OCEAN

www.SafeHarborEnv.com

Outer Cape Environmental Awareness Newsletter

OCEAN 52 shares an extraordinary contrast, of how Cape Cod residents a hundred years ago experienced their island vanishing from beneath them and last month, a unique coalition of environmental groups, acted to save another island from development. We also began a new series on "Who We Are", finding out who our Researchers are. My favorite article is about a humble group that found a way to make in-pavement driveway solar cells from used water bottles. This remarkable idea received our Environmental Innovation Award. **OCEAN** is the environmental education publication of Safe Harbor Environmental Services and is self-funded, with no advertising. We put this together for you, our readers, who are curious about local and large scale, environmental trends, anomalies and unusual events. This is a public domain publication and is yours to share. We begin with suggestions in our continuing series "Staying Safe". Gordon Peabody

September 2020 Issue No. 52

STAYING SAFE (PART II)

In our last issue, **OCEAN 51**, we wanted to provide our community with some resources and safety tips to stay informed during this changing time. 2020 has been a year marked by a global pandemic and we have all worked hard as a community to come together and prevent the spread of COVID-19. This issue we want to continue to share resources and safety tips with our readers to better enable our community to have a safe, healthy, summer.

To review up to date local information from the Barnstable County Department of Health and Environment please view: www.barnstablecountyhealth.org to view up to date local information from the Massachusetts Department of Public Health please view: www.mass.gov/covid19. Remember to stay informed on local advisories and updates.

While staying home and away from crowds whenever possible is the best way to minimize potential exposure, following advice such as; wearing masks, washing hands, and using hand sanitizer is also important. To support Cape Cod consider donating homemade face masks or headbands for face shields to Barnstable County (https://www.barnstablecounty.org/2020/04/03/donate-home-made-face-masks-or-face-shield-headbands-to-support-covid-19-emergency-response/) to support emergency responders. Those with 3D printers can even print face shields by following these instructions: https://www.designthatmatters.org/covid-19. If you can't donate face masks or face shields but are looking for additional ways to help the Cape Cod community you can donate blood or volunteer for the Cape Cod Medical Reserve Corps. We hope everyone has a safe healthy summer!

Further information:
www.barnstablecountyhealth.org
www.mass.gov/covid19
https://www.barnstablecounty.org/2020/04/03/donate-home-made-face-masks-or-face-shield-headbands-to-support-covid-19-emergency-response/
https://www.designthatmatters.org/covid-19

Written by the Editor, Gordon Peabody

Photo credited to Barnstable County Health Department

CAPE COD'S "ATLANTIS"


Circa 1890, Photo credited to Lisa King

Most people are familiar with the two islands off the coast of Cape Cod; Martha's Vineyard and Nantucket. However, many would be surprised to find out that there used to be another island: Billingsgate, though it didn't begin as an island. In 1620 when the pilgrims first arrived in Provincetown, they began exploring and stumbled upon a fertile waterway that was rich with oysters, this eventually became Billingsgate, named after the world-famous fish market in London. With time, as areas were renamed, the area known as Billingsgate became smaller and referred to one area in Wellfleet Harbor in particular. During the 19th century, a town existed there, that became a prosperous fishing village. Billingsgate included 50 acres of land, 30 homes, a school, and a lighthouse. However, the highest point on the island was roughly 10 feet above sea level and residents at that time were unaware of the critical relationship native vegetation played in stabilizing sand. Deforestation, overgrazing, and lack of fire control resulted in Billingsgate being cut off from land and it became an island off of Wellfleet. Shortly after the lighthouse was built it became apparent that erosion was affecting the island as well, chipping away around the lighthouse. Over the years, erosion continued and intensified, until the Billingsgate Island began to vanish. By the late 1800's, accelerating erosion forced residents to move to ashore, bringing their homes with them. Following the disappearance of Billingsgate, low tides uncovered remnants from old structures which were visible for some time. However, as time progressed these sightings became farther and fewer between. Now, in place of a once thriving fishing village is a bit of history and Cape Cod's Atlantis.

All that remains of Billingsgate Island of Wellfleet is a shoal exposed during very low tides, 1991. The fate of Billingsgate Island may be a precursor for Cape Cod as the sea continues to erode the fragile land. ***Photograph by Dann S. Blackwood, U.S. Geological Survey.***

Check out these links for further reading: www.capecodfishermen.org/item/chartbillingsgate-0528?category_id=9, www.capecod.com/lifestyle/billingsgate-the-lost-cape-cod-island/, www.capecodlife.com/billingsgate-island-wellfleet/

Thank you to ***OCEAN*** *Researcher Lindsey Stanton*

CAPE COD ISLAND SAVED FROM DEVELOPMENT

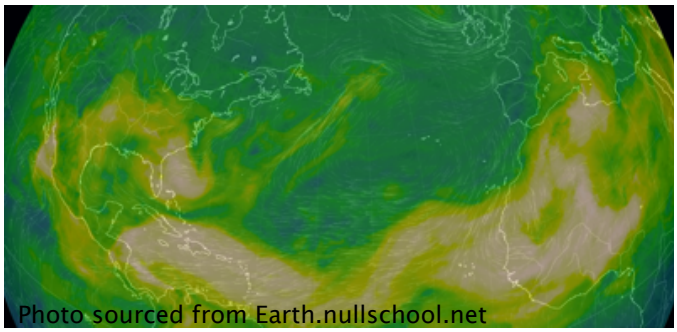
Changing times choose preservation over development. A coalition of environmental groups recently completed purchase of 24-acre Sipson Island, in Pleasant Bay on Cape Cod. We were unsuccessful in contacting Sipson Island Trust's President, but the following link provides more information: Island Off Cape Cod Opens to Public for First Time in 300 Years

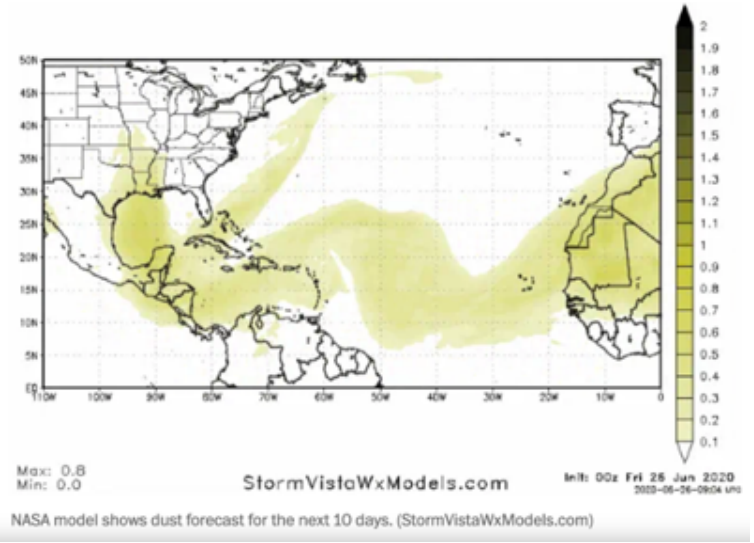
Written by the Editor


Photo credited to Sipson Island Trust

BREATHING AFRICAN DUST

In late June of 2020, as the global pandemic was dominating news cycles, another respiratory threat was also traveling across continents: dust. As described in **OCEAN 32**, dust from the Sahara Desert blows across the Atlantic Ocean most summers, when strong winds lift desert sand into the air, allowing easterly trade winds to bring it across the Atlantic. This phenomenon, known as the Saharan Air Layer (SAL) was particularly strong in the summer of 2020, with *more dense dust than has been observed over the past 50 years*. In early June, tall thunderstorms south of the Sahara caused vertical winds that brought dust up to 20,000 feet, which is the suspected cause of this year's SAL intensity. Normally, the SAL brings colorful sunsets, and it can also dampen hurricane formation (by blocking transfer of solar energy to the Sea surface) and bring important nutrients to the ecosystems in the Western Hemisphere. However, levels this year resulted in dangerous air quality that presented health risks. Residents of Caribbean nations were cautioned to stay inside and wear masks to protect themselves from the dust. Particulate content in the air above Puerto Rico was more than three times the unhealthy level established by the US Environmental Protection Agency. The SAL also made its way to the lower 48 states, causing air quality in the Gulf to deteriorate. Health experts expressed concern that the dust could present further risks to those dealing with coronavirus symptoms. Visibility also declined, as large swaths of the region experienced brown and grey skies. Fortunately, the event was short lived.





NASA model shows dust forecast for the next 10 days. (StormVistaWxModels.com)

Check out these links for further reading: https://weather.com/storms/hurricane/news/2020-06-21-saharan-dust-sal-caribbean-gulf-of-mexico-us-forecast, https://thehill.com/changing-america/sustainability/environment/504181-godzilla-sahara-dust-cloud-headed-toward-the-us?fbclid=IwAR0d4aafGH_JhW5psb2FdTQRMetBEuSOpzW6-z-zBB3zga4gQL8rsWFHMUA, https://www.scientificamerican.com/article/saharan-dust-plume-slams-u-s-kicking-up-climate-questions/

*Thank you to **OCEAN** Researcher Rae Taylor-Burns*

WHAT'S GOING ON WITH VICTORIA FALLS?

Victoria Falls, one of the seven wonders of the world, has come roaring back to life after a period of drought in 2019 brought the falls to a trickle. The falls are on the Zambezi River, which is one of the largest rivers in Africa. The Zambezi flows through Angola, Zambia, Namibia, Botswana and Zimbabwe before emptying into the Indian Ocean in Mozambique at the end of its 1,700 miles. It supplies people along its path with water, fish, transportation, and electricity, as well as tourist dollars from attractions such as Victoria Falls. Victoria Falls, which is called Mosi oa Tunya by locals, which translates to "The Smoke that Thunders", is known as the largest waterfall in the world (though it is neither the tallest nor the widest) due to the volume of water that typically flows over the falls. In 2019, the river and the falls were at their lowest flow since 1995. Outflow from electricity generating dams on the river had to be limited, causing widespread blackouts across Zambia. Fishing grounds dried up and crops failed due to the drought.

(continued on the next page)

WHAT'S GOING ON WITH VICTORIA FALLS? (cont.)

Victoria Falls slowed to a trickle, causing tourism in the region to slow as well. In January 2020 the flow in the river was 349 cubic meters per second. However, in following months the river began to rise and by April of 2020, the river came roaring back to life during the largest flood since 1977-1978. The flow had increased by tenfold, up to 3,890 cubic meters per second. Mosi oa Tunya began to smoke and thunder once again, giving hope to locals. One twitter user posted a video of the falls flowing full force and wrote "Africa my home. Victoria Falls back to life. Nature reigning supreme. 'No one dare challenge when I say I am An African' Africa will survive." Ironically, though Victoria Falls is putting on a fantastic show due to the historic flood, coronavirus travel restrictions are still severely hampering tourism in the region. Locals will be the only people to see Victoria Falls at its highest flow since recording began.

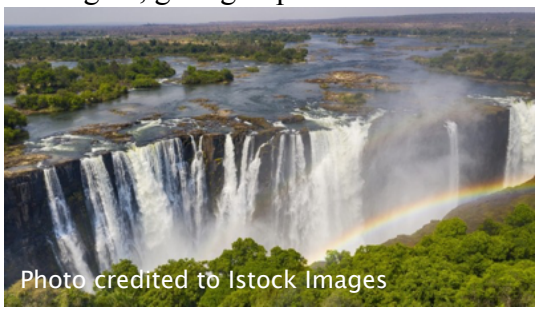
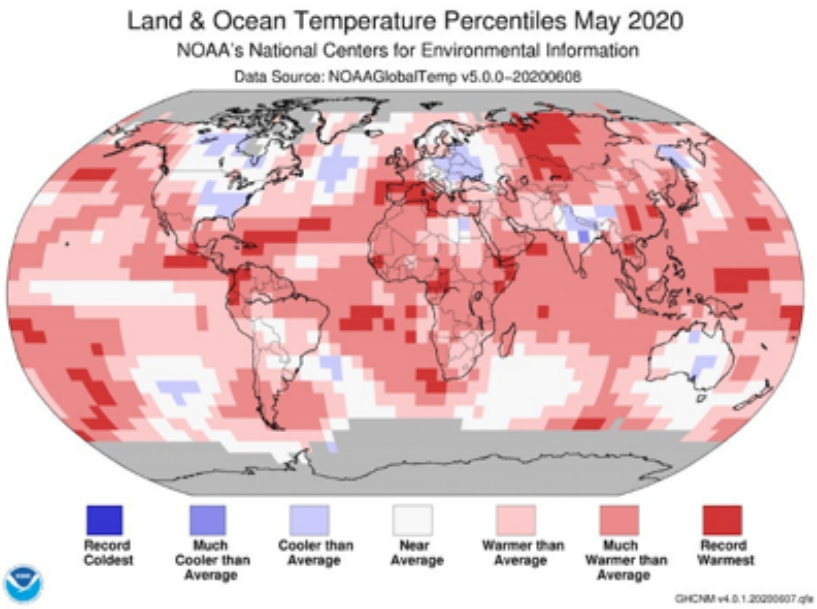


Photo credited to Istock Images

Check out these links for further reading:
https://www.bloomberg.com/features/2019-zambezi-river-climate-crisis/, https://www.timeslive.co.za/sunday-times/lifestyle/travel/2020-04-22-vic-falls-records-highest-flows-in-a-decade-but-covid-19-lockdown-means-tourists-cant-see-it-first-hand/?fbclid=IwAR2k1cmnhZpE5x_IKry_PT8hDUkNUxZFyh-SEqB8--wehWSVkBB5Bzox4Zg, https://www.thesouthafrican.com/news/africa/watch-victoria-falls-drought-water-flowing-recovery-levels-video/

*Thank you to **OCEAN** Researcher Rae Taylor-Burns*

TURNING UP THE HEAT



While 2020 has been a year full of uncertainty and unknowns, this is some news we probably expected to hear. This year, like last year, and almost every year for the past six decades, could become one of the hottest years on record since data tracking began 141 years ago. A predicted by experts, this year has fallen in line with the trend of increasing average global surface temperatures. The past five years have been the hottest on record and each decade has consistently become warmer since the 1960s. This past May was 0.06º degrees Celsius warmer than that of May 2016, which previously was the hottest May on record since the 1880s, according to NASA. Typically, global temperatures peak during the solar cycle, and/or during El Niño events, although 2020 has already broken records regardless of those factors. However, not all parts of our planet experienced the same record-breaking heat. For example, Canada and the Eastern U.S., fell 1.0º degrees Celsius below average. Although there is some outlying data, the overall trend for increasing average global surface temperatures continues to be strongly reflected in the data collected. This means hotter temperatures can continue to be expected until the cause of this, greenhouse gas emissions, are dealt with on a global scale.

Check out these links for further reading:
https://www.nbcnews.com/science/environment/2020-track-be-one-warmest-years-record-n1231481, https://www.nytimes.com/2020/06/18/climate/summer-weather-prediction.html, https://www.wunderground.com/cat6/may-2020-earths-warmest-may-on-record?cm_ven=hp-slot-2

*Thank you to **OCEAN** Researcher Tess Holland*

HEATWAVES IN THE ARCTIC CIRCLE

There has been a noticeable and alarming trend of climbing temperatures seen in the Arctic Circle as well as in the northern region of Siberia in recent years. This region normally experiences a series of high-pressure and low-pressure systems. During the 2019-2020 winter season, a strong jet stream led to very warm conditions. While this is the basic formula for heat waves around the globe, the Arctic Circle has a unique set of circumstances adding to the rise in temperatures, as the region is experiencing more than twice the average global rate of warming.

These high temperatures have resulted in an increase in widespread wildfires which have a variety of health effects for humans and the environment. This can include smoke inhalation by humans due to the prolonged fires in the areas, a change in fish migration behavior, melting of permafrost and many further impacts. The melting of permafrost has been a huge threat infrastructure integrity. As a result, there have been fuel leakages and other environmental disasters related to oil industry as failing infrastructure causes potential releases of methane gas into the atmosphere.

Photo credited to Denis Kozhevnikov/TASS via Getty Images

The rapid changes occurring in this region could be an indicator of things to come across the planet. Scientific analysis shows that these temperatures would be impossible without human-induced climate change. Human emissions of greenhouse gases like carbon dioxide contribute significantly to the warming of the Artic. Though scientists aren't sure why it is warming at double the rate of the rest of the planet, what the Artic is experiencing certainly highlights the devastating possibilities for future impacts of climate change.

Check out these links for further reading: https://www.worldweatherattribution.org/siberian-heatwave-of-2020-almost-impossible-without-climate-change/, https://www.vox.com/2020/6/23/21300279/arctic-siberia-temperature-heat-wave-record-russia-fire-climate-change, https://www.nytimes.com/2020/06/09/world/europe/russia-arctic-oil-spill.html

*Thank you to **OCEAN** Researcher Madeline Conley*

OCEAN 2020 INNOVATION AWARD

OCEAN would like to recognize the **Platio Home System** for the 2020 Environmental Innovation Award. Platio Solar, a Budapest based technology company, focuses on clean energy solutions that are aesthetically pleasing and practical. The Platio Home System technology converts used PET bottles (polyethylene terephthalate is one of the most commonly used plastics) into parts of solar panels that can be installed in home driveways.

Solar panels are known to be expensive upfront but are a sustainable alternative to relying on the grid for coal-powered electricity. On average, a home with solar panels pays off the initial cost in eight years, after which the return on investment can be up to 20%. While solar panels seem to be an ideal green energy solution, they can be visually unappealing and are often built out of materials that are almost impossible to dispose of. This makes them a significant source waste after they are past their use lifespan of about twenty-five years (continued on the next page)

Photo credited to Platio Solar

OCEAN 2020 INNOVATION AWARD (cont.)

The Platio Solar company is overcoming these challenges to the solar panel industry by employing recycled plastics in the paving slabs underneath the solar cells and glass tiles. One square meter section of Platio solar pavement is made from 400 recycled PET bottles, and twenty square meters is enough to power an average household. Their panels are designed to fit seamlessly into walkways with a sleek visual profile and a non-slip surface. Platio Solar has already installed these systems in public spaces. In 2019 they placed one square meter pavement sections in a park, providing safe, low profile charging stations for people walking by. The company is now creating designs that integrate solar panels into home driveways, durable enough to withstand the stress of weather and cars. This green energy solution is incredibly innovative, as it employs recycled materials in combination with practicality and visual appeal, making it ideal for propelling sustainability into the future.

Check out these links for further reading:

http://platiosolar.com/, https://www.energysage.com/solar/why-go-solar/earn-great-returns/, https://www.forbes.com/sites/michaelshellenberger/2018/05/23/if-solar-panels-are-so-clean-why-do-they-produce-so-much-toxic-waste/#53a98714121c

*Thank you to **OCEAN** Researcher Dana Bloch*

UNWELCOME COMPANY

Photo credited to Juan Cuetos for Oceana

Often summer beachgoers are concerned about sharks and sunburns, but this year there is some new company consider when at the beach. With tentacles reaching up to 120 feet in length, the Lion's Mane jellyfish tops the charts for the largest jellyfish species in the world. For such a remarkable size, their average lifespan is only a year, but their size does bring a strong sting. They have upwards of 150 tentacles per lobe which could add up to 1200 stingers per jellyfish, making a sting difficult to prevent. The majority of Lion's Mane jellyfish are found in the North Pacific and Artic Ocean. Recently they are expanding their presence to the New England coast and sightings have of these monstrous jellyfish are increasing. Their primary diet consists of plankton, small fish, and crustaceans. Despite not hunting humans, the Lion's Mane jellyfish put people at risk due to their long tentacles and presence nearshore.

Jellyfish are primarily pelagic creatures, residing in the open ocean, and rely on currents to travel. This can cause travel patterns to be unpredictable, so staying up to date on any sightings near you or local beaches is the best information one can use as a precaution for enjoying the beach. Research has shown that overfishing and pollution have increased the jellyfish's food sources and habitat range. This has led to increases jellyfish populations in human areas nearshore that may put beachgoers at risk. Although the Lion's Mane jellyfish sting is not known to be life threatening, it brings on massive pain that may prevent individuals from getting to safety, or even cause individuals to have an allergic reaction to the sting.

Photo credited to Scott Landry, from Provincetown's Center for Coastal Studies, who posted a Leatherback Sea Turtle on Stellwagon Bank, lunching on one of these.

You may be asking, as a beachgoer, what can I do if I encounter a Lion's Mane jellyfish and how can I help educate others? Vinegar is a great solution for counteracting the pain of jellyfish stings and lifeguards often have it handy in for this very use. In general, it is always good practice when near the sea to stay up to date on information (like jellyfish sightings), following beach warning signs, and stay aware of your surroundings to protect yourself from any uncertainty and danger.

Check out these links for further reading:

www.oceana.ca/en/marine-life/corals-other-invertebrates/lions-mane-jellyfish, www.wgbh.org/news/local-news/2020/06/16/lions-mane-jellyfish-spotted-in-new-england-waters#:~:text=16%2C%202020-,Lion's%20Mane%20Jellyfish%20Spotted%20In%20New%20England%20Waters,down%20the%20New%20England%20coast, www.cranberrycounty.blogspot.com/2020/06/our-friend-lions-mane-jellyfish.html?fbclid=IwAR0KGuWaMFnj4j8DP4jPNhMpKHHXbu_m8TlyaY6f7Bw_j5HLDy76msmxDTk

*Thank you to **OCEAN** Researcher Abigail Eilar*

DISPATCH FROM ALASKA

Who We Are: OCEAN Researcher Dana Bloch

Photo from Dana Bloch

Our **OCEAN** Researchers are scattered to the four winds in my digital world. So, I decided to try and find out more about some of them and chose Dana Bloch. I soon discovered she was on the Alaskan coast, doing whale research. I was challenged, tracking our time zone and daylight differences but we finally had a chance to talk. I can say this "Dana is a committed scientist".

"Currently I am in Warm Springs Bay, Alaska as a research assistant for the Alaska Whale Foundation, studying humpback whales. Our days on the water start early, typically around six in the morning, to beat any afternoon wind. The research varies depending on the day. We are seeking abundance and distribution data and collect photo identification of each whale we encounter. We also study the body condition of the whales using high resolution images collected from drones and collect data to study the social structure of foraging groups. Days on the water are balanced with long days of processing data, an important component in any successful field season!"

"This summer, I am initiating an additional project with an oceanographic component that will focus on the impact of humpback whales on oceanic carbon and nutrient cycling. I hope to turn this investigation into graduate research to better understand the complex interactions between marine organisms and the environment in which they live. Ultimately, I would like to work to bridge the gap between the scientific community and the general public to help conserve the earth's magnificent ecosystems."


Photo from Dana Bloch

Introduced by the Editor, written by Dana Bloch

HERRING RIVER RESTORATION GAINS MORE FUNDING

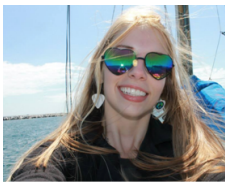
https://www.capecod.com/newscenter/state-announces-grants-for-river-and-wetland-restoration-and-climate-adaptation/?fbclid=IwAR3jVXzDAapgDW22IH7xNzGgE7ivPNuwCJeAsEq6p-ddH9haYMypdR2mcGY

For current updates, go to Friends of Herring River website.

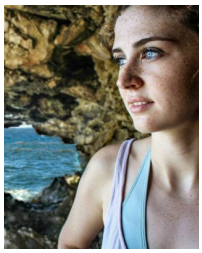
Image of Wellfleet Oysters by Joy Cuming, Aline Architects, Orleans, MA.

Photo credited to Sama Thywissen

Brief Update from the Associate Editor at 14,000 feet! I have been given the opportunity to continue my graduted studies in Environmental and Natural Resource Policy at University of Colorado Boulder. Greetings from the Front Range!



A special thank you to Samantha Thywissen, for her continued, professional level of formatting and editing each issue of as ***Associate Editor*** **OCEAN 52**.



To Jessica Hillman,
thank you for coordinating our far-flung research team
and tracking the various articles for each issue.

Check out our website for other free publications: <http://safeharborenv.com/free-publications/>

Thank you for your support!