



Autumn 2019

CAPSTONE SYMPOSIUM

Wednesday, November 20, 2019
Fisheries Lobby and Auditorium, 4:30 – 8:00pm

Share your thoughts on Twitter

Students will be live-tweeting all sessions so if you miss one, follow the updates. If you tweet, we encourage you to share what you learn and use the hashtag, #POEcap.

The Capstone experience is a three-course series (ENVIR 490, 491, 492) centered on a quarter-long project-based internship with a community site partner. Capstone sites range from community based non-profits and government agencies to faculty research projects and private sector initiatives. With the mentorship of a faculty advisor and the support of the site supervisor, students gain valuable hands-on experience, explore career possibilities, and build a wide spectrum of professional communication skills.

WE THANK YOU

To all faculty advisors, site supervisors, Program on the Environmental staff and to the audience for your support. We could not have done any of this without you!

CONNECTING FOOD DESERTS TO NUTRITIOUS FOOD SOURCES

Bernice Alora*, @AloraBernice, Program on the Environment, University of Washington

Site Supervisor: James Maiocco, Barn2Door

Faculty Advisor: Eli Wheat, Program on the Environment, University of Washington

The existence of food deserts is an environmental justice issue that compromises the health of the communities residing in these areas. They have limited access to affordable, nutritious food from the lack of available nearby supermarkets, and food available to them are typically pre-packaged meals; this makes them more vulnerable to conditions like malnutrition, diabetes and obesity. The main purpose of this research is to identify how communities in food deserts can access nutritious food sources from local sustainable farms. To accomplish this, I interned with Barn2Door, where I researched and learned all about the different local farms and farmers markets. Accompanying this, I also conducted independent research which included a literature review of different topics revolving around direct farm marketing and food insecurity in the U.S., and conducted surveys with West Seattle residents to identify the different factors that go into their food decision-making process. I found that geographical and economic constraints are the two biggest issues that food deserts face when it comes to food, and that more food insecure individuals would buy directly from farms if they delivered locally, but only if their products weren't too costly. With this information, I realized that bridging the distance between food deserts and nutritious food sources through direct farm marketing, and alleviating their financial burdens by encouraging more farms/farmers markets to accept EBT payments, help improve their health as they gain increased access to more nutritious food.

BOLSTERING FOOD SECURITY THROUGH COMMUNITY BUILDING

Elizabeth Besser*, @lizb920, Program on the Environment, University of Washington

Site Supervisor: Juan Pena, City Fruit

Faculty Advisor: Anita Verna Crofts, Department of Communication, University of Washington

Food insecurity is an issue that affects people all over the world. In the state of Washington alone one in nine people struggle with food insecurity. If people are unable to meet their basic needs, they are more less likely to look beyond to other needs, such as health and relationships. The aim of my research was to look into the opportunities and challenges of using community building as a tool to bolster food security. Also to see what impacts local, food-oriented organizations have on the communities they serve. I looked into these during my time interning with City Fruit, a local gleaning organization, on their community engagement and harvest team. To accomplish my research, I conducted online surveys and in-person interviews of other local, food organizations and City Fruit members. I also made observations of participants at community outreach events. In my research I found that some opportunities to community building were that it created stronger, more resilient communities and it allowed for communities to better advocate for themselves. Some challenges that were presented were cultural barriers and lack of resources. Also, that community building cannot be the only tool used to solve food insecurity. Knowing the challenges to community building can help local organizations adapt so that they can have a bigger and more meaningful impact on the communities they serve. Learning to use community building as an effective tool can also lead to communities looking into other issues that present in their community.

PROMOTING SUSTAINABLE LIVING THROUGH COMPOSTING

Madelyn Bloom*, @MadelynBloom2, Program on the Environment, University of Washington
Site Supervisor: Danielle Bogardus, Connect 3

Faculty Advisor: Sally Brown, College of the Environment, University of Washington

Composting is one of the key components for fighting against our current climate crisis.

According to the EPA, landfills are one of the top three causes of methane emissions. People across the global south suffer greatly from the environmental and human health issues that stem from lack of proper waste management. Providing compost systems to a larger number of communities can help improve crop yields, lower methane emissions, create jobs, improve human health, and decrease landfill size. The purpose of this study was to explore the factors that need to be explored in order to give communities in the global south the best possible compost system. In order to do this I conducted an in depth literature review as well as toured a local compost facility. By doing this I was able to narrow down the factors which I found to be the most important when choosing a compost system for a community. Based on my literature review, I divided my factors into two main categories; Population and Government. Within population the three sub categories are population size, amount of waste per capita, and culture. Under government the three categories are utilities/ infrastructure, economics, and land access. With an understanding of these factors it will be easier to determine the most beneficial compost system for each individual community. Therefore, maximizing the endless benefits that compost has to offer for the health of humans and the planet.

SPORTS MARKETING AS A CHANNEL FOR SUSTAINABLE CONSUMPTION

Dana Brooks*, @DanaBro43639062, Program on the Environment, University of Washington

Site Supervisor: Ashley Gray, Clif Bar & Company

Faculty Advisor: Alexa Schreier, Program on the Environment, University of Washington

Marketing is used to persuade the public to consume products. However, over the decades, marketing has been so successful in this goal, that it has created a society with consumption habits that are ultimately unsustainable. Now, with a social movement that demands more sustainable products (i.e. sustainable fashion, and the wide spread ban of single use plastics), how can marketing help persuade the public to consume more sustainably? To help answer this broad question, I worked as a sports marketing intern with Clif Bar & Company, an energy bar company who is committed to “running a different kind of company...one that strives for a more sustainable world.” Through this experience, I refined my study question to: how can sports marketing influence consumers’ decisions to purchase more sustainable energy bars? After ten weeks at Clif Bar & Co., I learned how companies can use athletes to deliver messages that not only promote their products, but promote messages of sustainability. Along-side this internship, I surveyed Division I athletes at the University of Washington to get a basic understanding of the importance of sustainability in relation with athletic performance products. The purpose of this study is to provide a foundation for the sports marketing industry so that it can ultimately influence more sustainable consumer habits.

VITAMIN N(ATURE): TIME SPENT OUTDOORS IMPROVES STUDENT WELL BEING AND IMPACTS ENVIRONMENTAL WORLDVIEW

Emily Busse*, @sunstalker, Program on the Environment, University of Washington

Site Supervisor: Aurora Blackmore, Seattle Waldorf School

Faculty Advisor: Kristi Straus, Program on the Environment, University of Washington

Adolescents are spending less time in nature and are more disconnected from the environment than previous generations and also report experiencing higher levels of stress and anxiety. Increased exposure to nature has been shown to decrease stress in some populations. This study explored how time in nature can affect student stress levels as well as their environmental attitudes. Students at the Seattle Waldorf high school participated in 5 day outdoor education trips, which focused on developing self-awareness, promoting environmental stewardship, and developing a connection to place and sense of belonging within the Pacific Northwest. Two types of surveys were administered: one to measure environmental attitudes pre and post trip, and one to measure student stress levels. The stress surveys were administered three times, before, during, and after the trip. Results show a significant decrease in stress levels of students on trips and an overall increase in environmental attitudes. These results point to the importance of time in nature for adolescents and the ability of these types of extended trips to both improve well being and promote environmental stewardship.

TRUST: THE CORE OF ENVIRONMENTAL DONATING DECISION

Nicole Chhou*, @ChhouNicole, Program on the Environment, University of Washington

Site Supervisor: Danielle Bogardus, Founder, Connect-3

Faculty Advisor: Lea Dunn, Foster School of Business, University of Washington

As we increase our understanding of this topic, non-profit organizations receive more support to combat environmental and health issues related to the lack of waste management. Despite the increase in support, funding is still a limiting factor to build proper waste disposal systems in developing countries. They are facing high public health and environmental risks because burning and open dumps are still the main methods to dispose of municipal waste. The purpose of this study is to find factors that influence the public's decision on donating to a non-profit environmental organization. During my internship with Connect-3, I created info-graphics for Connect-3 with the purpose to increase the awareness of impacts from poor waste management. I studied various info-graphics and non-profit organization websites to understand their strategies in encouraging donations. I also used this knowledge to conduct an online survey to quantify factors that influence the public's decision in environmental donation. Survey results show that credibility, the impact of their donations, organization's financial report and donor's financial availability are the top four factors in donating decisions. Organizations can incorporate these factors to increase donor involvement and funding. This study results can help developing countries improve their waste management systems through environmental non-profit donations. We can improve millions of people's health, living conditions, and the environment by removing waste in the water system, smoke in the air and disease vectors that come from municipal waste.

EVALUATING RECREATION EQUITY: DO WA PUBLIC LANDS SERVE EVERYONE?

Lela Cooper*, @lelacooper_, Program on the Environment, University of Washington

Site Supervisor: Leah Dobey, Washington State Department of Natural Resources

Faculty Advisor: Ken Yocom, Landscape Architecture, University of Washington

Public lands are designed to be resources that all can enjoy, regardless of background. However, many marginalized groups are underrepresented in the outdoors, due to social, cultural, and economic barriers to recreation. The aim of this study was to determine who uses Washington Department of Natural Resources (WA DNR) managed lands, and if these users reflect the racial diversity of the Washington public. Additionally, outreach efforts were done to make recreation more accessible to underserved groups. This project revolved around the creation of a statewide survey of WA DNR users, to gain an understanding of who is currently coming to the agency's managed lands. Additionally, based off the survey findings, foreign language information resources were created, and in-community outreach was conducted with racial minority communities in Seattle. Overall, the survey results demonstrated that WA DNR users do not reflect the racial makeup of Washington State, with approximately 8% of survey respondents indicating being racial minorities and 92% of respondents self-reporting as white. This statistic proved similar to broader demographic measurements of federal public land users in the Northwest. However, in-community outreach and foreign language information resources proved to be a promising strategy for land managers to reach underserved communities. Public lands are meant to be accessible to all, and it is necessary that land managers ensure everyone can use these landscapes, for the health and welfare of marginalized communities. Furthermore, increasing recreation access to communities of color is crucial for the future of public lands, in a quickly diversifying U.S.

SHOULD I POST THIS?: HOW IMAGES TELL A STORY AND CAPTURE YOUR TARGET AUDIENCE.

Maddy Eppel*, @MaddyeUW, Program on the Environment, University of Washington

Site Supervisor: Kristin Canning, Rainforest Rescue Australia

Faculty Advisor: Deb Hagen-Lukens, Entrepreneurship Lecturer, University of Washington

Organizations use social media as an inexpensive way to reach global viewers. The use of social media is meaningless if it does not capture the audience and effectively communicate a story. The aim of this study is to learn what makes online campaigns successful by observing the types of images that connect with an environmental organization's audience the most. I interned for 6 months as a social media and business admin intern and learned what the organization's core message and goal were. My team prioritized updating the organization's online presence including the website, Instagram and Facebook. Our motivation was to increase the audience's understanding of the core message as well as build up the level of trust in the organization to make people feel more inclined to get involved or donate. I focussed on the Instagram updates and ran an experiment to see what content the audience resonated with the most. I posted a series of photos under the three categories of (1) landscapes (2) people and (3) animals and measured the number of impressions they received using Instagram analytics. I found that the number of impressions differed from the number of likes making likes an unreliable way of tracking engagement and viewer interest. I also found that trust in an organization is the primary determinant of viewer support. Together, these results are useful when crafting online campaigns for organizations.

SPEAKING ON SUSTAINABILITY: ENVIRONMENTAL COMMUNICATION IN BUSINESS & PROFESSIONAL CONTEXTS

Dakota Fry*, @dakotarfry, Program on the Environment, University of Washington

Site Supervisor: Tony D'Onofrio, Town & Country Markets Inc.

Faculty Advisor: Eric Morel, Program on the Environment, University of Washington

Many social, psychological, and political complications hinder effective environmental communications, and these issues can be exacerbated when presented in business and professional environments. However, in a society that is largely driven by for-profit companies, it's vital that effective environmental education comes at least in part from employers. The purpose of this study was to find crucial overlaps between established, effective environmental communication techniques and professional communication techniques. I partnered with Town & Country Markets — a local, sustainability-minded grocery chain that offers environmental trainings to its 1,000+ employees — to create a report and set of recommendations based on individual research on environmental communication techniques as they apply to environmental trainings in a corporate setting. Second, I implemented my findings into a redesigned multimedia presentation and training tool on environmental issues for Town & Country employees. My research on the overlap between successful environmental communication techniques and successful professional communication techniques shed light on the particular importance of three primary commonalities: 1) tailoring to specific interests of the group being communicated to, 2) using visual storytelling to craft a strong message, and 3) focusing on solutions rather than problems. These principles guide the success of general trainings in the workplace just as they do communication of environmental principles; with the proper consideration of these factors, it is possible to not only bring much-needed improvements to private-sector environmental performances, but to elicit widespread pro-environment behavior change on an individual level.

RETHINKING COMMUNICATIONS: USING STORYTELLING TO UNDERSTAND SENSE OF PLACE THROUGH THE EYES OF THE CHILDREN IN SODO, ETHIOPIA

Celine Fujikawa*, @cafujikawa, Program on the Environment, University of Washington

Site Supervisor: Danielle Bogardus, Connect 3

Faculty Advisor: Kristiina Vogt, School of Forest and Environmental Sciences, University of Washington

Storytelling as form of communication acts as universal tool that has the potential to transcend messages across cultures and places value, meaning and significance into the individuals and communities being represented. Traditionally, scientific knowledge has been communicated as logical ideas with very little cultural context to diverse communities. However, this approach has become more scrutinized for the lack of community participation, which in turn creates inequitable solutions. The purpose of this study was to understand how the use of storytelling can reveal a person's sense of place and how understanding that can contribute to effective environmental communication. I interned with Connect 3 in Ethiopia and framed my research around culturally sensitive approaches, which focuses on building trust with the community and understanding cultural values. I taught weekly English classes to children ages 8-16 and incorporated storytelling activities that experimented with mediums such as creative writing, illustrations and oral stories to better understand the children's sense of place in the environment. As a result, the children were able to create stories that expressed their place meaning and place attachment through landscape imagery and symbolic representations in Ethiopian folktales. Members in the community actively create meaningful places through conversations and interactions with others, and the best way to understand another's place is to listen and validate their existing perspectives. This helped me understand the best ways to begin conversations on identifying issues and working together to create sustainable, culturally relevant solutions for the community.

DIRT, SAWDUST, AND RED TAPE: THE CHALLENGES OF TRAIL PLANNING AND DEVELOPMENT

Gabe Greene*, @cincogreene, Program on the Environment, University of Washington

Site Supervisor: James DeSalvo, Methow Trails

Faculty Advisor: Spencer Wood, EarthLab, University of Washington

Trails provide opportunities for people to view scenic areas not accessible by other modes of transportation and are key for bettering mental health, exercise, and social interactions. Outdoor recreation is a growing activity in the United States, with increasing participation and economic growth. There are a variety of challenges facing the planning, development, and maintenance of trails. The purpose of this project was to identify common challenges of outdoor recreation organizations (OROs) face when planning and developing trails. In order to identify potential challenges that are faced by OROs involved with trail planning and development, I conducted a literature and extensively interviewed representatives involved in trail planning and development from TREAD, Washington Trails Association, Evergreen Mountain Bike Alliance, Mountains to Sound Greenway, and Methow Trails. Interviews were recorded and analyzed for major challenges that the interviewee perceived their organization faced. Then a full list of challenges was created from both the literature review and interviews. Additionally, I interned with Methow Trails to gain firsthand experience working on all stages of trail planning, development, routing, construction, and maintenance. The three most common challenges between the literature review and interviews were funding, ownership of lands/landowner support, and time limitations. All outdoor recreation organizations face a wide variety of challenges when planning and developing trails. Some potential solutions to these as stated by the interviewees includes advocacy towards governments on all levels for prioritizing outdoor recreation, volunteering with local OROs, and continued use of trail systems.

FACILITATING CITIZEN SCIENCE AND IMPROVING CONTINUAL ENGAGEMENT IN COMMUNITY PROJECTS

Sarah Haughney*, @HaughneySarah, Program on the Environment, University of Washington

Site Supervisor: Claire O'Neill, Earthwise Aware

Faculty Advisor: Julia Parrish, College of the Environment, University of Washington

Citizen Science in America is an avenue for scientist and volunteers to collaborate and get community members involved in research. I took a dive into the field of citizen science to get a better understanding of why people get involved in these projects and how to recruit other community members. The goals of this study were to get a better understanding of citizen scientists, to learn about retention in programs, and why people get involved in the first place. There was two parts to the project, the internship which included field work such as collecting data with participants and going to all of events hosted by my host organization. Paired with the facilitation of interviews with hosts of other citizen science programs. One of the main findings were that people want to be a part of something bigger than themselves, such as being involved in a community or contributing data to research. The more we know about participants the easier it is to cater to them and make it an encouraging environment to return.

PREPARING FOR AN UNCERTAIN FUTURE: GRANT AGENCY REQUIREMENTS TO SUPPORT ADAPTIVE MANAGEMENT

Madison Hoiland*, @MadisonHoiland, Program on the Environment, University of Washington

Site Supervisor: Emily Howe, Aquatic Ecologist, The Nature Conservancy of Washington

Faculty Advisor: Jennifer Ruesink, Department of Biology, University of Washington

Adaptive management is an emerging conservation strategy that uses monitoring to identify problems and potential solutions. Learning projects are especially important in an era of climate change, where the only certainty of the future is uncertainty. However, the majority of grant sources fund short-term projects, especially restoration and acquisition, that have tangible returns. The long-term nature and uncertainty of adaptive learning projects make finding funding challenging. I found that most grants either don't fund adaptive management projects or are acquisition/restoration dominated. Therefore, the goal of this study was to identify what additional components grant agencies should include in proposal requirements to provide more support for adaptive management. Using my Port Susan Bay vegetation monitoring internship with The Nature Conservancy as a case study of adaptive management in action, combined with research of the available literature for adaptive management and grant recovery, I identify the key adaptive management components. Suggestions for requirements include a responsibility requirement for monitoring post-restoration, a required climate change component explaining how the project will account for future conditions, benchmarks or thresholds for when adaptive action should occur, and a detailed schedule for monitoring and analysis. Learning projects can advance our scientific knowledge of ecosystem functioning and resilience to account for the uncertainty of climate change in the future. These requirements will encourage applicants to account for climate change in their plans while increasing the funding of adaptive management to improve the protection of our natural resources.

GETTING FISH-Y WITH ENVIRONMENTAL EDUCATION

Skylar Jacobson*, @jacobson_skylar, Program on the Environment, University of Washington
Site Supervisor: Pepper Hambrick, Program Coordinator at Friends of the Issaquah Salmon Hatchery

Faculty Advisor: Tim Billo, Program on the Environment, University of Washington

Hatcheries are crucial supporting factors to local communities and as such, can be used as an educational tool. My main goal while working at the Issaquah Salmon Hatchery in the Friends of the Issaquah Salmon Hatchery (FISH) Summer Camp Program was to use informal environmental education through a variety of different activities to increase knowledge of the summer camp attendees. Through this experience, I was able to identify the learning activities and techniques that were most impactful on the campers by observing the students and their progress through the camp. The campers ranged in age from three to twelve years old, which allowed my site supervisor, Pepper, and I to create the activities based around their learning stage. I categorized my results into five categories of techniques that were most useful: Inquiry-based learning, observation, hands-on learning, game-based learning, and reflection. Through my time at the Issaquah Salmon Hatchery, I also observed how the hatchery was able to balance their educational outreach while prioritizing the fish production. They were able to accomplish this because of the motivation and passion of the hatchery employees taking time out of their day to teach the campers about their jobs and to answer their questions. The overall significance of this research is that informal education centers are a way for people to be more involved in their communities while helping the environment. Therefore, this research increases awareness and provides results for informal education centers along with feedback for the FISH program.

COMPOSTABLE DIAPERS: EXAMINING CHALLENGES, OPPORTUNITIES AND BARRIERS TO WIDESPREAD TRANSFORMATION OF THE DIAPER MARKET

Kyler Jobe*, @JobeKyler, Program on the Environment, University of Washington

Site Supervisor: Danielle Bogardus, Connect 3

Faculty Advisor: Kristi Straus, Program on the Environment, University of Washington

Diaper waste is a global problem with human and environmental health impacts. Compostable diapers are a promising solution, but such diapers aren't widely available and research on their niche within the diaper market is scarce. The aim of this study was to understand the challenges facing compostable diapers, especially how consumer awareness and values affects diaper purchasing habits. I interned for Connect 3, researching compostable diapers and the feasibility of such products for Uryadi's Village in Sodo, Ethiopia. I also conducted a literature review and distributed an online survey of diapering habits and values to parents. The results indicate that compostable diapers will have to contend with existing brand preferences, economic constraints, performance benchmarks of conventional diapers, and the capacity of regional composting infrastructure. Although the growth of compostable diapers is limited by significant obstacles, the emerging compostable diaper brands do likely represent the early phase of a market transition to a more sustainable state. Compostable diapers have the potential to demonstrate a circular economic model and improve the health of communities globally.

ART-ICULATING SCIENCE: ART BASED ENVIRONMENTAL EDUCATION IN CHILDREN

Lina Li*, @LinaLi51786472, Program on the Environment, University of Washington

Site Supervisor: Danielle Bogardus, Founder & President

Faculty Advisor: Eli Wheat, Program on the Environment, University of Washington

Inadequate environmental education continues to limit environmental awareness in many developing countries. It requires improved methods to communicate and visualize the barriers and find creative and culturally appropriate solutions to address those environmental issues. However, how can we effectively communicate science with the language barrier, cultural difference, and educational background to the community in remote developing world regions? My internship with Connect 3 allowed me to work with the children at Uryadi's Village in Sodo, Ethiopia, to explore the avenue of using visual arts in environmental education. Children expressed their understandings of the environment with the creation of art pieces. Pipeline project allows me to see Concord Elementary Eco Club students' interpretation of the environment. Through analyzation of children's artwork internationally and locally, I find that children understand and appreciate different elements of nature. They are observant and highly aware of the environment and are deeply connected to the environment. Art can be utilized to communicate science across different cultures, languages, and educational backgrounds, and that is especially beneficial in low resource settings. Still, also it can be implemented as an alternative way of teaching and assessment in education. The art-based approach allows children to be comprehensive, creative, and to be the creator of knowledge. It connects children to the environment in an open-end atmosphere, where they can own and express their inner voice. When art meets science, it can have unique and profound impacts on the development of children. So, what can we do more?

COMMUNICATING FISH INFORMATION AND FISHING REGULATIONS IN MOUNT RAINIER NATIONAL PARK

Marwa Mahmoud*, @marwaofearth, Program on the Environment, University of Washington

Site Supervisor: Rebecca Lofgren, Aquatic Ecologist, Mount Rainier National Park Service

Faculty Advisor: Tim Billo, Program on the Environment, University of Washington

With strong communication, the National Park Service (NPS) has the ability to inform the public on conservation issues around fish management and regulations. Public involvement with fish conservation depends on effective communication by National Park entities. In the 17 National Parks surveyed in this study, there is a lack of continuity in communication between the NPS and the public. My internship with the NPS at Mount Rainier National Park (MORA) focused on collecting data for long term wild fish studies. Aside from field work, I was tasked with improving communication of fish information and regulations. The aim of this study was to perform a meta-analysis based on Bielak et al.'s (2008) themes of strong communication for scientific governmental organizations. Bielak et al. (2008) suggests that scientific based governmental entities provide raw data, leading edge science, general and informed layperson interpretations, and advice for action. The goal of the meta-analysis was to understand the methods of communication that the surveyed National Parks use. Analysis results showed that the least represented themes were advise for action, raw data, and leading-edge science. The meta-analysis informed the fish webpages and supplementary fish identification card that I created for MORA. Understanding and implementing the elements required for effective science communication in governmental organizations can lead to a better-informed public around fish conservation. With well communicated knowledge on fish information and regulations, the public can become stewards of the environment, inside and outside of National Park boundaries.

ENCOURAGING STEWARDSHIP AND FIGHTING ECOPHOBIA THROUGH SERVICE LEARNING

Evan Maun*, @evanmaunuw, Program on the Environment, University of Washington
Site Supervisor: Meghan Fluharty, National Forest Service, Olympic National Forest, Hood Canal Ranger District
Faculty Advisor: Francesca Lo, Executive Director of Leadership Education
Director, Husky Leadership Initiative

A large issue facing environmental educators today is how to directly engage kids with nature, encouraging stewardship of the land without scaring them of the environmental issues facing the world at large today. The concept of Ecophobia (Sobel 1998) is that when kids are introduced to environmental issues such as climate change, mass extinction and the like at too young of an age, and thus feel like we are losing a battle. A similar concept is Nature Deficit Disorder (Louv 2008), in which there is a disconnect of kids and free time spent in nature, for a variety of reasons. My work over the summer sought to combat these concepts with a service learning program, combining valuable trail work for Olympic National Forest, with environmental education and reflection, thus encouraging the kids to feel more connected and responsible for the natural world around them. Over my time spent with the Quilcene Ranger Corps, another intern and I taught lessons on wilderness survival, navigation, plant ID, and the use of various tools. It was a good experience for myself and the kids and I think it definitely encouraged a closer relationship with the public lands for the kids. Programs such as these are transferable and an excellent tool to educate and expose kids to nature, as well as getting valuable work done on often underfunded public lands.

FIREFIGHTERS TALK TRASH, WE TALK COMPOST: EXPLORING COMPOSTING OPPORTUNITIES AT US FOREST SERVICE FIRE CAMPS

Remy Nguyen*, @Remfrawg, Program on the Environment, University of Washington

Site Supervisor: Hannah Johnson, Human Eco Consulting

Faculty Advisor: Stanley Asah, Environmental and Forest Sciences, University of Washington

Composting is a powerful waste-reduction practice that can benefit local ecosystems, agriculture, and economies. The U.S. Forest Service does not currently have a composting option at wildland fire camps, consequently sending hundreds of thousands of pounds of food waste to landfills every season. The purpose of this study was to identify and overcome barriers to composting at U.S. Forest Service wildland fire camps through interviews, conversations, and strategic planning. After consulting key stakeholders, real and perceived barriers were identified: potential health risks, threats to efficiency, lack of composting facilities, and contracting complications. One solution to overcome these barriers is to create a composting framework which mitigates real barriers and dismisses perceived ones. By communicating the framework in a clear and professional manner, contracting complications may also be avoided. This framework will have the potential to reduce strain on local municipalities and benefit local agriculture, as well as improve sustainability's standing in the emergency response conversation.

SOIL SAMPLING IN DISCOVERY PARK: WHY IS IT IMPORTANT TO KNOW OUR SOILS

Claire Perez*, @claireeperez, Program on the Environment, University of Washington

Site Supervisor: Garrett Esperum, Member of Friends of Discovery Park

Faculty Advisor: Sally Brown, Research Professor in SEFS, University of Washington

The purpose of this study was to learn if there was any heavy metal contamination in the soils of Discovery Park. For my research outside of my internship, I was looking at how to improve the quality of soils after they had been degraded from anthropogenic causes, like lead paint on surrounding buildings, and possibly heavy pollution. For my internship with Friends of Discovery Park (FoDP) I was taking soil samples from around the park, having them analyzed and then plotting the analysis on a map using ArcGIS Online. This is important work, as we are becoming a more and more populated society the easiest way for people to have access to green spaces is going to overwhelmingly be through urban parks. If these parks are unsafe for people to be going to the entire point of having them is going to become pointless. Which brings me to the results of my project. During my internship, I found that generally soil levels are healthy in Discovery Park except for one area called the Historic District which had elevated levels of lead. In my research, I found that most of the reasons for that soil in parks can be unsafe urban parks is from heavy metals in the soil. This shows that areas we think are perfectly healthy could be a somewhat toxic area that you don't want to be sticking your hands in. In the future, we need to learn more about our soils and their health.

CAN FINANCIAL INCENTIVES INFLUENCE PRO-ENVIRONMENTAL BEHAVIOR?

Max Rennie*, @maxrennie1, Program on the Environment, University of Washington

Site Supervisor: Jenny Heins, Sustainable Ballard, RainWise Outreach Team

Faculty Advisor: Gordon Bradley, Environmental and Forest Sciences, University of Washington

Encouraging pro-environment behavior is an issue that has become much more topical in recent years, and will have a large impact on the outcome of climate change. The motivation of this study was to determine what programs incentivize individuals to increase pro-environmental behaviors in the hope of decreasing individuals environmental impact. The purpose of this study was to determine whether incentive based programs have an influence on an individual's pro-environment behaviors. The case study being considered was through an internship with Sustainable Ballard with their RainWise Outreach Team. A survey was administered to homeowners with existing RainWise systems (rain garden or cistern) that tried to determine whether joining the program had any influence on their behavior. The survey assessed behaviors and motivations before and after individuals became involved in the program. Although majority of the homeowners showed signs of pro-environment behavior before becoming involved in the program, there was a subgroup of households that were motivated most by the financial incentive. This subgroup showed the largest signs of increasing pro-environment behavior. The significance of this research is that we now know more about how incentive based programs can help to influence individual's behavior to act more environmentally conscious. Encouraging this behavior is an important factor in helping mitigate climate change. Through determining what influences individuals to become more environmentally conscious, we can target individuals that are motivated by financial incentives to increase the amount of pro-environment behaviors they partake in.

COMMUNITY OUTREACH AND ALLYSHIP: REPLACING THE “TEACH TO” WITH A “LEARN FROM” ATTITUDE

Heather Schronce*, @heatherschronce, Program on the Environment, University of Washington
Site Supervisor: Laura McGrath, Tilth Alliance

Faculty Advisor: Tania Busch Isaksen, Department of Environmental and Occupational Health Sciences, University of Washington

Environmental stewardship programs have historically lacked representations of diversity, equity and inclusion. These programs, most of which are free, are seemingly accessible, but remain largely inaccessible for communities of color and low-income communities. Over the past 6 months, I interned with Tilth Alliance, a nonprofit dedicated to sustainable and equitable food systems. I worked within their Soil and Water Stewardship Program which consists of classroom and hands-on project work, covering topics from food waste prevention to raingarden construction. With organization-wide goals of enhancing diversity, equity and inclusion, I was on a mission to participate in community outreach and connection with a “learn from” attitude, not a “teach to” one. As a white individual, this specific aspect of allyship is one I focused heavily on as I prepared for and moved through this project. It was vital that I first fully understand and recognize my own privilege before moving through this research from a community ally position. I interviewed 4 local stewardship program coordinators to learn how they operationalize values of diversity, equity and inclusion when recruiting program participants. I found that 75% of them do not utilize targeted recruitment methods to reach more diverse communities. Using targeted methods creates more equal access to these programs and in turn can create more environmental education opportunities for climate-vulnerable communities. Additionally, greater demographic diversity brings greater diversity of perspectives and experiences into these programs which can lead to necessary program reform to make them more accessible, culturally relevant and consequently more inclusive.

IT'S ALL PART OF THE SYSTEM: A SYSTEMATIC METHOD TO ASSESS DEVELOPING WASTE, WATER, AND EDUCATIONAL INFRASTRUCTURE

Mick Smoot*, @mick_smoot, Program on the Environment, University of Washington

Site Supervisor: Danielle Bogardus, Connect 3

Faculty Advisor: Scott Meschke, PhD. Water and Environmental Health, University of Washington

A society's resilience is dependent on inherent education, waste, and water (EWW) systems. Hundreds of millions of people still live without access to basic water systems, waste management, and relevant educational materials, leaving societies in poverty, dependent on aid, and corrupt. Despite billions of dollars being spent every year in aid, the majority of projects fail to sustain themselves within a few years post-implementation. These projects fail as a result of a linear assessment framework used to evaluate education, waste, and water systems independent of each other. This approach has resulted in a misrepresentation of the feedback loops and interactions within a society, stakeholders left unaccountable, and few long term solutions. The purpose of this research was to discover what systemic factors and feedbacks, on both a local and national level, affect a society's resilience using EWW systems as the key indicators in a dynamic assessment model that accurately pinpoints the root causes of the breakdowns. Methods include a comprehensive literature review of system-dynamics, quantitative and qualitative indicators of unsustainable EWW infrastructure, and an analysis of current community assessment methodologies. Results include an assessment method paired with an integrated EWW feedback loop. Both the assessment and feedback loop are systems-based and scalable. This method can be used to assess the current state of EWW systems in communities and regions. This unique framework is crucial in the planning of long-term EWW projects and a society's resilience.

KEEPING WILDERNESS WILD: THE IMPORTANCE OF WILDERNESS MANAGEMENT

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The Wilderness Act of 1964 mandates that Wilderness must be protected and managed to maintain natural characteristics. As Wilderness areas are increasingly used, human impacts are more noticeable and detrimental. The purpose of this study is to determine the degree of human impact in the Buckhorn Wilderness, located in the Olympic National Forest, and to explore management solutions to perennial problems like impacts from campsites and improper human waste disposal. To accomplish this, I worked with the United States Forest Service (USFS) to gather quantitative data on recreation sites and participated in public engagement about human waste disposal. In concurrence with gathering data and public engagement, I conducted a literature review and administered a survey assessing visitor waste disposal habits and knowledge. My results indicate that there may be some signs of crowding, like the abundance of low-impact campsites, and that the USFS should continue waste disposal education using Leave-No-Trace principles, but also provide privies at the busiest campsites. Eventually, a visitor quota may be implemented to reduce overall impact from campsites and feces. Additionally, visitor-ranger interaction is a powerful tool for education and persuasion and should be present at busy trails, trailheads, or campsites during the busiest times. This project demonstrates the importance of Wilderness management, defining standards, and monitoring in the protection of Wilderness. Effective management is crucial to fulfill legal mandates as well as make these wonderful places as accessible as possible.

SUCCESSFUL COMMUNITY SCIENCE TAKEAWAYS: A CASE STUDY

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This project looks to bridge the gap between community and science by identifying common key factors that go into making a successful community science (CS) design. Community science is scientific research conducted, in whole or in part, by amateur scientists. The idea of community science (sometimes called citizen science) is to get local communities more involved in the scientific process and making sure that CS programs are successful is essential. The purpose of this study was to identify these key factors of CS designs and analyze the results so recommendations could be provided for the Green Futures Lab (GFL) moving forward. The approach taken was separated into two parts, first: gaining first-hand experience of volunteer work in the monitoring of BioBarges for GFL, and second: deploying a survey to professionals and volunteers that looked to answer the question, “what makes for a successful community science design?” The key findings from the survey showed that the most important aspects of a community science design were efficiency, education, communication, accessibility and inclusivity. Specific recommendations from the survey that were found were things such as acknowledging and honoring Native Lands, creating a communication plan for community scientists and creating a timeline for the project. These key findings serve as a starting place for developing a successful community science design. And with a more successful design that looks to get more volunteers involved, bolster retainment, and improve the transfer of knowledge while building trust, the gap between science and the community can be bridged.

ADDRESSING ENVIRONMENTAL JUSTICE THROUGH POLICY AND INFRASTRUCTURE SOLUTIONS FOR SAFER ROUTES TO SCHOOL IN SEATTLE

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There is a general decline of walking and biking to school, due to a lack of safe walking or biking routes. Additionally, there are also disparities when it comes to walking and biking. Children from lower socioeconomic backgrounds tend to walk and bike more often but live in disproportionately dangerous areas that are highly unsafe to walk or bike. The aim of my study is to find policies and infrastructures that could increase rates of walking and biking through the Safe Routes to School program and address Environmental Justice concurrently in Seattle. To accomplish this, I interned with Seattle Neighborhood Greenways, and conducted literature research to produce a recommendations report. I also volunteered at events, helped with a storytelling project about biking and wrote a blog post. My findings show that the Safe Routes to School program in Seattle needs to adopt more funding and outreach policies for current schools and consider active transportation policies when building new schools to address the environmental injustice and unsafe routes that are present. Safer infrastructure should be a standard requirement around schools, and the use of pop-up or DIY projects prior to installing actual infrastructures could gauge public feedback and allow for long-term and useful infrastructures to be implemented. An increase in rates of walking and biking would increase physical activity, safety, and reduce traffic and air pollution. Furthermore, people-oriented streets and neighborhoods would also be created in the long-term, diminishing automobile-oriented areas, creating safer and healthier streets for everyone.

FUNDING CLIMATE ACTION: THE ROLE OF SMALL FUNDERS

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Climate change is a daunting issue needing interdisciplinary solutions and collective efforts. Currently, only 2% of all philanthropic giving goes to fight climate change with over half of the funding going toward large capital mitigation efforts. While mitigation strategies are important and perfect for large funders, adaptation strategies focusing on the communities who are suffering from the effects of climate change now are of equal importance yet severely underfunded. The purpose of this study was to identify the role small funders play in climate philanthropy. To accomplish this research, I utilized the Foundation Center Directory to identify philanthropies who funded in the area of climate and to assess their grant sizes and projects. Once a list was made, I reached out to small funders for an interview followed by a literature review of philanthropic news and foundation websites. Findings show that funders who gave grants amounts of \$25 thousand or less tend to fund in the areas of climate adaptation and climate justice. Small funders are uniquely positioned to advance adaptation strategies due to their ability to better address issues of equity; can assume more risk and create visibility for local projects by taking on community projects that may not be highly visible or have all the metrics and methods required by large funders to obtain grants; offer flexibility to change with the community time and place; works directly with the community which builds expertise in their needs; empower voices and leaders from local communities; and provide support in addition to funding.

THE SHORELINE ENVIRONMENTAL IMPACT EVALUATION ON DUWAMISH INVERTEBRATES

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Duwamish River is important to local ecologies because it serves as the natural habitat for surrounding invertebrates, but human activities like the port industry irreversibly changed the habitat with rock and concrete. Because invertebrates play a significant role in the main diets of Duwamish salmonids, it is crucial to figure out how such a change will affect the invertebrate groups. The purpose of this study is to figure out how invertebrate population differs among 5 monitoring sites from different types of shorelines (soft/armored shorelines). In this research, soft shorelines are commonly referring those natural shorelines, while armored shorelines are represented by rocky and concrete shorelines. To compare their environmental impacts, I collected and identified invertebrate samples along the Duwamish River. During the 2 months of researching, I processed 1,027 invertebrate samples and conducted my preliminary deliverables. The results indicted different capacities of shorelines in support of the invertebrates nearby. Soft shorelines were suitable for diverse invertebrate population, because more invertebrate taxa were found in average; while armored shorelines were more suitable for certain dominant species because fewer taxa shared more resources there. The disparities among different shorelines allow us to protect the Duwamish invertebrates by habitat restoration catering to their preference. As we conduct more researches like this, we will be able to better protect these important species

SAVING THE FISHERMAN'S GREATEST CATCH

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Understanding the differences between land cover for salmonid spawning grounds to increase their low abundance levels in the Lower Columbia River Basin (LCRB) due to human land-use impacts is crucial for preservation. The historic salmonid population in the LCRB was over a million currently estimates are around the thousands. Salmonids provide many benefits such as driving the Alaskan fisheries where it produces more than half of the seafood in the United States providing economic growth for the region. They also provide native tribes with subsistence and an ecological balance of nutrients in the streams and rivers of the ecosystem with their mortality. This study was aimed to find land cover correlations that may negatively affect salmonid abundance in the LCRB. In my internship, I examined spatial land cover data with an Ecosystem Diagnosis and Treatment (EDT) model which is a model that will evaluate species extinction risk with different ecological variables to examine spawning areas of two different salmonid species (Winter Steelhead and Chum) that may have impacted by different types of land usage as seen in their abundance levels. Spawning areas that have a higher risk are more associated with more development and agricultural land cover. Understanding these correlations and the methodology that was used to find patterns can help us dive further into specific land covers that are the most impactful. This can lead to better land management, policies, and more efficient strategies to preserve salmonid abundance.

THE CONSEQUENCES OF DELAYING PARK RESTORATION

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Washington state park foundation is interested in projecting the impacts of delayed restoration cost. This is important due to the impacts it has on road safety, people satisfaction, job availability and future cost savings. It was found that since 69.5% of the revenue is generated by the parks this revenue would decrease. This decrease would be due to the decline of customer satisfaction caused by the delayed restoration, such as unsafe road conditions. This reduction in visitors would lead to a drop in income which would then lead to a decline in jobs. Over time more budget cuts will be made to accommodate the revenue reduction which will lead to a greater loss. In conclusion, the money saving plan would lead to greater loss over time.