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WENTWORTH LAKE

LAKES LAY MONITORING PROGRAM

1985

Freshwater Biology Group (FBG)

University of New Hampshire

Durham

by

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LAKES LAY MONITORING PROGRAM

To obtain more information about the Lakes Lay Monitoring Program (LLMP) contact the LLMP Coordinator (T. Kenealy) at (603)-862-3848, Dr. Baker at 862-3845 or Dr. Haney at 862-2106.

TABLE OF CONTENTS

This is a LEVEL II report. (See last page for definition.)

All data in this report are available to any person or organization upon request and payment of costs involved.

PREFACE

Importance of long-term monitoring

Lake monitoring carried out weekly over the course of several consecutive summers benefits the lake in a number of ways. The resulting data not only indicate the lake's condition for a particular summer, but they also suggest what it was like in the past, and make it possible to predict its condition in the future.

For this reason, it is important to distinguish between short-term and long-term results. As an example, a 30 year time-span may provide evidence for a long-term trend towards eutrophy (Fig. 1). Yet, if one looks at data over a 1-5 year time-span, one sees only short-term fluctuations; there are no apparent trends nor is it possible to separate the "signal" from "noise". Chlorophyll, water transparency, and phosphorus may fluctuate from year to year in response to annual variations in climate and activity on the lake, and may be unrelated to long-term trends. The more such "noise" in the data, whether due to real or analytical variations, the longer a monitoring program must continue to demonstrate long-term trends.

Use of long-term trends

Long-term trends serve several important functions. From them, past deterioration of the lake can be recognized. They can also be used to forecast the future condition of the lake, and if

They can also be used to forecast the future condition of the lake, and if necessary, management techniques can be implemented to keep potential problems from becoming worse. Finally, long-term trends provide a basis for evaluation of existing management programs so that necessary changes may be brought about.

It takes a great deal of motivation, perseverance, and a love for one's lake to be a lay monitor. Sometimes it may seem to be an inconvenience, or to be discouraging when it's unclear just what a year's worth of hard work means with respect to the "big picture" of the lake. Yet, each observation by a lay monitor is a significant contribution.

Thus, continuation of data collection is important. The LLMP data base is becoming more comprehensive and valuable each year. We are pleased with the interest and commitment of lakeshore volunteers. Keep up the great work!

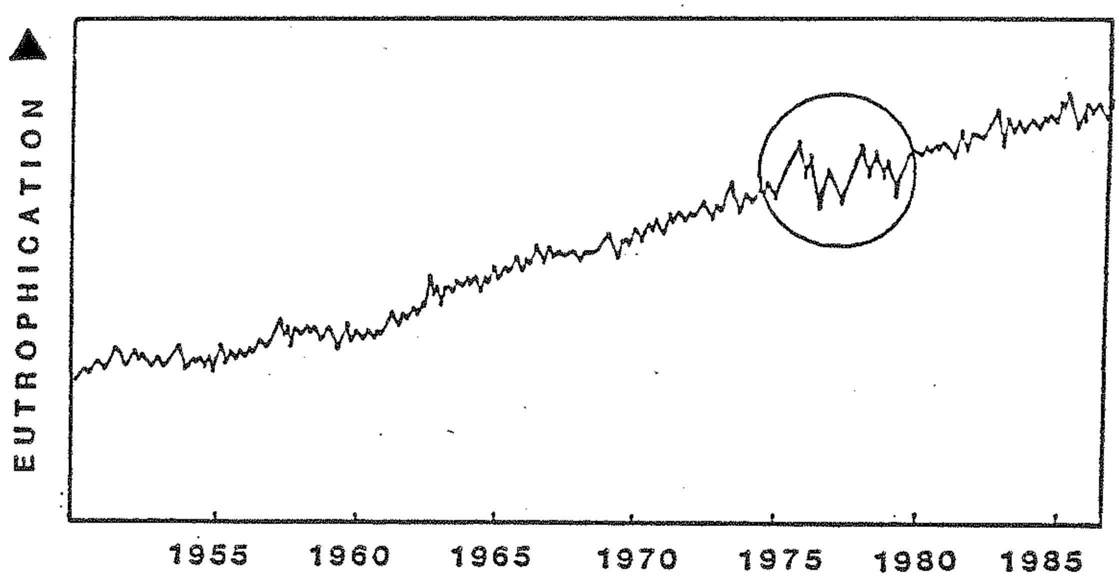

Figure 1. Long-term vs. short-term trends in a hypothetical lake approaching eutrophication.

ACKNOWLEDGEMENTS

Lake Wentworth has been a part of the Lakes Lay Monitoring Program since 1984. The program continued strongly in 1985 through the direction and organization of Dr. Richard Goldthwait and other dedicated monitors. Weekly monitoring began in June and was carried out through September by Mal Blodget, Lawrence Goldthwait, Richard Goldthwait and Fredrick Pflueger.

The Freshwater Biology Group congratulates the monitors on the quality of their work and the time and effort put forth. We encourage them and other interested members of the Lake Wentworth Association to continue monitoring during the 1986 season. We would also like to thank Dr. Goldthwait for his continued dedication to the maintenance and organization of the LLMP for the lake.

Members of the Freshwater Biology Group included Kim Babbitt, Henry Burke, Tracy Kenealy, Sandra Lord, Elizabeth Trieff, Celia Acacia, and Deb Thunburg. Kim was the LLMP Coordinator, and was responsible for arranging the field trips and supervising the research team. Liz and Sandy were responsible for phosphorous, Henry for equipment production and upkeep, Celia for phytoplankton, and Deb for zooplankton. Tracy was responsible for data entry and analysis, and for writing the reports in the fall.

We would also like to recognize the UNH Office of Computer Services for their provision of computer time and data storage

space. The final text is available on an IBM-compatible diskette.

NON-TECHNICAL SUMMARY OF LAY MONITOR DATA

1) Both water transparencies and chlorophyll a concentrations indicate that Wentworth Lake is oligotrophic. Seasonal readings for secchi disk and chlorophyll suggest that the lake is nutrient poor and contains relatively few planktonic algae.

2) This year, alkalinity was measured frequently on the lake. Alkalinity indicates the ability of water to buffer acids. Data from 1985, as well as past data, indicate that the buffering capacity in Wentworth may be slowly decreasing. This suggests that the effects of acidification may become a problem in the future.

3) Levels of total phosphorus were low in Wentworth Lake, but levels at Willey brook were higher than levels at other sites. Thus, this inlet may be a potential source of phosphorus.

4) The water this year was more transparent and contained less green coloring fron suspended algae than last year. Short-term fluctuations such as these are common, possibly due to changes in weather from year to year.

COMMENTS AND RECOMMENDATIONS

1) We recommend that the Lake Wentworth Association continue its long-term monitoring program in 1986. The Association has established a two-year data base that can be strengthened through further monitoring. A data base resulting from several years of monitoring will be a valuable resource in the future as trends in the chemistry and biology of the lake become evident.

2) We strongly recommend the continuation of alkalinity testing. Results from testing done by the New Hampshire Water Supply and Pollution Control Commission in 1979, and data from the FBG in 1984 and 1985 indicate that the buffering capacity may be decreasing in Wentworth. Results from recent scientific literature have shown that alkalinity measurements may be a more reliable early indicator of lake acidification than pH. It is important to establish a data base for alkalinity in order to detect changes as early as possible, especially in a lake such as Wentworth where the buffering capacity is already low.

3) Phosphorus sampling should be continued in 1986. Since it is suspected that Willey Brook may be a source of some nutrient loading, the amounts of phosphorus which enter the lake should be monitored.

4) As a general addition to our Lakes Lay Monitoring Program, we are suggesting that each lake in the Program begin monitoring the condition of the fish taken from the lake. The "Fish Monitoring" will require that at least one lay monitor record the species, length and weight and collect a sample of fish scales for each fish examined. In most lakes this will involve periodic creel census of sport fishermen on the lake. Equipment required will cost approximately $100. Special instruction will be given to the lay monitors who chose to measure this parameter.

Length-to-weight ratios give a measure of the nutritional condition of the fish. Analysis of the fish scales (to be done at UNH) will tell how old each fish is. Together, these data will be extremely useful indicators of the health of the fish populations in the lake, and, of course, the "health" of the lake.

METHODS OF LAY MONITORS

This year, data were collected on five parameters: thermal stratification, water clarity (secchi disk depth), chlorophyll a concentration, alkalinity, and total phosphorous. Whenever possible, testing was done weekly between the hours of 9 am and 3 pm, the period of maximum sunlight penetration into the water. All samples and data were mailed to the FBG at UNH for analysis.

Thermal (temperature) profiles were obtained by collecting lakewater samples at several successive depths using a modified Meyer bottle (Lind, 1979). A weighted, empty bottle with a stopper was lowered to a specific depth. At that depth, the stopper was pulled, allowing the bottle to be filled with water. The bottle was quickly pulled back up to the surface where the temperature of the sample was taken with a Taylor pocket thermometer, and recorded in degrees Celsius. This procedure was repeated at one meter intervals through the epilimnion and hypolimnion, and at one-half meter intervals throughout the metalimnion.

Water clarity was measured by lowering a secchi disk (approximately 20 cm. or 8 inches) through the water off the shady side of the boat, and noting the average depth at which it disappeared upon lowering and reappeared when being raised (the cord attached to the secchi disk was marked in one-half meters).

This process was done while holding a view-scope just below the surface to eliminate effects of surface reflection and wave action. This was repeated two or three times, and an average to the nearest one-tenth of a meter was recorded.

Chlorophyll a concentration was used as an index of algal biomass that is useful in determining the trophic state of the lake. A weighted plastic tube (10 meters in length) was lowered through the epilimnion, or "upper lake" to the top of the metalimnion, or "middle lake" (the depths of the epilimnion and metalinmion are determined from the temperature profile). The end of the tube above water is folded to shut off the water flow into or out of the tube. The weighted end of the tube is pulled up out of the water with an attached cord, trapping an integrated sample of water representing the "upper lake" in the tube. This sample is poured into a plastic 2.5 liter bottle and stored for chlorophyll filtration and alkalinity determination.

Water samples for chlorophyll a filtration were filtered through a 0.45 micron membrane filter. Damp filters, containing chlorophyll-bearing algae, were air-dried for at least 15 minutes, out of the sun, to prevent decomposition or bleaching of the chlorophyll on the filter. These filters were sent to UNH where members of the FBG analyzed them for chlorophyll a (see Methods of the Freshwater Biology Group).

To determine the alkalinity, a two-endpoint titration was done with 0.002 N sulfuric acid to a ph of 4.5 and 5.1. The endpoint indicator was methyl red/bromocresol green. The amount of titrant used (dilute sulfuric acid) was recorded to the nearest 0.1 ml, representing the equivalent milligrams of calcium carbonate per liter.

Samples for total phosphorous analysis were collected in two ways. For determination of epilimnetic phosphorous, water was taken from the integrated sample collected with the tube-sampler. On parts of the lake where it was suspected that phosphorous might be high, (eg. sites along the shoreline, inlets or outlets), surface samples were taken by dipping a bottle into the water and letting it fill. All samples were collected in acid-washed 250 ml bottles, fixed with 1.0 ml of concentrated sulfuric acid, and stored frozen until analysis by the FBG team. (See Methods by the Fresh-water Biology Group.)

METHODS OF THE FRESHWATER BIOLOGY GROUP

The Freshwater Biology Group (FBG) research team took one trip to the lake and conducted several tests which included measurements of sunlight penetration into the water, dissolved oxygen, alkalinity, free (unbound) carbon dioxide, pH, specific conductivity, chlorophyll a, total phosphorous, and a survey of the microscopic plants (phytoplankton) present. The FBG was also responsible for chlorophyll a and phosphorus analysis of lay monitor samples, as well as filing and analyzing 1985 data, performing statistical tests, and determining possible trends based on past data.

Field and Laboratory Methods

On the lake, a dissolved oxygen and temperature profile was taken using a Yellow Springs Instruments Model 54A Oxygen/Temperature meter with a submersible probe. Readings were taken at one-meter intervals throughout the epilimnion and hypolimnion, and at one-half meter intervals through the metalimnion.

Sunlight and skylight penetration into the water was measured with a Whitney submersible photometer model LMA-8A, off the sunny side of the boat. From the relative light intensities which were recorded, the coefficient of light extinction was later determined.

Samples for water chemistry (dissolved oxygen, alkalinity, free (unbound) carbon dioxide, pH, and specific conductivity) were collected with a 3-liter Van Dorn bottle at depths which represented the surface, mid-epilimnion, metalimnion, and hypolimnion. Alkalinity, free carbon dioxide, and pH samples were stored on ice in 250 milliliter polyethylene bottles and were analyzed in the field within 1 to 2 hours of sampling. Specific conductivity samples were analyzed in the FBG lab at room temperature.

In addition to the oxygen profile taken, the dissolved oxygen (DO) concentration of specific lakewater samples (epilimnetic and hypolimnetic) was determined chemically using the Winkler method for dissolved oxygen. The precision of the method allows us to to check the accuracy of the electronic probe, so that adjustments could be made in the probe readings if necessary. In the Winkler method, water is collected in Biological Oxygen Demand (BOD) bottles and fixed with manganese sulfate and alkali-iodine-azide. A loose precipitate (floc) of manganous hydroxide is formed that will absorb any dissolved oxygen present. The sample is then acidified with concentrated sulfuric acid in the presence of of iodide, and iodine is released in a quantity equal to the amount of dissolved oxygen present.

To determine the alkalinity, a two-endpoint titration was done with 0.002 N sulfuric acid to a pH of 4.5 and 5.1. The endpoint indicator used was methyl red/bromocresol green. The amount of titrant used (dilute sulfuric acid) was recorded to the nearest 0.1 ml, representing the equivalent milligrams of calcium carbonate per liter.

Free carbon dioxide concentration was determined by titrating the fresh lakewater samples with 0.0027 N NaOH to a final pH of 8.3, using the dye phenolphthalein as the end-point indicator.

Lakewater pH was measured with a digital pH meter (Orion model 231) equipped with a combination probe (Orion Co.)

Specific conductivity was measured with a Barnstead Conductivity Bridge Model PM-70CB , with a model B-10 probe (cell constant = 1.0). Corrections were made for sample temperatures with a standard curve.

Samples to be analyzed for chlorophyll a, total phosphorus and phytoplankton were collected with a vertical tube sampler into a 2.5 liter plastic bottle. Chlorophyll samples were filtered through a 0.45 micron membrane filter and air-dried until analysis. The chlorophyll a content was analyzed by extracting the chlorophyll with a 95% acetone solution saturated with magnesium carbonate. The samples were then centrifuged and their light absorbances read at two standard wavelengths (663 and 750 nanometers).

Phosphorus samples were fixed with 1.0 milliliter of concentrated sulfuric acid and stored refrigerated until analysis. Also, phosphorus samples from lay monitors were received by the FBG in a refrigerated or frozen state, and stored cold until analysis. To determine the total phosphorus content, ammonium persulfate and 11 N sulfuric acid was added to digest the total phosphorus, and the samples were auto-claved for one hour. A single-reagent method was employed using potassium antimony tartrate, ammonium molybdate, and a fresh solution of ascorbic acid (E.P.A. 1979). Absorbance of the blue phosphorus complex was measured spectrophotometrically at 650 nm. Each sample was analyzed twice and an average of the two values taken as the phosphorus content in parts per billion.

Phytoplankton samples were fixed with iodine (Lugol's solution) immediately after collection. The preserved samples were later counted with an inverted microscope after settling for 24 hours in counting chambers. At least 200 individual algal "units" were counted with a modified scan technique (Baker, 1973).

How the data are analyzed

Incoming data are received through the mail during the sampling season and are first filed in an "incoming data" book. This provides temporary storage until the corresponding chlorophyll and/or phosphorous sample for each data sheet is analyzed. All data, including date, lake, site, secchi disk depth, chlorophyll a and phosphorous content, alkalinity, and color measurements, are filed and stored on a computerized data-management system of the University of New Hampshire. Data can be easily retrieved by lake, sampling station or date, and used for individual reports and for each year.

Statistical treatment of the data for each lake includes a comparison of seasonal tendencies found throughout the year, monthly means for the different parameters tested, and confidence levels for each site. The same comparisons mentioned above are made on a yearly basis if the lake has been in the program for two years or more. If sufficient data are available from several years, regression analyses and other statistical tests are performed. Such analyses may identify trends and help explain variations in the data (eg. secchi disk depth, chlorophyll a, color). In addition, data is compared with other lakes in the program and to published water quality classifications. Trophic boundaries of Forsberg and Ryding (1980) are used to classify each lake.

RESULTS AND DISCUSSION OF LAY MONITOR DATA

Results from the lay monitors are presented separately from those obtained by the Freshwater Biology Group, as the two groups conducted separate research.

In 1985, lay monitors collected data on water transparency, chlorophyll a concentration, alkalinity, and total phosphorus concentration. Weekly monitoring was done from the deep site on the lake (1 Fullers) from June through September, and also from a shallower site (2 Triggs) in August and September. See Figure 2 for 1985 sampling sites and Appendix A and B for lay monitor data from 1984-1985.

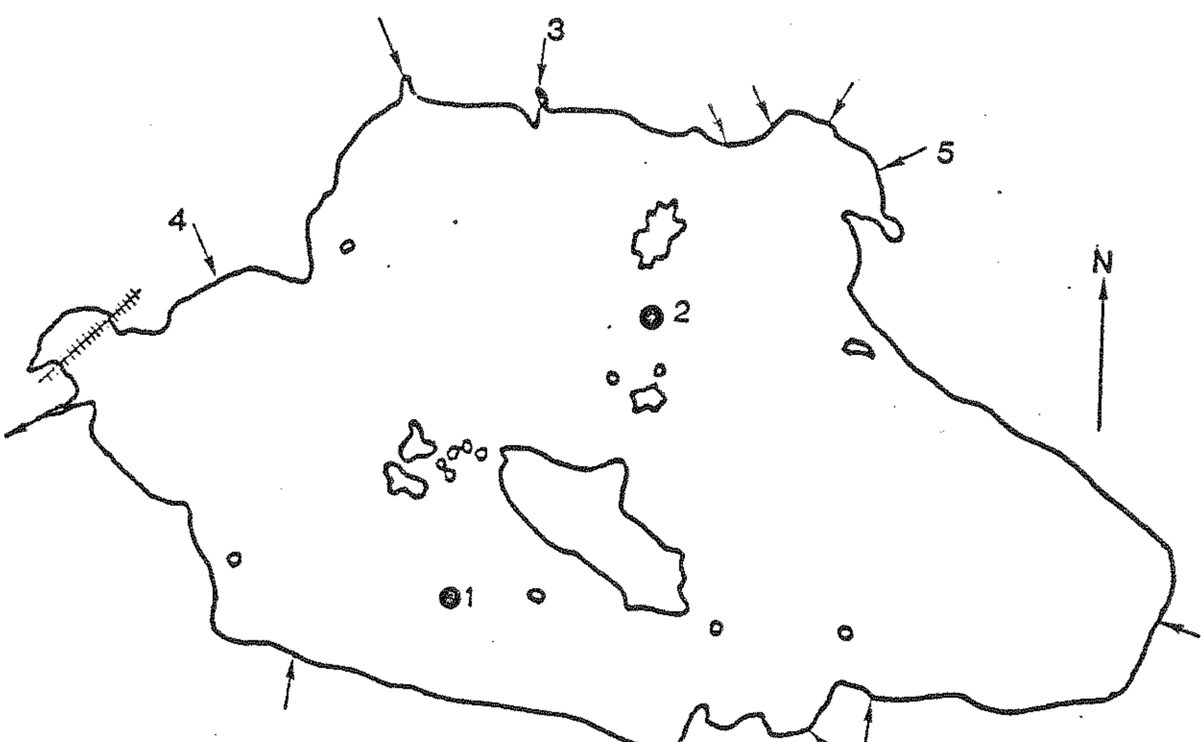

Figure 2. Lake Wentworth, Town of Wolfeboro, New Hampshire. Outline map and location of 1985 sampling sites.

Secchi Disk Depth and Chlorophyll a

Water transparency (secchi disk depth), was in the range of 5.3 to 9.5 meters, with an average of 7.8 meters. At site 1, water transparency was lowest in June, highest in July, and decreased slightly as the summer progressed (Table 1). At site 2, the water transparency was higher in August than September.

Chlorophyll a concentrations at site 1 were highest in June (average 2.8 mg per cubic meter), low in July and August, and lowest in September (0.6 mg per cubic m). At site 2, the average chlorophyll a concentration was 0.5 mg per cubic m in August and 0.4 in September.

An inverse relationship appears to exist between the water transparency and the chlorophyll a concentration where the higher chlorophyll concentrations correspond to the shallower secchi disk depths (Table 1). This indicates that the water transparency may be regulated largly by the phytoplankton populations.

	mean SDD		mean chl. a	
June	7.0		2.8	
July	8.2		0.7	
August	8.0	(9.2)	0.8	(0.5)
Sept.	7.9	(7.5)	0.6	(0.4)

Table 1. A comparison of monthly means at site 1 of secchi disk depth (in meters) and chlorophyll a concentration (in milligrams per cubic meter). Values in parentheses represent site 2.

The water transparency and chlorophyll a concentrations indicate that Wentworth Lake is oligotrophic. In 1985, the water transparency was higher and chlorophyll concentration was lower than in 1984. This may be due to differences in the weather for the two years.

Alkalinity

Lay monitor alkalinity testing began in mid-August and was continued weekly through early September at both sites. Values at the pH 4.5 endpoint (pink) were in the range of 6.7 - 9.9 milligrams calcium carbonate per liter, with an average of 8.1. The average alkalinity for New Hampshire lakes in approximately 9 mg per liter. Results from Wentworth suggest that the lake has sufficient buffering capacity at this time, however, this parameter should be monitored each year to detect changes as they occur. Lay monitors found alkalinity values which were slightly higher than the FBG (see Results and Discussion of FBG Data), and continued monitoring would give a more accurate assessment of the alkalinity in the lake.

Phosphorus

Phosphorus samples taken from various sites around the lake (Figure 1) had concentrations in the range of 1.3-6.6 parts per billion (micrograms per liter). Phosphorus levels in this range indicate low levels of nutrient inputs. The highest levels of phosphorus were found at Willey Brook, which is a stream flowing through an area with many cotteges and several old septic systems

(Goldthwait, pers. comm.). The higher levels at Willey Brook suggest that the inlet may be a source of some nutrient loading into Wentworth. Similar results were found in 1984.

RESULTS AND DISCUSSION OF FBG DATA

Temperature and Dissolved Oxygen

Wentworth Lake was thermally stratified at site 1. The epilimnion extended to nealy 10 meters (m), the metalimniom (thermocline) occured from 10 to 15 m, and the hypolimnion extended from 15 to 25 meters. There was no thermal stratification at site 2.

At both sites, oxygen was abundant at the surface (8 parts per million), and decreased rapidly throughout the metalimnion. There was a slight oxygen maximum at 10.5 m at site 1. Oxygen concentrations were very low in the hypolimnion at both sites (approximately 2 ppm), and near depletion at the bottom. At concentrations below 4 ppm, the distribution of some cold-water fish such as lake trout and salmon may be limited.

Water Transparency

Water transparency was very high on Lake Wentworth. The secchi disk depths measured by the FBG were 9.7 m at site 1 and 9.9 m at site 2. This data is similar to that found by lay monitors on the previous day. Secchi disk depths in this range (oligotrophic) suggest nutrient-poor conditions.

Chlorophyll a and Dissolved Water Color

Water transparency is regulated by three major factors: the planktonic algae in the water column (assessed by the chlorophyll a concentration), the dissoloved water color, and suspended particles in the water column. By measuring two of these parameters, the chlorophyll a concentration and the dissolved water color, the FBG can estimate the relative effect each has in influencing the secchi disk depth.

The chlorophyll a concentrations were 0.3 milligrams per cubic meter at site 1 and 0.8 mg per cubic meter at site 2. These results are comparable to those from the lay monitors, and indicate oligotrophic conditions.

Dissolved water color, which is the brown coloring of lakewater due primarily to dissolved humic acids, was 0.3 at site 1 and 0.2 at site 2. These values are low, and consistent with other lakes in the LLMP. Both the dissolved water color and the low concentrations of chlorophyll help account for the high water transparency observed.

Total Phosphorus

Total phosphorus concentrations measured by the FBG were 5.1 micrograms per liter at site one and 1.25 micrograms per liter at site 2. These levels fall in the oligotrophic range and indicate low levels of nutrient loading into Wentworth.

Alkalinity, pH, and Free Carbon Dioxide

Surface values of alkalinity were 5.4 milligrams per liter at site 1, and increased to 6.1 at the bottom. Similar results were found at site 2, where the alkalinity was 5.4 at the surface and 7.8 at the bottom. The average alkalinity for the lake was 5.8 mg per liter. The average for the state of New Hampshire is approximately 9 mg/l. A critical point occurs at alkalinity values of about 2 mg/l when there is little or no resistance of a lake to acidification; with little buffering capacity, the pH of the water is unstable and will decrease rapidly if further acid is added.

In 1979, the New Hampshire Water Supply and Pollution Control Commission (WSPCC) sampled Lake Wentworth and measured near-surface alkalinities of 9 mg per liter. Data from 1985 indicate a decrease in alkalinity between 1979 and 1985. Alkalinity should be carefully monitored in the future to detect further changes in buffering capacity.

The epilimnetic pH was 6.8 at both sites. The pH in the hypolimnion was 5.7 at site 1, and 6.0 at site 2. These values are higher than what the FBG found in 1984, and similar to results from the WSPCC in 1979. Causes for pH fluctuation include time of day, season, and errors associated with the use of the pH meter.

At both sites, free carbon dioxide levels near the surface were very low (0.8 mg per liter), and increased towards the bottom (8.3 mg per liter at site 1 and 6.7 at site 2). Carbon dioxide which accumulates in the hypolimnion is an indicator of production in the trophogenic zone.

Specific Conductivity

Wentworth lake had a very low specific conductivity (46.9 micromhos at site 1 and 30.6 micrmhos at site 2). Values in this range indicate low levels of road salt or raw sewage.

Phytoplankton

The phytoplankton density was moderate at both sites with 2022 cells per milliliter (cells/ml) at site 1 and 2916 cells/ml at site 2. At both sites, the Chrysophyceae (Kephyrion) were co-dominant with the Prymnesiophyceae (Chrysochromulina). Densities of the Cyanophyceae (bluegreens) were also relatively abundant (Merismopoda, Aphanotheca, Aphanocapsa).

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APPENDIX A

LLMP -- Lay Monitor Data: Wentworth   Feb-21-86   17:28.09

Date	Lake	Site	SDD	Chl
Jun-15-84	Wentworth	1 Fullers	6.20	1.93
Jun-23-84	Wentworth	1 Fullers	7.30	.93
Jun-30-84	Wentworth	1 Fullers	6.40	1.78
Jul-08-84	Wentworth	1 Fullers	6.50	1.86
Jul-14-84	Wentworth	1 Fullers	6.70	1.57
Jul-21-84	Wentworth	1 Fullers	6.50	1.14
Jul-28-84	Wentworth	1 Fullers	6.50	1.86
Aug-04-84	Wentworth	1 Fullers	6.50	1.28
Aug-11-84	Wentworth	1 Fullers	7.40	1.21
Aug-16-84	Wentworth	1 Fullers	7.25	.78
Aug-26-84	Wentworth	1 Fullers	7.30	1.14
Sep-01-84	Wentworth	1 Fullers	7.50	.78
Sep-08-84	Wentworth	1 Fullers	7.40	1.07
Jun-09-85	Wentworth	1 Fullers	7.50	2.14
Jun-15-85	Wentworth	1 Fullers	7.30	1.28
Jun-22-85	Wentworth	1 Fullers	7.00	2.71
Jun-29-85	Wentworth	1 Fullers	6.00	2.28
Jul-06-85	Wentworth	1 Fullers	7.00	1.36
Jul-14-85	Wentworth	1 Fullers	7.70	.43
Jul-21-85	Wentworth	1 Fullers	8.80	.36
Jul-28-85	Wentworth	1 Fullers	9.25	.50
Aug-04-85	Wentworth	1 Fullers	8.80	1.07
Aug-11-85	Wentworth	1 Fullers	9.20	.71
Aug-18-85	Wentworth	1 Fullers	8.50	.43
Aug-20-85	Wentworth	1 Fullers	5.30	1.14
Aug-25-85	Wentworth	1 Fullers	8.20	.50
Sep-01-85	Wentworth	1 Fullers	7.40	.64
Sep-08-85	Wentworth	1 Fullers	8.30	.50
Aug-12-85	Wentworth	2 Triggs	---	---
Aug-18-85	Wentworth	2 Triggs	9.50	.43
Aug-25-85	Wentworth	2 Triggs	8.80	.57
Sep-01-85	Wentworth	2 Triggs	7.20	.43
Sep-08-85	Wentworth	2 Triggs	7.80	---
Jun-19-85	Wentworth	3 Willey	---	---
Aug-01-85	Wentworth	3 Willey	---	---
Aug-02-85	Wentworth	4 Tyler	---	---

Aug-01-85	Wentworth	5 Ryfield	---	---
Jan-02-00	Wentworth	1	---	---

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APPENDIX B

LLMP -- Lay Monitor Data: Wentworth Feb-21-86 17:32.03

Date	Lake	Site	Alk (ppm)	Tot-P
Aug-18-85	Wentworth	1 Fullers	6.9	---
Aug-20-85	Wentworth	1 Fullers	9.4	---
Aug-25-85	Wentworth	1 Fullers	9.9	---
Sep-01-85	Wentworth	1 Fullers	6.7	---
Sep-08-85	Wentworth	1 Fullers	7.8	---
Aug-12-85	Wentworth	2 Triggs	---	1.3
Aug-18-85	Wentworth	2 Triggs	6.7	---
Aug-25-85	Wentworth	2 Triggs	7.2	---
Sep-01-85	Wentworth	2 Triggs	7.5	---
Sep-08-85	Wentworth	2 Triggs	7.8	---
Jun-19-85	Wentworth	3 Willey	---	5.9
Aug-01-85	Wentworth	3 Willey	---	6.6
Aug-02-85	Wentworth	4 Tyler	---	3.6
Aug-01-85	Wentworth	5 Ryfield	---	2.8
Jan-02-00	Wentworth	1	---	3.3

>>> END OF LIST <<<

NOTE

There are three levels of reports available to participating lake associations in the LLMP. They are differentiated as follows:

LEVEL I - This is a basic report that includes sections on the methods employed, comments and recommendations, and a brief summary of results. It also contains an appendix listing data from the present and past years.

LEVEL II - This is a mid-level report that includes methods employed, a non-technical summary of lay monitor and FBG data, comments and recommendations and an in-depth results and discussion section. It contains an appendix listing data from the present and past years.

LEVEL III - This is a full report which includes the following sections: methods employed, a non-technical summary, comments and recommendations, a technical summary, and a complete results and discussion section supplemented by computerized graphics. It also contains 3-4 appendixes: a listing of present-year and past data, limnological concepts and technical terms, and a glossary.