



STATE OF THE WATERS: CAPE COD **2021 REPORT**



APCC
Association to
Preserve Cape Cod



Our State of the Waters: Better Days Ahead

By Andrew Gottlieb, APCC Executive Director

There is a lot packed into the third annual update of our State of the Waters: Cape Cod report. The findings this year continue to document declining water quality in our estuaries, ponds and in some drinking water supplies. The underlying reasons for the problems we face remain the same: Excessive nutrients from inadequately treated wastewater, along with fertilizers and stormwater runoff, are responsible for most of our water quality issues. While this report shows that conditions continue to worsen, I think we will look back at 2021 as the year when things started to turn around.

Why the optimism? Several towns took big steps forward in authorizing major wastewater infrastructure construction projects. Many other towns made strides finalizing their construction plans, and still more established financing mechanisms that will support long term nutrient management programs.

Other reasons to view 2021 in a positive light include the promise of the Cape and Islands Water

Protection Fund becoming a reality, providing \$71 million in property tax

relief to eight Cape towns to support wastewater management, with a commitment to support 25 percent of the cost of future projects that qualify for state financing.

The federal infrastructure bill provided a five-year infusion of money to further offset local costs when towns begin new construction projects. In addition, APCC proposed—and Barnstable County is seriously considering—expansion of the county's loan program to support the costs of connecting homes to sewer

projects at a 0 percent interest rate, an enormously helpful tool to improve affordability for the average homeowner.

While 2021 was a banner year for the development of financing tools and progress on town projects to improve marine waters, we also saw a great awakening around freshwater pond health. APCC's cyanobacteria program expanded in 2021, and with it came a greater public awareness of the threats to pond health along with a broad consensus on the need to understand and address the problems. Towns are starting to include pond health in their plans for wastewater management, and the public is learning how to lessen the impact of lawn care on water quality and the importance of eliminating fertilizer use.

None of this means the job is finished, but the direction has changed. Nothing good happens by accident and this progress, although still at an early stage, reflects countless hours of hard work at the local level by volunteers, town staff and elected leaders. The year 2021 will be seen as a turning point. We at APCC, staff and members alike, believe we have played an important role in helping to turn the tide. I can see the day ahead when the State of the Waters report will begin tracking, documenting and publicizing water quality improvement. That makes it all worthwhile.



For more information
Visit capecodwaters.org



On the cover

"Thriving Waters"
Miller Pond, Yarmouth Port
Photo by Steven Koppel
Expressions Gallery
expressionsgallery.com



State of the Waters: Cape Cod 2021 Report

The release of the Association to Preserve Cape Cod's third annual State of the Waters: Cape Cod report in December 2021 showed continued degradation of coastal embayment and freshwater pond water quality as well as lower grades for public drinking water quality in some Cape towns.

The State of the Waters report is a yearly comprehensive assessment by APCC of the quality of the Cape's coastal embayments, freshwater ponds and public water supplies. The purpose of the report is to generate greater public awareness of the Cape's overall water quality and to advocate for action by policy makers to adopt water quality improvement measures.

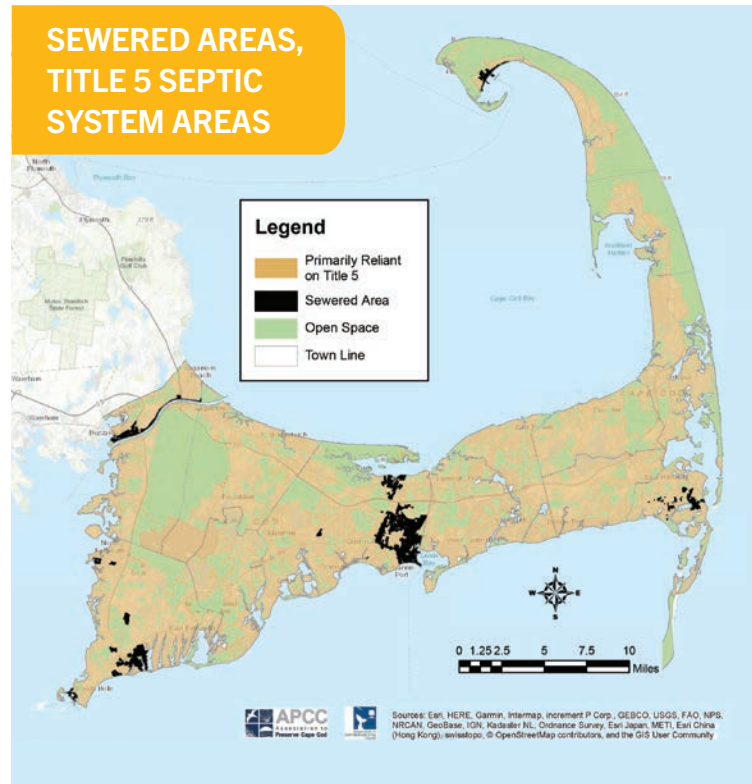
The report grades the quality of individual water bodies and water supplies based on existing data that has been compiled over years of water sampling and monitoring across the Cape by nonprofit organizations, municipalities and volunteers. Three grading systems—one each for coastal embayments, freshwater ponds and drinking water—are used for the project.

Each of the grading systems utilize specific water quality parameters to develop scores, and the scores are translated into grades of either acceptable or unacceptable water quality for coastal embayments and freshwater ponds, and excellent, good or poor for public water supplies.

A Troubling Pattern

Over the past three years, the State of the Waters study has shown a consistent pattern of poor water quality in many of the Cape's coastal embayments and freshwater ponds due to the impact of excessive nutrients on the region's water resources. The greatest source of nutrients impacting embayments and ponds is from inadequately treated wastewater from septic systems. Stormwater runoff and fertilizers are important additional sources of nutrients impacting the Cape's waterbodies.

Although the report's findings continue to document degrading water quality, there is reason for optimism as many towns move forward with



The cause: Lack of adequate wastewater infrastructure is the greatest reason behind Cape Cod's water quality woes.

plans to construct wastewater infrastructure.

Along with the report's findings and grades, APCC made recommendations for immediate actions that need to be taken to address the Cape's water quality concerns. Topping the list is APCC's strong encouragement for towns to take advantage of new funding opportunities that are emerging at the local, state and federal levels for wastewater infrastructure, including the Cape Cod and Islands Water Protection Fund, federal dollars coming from the American Recovery Plan Act and the recently-signed federal infrastructure bill.

APCC's report also called for implementation in 2022 of the Cape Cod Commission's proposal for a water quality study for freshwater ponds comparable to the study conducted for the Cape's coastal embayments—the Cape Cod Area Wide Water Quality Management Plan Update developed pursuant to Section 208 of the Clean Water Act 208, commonly called the 208 Plan.

41 embayments
were graded as
having unacceptable
water quality,
representing

87%
OF THE TOTAL



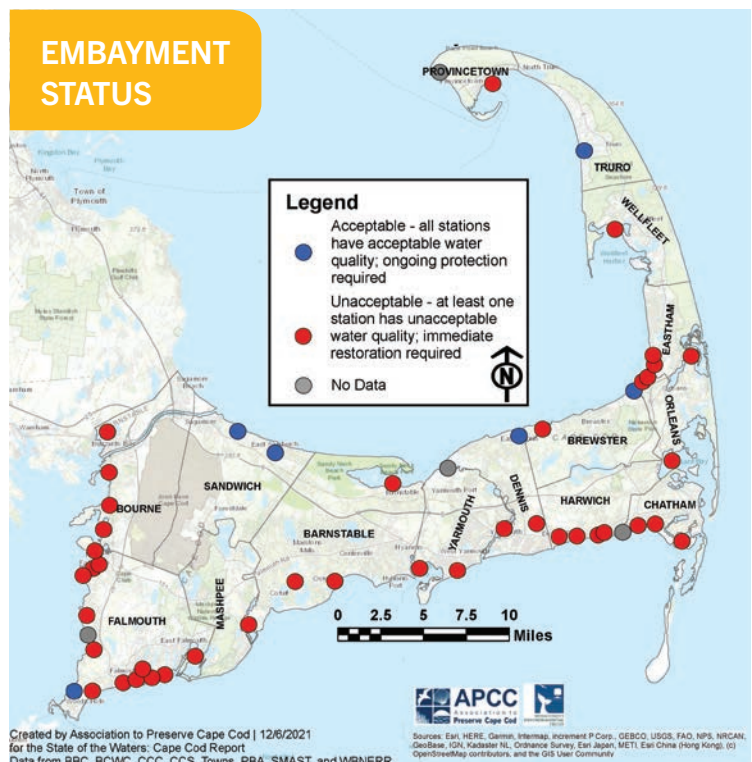
The Grades: Coastal Embayments

Photo: Laurie Keeran

The 2021 grades for coastal embayments showed an increase in the number and percentage of embayments with unacceptable water quality compared to previous years, with three additional embayments evaluated as unacceptable—two on Cape Cod Bay and one on Buzzards Bay. Forty-one embayments were graded as having unacceptable water quality, representing 87 percent of the total. In APCC's 2020 report, 38 embayments or 79 percent, were unacceptable. In 2019, 32 embayments, or 68 percent, were unacceptable.

This year, only six of the 47 graded embayments were determined to have acceptable water quality, representing 13 percent of the graded embayments. No embayments improved from an unacceptable to acceptable grade.

The findings show that coastal embayment water quality continues to decline despite important decisions made recently by the citizens of many towns to proceed with the upgrades to wastewater treatment that are needed to reduce the nutrient pollution impacting the Cape's bays. Such projects take time to implement and produce results. Except for a few limited cases, municipal wastewater management programs have not had time yet to result in a positive impact on the nutrient levels reaching our embayments. Residual nitrogen from current and historic septic system discharge is still working its way through the groundwater and continues to degrade water quality.



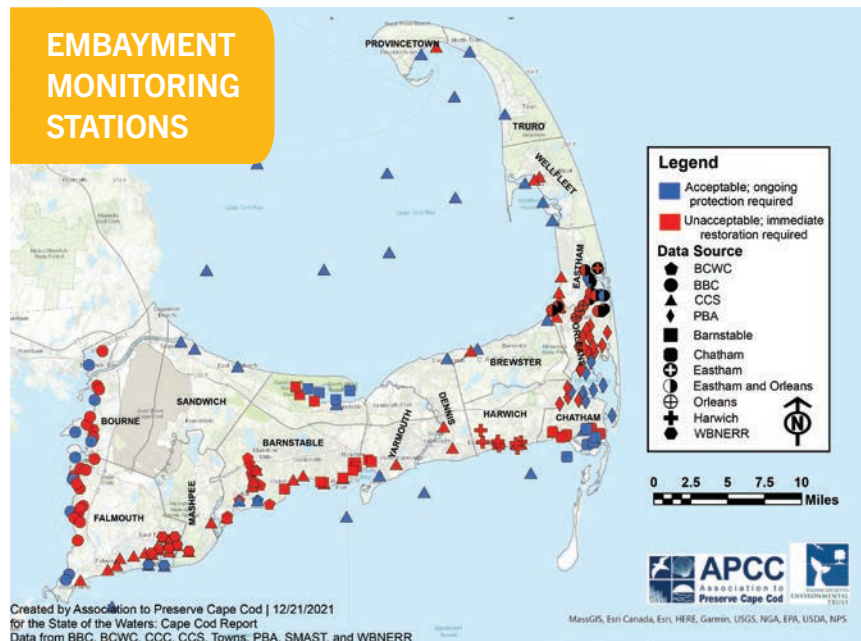
Red dots show embayments with unacceptable water quality; blue dots indicate acceptable water quality.

There is reason to be optimistic, though. While water quality will likely continue to get worse even as towns build out their wastewater collection and treatment systems, once enough septic systems are removed and nutrient loading is reduced, coastal embayments will begin to heal. The challenge now is for towns to implement their wastewater management programs as quickly as possible.

Recommended Actions for Coastal Embayments

In the State of the Waters report, APCC called on Cape Cod towns in the next five years to move aggressively in taking advantage of new federal and state funding opportunities for wastewater infrastructure investment. APCC also called on Barnstable County to eliminate interest charges on community septic management financing to provide support to those in need of assistance in upgrading septic systems or connecting to sewers.

APCC encouraged members of the public to become involved by urging local and regional officials to move forward in securing the investments necessary to improve coastal water quality. See the complete *State of the Waters Action Plan recommendations for coastal embayments* at capecodwaters.org.



Icons reflect water quality status at specific monitoring stations.
Blue is acceptable water quality; red is unacceptable.



The Grades: Freshwater Ponds



A cyanobacteria bloom at Santuit Pond in Mashpee.

38 ponds were graded as having unacceptable water quality, representing

35%
OF THE TOTAL

For the second year in a row, freshwater ponds were graded by applying data collected from APCC's cyanobacteria monitoring program in addition to the standard Carlson

Trophic Index (CTI), which is used to determine the trophic status of pond water quality using data on total phosphorus, chlorophyll and water clarity. Those ponds for which there was insufficient data to rely upon a CTI but were monitored by APCC and produced high cyanobacteria levels, or ponds where towns posted bloom advisories, were added to the ponds receiving an unacceptable water quality grade. A total of 87 ponds were monitored for cyanobacteria.

The results show that Cape Cod ponds continue to be impacted by nutrient pollution. This year, 109 ponds were graded compared to 93 last year, with 38 ponds, or 35 percent, graded as having unacceptable water quality. Seventy-one ponds, or 65 percent, received an acceptable water quality grade. Although the number of ponds studied in the 2021 report increased from previous years, the percentage of ponds with unacceptable water quality in the

The Grades: Freshwater Ponds can't.

2019, 2020 and 2021 State of the Waters reports has remained relatively consistent at approximately one-third of graded ponds.

Grades for a majority of the ponds—73—relied exclusively on APCC's cyanobacteria monitoring data due to the lack of data from other pond monitoring programs across the Cape. The lack of sufficient data prevented a CTI analysis in the vast majority of Cape lakes and ponds and reflects a serious deficiency in the public sector monitoring of freshwater ponds.

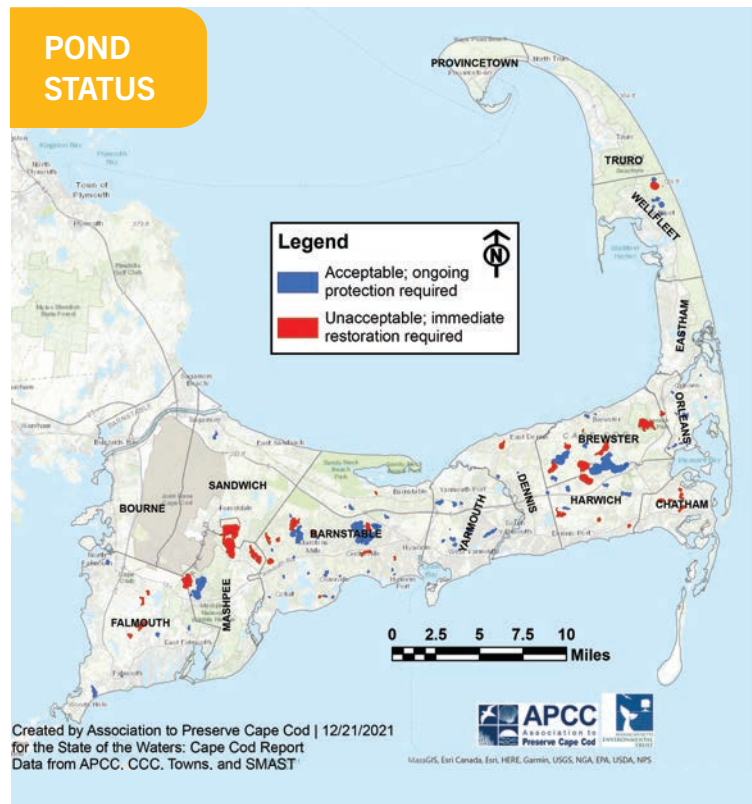
While water quality data for most Cape ponds are limited or nonexistent, the information that has been collected suggests that many Cape ponds across the region are impacted by nutrient pollution that has degraded water quality. Of the small number of ponds that are monitored, between 30 to 40 percent have experienced one or more cyanobacteria blooms or other signs of impairment in the last two years.

As is true of coastal embayments, nutrients from septic systems, fertilizer use and stormwater runoff, combined with warming temperatures, are to blame for adverse impacts to our freshwater ponds, and in some cases, produce conditions for cyanobacteria blooms that can result in the need to limit contact with pond water to protect human and pet health.

Recommended Actions for Freshwater Ponds

With nearly a thousand Cape Cod ponds—but only about 10 percent receiving a grade in APCC's report—there is a great need to significantly increase the Cape's freshwater pond monitoring efforts. In the report, APCC stressed the necessity of expanding pond monitoring across the Cape, particularly for those ponds where there are swimming beaches, public access, or the presence of sensitive natural resources. APCC also urged the Barnstable County Commissioners and Assembly of Delegates to move forward in 2022 in approving the Cape Cod Commission's proposed 208 scale water quality study for ponds, similar to what was done for the Cape's coastal embayments.

As with recommended action to take in restoring coastal embayments, APCC encouraged the public to urge local and regional officials to act swiftly in securing available funding to address the quality of freshwater ponds. *See the complete State of the Waters Action Plan recommendations for freshwater ponds at capecodwaters.org.*



Ponds in blue were graded as having acceptable water quality. Red ponds indicate unacceptable water quality.





Most, but not all, public water supplies continued to receive excellent water quality scores.

The exceedances of state and federal standards by those Cape towns do not reflect the presence of per- and polyfluoroalkyl substances, or PFAS, recently detected in the drinking water supplies of several Cape towns. Massachusetts standards for regulating PFAS had not yet gone into effect in 2020, the year scored for APCC's 2021 report. The scoring for next year's State of the Waters report will factor in the new state PFAS regulations, which APCC expects will impact the scoring results. A fact sheet about PFAS is included in this year's report.

The presence of bacteria in some of the Cape's drinking water systems suggests there is a need to continue to invest in and maintain municipal water supply infrastructure. Town residents should support these investments to ensure the continued quality of local water supplies.

PUBLIC WATER SUPPLY STATUS

Legend

Finished Water Quality Grade

- Green star: Excellent
- Yellow star: Good
- Red star: Poor

Towns and Water Supply Status:

- Provincetown: Poor
- Wellfleet: Poor
- Eastham: Excellent
- Orleans: Excellent
- Brewster: Excellent
- Chatham: Excellent
- Harwich: Excellent
- Yarmouth: Excellent
- Barnstable: Excellent
- Hyannis: Excellent
- Dennis: Excellent
- Barnstable Fire District: Excellent
- Sandwich: Excellent
- Bourne: Excellent
- Buzzards Bay: Excellent
- North Sagamore: Excellent
- Sandwich Water District: Excellent
- Cotuit Water Department: Excellent
- Mashpee: Excellent
- Falmouth: Excellent
- Mashpee Water District: Excellent
- Town of Falmouth: Excellent
- Town of Orleans Water Department: Excellent
- Brewster Water Department: Excellent
- Chatham DPW Water Divisor: Excellent
- Harwich Water Department: Excellent
- Yarmouth Water Department: Excellent
- Barnstable COMM: Excellent
- Otis Air National Guard Base: Excellent

Scale: 0 to 10 Miles

North Arrow: N

APCC
Association to Preserve Cape Cod

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GEBCO, IGN,勘測院 NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

There is also the need to continue to protect drinking water and its groundwater source by protecting the land above it through open space preservation and improved land use regulations.

And, as is evidenced by the drought conditions experienced on the Cape the past two years, it is also important for towns to promote water conservation to protect water supplies. *See the complete State of the Waters Action Plan recommendations for drinking water supplies at capecodwaters.org.*





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ASSOCIATION TO PRESERVE CAPE COD

482 Main St., Dennis MA 02638
508-619-3185 info@apcc.org

The Association to Preserve Cape Cod is a 501(c)(3) non-profit organization founded in 1968 to foster policies and programs that promote the preservation of natural resources on Cape Cod.


Support comes from thousands of members, and from gifts and grants from individuals, foundations and businesses.

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Jo Ann Muramoto, Ph.D., *Director of Science Programs/Mass Bays Program Regional Coordinator*
Kristin Andres, *Associate Director for Education and Informational Services*
April Wobst, *Restoration Ecologist*
Jordan Mora, *Restoration Ecologist*
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Read the full State of the Waters: Cape Cod report.

The State of the Waters: Cape Cod 2021 report, including interactive maps, State of the Waters Action Plan, Atlas of Water Restoration Needs and Solutions, a fact sheet on PFAS, and much more useful information, can be found at:

capecodwaters.org

Photo: Gerald Beetham



FUNDING FOR THE STATE OF THE WATERS: CAPE COD REPORT

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Photo: Gerald Beetham

