



Welcome and thank you for being here today!

Freshwater Initiative

Cape Cod Regional Pond Monitoring Program



CAPE COD
COMMISSION





Project Objectives

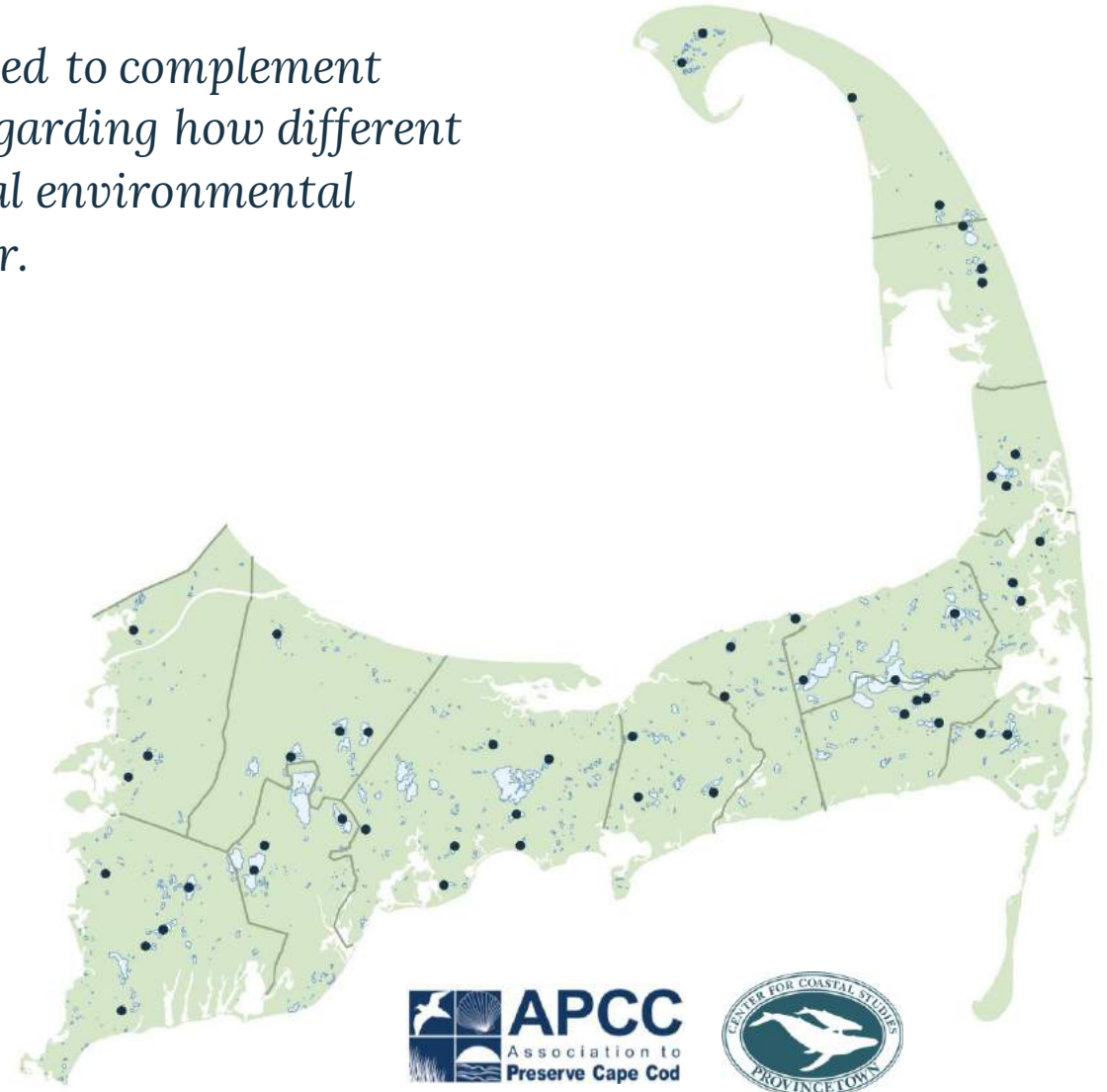
- Help Cape Cod communities to better protect and manage our ponds by collecting water quality data to characterize pond conditions
- Understand the effects of watershed development and other stressors
- Standardize data collection following quality control standards set by state and federal agencies
- Inform pond protection and management strategies

REGIONAL POND MONITORING PROGRAM

The Regional Pond Monitoring Program has been designed to complement existing monitoring efforts and provide baseline data regarding how different types of ponds on Cape Cod respond to changing regional environmental conditions throughout the summer and from year to year.

Pond selection criteria:

- Spatial coverage across all towns and aquifer lenses
- Range of pond physical characteristics (e.g., size, depth, level of watershed development)
- Stream/herring run connections and implementation projects
- Water quality status
- Public uses of ponds
- Located in or adjacent to environmental justice area





Pond Water Quality Monitoring Program – Selected Ponds

Ponds by Town

Barnstable

Garretts Pond
Hathaway Pond
Long Pond
Lovells Pond
Lake Elizabeth
Micah Pond
Parker Pond

Bourne

Flax Pond
Queen Sewell Pond
Red Brook Pond

Brewster

Cliff Pond
Long Pond
Slough Pond

Chatham

Goose Pond
Barclay Pond

Dennis

Coles Pond
Flax Pond
Scargo Lake

Eastham

Bridge Pond
Herring Pond

Ministers Pond

Falmouth

Coonamesset Pond
Jenkins Pond
Mares Pond
Shivericks Pond
Wing Pond

Harwich

Cornelius Pond
Hawksnest Pond
Sand Lake
Walkers Pond

Mashpee

Johns Pond
Moody Pond
Santuit Pond

Orleans

Crystal Lake
Pilgrim Lake

Reubens Pond

Provincetown

Blackwater Pond
Clapps Pond

Sandwich

Lawrence Pond
Peters Pond
Shawme Lake
Spectacle Pond

Truro

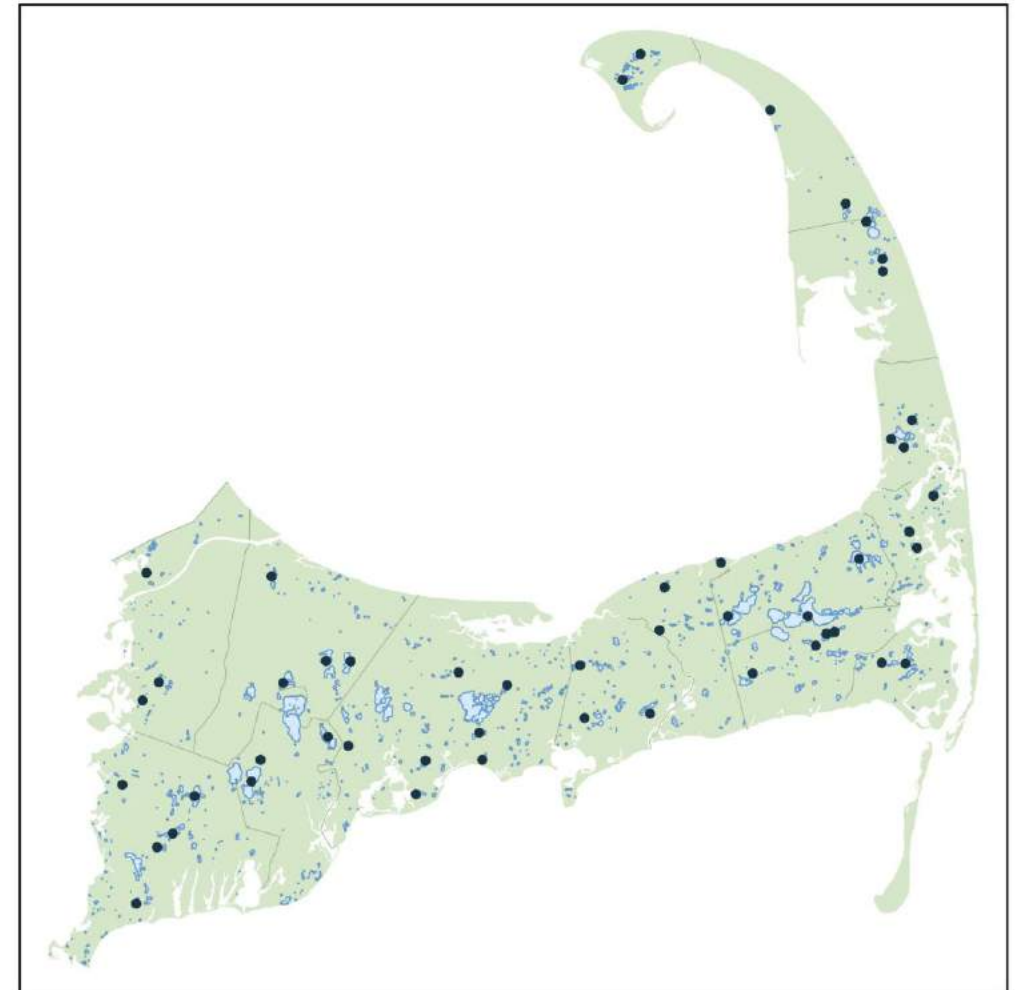
Village Pond
Great Pond

Wellfleet

Duck Pond
Great Pond
Herring Pond

Yarmouth

Dennis Pond
James Pond
West Sandy Pond

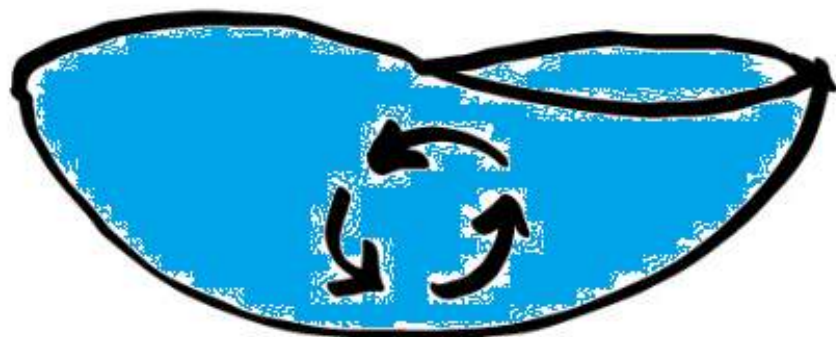




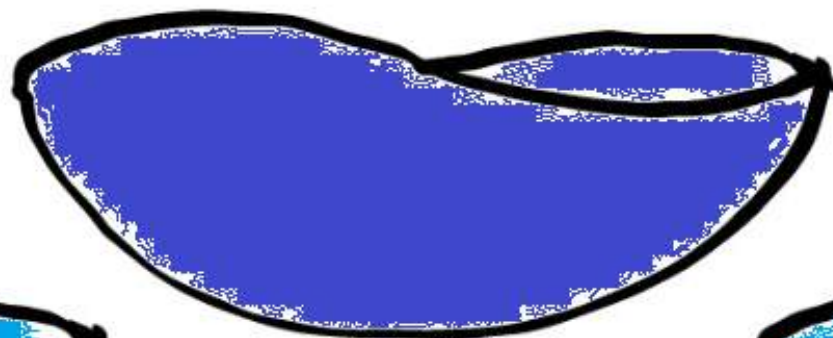
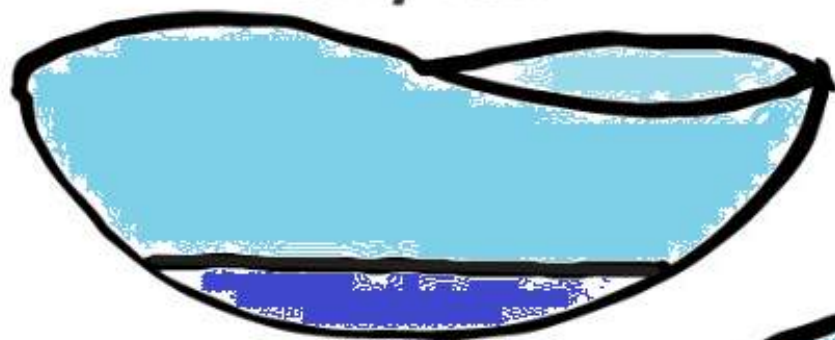
Project Plan

- Monitor 50 ponds throughout all Cape Cod towns 7x a year between April and October for 3 years
- Monitoring includes:
 - water clarity using Secchi depth measurements
 - collection of water quality parameters using a sonde lowered into the water
 - collection of water samples for lab analyses of nutrients, pigments, and alkalinity

Fall Turnover

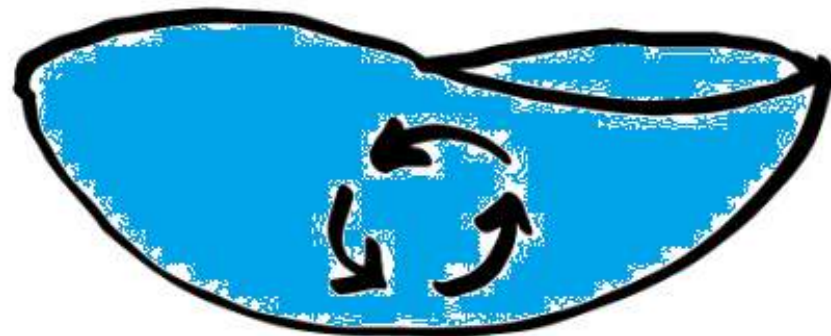


Early Fall



Winter

Spring Turnover



Early Summer



Late Summer

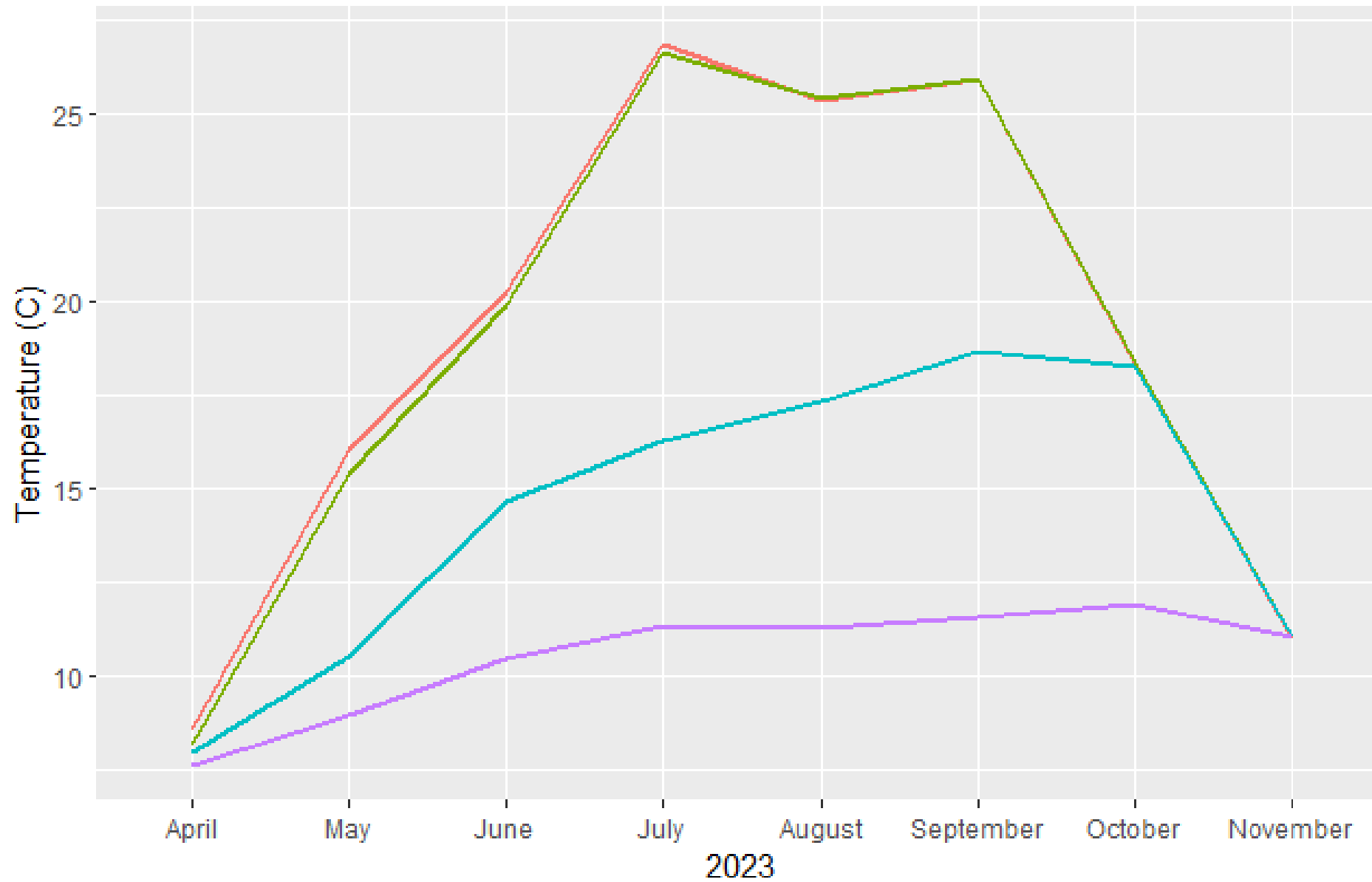


Annual
Stratification
Cycle

-  = Warm
-  = Cold
-  = Mixed

In Situ Data 2023

Scargo Lake - Temperature



Depth Designation

- 1 (Surface)
- 2 (3 meters)
- 3 (9 meters)
- 4 (Bottom)

APCC Monitoring Team

Emma Hazel



Volunteers 😊



John-Tyler Percy (JT)



What Will a Volunteer Shift Look Like?

- One volunteer shift will last ~5½ hours, from 7:30am-1pm
- We will monitor 2 ponds in one shift
- Monitoring will involve paddling to the deepest point with a canoe to collect data throughout the pond's water column



Our monitoring is weather- dependent

—

We will check in
with you the night
before monitoring

Safety is our main priority!

T-Mobile Wi-Fi 17:51 100 %

Detailed Forecast

This Afternoon
A slight chance of showers. Mostly cloudy, with a high near 49. North wind around 17 mph. Chance of precipitation is 20%.

Tonight
A slight chance of showers before 3am. Mostly cloudy, with a low around 45. North wind 10 to 13 mph. Chance of precipitation is 20%.

Friday
Cloudy, then gradually becoming mostly sunny, with a high near 50. North wind 13 to 15 mph.

Friday Night
Mostly clear, with a low around 44. West wind 6 to 9 mph.

Saturday
Sunny, with a high near 61. Northwest wind 8 to 10 mph.

Saturday Night
Partly cloudy, with a low around 50. West wind around 9 mph.

Sunday
Mostly sunny, with a high near 63. West wind around 9 mph.

Sunday Night
Partly cloudy, with a low around 51. West wind around 11 mph.

Monday
Sunny, with a high near 63. West wind 8 to 10 mph becoming north in the afternoon.

Monday Night
Partly cloudy, with a low around 49. South wind around 10 mph becoming northwest after midnight.

Tuesday
Partly sunny, with a high near 50. North wind around 10 mph becoming east in the afternoon.

[View in Desktop Mode](#)

forecast.weather.gov

T-Mobile Wi-Fi 17:52 100 %

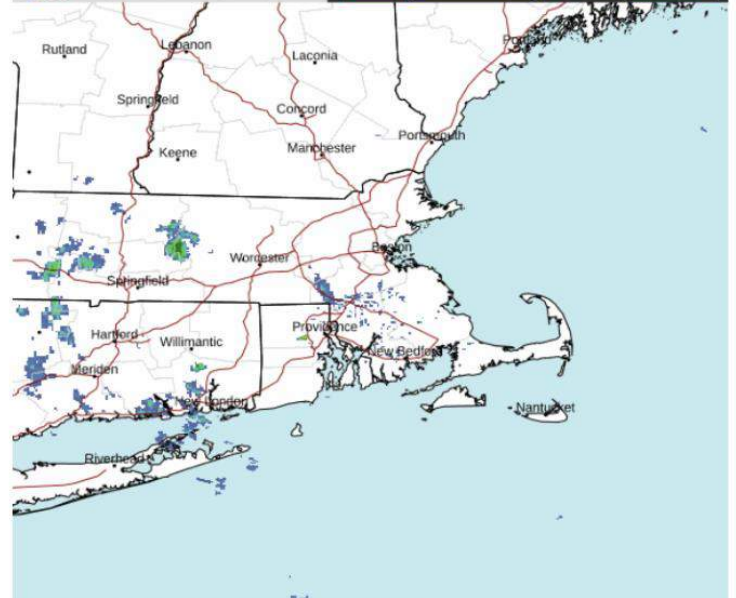
NWS | Radar

Interactive radar is available on the [Enhanced KBOX Radar](#) page, which is now located on the main navigation using the down arrow button.

Pan High Res KBOX

NATIONAL WEATHER SERVICE

Tornado Severe Thunderstorm Flash Flood Special Marine



05/04/2023 21:41 UTC (17:41 EDT) KBOX

Auto Playback

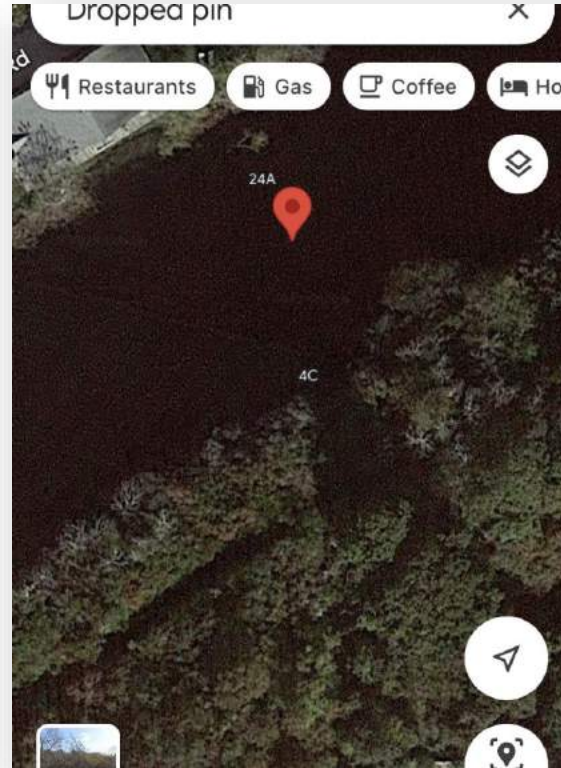
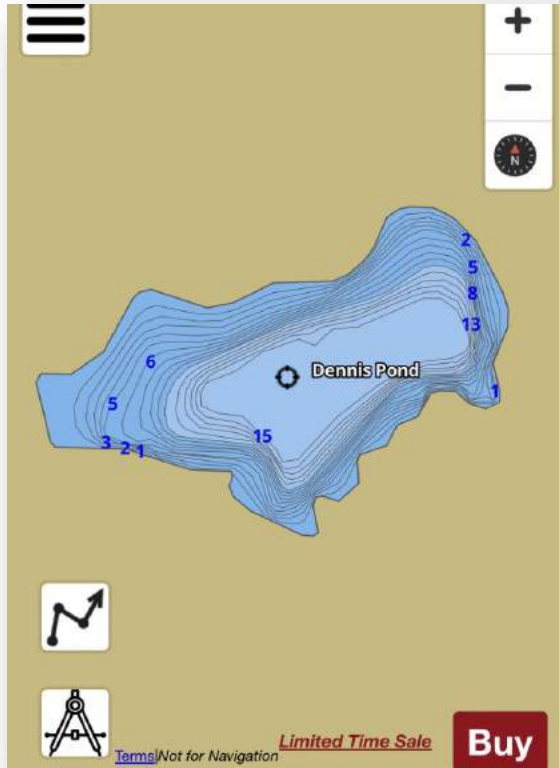
AA radar.weather.gov

< > Share Bookmarks Tabs

Monitoring: Start of the Day

- Teams will meet at the 1st pond of the day at 7:30
- Technicians will have the canoe and field gear ready for deployment
- Teams will begin by paddling out to the deepest point of the pond

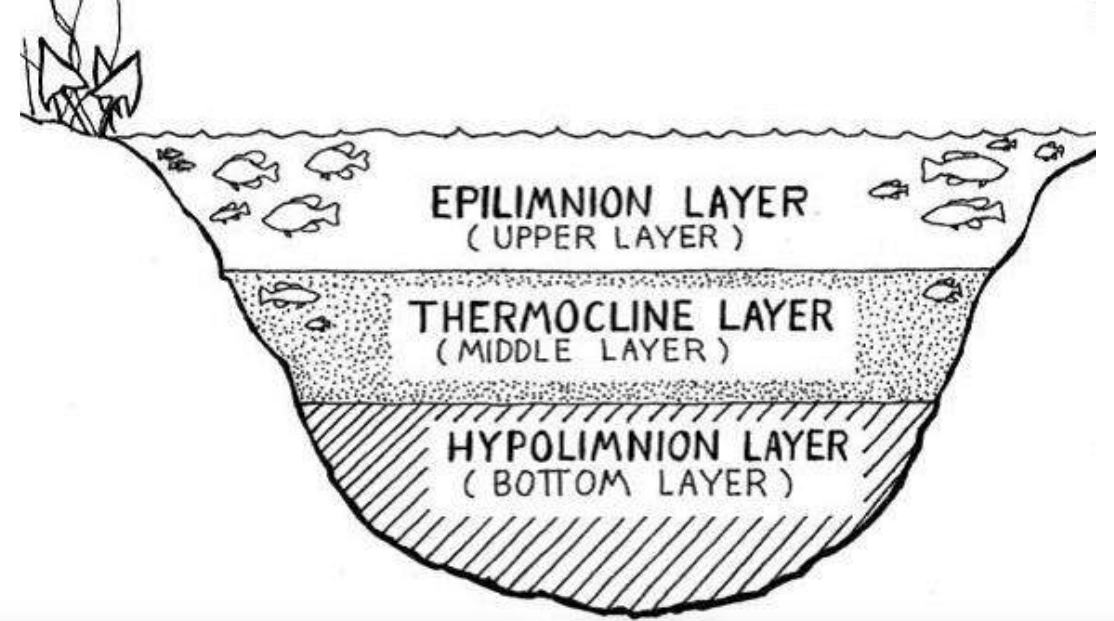




Monitoring: Determining Total Depth

- Located deepest point at each pond at start of pilot season
- Determine total depth remotely with fish finder
- Use GPS coordinates and fish finder to relocate deepest point when location is not marked by buoy

Monitoring: Collecting Water Quality Data Using In-Situ Sonde



Aqua TROLL 500 Vented - SN 1017840

Device Location GPS:

Your device's GPS location will...

[Change Location >](#)

Refresh Rate: 2 sec

<input checked="" type="checkbox"/>	RDO Concentration	9.82 mg/L		
<input checked="" type="checkbox"/>	RDO Saturation	105.98 %Sat		
<input checked="" type="checkbox"/>	Oxygen Partial Pressure	151.03 Torr		
<input checked="" type="checkbox"/>	pH	7.41 pH		
<input checked="" type="checkbox"/>	pH mV	-24.0 mV		
<input checked="" type="checkbox"/>	ORP	202.9 mV		
<input checked="" type="checkbox"/>	Actual Conductivity	314.06 μ S/cm		

Cape Cod Regional Pond Monitoring Program Field Form

Depth (m)	Temp (C)	SpCond (uS/cm)	%ODO (%Sat)	ODO (mg/L)	pH (pH)	Salinity (PSU)	Turbidity (NTU)	ORP (mV)
Air	Strike through boxes for missing measurement. Check off meters as they are logged with In Situ instrument.							
0.5								
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								
1m a.b.*								
0.5m a.b.*								

*a.b. = above bottom

Monitoring: Recording the Data

- Back of field data sheet: meter-by-meter readings
- Serves as hard copy of In-Situ sonde data
- Built-in quality control

Recording the Data: Front of Data Sheet

- Spatiotemporal data
 - Time anchored, total depth
- Environmental data
 - Weather, water appearance
- Secchi measurements
- Field observations

Cape Cod Regional Pond Monitoring Program Field Form

Pond and ID _____		Date _____		Time _____	
Cloud Cover (circle one)	<20% 20-50% >50% 100% light rain	Depth (m)		Pre ODO%:	mmHG:
Wind (circle one)	calm slight breeze windy	Secchi average (m)		Post ODO%:	mmHG:

Wave Intensity	Still	Calm	Average	Rough	Stormy
Water Odor	None	Faint	Medium	Strong	Smells like:
TURBIDITY	Clear	Slightly cloudy	Turbid	Opaque	Clumps
Water Color	Clear	Blue	Green	Brown	Other
GPS Location	Lat: _____		Lon: _____		
Check when GPS location is changed on In Situ app					<input type="checkbox"/>
Time 1 st sample taken			CCS latest drop off time		

Lab Calibration (daily)			
T(°C):	Sonde(SN: _____):		
	Pre Cal	Post Cal	Post Field
ODO%			
ODO Gain	NA		NA
BARO(mmHg)		NA	
Check Depth Reading (m)			
Recorder			Deep Sample(m)
In Situ Operator			

Secchi depth (m)	tech(): vol():
WITH AquaView	tech(): vol():
TIME:	
Did you HIT BOTTOM during In Situ profile?Y*/N Secchi?Y/N	

* if Yes, EXPLAIN what you did (& if reading possibly affected by hitting, etc.)

Plant, wildlife, human activity:



Monitoring: Water Sample Collection

Monitoring: Water Sample Collection



Monitoring: Secchi Reading

→ Measures water turbidity

- The disk is lowered into the water until it disappears from sight
- The “AquaView” will help our reading stay consistent in varying light conditions
- The measurement is taken at water surface level



Now we are off to our second pond!





We will bring:

- Life vests
- All monitoring gear
- A canoe and paddles

You will need:

- Muck boots/water shoes
- A hat/sunscreen
- Bug spray
- Water and Snacks
- Transportation between ponds
- Weather-appropriate clothing

APCC Pond Monitor Volunteer – Onboarding



1. **Fill out Volunteer Pond Monitor application** form on our website here:

<https://apcc.org/our-work/science/community-science/pond-monitoring-volunteer/>



2. **Attend Pond Monitor Orientation ZOOM** (or watch video recording).

3. **Sign up for Pond Monitor shifts** on our Bloomerang Volunteer Portal

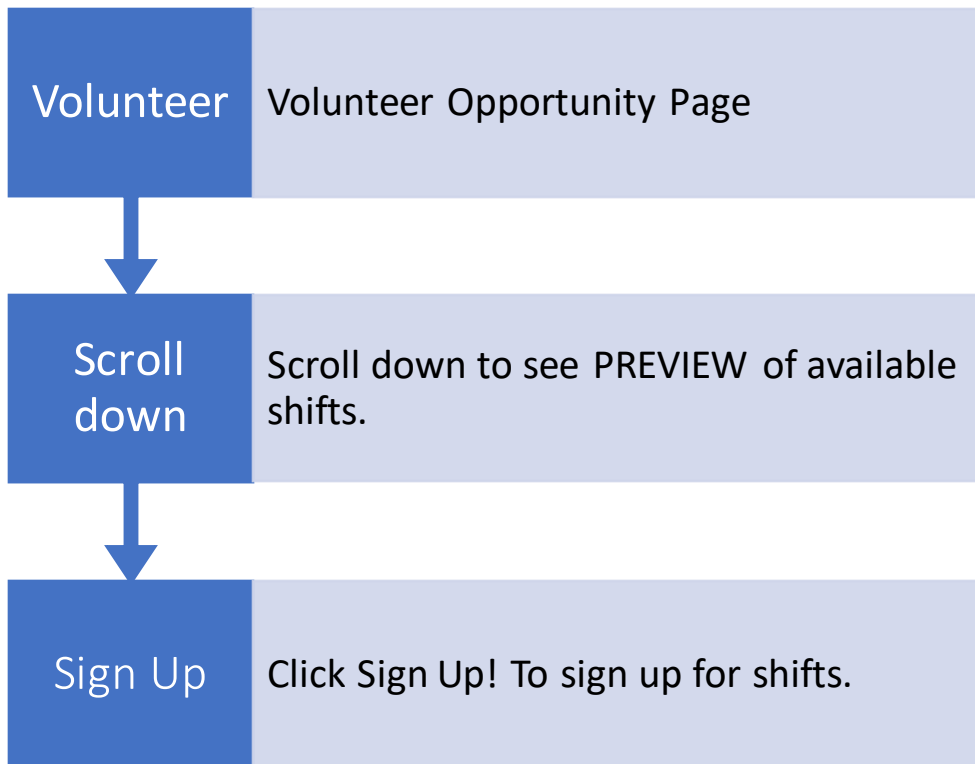
<https://app.initlive.com:443/JE/q98u8u24a984ab>




4. **Mark your calendar** with all monitoring shifts and check your email for reminders.

5. **Connect with APCC staff lead technician.** After signing up for monitoring shifts, you will receive an email and/or phone call from our APCC staff to coordinate.

Be safe and have FUN!







22 OPEN SHIFTS


Pond Monitor Shift Sign-Up

🕒 7:30 am - 1:30 pm
📅 Thursday, February 29, 2024 - Tuesday, April 30, 2024
🟢 Opportunity is Open.

Sign Up!

 Association to Preserve Cape Cod

 Dee Marsh ★ Primary Manager

 (UTC-05:00) America/New_York

Thank you for signing up to be a APCC 2024 Pond Monitor. You will be able to sign up for Pond Monitoring Shifts here. We will be posting shifts, one month at a time. And as you may see we are using a NEW volunteer software and hope that this will help us better communicate with you over the pond monitoring season. If you have any questions or need help please reach out to Dorria (Dee) Marsh at volunteer@apcc.org or call (508) 619-3185 and leave a message.

APCC is an equal opportunity provider and employer.

Preview Available Shifts (22)

This is a preview only. If you are interested in working a Shift, you must first signup to this Opportunity and meet all of the requirements. Helpful Tip: Switch between views! List View provides a high level summary, Card View provides more details about the Shift.

All Roles

All Places

All Dates

🔍 Search Keywords

🗪 Card View

2 OPEN SPOTS

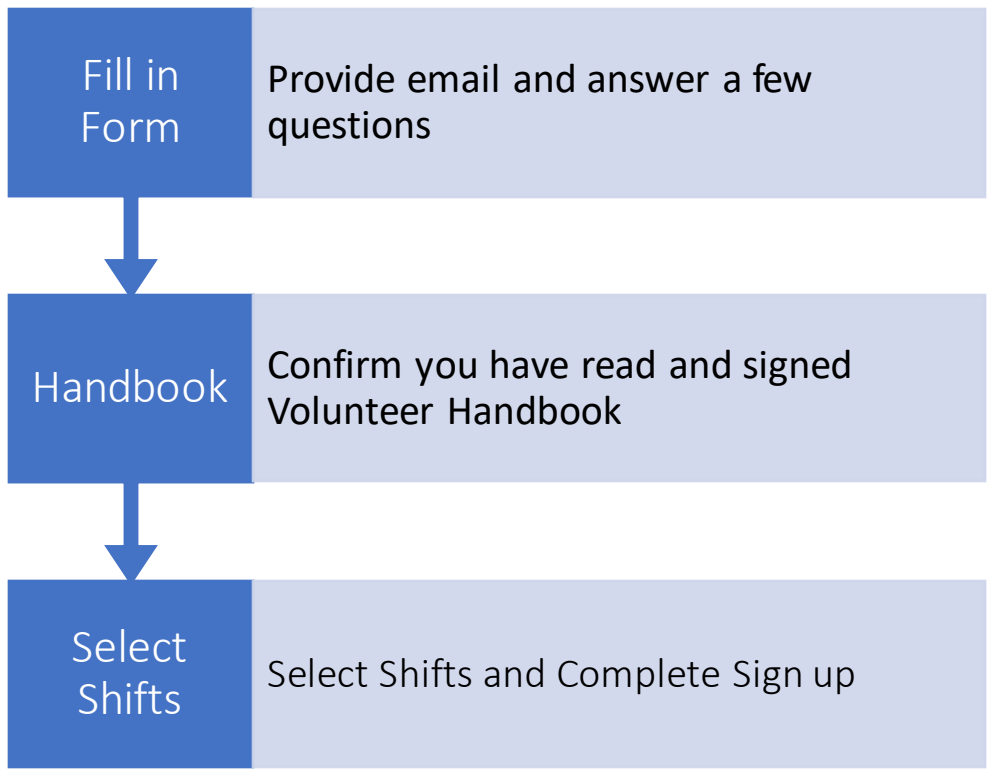
Pond Monitor
🕒 7:30 AM - 1:30 PM
(0 Hours)
📅 Monday, April 1, 2024
📍 Dennis, Ma - Dennis, Ma

2 OPEN SPOTS

Pond Monitor
🕒 7:30 AM - 1:30 PM
(0 Hours)
📅 Tuesday, April 2, 2024
📍 Harwich, Ma - Harwich, Ma

2 OPEN SPOTS

Pond Monitor
🕒 7:30 AM - 1:30 PM
(0 Hours)
📅 Wednesday, April 3, 2024
📍 Brewster



Pond Monitor Shift Sign-Up

Get started by entering your email.

Email

Next

✓

1 OPEN SPOTS

Pond Monitor

🕒 7:30 AM - 1:30 PM
(6 Hours)

📅 Wednesday, April 3, 2024

📍 Brewster

Pond Monitor

You will receive information on the specific location of the pond you will be monitoring one to two days prior to your shift. If you have any question leading up to your shift please reach out to Lynn Francis at lfrancis@appc.org

✓

ALREADY SCHEDULED

Pond Monitor

🕒 7:30 AM - 1:30 PM
(6 Hours)

📅 Thursday, April 4, 2024

📍 Harwich, Ma - Harwich, Ma

Pond Monitor

You will receive information on the specific location of the pond you will be monitoring one to two days prior to your shift. If you have any question leading up to your shift please reach out to Lynn Francis at lfrancis@appc.org

❑

2 OPEN SPOTS

Pond Monitor

🕒 7:30 AM - 1:30 PM
(6 Hours)

❑

2 OPEN SPOTS

Pond Monitor

+1 Shift

🏠

Go to the Opportunity Page

🛒

Complete Signup →

- **YOU DID IT!**
- **Thank you for Volunteering!**

Signup Process Complete!

(UTC-05:00) America/New_York

✓

Process Complete

Step 4 of 4

Congratulations! You have completed all of the mandatory information.

Message From the Manager

Thank you for signing up to be a Pond Monitor Volunteer. You will receive more information with specific POND location one to two days prior to your shift. You will also receive a SHIFT REMINDER. If you have any questions please reach out to Lynn Francis at lfrancis@apcc.org

My Shifts


My Waitlist

Email Myself This Schedule

Add to Calendar

Contact Manager

Role	Date	Time	Shift Length	Details
Pond Monitor	Wednesday, April 3, 2024	7:30 AM - 1:30 PM	6 hrs	
Pond Monitor	Friday, April 5, 2024	7:30 AM - 1:30 PM	6 hrs	

 **Pond Monitor Shift**
Step 4 of 4

Go Home

- **HOME PAGE**

- **Edit Shifts**
- -OR-
- **Sign up** for more shifts
- -OR-
- **Remove** yourself from this opportunity

The screenshot shows the APCC 2024 Pond Monitor interface. At the top, there is a header with a clock icon and the text "7:30 am - 1:30 pm", a calendar icon and the text "Thursday, February 29, 2024 - Friday, March 8, 2024", and a green dot with the text "You are part of this Opportunity". To the right of the header are three buttons: "Contact Manager" (blue), "Edit" (white with a blue border), and "Signup for more Shifts!" (green with a white border). The "Edit" button is circled in blue, and the "Signup for more Shifts!" button is circled in yellow.


Below the header, there are two main sections on the left. The first section, "My Overview", features a blue circular icon with a calendar and a red "2" badge, and a blue "My Overview" button. The second section, "Remove Me from this Opportunity", features a red circular icon with a white "X" and a red "Remove Me" button. Both sections are circled in blue and yellow respectively.


On the right side, there is a text block that reads: "Thank you for signing up to be a APCC 2024 Pond Monitor. You will be able to sign up for Pond Monitoring Shifts here. We will be posting shifts, one month at a time. And as you may see we are using a NEW volunteer software and hope that this will help us better communicate with you over the pond monitoring season. If you have any questions or need help please reach out to Lynn Francis at lfrancis@apcc.org".

Below the text block, there is a section titled "Preview Available Shifts (21)". It contains a paragraph: "This is a preview only. If you are interested in working a Shift, you must first sign up to this Opportunity and meet all of the requirements. Helpful Tip: Switch between views! List View provides a high level summary, Card View provides more details about the Shift." Below this paragraph are three filters: "All Roles" (with a dropdown arrow), "All Places" (with a dropdown arrow), and "All Dates" (with a dropdown arrow). Below the filters is a search bar with the text "Search Keywords" and a search icon. To the right of the search bar is a "Card View" button with a dropdown arrow.


At the bottom, there are three cards, each titled "Pond Monitor". The first card has "1 OPEN SPOTS" and shows a shift for "Tuesday, April 2, 2024" from "7:30 AM - 1:30 PM (6 Hours)". The second card has "1 OPEN SPOTS" and shows a shift for "Wednesday, April 3, 2024" from "7:30 AM - 1:30 PM (6 Hours)". The third card has "2 OPEN SPOTS" and shows a shift for "Thursday, April 4, 2024" from "7:30 AM - 1:30 PM (6 Hours)".

My Overview

 7:30 am - 1:30 pm

 Thursday, February 29, 2024 - Friday, March 8, 2024

You are part of this Opportunity




My Overview

This is a snapshot of the information and your personal schedule.

My Overview

My Schedule



Additional Information

My Schedule

My Availability

My Roles

My Qualifications

My Form Answers

Documents

Hours Worked

Download My Schedule

Pond Monitor Shift Sign-Up

Download My Schedule

Scheduled (3)

Shift Title	Date	Hours	Venue & Location	Role
Pond Monitor	Tue Apr 16, 2024	7:30 AM - 1:30 PM	Barnstable, Ma - Barnstable, Ma	Pond Monitor
Pond Monitor	Wed Apr 17, 2024	7:30 AM - 1:30 PM	Harwich, Ma - Harwich, Ma	Pond Monitor
Pond Monitor	Thu Apr 18, 2024	7:30 AM - 1:30 PM	Sandwich, Ma - Sandwich, Ma	Pond Monitor

Signup for more Shifts!

1) Choose a day

Add Hours Worked

Date

- Select a Date -

April 2024

	Sun	Mon	Tue	Wed	Thu	Fri	Sat
14	31	01	02	03	04	05	06
15	07	08	09	10	11	12	13
16	14	15	16	17	18	19	20
17	21	22	23	24	25	26	27
18	28	29	30	01	02	03	04
19	05	06	07	08	09	10	11

Cancel Submit

2) Report by Hour & Minute And add Notes

Add Hours Worked

Date

2024-04-05

How would you like to track your hours?

☒ By Hours and Minutes

☐ By Start and End Time

Hours

2

Minutes

Additional Notes / Comments

Pond Monitoring Scargo Lake - sunny and warm

Please Note: This information NOT internal. It can be seen by all parties and cannot be removed.

Cancel Submit

3) See list of hours reported and total hours

Dorria - TEST Marsh

Opportunity Total: 1hr 20m Organization Total: 1hr 20m Download Filtered Hours Add Hours Worked

Apr 3, 2024 - Apr 6, 2024

Show All Logs Filtered Results: 2 Total Logs: 2

Time of Entry	Actioned by	Date Hours Occurred	Total Hours
Friday, April 05, 2024 01:12 PM	Other / Manager	Friday, April 05, 2024	1hr 20m
Wednesday, April 03, 2024 01:59 PM	Other / Manager	Wednesday, April 03, 2024	Less than a minute

- **HELP WITH POND SHIFT SIGN UP**

- **Dee Marsh**

- Volunteer@apcc.org

- **508-364-5561 (mobile)**



Contact list

Sophia Feuerhake

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Emma Hazel

Water Quality Technician

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Lynn Francis

Pond and Cyanobacteria Operations and Logistics Coordinator

lfrancis@apcc.org

Julie Hambrook Berkman, Ph.D.

Pond and Cyanobacteria Program Manager

jhambrook@apcc.org



Thank you so much for being here!

We are very excited to get to know you and to learn all about
our beautiful Cape Cod ponds together 😊