The EPIB Trail staff welcomes students and faculty back to school for another semester, and thanks you for your continued loyal support. As we enjoy our last freezing days before Spring begins, we are excited to share with you the February 2015 edition of the Trail. Stay warm and don’t let midterms get you down!

Your editors,
Holly Berman, Chloe’ Lewis,
Alexander Toke, and James Duffy

A Special Thank You to Our Wonderful Advisors:
Kristen Goodrich & Dr. George F. Clark

Meet the Writers...
Arcadia Lee Papalski
Matt Golden
Christopher Wilkinson
Holly Berman
Alexander Toke
James Duffy
Alexander Nayfeld
Sagarika Rana
Alexus Lizardi
Langley Oudemans
Ryan Koch
Christopher Wilson
Marc Katronesky
Tom Armstrong
Jeanne-Marie LaVergne
Collin Dobson
Ariel Schwalb
Derek Leckner
Morgan Lewis
Christi Capazzo
Rishi Jaggernauth
Will Shinn
Chloe’ Lewis
Melissa Mertz
Going the Distance: 
The Environmental Impact of the Super Bowl
By Christopher Wilkinson

The Super Bowl is a big event that occurs every year that you may have heard of in your travels. As with any large-scale event, it falls under the scrutiny of environmentalists everywhere, who try to determine the damage caused by the event both directly and indirectly. So, after doing some intense research (typing things into Google) and compiling various articles (clicking things in Google), here’s what I’ve determined about the Super Bowl’s environmental footprint. It’s big, and there’s probably not a whole lot we could do to change it. However, not all is lost for the environmental team, since the good old boys at Super Bowl HQ actually seem to have a greater sense of corporate responsibility than one might think.

There are three major components to the Super Bowl that I’m going to cover, and while there are a lot more, these are the easiest to explain and break down. They are waste, energy usage, and carbon emissions. “Waste” is just one of those things that we as a society have perfected the production of, and is costly to do anything with. The Super Bowl and its partners deal with waste in some pretty progressive ways: Verizon, the Super Bowl’s biggest partner, has hosted a recycling rally program in the host city of the event since 2009 and has collected 1.8 million pounds of electronic waste total. They also partner with Waste Management Phoenix Open to keep all waste out of landfills, and they’ve recycled 18 tons of paper in the 2012 game alone. They also partner with various local food organizations to recycle unconsumed food, and in 2008 recovered 90,000 pounds of food. So, we have to give them points for effort in the waste management regard for not simply going the cheap route, and while there are certainly ways to improve, they seem to be trying.

Energy usage and carbon emissions are two sides of the same coin, but are dealt with by the Super Bowl committee in different ways. The festival of football committee has begun a reforestation program in Arizona that will offset the event’s ground fleet of cars and busses’ carbon emissions, totaling to about 350 tons of greenhouse gas emissions. This, however, only covers the vehicles used by staff and players for the event, and doesn’t consider commuters or fliers, but it’s still a generous gesture by our benevolent sport overlords. Furthermore, the 15,000 megawatts of energy used to power the event will be accounted for via purchasing “renewable energy credits” from Green Mountain Energy, which will be used to fund and produce energy from non-carbon emitting sources.

So, while the event is largely reactive in how they tackle energy and waste concerns, we have to respect their defensive line of environmental partnerships that make them a strong team in this upcoming Super Bowl. While a lot of their initiatives may simply be safety measures for public relations purposes, they call some good plays when it comes to trying to offset their carbon and waste footprints. They seem to be getting more aggressive with how far they’ll run the environmental ball each year, and maybe we’ll have a completely environmentally Super Bowl one of these years. Of course, that will take a lot of work and some technological breakthroughs, but they seem willing to spend a lot of money to ensure they’re at least slightly offsetting their impact on the environment.

Because when it comes to the environment, every game is a home game.

http://www.huffingtonpost.com/2012/02/05/superbowl-xvi-greening-n_1255925.html
Brazil’s Soy Moratorium:  
A Successful Industry Led Effort to Reduce Deforestation

By: Holly Berman

In response to rapid and widespread deforestation in the Amazon rainforest, Brazil’s soy industry implemented an agreement in 2006 called, the Soy Moratorium. The purpose of the Soy Moratorium is to promote industry wide sustainable farming, thereby halting deforestation in the Amazon region. The Moratorium was proposed after a great deal of pressure on the soy industry. Members of the agreement encouraged farmers to only plants in previously used lands by refusing to trade or finance farmers that were growing on newly-deforested land. Before the Moratorium, even with Brazil’s strict environmental regulations, deforestation was steadily increasing. In one study conducted by the European Commission found that between 2001 and 2004, about 2,000 square miles of forest in the region had been cleared for crop, but specifically soy, production. The Soy Moratorium serves as a great example of effective supply-chain governance, as opposed to a traditional top-down regulatory approach.

In 2006, following a report published by Greenpeace, multi-national companies like McDonalds and Wal-Mart stopped purchasing soy grown on recently cleared Amazon land, pushed by consumer pressure. This, in turn, put pressure on commodity traders. Thus, the Soy Moratorium was born. In a study published in January of 2015, The University of Wisconsin-Madison’s Holly Gibbs, in conjunction with other colleagues across the United States and Brazil, concluded that the Moratorium did, in fact, helped to drastically decrease deforestation linked to soy production in the Amazon region.

Gibbs, a professor of environmental studies and geography in the UW-Madison Nelson Institute’s Center for Sustainability and the Global Environment (SAGE), commented, “What we found is that before the moratorium, 30 percent of soy expansion occurred through deforestation, and after the moratorium, almost none did; only about 1 percent of the new soy expansion came at the expense of forest”. As Science Daily explained, “By 2014, after eight years of the moratorium, almost no additional forest was cleared to grow new soy, even though soy production area had expanded another 1.3 million hectares. Farmers were planting on already cleared land”. Although Brazil is home to strict environmental and deforestation regulations, the study explained that these regulations were simply not enough, and that an industry-led approach, in addition to government regulations, is effective in managing land loss in Brazil. When the Moratorium was proposed, it was scheduled to end in 2014. As of January, the soy industry extended this date to May of 2016.

With the success of the Soy Moratorium, other food production industries are beginning to follow in the soy industry’s footsteps. Recently, the cattle and palm oil industries in the area have also proposed similar industry-led deforestation agreements. Looking at the bigger picture, Brazil’s example can show that governmental environmental regulations are not always enough to create a large-scale change. In order to protect what is left of our forested land and natural resources, agriculture and food production systems must begin to initiate more and more industry-led, environmentally sustainable approaches. In addition, consumer attitudes towards the environment can push these industries in the right direction. When talking about individual action, Gibbs commented, “Our consumer choices matter. One of the things I’ve learned from working with all these companies is that they listen. They respond to... consumer pressure. I would really encourage Cardinal readers to learn about how much they matter globally, and about how decisions we make here can affect the Amazon River Basin and beyond”.

SOURCES:
⇒ http://host.madison.com/daily-cardinal/soy-moratorium-is-helping-protect-the-environment/article_3b290018-b173-11e4-b69c-0fbd8e28303.html
⇒ http://www.sciencedaily.com/releases/2015/01/150123081325.htm
⇒ http://www.sciencemag.org/content/347/6220/377.summary
The Regional Greenhouse Gas Initiative (RGGI) is the first market-based regulatory program in the United States to reduce greenhouse gas emissions. RGGI is a cooperative multi-state effort, which includes the following states: Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont. Under the Regional Greenhouse Gas Initiative, these states cap and reduce CO2 emissions in the power sector. To reduce emissions of greenhouse gases, the RGGI States use a market-based cap-and-trade approach that includes:

- Requirement of fossil fuel-fired electric power generators with a capacity of 25 megawatts (MW) or greater ("regulated sources") to obtain an allowance for each ton of CO2 annually.
- Power plants may comply with the cap by purchasing allowances from quarterly auctions, other generators in the region, or offset projects.
- Investing proceeds from the CO2 allowance auctions in consumer benefit programs to improve energy efficiency and accelerate the deployment of renewable energy technologies
- Allowing offsets (greenhouse gas emissions reduction or carbon sequestration projects outside the electricity sector) to help companies meet their compliance obligations
- An emissions and allowance tracking system to record and track RGGI market and program data, including CO2 emissions from regulated power plants and CO2 allowance transactions among market participants

In 2011, Governor Chris Christie pulled New Jersey out of the RGGI initiative even though both State Houses approved the bill. State Senate President Stephen Sweeney and State Senator Bob Smith believe they have found a way to get NJ to join onto the regional agreement with the nine other northeastern states. Again, lobbyists and interest groups will express concerns or be in favor of the policy.

RGGI has been politically debated across the nation, with a majority of Republicans and business industries opposing the cap and trade initiative. Partisan issues aside, RGGI is back up for debate. Certainly, it will be exciting to track the bill through both Houses and see what the Governor does this time.

New Start New Jersey (NSNJ), a non-profit organization founded by Phillip Murphy and his wife Tammy, was started to strengthen New Jersey's middle class and boost the local economy. NSNJ has been discussing some of RGGI's potential affects to NJ's economy. To find out more about NSNJ's initiative check out the podcast link, found below. Among those involved include Phil Murphy, 2 Board Members, Kelly Speakes-Backman, RGGI Chair and Maryland Public Service Commissioner, and David Cash, Massachusetts Department of Environmental Protection Commissioner, and famous musician—Jon Bon Jovi. Phillip Murphy is considered a candidate for the 2017 run for Governor.

Podcast Link:


More information on New Start New Jersey:


By Alexander Toke

Stretching 1,179 miles from the tar sands of Alberta, Canada, to the Gulf Coast of Texas, the Keystone XL pipeline has emerged not only as a major point of contention between members of Congress, but also a hotbed environmental issue that has gripped national consciousness. The Keystone XL is built to carry around 830,000 barrels of tar sands oil per day and bare a particularly dirty variety of oil; the refining of which produces 17 percent more emissions than normal crude.

There are proponents and opponents of its construction; the relationship between energy development and the environment being the primary distinction between the two sides. On one hand, supporters of its construction claim that it will produce thousands of jobs involved in both its construction and maintenance, but also in the states through which it passes. Opponents of the project cite the multitude of dangers associated with the transportation of oil, especially oil as dirty as tar sands, as well as the impact that increased oil production will have on American greenhouse gas emissions contributing to Climate Change. With the project having passed both the House of Representatives and the Senate, the tension is palpable as both sides wait to see where the President's pen might fall.

This particular pipeline entered the national stage during the summer of 2011, when James Hansen, who was then the director of NASA's Goddard Institute for Space Studies, raised concerns about the project, which was then still under debate, albeit subdued debate. Hansen published an article titled “Silence is Deadly,” in which he states that “governments are acting as if they are oblivious to the fact that there is a limit on how much fossil fuel carbon we can put into the air”; an attitude shared by many in the environmental movement and the scientific community. He concluded that the pipeline was not in the national interest, because it contributes to Climate Change, which will result in largely adverse effects on the American people.

Through the intervening years, thousands of protests around the country have sparked a firestorm of debate over Keystone XL, with the most notable being the journey of hundreds of First Nation activists from Native American tribes around the United States and Canada. Dubbed “the Cowboy Indian Alliance” among others, these groups have come to be emblematic of the fight against the pipeline, which many First Nations peoples have called “the black snake”.

Now, four years later, the pipeline has been approved by both the House and Senate, dominated as they are by Republicans who favor the project at the expense of the environment, and is awaiting an expected veto from lame-duck President Barack Obama. President Obama has stipulated in past months that Climate Change and the environment will be centerpieces of the final years of his administration, and many in the environmental movement are hoping to see their first major victory of this century on Capitol Hill. The project requires presidential approval as it crosses the border of the United States from a foreign entity. With a recent report from the Environmental Protection Agency citing that the pipeline would both contribute to harmful emissions that cause Climate Change via the tar sands pumped through it, as well as potentially damage water infrastructure and contaminate the local environment through which it passed.

While proponents of both outcomes wait with bated breath for the President’s veto or approval, President Obama’s words regarding his commitment to combating Climate Change come to mind: “failure to do so would betray our children and future generations.” With the effects of Climate Change becoming more apparent and seemingly-inevitable day by day, evaluating the long-term costs of projects such as the Keystone XL pipeline are essential, because in a society obsessed with short-term profits, the global environment and the future of humanity cannot afford to be up for sale.

Our lovely state of New Jersey is ranked number one in having the best percentage of students getting undergraduate degrees, is one of the most diverse states, and is home to some of the most bountiful farms in the nation. Yet, besides trying to catch the F or EE into Cook/Douglass or go from Cook/Douglass into Livingston, or from anywhere for that matter, one of the most serious issues the students of our state university has to worry about is getting clean water. In the 1700s, there was one beverage commonly drank by the New Jersey delegates and other founding fathers, and it wasn’t water. Water was considered poison. However, that was during a time before the invention of the light bulb and long before the first modern water treatment facilities. There shouldn’t be any excuses more than three hundred years and several trips to the moon later. Despite these human achievements, many people do not know that one of the most serious issues we face today, not only as Rutgers students, but also as one of the many college students across the country, may still be our lack of access to clean water. For many Rutgers students, we are told by our RAs that our dorm water is not the cleanest and our alternative use of plastic bottled water is not only killing our planet, but could also be contaminated as well. As of late, an organization called Food Water Watch has swept over Rutgers with the mission to educate and remedy this self-hydration issue.

The Food Water Watch is an environmental group that supports the campaign called “Take Back the Tap.” The goal of the campaign is to raise money and support for the installation of water filters in all Rutgers University residence halls. These filters can insure students living and visiting on campus that the water they intake is clean and lacks any harmful chemicals. Furthermore, these filters are also water-refilling stations, as students are encouraged to use them to refill their non-plastic thermoses, NOT water bottles, as another part of the goal of these water filters is to make plastic bottles obsolete.

These water filter stations are not a new concept, as many already exist in a variety of places in New Brunswick. Currently, these water filter stations are in every Rutgers student center from College Avenue to Busch. Unfortunately, the few that exist are not used that much, as many do not often visit their local student center or pass by the area where they are set up, making them less efficient at accomplishing their goals as they could be. With the lack of knowledge and quantity of these stations, water in the halls are still dirty and students continue to stock up on cases of non-recyclable water bottles whose chemicals slowly break down and taint your allegedly clean water. Thankfully, steps to make these water filter stations more prominent in Rutgers residence halls are al-
ready underway with the ‘Take Back The Tap’ campaign. The campaign coordinator Lindsey Sigmund, a senior at Rutgers University helped sponsor the Take Back The Tap bill that was presented and as of February 9th, passed by the SEBS governing council. This bill granted the allocation of money to install these water filter stations in the halls of the Cook/Douglass campus. The successful passing of this bill will now start a domino effect calling many other campuses to possibly decide to follow in SEBSGC’s footsteps, eventually accommodating every hall on every floor on every campus with access to clean, fresh, and filtered water.

Students who are not part of governing councils or even hall government can still get involved with making sure you have access to the cleanest and healthiest water possible. Campaign Coordinator Lindsey Sigmund and her organization are currently working to gather student signatures in support of this movement for filter stations in dorms. Presently they have around 400 and plan to double it. Lindsey believes that this is not just a movement to get clean water in the halls or to eliminate the need for water bottles, but she also believes that “Rutgers Students shouldn’t have to pay for water.” The truth is that tuition is already incredibly expensive and a meal swipe can cost between 8-18 dollars depending what time of day you go to the dining hall. Water fountains often have an unusual taste, and the water bottles we spend our personal money on along with our tuition, books, and other fees also are not always guaranteed to be clean. Lindsey and her other campaign members meet at the Cook Student Center every Monday at 8:30 where students have the opportunity to sign the petition or get involved. You can also find Lindsey on Facebook for more questions on how to get involved and take part being able to help “take back the tap.”

References:
Lindsey Sigmund
Campaign Coordinator
foodwaterwatch.org
Robert Brennan
Environmental Education:
Teaching the Future

By Morgan Lewis

Sitting outdoors, as I watched my sister play, I often wondered whether she truly understood the environment that surrounded her. Did she know that if she walked approximately twenty feet to the left, she'd likely come home with some itchy patches of poison ivy? Had she learned about the aquifer beneath her feet? My questions were probably best answered when returned home scratching her legs. Had I asked my sister what show aired on Nickelodeon at dinnertime or the location of the closest GameStop, I know I would have received an accurate response.

On average, Americans spend approximately 90 percent of their time indoors. Where you play is where you learn. Unlike my sister, many children do not even have the opportunity to venture out into a backyard. The actuality of these situations is alarming. Children and adults are no longer living in the world that they were born into, but rather in the four-walled rooms that they have constructed. Not only has indoor isolation restricted environmental education, it also has possible links to various health risks prevalent in children such as obesity, cardiovascular disease, Vitamin D deficiency, and ADD/ADHD. Environmental issues are becoming the hot topics of this era. Without a well-informed citizenry, who will overcome these obstacles?

Environmental education (EE) is more than just a classroom discussion on the water cycle. We must learn about our surroundings through hands-on interaction, supervision, and experience. Environmental education programs and curriculums incorporate various teaching methods to give children and adults a deeper understanding of the world around them. These programs help increase public awareness, teach critical thinking, and allow individuals to form their own opinions on the diverse environmental issues we face today.

Providing our community, nation, and world with the access to such teachings is crucial to the development of a more consciously engaged society. Numerous programs have already been appearing across the nation. Some organizations that have been pivotal in the creation of these programs are GrowNYC, ProjectWILD, and the North American Association for Environmental Education. The EPA also offers workshops, class visits, and the President's Environmental Youth Awards program through the National Environmental Education Act of 1990. Other organizations are looking to expand environmental education implementation, such as the No Child Left Inside Act (NCLI), which encompasses the idea of providing incentives and support for states to develop environmental literacy programs and motivating school systems to make environmental education available to all students.

The implementation of environmental education is not only crucial to the individual but also our society as a whole.

http://cfpub.epa.gov/eroe/index.cfm?fuseaction=list.listBySubTopic&ch=46&s=343
http://www2.epa.gov/education/what-environmental-education
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Across Tokyo Bay, and about an hour drive from the center of Tokyo, two Japanese companies, Kyocera and Century Tokyo Leasing Corporation, are teaming up with a French company by the name of Ciel et Terra (Sky and Earth) to find innovative solutions to renewable energy in areas where land is in high demand. At Yamakura Dam, there are plans to put in enough photovoltaic cells to offset 8,000 tons, or 1,700 cars’ worth of carbon annually. Several other countries like the United Kingdom, Australia, India and Italy are following Japan's ambitious solar initiative to include floating solar panels in infrastructure upgrades taking place in the near future.

To minimize the effect of decreased sunlight on the water from the shadows cast, the arrays will be placed in the center in order to avoid the delicate fauna and ecosystems near the banks and placement in man-made reservoirs is preferred to natural ones. Avoiding the contamination of drinking water is also a top priority and is why Japanese electronics manufacturer Kyocera is teaming up with the French company Ciel et Terre to ensure that the photovoltaic cells of the planned Yamakura plant do not corrode or break the seals.

Engineers planning the facility recognized the difficulties of waterproof panels early on in the process and sought out help. The general manager of Kyocera's solar energy marketing division, Ichiro Ikeda, chose Ciel et Terre because of their expertise in designing exactly what was needed for the project to be a success, “The floating platforms made by the French company Ciel et Terre are recyclable and resistant to years of solar abuse and corrosion.” Another thing to consider for Japanese infrastructure work is the possibility of natural disasters and so the arrays have been tested against all foreseeable events. In France, the frames holding the array together and waterproofing it were tested against winds up to 118 miles per hour in France’s premier aerospace laboratory, On-era, just 25 minutes south of Paris.

According to Kyocera's planners, the solar farm within Yamakura Dam should be in operation by March of 2016 and, if this experiment is successful, should be the first of many similar farms in Japan and around the world. The reason that Japan is the poster child of this movement is largely due to their already widespread reservoir system being used to allow for their extensive rice industry. This in addition to the country’s shortage of usable land for building and the need to feed the city of Tokyo, which has the highest population density in Japan provides a unique opportunity for planners. This combination of factors makes land a commodity and therefore makes solar arrays a pricey energy option (2). Placing the solar array in the reservoir avoids the expensive land rent and the water surrounding the cells provides an unforeseen benefit and cools them. According to Ciel et Terra this could generate up to 20% more energy than a similar array on land. The shift to solar arrays in Japan’s numerous reservoirs could allow for older solar arrays to be used for other more efficient endeavors and make energy more inexpensive for the residents of the surrounding area.

For now the plans for floating solar cells are limited to reservoirs or even lakes depending on the context, but Kyocera and Ciel et Terre already have their eyes on salt water systems of a much larger scale. At the moment there seem to be more issues with logistics than there are energy benefits. In Thailand, Ciel et Terre has been experimenting in salt water systems but the general theme seems to be that they are a worse investment than a standard land solar farm. There is also the question of transporting the energy to shore, and the longer the wire, the greater the chance that something will go wrong. In the meantime, the collaboration between French and Japanese companies seems to have its roots in conservation of space and efficiency, and this works in Japan. However, as this idea spreads there are more possibilities, which can be applied in other countries to help move solar farms forward.

**SOURCES**


(2) [http://www.nationsonline.org/oneworld/japan_cities.htm](http://www.nationsonline.org/oneworld/japan_cities.htm)
Swaying Gas Prices and the Cost to the Environment

By Christi Capazzo

Recently, gas prices have been fluctuating, but the prices indicate bigger movements than just the change in people’s pockets or the numbers in their bank accounts. Gas prices have steadily dropped from June of 2014 until January of 2015. In the eyes of the public, this is a good move for the economy since it allows vehicle owners to worry less about the money they spend on gas and allow them to put more money into the economy. However, prices have risen again since the end of January and connect to larger and more trends such as: drastic changes in oil production and the purchase of fuel-efficient cars.

One of the first issues that gas prices indicated was the price of oil per barrel, which is typically based off of market costs and the volume of oil being produced. Due to the introduction of hydraulic fracturing and the manipulation of U.S. shale oil resources, the U.S. has become a competitor in the global oil market; doing so led to a drop in domestic oil prices. While the public cheers for cheaper gas, the drop in prices hurts the production of shale oil. With such a volatile market, entire drill sites have shut down in Texas. The Federal Reserve of Dallas cites that Texas alone added two million barrels of oil a day to the market over the past four years. Despite this major contribution, some of these sites have shut down entirely, leaving their workers unemployed. The extraction process is expensive for shale manufacturing and it is economically feasible only if the barrel of oil stays at about $70 a barrel.

An alarming trend that has also been reported is the increase of sales in trucks and SUVs since gas prices have dropped in 2008. This is clearly due to the decline in oil prices as gas prices have effectively remained cheap, but as mentioned earlier, the prices of the oil market are difficult to project. Global oil production only continues to increase by driving down the cost per barrel; as seen in the record production of 10.67 million barrels of oil a day from Russia. But what is the cost to the environment? As Bryan Walsh states in his portion of the article from *Time*, “cheap crude will just keep people addicted,” it is senseless to continue to use a fuel source that is known to be unstable in cost and harmful to the environment when there are cleaner alternatives.

Although gas prices remain noticeably cheaper compared to a year ago, there is still a lack of attention being given to the fact that prices have experienced a slow yet steady increase over this past week. Michigan and Florida shed positive light on the fact that gas prices are nowhere near being as high as they have been in recent years; this naturally encouraged people to spend more on gas and travel. This craze for cheap gas prices will inevitably hurt the market for electric cars. Typically, when gas prices are low, the public shies away from buying hybrid of electric cars and shifts back to buying vehicles that do not move along our goals to reduce emissions. If people are easily swayed by the price in gas, this exemplifies a larger concern that must be considered over how seriously the people consider climate change. Collectively, choosing fuel efficient vehicles or hybrids and not allowing cheap gas prices to sway mindsets so easily may be key steps in assuring that emissions reductions hit their goal.

◊ http://www.detroitnews.com/story/business/2015/02/09/gas-prices-expected-rise-
◊ spring/23149495/
Climate Change & Poor Countries: 
Unequal Effects & Incentives

By Rishi Jaggernauth

Despite a scientific and political consensus calling for limiting average global temperature increases to 2°C above the preindustrial global norm, greenhouse gas emissions continue to rise to unprecedented levels. Climate change poses a unique challenge in particular for many developing nations as the most salient impacts of climate change will likely be felt by the most vulnerable populations in these countries. Developing countries face the added burden of human and economic development challenges that further complicate efforts to reduce greenhouse gas emissions. Those populations at the brink of poverty have limited resources and capital to adapt to the effects of climate change. As many low-lying and vulnerable countries clamor vociferously for continued action on climate change, the question that naturally arises is how the 5 to 7% annual reduction deemed necessary to keep global temperature increases within 2°C can be achieved amongst the most advanced economies responsible for the greatest emissions.

The recent accord between United States and China on greenhouse gas emissions suggests a greater receptivity amongst advanced economies to reduce climate change, but the economic incentives may not provide as large of an impetus for these developed nations in comparison to the most vulnerable developing countries. One study in the Journal of Environment and Development Economics suggested that climate change would result in virtually no net impact for countries in the upper quartile of Gross Domestic Product (GDP). Although it is clear that all countries will be susceptible to the effects of climate change, the majority of individuals in more advanced economies and wealthier countries are still not affected acutely enough to be motivated to embrace further climate change action.

This lack of urgency is an important consideration given the need for broad-scale, multilateral agreements for climate change mitigation. The diffusion of responsibility on a global scale amongst the largest greenhouse gas emitters may reflect not only a lingering perception that climate change will not be as deleterious as predicted, but also a lack of exigency regarding the effects for developed nations. In one study, Frantz and Mayer applied the theory of emergency response to highlight our innate tendency as humans to avoid taking action on climate change until we perceive it is in our self-interest to address it.

Establishing a more definitive and stronger link between climate change and economic growth amongst advanced economies may help provide the added impetus for advanced economies to take action sooner rather than later. In countries that are the most susceptible, it is clear that the direct consequences of climate change are dire enough to warrant proactive measures to reduce emissions. What this suggests is that modeling projections may need to increase the social cost of carbon to spur action amongst these developed nations. Political leaders in developed nations have not shown enough of an appetite to stray from their current course of inaction given the lack of immediacy of the effects of climate change back home. An illustration of how climate change and extreme weather events can impact local economies in dollars and sense may create a sense of urgency needed to champion this issue in these countries.

If the societal cost of carbon can fully represent the impacts of climate change for developed nations and make the “nonvisible” impacts visible, populations in developed nations may start to begin to hear the message that the much of the rest of the world has seemingly already heard.

* [http://journals.cambridge.org/action/displayFulltext?type=1&fid=416003&jid=EDE&volumeId=11&issueId=0&aid=416002](http://journals.cambridge.org/action/displayFulltext?type=1&fid=416003&jid=EDE&volumeId=11&issueId=0&aid=416002)
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A few weeks ago the world watched billionaire Bill Gates take a sip of water that had just been extracted from feces. The clean, drinkable water is just one byproduct of a new process that may revolutionize the way rural areas deal with human waste. The Omniprocessor, developed by Janicki Bioenergy, is essentially a small power plant that runs on human waste to generate both electricity and clean drinking water. The Omniprocessor is surprisingly simple and incredibly sustainable, it is exactly the type of technology we need.

On one end, solid human waste is loaded onto a conveyor belt and moved into a heating chamber where water begins to evaporate from the solids. The water is collected, filtered, and stored for drinking, cooking, and cleaning while the solids move forward to drop into a furnace. The solids fuel the furnace and help generate steam, which is transported and used to power the attached generator. This generator runs the entire operation and provides energy to the local grid for personal or commercial use. The process is applicable to current systems and may help other areas of the world raise the standard of living without having to deal with huge corporate entities.

If the US were to use this technology, we would be able to ease some of the pressure on waste processing plants while decentralizing the massive energy grids that currently exist. It is just one more weapon to add to an ever-growing arsenal of sustainable energies. However, the largest potential impact can be made is outside of the US where there are huge populations that go without energy or deal with energy shortages on a daily basis. The Omniprocessor is a cheap and viable solution for these areas, which will allow them to take some control of their energy production.

While it is often the political landscape that makes the biggest difference in the end, the Omniprocessor could potentially play a huge role in improving the lives of those who are not fortunate enough to have access to clean water or even a minimal amount of electricity. It is tough to say how long it will take to implement the Omniprocessor, but once it is it will likely be difficult to reject. It might seem off-putting at first to drink “poo water,” but it is senseless to let waste become just that, waste. Real progress will come when people can look at this waste as a resource that has the potential to give a number of people the freedom that they deserve.

⇒ https://www.youtube.com/watch?v=bVzppWSIFU0#t=15
The Galapagos Giant Tortoises: A Wildlife Success Story

By Chloe’ Lewis

For the first time in 150 years, the Galapagos welcomed new baby tortoise hatchlings on the shores of Pinzon Island. After 50 long, tireless years of conservation efforts, saddleback giant tortoises have officially shown researchers they have successfully and seemingly permanently established a growing, stable population in the Galapagos. This is arguably the wildlife success story of last year. Researchers made the awe-inspiring discovery in early December of 2014, when they stumbled upon ten freshly hatched baby tortoises. This finding is evidence that the small giant tortoise population on the island is officially reproducing independently in the wild. Scientists suspect there are many more hatchlings that are obscured by their camouflage and small stature. Given the fact that researchers are said to have spotted a total of 300 adult tortoises during their trip, they estimate more than 500 are currently living on the island.

Of all of the native species of the Galapagos, giant tortoises were the most devastated after rat invasions and human threats. One of the giant tortoise’s most amazing adaptations — its ability to survive without food or water for up to a year — was also the indirect cause of their demise. Buccaneers, whalers, and fur traders began massively overexploiting the animals by storing live giant tortoises in the holds of their ships. Tortoises were also exploited for their oil, which was used to light the lamps of Quito. Two centuries of exploitation resulted in the loss of between 100,000 to 200,000 tortoises. Three of the four original species are extinct. One species lost its last member, dubbed Lonesome George, in June of 2012.

With the establishment of the Galapagos National Park and the Charles Darwin Foundation in 1959, a review of the status of the tortoise populations was underway. It was discovered that only 11 of the 14 original populations remained. Most of them were endangered if not already on the brink of collapse. Conservationists adopted a strategy to extend the tortoises’ longevity, with the goal keeping some of the remaining old adults alive until efforts could save their unstable species.

In the 1960s the Galapagos National Park and associates set out to save and protect the remaining 100 giant tortoises the islands had left. This led to 50 years of collecting eggs, raising hatchlings in captivity, protection against early pirates and whale hunters, and drastic rat-eradication efforts. In 2012, conservationists waged an aggressive campaign for a pioneering operation to eradicate the invasive rat species on Pinzon Island by distributing poison via helicopter. The poison would only attract rats. This was a major turning point for the island’s small and struggling tortoise population. With the invasive rat species gone, the adult tortoises now had the opportunity to breed successfully for the first time. This has been a major success, and we look forward to increased populations of giant tortoises once again.

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Recovery from the Brink of Extinction

By Melissa Mertz

A breed of ferocious big cat is making a fierce recovery as populations of wild tigers in India have increased by 30% since the last population count released in 2011 (CNN). The National Tiger Conservation Authority released the census, stating that 2,226 tigers were recorded in forests across the country, up from 1,706 counted in 2010 (NBC). This is a huge step for the progression of conservation of these endangered animals, which were close to extinction not too many years ago.

India is home to about 70% of the tiger population, so their conservation efforts have been particularly vital to the total conservation of the tiger population. India’s strategy has revolved around the National Tiger Conservation Authority and the Wildlife (Protection) Act of 1972. Since the mid-1970s, 102 national parks, 515 wildlife sanctuaries, 44 conservation reserves, and 4 community reserves have been set aside for tiger protection because of the regulations of NTCAWA. In these particular locations especially, tiger density has increased. (WPSI)

However, the fight has not yet been won. Poaching is still a massive issue and the largest threat to the tiger population. Very few of these conservation areas have any armed protection or intelligence network against poachers. Forest guards are vulnerable against poachers and there have been recent cases of assault and murder of forest guards. (WPSI) The tiger is still highly sought after for its body parts, and illegal trade runs rampant through India, China, Vietnam, Thailand, and almost every area where tigers breed naturally. The trade is very complex and sophisticated, which makes it difficult to track and contain. (CNN) Although the number of tigers is increasing in India, it is still falling in total (NBC).

Tigers are worth more than their beautiful fur and economic value. We have to protect tigers because they are a vital aspect of the ecosystem. Tiger populations are indicators—they represent the health of the forest around them. They show conservation efforts for more than just the tiger itself. These efforts are interconnected and forests are necessary for water sources and climate change mitigation. (CNN)

Environmental agencies and individuals alike are excited about the positive news for these tigers in India. It is a rare occurrence for any species to be pulled out of endangerment. On the other hand, this amplifies how essential it is to pursue more extensive conservation efforts in order to maintain an upward slope of population growth. Poaching for tiger furs needs to diminish—besides, animal print is so passé.

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Israel: Leading Vegan Country

By Ariel Schwalb

A survey that came out in January revealed that 5% of Israelis are vegan, an additional 8% are vegetarian, and 40% know someone who has gone meatless over the past year. There are many factors that have led to the recent surge of Veganism in Israel, from media, to activism, to an increase in vegan eateries. This is good news for Earth, as veganism is the least energy intensive way of eating, in comparison to vegetarianism and meat eating diets.

On reality TV in Israel, Tal Gilboa was the most recent winner of the show Big Brother, which is about strangers living together in a house and voting each other out until there is only one left. Both Gilboa and the runner up were vegan animal rights activists. Gilboa led controversial debates on the show about where our food comes from and the ethics of eating animal products. One survey found that 60% of the viewers declared that they would make the change to veganism after listening to her speak about animal suffering. Although it is unlikely that many will act on this, it has provoked a national discourse about the issue.

There have been a million Israeli views of a vegan activist Gary Yourofsky’s lecture on YouTube. It has been translated into over 30 languages and has since become very influential. Since then, Gary has gone on two lecture tours of the country. In one video, he makes a connection between the Holocaust and industrial animal agriculture. He says that Hitler designed concentration camps after the assembly lines that Ford used, and Ford had designed his assembly lines after pig slaughterhouses in Chicago.

In the news, vegan activism has had a major impact. Videos of animal cruelty at the most powerful meat and dairy corporations in the country were shown on national television for all to see. This created an uproar. Activists have also been participating in gruesome demonstrations on the streets, forcing citizens to actively think about their meals.

Changes in Israeli life are becoming more and more visible. The IDF now allows soldiers to wear leather-free boots and adhere to a vegan diet. Domino’s pizza has sold 300,000 soy cheese pizzas this past year. Café Greg food restaurant chain’s manager was quoted saying that in a past 1.5 years, there has been a 30-40% increase in demand for vegan dishes. Tnuva, the country’s largest dairy supplier, have been successful in selling vegan milks and yogurts at almost every supermarket.

Eating Kosher has also helped Israelis be open to veganism and vegetarianism. Those who eat this way never eat meat and dairy at the same time, so if they want to have a meal with dairy in it, it automatically has to be vegetarian. There may also be a connection between eating in a way that follows religious practices and eating in a way that seems more ethical. From my own experience, when I went to Israel in 2013 as a vegetarian, I found it to be quite easy. Over there, all of the street food sellers offered falafel and hummus, and most of the restaurants had pasta and vegetable dishes. Tropical fruit was abundant. It will be interesting to see how Israel will continue efforts to become more vegan friendly, and how this will effect environmental and social issues.

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Of Pipes and Pines: Controversy in the Pine Barrens
By James Duffy

With the start of a new year in New Jersey has come the resurrection of a now perennial land use controversy in the Garden State’s iconic Pine Barrens, as Governor Chris Christie has again sought to change the membership of the public body charged with the pinelands’ management. Since 2013, utilities provider South Jersey Gas Co. has sought approval from the New Jersey Pinelands Commission to construct 10 miles of a proposed 22-mile natural gas pipeline through protected pinelands forest. In January of 2014, the Pinelands Commission, the independent public body charged with overseeing development in the Pinelands National Reserve, voted in a split 7-7 decision not to allow the pipeline’s construction.

Following the pipeline’s initial failure, Governor Chris Christie moved to replace two no-voting Pinelands Commission members with nominees of his own. This immediately drew the ire of state environmental organizations, as well as accusations of stacking the commission with members favorable to the governor’s pro-development political agenda. In accordance with the rules governing the Pinelands Commission, both nominees went before the state Senate Judiciary Committee for an approval process last fall. Pipeline opponents and proponents alike eagerly awaited the hearings’ results. During proceedings, both of Governor Christie’s nominees stepped lightly around the issue of pipeline development, with nominee Robert Barr claiming he had kept himself intentionally unaware of the highly publicized controversy, so as not to join the commission with any preconceived biases. This claim was met with amused skepticism from at least one Judiciary Committee member, and the committee ultimately decided to neither approve nor disapprove the two nominees. This meant that neither nominee would join the Pinelands Commission.

However, the specter of natural gas concessions in the Pine Barrens was raised once more last month, when Governor Christie again nominated Ocean City political figure Robert Barr to replace a current Pinelands Commission member. This time, the Senate Judiciary Committee declared that it would postpone any vote on the subject, with one committee member stating there did not appear to be enough committee support for Barr’s nomination to proceed. While the pipeline plan has stalled yet again, most believe further political maneuvers are yet to come.

The stakes at hand over the construction of a pipeline through protected segments of the Pine Barrens are high for both sides of the controversy. Pipeline opponents point to the Pine Barrens’ uniqueness as an imperative for its preservation; much like the Florida Everglades, no direct analog to the Pine Barrens can be found anywhere else in the world. Furthermore, the Pine Barrens sit atop one of the largest aquifers in the United States, and are home to numerous plant and animal species found nowhere else in the world.

Pipeline proponents argue that construction of a natural gas pipeline would create jobs for New Jersey residents, bolster tax revenues, and supply outdated power plants with a cleaner fuel source. Pinelands advocacy groups have voiced concerns that concessions made to development now would compromise the sustainable management goals created under the Pinelands Protection Act of 1979, and provide justification for future inroads into what remains of New Jersey’s pinelands.

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Utility of Natural Gas Questionable at Best

By: Alexander Nayfeld

Development of sustainable infrastructure for energy transportation has been an increasingly important task for cities with growing populations. The dissemination of energy resources within high-density population centers, however, is proving to be a dilemma with regard not only to the costs and planning involved, but also with regard to the environmental impact of the necessary infrastructure. A team of researchers led by Kathryn McKain of Harvard University has released a study, which posits that there exists definitive proof that approximately three percent of the natural gas delivered to Boston leaks directly from the pipeline into the atmosphere. In fact, the correlation within Boston between miles of pipeline and leakages is, for all intents and purposes, considered linear by the Center for Energy and Environmental Studies; for every 50 miles of cast iron mains throughout Boston, there exist a consistent 300 leaks. The most pressing issue with this leakage is that the predominant natural gas leaking into the atmosphere is methane, a greenhouse gas which, molecule for molecule, has significantly more global warming potential than carbon dioxide: by a factor of approximately 72 times.

This study is directly corroborated by a previous cooperative study conducted by Google and the Environmental Defense Fund, which utilized sensors to determine that Boston’s pipelines are critically aged, and were definitively not providing secure transport for natural gas.

The issue here, however, is not solely that the leakage of methane into the atmosphere is harmful as a result of climate change impacts, but that the usage of natural greenhouse gases to fuel our energy requirements is likely itself a significant problem. This goes hand in hand with EPA affiliated researchers’ claims that the environmental costs of natural gas are undersold by potentially 75%. Increased popularity in natural gas consumption as a source of “clean” energy has spurred a wide array of construction of pipeline infrastructure for the exclusive transport of said gases. If we look at the inefficient nature of transportation of said gases within Boston as a microcosm, picturing the collective pipeline infrastructure of America alone becomes very frightening.

The picture, which materializes, then is essentially a poorly contained system of free-flowing, potent greenhouse gases which has spread across the entire continental United States and beyond. If even half of the national system is as poorly maintained and as inefficient as Boston’s unique pipelines, the outlook for America’s climate change prospects are grim to say the least. With enough methane to fuel 200,000 homes year-round being dissipated into the atmosphere on an annual basis within Boston alone, it may become increasingly important to evaluate the benefits of natural gas sources of energy with a grain of salt.

Further, all across the state of Massachusetts, the immediate ecological effects of leaky natural gas pipelines have been incredibly prominent. Belowground pipelines, which had been leaking methane for extended periods of time, actually are directly responsible for the dying off of trees in many areas. The methane leaking out of these pipelines actually deprives trees of oxygen at the roots, causing trees to, essentially, suffocate. In addition, many of these trees are public shade trees, and with many of these trees taking between 60 and 80 years to become fully grown, and costing near $100,000 each, the negative externalities of these gas pipelines are truly becoming gargantuan over time.

All concerns of the consequences of natural gas pipelines, real or potential, ought to be well evaluated in the future calculus of how energy transportation infrastructure will be developed. Fortunately, the mass majority of natural gas leakage problems are centered at a few select areas, making it relatively simple to target the worst transgressors of natural gas pipeline inefficiencies and eradicate the problem at the source. As a collective society, which is constantly intent on pursuing new ways to fuel itself, we need to also understand the fatal error in blindly setting up media to deliver these fuel alternatives to all population centers of the world. A methane leakage rate of three percent is nothing to dismiss lightly, especially when this leakage is derived from a pipeline, which serves to fuel one of the largest metropolitan centers in the world. It is time we become weary of our methods of energy consumption and begin critically analyzing the implications of all facets involved in that consumption. Without this mindfulness, it is almost a certainty that humanity’s effect on the climate will become increasingly catastrophic as our dependency on energy grows upwards.

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The EPIB Trail typically has an environmentally conscious audience. Whether you practice eco-friendly behaviors through recycling, purchasing an efficient car, or getting an environmental degree that you don’t know what you’re going to do with. There is one practice that massively affects each individual’s carbon footprint.

This issue is in animal agriculture, which tends to be a sensitive subject because food is very personal experience for everyone. Regardless of this, it is important to take a look at the issue critically. Historically, fruits, vegetables, and grains have been the staple food groups of people of lower socioeconomic classes. This is because less energy is put into producing these items than animal products. Throughout time, more people in America wanted to eat animal products. For this reason, subsidies began to be put on animal products to decrease the price and allow availability to more people. This is why today one can purchase chicken nuggets for a significantly price cheaper than a salad.

So why is animal agriculture so much more carbon and energy intensive than the other parts of the food pyramid? Basically, to get a steak to your plate is quite a process. First a farmer needs (in this case, I mean factory farms) many, many cows and these cows need to be fed until they are at the right age to be slaughtered. To feed these cows, there must be a great amount of wheat and soy. So not only does there need to be land set aside for keeping the cows on, but there also needs to be a ton of land put aside just to feed the animals that are going to be killed to be eaten by a different species of animal (us). This leads to land degradation, because 30% of Earth’s land mass is used for grazing and for feed. Along with land, water is also needed. In the United States, about half of all water used is for farm animals. On top of this, factory farming allows the animals to pollute a significant amount of water. This is because with the large amount of animals, there comes a large amount of feces, which can mix into run off and pollute water. Air is also polluted in this process because the animals release about 80% of ammonia emissions and also release hydrogen sulfide through their waste.

Another issue with animal agriculture is the numerous steps by which this commodity gets to destination. More specifically, where the animal is raised is not where it is slaughtered, where the animal is slaughtered is not where it is processed, and where it is processed is not where it is sold to individuals. Therefore, before animal products can be sold to consumers, a great deal of transportation must take place, and this transportation is energy intensive.

For these reasons listed above, one calorie of plant protein requires one-tenth the fossil fuels than one calorie of animal protein. In more statistical terms, farm animals produce 40% of methane, 9% of CO2, and 18% of all greenhouse gases emitted. These numbers show that factory farming is a large contributor to the environmental problems the world is facing today. Animal agriculture unquestionably has environmental effects and yet when speaking of environmentalism, a solution to the problems of animal agriculture is often not heavily considered. Most of the discussion is guided by talk of cleaner energy, carbon taxes, waste management, etc. There’s a plethora of environmental problems, and obviously this not the only one, but the facts do show that the meat industry must be looked at more critically.

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Mystery films are a favorite of many, captivating the minds of the viewers, but a mysterious environmental event is not usually something environmentalists and scientist look forward to. The words, “I don’t know” are spoken usually laced with regret and worry, and when a mysterious goop started appearing on hundreds of birds in the San Francisco Bay area in late January, this was the case. Over 200 birds have been found dead due to the exposure of a strange and unidentifiable substance off the coast of California. However, officials say that the substance is not poisonous. The reason for these deaths is the fact that the goop is degrading the water-repellent coatings of the birds’ feathers, which is causing the birds to get hypothermia. Oil has the same effect on birds’ impermeable feathers, but oil has already been crossed off the list because the usual treatment for birds covered in oil is not working for these birds. In the case of an oil spill, birds would have to be washed with soap and water, but in this situation birds have to be stabilized and hydrated, the substance must be treated using baking soda, vinegar and a chemical agent, and then the birds are washed with soap and water. Scientists are puzzled by this incident and are working day and night to figure out what exactly this substance is. Once they crossed oil off the list, they moved to another known bird-killer as a possibility, the synthetic fuel additive polyisabutylene. This chemical caused the death of over 4,000 birds in 2013 when it was spilled by a cargo ship off the coast of southwest England. After many tests, the mystery began to heat up even more when technicians had to cross polyisabutylene off the list as well. The next target of research will be a poisonous algae bloom, which killed hundreds of birds in the Pacific in 2007.

Workers at the International Bird Rescue have been working nonstop, collecting the birds from the shore and water as well as cleaning and stabilizing the survivors. Apparently it has cost them around $8,000 a day and according to the spokeswoman for the IBR, “nobody’s paying because they don’t know what it is and they don’t have a responsible party. We’re footing the bill on our own”. That extreme expense offsets some of the conspiracies of the case, in which people believe that scientists know what the substance is but do not want to let the public know, but without an explanation, it’s hard not to be suspicious.

What really matters here are the birds, and even though the mystery continues to go unsolved, rescue efforts are increasing and more and more birds are being rescued before it is too late.

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Oklahoma – a vast state where buffalos and armadillos roam – is well known for its extensive landscapes and fast-growing economy. The majority of the state lies right in the middle of tornado alley and experiences severe weather conditions often. Moreover, Oklahoma has recently seen an increase in earthquakes as well, with over 2,500 quakes recorded since 2008. Although Oklahoma is located in an area prone to relatively frequent earthquakes, the number of occurrences has exponentially increased in the past several years. The majority of the quakes are small tremors, causing little to no damage; however, roughly 25% of the total number of earthquakes had a magnitude of 3 or greater. The earthquakes in this time frame included the largest earthquake in the state’s history, occurring in 2011 with a magnitude of 5.6. I visited Oklahoma in early 2015, and during the two-day visit, I experienced three noticeable earthquakes. After this experience, further research was needed in order to assess what was causing such frequent quakes.

Originally, it was hypothesized that the high number of earthquakes was linked to hydraulic fracturing — a.k.a. fracking. Fracking is a method of extracting natural gas and oil from many miles underground by pumping water, sand, and other chemicals into underground rock at high pressures. This process creates high quantities of wastewater, which oil and gas companies then pump back down into underground wells. It is now believed that the storage of fracking wastewater is the underlying cause of the earthquakes. In Jones, Oklahoma, millions of barrels of wastewater are pumped into high-volume storage wells every month. In a study by Professor Katie Keranen at Cornell University, it was found that these storage wells can have serious impacts on regional seismicity, mainly due to the pressure buildup. On its way down, the wastewater builds up this pressure, eventually causing fault lines to slip, followed by an earthquake.

A simple solution to these quakes might be to stop using or shut down the storage wells. This is not that simple in a place like Oklahoma where the people rely on gas and oil. The energy sector comprises nearly 10% of the state’s economic product, and many individuals rely on this for profit and jobs. The oil and gas industry, however, is still reluctant to announce that the earthquakes are directly related to the fracking, saying “ultimately it takes time, it takes data, and it takes scientists to figure this out.” The U.S. Geological Survey for Oklahoma has already reported 375 higher magnitude earthquakes over the past year. The frequency of these earthquakes is only increasing, along with the intensity of them. As of now, scientists have already acquired the data, so now it seems to be a waiting game until further actions can be made. In the meantime, the safest bet for Oklahomans is to do what the armadillos do – curl up in a ball and hide.
There are five living species of Rhino (white, black, greater one-horned, Javan and Sumatran) left in the world. In 2011, one of the six species of Rhinos left in the world, the western African rhino went extinct. This massive creature used to be found all across Africa and Asia. However, due to massive amounts of poaching, their numbers have steadily decreased.

There were an estimated 500,000 Rhinos at the turn of the 20th century, but that number has dwindled down to about 30,000. Africa is now the leading area for rhino conservation, but as time passes, the number of poached Rhinos also has risen. In 2014, the number of poached Rhinos reported in South Africa reached 1,215 as compared to just six in 2006. Poaching is not limited to South Africa, but rather happens all across Africa and smaller “reserves” in Asia.

The greater one-horned rhinoceros is one vulnerable species that resides in reserves located in northern India. Although the greater one horned rhinoceros has steadily increased, this is not enough to offset the effects of poaching. If something is not done soon, the rhinoceros’ total births will not cover the ever-increasing amounts of deaths. Some scientists estimate that by 2016, if current poaching rates stay the same, the species will go extinct.

The rhino horn is the main selling point of the animal, worth its weight in gold (quite possibly even more) on the black market. Places like Vietnam and China are the main perpetrators, and the economic boom has made it easy to establish trading routes. The horn can be used as a status symbol, a sign of wealth, or as an aphrodisiac. Many believe that the horn has medical properties that heal even the most obscure diseases you could think of. This practice has been used in traditional Chinese medicine, which may date back to the 1500’s and which, in recent years, has surged up again. The horn is made up of keratin, the same substance that your hair is made of. The horn is not actually attached to the skull, as it is made up of hair-like fibers compacted and grown over the rhino’s lifetime. The strange affiliation with super-healing properties might have come from the fact that the horn contains a wide assortment of amino acids such as tyrosine and cysteine. In traditional Chinese medicine, it is thought to be able to cure gout, fever, devil possession, snakebites and headaches. ‘New “treatments” in ‘Vietnam claim that the horn can cure hangovers and terminal illnesses. Although the horn does not have any proven healing benefits, years of tradition blind the people to the sad, decreasing rhino population.

There are a number of organizations founded to help save the rhinos. Numerous communities have upped the punishment for poaching animals, especially rhinos and elephants in these areas. Savetherhino.org is an organization that raises awareness about the growing problem and helps provide funds to keep the rhinos safe. ‘World Rhino day so happens to be on September 22 of every year, which generally stirs up a bunch of support for the giant, cute creatures.

Rhinos aren’t helping their situation either, with their long 15-16 month pregnancies and tendency to not mate in zoos. On June 23, 2012, Andatu was the first rhino to be born in captivity in over a century. It turns out that male rhinos need to interact with a large number of females to get aroused in order to reproduce. Cysts can also completely inhibit the ability to have offspring, and not breeding while mature enough to do so would ruin the reproductive tract. Recently though, in a Danish zoo, a new rhino was welcomed into the world. Born on the 31st of January, Fara was a new member of the Black rhino family, which currently has a population of 650 rhinos. Originally underweight at 160 pounds, Fara is now doing much better as caretakers painstakingly fed her every 2 hours and is now at a healthy 190 and growing. This is but a small victory in the fight against poachers and population declines. But by pulling together, we will be able to keep the rhinos alive for generations to come.

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The Forgotten Fires

By Marc Katronetsky

It burns! For fifty long years the city of Centralia, Pennsylvania has burned. Mining for coal in the area began in the mid-1800s and the industry soon became the major backbone for the economy in the region. For one hundred years the small town of Centralia worked to extract coal from the ground and to provide fuel for neighboring cities and nationwide. Then, in 1962 a fire worked its way inside the coal mines; the mines have been burning ever since. This eventually led to a mass exodus from the town for a multitude of reasons including: unsafe work conditions, toxic chemicals being released into the air, and cave-ins.

For twenty years after the fire started it slowly burned and worked its way underground to all corners of the town. The situation reached its worst peak when, in 1981, a young boy by the name of Todd Domboski fell into a sink hole as the ground beneath him collapsed caused by the ever burning coal. Luckily, he survived. However, the state determined that things had gone too far and did their best to remove as many individuals as possible from the town spending upwards of forty two million dollars on residents to relocate.

Soon after the Centralia coal mine fire started, many attempts were made to try to extinguish the flames and prevent damage to the mine and town, however no conclusions were reached. Other techniques that are often used in similar situations — such as sealing the mine or smothering it — are often discussed, but no definitive progress can be made because of the overwhelming size of this particular incident. To make matters worse Pennsylvania is the state with the largest abandoned mine problem in the country and has a very limited amount of resources to contain such problems. Furthermore, the state and federal government choose to focus on those sites which are agreed upon to have the greatest chance of recovery through the means of intervention. Centralia is not one of those sites.

Although it is not an issue that is frequently discussed by environmentalists, abandoned coal and natural gas fires play a huge part in carbon emissions into the atmosphere. The International Institute for Geo-Information Science and Earth Observation estimates that well over one billion metric tons of carbon dioxide emissions are poured into the atmosphere annually from the coal mine fires burning in China alone. It is estimated that these free burning coal fires in China alone equate anywhere from 2-3% of the entire world’s carbon emissions.

Along with coal mine fires another major threat to the environment around the world through the release of uncontrolled carbon emissions are the fires burning from previous oil and natural gas fields. Perhaps the most well known natural gas fire that started burning in 1971 and continues to do so while you read this article is the ‘Door to Hell’; located in Turkmenistan a middle eastern country located above Iran and Afghanistan. Due to its location in a desert, the ‘Door to Hell’ has not posed a great risk to human health however does limit the ability for the country to adequately extract natural gas from the surrounding area. The current President of Turkmenistan would like to see the burning hole, which is seventy meters in diameter, extinguished as soon as possible in order to not interfere with the creation of future development.

Due to human activity, especially exploitation of environmental resources it is apparent that mistakes will be made and there are associated risks with nearly every action. However, it is crucial that these mistakes are not brushed under the rug, forgotten about, and left to the children of the future to deal with. The solutions to these problems are not simple, will not happen overnight, and require a bit of innovative thinking which makes it easy to understand why this can be such a sore topic to some. Is it in our best interest to extinguish these fires for good or would it be possible to harness the energy from these already existing events? A solution can never be agreed upon if the conversation never begins.

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So it is Possible...

By Tom Armstrong

15 kilometers off the coast of the Jutland Peninsula lies the Danish Island of Samso, or what an environmentalist might consider a utopian society. Samso, Denmark’s renewable energy island, is a society that generates all of its electricity using wind turbines and one which is 100% carbon neutral. The island came together as a community in 1998, accepting a challenge from government officials to become a completely energy self-sufficient society. The residents of Samso decided that it was in the islands’ best interest to invest in renewable energy sources. Community residents, many of whom are farmers, saw the benefit to the environment as reason enough to invest in new energy infrastructure. What they did not necessarily predict however were the substantial economic benefits. Having 15 plus years of continued prosperity can provide insight for the rest of the world as to the net benefits of a renewables-based economy.

A society and thus an economy should not be based solely on one or two commodities. Sadly all too often it is. Many nations are frequently reliant on the prosperity of petroleum fuel companies and coal mining operations to economically sustain various regions and sectors of the country. As a result, we look at energy as a commodity and not as a natural resource. It is important to realize that energy production does not have to be, and ought not to be, as large scale as it currently is in most places around the world. By having localized energy production, infrastructure needs are reduced, a varied assortment of energy sources is more easily used, and efficiency is maximized.

In setting up energy systems, localized production and distribution reduces the need for energy infrastructure. Pipelines to transport fuels or railway systems used for fuel transportation are limited and only have to be built big enough to satisfy the needs of the locals. This reduces costs to companies and thus consumers all while minimally effecting local ecosystems. Not only does localized production save everyone money, it proves to be a sustainable way of living.

Residents of Samso use nearly every renewable resource or technology available, ranging from various biofuels and wind turbines all the way to geothermal heating and solar panels. This wide array of sources is available due to the localized production and availability of resources. The abundance of resources led to not only the outright powering of Samso, but also various other places in Denmark. As the people of Samso have shown, it is imperative we use what resources we have locally and regionally if we want to truly live in a sustainable manner.

Sources:
http://www.visitsamsoe.dk/en/
http://ecowatch.com/2014/05/01/samso-renewable-energy-island-sustainable-communities/
For the first time in nearly one hundred years, a Sierra Nevada red fox (*Vulpes vulpes necator*) has been spotted in Yosemite National Park. Previously seen within park boundaries when a pair were shot for museum taxidermy in 1916, the new title of most recent sighting goes to two recordings by motion-sensitive cameras on December 13, 2014, and then January 4, 2015. With populations dwindling drastically throughout the state since then due to such possible factors as disease, inbreeding, predation, habitat loss, and species competition, this native species has been severely imperiled for nearly a century. Though there have been at least ten reported sightings of the Sierra Nevada red fox in Yosemite since 1977, these were unsubstantiated by photographic or physical evidence, and so could easily have been accidental false reporting by someone sighting a fox with a similar appearance to that of the Sierra Nevada red, such as a gray fox.

The Sierra Nevada red fox is the one of three red fox species found naturally at high elevation in North America, though lowland species of fox commonly thought to be of exotic origin have been encroaching upon the native range of the Sierra Nevada red. This has provided some measure of both concern and comfort, for though the overlap of territory can crowd out a specialized species, it can also provide new breeding opportunities. There has been genetic evidence from as recently as 2007 that the Sierra Nevada red fox has maintained a degree of presence in California, though genetic variation was limited to a single observed haplotype for all nine members of the sample population, which was in the north of the state and whose gene flow between eastern and southern populations appeared to be facing some form of unidentified barrier. There is an estimated maximum of fifty individuals currently remaining in the wild, making the Sierra Nevada red fox critically endangered.

Because of the presence of other fox species in the area, Yosemite Park biologists embarked on a five-day expedition to ensure that the sighted animal was, in fact, a Sierra Nevada red. Using motion-capture cameras and "hair-snare" (which captures hair samples from passing animals) equipment, which could document both visually and with testable material evidence their presence. Monitoring with this equipment, park officials say, will be ongoing. These measures will allow park biologists to monitor the genetic diversity of the population while assessing their territorial range both within and outside the park, working in joint with other research groups, furthering their knowledge of the animals' current status, and giving insight into what conservation efforts may best help the species.

Yosemite National Park’s Superintendent, Don Neubacher, has called the Sierra Nevada red fox, “one of the most rare and elusive animals in the Sierra Nevada.” He was also quoted as saying, “National parks like Yosemite provide habitat for all wildlife, and it is encouraging to see that the red fox was sighted in the park.” At present, the species' continued existence is in great peril, and its status will be discussed later in the year to determine its protected status.

New Hand Held Device Could Help Reduce Labeling Fraud in Seafood Markets

By Collin Dobson

Did you know that up to 30% of the total seafood entering the U.S market is labeled incorrectly? Often times, seafood may be labeled and sold as a more popular or profitable species than what it actually contains. This fraudulent mislabeling of seafood puts American consumers on the hook for about $20 million annually as they overpay for a lesser quality of seafood. One of the most common instances of this fraudulent practice involves labeling fish of a lower quality or value as “grouper.” Currently, the U.S Food and Drug Administration allows 64 different species of fish to be labeled as “grouper” in the market. With such a large number of different species being lumped together and deemed grouper, it is easy to see how some lesser quality species may slip through the cracks and be mislabeled as such.

Researchers at the University of South Florida’s College of Marine Science have developed a handheld device that can help debunk this fraudulent mislabeling of grouper. The QuadPyre RT-NASBA assays seafood samples using real-time nucleic acid sequence-based amplification (RT-NASBA). This instrument, which can be used on-site, dockside, or in restaurants and markets, can provide a complete assay in fewer than 45 minutes. This is a major advancement for assay technology, as previous procedures for the same purpose could take anywhere from a few hours to days. Researchers working on this device tested it on fish at the point of restaurant service, and were able to successfully obtain an accurate assay. Even more remarkable is the fact that they were also able to obtain an accurate assay even when the grouper was already prepared with breading or sauces.

Currently this handheld device is designed to only test for labeling fraud involving grouper. This fish is currently the third most economically valuable seafood product in Florida, and the demand cannot be met by the harvesting of domestic species alone. In 2012, the United States imported over 4,000 metric tons of foreign grouper which was valued at approximately $33 million. Such conditions create opportunities for the fraudulent labeling of grouper. Labeling fish of a lesser quality as “grouper” allows importers to make more money for a lesser valued species and may allow them to avoid paying tariffs.

Though the QuadPyre RT-NASBA is currently only capable of analyzing assays of grouper, there are many similar devices in development that will be used to assay other commercially important seafood items. It is the responsibility of the Food and Drug Administration to ensure that consumers are not being misled when purchasing food or drugs. Devices like the QuadPyre RT-NASBA will help the FDA reduce the amount of seafood (both imported and domestic) that is labeled incorrectly and will help prevent American consumers from overpaying for seafood of lesser quality.

Sources:
- http://www.sciencedaily.com/releases/2015/02/150203123419.htm
- http://news.usf.edu/article/templates/?a=6692&z=220
Dr. Clark’s News of the Weird:

Harvard University medical researcher Mark Shrime documented recently how easily made-up research can wind up in reputable-sounding academic journals -- by submitting an article composed by random-generating text software, supposedly about "the surgical and neoplastic role of cacao extract in breakfast cereals" (and authored by "Pinkerton A. LeBrain and Orson Welles"). Of 37 journals, 17 quickly accepted it, some feigning actually having read it, with the only catch being that Shrime would have to pay a standard $500 fee for publication. Shrime warned that some of the journals have titles dangerously close to highly respected journals and cautions journalist (and reader) skepticism. [Fast Company, 1-27-2015]

Because We Can: Scientists at the University of California, Irvine (with Australian partners) announced in January that they had figured out how to unboil a hen's egg. (After boiling, the egg's proteins become "tangled," but the scientists' device can untangle them, allowing the egg white to return to its previous state.) Actually, the researchers' paper promises dramatically reduced costs in several applications, from cancer treatments to food production, where similar, clean untanglings might take "thousands" of times longer. [UC Irvine press release, promoting publication in the ChemBioChem journal, 1-23-2015]