Issue 4, Summer 2018

Barnstable Clean Water Coalition

COALITION Quarterly

Is This Our Future?

Ulva lactuca outbreak, Prince Cove and Warren's Cove, June 2018. Photos by: J. Kassakian

BCleanWater.org

A Note from The Helm

After a cold wet spring, we were greeted by images like those on the cover of *Ulva lactuca*, an alga more commonly known as sea lettuce, all along the southern coast of Cape Cod. Unfortunately, regarding algae in our local waters, the future is now!

While algae occurs naturally in our waters and around the world, it becomes a serious problem for the health of our waters as we overload our ecological systems with nitrogen and other nutrients. Warning signs were out in spades earlier this summer with the overabundance of algae so early in the season. People around town agree that this was the worst outbreak of *Ulva* they had ever seen.

Education is the key to understanding complex ecosystems. With that in mind, the main article in this newsletter highlights the various kinds of algae you are likely to encounter in our estuaries and ponds and how they interact with our marine systems. Knowing more about the role algae plays in our estuaries will give us a stronger scientific foundation as we work to restore sustainable ecological systems.

Ecosystems are a balancing act and oftentimes, Mother Nature is capable of providing natural treatments to rebalance existing conditions. Unfortunately, as ecosystems are thrown out of whack, bad things can happen. Higher water temperatures combined with nutrient overloading leads to increased blooms of *Ulva*, brown and red tides in our brackish and salt waters, and blue-green algae (cyanobacteria) in our freshwater ponds and lakes.

Definitive approaches to algae control are elusive. Lowering nutrient inputs into our waters remains a critical first step, which is why we continue to work so hard to develop pilot projects to mitigate nitrogen in our watersheds. We are working on many approaches for nutrient reduction including more shellfish, permeable reactive barriers, wetland restoration, and innovative/alternative septic systems.

With the right research and strategies for implementing solutions, we can be successful in rebalancing our estuaries and reducing stressors that can lead to these harmful overabundances of algae in future years. Your support is critical, so please continue to spread the word about clean water issues and support our work through donations and volunteering so we can win this battle!

Our work truly is a "rescue mission" and I want to recognize and thank everyone for their continued support in this important effort.

Zenas "Zee" Crocker
Executive Director

I especially want to acknowledge two long-time friends on our mission, Sia Karplus and Peter Tarnoff, who have recently passed.

Sia Karplus worked as a consultant on several aquaculture projects in the Three Bays estuary that focused on nutrient uptake and nitrogen reduction by oysters. Her research demonstrated the many benefits oysters and other shellfish have on improving water quality.

Peter Tarnoff was a long-time water quality monitoring volunteer. He not only gave his time, but he also donated his boat to assist with collecting water samples throughout the summer in the Three Bays estuary for many years.

Join BCWC at These Upcoming Events

8th Annual Paddle for the Bays RACE Cape Cod

When: Saturday, Sept. 15th
Where: The Beach at Oyster Harbors Club, Osterville
Time: 9 a.m. to 3 p.m.

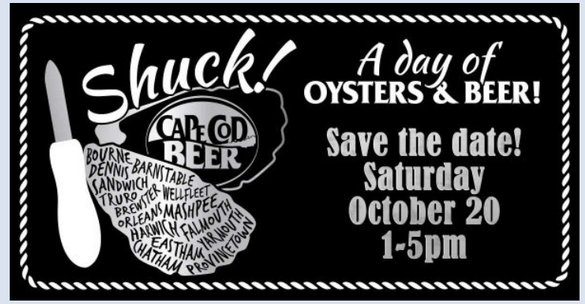
All paddleboarders, kayakers and ages welcome in this race for clean water! Individual racers compete in a 5 or 10-mile course thru scenic Cotuit, North and West Bays. Individuals can also grab a friend for a relay team. Four-person paddleboard relay teams compete in a shorter nearshore race course in Tims Cove.

Prizes for top finishers, top fundraisers and best costumed relay team!

Join the fun on the beach for a fabulous Beach Party with cookout, live music with Jack & Oriana, silent auction and other fun activities.

Racers receive long-sleeved t-shirt and Beach Party ticket. For more information, to register for the RACE or to buy Beach Party tickets, go to **BCleanWater.org**

Race proceeds directly benefit the education, monitoring, mitigation and advocacy programs of Barnstable Clean Water Coalition to improve water quality in the town of Barnstable.



SHUCK! A Day of Oysters and Beer

When: Saturday, October 20th
Where: Cape Cod Beer, Hyannis
Time: 1 p.m. to 5 p.m.

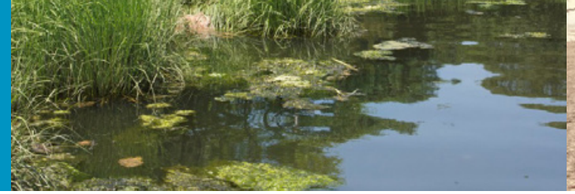
Join BCWC, Big Rock Oyster, Cape Cod Oysters, the Greater Hyannis Chamber of Commerce and the Barnstable Association for Recreational Shellfishing (BARS) at Cape Cod Beer for a day filled with locally-grown and harvested oysters, live music with 57 Heavy, and beer brewed right on site in Hyannis.

Get your tickets online today for this sure-to-be popular festival. Choose from a VIP Shuck Package that includes admission, beer ticket, ½ dozen oysters, access to VIP only beer line, 16 oz. stainless steel souvenir pint glass and official Shuck! festival t-shirt. Or buy individual admission, beer and oyster tickets separately.

For more information or to buy tickets, go to **BCleanWater.org** or **capecodbeer.com/event/shuck**.

Remember – you can't brew great beer or grow delicious oysters without clean water!

Alga –
The Good, The Bad and The Ugly



By Casey Dannhauser

As you enjoyed Barnstable's waters this summer, you probably noticed some of the effects of increased nutrient pollution. Although alga is a normal part of coastal ecosystems, excessive nutrients can lead to out-of-control growth known as an algal bloom. These blooms can produce toxins harmful to marine and human life and can create dead zones in the water. In addition, onshore decomposition of algal blooms produces foul odors and limits the ability for us to use and enjoy our beautiful beaches.

Species of alga found in estuaries and ponds

There are two general categories of alga: microalgae and macroalgae. Microalgae, or microscopic unicellular algae, is found in both freshwater and saltwater. Cyanobacteria blooms are found in ponds while rust tides and red tides are found in bays and inlets. Macroalgae, on the other hand, are large multicellular algae, which are visible to the naked eye. Seaweeds are marine macroalgae. They include dead man's fingers and sea lettuce.

What causes blooms?

An algal bloom is a rapid population increase of an alga caused by a combination of increased nutrients in the water, large amounts of sunlight, and warm temperatures. While this is a natural process, nutrient overloading leads to it occurring more often and with increasing intensity. In ponds, these blooms are the result of increased levels of phosphorous, while in estuaries they come from increased levels of nitrogen.

Why is this a problem?

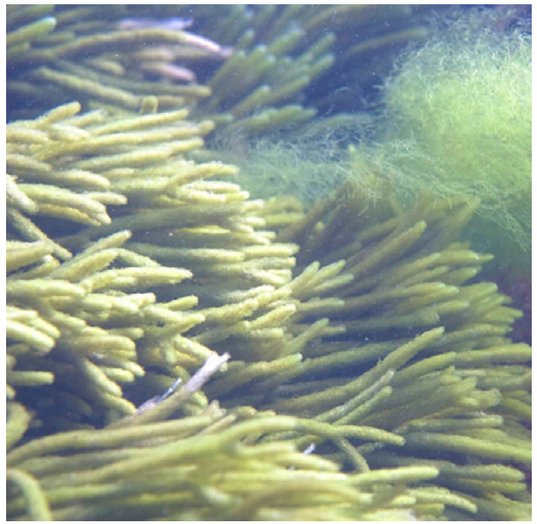
Algal blooms are problematic for several reasons. First, when algal blooms form, they block sunlight from reaching important marine plants such as eelgrass. This has contributed to the dramatic loss of eelgrass in Cape Cod's estuaries and bays in recent decades. Additionally, algal blooms result in low oxygen zones which can harm or even kill marine life. Algal blooms also cause aesthetic problems. Water clarity is extremely diminished and can be tinted green or red. As the algae die and decompose, they can produce extremely unpleasant odors.

Solutions to alga problems

The main solution to problems caused by algae overgrowth is nutrient reduction. Decreasing the amount of nutrients in the waterbody limits the amount of food the algae uses to grow. The two avenues for nutrient reduction are source reduction (municipal treatment and alternative septic systems) and in-situ reduction (aquaculture, floating wetlands, and other non-traditional technologies). BCWC is working to reduce nitrogen loading in our bays by addressing nutrient overloading both at the source and in the waters.

Blue-green alga *(Cyanobacteria)* – Found in ponds; contact with this alga can cause skin and eye irritation. Potentially fatal to dogs when ingested.

Dead man's fingers *(Codium fragile)* – While this invasive alga does not have any human health effects, *Codium* fouls shellfish beds and creates unpleasant smells as it decomposes on the beach.



Sea lettuce *(Ulva lactuca)* - Grows in bright green sheets. Blooms prevent sunlight from reaching submerged vegetation. Decomposition in the water leads to oxygen minimum zones. *Ulva* also washes ashore in large mats and creates foul odors as it decomposes.

Rust tide *(Cochlodinium polykrikoides)* – Creates a compound that damages gill tissue in fish and shellfish. If the bloom is large enough, it can turn the water a rusty color. Decomposition may reduce oxygen in water and lead to fish kills.

Red tide *(Alexandrium fundyense)* – Blooms of this alga cause the water to turn a reddish color. While it is safe to swim during a red tide, this alga produces a toxin that can be stored in shellfish tissue. Eating shellfish exposed to a red tide can cause paralytic shellfish poisoning.

Field Notes from Meg

Meet Our Summer Crew

Oliver Randon lives in Connecticut and spends his summers on the Cape. He is entering his second year at the University of St. Andrews in Scotland and is studying English and Modern History. His passions include running, cars, and NASA. Oliver wants to clean up our waters and environment for future generations to enjoy.

Isaac Benaka hails from Washington, D.C. and enjoys summers in Cotuit, where he can often be found on his boat around Cotuit Bay. He is currently attending Emory University in Atlanta, Georgia pursuing a Bachelor of Science degree in Environmental Science. Isaac hopes to pursue his interests in environmental policy or renewable energy. He likes to play golf and DJ.

Stephen McCloskey recently relocated to Cape Cod from California. He has a Bachelor of Science degree in Environmental Science from Georgia College and is currently finishing his Master's Degree in Biology. Stephen likes to play basketball and Chessmaster, and loves being outside.

Carter Teed is our only local Cape Codder. He is entering his senior year at Mashpee High School and is interested in studying animals and technology at college next year. Carter volunteers his time helping animals at several local non-profits. His interests include basketball, Kung Fu and working with his school's audio-visual club.

Casey Dannhauser of Cotuit grew up in New York, while spending her childhood summers boating on Cotuit Bay. She has a Bachelor of Arts degree in Environmental Studies from Holy Cross and next year will complete her Master's Degree in Oceanography at the University of Rhode Island. Casey loves sailing and any activities that take her outside.

Our seasonal staff have been very busy this summer out on the waters, beaches and docks in the Town of Barnstable. The staff could usually be found on Dead Neck Sampson's Island working in conjunction with Massachusetts Audubon Society staff, who co-own and co-manage the island with BCWC. They educated beachgoers and boaters about the birds, including piping plovers and least terns, that nest and live on the island. Staff used a seine net to collect marine organisms in the nearshore waters to identify and show people the multitude of creatures present in the area. In addition, they shared information about clean boating practices from the Town of Barnstable and educated boaters about how we can all work together to improve the water quality in our estuary.

When not on the island or the water, the staff were responsible for several monitoring and sampling programs around the town. They monitored six sites for marine invasive species as part of the state of Massachusetts' MIMIC (Marine Invader Monitoring and Information Collaborative) program. The staff inspected docks, pilings, and cobble beaches looking for 18 invasive organisms at various sites in the Three Bays estuary, Hyannis Harbor and Millway Marina.

The staff collected water samples and data from the Three Bays estuary for the SMAST monitoring program, and from Wequaquet Lake, Bearse Pond and Long Pond in Centerville for the weekly pond monitoring program previously done by the Barnstable High School Environmental Club. They were all trained to use sampling equipment such as dissolved oxygen meters, Secchi discs, and Winkler, nitrogen and phosphorous test kits. All the data and information collected is essential in tracking the water quality conditions in these local waters.

If you see our BCWC staff out on the water or around town, please say hi!

Oliver Randon

Isaac Benaka

Stephen McCloskey

Carter Teed

Casey Dannhauser

Barnstable Clean Water Coalition

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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.

Upcoming Events! BCleanWater.org

For more details on these events and more, visit our website at BCleanWater.org

Saturday, September 8th,
10 a.m. to 3 p.m.
9th Annual Cape Cod Wildlife Festival
Long Pasture Wildlife Sanctuary, Cummaquid

Saturday, September 15th
8th Annual Paddle for the Bays RACE Cape Cod
9 a.m. to 3 p.m.
Oyster Harbors Club, Osterville

Saturday, October 20th,
1 p.m. to 5 p.m.
Shuck! A Day of Oysters and Beer
Cape Cod Beer, Hyannis

We are very excited to have our oyster upweller tank up and running at Gateway Marina on Hyannis Harbor. A partnership between BCWC, Massachusetts Oyster Project and the Town of Barnstable, the upweller contains 50,000 oysters that are being grown from seed using water pumped in from the harbor. The oysters clean the water by filtering and feeding from the nutrients and sediment in the water. In the fall, the Town of Barnstable will relocate the oysters to sites where they can grow to harvestable size and continue improving water quality.

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