

# REPORTER

Winter 1995

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## Oxygen in Otsego

Oxygen concentrations in the deep waters of Otsego Lake have been of great concern in recent years because of the potential effects on internal nutrient loading and the survival of the cold-water fishery. This past fall, however, the problem abated somewhat.

Conditions necessary to support viable lake trout populations generally require water colder than 15° C (59° F) with oxygen levels higher than 5 mg/l. This fall the deep layer was about 15 m (50') thick compared to 7 m (23') in 1993. In 1988 optimal conditions existed in a layer 30 m (100') thick.

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## Sink Or Swim

Funding from the SUNY Office of Educational Technology and the Great Lakes Protection Fund, coordinated by the SUNY College of Environmental Science and Forestry at Syracuse, will provide for the manufacture and testing of our biodiversity board game "Sink or Swim," created by Bill Harman and designed by Kathy Ernst.

It is one item used in an interactive distance learning module "Life in Troubled Waters: The Limnology

of an Inland Lake" aimed at NY State high school students.

The module also includes a modified version of "Eye on Otsego." The original was produced and directed by Dan Rosen with Dave Geasey doing the videography and graphics. Dave, producer at the SUNY Oneonta Hodgden Instructional Resources Center, working from those facilities and at the BFS, collaborated with Dan on the new version.



Do we have you covered?

Located in Cooperstown and founded in 1966, the Biological Field Station is a unique facility serving the Upper Susquehanna Watershed, Otsego county and the immediate Cooperstown area. It is presently a teaching and research center for undergraduate and graduate

students from across New York, the United States, and Canada. Directed by Dr. Willard Harman and staffed with talented, experienced professionals, the Biological Field Station is presently the focal point for information about issues affecting Lake Otsego and the Susquehanna River.

## Our Natural Resources: Weaver Lake/Maumee Swamp

In 1992 Mr. William Isaac provided the BFS access to a 56 acre parcel of land adjacent to Weaver Lake. It is North of Rt. 20 near Richfield Springs.

The lake is about 1/2 a mile across with a maximum depth of about 10 feet. A hard-water lake, its basin is a depression in limestone bedrock.

It is fed by surface water and streams draining Maumee Swamp, a classic northern hardwood swamp/forest of about 800 acres.

Low lying lands around the lake, including Mr. Isaac's, are marshy in character. Several rare, threatened or endangered plants such as spreading globeflower, roundleaf orchid, calypso orchid, ram's-head orchid, marsh valerian and Jacob's ladder have been recorded in the swamp.

We posted the land in 1993. Since then Scott Graham and Judy Gardner, students in the SUNY Oneonta Earth sciences programs, have completed a study on the origin and geochemistry of the lake. Cindy McArthur, a



*"In the end we will conserve only what we love; we will love only what we understand; we will understand only what we are taught."*

—Babe Dloum

BFS graduate student, has initiated a thesis project involved with a limnological characterization and biological survey of the Weaver Lake area.

Tavis Austin, a high school intern supported by the New York Academy of Sci-

ences, and Robert Sherry, a SUNY Oneonta undergraduate, completed botanical surveys of the lake and adjacent wetlands last summer.

Mr. Isaac's contributions will benefit generations of future students as well as

those concerned with the water quality in Otsego Lake. Weaver Lake is the headwaters of Cripple Creek, which runs to Young Lake and on to Otsego comprising about 22% of Otsego Lake's watershed.

## Oxygen in Otsego, cont.

There continues to be a period several weeks in duration each late summer/fall when oxygen concentrations at the bottom are less than 1 mg/l creating conditions which are conducive to phosphorus release from the sediments.

Phosphorus rich particulate matter settling out of the water column and resuspended from the sediments greatly enhances internal nutrient loading and is an important factor to consider when developing management strategies to reduce excess phosphorus pollution. We have been studying rates of sediment accumulation in deep waters and resuspension in shallow areas in order to un-

derstand these phenomena in Otsego Lake. In deep water sediment accumulation fluctuates around 9 g/m<sup>2</sup>/day (0.02

lb/m<sup>2</sup>/day). In shallow water 1,937 g/m<sup>2</sup>/day (4.3 lb/m<sup>2</sup>/day) of sediment is in constant motion. If these latter sediments settle to the bottom they move

phosphorus out of the water to the lake bottom where it is unavailable to algae.

If, however the sediments are stirred up by waves, particularly in protected areas having large masses of rooted aquatic plants and algae present, phosphorus can be released directly into even well oxygenated waters.

Managers also need to recognize that sediments are limited in the amounts of phosphorus that they can retain. Release of phosphorus

will eventually occur, in both deep and shallow waters, particularly if conditions resulting in low oxygen concentrations continue to be a problem. ❄️

### Glossary

1 m = 1 meter = 3.28 feet

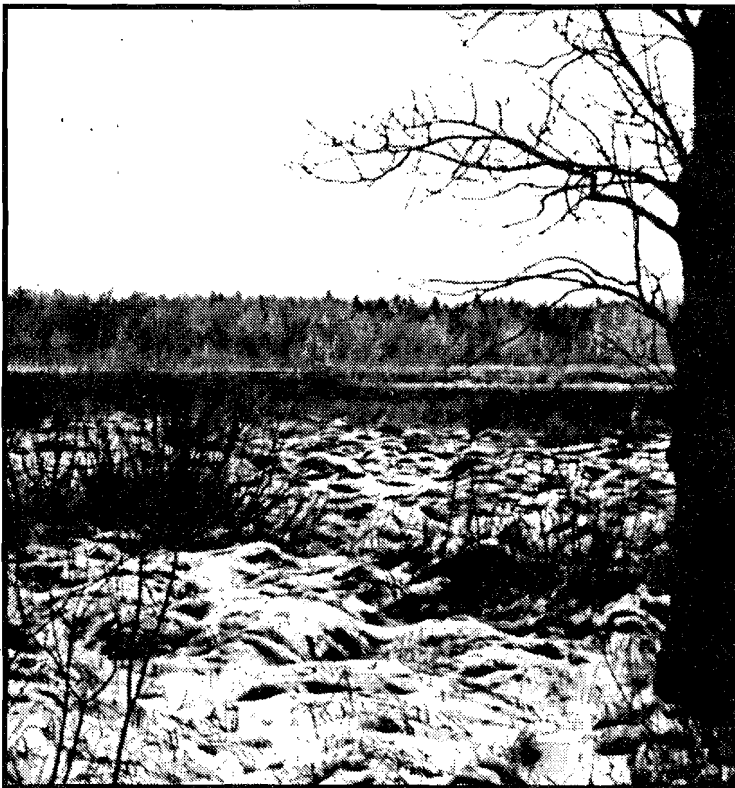
15 C = 15 Celsius = 59 Fahrenheit

1 mg/l = 1 milligram/liter = 1 part per million

1 µg/l = 1 microgram/liter = 1 part per billion

1 g = 1 gram = 0.04 ounces

1 g/m<sup>2</sup>/day = 1 gram/square meter/day



## Updates, cont.

- This fall **Ann Mary Meyers** and **Tavis Austin** presented the results of their summer 1994 studies on Cranberry Bog and Weaver Lake to the New York Academy of Sciences in New York City.
- BFS data was utilized by **G.T. McCarthy** and **A.P. Mele** for a paper entitled "A Statistical Analysis of Motorboat Effects on the

Turbidity of Otsego Lake", presented at a "Boating Impact Workshop" in Woods Hole, Massachusetts, on 7 December, sponsored by the **Island Institute** and the **Woods Hole Oceanographic Institute**. The authors suggest "...that there is room, amid a great deal of uncertainty, (suggesting) motorboats do have an identifiable role in the creation of turbidity, thus warranting further study." ❄️

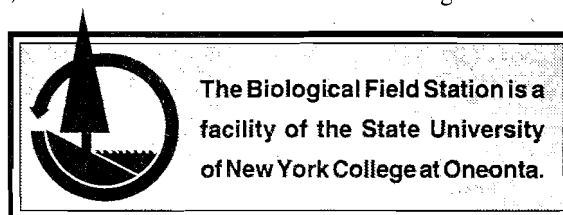
# Updates

- **Dr. Michael Greco**, DDS (Class of '72), Shreveport, Louisiana, sent us some large scorpions, wasps and spiders which he caught in his garage. He impressed us with his southern coastal-plain arthropod biodiversity
- **Stefanie Komorowski** completed her MA in Biology last spring and has recently taken a position with a composting firm in Massachusetts.
- **The Otsego County Conservation Association** has published Otsego Lake watershed maps indicating the ability of local soils to support both septic tank/leach field waste disposal systems and the development of roads. **Paul Baumann** used **The Otsego Lake Watershed Geographic Information System** (OLWGIS) to make the maps.
- Field Station activities were noted in the Fall 1994 issue of *Clearwaters*, the journal of the **New York Water Environment Association, Inc.** The issue was devoted to the Susquehanna and Chemung River basins in New York and included articles by authors from the Susquehanna River Basin Commission, NYSDEC, Southern Tier East Regional Planning Board, planners from Broome and Cortland Counties, US Army Core of Engineers and The Alliance for Chesapeake Bay.
- **Dr. John Titus** (Binghamton University) has published "Submersed Plant Invasions and Declines in New York" in *Lake and Reservoir Management*, a journal of the North American Lake Management Society. In the article several references were made to Otsego Lake data collected at the BFS.
- **The 1993 BFS Annual Report** is now available. It includes 8 reports on long-term studies and 16 on short-term research projects.
- Funds for **zebra mussel research** (NOAA/Sea Grant) were combined with a contribution from **William and Edward Smith** to purchase a 1990 Ford sedan for BFS use. Our work on zebra mussels involves regular travel over much of the State.
- **Kristin France** was honored as Oneonta High School's student of the month in December. Kristin has worked at the BFS for two summers sponsored by the OCCA FHV Mecklenburg Conservation Internship program. She was also employed during the fall of 1993 to work on campus analyzing Otsego Lake zooplankton. Kristin's photo now appears in public relations materials for the College, the biology department and the BFS.
- **Dr. Robert Crowther** (Class of '73), Dept. of Biology, University of New Brunswick, visited the station recently. He has been involved in basic research on marine invertebrate development since leaving Oneonta. He has worked at the **Marine Biological Laboratory** at Woods Hole much of his career.
- **Mr. Matthew LaPilusa**, from Oneonta, is working two days each week over the winter as a volunteer research assistant at the BFS.

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Fiscal challenges in recent years have constrained the work of the Biological Field Station. Private gift support from individuals, foundations, and corporations is essential and an investment in the Biological Field Stations' continued success and services to the community. For more information, call or write:

Dr. Willard Harman  
Professor and Director  
RD#2 Box 1066  
Cooperstown, NY 13326  
(607) 547-8778



The College at Oneonta Foundation receives and manages gifts for the Biological Field Station. All gifts are used expressly for the purposes for which they are given and they are tax-deductible. Information is available through:

The College Foundation Office  
Netzer Administration Building  
SUNY College at Oneonta  
Oneonta, NY 13820  
(607) 436-2535.