



THE ENVIRONMENTAL EAGLE

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FEATURED

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OUR TEAM

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New Storage Facility Proposal Raises Environmental Concerns

By Chris Joseph

Boston College's Office of Facilities Management has proposed a plan to construct a storage facility in the rear parking lot of BC's 300 Hammond Pond Parkway property. The proposed facility would stand in close proximity to a large vernal pool called Bare Pond. Some BC students and faculty have expressed concerns that runoff from road salt stored at the facility will impact the vernal pool, which serves as a breeding ground for Webster Woods' local salamanders and frogs.

Tara Pisani Gareau, acting director of the Environmental Studies Program and a professor of Earth and Environmental Science, has used Bare Pond and the area around it as a research site for two of her courses.

A vernal pool is a wetland habitat that contains water during only part of the year. Typically, vernal pools dry out in the summer, when warmer temperatures increase evapotranspiration. In the winter and spring, water accumulates, and the pool becomes a temporary pond.

The alternating dry and wet conditions make vernal pools typically unsuitable for fish, but perfectly suitable for salamanders and frogs—amphibians that would be fish food in other habitats. Salamanders thrive in vernal pools, reproducing fruitfully and roaming widely in the surrounding area.

The proposed covered seasonal storage area, which will store road salt and gravel in the winter and mulch in the summer, will stand within 200 feet of Bare Pond. The site will occupy a 32 foot by 30 foot zone at the south end of 300 Hammond Pond Parkway's rear parking lot. The new facility is necessary because the former storage



Photo Credit: Tara Pisani Gareau

The Bare Pond in dry conditions (top) and wet conditions in late November (bottom).

space was lost to an expansion of the central heating plant on main campus, located between Conte Forum and Higgins Hall, according to Facilities Services associate vice president Martin Dugal.

The proximity of the storage facility to the pond raises concerns of contamination. Gareau explained that while some vernal pools may appear isolated, they can interact with the underground water table, and large scale hydrological processes may carry contaminants between the vernal pool, the groundwater, and other surface waters.

On November 7th, Gareau and Earth and Environmental Sciences department chair Ethan Baxter arranged a meeting with

Dugal to discuss the project's environmental impacts. Stevie Walker, a member of EcoPledge and MCAS '19, also attended the meeting.

At the meeting, Dugal explained that Facilities Services is aware of the risk of contamination. The proposal includes plans to minimize the effects of the storage site on the environment. First, facilities will regrade and repave the entire rear parking lot. It's an effort that requires much more work than simply constructing the storage facility, but Dugal said the work is crucial for managing the area's water.

"The current lot is crowned in multiple directions," Dugal said.

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“We’re trying to make the entire lot pitch in one direction. We’re pitching it away from the vernal pool, and we’re proposing a water management structure at the end of the lot. Basically, solids and sediments fall out, and there’s a filter before runoff enters the woods.”

The regrading and filtration system are not the only environmental considerations included in the plan. Facilities is also proposing to screen-in the parking lot so headlights in the area do not carry into the forest, and the light fixtures

of the lot itself will be exchanged for more efficient LED lights with reduced spillover into the forest.

Whatever the outcome of the project, Gareau views the situation as an opportunity to study the effects of land use changes on a wetland ecosystem.

“We know very little about the pond itself, which provides a wonderful opportunity for classroom learning,” she said.

Gareau hopes to research how the water quality of Bare Pond will change with the new construction and if Bare Pond connects to other vernal pools in Webster Woods.

She already uses the property at 300 Hammond Pond Parkway for her Ecosystems course. This fall, students in the class travelled to the wooded area to practice ecological field research techniques, such as counting unique tree species within field plots.

Gareau suggests that the salinity of vernal pools in Webster Woods could be a topic of field research in the coming months. Wetland plants and animals are very sensitive to salt in their habitat, so students might be interested in gathering baseline data on salinity levels. Last year, an undergraduate

research group found salamander egg masses in Bare Pond and salamander adults in the vicinity. In addition, Gareau believes it will be good to continue to monitor the biodiversity of the vernal pools.

“These are perfect Environmental Studies projects for the springtime,” Gareau said. “Students can learn a lot about the ecology and hydrology of vernal pools through research on their own campus, while providing useful data to Facilities. The Facilities staff have always been wonderful collaborators for undergraduate projects.”

Landrigan Returns to Discuss Human Health, Climate Change and Pollution

By Eva Laxo

Pollution kills nine million people per year, which is three times more than AIDS, malaria, and tuberculosis combined. This astonishing discovery was made in the Lancet Report on Pollution and Health, co-authored by Philip Landrigan, the director of the Global Observatory on Pollution and Health and a professor of biology. On November 7th, Landrigan discussed all of the report’s findings in a talk titled “Human Health, Climate Change & Pollution.”

After graduating from Boston College in 1963 and attending Harvard Medical School, Landrigan went on to an esteemed career working in the fields of epidemiology, pediatrics, and public health. Landrigan then went on to work at both the Center for Disease Control and the National Institute for Public Safety Health, before moving to the Environmental Protection Agency (EPA) as a senior advisor, where he established the Office of Children’s Health Protection.

In the fall of 2018, Landrigan returned to Boston College to direct the university’s new Global Health Initiative, which conducts research on the impacts of environmental pollution and is developing a undergraduate minor expected to become

available in 2019.

“The aim of our commission is to raise public attention about pollution,” Landrigan said. “Pollution has always been kind of a neglected problem on a global stage.”

Despite the severity of his

“The cost of pollution—the disease, the devastation, the environmental degradation that is caused by pollution—is actually much more expensive than the cost of pollution control.”

- Philip Landrigan, director of the Global Observatory on Pollution and Health

research and reports’ findings, Landrigan has seen understated reactions to the crisis. The report analyzed and communicated the massively underreported impacts of pollution on both global health and economies and highlighted the ramifications of neglecting these impacts.

“One of our responsibilities, therefore, was to raise attention and ultimately turn that attention into action to get leaders at multiple levels to do something about the problem,” Landrigan said.

Landrigan outlined the re-

port’s devastating findings on the impacts that pollution has had internationally, specifically in middle and low income nations where much of today’s industrialization is taking place. These nations, such as India and Vietnam, have historically had weak environmental protections, high population growth, and high pollutant outputs—a combination that creates, according to Landrigan, some of the most unhealthy places on earth.

The most astonishing finding of the report, according to Landrigan, was that pollution kills nine million people per year, which is three times more than AIDS, malaria, and tuberculosis combined. Deaths attributed to pollution are outnumbered only by high blood pressure and diet related illnesses. Deaths caused

“The good news here is that any action we take against one of these problems [pollution and global warming] is, inevitably, going to have beneficial effects on the other.”

- Philip Landrigan

by rapidly increasing air pollution are currently projected to double by 2050. According to Landrigan, these numbers are

conservative estimates.

Landrigan cited a study conducted by the EPA on these benefits during his talk, which calculated a thirty dollar return for every dollar invested into the control of air pollution. Landrigan’s hope in including economists in the report was to show that the economic determinants of pollution would elicit a stronger response than focusing only on human impacts.

“What they found is that, generally speaking, the cost of pollution—the disease, the devastation, the environmental degradation that is caused by pollution—is actually much more expensive than the cost of pollution control,” Landrigan said.

Landrigan concluded the discussion on a hopeful note, emphasizing that pollution is indeed a solvable issue if society decides to engage with it on the individual, city, and state levels. He emphasized the link between pollution and climate change, explaining how as people move toward solving one global issue, others will follow.

“The good news here is that any action we take against one of these problems is, inevitably, going to have beneficial effects on the other,” Landrigan said. “This is the solution to pollution and this is the solution to global warming.”

BC Dining Promotes Fresh Sustainably Harvested Fish from the Gulf of Maine

By Alinda Dersjant

Many students are unaware of the variety of sustainably caught fish species that are available to them both on and off campus, which is one of the reasons why on Wednesday, November 14, BC Dining hosted a talk with Kyle Foley, the Sustainable Seafood Brand Manager at the Gulf of Maine Institute, at the FRESH-to-Table demo kitchen in Corcoran Commons. At the event, Foley stressed the importance of increasing and diversifying seafood consumption in order to promote a more sustainable eating pattern while also facilitating growth of the local economy by working with local fishermen.

Both Lower Live and Carney serve fish with the label, “Gulf of Maine Responsibly Harvested,” a certification issued by the Gulf of Maine Institute. Fish certified with this label contribute toward the total 44 percent of the sustainably-caught fish currently served on campus. The GMRH label allows students to recognize and choose sustainable options when eating at participating campus dining halls. The label also includes a promise to support the local economy in the Gulf of Maine area by connecting small-scale local fisheries with the GMRH label with markets in the Northeast.

Foley works with people whose livelihoods depend on fisheries, and her efforts contribute not only to environmental sustainability but also economic equity, as small-scale fisheries tend to be excluded from



Carefully prepared samples allowed students to taste the pollock tacos that will be served every Tuesday in the Lower dining hall, starting next semester.

the market as large multinational companies become more prevalent.

One focus of the Gulf of Maine Institute is to promote fish species that are in low demand, which the Institute calls “underutilized fish.”

According to Foley, the main problem is that consumers tend to choose one of the four most popular fish species—salmon, shrimp, tuna, and tilapia. The popularity of these species has resulted in a restriction of the amount fishermen may harvest out of the Gulf of Maine. At the same time, these fishermen only harvest a fraction of the allowed amount of underutilized species.

Few Americans consider buying fish like mackerel, pollock and redfish, as they are seldom found on menus in restaurants or in local supermarkets. Consumers are hesitant to choose species unknown to them, which contributes to the low market value of these underutilized species, Foley said.

As a result, the Gulf of Maine Institute works to promote awareness of fish species diversity on college campuses in hopes of gradually increasing consumer demand for underutilized species.

“There are a lot of opportunities, but it really comes down to consumer demand,” Foley said.

BC Dining also makes strides toward using underutilized species—for example, all fried fish on campus is pollock. There are several benefits to increasing the demand for underutilized fish, including the support of equitable local economies and the development of the base of a more sustainable eating pattern, as well as benefits associated to eating fish in general, like the improvement of human dietary health.

Foley explained that consuming fish is one of the most environmentally friendly ways to obtain high-quality protein compared to land-based sources including dairy,

chicken, pork and beef. Additionally, carbon emissions are decreased when fish is locally harvested, as local harvests decrease transportation emissions—yet still 91 percent of fish consumed in the United States are imported.

According to Foley, decreasing the human carbon footprint should be a top priority, as the effects of climate change are becoming more evident. Global water temperatures have been rising steadily, but water temperatures in the Gulf of Maine have risen even more quickly than 99 percent of the oceanic surface as a result of specific currents congregating in the Gulf.

The Gulf of Maine Institute continues to investigate how this rise in temperature will further affect fisheries in the future.

BC Dining encourages students to make sustainable choices by choosing the “Gulf of Maine Sustainably Harvested” labelled items in on-campus dining halls as well as by educating students on different types of fish.

The event closed with a sampling of fish tacos produced with locally caught pollock—emphasizing not only that underutilized species are more sustainable, but also can serve as delicious alternatives to more commonly known fish species served to consumers.

In the spring, students can expect to see pollock tacos in Lower every Tuesday. “They taste amazing—much better than the name sounds,” said a student who tried one of the tacos at the event.

Faculty Spotlight: Boston College Welcomes Dr. Mark Behn to the EESC Department

By Frankie Wilton

Boston College welcomes a new faculty member this fall—Mark Behn, an associate professor in the Earth and Environmental Sciences department.

Growing up in North Carolina, Behn was always an avid outdoorsman.

“I was big into hiking, camping, fishing—I did it all growing

up,” Behn said. “But, I was never going to be a geology major. It wasn’t even on the radar.”

That changed when Behn found himself at Bates College in Maine, enrolled in an introduction to geology course in his first semester. Though a math major at the time, Behn had a transformative experience in the class that steered him toward the earth sciences.

“The first class period, we hiked up Mount David, the highest point on Bates’ campus,” Behn said. “The professor showed us all the land you could see and said, ‘In the last Ice Age, everything you see was underwater.’”

That sparked an interest in Behn that continues through to this day.

Upon graduation from Bates, Behn received his PhD from a

joint program with MIT and the Woods Hole Oceanographic Institute. The quantitative, mathematical approach that Behn employed as a math student was integral in his early professional work. Ultimately, he found himself synthesizing this approach with in-depth field work.

“I started off studying fault-

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ing and deformation of the lithosphere,” Behn said. “That involved both mapping fault structures and numerical modeling of how faults evolve.”

After years working with grants, Behn entered a faculty position at Woods Hole in 2004 and began working alongside a glaciologist.

“She and I started to apply the same ideas [of fault deformation] to ice sheets,” Behn said.

The two eventually found themselves in Greenland studying ice sheets, trying to understand how the melting of ice sheets in summer and flow of glacial lakes has evolved.

Behn submitted a grant proposal to return to the site in 2020 and continue his research.

Behn’s research at Woods Hole may prove critical as researchers attempt to model the effects of climate change. Comparisons of past data to that of 2020 may provide insight into the role of warming summer months and decreased ice sheet mass on the geology of Greenland and other polar areas, Behn said.

Here at BC, Behn has received funding for a research cruise to the Gofar Fault, a transform fault in the east Pacific with interesting seismic activity. The fault has an earthquake regularly—about once every six years.

“We’d like to put seismometers down, dredge rocks within the fault zone, then we’ll go back a year later,” Behn said.

Ultimately, the goal of this experiment is to have a means

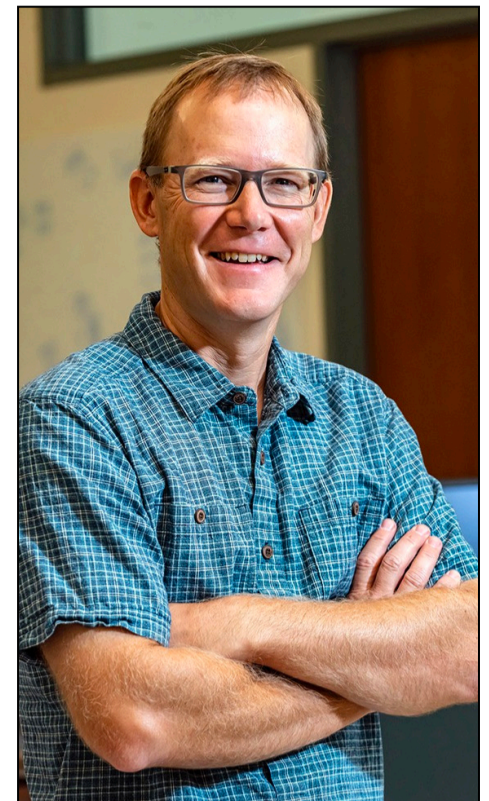
of predicting earthquakes in this region and making adequate preparations.

Currently, Behn offers a course called Earth Processes and Risks, which he describes as a natural hazards and disasters class.

“We talk about [natural disasters] and both certain geologic hazards and dangers associated with them and different ways humans try to mitigate and deal with those hazards,” Behn said.

Behn will also begin to teach quantitative geoscience courses sometime in the near future.

Though still settling into his new role at BC, Behn has already engaged himself deep in his work—through both his research and new course offerings for prospective geoscience students.



Courtesy of the BC Earth and Environmental Sciences Department

EcoPledge Volunteers Lend a Hand Along the Charles River and at Revere Beach

By Kelsey Kosten

Piles of plastics and beer cans were collected and gathered together alongside the Charles River on November 4. The trash was collected by five members of EcoPledge who participated in a trash clean-up event at Artesani Park and the Charles River Reservation.

The group spent the afternoon picking up trash from the side of the river and the surrounding park grounds. In total, the volunteers collected over 84 plastic bottles, 13 glass bottles, 10 cans, and a significant quantity of food wrappers, Styrofoam, and straws. When disposed of properly, many of these items can be recycled and potentially reused. However, many old pieces of plastic were found, undecomposed, along the riverbed.

Having participated in a similar cleanup event at Revere Beach earlier in the semester, the volunteers recognized similarities in the types of trash found in both locations. Waste disposed of in rivers is often swept directly into oceans, which means that trash dumped along the Charles River ends up in the Atlantic Ocean.

On November 17, ten EcoPledge members returned to Revere

Beach for a ‘bioblitz’ with the New England Aquarium. As part of its Live Blue Service Corps volunteer initiative, the group recorded the types and quantities of debris, trash, and marine species found on the beach.

“Tracking each piece of trash we threw away made me much more conscious of how common certain items are, especially cigarettes, wrappers, and straws,” said Michelle Krug, first-time volunteer and MCAS ’19.

Krug, along with two other volunteers in her cleanup group counted 37 food wrappers, 21 cigarette butts, 19 straws, 58 small pieces of plastic, and many other trash items.

“I have been to that beach a few times over the summer and always noticed how much trash people leave behind,” Krug said. “But it shocked me to see the amount we could still find several months later during the off-season.”

Looking ahead to the spring semester, EcoPledge’s volunteer committee plans to collaborate with the Charles River Watershed Association for its annual Earth Day cleanup event, where volunteers will again suit up for another local cleanup initiative.



Volunteers collected a variety of waste materials along the Charles River and at Revere Beach.

EcoPledge Helps Centre Street Food Pantry Restock Ahead of Busy Holiday Season

By Emily Kraus

The Centre Street Food Pantry had some additional helpers on December 1. Seven members of EcoPledge's volunteer committee arrived at the location in Newton Centre to help to organize, sort, and restock items in preparation for the pantry's

upcoming holiday shoppers.

The group arrived after the pantry closed for the day, which gave the volunteers an opportunity to take inventory of the products and replenish shelves that were running low. By the end of the evening, the pantry's shelves were re-stocked and ready for its next round of shoppers.

While at the pantry, volunteers learned how the it acquires items like toiletries, canned goods, and fruits from local businesses and food drives. These donations provide families in-need the opportunity to receive goods at no charge.

"We had a great time helping the staff organize and restock the

food pantry," said Molly Funk, a member of the volunteer committee and MCAS '22. "From an environmental standpoint, it was wonderful to hear that places like Panera have been donating leftover bread to the pantry, so that instead of going to waste it's being repurposed to feed families."

Europe Spotlight: Great Britain Leads Revolution in Sustainable Technology

By Alinda Dersjant

Great Britain's Department for Business, Energy and Industrial Strategy announced the winners of a national competition for innovative solutions to the harmful effects of plastics during the Green GB Week in October. Great Britain's national government organizes Green GB Week to promote clean growth as a means to fight climate change. The competition is a result of Great Britain's recent industrial strategy which aims to utilize green and clean innovations to move the economy toward one that facilitates protection of the environment and focuses on growing the market for clean, sustainable technology.

Funding for the contest came from Britain's new Plastics Research and Innovation Fund of \$26 million—\$5 million of which was used as a reward grant for the contest winners. Among the eleven winners of the \$5 million grant, several have funneled part of the fund toward further development while also starting to implement their cutting-edge technologies and models into the marketplace.

One of the winners, the Skipping Rocks Lab in London, designed seaweed packaging that is not only a cheaper alternative to oil-based plastics, but also degrades as quickly as food waste. In addition, consumers can eat the packaging after its use which aligns with their slogan, "We make packaging disappear."



Alinda Dersjant

Another winner, Ichthion, works on clearing the environment from plastic pollution and used biomimicry to design a revolutionary technique that cleans plastics from British waterways and coastal areas.

One of Ichthion's energy-generative techniques is based on the way one fish species, the remora, feeds. The technique consists of a turbine which is latched onto commercial ships and fully utilizes the ship's existing infrastructure to move, while removing the plastics it encounters from the water. This innovation makes Ichthion's plastic removal technique one of the first techniques that is commercially-feasible and scalable.

What makes these projects unique and effective is their economic impact. By creating

initiatives that appeal from an economic standpoint, these environmental projects are more likely to succeed at combating the problem of plastic pollution and are more likely to be sustained for a longer period. Business and Energy Secretary Greg Clark believes the contest effectively utilizes Great Britain's resources to pave the way toward a more sustainable future.

"Companies are capitalizing on the UK's world-leading research base to develop products that tackle the global scourge of plastic waste while grasping the business opportunities found in the green economy," Clark said, according to a press release from Great Britain's government.

Great Britain has proven to be a leader in plastic policy and innovation by taking action well

before most countries have taken any steps toward tackling the problem of plastic pollution. After the introduction of a five penny tax on plastic bags in 2012, total consumption of plastic bags in Great Britain has dropped 90 percent.

The UK Plastics Pact further pushes for reductions in plastic consumption by setting goals for 2025. The main goal of the Pact is that by 2025 all plastic packaging sold in Great Britain should be reusable, recyclable, or compostable—and an estimated 70 percent of the plastic packaging will be effectively recycled or composted.

Looking ahead, Great Britain's government aspires to further increase its expenditure on research and development to 2.4 percent of its GDP in 2027. Through its focus on innovative research and clean technologies, Great Britain has found a way to harness the harmful effects of plastics as economic opportunities and catalyze further development toward an innovative, clean and green economy.

The Industrial Strategy plan's slogan, "Building a Britain fit for the future," highlights Great Britain's focus on creating innovative technologies to tackle the plastic problem. By encouraging the development of new technologies to reduce plastic waste, the nation shows itself as one of the world leaders in environmental activism as well as providing an example for how global economies can transition toward a cleaner, more sustainable future.