Waterworks

Fall 1989 Volume 5 Number 4

Onondaga Lake Water Quality: Changes, Current Status

Onondaga Lake has been described as the most polluted lake in the United States (e.g., United States Senate, Committee on Environment and Public Works, 1989). How much of this is media and political hype, and on what basis are these statements made? Are there any reasons to be optimistic about the future of the lake? This article presents some of the technical facts regarding the prevailing water quality of Onondaga Lake from the perspective of criteria established to protect public health and uses of surface waters. Further, the response of the lake to previous remediation efforts and on-going modeling efforts are reviewed.

Description of the Lake

Onondaga Lake is a hard water alkaline system located in metropolitan Syracuse, New York. The lake has a surface-area of 11.7 km^2 (4.5 mi^2), a mean depth of 12 m (39.4 ft), and a maximum depth of 20 m (65.6 ft). Two tributaries, Nine Mile Creek and Onondaga Creek, account for approximately 75% of the flow into the lake on an annual basis. The third largest inflow is the Onondaga County metropolitan sewage treatment plant (METRO). METRO contributes approximately 15% of the lake's inflow on an annual basis, but as much as 45% during the summer months. The lake flushes rapidly; approximately 2.5 to 5.0 times per year. This feature has important implications from the restoration perspective, as it means the lake should respond rapidly to remedial actions. The lake discharges into the Seneca River which flows into Lake Ontario.

History, Remediation Efforts, and Responses

Onondaga Lake supported a commercial cold water fishery and salmon migrated through the lake to spawn in tributaries of the lake until the late 1800's. These resources were apparently eliminated as a result of degradation of the lake with domestic and industrial wastes. The inputs from an adjoining chlor-alkali facility, which closed in 1986, have had pervasive effects on the lake (Effler, 1987). The lake was closed to swimming in the 1930's and to fishing in 1972 as a result of its degraded condition. Studies of the lake conducted in the late 1960's and early 1970's documented a number of the polluted features of the lake.

A number of remediation actions have been taken to recover the water quality of Onondaga Lake. Actions taken since 1970 include:

1. phosphorus detergent ban in 1972,
2. reduction in mercury loading from the chlor-alkali facility in the early 1970's,
3. upgrading of METRO from a primary plant to a tertiary facility in the late 1970's and early 1980's (contact stabilization for secondary treatment and chemical precipitation of phosphorus for tertiary treatment), and
4. "best management practices" (BMP) program on the Syracuse sewer system.

Further, the closure of the chlor-alkali facility resulted in major reductions in ionic inputs to the lake.

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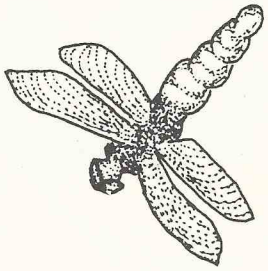
ON THE LOCAL SCENE



Little Fresh Pond

A small, active association on Long Island takes a leading role in lake preservation.

Little Fresh Pond is located in the town of Southampton, a section of Long Island that enjoys a colorful history dating back to the early 1600's. Over 300 years ago when our country was still under English rule, King James approved the original Dongan Patent request for 2500 acres of the Town's lakes, streams and bays and all the land under these waters to be vested to elected trustees who were to act as the custodians. Within this century, these patent rights were tested in the State of N.Y. and U.S. courts which found them to be valid. Several years ago, local homeowners banded together to form a non-profit lake association, designed to protect Little Fresh Pond from non-point source pollution that was threatening the water quality.

The South Fork section of Long Island, where Little Fresh Pond is located, is a narrow strip of land that ranges from one to four miles wide, with Peconic Bay to the north and the Atlantic Ocean to the south. Some pollutant inputs to the pond may originate from local cesspools and septic systems, excessive road run-off, lawn fertilization, and a significant local waterfowl population. To compound the threat to the pond's natural ecology, the South Fork is a summer resort area, which strains the natural resources by doubling the population during vacation months.

In 1986, Little Fresh Pond (LFP) became the first lake association on Long Island to join the NY Federation of Lake Associations. LFP later became an enthusiastic participant in the Citizens' Statewide Lake Assessment Program and, in 1989, several of the lake association members were involved in the weekly water quality sampling program.

A long-standing effort has been made by the LFP community to work closely with town officials and local conservation groups that have an interest in surface water issues. This cooperative approach has resulted in increased communication and has greatly enhanced the decision-making process when water quality improvement projects are proposed. Over the past several years, for example, LFP has worked with the Town Board on proposed zoning changes that might have environmental impacts on the pond. This cooperative effort has paid off. The town recently installed two dry wells at the public beach to decrease the amount of road pollutants entering the pond and several steps have been made to ensure that dry wells and catch basins are repaired and cleaned on a regular basis.

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Waterworks is published four times a year. Individuals who wish to submit articles, calendar items, artwork, or photography to **Waterworks** are welcome to contact the editor, Anne B. Saltman, 2175 Ten Eyck Avenue, Cazenovia, New York 13035 (315) 655-2236. For additional copies of **Waterworks** and address changes, contact John Colgan, FOLA President, 273 Hollywood Avenue, Rochester, New York 14618 (716) 271-0372. Permission to reprint articles is granted with credit.

The New York State Self-Help Support System

Financial and Technical Assistance Available to NYS Communities

The Departments of State, Environmental Conservation, and Health, with assistance from the Rensselaerville Institute, established the New York State Self-Help Support System in 1985. This system provides help to alleviate water and wastewater problems in small communities. Technical advice, "how-to" materials, and financing are among the kinds of assistance available through this program to help reduce costs and make projects possible. Self-help has been an effective alternative for many communities with limited financial resources to deal with water and/or wastewater problems.

A Self-Help staff of seven within the DEC is now working with 40 small New York State communities on their water and wastewater projects. Assistance and guidance has been provided in organizing specialized projects, establishing long and short term goals, completing the self-help portions of the project, providing model documents (including ordinances and agreements for the community's use) and in purchasing materials and services.

The Town of West Monroe in Oswego County has been working with the NY State Self-Help Support System (NYS SHSS) since February, 1987. The DEC staff from the NYS SHSS has been working with town officials and the County Health Department in this community to develop an affordable solution to the wastewater problems faced by approximately 200 homes and several commercial establishments in West Monroe. Small lot sizes, poor soils and high ground water had resulted in pollution entering ground water and Oneida Lake from failing individual septic systems. No funding sources had been available to make a community wastewater project easily feasible, but through the efforts of the NYS SHSS, the County Health Department, an accommodating consulting engineer, and the FmHA, advice on engineering, planning, financing, and community organization was provided to assess and correct the community's wastewater problems at a 40% reduction of the original project cost.

An important function of the NYS SHSS is to provide small communities with access to interim project financing. This funding is used to pay for technical and construction services, supplies, and equipment during the engineering and construction phases.

The eventual benefits of the program are not only financial savings, but also the development of greater unity and coordination within state government and a greater sense of community self-reliance, ownership, and responsibility for the project.

For more information on the Self-Help Support System, contact the NYS Department of State, Office for Local Government Services, Self-Help Support System, 162 Washington Avenue, Albany, NY 12231. (518) 473-3355.

Thermal Stratification and Dissolved Oxygen Interactions in Reservoirs

What Is Thermal Stratification In Reservoirs?

Thermal stratification occurs in many reservoirs from late spring through early fall when the sun warms surface waters more rapidly than deeper waters. As the surface waters warm, they become less dense and form a layer over the colder, more dense waters. This separation into two layers of different temperature and density is called thermal stratification. A mid-temperature layer (the thermocline) forms a barrier which separates the warm surface layer (epilimnion) from the deeper cooler waters (hypolimnion).

What Is Dissolved Oxygen (D.O.)?

Dissolved oxygen is oxygen which has dissolved in water either by absorption directly from the atmosphere or by plant photosynthesis. Oxygen is absorbed directly from the atmosphere by a relatively slow process called diffusion, then is distributed within the water by thermal and wind-induced mixing. Dissolved oxygen in lakes and reservoirs is essential for most aquatic organisms.

How Does Thermal Stratification Affect Dissolved Oxygen?

The distribution of dissolved oxygen in a lake or reservoir is governed by a balance among (1) sources, the atmosphere, photosynthesis, and water entering the reservoir; (2) losses during chemical and biological reactions; and (3) mixing of the water in the reservoir. During thermal stratification, the thermocline forms a barrier which confines wind-induced mixing to the epilimnion. As a result, the deeper waters are isolated from an atmospheric oxygen supply for the duration of the thermal stratification (usually late spring to late fall). Under normal conditions, natural decay diminishes dissolved oxygen levels in the hypolimnion throughout the summer until fall when seasonal mixing (overturn) recharges the supply. In many reservoirs the dissolved oxygen in the deeper water is completely depleted by midsummer, resulting in an anaerobic (totally lacking oxygen) hypolimnion until fall overturn. This occurs most often in deep reservoirs which release only small flows downstream, and in reservoirs which receive municipal or industrial wastewaters. In reservoirs, the water used and released for power production usually comes from the hypolimnion. When this water is particularly low or lacking in oxygen, the low level of dissolved oxygen may harm downstream fisheries.

How Do Levels Of Dissolved Oxygen Affect Fish?

Fish and other aquatic animals require dissolved oxygen for respiration. Generally, fish need a concentration of about five parts per million of dissolved oxygen, although some (such as trout) require more, and others (such as carp) can get by with less. Most fish are very sensitive to even slight reductions in dissolved oxygen levels. Only the most tolerant species of fish can survive when dissolved oxygen concentrations drop below about three parts per million. Therefore, any wastewater discharge, spill, or natural process which causes dissolved oxygen to decrease to less than about three parts per million can result in fish kills.

How Do Water Resource Managers Use This Information?

Water resource managers use information about temperature and dissolved oxygen dynamics to reduce the occurrence of low dissolved oxygen in reservoirs and to reduce its impacts on water uses. Establishing a maximum limit on the waste load which can be discharged to a reservoir, specifying discharge through a diffuser which helps dilute the wastewater initially, and operating the reservoir to try to maintain a flow along the bottom are examples of the alternatives available. Adverse impacts on fishing, water supplies, and other uses can also be reduced or eliminated by these and other means.

Reprinted from a TVA handout

ONONDAGA LAKE (continued from page 1)

Reductions in the concentrations of various pollutants, and manifestations of these changes in response to these efforts, have been documented. Major reductions in the concentration of phosphorus in the lake were achieved by the detergent ban. This eliminated the annual occurrence of noxious blooms of nitrogen-fixing blue green algae. Mercury concentrations in fish flesh have decreased significantly since the early 1970's, apparently in response to the reduction in loading from the chlor-alkali plant (Sloan, et al., 1987). The degree of contamination of the lake with bacteria indicative of sewage has decreased substantially since implementation of the BMP program.

The concentrations of the ionic species, chloride, calcium and sodium, have decreased greatly in the lake since the closure of the chlor-alkali plant. For example, the concentration of chloride in the lake has decreased approximately 70%. As a result of this reduction in ionic input, chemical stratification has been essentially eliminated, and the routine occurrence of spring turnover (common to lakes of the dimensions of Onondaga Lake in this region) has been reestablished. Substantial improvements in water clarity (or transparency) have also been observed in the late 1980's.

The positive responses to reductions in material loading make it clear that Onondaga Lake is not a dead lake. Further improvements would undoubtedly occur with additional reductions in the input of pollutants.

Present Status

Despite the improvements described, the lake remains highly polluted. Important manifestations of this condition include its hypereutrophic state (extremely high level of plant growth, particularly the phytoplankton (microscopic algae common to the open waters)), the degraded condition of the fishery, and industrial residuals. The hypereutrophic state of the lake is manifested as poor clarity and limited oxygen resources. Swimming in the lake continues to be prohibited due to low transparency and the presence of high numbers of bacteria, indicative of fecal contamination, after runoff events. The bacteria problem is most severe in the southern basin of the lake. The fish from the lake still cannot be eaten because of contamination with mercury. The New York State minimum oxygen concentration criterion is contravened during the fall of most years. Free ammonia concentrations exceed USEPA criteria throughout the lake for most of the summer period. Further, the near-shore sediments have been degraded with deposits described as oncolites, that have an industrial origin (Dean and Eggleston, 1984); no criterion exists for this condition. These conditions are inconsistent with the national goal to make all surface waters fishable and swimmable by July 1988 (Section 101 of the Clean Water Act).There are a number of other, less well defined, problems that also deserve attention. Some of these problems include: releases of nutrients and perhaps toxics from the lake's sediments, contamination with chlorobenzene and perhaps other organics, high sedimentation rates, seepage of contaminants from the waste beds of the chlor-alkali plant into Nine Mile Creek and subsequently the lake, inundation of the bed of Nine Mile Creek with industrial deposits, poor aesthetic conditions in Onondaga Creek near its mouth, and the negative impact of the lake on the Seneca River and other downstream systems.

On-Going Studies

In 1987, a multi-institutional interdisciplinary study was initiated in an effort to develop reliable mathematical models for several aspects of water quality in the lake, to support management decisions to further remediate the lake's problems. Basically, models serve to predict the outcomes to specified actions. In the case of water quality, models can be used to predict the change(s) in water quality that would occur as a result of changes in the input of various important materials. Models and their predictions can only be as good as the information that is used to develop them. Thus, the Onondaga Lake modeling effort is being based on extensive scientific and engineering data and analyses. Models are presently being prepared for indicator bacteria, transparency, ammonia and dissolved oxygen. These models are intended to be completed by 1991. The models will be invaluable in determining the loading reductions that will be necessary to meet related water quality criteria. The model development effort has been supported by funding from Onondaga County, the State of New York, and the Federal government.

Words of Caution

It should be recognized that water quality modeling has only recently been embraced by regulators as a valuable management tool for

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IN-LAKE RESTORATION TECHNIQUES

Chemical Control

Technique	Advantages	Drawbacks	Cost	Term of Effectiveness
Algicides(A,H)	simple application, no/low human toxicity	DO depletion with fish kills, zooplankton toxicity and algal "rebound", blue-green algae tolerance, may be ineffective	C=$ O=$	immediate; repeated up to several times yearly
Herbicides (P)	species specific, often effective	nutrient release with DO depletion, non-target toxicity, target plants replacing non-target plants, dangerous application, public perception	C=$ O=$$	immediate; repeated yearly or more often
Liming (AC)	restores acceptable pH, alkalinity; restocking possible	aluminum toxicity, lime handling and pH "hot spots", precipitation of organic alkalinity	C=$$ O=$$	immediate; duration unknown; depends on lake characteristics
Precipitation and Inactivation (A,T)	reduces internal nutrient cycling, increased clarity, reduced intensity/ duration of algae blooms	toxic/pH affects from aluminum salts, weed growth from increased clarity, only stratified lakes	C=$$ O=$	immediate; potentially long-term control
Sediment Oxidation (A,T)	chemicals confined, sedment promotes organic matter decay, low toxicity	relatively untested, ineffective in shallow lakes with high bottom pH	C=$$ O=$	immediate; potentially long-term control

IN-LAKE RESTORATION TECHNIQUES

Biological Control

Technique	Advantages	Drawbacks	Cost	Term of Effectiveness
Food Web Manipulation (**A,F**)	"natural" control, may improve clarity, can introduce desired species	may effect non-target species in web, algal "rebound", potentially large unknown effects	C=$$ O=?	delayed; duration unknown
Grass Carp (**P**)	slow control, no chemicals or machinery needed, selective control possible	understocking may control only native plants, overstocking may eradicate plants, and damage ecosystem, fish may escape and affect non-target lakes and streams	C=$$ O=$	delayed; potentially long-term control
Research Projects: Plant Pathogens, Aquatic Insects (**P**)	"natural" control, can target specific plants and areas, slow control	unknown effects, non-target areas may be affected, limited to warm climate	C=$ O=$	delayed; duration unknown, potentially long-term

Legend for Table:

Technique: (bold letter addresses the following problems)

P - Nuisance Aquatic Plants (Macrophytes)
A - Nuisance Algae (Phytoplankton)
T - Toxic or Hazardous Materials
H - Bacteriological, Taste, Odor, or Other Health-Related Problems
F - Fisheries Restoration
AC - Acidified Conditions

Cost:

C = capital expense
O = operational expense (one application or a single season of use, whichever is longer)

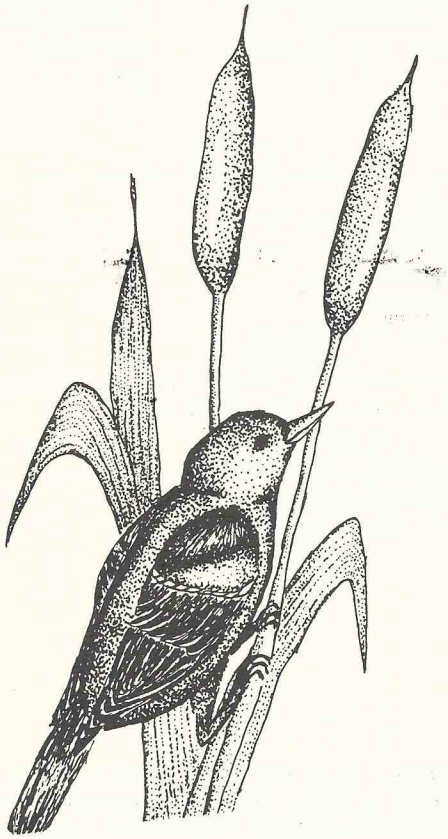
$ = low cost; $$ = medium cost; $$$ = high cost;

This is the second of a three-part summary on in-lake restoration techniques. It is reprinted from a publication (now in draft form) called, Diet For A Small Lake - A New Yorker's Guide to Lake Management, which was written as a joint effort between the Department of Environmental Conservation and the Federation of Lake Associations.

WELCOME NEW MEMBERS

Waynewood Association
David J. Westpfahl
Lake Alice
Waterfront Owners Assn.
Property Owners Assn. of Chase's Lake
Mariaville Civic Assn.
Sandra E. Scott
Indian Field Association
Lake Lorraine Property Owners Assn.
Little York Improvement Society
Canaan Lake Restoration Assn.
Wanaksink Lake Club, Inc.

Many thanks to Janet C. Rith-Najarian, ***ecologist and wildlife artist from Bemidji, MN, for providing the artwork in this issue of "Waterworks".***



ONONDAGA LAKE (continued from page 5)

Onondaga Lake. Further, the scope of these recently initiated efforts fails to address a number of the problems of the lake and its tributaries. Particularly conspicuous by their absence in on-going studies are the problems of mercury, the interaction between the lake's sediments and its water quality, and the sediment load carried by Onondaga Creek. Since the recognition of contamination of fish flesh and the sediments in the early 1970's, no systematic evaluation of the cycling of mercury in the lake has been conducted. Further, we must understand and quantify the exchange processes between the lake sediments and the overlying water column to determine the extent to which the sediments will impede the recovery of the lake.

Many of the lake's problems interact directly or indirectly. Thus, it is important to develop a quantitative understanding of all the interacting components. A management approach that focuses on only one component risks making a short-sighted decision that may subsequently be obviated or even found to be inappropriate. Further, it is extremely important that a high degree of interaction be maintained between the scientists and engineers involved in model development and the water quality managers and facility designers so that models can be designed to best serve the remediation needs of the lake.

Steven W. Effler, Ph.D
Research Engineer and Scientist
The Upstate Freshwater Institute
Project Director of the Onondaga Lake Water Quality Modeling Project

The Upstate Freshwater Institute is a not-for-profit research corporation which is dedicated to the improvement of water quality.

A longer version of this article, with figures, tables and references, will soon be printed in CLEARWATERS, a publication of The New York Water Pollution Control Association, Inc.

ETCETERA

The Forest Lake Watershed Management Organization, a group working to enact legislation preserving wetlands from destruction, needs examples of wetlands ordinances that incorporate the No Net Loss concept. For more information, contact Curtis Sparks, Minnesota Pollution Control Agency, 520 Lafayette Rd., St. Paul, Minn. 55155 (612)297-1831.

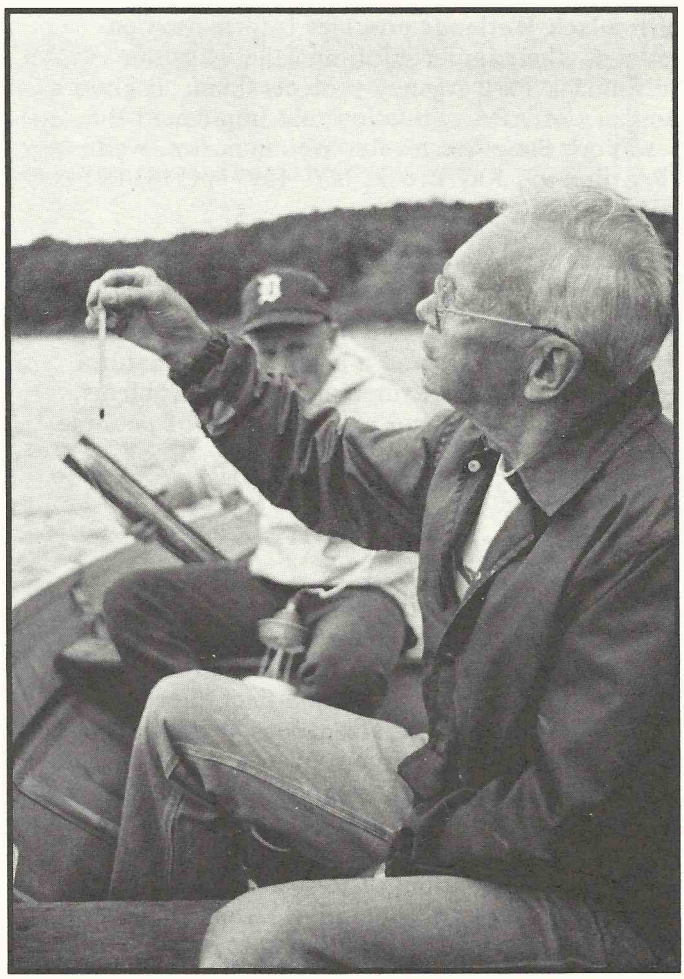
The National Wetlands Newsletter, published six times a year by the Environmental Law Institute, provides in-depth information on one of the fastest growing areas of environmental concern - wetlands protection. Wetlands law, policy and science are all covered by the journal and its staff of lawyers, environmentalists, and scientists. Subscriptions are $48 yearly and are available from the Institute at 1616 P Street, NW, Suite 200, Washington, D.C. 20036.

Lake Managers can now be certified by the North American Lake Management Society (NALMS), following board approval of a certification plan which establishes standards for the land management profession. Certification will be classified either as Professional or Provisional Professional, depending on education, experience, and the successful passage of an examination. Applications will be reviewed annually, with submission no later than October 1, beginning in 1990.

A newly created **wetland habitat** has recently been announced by the DEC Albany office. The project, located at the Oak Orchard Wildlife Management Area in Genesee County, east of Buffalo, included developement of a 150-acre marsh by construction of a 6,000-foot earthern dike. Thirty-five acres of special grasses were planted to provide for dense nesting cover. The new marsh is the third migratory bird habitat project in the state to be funded by New York's migratory bird stamp and print program and Ducks Unlimited's MARSH program.

Request For Proposals

The Onondaga County Water Quality Management Agency (WQMA) has issued a **Request For Proposals** (RFP) for the development of a remediation plan for Beaver Lake located in the town of Lysander. Interested firms/individuals may obtain a copy of the RFP from the Onondaga County Water Quality Management Agency, 1100 Civic Center, 421 Montgomery Street, Syracues, NY 13202 (315) 425-2616.



Volunteers on Gorton Lake participate in CSLAP water quality sampling

PUBLICATIONS

Reservoir Management is the subject of a new Corps of Engineers book - Water Quality Management for Reservoirs and Tailwaters - written by Dennis Cooke of Kent State and Robert Kennedy of the Corps. Contact the Corps (P.O. Box 631, Vicksburg, Miss. 39181-0631) for a copy, specifying Technical Report E-89-1.

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Brochures, handbooks, manuals, videos and films about small community wastewater systems are available from the EPA National Small Flows Clearinghouse. For more information, call (800) 624-8301.

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Adirondack Wetlands provides information on wetlands, their importance, and the ways the Adirondack Park Agency protects them. It gives a summary of APA regulation that implement the New York State Freshwater Weltands Act. Write to APA, Box 99, Ray Brook, NY 12977, (518) 891-4050.

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Adirondack Lakes gives a brief technical description of Adirondack lakes and a primer on the natural working of a lake. It summarizes lake problems, including acid rain, and provides a list of possible solutions. Write to APA, Box 99, Ray Brook, NY 12977 or call (518) 891-4050

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Correct disposal of left-over paint, stain, varnish, disinfectants and other household chemicals can help protect surface and groundwater resources. Cornell's Cooperative Extension Fact Sheet called, "**Disposal of Household Hazardous Waste**" tells how to safely recycle and dispose of used batteries and household chemicals. A complete bibliography and references for nontoxic alternatives are provided. This Fact Sheet is available by writing to Cornell Universiy Distribution, 7 Research Park, Ithaca, New York 14850. Cooperative Extension county offices may also carry copies of this publication.

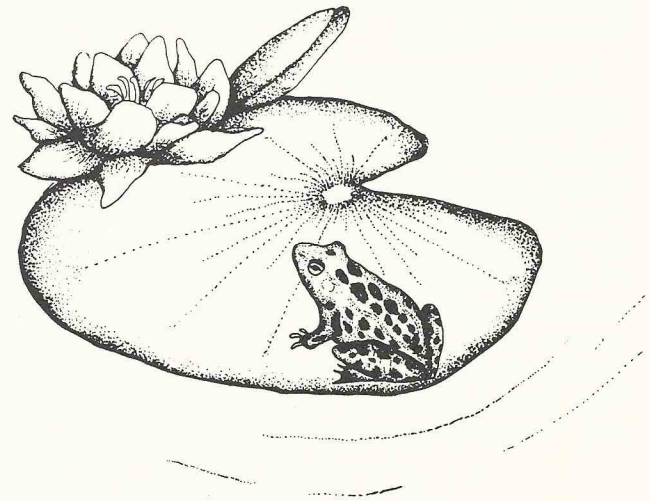
CALENDAR OF EVENTS

December 11-12, 1989
National Symposium on Nonpoint Water Quality Concerns: Legal and Regulatory Aspects. *New Orleans Marriott. Sponsored by the American Society of Agricultural Engineers. Contact Donald Pfost (314) 882-2731.*

February 11-16, 1990
International Conference on Acidic Deposition: State of Science and Technology. *Hilton Head Island, South Carolina. Contact Patricia Irving (202) 395-5771.*

June 8,9,10, 1989
Federation of Lake Associations Annual Scientific Conference.
Paul Smith's College,
Paul Smith, New York

July, 1989
Federation of Lake Associations Regional Conferences, *Finger Lakes and Lower Hudson Valley Regions. Dates and locations to be announced.*



FEDERATION NEWS

For Federation members and others who were unable to attend the Annual Scientific Conference last June, **audio tapes of the speakers are available**. During the successful three-day event, excellent presentations were given on the identification and control of non-point source pollution and case histories of watershed management projects conducted in New York State. Additional presentations were given on SEQR, acid rain, human health aspects of concern for water quality, public access and user conflicts, and grass carp investigations.

Unedited tapes of the entire conference or of individual speakers may be purchased for $5.00/tape by writing to the Federation of Lake Associations, Inc. 2175 Ten Eyck Avenue, Cazenovia, New York 13035. Names, addresses, and topics of the speakers are also available by writing to this address.

The Federation of Lake Associations currently provides **additional copies of "Waterworks"** to lake association presidents for distribution to interested individuals within their associations (see bottom of FOLA application form on page eleven). In order to improve on this service, we will soon provide *individual subscriptions of Waterworks,* whereby copies of the newsletter will be sent directly to all those who apply. We will begin providing this service in April.

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In addition to the scheduled FOLA 1990 Scientific Conference which will be held in the Adirondacks next June, the Federation of Lake Associations is also planning to conduct two **regional day-long conferences** in other areas of the state. Regional FOLA conferences on lake and watershed management will be held in July and August in the Finger Lakes and Lower Hudson Valley regions.

The Federation of Lake Associations

We are a coalition of organizations dedicated to the preservation and restoration of all lakes, ponds and rivers throughout New York State. We welcome and encourage the memberships of lake associations, property owner groups, fish and game clubs, corporations and individuals. The Federation is incorporated under two mirror organizations with the same officers and board of directors.

The Federation of Lake Associations, Inc. purposes are:

* to provide a clearinghouse of environmental information and expertise in all matters pertaining to lake management.
* to promote by education the wise use and appreciation of the lakes in New York State.
* to provide a pool of technical knowledge and expertise to advise and assist member associations and individuals.
* to establish liaison with other environmental groups and agencies.
* to provide a coordinating structure for lake-related research projects.

The Federation of Lakes, Inc. purposes are:

* to monitor and report to members on legislation and administrative actions affecting the waters of New York State.
* to support and lobby for legislation and admistrative actions which promote the sound management of the waters of New York State.

MEMBERSHIP CATERGORIES

Associations with up to 99 members ..... $30.00/yr.
Associations with 100 to 199 members ..... $50.00/yr.
Associations with 200 or more members ..... $100.00/yr.
Individual ..... $15.00/yr. Corporate ..... $100.00/yr.

Additional Copies of ***Waterworks*** ..... $.50 each

Membership dues over $5.00 are tax deductible contributions to the Federation of Lake Associations, to be used for educational, scientific and public information activities of the Federation.

APPLICATION FOR MEMBERSHIP

THE FEDERATION OF LAKE ASSOCIATIONS, INC., 273 HOLLYWOOD AVE., ROCHESTER, NY 14618

Type of Membership (please check) ☐ Association ☐ Individual ☐ Corporate

Association Name: _____

Assoc. Address: Street _____ City _____ State _____ Zip _____ County _____

President/Contact Person: _____

Summer Address _____ Winter Address _____

Summer Phone ( ) _____ Winter Phone ( ) _____

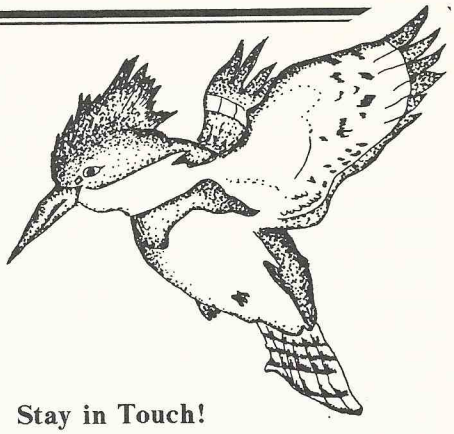
Total number of newsletters requested of each issue: _____

LITTLE FRESH POND (continued from page 2)

Another top priority of LFP has been to educate all the families within the watershed with respect to lake and watershed protection. Well-planned, informative association meetings and periodic newsletters have been effective ways to spread the word on lake issues to homeowners living around the Pond. In addition to regular lake association meetings, social get-togethers are also held. This helps neighbors to meet and friendships are developed on a more informal basis.

Additional efforts on the part of town officials, volunteers, and students from a local Community College have resulted in the identification and quantification of pollution sources. Water quality sampling and testing, water level monitoring, and counts taken of local waterfowl populations have been initiated to help assess the current status of the pond and to identify pollution sources.

Through cooperative efforts made by the whole community, projects have been undertaken on Little Fresh Pond to preserve and protect it from long-term developmental pressures. In the long run, good communication with local officials and education have provided strength in this community's efforts to preserve its pond and to maintain its natural beauty and charm.



Stay in Touch!

The Federation of Lake Association offers an **Information Management Service** (IMS) to our members whereby assistance is provided with lake and watershed management concerns and questions. The program is designed to enhance the level of communication between lake associations, to provide increased coordination between water resources organizations throughout the State, and to provide a convenient opportunity for people to collect information about surface water resource topics.

We can use your help to increase the effectiveness of the IMS. Please put us on your mailing list and send us any relevant water resources information from your area.

If FOLA members would like to request information through the Information Management Service or if you have information to provide, please write or call the Federation of Lake Associations, IMS Program Coordinator, 2175 Ten Eyck Avenue, Cazenovia, New York 13035 (315) 655-2236.

The Federation of Lake Associations, Inc.
273 Hollywood Avenue
Rochester, New York 14618

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