

Kettle Lakes Association  
Storm Response Plan

**Prevention, Mitigation, and Immediate Storm Response**

The principal objective of this storm response plan is to provide a rapid and coordinated response to large-scale storm events to ensure the health and safety of residents of our Kettle Lakes community.

Corollary objectives include the preservation and protection of homeowner property from flood induced damage as well as the water quality of our Kettle Lakes.

The Cortland-Onondaga Federation of Kettle Lakes (Kettle Lakes Association) was formed in 2009 with the mission to support our neighbors in our four kettle lake communities (Tully, Crooked, Song and Little York Lakes) as they address challenges from the growing number of significant storm events that result in run-off and flooding. Our focus is on prevention, mitigation, and immediate storm response.

Prepared by representatives from the Cortland-Onondaga Federation of Kettle Lakes  
Crooked Lake Property Owners Association  
Little York Lake Preservation Society  
Song Lake Property Owners Association  
Tully Lake Property Owners Association

Last update by The Kettle Lakes Association Storm Team - January 2023

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## I. Background

Across the globe, impacts from climate change are being felt in a variety of ways. The extreme weather, or natural disasters that impact each region, are based on a variety of factors. We know that in our region, we have already experienced and can anticipate an increasing frequency and severity of significant rain events. The Northeast is getting wetter and enduring more impactful, heavier storms. Indeed, the number of severe rainstorms - those that drop more than 1 inch in 24 hours - has increased by 74 percent in the Northeast, more than in any other region of the country, according to the National Climate Assessment.

The storm events and subsequent flooding within the Kettle Lakes watershed during 2021 underscore the need for a coordinated response to such events. The remnants of Hurricane Ida dropped more than 8 inches of rain over a two-day period in August 2021 (an atmospheric river) that resulted in home flooding, property damage, road closures and threatened to inundate the Tully Wastewater Treatment Plant. Two months later, the remnants of tropical storm Fred dropped 3.9 inches of rain on our saturated watersheds invoking a new flooding threat.

Photo credit-Colleen Zawadzki



*Hoffman Road, August 2021*

The flooding compromised some homeowners' drinking water wells with bacterial contamination, some septic systems were severely or mildly compromised, property damage occurred to low lying homes, shorelines and docks and some roads were impassable resulting in delayed services. We also lost recreational use of the lakes for a recovery period to prevent health risks from swimming in the potential of bacteria tainted waters. Boating in waters with unseen hazards from broken branches became dangerous and had the potential for causing wake damage. Other concerns were unmoored docks, and other floating and submerged debris, and shoreline erosion resulted from high water levels. For many residents, this threat continued into the following spring when snowmelt exacerbated already high-water levels.

While the community response to this emergency was decisive and swift, thanks to the individual and collective Kettle Lakes' leadership, these events and the likelihood of similar events becoming more frequent underscored the need for a coordinated storm response including a communication plan to notify lake residents of the inherent hazards in a timely manner.

### **Our Watersheds**

Combined, the Kettle Lakes Watershed represents a 19,000+ acre area in northern Cortland County and southern Onondaga County. The watershed is also known as the Tully Lakes area due to the nearby Town of Tully. While kettle lakes are present throughout the Upper Susquehanna River watershed, this region includes a high quantity of kettle lakes, including several large lakes positioned in a compact area. The lakes are sought after for aesthetic and recreational purposes, and many have highly developed shorelines for relatively small bodies of water, resulting in elevated water quality concerns. Watershed groups for many of the larger lakes including the Kettle Lakes Association have been hard at work seeking to better understand water quality issues and their causes. These groups

have partnered with organizations and agencies to educate residents and municipalities, develop lake management plans, and begin implementing practices to improve water quality.



*(Map Credit, Upper Susquehanna Coalition)*

### **Kettle Lake Characteristics -**

While we enjoy the beauty of our kettle lakes, we also face great challenges. Each lake shares a hydrogeological history, having been formed at the same time as the Finger Lakes from the retreating Pleistocene Glacier. While remaining unique, we also share some common watershed issues. Here is a quick synopsis of each of our member lakes.

**Crooked Lake** is in Onondaga County but has a shared hydrogeology with all the kettle lakes. Interestingly, while our lakes drain predominantly into the Susquehanna River Basin, Crooked Lake is perched on a divide that drains either to the Great Lakes or the Chesapeake Bay. Historically, Crooked Lake was greatly impacted by water withdrawals by Solvay Process for salt solution mining through the Tully Valley. Today, the residents of Crooked Lake continue to protect the waters by reestablishing the covenants put in place to protect the lake and restore it from past abuse.

**Little York Lake** is entirely in Cortland County. It has a lovely County Park and is a thriving attraction for residents and visitors to the area. With renowned

bass fishing and home to the Cortland Repertory Theater, a tremendous fondness for Little York Lake prevails. Many know that it is home to numerous aquatic invasive species and other invasive species. These **Aquatic Invasive Species (AIS)** have altered the water quality of the lake and provided an environment that has allowed variable water milfoil to take over, causing significant damage. Ridding the lake of this invasion is a high priority.

**Song Lake** is a small, mostly private lake. It has also been heavily impacted by past practices of agricultural runoff, outdated septic systems and suffocating milfoil. Despite the diligent efforts on the part of homeowners, zebra mussels were found in 2018. The introduction of this aquatic invasive has had significant impacts on the lake with the aggressive rebounding of aquatic plants. The sporadic appearance of **Harmful Algal Blooms (HABs)** occasionally places this lake in jeopardy for both recreational swimming and fish habitat. Lakes around the world are facing these blooms, and a solution to this hazard is a concern for lake residents here and in most of our kettle lakes.

**Tully Lake** strides the divide between Cortland and Onondaga Counties. It was historically a thriving tourist attraction (1890s to 1940s) with a long history of recreational enjoyment and grand hotels. With its meandering shoreline and quiet coves, it remains an idyllic lake. Within its beauty, Tully Lake is also a waterbody at risk from the threat of invasive species, proliferation of Eurasian watermilfoil, invasive chara and now HABs. Protecting the lake from over development and from the entry of unwashed boats is a significant concern.

### **Storm Water Runoff**

Whenever it rains, water from roofs, roads, and fields carry sediments, oil, pesticides, bacteria, fertilizer, and all manner of untreated pollutants into our waterways. For our small lakes, the impact can be severe since we depend on septic systems and drinking water wells, while being surrounded by agricultural fields and highways. Some of these concerns can cause short-term damage to property and neighborhoods, such as road washouts, erosion and damage to landscaping and recreation, causing financial hardships. Bacteria from aging septic systems can result in drinking well contamination requiring testing and remediation. More problematically, these storms can result in long term negative impacts to the lakes by increasing the available nutrients for excessive plant growth and algae or by allowing the introduction of AIS.

Each of our lakes has been affected by invasive weeds, and most of our lakes by algae. **Harmful Algal Blooms** (HABs) have become a concern for most lakes in the US, and three types of potentially toxic cyanobacteria have been identified in our lakes. Once these cyanobacteria are in a lake, there is little to be done to mitigate them. They do, however, need nutrients to survive. Phosphorus and nitrogen from runoff are the most available sources of nutrients, making a reduction in stormwater the best management practice we have available. Each of our Kettle Lake associations have been actively involved in efforts to reduce stormwater inputs by increasing the buffers around lakeshores with trees and shrubs, looking for opportunities to reopen wetland regions and working with our Soil and Water Conservation Districts to examine ways we can slow or eliminate runoff into our lakes.

While the introduction of AIS can occur in innumerable ways, including those carried in by wildlife, boats and tributaries, the addition of storm runoff increases the prospect of introducing a new AIS from one waterbody to another. Zebra and Quagga mussels have wreaked havoc in lakes, upending the stability of the aquatic ecosystem. All measures need to be taken to prevent the spread of AIS, including reducing stormwater inputs.

### **The Kettle Lakes Stormwater Implementation Plans**

As beneficiaries of the *National Fish and Wildlife Fund \$50,000 Chesapeake Bay Technical Capacity Grant*, in collaboration with Syracuse University's Environmental Finance Center (EFC-SU), Princeton Hydro and Cortland County Soil & Water, we examined potential harmful stormwater impacts on our kettle lakes and positive remediation for each concern found during lake research. We hosted two information sessions in Homer and Tully in November sharing the findings for each lake and possible action steps to address these concerns. An example of one solution shared among several lakes was increasing riparian growth along shorelines to decrease erosion and stream run-off. A link to each of these WATERSHED IMPLEMENTATION PLANS (WIPs) is available at:

<https://www.kettlelakesassociation.org/lake-management>

## II. Emergency Preparedness

A survey was conducted on all four of the kettle lakes, between March and August 2022 with 83 individual responses. While Tully Lake appeared to have been most impacted, all the lake respondents shared their concerns and damages from the 2021 storms. The most common concerns include land erosion and damage to personal property, contamination of well water, septic system contamination, other water quality issues including the contamination of wildlife and fish, loss of recreation and turbidity causing an inability to see below the waterline after these events, flooding of basements and roads, erosion from roads and fields with ongoing concerns around contamination from agricultural runoff, increased nutrient loads causing more frequent Harmful Algal Blooms. On Tully Lake, the issue of beaver dams was questioned as contributing to flooding. Many responded that the storm cost them between \$100 and \$1,000, and 25 respondents reported that the storms of 2021 cost them more than \$1000 in damages.

The survey showed the need to address the predicted increase in weather events of this type, on our team used this information to help inform our actions and planning.

Storm-induced flood emergencies create a variety of hazards. Preparing beforehand greatly diminishes the threat of property damage and bodily injury. This plan was developed to prepare our lake community for the possibility of a likely recurrence of storm-induced flooding and to help ensure the health and safety of the Kettle Lakes community.

### **Storm Alert**

One of the key components of a storm response plan is identifying a potentially significant storm prior to its arrival within our watershed. For this element of the plan, we will be relying on the National Weather Service flood warning system (<https://www.weather.gov/safety/flood-watch-warning>). The system constitutes four flood condition alerts:

**Flood Advisory: Be Aware:** A Flood Advisory is issued when a specific weather event that is forecast to occur may become a nuisance. A Flood Advisory is issued when flooding is not expected to be bad enough to issue a warning. However, it may cause significant inconvenience, and if caution is not exercised, it could lead to situations that may threaten life and/or property.

**Flood Watch: Be Prepared:** A Flood Watch is issued when conditions are favorable for a specific hazardous weather event to occur. A Flood Watch is issued when conditions are favorable for flooding. It does not mean flooding will occur, but it is possible.

**Flood Warning: Take Action!** A Flood Warning is issued when the hazardous weather event is imminent or already happening. A Flood Warning is issued when flooding is imminent or occurring.

**Flash Flood Warning: Take Action!** A Flash Flood Warning is issued when a flash flood is imminent or occurring. If you are in a flood-prone area, move at once to high ground. A flash flood is a sudden violent flood that can take from minutes to hours to develop. It is even possible to experience a flash flood in areas not immediately receiving rain.

## Weather Alert System

The Kettle Lakes Associations Storm Team will assist our lake residents in monitoring upcoming significant storm events that could negatively impact our communities and waterbodies and will make every effort to share this information in a timely manner on our website and Facebook pages, and through email chains whenever possible.

### Threat Levels



**Green** - No threat, storm unlikely, dry antecedent conditions

**Yellow** - Low to moderate threat, storm may produce some localized flooding, wet antecedent conditions

**Red** - High threat, storm is likely to produce extensive or severe flooding, very wet antecedent conditions

The information published by the National Weather Service regarding flood conditions alerts for our area are included on our Kettle Lakes Storm Response website link for IMMEDIATE STORM RESPONSE ([Immediate Storm Response](#)) which includes real time alerts, Doppler Radar and advisories for the Kettle Lakes area and also offers a wealth of other storm related resources and information.

The Storm Team will communicate among themselves via a cell phone group text and initiate monitoring of local forecasts, local doppler radar, as well as the National Weather Service Northeast Region River Forecast Center. ([NWS Northeast River Forecast Center](#) )

The warnings and forecast issued by the National Weather Service will inform the declaration of specific color-coded threat levels for our Kettle Lakes as follows:

#### Threat Levels

Once a yellow or red threat level has been determined by current weather conditions, the Storm Team will make every effort to inform the residents of each respective kettle lake and local authorities in accordance with the established water quality monitoring and communication plan.

### III. Water Quality Monitoring

In addition to communication to the lake residents and local authorities, the threat levels described above will be used to mobilize and execute storm water quality monitoring at each lake.

Although we have long-term data sets on our lakes, the following process will give us clear pre- and post-storm readings in a timely manner. Real-time data will provide better indicators of immediate storm impacts and the data sets we create may assist in understanding the mitigation measures we may need to address.

The materials and methods for this monitoring will be in accordance with the NYS DEC Citizens Statewide Lake Assessment Program [https://www.dec.ny.gov/docs/water\\_pdf/cslapsampro.pdf](https://www.dec.ny.gov/docs/water_pdf/cslapsampro.pdf). Each of our lakes has trained volunteers to do lake sampling in a safe and appropriate manner. This sampling is NOT part of any other monitoring programming. We think that the mechanisms are in place for individual lakes to provide a safe and accurate level of monitoring for the purposes stated. Each lake will identify monitoring sites. The deep water in-lake sites are identified on the maps in the appendix. The tributary sites are located based on the Storm Water Implementation Plans from 2017 for each lake, and resident observations. Each of those sites is identified on the maps in the Appendix.

Lakes may choose to record monitoring information on the monitoring sheets attached, or directly into the Excel system link provided at the website.

The monitoring actions and associated chemical and biological analysis will be:

**At Threat Level Green-** No special monitoring will take place. All our lakes participate in annual water quality assessment monitoring. At this level, the water quality results, lake level, and groundwater elevations are all normal for this time of year and no additional testing would be called for.

**At Threat Level Yellow—** We will assemble and prepare to collect **pre-storm** deep water lake and tributary samples.

**In-lake -** Prepare bottles for chemical analysis to go to the laboratory. Record temperature and Secchi depth readings. Include visual observations (brief narrative) and a picture of pre-storm conditions.

**Lake Tributaries -**Prepare bottles as needed from monitoring stations (inflow and outflow). We will **hold and refrigerate samples until the threat passes**. If no storm has occurred, then discard samples. If the storm does occur, refrigerated samples will be submitted along with post samples to Upstate Freshwater Institute for analysis as soon as reasonably possible, ideally within 24-48 hours.

**At Threat Level Red— After flooding has occurred,** each lake must assess safety before collecting any samples. Safety issues may include, but not be limited to boating in and around any debris in the lake, as well as the potential for bacterial exposure. Once conditions are deemed safe, continue to monitor lake and tributary conditions as above and submit storm chemistry and biology samples to the Upstate Freshwater Institute, complete with the chain of custody, for analysis along with the pre-storm water quality as soon as reasonably possible, ideally within 24-48 hours.

The day following the conclusion of the storm and once again a week after the storm, we highly recommend each lake do a field analysis and re-examine their lakes. This field data will include Secchi Disc readings, sounding depth at deep site and clarity readings, temperature, visual observations, and photograph(s) and input this data into the monitoring sheets.



#### **IV. Communication and Responsibilities**

While the Kettle Lakes Association will do its best to disseminate information, each individual Lake Association must do their best to keep the information related to the Storm Response updated and timely.

1. Information Resources-The Kettle Lakes Storm Response Team will serve as a clearinghouse for information to Individual Lake Coordinators

Kettle Lakes **Storm Response** Website: [Kettle Lakes Storm Response](#)

Kettle Lakes **Storm Response** Facebook Page:

<https://www.facebook.com/profile.php?id=100083237916874>

Kettle Lakes Association Website: [Kettle Lakes Association](#)

Kettle Lakes Association Facebook Page:<https://m.facebook.com/cofokla/>

Little York Lake Preservation Society Website: [Little York Lake Preservation Society](#)

Little York Lake Preservation Society FB Page: <https://www.facebook.com/littleyorklake>

Song Lake Property Owners Association Website: <https://songlakepoa.org/home-page>

Song Lake Property Owners Association Facebook Page: <https://www.facebook.com/SongLakePOA>

Tully Lake Property Owners Association Website: [Tully Lake Property Owners Association](#)

Tully Lake Property Owners Association FB - member only site.

<https://m.facebook.com/groups/614036675303724/>

2. Responsibilities for Implementation for Storm Plan Components:

##### **Drinking Water Bacterial Testing**

Kit Distribution and Coordination for bacterial lab analysis at Life Science Laboratories, Inc. located in at 5854 Butternut Drive, East Syracuse NY. The chain of custody sheet will be filled in by the homeowner with accompanying payment. Each kettle lake will develop their own system for distribution of bottles and a process for delivery to the testing analysis site. Most associations will coordinate these tasks among multiple lake residents.

Song Lake – President Tony Goddard [tony@lafayettemp.com](mailto:tony@lafayettemp.com)

Tully Lake – President Colleen Zawadzki [Karatecolleen123@gmail.com](mailto:Karatecolleen123@gmail.com)

Crooked Lake-President Seth Aldrich [sethfaldrich@gmail.com](mailto:sethfaldrich@gmail.com)

Little York Lake- President Gary Lawrence [garylawrence1805@yahoo.com](mailto:garylance1805@yahoo.com)

**Outreach to Vulnerable Residents-** Each Kettle Lake Association will develop a plan for contacting those residents who are unlikely to be able to access electronic information systems for support during storm events to determine needs. This may be like a “Neighborhood Watch” type of model. A neighborhood watch program is a group of people living in the same area who want to make their community and neighborhood safe by working together. They often network and outreach to local support agencies.

**\*ANY EMERGENCY CALL 911**

***The Kettle Lakes Storm Response Team will apprise local and state and municipal agencies as appropriate. See Appendix (Resource List)***

## V. Homeowners

### **Essentials**

The first line of action for all homeowners is to monitor the weather, keep track of emergency weather statements, and keep open all lines of communication with your lake association. Be sure you have all your emergency contact information on hand and keep an updated emergency supply kit.

Supply Kit Recommendations:

**Food and Water.** The most essential part of your kit is several days' supply of [food](#) and [water](#) for you, your family and your [pets](#). More detailed suggestions for these can be found at official Federal Emergency Management Agency (FEMA) website, [www.ready.gov](http://www.ready.gov) Here are other items that you should consider including in your kit:

### **Any Medications.**

**Extra Cell Phone Charger.** Often cell phones can access critical information when power is out.

**Flashlight.** Extra batteries for the flashlight are also a good idea. If your power is out and you have no way to charge your phone, you might need to rely on a flashlight to get around at night.

**Whistle.** A whistle can help you signal for help if you are stranded and need search and rescue to hear you.

**Dust Masks.** Depending on the emergency, you may need a mask to help protect you against contaminated air.

**Local Maps.** If you need to evacuate but have no power or access to the internet, you may need to rely on a paper map to find your way to safety.

**Manual Can Opener.** Your emergency kit is probably made up of canned food, which lasts for a long time. If you don't have power, you'll need a way to open these cans.

**Battery-powered or Hand Cranked Radio.** A radio will help you receive updates on the disaster and any known safety risks.

**Recreation.** Books, games, puzzles or other activities for children. Disasters can be stressful. If you have fun games or activities that your children can do when the power is out, this can help them cope with the stress.

**First Aid Kit.** Conditions during and after a disaster can vary dramatically. You may need to provide immediate care to an injured family member.

**Supplies for your [pet](#).** Your pet is a member of your family. You will want to have enough of their supplies for several days, as well as a favorite toy to comfort them.

**Wrench, pliers and other essential tools.** These tools can come in handy if you need to turn off utilities. Visit [ready.gov/safety-skills](http://ready.gov/safety-skills) to discover more valuable skills that can be useful in emergency situations.

### **Prepare your home, year round**

This section on preparing your home and property comes from [\[MUST KNOW TIPS\] How To Prepare Your Home For Heavy Rain](https://911waterdamageexperts.com/must-know-tips-how-to-prepare-your-home-for-heavy-rain/)

<https://911waterdamageexperts.com/must-know-tips-how-to-prepare-your-home-for-heavy-rain/>

*Did you know that nearly 40% of all home insurance claims result from water damage? It's without question that all types of rain can cause damage to your property, but most insurance claims related to rain damage come from heavy rain downpours.*

**Keep Your Gutters Clean** - Gutters are your home's first line of defense against heavy rains. They are designed to catch rainwater and direct it away from your home ultimately preventing rot, mold, and other rain-related problems. Unfortunately, they don't work if they're clogged. When a gutter gets backed up with pine needles or other debris, it can't channel water efficiently. In fact, the debris creates a dam which can push water back up under your roof, or down the siding of your house. With this in mind, keep your gutters clean, especially when you're expecting heavy spring rains. While there are many ways to clean gutters, rinsing them with a garden hose is typically sufficient.

**Clear Debris from Stairwell Drains, Window Well Drains & More** - During sudden storms, stairwells and window wells can act as catch basins where water can accumulate. Checking and clearing any drains will help reduce the risk of water building up and causing pressure on the foundation. Some small leaves, dirt, and debris will find themselves in the sump of the drain. It can then accumulate to form a clog. To clear the drain, open the grate to see if there is an accumulation of debris directly beneath it. The area directly below the grate is called a sump; the area drain itself. Use a small shovel or your hands (with gloves) to take out the material causing the clog.

**Check All Wall Air Conditioners** - If your home has wall air conditioners, ensure the size of the internal drainpipe has adequate water and is flowing freely. Double check that there is proper caulking and weather stripping around the unit. Ensure the unit is installed with a 1/4-inch (2-degree) bubble tilt toward the outside. Look for any gaps, cracks, or other damage that indicates improper caulking around the edge of the sleeve to the exterior of the building. This increases vulnerability to water entry. If the AC unit has an internal drain, make sure pipe size is correct and water is running and flowing freely to handle a large volume of water.

**Check Sump Pump Discharge Lines** - Throughout the summer months, storms can bring heavy rainfall in a short time, which means your sump pump is going to run. Check your sump pump discharge line to make sure it is not blocked by obstructions and that water is pumped safely away from your home.

**Re-Seal Your Windows and Doors** - When it rains for weeks at a time, your windows and doors act as defense mechanisms for your home. If they're poorly or improperly sealed, though, they could wind up leaking a lot of heat or allowing water to enter the home. Be sure to re-seal your windows and doors before the heavy rains start. Use weatherstripping, foam tape, caulk, rigid foam insulation, or window film to block any air or water leaks and keep your home cozy.

### **Have Your Basement Inspected**

If you live in a wet environment, your basement could be at significant risk of flooding when the rainy season starts up. With this in mind, it's smart to have the space professionally inspected before the rains start. A professional will be able to evaluate your basement for leaks, structural weak spots, and other risk factors that could lead to problems during heavy rain. If the inspection uncovers mold,

*electrical damage, or mildew, it's wise to hire a disaster cleanup or restoration company to address these issues before the rain starts to fall. If you have a sump pump in your basement, ensure it's in proper working order and that there is a backup system in place, in case the power goes out during a big storm.*

### ***Inspect Your Roof***

*If your roof is missing shingles, sagging, or just old, have it inspected before it starts to rain. If there are areas that need attention, have them fixed now rather than waiting until Spring is over. Don't forget to check your chimney for cracks, gaps, or missing tiles that could allow leaks.*

***Trim The Trees Around Your Home*** - While you might not think much about trees, branches, and other items around your home, it's important to remember that fallen trees and tree limbs are the top cause of preventable property damage. Keeping these landscape elements trimmed back during the spring is especially important, as heavy rainstorms often create high winds that can bring down debris.

***Avoid Aggressive Roots When Planting Trees*** Large shade trees, such as silver maple trees, should be planted at least 20 feet away from the home to help avoid foundation cracks from roots. Smaller trees, such as white fir trees, should be given a clearance of at least 10 feet from the home. (Kettle Lakes recommends riparian trees that will survive long spells in water such as River Birch, Black Tupelo, or Red Maple)

***Build A Soil Crown*** - When landscaping the area directly around the house, be sure that the soil next to the home is the highest grade while still below the top of the foundation wall. This keeps water from pooling next to the home and spilling over the top of the foundation walls as well as causing undue hydrostatic pressure on the foundation underground

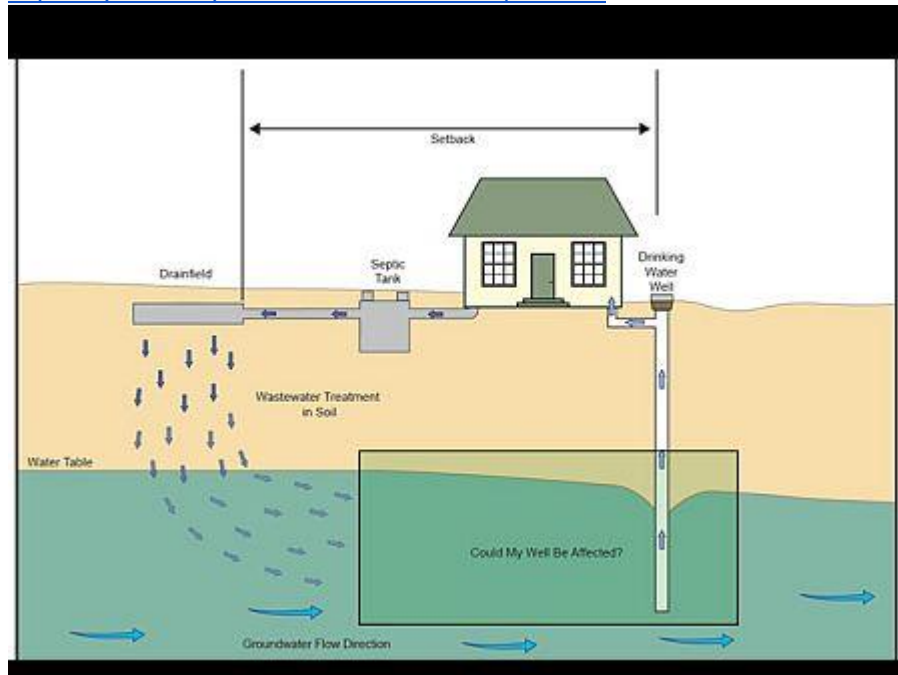
***Check The Driveway*** - Driveway curbs should channel water so that it runs off into the street or away from the home. Sealing open cracks in the driveway can prevent water from gathering under the driveway and potentially making its way into your basement.

***Prepare For Flooding*** - If you live in a flood-prone area, or your home (or basement) has flooded before, take some time to prepare for rising tides. Move electrical cords up off the floor, elevate anything delicate or easy to damage, and move boxes of documents, furniture, or other special items to higher ground. You may also want to ensure you've got a stock of candles, batteries, and non-electric lights stashed somewhere, just in case the power goes out.

## Septic systems

Homeowners need to know where their septic system is, and what kind of system it is. There are many different types of systems available, but all are based on the same premise that wastewater must be separated to allow solids to settle, then the remaining wastewater must be treated to remove contaminants before reaching groundwater. The Environmental Protection Agency explains the variety of septic systems available and how they each work, however, knowing YOUR system is the key to understanding specific maintenance needs. Knowing the age of your system, and its proximity to your drinking water well, and those of your neighbors, is also key to keeping the community and the watershed healthy.

### [Septic System Impacts on Water Sources | US EPA](#)



1- Wastewater from toilets, sinks, showers, and other appliances contains harmful bacteria, viruses, and nutrients that could make you sick if it comes in contact with your drinking water well. Make sure the wastewater is properly treated by your septic system and that your drinking water well is located at the appropriate distance (set back) from your and your neighbor's system. Avoid flushing other chemicals or medications down the drain or toilet since they could also contaminate your drinking water well.

2- The septic tank is a buried, water-tight container that holds wastewater for separation and treatment. The solids settle to the bottom (sludge) and fats, oil and grease float to the top (scum). Microorganisms act to break down the sludge and destroy some of the contaminants in the wastewater. **Your septic tank should be serviced and pumped on a regular basis to make sure it's working properly.**

3- The drainfield is a shallow, covered trench made in the soil in your yard. Partially treated wastewater from the septic tank flows out through the drainfield, filters down through the soil and enters the groundwater. If the drainfield is overloaded with too much liquid or clogged with solids, it will flood and cause sewage to surface in your yard or back up into your home.

4- Filtering wastewater through the soil removes most bacteria and viruses (also known as pathogens) and some nutrients. While soil can treat many contaminants, it cannot remove all of them (e.g., medicines, some cleaning products, other potentially harmful chemicals). If untreated, wastewater that surfaces in the yard may contaminate your drinking water through an unsecured well cap or cracks in the well casing. It's important to avoid flushing medication and chemicals into your wastewater since it could contaminate your drinking water. (Kettle Lakes note: modern engineered systems using aerobic treatment, will not require a leach or drain field, but may require a sand filtration bed).

5- The water table is where you first hit water if you dig a hole into the ground.

6- The water below the water table is called groundwater. Groundwater flowing underneath a drainfield captures any remaining contaminants released from the septic system. A drinking water well is at greater risk of becoming contaminated if it is in the path of groundwater flow beneath a septic system.

7- A drinking water well is drilled or dug into the groundwater so water can be pumped to the surface. Deep wells located farther away from a septic system and not in the path of the groundwater flow from the septic system are least likely to be contaminated. Drinking water wells should be regularly tested to ensure your home's water is safe to drink.

8- In New York State, the setback requirement is between 50 and 100 feet depending on water tightness, type of unit and other conditions. [Part 5, Subpart 5-1 Standards for Water Wells - Appendix 5B \(ny.gov\)](#) As a general rule of thumb, contamination is less likely the farther apart a well is from a septic system and the newer the system is. Your septic system could contaminate your drinking water well or a nearby well under certain conditions. Remember to test the drinking water from your well regularly and take corrective action as needed. The contamination risk to your well is LOWER the farther apart the well and septic system are located; the deeper the well is placed and if it is in bedrock or below a defined layer of silt or clay; or, when your septic system is pumped, and serviced on a regular basis.

The contamination risk to your well is HIGHER if the well is at a shallow depth and in permeable soil; if the well is downgradient of the septic system (i.e., if the groundwater flows from the septic system towards the well); if there are many homes on septic systems near the well; or, if there is poor construction or maintenance of the well and/or septic system (contaminants can enter a cracked drinking well casing from ground or surface water).

### **Drinking water wells**

There are many useful sources from the EPA on drinking water and contamination. This pdf provides valuable information for those of us with private wells

<https://nepis.epa.gov/Exe/ZyPDF.cgi/200024OD.PDF?Dockey=200024OD.PDF>

The most common and most often dangerous pollutant found in wells after intense flooding is bacteria, particularly, E. coli. The Kettle Lakes Storm Response Team has provided bacteria testing bottles, with chain of custody forms, to each lake association. We are working with Life Science Laboratories in East Syracuse for this action. The Kettle Lake Storm Response representative from each lake association will arrange delivery of water samples to the lab. These samples must be provided within the 24-hour window from time of sampling to delivery.

**You MUST USE the approved testing bottles provided.** A copy of the Analysis Request is found in the Appendix with complete instructions for taking the sample. The homeowner is responsible for providing the fee at the time of service, and this can be bundled as cash or check into the sampling bag. Your lake association representative will provide the text or email, to let you know the time they plan to take samples to the lab so that you may plan to sample within that 24-hour window.

**Please refer to this guide for the proper way to shock your well once contamination has been confirmed:** [Restoring Your Private Well](#)

**Be sure you are aware of the basic components found in a private water well.**

The following is taken from: <https://www.epa.gov/privatewells/learn-about-private-water-wells> as adapted from the [National Ground Water Association](#).



**Well Casing:** The well casing maintains the well opening from the ground water to the surface. The casing keeps dirt and excess water out of the well. This helps to keep contaminants from entering the well and mixing with the drinking water. The geology of the region will determine the material used for the casing, but the most common are carbon steel, plastic, and stainless steel.

**Well Caps:** Well caps are placed on top of the well casing to prevent debris, insects, or small animals from getting into the well. Well caps are usually made of aluminum or plastic and include a vent to control pressure during well pumping.

**Well Screens:** These are attached to the bottom of the casing to prevent too much sediment from entering the well. The most

common well screens are continuous slot, slotted pipe, and perforated pipe.

**Pitless Adapter:** A pitless adapter is a connector that allows the pipe carrying water to the surface to remain below the frost line. This creates a sanitary and frost-proof seal.

**Jet Pumps:** These are mostly used for shallow wells (depth of 25 feet or less). They are mounted above ground and use suction to draw water from the well.

**Submersible Pumps:** These pumps are mainly used for deep private wells. The pumping unit is placed inside the well casing and connected to a power source on the surface.

## **VI. Special Considerations for Lakeside Residents**

Lakeside living brings daily rewards, but also, seasonal issues that may not impact those living on higher ground, or with municipal resources. Sometimes those of us living on lakes need to expand our knowledge of homeownership to areas beyond the walls and immediate grounds.

### **Are you in a Flood Zone?**

Although floods can occur almost anywhere, living near a body of water, river or coastal regions increase the risk of flooding. The Federal Emergency Management Agency (FEMA) had created flood maps to aid homeowners in risk assessment. An easy to use, flood mapping tool is available at : <https://www.fema.gov/flood-maps> If you believe you are in a flood zone, you may want to look for flood insurance assistance. Programs and benefits are available at : <https://www.fema.gov/flood-insurance>

### **Lake water flooding**

Lake levels are variable every year, and dependent on the lake water sources. One thing is certain, flooding will impact lakeside residents in diverse ways, but there will be impact. To reduce property damage and/or physical harm, be sure to prepare for the storm, and take caution afterwards.

### **Be sure that docks are secure and protected**

To do this, you might place water-filled, plastic garbage cans or barrels on your dock to hold it in place, filling to three-quarter mark to allow for ice expansion. Alternatively, store canoes, paddle boats or kayaks on your dock and fill them with water. Be sure to tie them down to the dock rings. Disconnect floating docks from stationary docks and tie to shoreline and clear docks, boathouses, sheds and the shoreline of anything that can float.

### **Boating safety**

If you must go out on the water, remember that high water sets afloat all sorts of things, from propane tanks and refrigerators to fallen trees and the neighbor kid's yard toys. Such flotsam (debris that inadvertently ends up in the water) can drift around for weeks.

First, check the boat for damage. Storms can leave boats with damage ranging from a dented propeller to a hole in the hull.

Wise captains will always look out for obstacles, but it's crucial to be extra vigilant following a storm. Very often, debris will be just below the water's surface and very hard to see. Look for isolated ripples, small reflections, or shiny spots on the water.

The "100-foot rule," applies regardless of the water line, and requires boaters to operate at a slow, no-wake speed within 100 feet of the shoreline, docks, launch ramps, swimmers, or downed skiers; persons wading in the water; anchored, moored or drifting boats; and floats. In New York State, speed is limited to 5 mph when within 100 feet of any shore, dock, pier, raft, float, or anchored boat.

Potential wake from passing boats could cause additional damage to shoreline property, and physical structures, including homes along the lakeshore. Boaters are reminded that they are civilly and criminally responsible for their wake and any damage they cause.



## **VII. Resources**

### **Kettle Lakes**

Main Website: [www.kettlelakesassociation.org](http://www.kettlelakesassociation.org)

Storm Response: [www.kettlelakesstormresponse.org](http://www.kettlelakesstormresponse.org)

Watershed implementation Plans: [www.kettlelakesassociation.org/lake-management](http://www.kettlelakesassociation.org/lake-management)

Timely information from our team: <https://www.facebook.com/profile.php?id=100083237916874>

### **Weather Information**

Northeast National Weather Service: <https://www.weather.gov/nerfc/>

NWS Flood Warning: <https://www.weather.gov/safety/flood-watch-warning>

### **Safety**

Federal Emergency Management Site on home safety: [www.ready.gov](http://www.ready.gov)

<https://www.fema.gov/blog/10-items-include-your-emergency-kit>

911 Water Damage Experts: [MUST KNOW TIPS] How to Prepare Your Home for Heavy Rain

<https://911waterdamageexperts.com/must-know-tips-how-to-prepare-your-home-for-heavy-rain/>

### **Drinking Water Wells**

Restoring Your Private Well -

[https://www.health.ny.gov/environmental/water/drinking/restoring\\_testing\\_well.htm](https://www.health.ny.gov/environmental/water/drinking/restoring_testing_well.htm)

EPA, Learn About Private Wells <https://www.epa.gov/privatewells/learn-about-private-water-wells>

NYS Department of Environmental Conservation: Water Well Standards

[https://www.health.ny.gov/regulations/nycrr/title\\_10/part\\_5/appendix\\_5b.htm](https://www.health.ny.gov/regulations/nycrr/title_10/part_5/appendix_5b.htm)

USEPA Drinking Water from Household Wells

<https://nepis.epa.gov/Exe/ZyPDF.cgi/200024OD.PDF?Dockey=200024OD.PDF>

### **Flooding**

National Ground Water Association <https://www.ngwa.org/what-is-groundwater/About-groundwater>

Federal Emergency Management Agency Flood Maps: <https://www.fema.gov/flood-maps>

Federal Emergency Management Agency Insurance: [https://www.fema.gov/flood\\_insurance](https://www.fema.gov/flood_insurance)

USGS Water Dashboard

<https://dashboard.waterdata.usgs.gov/app/nwd/en/?aoi=usgs-424452076081902>

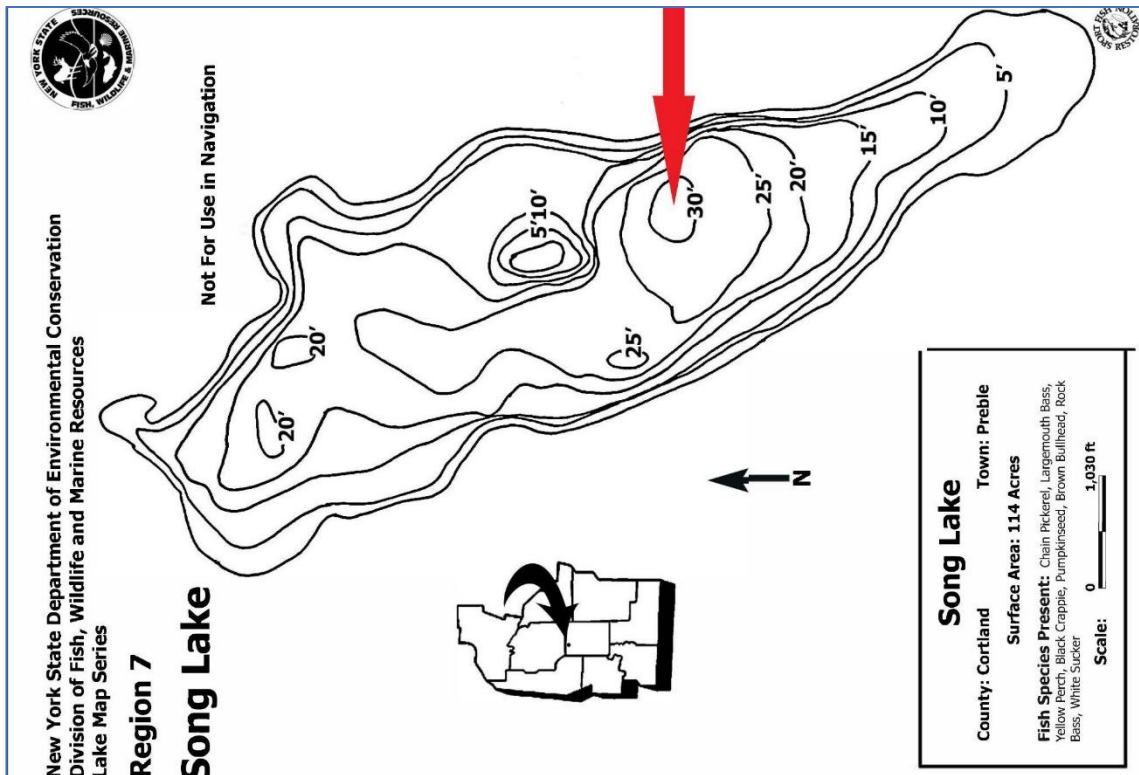
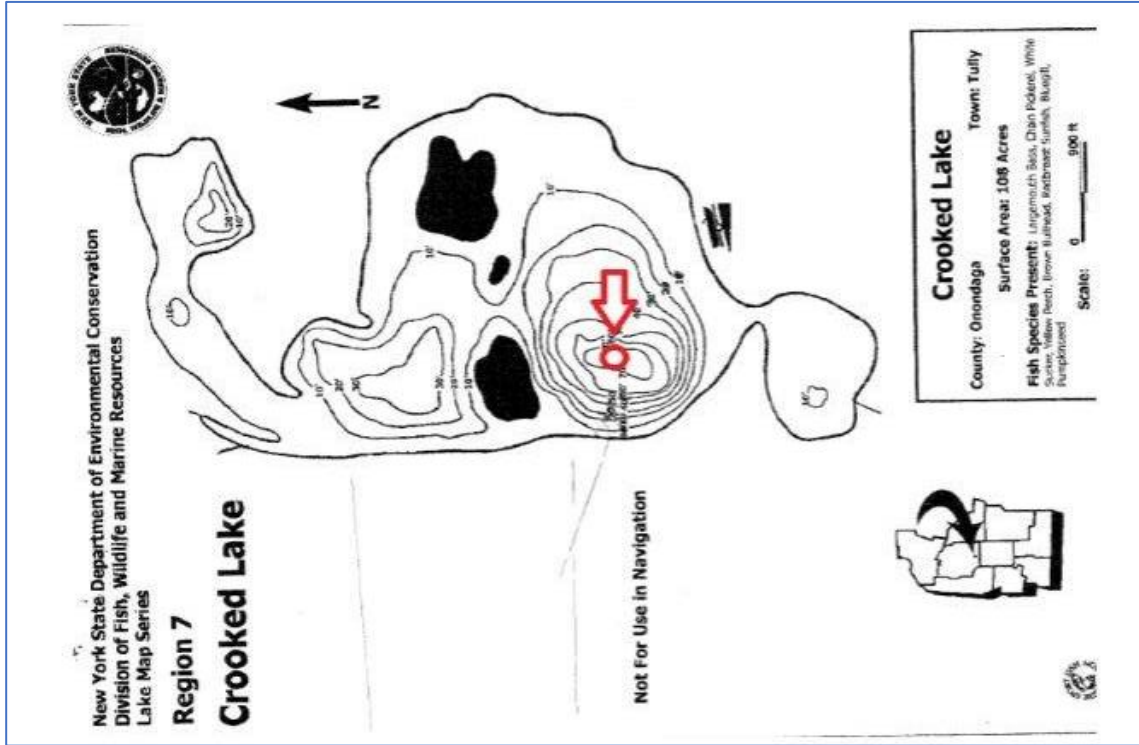
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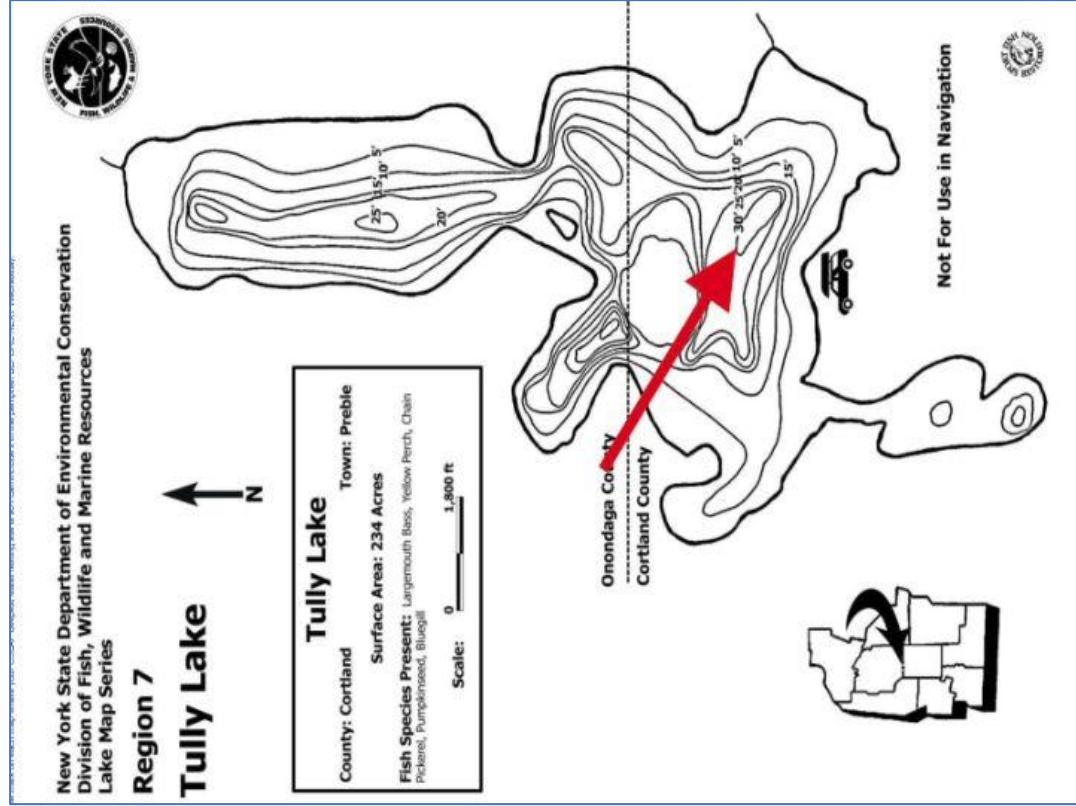
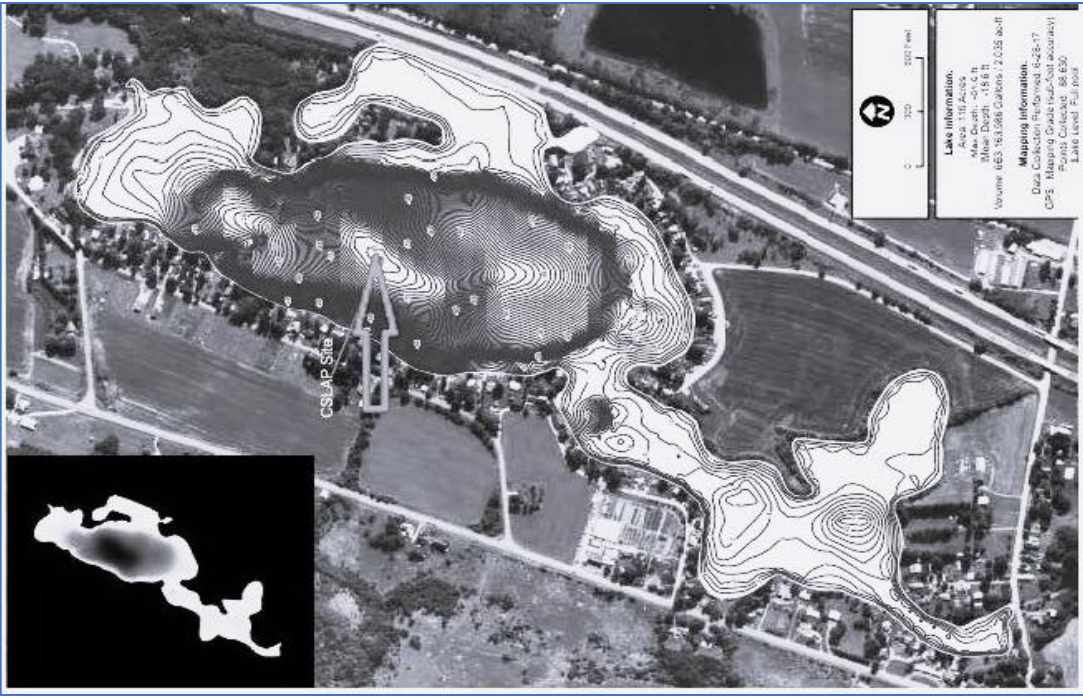
Decentralized/Onsite Systems | US EPA: <https://www.epa.gov/septic/benefits-decentralized-wastewater-treatment-systems>

Septic System Impacts on Water Sources | US EPA: <https://www.epa.gov/septic/septic-system-impacts-water-sources>

Appendix

Maps of deep-water testing sites for each kettle lake





## Water Quality Testing Rationale

**In-Lake testing** for our four kettle lakes is currently performed eight times a year between June and October. Pre-storm testing should not be required unless the storm falls outside these testing months. Testing will be done at the discretion of each lake association as they determine safety and need. Only volunteers trained in water quality collection will be assigned to this task.

**Field Observations** are recommended with or without analytic testing. Observations should be recorded pre and post storm. **Field Data** will include Secchi Disc readings, sounding depth at deep site and clarity readings, temperature, visual observations and photographs. The presence of any suspected **Cyanobacteria or Harmful Algal Blooms** will be visually assessed and documented with photographs and microscopic analysis

**Recommendations for post storm testing** are based on current water quality parameters and costs for the analyte sampling.

**Phosphorus** is considered the most “limiting nutrient” in freshwater systems because phosphorus is an essential element for cellular formation of plant, bacteria and animal life. When phosphorus is added to a freshwater system, rapid algal cell growth often occurs. This can create conditions for both nontoxic and toxic algae to thrive, which in turn can stress and even cause fish and other aquatic organisms to die. Decomposition of these organisms consumes oxygen and can cause a rapid decline in the dissolved oxygen necessary for the continuance of aquatic life.

**TP** – Total Phosphorus would give us a quantitative comparison with pre-storm levels.

**TDP** - Total Dissolved Phosphorus is included here to compare with stream monitoring data.

**Nitrogen**, like phosphorus, nitrogen is a nutrient. Nitrogen presents itself in several different forms, including Nitrates, Nitrites and Ammonia. For our analysis here, we are looking at total nitrogen compared directly to total phosphorus levels to evaluate which nutrient may be limiting algae growth. Cost factors limit our choices; however, lakes may choose to compare the component forms.

**TN** – Total Nitrogen would give us a quantitative comparison with pre-storm levels and provide quantitative information for phosphorus to nitrogen ratios.

**Dissolved Oxygen** is a measure of the amount of oxygen in the water. It is vital that there be sufficient oxygen for the survival of fish and other aquatic organisms.

**Recommendations for Tributary/Stream Testing** are based on best practices for pollution monitoring. Currently, our tributaries are not part of a consistent monitoring program. These would provide a single point of reference after a storm surge. Recommendations are for **Total Phosphorus** and **Total Dissolved Phosphorus** as explained in-lake assessment. In addition, a quantitative measure of the **Total Suspended Solids** is recommended. High TSS can impact water temperature and dissolved oxygen levels impairing the water quality for aquatic species. TSS may also carry pollutants from upstream into the lake.

For more information, please look at these fact sheets- [Lake Parameter Fact Sheets](#)

## Emergency Resources and Phone Numbers

# ***FOR LIFE THREATENING EMERGENCIES CALL 911***

Onondaga County Department of Emergency Management

[Department of Emergency Management \(ongov.net\)](http://ongov.net)

Cortland County Emergency Management

[Emergency Management | Cortland County, NY \(cortland-co.org\)](http://cortland-co.org)

NYSEG Power Outage Resources

[Outages - NYSEG](#)

New York State Citizen Preparedness Corps

[Citizen Preparedness Corps | Division of Homeland Security and Emergency Services \(ny.gov\)](http://ny.gov)

Onondaga County Sheriff's Office

[Onondaga County Sheriff's Office \(ongov.net\)](http://ongov.net)

Cortland County Sheriff's Office

[Cortland County Sheriff's Office | Cortland County, NY \(cortland-co.org\)](http://cortland-co.org)

Onondaga County Health Department

[Onondaga County Health Department \(ongov.net\)](http://ongov.net)

Cortland County Health Department

[Welcome to the Cortland County Health Department | Cortland County, NY \(cortland-co.org\)](http://cortland-co.org)

American Red Cross (CNY DIVISION)

[Central & Northern New York | Eastern NY | American Red Cross](#)

FEMA REGION 2, NEW YORK STATE

[New York | FEMA.gov](http://fema.gov)

Interactive Power Outage Map of New York (Updated every five minutes)

[Power Outage Map | National Grid \(nationalgridus.com\)](http://nationalgridus.com)

National Grid Power Company


**(800) 642-4272**

**For your Bacterial Testing:**

Do not use this form – Please only use the Chain of Custody form that comes with the Bacterial Bottle and Testing Kit provided by your lake association. Follow the procedures on the form.

Only use the testing bottle from the company as it contains a tablet of sodium thiosulphate needed to ensure proper testing. Be sure that the tap you select to draw water does not have a screen and wipe the unit with bleach before collecting the sample. Be sure your hands are clean, or wear gloves during the collection process.

**Life Science Laboratories, Inc.**

	<b>LSL North Lab.</b> 131 St. Lawrence Avenue Waddington, NY Phone# 315-388-4476 Fax# 315-388-4061	<b>LSL Central Lab.</b> 5854 Butternut Drive East Syracuse, NY Phone# 315-445-1105 Fax# 315-445-1301	<b>LSL Finger Lakes Lab.</b> 16 N. Main St., PO Box 424 Wayland, NY 14572 Phone# 716-728-3320 Fax# 716-728-2711	<b>LSL Southern Tier Lab.</b> 30 East Main St. Cuba, N.Y. 14727 Phone: 585-968-2640 Fax: 585-968-2640
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**ANALYSIS REQUEST FOR WATER PURITY TEST (Coliform Bacteria)**

**Mailing Address for Final Report:** \_\_\_\_\_ for Drinking Water  
Please fill in the following and check your preference of report delivery.

Name: \_\_\_\_\_ Copy to: \_\_\_\_\_  
Street: \_\_\_\_\_ Email: \_\_\_\_\_  
City/State: \_\_\_\_\_  
Phone #: \_\_\_\_\_ Phone #: \_\_\_\_\_

Check one for method of report delivery: FAX  E-mail  Mail

E-mail address: \_\_\_\_\_

<b>Analysis Requested:</b>	<b>Total Coliform &amp; E coli</b>	\$30.00/sample
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Please circle the requested analysis

Sampling Point: (Kitchen Cold Water Tap, Outside Faucet, Etc.) \_\_\_\_\_

Address Where Sample Was Collected: \_\_\_\_\_

Dug Well Sample      Depth: \_\_\_\_\_ (if known)

Drilled Well Sample      Depth: \_\_\_\_\_ (if known)

Sampled by: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_ a.m.  
p.m.

Received at LSL by: \_\_\_\_\_ Date/Time \_\_\_\_\_

Thank you for choosing Life Science Laboratories (LSL) to analyze your drinking water sample. If you have any questions regarding these instructions, please do not hesitate to contact us at the telephone numbers listed above.

**Total Coliform**

**TAKING THE SAMPLE:**

The container provided for the test is sterile and contains a tablet of sodium thiosulfate, a chemical that is needed to eliminate residual chlorine.

- Select a water tap that is free of screens or remove the screen before sampling.
- Wipe the inside and outside of the faucet with household bleach.
- Let the cold water run for 2-3 minutes to clear the pipe.
- Reduce the flow to prevent splashing.
- Carefully open the sample bottle, making sure not to touch the inside of the bottle or the lid.
- Fill the bottle to the top, close the lid, and deliver the sample to the laboratory as soon as possible.
- Record sample information in spaces above.
- Samples must be received at lab within 24 hours of sampling.

**RESULTS:**  
Results will be available within about 5 business days after receipt of your sample at LSL. A report will be sent or mailed to you. An acceptable result, according to the New York State Sanitary Code, for the Total Coliform test is <1 cfu/100 ml or negative. A result of 1 or greater is unacceptable under the State Sanitary Code. Contact your local county health department for any further information.

SAMPLE – Do not use for Lab purposes.

### **Disclaimer**

**All the information on this pamphlet is published in good faith and while we have done our due diligence to provide accurate and helpful information based on high quality resources, we do not make any warranties about the completeness, reliability, and accuracy of this information.**

**Any action you take upon the information provided here is strictly at your own risk. We are not liable for any losses and damages in connection with this document.**

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**This document is intended to be an ever-evolving support to our kettle lake communities, and it is the goal of the Storm Response Team, to continually add new resources and information as they become available for distribution.**

To activate the live links in this documnet, go to: [www.kettlelakesstormresponse.org/](http://www.kettlelakesstormresponse.org/)