Message from the Editors:

As 2014 comes to an end, the EPIB Trail writers and staff would like to thank you for such a great year. As always, your kind words and positive messages encourage us to continue to grow and improve with each issue. As professors grade final papers and students celebrate winter break, we hope you take some time to enjoy this edition of the Trail and learn something new.

Happy Holidays!

Holly, Francesca, Selen, s Chloe’

Meet the Writers

- Aloe Roth
- Alexander Mayfield
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- Christopher Wilkinson
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- Selon Altiiok
- Tami Segal
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Many people often perceive wildfires negatively. While wildfires can be destructive, they are a part of the natural cycle of many forests. The changes resulting from wildfires should not be thought of as necessarily bad, but natural. For example, the cone of a black spruce remains unopened until a fire strikes, opening and dispersing the seeds throughout the forest floor. After a fire, nitrogen and other nutrients are released into the soil in the form of ash. The increase in mineral-rich soil allows for new plant growth, while initiating one of the early stages of succession. Fires can also create improved conditions for various animal species, including birds, insects, and rodents.

Although there have been several occurrences in history when wildfires became out of control and hazardous, we have learned from our actions in order to safely control and prevent them. In 1988, some of the most destructive wildfires had struck Yellowstone National Park, resulting from an extremely dry summer. In the years following the fires, Yellowstone created a stricter fire management plan. Prior to the 1940s, it was thought of as good stewardship to immediately suppress all wildfires. After understanding that fires were a natural part of the ecosystems, ecologists began to use prescribed burns more frequently.

Prescribed burns take into consideration the proper timing of when a fire should commence. Seasonality, humidity, temperature, wind, and topography all influence the timing of a burn. For example, the most favorable weather conditions for fire in Alaska often occur in the dryer months of May-June. During these months, temperature and humidity often are more intense. Winds can also help the wildfires by blowing the heat towards more fuel. In addition, fires generally burn up a steep slope faster than on ground level, and receive more warmth from the sun when on a south and west-facing slope.

The use of prescribed burns is important as a management tool for many native grasslands, especially in the tallgrass areas. It can be used effectively in controlling undesirable plants, such as buck brush or smooth sumac. In order to control these perennials, they must be burned for 2-3 consecutive years in late spring because this is during their weakest point in their growth stage. Prescribed burns can also be used in favor of desirable plants. Such grasses like big bluestem, indiangrass, and switchgrass should be burned in late spring. At this point, they are able to grow quickly.

Prescribed burns, however, are not only used for plants. If livestock feed on burned pastures, it often allows animals to gain more energy due to higher quality forage available. Many bird species often benefit from burns as more seeds and insects become available and nesting cover increases. As different forest succession levels change, new animals take over. When a mature oak forest is burned, abundant grasses and shrubs provide sufficient habitat for small rodents, deer, and birds. More predators, such as foxes, may follow. In addition, several berry species may become abundant, which are excellent food sources for bears.

Fires can be used as a major tool in managing the diversity of forests and rangelands all around the world. In fact, many plant species rely on them for completing their lifecycles. Humans have created the best management practices in order to cycle soil nutrients, improve diversity, and protect areas where fires are not wanted. The next time you are sitting by a warm fire, think about how important fire can be to an ecosystem.
Scientific Whaling: The Facts and Fallacies behind the Controversy

By Francesca Battaglia

Earlier this year, the International Court of Justice (ICJ), the judicial body of the United Nations, ruled that Japan’s whaling program in the Antarctic was not scientific in nature and thus violated the moratorium on commercial whaling. Although the International Whaling Commission (IWC) imposed the moratorium in 1986, Japan has continued killing hundreds of whales every year by exploiting the legal loophole in the ban, which allows governments to issue whaling permits for the purpose of scientific research. Since the launch of JARPA/JARPA II, Japan’s scientific whaling program in the Antarctic, Japan has claimed the lives of over 14,000 baleen whales. The primary species targeted by Japanese whalers are Antarctic minke whales; the quota just before the ICJ’s ruling was set at 850 +/- 10% whales per year, but the permits also allow for the take of 50 fin and 50 humpback whales.

For years, Japan has been the recipient of criticism and opposition from the international community. Opponents believe that the scientific whaling programs were never intended to be based on scientific principles, but rather are merely a pretext for commercial whaling. Australia and New Zealand, particularly vocal opponents of Japan’s whaling efforts, brought a lawsuit against Japan in 2010 in hopes of exposing the supposed ploy. This was largely brought about by the fact that Japan’s research output has been modest; although some 3,600 whales have been killed since 2005, Japan’s Institute of Cetacean Research, the organization that oversees the scientific whaling programs, has only produced two peer-reviewed papers to show for the slaughter. The ICJ ruled in favor for Australia, finding that Japan’s program violated three provisions of the International Convention for the Regulation of Whaling (ICRW): the moratorium on commercial whaling, the use of factory ships to process whales, and the prohibition on whaling in the Southern Ocean Sanctuary. Japan must revoke any current permits and refrain from granting permits in the future in pursuance of the objectives of JARPA II.

Although many considered the ICJ’s ruling a victory for the plight of baleen whales, Japan announced this fall that it has plans to resume whaling in the Antarctic in 2016 under a revised program. The program would last for 12 years and allow for the take of 333 Antarctic minke whales per year. For many, Japan’s resiliency in the face of much opposition is puzzling, but there are many reasons why Japanese officials continue to hold their ground. First, it must be taken into consideration that when the International Whaling Commission was first formed in 1946, it was composed of 15 nations that actively participated in whaling and its main focus was to “provide for the proper conservation of whale stocks and thus make possible the orderly development of the whaling industry”. Therefore it was not so much about protecting whales but setting regulations for sustainable use. It was not until the 1970s when many nations with no previous history of whaling joined the IWC that the shift in policy occurred. Japan’s history of whaling runs deep into history beginning in the late 1500s. During World War II, Germany, the United States, and Europe purchased whale oil from Japan and the meat was used to feed thousands of people. By the end of the war, whale meat had become a staple in Japanese diet. For these reasons, Japan argues that whaling is embedded in its culture, and thus accuses western anti-whaling nations of practicing cultural imperialism.

Moreover, it is believed that the main reason why Japan is very adamant to continue whaling stems from a perceived notion that it is necessary for maintaining control over fishing resources. Despite originally objecting to the moratorium on commercial whaling, Japan eventually accepted due to economic pressures imposed by the United States. With potential U.S. sanctions jeopardizing access for Japanese fishermen in Alaskan waters, Japan agreed to withdraw its objection to the moratorium by 1988. Japan, sensitive to the imminent threat of encroachment on its fishing activities, continued whaling but only under the guise of scientific research. Joji Morishita, Japan’s commissioner to the IWC, expressed the fear that Japan’s “right to exploit other fish and animal products would be infringed upon” if it conceded to too much. In particular, Japan is concerned for its tuna industry. Although the demand for whale meat has plummeted in recent decades, seafood persists as not only a commercial necessity, but also a source of cultural pride for Japan.

Japan provides scaffolding for their whaling case by claiming that their research has led to the conclusion that the whales consume copious amounts of commercially important fish, suggesting that they are responsible for the global decline in fish populations and are in direct competition with humans. Most scientists have dismissed this claim because the decline in fish stocks has been attributed largely to overfishing, pollution, and habitat destruction. Moreover, baleen whales are in fact not top predators and feed mostly on zooplankton. Minke whales do consume some species of small schooling fish as well, although krill has been reported to constitute the majority of their diet. There currently exists very little scientific evidence that supports a correlation between predation by whales and decline of fish populations, and in fact, many fisheries were flourishing while whales were abundant, prior to being decimated by whaling activities. In fact, whales are increasingly being considered by marine biologists to be “ecosystem engineers”, that is, organisms that directly or indirectly modulate the availability of resources for other species in the ecosystem. Large whales aid in the horizontal and vertical transmission of nutrients by migrating long distances, feeding at depth and then defecating near the surface, and also by providing a detrital feast for deep-sea organisms when their carcasses sink. As such, it is hypothesized that the recovery of whale populations would actually aid in the recovery of many fish populations.

Japan’s stubborn stance in the whaling controversy belies the position of environmental stewardship that it has adopted on many other issues, most notably the reduction of carbon emissions and adoption of novel, “green” technologies. The controversy is far from sorted out, and with the impending proposal for a revised scientific program meant to replace JARPA II, it will be interesting to see how the IWC and the international community responds.

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Pharmaceutical Waste:
A Recent Study

By Holly Berman

The University of Exeter Medical School and Plymouth University recently published a study about the effects of pharmaceutical chemicals on plant growth, specifically edible crops, such as lettuce and radish plants. The research focused on non-steroidal anti-inflammatory drugs, such as ibuprofen, which are extremely common and prescribed to more than 30 million people each day around the world. When not disposed of properly, these chemicals have been found to seep into water tables, as most waste management systems currently are unable to filter them from sewage.

The study, titled “Evaluation of biological endpoints in crop plants after exposure to non-steroidal anti-inflammatory drugs (NSAIDs): Implications for phytotoxicological assessment of novel contaminants”, found that each drug, even in extremely small concentrations, can affect plants in a variety of ways. One finding was that ibuprofen, the common ingredient found in over the counter drugs like Advil and Motrin, could disrupt the early root development of lettuce plants.

One of the leading scientists of the project, Dr. Clare Redshaw, explained, “The huge amounts of pharmaceuticals we use ultimately end up in the environment, yet we know very little about their effects on flora and fauna. As populations age and generic medicines become readily available, pharmaceutical use will rise dramatically and it’s essential we take steps towards limiting environmental contamination. We haven’t considered the impact on human health in this study, but we need to improve our understanding quickly so that appropriate testing and controls can be put in place.”

In 2008, the US Department of Environmental Protection (EPA) proposed to add hazardous waste pharmaceuticals to the Universal Waste Program, but the proposal was never finalized due to “adverse public comments received regarding the lack of notification and tracking requirements under the Universal Waste Program” (EPA website). Currently, the EPA is developing a new proposal, which is identified as a continuation of the 2008 effort. The new proposal, however, will only apply to pharmaceutical waste that meets the current definition of RCRA (Resource Conservation and Recovery Act) hazardous waste and that are disposed of by healthcare facilities. This proposal does not include disposal of drugs by the general public.

Unfortunately, the presence of pharmaceutical drugs in the water supply could mean more than just adverse effects on plant growth. There have been multiple studies published that examine some extent of the effects of this waste on the environment, but no long-term studies looking into human health effects. A study like this would require a great deal of time and resources, but could have significant results of interest to the public, healthcare facilities, and waste management facilities. A 2002 U.S. Geological Survey “found organic wastewater contaminants (OWCs), including many pharmaceutical and personal care product contaminants, in 80 percent of 139 streams sampled in 30 states”. With a growing and aging population, pharmaceutical use in the United States will only grow with time.

The state of New Jersey has a specific protocol for “Pharmaceutical Waste Compliance for Healthcare Facilities”, but like the federal regulations, must eventually be expanded to include personal and agricultural use. In addition, New Jersey is only one of six states to have added additional regulations to the existing federal compliance measures.

To deal with this critical issue, we must place importance upon creating and maintaining additional legislation and infrastructure to deal with the waste management of pharmaceutical drugs. Further research about the effects of this waste, on human health and the environment, will be necessary to create new procedures to manage it.

http://www.epa.gov/wastes/hazard/generation/pharmaceuticals.htm
http://www.enn.com/ecosystems/article/48068
When one thinks of global climate change, they often think of the greater effects—sea levels rising, global temperature variation, and the possibility of effects on biodiversity. On the other hand, climate change is beginning to affect a variation of aspects on a more intimate level with broad ramifications. The year 2014 commenced the start of a massive avocado shortage that is not predicted to have a positive future.

According to Modern Farmer, interest in avocados has more than tripled in the past three decades and producers are having difficult keeping up to the demand. The burrito chain Chipotle alone uses 97,000 avocados a day, or about 95 million pounds of avocados per year (Metro). It takes 74 gallons of water to produce a pound of avocados, which is significantly more rain than California (the main supplier of avocados in the United States) is getting during this drought period. Several growers are abandoning their fields due to an increase in price of fertilizer and cheaper fruit imports from other countries. Unfortunately, other countries are struggling with drug cartels intervening in the citrus trade and droughts of their own (Food and Wine).

Although a shortage of avocados does not appear to be devastating world news, it reveals the deeper impacts of climate change. A Stanford University study led by scientist Noah Diffenbaugh claims that a drought of this magnitude “is much more likely to occur today than prior to the human emission of greenhouse gases.” These repercussions can be felt by more than just a loss of a tasty fruit—the lack of tangible farmland has resulted in the loss of over 17,000 seasonal jobs and has netted a loss of approximately $2.2 billion in direct and indirect costs to the agricultural industry (Standford). Scientists predict that this weather will not change, causing an estimated 40 percent drop in production of avocados over the next three decades (ABC Local).

Restaurants like Chipotle, who rely very heavily on their guacamole sales, are keeping a close watch. In its annual business report, Chipotle stated it might eventually have to temporarily suspend salsa and guacamole sales. The broader consequences of a decision like such are immense, including a devastating loss of investors and a major decline in sales (ABC Local).

An avocado shortage may seem like a superficial topic to make national news, but the scope of this shortage is incredibly extensive and reveals that the ramifications of global climate change are more than just a change in temperature. Climate change will affect every dimension of the world, from economics to eating patterns. Be aware, avocado lovers, that every action may have an unintended reaction.

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Climate change impacts can no longer be avoided and international leaders along with climate change experts are pressing for new binding agreements to occur in the New Year. COP20 in Lima, Peru was about a two weeklong conference from December 1st until the 12th. The name is due to the 20th time several countries have met to discuss climate change issues since 1992. There were 195 countries that met with the purposes of creating new pledges and documents before the meeting in Paris in December 2015. The Lima gathering intended on developing drafts to present at the critically important meeting in France late next year, in which definitive agreements will be made. It is said that countries are in better shape to approach climate change that they were in 2009 for the Copenhagen meeting. In China, there are proposals for capping emissions by 2030 and to increase renewable energy generation by 20%. In the U.S., emissions will be cut by 26-28% by 2025. However, there are still evident obstacles that need to be faced in order for new settlements to be successful.

Time and flexibility are huge issues that will be addressed at the 2015 meeting. There are continuous debates and disagreements on the necessary length of the agreements, but politics in the U.S. are geared towards short-term thinking and planning. It is quite clear that long-term solutions and strategies are needed to approach climate change, which does not equate to five or 10 years—it would be 30 to 40 years. In Copenhagen, leaders wanted treaties to extend until 2020, but that is not a sufficient amount of time to accomplish the goals that nations need to reach. Some leaders are hoping that the settlements last longer, possibly to 2050, allowing for a bit of flexibility toward change. This approach seems more realistic and necessary to incorporate within the decision-making at the 2015 conference. For international agreements, time is one of the most crucial aspects discussed since climate change will not miraculously disappear in 10 or 15 years. There need to be solutions that not only involve the present generation, but future generations 40, 50 or 60 years from now.

Another issue that will arise at the Paris conference is whether or not to legally bind nations or to have voluntary commitments. Apparently, the U.S. is pushing for voluntary and the EU is for legally binding, thus this is yet another discrepancy that may impact how nations approach their goals. Since the 1990s, the negotiations and planning are termed to have been “soft”, thus lacking stringency towards accomplishing climate change targets. If nations are not legally bound to agreements or negotiations, can it be assumed that nations will be diligent enough to reach necessary goals? Climate change is a serious international crisis that should no longer be approached with voluntary actions. The U.S. is one of the top nations contributing to climate change and should not be advocating for voluntary commitments—it does not seem right.

U.N officials in Lima pressed the seriousness of climate change impacts throughout the world. General Bon Ki-Moon stressed the requirement of treaty transformation rather than merely switching around the words. He stated, “It is not a time for tinkering- it is a time for transformation”. He declared that there is a significant need to build “more resilient, prosperous and healthier societies” and future investments and development must incorporate climate goals. There needs to be international collaboration that transforms our current economic and social statuses that are geared towards “carbon and climate neutral economies”. The Executive Secretary of the UNFCCC, Christina Figueres, stated that, “It is not about reductions in greenhouse gas emissions but also protecting the most vulnerable, alleviating poverty and creating a future with prosperity for all”. The Lima conference has ended and will hopefully unearth necessary documents and agreements that will shape how nations approach climate change in the near future.

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Palm Oil, A Slippery Slope
By Sagarika Rana

Lipstick, shampoo, pizza dough and biodiesel; this variety of commonly found items have one key thing grouping them together. Each of the objects has palm oil as an ingredient. Palm oil accounts for at least 65% of all vegetable oil traded internationally. Next time you find yourself taking a bite out of a cookie, be sure to thank palm oil plants. While the oil has almost limitless intended uses, it does come with a price.

What exactly makes palm oil so great? For starters, palm oil has been used since the ancient Egyptians. It is also packed with vitamins, antioxidants, and is high in saturated fats. The tree reaches fruit bearing maturity only after 3 years and typically lasts for about 25 years. While the plant itself yields 10 tons of fresh fruit per hectare, it only requires 10 times less land than oil producing crops. Palm oil can be harvested throughout the entire year, and each fruit contains about 50% oil. The leftover material extracting the oil is called palm kernel expeller and is used primarily for animal feed. The palm fruit actually contains two different types of oils, palm oil (from the flesh of the fruit) and palm kernel (from the pit). The flesh is the edible type of oil while the kernel is used for cosmetics and soaps. This rich oil can also be used a biofuel. Places like Malaysia and Indonesia account for most of its production. In less developed countries, this becomes a great export. But in that lies part of the problem. High in nutritional value, famers and communities in poor countries rely on this crop for much needed income. As Benjamin Franklin “Moderation in all things -- including moderation”: this plant is a big help, but it is causing major problems that we cannot overlook.

The major problem is not the plant, but cultivation methods. Even though the plant does not require a large amount of land, it is the leading oil traded internationally, specifically 65% overall. The need for more oil, the greed for wealth and the available land space leads to massive deforestation. Where does this land come from or more specifically, what was it before? Most of the time, the area was a rich biodiverse rainforest. When these areas are re-purposed for palm oil plantations, we strip away the homes to many area specific animals and plants. Rhinos, elephants, orangutans and tigers are being pushed to the brink of extinction. Farmers that resided in these rainforest areas are forced to evacuate their homes. The palm oil industry is linked to major human rights violations, including child labor. There would also be an increase of greenhouse gas emissions. Massive reworking in the land would also increase soil erosion, without these trees and other plants anchoring down soil, the rich soil would just be swept away by rainstorms. Palm oil use is predicted to double by 2020, with the steady increase of the worldwide population. But people taking measures to protect and fix what has happened.

Sustainable palm oil is ever increasing option for people everywhere. This plan aims to produce palm oil without causing massive deforestation alongside with not harming human rights. Raising awareness for the misuse of land and human rights can also cause change in rural areas. There are many activist websites, where citizens can voice their opinion on the subject such as greenpeace.org/Africa/StopHerakles/. Creating protected areas of rainforest would also stop deforestation of these rich areas. With the support of the people, new laws could be set in place, so that these areas can and will be protected for humans and animals alike. Lastly, promoting the use of sustainable bioenergy would also give companies incentive to change over to more sustainable energy usage.

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Climate change is a many-headed beast, affecting all parts of the world in various ways. Population shifts attributable to climate changes have been observed both on land and at sea, but those at sea may be affected more quickly and more drastically. As average temperatures rise, ocean acidity increases and oxygenation decreases. This spells danger for all forms of life, from the smallest corals up to large-bodied regionally endothermic fish.

Yes, fish can be endothermic. It may be hard to imagine something without fuzz, fur or feathers as a warm-bodied animal, but there are several. There are many highly active and large pelagic species including tuna and lamnid sharks, such as Great Whites, have red muscle which functions not only for locomotion but also for internal body heat. By having higher internal body temperatures, the hearts of these fish can pump more effectively, their aerobic swimming performance increases, and these fish dominate their native ranges. Ranges, which, thanks to global climate change, are also changing.

Warm water does not hold as much dissolved oxygen as colder water can. Endotherms require more oxygen than comparably sized ectotherms in order to maintain homeostatic body temperature. For warm-bodied fish, this means that the warmer the oceans are, the further north their range will shift as they are forced to follow the changing oxygen gradient of the ocean. Though their warm muscles and their complex system of counter-current heat exchangers keep their bodies warm, the northward shift in range is not a cause for concern as much as the loss of southern territory.

Though pelagic species spend most of their lives far from shores, many seek shallower waters in which to breed. In a study presented by Dr. B. Block of Stanford at Rutgers University in November 2014, the densest population of Pacific tuna in the California current move up and down the North American Pacific coast in response to changes in temperature. It’s not a far leap to predict that, in addition to their seasonal changes in range, their year-round range will be altered as oceanic temperatures increase. They are already heavily sought for commercial consumption, and changes in range may bring fish out of protected areas and into our nets. The location differences may also represent changes in conditions like prey availability, salinity, flow rate and flow direction of the surrounding waters during breeding, which may alter success. It is also important to note that many of these large species exhibit high site fidelity. What is going to happen when the sites they seek are no longer habitable?

Furthermore, a paper which Dr. Block co-authored in 2012 predicted a 35% change in core habitat for some species of pelagic predators, wherein sharks were represented as those most likely to experience greatest loss of habitat and tuna were actually predicted to experience an increase in potential core habitat. Between potential loss of habitat and expansion of habitat into heavily fished waters, such drastic alteration may prove devastating for these and other species.

We can analyze the effects ocean deoxygenation is having on large endothermic fish, but the importance of such studies extends beyond mankind’s hunger for tuna. What is rapidly happening in the oceans may be in its beginning stages on land. Changes in atmospheric composition, weather patterns, and surface temperature all affect life on earth. It is important that we look to these studies of our oceans as harbingers of what is to come, assess the potential for the good and for the bad, and act accordingly.

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Interview with Jeanne Fox
By: Arcadia Lee Papalski

Jeanne Fox has had many reputable and distinguishing accomplishments in the energy and political field. To name a few, she has been the:

* Chair, Energy Resources and Environmental Committee, National Association of Regulation Utility Commissions (NARUC)
* EPA Regional Administrator
* Commissioner, New Jersey Board of Public Utilities (NJ BPU)
* President, NJ BPU
* Chief of Staff, NJ BPU
* Vice President, National Women’s Political Caucus
* Commissioner, New Jersey Department of Environmental Protection (NJ DEP)

Since her recent retirement in September of 2014, she has been endowed with the prestigious honor of being named of President of the Associate Alumnae of Douglass College (AADC). I decided that I wanted to learn more about Jeanne, her career with the NJ BPU and the EPA to educate myself and the SEBS community about New Jersey’s energy infrastructure.

Arcadia: Can you please describe what you consider to be the most difficult responsibility you had as the President of the NJ BPU.

Ms. Fox: Well, the hardest part of my work was handling personnel issues. When staff is having internal conflicts (managers, employees, etc.) that can be really difficult to deal with. Especially, when staff members have psychological issues, sometimes it can be very difficult to work things out.

Arcadia: What made you want to get involved in the energy field and political infrastructure?

Ms. Fox: I had asked Governor McGreevey for this job back in ’01 specifically because of my concerns about Climate Change. Electricity generation is the second largest producer of greenhouse gas emissions (e.g. carbon emissions) but nobody was doing anything. Back then, national politicians were talking about doing something about Climate Change, like a cap and trade program, but nothing was happening. When George W. Bush ran for President, he campaigned on Climate Change. Christie Todd Whitman took the EPA Administrator position with Bush, in part, to mobilize his efforts, but 2 months later, while she was in Europe with her EU environmental peers, the Bush White House did a 180 and declined to move forward on Climate Change. I believe their decision was likely due to the Vice President’s (Dick Cheney) relationship with the petroleum industry.

Arcadia: What strategies have you used to bridge the communication gap between science and politics?

Ms. Fox: It’s important to look at matters from the other person’s perspective. So why is this good for him/her/them? In an elected official’s case, why is it politically good for them? There are some politicians out there who care about the environment, like Jim Florio or Frank Pallone, but many base their decisions primarily on self-interest or other priorities. In NJ, luckily, both Democratic and Republican legislators historically have been supportive of the environment. As humans, people tend to look at things with self-interest and that includes elected officials. Of course, there are a few strong elected environmental leaders.

Arcadia: What was your greatest achievement in your professional career so far and why?

Ms. Fox: There are two. First, forming and leading the team that created one of the best solar photovoltaic programs in the country. When I became President in January of 2002, there were 6 solar installations in New Jersey. Now, there are over 30,000. It’s impossible to do all that work by yourself, you need a team. I try to always have people smarter than me working with me. We formed the Clean Energy Council, after hav-
ing hearings around the state. I chaired the council which was made up of about 22 people. Five other state agencies were involved, the U.S. Department of Energy (DOE), 2 utility companies and some environmentalists, energy efficiency, and solar groups. A DOE energy laboratory gave us recommendations and the result was a program that was the first in the world with cutting edge solar policies. Other states followed our lead by using similar policies to create their own solar programs.

My second greatest achievement was protecting New York City’s water during my career as a Regional Administrator with the EPA. New York City was expected to be ordered by the EPA to filter their water supply according to the Clean Water Act (CWA). New York City’s water comes from the north in Westchester County. Their water system was set up in the 1880’s with enormous pipes moving water by gravity into the city. As a lawyer, I decided to look at some of the CWA’s language and discovered it might be possible to avoid filtration by meeting other standards (that were meant for smaller communities). I went to the head of the EPA at the time, Carol Browner, laid out my plan and she said to give it a try. I spoke with the Mayor of NYC at the time, Rudy Giuliani (and his Chief of Staff) and the Governor at the time, George Pataki (and his Chief of Staff) about the proposal. We each set up negotiating teams and spent 22 months to find alternatives to water filtration, which would have cost the city about $7 billion. The result of our hard work was that NYC didn’t have to filter their water supply. The alternative measures cost the city about $2 billion, so we were able to save taxpayers approximately $5 billion. In place of filtration, the city had to do things like set-backs, ozone treatment plants, buffer zones, etc. in order to meet the specific water quality standards of the CWA.

Arcadia: Can you explain how New Jersey’s rate system works in energy distribution?

Ms. Fox: Typically, what we do at a utility commission is set the utility rates for the public. We raise (and sometimes lower) customers’ rates. We make sure people get, as we say, “safe, adequate, and proper service at reasonable rates” though “rate cases” . Rate cases are typically held in Administrative Courts where utilities apply for a rate increase but they will have to prove why it’s necessary. The utility company must justify their expenses, which consumer class benefits, and the rate customers should pay for their energy. In order for any new rate to go into effect, it must be justified and then approved by the BPU Commissioners at an open public meeting.

Arcadia: What changes do you envision for America’s energy infrastructure?

Ms. Fox: A couple things. We obviously have to stop using fossil fuels for electricity generation. We have to rely even more on renewables, because Climate Change is happening. It’s here. Natural gas is better than oil and petroleum but it’s still a fossil fuel which produces less carbon emissions than oil. By 2050, we need to have more advanced alternative energy technologies and a more sustainable infrastructure. In order to replace fossil fuels we need to rely more on wind, solar, hydro, geothermal, and biomass as well as, greatly improve energy efficiency. Building codes aren’t as strong as they could be. Europe has building codes that are much stronger and more effective than ours. The problem with renewables is that they are intermittent, especially solar and wind. They have such great potential, but it’s not sunny or windy at all times. When you create electricity from any form, with the exception of hydropower, you have to use it as you create it. Therefore, we need what’s called ‘energy storage’. When we develop cost effective energy storage units, renewables can expand. Micro grids are a fantastic concept because they help with efficiency and security, but it’s not a feasible solution right now since communities wouldn’t be able to afford building their own systems. The bottom line is that there’s a lot of work that goes into our central grid system and we can’t just abandon it. We have to create the steps needed to transition into the next energy age.

Arcadia: What piece of advice would you give to college students with aspirations of pursuing a career in the energy/political field?

Ms. Fox: Read. Read as much as you can. Knowledge is power. Just be careful about your sources. As for Climate Change, there’s a lot of misinformation out there. Make sure any scientific statements are based on good, peer-reviewed science. Be sure to double check the credibility of the source while drawing your own conclusions about the text.
Arguably the most important issue of the current era, anthropogenic climate change is a topic illustrative of a crossroads in human interactions with the environment. The culmination of centuries of human development, over-consumptive of unsustainable carbon-rich fuel sources such as oil, coal, and natural gas, climate change is a dramatic shift in global environmental forces that scientists can, with a very-high degree of certainty, attribute to the actions of humankind. The international community, assembled in the United Nation, has stated that it is a priority of all peoples to attempt to mitigate or adapt to the effects brought on by global climatic shifts. The Intergovernmental Panel on Climate Change has published multiple reports concerning projections and implications of the effects of climate change if no decisive action is taken. So far the reports have seemed quite dire, and for good reason: there remains a lack of decisive action on the part of global policymakers concerning the human and ecological implications of human interference in climate patterns.

Besides increased emissions as a result of rapid global development, one detrimental effect that has received relatively little discussion in the overall dialogue concerning climate change is the effect on human rights, and the way that these integral tenets are recognized in a world where humans can affect natural processes to such a scale as to endanger the welfare of all. In order for there to be a comprehensive framework put in place for finding a solution to global climate change, there must first exist a comprehensive framework for recognizing the effects as they apply to humans, as well as the environment in which they live. While there are many inequalities and perceived differences seen by many as justifying the divides between people, at the core of the human experience is the equality that is owed to all.

Affirmed by the Universal Declaration of Human Rights, all human beings are endowed with fundamental and inalienable rights. These rights serve as a framework for the empowerment and wellbeing of all citizens of the world, regardless of political, socioeconomic, or cultural differences, and the document includes articles regarding rights of assembly, free speech, any and all beliefs, and numerous others. All members of the global governing body have ratified the declaration, which is responsible for dictating the power that state actors have to affect the lives of their constituents. These rights are known collectively as “human rights”, and have become the centerpiece of political debate following the grievous affronts of the Second World War. While all states are required by international law to uphold these fundamental human rights, there are international regulatory bodies that are responsible for the protection of these inalienable rights, and work to ensure that they remain inviolable.

The United Nations Human Rights Council (UNHRC) is one such body with the explicit goal of defending and promoting human rights under all circumstances. The Council is responsible for identifying violations of human rights, and encouraging member states to act to discourage those violations. While
the overt international discussion of climate change has rarely focused on the potential violations of human rights, the UNHRC has passed numerous resolutions and declarations that detail the various permutations of human rights that exist in a modern context. Recent resolutions 7/23, 25/21, and 19/10, are concerned with identifying other fundamental rights which are components of the defined articles of the Universal Declaration of Human Rights. More specifically, these resolutions deal with the degree of unevenness that the effects of climate change are likely to exert on the poorer and less-adaptable populations and countries (7/23), and broader explanations of human rights to a sustainable environment as ordained in numerous other UN resolutions, various international conferences such as those in Rio and Vienna, and international law as a whole (19/10 and 25/21). Pertinent to discussions of climate change are the rights to sanitary living conditions, food and water, security of person, rights to mobility, and the right to be recognized everywhere as a person before the law, among others. These rights are seen as conducive to a right to a sustainable environment, and recognition of the unequal distribution of detrimental effects is key to establishing a more comprehensive approach to climate change, and pursuant to that, climate justice.

With respect to justice, as well as the universal nature of human rights, it is important too to recognize the Declaration on Human Rights Defenders, passed by the General Assembly of the United Nations, which states that all individuals have a role to fulfill as defenders of human rights. It is this resolution that especially deserves increased attention in the current political and social clime. Imperative to the achievement of progressive action towards climate change is the recognition that all have a part to play in defending the rights that the effects of anthropogenic climate change will abridge, and are currently abridging as those effects progress unchecked. While some states may argue, with full legality, that they have an imperative to achieve the same level of development as other, more-developed, states, everyone has the priority of upholding human rights. Without further discussion of the role that climate change will play in affecting the human rights of all the planet’s citizens, it will be impossible for an address of the broader effects of climate change to take place. Regardless of the upheaval it is bringing for the natural forces that shape the world, global ecosystems, and human development, climate change remains, at its core, a human issue, and it is one that humanity must face in solidarity, or flounder in division.

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Project PORTS: An Alternative Approach to Restoration

By: Collin Dobson

The eastern oyster (*Crassostrea virginica*) has a long and important history in the Delaware Bay community of southern New Jersey. For centuries, the oyster has made a large contribution to the economy and served as a sustainable food supply to these communities. In addition to its economic value, oysters are also extremely valuable to their ecosystems. Oyster reefs can provide a number of invaluable ecosystem services including water filtration, carbon sequestration, and habitat for fishes and invertebrates. Unfortunately, the introduction of disease in the 1950s, and again in the 1990s, has contributed to a significant decrease in the oyster populations of the Delaware Bay.

Many different groups and organizations are dedicated to the cause of restoring the oyster populations in the Delaware Bay and outreach about its importance (e.g. Partnership for the Delaware Estuary) but there is one that takes quite a unique approach. Project PORTS (Promoting Oyster Research through Schools) is an outreach initiative of Rutgers' very own Haskin Shellfish Research Laboratory, created in 2007 by program director Lisa Calvo. Project PORTS is a community-based restoration program geared towards elementary and middle school students of South Jersey's Delaware Bay shore region. The main goal of this project is to promote the local significance and scientific concepts of oysters to these students by using hands-on activities. This is achieved in two different ways: through in-class enrichment programs and through hands-on restoration projects.

In-class enrichment programs involve coupling science with locally relevant historical and social context so that students are better able to connect with and appreciate the importance of the oyster. Project PORTS produced a curriculum guide so that educators are able to adopt this program into their classroom teachings. In 2014, 8 different schools and nearly 1000 students participated in PORTS. The goal is to expand the program and grow to 15 schools in the 2015 school year.

The second component of PORTS involves getting students and community members involved in hands-on restoration activities. One of the biggest pieces of the restoration efforts involves students constructing shell bags that are deployed in the bay to serve as a future home to millions of oysters. Constructed on-site at each school using stretchy mesh bags and clamshells, these shell bags are transported to a location in the lower bay where they will serve as settlement surface for oyster larvae. After two months, these oysters and the shell that they settled on are then transported to the upper bay and deployed as artificial reefs, where they will thrive and be able to provide important ecosystem services.

One of the most influential members of the PORTS team, Jenny Paterno, is a Rutgers graduate student in the school of Ecology and Evolution. Jenny began working on the project in 2012 and has incorporated the project into her research. Her two biggest goals are to assess some of the ecosystem services that the artificial oyster reefs created by PORTS are providing for fish, and to convert research data into classroom activity. Preliminary results of her research show that these reefs can provide some valuable habitat to fishes and invertebrates. She has also been successful in converting data collected during her fish sampling into engaging classroom activities and has found that the real-world connection has provided to be a valuable tool in enhancing student learning.

Oysters can provide extremely valuable services in the ecosystems in which they live. Unfortunately, the oyster does not play quite the same role in the economy and culture of the Delaware Bay Shore region that it once did. Committed to preserving the historical significance of the oyster and helping to restore the natural populations in the Delaware Bay, Project PORTS is making a difference by employing the help of the next generation.

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Non-Tested GMO Bananas to Be Used On International College Students
By: Chloe’ A.H Lewis

This fall marks the beginning of a controversial and extremely potentially detrimental experiment on American college women conducted by the Bill & Melinda Gates Foundation and launched by Australia’s Queensland University of Technology. The tests will be carried out for the first time on humans with no previous testing being done on animals; therefore the consequences of the students ingesting this genetically modified fruit are unknown. According to the Des Moines Register (a large Iowa newspaper), 12 out of the 500 student volunteers will act as the guinea pigs for the first test. The bananas consist of artificial levels of beta-carotene (vitamin-A). The 12 students are to consume these GMO bananas for 4 days during 3 separate periods of study for a total of 12 days. The incentive for the students is a sum of $900 dollars: desirable enough, especially for needy college students. It is here where questions of morality and of public health combat small restitutions, tempting incentives, and the overall overwhelming ability money has on the human senses. Though it is unknown as to why exactly these students volunteered themselves as offerings in the name of GMO science, it is safe to surmise that the sizeable bait of money, potential financial struggles, student debt pressures, diminishing financial aid, biased propaganda by the sources funding the project, and other personal factors are largely the reasons as to why.

The intent behind this controversial experimentation is that the cultivation and use of the bananas will be applied to poor countries in Africa of which the citizens severely lack vitamin A. GMO companies proclaim large profits and seek to commence production in places Uganda, Rwanda, Kenya, and Tanzania. Note that these are only a small handful of poorer countries under early testing; if given the green light and with more profits, it goes without saying that other GMO industries will hop on the bandwagon seeking even greater profits and will seek to expand their GMO product seeds around the world in other poor countries and even with other food products. Realize that these GMO bananas are not the first genetically modified global project to be offered as a solution to vitamin-A deficient countries; there was the infamous “golden rice” project also enriched with vitamin-A that later failed all tests.

Much of the global scientific community — including world renowned scientists — as well as civilians are in direct opposition of this and global projects of the like; especially considering the fact that no prior testing has been done before the human trials. Nothing in this world, especially in terms of science, is singularly solved; there are a number of ways in which vitamin-A deficiency can be remedied. The following are some of the natural foods that contain higher levels of vitamin-A: sweet potatoes, carrots, pumpkins, persimmon apples, spinach, apricots, mango, etc. But it is only through self-education and sharing of knowledge oversees that the worldwide civilian population will discover these and gravitate toward making more healthful nutrition decisions. Wherever there exists a genetically modified way of sustenance, there exists the predecessor, a 100% natural way of sustenance; artificial anything sources its power from natural everything on planet earth.

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Asthma and NJ Air Quality

By: Christi Capazzo

New Jersey has long been known for its poor air quality, especially in the more urban areas of the state, and also has a high prevalence of asthma. New Jersey’s Department of Health tracks the instances of hospitalizations due to asthma and data shows that these hospitalizations are more prevalent in urban areas but are beginning to show signs of decline and this may be partly due to the fact that there is progress in improving the state’s air quality.

Asthma is a chronic disease that involves a swelling of the airways making it difficult to breathe. It can be triggered by factors that are environmental or occupational such as air pollutants, which is why it is such a concern in New Jersey and has been since the early 2000s. New Jersey has only recently begun to meet some of the federal standards for air quality according to the state’s Department of Environmental Protection. The state still has not attained acceptable levels of ozone or levels of fine particles in urban areas but has achieved the levels required for standards in lead, nitrogen dioxide, and sulfur dioxide. As an indicator of air quality, asthma hospitalizations are important to keep track of because the rates indicate which areas of the state are more problematic. New Jersey falls at number 22 on the list of states with the worst air quality based on air quality index.

One concern with asthma rates in New Jersey is the disproportionate number of cases that affect children. The New Jersey Asthma Program published an update in 2006 showing that children under the age of 5 have an abnormally high rate of emergency department visits in comparison to other age groups. Part of the report’s conclusion is that about 9% of children have asthma and 12% have a history of asthma. That is almost 1 in every 10 kids having asthma when it is a preventable problem if air quality was improved upon in problematic areas. New Jersey air quality will continue to improve with higher standards that are being set to coal-fired power plants in surrounding states. Emissions have been cut in states such as Pennsylvania while some older and more dangerous coal plants have been shut down or set to shut down in the near future thereby reducing emissions and their effect on air quality.

There are programs in place that are here to combat the asthma problem in New Jersey. New Jersey is part of the Center for Disease Control and Prevention’s (CDC) National Asthma Control Program that aims “to reduce the number of deaths, hospitalizations, emergency department visits, school or work days missed, and limitations on activities due to asthma.” New Jersey also has its own Asthma Awareness and Education Program in place to take action against asthma incidences and rates by educating people with asthma and helping them to be prepared. The program seeks to track and monitor rates in the state so as to prevent death and hospitalizations. The hope is that with careful planning the asthma rates will continue to drop but this seems unlikely unless more effort is made to improve the air quality in New Jersey.

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Indigenous Leader and Climate Activist Killed Before COP20 Protest

By Ariel Schwalb

José Isidro Tendetza Antún, former Vice President of Ecuadorian indigenous group of Shuar Federation of Zamora was an outspoken environmental activist. He and his community members have been opposing a large-scale mining project at the opencast pit Condor Mirador mine proposed by the Chinese corporation EcuaCorriente. Many believe that this project came about to pay off debts to China.

The Mine just happens to be where the Shuar, the second largest indigenous group in the nation live. The land is characterized by its extremely high biodiversity, and the Shuar are worried about the impact this project will have on their livelihood, as it will ruin 450,000 acres of forest.

Tendetza is the third Shuar activist to be killed in the past four years. It is not a coincidence that he was murdered days before the NGO organized Rights of Nature Tribunal at the Lima climate talks, because he intended to speak out against both Mirador and the Ecuadorian government.

“We believe that this murder is part of a pattern of escalating violence against indigenous leaders which responds to the Ecuadorean government and the companies’ need to clear the opposition to a mega-mining project in the Cordillera del Condor,” said Luis Corral, an advisor to Ecuador’s Assembly of the People of the South.

He went missing on November 28th and his body was found buried in an unmarked grave last week. It has been rumored that he was tortured to death, but the government has been slow to conduct an autopsy, so no one is really sure.

“This is a camouflaged crime,” said Shuar leader Ankuash. “In Ecuador, multinational companies are invited by the government and get full state security from the police and the army. The army and police don’t provide protection for the people; they don’t defend the Shuar people. They’ve been bought by the company.”

Before the murder, Tendetza’s farm had been burned down and his home was destroyed. He had also received bribes from the company to keep quiet about his stance on the project. Clearly, he was perceived to be a threat to development in the country. President Correa not only has intentions to mine the rainforest, but he also wants to drill for oil.

Developing countries should have the right to develop, but not at the expense of their people and wildlife. Killing off opponents is unacceptable and further undermines to validity of this project. With the climate destabilizing and corporations growing, we are all José Isidro Tendetza Antún.

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Buzzing in Spite of the Cold

By: Christopher Wilson

If you’ve ever taken a mid-winter stroll through a dense, snow-covered forest and found yourself wondering where all the honeybees go, you are not alone. When I first started to study honeybees as a hobby, this question frequented my mind. How could such tiny bees survive through the freezing winter cold? Do they all die off except the queen? If not, how do they keep warm? At first, I thought, “Perhaps they migrated to a warmer place.” It turns out that honeybees do not migrate. They instead take to their hives to wait out the winter in opposition to the frigid weather outside. This “hibernation” is absolutely amazing. Yes, the mighty bear might spend all spring, summer, and fall gorging itself in preparation for the great winter snooze and the snakes of the world may burrow and coalesce into a warm, wriggling ball beneath the frost line, but bees are special in their approach to staving off the winter cold.

Before we get into the specifics of what makes the honeybee hibernation special, I will go over a bit about honey. Honey, as we all know, is a delicious addition to hundreds, if not thousands, of human recipes. A teaspoon of honey in one’s tea or oatmeal is indeed a welcome thing during the winter, just as it is for the bees. The bees spend all year, typically from early April to late September, gathering nectar and pollen to maintain their hives and build their winter store of honey. This is no different than hundreds of animals that amass foods and nutrients in preparation for winter. This honey is the life-blood of the winter bees, as it is the singular source of nutrients that they have access to during the winter. Without it, they could not possibly survive the freezing temperatures between October and March. So, what drives the bees inside? Most scientists have reached a consensus that the honeybees stop flying as soon as the temperatures go below 50 degrees. This acts as a signal that winter is coming, and begins the hive-wide process that is winterization. The honeybees reinforce the honeycomb walls with a final flurry of activity, hoping to insulate them further from the cold, and begin to lessen their flights out of the hive. Typically, in early November, the bees have stopped their flights entirely, and have begun to practice the amazing portion of their “hibernation.”

So far, we have only talked about the behavior of the honeybees as we would most other animals—collect food all year, and bed down for the winter. The unique aspects of the winter honeybee are twofold. First, shortly before winter, the queen begins to produce “winter bees.” These progeny are physiologically different than the “summer” bees, and thus live much longer and preserve energy more efficiently. For instance, a summer bee will only live about 54 days, whereas a winter bee will live 4-5 months. After creating a generation of winter bees, the hive begins to draw inward. They buzz away from all the outer sections of the hive and...
coalesce into a magnificent, pulsating cluster of bees. They then do something amazing. They vibrate their bodies in such a way to increase the temperature within the cluster, and depending on the outside temperature, expand or contract the cluster to allow for more or less heat to escape. If the temperature outside drops, the cluster will contract and the bees will vibrate faster, increasing the temperature in the center of the ball. If the opposite happens, the bees will lessen their vibrations and expand the cluster, allowing the temperature to drop. Naturally, the queen resides in the center of the cluster, never leaving even for a moment. She enjoys quite the lap of luxury--the temperatures that the center of the ball can reach sometimes even surpass 90 degrees Fahrenheit!

To make sure the bees on the outer perimeter of the cluster do not die from the cold, the bees take shifts. The bees thus form a sort of “current.” The outer bees slowly move inward while the inner bees move outward. This has a few benefits. For one, this assures that many of the bees remain above 48 degrees, which is the tipping point below which their thorax will not be able to contract due to the cold—disabling their ability to vibrate and contribute to the cluster. This happens to many of the bees during the long winter and accounts for many of the wintertime deaths. The second benefit is that the inner bees can carry some of the feces, bodies of dead bees, and other general debris out of the cluster to be dropped at the bottom of the hive for disposal during the warmer days.

This cluster is a unique adaptation that I find amazing due to the relative simplicity of the honeybee's neurology and physiology. Their brains are majorly reliant on outside stimuli from the greater hive in order to make decisions and are thus very dependent on each other. To have these seemingly simple organisms work together during the entirety of winter and survive in relative comfort and warmth is impressive and worth marveling at. Hopefully you, too, will find a cluster of warmth this winter to stave off the frigid weather. Happy Holidays!

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On a Socially Constructed Environment

By: Alec Roth

It is politically imperative today that we realize that the environment is not merely the ecological strata that surround us like a neutral container, but rather we are and it is the product of a reciprocal interaction. If we limit our environmental concerns to greenhouse gas emissions, then we neglect the social conflicts that force humans to expend energy finding more innovative ways to kill each other. The story of Eric Garner of New York City and Michael Brown of Ferguson must be told and retold. As an environmental newsletter we strive for a sustainable future, however this means we cannot only focus on environmental justice, but we must also fight for social and economic justice as well. To gain support for environmental issues we must lend support to other causes. More importantly it is a chance to prove that these issues (environmental, social, and economic) are interconnected. A dynamic collective consciousness is required to understand the convergence of these issues. This consciousness is what will establish a united public with similar ideas, notions and goals. We have seen examples of a united public this year with the People’s Climate March which attracted 400,000 protesters from all over the country featuring a variety of grassroots organizations. This month in particular has been extremely important for the modern collective conscious as thousands continue to rally around the country against police brutality, systemic racism, the excesses of America’s militarized police forces, and for Eric Garner, who was strangled to death after being accused of selling individual cigarettes and for Michael Brown, who was shot six times after a confrontation with the an officer. Although there are conflicting stories and evidence not made public, the excessive force used in both situations is clear.

The tragic stories of both Garner and Brown are unfortunately not unique isolated cases in America. Police violence has become too common in the United States with an average of 400 civilian deaths caused by police annually (USA Today). African Americans are disproportionately targeted by this excessive use of force. According to a Department of Justice Survey in 2008, blacks are more likely than whites or Hispanics to experience a police officer’s threats or use of force. In the same survey, those who felt that police had used or threatened the use of force, 74% believed the officer’s actions were excessive. Additional statistics provided by the CDC show that between 1968 and 2011, blacks were on average 4.2 times more likely to get shot and killed by a police officer than whites. Although the disparity drops over time, the racial disparities are clear. As seen in the graph provided by Justice Department's Bureau of Justice

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**Firearms Per 100 People**

- United States: 88.8
- Norway: 31.3
- Canada: 30.8
- Australia: 15
- Israel: 7.3
- United Kingdom: 6.2
- Japan: 0.6

Source: Small Arms Survey | Graphic: Hagit Bachrach

**Firearm Homicides Per 100,000**

- United States: 3.21
- Canada: 0.51
- Australia: 0.14
- Israel: 0.09
- United Kingdom: 0.07
- Norway: 0.05
- Japan: 0.01

Source: UNODC | Graphic: Hagit Bachrach
Statistics, blacks are nearly 4 times more likely to die in an arrest-related death than whites. Although this data shows some racial patterns behind police-civilian gun violence, the US statistics on this type of data collection is not extremely accurate. As CNN notes, most of these data are collected via a self-reporting system; therefore the incomplete data does not allow for comprehensive correlation conclusions. While the data is imperfect, the disproportionate racial deaths prove structural racism did not die with the Civil Rights Act in 1964. The racial divides that still exist in America thwart the growth of community cohesion and social capital. There is a clear lack of trust between US citizens and the police, which has been proven through the mass protests across the country. The militarization of local police does not help this relationship, as the Pentagon continues to send excess military grade weapons and vehicles to local authorities.

Citizen-police shootings are however, only a subcategory of gun violence in America. In 2011 the CDC reported 16,238 domestic homicides, of which firearms contributed to 68% or 11,068 of those deaths (CDC). That is over 11,000 preventable deaths in a country with some of the most lenient gun laws, clearly expressed in the graphic below.

The United States needs to close the racial and social gaps that promote gun violence and leave the American public fragmented. An intersectional environmental movement, that understands our problem is not just the carbon saturation of the atmosphere but also the social environments that we construct, has the potential to weave together public disparity. The unification of grassroots campaigns that strive for equality and sustainability offers a chance to establish a unified public through which we can achieve revolutionary political and social change.

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Being Eaten Alive on Television: The Pros and Cons

By Chris Wilkinson

When Paul Rosolie, snake expert and Amazon enthusiast, as slated to star on Discovery Channel’s special “Eaten Alive”, the nation responded in a full spectrum of emotion. The event in question would involve Rosolie being swallowed alive by a giant anaconda, donning a carbon nanofiber suit to protect him from the snake’s crushing force. This event was met with polar reactions: on the one hand, condemnation from organizations like PETA, and on the other, excitement from people who enjoy watching others get eaten by giant anacondas. The show was pre-recorded and primed to air on December 7th, and a whole nation gathered around their television sets to tune into the channel that airs such educational programming as “Fat n’ Furious” and “Amish Mafia”.

Despite claims that the act could be considered animal cruelty, Discovery Channel greenlit the publicity stunt understandably under the assumption that a man getting eaten by a giant anaconda is something the nation wants to see. As December 7th crept closer, social networking sites such as Twitter and Facebook lit up with activity over the stunt. So, when the event actually happened, and the people were promised a man getting eaten by a giant anaconda, was the hype worth it? Were the animal abuse implications offset by this awesome event?

No.

The event was, by all accounts, a bust. As soon as the snake took a little bit of Rosolie’s head and some of his arm, the brave soul tapped out, stating that he felt his arm about to break. This begs the question of “was it worth it”, to society as well as the discovery channel. There are a few viewpoints from which judge this event’s success: from an ethical lens, from a research lens, and from a bang-for-your-buck lens. Ethically, the anaconda wasn’t really at risk of being injured considering it can eat animals as large as deer and be just fine—so unless Rosolie was 500 pounds and hooved, he would’ve gone down relatively easily. Of course, the implications for removal would’ve gotten a bit risky. Rosolie had simply theorized that the anaconda, after deeming the man too much hassle to digest, would vomit him back up. Of course, if the snake decided to go through with the plan of “eat this guy” from start to finish, it would’ve had to either been forced to vomit or even possibly killed. Since killing an animal for absolutely no real reason is generally frowned upon, it’s hard to imagine this event going well (had it gone to conclusion) if the snake decided that the nutritional benefits of Rosolie outweighed his societal ones.
From a research perspective, it’s hard to imagine this answering any questions that haven’t been solved by watching the snake eat other large mammals. It would have been very dark inside, making visual observations not very possible—and there wouldn’t have been room for a notebook for taking notes inside the gut of the beast. If it had gone through with the whole plan, it’s hard to imagine any sort of meaningful data that could be pulled from the stunt. Furthermore, the failure was completely foreseeable—it’s a snake that kills jaguars and other large mammals by essentially being one continuous extremely powerful muscle. Any snake researcher worth his salt would’ve said that there was a very big risk of cardiac issues and bone fractures, considering the snake generally doesn’t accommodate for comfort when it’s eating something. Which brings us as to why discovery approved the event: it was a low-production cost program, with essentially guaranteed high viewership.

In that aspect, it was a huge success. The show had a huge viewership, and the money made off advertisements must have been enormous. But it’s just disappointing when a seemingly premiere “science” channel resorts to these sorts of tactics to get viewers interested. Why not a documentary on anacondas that say “yeah, this thing could totally eat you and you would likely not enjoy it”? I think I speak for a lot of people who have seen the gradual shift away from science on stations like Discovery Channel and Animal Planet when I say I’m just disappointed the channel had to resort to this tactic. I like snakes, but I don’t like attention-garnering people who try to become the next big thing by potentially endangering an innocent animal for advertisement money. Also, it was a complete failure. Maybe this will steer Discovery Channel away from these sorts of shows, but this just seems to be the way things work now.

Please don’t potentially kill a totally awesome creature on live television for views.

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With an overwhelming majority vote, the House of Representatives voted for the construction of the Keystone XL Pipeline on Friday, November 14. Around 31 Democrats alongside 221 Republicans voted for the legislation that would allow construction permits to go onto the Senate floor; which failed to pass through the Senate about a week later.

The senate voted 59 in favor to 41 against expansion of the Keystone Pipeline, which did not meet the requirement of 60 votes to pass. While there was some celebration amongst environmentalists and other opponents of the bill, it was more of a political loss for Democratic Louisiana Senator Mary Landrieu. As the chairperson for the Senate’s Energy and Natural Resources Committee, she saw the pipeline as her last chance to show voters in energy-rich Louisiana her effectiveness. The Senate’s failure to pass the bill proved to be her failure, as she had promised Louisiana voters the pipeline’s success. On December 6’s runoff election, Senator Landrieu lost to Republican Representative Bill Cassidy.

As the Senate stands now there are 53 Democrats and 45 Republicans. After January 6, 2015, republicans will take control of the Senate with 53 republicans and 44 democrats. It is now more likely that the Keystone XL Pipeline reaches a passing vote and moves forward. However, President Obama has clearly stated on numerous occasions that he would veto the bill should it pass both the House and Senate.

Extending the Keystone Pipeline would mean adding another 1200 miles of 36 inch wide piping, from Hardisty (a city in Alberta, Canada) down to Steel City, Nebraska. While CNN cites environmental impacts, such as spoilage to scenery and landscape, as major upsets to environmentalists, the promotion of “dirty” or crude oil even after its association to greenhouse gasses, carcinogens, and teratogens does not seem to top the list of concerns.
In addition, any oil spills on those lands, specifically the South Dakota prairie, belong to many Native American tribes. Not only do Native American activists protest the Keystone Pipeline expansion, they positively abhor it, declaring it an act of war if construction begins on their sovereign lands. However, the United States government has continuously decreased the amount of allotted land to Native Americans since the General Allotment Act of 1887 (also known as Dawes Act). A series of treaties has consequently forced the removal of Native Americans from their lands, which has significantly dwindled ever since.

Water contamination is also a major concern, as a great amount of water is needed during the oil extraction process. Not only does the Keystone Pipeline require access to rivers and underground aquifers, but also entails byproducts to be kept in tailing ponds, human-made pools for storing polluted water. Pollutants such as heavy bitumen, sinks to bottom of these ponds and can form into harmful substances that eventually make their way into clean water supplies.

Proponents for construction of the Keystone XL Pipeline say it would bring 42,100 jobs to Americans. However, many would be temporary and construction-related. Of about 50 of those jobs would still be there after construction is over, as the Pipeline does require some maintenance and upkeep. Regardless of its construction, oil shipments occur daily in a variety of forms. As of now, rising rail shipments to provide us with the energy we need is at an all-time high, and many advocates state that constructing the pipeline would provide a much safer way for transportation.

Moreover, the expansion of Keystone Pipeline is an ongoing debate that has now spanned over six years. The slow-moving process has allowed both proponents and opponents to research their sides and come back with valuable information that weighs on both the positives and negatives of constructing such a pipeline. However, it is no longer simply about the Pipeline; millions have poured in for both sides, which moves the debate into a more politically charged way for citing climate change.

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Cow Power!

By William Shinn

While New Jersey has been showered with quite a bit of rain recently, Upstate New York and Vermont have been blasted with snow. With the conditions being more than ideal for snowboarding, I have made my way to Killington, Vermont for the next few days in an attempt to escape the stress of finals. I feel that I now have the perfect opportunity to discuss some of the eco-friendly practices the mountain employs to reduce their carbon footprint here in the Green Mountain State. One of the earliest changes to the park came in 1987 when a new design made it possible to recycle wastewater from the mountain’s 6 lodges and has now resulted in about 62 million gallons of fresh water conserved.

A simple change in the water system has eased the aquifer here for over 20 years and the goal of conservation seems to have stayed the same. More current initiatives on the mountain include a shift to eco-friendly refrigeration, zero-sort recycling, and very recently the addition of charging stations for electronic vehicles. These are all fascinating changes in my opinion, but the one I find most interesting is the shift towards cow power. Cow power, as it’s called, utilizes the manure of local cattle to generate electricity, which can then be distributed through the grid to homes and businesses as it usually would. The mountain’s main gondola, K-1, and the peak lodge are both completely powered using manure in an attempt to keep Vermont green.

Green Mountain Power Company works with farmers in the area to capture the thousands of gallons of manure that are excreted by dairy cows on a daily basis. The farmers then use methane, a byproduct of the manure, to turn generators and produce electricity for environmentally conscious consumers. Cow power is a local renewable energy source that may not have the capacity to light up the entire mountain, but definitely offsets some of the power used here. It is also an efficient use of methane which would otherwise become trapped in the atmosphere and potentially accelerate global warming. Cow power may not seem as futuristic as solar panels, but it is an incredibly practical solution to both energy and waste issues in the area.

Cow power may not be as viable in other areas as it is here, but should be something that’s considered when seeking environmentally friendly solutions for energy in the US. It is also important to keep in mind that much like solar panels, cow power is not going to be a panacea for all of our power problems. There are a number of things we have to do as a culture if we want overcome the quickly approaching hurdle of climate change and these small steps should prepare society for any large leaps that are forced upon us by mother nature. The innovative practices used in Killington give me hope that our modern way of life can coincide with a world that is constantly trying to reclaim itself from the clutches of mankind.

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Approximately 290 million rubber tires are discarded in the United States each year. Looking at the numbers, that is almost equivalent to one tire per person, yet people are not walking down the streets with tires in hand; so where are all of the tires going? The popularity of recycling tires decreased in the 1960's, increasing the amount of rubber being dumped in landfills. Rubber in tires is vulcanized, meaning it is treated with sulfur to harden the rubber. This is meant to help maintain the rubber in tough conditions, but this also means that they do not decompose when left in landfills. Now that the process has nearly been perfected and creates a profitable market while helping the environment, for the past few decades the concept of recycling tires has been on the rise.

Yes, keeping these tires from the landfill are important for the sake of space, but there is so much more to it than that. Tires that are left either as litter or in landfills contain many different oils and contaminants on them that get washed off in the rain, polluting runoff water. This creates issues for environmental and public health. Recycling rubber from tires has shown to be a lucrative process in addition to being environmentally friendly. Using recycled rubber can cost half the price of creating new rubber, and often the quality is more useful for reuse. For example: used rubber is worn in and tends to be softer, making a nicer cushion type feel for mats and playground floors. The process of working with recycled rubber uses much less energy than making new rubber, leaving recycling rubber with lower production costs than producing fresh rubber, as well as more energy efficient.

There are many alternative options for this rubber to be used instead of being left in landfills. By reusing the rubber, a number of items can be created such as the following: shoes, doormats, pots, bike pedals, playground mulch, and water containers. Of these items, playground mats and flooring is the fastest growing market. Many schools are choosing to use the used rubber bits as the flooring of their playgrounds. Rubber is easier to take care of than wood chips, which often need to be reordered and replaced to maintain fresh. It is also a softer option, making it a safer option. Additionally, recycled rubber is used very often in turf fields. Turf created from rubber is often preferred due to the neat looking appearance, and little maintenance that is required compared to a traditional grass turf field.
Though recycled rubber seems to be the answer for rubber to get another chance at life, there are some issues that arise when using this pre-used rubber. What seems to be the main concern is when it is used at playground facilities. About 28 million tires are scrapped a year to use for surfaces such as playground floors. Children are very susceptible to hazards, and many are concerned about the risks associated with playing on used car tires.

In 2012, a study analyzed rubber mulch from playgrounds in Spain. This study showed there were harmful chemicals present in all the playgrounds tested. Of the nine different playgrounds (all located in urban areas), each showed contaminants of at least one hazardous chemical; majority of the samples showed to have multiple chemicals and high concentrations as well. This is an issue while children are constantly in contact with the rubber, being exposed by dermal contact, ingestion, and even inhalation. Inhalation becomes a major problem in warmer temperatures because many of these chemicals are released more frequently in warm air. These health issues are a serious concern for some, but will that concern outweigh the huge recycling industry that is helping prevent millions of tires from going into landfills or being illegally dumped in the United States?

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Sweden Leads the World in Global Environmental Economic Development

By Alexander Nayfeld

Sweden, a Nordic country which can have as little as three hours of sunlight per day in the winter season, is no longer notable solely for its founding of Ikea. According to Dual Citizenship Incorporated, a international company which specializes in data analysis and strategic communication consulting, Sweden outranks every other nation in overall environmental consciousness in developing its economy. The ranking of nations by their economic development’s focus on environmental sustainability is done through a comprehensive analysis of several key criteria, culminating into what is called the “Global Green Economy Index”.

This index rests primarily upon four major criteria. First, “leadership and climate change”, which identifies a nation’s political willingness to better the environment via international forums or media coverage. Second, “efficiency sectors”, which analyzes the environmental efficacy of general public services or structures, include buildings, transport, energy production, and tourism. Third is the criterion of “markets and investment”, taking into account “renewable energy investment, CleanTech innovation, CleanTech commercialization, and green investment facilitation”. Last is “environment and natural capital”, which assesses the abundance and health of a nation’s agriculture, air quality, water, biodiversity, fisheries, and forests.

All of these criteria combined serve to illuminate a comprehensive analysis of national economic development as it pertains to sustainable environmental strategies. Sweden exhibits tremendous prowess in all of the above-mentioned categories, and comparatively, the United States ranks a mere 28 out of the 60 countries analyzed. The United States, though in the top five in the category of “markets and investment”, lags in almost every other notable standard for environmentally sustainable market practices. Perhaps even more troublesome, however, is that the Global Green Economy Index also had separate rankings for perception of economic sustainability alongside those based upon strict performance. In the perception-based rankings, America ranked second of all the countries analyzed; a truly worrisome indicator of the perceived progressiveness of the world’s largest economy, and perhaps a reminder of how generally skewed international opinions are of America as a catalyst for change.

Current governmental administration in America does very little to actively promote the continuous evolution of ecological sustainability, which is required in the constantly shifting economic climate of the world. Moreover, most of America’s policies are currently defunct, whereas Sweden encourages environmental growth at the executive level on a consistent basis. In addition, the majority of America’s infrastructure is terribly antiquated in terms of environmental sustainability, and with the vast majority of energy in the U.S. derived from fossil fuels such as coal and oil, it is no wonder that so many countries have pulled ahead. Sweden, as the most prominent example, generates 78 percent of its energy needs through nuclear and hydroelectric technologies, compared to America’s feeble 13 percent.
The worst facet of American development as it pertains to ecological sustainability, however, is definitively the “environment and natural capital” criterion. With American fisheries and forest almost entirely decimated outside of government-regulated national parks, and with no truly effective widespread policy implementation in order to aid the restoration, it is no wonder that America, despite its immense political and monetary capital, fails to compete with nations that are several orders less influential in the international sphere.

Ultimately, what the Global Green Economy Index demonstrates is that international economic pertinence is not important for a country to have the capacity for implementing positive economic policies, which fall into step with environmental benefits. With countries such as Costa Rica and Ireland cracking the top of the rankings, economic heavyweights like the United States have no excuse not to be up to par with environmentally conscious economic development policies. With so much American discourse revolving around innovation in renewable energy sources in order to safeguard the global ecosystem, the United States proves to be all talk and no substance with countries such as Sweden plowing the road for legitimate sustainability.

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Return of the Thunderbird: A Look at Condor Conservation

By James Duffy

There was once a bird known as the Thunderbird; it roamed across all of North America, its ten-foot wingspan unrivaled among all other flying birds on the continent. When humans entered the North American landscape for the first time, they came to venerate this animal as a symbol of power, believing that its immense wings were responsible for bringing thunder to the sky. A creature as mythical as the Thunderbird, carrying the power of the skies in its wings of dignified black and white, must have seemed invulnerable to the first human cultures to behold it. But those living today know the history of the Thunderbird to have developed quite differently—for the Thunderbird is known now as Gymnogyps californianus: the critically endangered California condor, a bird synonymous with intensive and protracted conservation efforts. How did the California condor descend to the precarious point on which it teeters today, and what future does it face?

Fossil records show that the condor’s range once stretched from the Atlantic coast of North America all the way to the Pacific—a distribution much larger than that encountered by the first Europeans to study American wildlife. This suggests that even before Europeans arrived in the Americas, the condor had suffered significant declines as the herds of megafauna on whose carcasses these apex scavengers could once depend vanished from the landscape.

Whatever the cause of the condor’s initial ebb, it was eventually found only in the western half of its previous transcontinental range. In 1805, Lewis and Clark observed numerous individuals along the Columbia River in the Pacific Northwest. By the 1930’s, the birds were still found in the mountains of Baja California. By 1982, there were fewer than 25 left in the wild, all found in southern California.

The exact causes of the California condor’s precipitous decline are not entirely known; more likely than not it was a cocktail of human disturbances. Illegal egg collection, lead poisoning, and the never-ending march of development across North America’s open landscapes are the most obvious culprits. Ingestion of lead bullets that hunters leave in animal carcasses continues to be one of the most serious threats facing the condor’s long-term survival.
Aspects of the condor’s reproductive biology have also enabled its decline and hampered its recovery. Typical of many large endangered animals, the condor reaches sexual maturity relatively slowly at the age of six to eight years. Even then, females lay only one egg every two years. Beginning in the late 1970’s, scientists began to collect eggs for captive incubation and adult birds for breeding. By 1987, the wild population dropped to below ten individuals, and all remaining birds were taken into captivity, marking the start of one of the most ambitious captive breeding programs ever attempted.

Reintroductions of condors to the wild began in 1992. As of June of 2014, the condor population lies at 433 individuals, with 238 of those living in the wild across Arizona, Utah, Mexico, and Southern California. While reestablishing self-sustaining populations of wild condors has been an uphill battle in the face of continued lead poisoning and power line collisions, recent years have seen hopeful developments in the condor’s recovery. 2014 saw the first condor sighting in San Mateo County, California, since 1904. Talks among the US Fish & Wildlife Service of beginning reintroductions to coastal northern California and southern Oregon contain promise of continued range expansions. A diverse and widespread population remains the condor’s best chance at survival, guarding against catastrophic population loss from any singular event, and allowing for greater range flexibility in response to global climate change.

Fun Condor Facts!

- California condors may live to be over 60 years old, though no members of the current population have achieved this advanced age.
- Reflecting a common adaptation among vultures, the head of California condors is entirely bald, allowing them to dig into carcasses during feeding without dirtying their feathers.
- In 2008, there were more California condors flying free in the wild than in captivity for the first time since the recovery program began.

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Smart Growth

By Tom Armstrong

Smart growth is a theory based around the premise of developing towns and cities in an environmentally sound, energy efficient, economically viable, and community oriented way. With an ever-increasing population and carbon footprint, smart growth practices are gaining a lot of ground worldwide as well as in the United States. This past November, various states passed legislation reinforcing these practices, which enabled developers, homeowners, and local officials to develop towns consistent with Smart Growth practices. New Jersey happens to be a perfect place to institute smart growth initiatives, as we are the most densely populated state in the nation.

The New Jersey Economic Opportunity Act was signed into law in September of 2013 and we have seen mostly positive results in the way of smart growth practices. The EOA included two tax credit programs, the Grow New Jersey Assistance Program and the Economic Growth and Redevelopment Program each providing tax credits for smart growth practices. Among those given priority as advocated by NJFuture were those municipalities, which have weak real estate markets, are economically distressed, have transit oriented development locations, and areas designated for growth by The Highlands Council, Meadowlands commission, or the Pineland commission.

The areas referred to as economically distressed, particularly Trenton, Camden, Patterson, and Passaic have seen significant benefits from the enactment of the EOA. Camden has been a large beneficiary, seeing an influx of businesses relocating to the city including Holtec International, a well-respected energy production equipment company; Subaru of America, a world renowned automobile manufacturer; Lockheed Martin, the infamous defense contractor; and the 76ers professional basketball team who practices in New Jersey. All of these companies providing a much needed economic stimulus to the Camden community.

Along with last year’s passage of the EOA, this year New Jersey passed a ballot initiative to secure funding for open space and farmland preservation. As previously stated, New Jersey is the most densely populated state in America and also the most developed. As a result it is imperative to preserve the land that is undeveloped. The funds for the preservation will be taken from the corporate business tax that currently goes to other environmental efforts, however the initiative only devotes 6 percent of the tax to the funding of open space. Despite our ever-increasing development it is crucial that we maintain lands still untouched by the hands of humans and machines of industrial America.

As a result of our prominence as a world leader and our reputation as the land of opportunity, we have developed many acres of land and often times done so with little respect to the environment, our energy consumption, and the overall wellbeing of our communities. Fortunately, it is not too late to make changes and to start developing in a “smart” way with respect to the land we live on and the people we live beside.

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Rutgers University

Dance Marathon (RUDM)

is the largest student-run philanthropic event in the state of New Jersey. Last year, RUDM raised over $620,000 for Embrace Kids Foundation, a nonprofit organization that raises money for kids with cancer and other blood disorders. This year, they are trying to find creative ways to fundraise for the event. We have paired up with a company called text2give.

What is text2give?

text2give is a 1-click donation where the amount goes on the donor’s cell phone bill. The current donation amounts of $5 and $10 are set by the phone carriers.

Dr. Clark’s Weird News

“Compelling Explanations”

Eric Opitz, 45, who was indicted on 13 counts of fraud in Philadelphia in October, had explained that the reason he needed human growth hormone (that he would resell) despite being 6-foot-3, 450 pounds, was that he was really a dwarf and feared he would recede if he stopped the medication. [NJ.com, 10-10-2014]

“The New Normal”

An Oceanside, California, couple was surprised in November to discover that buying a purebred bichon frise on credit meant they were only leasing the dog for 27 months and would have to make a 28th payment to actually "own" Tresor. Furthermore, the lease, under a "repo" threat, required "daily exercise," "regular bathing and grooming" and "immediate" disposal of Tresor’s "waste." A spokesperson for the store, Oceanside Puppy (which works with four finance companies), told the San Diego Union-Tribune that the arrangement is fairly standard now for expensive pets. [San Diego Union-Tribune, 11-28-2014]