

THORNDIKE POND WATER QUALITY UPDATE - 2025



NEW VOLUNTEER FOR THORNDIKE POND WATER SAMPLING

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(she/her)



THANK YOU JONATHAN BIRGE!

We appreciate the time and effort you spent as our Thorndike Pond New Hampshire VLAP (Volunteer Lake Assessment Program) volunteer!

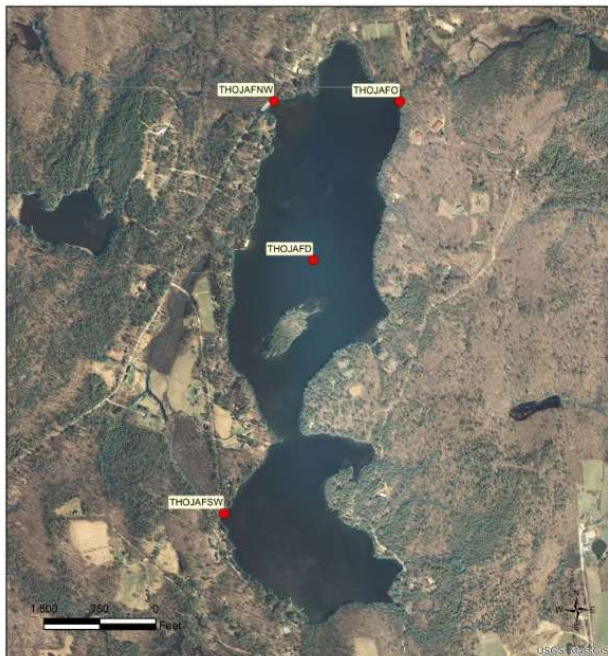


PRESENTATION AIMS:

1. 2024 Water Quality - September Results & Averages
2. 2025 Water Quality - What We Know So Far & The Plan
3. Historic Data Trends - What Can We Learn?
4. Water Quality Concerns for NH Lakes, Thorndike Pond & What We Can Do

TESTS & MEASUREMENTS

Chlorophyll-A
 Water Temperature & Color
 Dissolved Oxygen
 Oxygen Saturation Levels
 Water Transparency & Turbidity
E. coli Bacteria Presence
 Alkalinity/pH Acidity
 Phosphorus Levels
 Chloride Levels & Conductivity



THORNDIKE POND JAFFREY

VOLUNTEER LAKE ASSESSMENT PROGRAM

STATIONID	STATION NAME
THOJAFD	DEEP SPOT
THOJAFNW	NORTH WEST INLET
THOJAFO	OUTLET
THOJAFSW	SOUTH WEST INLET

SAMPLING SITES ON THORNDIKE POND

Source: The data layers are derived from MDCES data and are under constant revision. MDCES is not responsible for the use or interpretation of this information. Not intended for legal use. MDCES Watershed Management Bureau Date: 2/17/2021



2024 WATER TESTING RESULTS

	June	September	Standard
<i>E. coli</i> Bacteria	2 mpn (well below)	(none)	88 mpn/100 ml
Phosphorus	8.95, 10.1, 11.1, 11.4, 54.5	7.21, 7.33, 8.18, 38.6	Ave.: 11-20 ug/L
Dissolved Oxygen	0.88 - 7.45 mg/L	(none)	> 5 mg/L
Oxygen Saturation	10.2 - 91.1 %	(none)	Varies
Water Transparency	2.5 m (shallower)	4.63 m (deeper)	3.3 m
pH	6.24-6.88	6.58-6.73	pH 6.5 - 8.0
Alkalinity	4 mg/L	3.5 mg/L	4.5 mg/L*

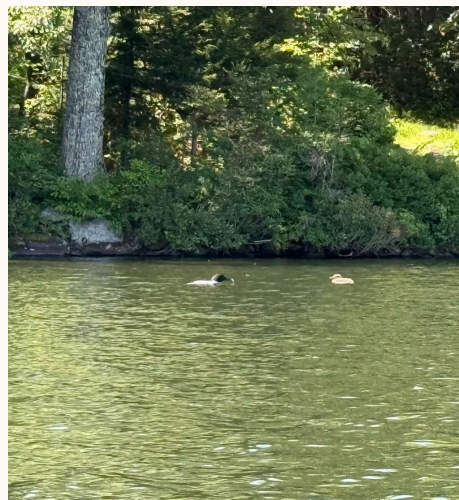
* Note: historically NH has low alkaline water levels due to the granite bedrock; >2 - 5 is "endangered"

2024 WATER TESTING RESULTS

	June	September	Standard
Chloride	6.65 mg/L	4.97 mg/L	< 230 mg/L
Conductivity	26.9 - 37.1 uS/cm	26.9 - 27.9 uS/cm	42.3, <100 uS/cm
Water Temperature	20.4 - 23.6 °C	(none)	Varies
Turbidity	1.3 - 4.84 NTU	0.53 - 0.99 NTU	< 10 NTU
Color	38	27	0 - >75
Chlorophyll-A	5.92 ug/L	2.85 ug/L	4.39 ug/L

2025 PRELIMINARY RESULTS

- Water Transparency
- Dissolved Oxygen
- Color
- Water Temperature

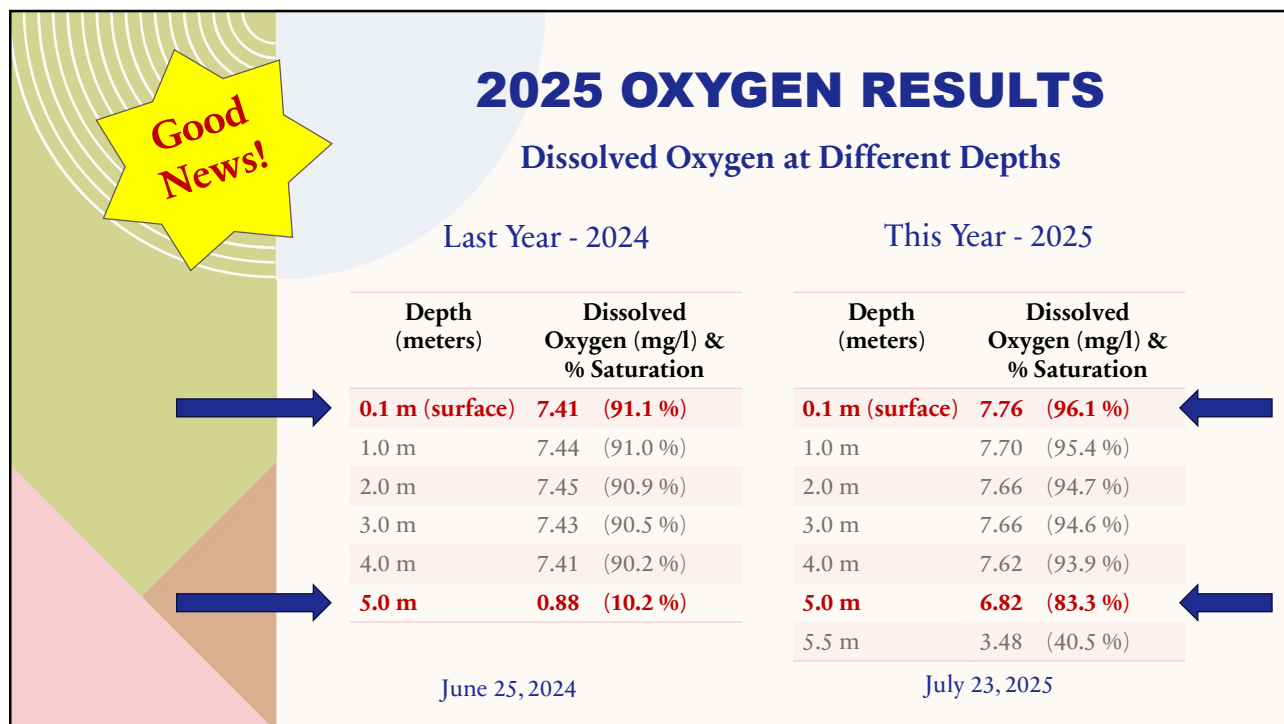


2025 WATER TRANSPARENCY

Improvement!

- Secchi Disk Readings:
 - Without Scope/By Eye: 3.7 m
 - With Scope: 4.2 m
- Last Year:
 - June: 2.5 m
 - September: 4.6 m





HISTORIC DATA: WHAT ARE THEY TELLING US?

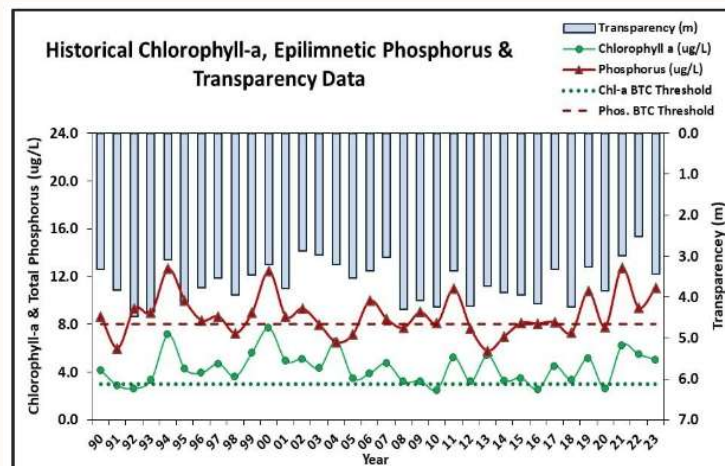


Thorndike Pond
1949

CHLOROPHYLL, PHOSPHORUS & TRANSPARENCY

Phosphorus
NH Median
is 11 ug/L

Chlorophyll a
NH Median
is 4.39 ug/L

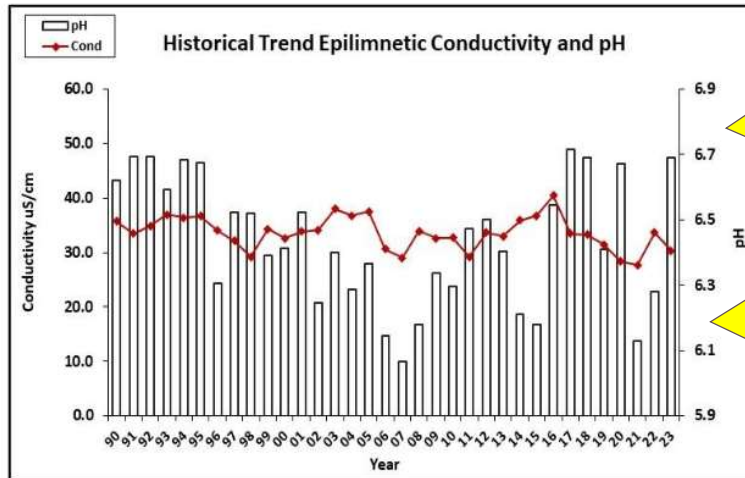


<https://www.des.nh.gov/sites/g/files/ehbemt341/files/documents/2023-thorndike-jaffrey.pdf>

ACIDITY & CONDUCTIVITY

Conductivity
looks good
< 100 uS/cm

Healthy
Aquatic
Life:
pH 6.5 - 8



<https://www.des.nh.gov/sites/g/files/ehbemt341/files/documents/2023-thorndike-jaffrey.pdf>

E. COLI BACTERIA

- Shattuck Park (town beach) had a bacteria closure in July 2020, may have been anomaly
- Historically our bacteria numbers have been very low
- The camps have a history of very low bacteria counts, they do a great job!

ADVISORY

High levels of BACTERIA have been detected in this WATER.

N.H. Dept. of Environmental Services

**WATER CURRENTLY NOT
SUITABLE FOR WADING
OR SWIMMING!**

Exposure to this water may cause nausea, vomiting, diarrhea, or fever.

Children, the elderly and others with sensitive immune systems are especially vulnerable.

All current advisories posted at www.des.nh.gov.
Click "beach advisory" in left column

CONTACT INFORMATION:
NHDES Beach Program
29 Hazen Dr., Concord, NH
(603) 271-0698
beaches@des.nh.gov



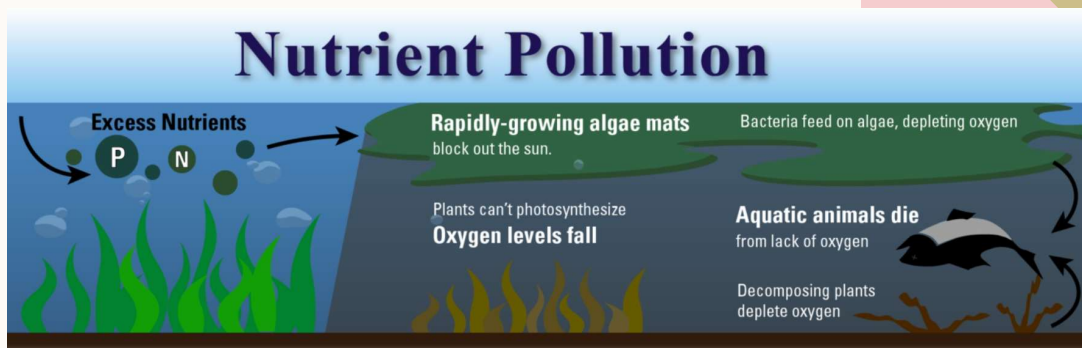
HARMFUL ALGAL BLOOMS



Picasso / Courtesy Of New Hampshire Department Of Environmental Services

- None on record for Thorndike Pond so far
- We have higher algal counts
- Other NH lakes and ponds have had harmful algal blooms
- The last 4 years have broken state records for harmful algal blooms in NH

HARMFUL ALGAL BLOOMS



<https://www.usgs.gov/media/images/nutrient-pollution-0>

HARMFUL ALGAL BLOOMS

SMALL BLOOMS

- Can clear naturally
- Can clear with some interventions
- Temporary restrictions on water recreation
- Temporary toxin warnings
- Short term health effects



LARGE BLOOMS

- Long term or permanent “Lake Death”
- Human health hazards, in water and in air near pond
- Lethal to smaller animals
- Decreased quality of life near pond, damaged ecosystem
- Well water contamination
- Property value decreases

WHAT SHOULD WE EXPECT?

Possible Harmful Algal Blooms Due to Climate Change



WHAT SHOULD WE EXPECT?

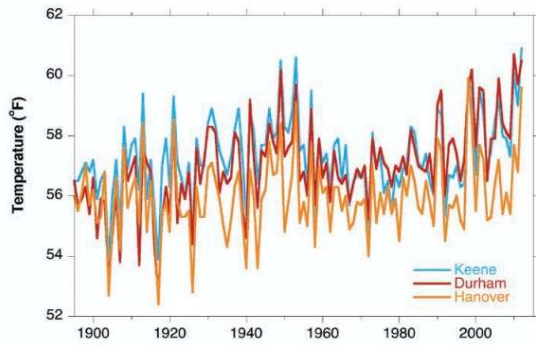


FIGURE 2. Annual *maximum* temperature records for USHCN stations in southern New Hampshire for the period 1895–2012.

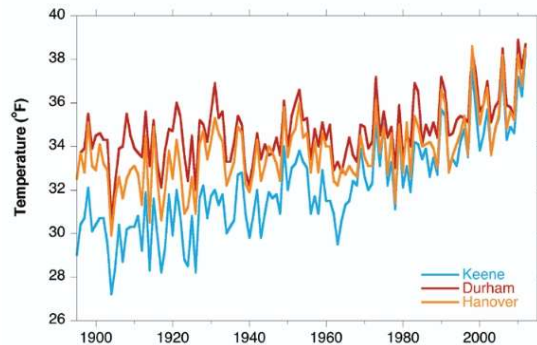
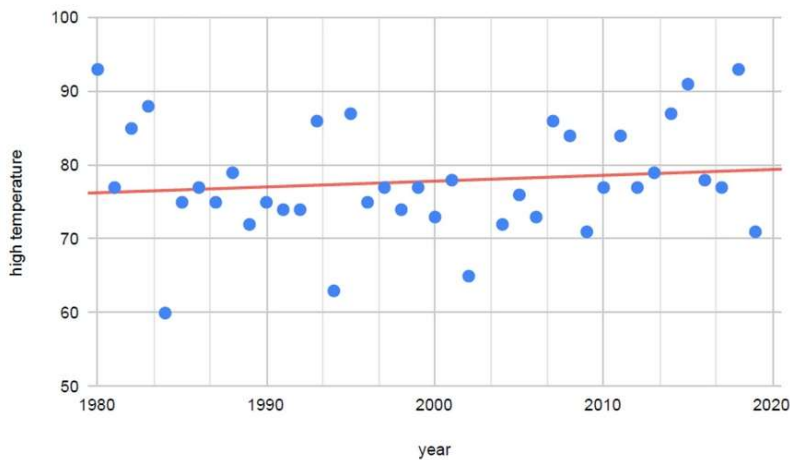


FIGURE 3. Annual *minimum* temperature records for USHCN stations in southern New Hampshire for the period 1895–2012.

Wake, Cameron P.; Burakowski, Elizabeth A.; Wilkinson, Peter; Hayhoe, Katharine; Stoner, Anne; Keeley, C.; and LaBranche, Julie, "Climate Change in Southern New Hampshire: Past, Present and Future" (2014). *The Sustainability Institute*. 2.
<https://scholars.unh.edu/sustainability/2>

WHAT SHOULD WE EXPECT?

Daily high temperatures on Labor Day in Manchester, NH, 1980-2019



Source: Weather Underground historical data for Manchester-Boston Regional Airport weather station

Annie Ropeik / NHPR

WHAT SHOULD WE EXPECT?



Extreme Precipitation Trends

While overall increases in precipitation have been modest, the frequency of the most extreme precipitation events (4 inches in 48 hours) has increased four to ten times since 1960, depending on the location of the station.

Wahr, Cameron P.; Baranowski, Elizabeth A.; Wilkinson, Peter; Hayhoe, Katherine; Storer, Anne; Kesting, C.; and Lallweber, Julie. "Climate Change in Southern New Hampshire: Past, Present and Future" (2014). The Sustainability Institute 2.
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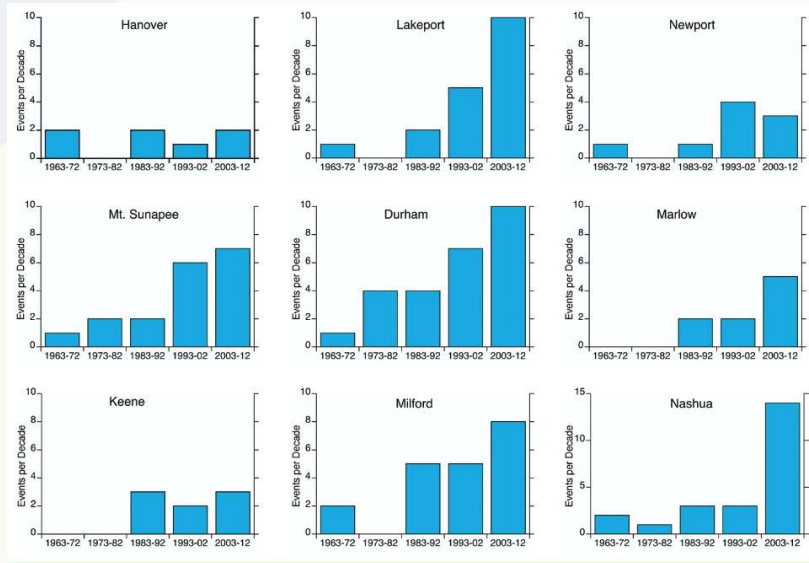
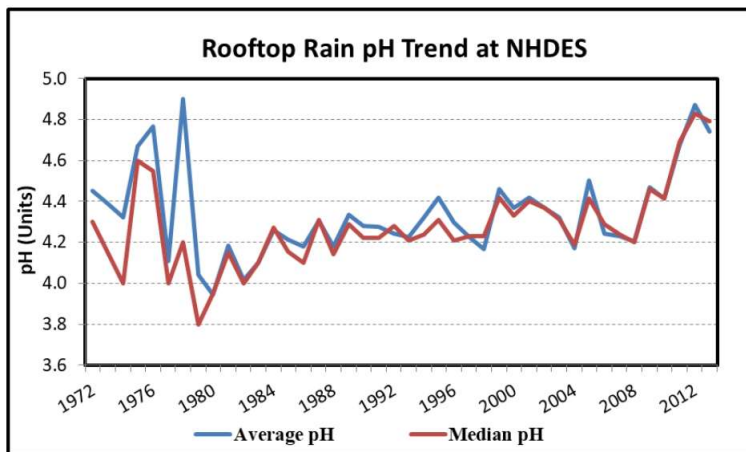


FIGURE 7. Trends in extreme precipitation events per decade (greater than 4 inches of precipitation in 48 hours) for nine GHCN-Daily stations in southern New Hampshire, 1963–2012.

WHAT SHOULD WE EXPECT?

Trend in pH values of precipitation collected at NHDES through the Rooftop Rain Program, 1972 – 2013.



- We have high acidity & and low acid buffering capacity
- Clean Air Act, 1970
- White House plans to roll back greenhouse gas emissions restrictions

<https://www.des.nh.gov/sites/g/files/ehbemt341/files/documents/2020-01/bb-8.pdf>

WHAT SHOULD WE EXPECT?

Continued need to monitor for invasive species and anything that could disrupt the pond ecosystem



Photo credit: NHDES

Variable milfoil



Leslie J. Mehrhoff, University of Connecticut

Curly-leaf pondweed



Amy Benson, U.S. Geological Survey, Bug

Zebra mussel

<https://nhlakes.org/aquatic-invasive-species-in-new-hampshire/>

WHAT CAN WE DO TO KEEP A HEALTHY POND ECOSYSTEM?

Keep the “bad” stuff out



Support a healthy ecosystem



HAVE YOUR SEPTIC SYSTEM INSPECTED REGULARLY



Help to keep sewage and waste out of the pond and the land around the pond

Sewage leaks can lead to algal blooms AND the presence of harmful bacteria in the water

CHOOSE HOUSEHOLD PRODUCTS WITHOUT PHOSPHATES

Phosphates are mostly banned and phased out but check the labels



DO NOT APPLY FERTILIZERS TO YOUR PROPERTY



Fertilizers add excess phosphorus and nitrogen to the soil surface – rain, irrigation and erosion carry this directly into the pond

This increase the risk of algal blooms

KEEP A BUFFER OF VEGETATION AROUND THE POND

Help prevent erosion into the pond by allowing native plants and trees to grow along the water's edge

Excess erosion carries too many nutrients into the pond and risks an algal bloom



VOLUNTEER TO KEEP AN EYE OUT AT THE POND

Do a shift as a **lake host volunteer** – keep invasives out of the pond, they disrupt the ecosystem!

➡ Talk to **Skip Cornelius**

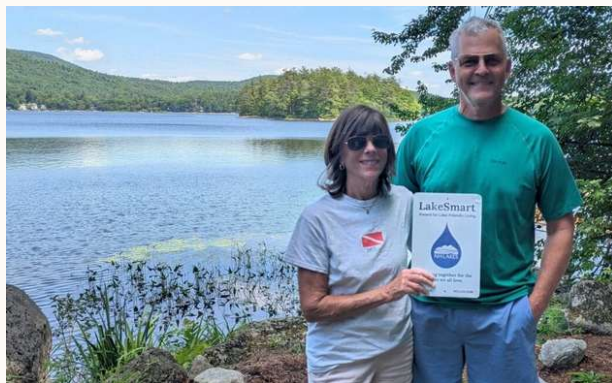
Join our **Weed Watchers** group to look for invasives or concerning plant/algal growth at the pond

➡ Talk to **David Nash**



SCHEDULE A NH LAKE SMART PROGRAM VISIT

Visit <https://nhlakes.org> to schedule a FREE visit to your property next summer and to learn more!



VOTE TO SUPPORT CLEAN WATER & AIR IN NEW HAMPSHIRE



QUESTIONS?

**THANK
YOU**

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