



New York State Federation
of Lake Associations

2024 NYSFOLA ANNUAL CONFERENCE

Lake George, Fort William Henry Conference Center
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Community Leadership for Healthy Lakes in New York

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I am privileged to have been invited to be the first speaker at this 2024 Annual Conference of the New York State Federation of Lake Associations. Since 1983, you have greatly advanced our understanding of lakes, as pleasurable and beautiful features of our landscape, as ecological links essential to the web of life, and as invaluable pools of fresh water and as bonds connecting us locally to Earth's hydrologic cycle. I admire your dedication to the care of lakes in your respective communities across our State.

You have, quite literally, written the book on lake stewardship. Now in its second edition, prepared in cooperation with the NYS Department of Environmental Conservation, [Diet for a Small Lake: The Expanded Guide to New York State Lake and Watershed Management](#)¹ offers lakefront property owners, local governments, nature conservation organizations and the public an accessible and clear compendium of best practices to sustain the health of lakes. Your contributions to the Citizens State-wide Lake Assessment Program are essential for gauging how to manage lake watersheds.

May I share some thoughts with you about what might be considered for including in a third edition of this book? Let us look at our lakes as we saw them in the 19th century, the 20th century and what comes in the 21st century.

New York's some 7,600 lakes and ponds and reservoirs are managed mostly as local, individual places. Our land use practices, borders between towns, and various laws do not encourage (much less require) regional recognition of remote impacts on lakes. The distant contamination of lakes from acid rain, discovered in 1963 by Dr. Gene Likens,² required amendments to the federal Clean Air Act, to abate waste gas emissions of sulfur and nitrogen that

¹ [Diet for a Small Lake](https://dec.ny.gov/environmental-protection/water/water-quality/diet-for-a-small-lake), at <https://dec.ny.gov/environmental-protection/water/water-quality/diet-for-a-small-lake>

² Gene E. Likens and Richard T. Holmes, [The Discovery of Acid Rain](#) (Yale University Press, 2016).

mixed with water vapor, to precipitate as acid snow or rain on our lakes, from smoke stacks far away. Action by the US Environmental Protection Agency has much reduced, but not yet eliminated, acid rain.

Terrestrial impacts on lakes within a town often flow from watersheds outside of that township. The largest, regional watershed management system is New York City's comprehensive watershed protection program,³ established in 1997. It manages the several watershed to prevent contamination of reservoirs that furnish 1.1 billion gallons of drinking water a day serving more than 9 million people in the NY City and adjacent suburbs. The program includes numerous individual undertakings that provide funds to prevent potential sources of contamination. The NYC Watershed Program is unique and not likely to be replicated elsewhere. Nonetheless, its best practices can be studied, adapted and implemented elsewhere.

Whether the scale is local, regional or national, the common denominator - as you know well - is the education of stakeholders in a watershed in order to build a culture of cooperation on lake ecosystem stewardship. In the nineteenth century, New Yorkers have been building this culture for generations. In 1894 we established in our Constitution the provision that the Forest Preserve shall be kept as "forever wild" forest land.⁴ In 1911, we were the first state to codify all our nature conservation laws into the Conservation Law. We took our lakes for granted. They were stable gems in the landscape. The Conservation Law did not provide any chapter of laws governing lakes, as it does for lands and forests. When Theodore Roosevelt became Governor, New York already was a leading steward of nature. He would share this conservation ethic nationally as President.

This acceptance of the idea that our government should sustain nature was cultivated in New York by naturalists such as John Burroughs. He was a prolific writer, whose essays on nature were read widely in the 19th century. When writing to explain water and its cycles, Burroughs took care to also celebrate appreciation of nature. He wrote: "Upon the lake you had the wildness and solitude at arm's length, and could better take their look and measure. You become something apart from them...seated upon my raft ... I was alone with the spirit of the forest-bound lakes and felt its presence and magnetism. ... Then a lake is the ear and as well as the eye of the forest. It is the place to go to listen and ascertain what sounds are abroad in the air. ... there is a wonderful unity of movement in the two elements, air and water. When there is

³ NYC Watershed Program, described at the NYS Department of State webpage: <https://dos.ny.gov/new-york-city-watershed-program> . It was the product of an agreement among governmental and non-governmental stakeholders, following settlement of several law suits, including those by the Pace Law School's Environmental Litigation Clinic. In April of 1997, far-reaching regulations aimed at the protection of New York City's drinking water supply went into effect. The Watershed Agreement was reached after more than two years of delicate negotiations by the City, the Coalition of Watershed Towns, the State of New York, the Environmental Protection Agency and a handful of environmental groups. It was agreed that the City would spend \$1.2 billion to protect its water supply at its source, rather than construct a filtration plant that would be required by the federal government under the Safe Drinking Water Act. The New York City Department of Environmental Protection (DEP) was charged with the duty to implement Watershed protection and enforce the new regulations. See generally, 15 PACE ENVTL. L. REV. 233 (1997) at <https://doi.org/10.58948/0738-6206.1339>

⁴ NYS Constitution, Article VIX, Section 1.

much going on in one there is sure to be much going on in the other. You have been casting, perhaps, with scarcely a jump or anything about you, when presently the air freshens and the trout begin to respond, then of a sudden all the performers rush in: ducks come sweeping in....the fish hawk screams, the bald eagle goes flapping by and your eyes and hands are full.”⁵

Burrough’s sentiments of nature appreciation express experiences that any one of us has had out on a lake. In Burroughs’ day, the quality of life on a lake had not changed much since Henry David Thoreau (1817-62) wrote of Walden Pond.⁶ Threats to lakes, such as from the felling of timber or discharge of wastes from mining, were isolated and localized events. In the 19th century the health of lakes was taken for granted. Lakes seemed to have existed from time immemorial, and they would last.

The 20th century, three developments shaped anew our perceptions about the “health of our lakes”: 1) lake ecology emerged as a scientific discipline; 2) chemical pollution became pervasive; and 3) environmental laws were enacted.

First, as the century opened, the scientific disciplines of ecology and limnology emerged for the first time. Limnology had begun in studies of Swiss lakes, by François Alphones Forel (1841-1912), on Lake Geneva (Le Léman) in Morges. The international limnology society was founded in 1922. In England, studies at Lake Windermere in the Lake District were underway when World War II interrupted them. As a young scientist, building on this European work and early lake studies at the University of Wisconsin, G. Evelyn Hutchinson, advocated for recognition of limnology as a scientific discipline. At Yale, with his students he investigated the biogeochemical aspects of Lindsley Pond, in Connecticut.

Hutchinson’s studies founded today’s ecological understanding of limnology. His four volume Treatise On Limnology is his comprehensive “study of lakes.” Volume 1 in the 1957, 2 in 1967, 3 in 1975 and 4 in 1993 published after his death in 1991.⁷ Hutchinson was 81, the year that NYSFOLA was founded. The research of Hutchinson and others provides the foundation and framework for the Citizens Statewide Lake Assessment Program in New York and comparable undertakings in Illinois, Maine, Minnesota and Vermont. Today scientific tools exist to assess the health of lakes, and guide lake stewardship.

Second, science began to document the unintended consequences of industrialization. Novel synthetic and organic chemicals were invented, put to use through new commercial products, and discharged as wastes into the air, waters and lands across the world. In the USA, as with the discovery of acid rain, scientists began to document the impact of wasteful and polluting practices. The invention of reactive nitrogen enabled the production of new fertilizers for crops, golf courses and suburban lawns. The excess run-off of nutrients shows up as algal blooms and lake eutrophication. The insecticide DDT impacted the reproduction of hawks and eagles, and other birds. In 1962, Rachel Carlson wrote Silent Spring, and while DDT use was curbed, the

⁵ John Burroughs, Locusts and Wild Honey, (Houghton Mifflin Co., 1879) at pp 210-212.

⁶ Henry David Thoreau, Walden - Or Life in the Woods (1854).

⁷ Nancy G. Slack, G. Evelyn Hutchinson and the Invention of Modern Ecology (Yale, 2010), chapter 8.

volume of manufactured pesticides and herbicides today exceeds the levels in 1962 by more than 800% . New York curbed most industrial water pollution, but has yet to stop much municipal sewage discharges. Ground water is not protected, as the pollution of well water in Hoosick Falls alarmed us in 2016. Pollution world-wide is at an all-time high,⁸ and the winds and water bring discharges abroad back to us in New York. PFAS “forever chemicals” are in waters world-wide and we do not know how to remove them.⁹

Third, since the first Earth Day, legislatures in New York and Washington, and world-wide, established the field of environmental law. Informed by teachings of ecology and other environmental sciences, I and others worked to create the discipline of environmental law. Our field of environmental law first appears in New York with innovative legislation and with judicial decisions¹⁰ in the late 1960s and early 1970s. With Gov. Nelson Rockefeller’s leadership, the “Conservation Law” was recodified to become the “Environmental Conservation Law” or ECL in 1972. Congress enacted the National Environmental Policy Act in 1969 (NEPA)¹¹ and for the next twenty years elaborated extensive laws that agencies such as the US Environmental Protection Agency, implemented. These laws sought to restore environmental “quality” and curb pollution, bringing Lake Erie back from the brink. Onondaga Lake became a superfund site. Concern for lakes remained a state and local focus. Few laws addressed chemical uses or the environmental risks of new chemicals.

Many federal environmental laws relied upon the states to apply and enforce them. States like New York funded implementation of environmental laws. New York’s voters repeatedly adopted Bond Acts to preserve lands and provide needed infrastructure to abate pollution. Like NEPA, New York’s State Environmental Quality Review Act (SEQRA)¹² requires avoiding adverse impacts on lakes from nearby real estate development¹³ and other activities permitted by state or local governmental agencies. New York continues to refine its state environmental legislation, going well beyond what the federal government has enacted. For example, in 1988 the legislature amended the ECL to provide in Section 17-0305 mandates for the Citizen Science Lake Assessment Program.

New York voters adopted our most dramatic environmental legislation directly in 2021, when by a 2:1 margin they added “Environmental Rights” to the State Constitution’s Bill of Rights. Article I, Section 19 states that: “Each person shall have the right to clean air and water,

⁸ See the UN Environment Programme’s scientific synthesis report, “Making Peace With Nature,” at <https://www.unep.org/resources/making-peace-nature>

⁹ Deiger Erdenesanaa, “PF AS ‘Forever Chemicals’ Are Pervasive in Water Worldwide, Study Finds,” New York Times (April 8, 2024), at <https://www.nytimes.com/2024/04/08/climate/pfas-forever-chemicals-water.html>

¹⁰ *Scenic Hudson Preservation Conference v. Federal Power Commission*, 354 F. 2d 608 (2d Cir. 1965), available at <https://supreme.justia.com/cases/federal/us/407/926/> .

¹¹ 42 U.S.C. 4321. See <https://ceq.doe.gov/laws-regulations/laws.html>

¹² Article 8, Environmental Conservation Law.

¹³ See, e.g. the current struggle to preserve Pocantico Lake, in Westchester County. The lake is a County Park, but the development that would impact is it outside the Park boundaries. See “Save Pocantico Lake” at <https://www.savepocanticolake.org/>

and a healthful environment.”¹⁴ It will take several years for New York State’s courts to interpret and enforce these rights. For example, when a state agency or local government acts to violate a person’s right to clean water, that person may ask a court to provide a remedy to safeguard or restores the clean water. In the context of lakes, this right to clean water and a healthful environment elevates a person’s right to enjoy clean lake water. In instances of incompatible uses, a person’s right to clean water now enjoys constitutional priority over other uses that deny clean water and water’s health fulfilling benefits. Courts will define what is “clean” in the factual context of each governmental action that violates a person’s claimed right. The human right to water is well documented,¹⁵ and the history of Article I, Section 19 makes it clear that this guarantee applies to government actions that fail to protect a person, as happened for persons at Hoosick Falls.¹⁶ The NYS DEC today is providing a safe source of drinking water for persons in Hoosick Falls.¹⁷

Thus, where a lake, or the aquifer around a lake, provides drinking water or clean water for other healthful purposes, each person’s right to that clean water is now guaranteed in the constitution. Whenever governmental action, or the failure to act, causes a threat or denial of this right, a person can demand that his or her right be respected, and if it is not, the person can ask a court to require that a governmental official honor that right. Healthy freshwater wetlands recharge ground water and filter out pollutants. Governmentally sanctioned harm to wetlands and releases of pollutants can cause eutrophication, which may cause risk to human health.¹⁸

To bring a claim to a state court, a person whose clean lake water rights are at risk will need to gather the ecological and limnological facts that support judicial intervention to enforce their rights. This will require a lot of empirical field work, and solid environmental facts. Once the claim is made, however, the burden is on the government agency to show a judge that it is honoring its constitutional duty to guarantee a person’s environmental rights.

These small examples show how environmental law in New York is entering a new era. Just as New York’s Bill of Rights protects each person’s right to due process of law and freedom of speech or religion, or prohibits government from arbitrarily taking property without just compensation, or guarantees a defendant’s right to a jury in a criminal prosecution, *so now it also protects environmental rights*. Clean air and water are birth rights, not amenities. The NYS Department of Health and NYS DEC no longer have discretion to postpone or solely determine what to do if persons claim their environmental rights are being denied. Whenever environmental

¹⁴ See the archive on these rights at <https://nygreen.pace.edu/>

¹⁵ *Id.*, “right to water” under secondary references, at <https://bpb-us-w2.wpmucdn.com/blogs.pace.edu/dist/1/400/files/2023/05/Right-to-Water.pdf>

¹⁶ See comments of legislators in the debates to adopt the “Green Amendment” before submitting it to the voters as a constitutional amendment. <https://nygreen.pace.edu/>

¹⁷ <https://dec.ny.gov/news/press-releases/2021/12/dec-releases-final-plan-to-provide-new-permanent-clean-drinking-water-source-for-hoosick-falls>

¹⁸ See Hwang SJ. “Eutrophication and the Ecological Health Risk.” *Int J Environ Res Public Health*. 2020 Aug 31;17(17):6332. doi: 10.3390/ijerph17176332. PMID: 32878106; PMCID: PMC7503835. Available on line at <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7503835/>

impacts are studied under the State Environmental Quality Review Act (SEQRA),¹⁹ governmental agencies will need to assess whether or not a proposed action would violate a person’s constitutional environmental rights. Many regulations may need to be revised to observe these new Environmental Rights.

Some are worried about how courts will interpret environmental rights, upsetting settled patterns of behavior. Others welcome the new rights as arriving just in time to be useful in coping with the impacts of climate change. The disruptions of climate change will change everything. The North American Lake Management Society has selected these impacts as the theme for its annual conference next November.²⁰ At the end of 2022, New York State adopted a legally binding Climate Scoping Plan,²¹ designed to guide New York’s legislated duty to reduce greenhouse gas emissions and achieve net-zero emissions, increase renewable energy use, and ensure all communities equitably benefit in the clean energy transition. The Scoping Plan’s chapter on “Land Use” will affect regional planning for lakes and wetlands and forests:

“There are more than 28 million acres of natural and working lands in New York. Smart growth and local planning and decision-making are needed to inventory and maintain existing wetlands, high value conservation areas, and agricultural production for GHG [greenhouse gas] emissions mitigation, resilience, and adaptation benefits while balancing the increased demand for areas devoted to renewable energy production, forest land, and development.”

The key strategies in the Scoping Plan include wetlands, but make no mention of lakes. This is a mistake, which can be remedied. The Scoping Plan is to be revised every five years. Carbon storage and sequestration is the focus of the Land Use chapter. The Scoping Plan notes that “At the State level, the threshold for freshwater wetland protection will drop from 12.4 to 7.4 acres in 2028, and implementation of the expanded protection will require changes to regulations, updated guidance, and greater administration and enforcement.”²² Many wetlands are associated with lakes, and *vice versa*. The review of these regulations will necessarily bring lake stewardship into the picture. Implementing New York’s Climate Scoping Plan offers opportunities to strengthen lake stewardship.

Beyond the Scoping Plan, a further source for new concepts in lake stewardship will emerge from the Nature Conservancy’s freshwater research preserve at Follensby Pond in the

¹⁹ Article 8, Environmental Conservation Law. Discussed in Chapter 10, “Legal Framework: It Helps to Know the Rules,” in *Diet for a Small Lake*, at <https://dec.ny.gov/environmental-protection/water/water-quality/diet-for-a-small-lake>

²⁰ “Flood and Drought, Fire and Ice: Managing lakes under changing climates” NALMS 44th International Symposium, November 5-8, 2024, at South Lake Tahoe, California/Nevada. See <https://www.nalms.org/>

²¹ <https://climate.ny.gov/resources/scoping-plan/>

²² *Id.*, at Chapter 10.

Adirondack Forest Preserve.²³ The Conservancy, with DEC and other agencies, will study this nearly pristine pond to learn how to sustain cold freshwater fish and their habitat amidst the myriad impacts of climate change. Fostering a lake's resilience is emerging as the front line for nature conservation. Research also draws on traditional ecological knowledge of Indigenous Peoples, the theme of the NYSFOLA annual conference opening address by Neil Patterson last year. Dr. Robin Wall Kimmerer, director of SUNY College of Environmental Science and Forestry's Center for Native Peoples and the Environment, welcome participating in this research at Follensby Pond. She observed, "With our partners, we look forward to creating opportunities for a productive collaboration between Traditional Ecological Knowledge and conservation science based on mutual respect, reciprocity and shared access. Land care which reflects Indigenous perspectives and priorities has the potential to enhance the well-being of land and cultures in the extraordinary landscape of Follensby Pond."²⁴ New York's Follensby Pond is for limnology tomorrow what Connecticut's Lindsley Pond was for Evelyn Hutchinson. A new chapter of limnology ecology is likely to emerge, which can guide enactment of new ecological laws for sustaining the health of lakes.

Robin Wall Kimmerer describes her relations with a lake in Braiding Sweetgrass (2013):

"I don't know how long I floated, but my little red boat drifted the length of the lake. Rustling whispers around my hull drew me from reveries and the first thing I saw upon opening my eyes were polished green leaves of water lilies and spatterdock smiling up at me again, rooted in darkness and floating in light. ... The lilies seemed to pulse with light, green hearts beating with my own. There were young heart leaves below the water on their way up and old leaves on the surface, some with edges tattered by a summer of wind and waves and, no doubt, kayak paddles. ... The new leaves take up oxygen into the packed air spaces of their young, developing tissues ... the older leaves create a low pressure region where oxygen can be released into the atmosphere.... The young and the old are linked in one long breath, an inhalation that calls for reciprocal exhalation, nourishing the common root from which they both arise. New leaf to old, old to new, mother to daughter – mutuality endures. I am consoled by the lesson of lilies."²⁵

Humans relate to lakes in deeply personal ways. You and I have enjoyed moments on lakes akin to those described by Kimmerer and Burroughs. Lakes have refreshed my body and soul. Do we not know as much, if not more, about lakes from personal experience, than we do from the data collected for limnology?

²³ <https://www.nature.org/en-us/about-us/where-we-work/united-states/new-york/stories-in-new-york/follensby-pond-raquette-river/>

²⁴ *Id.*

²⁵ Robin Wall Kimmerer, Braiding Sweetgrass (2013) at pp. 102-103.

We have an instinctive appreciation for lakes, admiring mists rising off their surface, marveling at the beauty of flowers of the deeply rooted lilies, or meandering along lake shores where land, air and water combine. Like many other mammals, we share lakes with insects, water fowl, fish, and plants. As lake stewards, we share with others how to care for lakes. No one tells us to do so; we do so because we care.

Today, in the 21st century, the times increasingly test our capacity to be effective stewards. Climate disruption is changing the biodiversity of each lake.²⁶ New invasive species appear. Distant pollutants endanger lake life. As Earth's hydrologic cycle changes, recurring droughts and floods will test the resilience of lakes.²⁷ Our recollections of past extreme events can provide a basis to rethink environmental stewardship. For example, the naturalist John Hay recalls how the Hurricane of 1938 "cut a swath through inland New England and hit our lakeside area head on."²⁸ We shall again face the orange skies of thick smoke from Canadian wildfires, polluting our air, as we experienced in 2023. We would do well to remember the autumn of 1876, when drought denied New York rain for three months, and John Burroughs wrote, "the capacity of the atmosphere to absorb and dissipate the smoke was exhausted and innumerable fires in forests and peat-swamps made the days and weeks – not blue but a dirty yellowish white."²⁹ Droughts already deplete and dry up reservoirs. We recall the "Dust Bowl" from John Steinbeck's Grapes of Wrath (1939).

We and nature have recovered from these "extreme" events in the past, and we can learn how to strengthen resilience to do so again. We make our tasks more difficult because we allow pollution to weaken the ecological systems that we depend upon, while harming our human health. Invoking our constitutional environmental rights to sustain clean air and water can assist us in our quest to find new ways to cope with climate change, biodiversity loss and pollution.

New themes in lake stewardship have emerged, and others will emerge. As you contemplate the contents of a possible 3rd edition of Diet for a Small Lake, it is likely that your guidance will need to assess *how* NYSFOLA can best sustain and restore lake resilience, Strengthening resilience in our communities of humans and lakes becomes as important as anything we have sought to do to date. .

Thank you for the privilege of sharing these thoughts as you begin your annual conference.

²⁶ Grant, L., Vanderkelen, I., Gudmundsson, L. *et al.* "Attribution of global lake systems change to anthropogenic forcing," *Nat. Geosci.* 14, 849–854 (2021). <https://doi.org/10.1038/s41561-021-00833-x>,

²⁷ The scientific consensus on climate impacts broadly is documented in the reports of the Intergovernmental Panel Climate Change, at <https://www.ipcc.ch/>

²⁸ John Hay, "Custodians of Space," The Immortal Wilderness (198 7).

²⁹ John Burroughs, Locusts and Wild Honey, at pp. 74-75.

