

REPORTER

Spring 1998

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Here Today, Gone Tomorrow?

The process of spring and fall lake circulation involving oxygenation of deep-water during mixing is known to readers of the "BFS Reporter". The recent trend toward lower oxygen levels in deep water before fall turnover, placing the cold-water fishery in jeopardy, is also familiar.

This may seem at odds with the experience of fishermen who have had considerable success in harvesting rapidly growing lake trout in recent years, one of those cold-water fish. Recent DEC fish surveys have confirmed their observations.

Why then, if oxygen at the bottom is decreasing, does the lake trout population seem healthier? Let's start with what promotes the growth of life in a lake or what makes it productive. Plants in a lake, in particular algae, convert solar energy to grow. Tiny animals eat this algae, and other larger animals eat them. The bigger ones are prey to others further up the food chain. In sum, life flourishes because more plant life is paralleled by more photosynthesis which, ultimately, generates more food as animals at the bottom of the food chain are prey for those at higher levels.

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A Warm Winter — a Colder Lake

As of March 31, 1998 Otsego Lake remained free of total ice cover although US Weather Service observers recorded it closing briefly on the 16th of February before warm weather enlarged the open area to about 50 acres in size. Interestingly, the long period of partial ice cover when circulation is continuous, results in the lake being colder than usual. Under spring conditions much of the water from top to bottom has a temperature between 1-3° C. During complete ice cover

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Do we have your correct address?

Located in Cooperstown and founded in 1968, the Biological Field Station is a unique facility serving the Upper Susquehanna Watershed, Otsego County and the immediate Cooperstown area. It is primarily 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.

Here Today, cont.

The productivity of a lake then is dependent upon the nutrients that can act as fertilizer for plant growth and, in turn, animal growth. Earlier, Otsego Lake was not as productive as it is now. It had far less algae and rooted plants because it had a low supply of essential plant nutrients. One nutrient, phosphorus, is generally the limiting factor in aquatic plant growth. In addition, thousands of years ago during the Pleistocene glaciation, the Lake's contours were shaped:

retreating glaciers scoured a deep, steep-shored lake. It was also quite clear and bottom waters were rich in oxygen. Shallow areas such as Hyde Bay are naturally more productive because light penetrates to the bottom, but they represent a small part of the lake's total area. All told, a lake with such characteristics—steep-sided and deep with limited nutrients—is generally not as productive as lakes that are shallow with gradually sloping basins and

high nutrient levels. The former might have the same, or even a greater variety of fish as the latter, but their numbers are fewer and they grow more slowly.

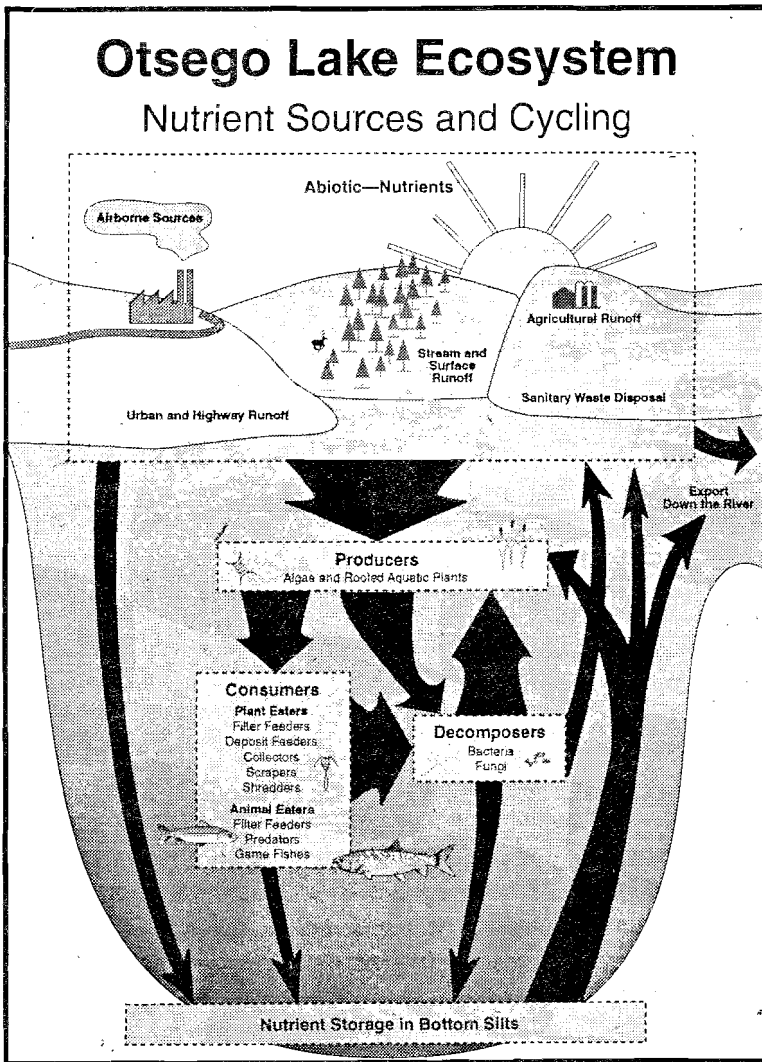
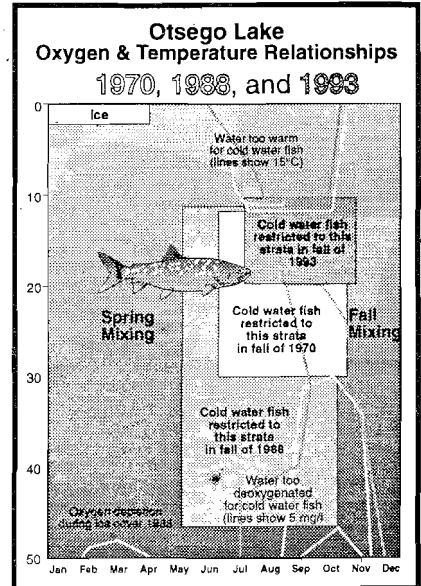
How does this relate to lake trout? They have always been here. But they're better fed now. That's partially because the Lake has more plant

life since 'cultural pol-

lution' has 'fertilized' the Lake. More plants mean more animals and more food, as we've seen. In addition, lake trout are flourishing because of the introduction of alewives. This exotic forage fish came into the Lake about 10 years ago. Their numbers irrupted and the lake trout began to grow rapidly because alewives are a very good energy source for them.

The surge in lake trout growth has occurred at roughly the same time the rate of oxygen use by decaying and respiring organisms in the cold, lower

depths has increased. Put another way, oxygen deficits at the bottom have increased. From a short-sighted view, some fishing the Lake think things are rosy. However, the processes that are enhancing today's lake trout fishery are, at the same time, jeopardizing its future. Trout must have oxygen to live. Taking a longer view, the nutrient loading that is at the root of the oxygen-depletion problem, unless mitigated, will spell the end of this splendid fish in Otsego Lake. It is also the cause for the loss of clarity in the water—a characteristic long prized by residents and visitors alike. Alewives have compounded the problem of clarity loss because they have fed on and reduced significantly planktonic animals that feed on algae, allowing the algae to thrive unimpeded.



A Warm Winter, cont.

most of the deeper water remains at 4° C, its densest, because circulation stops as soon as the ice completely covers the surface. Circulating water also oxygenates the deepest part all winter preventing oxygen depletion under the ice.

This situation has never been documented before on Otsego Lake, so we don't know what is going to happen, but subtle changes such as these do effect the way organisms compete with each other and are impacted. For example: 1. Alewife populations living in 4° C water deep in other lakes have been decimated by forcing the water to circulate under the ice exposing them suddenly to colder water. 2. BFS has always been concerned about changing water levels in the Lake. Whitefish eggs are deposited on the bottom near the shoreline. Optimal temperatures for their development are less than 4° C, normally just under the ice. If lake levels rise, bottom water would be too warm; if lake levels were lower, the eggs would be crushed between the ice and the bottom. 🐾



Scholarship Available!

Otsego 2000 is sponsoring several internships this summer designed for SUNY Oneonta Environmental Sciences Majors. The organization's primary interest is to find an intern to develop and carry out a work plan for creating a New York State Scenic By-way designation for Routes 166 and 33 in the towns of Cherry Valley, Roseboom, Middlefield and Milford. The preferred candidate should have completed course work in environmental planning or a related field, have strong interpersonal skills, word processing capability and reliable transportation. Those interested should contact and send resumes to the Otsego 2000 Coordinator: Polly Renckens, PO Box 173, Cooperstown, NY 13326. Phone 607-547-8881.

Updates, cont.

- **Dave Warner**, BFS graduate student, will be presenting another paper in May with **Lars Rudstam**, BFS visiting researcher (Cornell Univ.), on acoustic modeling of alewife populations in Otsego Lake at the annual meetings of the "International Association of Great Lakes Researchers."
- Twenty-seven contributions appear in the 1997 (our 30th) BFS Annual Report. Examples include: Water

quality monitoring of Otsego Lake's five major tributaries, **Carrie Miller**; Analysis of fecal coliforms bacteria concentrations of the upper Susquehanna River, **Jessica Salo**; Tick surveillance in Greenwoods Conservancy, **William Butts**; An inventory of meroplankton associated with *Myriophyllum spicatum*, focusing on *Acentria ephemerella* in Otsego Lake, summer 1997, **Mary Miner**; Filtering rates of Otsego

Lake zooplankton, summer 1997, **Shane Haresign** and **David Warner**; Biological control of purple loosestrife in Goodyear Swamp Sanctuary using *Galruccella* spp., summer 1977, **Tavis Austin**; An aquatic macrophyte survey of Moraine Lake, Madison County, NY, summer 1997 as related to management efforts utilizing Sonar application, **Shannon Bennett, Matt Albright, and W. N. Harman**. 🐾

Updates

- **Scott Stanton**, BFS graduate student working on movements of salmonid fish in the Delaware River, was recently the subject of an article in the Oneonta Star. Highlighted is his love of fishing, the fact that he is a NY State-licensed guide and runs "Real Fun Fishing Guide Service", his business, for eight years.
- **Matt Albright, Marcy Goldberg, Karren Illsley, Brenda Hewett, Rene Ferguson, Chris Bender and Bill Harman**, BFS students and staff, were the subject of a report in "Dreissena!" Sea Grant's "National Aquatic Nuisance Species Clearinghouse," Vol. 8:5, 98 titled "The Susquehanna River in New York Remains Free of Zebra Mussels." The report indicates that "This appears to be the only case currently documented in North America where zebra mussels invaded a river system without successfully colonizing it".
- Thanks to graduate student **Paul Lord**, the BFS has been awarded \$1,300 through the New York State Graduate Research Initiative for Non-doctoral Colleges for an "Otsego Lake Trophic Layer Model". Funding will be used for a modeling software package and computer upgrade. Paul has written two other small grant proposals on behalf of the Station; one was successful; the other is pending.
- **Shannon M. Bennett**, 1997 summer intern, was named to the dean's list for the fall semester at Southampton College of Long Island University. She is a freshman majoring in psychobiology. Last summer she worked with Eurasian Milfoil on Moraine Lake near Hamilton.
- **Mike Kappesser**, a SUNY Oneonta Environmental Sciences Major, has been working with Paul Lord curating the BFS "pearly fresh-water mussel collection". This turn-of-the-century collection is unique, containing many specimens from the southeastern United States which are now extinct or endangered.
- **Alexis Lord**, SUNY Cortland, spent Christmas vacation at the BFS identifying, cataloging and curating a collection of mollusks collected over a 15 year period from the Western Pacific by her father, Paul, who donated them.
- The **Lake and Valley Garden Club** has provided funding for a new four-color cover for the Goodyear Swamp Sanctuary trail guide and a smaller two panel flier. They have also purchased metal signs to be posted along the walkways pointing out salient features. Many thanks!
- **Jeane Bennett O'Dea**, BFS graduate student, has synthesized five years work on the vascular flora of Greenwood Conservancy generating extensive taxonomic inventories. Her work appears in the soon-to-be published 1997 BFS Annual Report.
- BFS personnel have not been able to get to the center of the lake, since January - not enough ice! It's the first time since we started collecting data in 1968 that we have missed sampling during February.

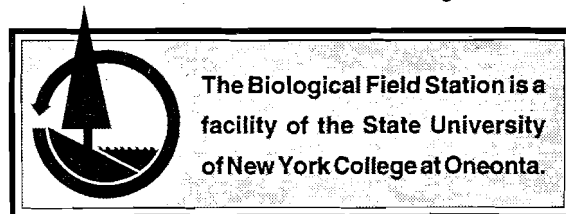
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Fiscal challenges in recent years have constrained the work of the Biological Field Station. Private gift support from individuals, foundations, and corporations is essential and an investment in the Biological Field Stations' continued success and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

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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:

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