



Department of  
Environmental  
Conservation

# What To Do With All Those Bottles?

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NYSDEC, Division of Water, Bureau of Water Assessment & Management, Finger Lakes Watershed Hub

**NYSFOLA**

**May the Fourth, 2019**

# What To Do With All Those Bottles, Literally

...

Fill them with  
lake water!



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# What To Do With All Those Bottles, Actually

...



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# NYSDEC: Why we sample what we sample

- Reporting/Inventory: WI-PWL, 305(b), 303(d), TMDL
- Evaluating water quality standards, criteria, guidance values
- Biological “trackdown” (invasives, HABs, bacteria)
- Lake uses (beaches, potable water intakes)
- Logistics (access, staffing, cost, boat availability, lab)

➤ All about assessments!





**New York Citizens Statewide  
Lake Assessment Program**

PHYSICAL AND CHEMICAL CSLAP SAMPLING

**Updated in 2019**

Questions? Call Nancy Mueller at 800-796-3652  
or Stephanie June at 518-402-8179

Note: Special projects may have additional procedures not addressed in this document



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**New York State Federation  
of Lake Associations**

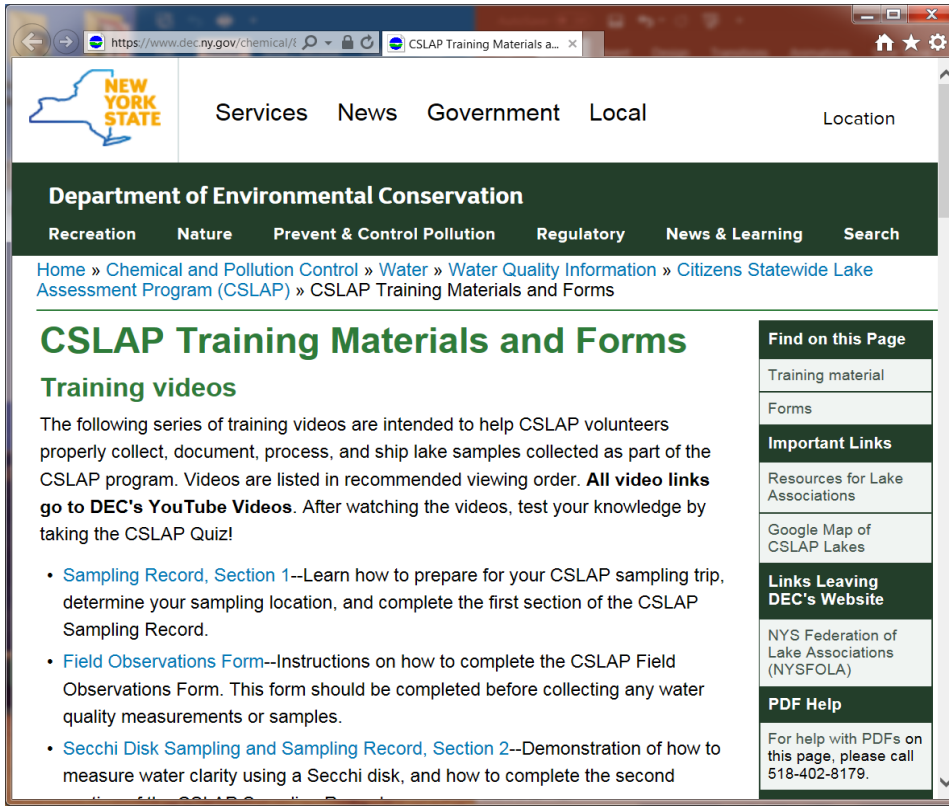
# Use the Protocols Luke (and Everyone Else)

- Introduction and Contact Information
- Becoming a CSLAP volunteer or a CSLAP lake
- Planning to Sample
- Meet the Paperwork
- On-Lake Sampling
- On-Shore Processing
- Checklists, Procedures, Info on Parameters



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# If Reading's Not Your Thing



https://www.dec.ny.gov/chemical/81849.html

NEW YORK STATE

Services News Government Local Location

Department of Environmental Conservation

Recreation Nature Prevent & Control Pollution Regulatory News & Learning Search

Home » Chemical and Pollution Control » Water » Water Quality Information » Citizens Statewide Lake Assessment Program (CSLAP) » CSLAP Training Materials and Forms

## CSLAP Training Materials and Forms

### Training videos

The following series of training videos are intended to help CSLAP volunteers properly collect, document, process, and ship lake samples collected as part of the CSLAP program. Videos are listed in recommended viewing order. **All video links go to DEC's YouTube Videos.** After watching the videos, test your knowledge by taking the CSLAP Quiz!

- [Sampling Record, Section 1](#)--Learn how to prepare for your CSLAP sampling trip, determine your sampling location, and complete the first section of the CSLAP Sampling Record.
- [Field Observations Form](#)--Instructions on how to complete the CSLAP Field Observations Form. This form should be completed before collecting any water quality measurements or samples.
- [Secchi Disk Sampling and Sampling Record, Section 2](#)--Demonstration of how to measure water clarity using a Secchi disk, and how to complete the second

**Find on this Page**

- Training material
- Forms

**Important Links**

- Resources for Lake Associations
- Google Map of CSLAP Lakes

**Links Leaving DEC's Website**

- NYS Federation of Lake Associations (NYSFOLA)

**PDF Help**

For help with PDFs on this page, please call 618-402-8179.

<https://www.dec.ny.gov/chemical/81849.html>



YouTube

Search

04 CSLAP Water Sampling Collection

1:57 / 5:14

# May the *Checklist* be With You, Always

## CSLAP Field Sample Collection Checklist

### I. Predeparture Equipment Check

① Complete the following checklist **before departing** the dock.

<input type="radio"/>	CSLAP Field Observation Form – Lake Perception, and Health and Safety Form; Sampling Record Form	<input type="radio"/>	Pen or pencil to fill out forms
<input type="radio"/>	HAB Visual Observation Reference Sheet; HAB Shoreline Survey	<input type="radio"/>	HAB bloom sample collection bottle and plastic gloves
<input type="radio"/>	Thermometer	<input type="radio"/>	Watch, phone, etc. to get time of day, GPS
<input type="radio"/>	Secchi disk and tape measure	<input type="radio"/>	Boat, anchor and line, and appropriate safety equipment
<input type="radio"/>	Kemmerer sampling bottle and marked line	<input type="radio"/>	Camera or phone for photos of algae blooms
<input type="radio"/>	Collapsible water sample container and cap with spigot (For stratified lakes – deep collection container also)	<input type="radio"/>	Supplemental shallow water collection container (or replacement large container)

### II. On-Lake Sampling

#### 1. Complete paperwork:

- ① Go to your sampling site by using GPS or triangulation and anchor (if possible)
- ② Determine sounding depth (lake depth) with Secchi disk or depth finder and record in meters
- ③ Fill out “CSLAP Field Observation Form – Lake Perception and Health and Safety” (page 18 in protocol)
- ④ Fill out “CSLAP Sampling Record Form” (page 20 in protocol), consulting with others if necessary
  - Assess wind and sky conditions
  - Assess visual algae conditions at CSLAP site
  - Complete comments section

#### 2. Complete Temperature, Secchi disk and Sampling

- ① Take the air temperature reading using the provided thermometer, and record to nearest 1 degree Celsius
- ② Collect Secchi Disk measurement off the shady side of boat to the nearest 1/10<sup>th</sup> meter – **do not use aides or sunglasses**
- ③ Collect Surface sample (at 1.5 m depth). Remember to:
  - Keep the Kemmerer line as straight as possible
  - Avoid touching inside the Kemmerer while setting the tripping mechanism
  - Rinse the collapsible container with sample water- fill ¼ full, shake, and discard completely before filling
  - Avoid touching the spigot/sample while discharging from container
  - Collect additional samples if needed until the surface collapsible container is filled
- ④ Take the water temperature reading from the water sample, and record to the nearest 1 degree Celsius
- ⑤ Record Hydrogen Sulfide (“rotten egg”) odor if applicable
- ⑥ Put collapsible container(s) in a cooler or in the shade to keep cool, out of sunlight prior to on-shore processing
- ⑦ Repeat ③-⑥ if collecting a Deep Sample

### III. On-Shore Observations

- ① Fill out “CSLAP Shoreline Algae Bloom Form” (page 28 in protocol)
  - Inspect portion of the shoreline and note location
  - Assess observed shoreline bloom conditions
  - Collect a HAB sample by skimming bloom surface if conditions warrant – **make sure to wear gloves**
- ② Complete macrophyte observations

# In The Field





# You'll Find A Lot of Things Depend on Your Point of View

PLEASE CIRCLE THE ONE NUMBER THAT BEST DESCRIBES YOUR OPINION OF THE SUITABILITY OF THE LAKE FOR RECREATIONAL ENJOYMENT TODAY (QC):

1. Beautiful, could not be nicer
2. Very minor aesthetic problems- excellent for swimming, boating, and overall enjoyment
3. Swimming and aesthetic enjoyment slightly impacted
4. Desire to swim and enjoy the lake substantially reduced, although the lake still can be used
5. Swimming and aesthetic enjoyment of the lake impossible

6 questions about perceived water quality


- Critical to do first – before any measurements!
- Gut reaction to water quality
- Usually correlates well to water quality



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# CSLAP SAMPLING RECORD FORM

PLEASE PRINT LEGIBLY

SECTION 1 - GENERAL			
LAKE NAME AND SITE # (IF APPLICABLE)	COUNTY	CSLAP ROUND #	DATE
<b>SAMPLER(S)</b> Sample Collection: _____ Secchi Readings: _____			
<b>NAMES OF OTHERS WHO ASSISTED TODAY</b> <u>Please be sure to send a waiver form for every person</u> _____			
SECTION 2 - SECCHI DEPTH & LAKE INFORMATION			
<b>SOUNDING DEPTH</b> _____ meters <b>NOTE:</b> The depth to the bottom of the lake at your sampling location.		<b>LAKE LEVEL</b> <input type="checkbox"/> High <input type="checkbox"/> Normal <input type="checkbox"/> Low	
<b>READING 1:</b> Secchi Disk Lowered Until it Disappears _____ meters   On bottom? <input type="checkbox"/> Yes <input type="checkbox"/> No			
<b>READING 2:</b> Secchi Disk Raised Until it Reappears _____ meters   On bottom? <input type="checkbox"/> Yes <input type="checkbox"/> No			
<b>NOTE:</b> The Secchi readings should never be deeper than the Sounding Depth.			
SECTION 3 - SAMPLE TIME & TEMPERATURE			
<b>TIME (Military Preferred)</b> AM <input type="checkbox"/> PM <input type="checkbox"/>	<b>AIR TEMPERATURE</b> _____ °C	<b>WATER SAMPLING DEPTH</b> Surface Sample _____ meters Deep Sample (if applicable) _____ meters*	<b>WATER TEMPERATURE</b> Surface _____ °C Deep _____ °C
<b>SULFUR ODOR IN DEEP SAMPLE:</b> If applicable, is there a sulfur odor in your deep sample? <input type="checkbox"/> Yes <input type="checkbox"/> No			

SECTION 4 - HARMFUL ALGAL BLOOM OBSERVATIONS	
<b>CONDITIONS OBSERVED AT CSLAP SITE</b>	<input type="checkbox"/> A. Spilled Paint <input type="checkbox"/> B. Pea Soup <input type="checkbox"/> C. Streaks <input type="checkbox"/> D. Green Dots or Clumps <input type="checkbox"/> E. Bubbling Scum <input type="checkbox"/> F. Slight Green or Brown Tint <input type="checkbox"/> G. Duckweed or Watermeal <input type="checkbox"/> H. Other _____ <input type="checkbox"/> I. No Evidence of Bloom
<b>NOTE:</b> Document shoreline HAB conditions (bloom and no bloom) on the shoreline HAB survey form.	

## Records:

- Samplers
- Site depth
- Secchi disk clarity
- Temperature
- Environmental conditions
- HABs



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# HAB Visual Observation Reference Sheet

Use the following images to identify harmful algal bloom (HAB) conditions on your lake:

- If you observe shoreline HAB conditions, please complete the shoreline survey form and collect a sample.
- If you do not observe HAB conditions, please complete the survey form indicating no bloom observed.

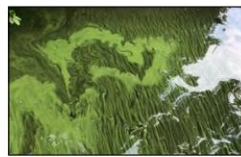
## Harmful Algal Bloom



A. Spilled paint appearance on surface



B. Pea soup appearance within the water



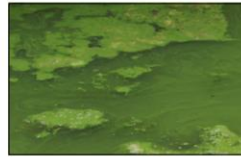
C. Streaks (usually green) on the water



D. Green dots or clumps on or in the water



D. Green dots or clumps on or in the water



A, B, C and D. Multiple conditions present at once

## Not a Harmful Algal Bloom

Do Not Collect a HAB Sample



E. Bubbling scums on or below the lake surface



F. Slight greenish or brownish tint to the water



G. Duckweed or watermeal

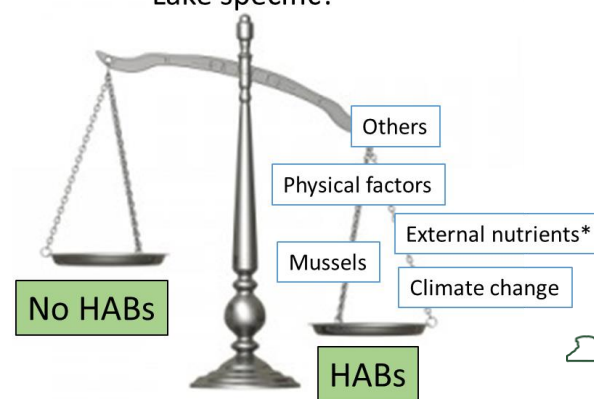
H. Other

I. No evidence of bloom

## State of the State 2018

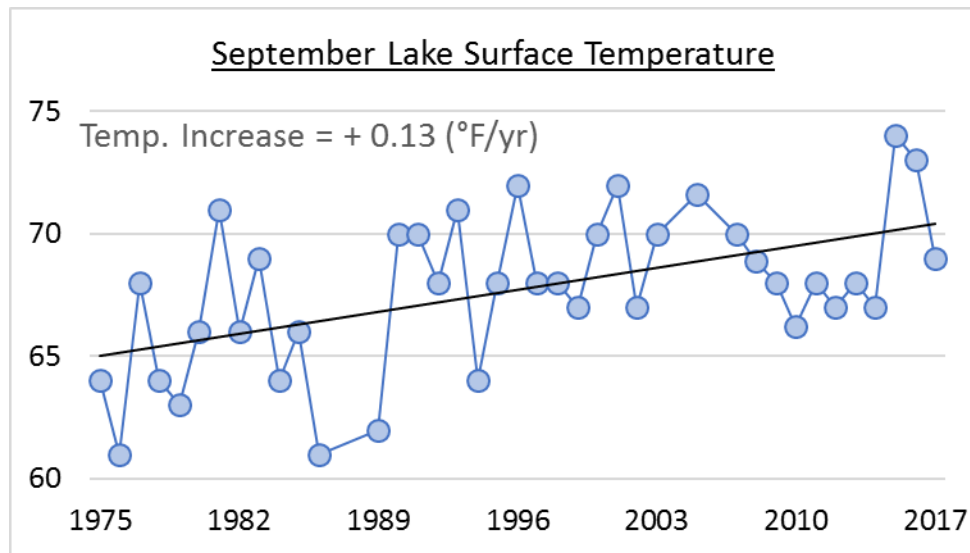


Lake specific?



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# Why (Air and Water) Temperature Matters?



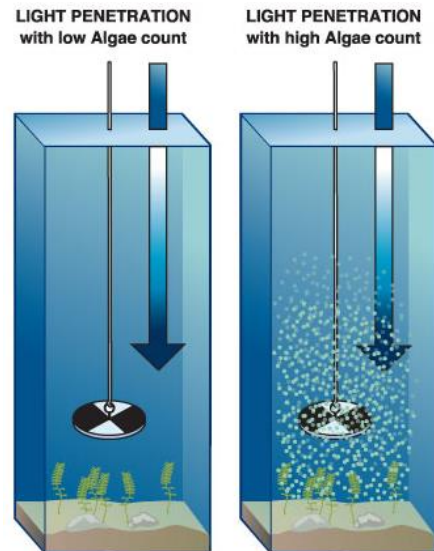
- Biological production
- Chemical reactions
- Assessment of trends
- Modeling and water movement (mixing)
- Stratification
- Climate change impacts

# Clear, The Water Should Be

## The Secchi Disk

- Developed for oceanographic work in the late 1800s
- Limnological standard for clarity for decades
- Relates to water clarity which can be affected by:
  - Algae levels or
  - Suspended sediment or
  - Water color

<http://www.maine-lakedata.org/secchi-simulator/disk.php>



# That *Kemmerer* is Operational



Collecting Samples (a few points):

- Avoid touching inside the Kemmerer while setting the tripping mechanism
- **Rinse the collapsible container** with sample water- fill  $\frac{1}{4}$  full, shake, and discard completely before filling
- **Avoid touching the spigot/sample** while discharging from container
- **Put collapsible container(s) in a cooler or in the shade** to keep cool,



# In The Lab (or Kitchen)



# Don't Forget the Paperwork!

## Chains of Custody Labels

### 2019 CSLAP

1L Unfiltered

Sample No: 19-xxx-01

Date: \_\_\_/\_\_\_/19

Lake Lovely – surface (1.5m depth)

CHAIN OF CUSTODY/REQUEST FOR ANALYSIS - UPSTATE FRESHWATER INSTITUTE  
224 Midler Park Dr., Syracuse, N.Y. 13214 (315) 431-4962  
N.Y.S. ELAP ID# 11462

1. Sampling Date _____								
2. Sampled by _____								
Sampling Location/Project: <u>Lake Lucille / CSLAP</u>								
Field ID Number: <u>Surface Water: 19-1-01</u>								
Sample ID # (for lab use only)	3. Collection Time	Sample container (# / type)	Exact sampling location	Matrix	Bulk Chemistry * unfiltered-4L bottle	Color Field filtered 125mL bottle	Chl.a Filter w/ MgCO <sub>3</sub> , blue cap vial	HAB ** unfiltered- 125mL amber glass bottle
		1 L plastic, unfiltered 1 125 mL plastic, filtered 1 blue cap vial w/ filter 1 125 mL glass amber unfiltered	Lake surface (1.5m)	Water	X	X	X	X DO NOT FREEZE

**SAMPLING VOLUNTEERS- PROVIDE INFORMATION IN BOXES**  
1. Date, 2. Sampled By (Printed), 3. Time (Military Hours), 4. Sample Relinquished By (Signature)

Comments (FOR LAB USE ONLY): _____ _____	
By signing this form, I certify that the samples enclosed were collected in accordance with the CSLAP protocols.	
4. Sample relinquished by: _____	Date: _____ Time: _____
Sample bottles prepared by: <u>Guad Kehoe</u>	Date: _____ Time: _____
Received @ UFI laboratory signature: _____	Date: _____ Time: _____

When a container type is listed it is understood that proper preservation techniques and the appropriate containers are being used. Be advised that the field sampler is responsible for the care of the samples collected until they are transferred or dispatched properly.

\* Requested analytes: pH, L, SC, L, TP, TDP, NH<sub>3</sub>, NO<sub>3</sub>, TN, TDN, Ca  
\*\* Requested analytes: Fluorprobe; if >10µgCHL/L, then microscopy & microcystin

(for lab use only)
Bulk Temp(°C): _____ HABs Temp(°C): _____



# What To Do With All Those Bottles?



Fewer bottles in 2019!! Program Dependent

## 4 Bottle Types in 2019

1. Plastic “Bulk Chemistry”
  2. 125 mL-plastic “Filtered Water”
  3. Capped vial (for Chlorophyll-a filter)
  4. 125 mL-amber glass “HABs”
- SRP for Finger Lakes, others?



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# Plastic Bulk Chemistry



Fill the 2 500 mL unfiltered water to the shoulder and freeze

Analyzed for:

- Total phosphorus
- Total nitrogen
- $\text{NO}_x$ ,  $\text{NH}_3$
- Specific conductivity, pH
- Calcium, Chloride
- Others?

## TP, TN, NO<sub>x</sub>, NH<sub>3</sub>

- Important water quality indicators
- Water quality standards and/or guidance values
- Indicators of human impacts

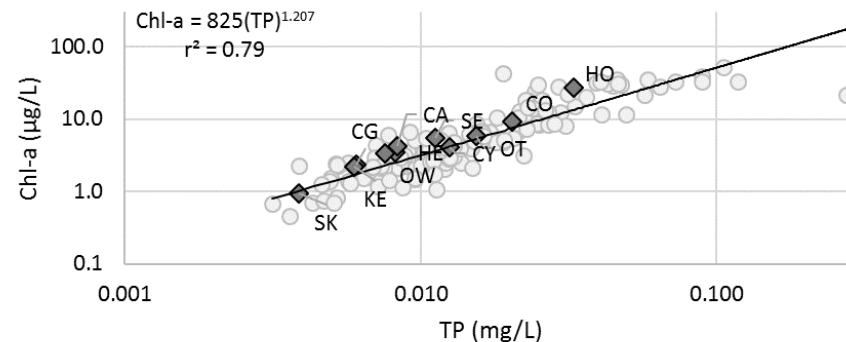
## Calcium

- Important indicators of water hardness

## Chloride

- Indicator of salinity, human impacts

# Nutrients

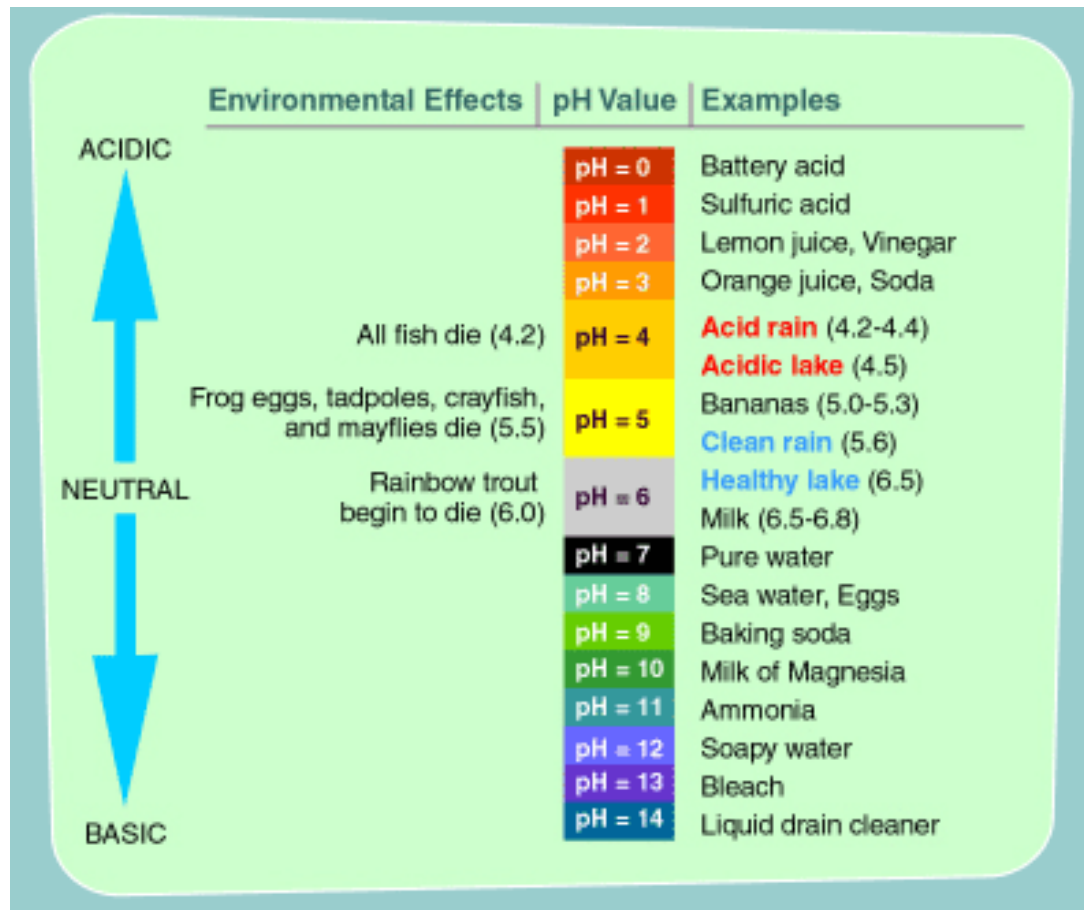


# Conductivity – It's Electric



Type	Electrical Conductivity ( $\mu\text{S}/\text{cm}$ )
Pure Water	0.05
Distilled Water	1
Rain or Snow	2 - 100
Surface / Ground Water	50 - 50,000
Seawater	50,000

# Power, Powers of Hydrogen (pH)



# Filtered Water Sample – Water Color

- Put on vinyl gloves
- Rinse entire filtration apparatus with distilled water and discard water
- Using forceps, place 1 filter paper in the filter holder
- Secure filter to holder by gently threading the cup onto the holder
- Filter 100 ml water – apply a slight vacuum (a few pumps) to the sample to avoid rupturing the filter
- Discard the filter
- Pour Filtered water into “Filtered (filter 100ml water)- WATER” bottle
- Rinse equipment with distilled water



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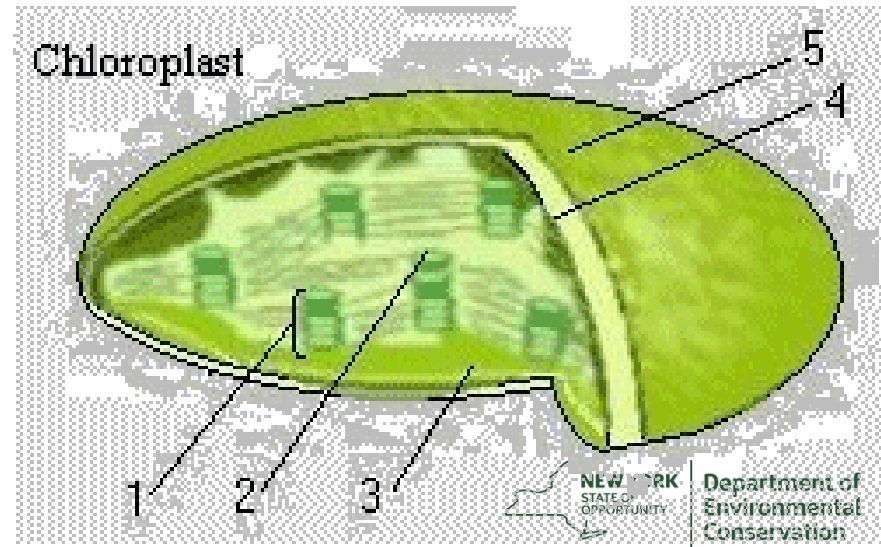
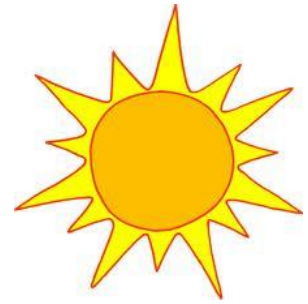
# Chlorophyll-a

- Put on vinyl gloves
- Using forceps, place 1 filter paper in the filter holder
- Cover Filter Paper with 6-10 drops of  $\text{MgCO}_3$  from bottle (shake well)
- Filter 100ml of water
- Wash graduated cylinder and walls of upper apparatus with distilled water and filter to capture all Chlorophyll a
- Fold Filter Paper in quarters and place in vial labeled "Filter (filter 100 ml water)- NO WATER"
- Wrap Chl-a filter vial with aluminum foil

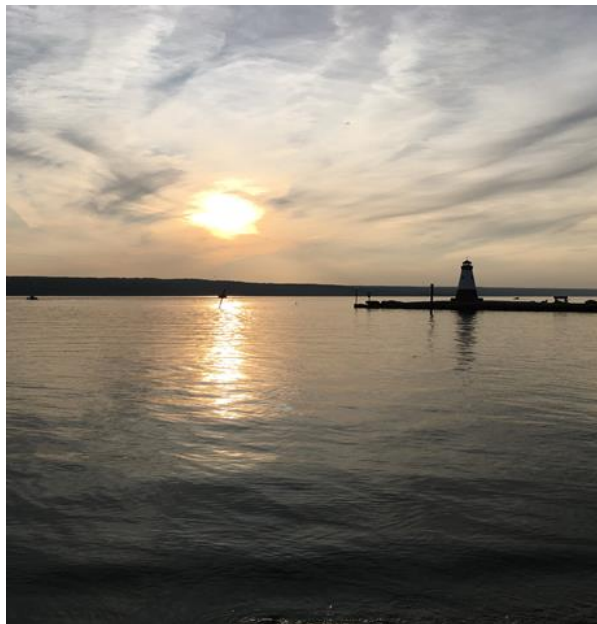


# Chlorophyll-a

- Key indicator of algae concentration
- Used to estimate biological production of algae/phytoplankton
- Important water quality indicator used to assess water quality standards and best use







## Trophic State: Clarity, Nutrients, and Chl-a

# HABs (Hopefully Not This Bad)



Enter Field Data to Online System  
(<https://www.cslapdata.org/>)

# Do Or Do Not, There is no Try

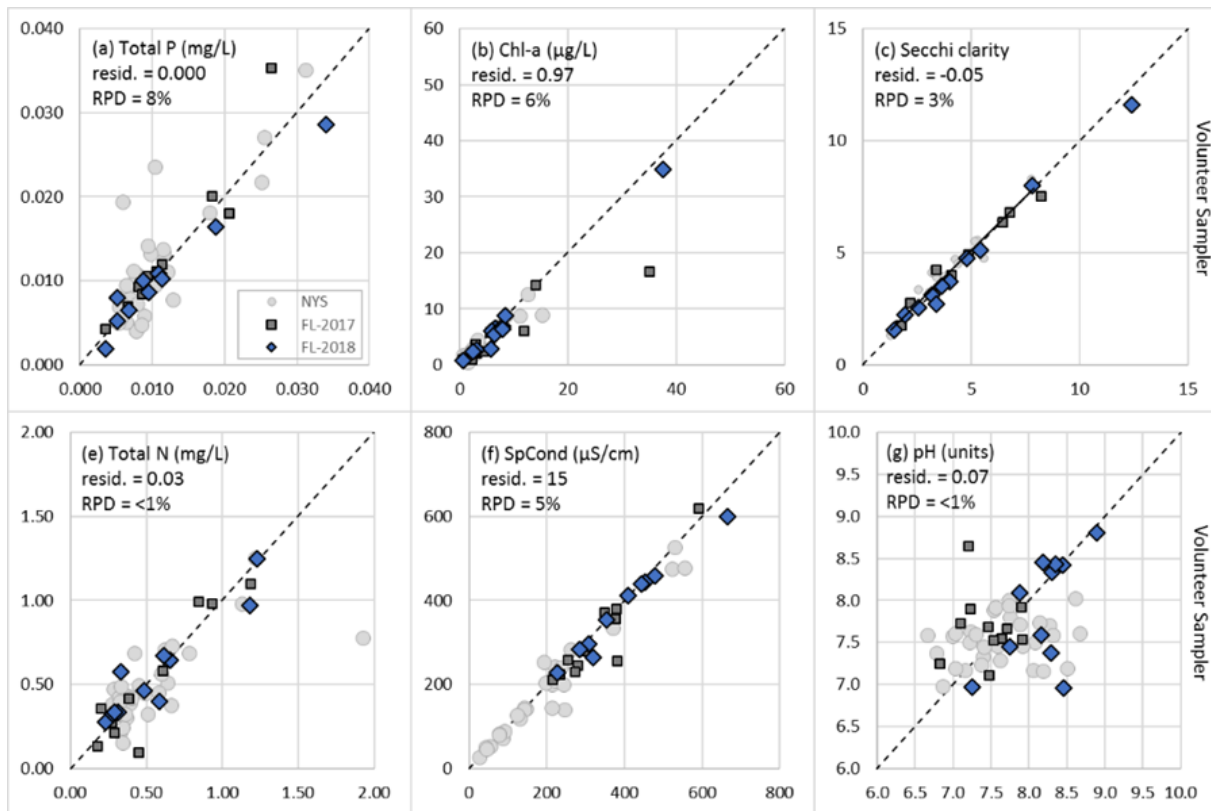
1. Verify all paperwork is complete, bottles are labeled and place paperwork in return cooler
2. Samples to Place in Freezer – both top and deep samples
3. Samples to Place in Refrigerator – DO NOT FREEZE!!
4. **Rinse equipment with distilled water and set aside to dry until next session. Hang Kemmerer inside.**
5. Ship samples the following day to UFI – place the pre-paid shipping label on the cooler and bring to UPS outlet
  - Retrieve samples from the refrigerator and freezer – water samples and bloom sample if collected
  - Pack all samples in the big cooler box with sufficient ice packs to remain cooled
  - Place paperwork on top of cooler inside cardboard box. Use a separate sheet on top to request supplies



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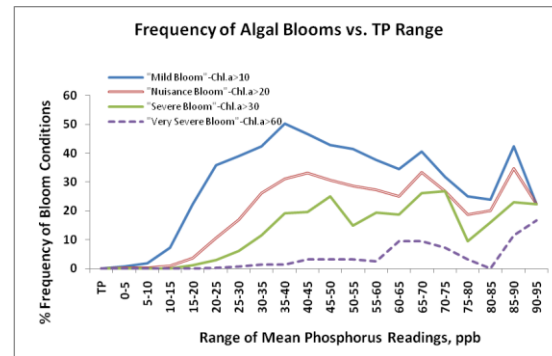
# Maintaining Quality

- CSLAP is a great program that yields high(est) quality data!
- Follow the protocols, maintain the equipment
- Ask questions as they come up



# NYSDEC Uses of CSLAP Data

- To meet federal reporting requirements
- To meet state assessment needs
- To provide and enhance education about lakes and local conditions
- To identify new or expanding lake issues
- To help develop water quality standards
- To assess NYS conditions and trends



# Data Flow and Reporting

- CSLAP data breakdown
- Delivery from the lab by December
- The data gets QA-ed over the winter (looking for outliers/incorrect data points)
- Report generation/compilation in winter spring



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# CSLAP Reports

One per lake

Written by DEC for lake assns, govt, others

Common format

Background information

Evaluation of indicators

Waterbody assessment

Tables and graphs

Raw data

Appendices

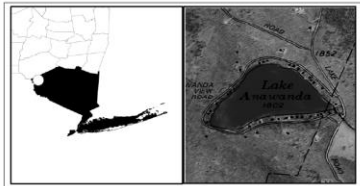
Built from field and lab data sent to DEC Dec-Jan

Issued Jan-April

CSLAP 2013 Lake Water Quality Summary:  
Anawanda Lake

General Lake Information	
Location	Town of Callicoon Center
County	Sullivan
Basin	Delaware River
Size	15.5 hectares (38.3 acres)
Lake Origins	Natural
Watershed Area	80 hectares (196 acres)
Retention Time	2.5 years
Mean Depth	0.6 meters
Sounding Depth	13.8 meters
Public Access?	lake association beach
Major Tributaries	no named tribs
Lake Tributary To...	unnamed outlet to North Branch Callicoon Creek to East Branch Callicoon Creek to Delaware River
WQ Classification	B(T) (contact recreation = swimming)
Lake Outlet Latitude	41.856
Lake Outlet Longitude	-74.959
Sampling Years	1988-1993, 1995-1996, 1998-2013
2013 Samplers	Karl Stahl
Main Contact	Karl Stahl

Lake Map



# Lake Use Scorecard

Included on Q&A page

Lake Use Scorecard compares conditions to designated uses

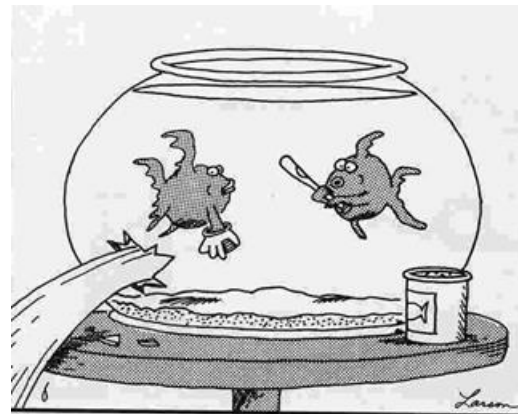
- Designated uses for all lakes- swimming/boating (recreation), aquatic life, fish consumption
- Drinking water for some lakes
- Average conditions and current year
- Cites primary reason for rating

Also compares to PWL if available

- Priority Waterbody List

Lake Use				
PWL	Average Year	2014	Primary Issue	
Potable Water	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Not applicable
Swimming	<input type="checkbox"/>	◆	●	Algae blooms
Boating / Fishing	<input type="checkbox"/>	●	●	No impacts
Aquatic Life	<input type="checkbox"/>	◆	◆	Bottom Oxygen
Aesthetics	<input type="checkbox"/>	▲	●	No impacts
Fish Consumption	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Not applicable

- Supported
- ▲ Threatened
- ◆ Stressed
- Impaired
- Not Known





# But mostly what we want to say today...

## THANK YOU!!!!!!

To the CSLAP volunteers, who make CSLAP work

To the FOLA lake associations, for their support for the program

To UFI, Nancy, and others for their dedication and for doing WAY more work than we pay for...

To the CSLAP committee members for their good ideas, patience, and hard work

