



Department of
Environmental
Conservation

Great Lakes Program Report

2020–2022

Kathy Hochul, Governor | Basil Seggos, Commissioner





A grove of hemlock
trees at Mexico
Point State Park

Table of Contents

Message from the Commissioner 2

List of Abbreviations and Acronyms 3

New York’s Great Lakes Program Background and Updates 4

Restoring Environmental Quality 6

Conserving and Restoring Natural Resources 10

Promoting Resilient Communities and Sustainable Development 13

Building Science, Great Lakes Literacy, and Stewardship Capacity 17

Looking Ahead 20

How to Get Involved 21



Barcelona
Lighthouse on
Lake Erie

Message from the Commissioner

New York's Great Lakes and their watershed, including Lake Erie, Lake Ontario, and the Niagara and St. Lawrence rivers, are major defining natural features of upstate New York, familiar to millions who enjoy the region's scenic byways or admire its grandeur from the headwaters in the Adirondacks and Finger Lakes. The Great Lakes support communities and key industries such as shipping, fisheries, tourism, and recreation, and the lakes provide drinking water to about 4 million people. It is essential that we manage this invaluable resource responsibly. This report highlights the Great Lakes Program and the actions that the New York State Department of Environmental Conservation (DEC) and partners are taking to help protect and enhance our Great Lakes for the benefit of the people and wildlife that depend on these ecosystems.



Donald Zelazny

This fall, DEC Great Lakes Programs Coordinator, Donald Zelazny, retired following an accomplished career dedicated to restoring and protecting the incredible land and water resources of New York's Great Lakes region. Don served as the coordinator of the Great Lakes Program since joining the DEC in 2000. His vision and passion guided and significantly expanded DEC's role in Great Lakes ecosystem management. Don worked effectively across state and national lines to build strong partnerships that have resulted in lasting benefits for New York's Great Lakes.

An engaged public is critical to conserving and enhancing the Great Lakes ecosystem. The Great Lakes Program, in collaboration with government partners, civic and environmental groups, and residents and visitors, will continue to implement the shared vision and mission of New York's Great Lakes Action Agenda, as exemplified by the many successes detailed in this report. This work will continue by advancing Governor Kathy Hochul's vision, including the Clean Water, Clean Air, and Green Jobs Environmental Bond Act; New York's Ocean and Great Lakes Program; and the Great Lakes Restoration Initiative. A key component of this work will be meeting New York's goals under the binational Great Lakes Water Quality Agreement.

We look forward to your participation and partnership as we work to protect and enhance the integrity of New York's Great Lakes and their watershed.

Sincerely,

A handwritten signature in black ink, appearing to read 'Basil Seggos'.

Basil Seggos, Commissioner



Basil Seggos,
Commissioner

List of Abbreviations and Acronyms

9E – Nine Element (Plan)

AGM – (New York State) Department of Agriculture and Markets

AIS – Aquatic Invasive Species

AOC – Area of Concern

BMP – Best Management Practice

BUI – Beneficial Use Impairment

CLEAR – Coastal Lakeshore Economies and Resiliency

CSC – Climate Smart Communities

CSMI – Cooperative Science and Monitoring Initiative

DEC – (New York State) Department of Environmental Conservation

DOS – (New York State) Department of State

DOW – (DEC) Division of Water

EBM – Ecosystem-Based Management

EPF – Environmental Protection Fund

FEMA – Federal Emergency Management Agency

FL Hub – (DEC) Finger Lakes Watershed Program

FLLOWPA – Finger Lakes-Lake Ontario Watershed Protection Alliance

GLAA – (New York's) Great Lakes Action Agenda

GLEEE – (New York's) Great Lakes Ecosystem Education Exchange

GLLA – Great Lakes Legacy Act

GLRI – Great Lakes Restoration Initiative

GLWQA – Great Lakes Water Quality Agreement

IWAP – Integrated Watershed Action Plan

LAMP – Lakewide Action and Management Plan

LEWPA – Lake Erie Watershed Protection Alliance

LWRP – Local Waterfront Revitalization Program

NAACC – North Atlantic Aquatic Connectivity Collaborative

NYSG – New York Sea Grant

OCWC – Oatka Creek Watershed Committee

OPRHP – (New York State) Office of Parks, Recreation and Historic Preservation

REDI – Resiliency and Economic Development Initiative

SUNY ESF – State University of New York College of Environmental Science and Forestry

SLRWP – St. Lawrence River Watershed Project

SRMT – St. Regis Mohawk Tribe

SWCD – Soil and Water Conservation District

TILT – Thousand Islands Land Trust

TMDL – Total Maximum Daily Load

USACE – U.S. Army Corps of Engineers

USEPA – U.S. Environmental Protection Agency

USGS – U.S. Geological Survey

USFWS – U.S. Fish and Wildlife Service

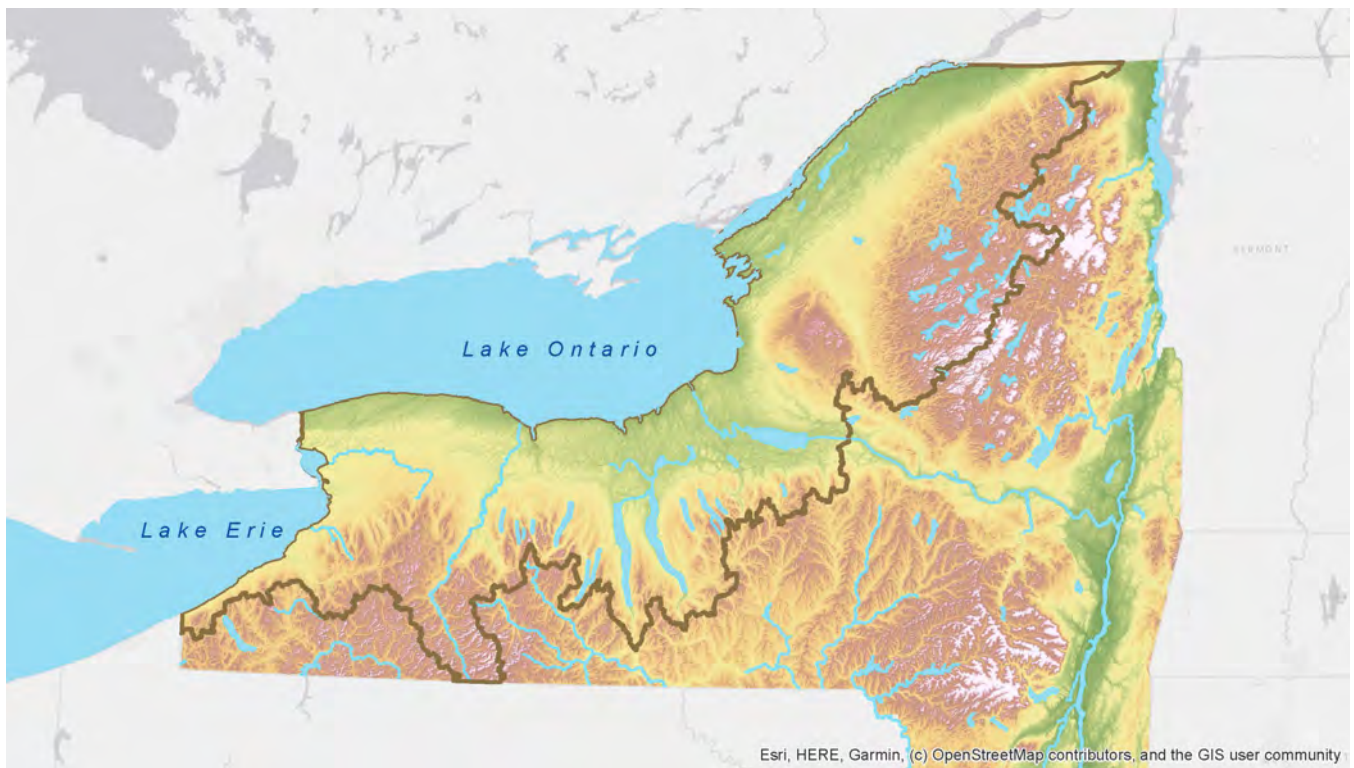
WHIRL – Water and Habitat on the Indian River Lakes

WMP – Watershed Management Plan

WQIP – Water Quality Improvement Project Program

WRI – Water Resources Institute (at Cornell University)

The Erie Canal and Greenway
Trail in Brockport, NY



New York's Great Lakes Program Background and Updates

The DEC Great Lakes Program works to protect, restore, and enhance water quality and ecosystem integrity for lands and waters within the state's Great Lakes watershed, by applying an ecosystem-based management (EBM) approach. For more information, visit <https://www.dec.ny.gov/lands/25562.html>.

Ecosystem-based management is a systems-based approach that strives to balance the needs of people, nature, and the economy through scientifically informed decision-making.

The efforts of DEC's Great Lakes Watershed Program are guided by New York's Great Lakes Action Agenda (GLAA). From 2020–2022 the DEC, along with other state agencies and partners, has been working to update the GLAA with goals, strategies, and actions needed through 2030 to conserve, restore, protect, and enhance New York's Great Lakes lands and waters. For more information, visit <https://www.dec.ny.gov/lands/91881.html>.

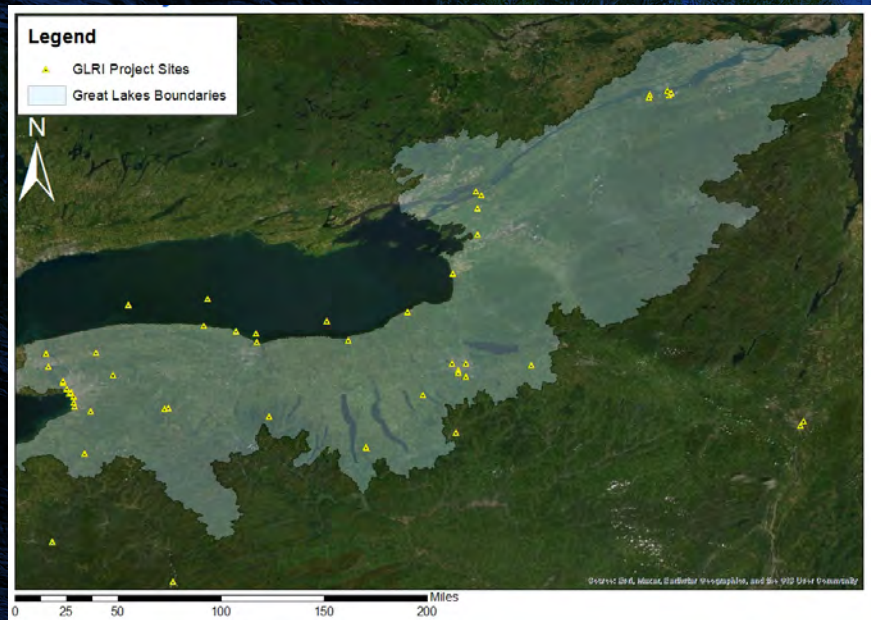


An aerial view of the restoration work at Grand Island, photo by NYS OPRHP

By the Numbers

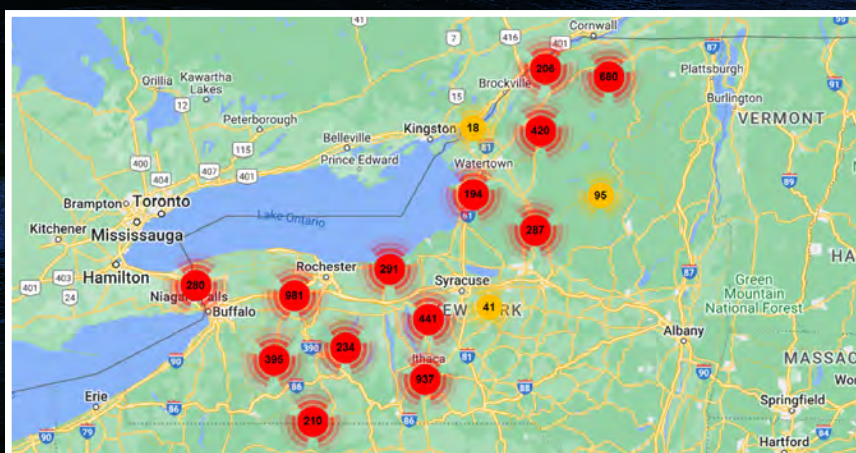
From 2020–2022, the Great Lakes Program and partners have made the following progress in support of implementing the GLAA in New York's Great Lakes watershed:

- **7 BENEFICIAL USE IMPAIRMENTS (BUIs)** removed within 3 Areas of Concern (AOCs);
- **84 DEC WATER QUALITY IMPROVEMENT PROJECT (WOIP) GRANTS** totaling over \$104 million;
- **43 NYS DEPARTMENT OF AGRICULTURE AND MARKETS (AGM) Agricultural Nonpoint Source Abatement and Control projects** supported with nearly \$12 million;
- **207 GREAT LAKES RESTORATION INITIATIVE (GLRI) PROJECTS** totaling \$40,764,313 in federal funding;
- **90 REGISTERED CLIMATE SMART COMMUNITIES (CSC);**
- **2 NINE ELEMENT (9E) WATERSHED PLANS DEVELOPED;**



Map portraying locations of projects funded by Great Lakes Restoration Initiative in New York 2020–2022

- **79 TEACHERS PARTICIPATED** in 8 Great Lakes Ecosystem Education Exchange (GLEEE) workshops with an estimated **5,175 STUDENTS REACHED;**
- **22 RESILIENT NY STREAM STUDIES COMPLETED;**
- **3,600 ACRES SURVEYED** for aquatic macrophytes under new Region 7 and Region 9 aquatic invasive species (AIS) coordination capacity;
- **1,183 CULVERT ASSESSMENTS COMPLETED** using the North Atlantic Aquatic Connectivity (NAACC) Protocols;
- **29 MILES OF UPSTREAM AQUATIC HABITAT RECONNECTED;**
- **2 INTEGRATED WATERSHED ACTION PLANS (IWAPS) BEING DEVELOPED;**
- **120 UNIQUE ATTENDEES JOINED US** for the Great Lakes Collaborators webinar series in 2020.



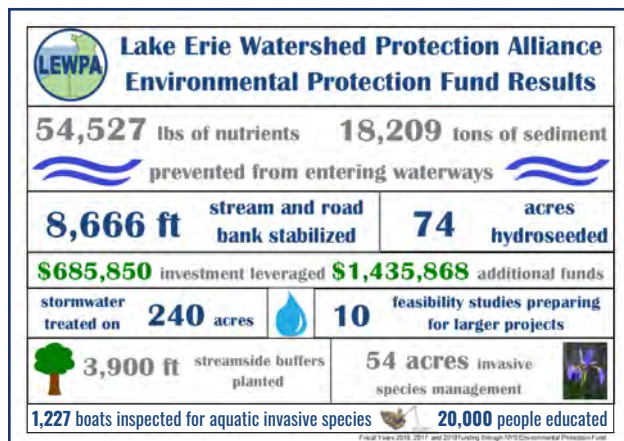
Map portraying the number of culvert assessments completed in New York's Great Lakes as of September 2022

Restoring Environmental Quality

DEC relies on local partners to develop and implement clean water plans. The following information explains how each major watershed is being managed for environmental quality:

Lake Erie

DEC and the U.S. Geological Survey (USGS) conducted monthly sampling for nutrients and sediments in 19 locations across the watershed, and the Lake Erie Watershed Protection Alliance (LEWPA) conducted pathogen monitoring at the same 19 sites for E. coli, fecal coliform, and total coliform bacteria. The baseline water quality data will be used to develop a watershed model for the Regional Niagara River/Lake Erie Watershed Management Plan (WMP), a Nine Element Plan (9E Plan), which will help target further water quality improvement efforts in the basin. For more information from LEWPA, visit <https://www3.erie.gov/environment/watershed-management-plan>. For more information on 9E plans from DEC, visit https://www.dec.ny.gov/docs/water_pdf/9efaq17.pdf.



LEWPA infographic of efforts supported through Environmental Protection Funds

Genesee River

The Genesee River Coalition of Water Districts and other local partners continue to implement the Genesee River 9E Plan for Phosphorus and Sediment. Between 2020 and 2022, partners in the watershed secured millions of dollars in state and federal grants to support projects that protect and improve water quality, including agricultural BMPs (such as cover crops), waste and stormwater system improvements, streambank stabilization, and salt storage. For more information about the coalition, visit <https://monroecountyswcd.org/page-45.html>. Access the Genesee River 9E Plan at https://www.dec.ny.gov/docs/water_pdf/geneseeninelement.pdf.

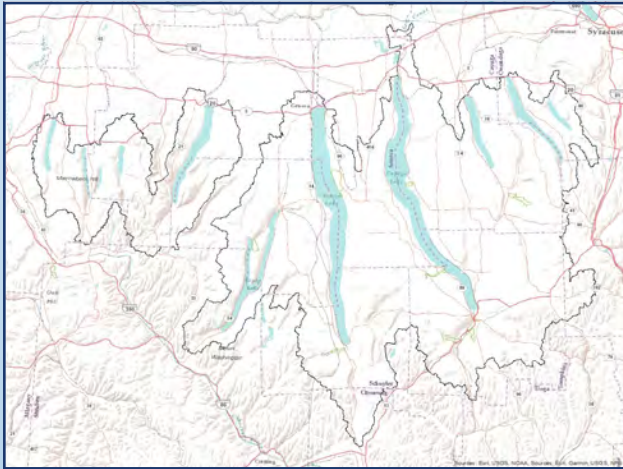
Black River

The Black River Initiative continues as a model for engaging with stakeholders to implement watershed management, including efforts to adaptively model and monitor nutrient loading in the watershed. DEC is monitoring the Black River watershed as part of the 2022 Rotating Intensive Basin Studies to evaluate water quality trends and the benefits of project implementation. Additionally, the Tug Hill Commission assessed the annual Black River Trash Bash efforts and reported that since 2012, participants have removed 6,000 pounds of trash from the watershed. To learn more and get involved with the Black River Initiative, visit <https://tughill.org/projects/black-river-projects>.

St. Lawrence River

St. Lawrence River Watershed Project (SLRWP) partners have been busy promoting awareness about the final St. Lawrence River Watershed Revitalization Plan and developing project proposals to implement recommendations of the plan. DEC has recently announced plans to develop a phosphorus Total Maximum Daily Load Plan (TMDL)—a regulatory clean water plan—for the impaired Black Lake and its surrounding watershed, as required by the Clean Water Act. A TMDL is required for Black Lake to restore its best uses of primary and secondary contact recreation, including swimming, fishing, and boating. The TMDL will identify phosphorus loading reductions needed from various point and nonpoint sources to support best uses. DEC will engage local stakeholders throughout the TMDL development process. For more information on SLRWP, visit <https://fcswcd.org/partnerships/st-lawrence-river-watershed-partnership-slrwp/>. For information on TMDLs, visit https://www.dec.ny.gov/docs/water_pdf/tmdlfaq17.pdf. To contact the DOW with questions, email DOWinformation@dec.ny.gov.

Oswego-Finger Lakes



Finger Lakes watershed boundary map

DEC's Finger Lakes Watershed Program (FL Hub) works with partners to conserve, preserve, and restore the environmental quality of the Finger Lakes and their watersheds, while helping to manage the resources of the region for a sustainable future. From 2020–22, FL Hub accomplished the following in the region:

- FL Hub staff administered contracts with Finger Lakes-Lake Ontario Watershed Protection Alliance (FLOWPA) and LEWPA, provided technical assistance and quality assurance support, and reviewed annual workplans for consistency with DEC Division of Water (DOW) priorities. FL Hub staff undertook several projects, including installation of best management practices (BMPs), water quality monitoring, public education, and invasive species control. DEC FL Hub finalized two 9E WMPs with support from New York State Department of State (DOS) to reduce nutrient loading to the Finger Lakes, including an Owasco Lake Watershed 9E Plan for Phosphorus Reduction, and the Seneca-Keuka Watershed 9E Plan for Phosphorus. For more information about FLOWPA, visit <http://www.flowpa.org/>, and for more information on clean water plans, visit <https://www.dec.ny.gov/chemical/23835.html>.
- DEC FL Hub staff continued to support water quality monitoring efforts by conducting winter sampling at all 11 Finger Lakes and coordinating citizen-science monitoring efforts with New York State Federation of Lake Associations under DEC's Citizen Statewide Lake Assessment Program, which is available at <https://www.dec.ny.gov/chemical/81576.html>.
- DEC FL Hub staff coordinated with Department of Agriculture and Markets (AGM) and regional Soil and Water Conservation Districts (SWCDs) to complete the Eastern Finger Lakes Cover Crop Initiative pilot program. The program installed over 4,800 acres of cover crops to protect water quality in Cayuga, Owasco, and Skaneateles lakes. This successful program has been expanded to all 11 counties in the Finger Lakes watersheds in 2022. For more information, visit <https://www.dec.ny.gov/lands/122661.html>.

Managing the Lakes to Meet Binational Commitments

Lakewide Action and Management Plans (LAMPs) for Lake Erie and Lake Ontario are binational EBM strategies to restore and protect the water quality of the lakes and their connecting river systems, the Niagara and St. Lawrence. The plans identify actions needed and objectives for achieving Great Lakes Water Quality Agreement (GLWQA) commitments for swimmable, fishable, and drinkable lakes in the U.S. and Canada. These plans are updated every five years, with plans for Lake Ontario to be updated in 2023 and Lake Erie in 2024. Annual Lake Erie and Lake Ontario LAMP reports share successes of the LAMP implementation in the U.S. and Canada. Reports from EPA are available at www.binational.net, and more information is available from DEC at <https://www.dec.ny.gov/lands/92335.html>.

Informing Lake Management with Science

The Cooperative Science and Monitoring Initiative (CSMI) is a binational effort by the U.S. and Canada under the GLWQA to coordinate research and monitoring activities that provide resource managers with the science necessary to support LAMP actions and other management decisions. A five-year cycle is employed to coordinate the CSMI process for each Great Lake, so that intensive monitoring occurs on one of the lakes each year. CSMI monitoring of Lake Ontario and Lake Erie last occurred in 2018 and 2019, respectively. The next CSMI monitoring years for those lakes are 2023 and 2024, respectively. Lake Ontario research priorities in 2023 have been awarded \$2,301,440 in Great Lakes Restoration Initiative (GLRI) funding, and include the following projects and partner recipients:

- Identify lake trout spawning distributions and habitats to address reproductive impediments to Lake trout restoration in Lake Ontario, U.S. Fish and Wildlife Service (USFWS);
- Complete Lake Ontario lake trout spawning habitat assessment, USFWS;
- Study Lake Ontario nearshore nutrient and contaminants, USGS;
- Monitor Lake Ontario embayment continuous productivity, USGS;
- Provide field and analytical support for Lake Ontario CSMI lake trout spawning habitat research, USGS;
- Conduct mercury cycling and bioaccumulation in the Lake Ontario food web, USGS.

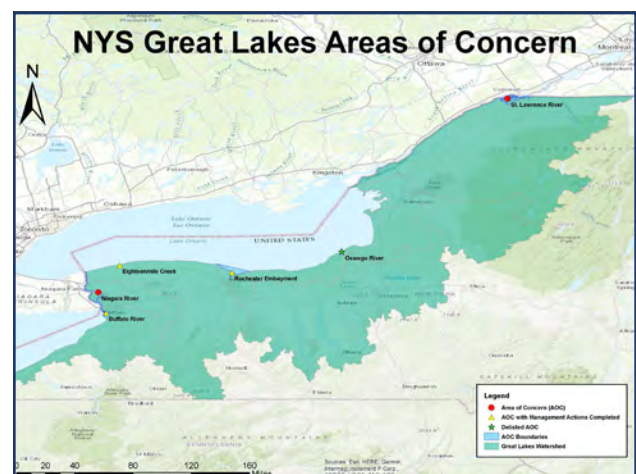
For more information, visit <https://www.epa.gov/great-lakes-monitoring/cooperative-science-and-monitoring-initiative-csmi>.



The EPA Research Vessel Lake Guardian on Lake Ontario

Environmental Justice is the fair and meaningful treatment of all people, regardless of race, income, national origin, or color, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. For more information, visit <https://www.dec.ny.gov/public/911.html>.

Restoring AOCs

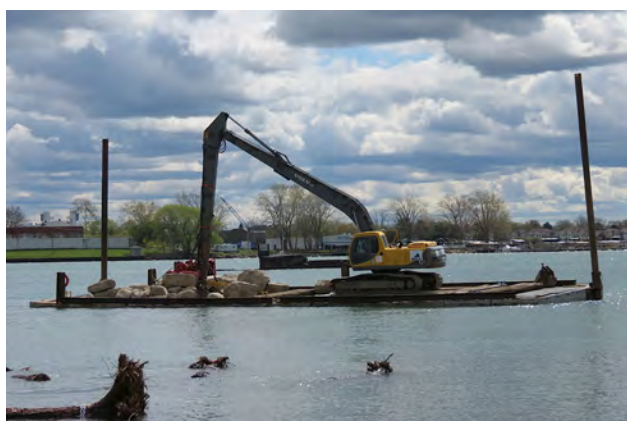


Map of locations of AOCs in New York

DEC and partners continue to work toward restoring beneficial uses (such as fish and wildlife habitat, aesthetics, and bathing beaches) and delisting the five remaining Great Lakes Areas of Concern (AOCs) within New York State. Many of these areas are also located within DEC-designated potential environmental justice areas. For more information about AOCs, visit <https://www.dec.ny.gov/lands/91213.html>.

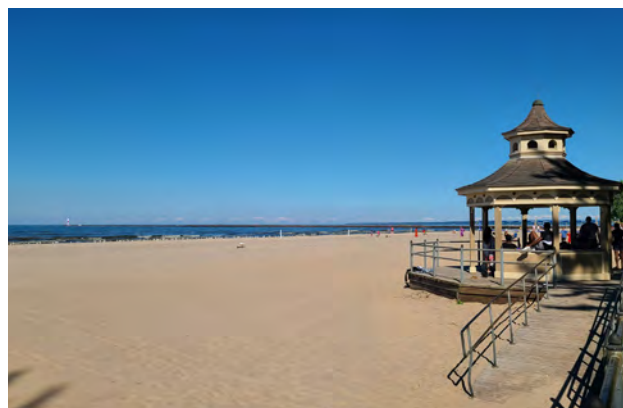
From 2020–2022, in collaboration with other DEC programs, federal, state, tribal, and local agencies, as well as non-government partner organizations, have continued to implement restoration and monitoring/assessment projects that have led to the removal of several Beneficial Use Impairments (BUIs) in New York's Great Lakes AOCs, including:

- **Buffalo River:** The Tainting of Fish and Wildlife Flavor and Restrictions on Dredging Activities BUIs were removed in 2020 and 2022, respectively. Two additional BUIs, Loss of Fish and Wildlife Habitat and Degradation of Benthos, are scheduled to be removed in 2023. All restoration projects that had been identified as necessary for removing the remaining BUIs have been completed, although some additional monitoring will be needed to confirm that conditions have been restored to the degree necessary for BUI removal. Check out a recent video highlighting this work at <https://www.youtube.com/watch?v=fly0hNQ1hRA>.
- **Niagara River:** The USGS completed a study of the river's benthic (bottom-dwelling) community in support of the potential removal of the Degradation of Benthos BUI in 2023. EPA has set a goal of remediating all contaminated sediment by 2030, with substantial federal investment under the Great Lakes Legacy Act (GLLA). DEC and EPA entered a GLLA partnership agreement under which they will investigate and design remedies for contaminated sediment in lower Scajaquada Creek and the Black Rock Canal. They are also developing additional GLLA partnership agreements for other areas of the AOC. Seven of 12 habitat restoration projects required by the AOC Habitat Restoration Plan, which calls primarily for coastal wetland restoration, are now complete, and work is underway on 3 others. Overall, about 40 habitat restoration projects have been completed in the AOC since the publication of the Remedial Action Plan in 1994. To watch a video highlighting joint U.S. and Canadian habitat restoration efforts, visit <https://ourniagarariver.ca/binational-habitat/>.



A barge on Spicer Creek is placing stone and wood to protect wetlands and restore habitat.

- **Eighteen Mile Creek:** Progress through 2022 has included the removal of the Restrictions on Dredging Activities BUI, and data collection in support of removing the Degradation of Benthos and Degradation of Fish and Wildlife Populations BUI. Benthic community assessments and fish contaminant monitoring are ongoing. Several additional BUI removals will be dependent on the completion and outcomes of ongoing sediment remediation being performed under the federal Superfund program, which EPA recently announced additional support for under the Bipartisan Infrastructure Law.
- **Rochester Embayment:** Several BUIs have been removed in recent years, including Restrictions on Fish and Wildlife Consumption (2020), Degradation of Fish and Wildlife Populations (2021), Degradation of Aesthetics (2022), and Bird or Animal Deformities or Reproduction Problems (2022). Removal of the last remaining BUI, Loss of Fish and Wildlife Habitat, is anticipated in 2023, which would then allow DEC and partners to move into the AOC delisting phase. This would be the second New York State AOC to be delisted, the first being Oswego River in 2006.



Ontario Beach in Rochester supports recreation within a DEC-designated potential environmental justice community.

- **St. Lawrence River at Massena/Akwesasne:** DEC coordinates AOC restoration efforts with the Saint Regis Mohawk Tribe (SRMT) under a cooperative agreement finalized in 2019. SRMT and DEC have led efforts to protect and restore native mussel species during and after sediment remediation activities. DEC and SRMT developed targeted endpoints for native mussel restoration as part of the removal criteria for the Degradation of Benthos BUI. In addition to the mussel restoration work, several studies are underway to investigate habitat restoration needs, including shoreline and riparian habitat assessments, wetland surveys, and submerged and emergent aquatic vegetation studies.

Conserving and Restoring Natural Resources

To conserve and protect important Great Lakes fish and wildlife habitats, DEC and partners have completed or initiated the following actions over the past two years:

Advancing Aquatic Connectivity

- **NAACC:** DEC has been coordinating with the North Atlantic Aquatic Connectivity (NAACC) work group in New York to engage State agencies and partners in culvert assessments and enhancements that will improve aquatic connectivity, stream resiliency, and public safety. Additional training, funding opportunities, and demonstration projects are continuing to promote the state of practice. An additional 1,183 culvert assessments have been completed in New York's Great Lakes basin since 2020. This assessment data can be used by local municipalities and partners for decision-making and implementation of culvert enhancement (or right-sizing) projects. NAACC data can be accessed at <https://streamcontinuity.org/naacc/>.



DEC staff and partners learn how to assess culverts using the NAACC protocols at a training in October 2022.

- **Smith Mills Dam Removal:** DEC and partners completed a dam removal in 2020 on the Silver Creek tributary to Lake Erie to restore four miles of fish passage for steelhead trout and other aquatic organisms, and to improve public safety. Project partners included Chautauqua County, LEWPA, Village of Silver Creek, Town of Hanover, DEC, and USFWS. Funding from the DEC Water Quality Improvement Project (WQIP) was awarded in support of the project. A story map was developed to showcase this effort, which can be accessed at <https://storymaps.arcgis.com/stories/ba01e3f8b50f443f817a3081ea5d7ef4>.

- **Restoring stream connectivity on Wiscoy Creek:** Wiscoy Creek in the Genesee River watershed is a premier wild trout fishery supporting both brown and brook trout. In 2021, the 100-plus-year-old Pike Dam was replaced with an engineered rock riffle to allow fish passage over the structure, maintain the lower pool, and support an accessible fishing platform. A total of 25 miles of stream were reconnected for the benefit of fish and anglers. The project was a partner effort involving DEC, the Town of Pike, and Wyoming County SWCD, with funding from USFWS and the National Fish and Wildlife Foundation's "Sustain Our Great Lakes" program.



BEFORE



AFTER

Before and after restoration of Wiscoy Creek to improve fish habitat

Managing Invasive Species

- DEC has partnered with the New York State Water Resources Institute (WRI) at Cornell University to build capacity to manage aquatic invasive species (AIS), helping to reduce the negative impact of AIS in our waterways. Two new AIS coordinators were hired in Syracuse and Buffalo to coordinate efforts within their respective DEC regions. Throughout the past year, staff have worked with partners to conduct macrophyte surveys across 3,600 acres of lakes and rivers, support hydrilla control in Tonawanda Creek, Erie Canal, and Cayuga Lake, and assisted the Finger Lakes Partners for Regional Invasive Species Management with hand pulling 6,500 pounds of water chestnut and European frogbit, including 5,000 pounds from one outing at Montezuma Wildlife Refuge. AIS coordinators assisted DEC Fisheries staff with completing assessments of muskellunge habitats in the Niagara River and partnered with The Nature Conservancy to survey submerged aquatic vegetation in the Buffalo River. For more information and to learn how you can help prevent the spread of AIS, visit <https://www.dec.ny.gov/animals/50121.html>.

This July, DEC and partners also participated in the 4th annual Great Lakes AIS Landing Blitz to communicate with boaters throughout New York State about the risks of AIS and how to prevent their spread. Learn more at <https://www.glc.org/work/blitz>.



Water chestnut harvest on the Oswegatchie River

- **Lake Sturgeon Recovery Success in the Lower Genesee River:** On May 25, 2021, USGS Tunison Laboratory of Aquatic Science documented a 61-inch, nearly 70-pound spawning female lake sturgeon (*Acipenser fulvescens*) in the lower Genesee River. This was the first time that a spawning female lake sturgeon had been netted in the lower Genesee River in over 50 years, a milestone for the restoration of this species. The sturgeon was collected within the Rochester Embayment AOC section of the lower Genesee River, and monitoring efforts during May 2022 resulted in the capture of three adult females and nine adult males, showing further success of lake sturgeon restoration efforts. Partners involved with the implementation of the Lake Sturgeon Recovery Plan 2018–2024 include DEC, USGS, USFWS, Cornell University, SRMT, and multiple local governments, non-governmental organizations, and utility providers. To access the full press release, visit <https://www.dec.ny.gov/press/123388.html>. The Lake Sturgeon Recovery Plan can be viewed at https://www.dec.ny.gov/docs/fish_marine_pdf/lakesturgeonrp.pdf.
- **Aquatic Habitat Improvements in Jefferson County:** Habitat enhancements were completed on the Black River below the town of Dexter and in Chaumont Bay in partnership with USFWS and USGS. Spawning beds and reefs were constructed to create new spawning habitat for native fish species, including walleye and the New York State Threatened lake sturgeon, which are critical fish species for local economies and ecological diversity in the region. DEC will monitor the Black River for use by adult walleye and lake sturgeon during the spring spawning period. This project was made possible with \$750,000 from the United States Environmental Protection Agency (USEPA) GLRI funding for the construction and evaluation of the site. For the full press release, visit <https://www.dec.ny.gov/press/126109.html>.

- **NYSOPRHP Grass Island Enhancement at Buckhorn Island State Park:** The 10.5-acre riverine wetland of Grass Island was protected and enhanced through a project completed in the fall of 2021 by New York State Office of Parks, Recreation and Historic Preservation (OPRHP). The project involved constructing rock reefs around three acres of existing emergent wetland vegetation to protect it from waves, ice, and human impacts. Root wads were also installed for woody structures and over 40,000 wetland plants were planted to improve habitat for fish and wildlife. The pied-billed

grebe (New York State Threatened) nests at Grass Island, purple martins at times roost in the cattails by the thousands during fall migration, and many other species of waterfowl and marsh birds use the wetland for nesting, feeding, and cover. The blacknose shiner fish has been observed at Grass Island, and the large beds of submerged American eelgrass are used by muskies for feeding and reproduction. This project protects the important wetland ecosystem of Grass Island while supporting the recreational activities of fishing and birding.



Aquatic vegetation plantings in the Niagara River, photo by NYS OPRHP

Promoting Resilient Communities and Sustainable Development

A healthy and connected ecosystem can foster community resilience in the face of climate-induced stressors. To promote resilient communities and sustainable development, DEC and partners have advanced actions under New York's 2019 Climate Leadership and Community Protection Act and Community Risk and Resiliency Act, as follows:

DOS Collaborations Supporting Resiliency and Sustainability

- **Local Waterfront Revitalization Plans:** DOS is collaborating with waterfront communities throughout the Great Lakes watershed to develop Local Waterfront Revitalization Programs (LWRPs) and intermunicipal watershed plans that promote resilient communities, sustainable development, improvements to waterfront access, and protection of natural resources. Most recently, the Town of Porter adopted its LWRP, which was also approved by the Secretary of State. LWRPs and watershed plans are funded through Title 11 of the New York State Environmental Protection Fund (EPF). For more information on LWRPs, visit <https://dos.ny.gov/local-waterfront-revitalization-program>.
- **Monitoring Shoreline Resiliency Outcomes:** DOS has supported the Statewide Shoreline Monitoring Framework, which is designed to help decision-makers manage and monitor shorelines for resilience. The Framework has been updated and improved since its initial release in 2020. These updates include refinements and efficiencies to the monitoring protocols, additional data collection at existing and new monitoring sites, and a new data management solution that improves data management capabilities and streamlines data collection. DOS intends to provide support for future advancements, including additional data collection at shoreline sites and data analysis and visualization. For more information on the Framework, visit <https://dos.ny.gov/statewide-shoreline-monitoring-framework>.

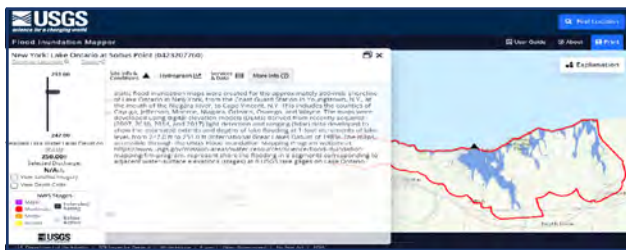
- **Coastal Lakeshore Economy and Resiliency (CLEAR) Initiative:** DOS has developed and led the Coastal Lakeshore Economy and Resiliency (CLEAR) Initiative, providing opportunities for local and regional stakeholders in shoreline communities along Lake Ontario, the lower Niagara River, and the upper St. Lawrence River, to collaborate on the development of regional comprehensive coastal resiliency plans, which DOS is currently refining for future implementation. Within each of five CLEAR planning regions, steering committees and public engagement identified neighborhood-scale assets at risk from flooding and erosion, needs and opportunities for vibrant communities and economies, a resilience vision for the region, and actions and strategies to help reduce impacts from fluctuating water levels. As a result of the CLEAR process, adaptive resilience solutions were developed with the goal of advancing long-term, cohesive, regional approaches to shoreline and economic resiliency, restoration, and environmental sustainability within these regions. For more information on CLEAR, visit <https://dos.ny.gov/coastal-lakeshore-economy-and-resiliency-clear-initiative>.



Planning region boundaries for CLEAR

New USGS Lake Ontario Flood Inundation Mapper

DEC released a new flood inundation mapping tool for Lake Ontario, developed in collaboration with USGS, to assist local decision-making within flood-prone communities. The Flood Inundation Mapper features real-time water level and wave data collected from eight new USGS lake gauges and depicts estimates of inundation areas and depths of lake flooding at 1-foot increments of lake level, from 247.0 feet to 251.0 feet (based on the International Great Lakes Datum of 1985). The mapper supports decision-making related to flood preparedness, planning, and response; flood and ecosystem resilience; and habitat protection for the benefit of Lake Ontario's shoreline and communities. The mapper can be accessed at <https://fim.wim.usgs.gov/fim/>.



The USGS Lake Ontario Flood Inundation Mapper portrays flood risks along Lake Ontario's shoreline.

New partnership with Civil Air Patrol to capture aerial shoreline imagery

DEC partnered with Civil Air Patrol-New York Wing to collect oblique aerial imagery of the New York Great Lakes shorelines. In early June 2022, the Civil Air Patrol completed imagery flights along 850 miles of the Lake Erie, Lake Ontario, Niagara River, and St. Lawrence River coastlines. The Civil Air Patrol uses volunteer pilots and photographers equipped with high-resolution cameras to collect aerial imagery at a significantly reduced cost compared to commercial options. The updated imagery, which is planned to be collected annually, will be hosted on a publicly available Great Lakes Shore Viewer web tool currently under development. Routinely updated coastal oblique imagery will support state resilience programs, promote ecosystem-based shoreline management, and assist with shoreline change monitoring.

REDI Projects Support GLAA Resiliency Goals

In response to the extended pattern of flooding along the shores of Lake Ontario and the St. Lawrence River, the State established the Resiliency and Economic Development Initiative (REDI) to increase the resilience of shoreline communities and bolster economic development in the region. Five REDI Regional Planning Committees, comprised of representatives from eight counties (Niagara, Orleans, Monroe, Wayne, Cayuga, Oswego, Jefferson, and St. Lawrence) were established to identify local priorities, at-risk infrastructure and other assets, and public safety concerns. From 2020 through 2022, DEC and 12 other state agencies led forward-thinking efforts, supporting the program with permitting guidance and project oversight. Through REDI, the State has committed up to \$300 million to benefit communities and improve resiliency in flood-prone regions along Lake Ontario and the St. Lawrence River.

Since the creation of the State's REDI program in spring 2019, 134 REDI-funded local and regional projects are underway or completed, including 51 projects in the design phase, 39 projects in the construction phase, and 44 projects completed.

The success of REDI will be measured in cost savings by these coastal communities under a changing climate. This program also demonstrates an "all-hands-on-deck" solution for New York State communities, while supporting resiliency actions under the GLAA. More information on REDI is available at <https://www.governor.ny.gov/programs/lake-ontario-resiliency-and-economic-development-initiative-redi>.

Restored Dune and Beach

Sodus Point Beach Restoration in Sodus Point, Wayne County, helped protect shoreline property owners from negative impacts of blowing sand and erosion, while also improving beach access and coastal habitat for shorebirds. More information on this project is available at <https://www.arcgis.com/apps/Cascade/index.html?appid=c54ac48dd343448498d78ab4965dd29a>.



Resilient NY Stream Studies Completed

Progress under the Resilient NY flood mitigation program continues with the completion of studies that identify what communities can do to reduce flood impacts and ice-jam risks, while also improving aquatic and riparian habitat. The following are studies in the Great Lakes completed through 2022:

- Buffalo Creek, Butternut Creek, Canadaway Creek, Cayuga Creek (Erie County), Cayuga Creek (Niagara County), Cazenovia Creek, Chittenango Creek, Clear Creek (upper Cattaraugus Creek watershed), Connoisarauley Creek, Crooked Brook, Donner Creek, Eighteen Mile Creek (Erie County), Eighteen Mile Creek (Niagara County), Ellicott Creek, Fish Creek, Gott Creek, Grannis Creek, Irondequoit Creek, Ransom Creek, Silver Creek, Tonawanda Creek, and Walnut Creek.

Communities within DEC-designated potential environmental justice areas that will benefit from these studies include Buffalo, Niagara Falls, North Tonawanda, Lockport, Arcade, Wende, West Seneca, Blossvale, Taberg, and Glenmore. For more information and to access the completed studies, visit <https://www.dec.ny.gov/lands/121102.html>.

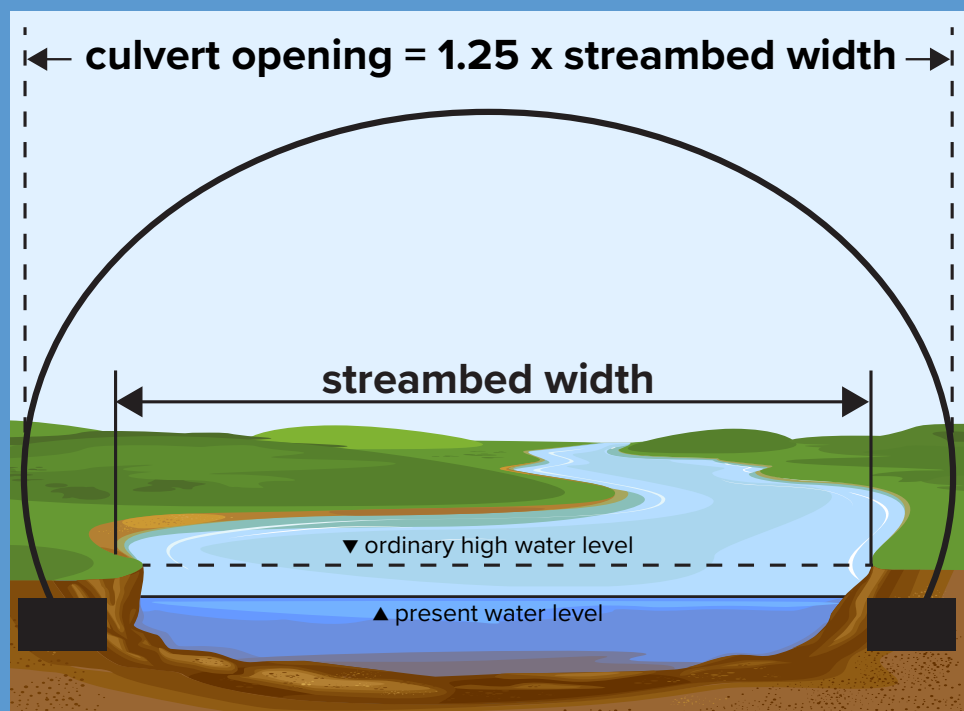
Climate Smart Communities in the Great Lakes

Climate Smart Communities (CSC) is a State program that helps local governments take action to reduce greenhouse gas emissions and adapt to a changing climate. As of 2022, 90 municipalities in New York's Great Lakes basin have taken the climate-smart pledge to become registered as CSC. Registered municipalities can earn points toward becoming certified by completing climate mitigation and adaptation actions. Certification level is based on the number of points accrued by communities. Between 2020 and 2022, eight Great Lakes communities received bronze certification by completing planning and implementation actions that reduce greenhouse gas emissions and improve community resilience to climate change.

DEC's CSC Grant Program provides 50/50 matching grant funds to assist communities in completing climate mitigation, adaptation, planning, and assessment projects, including actions that achieve CSC certification. In 2019, several Great Lakes basin municipalities were awarded CSC grants to implement climate adaptation and resilience projects, including the Village of Cayuga Heights for a culvert right-sizing project to reduce local roadway flooding, Monroe County for a Federal Emergency Management Agency (FEMA) Regional Community Rating System Strategy to reduce flood risk to the region, and the Village of Canton for culvert upgrades to reduce roadway flooding and winter icing. Visit <https://climatesmart.ny.gov/> for more information.

Correctly Installed Open-bottom Arch Culvert With Footings

Culvert right-sizing can prevent future flooding along roadways and improve habitat for fish and other aquatic life.



New York Sea Grant Promotes Great Lakes Coastal Resiliency

New York Sea Grant (NYSG) has continued to enhance outreach to shoreline property owners, local government leaders, educators, and other members of the Great Lakes communities.

- NYSG partnered with DEC, DOS, and U.S. Army Corps of Engineers (USACE) to hold two virtual Shoreline Erosion Management workshops geared toward shoreline residents along Lake Ontario and Lake Erie. Attendees learned about coastal processes; shoreline erosion management techniques; natural and nature-based features; and local, state, and federal permitting processes relevant to their respective geographic areas. NYSG also partnered with DOS, DEC, Save The River, St. Lawrence County Planning, and Jefferson County SWCD to hold the in-person "Working with Nature to Protect the St. Lawrence River Shoreline" workshop in Ogdensburg, and the "Working with Nature to Protect the St. Lawrence River-Lake Ontario Shoreline" workshop in Chaumont. The workshops featured a tour of shoreline management at Fort De La Presentation and the Village of Chaumont and chances to learn about volunteer and funding opportunities, services available from County Planning and the Soil and Water District, and state permitting considerations.
- NYSG, in collaboration with university scientists and funded by DEC, published a new fact-sheet, titled "Seiche Events on Lake Erie," to help shoreline property owners prepare for and respond to seiche events and associated hazards. Seiche (pronounced "saysh") events occur when a prolonged, standing wave oscillates through a body of water such as a lake or bay. This publication is available at <https://www.seagrant.sunysb.edu/Images/Uploads/PDFs/GreatLakes-SeicheEvents-LakeErie.pdf>.
- NYSG led a series of three local government workshops throughout the basin in partnership with DEC, Regional Planning, and other public/private organizations in November 2022. The "Understanding and Managing Floodplains for Healthy Watersheds and Resilient Communities" workshops intended to help municipal and tribal decision-makers reduce flood risks and improve water quality throughout the Great Lakes watershed by maintaining and enhancing healthy floodplains.



A tour of the shoreline management at Fort De La Presentation held this summer

Building Science, Great Lakes Literacy, and Stewardship Capacity

To build program capacity, inform environmental decision-making, and promote the next generation of stewards, DEC provides funding for grants and programming from the EPF under the authority of the New York Ocean and Great Lakes Ecosystem Conservation Act, as follows:

Building Great Lakes Literacy and Stewardship Capacity

Small Grants Support Youth Education

A total of \$198,891 was awarded in 2021 under New York's Great Lakes basin small-grants program, a collaborative program of NYSG and DEC, to build capacity to engage youth in environmental education and stewardship and promote the next generation of Great Lakes stewards. Project awards included the following:

- Buffalo Young Environmental Leaders Program; Buffalo Niagara Waterkeeper;
- Environmental Ambassadors Workforce Development Program; Genesee Land Trust;
- Lake Ontario, Onondaga, and Oneida Program into Education; Upstate Freshwater Institute;
- Great Lakes Data Jam & Environmental Justice Stewards Project; Friends of Reinstein Woods;
- Building Capacity for the Water and Habitat on the Indian River Lake (WHIRL); Clarkson University and Indian River Lakes Conservancy;
- Youth for Water and Climate Action in New York State's Great Lakes Basin; Finger Lakes Institute;
- Plastic Pollution in Lake Ontario: Meaningful Watershed Education Experiences for In and Out of School Settings; Rochester Institute of Technology.

New Online Story Map & Portal to Promote Small Grants

NYSG launched a new web-based application in 2022 that provides access to interactive tools, including a dashboard and StoryMaps, highlighting the outcomes of past small-grant-funded projects and how these projects have implemented EBM to support GLAA goals. This resource is available at <https://small-grants-program-ccegeomaps.hub.arcgis.com/>.

Teacher Engagement and Professional Development

In the summers of 2021 and 2022, DEC's Great Lakes Program and NYSG partnered with OPRHP and other local Great Lakes Ecosystem Education Exchange (GLEEE) partners to inspire 79 teachers and educators throughout New York's Great Lakes basin to impart a deeper understanding and appreciation for New York's Great Lakes within their classrooms and programs. A series of 8 workshops were held throughout New York's Great Lakes, reaching a diversity of teachers—including 14 from schools within DEC-designated potential environmental justice areas. Teachers were given free resources to take back to their classrooms, where they reach an estimated 5,575 students. For more information, visit <https://seagrant.sunysb.edu/articles/t/new-york-s-great-lakes-ecosystem-education-exchange-about-nygle3>.

Day in the Life of Lake Ontario-St. Lawrence River

Under a \$150,000 GLRI grant from the USEPA, DEC worked with NYSG, OPRHP, and other GLEEE partners to engage 305 middle school students in hands-on environmental monitoring and stewardship of Lake Ontario and its tributaries. Coordinated student-summit events were held at four locations throughout the watershed and a teacher workshop was held to train teachers and partners in advance of the Day in the Life student-summit event. For more information, visit <https://www.dec.ny.gov/education/125689.html>.



Student summit event for Day in the Life of Lake Ontario St. Lawrence River at Westcott Beach State Park

Supporting Coordinated Science to Inform Management Decisions

DEC's Great Lakes Program supports small grants through partnerships with State University of New York Environmental Science and Forestry's (SUNY ESF's) Great Lakes Research Consortium and Cornell University's WRI in the interests of coordinated, applied science, outreach, and management in support of New York's Great Lakes Action Agenda.

Great Lakes Research Consortium – Five projects totaling \$121,741 were awarded in support of Great Lakes research projects, as follows:

- Assessing connectivity patterns of invasive snails; Clarkson University;
- Measuring shifts in algal abundance, composition, and nutrients over the past century in four Finger Lakes; Hobart and William Smith Colleges;
- Historical coastline changes along Lake Ontario in Niagara and Orleans counties' GIS analysis; Binghamton University;
- Test technology process for detecting new and unknown water pollutants missed by traditional screen practices; SUNY ESF;
- Design of phosphorus sorption technology for deployment in agricultural settings in the Great Lakes; Seneca Watershed Intermunicipal Organization.

For more information, visit <https://www.esf.edu/gllrc/>.

New York State Water Resources Institute at Cornell University – In 2021, DEC's Great Lakes Program entered into an agreement with the WRI at Cornell University to bring innovative science to watershed planning and implementation within New York's Great Lakes. Building on the success of partnerships with the Hudson River Estuary and Mohawk River basin watershed programs, this collaboration supports GLAA capacity building and leverages unique access to scientific and technical resources at Cornell and other universities within the state's Great Lakes watershed. <https://wri.cals.cornell.edu/about/>.

Since 2021, annual research and outreach grants awarded a total of \$263,398 for 12 projects, described briefly as follows:

- Application of water quality indices in assessing status of New York Great Lakes tributaries; WRI;

- Identifying and reducing barriers to climate adaptation adoption along the Lake Ontario shoreline; WRI;
- Analysis of historical New York water well completion records to identify effects of drought on access to groundwater; SUNY ESF;
- Developing 350-year records of nutrient loading and environmental change in Skaneateles Lake and Oneida Lakes: evaluating end-member lake systems in upstate New York; Syracuse University;
- Advancing and expanding design for climate-resilient communities in New York State; Josh Cerra, Cornell University;
- Development of a decision tool for retrofitting municipal wastewater treatment plants toward energy and resource sustainability; Cornell University;
- Aquatic connectivity and ecosystem services restoration through removal and monitoring of outdated dams and barriers; Cornell University;
- Equitable green infrastructure planning: assessing the state of knowledge and best practices to facilitate collaborative learning; The New School;
- Efficiency of removing emerging contaminants from wastewater using electron beam; SUNY ESF
- Tracing lawn care chemicals in urban stormwater; University at Buffalo;
- Barriers to flooding adaptation in lakeshore communities of Lake Ontario: assessing the CLEAR Initiative; Cornell University.

For more information and to share project ideas, visit <https://wri.cals.cornell.edu/grants-funding/>.

Partner Priority Areas for EBM

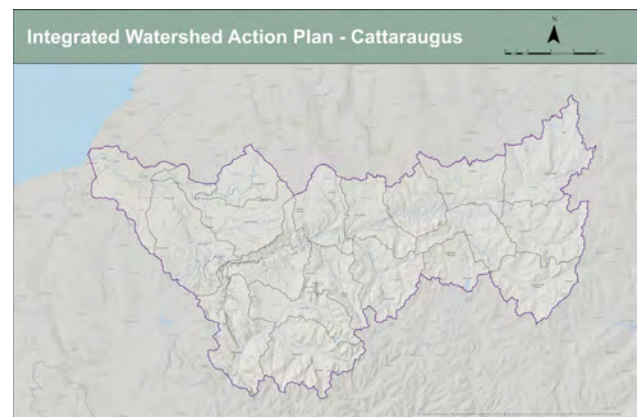


Partner priority areas (green) within each regional work group

Priority areas were identified by GLAA regional work groups to implement EBM approaches to achieve watershed-scale ecosystem health and resilience, while achieving a balance of community and economic benefits. The following actions are underway:

- **Cattaraugus and Sterling-Wolcott Creeks Watersheds: Integrated Watershed Action Planning (IWAP)**

DEC's Great Lakes Program is leading a pilot to develop EBM plans for two watersheds of regional interest: Cattaraugus Creek and Sterling-Wolcott Creek. The IWAPs will combine local and regional plans and identify shared priorities and actions to support local GLAA implementation. Watershed stakeholder committees will complete ecosystem assessments and risk analyses, and identify management strategies and projects that maintain, protect, and restore key ecosystem services and benefits at the watershed scale. The plans will be finalized in 2023, and the Great Lakes Program will work with communities and partners to promote plan implementation. To learn more and get involved, visit <https://www.dec.ny.gov/lands/124314.html>.



Maps of the boundaries for the Cattaraugus Creek and the Sterling-Wolcott Creek watersheds, courtesy of Ramboll

- **Oatka Creek: Engaging Municipalities in Watershed Management**

The Oatka Creek Watershed Committee (OCWC) has been a local champion for the development and implementation of the Oatka Creek WMP. The OCWC created WMP booklets and is conducting visits with each municipality in the watershed to discuss the information with local government officials. As a result, municipalities have coordinated with OCWC, County, Regional Planning, and State agency staff; updated local regulations; and incorporated recommendations from the WMP into municipal comprehensive plan updates. The work that OCWC does is integral to improving local knowledge of Oatka Creek watershed issues and driving projects that address these issues. For more information, visit: <https://oatka.org/>.

- **Goose Bay: Protecting Lands to Protect Source Waters**

The Thousand Islands Land Trust (TILT) has been working with DEC, private landowners, and community partners to conserve and protect sensitive natural landscapes within Goose Bay and surrounding watersheds under the DEC WQIP Source Water Protection Program. These acquisitions aim to protect the St. Lawrence River, which is a source of drinking water for Clayton, Alexandria Bay, and many other communities. TILT was awarded \$2,855,300 in WQIP grants to protect 6,300 feet of St. Lawrence River shoreline and 244 acres of the Mullet Creek watershed in 2022.

Looking Ahead

Adaptive management is a key tenet of the GLAA and the ecosystem-based approach to Great Lakes restoration and protection. It will continue to be a guidepost for us as we navigate these next few years—as we continue to emerge from a pandemic-focused reality to a new normal, as we tackle the climate crisis locally, and as we look forward to new beginnings with the roll-out of New York’s Great Lakes Action Agenda: 2030.

Despite all this change, a constant has been the resilience and power of our partnerships. Local, state, and federal partner agencies, organizations, universities, communities, teachers, and interested citizens have continued to buoy and strengthen the progress made under the first GLAA, while finding new opportunities to adapt and grow. The DEC’s Great Lakes Program looks forward to re-engaging with partners—new and old—throughout New York’s Great Lakes watershed to foster new connections, ideas, knowledge, and project opportunities. In 2023, we expect to resume the GLAA sub-basin workgroup meetings and offer additional, alternative ways to gather and ensure inclusive, diverse, and meaningful participation by all who are interested.

The DEC Great Lakes Program looks forward to the exciting road ahead and new beginnings under the GLAA 2030. For more information and to access the draft GLAA 2030, visit <https://www.dec.ny.gov/lands/91881.html>.



Aerial view of the American Narrows on the St. Lawrence River, Photo by Thousand Islands Land Trust

How to Get Involved



All New York State residents are invited to get involved in this important work by contacting greatlakes@dec.ny.gov and signing up for the e-bulletin at <https://www.dec.ny.gov/lands/25562.html>.

To connect with DEC's Great Lakes Watershed Programs Coordinator with basin-wide questions and interests, email Shannon.Dougherty@dec.ny.gov.

New York's Great Lakes Sub-basin Work Groups will continue to be essential partners in GLAA implementation. With the release of the updated GLAA 2030, these regionally based work groups will offer opportunities for coordination, collaboration, and implementation of GLAA goals and actions. To get involved with these work groups, reach out to your regional watershed coordinator as follows:

Ryan Elliott: Western Great Lakes (Lake Erie, Niagara River, Southwest Lake Ontario, and Genesee River) Watershed Coordinator, in partnership with WRI

Email: ryan.elliott@dec.ny.gov

Phone: (716) 851-7018

Emily Fell (formerly Sheridan): Eastern Great Lakes (Southeast and Northeast Lake Ontario, and St. Lawrence River) Watershed Coordinator, in partnership with WRI

Email: emily.fell@dec.ny.gov

Phone: (315) 785-2382

Connect on social media

DEC has several social media accounts where you can learn the latest information and engage through feedback and comments.

Follow DEC at:

Facebook: <https://www.facebook.com/NYSDEC>

Twitter: <https://twitter.com/NYSDEC>

Instagram: <https://www.instagram.com/nysdec/>

Flickr: <https://www.flickr.com/photos/nysdec/>

YouTube: https://www.youtube.com/channel/UC6xirBOO-47IWtU_ZZDT702w



NEW
YORK
STATE

Department of
Environmental
Conservation

