

A Progressive Project Exploring Your Lake: An Opportunity to Bloom Awareness

The Board of Connecticut Federation of Lakes (CFL) wants to present a year-long project, broken down into monthly focusses that build on themselves to create awareness of your lake and watershed. For our individual members we hope to help you focus on attainable projects that can be started by one person and eventually be built on to aid in the formation of a group and eventually an organization. For our seasoned organizations, we hope to offer ideas that will enrich and support your existing programs or start new ones. Our thought is to start by taking a step back and return to the basics of lake awareness. This will be a basic program, but we will offer more extensive resources if your curiosity has not been satisfied. In addition, we will offer a suggested task related to the publication to help produce a year-end product, report or flier, to demonstrate your knowledge of your lake and the work you have completed. This product can then be utilized to help gain the support of other individuals or residents, reach out to stakeholder organizations, exhibit your dedication to conservation, aid in gaining funding, and help inform your local government or the state of discovered needs.

Publication 2: Eutrophication and Its Effect on our Lakes

Eutrophication is the process of a body of water becoming enriched with nutrients. The process is a natural process that occurs to all bodies of water but is oftentimes exacerbated by human activity. This is known as anthropogenic eutrophication. This is an ideal focus when trying to make improvements to your watershed, because it is usually more of a contributor than natural causes. Erosion can also be a natural process where water can cause minerals, sands, and silts to be transported away from their intended spot on the landscape. Any raindrop that finds its way directly to our waterways, via land, has the potential to add to the eutrophication of a waterway. How much it adds to eutrophication depends on numerous factors. The worst-case scenario for the raindrops landing on our watershed leads to eutrophication by depositing the carried nutrients directly and quickly into our beloved waterways. As lake stewards, we need to take action and monitor our lakes, so we become aware of issues earlier. This can be done with a simple monitoring program conducted by a single or numerous concerned and caring lake enthusiasts.

Many of our lakes are fed by river(s). In a river, eroded sands and silts change the benthic (a.k.a. bottom) environment. When our rivers are burdened with excessive sand and silts, the water flow in them can be changed causing it to move faster in certain areas and slower in others, leading to faster bank erosion and potentially adding additional sands, silts, minerals, and nutrients to the system. Those crevices around the benthic rocks that get filled in with run off deposits are essential habitat for aquatic macroinvertebrates, the visible animals without backbones that live in those crevices and aid in cycling the nutrients out of the river. If those spaces fill faster than our macroinvertebrate friends can cycle the new and existing nutrients, the excessive nutrients continue to flow downstream into our beloved lakes and ocean. Here is

a fun video that explains river flow. When watching, think about how excessive, anthropogenic activity could affect a river's flow. [Why Do Rivers Curve?](#)

Eutrophication affects our lakes by allowing those nutrients, sands and silts to settle out and fall to the bottom, eventually. Deposited sands and silts make a great environment for aquatic plants to settle into and grow roots. Usually mixed with those sands are abundant and necessary nutrients to additionally aid in the growth of the aquatic plants. Unfortunately, the invasive plants we are trying to control tend to find these new fertile deposits first, adding to invasive aquatic plant control issues. In addition, those nutrients may also be available for use by algae and cyanobacteria, potentially leading to unpleasant and unhealthy harmful cyanobacteria blooms. Upon the death of the cyanobacteria blooms they fall to the bottom of the lake where decomposition will occur. When large masses of biological material find their way to the bottom all at once, the act of decomposition by the microbes starts to utilize all available oxygen in the hypolimnion, the lower level of a waterbody that is cooler and does not mix with the warmer top layer(s). When all the oxygen is utilized, the area becomes anoxic, causing a chemical reaction to occur that releases nutrients from the bottom, potentially leading to more cyanobacteria blooms. Here is a video to help visualize and understand lake stratification.

[NALMS Student Video Series #2: Lake Mixing & Stratification](#)

The source of eutrophication to a lake can be broken down into one of two categories, point sources and nonpoint sources pollution. Point sources of pollution are from human activities that result in a discharge from an identifiable point. These are regulated discharges and require permits from the Environmental Protection Agency in cooperation with CT DEEP. This permit program is known as the National Pollutant Discharge Elimination System (NPDES). If you had taken the chance to explore your watershed and utilized <https://modelmywatershed.org/> you can see what NPDES permits are issued in your area. The discharge for these areas is public knowledge that can be obtained by a visit to CT DEEP in Hartford. Here is the link to the EPA page on NPDES permits <https://www.epa.gov/npdes> . Don't be afraid to find and read the permits in your area to understand more. The NPDES permits include many areas. Some of the most common are Animal Feed Operations, Municipal wastewater, Industrial wastewater, and Stormwater. Reviewing these permits is a fantastic way to learn about the inputs into your favorite waterbody. The organizations that hold these permits may also be a great resource for partnering with fellow stakeholders in your area. A notable example is towns that require MS4 (Municipal Separate Storm Sewer System) Permits. Under these permits, the municipalities are required to perform public outreach and education. This is a terrific opportunity to partner with your municipality to achieve your organization's outreach goal and your municipality's goal together. UCONN has a program called Nonpoint Education for Municipal Officials (CT NEMO) that offers numerous resources in this area. <https://nemo.uconn.edu/>

The tricky discharges are the nonpoint sources. As the name eludes too, the source is not always known. Think about where rain runs off directly into a waterway or into a pipe that leads directly to a waterway. I know that sounds like a point source, but before it reaches the drain it is a nonpoint source. Some common sources of nonpoint pollution include agriculture, hydromodification, roads, paved surfaces, and lawns. These sources are usually best

addressed by buffer systems and low impact development (LID). Stream buffers on agricultural fields can help prevent fertilizer from reaching a waterway and will also help with stream bank stabilization too. Hydromodification can be combated with stream bank stabilization projects. Utilizing swales or diversions to retention areas alongside roads can help filter water before it enters our roadways. Testing before fertilizing and careful application to prevent overspread from landing on paved surfaces reduces nonpoint pollution. Having septic systems pumped and inspected regularly can prevent groundwater from becoming polluted. Here is a link to the EPA's resources page on nonpoint source pollution. <https://www.epa.gov/nps>

Task 2: Start a Water Quality Monitoring Program or Add to Your Current One.

The focus project for this month is to understand the current conditions of our lake. We want to quantify your starting point. Obtaining the current conditions will be used to educate and build awareness initially and eventually be used as a comparison to demonstrate improvement or degradation in the future, depending on the conditions in the watershed. To do this we want every lake to have at least one citizen scientist gathering data. A citizen scientist-based monitoring program promotes awareness through learning and involvement. Additionally, it helps fill in the gaps of surface water monitoring created by local, state, and federal budgetary constraints. It can be done with basic tools and expertise and as long as it is conducted in a consistent and reliable manner the data gained is a valuable tool in demonstrating current and changing health. Besides, it gives you another reason to go out or down to the lake. CT DEEP has developed a program called Lake Watch to ensure quality data is collected. This is a basic Volunteer Water Quality Monitoring Program. There is a training session scheduled for May 11, 2023 in Woodstock CT. See the next page for more information.

<https://portal.ct.gov/DEEP/Water/Inland-Water-Monitoring/Lake-Water-Quality-Monitoring>

Register for the training by emailing: DEEP.CTLakeWatch@ct.gov

Basic Equipment to purchase for Lake Watch participation: (Includes Approximate Prices)

- Secchi Disk - \$31
- Thermometer - \$16
- Underwater Viewing Tube - \$50
 - You can build one for under \$15 - Check back for plans.
- Data Notebook and waterproof pen or pencil
 - or use the Lake Observer App (Free)
- GPS Unit or Depth Finder - Under \$100
- Boat with an Anchor - Can be a paddle boat (Kayak, Canoe)
- Camera or Smartphone in a waterproof case
- Bloomwatch App (Free)
 - Details on BloomWatch: <https://cyanos.org/bloomwatch/>

If some of the basic equipment listed above is out of your reach for this season or you can't make the training - We have an alternative, but you still need:

- Secchi Disk - \$31
- Thermometer - \$16
- Data Notebook and waterproof pen or pencil

- Or use Lake Observer App (Free)
- Camera or Smartphone in a waterproof case
- Download training slides from <http://www.ces4health.info/find-products/view-product.aspx?code=6TPFD4D2>
 - Or watch training: Link will be added by 5/6/23
- Bloomwatch App (Free)
 - Details on Bloomwatch: <https://cyanos.org/bloomwatch/>

You can monitor from a deep dock, anchored buoy or platform, or a GPS identifiable location with a boat and anchor. If you cannot make the training - no worries. You can still collect quality data. Email all your secchi disk readings at the end of the season to info@ctlakes, send your July results to: <https://www.nalms.org/secchidipin/> , and keep your full records saved on the Lake Observer app, on paper, or on a drive. Remember: Quality data never goes bad!

As you can see the basic criteria used to investigate our waterways include temperature, clarity, color, and the presence of algal blooms. As time goes on you can add to your monitoring program by obtaining equipment that can collect data on some additional parameters including pH, dissolved oxygen, conductance, phosphorus levels, nitrogen levels, E. coli, and more. Another option is to collect the basic data yourself and hire a consultant to collect some of the other parameters. Please note: As much as we at the CFL would love to recommend a lake management consultant, we are not affiliated with any particular one, but talk to other lake associations or do an online web search to find out who is in your area and read the reviews.

SAVE THE DATE!

Volunteer Lake Monitoring Training Workshop

May 11, 2023
10:00 a.m. - 2:00 p.m.

Roseland Park
205 Roseland Park Road, Woodstock, CT

Are you interested in learning how to collect water quality samples on your lake or pond? Do you want to contribute data toward statewide efforts to monitor and assess water quality and cyanobacteria blooms? Are you a member of a lake association or watershed group? If so, this workshop is for you!

During the workshop, volunteers will be trained how to collect and contribute data to CT Lake Watch and Bloomwatch. Participants will also learn how their data will be used by CT DEEP for monitoring and assessment purposes. There is no cost to attend. Participants should bring their own lunch. If you want to practice monitoring techniques on the water, you need to bring your own boat and safety equipment.

Registration required; deadline to register is May 5th.

To register email: DEEP@LakeWatch@ct.gov



Training presented by the US EPA Region 1, CT DEEP
and The Last Green Valley

Volunteer Water Quality Monitoring Program

