Cape Cod Pond Network

Spring 2023 Quarterly Meeting



June 5, 2023 | via Zoom



Agenda

- Cape Cod Regional Pond Monitoring Program Update
- Grant Funding Opportunity
- Get to Know Your Pond To Do's
 - Monitoring Guide
 - Bathymetry Data
 - Secchi Data
 - Plant Survey
 - Pond Survey
- Pond Friendly Signage

Cape Cod Regional Pond Monitoring Program

Julie Hambrook Berkman, Association to Preserve Cape Cod

Cape Cod Ponds Network

Monday, Jun 05, 2023 4:30 PM

FRESHWATER INITIATIVE

Cape Cod Regional Pond Monitoring Program





CAPE COD COMMISSION





Program objectives

- Help Cape Cod communities to better protect and manage our ponds by collecting water quality data to characterize pond conditions, and to 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.



Cape Cod Pond Viewer

The Pond Viewer serves as a companion to the Atlas and can be used to explore Cape Cod's ponds, ecology, and the challenges they face.

Users can identify ponds and pond access information using the map interface. Click on a pond to view pond characteristics or click on a pond access point for pond access details. Not all ponds have available data.

EXPLORE: cccom.link/pond-atlas



MAP LAYERS

Available map layers include access points, pond watershed delineations, bathymetry data, 300 ft. pond buffer area, and other pond and surrounding land use characteristics.



POND CHARACTERISTICS

Select a pond and open the Info Panel to view related characteristics including acreage, depth, and more. Users can also explore surrounding land cover and land use summaries within a 300 ft. pond buffer area.

Cape Cod Pond Viewer

Land Cover Types





Cape Cod Pond Viewer

Pond Characteristics

Sand Pond

Alternative Name	
CCC-GIS-ID	HA-525
Town	Harwich
Village	Harwich
Acres	23.39
Maximum Depth (ft)	25.0
Great Pond	Yes - on State List
Ponds connected to cranberry bogs	Yes
Watershed Delineated	No
Ponds stocked with fish	No
NHESP Natural Community	No
Percent Protected Open Space in Pond's 300ft. buffer	22%



Cape Cod Regional Pond Monitoring

Estimating level of pond development







Pond Monitoring Program – Pond Selection

50 ponds

Ponds in Monitoring

Program



Pond Characteristics – Program Builder

CCC-GIS-ID	Name	Town	Acres	Depth	Depth Class	Development Class	Herring Run
BA-565	Hathaway Pond (N	l Barnstable	21.84	57	deep	Very Low	0
BA-737	Long Pond	Barnstable	54.32	23	deep	Very High	0
BA-759	Lovells Pond	Barnstable	55.67	37	deep	Medium	0
BA-795	Lake Elizabeth	Barnstable	7.147	4	shallow	High	Yes
BA-797	Micah Pond	Barnstable	15.95	41	deep	Very Low	0
BO-212	Queen Sewell Pon	d Bourne	17.97	28	deep	High	0
BO-556	Flax Pond	Bourne	22.78	6	shallow	High	0
BO-644	Red Brook Pond	Bourne	17.47	10	shallow	Medium	Yes
BR-1028	Cliff Pond	Brewster	205.2	95	deep	Very Low	0
BA-510	Garretts Pond	Barnstable	29.04	28	deep	Medium	0
BR-279	Long Pond	Brewster	742.9	70	deep	Medium	Yes
BR-321	Slough Pond	Brewster	32.37	30	deep	Medium	0
CH-458	Goose Pond	Chatham	40.88	52	deep	Very Low	0
CH-516	White Pond	Chatham	42.98	59	deep	Medium	0
DE-201	Coles Pond	Dennis	11.37	5.2	shallow	Very Low	No
DE-236	Scargo Lake	Dennis	60.95	48	deep	High	Yes

Barnstable Levels of Development

Low		
BA-565	Hathaway Pond (North)	deep
BA-596	Lamson Pond	shallow
BA-608	Little Israel Pond	#N/A
BA-723	Dunns Pond	#N/A
BA-797	Micah Pond	deep
BA-594	Hathaway Pond (South)	shallow
BA-719	Lumbert Pond	shallow
BA-807	Joshua Pond	deep

Garretts Pond	deep
Mystic Lake	deep
Shallow Pond	shallow
Hamblin Pond	deep
Round Pond	deep
Muddy Pond	deep
Lovells Pond	deep
	#N/A
	Garretts Pond Mystic Lake Shallow Pond Hamblin Pond Round Pond Muddy Pond Lovells Pond

High		
BA-664	Shubael Pond	deep
BA-748	Fawcetts Pond	#N/A
BA-795	Lake Elizabeth	shallow
BA-874	Neck Pond	#N/A
BA-875	Parker Pond	#N/A
BA-878	Crystal Lake	#N/A
BA-605	Wequaquet Lake	deep
BA-737	Long Pond	deep



Pond Water Quality Monitoring Program – Selected Ponds

Ponds by Town

Barnstable	7
Bourne	3
Brewster	3
Chatham	2
Dennis	3
Eastham	3
Falmouth	5
Harwich	4
Mashpee	3
Orleans	3
Provincetown	2
Sandwich	4
Truro	2
Wellfleet	3
Yarmouth	3

Size			
<5 ac	4		
5-10 ac	4		
10-25 ac	16		
25-50 ac	14		
>50 ac	12		

Depth

0-6 ft	8
6-12 ft	4
12-18 ft	3
18-24 ft	3
24-50 ft	17
>50 ft	10

Development Level

Very low	14
Low	6
Medium	14
High	12
Very High	2
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Pond Water Quality Monitoring Program – Selected Ponds



13 ponds with herring runs



6 ponds with rehabilitation projects

11 ponds with surface connections

Cape Cod Regional Pond Monitoring Locations





Pond Water Quality Monitoring Program – How it works



- Monthly April October
- 2-4 samples per pond collected from deepest point
- Field Parameters
 - DO, Temp, pH, Conductivity, Secchi
- Lab Parameters in 3 bottles
 - TN, TP, Chl-a, alkalinity, and dissolved nutrients





TN, TP



Alkalinity

Chlorophyll-a, Phaeophytin, Nitrate/nitrite, Ammonium, and Orthophosphate

Monitoring: Collecting water quality data using In Situ sonde







Monitoring:

Collecting water samples at different depths using the Van Dorn sampler

Once the 1st water sample is collected, we have 6 hours to drop the samples off at the Center for Coastal Studies

APCC Monitoring Team

Volunteers 🙂



John-Tyler Percy (JT)



APCC Pond Monitor Volunteer – Onboarding



Pond Water Quality Monitoring Program – Selected Ponds

Sandwich

Ponds by Town

<u>Barnstable</u>
Garretts Pond
Hathaway Pond
Long Pond
Lovells Pond
Lake Elizabeth
Micah Pond
Parker Pond
<u>Bourne</u>
Flax Pond
Queen Sewell Pond
Red Brook Pond
<u>Brewster</u>
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

Clapps Pond

Lawrence Pond Peters Pond Shawme Lake Spectacle Pond Truro Village Pond Great Pond Wellfleet Duck Pond Great Pond Herring Pond Yarmouth Dennis Pond Blackwater Pond James Pond West Sandy Pond



Contact Information

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Water Resources Analyst Cape Cod Commission

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For Information on Volunteering to Monitor Ponds:

Lynn Francis

Pond and Cyanobacteria Operations and Logistics

Association to Preserve Cape Cod

Ifrancis@apcc,org



Thank you for your interest in Cape Cod Ponds!

MassDEP Water Quality Monitoring Grant Program

Robert Smith, MassDEP



Watershed Planning Program (WPP) mission

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Director, Watershed Planning Program



MassDEP

History of the Water Quality Monitoring Grant program

- Program structure varies by State Fiscal Year (SFY)
- Most recent funding for
 - Direct monitoring
 - Capacity building
 - Long-term monitoring programs
- General program priorities (not limited to):
 - Submitting data
 - Environmental Justice
 - Coalitions (collaboration and synergies)
- Future program availability dependent on state budget (not yet released)
- Most recent (SFY23) timeline:
 - RFGP announced in October
 - Proposals due November

SFY	Program total	Grants awarded	Grant range
2019	\$200,000	17 awards (individual organizations)	\$3,303 to \$15,000
 2020	\$200,000	14 awards (individual organizations)	\$3,222 to \$15,000
2021	\$100,000	2 awards to coalitions (14 entities)	\$45,474 to \$54,526
2022	\$150,000	4 awards to coalitions (16 entities)	\$16,109 to \$51,960
2023	\$500,000	5 awards to coalitions (23 entities) and 4 individual awards	\$13,378 to \$114,789



SFY23 Water Quality Monitoring Grant program summary

- SFY23 RFGP priority analytes included:
 - E. coli and enterococci bacteria
 - Continuous or discrete measures of temperature, oxygen, pH, and conductivity
 - Chloride
 - Total phosphorus and total nitrogen
 - Basic limnological parameters related to trophic status of lake and pond ecosystems
- SFY23 allowable expenditures:
 - Equipment/supplies
 - Sub-contractual services
 - Salary
 - Training activities
 - Vehicle mileage
- https://www.mass.gov/info-details/grants-financial-assistance-watersheds-water-quality
- Contact: Bob Smith (Robert.F.Smith@mass.gov)

Get to Know Your Pond

Kathleen Mason, Cape Cod Commission



Volunteer Monitoring Guide

Monitoring Guidance for Cape Cod Ponds

Building on the history of pond monitoring that town staff and citizens alike have contributed to since the publication of the 2003 Ponds Atlas, a guiding framework for regional pond monitoring on Cape Cod is currently under development. As part of this framework, a Quality Assurance Project Plan (QAPP) for regional pond monitoring has been developed, which contains information about monitoring program structure, volunteer organization and training, data management, and protocols for sample collection, transport, and analysis. While certain elements of the monitoring framework are not yet in place, the information specific to sampling activities may be helpful as a reference for pond groups and organizations that are already established or are contemplating their own monitoring program. As groups continue to monitor or start monitoring, coordination of monitoring program will streamline the launch of that regional effort.

The following information has been adapted from the QAPP established for the upcoming regional monitoring program and reformatted to best guide pond groups and organizations.

Designing a sampling program

The structure of a sampling program should be informed by and be a direct reflection of the goals that monitoring is intended to achieve. While there will be some areas of overlap, the structure and objectives of a regional monitoring program may be quite different from a monitoring program for a single pond.

The goal of the regional monitoring program is to establish a representative sample of ponds across the Cape, that provide insight into regional freshwater pond water quality and how it is impacted by factors including pond size, surrounding land use, land cover, and watershed characteristics. Initially, the Cape Cod Ponds Monitoring Program will consist of a snapshot reconnaissance-level approach to monitoring pond water quality, similar to the Pond and Lake Stewards program, to identify potential issues that may require remediation or further in-depth monitoring or studies. It is expected that the monitoring program will expand over time, with ponds that fill gaps and allow for more representative sampling of different watershed characteristics being prioritized. Details for that prioritization will be included in subsequent revisions to the Program's QAPP.

The Regional Monitoring Program will use the following criteria to guide initial selection of ponds for monitoring:

- Ponds must have a public access point
- Ponds with an active monitoring presence or a history of monitoring (but not persearily an

https://capecodcommission.org/our-work/pondsand-lakes/

Measuring Water Clarity



URI Cooperative Extension, 1996

Secchi depth = proxy for depth of the photic zone, the depth in the pond that receives sufficient sunlight for productivity.

A small Secchi depth indicates limited penetration of light and could be an indicator of pollution.

- Make a secchi disk
- Define and locate sampling point (deepest point)
- Measure
- Document and save data

HOW TO MAKE A SECCHI DISK

MATERIALS:

111 11

- ✓ 20 cm diameter circle of acrylic disk 3/8" or 1/2" in thickness
- ✓ (aluminum or steel may be substituted, but wood is not recommended)
- ✓ 15 cm circle or square of 1/8" galvanized steel (used to weight the disk)
- ✓ hand drill
- ✓ eye bolt 5/16" x 2"
- ✓ two flat 5/16" washers
- ✓ one locking 5/16" washer
- ✓ two 5/16" nuts
- flat black rust resistant spray paint
- flat white rust resistant spray paint
- ✓ masking tape
- ✓ nylon rope (cut long enough to be the depth of your lake deep spot.
- ✓ Avoid cotton rope because it stretches)

INSTRUCTIONS:

- Divide the 20 cm acrylic disk into quadrants using masking tape. Spray paint alternating quadrants black and white, so that you have a disk that is similar to that pictured below. Let the paint dry. Apply a second coat of paint if necessary.
- 2. Drill a hole of 3/8' through the center of the acrylic disk and the galvanized steel disk.
- Assemble disks with eyebolt (5/16" in diameter). Use flat washers between disk and nut, and between steel plate and locking washer. Use 5/16" nuts at the top of the eyebolt and to bolt the steel plate on the underside of the acrylic disk.
- 4. Attach a brass chain or rope calibrated by 0.5 meter increments to the secchi-disk to use in the lake.

(Note: If rope is used, avoid using cotton rope or clothesline since it stretches when it is wet. Use non-stretching white plastic coated wire-core clothesline. Make sure to bend and straighten the line before you buy it to make sure that it will lie straight. Calibrate the rope at 0.5 meter increments using permanent pen, or by tying knots at each 0.5 meter interval.)









NALMS Student Video Series #1: How to Take a Secchi Depth

8.9K views • 6 years ago

North American Lake Management Society (NALMS)

The first installment of the NALMS Student Video Series, "Measuring Secchi Depth." The NALMS student video series is designed ...



Introduction | Safety | Measuring | Lowering | Weather Conditions | What Does It Mean | Recap 7 chapters >

Bathymetry Data

cccom.link/pond-atlas



Collecting Bathymetry Data

- Bathymetry can be used to determine:
 - Maximum depth
 - Mean Depth
 - Pond morphometry
 - Pond volume
 - Residence time



- How and where to sample?
 - Double the acreage of the waterbody to determine an appropriate interval distance between points. For example, if a waterbody is 50 acres in size, collect data points with an interval of 100 ft. between them.
 - At minimum, use an interval distance of 20 ft. Between data points.
 - Plan to navigate all areas of your pond documenting the coves, shoal areas and deep sites
 - For large areas with depth <5 ft, fewer measurements are needed
- Materials
 - boat
 - GPS app (smartphone, handheld GPS)
 - Fish finder, meter tape with a weight, marked PVC pipe, or other device to measure depth
- General procedure:
 - Record depth and location at points throughout the pond
 - Points can be converted to contours in GIS

New Hampshire VLAP Field Manual https://www.des.nh.gov/sites/g/files/ehbemt341/files/documents/wd-07-035.pdf

Weed Watcher Program

Massachusetts Department of Conservation and Recreation Lakes and Ponds Program Weed Watcher Program

"By monitoring your lake or pond you are taking an active role in ensuring the protection of your lake for the future."

Upcoming Training:

West Falmouth Library, June 28th

Request a Weed Watcher Training

Lakes and Ponds Program staff will bring live plant specimens to the training location for a hands-on identification workshop. Trainings are conducted at a time, date, and location of your choice but keep the following guidelines in mind:

- Location should be a public space (no private homes please).
- Dates for trainings should fall between the last week of May and the end of September.
- Trainings can be requested for any weekday during normal business hours or Monday through Thursday evenings beginning no later than 6:00 PM.
- Trainings typically last between two and three hours depending on the size of the group.
- Five to twenty participants is ideal.

Email **jim.straub@state.ma.us** or **tom.flannery@state.ma.us** to set up a training for your lake group.

Pond Survey

- Pondshore disturbance
 - pavement and other impervious surfaces
 - stormwaterinputs
 - culvert/outflow pipe
 - areas of erosion
 - lawns (particularly those without buffers)
 - beaches
 - docks
- Development surrounding the pond
 - % developed
 - type(s) of development
- Land cover surrounding the pond
 - % vegetation cover
 - type(s) of vegetation
- Pond usage
 - Current use types and levels
 - Known historical uses (in- and around pond)
- Restoration projects / efforts
 - In-pond / larger scale
 - Individual parcels and smaller projects

Pond Friendly Signage Examples

Lake Friendly Living Coalition Finger Lakes – New York



The Lake Friendly Living Coalition of the Finger Lakes With a commitment to protecting the health of our lakes, the coalition works together to educate watershed residents in homes and businesses to engage lake friendly practices. Thank you for your pledge and for your time. This lawn sign will be delivered to those who reside within the watershed and take the pledge (and request a sign) to help grow this initiative throughout the Owasco Lake Watershed.



Canandaigua Lake Lake Friendly Living Pledge



- 1. Practice lake-friendly lawn care by saying no to harmful chemicals and excess fertilizers
- 2. Maintain septic systems
- 3. Reduce household hazardous waste
- 4. Avoid flushing medications
- 5. Take your vehicle to a car wash instead of cleaning it in your driveway
- 6. Pick up pet waste
- 7. Identify and report terrestrial invasive species
- 8. Reduce the size of your lawn and plant native species

Cayuga Lake Lake Friendly Living Pledge



- Reduce Impermeable Surfaces
- 2. Limit Lawn Size
- 3. Use Water Wisely

Eliminate Pollutants

ELIMINATE POLLUTANTS

- 4. Use Phosphorus Free Fertilizer
- 5. Be Smart About Lawn Care
- 6. Maintain On Site Waste/Septic Systems
- 7. Minimize Erosion

Polyre & Infiltrate

CAPTURE & INFILTRATE

- 8. Plant a Rain Garden
- 9. Use Native Plants
- 10. Install a Rain Barrel
- 11. Protect From Invasive Species
- 12. Become a Water Steward



Seneca Lake Lake Friendly Living Program



Our program is simple. It is designed to help you learn and apply a level of practices that best suit your situation and abilities.

Take the Pledge

Take the pledge to adopt basic practices that will help reduce or eliminate pollutants and minimize runoff.



If you can do more...

Become a Lake Steward

Invest in gardening and landscape projects that can increase the positive impact on the watershed and lake quality.

With your pledge, you have access to our LFL resources to help you get started.

Lake Champlain Basin Program Raise the Blade Campaign



- Soil and lawn health information / demonstration signage
- Campaign communicating action and lifestyle change to community/neighbors

Maine Lakes LakeSmart Program



- Waterfront sign + driveway sign
- Requires a site assessment and evaluation
- The production and distribution of LakeSmart outreach materials are supported in part by a Giving While Living grant from the <u>Woodard and</u> <u>Curran Foundation</u>.

Vermont Agency of Natural Resources Lake Wise Awards

- Also requires site assessment and evaluation
- Information signs posted to explain the award
- Lakes with >15% of properties earning Lake Wise Awards win a Gold Lake Wise Award
- Three lakes have received the Gold Award



How Can Signage Make a Difference on Cape Cod?

Cape Cod Pond Network

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