



COALITION Quarterly

Rescue Mission



BCWC's Meg Materne
measures the flow of
water at Mill Pond.

For full article, see page 6.

BCleanWater.org

A note from Executive Director Zee Crocker

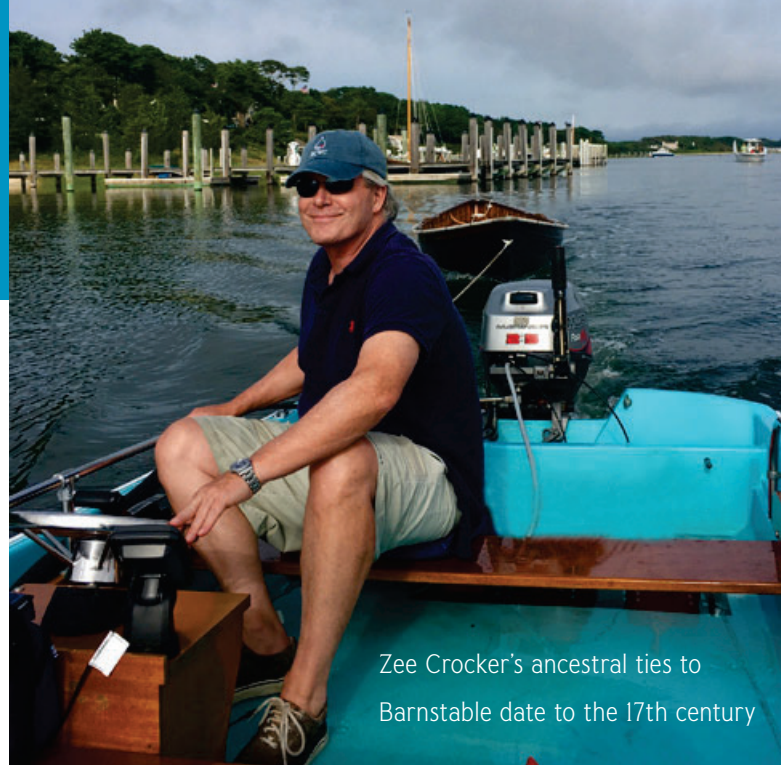
Welcome to the first newsletter of the Barnstable Clean Water Coalition! It is my pleasure to introduce myself as the new Executive Director for the Coalition and fill you in on the exciting changes we've made and our plans to protect and restore water throughout Barnstable.

My deep roots in this Town, and my love of the waters here as a sailor and fisherman, led me to take up this challenge. From the beginning, I have viewed this work as a "rescue mission"; saving what we love for our children and grandchildren. I am up to the task!

We have had a busy summer! Meg Materne remains hard at work in the field (check out that front page photo!), collecting hundreds of water samples this summer that will help inform our big picture strategy of cleaning up the Town's watersheds. We continue to work with our dedicated consultants, and we also have some new additions to the team. After officially joining the BCWC staff early this year, I brought on long-time environmental advocate and water steward Heather Rockwell as our Director of Operations. Native Cape Codder Jen Cullen has also joined to assist with development and outreach work to expand our allies and network throughout the town. We welcome you to swing by the office to meet the friendly faces of the Coalition!

As Cape Codders, we know how important clean water is to our health, environment, and local economy. What would Barnstable be without its dozens of ponds, lakes, streams, beaches, bays, and harbors? They're the reason we love this town. And this is exactly why it's time to roll up our sleeves and get to work protecting this precious resource.

Many of you are familiar with the long history of Three Bays Preservation to protect and preserve the Three Bays estuary. The degradation of the bays is not only scientifically measurable, but anyone who has spent time on the water recently has noticed the changes. Last year, we experienced a fish kill in Prince Cove and a dangerous algae bloom throughout the estuary. This year, the water was often brown and decaying plant life was rampant. The entire watershed is compromised by extremely high levels of excess nitrogen, throwing off the delicate balance of the ecosystem. Our ponds are loaded with phosphorus and our aquifer already contains many contaminants of emerging concern (CECs).



Zee Crocker's ancestral ties to Barnstable date to the 17th century

What we know is that this nitrogen comes from many sources upstream from Three Bays and pollution is a problem impacting water systems throughout our town. On average 85% of nitrogen contamination comes from septic systems, 10% from lawn fertilizers, and 5% from stormwater runoff. To adequately confront and solve pollution of this magnitude, we must utilize many tools, strategies and technologies. We will need strong leadership from our local and state officials and broad participation from residents.

The Coalition's efforts aim to educate and engage the Town not only on the challenges we face, but also about the many solutions we can pursue. We have big plans to collect and analyze as much data as possible on the sources of the pollution, and then use this hard science to develop a comprehensive watershed restoration plan. We will use everything from new technologies, like advanced septic systems, to good old-fashioned natural mitigation, like oysters. The multifaceted strategies we propose are innovative and groundbreaking. Our mission is to educate, monitor, mitigate and advocate for clean water and that is just what we are doing!

We live in an outstandingly beautiful and ecologically unique part of the world. We must take action to ensure it stays that way. Your participation and commitment is critical to our shared success on clean water. I thank you for your support and look forward to further engaging with you on how we can protect and restore this place we call home.

Zenas "Zee" Crocker
Executive Director

What is the Barnstable Clean Water Coalition?



Inside the office of the Barnstable Clean Water Coalition (BCWC), we take the phrase “rescue mission” very seriously. To succeed with our mission we need a “Coaliton”: Individuals, like-minded non-profits, businesses, the Town, the State...we all need to work together.

The stark fact is that marine embayments surrounding the Cape are significantly impaired, mostly by excess levels of nitrogen and other contaminants. Freshwater ponds are threatened by high levels of phosphorus. Groundwater from Cape Cod’s sole source aquifer used for drinking is consistently compromised by these above-ground dangers.

BCWC was known as Three Bays Preservation, Inc., founded in 1996 to protect and conserve Dead Neck/ Sampsons Island and the North, West and Cotuit Bays in the Three Bays watershed. Over the years, our monitoring has identified the worsening conditions locally and we have witnessed similar conditions Cape-wide. In Spring 2017, a unanimous vote by the Board of Directors resulted in the evolution of Three Bays into a town-wide entity to safeguard all waters in the 75-plus square miles of the Town of Barnstable.

Restoring and preserving clean water throughout Barnstable is the DNA of this 501(c)(3) non-profit organization.

The Coalition’s mission merges science, technology, and environmental conservation. We implement science for impactful, mindful stewardship. We have a devoted team of engineers, scientists, and volunteer citizen-scientists, as well as interns and policy experts, all of whom work on one issue and one issue alone: clean water. BCWC is committed to an emerging concept of functional stewardship and civic engagement that does not yet exist in many other places, and we’re proud of the trails in ecosystem studies that we’re blazing.

The sharpened focus of our re-branded mission is based on four cornerstones we’re calling **E.M.M.A.: Educate, Monitor, Mitigate and Advocate**. Here’s how we’re working:

- **Educate:** Engaging with stakeholders
- **Monitor:** Measuring water quality
- **Mitigate:** Removing contaminants from our water
- **Advocate:** Campaigning for political will and regulatory change

We do not work in a vacuum. We share the sandbox with other like-minded non-profits, and local, state and federal resource managers and scientific institutions, including Massachusetts Audubon, the Center for Coastal Studies, and the School for Marine Science and Technology at UMass Dartmouth.

BCWC is here to stay, and we’re establishing a foothold in the niche where environmental and community stewardship partner with effective science.

We live with environmental uncertainty that is altering life on Cape Cod. The threats are real and growing. Stakeholders recognize the time is now - right now - to mobilize!

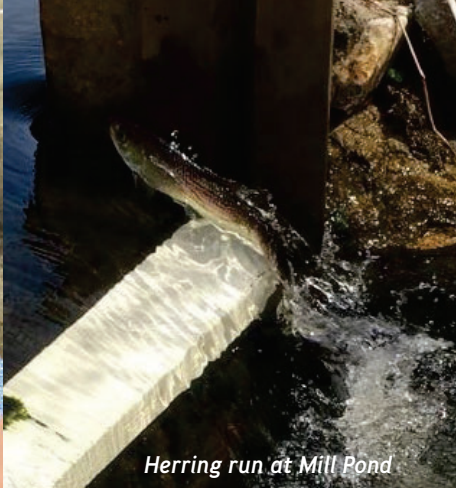
There’s a lot of work to do and we need your help.

As you read our newsletter, please scope out opportunities to donate, volunteer, and learn about our mission. Visit us online at BCleanWater.org.





Discover Pirate's Cove



Herring run at Mill Pond



Collecting water samples

Educate

No two education programs at BCWC are alike. They run the gamut from mainstream classroom settings to the outdoor sites within Barnstable's watersheds and waterways. We teach in marshes, in boats on the water, on the shore in intertidal zones, in the field, and just about anywhere our mission, and willing students, take us.

BCWC has had a busy year full of educational outreach, including the following programs:

- Bayside Explorers, a weekly beachside learning program for kids
- Discover Pirate's Cove, a biweekly hands-on shoreline discovery program for families
- Informative Wonder of Water Public Lectures in conjunction with the Osterville Village Library, a seven speaker series
- Co-sponsor of the 8th Annual Cape Cod Wildlife Festival
- BCWC display and exhibit at Osterville Village Day and Waquoit Bay Watershed Block Party
- Numerous water quality awareness presentations for community organizations



Scan here to view website and our new video

Monitor

We monitor year-round to determine the water quality of lakes, streams, ponds and marine environments. Measuring key scientific parameters provides data that drives our science-centric mission. We've been doing this for 20 years, and monitoring and measuring continue to remain critical to chart changes in our water systems. In 2017, BCWC has:

- Measured water quality at 18 sites in the Three Bays estuary in partnership with UMass Dartmouth's School of Marine and Science Technology (SMASST) and the Center for Coastal Studies
- Initiated a streamflow, nitrogen monitoring project at ten freshwater sites along the Marstons Mills River watershed
- Monitored the annual herring run count at Mill Pond along the Marstons Mills River
- Expanded freshwater sampling through the Ponds and Lakes Stewardship Program (PALS), from nine bodies of water to 23
- Widened the scope of MIMIC, (Marine Invader Monitoring Information Collaborative) in support of Massachusetts Office of Coastal Zone Management to now include a site on Barnstable Harbor, in addition to four existing locations on the south side of town

BCWC collects water samples at over 50 sites throughout the town of Barnstable





Measuring streamflow



Cultivating oysters for nutrient removal



Codium fragile, a marine invasive

Mitigate

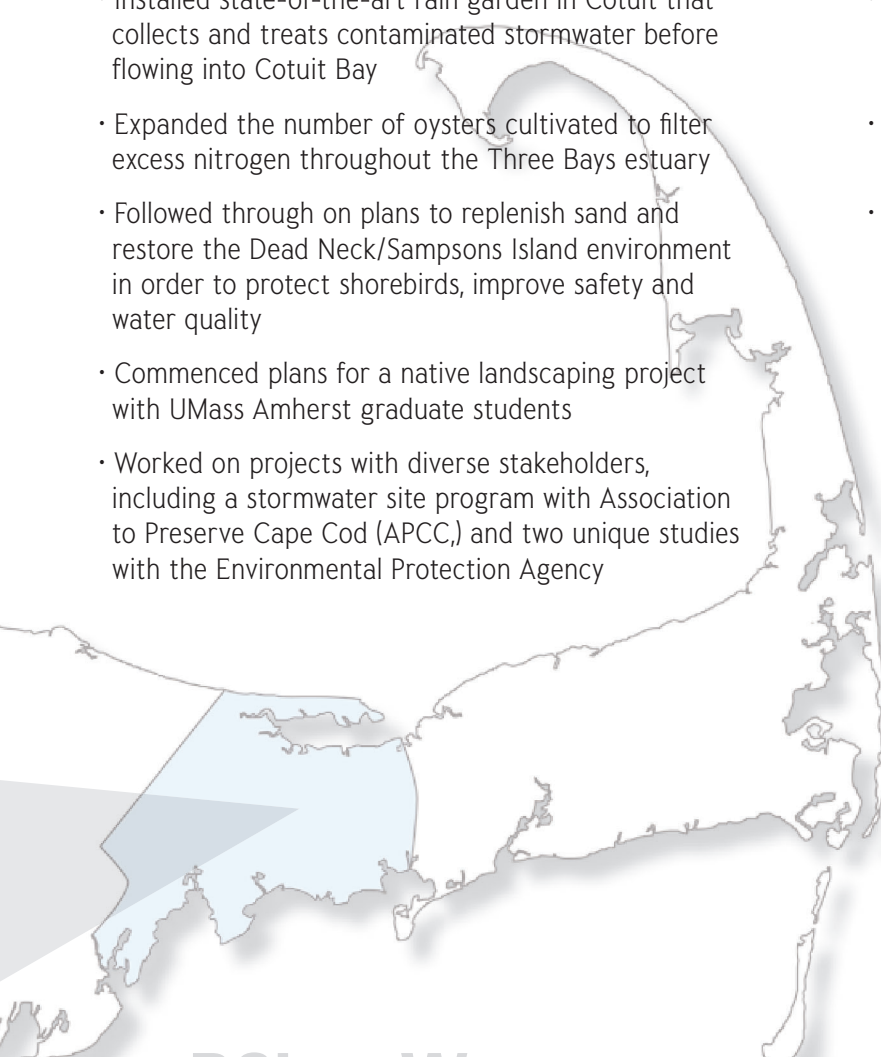
Mitigation goes hand-in-hand with monitoring. In 2017, BCWC set the stage to implement innovative concepts and Non-Traditional Technologies (NTTs) to restore and preserve clean water throughout Barnstable. These mitigation strategies, informed by our science, enable impactful changes to complement our mission. Here's a sampling of our work:

- Installed state-of-the-art rain garden in Cotuit that collects and treats contaminated stormwater before flowing into Cotuit Bay
- Expanded the number of oysters cultivated to filter excess nitrogen throughout the Three Bays estuary
- Followed through on plans to replenish sand and restore the Dead Neck/Sampsons Island environment in order to protect shorebirds, improve safety and water quality
- Commenced plans for a native landscaping project with UMass Amherst graduate students
- Worked on projects with diverse stakeholders, including a stormwater site program with Association to Preserve Cape Cod (APCC,) and two unique studies with the Environmental Protection Agency

Advocate

Responsible stewardship requires ongoing advocacy for clean water. In 2017, the Coalition continued its push to tell people what's happening with their water in Barnstable, and how they can help. Our to-do list is long, including the following ways in which our science and policy colleagues participate in political, policy, and civic dialogues to promote healthy watersheds:

- Hosted a well-attended Open House in June at Nauticus Marina to introduce our expanded mission and our plans to achieve these important milestones
- Held the popular 7th Annual Paddle for the Bays RACE Cape Cod in Cotuit in September
- Executive Director Zenas Crocker represented clean water interests in the following entities and organizations:
 - Barnstable County Cape Cod Water Protection Collaborative
 - Cape Cod Chamber of Commerce Wastewater Task Force
 - Marstons Mills Natural Treatment System Task Force
 - Town of Barnstable Aquaculture Advisory Committee
 - NPR discussion on "The Point" with Mindy Todd



Notes from the Field: Water Testing



Along the Marstons Mills River

By Meg Materne

Science Associate, Barnstable Clean Water Coalition

Water is life, and it's this belief that inspired my career in environmental science. It was an easy decision because I love nature and being outdoors. Luckily, much of my second summer of full-time work at Barnstable Clean Water Coalition (BCWC) was spent outside!

My hours have been dedicated to monitoring ten specific locations for stream flow and excess nitrogen along the Marstons Mills River. Excess nitrogen from leaching septic systems is the leading cause of impaired waters that eventually flow into North, West and Cotuit Bays in the Three Bays estuary.

These data will drive future strategies to clean Barnstable's polluted waters for both drinking and recreational use. For me, focusing on one watershed is like working in a living laboratory to produce data useful to other Cape Cod towns, too. After all, we're in this nitrogen crisis together.

To keep collected data uniform, I hit all ten sites in one day, once a week. This consistency in monitoring is very

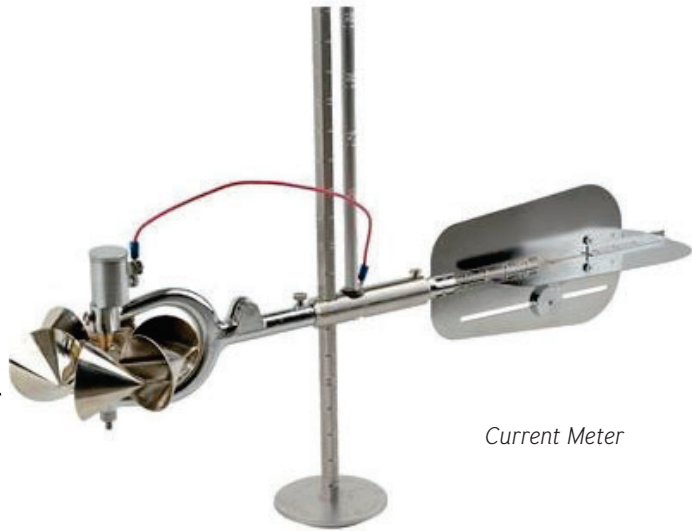
important. I take two samples at each site, for a total of 20 samples every week. I access these ten riverbank test sites by foot, wearing waders. Collecting hundreds of water samples provides baseline data on nitrogen sources throughout the Marstons Mills River watershed.

NITRATES AND NITROGEN

One test is for nitrates. Nitrates are the trigger for algae blooms. These blooms produce nasty green patches of seaweed-like organic material that chokes oxygen from the water and results in fish kills. The second test is for TKN, or Total Kjeldahl Nitrogen, so named for the scientist who developed the method that determines the total concentration of organic nitrogen and ammonia. I begin sampling where the river starts, in cranberry bogs off Whistleberry Road in Marstons Mills. I test by myself now, but plan to add trained volunteers (please sign up!) in the season ahead. On testing days, I also measure water temperature at each site.

Next I compare the flow of water and nitrogen discharging from the bogs and a herring run flume from the Indian Ponds. Once these two streams converge, they pour beneath River Road, site of our next station. Further downstream I'll test water at a trio of sites near Mill Pond.





Current Meter

These three sites mark the original batch of testing locations and they are critical in calculating how much nitrogen stays in the ecological kitchen sink that is Mill Pond.

WATER FLOW

Measuring water flow is almost as important as the quality of the water. Flow determines velocity, revealing how much nitrogen moves through each site every day. And yes, that picture of me on the front cover of the Coalition Quarterly shows the state-of-the-art instrument I'm using to calculate flow, aptly called a current meter. Your contributions helped the Coalition purchase this highly calibrated device.

First, I measure the width of the stream from bank to bank. Next, I measure the water depth every twelve inches from bank to bank. The current meter is set to the corresponding depth at each foot interval, placed in the stream and allowed to run for 40 seconds. The instrument counts the number of revolutions the small buckets make. From these parameters, flow is measured.

We can determine how much nitrogen flows down river per day from studying water flow, nitrates and TKN.

This ongoing study will narrow the local nonpoint sources of pollution, so BCWC can design a plan to rid the watershed of excess nitrogen.

See you in the field sometime!

Meg

WAYS TO GET INVOLVED!

We need your help!

Barnstable Clean Water Coalition depends on its donors, volunteers, partners and friends to assist us with our important work.

- **Join the Admiral's Watch:** Donors who generously contribute \$1,000 or more become part of our key sustainer's program to support the Coalition's ongoing work.
- **Become a BCWC Friend:** Donations of all sizes are much appreciated.
- **Volunteer with BCWC:** We could not successfully do our work without the critical help of volunteers. We need volunteers to help with everything from events to water sampling.
- **Speaking engagements:** Public education is an important part of our mission and we welcome opportunities to educate our communities by speaking at events/meetings.
- **Stay up to date:** Sign up for our email alerts at BCleanWater.org and follow us on Facebook and Instagram to stay current on our projects, efforts, and opportunities to participate.



Join Our Amazing Team of BCWC Volunteers!

Whether you like being on a boat collecting water samples or talking to people about clean water at public events, we have a volunteer opportunity for you here at BCWC. Our growing team of BCWC volunteers has been very busy this year. In April and May, we had over 40 volunteers at the Mill Pond herring run from dawn to dusk counting the fish as they travelled up the Marstons Mill River to their spawning grounds. In July and August, our newly trained crew of 10 water monitoring volunteers could be seen early in the morning collecting samples from boats throughout the Three Bays estuary. In September, several volunteers ventured out in kayaks with staff to sample 23 ponds and lakes in Barnstable. In addition, our volunteers were key in helping us at events this season ranging from our annual Paddle for the Bays RACE to the Cape Cod Wildlife Festival. We hope you will consider coming on board and getting involved with BCWC. Please visit our website at BCleanWater.org/ways-to-get-involved/volunteer to fill out an online application or contact us at info@bcleanwater.org.



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Mission Statement

Barnstable Clean Water Coalition will work to restore and preserve clean water in Barnstable. BCWC utilizes science as its foundation to educate, monitor, mitigate and advocate for clean water.

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Meg Materne
Science Associate

Jen Cullen
Development Director

Upcoming Events! BCleanWater.org

*Mark your calendar to attend or volunteer at our many events.
Check our website for further information:*

**November 9, 2017,
3pm-6pm:** Girl's Night
Out at Sara Campbell,
Main Street, Osterville –
come meet BCWC staff,
enjoy wine and cheese
and get a little early
holiday shopping done.

May 6, 2018: Join us as
we Race for the Pint
with Cape Cod Beer.

June 2018: BCWC
Annual Open House

September 2018: Grab
your paddle and get out
on the water for our
8th annual Paddle for
the Bays RACE Cape
Cod.

Photos courtesy of David Burlison, Heather Fone and BCWC staff throughout the newsletter.



2017 Paddle for the Bays RACE