The Hopkins Environmental

Summer 2019, Issue 3

Letter from the Director

The farming community is challenged during even the best of times with an average of around 500 Chapter 12 bankruptcies per year. But 2019 tariff battles and recent historic wet weather in the Midwest has inflicted new woes on American farmers. The challenge of actually making a living and simultaneously feeding a global population that is expected to reach 11 billion this century looms large on farmers worldwide. This is where we in the environmental realm are confronted with numerous science and policy challenges. Consider the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) recent report documenting that three-quarters of the land-based environment and about 66% of the marine environment have been significantly altered by human actions. More than a third of the world's land surface and nearly 75% of freshwater resources are now devoted to crop or livestock production. Approximately 25 per cent of the globe's greenhouse-gas emissions come from land clearing, crop production and fertilization, with animal-based food contributing 75 per cent of that. Our food system was developed around a set of policy drivers to make food cheaper and more available and these drivers have also led to a food system that is unsustainable through its impacts on human health (particularly the growing obesity epidemic) and the environment (e.g. as a major driver of climate change). What we, as consumers and citizens, do on a daily basis has the ability to affect these dire trends of economic pain for farmers and an agricultural carbon footprint that is also detrimental to the globe.

One thing that our students have learned in their food sustainability, agroecology and international environmental policy courses as well as others are that two basic elements are essential for sustainable food production: 1) agriculture based in principles of ecology, and 2) economic policies that end overproduction of cheap food and reestablish fair prices for farmers. There are answers out there and folks are stepping up in a variety of ways from the local farm to table food movement to trend setters like Imperfect Foods and Market Misfits.

Of course, we are in the political season and though food and farming haven't been high on the list of campaign priorities in recent decades that appears to be shifting. With the pivotal role that rural voters played in the last presidential election firmly in mind, many candidates are connecting agriculture to other pressing issues—notably climate change,

food insecurity, economic development, and more. So, in this era of tribalism and lack of discourse, we would ask that each of you consider carefully your purchasing and investment choices, your political candidates in all parties and to start following state and federal legislation. One place to begin monitoring and influencing legislation is to set up a Governmental Tracking alert like this one.

I have never been more convinced that ALL of our environmental voices are needed to transcend political divides and focus on the underlying values of fairness, compromise, inclusion, citizenship and putting sustainable foods on the table. I am off to pen a letter to my congressperson and then to visit the farmer's market. Anyone want to come?

Nature Conservation & Sustainability in Cuba

by Sarah Solomon

After less than an hour in the air, our group of forty students stepped out of José Martí International Airport into the Cuban sunshine. Coming from the harsh, mid-Atlantic January weather, the warm air and humidity were welcome. A fleet of 1950's American-made and smaller, Soviet-era cars were parked at the curb. Passing by the taxis (and the photo op they presented), we boarded a bus with our guide, Esperanza. With Esperanza on the mic, we learned about the many historical landmarks and government buildings along the highway into Havana. Posters and spray-painted art promoting the Communist Party of Cuba and praising Fidel Castro and Che Guevara lined the road, plastered on the sides of homes and businesses.

"VIVA LA REVOLUCIÓN!"

Our bus turned onto Avenida Salvador Allende and into the heart of historic Havana. Buildings here date from the 16th century through the 1920s, some crumbling and in disrepair. Others are painted in bright colors with clothes hanging out the windows and small dogs barking at passersby down on the street. The architecture is a mixture of Soviet concrete, old world Europe, and tropical flair. Wrought-iron balconies covered in scrollwork support buckets of flowers. Canopies shade windows and keep apartments cool and dark. Narrow streets open onto avenues that usher slow-moving traffic into plazas built around fountains and palm trees. At the heart of *Habana Vieja* is the country's capital building, an edifice evocative of the U.S. capital in Washington, D.C., which seemed to glow in the golden light of late afternoon.

In front of *El Capitolio* passed a long line of meticulously painted and maintained 1950s cars, some pink, orange, or lime green (nothing original to the manufacturer). Spare parts are hard to come by, so under-the-hood each machine is a unique combination of American and Soviet mechanics. Very rarely, a modern car sped by its antique counterparts. Turning off the main avenue, streets and back alleys were dotted with shops and art. Graffiti and political commentary was everywhere. Hemingway's favorite bars were crowded, but no tourist lacked for choices. Small cafes, *panaderías*, and restaurants lined the sidewalks, offering traditional dishes such as *ropa vieja* or *pastelitos* (sweet bread filled with guava and cheese). Art galleries dominated the main tourist thoroughfares of Old Havana, where the streets are cobblestone and every building has history. Along the *Paseo del Prado*, a raised marble walkway built by Spanish colonists in the 1770s, art students and professional painters displayed their work. Each piece was different. Some were stylized, modern and bold, while others were classical and highly realistic. Nearby, statues of Spanish kings and Cuban heroes -- poets, philosophers, and revolutionaries -- competed for attention with the stray dogs and cats.

The week that followed was a blur of movement, Spanglish, and scenery. Every day was a new adventure. One morning we visited the Orquideario de Soroa, a botanical garden overseen by our husband and wife guides, Drs. Ernesto Mujica. Here, they conduct research in Cuban plant life, specifically orchids, of which there are multiple native species.

Led by Professor Ernesto Mujica, we trekked over jagged karst to view the endangered Ghost Orchid (*Dendrophylax lindenii*). *D. lindenii* is native to Cuba and Florida. It prefers to grow at hip height on trees, such as the corkwood and Carolina ash, where its roots are so well camouflaged that the blossom appears to float in mid-air. The white blossom itself is lightly tinged with green and has two elongated petals that look like a Yosemite Sam moustache. Attempts to restore the wild Ghost Orchid population are proving tricky. Currently, there are believed to be around 120 wild, blooming specimens in Cuba with more in cultivation in greenhouses in Florida.

Throughout the trip, meals were a great time to get to know each other better and catch up on events of the day. Over mojitos, we shared stories about trips around the world, our day-to-day lives, families, interests, and even some nerdy jokes.

We had lunch at an organic farm

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Gratitude in Glacier

by John Toohey

Spending a little over a week during JHU Advanced Academic Programs' summer session studying the nearly pristine ecosystem that is Glacier National Park (GNP) was a true privilege. Sitting at the continental divide, GNP contains a wide variety of ecosystems – from a temperate forest to the west, a to much drier eastern side where the mountains descend onto America's High Plains. Alpine tundra dominates the higher elevations, while beautiful quacking aspens spread across the lowlands. Vibrant flora and charismatic fauna are everywhere to be found in June, while patchy snowbanks can still be observed in the surrounding peaks. Sadly, according to the U.S. Geological Survey, only 26 glaciers larger than 25 acres remain out of over 100 that were present when the park was opened in 1910. However, GNP was and continues to be simply stunning!

Our professor was none other than Dr. Albert "Al" Manville, whose career was inspired by the great Aldo Leopold, a friend of Dr. Manville's father, and founder of the wildlife conservation movement discipline in North America. Dr. Manville, a Certified Wildlife Biologist, previously lived and worked in GNP while studying grizzly bear behavior. His fieldwork portfolio includes marking and/or radio-tagging over 100 bears, assessing impacts of wolves in Alaska, and evaluating wildlife resilience after the *Exxon Valdez* oil spill. He is a true conservationist and wildlife expert, and put together a comprehensive summer syllabus which allowed students to begin learning several weeks prior to arriving at GNP, then internalize our readings and assignments with hands-on guided field trips and nightly journal entries.

Students also benefited from Dr. Manville's extensive network of colleagues, with each expert leading us into the field daily. For example, wildlife biologist and 35-year GNP backcountry ranger Dave Shea demonstrated broad expertise in species identification while regaling us with amazing stories of his encounters with grizzlies and mountain lions. Rick Yates, who spent a winter at GNP (!!) trapping, tagging, tracking and surveying wolverines, helped us understand the challenges of real-life field biology work. Walking with botanist Ellen Horowitz opened our eyes to the immense variety of plant species and how they adapt to the often-harsh conditions at high altitude and high latitude. And what many students though would just be "fish day" turned into the amazing discovery of a shifting habitat mosaic on the Flathead River's floodplain, led by Tom Bansak, assistant director of the historic Flathead Lake Biological Station. By the end of our time together, students felt ready to take on the final assignment: designing our own field research study.

There was no shortage of fun, either! Our camp was located at the Glacier Institute in West Glacier MT. Breakfast and hearty communal dinners were prepared by the staff, and we packed lunches for our hikes and days in the field. The Institute has hot showers, internet connection and WiFi, plus a library full of wildlife conservation related books. There was just enough time at the end of the week to add a hike of your choice, horseback ride, or go white-water rafting. And we slept in cozy cabins.

Ecosystems like GNP today face many challenges, from the expanding human footprint to global heating driven by the climate crisis. I can't think of a better place to learn about the impacts of these upon the plants and animals than the "living laboratory" of GNP.

The Importance of Science Communication in Facilitating Change

by Tatiana Eaves

We are living in the age of speed. Inherent value is placed on news articles that you can read in less than five minutes, titles desperately aimed to shock you enough to click them, and social media platforms with character limits. Science needs to catch up too. No longer can we sit within the safety of our peers, publishing our findings in journals and hoping to reach the masses. We must take the distribution of science into our own hands. Especially now, considering the growing spread of misinformation and the silencing of science by our highest branches of government, facilitating public distrust.

PNAS published a study back in 2014 where social psychologists surveyed how different American professions were viewed by Americans on scales of warmth, competence, and associated emotions. They found that people described scientists as competent, but cold. This is important because 'warmth' attributes to trustworthiness not just status and expertise. For example, doctors were rated high in both the competence and warmth category.

In order to curve public perception, more work needs to be done in effective science communication. Along with pursuing my Masters in the ESP program, I work as a science writer and communicator for just this reason. My background is in the biological sciences, but I work in scientific publishing. I have noticed this growing disparity between scientists, journalists, political officials and other non-scientists. Traditionally, research scientists are seen as wary to speak with journalists/policy holders for fear of having their work misunderstood or misrepresented and often, field-specific jargon becomes their casual vernacular.

It is essential to bridge these gaps between professions and well, humanize scientists. In that we must all become front-facing scientists, seeking out opportunities to discuss our research with non-scientists or individuals outside our fields. Strong communication skills and the ability to weed out jargon while discussing your research is crucial to increasing scietific literacy overall. A study published in PLOS ONE, illustrated that incorporating narrative elements in academic writing can actually lead to a higher citation frequency. People are more likely to cite your research if they can easily understand it.

Science is in need of a shift, and only we can lead it. People need to know that scientists can be the people sitting nxt to them at that coffee shop, or in that bar, that we get nervous and fumble over our words, that we are actual people. People are on the go and that means knowledge, opinions, and ideals are moving and changing more quickly than ever before. We cannot expect science to match the pace, we must facilitate it. There is a growing community within the field of science communication, but there is still a lot to be accomplished here. If we don't take communication into our own hands it is liable to be misunderstood in future.

All thoughts expressed in this piece are my own and are in no way a reflection of AAAS

Alumni Spotlight: **Cara Urban**

There is no "silver bullet" fix that addresses climate change for all agricultural systems… yet many farmers already see the impacts of climate change on their operations and know that the threats to their livelihood are increasing. Cara Urban graduated from the JHU ESP program in 2017 and works as a staffer for its state-level, national and international platforms (see the North American Climate Smart Agriculture Alliance and projects in North Carolina, Ohio, Missouri, Florida and the Delmarva Peninsula) at the nonprofit Solutions from the Land (SfL). SfL facilitates diverse, multi-stakeholder conversations among hundreds of crop and livestock organizations, value chain industry partners, academic institutions, governments, environmental organizations and—most importantly—agricultural producers at every scale. These dialogues embrace and highlight the tools, practices and incentives that can place farmers at the forefront of solving global challenges.

An exciting part of SfL's work at forums such as COP25 and UNFCCC's Koronivia Joint Work on Agriculture is that farmers are often not represented as active participants in global conversations about agriculture. Cara sees SfL's model as a way for multiple sectors to take their lead from environmentally aware farmers, while addressing shared concerns about productivity and profitability. Outside of work, Cara reads, writes, and volunteers around the Gunpowder River's watershed near Baltimore.

Environmental Innovation

By Scott Atkinson

We're pleased to announce a first-of-its-kind, new speaker series for the 2019-2020 calendar year. *The Business of Saving our Planet*, a four-part speaker series, will bring together some of the brightest minds in sustainable business for an informative and inspiring discussion with students, scientists, executives andentrepreneurs who are positively impacting our environment by disrupting the private and non-profit sectors. Students are invited to engage remotely via the Facebook live stream or join in person for a chance to attend and network in person. Moderated by Scott Atkinson, Partner at Heidrick & Struggles and current ESP student, this series will explore topics including: Global Food System Innovation & Sustainability, the Media's Role in Environmental Awareness & Behavior Change, the Movement Towards Environmental Impact Investing & Divestiture, Technology in Wildlife Conservation & Trafficking, and Environmentalism in the Fashion Industry.

The Business of Saving our Planet will feature top leaders in each category and curate discussions where different approaches to addressing issues such as climate change, wildlife restoration and sustainable business can be explored and debated. While learning about disruptive trends will be important, this series will offer a more personal look into the lives of some of the most notable leaders who are "in the business of saving the planet." What inspired their ideas? What risks did they take along their journeys? Join us to learn why some of most influential experts in their industries are optimistic about our ability to solve some of the most pressing environmental issues of our time, why you should be too, and how you can be part the impact revolution.

Alumni Spotlight: **Setsuko (Set) Ova**

Set is a monitoring and evaluation specialist working on environment-related projects in international development. She gained technical knowledge on environmental science and policy through the JHU ESP program, which she completed in 2017. Currently she is working on the USAID / Scaling up Renewable Energy (SURE) program which assists partner countries in the technical assistance needed for large-scale clean energy deployment towards energy security and GHG reduction. Within this program, her duties include developing and implementing the monitoring and evaluation strategy, developing data collection tools and supporting progress reporting to USAID and program stakeholders.

Within this program she is also working on Engendering Utilities, an activity aiming to increase gender equality in the energy sector. This activity specifically focuses on enhancing gender equity practices within the human resources systems of energy utilities in USAID partner countries. This requires an immense data collection, management and analysis effort, but is a promising and exciting strategy towards empowering women in a traditionally male-dominated sector.

Alumni Spotlight: **Ryan Campbell**

Ryan Campbell is a Program Manager at MDB, Inc. (MDB), a small strategic consulting firm focused on environmental science, worker safety, and public health. MDB offers a range of technical and creative services to help clients achieve their communication and program goals. Ryan started at MDB in 2010 during his first semester of the ESP program. In his nine-year tenure at MDB, he has been promoted to the company's Senior Leadership Group and has worked on a variety of projects supporting federal agencies, primarily EPA and HHS, public-private partnerships with NGOs and foundations, and the private sector, such as Waste Management. The ESP program provided a meaningful blend of science education and real-world focus applicable to stakeholder organizations and agencies.

Currently, Ryan manages MDB's contracts with the EPA Office of Water and oversees MDB's Water portfolio. He facilitates strategic partnerships to support environmental programs and advises clients on program operations, best management practices, stakeholder engagement, and communication strategies.

His work focuses on watershed protection, restoring urban waters, and sustainable wastewater treatment. Most notably, since 2012, he has been honored to support EPA's Urban Waters Federal Partnership, a public-private partnership between 15 federal agencies and 28 national NGOs working to revitalize urban watersheds in over 19 underserved communities across the country. In 2017, the program was the recipient of the People's Choice Service to America Award, one of the highest federal government recognition programs.

One of his favorite projects was supporting a federal interagency working group of the Partnership for Sustainable Communities, an Obama Administration initiative amongst EPA-HUD-DOT. The work focused on the inclusion of environmental justice principles into transportation and housing projects and the effort fostered collaboration amongst the three federal agencies to develop new resources and opportunities for communities.

Ryan thoroughly enjoys consulting and contributing to federal government programs. He has served as an ESP Ambassador and is always interested in meeting alumni and current students within the program. When he is not working, you can find him exploring everything DC has to offer (via public transportation) from Rock Creek Park to the Anacostia River and the city's great restaurants.

Stepping Across Deep Time with New Friends in Newfoundland and Labrador

By Aileen Craig and Owen Snoey

This summer 14 ESP students participated in an amazing journey across 1.8 billion years of geologic time in Newfoundland and Labrador, Canada. On this canvas we saw evidence of continents moving, oceans dying and being born, the origins of multi-cellular life, as well as, humanity's historical tenacious hold on this fragile environment.

The course, AS 420.738 Newfoundland and Labrador: The Making of a continent and a Journey through time, ranged from intensive dives into the geology and the origins of the North American continent and its surprisingly close connection to Africa, to forays into the causes of the Atlantic Cod fishery's collapse as a policy case study. The region is a living laboratory and has been historically relevant in validating the Theory of Plate Tectonics. Our leader, Dr Jerry Burgess, led us across the kilometers of distance and millions of years of time with skill and planning. His close knowledge of Newfoundland based on his work on the island helped us to take advantage of ad hoc opportunities that came up along the way, as well as, many roadside lectures at various rock outcrops with our notebooks at the ready. His efforts helped us to understand and visualize the story in the rocks as the continents did their dance. The students had the opportunity to explore the geochronology labs at Memorial University and to stand on and learn about 560 million-year-old fossils of the oldest known multicellular life at Mistaken Point Ecological Reserve (a UNESCO site), and hike through land comprised of the Earth's Mantle at the Tablelands in Gros Morne National Park (also a UNESCO site). We visited four UNESCO sites in all such as the two mentioned above but also got to experience time on more recent scales as we explored historic Basque whaling practices at Red Bay and generations of Cod Fishermen in Battle Harbour, both in Labrador.

As we made our way through Canada's easternmost province, our little band of diverse students also got to know each other. We supported each other, lent each other missing camping gear, complained about the weather and bonded as only those

going through a life enriching experience such as this can do. This course offered a unique experience as the first camping course offered by the department. A mix of seasoned and brand-new campers came together and supported each other through some rainy and below 40º nights. The team was later rewarded with sunshine and beautiful campsites along the coasts with whales in the distance. The result was, friendships based on a shared experience that can extend beyond the experience itself.

Over this course we learned a great deal about essential field work, the importance of notes as a record of the observations, as well as, how to better 'read the rock' from an expert in the field. Our discussions on the broader context of policy will help us to bring in the human realities along with the science into our policy formation process. We also got to see first-hand the result of policy failures such as those leading the collapse of the cod fishery as well as the introduction of the Moose into Newfoundland. These are examples to be learned from and will help us be better scientists and advisors. In the mean-time our memories of Newfoundland and Labrador, beautiful, fragile and friendly, will linger on as a wonderful shared experience.

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overlooking Viñales Valley, *Finca Agroecológica El Paraiso*. Truly, farm-to-table dining at its finest. Produce was grown on terraced plots in the shade of trees stepping down to a shallow river. Poultry roamed free across the property to help manage the bug population. Tobacco, also grown on-site, was used as natural pest control as well. Pigs rooted happily in the woods. Lemongrass, spearmint, and oregano flourished in the sun. Everything was used and nothing went to waste.

Over lunch, we learned that the Cuban tradition of and attention to ecologically and financially sustainable agriculture dates back to the Special Period of the 1990s. The dissolution of the Soviet Union and the cessation of the Council for Mutual Economic Assistance (COMECON) plunged Cuba into a severe economic crisis. The Special Period radically transformed Cuban society. It necessitated the introduction of sustainable agriculture, decreased use of cars, and reformation of the country's industries. It also drastically changed the national diet, greatly impacting citizen's health, as all were forced to live without many goods they had become accustomed to receiving from the USSR. Yet another example of the indominable spirit of the Cuban people.

One afternoon, we descended into Viñales Valley, a UNESCO World Heritage Site, to the base of the Sierra de los Órganos mountain range. We were given climbing helmets with small lights attached to the front like those worn by coal miners. Led by a team from the Antonio Núñez Jiménez National School of Speleology, we intended to explore in the Santo Tomás Cave. However, the only way to reach the entrance of the cave was to climb halfway up the side of a *mogote*, one of the round top mountains that dot the valley. Clinging to trees and scrambling over rocks, we made slow progress up the mountain. Inside the entrance of the cave we entered another world of low-hanging ceilings, ghostly echoes, and creeping shadows. Rocks changed shape in the flickering light of our helmet lamps. Stalactites and stalagmites loomed out of the darkness. Finally, around a bend, the cavern opened up into a gallery with vaulted ceilings and ferns dripping from the walls. We passed through another, smaller passage with access to the open air. Here, tucked away in a corner, was a rare cave-dwelling rock frog (*Eleutherodactylus zeus*). Found only in limestone caves in Cuba, *E. zeus* is a large species that lives in almost complete darkness and has adapted enlarged eardrums and exceptional vision to survive.

Crawling back through the semi-darkness, with the soft splashing of falling water accompanying each footstep, we came to a rippled rock with thin fins protruding from the front, almost like folds of cloth. Gently tapping the rock created musical, resonant notes that echoed around the cave.

Across the island, on a peninsula on the western coast of Cuba, we stopped to visit at the Parque Nacional Guanahacabibes Nature Center. Local guides led our group on a hike over-land to another cave. Here, curled in the dark, was a Cuban tree boa and a squat owl annoyed to be awoken by noisy, American tourists. Our guides pointed out plants and birds of interest, providing

their Latin and colloquial names, main attributes, and ecological niche. Back at the Nature Center, we were greeted by the resident pet iguana, a 5-foot-long, prehistoric-looking creature with no interest in cuddling. Across the street, on the quiet stretch of highway, goats munched contentedly on scraggly grass.

Five miles down the road, the highway curved to the south to hug the coastline along the Gulf of Mexico. Turquoise water and sandy beaches flashed passed on our right. Mangrove trees grew in profusion along the water's edge, natural protection against storms and the current. Patches of water rippled and waved, forming concentric rings even as the waves moved unendingly towards the shore. In these spots, fresh groundwater bubbled to the surface and mixed with the salty Gulf. Wild pigs and other animals often wander out into the Gulf to drink from these springs.

At our destination, María La Gorda, we changed into swimsuits and boarded a converted, 46-foot sportfishing boat. Motoring down the coast, we came to a sheltered cove with clear water and a profusion of coral. Donning masks and flippers, we jumped off the back of the boat with our laminated fish guidebooks. In a short time, we saw fish species of all colors and shapes. Those with slim bodies and chunky snouts. Some with deep blue, almost purple scales and others with bright yellow spots. Floating there, in the salty water with small fish playing around our feet, we marveled at the colors of the world around us.

Every night we debriefed. Lessons on Cuban politics and history were interspersed with lectures on geology and ecology. The significance of the Cuban Revolution and endemic species were treated with equal care. Plants and people so closely interconnected on an island 777 miles long and 119 wide. Discussion covered the importance of the adoption of eco-tourism and the implementation of environment protection laws. How Cuba's reintroduction into the global economy may impact its environment and the legal frameworks in place to curb over-development or exploitation. Cuba is already threatened by the footprint of foreign tourism, most especially the trash generated by cruise ships and plastic water

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bottles, and the strain on its delicate waste management infrastructure.

Currently, Cuba operates two currencies: one for locals and the other for tourists. Discrepancies in value and employment place the highly-educated population in a difficult position. Often, rather than working for the government, Cubans will seek employment in the tourism industry. Our guide, Esperanza, is highly educated with multiple degrees and international professional experience. She previously served as a communications specialist at the Cuban Embassy in Canada and traveled extensively in the United States. Our spelunking teacher trained as a doctor. Our taxi driver in Havana was an economist. Throughout our trip, the importance of academic and scientific exchange was stressed by the Cuban experts we met.

If Cuba is to take significant action to protect its environment from the threat of over-tourism and climate change, the government and research institutions must have all available data and tools at their disposal. This is the power of academic cooperation. The Cuban people are aware of the danger. Climate change denial is non-existent. The government has gone so far as to acknowledge climate change in the revised constitution. Although a small contributor to global greenhouse gas emissions, Cuba is a signatory to the Paris Agreement and has outlined a 100-year plan, called *Tarea Vida*, to adapt to and mitigate the impacts of climate change. *Tarea Vida* has been used as a template for climate action by other island nations around the world.

Our time in Cuba was brief, but inspiring. We were gifted a rare opportunity to learn from incredible people in a beautiful place. This spring, the American government again restricted travel to Cuba for purposes of tourism and academic exchange. We were offered a glimpse of a society, culture, and ecosystem that's often relegated to a few sentences in the history books. An island, geographically and politically isolated from the rest of the world, but eager to engage and share.

Graduation Ceremony 2019

by Candice Hilliard

This spring, I attended an ESP-EPC-GIS Master's graduation reception that differed a bit from receptions in the past. On the eve of the KSAS Master's Graduation Ceremony, around 65 graduates, family members, faculty, and staff gathered to celebrate. Our cohort first embarked on a campus tour led by ESP Director, Professor Jerry Burgess, then settled in for dinner at the Ambassador Dining Room. As we sat on the open patio surrounded by cozy fires and delicious food, the intimate and relaxed setting allowed for meaningful conversation and new connections. I had the opportunity to meet and have dinner with a fellow graduate and her family. In the absence of this reception, I would not have been able to shout and wave 'Congratulations!' as I passed her in the crowded arena the next day.

The feeling of connectedness continued as we gathered in the lower levels of the arena awaiting the start of the ceremony. Graduates laughed, embraced, and fixed each others' caps and gowns, while professors walked the halls, making sure to say hello and congratulations to all of their students. When my name was called, I walked across the stage feeling appreciative of the time the ESP faculty had taken to cultivate a personal connection with me and sense of

community within the department. My family cheered as I exchanged celebratory hugs with Professor Burgess and Dr. da Rosa.

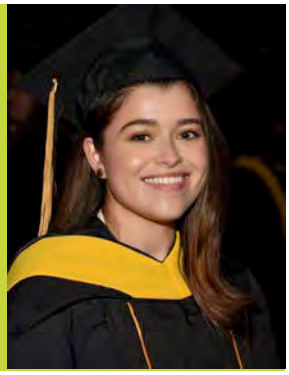
With the support of the JHU community, I aim to complete the final assignment that faculty and Commencement speaker Canadian Supreme Court Justice, Rosalie Abella, gave to graduates - "Use the skills and knowledge gained during our time at JHU to create positive change and better the world".

Outstanding Faculty Member of the Year: **Rachel Isaacs**

My love of travel and the environment led me to seek out opportunities to learn new skills and leverage these to travel around the world. This desire transitioned into a degree in Geography with a focus in GIS, Remote Sensing, spatial statistics, and landscape ecology throughout my undergraduate and graduate careers. As an undergraduate at the University of Hawai'i – Hilo, I had the opportunity to participate in research examining the succession of vegetation after lava flows. During my Master's at Texas A&M University, I used a combination of field and GIScience skills to explore the impacts of ice storms in Virginia and Arkansas. This research and improving my technical skills helped me get a full-time position in GIS environmental compliance before I even graduated. While working full-time, I missed academic research and the opportunity to learn new skills. I leapt at opportunities when invited to join research expeditions examining the roles of fire and climate change in Mount Rainier National Park, WA and Denali National Park, AK. My career and these expeditions helped solidify how valued these GIScience skills were across private, government, and academic industries. In particular, the Denali expedition convinced me to return for my Ph.D. at The Pennsylvania State University where I studied the spatiotemporal impacts of climate change on treeline in Denali combining my love of field work with GIScience skills. At Penn State, I was also given the opportunity to teach my first courses and discovered how much fun I had communicating my passions to others. It was at JHU, where I have been able to experiment with course design, that I really discovered how much fun it was to work with students who were just as eager as I to learn and explore new technology and the world around them.

Congratulations to Outstanding ESP Graduates

Diana Muller Sarah Solomon



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