

Why Citizen or Community Science?

- Brings together scientists and lake communities
- These groups can learn from and benefit each other
- 3 components:
 - Education and Training
 - Hands on data collection
 - Discussion



Why Wallenpaupack?

- 3rd largest lake in PA
- Important component of local and regional economy and way of life
- Its shape leads to potential differences in water quality over space

How is water quality changing over time and space?

NEED LOTS OF DATA!





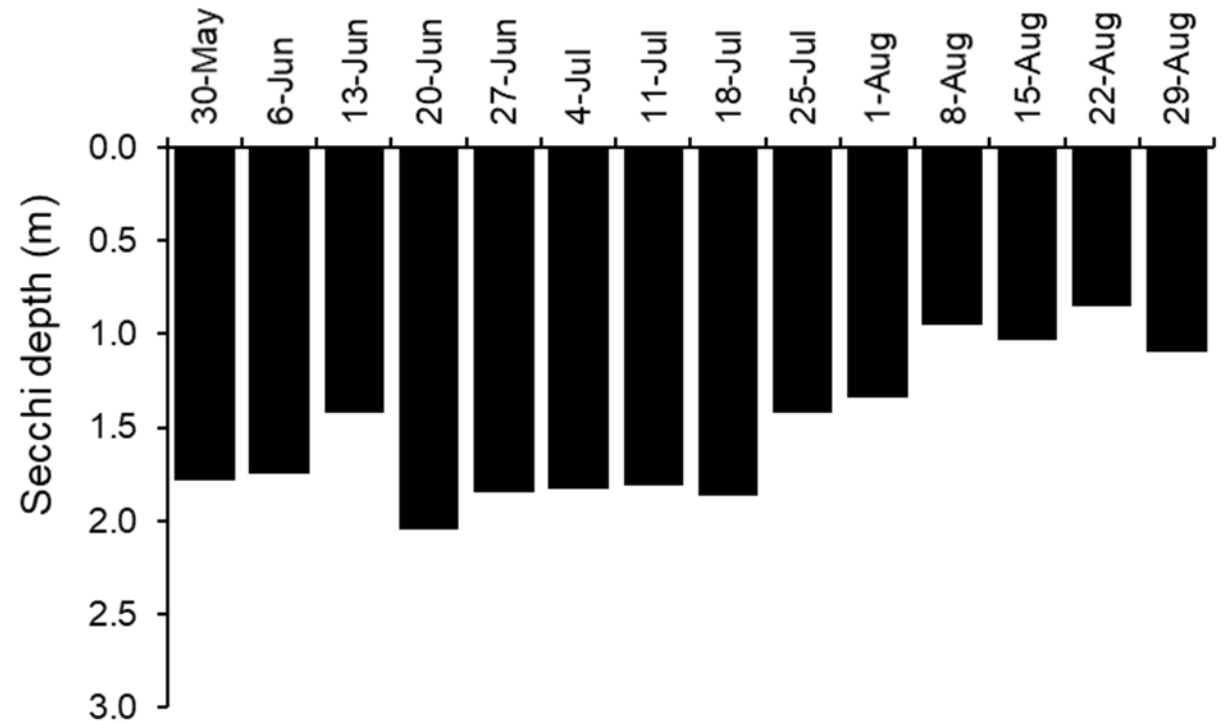
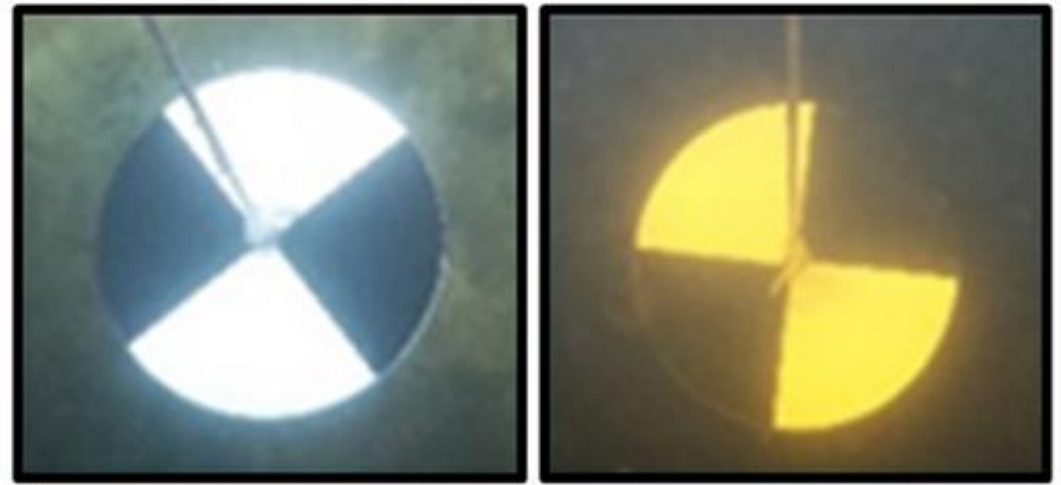
Water Quality and Lake Ecology Basics

What makes a healthy lake?

1. Water Clarity

- Secchi depth: a common way to estimate how clear a lake is
- Factors that can affect water clarity:
 - Dissolved materials
 - Particles in the water
 - Algae

Remember that the deeper the Secchi depth, the more clear the water!



2. Algae

- Small, photosynthetic organisms
 - Produce oxygen
- Important and natural components of lake food webs
- Can decrease water clarity when abundant
- Used to classify lakes
 - Oligotrophic: low algal productivity
 - Mesotrophic: moderate algal productivity
 - Eutrophic: high algal productivity
 - Hypereutrophic: VERY high algal productivity

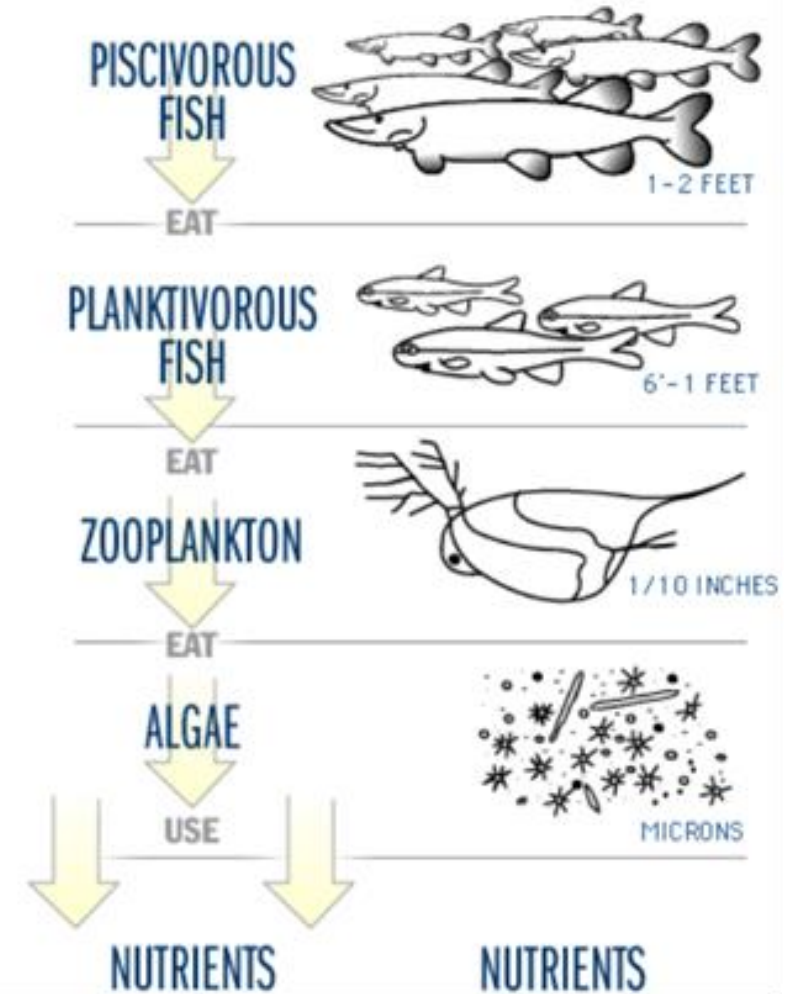
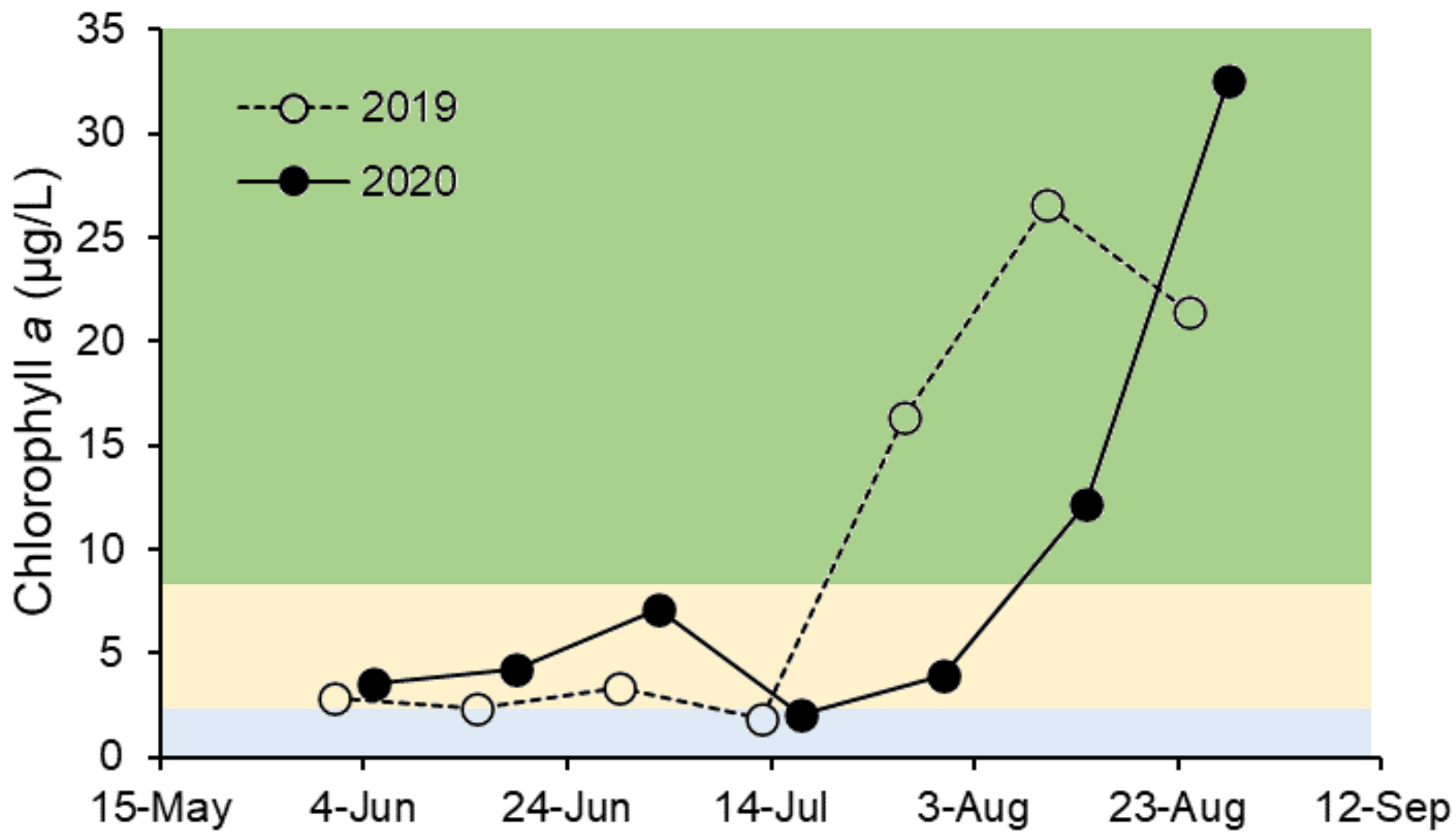


Figure 1: Typical lake food web. Image from lakeaccess.org



2. Harmful Algae Blooms



- Cyanobacteria are a type of algae
- Tend to thrive in warm, nutrient-rich water
- Some can produce toxins that are harmful to humans, pets, and wildlife
 - Many different kinds of toxins
 - Affect nervous system, kidneys, liver, skin
- Often assessed visually



3. Nutrients

- Algae need nitrogen and phosphorus to grow
- Significant amounts of N and P can come from the watershed
 - Leaky septic systems
 - Lawn fertilizers
 - Agriculture
 - Clear cutting or other land use changes
- Some algae can “fix” N from the atmosphere

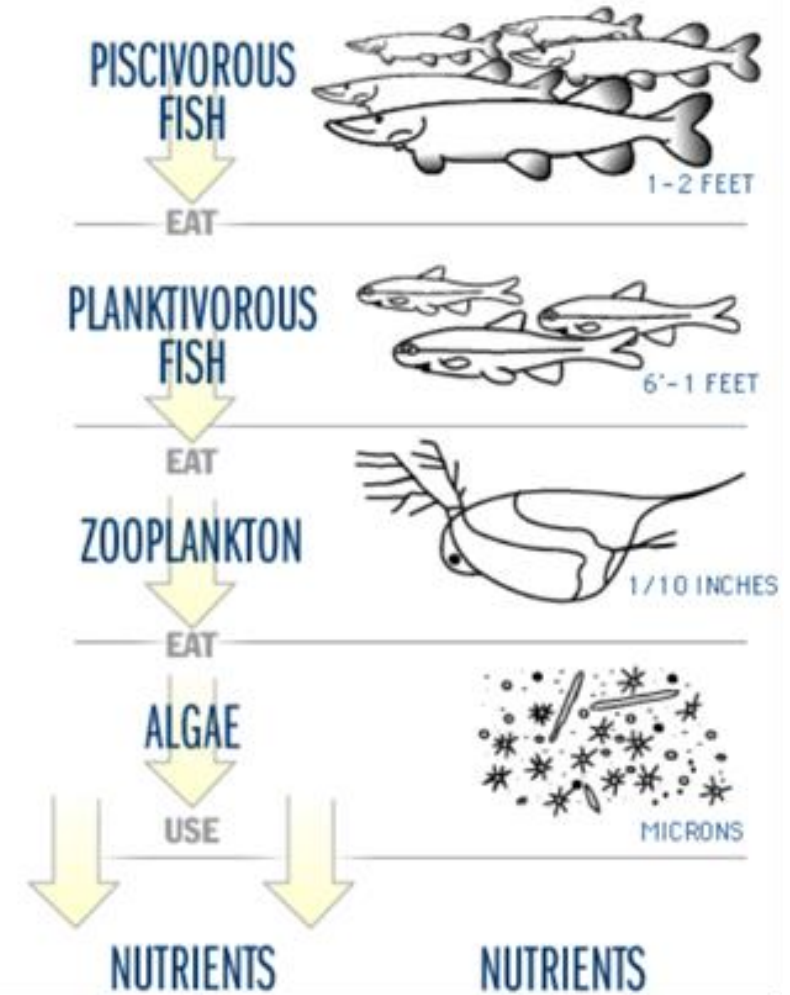
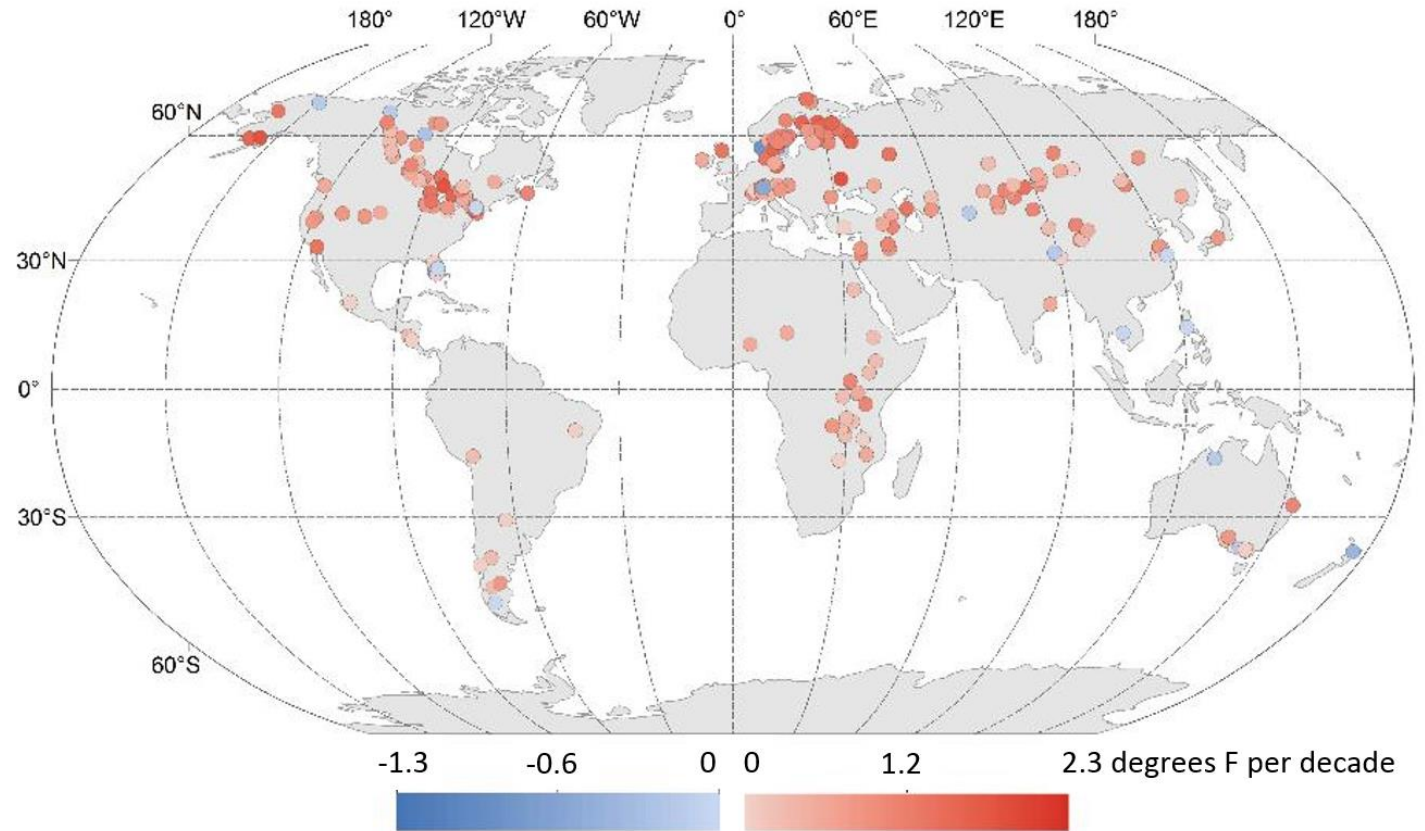


Figure 1: Typical lake food web. Image from lakeaccess.org

4. Water Temperature

- Water temperature plays an important role in the physical structure of lakes
- Can regulate algae growth
- Limiting factor for fish and other organisms



2021 Wallenpaupack Community-led Monitoring Program

How it works

How the monitoring program works...

- Attend a training workshop
- Select your monitoring site
 - Same location every week (June through September)
 - Designed for near-shore sampling
 - dock, pier, or moored boat
 - ~3 meters of water depth (roughly 9 feet)
- Send me the GPS coordinates of your sampling site AND a crew name
 - send to beth.norman@lacawac.org
 - Let me know if you are using the same site as last year...its already in the system!
- Pick up your sampling kit or kit refill pack at Lacawac Sanctuary
 - Local drop off is also available...arrange with me
 - Request a \$50 donation for new kits and \$10 for kit refills.



Shaping the Next Generation of Scientists & Earth Stewards



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Lacawac Sanctuary is dedicated to inspiring lifelong connections to nature and shaping the next generation of scientists and earth stewards through research, education, preservation.



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EDUCATION



PRESERVATION



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PreK-12th Grade Education Programs

Adopt-A-Tree Program

PLEON Citizen Science Program

Summer Camp Registration

How often do you want to make this donation?

One Time Weekly Every 2 Weeks Monthly Quarterly

Semi-Annually Annually

How the monitoring program works

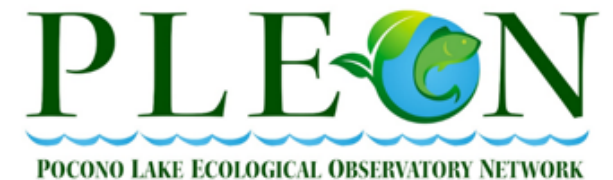
- Do monitoring protocol every Saturday in June, July, August
- If you can't sample on Sat, do so on Friday or Sunday
- Collect a water sample every other week
- Drop off your water samples at Lacawac Sanctuary
 - Labeled cooler in the foyer of the Visitors Center AND outside of the Lab door Friday-Monday of sampling weeks
 - Drop off samples as soon as possible after collection
- **ONLY collect water samples on the scheduled week**

At the Lake

Lets sample!

CITIZEN-LED WATER
QUALITY
MONITORING
PROTOCOLS

Lake Wallenpaupack



Paper Data Sheet

PLEON LAKE WALLENPAUPACK CITIZEN-LED WATER QUALITY MONITORING PROGRAM DATA SHEET - 2021

Crew Name: *Beth Norman*

Address or Coordinates *41.375861 -75.281259*

Site Name: **LWC**

Near-shore / Open Water

| Bottle # Date | Actual date/Time | Initials | Water Color* ** | L.O. App? | Water Temp (°C) | Secchi depth (m) | Water depth (m) | Cloud cover** | Algae on water surface** | Algae in water** | Extent of bloom** | | |
|----------------------------|---------------------|----------|---|---|--------------------|---------------------|--------------------|---|--|--|--|---|---|
| LWC -1 June 5 | | | <input type="checkbox"/> Brown <input type="checkbox"/> Blue/green <input type="checkbox"/> Green <input type="checkbox"/> Yellow/green <input type="checkbox"/> Light blue <input type="checkbox"/> Clear | <input type="checkbox"/> yes <input type="checkbox"/> no | | | | <input type="checkbox"/> Clear <input type="checkbox"/> Mostly clear <input type="checkbox"/> Partly cloudy <input type="checkbox"/> Equal | <input type="checkbox"/> Mostly cloudy <input type="checkbox"/> Overcast <input type="checkbox"/> Fog | <input type="checkbox"/> Streaks <input type="checkbox"/> Dots/clumps <input type="checkbox"/> Spilled paint <input type="checkbox"/> Full scum | <input type="checkbox"/> Duckweed/ <u>watermeal</u> <input type="checkbox"/> Nothing <input type="checkbox"/> Other | <input type="checkbox"/> Thick soup <input type="checkbox"/> Dots/clumps <input type="checkbox"/> Nothing <input type="checkbox"/> Other | <input type="checkbox"/> No bloom <input type="checkbox"/> Localized <input type="checkbox"/> Regional <input type="checkbox"/> Widespread <input type="checkbox"/> Other |
| NO SAMPLE June 12 | | | <input type="checkbox"/> Brown <input type="checkbox"/> Blue/green <input type="checkbox"/> Green <input type="checkbox"/> Yellow/green <input type="checkbox"/> Light blue <input type="checkbox"/> Clear | <input type="checkbox"/> yes <input type="checkbox"/> no | | | | <input type="checkbox"/> Clear <input type="checkbox"/> Mostly clear <input type="checkbox"/> Partly cloudy <input type="checkbox"/> Equal | <input type="checkbox"/> Mostly cloudy <input type="checkbox"/> Overcast <input type="checkbox"/> Fog | <input type="checkbox"/> Streaks <input type="checkbox"/> Dots/clumps <input type="checkbox"/> Spilled paint <input type="checkbox"/> Full scum | <input type="checkbox"/> Duckweed/ <u>watermeal</u> <input type="checkbox"/> Nothing <input type="checkbox"/> Other | <input type="checkbox"/> Thick soup <input type="checkbox"/> Dots/clumps <input type="checkbox"/> Nothing <input type="checkbox"/> Other | <input type="checkbox"/> No bloom <input type="checkbox"/> Localized <input type="checkbox"/> Regional <input type="checkbox"/> Widespread <input type="checkbox"/> Other |

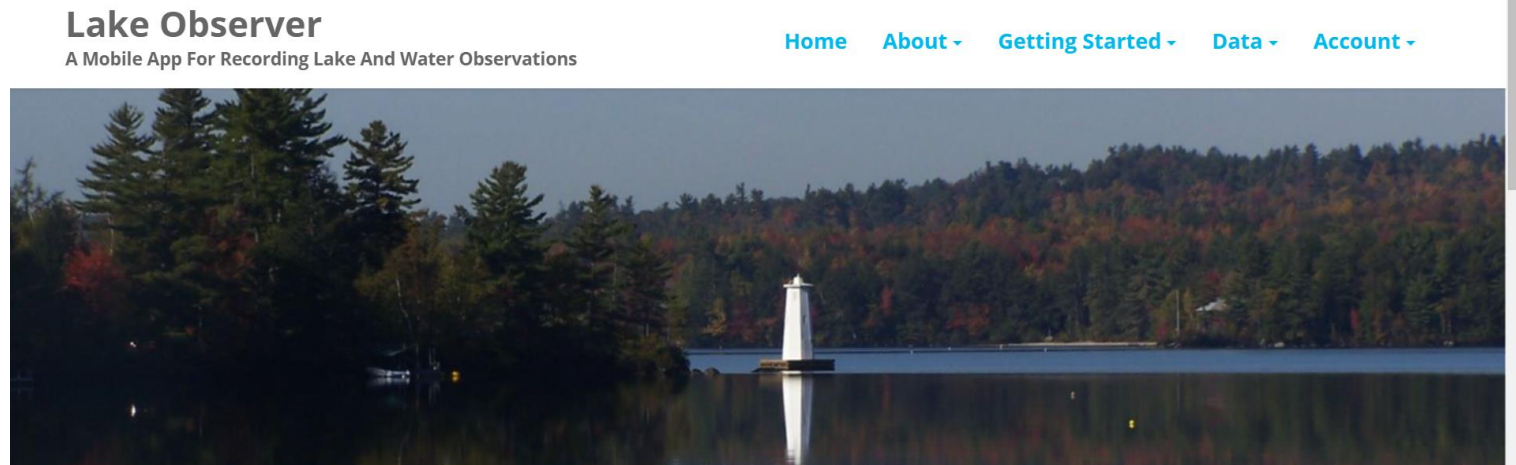


To the Lake!



Lake Observer

Using the app...



Welcome to Lake Observer

Lake Observer App

www.lakeobserver.org

Lake Observer

A Mobile App For Recording Lake And Water Observations

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Welcome to Lake Observer

The Lake Observer mobile app was designed by members of the Global Lake Ecological Observatory Network (GLEON) for both research scientists and citizen scientists to record lake and water quality observations. Lake Observer is part of a crowd-sourcing platform to facilitate the collection and sharing of lake- and water-related information across the globe.



Create an account

Basic Settings

Personal Settings

First Name

Beth

Last Name

Norman

Expertise

Research Scientist/Professional

Organization

Lacawac Sanctuary and Biological Field Station × Type Your Organization and Hit Enter/Tab

Select "Citizen Scientist (Trained Volunteer)" from the drop down menu

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A Mobile App For Recording Lake And Water Observations

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Basic Settings

Personal Settings

Username

bcnorman

This name will be associated with your public data

Email

beth.norman@lacawac.org

Password

Password Confirm

Join the Wallenpaupack Project

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A Mobile App For Recording Lake And Water Observations

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PLEON: Wallenpaupack Citizen Science Program [Admin] [Approved]

A citizen-led water quality monitoring program on Lake Wallenpaupack, PA

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PLEON


| ID | Membership | Data | Name | Description | Waterbodies | Sites | Organizations | Ke |
|----|---------------|--|---|---|---|--|--|------------|
| 32 | Administrator | 0 Entries VIEW DATA | PLEON: Wallenpaupack Citizen Science Program | A citizen-led water quality monitoring program on Lake Wallenpaupack, PA | Lake Wallenpaupack, Pike County, PA, USA | 12 sites VIEW SITES | Lacawac Sanctuary and Biological Field Station; | citi Wa |

[EDIT PROJECT](#)

Will say "Join Project"



Lets look at the App

- www.lakeobserver.org
 - Video guides available
 - The app will store your data if you don't have internet access. Go to “unsubmitted data” tab when you have service to submit.
- 

THANK YOU!

- Sign the registration sheet!
- Contact: Beth Norman: beth.norman@lacawac.org
- Donations are welcome!

