2013 Lake Ontario Ecosystem Forum

Port Terminal Building

1000 North River Street, Rochester NY 14612

August 15, 2013

SUMMARY

Welcome
Jen Baker, New York State (NYS) Department of Environmental Conservation (DEC), and
Mark Gregor, City of Rochester

Jen Baker welcomed participants to the forum and explained that the meeting was sponsored by the U.S. Environmental Protection Agency (EPA), NYS Department of Environmental Conservation and New York Sea Grant to provide the opportunity for participants to learn about the Lakewide Action and Management Plan (LAMP) and Lake Ontario research being conducted under the Great Lakes Restoration Initiative (GLRI). The forum was not intended to focus on water levels or related regulations.

Mark Gregor welcomed the participants to Rochester on behalf of the mayor. He noted that U.S. and Canadian management efforts have improved the shoreline and waters of Lake Ontario and outlined several recent environmental initiatives in the Rochester area. The forum will focus on the Lake Ontario LAMP as well as future restoration efforts. The waterfront has improved immensely, and Mr. Gregor said that a new Harbor Management Plan will improve the environmental management of the facility and local waters.

Lake Ontario Lakewide Action and Management Plan (LAMP)
Don Zelazny, NYS Department of Environmental Conservation

Don Zelazny stated that that he is frequently asked how the lake is doing, and he has struggled with how to answer that question for years because trends vary. There are many changes over time, including new threats that must be addressed. To accomplish this, the LAMP was implemented.

Lake Ontario is the 14th largest lake in the world and contains the largest watershed relative to lake surface area of all of the Great Lakes, including large agricultural and dairy operations. It is a freshwater inland sea. It receives 83 percent of its water from Lake Erie via the Niagara River, which creates a plume along the south shore throughout most of the year. The center of the lake is nutrient-poor, whereas the nearshore or "littoral" zone is nutrient-rich, with these rich nutrients causing algal blooms. This makes it difficult to create management plans to improve the system. Because it is the furthest downstream Great Lake, it is particularly susceptible to upstream nutrients, chemical contaminants and invasive species, such as Asian carp and zebra mussels, from the four upper Great Lakes. Approximately 10 million people live in the Lake Ontario watershed, with 2 to 3 million of those people living in the state of New York. The west end of the lake near Toronto, Ontario, is seeing tremendous population growth, creating additional problems that must be addressed. Three binational agreements manage different aspects of the lake. The Boundary Waters Treaty addresses water levels and flows, the International Convention for Great Lakes Fisheries manages sustainable fish populations, and the Great Lakes Water Quality Agreement (GLWQA) addresses water quality and ecosystem quality. EPA and Environment Canada are the lead agencies for the GLWQA, and the LAMP derives its authority from the GLWQA, which in turn has a standing of law under the Clean Water Act (CWA).

The purpose of the Lake Ontario LAMP is to protect, restore and maintain the Lake Ontario ecosystem and its watershed. Three broad goals were established. First, the Lake Ontario ecosystem services should be maintained and, as necessary, restored or enhanced to support self-reproducing and diverse biological communities. Second, the presence of contaminants will not limit human uses of fish, wildlife and waters of the Lake Ontario basin nor cause adverse health effects in plants and animals. Third, people will conduct activities with responsible stewardship for the Lake Ontario basin. The LAMP is a management plan that is designed to implement existing programs and policies on a collaborative, binational basis rather than advocate for new policies. The LAMP is managed by four federal, state and provincial government agencies. Additional agencies participate on workgroups and technical advisory committees. These agencies rely heavily on nongovernmental organizations, research universities, local groups and the general public. The GLWQA includes a Cooperative Science and Monitoring Initiative (CSMI), which focuses available funding and resources on one Great Lake annually within a 5-year cycle. Lake Ontario's intensive monitoring year under the initiative is 2013, with research-ship based efforts to understand the nutrient inputs, nutrient cycling and foodweb dynamics in the lake so that the most cost-effective restoration actions are taken.

Mr. Zelazny stated that there are sufficient statutory authorities established to restore the lake, but the challenge is to use the available authorities to accomplish needed actions. Currently, funding is at its highest for the Great Lakes; President Obama's focus on the Great Lakes has resulted in a 5-year, $2.2-billion program. Most of the studies being presented at this forum are a result of this funding.

Quality of Lake Ontario Beaches
Kelly St.-Clair, NYS Department of Health (DoH)

Kelly St.-Clair stated that the NYS DoH is responsible for public beach regulation via the NYS Sanitary Code, which outlines water quality requirements. The NYS DoH also is responsible for drowning and injury prevention; the state of New York has the lowest drowning rate in the United States, even with more than 1,600 regulated public beaches. Beach water quality is monitored via bacterial indicator standards, and when beaches exceed these standards, they are closed or placed under an advisory while the bacterial source is investigated. The Sanitary Code also calls for investigations into possible sources of pollution. Four categories of bacteria are included in the standards, and EPA considers *Escherichia coli* and *enterococci* to be the most valid and reliable indicators to assess water quality for the risk of gastrointestinal illness. Bacterial indicators are assessed using a typical dose-response curve that correlates bacterial indicators with likelihood of swimming-associated illness. It is a cost-effective method to determine whether a pollution source has infiltrated a beach and poses potential hazards.

The federal Beaches Environmental Assessment and Coastal Health (BEACH) Act of 2000 requires bacterial indicator monitoring of the Great Lakes and coastal beaches, with EPA designated as the responsible agency. Under the BEACH Act, 342 beaches in the state of New York must be monitored, including 23 Lake Ontario beaches and 17 Lake Erie beaches. As part of the BEACH Act, the state of New York collects the monitoring and beach action information from participating local jurisdictions; data trends during the last 5 years have remained fairly consistent. A "day under a beach action" is defined as a day when the beach is closed or under advisory. Preemptive protocols result in beach closures when environmental conditions associated with increased bacterial indicator concentrations exceed guidelines (e.g., rainfall, water clarity, algae density). Most New York beaches are open for swimming a majority of the time. The Great Lakes beaches have greater closure rates compared to marine beaches, possibly because marine beaches are less subject to combined sewer outfalls during heavy stormwater events, contain sand buffer areas and experience tidal flushing.

These data have been used to apply for additional funding and increased investigative work. Monitoring and notification are protective of public health, but the pollution sources affecting the beaches should be identified and the sources eliminated to protect public health and improve water quality. When regional EPA staff was able to secure additional BEACH Act funds for the state of New York, some additional resources were provided to appropriate jurisdictions to identify pollution sources at the highest risk beaches. Enhanced sanitary surveys were implemented at 14 beaches, including two on Lake Ontario. Additional funds were secured through the GLRI to perform enhanced monitoring and sanitary survey work on nine Lake Ontario beaches, 13 Lake Erie beaches and 16 St. Lawrence River beaches. This funding has allowed more in-depth investigations with the ultimate goal of identifying and reporting pollution sources. Point sources include sewage, combined stormwater overflows, failing septic systems and concentrated animal feeding operations; nonpoint sources include birds, agriculture and algae. The NYS DoH and Health Research Inc., a nonprofit research organization, also obtained grants to develop a website for beach water quality information, which should "go live" prior to the 2014 beach season. Grant money also is being used to implement rapid test methods, including an EPA-approved qPCR, that decrease turnaround time from 24 hours to 2 to 3 hours to support beach advisories.

Because beaches are a valuable resource, it is important to preserve them. Measures to improve water quality include: proper sanitary sewer hookups; proper design, installation and maintenance of septic systems; proper disposal of animal waste; reduced application of phosphorus; and implementation of rain collection and other stormwater runoff mitigation practices.

The Lake Ontario Benthic Foodweb/Restoration of Lake Sturgeon
Dawn Dittman, U.S. Geological Survey (USGS)

Dawn Dittman described her research objectives, which are to further understanding of the very small creatures that live at the bottom of Lake Ontario, known as "benthic macroinvertebrates." She outlined the key role played by these species in the food web and how their ability to thrive affects fish populations. USGS has conducted studies by sampling for benthic creatures at regular sites around the lake at various depths. The researchers found that the numbers of the amphipod *Diporeia* are at low levels; *Sphaeriidae* clams and *Oligiochaeta* worms are also low compared to results gathered in the 1990s. Quagga mussels also are tracked, and their population numbers are lower than past peak densities. Overall, the trend lines are down, with the exception of the Rochester area at a depth of 425 feet, which had the highest average numbers of quagga mussels among the 2012 index sites where USGS collected data. Dr. Dittman noted that invasive species have altered the food web in the lake.

In terms of restoring threatened lake sturgeon, USGS is collaborating with other partners to assess the numbers and status of sturgeon in New York. USFWS population estimates show that about 2,825 fish are present (with a statistical confidence interval between 1,636–5,093 fish) and that most of them are young fish born after 1995 in the Lower Niagara . She noted that the Black River has a dam where small numbers of sturgeon congregate. The Black River will undergo spawning bed enhancement in 2014–2015 and may make an optimal location for public outreach and education efforts. Finally, restocking is occurring rapidly and began in earnest in 1993. USGS is collaborating with the University of Rochester and the Seneca Zoo to collect nonlethal blood and tissue samples to study contaminants in Lake Ontario.

Lake Sturgeon Chemical Contaminant GLRI Research Update
Jeff Wyatt, University of Rochester and Seneca Park Zoo

Veterinarian and researcher Dr. Jeff Wyatt recounted the history of sturgeon in the Great Lakes, noting that they were so abundant at one time that they were dried and used as firewood by early settlers. The industrial revolution brought discharges of heavy metals, dioxins, pesticides and other pollutants to the lakes. With GLRI funding, Dr. Wyatt and his colleagues have studied sturgeon with non-lethal tissue and blood sampling methods. Recent USGS surveys show that in terms of habitat, juvenile sturgeon are using the deeper sections of Rochester-area rivers, and near shore Lake Ontario areas, which is considered a success. Their growth rates—which are measured by tagging and recapturing the fish later—are on track. Dr. Wyatt also provided a preliminary look specifically at mercury and cadmium levels in the sturgeon blood and reported that they were no more polluted than sturgeon in a non-Area of Concern (AOC), in this case the Oswegatchie River. He said that more studies are necessary to fully confirm the preliminary findings, but it appears as though recovery efforts and restocking programs are effective and concentrations of chemicals based on mercury and cadmium levels are not over-represented in the Rochester Embayment Area of Concern.

Lake Ontario Coast Wetlands, Monitoring and Restoration
Tim Howard, Natural Heritage Program

Tim Howard focused on wetlands in the Rochester AOC area and how adaptive management techniques are being used to monitor and respond to changes in the status of wetlands in the AOC. The team is conducting monitoring activities at 16 sites around Lake Ontario and the St. Lawrence River. Their efforts involve surveying for the size and extent of types within a wetland, the distribution of wetland types along an elevation gradient, muskrat abundance, and the presence of other rare species. Dr. Howard shared aerial imagery of Braddock Bay that mapped the various vegetation types and expansion of *Phragmites*, an invasive plant. The research team mapped wetland types using GIS and sampled vegetation along transects from the upland edge into the water of each marsh to better understand the distribution of vegetation along this elevation gradient. To date, they have completed sampling at 16 sites and will repeat collections at the same sites in 2014. Initial results show demarcations of vegetation types throughout a wetland and by elevation, patterns that can be tracked over time to help us understand what changes are occurring. Additional information and findings will continue to be shared, particularly in 2015, after the 2014 sampling period.

Rochester Embayment Area of Concern Update
Charlie Knauf, Monroe County Department of Public Health

Charlie Knauf introduced the boundaries of the AOC and listed the beneficial use impairments (BUIs) that must be removed to fully delist the Rochester Embayment area. Some of the BUIs include: fish and wildlife consumption, which the Remedial Advisory Committee thinks is a lakewide issue; eutrophication, which also is a lake wide issue and caused mostly by nutrients from upstream sources of the Genesee River rather than by AOC sources; and dredging, where the AOC is awaiting completion of toxicity testing in the lower river before it is able to move forward. Recent efforts involve a proposed engineering solution to remove algae at Ontario Beach and reduce the number of beach closings; chemical sensing and analysis of toxics at the Ford Street Station by USGS, and evaluation of benthic organisms in the lower river, bay and comparison sites in a study being done by USGS and NYSDEC. Sediment sampling undertaken by USEPA GLNPO in the lower river indicates that toxics such

as cadmium, dioxins, silver and polychlorinated biphenyls (PCBs) are present in the mud, but the AOC is in a predicament because contaminants are not elevated enough to merit a Great Lakes Legacy Act project to remove the sediment, but are too contaminated to allow open lake disposal if they were dredged and removed as part of smaller projects. Other efforts involve watershed monitoring by USGS and others and fielding and evaluating best management practices (BMPs) for reducing nutrient loads in upstream waters. There are many large dairy operations in the watershed, but some of the smaller dairies may present "low-hanging fruit" as they may not have had the staff to routinely incorporate BMPs. The U.S. Army Corps of Engineers is evaluating a habitat improvement strategy and options that may involve the installation of physical barriers to prevent further erosion and protect key wetlands in the Braddocks Bay portion of the AOC, and the U.S. Fish and Wildlife Service is completing an analysis of the quantity and quality of local wetlands.

The H2O Hero Program
Paul Sawyko, Water Education Collaborative (WEC)

Paul Sawyko described characteristics of the Lake Ontario watershed and noted that stormwater is one of the major sources of pollution in the area. He identified three key watersheds—Lake Ontario West, Genesee River and Lake Ontario Central—that are a major focus of WEC education and outreach efforts. WEC is highlighting how many of the flows in these watersheds make it to streams and rivers without any treatment before emptying into Lake Ontario. The WEC has created a "H2O Hero" program to promote environmentally friendly behaviors. The program includes the tag line "only rain down the drain" to prevent contaminants from homes and businesses finding their way to Lake Ontario. The collateral marketing materials for the program were drawn by a cartoonist to encourage school-age children to learn and respond to the campaign.

Question and Answer Session

Ms. Jennifer Baker opened the floor to those who had questions for the session speakers.

Why is Lake Ontario considered the "most stressed" of all the Great Lakes?

Mr. Zelazny said that Central Michigan University had collected data on a series of indicators across the Great Lakes and found that Lake Ontario's invasive species, algal blooms and nutrient problems led to that determination. The fact that it's downstream from all of the other Great Lakes means that toxic chemicals end up in Lake Ontario. There are positive developments as well in terms of restoration of sturgeon and other fish, and contaminant levels in sportfish have dropped to near or below (for some contaminants) the criteria used to determine consumption advisories.

What effect do the lower falls have on the Lake Ontario fishery?

Mr. Knauf said that the falls stop the upstream migration of Pacific salmon, which were originally introduced to control the alewife fish species. The dying salmon that can be seen in the Lower Genesee River are those in the last phases of their reproductive cycle, in which they lose their digestive tract, lay eggs, and then perish. The Rochester AOC has an aesthetics BUI related to reducing dead fish along shorelines that are deposited by fishermen leaving remains. Progress has been made on that issue, but shad die-offs and other dead fish that die from natural causes will sometimes be seen around the lake and river shorelines.

How effective is the binational effort to address sewer discharges?

Mr. Zelazny said that Toronto has a very modern sewer discharge capture system, but recent extreme storm events have affected stormwater discharges all around the lake. Toronto and Rochester have state-of-the-art deep tunneling systems that divert contaminants from entering the lake. Mr. Knauf said that it had been a very wet spring with rainfall amounts seen only every 10 years. Infrastructure requires cost-benefit analyses, and the current system is based on addressing a one-in-10-year event. Weather and other changes have accelerated impacts, but it can be difficult to justify the expense required to capture and treat a one-in-100- year event.

What is known about toxics in Lake Ontario?

Mr. Zelazny noted that lake sediments and waters contain small amounts of priority pollutants, such as PCBs, dioxins/furans, mercury, dieldrin, DDT and mirex. There are a variety of possible sources for these, like PCBs and mercury coming from distant industrial areas, which are finding their way through atmospheric deposition to Lake Ontario at measurable levels. Furans and dioxins are difficult and expensive to measure, but many come from plastics being burned in backyard fires in rural areas. Dieldrin, DDT and mirex are all legacy herbicides/persticides that have been banned from manufacture and use since the 1970's but still persist in the lake.

What invasive species are coming from ballast water in ships?

Mr. Zelazny said that the U.S. Coast Guard has new rules and is working with officials at St. Lawrence Seaway to ensure that tanks are sealed or flushed out in the open ocean before they are allowed to transit the seaway. Starting in December 2013, EPA permits will be required.

What about turbines on the lake bottom to generate energy?

DEC has permitting responsibility for any turbines in NY waters. The LAMP is not collecting information on this.

A participant expressed concern about development near Penfield, New York, where several large apartment buildings are being built. The guidelines for aesthetics, protecting the ecology and other development are not being followed.

Mr. Knauf said the South Bay Project plans came in for nine to 12 buildings in 2000. Mr Knauf pointed out that the way the SEQRA law was written, the municipal agency with the closest ties to the project gets review responsibility, which is why Penfield is being designated as lead agency. However, NYSDEC reviews this entire action. Others are concerned about environmental issues, but government officials cannot prohibit property owners from realizing a return on investment in their land without just cause. The Harbor Management Plan affects issues related to maintenance dredging for docks for recreational boating. Upcoming public meetings should allow interested parties to voice their concerns. An equilibrium needs to be reached between private property owners' objectives and environmental goals.

What changes in the food web are occurring as a result of macroinvertebrates?

Dr. Dittman said that young sturgeon eat small larvae, and then as they grow, they eat quagga mussels and other small fish, such as gobies. The sturgeon the researchers are following are growing at good rates.

What's the DEC position on offshore wind turbines in the Great Lakes? Why does the department not take a position against them?

Mr. Zelazny said that although the decision was out of his control, he appreciated the question. DEC is reviewing studies of impacts on birds and bats in collaboration with the Great Lakes Commission and Ohio and other states. There is no formal policy at this time other than the fact that DEC is concerned about impacts to fish and wildlife – especially birds, and will offer plenty of opportunities for public input should any future permit applications be received. Currently, there are no applications pending for offshore wind turbines in Lake Ontario or Lake Erie (except possibly in Ohio), which is a flyway for migratory birds. DEC has some concerns about songbird migrations on the New York side of Lake Ontario.

Mr. Zelazny thanked everyone for participating and asked for feedback on the workshop and what else participants would like to hear about in future meetings to help everyone be better stewards of the environment.

Ms. Baker thanked the participants for their interest and adjourned the forum at 8:45 p.m.

Media coverage of the event included a public television recording and online and video coverage from NewsChannel 8 in Rochester. Steve Gibb (SCG, Inc.-contractor) facilitated on camera interviews with Don Zelazny, Jeff Wyatt, Paul Sawyko and Charles Knauf, almost all of which were used in the following segment which showed the evening of Aug. 15, 2013.

http://www.rochesterhomepage.net/story/experts-concerned-about-lake-ontario-pollution/d/story/PUzfrCak4U6MlZHXstzHyw