

# The Clean Water Act Needs an “Enhanced” Clean Lakes Program

Kellie Merrell

The 50th anniversary of the Clean Water Act (CWA) is a great opportunity to reflect on the many accomplishments that states, tribes, local communities, and nonprofit organizations such as NALMS and lake associations have made to protect and restore our lakes and streams. It is also a time to reflect on the many challenges that remain as well as the new ones that emerge for protecting and restoring our waters – and especially lakes. The CWA is a multifaceted act that addresses a wide range of water pollution issues including lake water quality. For those who want a refresher or an introduction to the CWA, please visit EPA's Watershed Academy and you'll find several training modules on the Act.

The federal CWA has many different sections to address varied aspects of water pollution. Section 314 Clean Lakes Program is one of the sections and it was originally established in 1972 under the Federal Water Pollution Control Act Amendments (P.L. 92-500) to address lakes and was initially funded in 1976. The final year of Clean Lakes Program funding was in 1995; a total of \$145 million of Section 314 funds was awarded by Congress over a 20-year period, though \$380 million was originally authorized from 1973-1980.

## Section 314 Clean Lakes Program

In 1980, when NALMS was formed, there were many foundational lakes activities that were happening that were driven in large part by funding under the Section 314 Clean Lakes Program. This voluntary Clean Lakes Program helped states, tribes and local communities manage their lake resources with financial and technical assistance. Most Section 314 funds went to the implementation of projects to help locals restore their lakes.

EPA also funded \$35 million in research and development grants from 1975 to 1979 to advance the science of lake restoration and demonstrate the effectiveness of several types of lake management techniques.

Many key lessons were learned in these early efforts and provided an important foundational understanding of lakes and reservoirs and how to manage them to protect and restore their water quality. Responding to these lessons, EPA promulgated Clean Lakes Program regulations in 1980 (40 CFR Part 35, Subpart H). The 1980 regulations set up a program to award four types of grants under this program to states and tribes:

1. **Lake Classification Survey/Water Quality Assessments** – grants to assess the water quality of lakes across a state or reservation.
2. **Phase I – Diagnostic/Feasibility Studies** – grants to determine the causes of pollution to a specific lake and recommend the restoration methods.
3. **Phase II – Restoration and Protection Implementation Projects** – grants to fund implementation of Phase I recommendations.
4. **Phase III – Post-Restoration Monitoring Studies** – grants to support post-restoration monitoring and evaluation of completed Phase II projects.

More details on the Clean Lakes Program can be found in the actual Clean Lakes Program regulations, on an archived EPA lakes website: <https://archive.epa.gov/water/archive/web/html/onlndocs.html> and a *LakeLine* article at: <https://www.nalms.org/wp-content/uploads/2018/09/30-3-5.pdf>. Importantly, the Clean Lakes Program

successfully supported the restoration of several lakes across the country – a few of which are highlighted in the “sidebars” associated with this article.

## Section 319 Nonpoint Source Program

Another important section of the CWA is the Section 319 Nonpoint Source Program that was established in the 1987 Amendments to the CWA. Since 1990, EPA has been providing financial support to states and tribes through Section 319 grants to implement their nonpoint source management programs. EPA has encouraged states and tribes to use Section 319 funds to support the Clean Lakes work previously funded under the Section 314 Clean Lakes Program. EPA issued a set of questions and answers on the relationship between 319 and 314 – this guidance can be found via the link listed above. At the 2019 NALMS conference, Curtis and Flaherty reported that 19 percent of 319 funds are used annually to fund lakes-related projects, but it's use for that purpose varies widely by state and tribe.

## National Lakes Assessment

In addition to awarding grants to support lakes work, EPA has been funding a series of National Lakes Assessments (NLA) with the first one in 2007 and subsequent ones in 2012, 2017, and 2022. These assessments provide an unbiased estimate of the condition of natural and man-made freshwater lakes, ponds, and reservoirs across the country. The opening article in this issue was written by EPA and summarizes the history of data collected through the NLA.

Readers are encouraged to visit EPA's NLA Website at <https://www.epa.gov/national-aquatic-resource-surveys/nla> to read about the detailed findings of these assessments. But suffice it to say, the

trends and the findings are not good. For example, the surveys found the proportion of lakes in the nation that are eutrophic and hypereutrophic jumped from half to 69 percent in just the five-year period between the 2012 and 2017 surveys. As of 2017, only 11 percent of the nation's lakes remain oligotrophic.

### **NALMS 314 Workgroup**

While the NLA and the Section 319 programs are good, they are not sufficient

to address the water quality issues of lakes across the country today. Given this, NALMS established a workgroup in 2021 to try to increase funding for lake restoration and protection including reestablishing an enhanced Section 314 Clean Lakes Program. I have had the privilege to co-chair this NALMS workgroup and we have developed a policy statement calling for more funding for lakes restoration and protection. This policy statement was adopted by the

NALMS board and it is posted on the Web at: <https://www.nalms.org/nalms-position-papers/enhanced-314-clean-lakes-program-position-statement/>. We are also currently working on developing outreach materials to share with legislatures and others to raise awareness for the need for greater funding for lakes restoration and protection.

The following sidebars highlight some of the great work that the 314 Clean Lakes Program fostered:

## **Section 314 Clean Lakes Program Financial Assistance: A Catalyst for Inland Lakes Monitoring in Michigan**

Ralph Bednarz

***Michigan is a lake rich state*** with approximately 3,300 miles of Great Lakes shoreline and over 11,000 inland lakes. Michigan's history of lakes management dates back to the early 1900s along with fisheries management and the desire to culture and stock fish in Michigan lakes and streams (Latta 2006). However, prior to the passage of the Federal Water Pollution Control Act in 1972 and the implementation of the Clean Water Act Sec. 314 Clean Lakes Program in 1976, few water-chemistry data had been collected on Michigan lakes, which hampered understanding and documentation of status and trends in lake water quality.

Michigan initiated a systematic effort in 1973 to monitor the quality of its inland lakes (Walterhouse 2015). It was expected that the "significant" lakes, defined as public lakes 50 acres or larger in surface area, could be sampled every 5 years. These included 656 lakes with public access facilities out of the approximately 2,000 Michigan inland lakes of that size. By 1979, only 300 of the significant lakes had been sampled due to budget and personnel constraints. A more robust lake monitoring program was needed to fulfill the lake classification requirement of the Clean Lakes Program in Michigan.

Additional Clean Lakes Program funding became available to the states as one-time grants in 1980 for inventorying and classifying publically owned freshwater lakes according to trophic condition. Michigan was awarded a lake classification grant in 1980 and continued and completed the water quality monitoring and assessment for the 656 significant public lakes (Massey 1982).

In addition to the lake classification grant support, Michigan was awarded 16 individual project grants: seven Diagnostic-Feasibility Studies (Phase I) awards, eight Restoration and Protection Implementation Projects (Phase II) awards, and one Post-Restoration Monitoring Studies (Phase III) award, during the time period of the Section 314 Clean Lakes Program financial assistance.

Michigan also initiated a volunteer lakes monitoring program, the Self-Help program, in 1974. Now known as the

Cooperative Lakes Monitoring Program (CLMP) under the Michigan Clean Water Corps (MiCorps), the CLMP is the second-oldest volunteer lakes monitoring program in the nation (<https://micorps.net/>).

Congress eliminated funding for the Clean Lakes Program in 1995. Michigan continued its lake water quality assessment monitoring program in partnership with the U.S. Geological Survey (USGS) with support from the Clean Michigan Initiative bond fund, passed by the citizens of Michigan in 1998. From 2001-2010, 729 public access inland lakes greater than 25 acres in size were monitored for baseline water quality conditions and trophic status (Fuller and Tarieska 2011).

In 2002, Michigan initiated a statewide Status and Trend Program with a statistically based design and standardized sampling methods for public inland lakes ten acres and larger (Wehrly et al. 2011). The lakes are stratified by size and fisheries management unit, which allows for statewide and regional watershed assessments of fisheries, lake habitat, and water chemistry. The number of lakes surveyed per year varies depending upon individual management unit priorities, but typically about 25 lakes per year. Approximately 600 lakes have been surveyed with the status and trend protocols to date.

Michigan participates in the National Lakes Assessment every five years, from 2007 to present. A minimum of 50 lakes are sampled to provide for a state-scale assessment. In 2022, Michigan also participated in the Northern Lakes and Forest Ecoregion intensification project, which included approximately 65 Michigan lakes (<https://www.fs.usda.gov/detail/hiawatha/news-events/?cid=FSEPRD1057366>).

Section 314 Clean Lakes Program support was the catalyst that launched Michigan's inland lakes water quality monitoring and assessment programs. Restored funding for an enhanced Section 314 Clean Lakes Program would assist Michigan, and all the states, in expanding its lake monitoring and management programs for the preservation and protection of lake resources in Michigan and across the nation.

## References

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- Wehrly, K.E., D.H. Hayes and T.C. Wills. 2011. Status and Trends of Michigan Inland Lake Resources, 2002-2007. *University of Michigan, Institute of Fisheries Research Report*, 256 pp.

**Ralph Bednarz** is a retired limnologist after a 35-year career in environmental protection and water resources management with the Michigan Department of Environmental Quality. Ralph managed the Michigan's inland lakes water quality monitoring programs. He was responsible for the implementation of the 2007 and 2012 National Lakes Assessment (NLA) in Michigan and he served as a national trainer for the 2012 NLA. Ralph coordinated the development and implementation of the Michigan Clean Water Corps (MiCorps) volunteer water monitoring network, including the Cooperative Lakes Monitoring Program (CLMP). Ralph holds a BS in biology/chemistry from the University of Illinois and an MS in limnology from Michigan State University.



## Studying and Rehabilitating Harveys Lake

Fred Lubnow

**In response to cancelling an annual triathlon event** due to issues associated with water quality problems in Harveys Lake, the Borough of Harvey's Lake submitted for and was awarded funding through the Clean Lakes Program (Section 314) in 1993 to conduct a Phase I Diagnostic / Feasibility study of the lake and watershed. The resulting Management Plan was used to obtain funds for the implementation of a variety of watershed and in-lake management measures to reduce the lake's annual total phosphorus (TP) load. Most of the funds for these projects focused on stormwater management and originated from the Non-Point Source (Section 319) program as well as Pennsylvania's Growing Greener grant program.

The original management plan developed through the Section 314 funding served as the foundation for both the development of the lake's total maximum daily load (TMDL) for total phosphorus (TP) as well as its Watershed Implementation Plan. In turn, the subsequent implementation efforts resulted in the lake attaining 75 to 80 percent compliance with the TMDL and being in compliance with the targeted mean TP Trophic State Index of 50 or lower over eleven of the last 12 years. As a result of these conditions, the Pennsylvania Department of Environmental Protection has taken Harveys Lake off the impaired list.

While the use of 314 and 319 funds resulted in an improvement in the overall water quality of Harveys Lake, the lake is still an excellent example of why funds should be reinstated into the Clean Lakes Program. Although improvements in water quality were realized with each of the

nutrient control actions, hydrilla ended up entering the lake, more than likely via the public boat launch. The Borough and State have been working on getting the hydrilla under control in the lake; however, additional funds are needed if it is to be eradicated and additional proactive protection measures are to be implemented to prevent this and other invasive species from entering the lake.

Re-funding Section 314 of the Clean Lakes Program could provide the potential funds needed to address these long-term measurements of management and protection for this highly valuable recreational resource.

**Fred S. Lubnow** is the senior technical director of the Ecological Services at Princeton Hydro, and the office manager of the Exton, Pennsylvania office. Dr. Lubnow received his Bachelor of Science in biology from Susquehanna University (1988), his Master's degree in environmental sciences (1992) from the University of California Davis, and his Ph.D. in limnology (1994) from the University of California Davis. Dr. Lubnow has been an environmental consultant for 30 years and has worked on a variety of ecosystems throughout the Mid-Atlantic States. Dr. Lubnow is also an adjunct professor at Delaware Valley University, Doylestown, PA, where he teaches a course and laboratory on Watershed Management.



# Clean Water Act Section 314 Funding to Vermont

Kellie Merrell and Virginia Garrison

**From 1977 to 1994, Vermont received over one and a half million dollars** in Clean Water Act Section 314 grant funding. NALMS life member Virginia (Ginny) Garrison, who retired in 2008 after 35 years with the Department of Environmental Conservation managing and protecting Vermont's lakes recounted some examples of projects that were funded by 314.

- Starting in 1977, before the three-part 314 grant program was established in 1980, Vermont received \$74,640 to investigate the potential to permanently remove nutrients through aquatic plant harvesting on Lake Bomoseen.
- From 1979–1980 Vermont received \$100,000 to conduct a statewide Lake Classification Survey.
- In 1980 Vermont received over \$200,000 to conduct Phase I Diagnostic Feasibility Studies on Harvey's Lake and Lake Morey.
- In 1982, Vermont received over \$100,000 for a Phase I Diagnostic Feasibility Study on Lake Iroquois (Figure 1).
- In 1989, Vermont received over \$100,000 to conduct a Phase I Diagnostic Feasibility Study on Lake Champlain.
- In 1986, using the findings from the Phase I Diagnostic Study on Lake Morey, an alum treatment was successfully conducted with funding from a Phase II Restoration Project Grant (Figure 2 and Figure 3).
- In 1990, Vermont received over half a million dollars to conduct a Phase II Demonstration Project Grant on Lake Bomoseen to investigate the use of weevils to control Eurasian Watermilfoil.
- In 1990, 1993 and 1994, Vermont received Lake Water Quality Assessment Grants each for roughly \$50,000 and possibly more.

According to the 1996 Vermont Lake Water Quality Report, for the four lakes that received 314 Phase I Diagnostic Feasibility Study grants “In every case, causes have been determined and recommendations for management or restorative action have resulted from the studies.”

If we look at Vermont's long-term data from the Vermont Lake Score Card for the three inland lakes that used 314 funding to conduct Phase I Diagnostic Feasibility Studies; Harvey's Lake (1980) shown in Figure 4, Lake Morey (1980) shown in Figure 5, and Lake Iroquois (1982) shown in Figure 6, it seems 314 has left its legacy for all to see etched in the improving water quality trends on these three Vermont lakes.

The importance of the CWA Section 314 Phase I diagnostic feasibility studies cannot be understated for these three Vermont Lakes. Those studies allowed lake managers to



Figure 1. Photo of Lake Iroquois, Vermont.



Figure 2. Photo of Lake Morey, Vermont.



Figure 3. Photo of inlet to Lake Morey, Vermont.

# Vermont Lake Score Card

## Harveys Lake

Scores

Water Quality Data

Lake Information

### Plots

Trophic condition thresholds are indicated by shading:

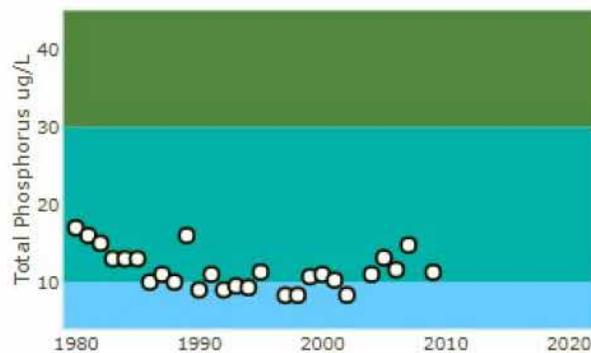
■ Hypereutrophic ■ Eutrophic ■ Mesotrophic ■ Oligotrophic

Click on "Daily Mean" or "Annual Mean" to toggle on or off the data layer.

#### Spring Phosphorus

Trend: Stable (p-value=0.1216)

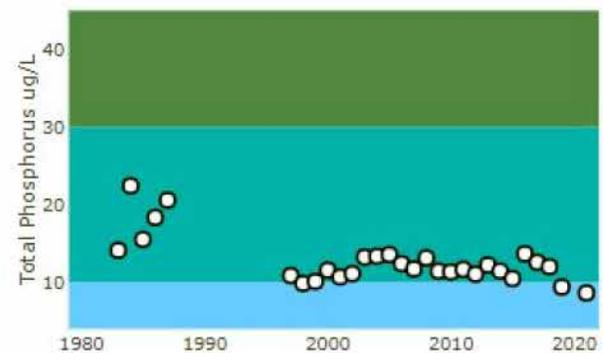
○ Annual Mean



#### Summer Phosphorus

Trend: Stable (p-value=0.0983)

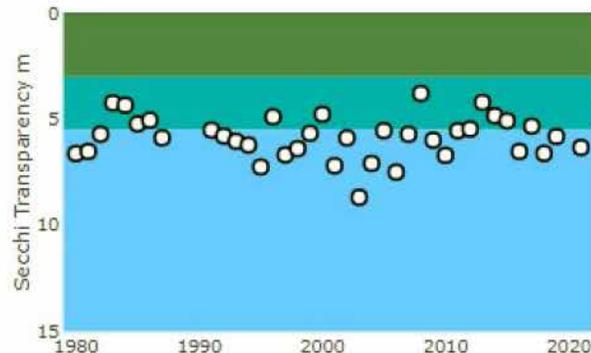
○ Annual Mean ○ Daily Mean



#### Summer Secchi

Trend: Stable (p-value=0.9887)

○ Annual Mean ○ Daily Mean



#### Summer Chlorophyll-a

Trend: Significantly Decreasing (p-value=0.0221)

● Annual Mean ● Daily Mean

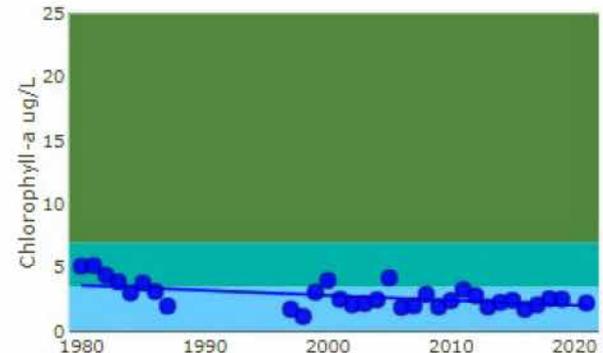


Figure 4. Harvey's Lake long-term water quality trends. VTDEC received a 314 Phase I Diagnostic Grant for Harvey's Lake in 1980.

make decisions in the management of these lakes that have led to lasting improvements in lake water quality. Remarkably, almost four decades later, Lake Morey is only now showing

signs the benefits of its alum treatment may be beginning to wane. Sadly, this time around there is not a 314 grant funding source to fund another Phase I diagnostic feasibility study and

# Vermont Lake Score Card

## Lake Morey

Scores

Water Quality Data

Lake Information

### Plots

Trophic condition thresholds are indicated by shading:

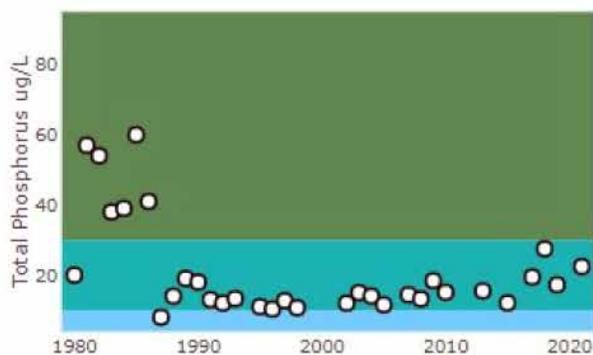
■ Hypereutrophic ■ Eutrophic ■ Mesotrophic ■ Oligotrophic

Click on "Daily Mean" or "Annual Mean" to toggle on or off the data layer.

#### Spring Phosphorus

Trend: Stable (p-value=0.3637)

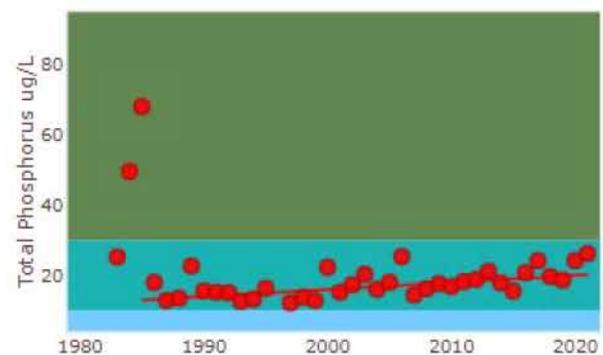
○ Annual Mean



#### Summer Phosphorus

Trend: Highly Significantly Increasing (p-value=0.0016)

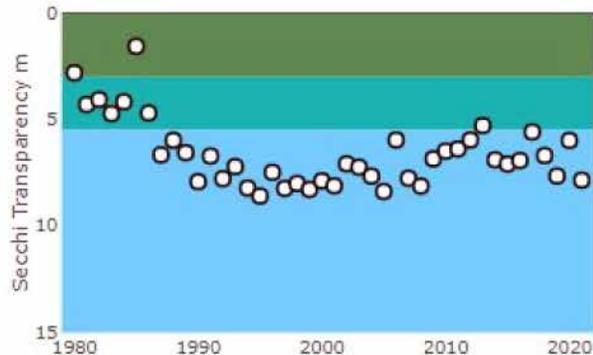
● Annual Mean ● Daily Mean



#### Summer Secchi

Trend: Stable (p-value=0.4177)

○ Annual Mean ○ Daily Mean



#### Summer Chlorophyll-a

Trend: Stable (p-value=0.1413)

○ Annual Mean ○ Daily Mean

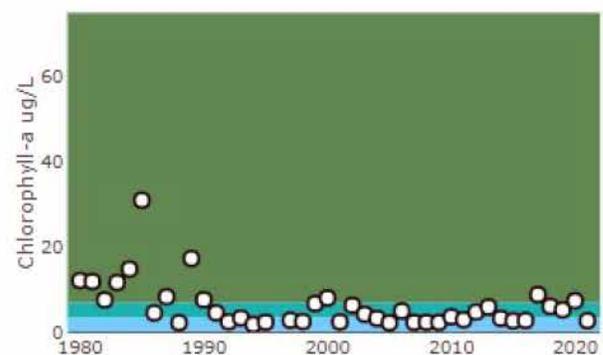


Figure 5. Lake Morey's long-term water quality trends. VTDEC received a 314 Phase I Diagnostic Grant in 1980 and Phase II Restoration Grant in 1986 to implement an alum treatment..

phase II restoration grant to determine if the increasing phosphorus trends in recent years is due to internal loading and to fund another alum treatment to restore the lake if that is determined to be the best lake management approach.

According to Ginny Garrison, retired Vermont Lakes Program Chief, besides the projects funded in Vermont "many of these grants funded new positions, long-term temporary positions that were eventually able to change to full-time. The

# Vermont Lake Score Card

## Lake Iroquois

Scores

Water Quality Data

Lake Information

### Plots

Trophic condition thresholds are indicated by shading:

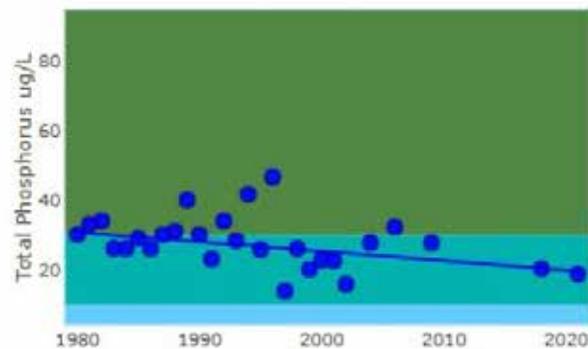
■ Hypereutrophic ■ Eutrophic ■ Mesotrophic ■ Oligotrophic

Click on "Daily Mean" or "Annual Mean" to toggle on or off the data layer.

#### Spring Phosphorus

Trend: Significantly Decreasing (p-value=0.0239)

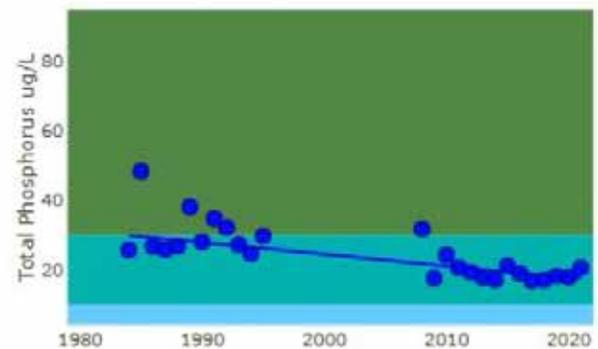
● Annual Mean



#### Summer Phosphorus

Trend: Highly Significantly Decreasing (p-value=1e-04)

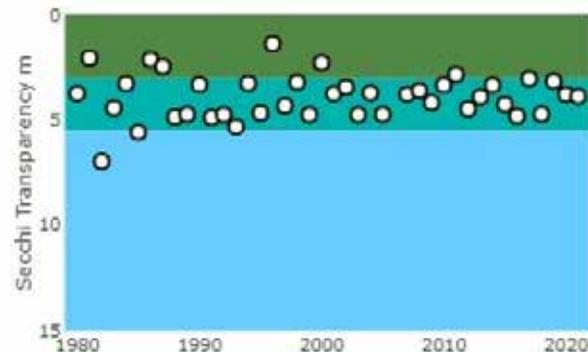
● Annual Mean ● Daily Mean



#### Summer Secchi

Trend: Stable (p-value=0.6371)

○ Annual Mean ○ Daily Mean



#### Summer Chlorophyll-a

Trend: Stable (p-value=0.0779)

○ Annual Mean ○ Daily Mean

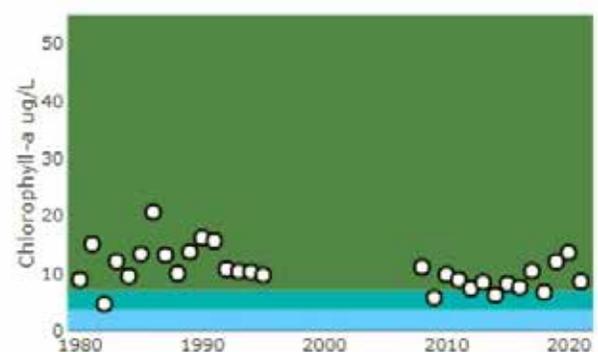


Figure 6. Lake Iroquois' long-term water quality trends. VTDEC received a 314 Phase I Diagnostic Grant for Lake Iroquois in 1982.

funds made it possible for the Lakes Program to learn a lot about Vermont's lakes and do innovative work to manage and protect them. The 314 focus on lakes and their watersheds, separate from the large river watersheds in Vermont that are

funded under 319, was important. The switch to 319 funding for lakes was a real loss for lakes, both in Vermont and nationally.”

**Kellie Merrell** is a program scientist with the Vermont Lakes and Ponds Management Program, and currently serves as the Region 1 NALMS Director.



**Virginia Garrison** is retired from the Vermont Lakes and Ponds Management and Protection Program, where she served as manager of the program for 35 years.



## Reflections on Additional Benefits to the 314 Clean Lakes Program

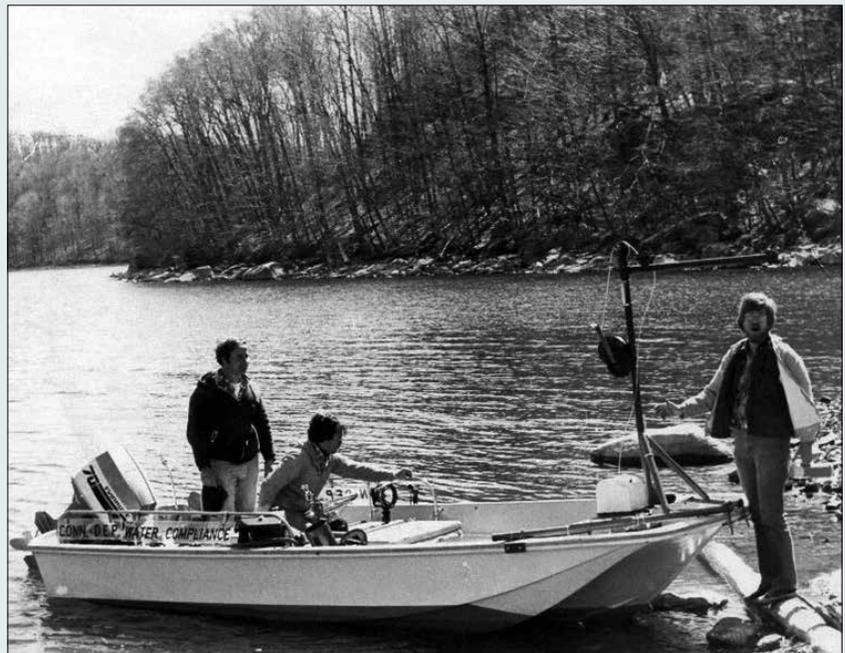
Tracy Lizotte

*Now that retirement is on the horizon*, I often find myself reflecting on what got me started in the field of environmental science and into water resource management. I believe some of my interest was initially started by my parents who are what I call Long Island Sound beach bums. In my early years, they were living in Atlanta, Georgia, and the place they found to fill their need to be on the water was Lake Lanier. There were many weekends spent learning to waterski and fish that gave me my love of the water, however, the key point that sent me on my career path was a high school internship that started with the CT Department of Environmental Protection (CT DEP) Water Compliance Unit in 1978. At that time, I did not even know about the Clean Water Act and how new many of the programs were. One such program was the 314 Clean Lakes Program which was established in 1972 and funded to 1995.

It turns out that this program was foundational to Connecticut's water monitoring program by (1) enhancing the technical ability of staff to assess lake water quality for status and trends; (2) conducting Phase I Diagnostic Feasibility studies to determine cause of pollution and evaluate potential controls and recommend the most feasible and cost-effective lake restoration methods; and (3) building the capacity to manage projects and implement lake restoration techniques that were referred to as Phase II projects. There was work done on important public recreational lakes like Lake Waramaug, Bantam Lake, and Candlewood Lakes as part of the Phase 2 project. During that time, I cannot say I knew how foundational this program would be to myself or the State of Connecticut lakes.

My personal foundation was started with CT DEP when I was placed in the water monitoring lab. My first jobs were not so great; I had to clean out a lot of old smelly fish and bug specimens that had been stored

way too long. Looking back now, my persistence of not giving up paid off and I got asked to go out on a Lake Classification Water Quality Assessment Survey (Figure 1). This is where things started to click for me and I could now find a use and application for biology (looking at phytoplanktonic communities), chemistry (looking at nutrient concentration in various lakes and their affects), earth science (looking at different lake types), physics (temperature and stratification effects), math (performing dissolved oxygen analysis with Winkler method), and technology (understanding how a pH or dissolved oxygen meter worked) that I was learning in school at the time. There were so many important things I was learning while doing these surveys. It was not just about the science, as there were other important life skills learned – such as working together as a team, especially on a small boat,



*Figure 1. Lake survey crew from the 1980s: Joe Nestico, Tom Haze, and Guy Hoffman. These were my mentors and the crew developing the survey method that CT still uses to today.*

planning skills to perform a survey, and learning to communicate this information to the public. As I went onto college and studied environmental studies and worked over my 35-year career I kept calling on the skills I learned on the water quality assessment surveys back at CT DEP in my early career, all in part to the 314 Clean Lakes Program.

Over my long working career and going to NALMS meetings I have heard others talk about similar experiences and getting their start from the 314 Clean Lake program. Just this summer we took out our student research assistant and I could see that same light bulb going off in their mind as the questions were rolling out. As our country's lakes are facing many new challenges such as global climate change, harmful algae blooms, nutrient enrichment, and invasive species, it is a

good time to re-fund the 314 Clean Lakes Program to meet these challenges, and I believe in doing so we will see additional benefits for STEM Education and turning the next bright minds on to finding solutions.

**Tracy Lizotte** is an environmental analyst in the Water Monitoring and Assessment Program with the Connecticut Department of Energy and Environmental Protection. Tracy works on a variety of projects that include the beach program, lake, and cyanobacteria monitoring, as well as statewide monitoring for Clean Water Act assessments.



So, in closing, let's celebrate all the great work done under the CWA over the past 50 years and especially under the Section 314 Clean Lakes Program for lakes. And let's recommit to establishing an "enhanced" Section 314 Clean Lakes Program. By "enhanced," we recommend revising the implementation of the Clean

Lakes Program by adding a Healthy Lakes component to protect high quality lakes and prioritize lakes with significant cultural heritage value and lakes in communities where there are environmental justice concerns. The "enhanced" 314 Clean Lakes Program will also need to discuss how Section 314 of

the CWA can be fully integrated with the other important CWA tools such as the Section 319 Nonpoint Source Program, TMDLs and the ongoing NLAs. 🌱

~ Kellie Merrell



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# Values of the Clean Water Act (CWA) - Clean Lakes Program (CLP) – Section 314 Funding

*Feedback from various program coordinators of these projects over the years:*

"I was fortunate to work on lakes in several states under the Clean Lakes Program. The Section 314 diagnostic-feasibility studies brought a focus to lake water quality issues, and potential solutions, that did not exist in many areas until those studies were conducted. Subsequent restoration efforts under both Sections 314 and 319 provided valuable information on the effectiveness, and in some cases lack thereof, of various restoration alternatives."

– **Chris Holdren, Environmental Consultant in Colorado, and Past President of NALMS**

"Turns out that the original Clean Lakes concept in the Clean Water Act really did work, the guidelines and EPA's various lake assessment publications provided very good techniques for both effective BMPs and ways to document improvement. In fact, PA DEP through the years adapted much of the Clean Lakes concept for our watershed assessment, implementation and restoration projects. Seems that good things come around again; I think the Clean Lakes Program concepts are timeless and so well thought out that lake assessment and restoration projects will benefit from a higher profile funding avenue from EPA."

– **Barbara Lathrop, retired from the Pennsylvania Department of Environmental Protection (PA DEP)**

"The passage of the Clean Water Act and Clean Lakes Program were quite literally watershed events for lakes across the country. Much of what New York state learned about lake management and assessments came from Section 314 Clean Lakes program demonstration projects, Phase I diagnostic studies, Phase II implementation projects, water quality assessment grants, and management conferences. More importantly, these projects managed and restored critically important water resources throughout the state, particularly urban lakes serving environmental justice communities. The loss of the Clean Lakes program funding in 1994 led to some states to allocate scarce Section 319 funding for these activities, but in New York and many other states, most of these Clean Lakes needs will continue to be unmet until the Clean Lakes program funding is reappropriated. I strongly urge Congress to restore Clean Lakes funding for EPA."

– **Scott Kishbaugh, retired from the New York State Department of Environmental Conservation (NYS DEC)**

"The Clean Lakes Program at the federal level provided the most complete framework for assessing lakes and determining a logical course of remedial or protective action. The CLP was adopted by many states with minor adjustments to guide lake programs across the USA. Those of us fortunate to have worked on projects under those programs both gained and contributed to a wealth of lake and watershed management knowledge that is the foundation of what we do today. The defunding of the federal program and gradual dismantling of many state programs has left lake management a fractured discipline in most areas. Approaches like Total Maximum Daily Loads and Watershed Based Plans, and Sec 319 projects are useful but represent only a portion of a complete program. We would do well to return to the complete assessment approach embodied in the original CLP, preferably with federal and state funding support."

– **Ken Wagner, Water Resources Services, Wilbraham, Massachusetts, Water resource consultant, former NALMS President, and former editor in chief of Lake and Reservoir Management**

"While the association I have worked for my entire career was not a direct recipient of Clean Lakes Program funding, the Section 314 program was instrumental in raising the regional and national awareness of the importance clean lakes. The assessments and demonstration projects showed many – professionals, citizens, and decisionmakers alike, the possibilities of applying science to improve our nation's water resources. For me, the many projects funded and completed through the Clean Lakes Program showcased the possibilities that I and many other lake managers could replicate with our own resources."

– **Larry Butler, Reston Association, Reston, Virginia, and past president of NALMS**

"I had the opportunity to work with local units of government, consultants, and USEPA on several Clean Lakes Program projects. The diagnostic-feasibility study, which served as the scientific basis for management decisions, remains a standard approach for lake and watershed assessments in local and state-run projects as well. Another very valuable facet of CLP was demonstration projects. These demonstrations became the basis for developing and refining in-lake and watershed approaches that are now routinely used across the country to improve water quality."

– **Steven Heiskary, research scientist (retired), Minnesota Pollution Control Agency, and former NALMS president**