



# COALITION Quarterly

## Working for Clean Water



# A Note From The Helm

This year we experienced a “tale of two summers”.

On one hand, we had a summer many described as the “best ever” in terms of weather. Constant sunshine and hardly any rain. Perfect weather for recreation: golf, tennis, and every activity on the water!

Water clarity was quite good compared to past years and more than one person came up to me and said “Whatever you are doing is working! The water looks better!” Offshore fishing was great, “conservation is working!”

After being closed for the past three years due to cyanobacteria blooms, Shubael Pond was open and so were many other formerly troubled ponds and lakes.

While I wish BCWC could take credit, that is not the case!

Meanwhile, the Cape experienced it’s hottest July on record. We, and much of the country, experienced drought conditions, some quite severe. Climate change? Just weather? Everyone has opinions and only time will tell.

Connecting the dots, we believe that the lack of rain helped our surface water conditions this year. In a normal year, rainwater helps move the nutrient-laden groundwater into our estuaries and ponds more quickly (groundwater moves about 1-4 feet a day through the Cape’s sandy soils) causing more frequent and noticeable algal blooms.

But the heat did hurt and in ways that were not necessarily visible. BCWC measured dissolved oxygen (DO) levels more than a dozen times this summer in the Three Bays estuary. After July’s heat wave, we saw record low “DO” numbers. Not good. Oxygen is the key to survival for fish and animals!

This newsletter highlights our volunteers and summer interns. Without their collective effort (along with our full-time staff!), none of our work would be possible. Please take the time to look over some of the important work that is happening in your backyard: water sampling and collecting water quality data, monitoring weather conditions, documenting and identifying invasive species, and all the while developing and piloting nature-based solutions that will help clean and restore our waters.



After installing a dozen high performing KleanTu® NitROE Wastewater Treatment Systems, we are trialing a second technology: Yankee 1. We are laser focused on low cost, high performing wastewater treatment systems that can replace our polluting Title 5 systems and cesspools! Stay tuned for more results!

This summer, I ran into an old friend who stopped me when I was heading to lunch. “Zee”, he said, “I really can’t tell you how much I enjoy the newsletters. I learn so much; I think they are really well done, and I always look forward to the next one...I suppose I really should make a donation!!”

Please DO donate! We are supported by our readers, all private individuals, for virtually our entire annual operating budget. Fortunately, our success has led us to project funding, like the Marstons Mills Cranberry Bog Restoration Project, where we have been able to secure grants. Perhaps you know a private or family foundation who could help support our work for clean water?

Please don’t hesitate to write, call, or just stop by the BCWC office next time you are in Osterville!

Handwritten signature of Zee.



# Introducing Yankee 1 - The Newest Member of the Shubael Pond I/A Septic System Project

As mentioned, we have installed twelve KleanTu® NitROE Wastewater Treatment Systems in Marstons Mills as part of the Shubael Pond I/A Septic System Project. This summer, we introduced a second alternative septic system technology to the project and will test its performance. A home located in the Shubael Pond area was selected and installation of this new system was completed in August.

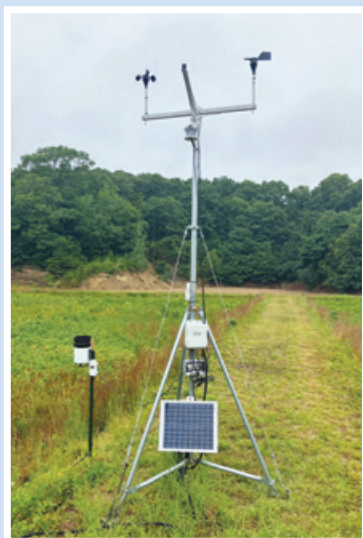
This new system, called Yankee 1, is a denitrifying woodchip bioreactor septic system developed by our partners at the Massachusetts Alternative Septic System Test Center (MASSTC). MASSTC installed a similar pilot system in 2018 on Joint Base Cape Cod, which has been producing average nitrogen reduction levels of 7 mg/L over the past four years, with 5 mg/L during the summer months. These are game-changing results!

Three Yankee 1 systems have been installed on Long Island and the one at Shubael Pond is the first one installed in Massachusetts.



## Data Collection Continues in the Bogs

Our partners at the U.S. Environmental Protection Agency's Office of Research and Development installed a weather station at the cranberry bogs in Marstons Mills earlier this summer. Information gathered by the station, including precipitation amounts and water levels, will help inform and guide the design for the wetlands restoration project in the bogs.



## How Yankee 1 works:

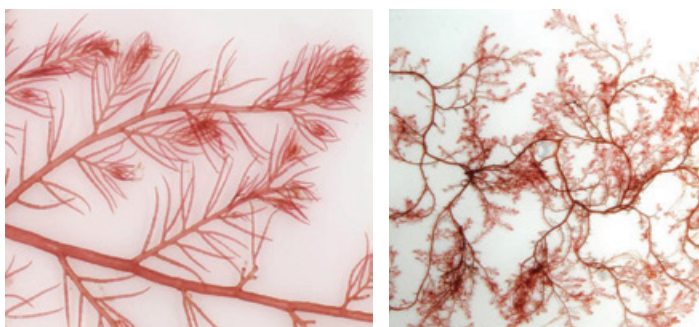
- Wastewater flows into a layered bed with a liner, sand, pea stone and a pressure wastewater distribution system called a Geomat®, where the nitrification process begins converting ammonium to nitrate.
- The wastewater then flows into a woodchip tank where the denitrification process begins, converting the nitrate into nitrogen gas, which is released into the air.
- The denitrified wastewater flows into the leaching field and ultimately into the ground water.

This installation was made possible through grants from the U.S. Environmental Protection Agency and Agua Fund, Inc., along with donated goods and services from the Horsley Witten Group, Geomatrix Systems, and Infiltrator Water Technologies.

# A New Invader on Our Shores

## What is it?

*Dasysiphonia japonica* (henceforth referred to as Dasy) is a filamentous red alga native to the western Pacific that has been appearing in large amounts on Cape Cod beaches. The first recorded sighting of Dasy was in Rhode Island in 2007 and it has since spread from Long Island to Nova Scotia.



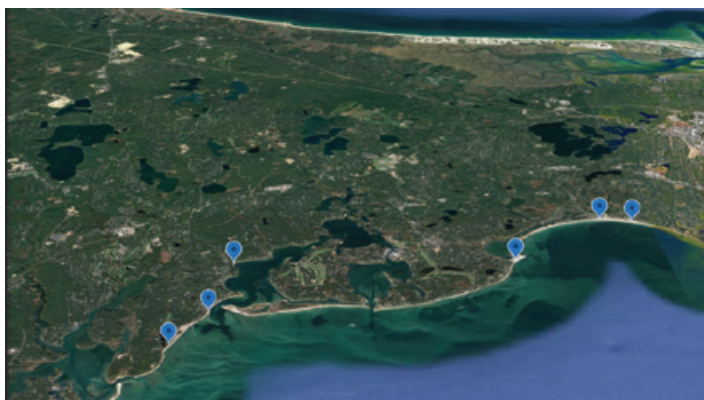
## Why is it a problem?

Dasy outcompetes native algae and seagrass species creating blooms, which cover benthic (bottom) habitats and change the ecosystem structure. These blooms die off and decompose, depleting the dissolved oxygen in our coastal waters. When decomposing, Dasy has also been shown to cause significant mortality to juvenile finfish and shellfish. When these decomposing blooms wash up on our beaches, it produces a foul, sulfuric smell that is unpleasant to beachgoers and coastal homeowners.



## Why is it happening here?

Excessive nutrient loading! Dasy has a high nitrate uptake efficiency, which means that it can effectively use excess nutrients to displace native algae. Excess nitrogen from our septic tanks is traveling through watersheds and into our coastal bays, effectively fertilizing the water and leading to massive blooms of Dasy. This along with elevated carbon dioxide levels and a broad ideal temperature range (long growing season) are causing Dasy to proliferate and spread along our coast.



*BCWC interns monitored six beaches on Nantucket Sound this summer for the presence of Dasy. Those sites, indicated in blue on the map above, are (left to right): Oregon, Loop and Ropes in Cotuit, Dowses in Osterville, and Craigville and Covell's in Centerville.*





# Taking Action

## What are we doing?

Although we know *Dasy* is already present in our local waters, we are looking to learn more about its life cycle and seasonality. In collaboration with Nicole Corbett and the Popponeset Water Stewardship Alliance, our interns Samuel Norman, Tim Pesek, Christian Tittel and Toby Welo spent the summer surveying beaches in Centerville, Osterville and Cotuit for the presence and abundance of *Dasy*, both in the water and on shore. This survey data will allow us to find growth patterns in the spread of this invasive species on the southside of Cape Cod. Interns also collected samples to identify and send to researchers at the University of New Hampshire for isotope analysis to confirm whether the nitrogen found in *Dasy* is from human sources, i.e., septic system waste.



## Who are we working with?

Nicole Corbett (pictured right) is the founder and lead researcher of the Popponeset Water Stewardship Alliance (PWSA). An avid swimmer who has spent countless summers in the waters off Popponeset Beach in Mashpee, Nicole first noticed the arrival of large accumulations of drift seaweeds in nearshore waters in the 2000s. Although she initially thought the seaweed inundations only occurred during the summer, Nicole was surprised to see large amounts of red seaweed during the fall and winter months as well. She reached out to various organizations, including the Massachusetts Office of Coastal Zone Management, to bring attention to the issue and learned that this was an algal species not previously found in Nantucket Sound. Nicole formed PWSA, a small grassroots environmental group with volunteers, and began a nutrient water quality testing program along Popponeset Beach in collaboration with the Center for Coastal Studies. Water testing results have identified *Dasy* as a major component of the drift seaweeds and the primary species accumulating along our shores during colder months.



**Popponeset Water Stewardship Alliance**

Learn more about PWSA at <https://poppywater.org/>

# Oysters & MIMIC

## Oyster Upweller

This summer, BCWC was fortunate to have four interns – Zack Kubsch, May Lopopolo, Ethan Moeller, and Audrey Sawyer – dedicated to working seven days a week at our demonstration oyster upweller on Hyannis Harbor. This is the fifth season of a collaborative effort with the Massachusetts Oyster Project and town of Barnstable to raise oysters, showcase the important role oysters play in the marine ecosystem and contribute to our blue economy.

While at the upweller, the interns perform duties associated with raising juvenile oysters: cleaning and maintaining the tank and equipment, grading and sorting oysters by size, and monitoring water quality both in the tank and in the harbor. They are also responsible for educating visitors to the upweller about what we do at BCWC, our goals of mitigating human impacts on our waters, and how oysters improve water quality and biodiversity.



## MIMIC

The Marine Invader Monitoring and Information Collaborative (MIMIC)—organized by the Massachusetts Office of Coastal Zone Management (CZM)—brings together volunteers and scientific experts from state, federal, and nonprofit organizations to monitor for marine invasive species along the New England coast.

BCWC interns and volunteers monitor six sites in Barnstable from June through September searching for 18 invasive species on docks and along a cobble shoreline. These invasives include multiple species of tunicates and bryozoans, along with crustaceans and algae. Monitoring these organisms helps scientists decipher the patterns and spread of marine invaders in our region.

To learn more about MIMIC, visit their website at [www.mass.gov/marine-invasive-species-program](http://www.mass.gov/marine-invasive-species-program)



***BCWC would like to thank each of our summer interns for their hard work and dedication, and we hope everyone has a productive year at school.***

**Zack Kubsch** – a senior at SUNY Cobleskill majoring in fisheries and wildlife

**May Lopopolo** – a junior at the University of Vermont studying environmental science with a concentration in ecological design

**Ethan Moeller** – a junior at Dean College majoring in biology

**Samuel Norman** – a senior at Barnstable High School

**Tim Pesek** – a senior at Connecticut College majoring in environmental studies and minoring in geoscience

**Audrey Sawyer** – a sophomore at the University of Vermont studying environmental science with a concentration in ecological design

**Christian Tittel** – a sophomore at Barnstable High School

**Toby Welo** – a freshman at Washington University in St. Louis interested in environmental studies



# BCWC Welcomes Two New Staff

**Liv Graham** is BCWC's new Water Quality Specialist. She grew up on Cape Cod surrounded by water and nature. Liv recently graduated from the College of the Holy Cross in Worcester where she received her BA in biology with a minor in environmental science and geology. She spent last summer at BCWC as a water quality intern and is excited to be working on the Cape's water quality issues full time. When not out collecting water samples and data on Barnstable's bays, bogs, rivers and ponds, Liv enjoys birding, hiking, and spending time with family and friends.



**Luke Cadrin** came on board with BCWC this spring as the new Field Operations Manager. A native Cape Codder, Luke grew up with a deep appreciation for the Cape's ponds, marshes, and woods. He received his BS in biology at Saint Michael's College in Vermont in 2011. The ocean eventually lured Luke back to the Cape where he has worked as a park interpreter, fisheries observer, shellfish constable, and oyster farmer. He joined BCWC with the goal of helping to protect the local waters and habitats he enjoyed so much as a youth. Luke lives in Mashpee with his wife Kacey and their many pets, and he can be found out and about exploring the Cape's natural areas.



## 2022 River Herring Run Update

From April 1<sup>st</sup> through June 15<sup>th</sup>, BCWC volunteers stood watch at three fish ladders in the town of Barnstable counting river herring traveling upstream on their annual spring spawning migration. Over the course of two and a half months, volunteers collected observational data and made over 860 visual counts at the Mill Pond and Middle Pond fish ladders in Marstons Mills, and the fish ladder at Boat Cove Creek in West Barnstable.

Scientists at the Massachusetts Division of Marine Fisheries (DMF) use the collected visual count data to calculate the estimated run size of river herring at each fish ladder. At the Mill Pond fish ladder, volunteers counted 5,608 herring and DMF estimated a run size of approximately 51,000 herring. At the Middle Pond fish ladder, volunteers counted 2,775 herring and DMF estimated a run size of approximately 26,500 herring. Unfortunately, no herring were seen at the Boat Cove Creek fish ladder this year. The Mill Pond and Middle Pond herring run estimates were up slightly this year, which is encouraging considering many other herring runs saw lower numbers in 2022.



Thank you to all the volunteers who stood outside in sun and rain, seven days a week from 7am to 7pm, to help BCWC gather this valuable river herring data!



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### Mission Statement

*Barnstable Clean Water Coalition works 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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and APHOTOMARINE

## Thank You BCWC Volunteers!

As summer winds down, we want to pause and thank our amazing volunteers who assist BCWC with everything from herring counting, water sampling, and invasive species monitoring to gardening and working at special events. We wouldn't be able to accomplish our goals of improving and protecting our local waters without their help.



Donate online at:  
[BCleanWater.org](http://BCleanWater.org)



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