



Letter from the Director

Given the challenges of the past year, I would like to take a more forward-looking perspective on environmental themes that we might see bolstered in the next few years. Clearly there are local environmental problems, and these can at times be overshadowed by global crises dealing with the loss of biodiversity or climate change. Both are important but the large-scale issues are the more intractable ones and require real resolve. As our world has become more interconnected through goods and services and flows of information we see that changes in our biogeochemical cycles, ecosystem services and our own habitability comfort index are all compromised. The drivers of environmental change are not necessarily of an environmental origin (e.g., global urbanization, migrating populations, and power shifts in governance). These various drivers are catalyzing societal change for the restoration of the environment and spurring an even greater urgency to tackle the climate/biodiversity crisis in tandem with business and commerce. We are seeing trends in manufacturing such as the commitments by major automotive companies to end our reliance on fossil fuel driven vehicles and in shareholder boardrooms with new models of shared governance with environmentally focused directors (e.g., Exxon and Engine 1). Looking into the crystal ball, we see decarbonization taking hold across a variety of industries including transportation,

construction and material manufacturing. Decarbonization will require energy efficiency, behavioral change, electrification, renewables, hydrogen and hydrogen-based fuels, bioenergy and carbon capture, utilization and storage. There will be no silver bullet – all options are needed on the table to develop a portfolio that is diverse and geographically appropriate.

We see that consumers are driving companies to stop the practice of green washing and make sustainability a requirement for doing business. The investment community (e.g., Blackrock) has taken note and environmental strategies are becoming top priorities for companies that want to be in business for the long haul based on purpose-driven outcomes.

We are likely to see are digital transformations in areas like carbon emissions, the virtual workplace, and recycling. In recycling, for example, we can no longer tolerate the majority of our single stream home recycling to end up in a landfill and we will see more use of AI for better segregation of waste resulting in a more efficient recycling process. If we want a smaller footprint and we want good jobs for our communities, then we need to shorten product transport lines while eliminating ethically grey and abusive worker practices by supplying the consumer demand using locally produced and sourced products. Look for the spotlight to be on blockchain



Jerry L. Burgess, Ph.D.

Director for the Environmental Science and Policy & GIS Programs

technologies which provide a verifiable record of a company's claims of being resource-positive or reducing their environmental impact.

Finally, another trend that is here to stay involves environmental justice. The literature is now replete with information that clearly document the disproportionate risk that people of color (Black, Latino, Asian and Native American) encounter from pollution sources such as their proximity to manufacturing, waste management facilities, contaminated water bodies among others. Dr. King's words, often voiced by President Obama will have an environmental flavor over the next few years: The arc of the moral universe is long, but it bends towards environmental justice. Our job: make sure it happens.

An Introduction to the Pathways Program for Students and Recent Graduates to Federal Careers

By Amy Lynn Walker

Hello all! My name is Amy Lynn and I am an Environmental Science and Policy student in my fourth semester with AAP at Johns Hopkins! While attending school, I work full time as a Pathways intern for the U.S. Environmental Protection Agency in D.C. in the Office of Mission Support. I owe my acceptance to this amazing internship program in large part to the skills, knowledge, and friendships I have gained during my time at Johns Hopkins. For this reason, I would like to share some more detailed information on the Pathways program with my fellow students in hopes that more people will be able to take advantage of this exciting career opportunity!

The Pathways program was developed as part of a 2010 executive order to improve federal recruiting efforts, creating a 'pathway' to careers in federal government for students and recent graduates. The program consists of three different paths, including the internship program, the Recent Graduates program, and the Presidential Management Fellows program. The internship program is a paid opportunity for students currently in high school, college, graduate school, or trade school to explore federal careers while still attending school. The Recent Graduates program is a developmental experience for individuals who have graduated within the past two years with an associates, bachelors, masters, professional, doctorate, or technical degree. The Presidential Management Fellows program is a leadership development program for those currently pursuing advanced degrees or have received an advanced degree within the previous two years.

The Pathways Internship program, which is the program that I am a

part of at the EPA, is a great opportunity for students looking to pursue a career in the federal government after graduation. Each individual Pathways position differs in duties, requirements, and expectations depending on the hiring agency and department. Agencies can hire Pathways interns on a temporary basis, which lasts for up to one year, or on an indefinite basis, which lasts for as long as it takes the student to complete their educational requirements.

The internship work schedule is meant to accommodate the student's course load, so the opportunity exists to switch between working part- or full-time hours as the number of classes being taken changes.

Pathways interns have the opportunity to be converted to a permanent position in federal government within 120 days of successful completion of their academic program. To be eligible for the conversion, interns only need to complete at least 640 hours of work experience through the internship program, complete their degree, and meet any agency-specific requirements for the position to which the intern will be converted.

The Recent Graduates program also offers the opportunity to be converted to a permanent position after successfully completing at least one year of continuous service. Once converted to a permanent, competitive service position, your time spent in the program will be counted towards your total competitive service time. Recent graduate positions as well as interns hired on a long-term basis are eligible for health, life, dental, and



Amy Lynn Walker

vision insurance as well as paid time off. All available Pathways program opportunities can be found on the [USAJobs](#) job board. Federal jobs open to students and recent graduates will be marked with either a graduation cap or book icon, or you can narrow your search using the students or recent graduates filter.

I highly recommend this program for anybody looking to gain experience or pursue a career with the federal government after graduation. I greatly appreciate the emphasis that is placed on learning and training during the program, all while accommodating a student's busy schedule. Additionally, not having to worry about sending out hundreds of job applications before graduation is a major perk! Please follow these links if you would like more general information on the [Pathways Program](#) or more specific information about [Student Internships](#) at the EPA! I would also be happy to answer any questions about the program or my experience in the program at the EPA, please feel free to reach out to me at walkeramy014@gmail.com!

“A Journey Upstream”

By Andrew Braker

Growing up I practically lived outdoors— building forts in the woods, exploring streams, and learning to love the beauty of nature. As I grew older, I continued to love the outdoors but in new ways, like camping, hiking, and fly fishing. This interest in the natural world inevitably led me to the JHU ESP program in 2019. In 2020, I decided to take this passion and knowledge for the natural world and I channeled it into creating an environmental film.

“A Journey Upstream,” at its heart, is a film that is meant to inspire and educate people about the importance of a healthy Chesapeake Bay watershed. This story has been told time and time again, but I wanted this one to be different. “A Journey Upstream” is a film about fly fishing for two native Maryland fish species— brook trout and striped bass—and how the ecological connectivity of these two species can help inform us about the importance of a healthy Chesapeake Bay watershed.

The Chesapeake Bay is home to a well-known striped bass fishery in its estuarine waters, but not many people tend to think about the massive watershed that surrounds the Chesapeake. The 64,000 square miles that make up the watershed extend across a large portion of the east coast— covering over six different states! A lot of fisheries exist in this space, but what makes brook trout so special is that they are the fish that exists in the furthest reaches of this watershed.

If you literally went on a journey that started where the Chesapeake Bay meets the Atlantic, then traveled upstream until you reached the end of the furthest headwaters, the first species you would catch would be a striped bass, and the last species would be a brook trout. In this sense,



these species act as bookends for this watershed.

Like all fish species, the health of striped bass and brook trout populations can be negatively impacted by factors including overfishing, chemical pollution, sedimentation, changes in temperature, and many others. When we figure out the health of a fish population, we also gain a greater understanding about the health of lands that surround the water where those fish live (i.e., the watershed).

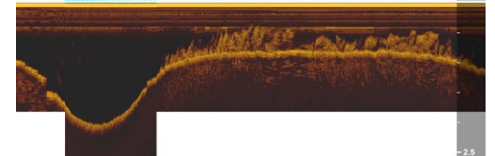
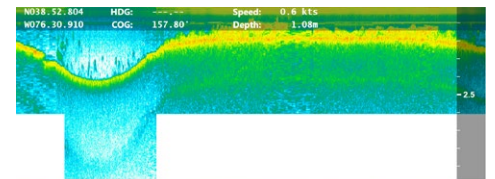
If brook trout and striped bass are indicator species for a healthy watershed, and one of them is located at the start of the watershed, and the other at the end, the health of these fisheries can tell us a great deal about the Chesapeake Bay watershed as a whole.

The film is gaining traction in the 2021 film festival cycle. So far, the film has been accepted into the 2021 [Fly Fishing Film Tour](#) and the [Annapolis Film Festival](#). To learn more about the film, and to stay updated on future progress, follow the film’s [Instagram](#) or [Facebook](#) page. If you would like to follow up with me personally, please email me at andbraker2@gmail.com.

Drones and Environmental Problem Solving

By Dr. Jim Blanchard

Researchers and scientists are really seeing the benefits of remote sensing for environmental monitoring and conservation. Drones (or UAVs/ UAS) such as the ones used in our Drones in Geospatial Decision-making course, offer quick, easy and cost-effective insights. This summer we have graduate students Thomas Blair, Caitlin Eversmier, Brian Redding, and Nilisha Patel working with our expert faculty Dr. J. Blanchard to solve environmental problems as part of an independent research project at the Smithsonian Environmental Research Center. These researchers are exploring scientific questions using a variety of techniques ranging from sonar to LASR-Air systems. To see a snapshot of the data they are gathering, here is a sonar image tuned to detect SAV (subaquatic vegetation) which in this image is mature and the data should allow them to generate dimensions and estimate biomass. You can see part of the team in the picture taken from the LASR-Air system while they are at anchor operating a LASR-Sea system in the lower right. Dr. Blanchard will be teaching his Drones course this Fall and an advanced course in 2022.



Journey to the Deep

By Maddie Chohnoky

From a young age, I always found myself being drawn to the ocean. I grew up in Saratoga Springs, NY, and spent most of my younger life in landlocked areas. The first time I was given an opportunity to SCUBA dive was at the age of 12 during a family trip to Bermuda. That moment changed my life, the world got much bigger, and I started thinking in ways I hadn't before. A whole world down beneath the surface of the water? A world most people have never seen? It was magical, I floated there suspended in the water column as fish circled around me and vibrant corals danced in the refracting sun rays. In that moment the ocean was and still is the most beautiful place I have ever seen.

I knew I wanted my life to always encompass marine life in some shape or form. So I began to travel and learn through school and other educational programs. I spent time immersing myself in different marine environments and connecting to people who were also compelled by the underwater world in Australia, Belize, Hawaii, the Bahamas, the British Virgin Islands, Fiji, and more. The more I learned about the ocean and its ecosystems, the more questions arose and the more I felt compelled to be involved in preservation and education efforts to share with others how my life had changed in hopes that it would perhaps spark inspiration in them as well.

I went on to earn a BA in Environmental Studies from Rollins College in Winter Park, Florida. While there, I continued my diving education and worked as a Dive Master with the SCUBA diving program at the college. During my senior year of college I accepted a job as an administrative assistant for a privately owned investment firm in Chicago. The job didn't align with my degree, however, it was a good opportunity and everything I had hoped for to set me up for a stable and successful future. However, I found myself stuck in a position where I lacked drive and a feeling of success in the work I was doing. The time I had off I would often venture in the Shedd Aquarium, spending my weekends sitting and watching the exhibits, marveling at the creatures of all shapes, sizes, and colors that floated effortlessly through the salt water. Chicago wasn't my story or my life and I decided to make a big change in hopes of prioritizing what made me feel fulfilled. I took the growth and skills I had acquired at my job and left Chicago in 2018. From there I moved directly to the Florida Keys to further my diving career and be in the ocean again. I wanted to prioritize what inspired me even if it was a big step out of my comfort zone.

(Continued on page 5)



Journey to the Deep

Continued from page 4

I earned my PADI Master Scuba Diver Trainer certification and worked at Rainbow Reef Dive Center, one of the largest dive shops globally, for three years, interacting with and certifying hundreds of divers during that time. On a daily basis, I was able to help people of all ages and backgrounds experience the magic I did when I went diving for the first time. While there, I expanded my career by helping with and eventually overseeing the conservation program at Rainbow Reef. With immense support from my co-workers I was able to grow the program tremendously. Through this work, I managed both recreational and professional countless marine debris removal dives, coral rehabilitation dives, and created a variety of other marine conservation-oriented events to engage the community. I gained unbelievable passion for the work I was doing with a team of equally dedicated individuals helping expand the program to a level I could have only imagined years prior.

After achieving immense amounts of hands on work in and out of the water I began to notice the many issues the ocean, my place of work and what I call my office, is facing. I wanted further my education to expand my opportunities to help, so I began a Master's degree program in ESP Making from Johns Hopkins University. I will start my second semester in Fall 2021 and am thrilled with what I have been learning thus far and the people I have met through this journey.

This past March I took a step away from diving professionally full time. I applied for and was offered the Community Stewardship Coordinator position at the National Marine Sanctuary Foundation: Florida Keys Chapter and have been there since. I had worked with individuals from the Foundation in my previous position overseeing the conservation team at Rainbow Reef. Now as the Community Stewardship Coordinator, I am able to assist dive operators throughout the entirety of the Keys participate in and support marine conservation work. This includes helping them in applying for permits and funding opportunities, providing training sessions, and supporting the events that they run. The majority of my work involves developing and implementing volunteer programs for Mission: Iconic Reefs, Goal: Clean Seas Florida Keys, and identifying, recruiting, and supporting Blue Star operators.

The main project I support is called Mission: Iconic Reefs. It is a projected 20-year project to help reintroduce and maintain resistant hard corals, such as elkhorn and staghorn, to the reef systems in the Florida Keys National Marine Sanctuary. Current coral coverage is estimated to be only 2% of what it used to be. As the Community Stewardship Coordinator, I serve as a liaison between the different dive operators, NOAA employees, and coral practitioners to help collect and relay information. With this knowledge I am helping to develop and deploy volunteer programs for dive operators as well as recreational divers to participate

in Mission: Iconic Reefs.

The second project I am working on is Goal: Clean Seas FL Keys. This is a major marine debris removal initiative taking place throughout the Florida Keys. I assist dive operators by making sure their permits are up to date, help them with in water training and presentations, and well as filing their invoices and progress reports so they can be reimbursed for their debris removal dives. In 2020, Goal: Clean Seas FL Keys supported the removal of over 4,500lbs of harmful marine debris.

Lastly, I help to recruit new Blue Star dive operators as well as keep current ones up to date on funding opportunities for conservation efforts. The Blue Star program is specific to the FL Keys and any operator that is certified as "Blue Star" upholds a high standard of marine conservation. They have to take online training, give specific dive briefings to make sure their customers maintain practices that help preserve and protect the marine environment.

I feel extremely fulfilled by the current development of my career. My journey and progression throughout my profession was not linear or compelled by small easy decisions. However, all experiences benefited me and led me to where I am today. So, for those reading this I challenge you to pursue your passions, ask questions, and step outside your comfort zone. The world, both above and below the surface of the ocean, is vast and full of opportunity.

Nature Bound: The ESP Blue Jay Book Review

By Morgan Conover



In 2015 I read Naomi Klein's book *This Changes Everything: Capitalism vs. The Climate* and I was struck by a passage in the introduction:

"I denied climate change for longer than I care to admit. I knew it was happening, sure. [...] But I stayed pretty hazy on the details and only skimmed most of the news stories,

especially the really scary ones. [...] A great many of us engage in this kind of climate change denial. We look for a split second and then we look away. [...] Or maybe we do look—really look—but then, inevitably, we seem to forget. Remember and then forget again. Climate change is like that; it's hard to keep it in your head for very long. We engage in this odd form of on-again-off-again ecological amnesia for perfectly rational reasons. We deny because we fear that letting in the full reality of this crisis will change everything. And we are right."

The first time I read the passage I felt directly confronted by the laziness of my environmentalist resolve. Admittedly, the feeling has waxed and waned over the years, just as Klein describes. But I was again confronted with the feeling while reading the essays in Scott Russell Sanders' book *The Way of Imagination*. In the book, Sanders traces how we got to our

The Way of Imagination: Essays

By Scott Russell Sanders

272 pages. Counterpoint Press

collective present moment through personal anecdotes and his moral journey. He outlines what drives our excessive consumption and reckless behavior toward the earth and considers how we might succeed in undoing the damage we have caused. He proposes that we must draw on our imaginations to envision solutions to our environmental problems: "To find solutions, we will need to reimagine our place in nature, our responsibilities as members of communities, and the meaning of a good life—which is to say, we will require a shift in consciousness as radical as any mutation in our evolutionary history." While I'm not sure I have complete faith that we, as a selfish species, can come to terms with the fact that we are not exempt from ecological constraints, Sanders's proposed path gives me hope. His essays inspire a vision of the future in which humans live in reciprocity with the earth—a vision toward which we must continually strive.

My Path to Purpose: A Career in Policy

By Ben Vauter

My career path has not been direct. I haven't always known what my passion was, or what field I wanted to work in. Growing up in the Pocono Mountains of Pennsylvania, my connection with nature was forged early, but I never considered myself an environmentalist. By my late teens, I was spending less time in the woods and more time lamenting that I lived so far from the buzz and diversity of city life. For my undergraduate studies I chose to attend the University of Pittsburgh, where I studied Finance and International Business, in an attempt to expand my horizons and escape the simple forest life. The city of Pittsburgh and the internationally focused courses I took planted in me a cultural curiosity that led me to join the Peace Corps in Guatemala where I would eventually reconnect with my nature boy roots.

My Peace Corps service inspired my commitment to a career in environmentalism. When assigned to Guatemala, I dreamt of a lush, pristine landscape. Instead, I was struck by the stark reality of poor air quality, contaminated waterways, and deforested hillsides. I realized how the degraded environment had a such deep impact on the indigenous people who had traditionally relied upon its bounty for survival; nature's splendor inspiring their cultural traditions. My time spent living, working, and learning from the indigenous Maya in Guatemala had a profound, course-setting impact on my life. It was during this time that I committed, personally and professionally, to work to fight against the types of environmental degradation I observed. I spent the remainder of my Peace Corps service helping to develop community-based environmental programs to reduce chemical fertilizer usage, reintroduce native plant species, and teach environmental lessons to school children in my host community.



(Continued on page 7)

Drought and the Food Water NEXUS Speaker Series

By Dr. Cassandra Hansen



In the western United States, growing crops means irrigating land, often with water diverted from rivers. The dams, diversions, and canals that deliver this water can

be more than a century old. With these inefficient, aging systems, farmers need to increasingly divert greater amounts of water and use more energy to grow crops. Investing in modernizing this critical infrastructure is one of the greatest agricultural, environmental, and local energy development opportunities in the western United States and a great challenge. In February 2021 Julie O'Shea CEO and Co-founder of the Farmers Conservation Alliance (FCA) spoke about FCA's efforts that have mobilized over \$160M into communities across the western United States to modernize irrigation infrastructure in [part 2](#) of the Environmental Sciences and Policy NEXUS Food Water and Energy speaker series.

Why should farmers be leading the way in irrigation conservation? In [part 4](#) of the NEXUS series (March 2021) Dr. Hallar used her recent analysis of satellite data and surface networks to show that airborne dust has increased significantly over the last two decades. Dr. Hallar explained to the Johns Hopkins University community that the airborne dust resulting from increases in agricultural production, is negatively influencing human health and visibility. Her results foreshadow a future in which desertification becomes an increasing risk to the Great Plains under conditions of increased drought severity throughout the western United States due to our changing climate.

(Continued on page 8)

A Career in Policy *(Continued from page 6)*

Engaging my rediscovered passion, I returned to DC to pursue a position with the EPA. One of the benefits earned by Returned Peace Corps Volunteers (RPCVs) is non-competitive eligibility (NCE) for government hiring which provides an expedited path for agencies to hire RPCVs. Six months into working in a temporary position as a grants administrator for the Corporation for Public Broadcasting, I met an EPA recruiter at a Peace Corps-organized job fair who helped me land a job as a Grants Management Specialist in the EPA's Office of Grants and Debarment (OGD).

I was ecstatic to land a job at the EPA, though I must admit I was not overly enthusiastic about my job within the grants office. Finally, after four years with the grants office, I maneuvered my way into the job of my dreams working with the EPA's Office of International and Tribal Affairs. All of the knowledge and experience I gleaned over the years, along with the relationships I'd built, had helped me to secure my new position.

Now, as an EPA International Environmental Protection Specialist, I've spent the last four years supporting global implementation of the Minamata Convention on Mercury, an international UN treaty to reduce and eliminate mercury use in products and processes around the world. The Minamata Convention entered into force in 2017, one year after I started in my new role, so the work is new and fascinating. I am finally able to work creatively on the cutting edge of policy and program development, building partnerships, and learning from the best and brightest environmental policymakers, scientists, and engineers in the field. Initially I felt that my Finance undergraduate degree would put me at a disadvantage in the environmental field. I felt I'd wasted my time in

college, and wished I'd discovered the environmentalist in me sooner and studied Environmental Sciences or something similar when I was in undergrad. But it turns out that my knowledge of Finance and my passion for the environment are a huge asset to my office. Artisanal and small-scale gold mining (ASGM) is the leading source of mercury emissions globally, making it the most important sector to the Minamata Convention. I have been able to contribute new perspectives to policy discussions around how to reduce mercury in ASGM, suggesting a global supply chain approach to create a globally enabling environment for local changes in mining communities. This work has been integrated into efforts undertaken by the Organization for Economic Cooperation and Development (OECD), the UN, and is influencing the way the US government approaches mineral supply chains.

Of course, I must remember what I've learned throughout my career thus far. First, that patience is key. Typically, nothing good happens fast and I sure as hell am not going to change the entire global economy overnight. Most of the progress I feel I've made in the ASGM space probably goes unnoticed by people outside of my office, but I am grateful for the progress I've witnessed. And most importantly, I am keeping my eye on the my ultimate goal of protecting the right to a clean environment especially for the most underrepresented communities amongst us, in this case poor gold mining communities around the world who are negatively impacted by mercury pollution. My job, the organization, and the sector I work in may change throughout my career, but I will always remember my lessons: to stay patient, acknowledge and embrace progress, and to maintain my focus on my long-term goals.

Drought and the Food Water NEXUS Speaker Series

(Continued from page 7)

Drought is defined as a deficiency in precipitation over an extended period. The National Weather Service further subdivides this definition into four types of drought:

- **Meteorological** drought based on the degree of dryness (rainfall deficit)
- **Hydrological** drought based on the impact of rainfall deficits on water supply such as stream flow, reservoir, and lake levels, and ground water table decline.
- **Agricultural** drought based on the impacts to agriculture by factors such as rainfall deficits, soil water deficits, reduced groundwater, or reservoir levels needed for irrigation.
- **Socioeconomic** drought which is based on the impact of drought conditions (meteorological, agriculture, or hydrological drought) on supply and demand of some economic goods exceeds supply because of a weather-related deficit in water supply (NWS.gov, 2021).

In early March Oregon Governor Kate Brown submitted a drought declaration for Oregon's Klamath Watershed. This regional drought declaration was later joined by California Governor Gavin Newsom on May 10, 2021. This drought declaration resulted from a second consecutive year of severe drought in the Western states. According to the UC Davis Center for Watershed Sciences, "Northern California has received about 48% of average historical precipitation for this time of year. We are entering the 3rd driest water year on record, so far. Only 1924 and 1977 were drier in precipitation over the last 101 years. At this time of year, there will probably be little more precipitation until fall. Statewide snowpack is about 30% of the average for this date. Snowmelt will only help reservoir storage a little this year, but we will be glad to get any of it."

The Klamath Basin has faced drought conditions almost every year this past decade, and 2021 is on track to becoming the worst water year in at least four decades. In the Klamath Basin, farmers, indigenous tribes, endangered species, and municipal demands are all competing

for water that is increasingly in short supply. What will be the impacts of severe drought for this sensitive region of the world? Minimal rainfall and lack of sufficient snowfall last fall and winter threatens [local SONCC Coho Salmon](#) populations due to extremely low flow conditions that could disconnect suitable habitat, disrupt out-migration, and jeopardize existing redds in key spawning tributaries. Critically low flows along the lower seven miles of the river during the last month of the irrigation season (September) severely hinder the in-migration of Fall chinook salmon. Unable to reach their traditional spawning grounds upriver because of the lack of water, the migrating adults must hold in pools at the river mouth until irrigation season ends and flows recover enough to allow passage along the lower reaches of the river. These pools where the fish hold can be very shallow and warm; and can have extremely low levels of dissolved oxygen. Such poor water quality conditions can lead to aquatic parasite infestations and disease transmission between adults and subsequent fish kills. Similarly, during the dry summer months, low flows can isolate juvenile coho from the cold, nutrient-rich waters necessary for healthy development. Without access to cold water refugia, these fish have to over-summer in shallow, warm pools, the results of which can include impaired growth, increased susceptibility, and mortality (CalTrout, 2021).

An emerging and exacerbating factor in this equation is the exponential boom in large-scale cannabis cultivation throughout the Shasta Valley in Siskiyou County, a critical area of the Klamath Watershed. This battle between an emerging industry and a culturally important and threatened fishery illustrates how in some parts of California, the legalization of marijuana has failed to bring the cannabis industry fully out of the shadows. In these places, large-scale marijuana farming remains a criminal enterprise. Proposition 64, approved in 2016, allows local governments to ban commercial cannabis operations if they choose. Some conservative rural counties, like Siskiyou County, have chosen to ban commercial cannabis operations. Siskiyou

County limits the number of cannabis plants on a property to 12 and has banned outdoor growing operations. Of largest concern is the purchasing of groundwater pumped from local wells and water allotted to farmers to support these growing operations, which is then trucked to the grow site and stored in large tanks for irrigation purposes. For the last five years farmers' water rights have been purchased to return water to the Klamath River tributaries to increase flow and decrease temperatures which is vital for the survival of native salmon.

Efforts to increase the quantity and quality of water has been met with an influx of development and over the last three years with the addition of thousands of cannabis plants and greenhouses that have quickly replaced a few square miles of juniper and brush contributing unnecessary and illegal fertilizers to the sensitive Klamath Watershed along with extreme water usage and groundwater withdrawal (Wilson et al. 2019). How will state and perhaps federal regulators respond to this particular unchecked water use situation during extreme drought conditions in the west? Click on the link and [compare NAIP imagery to view the cannabis developments in the Shasta Valley from 2019 to 2021](#).

Federal drought relief was one of many climate focused topics stated by the National Climate Task Force through the USDA Conservation Reserve Program (CRP) announced by White House Secretary Tom Vilsack on April 21, 2021. The USDA also announced investments in climate-smart agriculture, including \$330 million in the Regional Conservation partnership Program (RCP) and \$25 million for On-Farm Conservation Innovation Trials. This is an important area to watch over the next few months and years throughout the Biden-Harris administration. Immediate actions need to be taken to maintain a healthy and balanced watershed during these prolonged drought conditions. This issue requires scrutiny and ongoing analysis to ensure that policies and regulations are reflecting the dynamic and increasingly dire water situation across the west.

Business of Saving the Planet Series 21–22

By Scott Atkinson

On April 12th, we hosted **Dr. Jane Goodall**, **Lisa Jackson** (VP, Environment at Apple and Former Administrator of the US Environmental Protection Agency), and **Ryan Gellert** (CEO of Patagonia) for an intimate conversation on environmental leadership. “A Call to Environmental Leadership”, the 3rd panel in our Business of Saving our Planet speaker series, focused on the growing need and demand for environmental leaders within the private and public sectors. The panelists shared personal stories about what caused them to chart a career focused on driving positive environmental change.

For Dr. Jane Goodall, the catalyst was flying over Gombe National Park and seeing massive deforestation in the area where she was studying chimpanzees. For Lisa, a Louisiana native, her path was informed by seeing the health impacts of a polluted Mississippi River and having her house destroyed by Hurricane Katrina. Additionally, she observed that many of the nation’s low-income communities frequently live in industrial zones where they suffer disproportionately from air and water pollution. Additionally, Ryan’s route was informed by a strong passion for rock climbing, surfing and snowboarding which led him to align his love for outdoor sports with platforms where he could advance environmental solutions. While each panelist had a different personal story, they all agreed that humanity won’t respond effectively



to the challenges of climate change, nor be able to chart a path towards a regenerative society, without strong next-generation environmental leaders. Our panel included a warm introduction from Dr. Jerry Burgess, an engaging Q&A led by Dr. Jenn da Rosa, and moderation by Scott Atkinson (’21 alum). [A recording of the panel can be accessed at here](#). Stay tuned for announcements on episode 5 of the Business of Saving the Planet series which will be held in person at The California Academy of Sciences in San Francisco, California.

Faculty Spotlight: Dr. Elizabeth B. Hessami

This year we are honored to report that the ever delightful and brilliant **Dr. Elizabeth B. Hessami** (J.D., LL.M.) was selected as our **Excellence in Teaching** award recipient. Anyone that has ever been in one of her courses, realize that her love for the material is intoxicating. She has the ability to spread that enthusiasm throughout her courses and has established herself as a role model and mentor for students.

Though she maintains a presence on both the East and West Coasts, her real home base is Central Florida. She loves spending time in Florida Springs and likes to free dive there. Her biography is laudable, and she has written extensively on Afghanistan’s natural resources and armed conflict and is a member of the Society of Environmental Journalists. She is also a Visiting Attorney for the Environmental Law Institute researching post-conflict natural resources management with a focus on climate change and developing nations. She was a founding member of the Environmental Peacebuilding Association for which she is currently producing content and a member of the IUCN World Commission on Environmental Law Specialist Group on Peace, Security and Conflict. Prof. Hessami is originally from Bethesda, MD where a small grove of trees behind her house served as her childhood

sanctuary and it is perhaps no surprise that her absolute favorite place on earth is amongst the California Redwoods in the beautiful Muir Woods north of San Francisco (a real tree hugger according to the photograph). She is an avid hiker and birdwatcher and during her free time is working on a new course for ESP and is currently researching the pros and cons of ecotourism in post-conflict/conflict-impacted nations such as Afghanistan in preparation for the next Environmental Peacebuilding Assc. Conference next February in Geneva, Switzerland! If you get a chance to take a course with Prof. Hessami – do it. We here at Hopkins are incredibly grateful for her talents.



Alumni Spotlight: James Wolf

At the turn of the 20th century, the Olmsted Brothers Landscape Architects (OBLA) were the standard bearers in the still nascent field of Landscape Architecture. The Brothers furthered the visions of their father, Frederick Law Olmstead who was a progenitor of the field and creator of the landscapes at Central Park and The Biltmore Estate. Baltimore City called upon OBLA 1904. OBLA produced a *Report Upon the Development of Public Grounds for Greater Baltimore* which included a focus on the Stony Run. The Stony Run is a 3-mile-long stream valley which moves south along the west side of the Homewood Campus before it flows into the Jones Falls. The OBLA report indicated the Stony Run's reach along the Homewood Campus with "old beech trees and bold topography" as "the finest single passage of scenery in the whole valley". When strolling down San Martin Drive, you'll still find the mature stand of *Fagus grandifolia* (American Beech). Wild *Mertensia virginica* (Virginia Bluebells) flowers can be seen there in the Spring. Barred owls can be heard in the trees on warm evenings. Adjacent to the Beech forest, just behind Olin Hall, is a large and aggressive stand of invasive Japanese Knotweed.

Wyman Park is a treasure. Unfortunately, its ecosystem is beset by non-native invasive plant species (NNI). Fortunately, a group of stewards is now coalescing to combat NNI in the park. The Friends of Stony Run (FSR) is a volunteer organization of that works in stewardship of the Stony Run and its watershed. Baltimore City's Weed Warriors Program is a free training course, in which city residents can become certified to remove NNI on public lands

in the City. Weed Warriors and the FSR have worked separately to host clean-ups and NNI removal events in Wyman Park. Recently, the members of these groups have started to work together with cooperation from the City's Forestry Department. The Weed Warriors have begun hosting a monthly event to work systematically towards forest restoration in Wyman Park. FSR has a Planting Committee which is generating guidance for native plantings favorable to conditions in the park. The aim is to restore native species in areas where NNI has been removed. These developments are heartening. However, the nature of the NNI problem is widespread and persistent.

Wyman Park can use all the help it can get. East of the Stony Run is not Baltimore City Property. It belongs to Johns Hopkins University. If the JHU Community were to share in the enthusiasm and drive to restore Wyman Park, who knows what would be possible. The restoration of Wyman

Park presents a great opportunity for community building. It also presents great opportunities for experiential learning in an outdoor setting which could yield tangible and long-lasting results. The nature of the task lends itself to many fields of environmental study. The NNI removal events are fun and a great way to meet environmentally minded neighbors and liberating trees from the grips of invasive vines is its own reward. Please consider helping this budding initiative to bridge the Stony Run.

The Wyman Park Weed Warrior events are open to the public and held on the 3rd Sunday of each month at 10am. They meet at the playground on the corner of 34th Street and Beech Avenue.

James Wolf is the Vice President of the Friends of Stony Run and a 2011 graduate of JHU's AAP Program for Environmental Sciences and Policy. He can be reached at jamesdwolf@gmail.com or 410.603.4005



Climate Progress and Polarization

Dr. Jenn da Rosa

The last six months have brought transformations in the United States, principle of which is a change of presidential leadership and with that several gains and milestones in the fight to combat climate change. Yet despite these achievements, the very *climate* of climate change mitigation has become increasingly polarized, making it difficult to muster support for climate action as tribalism has entrenched along party lines.

On the Biden-Harris Administration's Immediate Priorities webpage, climate change is listed as a second priority to tackle, just below controlling the COVID-19 emergency. Matching intent with action, and within hours of his inauguration, President Biden signed an order signaling his intent for the United States to rejoin the Paris Climate Accord. His predecessor, President Trump, began the process of removing the US from the climate agreement in 2017, which became final in November of 2020. The Paris Climate Accord, or Paris Agreement, is the largest international treaty on climate change, involving approximately 200 signatories, and requiring science-based social and economic alterations to achieve the goal of limiting global warming to 1.5 degree Celsius worldwide.

An additional climate action was taken on President Biden's Inauguration Day, further setting the tone for the next 6 months of policy and focus. Tollefson's (2020) *Nature* article, "How Trump damaged science — and why it could take decades to recover" explains that, for many in the scientific community, actions taken during President Trump's tenure such as the rollback of environmental and climate regulations, the misrepresentation of the coronavirus threat, and the consistent undermining of scientific institutions were seen as a direct attack on science. Thus, the signing of Executive Order No. 13990 on January 20, 2021, appropriately titled, *Protecting Public Health and the Environment and Restoring Science*

to Tackle the Climate Crisis, signaled that the Biden Administration was putting science at the forefront of the decision-making process with regard to public health, climate change, environmental degradation, and issues of environmental justice. With regard to climate change, this order placed a temporary moratorium on the Coastal Plain Oil and Gas Leasing Program in the Arctic National Wildlife Refuge (ANWR). On June 1, the Department of Interior further suspended all activities related to the Coastal Plain Oil and Gas Leasing Program in ANWR pending a full National Environmental Policy Act (NEPA) analysis. Executive Order No. 13990 also reinstated the withdrawal of certain regions in Arctic waters and in the Bering Sea from oil and gas drilling. These same regions had been removed from oil and gas drilling by President Obama to form the Northern Bering Sea Climate Resilience Area; however, President Trump had revoked this decision. In a see-saw-like manner that comes with changing political winds, President Biden reinstated these protections. The executive order also established an Interagency Working Group on the Social Cost of Greenhouse Gases, thereby recognizing that government agencies must accurately capture the costs of greenhouse gas (GHG) emissions regarding changes in agricultural productivity, property damage and costs, human health impacts, flood risk, and ecosystem services. Finally, recognizing that it was at odds with our country's climate goals and leadership actions, Executive Order No. 13990 revoked the permit for the Keystone XL Pipeline. On June 9, the company behind the project, TC Energy, officially terminated the project for good.

In the following months, a number of executive orders laid the groundwork for the Biden Administration's climate policy and precedent. On January 27, President Biden signed Executive Order No. 14008, *Tackling the Climate Crisis at Home*



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and Abroad, which acknowledges that responding to the climate crisis requires significant reductions in GHG emissions in the short term and, in the long term, net-zero global emissions. Proposed in this executive order is the following:

- that the US host a Leader's Climate Summit to raise "climate ambition," engage with other countries, and exhibit climate leadership (this event eventually took place on April 22-23);
- that the US pursue green recovery efforts, advance a clean energy transition, work towards decarbonization, and pursue a climate financial plan within the objectives of Paris Climate Accord;
- that the US Prioritize climate change in foreign policy and national security;
- that the US achieve net-zero emissions by the year 2050;
- that the US lead by example and combat climate change on public land by achieving a carbon-pollution free electricity sector by 2035 and by the use of only clean, American-made zero-emission vehicles for federal, state, local, and tribal fleets (including the US Postal Service);
- that the US consider, with Indigenous

(Continued on page 12)

Climate Progress and Polarization (Continued from page 11)

stakeholders, siting and leasing of renewable energy on public lands and offshore waters with the goal of increasing production and doubling offshore wind by 2030 while still maintaining protections for land, water, and habitat;

- that the US take steps to ensure federal funding is not subsidizing fossil fuels moving forward;
- that the US create a new position: Special Presidential Envoy for Climate (this position is held by former US Secretary of State John Kerry);
- that the US establish a White House Office of Domestic Climate Policy within Executive Office of President;
- that the US establish a National Climate Task Force chaired by the National Climate Advisor;
- that the US improve climate forecast capabilities and public access to climate information;
- that the US develop a strategy to create the Civilian Climate Corps Initiative, the aim being “to conserve and restore public lands and waters, bolster community resilience, increase reforestation, increase carbon sequestration in the agricultural sector, protect biodiversity, improve access to recreation, and address the changing climate” (p. 7627).

Other executive actions that touch directly or indirectly on climate change include those associated with migration, the State Department, and financial risk. On February 4, President Biden signed Executive Order No. 14013, **Rebuilding and Enhancing Programs to Resettle Refugees and Planning for the Impact of Climate Change on Migration**. Focusing on humanitarian aid and global refuges, this order requests analysis of climate change’s impact on migration patterns, including forced migration and displacement, how to identify individuals displaced by climate change, and how to work effectively with other countries

and non-governmental organizations to respond. On May 7, the president signed Executive Order No. 14027 establishing the Climate Change Support Office in the Department of State. This office supports other executive departments and agencies with regard to climate change, engages on climate issues, exercises climate leadership, and ensures climate change is in all parts of US foreign policy. Finally, on May 20, President Biden signed Executive Order No. 14030, called **Climate-Related Financial Risk**. This order involves the development of a comprehensive strategy to assess, mitigate, and reveal climate-related financial risk to government agencies, programs, and operations. This strategy will address how to finance the needs associated reaching net-zero GHG by 2050 using public and private investments. Each of these orders addresses a social, structural, and financial aspect of climate change mitigation and adaptation, respectively.

One might argue that, while there has been definite climate progress over the last six months, these actions are associated with executive orders that can eventually be revoked when a different person is elected to the office of President. Lasting action on climate change needs to take place with the

passing of a bill through Congress, and to do so, bipartisan support is needed. The best bet for climate action at the moment is the current infrastructure bill that is under negotiation. In addition to repairing bridges, highways, and airports, the Biden Administration’s American Jobs Plan aims to address climate change by updating and building a more resilient electric grid; by modernizing public transit; by establishing an Energy Efficiency and Clean Electricity Standard; by electrifying vehicles; by replacing all lead drinking water pipes; by upgrading wastewater and stormwater systems; by capping thousands of orphan oil and gas wells; and by retrofitting existing buildings and homes to make them more energy efficient. Although, at the time of writing this, negotiations between Republicans and Democrats have been ongoing since March, with Republicans preferring a more palatable price tag and a more traditional definition of infrastructure (just road and bridges), and Democrats initially taking an everything-and-the-kitchen-sink approach to the bill and, through it all, refusing to budge on climate provisions. For effective climate progress, much hinges on a successful bipartisan agreement for infrastructure that addresses climate and energy needs.

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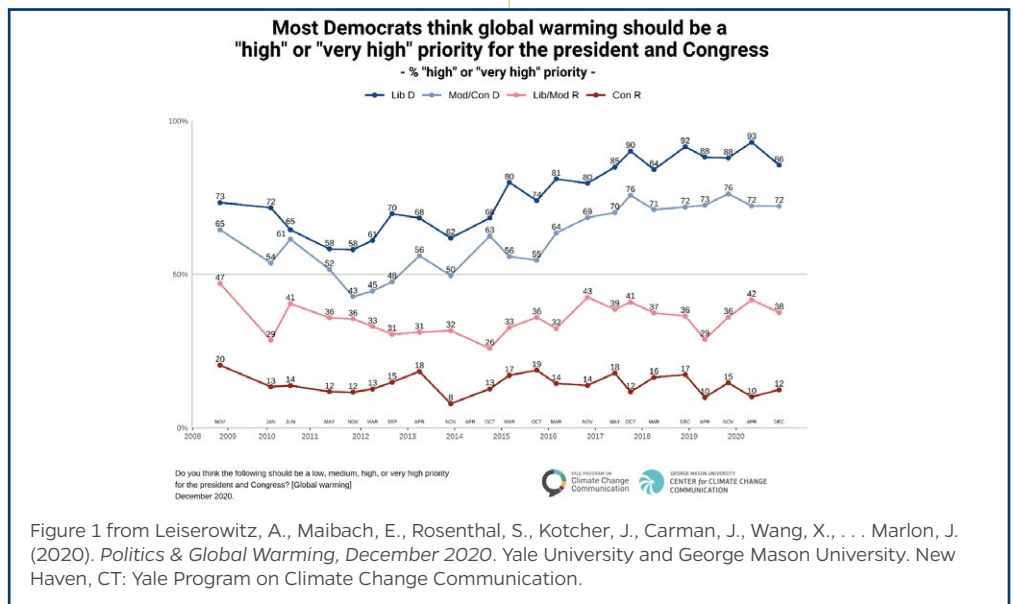


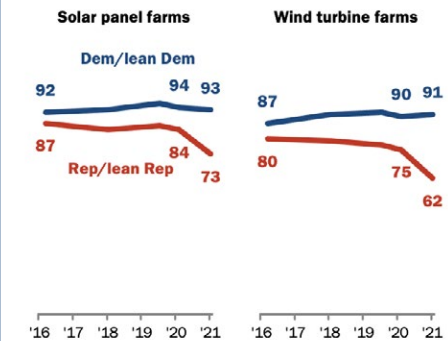
Figure 1 from Leiserowitz, A., Maibach, E., Rosenthal, S., Kotcher, J., Carman, J., Wang, X., . . . Marlon, J. (2020). *Politics & Global Warming, December 2020*. Yale University and George Mason University. New Haven, CT: Yale Program on Climate Change Communication.

Climate Progress and Polarization *(Continued from page 12)*

Bipartisan agreement is not easy to achieve. Now, more than ever before, the United States is politically polarized over climate change. Political schism associated with climate change has been persistent in the US for the last 30 years with Democrats tending to believe in anthropogenic climate change and support policy and clean energy solutions to address it and Republicans exhibiting a range of attitudes from climate change denial, to natural climate change explanations, to a belief in anthropogenic climate change but low priority, to favoring a wait-and-see approach and a lack of action (note: scholars Aaron McCright and Riley Dunlap have documented this extensively in their work). To illustrate this continued and increasing polarization, Figure 1 shows that a majority of Liberal Democrats (86%) think climate change should be a high or very high priority for Congress and the president compared to Conservative Republicans (12%). The vertical space between blue and red lines is a visual representation of polarization; as the space increases over time, the polarization worsens. Furthermore, Pew Research Center recently demonstrated (Figure 2) that, although most adults in the US support the expansion of solar and wind farms (84% and 77%, respectively), partisan gaps on expanding solar and wind

Majorities in U.S. favor more wind, solar power, though GOP support has dipped

% of U.S. adults who favor more ...



Note: Respondents who gave other responses or did not give an answer are not shown.

Source: Survey conducted April 20-29, 2021.

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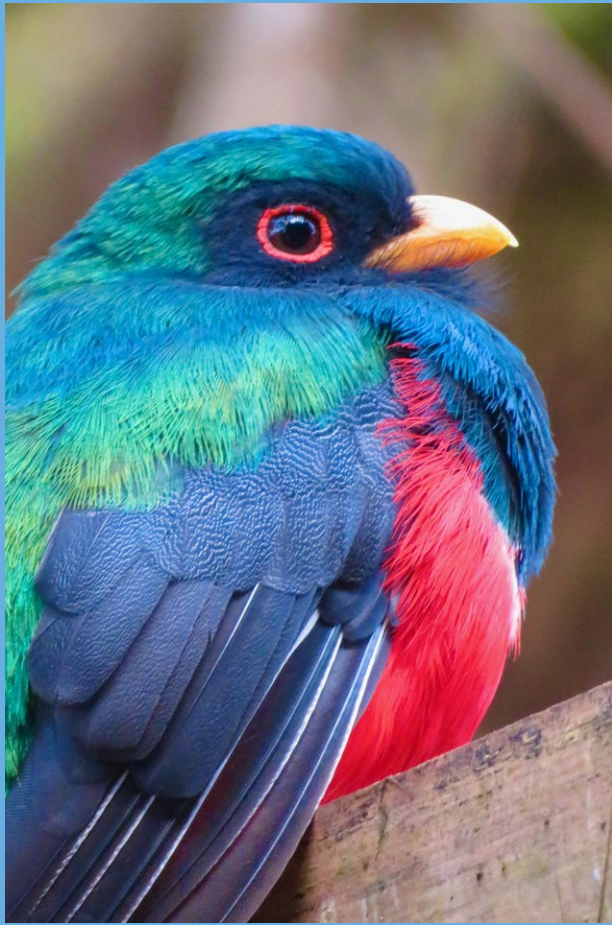
Figure 2 from Kennedy, B., & Spencer, A. (2021). [Most Americans support expanding solar and wind energy, but Republican support has dropped.](#)

are larger than they have ever been in the last five years with Democrats strongly favoring both and Republican support falling sharply.

At the heart of these widening gaps is political tribalism, or in a broader sense, the alignment of one's views to fit the political group, ideology, or "tribe" they subscribe to. Going strictly off of political party, these tribes are Republican and

Democrat; however, using a more nuanced worldview approach, the tribes are better referred to as the individualists and the egalitarians. Belonging to a group provides individuals with a strong sense of identity, and groups provide a sense of security to members while demanding loyalty from them. The dark side of political tribalism is that it encourages group members to dehumanize the other side, and social media contributes to this behavior by playing into the primitive and inflammatory aspects of human nature. This brings me back to the infrastructure bill, and why it is essential to have bipartisan support for a bill with climate provisions for an updated electric grid, electrification of vehicles, and improved energy efficiency in buildings. As Matthew Nisbet (2020) writes in his article, "Against climate change tribalism", in the *Skeptical Inquirer*: "There can be no progress on climate change until we rebuild our civic capacity to discuss, debate, and disagree in ways that do not turn every aspect of climate politics into an identity-driven tribal war between good and evil" (para. 17). The early days of the pandemic should remind us that there is no "us" and "them"; there is only "we". If we are to make the earth a safer, healthier place for future generations, we need everyone on board.





STAY TUNED FOR:

- **Energy and Environmental Speaker Series 2021-2022: Sustainable Solutions** – Our speaker series theme for the coming year is on sustainable solutions and it is focused on people that have leveraged technology, the private sector, and markets to solve environmental problems sustainably.
- **Sustainability Leadership in Costa Rica (420.670) Field Course** – Running during the 2022 January Intersession (6th-17th), the focus of the course was to develop leadership skills in the context of addressing environmental problems. The emphasis on teamwork and critical thinking skills in the tropical setting of Costa Rica helps developed confidence in our abilities to tackle complex problems.
- **Energy, Eutrophication, and Inundation in Coastal Louisiana (425.617) Field Course** – Running during the March 2022 Spring Break, this course is focused on the many compounding factors of energy infrastructure, wetlands loss and restoration efforts, sea-level rise, and climate impacts in coastal Louisiana. The trip involves a coastal flyover and boat tours, plus driving in and around New Orleans, Baton Rouge, and Grand Isle.
- **Ecology and Evolution of the Galapagos (420.673) Field Course** – Running during March 2022 from the 11th through the 21st this course will take students from the capital of Quito to the Ecuadorian Cloud Forest to the Andes Steppe to the Galapagos Islands as we explore the geology, tropical ecology and evolution of this unique landscape.

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