CAYUGA COUNTY
Water Quality Management Agency
NEWSLETTER

March 2023

Clean Up After Your Pet for Cleaner Water
By Michele Wunderlich, Cayuga County Department of Planning and Economic Development

Cleaning up after your dog is not just a courtesy, it helps keep our lakes and streams clean. Pet waste can pollute our local water resources and can be a significant risk to public health!

Dog waste contains harmful bacteria and nutrients such as phosphorus and nitrogen. When rain or snowmelt flows over the land surface, it can pick up the pet waste and carry these bacteria and nutrients into nearby lakes, streams and wetlands. The bacteria can cause human disease and health problems and can make the water unsafe for drinking and swimming. Nitrogen and phosphorus from the waste will also promote the growth of unwanted rooted aquatic plants and algae, including harmful algal blooms, in lakes and streams.

To prevent pet waste from getting into our waterbodies remember to take along a plastic bag or pooper scooper when you walk your dog. Flush the waste (not the bag) down the toilet or toss the waste (bag and all) into the garbage.

Clean water starts with you.

Electronics Collection Event
By Evan Tuthill, Cayuga County Department of Planning and Economic Development

The Cayuga County Department of Planning and Economic Development, in partnership with the Cornell Cooperative Extension of Cayuga County, is holding a free Electronic Waste Recycling Event in Cayuga County. The event is open to County residents looking to get rid of household electronic waste. The event will be held on April 1st, 2023 from 8:00 am to 12:00 pm. Registration is required for the event and will provide details on scheduling and location for the event.

Electronic items accepted at the event include out of date, broken or no longer used computers, keyboards, microwave ovens, fax machines, flatbed scanners, desk size photocopiers, cell phones, pagers, gaming systems, radios, all the power supply cords connecting these items to the electric receptacle, and more. Items not being accepted at this event include items containing freon or refrigerant, large home appliances, common household batteries, and devices that contain mercury including fluorescent light bulbs. If you are unsure about a specific item, please refer to the accepted materials list that can be found on the bottom of the registration page which can be found here: https://www.sunnking.com/events/cayuga-04-01-23.

For more information, please visit our website at https://www.cayugacounty.us/699/Solid-Waste-Management-and-Recycling. Our website also provides information on disposal options for the materials not being accepted at this event. If you have any questions regarding registration for the event, or are unsure about what items are being accepted or not accepted, please visit the Sunnking website at https://www.sunnking.com/, or contact Sunnking customer support via phone at (585) 637-8365 or email at office@sunnking.com.

"Give your old electronics a proper home"

Bob Brower Scientific Symposium
By Ann Robson, President of OWLA and Founding Board Member

The 2023 Bob Brower Scientific Symposium - *Effect of Climate Change on Owasco Lake* was held on Saturday, March 11, 2023, at the Auburn Public Theater. Through the generosity of the Brower family, the Owasco Watershed Lake Association (OWLA) organized this annual Scientific Symposium in "Plain English". The New York Chapter of American Water Works Association offered three Continuing Education Units to Professional Engineers and Water Treatment Operators who attended. This symposium was recorded and is posted on YouTube (https://www.youtube.com/playlist?list=PLuh7rKsN-joCw0R0_BSNiTNDhEbgtfltK).

Do you wonder what the effect of Climate Change has on the Finger Lakes? People who study the Earth see that Earth's climate is getting warmer. Small changes in Earth's temperature can have big effects. Changes to Earth's climate driven by increased human emissions of heat-trapping greenhouse gases are

already having widespread effects on the environment: glaciers and ice sheets are shrinking, plant and animal geographic ranges are shifting, and localized rain events are increasing.

Leading off the morning's presentations was NYSDEC's Assistant Director, Office of Climate Change, Mark Lowery, who spoke on *Climate Change Impacts in New York: New York State Rises to the Challenge*. Next, Dr. John Halfman, professor at Hobart and William Smith Colleges and research scientist at the Finger Lakes Institute presented *Status of Owasco Lake – 2022*. Following his presentation, as he prepares to retire, Professor Halfman was recognized for his efforts in studying water quality trends, nutrient loading issues and the drivers for cyanobacteria blooms in Owasco Lake.

Pictured left to right: Ken Kudla, Jim Beckwith, Gilda Brower, John Halfman

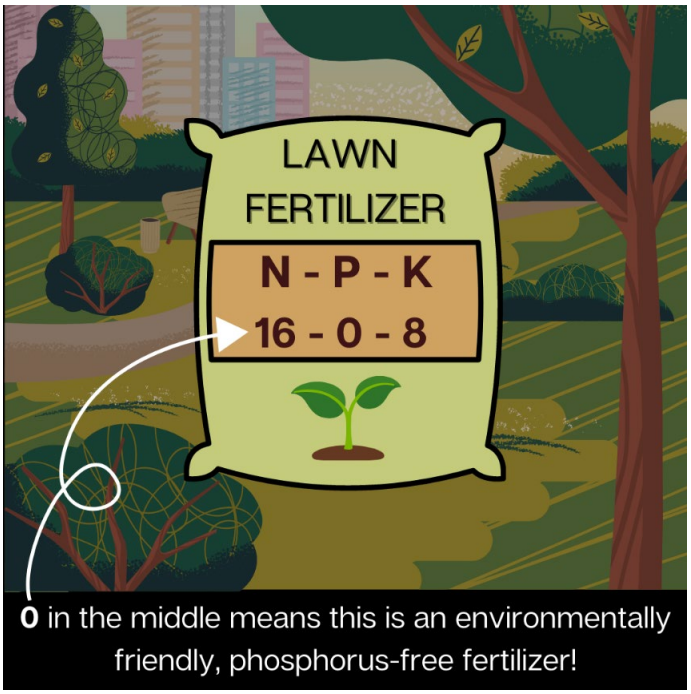
Behavioral Science of Agricultural Practice Change was the title of the presentation given by the Evidn team of Katri Haantera and Marissa Jordan. A case study of the Our Owasco behavioral change project, funded by The Nature Conservancy, demonstrated a community driven approach towards increasing the adoption of soil health management practices in the Owasco watershed. Dr. Andrew Brainard, from Upstate Freshwater Institute spoke on: *A change is going to come, but will we know? The value of long-term lake monitoring*. Long-term lake monitoring is essential to document changing conditions, including trends in lake trophic indicators and water temperature observed in New York lakes.

Since 1988, OWLA has been a citizen-based guardian of Owasco Lake and its Watershed. OWLA is a hands-on, boots dirty, take action not for profit organization. We do whatever we can to help protect and restore the health of Owasco Lake. We educate and inform at every opportunity be it the annual Bob Brower Scientific Symposium, our bi-monthly Public Forums or our science classroom activities throughout the watershed. The April 5, 2023, Public Forum will feature a presentation by the local Partners for a Healthy Watershed on agricultural Best Management Practices.

Promoting Lake Friendly Lawns within the Owasco Lake Watershed
By Ally Berry, Owasco Lake Watershed Inspection and Protection Division

With spring around the corner, watershed residents are beginning to think about lawn care practices and gardening plans. Landowners within the Owasco Lake should carefully consider whether or not (and the extent to which) lawn fertilizers will be used. Fertilizers that contain phosphorus can contribute to water quality issues in Owasco Lake, presenting challenges for local water resource managers looking to protect our valuable resource. During precipitation events, which are quite prevalent in the spring and summer, stormwater can pick up lawn fertilizers and transport them to Owasco Lake. Phosphorus is a "limiting nutrient" for Owasco Lake, meaning it is the least abundant nutrient that is necessary for the growth of photosynthesizing organisms. Once phosphorus enters a water body, it becomes available to these organisms, which include aquatic vegetation, algae, and cyanobacteria. This can result in an increase in their abundance, which would otherwise be limited. Cyanobacteria, or "blue-green algae," commonly manifests as Harmful Algal Blooms (HABs), which have been increasing in frequency statewide. HABs are of particular concern to water purveyors, such as the City of Auburn and the Town of Owasco, that supply drinking water to nearby municipalities and are responsible for protecting public health. HABs can render public and private areas of Owasco Lake unsafe for recreation and can increase toxin treatment requirements to make the water safe to drink.

Watershed residents can prevent the transport of phosphorus to Owasco Lake and "look for the zero." This is a common slogan used by the New York State Department of Environmental Conservation (NYSDEC) to encourage landowners to use phosphorus-free fertilizers. All lawn fertilizers have a label with three numbers separated by hyphens, which informs consumers about the ratio of nitrogen, phosphorus, and potassium (N-P-K) in the product. If the center number is zero, this signifies a product that has zero phosphorus. Similar to reading the nutritional facts on a food label, watershed residents are encouraged to "look for the zero" prior to purchasing and applying a product that will otherwise promote nutrient availability for HABs. As of 2012, the unnecessary spread of phosphorus on lawns became illegal (New York State Environmental Conservation Law, article 17, title 21 and Agriculture and Markets Law § 146-g). Prior to using lawn fertilizers, the NYSDEC recommends soil testing through Cornell Cooperative Extension to determine if a lawn is deficient in phosphorus. Using fertilizer that will bring no nutritional value to the landscaping, and may negatively impact water quality, can be a financial and ecological detriment to lakeshore owners. Soil testing not only informs decision making that benefits soil health and resource conservation, but also promotes improved efficiency when using these expensive products.



These sentiments have been echoed by the Lake Friendly Living Coalition of the Finger Lakes and watershed stakeholder groups that work to recognize residents who implement sustainable practices such as phosphorus-free lawn care. More information about the Owasco Lake Watershed Management Council's Lake Friendly Living Pledge Program can be found on their website (http://olwmc.org/lake-friendly-living). In addition, the recently approved Owasco Lake Nine Element Plan for Phosphorus Reduction outlines a watershed-based approach and project recommendations to limit phosphorus loading to the lake, and specifically mentions using phosphorus-free fertilizers.

Watershed Inspectors commonly observe yard signs that signify and advertise the application of fertilizers on properties that are adjacent to water resources. These observations highlight an opportunity to educate the public about ecological and financial benefits of following a phosphorus-free lawn care plan and considering alternatives for promoting grasses and other vegetation that do not rely heavily on fertilizers. Protecting ecosystem health is analogous to protecting human health. Reducing phosphorus loading to Owasco Lake will serve to protect the 47,000 people that rely on Owasco Lake as a drinking water source. If the 1.2 million landowners living in the Finger Lakes region can resolve to eliminate or minimize their use of fertilizers which have phosphorus, it will represent a strong commitment towards addressing water quality concerns.

Get to Know Different Water Quality Indicators with Community Science Institute's Fact Sheets
Grace Haynes, Outreach and Programs Coordinator, Community Science Institute

What makes a stream "healthy" or water "clean"? The answer may be more complicated than you expect. Community Science Institute (CSI) is a local environmental nonprofit that serves the Cayuga Lake Watershed community. With a focus on water quality data collection and reporting through community

(AKA citizen or participatory) science, CSI's volunteer groups have collected data on water quality for over 20 years in and around the Finger Lakes Region, with all their data available on CSI's free, online public database. CSI volunteers all share the goal of a healthy watershed, but how is that determined? CSI is now releasing fact sheets on the "what", "why" and "how" of different water quality indicators to help you begin to answer that question.

The "what" of a water quality indicator is its definition – what exactly does "pH" or "conductivity" (or any other indicator) mean?

The "why" delves into an indicator's meaning in the context of a waterway. What can a pH measurement tell us about overall water quality? How do different results relate to the health of aquatic organisms? This section varies depending on the water quality indicator in question – the impacts of pH and some others have been studied at different levels, but this is not true for every indicator.

The "how" breaks down the laboratory test or tests used at Community Science Institute to measure each water quality indicator. Understanding the mechanisms of laboratory tests can tell us a lot about the meaning of our indicators. For instance, the indicators turbidity and total suspended solids are related. Turbidity tells us about a water sample's cloudiness vs. clarity, while total suspended solids tells us about the particles floating in a water sample. Understanding the tests for each measure is important to understanding how they are different. The turbidity test measures how much light is scattered by a water sample: an optical measure. Total suspended solids, in contrast, measures the weight of the particles suspended. These two measurements can be highly correlated sometimes, but the indicators are in fact quite different!

To learn more about these and other measurements, visit Community Science Institute's learning materials page yourself. There, you can read and even download each fact sheet for your own understanding. Or, join a Community Science Institute volunteer team in Cayuga County to collect data on these water quality indicators firsthand! Opportunities for volunteering with Community Science Institute span all of Cayuga County, including many different waterways. Some volunteer teams monitor creeks such as Yawger Creek, Paines Creek, Salmon Creek, and more. Other volunteers monitor the shoreline of Cayuga Lake for Harmful Algal Blooms all summer long. You can find more resources about volunteering, public programming, or educational materials such as fact sheets on Community Science Institute's website (http://www.communityscience.org/).

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pH

Community Science Institute
Partnering with Communities to Protect Water

WHAT IS pH?

pH is a measure of how acidic or basic a water sample is. It can be thought of as the "potential of hydrogen" or "power of hydrogen." This is because on a chemical scale, the concentration of hydrogen ions (H^+) vs. hydroxyl ions (OH^-) determines how acidic or basic a solution is.

The pH scale runs from 1 (most acidic, like stomach acid) to 14 (most basic, like drain cleaner). Water with a pH of 7 is considered to be "neutral."

WHY DO WE MEASURE pH?

pH can be related to many other water quality indicators, making it an excellent general indicator.

Water that is *acidic*, or low in pH (<6 or 6.5), can make heavy metals (e.g. lead or copper) more soluble in the water. Low pH can also increase the toxicity of compounds like cyanides. Both of these changes can be harmful to aquatic life.

In water that is basic, or high in pH (above 9), ammonium (NH_4^+) converts to ammonia (NH_3), which is toxic if concentrated! Chronic exposure to high pH values can impact the sensory abilities of many fish.

Changes in pH can have natural causes, but more often they are a sign of industrial pollution of some sort. The following organisms can see sublethal effects at:

Daphnia sp. (water fleas)
pH under 4.5
pH over 10.3

Rainbow trout
pH under 5.5
pH over 9

Fathead minnows
pH under 6.5
pH over 9.8

February 2023

Perspectives on the Word Sustainability
Ryan Staychock, Cornell Cooperative Extension, Environmental/Natural Resources Educator

Defining the word sustainability can be challenging. I served for 8 years on a town planning board, and it was sometimes difficult to understand what an applicant meant by using the word sustainability in their presentation about a proposed project. Sometimes they would use the word sustainability in a context that was very different from my understanding of its meaning. For example, one applicant used the word sustainability to summarize the proposed project's expected revenue compared to the ongoing expenses associated with the project. The financial theme associated with the applicant's use of the word sustainability was different than the environmental tone that is often associated with the word. There is scientific research that summarizes how people have various perceptions about sustainability. I explored a couple articles in the International Journal of Sustainability in Higher Education and before I summarize those two articles, I want to review the history of the word sustainability, as I remember learning about it in my studies at Colorado State University.

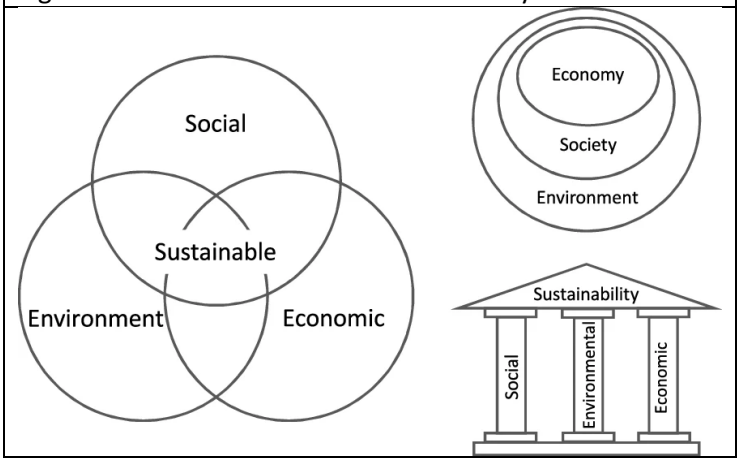
A commonly referenced definition of sustainability is from the 1987 United Nations Report of the World Commission on Environment and Development: Our Common Future. It is commonly known as the "Bruntland Report" because the chairperson's name was Gro Harlem Brundtland, who was also the Norwegian Prime Minister. The World Commission on Environment and Development introduced to the global community the concept of "sustainable development". The website for the United Nations defines sustainability as "meeting the needs of the present without compromising the ability of future generations to meet their own needs." The report referenced the intertwined nature of ecology (ecosystems) and the global economy, and in a separate context of the report brought equity into the discussion. The report brought attention to the idea of ecosystems, economies and people playing important roles for decision making surrounding the concept of sustainable development.

I read a research paper published in the International Journal of Sustainability in Higher Education titled "Perspectives of scholars on the nature of sustainability: a survey study." The authors included in their research two indigenous perspectives about the definition of sustainability. One perspective was from the Australian Aboriginal Communities and the other was from Indigenous leaders around the Pacific Salmon Runs of North America. In Australia there is a responsibility associated with the concept of sustainability that includes managing landscapes with maximum and minimum thresholds. In North America there is an "intergenerational view to build a balance between human-being and larger patterns of life." Both perspectives about sustainability place value on people being interconnected with their ecological surroundings.

In the same research paper outlined above, around the year 2005 the definition of sustainability had expanded from the 1987 Bruntland Report, and the paradigms included economy, society, and environment as the three pillars of sustainability. These three pillars, environment and economy and society, can be explained as the three legs of a stool- each leg is important to keep the seat functioning as it is designed (See Figure 1). The Environmental Protection Agency summarizes each of these pillars on their website (https://www.epa.gov/report-environment/sustainability-and-roe):

- The environment represents the natural world, including native animals and plants, mineral deposits, soil, water, and air.
- The economy comprises activities that provide products and services to people. These include manufacturing, agriculture, mining, power generation, drinking water treatment, wastewater treatment, solid waste management, health care, construction, and commercial fishing and aquaculture.
- Society represents people, their actions, and their quality of life. This includes human health and well-being, government and other institutions, buildings, transportation and utility infrastructure, and recreation.

Figure 1. Models for Pillars of Sustainability



Ambiguity remains on how to set priorities to be as sustainable as possible. It's hard to find the answers to perfect sustainability.

I often hear the word sustainability used in a context that is unfamiliar, maybe even uncomfortable to me. I wonder if people have a bias perspective of the word sustainability. James Madison University Department of Political Science researcher Rob Alexander explored personal definitions of sustainability and their impact on perceptions of "sustainability culture" at both James Madison University and Wofford College. Students, staff members and faculty completed a survey, 701 total respondents, and researchers found that sustainability is often perceived through the lens of the environmental pillar (one leg of the stool) compared to having a 'balanced' perception of sustainability that included all three pillars including social, economic, and environmental factors.

I am the Environmental/Natural Resources Educator for Cornell Cooperative Extension serving Cayuga, Schuyler and Seneca counties. Please feel free to contact me if I can be of any assistance to helping you or your organization strive for sustainability. I can be reached at 315-539-9251 (110), by email at ryan.staychock@cornell.edu, or by cell phone 585-694-0305. I would be happy to meet with you to brainstorm how I can be of assistance to you or your organization.

Cayuga County WQMA

For more information about the Cayuga County Water Quality Management Agency, check out our website at www.cayugacountywater.org.

The Cayuga County WQMA is also on social media.

For up-to-date information on water quality issues and events, please either friend us on Facebook at: https://facebook.com/CayugaCoWQMA or follow us on Twitter at https://twitter.com/CayugaCoWQMA.

The Cayuga County WQMA is looking for story ideas for its webpage and its newsletter. If you have something you would like to share, please email us at wqma@cayugacounty.us.

CAYUGA COUNTY Water Quality Management Agency
T: 315.253.1276 | 160 Genesee St., 5th Fl. | Auburn, New York | 13021
cayugacountywater.org