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OUTER CAPE ENVIRONMENTAL AWARENESS NEWSLETTER



We are proud to share our 39th issue of **OCEAN**, showcasing solar powered tents, created by inner city High School girls through a grant from MIT. Check out our “UPDATES” section to get caught up on our research for biodegradable balloons; our response to the Caribbean Hurricanes; and why neonicotinoid pesticides seem to be in 75% of honey tested. Please share **OCEAN 39** wherever there is interest, this is your environmental newsletter Thank you, Gordon Peabody, Editor

October, 2017 Issue No. 39



Photo credit: Gofundme DIYGirls @EurekafestMIT

Girl Power & Solar Power Bring Innovation for the Homeless

A group of twelve high school students from San Fernando have drawn increasing attention for an innovative idea to help the homeless through solar powered tents. The design of the tent allows it to fold up into a backpack it also has button powered lights, multiple USB ports, micro USB ports and may eventually be made with a sanitizing UVC light. The inspiration for this invention arose due to a drastic increase in homeless over the last few years in the area. According to the 2016’s homelessness statistics 564,708 people in the United States were homeless, with 15%

of those people being considered ‘chronically homeless’.

The goal of this invention was to ultimately improve the lives of individuals experiencing homelessness within their community. The girls were recruited by DIY Girls, a nonprofit program that teaches young girls from low income neighborhoods about math, science and engineering. With the help of DIY Girls the team was able to apply for, and was eventually awarded the Lemelson MIT \$10,000 dollar grant. The Lemelson MIT program encourages young people to pursue creativity through invention, and allowed these girls to begin developing their idea. Due to this grant the girls were able to bring their idea to life and on June 16th they traveled to Cambridge Massachusetts to present their creation.

Though there are still a few kinks to work through the prototype looks promising. One day the girls hope to mass-produce this product and in turn help countless individuals. Though this creation started as a way to help homeless people, one day it could be used to help refugees or others in a tight spot.

More information in the link below:

<http://mashable.com/2017/06/15/diy-girls-solar-powered-tent-homeless/#sEAnUlynkSql>

Thank you to **OCEAN** Researcher Lindsey Stanton

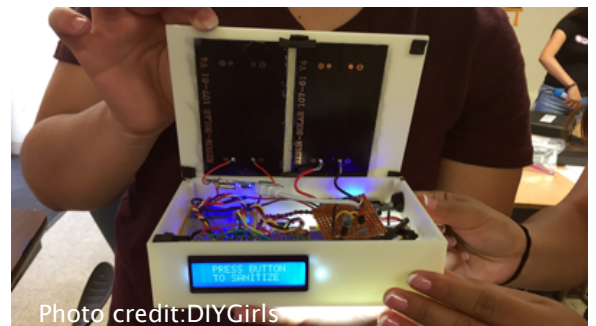


Photo credit:DIYGirls

Gravity Light

Gravity Light's foundation has created a new, innovative technology to improve lives through low-cost and safe lighting. Their goal is to replace kerosene lamps globally. This new technology is saving lives and the environment by replacing hazardous kerosene lamps. This novel idea started as a crowd funded solution to a worldwide problem and has since grown to produce the Gravity light and begun distribution.

Kerosene lamps are currently causing 3% of CO₂ emissions globally making them a source of pollution, negatively impacting the planet (Gravity Light Foundation, 2017). They are also dangerous to the health of users, because the smoke can cause respirator issues, accidental kerosene poisoning can be fatal, and household kerosene lamps are also a fire and burn hazard (Gravity Light Foundation, 2017). Kerosene lamps can also increase the circle of poverty because they require constant purchase of more kerosene, which can account for up to 30% of the poorest populations income (Gravity Light Foundation, 2017).

The Gravity light provides safe household lighting that is generated by the force of gravity and requires no batteries or any costs to users. The light has a 12 kg weight attached to it that slowly descends over the course of 20 minutes turning a gear that powers the motor of the LED light. The weight does need to be lifted after 20 minutes to continue powering the lamp but this task only requires a few seconds every twenty minutes. The Gravity Light was crowdfunded and the program was piloted in Kenya in 2015. The organization is now working to expand globally and hoping to reach all 1.2 billion people without electricity. The Gravity Light is currently available for purchase on Amazon for \$79.99, however the organization is planning to sell in developing countries for as little as \$5 to reach the target population it is hoping to serve.

More information in the links below:

<https://www.amazon.com/GravityLight-GL02-Portable-Self-Powered/dp/B01M7SM0KE>, <https://gravitylight.org/how-it-works>

Thank you to **OCEAN** Researcher Jessica Hillman

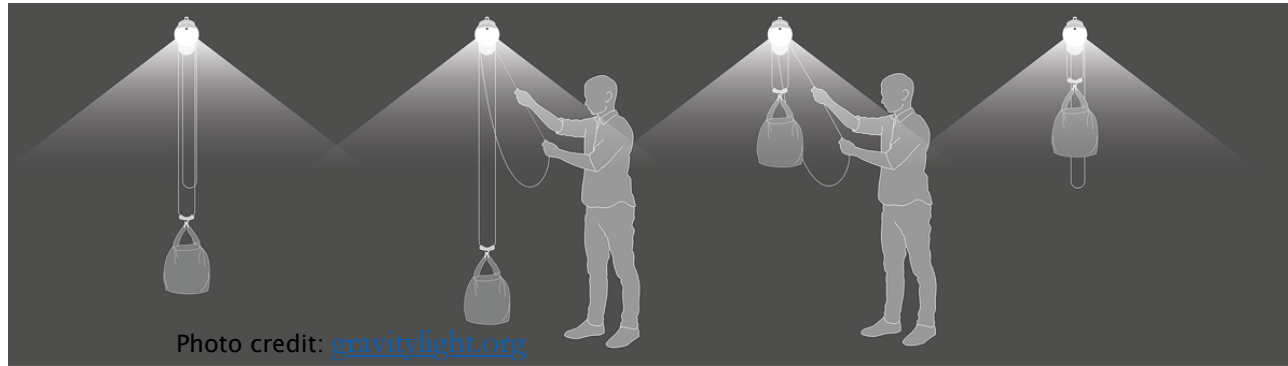


Photo credit: gravitylight.org

Home Remedy for Lyme Disease from Invasive Plant

The Tick borne illness of Lyme disease affects many New Englanders, especially throughout Cape Cod. Tick season can be bad on the Cape and sometimes protective clothing and bug spray cannot prevent tick bites. When a deer tick bites, Lyme disease symptoms such as a bullseye rash appears. It should signal obvious importance. Go to the doctor, get tested, and receive treatment. While seeing a doctor is the best way to treat Lyme disease there is a popular home remedy which has been garnering attention: Japanese Knotweed (*Fallopia Japonica*) Japanese Knotweed is an invasive plant species on Cape Cod, is originally from Eastern Asia.

Using Japanese Knotweed, in the form of a capsule or tincture has shown success in alleviating some symptoms of Lyme disease. The compound *resveratrol*, which is found in Japanese Knotweed, is an antioxidant and anti-mutagenic that is reported to help with symptoms such as Lyme arthritis. This home remedy should not be used without first consulting a doctor, however it could help with symptoms in conjunction with traditional treatment.

More information in the links below:

<http://everyhomeremedy.com/japanese-knotweed-extract-for-treating-lyme-disease/>, http://everyhomeremedy.com/wp-content/uploads/2015/07/1280px-Fallopia_japonica_MdE_2.jpg

Thank you to **OCEAN** Researcher Jessica Hillman

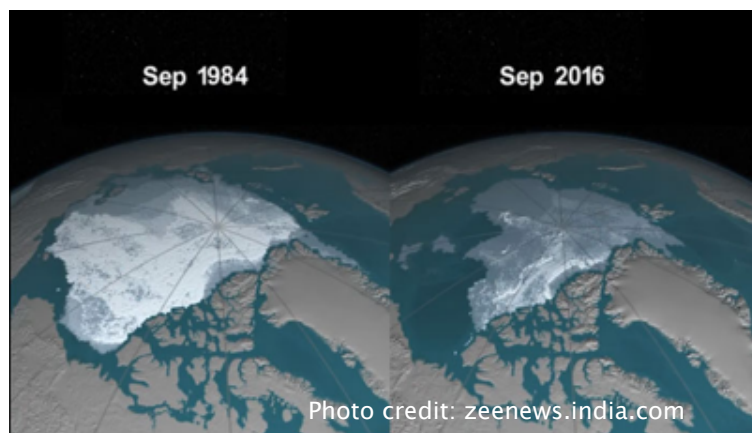


Photo Credit: everyhomeremedy.com

The Hottest Trends this Year and Next...

2016 was a climatic record-breaking year in several respects. It marked the first year that annual variation in atmospheric carbon dioxide levels did not drop below 400 parts per million, and the year also holds several other ribbon worthy titles. In 2016, arctic sea ice reached a record low, while atmospheric carbon dioxide reached a record high. It was overall the warmest year on record, and had the warmest globally averaged sea surface temperature on record. In the United States alone, more than 11,000 warm temperature records were broken in the summer of 2016.

Though climate change is happening to the world over, there are some subtleties to warming patterns. In 2016, the planet edged up to 1.5 degrees of warming since the industrial revolution, this threshold was identified as a key metric in the 2015 Paris Climate Accords. Climate scientists also use the reference period of the years between 1961 and 1990 to make climate comparisons. 2016 was 0.83 degrees Celsius warmer than the 1961-1990 reference period, but the arctic has warmed exceptionally, in 2016 it was 3 degrees Celsius above the 1961-1990 reference period temperature. Svalbard, a Norwegian island in the Arctic was 6.5 degrees Celsius above the reference period temperature. Scientists have not come to a unified explanation as to why the Arctic is warming so much more quickly than the rest of the planet, but the effect is alarming nonetheless. Sea ice and permafrost are thawing quickly, resulting in a feedback loop as the earth's surface absorbs more heat (water reflects much less heat than ice) and emits carbon dioxide that has been frozen for centuries.



Another important factor to consider is El Nino, and its effects on global climate. 2016 was a strong El Nino year, which contributed to signs of climate change. El Nino years are marked by masses of warm water in the Eastern Pacific Ocean. This impacts weather throughout the world, causing extreme precipitation in certain places and dryness in other places. WMO's State of the Global Climate 2016 report explains that the 2016 El Nino contributed 0.1 to 0.2 degrees to the long term warming trend, and also

reduced the tropical carbon sink on our planet. This reduction in the tropical carbon sink contributed to the extreme atmospheric carbon dioxide increase observed in 2016. Atmospheric carbon dioxide increased 3.4 parts per million in 2016, which is the greatest increase on record. Climate scientists think that though the increase was mostly caused by human emissions, the effects of El Nino played a role as well.

At this point, climate scientist Phil Williamson says, "human driven climate change is now an empirically verifiable fact". We will see the effects of climate change whether or not politicians choose to believe in it or make policy to address it.

More information in the links below:

<https://weather.com/news/news/peru-deadly-flooding-impacts>, <https://www.nytimes.com/2017/04/06/world/americas/peru-floods-mudslides-south-america.html>, <http://www.latimes.com/world/mexico-americas/la-fg-peru-floods-20170328-story.html>

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

What We Know About CO₂

In the year that has passed since September 2016, climate scientists have begun to suggest that the month - September 2016 - may be one that goes down in history as a major landmark in the unfolding story of climate change. Since the Scripps Observatory on Mauna Loa began monitoring atmospheric carbon dioxide concentrations in the late 1950's, atmospheric carbon dioxide concentrations have increased steadily over the course of 70 years, with oscillating annual variation. This variation is due to terrestrial photosynthesis on our planet. Because the northern hemisphere has much greater land mass than the southern hemisphere, during the northern hemisphere summer months global photosynthesis is maximized, and during the summer hemisphere summer months global photosynthesis is minimized. For this reason, every September, after a whole summer of plant growth, atmospheric carbon reaches its annual minimum.

September of 2016 marked the first September in human history when atmospheric carbon dioxide concentrations did not drop below 400 parts per million. This means that "it's unlikely we'll ever see CO₂ below 400 ppm during our lifetime and probably much longer," according to NOAA climate scientist Pieter Tans. In fact, current atmospheric carbon concentrations are higher than at any point in the past 10,000 years, and perhaps even more concerning is the rate of atmospheric carbon dioxide increase. 2016 was the second year in a row during which atmospheric carbon dioxide increased by three parts per million, which is roughly 100 to 200 times the carbon dioxide growth rate during the ice age transition.

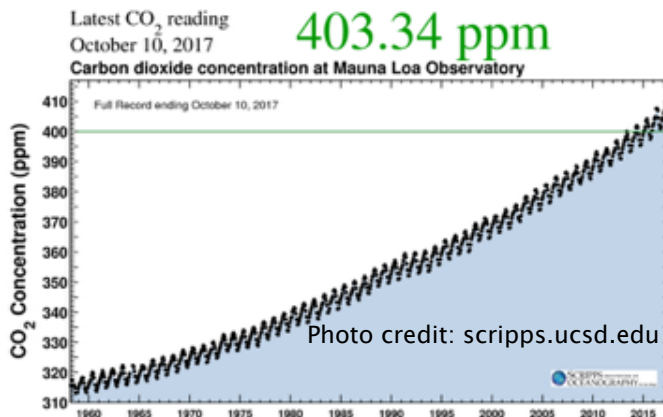
Climate scientists across the globe agree that we have entered uncharted territory. 400 parts per million has been dubbed a point of no return threshold. This level of atmospheric carbon dioxide will make it increasingly difficult to predict weather and will lead to sea level rise, more intense tropical storms, drought, and flooding across the globe. The evidence of these trends can be found in the news every day – hurricanes, extreme rainfall, and drought are already taking their toll on the United States and the world.

The consequences of increased atmospheric carbon dioxide are severe, but renewable energy sources such as wind and solar power can provide us with a path back to normalcy, though this will require global cooperation and dedication. And due to the nature of atmospheric cycling, even if we halt fossil fuel combustion and greenhouse gas emissions today, the carbon already in the atmosphere will remain for decades. Ultimately, fast action can solve the current problems contributing to climate change, but the global solution will take time.

More information in the links below:

<http://www.climatecentral.org/news/world-passes-400-ppm-threshold-permanently-20738>, https://www.ecowatch.com/noaa-carbon-dioxide-levels-2321635970.html?xrs=RebelMouse_fb&ts=1490025931

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



Shrinking Whales: A Warning

A key challenge the world is facing today, is knowing when a species may be on the verge of collapse. New research based on data collected from whales during the twentieth century shows that there is a correlation between shrinking body size of a species and the likelihood that the species will collapse. During the twentieth century, whaling was widespread which led to overharvesting of the species and almost extinction. The data published in "Nature & Ecology" shows that prior to the collapse of the whale population the average body size of various species drastically decreased.



Photo credit: abc.net.au & The Blue Whale Study

Shrinking Whales (cont.)

The analyzed data suggests that the collapse of a species could potentially be predicted up to 40 years in advance. This information has the ability to help not only the whale species, but others that suffer from overharvesting, or that may be on the brink of collapse. If the potential collapse of a species can be predicted early enough, regulatory measure can protect the species and potentially prevent collapse. A recent study published in “Marine Mammal Science” has found that the blue whale population off the coast of California has returned to prehistoric levels. Unfortunately, not all whale populations are rebounding as quickly as one would like, blue whales near Antarctica, which were previously the most numerous of all.

Although it is disappointing that the whale recovery effort is not going as quickly hoped, there is a lot that can be done to help. One aspect that initially helped with the whale recovery was government legislation regulation of harvesting, but more can be done. There are many ways to aid the whale species, including volunteering with whale advocacy groups, writing to your government representative to voice your concern.

More information in the links below:

<https://www.nature.com/articles/s41559-017-0188>, <https://www.vox.com/2014/9/8/6122867/we-nearly-hunted-blue-whales-to-extinction-now-theyre-bouncing-back>, <http://www.ibtimes.co.uk/why-lessons-learned-recent-whale-population-collapse-could-protect-endangered-sharks-1627592>

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

Droughts Reach Northern China

Droughts are growing in intensity and duration around the globe. One such region, in Northern China, encompassing the northeastern and eastern areas of the Inner Mongolian Autonomous Region, has been experiencing the worst drought on record. Chinese deserts have been expanding for years, recently growing at a rate of over 1,300 square miles a year. This is creating water shortages and climate refugees; these people are displaced by adverse environmental changes and are pushed toward already overpopulated Chinese cities.

One region, Hulunbuir, has had 16 million acres of pastureland affected and the government has spent \$16 million USD in aid to help the area. As of May 2017, 120,000 people and 500,000 livestock in regions affected by drought have suffered from drinking water shortage. Relief efforts in the region have included 5,500,000 people attempting to mitigate drought damages by building wells and pumping stations. While these relief efforts are helping many affected communities, the problem of drought and rapid desertification in China is still impacting many lives and will likely continue unless larger environmental changes are initiated.

The Chinese government is attempting to mitigate these damages through tree plantings and limiting grazing but these efforts have had little success. Chinese President Xi Jinping says that Climate Change is the largest contributor to this increased desertification and severe droughts, urging global leaders to stand by the Paris climate accord. The changing weather patterns in China are just a small piece of the changes occurring around the world.

More information in the links below:

<https://www.nytimes.com/2017/06/29/world/asia/china-drought.html>, http://news.xinhuanet.com/english/2017-06/16/c_136371902.htm

*Thank you to **OCEAN** Researcher Jessica Hillman*



Photo credit: [WWW.NEWS.CN](http://www.news.cn)

Updates from the Editor

BALOONS: Is it possible to use biodegradable Helium balloons? Current manufacturers claim latex balloons fit the bill but our research indicates the timeline for latex disintegration may not address environmental concerns. We are currently researching seaweed-based membranes, inspired by the edible water bottles article from [OCEAN 37](#).

HONEY: 75% of Honey Tested found to contain Neonicotinoids:

<http://www.bbc.com/news/science-environment-41512791>

OCEAN has published multiple articles on this concern, from Jess Hillman's [OCEAN 38](#) article about discovering neonicotinoids in our drinking water, to [OCEAN 35](#)'s "Update on Bee-kind", to [OCEAN 27](#)'s "Pollinator Mystery Update", and originally [OCEAN 23](#)'s "The Effects Neonicotinoids have on Pollinators" which outlined Bayer chemical company's neonicotinoid usage and the E.U.'s neonicotinoid ban.

OCEAN's Caribbean Antilles Relief Effort (CARE): Hurricanes are heat pumps, moving energy from hotter, tropical latitudes, to cooler, temperate latitudes. They have been recently busy devastating Caribbean Islands. The larger islands are considered the Greater Antilles and smaller islands are referred to as the Lesser Antilles. **OCEAN** created a small, realistic but useful program, focused on the French Antilles. **OCEAN** Advocacy Facilitator Jess Hashagen has been coordinating communications between manufacturers of critical relief products (new technology water filters and inflatable, solar powered lighting) and contacts she established with the French Government. With poor commercial shipping/delivery conditions, we felt the most reliable way to deliver things would be the French Government itself, which is doing just that.



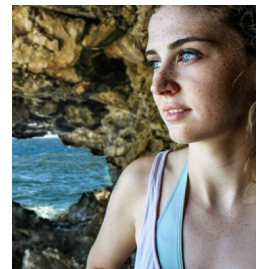
Up next in [OCEAN 40!](#)

A friend from Brooklyn dropped by our office and told me she was now managing a one acre farm. "There are no one acre farms in Brooklyn" I told her. "It's on a roof", she responded...and that will be in [OCEAN 40](#).



A "Special Thank You" to **Samantha Thywissen**, for her creative efforts putting [OCEAN 39](#) together while completing her final semester at Massachusetts Maritime Academy studying Marine Science & Environmental Protection!

And of course another "Special Thank You" to **Jessica Hillman**, [OCEAN 39](#) Research Coordinator also currently immersed in an accelerated graduated program with Brandeis University!



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