

Citizens Statewide Lake Assessment Program – Volunteers at Work

by Scott Kishbaugh

Twenty-five years ago, the state's lake water quality database was bursting at the seams, or so it seemed. One of the most ambitious lake monitoring programs ever undertaken in this country was nearing completion in New York State. The not-for-profit Adirondack Lake Survey Corporation (ALSC) project evaluated acidification in lakes in the Adirondacks, Catskills and neighboring areas on nearly 1,500 lakes. During the same timeframe, the state Lake Classification and Inventory (LCI) survey evaluated close to 200 lakes throughout the state, the National Eutrophication Survey evaluated about 25 New York State lakes, the Eastern Lakes Survey sampled another 200 lakes, and numerous fisheries and academic studies were conducted on many individual lakes across the state. Lots of lakes, lots of data.

But it was not enough. The ALSC project focused on small, high elevation, remote lakes in regions more susceptible to acidification than development. The LCI sampled primarily lakes with state launches. The Eastern Lakes Survey involved a single sample collected in the fall. Fisheries-based water quality studies were directed to lakes managed for fish stocking, and academic studies were often geared toward answering a specific scholarly question. None of these programs conducted multi-year sampling at a frequency or duration capable of evaluating changes imposed by weather, by season or by trends. Additionally, none of these programs looked at the rest of the more than 7,500 lakes in the state. Perhaps most importantly, these programs were not directed toward the large number of lakes used daily by swimmers, anglers, picnickers and other active lake communities, and did not take advantage of the local knowledge and experience gained by lake residents observing firsthand the daily and generational changes in their lakes. Simply put, most lake residents seeking information about their lakes, not to mention guidance to help manage lake problems, were out of luck. The datasets produced were vitally important to gaining an understanding of what makes New York lakes tick, but they were not sufficient.

CSLAP to the Rescue

As a result, New York State developed a volunteer-based monitoring program, adapted from models successfully implemented in

Vermont, Maine, Michigan and Illinois. The New York State Citizens Statewide Lake Assessment Program (CSLAP) was established in 1985 as a cooperative program between the New York State Department of Environmental Conservation (NYSDEC) and the New York Federation of Lake Associations (NYSFOLA), a non-profit coalition of lake associations, individual citizens, park districts, lake managers and consultants dedicated to the preservation and restoration of lakes and their watersheds throughout the state.

It started small with 25 lakes and about 100 volunteers, including tiny ponds and the Great Lakes, water supplies and fishing holes, and public and private lakes throughout the state. The model has continued over the years, with lay volunteers trained by NYSDEC and NYSFOLA, using standardized sampling and processing techniques and equipment. Samples are collected from a single site at the deepest part of a lake, or from the surface and the greatest depths of a lake, and then analyzed for a small suite of standard limnological indicators at a certified laboratory – initially, the NYS Department of Health, and now, at the Upstate Freshwater Institute, a research facility in Syracuse. Multiple sampling stations are established in very large lakes.

The program focuses on eutrophication indicators, the factors that make lakes green. Public perception surveys and historical water quality data from New York State lakes both show that the most common water quality problems and the impetus for lake management start at the bottom of the food chain. Thus, lake sampling focuses on algae – what makes them grow and their effect on lakes. Each CSLAP sample is analyzed for nutrients – phosphorus and several forms of nitrogen, *chlorophyll a* (a measure of algal densities), water color (a surrogate for dissolved organic carbon), pH, conductivity and water temperature. Calcium samples are occasionally collected to evaluate susceptibility for zebra mussel infestations; and aquatic macrophyte samples are submitted by some sampling volunteers for identification of invasive exotic, protected or merely interesting plants. Samplers, who are often lakefront residents with historical familiarity of the normal ebb and flow of their lakes, also provide qualitative assessments of water quality and recreational conditions and variations in aquatic plant coverage, all using standardized ranking scales employed by volunteer lake monitors in many other northeastern and midwestern states.

CSLAP Volunteers: The Arms and Legs of Limnology

These volunteers are part of a rich history and extensive network of citizen scientists throughout the country, dating back to at least the late 1800s with the National Weather Service. There are more than 1,000 volunteer environmental monitoring programs in the country and more than 50 in New York State alone. Some of these are school-based or privately run by individual samplers, and others use professional staff to coordinate a large team of monitors; but all lean heavily on the hard work and dedication of volunteers.

CSLAP is the most extensive of these programs in New York. Through 2008, nearly a quarter century after getting its feet wet, CSLAP has grown into the primary state lake water quality dataset. More than 1,500 CSLAP volunteers had donated nearly 100,000



Photo by Emily DeBolt – Lake George Association

CSLAP volunteers observing water sampling techniques at Lake George

hours to collect 18,000 samples from 230 New York State lakes. They may be retired teachers, or others long past their high school chemistry lessons; great-grandmothers enlisting grandchildren and their friends; and new lake residents to long-timers concerned about lake changes viewed from their fourth generation camps.

New York State has dedicated more than \$3 million in personnel, analytical services and equipment to implement the program, and the state Environmental Conservation Law was amended in 1988 (ECL 17-0305) to mandate CSLAP and provide a full-time program coordinator to oversee the monitoring.

Benefits of Partnering

Why would a lake resident dedicate several hours an evening or weekend, eight times a year on nice days during the short New York summer, to fill some bottles and complete a lot of paperwork? Why would NYSDEC dedicate significant time and money to an educational campaign?

It is because the benefits of volunteer monitoring programs generally, and CSLAP specifically, are numerous and impressive. CSLAP blends the best of the access and interest of involved local volunteers with the technical expertise and resources available from the government. It takes advantage of lake residents' eyes-on-the-ground (and water) familiarity with "normal," along with the opportunities for agencies to evaluate data and information in a consistent manner. It creates partnerships between concerned citizens seeking technical advice and a portal into the intricacies of government, and agencies seeking firsthand information to assist in local management and stewardship activities. Partnerships emerge because lake users are

continued on page 22



A CSLAP volunteer measures water transparency in Lake George.

*Photo by Emily DeBolt –
Lake George Association*

continued from page 21

asking questions and lake managers are seeking answers; researchers and government scientists are investigating environmental trends, such as new biological invaders, and volunteers are searching for a solution before a problem begins; or data collectors are filling information voids for data users.

Twenty-five years later, these partnerships are stronger than ever. CSLAP volunteers were the first to find that fanwort and Brazilian elodea, two southern climate exotic plants, had spread out of Long Island. Water samplers have collected long-term data showing an increase in water temperature in many New York State lakes. Both findings may be an indication of the growing influence of global climate change in their own backyards. Monitoring data has demonstrated a strong connection between eutrophication (lake aging) indicators and the recreational impacts from nutrient over-enrichment, as well as between water clarity and phosphorus. This information has created a robust database that will figure prominently in the development of state nutrient criteria and provide simple tools for assessing both impacts and recovery. In fact, the connection between lake perception and water quality can only be evaluated with local volunteers, since more distant samplers – whether they be consultants, government monitors or PhD candidates – have neither the proximity to evaluate short-term changes nor the historical perspective to assess deviation from “normal” conditions at most lakes.

CSLAP data have shown that lakes change slowly, though faster than expected given the geological clock inherently built into lake succession. These lake changes – the slow trickle through the trophic cascade from clear water to turbid and filled in with sediment and

plants – have been decelerated or even suspended by the stewardship activities initiated by the enlightened lake resident. It is a positive feedback loop that benefits lake and lake user alike.

The relative merits of specific lake management tools – in-lake tools, such as algicides and aerators, to watershed-based tools, such as stormwater best management practices (BMPs), wastewater diversion and other management activities – have been evaluated at specific lakes. The use of these tools contributes to a larger database of information to evaluate public policy decisions at the local or regional level.

This citizen lake assessment program shows that volunteer monitoring works, not just because volunteer monitors work. Environmental monitoring is not rocket science. With relatively simple but reproducible instructions, quality laboratory analysis, dedicated resources, and especially dedicated volunteers, the opportunities for greatly enhancing the understanding of lake conditions in New York State are nearly endless. This is fortunate, for with more than 7,850 lakes, reservoirs, and countless more small ponds dotting the New York landscape, these partnerships need as much data and information as they can obtain to manage these vital and magnificent resources.

For more information about the New York Citizens Statewide Lake Assessment Program, contact Scott Kishbaugh, NYS Department of Environmental Conservation Program Director, at 518-402-8282 or sakishba@gw.dec.state.ny.us; or Nancy Mueller, NYS Federation of Lake Associations Program Coordinator, at 800-796-3652 or folanancy@odyssey.net. Application forms and program reports can also be found at the NYSFOLA website at www.nysfola.org.



Photo by Emily DeBolt - Lake George Association

NYSDEC staff demonstrating the use of a water sampling device to a CSLAP volunteer on Lake George