

Cyanobacteria: What Can We Do?



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July 29, 2023 Sunrise Lake



Cyanobacteria

- Formerly known as blue-green algae
- Ubiquitous
- Native
- Thousands of species, hundreds of toxins
- Originated ~3.5 billion years ago
- Oxygenated the planet with the byproduct of photosynthesis



Cyanotoxins

- Affect people, pets and wildlife
- Exposure through ingestion
 - Drinking water
 - Swimming
 - Food
- Exposure through inhalation
- Acute and chronic toxicity
- Documented symptoms:
 - Skin irritation
 - Eye and nose irritation
 - Fatigue
 - Fever
 - Nausea, vomiting, diarrhea
 - Tingling, numbness, seizures
 - Nervous system and organ failure
 - Death

When in doubt, stay out!



Why prevent blooms?

- Blooms:
 - Threaten public health
 - Impair recreation
 - Harm wildlife
 - Affect business revenues
 - Decrease property values



Report a bloom: <https://arcg.is/1e8Tfy>

Cyanobacteria Management and Prevention (Outline)

- Identify & Report Blooms
- What causes blooms?
- What can Sunrise Lake do?
- Resources for homeowners



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Cyanobacteria Blooms

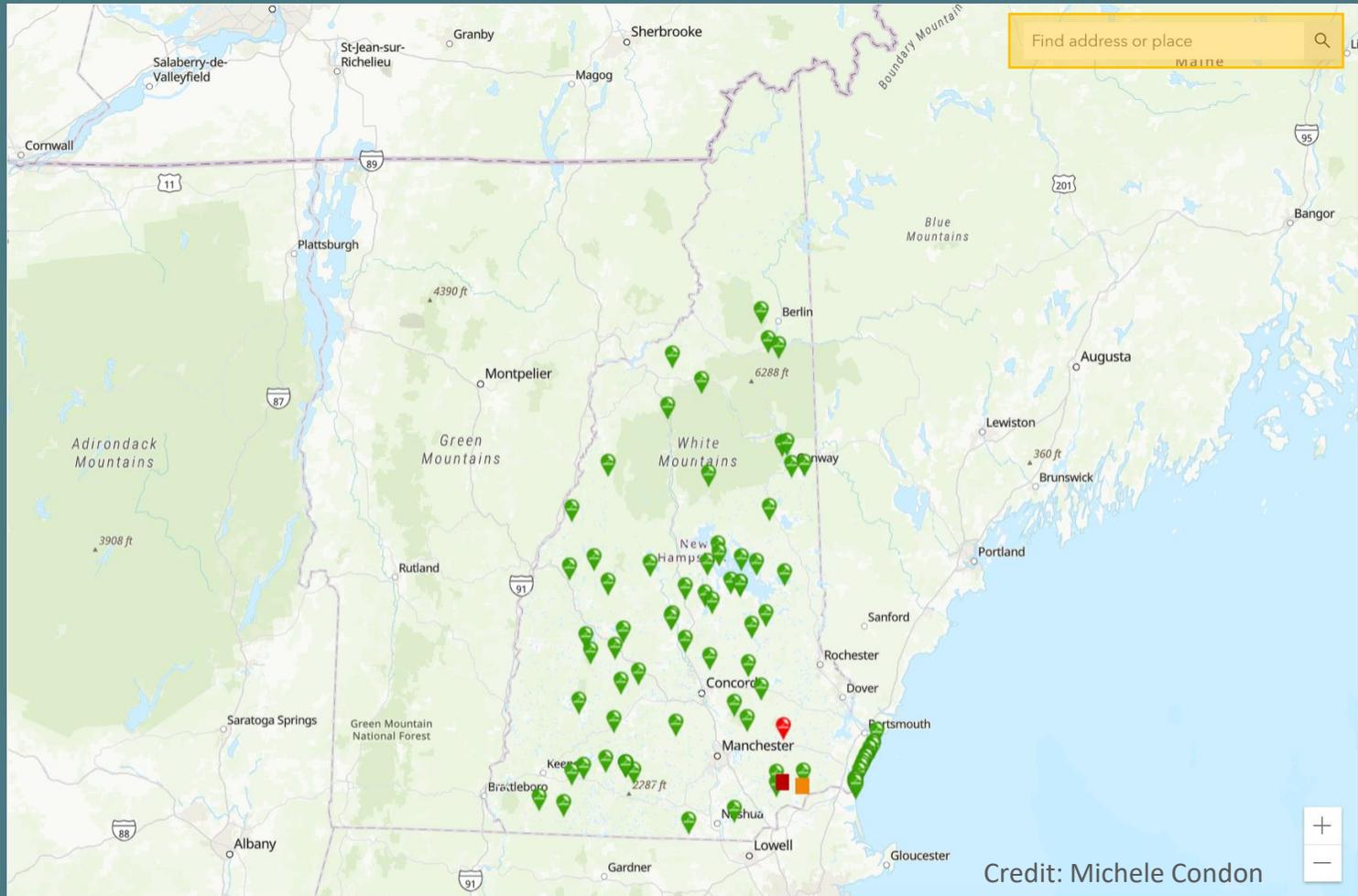


Credit: Amanda McQuaid

- Rapid growth
- Blooms change often and quickly
 - Move in the water column
 - Move to another part of the lake
 - Can last for a single day, or a full summer

Report a bloom: <https://arcg.is/1e8Tfy>





VCGI, Esri, HERE, Garmin, FAO, NOAA, USGS, EPA, NPS | The New Hampshire Department of Environmental Services, Watershed Management Bureau, Water Quality Planning Section, should... Powered by Esri

Current Beach Advisories

Pawtuckaway State Park Beach (on Pawtuckaway Lake) - Issued on 8/9/2022

Last update: 41 minutes ago

Current Cyanobacteria Alerts

COUNTRY POND - Issued on 5/23/2022

"No current Alerts"

Last update: 41 minutes ago

Current Cyanobacteria Advisories

ANGLE POND - Issued on 9/12/2022

Last update: 41 minutes ago



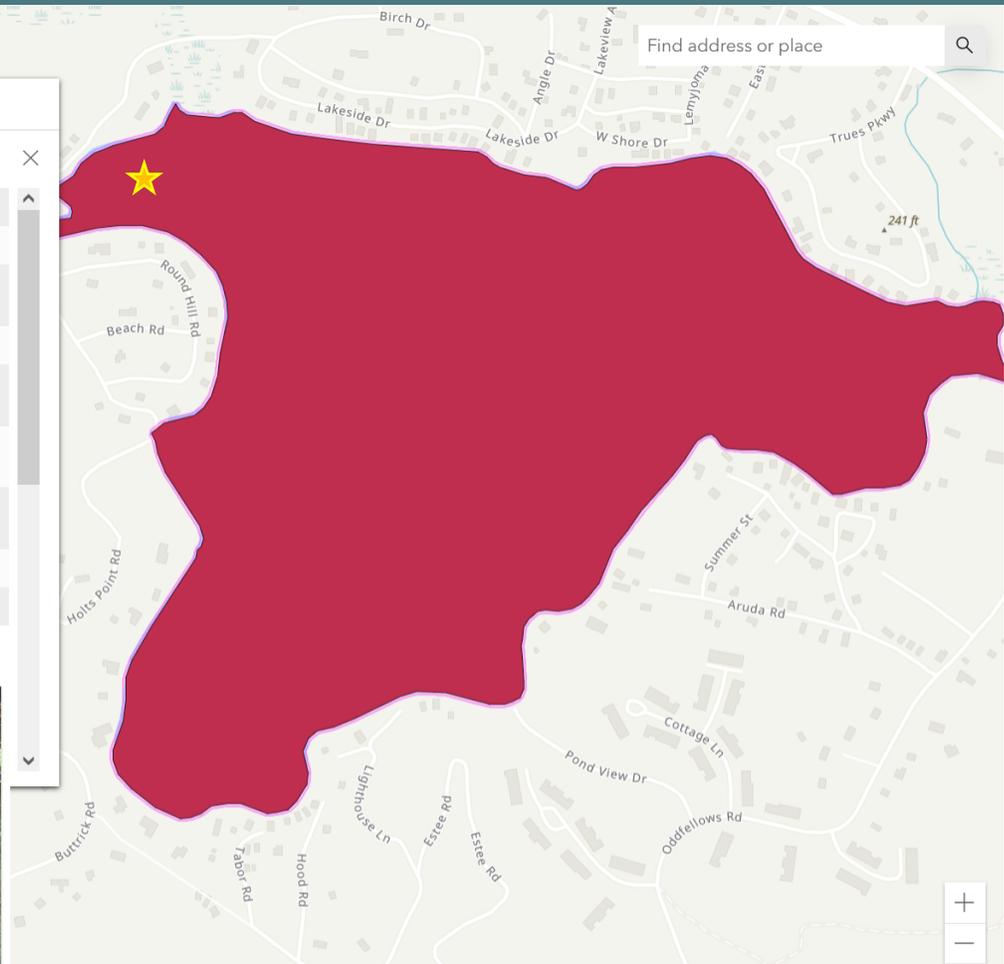


Zoom to Pan

ANGLE POND

Status	★ Advisory
Town	Sandown/Hampstead
Most Recent Sampling Date	9/12/2022
Date Issued	9/12/2022
Bloom Description	★ Green clouds and surface streaks.
Initial Cyanobacteria Identified	Dolichospermum
Initial Total Cyanobacteria Density (cells/mL)	138,200
2023 Advisory History	★ No advisories issued
Historical Advisories	★ View

Image taken on 9/9/2022



Current Beach Advisories

- ★ Pawtuckaway State Park Beach (on Pawtuckaway Lake) - Issued on 8/9/2022

Last update: 35 minutes ago

Current Cyanobacteria Alerts

- ▲ COUNTRY POND - Issued on 5/23/2022

Last update: 35 minutes ago

Current Cyanobacteria Advisories

- ▲ ANGLE POND - Issued on 9/12/2022

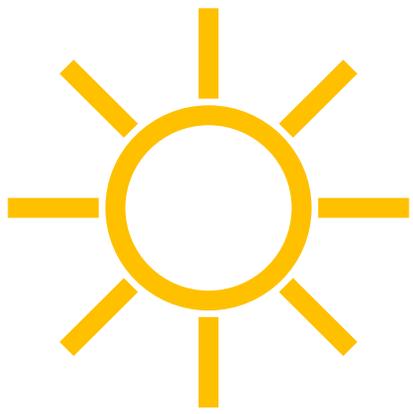
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Cyanobacteria Management and Prevention (Outline)

- Identify & Report Blooms
- **What causes blooms?**
- What can Sunrise Lake do?
- Resources for homeowners

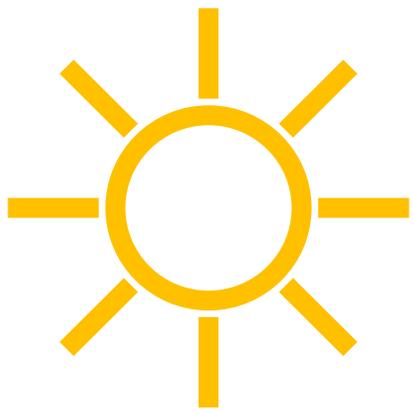




What creates a bloom?

Sunlight + More Nutrients (P) + Warm Water
=
Cyanobacteria Bloom





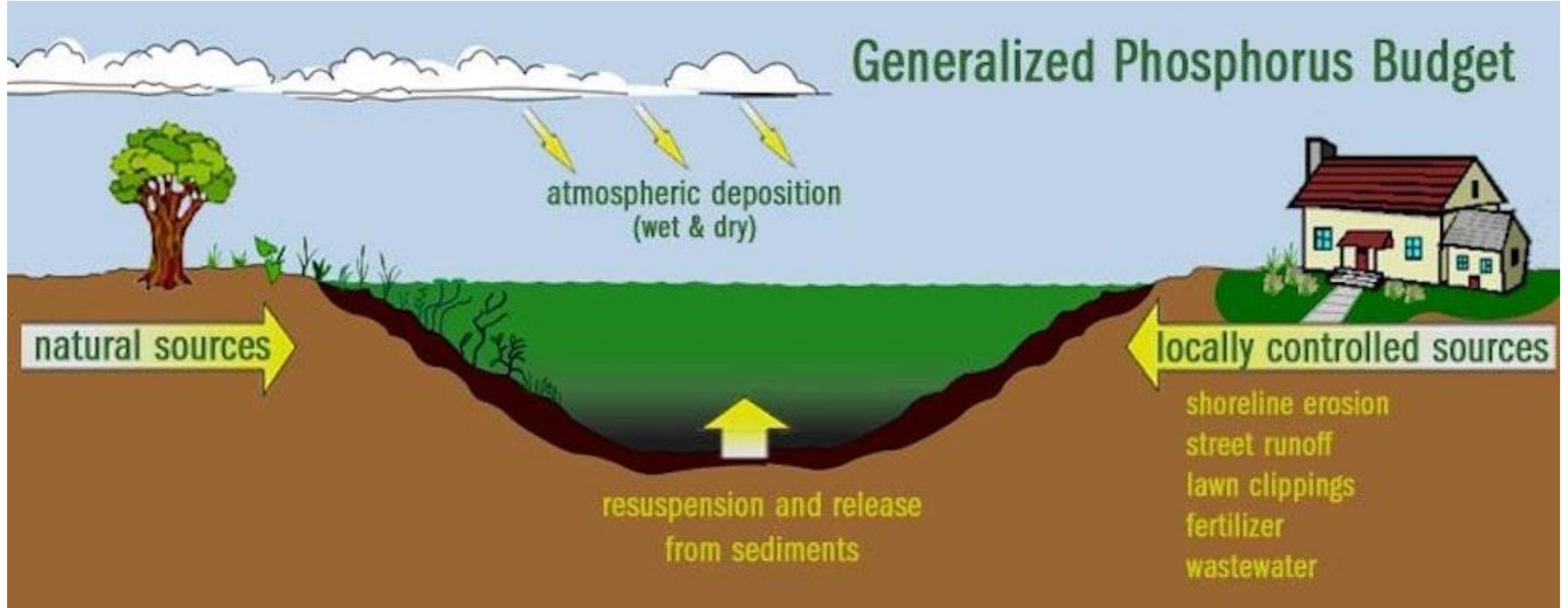
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Cyanobacteria Bloom



Watershed-based approach needed



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- **What can Sunrise Lake do?**
- Resources for homeowners



What can Sunrise Lake do?

1. Improve stormwater management
2. Protect shorelands
3. Upgrade/maintain septic systems
4. Education/outreach
5. Form a watershed association
6. Implement your watershed-based plan



1. Improve stormwater management: Examples

- Changing road grading
- Fixing culverts
- Permeable pavers
- Catchment basins
- Rain barrels
- Revegetating shorelines
- Protecting land



2. Protect Shorelands



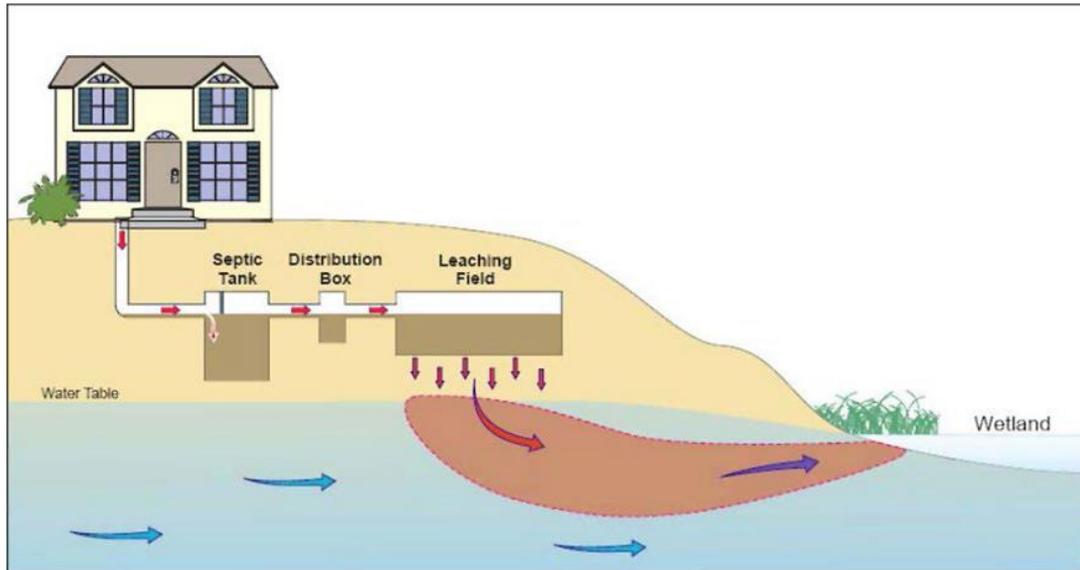
- Native plants:
 - Increase infiltration
 - Eliminate the need for fertilizer
 - Reduce ice damage
 - Reduce erosion/wake damage
 - Support biodiversity

How to Protect Shorelands

- Outreach/education to homeowners
- Land Conservation
- Reforest logged areas
- Shoreland buffer zones
- Shoreland permit enforcement
- Legislative advocacy



3. Upgrade/maintain septic systems



- Educate
- Collaborate: Pump-out Program
- Pass local regulations
- Identify, prioritize, replace problematic systems

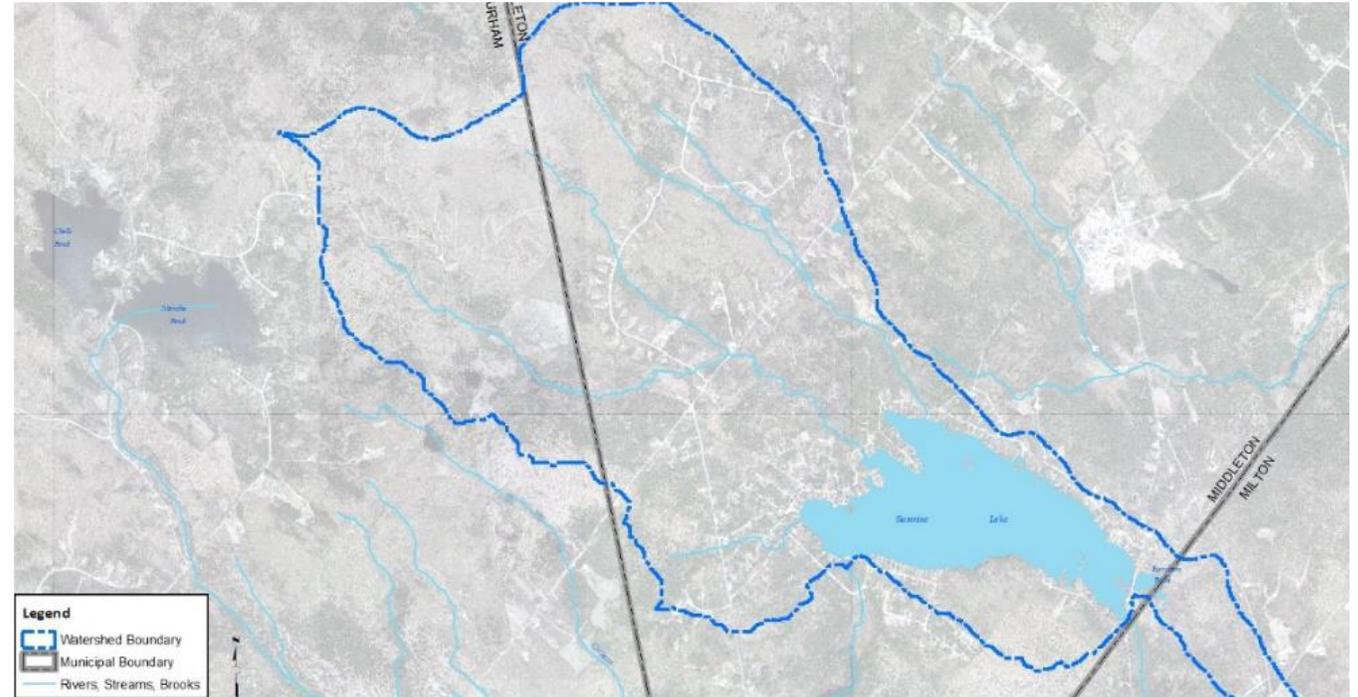
4. Education/Outreach

- What homeowners do affects water quality (and property values)
 - Shoreland vegetation
 - Stormwater runoff
 - Fertilizer use
 - Septic maintenance
- The risks of cyanobacteria blooms
 - How to ID & report: <https://arcg.is/1e8Tfy>



5. Form a watershed association

- Ensure watershed plan implementation
- Annual meetings
- Education campaigns
- Coordinate with the town
- Neighbor to neighbor conversations
- Some fun things too...



6. Implement your watershed-based plan

- A comprehensive, prioritized to-do list for how to protect/restore Sunrise Lake
- Identifies sources of nutrients and pollutants
- Describes specific actions to address nutrient sources
- Supports funding applications



Remember Why:

Less nutrient pollution



Lower likelihood of future cyanobacteria blooms

- Protecting water quality protects property values



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- **Resources for homeowners**



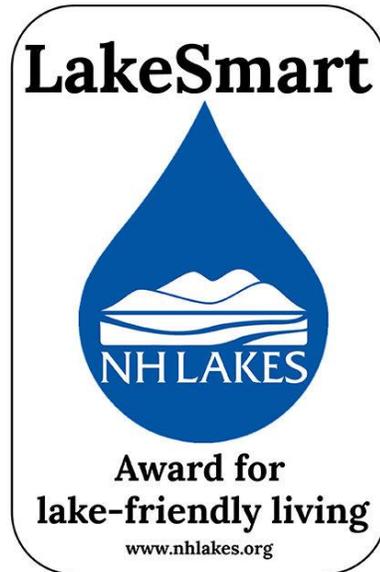
What can a homeowner do?

1. Avoid using fertilizer
2. Vegetate your shoreline
3. Prevent erosion on your property
4. Maintain your septic system (inspect/pump every 3 years)
5. Spread the word



Resources for Homeowners

- LakeSmart Program



- Contact [NH LAKES](http://www.nhlakes.org)

- Soak Up the Rain



- Contact lisa.loosigian@des.nh.gov



HB1066: Cyanobacteria Plan

- DES is creating a plan to:
 - understand the status, impacts, and risks of cyanobacteria blooms in New Hampshire waterbodies;
 - identify what is needed to prevent, avoid, and control blooms;
 - recommend ways to improve coordination among stakeholders and the communication of health risks from blooms.
- Input from an advisory committee
- Report due Nov. 1, 2023



Thank you! Questions?

Nisa Marks

Watershed Coordinator

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Report a bloom:

<https://arcg.is/1e8Tfy>

Healthy Swimming Mapper:

<https://www.des.nh.gov/water/healthy-swimming/healthy-swimming-mapper>



Two-tiered response based on cyanobacteria density

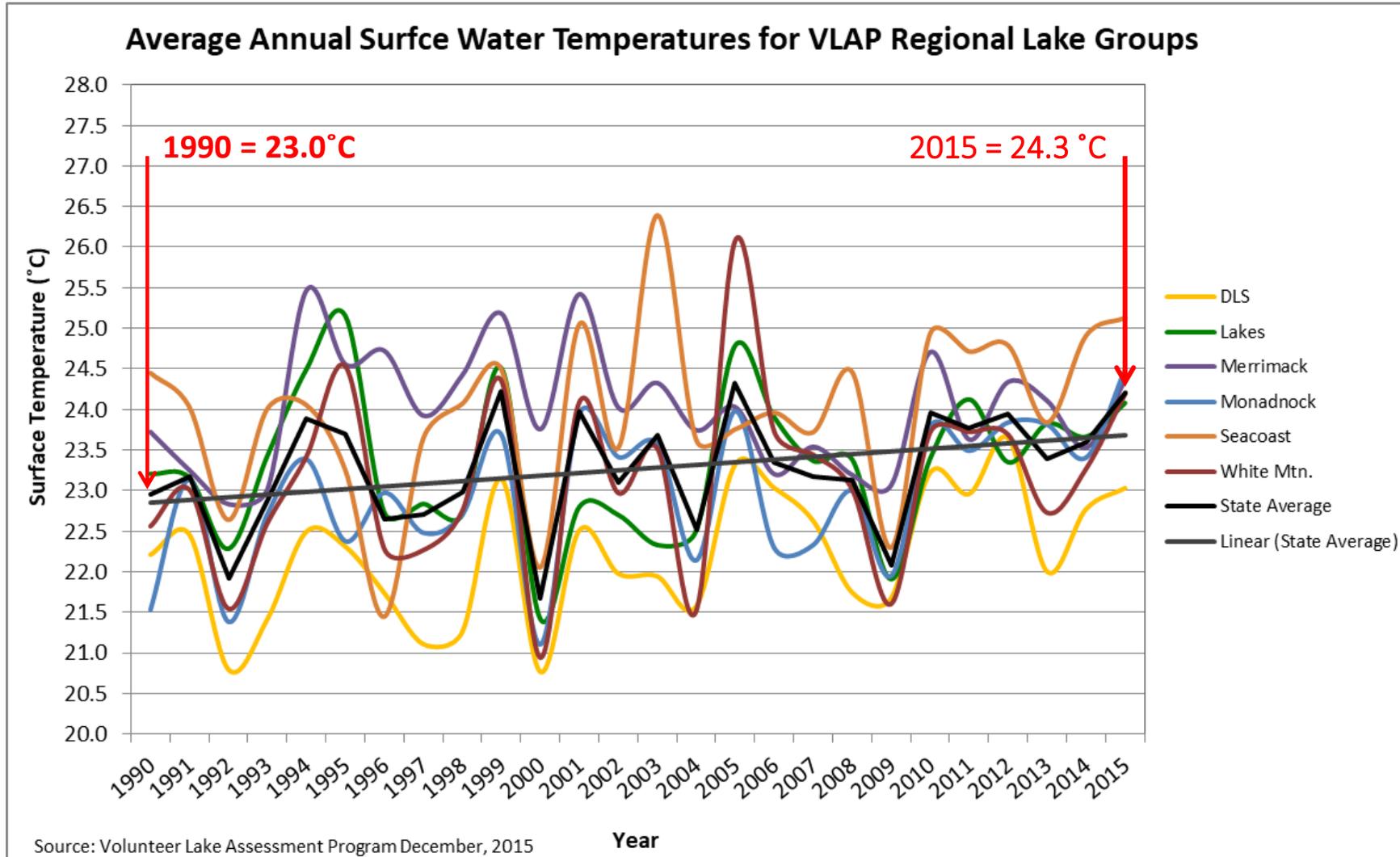
ALERT

- **Be on the lookout**
 - <70,000 cells/mL
 - Bloom could develop into something more significant
 - Bloom may have passed (weekends!)
 - Issued based on a photo and description of the bloom
- No signs posted
- Alert statement shared locally
- Resampled if residents inform us about continued presence / changing conditions

ADVISORY

- **Lake wide warning**
 - More than 70,000 cells/mL
 - Water is currently unsuitable for wading or swimming
 - Keep children and pets out of the water
 - Issued based on a water sample
- Signs posted at public access sites
- Advisory statement shared widely and publicly
- Resampled weekly until the cyanobacteria cell concentration drops below 70,000 cells/mL

Climate Change



Climate Change

