



Outer Cape Environmental Awareness Newsletter

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A word from OCEAN's Editor:

GORDON PEABODY

OCEAN 61 shares an inside look at some of our Interns this year. We also recommend an unusual article regarding fish falling from the sky and the explanation leaves me unconvinced, my opinion. Living on Cape Cod, the concept of a "Sand Battery" also caught my attention. **OCEAN** newsletter never has advertising and never will, as it is self-funded, to be shared by our readers and their friends. Thank you to our Associate Editor Catie Urquhart and Research Coordinator Jessica Hillman and thanks to you, our readers for enjoying and sharing our efforts. Safe Harbor is a small, interdisciplinary environmental consulting group, located on Duck Creek Marsh, in Wellfleet on Cape Cod.

-Gordon Peabody

New Clam in the Neighborhood

THANK YOU TO **OCEAN**
RESEARCHER LINDSEY STANTON

A new type of clam may soon be available for consumers in restaurants on Cape Cod. Though this is not an entirely new species, it is new to Cape Cod's restaurants. These clams, *Spisula solidissima*, are also known as Northeast Butter Clams, or surf clams. Their taste is described as sweeter and more delicate than little necks and cherrystones. The Cape Cod Oyster Company first began cultivating small batches of these butter clams last fall, and restaurants that have been able to procure them have received promising feedback from customers.

At this point, one big hurdle holding this new clam back from taking the restaurant industry by storm is the Massachusetts Division of Marine Fisheries regulation and permitting. Commercial Butter Clam beds cannot be expanded until these permits are in place. At one point the Cape Cod Cooperative Extension Marine Program was working with Cape Cod growers to get these clams to market, but efforts fizzled out due to the pandemic. Another factor is balancing supply and demand; many Cape Cod growers do not want to invest time and energy into growing these clams if there is not a market for them. At the same time, restaurants do not want to put a product on the menu that cannot be consistently available.

At the end of the day, biodiversity in the restaurant industry and in the ecosystem is a good thing. Currently 99% of the commercial shellfish grown in Massachusetts are quahogs or oysters. Diversifying can contribute to industry sustainability. We may all see Butter Clams on the menu soon.

Further information:

- www.capeandislands.org/arts/2017-08-10/butter-clams-a-new-species-diversifies-the-aquaculture-roster-on-cape-cod.
- <https://seagrant.whoi.edu/>
- https://www.capenews.net/regional_news/new-clam-species-could-soon-be-coming-to-the-table/article_acb19c18-3211-5b04-a8c7-049d6a2d7ab7.html?fbclid=IwAR3118DJVCRROXceaadyqzExcwv_p0fDBgblLJbUQMTl6GgG1c0m64bzOzM

Image source:

www.pangeashellfish.com/products/butter-clams.



"No Mow" Lawns

THANK YOU TO **OCEAN**
RESEARCHER LINDSEY STANTON

Back in **OCEAN 60**, we discussed how parts of Nevada were changing policies to make “non-functional turf” illegal. This was in an attempt to limit water consumption and return the region to more of its natural state. Minnesota has also passed new lawn regulations, but instead of focusing on saving water they're focusing on saving the bees. In that region the rusty patched bumblebee is at the brink of extension. This is in part due to the loss of natural habitat such as forests and prairies but also due to insecticides. This type of bee is of particular importance because they vibrate at such a frequency that allows them access to pollen that other insects can't reach.

To combat this crisis Minnesota has allocated almost 1 million dollars in incentives to urge residents to make their lawns more bee friendly. This entails the discontinued use of herbicides, less frequent lawn mowing, and a general rewilding of the lawn. The arrangement allows the bees to continue to have a food source with overall less work for the individual. Right now, people living in zones with the rusty bumble bee are eligible for up to \$500 dollars in order to make these changes. Other states are enacting similar measures to rewild landscapes, such as Philadelphia where a campaign could turn 10,000 acres of lawn into meadows and forests.

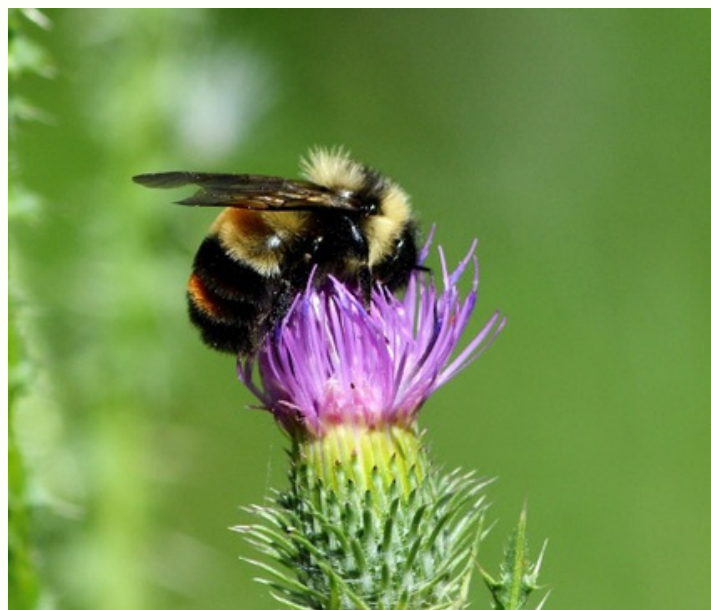
With more areas coming to the realization that important species may be on the brink of collapse, incentives like the one seen in Minnesota, and measures such as those seen in Philadelphia may become more commonplace.

Further Information:

- https://returntonow.net/2020/01/29/minnesota-will-pay-homeowners-to-replace-lawns-with-bee-friendly-wildflowers-clover-and-native-grasses/?fbclid=IwAR15A1QbkgTgTf9FuP36EG77Fp2_h7GWePv6bnfclDWhmPZng0D9L0b-xM
- https://www.northcentralpa.com/life/outdoors/pa-initiative-could-turn-10-000-acres-of-lawns-into-meadows-forests/article_71f3efe6-7d4b-11ea-bc77-97b2afdd3c38.html

Image Source:

<https://www.virginiamercury.com/2020/09/08/virginias-vanishing-bee-state-works-to-save-rusty-patched-bumblebee/>



Crabs Living in a Time Warp

THANK YOU TO **OCEAN**
RESEARCHER TESS HOLLAND

Children visiting our beaches are fascinated by the ancient-looking, dark-shelled creatures and will often flip them onto their backs, exposing legs and a gill system related to spiders. Given the beauty and serenity of Cape Cod, it is easy for local beachgoers and tourists alike to take advantage of our natural resources and forget to respect the creatures that have inhabited these waters far longer than we have been vacationing. Scientists discovered fossilized species of Horseshoe Crabs from 450 million years ago, making them older than even the dinosaurs.

Humans have been increasingly affecting horseshoe crab populations: The Lobster bait industry has shown interest in these crabs; Horseshoe Crabs are captured to test their copper-based blood with various vaccines and drugs but 10-30% of the horseshoe crabs released after their blood extraction do not survive. Although these creatures help us, in turn, we are harming them and threatening the other animals who rely on the horseshoe crab as a source of nutrition. Although it is easy to forget the millions of creatures and organisms that inhabit the beaches we claim as our own, we must remind ourselves not only of their importance in marine ecosystems, but also of their significance in our Earth's history. Mary Bergmann explains how "at night, when all the brightly colored bathing suits are hanging on clotheslines, and sand toys have been stowed in beach bags, the beach becomes a different place. It belongs to the Horseshoe Crabs" (Bergman, 2022). Instead of granting these magnificent creatures the peacefulness and solitude of only the night, let's provide them also with space during the sunny hours of the perfect beach day; after all, just as we are visitors on sandy dunes of Cape Cod, we are also visitors in the home of the Horseshoe Crabs.



Further Information:

- <https://www.capeandislands.org/in-this-place/2022-06-21/a-relic-from-another-time-still-very-much-alive-today?fbclid=IwAR0Ei9dfNzVY8KP8XugwQrigsoFDaNSeFpvl23xzSQkhDpn83gOBqdqZE8E>.
- <https://www.capecodtimes.com/story/news/environment/2018/06/17/growing-horseshoe-crabs-from-eggs/11742900007/>.
- <https://oceanconservancy.org/blog/2020/05/19/11-facts-horseshoe-crabs-will-blow-mind/>.

Image Source:

<https://www.massaudubon.org/get-outdoors/wildlife-sanctuaries/wellfleet-bay/about/our-conservation-work/horseshoe-crabs>

When Fish Actually Fell Out of the Sky

THANK YOU TO **OCEAN**
RESEARCHER TESS HOLLAND

Last December, as residents of Texarkana, Texas ventured out of their homes after the passing of a storm, they encountered an array of fish (a species of Shad) scattered outside and seemingly spread randomly over streets and yards. For nearly six months, scientists were unable to provide a concrete explanation as to why this occurred; many assumed it was due to small marine animals being swept up into waterspouts, but meteorologists at the National Weather Service reported that there were no signs of this event occurring.

In June 2022, geologist Sharon Hill and author Paul Cropper published an independent study attributing the falling fish to birds regurgitating and dropping the fish from above. Before reaching their conclusion, Hill and Paul explored various ways in which this mystery could have been explained; they examined the possibility of a flood from the storm depositing the fish onto the streets, planes dropping the fish accidentally when stocking nearby bodies of water, and even the idea that the entire situation was a prank. After much research and investigation, the two decided that the most logical hypothesis was that the fish were regurgitated by the birds or dropped from their beaks or talons. "Usually, they fly down in the morning. They go between two different lakes that are in the area and you'll see hundreds of them flying over at a time," Cropper said. Nearly ten pounds of fish were removed from an airport tarmac following the storm (Choi, 2022).

Further Information:

- <https://www.dallasnews.com/news/2022/06/22/scientists-figured-out-why-fish-fell-from-the-sky-in-texarkana-and-its-pretty-gross/>.
- <https://www.usatoday.com/story/news/nation/2021/12/31/fish-falling-from-sky-texarkana/9062273002/>.



Image Source:

<https://www.dallasnews.com/news/2022/06/22/scientists-figured-out-why-fish-fell-from-the-sky-in-texarkana-and-its-pretty-gross/>

Unique Concept in Green Energy

THANK YOU TO OCEAN RESEARCHER ABIGAIL EILAR



Green energy has become a hot topic as we think about the future of our energy sources. Heating homes and water, turning the lights on, or charging our favorite things all need energy and there are concerns over when renewable, intermittent sources may not be enough, as the wind stops or the sun sets. Researchers from Finland may be changing that, by developing a “Sand Battery”, using sand to store green power for months.

Sand can be heated at temperatures above the boiling point of water, allowing sand to store more energy than a silo of similar size filled with water. Sand is also a good medium for storing heat and over time, loses very little heat, making this an effective source of energy when needed. The sand battery is envisioned to serve as a reservoir of wind and solar energy and be a cost-effective source when energy is expensive. Currently the sand battery is in commercial operation in Western Finland that heats residential and commercial buildings. So far, the Finns are seeing success with the sand battery and it is their hope to continue to upscale the use for energy.



Further Information:

- <https://www.bbc.com/news/science-environment-61996520>
- <https://polarnightenergy.fi/sand-battery>

Image Source:
<https://www.smart-energy.com/storage/first-commercial-scale-sand-battery-goes-online-in-finland/>

Algae Blooms in Cape Cod

THANK YOU TO **OCEAN**
RESEARCHER ABIGAIL EILAR

As of November, over 100 freshwater ponds were being monitored for concentrations of cyanobacteria on Cape Cod. Cyanobacteria, or blue-green algae produces toxins that can affect liver and nerves. Typically, these blooms occur in the summer when water temperatures rise, nutrient levels from fertilizers, or runoff and wastewater seeping from the soil. The Association to Preserve Cape Cod (APCC), who conducts monitoring efforts, advises people to avoid water if they seem discolored or give off a strong odor.

There are growing concerns over algae blooms with increased water temperatures, sea level rise, and changes in rainfall and salinity all attributed to climate change factors. Andrew Gottlieb with the APCC, that without changes in human behavior, we may not be able to keep our ponds safe. Insufficient wastewater treatment of homes near ponds and the use of fertilizers on lawns will likely continue to contribute to these blooms if changes are not made. Luckily awareness of these algae blooms is growing, and monitoring efforts continue to keep the public safe. There are also online resources such mass.gov that has a list of current cyanobacterial advisories to help residents.



Further Information:

- <https://www.boston.com/news/local-news/2022/06/29/toxic-algae-is-back-this-time-on-the-cape/>
- <https://www.capecodtimes.com/story/news/2022/11/05/cape-cod-ponds-check-out-this-cyanobacteria-alert-list/69622549007/>
- <https://www.capeandislands.org/local-news/2022-07-01/toxic-blue-green-algae-blooms-are-back-in-local-ponds>
- <https://www.mass.gov/guides/cyanobacterial-harmful-algal-blooms-cyanohabs-water>

Image Source: APCC

Healthy Flour

THANK YOU TO **OCEAN**
RESEARCHER CATIE URQUHART

If you're someone who grew up exploring outdoors as a kid, you've probably been told not to eat strange mushrooms once or twice in your life. So, it may come as a surprise to learn about Hyfé Foods, a startup using mushroom mycelium—another word for the fungi's complex root system—to create a wheat flour alternative. Originally designed as a brand promoting improved nutrition due to the flour's high-protein, gluten-free makeup, Hyfé is one of the many food companies making waves in the climate sector. As we continue to see our climate changing, many warn of the impacts that our food economy will face. Harvard scientists have warned that even following the Paris Agreement and limiting warming to 2 degrees, we may lose 60% of wheat production by the turn of the century (BBC). This is furthered by concerns about monoculture in a changing climate—growing one crop is much riskier when facing drought or disease than introducing variety to our farm systems. Hyfé flour provides the diversity our food systems need and is easy enough to grow that it can be produced almost anywhere in the world. Furthermore, the Hyfé company has attempted to reduce its own environmental impact by repurposing gallons of water loaded with sugars that are washed away from beverage manufacturers to feed the mushrooms they're growing. Hyfé flour tastes and looks just like wheat flour; although we don't recommend munching on just any mushroom you find on the side of the road. It seems like these mushrooms may solve many of our health and environmental concerns in the coming years!



Further Information:

- <https://www.hyfefoods.com>
- <https://www.builtinchicago.org/2022/09/08/chicago-future-5-startup-hyfe-foods-q3-2022>
- <https://www.bbc.com/news/business-62646817>

Image Source:

<https://www.foodnavigator-usa.com/Article/2022/05/31/What-feedstocks-will-fuel-the-next-wave-of-microbial-fermentation-High-protein-mycelium-flour-startup-Hyfe-Foods-turns-to-goldmine-in-waste-water>

Deadly Rain in Death Valley

THANK YOU TO **OCEAN**
RESEARCHER CATIE URQUHART

Known for being dry and salty, Death Valley doesn't usually strike visitors as a rainy location. However, almost one thousand visitors were stuck inside the national park after a sudden and unordinary amount of rainfall caused flash floods all over the park in August 2022. Measured at 1.7 inches of rain (a casual week of rain in a rainforest), this amount of water was the greatest in recorded history for Death Valley. In fact, meteorologists explain that Death Valley typically only gets 2.2 inches of rain over a whole year, making this an "unprecedented" scenario (NPS). The damage to the roads and infrastructure, along with many tourists remaining stranded within the park go to show that we were not prepared for this striking weather event. However, from a geological standpoint, this flooding was not as surprising. Many know Death Valley for its extensive salt flats—but did you ever wonder how they got there? It turns out that this part of California is the lowest point in North America and over thousands of years, rain brought all of the salt minerals dissolved from rocks at higher altitudes down to the valley. In fact, the salty "Badwater Basin" even fills up with water during heavy rainfall. While Death Valley thankfully reopened in December of 2022, this flooding event goes to show that the wild, wild, west has some wild weather to go along with it and tourists should always take caution of flood alerts when planning trips to desert areas.



Further Information:

- <https://www.doi.gov/blog/12-things-you-didnt-know-about-death-valley>
- <https://www.bbc.com/news/av/world-us-canada-62455325>
- <https://www.nps.gov/deva/learn/nature/deva-deluge-2022.htm>

Image Source:

<https://www.theguardian.com/us-news/2022/aug/10/death-valley-floods-climate-crisis>

Internships with Safe Harbor

Safe Harbor has an active Intern program. Here are some of last year's interns that have worked with us.

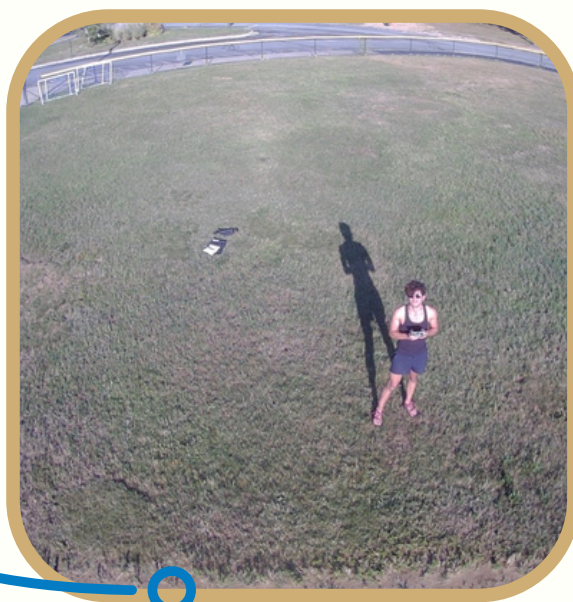
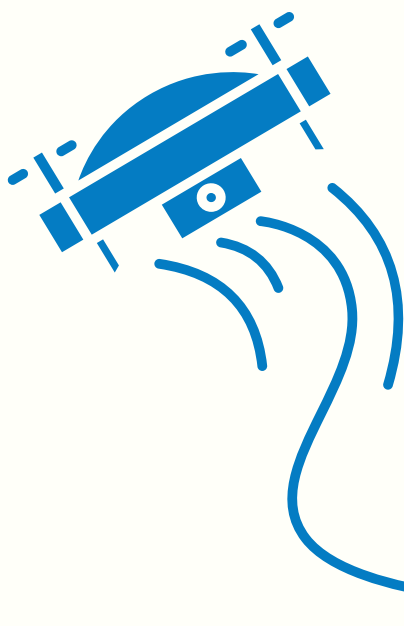


Jenna is a local College, Environmental Studies graduate, who began working with us as an intern and has stayed



Paige helped us measure beach sand movement this summer. [**Click here for a video!**](#)

Paige helped us part time, wanting to explore environmental work

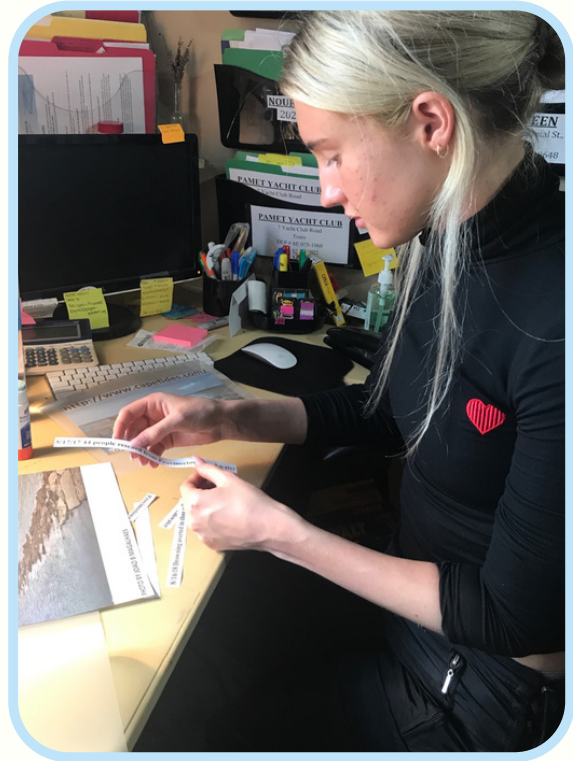


Jack is an Environmental Studies graduate who worked part time with us operating our drone

Internships with Safe Harbor



As part of her internship with our colleagues at Aline Architects, California High School student Kaela worked with us one day each week



Colleen interned with us for three years and just graduated from college



Jaimie coordinated our interns, tracking sand movement near shell fishing areas



Thank you!

Editor's Final Thoughts:

I am especially grateful to Associate Editor Catherine Urquhart and Research Coordinator Jessica Hillman, for supporting my commitment to environmental education.

-Gordon Peabody, **OCEAN** Editor.

Check out our website for other free publications:

www.safeharborenv.com/ocean-newsletter

Thank you for your support!



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