LAKE GILES

REPORT ON LIMNOLOGICAL CONDITIONS IN 1991

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INTRODUCTION

Personnel from Lehigh University visited Lake Giles on 17 dates throughout 1991 as part of a routine monitoring program of three lakes. These lakes were selected to span a trophic gradient, Lake Giles occupying the unproductive ("oligotrophic") end of the gradient. Similar reports will be submitted to the owners of Lake Waynewood, a nutrient-rich ("eutrophic") lake potentially affected by homes and agricultural practices within its drainage basin, and Lake Lacawac, a well protected lake of intermediate productivity ("mesotrophic"). Because Lake Lacawac has been little disturbed throughout its recent history, and is currently preserved as part of the Lacawac Sanctuary, it serves as a valuable reference lake for the region.

The monitoring of these lakes in the Pocono region of northeastern Pennsylvania is a key component of Lehigh's Pocono Comparative Lakes Program (PCLP). This program aims to better understand the natural functioning of lakes, differences in lakes that arise through natural or man-made differences in their watersheds, and long-term trends that may be occurring in northeastern Pennsylvania. Through the cooperation of lake owners, scientists from Lehigh and other institutions are obtaining basic information that provides objective documentation of current lake conditions as well as a context for more intensive studies. Financial support from the Andrew W. Mellon Foundation has made these studies possible.

1991 was the fourth consecutive year of the monitoring program, and the fourth year for summer sampling. This is the second year that winter and spring data were obtained. The present report summarizes conditions in Lake Giles over the full twelve-month period for 1991. The format closely follows that of the previous two years. Physical/chemical data are presented as tables for each date, and are summarized in figures. The following parameters were measured: **TEMPERATURE, LIGHT PENETRATION, SECCHI DEPTH, DISSOLVED OXYGEN, ALKALINITY, pH,** and algal **CHLOROPHYLL-a. ZOOPLANKTON DATA** are presented as graphs that give the concentration (number of individuals per liter) averaged over the entire water column. Algae samples were collected and preserved but have not yet been counted.

During 1991 more detailed chemical sampling of the water column has been resumed, for the most of the components analyzed by Dr. Jonathan Cole and Dr. Nina Curaco (Institute of Ecosystem Studies, New York Botanical Garden, Millbrook, NY) and reported in the 1990 Report. Giles was sampled at 5-6 depths on 4 dates in April, July, September and November. Analyses will be completed during 1992 and reported next year.

The Lacawac Sanctuary plays a major role in this program as the field laboratory and summer residence for the investigators. We especially appreciate the interest and cheerful assistance of its Director, Sally Jones. We wish to thank the members and management at the Blooming Grove Hunting and Fishing Club, and most particularly Ken Ersbak, for encouraging the inclusion of Lake Giles in this study of regional limnology.

1991 METHODS AND RESULTS

Data included in this report are extracted from an electronic database maintained at Lehigh University by Dr. Craig Williamson. The field sampling, laboratory analyses, and computer data entry were supervised by Dr. Robert Moeller and Gina Novak. Gina Novak, Timothy Vail, John Aufderheide and Scott Carpenter carried out most of the field sampling and laboratory analyses. John counted most of the microzooplankton, except September and October, which Gina counted. Macrozooplankton samples through May were counted by Gaby Grad. After 1 June, Tim Vail counted macrozooplankton samples. Gina managed all aspects of the computer database including data entry and printing of zooplankton graphs. Dr. Bruce Hargreaves and Scott Carpenter have played major roles in the development of the computerized database. Nataly Vinogradova and Brian Sharer verified the zooplankton data entries. Gina Novak, along with Tim Vail, Robert Moeller and Vanessa Jones analyzed chlorophyll samples. Alkalinity and pH were determined by Scott Carpenter (through April), John Aufderheide and Tim Vail (May-July), and Tim Vail and Gina Novak (August-December). Gina entered the physical/chemical data, which Robert Moeller checked and abstracted as tables and graphs.

Although efforts have been made to assure the accuracy of data included in the database, and compiled in this report, we cannot guarantee complete accuracy and do not claim specific levels of accuracy or precision. The data have been collected as part of a lake characterization program and may not be suitable for uses not envisioned by the investigators. A brief description of sampling and analytical techniques is included here; a more complete description will be issued later in 1992 as a special report.

Information acquired through the Pocono Comparative Lakes Program is to be shared among scientists desiring to make broad comparative studies or considering research projects in these lakes. Inquiries to examine or use the data are invited. Of course, the primary right to publish extensive extracts from the database, or from this unpublished report to the lake owners, resides with the PCLP cooperating investigators and students who generated the data. As of May 1991, most of the existing information is accessible through the software program Reflex™ (version 2, Borland International, copyright 1989) running on IBM PC-type microcomputers. Instructional workshops on how to use the database are offered periodically at Lehigh University.

SAMPLING PROGRAM

On each sampling occasion, Lake Giles was visited twice, once during the day (the nominal date) and again after dark (sometimes the previous night). The night-time visit was required for zooplankton sampling. Usually, other parameters were measured, and samples were collected, during the day. Sampling was carried out at a fixed station (site "A") at the deepest part of the lake (about 23 meters or 80 feet). The thermal stratification existing on any date dictated the depths from which other samples were collected **(Figure 1)**. The lake was sampled twice monthly when surficial water temperature stayed above 20°C, (June through September), then once monthly during cooler times.

TEMPERATURE AND PHYSICAL STRATIFICATION

Temperature was measured at 1-meter intervals with the thermister of a YSI™ oxygen meter, in degrees Celsius. Accuracy should be within 1 degree. (This is **Method #10.**)

Figure 2 shows the thermal stratification that develops during late spring and summer, then breaks down in the autumn. On day 19 (19 January) the lake was ice-covered, and displayed a "reverse stratification". After ice-out (shortly before 17 March) the water column circulated from top to bottom during "spring turnover", but by day 103 (13 April) a weak thermal stratification was established. By day 182 (1 July) the surface water had warmed to its summer maximum (23-24°C) and become strongly stratified, producing an upper warm water layer circulating in contact with the atmosphere (the **EPILIMNION**, 0-8 meters, temperature 22-24°C); an intermediate layer of rapid temperature decrease with depth (the **METALIMNION**, 7-15 meters); and a deep layer of cold water (the **HYPOLIMNION**, 15-23 meters, temperature 7-9°C). In Lake Giles, the metalimnion is thick and grades smoothly into the hypolimnion. The lake's transparency allows appreciable absorptive heating of the deeper part of the water column, creating a broad metalimnion, which can be defined as the zone with temperature change of greater than 1°C per meter (in the other, less transparent PCLP lakes, a criterion of greater than 2°C/m is more useful).

The usual course of thermal stratification is that of slow, gradual thickening of an epilimnion during the summer. By day 264 (21 September) Lake Giles' epilimnion extended to 11 meters. As the lake cooled during the autumn, the epilimnion thickened more rapidly until the lakewater was circulating from top to bottom. This period of full circulation, or "fall turnover", was in progress by day 326 (22 November). The lake continued to cool, down to 4°C, before freezing soon after day 351 (17 December).

The temperature pattern in the lake is controlled by climate, and will differ only slightly from year to year. Two major variables are the durations of winter ice-cover (ca. 10-12 weeks in 1990-91) and the completeness of spring turnover. Spring turnover was complete in 1991 and probably lasted at least 2 weeks. During an especially warm spring, Lake Giles might stratify quickly without a thorough mixing of deep and surficial layers. This might lead to some differences in the biology and chemistry of the summer plankton community, although the effect might be smaller than in lakes where more profundal oxygen is consumed during winter ice cover.

Figure 3 presents the detailed trends of water temperature at three fixed depths (2,11,21 meters) for comparison with other years. 1991 was a warm year, especially in the

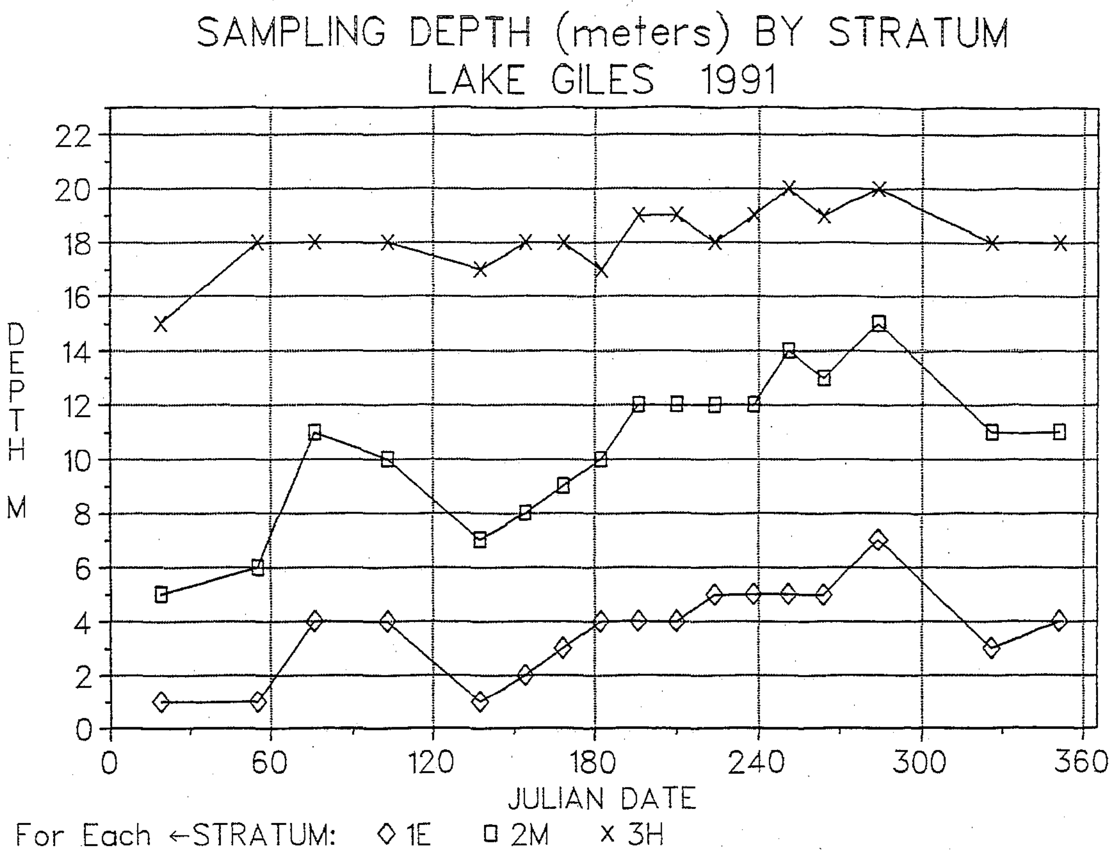


Figure 1. Depths of "EPI", "META", and "HYPO" samples from Lake Giles, 1991.

Sampling depths were selected by the field sampling crew based on the temperature profile on each date (see text for discussion).

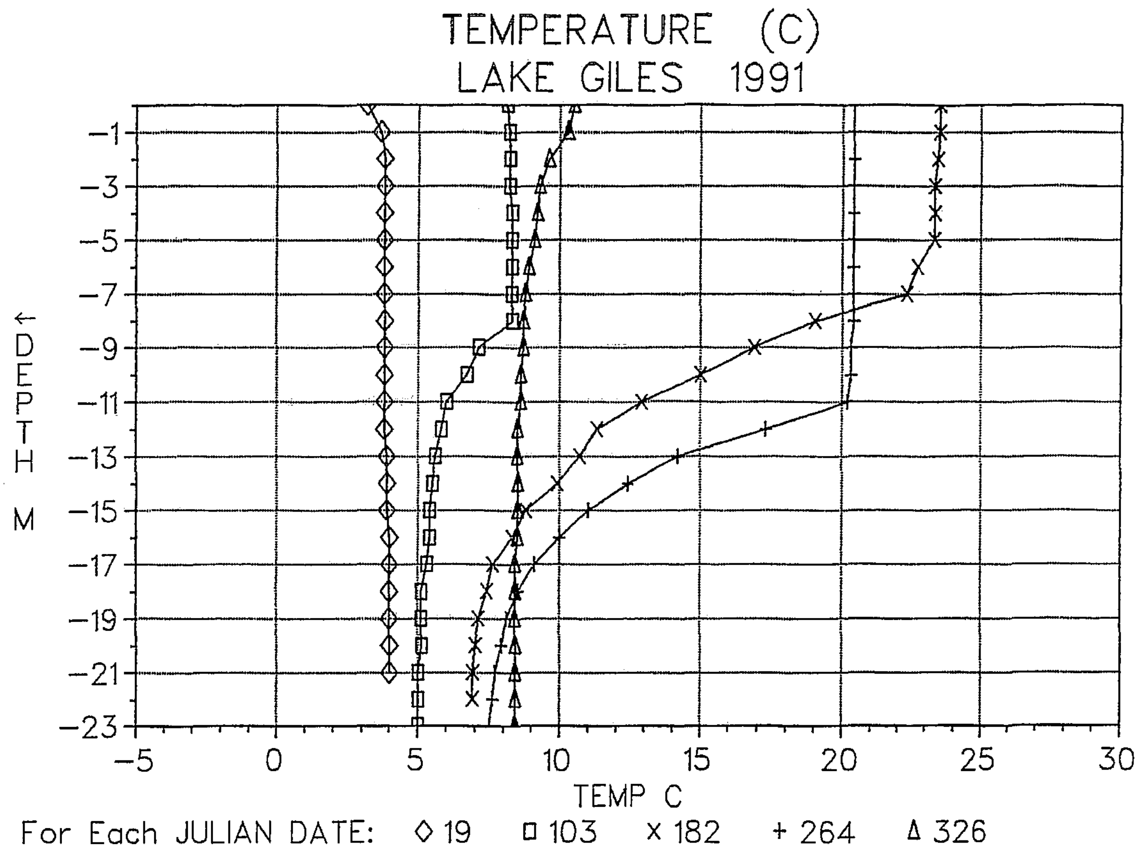


Figure 2. Temperature profiles in Lake Giles, 1991.

Values (°C) are plotted for five dates: **19 January** (day 19 --winter ice cover), **13 April** (day 103 --immediately following spring turnover), **1 July** (day 182 --midsummer stratification), **21 September** (day 264 --late stratification), and **22 November** (day 326 --fall turnover).

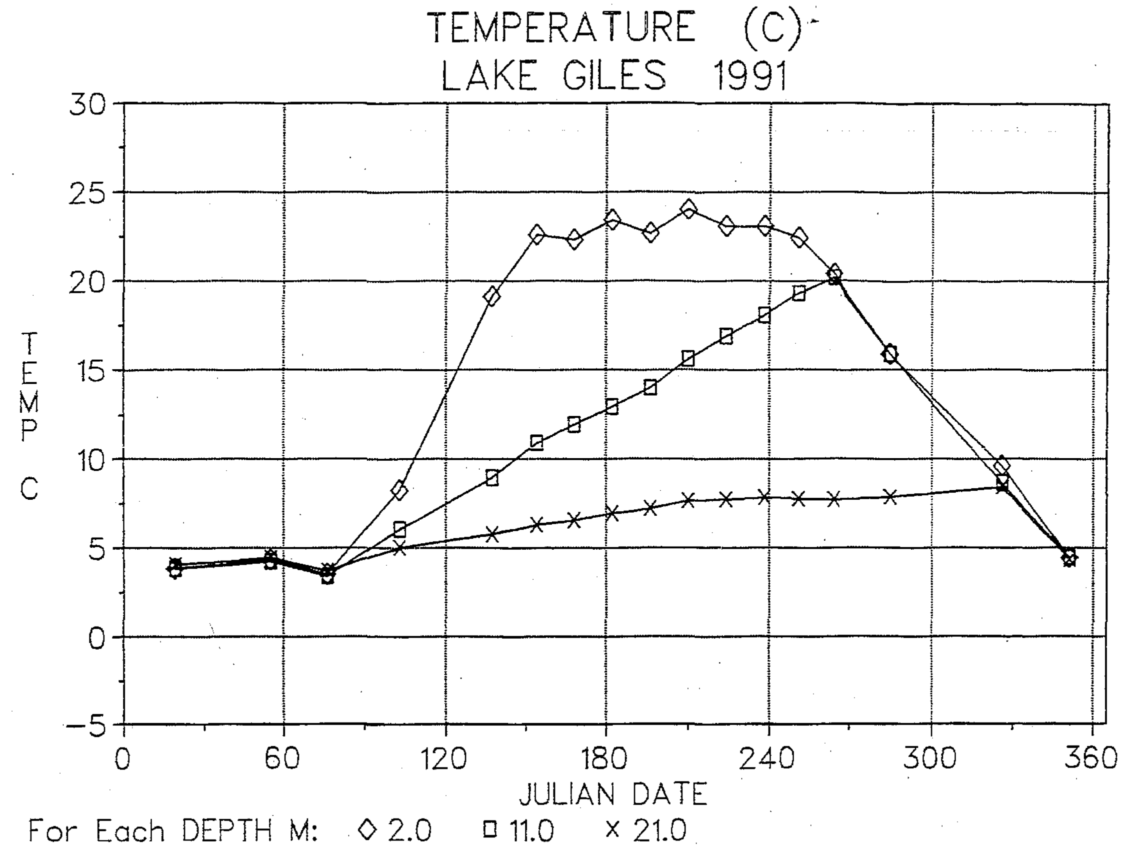


Figure 3. Temperature trends within Lake Giles, 1991.

Values (°C) are plotted for three fixed depths.

spring. The surface water warmed unusually rapidly, approaching the summer maximum in early June.

Water samples for **pH, alkalinity, chlorophyll, algae,** and **total phosphorus** were collected from mid-depths of the three layers when thermal stratification was well developed. During turnover periods, the lake was divided into three equal layers. Under ice-cover (e.g. 19 January), the topmost layer was 0-1m, and the remaining depths were divided at the Secchi depth (see **SECCHI DEPTH** below).

LIGHT PENETRATION

Light intensity at 1-meter intervals was calculated as a percentage of the light just below the lake surface (10 cm). Since 1988, three slightly different methods have been used to construct a 0-12 m profile of light penetration; method #12 (numbers correspond to codes from data tables) was used exclusively in 1990:

Method 12. Two sensors, mounted 1-m apart on a common line, electronically computed the ratio of light intensities between the nominal depth and the depth above it. The percentage penetration profile was constructed from these ratios. The sensors are Licor™ submersible flat-plate sensors filtered to give a quantum response to photosynthetically available radiation ("PAR"). Units are microeinsteins per meter square per second (μEin./m^2.sec).

Light penetration is plotted on a logarithmic scale for five dates **(Figure 4)**. During the summer, depths above 10 m (i.e. all of the epilimnion) received at least 5-10% of the light penetrating the lake surface. The metalimnion received 1-5% of surface light, enough for moderate rates of algal growth. Enough light reached the deepest waters to allow slow growth of low-light adapted algae. Unlike 1990, transparency was only slightly reduced during spring and fall--the spring algal populations were smaller than in 1990.

SECCHI DEPTH

Secchi depth is the depth, in meters, at which a white-and-black quartered disk 20 cm in diameter just ceases to be visible to an observer lowering it from a boat. It is a measure of water transparency. We observed the Secchi disk with a small glass-bottomed viewing box to reduce glare from the lake surface.

Secchi transparency was typically greater than 10 meters **(Figure 5)**. The spring-summer oscillation was less pronounced than in 1990, because of smaller spring algal populations. Transparency was 12-16 m during summer, as in 1989 and 1990, with the clearest conditions prevailing during the latter part of June.

OXYGEN CONTENT OF THE LAKEWATER

Dissolved oxygen was measured polarographically using a YSI™ submersible temperature-compensating oxygen meter. The meter was calibrated in air to 100% saturation immediately before use in the lake. The effect of Lake Giles' elevation above

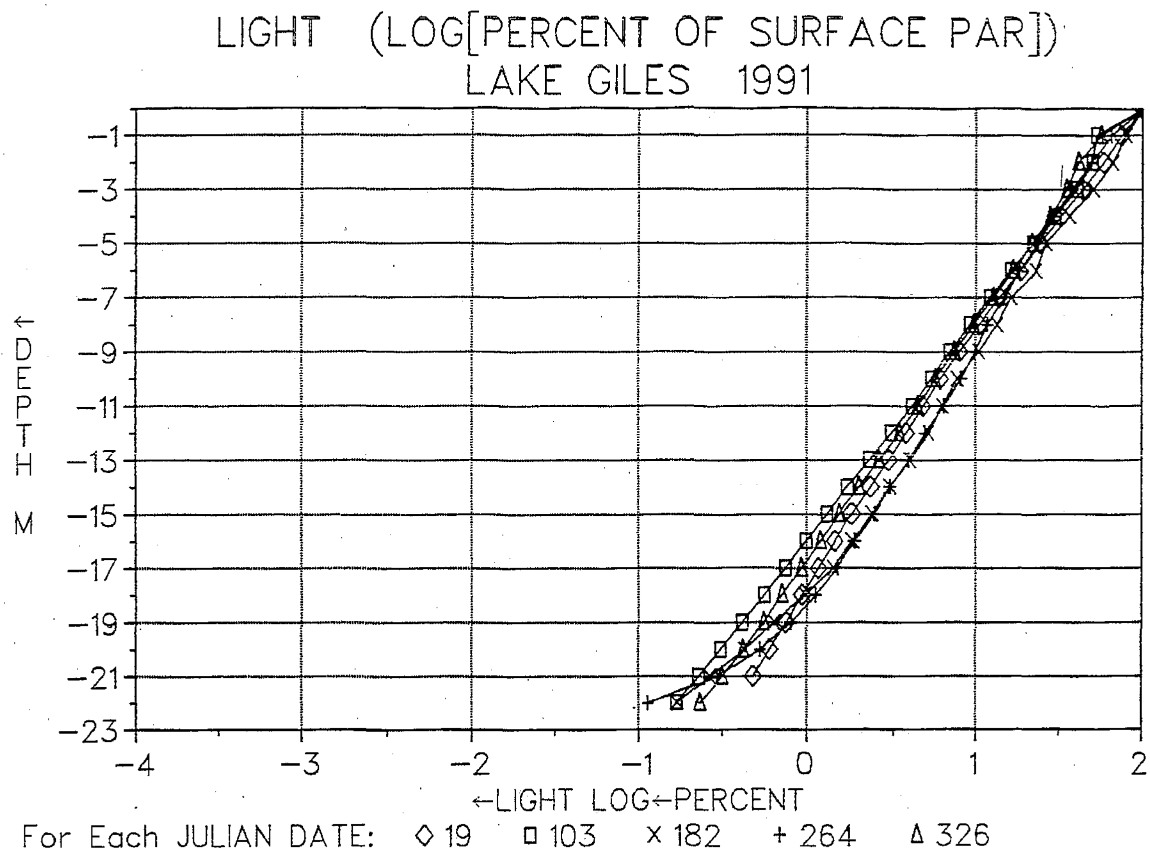


Figure 4. Light penetration in Lake Giles, 1991.

Values are percentages of the light at 0.1 m depth and are graphed on a logarithmic scale (i.e. 100% ="2", 10% ="1", 1% ="0", etc.) for five dates: **19 January** (day 19 --winter ice cover), **13 April** (day 103 --immediately following spring turnover), **1 July** (day 182 --midsummer stratification), **21 September** (day 264 --late stratification), and **22 November** (day 326 --fall turnover).

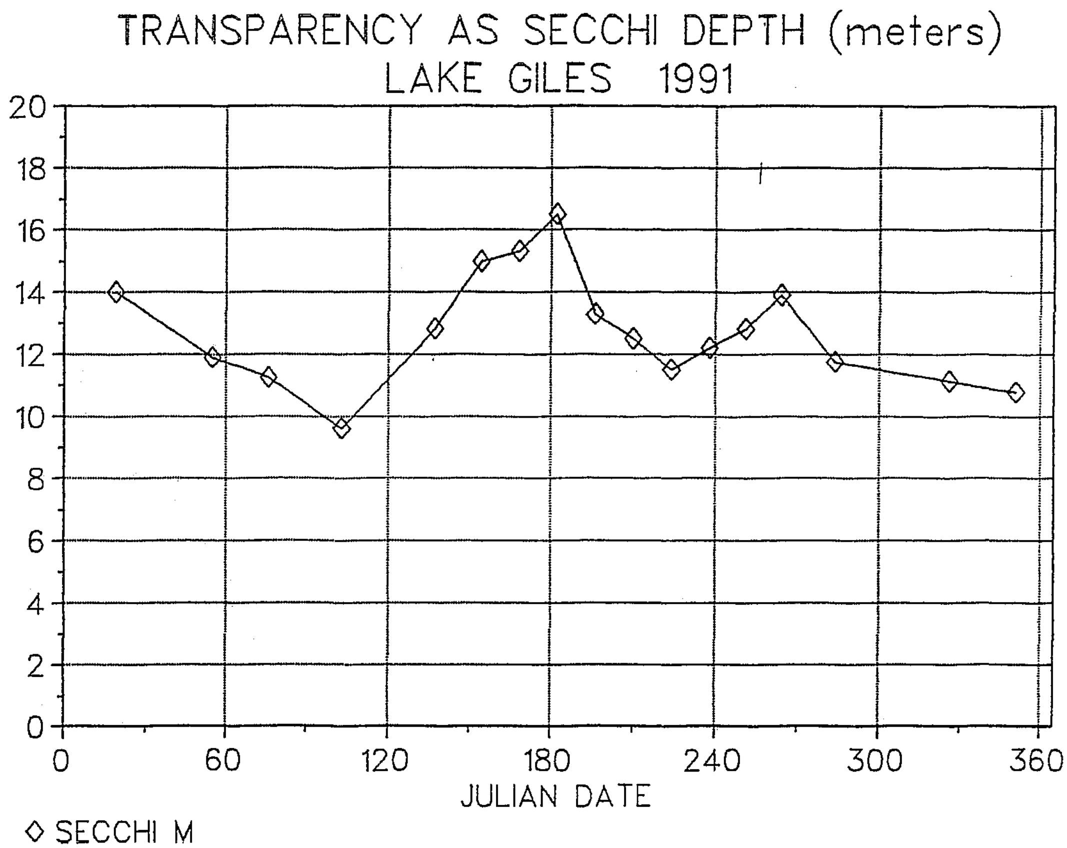


Figure 5. Transparency in Lake Giles, 1991.

Values plotted are the Secchi depths, in meters.

sea-level (1404 feet) was not taken into account when calibrating the meter, so all compiled values are roughly 5% too high. Units are mg O_2 per liter. (This is **Method #10.**)

Under winter ice cover, oxygen was not appreciably depleted (**Figure 6**). A small dip in the oxygen curve of day 19 at depths of 15-17 m may represent oxygen consumption by an especially dense microbial community. We suggested that a similar oxygen sag in 1990 might have been caused by aquatic mosses and their periphyton, but since the depths were not the same in both years (19-20 m in 1990), processes within the water column were more likely responsible. Oxygen concentration was set at atmospheric saturation during spring turnover, when the lake was still cold. During summer stratification, oxygen was slowly consumed within the hypolimnion, and lost from the warming epilimnion via outgassing to the atmosphere. These processes created the metalimnetic oxygen maximum that persisted throughout the summer (**Figure 6**). Oxygen was maintained at concentrations greater than 2 mg/L, except for the bottommost meter of the lake in late summer.

ALKALINITY AND pH

Alkalinity is a measure of the acid neutralizing, or buffering capacity. Alkalinity was determined by potentiometric titration of a 100-ml sample using 0.01 N sulfuric acid as titrant and monitoring pH change with an Orion™ model SA250 pH meter and Ross™ epoxy-body combination electrode. Titration points between pH 4.4 and 3.7 were plotted, after Gran transformation, to give alkalinity in microequivalents per liter (μeq./L). (This is **Method #11.**) Alkalinity was analyzed monthly, on alternate sampling dates during summer.

Samples for alkalinity and pH were taken from duplicate water collections (acrylic plastic Van Dorn bottle) at three depths, designated "**E**" (epilimnion), "**M**" (metalimnion), and "**H**" (hypolimnion). Selection of these depths is described in the section **TEMPERATURE AND THERMAL STRATIFICATION.** Samples were stored in air-tight polypropylene bottles for up to 24 hr (refrigerated) before analysis. Samples were warmed to room temperature before analysis. The pH meter and electrode described above were calibrated with commercial high ionic strength buffers. The pH was measured in 50-ml aliquots of sample, usually with gentle mixing. Two variants of the method were employed:

Method 11. As above, but a quality assurance protocol was followed, verifying electrode performance in distilled water and stability of calibration.

Method 12. As above, but 0.5 ml salt solution (Orion™ pHix™ solution) was added to increase ionic strength. Usually, this had little or no effect on the sample (pH change <0.1 unit). Although the data tables report method 11 as having been used, method 12 was used on all dates except 19 January.

Trends of pH are plotted for each layer in **Figure 7**. In the absence of intense biological activity, the pH of Lake Giles would be about 5.3-5.4 with an alkalinity of 0 to -5 μeq./L (**Figure 8**), judging from values in late spring and late autumn. Seasonal pH's have been remarkably consistent for the three years we have measured them. These values represent a lake without bicarbonate buffering. There was a modest within-lake generation of alkalinity in the hypolimnion during late summer and early fall; the metabolic processes responsible for this increase in alkalinity were probably located at the sediment surface.

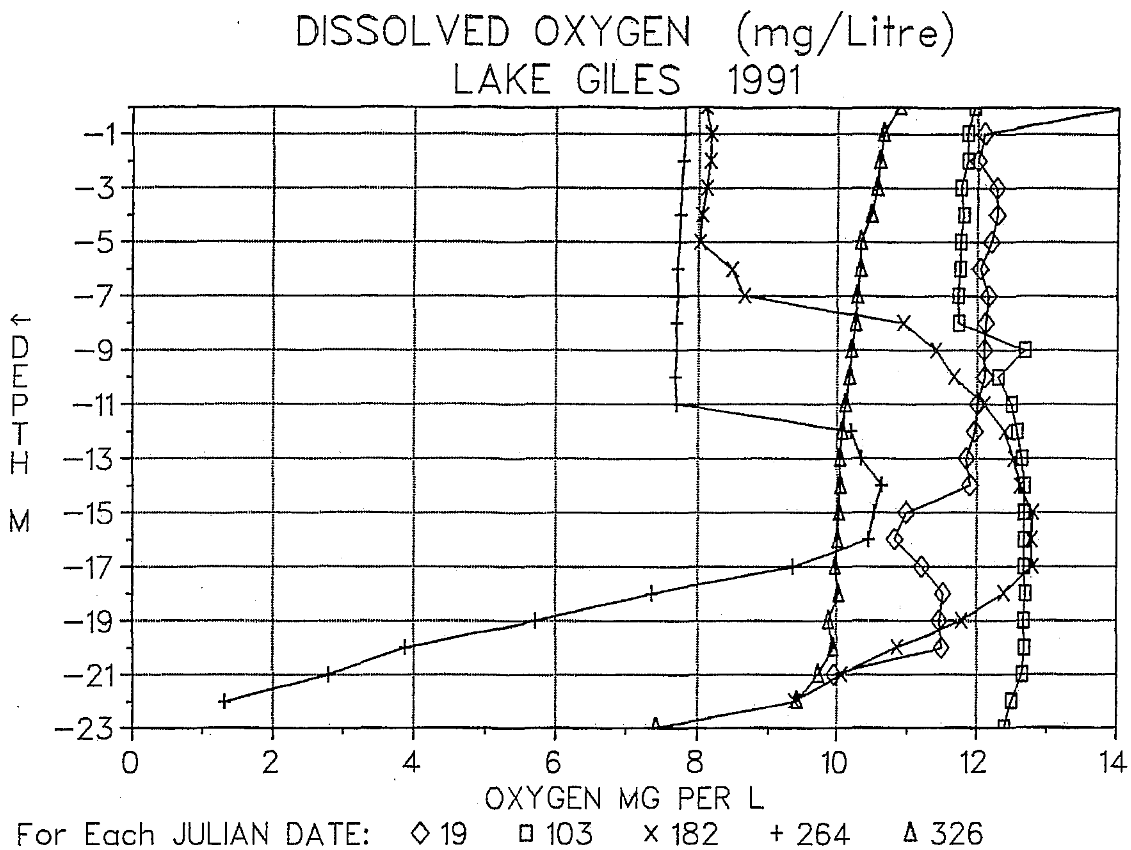


Figure 6. Dissolved oxygen in Lake Giles, 1991.

Values (mg oxygen per liter) are plotted for five dates: **19 January** (day 19 --winter ice cover), **13 April** (day 103 --immediately following spring turnover), **1 July** (day 182 --midsummer stratification), **21 September** (day 264 --late stratification), and **22 November** (day 326 --fall turnover).

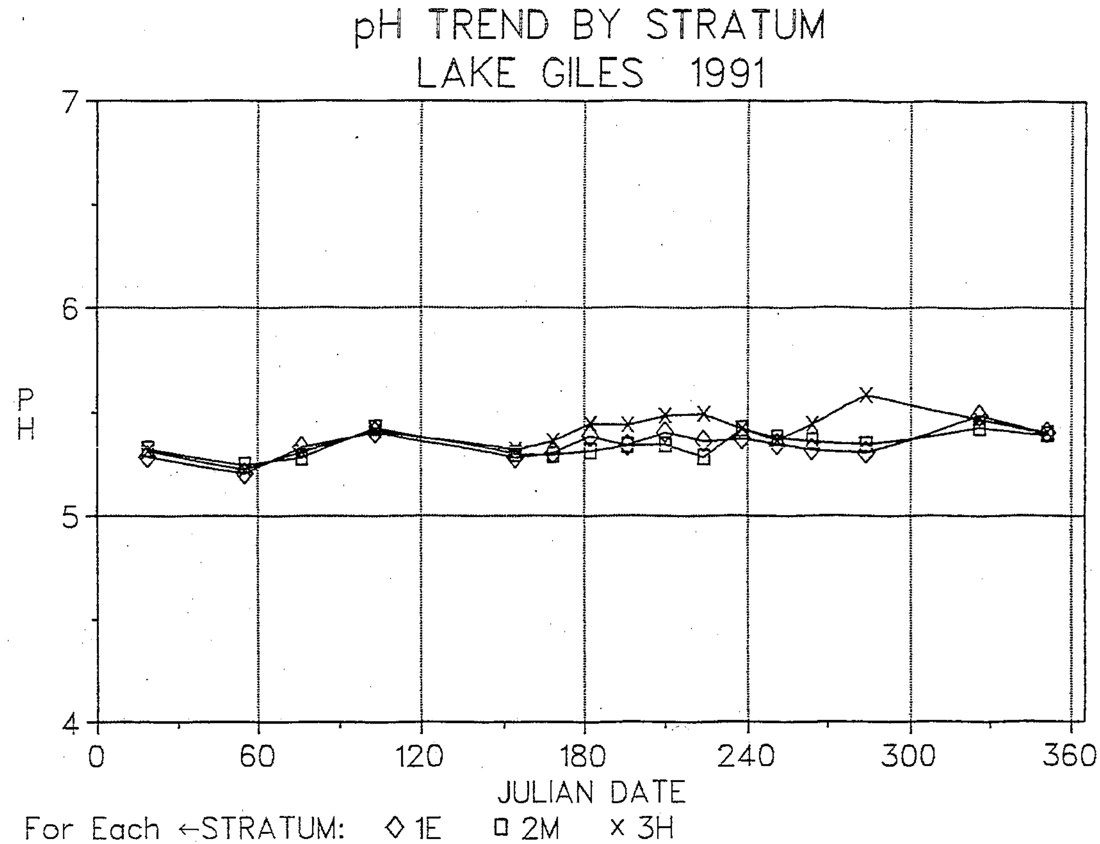


Figure 7. Trends of pH in Lake Giles, 1991.

Values are plotted for the mid-depths of the three layers, Epilimnion (**1E**), Metalimnion (**2M**), and Hypolimnion (**3H**). In autumn and winter, when these layers are not developed, samples are collected as described in **RESULTS AND METHODS.**

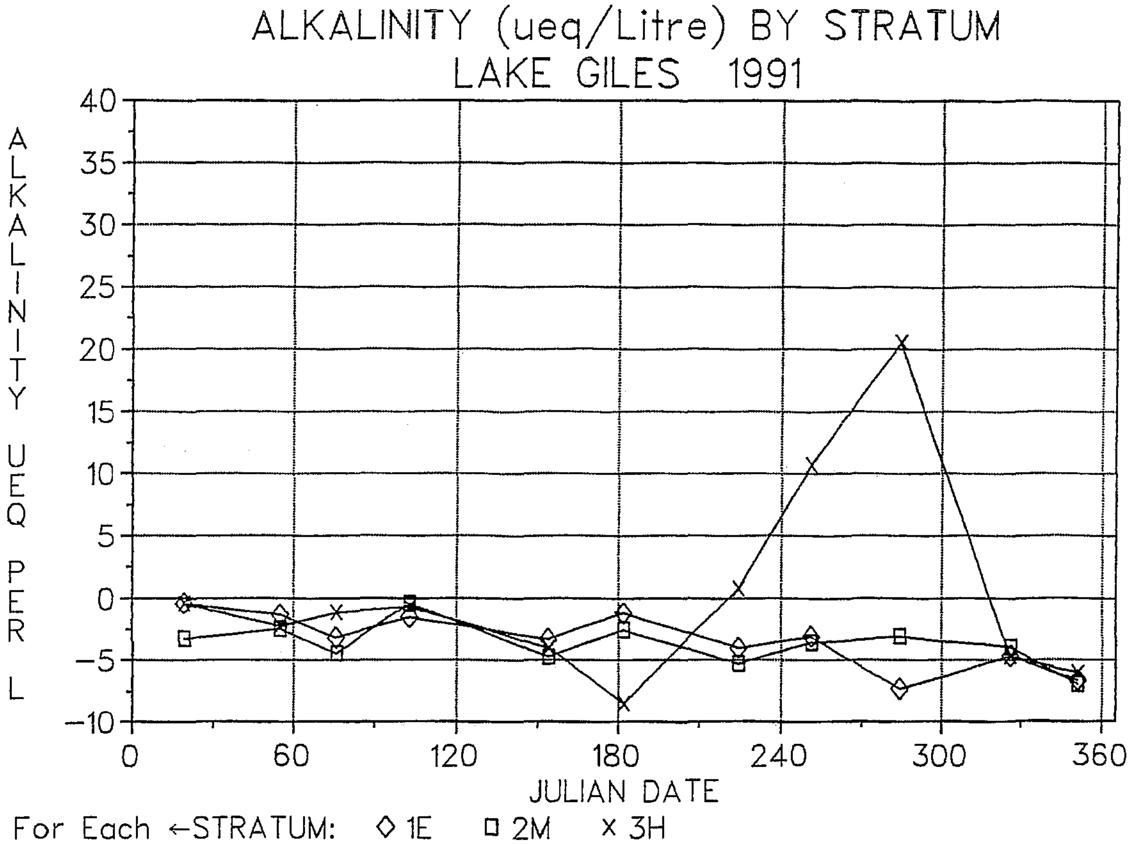


Figure 8. Trends of Alkalinity in Lake Giles, 1991.

Values are plotted for the mid-depths of the three layers, Epilimnion (1E), Metalimnion (2M), and Hypolimnion (3H). In autumn and winter, when these layers are not developed, samples are collected as described in **RESULTS AND METHODS**.

ALGAL CHLOROPHYLL-a

Chlorophyll-a is a measure of algal mass, since all algae contain this pigment. It is a widely used parameter for comparisons of lake trophic conditions.

Chlorophyll samples came from the same Van Dorn collections used for pH and alkalinity. Samples were stored in 1-L polyethylene bottles for 2-24 hr (refrigerated in darkness) before being filtered (0.5 L onto Gelman™ A/E filters) and frozen. Two samples were analyzed from each depth: a whole-water sample (for total chlorophyll-a) and a sample fractionated with a 22-μm nitex net. Often the sum of fractions was less than the total. This sum was only treated as a replicate for total chlorophyll-a if it was greater than or equal to 80% of the whole sample. The percentage of chlorophyll passing the 22um net (percent of the summed fractions) is presented in the data tables **(CHLAC P)**. **Method 12** was used for all chlorophyll extractions:

Method 12. Intact filters were extracted overnight at 2-4°C, in darkness, in 12 ml of a 5:1 (vol/vol) mixture of 90% basic acetone and methanol. Extracts were centrifuged and read in a Sequoia-Turner™ model 112 fluorometer equipped with F4TB/B lamp, red-sensitive photomultiplier, 5-60 excitation filter and 2-64 emission filter. The meter was calibrated with dilutions of pure chlorophyll-a or chlorophyll-a,b extracts from higher plants; these were assayed first by standard spectrophotometric techniques. Each sample was reread after acidification (to 0.03 N) to allow correction for pheopigments. We verified that chlorophyll behaves virtually the same in the mixed solvent as in 90% acetone alone, and that the extractions gave similar results. Two values are presented: Chlorophyll-a corrected for pheopigments (**CHLAC** in data tables and **Figure 9**) and Chlorophyll-a including pheopigments (**CHLASUM** in data tables).

In Lake Giles there was a very strong seasonal pattern of chlorophyll-a (**Figure 9**). The spring values, though high (3-6 ug/L), were lower than in 1990 (6-9 ug/L) and these did not follow high under-ice levels. The period of maximal algal biomass in early spring was succeeded by very low epilimnial chlorophyll-a concentrations, especially in the epilimnion and the metalimnion. Epilimnial concentrations remained below 0.5 ug/L throughout most of the summer. During summer stratification, higher concentrations of algae were present in the metalimnion and the hypolimnion than in the near-surface waters.

ZOOPLANKTON

Zooplankton receive a major emphasis in the PCLP program. These animals represent the key link between algal primary producers and fish populations. The intensity of grazing by herbivorous zooplankton strongly affects the kind of algae that dominate, and potentially can control (i.e. reduce) algal populations even in the face of abundant nutrient supply. Consequently the kinds and abundances of zooplankton have important implications for the perceived recreational quality of a lake.

Zooplankton were sampled at day and night, but only the nighttime data are presented here. Some species avoid the water column during the day. Zooplankton were collected with closing-style plankton nets that could be pulled through part of the water column open, collecting animals, then closed and pulled the rest of the way to the surface. In this way the water column was sampled as the three layers defined by temperature. In the present

report, data are calculated as mean concentrations (numbers of individuals per liter) over

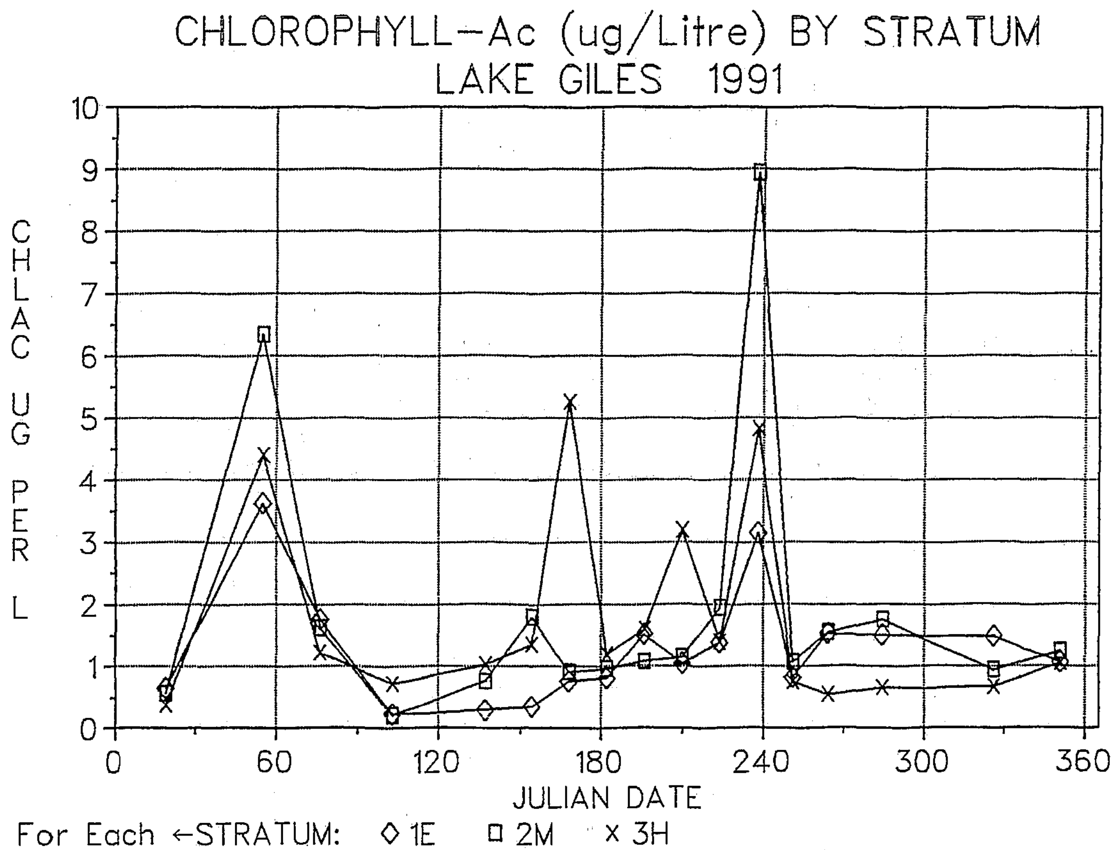


Figure 9. Trends of Chlorophyll-a in Lake Giles, 1991.

Values are plotted for the mid-depths of the three layers, Epilimnion (1E), Metalimnion (2M), and Hypolimnion (3H). In autumn and winter, when these layers are not developed, samples are collected as described in **RESULTS AND METHODS**. Chlorophyll-a values are corrected for pheopigments.

the entire 23-m water column. Details of the depth-distributions, and daily patterns of vertical movement, are still being analyzed.

Two sizes of nets were used: a 30-cm diameter net with a mesh of 202 μm, for some macrozooplankton; and a 15-cm diameter Wisconsin-style net with a 48-μm mesh for microzooplankton as well as other macrozooplankton. These were mounted side-by-side in "bongo" configuration. Microzooplankton includes mainly rotifers, but some copepods and small Cladocera also were counted from these samples. Our counting strategy was somewhat different in 1991 from 1989 or 1990, with *Chaoborus* and some some copepods (e.g. cyclopoid males and copepodids) being counted from the 48-μm sample that had been counted from 202-μm samples in previous years. This change was made to increase collection efficiency of forms (e.g. small instar *Chaoborus*, copepodids, male copepods, etc.) that were going through the 202-μm mesh net. Collections were duplicated for each depth range. Mean values are presented.

Seasonal trends in abundance are presented as a series of graphs for the most frequently encountered zooplankton, identified to genus and sometimes to species (**Figures 11-30**). **Table 1** lists the zooplankton identified to date. Several points can be highlighted:

(1) The herbivorous zooplankton were dominated by the cladoceran *Daphnia* (ca. 6/L in summer) and the calanoid copepod *Diaptomus minutus* (ca. 4-10 adults/L in summer). Another cladoceran, *Diaphanosoma*, was present at up to 1/L during late summer and early autumn. An additional calanoid, *Diaptomus spatulocrenatus*, was present in low numbers throughout most of the year, reaching 6/L during July.

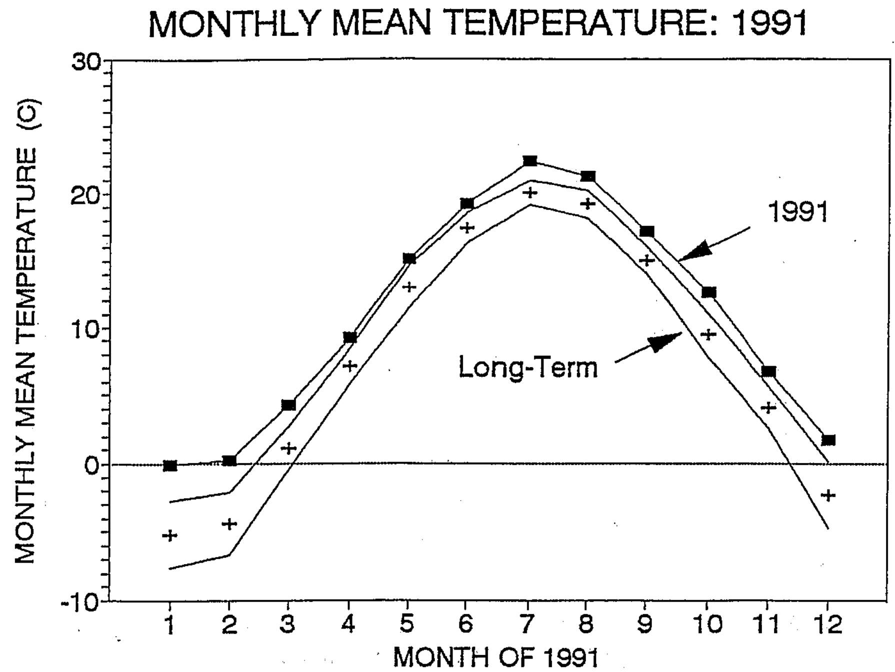
(2) Rotifers were present at low concentrations throughout the year (40-160/L). In 1991 they were only one-third as abundant during the winter and spring as they had been in 1990--perhaps reflecting lower algal concentrations (see chlorophyll **Figure 9**). Rotifers crashed during the autumn (to 20/L). Individual species showed pronounced seasonality. In winter-spring rotifers were dominated by *Polyarthra* as in 1990, but *Keratella taurocephala* was rare. *Polyarthra* was the most prevalent rotifer during summer as well. *Gastropus* also was relatively abundant (20-70/L) in late spring and early summer.

(3) Predatory macrozooplankton included *Cyclops scutifer*, which was a late spring and early summer species (adults at 1-2.5/L in May through July) and *Chaoborus punctipennis*, which was caught in equal numbers from June through August (ca. 0.3/L).

(4) The winter-spring period of high algal biomass was a time of low *Daphnia* density ($<$3/L). The sharp increase in *Daphnia* during May (to $>$10/L) occurred despite already low algal concentrations (chlorophyll $<$1 ug/L).

CLIMATE IN 1991

Weather data from Hawley, PA (20 km NW of Lake Giles) have been compiled for 1991 and the previous 30 years (**Figure 10**. These data are from a NOAA cooperator's station. 1991 was relatively warm and dry compared to the 30-year monthly averages. Rainfall was only 60% of normal for spring through summer.



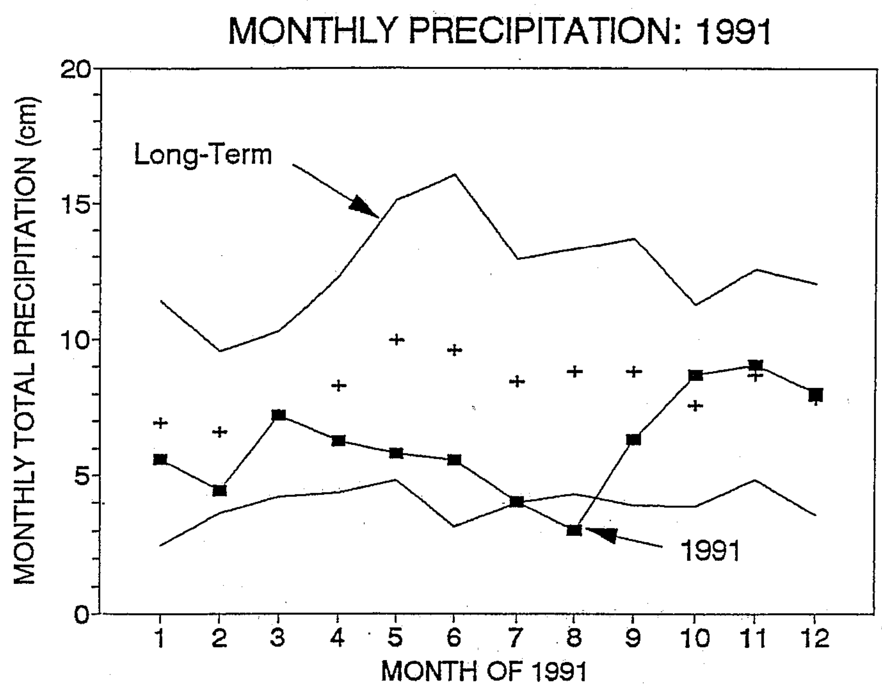


Figure 10. Monthly climate in 1991 compared to the 30-year averages.

(Top) Mean temperature (degrees Celsius). **(Bottom)** Monthly mean prcipitation (cm rain or thawed snow). Data are from the NOAA cooperator's station at Hawley, PA. Long-term values (+) are enclosed in an envelope defined by one standard deviation of the monthly values.

Table 1. Zooplankton species recorded from open-water samples in Lake Giles 1988-1991. Seasons of especially high or low abundance in 1991 are indicated.

	Taxon	Seasonal Abundance in 1991 High	Low
Diptera			
**	*Chaoborus punctipennis*	Su	[S,F,W]
Cyclopoid Copepoda			
**	*Cyclops scutifer*	Sp	[F,W]
	Orthocyclops modestus		
Calanoid Copepoda			
	Diaptomus spp.		
**	*D. minutus*	late F,W,Sp	
*	*D. spatulocrenatus*	early Su	[Sp]
Cladocera			
	Chydorus sp.		
**	*Daphnia* spp.	late Sp,Su	[W,F]
	D. catawba		
*	*Diaphanosoma* sp.	late Su	[F,W,Sp]
	Leptodora kindtii		
*	*Polyphemus pediculus*		
Rotifera			
*	*Ascomorpha* spp.	late Su	[F,W,Sp]
	Collotheca spp.		
*	*Conochilus* spp.	Su	[W,Sp,F]
	Euchlanis parva		
*	*Gastropus* spp.	late Sp	[W,Sp,F]
	G. hyptopus (?)		
	G. stylifer		
	Kellicottia sp.		
	K. longispina		
	Keratella spp.		
	K. hiemalis		
**	*K. taurocephala*	late Su,F	[late Sp]
	Lecane spp.		
	L. ligona		
	L. luna		
	L. mira		
	L. tenuiseta		

Continued next page
Table 1. Zooplankton in Lake Giles, 1991 (continued).

	Taxon	Seasonal Abundance in 1991 High	Low
	Monommata spp.		
	Monostyla spp		
	M. copeis		
	Ploesoma spp.		
**	*Polyarthra* spp. ("large")	late Su	[late Sp,F]
*	*Synchaeta* spp.	late Su	
	Testudinella spp.		
	Trichocerca spp.		
	T. similis		

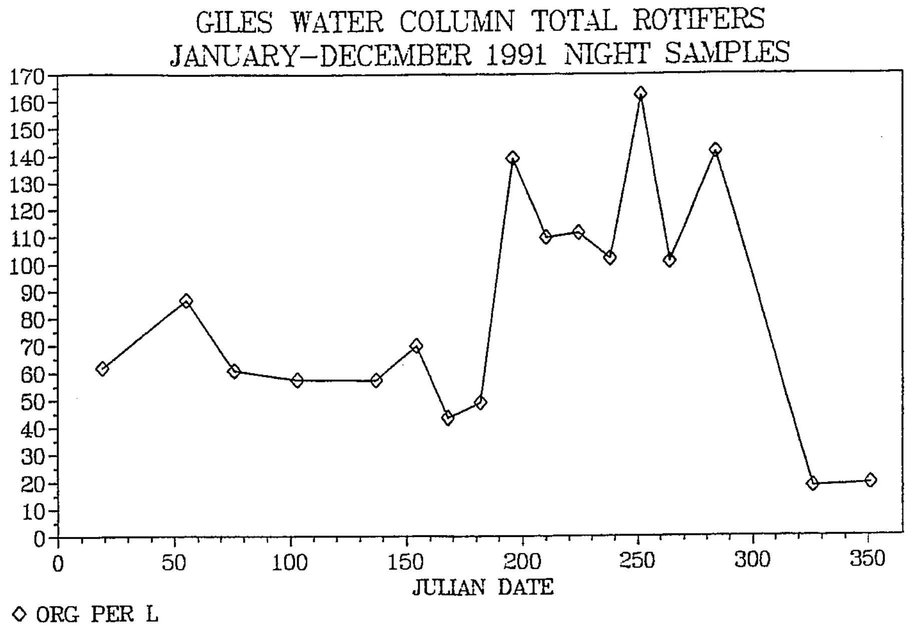
Abbreviations for seasons of maximal or [minimal] abundance:
W (winter), Sp (spring), Su (summer), F (fall).

** Dominant species included in Figures.
* Other species included in Figures.

ZOOPLANKTON GRAPHS

The following graphs present water-column mean nighttime concentrations of the common zooplankton at the main sampling station. Each data point is calculated by weighting concentrations in the three layers (EPI, META, HYPO) on each date by the relative thickness of the layer at the station, which is in the deepest part of the lake. Two replicate samples were taken in quick succession.

The electronic database contains the component concentrations within the three layers, separate counts for the two replicates, and similarly complete data from the comparable daytime sampling.



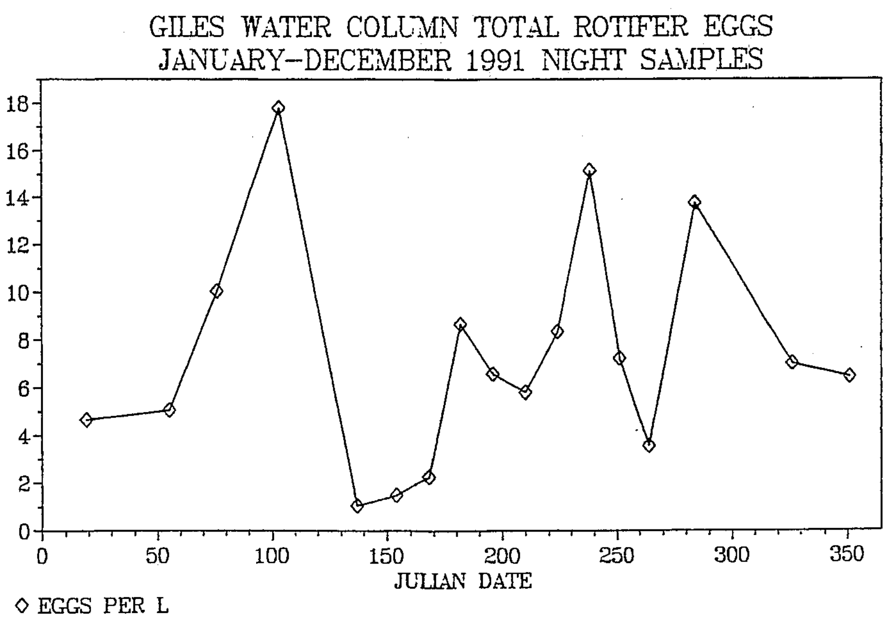
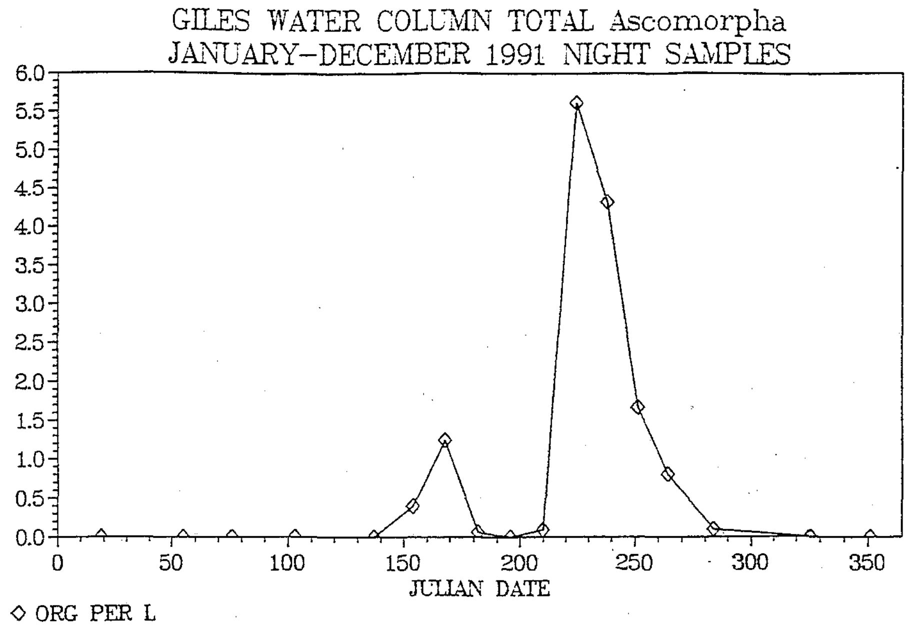


Figure 11. Rotifers in Lake Giles, 1991.

Nighttime net collections (48μm) from three depths have been combined to give a water column mean. **(Top)** Total individuals per liter. **(Bottom)** Rotifer eggs per liter.



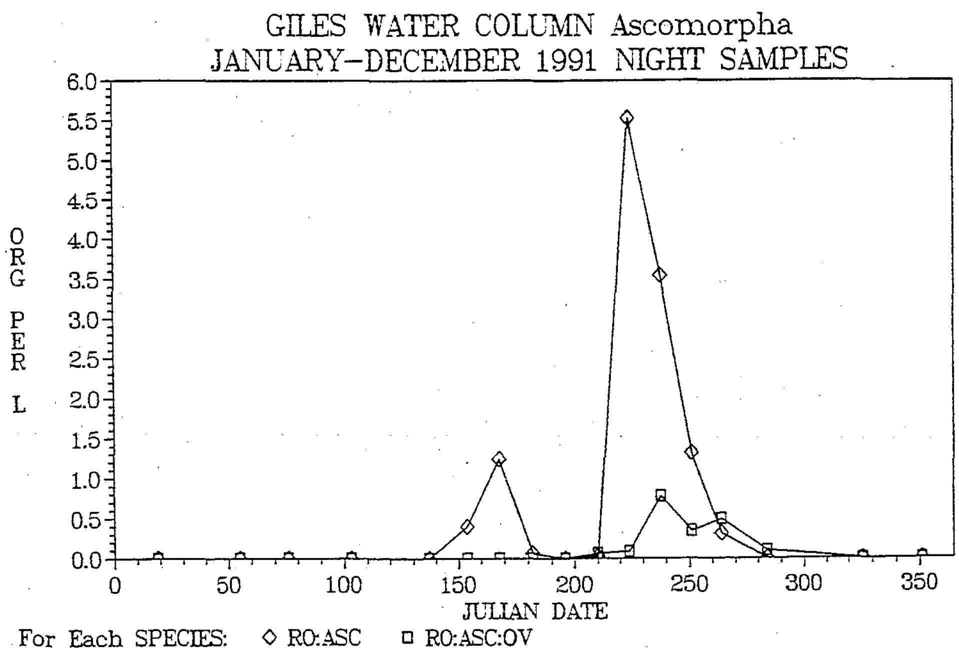
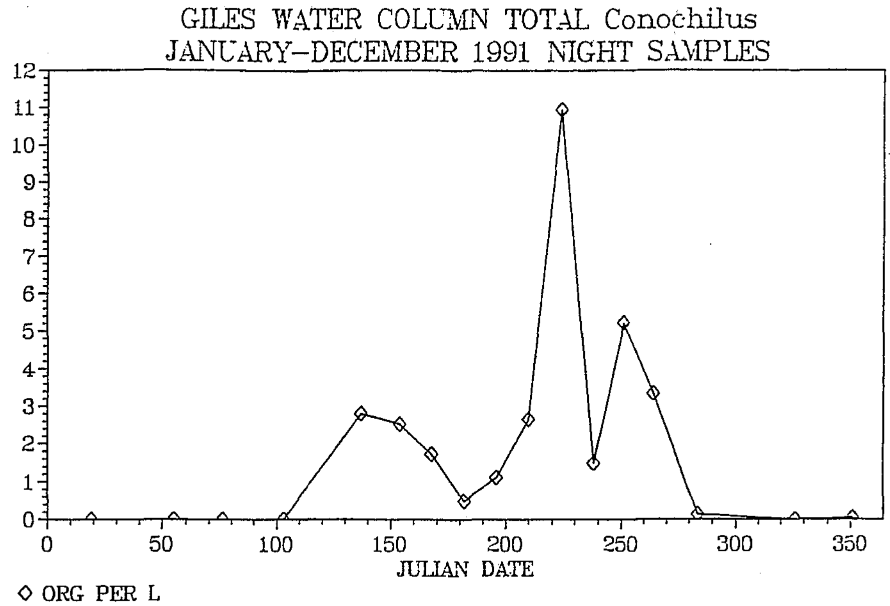


Figure 12. The rotifer *Ascomorpha* spp. in Lake Giles, 1991.

Nighttime net collections (48μm) from three depths have been combined to give a water column mean. **(Top)** all species. **(Bottom)** *Ascomorpha* by species: **ASC** undifferentiated species, **OV** *A. ovalis*.



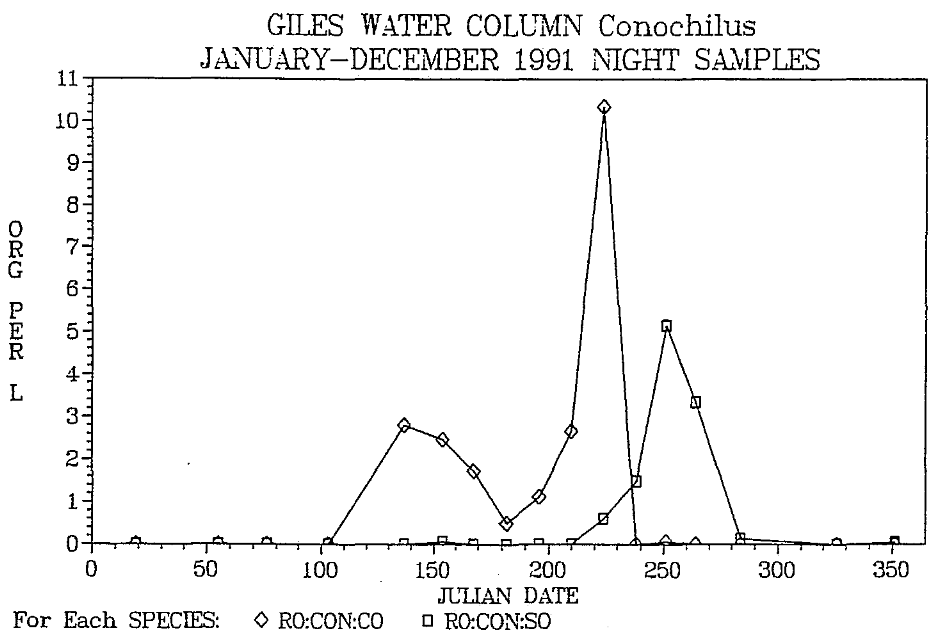


Figure 13. The rotifer *Conochilus* spp. in Lake Giles, 1991.

Nighttime net collections (48μm) from three depths have been combined to give a water column mean. **(Top)** all forms. **(Bottom)** by forms: **CO** colonial, **(SO)** solitary.

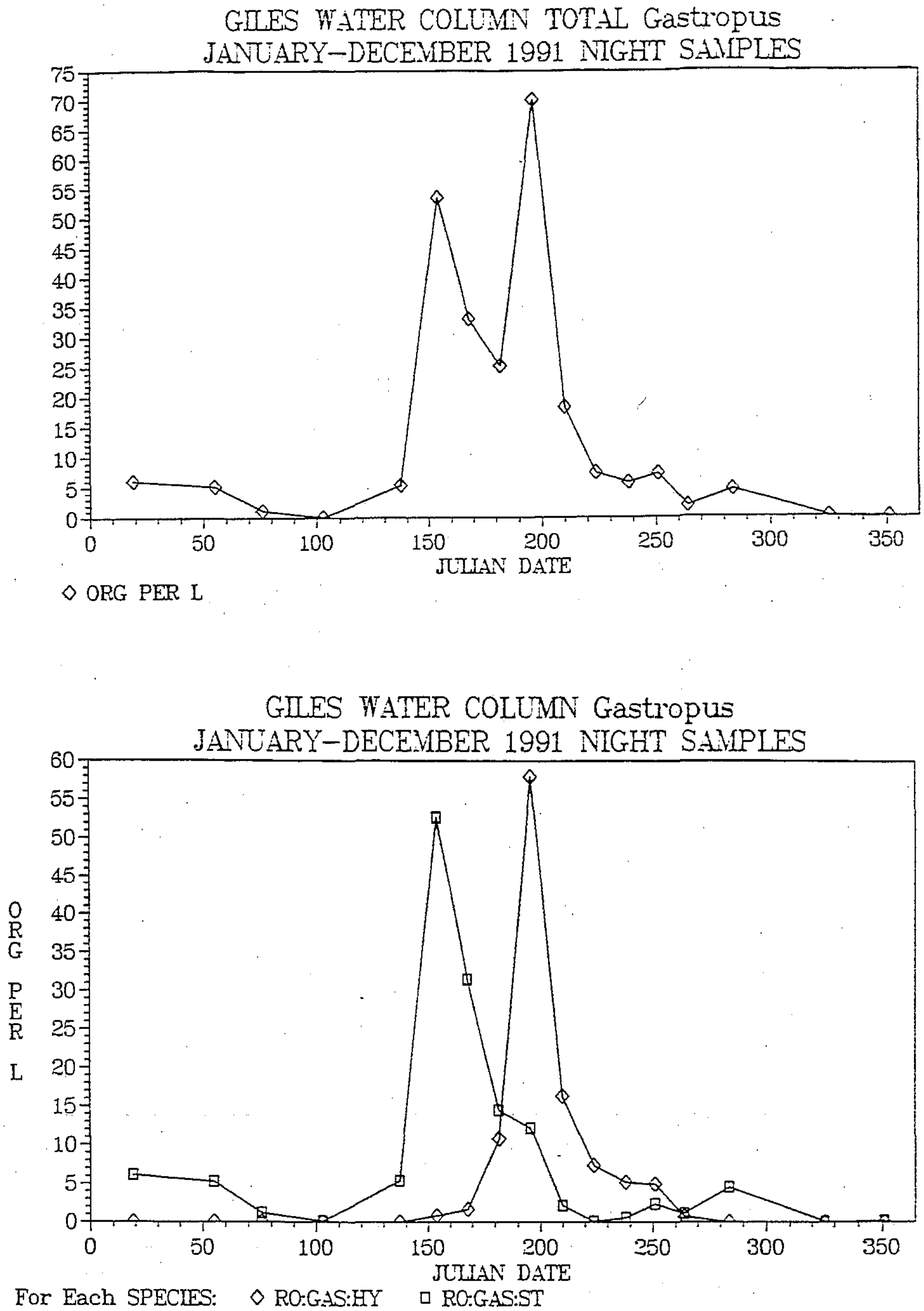
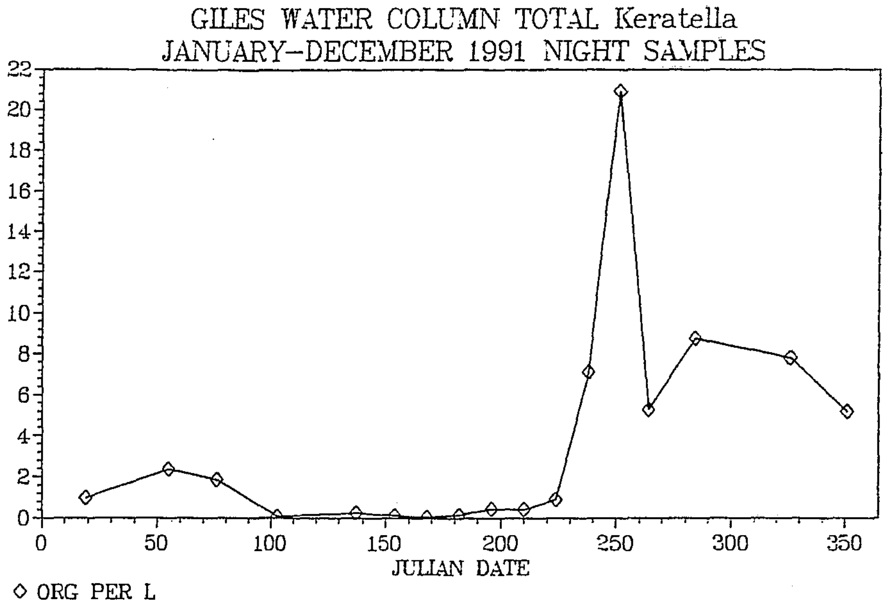


Figure 14. The rotifer *Gastropus* in Lake Giles, 1991.

Nighttime net collections (48μm) from three depths have been combined to give a water column mean. **(Top)** all species. **(Bottom)** *Gastropus* by species: **HY** *G. hyptopus*, **ST** *G. stylifer*.



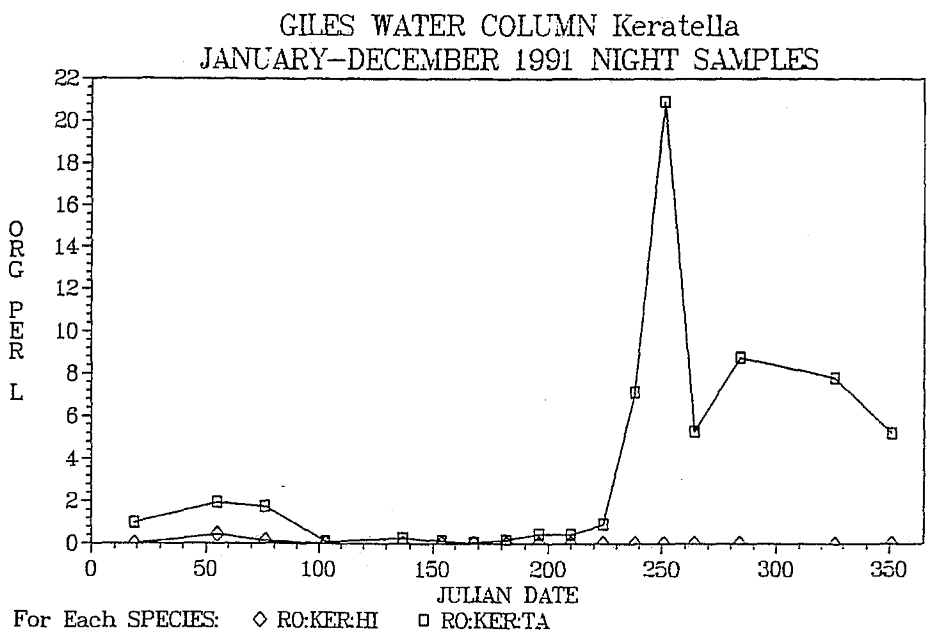
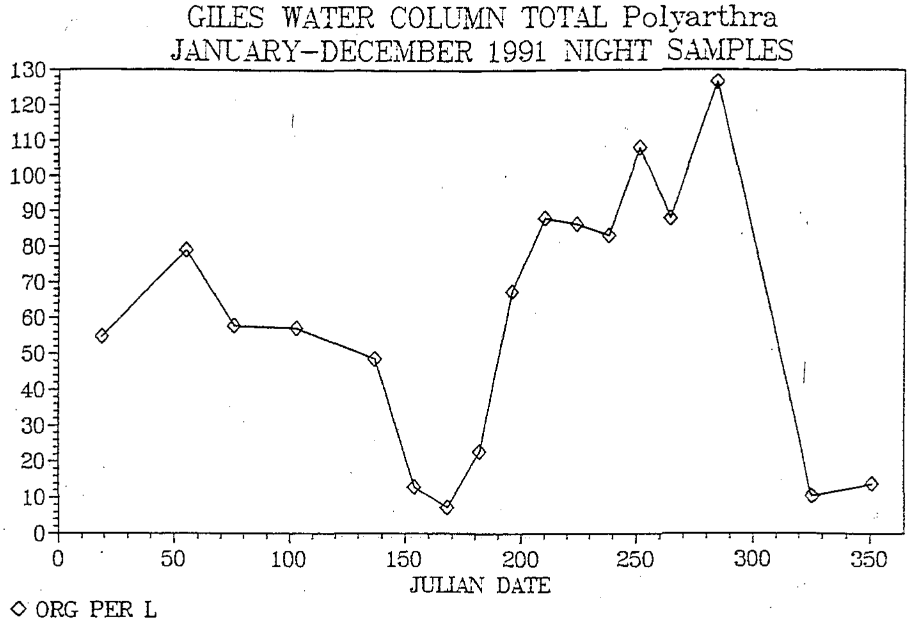


Figure 15. The rotifer *Keratella* spp. in Lake Giles, 1991.

Nighttime net collections (48μm) from three depths have been combined to give a water column mean. **(Top)** Total individuals per liter. **(Bottom)** *Keratella* by species: **HI** *K. hiemalis*, **TA** *K. taurocephala*.



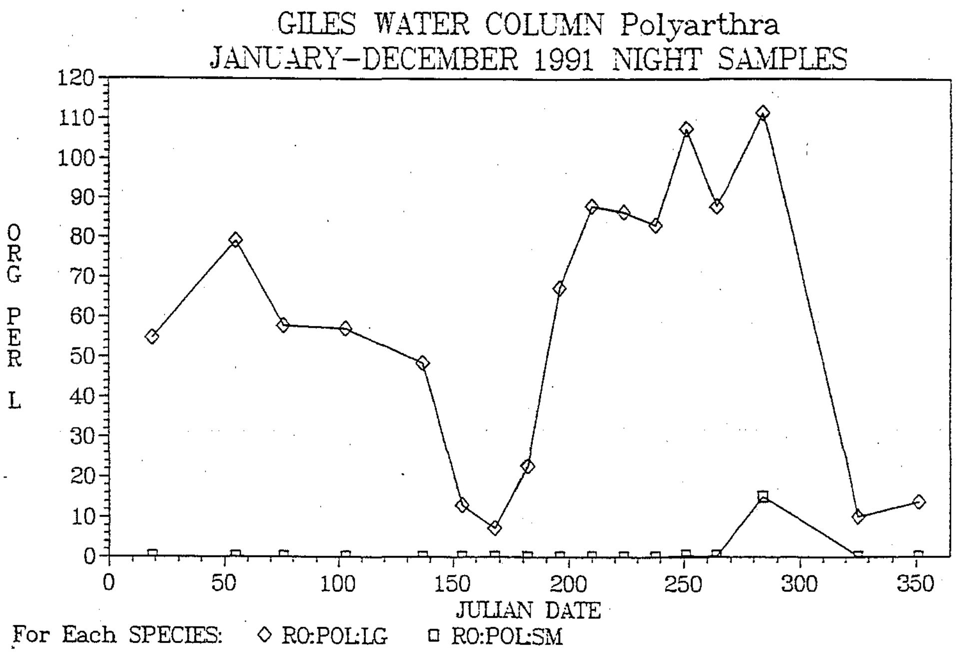


Figure 16. The rotifer *Polyarthra* spp. in Lake Giles, 1991.

Nighttime net collections (48μm) from three depths have been combined to give a water column mean. **(Top)** Total individuals per liter. **(Bottom)** *Polyarthra* by size classes: **LG** large and **SM** small.

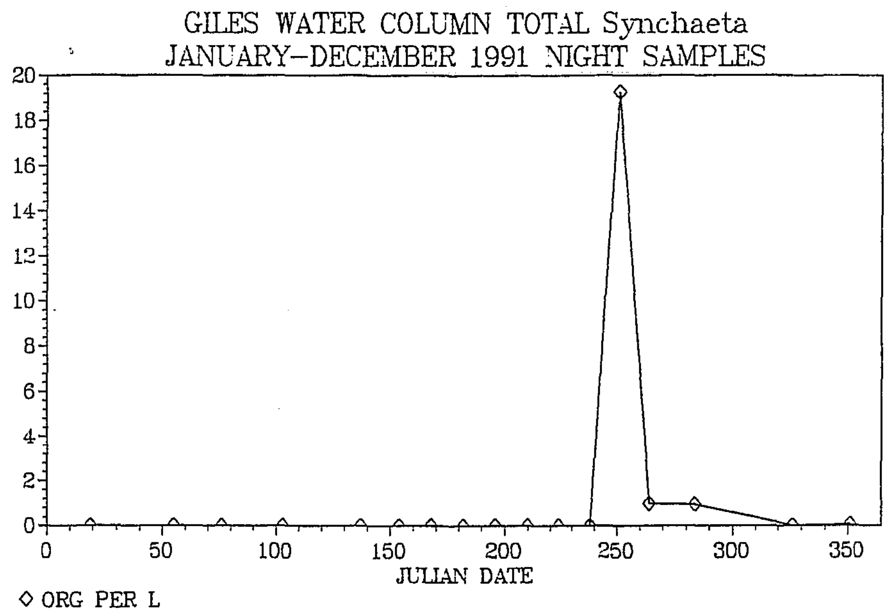


Figure 17. The rotifer *Synchaeta* spp. in Lake Giles, 1991.

Nighttime net collections (48μm) from three depths have been combined to give a water column mean.

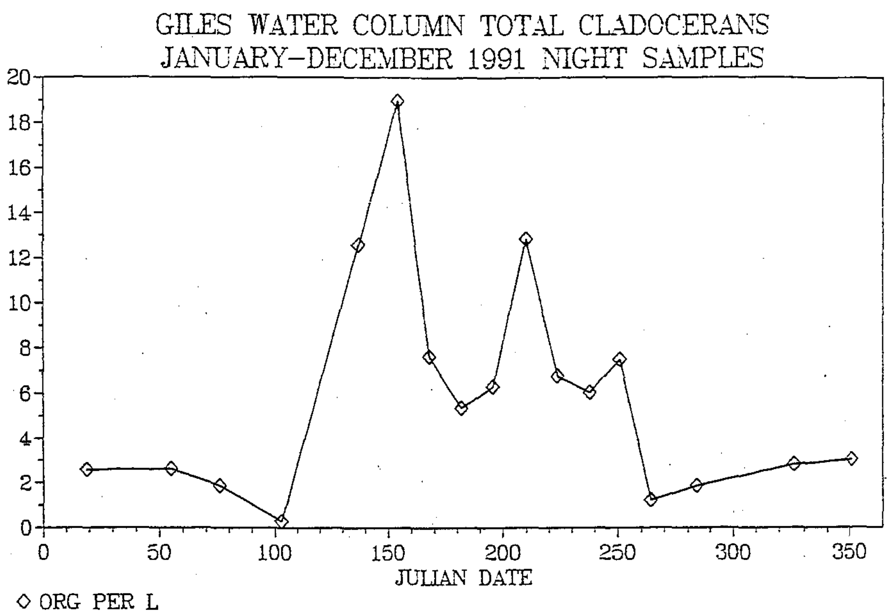
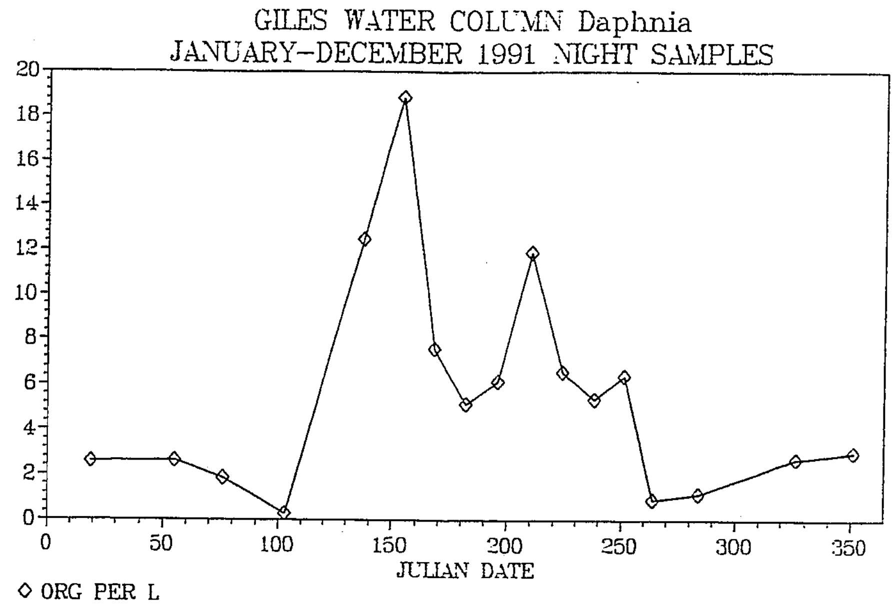


Figure 18. Cladocera in Lake Giles, 1991.

Nighttime net collections (202μm) from three depths have been combined to give a water column mean.



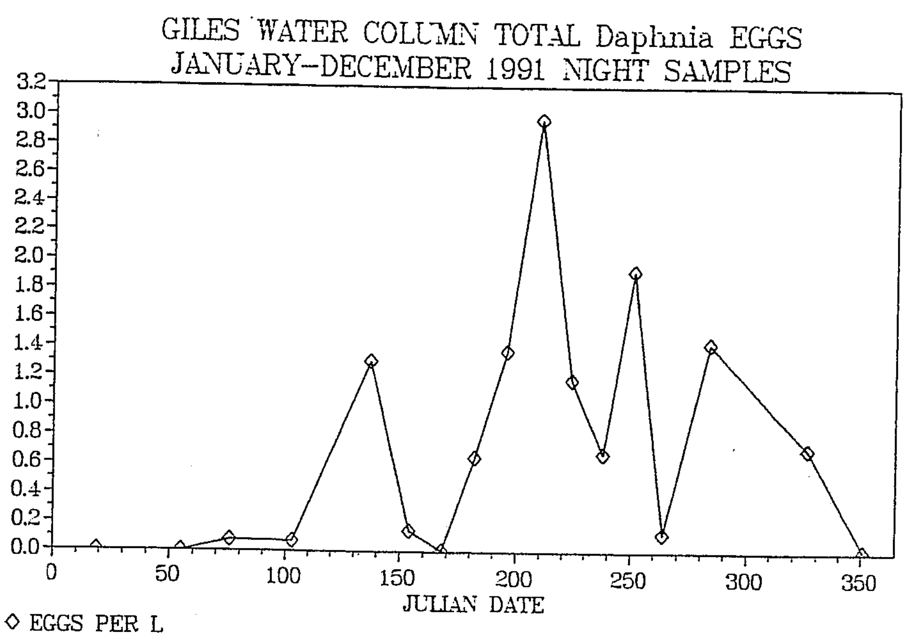


Figure 19. The cladoceran *Daphnia* spp. in Lake Giles, 1991.

Nighttime net collections (202μm) from three depths have been combined to give a water column mean. **(Top)** Total individuals per liter. **(Bottom)** Total eggs per liter.

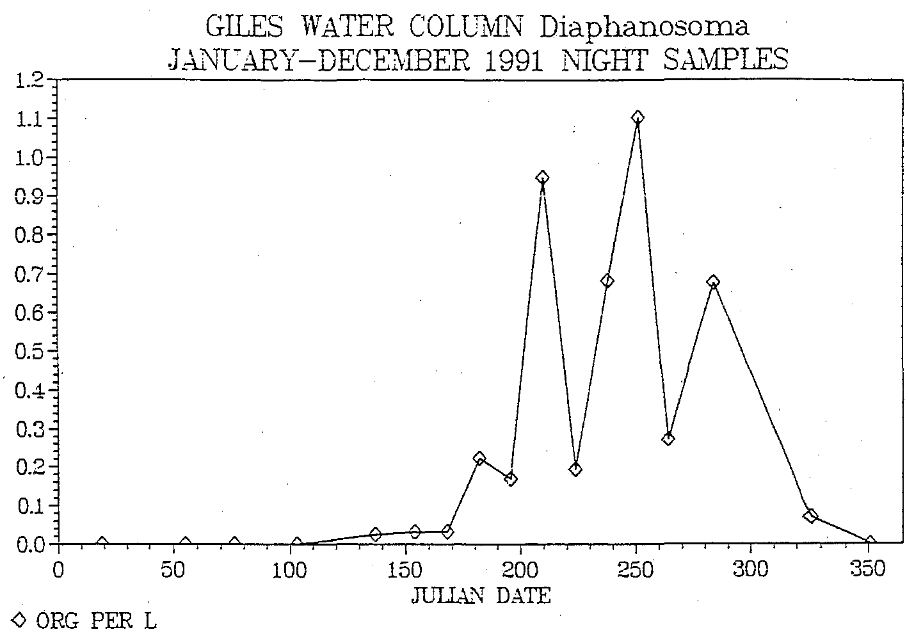


Figure 20. The cladoceran *Diaphanosoma* spp. in Lake Giles, 1991.

Nighttime net collections (202μm) from three depths have been combined to give a water column mean.

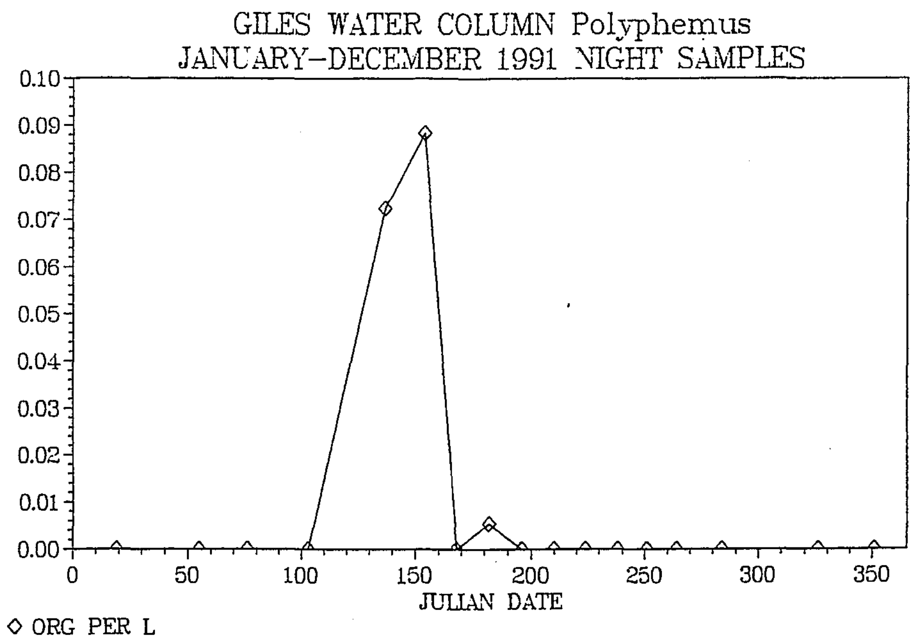


Figure 21. The cladoceran *Polyphemus pediculus* in Lake Giles, 1991.

Nighttime net collections (202μm) from three depths have been combined to give a water column mean.

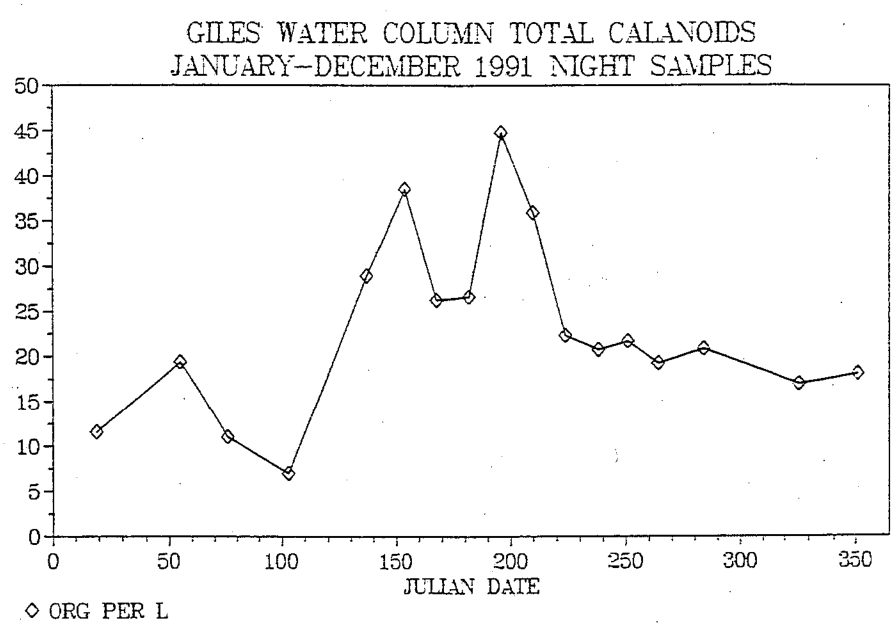


Figure 22. Calanoid copepods in Lake Giles, 1991.

Nighttime net collections (48μm) from three depths have been combined to give a water column mean.

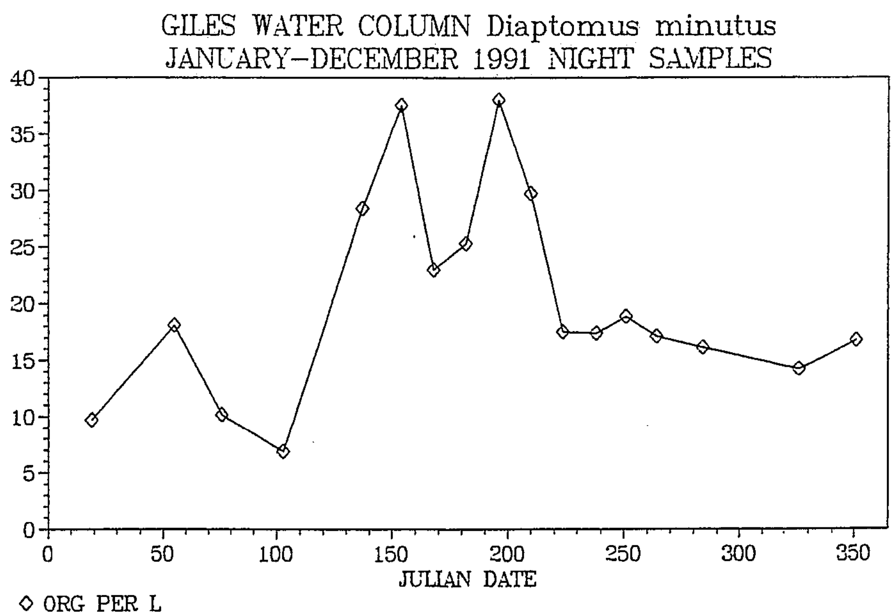
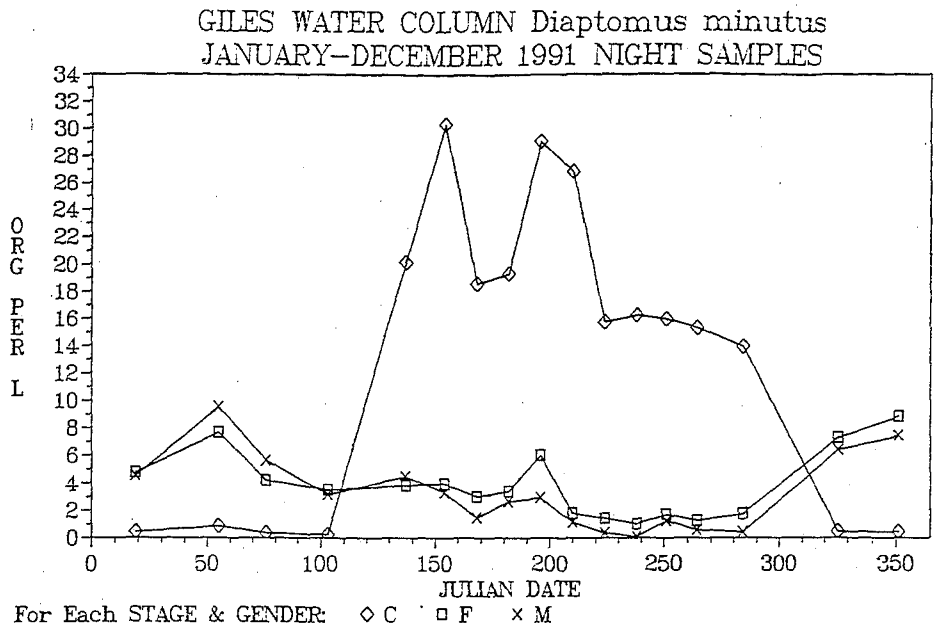


Figure 23. The calanoid copepod *Diaptomus minutus* in Lake Giles, 1991.

Nighttime net collections (48μm) from three depths have been combined to give a water column mean. Concentrations are total individuals per liter (excluding nauplii).



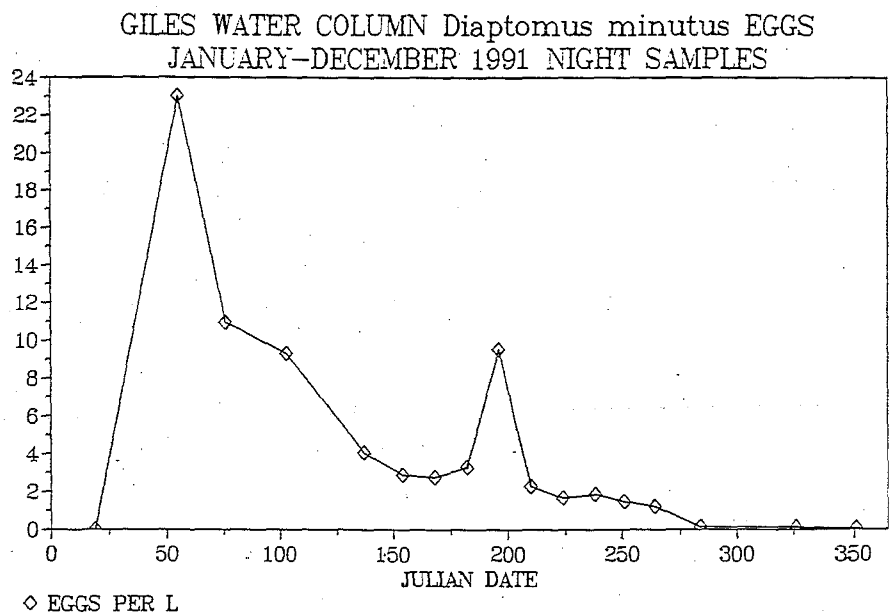


Figure 24. The calanoid copepod *Diaptomus minutus* in Lake Giles, 1991, by stage and gender.

Nighttime net collections (48μm) from three depths have been combined to give a water column mean. **(Top)** Adults (males and females separately) and copepodids. **(Bottom)** *D. minutus* eggs per liter.

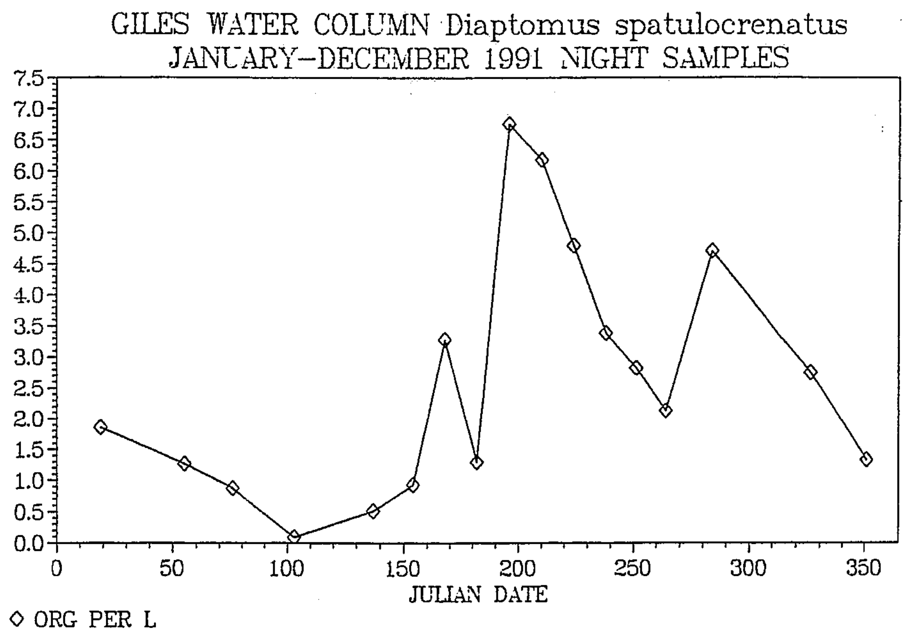
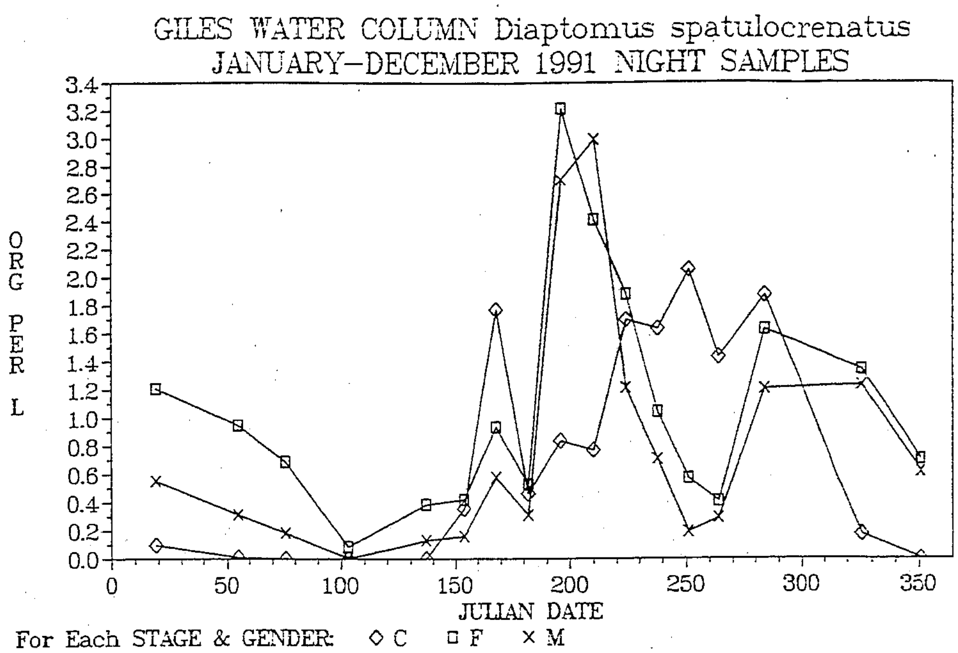


Figure 25. The calanoid copepod *Diaptomus spatulocrenatus* in Lake Giles, 1991.

Nighttime net collections (48μm) from three depths have been combined to give a water column mean. Concentrations are total individuals per liter (excluding nauplii).



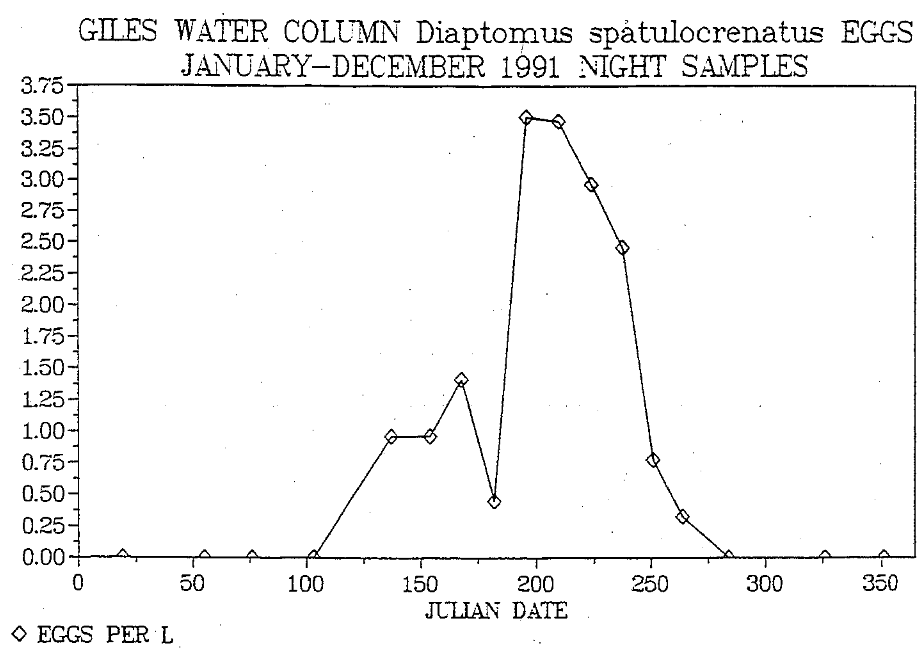


Figure 26. The calanoid copepod *Diaptomus spatulocrenatus* in Lake Giles, 1991, by stage and gender.

Nighttime net collections (48μm) from three depths have been combined to give a water column mean. **(Top)** Adults (males and females separately) and copepodids. **(Bottom)** *D. spatulocrenatus* eggs per liter.

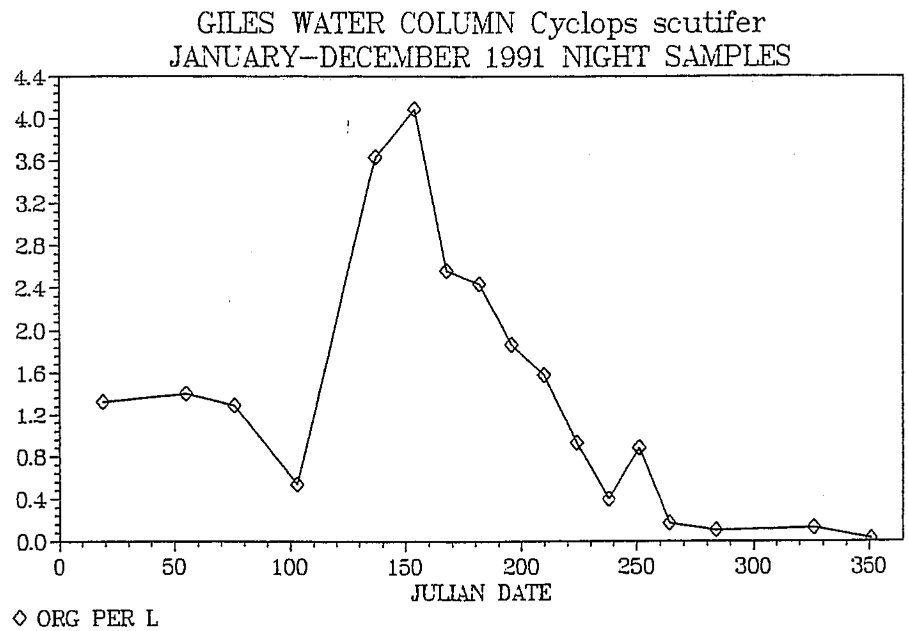


Figure 27. The cyclopoid copepod *Cyclops scutifer* in Lake Giles, 1991.

Nighttime net collections from three depths have been combined to give a water column mean. Total individuals per liter, excluding nauplii. Adult females were collected with a 202μm net, males and copepodids with the 48μm net.

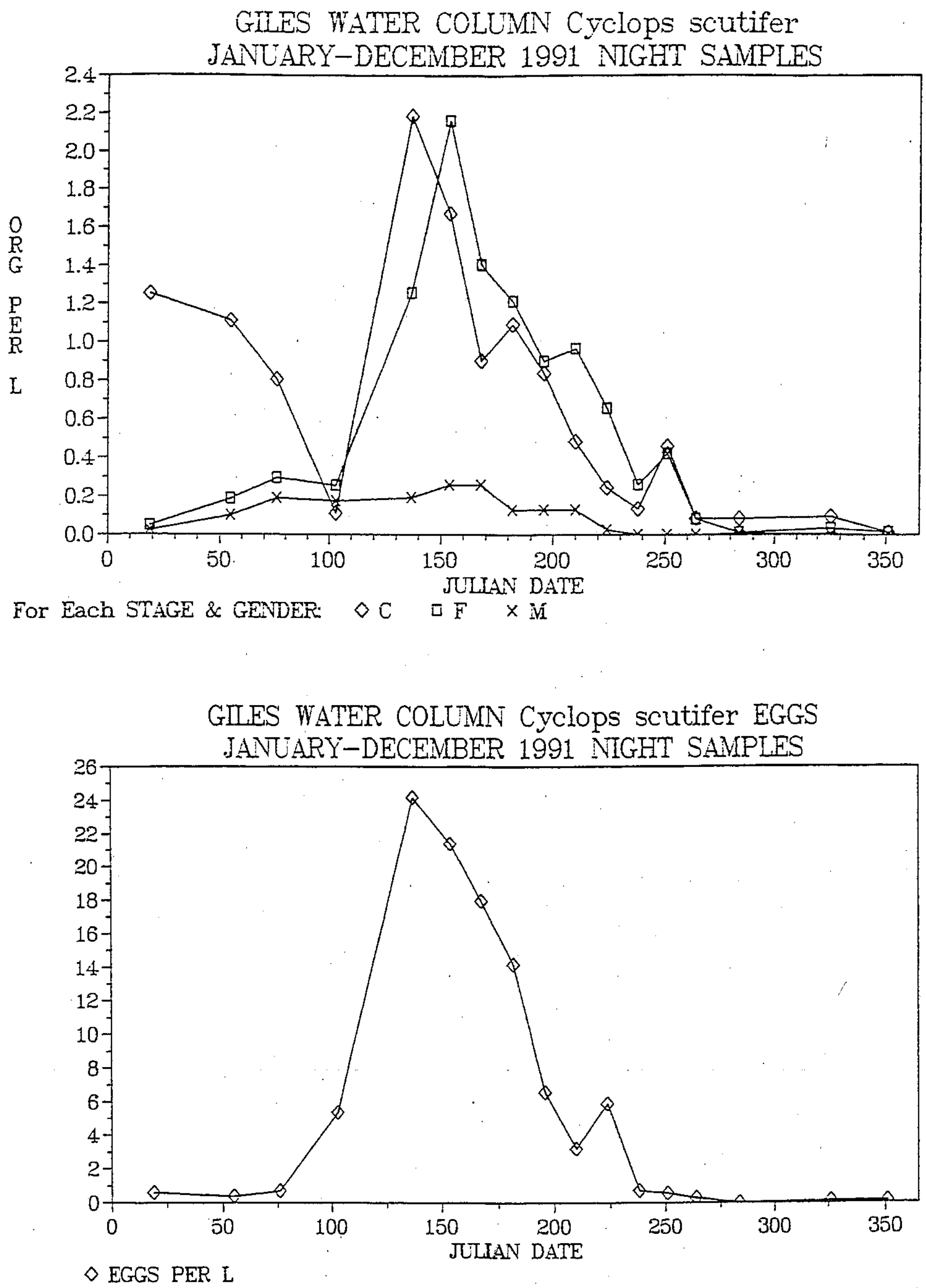


Figure 28. The cyclopoid copepod *Cyclops scutifer* in Lake Giles, 1991, by stage and gender.

Nighttime net collections from three depths have been combined to give a water column mean. **(Top)** Adults (males and females separately) and copepodids. Adult females were collected with a 202μm net, males and copepodids with the 48μm net. **(Bottom)** *C. scutifer* eggs per liter.

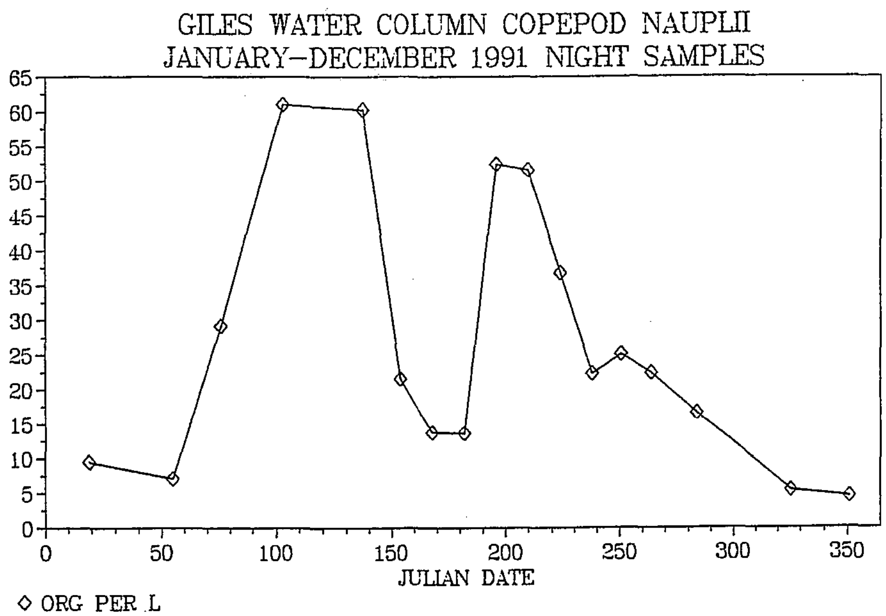


Figure 29. Total copepod nauplii in Lake Giles, 1991.

Nighttime net collections (48μm) from three depths have been combined to give a water column mean. Nauplii of calanoid and cyclopoid species were not differentiated.

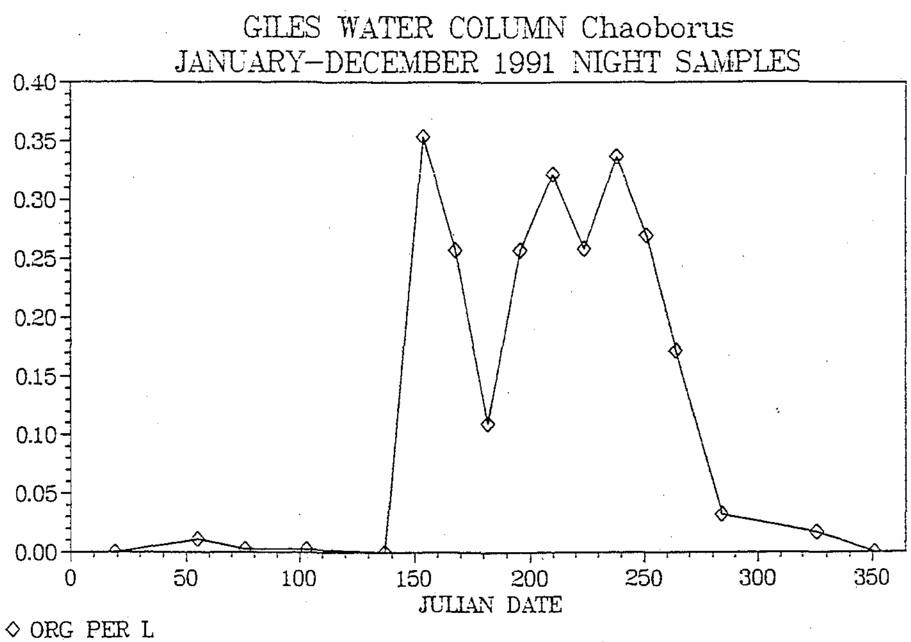


Figure 30. The dipteran *Chaoborus* spp. in Lake Giles, 1991.

Nighttime net collections (48μm) from three depths have been combined to give a water column mean.

EXPLANATION OF DATA TABLES

The following 17 tables present the physical/chemical information acquired on each date in 1991. The headings, abbreviations, and analytical units are explained here.

DATE OF SAMPLE: Date of the daytime visit, as month/day/year.

JULIAN DATE: Day of the year, from 1-365.

TIME: Approximate mid-time of sampling, 24-hr clock in decimal format (e.g. 1:30 PM is "13.50").

SECCHI M: Secchi depth in meters (m).

WEATHER: Brief comments on weather, especially cloudiness.

PERSONNEL: Initials of sampling crew (see names below).

TMETHOD: Temperature method #10 (see **METHODS AND RESULTS**).

LMETHOD: Light method #12 (see **METHODS AND RESULTS**).

AMETHOD: Alkalinity method #11 (see **METHODS AND RESULTS**).

OMETHOD: Oxygen method #10 (see **METHODS AND RESULTS**).

PHMETHOD: pH method should be #12 (see **METHODS AND RESULTS**).

CAMETHOD: Chlorophyll-a method #12 (see **METHODS AND RESULTS**).

COMMENTS: Notes on unusual procedures, also ice thickness.

DATE OF: Date of sample (month/day/year).

JULIAN: Julian date.

STRA: Stratum or layer: **S** (air above surface), **E** (epilimnion), **M**(metalimnion), **H** (hypolimnion).

REP: Replicate (1 or 2); Replicates were usually analyzed for pH, alkalinity, chlorophyll--other data are merely repeated on rep 2 line for convenience in graphing.

DEPTH: Depth of sample (meters); -1 for air above surface.

TEMP C: Temperature in degrees Celsius (°C).

OXYGEN: Dissolved oxygen (mg per liter--not corrected for elevation).

OFLAG: Error flag for oxygen; "4" means reported value should be interpreted as a true "zero".

LIGHT PC: Light as percent of intensity at 0.1-m depth.

pH: pH.

ALKAL: Alkalinity as microequivalents per liter (μeq/L).

CHLAC: Chlorophyll-a, corrected for pheopigments (μg/L).

CHLASUM: Chlorophyll-a, including pheopigments (μg/L).

CHLAC P: Percentage of CHLAC passing 22-μm net.

Names of Sampling Personnel:

JAA	John Aufderheide
GLB	Greg Brockway
SRC	Scott Carpenter
PRG, PG	Pat Gorski
SLM	Shawna McConnell
REM	Robert Moeller
EMN	Gina Novak
AMS	Alice Shumate
PLS	Paul Stutzman
TLV	Tim Vail

LAKE GILES: SUMMARY OF PHYSICAL/CHEMICAL DATA

DATE OF SAMPLE: 1/19/91 JULIAN DATE: 19 TIME: 10.50

SECCHI M: 14.0 WEATHER: Partly cloudy, cold

PERSONNEL: JAA SRC EMN

TMETHOD: 10 LMETHOD: 12 AMETHOD: 11
OMETHOD: 10 PHMETHOD: 10 CAMETHOD: 12

COMMENTS: 15cm candled ice, no snow

DATE OF	JULIAN	STRA	REP	DEPTH	TEMP C	OXYGEN	OFLAG	LIGHT PC	PH	ALKAL	CHLAC U	CHLASUM	CHLAC PC
1/19/91	19	S	1	-1.0	1.7								
1/19/91	19		1	0.0	3.2	14.13		100.0000					
1/19/91	19	E	1	1.0	3.7	12.10		74.5156	5.28	-4	0.77	1.25	
1/19/91	19	E	2	1.0	3.7	12.10		74.5156	5.29	3	0.52	1.10	58
1/19/91	19		1	2.0	3.8	12.00		57.9437					
1/19/91	19		1	3.0	3.8	12.27		43.4361					
1/19/91	19		1	4.0	3.8	12.28		32.5120					
1/19/91	19	M	1	5.0	3.8	12.20		24.3536	5.31	-3	0.53	0.96	
1/19/91	19	M	2	5.0	3.8	12.20		24.3536	5.32	-4	0.59	0.98	64
1/19/91	19		1	6.0	3.8	12.04		18.4497					
1/19/91	19		1	7.0	3.8	12.16		13.8511					
1/19/91	19		1	8.0	3.8	12.12		10.5653					
1/19/91	19		1	9.0	3.8	12.10		8.0345					
1/19/91	19		1	10.0	3.8	12.11		6.1946					
1/19/91	19		1	11.0	3.8	12.01		4.7983					
1/19/91	19		1	12.0	3.8	11.97		3.7723					
1/19/91	19		1	13.0	3.9	11.85		2.9820					
1/19/91	19		1	14.0	3.9	11.90		2.3667					
1/19/91	19	H	1	15.0	3.9	10.98		1.8709	5.31	-1	0.39	0.76	
1/19/91	19	H	2	15.0	3.9	10.98		1.8709	5.31	0	0.33	0.72	73
1/19/91	19		1	16.0	4.0	10.81		1.4837					
1/19/91	19		1	17.0	4.0	11.20		1.1747					
1/19/91	19		1	18.0	4.0	11.51		0.9390					
1/19/91	19		1	19.0	4.0	11.45		0.7524					
1/19/91	19		1	20.0	4.0	11.48		0.6015					
1/19/91	19		1	21.0	4.0	9.96		0.4808					

LAKE GILES: SUMMARY OF PHYSICAL/CHEMICAL DATA

DATE OF SAMPLE: 2/24/91 JULIAN DATE: 55 TIME: 10.58

SECCHI M: 11.9 WEATHER: Overcast, cold, windy

PERSONNEL: JAA EMN SRC

TMETHOD: 10 LMETHOD: 12 AMETHOD: 11
OMETHOD: 10 PHMETHOD: 12 CAMETHOD: 12

COMMENTS: 13cm translucent ice, 0.1% snow cover

DATE OF	JULIAN	STRA	REP	DEPTH	TEMP C	OXYGEN	OFLAG	LIGHT PC	PH	ALKAL	CHLAC U	CHLASUM	CHLAC PC
2/24/91	55	S	1	-1.0	1.5								
2/24/91	55		1	0.0	4.3	11.74		100.0000					
2/24/91	55	E	1	1.0	4.3	11.81		96.8054	5.21	-2	3.62	3.62	
2/24/91	55	E	2	1.0	4.3	11.81		96.8054	5.20	-1	2.21	2.41	24
2/24/91	55		1	2.0	4.3	11.82		80.6712					
2/24/91	55		1	3.0	4.3	11.83		64.3824					
2/24/91	55		1	4.0	4.4	11.82		48.3352					
2/24/91	55		1	5.0	4.4	11.90		35.5929					
2/24/91	55	M	1	6.0	4.3	11.93		26.4042	5.24	-2	6.30	6.30	
2/24/91	55	M	2	6.0	4.3	11.93		26.4042	5.24	-3	6.37	6.37	10
2/24/91	55		1	7.0	4.3	11.87		19.4006					
2/24/91	55		1	8.0	4.3	11.77		14.5541					
2/24/91	55		1	9.0	4.2	11.32		10.9925					
2/24/91	55		1	10.0	4.2	11.60		8.3151					
2/24/91	55		1	11.0	4.2	11.51		6.3136					
2/24/91	55		1	12.0	4.2	11.46		4.8306					
2/24/91	55		1	13.0	4.2	11.47		3.7216					
2/24/91	55		1	14.0	4.2	11.50		2.8694					
2/24/91	55		1	15.0	4.2	11.53		2.2505					
2/24/91	55		1	16.0	4.2	11.48		1.7446					
2/24/91	55		1	17.0	4.3	11.43		1.3715					
2/24/91	55	H	1	18.0	4.3	11.37		1.0707	5.22	-2	4.03	4.03	
2/24/91	55	H	2	18.0	4.3	11.37		1.0707	5.22	-3	4.77	5.16	16
2/24/91	55		1	19.0	4.3	10.44		0.8371					
2/24/91	55		1	20.0	4.3	10.11		0.6424					
2/24/91	55		1	21.0	4.4	10.05		0.4809					
2/24/91	55		1	22.0	4.4	9.46		0.3482					
2/24/91	55		1	23.0									

LAKE GILES: SUMMARY OF PHYSICAL/CHEMICAL DATA

DATE OF SAMPLE: 3/17/91 JULIAN DATE: 76 TIME: 10.67

SECCHI M: 11.3 WEATHER: Clear, sunny, sl. breeze

PERSONNEL: JAA EMN TLV

TMETHOD: 10 LMETHOD: 12 AMETHOD: 11
OMETHOD: 10 PHMETHOD: 12 CAMETHOD: 12

COMMENTS:

DATE OF	JULIAN	STRA	REP	DEPTH	TEMP C	OXYGEN	OFLAG	LIGHT PC	PH	ALKAL	CHLAC U	CHLASUM	CHLAC PC
3/17/91	76	S	1	-1.0	12.3								
3/17/91	76		1	0.0	3.6	12.71		100.0000					
3/17/91	76		1	1.0	3.5	12.72		67.7507					
3/17/91	76		1	2.0	3.5	12.71		44.9872					
3/17/91	76		1	3.0	3.4	12.70		34.0812					
3/17/91	76	E	1	4.0	3.4	12.69		24.1368	5.33	-4	1.85	2.34	
3/17/91	76	E	2	4.0	3.4	12.69		24.1368	5.33	-3	1.67	2.12	43
3/17/91	76		1	5.0	3.4	12.66		16.0484					
3/17/91	76		1	6.0	3.4	12.67		10.6634					
3/17/91	76		1	7.0	3.4	12.63		7.4309					
3/17/91	76		1	8.0	3.4	12.62		5.4599					
3/17/91	76		1	9.0	3.4	12.65		4.0685					
3/17/91	76		1	10.0	3.4	12.65		2.8001					
3/17/91	76	M	1	11.0	3.4	12.63		2.0364	5.22	-7	1.72	2.21	
3/17/91	76	M	2	11.0	3.4	12.63		2.0364	5.33	-2	1.51	1.87	48
3/17/91	76		1	12.0	3.4	12.62		1.5665					
3/17/91	76		1	13.0	3.4	12.60		1.1708					
3/17/91	76		1	14.0	3.4	12.58		0.8187					
3/17/91	76		1	15.0	3.4	12.58		0.6212					
3/17/91	76		1	16.0	3.5	12.51		0.4797					
3/17/91	76		1	17.0	3.5	12.50		0.3716					
3/17/91	76	H	1	18.0	3.6	12.50		0.2685	5.30	-1	1.35	1.69	
3/17/91	76	H	2	18.0	3.6	12.50		0.2685	5.32	-2	1.09	1.39	54
3/17/91	76		1	19.0	3.6	12.46		0.1968					
3/17/91	76		1	20.0	3.7	12.38		0.1489					
3/17/91	76		1	21.0	3.7	12.43		0.1107					
3/17/91	76		1	22.0	3.8	12.44		0.0855					
3/17/91	76		1	23.0									

LAKE GILES: SUMMARY OF PHYSICAL/CHEMICAL DATA

DATE OF SAMPLE: 4/13/91 JULIAN DATE: 103 TIME: 15.00

SECCHI M: 9.6 WEATHER: Thick overcast, wet snow

PERSONNEL: SRC REM EMN JAA

TMETHOD: 10 LMETHOD: 12 AMETHOD: 11
OMETHOD: 10 PHMETHOD: 12 CAMETHOD: 12

COMMENTS: Extra pump samples: 0.5, 4, 10, 14, 18, 22 m

DATE OF	JULIAN	STRA	REP	DEPTH	TEMP C	OXYGEN	OFLAG	LIGHT PC	PH	ALKAL	CHLAC U	CHLASUM	CHLAC PC
4/13/91	103	S	1	-1.0	5.6								
4/13/91	103		1	0.0	8.1	11.95		100.0000					
4/13/91	103		1	1.0	8.2	11.85		52.6039					
4/13/91	103		1	2.0	8.2	11.85		49.6263					
4/13/91	103		1	3.0	8.2	11.75		39.8925					
4/13/91	103	E	1	4.0	8.3	11.80		29.9494	5.39	-2	0.23	0.46	
4/13/91	103	E	2	4.0	8.3	11.80		29.9494	5.42	-1	0.22	0.42	64
4/13/91	103		1	5.0	8.3	11.75		22.0540					
4/13/91	103		1	6.0	8.3	11.75		16.2880					
4/13/91	103		1	7.0	8.3	11.72		12.2191					
4/13/91	103		1	8.0	8.3	11.72		9.2359					
4/13/91	103		1	9.0	7.1	12.68		7.0235					
4/13/91	103	M	1	10.0	6.7	12.30		5.3696	5.42	-1	0.20	0.43	
4/13/91	103	M	2	10.0	6.7	12.30		5.3696	5.42	0	0.20	0.45	85
4/13/91	103		1	11.0	6.0	12.50		4.0679					
4/13/91	103		1	12.0	5.8	12.58		3.0818					
4/13/91	103		1	13.0	5.6	12.65		2.3259					
4/13/91	103		1	14.0	5.5	12.68		1.7580					
4/13/91	103		1	15.0	5.4	12.68		1.3198					
4/13/91	103		1	16.0	5.4	12.68		0.9924					
4/13/91	103		1	17.0	5.3	12.68		0.7428					
4/13/91	103	H	1	18.0	5.1	12.70		0.5560	5.41	-0	0.70	1.31	
4/13/91	103	H	2	18.0	5.1	12.70		0.5560	5.41	-1	0.72	1.36	94
4/13/91	103		1	19.0	5.1	12.68		0.4149					
4/13/91	103		1	20.0	5.1	12.68		0.3085					
4/13/91	103		1	21.0	5.0	12.65		0.2299					
4/13/91	103		1	22.0	5.0	12.50		0.1698					
4/13/91	103		1	23.0	5.0	12.40							

LAKE GILES: SUMMARY OF PHYSICAL/CHEMICAL DATA

DATE OF SAMPLE: 5/17/91 JULIAN DATE: 137 TIME: 15.00

SECCHI M: 12.8 WEATHER: Mostly cloudy, windy

PERSONNEL: JAA EMN

TMETHOD: 10 LMETHOD: 12 AMETHOD:
OMETHOD: 10 PHMETHOD: CAMETHOD: 12

COMMENTS: Day 202 um zooplankton samples not narcotized; pH/Alkalinity data lost

DATE OF	JULIAN	STRA	REP	DEPTH	TEMP C	OXYGEN	OFLAG	LIGHT PC	PH	ALKAL	CHLAC U	CHLASUM	CHLAC PC
5/17/91	137	S	1	-1.0	29.9								
5/17/91	137		1	0.0	19.2	9.38		100.0000					
5/17/91	137	E	1	1.0	19.2	9.37		97.5610			0.29	0.29	
5/17/91	137	E	2	1.0	19.2	9.37		97.5610			0.27	0.31	93
5/17/91	137		1	2.0	19.1	9.30		93.8989					
5/17/91	137		1	3.0	17.6	9.96		89.4275					
5/17/91	137		1	4.0	15.3	10.59		74.8974					
5/17/91	137		1	5.0	14.8	10.74		55.9354					
5/17/91	137		1	6.0	13.9	10.62		45.0365					
5/17/91	137	M	1	7.0	12.7	11.01		35.0479			0.82	0.82	
5/17/91	137	M	2	7.0	12.7	11.01		35.0479			0.68	0.78	44
5/17/91	137		1	8.0	11.6	11.50		26.7745					
5/17/91	137		1	9.0	10.6	11.81		22.3867					
5/17/91	137		1	10.0	9.9	11.85		18.7180					
5/17/91	137		1	11.0	8.9	12.21		16.2765					
5/17/91	137		1	12.0	8.2	12.53		12.6764					
5/17/91	137		1	13.0	7.4	12.79		10.2977					
5/17/91	137		1	14.0	7.0	12.85		8.1148					
5/17/91	137		1	15.0	6.6	12.79		6.4918					
5/17/91	137		1	16.0	6.0	12.42		4.8995					
5/17/91	137	H	1	17.0	6.0	12.35		3.7863			1.02	1.02	
5/17/91	137	H	2	17.0	6.0	12.35		3.7863			0.55	0.80	80
5/17/91	137		1	18.0	5.9	12.25		3.0098					
5/17/91	137		1	19.0	5.8	12.08		2.2034					
5/17/91	137		1	20.0	5.7	11.82		1.7254					
5/17/91	137		1	21.0	5.7	11.30		1.2809					
5/17/91	137		1	22.0	5.7	10.85		0.9682					

LAKE GILES: SUMMARY OF PHYSICAL/CHEMICAL DATA

DATE OF SAMPLE: 6/03/91 JULIAN DATE: 154 TIME: 11.08

SECCHI M: 15.0 WEATHER: Mostly sunny, sl. breeze

PERSONNEL: EMN TLV JAA SLM PRG AMS

TMETHOD: 10 LMETHOD: 12 AMETHOD: 11
OMETHOD: 10 PHMETHOD: 12 CAMETHOD: 12

COMMENTS:

DATE OF	JULIAN	STRA	REP	DEPTH	TEMP C	OXYGEN	OFLAG	LIGHT PC	PH	ALKAL	CHLAC U	CHLASUM	CHLAC PC
6/03/91	154	S	1	-1.0	23.6								
6/03/91	154		1	0.0	22.8	8.14		100.0000					
6/03/91	154		1	1.0	22.7	7.94		69.9790					
6/03/91	154	E	1	2.0	22.6	7.99		52.6554	5.29	-1	0.37	0.37	
6/03/91	154	E	2	2.0	22.6	7.99		52.6554	5.28	-5	0.32	0.35	75
6/03/91	154		1	3.0	22.5	8.00		45.0817					
6/03/91	154		1	4.0	21.5	8.97		34.5453					
6/03/91	154		1	5.0	19.2	10.16		26.9464					
6/03/91	154		1	6.0	17.8	10.35		22.7204					
6/03/91	154		1	7.0	16.1	11.01		18.1909					
6/03/91	154	M	1	8.0	14.9	11.24		13.8650	5.30	-6	1.97	1.97	
6/03/91	154	M	2	8.0	14.9	11.24		13.8650	5.31	-4	1.63	1.65	20
6/03/91	154		1	9.0	13.3	11.56		10.6654					
6/03/91	154		1	10.0	12.0	11.80		8.4579					
6/03/91	154		1	11.0	10.9	12.03		7.0718					
6/03/91	154		1	12.0	9.7	12.53		5.5205					
6/03/91	154		1	13.0	8.9	12.86		4.4413					
6/03/91	154		1	14.0	8.2	12.87		3.2777					
6/03/91	154		1	15.0	7.7	13.06		2.5708					
6/03/91	154		1	16.0	7.2	12.96		1.8521					
6/03/91	154		1	17.0	6.9	12.81		1.4085					
6/03/91	154	H	1	18.0	6.6	12.65		1.0809	5.32	-4	1.35	1.49	
6/03/91	154	H	2	18.0	6.6	12.65		1.0809	5.32	-4	0.93	1.43	26
6/03/91	154		1	19.0	6.5	12.32		0.7618					
6/03/91	154		1	20.0	6.4	12.03		0.5630					
6/03/91	154		1	21.0	6.3	11.44		0.4177					
6/03/91	154		1	22.0	6.2	10.67		0.2884					
6/03/91	154		1	23.0									

LAKE GILES: SUMMARY OF PHYSICAL/CHEMICAL DATA

DATE OF SAMPLE: 6/17/91 JULIAN DATE: 168 TIME: 10.75

SECCHI M: 15.3 WEATHER: Partly cloudy, sl. breeze

PERSONNEL: JAA PRG EMN TLV

TMETHOD: 10 LMETHOD: 12 AMETHOD:
OMETHOD: 10 PHMETHOD: 12 CAMETHOD: 12

COMMENTS:

DATE OF	JULIAN	STRA	REP	DEPTH	TEMP C	OXYGEN	OFLAG	LIGHT PC	PH	ALKAL	CHLAC U	CHLASUM	CHLAC PC
6/17/91	168	S	1	-1.0	22.5								
6/17/91	168		1	0.0	22.6	8.46		100.0000					
6/17/91	168		1	1.0	22.5	8.33		73.8007					
6/17/91	168		1	2.0	22.3	8.41		64.9654					
6/17/91	168	E	1	3.0	22.2	8.41		46.2387	5.25		0.80	0.80	
6/17/91	168	E	2	3.0	22.2	8.41		46.2387	5.34		0.73	0.74	85
6/17/91	168		1	4.0	21.4	8.62		36.9910					
6/17/91	168		1	5.0	21.2	8.65		31.2953					
6/17/91	168		1	6.0	20.8	8.76		24.3543					
6/17/91	168		1	7.0	19.4	10.45		19.4058					
6/17/91	168		1	8.0	17.0	11.32		15.6121					
6/17/91	168	M	1	9.0	15.7	11.51		12.1589	5.26		0.99	0.99	
6/17/91	168	M	2	9.0	15.7	11.51		12.1589	5.32		0.83	0.84	53
6/17/91	168		1	10.0	13.3	11.89		9.0200					
6/17/91	168		1	11.0	11.9	12.17		6.9331					
6/17/91	168		1	12.0	10.4	12.57		5.2365					
6/17/91	168		1	13.0	9.5	12.78		4.0436					
6/17/91	168		1	14.0	8.9	12.85		3.0564					
6/17/91	168		1	15.0	8.3	12.80		2.2408					
6/17/91	168		1	16.0	7.8	12.74		1.6167					
6/17/91	168		1	17.0	7.3	12.64		1.1784					
6/17/91	168	H	1	18.0	6.9	12.23		0.8477	5.38		5.39	5.39	
6/17/91	168	H	2	18.0	6.9	12.23		0.8477	5.34		5.10	5.30	19
6/17/91	168		1	19.0	6.7	11.59		0.5783					
6/17/91	168		1	20.0	6.5	9.83		0.3740					
6/17/91	168		1	21.0	6.5	9.53		0.2392					
6/17/91	168		1	22.0	6.5	9.16		0.1525					

LAKE GILES: SUMMARY OF PHYSICAL/CHEMICAL DATA

DATE OF SAMPLE: 7/01/91   JULIAN DATE: 182   TIME: 11.65

SECCHI M: 16.5   WEATHER: Sunny

PERSONNEL: JAA TLV EWH

TMETHOD: 10   LMETHOD: 12   AMETHOD: 11
OMETHOD: 10   PHMETHOD: 12   CAMETHOD: 12

COMMENTS: Chemistry samples 0.5, 4,7,10,17,22m

DATE OF	JULIAN	STRA	REP	DEPTH	TEMP C	OXYGEN	OFLAG	LIGHT PC	PH	ALKAL	CHLAC U	CHLASUM	CHLAC PC
7/01/91	182	S	1	-1.0	24.1								
7/01/91	182		1	0.0	23.5	8.10		100.0000					
7/01/91	182		1	1.0	23.5	8.17		79.6813					
7/01/91	182		1	2.0	23.4	8.16		66.1255					
7/01/91	182		1	3.0	23.3	8.11		50.1711					
7/01/91	182	E	1	4.0	23.3	8.05		36.2246	5.34	3	0.85	0.85	
7/01/91	182	E	2	4.0	23.3	8.05		36.2246	5.41	-6	0.77	0.79	79
7/01/91	182		1	5.0	23.3	8.02		26.5188					
7/01/91	182		1	6.0	22.7	8.48		23.0598					
7/01/91	182		1	7.0	22.3	8.66		16.4948					
7/01/91	182		1	8.0	19.0	10.92		13.4762					
7/01/91	182		1	9.0	16.9	11.39		10.4791					
7/01/91	182	M	1	10.0	15.0	11.66		7.7912	5.31	1	0.99	0.99	
7/01/91	182	M	2	10.0	15.0	11.66		7.7912	5.31	-6	0.94	0.99	51
7/01/91	182		1	11.0	12.9	12.10		6.3240					
7/01/91	182		1	12.0	11.3	12.40		5.1583					
7/01/91	182		1	13.0	10.7	12.53		3.9801					
7/01/91	182		1	14.0	9.9	12.62		3.0336					
7/01/91	182		1	15.0	8.8	12.80		2.4096					
7/01/91	182		1	16.0	8.3	12.78		1.8854					
7/01/91	182	H	1	17.0	7.6	12.80		1.4437	5.46	-10	1.19	1.39	
7/01/91	182	H	2	17.0	7.6	12.80		1.4437	5.43	-7	1.18	1.44	59
7/01/91	182		1	18.0	7.4	12.39		0.9728					
7/01/91	182		1	19.0	7.1	11.78		0.6342					
7/01/91	182		1	20.0	7.0	10.84		0.4291					
7/01/91	182		1	21.0	6.9	10.07		0.2665					
7/01/91	182		1	22.0	6.9	9.38		0.1716					
7/01/91	182		1	23.0									

LAKE GILES: SUMMARY OF PHYSICAL/CHEMICAL DATA

DATE OF SAMPLE: 7/15/91 JULIAN DATE: 196 TIME: 11.50

SECCHI M: 13.3 WEATHER: Sunny, sl. wind

PERSONNEL: PG EMN TLV JAA

TMETHOD: 10 LMETHOD: 12 AMETHOD:
OMETHOD: 10 PHMETHOD: 12 CAMETHOD: 12

COMMENTS: Light meter giving erratic readings, light data suspect

DATE OF	JULIAN	STRA	REP	DEPTH	TEMP C	OXYGEN	OFLAG	LIGHT PC	PH	ALKAL	CHLAC U	CHLASUM	CHLAC PC
7/15/91	196	S	1	-1.0	22.8								
7/15/91	196		1	0.0	22.9	8.04		100.0000					
7/15/91	196		1	1.0	22.8	8.00		74.0741					
7/15/91	196		1	2.0	22.7	8.05		60.9162					
7/15/91	196		1	3.0	22.6	8.03		41.3833					
7/15/91	196	E	1	4.0	22.6	8.04		34.9226	5.35		1.55	1.55	
7/15/91	196	E	2	4.0	22.6	8.04		34.9226	5.34		1.50	1.54	37
7/15/91	196		1	5.0	22.6	7.97		32.5467					
7/15/91	196		1	6.0	22.6	7.96		27.0997					
7/15/91	196		1	7.0	22.5	7.94		22.8689					
7/15/91	196		1	8.0	21.9	8.92		17.6186					
7/15/91	196		1	9.0	18.3	10.84		13.1678					
7/15/91	196		1	10.0	16.0	11.21		9.5350					
7/15/91	196		1	11.0	14.0	11.56		6.9649					
7/15/91	196	M	1	12.0	12.4	12.02		5.8284	5.33		1.20	1.27	
7/15/91	196	M	2	12.0	12.4	12.02		5.8284	5.34		0.96	1.14	60
7/15/91	196		1	13.0	11.4	12.16		4.4868					
7/15/91	196		1	14.0	11.1	12.17		3.1709					
7/15/91	196		1	15.0	9.9	12.25		2.4929					
7/15/91	196		1	16.0	8.8	12.40		1.7896					
7/15/91	196		1	17.0	8.3	12.27		1.5230					
7/15/91	196		1	18.0	7.8	11.63		1.0475					
7/15/91	196	H	1	19.0	7.5	11.33		0.7189	5.44		1.72	2.51	
7/15/91	196	H	2	19.0	7.5	11.33		0.7189	5.45		1.47	2.20	84
7/15/91	196		1	20.0	7.3	10.15		0.5020					
7/15/91	196		1	21.0	7.2	9.30							
7/15/91	196		1	22.0	7.2	8.66							
7/15/91	196		1	23.0	7.1	6.23							

LAKE GILES: SUMMARY OF PHYSICAL/CHEMICAL DATA

DATE OF SAMPLE: 7/29/91 JULIAN DATE: 210 TIME: 11.70

SECCHI M: 12.5 WEATHER: Overcast, sl. wind

PERSONNEL: AMS EMN TLV JAA

TMETHOD: 10 LMETHOD: 12 AMETHOD:
OMETHOD: 10 PHMETHOD: 12 CAMETHOD: 12

COMMENTS: Night zooplankton not narcotized

DATE OF	JULIAN	STRA	REP	DEPTH	TEMP C	OXYGEN	OFLAG	LIGHT PC	PH	ALKAL	CHLAC U	CHLASUM	CHLAC PC
7/29/91	210	S	1	-1.0	22.9								
7/29/91	210		1	0.0	23.8	8.31		100.0000					
7/29/91	210		1	1.0	23.9	8.31		86.1326					
7/29/91	210		1	2.0	24.0	8.31		85.3644					
7/29/91	210		1	3.0	24.0	8.29		78.2441					
7/29/91	210	E	1	4.0	24.0	8.22		68.7558	5.39		1.08	1.11	
7/29/91	210	E	2	4.0	24.0	8.22		68.7558	5.40		1.00	1.04	70
7/29/91	210		1	5.0	24.0	8.23		58.2677					
7/29/91	210		1	6.0	24.0	8.20		50.3610					
7/29/91	210		1	7.0	23.9	8.21		42.7150					
7/29/91	210		1	8.0	23.6	8.30		36.6024					
7/29/91	210		1	9.0	20.6	11.05		30.4007					
7/29/91	210		1	10.0	18.1	11.46		25.4399					
7/29/91	210		1	11.0	15.6	12.13		21.5410					
7/29/91	210	M	1	12.0	13.7	12.59		18.5538	5.35		1.17	1.20	
7/29/91	210	M	2	12.0	13.7	12.59		18.5538	5.32		1.13	1.30	17
7/29/91	210		1	13.0	12.4	12.95		16.0639					
7/29/91	210		1	14.0	11.4	13.13		13.5790					
7/29/91	210		1	15.0	10.3	13.27		11.3347					
7/29/91	210		1	16.0	9.5	13.18		9.2679					
7/29/91	210		1	17.0	8.8	13.07		7.4802					
7/29/91	210		1	18.0	8.3	12.39		5.9414					
7/29/91	210	H	1	19.0	8.0	11.75		4.6453	5.45		3.19	4.23	
7/29/91	210	H	2	19.0	8.0	11.75		4.6453	5.52		1.92	2.49	85
7/29/91	210		1	20.0	7.8	10.63		3.5139					
7/29/91	210		1	21.0	7.6	8.42		2.5743					
7/29/91	210		1	22.0	7.5	6.73		1.8309					
7/29/91	210		1	23.0	7.4	0.32	4	0.0000					

LAKE GILES: SUMMARY OF PHYSICAL/CHEMICAL DATA

DATE OF SAMPLE: 8/12/91 JULIAN DATE: 224 TIME: 11.17

SECCHI M: 11.5 WEATHER: Mostly cloudy, windy

PERSONNEL: EMN AMS TLV

TMETHOD: 10 LMETHOD: 12 AMETHOD: 11
OMETHOD: 10 PHMETHOD: 12 CAMETHOD: 12

COMMENTS: O2 readings fluctuating greatly, temp. readings steady

DATE OF	JULIAN	STRA	REP	DEPTH	TEMP C	OXYGEN	OFLAG	LIGHT PC	PH	ALKAL	CHLAC U	CHLASUM	CHLAC PC
8/12/91	224	S	1	-1.0	26.4		10						
8/12/91	224		1	0.0	23.3	8.18		100.0000					
8/12/91	224		1	1.0	23.2	8.26		58.4795					
8/12/91	224		1	2.0	23.1	8.27		47.1229					
8/12/91	224		1	3.0	23.0	8.23		40.8698					
8/12/91	224		1	4.0	23.0	8.19		35.7254					
8/12/91	224	E	1	5.0	23.0	8.14		31.5039	5.34	-4	1.45	1.50	
8/12/91	224	E	2	5.0	23.0	8.14		31.5039	5.37	-4	1.33	1.43	64
8/12/91	224		1	6.0	22.9	8.09		25.8865					
8/12/91	224		1	7.0	22.9	8.11		21.6986					
8/12/91	224		1	8.0	22.9	8.03		18.4043					
8/12/91	224		1	9.0	22.8	8.04		15.2227					
8/12/91	224		1	10.0	19.8	10.91		11.7823					
8/12/91	224		1	11.0	16.9	11.22		9.7134					
8/12/91	224	M	1	12.0	15.0	11.81		8.1012	5.29	-5	1.86	2.05	
8/12/91	224	M	2	12.0	15.0	11.81		8.1012	5.28	-6	2.03	2.27	58
8/12/91	224		1	13.0	13.4	12.03		6.7510					
8/12/91	224		1	14.0	12.1	12.38		5.5793					
8/12/91	224		1	15.0	10.9	12.10		4.4958					
8/12/91	224		1	16.0	10.0	12.36		3.5568					
8/12/91	224		1	17.0	9.2	12.29		2.8684					
8/12/91	224	H	1	18.0	8.8	11.91		2.2445	5.51	0	1.40	2.54	
8/12/91	224	H	2	18.0	8.8	11.91		2.2445	5.47	1	1.09	2.03	79
8/12/91	224		1	19.0	8.3	10.29		1.6838					
8/12/91	224		1	20.0	7.9	7.82		1.2087					
8/12/91	224		1	21.0	7.7	5.57		0.7994					
8/12/91	224		1	22.0	7.6	4.20		0.4798					

LAKE GILES: SUMMARY OF PHYSICAL/CHEMICAL DATA

DATE OF SAMPLE: 8/26/91 JULIAN DATE: 238 TIME: 12.43

SECCHI M: 12.2 WEATHER: Sunny, windy

PERSONNEL: EMN TLV

TMETHOD: 10 LMETHOD: 12 AMETHOD:
OMETHOD: 10 PHMETHOD: 12 CAMETHOD: 12

COMMENTS:

DATE OF	JULIAN	STRA	REP	DEPTH	TEMP C	OXYGEN	OFLAG	LIGHT PC	PH	ALKAL	CHLAC U	CHLASUM	CHLAC PC
8/26/91	238	S	1	-1.0	25.7								
8/26/91	238		1	0.0	23.6	7.90		100.0000					
8/26/91	238		1	1.0	23.4	7.95		67.5676					
8/26/91	238		1	2.0	23.1	7.97		62.3317					
8/26/91	238		1	3.0	23.1	7.94		51.4713					
8/26/91	238		1	4.0	23.0	7.98		40.4967					
8/26/91	238	E	1	5.0	23.0	7.99		40.3755	5.36		3.18	3.18	
8/26/91	238	E	2	5.0	23.0	7.99		40.3755	5.38		3.09	3.09	64
8/26/91	238		1	6.0	23.0	7.95		33.7025					
8/26/91	238		1	7.0	23.0	7.96		25.5322					
8/26/91	238		1	8.0	22.9	7.66		21.1359					
8/26/91	238		1	9.0	22.8	7.88		17.2820					
8/26/91	238		1	10.0	21.8	9.01		13.3969					
8/26/91	238		1	11.0	18.1	11.41		10.2033					
8/26/91	238	M	1	12.0	15.7	11.69		7.9589	5.41		9.40	9.40	
8/26/91	238	M	2	12.0	15.7	11.69		7.9589	5.42		8.47	8.47	56
8/26/91	238		1	13.0	13.7	11.79		5.9707					
8/26/91	238		1	14.0	12.2	11.98		4.5787					
8/26/91	238		1	15.0	10.9	12.18		3.6718					
8/26/91	238		1	16.0	10.0	11.56		2.7018					
8/26/91	238		1	17.0	9.2	10.44		1.9480					
8/26/91	238		1	18.0	8.6	10.24		1.4355					
8/26/91	238	H	1	19.0	8.3	8.98		1.0665	5.40		5.07	5.99	
8/26/91	238	H	2	19.0	8.3	8.98		1.0665	5.43		4.56	5.36	66
8/26/91	238		1	20.0	8.0	6.74		0.7406					
8/26/91	238		1	21.0	7.8	4.73		0.4934					
8/26/91	238		1	22.0	7.7	3.24		0.2913					
8/26/91	238		1	23.0	7.6	0.83		0.0000					

LAKE GILES: SUMMARY OF PHYSICAL/CHEMICAL DATA

DATE OF SAMPLE: 9/08/91 JULIAN DATE: 251 TIME: 10.97

SECCHI M: 12.8 WEATHER: Sunny, calm to windy

PERSONNEL: EMN TLV

TMETHOD: 10 LMETHOD: 12 AMETHOD: 11
OMETHOD: 10 PHMETHOD: 12 CAMETHOD: 12

COMMENTS:

DATE OF	JULIAN	STRA	REP	DEPTH	TEMP C	OXYGEN	OFLAG	LIGHT PC	PH	ALKAL	CHLAC U	CHLASUM	CHLAC PC
9/08/91	251	S	1	-1.0	19.8								
9/08/91	251		1	0.0	22.7	7.84		100.0000					
9/08/91	251		1	1.0	22.5	7.78		75.8725					
9/08/91	251		1	2.0	22.4	7.86		51.8255					
9/08/91	251		1	3.0	22.4	7.85		36.9918					
9/08/91	251		1	4.0	22.3	7.83		28.6758					
9/08/91	251	E	1	5.0	22.3	7.91		22.5085	5.30	-1	0.87	1.00	
9/08/91	251	E	2	5.0	22.3	7.91		22.5085	5.39	-5	0.76	0.90	41
9/08/91	251		1	6.0	22.3	7.85		18.0501					
9/08/91	251		1	7.0	22.3	7.81		14.4170					
9/08/91	251		1	8.0	22.2	7.72		11.4512					
9/08/91	251		1	9.0	22.1	7.51		9.0452					
9/08/91	251		1	10.0	22.0	7.65		7.2477					
9/08/91	251		1	11.0	19.3	10.39		5.5368					
9/08/91	251		1	12.0	15.9	11.66		4.3155					
9/08/91	251		1	13.0	14.2	11.64		3.3145					
9/08/91	251	M	1	14.0	12.5	11.69		2.5575	5.38	-3	1.08	1.48	
9/08/91	251	M	2	14.0	12.5	11.69		2.5575	5.36	-5	1.03	1.43	95
9/08/91	251		1	15.0	11.1	11.77		1.9704					
9/08/91	251		1	16.0	10.2	11.82		1.5168					
9/08/91	251		1	17.0	9.3	10.27		1.1370					
9/08/91	251		1	18.0	8.4	9.45		0.8361					
9/08/91	251		1	19.0	8.1	7.18		0.5951					
9/08/91	251	H	1	20.0	7.8	5.41		0.4065	5.35	11	0.61	0.81	
9/08/91	251	H	2	20.0	7.8	5.41		0.4065	5.36	10	0.87	1.48	63
9/08/91	251		1	21.0	7.7	3.91		0.2536					
9/08/91	251		1	22.0	7.6	2.71		0.1496					
9/08/91	251		1	23.0	7.6	1.16		0.0000					

LAKE GILES: SUMMARY OF PHYSICAL/CHEMICAL DATA

DATE OF SAMPLE: 9/21/91 JULIAN DATE: 264 TIME: 11.92

SECCHI M: 13.9 WEATHER: Partly cloudy, windy

PERSONNEL: EMN TLV GLB EAMV

TMETHOD: 10 LMETHOD: 12 AMETHOD:
OMETHOD: 10 PHMETHOD: 12 CAMETHOD: 12

COMMENTS: Chemical samples 0.5,5,9,13,19,22m

DATE OF	JULIAN	STRA	REP	DEPTH	TEMP C	OXYGEN	OFLAG	LIGHT PC	PH	ALKAL	CHLAC U	CHLASUM	CHLAC PC
9/21/91	264	S	1	-1.0	14.4								
9/21/91	264		1	0.0	20.4	7.81		100.0000					
9/21/91	264		1	1.0	20.4	7.81		64.9773					
9/21/91	264		1	2.0	20.4	7.78		48.8551					
9/21/91	264		1	3.0	20.4	7.76		37.6678					
9/21/91	264		1	4.0	20.4	7.75		29.7534					
9/21/91	264	E	1	5.0	20.4	7.74		23.4833	5.32		1.68	1.71	
9/21/91	264	E	2	5.0	20.4	7.74		23.4833	5.31		1.37	1.54	71
9/21/91	264		1	6.0	20.4	7.71		18.2466					
9/21/91	264		1	7.0	20.4	7.72		14.9317					
9/21/91	264		1	8.0	20.4	7.69		11.8694					
9/21/91	264		1	9.0	20.3	7.70		9.9576					
9/21/91	264		1	10.0	20.3	7.68		8.1888					
9/21/91	264		1	11.0	20.2	7.70		6.5301					
9/21/91	264		1	12.0	17.3	10.20		4.8988					
9/21/91	264	M	1	13.0	14.2	10.35		3.9191	5.36		1.65	1.99	
9/21/91	264	M	2	13.0	14.2	10.35		3.9191	5.37		1.45	1.83	75
9/21/91	264		1	14.0	12.4	10.62		3.0357					
9/21/91	264		1	15.0	11.0	10.52		2.5006					
9/21/91	264		1	16.0	10.0	10.45		1.9384					
9/21/91	264		1	17.0	9.1	9.36		1.5336					
9/21/91	264		1	18.0	8.5	7.36		1.1309					
9/21/91	264	H	1	19.0	8.1	5.72		0.8090	5.43		0.55	1.15	
9/21/91	264	H	2	19.0	8.1	5.72		0.8090	5.45		0.39	0.91	77
9/21/91	264		1	20.0	7.9	3.87		0.5298					
9/21/91	264		1	21.0	7.7	2.79		0.2946					
9/21/91	264		1	22.0	7.6	1.31		0.1137					
9/21/91	264		1	23.0	7.5			0.0000					

LAKE GILES: SUMMARY OF PHYSICAL/CHEMICAL DATA

DATE OF SAMPLE: 10/11/91 JULIAN DATE: 284 TIME: 11.37

SECCHI M: 11.8 WEATHER: Overcast, rain

PERSONNEL: EMN TLV

TMETHOD: 10 LMETHOD: 12 AMETHOD: 11
OMETHOD: 10 PHMETHOD: 12 CAMETHOD: 12

COMMENTS:

DATE OF	JULIAN	STRA	REP	DEPTH	TEMP C	OXYGEN	OFLAG	LIGHT PC	PH	ALKAL	CHLAC U	CHLASUM	CHLAC PC
10/11/91	284	S	1	-1.0	11.2								
10/11/91	284		1	0.0	15.8	9.18		100.0000					
10/11/91	284		1	1.0	15.9	9.09		77.4593					
10/11/91	284		1	2.0	15.9	9.13		71.2597					
10/11/91	284		1	3.0	15.9	9.12		60.2874					
10/11/91	284		1	4.0	15.9	9.08		47.9995					
10/11/91	284		1	5.0	15.9	8.96		38.8660					
10/11/91	284		1	6.0	15.9	9.00		31.7793					
10/11/91	284	E	1	7.0	15.9	9.08		25.3625	5.30	-7	1.50	1.70	
10/11/91	284	E	2	7.0	15.9	9.08		25.3625	5.30	-8	0.75	0.85	61
10/11/91	284		1	8.0	15.9	9.02		20.2738					
10/11/91	284		1	9.0	15.9	9.04		16.3104					
10/11/91	284		1	10.0	15.9	9.02		13.1748					
10/11/91	284		1	11.0	15.9	9.03		10.6592					
10/11/91	284		1	12.0	15.8	8.94		8.6379					
10/11/91	284		1	13.0	15.8	8.89		7.0341					
10/11/91	284		1	14.0	15.7	8.98		5.6636					
10/11/91	284	M	1	15.0	11.9	10.50		4.1522	5.33	-4	1.75	2.40	
10/11/91	284	M	2	15.0	11.9	10.50		4.1522	5.34	-3	1.25	1.65	76
10/11/91	284		1	16.0	10.0	9.35		2.9786					
10/11/91	284		1	17.0	9.2	8.48		2.1140					
10/11/91	284		1	18.0	8.8	6.98		1.5025					
10/11/91	284		1	19.0	8.4	5.55		1.0077					
10/11/91	284	H	1	20.0	8.0	3.44		0.6078	5.57	19	0.65	2.26	
10/11/91	284	H	2	20.0	8.0	3.44		0.6078	5.60	22	0.13	0.45	62
10/11/91	284		1	21.0	7.8	1.45		0.2885					
10/11/91	284		1	22.0	7.6	0.59		0.1133					
10/11/91	284		1	23.0	7.5			0.0000					

LAKE GILES: SUMMARY OF PHYSICAL/CHEMICAL DATA

DATE OF SAMPLE: 11/22/91 JULIAN DATE: 326 TIME: 11.13

SECCHI M: 11.1 WEATHER: Cloudy, rainy, fog

PERSONNEL: EMN TLV PLS

TMETHOD: 10 LMETHOD: 12 AMETHOD: 11
OMETHOD: 10 PHMETHOD: 12 CAMETHOD: 12

COMMENTS:

DATE OF	JULIAN	STRA	REP	DEPTH	TEMP C	OXYGEN	OFLAG	LIGHT PC	PH	ALKAL	CHLAC U	CHLASUM	CHLAC PC
11/22/91	326	S	1	-1.0	11.7								
11/22/91	326		1	0.0	10.5	10.87		100.0000					
11/22/91	326		1	1.0	10.3	10.64		55.7103					
11/22/91	326		1	2.0	9.6	10.59		40.9334					
11/22/91	326	E	1	3.0	9.3	10.55		34.9858	5.49	-5	1.48	1.57	
11/22/91	326	E	2	3.0	9.3	10.55		34.9858	5.48	-5	1.08	1.19	94
11/22/91	326		1	4.0	9.2	10.48		28.0560					
11/22/91	326		1	5.0	9.1	10.33		21.8165					
11/22/91	326		1	6.0	8.9	10.33		16.7304					
11/22/91	326		1	7.0	8.8	10.29		12.8498					
11/22/91	326		1	8.0	8.7	10.26		9.8090					
11/22/91	326		1	9.0	8.7	10.20		7.4992					
11/22/91	326		1	10.0	8.6	10.18		5.7554					
11/22/91	326	M	1	11.0	8.6	10.12		4.4035	5.37	-4	1.02	1.15	
11/22/91	326	M	2	11.0	8.6	10.12		4.4035	5.46	-4	0.86	0.94	99
11/22/91	326		1	12.0	8.5	10.08		3.4295					
11/22/91	326		1	13.0	8.5	10.05		2.6381					
11/22/91	326		1	14.0	8.5	10.05		2.0340					
11/22/91	326		1	15.0	8.5	10.03		1.5755					
11/22/91	326		1	16.0	8.5	10.01		1.2138					
11/22/91	326		1	17.0	8.4	9.98		0.9323					
11/22/91	326	H	1	18.0	8.4	10.02		0.7149	5.46	-5	0.71	1.13	
11/22/91	326	H	2	18.0	8.4	10.02		0.7149	5.46	-5	0.61	0.97	90
11/22/91	326		1	19.0	8.4	9.88		0.5516					
11/22/91	326		1	20.0	8.4	9.94		0.4201					
11/22/91	326		1	21.0	8.4	9.72		0.3171					
11/22/91	326		1	22.0	8.4	9.41		0.2326					
11/22/91	326		1	23.0	8.4	7.42		0.0000					

LAKE GILES: SUMMARY OF PHYSICAL/CHEMICAL DATA

DATE OF SAMPLE: 12/17/91 JULIAN DATE: 351 TIME: 11.60

SECCHI M: 10.8 WEATHER: Overcast, snow, windy

PERSONNEL: EMN TLV PLS

TMETHOD: 10 LMETHOD: 12 AMETHOD: 11
OMETHOD: 10 PHMETHOD: 12 CAMETHOD: 12

COMMENTS: No ice

DATE OF	JULIAN	STRA	REP	DEPTH	TEMP C	OXYGEN	OFLAG	LIGHT PC	PH	ALKAL	CHLAC U	CHLASUM	CHLAC PC
12/17/91	351	S	1	-1.0	-1.0								
12/17/91	351		1	0.0	4.3	11.60		100.0000					
12/17/91	351		1	1.0	4.3	11.25		57.4053					
12/17/91	351		1	2.0	4.4	11.09		42.6805					
12/17/91	351		1	3.0	4.4	10.99		36.1087					
12/17/91	351	E	1	4.0	4.4	10.96		28.4545	5.39	-6	1.11	1.44	
12/17/91	351	E	2	4.0	4.4	10.96		28.4545	5.41	-7	1.00	1.43	89
12/17/91	351		1	5.0	4.4	10.88		22.2301					
12/17/91	351		1	6.0	4.4	10.89		17.0345					
12/17/91	351		1	7.0	4.4	10.86		12.9935					
12/17/91	351		1	8.0	4.4	10.89		9.9644					
12/17/91	351		1	9.0	4.4	10.86		7.6649					
12/17/91	351		1	10.0	4.4	10.85		5.9188					
12/17/91	351	M	1	11.0	4.4	10.84		4.5811	5.38	-7	1.26	1.54	
12/17/91	351	M	2	11.0	4.4	10.84		4.5811	5.40	-7	1.21	1.55	80
12/17/91	351		1	12.0	4.4	10.84		3.5485					
12/17/91	351		1	13.0	4.3	10.84		2.7551					
12/17/91	351		1	14.0	4.3	10.82		2.1407					
12/17/91	351		1	15.0	4.4	10.80		1.6763					
12/17/91	351		1	16.0	4.4	10.78		1.3035					
12/17/91	351		1	17.0	4.4	10.73		1.0216					
12/17/91	351	H	1	18.0	4.3	10.78		0.7987	5.40	-6	1.05	1.49	
12/17/91	351	H	2	18.0	4.3	10.78		0.7987	5.40	-7	0.82	1.28	90
12/17/91	351		1	19.0	4.3	10.73		0.6279					
12/17/91	351		1	20.0	4.3	10.68		0.4894					
12/17/91	351		1	21.0	4.3	10.70		0.3897					
12/17/91	351		1	22.0	4.4	10.67		0.3080					