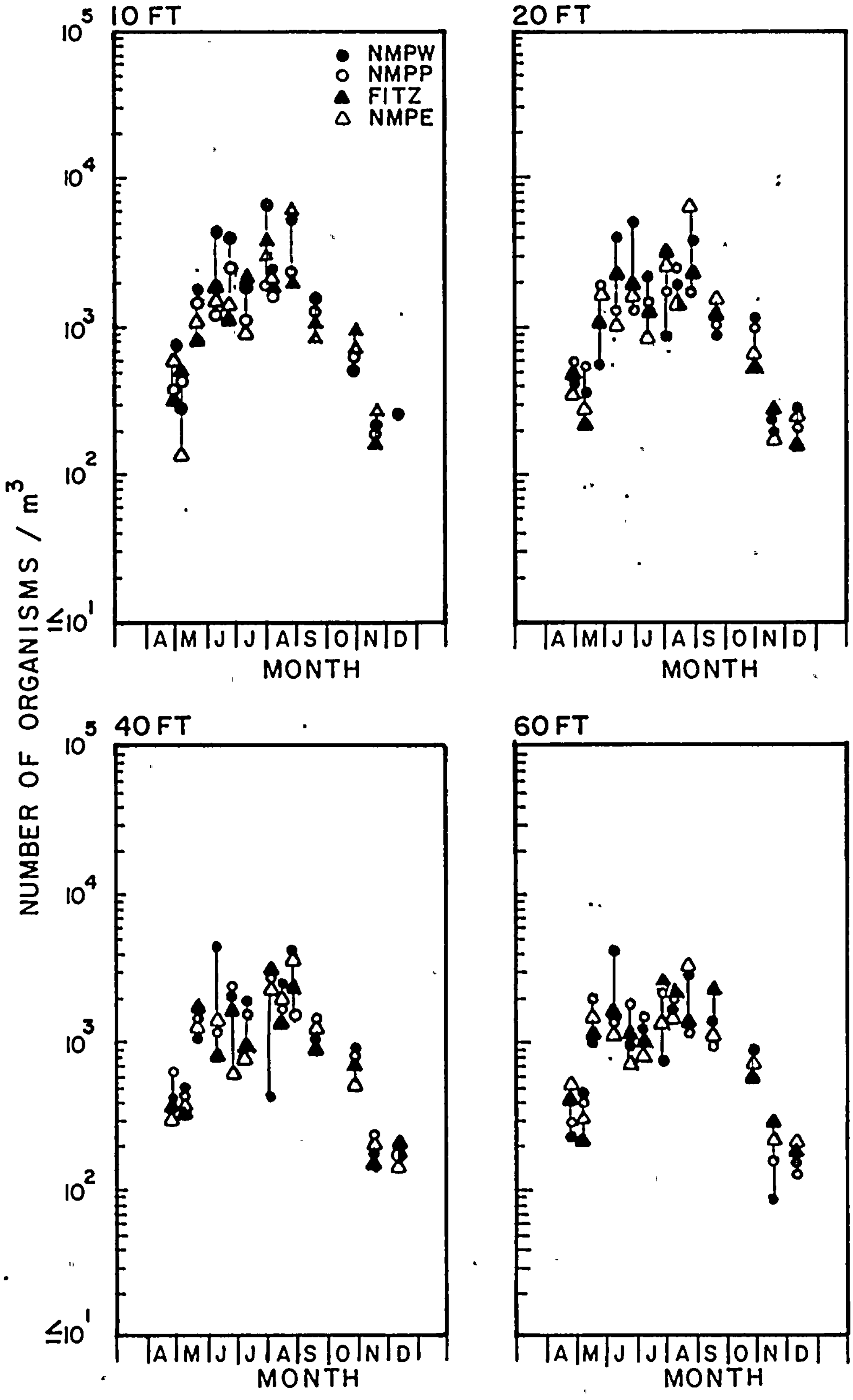
DATE	STATION			
	NMPW-20 FT	NMPP-20 FT	FITZ-20 FT	NMPE-20 FT
29 APR	7.2	6.0	4.9	6.8
6 MAY	4.1	6.3	3.3	4.1
20 MAY	9.6	9.0	7.9	7.4
10 JUN	9.5	8.6	6.6	7.4
24 JUN	10.3	9.2	12.7	13.4
8 JUL	6.8	5.5	4.5	3.9
29 JUL	8.2	6.8	13.0	7.3
4 AUG	8.2	7.4	6.7	4.8
24 AUG	5.7	2.1	2.0	6.3
18 SEP	3.0	2.6	2.6	4.9
27 OCT	5.3	6.2	7.0	5.7
17 NOV	1.8	1.8	1.5	2.5
12 DEC	0	2.1	1.8	2.6

*µg/1; composite of samples taken at 50%, 25%, and 1% light transmittance depths

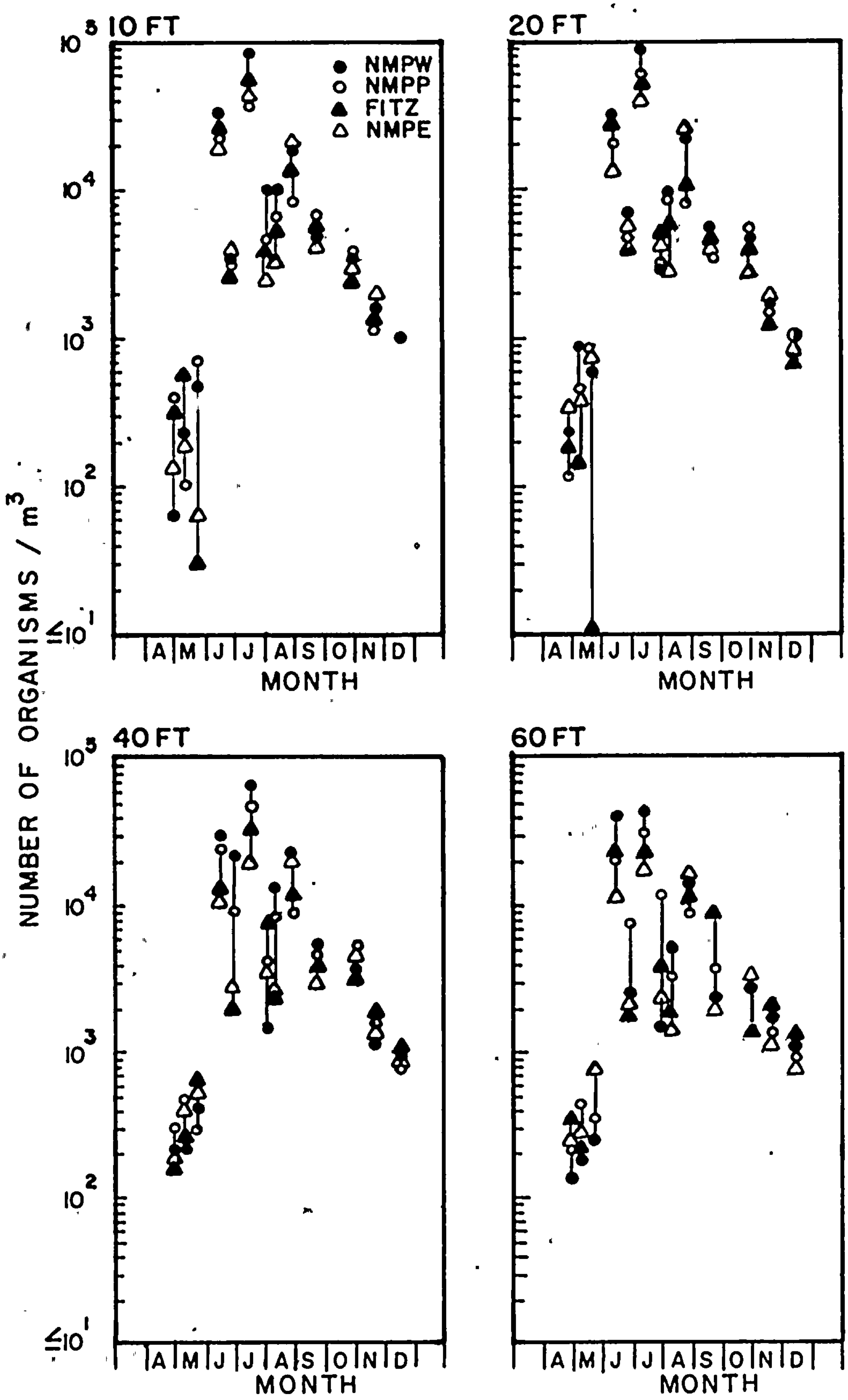
FIGURE VA-3


ABUNDANCE OF BACILLARIOPHYCEAE
NINE MILE POINT VICINITY—1975
10 FT
20 FT
40 FT
60 FT
NMPW
NMPP
FITZ
NMPE
10^5
10^4
10^3
10^2
$\leq 10^1$
NUMBER OF ORGANISMS / m^3
A M J J A S O N D
MONTH

ABUNDANCE OF CHLOROPHYCEAE
NINE MILE POINT VICINITY—1975



ABUNDANCE OF MYXOPHYCEAE
NINE MILE POINT VICINITY—1975



The biomass data for Bacillariophyceae, Chlorophyceae, Myxophyceae, Chrysophyceae, and total phytoplankton at the 20 and 40 ft stations were examined for spatial and temporal distribution patterns (Figure VA-6 to VA-10). These are the depth contours at which an effect of power plant operation would be observable.

As observed for cell abundance, distribution of phytoplankton biomass (mg/m^3) appears to be affected primarily by such abiotic factors as temperature and solar radiation and shifts in the weather (e.g., around 29 July). There were no patterns obvious in the spatial distribution of biomass, indicating that algal distribution is being affected by a complex of factors among which possible power plant effects are not evident.

Three diatom species which composed a substantial portion of the population when diatom biomass was high were *Melosira binderana* on 29 April and 12 December, *Stephanodiscus hantzschii* on 20 May and *Coscinodiscus rothii* on 29 July. Stoermer et al. (1975) reported that these species (particularly *C. rothii*) are characteristic of eutrophic conditions.

The growth of these species is temperature related. *M. binderana* is restricted to the colder spring and late fall/winter months, as was also observed by Munawar and Munawar (1975); *C. rothii* (*subsalsa*), unlike most diatoms, requires relatively high temperatures for maximum growth, and population maxima are usually observed in late summer and fall (Stoermer et al., 1975). Since the growth rate of these species as well as other phytoplankters is affected by temperature, it might therefore be affected by the discharge of waste heat. However, temperature variations as a result of the Nine Mile Point plant discharge were almost indiscernable from natural temperature variation (see section IV.C.1 on Water Quality). In addition, the stimulatory and/or inhibitory effects of elevated temperatures would require at least a day to produce noticeable differences in the abundance or biomass of a species. At an average longshore current flow rate of 0.3 ft/sec (Gunwaldsen et al., 1970), phytoplankton residence time within the discharge plume would be short (several hours) and the organisms would be transported out of the entire study area in less than a day. Since the magnitude and duration of the temperature effect and the chances of observing a response to that effect are small, it is unlikely that variations in the biomass of diatoms and other phytoplankters could be attributed to thermal discharge from either power plant.

BIOMASS OF BACILLARIOPHYCEAE

NINE MILE POINT VICINITY-1975

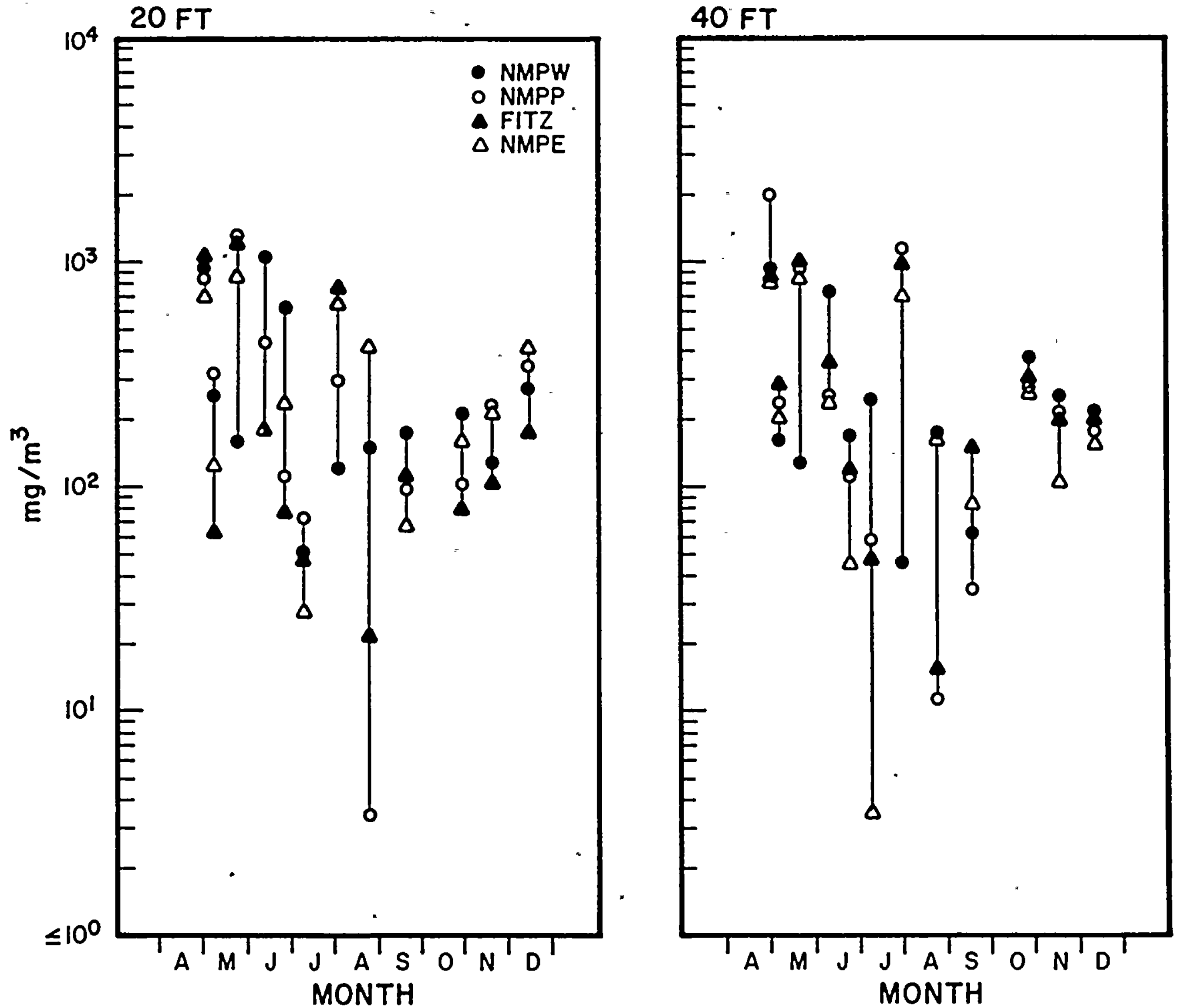


FIGURE VA-6

BIOMASS OF CHLOROPHYCEAE

NINE MILE POINT VICINITY-1975

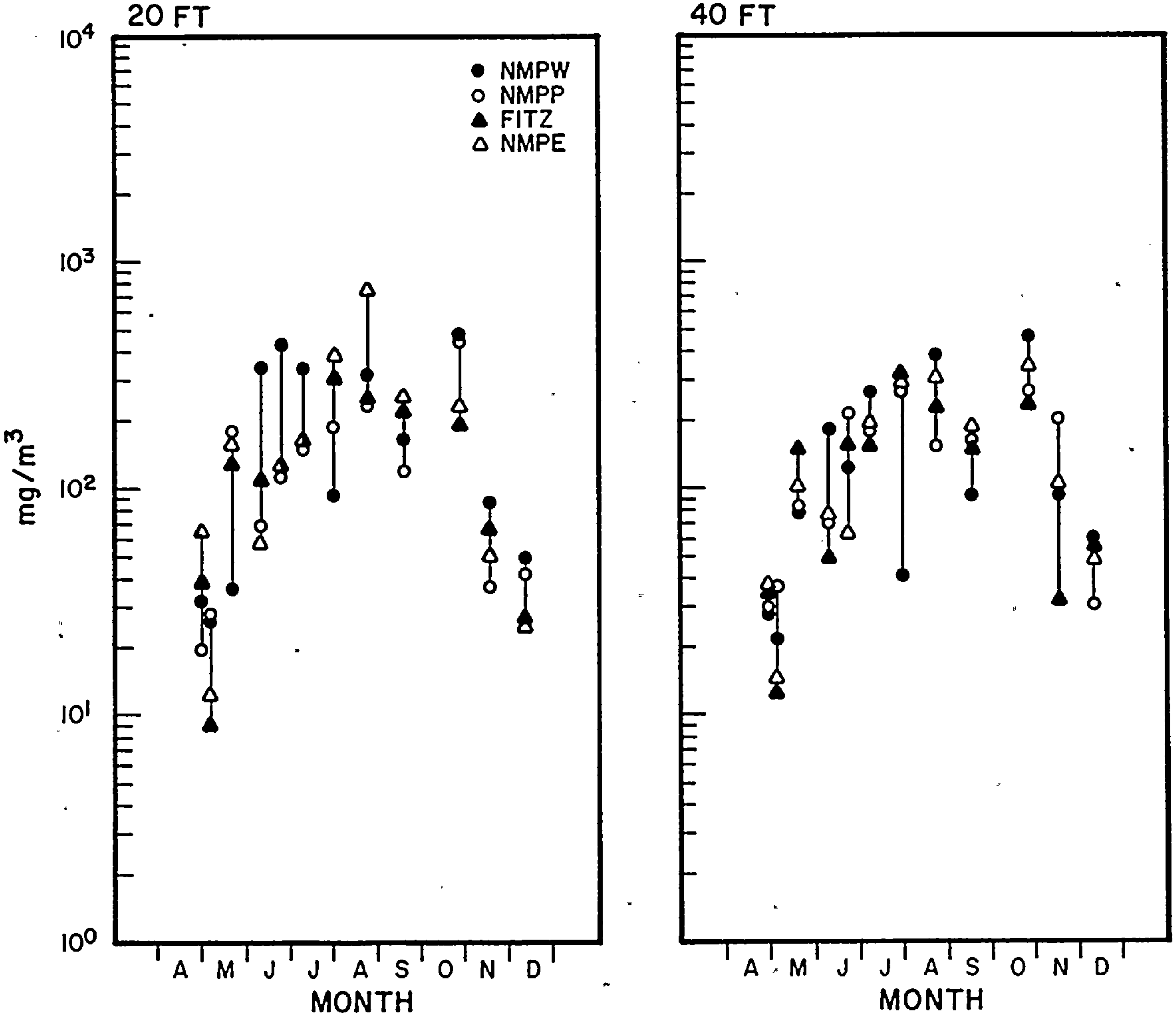


FIGURE VA-7

BIOMASS OF MYXOPHYCEAE

NINE MILE POINT VICINITY-1975

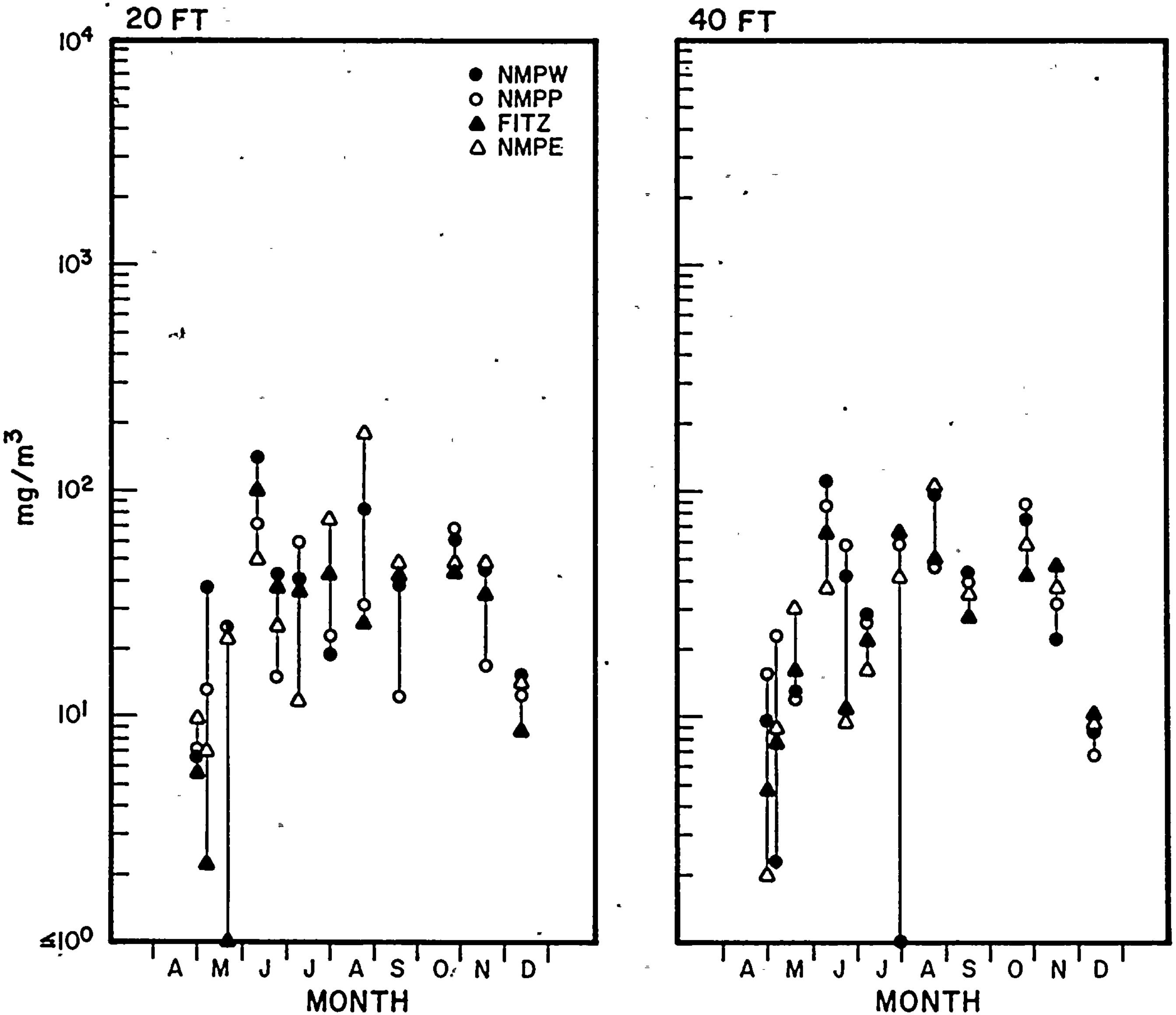


FIGURE VA-8

BIOMASS OF CHRYSOPHYCEAE

NINE MILE POINT VICINITY-1975

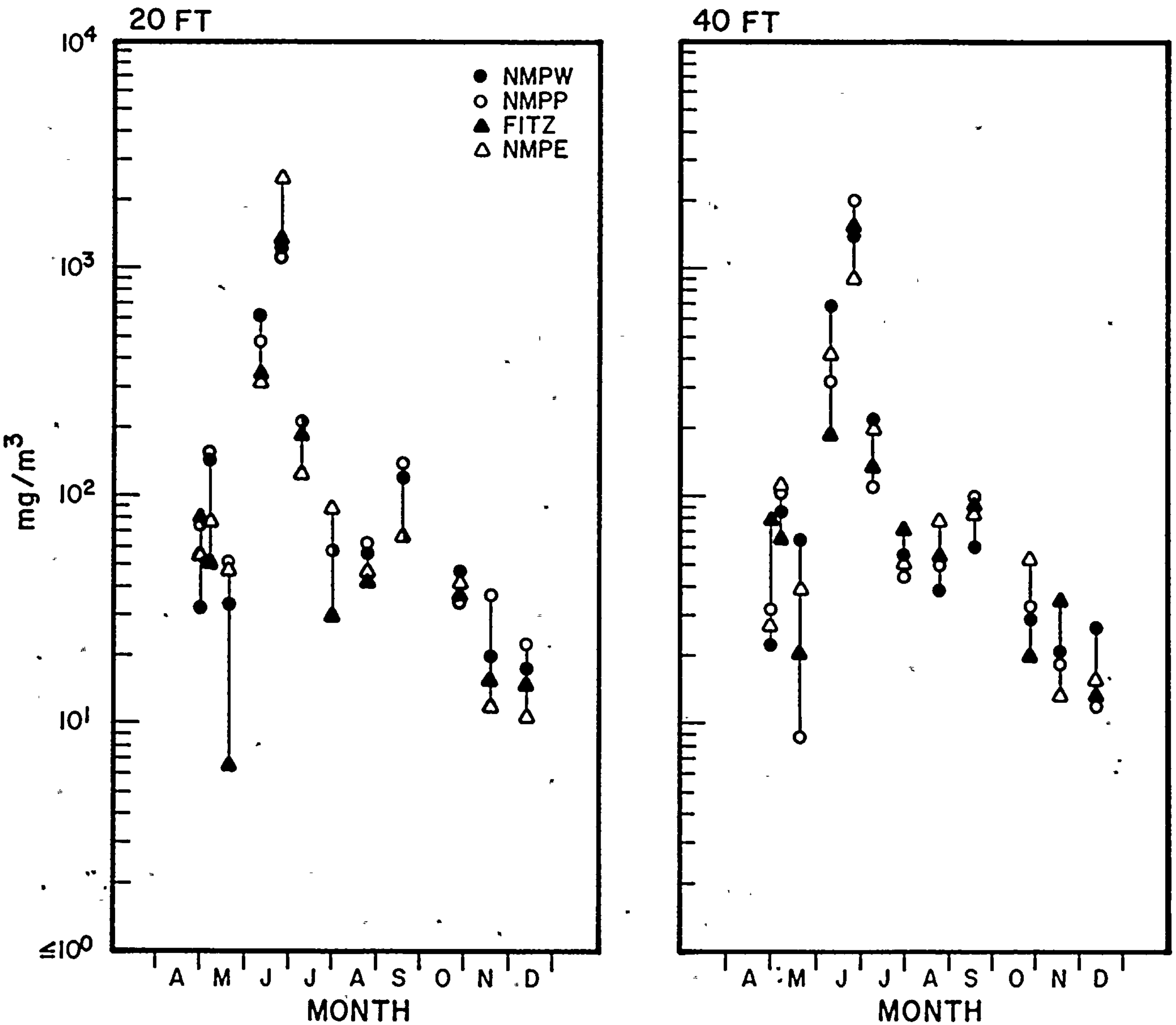


FIGURE VA-9

BIOMASS OF TOTAL PHYTOPLANKTON

NINE MILE POINT VICINITY-1975

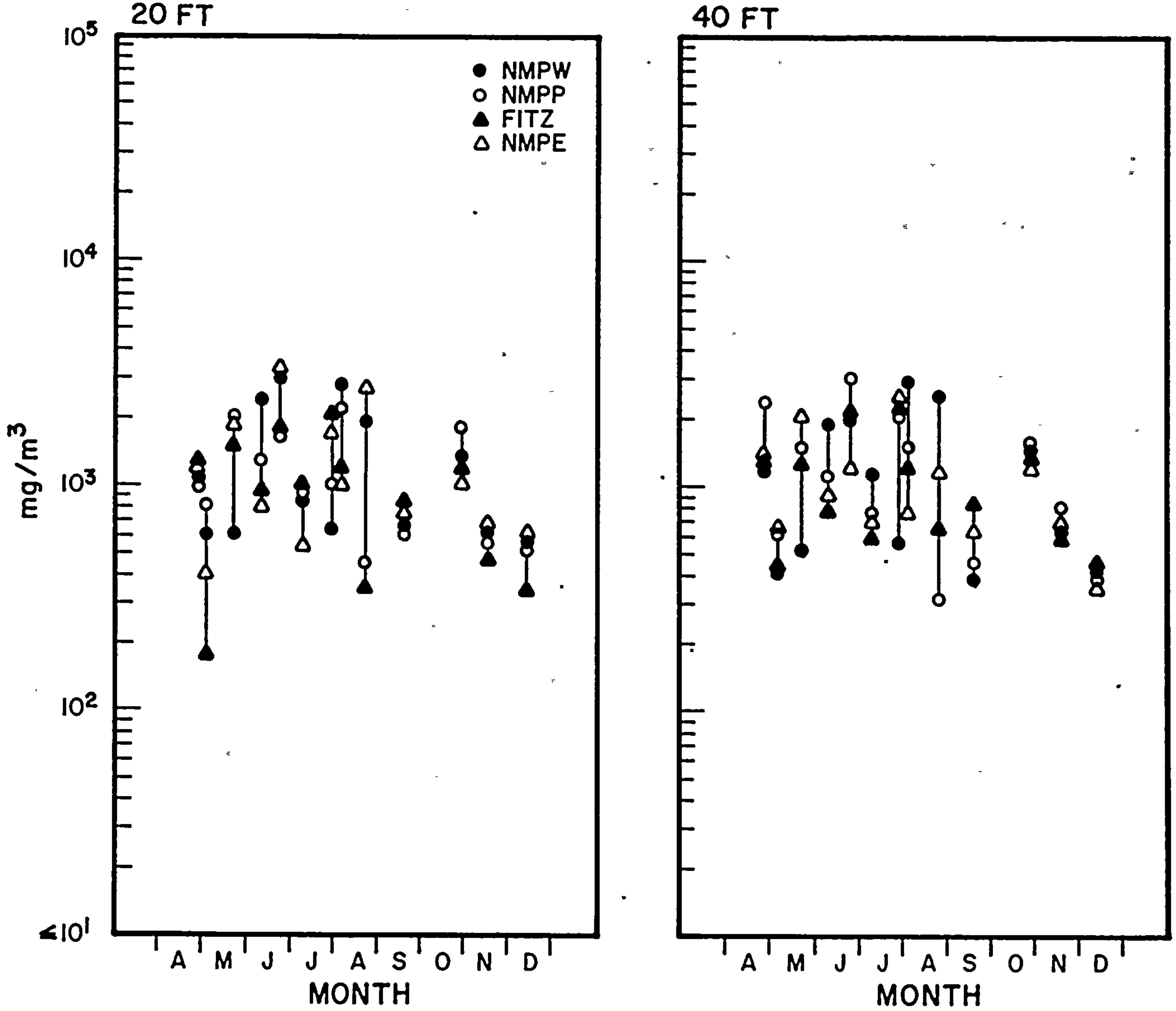


FIGURE VA-10

The biomass of green algae (Figure VA-7) increased during April and May, fluctuated during the summer, and decreased in November and December. This is the typical seasonal pattern of green algal growth and reflects the higher optimum growth temperature of the group as a whole (Patrick, 1969). The temporal pattern of blue-green algal biomass (Figure VA-8) was similiar to that of green algae, also reflecting the higher optimum growth temperature for this group.

Chrysophyte biomass was characterized by a sharp peak on 24 June (Figure VA-9), due to the growth of *Ochromonas* sp.

The dinoflagellate *Glenodinium pulvisculus* composed a substantial portion of the phytoplankton biomass during July and August (Appendix VA-3). Stoermer et al. (1975) has also noted an increased dominance of a composite group of *Gymnodinium* and *Glenodinium* during June and July.

4. Conclusions

1. Standing crop data for phytoplankton abundance, biomass, and chlorophyll *a* indicated that temporal variations were large compared to spatial variations. It was concluded that the major phytoplankton distribution patterns were affected by large-scale seasonal factors or short-term shifts in weather conditions.

2. The lack of a definable pattern in the spatial distribution of phytoplankton standing crop indicated the presence of a mosaic of small scale factors among which the effects of the power plants could not be differentiated.

3. Temporal variations in primary production were dependent primarily on variations in the rate of photosynthesis rather than on standing crop.

4. Zooplankton grazing does not appear to be of a sufficient magnitude to control phytoplankton population growth. Rather sinking of the phytoplankton out of the water column and transport offshore to the deep lake waters were considered more important.

B. ZOOPLANKTON

1. Microzooplankton

a. Introduction

Planktonic animals collected with 76μm mesh nets are collectively called microzooplankton. This grouping primarily includes rotifers, copepods, cladocerans, and protozoans.

Microzooplankton are essential in transferring energy and nutrients from lower to higher trophic levels. Because of their small size and small mouth parts, microzooplankton feed primarily on the planktonic microflora (algae, yeasts, and bacteria); others are carnivorous. Microzooplankton, in turn, are consumed by predaceous macrozooplankton, ichthyoplankton, and planktivorous fishes, and therefore are an integral part of the Lake Ontario food web.

Since microzooplankton are "middle men" in energy and nutrient flow, their availability and suitability as food will, in part, determine the structure (e.g., relative abundance of species) of higher trophic levels. Therefore, if the species composition and abundance of the microzooplankton community is altered as a result of environmental perturbations, the species composition of predaceous macrozooplankton and fish could subsequently be affected.

This study is a continuation of the program established in 1973 to examine the microzooplankton populations in the Nine Mile Point vicinity and to evaluate the impact of the Nine Mile Point Nuclear Station and the James A. FitzPatrick Nuclear Power Plant on this community. This report will focus on interpreting the data collected during 1975.

b. Materials and Methods

Microzooplankton were collected with a 12.7 cm diameter Clarke-Bumpus sampler (76μm aperture net) at the 10, 20, 40, and 60 ft depth contours along the NMPW, NMPP, FITZ, and NMPE transects (16 stations) (Figure VA-1). The sampler was opened at the lake's bottom by a messenger and towed obliquely to the surface (tows were 2-3 minutes in duration). Samples were preserved in 5% buffered formalin. Collections were made once monthly in April and September through December and twice monthly from May through August.

Microzooplankton samples were divided into two equal fractions with a Folsom plankton splitter. Two 1-ml fractions were analyzed at 100 magnifications by enumerating and identifying the organisms encountered in 10 strips (the width of a Whipple Grid) in a Sedgewick-Rafter counting chamber (1-ml capacity).

c. Results and Discussion

(i) Community Structure

A list of the microzooplankton species collected in the Nine Mile Point vicinity is presented in Table VB-1. Rotifers comprised the greatest number of species (50); cladocerans were represented by eight species and identified copepods by six. The Protozoa are the least known taxonomically and many of the species are presently unidentifiable.

The presence of a species or taxon on any sampling date is shown in Table VB-1, which also indicates dominant species, i.e., those which composed greater than 15% of any sample on a particular date. The microzooplankton fauna were characterized by species which occurred throughout the sampling program as well as by others which were present seasonally. Representatives of the former group include the tintinnid protozoan *Codonella cratera*, the rotifers *Brachionus angularis* and *Kellicottia longispina*, the cladoceran *Bosmina longirostris*, and the copepod *Diacyclops bicuspidatus thomasi*. Seasonal representatives include spring/early summer species such as the protozoan *Staurophyra elegans*, the rotifers *Notholca squamula* and *Synchaeta tremula*, and late summer/fall species such as the rotifer *Ploesoma hudsoni*. The rotifer *Synchaeta tremula* provided a good example of the effects of season; it occurred at densities greater than 10,000 organisms/m^3 during April and May but was virtually absent the rest of the year.

Shifts in the dominant taxa were observed throughout the year. From April through May, Vorticellidae and the rotifer *Synchaeta tremula* were dominant. From 10 June through 8 July, dominant species included the rotifers *Keratella quadrata*, *Asplanchna priodonta*, *Ploesoma truncatum*, *Synchaeta stylata*, and *Conochilus unicornis*, and the cladoceran *Bosmina longirostris* (on 8 July). From 29 July through 18 September, dominant taxa observed were vorticellids and epistylid protozoans, the rotifers *Keratella crassa*, *Polyarthra major*, *Synchaeta stylata*, the cladoceran *Bosmina longirostris*, and copepod nauplii and juveniles.

TABLE VB-1

OCCURRENCE OF MICROZOOPLANKT[illegible] DATE
NINE MILE POINT VICINITY - 1975

TAXA	29APR	06MAY	20MAY	10JUNE	24JUNE	08JULY	29JULY	04AUG	24AUG	18SEP	27OCT	17NOV	12DEC
PROTOZOA													
DIFFLUGIA SP.							X	X	X	X			
CODONELLA CRATERA	X	X	X	X	X	X	X	X	X	X	X	X	X
VORTICELLIDAE	D	D	D	X	X		D	X	X	X	X	X	X
EPISTYLIDAE	X	X	X	X	D	X	X	D	X	D	X	X	X
EPISTYLIS SP.							X						
ACINETA SP.	X	X	X	X			X						X
TOKOPHYRA SP.	X		X		X		X	X					
THECACINETA SP.	X	X	X	X	X		X						
PARACINETA SP.	X	X			X	X				X			
STAUROPHYRA ELEGANS	X	X	X	X	X					X			
ROTIFERA													
BDELLOIDEA					X	X	X	X					
BRACHIONUS ANGULARIS	X	X	X	X	X	X	X	X	X	X	X	X	X
BRACHIONUS CALYCIFLORUS	X	X	X	X	X		X	X	X			X	X
BRACHIONUS HAVANAENSIS							X	X					
BRACHIONUS QUADRIDENTATUS			X	X	X		X	X		X			
BRACHIONUS URCEOLARIS	X		X		X								
BRACHIONUS CAUDATUS					X		X	X					
BRACHIONUS BUDAPESTINENSIS						X	X	X	X				
EUCLANIS DILATATA			X	X	X	X							
KELLICOTTIA BOSTONIENSIS							X						
KELLICOTTIA LONGISPINA	X	X	X	X	X	X	X	X	X	X	X	X	X
KERATELLA CRASSA			X	X	X	X	X	X	D	X	X	X	X
KERATELLA COCHLEARIS	X	X	D	X	X	D	X	X	X	X	X	X	X
KERATELLA EARLINAE		X	X	D	D	D	X	X	X	X	X	X	X
KERATELLA QUADRATA	X	X	X	X	X	X	X	X	X		X	X	X
KERATELLA VALGA		X	X			X	X				X		X
LEPADELLA SP.	X				X	X			X				
NOTHOLCA SP.			X										
NOTHOLCA ACUMINATA	X	X	X	X	X	X							
NOTHOLCA SQUAMULA	X	X	X	X	X				X				
NOTHOLCA STRIATA	X	X	X	X								X	
PLATYAS PATULUS					X			X					
TRICHOTRIA SP.			X	X	X								
MONOSTYLA SP.				X	X	X							X
CEPHALODELLA SP.				X						X			
TRICHOCERCA CYLINDRICA			X			X	X	X	X	X			
TRICHOCERCA MULTICRINIS				X	X	X	X	X	X	X	X	X	X
TRICHOCERCA PORCELLUS											X	X	X
TRICHOCERCA SIMILIS							X	X		X			
ASCOMORPHA SP.							X	X	X		X		
ASCOMORPHA ECAUDIS					X			X	X		X		
CHROMOGASTER OVALIS			X	X	X	X		X	X				
ASPLANCHNA PRIODONTA	X	X	X	X	D	X		X	X	X	X	X	X
PLOESOMA LENTICULARE	X			X				X	X	X			
PLOESOMA HUDSONI							X	X	X	X	X	X	
PLOESOMA TRUNCATUM		X	X	X	D	D	X	X	X	X	X		

TABLE VB-1 (continued)

TAXA	29APR	06MAY	20MAY	10JUNE	24JUNE	08JULY	29JULY	04AUG	24AUG	18SEP	27OCT	17NOV	12DEC
POLYARTHRA SP.	X	X	X										
POLYARTHRA EURYPTERA						X	X	X	X	X	X		
POLYARTHRA VULGARIS	X	X	X	X	X	X	X	X	X	X	X	X	X
POLYARTHRA DOLICHOPTERA	X	X	D	X	X	X	X	X		X			
POLYARTHRA MAJOR		X	X	X	X	X	D	D	X	X	X	X	X
POLYARTHRA REMATA		X	X	X	X	X	X	X	X	X	X	X	X
SYNCHAETA LACKOWITZIANA	X	D	D	X	X	X	X	X	X	X	X	X	X
SYNCHAETA PECTINATA	X	X	X	X			X				D	X	X
SYNCHAETA TREMULA	D	D	D	X						X			
SYNCHAETA STYLATA	X	X	X	D	X	X	X	D	X	X	D	X	X
HEXARTHRA SP.								X	X	X	X		
FILINIA LONGISETA	X	X	X	X	X	X	X	X	X	X	X		X
CONOCHILOIDES SP.								X		X			
CONOCHILUS UNICORNIS	X	X	X	X	D	D	X	X	X	X	X	X	
COLLOTHECA MUTABILIS				X	X	X	X	X	X	X	X	X	X
CLADOCERA													
DIAPHANOSOMA LEUCHTENBERGIANUM							X	X	X	X	X		
CERIODAPHNIA LACUSTRIS					X	X	X	X	X	X	X	X	
CERIODAPHNIA QUADRANGULAR							X	X					
DAPHNIA RETROCURVA	X					X	X	X	X	X	X	X	X
BOSMINA COREGONI			X		X		X	X	X	X	X	X	X
BOSMINA LONGIROSTRIS	X	X	X	X	X	D	D	D	X	D	D	D	X
ALONA AFFINIS							X						
CHYDORUS SPHAERICUS		X		X	X	X	X	X	X	X	X	X	X
COPEPODA													
COPEPODA NAUPLII	X	X	X	X	X	X	D	D	X	X	X	X	D
CALANOIDA								X			X		
CALANOIDA JUVENILE	X	X	X	X	X	X	X	X	X	X	X	X	X
EURYTEMORA AFFINIS					X		X	X	X				
DIAPTOMUS SP.	X	X			X		X	X	X	X	X	X	X
LIMNOCALANUS MACRURUS													X
CYCLOPOIDA JUVENILE	X	X	X	X	X	X	D	X	D	D	D	D	D
ACANTHOCYCLOPS VERNALIS								X			X		
DIACYCLOPS BICUSPIDATUS THOMAS	X	X	X	X	X	X	X	X	X	X	X	X	X
TROPOCYCLOPS PRASINUS MEXICAN	X	X	X	X	X	X	X	X	X	X	X	X	X
HARPACTICOIDA					X	X	X						
HARPACTICOIDA JUVENILE					X								

D Indicates abundance of $>$ 15 percent of total microzooplankton at one or more stations

X INDICATES PRESENCE AT ONE OR MORE STATIONS

(ii) Spatial and Temporal Distribution

Analyses of possible power plant impact may also be conducted through examination of patterns in the spatial distribution of microzooplankton* abundance. Elevated temperatures in the thermal discharge could increase the microzooplankter's reproductive and developmental rates and therebye result in increased abundance. However, it is unlikely that such an effect would be evident in the Nine Mile Point vicinity since the temperature increases are frequently not discernable from ambient fluctuations (Section IV), and the long shore currents are of such a magnitude (0 to 0.5 ft/sec) that the duration of exposure to the elevated temperature water is short. In addition, there stimulatory effects would require at least a day or two to cause an increase in microzooplankton abundance, by which time the organisms would be transported out of the entire study area. Decreases in microzooplankton abundance could result from mortality associated with power plant entrainment. The dead organisms sinking out of the water column could result in depletion of the population near the vicinity of the discharge.

The plankton sampling program in the Nine Mile Point vicinity was designed to include stations in or near the power plants' discharges (NMPP and FITZ transects) and stations more or less beyond the effects of the plant (NMPW and NMPE transects); the station closest to the point of discharge from the Nine Mile Point Nuclear Station is NMPP-20 ft. The data were examined to determine if microzooplankton abundance near the discharge, in particular stations NMPP-10 ft, NMPP-20 ft, NMPP-40 ft and FITZ -20 ft, had lower or higher values than other stations at comparable depth contours. Since the distribution of microzooplankton abundance is affected by a number of factors, their abundance at the discharge stations could be high or low on a particular date and this may have nothing to do with a discharge effect. Therefore, it is necessary to examine data from a number of sucessive sampling dates and to determine if a consistently recurring pattern in microzooplankton abundance exists.

The spatial and temporal distribution of selected taxa were examined. These included total microzooplankton, total copepods, total rotifers, and the cladoceran Bosmina longirostris.

*used here as a catch-all for species, groups or totals.

- Rotifera

Rotifers were considered an appropriate group to examine for patterns of spatial distribution because they comprised a larger numerical proportion and were represented by more identified species than any other taxon.

Total rotifer densities are presented in Figure VB-1. At all depth contours rotifer abundance increased from approximately 20,000 organisms/m^3 in May to approximately 700,000 organisms/m^3 in July and then decreased throughout the rest of the year.

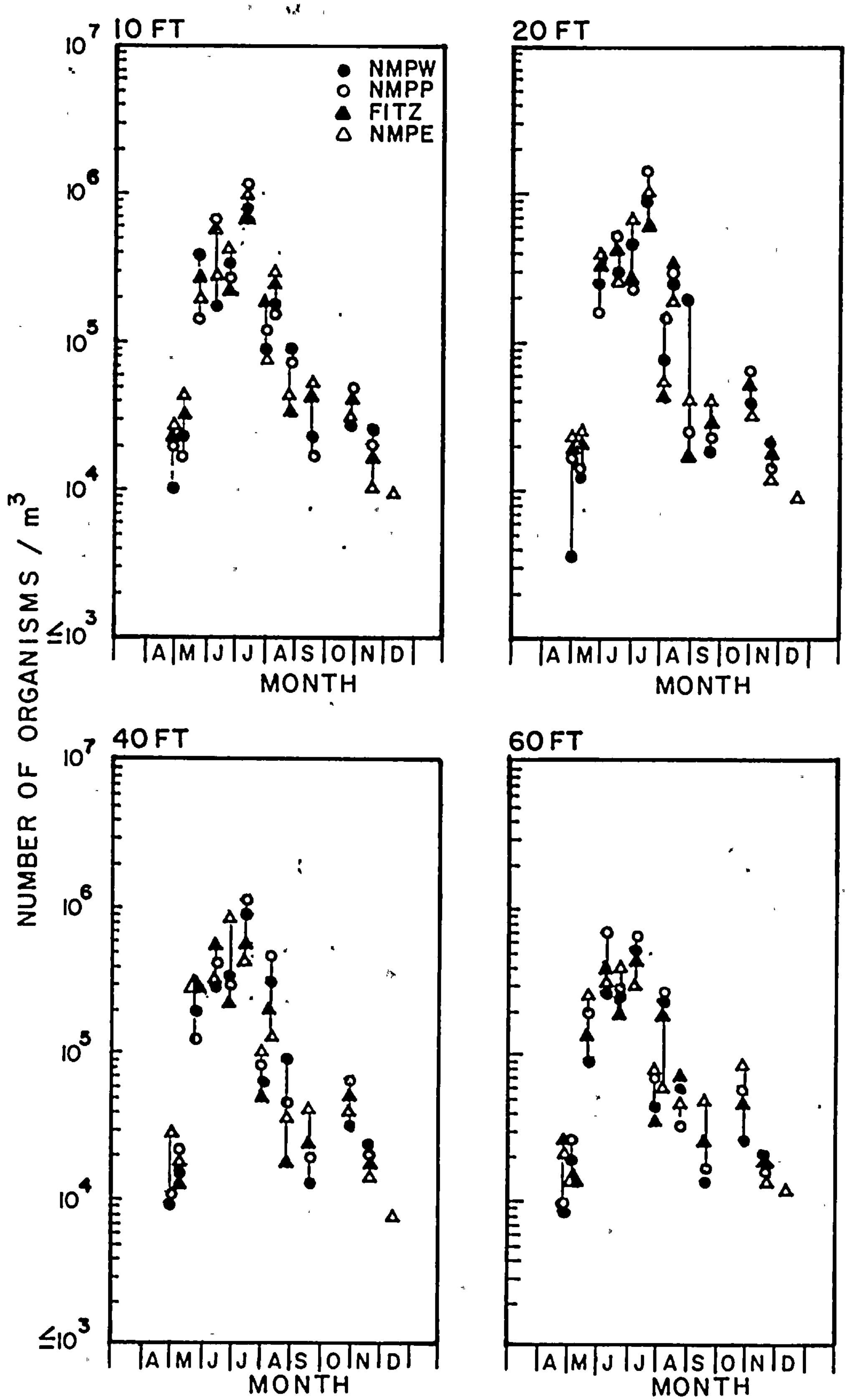
These temporal fluctuations in rotifer abundance were large compared to within-date spatial variability; with few exceptions, the stations conformed to the general temporal pattern. This indicates that those factors associated with temporal fluctuations in rotifer abundance (e.g., seasonal changes in ambient temperature and food availability) exert a stronger effect on the rotifer populations than do small-scale spatial variations in these and other factors. The stations near the power plant discharge variously had higher, lower, or about the same abundance of rotifers as other stations and no consistently recurring pattern was observed.

Spatial distribution of rotifera in each sampling period was examined in greater detail. Hierarchical classification analysis was used for this examination. A dissimilarity matrix was generated using Gower's (1971) coefficient and the groupings, or clusters were formed by the unweighted pair group, also called group average method (Sneath and Sokal, 1973). Stations were classified using species abundances for comparisons. The results of these analyses are presented as dendrograms (Figure VB-2), one dendrogram for each sampling date.

On 29 April the sampling sites NMPE-20 ft, NMPE-40 ft, and NMPE-60 ft join the cluster of other stations at a dissimilarity value of about 3.4, compared to the highest dissimilarity within that cluster of about 2.5. Within the larger cluster NMPE-10 and FITZ-60 ft join at the highest level of dissimilarity. This indicates that the rotifer populations at the NMPE transect and the FITZ-60 ft station differ from the remainder of the stations. The spatial distribution of these clusters is represented on Figure VB-3, and is an east-west separation.

ABUNDANCE OF ROTIFERA

NINE MILE POINT VICINITY—1975



CLUSTER ANALYSIS OF ROTIFERA
NINE MILE POINT VICINITY-1975

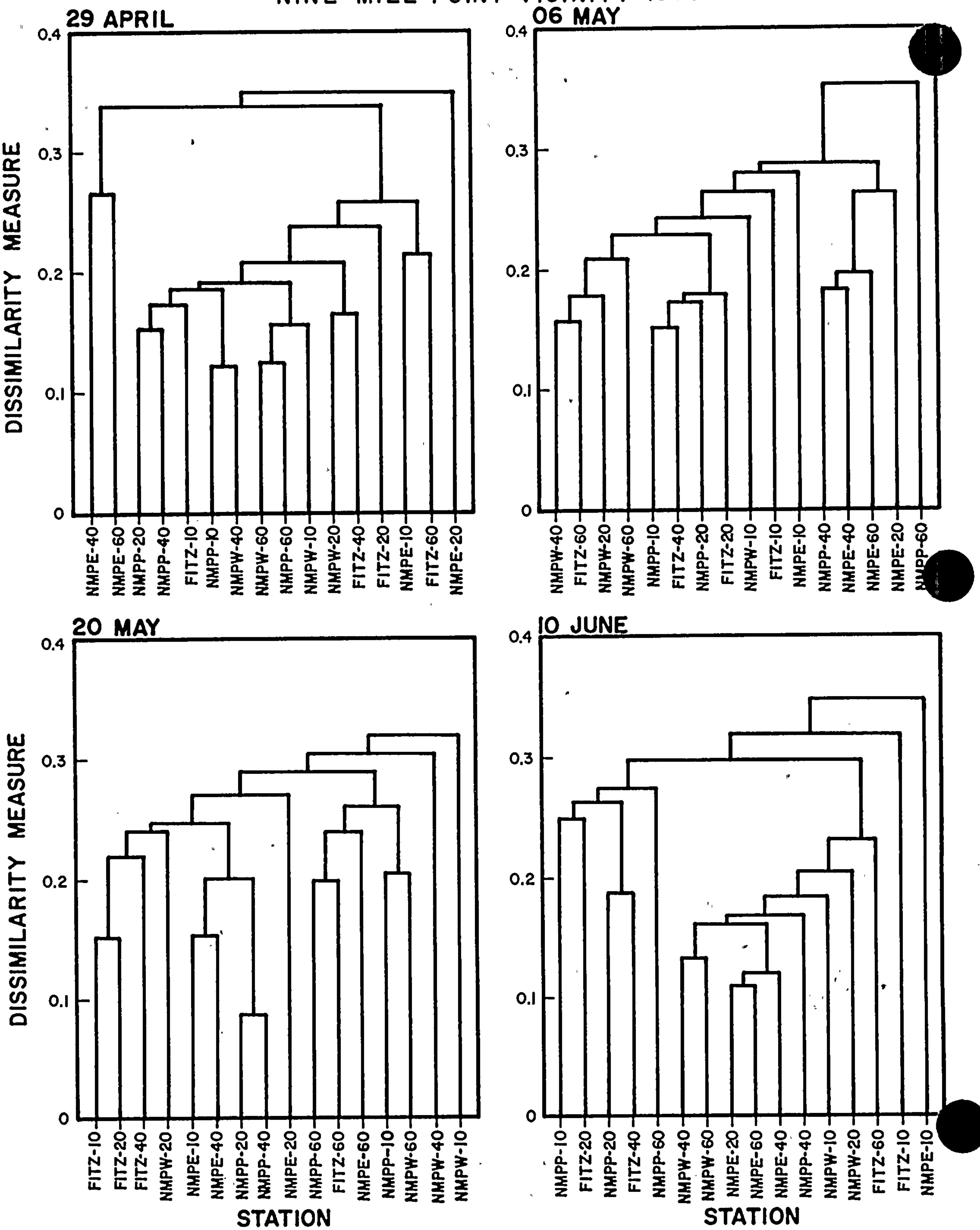
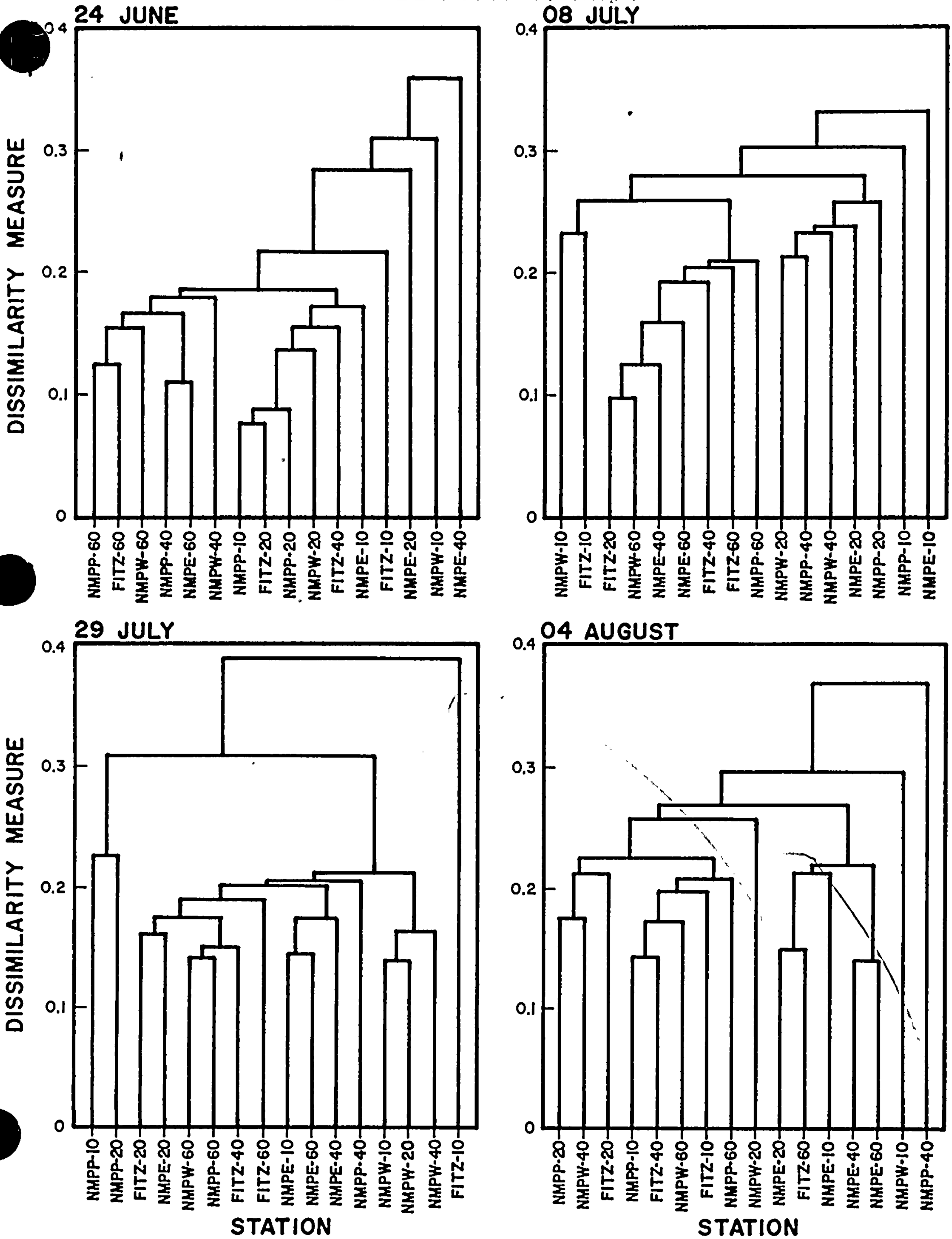
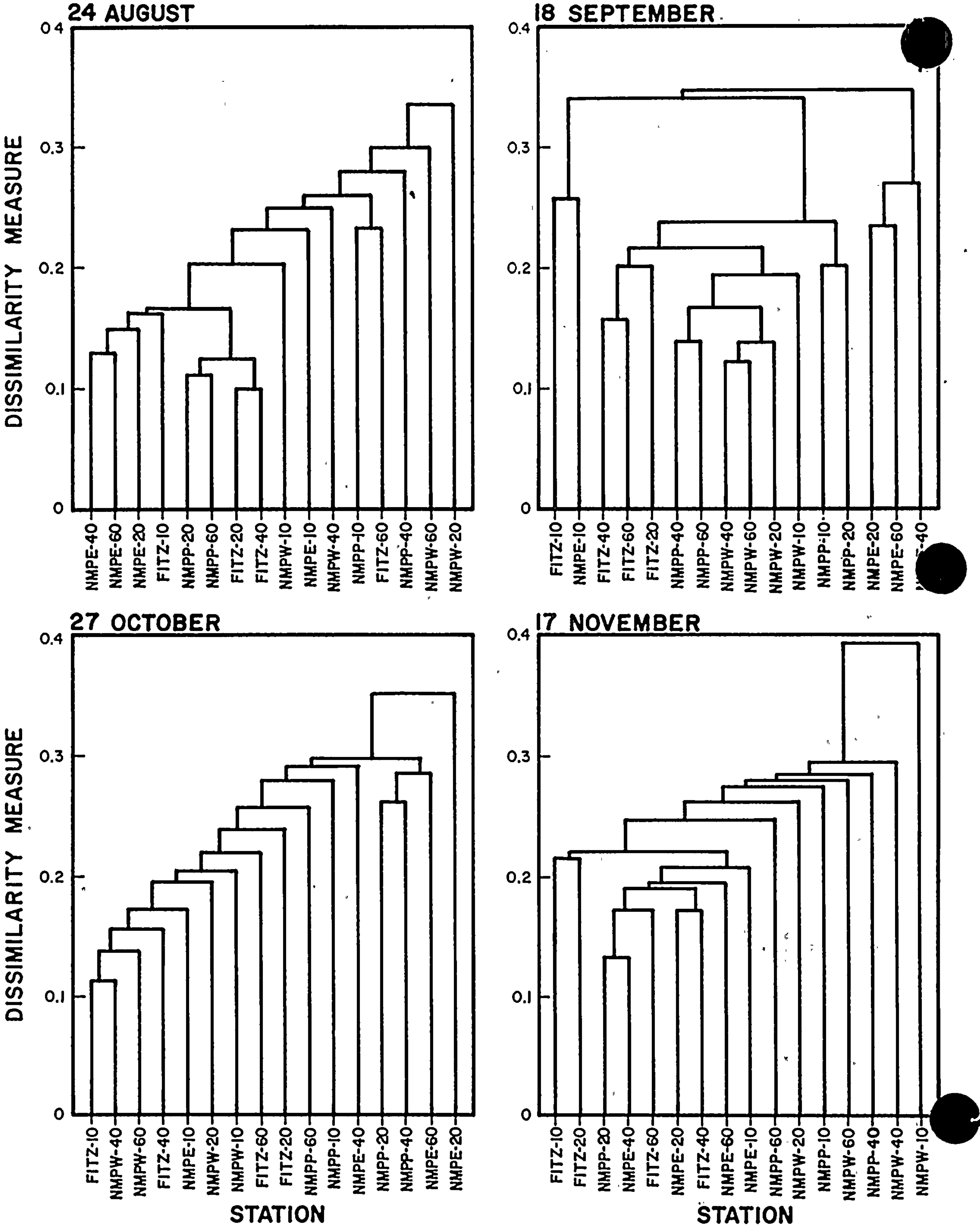


FIGURE VB-2
(Con't)

CLUSTER ANALYSIS OF ROTIFERA
NINE MILE POINT VICINITY-1975

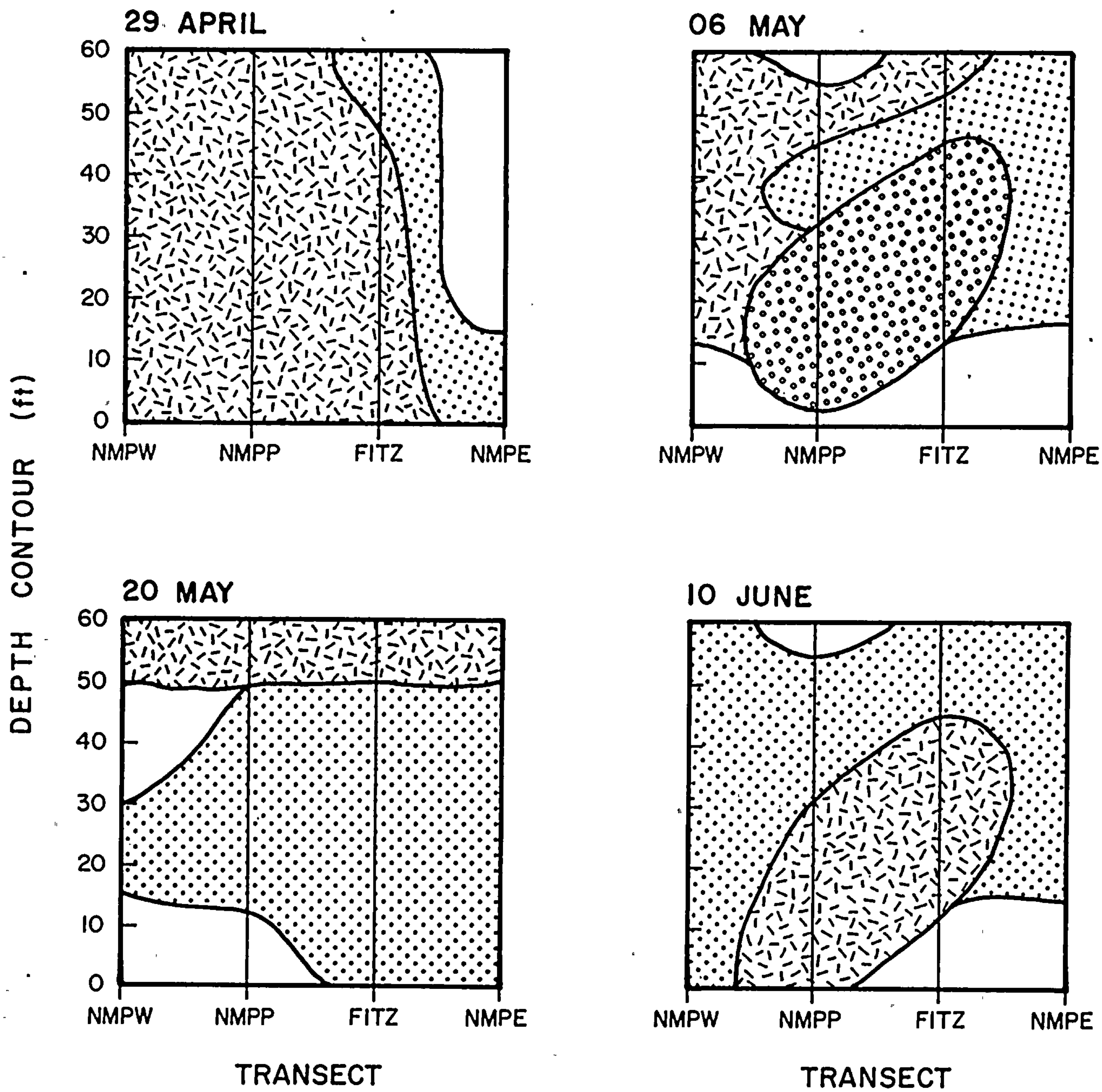


CLUSTER ANALYSIS OF ROTIFERA
NINE MILE POINT VICINITY-1975



SCHEMATIC DISTRIBUTIONS OF ROTIFERA ASSOCIATIONS*

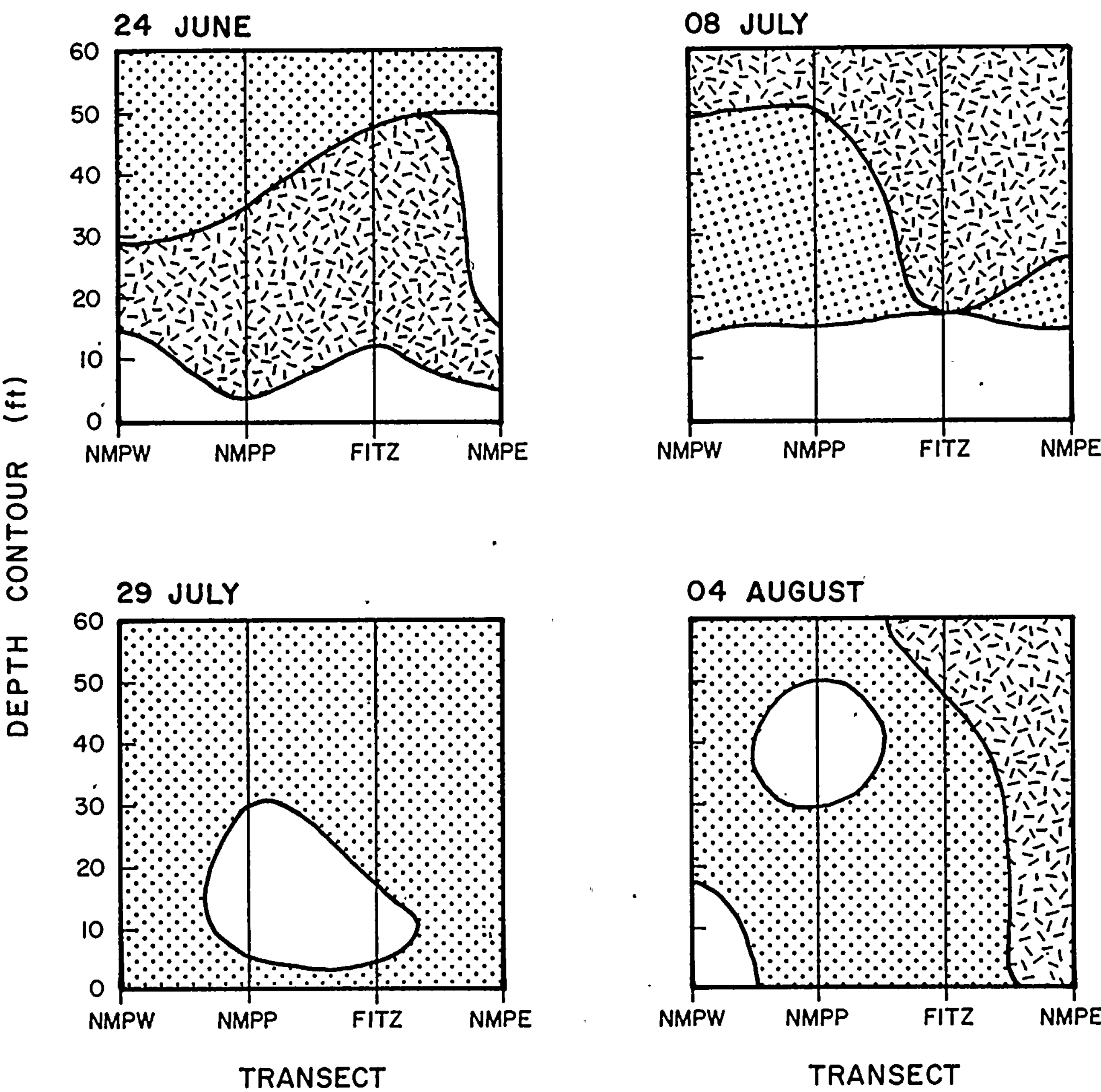
NINE MILE POINT VICINITY - 1975



*Not comparable among dates

SCHEMATIC DISTRIBUTIONS OF ROTIFERA ASSOCIATIONS*

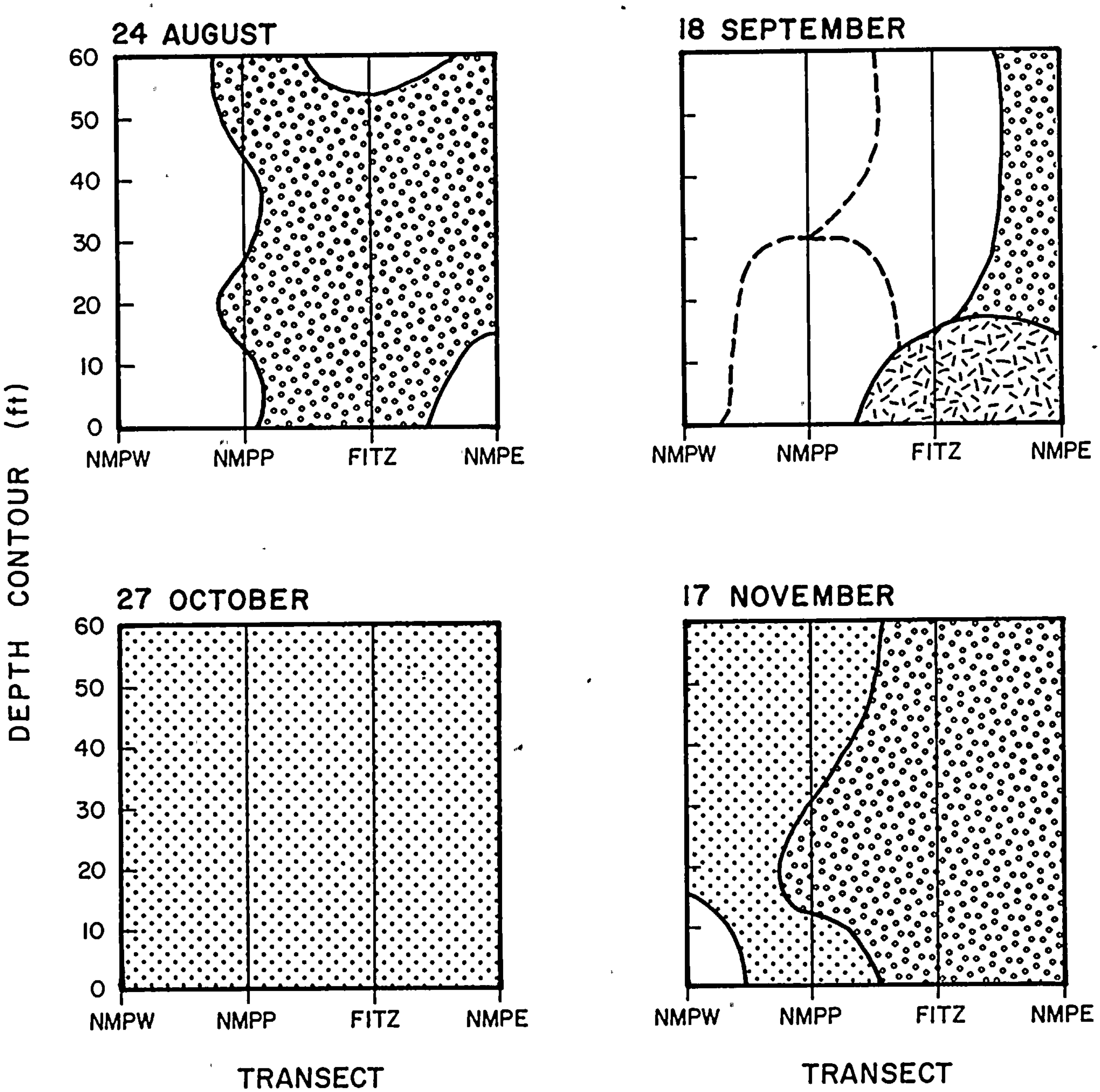
NINE MILE POINT VICINITY - 1975



*Not comparable among dates

SCHEMATIC DISTRIBUTIONS OF ROTIFERA ASSOCIATIONS*

NINE MILE POINT VICINITY - 1975



*Not comparable among dates

On 6 May the cluster NMPP-10ft, FITZ-40 ft, NMPP-20 ft, FITZ-20 ft can be discerned (Figure VB-2). A second cluster of more offshore sites is NMPW-40 ft, FITZ-60 ft, NMPW-20 ft, NMPW-60 ft. Associated with these groups are the other 10 ft sites, and a further cluster of NMPP-40 ft, NMPE-40 ft, NMPE-60 ft, and NMPE-20 ft partly surrounds the first cluster (Figure VB-3). This may represent a transition between the east-west distribution of rotifer associations on 29 April and the inshore-offshore distribution of 20 May.

On 20 May, two large clusters may be seen, an inshore group (FITZ-10 ft, FITZ-20 ft, FITZ-40 ft, NMPW-20 ft, NMPE-10 ft, NMPE-40 ft, NMPP-20 ft, NMPP-40 ft, and NMPE-20 ft) and an offshore group (NMPP-60 ft, FITZ-60 ft, NMPE-60 ft, NMPW-60 ft, and NMPP-10 ft), of which the last member is physically separated although similar in composition to the rest of the cluster. Two sites on the west transect (NMPW-40 ft and NMPW-10 ft) probably represent a mixing area between the two clusters (Figure VB-3).

On 10 June, two major clusters were separated (Figures VB-2 and VB-3) and the resulting spatial distribution of rotifer associations was similar to that found on 6 May.

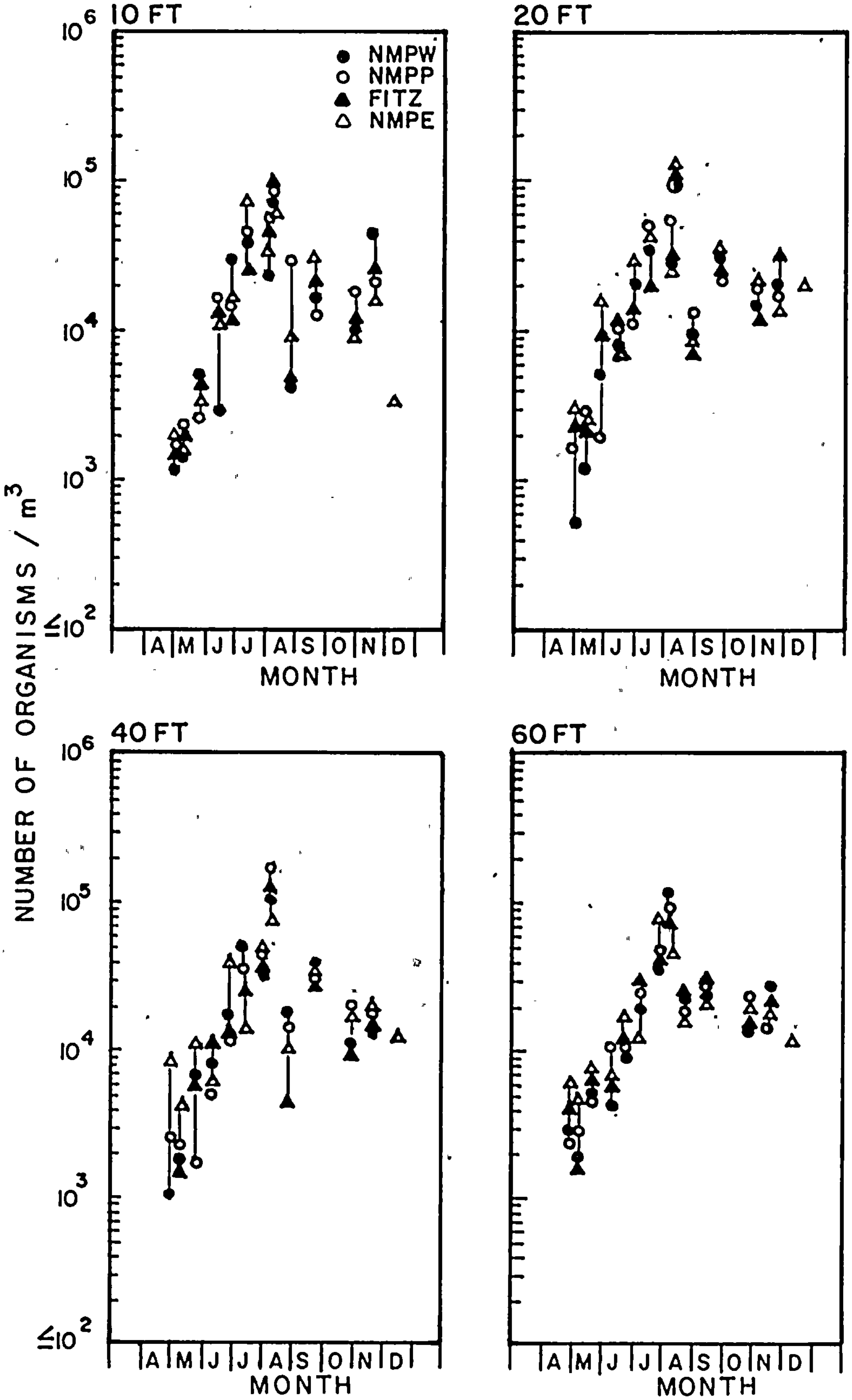
Results of cluster analysis of samples of 24 June, 8 July, and 29 July (Figures VB-2 and VB-3) indicate an inshore-offshore distribution of rotifer associations. This distribution changes to an east-west pattern with the sample of 4 August, and that pattern remains, with the exception of 27 October, throughout the rest of the sampling period (Figures VB-2 and VB-3). On 27 October no clusters were clearly separated, indicating no patterns of rotifer association.

From these analyses it is concluded that associations of planktonic Rotifera generally are distributed in two recognizable patterns in the Nine Mile Point vicinity, an inshore-offshore distribution or an east-west distribution. Transitional patterns were observed. Patterns are seasonal, possibly directly associated with seasonal hydrographic changes, with east-west patterns in April, transitional in May to June, inshore-offshore in June and July, and east-west patterns from August through November. The presence of the thermal plume was not evident in these patterns.

- Copepoda

The data on total copepod densities are presented in Figure VB-3. Copepod abundance increased from less than

ABUNDANCE OF COPEPODA
NINE MILE POINT VICINITY–1975



10,000 organisms/m^3 in May to greater than 50,000 organisms/m^3 in August; September through December copepod abundance fluctuated around 20,000 organisms/m^3. The data on copepod abundance lead to the same conclusions as those regarding spatial distribution of rotifer abundance, i.e., with a few exceptions, stations conformed to the general temporal pattern and there was no consistently recurring spatial pattern. Again, this indicates that a power plant effect is not evident. The within-date spatial variability in copepod abundance at the 60 ft depth contour stations was less than at the shallower depth contours, suggesting that there are processes at the shallower depths which produce greater variations in abundance. These abiotic and/or biotic processes may be important in overshadowing the effects of the power plants.

- Bosmina longirostris

Data on the density of the cladoceran Bosmina longirostris are presented in Figure VB-9. The abundance of this species increased at all depths from less than 1000 organisms/m^3 in April and May to greater than 100,000 organisms/m^3 on 8 July. With the exception of 24 August, the abundance of B. longirostris was greater than 10,000 organisms/m^3 from 29 July through 17 November; on 24 August the abundance was approximately 1000 organisms/m^3. The latter value occurred during a period when the thermocline was farther offshore (Chapter IV), this may have been important in diluting the Bosmina population and/or advecting the population away from the Nine Mile Point vicinity.

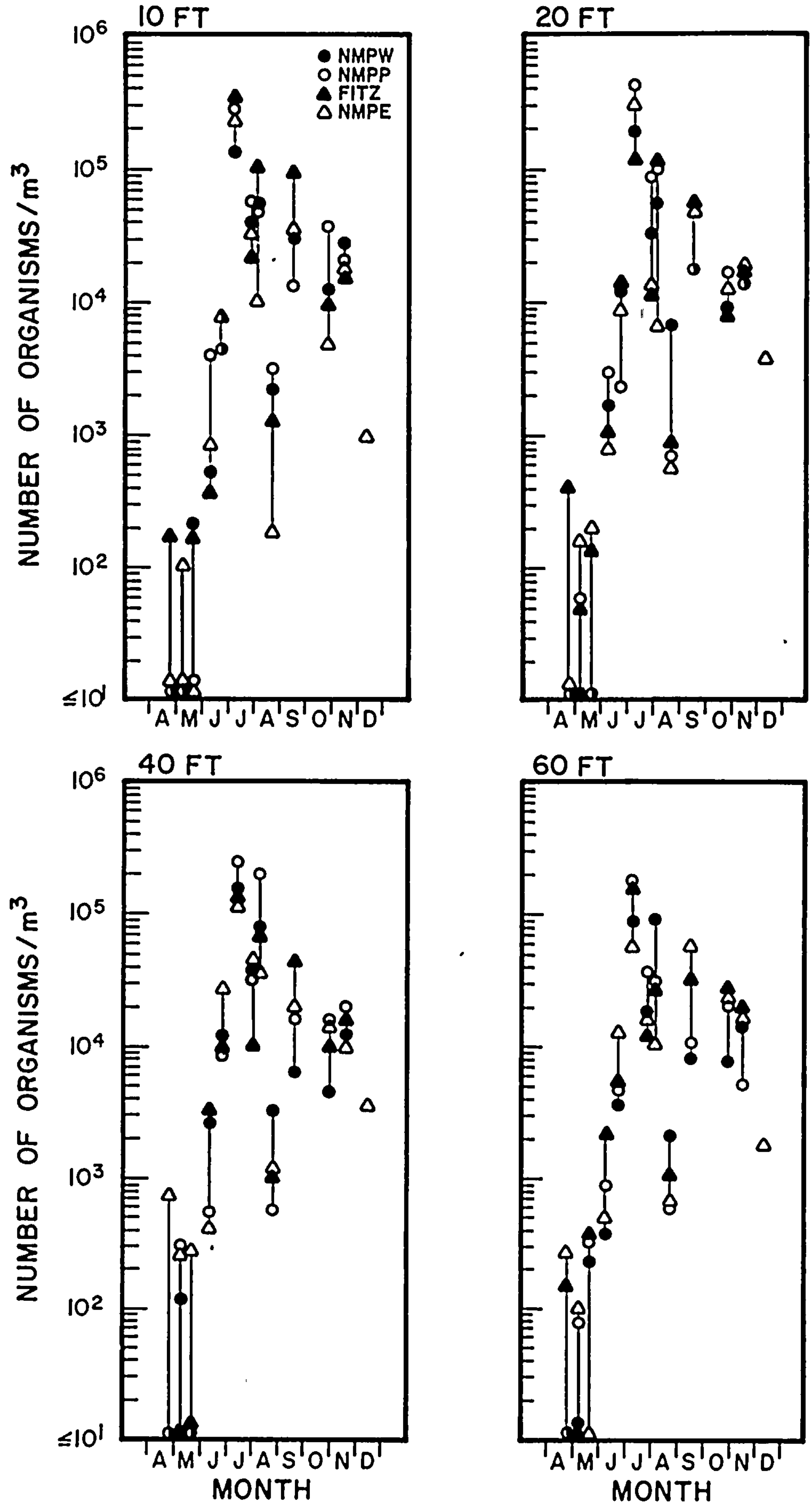
The data on the abundance of B. longirostris agree with the observation made on the spatial distribution of rotifers and copepods. There was no consistently recurring spatial pattern which might indicate the presence of a power plant effect.

- Total Microzooplankton

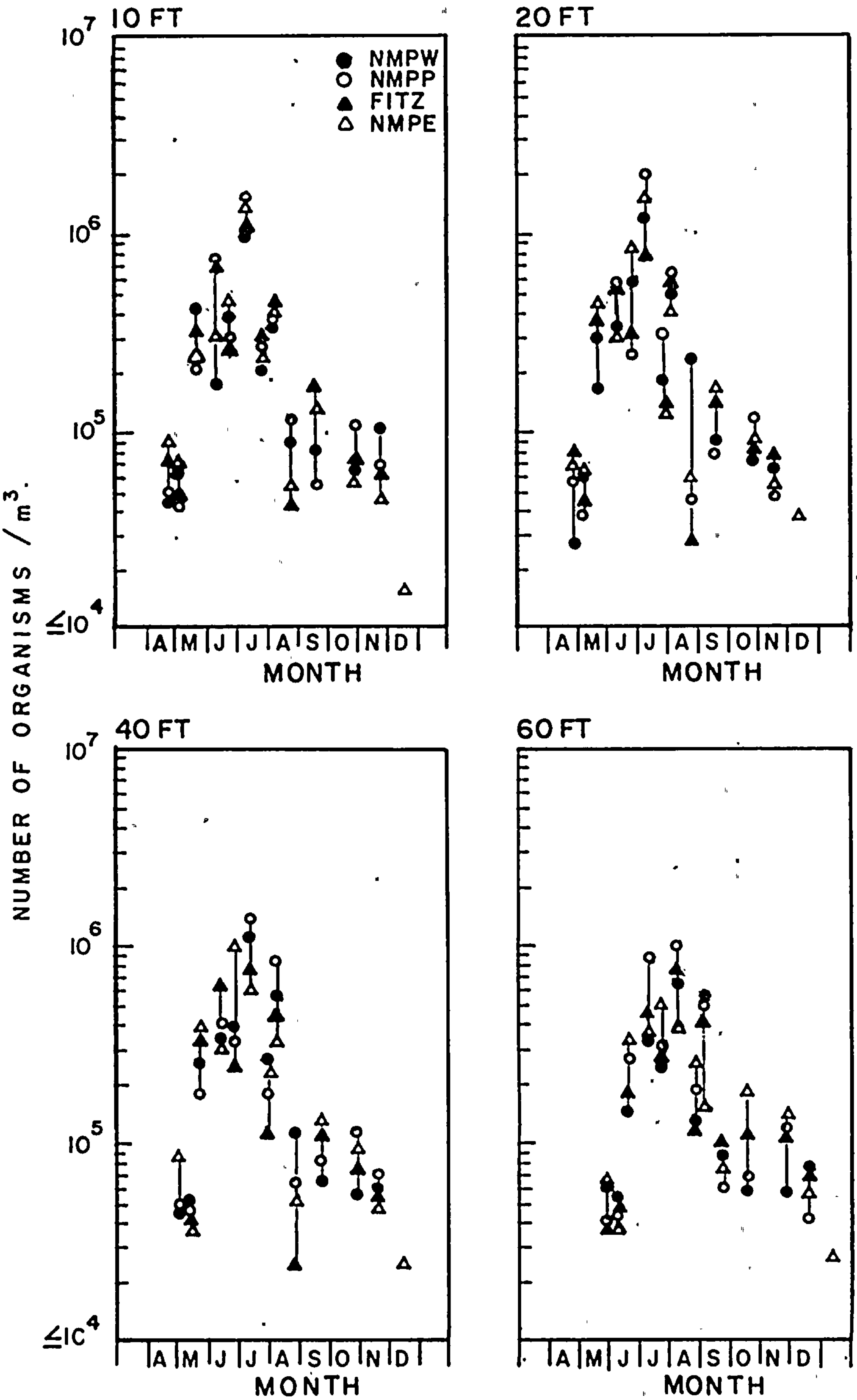
Data on total microzooplankton abundance are presented in Figure VB-10. The highest densities were observed during June and July and the maximum occurred on 8 July when microzooplankton abundance was approximately 1,000,000 organisms/m^3.

ABUNDANCE OF BOSMINA LONGIROSTRIS

NINE MILE POINT VICINITY - 1975



ABUNDANCE OF TOTAL MICROZOOPLANKTON
NINE MILE POINT VICINITY—1975



The temporal fluctuations in total microzooplankton abundance reflected primarily the fluctuations in rotifer abundance (Figure VB-7). In addition, the spatial distribution of total microzooplankton abundance on particular dates was similar to that of rotifers. Therefore, the observations made on the distribution of rotifer abundance apply also to total microzooplankton; i.e., the stations near the power plant discharge variously had higher, lower or about the same abundance and no consistently recurring pattern was evident.

Seasonal variations in the microzooplankton population in the Nine Mile Point vicinity were similar to those reported by other workers on Lake Ontario and generally reflect the effects of increased temperature and availability of food during the summer (Patalas, 1969; Nauwerck et al., 1972; Watson and Carpenter, 1974). A review of the literature is presented in LMS (1975a).

The effects of urbanization on the horizontal distribution of Lake Ontario zooplankton has been discussed by McNaught et al. (1975); Oswego vicinity had the highest densities of Bosmina longirostris, a cladoceran indicative of eutrophic waters. McNaught et al. (1975) showed that the influence of the Oswego River extended east and west of the river discharge and included the Nine Mile Point vicinity. Analyses of the water quality data collected in the present study (Section IV.C) also indicate the presence of Oswego River influence at Nine Mile Point, the greatest effect being observed at the NMPW transect.

Spatial variability in microzooplankton could arise from such cropping factors as predation (by ichthyoplankton, fish, macrozooplankton, and other microzooplankton) and circulation processes which transport the organisms offshore and into nutritionally dilute environments. Although the importance of these factors is recognized, their impact on the microzooplankton has not been quantified.

d. Conclusions

1. Analyses of the structure of the rotifer fauna indicated no obvious power plant effects. The rotifer fauna appeared to be affected by a mosaic of factors which resulted in interfacing east-west (transect) and inshore-offshore (depth contour) patterns.

2. Variations in the abundance of rotifers, copepods, the cladoceran Bosmina longirostris, and total microzooplankton were attributed primarily to seasonal factors and meteorological conditions.

3. There were no continually recognizable patterns in the spatial distribution of microzooplanters, suggesting that these organisms are being affected by a number of factors among which possible power plant effects are not evident.

4. The seasonal patterns of microzooplankton abundance were similar to those reported by other workers on Lake Ontario and which have been reviewed in LMS (1975a).

REFERENCES CITED

Findenegg, I. 1969. Expressions of populations, p.16-17 In R.A. Vollenweider (ed.) A manual on methods for measuring primary production in aquatic environments. IBP Handbook 12. Blackwell Science Publ., London. 225p.

Golterman, H.T. 1971. Methods for chemical analysis of freshwaters. IBP Handbook No. 8. International Biological Programme, Blackwell Scientific Publ., Oxford. 166p.

Gower, J.C. 1971. A general coefficient of similiarity and some of its properties. Biometrics 27:857-887.

Gunwaldsen, R.W., B. Brodfeld, and G.E. Hecker. 1970. Current and temperature surveys in Lake Ontario for James A. FitzPatrick Nuclear Power Plant. Proc. 13th Conf. Great Lakes Res. 1970: 914-926.

Lawler, Matusky and Skelly Engineers. 1975a. The Lake Ontario ecosystem and power plant impact. Prepared for Empire State Electric Energy Research Corp.

Lawler, Matusky and Skelly Engineers. 1975b. 1974 Nine Mile Point aquatic ecology studies. Prepared for Niagara Mohawk Power Corp. and Power Authority of the State of New York.

McNaught, D.C., M. Buzzard, and S. Levine. 1975. Zooplankton production in Lake Ontario as influenced by environmental perturbation. U.S. Environ. Protection Agency, EPA 660/3-75-021.

Munawar, M. and I.F. Munawar. 1975. Some observations on the growth of diatoms in Lake Ontario with emphasis on Melosira binderana Kutz during thermal bar conditions. Arch. Hydrobiol. 75:490-499.

Nauwerck, A., G.F. Carpenter, and L. Devey. 1972. The crustacean zooplankton of Lake Ontario, 1970. Paper presented at Proc. 15th Conf. Great Lakes Res. 20p.

Patalas, K. 1969. Composition and horizontal distribution of crustacean plankton in Lake Ontario. J. Fish. Res. Bd. Canada 26:2135-2164.

Patrick, R. 1969. Some effects of temperature of freshwater algae. In P.A. Kremkel and F.L. Parker (eds.) Biological aspects of thermal pollution. Vanderbilt Univ. Press, Nashville, Tenn. 407p.

REFERENCES CITED (Continued)

Quirk, Lawler and Matusky Engineers. 1974. 1973 Nine Mile Point aquatic ecology studies - Nine Mile Point Generating Station. Prepared for Niagara Mohawk Power Corp.

Sneath, P.H.A. and R.R. Sokal. 1973. Numerical taxonomy: the principles and practice of numerical classifiction. W.H. Freeman and Co., San Francisco. 573p.

Stoermer, E.F., M.M. Bowman, J.C. Kingston, and A.L. Schaedel. 1975. Phytoplankton composition and abundance in Lake Ontario during IFYGL. U.S. EPA, Environ. Monitor Ser. 660/3-75-004. 373p.

Utermohl, H. 1958. Zur Vervolkommnung der quantitativen Phytoplankton-Methodek. Mitl. Intern. Ver. Limnol. 9:1-38.

Vollenweider, R.A. (ed.). 1974. A manual on methods for measuring primary production in aquatic environments. IBP Handbook 12. 2nd ed. International Biological Programme, Blackwell Scientific Publ., Oxford. 225p.

Watson, N.H.F. and G.F. Carpenter. 1974. Seasonal abundance of crustacean zooplankton and net plankton biomass of Lakes Huron, Erie, and Ontario. J. Fish. Res. Bd. Canada 31(3):319-325.

APPENDIX VA-1

PRIMARY PRODUCTION, CHLOROPHYLL A[a], AND PHAEOPIGMENT CONCENTRATIONS IN SURFACE SAMPLES

NINE MILE POINT VICINITY - 1975

I. DATE: 29 APRIL

STATION (transect/ depth contour [ft])	C-14 PRODUCTION (mg C/m^3/hr)	CHLOROPHYLL a (µg/l)	PHAEOPIGMENT (µg/l)	PRODUCTION-CHLOROPHYLL a RATIO	PHAEOPIGMENT-CHLOROPHYLL a RATIO
NMPW-10	NA	7.3	0.1	-	<0.1
20	4.7	9.6	0.0	0.5	0.0
40	4.3	9.0	0.0	0.5	0.0
60	5.3	6.2	0.4	0.8	0.1
NMPP-10	3.0	7.5	0.0	0.4	0.0
20	1.6	6.0	0.0	0.3	0.0
40	2.9	4.9	0.7	0.6	0.1
60	2.4	4.5	0.4	0.5	0.1
FITZ-10	2.6	6.2	1.1	0.4	0.2
20	2.0	6.2	0.0	0.3	0.0
40	2.0	5.5	0.5	0.4	0.1
60	1.7	5.8	0.2	0.3	<0.1
NMPE-10	3.9	5.5	1.3	0.7	0.2
20	8.6	4.9	1.3	1.8	0.3
40	0.0	6.4	0.4	0.0	0.1
60	3.4	6.2	0.2	0.6	<0.1

II. DATE: 6 MAY

STATION (transect/ depth contour [ft])	C-14 PRODUCTION (mg C/m^3/hr)	CHLOROPHYLL a (µg/l)	PHAEOPIGMENT (µg/l)	PRODUCTION-CHLOROPHYLL a RATIO	PHAEOPIGMENT-CHLOROPHYLL a RATIO
NMPW-10	NS	3.5	0.2	-	<0.1
20	NS	1.9[b]	2.1	-	1.1
40	NS	1.8	1.2	-	0.6
60	NS	2.9	1.0	-	0.3
NMPP-10	NS	2.5	0.7	-	0.3
20	NS	2.9	0.4	-	0.2
40	NS	2.7	0.8	-	0.3
60	NS	2.6	0.6	-	0.2
FITZ-10	NS	3.2	0.7	-	0.2
20	NS	2.5	0.4	-	0.1
40	NS	2.8	0.2	-	0.1
60	NS	2.1	1.2	-	0.5
NMPE-10	NS	1.6	2.0	-	1.2
20	NS	1.9	1.6	-	0.8
40	NS	2.5	2.2	-	0.9
60	NS	3.8	0.0	-	0.0

APPENDIX VA-1
(Continued)

PRIMARY PRODUCTION, CHLOROPHYLL A[a], AND PHAEOPIGMENT CONCENTRATIONS IN SURFACE SAMPLES

III. DATE: 20 MAY

STATION (transect/ depth contour [ft])	C-14 PRODUCTION (mg C/m^3/hr)	CHLOROPHYLL a (μg/l)	PHAEOPIGMENT (μg/l)	PRODUCTION-CHLOROPHYLL a RATIO	PHAEOPIGMENT-CHLOROPHYLL a RATIO
NMPW-10	15.7	6.0	3.7	2.6	0.6
20	27.5	3.0	0.6	9.2	0.2
40	25.7	2.4	0.8	10.7	0.3
60	29.0	1.8	2.0	16.1	1.1
NMPP-10	25.4	8.0	2.8	3.2	0.3
20	23.5	8.0	2.0	2.9	0.2
40	17.3	5.2	3.2	3.3	0.6
60	9.6	6.6	4.3	1.4	0.6
FITZ-10	4.1	5.9	2.2	0.7	0.4
20	5.7	5.3	2.2	1.1	0.4
40	6.4	3.4	2.6	1.9	0.8
60	7.7	3.2	4.4	2.4	1.4
NMPE-10	11.0	5.6	3.7	2.0	0.7
20	11.3	4.9	4.4	2.3	0.9
40	16.4	7.3	1.2	2.2	0.2
60	13.8	7.4	3.3	1.9	0.4

IV. DATE: 10 JUNE

STATION (transect/ depth contour [ft])	C-14 PRODUCTION (mg C/m^3/hr)	CHLOROPHYLL a (μg/l)	PHAEOPIGMENT (μg/l)	PRODUCTION-CHLOROPHYLL a RATIO	PHAEOPIGMENT-CHLOROPHYLL a RATIO
NMPW-10	NS	12.9	0.0	-	0.0
20	NS	13.2	0.0	-	0.0
40	NS	8.8	0.4	-	<0.1
60	NS	9.1	1.3	-	0.1
NMPP-10	NS	6.6	0.4	-	0.1
20	NS	5.9	2.1	-	0.4
40	NS	5.6	3.4	-	0.6
60	NS	6.0	1.4	-	0.2
FITZ-10	NS	6.3	0.5	-	0.1
20	NS	7.0	1.4	-	0.2
40	NS	5.5	2.8	-	0.5
60	NS	6.0	1.3	-	0.2
NMPE-10	NS	6.4	1.3	-	0.2
20	NS	7.4	0.7	-	0.1
40	NS	6.3	0.7	-	0.1
60	NS	6.3	1.6	-	0.2

APPENDIX VA-1
(Continued)

PRIMARY PRODUCTION, CHLOROPHYLL A[a], AND PHAEOPIGMENT CONCENTRATIONS IN SURFACE SAMPLES

V. DATE: 24 JUNE

STATION (transect/ depth contour [ft])	C-14 PRODUCTION (mg C/m^3/hr)	CHLOROPHYLL a (µg/l)	PHAEOPIGMENT (µg/l)	PRODUCTION-CHLOROPHYLL a RATIO	PHAEOPIGMENT-CHLOROPHYLL a RATIO
NMPW-10	15.2	10.7	4.0	1.4	0.4
20	6.2	10.8	5.0	0.6	0.5
40	5.7	12.2	3.7	0.5	0.3
60	4.2	9.7	3.1	0.4	0.3
NMPP-10	7.4	8.7	2.7	0.9	0.3
20	7.3	8.2	3.2	0.9	0.4
40	17.2	15.4	4.9	1.1	0.3
60	18.6	10.9	3.6	1.7	0.3
FITZ-10	7.6	10.4	3.7	0.7	0.4
20	9.0	10.3	3.0	0.9	0.3
40	7.8	11.2	2.9	0.7	0.3
60	19.3	12.0	1.5	1.6	0.1
NMPE-10	7.2	7.0	1.5	1.0	0.2
20	4.8	10.8	1.8	0.4	0.2
40	6.1	8.5	2.9	0.7	0.3
60	2.5	5.9	2.2	0.4	0.4

VI. DATE: 8 JULY

STATION (transect/ depth contour [ft])	C-14 PRODUCTION (mg C/m^3/hr)	CHLOROPHYLL a (µg/l)	PHAEOPIGMENT (µg/l)	PRODUCTION-CHLOROPHYLL a RATIO	PHAEOPIGMENT-CHLOROPHYLL a RATIO
NMPW-10	NS	4.6	1.8	-	0.4
20	NS	6.6	1.4	-	0.2
40	NS	3.9	5.0	-	1.3
60	NS	3.2	1.6	-	0.5
NMPP-10	NS	4.5	1.3	-	0.3
20	NS	5.3	1.3	-	0.2
40	NS	4.8	1.2	-	0.2
60	NS	5.1	1.0	-	0.2
FITZ-10	NS	5.1	1.5	-	0.3
20	NS	3.8	1.2	-	0.3
40	NS	4.4	0.5	-	0.1
60	NS	4.4	0.8	-	0.2
NMPE-10	NS	3.3	2.0	-	0.6
20	NS	3.8	0.9	-	0.2
40	NS	3.9	0.8	-	0.2
60	NS	4.7	0.0	-	0.0

APPENDIX VA-1
(Continued)

PRIMARY PRODUCTION, CHLOROPHYLL A[a], AND PHAEOPIGMENT CONCENTRATIONS IN SURFACE SAMPLES

XIII. DATE: 12 DECEMBER

STATION (transect/ depth contour [ft])	C-14 PRODUCTION (mg C/m^3/hr)	CHLOROPHYLL a (μg/l)	PHAEOPIGMENT (μg/l)	PRODUCTION-CHLOROPHYLL a RATIO	PHAEOPIGMENT-CHLOROPHYLL a RATIO
NMPW-10	3.8	1.2	0.9	3.2	0.7
20	4.4	1.8	0.1	2.4	0.1
40	4.9	0.2	1.1	24.5	5.5
60	2.6	0.3	0.7	8.6	2.3
NMPP-10	3.4	1.9	0.1	1.8	<0.1
20	5.6	1.9	0.0	3.1	0.0
40	NA	1.4	0.4	-	0.3
60	3.8	1.9	0.0	2.0	0.0
FITZ-10	3.5	1.5	0.2	2.3	0.1
20	3.4	1.9	0.0	1.8	0.0
40	2.6	1.2	0.4	2.1	0.4
60	3.7	1.5	0.4	2.4	0.3
NMPE-10	5.1	2.9	0.3	1.7	0.1
20	4.7	1.9	0.8	2.5	0.4
40	3.7	1.8	0.2	2.1	0.1
60	1.9	1.4	1.1	1.3	0.8

NA = Not available
NS = No sample
- = Not applicable

[a]Mean of two sampling
[b]One sample
[c]One Light bottle sample lost

APPENDIX VA-1
(Continued)

PRIMARY PRODUCTION, CHLOROPHYLL A[a], AND PHAEOPIGMENT CONCENTRATIONS IN SURFACE SAMPLES

XI. DATE: 27 OCTOBER

STATION (transect/ depth contour [ft])	C-14 PRODUCTION (mg C/m³/hr)	CHLOROPHYLL a (µg/l)	PHAEOPIGMENT (µg/l)	PRODUCTION-CHLOROPHYLL a RATIO	PHAEOPIGMENT-CHLOROPHYLL a RATIO
NMPW-10	13.3	6.5	0.3	2.1	<0.1
20	11.4	5.4	0.4	2.1	0.1
40	16.1	4.9	0.7	3.3	0.1
60	9.0	5.1	0.4	1.7	0.1
NMPP-10	11.1	3.5	0.9	3.2	0.3
20	11.7	5.1	2.4	2.3	0.5
40	9.3	6.5	0.3	1.4	<0.1
60	10.5	5.9	0.3	1.8	<0.1
FITZ-10	11.9	6.7	1.4	1.8	0.2
20	13.8	5.6	1.1	2.5	0.2
40	14.3	6.1	0.7	2.3	0.1
60	12.0	5.5	0.2	2.2	<0.1
NMPE-10	11.7	6.3	0.4	1.8	0.1
20	12.3	7.0	0.3	1.7	<0.1
40	14.8	4.5	0.6	3.3	0.1
60	10.8	4.7	0.5	2.3	0.1

XII. DATE: 17 NOVEMBER

STATION (transect/ depth contour [ft])	C-14 PRODUCTION (mg C/m³/hr)	CHLOROPHYLL a (µg/l)	PHAEOPIGMENT (µg/l)	PRODUCTION-CHLOROPHYLL a RATIO	PHAEOPIGMENT-CHLOROPHYLL a RATIO
NMPW-10	3.5	1.9	0.3	1.8	0.2
20	2.2	1.5	0.1	1.4	0.1
40	3.1	1.5	0.1	2.1	0.1
60	1.6	1.7	0.0	0.9	0.0
NMPP-10	1.9	1.5	0.4	1.2	0.3
20	2.9	1.1	0.6	2.6	0.5
40	NA	1.9	0.2	-	0.1
60	2.4	1.9	0.2	1.3	0.1
FITZ-10	2.8	1.6	0.2	1.7	0.1
20	2.7	1.6	0.4	1.7	0.2
40	2.8	1.5	0.2	1.9	0.1
60	2.4	1.6	0.0	1.5	0.0
NMPE-10	3.2	1.5	0.6	2.2	0.4
20	4.0	2.2[b]	1.3	1.8	0.6
40	4.5	2.1	0.2	2.2	0.1
60	4.6	2.6	0.4	1.7	0.1

APPENDIX VA-1
(Continued)

PRIMARY PRODUCTION, CHLOROPHYLL A[a], AND PHAEOPIGMENT CONCENTRATIONS IN SURFACE SAMPLES

IX. DATE: 24 AUGUST

STATION (transect/ depth contour [ft])	C-14 PRODUCTION (mg C/m^3/hr)	CHLOROPHYLL a (μg/l)	PHAEOPIGMENT (μg/l)	PRODUCTION-CHLOROPHYLL a RATIO	PHAEOPIGMENT-CHLOROPHYLL a RATIO
NMPW-10	13.9	6.5	1.7	2.1	0.3
20	16.0	4.2	1.8	3.8	0.4
40	16.0	6.8	0.6	2.4	0.1
60	9.8	3.6	0.1	2.7	<0.1
NMPP-10	4.3	1.9	1.2	2.3	0.6
20	9.0	2.3	0.9	3.9	0.4
40	7.8	2.5	0.6	3.1	0.2
60	7.4	1.8	1.1	4.1	0.6
FITZ-10	9.4	2.8	0.5	3.4	0.2
20	13.0	2.7	0.4	4.8	0.1
40	10.2	1.6	0.5	6.4	0.3
60	8.5	2.1	0.5	4.0	0.2
NMPE-10	22.1	7.8	0.4	2.8	<0.1
20	20.3	7.8	0.5	2.6	0.1
40	17.2	5.5	0.4	3.1	0.1
60	13.8	3.2	0.2	4.3	0.1

X. DATE: 18 SEPTEMBER

STATION (transect/ depth contour [ft])	C-14 PRODUCTION (mg C/m^3/hr)	CHLOROPHYLL a (μg/l)	PHAEOPIGMENT (μg/l)	PRODUCTION-CHLOROPHYLL a RATIO	PHAEOPIGMENT-CHLOROPHYLL a RATIO
NMPW-10	9.6	2.6	1.4	3.7	0.5
20	8.6	2.1	1.5	4.1	0.7
40	6.2	2.1	0.7	2.9	0.3
60	6.6[c]	2.3[b]	1.0[b]	2.9	0.4
NMPP-10	7.9	2.5	0.5	3.2	0.2
20	8.0	1.9	0.9	4.2	0.5
40	7.4	2.8	0.2	2.6	0.1
60	9.1	2.5	1.7	3.6	0.7
FITZ-10	13.6	2.8	1.2	4.9	0.4
20	15.7	4.2	0.7	3.7	0.2
40	11.3	3.7	0.9	3.0	0.2
60	NA	2.6	1.6	-	0.6
NMPE-10	10.5	4.5	1.0	2.3	0.2
20	5.6	4.8	0.3	1.2	0.1
40	8.8	1.8	3.0	4.9	1.7
60	NA	3.4	1.0	-	0.3

APPENDIX VA-1
(Continued)

PRIMARY PRODUCTION, CHLOROPHYLL A[a], AND PHAEOPIGMENT CONCENTRATIONS IN SURFACE SAMPLES

VII. DATE: 29 JULY

STATION (transect/ depth contour [ft])	C-14 PRODUCTION (mg C/m³/hr)	CHLOROPHYLL a (µg/l)	PHAEOPIGMENT (µg/l)	PRODUCTION-CHLOROPHYLL a RATIO	PHAEOPIGMENT-CHLOROPHYLL a RATIO
NMPW-10	291.7	21.6	1.5	13.5	0.1
20	89.0	6.3	2.5	14.1	0.4
40	58.2	4.9	0.2	11.9	<0.1
60	40.2	4.1	0.2	9.8	<0.1
NMPP-10	81.1	5.4	2.3	15.0	0.4
20	73.7	6.3	1.7	11.7	0.3
40	65.6	7.9	4.3	8.3	0.5
60	70.0	7.0	4.0	10.0	0.6
FITZ-10	218.6	14.3	0.5	15.3	<0.1
20	183.7	12.3	3.0	14.9	0.2
40	103.7	8.3	2.0	12.5	0.2
60	109.5	9.7	2.6	11.3	0.3
NMPE-10	41.6	8.2	0.9	5.1	0.1
20	70.8	9.6	0.9	7.4	0.1
40	99.6	12.6	2.2	7.9	0.2
60	25.6	7.3	0.9	3.5	0.1

VIII. DATE: 4 AUGUST

STATION (transect/ depth contour [ft])	C-14 PRODUCTION (mg C/m³/hr)	CHLOROPHYLL a (µg/l)	PHAEOPIGMENT (µg/l)	PRODUCTION-CHLOROPHYLL a RATIO	PHAEOPIGMENT-CHLOROPHYLL a RATIO
NMPW-10	NS	8.9	1.8	-	0.2
20	NS	10.7	0.5	-	<0.1
40	NS	7.7	2.4	-	0.3
60	NS	7.0	1.4	-	0.2
NMPP-10	NS	5.5	0.3	-	<0.1
20	NS	11.2	0.0	-	0.0
40	NS	7.4	0.3	-	<0.1
60	NS	7.9	0.8	-	0.1
FITZ-10	NS	6.6	0.8	-	0.1
20	NS	6.2	1.8	-	0.3
40	NS	3.9	0.8	-	0.2
60	NS	4.8	0.0	-	0.0
NMPE-10	NS	5.2	1.3	-	0.2
20	NS	5.2	0.5	-	0.1
40	NS	4.4	0.7	-	0.2
60	NS	5.2	0.2	-	<0.1

APPENDIX VA-2

PRIMARY PRODUCTION, CHLOROPHYLL A, AND PHAEOPIGMENT[a]
AT THREE DISCRETE LIGHT TRANSMITTANCE DEPTHS

NINE MILE POINT VICINITY - 1975

I. DATE: 29 APRIL

STATION	PERCENT TRANSMITTANCE	DEPTH (m)	C-14 PRODUCTION (mg C/m^3/hr)	CHLOROPHYLL *a* (μg/l)	PHAEOPIGMENT (μg/l)	PRODUCTION-CHLOROPHYLL *a* RATIO	PHAEOPIGMENT-CHLOROPHYLL *a* RATIO
NMPW-20							
	50%	<0.5	4.7	9.6	0.0	0.5	0.0
	25%	0.6	4.7	9.0	0.0	0.5	0.0
	1%	3.6	3.6	8.4	0.0	0.4	0.0
NMPP-20							
	50%	<0.5	1.6	6.0	0.0	0.3	0.0
	25%	0.6	5.5	6.8	0.0	0.8	0.0
	1%	4.5	3.6	7.0	0.0	0.5	0.0
FITZ-20							
	50%	<0.5	2.0	6.2	0.0	0.3	0.0
	25%	0.2	2.7	5.9	0.0	0.5	0.0
	1%	4.5	1.9	5.5	0.4	0.3	0.1
NMPE-20							
	50%	0.2	8.6	4.9	1.3	1.8	0.3
	25%	0.6	8.1	5.2	1.5	1.6	0.3
	1%	4.6	2.5	5.5	2.0	0.4	0.4
NMPE-40							
	50%	0.2	0.0	6.4	0.4	0.0	0.1
	25%	1.0	6.5	5.6	0.5	1.2	0.1
	1%	5.5	2.7	7.8	0.0	0.3	0.0

II. DATE: 6 MAY

STATION	PERCENT TRANSMITTANCE	DEPTH (m)	C-14 PRODUCTION (mg C/m^3/hr)	CHLOROPHYLL *a* (μg/l)	PHAEOPIGMENT (μg/l)	PRODUCTION-CHLOROPHYLL *a* RATIO	PHAEOPIGMENT-CHLOROPHYLL *a* RATIO
NMPE-40							
	50%	0.5	NR	2.5	2.2	-	0.9
	25%	1.2	NR	2.2	2.4	-	1.1
	1%	8.0	NR	3.3	0.1	-	<0.1

APPENDIX VA-2

PRIMARY PRODUCTION, CHLOROPHYLL A, AND PHAEOPIGMENT[a] AT THREE DISCRETE LIGHT TRANSMITTANCE DEPTHS (Continued)

III. DATE: 20 MAY

STATION	PERCENT TRANSMITTANCE	DEPTH (m)	C-14 PRODUCTION (mg C/m³/hr)	CHLOROPHYLL *a* (µg/l)	PHAEOPIGMENT (µg/l)	PRODUCTION-CHLOROPHYLL *a* RATIO	PHAEOPIGMENT-CHLOROPHYLL *a* RATIO
NMPW-20							
	50%	0.5	27.5	3.0	0.6	9.2	0.2
	25%	0.8	31.4	7.5	2.2	4.2	0.3
	1%	6	2.9	16.5	0.7	0.2	<0.1
NMPP-20							
	50%	0.5	23.5	8.0	2.0	2.9	0.2
	25%	1	19.9	6.2	1.4	3.2	0.2
	1%	6	5.3	11.1	4.9	0.5	0.4
FITZ-20							
	50%	0.3	5.7	5.3	2.2	1.1	0.4
	25%	1	8.6	6.2	1.2	1.4	0.2
	1%	6	3.5	14.4	5.3	0.2	0.4
NMPE-20							
	50%	0.5	11.3	4.9	4.4	2.3	0.9
	25%	1.2	15.0	5.8	3.6	2.6	0.6
	1%	6	3.7	13.9	6.8	0.3	0.5
NMPP-40							
	50%	0.5	16.4	7.3	1.2	2.2	0.2
	25%	1	19.0	9.3	2.2	2.0	0.2
	1%	6	4.5	7.2	2.7	0.6	0.4

IV. DATE: 10 JUNE

STATION	PERCENT TRANSMITTANCE	DEPTH (m)	C-14 PRODUCTION (mg C/m³/hr)	CHLOROPHYLL *a* (µg/l)	PHAEOPIGMENT (µg/l)	PRODUCTION-CHLOROPHYLL *a* RATIO	PHAEOPIGMENT-CHLOROPHYLL *a* RATIO
NMPE-40							
	50%	S	NR	6.3	0.7	-	0.1
	25%	0.8	NR	6.2	0.7	-	0.1
	1%	5.5	NR	5.8	1.2	-	0.2

APPENDIX VA-2

PRIMARY PRODUCTION, CHLOROPHYLL A, AND PHAEOPIGMENT[a]
AT THREE DISCRETE LIGHT TRANSMITTANCE DEPTHS
(Continued)

V. DATE: 24 JUNE

STATION	PERCENT TRANSMITTANCE	DEPTH (m)	C-14 PRODUCTION (mg C/m^3/hr)	CHLOROPHYLL *a* (μg/l)	PHAEOPIGMENT (μg/l)	PRODUCTION-CHLOROPHYLL *a* RATIO	PHAEOPIGMENT-CHLOROPHYLL *a* RATIO
NMPW-20							
	50%	0.3	6.2	10.8	5.0	0.6	0.5
	25%	0.7	6.5	9.0	3.9	0.7	0.4
	1%	4.4	2.3	9.7	2.8	0.2	0.3
NMPP-20							
	50%	S	7.3	8.2	3.2	0.9	0.4
	25%	0.5	7.0	9.6	3.1	0.7	0.3
	1%	5	4.1	7.3	3.3	0.6	0.4
FITZ-20							
	50%	S	9.0	10.3	3.0	0.9	0.3
	25%	0.5	8.6	11.7	1.8	0.7	0.1
	1%	4.5	5.8	9.0	2.0	0.6	0.2
NMPE-20							
	50%	S	4.8	10.8	1.8	0.4	0.2
	25%	0.5	6.0	13.7	1.5	0.4	0.1
	1%	4	2.6	16.1	1.2	0.2	0.1
NMPE-40							
	50%	S	6.1	8.5	2.9	0.7	[illegible]
	25%	0.5	4.9	8.9	3.0	0.5	0.3
	1%	7	1.1	7.7	0.8	0.1	0.1

VI. DATE: 8 JULY

STATION	PERCENT TRANSMITTANCE	DEPTH (m)	C-14 PRODUCTION (mg C/m^3/hr)	CHLOROPHYLL *a* (μg/l)	PHAEOPIGMENT (μg/l)	PRODUCTION-CHLOROPHYLL *a* RATIO	PHAEOPIGMENT-CHLOROPHYLL *a* RATIO
NMPE-40							
	50%	S	NR	3.9	0.8	-	0.2
	25%	0.5	NR	4.2	2.3	-	0.5
	1%	5.0	NR	3.0	0.8	-	0.3

APPENDIX VA-2

PRIMARY PRODUCTION, CHLOROPHYLL A, AND PHAEOPIGMENT[a]
AT THREE DISCRETE LIGHT TRANSMITTANCE DEPTHS
(Continued)

VII. DATE: 29 JULY

STATION	PERCENT TRANSMITTANCE	DEPTH (m)	C-14 PRODUCTION (mg C/m^3/hr)	CHLOROPHYLL a (µg/l)	PHAEOPIGMENT (µg/l)	PRODUCTION-CHLOROPHYLL a RATIO	PHAEOPIGMENT-CHLOROPHYLL a RATIO
NMPW-20							
	50%	0.3	89.0	6.3	2.5	14.1	0.4
	25%	0.6	74.6	7.4	0.7	10.1	0.1
	1%	4	42.0	10.5	0.0	4.0	0.0
NMPP-20							
	50%	0.3	73.7	6.3	1.7	11.7	0.3
	25%	0.6	51.5	7.0	2.8	7.4	0.4
	1%	4	21.1	4.5	2.6	4.7	0.6
FITZ-20							
	50%	0.3	183.7	12.3	3.0	14.9	0.2
	25%	0.6	213.5	10.0	1.3	21.3	0.1
	1%	4	46.1	8.1	2.7	5.7	0.3
NMPE-20							
	50%	0.3	70.8	9.6	0.9	7.4	0.1
	25%	0.6	94.3	10.1	0.1	9.3	<0.1
	1%	4	26.0	10.5	0.3	2.5	<0.1
[illegible]-40							
	50%	0.3	99.6	12.6	2.2	7.9	0.2
	25%	0.6	103.9	14.1	0.0	7.4	0.0
	1%	4.5	11.6	11.3	2.9	1.0	0.3

VIII. DATE: 4 AUGUST

STATION	PERCENT TRANSMITTANCE	DEPTH (m)	C-14 PRODUCTION (mg C/m^3/hr)	CHLOROPHYLL a (µg/l)	PHAEOPIGMENT (µg/l)	PRODUCTION-CHLOROPHYLL a RATIO	PHAEOPIGMENT-CHLOROPHYLL a RATIO
NMPE-40							
	50%	S	NR	4.4	0.7	-	0.2
	25%	0.3	NR	4.2	1.8	-	0.4
	1%	4.8	NR	3.0	1.7	-	0.6

APPENDIX V A-2

PRIMARY PRODUCTION, CHLOROPHYLL A, AND PHAEOPIGMENT[a]
AT THREE DISCRETE LIGHT TRANSMITTANCE DEPTHS
(Continued)

IX. DATE: 24 AUGUST

STATION	PERCENT TRANSMITTANCE	DEPTH (m)	C-14 PRODUCTION (mg C/m³/hr)	CHLOROPHYLL a (μg/l)	PHAEOPIGMENT (μg/l)	PRODUCTION-CHLOROPHYLL a RATIO	PHAEOPIGMENT-CHLOROPHYLL a RATIO
NMPW-20							
	50%	0.3	16.0	4.2	1.8	3.8	0.4
	25%	0.5	21.1	6.0	0.7	3.5	0.1
	1%	6.1	5.9	7.2	0.6	0.8	0.1
NMPP-20							
	50%	0.3	9.0	2.3	0.9	3.9	0.4
	25%	1	8.8	2.2	1.1	4.0	0.5
	1%	6.1	3.6	2.3	0.6	1.6	0.3
FITZ-20							
	50%	0.5	13.0	2.7	0.4	4.8	0.1
	25%	1	12.5	2.6	1.2	4.8	0.5
	1%	6.1	6.2	3.2	0.5	1.9	0.2
NMPE-20							
	50%	0.3	20.3	7.8	0.5	2.6	0.1
	25%	0.5	19.4	6.4	1.1	3.0	0.2
	1%	5.5	3.0	4.7	0.5	0.6	0.1
NMPE-40							
	50%	S	17.2	5.5	0.4	3.1	0.1
	25%	0.5	13.2	4.7	0.4	2.8	0.1
	1%	6.8	3.4	4.6	0.9	0.7	0.2

X. DATE: 18 SEPTEMBER

STATION	PERCENT TRANSMITTANCE	DEPTH (m)	C-14 PRODUCTION (mg C/m³/hr)	CHLOROPHYLL a (μg/l)	PHAEOPIGMENT (μg/l)	PRODUCTION-CHLOROPHYLL a RATIO	PHAEOPIGMENT-CHLOROPHYLL a RATIO
NMPW-20							
	50%	0.2	8.6	2.1	1.5	4.1	0.7
	25%	0.8	7.0	1.9	1.5	3.7	0.8
	1%	6.1	2.0	2.1	1.0	1.0	0.5
NMPP-20							
	50%	0.2	8.0	1.9[b]	0.9[b]	4.2	0.5
	25%	0.8	6.9	2.8[b]	0.4[b]	2.5	0.1
	1%	6.1	1.1	2.4	1.0	0.4	0.4
FITZ-20							
	50%	0.2	15.7	4.2	0.7	3.7	0.2
	25%	0.8	11.6	2.8[b]	1.2[b]	4.1	0.4
	1%	6.1	7.3	2.3[b]	1.1[b]	3.2	0.5
NMPE-20							
	50%	0.2	5.6	4.8	0.3	1.2	0.1
	25%	0.8	4.9	5.1	0.2	1.0	<0.1
	1%	6.1	0.5	4.9	0.7	0.1	0.1
NMPE-40							
	50%	0.2	8.8	1.8	3.0	4.9	1.7
	25%	0.8	6.4	3.7	1.1	1.7	0.3
	1%	8.0	2.0	2.5	1.5	0.8	0.6

APPENDIX VA-2

PRIMARY PRODUCTION, CHLOROPHYLL A, AND PHAEOPIGMENT[a]
AT THREE DISCRETE LIGHT TRANSMITTANCE DEPTHS
(Continued)

XI. DATE: 27 OCTOBER

STATION	PERCENT TRANSMITTANCE	DEPTH (m)	C-14 PRODUCTION (mg C/m^3/hr)	CHLOROPHYLL a (μg/l)	PHAEOPIGMENT (μg/l)	PRODUCTION-CHLOROPHYLL a RATIO	PHAEOPIGMENT-CHLOROPHYLL a RATIO
NMPW-20							
	50%	S	11.4	5.4	0.4	2.1	0.1
	25%	0.5	16.8	5.4	0.8	3.1	0.1
	1%	6	5.6	2.9	0.7	1.9	0.2
NMPP-20							
	50%	0.5	11.7	5.1	2.4	2.3	0.5
	25%	1	12.1	5.9	1.4	2.0	0.2
	1%	6.3	1.8[b]	5.4	1.5	0.3	0.3
FITZ-20							
	50%	0.5	13.8	5.6	1.1	2.5	0.2
	25%	0.6	14.4	5.5	2.0	2.6	0.4
	1%	6.3	3.3	6.3	0.6	0.5	0.1
NMPE-20							
	50%	0.5	12.3	7.0	0.3	1.7	<0.1
	25%	1	12.8	5.5	1.0	2.3	0.2
	1%	6	5.6	4.4	0.4	1.3	0.1
N[illegible]							
	50%	0.3	14.8	4.5	0.6	3.3	0.1
	25%	1	12.7	3.8	0.7	3.4	0.2
	1%	5.5	3.4	6.3	1.2	0.5	0.2

XII. DATE: 17 NOVEMBER

STATION	PERCENT TRANSMITTANCE	DEPTH (m)	C-14 PRODUCTION (mg C/m^3/hr)	CHLOROPHYLL a (μg/l)	PHAEOPIGMENT (μg/l)	PRODUCTION-CHLOROPHYLL a RATIO	PHAEOPIGMENT-CHLOROPHYLL a RATIO
NMPW-20							
	50%	0.3	2.2	1.5	0.1	1.4	0.1
	25%	0.6	4.0	1.6	0.1	2.5	0.1
	1%	5.2	3.2	1.1	1.2	2.9	1.1
NMPP-20							
	50%	0.3	2.9	1.1	0.6	2.6	0.5
	25%	0.6	2.9	1.5	0.5	1.9	0.3
	1%	6.1	3.2	1.8	0.3	1.8	0.2
FITZ-20							
	50%	0.3	2.7	1.6	0.4	1.7	0.2
	25%	0.6	3.1	1.4	0.7	2.2	0.5
	1%	6.1	2.0	1.3	0.1	1.5	0.1
NMPE-20							
	50%	0.3	4.0	2.2[b]	1.3	1.8	0.6
	25%	0.6	5.0	1.1	1.1	4.6	1.0
	1%	6.1	1.2	0.7	1.1	1.8	1.6
NMPE-40							
	50%	0.6	4.5	2.1	0.2	2.1	0.1
	25%	1.0	4.1	1.8	0.4	2.3	0.2
	1%	7.5	1.3	2.2	0.1	0.6	0.0

APPENDIX VA-2

PRIMARY PRODUCTION, CHLOROPHYLL A, AND PHAEOPIGMENT[a]
AT THREE DISCRETE LIGHT TRANSMITTANCE DEPTHS
(Continued)

XIII. DATE: 12 DECEMBER

STATION	PERCENT TRANSMITTANCE	DEPTH (m)	C-14 PRODUCTION (mg C/m^3/hr)	CHLOROPHYLL a (µg/l)	PHAEOPIGMENT (µg/l)	PRODUCTION-CHLOROPHYLL a RATIO	PHAEOPIGMENT-CHLOROPHYLL a RATIO
NMPW-20							
	50%	0.5	4.4	1.8	0.1	2.4	0.1
	25%	2	6.6	1.5	0.5	4.4	0.3
	1%	6.1	3.5	1.3	1.1	2.7	0.8
NMPP-20							
	50%	0.5	6.0	1.9	0.0	3.1	0.0
	25%	2	4.6	1.5	0.7	3.1	0.5
	1%	6.1	2.9	1.4	0.3	2.1	0.2
FITZ-20							
	50%	0.5	3.4	1.9	0.0	1.8	0.0
	25%	2	5.1[b]	1.5	0.1	3.4	0.1
	1%	6.1	4.7[b]	1.9	0.0	2.5	0.0
NMPE-20							
	50%	0.5	4.7	1.9	0.8	2.5	0.4
	25%	2	10.1	2.1	0.7	4.8	0.3
	1%	6.1	4.6	2.6	0.4	1.8	0.1
NMPE-40							
	50%	2	3.7	1.8	0.2	2.1	0.1
	25%	4	2.4	1.4	1.1	1.7	0.8
	1%	13	0.6	1.0	2.4	0.6	

[a]Mean of two samples
[b]One sample
S = Surface
– = Not applicable
NS = No sample
NR = C-14 Not required

APPENDIX VA-3

NINE MILE POINT VI[illegible] - 1975
AVERAGE OF PRIMARY [illegible]REPLICATE SAMPLES
TOP FIVE SPECIES BY BIOMASS MG/M*3 AND PERCENT OF TOTAL OF SURFACE WHOLE WATER PHYTOPLANKTON AT EACH SAMPLING STATION.
APR 29,1975 .

1 NMPW/10 FT

		BIOMASS	PERCENT
BACILLARIOPHYCEAE	MELOSIRA BINDERANA	308.69	27.46
BACILLARIOPHYCEAE	STEPHANODISCUS HANTZSCHII	127.87	11.37
DINOPHYCEAE	PERIDINIUM ACICULIFERUM	102.59	9.12
BACILLARIOPHYCEAE	STEPHANODISCUS NIAGARAE	99.75	8.87
BACILLARIOPHYCEAE	FRAGILARIA CROTONENSIS	88.02	7.83

2 NMPP/10 FT

		BIOMASS	PERCENT
BACILLARIOPHYCEAE	STEPHANODISCUS NIAGARAE	498.86	27.61
BACILLARIOPHYCEAE	MELOSIRA BINDERANA	470.24	26.03
BACILLARIOPHYCEAE	STEPHANODISCUS ASTREA VAR. MIN	274.06	15.17
DINOPHYCEAE	GYMNODINIUM SP.	91.40	5.06
BACILLARIOPHYCEAE	MELOSIRA ISLANDICA	55.81	3.09

3 FITZ/10 FT

		BIOMASS	PERCENT
BACILLARIOPHYCEAE	STEPHANODISCUS NIAGARAE	199.51	26.61
BACILLARIOPHYCEAE	MELOSIRA BINDERANA	198.27	26.44
BACILLARIOPHYCEAE	MELOSIRA ISLANDICA	40.28	5.37
BACILLARIOPHYCEAE	ASTERIONELLA FORMOSA	35.17	4.69
DINOPHYCEAE	GYMNODINIUM SP.	30.46	4.06

4 NMPE/10 FT

		BIOMASS	PERCENT
BACILLARIOPHYCEAE	MELOSIRA BINDERANA	335.34	24.10
BACILLARIOPHYCEAE	STEPHANODISCUS NIAGARAE	299.31	21.51
DINOPHYCEAE	PERIDINIUM ACICULIFERUM	128.23	9.21
BACILLARIOPHYCEAE	STEPHANODISCUS ASTREA VAR. MIN	91.35	6.56
BACILLARIOPHYCEAE	STEPHANODISCUS HANTZSCHII	88.53	6.36

5 NMPW/20 FT

		BIOMASS	PERCENT
BACILLARIOPHYCEAE	MELOSIRA BINDERANA	441.41	36.90
BACILLARIOPHYCEAE	STEPHANODISCUS ASTREA VAR. MIN	114.19	9.55
DINOPHYCEAE	GYMNODINIUM SP.	92.67	7.75
BACILLARIOPHYCEAE	STEPHANODISCUS HANTZSCHII	82.97	6.94
BACILLARIOPHYCEAE	ASTERIONELLA FORMOSA	77.82	6.51

6 NMPP/20 FT

		BIOMASS	PERCENT
BACILLARIOPHYCEAE	MELOSIRA BINDERANA	341.32	29.41
BACILLARIOPHYCEAE	STEPHANODISCUS ASTREA VAR. MIN	159.87	13.78
DINOPHYCEAE	GYMNODINIUM SP.	112.98	9.74
BACILLARIOPHYCEAE	STEPHANODISCUS HANTZSCHII	95.80	8.26
BACILLARIOPHYCEAE	STEPHANODISCUS NIAGARAE	78.74	6.79

APPENDIX VA-3 (Continued)

7 FITZ/20 FT

		BIOMASS	PERCENT
BACILLARIOPHYCEAE	MELOSIRA BINDERANA	390.28	28.19
BACILLARIOPHYCEAE	STEPHANODISCUS NIAGARAE	199.51	14.41
BACILLARIOPHYCEAE	MELOSIRA ISLANDICA	147.30	10.64
BACILLARIOPHYCEAE	STEPHANODISCUS ASTREA VAR. MIN	94.21	6.81
BACILLARIOPHYCEAE	STEPHANODISCUS HANTZSCHII	93.23	6.73

8 NMPE/20 FT

		BIOMASS	PERCENT
BACILLARIOPHYCEAE	MELOSIRA BINDERANA	257.83	23.17
BACILLARIOPHYCEAE	STEPHANODISCUS ASTREA VAR. MIN	139.87	12.57
DINOPHYCEAE	GYMNODINIUM SP.	128.21	11.52
BACILLARIOPHYCEAE	STEPHANODISCUS NIAGARAE	99.75	8.97
BACILLARIOPHYCEAE	ASTERIONELLA FORMOSA	60.60	5.45

9 NMPW/40 FT

		BIOMASS	PERCENT
BACILLARIOPHYCEAE	MELOSIRA BINDERANA	334.53	26.68
BACILLARIOPHYCEAE	STEPHANODISCUS NIAGARAE	199.51	15.91
BACILLARIOPHYCEAE	FRAGILARIA CAPUCINA	168.14	13.41
DINOPHYCEAE	GYMNODINIUM SP.	107.89	8.60
DINOPHYCEAE	PERIDINIUM ACICULIFERUM	89.75	7.16

10 NMPP/40 FT

		BIOMASS	PERCENT
BACILLARIOPHYCEAE	STEPHANODISCUS NIAGARAE	997.71	40.80
BACILLARIOPHYCEAE	MELOSIRA BINDERANA	401.16	16.41
BACILLARIOPHYCEAE	STEPHANODISCUS ASTREA VAR. MIN	302.61	12.38
DINOPHYCEAE	PERIDINIUM ACICULIFERUM	128.23	5.24
DINOPHYCEAE	GYMNODINIUM SP.	102.83	4.21

11 FITZ/40 FT

		BIOMASS	PERCENT
BACILLARIOPHYCEAE	MELOSIRA BINDERANA	329.90	25.33
BACILLARIOPHYCEAE	STEPHANODISCUS ASTREA VAR. MIN	188.42	14.47
DINOPHYCEAE	PERIDINIUM ACICULIFERUM	128.23	9.85
BACILLARIOPHYCEAE	STEPHANODISCUS NIAGARAE	99.75	7.66
BACILLARIOPHYCEAE	STEPHANODISCUS HANTZSCHII	81.69	6.27

12 NMPE/40 FT

		BIOMASS	PERCENT
DINOPHYCEAE	PERIDINIUM ACICULIFERUM	259.65	18.61
BACILLARIOPHYCEAE	MELOSIRA BINDERANA	202.35	14.50
BACILLARIOPHYCEAE	STEPHANODISCUS NIAGARAE	199.51	14.30
BACILLARIOPHYCEAE	STEPHANODISCUS ASTREA VAR. MIN	194.11	13.91
DINOPHYCEAE	GYMNODINIUM SP.	128.21	9.19

13 NMPW/60 FT

		BIOMASS	PERCENT
BACILLARIOPHYCEAE	STEPHANODISCUS NIAGARAE	149.63	23.27
BACILLARIOPHYCEAE	MELOSIRA BINDERANA	80.23	12.48
BACILLARIOPHYCEAE	STEPHANODISCUS ASTREA VAR. MIN	68.52	10.66

BACILLARIOPHYCEAE	STEPHANODISCUS HANTZSCHII	60.30	9.38
DINOPHYCEAE	PERIDINIUM ACICULIFERUM	51.29	7.98

14 NMPP/60 FT

		BIOMASS	PERCENT
BACILLARIOPHYCEAE	MELOSIRA BINDERANA	254.02	27.71
BACILLARIOPHYCEAE	STEPHANODISCUS NIAGARAE	149.63	16.32
BACILLARIOPHYCEAE	STEPHANODISCUS ASTREA VAR. MIN	142.71	15.57
BACILLARIOPHYCEAE	MELOSIRA ISLANDICA	55.81	6.09
BACILLARIOPHYCEAE	STEPHANODISCUS HANTZSCHII	49.81	5.43

15 FITZ/60 FT

		BIOMASS	PERCENT
BACILLARIOPHYCEAE	STEPHANODISCUS NIAGARAE	324.25	34.88
BACILLARIOPHYCEAE	MELOSIRA BINDERANA	117.22	12.61
DINOPHYCEAE	GYMNODINIUM SP.	97.75	10.52
BACILLARIOPHYCEAE	STEPHANODISCUS ASTREA VAR. MIN	85.64	9.21
BACILLARIOPHYCEAE	MELOSIRA ISLANDICA	54.66	5.88

16 NMPE/60 FT

		BIOMASS	PERCENT
DINOPHYCEAE	PERIDINIUM ACICULIFERUM	230.82	19.25
DINOPHYCEAE	GYMNODINIUM SP.	205.65	17.15
BACILLARIOPHYCEAE	MELOSIRA BINDERANA	179.23	14.94
BACILLARIOPHYCEAE	STEPHANODISCUS ASTREA VAR. MIN	165.58	13.81
BACILLARIOPHYCEAE	MELOSIRA ISLANDICA	67.32	5.61

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NINE MILE POINT VICINITY - 1975
AVERAGE OF PRIMARY AND REPLICATE SAMPLES
TOP FIVE SPECIES BY BIOMASS MG/M*3 AND PERCENT OF TOTAL OF SURFACE WHOLE WATER PHYTOPLANKTON AT EACH SAMPLING STATION.
MAY 6,1975 .

1 NMPW/10 FT

		BIOMASS	PERCENT
BACILLARIOPHYCEAE	FRAGILARIA CAPUCINA	128.21	15.17
CHRYSOPHYCEAE	UNIDENTIFIED CHRYSOMONADALES	121.07	14.33
BACILLARIOPHYCEAE	STEPHANODISCUS NIAGARAE	99.75	11.81
BACILLARIOPHYCEAE	MELOSIRA BINDERANA	98.73	11.68
BACILLARIOPHYCEAE	STEPHANODISCUS HANTZSCHII	55.60	6.58

2 NMPP/10 FT

		BIOMASS	PERCENT
BACILLARIOPHYCEAE	STEPHANODISCUS NIAGARAE	99.75	14.46
CHRYSOPHYCEAE	UNIDENTIFIED CHRYSOMONADALES	89.26	12.94
CRYPTOPHYCEAE	CHROOMONAS ACUTA	54.85	7.95
BACILLARIOPHYCEAE	STEPHANODISCUS HANTZSCHII	54.74	7.94
DINOPHYCEAE	GYMNODINIUM SP.	40.62	5.89

3 FITZ/10 FT

		BIOMASS	PERCENT
DINOPHYCEAE	PERIDINIUM ACICULIFERUM	76.94	14.43
DINOPHYCEAE	GYMNODINIUM SP.	50.78	9.52
BACILLARIOPHYCEAE	STEPHANODISCUS NIAGARAE	49.88	9.35
CHRYSOPHYCEAE	UNIDENTIFIED CHRYSOMONADALES	46.40	8.70
BACILLARIOPHYCEAE	ASTERIONELLA FORMOSA	45.22	8.48

4 NMPE/10 FT

		BIOMASS	PERCENT
DINOPHYCEAE	PERIDINIUM ACICULIFERUM	25.65	17.76
CRYPTOPHYCEAE	CHROOMONAS ACUTA	12.59	8.72
BACILLARIOPHYCEAE	ASTERIONELLA FORMOSA	12.33	8.54
BACILLARIOPHYCEAE	STEPHANODISCUS ASTREA VAR. MIN	11.42	7.91
CHRYSOPHYCEAE	UNIDENTIFIED CHRYSOMONADALES	10.61	7.34

5 NMPW/20 FT

		BIOMASS	PERCENT
CHRYSOPHYCEAE	UNIDENTIFIED CHRYSOMONADALES	106.93	17.45
DINOPHYCEAE	PERIDINIUM ACICULIFERUM	51.29	8.37
BACILLARIOPHYCEAE	STEPHANODISCUS NIAGARAE	49.88	8.14
BACILLARIOPHYCEAE	STEPHANODISCUS HANTZSCHII	49.18	8.03
BACILLARIOPHYCEAE	MELOSIRA ISLANDICA	46.61	7.61

6 NMPP/20 FT

		BIOMASS	PERCENT
DINOPHYCEAE	PERIDINIUM ACICULIFERUM	128.23	15.20
BACILLARIOPHYCEAE	STEPHANODISCUS NIAGARAE	99.75	11.82
CHRYSOPHYCEAE	UNIDENTIFIED CHRYSOMONADALES	92.79	11.00
CRYPTOPHYCEAE	CHROOMONAS ACUTA	89.03	10.55
DINOPHYCEAE	GYMNODINIUM SP.	60.93	7.22

7 [illegible]TZ/20 FT

		BIOMASS	PERCENT
CHRYSOPHYCEAE	CHRYSOCHROMULINA PARVA	27.59	14.84
CRYPTOPHYCEAE	CHROOMONAS ACUTA	26.92	14.48
CHRYSOPHYCEAE	UNIDENTIFIED CHRYSOMONADALES	21.21	11.40
DINOPHYCEAE	GYMNODINIUM SP.	20.31	10.92
BACILLARIOPHYCEAE	ASTERIONELLA FORMOSA	14.47	7.78

8 NMPE/20 FT

		BIOMASS	PERCENT
DINOPHYCEAE	PERIDINIUM ACICULIFERUM	102.59	25.33
CHRYSOPHYCEAE	CHRYSOCHROMULINA PARVA	47.95	11.84
BACILLARIOPHYCEAE	ASTERIONELLA FORMOSA	33.96	8.38
CRYPTOPHYCEAE	CHROOMONAS ACUTA	30.60	7.55
BACILLARIOPHYCEAE	NITZSCHIA GRACILIS	27.04	6.68

9 NMPW/40 FT

		BIOMASS	PERCENT
DINOPHYCEAE	GYMNODINIUM SP.	60.93	14.57
BACILLARIOPHYCEAE	STEPHANODISCUS ASTREA VAR. MIN	45.68	10.92
CRYPTOPHYCEAE	CHROOMONAS ACUTA	40.15	9.60
CHRYSOPHYCEAE	CHRYSOCHROMULINA PARVA	38.35	9.17
BACILLARIOPHYCEAE	STEPHANODISCUS HANTZSCHII	35.93	8.59

10 NMPP/40 FT

		BIOMASS	PERCENT
CRYPTOPHYCEAE	CHROOMONAS ACUTA	73.23	12.00
BACILLARIOPHYCEAE	MELOSIRA ISLANDICA	71.93	11.79
CHRYSOPHYCEAE	UNIDENTIFIED CHRYSOMONADALES	49.93	8.18
BACILLARIOPHYCEAE	STEPHANODISCUS HANTZSCHII	47.90	7.85
CRYPTOPHYCEAE	CRYPTOMONAS OVATA	46.08	7.55

11 FITZ/40 FT

		BIOMASS	PERCENT
BACILLARIOPHYCEAE	STEPHANODISCUS ASTREA VAR. MIN	85.64	20.58
BACILLARIOPHYCEAE	STEPHANODISCUS NIAGARAE	49.88	11.98
CRYPTOPHYCEAE	CHROOMONAS ACUTA	40.15	9.65
BACILLARIOPHYCEAE	TABELLARIA FENESTRATA	34.70	8.34
CHRYSOPHYCEAE	UNIDENTIFIED CHRYSOMONADALES	28.28	6.79

12 NMPE/40 FT

		BIOMASS	PERCENT
DINOPHYCEAE	PERIDINIUM ACICULIFERUM	128.23	19.90
CRYPTOPHYCEAE	CHROOMONAS ACUTA	78.01	12.10
CHRYSOPHYCEAE	CHRYSOCHROMULINA PARVA	76.18	11.82
BACILLARIOPHYCEAE	STEPHANODISCUS NIAGARAE	49.88	7.74
CRYPTOPHYCEAE	CRYPTOMONAS OVATA	46.08	7.15

13 NMPW/60 FT

		BIOMASS	PERCENT
DINOPHYCEAE	PERIDINIUM ACICULIFERUM	102.59	15.69
BACILLARIOPHYCEAE	STEPHANODISCUS NIAGARAE	99.77	15.26
CRYPTOPHYCEAE	CHROOMONAS ACUTA	48.60	7.44

CHLOROPHYCEAE	GLUEOCYSTIS GIGAS	45.53	6.96
CHRYSOPHYCEAE	CHRYSOCHROMULINA PARVA	35.10	5.37

14 NMPP/60 FT

		BIOMASS	PERCENT
CRYPTOPHYCEAE	CHROOMONAS ACUTA	51.91	10.23
DINOPHYCEAE	PERIDINIUM ACICULIFERUM	51.29	10.11
BACILLARIOPHYCEAE	STEPHANODISCUS NIAGARAE	49.88	9.83
DINOPHYCEAE	GYMNODINIUM SP.	40.62	8.01
BACILLARIOPHYCEAE	STEPHANODISCUS HANTZSCHII	35.93	7.08

15 FITZ/60 FT.

		BIOMASS	PERCENT
BACILLARIOPHYCEAE	FRAGILARIA CAPUCINA	47.56	13.92
BACILLARIOPHYCEAE	STEPHANODISCUS ASTREA VAR. MIN	34.26	10.03
DINOPHYCEAE	GYMNODINIUM SP.	30.47	8.92
CRYPTOPHYCEAE	CRYPTOMONAS OVATA	27.65	8.09
BACILLARIOPHYCEAE	ASTERIONELLA FORMOSA	23.60	6.91

16 NMPE/60 FT

		BIOMASS	PERCENT
CRYPTOPHYCEAE	CHROOMONAS ACUTA	78.37	17.39
DINOPHYCEAE	PERIDINIUM ACICULIFERUM	76.94	17.07
BACILLARIOPHYCEAE	STEPHANODISCUS NIAGARAE	49.88	11.07
CHRYSOPHYCEAE	CHRYSOCHROMULINA PARVA	46.29	10.27
BACILLARIOPHYCEAE	STEPHANODISCUS HANTZSCHII	43.19	9.59

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APPENDIX VA-3 (Continued)

NINE MILE POINT VI[illegible]Y - 1975
AVERAGE OF PRIMARY [illegible] REPLICATE SAMPLES
TOP FIVE SPECIES BY BIOMASS MG/M*3 AND PERCENT OF TOTAL OF SURFACE WHOLE WATER PHYTOPLANKTON AT EACH SAMPLING STATION.
MAY 20,1975 .

1 NMPW/10 FT

		BIOMASS	PERCENT
BACILLARIOPHYCEAE	STEPHANODISCUS HANTZSCHII	794.89	45.41
DINOPHYCEAE	PERIDINIUM ACICULIFERUM	171.92	9.82
BACILLARIOPHYCEAE	MELOSIRA ITALICA VAR. SUBARCTI	76.83	4.39
CHLOROPHYCEAE	CLOSTERIUM VENUS	75.61	4.32
BACILLARIOPHYCEAE	STEPHANODISCUS ASTREA	59.84	3.42

2 NMPP/10 FT

		BIOMASS	PERCENT
BACILLARIOPHYCEAE	STEPHANODISCUS HANTZSCHII	723.01	39.34
DINOPHYCEAE	PERIDINIUM ACICULIFERUM	319.27	17.37
CHLOROPHYCEAE	TROCHISCIA SP.	222.98	12.13
BACILLARIOPHYCEAE	MELOSIRA ITALICA VAR. SUBARCTI	73.28	3.99
BACILLARIOPHYCEAE	CYCLOTELLA MENEGHINIANA	66.49	3.62

3 FITZ/10 FT

		BIOMASS	PERCENT
BACILLARIOPHYCEAE	STEPHANODISCUS HANTZSCHII	477.78	36.02
CHLOROPHYCEAE	CLOSTERIUM VENUS	151.24	11.40
CHLOROPHYCEAE	TROCHISCIA SP.	105.55	7.96
DINOPHYCEAE	PERIDINIUM ACICULIFERUM	98.24	7.41
BACILLARIOPHYCEAE	ASTERIONELLA FORMOSA	74.77	5.64

4 NMPE/10 FT

		BIOMASS	PERCENT
BACILLARIOPHYCEAE	STEPHANODISCUS HANTZSCHII	363.62	30.19
DINOPHYCEAE	PERIDINIUM ACICULIFERUM	319.27	26.51
BACILLARIOPHYCEAE	DIATOMA ELONGATUM	71.35	5.92
BACILLARIOPHYCEAE	ASTERIONELLA FORMOSA	71.03	5.90
BACILLARIOPHYCEAE	MELOSIRA BINDERANA	69.71	5.79

5 NMPW/20 FT

		BIOMASS	PERCENT
DINOPHYCEAE	PERIDINIUM ACICULIFERUM	294.71	46.61
DINOPHYCEAE	GLENODINIUM SP.	83.30	13.17
BACILLARIOPHYCEAE	ASTERIONELLA FORMOSA	45.24	7.15
BACILLARIOPHYCEAE	FRAGILARIA CAPUCINA	43.43	6.87
BACILLARIOPHYCEAE	DIATOMA ELONGATUM	35.82	5.67

6 NMPP/20 FT

		BIOMASS	PERCENT
BACILLARIOPHYCEAE	STEPHANODISCUS HANTZSCHII	670.16	32.98
DINOPHYCEAE	PERIDINIUM ACICULIFERUM	368.39	18.13
BACILLARIOPHYCEAE	STEPHANODISCUS NIAGARAE	212.41	10.45
BACILLARIOPHYCEAE	DIATOMA ELONGATUM	91.57	4.51
BACILLARIOPHYCEAE	ASTERIONELLA FORMOSA	71.99	3.54

7 FITZ/20 FT

		BIOMASS	PERCENT
BACILLARIOPHYCEAE	STEPHANODISCUS HANTZSCHII	695.53	44.34
DINOPHYCEAE	PERIDINIUM ACICULIFERUM	171.92	10.96
BACILLARIOPHYCEAE	STEPHANODISCUS NIAGARAE	106.19	6.77
BACILLARIOPHYCEAE	ASTERIONELLA FORMOSA	66.98	4.27
BACILLARIOPHYCEAE	TABELLARIA FENESTRATA	66.96	4.27

8 NMPE/20 FT

		BIOMASS	PERCENT
DINOPHYCEAE	PERIDINIUM ACICULIFERUM	761.35	39.19
BACILLARIOPHYCEAE	STEPHANODISCUS HANTZSCHII	524.29	26.99
BACILLARIOPHYCEAE	ASTERIONELLA FORMOSA	77.37	3.98
BACILLARIOPHYCEAE	DIATOMA ELONGATUM	76.26	3.93
DINOPHYCEAE	GLENODINIUM SP.	49.98	2.57

9 NMPW/40 FT

		BIOMASS	PERCENT
DINOPHYCEAE	GLENODINIUM SP.	150.98	28.37
DINOPHYCEAE	PERIDINIUM ACICULIFERUM	98.24	18.46
BACILLARIOPHYCEAE	DIATOMA ELONGATUM	44.15	8.30
CHRYSOPHYCEAE	OCHROMONAS SP.	36.92	6.94
CHLOROPHYCEAE	SCENEDESMUS BIJUGA	36.83	6.92

10 NMPP/40 FT

		BIOMASS	PERCENT
BACILLARIOPHYCEAE	STEPHANODISCUS HANTZSCHII	638.45	41.81
DINOPHYCEAE	PERIDINIUM ACICULIFERUM	396.02	25.93
BACILLARIOPHYCEAE	MELOSIRA ITALICA VAR. SUBARCTI	88.64	5.80
DINOPHYCEAE	GLENODINIUM SP.	66.64	4.36
BACILLARIOPHYCEAE	DIATOMA ELONGATUM	55.44	3.63

11 FITZ/40 FT

		BIOMASS	PERCENT
BACILLARIOPHYCEAE	STEPHANODISCUS HANTZSCHII	629.99	48.47
DINOPHYCEAE	PERIDINIUM ACICULIFERUM	98.24	7.56
BACILLARIOPHYCEAE	ASTERIONELLA FORMOSA	66.50	5.12
CHLOROPHYCEAE	SCENEDESMUS BIJUGA	58.23	4.48
BACILLARIOPHYCEAE	MELOSIRA BINDERANA	57.58	4.43

12 NMPE/40 FT

		BIOMASS	PERCENT
DINOPHYCEAE	PERIDINIUM ACICULIFERUM	985.46	47.03
BACILLARIOPHYCEAE	STEPHANODISCUS HANTZSCHII	469.32	22.40
BACILLARIOPHYCEAE	CYCLOTELLA MENEGHINIANA	70.65	3.37
BACILLARIOPHYCEAE	FRAGILARIA CAPUCINA	68.00	3.25
BACILLARIOPHYCEAE	ASTERIONELLA FORMOSA	65.53	3.13

13 NMPW/60 FT

		BIOMASS	PERCENT
DINOPHYCEAE	GLENODINIUM SP.	134.32	28.65
DINOPHYCEAE	PERIDINIUM ACICULIFERUM	122.80	26.20
BACILLARIOPHYCEAE	ASTERIONELLA FORMOSA	43.79	9.34

CHLOROPHYCEAE	SCENEDESMUS BIJUGA	37.78	8.06
BACILLARIOPHYCEAE	STEPHANODISCUS ASTREA VAR. MIN	26.39	5.63

14 NMPP/60 FT

		BIOMASS	PERCENT
BACILLARIOPHYCEAE	STEPHANODISCUS HANTZSCHII	959.78	37.10
DINOPHYCEAE	PERIDINIUM ACICULIFERUM	690.74	26.70
BACILLARIOPHYCEAE	MELOSIRA ITALICA VAR. SUBARCTI	118.41	4.58
BACILLARIOPHYCEAE	CYCLOTELLA MENEGHINIANA	103.90	4.02
BACILLARIOPHYCEAE	DIATOMA ELONGATUM	95.28	3.68

15 FITZ/60 FT

		BIOMASS	PERCENT
BACILLARIOPHYCEAE	STEPHANODISCUS HANTZSCHII	564.45	37.86
DINOPHYCEAE	PERIDINIUM ACICULIFERUM	371.46	24.91
BACILLARIOPHYCEAE	DIATOMA ELONGATUM	82.80	5.55
BACILLARIOPHYCEAE	ASTERIONELLA FORMOSA	77.37	5.19
BACILLARIOPHYCEAE	TABELLARIA FENESTRATA	48.15	3.23

16 NMPE/60 FT

		BIOMASS	PERCENT
DINOPHYCEAE	PERIDINIUM ACICULIFERUM	1206.49	52.57
BACILLARIOPHYCEAE	STEPHANODISCUS HANTZSCHII	418.58	18.24
BACILLARIOPHYCEAE	DIATOMA ELONGATUM	94.69	4.13
BACILLARIOPHYCEAE	ASTERIONELLA FORMOSA	69.64	3.03
BACILLARIOPHYCEAE	TABELLARIA FENESTRATA	66.96	2.92

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APPENDIX VA-3 (Continued)

NINE MILE POINT VICINITY - 1975
AVERAGE OF PRIMARY AND REPLICATE SAMPLES
TOP FIVE SPECIES BY BIOMASS MG/M*3 AND PERCENT OF TOTAL OF SURFACE WHOLE WATER PHYTOPLANKTON AT EACH SAMPLING STATION.
JUN 10,1975 .

1 NMPW/10 FT

		BIOMASS	PERCENT
CHRYSOPHYCEAE	OCHROMONAS SP.	724.43	25.43
BACILLARIOPHYCEAE	STEPHANODISCUS HANTZSCHII	618.02	21.70
BACILLARIOPHYCEAE	STEPHANODISCUS ASTREA VAR. MIN	194.62	6.83
BACILLARIOPHYCEAE	CYCLOTELLA ATOMUS	166.26	5.84
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	145.99	5.13

2 NMPP/10 FT

		BIOMASS	PERCENT
CHRYSOPHYCEAE	OCHROMONAS SP.	502.08	32.72
BACILLARIOPHYCEAE	DIATOMA ELONGATUM	148.58	9.68
BACILLARIOPHYCEAE	STEPHANODISCUS HANTZSCHII	95.75	6.24
DINOPHYCEAE	PERIDINIUM ACICULIFERUM	75.56	4.92
BACILLARIOPHYCEAE	MELOSIRA BINDERANA	61.22	3.99

3 FITZ/10 FT

		BIOMASS	PERCENT
CHRYSOPHYCEAE	OCHROMONAS SP.	224.74	23.29
BACILLARIOPHYCEAE	STEPHANODISCUS HANTZSCHII	130.57	13.53
CRYPTOPHYCEAE	KATABLEPHARIS OVALIS	60.80	6.30
CHRYSOPHYCEAE	CHRYSOCHROMULINA PARVA	57.15	5.92
CHLOROPHYCEAE	MOUGEOTIA SP.	53.78	5.57

4 NMPE/10 FT

		BIOMASS	PERCENT
CHRYSOPHYCEAE	OCHROMONAS SP.	236.69	27.22
BACILLARIOPHYCEAE	STEPHANODISCUS HANTZSCHII	113.16	13.01
CHLOROPHYCEAE	MOUGEOTIA SP.	47.06	5.41
CRYPTOPHYCEAE	CRYPTOMONAS OBOVATA	46.92	5.39
MYXOPHYCEAE	CHROOCOCCUS DISPERSUS VAR. MIN	40.50	4.66

5 NMPW/20 FT

		BIOMASS	PERCENT
CHRYSOPHYCEAE	OCHROMONAS SP.	521.20	20.96
BACILLARIOPHYCEAE	STEPHANODISCUS HANTZSCHII	322.07	12.95
BACILLARIOPHYCEAE	CYCLOTELLA ATOMUS	227.51	9.15
CHLOROPHYCEAE	CHLAMYDOMONAS GLOBOSA	172.71	6.95
BACILLARIOPHYCEAE	COSCINODISCUS LACUSTRIS	146.60	5.90

6 NMPP/20 FT

		BIOMASS	PERCENT
CHRYSOPHYCEAE	OCHROMONAS SP.	406.44	29.72
BACILLARIOPHYCEAE	COSCINODISCUS LACUSTRIS	146.60	10.72
ACILLARIOPHYCEAE	STEPHANODISCUS HANTZSCHI	130.56	9.55
RYPTOPHYCEAE	CRYPTOMONAS EROSA	91.24	6.67
BACILLARIOPHYCEAE	FRAGILARIA CAPUCINA	55.32	4.05

7 [illegible]/20 FT

		BIOMASS	PERCENT
CHRYSOPHYCEAE	OCHROMONAS SP.	267.77	27.68
BACILLARIOPHYCEAE	DIATOMA ELONGATUM	59.87	6.19
MYXOPHYCEAE	CHROOCOCCUS DISPERSUS VAR. MIN	58.86	6.08
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	54.75	5.66
CRYPTOPHYCEAE	CHROOMONAS ACUTA	48.31	4.99

8 NMPE/20 FT

		BIOMASS	PERCENT
CHRYSOPHYCEAE	OCHROMONAS SP.	227.13	28.39
DINOPHYCEAE	PERIDINIUM ACICULIFERUM	75.56	9.45
BACILLARIOPHYCEAE	STEPHANODISCUS HANTZSCHII	65.42	8.18
BACILLARIOPHYCEAE	DIATOMA ELONGATUM	55.44	6.93
CHRYSOPHYCEAE	CHRYSOCHROMULINA PARVA	48.64	6.08

9 NMPW/40 FT

		BIOMASS	PERCENT
CHRYSOPHYCEAE	OCHROMONAS SP.	590.54	30.68
BACILLARIOPHYCEAE	STEPHANODISCUS HANTZSCHII	348.18	18.09
BACILLARIOPHYCEAE	CYCLOTELLA ATOMUS	106.10	5.51
BACILLARIOPHYCEAE	CYCLOTELLA GLOMERATA	72.82	3.78
MYXOPHYCEAE	CHROOCOCCUS DISPERSUS VAR. MIN	56.63	2.94

10 NMPP/40 FT

		BIOMASS	PERCENT
CHRYSOPHYCEAE	OCHROMONAS SP.	224.74	18.95
DINOPHYCEAE	CERATIUM HIRUNDINELLA	199.33	16.81
BACILLARIOPHYCEAE	COSCINODISCUS LACUSTRIS	73.30	6.18
BACILLARIOPHYCEAE	DIATOMA ELONGATUM	68.75	5.80
CRYPTOPHYCEAE	CRYPTOMONAS OVATA	48.56	4.09

11 FITZ/40 FT

		BIOMASS	PERCENT
BACILLARIOPHYCEAE	STEPHANODISCUS HANTZSCHII	235.02	30.11
CHRYSOPHYCEAE	OCHROMONAS SP.	119.54	15.31
BACILLARIOPHYCEAE	DIATOMA ELONGATUM	79.83	10.23
CHRYSOPHYCEAE	RHIZOCHRYSIS SP.	34.65	4.44
CRYPTOPHYCEAE	KATABLEPHARIS OVALIS	33.95	4.35

12 NMPE/40 FT

		BIOMASS	PERCENT
CHRYSOPHYCEAE	OCHROMONAS SP.	351.45	38.67
BACILLARIOPHYCEAE	FRAGILARIA CROTONENSIS	84.69	9.32
BACILLARIOPHYCEAE	FRAGILARIA VAUCHERIAE	63.93	7.03
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	54.75	6.02
BACILLARIOPHYCEAE	DIATOMA ELONGATUM	39.92	4.39

13 NMPW/60 FT

		BIOMASS	PERCENT
CHRYSOPHYCEAE	OCHROMONAS SP.	427.96	19.71
BACILLARIOPHYCEAE	STEPHANODISCUS HANTZSCHII	356.88	16.43
BACILLARIOPHYCEAE	STEPHANODISCUS ASTREA VAR. MIN	212.31	9.78

BACILLARIOPHYCEAE	MELOSIRA BINDERANA	111.52	5.14
BACILLARIOPHYCEAE	CYCLOTELLA MENEGHINIANA	102.85	4.74

14 NMPP/60 FT

		BIOMASS	PERCENT
CHRYSOPHYCEAE	OCHROMONAS SP.	322.76	26.02
BACILLARIOPHYCEAE	STEPHANODISCUS HANTZSCHII	156.68	12.63
BACILLARIOPHYCEAE	COSCINODISCUS LACUSTRIS	73.30	5.91
BACILLARIOPHYCEAE	DIATOMA ELONGATUM	66.53	5.36
CRYPTOPHYCEAE	CHROOMONAS ACUTA	57.10	4.60

15 FITZ/60 FT

		BIOMASS	PERCENT
CHRYSOPHYCEAE	OCHROMONAS SP.	176.92	14.96
BACILLARIOPHYCEAE	DIATOMA ELONGATUM	124.19	10.50
BACILLARIOPHYCEAE	MELOSIRA BINDERANA	90.74	7.67
CHLOROPHYCEAE	MOUGEOTIA SP.	85.72	7.25
CRYPTOPHYCEAE	CRYPTOMONAS ROSTRATA	84.43	7.14

16 NMPE/60 FT

		BIOMASS	PERCENT
CHRYSOPHYCEAE	OCHROMONAS SP.	246.26	36.75
BACILLARIOPHYCEAE	STEPHANODISCUS HANTZSCHII	113.16	16.89
BACILLARIOPHYCEAE	DIATOMA ELONGATUM	55.44	8.27
CHRYSOPHYCEAE	RHIZOCHRYSIS SP.	34.65	5.17
CRYPTOPHYCEAE	KATABLEPHARIS OVALIS	33.95	5.07

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APPENDIX VA-3 (Continued)

NINE MILE POINT VICI[illegible] 1975
AVERAGE OF PRIMARY AN[illegible]PLICATE SAMPLES
TOP FIVE SPECIES BY BIOMASS MG/M*3 AND PERCENT OF TOTAL OF SURFACE WHOLE WATER PHYTOPLANKTON AT EACH SAMPLING STATION.
JUN 24,1975 .

1 NMPW/10 FT

		BIOMASS	PERCENT
CHRYSOPHYCEAE	OCHROMONAS SP.	1293.27	49.36
BACILLARIOPHYCEAE	STEPHANODISCUS NIAGARAE	235.62	8.99
CRYPTOPHYCEAE	CRYPTOMONAS OVATA	159.52	6.09
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	130.47	4.98
CHLOROPHYCEAE	MOUGEOTIA SP.	107.62	4.11

2 NMPP/10 FT

		BIOMASS	PERCENT
CHRYSOPHYCEAE	OCHROMONAS SP.	926.52	57.14
CRYPTOPHYCEAE	CRYPTOMONAS OVATA	141.80	8.74
BACILLARIOPHYCEAE	COSCINODISCUS LACUSTRIS	106.69	6.58
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	72.48	4.47
BACILLARIOPHYCEAE	DIATOMA ELONGATUM	67.94	4.19

3 FITZ/10 FT

		BIOMASS	PERCENT
CHRYSOPHYCEAE	OCHROMONAS SP.	1494.74	70.39
DINOPHYCEAE	CERATIUM HIRUNDINELLA	199.33	9.39
CRYPTOPHYCEAE	CRYPTOMONAS OVATA	106.35	5.01
BACILLARIOPHYCEAE	DIATOMA ELONGATUM	46.20	2.18
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	43.49	2.05

4 NMPE/10 FT

		BIOMASS	PERCENT
CHRYSOPHYCEAE	OCHROMONAS SP.	1036.31	63.95
CRYPTOPHYCEAE	CRYPTOMONAS OVATA	212.69	13.12
CHLOROPHYCEAE	MOUGEOTIA SP.	61.96	3.82
BACILLARIOPHYCEAE	DIATOMA ELONGATUM	48.92	3.02
CHLOROPHYCEAE	ANKISTRODESMUS FALCATUS	40.88	2.52

5 NMPW/20 FT

		BIOMASS	PERCENT
CHRYSOPHYCEAE	OCHROMONAS SP.	1220.89	40.01
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	362.42	11.88
BACILLARIOPHYCEAE	COSCINODISCUS LACUSTRIS	213.37	6.99
CHLOROPHYCEAE	CHLAMYDOMONAS GLOBOSA	114.06	3.74
CHLOROPHYCEAE	MOUGEOTIA SP.	112.51	3.69

6 NMPP/20 FT

		BIOMASS	PERCENT
CHRYSOPHYCEAE	OCHROMONAS SP.	1102.66	63.67
CRYPTOPHYCEAE	CRYPTOMONAS OVATA	212.69	12.28
BACILLARIOPHYCEAE	DIATOMA ELONGATUM	76.09	4.39
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	57.99	3.35
CHLOROPHYCEAE	ANKISTRODESMUS FALCATUS	34.31	1.98

APPENDIX VA-3 (Continued)

7 FITZ/20 FT

		BIOMASS	PERCENT
CHRYSOPHYCEAE	OCHROMONAS SP.	1308.96	71.51
CRYPTOPHYCEAE	CRYPTOMONAS OVATA	124.07	6.78
BACILLARIOPHYCEAE	DIATOMA ELONGATUM	65.22	3.56
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	57.99	3.17
CHLOROPHYCEAE	MOUGEOTIA SP.	30.98	1.69

8 NMPE/20 FT

		BIOMASS	PERCENT
CHRYSOPHYCEAE	OCHROMONAS SP.	2428.50	71.82
CRYPTOPHYCEAE	CRYPTOMONAS OVATA	212.69	6.29
DINOPHYCEAE	CERATIUM HIRUNDINELLA	199.33	5.89
BACILLARIOPHYCEAE	DIATOMA ELONGATUM	111.42	3.30
BACILLARIOPHYCEAE	FRAGILARIA CROTONENSIS	71.76	2.12

9 NMPW/40 FT

		BIOMASS	PERCENT
CHRYSOPHYCEAE	OCHROMONAS SP.	1352.39	65.62
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	101.48	4.92
BACILLARIOPHYCEAE	DIATOMA ELONGATUM	97.83	4.75
DINOPHYCEAE	PERIDINIUM ACICULIFERUM	82.35	4.00
CRYPTOPHYCEAE	CRYPTOMONAS OVATA	53.17	2.58

10 NMPP/40 FT

		BIOMASS	PERCENT
CHRYSOPHYCEAE	OCHROMONAS SP.	1965.24	65.08
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	202.95	6.72
CRYPTOPHYCEAE	CRYPTOMONAS OVATA	177.24	5.87
DINOPHYCEAE	PERIDINIUM ACICULIFERUM	164.70	5.45
BACILLARIOPHYCEAE	DIATOMA ELONGATUM	86.96	2.88

11 FITZ/40 FT

		BIOMASS	PERCENT
CHRYSOPHYCEAE	OCHROMONAS SP.	1491.12	67.83
CRYPTOPHYCEAE	CRYPTOMONAS OVATA	212.69	9.68
DINOPHYCEAE	PERIDINIUM ACICULIFERUM	82.35	3.75
BACILLARIOPHYCEAE	DIATOMA ELONGATUM	67.94	3.09
CHLOROPHYCEAE	MOUGEOTIA SP.	66.85	3.04

12 NMPE/40 FT

		BIOMASS	PERCENT
CHRYSOPHYCEAE	OCHROMONAS SP.	830.01	65.04
CRYPTOPHYCEAE	CRYPTOMONAS OVATA	159.52	12.50
CHRYSOPHYCEAE	CHRYSOCHROMULINA PARVA	69.31	5.43
CHLOROPHYCEAE	ANKISTRODESMUS FALCATUS	29.93	2.35
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	28.99	2.27

13 NMPW/60 FT

		BIOMASS	PERCENT
CHRYSOPHYCEAE	OCHROMONAS SP.	906.01	68.98
CRYPTOPHYCEAE	CRYPTOMONAS OVATA	106.35	8.10
BACILLARIOPHYCEAE	DIATOMA ELONGATUM	81.53	6.21

LOROPHYCEAE	MOUGEOTIA SP.	37.50	2.86
RYPTOPHYCEAE	CRYPTOMONAS EROSA	28.99	2.21

14 NMPP/60 FT

		BIOMASS	PERCENT
CHRYSOPHYCEAE	OCHROMONAS SP.	1366.86	67.37
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	144.97	7.15
CRYPTOPHYCEAE	CRYPTOMONAS OVATA	141.80	6.99
BACILLARIOPHYCEAE	DIATOMA ELONGATUM	97.83	4.82
CHLOROPHYCEAE	ANKISTRODESMUS FALCATUS	35.77	1.76

15 FITZ/60 FT

		BIOMASS	PERCENT
CRYPTOPHYCEAE	CRYPTOMONAS OVATA	16093.78	88.39
CHRYSOPHYCEAE	OCHROMONAS SP.	1564.71	8.59
DINOPHYCEAE	PERIDINIUM ACICULIFERUM	164.70	0.90
BACILLARIOPHYCEAE	DIATOMA ELONGATUM	76.09	0.42
BACILLARIOPHYCEAE	CYCLOTELLA MENEGHINIANA	60.82	0.33

16 NMPE/60 FT

		BIOMASS	PERCENT
CHRYSOPHYCEAE	OCHROMONAS SP.	469.29	51.27
CRYPTOPHYCEAE	CRYPTOMONAS OVATA	194.97	21.30
CHRYSOPHYCEAE	CHRYSOCHROMULINA PARVA	67.29	7.35
CHLOROPHYCEAE	ANKISTRODESMUS FALCATUS	37.96	4.15
BACILLARIOPHYCEAE	DIATOMA ELONGATUM	29.89	3.27

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NINE MILE POINT VICINITY - 1975
AVERAGE OF PRIMARY AND REPLICATE SAMPLES
TOP FIVE SPECIES BY BIOMASS MG/M*3 AND PERCENT OF TOTAL OF SURFACE WHOLE WATER PHYTOPLANKTON AT EACH SAMPLING STATION.
JUL 8,1975 .

1 NMPW/10 FT

		BIOMASS	PERCENT
CHRYSOPHYCEAE	DINOBRYON SOCIALE	119.41	13.98
DINOPHYCEAE	PERIDINIUM CINCTUM	88.36	10.34
CHLOROPHYCEAE	MOUGEOTIA SP.	88.17	10.32
DINOPHYCEAE	GLENODINIUM PULVISCULUS	50.61	5.92
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	47.64	5.58

2 NMPP/10 FT

		BIOMASS	PERCENT
CHLOROPHYCEAE	CLOSTERIUM MONULIFERUM	346.23	33.81
CRYPTOPHYCEAE	CRYPTOMONAS OVATA	98.64	9.63
CHRYSOPHYCEAE	DINOBRYON SOCIALE VAR. AMERICA	63.17	6.17
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	59.55	5.82
CHLOROPHYCEAE	MOUGEOTIA SP.	56.68	5.54

3 FITZ/10 FT

		BIOMASS	PERCENT
CHRYSOPHYCEAE	DINOBRYON SOCIALE	145.22	20.46
CHLOROPHYCEAE	MOUGEOTIA SP.	73.47	10.35
CHLOROPHYCEAE	CARTERIA CORDIFORMIS	54.95	7.74
CRYPTOPHYCEAE	CRYPTOMONAS OVATA	53.80	7.58
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	47.64	6.71

4 NMPE/10 FT

		BIOMASS	PERCENT
CHRYSOPHYCEAE	DINOBRYON SOCIALE	104.56	20.04
CHLOROPHYCEAE	MOUGEOTIA SP.	102.86	19.72
CRYPTOPHYCEAE	CRYPTOMONAS OVATA	80.71	15.47
CHRYSOPHYCEAE	DINOBRYON SOCIALE VAR. AMERICA	34.01	6.52
DINOPHYCEAE	GLENODINIUM SP.	33.15	6.35

5 NMPW/20 FT

		BIOMASS	PERCENT
CHRYSOPHYCEAE	DINOBRYON SOCIALE	138.12	14.25
CHLOROPHYCEAE	MOUGEOTIA SP.	132.25	13.64
CRYPTOPHYCEAE	CRYPTOMONAS OVATA	89.68	9.25
CHLOROPHYCEAE	CARTERIA CORDIFORMIS	79.37	8.19
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	53.59	5.53

6 NMPP/20 FT

		BIOMASS	PERCENT
CHRYSOPHYCEAE	DINOBRYON SOCIALE VAR. AMERICA	138.48	14.87
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	113.14	12.15
CRYPTOPHYCEAE	CRYPTOMONAS OVATA	98.64	10.59
BACILLARIOPHYCEAE	CYCLOTELLA MENEGHINIANA	52.85	5.67
CHLOROPHYCEAE	MOUGEOTIA SP.	52.48	5.63

7 [illegible]/20 FT

		BIOMASS	PERCENT
DINOPHYCEAE	GYMNODINIUM SP.	233.99	25.37
CRYPTOPHYCEAE	CRYPTOMONAS OVATA	134.51	14.58
CHRYSOPHYCEAE	DINOBRYON SOCIALE VAR. AMERICA	75.31	8.16
CHRYSOPHYCEAE	DINOBRYON SOCIALE	66.48	7.21
CHLOROPHYCEAE	MOUGEOTIA SP.	56.68	6.14

8 NMPE/20 FT

		BIOMASS	PERCENT
CHLOROPHYCEAE	MOUGEOTIA SP.	119.65	22.88
CRYPTOPHYCEAE	CRYPTOMONAS OVATA	107.61	20.58
CHRYSOPHYCEAE	DINOBRYON SOCIALE	95.52	18.27
CRYPTOPHYCEAE	CRYPTOMONAS MARSSONII	32.14	6.15
BACILLARIOPHYCEAE	CYCLOTELLA MENEGHINIANA	26.42	5.05

9 NMPW/40 FT

		BIOMASS	PERCENT
BACILLARIOPHYCEAE	STEPHANODISCUS NIAGARAE	158.75	13.63
CHRYSOPHYCEAE	DINOBRYON SOCIALE VAR. AMERICA	111.76	9.59
DINOPHYCEAE	GLENODINIUM PULVISCULUS	101.22	8.69
CHLOROPHYCEAE	CARTERIA CORDIFORMIS	97.69	8.39
CHRYSOPHYCEAE	DINOBRYON SOCIALE	61.96	5.32

10 NMPP/40 FT

		BIOMASS	PERCENT
CRYPTOPHYCEAE	CRYPTOMONAS OVATA	224.19	28.17
CHRYSOPHYCEAE	DINOBRYON SOCIALE	71.64	9.00
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	65.50	8.23
CHLOROPHYCEAE	MOUGEOTIA SP.	65.07	8.18
CRYPTOPHYCEAE	CRYPTOMONAS MARSSONII	48.22	6.06

11 FITZ/40 FT

		BIOMASS	PERCENT
CRYPTOPHYCEAE	CRYPTOMONAS OVATA	134.51	22.46
CHLOROPHYCEAE	MOUGEOTIA SP.	79.77	13.32
CHRYSOPHYCEAE	DINOBRYON SOCIALE	56.15	9.38
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	53.59	8.95
CHRYSOPHYCEAE	DINOBRYON SOCIALE VAR. AMERICA	51.02	8.52

12 NMPE/40 FT

		BIOMASS	PERCENT
CRYPTOPHYCEAE	CRYPTOMONAS OVATA	143.48	20.47
CHLOROPHYCEAE	MOUGEOTIA SP.	130.15	18.57
CHRYSOPHYCEAE	DINOBRYON SOCIALE	118.76	16.94
CRYPTOPHYCEAE	CRYPTOMONAS MARSSONII	57.14	8.15
CRYPTOPHYCEAE	CHROOMONAS ACUTA	54.74	7.81

13 NMPW/60 FT

		BIOMASS	PERCENT
DINOPHYCEAE	PERIDINIUM INCONSPICUUM	222.92	28.81
CHRYSOPHYCEAE	DINOBRYON SOCIALE VAR. AMERICA	160.35	20.72
CHLOROPHYCEAE	MOUGEOTIA SP.	77.67	10.04

CRYPTOPHYCEAE	CRYPTOMONAS OVATA	62.77	8.11
CHRYSOPHYCEAE	DINOBRYON SOCIALE	45.82	5.92

14 NMPP/60 FT.

		BIOMASS	PERCENT
CRYPTOPHYCEAE	CRYPTOMONAS OVATA	143.48	17.68
CHLOROPHYCEAE	MOUGEOTIA SP.	115.46	14.22
CHRYSOPHYCEAE	DINOBRYON SOCIALE VAR. AMERICA	109.33	13.47
CHRYSOPHYCEAE	DINOBRYON SOCIALE	107.14	13.20
DINOPHYCEAE	GLENODINIUM PULVISCULUS	50.61	6.24

15 FITZ/60 FT

		BIOMASS	PERCENT
CRYPTOPHYCEAE	CRYPTOMONAS OVATA	107.61	21.94
CHRYSOPHYCEAE	DINOBRYON SOCIALE	61.96	12.63
DINOPHYCEAE	GYMNODINIUM SP.	46.80	9.54
CRYPTOPHYCEAE	CRYPTOMONAS MARSSONII	39.29	8.01
CHRYSOPHYCEAE	DINOBRYON SOCIALE VAR. AMERICA	24.29	4.95

16 NMPE/60 FT

		BIOMASS	PERCENT
CRYPTOPHYCEAE	CRYPTOMONAS OVATA	161.41	21.69
CHRYSOPHYCEAE	DINOBRYON SOCIALE	149.10	20.04
CHLOROPHYCEAE	MOUGEOTIA SP.	77.67	10.44
CRYPTOPHYCEAE	CRYPTOMONAS MARSSONII	57.14	7.68
CHRYSOPHYCEAE	DINOBRYON SOCIALE VAR. AMERICA	51.02	6.86

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APPENDIX VA-3 (Continued)

NINE MILE POINT VICINITY 1975
AVERAGE OF PRIMARY AND REPLICATE SAMPLES
TOP FIVE SPECIES BY BIOMASS MG/M*3 AND PERCENT OF TOTAL OF SURFACE WHOLE WATER PHYTOPLANKTON AT EACH SAMPLING STATION.
JUL 29,1975 .

1 NMPW/10 FT

		BIOMASS	PERCENT
DINOPHYCEAE	GLENODINIUM PULVISCULUS	1428.89	30.11
BACILLARIOPHYCEAE	COSCINODISCUS ROTHII	765.55	16.13
CHLOROPHYCEAE	CARTERIA CORDIFORMIS	297.91	6.28
DINOPHYCEAE	PERIDINIUM CINCTUM	243.79	5.14
BACILLARIOPHYCEAE	CYCLOTELLA MENEGHINIANA	184.78	3.89

2 NMPP/10 FT

		BIOMASS	PERCENT
BACILLARIOPHYCEAE	COSCINODISCUS ROTHII	191.39	16.87
DINOPHYCEAE	PERIDINIUM CINCTUM	121.89	10.74
BACILLARIOPHYCEAE	CYCLOTELLA MENEGHINIANA	119.76	10.55
BACILLARIOPHYCEAE	MELOSIRA GRANULATA	84.13	7.41
MYXOPHYCEAE	ANACYSTIS AERUGINOSA	70.86	6.24

3 FITZ/10 FT

		BIOMASS	PERCENT
BACILLARIOPHYCEAE	COSCINODISCUS ROTHII	738.20	25.83
DINOPHYCEAE	GLENODINIUM PULVISCULUS	372.75	13.05
BACILLARIOPHYCEAE	COSCINODISCUS LACUSTRIS	246.07	8.61
BACILLARIOPHYCEAE	MELOSIRA ITALICA	135.63	4.75
BACILLARIOPHYCEAE	MELOSIRA GRANULATA	130.47	4.57

4 NMPE/10 FT

		BIOMASS	PERCENT
BACILLARIOPHYCEAE	COSCINODISCUS ROTHII	191.39	14.89
DINOPHYCEAE	PERIDINIUM CINCTUM	121.89	9.48
DINOPHYCEAE	GLENODINIUM PULVISCULUS	93.19	7.25
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	78.57	6.11
CHRYSOPHYCEAE	OCHROMONAS SP.	73.72	5.73

5 NMPW/20 FT

		BIOMASS	PERCENT
DINOPHYCEAE	GYMNODINIUM SP.	125.19	19.50
DINOPHYCEAE	GLENODINIUM PULVISCULUS	124.25	19.35
CHRYSOPHYCEAE	OCHROMONAS SP.	56.61	8.82
BACILLARIOPHYCEAE	COSCINODISCUS ROTHII	54.68	8.52
BACILLARIOPHYCEAE	CYCLOTELLA MENEGHINIANA	30.80	4.80

6 NMPP/20 FT

		BIOMASS	PERCENT
DINOPHYCEAE	GLENODINIUM PULVISCULUS	217.44	21.03
CRYPTOPHYCEAE	CRYPTOMONAS OVATA	121.59	11.76
BACILLARIOPHYCEAE	CYCLOTELLA MENEGHINIANA	95.81	9.26
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	52.38	5.06
CHRYSOPHYCEAE	OCHROMONAS SP.	51.34	4.96

7 FITZ/20 FT

		BIOMASS	PERCENT
BACILLARIOPHYCEAE	COSCINODISCUS ROTHII	546.82	26.65
DINOPHYCEAE	GLENODINIUM PULVISCULUS	528.07	25.73
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	144.04	7.02
DINOPHYCEAE	CERATIUM HIRUNDINELLA	78.84	3.84
BACILLARIOPHYCEAE	CYCLOTELLA MENEGHINIANA	75.28	3.67

8 NMPE/20 FT

		BIOMASS	PERCENT
DINOPHYCEAE	PERIDINIUM CINCTUM	243.79	13.70
BACILLARIOPHYCEAE	COSCINODISCUS ROTHII	191.39	10.76
BACILLARIOPHYCEAE	STEPHANODISCUS HANTZSCHII	127.17	7.15
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	117.85	6.63
BACILLARIOPHYCEAE	MELOSIRA ISLANDICA	106.41	5.98

9 NMPW/40 FT

		BIOMASS	PERCENT
DINOPHYCEAE	PERIDINIUM ACICULIFERUM	160.41	28.32
DINOPHYCEAE	PERIDINIUM CINCTUM	121.89	21.52
CHRYSOPHYCEAE	OCHROMONAS SP.	52.00	9.18
BACILLARIOPHYCEAE	MELOSIRA ISLANDICA	43.82	7.73
CRYPTOPHYCEAE	CRYPTOMONAS OVATA	40.53	7.15

10 NMPP/40 FT

		BIOMASS	PERCENT
BACILLARIOPHYCEAE	COSCINODISCUS ROTHII	546.82	26.15
DINOPHYCEAE	GLENODINIUM PULVISCULUS	341.69	16.34
BACILLARIOPHYCEAE	MELOSIRA GRANULATA	148.76	7.11
BACILLARIOPHYCEAE	MELOSIRA ITALICA	119.98	5.74
BACILLARIOPHYCEAE	CYCLOTELLA MENEGHINIANA	106.08	5.07

11 FITZ/40 FT

		BIOMASS	PERCENT
DINOPHYCEAE	GLENODINIUM PULVISCULUS	528.07	23.75
BACILLARIOPHYCEAE	MELOSIRA GRANULATA	391.47	17.61
BACILLARIOPHYCEAE	COSCINODISCUS ROTHII	246.07	11.07
BACILLARIOPHYCEAE	MELOSIRA ITALICA	100.27	4.51
BACILLARIOPHYCEAE	CYCLOTELLA MENEGHINIANA	92.39	4.16

12 NMPE/40 FT

		BIOMASS	PERCENT
DINOPHYCEAE	GLENODINIUM PULVISCULUS	776.57	30.59
BACILLARIOPHYCEAE	COSCINODISCUS ROTHII	300.75	11.85
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	218.25	8.60
DINOPHYCEAE	PERIDINIUM CINCTUM	121.89	4.80
CRYPTOPHYCEAE	CHROOMONAS ACUTA	104.68	4.12

13 NMPW/60 FT

		BIOMASS	PERCENT
[illegible]INOPHYCEAE	GLENODINIUM PULVISCULUS	124.25	20.47
DINOPHYCEAE	CERATIUM HIRUNDINELLA	78.84	12.99
CRYPTOPHYCEAE	CRYPTOMONAS OVATA	69.48	11.45

BACILLARIOPHYCEAE	COSCINODISCUS ROTHII	54.68	9.01
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	39.28	6.47

14 NMPP/60 FT

		BIOMASS	PERCENT
BACILLARIOPHYCEAE	COSCINODISCUS ROTHII	492.14	27.23
DINOPHYCEAE	GLENODINIUM PULVISCULUS	310.63	17.19
CRYPTOPHYCEAE	CRYPTOMONAS OVATA	98.43	5.45
CRYPTOPHYCEAE	CRYPTOMONAS MARSSONII	84.49	4.67
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	69.84	3.86

15 FITZ/60 FT

		BIOMASS	PERCENT
BACILLARIOPHYCEAE	COSCINODISCUS ROTHII	355.43	21.72
DINOPHYCEAE	PERIDINIUM CINCTUM	243.79	14.90
DINOPHYCEAE	GLENODINIUM PULVISCULUS	124.25	7.59
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	109.12	6.67
BACILLARIOPHYCEAE	MELOSIRA GRANULATA	73.16	4.47

16 NMPE/60 FT

		BIOMASS	PERCENT
BACILLARIOPHYCEAE	MELOSIRA ISLANDICA	126.24	13.17
DINOPHYCEAE	GLENODINIUM PULVISCULUS	124.25	12.96
BACILLARIOPHYCEAE	COSCINODISCUS ROTHII	82.02	8.56
CRYPTOPHYCEAE	CRYPTOMONAS OVATA	69.48	7.25
BACILLARIOPHYCEAE	CYCLOTELLA MENEGHINIANA	68.44	7.14

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APPENDIX VA-3 (Continued)

NINE MILE POINT VICINITY - 1975
AVERAGE OF PRIMARY AND REPLICATE SAMPLES
TOP FIVE SPECIES BY BIOMASS MG/M*3 AND PERCENT OF TOTAL OF SURFACE WHOLE WATER PHYTOPLANKTON AT EACH SAMPLING STATION.
AUG 4,1975 .

1 NMPW/10 FT

		BIOMASS	PERCENT
DINOPHYCEAE	GLENODINIUM PULVISCULUS	924.55	32.17
DINOPHYCEAE	PERIDINIUM ACICULIFERUM	450.20	15.66
MYXOPHYCEAE	ANABAENA SP.	231.54	8.06
BACILLARIOPHYCEAE	CYCLOTELLA MENEGHINIANA	226.74	7.89
CHLOROPHYCEAE	CARTERIA CORDIFORMIS	167.81	5.84

2 NMPP/10 FT

		BIOMASS	PERCENT
MYXOPHYCEAE	ANABAENA SP.	112.83	18.17
BACILLARIOPHYCEAE	CYCLOTELLA MENEGHINIANA	67.73	10.91
CHLOROPHYCEAE	CARTERIA CORDIFORMIS	53.39	8.60
DINOPHYCEAE	PERIDINIUM ACICULIFERUM	50.02	8.06
DINOPHYCEAE	GLENODINIUM PULVISCULUS	49.98	8.05

3 FITZ/10 FT

		BIOMASS	PERCENT
DINOPHYCEAE	PERIDINIUM CINCIUM	184.27	13.38
DINOPHYCEAE	PERIDINIUM CUNNINGTONII	181.64	13.18
CHLOROPHYCEAE	CARTERIA CORDIFORMIS	167.81	12.18
MYXOPHYCEAE	ANABAENA SP.	122.33	8.88
DINOPHYCEAE	CERATIUM HIRUNDINELLA	118.05	8.57

4 NMPE/10 FT

		BIOMASS	PERCENT
DINOPHYCEAE	GLENODINIUM PULVISCULUS	199.90	26.07
DINOPHYCEAE	PERIDINIUM CINCIUM	92.14	12.01
CHLOROPHYCEAE	CARTERIA CORDIFORMIS	80.09	10.44
CHLOROPHYCEAE	CHLAMYDOMONAS SP.	52.14	6.80
DINOPHYCEAE	PERIDINIUM ACICULIFERUM	50.02	6.52

5 NMPW/20 FT

		BIOMASS	PERCENT
DINOPHYCEAE	GLENODINIUM PULVISCULUS	1349.34	47.87
MYXOPHYCEAE	ANABAENA SP.	310.33	11.01
DINOPHYCEAE	PERIDINIUM ACICULIFERUM	250.11	8.87
BACILLARIOPHYCEAE	CYCLOTELLA MENEGHINIANA	200.23	7.10
DINOPHYCEAE	CERATIUM HIRUNDINELLA	157.40	5.58

6 NMPP/20 FT

		BIOMASS	PERCENT
DINOPHYCEAE	GLENODINIUM PULVISCULUS	599.71	26.41
MYXOPHYCEAE	ANABAENA SP.	245.36	10.80
CHLOROPHYCEAE	CARTERIA CORDIFORMIS	232.65	10.24
DINOPHYCEAE	PERIDINIUM SP.	222.83	9.81
DINOPHYCEAE	PERIDINIUM CINCIUM	184.27	8.11

APPENDIX VA-3 (Continued).

7 F[illegible]20 FT

		BIOMASS	PERCENT
DINOPHYCEAE	PERIDINIUM SP.	278.54	23.09
CHLOROPHYCEAE	CARTERIA CORDIFORMIS	175.44	14.54
DINOPHYCEAE	GLENODINIUM PULVISCULUS	124.94	10.36
DINOPHYCEAE	PERIDINIUM ACICULIFERUM	100.04	8.29
DINOPHYCEAE	PERIDINIUM CINCTUM	92.14	7.64

8 NMPE/20 FT

		BIOMASS	PERCENT
DINOPHYCEAE	PERIDINIUM CINCTUM	184.27	18.27
CHLOROPHYCEAE	CARTERIA CORDIFORMIS	152.55	15.13
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	100.44	9.96
DINOPHYCEAE	PERIDINIUM CUNNINGTONII	90.82	9.00
DINOPHYCEAE	GLENODINIUM PULVISCULUS	74.96	7.43

9 NMPW/40 FT

		BIOMASS	PERCENT
DINOPHYCEAE	GLENODINIUM PULVISCULUS	1674.18	56.83
CHLOROPHYCEAE	CARTERIA CORDIFORMIS	198.32	6.73
DINOPHYCEAE	PERIDINIUM SP.	167.12	5.67
MYXOPHYCEAE	ANABAENA SP.	162.77	5.53
BACILLARIOPHYCEAE	COSCINODISCUS ROTHII	114.94	3.90

10 NMPP/40 FT

		BIOMASS	PERCENT
DINOPHYCEAE	GLENODINIUM PULVISCULUS	399.80	26.22
MYXOPHYCEAE	ANABAENA SP.	208.90	13.70
DINOPHYCEAE	PERIDINIUM ACICULIFERUM	150.07	9.84
BACILLARIOPHYCEAE	CYCLOTELLA MENEGHINIANA	123.67	8.11
CHLOROPHYCEAE	CARTERIA CORDIFORMIS	95.35	6.25

11 FITZ/40 FT

		BIOMASS	PERCENT
DINOPHYCEAE	PERIDINIUM CINCTUM	460.69	37.95
DINOPHYCEAE	PERIDINIUM SP.	167.12	13.77
DINOPHYCEAE	CERATIUM HIRUNDINELLA	118.05	9.72
DINOPHYCEAE	PERIDINIUM ACICULIFERUM	100.04	8.24
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	50.22	4.14

12 NMPE/40 FT

		BIOMASS	PERCENT
DINOPHYCEAE	PERIDINIUM ACICULIFERUM	150.07	19.90
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	114.79	15.23
DINOPHYCEAE	PERIDINIUM SP.	111.41	14.78
CHLOROPHYCEAE	CARTERIA CORDIFORMIS	53.39	7.08
CRYPTOPHYCEAE	CRYPTOMONAS MARSSONII	46.52	6.17

13 NMPW/60 FT

		BIOMASS	PERCENT
DINOPHYCEAE	GLENODINIUM PULVISCULUS	274.86	27.28
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	104.03	10.32
CHLOROPHYCEAE	CARTERIA CORDIFORMIS	102.97	10.22

MYXOPHYCEAE	ANABAENA SP.	100.39	9.96
BACILLARIOPHYCEAE	CYCLOTELLA MENEGHINIANA	64.78	6.43

14 NMPP/60 FT

		BIOMASS	PERCENT
DINOPHYCEAE	GLENODINIUM PULVISCULUS	374.82	23.15
DINOPHYCEAE	PERIDINIUM CUNNINGTONII	242.18	14.96
CHLOROPHYCEAE	CARTERIA CORDIFORMIS	217.39	13.43
MYXOPHYCEAE	ANABAENA SP.	141.43	8.73
DINOPHYCEAE	PERIDINIUM SP.	139.27	8.60

15 FITZ/60 FT

		BIOMASS	PERCENT
DINOPHYCEAE	PERIDINIUM CINCTUM	276.41	27.31
DINOPHYCEAE	CERATIUM HIRUNDINELLA	118.05	11.66
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	86.09	8.51
DINOPHYCEAE	PERIDINIUM SP.	83.56	8.26
CHLOROPHYCEAE	CARTERIA CORDIFORMIS	76.28	7.54

16 NMPE/60 FT

		BIOMASS	PERCENT
DINOPHYCEAE	GLENODINIUM PULVISCULUS	227.68	21.65
DINOPHYCEAE	PERIDINIUM CINCTUM	184.27	17.53
DINOPHYCEAE	PERIDINIUM SP.	139.27	13.24
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	64.57	6.14
DINOPHYCEAE	PERIDINIUM CUNNINGTONII	60.55	5.76

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APPENDIX VA-3 (Continued)

NINE MILE POINT VICINITY 1975
AVERAGE OF PRIMARY AND REPLICATE SAMPLES
TOP FIVE SPECIES BY BIOMASS MG/M*3 AND PERCENT OF TOTAL OF SURFACE WHOLE WATER PHYTOPLANKTON AT EACH SAMPLING STATION.
AUG 24,1975 .

1 NMPW/10 FT

		BIOMASS	PERCENT
DINOPHYCEAE	GLENODINIUM PULVISCULUS	2939.79	70.59
CRYPTOPHYCEAE	CHROOMONAS ACUTA	233.74	5.61
DINOPHYCEAE	CERATIUM HIRUNDINELLA	165.05	3.96
CHLOROPHYCEAE	COELASTRUM MICROPORUM	80.26	1.93
CRYPTOPHYCEAE	CRYPTOMONAS OVATA	64.87	1.56

2 NMPP/10 FT

		BIOMASS	PERCENT
DINOPHYCEAE	CERATIUM HIRUNDINELLA	82.53	15.08
DINOPHYCEAE	GLENODINIUM PULVISCULUS	77.36	14.14
CHLOROPHYCEAE	COELASTRUM MICROPORUM	45.65	8.34
CHLOROPHYCEAE	EUDORINA ELEGANS	35.35	6.46
MYXOPHYCEAE	COELOSPHAERIUM KUETZINGIA	31.20	5.70

3 FITZ/10 FT

		BIOMASS	PERCENT
BACILLARIOPHYCEAE	CYCLOTELLA MENEGHINIANA	71.37	15.33
CHLOROPHYCEAE	PANDORINA MORUM	71.27	15.31
CHLOROPHYCEAE	COELASTRUM MICROPORUM	26.51	5.69
CHRYSOPHYCEAE	CHRYSOCHROMULINA PARVA	25.51	5.48
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	19.71	4.23

4 NMPE/10 FT

		BIOMASS	PERCENT
CRYPTOPHYCEAE	CHROOMONAS ACUTA	377.58	18.34
DINOPHYCEAE	GLENODINIUM PULVISCULUS	232.09	11.27
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	206.95	10.05
BACILLARIOPHYCEAE	CYCLOTELLA MENEGHINIANA	121.33	5.89
BACILLARIOPHYCEAE	COSCINODISCUS ROTHII	120.30	5.84

5 NMPW/20 FT

		BIOMASS	PERCENT
DINOPHYCEAE	GLENODINIUM PULVISCULUS	773.63	39.09
DINOPHYCEAE	CERATIUM HIRUNDINELLA	165.05	8.34
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	128.11	6.47
CRYPTOPHYCEAE	CHROOMONAS ACUTA	111.48	5.63
BACILLARIOPHYCEAE	CYCLOTELLA MENEGHINIANA	78.51	3.97

6 NMPP/20 FT

		BIOMASS	PERCENT
CHLOROPHYCEAE	EUDORINA ELEGANS	88.37	19.10
DINOPHYCEAE	CERATIUM HIRUNDINELLA	82.53	17.83
CHLOROPHYCEAE	STAURASTRUM SP.	42.85	9.26
CHLOROPHYCEAE	COELASTRUM MICROPORUM	28.72	6.21
CHRYSOPHYCEAE	CHRYSOCHROMULINA PARVA	25.21	5.45

7 FITZ/20 FT

		BIOMASS	PERCENT
CHLOROPHYCEAE	EUDORINA ELEGANS	68.49	19.29
CHLOROPHYCEAE	OOCYSTIS BORGEI	30.14	8.49
CHRYSOPHYCEAE	CHRYSOCHROMULINA PARVA	26.12	7.36
CHLOROPHYCEAE	MOUGEOTIA SP.	21.13	5.95
CHLOROPHYCEAE	TETRASPORA LACUSTRIS	19.26	5.43

8 NMPE/20 FT

		BIOMASS	PERCENT
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	482.89	17.38
CRYPTOPHYCEAE	CHROOMONAS ACUTA	345.22	12.43
DINOPHYCEAE	GLENODINIUM PULVISCULUS	232.09	8.36
CHLOROPHYCEAE	COSMARIUM SP.	198.25	7.14
BACILLARIOPHYCEAE	CYCLOTELLA MENEGHINIANA	135.60	4.88

9 NMPW/40 FT

		BIOMASS	PERCENT
DINOPHYCEAE	GLENODINIUM PULVISCULUS	1237.81	49.43
DINOPHYCEAE	CERATIUM HIRUNDINELLA	165.05	6.59
CRYPTOPHYCEAE	CHROOMONAS ACUTA	155.83	6.22
CHLOROPHYCEAE	PANDORINA MORUM	71.27	2.85
DINOPHYCEAE	PERIDINIUM SP.	69.63	2.78

10 NMPP/40 FT.

		BIOMASS	PERCENT
CHRYSOPHYCEAE	CHRYSOCHROMULINA PARVA	32.12	10.21
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	29.56	9.40
CHLOROPHYCEAE	GLOEOCYSTIS GIGAS	27.59	8.77
CHLOROPHYCEAE	CHLAMYDOMONAS SP.	25.17	8.00
CHLOROPHYCEAE	OOCYSTIS BORGEI	18.08	5.75

11 FITZ/40 FT

		BIOMASS	PERCENT
DINOPHYCEAE	PERIDINIUM CINCTUM	131.39	20.04
DINOPHYCEAE	GLENODINIUM PULVISCULUS	77.36	11.80
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	68.98	10.52
CHRYSOPHYCEAE	CHRYSOCHROMULINA PARVA	34.22	5.22
CHLOROPHYCEAE	MICRACTINIUM PUSILLUM	30.58	4.67

12 NMPE/40 FT

		BIOMASS	PERCENT
CRYPTOPHYCEAE	CHROOMONAS ACUTA	186.99	15.98
DINOPHYCEAE	GLENODINIUM PULVISCULUS	154.73	13.23
BACILLARIOPHYCEAE	CYCLOTELLA MENEGHINIANA	135.60	11.59
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	118.26	10.11
CHLOROPHYCEAE	COELASTRUM MICROPORUM	65.54	5.60

13 [illegible]H/60 FT

		BIOMASS	PERCENT
DINOPHYCEAE	GLENODINIUM PULVISCULUS	386.81	30.78
DINOPHYCEAE	CERATIUM HIRUNDINELLA	82.53	6.57
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	78.84	6.27

BACILLARIOPHYCEAE	CYCLOTELLA MENEGHINIANA	78.51	6.25
CRYPTOPHYCEAE	CRYPTOMONAS OVATA	64.87	5.16

14 NMPP/60 FT

		BIOMASS	PERCENT
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	29.56	11.14
CRYPTOPHYCEAE	CHROOMONAS ACUTA	25.17	9.49
CHRYSOPHYCEAE	CHRYSOCHROMULINA PARVA	24.31	9.16
CHLOROPHYCEAE	COELASTRUM MICROPORUM	17.67	6.66
MYXOPHYCEAE	OSCILLATORIA LIMNETICA	16.46	6.20

15 FITZ/60 FT

		BIOMASS	PERCENT
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	59.13	14.85
CRYPTOPHYCEAE	CHROOMONAS ACUTA	43.15	10.84
CHRYSOPHYCEAE	CHRYSOCHROMULINA PARVA	41.43	10.41
CHLOROPHYCEAE	COELASTRUM MICROPORUM	23.56	5.92
CRYPTOPHYCEAE	CRYPTOMONAS OVATA	21.62	5.43

16 NMPE/60 FT

		BIOMASS	PERCENT
DINOPHYCEAE	GLENODINIUM PULVISCULUS	77.36	10.64
BACILLARIOPHYCEAE	CYCLOTELLA MENEGHINIANA	71.37	9.82
DINOPHYCEAE	PERIDINIUM CUNNINGTONII	70.97	9.76
CRYPTOPHYCEAE	CHROOMONAS ACUTA	49.15	6.76
CHRYSOPHYCEAE	CHRYSOCHROMULINA PARVA	42.32	5.82

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NINE MILE POINT VICINITY - 1975
AVERAGE OF PRIMARY AND REPLICATE SAMPLES
TOP FIVE SPECIES BY BIOMASS MG/M*3 AND PERCENT OF TOTAL OF SURFACE WHOLE WATER PHYTOPLANKTON AT EACH SAMPLING STATION.
SEP 18,1975 .

1 NMPW/10 FT

		BIOMASS	PERCENT
CHLOROPHYCEAE	OEDOGONIUM SP.	79.31	13.78
BACILLARIOPHYCEAE	FRAGILARIA CROTONENSIS	59.45	10.33
CHRYSOPHYCEAE	OCHROMONAS SP.	49.57	8.62
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	45.25	7.86
CRYPTOPHYCEAE	CHROOMONAS ACUTA	42.06	7.31

2 NMPP/10 FT

		BIOMASS	PERCENT
MYXOPHYCEAE	ANACYSTIS AERUGINOSA	7644.75	90.96
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	87.01	1.04
BACILLARIOPHYCEAE	FRAGILARIA CAPUCINA	74.27	0.88
MYXOPHYCEAE	APHANIZOMENON FLOS-AQUAE	64.80	0.77
BACILLARIOPHYCEAE	FRAGILARIA VAUCHERIAE	55.29	0.66

3 FITZ/10 FT

		BIOMASS	PERCENT
DINOPHYCEAE	CERATIUM HIRUNDINELLA	124.24	17.96
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	114.86	16.61
CRYPTOPHYCEAE	CHROOMONAS ACUTA	69.97	10.12
CHRYSOPHYCEAE	OCHROMONAS SP.	55.77	8.06
BACILLARIOPHYCEAE	STEPHANODISCUS ASTREA VAR. MIN	50.30	7.27

4 NMPE/10 FT

		BIOMASS	PERCENT
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	114.86	17.88
CRYPTOPHYCEAE	CHROOMONAS ACUTA	109.11	16.99
DINOPHYCEAE	PERIDINIUM CINCTUM	77.22	12.02
CHRYSOPHYCEAE	OCHROMONAS SP.	56.80	8.85
CRYPTOPHYCEAE	RHODOMONAS MINUTA	49.27	7.67

5 NMPW/20 FT

		BIOMASS	PERCENT
CHRYSOPHYCEAE	OCHROMONAS SP.	113.61	17.57
CHLOROPHYCEAE	OEDOGONIUM SP.	90.50	13.99
BACILLARIOPHYCEAE	FRAGILARIA VAUCHERIAE	75.93	11.74
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	48.73	7.53
BACILLARIOPHYCEAE	FRAGILARIA CROTONENSIS	42.78	6.62

6 NMPP/20 FT

		BIOMASS	PERCENT
CHRYSOPHYCEAE	OCHROMONAS SP.	130.14	21.19
DINOPHYCEAE	PERIDINIUM CINCTUM	77.22	12.57
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	73.09	11.90
BACILLARIOPHYCEAE	TABELLARIA FENESTRATA	41.58	6.77
BACILLARIOPHYCEAE	FRAGILARIA CROTONENSIS	36.67	5.97

7 [illegible] 20 FT

		BIOMASS	PERCENT
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	139.22	16.46
CRYPTOPHYCEAE	CHROOMONAS ACUTA	114.95	13.59
CHRYSOPHYCEAE	OCHROMONAS SP.	59.90	7.08
CRYPTOPHYCEAE	RHODOMONAS MINUTA	52.92	6.26
CHLOROPHYCEAE	TETRASPORA LACUSTRIS	42.76	5.06

8 NMPE/20 FT

		BIOMASS	PERCENT
CRYPTOPHYCEAE	CHROOMONAS ACUTA	129.94	16.97
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	76.57	10.00
CRYPTOPHYCEAE	CRYPTOMONAS OVATA	75.99	9.93
CHRYSOPHYCEAE	OCHROMONAS SP.	60.94	7.96
CHLOROPHYCEAE	MOUGEOTIA SP.	40.52	5.29

9 NMPW/40 FT

		BIOMASS	PERCENT
DINOPHYCEAE	CERATIUM HIRUNDINELLA	62.12	15.74
CHRYSOPHYCEAE	OCHROMONAS SP.	55.77	14.13
CRYPTOPHYCEAE	CHROOMONAS ACUTA	35.40	8.97
BACILLARIOPHYCEAE	FRAGILARIA VAUCHERIAE	33.17	8.40
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	17.40	4.41

10 NMPP/40 FT

		BIOMASS	PERCENT
CHRYSOPHYCEAE	OCHROMONAS SP.	83.66	18.03
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	59.17	12.75
CHLOROPHYCEAE	OEDOGONIUM SP.	34.55	7.44
CRYPTOPHYCEAE	CHROOMONAS ACUTA	32.48	7.00
CRYPTOPHYCEAE	CRYPTOMONAS OVATA	25.33	5.46

11 FITZ/40 FT

		BIOMASS	PERCENT
DINOPHYCEAE	PERIDINIUM SP.	137.02	16.47
CRYPTOPHYCEAE	CHROOMONAS ACUTA	91.62	11.01
CHRYSOPHYCEAE	OCHROMONAS SP.	82.63	9.93
BACILLARIOPHYCEAE	FRAGILARIA CROTONENSIS	63.34	7.61
CRYPTOPHYCEAE	CRYPTOMONAS OVATA	50.66	6.09

12 NMPE/40 FT

		BIOMASS	PERCENT
CHRYSOPHYCEAE	OCHROMONAS SP.	81.59	13.29
BACILLARIOPHYCEAE	FRAGILARIA CAPUCINA	68.70	11.19
DINOPHYCEAE	PERIDINIUM SP.	68.51	11.16
CRYPTOPHYCEAE	CHROOMONAS ACUTA	62.47	10.17
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	59.17	9.64

13 NMPW/60 FT

		BIOMASS	PERCENT
BACILLARIOPHYCEAE	FRAGILARIA CROTONENSIS	91.68	22.36
CHRYSOPHYCEAE	OCHROMONAS SP.	43.38	10.58
CHLOROPHYCEAE	OEDOGONIUM SP.	37.95	9.26

CRYPTOPHYCEAE	CRYPTOMONAS ERUSA	20.88	5.09
BACILLARIOPHYCEAE	FRAGILARIA VAUCHERIAE	18.43	4.49

14 NMPP/60 FT

		BIOMASS	PERCENT
CHLOROPHYCEAE	OEDOGONIUM SP.	105.10	19.79
CHRYSOPHYCEAE	OCHROMONAS SP.	101.22	19.06
BACILLARIOPHYCEAE	FRAGILARIA CROTONENSIS	62.79	11.82
CRYPTOPHYCEAE	CRYPTOMONAS ERUSA	38.28	7.21
CRYPTOPHYCEAE	CHROOMONAS ACUTA	35.40	6.67

15 FITZ/60 FT

		BIOMASS	PERCENT
BACILLARIOPHYCEAE	FRAGILARIA CROTONENSIS	779.02	29.47
CHLOROPHYCEAE	OEDOGONIUM SP.	515.52	19.50
BACILLARIOPHYCEAE	FRAGILARIA VAUCHERIAE	403.12	15.25
MYXOPHYCEAE	ANABAENA SP.	144.15	5.45
CRYPTOPHYCEAE	CRYPTOMONAS ERUSA	114.86	4.34

16 NMPE/60 FT

		BIOMASS	PERCENT
CHRYSOPHYCEAE	OCHROMONAS SP.	70.23	12.26
DINOPHYCEAE	CERATIUM HIRUNDINELLA	62.12	10.85
CRYPTOPHYCEAE	CRYPTOMONAS ERUSA	59.17	10.33
CRYPTOPHYCEAE	CHROOMONAS ACUTA	44.98	7.85
CHLOROPHYCEAE	OOCYSTIS BORGEI	41.27	7.20

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APPENDIX VA-3 (Con[illegible]ed)

NINE MILE POINT VICINITY - 1975
AVERAGE OF PRIMARY AND REPLICATE SAMPLES
TOP FIVE SPECIES BY BIOMASS MG/M*3 AND PERCENT OF TOTAL OF SURFACE WHOLE WATER PHYTOPLANKTON AT EACH SAMPLING STATION.
OCT 27,1975 .

1 NMPW/10 FT

		BIOMASS	PERCENT
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	131.95	19.15
CRYPTOPHYCEAE	CHROOMONAS ACUTA	114.94	16.68
CRYPTOPHYCEAE	CRYPTOMONAS OVATA	70.63	10.25
MYXOPHYCEAE	APHANIZOMENON FLOS-AQUAE	44.32	6.43
CRYPTOPHYCEAE	RHODOMONAS MINUTA	40.74	5.91

2 NMPP/10 FT

		BIOMASS	PERCENT
CHLOROPHYCEAE	OEDOGONIUM SP.	204.59	20.80
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	167.13	16.99
CRYPTOPHYCEAE	CHROOMONAS ACUTA	66.54	6.77
CRYPTOPHYCEAE	CRYPTOMONAS EROSA VAR. REFLEXA	63.52	6.46
CRYPTOPHYCEAE	RHODOMONAS MINUTA	60.19	6.12

3 FITZ/10 FT

		BIOMASS	PERCENT
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	316.67	25.22
BACILLARIOPHYCEAE	MELOSIRA BINDERANA	138.20	11.01
CRYPTOPHYCEAE	RHODOMONAS MINUTA	125.94	10.03
CHLOROPHYCEAE	OEDOGONIUM SP.	114.90	9.15
CRYPTOPHYCEAE	CHROOMONAS ACUTA	111.41	8.87

4 NMPE/10 FT

		BIOMASS	PERCENT
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	552.97	40.67
BACILLARIOPHYCEAE	MELOSIRA BINDERANA	96.74	7.11
CRYPTOPHYCEAE	CHROOMONAS ACUTA	80.75	5.94
CRYPTOPHYCEAE	RHODOMONAS MINUTA	61.69	4.54
BACILLARIOPHYCEAE	STEPHANODISCUS ASTREA VAR. MIN	57.81	4.25

5 NMPW/20 FT

		BIOMASS	PERCENT
CHLOROPHYCEAE	OEDOGONIUM SP.	266.11	19.15
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	158.34	11.40
BACILLARIOPHYCEAE	MELOSIRA BINDERANA	96.74	6.96
CRYPTOPHYCEAE	CHROOMONAS ACUTA	77.13	5.55
CRYPTOPHYCEAE	CRYPTOMONAS REFLEXA	75.12	5.41

6 NMPP/20 FT

		BIOMASS	PERCENT
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	571.77	31.01
CHLOROPHYCEAE	OEDOGONIUM SP.	349.13	18.94
DINOPHYCEAE	PERIDINIUM CI[illegible]UM	188.88	10.25
CRYPTOPHYCEAE	CHROOMONAS ACUTA	110.91	6.02
CRYPTOPHYCEAE	RHODOMONAS MINUTA	104.64	5.68

APPENDIX VA-3 (Continued)

7 FITZ/20 FT

		BIOMASS	PERCENT
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	351.86	27.89
CRYPTOPHYCEAE	RHODOMONAS MINUTA	167.61	13.28
CHLOROPHYCEAE	OEDOGONIUM SP.	104.52	8.28
CRYPTOPHYCEAE	CHROOMONAS ACUTA	97.30	7.71
CRYPTOPHYCEAE	CRYPTOMONAS EROSA VAR. REFLEXA	85.94	6.81

8 NMPE/20 FT

		BIOMASS	PERCENT
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	210.51	20.30
CRYPTOPHYCEAE	CHROOMONAS ACUTA	80.73	7.79
CRYPTOPHYCEAE	CRYPTOMONAS EROSA VAR. REFLEXA	66.62	6.43
CRYPTOPHYCEAE	RHODOMONAS MINUTA	65.81	6.35
CHLOROPHYCEAE	OEDOGONIUM SP.	62.89	6.07

9 NMPW/40 FT

		BIOMASS	PERCENT
CHLOROPHYCEAE	OEDOGONIUM SP.	380.27	26.11
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	237.50	16.31
BACILLARIOPHYCEAE	MELOSIRA BINDERANA	200.40	13.76
BACILLARIOPHYCEAE	FRAGILARIA CAPUCINA	97.91	6.72
CRYPTOPHYCEAE	CHROOMONAS ACUTA	95.28	6.54

10 NMPP/40 FT

		BIOMASS	PERCENT
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	492.60	31.77
BACILLARIOPHYCEAE	MELOSIRA BINDERANA	147.42	9.51
CHLOROPHYCEAE	OEDOGONIUM SP.	134.17	8.65
CRYPTOPHYCEAE	CHROOMONAS ACUTA	125.02	8.06
CRYPTOPHYCEAE	RHODOMONAS MINUTA	106.49	6.87

11 FITZ/40 FT

		BIOMASS	PERCENT
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	518.99	37.36
BACILLARIOPHYCEAE	MELOSIRA BINDERANA	177.36	12.77
CRYPTOPHYCEAE	CHROOMONAS ACUTA	106.37	7.66
CHLOROPHYCEAE	OEDOGONIUM SP.	104.52	7.52
CRYPTOPHYCEAE	CRYPTOMONAS EROSA VAR. REFLEXA	56.05	4.03

12 NMPE/40 FT

		BIOMASS	PERCENT
CHLOROPHYCEAE	OEDOGONIUM SP.	202.44	16.51
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	179.58	14.64
CRYPTOPHYCEAE	RHODOMONAS MINUTA	131.15	10.69
CHLOROPHYCEAE	STAURASTRUM SP.	80.60	6.57
BACILLARIOPHYCEAE	MELOSIRA BINDERANA	79.37	6.47

13 NMPW/60 FT

		BIOMASS	PERCENT
BACILLARIOPHYCEAE	MELOSIRA BINDERANA	255.68	17.75
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	246.30	17.10
CRYPTOPHYCEAE	CHROOMONAS ACUTA	84.69	5.88

CRYPTOPHYCEAE	CRYPTOMONAS OVATA	82.40	5.72
BACILLARIOPHYCEAE	STEPHANODISCUS ASTREA	66.98	4.65

14 NMPP/60 FT

		BIOMASS	PERCENT

15 FITZ/60 FT

		BIOMASS	PERCENT
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	387.04	32.30
CHLOROPHYCEAE	OEDOGONIUM SP.	183.83	15.34
CRYPTOPHYCEAE	CHROOMONAS ACUTA	99.82	8.33
CRYPTOPHYCEAE	RHODOMONAS MINUTA	94.45	7.88
CRYPTOPHYCEAE	CRYPTOMONAS REFLEXA	64.39	5.37

16 NMPE/60 FT

		BIOMASS	PERCENT
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	140.74	11.94
CRYPTOPHYCEAE	CHROOMONAS ACUTA	138.13	11.72
CRYPTOPHYCEAE	RHODOMONAS MINUTA	110.20	9.35
CRYPTOPHYCEAE	CRYPTOMONAS EROSA VAR. REFLEXA	97.15	8.25
CHLOROPHYCEAE	OEDOGONIUM SP.	62.27	5.28

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APPENDIX VA-3 (Continued)

NINE MILE POINT VICINITY - 1975
AVERAGE OF PRIMARY AND REPLICATE SAMPLES
TOP FIVE SPECIES BY BIOMASS MG/M*3 AND PERCENT OF TOTAL OF SURFACE WHOLE WATER PHYTOPLANKTON AT EACH SAMPLING STATION.
NOV 17,1975 .

1 NMPW/10 FT

		BIOMASS	PERCENT
BACILLARIOPHYCEAE	STEPHANODISCUS ASTREA	127.65	19.97
BACILLARIOPHYCEAE	TABELLARIA FENESTRATA	82.04	12.83
CRYPTOPHYCEAE	CHROOMONAS ACUTA	75.71	11.84
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	40.10	6.27
CHLOROPHYCEAE	EUDORINA ELEGANS	39.29	6.15

2 NMPP/10 FT

		BIOMASS	PERCENT
CRYPTOPHYCEAE	CHROOMONAS ACUTA	104.75	16.60
CRYPTOPHYCEAE	CHROOMONAS SP.	99.56	15.77
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	72.03	11.41
BACILLARIOPHYCEAE	STEPHANODISCUS ASTREA VAR. MIN	35.27	5.59
BACILLARIOPHYCEAE	TABELLARIA FENESTRATA	31.92	5.06

3 FITZ/10 FT

		BIOMASS	PERCENT
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	117.78	17.90
CRYPTOPHYCEAE	CHROOMONAS ACUTA	100.18	15.23
BACILLARIOPHYCEAE	STEPHANODISCUS ASTREA	71.88	10.93
CHLOROPHYCEAE	STAURASTRUM SP.	68.51	10.41
CRYPTOPHYCEAE	CHROOMONAS SP.	60.31	9.17

4 NMPE/10 FT

		BIOMASS	PERCENT
BACILLARIOPHYCEAE	TABELLARIA FENESTRATA	110.28	16.17
CRYPTOPHYCEAE	CHROOMONAS ACUTA	100.69	14.76
CRYPTOPHYCEAE	CHROOMONAS SP.	61.27	8.98
CRYPTOPHYCEAE	CRYPTOMONAS ROSTRATA	39.27	5.76
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	36.02	5.28

5 NMPW/20 FT

		BIOMASS	PERCENT
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	197.59	31.40
CRYPTOPHYCEAE	CHROOMONAS ACUTA	123.46	19.62
BACILLARIOPHYCEAE	MELOSIRA BINDERANA	51.47	8.18
CHLOROPHYCEAE	STAURASTRUM SP.	44.89	7.13
MYXOPHYCEAE	APHANIZOMENON FLOS-AQUAE	34.48	5.48

6 NMPP/20 FT

		BIOMASS	PERCENT
CRYPTOPHYCEAE	CHROOMONAS ACUTA	92.28	16.21
BACILLARIOPHYCEAE	TABELLARIA FENESTRATA	84.14	14.78
BACILLARIOPHYCEAE	STEPHANODISCUS ASTREA	53.90	9.47
BACILLARIOPHYCEAE	MELOSIRA BINDERANA	48.61	8.54
CRYPTOPHYCEAE	CHROOMONAS SP.	40.81	7.17

APPENDIX VA-3 (Continued)

7 [illegible]/20 FT

		BIOMASS	PERCENT
CRYPTOPHYCEAE	CHROOMONAS ACUTA	71.48	15.10
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	67.36	14.23
BACILLARIOPHYCEAE	MELOSIRA BINDERANA	60.05	12.68
CRYPTOPHYCEAE	CHROOMONAS SP.	40.53	8.56
DINOPHYCEAE	GYMNODINIUM HELVETICUM	33.38	7.05

8 NMPE/20 FT

		BIOMASS	PERCENT
CRYPTOPHYCEAE	CHROOMONAS ACUTA	134.99	19.65
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	102.79	14.96
BACILLARIOPHYCEAE	MELOSIRA BINDERANA	69.04	10.05
BACILLARIOPHYCEAE	TABELLARIA FENESTRATA	65.95	9.60
BACILLARIOPHYCEAE	FRAGILARIA CROTONENSIS	45.84	6.67

9 NMPW/40 FT

		BIOMASS	PERCENT
CRYPTOPHYCEAE	CHROOMONAS ACUTA	110.67	18.08
BACILLARIOPHYCEAE	STEPHANODISCUS ASTREA	91.71	14.98
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	87.80	14.34
BACILLARIOPHYCEAE	TABELLARIA FENESTRATA	72.55	11.85
CHLOROPHYCEAE	OEDOGONIUM SP.	48.54	7.93

10 NMPP/40 FT

		BIOMASS	PERCENT
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	136.86	16.95
BACILLARIOPHYCEAE	MELOSIRA BINDERANA	122.26	15.14
CHLOROPHYCEAE	COSMARIUM SP.	116.67	14.45
CRYPTOPHYCEAE	CHROOMONAS ACUTA	95.01	11.77
CRYPTOPHYCEAE	CHROOMONAS SP.	75.05	9.30

11 FITZ/40 FT

		BIOMASS	PERCENT
BACILLARIOPHYCEAE	MELOSIRA BINDERANA	114.96	19.34
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	93.64	15.76
CRYPTOPHYCEAE	CHROOMONAS ACUTA	90.95	15.30
CRYPTOPHYCEAE	CHROOMONAS SP.	59.74	10.05
MYXOPHYCEAE	APHANIZOMENON FLOS-AQUAE	44.20	7.44

12 NMPE/40 FT

		BIOMASS	PERCENT
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	132.58	21.23
CRYPTOPHYCEAE	CHROOMONAS ACUTA	115.28	18.46
CRYPTOPHYCEAE	CHROOMONAS SP.	53.15	8.51
CHLOROPHYCEAE	STAURASTRUM SP.	51.09	8.18
BACILLARIOPHYCEAE	MELOSIRA BINDERANA	48.12	7.71

13 NMPW/60 FT

		BIOMASS	PERCENT
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	126.93	20.47
CRYPTOPHYCEAE	CHROOMONAS ACUTA	112.93	18.21
BACILLARIOPHYCEAE	MELOSIRA BINDERANA	85.01	13.71

BACILLARIOPHYCEAE	FRAGILARIA CROTONENSIS	64.07	10.33
CRYPTOPHYCEAE	CHROOMONAS SP.	55.97	9.03

14 NMPP/60 FT

		BIOMASS	PERCENT
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	115.64	20.08
CRYPTOPHYCEAE	CHROOMONAS ACUTA	98.71	17.14
CRYPTOPHYCEAE	CHROOMONAS SP.	49.38	8.57
BACILLARIOPHYCEAE	MELOSIRA BINDERANA	42.80	7.43
CHLOROPHYCEAE	STAURASTRUM SP.	28.64	4.97

15 FITZ/60 FT

		BIOMASS	PERCENT
CRYPTOPHYCEAE	CHROOMONAS ACUTA	87.70	13.36
BACILLARIOPHYCEAE	TABELLARIA FENESTRATA	75.46	11.49
CRYPTOPHYCEAE	CHROOMONAS SP.	73.52	11.20
CHRYSOPHYCEAE	OCHROMONAS SP.	47.24	7.20
CHLOROPHYCEAE	OEDOGONIUM SP.	42.73	6.51

16 NMPE/60 FT

		BIOMASS	PERCENT
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	136.08	20.55
CRYPTOPHYCEAE	CHROOMONAS ACUTA	131.19	19.81
CRYPTOPHYCEAE	CHROOMONAS SP.	57.17	8.63
CHLOROPHYCEAE	OEDOGONIUM SP.	54.71	8.26
BACILLARIOPHYCEAE	MELOSIRA BINDERANA	29.19	4.41

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APPENDIX VA-3 (Continued)

NINE MILE POINT VICINITY - 1975
AVERAGE OF PRIMARY AND REPLICATE SAMPLES
TOP FIVE SPECIES BY BIOMASS MG/M*3 AND PERCENT OF TOTAL OF SURFACE WHOLE WATER PHYTOPLANKTON AT EACH SAMPLING STATION.
DEC 12,1975 .

1 NMPW/10 FT

		BIOMASS	PERCENT
CRYPTOPHYCEAE	CRYPTOMONAS ERUSA	66.17	14.52
BACILLARIOPHYCEAE	STEPHANODISCUS HANTZSCHII	62.05	13.61
CRYPTOPHYCEAE	CHROOMONAS ACUTA	55.33	12.14
BACILLARIOPHYCEAE	MELOSIRA BINDERANA	53.59	11.76
BACILLARIOPHYCEAE	STEPHANODISCUS ASTREA VAR. MIN	53.27	11.69

2 NMPP/10 FT

		BIOMASS	PERCENT

3 FITZ/10 FT

		BIOMASS	PERCENT

4 NMPE/10 FT

		BIOMASS	PERCENT

5 NMPW/20 FT

		BIOMASS	PERCENT
CRYPTOPHYCEAE	CRYPTOMONAS ERUSA	87.16	15.57
BACILLARIOPHYCEAE	STEPHANODISCUS HANTZSCHII	79.42	14.18
BACILLARIOPHYCEAE	MELOSIRA BINDERANA	73.72	13.16
CRYPTOPHYCEAE	CHROOMONAS ACUTA	63.74	11.38
BACILLARIOPHYCEAE	TABELLARIA FENESTRATA	37.68	6.73

6 NMPP/20 FT

		BIOMASS	PERCENT
BACILLARIOPHYCEAE	MELOSIRA BINDERANA	122.82	22.05
BACILLARIOPHYCEAE	TABELLARIA FENESTRATA	69.71	12.52
CRYPTOPHYCEAE	CHROOMONAS ACUTA	64.50	11.58
BACILLARIOPHYCEAE	STEPHANODISCUS HANTZSCHII	61.06	10.96
BACILLARIOPHYCEAE	STEPHANODISCUS ASTREA VAR. MIN	40.37	7.25

7 FITZ/20 FT

		BIOMASS	PERCENT
BACILLARIOPHYCEAE	MELOSIRA BINDERANA	51.99	14.83
CRYPTOPHYCEAE	CHROOMONAS ACUTA	49.57	14.14
BACILLARIOPHYCEAE	STEPHANODISCUS HANTZSCHII	48.37	13.80
CRYPTOPHYCEAE	CRYPTOMONAS ERUSA	45.50	12.98
BACILLARIOPHYCEAE	STEPHANODISCUS ASTREA VAR. MIN	29.36	8.38

8 NMPE/20 FT

		BIOMASS	PERCENT
BACILLARIOPHYCEAE	STEPHANODISCUS HANTZSCHII	98.63	16.65
BACILLARIOPHYCEAE	TABELLARIA FENESTRATA	98.37	16.61
BACILLARIOPHYCEAE	MELOSIRA BINDERANA	61.16	10.33

CRYPTOPHYCEAE	CHROOMONAS ACUTA	52.38	8.84
BACILLARIOPHYCEAE	STEPHANODISCUS ASTREA VAR. MIN	42.60	7.19

9 NMPW/40 FT

		BIOMASS	PERCENT
BACILLARIOPHYCEAE	STEPHANODISCUS NIAGARAE	63.86	15.45
CRYPTOPHYCEAE	CHROOMONAS ACUTA	56.83	13.75
BACILLARIOPHYCEAE	MELOSIRA BINDERANA	51.41	12.44
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	34.47	8.34
BACILLARIOPHYCEAE	STEPHANODISCUS HANTZSCHII	28.32	6.85

10 NMPP/40 FT

		BIOMASS	PERCENT
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	58.98	14.98
BACILLARIOPHYCEAE	STEPHANODISCUS HANTZSCHII	52.94	13.44
CRYPTOPHYCEAE	CHROOMONAS ACUTA	52.81	13.41
BACILLARIOPHYCEAE	TABELLARIA FENESTRATA	33.96	8.62
BACILLARIOPHYCEAE	STEPHANODISCUS ASTREA VAR. MIN	30.63	7.78

11 FITZ/40 FT

		BIOMASS	PERCENT
CRYPTOPHYCEAE	CHROOMONAS ACUTA	56.33	13.12
BACILLARIOPHYCEAE	STEPHANODISCUS ASTREA VAR. MIN	47.82	11.13
BACILLARIOPHYCEAE	MELOSIRA BINDERANA	39.12	9.11
BACILLARIOPHYCEAE	STEPHANODISCUS HANTZSCHII	37.03	8.62
CHLOROPHYCEAE	STAURASTRUM SP.	36.88	8.59

12 NMPE/40 FT

		BIOMASS	PERCENT
BACILLARIOPHYCEAE	MELOSIRA BINDERANA	78.16	20.99
CRYPTOPHYCEAE	CHROOMONAS ACUTA	43.04	11.56
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	39.62	10.64
BACILLARIOPHYCEAE	STEPHANODISCUS HANTZSCHII	35.56	9.55
CHLOROPHYCEAE	STAURASTRUM SP.	28.73	7.72

13 NMPW/60 FT

		BIOMASS	PERCENT
CRYPTOPHYCEAE	CHROOMONAS ACUTA	55.36	14.58
BACILLARIOPHYCEAE	STEPHANODISCUS HANTZSCHII	51.09	13.45
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	49.67	13.08
BACILLARIOPHYCEAE	STEPHANODISCUS NIAGARAE	31.93	8.41
BACILLARIOPHYCEAE	TABELLARIA FENESTRATA	26.57	7.00

14 NMPP/60 FT

		BIOMASS	PERCENT
BACILLARIOPHYCEAE	TABELLARIA FENESTRATA	69.71	13.45
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	67.35	12.99
BACILLARIOPHYCEAE	STEPHANODISCUS HANTZSCHII	56.90	10.98
CRYPTOPHYCEAE	CHROOMONAS ACUTA	55.22	10.65
[illegible]ACILLARIOPHYCEAE	STEPHANODISCUS ASTREA VAR[illegible]N	47.33	9.13

1[illegible]Z/60 FT

		BIOMASS	PERCENT

APPENDIX VA-3 (Continued)

BACILLARIOPHYCEAE	MELOSIRA BINDERANA	69.27	16.87
BACILLARIOPHYCEAE	STEPHANODISCUS ASTREA VAR. MIN	57.61	14.03
CRYPTOPHYCEAE	CRYPTOMONAS ERosa	55.47	13.51
CRYPTOPHYCEAE	CHROOMONAS ACUTA	49.53	12.07
BACILLARIOPHYCEAE	STEPHANODISCUS HANTZSCHII	41.49	10.11

16 NMPE/60 FT

		BIOMASS	PERCENT
CRYPTOPHYCEAE	CRYPTOMONAS EROSA	66.38	18.20
CRYPTOPHYCEAE	CHROOMONAS ACUTA	52.17	14.30
BACILLARIOPHYCEAE	MELOSIRA BINDERANA	49.40	13.54
BACILLARIOPHYCEAE	STEPHANODISCUS HANTZSCHII	43.21	11.85
BACILLARIOPHYCEAE	GYROSIGMA ATTENUATUM	21.92	6.01

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APPENDIX VB-1

MACROZOOPLANKTON AND ICHTHYOPLANKTON SAMPLING PROGRAM

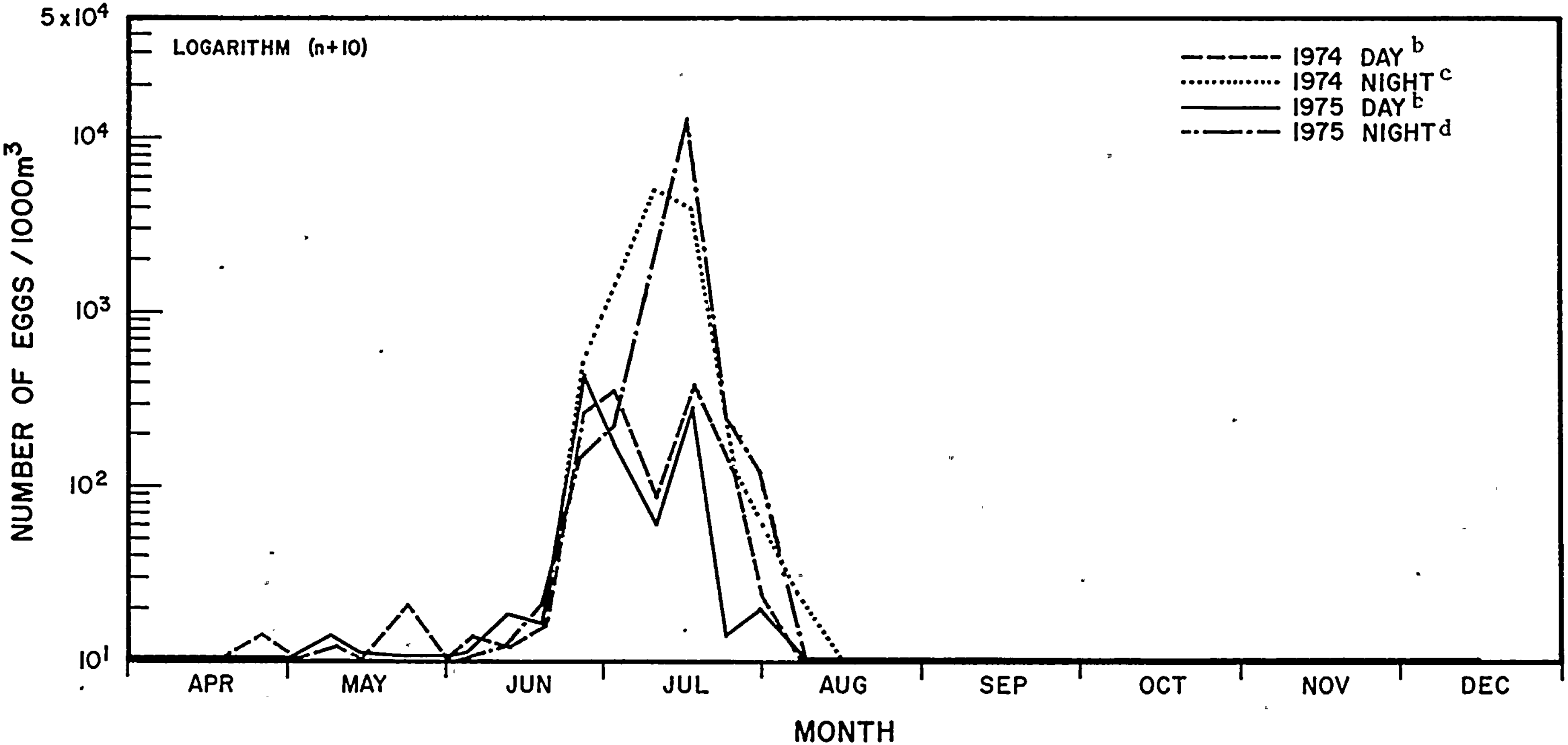
NINE MILE POINT VICINITY - 1975

DATE	DAY	NIGHT
1 APR	X	
10 APR	X	
17 APR*	X	
25 APR	X	
30 APR	X	
7 MAY	X	
14 MAY	X	
21 MAY*	X	
28 MAY	X	
4-5 JUN	X	X
11-12 JUN	X	X
18,19 JUN*	X	X
25,26,27,28 JUN	X	X
2-3 JUL	X	X
10-11 JUL	X	
16-17 JUL*	X	X
23-24 JUL	X	X
30-31 JUL	X	X
7-8 AUG	X	X
13,15 AUG*	X	X
21-22 AUG	X	X
28-29 AUG	X	X
4-6 SEP	X	X
10 SEP	X	X
18 SEP*	X	
26 SEP	X	
1 OCT	X	
8 OCT	X	
15 OCT*	X	
23 OCT	X	
2 NOV	X	
7 NOV	X	
12 NOV*	X	
19 NOV	X	
26 NOV	X	
4 DEC	X	
13 DEC*	X	

*Samples analyzed for macrozooplankton.

ABUNDANCE OF FISH EGGS[a]

NINE MILE POINT VICINITY – 1974-1975



[a]Mean of all stations and sample depths; number of eggs/m^3
[b]Sampling continued until 13 Dec, no eggs were collected after Aug.
[c]Sampling continued until 11 Sep, no eggs were collected after Aug.
[d]Sampling continued until 10 Sep, no eggs were collected after Aug.

APPENDIX VB-2

APPENDIX VB-3

SPECIES INVENTORY - ICHTHYOPLANKTON SURVEY

NINE MILE POINT VICINITY - 1975

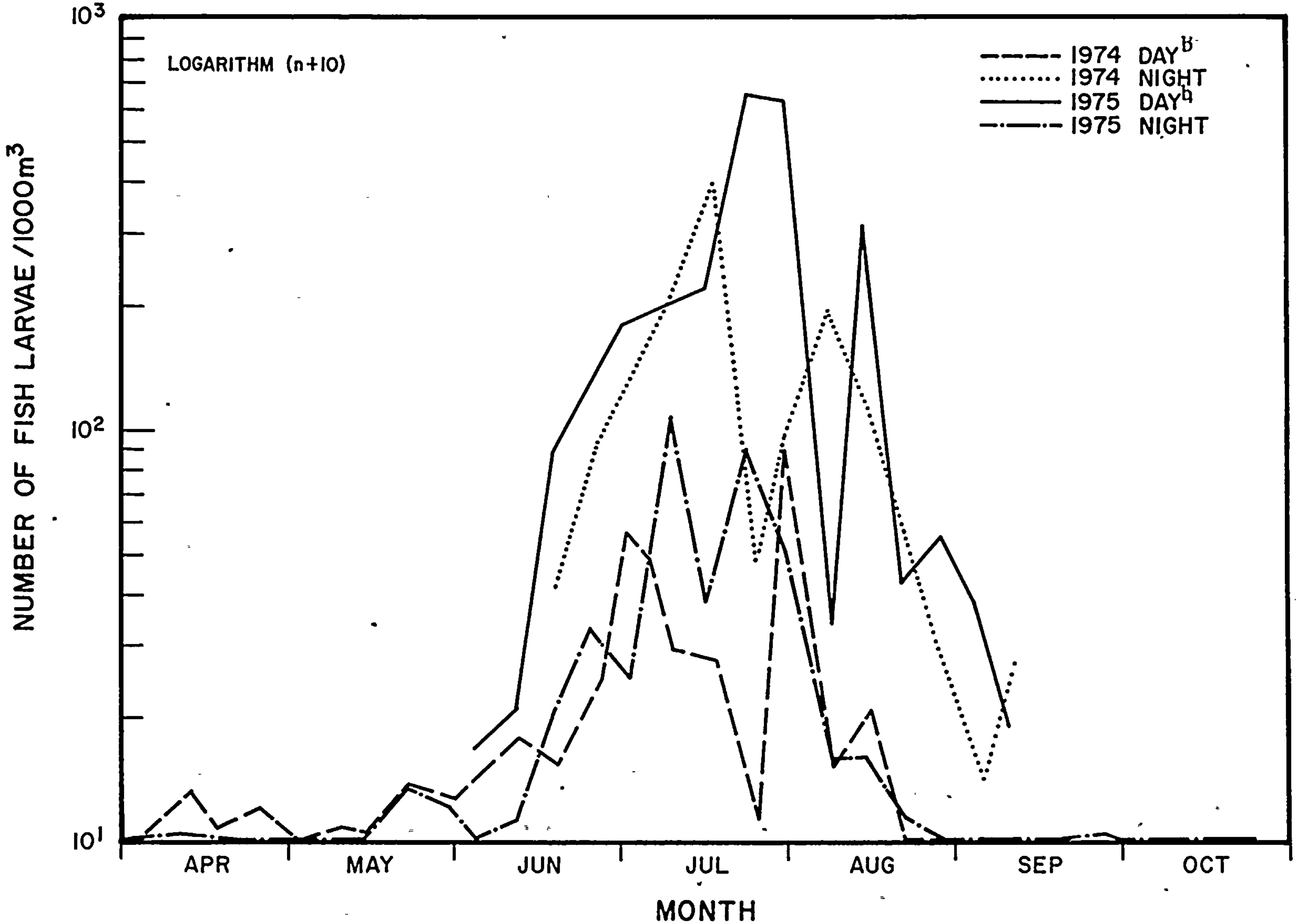
FAMILY	SCIENTIFIC NAME	COMMON NAME
Clupeidae	Alosa pseudoharengus	Alewife
	Dorosoma cepedianum	Gizzard shad*
Salmonidae	Coregonus artedii	Lake herring
Osmeridae	Osmerus mordax	Rainbow smelt
Cyprinidae	Cyprinus carpio	Carp
	Notropis sp.	Shiner
	N. atherinoides	Emerald shiner
	N. cornutus	Common shiner*
	N. hudsonius	Spottail shiner
	Pimephales notatus	Bluntnose minnow
	UID Cyprinidae	-
Gadidae	Lota lota	Burbot
Gasterosteidae	Gasterosteus aculeatus	Threespine stickleb
Percopsidae	Percopsis omiscomaycus	Trout-perch
Percichthyidae	Morone americana	White perch
Centrarchidae	Lempomis sp.	Sunfish
	UID Centrarchidae	-
Percidae	Etheostoma sp.	-
	E. nigrum	Johnny darter
	Perca flavescens	Yellow perch
Cottidae	Cottus bairdi	Mottled sculpin

*Eggs only

NA - Not applicable

ABUNDANCE[a] OF T[illegible]AL FISH LARVAE

NINE MILE POINT VICINITY — 1974-1975



[a]Mean of all stations and sample depths; number of larvae/1000 m^3

[b]Sampling continued unitl 13 Dec, no larvae were collected after Sep.

APPENDIX VB-5

ABUNDANCE[a] OF SELECTED FISH LARVAE

NINE MILE POINT VICINITY - 1975

I. JOHNNY DARTER

DATE[b]	3-NMPW		1-NMPW		.5-NMPW		NMPP			.5-NMPE		1-NMPE		3-NMPE	
	20	40	20	40	20	40	60	80	100	20	40	20	40	20	40
4 JUN	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 JUN	5	0	1	0	7	1	0	1	0	1	0	0	0	0	0
18 JUN	69	7	52	13	18	20	1	0	0	40	4	18	0	2	3
25-28 JUN	69	15	59	27	22	36	2	0	0	80	36	61	2	177	12
2 JUL	10	6	43	12	48	18	0	0	4	77	41	285	0	30	4
10 JUL	6	0	0	0	5	0	0	0	0	1	0	5	0	0	0
16 JUL	12	7	4	3	24	6	3	0	0	15	4	5	1	4	0
23 JUL	8	4	13	5	8	8	1	0	1	30	8	0	0	0	0
30 JUL	2	2	2	1	5	1	0	1	0	2	2	1	2	0	0
8 AUG	0	2	0	3	0	1	3	1	5	5	3	0	0	0	0
13-15 AUG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 AUG	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
28 AUG	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
4-6 SEP	0	0	0	0	0	0	0	0	0	0	0	15	0	13	0
10 SEP	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0

II. WHITE PERCH

DATE[c]	3-NMPW		1-NMPW		.5-NMPW		NMPP			.5-NMPE		1-NMPE		3-NMPE	
	20	40	20	40	20	40	60	80	100	20	40	20	40	20	40
17 APR	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
25 APR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30 APR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 MAY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14 MAY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 MAY	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0
29 MAY	2	0	1	2	0	0	0	2	0	0	0	0	0	0	0
4 JUN	1	0	1	2	2	0	0	1	0	4	1	1	0	0	1
11 JUN	1	<1	0	0	0	0	0	0	1	0	0	0	1	0	0
18 JUN	1	1	5	2	1	0	2	1	3	2	1	3	1	1	0
25-28 JUN	1	0	0	0	0	0	0	1	0	0	0	0	0	1	1
2 JUL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10 JUL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16 JUL	0	1	0	2	0	1	0	1	1	2	0	1	3	4	3
23 JUL	0	2	1	0	5	4	2	3	1	2	5	2	4	0	2
30 JUL	4	11	4	4	3	7	4	9	4	10	1	13	6	2	2
8 AUG	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0
13-15 AUG	1	1	0	2	1	0	1	0	1	0	0	0	0	0	0
21 AUG	0	0	2	0	0	0	0	1	0	0	0	0	0	0	0
28 AUG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

APPENDIX VB-5 (Continued)

ABUNDANCE[a] OF SELECTED FISH LARVAE

III. YELLOW PERCH

DATE[d]	3-NMPW 20	3-NMPW 40	1-NMPW 20	1-NMPW 40	.5-NMPW 20	.5-NMPW 40	NMPP 60	NMPP 80	NMPP 100	.5-NMPE 20	.5-NMPE 40	1-NMPE 20	1-NMPE 40	3-NMPE 20	3-NMPE 40
4 JUN	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
11 JUN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18 JUN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25-28 JUN	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0

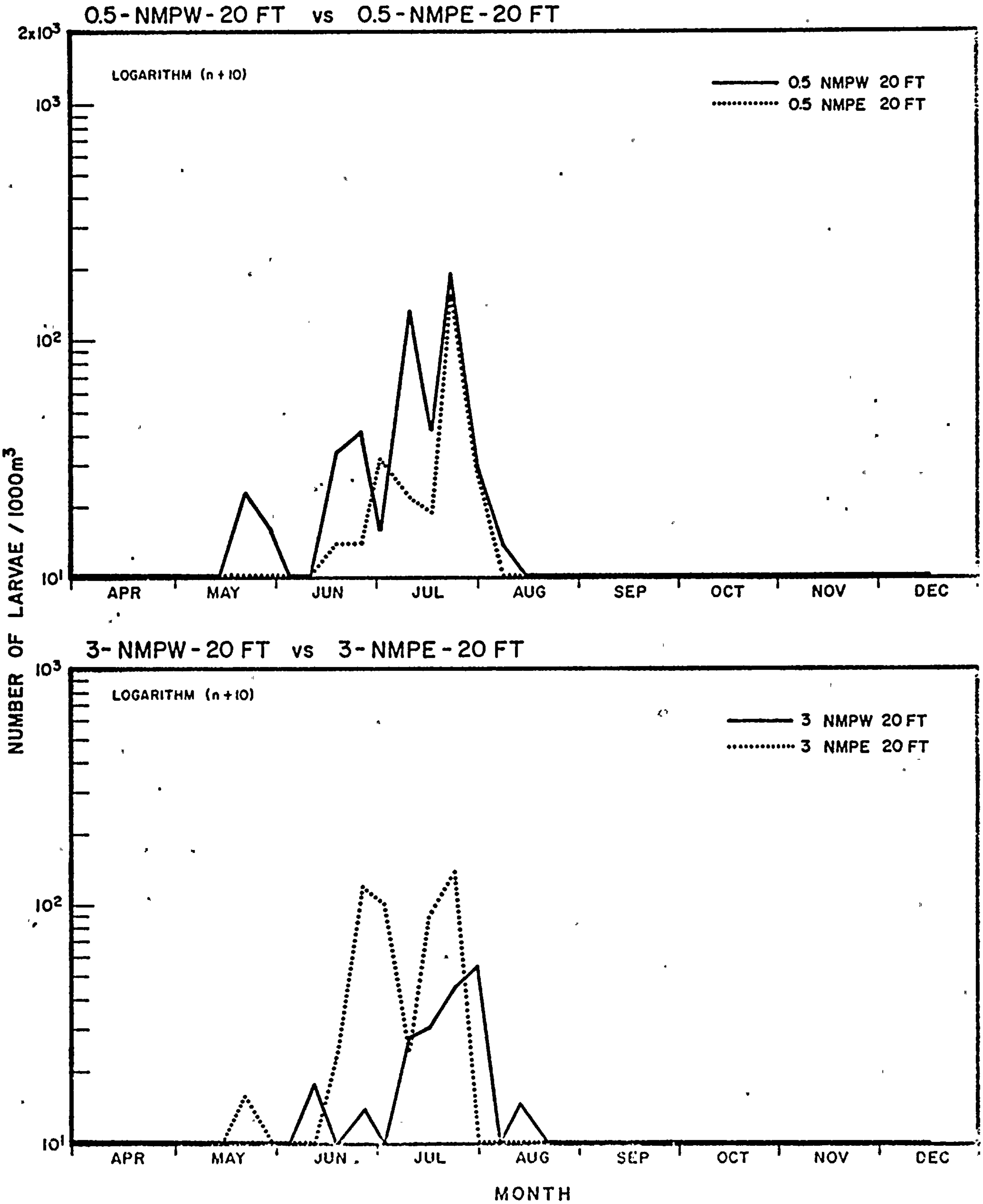
IV. OTHER

DATE	3-NMPW 20	3-NMPW 40	1-NMPW 20	1-NMPW 40	.5-NMPW 20	.5-NMPW 40	NMPP 60	NMPP 80	NMPP 100	.5-NMPE 20	.5-NMPE 40	1-NMPE 20	1-NMPE 40	3-NMPE 20	3-NMPE 40
1 APR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10 APR	0	0	6	0	0	0	0	1	0	0	0	0	0	0	0
17 APR	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
25 APR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30 APR	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
8 MAY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14 MAY	0	0	0	0	0	0	0	0	0	0	0	0	3	0	2
21 MAY	0	2	2	0	2	5	7	0	0	7	4	2	8	2	2
29 MAY	0	0	2	0	0	0	5	0	2	2	0	0	0	0	7
4 JUN	14	2	5	2	5	2	1	2	0	0	0	2	0	2	1
11 JUN	3	3	2	1	14	12	5	2	0	0	14	0	1	1	0
18 JUN	16	3	24	6	11	41	47	0	2	33	20	13	5	38	5
25-28 JUN	2	2	14	3	17	10	5	0	0	78	6	26	2	3	9
2 JUL	1	4	13	7	63	10	3	3	0	43	44	15	9	7	6
10 JUL	5	1	0	0	3	5	1	1	0	34	0	5	0	0	0
16 JUL	7	1	0	0	2	0	8	0	1	87	1	1	1	2	0
23 JUL	3	1	15	4	5	1	0	1	0	14	0	0	2	0	1
30 JUL	2	2	4	1	5	1	4	1	2	2	0	8	1	2	1
8 AUG	0	1	0	0	0	1	2	2	4	2	2	2	6	0	1
13-15 AUG	0	0	0	0	5	2	1	0	0	2	2	0	1	1	0
21 AUG	1	4	1	1	1	1	0	0	0	0	2	0	0	0	1
28 AUG	2	0	0	3	1	0	0	0	0	0	0	0	1	1	1
4-6 SEP	4	1	2	1	6	7	4	0	0	9	2	2	2	3	3
10 SEP	5	1	2	0	1	0	0	0	0	2	1	1	0	0	2
17 SEP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26 SEP	0	0	0	0	0	0	0	0	0	0	3	2	0	0	0
1 OCT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 OCT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

[a] Mean of surface, mid-depth, and bottom; mean of day and night; number of larvae/1000 m^3
[b] No larvae collected prior to 29 May or after 10 Sep.
[c] No larvae collected on 1 and 10 April or after 21 August.
[d] No larvae collected prior to 4 June or after 28 June.

ABUNDANCE[a] OF FISH LARVAE IN BOTTOM DAY COLLECTIONS[b]

NINE MILE POINT VICINITY - 1975



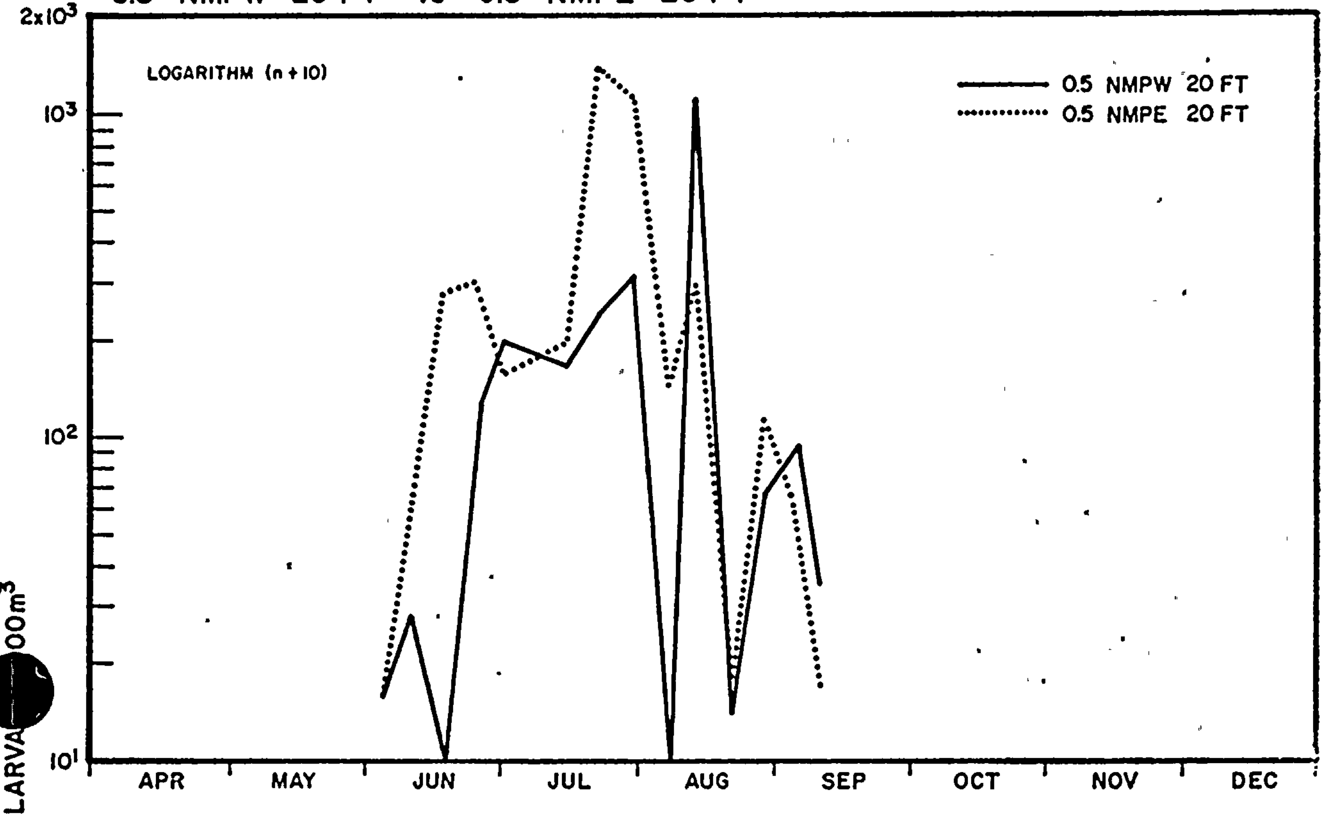
[a]Number of larvae/ 1000 m^3

[b]Sampling continued until 13 Dec, no larvae were collected after Aug.

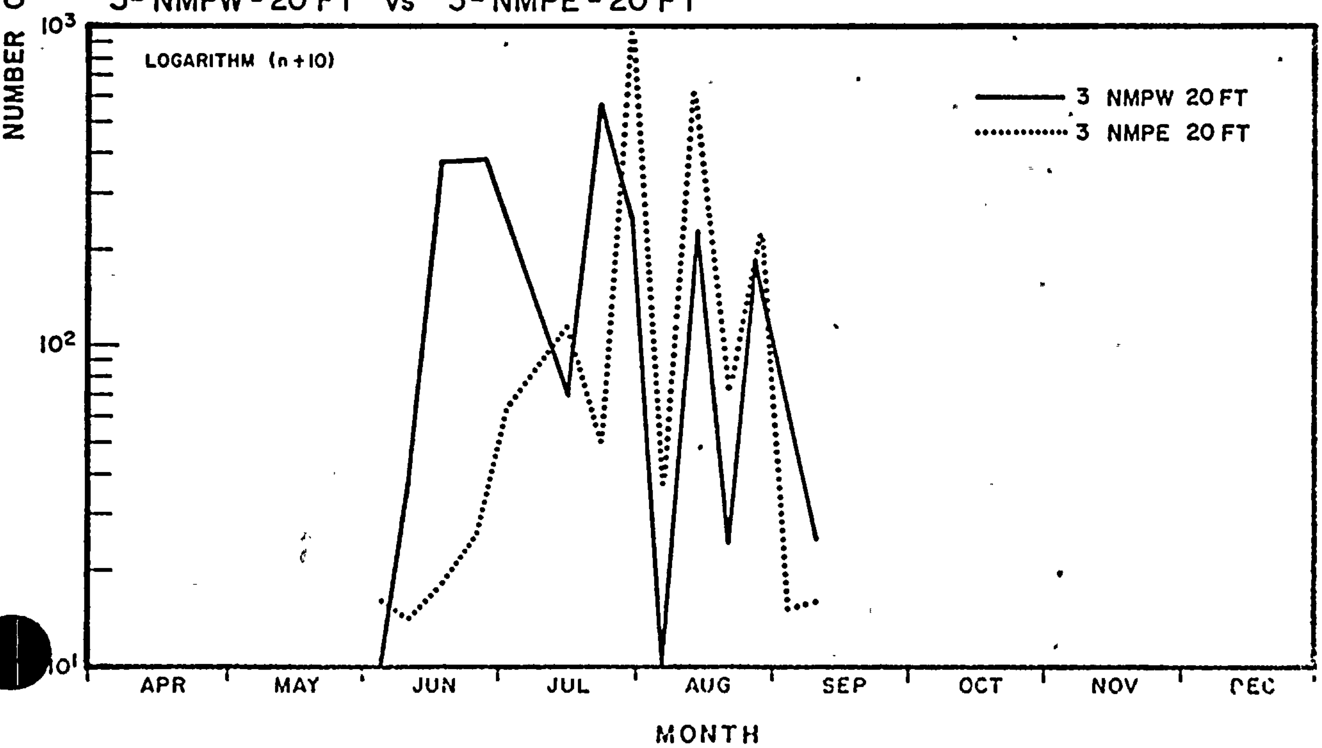
ABUNDANCE* OF FISH LARVAE IN BOTTOM NIGHT COLLECTIONS

NINE MILE POINT VICINITY - 1975

0.5-NMPW-20 FT vs 0.5-NMPE-20 FT



3-NMPW-20 FT vs 3-NMPE-20 FT



*Number of larvae/1000 m³

APPENDIX VB-7

TAXONOMIC INVENTORY OF MACROZOOPLANKTON IN LAKE COLLECTIONS

NINE MILE POINT VICINITY - 1975

COELENTERATA
- Hydrozoa
  - *Hydra* sp.

PLATYHELMINTHES
- Turbellaria

NEMATODA

ANNELIDA
- Polychaeta
  - Sabellidae
    - *Manayunkia speciosa*
- Oligochaeta
- Hirudinea

MOLLUSCA
- Gastropoda
- Pelecypoda

ARTHROPODA
- Arachnoidea
  - Hydracarina (Acarina)
- Crustacea
  - Branchiopoda
    - Cladocera
      - *Leptodora kindtii*
  - Ostracoda
    - Podocopa
  - Malacostraca
    - Mysidacea
      - *Mysis relicta oculata*
    - Isopoda
    - Amphipoda
      - Gammaridea
        - *Gammarus fasciatus*
        - *Crangonyx* sp.
        - *Pontoporeia affinis*
- Insecta
  - Ephemeroptera
  - Odonata
  - Hemiptera
  - Trichoptera
  - Lepidoptera
  - Diptera
    - Culicidae
      - *Chaoborus* sp.

APPENDIX VB-8

ABUNDANCE* OF SELECTED MACROZOOPLANKTON SPECIES IN DAY/NIGHT COLLECTIONS

NINE MILE POINT VICINITY - 1975

I. GAMMARUS FASCIATUS: NIGHT

DATE	SAMPLE DEPTH	STATION 3-NMPW 20	3-NMPW 40	1-NMPW 20	1-NMPW 40	.5-NMPW 20	.5-NMPW 40	NMPP 60	NMPP 80	NMPP 100	.5-NMPE 20	.5-NMPE 40	1-NMPE 20	1-NMPE 40	3-NMPE 20	3-NMPE 40
JUN	S	72	87	81	217	82	71	14	0	9	227	18	45	23	141	50
	M	387	830	617	506	92	329	13	13	0	232	24	366	119	30	726
	B	197	130	215	175	18	813	72	5	28	953	190	299	1314	493	472
JUL	S	789	675	613	499	2006	1360	102	0	0	701	950	808	400	1235	503
	M	1273	669	1357	736	4493	3233	313	197	29	1984	2662	3441	2038	419	3134
	B	686	636	928	488	2751	2203	64	39	0	3952	3071	1452	1832	6261	2534
AUG	S	125	225	46	69	80	0	15	4	0	111	32	157	67	78	106
	M	56	138	742	416	1301	11066	1056	172	89	3283	55	1496	260	2655	83
	B	419	354	725	580	14	7945	803	273	4	3694	1079	3850	1787	6052	3196

* Number of organisms/1000 m^3
S = Surface
M = Mid-Depth
B = Bottom

APPENDIX VB-8 (Continued)

ABUNDANCE* OF SELECTED MACROZOOPLANKTON SPECIES IN DAY/NIGHT COLLECTIONS

LEPTODORA KINDTII: NIGHT

II.

DATE	SAMPLE DEPTH	3-NMPW 20	3-NMPW 40	1-NMPW 20	1-NMPW 40	.5-NMPW 20	.5-NMPW 40	NMPP 60	NMPP 80	NMPP 100	.5-NMPE 20	.5-NMPE 40	1-NMPE 20	1-NMPE 40	3-NMPE 20	3-NMPE 40
JUN	S	820	2163	919	1043	2122	1129	955	459	231	3629	65	1187	1840	4385	1714
	M	1485	2676	4219	2398	863	2342	511	416	424	2297	1844	3712	3297	45	6881
	B	1040	595	1291	534	83	7405	537	300	641	1472	1613	5305	14248	1936	7022
JUL	S	19532	52664	49879	47196	108603	75930	20671	18925	9737	96774	75638	54379	16459	59900	14550
	M	33196	39785	157361	94136	43082	37731	62887	69540	10740	87755	25408	269342	31924	61468	26350
	B	26605	17843	93003	13868	56834	43521	50048	82270	8787	23711	31044	50304	30311	129629	20477
AUG	S	341775	254700	441888	201568	459964	7862	157134	43834	107710	274072	291760	436959	205386	205871	105423
	M	134306	152859	191188	123233	676633	328855	146322	118387	95874	674107	540583	610344	186206	220048	205540
	B	88836	427337	357770	114495	450034	48847	165024	128392	130195	407844	423830	838866	48233	824385	162778

* Number of organisms/1000 m^3

S = Surface

M = Mid-Depth

B = Bottom

APPENDIX VB-8 (Continued)

ABUNDANCE* OF SELECTED MACROZOOPLANKTON SPECIES IN DAY/NIGHT COLLECTIONS

NINE MILE POINT VICINITY - 1975

III. DIPTERA: NIGHT

DATE	SAMPLE DEPTH	STATION: 3-NMPW 20	3-NMPW 40	1-NMPW 20	1-NMPW 40	.5-NMPW 20	.5-NMPW 40	NMPP 60	NMPP 80	NMPP 100	.5-NMPE 20	.5-NMPE 40	1-NMPE 20	1-NMPE 40	3-NMPE 20	3-NMPE 40
JUN	S	23	17	22	90	54	18	14	0	5	44	18	10	40	0	327
	M	35	61	25	54	67	18	0	26	26	44	94	83	73	11	308
	B	12	0	72	20	0	180	10	26	0	87	25	62	101	0	271
JUL	S	65	0	0	0	332	44	0	0	0	104	24	0	0	33	169
	M	169	0	93	0	248	0	0	0	0	78	141	242	708	175	95
	B	65	0	0	0	297	0	0	0	27	443	112	234	0	77	88
AUG	S	81	112	180	104	131	0	83	84	0	134	101	119	29	28	37
	M	694	63	77	214	55	49	28	28	0	72	248	66	527	94	181
	B	99	100	163	138	76	494	28	21	0	91	78	83	158	138	48

* Number of organisms/1000 m^3
S = Surface
M = Mid-Depth
B = Bottom

APPENDIX VB-8 (Continued)

ABUNDANCE* OF SELECTED MACROZOOPLANKTON SPECIES IN DAY/NIGHT COLLECTIONS

GAMMARUS FASCIATUS: DAY

DATE	SAMPLE DEPTH**	3-NMPW 20FT	3-NMPW 40FT	1-NMPW 20FT	1-NMPW 40FT	1/2-NMPW 20FT	1/2-NMPW 40FT	NMPP 60FT	NMPP 80FT	NMPP 100FT	1/2-NMPE 20FT	1/2-NMPE 40FT	1-NMPE 20FT	1-NMPE 40FT	3-NMPE 20FT	3-NMPE 40FT
APR	S	-	-	-	-	-	-	-	9	36	-	-	-	-	0	-
	M	-	-	-	-	-	-	-	-	-	-	5	-	-	0	-
	B	-	-	-	-	5	-	0	-	4	0	0	0	-	0	0
MAY	S	101	0	0	0	0	0	0	0	0	-	6	0	0	0	0
	M	6	0	0	0	21	0	0	0	0	0	0	0	0	0	0
	B	0	0	7	0	13	0	0	0	6	0	6	0	0	12	13
JUN	S	0	0	8	0	10	0	4	11	12	12	0	0	0	0	0
	M	0	0	0	0	0	0	0	0	0	0	4	8	0	0	0
	B	0	0	8	0	80	0	4	0	11	0	4	0	0	26	0
JUL	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	B	0	0	0	93	0	10	0	0	0	626	326	377	25	73	96
AUG	S	11	0	28	4	10	10	0	0	0	0	0	0	0	0	0
	M	0	0	6	0	32	9	0	0	3	93	10	1070	0	0	9
	B	19	4	54	4	10	4	0	0	0	0	0	0	0	0	0
SEP	S	0	4	4	5	16	0	0	15	0	0	5	0	5	0	0
	M	0	0	0	0	8	0	0	0	0	0	0	0	0	0	0
	B	1148	124	5	42	14	13	0	0	0	0	0	5	0	0	0
OCT	S	0	0	0	0	7	0	0	39	0	0	0	0	0	0	0
	M	0	-	0	0	0	0	0	0	3	11	39	32	0	0	0
	B	97	0	0	0	98	0	0	34	330	0	95	0	0	0	0
NOV	S	0	0	0	0	4	4	0	0	0	4	0	18	0	8	0
	M	6	0	0	0	5	0	0	0	0	4	0	34	0	0	0
	B	0	0	0	0	0	0	0	0	3	0	0	88	0	0	0
DEC	S	0	0	0	0	0	0	0	4	0	5	0	0	0	0	0
	M	0	0	0	0	0	0	0	0	0	12	17	0	0	0	0
	B	0	0	0	0	0	5	0	0	0	323	16	0	0	5	0

* = NO. OF ORGANISMS/1000 M3
**DEPTH: S = SURFACE M = MID-DEPTH B = BOTTOM
NS = NO SAMPLES
\- = SAMPLES NOT YET ANALYZED

ABUNDANCE OF SELECTED [illegible]CROZOOPLANKTON SPECIES IN DAY/NIGHT COLLECTIONS

V. - LEPTODORA KINDTII: DAY

DATE	SAMPLE DEPTH**	3-NMPW 20FT	3-NMPW 40FT	1-NMPW 20FT	1-NMPW 40FT	1/2-NMPW 20FT	1/2-NMPW 40FT	N M P P 60FT	N M P P 80FT	N M P P 100FT	1/2-NMPE 20FT	1/2-NMPE 40FT	1-NMPE 20FT	1-NMPE 40FT	3-NMPE 20FT	3-NMPE 40FT
MAY	S	0	0	0	31	7	0	46	36	11	–	0	19	5	27	6
	M	6	15	19	15	10	0	7	68	29	6	6	11	30	0	13
	B	7	0	0	0	0	0	19	17	6	101	13	14	14	0	0
JUN	S	147	31	53	4	45	57	4	11	0	130	192	200	63	595	142
	M	2817	511	951	988	188	379	435	81	33	1332	911	1255	364	1328	1799
	B	955	474	494	581	80	289	136	48	53	1523	655	397	287	2305	1056
JUL	S	1161	34711	48953	10308	2928	17799	18784	217	7661	183	10781	1062	10000	5707	15518
	M	13136	41918	42787	24022	2529	14092	4522	5273	9127	74916	24690	15445	11055	71085	46114
	B	10696	35952	9702	52289	15978	1768	8517	20435	13219	37169	14720	15656	14718	91737	11664
AUG	S	3780	3641	106550	4526	150527	6955	22719	159399	1616	97361	96269	92269	42415	5419	3722
	M	31920	192950	19942	92623	98818	139904	235039	129234	15177	159905	90522	185627	192415	202922	157564
	B	197597	447370	275245	428818	558657	500344	292459	68031	63796	398007	1177838	202777	313827	358551	234568
SEP	S	30398	4624	21587	766	13394	4650	105769	54785	156918	83346	147208	85017	27753	40899	65301
	M	13669	107579	75115	172459	73450	159495	114101	160318	68597	122556	127000	194571	147144	130001	200989
	B	58032	117989	120447	76630	57419	73922	67988	26216	81555	118941	126635	145080	81676	118487	52351
OCT	S	22194	10780	9027	7669	5073	7014	8426	4630	11005	15884	6837	15067	6810	7167	10960
	M	21920	–	18493	6353	15866	7562	9864	16688	13830	26401	6424	8343	9268	2576	7143
	B	13581	8332	6567	9262	18784	6316	8980	10988	6516	14713	6759	10819	4990	26728	9310
NOV	S	1284	598	1761	68	1476	979	1191	15	1431	1592	615	2147	2455	1219	1112
	M	2440	854	3628	1338	3133	3984	2460	208	2037	2525	96	1213	2787	963	2674
	B	1402	1065	2303	1262	1468	1999	1940	1378	911	2829	5947	1097	1053	3861	2035
DEC	S	113	41	204	25	69	44	39	62	5	85	50	112	17	34	30
	M	56	51	43	56	0	37	52	65	21	47	80	102	35	46	86
	B	120	109	29	40	54	34	34	47	14	23	130	92	60	169	25

* = NO. OF ORGANISMS/1000 M3
**DEPTH: S = SURFACE M = MID-DEPTH B = BOTTOM
NS = NO SAMPLES
– = SAMPLES NOT YET ANALYZED

APPENDIX VB-8 (Continued)

ABUNDANCE* OF SELECTED MACROZOOPLANKTON SPECIES IN DAY/NIGHT COLLECTIONS

VI.

DIPTERA: DAY

DATE	SAMPLE DEPTH**	3-NMPW 20FT	3-NMPW 40FT	1-NMPW 20FT	1-NMPW 40FT	1/2-NMPW 20FT	1/2-NMPW 40FT	1/2-NMPW 60FT	NMPP 80FT	NMPP 100FT	1/2-NMPE 20FT	1/2-NMPE 40FT	1-NMPE 20FT	1-NMPE 40FT	3-NMPE 20FT	3-NMPE 40FT
APR	S	–	–	–	–	–	–	–	5	58	–	–	–	–	6	–
	M	–	–	–	–	–	–	–	–	–	–	0	–	–	7	–
	B	–	–	–	–	5	–	0	–	0	60	0	5	–	10	4
MAY	S	0	0	0	0	0	5	0	0	0	–	12	0	0	0	6
	M	6	0	0	0	5	0	7	0	0	0	6	6	0	0	0
	B	7	36	7	0	0	0	0	0	12	0	25	0	7	19	13
JUN	S	0	4	11	0	13	8	0	0	0	4	0	0	0	0	8
	M	10	0	16	17	13	9	0	0	0	17	13	4	0	16	0
	B	4	0	15	0	38	4	0	0	0	8	4	4	0	22	0
JUL	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	M	0	0	0	0	0	0	0	0	0	21	0	0	0	17	0
	B	0	0	0	0	0	0	0	0	0	87	0	755	25	369	0
AUG	S	0	30	34	0	25	0	6	0	0	0	0	8	0	0	8
	M	16	0	6	0	38	5	0	4	0	16	0	57	0	4	4
	B	52	18	38	0	50	4	0	0	4	0	7	0	6	0	0
SEP	S	0	0	4	10	5	9	5	15	0	11	5	0	5	0	0
	M	61	42	47	41	67	15	15	0	8	91	23	0	0	4	0
	B	19	18	32	0	9	17	0	0	8	15	20	0	5	5	0
OCT	S	4	0	0	4	0	0	0	0	0	0	0	0	0	0	0
	M	0	–	0	0	0	0	0	3	3	0	0	0	0	0	0
	B	0	0	0	0	0	30	0	0	27	0	0	0	0	0	0
NOV	S	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0
	M	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0
	B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DEC	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	M	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0
	B	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0

* = NO. OF ORGANISMS/1000 M3
**DEPTH: S = SURFACE M = MID-DEPTH B = BOTTOM
NS = NO SAMPLES
– = SAMPLES NOT YET ANALYZED

VI. BENTHOS

A. NATURAL HABITATS

1. Introduction

The benthic sampling program conducted in the vicinity of Nine Mile Point is a continuation of work performed in 1973 and 1974. Only minor changes were introduced and these are described in Section 2, Materials and Methods.

Observation of the benthos is a continuing program because of the central importance of many benthic organisms in the lake food web and the inability of many benthic forms to escape environmental perturbation by migration.

The following observations were made in the 1974 benthos study: abundance and biomass in the area of the thermal plume were generally low, an observation possibly correlated with the stability of the substrata; animal-substratum relations were investigated in more depth than in 1973 and the preferences of certain species described; seasonal and depth distributions of many benthic species were described; and Cladophora biomass appeared to have a unimodal distribution, with the peak in June.

The objectives of the 1975 report will be to analyze the benthic association as a unit, employing various community analyses. Emphasis will be placed on determining whether inter-transect differences exist, and the nature of any such differences.

2. Materials and Methods

a. Field Collection

Two replicate benthic samples were collected in alternate months from April through October at the 10, 20, 30, 40, and 60 ft depth contours on four transects: NMPW, NMPP, FITZ, and NMPE (Figure VI-1, Table VI-1) following the same method as in 1974 (LMS, 1975). The scheduled December collections were not made because of adverse weather conditions. The type of substratum of each sample was determined by diver observation following defined critera (Table VI-2). In addition, divers scooped sediment samples into sealable containers at each site for grain size analyses, and determined sediment accumulation on calibrated staffs installed near the three periphyton buoy anchors.

TABLE VI -1

BENTHOS SAMPLING PROGRAM

NINE MILE POINT VICINITY - 1975

DATE	STATION [TRANSECT AND DEPTH CONTOUR (ft)]																							
	NMPW						NMPP						FITZ						NMPE					
	10C	10NC	20	30	40	60	10C	10NC	20	30	40	60	10C	10NC	20	30	40	60	10C	10NC	20	30	40	60
16 APR							X	X	X	X	X	X												
17 APR		X	X	X	X	X																		
23 APR														X	X	X	X	X						
24 APR																				X	X	X	X	X
17 JUN													X	X	X	X	X	X	X	X	X	X	X	X
18 JUN	X		X	X	X	X	X	X	X	X	X	X												
4 AUG		X	X	X	X	X		X	X	X	X	X												
5 AUG														X	X	X	X	X		X	X	X	X	X
20 OCT														X	X					X	X			
25 OCT		X	X	X	X	X																		
28 OCT																X	X	X				X	X	X
31 OCT								X	X	X	X	X												

X = Two replicate samples collected
10C = 10-ft *Cladophora* station
10NC = 10-ft non-*Cladophora* station

TABLE VI-2

DEFINITIONS OF SUBSTRATE TYPE

Bedrock	=	Large flat rock
Boulder	=	256 mm rounded rock
Rubble	=	64 to 256 mm - mixture of flat and rounded rock of cobblestone size
Gravel	=	2 to 64 mm rock
Mixed Rock	=	Bedrock predominant with pieces of rubble between
Sand & Silt Over Bedrock	=	Mask of sand less than 5 cm over bedrock
Sand & Silt	=	Sand deeper than 5 cm (maybe over bedrock or rubble, but not necessary to see it)

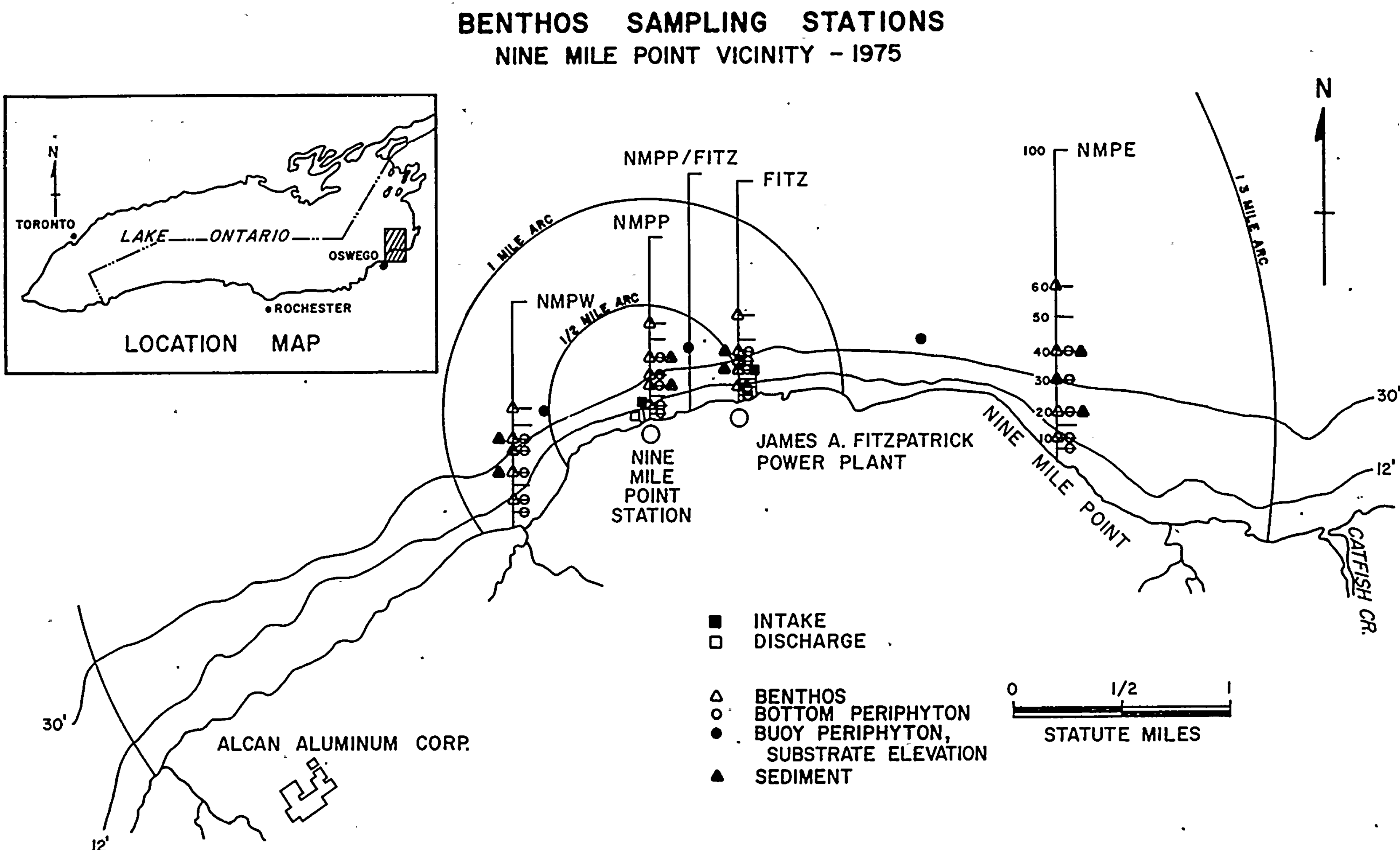

BENTHOS SAMPLING STATIONS
NINE MILE POINT VICINITY - 1975
LOCATION MAP
TORONTO
LAKE ONTARIO
OSWEGO
ROCHESTER
N
NMPP/FITZ
FITZ
NMPP
NMPW
NMPE
1 MILE ARC
1/2 MILE ARC
1.5 MILE ARC
100
60
50
40
30
20
10
30'
12'
NINE MILE POINT STATION
JAMES A. FITZPATRICK POWER PLANT
NINE MILE POINT
CATFISH CR.
ALCAN ALUMINUM CORP.
INTAKE
DISCHARGE
BENTHOS
BOTTOM PERIPHYTON
BUOY PERIPHYTON, SUBSTRATE ELEVATION
SEDIMENT
0
1/2
1
STATUTE MILES

FIGURE VI-1

b. Laboratory Analysis

Except for the following modifications, laboratory procedures were not changed from 1974 (LMS, 1975).

The subsamples of benthic samples were either 1/4 or 1/2 of the original sample size, depending upon the original sample size. All subsamples were picked, counted, and sorted into major taxonomic groups. The wet weight biomass of all major taxa was determined by soaking the organisms in water, drying them for 1/2-hr in a desiccator with Drie-Rite, and weighing on tared screens with a Mettler H-54 analytical balance.

Sediment grain size was analyzed from diver sediment samples collected in June, August, and October. Grain size was analyzed by hydrometer and organic fraction determined by ashing sediments at 600°C (Lambe, 1951).

3. Results and Discussion

a. Community Structure

The abundance and percent composition of macroinvertebrates collected in benthic samples is presented by station in Appendix VI-1a.

b. Physical Characteristics of the Study Area

In the 1974 report (LMS, 1975) it was speculated that substrata in the NMPP-FITZ area were more unstable than at either the NMPE or NMPW areas. This was tested by diver observation of sediment accumulation on calibrated staffs installed near the three periphyton buoy anchors.

Results of these observations (Table VI-3) indicate little or no sedimentation at either the NMPW or NMPP/FITZ stations. At the NMPE station, both sedimentation and scouring (alternately) occurred, indicating that the NMPE transect has the most unstable sediments. The general trend of sand and silt accumulation being thicker in the east and thinning in the westerly direction was found by divers again in 1975.

Sediments collected at each sampling site were analyzed (Appendix VI-1b) and the results show that sediment is mainly composed of sand.

TABLE VI-3

OBSERVATIONS OF SEDIMENT ACCUMULATION NEAR PERIPHYTON BUOY ANCHORS

NINE MILE POINT VICINITY - 1975

DATE	STATION		
	NMPW	NMPP/FITZ	NMPE
27 JUN	NS	TRACE	TRACE
13 AUG	1/4 mm	1/4 mm	2-4 mm
29 AUG	TRACE	TRACE	0-20 mm*
15 SEP	2 mm	0	0-1 mm
13 OCT	TRACE	TRACE	0-20 mm*
18 NOV	0	NS	20 mm
26 NOV	NS	0	NS
12 DEC	TRACE	TRACE	50-60mm

* A rippled surface

c. Distribution of Selected Taxa

(i) *Cladophora*

When possible, divers collected benthic samples from areas with both heavy *Cladophora* growth (10C) and light *Cladophora* growth (10NC) at the 10 ft depth contour. This was most successful in June (Table VI-4), when divers were able to locate both *Cladophora* and non-*Cladophora* areas at 3 of the 4 transects (NMPW was the exception).

In order to determine patterns in distribution of *Cladophora* biomass associated with season and depth, mean values including all transects, both replicate samples, and both C and NC samples, when they occurred, were used in graphic presentation (Figure VI-2). *Cladophora* exhibited a unimodal seasonal pattern of production, as was seen in 1974, with the peak period of production in June.

The observed unimodality may be a sampling artifact and not a biological reality. The pattern of *Cladophora* growth in Lake Ontario generally has a major peak in June, a trough in July/early August, and a secondary peak in late August/September, declining from September into the winter months (Storr and Sweeney, 1971).

The possibility exists that the first peak was sampled in June, the trough missed by not sampling in July, the second peak sampled in August, and the winter decline sampled in October. Only a more complete sampling program could determine whether *Cladophora* growth in the Nine Mile vicinity has the typical bimodal or the atypical unimodal pattern.

Cladophora biomass decreases rapidly with increasing depth, and the alga generally does not occur below 30 to 40 ft (Figure VI-2). This agrees with previous observations (Neil and Owen, 1964) in western Lake Ontario of 7.7 m (25 ft) and eastern Lake Ontario of 13.8 m (45 ft).

Because of diver selection of C and NC stations on the basis of *Cladophora* biomass, analysis of variance techniques on this data are inappropriate and were not performed. However, examination of Table VI-4 reveals no obvious difference in *Cladophora* biomass associated with transects. This was not the case in 1974, when the greatest biomass was associated with the NMPP and NMPW transects.

TABLE VI-4

CLADOPHORA BIOMASS*

NINE MILE POINT VICINITY - 1975

STATION [Transect/Depth Contour (Ft.)]		16,24 APR			17,18 JUN			4,5 AUG			20 OCT		
		R-1	R-2	MEAN	R-1	R-2	MEAN	R-1	R-2	MEAN	R-1	R-2	MEAN
NMPW	10C	NS	NS	NS	63.255	64.200	63.728	NS	NS	NS	NS	NS	NS
	10NC	43.609	5.254	24.432	NS	NS	NS	1.487	1.745	1.616	0	0	0
	20	0.693	13.335	7.014	1.230	1.643	1.437	2.813	0.236	1.525	3.666	0.334	2.000
	30	0.924	0	0.462	1.319	9.401	5.360	0	0	0	0	0.023	0.012
	40	0	0	0	0	0	0	0	0	0	0	0	0
	60	0	0	0	0	0	0	0	0	0	0	0	0
NMPP	10C	41.732	55.270	48.501	52.746	33.674	43.210	NS	NS	NS	NS	NS	NS
	10NC	4.457	2.282	3.370	0.113	0.937	0.525	1.169	0.912	1.041	0	0	0
	20	2.404	0.803	1.604	0	5.356	2.678	0.515	0	0.257	0.175	1.290	0.733
	30	0	0	0	0	0	0	0	0	0	0	0.875	0.438
	40	0	0	0	0	0	0	0	0	0	0.420	0.093	0.257
	60	0	0	0	0.097	0	0.049	0	0	0	0	0	0
FITZ	10C	NS	NS	NS	3.659	26.250	14.955	NS	NS	NS	NS	NS	NS
	10NC	0.913	0.542	0.728	3.412	1.345	2.379	0.280	1.554	0.917	1.289	0.916	1.103
	20	6.612	0	3.306	0	0.089	0.045	1.662	0.763	1.213	0	0	0
	30	0	0	0	0	0	0	0	0	0	0	0	0
	40	0	0	0	1.439	0	0.720	0	0	0	0	0	0
	60	0	0	0	0	0	0	0	0	0	0	0	0
NMPE	10C	NS	NS	NS	14.493	28.264	21.379	NS	NS	NS	6.032	NS	4.061
	10NC	0	2.600	1.300	5.651	4.067	4.859	8.200	2.118	5.159	1.036	2.090	0.604
	20	0	0	0	0	0	0	0.049	0	0.025	0	0.172	0
	30	0	0	0	0	0	0	0	0	0	0	0	0
	40	0	0	0	0	0	0	0	0	0	0	0	0
	60	0	0	0	0	0	0	0	0	0	0	0	0

*Taken with benthos sample; g ash-free dry wt/m^2

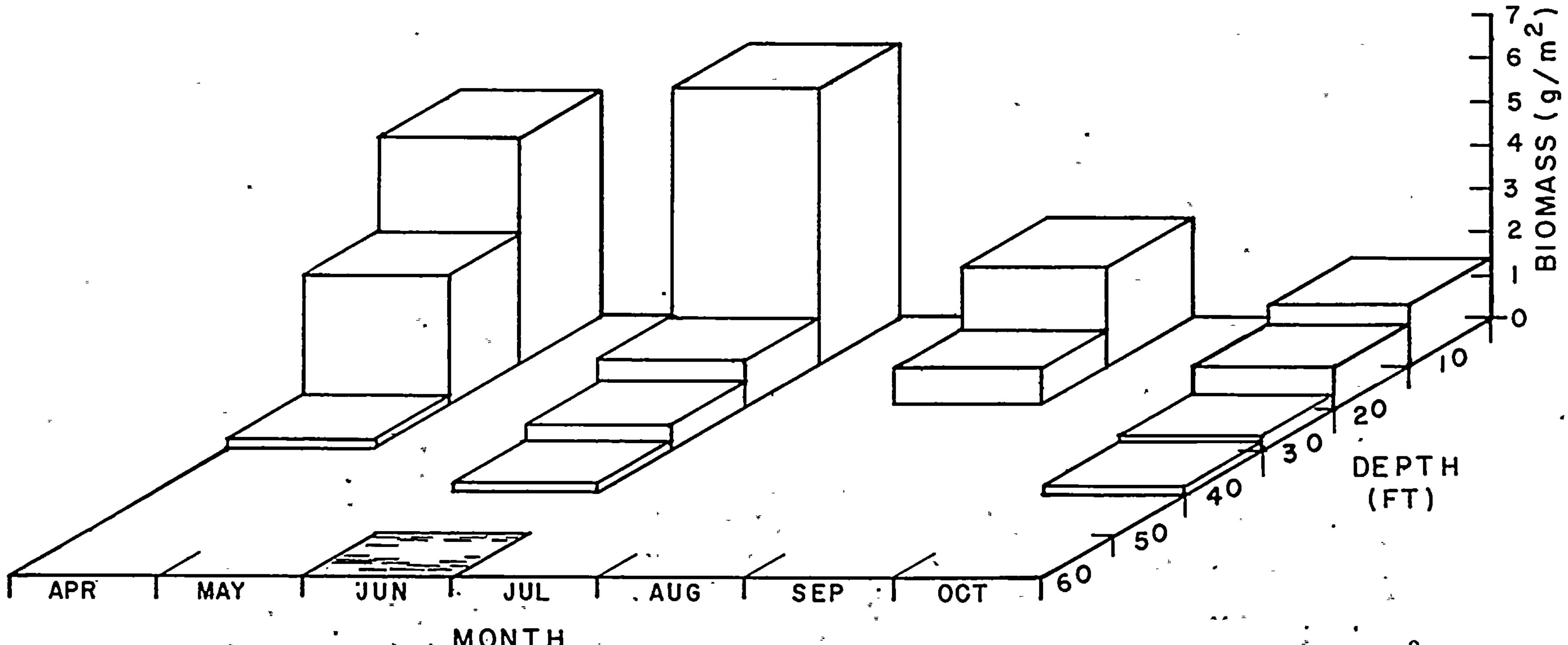
NS = No sample

C = Cladophora

NC = Non-Cladophora

SEASONAL DISTRIBUTION OF CLADOPHORA BIOMASS*

NINE MILE POINT VICINITY—1975



*Mean of R-1 and R-2; mean of 10 ft Cladophora and non-Cladophora stations: g ash-free dry weight/m^2

FIGURE VI-2

Biomass values (g ash free dry wt/m^2) agree with previous studies. In June samples, values ranged from 38-185 g/m^2 from 1969 to 1972 (Storr, 1973) and in 1972, 111 g/m^2 was recorded (Moore, 1975). In August samples, values ranged from 0-33 g/m^2 from 1968 to 1972 (Storr, 1973) and 2 g/m^2 was recorded in 1972 (Moore, 1975). Storr's data were from 5 ft depth, and Moore's from 10 ft. This compares to average values of 21.576 g/m^2 in August recorded at the 10 ft depth contour in this study. This suggests that Cladophora production was lower this year than in past years; however, collection and laboratory methods may contribute much to this difference.

(ii) Other Selected Species

Distribution data for *Gammarus fasciatus* is presented in Table VI-4b.

4. Conclusions

a. Diver observation of sediment accumulation indicates that the sediments at the NMPE station are the least stable of all three stations.

b. The biomass of *Cladophora* was similar in magnitude and in seasonal distribution to that recorded in 1974 (LMS, 1975), decreasing with depth.

B. ARTIFICIAL SUBSTRATES - PERIPHYTON

1. Introduction

The periphyton program in 1975 was a continuation of the 1974 periphyton program. Minor modifications are included in Section 2, Materials and Methods. Emphasis will be placed on elucidation and interpretation of temporal and spatial distribution of biomass, chlorophyll *a*, and various taxa. Trends found in 1974 will be investigated further in 1975 data.

2. Materials and Methods

a. Field Collection

Periphyton on plexiglass substrates affixed to either buoys or resting on the lake bottom were sampled monthly from April to

TABLE VI-4b

ABUNDANCE* OF GAMMARUS FASCIATUS

NINE MILE POINT VICINITY - 1975

I. NON-CLADOPHORA STATIONS

MONTH	10 FT				20 FT				30 FT				40 FT				60 FT			
	NMPW	NMPP	FITZ	NMPE	NMPW	NMPP	FITZ	NMPE	NMPW	NMPP	FITZ	NMPE	NMPW	NMPP	FITZ	NMPE	NMPW	NMPP	FITZ	NMPE
APR	834	41	187	248	355	13	1012	106	30	12	3	8	7	6	3	3	21	9	3	55
JUN	NS	86	682	169	203	53	46	69	27	148	104	50	18	NS	589	12	78	NS	75	49
AUG	5724	14244	4325	11651	56	447	1640	765	34	82	464	120	22	10	136	126	95	30	86	33
OCT	4712	4704	5928	3465	69	2179	30	358	283	483	202	197	228	1052	500	541	194	616	670	350

II. CLADOPHORA STATIONS

MONTH	NMPW-10 FT	NMPP-10 FT	FITZ-10 FT	NMPE-10 FT
APR	NS	635	NS	NS
JUN	1404	2572	3475	2066

NS = No sample

December at the same transects and depths as in 1974 (Table VI-5). Exposure time of substrates was, with one exception, four weeks.

b. Laboratory Analysis

Laboratory procedures in 1975 were unchanged from 1974 except for the following modifications. Protozoans, rotifers, and algae were enumerated using the Sedwick-Rafter cell method (APHA, 1971).

Biomass was determined by scraping the periphyton off four 5 x 6.25 cm (2 x 2.5 in) surfaces into weighing pans. Samples were dried at 105°C for 12 hrs, cooled in a desiccator for 1/2 hr, and weighed to the nearest 10^{-5} g on a Mettler H-54 analytical balance. Dried samples were then heated for 1/2 hr at 500°C in a muffle furnace, and cooled in a desiccator for 1/2 hr; the ash content was then determined to the nearest 10^{-5} g. Ash-free dry weight was determined from the difference in weights.

Heavy filamentous algal growth of *Lyngbya* and *Oscillatoria* on buoy slides necessitated additions to identification procedures during 1975. After algal matrices were scraped from plexiglass substrata, they were suspended in a 5% formalin solution and separated using a four-blade 'blender' at 1500 rpm for at least three minutes. Microscopic examination was as follows:

- Average length of all *Lyngbya* and *Oscillatoria* filaments within each field was estimated.
- The total number of clumps within the counting cell was counted.
- Species abundance and average filament length were recorded for five individual clumps.
- Cells from 20 filaments were measured.

Cell density was determined as follows:

$$C = X + Y$$

$$Y = \frac{\text{Cell counts x (ml of sample) x 1000 } \frac{mm^3}{ml}}{\text{Whipple disc } (mm)^2 \text{ x (No. of fields) x 1.0 mm x area of substrate } (dm)^2}$$

$$X = \frac{\text{No. clumps x ml of sample x U}}{\text{1 ml x area of substrate } (dm)^2}$$

TABLE VI-5

PERIPHYTON SAMPLING PROGRAM

NINE MILE POINT VICINITY - 1975

I. BUOY[a]

DATE SAMPLE RETRIEVED	TRANSECT NMPW	NMPP/FITZ	NMPE
14 MAY	X	X	X
29 MAY[c]	X	X	X
12 JUN	X	X	X
27 JUN	X	X	X
14 JUL	X	X	X
30 JUL	X	X	X
13 AUG	X	X	X
29 AUG	X	X	X
15 SEP	X	X	X
13 OCT	X	X	X
18 NOV	X		X
26 NOV		X	
12 DEC	X	X	X

II. BOTTOM[b]

DATE SAMPLE RETRIEVED	TRANSECT NMPW	NMPP	FITZ	NMPE
15 MAY	X	X	X	X
13 JUN	X	X	X	X
15 JUL	X			
16 JUL		X	X	X
15 AUG	X			
16 AUG		X	X	X
16 SEP			X	X
18 SEP	X	X		
15 OCT	X	X	X	X
20 NOV	X	X	X	X
12 DEC	X	X	X	X

[a]Buoy station at 40 ft depth contour.
[b]Bottom stations at 5, 10, 20, 30, and 40 ft depth contours.
[c]Exposure two-weeks.

$$U = \frac{\text{Total length of all filaments in 5 clumps } (\mu)}{\text{average cell length } (\mu) \times 5 \text{ clumps}}$$

C = concentration of cells or cells/(dm)^2
Y = concentration of cells excluding clumps
X = concentration of cells found in clumps
U = average number of cells per clump

3. Results and Discussion

a. Community Structure

Data not analyzed for this report.

b. Spatial and Temporal Distribution Patterns

(i) Phycoperiphyton Abundance and Nuisance Species

Data not analyzed for this report.

(ii) Zooperiphyton Abundance

Data not analyzed for this report.

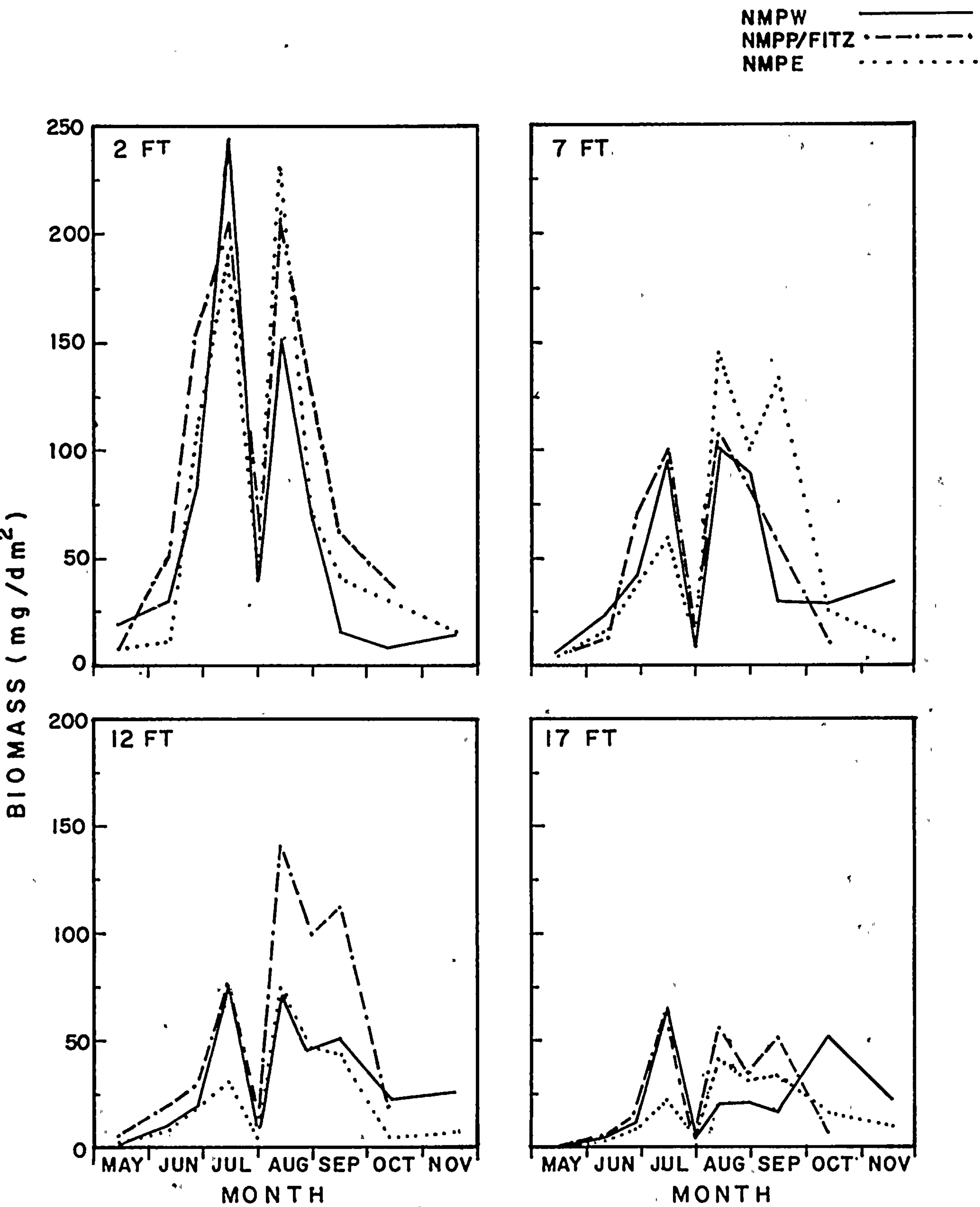
(iii) Chlorophyll a and Biomass at Buoy Stations

There are three possible patterns of chlorophyll a and biomass distribution in this experiment: temporal or seasonal patterns, depth related patterns, and station related patterns. In addition, the relationship between biomass and chlorophyll a (the autotrophic relationship) may also change with sample depth, time, or station. Data from 29 May were excluded from the analysis because, as the result of a two-week, not a four-week, exposure interval, they are therefore not comparable to other data. December data and data from NMPP/FITZ transect for 18 November were excluded because of the loss of samples due to inclement weather.

Patterns in distribution of biomass and chlorophyll a will be considered first, and then the relationship between biomass and chlorophyll a.

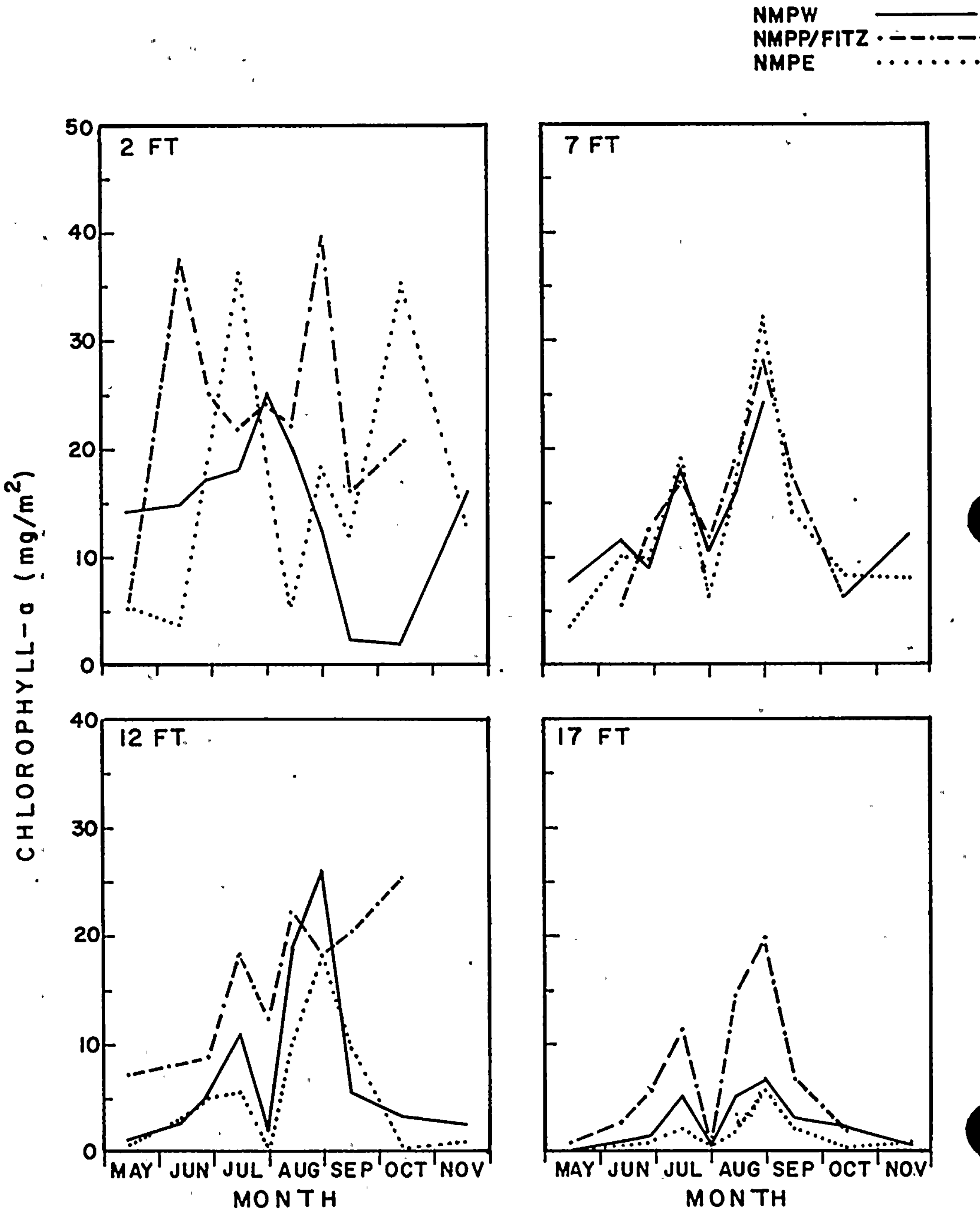
The seasonal pattern of both biomass (Figure VI-3) and chlorophyll a (Figure VI-4) collected from buoy stations is bimodal; the first peak occurs in mid-July and the second in mid-August. The depression of periphyton production in late July might have been emphasized by the windy and stormy weather which

BIOMASS* OF BUOY PERIPHYTON BY SAMPLE DEPTH
NINE MILE POINT VICINITY — 1975



*Mean of R-1 and R-2; mg/dm²

CHLOROPHYLL-a CONCENTRATION OF BUOY PERIPHYTON BY SAMPLE DEPTH
NINE MILE POINT VICINITY — 1975



occurred during that period (21, 25, 26, 28 July). The resulting turbulence, abrasion, and turbidity might have contributed to decreased production. Turbidity from the 28 July storm had cleared before 31 July (Appendix IV-7).

The pattern of chlorophyll a production in phytoplankton precedes the pattern in buoy periphyton by approximately four weeks. This suggests that the initial phytoplankton seeding density on the artificial substrata is of major importance in determining subsequent periphyton production; if the initial settlement on the artificial (plexiglass) substrata is dense, the resulting production will be dense. A bimodal, seasonal distribution of both biomass and chlorophyll a were also evident in 1974 (LMS, 1975).

The increase in biomass from May through July corresponds very closely to the increase in lake temperature during those months (Figure VI-5). In the same manner, the decrease in production of biomass closely follows the decrease in temperature from August through November. Decrease in photoperiod may also influence biomass production during the latter period.

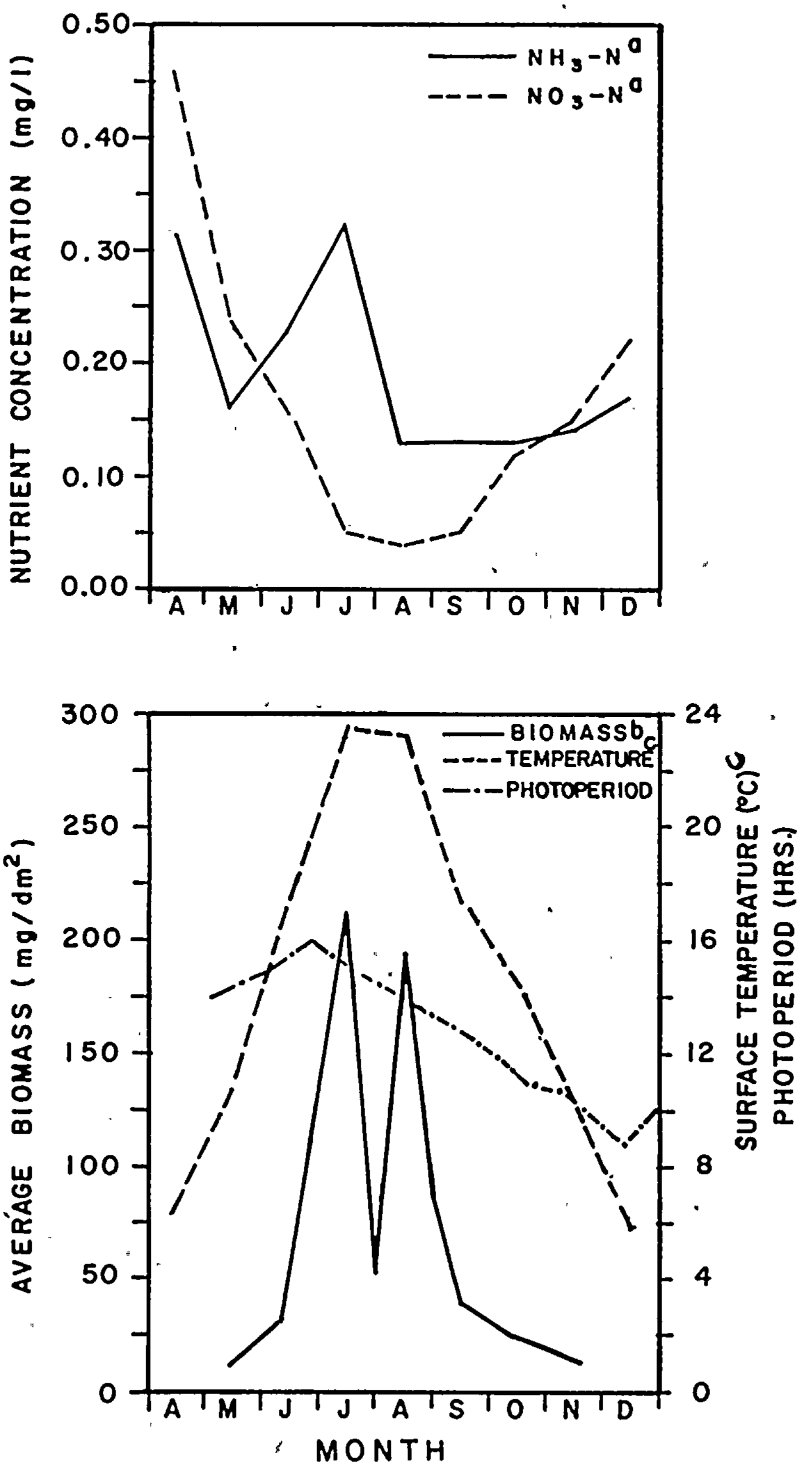
The drop in biomass production in late July, between two peak productive periods in mid-July and mid-August, corresponds to a period of low ammonia production (Figure VI-5). This may be evidence of nutrient limitation during July, a factor which, combined with the decrease in seeding from phytoplankton previously discussed, may cause low periphyton production in late July.

Differences in distribution of log-transformed biomass with sample depth and station from 14 May through 13 October were tested by analysis of variance (Appendices VI-2 through VI-10). Sample depth was a significant source of variance ($\alpha \leq .05$) in all months except October. A Student-Newman-Keuls (SNK) test was applied to locate the depths which were different, and the test results reveal different patterns of biomass distribution in different months with the exception of the 2 and 17 ft sample depths which had the greatest and least biomass, respectively in 75% of the dates analyzed (Appendices VI-2 to VI-10). Distribution of geometric means and 95% confidence intervals of biomass were then graphed against sample depth for each month (Figure VI-6).

From 14 May, the first sampling date, until 13 August biomass decreased logarithmically with depth. On 29 August and 15 September, surface production decreased in relation to deeper sample depths, possibly reflecting inhibition of algal growth

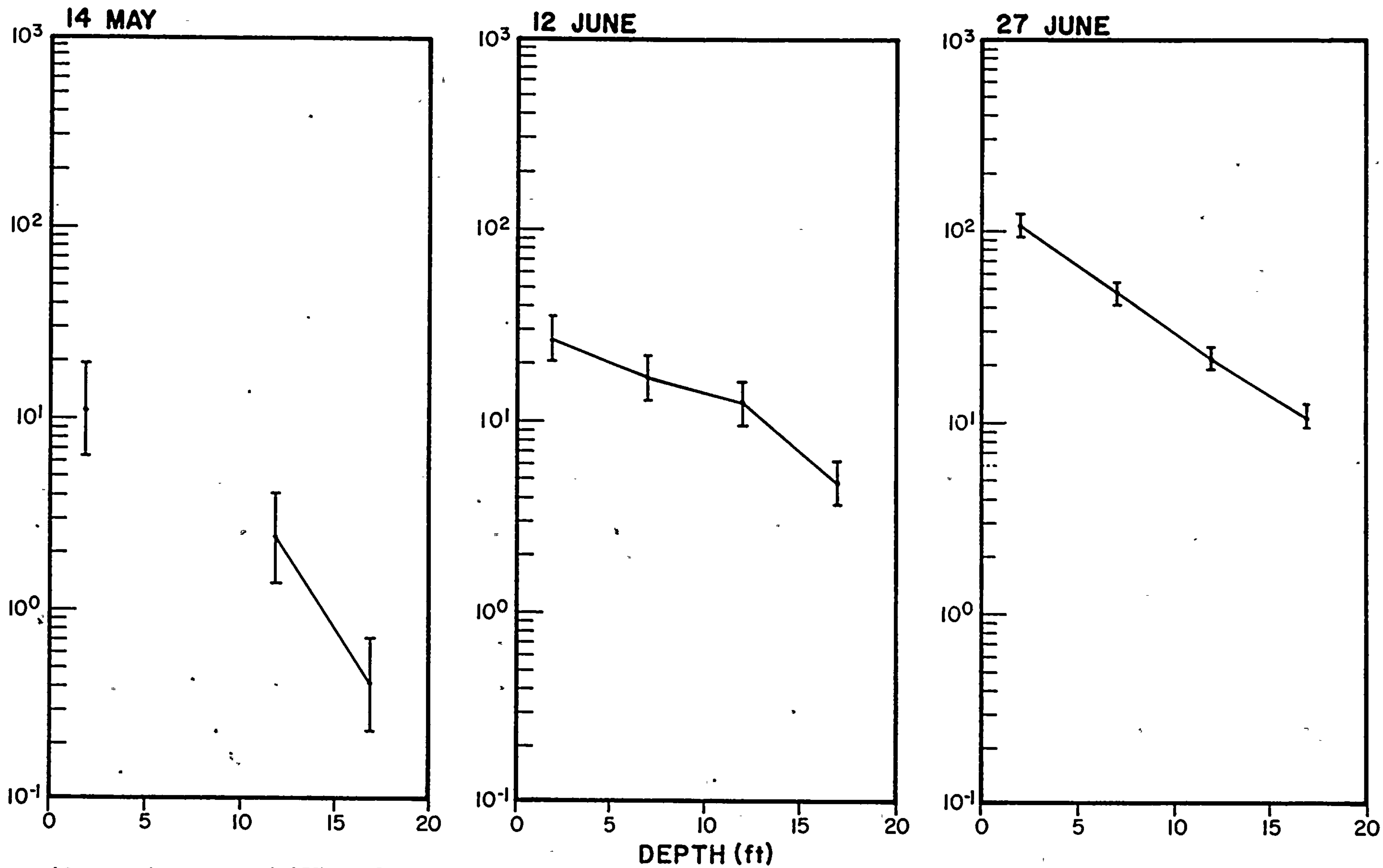
COMPARISON OF BUOY PERIPHYTON BIOMASS AND SELECTED PARAMETERS

NINE MILE POINT VICINITY—1975



[a] Monthly mean from bimonthly water quality program, all stations
[b] Biomass for November does not include NMPP/FITZ data
[c] Monthly mean temperature at 40 ft contour

DISTRIBUTION* OF BUOY PE[illegible]IYTON BIOMASS BY DEPTH
NINE MILE POINT VICINITY-1975

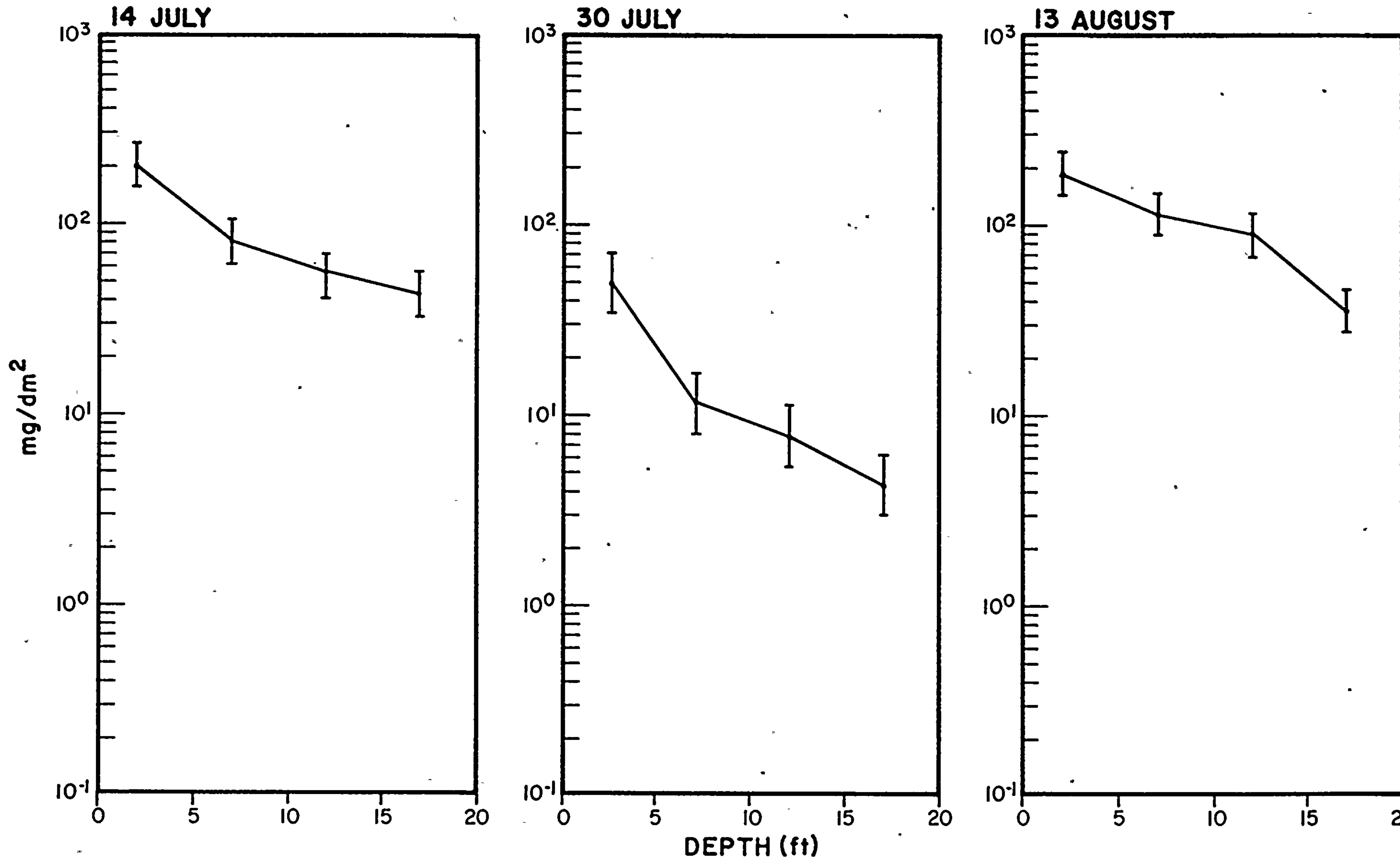


*Geometric mean and 95% confidence interval of all stations.

FIGURE VI-6

DISTRIBUTION* OF BUOY PERIPHYTON BIOMASS BY DEPTH

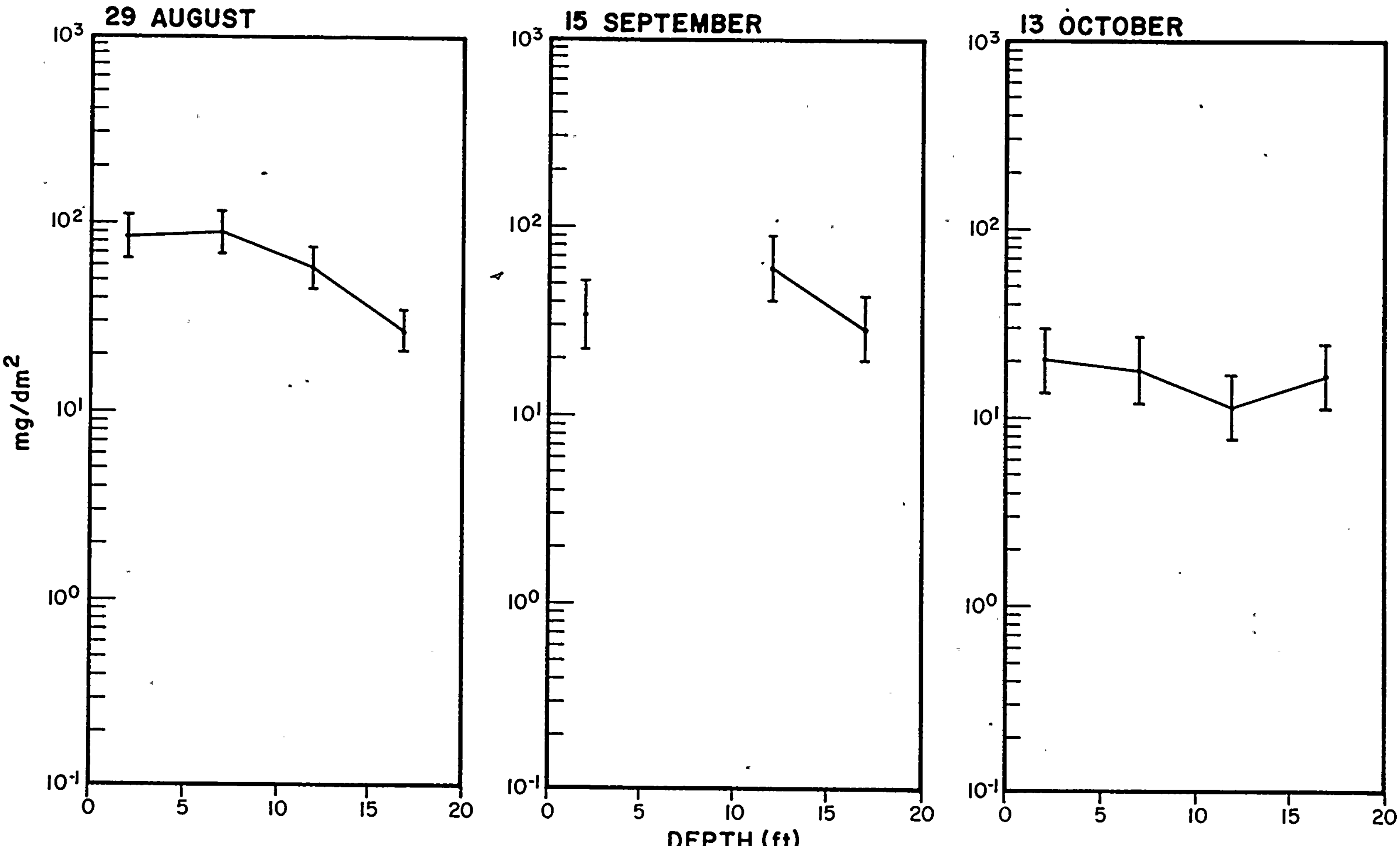
NINE MILE POINT VICINITY-1975



*Geometric mean and 95% confidence interval of all stations.

FIGURE VI-6 (continued)

DISTRIBUTION* OF BUOY PERIPHYTON BIOMASS BY DEPTH
NINE MILE POINT VICINITY-1975



*Geometric mean and 95% confidence interval of all stations.

FIGURE VI-6
(continued)

due to increased surface water temperature. This inhibition occurred approximately four weeks after the period of peak surface temperatures, again suggesting that the early period of settlement on the substratum is crucial for subsequent biomass production.

The NMPP/FITZ station at 12 and 17 ft depths appeared to have higher biomass production than NMPW and NMPE stations at those depths. To test this hypothesis, nested analysis of variance was used on log-transformed data, with stations nested within depths. This type of analysis detects the presence of differences among stations at each depth, and the location of these differences can then be revealed with *a posteriori* tests. Dunnett t-tests were chosen as *a posteriori* tests because the comparison of interest was one-sided; i.e., whether production at the plant is higher than at a control at the same depth. Results of the ANOVA and Dunnett's t-tests appear in full in Appendices VI-2 to VI-10 and are summarized on Table VI-6.

At both the 12 and 17 ft depths, the NMPP/FITZ station has higher biomass than either the NMPE or NMPW transect in 30 out of 36 possible occurrences (Table VI-6). This difference is significant at the 95% or greater level 13 times, and at the 99% or greater level 7 times.

In the upper sample depths, 2 and 7 ft, there is also a trend for the NMPP/FITZ station to have greater biomass production (Table VI-6). Out of 26 possible comparisons, NMPP/FITZ is higher than either control station 22 times, significantly higher at the 95% or greater level 8 times, and significantly higher at the 99% level or higher 5 times.

Attempts were made to correlate this increased biomass production with patterns of nutrient levels and turbidity, but correlations could not be found. Temperature measurements were insufficient to determine whether this increased production down to the 17 ft depth is correlated to temperature, but it is questionable whether the plume reaches this depth. No satisfactory explanation of the increased production can be offered at this time.

Biomass and chlorophyll *a* vary in a similar manner; the amount of plant biomass partially determines the amount of chlorophyll *a*. The variation in chlorophyll *a* attributable to ash-free biomass (r^2) is 36% for all data and 53% for all data below the 2-ft depth. This low correlation indicates that factors other than chlorophyll *a* are also important in the distribution

TABLE VI-6

SUMMARY OF RESULTS BETWEEN STATIONS AT SELECTED DEPTHS FOR BIOMASS OF BUOY PERIPHYTON

NINE MILE POINT VICINITY - 1975

DATE	DEPTH AND STATION							
	2 FT		7 FT		12 FT		17 FT	
	NMPP/FITZ>NMPE	NMPP/FITZ>NMPW	NMPP/FITZ>NMPE	NMPP/FITZ>NMPW	NMPP/FITZ>NMPE	NMPP/FITZ>NMPW	NMPP/FITZ>NMPE	NMPP/FITZ>NMPW
14 MAY	1		NA	NA	+	*	1	**
12 JUN	**	1			*	1	1	1
27 JUN	*	**	**	**	*	**	**	1
14 JUL	1		1	1	**		**	1
30 JUL	1	1	1	1	*	1		
13 AUG		1		1	1	1	1	**
29 AUG	*	+			*	*	1	1
15 SEP	1	*	NA	NA	+	+	1	1
13 OCT	1	**			**			

NA - Not available
1 = Geometric mean greater at one station than another but not significantly ($\alpha \leq .05$) greater
+ = Geometric means are differerent at $\alpha = .10$
* = Significant at $\alpha = .05$
** = Significant at $\alpha = .01$

of biomass. Some of these factors could be phylogenetic differences in chlorophyll/biomass ratios, inclusion of detritus or heterotrophic organisms in biomass determinations, experimental and measurement variance, intensity of light at sample depth, and condition of the algae.

One method of analyzing differences in chlorophyll a and biomass is to calculate an autotrophic index (AI), which is the ratio of ash-free dry weight to chlorophyll a (Weber 1973a, 1973b). In clean flowing waters, chlorophyll a is usually about one percent of the biomass (AI-100); organic pollution will increase both heterotrophs and detritus, and result in higher autotrophic indices. High indices are indicative of either organic pollution, eutrophic conditions, or both. The mean AI for buoy periphyton was 565, the range 19-5450 (Appendix VI-11). The mean is over five times that expected in clean waters, possibly reflecting both a high organic and detrital load.

Analysis of variance was performed to determine whether differences in AI were attributable to stations or to sample depths (Appendix VI-12). No significant differences ($\alpha \leq .05$) were indicated with stations or depths. No evidence of change in the autotrophic index was found to be associated with the thermal plume.

(iv) Chlorophyll a and Biomass of Bottom Periphyton

Bottom periphyton will be treated in the same manner as buoy periphyton. Spatial and temporal patterns of chlorophyll a and biomass will be examined first, and then the patterns of the relationship between them.

Sampling gear (plexiglass substrates) for bottom periphyton experiments are more subject to damage and loss than are buoy periphyton equipment. Table VI-7 summarizes the collected samples of bottom periphyton used for biomass and chlorophyll a determinations. The large number of missing samples is attributable to either loss or damage of artificial substrata. November and December data were not analyzed because the large numbers of missing values precluded any meaningful comparisons.

The seasonal pattern of distribution of both chlorophyll a and biomass is unimodal (Figures VI-7 and VI-8). This is unlike the bimodal distribution found in both buoy periphyton and phytoplankton, and probably reflects colonization of

TABLE VI-7

SAMPLES COLLECTED FOR BOTTOM PERIPHYTON BIOMASS
AND CHLOROPHYLL A DETERMINATION
NINE MILE POINT VICINITY - 1975

SAMPLING DATE	TRANSECT/DEPTH CONTOUR																			
	NMPW					NMPP					FITZ					NMPE				
	5	10	20	30	40	5	10	20	30	40	5	10	20	30	40	5	10	20	30	40
15 MAY	x x	x	x x	x x	x x	x x	x x	x x	x x		x x	x x	x x	x x	x x	x x	x x	x x	x x	x x
13 JUN	x x	x x	x x	x x	x x	x x	x x	x x	x x	x x	x x	x x	x x	x x	x x	x x	x x	x x	x x	x x
15,16 JUL[a]	x x	x x	x	x	x x			x x	x x	x x	x x	x x		x x	x x	x x	x x	x x	x x	x x
15,16 AUG[b]			x x	x x	x x			x	x x	x	x x	x x	x	x x	x x	x x	x x	x x	x x	x x
16,18 SEP[c]						x x	x x				x x	x x	x x	x x					x x	x x
15 OCT	x x	x x	x x	x x	x x	x x	x x	x x		x x	x x	x	x x	x x	x x	x x	x x	x x	x x	x x
20 NOV			x x	x		x x	x x				x x		x x	x x			x x			
12 DEC		x x	x	x		x x							x x		x					

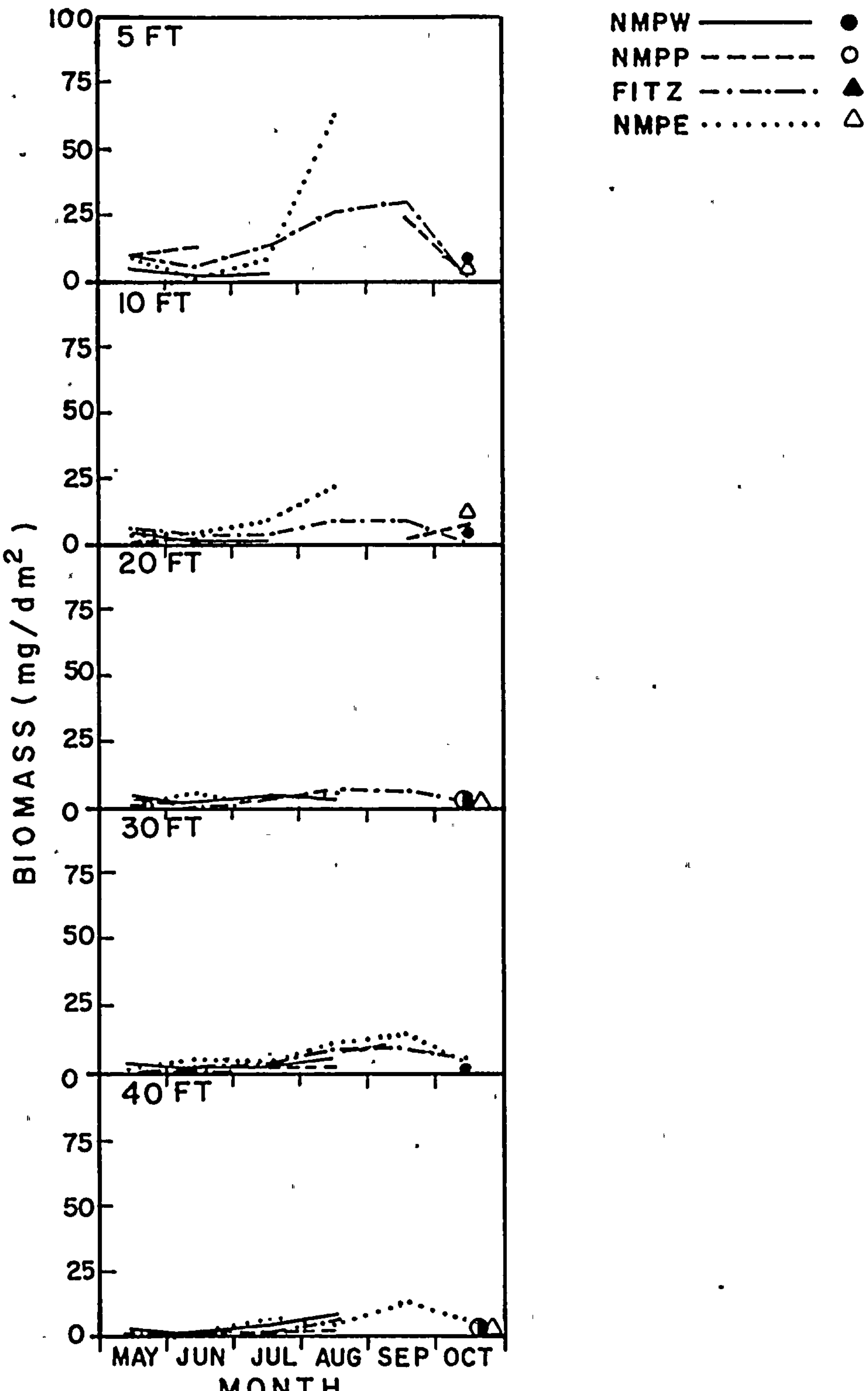
x
x = Two replicates collected   x = One replicate collected

a = 15 July: NMPW; 16 July: NMPP, FITZ, NMPE

b = 15 August: NMPW; 16 August: NMPP, FITZ, NMPE

c = 16 September: FITZ, NMPE; 18 September: NMPW, NMPP

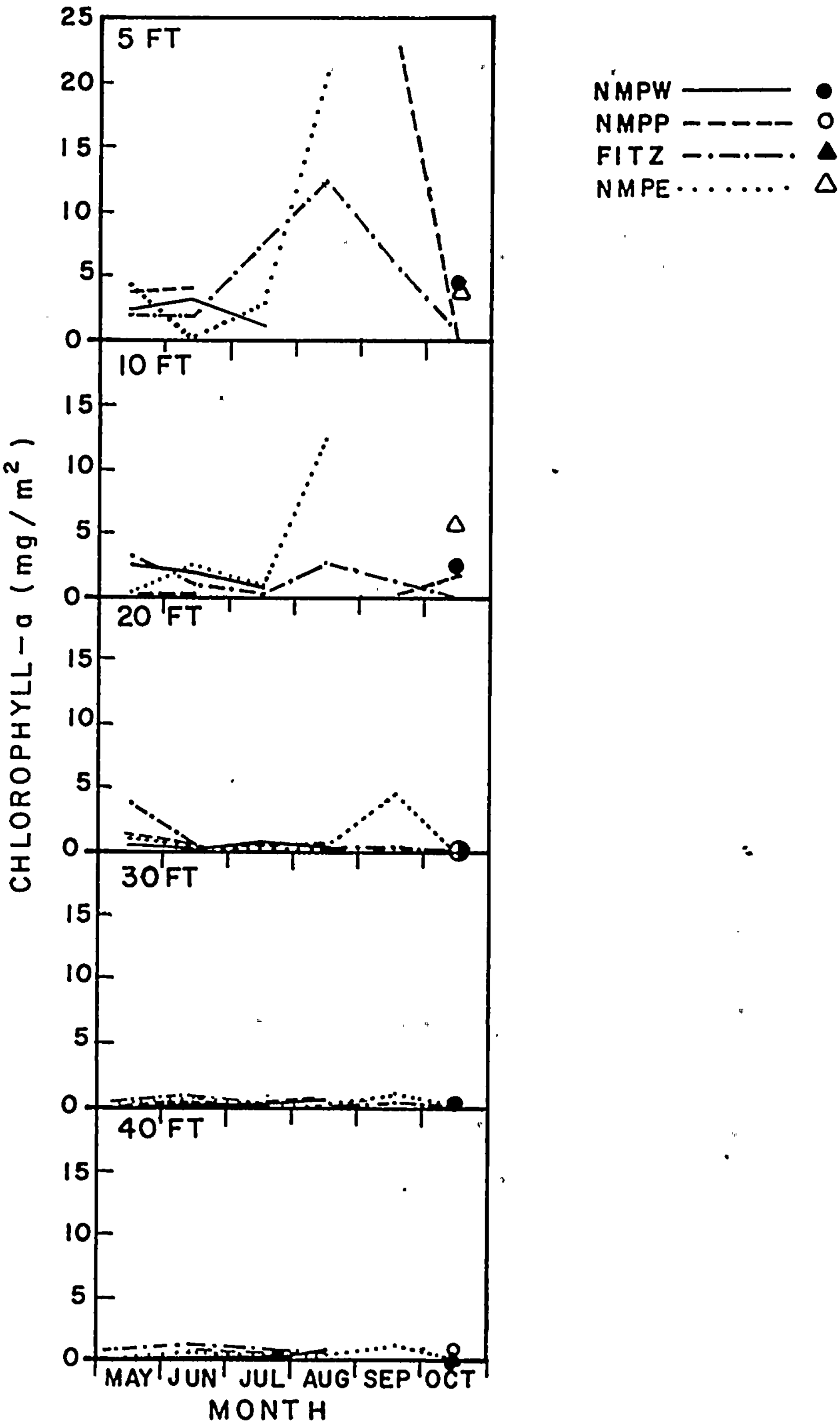
BIOMASS* OF BOTTOM PERIPHYTON BY DEPTH CONTOUR
NINE MILE POINT VICINITY — 1975



*Mean of R-1 and R-2; mg/dm^2

CHLOROPHYLL-a CONCENTRATION OF BOTTOM PERIPHYTON BY DEPTH CONTOUR

NINE MILE POINT VICINITY — 1975



bottom substrata by a different suite of species. The possibility cannot be dismissed, however, that there are insufficient data to resolve a bimodal pattern, due to the large portion of lost and destroyed samples at the shallow water (5 and 10 ft) stations.

The peak of periphyton chlorophyll a and biomass distribution appears to occur in late August/early September. This is approximately one month after the time of highest lake temperature and two months following the longest duration of daylight (summer solstice).

The period of highest production cannot be narrowly defined on the basis of the present data, because of too many missing or destroyed samples. This circumstance also precludes identification at this time of major factors controlling seasonal distribution of bottom periphyton. However, it may be concluded either that bottom periphyton responds differently to lake temperature and dissolved nutrients than buoy periphyton, or that the microenvironment directly above the lake bottom is different from the environments in the water column.

Significant ($\alpha \leq .05$) decrease in bottom periphyton biomass was found to be associated with depth for the 15 May and 13 June samples, but not for those of 15 October (Appendix VI-13). No other months were tested due to the amount of missing data. This decrease in production with depth was also found for buoy periphyton and is probably the direct result of decreased light intensity with depth.

In May and June, biomass decreased as an exponential function of depth (Figure VI-9). This was also found in buoy periphyton and is similar to the exponential decrease in light intensity with depth. In October, biomass decreased from the 5 to 20-ft depths, but increased slightly at the 40-ft depth (Figure VI-9). Samples for 10 and 30 ft depths are missing. Depth differences were not significant at the 95% level of confidence (Appendix VI-13). This same breakdown of the normal biomass-depth relationship is also seen for buoy periphyton in October.

Differences between transects were investigated to determine whether any indication of increased production was evident at the NMPP and FITZ transects, as was found with buoy periphyton. May, June, and October samples were analyzed by nested design analysis of variance, in the same manner as buoy data. One-way analysis of variance was used to make specific comparisons of sites for August and September. This technique,

DISTRIBUTION OF BOTTOM PERIPHYTON BIOMASS BY DEPTH

NINE MILE POINT VICINITY-1975

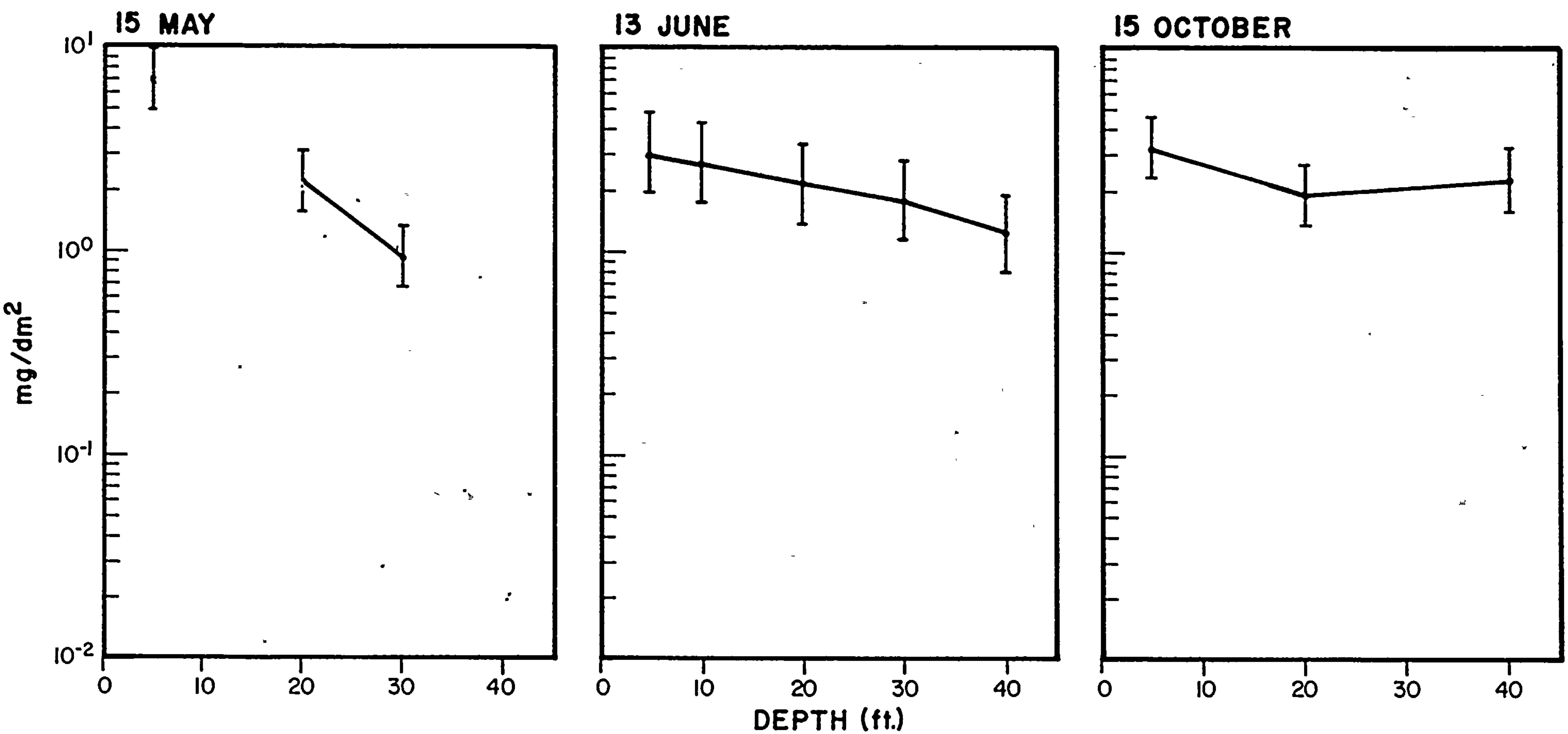


FIGURE VI-9

which tests specific hypotheses about the data, was selected because it is more amenable to a data base with many voids than is nested design ANOVA. November and December data were not analyzed because the large numbers of missing values precluded any meaningful comparisons.

In May, the biomass at the 30-ft depth of the NMPW transect was significantly higher ($\alpha = .01$) than at the remaining transects (Appendix VI-13). In June, a significant difference between transects ($\alpha = .01$) was observed at the 5 ft depth contour, production was highest at NMPP. During that month, biomass was significantly higher ($\alpha = .05$) at the 5-ft depth of the NMPP transect than at other transects at that depth (Appendix VI-13).

At the 30-ft depth in August, the difference between production at the four transects was highly significant ($\alpha = .01$). The NMPP transect had significantly lower production than the other three transects (Appendix VI-13), of which NMPE had the highest. No significant differences between transect biomass were found for depths greater than 10 ft in September (Appendix VI-13).

In October significant differences were observed between transects ($\alpha = .05$) at both the 5 and 40-ft depths. Production was highest at the 5-ft depth of the NMPW transect, and at the 40-ft depth of NMPE. Based on these data, there is no evidence of increased biomass production at any depth associated with either the NMPP or FITZ transect. This contradicts the trend observed for biomass production on buoy stations, where increased production was associated with the NMPP/FITZ station at greater sample depths (12 and 17 ft). Once again this suggests that the microenvironment at or just above the sediment surface differs from that of the water column, and that the periphyton is responding to that difference.

As in the case of buoy periphyton, the correlation between chlorophyll _a_ and biomass of bottom periphyton appeared high. The variance in biomass attributable to chlorophyll _a_ differences (r^2) is 63%; the correlation coefficient (r) is 0.794.

4. Conclusions

a. The seasonal distribution of buoy periphyton biomass and chlorophyll _a_ was bimodal, and unimodal for bottom periphyton.

b. There was a trend of higher production of buoy periphyton biomass at the NMPP/FITZ station than at the control stations and particularly at the 12 and 17 ft depths; this trend was also apparent at the 2 and 7 ft depths.

c. The correlation between chlorophyll a and biomass was not exceptionally high in either bottom or buoy periphyton.

d. Autotrophic indices for buoy periphyton were high, possibly indicating high organic and detrital loads.

REFERENCES CITED

American Public Health Association (APHA). 1971. Standard method for the examination of water and wastewater. 13 ed. M.J. Taras (chm. of eds.). American Public Health Assoc., Washington, D.C. 874p.

Lambe, T.W. 1951. Soil testing for engineers. Wiley, New York.

Lawler, Matusky and Skelly Engineers. 1975. 1974 Nine Mile Point aquatic ecology studies. Prepared for Niagara Mohawk Power Corp. and Power Authority of the State of New York.

Moore, R.B. 1975. Summary of workshop presentation: biomass of Cladocera, p. 61-69. In H. Shear and D.E. Konasewich (eds.). Cladophora in the Great Lakes. International Joint Commission, Great Lakes Res. Advisory Bd., Windsor, Ont. 179p.

Neil, J.H. and G.E. Owen. 1964. Distribution, environmental requirements and significance of Cladophora in the Great Lakes. Great Lakes Res. Div. Publ. [Proc. 7th Conf. Great Lakes Res., 1964] 11:113-121.

Storr, J.F. 1973. Ecological studies of cooling water discharge. Rochester Gas and Electric Corp.

Storr, J.F. and R.A. Sweeney. 1971. Development of a theoretical seasonal growth response curve of Cladophora glomerata to temperature and photoperiod. Proc. 14th Conf. Great Lakes Res. 1971:119-127.

Weber, C.I. 1973a. Biological field and laboratory methods for measuring the quality of surface waters and effluents. EPA, Environ. Monitor. Ser. EPA-670/4-73-001.

Weber, C.I. 1973b. Recent developments in the measurement of the response of plankton and periphyton to change in their environment, p. 119-135. In G.E. Glass (ed.). Bioassay techniques and environmental chemistry. Ann Arbor Science Publ., Inc.

APPENDI[illegible]a (Continued)

ABUNDANCE AND PERCENT COMPOSITION OF BENTHOS

AT NMPW - 10 FT NC STATION

	APR		AUG		OCT				SAMPLE MEAN	
	NO.PER SQ. METER	PER CENT	NO.PER SQ. METER	PER CENT	NO.PER SQ. METER	PER CENT	NO.PER SQ. METER	PER CENT	NO.PER SQ. METER	PER CENT
CNIDARIA										
HYDROZOA										
ATHECATA	0	0.0	-		0	0.0			**	
CLAVIDAE										
CORDYLOPHORA										
C.LACUSTRIS	8	0.3	-		196	3.1			68	1.3
RHYNCHOCOELA	6	0.3	-		19	0.4			8	0.2
PLATYHELMINTHES										
TURBELLARIA										
TRICLADIDA										
PLANARIIDAE	8	0.4	67	1.0	14	0.2			30	0.6
ASCHELMINTHES										
NEMATODA	0	0.0	-		662	10.6			221	4.4
ENOPLIDA										
ALAIMIDAE										
ALAIMUS	11	0.4	-		-				4	*
DORYLAIMIDA										
DORYLAIMIDAE										
DORYLAIMUS	3	0.2	-		-				1	0.1
MOLLUSCA										
GASTROPODA	0	0.0	42	0.6	0	0.0			14	0.2
MESOGASTROPODA										
BULIMIDAE										
AMNICOLA	-		2	0.1	-				1	0.1
A.LIMNOSA	3	0.1	43	0.6	33	0.5			26	0.5
BITHYNIA TENTACULATA	23	1.0	14	0.2	-				12	0.2
PLEUROCERIDAE										
GONIOBASIS										
G.LIVESCENS	14	0.6	89	1.4	58	1.0			54	1.1
BASOMMATOPHORA										
PHYSIDAE										
PHYSA	-		43	0.6	6	0.1			16	0.3
P.INTEGRA	3	0.2	11	0.2	110	1.7			41	0.8
PLANORBIDAE										
GYRAULUS										
G.PARVUS	-		14	0.2	-				5	0.1
BIVALVIA	0	0.0	0	0.0	0	0.0			**	
HETERODONTIDA										
SPHAERIIDAE										
PISIDIUM	6	0.2	14	0.2	4	0.1			8	0.2
SPHAERIUM	-		3	*	-				1	*
ANNELIDA										
POLYCHAETA	0	0.0	0	0.0	0	0.0			**	
SABELLIDA										

APPENDIX VI-1a (Continued)

ABUNDANCE AND PERCENT COMPOSITION OF BENTHOS

AT NMPW - 10 FT NC STATION

(CONTINUED)	APR NO.PER SQ. METER	APR PER CENT	AUG NO.PER SQ. METER	AUG PER CENT	OCT NO.PER SQ. METER	OCT PER CENT	NO.PER SQ. METER	PER CENT	SAMPLE MEAN NO.PER SQ. METER	SAMPLE MEAN PER CENT
SABELLIDAE										
MANAYUNKIA										
M.SPECIOSA	84	3.7	207	3.2	230	3.7			174	3.4
OLIGOCHAETA	0	0.0	0	0.0	-				**	
PROSOPORA										
LUMBRICULIDAE	6	0.2	-		-				2	0.1
STYLODRILUS										
S.HERINGIANUS	11	0.5	-		-				4	*
PLESIOPORA										
TUBIFICIDAE										
PELOSCOLEX										
P.FEROX	3	0.2	-		-				1	0.1
NAIDIDAE										
NAIS	-		2	*	-				1	*
CHAETOGASTER										
C. LIMNAEI	-		2	*	-				1	*
PRISTINA	3	0.1	-		-				1	*
ENCHYTRAEIDAE	3	0.1	-		-				1	*
ARTHROPODA										
ARCHNIDA										
ACARI	0	0.0	0	0.0	0	0.0			**	
LIMNESIIDAE										
LIMNESIA	-		4	0.1	-				1	0.1
HYGROBATIDAE										
HYGROBATES										
H.SP 1	-		-		2	*			1	*
LEBERTIIDAE										
LEBERTIA	61	2.7	35	0.5	23	0.4			40	0.8
INSECTA										
TRICHOPTERA	0	0.0	0	0.0	0	0.0			**	
HYDROPTILIDAE										
AGRAYLEA	-		2	*	-				1	*
LEPTOCERIDAE										
OECETIS	2	0.1	-		-				1	*
ARTHRIPSODES	3	0.1	-		2	*			2	0.1
DIPTERA	0	0.0	0	0.0	0	0.0			**	
TENDIPEDIDAE	242	10.6	3	0.1	2	*			82	1.6
CALOPSECTRA	2	0.1	3	*	3	0.1			3	*
CHIRONOMUS	-		-		2	*			1	0.1
CRICOTOPUS	927	40.5	2	0.1	2	0.1			310	6.1
DICROTENDIPES	-		8	0.1	2	*			3	*
MICROPSECTRA	2	0.1	-		-				1	0.1
MICROTENDIPES	-		2	*	-				1	*
PSECTROCLADIUS	-		-		2	*			1	*
RHEOTANYTARSUS	18	0.8	[illegible]	0.5	144	2.3			[illegible]	1.3

APPENDIX VI-1a (Continued)

ABUNDANCE AND PERCENT COMPOSITION OF BENTHOS

AT NMPW - 10 FT NO STATION

(CONTINUED)	APR NO.PER SQ. METER	APR PER CENT	AUG NO.PER SQ. METER	AUG PER CENT	OCT NO.PER SQ. METER	OCT PER CENT	NO.PER SQ. METER	PER CENT	SAMPLE MEAN NO.PER SQ. METER	SAMPLE MEAN PER CENT
CRUSTACEA										
ISOPODA	-		0	0.0	-				**	
ASELLIDAE										
ASELLUS	-		3	0.1	-				1	*
AMPHIPODA	2	*	0	0.0	0	0.0			1	*
GAMMARIDAE										
GAMMARUS										
G.FASCIATUS	834	36.5	5724	86.1	4712	75.7			3757	74.3
OSTRACODA	-		4	0.1	-				1	*
BRYOZOA	-		268	4.0	3	*			90	1.8
TOTALS	2288		6645		6231				5058	

NOTE. '*' LESS THAN 0.1 PER CENT. '**' LESS THAN 1 NO.ORG.

APPENDIX VI-1a (Continued)

ABUNDANCE AND PERCENT COMPOSITION OF BENTHOS

AT NMPP - 10 FT NC STATION

	APR		JUN		AUG		OCT		SAMPLE MEAN	
	NO.PER SQ. METER	PER CENT	NO.PER SQ. METER	PER CENT	NO.PER SQ. METER	PER CENT	NO.PER SQ. METER	PER CENT	NO.PER SQ. METER	PER CENT
CNIDARIA										
HYDROZOA										
ATHECATA	0	0.0	0	0.0	0	0.0	0	0.0	**	
CLAVIDAE										
CORDYLOPHORA										
C.LACUSTRIS	-		2	0.7	132	0.9	292	5.5	107	2.0
HYDRIDAE										
HYDRA										
H.AMERICANA	4	1.5	4	1.5	3	*	-		3	0.1
RHYNCHOCOELA	-		-		-		11	0.3	3	0.1
PLATYHELMINTHES										
TURBELLARIA										
TRICLADIDA										
PLANARIIDAE	-		2	0.7	2	*	25	0.4	7	0.1
ASCHELMINTHES										
NEMATODA	0	0.0	0	0.0	-		34	0.7	9	0.2
ENOPLICA										
ALAIMIDAE										
ALAIMUS	2	0.8	7	2.5	-		-		2	*
MOLLUSCA										
GASTROPODA	-		0	0.0	0	0.0	0	0.0	**	
MESOGASTROPODA										
VALVATIDAE										
VALVATA										
V.PERDEPRESSA	-		-		-		11	0.2	3	0.1
V.TRICARINATA	-		-		-		3	*	1	*
BULIMIDAE	-		-		10	0.1	-		3	*
AMNICOLA	-		-		-		2	0.1	1	0.1
A.INTEGRA	-		-		2	*	-		1	*
A.LIMNOSA	-		-		3	*	23	0.4	7	0.1
PLEUROCERIDAE										
GONIOBASIS										
G.LIVESCENS	-		-		12	0.1	8	0.2	5	0.1
BASOMMATOPHORA										
PHYSIDAE										
PHYSA	-		2	0.7	3	*	4	*	2	*
P.INTEGRA	-		-		12	0.1	18	0.4	8	0.2
LYMNAEIDAE										
LYMNAEA										
L.CATASCOPIUM	-		-		-		6	0.1	2	*
PLANORBIDAE										
GYRAULUS										
G.PARVUS	-		-		-		2	*	1	*
HELISOMA	-		-		6	*	-		2	0.1

APPENDIX [illegible]a (Continued)

ABUNDANCE AND PERCENT COMPOSITION OF BENTHOS

AT NMPP - 10 FT NC STATION

(CONTINUED)	APR NO.PER SQ. METER	APR PER CENT	JUN NO.PER SQ. METER	JUN PER CENT	AUG NO.PER SQ. METER	AUG PER CENT	OCT NO.PER SQ. METER	OCT PER CENT	SAMPLE MEAN NO.PER SQ. METER	SAMPLE MEAN PER CENT
BIVALVIA	-		0	0.0	0	0.0	0	0.0	**	
HETERODONTIDA										
SPHAERIIDAE										
PISIDIUM	-		2	0.7	4	0.1	19	0.4	6	0.1
SPHAERIUM	-		-		4	*	-		1	*
ANNELIDA										
POLYCHAETA	-		-		0	0.0	-		**	
SABELLIDA										
SABELLIDAE										
MANAYUNKIA										
M.SPECIOSA	-		-		5	*	-		1	*
OLIGOCHAETA	0	0.0	46	16.6	0	0.0	0	0.0	12	0.3
PLESIOPORA										
TUBIFICIDAE	-		-		-		15	0.3	4	*
LIMNODRILUS										
L.HOFFMEISTERI	-		18	6.5	-		2	*	5	0.1
L.UDEKEMIANUS	-		2	0.7	-		-		1	0.1
L.PROFUNDICOLA	-		4	1.4	-		-		1	*
PELOSCOLEX										
P.FREYI	-		2	0.7	-		-		1	*
POTAMOTHRIX										
P.VEJDOVSKYI	-		3	1.1	-		2	0.1	1	*
NAIDIDAE										
NAIS	-		-		20	0.1	-		5	0.1
N.BRETSCHERI	-		3	1.1	362	2.4	30	0.5	99	1.9
N.ELINGUIS	4	1.6	-		-		-		1	*
ARTHROPODA										
ARACHNIDA										
ACARI	-		0	0.0	0	0.0	0	0.0	**	
HYGROBATIDAE										
HYGROBATES	-		2	0.7	-		-		1	*
H.SP.1	-		31	11.2	-		-		8	0.2
UNIONICOLIDAE										
UNIONICOLA										
U.SP 1	-		-		-		2	0.1	1	*
PIONIDAE										
FORELIA	-		15	5.4	-		-		4	0.1
LEBERTIIDAE										
LEBERTIA	-		-		13	0.1	14	0.2	7	0.1
INSECTA										
TRICHOPTERA	-		0	0.0	0	0.0	-		**	
LEPTOCERIDAE										
OECETIS	-		2	0.7	-		-		1	*
ATHRIPSODES	-		-		2	*	-		1	0.1
DIPTERA	0	0.0	0	0.0	0	0.0	2	0.1	1	*

APPENDIX VI-1a (Continued)

ABUNDANCE AND PERCENT COMPOSITION OF BENTHOS

AT NMPP - 10 FT NC STATION

(CONTINUED)	APR NO.PER SQ. METER	APR PER CENT	JUN NO.PER SQ. METER	JUN PER CENT	AUG NO.PER SQ. METER	AUG PER CENT	OCT NO.PER SQ. METER	OCT PER CENT	SAMPLE MEAN NO.PER SQ. METER	SAMPLE MEAN PER CENT
TENDIPEDIDAE	43	16.6	4	1.4	54	0.4	-		25	0.5
CALOPSECTRA	-		-		4	*	-		1	*
CLADOTANYTARSUS	-		-		2	*	-		1	*
CRICOTOPUS	144	55.6	-		4	0.1	-		37	0.7
CRYPTOCHIRONOMUS	-		3	1.1	-		2	*	1	*
DICROTENDIPES	-		2	0.7	12	*	3	0.1	4	0.1
GLYPTOTENDIPES	2	0.7	-		4	0.1	-		2	*
MICROTENDIPES	-		-		2	*	10	0.2	3	0.1
PARACHIRONOMUS	-		-		2	*	-		1	*
PHAENOSPECTRA	-		2	0.7	-		-		1	*
POLYPEDILUM	-		2	0.8	-		-		1	*
PSEUDOCHIRONOMUS	-		-		-		2	*	1	0.1
PSECTROCLADIUS	-		-		4	*	-		1	*
RHEOTANYTARSUS	17	6.6	-		143	1.0	8	0.2	42	0.8
CRUSTACEA										
AMPHIPODA	0	0.0	0	0.0	0	0.0	0	0.0	**	
GAMMARIDAE										
GAMMARUS										
G.FASCIATUS	41	15.8	86	30.9	14244	94.3	4704	89.3	4769	91.0
HAUSTORIIDAE										
PONTOPOREIA										
P.AFFINIS	-		-		-		3	0.1	1	*
OSTRACODA	-		32	11.5	11	0.1	-		11	0.2
BRYOZOA	-		-		22	0.1	6	0.1	7	0.2
ACANTHOCEPHALON	2	0.8	-		-		-		1	*
TOTALS	259		278		15103		5263		5239	

NOTE '*' LESS THAN 0.1 PER CENT. '**' LESS THAN 1 NO.ORG.

APPENDIX [illegible] (Continued)

ABUNDANCE AND PERCENT COMPOSITION OF BENTHOS

AT NMPE - 10 FT NC STATION

	APR NO.PER SQ. METER	APR PER CENT	JUN NO.PER SQ. METER	JUN PER CENT	AUG NO.PER SQ. METER	AUG PER CENT	OCT NO.PER SQ. METER	OCT PER CENT	SAMPLE MEAN NO.PER SQ. METER	SAMPLE MEAN PER CENT
CNIDARIA										
HYDROZOA										
ATHECATA	-		-		-		0	0.0	**	
CLAVIDAE										
CORDYLOPHORA										
C.LACUSTRIS	-		-		-		34	0.5	9	0.1
HYDRIDAE										
HYDRA										
H.AMERICANA	-		-		-		4	*	1	0.1
RHYNCHOCOELA	-		6	0.2	-		174	2.4	45	0.7
PLATYHELMINTHES										
TURBELLARIA										
TRICLADIDA										
PLANARIIDAE	-		21	0.8	8	0.1	54	0.8	21	0.3
ASCHELMINTHES										
NEMATODA	0	0.0	0	0.0	0	0.0	0	0.0	**	
ENOPLIDA										
ALAIMIDAE										
ALAIMUS	19	4.0	25	0.8	15	0.1	2	*	15	0.3
DORYLAIMIDA										
DORYLAIMIDAE										
DORYLAIMUS	4	0.9	30	1.1	8	*	14	0.2	14	0.2
MOLLUSCA										
GASTROPODA	0	0.0	2	0.1	0	0.0	0	0.0	1	*
MESOGASTROPODA										
VALVATIDAE										
VALVATA	-		-		2	*	2	*	1	0.1
V.PERDEPRESSA	-		15	0.5	3	0.1	-		5	*
V. PINCINALIS	-		-		-		2	0.1	1	0.1
BULIMIDAE										
AMNICOLA										
A.INTEGRA	-		-		2	*	-		1	*
A.LIMOSA	4	0.8	8	0.3	13	0.1	17	0.2	11	0.2
A.LUSTRICA	-		2	0.1	-		3	0.1	1	*
BITHYNIA TENTACULATA	3	0.7	-		-		-		1	*
PLEUROCERIDAE										
GONIOBASIS										
G.LIVESCENS	-		6	0.2	3	*	97	1.3	27	0.4
BASOMMATOPHORA										
PHYSIDAE										
PHYSA	-		42	1.5	4	*	3	*	12	0.2
P.INTEGRA	3	0.6	-		19	0.2	30	0.5	13	0.2
P.SAYII	-		-		-		2	*	1	0.1
PLANORBIDAE										

APPENDIX VI-1a (Continued)

ABUNDANCE AND PERCENT COMPOSITION OF BENTHOS

AT NMPE - 10 FT NC STATION

(CONTINUED)	APR NO.PER SQ. METER	APR PER CENT	JUN NO.PER SQ. METER	JUN PER CENT	AUG NO.PER SQ. METER	AUG PER CENT	OCT NO.PER SQ. METER	OCT PER CENT	SAMPLE MEAN NO.PER SQ. METER	SAMPLE MEAN PER CENT
HELISOMA										
H.ANCEPS	-		-		-		3	*	1	*
H.TRIVOLVIS	-		-		2	*	-		1	*
ANCYLIDAE										
FERRISSIA	-		-		-		2	0.1	1	*
F.TARDA	-		2	*	-		-		1	*
BIVALVIA	0	0.0	0	0.0	0	0.0	0	0.0	**	
EULAMELLIBRANCHIA										
UNIONIDAE	-		-		2	*	-		1	*
HETERODONTIDA										
SPHAERIIDAE										
MUSCULIUM	-		-		3	*	-		1	0.1
PISIDIUM	11	2.3	23	0.9	332	2.4	54	0.7	105	1.7
SPHAERIUM	19	4.1	7	0.2	30	0.2	4	0.1	15	0.2
ANNELIDA										
POLYCHAETA	0	0.0	0	0.0	0	0.0	0	0.0	**	
SABELLIDA										
SABELLIDAE										
MANAYUNKIA										
M.SPECIOSA	12	2.5	60	2.1	371	2.7	3128	43.4	893	14.7
OLIGOCHAETA	3	0.7	6	0.2	0	0.0	-		2	*
PLESIOPORA										
TUBIFICIDAE	-		-		100	0.7	-		25	0.4
AULODRILUS										
A.LIMNOBIUS	-		-		3	0.1	-		1	*
LIMNODRILUS										
L.HOFFMEISTERI	-		-		3	*	-		1	0.1
L.UDEKMIANUS	-		2	0.1	3	*	-		1	*
PELOSCOLEX										
P.FREYI	-		-		2	*	-		1	*
POTAMOTHRIX										
P.VEJDOVSKYI	-		6	0.2	-		-		2	*
NAIDIAE										
NAIS	-		-		7	0.1	-		2	*
N.BRETSCHERI	-		-		8	*	-		2	0.1
N.ELINGUIS	-		6	0.2	-		-		2	*
VEJDOVSKYELLA										
V.INTERMEDIA	-		2	0.1	-		-		1	*
ENCHYTRAEIDAE	-		-		3	*	-		1	*
ARTHROPODA										
ARACHNIDA										
ACARI	0	0.0	0	0.0	0	0.0	0	0.0	**	
LIMNESIIDAE										
LIMNESIA	-		-		8	0.1	-		2	0.1
HYGROBATIDAE										

ABUNDANCE AND PERCENT[illegible]OSITION OF BENTHOS

AT AMPE - 10 FT NO STATION

(CONTINUED)	APR NO.PER SQ. METER	APR PER CENT	JUN NO.PER SQ. METER	JUN PER CENT	AUG NO.PER SQ. METER	AUG PER CENT	OCT NO.PER SQ. METER	OCT PER CENT	SAMPLE MEAN NO.PER SQ. METER	SAMPLE MEAN PER CENT
HYGROBATES										
H.SP 1	-		86	3.1	4	*	-		23	0.4
H.SP 3	-		-		-		6	0.1	2	*
H.SP 4	-		2	*	-		-		1	*
UNIONICOLIDAE										
UNIONICOLA										
U.SP 1	-		2	0.1	-		-		1	*
PIONIDAE										
FORELIA	-		156	5.5	-		-		39	0.7
LEBERTIIDAE										
LEBERTIA	4	0.8	6	0.2	50	0.4	78	1.1	35	0.5
INSECTA										
TRICHOPTERA	0	0.0	0	0.0	0	0.0	0	0.0	**	
PSYCHOMYIIDAE	-		2	0.1	-		-		1	0.1
LEPTOCERIDAE										
OECETIS	8	1.7	26	0.9	20	0.1	4	*	15	0.2
ARTHRIPSODES	-		3	0.1	-		-		1	*
DIPTERA	0	0.0	0	0.0	0	0.0	0	0.0	**	
TENDIPEDIDAE	53	11.3	19	0.7	35	0.3	-		27	0.5
CALOPSECTRA	-		3	0.1	11	0.1	-		4	*
CLADOTANYTARSUS	-		4	0.2	19	0.1	-		6	0.1
CRICOTOPUS	27	5.7	127	4.5	-		-		39	0.7
CRYPTOCHIRONOMUS	5	1.1	9	0.3	73	0.5	-		22	0.3
DICROTENDIPES	-		-		68	0.5	-		17	0.3
MICROTENDIPES	-		-		17	0.2	-		4	0.1
PARACLADOPELMA	-		-		17	0.1	-		4	*
PARACHIRONOMUS	-		2	0.1	-		-		1	0.1
POLYPEDILUM	-		12	0.4	226	1.6	-		60	0.9
PROCLADIUS	-		4	0.1	-		-		1	0.1
PSEUDOCHIRONOMUS	34	7.2	22	0.8	493	3.6	3	0.1	138	2.2
PSECTROCLADIUS	-		-		-		2	*	1	*
RHEOTANYTARSUS	3	0.6	275	9.8	70	0.5	5	0.1	88	1.5
STICTOCHIRONOMUS	-		2	*	-		-		1	*
TRISSOCLADIUS	8	1.7	-		-		-		2	*
CRUSTACEA										
AMPHIPODA	0	0.0	0	0.0	0	0.0	0	0.0	**	
GAMMARIDAE										
GAMMARUS										
G.FASCIATUS	248	52.7	169	6.0	11651	84.3	3465	48.1	3883	63.7
OSTRACODA	3	0.6	1576	55.9	112	0.8	6	0.1	424	7.0
BRYOZOA	-		42	1.5	2	*	2	*	12	0.2
TOTALS	471		2820		13822		7200		6094	

NOTE... '*' LESS THAN 0.1 PER CENT. '**' LESS THAN 1 NO.ORG.

APPENDIX VI-1a (Continued)

ABUNDANCE AND PERCENT COMPOSITION OF BENTHOS

AT FITZ - 10 FT NC STATION

	APR		JUN		AUG		OCT		SAMPLE MEAN	
	NO.PER SQ. METER	PER CENT	NO.PER SQ. METER	PER CENT	NO.PER SQ. METER	PER CENT	NO.PER SQ. METER	PER CENT	NO.PER SQ. METER	PER CENT
CNIDARIA										
HYDROZOA										
ATHECATA	0	0.0	0	0.0	-		0	0.0	**	
CLAVIDAE										
CORDYLOPHORA										
C.LACUSTRIS	3	1.2	11	0.6	-		8	0.1	6	0.2
HYDRIDAE										
HYDRA										
H.AMERICANA	6	2.4	-		-		-		2	*
RHYNCHOCOELA	-		4	0.3	-		4	0.1	2	0.1
PLATYHELMINTHES										
TURBELLARIA										
TRICLADIDA										
PLANARIIDAE	2	0.8	23	1.3	-		6	0.1	8	0.3
ASCHELMINTHES										
NEMATODA	-		0	0.0	0	0.0	-		**	
ENOPLIDA										
ALAIMIDAE										
ALAIMUS	-		2	0.1	2	*	-		1	*
MOLLUSCA										
GASTROPODA	-		0	0.0	0	0.0	0	0.0	**	
MESOGASTROPODA										
VALVATIDAE										
VALVATA										
V.TRICARINATA	-		-		2	0.1	-		1	*
BULIMIDAE										
AMNICOLA										
A.INTEGRA	-		-		2	*	-		1	0.1
A.LIMNOSA	-		-		4	0.1	12	0.2	4	0.1
A.LUSTRICA	-		6	0.3	-		2	*	2	*
PLEUROCERIDAE										
GONIOBASIS										
G.LIVESCENS	-		80	4.6	31	0.7	11	0.2	31	1.0
BASOMMATOPHORA										
PHYSIDAE										
PHYSA	-		38	2.2	2	*	6	0.1	12	0.4
P.INTEGRA	-		16	0.9	11	0.3	3	*	8	0.2
LYMNAEIDAE										
LYMNAEA	-		-		6	0.1	-		2	0.1
L.CATASCOPIUM	-		-		85	1.9	4	0.1	22	0.7
PLANORBIDAE	-		-		3	*	-		1	*
HELISOMA										
H.ANCEPS	-		6	0.3	-		2	*	2	0.1
ANCYLIDAE										

APPENDIX VI (Continued)

ABUNDANCE AND PERCENT COMPOSITION OF BENTHOS

AT FITZ - 10 FT NO STATION

(CONTINUED)	APR		JUN		AUG		OCT		SAMPLE MEAN	
	NO.PER SQ. METER	PER CENT	NO.PER SQ. METER	PER CENT	NO.PER SQ. METER	PER CENT	NO.PER SQ. METER	PER CENT	NO.PER SQ. METER	PER CENT
FERRISSIA	-		-		-		6	0.1	2	*
F.TARDA	-		-		4	0.1	-		1	0.1
BIVALVIA	-		-		0	0.0	-		**	
HETERODONTIDA										
SPHAERIIDAE										
SPHAERIUM	-		-		2	*	-		1	*
ANNELIDA										
POLYCHAETA	-		0	0.0	0	0.0	0	0.0	**	
SABELLIDA										
SABELLIDAE										
MANAYUNKIA										
M.SPECIOSA	-		39	2.3	2	0.1	3	0.1	11	0.3
OLIGOCHAETA	0	0.0	0	0.0	0	0.0	0	0.0	**	
PLESIOPORA										
TUBIFICIDAE	-		-		-		2	*	1	0.1
NAIDIDAE										
NAIS	-		6	0.3	-		63	1.0	17	0.5
N.BRETSCHERI	-		97	5.6	-		11	0.2	27	0.8
N.ELINGUIS	6	2.4	16	0.9	-		-		6	0.2
N. COMMUNIS	-		-		-		3	0.1	1	0.1
OPHIDONAIS										
O.SERPENTINA	-		6	0.3	-		-		2	*
PARANAIS										
P.SIMPLEX	2	0.8	-		-		-		1	0.1
ENCHYTRAEIDAE	-		-		2	*	-		1	*
ARTHROPODA										
ARACHNIDA										
ACARI	0	0.0	0	0.0	2	0.1	0	0.0	1	*
LIMNESIIDAE										
LIMNESIA	-		-		2	*	-		1	*
HYGROBATIDAE										
HYGROBATES										
H.SP 1	-		39	2.3	-		-		10	0.4
UNIONICOLIDAE										
UNIONICOLA										
U.SP 1	-		7	0.4	-		-		2	*
PIONIDAE										
FORELIA	-		19	1.0	-		-		5	0.2
LEBERTIIDAE										
LEBERTIA	3	1.2	27	1.6	21	0.5	7	0.1	15	0.4
INSECTA										
EPHEMEROPTERA	-		-		0	0.0	-		**	
BAETIDAE	-		-		2	*	-		1	0.1
TRICHOPTERA	-		0	0.0	-		-		**	
LEPTOCERIDAE										

APPENDIX VI-1a (Continued)

ABUNDANCE AND PERCENT COMPOSITION OF BENTHOS

AT FITZ - 10 FT NO STATION

(CONTINUED)	APR NO.PER SQ. METER	APR PER CENT	JUN NO.PER SQ. METER	JUN PER CENT	AUG NO.PER SQ. METER	AUG PER CENT	OCT NO.PER SQ. METER	OCT PER CENT	SAMPLE MEAN NO.PER SQ. METER	SAMPLE MEAN PER CENT
OECETIS	-		6	0.3	-		-		2	*
DIPTERA	0	0.0	0	0.0	0	0.0	0	0.0	**	
TENDIPEDIDAE	18	7.3	33	1.9	14	0.3	2	*	17	0.6
CALOPSECTRA	-		15	0.9	4	0.1	-		5	0.1
CRICOTOPUS	20	8.0	47	2.7	3	0.1	11	0.2	20	0.6
CRYPTOCHIRONOMUS	-		-		3	*	-		1	0.1
DICROTENDIPES	-		2	0.1	7	0.2	-		2	*
MICROTENDIPES	-		-		2	*	10	0.1	3	0.1
PSEUDOCHIRONOMUS	-		-		-		2	0.1	1	0.1
RHEOTANYTARSUS	2	0.8	37	2.1	41	0.9	49	0.8	32	1.0
CRUSTACEA										
ISOPODA	-		-		0	0.0	-		**	
ASELLIDAE										
ASELLUS	-		-		2	0.1	-		1	*
AMPHIPODA	0	0.0	0	0.0	0	0.0	0	0.0	**	
GAMMARIDAE										
GAMMARUS										
G.FASCIATUS	187	75.1	682	39.0	4325	93.9	5928	95.7	2781	86.6
HAUSTORIIDAE										
PONTOPOREIA										
P.AFFINIS	-		2	0.1	-		33	0.6	9	0.3
OSTRACODA	-		482	27.6	14	0.3	-		124	3.8
BRYOZOA	-		-		3	0.1	3	*	2	0.1
TOTALS	249		1748		4603		6191		3211	

NOTE - '*' LESS THAN 0.1 PER CENT. '**' LESS THAN 1 NO.ORG.

APPENDIX [illegible]la (Continued)

ABUNDANCE AND PERCENT COMPOSITION OF BENTHOS

AT AMPH - 10 FT C STATION

	JUN								SAMPLE MEAN	
	NO.PER SQ. METER	PER CENT	NO.PER SQ. METER	PER CENT	NO.PER SQ. METER	PER CENT	NO.PER SQ. METER	PER CENT	NO.PER SQ. METER	PER CENT
CNIDARIA										
HYDROZOA										
ATHECATA	0	0.0							**	
CLAVIDAE										
CORDYLOPHORA										
C.LACUSTRIS	16	0.3							16	0.3
HYDRIDAE										
HYDRA										
H.AMERICANA	6	0.2							6	0.2
RHYNCHOCOELA	17	0.3							17	0.3
PLATYHELMINTHES										
TURBELLARIA										
TRICLADIDA										
PLANARIIDAE	76	1.6							76	1.6
ASCHELMINTHES										
NEMATODA	0	0.0							**	
ENOPLIDA										
ALAIMIDAE										
ALAIMUS	81	1.7							81	1.7
MOLLUSCA										
GASTROPODA	0	0.0							**	
BASOMMATOPHORA										
PHYSIDAE										
PHYSA	11	0.2							11	0.2
ANNELIDA										
POLYCHAETA	0	0.0							**	
SABELLIDA										
SABELLIDAE										
MANAYUNKIA										
M.SPECIOSA	11	0.2							11	0.2
OLIGOCHAETA	6	0.1							6	0.1
PLESIOPORA										
TUBIFICIDAE										
POTAMOTHRIX										
P.VEJDOVSKYI	6	0.2							6	0.2
NAIDIDAE										
NAIS	81	1.6							81	1.6
N.BRETSCHERI	54	1.2							54	1.2
N.ELINGUIS	775	16.0							775	16.0
N.SIMPLEX	103	2.2							103	2.2
OPHIDONAIS										
O.SERPENTINA	11	0.2							11	0.2
CHAETOGASTER										
C.DIAPHANUS	382	7.9							382	7.9

APPENDIX VI-1a (Continued)

ABUNDANCE AND PERCENT COMPOSITION OF BENTHOS

AT NMPW - 10 FT C STATION

(CONTINUED)	JUN NO.PER SQ. METER	PER CENT	NO.PER SQ. METER	PER CENT	NO.PER SQ. METER	PER CENT	NO.PER SQ. METER	PER CENT	SAMPLE MEAN NO.PER SQ. METER	PER CENT
VEJDOVSKYELLA										
V.INTERMEDIA	16	0.3							16	0.3
ARTHROPODA										
ARCHNIDA										
ACARI	0	0.0							**	
HYGROBATIDAE										
HYGROBATES	6	0.2							6	0.2
LEBERTIIDAE										
LEBERTIA	27	0.5							27	0.5
INSECTA										
TRICHOPTERA	0	0.0							**	
HYDROPTILIDAE										
AGRAYLEA	6	0.2							6	0.2
LEPTOCERIDAE										
OECETIS	27	0.5							27	0.5
ARTHRIPSODES	6	0.1							6	0.1
DIPTERA	0	0.0							**	
TENDIPEDIDAE	11	0.3							11	0.3
CALOPSECTRA	75	1.5							75	1.5
CHIRONOMUS	6	0.1							6	0.1
CRICOTOPUS	156	3.3							156	3.3
CRYPTOCHIRONOMUS	6	0.1							6	0.1
GLYPTOTENDIPES	6	0.1							6	0.1
HETEROTRISSOCLADIUS	6	0.2							6	0.2
PHAENOSPECTRA	6	0.1							6	0.1
POLYPEDILUM	6	0.1							6	0.1
PROCLADIUS	17	0.4							17	0.4
RHEOTANYTARSUS	97	2.0							97	2.0
CRYPTOCLADOPELMA	6	0.1							6	0.1
PARATENDIPES	6	0.1							6	0.1
TRICHOCLADIUS	6	0.1							6	0.1
CRUSTACEA										
AMPHIPODA	0	0.0							**	
GAMMARIDAE										
GAMMARUS										
G.FASCIATUS	1404	29.1							1404	29.1
OSTRACODA	1286	26.7							1286	26.7
TOTALS	4824								4824.	

NOTE. '*' LESS THAN 0.1 PER CENT. '**' LESS THAN 1 NO.ORG.

APPENDIX VI[illegible] (Continued)

ABUNDANCE AND PERCENT [illegible]COSITION OF BENTHOS

AT NMPP - 10 FT C STATION

	APR NO.PER SQ. METER	APR PER CENT	JUN NO.PER SQ. METER	JUN PER CENT	NO.PER SQ. METER	PER CENT	NO.PER SQ. METER	PER CENT	SAMPLE MEAN NO.PER SQ. METER	SAMPLE MEAN PER CENT
CNIDARIA										
HYDROZOA										
ATHECATA	-		0	0.0					**	
CLAVIDAE										
CORDYLOPHORA										
C.LACUSTRIS	-		76	1.6					38	1.3
HYDRIDAE										
HYDRA										
H.AMERICANA	-		43	0.9					22	0.8
PLATYHELMINTHES										
TURBELLARIA										
TRICLADIDA										
PLANARIIDAE	6	0.7	60	1.2					33	1.2
ASCHELMINTHES										
NEMATODA	11	1.4	0	0.0					6	0.2
ENOPLIDA										
ALAIMIDAE										
ALAIMUS	-		22	0.4					11	0.4
DORYLAIMIDA										
DORYLAIMIDAE										
DORYLAIMUS	-		6	0.2					3	0.1
MOLLUSCA										
GASTROPODA	0	0.0	0	0.0					**	
MESOGASTROPODA										
BULIMIDAE										
AMNICOLA										
A.LIMNOSA	-		11	0.2					6	0.2
PLEUROCERIDAE										
GONIOBASIS										
G.LIVESCENS	-		6	0.1					3	0.1
BASOMMATOPHORA										
PHYSIDAE										
PHYSA	-		6	0.1					3	0.1
P.INTEGRA	6	0.8	22	0.5					14	0.5
PLANORBIDAE										
HELISOMA										
H.ANCEPS	-		6	0.1					3	0.1
ANNELIDA										
POLYCHAETA	-		0	0.0					**	
SABELLIDA										
SABELLIDAE										
MANAYUNKIA										
M.SPECIOSA	-		33	0.7					17	0.6
OLIGOCHAETA	-		0	0.0					**	

APPENDIX VI-1a (Continued)

ABUNDANCE AND PERCENT COMPOSITION OF BENTHOS

AT MHPP - 10 FT C STATION

(CONTINUED)	APR NO. PER SQ. METER	APR PER CENT	JUN NO. PER SQ. METER	JUN PER CENT	NO. PER SQ. METER	PER CENT	NO. PER SQ. METER	PER CENT	SAMPLE MEAN NO. PER SQ. METER	SAMPLE MEAN PER CENT
PLESIOPORA										
TUBIFICIDAE										
PELOSCOLEX										
P.FREYI	-		6	0.1					3	0.1
NAIDIDAE										
NAIS	-		43	0.9					22	0.8
N.BRETSCHERI	-		845	17.5					423	14.9
N.ELINGUIS	-		76	1.5					38	1.4
N.SIMPLEX	-		11	0.3					6	0.2
OPHIDONAIS										
O.SERPENTINA	-		6	0.1					3	0.1
ENCHYTRAEIDAE	-		33	0.7					17	0.6
HIRUDINEA	-		0	0.0					**	[illegible]
RHYNCHOBDELLIDA										
PISCICOLIDAE	-		6	0.1					3	0.1
ARTHROPODA										
ARACHNIDA										
ACARI	0	0.0	0	0.0					**	[illegible]
LIMNESIIDAE										
LIMNESIA	6	0.7	6	0.1					6	0.2
HYGROBATIDAE										
HYGROBATES	-		6	0.1					3	0.1
H.SP. 1	-		200	4.2					100	3.5
UNIONICOLIDAE										
UNIONICOLA										
U.SP 1	-		11	0.2					6	0.2
PIONIDAE										
FORELIA	-		135	2.8					68	2.4
LEBERTIIDAE										
LEBERTIA	-		17	0.3					9	0.4
INSECTA										
TRICHOPTERA	-		0	0.0					**	
HYDROPTILIDAE										
AGRAYLEA	-		6	0.2					3	0.1
LEPTOCERIDAE										
OECETIS	-		60	1.2					30	1.0
ARTHRIPSODES	-		81	1.7					41	1.5
DIPTERA	0	0.0	0	0.0					**	
TENDIPEDIDAE	54	6.7	49	1.0					52	1.8
CALOPSECTRA	6	0.7	6	0.1					6	0.2
CRICOTOPUS	65	8.1	124	2.6					95	3.4
DICROTENDIPES	-		27	0.5					14	0.5
MICROTENDIPES	6	0.8	-						3	0.1
PARACHIRONOMUS	-		6	0.1					3	0.1
POLYPEDILUM	-		[illegible]	0.3					[illegible]	0.2

APPENDIX VI-1a (Continued)

ABUNDANCE AND PERCENT [illegible]SITION OF BENTHOS

AT NMPP - 10 FT C STATION

(CONTINUED)	APR NO. PER SQ. METER	APR PER CENT	JUN NO. PER SQ. METER	JUN PER CENT	NO. PER SQ. METER	PER CENT	NO. PER SQ. METER	PER CENT	SAMPLE MEAN NO. PER SQ. METER	SAMPLE MEAN PER CENT
PSECTROCLADIUS	-		11	0.2					6	0.2
RHEOTANYTARSUS	11	1.3	43	0.9					27	0.9
CRUSTACEA										
AMPHIPODA	0	0.0	0	0.0					**	
GAMMARIDAE										
GAMMARUS										
G.FASCIATUS	635	78.8	2572	53.1					1604	56.6
OSTRACODA	-		156	3.2					78	2.8
TOTALS	806		4844						2834	

NOTE. '*' LESS THAN 0.1 PER CENT. '**' LESS THAN 1 NO.ORG.

APPENDIX VI-1a (Continued)

ABUNDANCE AND PERCENT COMPOSITION OF BENTHOS

AT NMPE - 10 FT C STATION

	JUN NO.PER SQ. METER	PER CENT	NO.PER SQ. METER	PER CENT	NO.PER SQ. METER	PER CENT	NO.PER SQ. METER	PER CENT	SAMPLE MEAN NO.PER SQ. METER	PER CENT
PLATYHELMINTHES										
TURBELLARIA										
TRICLADIDA										
PLANARIIDAE	43	0.7							43	0.7
ASCHELMINTHES										
NEMATODA	0	0.0							**	
ENOPLIDA										
ALAIMIDAE										
ALAIMUS	27	0.4							27	0.4
DORYLAIMIDA										
DORYLAIMIDAE										
DORYLAIMUS	27	0.5							27	0.5
MOLLUSCA										
GASTROPODA	0	0.0							**	
MESOGASTROPODA										
BULIMIDAE										
AMNICOLA										
A.LIMNOSA	16	0.2							16	0.2
PLEUROCERIDAE										
GONIOBASIS										
G.LIVESCENS	6	0.1							6	0.1
BASOMMATOPHORA										
PHYSIDAE										
PHYSA	6	0.1							6	0.1
PLANORBIDAE										
HELISOMA										
H.ANCEPS	6	0.1							6	0.1
BIVALVIA	0	0.0							**	
HETERODONTIDA										
SPHAERIIDAE										
PISIDIUM	11	0.2							11	0.2
SPHAERIUM	6	0.1							6	0.1
ANNELIDA										
POLYCHAETA	0	0.0							**	
SABELLIDA										
SABELLIDAE										
MANAYUNKIA										
M.SPECIOSA	237	3.8							237	3.8
OLIGOCHAETA	6	0.1							6	0.1
PROSOPORA										
LUMBRICULIDAE										
STYLODRILUS										
S.HERINGIANUS	11	0.2							11	0.2
PLESIOPORA										

APPENDIX VI-1a (Continued)

ABUNDANCE AND PERCENT COMPOSITION OF BENTHOS

AT AMPE - 10 FT C STATION

(CONTINUED)

	JUN NO.PER SQ. METER	PER CENT	NO.PER SQ. METER	PER CENT	NO.PER SQ. METER	PER CENT	NO.PER SQ. METER	PER CENT	SAMPLE MEAN NO.PER SQ. METER	PER CENT
NAIDIAE										
NAIS										
N.BRETSCHERI	11	0.2							11	0.2
CHAETOGASTER										
C.DIAPHANUS	16	0.2							16	0.2
ENCHYTRAEIDAE	6	0.1							6	0.1
ARTHROPODA										
ARCHNIDA										
ACARI	0	0.0							**	
HYGROBATIDAE										
HYGROBATES										
H.SP 1	6	0.1							6	0.1
PIONIDAE										
FORELIA	6	0.1							6	0.1
LEBERTIIDAE										
LEBERTIA	6	0.1							6	0.1
INSECTA										
TRICHOPTERA	0	0.0							**	
LEPTOCERIDAE										
OECETIS	17	0.3							17	0.3
ARTHRIPSODES	22	0.4							22	0.4
DIPTERA	0	0.0							**	
TENDIPEDIDAE	108	1.7							108	1.7
CALOPSECTRA	22	0.4							22	0.4
CLADOTANYTARSUS	11	0.1							11	0.1
CRICOTOPUS	1474	23.8							1474	23.8
POLYPEDILUM	33	0.6							33	0.6
PSEUDOCHIRONOMUS	33	0.5							33	0.5
RHEOTANYTARSUS	775	12.5							775	12.5
STICTOCHIRNOMUS	11	0.2							11	0.2
CRUSTACEA										
AMPHIPODA	0	0.0							**	
GAMMARIDAE										
GAMMARUS										
G.FASCIATUS	2066	33.4							2066	33.4
HAUSTORIIDAE										
PONTOPOREIA										
P.AFFINIS	6	0.1							6	0.1
OSTRACODA	1157	18.7							1157	18.7
TOTALS	6188								6188	

NOTE. '*' LESS THAN 0.1 PER CENT. '**' LESS THAN 1 NO.GRG.

APPENDIX VI-1a (Continued)

ABUNDANCE AND PERCENT COMPOSITION OF BENTHOS

AT FITZ - 10 FT C STATION

	JUN NO.PER SQ. METER	PER CENT	NO.PER SQ. METER	PER CENT	NO.PER SQ. METER	PER CENT	NO.PER SQ. METER	PER CENT	SAMPLE MEAN NO.PER SQ. METER	PER CENT
CNIDARIA										
HYDROZOA										
ATHECATA	0	0.0							**	
HYDRIDAE										
HYDRA										
H.AMERICANA	22	0.2							22	0.2
RHYNCHOCOELA	6	0.1							6	0.1
PLATYHELMINTHES										
TURBELLARIA										
TRICLADIDA										
PLANARIIDAE	59	0.6							59	0.6
ASCHELMINTHES										
NEMATODA	0	0.0							**	
ENOPLIDA										
ALAIMIDAE										
ALAIMUS	16	0.1							16	0.1
DORYLAIMIDA										
DORYLAIMIDAE										
DORYLAIMUS	16	0.2							16	0.2
MOLLUSCA										
GASTROPODA	6	0.1							6	0.1
MESOGASTROPODA										
BULIMIDAE										
AMNICOLA										
A.LIMNOSA	11	0.1							11	0.1
PLEUROCERIDAE										
GONIOBASIS										
G.LIVESCENS	97	0.9							97	0.9
BASOMMATOPHORA										
PHYSIDAE										
PHYSA										
P.INTEGRA	59	0.6							59	0.6
ANNELIDA										
POLYCHAETA	0	0.0							**	
SABELLIDA										
SABELLIDAE										
MANAYUNKIA										
M.SPECIOSA	59	0.6							59	0.6
OLIGOCHAETA	22	0.2							22	0.2
PROSOPORA										
LUMBRICULIDAE										
STYLODRILUS										
S.HERINGIANUS	6	0.1							6	0.1
PLESIOPORA										

APPENDIX VI-1a (Continued)

ABUNDANCE AND PERCENT COMPOSITION OF BENTHOS

AT FITZ - 10 FT C STATION

(CONTINUED)	JUN NO.PER SQ. METER	PER CENT	NO.PER SQ. METER	PER CENT	NO.PER SQ. METER	PER CENT	NO.PER SQ. METER	PER CENT	SAMPLE MEAN NO.PER SQ. METER	PER CENT
NAIDIDAE	6	0.1							6	0.1
NAIS	97	0.9							97	0.9
N.BRETSCHERI	4465	44.9							4465	44.9
N.ELINGUIS	124	1.2							124	1.2
N.SIMPLEX	27	0.3							27	0.3
CHAETOGASTER										
C.DIAPHANUS	151	1.5							151	1.5
STYLARIA										
S.LACUSTRIS	43	0.5							43	0.5
ENCHYTRAEIDAE	43	0.4							43	0.4
ARTHROPODA										
ARCHNIDA										
ACARI	0	0.0							**	
HYGROBATIDAE										
HYGROBATES										
H.SP 1	6	*							6	*
UNIONICOLIDAE										
UNIONICOLA										
U.SP 1	6	0.1							6	0.1
LEBERTIIDAE										
LEBERTIA	33	0.3							33	0.3
INSECTA										
TRICHOPTERA	0	0.0							**	
HYDROPTILIDAE										
AGRAYLEA	11	0.1							11	0.1
LEPTOCERIDAE										
OECETIS	22	0.3							22	0.3
ARTHRIPSODES	27	0.2							27	0.2
DIPTERA	0	0.0							**	
TENDIPEDIDAE	59	0.6							59	0.6
CALOPSECTRA	22	0.3							22	0.3
CRICOTOPUS	366	3.6							366	3.6
CRYPTOCHIRONOMUS	11	0.1							11	0.1
DICROTENDIPES	11	0.2							11	0.2
PSEUDOCHIRONOMUS	6	*							6	*
RHEOTANYTARSUS	81	0.8							81	0.8
PARATENDIPES	6	0.1							6	0.1
CRUSTACEA										
AMPHIPODA	0	0.0							**	
GAMMARIDAE										
GAMMARUS										
G.FASCIATUS	3475	34.9							3475	34.9
OSTRACODA	479	4.8							479	4.8
TOTALS	9956								9956	

NOTE. '*' LESS THAN 0.1 PER CENT. '**' LESS THAN 1 NO.ORG.

APPENDIX VI-1a (Continued)

ABUNDANCE AND PERCENT COMPOSITION OF BENTHOS AT NMPW - 20 FT STATION

	APR NO. PER SQ. METER	APR PER CENT	JUN NO. PER SQ. METER	JUN PER CENT	AUG NO. PER SQ. METER	AUG PER CENT	OCT NO. PER SQ. METER	OCT PER CENT	SAMPLE MEAN NO. PER SQ. METER	SAMPLE MEAN PER CENT
CNIDARIA										
HYDROZOA										
ATHECATA	0	0.0	0	0.0	0	0.0	0	0.0	**	
CLAVIDAE										
CORDYLOPHORA										
C.LACUSTRIS	-		116	3.4	10	0.7	23	1.5	37	2.1
HYDRIDAE										
HYDRA										
H.AMERICANA	4	0.6	4	0.1	2	0.2	-		3	0.2
RHYNCHOCOELA	2	0.3	23	0.7	4	0.3	25	1.7	14	0.8
PLATYHELMINTHES										
TURBELLARIA										
TRICLADIDA										
PLANARIIDAE	3	0.5	2	*	19	1.4	92	6.0	29	1.6
ASCHELMINTHES										
NEMATODA	0	0.0	2	0.1	0	0.0	3	0.2	1	0.1
ENOPLIDA										
ALAIMIDAE										
ALAIMUS	-		-		3	0.2	-		1	0.1
DORYLAIMIDA										
DORYLAIMIDAE										
DORYLAIMUS	2	0.3	2	*	7	0.6	-		3	0.1
MOLLUSCA										
GASTROPODA	0	0.0	0	0.0	0	0.0	0	0.0	**	
MESOGASTROPODA										
VALVATIDAE										
VALVATA	-		-		2	0.1	-		1	0.1
BULIMIDAE										
AMNICOLA										
A.LIMNOSA	61	9.4	22	0.7	37	2.8	161	10.6	70	4.0
PLEUROCERIDAE										
GONIOBASIS										
G.LIVESCENS	6	0.9	11	0.3	61	4.5	14	0.9	23	1.3
BASOMMATOPHORA										
PHYSIDAE										
PHYSA	-		15	0.4	14	1.0	2	0.1	8	0.5
P.INTEGRA	-		3	0.1	46	3.5	29	1.9	20	1.1
PLANORBIDAE										
HELISOMA										
H.ANCEPS	-		3	0.1	20	1.5	11	0.8	9	0.5
ANCYLIDAE	-		-		3	0.2	2	0.1	1	0.1
FERRISSIA										
F.TARDA	-		-		-		4	0.3	1	*
BIVALVIA	0	0.0	-		0	0.0	0	0.0	**	

APPENDIX [illegible]a (Continued)

ABUNDANCE AND PERCENT COMPOSITION OF BENTHOS

AT NMPW - 20 FT STATION

(CONTINUED)	APR NO.PER SQ. METER	APR PER CENT	JUN NO.PER SQ. METER	JUN PER CENT	AUG NO.PER SQ. METER	AUG PER CENT	OCT NO.PER SQ. METER	OCT PER CENT	SAMPLE MEAN NO.PER SQ. METER	SAMPLE MEAN PER CENT
EULAMELLIBRANCHIA										
UNIONIDAE	-		-		3	0.2	-		1	0.1
HETERODONTIDA										
SPHAERIIDAE										
PISIDIUM	-		-		127	9.5	35	2.3	41	2.3
SPHAERIUM	2	0.3	-		7	0.5	3	0.2	3	0.2
ANNELIDA										
POLYCHAETA	0	0.0	0	0.0	0	0.0	0	0.0	**	
SABELLIDA										
SABELLIDAE										
MANAYUNKIA										
M.SPECIOSA	81	12.4	2195	63.9	429	32.0	234	15.3	735	42.1
OLIGOCHAETA	0	0.0	0	0.0	0	0.0	0	0.0	**	
PROSOPORA										
LUMBRICULIDAE	-		-		6	0.4	3	0.2	2	0.1
PLESIOPORA										
TUBIFICIDAE	-		-		73	5.5	28	1.9	25	1.4
AULODRILUS										
A.LIMNOBIUS	-		-		8	0.5	-		2	0.1
LIMNODRILUS										
L.HOFFMEISTERI	-		-		14	1.1	-		4	0.3
PELOSCOLEX										
P.MULTISETOSUS	-		-		-		3	0.2	1	*
P.MULTISETOSUS LONGIDENT	-		-		8	0.6	36	2.3	11	0.6
POTAMOTHRIX										
P.VEJDOVSKYI	-		-		-		6	0.4	2	0.2
NAIDIDAE										
NAIS										
N.ELINGUIS	2	0.3	6	0.1	-		-		2	0.1
ARTHROPODA										
ARACHNIDA										
ACARI	0	0.0	0	0.0	0	0.0	0	0.0	**	
LIMNESIIDAE										
LIMNESIA	-		-		2	0.1	-		1	*
HYGROBATIDAE										
HYGROBATES	4	0.7	-		-		-		1	0.1
H.SP 1	8	1.2	227	6.6	255	19.0	140	9.2	158	9.0
H.SP 3	2	0.3	-		-		506	33.3	127	7.3
UNIONICOLIDAE										
UNIONICOLA										
U.SP 1	-		7	0.3	-		-		2	0.1
PIONIDAE										
FORELIA	-		80	2.3	-		-		20	1.1
LEBERTIIDAE										
LEBERTIA	20	3.1	9	0.2	6	0.5	19	1.3	14	0.8

APPENDIX VI-1a (Continued)

ABUNDANCE AND PERCENT COMPOSITION OF BENTHOS

AT NMPP - 20 FT STATION

(CONTINUED)	APR NO.PER SQ. METER	APR PER CENT	JUN NO.PER SQ. METER	JUN PER CENT	AUG NO.PER SQ. METER	AUG PER CENT	OCT NO.PER SQ. METER	OCT PER CENT	SAMPLE MEAN NO.PER SQ. METER	SAMPLE MEAN PER CENT
INSECTA										
EPHEMEROPTERA	-		-		-		0	0.0	**	
HEPTAGENIIDAE										
STENONEMA	-		-		-		15	1.0	4	0.3
TRICHOPTERA	-		0	0.0	-		0	0.0	**	
LEPTOCERIDAE										
OECETIS	-		47	1.4	-		2	0.1	12	0.7
ARTHRIPSODES	-		53	1.6	-		2	0.1	14	0.8
DIPTERA	0	0.0	0	0.0	0	0.0	0	0.0	**	
TENDIPEDIDAE	7	1.0	8	0.2	2	0.1	-		4	0.2
CALOPSECTRA	-		8	0.2	-		-		2	0.1
CHIRONOMUS	-		-		6	0.5	-		2	0.1
CLADOTANYTARSUS	-		2	0.1	-		-		1	0.1
CRICOTOPUS	78	12.0	4	0.1	-		-		21	1.2
GLYPTOTENDIPES	-		7	0.2	-		-		2	0.1
MICROPSECTRA	-		3	0.1	-		-		1	0.1
PARACHIRONOMUS	-		15	0.4	-		-		4	0.2
PSEUDOCHIRONOMUS	-		-		2	0.1	-		1	*
PSECTROCLADIUS	-		3	0.1	-		-		1	0.1
RHEOTANYTARSUS	3	0.5	14	0.4	2	0.2	2	0.1	5	0.3
CRUSTACEA										
AMPHIPODA	0	0.0	0	0.0	0	0.0	0	0.0	**	
GAMMARIDAE										
GAMMARUS										
G.FASCIATUS	355	54.5	203	5.9	56	4.2	69	4.6	171	9.8
HAUSTORIIDAE										
PONTOPOREIA										
P.AFFINIS	-		2	0.1	-		-		1	*
DECAPODA	-		-		-		0	0.0	**	
ASTACIDAE										
ORCONECTES										
O.PROPINQUUS	-		-		-		2	0.1	1	0.1
OSTRACODA	11	1.7	339	9.8	22	1.6	2	0.1	94	5.4
BRYOZOA	-		2	0.1	86	6.4	48	3.2	34	1.9
TOTALS	651		3437		1342		1521		1748	

NOTE. '*' LESS THAN 0.1 PER CENT. '**' LESS THAN 1 NO.ORG.

APPENDIX V[illegible] (Continued)

ABUNDANCE AND PERCENT COMPOSITION OF BENTHOS

AT NMPP - 20 FT STATION

	APR NO.PER SQ. METER	APR PER CENT	JUN NO.PER SQ. METER	JUN PER CENT	AUG NO.PER SQ. METER	AUG PER CENT	OCT NO.PER SQ. METER	OCT PER CENT	SAMPLE MEAN NO.PER SQ. METER	SAMPLE MEAN PER CENT
CNIDARIA										
HYDROZOA										
ATHECATA	-		0	0.0	0	0.0	0	0.0	**	
CLAVIDAE										
CORDYLOPHORA										
C.LACUSTRIS	-		3	0.3	61	4.4	247	6.9	78	4.7
HYDRIDAE										
HYDRA										
H.AMERICANA	-		2	0.2	-		4	0.1	2	0.1
RHYNCHOCOELA	-		3	0.3	3	0.2	46	1.3	13	0.8
PLATYHELMINTHES										
TURBELLARIA										
TRICLADIDA										
PLANARIIDAE	-		-		-		22	0.7	6	0.4
ASCHELMINTHES										
NEMATODA	-		0	0.0	0	0.0	10	0.2	3	0.1
DORYLAIMIDA										
DORYLAIMIDAE										
DORYLAIMUS	-		2	0.2	3	0.2	-		1	0.1
MOLLUSCA										
GASTROPODA	0	0.0	0	0.0	0	0.0	0	0.0	**	
MESOGASTROPODA										
BULIMIDAE										
AMNICOLA										
A.LIMOSA	-		10	1.0	2	0.1	12	0.4	6	0.4
A.LUSTRICA	-		3	0.3	-		-		1	*
PLEUROCERIDAE										
GONIOBASIS										
G.LIVESCENS	6	0.9	6	0.7	-		-		3	0.2
BASOMMATOPHORA										
PHYSIDAE										
PHYSA	-		4	0.4	6	0.5	6	0.1	4	0.3
P.INTEGRA	-		2	0.2	4	0.3	8	0.3	4	0.2
P.SAYII	-		2	0.2	-		-		1	0.1
ANCYLIDAE										
FERRISSIA										
F.TARDA	-		2	0.2	-		-		1	*
BIVALVIA	-		-		0	0.0	0	0.0	**	
HETERODONTIDA										
SPHAERIIDAE										
PISIDIUM	-		-		-		8	0.2	2	0.1
SPHAERIUM	-		-		2	0.1	6	0.2	2	0.2
ANNELIDA										
POLYCHAETA	0	0.0	0	0.0	0	0.0	0	0.0	**	

APPENDIX VI-1a (Continued)

ABUNDANCE AND PERCENT COMPOSITION OF BENTHOS

AT NMPP - 20 FT STATION

(CONTINUED)	APR NO.PER SQ. METER	APR PER CENT	JUN NO.PER SQ. METER	JUN PER CENT	AUG NO.PER SQ. METER	AUG PER CENT	OCT NO.PER SQ. METER	OCT PER CENT	SAMPLE MEAN NO.PER SQ. METER	SAMPLE MEAN PER CENT
SABELLICA										
SABELLIDAE										
MANAYUNKIA										
M.SPECIOSA	3	0.4	129	13.1	357	25.5	868	24.3	339	20.4
OLIGOCHAETA	-		-		0	0.0	0	0.C	**	
PLESIOPORA										
TUBIFICIDAE	-		-		8	0.6	3	0.1	3	0.2
NAIDIDAE										
NAIS	-		-		16	1.1	-		4	0.2
N.BRETSCHERI	-		-		54	3.9	-		14	0.9
ENCHYTRAEIDAE	-		-		3	0.2	-		1	*
ARTHROPODA										
ARCHNICA										
ACARI	0	0.0	0	0.0	0	0.0	0	0.C	**	
HYGROBATIDAE										
HYGROBATES										
H.SP 1	-		199	20.3	12	0.9	2	0.1	53	3.2
H.SP 3	-		-		-		12	0.3	3	0.2
H.SP 4	-		3	0.4	-		-		1	0.1
UNIONICOLIDAE										
UNIONICOLA										
U.SP 1	-		5	0.5	-		-		1	*
PIONIDAE										
FORELIA	-		135	13.7	-		-		34	2.1
LEBERTIIDAE										
LEBERTIA	7	1.1	8	0.9	15	1.1	45	1.3	19	1.1
INSECTA										
TRICHOPTERA	-		0	0.0	-		-		**	
LEPTOCERIDAE										
OECETIS	-		11	1.1	-		-		3	0.2
DIPTERA	C	0.0	0	0.0	0	0.0	0	0.C	**	
TENDIPEDIDAE	213	31.7	17	1.7	10	0.7	-		60	3.6
CALOPSECTRA	-		4	0.4	4	0.3	-		2	0.1
CRICOTOPUS	423	63.1	2	0.2	-		-		106	6.4
CRYPTOCHIRONOMUS	-		2	0.2	-		-		1	0.1
DICROTENDIPES	-		3	0.3	7	0.5	-		3	0.2
MICROTENDIPES	3	0.4	-		-		-		1	*
RHEOTANYTARSUS	3	0.5	-		15	1.0	13	0.3	8	0.5
CRUSTACEA										
ISOPODA	-		-		-		0	0.C	**	
ASELLIDAE										
ASELLUS	-		-		-		4	0.1	1	0.1
AMPHIPODA	C	0.0	0	0.0	0	0.0	0	0.C	**	
GAMMARIDAE										
GAMMARUS										

APPENDIX VI-1a (Continued)

ABUNDANCE AND PERCEN[illegible]POSITION OF BENTHOS

AT NMPP - 20 FT STATION

(CONTINUED)	APR NO.PER SQ. METER	APR PER CENT	JUN NO.PER SQ. METER	JUN PER CENT	AUG NO.PER SQ. METER	AUG PER CENT	OCT NO.PER SQ. METER	OCT PER CENT	SAMPLE MEAN NO.PER SQ. METER	SAMPLE MEAN PER CENT
G.FASCIATUS	13	1.9	53	5.4	447	32.0	2179	61.2	673	40.5
HAUSTORIIDAE										
PONTOPOREIA										
P.AFFINIS	-		-		-		33	0.9	8	0.5
OSTRACODA	-		335	34.2	-		4	0.2	85	5.1
BRYOZOA	-		35	3.6	369	26.4	30	0.8	109	6.6
TOTALS	671		980		1398		3562		1659	

NOTE. '*' LESS THAN 0.1 PER CENT. '**' LESS THAN 1 NO.ORG.

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APPENDIX VI-1a (Continued)

ABUNDANCE AND PERCENT COMPOSITION OF BENTHOS

AT AMPE - 20 FT STATION

	APR NO.PER SQ. METER	APR PER CENT	JUN NO.PER SQ. METER	JUN PER CENT	AUG NO.PER SQ. METER	AUG PER CENT	OCT NO.PER SQ. METER	OCT PER CENT	SAMPLE MEAN NO.PER SQ. METER	SAMPLE MEAN PER CENT
CNIDARIA										
HYDROZOA										
ATHECATA	0	0.0	-		-		0	0.0	**	
CLAVIDAE										
CORDYLOPHORA										
C.LACUSTRIS	-		-		-		19	0.8	5	0.2
HYDRIDAE										
HYDRA										
H.AMERICANA	7	2.6	-		-		-		2	0.1
RHYNCHOCOELA	-		-		-		54	2.4	14	0.5
PLATYHELMINTHES										
TURBELLARIA										
TRICLADIDA										
PLANARIIDAE	-		13	0.4	3	0.1	178	7.9	49	1.9
ASCHELMINTHES										
NEMATODA	0	0.0	0	0.0	0	0.0	0	0.0	**	
ENOPLICA										
ALAIMIDAE										
ALAIMUS	-		-		7	0.1	-		2	0.1
DORYLAIMIDA										
DORYLAIMIDAE										
DORYLAIMUS	4	1.5	19	0.5	4	0.1	7	0.3	9	0.4
RHABDITICA										
RHABDITIDEA										
BUTLERIUS	-		-		3	0.1	-		1	*
MOLLUSCA										
GASTROPODA	0	0.0	0	0.0	0	0.0	0	0.0	**	
MESOGASTROPODA										
VALVATIDAE										
VALVATA	-		6	0.2	-		-		2	0.1
V.PERDEPRESSA	2	0.8	7	0.2	14	0.4	-		6	0.2
BULIMIDAE										
AMNICOLA	-		-		-		27	1.2	7	0.3
A.INTEGRA	-		-		27	0.6	2	*	7	0.3
A.LIMNOSA	3	1.1	2	*	517	12.8	155	6.9	169	6.6
A.LUSTRICA	-		-		95	2.4	155	6.8	63	2.5
PLEUROCERIDAE										
GONIOBASIS										
G.LIVESCENS	-		-		30	0.7	-		8	0.3
BASOMMATOPHORA										
PHYSIDAE										
PHYSA	-		-		11	0.3	8	0.4	5	0.2
P.INTEGRA	-		-		64	1.6	23	1.0	22	0.9
ANCYLIDAE										

APPENDIX [illegible]la (Continued)

ABUNDANCE AND PERCENT COMPOSITION OF BENTHOS

AT NMPE - 20 FT STATION

(CONTINUED)	APR NO.PER SQ. METER	APR PER CENT	JUN NO.PER SQ. METER	JUN PER CENT	AUG NO.PER SQ. METER	AUG PER CENT	OCT NO.PER SQ. METER	OCT PER CENT	SAMPLE MEAN NO.PER SQ. METER	SAMPLE MEAN PER CENT
FERRISSIA	-		-		-		5	0.2	1	*
F.TARDA	-		-		2	*	2	0.1	1	*
BIVALVIA	0	0.0	0	0.0	0	0.0	0	0.0	**	
EULAMELLIBRANCHIA										
UNIONIDAE	-		-		4	0.1	2	0.1	2	0.1
HETERODONTIDA										
SPHAERIIDAE										
MUSCULIUM	-		-		3	0.1	-		1	0.1
PISIDIUM	7	2.6	455	12.9	1044	25.8	19	0.8	381	14.9
SPHAERIUM	23	8.6	47	1.3	-		4	0.2	19	0.8
ANNELIDA										
POLYCHAETA	-		0	0.0	0	0.0	0	0.0	**	
SABELLIDA										
SABELLIDAE										
MANAYUNKIA										
M.SPECIOSA	-		18	0.5	167	4.2	380	16.7	141	5.5
OLIGOCHAETA	8	2.9	171	4.9	0	0.0	0	0.0	45	1.8
PLESIOPORA										
TUBIFICIDAE	-		-		506	12.5	14	0.6	130	5.1
AULODRILUS										
A.AMERICANUS	-		-		3	*	-		1	*
A.LIMNOBIUS	-		-		6	0.2	-		2	0.1
A.PLURISETA	-		-		3	0.1	-		1	*
A.PIGUETI	-		-		16	0.4	-		4	0.2
LIMNODRILUS										
L.HOFFMEISTERI	6	2.3	49	1.4	76	1.8	-		33	1.3
PELOSCOLEX										
P.FREYI	-		7	0.1	3	0.1	-		3	0.1
P.MULTISETOSUS	-		-		-		2	0.1	1	*
P.MULTISETOSUS LONGIDENT	-		-		-		2	0.1	1	0.1
POTAMOTHRIX										
P.MOLDAVIENSIS	3	1.1	2	0.1	6	0.2	-		3	0.1
P.VEJDOVSKYI	3	1.1	22	0.6	3	*	3	0.1	8	0.3
NAIDIDAE										
NAIS										
N.ELINGUIS	-		3	0.1	-		-		1	*
PIGUETIELLA										
P.MICHIGANENSIS	2	0.8	-		-		-		1	0.1
CHAETOGASTER										
C.DIAPHANUS	-		-		-		2	0.1	1	*
VEJDOVSKYELLA										
V.INTERMEDIA	-		-		-		2	0.1	1	0.1
ENCHYTRAEIDAE	-		2	0.1	-		-		1	*
ARTHROPODA										
ARACHNIDA										

APPENDIX VI-1a (Continued)

ABUNDANCE AND PERCENT COMPOSITION OF BENTHOS

AT NMPE - 20 FT STATION

(CONTINUED)	APR NO.PER SQ. METER	APR PER CENT	JUN NO.PER SQ. METER	JUN PER CENT	AUG NO.PER SQ. METER	AUG PER CENT	OCT NO.PER SQ. METER	OCT PER CENT	SAMPLE MEAN NO.PER SQ. METER	SAMPLE MEAN PER CENT
ACARI	C	0.0	0	0.0	0	0.0	0	0.C	**	
HYGROBATIDAE										
HYGROBATES	-		119	3.3	-		-		30	1.2
H.SP 1	2	0.7	635	18.0	112	2.8	205	9.C	239	9.3
H.SP 3	-		-		-		511	22.6	128	5.1
UNIONICOLIDAE										
UNIONICOLA										
U.SP 1	-		3	0.1	6	0.2	2	*	3	0.1
U.SP 4	-		-		2	*	-		1	*
PIONIDAE										
FORELIA	-		235	6.6	4	0.1	-		60	2.4
LEBERTIIDAE										
LEBERTIA	-		6	0.2	24	0.6	14	0.7	11	0.4
INSECTA										
EPHEMEROPTERA	-		-		0	0.0	-		**	
HEPTAGENIIDAE										
STENONEMA	-		-		3	0.1	-		1	0.1
TRICHOPTERA	-		0	0.0	0	0.C	0	0.0	**	
LEPTOCERIDAE										
OECETIS	-		6	0.2	11	0.3	-		4	0.1
ARTHRIPSODES	-		-		-		2	0.1	1	0.1
DIPTERA	C	0.0	0	0.0	0	0.0	-		**	
TENDIPEDIDAE	6	2.3	55	1.5	73	1.8	-		34	1.3
CALOPSECTRA	-		-		63	1.5	-		16	0.6
CHIRONOMUS	2	0.7	-		30	0.8	-		8	0.3
CLADOTANYTARSUS	-		-		3	*	-		1	0.1
CRYPTOCHIRONOMUS	32	11.9	47	1.3	38	1.0	-		29	1.1
DICROTENDIPES	-		6	0.2	-		-		2	0.1
HETEROTRISSOCLADIUS	-		-		2	*	-		1	*
MICROPSECTRA	-		2	0.1	-		-		1	0.1
PARACLADOPELMA	-		-		2	0.1	-		1	*
PHAENOSPECTRA	-		-		2	*	-		1	*
POLYPEDILUM	-		54	1.5	119	3.0	-		43	1.7
PROCLADIUS	-		-		3	*	-		1	0.1
PSEUDOCHIRONOMUS	-		-		3	0.1	-		1	*
RHEOTANYTARSUS	-		-		2	0.1	-		1	*
STICTOCHIRONOMUS	2	0.8	-		-		-		1	0.1
TRISSOCLADIUS	11	4.1	-		-		-		3	0.1
PARATENDIPES	-		-		2	*	-		1	*
LEPIDOPTERA	-		-		-		2	*	1	0.1
CRUSTACEA										
ISOPODA	-		0	0.0	-		0	0.0	**	
ASELLIDAE										
ASELLUS	-		2	*	-		2	0.1	1	*
AMPHIPODA	C	0.0	[illegible]	0.0	0	0.0	0	0.C	*	

APPENDIX VI-1a (Continued)

ABUNDANCE AND PERCEN[illegible]POSITION OF BENTHOS

AT NMPE - 20 FT STATION

(CONTINUED)	APR NO.PER SQ. METER	APR PER CENT	JUN NO.PER SQ. METER	JUN PER CENT	AUG NO.PER SQ. METER	AUG PER CENT	OCT NO.PER SQ. METER	OCT PER CENT	SAMPLE MEAN NO.PER SQ. METER	SAMPLE MEAN PER CENT
GAMMARIDAE										
GAMMARUS										
G.FASCIATUS	106	39.5	69	2.0	765	18.9	358	15.8	325	12.8
HAUSTORIIDAE										
PONTOPOREIA										
P.AFFINIS	27	10.1	6	0.2	-		-		8	0.3
DECOPODA	-		-		3	0.1	2	0.1	1	*
OSTRACODA	12	4.5	1469	41.5	151	3.8	76	3.3	427	16.8
BRYOZOA	-		-		2	*	31	1.4	8	0.3
TOTALS	268		3537		4042		2270		2548	

NOTE.. '*' LESS THAN 0.1 PER CENT. '**' LESS THAN 1 NO.ORG.

APPENDIX VI-1a (Continued)

ABUNDANCE AND PERCENT COMPOSITION OF BENTHOS

AT FITZ - 20 FT STATION

	APR		JUN		AUG		OCT		SAMPLE MEAN	
	NO.PER SQ. METER	PER CENT	NO.PER SQ. METER	PER CENT	NO.PER SQ. METER	PER CENT	NO.PER SQ. METER	PER CENT	NO.PER SQ. METER	PER CENT
CNIDARIA										
HYDROZOA										
ATHECATA	-		0	0.0	0	0.0	-		**	
CLAVIDAE										
CORDYLOPHORA										
C.LACUSTRIS	-		-		3	0.1	-		1	0.1
HYDRIDAE										
HYDRA										
H.AMERICANA	-		2	0.6	-		-		1	*
PLATYHELMINTHES										
TURBELLARIA	2	0.2	-		-		-		1	0.1
TRICLADIDA										
PLANARIIDAE	-		3	0.8	-		-		1	0.1
ASCHELMINTHES										
NEMATODA	-		0	0.0	-		0	0.0	**	
ENOPLIDA										
ALAIMIDAE										
ALAIMUS	-		2	0.6	-		-		1	0.1
DORYLAIMIDA										
DORYLAIMIDAE										
DORYLAIMUS	-		2	0.6	-		4	2.8	2	0.1
MOLLUSCA										
GASTROPODA	0	0.0	0	0.0	0	0.0	0	0.0	**	
MESOGASTROPODA										
VALVATIDAE										
VALVATA										
V.PERDEPRESSA	-		-		-		4	2.9	1	0.1
BULIMIDAE										
AMNICOLA										
A.LIMNOSA	2	0.2	-		10	0.2	2	1.4	4	0.3
A.LUSTRICA	2	0.1	2	0.5	3	0.1	-		2	0.1
PLEUROCERIDAE										
GONIOBASIS										
G.LIVESCENS	2	0.2	4	1.2	3	0.1	-		2	0.2
BASOMMATOPHORA										
PHYSIDAE										
PHYSA	-		3	0.8	-		-		1	0.1
P.INTEGRA	3	0.3	-		4	0.1	-		2	0.1
LYMNAEIDAE										
LYMNAEA	-		-		4	0.1	-		1	0.1
PLANORBIDAE										
GYRAULUS										
G.PARVUS	-		-		2	0.1	-		1	0.1
HELISOMA	-		-		2	*	-		1	*

APPENDIX [illegible]a (Continued)

ABUNDANCE AND PERCENT COMPOSITION OF BENTHOS

AT FITZ - 20 FT STATION

(CONTINUED)	APR NO.PER SQ. METER	APR PER CENT	JUN NO.PER SQ. METER	JUN PER CENT	AUG NO.PER SQ. METER	AUG PER CENT	OCT NO.PER SQ. METER	OCT PER CENT	SAMPLE MEAN NO.PER SQ. METER	SAMPLE MEAN PER CENT
H.ANCEPS	-		-		3	0.1	-		1	0.1
ANCYLIDAE										
FERRISSIA										
F.TARDA	-		2	0.6	2	0.1	-		1	0.1
BIVALVIA	0	0.0	-		0	0.0	0	0.0	**	
HETERODONTICA										
SPHAERIIDAE										
MUSCULIUM	-		-		3	*	-		1	*
PISIDIUM	-		-		8	0.3	3	2.1	3	0.3
SPHAERIUM	2	0.2	-		-		-		1	*
ANNELIDA										
POLYCHAETA	0	0.0	0	0.0	0	0.0	-		**	
SABELLIDA										
SABELLIDAE										
MANAYUNKIA										
M.SPECIOSA	7	0.6	3	0.9	1859	49.7	-		467	34.6
OLIGOCHAETA	0	0.0	0	0.0	0	0.0	0	0.0	**	
PROSOPORA										
LUMBRICULIDAE										
STYLODRILUS										
S.HERINGIANUS	2	0.2	-		-		-		1	0.1
PLESIOPORA										
TUBIFICIDAE	-		-		6	0.1	25	17.8	8	0.6
AULODRILUS										
A.AMERICANUS	-		-		-		3	2.1	1	*
A.LIMNOBIUS	-		-		2	0.1	-		1	0.1
NAIDIDAE										
NAIS	-		-		3	0.1	-		1	0.1
N.BRETSCHERI	-		2	0.5	-		-		1	*
PARANAIS										
PARANAIS LITORALIS	2	0.1	-		-		-		1	0.1
PIGUETIELLA										
P.MICHIGANENSIS	-		-		-		2	1.4	1	0.1
ARTHROPODA										
ARACHNIDA										
ACARI	0	0.0	0	0.0	2	*	-		1	0.1
HYGROBATIDAE										
HYGROBATES	3	0.3	-		-		-		1	*
H.SP 1	-		22	6.3	3	0.1	-		6	0.5
UNIONICOLIDAE										
UNIONICOLA										
U.SP 1	-		3	0.9	-		-		1	0.1
PIONIDAE										
FORELIA	-		106	30.3	-		-		27	2.0
LEBERTIIDAE										

APPENDIX VI-1a (Continued)

ABUNDANCE AND PERCENT COMPOSITION OF BENTHOS

AT FITZ - 20 FT STATION

(CONTINUED)	APR NO.PER SQ. METER	APR PER CENT	JUN NO.PER SQ. METER	JUN PER CENT	AUG NO.PER SQ. METER	AUG PER CENT	OCT NO.PER SQ. METER	OCT PER CENT	SAMPLE MEAN NO.PER SQ. METER	SAMPLE MEAN PER CENT
LEBERTIA	54	4.8	10	2.8	43	1.1	-		27	2.0
INSECTA										
TRICHOPTERA	-		0	0.0	-		-		**	
LEPTOCERIDAE										
OECETIS	-		3	0.9	-		-		1	*
ARTHRIPSODES	-		2	0.6	-		-		1	0.1
DIPTERA	0	0.0	0	0.0	0	0.0	0	0.0	**	
TENDIPEDIDAE	20	1.8	19	5.4	2	0.1	-		10	0.7
CALOPSECTRA	-		6	1.7	5	0.1	-		3	0.3
CHIRONOMUS	-		-		-		7	5.0	2	0.1
CRICOTOPUS	6	0.5	2	0.6	-		-		2	0.2
CRYPTOCHIRONOMUS	-		-		23	0.6	18	12.7	10	0.7
DICROTENDIPES	-		-		3	0.1	-		1	0.1
HETEROTRISSOCLADIUS	-		-		2	0.1	-		1	*
MICROTENDIPES	-		-		2	*	-		1	0.1
RHEOTANYTARSUS	7	0.6	-		2	0.1	-		2	0.2
CRUSTACEA										
AMPHIPODA	0	0.0	0	0.0	0	0.0	0	0.0	**	
GAMMARIDAE										
GAMMARUS										
G.FASCIATUS	1012	89.9	46	13.1	1640	43.8	30	21.3	682	50.4
HAUSTORIIDAE										
PONTOPOREIA										
P.AFFINIS	-		4	1.2	-		43	30.5	12	0.9
OSTRACODA	-		88	25.1	39	1.1	-		32	2.4
BRYOZOA	-		14	4.0	57	1.5	-		18	1.3
TOTALS	1126		350		3740		141		1352	

NOTE. '*' LESS THAN 0.1 PER CENT. '**' LESS THAN 1 NO.ORG.

APPENDIX V (Continued).

ABUNDANCE AND PERCENT COMPOSITION OF BENTHOS

AT AMPW - 30 FT STATION

	APR NO.PER SQ. METER	APR PER CENT	JUN NO.PER SQ. METER	JUN PER CENT	AUG NO.PER SQ. METER	AUG PER CENT	OCT NO.PER SQ. METER	OCT PER CENT	SAMPLE MEAN NO.PER SQ. METER	SAMPLE MEAN PER CENT
CNIDARIA										
HYDROZOA										
ATHECATA	0	0.0	0	0.0	0	0.0	0	0.0	**	
CLAVIDAE										
CORDYLOPHORA										
C.LACUSTRIS	-		4	0.2	35	6.6	51	5.0	23	2.4
HYDRIDAE										
HYDRA										
H.AMERICANA	2	1.0	-		-		-		1	0.1
RHYNCHOCOELA	-		6	0.3	2	0.3	7	0.6	4	0.5
PLATYHELMINTHES										
TURBELLARIA										
TRICLADIDA										
PLANARIIDAE	-		4	0.2	2	0.4	49	4.8	14	1.4
ASCHELMINTHES										
NEMATODA	0	0.0	0	0.0	-		0	0.0	**	
DORYLAIMIDA										
DORYLAIMIDAE										
DORYLAIMUS	2	1.1	4	0.2	-		-		2	0.2
RHABDITIDA										
RHABDITIDEA										
BUTLERIUS	-		-		-		2	0.2	1	0.1
MOLLUSCA										
GASTROPODA	-		0	0.0	0	0.0	0	0.0	**	
MESOGASTROPODA										
VALVATIDAE										
VALVATA										
V.PERDEPRESSA	-		3	0.2	-		-		1	0.1
V.SINCERA	-		-		-		3	0.3	1	0.2
BULIMIDAE	-		-		3	0.6	-		1	0.1
AMNICOLA										
A.LIMNOSA	-		38	1.9	-		35	3.4	18	1.9
A.LUSTRICA	-		4	0.2	2	0.4	2	0.2	2	0.2
BASOMMATOPHORA										
PHYSIDAE										
PHYSA	-		39	1.9	3	0.5	-		11	1.1
P.INTEGRA	-		-		2	0.4	10	0.9	3	0.3
PLANORBIDAE										
HELISOMA	-		-		3	0.6	-		1	0.1
H.ANCEPS	-		3	0.2	-		10	1.0	3	0.4
ANCYLIDAE	-		2	0.1	-		-		1	0.1
BIVALVIA	-		-		0	0.0	-		**	
HETERODONTICA										
SPHAERIIDAE										

APPENDIX VI-1a (Continued)

ABUNDANCE AND PERCENT COMPOSITION OF BENTHOS

AT NMPW - 30 FT STATION

(CONTINUED)	APR NO.PER SQ. METER	APR PER CENT	JUN NO.PER SQ. METER	JUN PER CENT	AUG NO.PER SQ. METER	AUG PER CENT	OCT NO.PER SQ. METER	OCT PER CENT	SAMPLE MEAN NO.PER SQ. METER	SAMPLE MEAN PER CENT
PISIDIUM	-		-		3	0.5	-		1	0.1
ANNELIDA										
POLYCHAETA	0	0.0	0	0.0	0	0.0	0	0.0	**	
SABELLIDA										
SABELLIDAE										
MANAYUNKIA										
M.SPECIOSA	130	67.0	1014	50.8	207	38.9	30	2.9	345	36.3
OLIGOCHAETA	-		0	0.0	-		0	0.0	**	
PROSOPORA										
LUMBRICULIDAE										
STYLODRILUS										
S.HERINGIANUS	-		3	0.1	-		-		1	0.1
PLESIOPORA										
TUBIFICIDAE	-		-		-		6	0.6	2	0.2
PELOSCOLEX										
P.MULTISETOSUS LONGIDENT	-		-		-		7	0.7	2	0.3
ARTHROPODA										
ARACHNIDA										
ACARI	0	0.0	0	0.0	2	0.3	0	0.0	1	0.1
LIMNESIIDAE										
LIMNESIA	-		-		-		2	0.2	1	0.1
HYGROBATIDAE										
HYGROBATES	-		-		2	0.4	-		1	0.1
H.SP 1	2	1.0	244	12.2	119	22.3	105	10.2	118	12.4
H.SP 3	3	1.5	-		-		254	24.6	64	6.7
H.SP 4	-		10	0.5	2	0.4	-		3	0.4
UNIONICOLIDAE										
UNIONICOLA										
U.SP 1	-		22	1.1	-		-		6	0.6
PIONIDAE										
FORELIA	-		407	20.4	-		-		102	10.7
LEBERTIIDAE										
LEBERTIA	7	3.7	27	1.4	3	0.6	10	1.0	12	1.3
INSECTA										
TRICHOPTERA	-		0	0.0	-		-		**	
LEPTOCERIDAE										
OECETIS	-		3	0.1	-		-		1	0.1
DIPTERA	0	0.0	0	0.0	0	0.0	0	0.0	**	
TENDIPEDIDAE	-		3	0.2	2	0.3	-		1	0.1
CALOPSECTRA	-		-		2	0.4	-		1	0.1
CHIRONOMUS	-		-		-		2	0.2	1	0.1
CRICOTOPUS	18	9.2	-		-		-		5	0.6
RHEOTANYTARSUS	-		-		2	0.4	-		1	0.1
CRUSTACEA										
ISOPODA	-		[illegible]		-		0	0.0	**	

APPENDIX VI-1a (Continued)

ABUNDANCE AND PERCENT COMPOSITION OF BENTHOS

AT AMPW - 30 FT STATION

(CONTINUED)	APR NO.PER SQ. METER	APR PER CENT	JUN NO.PER SQ. METER	JUN PER CENT	AUG NO.PER SQ. METER	AUG PER CENT	OCT NO.PER SQ. METER	OCT PER CENT	SAMPLE MEAN NO.PER SQ. METER	SAMPLE MEAN PER CENT
ASELLIDAE										
ASELLUS	-		-		-		2	0.2	1	0.1
AMPHIPODA	0	0.0	0	0.0	0	0.0	0	0.0	**	
GAMMARIDAE										
GAMMARUS										
G.FASCIATUS	30	15.5	27	1.3	34	6.4	283	27.5	94	9.9
OSTRACODA	-		125	6.3	7	1.3	39	3.8	43	4.5
BRYOZOA	-		4	0.2	96	18.0	121	11.7	55	5.8
TOTALS	194		1996		533		1030		949	

NOTE. '*' LESS THAN 0.1 PER CENT. '**' LESS THAN 1 NO.ORG.

APPENDIX VI-1a (Continued)

ABUNDANCE AND PERCENT COMPOSITION OF BENTHOS

AT NMPP - 30 FT STATION

	APR NO.PER SQ. METER	APR PER CENT	JUN NO.PER SQ. METER	JUN PER CENT	AUG NO.PER SQ. METER	AUG PER CENT	OCT NO.PER SQ. METER	OCT PER CENT	SAMPLE MEAN NO.PER SQ. METER	SAMPLE MEAN PER CENT
CNIDARIA										
HYDROZOA										
ATHECATA	0	0.0	0	0.0	0	0.0	0	0.0	**	
CLAVIDAE										
CORDYLOPHORA										
C.LACUSTRIS	-		54	5.6	11	2.2	105	4.2	43	4.3
HYDRIDAE										
HYDRA										
H.AMERICANA	2	9.1	-		2	0.4	18	0.8	6	0.6
RHYNCHOCOELA	2	9.1	-		-		11	0.4	3	0.3
PLATYHELMINTHES										
TURBELLARIA										
TRICLADIDA										
PLANARIIDAE	-		-		-		205	8.3	51	5.1
ASCHELMINTHES										
NEMATODA	-		-		3	0.6	3	0.1	2	0.2
MOLLUSCA										
GASTROPODA	-		-		0	0.0	0	0.0	**	
MESOGASTROPODA										
VALVATIDAE										
VALVATA										
V.SINCERA	-		-		-		4	0.2	1	0.1
V. PISCINALIS	-		-		4	0.8	-		1	0.1
BULIMIDAE										
AMNICOLA										
A.INTEGRA	-		-		-		2	*	1	0.1
A.LIMOSA	-		-		2	0.4	100	4.1	26	2.5
A.LUSTRICA	-		-		-		4	0.1	1	0.1
BASOMMATOPHORA										
PHYSIDAE										
PHYSA	-		-		-		2	0.1	1	0.1
P.INTEGRA	-		-		-		26	1.1	7	0.7
PLANORBIDAE										
HELISOMA										
H.ANCEPS	-		-		-		3	0.1	1	0.1
BIVALVIA	-		-		0	0.0	0	0.0	**	
EULAMELLIBRANCHIA										
UNIONIDAE	-		-		-		2	0.1	1	0.1
HETERODONTIDA										
SPHAERIIDAE										
PISIDIUM	-		-		-		38	1.5	10	1.0
SPHAERIUM	-		-		2	0.4	-		1	0.1
ANNELIDA										
POLYCHAETA	-		[illegible]	0.0	0	0.0	0	0.0	**	

APPENDIX V[illegible] (Continued)

ABUNDANCE AND PERCENT COMPOSITION OF BENTHOS

AT NMPP - 30 FT STATION

(CONTINUED)	APR NO.PER SQ. METER	APR PER CENT	JUN NO.PER SQ. METER	JUN PER CENT	AUG NO.PER SQ. METER	AUG PER CENT	OCT NO.PER SQ. METER	OCT PER CENT	SAMPLE MEAN NO.PER SQ. METER	SAMPLE MEAN PER CENT
SABELLIDA										
SABELLIDAE										
MANAYUNKIA										
M.SPECIOSA	-		115	11.9	283	56.0	647	26.1	261	26.0
OLIGOCHAETA	-		-		-		0	0.0	**	
PLESIOPORA										
TUBIFICIDAE	-		-		-		31	1.2	8	0.8
LIMNODRILUS										
L.HOFFMEISTERI	-		-		-		10	0.4	3	0.3
PELOSCOLEX										
P.MULTISETOSUS LONGIDENT	-		-		-		19	0.8	5	0.5
POTAMOTHRIX										
P.VEJDOVSKYI	-		-		-		2	0.1	1	0.1
ARTHROPODA										
ARACHNIDA										
ACARI	0	0.0	0	0.0	0	0.0	0	0.0	**	
LIMNESIIDAE										
LIMNESIA	-		-		2	0.4	-		1	0.1
HYGROBATIDAE										
HYGROBATES										
H.SP 1	-		27	2.7	35	6.9	65	2.6	32	3.2
H.SP 3	-		-		-		537	21.7	134	13.4
UNIONICOLIDAE										
UNIONICOLA										
U.SP 1	-		16	1.7	3	0.6	-		5	0.5
PIONIDAE										
FORELIA	-		88	9.1	5	1.0	-		23	2.2
LEBERTIIDAE										
LEBERTIA	6	27.3	13	1.3	7	1.4	35	1.4	15	1.5
INSECTA										
EPHEMEROPTERA	-		-		-		0	0.0	**	
HEPTAGENIIDAE										
STENONEMA	-		-		-		2	*	1	0.1
TRICHOPTERA	-		0	0.0	-		-		**	
LEPTOCERIDAE										
OECETIS	-		10	1.1	-		-		3	0.3
ARTHRIPSODES	-		2	0.2	-		-		1	0.1
DIPTERA	-		0	0.0	0	0.0	0	0.0	**	
TENDIPEDIDAE	-		66	6.8	3	0.6	-		17	1.7
CALOPSECTRA	-		19	2.0	2	0.4	-		5	0.5
CRYPTOCHIRONOMUS	-		-		2	0.4	-		1	0.1
DICROTENDIPES	-		-		3	0.6	-		1	0.1
PARACHIRONOMUS	-		3	0.3	-		-		1	0.1
PROCLADIUS	-		2	0.2	2	0.4	-		1	0.1
PSECTROCLADIUS	-		3	0.3	-		-		1	0.1

APPENDIX VI-1a (Continued)

ABUNDANCE AND PERCENT COMPOSITION OF BENTHOS

AT NMPP - 30 FT STATION

(CONTINUED)	APR NO.PER SQ. METER	APR PER CENT	JUN NO.PER SQ. METER	JUN PER CENT	AUG NO.PER SQ. METER	AUG PER CENT	OCT NO.PER SQ. METER	OCT PER CENT	SAMPLE MEAN NO.PER SQ. METER	SAMPLE MEAN PER CENT
RHEOTANYTARSUS	-		-		4	0.8	6	0.3	3	0.3
NEUROPTERA	-		-		-		0	0.0	**	
SISYRIDAE										
CLIMACIA										
C.AREOLARSIS	-		-		-		2	0.1	1	0.1
CRUSTACEA										
ISOPODA	-		-		-		0	0.0	**	
ASELLIDAE										
ASELLUS	-		-		-		34	1.3	9	0.9
AMPHIPODA	0	0.0	0	0.0	0	0.0	0	0.0	**	
GAMMARIDAE										
GAMMARUS										
G.FASCIATUS	12	54.5	148	15.3	82	16.2	483	19.5	181	18.1
OSTRACODA	-		70	7.2	17	3.4	27	1.1	29	2.8
BRYOZOA	-		332	34.3	31	6.1	57	2.3	105	10.5
TOTALS	22		968		505		2480		1004	

NOTE. '*' LESS THAN 0.1 PER CENT. '**' LESS THAN 1 NO.ORG.

APPENDIX VI- (Continued)

ABUNDANCE AND PERCENT COMPOSITION OF BENTHOS

AT AMPE - 30 FT STATION

	APR NO.PER SQ. METER	APR PER CENT	JUN NO.PER SQ. METER	JUN PER CENT	AUG NO.PER SQ. METER	AUG PER CENT	OCT NO.PER SQ. METER	OCT PER CENT	SAMPLE MEAN NO.PER SQ. METER	SAMPLE MEAN PER CENT
CNIDARIA										
HYDROZOA										
ATHECATA	0	0.0	-		-		0	0.0	**	
CLAVIDAE										
CORDYLOPHORA										
C.LACUSTRIS	-		-		-		3	0.1	1	*
HYDRIDAE										
HYDRA										
H.AMERICANA	3	0.2	-		-		-		1	0.1
RHYNCHOCOELA	2	0.2	2	*	-		-		1	*
PLATYHELMINTHES										
TURBELLARIA										
TRICLADIDA										
PLANARIIDAE	-		38	0.6	-		5	0.3	11	0.3
ASCHELMINTHES										
NEMATODA	0	0.0	0	0.0	0	0.0	0	0.0	**	
ENOPLICA										
ALAIMIDAE										
ALAIMUS	15	1.0	11	0.2	14	0.5	4	0.2	11	0.4
DORYLAIMIDA										
DORYLAIMIDAE										
DORYLAIMUS	47	3.4	189	2.9	138	5.4	25	1.1	100	3.2
MOLLUSCA										
GASTROPODA	0	0.0	0	0.0	0	0.0	0	0.0	**	
MESOGASTROPODA										
VALVATIDAE										
VALVATA	-		3	0.1	-		-		1	*
V.PERDEPRESSA	178	12.9	226	3.5	669	26.0	326	15.1	350	11.1
V. PISCINALIS	-		-		242	9.4	-		61	1.9
BULIMIDAE										
AMNICOLA										
A.INTEGRA	-		-		7	0.3	-		2	0.1
A.LIMNOSA	78	5.6	126	1.9	85	3.3	296	13.7	146	4.6
A.LUSTRICA	-		3	0.1	-		3	0.1	2	0.1
BASOMMATOPHORA										
PHYSIDAE										
PHYSA										
P.INTEGRA	-		-		3	0.1	3	0.2	2	0.1
LYMNAEIDAE										
LYMNAEA										
L.CATASCOPIUM	-		-		13	0.5	5	0.2	5	0.1
PLANORBIDAE										
HELISOMA										
H.ANCEPS	-		-		2	0.1	-		1	0.1

APPENDIX VI-1a (Continued)

ABUNDANCE AND PERCENT COMPOSITION OF BENTHOS

AT NMPE - 30 FT STATION

(CONTINUED)	APR NO.PER SQ. METER	APR PER CENT	JUN NO.PER SQ. METER	JUN PER CENT	AUG NO.PER SQ. METER	AUG PER CENT	OCT NO.PER SQ. METER	OCT PER CENT	SAMPLE MEAN NO.PER SQ. METER	SAMPLE MEAN PER CENT
P.TRIVOLVIS	-		-		-		3	0.2	1	*
BIVALVIA	0	0.0	0	0.0	0	0.0	0	0.0	**	
HETERODONTICA										
SPHAERIIDAE										
MUSCULIUM	-		-		25	1.0	-		6	0.2
PISIDIUM	175	12.6	111	1.7	482	18.7	802	37.1	393	12.5
SPHAERIUM	92	6.7	168	2.6	116	4.6	124	5.7	125	3.9
ANNELIDA										
POLYCHAETA	-		0	0.0	0	0.0	0	0.0	**	
SABELLIDA										
SABELLIDAE										
MANAYUNKIA										
M.SPECIOSA	-		3	0.1	6	0.2	2	0.1	3	0.1
OLIGOCHAETA	393	28.3	277	4.3	11	0.4	0	0.0	170	5.4
PLESIOPORA										
TUBIFICIDAE	-		-		126	4.9	153	7.1	70	2.2
AULODRILUS										
A.LIMNOBIUS	3	0.2	-		-		-		1	0.1
A.PIGUETI	19	1.4	-		-		-		5	0.1
LIMNODRILUS										
L.HOFFMEISTERI	18	1.3	35	0.5	-		-		13	0.4
L.PROFUNDICOLA	10	0.7	-		-		-		3	0.1
PELOSCOLEX										
P.FREYI	-		35	0.6	6	0.3	-		10	0.3
TUBIFEX										
T.NEWAENSIS	-		3	*	-		-		1	0.1
POTAMOTHRIX										
P.MOLDAVIENSIS	68	4.9	92	1.4	16	0.6	3	0.1	45	1.4
P.VEJDOVSKYI	19	1.4	27	0.5	2	0.1	-		12	0.4
NAIDIDAE										
NAIS	-		3	*	-		-		1	*
PIGUETIELLA										
P.MICHIGANENSIS	6	0.4	-		-		3	0.2	2	0.1
CHAETOGASTER										
C.DIAPHANUS	-		49	0.8	-		-		12	0.4
ARTHROPODA										
ARACHNIDA										
ACARI	-		0	0.0	14	0.5	0	0.0	4	0.1
LIMNESIIDAE										
LIMNESIA	-		2	*	5	0.2	2	0.1	2	0.1
HYGROBATIDAE										
HYGROBATES										
H.SP 1	-				11	0.4	8	0.3	5	0.1
UNIONICOLIDAE										
UNIONICOLA										

APPENDIX VI-1a (Continued)

ABUNDANCE AND PERCENT COMPOSITION OF BENTHOS

AT NMPE - 30 FT STATION

(CONTINUED)	APR NO.PER SQ. METER	APR PER CENT	JUN NO.PER SQ. METER	JUN PER CENT	AUG NO.PER SQ. METER	AUG PER CENT	OCT NO.PER SQ. METER	OCT PER CENT	SAMPLE MEAN NO.PER SQ. METER	SAMPLE MEAN PER CENT
U.SP 1	-		3	*	-		-		1	*
PIONIDAE										
FORELIA	-		4	0.1	2	0.1	-		2	0.1
PIONA	-		3	0.1	-		-		1	*
INSECTA										
HEMIPTERA	-		-		-		2	0.1	1	0.1
TRICHOPTERA	-		0	0.0	0	0.0	0	0.0	**	
LEPTOCERIDAE										
OECETIS	-		2	*	4	0.2	3	0.2	2	*
DIPTERA	58	4.2	0	0.0	0	0.0	0	0.0	15	0.5
TENDIPEDIDAE	16	1.2	4	*	6	0.2	2	0.1	7	0.2
CALOPSECTRA	-		1351	21.0	15	0.6	-		342	10.9
CHIRONOMUS	-		2	0.1	2	*	-		1	*
CRICOTOPUS	2	0.1	-		-		-		1	*
CRYPTOCHIRONOMUS	68	4.9	57	0.9	66	2.6	34	1.5	56	1.8
DEMICRYPTOCHIRONOMUS	-		-		-		3	0.2	1	0.1
HETEROTRISSOCLADIUS	-		-		3	0.1	-		1	*
PARACLADOPELMA	-		28	0.4	10	0.4	-		10	0.3
POLYPEDILUM	-		20	0.3	18	0.7	-		10	0.3
PROCLADIUS	-		-		3	0.1	2	0.1	1	0.1
POTTHASTIA	2	0.2	-		-		28	1.3	8	0.2
STICTOCHIRONOMUS	-		-		-		2	0.1	1	*
CERATOPOGONIDAE	-		-		2	0.1	-		1	0.1
CRUSTACEA										
AMPHIPODA	0	0.0	0	0.0	0	0.0	0	0.0	**	
GAMMARIDAE										
GAMMARUS										
G.FASCIATUS	8	0.6	50	0.8	120	4.7	197	9.1	94	3.0
HAUSTORIIDAE										
PONTOPOREIA										
P.AFFINIS	85	6.1	424	6.6	271	10.5	54	2.5	209	6.6
OSTRACODA	21	1.5	3081	47.8	54	2.1	63	2.9	805	25.5
BRYOZOA	-		4	0.1	2	0.1	-		2	0.1
TOTALS	1386		6436		2571		2160		3151	

NOTE. '*' LESS THAN 0.1 PER CENT. '**' LESS THAN 1 NO.ORG.

APPENDIX VI-1a (Continued)

ABUNDANCE AND PERCENT COMPOSITION OF BENTHOS

AT FITZ - 30 FT STATION

	APR		JUN		AUG		OCT		SAMPLE MEAN	
	NO.PER SQ. METER	PER CENT	NO.PER SQ. METER	PER CENT	NO.PER SQ. METER	PER CENT	NO.PER SQ. METER	PER CENT	NO.PER SQ. METER	PER CENT
CNIDARIA										
HYDROZOA										
ATHECATA	-		-		0	0.0	0	0.0	**	
CLAVIDAE										
CORDYLOPHORA										
C.LACUSTRIS	-		-		6	1.2	2	0.5	2	0.4
RHYNCHOCOELA	2	1.0	2	0.2	-		-		1	0.2
PLATYHELMINTHES										
TURBELLARIA										
TRICLADIDA										
PLANARIIDAE	-		-		-		6	1.5	2	0.4
ASCHELMINTHES										
NEMATODA	-		0	0.0	0	0.0	0	0.0	**	
ENOPLIDA										
ALAIMIDAE										
ALAIMUS	-		3	0.4	2	0.4	-		1	0.2
DORYLAIMIDA										
DORYLAIMIDAE										
DORYLAIMUS	-		7	0.9	-		2	0.5	2	0.4
MOLLUSCA										
GASTROPODA	0	0.0	0	0.0	0	0.0	0	0.0	**	
MESOGASTROPODA										
VALVATIDAE										
VALVATA										
V.PERDEPRESSA	2	1.0	2	0.2	-		17	4.1	5	1.1
BULIMIDAE										
AMNICOLA										
A.LIMOSA	-		-		2	0.4	6	1.5	2	0.4
PLEUROCERIDAE										
GONIOBASIS										
G.LIVESCENS	-		-		-		2	0.5	1	0.2
BIVALVIA	0	0.0	0	0.0	0	0.0	0	0.0	**	
HETERODONTIDA										
SPHAERIIDAE										
PISIDIUM	3	1.4	6	0.7	4	0.9	38	9.3	13	2.7
SPHAERIUM	10	4.9	-		-		-		3	0.6
ANNELIDA										
POLYCHAETA	-		-		-		0	0.0	**	
SABELLIDA										
SABELLIDAE										
MANAYUNKIA										
M.SPECIOSA	-		-		-		2	0.5	1	0.2
OLIGOCHAETA	78	38.3	109	13.3	-		0	0.0	47	9.6
PLESIOPORA										

APPENDIX V (Continued)

ABUNDANCE AND PERCENT COMPOSITION OF BENTHOS

AT FITZ - 30 FT STATION

(CONTINUED)	APR NO.PER SQ. METER	APR PER CENT	JUN NO.PER SQ. METER	JUN PER CENT	AUG NO.PER SQ. METER	AUG PER CENT	OCT NO.PER SQ. METER	OCT PER CENT	SAMPLE MEAN NO.PER SQ. METER	SAMPLE MEAN PER CENT
TUBIFICIDAE	-		-		-		14	3.4	4	0.8
LIMNODRILUS										
L.HOFFMEISTERI	-		3	0.4	-		-		1	0.3
PELOSCOLEX										
P.FREYI	-		14	1.7	-		-		4	0.8
POTAMOTHRIX										
P.MOLDAVIENSIS	72	35.3	11	1.3	-		-		21	4.3
P.VEJDOVSKYI	4	1.9	8	1.0	-		-		3	0.6
NAIDIDAE										
PARANAIS										
P.SIMPLEX	2	1.0	-		-		-		1	0.2
PIGUETIELLA										
P.MICHIGANENSIS	-		2	0.3	-		-		1	0.2
ARTHROPODA										
ARCHNIDA										
ACARI	-		0	0.0	0	0.0	0	0.0	**	
HYGROBATIDAE										
HYGROBATES										
H.SP 1	-		8	0.9	2	0.4	2	0.5	3	0.6
UNIONICOLIDAE										
UNIONICOLA										
U.SP 1	-		10	1.3	-		-		3	0.6
PIONIDAE										
FORELIA	-		48	5.8	2	0.4	-		13	2.7
PIONA	-		2	0.3	-		-		1	0.2
INSECTA										
TRICHOPTERA	-		0	0.0	-		-		**	
LEPTOCERIDAE										
ARTHRIPSODES	-		2	0.2	-		-		1	0.2
DIPTERA	0	0.0	0	0.0	0	0.0	0	0.0	**	
TENDIPEDIDAE	-		3	0.4	-		2	0.5	1	0.2
CALOPSECTRA	-		3	0.3	-		-		1	0.2
CHIRONOMUS	-		2	0.3	2	0.4	-		1	0.2
CRYPTOCHIRONOMUS	15	7.4	51	6.2	-		19	4.7	21	4.4
PARACLADOPELMA	-		2	0.2	2	0.4	-		1	0.2
POLYPEDILUM	-		10	1.3	-		-		3	0.6
POTTHASTIA	2	0.9	-		-		11	2.6	3	0.6
CRUSTACEA										
AMPHIPODA	0	0.0	0	0.0	0	0.0	0	0.0	**	
GAMMARIDAE										
GAMMARUS										
G.FASCIATUS	3	1.5	104	12.6	464	94.5	202	49.6	193	39.6
HAUSTORIIDAE										
PONTOPOREIA										
P.AFFINIS	11	5.4	244	29.8	3	0.6	81	19.8	85	17.5

APPENDIX VI-1a (Continued)

ABUNDANCE AND PERCENT COMPOSITION OF BENTHOS

AT FITZ - 30 FT STATION

(CONTINUED)	APR NO.PER SQ. METER	APR PER CENT	JUN NO.PER SQ. METER	JUN PER CENT	AUG NO.PER SQ. METER	AUG PER CENT	OCT NO.PER SQ. METER	OCT PER CENT	SAMPLE MEAN NO.PER SQ. METER	SAMPLE MEAN PER CENT
OSTRACODA	-		164	20.0	2	0.4	2	0.5	42	8.6
TOTALS	204		820		491		408		487	

NOTE. '*' LESS THAN 0.1 PER CENT. '***' LESS THAN 1 NO.ORG.

APPENDIX [illegible] (Continued)

ABUNDANCE AND PERCENT COMPOSITION OF BENTHOS

AT NMPW - 40 FT STATION

	APR		JUN		AUG		OCT		SAMPLE MEAN	
	NO.PER SQ. METER	PER CENT	NO.PER SQ. METER	PER CENT	NO.PER SQ. METER	PER CENT	NO.PER SQ. METER	PER CENT	NO.PER SQ. METER	PER CENT
CNIDARIA										
HYDROZOA										
ATHECATA	0	0.0	0	0.0	0	0.0	2	0.2	1	0.2
CLAVIDAE										
CORDYLOPHORA										
C.LACUSTRIS	-		4	0.8	3	1.8	-		2	0.5
HYDRIDAE										
HYDRA										
H.AMERICANA	7	13.0	-		-		-		2	0.4
PLATYHELMINTHES										
TURBELLARIA										
TRICLADIDA										
PLANARIIDAE	-		2	0.4	-		50	5.2	13	3.0
ASCHELMINTHES										
NEMATODA	-		0	0.0	-		-		**	
ENOPLIDA										
ALAIMIDAE										
ALAIMUS	-		2	0.4	-		-		1	0.3
DORYLAIMIDA										
DORYLAIMIDAE										
DORYLAIMUS	-		2	0.4	-		-		1	0.2
MOLLUSCA										
GASTROPODA	-		-		0	0.0	0	0.0	**	
MESOGASTROPODA										
VALVATIDAE										
VALVATA	-		-		-		2	0.2	1	0.2
V.PERDEPRESSA	-		-		-		3	0.3	1	0.2
V.TRICARINATA	-		-		-		2	0.2	1	0.3
V. PINCINALIS	-		-		-		72	7.4	18	4.1
BULIMIDAE										
AMNICOLA										
A.LIMNOSA	-		-		-		27	2.8	7	1.6
A.LUSTRICA	-		-		-		4	0.4	1	0.2
PLEUROCERIDAE										
GONIOBASIS										
G.LIVESCENS	-		-		2	1.2	10	1.0	3	0.7
BASOMMATOPHORA										
PHYSIDAE										
PHYSA	-		-		-		2	0.2	1	0.3
P.INTEGRA	-		-		-		3	0.3	1	0.2
PLANORBIDAE										
GYRAULUS										
G.PARVUS	-		-		-		6	0.6	2	0.4
HELISOMA	-		-		2	1.1	-		1	0.3

APPENDIX VI-1a (Continued)

ABUNDANCE AND PERCENT COMPOSITION OF BENTHOS

AT NMPN - 40 FT STATION

(CONTINUED)	APR NO. PER SQ. METER	APR PER CENT	JUN NO. PER SQ. METER	JUN PER CENT	AUG NO. PER SQ. METER	AUG PER CENT	OCT NO. PER SQ. METER	OCT PER CENT	SAMPLE MEAN NO. PER SQ. METER	SAMPLE MEAN PER CENT
H. ANCEPS	-		-		-		8	0.9	2	0.4
ANCYLIDAE										
FERRISSIA										
F. TARDA	-		-		-		2	0.2	1	0.3
BIVALVIA	-		-		0	0.0	0	0.0	**	
HETERODONTIDA										
SPHAERIIDAE										
PISIDIUM	-		-		-		3	0.3	1	0.2
SPHAERIUM	-		-		2	1.2	-		1	0.2
ANNELIDA										
POLYCHAETA	-		0	0.0	0	0.0	0	0.0	**	
SABELLIDA										
SABELLIDAE										
MANAYUNKIA										
M. SPECIOSA	-		6	1.3	3	1.8	2	0.2	3	0.7
OLIGOCHAETA	4	7.4	0	0.0	-		0	0.0	1	0.2
PLESIOPORA										
TUBIFICIDAE	-		-		-		5	0.5	1	0.3
AULODRILUS										
A. PIGUETI	-		2	0.4	-		2	0.2	1	0.2
POTAMOTHRIX										
P. VEJDOVSKYI	-		-		-		2	0.2	1	0.2
NAIDIDAE										
VEJDOVSKYELLA										
V. INTERMEDIA	-		3	0.6	-		-		1	0.3
ARTHROPODA										
ARACHNIDA										
ACARI	0	0.0	0	0.0	2	1.2	0	0.0	1	0.2
HYGROBATIDAE										
HYGROBATES	-		-		2	1.2	-		1	0.2
H. SP 1	-		48	9.8	37	21.9	76	7.8	40	9.2
H. SP 3	17	31.5	-		-		229	23.6	62	14.2
UNIONICOLIDAE										
UNIONICOLA										
U. SP 1	-		10	2.0	2	1.1	-		3	0.7
U. SP 4	-		-		-		3	0.3	1	0.2
PIONIDAE										
FORELIA	-		261	53.1	10	6.0	-		68	15.6
LEBERTIIDAE										
LEBERTIA	3	5.5	7	1.5	2	1.1	3	0.3	4	0.9
INSECTA	-		-		2	1.2	-		1	0.3
DIPTERA	0	0.0	0	0.0	0	0.0	0	0.0	**	
TENDIPEDIDAE	-		16	3.2	4	2.4	-		5	1.1
CALOPSECTRA	-		15	3.1	3	1.8	-		5	1.2
CHIRONOMUS	-		[illegible]		2	1.2	2	0.3	1	0.2

APPENDIX VI-1a (Continued)

ABUNDANCE AND PERCENT [illegible]SITION OF BENTHOS

AT NMPH - 40 F[illegible] STATION

(CONTINUED)

	APR NO.PER SQ. METER	APR PER CENT	JUN NO.PER SQ. METER	JUN PER CENT	AUG NO.PER SQ. METER	AUG PER CENT	OCT NO.PER SQ. METER	OCT PER CENT	SAMPLE MEAN NO.PER SQ. METER	SAMPLE MEAN PER CENT
CRICOTOPUS	4	7.4	-		-		-		1	0.2
PARACLADOPELMA	-		2	0.4	-		-		1	0.3
PROCLADIUS	-		2	0.4	-		-		1	0.2
POTTHASTIA	-		-		2	1.1	-		1	0.2
RHEOTANYTARSUS	2	3.7	2	0.4	-		-		1	0.2
PARATENDIPES	-		-		2	1.2	-		1	0.3
CRUSTACEA										
ISOPODA	-		-		0	0.0	-		**	
ASELLIDAE										
ASELLUS	-		-		2	1.2	-		1	0.2
AMPHIPODA	0	0.0	0	0.0	0	0.0	0	0.0	**	
GAMMARIDAE										
GAMMARUS										
G.FASCIATUS	7	13.0	18	3.7	22	13.0	228	23.4	69	15.8
HAUSTORIIDAE										
PONTOPOREIA										
P.AFFINIS	-		2	0.4	2	1.2	-		1	0.3
MYSIDACEA	-		-		-		0	0.0	**	
MYSIDAE										
MYSIS										
M.OCULATA RELICTA	-		-		-		2	0.2	1	0.2
DECAPODA	0	0.0	-		-		-		**	
ASTACIDAE										
CAMBARUS										
C.BARTONI	2	3.7	-		-		-		1	0.2
OSTRACODA	8	14.8	71	14.4	54	32.0	221	22.8	89	20.4
BRYOZOA	-		16	3.3	7	4.1	-		6	1.4
TOTALS	54		491		169		971		436	

NOTE. '*' LESS THAN 0.1 PER CENT., '**' LESS THAN 1 NO.ORG.

APPENDIX VI-1a (Continued)

ABUNDANCE AND PERCENT COMPOSITION OF BENTHOS

AT NMPP - 40 FT STATION

	APR		JUN		AUG		OCT		SAMPLE MEAN	
	NO.PER SQ. METER	PER CENT	NO.PER SQ. METER	PER CENT	NO.PER SQ. METER	PER CENT	NO.PER SQ. METER	PER CENT	NO.PER SQ. METER	PER CENT
CNIDARIA										
HYDROZOA										
ATHECATA	-		-		0	0.0	0	0.0	**	
CLAVIDAE										
CORDYLOPHORA										
C.LACUSTRIS	-		-		6	2.0	49	2.4	14	1.9
HYDRIDAE										
HYDRA										
H.AMERICANA	-		-		-		8	0.4	2	0.2
RHYNCHOCOELA	-		-		-		4	0.2	1	0.2
PLATYHELMINTHES										
TURBELLARIA										
TRICLADIDA										
PLANARIIDAE	4	13.8	-		2	0.6	24	1.1	8	1.0
ASCHELMINTHES										
NEMATODA	-		-		0	0.0	3	0.2	1	0.2
DORYLAIMIDA										
DORYLAIMIDAE										
DORYLAIMUS	-		-		2	0.7	-		1	0.1
MOLLUSCA										
GASTROPODA	-		0	0.0	0	0.0	0	0.0	**	
MESOGASTROPODA										
VALVATIDAE										
VALVATA	-		-		20	6.6	-		5	0.6
V.PERDEPRESSA	-		-		2	0.7	-		1	0.2
BULIMIDAE										
AMNICOLA	-		-		-		3	0.1	1	0.1
A.LIMOSA	-		-		14	4.6	7	0.4	5	0.7
PLEUROCERIDAE										
GONIOBASIS										
G.LIVESCENS	-		2	0.3	30	9.9	-		8	1.0
BASOMMATOPHORA										
PHYSIDAE										
PHYSA	-		-		4	1.3	-		1	0.2
P.INTEGRA	-		-		22	7.3	-		6	0.8
PLANORBIDAE										
GYRAULUS										
G.PARVUS	-		-		2	0.6	-		1	0.1
HELISOMA										
H.ANCEPS	-		-		8	2.7	-		2	0.3
ANCYLIDAE										
FERRISSIA	-		-		3	1.0	-		1	0.1
BIVALVIA	-		-		0	0.0	0	0.0	**	
HETERODONTIDA										

APPENDIX V (Continued)

ABUNDANCE AND PERCENT COMPOSITION OF BENTHOS

AT NMPP - 40 FT STATION

(CONTINUED)	APR NO.PER SQ. METER	APR PER CENT	JUN NO.PER SQ. METER	JUN PER CENT	AUG NO.PER SQ. METER	AUG PER CENT	OCT NO.PER SQ. METER	OCT PER CENT	SAMPLE MEAN NO.PER SQ. METER	SAMPLE MEAN PER CENT
SPHAERIIDAE										
MUSCULIUM	-		-		2	0.6	-		1	0.1
PISIDIUM	-		-		11	3.6	4	0.2	4	0.6
SPHAERIUM	-		-		4	1.4	-		1	0.1
ANNELIDA										
POLYCHAETA	0	0.0	-		-		0	0.0	**	
SABELLIDA										
SABELLIDAE										
MANAYUNKIA										
M.SPECIOSA	2	6.9	-		-		171	8.3	43	5.7
OLIGOCHAETA	-		-		0	0.0	0	0.0	**	
PLESIOPORA										
TUBIFICIDAE	-		-		6	1.9	3	0.1	2	0.3
LIMNODRILUS										
L.HOFFMEISTERI	-		-		2	0.7	-		1	0.1
POTAMOTHRIX										
P.VEJDOVSKYI	-		-		-		2	0.1	1	0.1
ARTHROPODA										
ARACHNIDA										
ACARI	0	0.0	0	0.0	0	0.0	0	0.0	**	
LIMNESIIDAE										
LIMNESIA	-		-		2	0.7	-		1	0.2
HYGROBATIDAE										
HYGROBATES										
H.SP 1	3	10.3	42	7.3	17	5.6	141	6.9	51	6.7
H.SP 3	5	17.3	-		-		466	22.6	118	15.7
UNIONICOLIDAE										
UNIONICOLA										
U.SP 1	-		3	0.5	-		3	0.1	2	0.3
U.SP 4	-		-		6	2.0	3	0.2	2	0.2
PIONIDAE										
FORELIA	-		369	63.9	23	7.5	2	0.1	99	13.2
LEBERTIIDAE										
LEBERTIA	2	6.9	4	0.7	4	1.4	19	0.9	7	0.9
INSECTA										
DIPTERA	0	0.0	0	0.0	0	0.0	0	0.0	**	
TENDIPEDIDAE	-		19	3.3	2	0.6	2	0.1	6	0.8
CALOPSECTRA	-		22	3.8	4	1.3	-		7	1.0
CHIRONOMUS	-		-		7	2.4	-		2	0.2
CRICOTOPUS	2	6.9	-		-		-		1	0.2
DICROTENDIPES	-		-		-		2	0.1	1	0.1
PARACLADOPELMA	-		2	0.3	-		-		1	0.1
PHAENOSPECTRA	-		-		2	0.6	-		1	0.1
PROCLADIUS	-		-		2	0.7	-		1	0.2
RHEOTANYTARSUS	-		-		3	1.0	2	0.1	1	0.1

APPENDIX VI-1a (Continued)

ABUNDANCE AND PERCENT COMPOSITION OF BENTHOS

AT NMPP - 40 FT. STATION

(CONTINUED)	APR NO.PER SQ. METER	APR PER CENT	JUN NO.PER SQ. METER	JUN PER CENT	AUG NO.PER SQ. METER	AUG PER CENT	OCT NO.PER SQ. METER	OCT PER CENT	SAMPLE MEAN NO.PER SQ. METER	SAMPLE MEAN PER CENT
XENOCHIRONOMUS	-		3	0.5	-		-		1	0.1
CRUSTACEA										
ISOPODA	0	0.0	-		-		-		**	
ASELLIDAE										
ASELLUS	3	10.3	-		-		-		1	0.2
AMPHIPODA	0	0.0	-		0	0.0	0	0.0	**	
GAMMARIDAE										
GAMMARUS										
G.FASCIATUS	6	20.7	-		10	3.3	1052	51.1	267	35.4
HAUSTORIIDAE										
PONTOPOREIA										
P.AFFINIS	-		-		-		27	1.3	7	1.0
DECAPODA	-		-		2	0.6	-		1	0.1
OSTRACODA	2	6.9	76	13.2	72	23.8	8	0.4	40	5.3
BRYOZOA	-		36	6.2	7	2.3	53	2.6	24	3.2
TOTALS	29		578		303		2058		753	

NOTE. '*' LESS THAN 0.1 PER CENT. '**' LESS THAN 1 NO.ORG.

APPENDIX V (Continued)

ABUNDANCE AND PERCENT COMPOSITION OF BENTHOS

AT AMPE - 40 FT STATION

	APR		JUN		AUG		OCT		SAMPLE MEAN	
	NO.PER SQ. METER	PER CENT	NO.PER SQ. METER	PER CENT	NO.PER SQ. METER	PER CENT	NO.PER SQ. METER	PER CENT	NO.PER SQ. METER	PER CENT
CNIDARIA										
HYDROZOA										
ATHECATA	0	0.0	-		-		0	0.0	**	
CLAVIDAE										
CORDYLOPHORA										
C.LACUSTRIS	-		-		-		8	0.2	2	0.1
HYDRIDAE										
HYDRA										
H.AMERICANA	3	0.2	-		-		-		1	*
RHYNCHOCOELA	-		3	0.1	2	0.1	-		1	*
PLATYHELMINTHES										
TURBELLARIA										
TRICLADIDA										
PLANARIIDAE	-		3	*	-		6	0.2	2	0.1
ASCHELMINTHES										
NEMATODA	0	0.0	0	0.0	0	0.0	0	0.0	**	
ENOPLIDA										
ALAIMIDAE										
ALAIMUS	2	0.1	20	0.4	3	0.1	12	0.4	9	0.2
DORYLAIMIDA										
DORYLAIMIDAE										
DORYLAIMUS	30	1.7	315	5.6	124	4.0	34	1.1	126	3.7
MOLLUSCA										
GASTROPODA	0	0.0	0	0.0	0	0.0	0	0.0	**	
MESOGASTROPODA										
VALVATIDAE										
VALVATA	-		-		100	3.3	-		25	0.7
V.PERDEPRESSA	285	16.2	299	5.3	861	28.1	425	13.1	468	13.7
BULIMIDAE										
AMNICOLA										
A.INTEGRA	-		-		16	0.5	14	0.4	8	0.2
A.LIMNOSA	117	6.7	189	3.3	293	9.6	317	9.8	229	6.7
BITHYNIA TENTACULATA	2	0.1	-		-		-		1	*
BASOMMATOPHORA										
PHYSIDAE										
PHYSA										
P.INTEGRA	-		-		-		5	0.2	1	0.1
LYMNAEIDAE										
LYMNAEA										
L.CATASCOPIUM	-		-		33	1.1	3	0.1	9	0.2
L. AURICULARIA	-		-		-		3	0.1	1	*
PLANORBIDAE										
GYRAULUS										
G.PARVUS	-		2	*	-		-		1	0.1

APPENDIX VI-1a (Continued)

ABUNDANCE AND PERCENT COMPOSITION OF BENTHOS

AT NMPE - 40 FT STATION

(CONTINUED)	APR NO.PER SQ. METER	APR PER CENT	JUN NO.PER SQ. METER	JUN PER CENT	AUG NO.PER SQ. METER	AUG PER CENT	OCT NO.PER SQ. METER	OCT PER CENT	SAMPLE MEAN NO.PER SQ. METER	SAMPLE MEAN PER CENT
HELISOMA										
H.ANCEPS	-		-		-		3	*	1	*
H.TRIVOLVIS	-		-		-		3	0.1	1	*
BIVALVIA	0	0.0	0	0.0	0	0.0	0	0.0	**	
HETERODONTIDA										
SPHAERIIDAE										
MUSCULIUM	-		-		54	1.7	-		14	0.4
PISIDIUM	166	9.5	364	6.5	616	20.1	748	23.2	474	13.9
SPHAERIUM	190	10.8	210	3.7	59	2.0	310	9.5	192	5.6
ANNELIDA										
POLYCHAETA	-		0	0.0	0	0.0	0	0.0	**	
SABELLIDA										
SABELLIDAE										
MANAYUNKIA										
M.SPECIOSA	-		11	0.2	7	0.2	11	0.4	7	0.2
OLIGOCHAETA	485	27.7	621	11.1	7	0.2	0	0.0	278	8.1
PLESIOPORA										
TUBIFICIDAE	-		-		27	0.9	252	7.8	70	2.0
LIMNODRILUS										
L.HOFFMEISTERI	8	0.4	8	0.1	-		-		4	0.1
PELOSCOLEX										
P.FREYI	-		54	1.0	-		-		14	0.4
P.FEROX	-		6	0.1	-		-		2	0.1
TUBIFEX										
T.TUBIFEX	3	0.2	-		-		-		1	*
POTAMOTHRIX										
P.MOLDAVIENSIS	108	6.2	113	2.0	-		-		55	1.6
P.VEJDOVSKYI	35	2.0	44	0.7	-		8	0.2	22	0.7
NAIDIDAE										
NAIS										
N.BARBATA	14	0.8	-		-		-		4	0.1
N. PSEUDOBTUSA	11	0.6	-		-		-		3	0.1
PARANAIS										
P.SIMPLEX	3	0.2	-		-		-		1	*
PARANAIS LITORALIS	11	0.6	-		-		-		3	0.1
PIGUETIELLA										
P.MICHIGANENSIS	8	0.4	-		-		-		2	*
STYLARIA										
S.FOSSULARIS	-		3	0.1	-		-		1	0.1
ARTHROPODA										
ARACHNIDA										
ACARI	-		2	*	43	1.4	0	0.0	11	0.3
LIMNESIIDAE										
LIMNESIA	-				2	0.1	2	0.1	1	*
HYGROBATIDAE										

APPENDIX VI-1a (Continued)

ABUNDANCE AND PERCENT C[illegible]ITION OF BENTHOS

AT NMPE - 40 FT STATION

(CONTINUED)

	APR NO.PER SQ. METER	APR PER CENT	JUN NO.PER SQ. METER	JUN PER CENT	AUG NO.PER SQ. METER	AUG PER CENT	OCT NO.PER SQ. METER	OCT PER CENT	SAMPLE MEAN NO.PER SQ. METER	SAMPLE MEAN PER CENT
HYGROBATES										
H.SP 1	-		5	0.1	33	1.0	46	1.4	21	0.6
UNIONICOLIDAE										
UNIONICOLA										
U.SP 1	-		4	0.1	-		-		1	0.1
PIONIDAE										
FORELIA	-		2	*	5	0.2	-		2	*
LEBERTIIDAE										
LEBERTIA	-		2	0.1	-		2	0.1	1	*
INSECTA										
TRICHOPTERA	-		0	0.0	0	0.0	0	0.0	**	
LEPTOCERIDAE										
OECETIS	-		2	*	3	0.1	12	0.3	4	0.2
ATHRIPSODES	-		2	*	-		-		1	*
DIPTERA	0	0.0	0	0.0	0	0.0	0	0.0	**	
TENDIPEDIDAE	10	0.6	44	0.8	11	0.4	-		16	0.5
CALOPSECTRA	-		18	0.3	23	0.7	-		10	0.3
CHIRONOMUS	-		-		3	0.1	-		1	*
CRICOTOPUS	4	0.2	-		-		-		1	*
CRYPTOCHIRONOMUS	57	3.3	29	0.6	25	0.8	49	1.5	40	1.2
DEMICRYPTOCHIRONOMUS	2	0.1	-		-		-		1	*
HETEROTRISSOCLADIUS	-		-		8	0.3	-		2	0.1
PARACLADOPELMA	7	0.4	42	0.7	4	0.1	-		13	0.3
POLYPEDILUM	-		11	0.2	-		-		3	0.1
PROCLADIUS	-		3	*	6	0.2	10	0.4	5	0.2
PSEUDOCHIRONOMUS	3	0.2	-		-		2	*	1	*
POTTHASTIA	7	0.4	-		-		32	1.0	10	0.3
STICTOCHIRONOMUS	-		-		-		3	0.1	1	*
TRISSOCLADIUS	2	0.1	-		-		-		1	0.1
CRUSTACEA										
ISOPODA	0	0.0	-		-		-		**	
ASELLIDAE										
ASELLUS	2	0.1	-		-		-		1	*
AMPHIPODA	0	0.0	0	0.0	0	0.0	0	0.0	**	
GAMMARIDAE										
GAMMARUS										
G.FASCIATUS	3	0.2	12	0.3	126	4.1	541	16.7	171	5.0
HAUSTORIIDAE										
PONTOPOREIA										
P.AFFINIS	133	7.5	601	10.6	506	16.5	208	6.4	362	10.5
OSTRACODA	43	2.5	2590	46.0	61	2.0	167	5.2	715	20.9
BRYOZOA	-		-		2	0.1	-		1	*
TOTALS	1754		5634		3063		3236		3430	

NOTE. '*' LESS THAN 0.1 PER-CENT. '**' LESS THAN 1 NO.ORG.

NIAGARA MOHAWK POWER CORPORATION

ABUNDANCE AND PERCENT COMPOSITION OF BENTHOS

AT FITZ - 40 FT STATION

	APR		JUN		AUG		OCT		SAMPLE MEAN	
	NO.PER SQ. METER	PER CENT	NO.PER SQ. METER	PER CENT	NO.PER SQ. METER	PER CENT	NO.PER SQ. METER	PER CENT	NO.PER SQ. METER	PER CENT
CNIDARIA										
HYDROZOA										
ATHECATA	0	0.0	0	0.0	-		0	0.0	**	
CLAVIDAE										
CORDYLOPHORA										
C.LACUSTRIS	2	0.3	28	0.3	-		2	0.2	8	0.3
HYDRIDAE										
HYDRA										
H.AMERICANA	2	0.3	3	*	-		-		1	*
PLATYHELMINTHES										
TURBELLARIA										
TRICLADIDA										
PLANARIIDAE	-		10	0.2	-		4	0.3	4	0.1
ASCHELMINTHES										
NEMATODA	0	0.0	0	0.0	0	0.0	0	0.0	**	
ENOPLIDA										
ALAIMIDAE										
ALAIMUS	2	0.3	30	0.3	-		-		8	0.3
DORYLAIMIDA										
DORYLAIMIDAE										
DORYLAIMUS	5	0.7	381	4.3	77	6.3	2	0.1	116	3.8
MOLLUSCA										
GASTROPODA	0	0.0	0	0.0	0	0.0	0	0.0	**	
MESOGASTROPODA										
VALVATIDAE										
VALVATA	-		-		6	0.5	2	0.2	2	0.1
V.PERDEPRESSA	15	2.2	120	1.3	88	7.1	73	5.5	74	2.4
V.TRICARINATA	-		-		-		2	0.2	1	*
BULIMIDAE										
AMNICOLA										
A.LIMNOSA	2	0.3	15	0.2	41	3.3	16	1.2	19	0.7
A.LUSTRICA	-		2	*	-		2	0.2	1	*
BASOMMATOPHORA										
PHYSIDAE										
PHYSA										
P.INTEGRA	-		-		2	0.2	-		1	*
LYMNAEIDAE										
LYMNAEA										
L.CATASCOPIUM	-		3	0.1	4	0.3	-		2	0.1
PLANORBIDAE										
GYRAULUS										
G.PARVUS	-		-		-		3	0.2	1	*
BIVALVIA	0	0.0	0	0.0	0	0.0	0	0.0	**	
HETERODONTIDA										

APPENDIX [illegible] (Continued)

ABUNDANCE AND PERCENT COMPOSITION OF BENTHOS

AT FITZ - 40 FT STATION

(CONTINUED)	APR NO.PER SQ. METER	APR PER CENT	JUN NO.PER SQ. METER	JUN PER CENT	AUG NO.PER SQ. METER	AUG PER CENT	OCT NO.PER SQ. METER	OCT PER CENT	SAMPLE MEAN NO.PER SQ. METER	SAMPLE MEAN PER CENT
SPHAERIIDAE										
PISIDIUM	12	1.7	26	0.2	56	4.6	105	8.0	50	1.7
SPHAERIUM	11	1.6	-		10	0.8	10	0.8	8	0.2
ANNELIDA										
POLYCHAETA	-		0	0.0	-		-		**	
SABELLIDA										
SABELLIDAE										
MANAYUNKIA										
M.SPECIOSA	-		11	0.2	-		-		3	0.1
OLIGOCHAETA	472	68.3	985	11.0	11	0.9	3	0.2	368	12.1
PLESIOPORA										
TUBIFICIDAE	-		-		317	25.8	263	20.0	145	4.8
AULODRILUS										
A.PIGUETI	3	0.4	6	0.1	3	0.2	-		3	0.1
LIMNODRILUS										
L.HOFFMEISTERI	6	0.9	22	0.2	-		-		7	0.2
PELOSCOLEX										
P.FREYI	-		54	0.7	20	1.7	-		19	0.6
POTAMOTHRIX										
P.MOLDAVIENSIS	61	8.8	140	1.5	74	6.0	2	0.2	69	2.3
P.VEJDOVSKYI	10	1.5	16	0.2	11	0.9	-		9	0.3
NAIDIDAE										
NAIS	-		-		2	0.1	-		1	*
ARTHROPODA										
ARACHNIDA										
ACARI	-		0	0.0	0	0.0	0	0.0	**	
LIMNESIIDAE										
LIMNESIA	-		-		2	0.2	-		1	0.1
HYGROBATIDAE										
HYGROBATES	-		3	*	-		-		1	*
H.SP 1	-		22	0.3	4	0.3	2	0.2	7	0.2
UNIONICOLIDAE										
UNIONICOLA										
U.SP 1	-		8	0.1	2	0.2	-		3	0.1
PIONIDAE										
FORELIA	-		25	0.3	6	0.5	-		8	0.3
INSECTA										
TRICHOPTERA	-		2	*	-		0	0.0	1	*
LEPTOCERIDAE										
OECETIS	-		6	0.1	-		3	0.2	2	0.1
DIPTERA	0	0.0	0	0.0	0	0.0	0	0.0	**	
TENDIPEDIDAE	-		30	0.3	-		2	0.1	8	0.3
CALOPSECTRA	-		28	0.3	4	0.3	-		8	0.2
CHIRONOMUS	-		-		3	0.3	-		1	0.1
CRYPTOCHIRONOMUS	26	3.7	59	0.7	8	0.6	29	2.2	31	1.0

APPENDIX VI-1a (Continued)

ABUNDANCE AND PERCENT COMPOSITION OF BENTHOS

AT FITZ - 40 FT STATION

(CONTINUED)	APR NO.PER SQ. METER	APR PER CENT	JUN NO.PER SQ. METER	JUN PER CENT	AUG NO.PER SQ. METER	AUG PER CENT	OCT NO.PER SQ. METER	OCT PER CENT	SAMPLE MEAN NO.PER SQ. METER	SAMPLE MEAN PER CENT
DEMICRYPTOCHIRONOMUS	2	0.3	-		-		-		1	*
PARACLADOPELMA	-		6	*	3	0.3	-		2	0.1
PARACHIRONOMUS	-		2	0.1	-		-		1	*
PHAENOSPECTRA	-		2	*	-		-		1	*
POLYPEDILUM	-		43	0.5	11	0.8	-		14	0.5
POTTHASTIA	3	0.5	-		-		27	2.1	8	0.3
CRUSTACEA										
AMPHIPODA	0	0.0	0	0.0	0	0.0	0	0.0	**	
GAMMARIDAE										
GAMMARUS										
G.FASCIATUS	3	0.4	589	6.6	136	11.1	500	38.1	307	10.1
HAUSTORIIDAE										
PONTOPOREIA										
P.AFFINIS	50	7.2	296	3.3	199	16.2	237	18.1	196	6.4
OSTRACODA	4	0.6	5913	66.4	127	10.3	22	1.7	1517	49.9
BRYOZOA	-		14	0.2	2	0.2	-		4	0.1
TOTALS	691		8900		1229		1311		3042	

NOTE. '*' LESS THAN 0.1 PER CENT. '**' LESS THAN 1 NO.ORG.

APPENDIX V (Continued)

ABUNDANCE AND PERCENT COMPOSITION OF BENTHUS

AT AMPH - 60 FT STATION

	APR		JUN		AUG		OCT		SAMPLE MEAN	
	NO. PER SQ. METER	PER CENT	NO. PER SQ. METER	PER CENT	NO. PER SQ. METER	PER CENT	NO. PER SQ. METER	PER CENT	NO. PER SQ. METER	PER CENT
CNIDARIA										
HYDROZOA										
ATHECATA	-		-		0	0.0	-		**	
HYDRIDAE										
HYDRA										
H. AMERICANA	-		-		2	0.2	-		1	*
PLATYHELMINTHES										
TURBELLARIA										
TRICLADIDA										
PLANARIIDAE	-		23	0.2	10	1.2	4	0.1	9	0.2
ASCHELMINTHES										
NEMATODA	0	0.0	0	0.0	-		-		**	
ENOPLIDA										
ALAIMIDAE										
ALAIMUS	2	0.2	31	0.3	-		-		8	0.2
DORYLAIMIDA										
DORYLAIMIDAE										
DORYLAIMUS	-		23	0.2	-		-		6	0.1
MOLLUSCA										
GASTROPODA	-		0	0.0	0	0.0	2	*	1	*
MESOGASTROPODA										
VALVATIDAE										
VALVATA	-		-		8	1.0	3	*	3	0.1
V. PERDEPRESSA	-		7	0.1	-		10	0.2	4	*
V. SINCERA	-		-		-		3	*	1	0.1
V. TRICARINATA	-		-		-		4	0.1	1	*
V. PINCINALIS	-		-		-		4	0.1	1	*
BULIMIDAE										
AMNICOLA										
A. LIMNOSA	-		-		11	1.3	7	0.1	5	0.1
BASOMMATOPHORA										
PHYSIDAE										
PHYSA	-		-		3	0.4	-		1	*
P. INTEGRA	-		-		14	1.7	-		4	0.1
PLANORBIDAE	-		-		4	0.5	-		1	*
HELISOMA	-		-		2	0.2	-		1	*
BIVALVIA	0	0.0	0	0.0	0	0.0	0	0.0	**	
HETERODONTIDA										
SPHAERIIDAE										
PISIDIUM	-		293	2.6	31	3.7	1017	15.6	335	6.8
SPHAERIUM	35	2.7	2	*	10	1.2	8	0.1	14	0.3
ANNELIDA										
OLIGOCHAETA	796	62.4	3110	27.9	0	0.0	0	0.0	977	19.7
PLESIOPORA										

APPENDIX VI-1a (Continued)

ABUNDANCE AND PERCENT COMPOSITION OF BENTHOS

AT AMPH - 60 FT STATION

(CONTINUED)	APR NO.PER SQ. METER	APR PER CENT	JUN NO.PER SQ. METER	JUN PER CENT	AUG NO.PER SQ. METER	AUG PER CENT	OCT NO.PER SQ. METER	OCT PER CENT	SAMPLE MEAN NO.PER SQ. METER	SAMPLE MEAN PER CENT
TUBIFICIDAE	-		-		76	9.2	2453	37.6	632	12.7
AULODRILUS										
A.AMERICANUS	-		-		2	0.2	11	0.2	3	0.1
A.PLURISETA	-		44	0.4	2	0.2	199	3.0	61	1.2
A.PICQUETI	-		-		4	0.5	-		1	0.1
LIMNODRILUS										
L.HOFFMEISTERI	92	7.2	818	7.3	6	0.7	-		229	4.6
L.CLAPAREDIANUS	6	0.5	-		-		-		2	*
L.PROFUNDICOLA	-		11	0.1	-		-		3	0.1
L.SPIRALIS	6	0.5	-		-		-		2	*
PELOSCOLEX										
P.MULTISETOSUS	-		11	0.1	20	2.4	11	0.2	11	0.2
P.MULTISETOSUS LONGIDENT	-		-		10	1.2	38	0.6	12	0.3
TUBIFEX										
T.TUBIFEX	-		183	1.7	-		-		46	0.9
POTAMOTHRIX										
P.MOLDAVIENSIS	167	13.1	549	4.9	-		38	0.6	189	3.8
P.VEJDOVSKYI	70	5.5	538	4.8	28	3.4	614	9.4	313	6.3
NAIDIDAE										
CHAETOGASTER										
C.DIAPHANUS	-		-		3	0.4	-		1	*
STYLARIA										
S.LACUSTRIS	-		-		32	3.8	-		8	0.2
ARTHROPODA										
ARACHNIDA										
ACARI	0	0.0	0	0.0	0	0.0	0	0.0	**	
LIMNESIIDAE										
LIMNESIA	-		6	0.1	-		-		2	*
HYGROBATIDAE										
HYGROBATES	-		2	*	2	0.3	2	*	2	0.1
H.SP 1	-		24	0.2	49	5.8	3	0.1	19	0.4
H.SP 2	-		-		-		3	*	1	*
H.SP 3	3	0.2	-		-		-		1	*
H.SP 4	-		2	*	3	0.4	-		1	*
UNIONICOLIDAE										
NEUMANIA	-		-		-		2	*	1	0.1
UNIONICOLA										
U.SP 1	-		5	0.1	6	0.7	6	0.1	4	*
U.SP 4	-		-		-		3	0.1	1	0.1
KOENIKIA	-		-		2	0.3	-		1	*
PIONIDAE										
FORELIA	-		4	*	57	6.8	2	*	16	0.3
LEBERTIIDAE										
LEBERTIA	-		-		3	0.4	-		1	*
INSECTA										

APPENDIX VI-1a (Continued)

ABUNDANCE AND PERCENT COMPOSITION OF BENTHOS

AT NMPW - 60 FT STATION

(CONTINUED)	APR NO.PER SQ. METER	APR PER CENT	JUN NO.PER SQ. METER	JUN PER CENT	AUG NO.PER SQ. METER	AUG PER CENT	OCT NO.PER SQ. METER	OCT PER CENT	SAMPLE MEAN NO.PER SQ. METER	SAMPLE MEAN PER CENT
TRICHOPTERA	-		-		0	0.0	-		**	
LEPTOCERIDAE										
ARTHRIPSODES	-		-		2	0.2	-		1	*
DIPTERA	0	0.0	0	0.0	0	0.0	0	0.0	**	
TENDIPEDIDAE	-		37	0.3	2	0.3	3	0.1	11	0.3
CALOPSECTRA	-		452	4.1	15	1.8	2	*	117	2.3
CHIRONOMUS	25	2.0	21	0.2	4	0.4	331	5.1	95	1.9
CRYPTOCHIRONOMUS	-		5	*	-		-		1	0.1
HETEROTRISSOCLADIUS	3	0.2	-		-		-		1	*
MICROTENDIPES	-		-		-		3	*	1	*
PARACLADOPELMA	4	0.3	4	*	-		-		2	*
PARACHIRONOMUS	-		-		2	0.3	-		1	0.1
POLYPEDILUM	-		3	0.1	-		2	*	1	*
PROCLADIUS	-		5	*	3	0.3	28	0.5	9	0.2
POTTHASTIA	-		-		-		2	*	1	*
TRISSOCLADIUS	2	0.2	-		-		-		1	*
XENOCHIRONOMUS	-		-		2	0.3	-		1	*
CRYPTOCLADOPELMA	-		4	0.1	2	0.2	-		2	0.1
CRUSTACEA										
ISOPODA	-		-		0	0.0	-		**	
ASELLIDAE										
ASELLUS	-		-		88	10.6	-		22	0.4
AMPHIPODA	0	0.0	0	0.0	0	0.0	0	0.0	**	
GAMMARIDAE										
GAMMARUS										
G.FASCIATUS	21	1.6	78	0.7	95	11.4	194	3.0	97	2.0
CRANGONYX	-		-		6	0.7	-		2	*
HAUSTORIIDAE										
PONTOPOREIA										
P.AFFINIS	8	0.7	1208	10.8	-		92	1.4	327	6.6
DECAPODA	-		-		2	0.3	-		1	*
OSTRACODA	35	2.7	3646	32.7	191	22.9	1415	21.7	1322	26.7
BRYOZOA	-		-		18	2.2	-		5	0.1
ACANTHOCEPHALON	-		2	*	-		-		1	*
TOTALS	1275		11151		832		6519		4958	

NOTE. '*' LESS THAN 0.1 PER CENT. '**' LESS THAN 1 NO.ORG.

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APPENDIX VI-1a (Continued)

ABUNDANCE AND PERCENT COMPOSITION OF BENTHOS

AT AMPP - 60 FT STATION

	APR NO.PER SQ. METER	APR PER CENT	JUN NO.PER SQ. METER	JUN PER CENT	AUG NO.PER SQ. METER	AUG PER CENT	OCT NO.PER SQ. METER	OCT PER CENT	SAMPLE MEAN NO.PER SQ. METER	SAMPLE MEAN PER CENT
CNIDARIA										
HYDROZOA										
ATHECATA	-		-		-		0	0.0	**	
CLAVIDAE										
CORDYLOPHORA										
C.LACUSTRIS	-		-		-		7	0.1	2	0.1
RHYNCHOCOELA	-		-		-		4	0.1	1	0.1
PLATYHELMINTHES										
TURBELLARIA										
TRICLADIDA										
PLANARIIDAE	3	6.0	-		-		126	2.5	32	2.2
ASCHELMINTHES										
NEMATODA	-		-		-		0	0.0	**	
DORYLAIMIDA										
DORYLAIMIDAE										
DORYLAIMUS	-		-		-		6	0.1	2	0.1
MOLLUSCA										
GASTROPODA	0	0.0	-		0	0.0	0	0.0	**	
MESOGASTROPODA										
VALVATIDAE										
VALVATA										
V.PERDEPRESSA	-		-		-		4	0.1	1	0.1
BULIMIDAE										
AMNICOLA										
A.INTEGRA	-		-		3	0.7	-		1	0.1
A.LIMNOSA	2	4.0	-		-		6	0.1	2	0.1
A.LUSTRICA	-		-		-		14	0.3	4	0.3
BASOMMATOPHORA										
PHYSIDAE										
PHYSA	-		-		2	0.5	-		1	*
P.INTEGRA	-		-		11	2.7	-		3	0.2
BIVALVIA	-		-		0	0.0	2	*	1	0.1
EULAMELLIBRANCHIA										
UNIONIDAE	-		-		-		2	0.1	1	0.1
HETERODONTIDA										
SPHAERIIDAE										
MUSCULIUM	-		-		4	1.0	-		1	0.1
PISIDIUM	-		-		3	0.7	57	1.1	15	1.0
ANNELIDA										
OLIGOCHAETA	-		-		0	0.0	0	0.0	**	
PLESIOPORA										
TUBIFICIDAE	-		-		-		877	17.3	219	14.9
AULODRILUS										
A.PIGUETI	-		-		-		18	0.3	5	0.4

APPENDIX [illegible]a (Continued)

ABUNDANCE AND PERCENT COMPOSITION OF BENTHOS

AT NMPP - 60 FT STATION

(CONTINUED)	APR NO.PER SQ. METER	APR PER CENT	JUN NO.PER SQ. METER	JUN PER CENT	AUG NO.PER SQ. METER	AUG PER CENT	OCT NO.PER SQ. METER	OCT PER CENT	SAMPLE MEAN NO.PER SQ. METER	SAMPLE MEAN PER CENT
LIMNODRILUS										
L.HOFFMEISTERI	-		-		-		40	0.8	10	0.7
L.PROFUNDICOLA	-		-		-		6	0.1	2	0.1
PELOSCOLEX										
P.MULTISETOSUS	-		-		-		11	0.2	3	0.2
P.MULTISETOSUS LONGIDENT	-		-		8	1.9	-		2	0.2
POTAMOTHRIX										
P.VEJDOVSKYI	-		-		-		319	6.3	80	5.4
NAIDIDAE										
STYLARIA										
S.FOSSULARIS	-		-		38	9.2	-		10	0.7
S.LACUSTRIS	-		-		10	2.5	-		3	0.2
ARTHROPODA										
ARACHNIDA										
ACARI	0	0.0	0	0.0	0	0.0	0	0.0	**	
LIMNESIIDAE										
LIMNESIA	2	4.0	-		-		2	0.1	1	0.1
HYGROBATIDAE										
HYGROBATES										
H.SP 1	2	4.0	8	3.1	30	7.3	62	1.2	26	1.8
H.SP 3	15	30.0	-		-		31	0.6	12	0.8
H.SP 4	-		-		-		3	*	1	*
UNIONICOLIDAE										
NEUMANIA	-		-		2	0.4	2	0.1	1	0.1
UNIONICOLA										
U.SP 1	-		-		-		10	0.2	3	0.2
U.SP 4	-		-		3	0.8	3	*	2	0.2
PIONIDAE										
FORELIA	-		36	13.7	34	8.2	54	1.1	31	2.1
PIONA	-		-		2	0.5	-		1	*
LEBERTIIDAE										
LEBERTIA	-		3	1.1	-		2	*	1	0.1
INSECTA	-		-		2	0.5	-		1	0.1
TRICHOPTERA	-		0	0.0	-		-		**	
LEPTOCERIDAE										
ARTHRIPSODES	-		2	0.8	-		-		1	*
DIPTERA	0	0.0	0	0.0	0	0.0	0	0.0	**	
TENDIPEDIDAE	-		6	2.3	3	0.7	2	0.1	3	0.3
CALOPSECTRA	-		73	27.9	6	1.5	22	0.4	25	1.7
CHIRONOMUS	-		-		2	0.5	101	2.0	26	1.7
CRYPTOCHIRONOMUS	-		-		2	0.4	3	0.1	1	0.1
MICROPSECTRA	2	4.0	-		-		-		1	0.1
PARACLADOPELMA	-		2	0.7	-		-		1	*
POLYPEDILUM	-		-		2	0.5	12	0.2	4	0.3
PROCLADIUS	-		2	0.8	3	0.8	11	0.2	4	0.3

APPENDIX VI-1a (Continued)

ABUNDANCE AND PERCENT COMPOSITION OF BENTHOS

AT NMPP - 60 FT STATION

(CONTINUED)	APR NO.PER SQ. METER	APR PER CENT	JUN NO.PER SQ. METER	JUN PER CENT	AUG NO.PER SQ. METER	AUG PER CENT	OCT NO.PER SQ. METER	OCT PER CENT	SAMPLE MEAN NO.PER SQ. METER	SAMPLE MEAN PER CENT
RHEOTANYTARSUS	-		2	0.7	-		-		1	0.1
TRISSOCLADIUS	3	6.0	-		-		-		1	*
CRUSTACEA										
ISOPODA	-		-		0	0.0	-		**	
ASELLIDAE										
ASELLUS	-		-		3	0.7	-		1	0.1
AMPHIPODA	0	0.0	-		0	0.0	0	0.0	**	
GAMMARIDAE										
GAMMARUS										
G.FASCIATUS	9	18.0	-		30	7.3	616	12.1	164	11.2
HAUSTORIIDAE										
PONTOPOREIA										
P.AFFINIS	-		-		26	6.3	-		7	0.5
OSTRACODA	12	24.0	118	45.1	175	42.5	2644	52.1	737	50.4
BRYOZOA	-		10	3.8	8	1.9	-		5	0.3
TOTALS	50		262		412		5079		1463	

NOTE. '*' LESS THAN 0.1 PER CENT. '**' LESS THAN 1 NO.ORG.

APPENDIX V[illegible] (Continued)

ABUNDANCE AND PERCENT COMPOSITION OF BENTHOS

AT NMPE - 60 FT STATION

	APR NO. PER SQ. METER	APR PER CENT	JUN NO. PER SQ. METER	JUN PER CENT	AUG NO. PER SQ. METER	AUG PER CENT	OCT NO. PER SQ. METER	OCT PER CENT	SAMPLE MEAN NO. PER SQ. METER	SAMPLE MEAN PER CENT
CNIDARIA										
HYDROZOA										
ATHECATA	0	0.0	-		-		0	0.0	**	
CLAVIDAE										
CORDYLOPHORA										
C.LACUSTRIS	-		-		-		2	*	1	*
HYDRIDAE										
HYDRA										
H.AMERICANA	2	0.1	-		-		-		1	*
PLATYHELMINTHES										
TURBELLARIA										
TRICLADIDA										
PLANARIIDAE	2	0.2	8	0.1	-		12	0.3	6	0.2
ASCHELMINTHES										
NEMATODA	0	0.0	0	0.0	0	0.0	0	0.0	**	
ENOPLIDA										
ALAIMIDAE										
ALAIMUS	3	0.1	6	0.1	15	0.4	2	0.1	7	0.2
DORYLAIMIDA										
DORYLAIMIDAE										
DORYLAIMUS	2	0.2	131	2.2	326	8.1	38	0.8	124	3.0
RHABDITIDA										
RHABDITIDEA										
BUTLERIUS	-		-		6	0.2	-		2	0.1
MOLLUSCA										
GASTROPODA	0	0.0	0	0.0	0	0.0	0	0.0	**	
MESOGASTROPODA										
VALVATIDAE										
VALVATA	-		-		27	0.6	-		7	0.1
V.PERDEPRESSA	215	13.7	536	8.7	578	14.5	557	12.4	472	11.6
BULIMIDAE										
AMNICOLA										
A.INTEGRA	-		-		10	0.2	14	0.3	6	0.2
A.LIMNOSA	62	4.0	100	1.6	96	2.4	175	3.9	108	2.6
BASOMMATOPHORA										
PHYSIDAE										
PHYSA	-		-		2	0.1	-		1	0.1
P.INTEGRA	-		8	0.1	11	0.2	-		5	0.1
LYMNAEIDAE										
LYMNAEA	-		-		6	0.2	-		2	*
L.CATASCOPIUM	3	0.2	14	0.3	65	1.6	43	0.9	31	0.8
PLANORBIDAE										
HELISOMA										
H.ANCEPS	-		3	*	-		-		1	*

APPENDIX VI-1a (Continued)

ABUNDANCE AND PERCENT COMPOSITION OF BENTHOS

AT NMPE - 60 FT STATION

(CONTINUED)	APR NO.PER SQ. METER	APR PER CENT	JUN NO.PER SQ. METER	JUN PER CENT	AUG NO.PER SQ. METER	AUG PER CENT	OCT NO.PER SQ. METER	OCT PER CENT	SAMPLE MEAN NO.PER SQ. METER	SAMPLE MEAN PER CENT
BIVALVIA	0	0.0	0	0.0	0	0.0	0	0.0	**	
HETERODONTIDA										
SPHAERIIDAE										
MUSCULIUM	-		46	0.8	41	1.0	-		22	0.6
PISIDIUM	143	9.2	293	4.7	823	20.6	747	16.6	502	12.3
SPHAERIUM	241	15.4	76	1.3	51	1.3	50	1.1	105	2.6
ANNELIDA										
POLYCHAETA	-		0	0.0	0	0.0	0	0.0	**	
SABELLIDA										
SABELLIDAE										
MANAYUNKIA										
M.SPECIOSA	-		16	0.2	39	0.9	24	0.6	20	0.5
OLIGOCHAETA	198	12.7	245	4.0	15	0.4	0	0.0	115	2.8
PROSOPORA										
LUMBRICULIDAE	-		-		-		63	1.4	16	0.4
STYLODRILUS										
S.HERINGIANUS	29	1.9	240	3.9	86	2.2	108	2.4	116	2.9
PLESIOPORA										
TUBIFICIDAE	-		-		235	5.8	416	9.2	163	4.0
LIMNODRILUS										
L.HOFFMEISTERI	10	0.6	22	0.4	6	0.2	3	0.1	10	0.2
L.PROFUNDICOLA	-		3	*	-		-		1	*
PELOSCOLEX										
P.FREYI	-		3	0.1	13	0.3	-		4	0.1
P.FEROX	-		-		16	0.4	-		4	0.1
P.MULTISETOSUS	-		-		11	0.3	-		3	0.1
POTAMOTHRIX										
P.MOLDAVIENSIS	45	2.9	24	0.4	-		-		17	0.4
P.VEJDOVSKYI	78	5.0	78	1.2	-		94	2.0	63	1.6
NAIDIDAE										
NAIS										
N. PSEUDOBTUSA	2	0.1	-		-		-		1	*
PARANAIS										
PARANAIS LITTORALIS	5	0.3	-		-		-		1	*
ARTHROPODA										
ARACHNIDA										
ACARI	0	0.0	0	0.0	0	0.0	0	0.0	**	
LIMNESIIDAE										
LIMNESIA	2	0.2	2	0.1	-		2	0.1	2	0.1
HYGROBATIDAE										
HYGROBATES	-		-		-		4	0.1	1	*
H.SP 1	4	0.2	16	0.2	8	0.2	14	0.3	11	0.3
H.SP 3	-		-		-		2	*	1	*
PIONIDAE										
FORELIA	-		[illegible]	0.3	4	0.1	-		[illegible]	0.1

APPENDIX VI-1a (Continued)

ABUNDANCE AND PERCENT C[illegible]ITION OF BENTHOS

AT AMPE - 60 FT STATION

(CONTINUED)	APR NO.PER SQ. METER	APR PER CENT	JUN NO.PER SQ. METER	JUN PER CENT	AUG NO.PER SQ. METER	AUG PER CENT	OCT NO.PER SQ. METER	OCT PER CENT	SAMPLE MEAN NO.PER SQ. METER	SAMPLE MEAN PER CENT
LEBERTIIDAE										
LEBERTIA	2	0.1	-		-		-		1	*
INSECTA										
TRICHOPTERA	-		0	0.0	-		0	0.C	**	
LEPTOCERIDAE										
OECETIS	-		3	*	-		2	0.1	1	0.1
DIPTERA	2	0.2	0	0.0	0	0.0	0	0.C	1	*
TENDIPEDIDAE	14	0.9	14	0.3	4	0.1	-		8	0.2
CALOPSECTRA	-		27	0.4	36	0.9	-		16	0.4
CHIRONOMUS	14	0.9	2	*	22	0.5	16	0.3	14	0.3
CRICOTOPUS	3	0.2	-		-		-		1	0.1
CRYPTOCHIRONOMUS	3	0.1	2	0.1	-		7	0.2	3	*
DEMICRYPTOCHIRONOMUS	-		-		-		2	*	1	0.1
HETEROTRISSOCLADIUS	3	0.2	-		3	0.1	-		2	*
MICROPSECTRA	3	0.2	-		-		-		1	*
MICROTENDIPES	2	0.2	-		2	*	-		1	*
PARACLADOPELMA	7	0.4	6	0.1	-		-		3	0.1
PROCLADIUS	4C	2.6	15	0.2	10	0.3	26	0.6	23	0.6
PSEUDOCHIRONOMUS	2	0.1	-		-		-		1	*
POTTHASTIA	2	0.1	-		-		7	0.2	2	0.1
STICTOCHIRONOMUS	-		-		-		3	*	1	*
CRUSTACEA										
ISOPODA	-		-		0	0.0	-		**	
ASELLIDAE										
ASELLUS	-		-		3	0.1	-		1	*
AMPHIPODA	C	0.0	0	0.0	0	0.0	0	0.C	**	
GAMMARIDAE										
GAMMARUS										
G.FASCIATUS	55	3.5	49	0.8	33	0.8	350	7.8	122	3.0
HAUSTORIIDAE										
PONTOPOREIA										
P.AFFINIS	127	8.2	1579	25.7	1099	27.4	512	11.4	825	20.4
OSTRACODA	236	15.1	2563	41.7	303	7.6	1208	26.8	1078	26.5
TOTALS	1561		6145		4005		4503		4067	

NOTE. '*' LESS THAN 0.1 PER CENT. '**' LESS THAN 1 NO.ORG.

APPENDIX VI-1a (Continued)

ABUNDANCE AND PERCENT COMPOSITION OF BENTHOS

AT FITZ - 60 FT STATION

	APR		JUN		AUG		OCT		SAMPLE MEAN	
	NO.PER SQ. METER	PER CENT	NO.PER SQ. METER	PER CENT	NO.PER SQ. METER	PER CENT	NO.PER SQ. METER	PER CENT	NO.PER SQ. METER	PER CENT
CNIDARIA										
HYDROZOA										
ATHECATA	-		-		-		0	0.0	**	
CLAVIDAE										
CORDYLOPHORA										
C.LACUSTRIS	-		-		-		27	0.6	7	0.2
RHYNCHOCOELA	-		6	0.1	-		-		2	*
PLATYHELMINTHES										
TURBELLARIA										
TRICLADIDA										
PLANARIIDAE	-		15	0.1	-		6	0.1	5	0.1
ASCHELMINTHES										
NEMATODA	0	0.0	0	0.0	0	0.0	0	0.0	**	
ENOPLICA										
ALAIMIDAE										
ALAIMUS	2	0.4	14	0.1	-		10	0.3	7	0.2
DORYLAIMIDA										
DORYLAIMIDAE										
DORYLAIMUS	11	2.0	270	2.7	41	2.7	58	1.3	95	2.3
MOLLUSCA										
GASTROPODA	0	0.0	0	0.0	0	0.0	0	0.0	**	
MESOGASTROPODA										
VALVATIDAE										
VALVATA	-		-		3	0.2	2	*	1	*
V.PERDEPRESSA	12	2.1	476	4.7	335	21.9	198	4.4	255	6.1
V.SINCERA	-		3	*	-		-		1	*
V.TRICARINATA	-		3	0.1	-		4	0.1	2	0.1
BULIMIDAE										
AMNICOLA										
A.INTEGRA	-		-		2	0.2	-		1	*
A.LIMNOSA	4	0.7	107	1.0	42	2.7	58	1.3	53	1.3
A.LUSTRICA	-		-		-		2	0.1	1	*
BITHYNIA TENTACULATA	2	0.4	-		-		2	*	1	*
BASOMMATOPHORA										
PHYSIDAE										
PHYSA	-		8	0.1	8	0.5	-		4	0.1
P.INTEGRA	-		-		8	0.5	8	0.2	4	0.1
LYMNAEIDAE										
LYMNAEA										
L.CATASCOPIUM	-		17	0.2	25	1.7	-		11	0.3
PLANORBIDAE										
HELISOMA										
H.TRIVOLVIS	-		3	*	-		-		1	*
BIVALVIA	0	0.0		0.0	0	0.0	0	0.0	**	

APPENDIX VI (Continued)

ABUNDANCE AND PERCENT COMPOSITION OF BENTHOS

AT FITZ - 60 FT STATION

(CONTINUED)

	APR NO.PER SQ. METER	APR PER CENT	JUN NO.PER SQ. METER	JUN PER CENT	AUG NO.PER SQ. METER	AUG PER CENT	OCT NO.PER SQ. METER	OCT PER CENT	SAMPLE MEAN NO.PER SQ. METER	SAMPLE MEAN PER CENT
HETERODONTIDA										
SPHAERIIDAE										
PISIDIUM	19	3.4	367	3.6	195	12.8	368	8.2	237	5.7
SPHAERIUM	15	2.8	30	0.3	54	3.5	21	0.5	30	0.7
ANNELIDA										
POLYCHAETA	-		0	0.0	0	0.0	0	0.0	**	
SABELLIDA										
SABELLIDAE										
MANAYUNKIA										
M.SPECIOSA	-		16	0.2	2	0.1	3	0.1	5	0.1
OLIGOCHAETA	277	50.0	898	8.9	0	0.0	0	0.0	294	7.0
PLESIOPORA										
TUBIFICIDAE	-		-		60	4.0	1128	25.3	297	7.2
AULODRILUS										
A.PLURISETA	-		27	0.2	-		-		7	0.1
LIMNODRILUS										
L.HOFFMEISTERI	22	4.0	102	1.0	6	0.3	-		33	0.8
L.CLAPAREDIANUS	-		6	0.1	-		-		2	0.1
L.PROFUNDICOLA	-		6	0.1	-		-		2	*
PELOSCOLEX										
P.FREYI	6	1.1	59	0.5	8	0.6	-		18	0.4
TUBIFEX										
T.NEWAENSIS	-		-		2	0.1	-		1	0.1
T.TUBIFEX	3	0.6	-		-		-		1	*
POTAMOTHRIX										
P.MOLDAVIENSIS	29	5.2	183	1.9	7	0.5	11	0.2	58	1.4
P.VEJDOVSKYI	36	6.5	533	5.2	35	2.3	89	2.0	173	4.1
NAIDIDAE										
NAIS	-		6	0.1	-		-		2	0.1
VEJDOVSKYELLA										
V.INTERMEDIA	-		6	*	-		-		2	*
HIRUDINEA	-		-		-		0	0.0	**	
RHYNCHOBDELLIDA										
PISCICOLIDAE										
PISCICOLA	-		-		-		2	*	1	*
ARTHROPODA										
ARACHNIDA										
ACARI	-		0	0.0	0	0.0	0	0.0	**	
LIMNESIIDAE										
LIMNESIA	-		6	0.1	-		-		2	0.1
HYGROBATIDAE										
HYGROBATES										
H.SP 1	-		31	0.3	3	0.1	3	0.1	9	0.2
UNIONICOLIDAE										
UNIONICOLA										

APPENDIX VI-1a (Continued)

ABUNDANCE AND PERCENT COMPOSITION OF BENTHOS

AT FITZ - 60 FT STATION

(CONTINUED)	APR NO.PER SQ. METER	APR PER CENT	JUN NO.PER SQ. METER	JUN PER CENT	AUG NO.PER SQ. METER	AUG PER CENT	OCT NO.PER SQ. METER	OCT PER CENT	SAMPLE MEAN NO.PER SQ. METER	SAMPLE MEAN PER CENT
U.SP 1	-		7	0.1	3	0.2	2	0.1	3	0.1
PIONIDAE										
FORELIA	-		112	1.1	4	0.3	-		29	0.7
PIONA	-		-		3	0.2	-		1	*
LEBERTIIDAE										
LEBERTIA	-		3	*	-		-		1	*
INSECTA										
TRICHOPTERA	-		0	0.0	-		-		**	
LEPTOCERIDAE										
OECETIS	-		2	*	-		-		1	*
DIPTERA	0	0.0	0	0.0	0	0.0	0	0.0	**	
TENDIPEDIDAE	-		12	0.2	-		3	*	4	0.1
CALOPSECTRA	-		250	2.4	38	2.5	-		72	1.8
CHIRONOMUS	12	2.2	15	0.2	3	0.2	88	2.0	30	0.7
CRICOTOPUS	2	0.3	-		-		-		1	*
CRYPTOCHIRONOMUS	7	1.3	14	0.1	2	0.1	11	0.2	9	0.2
HETEROTRISSOCLADIUS	2	0.4	-		4	0.3	-		2	0.1
MICROPSECTRA	-		2	*	-		-		1	*
MICROTENDIPES	-		-		-		4	0.1	1	*
PARACLADOPELMA	-		17	0.2	-		-		4	0.1
POLYPEDILUM	-		3	*	-		-		1	*
PROCLADIUS	-		3	0.1	2	0.1	11	0.3	4	0.1
POTTHASTIA	-		-		-		19	0.4	5	0.1
RHEOTANYTARSUS	-		2	*	-		-		1	0.1
CRUSTACEA										
ISOPODA	-		-		0	0.0	0	0.0	**	
ASELLIDAE										
ASELLUS	-		-		2	0.1	2	*	1	*
AMPHIPODA	0	0.0	0	0.0	0	0.0	0	0.0	**	
GAMMARIDAE										
GAMMARUS										
G.FASCIATUS	3	0.5	75	0.7	86	5.7	670	15.1	209	5.0
HAUSTORIIDAE										
PONTOPOREIA										
P.AFFINIS	40	7.2	1186	11.7	121	7.9	396	8.8	436	10.4
OSTRACODA	49	8.9	5216	51.6	423	27.7	1257	28.2	1736	41.6
TOTALS	553		10117		1527		4463		4177	

NOTE. '*' LESS THAN 0.1 PER CENT. '**' LESS THAN 1 NO.ORG.

APPENDIX VI-1b

SEDIMENT ANALYSIS[a]

NINE MILE POINT VICINITY - 1975

I. JUNE

DEPTH (FT)	TRANSECT											
	NMPW[b]			NMPP[b]			FITZ[c]			NMPE[c]		
	% CLAY	% SILT	% SAND	% CLAY	% SILT	% SAND	% CLAY	% SILT	% SAND	% CLAY	% SILT	% SAND
10 C	3	16	81	3	4	93	NA	NA	NA	8	11	81
10 NC	NS	NS	NS	3[d]	3[d]	94[d]	4[d]	7[d]	89[d]	3	2	95
20	8	51	41	NA	NA	NA	NA	NA	NA	3	8	89
30	NA	NA	NA	NA	NA	NA	3	2	95	3	9	88
40	8[d]	68[d]	24[d]	NA	NA	NA	3	10	87	3	26	71
60	3	24	73	NA	NA	NA	4	4	92	3	8	89

II. AUGUST

DEPTH (FT)	TRANSECT											
	NMPW			NMPP			FITZ			NMPE		
	% CLAY	% SILT	% SAND	% CLAY	% SILT	% SAND	% CLAY	% SILT	% SAND	% CLAY	% SILT	% SAND
10 C	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
10 NC	NA	NA	NA	0[d]	31[d]	69[d]	NA	NA	NA	0	2	98
20	0[d]	36[d]	64[d]	NA	NA	NA	NA	NA	NA	0[d]	7[d]	93[d]
30	NA	NA	NA	NA	NA	NA	0	3	97	0	25	75
40	NA[d]	NA[d]	NA[d]	NA	NA	NA	0	7	93	0	11	89
60	3	61	36	0	38	62	0	13	86	0	12	88

III. OCTOBER

DEPTH (FT)	TRANSECT											
	NMPW[e]			NMPP[f]			FITZ[g]			NMPE[g]		
	% CLAY	% SILT	% SAND	% CLAY	% SILT	% SAND	% CLAY	% SILT	% SAND	% CLAY	% SILT	% SAND
10 NC	NA	NA	NA	NA	NA	NA	NA	NA	NA	0	1	99
20	NA	NA	NA	NA	NA	NA	0	8	92	0[d]	11[d]	89[d]
30	NA	NA	NA	NA	NA	NA	0	9	91	0	5	95
40	1[d]	44[d]	55[d]	NA	NA	NA	0	10	90	0	18	82
60	1	45	54	NA	NA	NA	0	16	84	0	4	96

[a] Mean of R-1 and R-2; laboratory determination
[b] Sampling date - 18 JUN
[c] Sampling date - 17 JUN
[d] R-1 or R-2
[e] Sampling date - 25 OCT
[f] Sampling date - 31 OCT
[g] Sampling date - 20 OCT for 10 and 20 ft samples; 28 OCT for 30, 40, and 60 ft samples.
NS - No sample
NA - Not available

APPENDIX VI-2

STATISTICAL ANALYSIS OF BUOY PERIPHYTON BIOMASS[a] PRODUCTION

NINE MILE POINT VICINITY - 14 MAY 1975

NESTED ANALYSIS OF VARIANCE
(Log Transformed)

SOURCE	DF	SS	MS	F
SAMPLE DEPTHS	2	6.2292	3.1146	43.55**
STATIONS WITHIN DEPTHS[b]	6	1.5100		
2 FT	2	0.1901	0.0951	1.33
12 FT	2	0.4502	0.2251	3.15
17 FT	2	0.8697	0.4349	6.08*
ERROR	9	0.6436	0.0715	
TOTAL	17	8.3828		

**Significant at $\alpha = .01$
*Significant at $\alpha = .05$

GEOMETRIC MEANS FOR SAMPLE DEPTHS

DEPTH	GEOM. MEAN	95% CONFIDENCE INTERVAL
2 ft	10.93	(6.19, 19.30)
12 ft	2.35	(1.33, 4.15)
17 ft	0.40	(0.22, 0.70)

STUDENT-NEWMAN-KEULS TEST - SAMPLE DEPTHS ($\alpha = .05$)
Largest: 2 ft 12 ft 17 ft: Smallest

GEOMETRIC MEANS FOR STATIONS WITHIN SAMPLE DEPTHS

2 FT

STATION	GEOM. MEAN	95% CONFIDENCE INTERVAL
NMPE	7.77	(2.90, 20.82)
NMPP/FITZ	8.63	(3.22, 23.11)
NMPW	19.45	(7.26, 52.08)

APPENDIX VI-2 (Continued)

BUOY PERIPHYTON BIOMASS[a] - 14 MAY 1975

12 FT

STATION	GEOM. MEAN	95% CONFIDENCE INTERVAL
NMPE	1.71	(0.64, 4.58)
NMPP/FITZ	5.67	(2.12, 15.20)
NMPW	1.34	(0.50, 3.59)

DUNNETT t TESTS (1-SIDED) FOR COMPARISONS OF CONTROLS WITH PLANT STATION

NMPE < NMPP/FITZ: t=1.95
NMPW < NMPP/FITZ: t=2.34*

17 FT

STATION	GEOM. MEAN	95% CONFIDENCE INTERVAL
NMPE	0.58	(0.22, 1.55)
NMPP/FITZ	0.92	(0.34, 2.45)
NMPW	0.12	(0.04, 0.32)

DUNNETT t TESTS (1-SIDED) FOR COMPARISONS OF CONTROLS WITH PLANT STATION

NMPE < NMPP/FITZ: t=0.75
NMPW < NMPP/FITZ: t=3.31**

[a] Ash-free dry weight

[b] 7ft Depth excluded due to missing data points

APPENDIX VI-3

STATISTICAL ANALYSIS OF BUOY PERIPHYTON BIOMASS[a] PRODUCTION

NINE MILE POINT VICINITY - 12 JUNE 1975

NESTED ANALYSIS OF VARIANCE
(Log Transformed)

SOURCE	DF	SS	MS	F
SAMPLE DEPTHS	3	1.8314	0.6105	35.72**
STATIONS WITHIN DEPTHS	8	0.7345		
2 FT	2	0.3976	0.1988	11.63**
7 FT	2	0.1200	0.0600	3.51
12 FT	2	0.1563	0.0781	4.57*
17 FT	2	0.0606	0.0303	1.77
ERROR	12	0.2051	0.0171	
TOTAL	23	2.7710		

**Significant at $\alpha = .01$
*Significant at $\alpha = .05$

GEOMETRIC MEANS FOR SAMPLE DEPTHS

DEPTH	GEOM. MEAN	95% CONFIDENCE INTERVAL
2 ft	26.85	(20.54, 35.10)
7 ft	16.72	(12.79, 21.86)
12 ft	12.15	(9.29, 15.88)
17 ft	4.72	(3.61, 6.17)

STUDENT-NEWMAN-KEULS TEST - SAMPLE DEPTHS ($\alpha = .05$)
Largest: 2 ft 7ft 12 ft 17 ft: Smallest

APPENDIX VI-3 (Continued)

BUOY PERIPHYTON BIOMASS[a] - 12 JUNE 1975

GEOMETRIC MEANS FOR STATIONS WITHIN SAMPLE DEPTHS

2 FT

STATION	GEOM. MEAN	95% CONFIDENCE INTERVAL
NMPE	12.14	(7.67, 19.23)
NMPP/FITZ	50.46	(31.73, 80.24)
NMPW	31.59	(19.87, 50.24)

DUNNETT t TESTS (1-SIDED) FOR COMPARISONS OF CONTROLS WITH PLANT STATION

NMPE < NMPP/FITZ: t=4.73**
NMPW < NMPP/FITZ: t=1.56

7 FT

STATION	GEOM. MEAN	95% CONFIDENCE INTERVAL
NMPE	17.28	(10.87, 27.48)
NMPP/FITZ	11.05	(6.95, 17.58)
NMPW	24.49	(15.40, 38.94)

12 FT

STATION	GEOM. MEAN	95% CONFIDENCE INTERVAL
NMPE	8.19	(5.15, 13.03)
NMPP/FITZ	19.99	(12.57, 31.79)
NMPW	10.94	(6.88, 17.40)

DUNNETT t TESTS (1-SIDED) FOR COMPARISONS OF CONTROLS WITH PLANT STATION

NMPE < NMPP/FITZ: t=2.96*
NMPW < NMPP/FITZ: t=2.00

17 FT

STATION	GEOM. MEAN	95% CONFIDENCE INTERVAL
NMPE	3.48	(2.19, 5.53)
NMPP/FITZ	6.09	(3.83, 9.68)
NMPW	4.96	(3.12, 7.89)

[a]Ash-free dry weight

APPENDIX VI-4

STATISTICAL ANALYSIS OF BUOY PERIPHYTON BIOMASS[a] PRODUCTION

NINE MILE POINT VICINITY - 27 JUNE 1975

NESTED ANALYSIS OF VARIANCE
(Log Transformed)

SOURCE	DF	SS	MS	F
SAMPLE DEPTHS	3	3.4129	1.1376	275.79**
STATIONS WITHIN DEPTHS	8	0.2630		
2 FT	2	0.0708	0.0354	8.58**
7 FT	2	0.0793	0.0397	9.61**
12 FT	2	0.0484	0.0242	5.87*
17 FT	2	0.0705	0.0353	8.55**
ERROR	12	0.0495	0.0041	
TOTAL	23	3.7314		

**Significant at α = .01
*Significant at α = .05

GEOMETRIC MEANS FOR SAMPLE DEPTHS

DEPTH	GEOM. MEAN	95% CONFIDENCE INTERVAL
2 ft	110.88	(97.25, 126.43)
7 ft	47.49	(41.65, 54.15)
12 ft	21.70	(19.03, 24.74)
17 ft	10.84	(9.51, 12.36)

STUDENT-NEWMAN-KEULS TEST - SAMPLE DEPTHS (α = .05)
Largest: 2 ft 7ft 12 ft 17 ft: Smallest

APPENDIX VI-4 (Continued)

BUOY PERIPHYTON BIOMASS[a] - 27 JUNE 1975

GEOMETRIC MEANS FOR STATIONS WITHIN SAMPLE DEPTHS

2 FT

STATION	GEOM. MEAN	95% CONFIDENCE INTERVAL
NMPE	108.00	(86.04, 135.54)
NMPP/FITZ	152.51	(121.51, 191.42)
NMPW	82.77	(65.95, 103.89)

DUNNETT t TESTS (1-SIDED) FOR COMPARISONS OF CONTROLS WITH PLANT STATION

NMPE < NMPP/FITZ: t=2.34*
NMPW < NMPP/FITZ: t=4.15**

7 FT

STATION	GEOM. MEAN	95% CONFIDENCE INTERVAL
NMPE	37.54	(29.91, 47.17)
NMPP/FITZ	68.75	(54.78, 86.29)
NMPW	41.51	(33.07, 52.10)

DUNNETT t TESTS (1-SIDED) FOR COMPARISONS OF CONTROLS WITH PLANT STATION

NMPE < NMPP/FITZ: t≤4.10**
NMPW < NMPP/FITZ: t=3.42**

APPENDIX VI-4 (Continued)

BUOY PERIPHYTON BIOMASS[a] - 27 JUNE 1975

12 FT

STATION	GEOM. MEAN	95% CONFIDENCE INTERVAL
NMPE	19.09	(15.21, 23.96)
NMPP/FITZ	29.05	(23.15, 36.46)
NMPW	18.42	(14.68, 23.12)

DUNNETT t TESTS (1-SIDED) FOR COMPARISONS OF CONTROLS WITH PLANT STATION

NMPE < NMPP/FITZ: t=2.85*
NMPW < NMPP/FITZ: t=3.09**

17 FT

STATION	GEOM. MEAN	95% CONFIDENCE INTERVAL
NMPE	7.77	(6.19, 9.75)
NMPP/FITZ	14.17	(11.29, 17.79)
NMPW	11.57	(9.22, 14.52)

DUNNETT t TESTS (1-SIDED) FOR COMPARISONS OF CONTROLS WITH PLANT STATION

NMPE < NMPP/FITZ: t=4.08**
NMPW < NMPP/FITZ: t=1.37

[a]Ash-free dry weight

APPENDIX VI-5

STATISTICAL ANALYSIS OF BUOY PERIPHYTON BIOMASS[a] PRODUCTION

NINE MILE POINT VICINITY - 14 JULY 1975

NESTED ANALYSIS OF VARIANCE
(Log Transformed)

SOURCE	DF	SS	MS	F
SAMPLE DEPTHS	3	1.6388	0.5463	31.11
STATIONS WITHIN DEPTHS	8	0.6690		
2 FT	2	0.0133	0.0067	0.38
7 FT	2	0.0614	0.0307	1.75
12 FT	2	0.2375	0.1188	6.76*
17 FT	2	0.3568	0.1784	10.16**
ERROR	12	0.2107	0.0176	
TOTAL	23	2.5185		

**Significant at $\alpha = .01$
*Significant at $\alpha = .05$

GEOMETRIC MEANS FOR SAMPLE DEPTHS

DEPTH	GEOM. MEAN	95% CONFIDENCE INTERVAL
2 ft	210.83	(160.66, 276.68)
7 ft	81.35	(61.99, 106.76)
12 ft	53.91	(41.08, 70.75)
17 ft	44.16	(33.65, 57.95)

STUDENT-NEWMAN-KEULS TEST - SAMPLE DEPTHS ($\alpha = .05$)
Largest: 2 ft 7ft 12 ft 17 ft: Smallest

APPENDIX VI-5 (Continued)

BUOY PERIPHYTON BIOMASS[a] - 14 JULY 1975

GEOMETRIC MEANS FOR STATIONS WITHIN SAMPLE DEPTHS

2 FT

STATION	GEOM. MEAN	95% CONFIDENCE INTERVAL
NMPE	188.80	(117.91, 302.31)
NMPP/FITZ	203.24	(126.93, 325.43)
NMPW	244.22	(152.52, 391.06)

7 FT

STATION	GEOM. MEAN	95% CONFIDENCE INTERVAL
NMPE	58.69	(36.65, 93.97)
NMPP/FITZ	99.51	(62.14, 159.33)
NMPW	92.19	(57.58, 147.62)

12 FT

STATION	GEOM. MEAN	95% CONFIDENCE INTERVAL
NMPE	28.22	(17.62, 45.18)
NMPP/FITZ	72.74	(45.43, 116.48)
NMPW	76.32	(47.67, 122.21)

DUNNETT t TESTS (1-SIDED) FOR COMPARISONS OF CONTROLS WITH PLANT STATION

NMPE < NMPP/FITZ: t=3.10**
NMPW > NMPP/FITZ: t=-0.16

17 FT

STATION	GEOM. MEAN	95% CONFIDENCE INTERVAL
NMPE	19.97	(12.47, 31.98)
NMPP/FITZ	67.42	(42.10, 107.95)
NMPW	63.96	(39.94, 102.41)

DUNNETT t TESTS (1-SIDED) FOR COMPARISONS OF CONTROLS WITH PLANT STATION

NMPE < NMPP/FITZ: t=3.98**
NMPW < NMPP/FITZ: t=0.17

[a] Ash-free dry weight

APPENDIX VI-6

STATISTICAL ANALYSIS OF BUOY PERIPHYTON BIOMASS[a] PRODUCTION

NINE MILE POINT VICINITY - 30 JULY 1975

NESTED ANALYSIS OF VARIANCE
(Log Transformed)

SOURCE	DF	SS	MS	F
SAMPLE DEPTHS	3	3.6951	1.2317	36.58**
STATIONS WITHIN DEPTHS	8	0.3815		
2 FT	2	0.1041	0.0521	1.55
7 FT	2	0.0340	0.0170	0.51
12 FT	2	0.2415	0.1208	3.59
17 FT	2	0.0019	0.0010	0.03
ERROR	12	0.4040	0.0337	
TOTAL	23	4.4807		

**Significant at $\alpha = .01$

GEOMETRIC MEANS FOR SAMPLE DEPTHS

DEPTH	GEOM. MEAN	95% CONFIDENCE INTERVAL
2 ft	49.08	(33.69, 71.49)
7 ft	11.29	(7.75, 16.44)
12 ft	7.70	(5.29, 11.22)
17 ft	4.23	(2.91, 6.17)

STUDENT-NEWMAN-KEULS TEST - SAMPLE DEPTHS ($\alpha = .05$)
Largest: 2 ft 7ft 12 ft 17 ft: Smallest

APPENDIX VI-6 (Continued)

BUOY PERIPHYTON BIOMASS[a] - 30 JULY 1975

GEOMETRIC MEANS FOR STATIONS WITHIN SAMPLE DEPTHS

2 FT

STATION	GEOM. MEAN	95% CONFIDENCE INTERVAL
NMPE	48.41	(25.24, 92.87)
NMPP/FITZ	71.63	(37.34, 137.41)
NMPW	34.09	(17.77, 65.38)

7 FT

STATION	GEOM. MEAN	95% CONFIDENCE INTERVAL
NMPE	12.03	(6.27, 23.08)
NMPP/FITZ	13.42	(7.00, 25.75)
NMPW	8.91	(4.64, 17.09)

12 FT

STATION	GEOM. MEAN	95% CONFIDENCE INTERVAL
NMPE	4.40	(2.29, 8.44)
NMPP/FITZ	13.65	(7.11, 26.18)
NMPW	7.61	(3.97, 14.60)

DUNNETT t TESTS (1-SIDED) FOR COMPARISONS OF CONTROLS WITH PLANT STATION

NMPE < NMPP/FITZ: t=2.68*
NMPW < NMPP/FITZ: t=1.38

17 FT

STATION	GEOM. MEAN	95% CONFIDENCE INTERVAL
NMPE	4.45	(2.32, 8.53)
NMPP/FITZ	4.02	(2.10, 7.72)
NMPW	4.24	(2.21, 8.12)

[a]Ash-free dry weight

APPENDIX VI-7

STATISTICAL ANALYSIS OF BUOY PERIPHYTON BIOMASS[a] PRODUCTION

NINE MILE POINT VICINITY - 13 AUGUST 1975

NESTED ANALYSIS OF VARIANCE
(Log Transformed)

SOURCE	DF	SS	MS	F
SAMPLE DEPTHS	3	1.6852	0.5617	33.86**
STATIONS WITHIN DEPTHS	8	0.3369		
2 FT	2	0.0366	0.0183	1.10
7 FT	2	0.0286	0.0143	0.86
12 FT	2	0.0870	0.0435	2.62
17 FT	2	0.1847	0.0924	5.57*
ERROR	12	0.1991	0.0166	
TOTAL	23	2.2212		

**Significant at $\alpha = .01$
*Significant at $\alpha = .05$

GEOMETRIC MEANS FOR SAMPLE DEPTHS

DEPTH	GEOM. MEAN	95% CONFIDENCE INTERVAL
2 ft	188.26	(144.59, 245.13)
7 ft	114.14	(87.66, 148.62)
12 ft	88.99	(68.35, 115.88)
17 ft	35.07	(26.93, 45.66)

STUDENT-NEWMAN-KEULS TEST - SAMPLE DEPTHS ($\alpha = .05$)
Largest: 2 ft 7ft 12 ft 17 ft: Smallest

GEOMETRIC MEANS FOR STATIONS WITHIN SAMPLE DEPTHS

2 FT

STATION	GEOM. MEAN	95% CONFIDENCE INTERVAL
NMPE	229.66	(145.39, 362.77)
NMPP/FITZ	195.60	(123.83, 308.98)
NMPW	148.54	(94.03, 234.64)

APPENDIX VI-7 (Continued)

BUOY PERIPHYTON BIOMASS[a] - 13 AUGUST 1975

7 FT

STATION	GEOM. MEAN	95% CONFIDENCE INTERVAL
NMPE	142.76	(90.38, 225.51)
NMPP/FITZ	103.95	(65.81, 164.20)
NMPW	100.21	(63.44, 158.30)

12 FT

STATION	GEOM. MEAN	95% CONFIDENCE INTERVAL
NMPE	73.01	(46.22, 115.34)
NMPP/FITZ	131.71	(83.38, 208.06)
NMPW	73.29	(46.40, 115.78)

17 FT

STATION	GEOM. MEAN	95% CONFIDENCE INTERVAL
NMPE	40.46	(25.61, 63.91)
NMPP/FITZ	52.72	(33.38, 83.29)
NMPW	20.23	(12.81, 31.95)

DUNNETT t TESTS (1-SIDED) FOR COMPARISONS OF CONTROLS WITH PLANT STATION

NMPE < NMPP/FITZ: t= .89
NMPW < NMPP/FITZ: t=3.23**

[a]Ash-free dry weight

APPENDIX VI-8

STATISTICAL ANALYSIS OF BUOY PERIPHYTON BIOMASS[a] PRODUCTION

NINE MILE POINT VICINITY - 29 AUGUST 1975

NESTED ANALYSIS OF VARIANCE
(Log Transformed)

SOURCE	DF	SS	MS	F
SAMPLE DEPTHS	3	1.0566	0.3522	21.61**
STATIONS WITHIN DEPTHS	8	0.2902		
2 FT	2	0.0973	0.0487	2.99
7 FT	2	0.0069	0.0034	0.21
12 FT	2	0.1465	0.0733	4.50*
17 FT	2	0.0395	0.0197	1.21
ERROR	12	0.1956	0.0163	
TOTAL	23	1.5424		

**Significant at $\alpha = .01$
*Significant at $\alpha = .05$

GEOMETRIC MEANS FOR SAMPLE DEPTHS

DEPTH	GEOM. MEAN	95% CONFIDENCE INTERVAL
2 ft	85.76	(66.02, 111.40)
7 ft	90.25	(69.48, 117.24)
12 ft	58.97	(45.40, 76.60)
17 ft	26.96	(20.76, 35.03)

STUDENT-NEWMAN-KEULS TEST - SAMPLE DEPTHS ($\alpha = .05$)
Largest: 7 ft 2ft 12 ft 17 ft: Smallest

APPENDIX VI-8 (Continued)

BUOY PERIPHYTON BIOMASS[a] - 29 AUGUST 1975

GEOMETRIC MEANS FOR STATIONS WITHIN SAMPLE DEPTHS

2 FT

STATION	GEOM. MEAN	95% CONFIDENCE INTERVAL
NMPE	69.34	(44.08, 109.09)
NMPP/FITZ	129.84	(82.54, 204.25)
NMPW	70.06	(44.54, 110.21)

DUNNETT t TESTS (1-SIDED) FOR COMPARISONS OF CONTROLS WITH PLANT STATION

NMPE < NMPP/FITZ: t=2.13*
NMPW < NMPP/FITZ: t=2.10

7 FT

STATION	GEOM. MEAN	95% CONFIDENCE INTERVAL
NMPE	100.28	(63.74, 157.74)
NMPP/FITZ	83.25	(52.92, 130.97)
NMPW	88.06	(55.98, 138.53)

12 FT

STATION	GEOM. MEAN	95% CONFIDENCE INTERVAL
NMPE	46.53	(29.59, 73.20)
NMPP/FITZ	98.05	(62.33, 154.25)
NMPW	44.94	(28.57, 70.70)

DUNNETT t TESTS (1-SIDED) FOR COMPARISONS OF CONTROLS WITH PLANT STATION

NMPE < NMPP/FITZ: t=2.54*
NMPW < NMPP/FITZ: t=2.65*

17 FT

STATION	GEOM. MEAN	95% CONFIDENCE INTERVAL
NMPE	27.22	(17.30, 42.82)
NMPP/FITZ	33.73	(21.44, 53.06)
NMPW	21.35	(13.57, 33.59)

[a] Ash-free dry weight

APPENDIX VI-9

STATISTICAL ANALYSIS OF BUOY PERIPHYTON BIOMASS[a] PRODUCTION

NINE MILE POINT VICINITY - 15 SEPTEMBER 1975

NESTED ANALYSIS OF VARIANCE
(Log Transformed)

SOURCE	DF	SS	MS	F
SAMPLE DEPTHS	2	0.3442	0.1721	4.61*
STATIONS WITHIN DEPTHS[b]	6	0.8124		
2 FT	2	0.3638	0.1819	4.87*
12 FT	2	0.2290	0.1145	3.07
17 FT	2	0.2196	0.1098	2.94
ERROR	9	0.3359	0.0373	
TOTAL	17	1.4925		

*Significant at $\alpha = .05$

GEOMETRIC MEANS FOR SAMPLE DEPTHS[b]

DEPTH	GEOM. MEAN	95% CONFIDENCE INTERVAL
2 ft	33.56	(22.25, 50.61)
12 ft	59.40	(39.39, 89.57)
17 ft	28.18	(18.69, 42.50)

STUDENT-NEWMAN-KEULS TEST - SAMPLE DEPTHS ($\alpha = .05$)
Largest: 12 ft 2 ft 17 ft: Smallest

APPENDIX VI-9 (Continued)

BUOY PERIPHYTON BIOMASS[a] - 15 SEPTEMBER 1975

GEOMETRIC MEANS FOR STATIONS WITHIN SAMPLE DEPTHS

2 FT

STATION	GEOM. MEAN	95% CONFIDENCE INTERVAL
NMPE	40.32	(19.79, 82.14)
NMPP/FITZ	60.18	(29.54, 122.60)
NMPW	15.57	(7.65, 31.73)

DUNNETT t TESTS (1-SIDED) FOR COMPARISONS OF CONTROLS WITH PLANT STATION

NMPE < NMPP/FITZ: t=0.90
NMPW < NMPP/FITZ: t=3.04*

12 FT

STATION	GEOM. MEAN	95% CONFIDENCE INTERVAL
NMPE	42.99	(21.10, 87.57)
NMPP/FITZ	112.20	(55.08, 228.57)
NMPW	43.44	(21.33, 88.50)

DUNNETT t TESTS (1-SIDED) FOR COMPARISONS OF CONTROLS WITH PLANT STATION

NMPE < NMPP/FITZ: t=2.16
NMPW < NMPP/FITZ: t=2.13

17 FT

STATION	GEOM. MEAN	95% CONFIDENCE INTERVAL
NMPE	26.90	(13.21, 54.81)
NMPP/FITZ	49.39	(24.25, 100.62)
NMPW	16.84	(8.27, 34.31)

[a]Ash-free dry weight

[b]7 ft depth excluded due to missing data points.

APPENDIX VI -10

STATISTICAL ANALYSIS OF BUOY PERIPHYTON BIOMASS[a] PRODUCTION

NINE MILE POINT VICINITY - 13 OCTOBER 1975

NESTED ANALYSIS OF VARIANCE
(Log Transformed)

SOURCE	DF	SS	MS	F
SAMPLE DEPTHS	3	0.2146	0.0715	1.95
STATIONS WITHIN DEPTHS	8	2.3566		
2 FT	2	0.5732	0.2866	7.81**
7 FT	2	0.2357	0.1179	3.21
12 FT	2	0.7706	0.3853	10.51**
17 FT	2	0.7771	0.3886	10.59**
ERROR	12	0.4401	0.0367	
TOTAL	23	3.0113		

**Significant at $\alpha = .01$

GEOMETRIC MEANS FOR SAMPLE DEPTHS

DEPTH	GEOM. MEAN	95% CONFIDENCE INTERVAL
2 ft	20.23	(13.66, 29.95)
7 ft	18.29	(12.35, 27.09)
12 ft	11.38	(7.69, 16.85)
17 ft	16.78	(11.34, 24.85)

APPENDIX VI-10 (Continued)

BUOY PERIPHYTON BIOMASS[a] - 13 OCTOBER 1975

GEOMETRIC MEANS FOR STATIONS WITHIN SAMPLE DEPTHS

2 FT

STATION	GEOM. MEAN	95% CONFIDENCE INTERVAL
NMPE	29.57	(14.98, 58.35)
NMPP/FITZ	37.50	(19.00, 74.01)
NMPW	7.46	(3.78, 14.73)

DUNNETT t TESTS (1-SIDED) FOR COMPARISONS OF CONTROLS WITH PLANT STATION

NMPE < NMPP/FITZ: t=0.54
NMPW < NMPP/FITZ: t=3.66**

7 FT

STATION	GEOM. MEAN	95% CONFIDENCE INTERVAL
NMPE	24.08	(12.20, 47.53)
NMPP/FITZ	9.62	(4.87, 18.98)
NMPW	26.43	(13.39, 52.16)

12 FT

STATION	GEOM. MEAN	95% CONFIDENCE INTERVAL
NMPE	3.57	(1.81, 7.04)
NMPP/FITZ	18.35	(9.30, 36.21)
NMPW	22.55	(11.42, 44.49)

DUNNETT t TESTS (1-SIDED) FOR COMPARISONS OF CONTROLS WITH PLANT STATION

NMPE < NMPP/FITZ: t=3.71**
NMPW < NMPP/FITZ: t=-0.47

17 FT

STATION	GEOM. MEAN	95% CONFIDENCE INTERVAL
NMPE	12.37	(6.27, 24.92)
NMPP/FITZ	7.34	(3.72, 14.48)
NMPW	52.08	(26.39, 102.78)

[a]Ash-free dry weight

APPENDIX VI-11

MEAN*AND RANGE OF AUTOTROPHIC INDEX OF BUOY PERIPHYTON

NINE MILE POINT VICINITY - 1975

DATE		STATION		
		NMPW	NMPP/FITZ	NMPE
14 MAY	NO.	4	3	4
	MEAN	155.8	127.3	494.8
	RANGE	89-279	78-174	126-1463
12 JUN	NO.	4	4	4
	MEAN	333.8	212.0	335.8
	RANGE	212-622	141-241	173-580
27 JUN	NO.	4	4	4
	MEAN	516.8	439.3	465.0
	RANGE	341-792	261-603	19-863
14 JUL	NO.	4	4	4
	MEAN	967.0	627.8	608.8
	RANGE	511-1349	400-936	311-1055
30 JUL	NO.	4	4	4
	MEAN	409.0	209.3	1055.0
	RANGE	89-1063	109-621	188-2275
13 AUG	NO.	4	4	4
	MEAN	542.8	634.3	1998.8
	RANGE	388-735	384-926	720-4111
29 AUG	NO.	4	4	4
	MEAN	359.0	336.3	380.5
	RANGE	174-562	172-547	260-563
15 SEP	NO.	3	4	4
	MEAN	696.0	503.8	804.0
	RANGE	563-901	325-761	337-1493
13 OCT	NO.	4	4	4
	MEAN	1006.5	197.8	1696.3
	RANGE	390-2495	72-368	88-5200
18 NOV	NO.	4	-	4
	MEAN	1721.3	-	590.8
	RANGE	85-5450	-	127-1314
TOTAL FOR ALL TRANSECTS	NO.	116		
	MEAN	635.4		
	RANGE	19-5450		

* Mean of sample depths
\- Sample not utilized

APPENDIX VI-12

STATISTICAL ANALYSIS OF AUTOTROPHIC INDEX OF BUOY PERIPHYTON

NINE MILE POINT VICINITY - 1975

I. 12 JUNE

TWO-WAY ANALYSIS OF VARIANCE

SOURCE	DF	SS	MS	F
STATIONS	2	40188	20094	1.651
SAMPLE DEPTHS	3	138630	46210	3.798
ERROR	6	73006	12168	
TOTAL	11	251824		

II. 27 JUNE

TWO-WAY ANALYSIS OF VARIANCE

SOURCE	DF	SS	MS	F
STATIONS	2	12463	6231	0.125
SAMPLE DEPTHS	3	281562	93854	1.886
ERROR	6	298510	49752	
TOTAL	11	592535		

III. 14 JULY

TWO-WAY ANALYSIS OF VARIANCE

SOURCE	DF	SS	MS	F
STATIONS	2	325060	162530	2.643
SAMPLE DEPTHS	3	629388	209796	3.412
ERROR	6	368899	61483	
TOTAL	11	1323347		

APPENDIX VI-13

STATISTICAL ANALYSIS OF BOTTOM PERIPHYTON BIOMASS[a] PRODUCTION

NINE MILE POINT VICINITY - 15 MAY 1975

NESTED ANALYSIS OF VARIANCE
(Log Transformed)

SOURCE	DF	SS	MS	F
DEPTH CONTOURS	2	3.1006	1.5503	40.88**
STATIONS WITHIN DEPTHS[b]	9	1.3949		
at 5 FT	3	0.1069	0.0356	0.94
at 20 FT	3	0.3344	0.1115	2.94
at 30 FT	3	0.9536	0.3179	8.38**
ERROR	12	0.4551	0.0379	
TOTAL	23	4.9506		

** Significant at α = .01

GEOMETRIC MEANS FOR DEPTH CONTOURS

DEPTH	GEOM. MEAN	95% CONFIDENCE INTERVAL
5 ft	7.13	(5.05, 10.07)
20 ft	2.23	(1.58, 3.15)
30 ft	0.95	(0.67, 1.34)

STUDENT-NEWMAN-KEULS TEST - DEPTH CONTOURS (α = .05)
Largest: 5 ft 20 ft 30 ft: Smallest

GEOMETRIC MEANS: TRANSECTS WITHIN DEPTH CONTOURS

5 FT

TRANSECT	GEOM. MEAN	95% CONFIDENCE INTERVAL
NMPE	8.30	(4.16, 16.55)
FITZ	7.43	(3.72, 14.82)
NMPP	9.16	(4.59, 18.28)
NMPW	4.58	(2.30, 9.14)

20 FT

TRANSECT	GEOM. MEAN	95% CONFIDENCE INTERVAL
NMPE	1.35	(0.68, 2.69)
FITZ	1.45	(0.72, 2.88)
NMPP	3.49	(1.75, 6.97)
NMPW	3.65	(1.83, 7.28)

30 FT

TRANSECT	GEOM. MEAN	95% CONFIDENCE INTERVAL
NMPE	0.76	(0.38, 1.51)
FITZ	1.06	(0.53, 2.12)
NMPP	0.33	(0.16, 0.66)
NMPW	3.02	(1.51, 6.03)

STUDENT-NEWMAN-KEULS TEST - TRANSECTS (α = .05)
Largest: NMPW FITZ NMPE NMPP: Smallest

[a] Ash-free dry weight
[b] The 10 ft and 40 ft depths were omitted because of missing samples.

APPENDIX VI-13

STATISTICAL ANALYSIS OF BOTTOM PERIPHYTON BIOMASS[a] PRODUCTION

NINE MILE POINT VICINITY - 13 JUNE 1975

NESTED ANALYSIS OF VARIANCE (Log Transformed)

SOURCE	DF	SS	MS	F
DEPTH CONTOURS	4	0.8960	0.2240	3.26*
STATIONS WITHIN DEPTHS	15	3.2004		
5 FT	3	1.9132	0.6377	9.27**
10 FT	3	0.2522	0.0841	1.22
20 FT	3	0.5538	0.1846	2.68
30 FT	3	0.4704	0.1568	2.28**
40 FT	3	0.0108	0.0054	0.08
ERROR	20	1.3752	0.0688	
TOTAL	39	5.4716		

* Significant at $\alpha = .05$
** Significant at $\alpha = .01$

GEOMETRIC MEANS FOR DEPTH CONTOURS

DEPTH	GEOM. MEAN	95% CONFIDENCE INTERVAL
5 ft	3.03	(1.94, 4.73)
10 ft	2.70	(1.73, 4.22)
20 ft	2.12	(1.36, 3.32)
30 ft	1.77	(1.13, 2.76)
40 ft	1.20	(0.77, 1.87)

STUDENT-NEWMAN-KEULS TEST - DEPTH CONTOURS ($\alpha = .05$)

Largest: 5 ft 10 ft 20 ft 30 ft 40 ft: Smallest

APPENDIX VI-13
(Continued)

BOTTOM PERIPHYTON BIOMASS[a] - 13 JUNE 1975

GEOMETRIC MEANS: TRANSECTS WITHIN DEPTH CONTOURS

5 FT

TRANSECT	GEOM. MEAN	95% CONFIDENCE INTERVAL
NMPE	0.61	(0.25, 1.48)
FITZ	5.67	(2.33, 13.83)
NMPP	12.13	(4.98, 29.56)
NMPW	2.02	(0.83, 4.93)

STUDENT-NEWMAN-KEULS TEST - TRANSECTS ($\alpha = .05$)
Largest: NMPP FITZ NMPW NMPE: Smallest

10 FT

TRANSECT	GEOM. MEAN	95% CONFIDENCE INTERVAL
NMPE	4.65	(1.87, 11.08)
FITZ	3.47	(1.42, 8.45)
NMPP	1.60	(0.66, 3.90)
NMPW	2.11	(0.87, 5.15)

20 FT

TRANSECT	GEOM. MEAN	95% CONFIDENCE INTERVAL
NMPE	5.70	(2.34, 13.89)
FITZ	1.99	(0.82, 4.84)
NMPP	1.60	(0.66, 3.90)
NMPW	1.12	(0.46, 2.73)

30 FT

TRANSECT	GEOM. MEAN	95% CONFIDENCE INTERVAL
NMPE	3.49	(1.43, 8.51)
FITZ	1.57	(0.64, 3.82)
NMPP	0.72	(0.30, 1.76)
NMPW	1.49	(0.61, 3.63)

40 FT

TRANSECT	GEOM. MEAN	95% CONFIDENCE INTERVAL
NMPE	1.35	(0.55, 3.29)
FITZ	1.11	(0.46, 2.70)
NMPP	1.10	(0.45, 2.68)
NMPW	1.24	(0.51, 3.03)

[a] Ash-free dry weight
[b] The 10 ft and 40 ft depths were omitted because of missing samples

APPENDIX VI-13

STATISTICAL ANALYSIS OF BOTTOM PERIPHYTON BIOMASS[a] PRODUCTION

NINE MILE POINT VICINITY - 15-16 AUGUST 1975

SOURCE	DF	SS	MS	F
ONE-WAY ANALYSIS OF VARIANCE (Log Transformed)				
SITES	12	4.0235	0.3353	
NMPE vs FITZ	1	0.1427	0.1427	5.45*
NMPE-10 vs FITZ-10	1	0.2073	0.2073	7.91*
NMPE-20 vs NMPW-20	1	0.0693	0.0693	2.65
NMPE-30 vs FITZ-30 vs NMPW-30	2	0.1188	0.0594	2.27
NMPE-40 vs NMPE-40 vs NMPW-40	2	0.0637	0.0319	1.22
NMPE-5, FITZ-5 vs NMPE-10, FITZ-10 vs NMPE-30, FITZ-30	2	0.8361	0.4191	16.00**
OTHER CONTRASTS	3	0.8361	0.2873	10.97**
ERROR	13	0.3400	0.0262	
TOTAL	25	4.3635		
ADDITIONAL CONTRASTS (NON-ORTHOGONAL)				
NMPE-30, FITZ-30, NMPW-30 vs NMPE-40, FITZ-40, NMPW-40	1	0.0733	0.0733	2.80
NMPE-30 vs FITZ-30 vs NMPP-30 vs NMPW-30	3	0.7108	0.2369	9.04**

* Significant at $\alpha = .05$
** Significant at $\alpha = .01$

GEOMETRIC MEANS FOR TRANSECTS AT 30 FT DEPTH CONTOUR

TRANSECT	GEOM. MEAN	95% CONFIDENCE INTERVAL
NMPE	11.50	(6.51, 20.32)
FITZ	8.42	(4.76, 14.87)
NMPP	1.88	(1.06, 3.32)
NMPW	5.23	(2.96, 9.24).

STUDENT-NEWMAN-KEULS TEST - TRANSECTS AT 30 FT DEPTH CONTOUR ($\alpha = .05$)
Largest: NMPE FITZ NMPW NMPP: Smallest

GEOMETRIC MEANS FOR DEPTH CONTOURS AT NMPE and FITZ TRANSECTS

DEPTH	GEOM. MEAN	95% CONFIDENCE INTERVAL
5 ft	39.99	(26.74, 59.80)
10 ft	12.86	(8.60, 19.23)
30 ft	9.84	(6.58, 14.72)

STUDENT-NEWMAN-KEULS TEST - DEPTHS AT NMPE AND FITZ TRANSECTS ($\alpha = .05$)
Largest: 5 ft 10 ft 30 ft: Smallest

[a]Ash-free dry weight

APPENDIX VI-13

STATISTICAL ANALYSIS OF BOTTOM PERIPHYTON BIOMASS[a] PRODUCTION

NINE MILE POINT VICINITY - 16-18 SEPTEMBER 1975

ONE-WAY ANALYSIS OF VARIANCE (Log Transformed)

SOURCE	DF	SS	MS	F
SITES	7	2.4708	0.3530	
NMPE-30 vs FITZ-30	1	0.0394	0.0394	0.74
FITZ-5 vs NMPP-5	1	0.0189	0.0189	0.35
FITZ-10 vs NMPP-10	1	0.5603	0.5603	10.50*
NMPE-5, FITZ-5 vs NMPP-10, FITZ-10	1	1.5691	1.5691	29.40**
OTHER CONTRASTS	3	0.2876	0.0959	1.80
ERROR	8	0.4269	0.0534	
TOTAL	15	2.8977		

* Significant at $\alpha = .05$
** Significant at $\alpha = .01$

GEOMETRIC MEANS FOR DEPTH CONTOURS AT NMPE AND FITZ TRANSECTS

DEPTH	GEOM. MEAN	95% CONFIDENCE INTERVAL
5 ft	25.48	(13.79, 47.05)
10 ft	3.31	(1.79, 6.12)

[a]Ash-free dry weight

APPENDIX VI-13

STATISTICAL ANALYSIS OF BOTTOM PERIPHYTON BIOMASS[a] PRODUCTION

NINE MILE POINT VICINITY - 15 OCTOBER 1975

NESTED ANALYSIS OF VARIANCE (Log Transformed)

SOURCE	DF	SS	MS	F
DEPTHS	2	0.2339	0.1170	3.01
STATIONS WITHIN DEPTHS[b]	9	1.1425		
5 FT	3	0.5438	0.1813	4.66*
20 FT	3	0.0392	0.0131	0.34
40 FT	3	0.5595	0.1865	4.80*
ERROR	12	0.4664	0.0389	
TOTAL	23	1.8428		

* Significant at $\alpha = .05$

GEOMETRIC MEANS FOR DEPTH CONTOURS

DEPTH	GEOM. MEAN	95% CONFIDENCE INTERVAL
5 ft	3.27	(2.30, 4.64)
20 ft	1.90	(1.34, 2.69)
40 ft	2.24	(1.58, 3.18)

GEOMETRIC MEANS FOR WITHIN DEPTH CONTOURS

5 FT

TRANSECT	GEOM. MEAN	95% CONFIDENCE INTERVAL
NMPE	5.85	(2.90, 11.77)
FITZ	1.55	(0.77, 3.12)
NMPP	2.12	(1.05, 4.26)
NMPW	5.94	(2.95, 11.96)

STUDENT-NEWMAN-KEULS TEST - TRANSECTS ($\alpha = .05$)
Largest: NMPW NMPE NMPP FITZ: Smallest

20 FT

TRANSECT	GEOM. MEAN	95% CONFIDENCE INTERVAL
NMPE	1.59	(0.79, 3.20)
FITZ	2.20	(1.10, 4.44)
NMPP	2.25	(1.12, 4.53)
NMPW	1.64	(0.82, 3.31)

40 FT

TRANSECT	GEOM. MEAN	95% CONFIDENCE INTERVAL
NMPE	5.54	(2.75, 11.15)
FITZ	2.20	(1.09, 4.43)
NMPP	2.09	(1.04, 4.21)
NMPW	0.99	(0.49, 2.00)

STUDENT-NEWMAN-KEULS TEST - TRANSECTS WITHIN ($\alpha = .05$)
Largest: NMPE FITZ NMPP NMPW: Smallest

[a] Ash-free biomass
[b] 10 and 30 ft depths omitted because of missing samples

VII. NEKTON

A. INTRODUCTION

The 1975 study represents the third year of an intensive, ongoing program of ecological investigations in the vicinity of the Nine Mile Point and James A. FitzPatrick nuclear generating stations.

Two basic conclusions from the 1974 study program (LMS, 1975) were: the presence of a thermal effluent had no measurable impact on the reproductive biology (maturation, fecundity, spawning activity) or age-growth parameters of alewife, rainbow smelt, and white perch in the Nine Mile Point vicinity; and alewives were significantly more abundant in bottom collections at the FITZ transect than at other sampling locations. The significance of the latter trend will be reexamined in 1976 as will specific details of the population dynamics of the numerically dominant species in the area.

Evaluation of the effects of power plant operation on the ichthyofauna of Lake Ontario includes the following general goals:

1. determination of spatial and temporal changes in relative abundance of dominant species;

2. correlation of changes in species population dynamics with changes in the physico-chemical environment (emphasizing plant effects);

3. establishing the significance of the above effects on the community and ecosystem as a whole.

B. MATERIALS AND METHODS

1. Field Collections

The fish sampling program in 1975 was similar to that established in 1973 and conducted in 1974: samples were collected from the shoreline to the 60 ft depth contour along four transects (NMPW, NMPP, FITZ, NMPE) (Figure VII-1) from April through December. NMPE and NMPW transects serve as controls, although the 2°C isotherm occasionally has an influence at these locations.

Three basic types of fishing gear were used: trawls, seines, and gill nets. Trawling, with a 23-ft otter trawl (2-inch stretched mesh with a 0.5-inch cod-end liner), was conducted twice monthly during day and night; 15-minute surface and bottom tows were made at each sampling location (Table VII-1).

TABLE VII-1

FISH SAMPLING PROGRAM

NINE MILE POINT VICINITY - 1975

GILL NETS		TRAWLS	SEINES	
GENERAL ECOLOGICAL	GUT ANALYSIS		TRANSECTS	ADDITIONAL SITES
		15 APR		
		24 APR		
22-27 APR		26 APR	29 APR	29 APR (6)
8-10 MAY		6 MAY	5 MAY	5 MAY (6)
21-23 MAY		20 MAY	19 MAY	
10-12 JUN		3 JUN	11 JUN	11 JUN (6)
	16-18 JUN	17 JUN		
24-26 JUN			26 JUN	26 JUN (1)
		1 JUL		
8-10 JUL		15 JUL	17 JUL	17 JUL (5)
23-27 JUL				
5- 7 AUG		5 AUG	1 AUG	
		7 AUG	15 AUG	15 AUG (5)
21-23 AUG	26 AUG	20 AUG	25 AUG	
	28 AUG			
10-12 SEP		2 SEP	8 SEP	8 SEP (4)
		3 SEP		
23-25 SEP		16 SEP	23 SEP (FITZ) (NMPE)	23 SEP (1)
			26 SEP (NMPW) (NMPP)	
7- 9 OCT		7 OCT		
22-24 OCT	27-28 OCT	23 OCT	23 OCT	
5- 7 NOV		12 NOV		
18-20 NOV		18 NOV		
		23 NOV		
		24 NOV	24 NOV	24 NOV (4)
4-6 DEC		8 DEC	13 DEC	13 DEC (2)

FISH SAMPLING STATIONS
NINE MILE POINT VICINITY - 1975

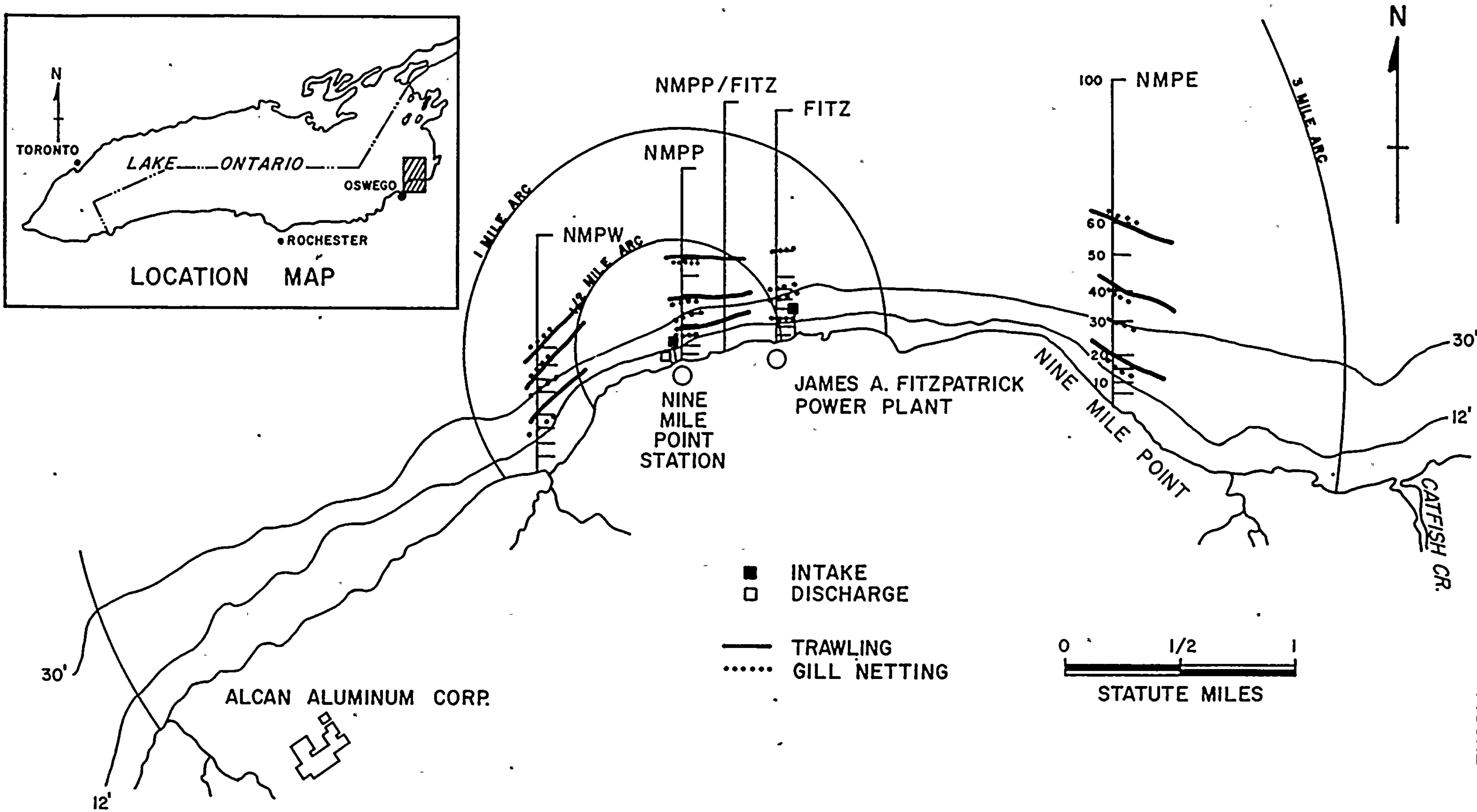


FIGURE VII-1

A 50 x 8 ft bag seine (0.5-inch stretched mesh) was utilized for collections twice monthly along the shoreline at the base of each transect. Five additional seine sites were selected on the basis of their ability to yield the largest number of fish and maximum species diversity; these sites were sampled with either a 50 x 8 ft or 200 x 8 ft bag seine (Figure VII-2).

Gill netting was carried out twice monthly for a 48-hour period with 12-hour retrievals. A 150 x 8 ft multifilament net was set at the surface and bottom along the 30, 40, and 60 ft contours and only at the surface at the 15 ft contour. In addition, gill nets were placed on the bottom at the 15 and 30 ft contours of all transects in alternate months for gut content analysis.

2. Laboratory Analyses

The following parameters were recorded for all species: weight (to the nearest 0.1 g), total length (to the nearest mm), and sex. If more than 60 individuals of a species were present in a single collection a subsampling regime was instituted: the number of organisms in a sample was estimated and the proper subsample sequence obtained from a series of random numbers table.

Data on population dynamics were obtained for the following five species: alewife (Alosa pseudoharengus), rainbow smelt (Osmerus mordax), white perch (Morone americana), yellow perch (Perca flavescens), and smallmouth bass (Micropterus dolomieui).

a. Age and Growth

The 1974 data analyses included observed and calculated age and growth studies of the five species. Details of the scale analysis program may be found in QLM (1974) and LMS (1975). Similar data were collected in 1975.

b. Coefficient of Maturity

Gonads were excised according to the techniques described in LMS (1975).

c. Fecundity

Fifteen ovaries per spawning age class were removed from alewife, rainbow smelt, yellow perch, white perch, and smallmouth bass. Fecundity analyses for the total number of eggs per gonad and the total number of spawnable eggs followed the procedure used in 1973 (QLM, 1974).

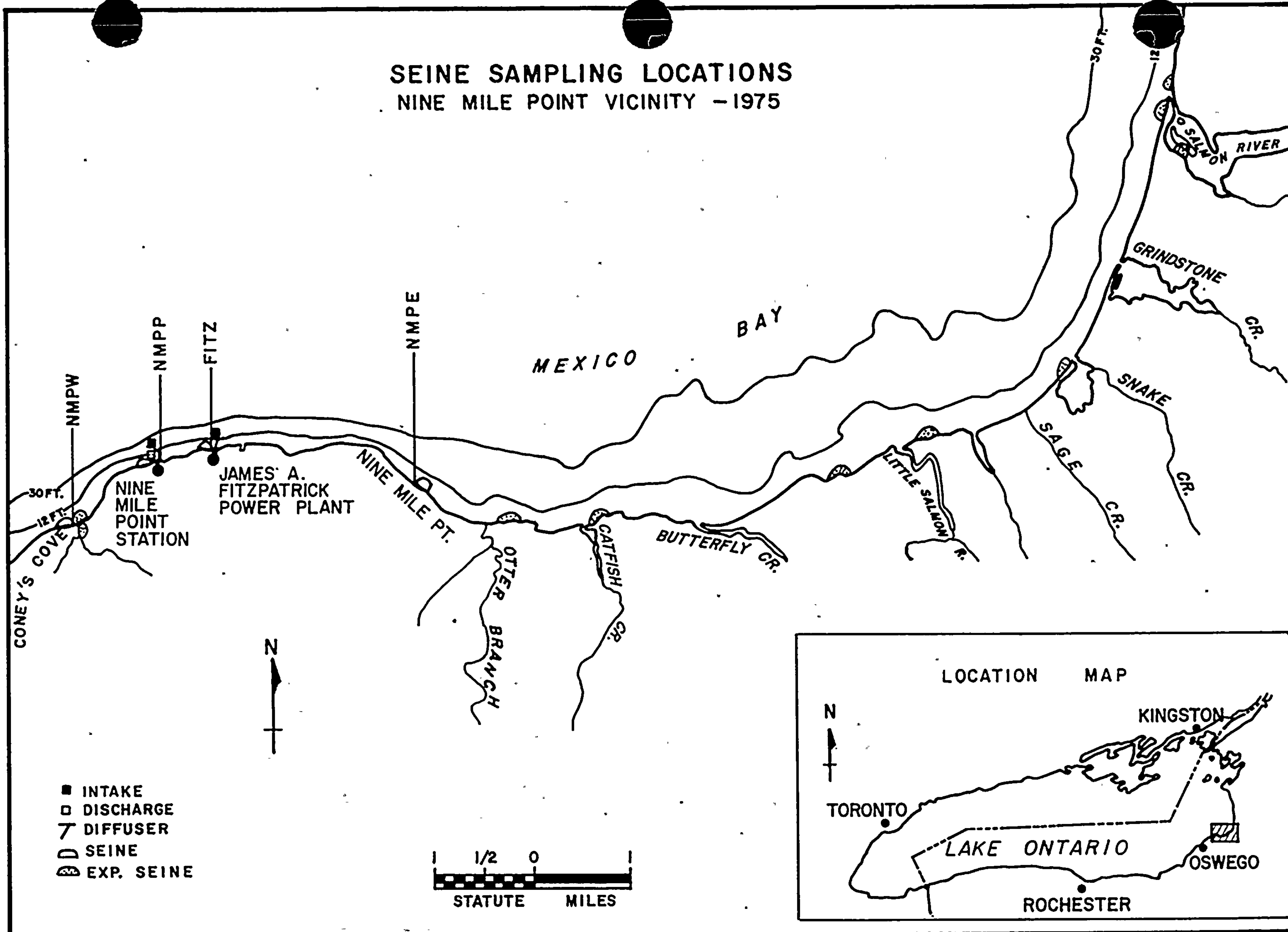

SEINE SAMPLING LOCATIONS
NINE MILE POINT VICINITY -1975
NMPW
NMPP
FITZ
NMPE
MEXICO BAY
30 FT.
12 FT.
CONEY'S COVE
NINE MILE POINT STATION
JAMES A. FITZPATRICK POWER PLANT
NINE MILE PT.
OTTER BRANCH
CATFISH CR.
BUTTERFLY CR.
LITTLE SALMON R.
SAGE CR.
SNAKE CR.
GRINDSTONE CR.
SALMON RIVER
N
INTAKE
DISCHARGE
DIFFUSER
SEINE
EXP. SEINE
1/2
0
1
STATUTE MILES
LOCATION MAP
KINGSTON
TORONTO
LAKE ONTARIO
OSWEGO
ROCHESTER

FIGURE VII-2

d. Gut Content Analysis

Smallmouth bass, yellow perch, and white perch were collected from special gill net sets (Table VII-1) for gut analysis; length, weight, sex and age were determined for each fish. All specimens were immediately preserved by intraperitoneal injection of 10% formalin; the gut was subsequently removed and stored in 10% formalin. Food items were identifed to the lowest taxon and enumerated; dry weight was obtained to the nearest 0.1 mg.

C. RESULTS AND DISCUSSION

1. Community Composition

a. Species Inventory

A total of 80,337 fishes representing 53 species* and 20 families were collected from various habitats in the Nine Mile Point vicinity (Tables VII-2 and VII-3). This total represents an 18% reduction over the number of individuals captured by all gear types in 1974. Several new species were added in the 1975 collections which were not taken previously: brook trout (Salvelinus fontinalis), splake* (S. namaycush x fontinalis), goldfish (Carassius auratus), fathead minnow (Pimephales promelas), dwarf longnose sucker (Catostomus catostomus nannonyzon), brook stickleback (Culea inconstans), and largemouth bass (Micropterus salmoides). In addition, four species collected in 1974 were not captured in 1975: common shiner (Notropis cornutus), black bullhead (Ictalurus melas), brook silverside (Labidesthes sicculus) and yellow bass (Morone mississippiensis). All of the gear used in 1975 was identical to the 1974 gear except that the experimental seines were added in 1975. Only five of the new species collected in 1975 were exclusively collected in the experimental seines (Table VII-3).

In 1975, 13 species comprised 99% of the total catch as compared to 10 species in 1974 (LMS, 1975). The alewife was again present in large numbers in 1975, consituting over 75% of the entire catch. However, the proportion of the catch represented by rainbow smelt, which was 11.71% of the 1974 total, was reduced to 2.47% of the 1975 abundance figures. This is because rainbow smelt are most abundant during April and there were nine sampling days in 1974 whereas in 1975 only three sampling days were conducted in April. The spottail shiner replaced the smelt as the second most abundant species with 11.07% of the total. In general,

*The splake is a hybrid form, not a true species.

TABLE VII-2

FISH SPECIES INVENTORY
FROM SEINE, TRAWL, AND GILL NET COLLECTIONS

NINE MILE POINT VICINITY - 1975

FAMILY	SCIENTIFIC NAME	COMMON NAME	SEINES	TRAWLS	GILL NETS
Petromyzontidae	Petromyzon marinus	Sea lamprey			X
Lepisosteidae	Lepisosteus osseus	Longnose gar			X
Amiidae	Amia calva	Bowfin	X		
Anguillidae	Anguilla rostrata	American eel		X	X
Clupeidae	Alosa pseudoharengus	Alewife	X	X	X
	Dorosoma cepedianum	Gizzard shad	X	X	X
Salmonidae	Salmo gairdneri	Rainbow trout			X
	S. trutta	Brown trout	X		X
	Salvelinus fontinalis	Brook trout			X
	S. namaycush	Lake trout			X
	S. namaycush x fontinalis	Splake trout			X
	Coregonus artedii	Cisco or Lake herring			X
	Oncornynchus tshawytscha	Chinook salmon	X		X
	O. kisutch	Coho salmon	X		X
Osmeridae	Osmerus mordax	Rainbow smelt	X	X	X
Esocidae	Esox americanus americanus	Redfin pickerel			X
	E. lucius	Northern pike	X		X
Cyprinidae	Carassius auratus	Goldfish			X
	Cyprinus carpio	Carp	X		X
	Hybognathus nuchalis	Silvery minnow	X		
	Notemigonus crysoleucas	Golden shiner	X		X
	Rhinichthys cataractae	Longnose dace	X		
	Notropis atherinoides	Emerald shiner	X	X	
	N. bifrenatus	Bridle shiner	X		
	N. hudsonius	Spottail shiner	X	X	X
	Pimephales promelas	Fathead minnow	X		
	Couesius plumbeus	Lake chub	X		X

TABLE VII-2
(Continued)

FISH SPECIES INVENTORY

FAMILY	SCIENTIFIC NAME	COMMON NAME	SEINES	TRAWLS	GILL NETS
Catostomidae	Catostomus commersoni	White sucker	X		X
	C. catostomus nannonyzon	Dwarf longnose sucker			X
	Erimyzon sucetta	Lake chubsucker	X		
	Hypentelium nigricans	Northern hogsucker	X		X
Ictaluridae	Ictalurus nebulosus	Brown bullhead	X		X
	I. punctatus	Channel catfish			X
	Noturus flavus	Stonecat			X
	N. gyrinus	Tadpole madtom	X		
Percopsidae	Percopsis omiscomaycus	Trout perch		X	X
Gadidae	Lota lota	Burbot			X
Cyprinodontidae	Fundulus diaphanus	Banded killifish	X		
Gasterosteidae	Culaea inconstans	Brook stickleback	X	X	
	Gasterosteus aculeatus	Threespine stickleback	X	X	X
Percichthyidae	Morone americana	White perch	X	X	X
	M. chrysops	White bass		X	X
Centrarchidae	Ambloplites rupestris	Rock bass	X	X	X
	Lepomis gibbosus	Pumpkinseed	X		X
	L. macrochirus	Bluegill sunfish	X		X
	Micropterus dolomieui	Smallmouth bass	X		X
	M. salmoides	Largemouth bass	X		
	Pomoxis nigromaculatus	Black crappie	X		X
Percidae	Etheostoma nigrum	Johnny darter	X	X	
	Perca flavescens	Yellow perch	X		X
	Percina caprodes	Logperch	X		
	Stizostedion vitreum vitreum	Walleye			X
Sciaenidae	Aplodinotus grunniens	Freshwater drum			X
Cottidae	Cottus bairdii	Mottled sculpin		X	X

TABLE VII-3

TOTAL FISH ABUNDANCE COLLECTED BY SEINES, TRAWLS AND GILL NETS

NINE MILE POINT VICINITY - 1975

COMMON NAME	SEINE		SURFACE TRAWL		BOTTOM TRAWL		TOTAL TRAWLS		SURFACE GILL NETS		BOTTOM GILL NETS		TOTAL GILL NETS		TOTAL *	
	NO. (TRANSECTS)	NO. (EXPER.)	NO.	CATCH/ EFFORT	NO.	CATCH/ EFFORT	NO.	CATCH/ EFFORT	NO.	CATCH/ EFFORT	NO.	CATCH/ EFFORT	NO.	CATCH/ EFFORT	NO.	%
Alewife	7055	13021	1981	6.47	1684	5.50	3665	5.99	35462	43.73	14146	12.63	49608	25.69	60328	75.09
Spottail shiner	51	3719			43	0.14	43	0.07	147	0.18	8652	7.73	8799	4.56	8893	11.07
White perch	15	249	3	0.01	38	0.12	41	0.07	115	0.14	3715	3.32	3830	1.98	3886	4.84
Rainbow smelt	1	3	58	0.19	175	0.57	233	0.38	860	1.06	893	0.80	1753	0.91	1987	2.47
Yellow perch	22	323							13	0.02	1005	0.90	1018	0.53	1040	1.29
Gizzard shad	8	98	3	0.01	18	0.06	21	0.03	398	0.49	451	0.40	849	0.44	878	1.09
Trout-perch			1	<0.01	21	0.07	22	0.04	2	<0.01	657	0.59	659	0.34	681	0.85
White sucker	7	324							9	0.01	636	0.57	645	0.33	652	0.81
Smallmouth bass	4	45							15	0.02	413	0.37	428	0.22	432	0.54
Rock bass		3			2	0.01	2	<0.01	5	0.01	289	0.26	294	0.15	296	0.37
Brown trout		1							116	0.14	66	0.06	182	0.09	182	0.23
Threespine stickleback	65	13	46	0.15	48	0.16	94	0.15			1	<0.01	1	<0.01	160	0.20
Lake chub	2								6	0.01	125	0.11	131	0.07	133	0.17
White bass			1	<0.01			1	<0.01	23	0.03	73	0.07	96	0.05	97	0.12
Brown bullhead		21							3	<0.01	89	0.08	92	0.05	92	0.11
Johnny darter		53			88	0.29	88	0.14							88	0.11
Mottled sculpin					68	0.22	68	0.11			10	0.01	10	0.01	78	0.10
Stonecat									1	<0.01	77	0.07	78	0.04	78	0.10
Emerald shiner	53.	780	9	0.03	5	0.02	14	0.02							67	0.08
Coho salmon	12	4							31	0.04	14	0.01	45	0.02	57	0.07
Golden shiner	39	103									1	<0.01	1	<0.01	40	0.05
Chinook salmon	7	20							11	<0.01	11	0.01	22	0.01	29	0.04
Lake trout									1	<0.01	27	0.02	28	0.01	28	0.03
Rainbow trout									14	0.02	4	<0.01	18	0.01	18	0.02
Pumpkinseed	2	57							1	<0.01	14	0.01	15	0.01	17	0.02
Carp	4	5							2	<0.01	8	0.01	10	0.01	14	0.02
American eel			3	0.01	5	0.02	8	0.01			5	<0.01	5	<0.01	13	0.02
Largemouth bass	12	19													12	0.01
Freshwater drum									1	<0.01	10	0.01	11	0.01	11	0.01
Burbot									1	<0.01	8	0.01	9	<0.01	9	0.01
Longnose dace	6	1													6	0.01
Longnose gar									4	<0.01	1	<0.01	5	<0.01	5	0.01

TABLE VII- 3 (Continued)

TOTAL FISH ABUNDANCE COLLECTED BY SEINES, TRAWLS, AND GILL NETS

NINE MILE POINT VICINITY - 1975

COMMON NAME	SEINE		SURFACE TRAWL		BOTTOM TRAWL		TOTAL TRAWLS		SURFACE GILL NETS		BOTTOM GILL NETS		TOTAL GILL NETS		TOTAL *	
	NO. (TRANSECTS)	NO. (EXPER.)	NO.	CATCH/ EFFORT	NO.	CATCH/ EFFORT	NO.	CATCH/ EFFORT	NO.	CATCH/ EFFORT	NO.	CATCH/ EFFORT	NO.	CATCH/ EFFORT	NO.	%
Brook stickleback	3				1	<0.01	1	<0.01							4	<0.01
Sea lamprey									1	<0.01	3	<0.01	4	<0.01	4	<0.01
Northern pike		4									3	<0.01	3	<0.01	3	<0.01
Walleye											3	<0.01	3	<0.01	3	<0.01
Black crappie	1	22									1	<0.01	1	<0.01	2	<0.01
Northern hogsucker		3									2	<0.01	2	<0.01	2	<0.01
Splake trout									1	<0.01	1	<0.01	2	<0.01	2	<0.01
Banded killifish	1														1	<0.01
Bluegill sunfish		1									1	<0.01	1	<0.01	1	<0.01
Bowfin	1														1	<0.01
Brook trout									1	<0.01			1	<0.01	1	<0.01
Channel catfish											1	<0.01	1	<0.01	1	<0.01
Cisco or Lake herring											1	<0.01	1	<0.01	1	<0.01
Fathead minnow	1														1	<0.01
Goldfish											1	<0.01	1	<0.01	1	<0.01
Longnose sucker											1	<0.01	1	<0.01	1	<0.01
Redfin pickerel											1	<0.01	1	<0.01	1	<0.01
Silvery minnow		10													-	-
Tadpole madtom		4													-	-
Logperch		3													-	-
Bridle shiner		1													-	-
Lake chubsucker		1													-	-

* Experimental seines not included in total number and percent
- Not applicable

the abundance values and percent composition of other dominant species (those making up, 99% of the total) do not exhibit any marked changes.

A rough approximation of the success of the salmonid stocking program in Lake Ontario is reflected in the catch per unit effort of these species at Nine Mile Point. Both the brown trout and the coho salmon were caught in greater numbers in 1975. The brown trout was represented by 182 specimens in 1975 as compared to 75 in 1974, an increase of more than 100%, and the coho salmon by 57 individuals in 1975 and by 13 in 1974, a 400% increase. Lake trout catch increased from four in 1974 to 28 in 1975. Other salmonids were captured in similar low numbers over the last two years. Largemouth bass showed a marked increase since none were collected in 1973 or 1974 and comparing the same gear, 12 were collected in 1975.

b. Seine Collections

The 1975 program included several experimental sampling sites (Figure VII-2) added to clarify the role of Mexico Bay as a contributor (e.g., spawning ground, nursery area) to the fish communities in the vicinity of Nine Mile Point.

In addition to the standard 50-ft seines, 200-ft nets were employed at the new localities. The ability of the larger nets to "fish" more efficiently is reflected in the collection of five species not previously captured at Nine Mile Point (Table VII-3). These included the silvery minnow (Hybognathus nuchalis), bridle shiner (Notropis bifrenatus), lake chubsucker (Erimyzon sucetta), tadpole madtom (Notrurus gyrinus), and logperch (Percina caprodes). Although habitat differences at the experimental sites are probably an important factor in this occurrence, a similar effort with a 50-ft seine yielded only a single new species (which was also captured with the 200-ft seine). This comparison is further complicated by the fact that the two seine types were used at different times of the year and with unequal monthly efforts. Therefore, the results due to habitat differences cannot be differentiated from sampling gear efficiency at this time.

The results of bimonthly seining surveys at the four plant transects are shown in Figure VII-3. Most individuals were collected during the summer months, May through September. Numbers of individuals were evenly distributed among the four transects in June; however, during May, July, August and September, considerably more specimens were captured at NMPE. Alewives predominated in the summer catches, comprising 99.0, 99.5, and 98.0%, respectively, of the total for those three months. The number of species collected remained

MONTHLY ABUNDANCE AND NUMBER OF
SPECIES IN 50-FT SEINE COLLECTIONS AT FOUR TRANSECTS

NINE MILE POINT VICINITY-1975

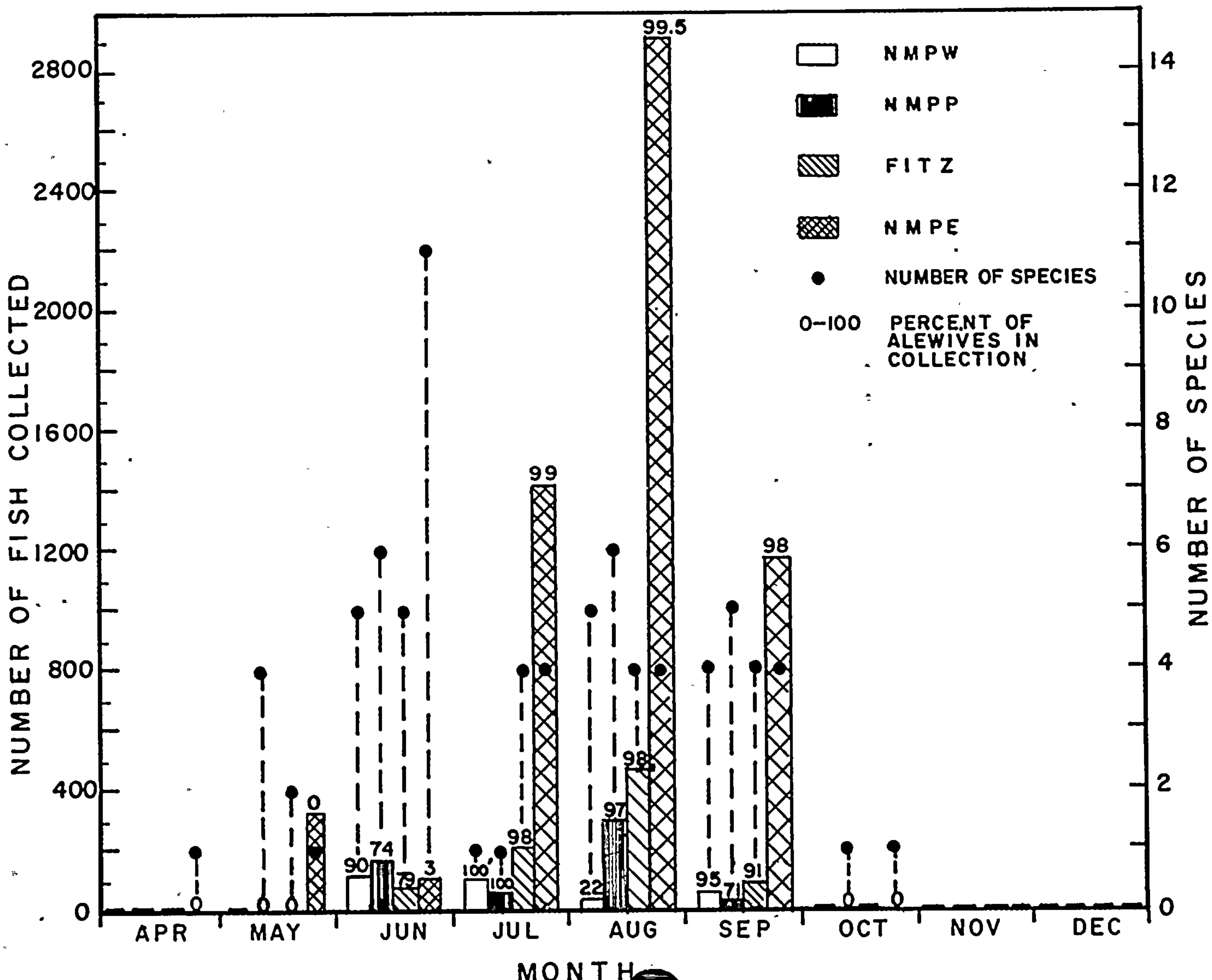


FIGURE VII-3

fairly constant throughout the summer, except at NMPE in June and NMPW and NMPP in July. Eleven species were collected at NMPE in June at a time when the percentage of alewives was at a minimum (3%).

Of the 35 species captured in 1975 seine collections, the lake chubsucker (Erimyzon sucetta) and the silvery minnow (Hybognathus nuchalis) were collected for the first time at the experimental seining sites. The former species is considered rare in Canada (Scott and Crossman, 1973), and the latter has a unique distribution, being found only in eastern Lake Ontario and in none of the other Great Lakes.

c. Trawls

Trawl collections did not yield adequate numbers of fishes for precise statistical evaluation by station. Analyses will, therefore, be limited to qualitative comparisons of the transects by month. Trawls produced the smallest number of species (14) of the three gear types. The data plotted in Figure VII-4 indicate that the distribution of species was fairly uniform among transects with none of the transects dominating in species richness. In addition, the number of species remained fairly constant throughout the year with the exception of December.

Abundance values, on the other hand, were greatest at the power plant transect (NMPP/FITZ) for each month, except during September and November. Similar results were noted in the 1973 collections; however, this relationship was less clear in 1974 when abundance values were greater at NMPW during April and May. Maximum abundance of fishes collected by trawls in 1975 was observed in August, when alewives predominated in the catches. Interestingly, both spring and fall trawl collections contained considerable numbers of alewives (Figure VII-4), unlike the corresponding seasonal catches with seines. The lack of alewives inshore in these months reflects the absence of juveniles which are normally abundant in the near-shore area during the summer months.

d. Gill Net Collections

The Shannon-Weaver diversity measure ($\bar{H}'$) commonly used in ecological studies provides valuable information for assessing community structure and environmental quality. However, a knowledge of community composition is also essential to these studies since diversity as measured by $\bar{H}'$ indicates little about the particular species makeup of a sample.

MONTHLY ABUNDANCE AND NUMBER OF SPECIES IN TRAWL COLLECTIONS AT THREE TRANSECTS

NINE MILE POINT VICINITY–1975

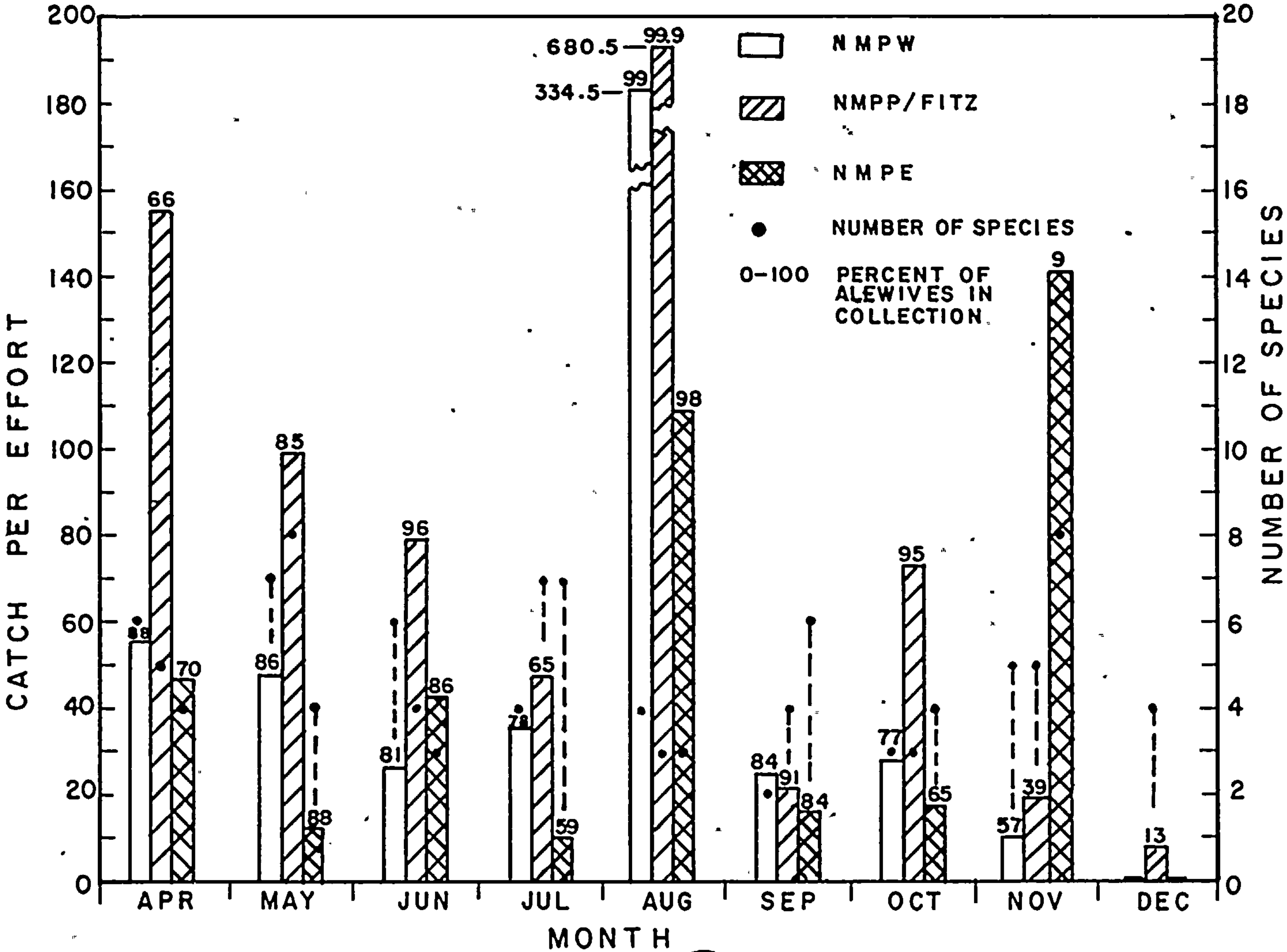


FIGURE VII-4

In this section community analysis is described by including species composition in several different analyses and investigating in greater detail those community parameters correlated with observed values of diversity.

As a basis for comparison with 1974, only bottom gill net data will be utilized. However, the relative composition of surface and bottom collections was different during 1975, when a greater percent of alewives were collected from the surface gill nets. Nearly 17,000 fewer alewives were caught at the bottom than at the surface; this species constituted 95.2% of the total surface catch in 1975 as opposed to 79.5% in 1974. In addition, the fact that bottom collections contained 13 more species than surface catches, and that 99% of the total surface catch was composed of only four species, compared to 13 species in bottom collections, indicate that the surface catch is largely dominated by the presence of the alewife. As a consequence, additional information may be gained in terms of community analysis if these data are omitted from consideration. These factors, however, must not preclude the importance of the upper water column collections in community analysis or in considerations dealing with the thermal plume which tends to disperse on the surface.

Diversity values for bottom gill net catches are shown in Figure VII-5. The fairly distinct west-to-east gradient of increasing diversity, which occurred in 1974, was not a prevalent trend in 1975. Instead, both the average diversity and the range were similar for all transects. When the 1974 data for diversity of species other than alewives were plotted (Figure VII-6), the west-to-east trend was eliminated, indicating increasing dominance, D*, of this species in a westerly direction in 1974. A similar result is obtained by calculating the average dominance contributed by alewives to each transect.

Tables VII-4 and VII-5 indicate that, in general, alewife abundance (expressed as dominance, D) was lower in 1975 than in 1974. The corresponding averages for the months of maximum alewife abundance over the two years are always greater in 1974. This is further reflected in the approximately 14,000 fewer alewives captured in 1975. The alewife dominated 1975 monthly bottom gill net collections less frequently than during 1974 (Table VII-4). For example, in a number of fall collections, the most abundant species was the white perch or spottail shiner. The

*This is a quantitative measure of dominance defined by $D = Ni/N$, where Ni is the number of individuals of the most abudant species and N is the total number of individuals.

TABLE VII-4

SPECIES DIVERSITY (H'), DOMINANCE (D), AND EVENNESS (J') OF BOTTOM GILL NET COLLECTIONS[a]

NINE MILE POINT VICINITY - 1975

ALL SPECIES

TRANSECT	INDEX	MONTH								
		APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
NMPW	H'	1.744	1.713	2.251	1.580	2.689	2.399	2.106	2.213	1.041
	D	0.656[c]	0.657[c]	0.474[c]	0.711[c]	0.329[c]	0.406[c]	0.565[c]	0.464[c]	0.821[c]
	J'	0.436	0.438	0.608	0.379	0.688	0.614	0.539	0.553	0.403
	N[b]	31.6	21.9	25.3	34.2	16.6	20.1	20.3	32.9	12.8
	S	16	15	13	18	15	15	15	16	6
NMPP	H'	1.913	2.739	2.412	2.163	2.974	2.520	2.275	2.059	1.420
	D	0.666[c]	0.287[c]	0.456[c]	0.608[c]	0.289[d]	0.342[e]	0.402[c]	0.429[e]	0.486[e]
	J'	0.490	0.685	0.590	0.500	0.700	0.604	0.536	0.504	0.411
	N	35.0	14.7	14.7	21.9	11.5	17.5	28.1	28.8	28.3
	S	15	16	17	20	19	18	19	17	11
FITZ	H'	1.792	2.654	2.071	1.479	2.616	2.550	2.321	1.486	1.432
	D	0.445[c]	0.336[c]	0.505[c]	0.703[c]	0.283[c]	0.392[e]	0.407[e]	0.647[e]	0.572[e]
	J'	0.565	0.679	0.560	0.342	0.669	0.638	0.594	0.390	0.452
	N	59.4	11.1	35.6	63.6	22.2	27.7	29.4	45.8	31.2
	S	9	15	13	20	15	16	15	14	9
NMPE	H'	1.950	2.622	1.505	2.161	2.236	2.190	2.207	1.941	1.132
	D	0.526[c]	0.325[c]	0.672[c]	0.447[c]	0.334[f]	0.423[d]	0.520[e]	0.536[e]	0.809[c]
	J'	0.544	0.642	0.453	0.553	0.587	0.611	0.580	0.510	0.357
	N	29.6	13.0	49.9	21.4	38.4	35.2	26.1	37.5	16.1
	S	12	17	10	15	14	12	14	14	9

[a]Day and night collections
[b]N = total catch per 12-hr
[c]Alewife most abundant species
[d]White perch most abundant species
Spottail shiner most abundant species
Alewife and white perch most abundant species (

TABLE VII-5

DOMINANCE[a] (D) IN BOTTOM GILL NETS

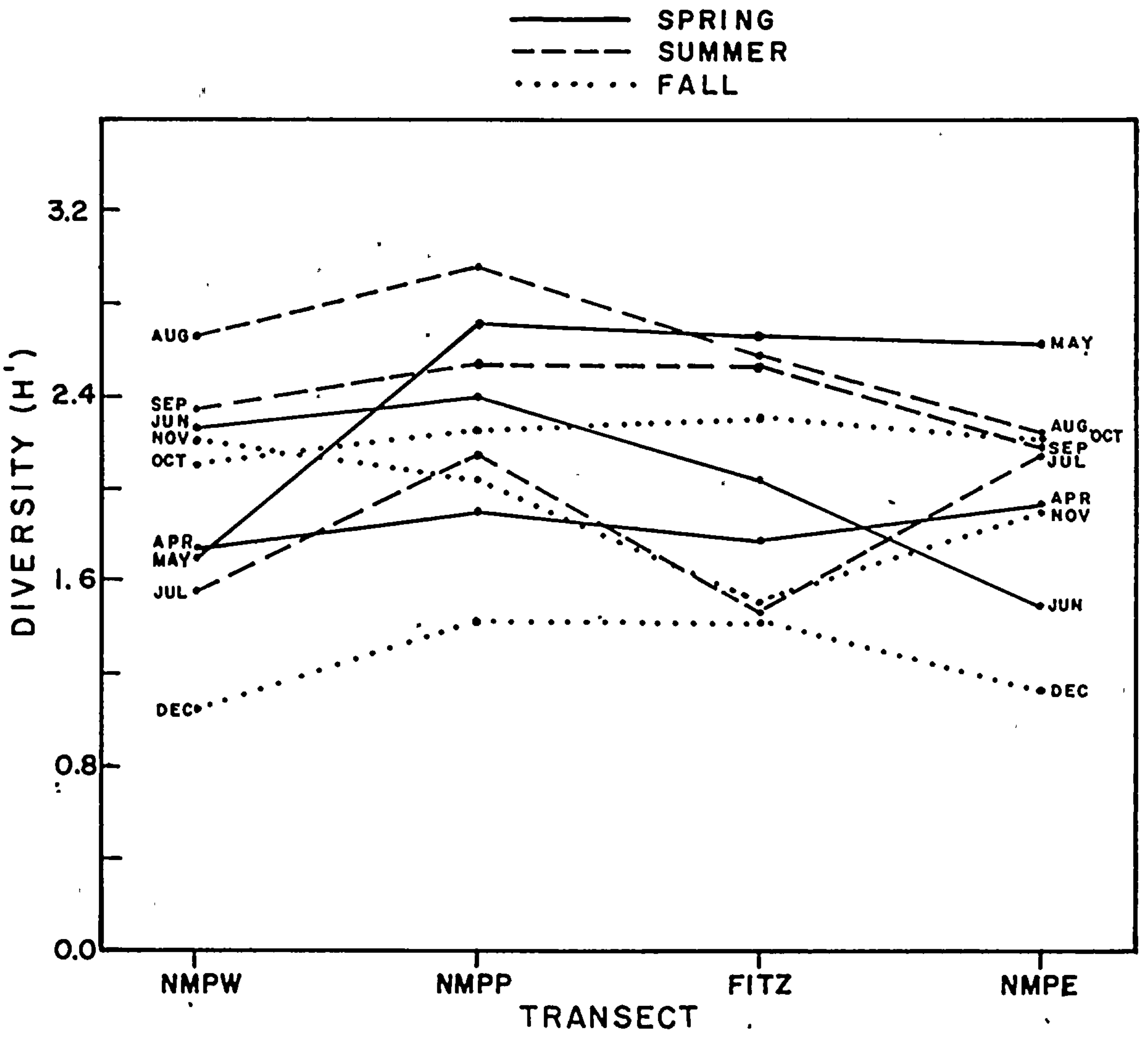
NINE MILE POINT VICINITY - 1974

DATE	TRANSECT			
	NMPE	NMPW	NMPP	FITZ
APR	0.665	0.739	0.651	0.637
MAY	0.534	0.534	0.444	0.649
JUN	0.524	0.762	0.860	0.637
JUL	0.828	0.847	0.916	0.814
AUG	0.450	0.556	0.648	0.452
SEP	0.461[b]	0.526	0.541	0.376
OCT	0.432[c]	0.334	0.198	0.541[c]
NOV	0.316	0.500[c]	0.341	0.631[c]
DEC	0.316[c]	0.444	0.375	0.673[c]
MEAN	0.638	0.720	0.717	0.684

[a] Alewife unless noted
[b] White perch
[c] Spottail shiner

SPECIES DIVERSITY (H')* BY MONTH OF FISH COLLECTED IN BOTTOM GILL NETS

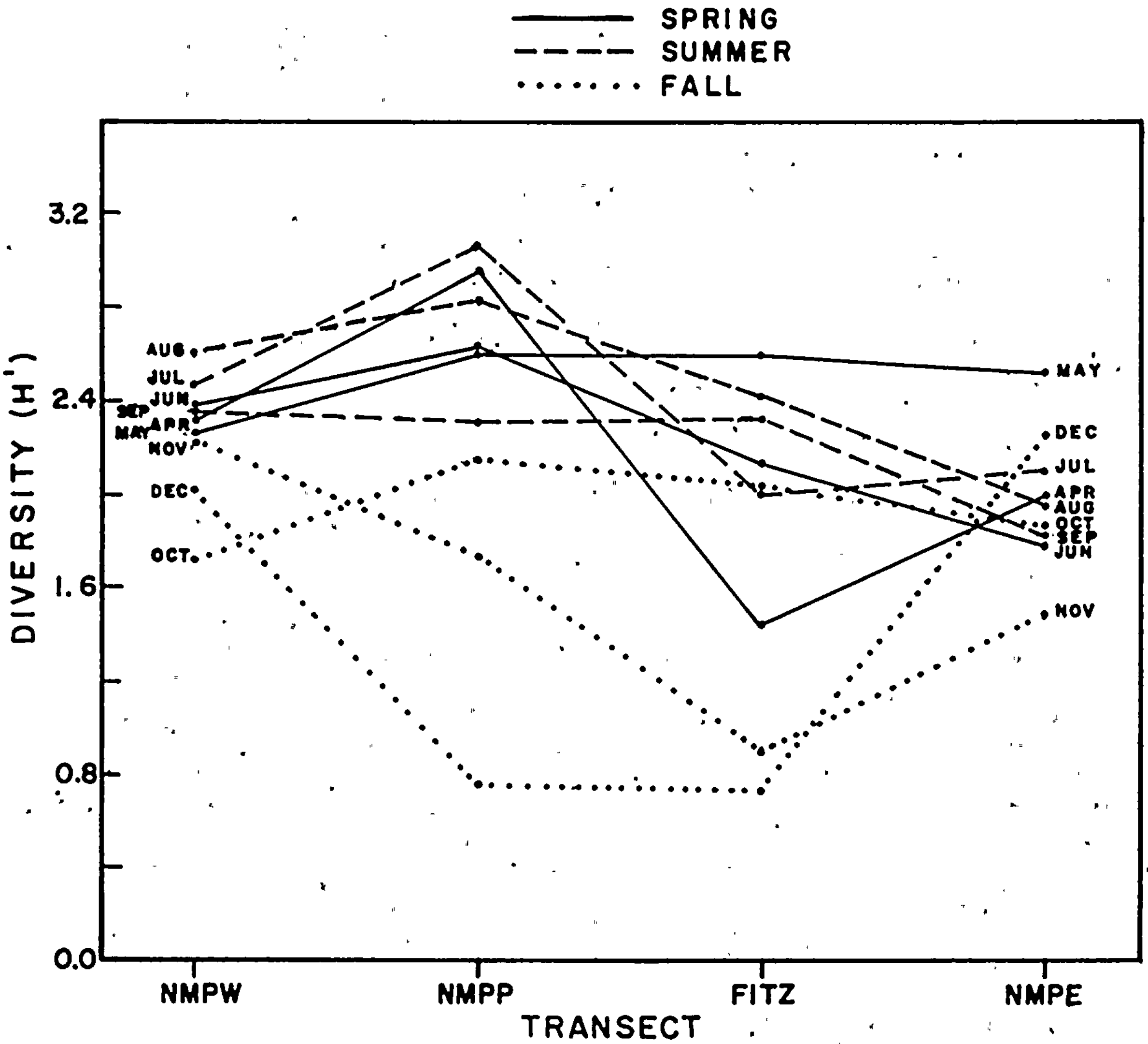
NINE MILE POINT-1975



*Value based on catch/effort in day and night collections; mean of depth contours; Shannon-Weaver diversity

SPECIES DIVERSITY (H')* BY MONTH OF FISH COLLECTED IN BOTTOM GILL NETS, EXCLUDING ALEWIVES

NINE MILE POINT–1975



*Value based on catch/effort in day and night collections; mean of depth contours; Shannon-Weaver diversity

same decreasing trend in alewife abundance has also been observed for larvae and juveniles collected in impingment and entrainment studies (see Chapters VIII and IX of this report).

Diversity values are shown on a monthly basis for 1975 in Figure VII-7. Diversity peaks occurred in the spring (May) and late summer (August). No clear trends are apparent among the transects. The low diversity values observed in June and July result from the higher dominance (D) (Table VII-4) exhibited by alewives during these months, particularly at NMPP, FITZ, and NMPE; this is also reflected in the corresponding evenness (J') measures for the same localities.

It is necessary to approach community analysis with additional methodology in order to obtain a more comprehensive picture of power plant impact. To achieve this goal, monthly station data were subjected to a clustering regime using the group-average strategy (Clifford and Stephenson, 1975). The results are presented in Appendix VII-1 to VII-3. This procedure is effective in grouping similar entities based on some predefined basis for association, in this instance, percent similarity. Three basic conclusions may be drawn from these data:

a) The transects do not differ greatly among themselves, i.e., there is no evidence that power plant operation is influencing the composition of the fish community (sampled by bottom gill nets) at the experimental transects.

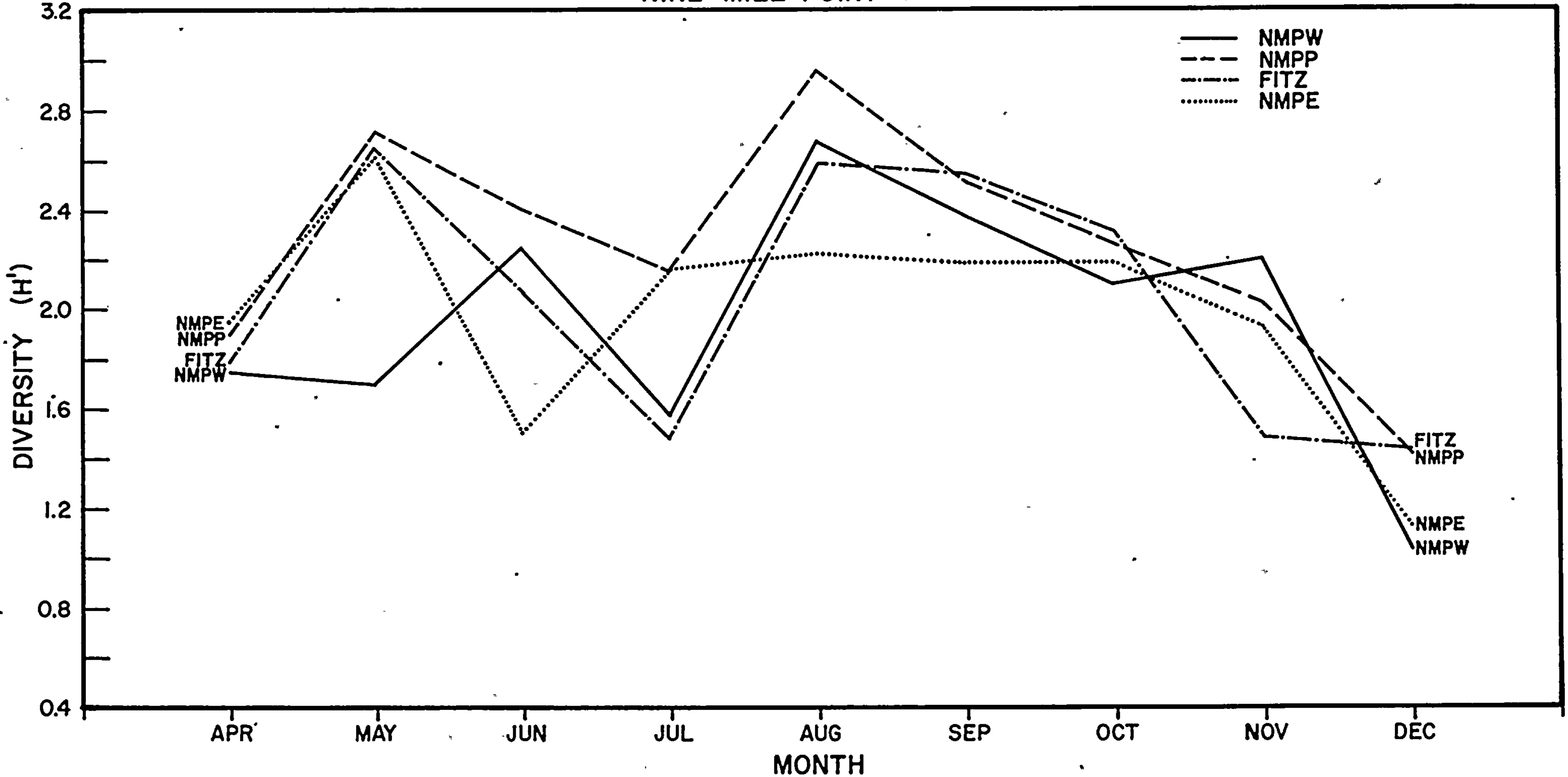
b) There is an apparent difference between inshore and offshore stations, in this case defined as the 15 and 30 ft and 40 and 60 ft depth contours, respectively.

c) "Outlying" stations, i.e., those distinctly different from most others, were few and not consistently observed.

Examination of the individual dendrograms indicates that, except for September, when all NMPE stations were in the same general cluster, and October, when the plant (NMPP) stations were uniform (within a distinct cluster), the stations at a given transect are generally not as similar to each other as are those stations at corresponding depth contours between transects. The latter conclusion is supported most clearly by data collected during the months of June, August, November and December, and to a lesser degree by those from other months. This trend of differences between depths suggests that further analysis be conducted to distinguish community differences associated with depth contours in the Nine Mile Point vicinity.

SPECIES DIVERSITY (H')* BY TRANSECT OF FISH COLLECTED IN BOTTOM GILL NETS

NINE MILE POINT-1975



*Value based of catch/effort in day and night collections; mean of depth contours; Shannon-Weaver diversity

FIGURE VII-7

No single station or group of stations was consistently different at all times. The strongly outlying associations include FITZ-60 ft in May; NMPE-30 ft in July, NMPP-60 ft in August, and NMPW-60 ft in December. Actually, the level of least association between most within-month clusters is very high, except those during December (where the single specimen of yellow perch caught at NMPW-60 ft resulted in a very low association of this station with all others). This is an indication of the overall similarity within the fish community in this area. This observation further supports the contention that plant operation is not having a major effect upon fish communities at Nine Mile Point.

The community inventory for bottom gill net collections is shown seasonally in Figure VII-8. The cycle for each transect is displayed separately to provide a basis for comparison. The data were arranged in this way, in order to permit investigation of any detectable differences in migratory behavior, behavior associated with the plume (e.g., avoidance during the summer and attraction during the winter), or any other seasonally induced patterns. A number of important observations are evident in these data. The catch per unit effort was greatest at the FITZ transect during the summer and fall months. This was due primarily to the large number of alewives captured in the gill nets during the summer and to spottail shiners captured in the fall (Appendix Table VII-4). Fewer fishes were collected at NMPP, especially during the spring and summer, primarily because alewives and spottail shiners were absent from the catches. The increased catch in the fall was due to an influx of these two species into the area (Appendix VII-4).

Fairly uniform catches were made at both NMPW and NMPE during the year. An important difference is noted, however, in the percent similarity recorded between seasons at the two transects. At NMPW, for example , the community composition was similar between spring and summer (86.7%) and although the catch per effort remained the same in the fall, the community composition changed, becoming more dissimilar (68.7%). The data in Appendix VII-4 indicate that, concurrent with the decrease in the catch/unit effort for alewives, there was an increase in the number of spottail shiners and rainbow smelt captured, resulting in the observed change in percent similarity.

In contrast, the similarity values remained low between seasons at NMPE and the lowest number of species was consistently recorded at NMPE for each season (Appendix VII-4).

SEASONAL COMMUNITY INVENTORY FOR BOTTOM GILL NET COLLECTIONS

NINE MILE POINT VICINITY—1975

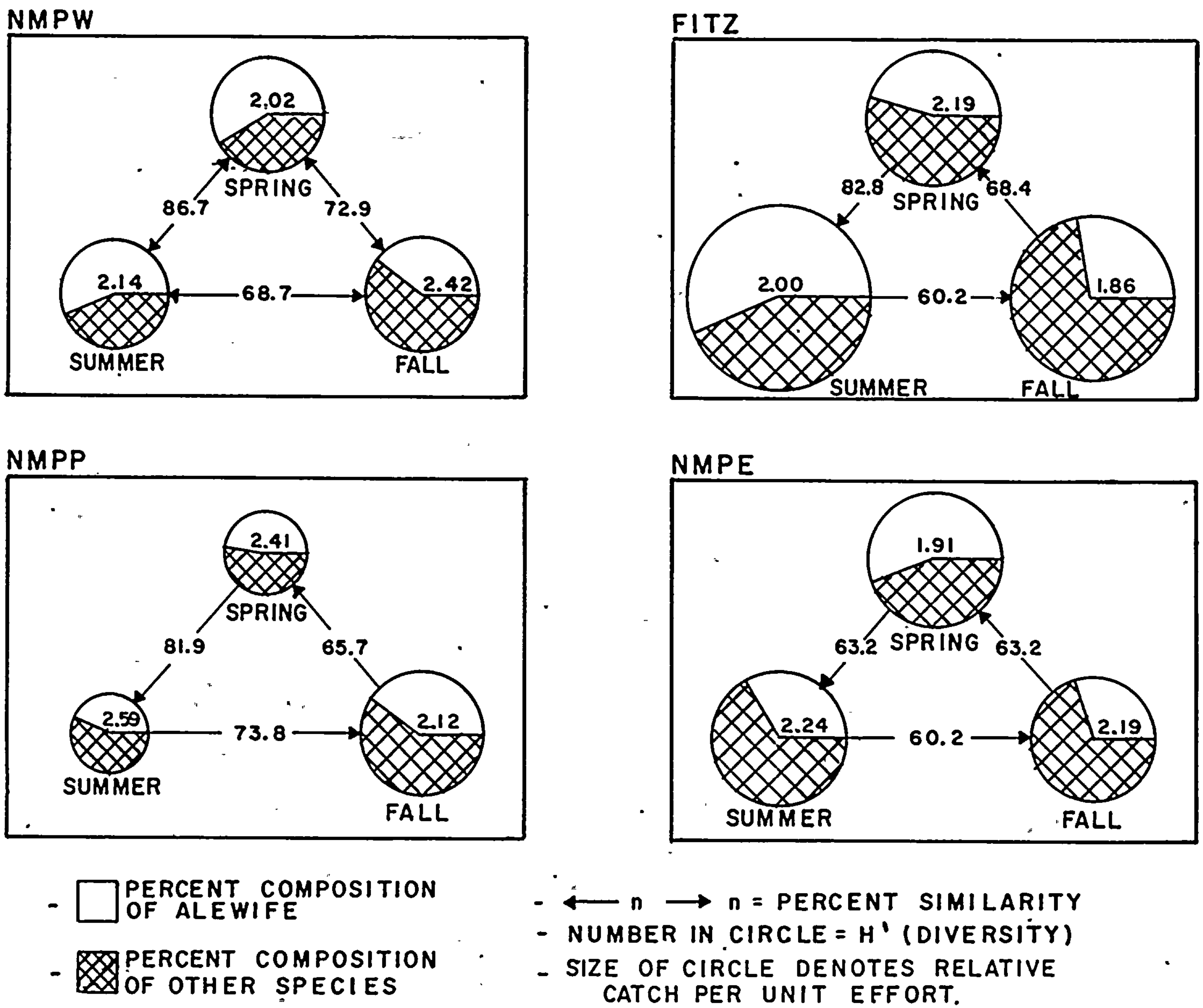


FIGURE VII-8

Diversity values did not reveal any consistent patterns between the transects, nor among seasons. In other studies, such as those of Haedrich (1975) and Haedrich and Haedrich (1974), diversity values were lowered during the season of maximum recruitment of young-of-the-year of the dominant species. Trawls were used in these studies, however, and that gear type is more efficient in capturing smaller individuals than are gill nets.

On the basis of diversity values alone, that is, their magnitude and their change between seasons, it must be concluded that no effects of thermal effluents on that portion of the fish community sampled with bottom gill nets is observed in the vicinity of Nine Mile Point. Diversity has not changed radically, either spatially (between transects) or temporally (seasonally) in this area. When the lack of difference in community composition between transects, expressed by percent similarity, is added to these observations, this hypothesis is strengthened further.

2. <u>Feeding Habits of Selected Taxa</u>

Feeding patterns of fishes are affected by many variables, including those which govern the general availability of food items. Some species are adventitious, usually consuming the most abundant prey, while others are specialized, selecting from a restricted range of foods. In either case, the "well being" of a population of a given species, expressed as standing crop, can be directly related to standing crop of the food supply.

When the diet of a given species is investigated, several important parameters should be considered, including size-related changes in diet, structural (morphological) and behavioral differences, and voracity. Food studies may also be conducted so as to analyze differences in spatial terms, i.e., among transects, or temporally, by studying changes with season (trends over time). Diurnal differences in feeding patterns may also be important considerations in the context of reducing interspecific competition.

All of these factors are potentially affected by the presence of power plants. Increased water temperatures in the vicinity of the plant might, for example, result in increased feeding rates (voracity). High temperatures may influence the community composition of prey organisms (Coutant, 1970), thereby reducing or even eliminating the food of certain predators, or may result in increased productivity ultimately increasing numbers of heat-tolerant herbivores and other associated orgnisms. The latter could be beneficial in making more food available for higher trophic levels.

The white perch, smallmouth bass, and yellow perch were collected in 1975 for gut content analysis. To permit quantitative comparisons of feeding habits, an attempt was made to obtain at least 25 specimens of each available size class (Table VII-6). Several of the length intervals designated in the 1974 study (LMS, 1975) have been consolidated in reporting the 1975 data to provide better resolution of any size-related changes in diet.

- White Perch

Sufficient numbers of white perch were collected over two length intervals, 161-210 mm (III) and >210 mm to permit a quantitative comparison of size-related food selection and differences among transects.

The contents of 87 white perch guts from the two size classes are listed in Table VII-7 and shown in Figures VII-9 and VII-10. For individuals in the length interval 161-210 mm, 29 guts contained food; however, five of these held only oligochaete remains which could not be quantified according to numbers or weight. These were considered only insofar as they contributed to absolute numbers of guts containing food (percent occurrence) but were eliminated from the quantitative portion of the study. Similar results were observed in the >210 mm size class; five guts contained only oligochaete setae and were treated in the same manner. Eight guts (21.6%) in the 161-210 mm and 20 (25.6%) in the >210 mm size classes were empty.

Because of the large differential in size of prey items, it was decided to use biomass (mg dry weight) as the parameter which describes white perch feeding habits most effectively; conclusions, therefore, are based on this dimension. The major food items (by weight) consumed by the larger specimens included fishes (Pisces), which contributed 77.4% of the total, and the amphipod Gammarus, which constituted nearly 16.%. Dipterans, especially Cricotopus and trichopterans, principally Athripsodes, represented <1.0% and 4.9%, respectively. Isopods of the genus Asellus totalled <1.0% of the gut contents of larger fish.

Food preference, defined by the number of guts in which a particular item was present*, is also an important parameter which food studies must consider. Thus, while Asellus composed nearly 1% of the total food consumed, it had been eaten by only one fish in the sample. Forage fish, on the other hand, were consumed

*Preference is distinguished here from active selection (hunting); in the latter, the occurrence of a particular prey organism in the gut may be higher than its occurrence in the environment.

VII-6

SIZE CLASSES* OF SELECTED FISH SPECIES FOR GUT CONTENT ANALYSIS

NINE MILE POINT VICINITY - 1975

SPECIES	SIZE CLASS INTERVAL			
Smallmouth bass	0-50	51-120	121-300	>301
White perch	0-80	81-160	161-210	>211
Yellow perch	0-80	81-160	>161	

*Length in mm.

TABLE VII-7

GUT CONTENTS OF WHITE PERCH

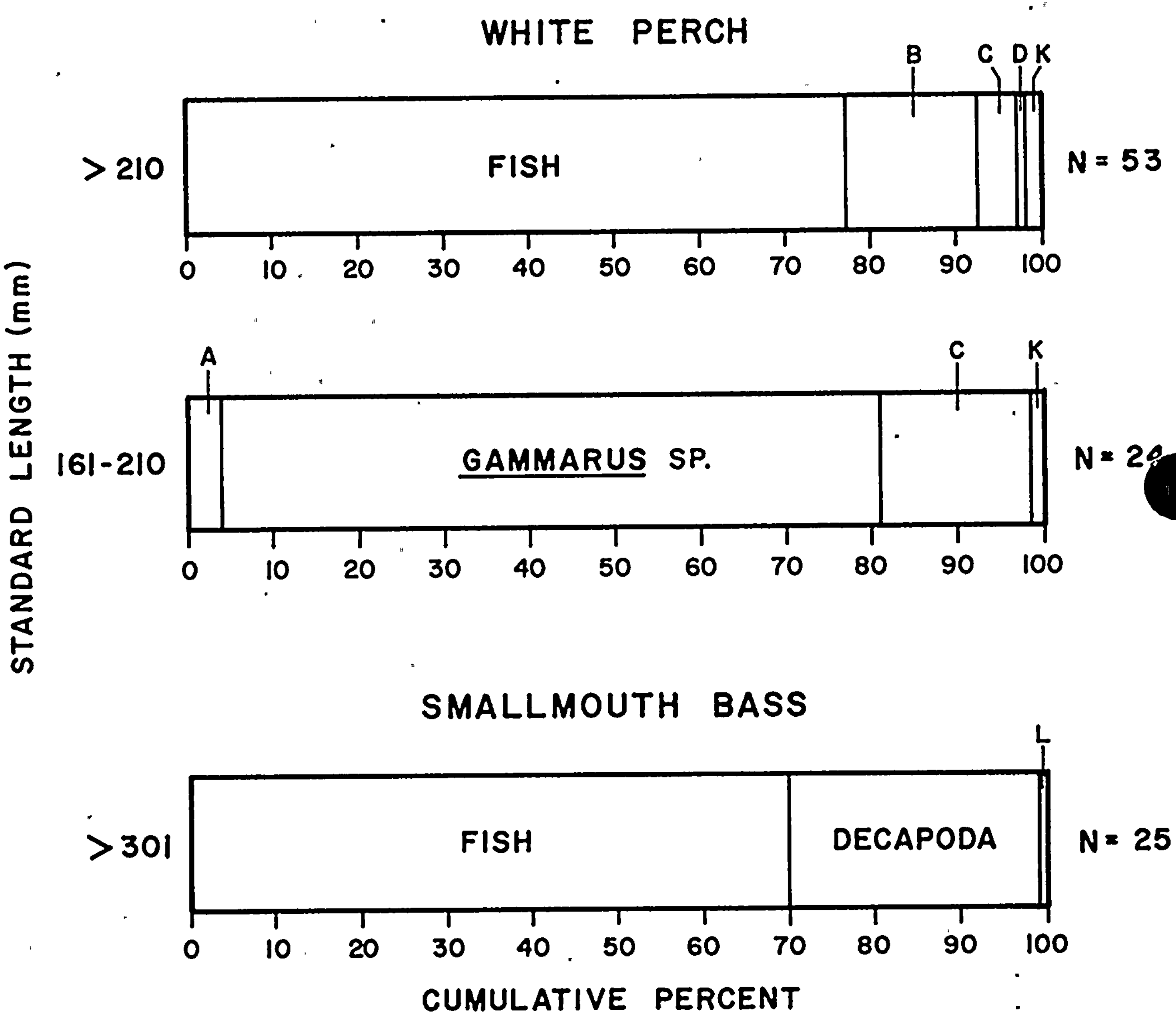
NINE MILE POINT VICINITY - 1975

TAXON	LENGTH INTERVAL: 161-210 mm; n=24[a]; EMPTY 8						LENGTH INTERVAL: >210 mm; n=53[a]; EMPTY 20					
	NO. PRESENT	DRY WT. (mg)	OCCURRENCE NO. OF GUTS[b]	OCCURRENCE % OF GUTS[b]	% OF TOTAL[c] ORGANISMS CONSUMED	% OF TOTAL[c] DRY WT.	NO. PRESENT	DRY WT. (mg)	OCCURRENCE NO. OF GUTS[b]	OCCURRENCE % OF GUTS[b]	% OF TOTAL[c] ORGANISMS CONSUMED	% OF TOTAL[c] DRY WT.
PISCES												
Etheostoma nigrum	1	69.6	1	3.4	<0.1	2.5	9	1501.0	6	10.3	0.3	9.6
Alosa pseudoharengus							7	5511.8	7	12.1	0.2	35.2
Notropis hudsonius							2	977.0	2	3.4	0.1	6.2
Cottus bairdi							1	729.9	1	1.7	<0.1	4.7
Osmerus mordax							1	NA	1	1.7	<0.1	NA
UID Pisces	2	59.2	2	6.9	0.1	2.1	24	3408.5	19	32.8	0.8	21.8
TOTAL (Pisces)	3	128.8	3	10.3	0.1	4.6	44	12128.2	32	55.2	1.5	77.4
MOLLUSCA												
Pulmonata												
Gyraulus sp.							5	42.8	1	1.7	0.2	0.3
Ferissia tarda	1	0.7	1	3.4	<0.1	<0.1	3	2.3	1	1.7	0.1	<0.1
Pelecypoda												
Sphaeriidae							14	47.5	1	1.7	0.5	0.3
ARTHROPODA												
Crustacea												
Ostracoda	11	8.3	1	3.4	0.5	0.3	83	62.4	3	5.2	2.8	0.4
Malacostraca												
Isopoda												
Asellus sp.							19	81.7	1	1.7	0.6	0.5
Amphipoda												
Gammarus sp.	2024	2153.7	19	65.5	86.3	76.9	2281	2426.8	19	32.8	77.6	15.5
Decapoda												
Cambarus sp.							2	61.6	2	3.4	0.1	0.4
Insecta												
Diptera												
Chironomidae												
Tanytarsini	6	7.1	2	6.9	0.3	0.3	24	8.6	3	5.2	0.8	0.1
Orthocladiinae												
Cricotopus sp.	64	19.5	5	17.2	2.7	0.7	85	26.5	11	19.0	2.9	0.2
C. sp. pupae	5	3.5	4	13.8	0.2	0.1	16	5.6	5	8.6	0.5	<0.1
Other Diptera							6	5.8	1	1.7	0.2	<0.1
Other Chironomidae	16	13.4	7	24.1	0.7	0.5	4	0.9	3	5.2	0.1	<0.1
Trichoptera												
Athripsodes sp.	215	465.9	12	41.4	9.2	16.6	353	765.2	15	25.9	12.0	4.9
TOTAL (All Prey Items)	2345	2800.9	–	–	100.0	100.0	2939	15665.9	–	–	100.0	100.1
Miscellaneous												
UID eggs	93	18.6	1	3.4	–	–	323	94.4	2	3.4	–	–
Gammarus eggs	15	2.9	1	3.4	–	–						
Nematoda							1	<0.1	1	1.7	–	–
Oligochaeta (setae)	–	–	14	48.3	–	–	–	–	13	22.4	–	–
Cyclops sp.	3	<0.1	1	3.5	–	–						

[a]Does not include 5 additional guts containing only oligochaeta setae
[b]Includes those guts containing oligochaeta setae
[c]Total of all prey items
NA = Not available
– = Not applicable

PERCENT COMPOSITION OF GUT CONTENT BIOMASS
NINE MILE POINT VICINITY–1975

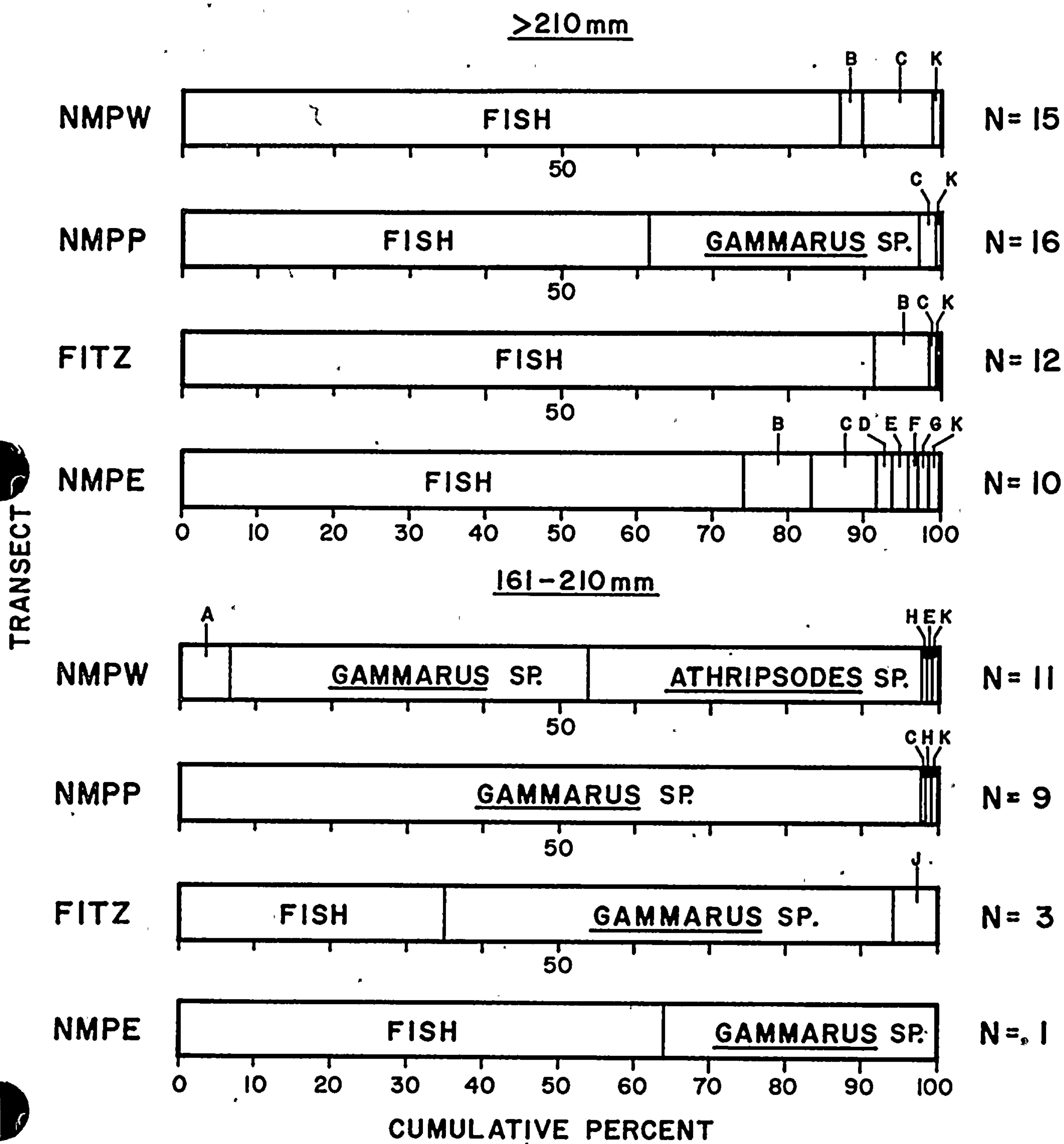
A FISH
B *GAMMARUS* SP.
C *ATHRIPSODES* SP.
D *ASELLUS* SP.
K OTHER
L INSECTA



PERCENT COMPOSITION OF GUT CONTENT BIOMASS IN WHITE PERCH BY TRANSECT

NINE MILE POINT VICINITY-1975

A FISH
B *GAMMARUS* SP.
C *ATHRIPSODES* SP.
D *ASELLUS* SP.
E OSTRACODA
F SPHAERIIDAE
G *GYRAULUS* SP.
H *CRICOTOPUS* SP.
J CHIRONOMIDS
K OTHERS



by 63.8% of large white perch and Gammarus and Athripsodes by 32.8% and 25.9%, respectively. Although they composed a relatively small percentage of the total biomass, Cricotopus was eaten by 27.6% of larger white perch and, similarly oligochaetes occurred in the guts of 22.4% of the total.

Smaller white perch did not differ in the qualitative composition of their diet; however, the proportions of the various items differed substantially. While this group consumed larger quantities of Gammarus, totalling 76.9%, fish constituted 4.6% in this small sample. The trichopteran Athripsodes was also eaten in greater quantities, constituting 16.6% of the total, and Cricotopus whose weight contributed little to total biomass (<1%) was taken in considerable numbers. Preferred food items include Gammarus (65.5%), Athripsodes (41.4%), Cricotopus (31.0%), and fish (10.4%).

Fish and invertebrate eggs were occasionally eaten; however, they may be far more important as a seasonal food item corresponding, of course, to peak spawning periods of dominant species. LMS (1974), for example, found that eggs constituted a large proportion (by percent occurrence) of the spring diet of white perch.

Of the several species of fish consumed by large white perch (Table VII-7), the Johnny darter Etheostoma nigrum and the alewife Alosa pseudoharengus were preferred food items. Unfortunately, 1/3 of all fish eaten could not be identified, preventing further conclusions concerning preference.

Only five specimens in the next smaller size interval, 81-160 mm, were captured. Of these, three individuals contained food, and a fourth only oligochaete remains. This small sample precludes any further analysis beyond general description of the food items. Two chironomids were observed, Chironomus and Cryptochironomus, totalling 12% (by weight). Gammarus formed the bulk (88%) of the items present, occurring in two of the three specimens containing food.

An attempt was made to categorize gut contents by transect (Figure VII-10 and Appendix VII-5), and the results of this statistical analysis are shown in Appendix VII-6. The single classification ANOVA indicates that significant differences ($p < 0.05$) occur among transects for the number of Gammarus consumed. A least significant difference procedure ($\alpha = 0.05$) applied to these data demonstrated that more Gammarus were eaten at NMPP transect (Appendix VII-6) than at the other transects; however, a more conservative test, the Bonferroni t-test, which requires that $p < 0.017$ for each test to maintain the overall "family" of $\alpha = 0.05$, results in a significant difference only between NMPP and NMPW transects (Appendix VII-6).

Insufficient samples were collected over seasons either to permit trends (if any) to be established, or to support any conclusions concerning diurnal feeding patterns. The data were also analyzed by sex; however, as expected no differences were noted.

Previous studies, particularly those of Cooper (1941) and Richards (1960) indicated a changing composition in white perch diet with increasing body length, from aquatic insects and crustaceans to fishes. Other investigations of freshwater populations corroborate these conclusions, although absolute composition may differ slightly. In general, feeding habits of white perch are governed largely by seasonal abundance of prey organisms and this species may, therefore, be considered a non-selective (generalized) feeder.

- Smallmouth Bass

Food selection patterns of adult smallmouth bass differed from those of adult white perch (Figure VII-9). The items consumed by 26 individuals in the size class >301 mm (IV) are listed in Table VII-8. Rather than ingesting a wide variety of organisms from their habitat, larger bass apparently limit their feeding to essentially two types of prey: small fishes and decapod crustaceans. Twenty-five specimens taken during a single effort is a small sample; however, previous studies support these results. Scott and Crossman (1973), for example, describe the diet of smallmouth bass as including crayfish, fish, insects, and occasional frogs. Fish are believed to be the most important component. In this study they constituted 70% (by weight) of the gut contents.

Fish were present in the guts of 73% of the bass, whereas comparable values for crayfish were 30% by weight and 30% by occurrence. Two genera of crayfish were taken, Orconectes and Cambarus, with the former occurring in greater numbers (Table VII-8).

- Yellow Perch

Ten yellow perch were collected during the food studies program. Of these, nine were captured during one gill net operation conducted on 16-18 June, while a single specimen, whose gut was empty, was taken in a gill net in October. Of the total number of fishes collected, 40% contained no food while the remainder had consumed one or more items. Organisms identified in the guts are listed in Table VII-9.

This small sample does not permit fully definitive statements to be made concerning yellow perch diet; however, the general selection of food organisms agrees closely with observations made in other studies. Scott and Crossman (1973), for example,

TABLE VII-8

GUT CONTENTS[a] OF SMALLMOUTH BASS

NINE MILE POINT VICINITY - 1975

LENGTH INTERVAL: >301 mm

TAXON	NO. PRESENT	DRY WT. (mg)	OCCURRENCE NO. OF GUTS[b]	OCCURRENCE % OF GUTS[b]	% OF TOTAL ORGANISMS CONSUMED	% OF TOTAL DRY WT.
PISCES						
Etheostoma nigrum	3	432.8	2	7.6	8.1	2.6
Alosa pseudoharengus	2	4068.3	2	7.6	5.4	24.2
Notropis hudsonius	1	101.8	1	3.8	2.7	0.6
Notropis sp.	2	109.9	2	7.6	5.4	0.7
Cottus bairdi	1	43.0	1	3.8	2.7	0.3
Osmerus mordax	3	4562.2	3	11.5	8.1	27.1
UID Pisces	11	2455.3	9	34.6	29.7	14.6
TOTAL (Pisces)	23	11773.3	19	73.1	62.2	70.0
ARTHROPODA						
Crustacea						
Decapoda						
Orconectes sp.	6	3063.5	5	19.2	16.2	18.2
O. propinguus	1	87.0	1	3.8	2.7	0.5
Cambarus sp.	1	1027.7	1	3.8	2.7	6.1
UID crayfish	3	802.2	2	7.7	8.1	4.8
TOTAL (Decapoda)	11	4980.1	7	26.9	29.7	29.6
Insecta						
Orthoptera	3	63.0	1	3.8	8.1	0.4
TOTAL (All Prey Items)	37	16816.4	-	-	100.0	100.0
Miscellaneous						
Oligochaete (setae)	-	-	1	3.8	-	-

[a]N = 25; does not include 1 additional gut containing oligochaete setae; empty = 10

[b]Includes those guts containing oligochaete setae; N = 26

- Not applicable

TABLE VII-9

GUT CONTENTS OF YELLOW PERCH

NINE MILE POINT VICINITY - 1975

LENGTH INTERVAL: >161 mm; n=6; EMPTY 4

TAXON	NO. PRESENT	DRY WT. (mg)	OCCURRENCE NO. OF GUTS	OCCURRENCE % OF GUTS	% OF TOTAL* ORGANISMS CONSUMED	% OF TOTAL* DRY WT.
PISCES						
Etheostoma nigrum	1	85.4	1	16.7	5.8	13.3
Alosa pseudoharengus						
Notropis hudsonius						
Cottus bairdi	5	252.9	2	33.3	29.4	39.4
Osmerus mordax						
UID Pisces	1	7.5	1	16.7	5.8	1.2
TOTAL (Pisces)	7	345.8	3	50.0	41.2	53.9
MOLLUSCA						
Pulmonata						
Gyraulus sp.						
Ferissia tarda						
Pelecypoda						
Sphaeriidae						
ARTHROPODA						
Crustacea						
Ostracoda						
Malacostraca						
Isopoda						
Asellus sp.						
Amphipoda						
Gammarus sp.	6	6.4	1	16.7	35.3	1.0
Decapoda						
Orconectes propinquus	2	289.2	1	16.7	11.8	45.1
Insecta						
Diptera						
Chironomidae						
Tanytarsini						
Orthocladiinae						
Cricotopus sp.						
C. sp. pupae						
Other Diptera						
Other Chironomidae	2	NA	2	33.3	11.8	NA
Trichoptera						
Athripsodes sp.						
TOTAL (All Prey Items)	17	641.4	-	-	99.9	99.9
Miscellaneous						
UID eggs	109	48.4	1	10.0	-	-
Gammarus eggs						
Nematoda						
Oligochaeta (setae)	-	-	2	20.0	-	-
Cyclops sp.						

*Total of all prey items
NA = Not available
- = Not applicable

state that large yellow perch (>150 mm) feed primarily on decapod crustaceans, small fishes and Odonata nymphs. In addition, they frequently ingest the eggs of a wide variety of fishes. Perch from Nine Mile Point consumed mostly fishes (54% by weight) and decapods (45% by weight). The only insects present in perch guts represented the order Diptera, and consisted exclusively of the family Chironomidae. Benthic collections made in 1973 and 1974 in the vicinity of Nine Mile Point did not yield any members of the order Odonata, a fact which explains the absence of this group in the perch's diet.

Other species found in this sample (Table VII-9) include the amphipod <u>Gammarus</u>, which comprised <1% by weight of the total biomass, and several oligochaetes which had been eaten by two fish. A mass of eggs (probably those of sculpin) were recorded from one individual, confirming the observation of Scott and Crossman (1973). Adult sculpin were also preferred food items, since they accounted for 83% of the total number of fish consumed.

Thus, with the exception of Odonata, perch in the vicinity of Nine Mile Point seem to reflect the characteristic diet of the species. The absence of Odonata is probably readily compensated for by the abundance of other insect groups, notably the chironomids.

D. CONCLUSIONS

1. A total of 80,337 fishes representing 53 species were collected in the vicinity of Nine Mile Point.

2. The alewife, rainbow smelt, and spottail shiner were the most abundant fish collected in 1975 as they were in 1974.

3. Six species were collected in 1974 which were not collected previously.

4. Increased numbers of salmon were collected which may be viewed as a measure of the success of the salmonid stocking program.

5. Diversity and clustering analysis did not reveal significant changes which could be attributed to power plant generation.

6. Gut content analyses on yellow perch, white perch, and smallmouth bass revealed that these species are consuming prey items in a manner similar to that reported in the literature.

REFERENCES CITED

Clifford, H.T. and W. Stephenson. 1975. An introduction to numerical classification. Academic Press, New York. 229 p.

Cooper, G.P. 1941. A. biological survey of lakes and ponds of the Androscoggin and Kennebec River drainage systems in Maine. Maine Dept. Inland Fish. Game, Fish Surv. Rept. 4:238p.

Coutant, C.C. 1970. Biological aspects of thermal pollution. I. Entrainment and discharge canal effects. CRC Crit. Rev. Environ. Cont. 1(3): 341-381.

Haedrich, R.L. 1975. Diversity and overlaps as measures of envirnmental quality. Water Res. 9:945-952.

Haedrich, R.L. and S.O. Haedrich. 1974. A seasonal survey of the fishes in the Mystic River, a pollution estuary in downtown Boston, Massachusetts. Estuarine Coast. Mar. Res. 2:59-73.

Lawler, Matusky and Skelly Engineers. 1974. 1973 Oswego Steam Station aquatic ecology studies. Prepared for Niagara Mohawk Power Corp.

Lawler, Matusky and Skelly Engineers. 1975. 1974 Nine Mile Point aquatic ecology studies. Prepared for Niagara Mohawk Power Corp. and Power Authority of the State of New York.

Quirk, Lawler and Matusky Engineers. 1974. 1973 Nine Mile Point aquatic ecology studies - Nine Mile Point Generating Station. Prepared for Niagara Mohawk Power Corp.

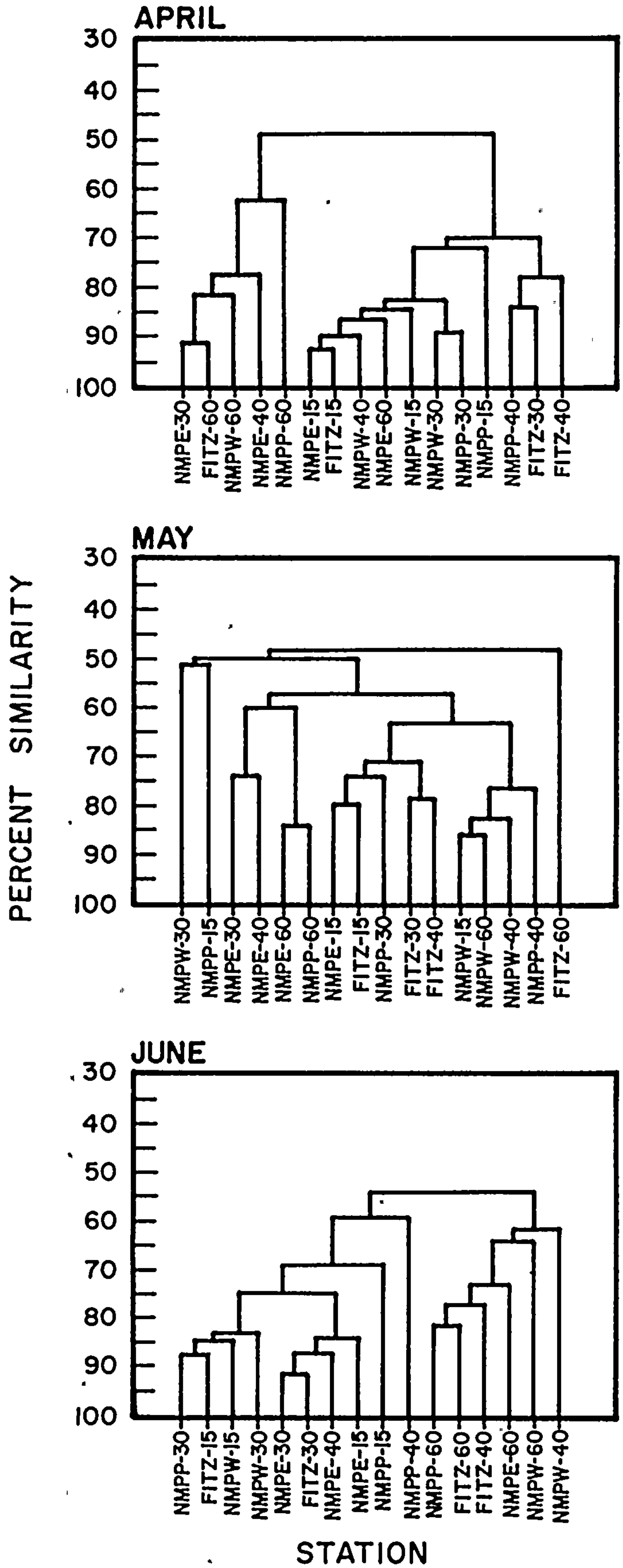
Richards, W.J. 1960. The life history, habits and ecology of the white perch, Roccus americanus (Gmelin), in Cross Lake, New York. M.S. Thesis, Syracuse Univ. 113p. [unpublished].

Scott, W.B. and E.J. Crossman. 1973. Freshwater fishes of Canada. Fish. Res. Bd. Canada Bull. 184: 966p.

APPENDIX VII-1

SIMILARITY OF BOTTOM GILL NET COLLECTIONS

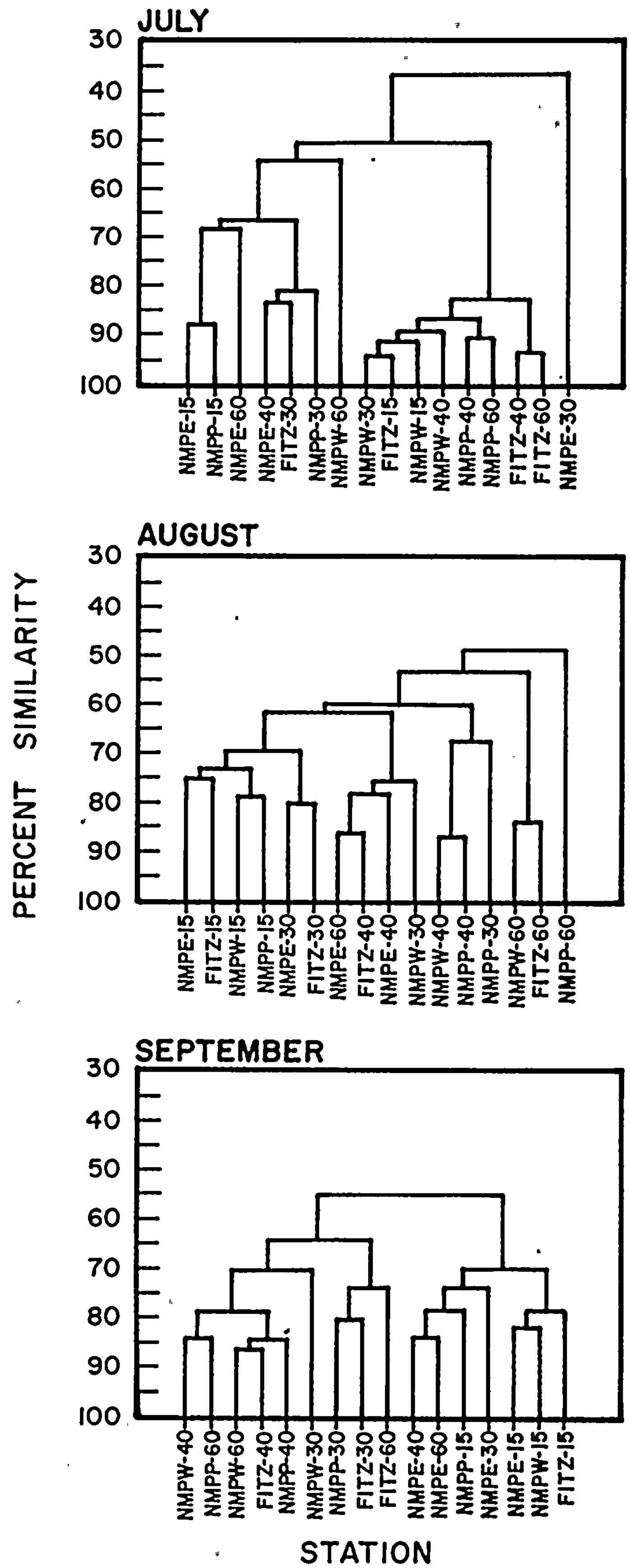
NINE MILE POINT VICINITY - 1975



APPENDIX VII-2

SIMILARITY OF BOTTOM GILL NET COLLECTIONS

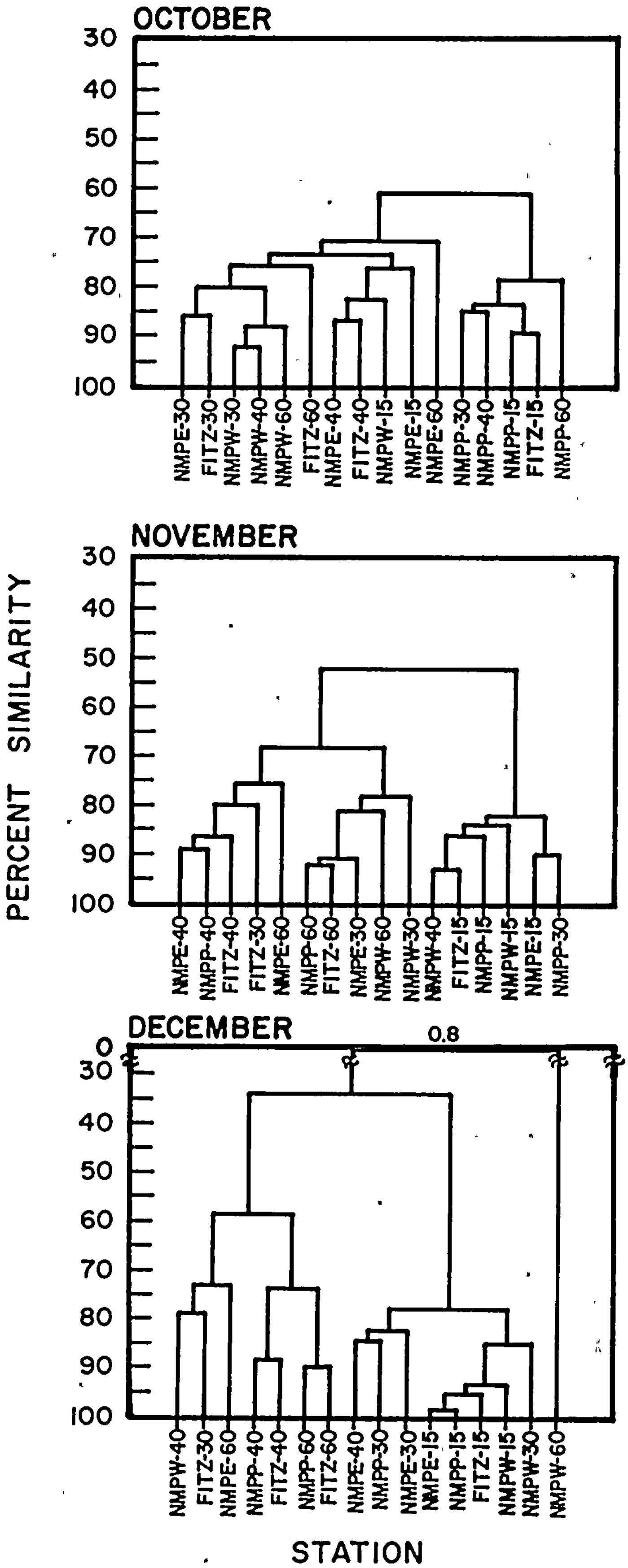
NINE MILE POINT VICINITY - 1975



APPENDIX VII-3

SIMILARITY OF BOTTOM GILL NET COLLECTIONS

NINE MILE POINT VICINITY - 1975



APPENDIX VII-4

PERCENT COMPOSITION AND CATCH PER EFFORT* OF BOTTOM GILL NET COLLECTIONS BY SEASON

NINE MILE POINT VICINITY - 1975

SPECIES	NMPW			NMPP			FITZ			NMPE		
	Spring	Summer	Fall	Spring	Summer	Fall	Spring	Summer	Fall	Spring	Summer	Fall
Alewife	58.32	56.39	40.11	48.87	44.29	40.42	45.73	55.52	27.42	58.26	33.45	26.89
Threespine stickleback	0.05											
Brown trout	0.19	0.05	0.10	1.03	0.54	0.25	0.43	0.03	0.20	0.16	0.04	0.17
Burbot		0.05	0.05		0.07	0.13						0.04
Chinook salmon	0.09	0.05			0.07	0.08		0.06		0.04		
Coho salmon	0.28			0.06		0.04	0.08			0.16		
Golden shiner	0.05											
Gizzard shad	0.05	1.44	2.53	0.64	1.90	3.35	0.04	1.09	2.18		1.04	3.60
Lake chub	1.09	0.43	2.33		0.27	0.55	0.04	0.06	0.20	0.04		
Lake trout	0.09		0.19	0.06			0.08		0.26	0.04		0.46
Mottled sculpin	0.05			0.32	0.07		0.04		0.03	0.04		
American eel				0.06	0.07			0.03				
Carp		0.14		0.06		0.04		0.03				
Pumpkinseed		0.05		0.13	0.20			0.06			0.12	
Rainbow smelt	2.47	0.48	6.47	2.70	1.02	2.54	9.41	0.24	5.14	3.71	0.08	5.05
Rock bass	0.47	2.36	0.83	1.03	3.54	0.93	0.20	0.65	0.10	0.67	0.52	0.04
Redfin pickerel								0.03				
Smallmouth bass	0.57	1.73	0.49	0.84	4.83	0.13	0.43	2.45	0.07	0.35	2.03	
Lake herring							0.04					
Spottail shiner	20.10	15.77	37.04	9.07	17.62	38.90	27.31	23.17	56.04	22.74	18.86	48.70
Stonecat	0.19	0.34	0.10	0.71	0.75	0.17		0.24	0.03	0.08	0.36	
Trout-perch	3.89	0.24	0.49	4.05	1.09	0.08	4.37	1.59	0.78	5.79	2.11	2.15
White bass	0.05	0.34	0.58	0.19	0.07	0.59	0.04	0.09	0.33	0.04		0.74
White perch	7.21	11.92	2.82	19.10	16.05	7.25	6.97	9.56	4.88	3.71	35.29	7.45
White sucker	2.23	3.22	3.50	2.44	2.04	2.92	1.10	0.94	0.91	2.01	1.91	2.73
Yellow perch	2.56	4.86	2.28	8.62	4.29	1.48	3.66	3.42	1.30	2.09	3.27	1.70
Rainbow trout					0.07		0.04		0.03			
Brown bullhead		0.05			0.88	0.04		0.65			0.84	0.08
Northern pike								0.03			0.04	
Goldfish								0.03				
Dwarf longnose sucker								0.03				
Freshwater drum		0.05	0.10		0.07				0.07		0.04	0.12
Northern hogsucker									0.03			0.04
Walleye					0.07							
Bluegill sunfish					0.07							
Gar					0.07							
Lamprey						0.04				0.08		
Splake												0.04
Channel catfish		0.05										
Black crappie						0.04						
Number of Species Collected	20	21	17	19	25	21	18	23	19	18	16	17
Catch per Effort for all Species	2.109	2.080	2.057	1.555	1.470	2:36	2.541	3.388	3.071	2.537	2.508	2.417

* Effort = 60-minute gill net set

APPENDIX VII-5

GUT CONTENTS OF WHITE PERCH BY TRANSECT

NINE MILE POINT VICINITY - 1975

> 210 mm[a]

TAXON	NMPW DRY WT. (mg)	NMPW % OF TOTAL DRY WT.	NMPP DRY WT. (mg)	NMPP % OF TOTAL DRY WT.	FITZ DRY WT. (mg)	FITZ % OF TOTAL DRY WT.	NMPE DRY WT. (mg)	NMPE % OF TOTAL DRY WT.
PISCES								
Etheostoma nigrum	612.9	18.4	315.1	6.4	85.4	2.0	487.6	15.5
Alosa pseudoharengus	165.7	5.0	2113.9	42.7	1796.0	41.6	1436.2	45.7
Notropis hudsonius					898.0	20.8	79.0	2.5
Cottus bairdi	792.9	23.9						
Osmerus mordax							NA	
UID Pisces	1309.0	39.4	624.6	12.6	1152.9	26.7	321.4	10.2
TOTAL (Pisces)	2880.5	86.7	3053.6	61.7	3932.3	91.1	2324.2	73.9
MOLLUSCA								
Pulmonata								
Gyraulus sp.							42.8	1.4
Ferissia tarda							2.3	0.1
Pelecypoda								
Sphaeriidae							47.5	1.5
ARTHROPODA								
Crustacea								
Ostracoda					8.3	0.2	54.1	1.7
Malacostraca								
Isopoda								
Asellus sp.							81.7	2.6
Amphipoda								
Gammarus sp.	93.6	2.8	1747.2	35.3	319.1	7.4	267.0	8.5
Decapoda								
Cambarus sp.	39.8	1.2					21.8	0.7
Insecta								
Diptera								
Chironomidae								
Tanytarsini					2.6	0.1	6.3	0.2
Orthocladiinae								
Cricotopus sp.	1.5	<0.1	3.9	<0.1	4.2	0.1	14.1	0.4
C. sp. pupae	1.6	<0.1	2.0	<0.1	2.0	0.1	2.4	0.1
Other Diptera							5.8	0.2
Other Chironomidae							0.9	<0.1
Trichoptera								
Athripsodes sp	303.4	9.1	140.9	2.8	47.7	1.1	273.2	8.7
TOTAL (All Prey Items)	3320.4	100.0	4947.6	99.9	4316.2	100.0	3144.1	100.0

[a] N = 53 fish; does not include guts containing only oligochaete remains
NA = Not Available

APPENDIX VII-5 (Continued)

GUT CONTENTS OF WHITE PERCH BY TRANSECT

NINE MILE POINT VICINITY - 1975

161- 210 mm[b]

TAXON	NMPW DRY WT. (mg)	NMPW % OF TOTAL DRY WT.	NMPP DRY WT. (mg)	NMPP % OF TOTAL DRY WT.	FITZ DRY WT. (mg)	FITZ % OF TOTAL DRY WT.	NMPE DRY WT. (mg)	NMPE % OF TOTAL DRY WT.
PISCES								
Etheostoma nigrum	69.6	6.7						
Alosa pseudoharengus								
Notropis hudsonius								
Cottus bairdi								
Osmerus mordax								
UID Pisces					13.9	35.1	45.3	64.0
TOTAL (Pisces)	69.9	6.7			13.9	35.1	45.3	64.0
MOLLUSCA								
Pulmonata								
Gyraulus sp.								
Ferissia tarda	0.7	0.1						
Pelecypoda								
Sphaeriidae								
ARTHROPODA								
Crustacea								
Ostracoda	8.3	0.8						
Malacostraca								
Isopoda								
Asellus sp.								
Amphipoda								
Gammarus sp.	487.6	47.0	1617.4	97.9	23.4	59.1	25.5	
Decapoda								
Cambarus sp.								
Insecta								
Diptera								
Chironomidae								
Tanytarsini	2.4	0.2	4.7	0.3				
Orthocladiinae								
Cricotopus sp.	5.3	0.5	14.3	0.9				
C. sp. pupae	1.2	0.1	2.7	0.2				
Other Diptera								
Other Chironomidae	4.5	0.4	6.6	0.4	2.3	5.8		
Trichoptera								
Athripsodes sp.	455.0	44.0	8.7	0.5				
TOTAL (All Prey Items)	1034.6	99.9	1654.4	100.1	39.6	100.0	70.8	100.0

[b]N = 24 fish; does not include guts containing only oligochaete remains

APPENDIX VII -6

STATISTICAL ANALYSIS OF WHITE PERCH GUT CONTENTS

NINE MILE POINT VICINITY - 1975

I.

ONE-WAY ANALYSIS OF VARIANCE
(Arc Sin Transformed)

SOURCE	DF	SS	MS(ERR)	F
TRANSECTS	3	2.5835	0.8611	4.25*
ERROR	34	6.8908	0.2027	
TOTAL	37	9.4743		

STATISTICALLY SIGNIFICANT AT α =.05

II.

BONFERRONI t-test

TRANSECT	N	MEAN % GAMMARUS	95% Confidence Interval
NMPW	10	44.67	18.37 - 72.70
NMPP	16	93.40	77.99 - 99.90
FITZ	8	60.77	29.20 - 88.00
NMPE	4	47.30	8.81 - 87.89

NMPP-NMPW: t=3.19 (p<.01)*
NMPP-FITZ: t=2.14 (p<.05)
NMPP-NMPE: t=2.20 (p<.05)

*Significant under the Bonferroni t-test requirement that p<.017 for each test to maintain the overall "family" of α=.05.

VIII. ENTRAINMENT

A. NINE MILE POINT NUCLEAR STATION UNIT 1

1. Introduction

Studies conducted by LMS during 1974 (LMS, 1975) of macrozooplankton and ichthyoplankton entrained at Nine Mile Point Nuclear Station Unit 1 have led to the following conclusions: 1) entrainment of macrozooplankton is dependent on the behavior of the organism studied; that is, bottom and mid-depth plankton appear to be more susceptible to entrainment than organisms which are more evenly distributed throughout the water column, 2) greater abundance of entrained plankton has been observed in nighttime collections, 3) the eggs and larvae of alewife and rainbow smelt have been entrained in greater numbers than other ichthyoplankton species, and 4) the low percent survival of entrained ichthyoplankton was attributed to the effects of sampling and plant passage.

Objectives of the 1975 entrainment studies were to describe the quantitative trends in macrozooplankton, fish egg, and fish larvae entrainment.

2. Materials and Methods

a. Field Collections

Entrainment samples were collected twice per month from April through October of 1975 (Table VIII-1). On each survey date, sampling commenced at 1100 hours; subsequent samples were collected every three hours, yielding eight runs per 24 hours of sampling. Each sample consisted of a 30 minute tow since the five surface and mid-depth samples were collected from the #11 (west) and #12 (center) intake forebays, respectively. A 0.5 meter diameter plankton net was used for sampling, as described in LMS (1975). The sample duration in 1975 was 30 minutes since 1974 samples collected over five minutes revealed low numbers of eggs and larvae.

b. Laboratory Analysis

Laboratory analysis procedures were identical to those outlined in Section V.B.2b for lake samples. Macrozooplankton were identified and enumerated on a monthly basis; the sample date chosen for analysis was coincident with the date of lake sampling. Ichthyoplankton and fish eggs were enumerated on all sampling dates.

TABLE VIII-1

MACROZOOPLANKTON AND ICHTHYOPLANKTON SAMPLING PROGRAM

1975

NINE MILE POINT NUCLEAR STATION UNIT 1	JAMES A. FITZPATRICK NUCLEAR POWER PLANT
9 APR*	
23 APR	
7 MAY	
21 MAY*	
4 JUN	
18 JUN*	
2 JUL	
16 JUL*	
6 AUG	
20 AUG*	
3 SEP	
17 SEP*	
1 OCT	
15 OCT*	15 OCT*
	5 NOV
	19 NOV*
	3 DEC*
	30 DEC

* Samples analyzed for macrozooplankton

C. Results and Discussion

a. Macrozooplankton

(i) Taxonomic Composition of Entrained Macrozooplankton

Four invertebrate taxa were most abundant in Nine Mile Point Nuclear Station entrainment collections during 1975: *Leptodora kindtii*, Hydroida (*Hydra* sp. and *Cordylophora caspia*), *Gammarus fasciatus* and Diptera (e.g., larval and pupal stages of chironomids and culicids). Table VIII-2 is a taxonomic inventory of all macrozooplankton present in entrainment collections at the Nine Mile Point plant.

The data describing Hydroida abundance are presented in Tables VIII-3 and VIII-4, but, the quantification of these sessile (and hence, non-planktonic) colonial organisms is not possible since the higher abundance frequently observed in the discharge sample indicates their residence in the screenwells. The data presented below will cover the three remaining taxa: *L. kindtii* (which comprised 98.7% of the entrained community, exclusive of hydroids), *G. fasciatus* (0.8%) and diptera (0.3%).

(ii) Seasonal Distribution of Selected Taxa

Leptodora kindtii is an aestival species (Sebestyen, 1960; Hutchinson, 1967; Cummins et al., 1969), which has been observed to be the most abundant macroplankter both in the near-shore Nine Mile Point vicinity (QLM, 1974; LMS, 1975; Sec. VB-2) and in entrainment collections at the Nine Mile Point Nuclear Station (LMS, 1975). Entrainment of *L. kindtii* was maximal during sampling in August and September (Table VIII-3), with 54.5% and 24.5% of all *Leptodora* entrained on these dates, respectively.

Entrainment abundance of *Gammarus fasciatus* showed a bimodal pattern, with a minor peak in July (24% of the total number of entrained *G. fasciatus*) and the major increase during October (44% of the total number of entrained *G. fasciatus*; Table VIII-3). This pattern differed somewhat from that observed during 1974 (LMS, 1975) when the major peak occurred during August, and October levels were quite low, relative to September and November 1974 collections.

Abundance of entrained dipterans underwent a gradual increase through August, after which abundance decreased (Table VII-3). A similar trend was shown to exist during 1974 (LMS, 1975).

TABLE VIII-2

TAXONOMIC INVENTORY OF MACROZOOPLANKTON IN ENTRAINMENT COLLECTIONS

NINE MILE POINT NUCLEAR STATION UNIT 1 - 1975

COELENTERATA
- Hydrozoa
  - *Hydra* sp.

PLATYHELMINTHES
- Turbellaria

NEMATODA

ANNELIDA
- Polychaeta
  - Sabellidae
    - *Manayunkia speciosa*
- Oligochaeta
- Hirudinea

MOLLUSCA
- Gastropoda
- Pelecypoda

ARTHROPODA
- Arachnoidea
  - Hydracarina (Acarina)
- Crustacea
  - Branchiopoda
    - Cladocera
      - *Leptodora kindtii*
  - Ostracoda
    - Podocopa
  - Malacostraca
    - Mysidacea
      - *Mysis relicta oculata*
    - Amphipoda
      - Gammaridea
        - *Gammarus fasciatus*
        - *Pontoporeia affinis*

INSECTA
- Ephemeroptera
- Trichoptera
- Diptera

TABLE VIII-3

MEAN MONTHLY ABUNDANCE* OF MACROZOOPLANKTON IN ENTRAINMENT COLLECTIONS

NINE MILE POINT NUCLEAR STATION UNIT 1 - 1975

MONTH	TOTAL MACROZOOPLANKTON (EXCLUDING HYDROIDA)	LEPTODORA KINDTII	GAMMARUS FASCIATUS	DIPTERANS	HYDROIDA
APR	29.8	0	23.6	4.4	424.1
MAY	127.7	13.6	71.4	19.9	435.5
JUN	811.1	610.4	74.9	65.8	722.4
JUL	21045.2	20419.1	396.4	108.4	1693.9
AUG	112876.2	112315.1	137.3	357.9	7605.6
SEP	61267.8	60864.8	218.6	140.8	1755.1
OCT	12513.7	11678.7	726.6	24.6	10562.0

* Number of organisms/1000 m^3

TABLE VIII-4

MEAN HOURLY ABUNDANCE* OF MACROZOOPLANKTON
IN ENTRAINMENT COLLECTIONS

NINE MILE POINT NUCLEAR STATION UNIT 1 - 1975

TAXON	HOURS 1100	1400	1700	2000	2300	0200	0500	0800
TOTAL MACROZOOPLANKTON (EXCLUDING HYDROIDA)	25117.1	12021.9	21253.6	27460.3	30606.0	49912.5	39607.1	32503.3
LEPTODORA KINDTII	24907.4	11747.9	21067.9	26994.5	29936.5	49381.1	39046.3	32234.5
GAMMARUS FASCIATUS	49.1	63.7	51.7	291.9	496.5	406.9	369.4	155.2
DIPTERA	131.4	185.9	77.4	123.6	95.0	73.8	71.7	66.2
HYDROIDA	3813.5	3047.6	4198.3	3390.0	2532.6	1604.9	3788.2	4137.6

* Number of organisms/1000 m^3

(iii) Diel Variations in Entrainment Abundance

Greater numbers of L. kindtii were entrained during the night than during the day (Table VIII-4). This observation is consistent with the organism's behavior: activity increases at night with vertical migration of the larger individuals occurring (Cummins, et al., 1969).

Greater numbers of G. fasciatus were entrained during nighttime collections (Table VIII-4) than during daytime. Since G. fasciatus is observed to be both benthic and semipelagic (Bousfield, 1958), this increased abundance at night was considered to represent the vertical migration of these organisms from the benthos into the water column, a commonly observed phenomenon in aquatic crustacea (Bainbridge, 1961).

Entrainment of dipterans did not show any definitive diel pattern (Table VIII-4). This was probably reflective of the behaviors of the different species obscuring any patterns.

b. Ichthyoplankton

(i) Species Composition

Seventeen species of fish larvae and eggs were identified from the entrainment collections at the Nine Mile Point Nuclear Station during 1975 (Table VIII-5); the two most abundant species were alewife and rainbow smelt. Eight of these species had been collected during the 1974 entrainment program. Two species (burbot and white sucker) collected during 1974 were not collected during 1975; nine species collected during 1975 were not collected during 1974. Those species which were not collected in either 1974 or 1975 only constituted a minor fraction of the total abundance of entrained eggs and larvae. One Coregonus sp. egg (10 eggs/1000 m^3) was collected on 24 April 1975.

- Fish Eggs

The eggs of rainbow smelt, were collected in entrainment samples between 23 April and 18 June, with maximum numbers collected on 23 April (450 eggs/1000 m^3)(Figure VIII-1). The eggs of the alewife comprised 96.8% of the total abundance of the entrained eggs. Their eggs were first collected on 4 June and were not collected after 6 August. The greatest number of eggs was collected during the 16-17 July survey. Eggs of other species which were identified were common shiner (21 May), white perch (4 and 18 June), yellow perch (18 June), and gizzard shad (18 June).

TABLE VIII-5

SPECIES INVENTORY OF ICHTHYOPLANKTON AND FISH EGGS IN ENTRAINMENT COLLECTIONS

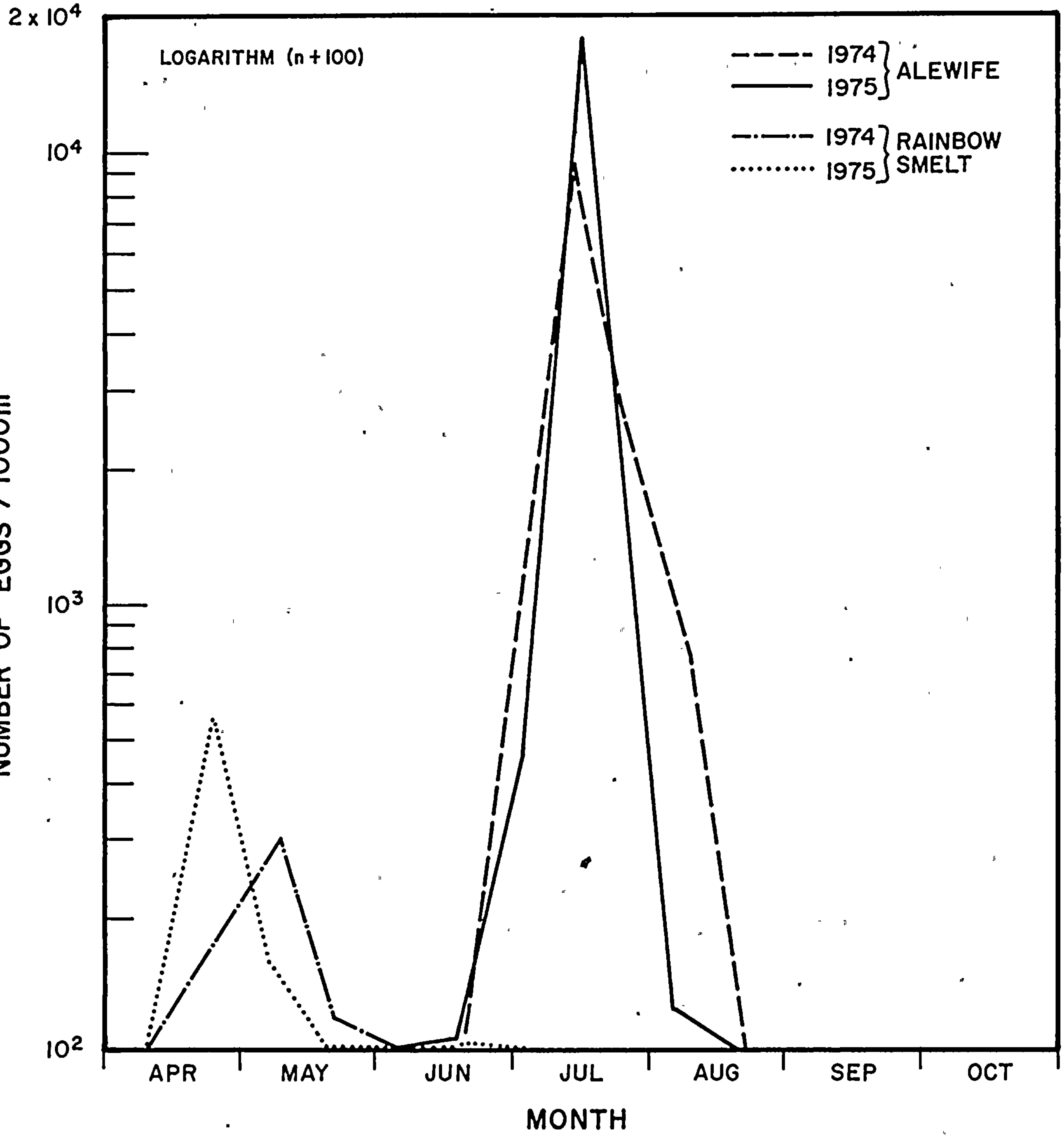
NINE MILE POINT NUCLEAR STATION UNIT 1 - 1975

FAMILY	SCIENTIFIC NAME	COMMON NAME
Clupeidae	*Alosa pseudoharengus*	Alewife[a]
	Dorosoma cepedianum	Gizzard shad[a]
Salmonidae	*Coregonus* sp.[b,c]	
Osmeridae	*Osmerus mordax*	Rainbow smelt[a]
Cyprinidae	*Cyprinus carpio*	Carp[b]
	Notropis atherinoides	Emerald shiner[b,c]
	N. cornutus	Common shiner[d]
	N. hudsonius	Spottail shiner[b,c]
	Pimephales notatus	Bluntnose minnow[b,c]
	P. promelas	Fathead minnow[b,c]
Percopsidae	*Percopsis omiscomaycus*	Trout-perch[b,c]
Percicthyidae	*Morone americana*	White perch[a]
Centrarchidae	*Lepomis* sp.[b,c]	
	L. macrochirus	Bluegill[b,c]
Percidae	*Etheostoma nigrum*	Johnny darter[b]
	Perca flavescens	Yellow perch[d]
Cottidae	*Cottus bairdi*	Mottled sculpin[b,c]

[a]Eggs and larvae
[b]Larvae only
[c]Not collected during 1974

ABUNDANCE[a] OF ALEWIFE AND RAINBOW SMELT EGGS IN ENTRAINMENT COLLECTIONS[b]

NINE MILE POINT NUCLEAR STATION UNIT I — 1974-1975



[a]Mean of surface and mid-depth collections

[b]1974: Five-minute collections; Sampling conntinued until 18 Dec, no eggs collected after Aug

1975: Thirty-minute collections; Sampling continued until 15 Oct, no eggs collected after Aug

- Fish Larvae

Alewife larvae were the most abundant larvae collected; they were present in entrainment samples from 18 June through 15 October. Rainbow smelt larvae were collected on the initial sampling date (9 April) and persisted through to the final sampling date (15 October), with peak abundance occurring on 3 September. Larval stages of johnny darter were initially collected on 18 June and were present through the beginning of August (Table VIII-6); peak abundance occurred on 2 July, similar to the trend observed in the lake (see Section VB-2). White perch larvae were present in June and August collections; maximum numbers were entrained on 4 June. Mottled sculpin larvae were collected on 18 June, when they were the predominant species.

(ii) Seasonal Distribution of Eggs and Larvae

- Fish Eggs

Fish egg entrainment abundance displayed a bimodal pattern, with peaks reflecting the spawning activities of the two most abundant species: alewife, a summer spawner, and rainbow smelt, a spring spawner (Scott and Crossman, 1973) (Table VIII-7).

Greater abundances of fish eggs were present in entrainment surveys during 1975 than during 1974 for both smelt and alewife (Figure VIII-1). The difference, however, is attributed to the natural variability in abundance over short time periods. The peak concentration of alewife eggs (120,180 eggs/1000 m^3) occurred during the 0200-0230 hrs collection on 17 July.

- Fish Larvae

Entrainment of fish larvae at the Nine Mile Point plant during 1975 was characterized by a pattern of abundance in which approximately 85% of the larvae were collected during the five sampling dates from 18 June to 20 August (Figure VIII-2). The peak larval abundance in entrainment collections was observed on 2 July; this peak preceded the peak in abundance observed for entrained fish eggs. However, ichthyoplankton lake collections on 2-3 July showed a patchy distribution in the vicinity of the Nine Mile Point intake structure; larvae were concentrated at two stations: 0.5-NMPW-20 ft and 1-NMPE-20 ft (see Section VB-2).

TABLE VIII-6

ABUNDANCE[a] OF SELECTED SPECIES OF ICHTHYOPLANKTON IN ENTRAINMENT COLLECTIONS

NINE MILE POINT NUCLEAR STATION UNIT 1 - 1975

DATE[c]	JOHNNY DARTER	WHITE PERCH	OTHERS[b]
21 MAY	0.0	0.0	0.4
4 JUN	0.0	2.5	0.4
18 JUN	10.1	0.8	24.2
2 JUL	17.9	0.0	5.8
16 JUL	8.7	0.0	9.8
6 AUG	0.9	0.0	1.8
20 AUG	0.0	0.6	0.0
3 SEP	0.0	0.0	0.5
17 SEP	0.0	0.0	0.5
1 OCT	0.0	0.0	0.5
15 OCT	0.5	0.0	0.0

[a]Number of larvae /1000 m^3 ; mean of times and depths for each sampling date

[b]Others includes: *Coregonus* sp., *Cyprinus carpio*, *Notropis cornutus*, *N. atherinoides*, *N. hudsonius*, *Pimephales notatus*, *P. promelas*, *Percopsis omiscomaycus*, *Lepomis* sp., *L. macrochirus*, *Cottus bairdi*.

[c]No larvae collected 9 and 23 April and 7 May.

TABLE VIII- 7

ABUNDANCE OF FISH EGGS AND PERCENT COMPOSITION OF DOMINANT SPECIES

NINE MILE POINT NUCLEAR STATION UNIT 1 - 1975

DATE	MEAN ABUNDANCE[a]	DOMINANT SPECIES	PERCENT COMPOSITION[b]
9 APR	7.0	Unidentified	100.0
23 APR	464.6	Rainbow smelt	99.9
7 MAY	69.1	Rainbow smelt	91.9
21 MAY	2.0	Rainbow smelt	43.8
4 JUN	10.1	Unidentified	61.5
18 JUN	42.8	Yellow perch	49.5
2 JUL	360.1	Alewife	99.9
16 JUL	17765.2	Alewife	100.0
6 AUG	24.3	Alewife	100.0

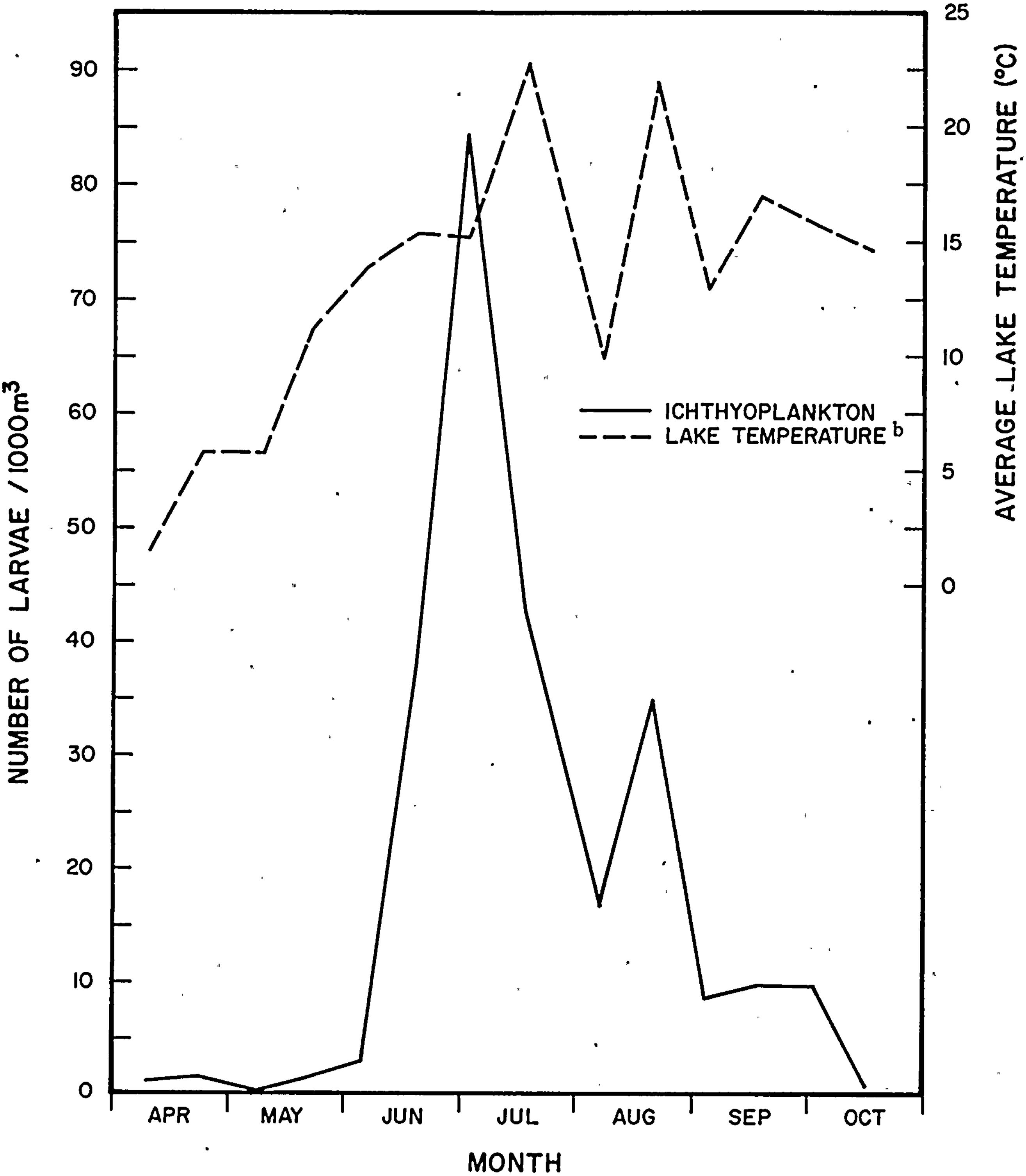
[a]Mean of surface and bottom collections; number of eggs/1000 m^3.

[b]Of the total per sampling date

[c]No eggs collected 20 Aug, 3 and 17 Sep, 1 and 15 Oct

ABUNDANCE OF ICHTHYOPLANKTON IN ENTRAINMENT COLLECTIONS[a]

NINE MILE POINT NUCLEAR STATION UNIT 1 - 1975



[a]Thirty-minute sampling collection
[b]Mean of temperatures corresponding to hours of entrainment collections; values from plant generation data, probe C318.

Entrained larval abundance declined during the two subsequent sampling dates (16 July and 8 August) and then displayed a minor sharp increase on 20 August (Figure VIII-2). This pattern of entrainment abundance may have been affected by the occurrence of an internal seiche during the 6 August sampling period.

Comparisons of abundance of entrained larvae between 1974 and 1975 were made on the basis of mid-depth samples only (surface samples were not collected on all sampling dates during 1974; LMS, 1975). Based on this criterion, fewer larvae were entrained during 1975 than during 1974 (Figure VIII-3).

During 1975, entrained larval abundance peaked only during mid-summer (attributable to alewife entrainment), whereas during 1974 there was a minor spring peak in abundance due to rainbow smelt, in addition to the summer alewife peak (Figure VIII-3).

(iii) Diel Distribution

Examination of the data for all species and sampling dates combined shows that the samples collected from 2300-0500 hours yielded greater numbers of entrained fish larvae than day collections (Table VIII-8). An analysis of variance conducted on the total number of ichthyoplankton collected relative to sampling time for five dates on which larvae were most abundant demonstrated that hour of collection was significant; the maximum numbers of larvae (57.82 larvae/1000 m^3, or 40.48%) were entrained during 0500-0530 hours, and collections at 1400 and 1700 hours yielded 2.83% of the total larvae entrained (Table VIII-8; Appendix VIII-1).

4. Conclusions

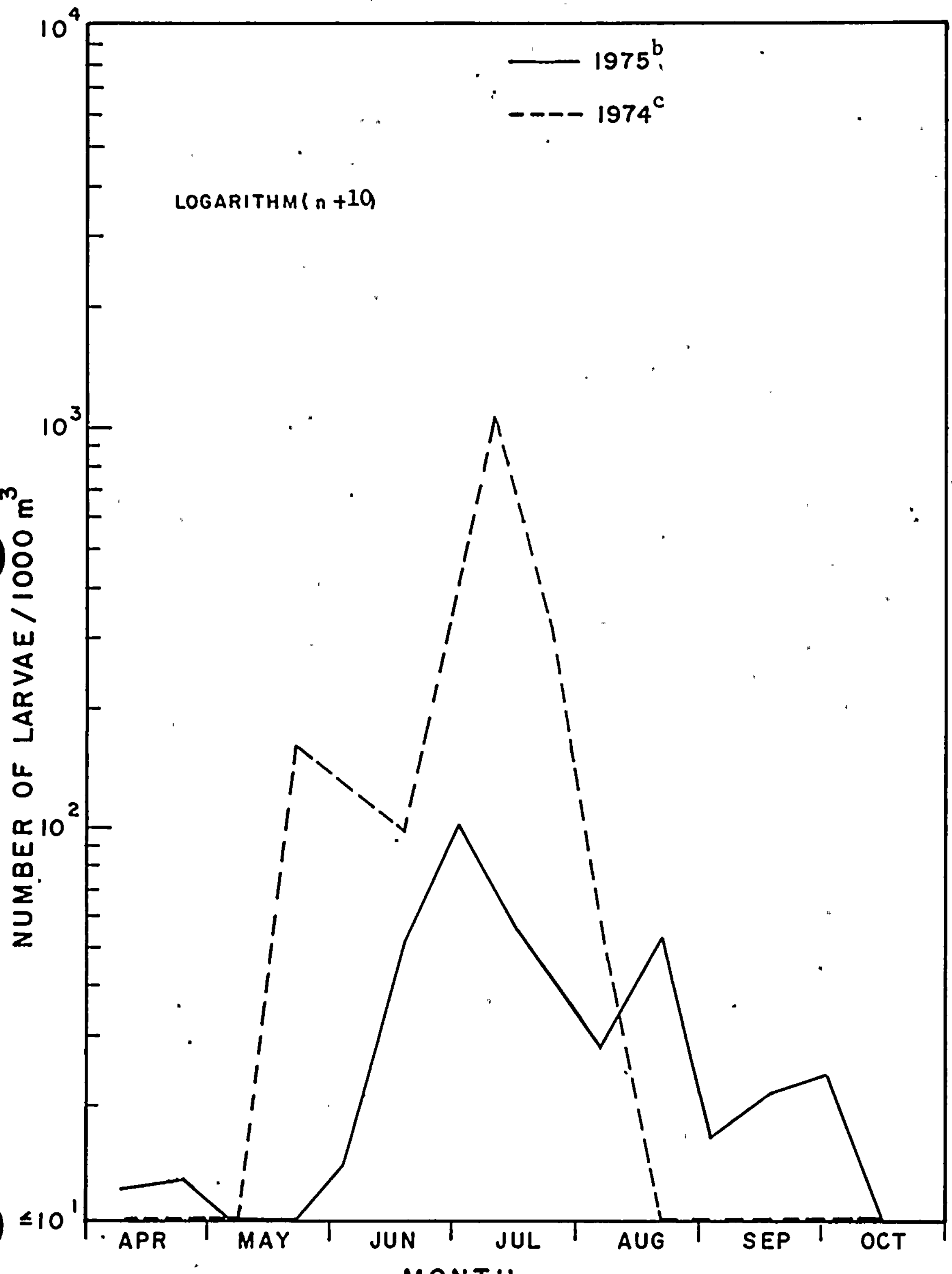
a. Macrozooplankton entrainment at the Nine Mile Point Nuclear Station during 1975 showed seasonal patterns similar to those observed both in the lake and in past entrainment programs.

b. Greater numbers of macrozooplankton were entrained at night, correlating with the periods of greatest activity of the most abundant taxa (*L. kindtii* and *G. fasciatus*).

c. The 1975 ichthyoplankton entrainment program at Nine Mile Point plant collected 17 species, nine of which were not collected during 1974.

ABUNDANCE[a] OF ICHTHYOPLANKTON IN ENTRAINMENT COLLECTIONS

NINE MILE POINT NUCLEAR STATION UNIT I — 1974-1975



[a]Mean of mid-depth stations

[b]Based on 30-minute collections

[c]Based on 5-minute collections

TABLE VIII-8

HOURLY ICTHYOPLANKTON ENTRAINMENT DATA

NINE MILE POINT NUCLEAR STATION UNIT 1 - 1975

SAMPLE TIME (HOURS)	HOURLY ABUNDANCE*	PERCENT COMPOSITION
1100-1130	5.96	4.11
1400-1430	2.11	1.46
1700-1730	1.93	1.33
2000-2030	8.25	5.69
2300-2330	28.43	19.62
0200-0230	33.93	23.41
0500-0530	57.82	39.90
0800-0830	6.50	4.48

* Number of larvae/1000 m^3; mean of surface and mid-depth collections at the intake

d. The seasonality of fish egg entrainment during 1975 was similar to that observed during 1974; eggs were more abundant during 1975 due to peak entrainment of alewife eggs in the early morning hours of 17 July.

e. Entrainment of fish larvae during 1975 showed a midsummer peak (due to alewife) only; during 1974 there was an early spring peak attributable to rainbow smelt as well as the mid-summer alewife peak. The magnitude of the 1975 larvae entrainment abundance was markedly reduced from 1974 collections.

f. Greater numbers of both eggs and larvae were entrained during nightime collections than during the day, as had also been observed during 1974.

g. The occurrence of peak alewife larvae abundance in early July on the sample date prior to the date of the peak egg abundance indicates that the alewife larvae collected at Nine Mile Point may originate at some other location. In 1974 peak alewife egg and larvae abundance occurred on the same date and could not have been from the same spawn since several weeks of development are required between egg and larval stages. Hence the 1974 and 1975 data support the hypothesis that alewife eggs and larvae are advected past the Nine Mile Point vicinity and are probably not representative of the same spawn.

B. JAMES A. FITZPATRICK NUCLEAR POWER PLANT

1. Introduction

In-plant entrainment sampling of larval fish and macrozooplankton at the intake of the James A. FitzPatrick Nuclear Power Plant commenced on 15 October 1975 and continued through 30 December, with samples collected every other week.

The objectives of this study were to provide initial estimates of entrained macrozooplankton and ichthyoplankton abundance and composition at the FitzPatrick station.

2. Materials and Methods

a. Field Collections

(i) Entrainment collections were made at the number 7 gate hatch at the FitzPatrick intake forebay. A rigid frame equipped with a pulley apparatus was affixed at this location. Two 0.5-m plankton nets of 571 μ mesh netting and a TSK flow meter were mounted so as to be able to sample at two depths (14 and 20 ft; bottom depth is 26 ft) simultaneously.

(ii) Entrainment surveys were conducted on 15-16 October, 5-6 November, 19-20 November, 3-4 December, and 30-31 December. All collections except those of 5-6 November and 30-31 December were analyzed for macrozooplankton; collections for all dates were analyzed for ichthyoplankton.

Samples were collected for a 30-minute period on all dates; the times of sampling were 1100, 1400, 1700, 2000, 0500, and 0800 hours for all dates except 15-16 October, when sample times were 1230, 1530, 1830, 2130, 0030, 0330, 0630, and 0930 hours.

b. Laboratory Analysis

See Section VB.2b(ii).

3. Results and Discussion

a. Macrozooplankton

Macrozooplankton abundance in entrainment samples at the FitzPatrick station decreased for all taxa during the October through December sampling period (Table VII-9). A greater decrease occurred between October and November than between November and December.

Hydroids were more abundant in daytime (0800-1600) collections than in nighttime (1700-0700) collections (Table VIII-9). The abundance of entrained Leptodora and Gammarus was greater at night than during the day and the nighttime increase of Leptodora was the greater. Other species of macrozooplankton, as a class, were generally less abundant than any of the above organisms and showed no persistent day/night difference in abundance. The seasonal fall increase in Gammarus reported from the Nine Mile Point entrainment sampling program was apparently followed in November and December by decreased abundance as evidenced by decreased collections at the FitzPatrick plant intake.

b. Ichthyoplankton

The sampling for entrained ichthyoplankton at Fitzpatrick commenced after the majority of Lake Ontario species had spawned in 1975 (cf. Section VB.2b). However, several post yolk-sac alewife larvae and fish eggs were collected (Table VIII-10). Both the timing of the collections and the paucity of specimens obviates any discussion of the effects of the operation of the FitzPatrick plant on the immature stages of the resident fish population.

TABLE VIII-9

ABUNDANCE[a] AND PERCENT COMPOSITION OF ENTRAINED MACROZOOPLANKTON IN DAY/NIGHT COLLECTIONS

JAMES A. FITZPATRICK NUCLEAR POWER PLANT - 1975

DATE	ABUNDANCE OF TOTAL MACROZOOPLANKTON EXCLUDING HYDROIDA	LEPTODORA ABUNDANCE	LEPTODORA PERCENT COMP.	GAMMARUS ABUNDANCE	GAMMARUS PERCENT COMP.	"OTHERS"[b] ABUNDANCE	"OTHERS"[b] PERCENT COMP.	HYDROIDA[c] ABUNDANCE
I. DAY (0800-1600)								
15-16 OCT	6752	5111	75.7	1386	20.5	255	3.8	45032
19-20 NOV	1854	944	50.9	219	11.8	691	37.3	6795
3- 4 DEC	587	127	21.6	440	75.0	20	3.4	2201
II. NIGHT (1700-0500)								
15-16 OCT	17479	15507	88.7	1729	9.9	243	1.4	39049
19-20 NOV	2085	1287	61.7	764	36.6	34	1.6	3786
3- 4 DEC	916	412	45.0	482	52.6	23	2.5	1608

[a] number of organisms/1000 m^3; mean of all depths

[b] "Others" - OCT: Diptera, Hydracarina, Gastropoda, Isopoda, Oligochaeta, Ostracoda, Nematoda, Pontoporeia
NOV: Diptera, Hydracarina, Gastropoda, Isopoda, Oligochaeta, Turbellaria
DEC: Diptera, Hydracarina, Gastropoda, Isopoda, Oligochaeta, Nematoda, Turbellaria, Pelecypoda

[c] Hydroida - *Hydra* sp. and *Cordylophora caspia* (= *lacustris*)

TABLE VIII-10

ENTRAINED FISH EGGS AND LARVAE

JAMES A. FITZPATRICK NUCLEAR POWER PLANT - 1975

DATE	SPECIES	NUMBER COLLECTED	STAGE
16 OCT	Alewife	7	Post yolk sac
5 NOV	Alewife	2	Post yolk sac
19 NOV	Alewife	4	eggs
	UID	1	eggs

UID = Unidentified

REFERENCES CITED

Bainbridge, R. 1961. Migrations. In T.H. Waterman (ed.). The physiology of crustacea. II. Academic Press, New York.

Bousfield, E.L. 1958. Fresh-water amphipod crustaceans of glaciated North America. The Canadian Field-Naturl. 72(2):55-113.

Cummins, K.W., R.R. Costa, R.E. Rowe, G.A. Moshuri, R.M. Scanion, and R.K. Zajdel. 1969. Ecological energetics of a natural population of the predaceous predator zooplankter Leptodora kindtii (Focke). Oikos 20: 189-223.

Hutchinson, G.E. 1967. A treatise of limnology. II. John Wiley and Sons, Inc., New York. 1115p.

Lawler, Matusky and Skelly Engineers. 1975. 1974 Nine Mile Point aquatic ecology studies. Prepared for Niagara Mohawk Power Corp. and Power Authority of the State of New York.

Quirk, Lawler and Matusky Engineers. 1974. 1973 Nine Mile Point aquatic ecology studies - Nine Mile Point Generating Station. Prepared for Niagara Mohawk Power Corp.

Scott, W.B. and E.J. Crossman. 1973. Freshwater fishes of Canada. Fish. Res. Bd Canada Bull. 184: 966p.

Sebestyen, O. 1960. On the food niche of Leptodora kindtii Focke (Crustacea, Cladocera) in the open water communities of Lake Balaton. Int. Revue ges. Hydrobial 45(2):277-282.

APPENDIX VIII-1

STATISTICAL ANALYSIS OF ENTRAINED ICHTHYOPLANKTON ABUNDANCE

NINE MILE POINT NUCLEAR STATION UNIT 1 - 1975

THREE-WAY ANALYSIS OF VARIANCE

SOURCE	DF	SS	MS	F
DATES[a]	4	40122.05	10030.51	12.43**
SAMPLE DEPTHS	1	2205.00	2205.00	2.73
TIMES	7	188734.80	26962.11	33.42**
DATE X DEPTH	4	625.00	156.25	0.19
DATE X TIME	28	312966.95	11177.39	13.86**
DEPTH X TIME	7	11062.60	1580.37	1.96
ERROR	28	22586.40	806.66	
TOTAL	79	578302.80		

** Significant at $\alpha = .01$

SCHEFFE'S METHOD - MEANS BY TIME OF DAY

Largest: 0500 0200 2300 0800 1100 2000 1400 1700: Smallest

[a]DATES: 18 JUN, 2 JUL, 16 JUL, 6 AUG, 20 AUG

IX. IMPINGEMENT

A. NINE MILE POINT NUCLEAR STATION UNIT 1

1. Introduction

Fish impingement studies at Nine Mile Point Nuclear Station Unit 1 began in May 1972. Analysis of 1973-1974 impingement data revealed an upward trend in the number of fish species collected and in the total number and biomass of fish impinged. However, the number of hours sampled also increased, from 1061 hours in 1973 to 3988 hours in 1974. The 1973-1974 data also showed that more fish were caught during the night time hours (QLM, 1974; LMS, 1975). The alewife and rainbow smelt were the most abundant species in both years, representing the same relative proportion of the collection.

The objectives of the 1975 impingement program were as follows:

- to determine the annual impingement rate;
- to describe the species impinged, their relative abundance, and the seasonal pattern of impingement;
- to assess the impact of the plant's operation on the near-field fish community;
- to evaluate the significance of physical factors on the rate of impingement;
- to compare impingement rates and species impinged at the Nine Mile Point and James A. FitzPatrick nuclear stations.

2. Materials and Methods

a. Field Collection

Fish collections were made at two locations, in the screen wash discharge and at the trash racks. A steel mesh basket was submerged in the screen wash discharge immediately below the sluiceway to collect the fish washed from the travelling screens. The metal fish basket was lined with 1/4-inch stretched mesh nylon netting. Prior to sampling, the trash racks and the travelling screens were cleared of all fish so that the catch would reflect the true number of fish impinged during the sampling period. Fish collected in the trash rack sample at the termination of the 24-hour sampling period were bagged separately, preserved, and returned to the laboratory for identification and further analysis.

Impingement sampling was initiated in January 1975 and continued through December of the same year. The program included collection of a daily, 24-hour composite, and an hourly 24-hour sample.

(i) Daily Collection

Composite collections (continuous 24-hour sampling) were made on Monday and Friday of each week throughout 1975. The fish basket was placed in the screen wash discharge at 1000 hours and allowed it to collect fish until 1000 hours on the next day. All fish were identified to the species level and enumerated in the field; they were then preserved in 10% buffered formalin and returned to the laboratory for further analysis.

At the initiation and termination of the sampling period the following parameters were recorded from the computer data sheets at the Nine Mile Point Nuclear Station: lake, condenser, and discharge water temperatures; air temperature; percent tempering; number of circulating water pumps and travelling screens operating; screen wash cycles and duration; plant output; wind direction and speed; and ambient weather conditions.

(ii) Hourly Collection

Hourly impingement sampling was conducted on Wednesday of each week for a 24-hour period. The fish basket was placed in the discharge bay at 1000 hours and was retrieved immediately after each hourly three-minute screen wash. All fish collected were identified and enumerated.

(iii) Frequency of Sampling

In addition to Monday, Wednesday, and Friday collections, increased sampling was conducted during periods of increased rate of impingement. When the number of fish impinged on a particular day exceeded 20,000 fish, daily collections continued on the following days (in addition to the regularly scheduled sampling days) until the number of fish impinged per 24-hr period dropped below 20,000 fish.

b. Laboratory Analysis

At the laboratory, all fish collected in hourly impingement samples were identified to the species level and counted in order to verify the field data; they were then weighed (to the nearest 1.0 g), measured (to the nearest 1.0 cm), and sexed.

c. Statistical Analysis

To analyze the impingement data collected in 1975, parametric techniques, following the method of Steel and Torrie (1960) and Sokal and Rohlf (1969), were used because of the large sample sizes and the high sensitivity of the tests. The analysis of variance and the correlation analysis techniques were used whenever their application was meaningful; an $\alpha < .05$ was chosen for the significance level for all correlations in order to eliminate natural variability and to increase the confidence. Statistical techniques for stratified sampling and the optimum allocation procedures were applied to the impingement data analyzed.

3. Results

a. Summary of Current and Previous Studies

The estimated total number of fish collected annually by LMS in impingement samples from 1973 through 1975 did not follow a specific trend but reached a peak in 1974 after which it declined (Table IX-1). The total number of fish collected in 1974 was approximately twice as great as during the previous year; however, the average number of fish impinged per hour declined in 1974. The estimated total number of fish impinged in 1975 (480,079 fish) was 38% of all fish impinged in 1974, even though sampling efforts were similar in both years. It is likely that the peak abundance of total fish attained in 1974 was related to fish behavior rather than to plant operation or increased sampling efforts between 1974 and 1975, as both factors were relatively consistent (Table IX-1). Higher abundance of alewife and rainbow smelt was noted in 1974 (LMS, 1975).

The majority of the fish collected during the past three years were impinged in either April or May (Figure IX-1): 85% of the 1973 fish collection were impinged in April (5,859 fish/hr), 63% of the annual total in May 1974 (1,491 fish/hr), and 57% in April 1975 (665 fish/hr). This high percentage resulted in all cases from impinged alewife, a species for which this period coincided with the seasonal onset of sexual maturity and the inshore migration of adults and juveniles.

The number of species collected increased from 37 species in 1973 to 48 species in 1974, but then remained constant in 1975 (47 species). The increase in the number of species may reflect the increased sampling effort in 1974/1975 compared to 1973. The species composition of the impinged fish was also variable

TABLE IX-1

SUMMARY OF IMPINGEMENT COLLECTIONS

NINE MILE POINT NUCLEAR STATION UNIT 1 - 1973-1975

I. ABUNDANCE OF TOTAL FISH

	1973	1974	1975
Number of Species	37	48	47
Total Number of Fish Collected	659,041	1,251,249	480,079
Total Number of Hours Sampled	1061	3988	3839
Average Number of Fish/Hour	621	314	125

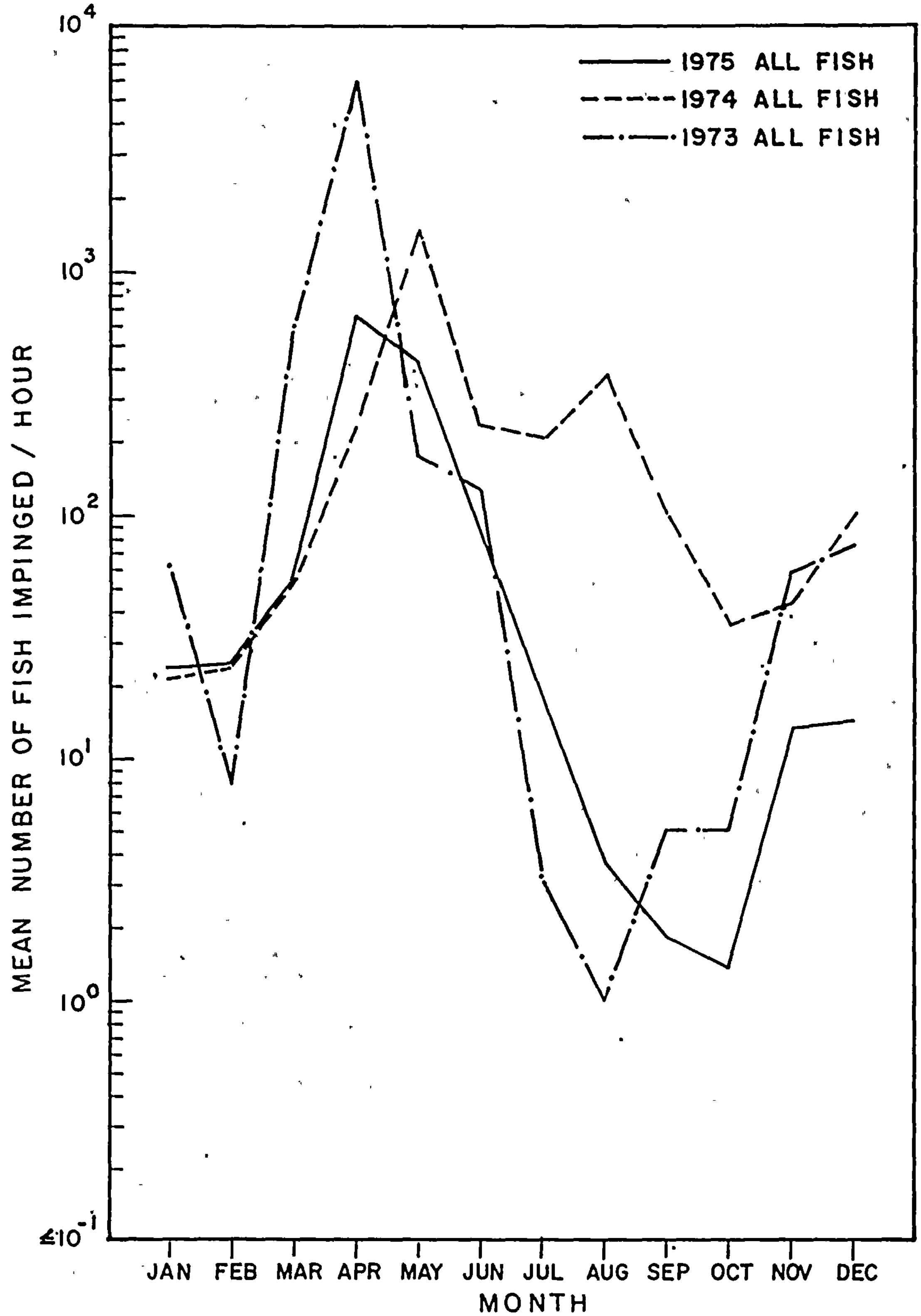
II. PERCENT COMPOSITION OF SELECTED SPECIES

	PERCENT COMPOSITION					
	1973		1974		1975	
SPECIES	ABUNDANCE	BIOMASS	ABUNDANCE	BIOMASS	ABUNDANCE	BIOMASS
Alewife	97.8	94.5	94.4	91.2	79.6	NA
Rainbow smelt	1.6	1.8	3.3	3.8	6.9	NA
Threespine stickleback	0.1	NA	0.5	0.1	11.2	NA
Others	0.5	1.3	1.8	4.9	2.3	NA

NA = Not available

MEAN HOURLY IMPINGEMENT RATE

NINE MILE POINT NUCLEAR STATION UNIT I — 1973-1975



between years: eight species were collected in 1974 but not in 1973 (QLM, 1974), and six species represented in 1974 collections were absent in 1975 collections; eight species collected in 1975 were collected neither in 1973 nor in 1974 (Table IX-2). Four species of salmonids not present in 1974 collections were impinged at the Nine Mile Point plant in 1975; however, each species constituted less than 0.01% of all fish collected and they occurred only in November (Table IX-3a).

Collections at the trash racks during the May-November period (Table IX-3b) included five species, dominated by alewife and rainbow smelt. The total number of fish collected from the trash racks, however, is insignificant when compared to the total number of fish impinged. All species collected from the trash racks were represented in the impingement collections.

Fish collections from 1973 through 1975 were dominated by alewife (Table IX-1). Rainbow smelt, which was the second most abundant species collected during 1973 and 1974, was third in abundance during 1975; despite that fact, their percent composition of the total collection increased from 1.6% in 1973 to 3.3% in 1974 and 6.9% in 1975. The threespine stickleback was the second most abundant species collected during 1975, with the majority impinged in February and March (Table IX-3), 31 and 45% of all fish collected, respectively. This species had been collected in previous years, but not in large numbers.

b. Species Inventory

An estimated 480,079 fish, representing 47 species, were present in impingement collections from January to December 1975 at Nine Mile Point Nuclear Station Unit 1 (Table IX-3). Family, common name, and the scientific name of all species collected are presented in Table IX-2.

The number of species collected varied from month to month, increasing from 26 species in January to a maximum of 34 species in April, after which it declined toward the end of the year, reaching a minimum of 15 species in September; this closely followed the pattern for number of fish impinged.

As in 1973 and 1974, alewife was the most abundant of all species impinged in 1975 (Figure IX-2); abundance and percentage, however, declined in 1975, when alewife made up 79.6% of all fish collected, compared to 97.8 and 94.4% in 1973 and 1974, respectively (Table IX-1). The mean number of alewife in yearly impingement collections was 608, 296, and 100 fish/hr, respectively, for the 1973, 1974, and 1975 sampling periods. In 1975, most alewife were impinged during April (54% of all alewife impinged) and May (33%).

TABLE IX-2

SPECIES INVENTORY OF FISHES IN IMPINGEMENT COLLECTIONS

NINE MILE POINT NUCLEAR STATION UNIT 1 - 1975

SCIENTIFIC NAME[a]	COMMON NAME
Family Petromyzontidae	
Petromyzon marinus	Sea lamprey
Family Anguillidae	
Anguilla rostrata	American eel
Family Clupeidae	
Alosa pseudoharengus	Alewife
Dorosoma cepedianum	Gizzard shad
Family Salmonidae	
Salmo trutta	Brown trout
S. gairdnerii	Rainbow trout[b]
Oncorhynchus kisutch	Coho salmon
Coregonus artedii	Cisco or Lake herring
Salvelinus fontinalis	Brook trout[b]
S. namaycush	Lake trout
S. namaycush xs *fontinalis*	Splake[b]
Oncorhynchus tshawytscha	Chinook salmon[b]
UID Salmonid	
Family Osmeridae	
Osmerus mordax	Rainbow smelt
Family Esocidae	
Esox lucius	Northern pike
Family Cyprinidae	
Carassius auratus	Goldfish
Pimephales promelas	Fathead minnow
Semotilus atromaculatus	Creek chub
Umbra limi	Mudminnow
Rhinichthys cataractae	Longnose dace
Notropis atherinoides	Emerald shiner
N. hudsonius	Spottail shiner
N. umbratilis	Redfin shiner[b]
Couesius plumbeus	Lake chub
Family Catostomidae	
Catostomus commersoni	White sucker
Moxostoma macrolepidotum	Shorthead redhorse[b]

TABLE IX-2 (Continued)

SPECIES INVENTORY OF FISHES IN IMPINGEMENT COLLECTIONS

SCIENTIFIC NAME[a]	COMMON NAME
Family Ictaluridae	
Ictalurus nebulosus	Brown bullhead
I. punctatus	Channel catfish
Noturus flavus	Stonecat
Family Percopsidae	
Percopsis omiscomaycus	Trout-perch
Percina caprodes	Logperch
Family Gadidae	
Lota lota	Burbot
Family Gasterosteidae	
Gasterosteus aculeatus	Threespine stickleback
Culara inconstans	Brook stickleback
Family Cottidae	
Cottus bairdi	Mottled sculpin
Family Percichthyidae	
Morone americana	White perch
Morone chrysops	White bass
Family Centrarchidae	
Ambloplites rupestris	Rock bass
Lepomis gibbosus	Pumpkinseed
L. macrochirus	Bluegill
Micropterus dolomieui	Smallmouth bass
Micropterus salimoides	Largemouth bass[b]
Pomoxis nigromaculatus	Black crappie
Family Percidae	
Etheostoma nigrum	Johnny darter
Perca flavescens	Yellow perch
Stizostedion vitreum	Walleye
Family Sciaenidae	
Aplodinotus grunniens	Freshwater drum
Family Atherinidae	
Labidesthes sicculus	Brook silverside[b]

[a] American Fisheries Society, 1970

[b] Not collected during 1973 or 1974 impingement programs

UID = Unidentified species

TABLE IX-3a

MONTHLY ABUNDANCE AND PERCENT COMPOSITION OF IMPINGEMENT COLLECTIONS

NINE MILE POINT NUCLEAR STATION UNIT 1 - 1975

SPECIES	JAN		FEB		MAR		APR		MAY		JUN	
	NO.	%	NO.	%	NO.	%	NO.	%	NO.	%	NO.	%
Alewife	3258	41.3	748	10.7	5186	29.8	206179	76.0	127093	96.9	27807	97.3
American eel	2	<0.1	1	<0.1	1	<0.1	6	<0.1	4	<0.1	6	<0.1
Black crappie	4	0.1	1	<0.1			1	<0.1				
Bluegill sunfish	2	<0.1	1	<0.1								
Brook silverside												
Brook stickleback					6	<0.1	23	<0.1	6	<0.1		
Brook trout												
Brown bullhead	5	0.1	3	<0.1	15	0.1	12	<0.1	2	<0.1	1	<0.1
Brown trout												
Burbot			4	0.1	1	<0.1	5	<0.1	1	<0.1		
Channel catfish												
Chinook salmon												
Cisco or Lake herring					1	<0.1						
Coho salmon							2	<0.1				
Creek chub	1	<0.1					3	<0.1	3	<0.1	1	<0.1
Emerald shiner	412	5.2	411	5.9	427	2.5	704	0.3	37	<0.1	1	<0.1
Fathead minnow					1	<0.1	9	<0.1	3	<0.1		
Freshwater drum	15	0.2	13	0.2	5	<0.1	2	<0.1	1	<0.1	1	<0.1
Gizzard shad	138	1.8	160	2.3	98	0.6	92	<0.1	2	<0.1		
Gold fish			1	<0.1	1	<0.1						
Johnny darter							36	<0.1	222	0.2	26	0.1
[illegible] chub	1	<0.1	9	0.1	10	0.1	28	<0.1	10	<0.1	5	<0.1
[illegible]rout	8	0.1	18	0.3	10	0.1	22	<0.1	3	<0.1	1	<0.1
[illegible]outh bass												
Logperch							7	<0.1				
Longnose dace			2	<0.1	2	<0.1	6	<0.1				
Mottled sculpin	137	1.7	146	2.1	83	0.5	617	0.2	174	0.1	28	0.1
Mudminnow	7	0.1	10	0.1	15	0.1	15	<0.1				
Northern pike			2	<0.1			2	<0.1				
Pumpkinseed	10	0.1	8	0.1	1	<0.1			1	<0.1		
Rainbow smelt	3276	41.6	2746	39.2	3438	19.7	20444	7.5	1985	1.5	279	1.0
Rainbow trout												
Redfin shiner							1	<0.1				
Rock bass	20	0.3	35	0.5	17	0.1	79	<0.1	11	<0.1	28	0.1
Sea lamprey	1	<0.1	4	0.1	3	<0.1	7	<0.1	2	<0.1	6	<0.1
Shorthead redhorse					1	<0.1						
Smallmouth bass	5	0.1	5	0.1	3	<0.1	2	<0.1	8	<0.1	9	<0.1
Splake (hybrid Lake trout)												
Spottail shiner	35	0.4	58	0.8	44	0.3	184	0.1	40	<0.1	59	0.2
Stonecat	1	<0.1	3	<0.1	1	<0.1	9	<0.1	10	<0.1	9	<0.1
Threespine stickleback	323	4.2	2155	30.8	7757	44.6	41758	15.4	1366	1.0	242	0.8
Trout-perch	6	0.1	20	0.3	21	0.1	165	0.1	139	0.1	46	0.2
Walleye					1	<0.1	1	<0.1				
White bass	8	0.1	19	0.3	13	0.1	39	<0.1	1	<0.1	1	<0.1
White perch	126	1.6	313	4.5	186	1.1	642	0.2	65	<0.1	10	<0.1
White sucker	2	<0.1	3	<0.1	4	<0.1	13	<0.1	8	<0.1	10	<0.1
Yellow perch	71	0.9	109	1.6	58	0.3	81	<0.1	17	<0.1	16	0.1
TOTAL	7883	-	7008	-	17410	-	271196	-	131214	-	28592	-
NUMBER HOURS SAMPLED	336		288		312		408		312		312	
[illegible]E NO./ [illegible]	23.5		24.3		55.8		664.7		420.6		91.6	

TABLE IX-3a
(Continued)

MONTHLY ABUNDANCE AND PERCENT COMPOSITION OF IMPINGEMENT COLLECTIONS

SPECIES	JUL		AUG		SEP		OCT		NOV		DEC		TOTAL	
	NO.	%	NO.	%	NO.	%	NO.	%	NO.	%	NO.	%	NO.	%
Alewife	5385	90.8	442	38.0	276	50.3	241	54.9	2143	56.1	3552	72.9	382310	79.6
American eel	5	0.1	6	0.5	2	0.4	10	2.3	18	0.5	2	<0.1	63	<0.1
Black crappie							2	0.5			2	<0.1	10	<0.1
Bluegill sunfish							54	12.3	37	1.0	11	0.2	105	<0.1
Brook silverside											1	<0.1	1	<0.1
Brook stickleback													35	<0.1
Brook trout									1	<0.1			1	<0.1
Brown bullhead	1	<0.1			3	0.5			1	<0.1			43	<0.1
Brown trout					1	0.2							1	<0.1
Burbot			1	0.1	1	0.2					1	<0.1	14	<0.1
Channel catfish											24	0.5	24	<0.1
Chinook salmon									1	<0.1			1	<0.1
Cisco or Lake herring													1	<0.1
Coho salmon													2	<0.1
Creek chub													8	<0.1
Emerald shiner			3	0.3			4	0.9	2	0.1	3	<0.1	2004	0.4
Fathead minnow													13	<0.1
Freshwater drum			1	0.1					4	0.1			42	<0.1
Gizzard shad	1	<0.1					8	1.8	1261	33.0	706	14.5	2466	0.5
Gold fish			1	<0.1									3	<0.1
Johnny darter	19	0.3	25	2.2	2	0.4	4	0.9	2	0.1			336	0.1
Lake chub	1	<0.1									1	<0.1	65	<0.1
Lake trout													62	[illegible]
Largemouth bass			1	0.1									1	[illegible]
Logperch													7	[illegible]
Longnose dace											1	<0.1	11	<0.1
Mottled sculpin	49	0.8	67	5.8	8	1.5	26	5.9	45	1.2	52	1.1	1432	0.3
Mudminnow													47	<0.1
Northern pike													4	<0.1
Pumpkinseed	2	<0.1	1	0.1									23	<0.1
Rainbow smelt	185	3.1	208	17.9	110	20.0	40	9.1	86	2.3	341	7.0	33138	6.9
Rainbow trout									1	<0.1			1	<0.1
Redfin shiner													1	<0.1
Rock bass	10	0.2	37	3.2	18	3.3	3	0.7	21	0.5	19	0.4	298	0.1
Sea lamprey	22	0.4					2	0.5	1	<0.1	1	<0.1	49	<0.1
Shorthead redhorse													1	<0.1
Smallmouth bass	3	0.1	21	1.8	6	1.1	3	0.7	6	0.2	3	0.1	74	<0.1
Splake (hybrid Lake trout)									1	<0.1			1	<0.1
Spottail shiner	39	0.7	234	20.1	106	19.3	12	2.7	24	0.6	19	0.4	854	0.2
Stonecat	7	0.1	6	0.5	1	0.2	9	2.1	9	0.2			65	<0.1
Threespine stickleback	79	1.3	1	0.1					6	0.2	11	0.2	53707	11.2
Trout-perch	23	0.4	1	0.1							3	0.1	424	0.1
Walleye	1	<0.1											3	<0.1
White bass	3	0.1							12	0.3	44	0.9	140	<0.1
White perch	13	0.2	56	4.8	5	0.9	4	0.9	115	3.0	36	0.7	1571	0.3
White sucker	22	0.4	15	1.3	7	1.3	5	1.1	2	0.1	2	<0.1	93	<0.1
Yellow perch	61	1.0	35	3.0	3	0.5	12	2.7	21	0.5	38	0.8	522	0.1
TOTAL	5931	-	1162	-	549	-	439	-	3820	-	4873	-	480079	-
NUMBER HOURS SAMPLED	312		312		312		312		287		336		3839	
AVERAGE NO./HR.	19.1		3.7		1.8		1.4		13.3		14.5		125.1	

TABLE IX-3b

ABUNDANCE OF FISH IN TRASH RACK SAMPLES

NINE MILE POINT NUCLEAR STATION UNIT 1 - 1975

DATE*	SPECIES	ABUNDANCE (NO.)
3 MAR	Unidentified	8
5 MAR	Rainbow smelt	12
12 MAR	Rainbow smelt	12
21 MAR	Rainbow smelt	4
26 MAR	Rainbow smelt	8
2 APR	Rainbow smelt	3
7 APR	Rainbow smelt	74
9 APR	Rainbow smelt	29
9 APR	Threespine stickleback	6
9 APR	Alewife	1
11 APR	Rainbow smelt	17
11 APR	Threespine stickleback	4
16 APR	Rainbow smelt	14
18 APR	Rainbow smelt	16
18 APR	Threespine stickleback	2
21 APR	Rainbow smelt	31
22 APR	Rainbow smelt	17
23 APR	Rainbow smelt	7
25 APR	Alewife	7
25 APR	Rainbow smelt	19
2 MAY	Rainbow smelt	2
5 MAY	Rainbow smelt	7
12 MAY	Alewife	1
12 MAY	Rainbow smelt	10
12 MAY	Lake chub	3
16 MAY	Rainbow smelt	2
21 MAY	Alewife	2
21 MAY	Rock bass	1
23 MAY	Alewife	1
23 MAY	Rock bass	1
18 JUN	Rock bass	3
23 JUN	Rock bass	1
11 JUL	Alewife	1
11 JUL	Rock bass	2
21 JUL	Rock bass	1
20 AUG	Rock bass	1
12 NOV	Alewife	1

* Only samples containing fish.

TABLE IX-4

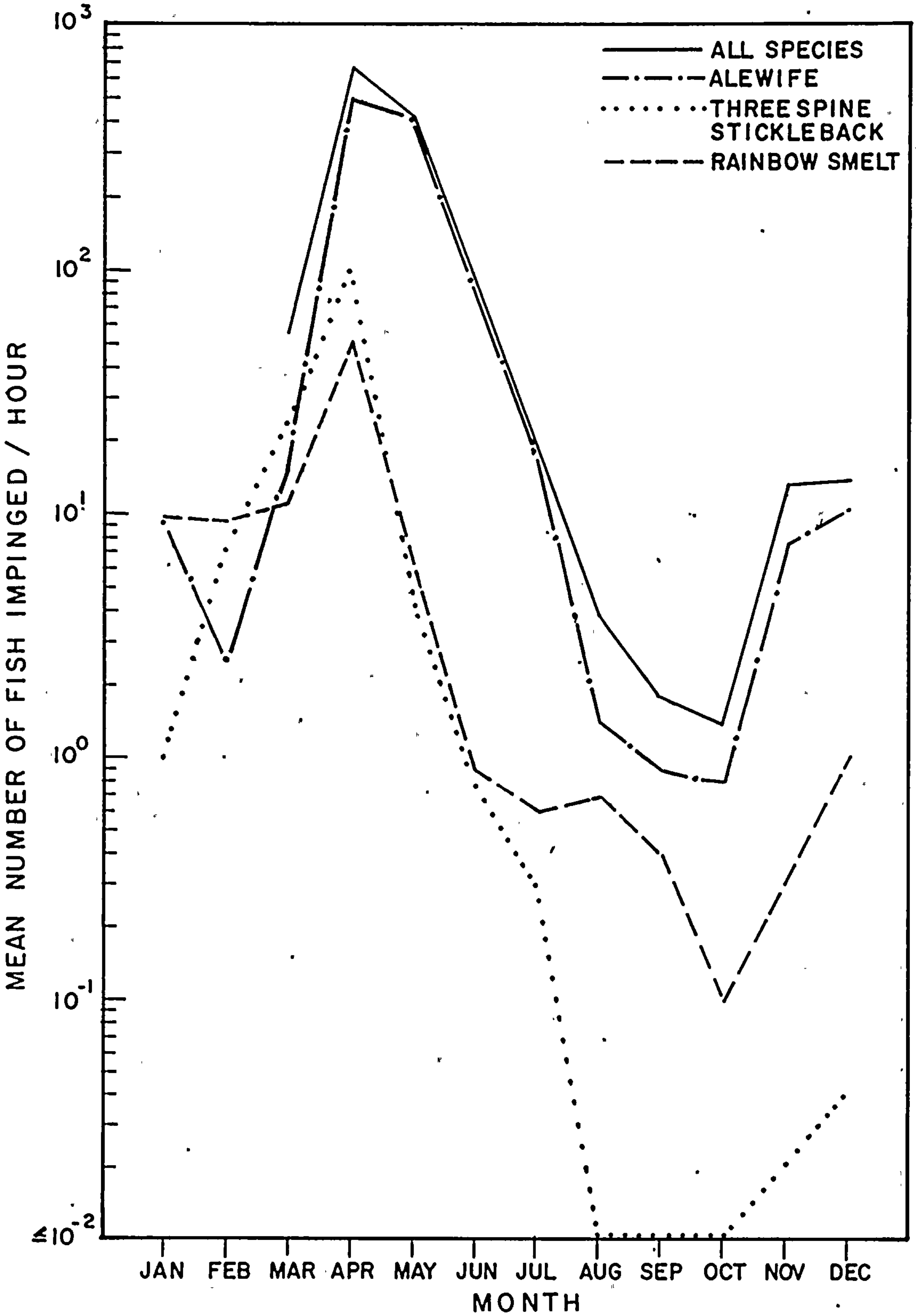
SEASONAL ABUNDANCE OF SELECTED SPECIES IN IMPINGEMENT COLLECTIONS

NINE MILE POINT NUCLEAR STATION UNIT 1 - 1975

SPECIES	WINTER (JAN-MAR)		SPRING (APR-JUN)		SUMMER (JUL-SEP)		FALL (OCT-DEC)	
	NUMBER	PERCENT OF TOTAL FISH	NUMBER	PERCENT OF TOTAL FISH	NUMBER	PERCENT OF TOTAL FISH	NUMBER	PERCENT OF TOTAL FISH
Alewife	32301	28.5	431004	83.8	7642	79.9	9132	65.0
Threespine Stickleback	10244	31.7	43366	10.1	80	1.0	17	0.2
Rainbow Smelt	9460	29.3	22708	5.3	503	6.6	467	5.1
Yellow Perch	238	0.7	114	<0.1	99	1.3	71	0.8
White Perch	625	1.9	717	0.2	74	1.0	155	1.7
Spottail Shiner	137	0.4	283	0.1	379	5.0	55	0.6
Gizzard Shad	396	1.2	94	<0.1	1	<0.1	1975	21.6

MEAN HOURLY IMPINGEMENT RATE FOR SELECTED SPECIES

NINE MILE POINT NUCLEAR STATION UNIT 1 – 1975



c. Seasonal Patterns of Impingement

Individuals of seven species composed 93.7-99.5% of the total fish impinged seasonally (Table IX-4). Alewife, rainbow smelt, and threespine stickleback dominated the fish collections in both winter and spring; however, the relative abundance of the three species was not equivalent in both seasons. Alewife was most abundant in the summer and fall, declining in numbers and percent composition of the total fish impinged compared to the spring peak abundance. Spottail shiner and gizzard shad replaced threespine stickleback as one of the three most abundant species in the summer and fall, respectively.

In the winter of 1975, the threespine stickleback was the most dominant fish species impinged at the Nine Mile Point station (Table IX-4). This species had been impinged during the winters of 1973 and 1974 (LMS, 1975), but a noticeable increase occurred in the winter of 1975 (10,244 fish, 12.3 fish/hr) compared to 1973 (109 fish; 0.9 fish/hr) and 1974 (2,925 fish; 3.3 fish/hr). This increase can be attributed to either increased sampling efforts between 1973 and 1974 or increased fish abundance in the study area. The former may account for the difference between the 1973 impingement collections and collections during 1974 and 1975 winter seasons, since during the latter two years sampling efforts were similar to each other but were different from the previous year (1973). Higher abundance near the site is indicated by the greater numbers of threespine stickleback caught in the bottom trawl in 1975 than either 1973 or 1974.

Alewife dominated the spring impingement samples, comprising an average of 83.8% of the total number of fish impinged. The increased number and percentage of alewife impinged in the spring is attributed to the inshore movement of small alewife and the spawning movement of the adult (Richkus, 1975). Graham (1956) reported alewife movement inshore in April-June in the eastern part of Lake Ontario. This movement, however, could occur as early as mid-March, and reach a peak in mid-April (Wells, 1968). The latter observation seems to be in agreement with the data presented in this report. The timing of the inshore movement of alewife, however, varies slightly from year to year. The maximum number of alewife were impinged in April of 1973 and May of 1974; this does not, however, occur at random but rather seems to correlate with several factors, most important of which is water temperature. For example, the maximum number of alewife impinged on a single day was on 7 May 1974 and on 22 April 1975 when water temperature was 46-49°F. This range was reported to be most appropriate for alewife spawning (Scott and Crossman, 1973).

d. Diel Patterns of Impingement

Because of the nocturnal activities of many of the fishes in the vicinity of Nine Mile Point Nuclear Station Unit 1 (QLM, 1974), fish impingement rates from the hourly 24-hour samples were evaluated for day and night variations and compared to results reported in 1974. The hours of dark and light samples were adjusted according to New York sunrise-sunset of Eastern Standard Time, corrected for daylight saving time, based on tables prepared by the United States Naval Observatory in Washington, D.C.

The impingement abundance data collected in 1975 indicated that three species, alewife, threespine stickleback, and rainbow smelt, accounted for 98% of all fish impinged throughout the year. Hence these three species were chosen for day-night cycle studies. Data analyzed for alewives were those collected in April and May (Appendix IX-1); alewife impinged in these two months comprised 87% of all alewife impinged in 1975. Rainbow smelt impinged from January through April (90% of all rainbow smelt impinged) and threespine stickleback impinged from February through April (96% of all threespine stickleback impinged) were investigated for day-night differences.

- Alewife

The average number of alewife impinged per hour based on day-night periods for the nine Wednesday collections during April and May was variable; values ranged from 57.3 to 648.1 fish per hour at night and from 26.6 to 1043.2 fish in day collections (Table IX-5). On the average, more alewife were impinged during the daylight hours in April and May than in the corresponding night samples; however the difference was not significant at $\alpha = .05$ (Appendix IX-1).

This agrees with the findings in 1974 (LMS, 1975). According to Richkus (1975), however, inshore daily migration patterns of alewife reach a maximum in midafternoon.

- Threespine Stickleback

Thirteen Wednesday collections from February through April 1975 (Table IX-5) were analyzed for threespine stickleback. In contrast to alewife, the average impingement rate of threespine stickleback was higher at night than during the daylight hours on 73% of the sampling dates (see Table IX-6). However, this photoperiod difference was not significant ($\alpha \leq .05$).

TABLE IX-5

HOURLY DAY/NIGHT IMPINGEMENT RATES FOR SELECTED SPECIES AND WATER TEMPERATURE DATA

NINE MILE POINT NUCLEAR STATION UNIT 1 - 1975

DATE[a]	TOTAL FISH NUMBER/HR		ALEWIFE NUMBER/HR		RAINBOW SMELT NUMBER/HR		THREESPINE STICKLEBACK NUMBER/HR		TEMPERATURE (°C)[b]			
									INTAKE		DISCHARGE	
	DAY	NIGHT	DAY	NIGHT	DAY	NIGHT	DAY	NIGHT	DAY	NIGHT	DAY	NIGHT
8 JAN	28.3	36.4			4.4	7.1			38.1	36.7	65.6	64.3
15 JAN	21.0	41.8			15.9	23.0			32.5	31.5	62.0	61.0
22 JAN	10.2	15.4			6.2	14.0			31.1	33.3	64.6	66.8
29 JAN	7.8	9.1			5.0	2.6			33.9	32.3	68.3	66.6
MEAN	16.8	25.7			7.9	11.7			33.9	33.5	64.8	64.7
5 FEB	3.5	13.5			3.3	8.9	0.4	0.4	32.3	32.1	35.3	33.7
12 FEB	6.7	14.7			4.3	9.6	0.6	1.2	31.1	32.1	50.0	52.9
19 FEB	16.7	20.2			7.1	6.3	7.7	10.2	30.7	31.1	64.2	64.8
26 FEB	22.1	26.5			6.3	10.3	3.1	1.5	32.7	32.4	66.9	66.5
MEAN	12.3	18.7			5.3	8.8	3.0	3.3	31.7	31.9	54.1	54.5
5 MAR	34.2	90.1			11.8	26.3	22.2	47.4	30.7	32.4	65.6	67.1
12 MAR	30.7	61.5			7.6	9.6	14.7	12.4	36.6	39.2	68.2	68.7
19 MAR	12.5	14.1			4.2	3.8	1.0	1.3	38.3	36.2	66.6	46.7
26 MAR	81.7	173.5			11.5	28.6	21.8	72.1	36.3	36.7	68.8	69.3
MEAN	39.8	84.8			8.8	17.1	14.9	33.3	35.5	36.1	67.3	63.0
2 APR	117.3	161.1	28.7	60.7	24.1	24.5	34.3	72.7	34.9	35.8	65.9	67.7
9 APR	98.1	248.3	26.6	57.3	39.0	95.2	27.2	72.1	34.5	34.6	65.2	65.8
16 APR	88.9	188.0	38.6	94.3	20.6	40.5	26.9	47.7	37.2	38.3	65.2	67.7
23 APR	1135.0	721.8	1043.2	648.1	35.4	43.8	53.8	24.2	42.6	42.9	74.7	75.1
30 APR	207.9	336.3	178.6	303.4	15.3	18.8	5.4	5.4	42.8	42.5	74.8	74.4
MEAN	329.4	331.1	263.1	232.8	26.9	44.6	29.5	44.4	38.4	38.8	69.2	70.1
7 MAY	136.7	153.3	127.6	140.1					42.3	42.7	71.8	72.1
14 MAY	619.5	390.7	609.4	371.2					49.8	47.7	79.0	77.0
21 MAY	238.3	222.0	228.5	211.3					53.3	52.0	82.9	81.8
28 MAY	148.4	138.3	142.2	137.6					52.2	52.8	80.8	82.8
MEAN	285.7	226.1	276.9	215.1					49.4	48.8	78.6	78.4

[a]Data from selected dates presented.

[b]Temperature probes #C318 and #C319; plant generation data.

- Rainbow Smelt

Rainbow smelt data from 17 Wednesday collections (Table IX-5) were used to test differences in day/night impingement rates for the period January-April 1975. The two-way analysis of variance indicated a significant difference ($\alpha = .05$) between day and night collections for impinged rainbow smelt. Night collections exhibited higher abundance.

e. Daily Impingement Comparisons

The upper limits of the annual rate of impingement in 1974 (for Mondays, Wednesdays, and Fridays), when estimated using the t-distribution techniques (LMS, 1975), differed significantly for each day. For instance, the estimated upper bound on the number of fish impinged in 1975 based on Monday collections was the highest, 4.5 million fish, as compared to 2.0 million and 3.0 million fish for Wednesdays and Fridays, respectively (LMS, 1975).

Daily impingement collections (Monday, Wednesday, and Friday) in 1974 (LMS, 1975) and 1975 were compared in order to reveal any systematic differences attributable to plant operation and/or the sampling scheme.

The average number of fish impinged per hour was estimated for Monday, Wednesday, and Friday separately throughout the year. The frequency with which the number of fish impinged on one day (e.g., Monday) exceeded those impinged on the other sampling days (Wednesday and Friday) is calculated for each month separately (Appendix IX-2).

The data indicated that the number of fish impinged per hour on Monday exceeded those impinged on Wednesday and Friday 31% of the time, Wednesday exceeded those impinged on Monday and Friday 35% of the time and Friday exceeded those of Monday and Wednesday 35% of the time (Appendix IX-2). Thus, even though the impingement rates may differ among different sampling days, no inherent bias is associated with the day itself. Hence all sampling days should be treated equally.

f. Comparison of Impinged Fish and Lake Fish

The abundances of lake fish and impinged fish were compared to determine whether fish become impinged immediately upon being entrained into the plant or whether a time lag precedes the impingement process; i.e., fish reside in the intake forebay for variable time periods.

Fish collected in impingement samples and those captured by gill nets set at the NMPP transect were compared on a daily basis. The number of fish per 24-hr period was estimated for impingement collections when two pumps were in operation and for surface and bottom gill net collections based on 1974 data. The impingement data for alewife and rainbow smelt were considered for this analysis for all dates coinciding with gill net samples (Appendix IX-3). It should be emphasized that these analyses are not intended to show numerical comparisons of the actual populations collected in the plant and the lake, but rather a comparison of the timing of the peaks in abundance between locations.

The number of alewife collected by gill nets showed a positive but insignificant (at $\alpha = .05$; Appendix IX-4) correlation with the number of alewife impinged in the period April-November 1974. In contrast to alewife, a significant correlation ($r = 0.96$, $\alpha = .005$, Appendix IX-4) was found between the number of rainbow smelt collected in gill nets and the number impinged on the same day.

The absence of a significant correlation between the abundance of lake alewife and impinged alewife per sampling date could indicate several possibilities: 1) the combination of surface and bottom gill net collections may have biased the data; 2) impinged fish may be coming from other transects (exhibit lateral or random movement); or 3) there may be a time lag before fish are impinged on the screens; thus, peaks of gill netted fish appear before peaks of impingement.

The first two possibilities were further tested using 1975 data and applying the same procedure with two reservations: 1) number of fish impinged per hour was correlated with bottom gill net collections per 12 hours in samples at 15 and 30 ft depth contours; and 2) the correlation was conducted for two transects, NMPP and NMPW.

The number of alewife impinged was not significantly correlated with the number of alewife collected in bottom gill nets at the selected stations (NMPW-15 ft, NMPW-30 ft, NMPP-15 ft and NMPP-30 ft stations) (Appendix IX-5).

Rainbow smelt exhibited a pattern similar to that of alewife at NMPW-30 ft and NMPP-30 ft stations (Appendix IX-6). In contrast to alewife, however, rainbow smelt showed a significant ($\rho = .005$) correlation ($r = 0.75$) between number of fish impinged and number of fish collected by gill nets at the NMPP-15 ft station. However, data in this case were fragmentary because rainbow smelt are not represented in 14 out of 21 days tested in gill nets (Appendix IX-6a).

A third possibility, a lag of one to several days between gill net collections and impingement, was investigated. If alewife showed a peak in the gill net catch on one day, a similar peak (not necessarily of the same magnitude) should appear one, or several days later for alewife impingement. Gill net and impingement data of alewife collected in 1974 were statistically analyzed.

The number of alewife collected in gill nets (Appendix IX-3) was compared with the estimated numbers of alewife impinged the same day and up to five days later than the date of the lake collection (Appendix IX-7). A significant correlation (ρ' = .005, r = 0.80) existed between the number of fish collected in gill nets and impingement collections occurring one day after lake collections (Appendix IX-8). The remaining time periods tested did not show a significant correllation. The presence of a high and significant correlation between alewife collected in gill nets and alewife impinged one day later indicated a period of residence of one day by fish in the intake forebay. It may be speculated that alewife resist impingement until they reach exhaustion, after which they are impinged. It should be emphasized that gill net data were examined only for collections at NMPP transect and for one species, the most abundant species.

B. JAMES A. FITZPATRICK NUCLEAR POWER PLANT

1. Introduction

The James A. FitzPatrick Nuclear Power Plant is located approximately 1/2 mile east of Nine Mile Point Nuclear Station on the southern shore of Lake Ontario. Operation at FitzPatrick Unit 1 began in summer 1975, but was interrupted at irregular intervals.

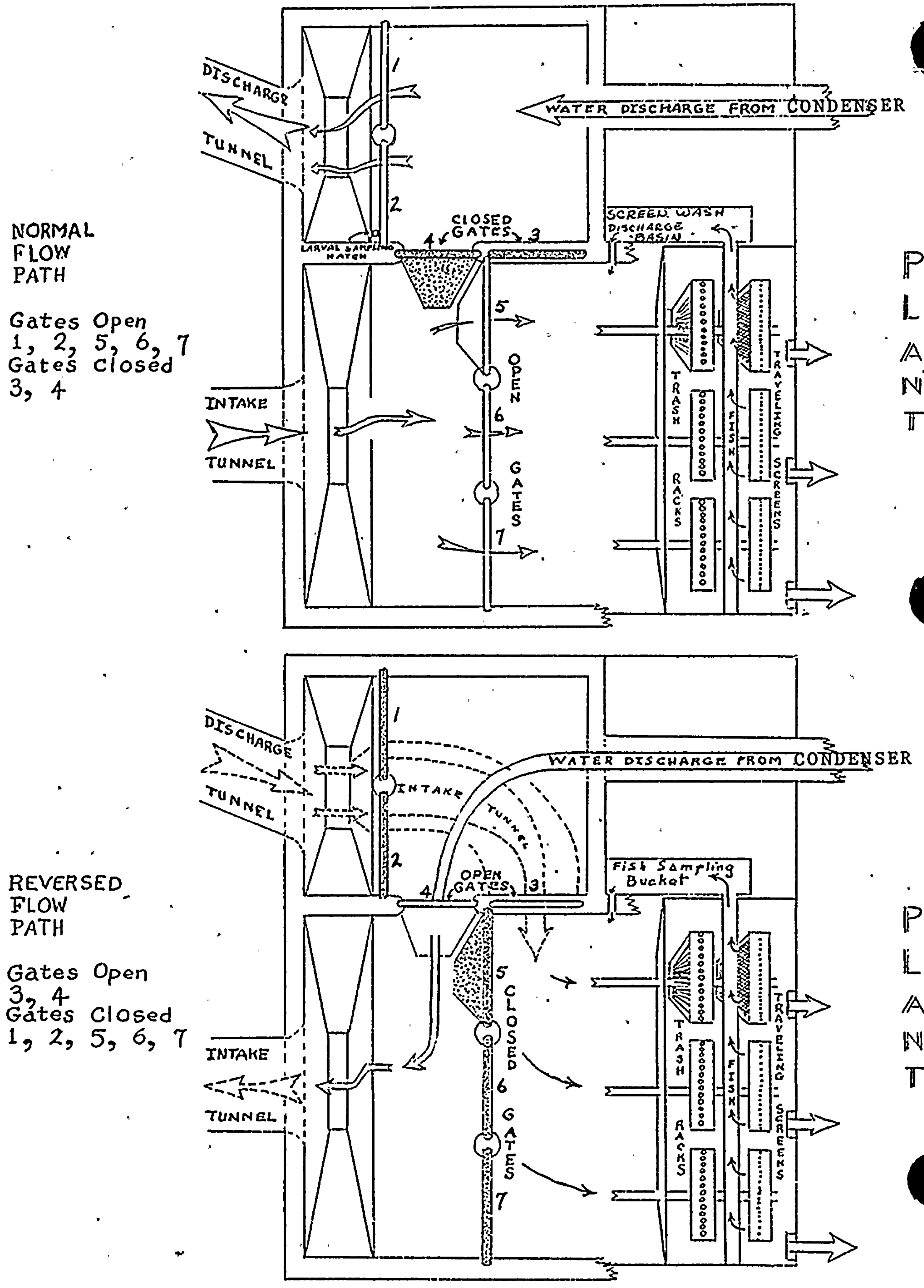
Cooling water for the James A. FitzPatrick Nuclear Power plant is drawn from the bottom waters of the lake by a maximum of three circulating water pumps, with a maximum capacity of 533 MGD. The water velocity through the intake structure ports is 1.2 fps increasing to 1.4 fps in the forebay in front of the screens. Normal and reversed flow paths are shown on Figure IX-3.

Under normal operating conditions, three screens are simultaneously rotated and backwashed for ten minutes every hour, and more frequently if clogging by *Cladophora* or fish occurs. Fish from the travelling screens are collected in a basket in the screen wash discharge basin and removed from the premises by land transportation, while the water from the wash cycle is returned to the forebay.

FIGURE IX-3

SCHEMATIC DIAGRAM OF WATER CIRCULATION PATTERNS

JAMES A. FITZPATRICK NUCLEAR POWER PLANT



The objectives of the 1975 FitzPatrick impingement program were:

- to determine the current impingement rate;
- to determine species composition and abundance at the FitzPatrick plant and to compare it to that at Nine Mile Point during the period September-December 1975;
- to assess the impact of the plant operation on the near-field fish community.

2. Materials and Methods

a. Field Collection

Field collection of impinged fish began on 10 September and continued through December 1975. As in the case of the Nine Mile Point Nuclear Station Unit 1, 24-hour composite samples were taken on Monday and Friday and hourly, and 24 hour samples were collected on Wednesday of each week throughout the program. All fish collected off the travelling screens were identified and enumerated in the field and subsequently preserved in 10% formalin. Fish collected off the trash racks were preserved and returned to the laboratory for analysis.

b. Laboratory Analysis

Fish collected from September through December 1975 were analyzed using the same procedures applied to Nine Mile Point Nuclear Station Unit 1 impingement samples (Chapter IX.A.2).

c. Statistical Analysis

All statistical tests and methodology are the same as those previously described (Chapter IX.A.2c).

3. Results and Discussion

a. Species Inventory

A total of 34 species were collected in impingement samples at the James A. FitzPatrick Nuclear Power Plant from 10 September through 31 December 1975 (Table IX-6). The most abundant species in impingement collections throughout the sampling period was alewife, which represented 70.2% of the total fish collected (Table IX-7), and were impinged in signficantly (α = .05) greater numbers in December than during other months sampled (Appendix IX-9). Rainbow smelt was the second most abundant species (13.27% of total fish collected); significantly (α = .05) more rainbow smelt were impinged in November and December than during the

TABLE IX-6

SPECIES INVENTORY OF FISHES IN IMPINGEMENT COLLECTIONS

JAMES A. FITZPATRICK NUCLEAR POWER PLANT - 1975

SCIENTIFIC NAME*	COMMON NAME
Family Petromyzontidae	
Petromyzon marinus	Sea lamprey
Family Anguillidae	
Anguilla rostrata	American eel
Family Clupeidae	
Alosa pseudoharengus	Alewife
Dorosoma cepedianum	Gizzard shad
Family Salmonidae	
Salmo trutta	Brown trout
Salvelinus namaycush	Lake trout
S. namaycush x *fontinalis*	Splake
Family Osmeridae	
Osmerus mordax	Rainbow smelt
Family Cyprinidae	
Semotilus atromaculatus	Creek chub
Umbra limi	Mudminnow
Rhinichthys cataractae	Longenose dace
Notropis hudsonius	Spottail shiner
N. atherinoides	Emerald shiner
Couesius plumbeus	Lake chub
Cyprinus carpio	Carp
Family Catostomidae	
Catostomus commersoni	White sucker

TABLE IX-6 (Continued)

SPECIES INVENTORY OF FISHES IN IMPINGEMENT COLLECTIONS

Family Ictaluridae	
Ictalurus nebulosus	Brown bullhead
I. punctatus	Channel catfish
Noturus flavus	Stonecat
Family Percopsidae	
Percopsis omiscomaycus	Trout perch
Family Gasterosteidae	
Gasterosteus aculeatus	Threespine stickleback
Family Amidae	
Amia calva	Bowfin
Family Cottidae	
Cottus bairdi	Mottled sculpin
Family Percichthyidae	
Morone americana	White perch
M. chrysops	White bass
Family Centrarchidae	
Ambloplites rupestris	Rock bass
Lepomis gibbosus	Pumpkinseed
L. macrochirus	Bluegill
Micropterus dolomieui	Smallmouth bass
M. salmoides	Largemouth bass
Pomoxis nigromaculatus	Black crappie
Family Percidae	
Etheostoma nigrum	Johnny darter
Perca flavescens	Yellow perch
Stizostedion vitreum	Walleye
Family Sciaenidae	
Aplodinotus grunniens	Freshwater drum

*American Fisheries Society, 1970.

TABLE IX-7

ABUNDANCE AND PERCENT COMPOSITION OF FISH IN IMPINGEMENT COLLECTIONS

JAMES A. FITZPATRICK NUCLEAR POWER PLANT - 10 SEPTEMBER - DECEMBER 1975

I. IMPINGEMENT COLLECTIONS

	SEP		OCT		NOV		DEC		TOTAL	
SPECIES	NO.	%	NO.	%	NO.	%	NO.	%	NO.	%
Alewife	2567	92.6	6541	69.5	6874	77.5	7594	60.6	23576	70.2
American eel	1	<0.1	4	<0.1	1	<0.1			6	<0.1
Black crappie			6	0.1	3	<0.1			9	<0.1
Bluegill sunfish	7	0.3	458	4.9	74	0.8	37	0.3	576	1.7
Bowfin			1	<0.1	1	<0.1			2	<0.1
Brown bullhead	3	0.1	1	<0.1	1	<0.1	6	<0.1	11	<0.1
Brown trout	1	<0.1							1	<0.1
Carp			1	<0.1					1	<0.1
Channel catfish			1	<0.1			4	<0.1	5	<0.1
Creek chub					1	<0.1			1	<0.1
Emerald shiner			5	0.1	3	<0.1	4	<0.1	12	<0.1
Freshwater drum			3	<0.1	3	<0.1	1	<0.1	7	<0.1
Gizzard shad	2	0.1	293	3.1	545	6.1	2577	20.6	3417	10.2
Johnny darter	4	0.1	42	0.4	25	0.3	5	<0.1	76	0.2
Lake chub							2	<0.1	2	<0.1
Lake trout			2	<0.1	2	<0.1	4	<0.1	8	<0.1
Largemouth bass			4	<0.1					4	<0.1
Longnose dace			3	<0.1			2	<0.1	5	<0.1
Mottled sculpin	15	0.5	80	0.8	169	1.9	91	0.7	355	1.1
Mudminnow			5	0.1	6	0.1	3	<0.1	14	<0.1
Pumpkinseed			8	0.1	2	<0.1	2	<0.1	12	<0.1
Rainbow smelt	89	3.2	1635	17.4	858	9.7	1834	14.6	4416	13.2
Rock bass	5	0.2	16	0.2	7	0.1	29	0.2	57	0.2
Sea lamprey			1	<0.1	1	<0.1			2	<0.1
Smallmouth bass	3	0.1	6	0.1	12	0.1	5	<0.1	26	0.1
Splake (hybrid Lake trout)					1	<0.1	1	<0.1	2	<0.1
Spottail shiner	50	1.8	158	1.7	125	1.4	92	0.7	425	1.3
Stonecat	7	0.3	45	0.5	27	0.3	6	<0.1	85	0.3
Threespine stickleback			1	<0.1	27	0.3	20	0.2	48	0.1
Trout-perch	4	0.1	6	0.1	8	0.1	14	0.1	32	0.1
Walleye							1	<0.1	1	<0.1
White bass					16	0.2	110	0.9	126	0.4
White perch	1	<0.1	46	0.5	43	0.5	46	0.4	136	0.4
White sucker	3	0.1	4	<0.1	3	<0.1	2	<0.1	12	<0.1
Yellow perch	10	0.4	41	0.4	26	0.3	39	0.3	116	0.3
TOTAL	2773	-	9417	-	8864	-	12531	-	33584	-
NO. HRS. SAMPLED	216		336		288		239			
AVG. NO. FISH/HR.	12.8		25.1		30.8		52.4			

II. TRASH RACK SAMPLES

DATE	SPECIES	NO.
26 SEP	White sucker	1
3 DEC	White sucker	1

TABLE IX-8

HOURLY DAY/NIGHT IMPINGEMENT RATES FOR SELECTED SPECIES

JAMES A. FITZPATRICK NUCLEAR POWER PLANT - 1975

DATE[a]	TOTAL FISH NUMBER/HR.		ALEWIFE NUMBER/HR.		RAINBOW SMELT NUMBER/HR.		BLUE GILL NUMBER/HR.		GIZZARD SHAD NUMBER/HR.	
	DAY	NIGHT	DAY	NIGHT	DAY	NIGHT	DAY	NIGHT	DAY	NIGHT
10 SEP	1.9	8.1	0.8	7.3	0.0	0.2				
17 SEP	0.8	4.7	0.7	4.1	0.0	0.1				
24 SEP[b]	3.1	36.3	2.7	34.8	0.1	0.8				
1 OCT[b]	6.4	16.1	0.8	4.2	0.2	3.1	5.2	7.7	0.0	0.3
8 OCT	3.5	47.4	2.2	35.3	0.8	7.7	0.0	0.2	0.1	2.8
15 OCT	11.7	35.1	8.4	29.9	1.0	0.8	0.1	1.1	0.8	0.7
22 OCT	1.4	5.5	0.9	5.0	0.1	0.2	0.0	0.0	0.1	0.0
29 OCT	1.7	5.4	1.3	3.9	0.1	0.1	0.0	<0.1	0.1	0.5
5 NOV	8.3	51.9	4.6	46.1	0.6	4.3			0.2	0.5
12 NOV[b]	19.7	24.1	10.3	13.2	6.1	8.5			0.8	0.4
19 NOV[b]	9.3	22.1	7.2	18.3	0.6	1.3			0.8	1.5
25 NOV	6.8	21.6	4.2	15.0	0.6	3.5			1.6	1.9
3 DEC[b]	78.9	66.0	23.3	33.4	5.3	12.8			46.4	17.8
10 DEC[b]	27.0	29.4	18.0	20.6	0.3	2.0			8.0	2.6
30 DEC	28.4	22.9	23.5	13.8	2.0	6.4			1.7	0.9

[a]Data from selected dates presented, three circulating water pumps operating unless noted otherwise.

[b]Two circulating water pumps were in operation (dates not included in statistical analysis; Appendix IX-9 and IX-10).

two preceding months (Appendix IX-10). Gizzard shad was third in abundance (10.2% of total fish collected in impingement samples), except during September when Spottail Shiner was the third most abundant species (Table IX-7).

b. Diel Patterns of Impingement

The day/night cycle of impingement was tested for the four most abundant fish species impinged at James A. FitzPatrick Nuclear Power Plant during the period September-December 1975: alewife, rainbow smelt, gizzard shad, and bluegill sunfish. The procedure followed was the same as described for the fish impinged at the Nine Mile Point plant; the Wednesday hourly impingement data were analyzed for day-night differences for the corresponding time of peak abundance for each species. The mean number of fish per hour per sampling date for the four most abundant species and total fish impinged was calculated irrespective of the number of circulating water pumps operating. The mean numbers of alewife impinged per hour per month in September, October, November, and December during periods of daylight and darkness are presented in Table IX-8.

The mean number of both alewife and rainbow smelt impinged per hour at night was significantly (α = .01) greater than the number impinged during the daylight hours from September through December (Appendix IX-9 and IX-10 respectively).

The analysis of bluebill data for five impingement sampling dates in October indicated that the peak in impingement occurred in the night collections. No difference could be detected in the day/night impingement rates of gizzard shad in October and November; however, the daylight impingement rate in December exceeded the night impingement rate.

c. Comparison of Impinged Fish and Lake Fish

The number of alewife and rainbow smelt impinged was compared with the number collected by gill nets at selected stations (NMPE-15 ft, NMPE-30 ft, FITZ-15 ft, FITZ-30 ft). The FITZ transect gill net collections were considered to represent fish in the immediate vicinity of the FitzPatrick plant, while those collected at NMPE transect represented fish moving westward along the shore. These groups were considered most vulnerable to impingement as well as subject to the effects of the FitzPatrick thermal plume. The same days were compared except for a few occasions when gill net data and impingement data were within ± 1 day of each other (Appendices IX-11a and IX-12a). Impingement data used were only those for days when three pumps were in operation; data for other operating conditions were disregarded.

No significant correlations (α = .05; Appendix IX-11b) existed between the number of alewife collected by gill nets at the selected stations and those impinged on the same days. However, the best correlation (r = 0.41) was found for alewife collected by bottom gill nets at the FITZ-30 ft station, the station nearest the intake.

Similarily, insignificant correlations (Appendix IX-12b) were exhibited between rainbow smelt impinged and those collected by gill nets at the selected stations.

The absence of significant correlations between impingement and gill net catches suggests that either fish caught in impingement catches do not reflect the fish population at these selected stations or that there is a lag period between entrainment and impingement.

C. CONCLUSIONS

The estimated number of fish impinged at Nine Mile Point plant, accounting for changes in level of effort, increased from 1973 to 1974; in 1975 the rate declined by 62%. The number of species increased from 37 species in 1973 to 48 and 47 species in 1974 and 1975, respectively.

Alewife and rainbow smelt were the two most abundant species in 1973 and 1974. In 1975 the alewife and threespine stickleback were the two most abundant fishes collected from impingement at Nine Mile Point Nuclear Station.

The annual rate of impingement at the Nine Mile Point plant in 1975 was lower than that of the preceeding year when estimated by the stratifying technique. The estimated annual number of fish impinged in 1975 is one million fish, whereas the estimate for 1974 is 2.0 million fish.

A total of 34 species were impinged at the FitzPatrick plant during the period September-December 1975. The majority of the fish impinged were alewife and rainbow smelt.

REFERENCES CITED

American Fisheries Society. 1970. A list of common and scientific names of fishes from the United States and Canada. 3rd. ed. Special Publ. 6:150p.

Graham, J.J. 1956. Observations on the alewife, Pomolobus pseudoharengus (Wilson), in freshwater. Univ. Toronto Biol. Ser. 62, Publ. Ont. Fish. Res. Lab. 74:43p.

Lawler, Matusky and Skelly Engineers. 1975. 1974 Nine Mile Point aquatic ecology studies. Prepared for Niagara Mohawk Power Corp. and Power Authority of the State of New York.

Mendenhall, W. 1969. Introduction to probability and statistics. Wadsworth Publ. Co., Belmont, Ca. 393p.

Quirk, Lawler and Matusky Engineers. 1974. 1973 Nine Mile Point aquatic ecology studies - Nine Mile Point Generating Station. Prepared for Niagara Mohawk Power Corp.

Richkus, W.A. 1974. The influence of environmental variables on migratory behavior of adults and juvenile alewives, Alosa pseudoharengus (Wilson) Ph.D. thesis, Univ. of Rhode Island. 225p.

Scott, W.B. and E.J. Crossman. 1973. Freshwater fishes of Canada. Fish. Res. Bd. Canada Bull. 184:966p.

Sokal, R.R. and J.F. Rohlf. 1969. Biometry: the principles and practice of statistics in biological research. W.H. Freeman and Co., San Francisco. 776p.

Steel, R.G.D. and J.H. Torrie. 1960. Principles and procedures of statistics. McGraw-Hill Book Co., Inc., New York. 481p.

Wells, L. 1968. Seasonal depth distribution of fish in southern Lake Michigan. Fish Bull. 67(1):1-15.

APPENDIX IX-1

STATISTICAL ANALYSIS OF THE ABUNDANCE OF SELECTED SPECIES IN DAY/NIGHT IMPINGEMENT COLLECTIONS

NINE MILE POINT NUCLEAR STATION UNIT 1 - 1975

I. ALEWIFE: APR - MAY

TWO-WAY ANALYSIS OF VARIANCE
(LOG TRANSFORMED)

SOURCE	DF	SS	MS	F
PHOTOPERIODS	1	0.0399	0.0399	1.47
DATES	8	3.3425		
BETWEEN MONTHS	1	0.3189	0.3189	11.81**
WITHIN MONTHS	7	3.0236		
APR	4	2.6316	0.6579	24.37**
MAY	3	0.3920	0.1307	4.84*
ERROR	8	0.2164	0.0270	
TOTAL	17	3.5988		

*Significant at $\alpha = .05$
**Significant at $\alpha = .01$

ESTIMATED MEANS FOR MONTHS

MONTH	ESTIMATED MEAN
APR	113.48
MAY	210.26

APPENDIX IX-1 (Con't)

STATISTICAL ANALYSIS OF SELECTED SPECIES IN IMPINGEMENT COLLECTIONS

II. THREESPINE STICKLEBACK: FEB - APR

TWO-WAY ANALYSIS OF VARIANCE
(LOG TRANSFORMED)

SOURCE	DF	SS	MS	F
PHOTOPERIODS	1	0.1045	0.1045	2.91
DATES	12	13.2613		
BETWEEN MONTHS	2	6.9653	3.4827	97.01**
WITHIN MONTHS	10	6.2960		
FEB	3	2.0157	0.6719	18.72**
MAR	3	3.0067	1.0022	27.92**
APR	4	1.2736	0.3184	8.87**
ERROR	12	0.4304	0.0359	
TOTAL	25	13.7962		

**Significant at $\alpha = .01$

ESTIMATED MEANS FOR MONTHS

MONTH	ESTIMATED MEAN
FEB	1.60
MAR	11.86
APR	27.40

FISHER SIGNIFICANT DIFFERENCE - MONTHS ($\alpha = .05$)

Largest: APR MAR FEB : Smallest

STATISTICAL ANALYSIS OF SELECTED SPECIES IN IMPINGEMENT COLLECTIONS

III. RAINBOW SMELT: JAN - APR

TWO-WAY ANALYSIS OF VARIANCE
(LOG TRANSFORMED)

SOURCE	DF	SS	MS	F
PHOTOPERIODS	1	0.2738	0.2738	14.01**
DATES	16	4.1185		
BETWEEN MONTHS	3	2.5706	0.8569	43.94**
WITHIN MONTHS	13	1.5479		
JAN	3	0.5817	0.1939	9.94**
FEB	3	0.0300	0.0100	0.51
MAR	3	0.5809	0.1936	9.93**
APR	4	0.3553	0.0888	4.55*
ERROR	16	0.3128	0.0195	
TOTAL	33	4.7050		

*Significant at α = .05
**Significant at α = .01

ESTIMATED MEANS FOR PHOTOPERIODS

PHOTOPERIODS	ESTIMATED MEANS
DAY	9.73
NIGHT	14.71

ESTIMATED MEANS FOR MONTHS

MONTH	ESTIMATED MEAN
JAN	7.74
FEB	6.58
MAR	10.22
APR	30.99

FISHER SIGNIFICANT DIFFERENCE - MONTHS (α = .05)

Largest: APR MAR JAN FEB : Smallest

APPENDIX IX-2

COMPARISONS OF IMPINGEMENT FOR
MONDAY, WEDNESDAY AND FRIDAY COLLECTIONS

NINE MILE POINT NUCLEAR STATION UNIT 1 - 1974-1975

MONTH*	NUMBER OF TIMES A SAMPLING DAY EXCEEDS THE OTHER 2 DAYS					
	MONDAY		WEDNESDAY		FRIDAY	
	1974	1975	1974	1975	1974	1975
JAN	2	1	1	1	0	2
FEB	1	0	2	1	2	3
MAR	3	2	0	1	1	1
APR	1	2	2	1	1	1
MAY	1	2	3	0	1	2
JUN	2	0	1	2	1	2
JUL	2	1	1	3	2	1
AUG	4	0	0	4	0	1
SEP	2	3	0	2	3	1
OCT	1	1	3	2	0	2
NOV	0	2	3	0	1	1
DEC	3	2	1	1	0	1
TOTAL	22	16	17	18	12	18
PERCENT	43	30.8	33	34.6	24	34.6

* Only weeks when three collections were conducted are included. When the impingement rate on three days was equal, the set of data is not included.

APPENDIX IX-3

ABUNDANCE[a] OF ALEWIFE AND RAINBOW SMELT IN IMPINGEMENT AND GILL NET[b] COLLECTIONS BY DATE

NINE MILE POINT NUCLEAR STATION UNIT 1 AND VICINITY - 1974

DATE	ALEWIFE		RAINBOW SMELT	
	LAKE	IN-PLANT	LAKE	IN-PLANT
18 APR	431	14744	304	670
7 MAY	983	18244	96	352
22 MAY	669	6067	78	274
6 JUN	783	7476	2	90
20 JUN	197	4259	2	94
10 JUL	2107	7404	2	17
24 JUL	897	1027	2	0
8 AUG	459	656	0	0
21 AUG	504	7409	5	0
10 SEP	114	2702	6	0
24 SEP	130	562	4	0
9 OCT	149	1604	14	16
26 OCT	67	846	7	12
8 NOV	196	615	13	13
19 NOV	178	596	6	22

[a]No. fish/24 hours
[b]Mean of surface and bottom gill net collections at NMPP transect

APPENDIX IX-4

CORRELATION BETWEEN ABUNDANCE OF ALEWIFE AND RAINBOW SMELT COLLECTED IN IMPINGEMENT AND SELECTED BOTTOM GILL NET STATIONS

NINE MILE POINT NUCLEAR STATION UNIT 1 AND VICINITY - 1974

PARAMETERS

X = Number of fish impinged/24 hr
Y = Gill net catch (No. fish/24 hr)
r = Correlation coefficient
t = $r \sqrt{(n-2)/(1-r^2)}$
n = Number of samples

I. ALEWIFE

Summation of X = 74211
Summation of Y = 7864
Summation of XY = 56500151
Summation of X SQ. 783903401
Summation of Y SQ. = 8086950
r = 0.43
t = 1.7+

II. RAINBOW SMELT

Summation of X = 1560
Summation of Y = 541
Summation of XY = 259855
Summation of X SQ. = 666158
Summation of Y SQ. = 108259
r = 0.96
t = 12.3**

+ Not significant at ρ = .05
** Significant at ρ = .005

APPENDIX IX-5a

ABUNDANCE OF ALEWIFE IN IMPINGEMENT AND SELECTED BOTTOM GILL NET COLLECTIONS

NINE MILE POINT NUCLEAR STATION UNIT 1 AND VICINITY - APRIL-DECEMBER 1975

DATES		NO. OF FISH IMPINGED PER HOUR	NO. OF FISH COLLECTED PER 12 HOURS IN GILL NETS			
GILL NETS	IMPINGEMENT		NMPW-15 FT	NMPW-30 FT	NMPP-15 FT	NMPP-30 FT
25-26 APR	25-26 APR	1325.1	36.6	25.0	12.0	14.9
8-9 MAY	7-8 MAY	133.9	82.1	2.3	16.9	3.7
9-10 MAY	9-10 MAY	684.9	94.4	0.0	10.0	4.0
21-22 MAY	21-22 MAY	219.9	8.3	0.5	4.8	4.1
11-12 JUN	11-12 JUN	125.2	2.0	0.5	1.0	0.5
24-25 JUN	23-24 JUN	46.6	140.1	22.8	11.6	16.4
25-26 JUN	25-26 JUN	100.9	9.7	1.5	9.7	8.1
9-10 JUL	9-10 JUL	30.4	1.5	0.0	0.0	1.0
23-24 JUL	23-24 JUL	0.2	65.1	85.9	1.0	15.0
5-7 AUG	6-7 AUG	11.3	0.5	4.3	8.4	0.0
21-23 AUG	22-23 AUG	0.4	10.0	7.1	8.8	0.0
10-11 SEP	10-11 SEP	0.2	2.5	21.7	8.5	0.0
11-12 SEP	12-13 SEP	0.1	0.5	8.3	6.0	3.5
23-25 SEP	24-25 SEP	0.4	2.3[a]	19.4[a]	3.5[b]	1.5[b]
8-9 OCT	8-9 OCT	2.4	0.9	2.0	19.9	11.2
22-23 OCT	22-23 OCT	0.8	11.5	4.0	36.7	5.9
5-6 NOV	5-6 NOV	0.6	12.2	2.6	21.0	24.3
6-7 NOV	7-8 NOV	0.9	49.4	12.9	16.8	10.8
18-19 NOV	17-18 NOV	14.6	17.5	1.5	39.5	7.4
19-20 NOV	19-20 NOV	9.2	17.5	0.5	13.6	23.1
5-6 DEC	5-6 DEC	3.9	28.6	6.2	23.6	8.1

a - Collected 24-25 SEP
b - Based on 48 Hours

APPENDIX IX-5b

CORRELATION BETWEEN ABUNDANCE OF ALEWIFE
COLLECTED IN IMPINGEMENT AND SELECTED BOTTOM GILL NET STATIONS

NINE MILE POINT NUCLEAR STATION UNIT 1 AND VICINITY - 1975

PARAMETERS

X = Number of fish impinged/hr
Y = Gill net catch (No. of fish/12 hr)
r = Correlation coefficient
$t = r \sqrt{(n-2)/(1-r^2)}$
n = Number of samples

I. NMPW-15 FT

Summation of X = 2711.9
Summation of Y = 593.2
Summation of XY = 134390.29
Summation of X SQ. = 2320663.49
Summation of Y SQ. = 45291.34
r = 0.24
t = 1.08+

II. NMPW-30 FT

Summation of X = 2711.9
Summation of Y = 229.0
Summation of XY = 34975.24
Summation of X SQ. = 2320663.49
Summation of Y SQ. = 9750.84
r = 0.05
t = 0.22+

III. NMPP-15 FT

Summation of X = 2711.9
Summation of Y = 273.3
Summation of XY = 28714.16
Summation of X SQ. = 2320663.49
Summation of Y SQ. = 5820.11
r = -0.10
t = -0.44+

IV. NMPP-30 FT

Summation of X = 2711.9
Summation of Y = 163.5
Summation of XY = 25967.14
Summation of X SQ. = 2320663.49
Summation of Y SQ. = 2365.19
r = 0.10
t = 0.44+

+ Not significant at $\rho = .05$

APPENDIX IX-6a

ABUNDANCE OF RAINBOW SMELT IN IMPINGEMENT AND SELECTED BOTTOM GILL NET COLLECTIONS

NINE MILE POINT NUCLEAR STATION UNIT 1 AND VICINITY - APRIL-DECEMBER 1975

DATES		NO. OF FISH IMPINGED PER HOUR	NO. OF FISH COLLECTED PER 12 HOURS IN GILL NETS			
GILL NETS	IMPINGEMENT		NMPW-15 FT	NMPW-30 FT	NMPP-15 FT	NMPP-30 FT
25-26 APR	25-26 APR	15.4	3.3	0.8	4.0	0.0
8-9 MAY	7-8 MAY	6.0	2.8	0.0	0.5	1.8
9-10 MAY	9-10 MAY	11.0	0.0	0.0	1.0	0.5
21-22 MAY	21-22 MAY	3.9	0.0	0.0	0.0	1.0
11-12 JUN	11-12 JUN	0.5	0.0	0.0	0.0	0.0
24-25 JUN	23-24 JUN	0.0	0.0	0.0	0.0	0.0
25-26 JUN	25-26 JUN	0.6	0.0	0.0	0.0	0.0
9-10 JUL	9-10 JUL	0.0	0.0	0.0	0.0	0.0
23-24 JUL	23-24 JUL	0.0	0.0	0.0	0.0	0.0
5-7 AUG	6-7 AUG	1.9	0.0	0.0	0.0	0.0
21-23 AUG	22-23 AUG	0.0	0.0	0.0	0.0	0.0
10-11 SEP	10-11 SEP	0.0	0.0	0.0	0.0	0.0
11-12 SEP	12-13 SEP	0.0	0.0	0.0	0.0	0.0
23-25 SEP	24-25 SEP	0.0	0.0[a]	0.4[a]	0.0[b]	0.0[b]
8-9 OCT	8-9 OCT	0.4	0.0	0.0	0.0	0.0
22-23 OCT	22-23 OCT	0.0	0.5	0.0	0.0	0.0
5-6 NOV	5-6 NOV	0.1	1.0	1.0	0.0	1.5
6-7 NOV	7-8 NOV	0.1	5.5	5.0	0.0	2.0
18-19 NOV	17-18 NOV	0.3	4.5	1.0	1.0	1.8
19-20 NOV	19-20 NOV	0.2	2.7	0.5	2.0	3.1
5-6 DEC	5-6 DEC	0.6	0.0	0.0	0.0	0.0

a - Collected 24-25 SEP
b - Based on 48 hours

APPENDIX IX-6b

CORRELATION BETWEEN ABUNDANCE OF RAINBOW SMELT COLLECTED IN IMPINGMENT AND SELECTED BOTTOM GILL NET STATIONS

NINE MILE POINT NUCLEAR STATION UNIT 1 AND VICINITY - 1975

PARAMETERS

X = Number of fish impinged/hr
Y = Gill net catch (No. of fish/12 hr)
r = Correlation coefficient
$t = r\sqrt{(n-2)/(1-r^2)}$
n = Number of samples

I. NMPW-15 FT

Summation of X = 41.0
Summation of Y = 20.3
Summation of XY = 70.16
Summation of X SQ. = 414.26
Summation of Y SQ. = 77.77
r = 0.22
t = 0.98**

II. NMPW-30 FT

Summation of X = 41.0
Summation of Y = 8.7
Summation of XY = 13.32
Summation of X SQ. = 414.26
Summation of Y SQ. = 28.05
r = -0.04
t = -0.17+

III. NMPP-15 FT

Summation of X = 41.0
Summation of Y = 8.5
Summation of XY = 76.30
Summation of X SQ. = 414.26
Summation of Y SQ. = 22.25
r = 0.75
t = 4.36**

IV. NMPP-30 FT

Summation of X = 41.0
Summation of Y = 11.7
Summation of XY = 21.71
Summation of X SQ. = 414.26
Summation of Y SQ. = 23.59
r = -0.01
t = -0.04+

+ Not significant at $\rho = .05$
** Significant at $\rho = .005$

APPENDIX IX-7

ABUNDANCE OF ALEWIFE IN GILL NET AND IMPINGEMENT COLLECTIONS AFTER A VARIABLE TIME FOLLOWING LAKE COLLECTIONS

NINE MILE POINT NUCLEAR STATION UNIT 1 AND VICINITY - 1974

DATE	NO. FISH/ 24 HRS[a]	NO. FISH IMPINGED/HR AFTER A PERIOD (DAYS) FOLLOWING LAKE COLLECTIONS					
		0	1	2	3	4	5
18 APR	431	307[b]	239			69	
23 APR	461	69	429		826	189	
7 MAY	983	11503	1152	257	389		
22 MAY	669	254		848	11982		286
6 JUN	783	312	272			132	
20 JUN	197	178	135			271	
10 JUL	2107	309		389			340
24 JUL	897	37		47			78
8 AUG	459	27	27			906	423
21 AUG	504	308		240			123
10 SEP	114	113	106		415		
24 SEP	130	23	23		26		
9 OCT	149	67		27			19
26 OCT	67	35		42		41	
8 NOV	196	26			41		24
19 NOV	178	25	36		22		
8 DEC	50		244		15		90

[a] Mean of surface and bottom gill nets at NMPP transect

[b] Collected on 17 APR

APPENDIX IX-8

CORRELATION BETWEEN NUMBER OF ALEWIFE COLLECTED BY GILL NETS AND NUMBER OF ALEWIFE IMPINGED AFTER 0-5 DAY LAG PERIODS

NINE MILE POINT NUCLEAR STATION UNIT 1 AND VICINITY - 1974

PARAMETERS

X = Number of fish impinged/hr
Y = Gill net catch (No. of fish/12 hr)
r = Correlation coefficient
$t = r \sqrt{(n-2)/(1-r^2)}$
n = Number of samples

I. 0 DAY LAG

Summation of X = 13593
Summation of Y = 8325
Summation of XY = 12810486
Summation of X SQ. = 132824319
Summation of Y SQ. = 8299471
r = 0.26
t = 1.01+

II. 1 DAY LAG

Summation of X = 2663
Summation of Y = 3980
Summation of XY = 1766176
Summation of X SQ. = 1733801
Summation of Y SQ. = 2348266
r = 0.80
t = 3.77**

III. 2 DAY LAG

Summation of X = 1850
Summation of Y = 5376
Summation of XY = 1809522
Summation of X SQ. = 998776
Summation of Y SQ. = 6938614
r = 0.32
t = 0.76+

IV. 3 DAY LAG

Summation of X = 13716
Summation of Y = 2781
Summation of XY = 8842523
Summation of X SQ. = 144577212
Summation of Y SQ. = 1728867
r = 0.42
t = 1.13+

V. 4 DAY LAG

Summation of X = 1608
Summation of Y = 2398
Summation of XY = 692212
Summation of X SQ. = 953864
Summation of Y SQ. = 1265350
r = 0.12
t = 0.24+

VI. 5 DAY LAG

Summation of X = 1383
Summation of Y = 5031
Summation of XY = 1245864
Summation of X SQ. = 406575
Summation of Y SQ. = 6219433
r = 0.53
t = 1.53+

+ = Not significant at $\rho = .05$
** = Significant at $\rho = 0.005$

APPENDIX IX-9

STATISTICAL ANALYSIS OF ABUNDANCE OF ALEWIFE IN IMPINGEMENT COLLECTIONS

JAMES A. FITZPATRICK NUCLEAR POWER PLANT - 1975

ANALYSIS OF VARIANCE
(LOG TRANSFORMED)

SOURCE	DF	SS	MS	F
PHOTOPERIODS (DAY/NIGHT)	1	1.4852	1.4852	20.67**
DATES[a]	11	2.5599		
BETWEEN MONTHS	3	1.2999	0.4333	6.03*
WITHIN MONTHS	8	1.2600		
SEP	2	0.3927	0.1964	2.73
OCT	3	0.7712	0.2571	3.58+
NOV	2	0.0632	0.0316	0.44
DEC	1	0.0329	0.0329	0.46
ERROR	11	0.7902	0.0718	
TOTAL	23	4.8353		

* Significant at $\alpha = .05$
** Significant at $\alpha = .01$
\+ Significant at $\alpha = .10$

ESTIMATED MEANS FOR PHOTOPERIODS

	ESTIMATED MEAN	95% CI
DAY	4.07	(2.43, 6.51)
NIGHT	14.96	(9.78, 22.61)

ESTIMATED MEANS FOR BETWEEN MONTHS

	ESTIMATED MEAN	95% CI
SEP	4.08	(1.92, 7.84)
OCT	5.76	(3.18, 9.92)
NOV	11.33	(6.09, 20.47)
DEC	22.46	(10.90, 45.27)

SCHEFFE'S METHOD - BETWEEN MONTHS ($\alpha = .05$)
Largest: DEC NOV OCT SEP : Smallest

[a]Only those dates when three circulating water pumps were operating

APPENDIX IX-10

STATISTICAL ANALYSIS OF RAINBOW SMELT IN IMPINGEMENT COLLECTIONS

JAMES A. FITZPATRICK NUCLEAR POWER PLANT - 1975

ANALYSIS OF VARIANCE
(LOG TRANSFORMED)

SOURCE	DF	SS	MS	F
PHOTOPERIODS (DAY/NIGHT)	1	0.3359	0.3359	12.08**
DATES[a]	11	2.6028		
BETWEEN MONTHS	3	1.8008	0.6003	21.59**
WITHIN MONTHS	8	0.8020		
SEP	2	0.0190	0.0095	0.34
OCT	3	0.4017	0.1339	4.82*
NOV	2	0.2934	0.1467	5.28*
DEC	1	0.0879	0.0879	3.16
ERROR	11	0.3058	0.0278	
TOTAL	23	3.2445		

*Significant at $\alpha = .05$
**Significant at $\alpha = .01$

ESTIMATED MEANS FOR PHOTOPERIODS

	ESTIMATED MEAN	95% CI
DAY	0.85	(0.45, 1.37)
NIGHT	2.20	(1.50, 3.08)

ESTIMATED MEANS FOR BETWEEN MONTHS

	ESTIMATED MEAN	95% CI
SEP	0.17	
OCT	0.76	(0.30, 1.37)
NOV	3.00	(1.84, 4.65)
DEC	5.62	(3.34, 9.11)

SCHEFFE'S METHOD - BETWEEN MONTHS ($\alpha = .05$)
Largest: <u>DEC NOV</u> <u>OCT SEP</u>: Smallest

[a]Only those dates when three circulating water pumps were operating.

APPENDIX IX-11a

ABUNDANCE OF ALEWIFE IN IMPINGEMENT AND SELECTED BOTTOM GILL NET COLLECTIONS

JAMES A. FITZPATRICK NUCLEAR POWER PLANT AND VICINITY
SEPTEMBER-DECEMBER 1975

DATES*		NO. OF FISH	NO. OF FISH COLLECTED PER 12 HOURS IN GILL NETS			
GILL NETS	IMPINGEMENT	IMPINGED PER HOUR	NMPE-15 FT	NMPE-30 FT	FITZ-15 FT	FITZ-30 FT
10-11 SEP	10-11 SEP	4.1	37.9	17.9	6.6	3.5
23-24 SEP	22-23 SEP	71.9	5.1	6.5	8.4	2.3
24-25 SEP	24-25 SEP	18.8	15.1	0.4	10.4	1.6
8- 9 OCT	8- 9 OCT	18.8	3.0	5.5	17.8	0.5
22-23 OCT	22-23 OCT	3.0	4.2	1.0	24.0	0.5
23-24 OCT	24-25 OCT	12.9	7.9	3.6	36.0	0.0
5- 6 NOV	5- 6 NOV	25.4	16.2	44.1	36.6	0.0
6- 7 NOV	7- 8 NOV	25.9	10.5	6.0	31.3	0.5
4- 5 DEC	3- 4 DEC	30.0	37.8	7.8	36.6	3.1
5- 6 DEC	5- 6 DEC	48.0	32.7	0.0	18.5	14.5

*Only those dates when three circulating pumps were operating.

APPENDIX IX-11b

CORRELATION BETWEEN ABUNDANCE OF ALEWIFE COLLECTED IN IMPINGEMENT AND SELECTED BOTTOM GILL NET STATIONS

JAMES A. FITZPATRICK NUCLEAR POWER PLANT AND VICINITY - 1975

PARAMETERS

X = Number of fish impinged/hour
Y = Gill net catch (No.fish/12 hr)
r = Correlation coefficient
$t = r\sqrt{(n-2)/(1-r^2)}$
n = number of samples

I. NMPE - 15 FT

Summation of X = 258.8
Summation of Y = 130.4
Summation of XY = 4363.90
Summation of X SQ. = 10588.68
Summation of Y SQ. = 4650.30
r = -0.02
t = -0.06+

II. NMPE - 30 FT

Summation of X = 258.8
Summation of Y = 92.8
Summation of XY = 2210.64
Summation of X SQ. = 10588.68
Summation of Y SQ. = 2448.68
r = -0.08
t = -0.23+

III. FITZ - 15 FT

Summation of X = 258.8
Summation of Y = 226.2
Summation of XY = 5423.89
Summation of X SQ. = 10588.68
Summation of Y SQ. = 6412.18
r = -0.19
t = -0.55+

IV. FITZ - 30 FT

Summation of X = 258.8
Summation of Y = 26.5
Summation of XY = 1022.65
Summation of X SQ. = 10588.68
Summation of Y SQ. = 240.71
r = 0.41
t = 1.27+

+ Not significant at $\rho = .05$

APPENDIX IX-12a

ABUNDANCE OF RAINBOW SMELT IN IMPINGEMENT AND SELECTED BOTTOM GILL NET COLLECTIONS

JAMES A. FITZPATRICK NUCLEAR POWER PLANT AND VICINITY
SEPTEMBER-OCTOBER 1975

DATES*		NO. OF FISH	NO. OF FISH COLLECTED PER 12 HOURS IN GILL NETS			
GILL NET	IMPINGEMENT	IMPINGED PER HOUR	NMPE-15 FT	NMPE-30 FT	FITZ-15 FT	FITZ-30 FT
10-11 SEP	10-11 SEP	0.1	0.0	0.0	0.0	0.0
23-24 SEP	22-23 SEP	1.1	0.0	0.0	0.0	0.0
24-25 SEP	24-25 SEP	0.5	0.0	0.0	0.0	0.0
8- 9 OCT	8- 9 OCT	4.3	0.0	0.0	0.0	0.0
22-23 OCT	22-23 OCT	0.2	0.5	0.5	0.5	0.5
23-24 OCT	24-25 OCT	0.0	0.5	0.5	2.5	0.0
5- 6 NOV	5- 6 NOV	2.5	1.5	1.5	2.2	2.2
6- 7 NOV	7- 8 NOV	1.4	2.0	3.0	3.5	2.0
4- 5 DEC	3- 4 DEC	10.0	0.0	0.0	1.6	0.0
5- 6 DEC	5- 6 DEC	2.7	0.0	0.0	0.5	0.5

*Only those dates when three circulating pumps were operating.

APPENDIX IX-12b

CORRELATION BETWEEN ABUNDANCE OF RAINBOW SMELT
COLLECTED IN IMPINGEMENT AND SELECTED BOTTOM GILL NET STATIONS

JAMES A. FITZPATRICK NUCLEAR POWER PLANT AND VICINITY - 1975

PARAMETERS

X = Number of fish impinged/hour
Y = Gill net catch (No. fish/12 hr)
r = Correlation coefficient
$t = r\sqrt{(n-2)/(1-r^2)}$
n = Number of samples

I. NMPE - 15 FT

Summation of X = 22.8
Summation of Y = 4.5
Summation of XY = 6.65
Summation of X SQ. = 135.50
Summation of Y SQ. = 6.75
r = -0.18
t = -0.52+

II. NMPE - 30 FT

Summation of X = 22.8
Summation of Y = 5.5
Summation of XY = 8.05
Summation of X SQ. = 135.50
Summation of Y SQ. = 11.75
r = -0.17
t = -0.49+

III. FITZ - 15 FT

Summation of X = 22.8
Summation of Y = 10.8
Summation of XY = 27.85
Summation of X SQ. = 135.50
Summation of Y SQ. = 26.50
r = 0.09
t = 0.26+

IV. FITZ - 30 FT

Summation of X = 22.8
Summation of Y = 5.2
Summation of XY = 9.75
Summation of X SQ. = 135.50
Summation of Y SQ. = 9.34
r = -0.09
t = -0.26+

+ Not significant at $\rho = 0.05$

TELEDYNE ISOTOPES

IWL-4715-389

APPENDIX X

NINE MILE POINT/FITZPATRICK GENERATING STATION

WATER MONITORING PROGRAM

SAMPLES FROM LAKE ONTARIO

SUMMARY REPORT

April 1975 - December 1975

Prepared for

Lawler, Matusky & Skelly, Engineers
415 Route 303
Tappan, New York 10983

Prepared by

Teledyne Isotopes
50 Van Buren Avenue
Westwood, New Jersey 07675

TELEDYNE ISOTOPES

TABLE OF CONTENTS

I. INTRODUCTION

This report presents the results of the radioanalysis of water samples collected from Lake Ontario in the vicinity of the Niagara Mohawk Power Corporation, Nine Mile Point/Fitzpatrick Generating Station.

Samples were collected monthly from April 1975 through December 1975 from twelve sampling stations and analyzed at Teledyne Isotopes, Westwood, New Jersey for:

- Gross alpha and gross beta activity
- Tritium activity by gas counting
- Gamma emitting nuclides by Ge(Li) gamma spectrometry

II. SAMPLING LOCATIONS AND MAP

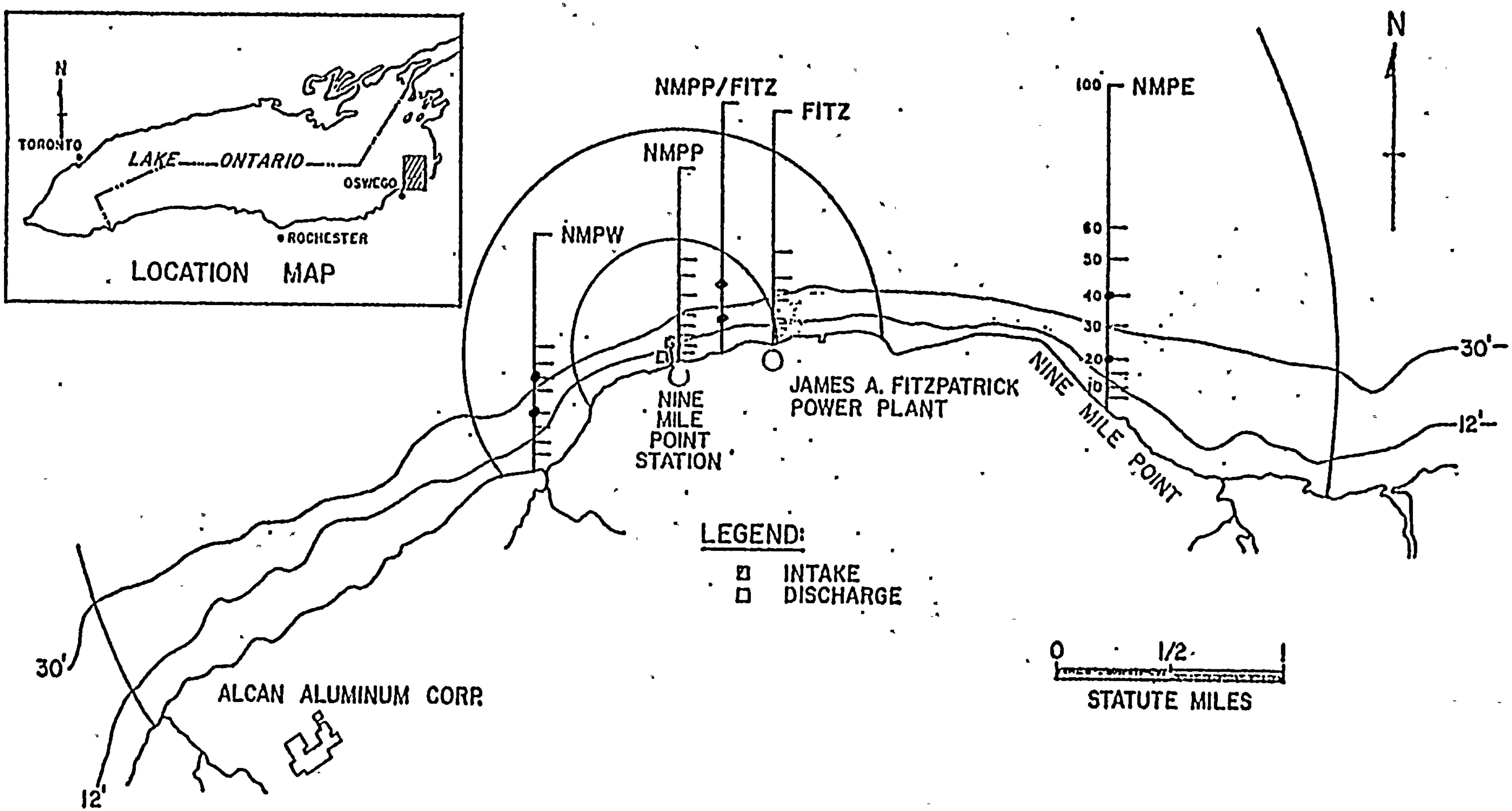
The sampling locations are shown in the table below, "Radiological Sampling Station Designations." A map is also appended of the Nine Mile Point Ecological Study Area.

RADIOLOGICAL SAMPLING STATION DESIGNATIONS

Station Identification	LMS Transect	Water Depth	Collection Depth
NMP-1	NMPE	20 ft.	Surface
NMP-2	NMPE	20 ft.	Bottom
NMP-3	NMPE	40 ft.	Surface
NMP-4	NMPE	40 ft.	Bottom
NMP-7	NMPP/Fitz	20 ft.	Surface
NMP-8	NMPP/Fitz	20 ft.	Bottom
NMP-9	NMPP/Fitz	40 ft.	Surface
NMP-10	NMPP/Fitz	40 ft.	Bottom
NMP-13	NMPW	20 ft.	Surface
NMP-14	NMPW	20 ft.	Bottom
NMP-15	NMPW	40 ft.	Surface
NMP-16	NMPW	40 ft.	Bottom

On the map the dot (•) closest to the shore at the three LMS transects is at the 20 ft. water depth. The dot farthest from shore is at the 40 ft. water depth.

NINE MILE POINT ECOLOGICAL STUDY AREA



III. SAMPLE RESULTS

Included in this section are summary tables of the radioanalysis performed at each station for:

- gross beta activity
- gross alpha activity
- tritium activity
- gamma emitters (the 16 gamma emitters routinely monitored in the environs of a nuclear generating station)

The mean ± standard deviation and the range are determined for analyses showing more than two detected measurements. Gross beta and tritium radioanalysis are in this category.

The less than (L.T.) values are tabulated for each of the radionuclides monitored but not detected. If no activity above three times the standard deviation of the background was detected, the results are tabulated as L.T. values. Gamma spectra and most of the gross alpha radioanalyses are in this category.

NINE MILE POINT/FITZP[illegible]CK GENERATING STATION

ENVIRONMENTA[illegible]ORING 1975

STATION NMP 1

EAST CONTROL 20' SURFACE

WATER (picocuries/liter)

COLLECTION DATE	GROSS BETA	GROSS ALPHA	TRITIUM	Be-7	K-40	Mn-54	Co-58	Co-60	Zr-95
04/11/75	4.2+-1.0 E 00	L.T.1 E 00	3.7+-0.7 E 02	L.T.2 E 02	L.T.1 E 02	L.T.5 E 00	L.T.1 E 01	L.T.4 E 00	L.T.3 E 01
05/05/75	4.4+-1.0 E 00	2.7+-1.7 E 00	6.5+-0.8 E 02	L.T.2 E 02	L.T.9 E 01	L.T.6 E 00	L.T.1 E 01	L.T.5 E 00	L.T.3 E 01
06/05/75	3.5+-0.9 E 00	L.T.2 E 00	3.7+-0.7 E 02	L.T.1 E 02	L.T.1 E 02	L.T.5 E 00	L.T.1 E 01	L.T.5 E 00	L.T.2 E 01
07/07/75	3.9+-0.9 E 00	L.T.1 E 00	4.1+-0.8 E 02	L.T.1 E 02	L.T.8 E 01	L.T.6 E 00	L.T.1 E 01	L.T.5 E 00	L.T.2 E 01
08/12/75	4.8+-0.9 E 00	L.T.2 E 00	3.2+-0.9 E 02	L.T.2 E 02	L.T.2 E 02	L.T.1 E 01	L.T.2 E 01	L.T.1 E 01	L.T.3 E 01
09/10/75	4.7+-1.0 E 00	L.T.1 E 00	5.0+-0.8 E 02	L.T.1 E 02	L.T.2 E 02	L.T.8 E 00	L.T.1 E 01	L.T.5 E 00	L.T.2 E 01
10/07/75	3.5+-0.9 E 00	L.T.1 E 00	3.9+-0.8 E 02	-	-	L.T.1 E 01	L.T.1 E 01	L.T.9 E 00	L.T.2 E 01
11/12/75	3.5+-0.9 E 00	L.T.2 E 00	4.5+-0.9 E 02	L.T.8 E 01	L.T.2 E 02	L.T.7 E 00	L.T.8 E 00	L.T.6 E 00	L.T.1 E 01
12/04/75	4.0+-0.8 E 00	L.T.2 E 00	4.5+-0.8 E 02	L.T.8 E 01	L.T.7 E 01	L.T.6 E 00	L.T.8 E 00	L.T.8 E 00	L.T.1 E 01
mean +- std. dev.	4.1+-0.5 E 00	-	4.3+-1.0 E 02	-	-	-	-	-	-
detected / measured	9/9	1/9	9/9	0/9	0/9	0/9	0/9	0/9	0/9
range	(3.5-4.7) E 00	-	(3.2-6.5) E 02	-	-	-	-	-	-

COLLECTION DATE	Ru-103	Ru-106	I-131	Cs-134	Cs-137	Ba-140	Ce-141	Ce-144	Ra-226	Th-228
04/11/75	L.T.4 E 01	L.T.5 E 01	-	L.T.5 E 00	L.T.5 E 00	-	L.T.1 E 02	L.T.4 E 01	L.T.6 E 01	L.T.6 E 00
05/05/75	L.T.3 E 01	L.T.6 E 01	-	L.T.6 E 00	L.T.5 E 00	-	L.T.1 E 02	L.T.6 E 01	L.T.1 E 02	L.T.1 E 01
06/05/75	L.T.2 E 01	L.T.5 E 01	-	L.T.5 E 00	L.T.5 E 00	-	L.T.6 E 01	L.T.5 E 01	L.T.1 E 02	L.T.9 E 00
07/07/75	L.T.2 E 01	L.T.5 E 01	-	L.T.6 E 00	L.T.6 E 00	L.T.2 E 03	L.T.4 E 01	L.T.3 E 01	L.T.6 E 01	L.T.6 E 00
08/12/75	L.T.2 E 01	L.T.1 E 02	-	L.T.1 E 01	L.T.1 E 01	L.T.4 E 02	L.T.4 E 01	L.T.7 E 01	L.T.1 E 02	L.T.1 E 01
09/10/75	L.T.2 E 01	L.T.8 E 01	-	L.T.9 E 00	L.T.9 E 00	L.T.2 E 02	L.T.3 E 01	L.T.7 E 01	L.T.1 E 02	L.T.1 E 01
10/07/75	L.T.2 E 01	L.T.9 E 01	-	L.T.1 E 01	L.T.1 E 01	L.T.1 E 02	L.T.3 E 01	L.T.8 E 01	L.T.2 E 02	L.T.1 E 01
11/12/75	L.T.1 E 01	L.T.6 E 01	L.T.5 E 01	L.T.8 E 00	L.T.8 E 00	L.T.6 E 01	L.T.2 E 01	L.T.7 E 01	L.T.2 E 02	L.T.1 E 01
12/04/75	L.T.1 E 01	L.T.6 E 01	-	L.T.6 E 00	L.T.8 E 00	L.T.9 E 01	L.T.2 E 01	L.T.4 E 01	L.T.1 E 02	L.T.8 E 00
mean +-std.dev.										
detected / measured	0/9	0/9	0/1	0/9	0/9	0/6	0/9	0/9	0/9	0/9
range	-	-	-							

NINE MILE POINT/FITZPATRICK GENERATING STATION

ENVIRONMENTAL MONITORING 1975

STATION NMP 2

EAST CONTROL 20' BOTTOM

WATER (picocuries/liter)

COLLECTION DATE	GROSS BETA	GROSS ALPHA	TRITIUM	Be-7	K-40	Mn-54	Co-58	Co-60	Zr-95
04/11/75	3.4+-0.9 E 00	L.T.1 E 00	2.8+-0.7 E 02	L.T.2 E 02	L.T.1 E 02	L.T.5 E 00	L.T.1 E 01	L.T.5 E 00	L.T.3 E 01
05/05/75	3.5+-0.9 E 00	3.4+-1.8 E 00	4.9+-0.8 E 02	L.T.3 E 02	L.T.1 E 02	L.T.8 E 00	L.T.2 E 01	L.T.7 E 00	L.T.4 E 01
06/05/75	3.5+-0.9 E 00	L.T.2 E 00	3.1+-0.7 E 02	L.T.2 E 02	L.T.1 E 02	L.T.7 E 00	L.T.1 E 01	L.T.6 E 00	L.T.3 E 01
07/07/75	4.2+-0.9 E 00	L.T.2 E 00	4.0+-0.8 E 02	L.T.8 E 01	L.T.1 E 02	L.T.5 E 00	L.T.8 E 00	L.T.5 E 00	L.T.2 E 01
08/12/75	4.1+-0.9 E 00	L.T.2 E 00	3.0+-0.8 E 02	L.T.8 E 01	L.T.2 E 02	L.T.1 E 01	L.T.2 E 01	L.T.1 E 01	L.T.3 E 01
09/10/75	5.4+-1.0 E 00	L.T.1 E 00	4.8+-0.8 E 02	L.T.1 E 02	L.T.2 E 02	L.T.8 E 00	L.T.1 E 01	L.T.8 E 00	L.T.2 E 01
10/07/75	3.7+-1.0 E 00	L.T.2 E 00	4.6+-0.8 E 02	L.T.1 E 02	L.T.2 E 02	L.T.1 E 01	L.T.1 E 01	L.T.1 E 01	L.T.2 E 01
11/12/75	3.0+-0.9 E 00	L.T.2 E 00	4.8+-0.9 E 02	L.T.1 E 02	L.T.2 E 02	L.T.1 E 01	L.T.1 E 01	L.T.1 E 01	L.T.2 E 01
12/04/75	4.2+-0.8 E 00	L.T.2 E 00	2.9+-0.9 E 02	L.T.6 E 01	L.T.7 E 01	L.T.5 E 00	L.T.6 E 00	L.T.6 E 00	L.T.1 E 01
mean +- std. dev.	3.9+-0.7 E 00	-	3.9+-0.9 E 02	-					
detected / measured	9/9	1/9	9/9	0/9	0/9	0/9	0/9	0/9	0/9
range	(3.0-5.4) E 00	-	(2.8-4.9) E 02	-					

COLLECTION DATE	Ru-103	Ru-106	I-131	Cs-134	Cs-137	Ba-140	Ce-141	Ce-144	Ra-226	Th-228
04/11/75	L.T.4 E 01	L.T.5 E 01	-	L.T.4 E 00	L.T.5 E 00	-	L.T.1 E 02	L.T.5 E 01	L.T.8 E 01	L.T.7 E 00
05/05/75	L.T.6 E 01	L.T.8 E 01	-	L.T.8 E 00	L.T.8 E 00	-	L.T.1 E 02	L.T.7 E 01	L.T.1 E 02	L.T.1 E 01
06/05/75	L.T.3 E 01	L.T.8 E 01	-	L.T.7 E 00	L.T.7 E 00	-	L.T.7 E 01	L.T.6 E 01	L.T.1 E 02	L.T.1 E 01
07/07/75	L.T.1 E 01	L.T.5 E 01	-	L.T.5 E 00	L.T.5 E 00	L.T.3 E 02	L.T.3 E 01	L.T.5 E 01	L.T.1 E 02	L.T.1 E 01
08/12/75	L.T.2 E 01	L.T.1 E 02	-	L.T.1 E 01	L.T.1 E 01	L.T.4 E 02	L.T.4 E 01	L.T.7 E 01	L.T.2 E 02	L.T.1 E 01
09/10/75	L.T.2 E 01	L.T.8 E 01	-	L.T.8 E 00	L.T.9 E 00	L.T.2 E 02	L.T.3 E 01	L.T.6 E 01	L.T.1 E 02	L.T.1 E 01
10/07/75	L.T.2 E 01	L.T.1 E 02	-	L.T.1 E 01	L.T.1 E 01	L.T.1 E 02	L.T.3 E 01	L.T.9 E 01	L.T.2 E 02	L.T.1 E 01
11/12/75	L.T.2 E 01	L.T.1 E 02	L.T.6 E 01	L.T.1 E 01	L.T.1 E 01	L.T.9 E 01	L.T.3 E 01	L.T.9 E 01	L.T.2 E 02	L.T.2 E 01
12/04/75	L.T.8 E 00	L.T.5 E 01	-	L.T.5 E 00	L.T.6 E 00	L.T.7 E 01	L.T.1 E 01	L.T.2 E 01	L.T.6 E 01	L.T.6 E 00
mean +- std. dev.	-									
detected / measured	0/9	0/9	0/1	0/9	0/9	0/6	0/9	0/9	0/9	0/9
range	-									

NINE MILE POINT/FITZPATRICK GENERATING STATION

ENVIRONME ONITORING 1975

ST N NMP 3

EAST CONTROL 40' SURFACE

WATER (picocuries/liter)

COLLECTION DATE	GROSS BETA	GROSS ALPHA	TRITIUM	Be-7	K-40	Mn-54	Co-58	Co-60	Zr-95
04/11/75	4.2+-1.0 E 00	L.T.1 E 00	3.0+-0.7 E 02	L.T.2 E 02	L.T.8 E 01	L.T.4 E 00	L.T.1 E 01	L.T.3 E 00	L.T.2 E 01
05/05/75	3.5+-0.9 E 00	2.5+-1.7 E 00	3.1+-0.7 E 02	L.T.3 E 02	L.T.2 E 02	L.T.9 E 00	L.T.2 E 01	L.T.8 E 00	L.T.4 E 01
06/05/75	4.0+-1.0 E 00	L.T.2 E 00	3.0+-0.8 E 02	L.T.2 E 02	L.T.2 E 02	L.T.8 E 00	L.T.1 E 01	L.T.6 E 00	L.T.3 E 01
07/07/75	4.1+-1.0 E 00	L.T.2 E 00	3.0+-0.7 E 02	L.T.1 E 02	L.T.1 E 02	L.T.7 E 00	L.T.1 E 01	L.T.6 E 00	L.T.2 E 01
08/12/75	5.0+-0.9 E 00	L.T.1 E 00	5.2+-0.9 E 02	L.T.8 E 01	L.T.2 E 02	L.T.9 E 00	L.T.2 E 01	L.T.9 E 00	L.T.2 E 01
09/10/75	4.9+-1.0 E 00	L.T.1 E 00	4.6+-0.8 E 02	L.T.8 E 01	L.T.1 E 02	L.T.6 E 00	L.T.7 E 00	L.T.6 E 00	L.T.1 E 01
10/07/75	3.5+-0.9 E 00	L.T.1 E 00	4.8+-0.8 E 02	L.T.9 E 01	L.T.2 E 02	L.T.7 E 00	L.T.9 E 00	L.T.7 E 00	L.T.2 E 01
11/12/75	2.6+-0.8 E 00	L.T.2 E 00	4.2+-0.9 E 02	L.T.8 E 01	L.T.9 E 01	L.T.8 E 00	L.T.7 E 00	L.T.1 E 01	L.T.2 E 01
12/04/75	3.6+-0.8 E 00	L.T.2 E 00	3.7+-0.8 E 02	L.T.6 E 01	L.T.1 E 02	L.T.5 E 00	L.T.6 E 00	L.T.5 E 00	L.T.1 E 01
mean +- std. dev.	3.9+-0.7 E 00	-	3.8+-0.9 E 02	-	-				
detected / measured	9/9	1/9	9/9	0/9	0/9	0/9	0/9	0/9	0/9
range	(2.6-5.0) E 00	-	(3.0-5.2) E 02	-	-				

COLLECTION DATE	Ru-103	Ru-106	I-131	Cs-134	Cs-137	Ba-140	Ce-141	Ce-144	Ra-226	Th-228
04/11/75	L.T.3 E 01	L.T.4 E 01	-	L.T.4 E 00	L.T.3 E 00	-	L.T.9 E 01	L.T.3 E 01	L.T.5 E 01	L.T.5 E 00
05/05/75	L.T.5 E 01	L.T.8 E 01	-	L.T.8 E 00	L.T.8 E 00	-	L.T.1 E 02	L.T.7 E 01	L.T.1 E 02	L.T.1 E 01
06/05/75	L.T.3 E 01	L.T.7 E 01	-	L.T.7 E 00	L.T.7 E 00	-	L.T.7 E 01	L.T.6 E 01	L.T.1 E 02	L.T.1 E 01
07/07/75	L.T.2 E 01	L.T.7 E 01	-	L.T.7 E 00	L.T.7 E 00	L.T.4 E 02	L.T.4 E 01	L.T.6 E 01	L.T.1 E 02	L.T.1 E 01
08/12/75	L.T.2 E 01	L.T.8 E 01	-	L.T.9 E 00	L.T.9 E 00	L.T.3 E 02	L.T.2 E 01	L.T.8 E 01	L.T.1 E 02	L.T.8 E 00
09/10/75	L.T.1 E 01	L.T.5 E 01	-	L.T.6 E 00	L.T.6 E 00	L.T.1 E 02	L.T.2 E 01	L.T.5 E 01	L.T.1 E 02	L.T.9 E 00
10/07/75	L.T.1 E 01	L.T.7 E 01	-	L.T.8 E 00	L.T.8 E 00	L.T.1 E 02	L.T.2 E 01	L.T.6 E 01	L.T.1 E 02	L.T.1 E 01
11/12/75	L.T.1 E 01	L.T.7 E 01	L.T.5 E 01	L.T.8 E 00	L.T.1 E 01	L.T.6 E 01	L.T.1 E 01	L.T.4 E 01	L.T.9 E 01	L.T.9 E 00
12/04/75	L.T.8 E 00	L.T.5 E 01	-	L.T.5 E 00	L.T.5 E 00	L.T.7 E 01	L.T.2 E 01	L.T.5 E 01	L.T.1 E 02	L.T.9 E 00
mean +- std. dev.	-									
detected / measured	0/9	0/9	0/9	0/9	0/9	0/9	0/9	0/9	0/9	0/9
range	-									

NINE MILE POINT/FITZPATRICK GENERATING STATION

ENVIRONMENTAL MONITORING 1975

STATION NMP 4

EAST CONTROL 40' BOTTOM

WATER (picocuries/liter)

COLLECTION DATE	GROSS BETA	GROSS ALPHA	TRITIUM	Be-7	K-40	Mn-54	Co-58	Co-60	Zr-95
04/11/75	3.5+-0.9 E 00	L.T.1. E 00	2.4+-0.7 E 02	L.T.2 E 02	L.T.6 E 01	L.T.5 E 00	L.T.1. E 01	L.T.4 E 00	L.T.2 E 01
05/05/75	3.8+-0.9 E 00	2.7+-1.7 E 00	3.4+-0.7 E 02	L.T.3 E 02	L.T.2 E 02	L.T.8. E 00	L.T.2 E 01	L.T.8 E 00	L.T.4 E 01
06/05/75	4.5+-1.0 E 00	L.T.2 E 00	5.0+-0.8 E 02	L.T.1 E 02	L.T.1 E 02	L.T.5 E 00	L.T.1 E 01	L.T.5 E 00	L.T.2 E 01
07/07/75	3.9+-1.0 E 00	L.T.2 E 00	3.0+-0.8 E 02	L.T.1 E 02	L.T.2 E 02	L.T.7 E 00	L.T.1 E 01	L.T.7 E 00	L.T.2 E 01
08/12/75	4.8+-0.9 E 00	L.T.2 E 00	3.5+-0.8 E 02	L.T.8 E 01	L.T.2 E 02	L.T.1. E 01	L.T.1. E 01	L.T.1 E 00	L.T.2. E 01
09/10/75	5.0+-1.0 E 00	L.T.1 E 00	3.1+-0.8 E 02	L.T.9 E 01	L.T.1 E 02	L.T.7 E 00	L.T.8. E 00	L.T.8 E 00	L.T.2 E 01
10/07/75	4.7+-1.0 E 00	L.T.1 E 00	3.7+-0.8 E 02	L.T.1. E 02	L.T 1. E 02	L.T.9. E 00	L.T.1. E 01	L.T.1 E 01	L.T.2. E 01
11/12/75	3.3+-0.9 E 00	L.T.2 E 00	3.9+-0.8 E 02	L.T.8 E 01	L.T.2. E 02	L.T.7 E 00	L.T.9 E 00	L.T.7 E 00	L.T.1 E 01
12/04/75	3.3+-0.8 E 00	L.T.2 E 00	3.2+-0.8 E 02	L.T.9. E 01	L.T.2 E 02	L.T.8. E 00	L.T.9. E 00	L.T.7 E 00	L.T.2 E 01
mean +- std. dev.	4.1+-0.7 E 00	-	3.5+-0.7 E 02	-	-				
detected / measured	9/9	1/9	9/9	0/9	0/9	0/9	0/9	0/9	0/9
range	(3.3-5.0) E 00	-	(2.4-5.0) E 02	-	-				

COLLECTION DATE	Ru-103	Ru-106	I-131	Cs-134	Cs-137	Ba-140	Ce-141	Ce-144	Ra-226	Th-228
04/11/75	L.T.4 E 01	L.T.4 E 01	-	L.T.5 E 00	L.T.5 E 01	-	L.T.9 E 01	L.T.3 E 01	L.T.6 E 01	L.T.6 E 00
05/05/75	L.T.5 E 01	L.T.8 E 01	-	L.T.9 E 00	L.T.8 E 00	-	L.T.1 E 02	L.T.7 E 01	L.T.1 E 02	L.T.1. E 01
06/05/75	L.T.2 E 01	L.T.5 E 01	-	L.T.6 E 00	L.T.5 E 00	L.T.1 E 03	L.T.5 E 01	L.T.5 E 01	L.T.8. E 01	L.T.8. E 00
07/07/75	L.T.2. E 01	L.T.7 E 01	-	L.T.7 E 00	L.T.7 E 00	L.T.4 E 02	L.T.4 E 01	L.T.6 E 01	L.T.1 E 02	L.T.9 E 00
08/12/75	L.T.6. E 00	L.T.8 E 01	-	L.T.1 E 01	L.T.1 E 00	L.T.3 E 02	L.T.2 E 01	L.T.8 E 01	L.T.6. E 01	L.T.9 E 00
09/12/75	L.T.1 E 01	L.T.7 E 01	-	L.T.7. E 00	L.T.8. E 00	L.T.2 E 02	L.T.2 E 01	L.T.5 E 01	L.T.1 E 02	L.T.9 E 00
10/07/75	L.T.1 E 01	L.T.8. E 01	-	L.T.1 E 01	L.T.1. E 01	L.T.1 E 02	L.T.2 E 01	L.T.6 E 01	L.T.1 E 02	L.T.1. E 01
11/12/75	L.T.1 E 01	L.T.6 E 01	L.T.5 E 01	L.T.8. E 00	L.T.7. E 00	L.T.6 E 01	L.T.2 E 01	L.T.7 E 01	L.T.2 E 02	L.T.1 E 01
12/04/75	L.T.1. E 01	L.T.8 E 01	-	L.T.8. E 00	L.T.8 E 00	L.T.1 E 02	L.T.2 E 01	L.T.6 E 01	L.T.1. E 02	L.T.1 E 01
mean +- std. dev.	-									
detected / measured	0/9	0/9	0/1	0/9	0/9	0/7	0/9	0/9	0/9	0/9
range	-									

NINE MILE POINT/F[illegible]ATRICK GENERATING STATION

ENVIRONM[illegible]ONITORING 1975

STATION NMP 7.

NMP/FITZ 20' SURFACE

WATER (picocuries/liter)

COLLECTION DATE	GROSS BETA	GROSS ALPHA	TRITIUM	Be-7	K-40	Mn-54	Co-58	Co-60	Zr-95
04/11/75	4.5+-1.0 E 00	L.T.1 E 00	5.3+-0.8 E 02	L.T.1 E 02	L.T.4 E 01	L.T.4 E 00	L.T.1 E 01	L.T.3 E 00	L.T.2 E 01
05/05/75	3.7+-1.0 E 00	1.6+-1.5 E 00	3.8+-0.8 E 02	L.T.2 E 02	L.T.1 E 02	L.T.6 E 00	L.T.1 E 01	L.T.5 E 00	L.T.3 E 01
06/05/75	4.0+-0.9 E 00	L.T.1 E 00	3.6+-0.7 E 02	L.T.1 E 02	L.T.9 E 01	L.T.7 E 00	L.T.1 E 01	L.T.7 E 00	L.T.2 E 01
07/07/75	4.0+-1.0 E 00	L.T.2 E 00	3.5+-0.8 E 02	L.T.1 E 02	L.T.2 E 02	L.T.8 E 00	L.T.1 E 01	L.T.7 E 00	L.T.2 E 01
08/12/75	3.5+-0.8 E 00	L.T.2 E 00	3.2+-0.9 E 02	L.T.8 E 01	L.T.2 E 02	L.T.7 E 00	L.T.1 E 01	L.T.8 E 00	L.T.2 E 01
09/10/75	5.1+-1.0 E 00	L.T.1 E 00	4.4+-0.8 E 02	L.T.8 E 01	L.T.9 E 01	L.T.6 E 00	L.T.9 E 00	L.T.6 E 00	L.T.2 E 01
10/07/75	3.4+-0.9 E 00	L.T.1 E 00	4.4+-0.8 E 02	L.T.8 E 01	L.T.9 E 01	L.T.7 E 00	L.T.9 E 00	L.T.7 E 00	L.T.2 E 01
11/12/75	3.8+-0.9 E 00	L.T.2 E 00	3.6+-0.8 E 02	L.T.1 E 02	L.T.2 E 02	L.T.1 E 01	L.T.1 E 01	L.T.1 E 01	L.T.2 E 01
12/04/75	3.7+-0.8 E 00	L.T.2 E 00	4.0+-0.8 E 02	L.T.1 E 02	L.T.1 E 02	L.T.1 E 01	L.T.1 E 01	L.T.9 E 00	L.T.2 E 01
mean+- std. dev.	4.0+-0.5 E 00	-	4.0+-0.6 E 02	-					
detected / measured	9/9	1/9	9/9	0/9	0/9	0/9	0/9	0/9	0/9
range	(3.4-5.1) E 00	-	(3.2-5.3) E 02	-					

COLLECTION DATE	Ru-103	Ru-106	I-131	Cs-134	Cs-137	Ba-140	Ce-141	Ce-144	Ra-226	Th-228
04/11/75	L.T.3 E 01	L.T.4 E 01	-	L.T.4 E 00	L.T.4 E 00	-	L.T.6 E 01	L.T.2 E 01	L.T.4 E 01	L.T.4 E 00
05/05/75	L.T.4 E 01	L.T.6 E 01	-	L.T.6 E 00	L.T.5 E 00	-	L.T.9 E 01	L.T.5 E 01	L.T.8 E 01	L.T.8 E 00
06/05/75	L.T.3 E 01	L.T.6 E 01	-	L.T.6 E 00	L.T.7 E 00	L.T.2 E 03	L.T.5 E 01	L.T.5 E 01	L.T.9 E 01	L.T.8 E 00
07/07/75	L.T.2 E 01	L.T.7 E 01	-	L.T.8 E 00	L.T.8 E 00	L.T.4 E 02	L.T.4 E 01	L.T.6 E 01	L.T.1 E 02	L.T.1 E 01
08/12/75	L.T.1 E 01	L.T.8 E 01	-	L.T.8 E 00	L.T.9 E 00	L.T.3 E 02	L.T.2 E 01	L.T.8 E 01	L.T.7 E 01	L.T.8 E 00
09/10/75	L.T.1 E 01	L.T.1 E 02	-	L.T.7 E 00	L.T.8 E 00	L.T.1 E 02	L.T.2 E 01	L.T.3 E 01	L.T.7 E 01	L.T.7 E 00
10/07/75	L.T.1 E 01	L.T.6 E 01	-	L.T.7 E 00	L.T.8 E 00	L.T.1 E 02	L.T.1 E 01	L.T.4 E 01	L.T.8 E 01	L.T.8 E 00
11/12/75	L.T.2 E 01	L.T.1 E 02	L.T.6 E 01	L.T.1 E 01	L.T.1 E 01	L.T.9 E 01	L.T.3 E 01	L.T.8 E 01	L.T.2 E 02	L.T.2 E 01
12/04/75	L.T.2 E 01	L.T.1 E 02	-	L.T.1 E 01	L.T.1 E 01	L.T.2 E 02	L.T.3 E 01	L.T.7 E 01	L.T.2 E 02	L.T.1 E 01
mean +- std. dev.	-									
detected / measured	0/9	0/9	0/1	0/9	0/9	0/7	0/9	0/9	0/9	0/9
range	-									

NINE MILE POINT/FITZPATRICK GENERATING STATION

ENVIRONMENTAL MONITORING 1975

STATION NMP 8

NMP/FITZ 20' BOTTOM

WATER (picocuries/liter)

COLLECTION DATE	GROSS BETA	GROSS ALPHA	TRITIUM	Ce-7	K-40	Mn-54	Co-58	Co-60	Zr-95
04/11/75	4.3+-1.0 E 00	L.T.1 E 00	2.8+-0.7 E 02	L.T.2 E 02	L.T.9 E 01	L.T.5 E 00	L.T.1 E 01	L.T.4 E 00	L.T.3 E 01
05/05/75	3.9+-1.0 E 00	1.5+-1.4 E 00	3.1+-0.8 E 02	L.T.2 E 02	L.T.9 E 01	L.T.8 E 00	L.T.2 E 01	L.T.8 E 00	L.T.4 E 01
06/05/75	3.0+-0.8 E 00	L.T.1 E 00	2.9+-0.8 E 02	L.T.1 E 02	L.T.7 E 01	L.T.5 E 00	L.T.1 E 01	L.T.5 E 00	L.T.2 E 01
07/07/75	3.7+-0.9 E 00	L.T.2 E 00	3.6+-0.8 E 02	L.T.9 E 01	L.T.1 E 02	L.T.6 E 00	L.T.8 E 00	L.T.5 E 00	L.T.2 E 01
08/12/75	3.5+-0.9 E 00	L.T.2 E 00	3.0+-0.8 E 02	L.T.1 E 02	L.T.2 E 02	L.T.1 E 01	L.T.1 E 01	L.T.1 E 01	L.T.3 E 01
09/10/75	4.2+-0.9 E 00	L.T.1 E 00	3.8+-0.8 E 02	L.T.8 E 01	L.T.1 E 02	L.T.6 E 00	L.T.7 E 00	L.T.5 E 00	L.T.1 E 01
10/07/75	4.0+-0.9 E 00	L.T.1 E 00	4.8+-0.8 E 02	L.T.8 E 01	L.T.1 E 02	L.T.8 E 00	L.T.9 E 00	L.T.7 E 00	L.T.2 E 01
11/12/75	3.1+-0.9 E 00	L.T.2 E 00	3.9+-0.8 E 02	L.T.7 E 01	L.T.2 E 02	L.T.6 E 00	L.T.7 E 00	L.T.6 E 00	L.T.1 E 01
12/04/75	4.0+-0.8 E 00	L.T.2 E 00	3.4+-0.8 E 02	L.T.2 E 02	L.T.1 E 02	L.T.8 E 00	L.T.1 E 01	L.T.1 E 01	L.T.2 E 01
mean +- std. dev.	3.7+-0.5 E 00	-	3.5+-0.6 E 02	-					
detected / measured	9/9	1/9	9/9	0/9	0/9	0/9	0/9	0/9	0/9
range	(3.0-4.3) E 00	-	(2.8-4.8) E 02	-					

COLLECTION DATE	Ru-103	Ru-106	I-131	Cs-134	Cs-137	Ba-140	Ce-141	Ce-144	Ra-226	Th-228
04/11/75	L.T.4 E 01	L.T.5 E 01	-	L.T.5 E 00	L.T.5 E 00	-	L.T.1 E 02	L.T.6 E 01	L.T.1 E 02	L.T.9 E 00
05/05/75	L.T.5 E 01	L.T.7 E 01	-	L.T.7 E 00	L.T.7 E 00	-	L.T.1 E 02	L.T.5 E 01	L.T.1 E 02	L.T.9 E 00
06/05/75	L.T.2 E 01	L.T.5 E 01	-	L.T.5 E 00	L.T.6 E 00	L.T.1 E 03	L.T.3 E 01	L.T.3 E 01	L.T.5 E 01	L.T.6 E 00
07/07/75	L.T.1 E 01	L.T.5 E 01	-	L.T.6 E 00	L.T.5 E 00	L.T.3 E 02	L.T.3 E 01	L.T.4 E 01	L.T.8 E 01	L.T.8 E 00
08/12/75	L.T.2 E 01	L.T.9 E 01	-	L.T.1 E 01	L.T.1 E 01	L.T.4 E 02	L.T.4 E 01	L.T.6 E 01	L.T.6 E 01	L.T.1 E 01
09/10/75	L.T.1 E 01	L.T.5 E 01	-	L.T.6 E 00	L.T.5 E 00	L.T.1 E 02	L.T.3 E 01	L.T.6 E 01	L.T.1 E 02	L.T.1 E 01
10/07/75	L.T.1 E 01	L.T.7 E 01	-	L.T.8 E 00	L.T.7 E 00	L.T.9 E 01	L.T.3 E 01	L.T.7 E 01	L.T.2 E 02	L.T.1 E 01
11/12/75	L.T.1 E 01	L.T.5 E 01	L.T.6 E 01	L.T.6 E 00	L.T.7 E 00	L.T.6 E 01	L.T.2 E 01	L.T.5 E 01	L.T.1 E 02	L.T.1 E 01
12/04/75	L.T.2 E 01	L.T.9 E 01	-	L.T.1 E 01	L.T.1 E 01	L.T.1 E 02	L.T.2 E 01	L.T.5 E 01	L.T.1 E 02	L.T.1 E 01
mean +- std. dev.	-									
detected / measured	0/9	0/9	0/1	0/9	0/9	0/7	0/9	0/9	0/9	0/9
range	-									

NINE MILE POINT/F[illegible]TRICK GENERATING STATION

ENVIRONME[illegible]ONITORING 1975

STATION NMP 9

NMP/FITZ 40' SURFACE

WATER (picocuries/liter)

COLLECTION DATE	GROSS BETA	GROSS ALPHA	TRITIUM	Be-7	K-40	Mn-54	Co-58	Co-60	Zr-95
04/11/75	3.5+-0.9 E 00	L.T.1 E 00	3.2+-0.8 E 02	L.T.3 E 02	L.T.1 E 02	L.T.8 E 00	L.T.2 E 01	L.T.6 E 00	L.T.4 E 01
05/05/75	4.0+-0.9 E 00	L.T.2 E 00	5.1+-0.8 E 02	L.T.2 E 02	L.T.7 E 01	L.T.6 E 00	L.T.1 E 01	L.T.5 E 00	L.T.3 E 01
06/05/75	3.7+-0.8 E 00	L.T.1 E 00	2.8+-0.7 E 02	L.T.1 E 02	L.T.9 E 01	L.T.5 E 00	L.T.1 E 01	L.T.4 E 00	L.T.2 E 01
07/07/75	4.4+-1.0 E 00	L.T.2 E 00	2.8+-0.7 E 02	L.T.1 E 02	L.T.9 E 01	L.T.7 E 00	L.T.1 E 01	L.T.7 E 00	L.T.2 E 01
08/12/75	4.1+-0.9 E 00	L.T.1 E 00	3.3+-0.8 E 02	L.T.1 E 02	L.T.2 E 02	L.T.1 E 01	L.T.1 E 01	L.T.1 E 01	L.T.3 E 01
09/10/75	4.0+-0.9 E 00	L.T.1 E 00	3.0+-0.8 E 02	L.T.1 E 02	L.T.1 E 02	L.T.7 E 00	L.T.1 E 01	L.T.6 E 00	L.T.2 E 01
10/07/75	3.5+-0.9 E 00	L.T.1 E 00	6.9+-0.8 E 02	L.T.1 E 02	L.T.2 E 02	L.T.9 E 00	L.T.1 E 01	L.T.1 E 01	L.T.2 E 01
11/12/75	3.4+-0.9 E 00	L.T.2 E 00	4.1+-0.8 E 02	L.T.9 E 01	L.T.1 E 02	L.T.8 E 00	L.T.1 E 01	L.T.9 E 00	L.T.2 E 01
12/04/75	4.1+-0.8 E 00	L.T.2 E 00	6.1+-0.8 E 02	L.T.1 E 02	L.T.2 E 02	L.T.8 E 00	L.T.1 E 01	L.T.7 E 00	L.T.2 E 01
mean +- std. dev.	3.9+-0.3 E 00	-	4.1+-1.5 E 02	-					
detected / measured	9/9	0/9	9/9	0/9	0/9	0/9	0/9	0/9	0/9
range	(3.4-4.4) E 00	-	(2.8-6.9) E 02	-					

COLLECTION DATE	Ru-103	Ru-106	I-131	Cs-134	Cs-137	Ba-140	Ce-141	Ce-144	Ra-226	Th-228
04/11/75	L.T.6 E 01	L.T.8 E 01	-	L.T.7 E 00	L.T.7 E 00	-	L.T.2 E 02	L.T.7 E 01	L.T.1 E 02	L.T.1 E 01
05/05/75	L.T.4 E 01	L.T.6 E 01	-	L.T.6 E 00	L.T.6 E 00	-	L.T.6 E 01	L.T.3 E 01	L.T.6 E 01	L.T.7 E 00
06/05/75	L.T.2 E 01	L.T.5 E 01	-	L.T.5 E 00	L.T.5 E 00	L.T.1 E 03	L.T.6 E 01	L.T.5 E 01	L.T.1 E 02	L.T.9 E 00
07/07/75	L.T.2 E 01	L.T.6 E 01	-	L.T.7 E 00	L.T.8 E 00	L.T.4 E 02	L.T.3 E 01	L.T.5 E 01	L.T.9 E 01	L.T.9 E 00
08/12/85	L.T.2 E 01	L.T.1 E 02	-	L.T.1 E 01	L.T.1 E 01	L.T.4 E 02	L.T.4 E 01	L.T.8 E 01	L.T.1 E 02	L.T.1 E 01
09/10/75	L.T.2 E 01	L.T.8 E 01	-	L.T.8 E 00	L.T.8 E 00	L.T.2 E 02	L.T.3 E 01	L.T.6 E 01	L.T.1 E 02	L.T.1 E 01
10/07/75	L.T.2 E 01	L.T.9 E 01	-	L.T.1 E 01	L.T.9 E 00	L.T.1 E 02	L.T.3 E 01	L.T.8 E 01	L.T.2 E 02	L.T.2 E 01
11/12/75	L.T.1 E 01	L.T.7 E 01	L.T.7 E 01	L.T.9 E 00	L.T.9 E 00	L.T.7 E 01	L.T.2 E 01	L.T.5 E 01	L.T.1 E 02	L.T.1 E 01
12/04/75	L.T.2 E 01	L.T.7 E 01	-	L.T.1 E 01	L.T.9 E 00	L.T.1 E 02	L.T.3 E 01	L.T.6 E 01	L.T.1 E 02	L.T.1 E 01
mean +- std. dev.	-									
detected / measured	0/9	0/9	0/1	0/9	0/9	0/7	0/9	0/9	0/9	0/9
range	-									

NINE MILE POINT/[illegible]TRICK GENERATING STATION

ENVIRONME[illegible]NOMITORING 1975

STATION NMP 10

NMP/FITZ 40' BOTTOM

COLLECTION DATE	GROSS BETA	GROSS ALPHA	TRITIUM	Be-7	K-40	Mn-54	Co-58	Co-60	Zr-95
04/11/75	3.4+-0.9 E 00	L.T.1 E 00	7.5+-0.9 E 02	L.T.3 E 02	L.T.1 E 02	L.T.9 E 00	L.T.2 E 01	L.T.7 E 00	L.T.5 E 01
05/05/75	5.5+-1.0 E 00	L.T.2 E 00	4.0+-0.8 E 02	L.T.2 E 02	L.T.1 E 02	L.T.6 E 00	L.T.1 E 01	L.T.5 E 00	L.T.3 E 01
06/05/75	3.7+-0.8 E 00	L.T.1 E 00	3.9+-0.8 E 02	L.T.2 E 02	L.T.1 E 02	L.T.7 E 00	L.T.1 E 01	L.T.6 E 00	L.T.3 E 01
07/07/75	4.0+-1.0 E 00	L.T.2 E 00	4.9+-0.8 E 02	L.T.8 E 01	L.T.7 E 01	L.T.5 E 00	L.T.9 E 00	L.T.6 E 00	L.T.2 E 01
08/12/75	3.4+-0.8 E 00	L.T.2 E 00	3.5+-0.8 E 02	L.T.1 E 02	L.T.2 E 02	L.T.8 E 00	L.T.1 E 01	L.T.9 E 00	L.T.2 E 01
09/10/75	4.1+-0.9 E 00	L.T.1 E 00	5.0+-0.8 E 02	L.T.2 E 02	L.T.2 E 02	L.T.1 E 01	L.T.1 E 01	L.T.9 E 00	L.T.3 E 01
10/07/75	4.2+-0.9 E 00	L.T.1 E 00	3.6+-0.8 E 02	L.T.1 E 02	L.T.2 E 02	L.T.9 E 00	L.T.1 E 01	L.T.7 E 00	L.T.2 E 01
11/12/75	3.1+-0.9 E 00	L.T.2 E 00	4.9+-0.9 E 02	L.T.7 E 01	L.T.8 E 01	L.T.7 E 00	L.T.7 E 00	L.T.6 E 00	L.T.1 E 01
12/04/75	4.3+-0.8 E 00	L.T.2 E 00	2.4+-0.7 E 02	L.T.1 E 02	L.T.2 E 02	L.T.9 E 00	L.T.1 E 01	L.T.1 E 01	L.T.2 E 01
mean +- std. dev.	4.0+-0.7 E 00	-	4.4+-1.4 E 02	-					
detected / measured	9/9	0/9	9/9	0/9	0/9	0/9	0/9	0/9	0/9
range	(3.1-5.5) E 00	-	(2.4-7.5) E 02	-					

COLLECTION DATE	Ru-103	Ru-106	I-131	Cs-134	Cs-137	Ba-140	Ce-141	Ce-144	Ra-226	Th-228
04/11/75	L.T.7 E 01	L.T.8 E 01	-	L.T.9 E 00	L.T.8 E 00	-	L.T.2 E 02	L.T.7 E 01	L.T.1 E 02	L.T.9 E 00
05/05/75	L.T.3 E 01	L.T.5 E 01	-	L.T.6 E 00	L.T.5 E 00	-	L.T.1 E 02	L.T.6 E 01	L.T.1 E 02	L.T.1 E 01
06/05/75	L.T.3 E 01	L.T.8 E 01	-	L.T.7 E 00	L.T.7 E 00	L.T.2 E 03	L.T.7 E 01	L.T.7 E 01	L.T.1 E 02	L.T.1 E 01
07/07/75	L.T.1 E 01	L.T.5 E 01	-	L.T.6 E 00	L.T.6 E 00	L.T.3 E 02	L.T.2 E 01	L.T.3 E 01	L.T.6 E 01	L.T.6 E 00
08/12/75	L.T.2 E 01	L.T.8 E 01	-	L.T.8 E 00	L.T.8 E 00	L.T.3 E 02	L.T.2 E 01	L.T.8 E 01	L.T.8 E 01	L.T.8 E 00
09/10/75	L.T.2 E 01	L.T.1 E 02	-	L.T.1 E 01	L.T.1 E 01	L.T.3 E 02	L.T.4 E 01	L.T.9 E 01	L.T.2 E 02	L.T.2 E 01
10/07/75	L.T.1 E 01	L.T.8 E 01	-	L.T.9 E 00	L.T.9 E 00	L.T.1 E 02	L.T.3 E 01	L.T.7 E 01	L.T.1 E 02	L.T.1 E 01
11/12/75	L.T.1 E 01	L.T.6 E 01	L.T.6 E 01	L.T.7 E 00	L.T.8 E 00	L.T.6 E 01	L.T.1 E 01	L.T.3 E 01	L.T.7 E 01	L.T.7 E 00
12/04/75	L.T.2 E 01	L.T.8 E 01	-	L.T.1 E 01	L.T.1 E 01	L.T.2 E 02	L.T.3 E 01	L.T.7 E 01	L.T.2 E 02	L.T.1 E 01
mean std. dev.	-	-								
detected / measured	0/9	0/9	0/1	0/9	0/9	7/9	9/9	9/9	9/9	9/9
range	-	-								

NINE MILE POINT/[illegible]ATRICK GENERATING STATION

ENVIRON[illegible] MONITORING 1975

STATION NMP 13

WEST CONTROL 20' SURFACE

WATER (picocuries/liter)

COLLECTION DATE	GROSS BETA	GROSS ALPHA	TRITIUM	Be-7	K-40	Mn-54	Co-58	Co-60	Zr-95
04/11/75	3.3+-0.9 E 00	L.T.1 E 00	5.4+-0.9 E 02	L.T.3 E 02	L.T.1 E 02	L.T.9 E 00	L.T.3 E 01	L.T.7 E 00	L.T.5 E 00
05/05/75	4.9+-1.0 E 00	L.T.1 E 00	3.3+-0.7 E 02	L.T.3 E 02	L.T.1 E 02	L.T.8 E 00	L.T.2 E 01	L.T.6 E 00	L.T.4 E 01
06/05/75	3.5+-0.8 E 00	L.T.1 E 00	3.9+-0.8 E 02	L.T.2 E 02	L.T.1 E 02	L.T.7 E 00	L.T.1 E 01	L.T.7 E 00	L.T.3 E 01
07/07/75	4.2+-1.0 E 00	L.T.2 E 00	3.7+-0.7 E 02	L.T.1 E 02	L.T.1 E 02	L.T.7 E 00	L.T.1 E 01	L.T.6 E 00	L.T.2 E 01
08/12/75	4.7+-0.9 E 00	L.T.2 E 00	3.1+-0.8 E 02	L.T.1 E 02	L.T.2 E 02	L.T.9 E 00	L.T.1 E 01	L.T.9 E 00	L.T.2 E 01
09/10/75	4.9+-1.0 E 00	L.T.1 E 00	5.9+-0.8 E 02	L.T.2 E 02	L.T.3 E 02	L.T.1 E 01	L.T.2 E 01	L.T.1 E 01	L.T.3 E 01
10/07/75	3.0+-0.9 E 00	L.T.1 E 00	7.1+-0.9 E 02	L.T.1 E 02	L.T.2 E 02	L.T.9 E 00	L.T.1 E 01	L.T.8 E 00	L.T.2 E 01
11/12/75	3.6+-0.9 E 00	L.T.2 E 00	3.7+-0.8 E 02	L.T.7 E 01	L.T.2 E 02	L.T.6 E 00	L.T.7 E 00	L.T.6 E 00	L.T.1 E 01
12/04/75	2.8+-0.7 E 00	L.T.2 E 00	3.9+-0.8 E 02	L.T.1 E 02	L.T.1 E 02	L.T.8 E 00	L.T.1 E 01	L.T.9 E 01	L.T.2 E 01
mean +- std. dev.	3.9+-0.8 E 00	-	4.4+-1.4 E 02	-					
detected / measured	9/9	0/9	9/9	0/9	0/9	0/9	0/9	0/9	0/9
range	(2.8-4.9) E 00	-	(3.1-7.1) E 02	-					

COLLECTION DATE	Ru-103	Ru-106	I-131	Cs-134	Cs-137	Ba-140	Ce-141	Ce-144	Ra-226	Th-228
04/11/75	L.T.7 E 01	L.T.8 E 01	-	L.T.9 E 00	L.T.8 E 00	-	L.T.2 E 02	L.T.7 E 01	L.T.1 E 02	L.T.1 E 01
05/05/75	L.T.5 E 01	L.T.8 E 01	-	L.T.8 E 00	L.T.8 E 00	-	L.T.1 E 02	L.T.7 E 01	L.T.1 E 02	L.T.1 E 01
06/05/75	L.T.3 E 01	L.T.7 E 01	-	L.T.7 E 00	L.T.7 E 00	L.T.2 E 03	L.T.6 E 01	L.T.6 E 01	L.T.1 E 02	L.T.9 E 00
07/07/75	L.T.2 E 01	L.T.7 E 01	-	L.T.8 E 00	L.T.8 E 00	L.T.5 E 02	L.T.4 E 01	L.T.6 E 01	L.T.1 E 02	L.T.1 E 01
08/12/75	L.T.2 E 01	L.T.8 E 01	-	L.T.9 E 00	L.T.1 E 01	L.T.3 E 02	L.T.4 E 01	L.T.8 E 01	L.T.9 E 01	L.T.8 E 00
9/10/75	L.T.2 E 01	L.T.1 E 02	-	L.T.1 E 01	L.T.1 E 01	L.T.3 E 02	L.T.5 E 01	L.T.9 E 01	L.T.2 E 02	L.T.1 E 01
10/07/75	L.T.2 E 01	L.T.8 E 01	-	L.T.9 E 00	L.T.9 E 00	L.T.1 E 02	L.T.3 E 01	L.T.7 E 01	L.T.1 E 02	L.T.1 E 01
11/12/75	L.T.9 E 00	L.T.5 E 01	L.T.5 E 01	L.T.7 E 00	L.T.6 E 00	L.T.6 E 01	L.T.2 E 01	L.T.6 E 01	L.T.1 E 02	L.T.1 E 01
12/04/75	L.T.1 E 01	L.T.8 E 01	-	L.T.9 E 00	L.T.1 E 01	L.T.1 E 02	L.T.2 E 01	L.T.6 E 01	L.T.1 E 02	L.T.1 E 01
mean +- std. dev.	-	-								
detected / measured	0/9	0/9	0/1	0/9	0/9	0/7	0/9	0/9	0/9	0/9
range	-	-								

NINE MILE POINT/FITZPATRICK GENERATING STATION

ENVIRONMEN[illegible]NITORING 1975

STA[illegible] NMP 14

WEST CONTROL 20' BOTTOM

WATER (picocuries/liter)

COLLECTION DATE	GROSS BETA	GROSS ALPHA	TRITIUM	Be-7	K-40	Mn-54	Co-58	Co-60	Zr-95
04/11/75	3.2+-0.9 E 00	L.T.1 E 00	3.2+-0.7 E 02	L.T.3 E 02	L.T.1 E 02	L.T.6 E 00	L.T.2 E 01	L.T.5 E 00	L.T.4 E 01
05/05/75	5.4+-1.0 E 00	L.T.1 E 00	3.6+-0.7 E 02	L.T.4 E 02	L.T.2 E 02	L.T.1 E 01	L.T.3 E 01	L.T.1 E 01	L.T.6 E 01
06/05/75	4.4+-0.9 E 00	L.T.1 E 00	3.8+-0.7 E 02	L.T.2 E 02	L.T.1 E 02	L.T.8 E 00	L.T.2 E 01	L.T.7 E 00	L.T.3 E 01
07/07/75	3.6+-0.9 E 00	L.T.2 E 00	3.1+-0.8 E 02	L.T.1 E 02	L.T.1 E 02	L.T.5 E 00	L.T.8 E 00	L.T.5 E 00	L.T.2 E 01
08/12/75	4.0+-0.9 E 00	L.T.2 E 00	2.6+-0.9 E 02	L.T.1 E 02	L.T.2 E 02	L.T.7 E 00	L.T.9 E 00	L.T.8 E 00	L.T.2 E 01
09/10/75	3.8+-0.9 E 00	L.T.2 E 00	3.6+-0.8 E 02	L.T.1 E 02	L.T.2 E 02	L.T.7 E 00	L.T.1 E 01	L.T.9 E 00	L.T.2 E 01
10/07/75	3.7+-1.0 E 00	L.T.2 E 00	4.6+-0.8 E 02	L.T.8 E 01	L.T 1 E 02	L.T.6 E 00	L.T.7 E 00	L.T.6 E 00	L.T.1 E 01
11/12/75	5.3+-1.0 E 00	L.T.2 E 00	4.8+-0.9 E 02	L.T.1 E 02	L.T.2 E 02	L.T.8 E 00	L.T.1 E 01	L.T.8 E 00	L.T.2 E 01
12/04/75	3.0+-0.7 E 00	L.T.2 E 00	3.1+-0.7 E 02	L.T.7 E 01	L.T.8 E 01	L.T.5 E 00	L.T.7 E 00	L.T.7 E 00	L.T.1 E 01
mean +- std. dev.	4.0+-0.8 E 00	-	3.6+-0.7 E 02	-	-				
detected / measured	9/9	0/9	9/9	0/9	0/9	0/9	0/9	0/9	0/9
range	(3.0-5.4) E 00	-	(2.6-4.8) E 02	-	-				

COLLECTION DATE	Ru-103	Ru-106	I-131	Cs-134	Cs-137	Ba-140	Ce-141	Ce-144	Ra-226	Th-228
04/11/75	L.T.6 E 01	L.T.6 E 01	-	L.T.6 E 00	L.T.5 E 00	-	L.T.1 E 02	L.T.5 E 01	L.T.8 E 01	L.T.8 E 00
05/05/75	L.T.7 E 01	L.T.1 E 02	-	L.T.1 E 01	L.T.1 E 01	-	L.T.2 E 02	L.T.9 E 01	L.T.2 E 02	L.T.2 E 01
06/05/75	L.T.3 E 01	L.T.7 E 01	-	L.T.8 E 00	L.T.8 E 00	L.T.2 E 03	L.T.7 E 01	L.T.6 E 01	L.T.1 E 02	L.T.1 E 01
07/07/75	L.T.1 E 01	L.T.5 E 01	-	L.T.6 E 00	L.T.5 E 00	L.T.4 E 02	L.T.3 E 01	L.T.4 E 01	L.T.8 E 01	L.T.8 E 00
08/12/75	L.T.1 E 01	L.T.6 E 01	-	L.T.7 E 00	L.T.8 E 00	L.T.3 E 02	L.T.4 E 01	L.T.8 E 01	L.T.6 E 01	L.T.7 E 00
09/10/75	L.T.2 E 01	L.T.8 E 01	-	L.T.9 E 00	L.T.8 E 00	L.T.2 E 02	L.T.3 E 01	L.T.7 E 01	L.T.1 E 02	L.T.1 E 01
10/07/75	L.T.1 E 01	L.T.5 E 01	-	L.T.6 E 00	L.T.6 E 00	L.T.9 E 01	L.T.2 E 01	L.T.5 E 01	L.T.1 E 02	L.T.9 E 00
11/12/75	L.T.1 E 01	L.T.8 E 01	L.T.7 E 01	L.T.9 E 00	L.T.9 E 00	L.T.9 E 01	L.T.2 E 01	L.T.7 E 01	L.T.2 E 02	L.T.1 E 01
12/04/75	L.T.1 E 01	L.T.5 E 01	-	L.T.6 E 00	L.T.7 E 00	L.T.1 E 02	L.T.1 E 01	L.T.3 E 01	L.T.7 E 01	L.T.7 E 00
mean +- std. dev.	-			-						
detected / measured	0/9	0/9	0/1	0/9	0/9	0/7	0/9	0/9	0/9	0/9
range	-			-						

NINE MILE POINT/F[illegible]ATRICK GENERATING STATION

ENVIRONM[illegible]ONITORING 1975

STATION NMP 15

WEST CONTROL 40' SURFACE

WATER (picocuries/liter)

COLLECTION DATE	GROSS BETA	GROSS ALPHA	TRITIUM	Be-7	K-40	Mn-54	Co-58	Co-60	Zr-95
04/11/75	3.0+-0.9 E 00	L.T.1 E 00	4.0+-0.8 E 02	L.T.3 E 02	L.T.8 E 01	L.T.8 E 00	L.T.2 E 01	L.T.6 E 00	L.T.5 E 01
05/05/75	5.2+-1.0 E 00	L.T.2 E 00	2.8+-0.7 E 02	L.T.3 E 02	L.T.1 E 02	L.T.9 E 00	L.T.2 E 01	L.T.9 E 00	L.T.4 E 01
06/05/75	3.3+-0.8 E 00	L.T.1 E 00	4.0+-0.7 E 02	L.T.1 E 02	L.T.1 E 02	L.T.6 E 00	L.T.1 E 01	L.T.6 E 00	L.T.2 E 01
07/07/75	3.1+-0.9 E 00	L.T.2 E 00	4.6+-0.8 E 02	L.T.1 E 02	L.T.9 E 01	L.T.6 E 00	L.T.1 E 01	L.T.5 E 00	L.T.2 E 01
08/12/75	3.6+-0.9 E 00	L.T.2 E 00	5.0+-0.9 E 02	L.T.1 E 02	L.T.2 E 02	L.T.1 E 01	L.T.1 E 01	L.T.1 E 01	L.T.3 E 01
09/10/75	3.1+-0.8 E 00	L.T.1 E 00	3.7+-0.8 E 02	L.T.2 E 02	L.T.2 E 02	L.T.1 E 01	L.T.2 E 01	L.T.1 E 01	L.T.2 E 01
10/07/75	3.8+-0.9 E 00	L.T.1 E 00	4.0+-0.8 E 02	L.T.9 E 01	L.T.1 E 02	L.T.7 E 00	L.T.9 E 00	L.T.8 E 00	L.T.2 E 01
11/12/75	3.0+-0.9 E 00	L.T.2 E 00	4.1+-0.8 E 02	L.T.5 E 01	L.T.1 E 02	L.T.4 E 00	L.T.5 E 00	L.T.4 E 00	L.T.1 E 01
12/04/75	2.8+-0.7 E 00	L.T.2 E 00	2.6+-0.7 E 02	L.T.7 E 01	L.T.1 E 02	L.T.6 E 00	L.T.7 E 00	L.T.5 E 00	L.T.1 E 01
mean +- std. dev.	3.4+-0.7 E 00	-	3.9+-0.8 E 02	-					
detected / measured	9/9	0/9	9/9	0/9	0/9	0/9	0/9	0/9	0/9
range	(2.8-5.2) E 00	-	(2.6-5.0) E 02	-					

COLLECTION DATE	Ru-103	Ru-106	I-131	Cs-134	Cs-137	Ba-140	Ce-141	Ce-144	Ra-226	Th-228
04/11/75	L.T.7 E 01	L.T.7 E 01	-	L.T.8 E 00	L.T.7 E 00	-	L.T.2 E 02	L.T.5 E 01	L.T.9 E 01	L.T.9 E 00
05/05/75	L.T.5 E 01	L.T.8 E 01	-	L.T.8 E 00	L.T.1 E 01	-	L.T.9 E 01	L.T.5 E 01	L.T.9 E 01	L.T.1 E 01
06/05/75	L.T.2 E 01	L.T.5 E 01	-	L.T.6 E 00	L.T.5 E 00	L.T.2 E 03	L.T.5 E 01	L.T.5 E 01	L.T.9 E 01	L.T.8 E 00
07/07/75	L.T.2 E 01	L.T.6 E 01	-	L.T.7 E 00	L.T.8 E 00	L.T.5 E 02	L.T.3 E 01	L.T.5 E 01	L.T.1 E 02	L.T.9 E 00
08/12/75	L.T.2 E 01	L.T.8 E 01	-	L.T.1 E 01	L.T.9 E 00	L.T.4 E 02	L.T.4 E 01	L.T.7 E 01	L.T.2 E 02	L.T.1 E 01
09/10/75	L.T.2 E 01	L.T.1 E 02	-	L.T.1 E 01	L.T.1 E 01	L.T.3 E 02	L.T.4 E 01	L.T.8 E 01	L.T.2 E 02	L.T.1 E 01
10/07/75	L.T.1 E 01	L.T.6 E 01	-	L.T.6 E 00	L.T.8 E 00	L.T.1 E 02	L.T.2 E 01	L.T.5 E 01	L.T.1 E 02	L.T.9 E 00
11/12/75	L.T.7 E 00	L.T.4 E 01	L.T.4 E 01	L.T.5 E 00	L.T.5 E 00	L.T.5 E 01	L.T.2 E 01	L.T.4 E 01	L.T.1 E 02	L.T.9 E 00
12/04/75	L.T.1 E 01	L.T.5 E 01	-	L.T.6 E 00	L.T.6 E 00	L.T.9 E 01	L.T.2 E 01	L.T.6 E 01	L.T.1 E 02	L.T.1 E 01
mean +- std. dev.	-									
detected / measured	0/9	0/9	0/1	0/9	0/9	0/7	0/9	0/9	0/9	0/9
range	-									

NINE MILE POINT/FITZPATRICK GENERATING STATION

ENVIRONMENTAL MONITORING 1975

STATION NMP 16

WEST CONTROL 40' BOTTOM

WATER (picocuries/liter)

COLLECTION DATE	GROSS BETA	GROSS ALPHA	TRITIUM		Be-7	K-40	Mn-54	Co-58	Co-60	Zr-95
04/11/75	4.0+-1.0 E 00	L.T.1 E 00	3.3+-0.8 E 02		L.T.2 E 02	L.T.8 E 01	L.T.7 E 00	L.T.2 E 01	L.T.6 E 00	L.T.3 E 01
05/05/75	3.7+-0.9 E 00	L.T.1 E 00	3.4+-0.7 E 02		L.T.2 E 02	L.T.6 E 01	L.T.6 E 00	L.T.1 E 01	L.T.6 E 00	L.T.3 E 01
06/05/75	3.5+-0.8 E 00	L.T.1 E 00	3.6+-0.8 E 02		L.T.2 E 02	L.T.9 E 01	L.T.7 E 00	L.T.1 E 01	L.T.7 E 00	L.T.3 E 01
07/07/75	1.6+-0.2 E 01	4.3+-3.0 E 00	2.5+-0.8 E 02	note (1)	L.T.6 E 02	L.T.6 E 02	L.T.4 E 01	L.T.6 E 01	L.T.4 E 01	L.T.1 E 02
08/12/75	3.9+-0.9 E 00	L.T.2 E 00	3.4+-0.9 E 02		L.T.8 E 01	L.T.2 E 02	L.T. E 01	L.T.2 E 01	L.T.1 E 01	L.T.3 E 01
09/10/75	4.1+-0.9 E 00	L.T.1 E 00	4.0+-0.8 E 02		L.T.1 E 02	L.T.1 E 02	L.T.1 E 01	L.T.1 E 01	L.T.9 E 00	L.T.2 E 01
10/07/75	3.4+-0.9 E 00	L.T.1 E 00	5.9+-0.8 E 02		L.T.7 E 01	L.T 8 E 01	L.T.6 E 00	L.T.6 E 00	L.T.6 E 00	L.T.1 E 01
11/12/75	3.1+-0.9 E 00	L.T.2 E 00	3.9+-0.8 E 02		L.T.8 E 01	L.T.1 E 02	L.T.6 E 00	L.T.7 E 00	L.T.6 E 00	L.T.1 E 01
12/04/75	3.2+-0.8 E 00	L.T.2 E 00	3.9+-0.8 E 02		L.T.1 E 02	L.T.2 E 02	L.T.8 E 00	L.T.1 E 01	L.T.8 E 00	L.T.2 E 01
mean +- std/ dev/	5.0+-4.1 E 00	-	3.8+-0.9 E 02							
detected / measured	9/9	1/9	9/9							
range	(3.1-16.0)E 00	-	(2.5-5.9) E 02							

note (1) Only 80 mℓs of sample available for Ge(Li) gamma counting, thus the limits of detection are higher than usual. Generally 1000 mℓs are assayed!

COLLECTION DATE	Ru-103	Ru-106	I-131	Cs-134	Cs-137	Ba-140	Ce-141	Ce-144	Ra-226	Th-228
04/11/75	L.T.5 E 01	L.T.6 E 01	-	L.T.6 E 00	L.T.6 E 00	-	L.T.1 E 02	L.T.3 E 01	L.T.6 E 01	L.T.7 E 00
05/05/75	L.T.4 E 01	L.T.6 E 01	-	L.T.6 E 00	L.T.6 E 00	-	L.T.6 E 01	L.T.3 E 01	L.T.6 E 01	L.T.6 E 00
06/05/75	L.T.3 E 01	L.T.7 E 01	-	L.T.7 E 00	L.T.8 E 00	L.T.2 E 03	L.T.6 E 01	L.T.5 E 01	L.T.1 E 02	L.T.9 E 00
07/07/75	L.T.1 E 02	L.T.3 E 02	-	L.T.4 E 01	L.T.5 E 01	L.T.3 E 03	L.T.1 E 02	L.T.2 E 02	L.T.5 E 02	L.T.5 E 01
08/12/75	L.T.2 E 01	L.T.1 E 02	-	L.T.1 E 01	L.T.1 E 01	L.T.4 E 02	L.T.8 E 01	L.T.8 E 01	L.T.1 E 02	L.T.1 E 01
09/10/75	L.T.2 E 01	L.T.7 E 01	-	L.T.1 E 01	L.T.1 E 01	L.T.2 E 02	L.T.2 E 01	L.T.5 E 01	L.T.1 E 02	L.T.1 E 01
10/07/75	L.T.9 E 00	L.T.5 E 01	-	L.T.6 E 00	L.T.7 E 00	L.T.8 E 01	L.T.1 E 01	L.T.3 E 01	L.T.6 E 01	L.T.7 E 00
11/12/75	L.T.1 E 01	L.T.6 E 01	L.T.6 E 01	L.T.7 E 00	L.T.7 E 00	L.T.7 E 01	L.T.2 E 01	L.T.5 E 01	L.T.1 E 02	L.T.1 E 01
12/04/75	L.T.2 E 01	L.T.8 E 01	-	L.T.8 E 00	L.T.1 E 01	L.T.3 E 01	L.T.7 E 01	L.T.1 E 02	L.T.1 E 02	L.T.2 E 01
mean +- std. dev.	-									
detected / measured	0/9	0/9	0/1	0/9	0/9	0/7	0/9	0/9	0/9	0/9
range	-									

IV. DISCUSSION OF RESULTS

The results of the radioanalysis of the water samples from the twelve sampling stations in Lake Ontario are presented in Section III of this report. Gross beta and tritium were detected for all of the samples monitored and the mean ± standard deviation of these analyses are entered on the attached Trends Plots.

A. Gross Beta

The gross beta activity during 1975 continues in the range of activities detected during 1973 and 1974. During 1975 the range of gross beta was 2.6 to 5.5 pCi/liter with the exception of one reading of 16 pCi/liter at NMP 16 on July 7, 1975. This high reading of 16 pCi/liter was due to the unusually high content of dissolved and/or suspended solids in the water sample. The sample was contaminated by bottom material during collection.

The mean of the gross beta measurements for the twelve stations is 4.0 pCi/liter, with a minimum mean of 3.4 pCi/liter and a maximum mean of 5.0 pCi/liter.

The results of this monitoring program compare to an average of 4 pCi/liter published in the 1974 Annual Report of "Environmental Radiation in New York State" for the Oswego City Hall Tap (Lake Ontario). This report was issued by the New York State Department of Environmental Conservation.

B. Gross Alpha

Gross alpha measurements were generally below the limits of detection. Positive results statistically close to the limits of detection were reported in less than one out of nine measurements at some of the sampling locations. The one definite gross alpha detection was at station NMP 16 on July 7, 1975, the same station with the high gross beta activity. This high activity was attributed to dissolved and/or an unusually high level of suspended solids in the water sample resulting from contamination of the sample with lake bed sediments.

C. Tritium

The activity levels of tritium for the 1975 sampling program ranged from 240 to 750 pCi/liter. The average tritium activity is 393 pCi/liter, statistically duplicating the measurements in 1974.

The results of this monitoring program compare to an average of <400 pCi/liter and a range of <300 to 800 pCi/liter published in the 1974 Annual Report of Environmental Radiation in New York State (page 40) for the Oswego City Hall Tap (Lake Ontario).

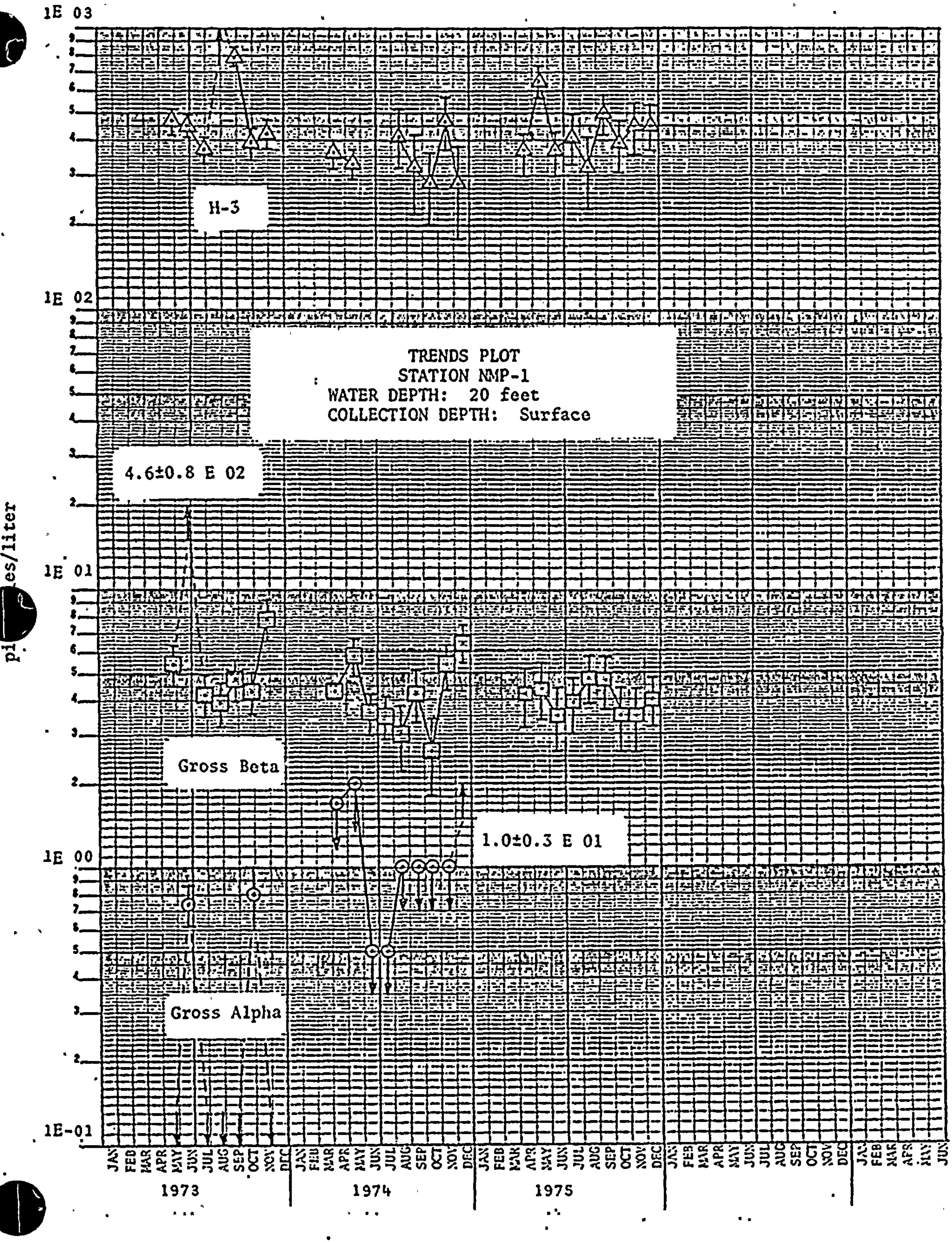
Published data for the October - December 1975 period list the tritium activity of 400 ± 200 pCi/liter in Lake Ontario. These results are published in Environmental Radiation Data - Report 4 (April 1976) issued by the USEPA, Office of Radiation Programs.

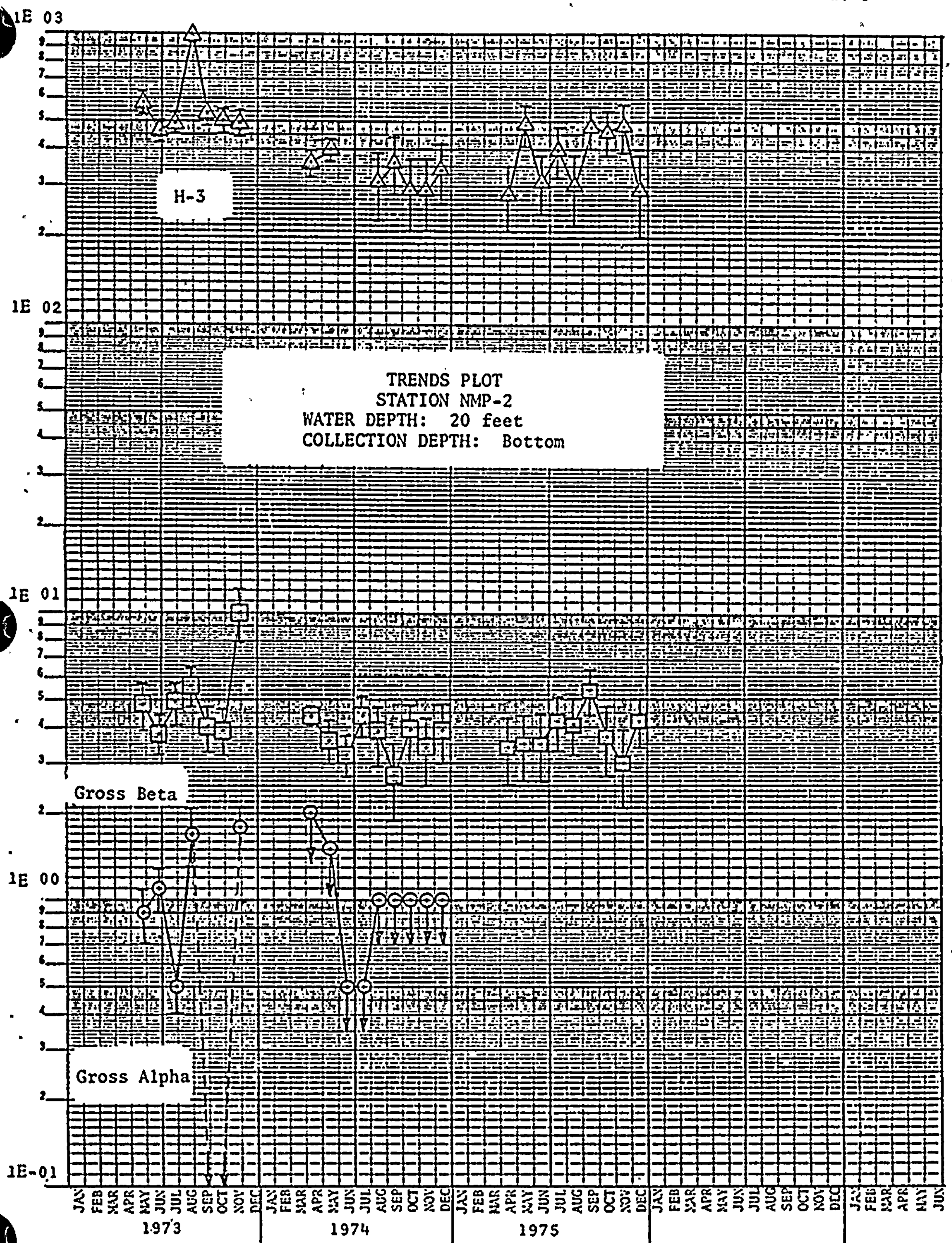
Gamma Emitters

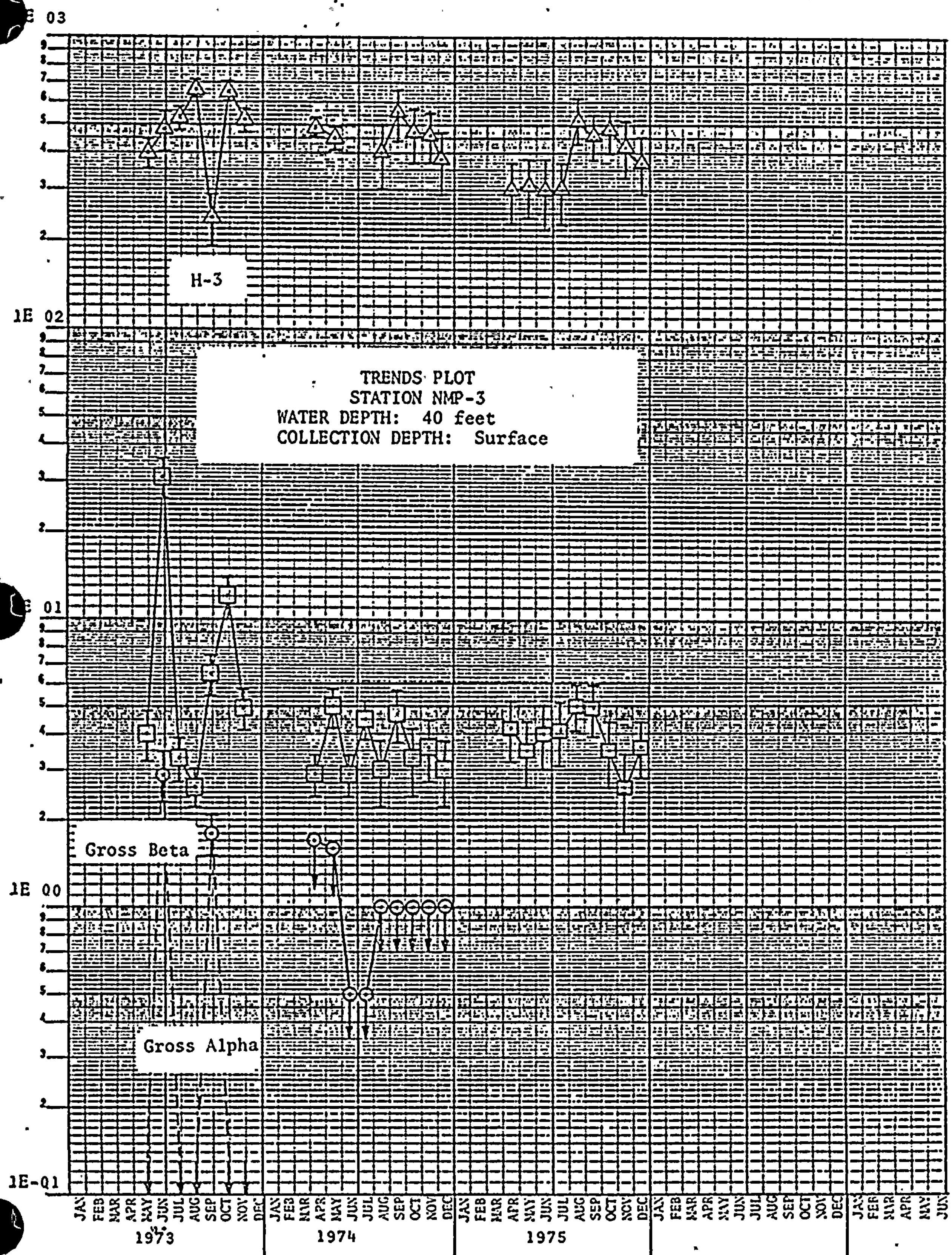
Gamma analyses by high resolution Ge(Li) gamma spectrometry were performed on the water samples analyzed in this program. A computer search was made for thirty-six possible gamma emitters. No detectable radioactivities of these nuclides were found and the less than (L.T.) values were calculated as three times the standard deviation of the background of the Ge(Li) detection system for the sixteen most probably candidates for detection. The detection limits are listed in the tables in Section III.

CONCLUSION

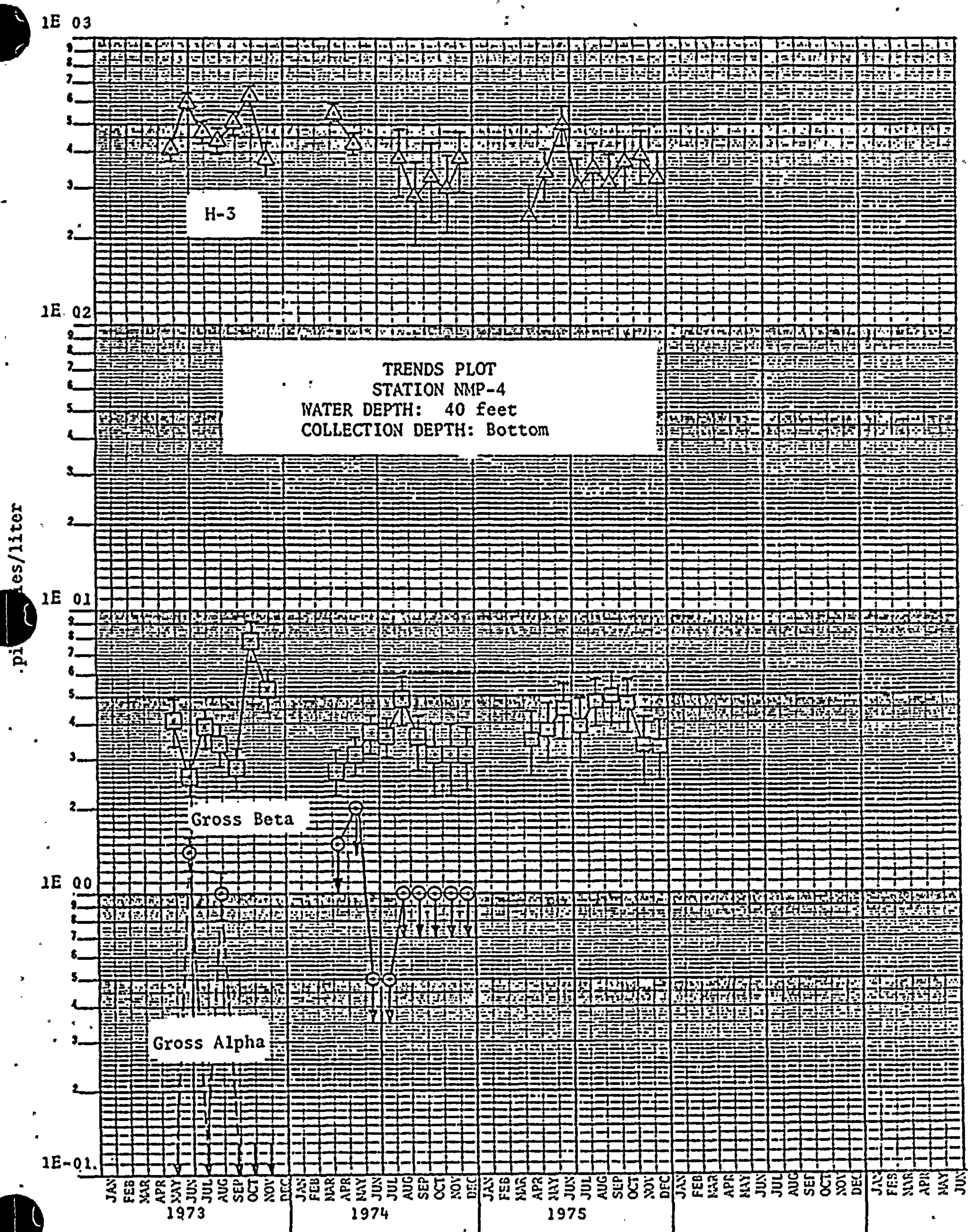
From the radioanalysis for gross beta, gross alpha, tritium, and gamma emitting nuclides, we conclude that no detectable radioactivities above limits of detection for gross alpha and gamma emitters, or above the levels in the environment for gross beta and tritium were monitored in the water samples collected from Lake Ontario in the vicinity of the Nine Mile Point/ Fitzpatrick Power Generating Station.

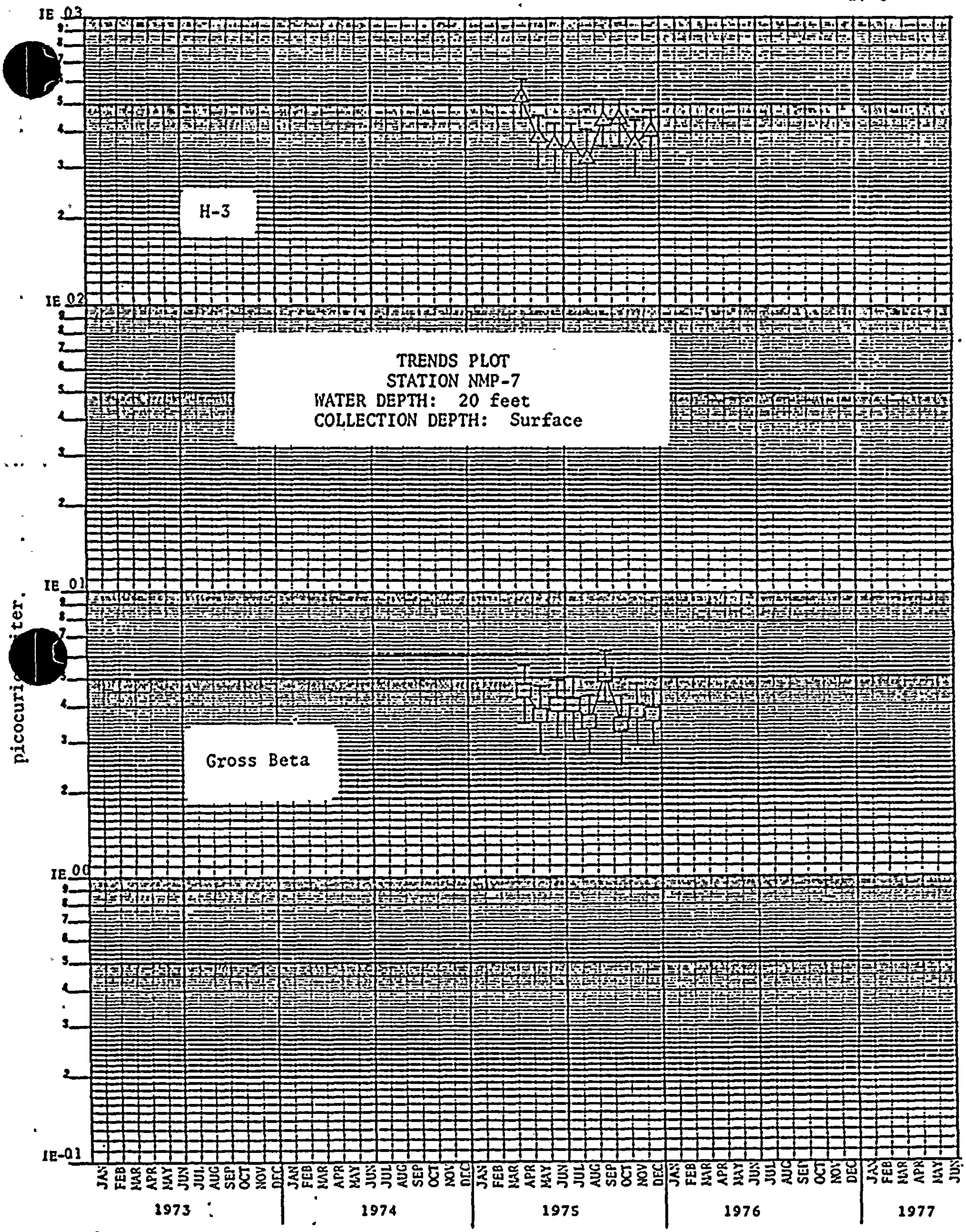

TRENDS PLOT
STATION NMP-1
WATER DEPTH: 20 feet
COLLECTION DEPTH: Surface
H-3
4.6±0.8 E 02
Gross Beta
1.0±0.3 E 01
Gross Alpha
1E 03
1E 02
1E 01
1E 00
1E-01
pi es/liter
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
1973
1974
1975

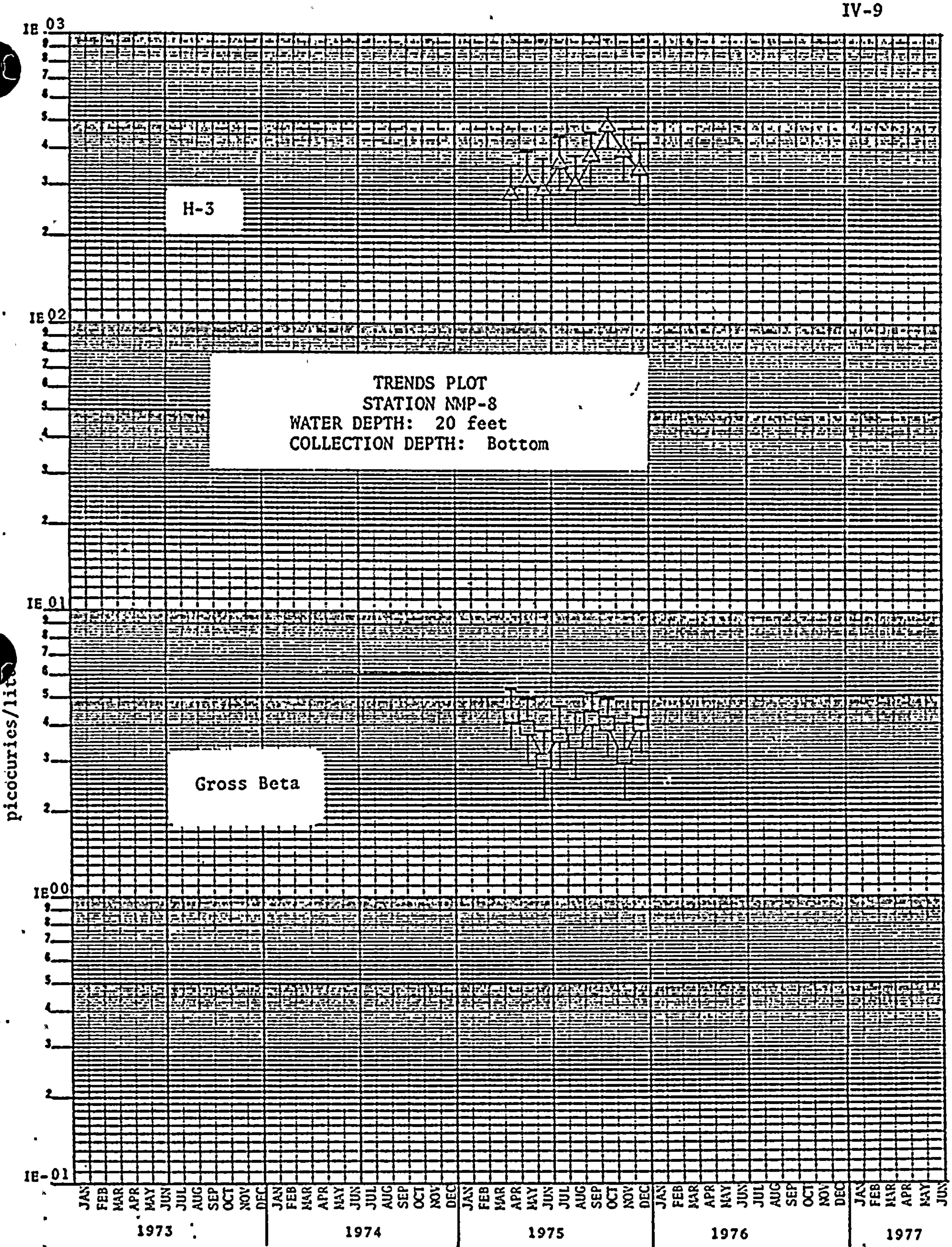

TRENDS PLOT
STATION NMP-2
WATER DEPTH: 20 feet
COLLECTION DEPTH: Bottom
H-3
Gross Beta
Gross Alpha
picoc /liter
1E 03
1E 02
1E 01
1E 00
1E-01
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
1973
1974
1975

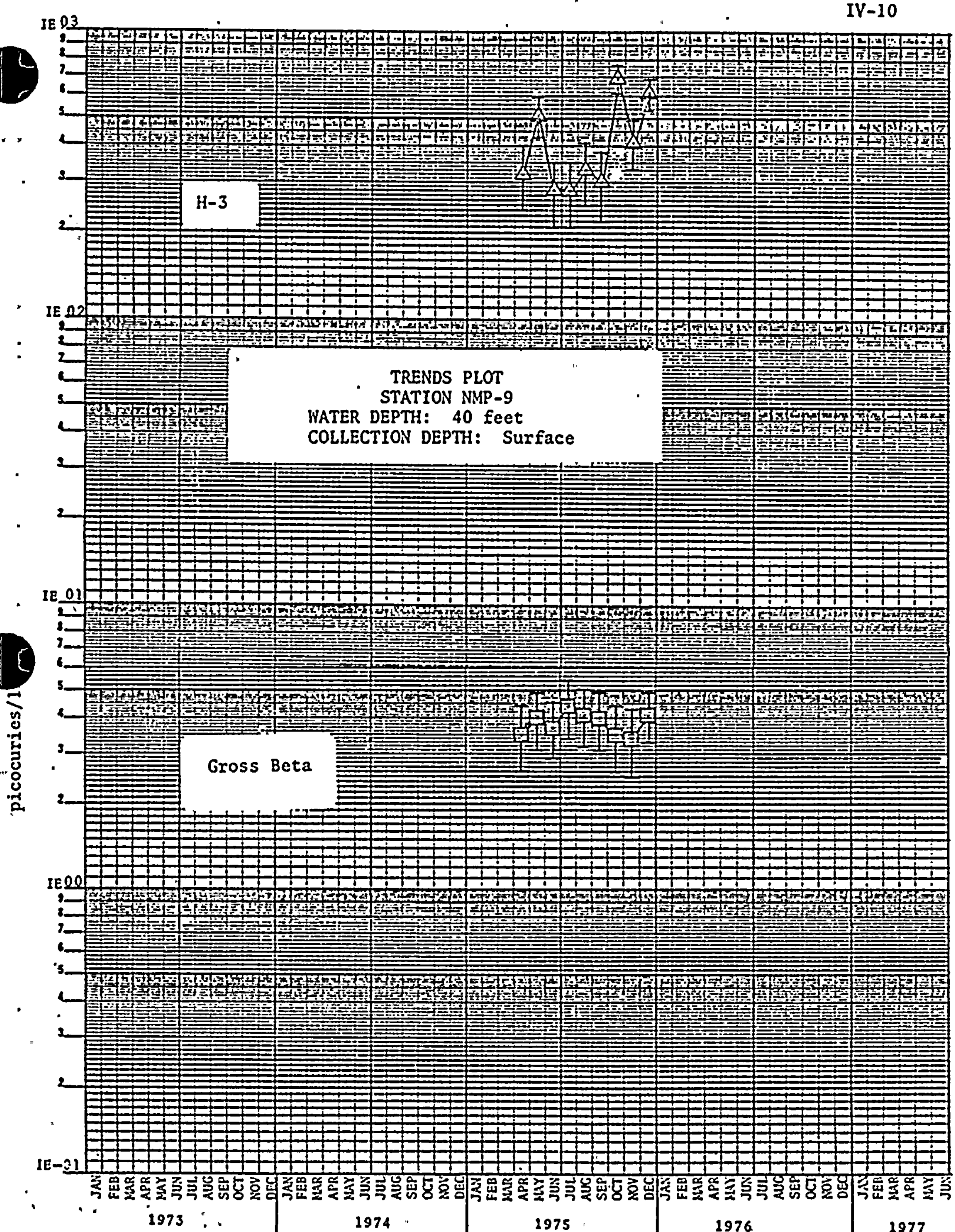


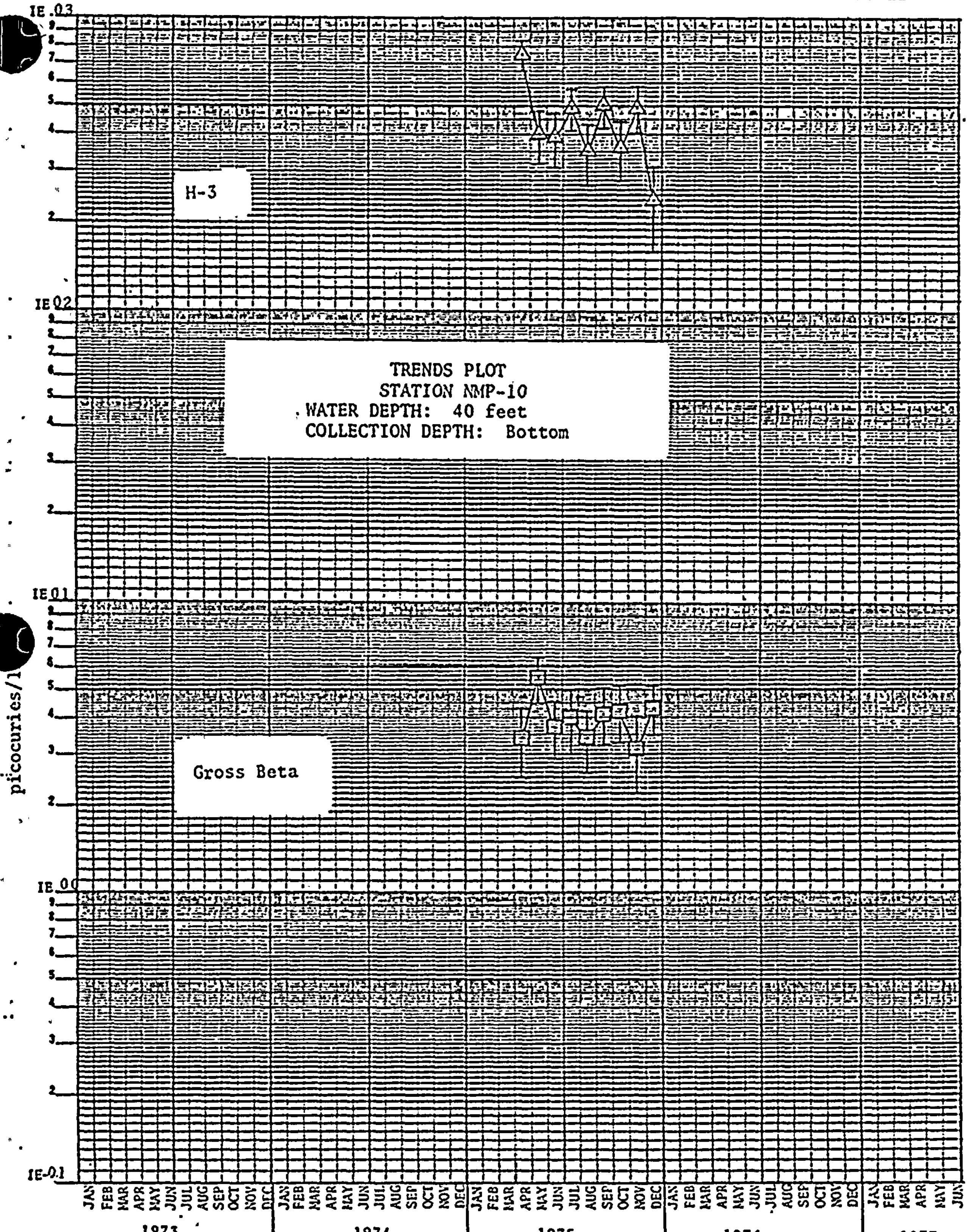
E 03
H-3
1E 02
TRENDS PLOT
STATION NMP-3
WATER DEPTH: 40 feet
COLLECTION DEPTH: Surface
pico /liter
E 01
Gross Beta
1E 00
Gross Alpha
1E-01
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
1973
1974
1975

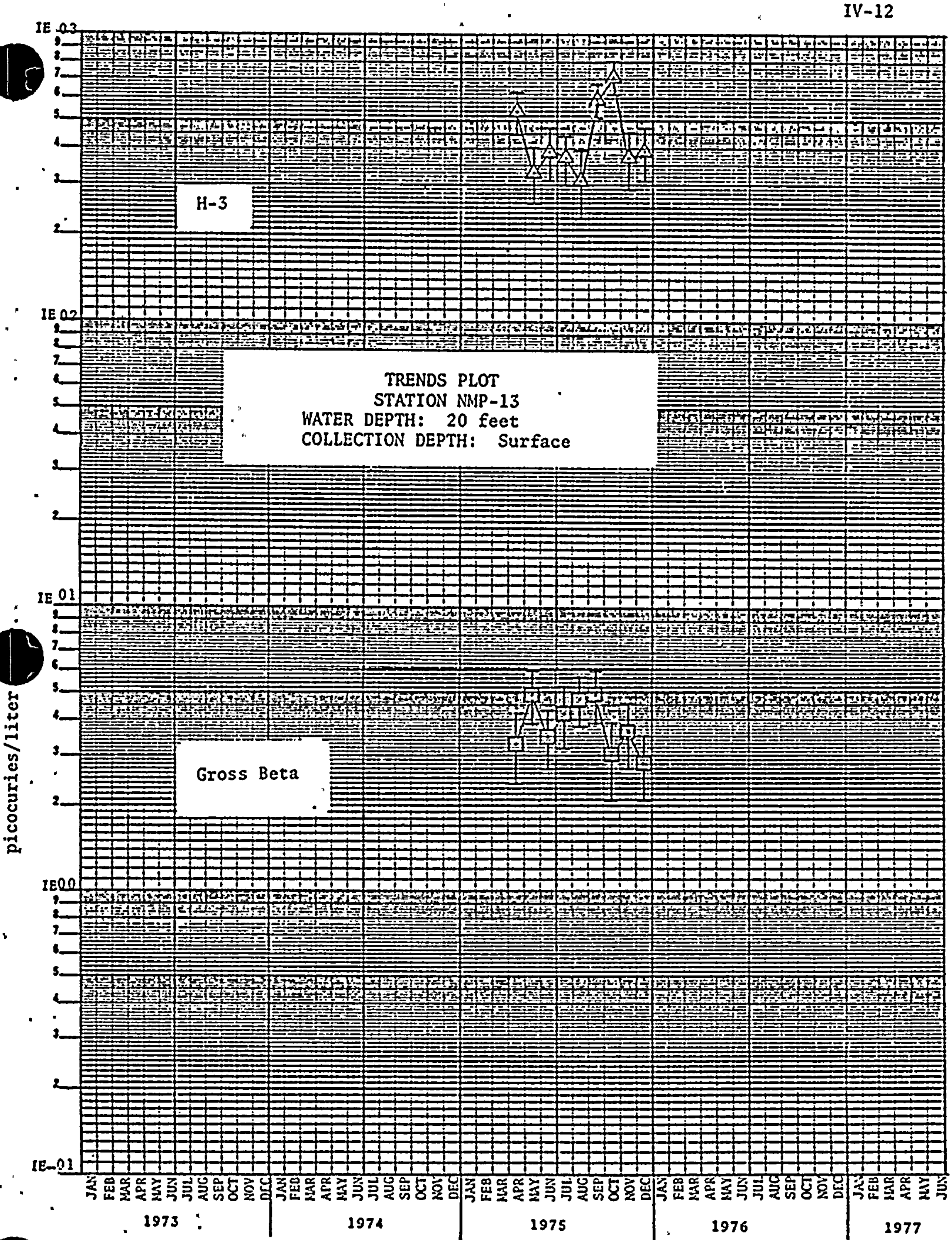

TRENDS PLOT
STATION NMP-4
WATER DEPTH: 40 feet
COLLECTION DEPTH: Bottom
H-3
Gross Beta
Gross Alpha
1E 03
1E 02
1E 01
1E 00
1E-01
picocuries/liter
1973
1974
1975

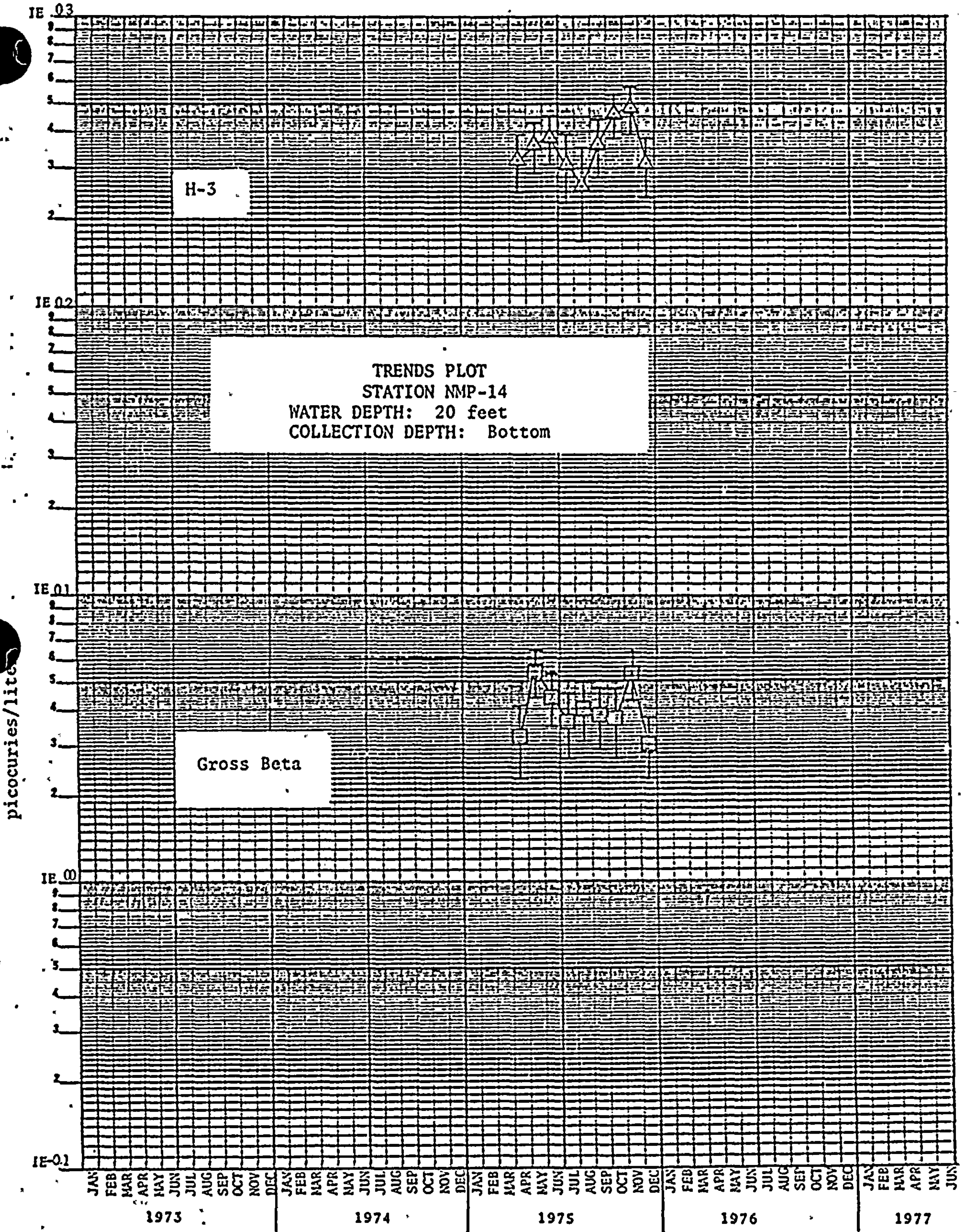

IE 03
H-3
IE 02
TRENDS PLOT
STATION NMP-7
WATER DEPTH: 20 feet
COLLECTION DEPTH: Surface
IE 01
Gross Beta
IE 00
IE-01
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
1973
1974
1975
1976
1977

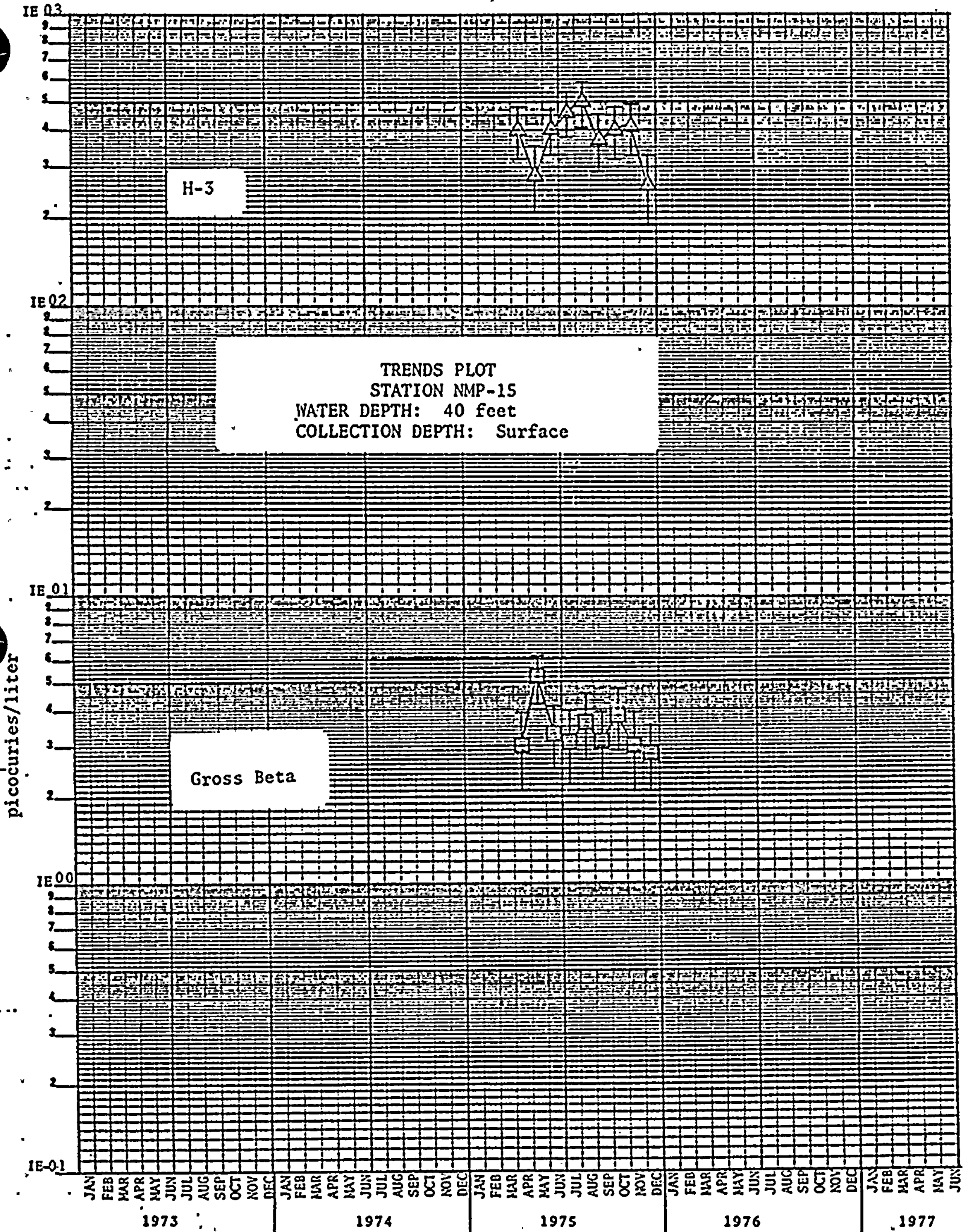

H-3
TRENDS PLOT
STATION NMP-8
WATER DEPTH: 20 feet
COLLECTION DEPTH: Bottom
Gross Beta
picocuries/liter
1E 03
1E 02
1E 01
1E00
1E-01
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
1973
1974
1975
1976
1977


H-3
TRENDS PLOT
STATION NMP-9
WATER DEPTH: 40 feet
COLLECTION DEPTH: Surface
Gross Beta
picocuries/l
IE 03
IE 02
IE 01
IE 00
IE-01
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
1973
1974
1975
1976
1977


IE 03
IE 02
IE 01
IE 00
IE-01
picocuries/1
H-3
TRENDS PLOT
STATION NMP-10
WATER DEPTH: 40 feet
COLLECTION DEPTH: Bottom
Gross Beta
1973
1974
1975
1976
1977


IE 03
IE 02
IE 01
IE00
IE-01
picocuries/liter
H-3
TRENDS PLOT
STATION NMP-13
WATER DEPTH: 20 feet
COLLECTION DEPTH: Surface
Gross Beta
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
1973
1974
1975
1976
1977


IE 03
IE 02
IE 01
IE 00
IE-01
picocuries/liter
H-3
TRENDS PLOT
STATION NMP-14
WATER DEPTH: 20 feet
COLLECTION DEPTH: Bottom
Gross Beta
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
1973
1974
1975
1976
1977


TRENDS PLOT
STATION NMP-15
WATER DEPTH: 40 feet
COLLECTION DEPTH: Surface
H-3
Gross Beta
picocuries/liter
IE 03
IE 02
IE 01
IE 00
IE-01
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
1973
1974
1975
1976
1977

APPENDIX A

ANALYTICAL PROCEDURES

RIVER OR LAKE WATER

Gross Beta/Gross Alpha

1. To 1 liter of sample, add 1 mℓ of nitric acid and evaporate to 1 - 2 mℓs volume.

2. Transfer to a 2 inch diameter stainless steel planchet and evaporate to dryness under an infrared heating lamp. Determine the weight of residue and submit for radioassay.

3. Count for 50 minutes in a Beckman-Sharp Wide Beta II counter for gross beta, then for gross alpha.

Tritium

An aliquot of sample is converted to hydrogen gas by reduction in a hot zinc furnace, mixed with methane counting gas, and radioassayed utilizing an internal low-level gas proportional counter. Very low levels of activity can be detected due to the sophistication of the counting equipment, the electronics, and the shielding.

Gamma Isotopic Analysis

One liter of sample is transferred to a 1 liter Marinelli wraparound counting beaker and counted for 8 hours on a high resolution gamma spectrometer. Specific gamma isotopes are indicated by peaks at discrete energies. The activity of each isotope is determined by computer-aided integration of the area under each peak.

APPENDIX B

DETECTION CAPABILITIES FOR ENVIRONMENTAL SAMPLE ANALYSIS

ANALYSIS	HALF-LIFE	LOWER LIMIT OF DETECTION (LLD)[a] by Radiochemical Methods					
		Water (pCi/ℓ)	Airborne Particulate or Gas (pCi/m³)	Fish, Meat or Poultry (pCi/kg, wet)	Milk (pCi/ℓ)	Vegetation (pCi/kg, wet)	Soil (pCi/kg, dry)
SAMPLE REQUIRED		1 liter	300 Cu. M	400 Gm Wet	1 liter	400 Gm Wet	50 Gm Dry
Gross β }e,f,h	N.A.	0.9	0.004	50	2	60	1300
Gross α }e,f,h	N.A.	0.3	0.002	-	-	-	-
SAMPLE REQUIRED		1 liter	1200 Cu. M	400 Gm Wet	1 liter	400 Gm Wet	50 Gm Dry
Sr^{89} (b) (h)	53 d	4	0.004	30 (g)	4	30	400
Sr^{90} (h)	28 y	0.8	0.0007	5 (g)	0.8	5	80
Cs^{137} (h)	30 y	2	0.001	-	2	-	20
SAMPLE REQUIRED		2 to 3 ℓ	300 Cu. M	400 Gm Wet	2 to 3 ℓ	400 Gm Wet	-
I^{131} (i)	8.1 d	0.4 0.5 (c)	0.003	-	0.4 0.5 (c)	80	-
SAMPLE REQUIRED		0.3 liter	-	400 Gm Wet	0.3 liter	400 Gm Wet	50 Gm Dry
elem Ca	N.A.	0.02 gm/ℓ	-	40 gm/kg wet	0.02 gm/ℓ	40 gm/kg wet	
elem K	N.A.	2 mg/ℓ	-	100 mg/kg wet	2 mg	100 mg/kg wet	

APPENDIX B (continued)

DETECTION CAPABILITIES [illegible]NVIRONMENTAL SAMPLE ANALYSIS

ANALYSIS	HALF-LIFE	LOWER LIMIT OF DETECTION (LLD)[a,b,d] Ge(Li) Gamma Spectrometry Analysis					
		Water (pCi/ℓ)	Airborne Particulate or Gas (pCi/m^3)	Fish, Meat or Poultry (pCi/kg, wet)	Milk (pCi/ℓ)	Vegetation (pCi/kg, wet)	Soil (pCi/kg, dry)
Sample Required		1 liter sample	1200 cu.m. sample	400 gm sample	1 liter sample	400 gm sample	400 gm sample
Be^7	53 d	80	0.02	200	80	200	200
K^{40}	1.3 E 09 y	200	0.04	500	200	500	500
Cr^{51}	27.8 d	80	0.07	200	80	200	200
Mn^{54}	290 d	8	0.002	20	8	20	20
Co^{58}	71 d	8	0.002	20	8	20	20
Fe^{59}	45 d	10	0.003	40	10	40	40
Co^{60}	5.3 y	8	0.002	20	8	20	20
Zn^{65}	245 d	20	0.005	30	20	30	30
Zr^{95}	65 d	10	0.003	40	10	40	40
Ru^{103}	40 d	8	0.002	20	8	20	20
Ru^{106}	368 d	80	0.02	200	80	200	200
I^{131}	8.1 d	10	0.002	30	10	30	30
Cs^{134}	2.1 y	9	0.002	20	9	20	20
Cs^{137}	30 y	9	0.002	20	9	20	20
$Ba\text{-}La^{140}$	12.8d/40 hr	15	0.005	80/40	15	80/40	40
Ce^{141}	33 d	20	0.003	40	20	40	40
Ce^{144}	284 d	80	0.02	200	80	200	200
Ra^{226}	1602 y	60	0.009	100	60	100	100
Th^{228}	1.9 y	10	0.009	20	10	20	20

Notes:

(a) The nominal lower limit of detection (LLD) is defined in HASL 300, pp D-08-01,-02,-03 at the 95% confidence level.

(b) The nominal LLD is at the counting time and must be corrected to the midcollection time.

(c) The LLD levels for I-131 in milk and water are decay corrected to the midcollection time. The midcollection to counting time must be <8 days to insure conformity to L.T. 0.5 pCi/liter (σm = 4) at the 97.7% confidence level or L.T. 0.4 pCi/liter (σm = 3.3) at the 95% confidence level. See (a) above for 95% confidence level referral.

(d) The LLD for radionuclides analyzed by Ge(Li) gamma spectrometry will vary according to the number of nuclides in the environmental sample and consequently the background continuum and Compton scattering.

(e) Not applicable - indicated by (N.A.). Activities calculated as of the counting date.

(f) This is the LLD for a weightless mount. Dissolved or suspended materials in the sample increase the self-absorption in the mount resulting in an increase of the LLD.

(g) Flesh only required for analysis. The ash weight percent of fish is ∿3%.

(h) Sample required is for analysis of bracketed nuclides.

(i) The midcollection to counting time of short-lived nuclides must be less than one half-life for the LLD to apply.