UNIVERSITY of WASHINGTON

Autumn 2023

Program on the Environment

CAPSTONE SYMPOSIUM

ALL ABSTRACTS COMPILED

ALPHABETICAL ORDER

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Wednesday, November 29th, Online, 4:30 – 7:30 pm
(https://washington.zoom.us/s/95748800932)

Wednesday, December 6th, In-Person, 4:30 – 7:30 pm
(UW School of Aquatic Fisheries & Science FSH 102 & Lobby)

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 nonprofits 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.

Student Abstracts:

Wed. Nov. 29th (Day One: Online) and December 6th (Day Two: In-Person)

in Alphabetical Order

LIKE, COMMENT, AND SHARE: HOW SOCIAL MEDIA CAN BOOST ENGAGEMENT FOR TRANSIT JUSTICE. **Session:** Day 1: A, Breakout Room: #1

Jasmine Barreto, @_jasminebarreto, Program on the Environment, Cinema & Media Studies, University of Washington
Site Supervisor: Keith Kyle, Seattle Subway Foundation
Faculty Advisor: Erin Gilbert, Program on the Environment, University of Washington

Social media is an emerging tool for nonprofit communication, but there is limited research on short-form video content. Moreover, minimal research concerning the online communication of transit justice in the nonprofit sector limits the use of short-form platforms. The aim of this study was to develop strategies for effective transit-centered communication on the platform TikTok. To accomplish this task, I created TikTok posts for the new Seattle Subway Foundation TikTok account. Then, I created and distributed an online survey to current Seattle Subway members asking them to reflect on social media expectations, important attributes of an online account, and assess three of my TikTok posts about public transit expansion. Additionally, I conducted a literature review of nonprofit communication case studies focusing on current online communication strategies such as two-way communication and rhetorical appeals. Findings show three central attributes of organizational social media accounts that have proven to establish audiences and increase engagement: organizational identity, transparency, and persuasive appeal. While 9.6% of respondents prefer storytelling, appealing to pathos, only 7% of respondents cited transparency as an important attribute despite researchers citing its importance in gaining trust and establishing a consistent audience. Transparency can be achieved through clearly stating organizational goals and values and elevated by storytelling appealing to an individual experience. Understanding the current relationship Seattle Subway members have with online communication methods can inform strategies to improve organizational content and engagement. Moreover, proper communication equips constituents with information to participate in opportunities for public comments, and possible votes concerning transit justice.

“GO GREEN! STORMWATER INFRASTRUCTURE” - BRIDGING THE EDUCATIONAL GAP BETWEEN HOMEOWNERS AND GSI. **Session:** Day 1: A, Breakout Room: #2
Carina Baxter, carina_baxter36, Program on the Environment, University of Washington
Site Supervisor: Jenny Heins, Sustainable Ballard
Faculty Advisor: Jason Benscher, Athletics Department, University of Washington

Green Stormwater Infrastructure, also known as GSI, is used to prevent sewer systems from overflowing by reducing the stormwater volume entering the drains. Places like Seattle feature a combined system, merging urban runoff and sewage in one pipe, and transporting them to a treatment plant, as seen in Figure 1 (ECOSS 2019). Heavy rainstorms overwhelm the system, leading to overflow into the Puget Sound and the Duwamish River. I worked with rain gardens and cisterns (two forms of GSI) during my internship with Sustainable Ballard and Rain Wise. A cistern collects rainwater and moves it from the roof to a storage tank. It is then slowly released into the sewers. Rain gardens utilize the building’s downspout, allowing the water to soak into the ground. At Sustainable Ballard I performed maintenance checkups, ensuring that local homeowners were taking care of their installations. I went through a checklist of required tasks, asking customers if they were aware of the responsibilities. The study’s purpose was to help RainWise strengthen its program and its customers’ understanding of maintenance. We found there was a lack of knowledge about how installations functioned and how to take care of them. As a result, we found many installations lacking proper maintenance and therefore weren’t functioning as intended. We learned that further education regarding these installations is not only necessary, but will also lead to less malfunction, and thereby less overflow into the local waterways.

WHY WE SHOULD CARE ABOUT WETLAND AND HOW TO RESTORE IT EFFICIENTLY.
Session: Day 1: B, Breakout Room: #1
Justin Chao, @JustinChao1127, Program on the Environment, University of Washington
Site Supervisor: Grace Stiller, Weed Warriors, Nature Stewards Program
Faculty Advisor: Tim Billo, Program on the Environment, University of Washington

Wetlands serve as a habitat for native species, maintain water quality in the surrounding area, and help to mitigate environmental problems. Therefore, the public needs to pay attention to wetland restoration projects. Unfortunately, many people do not care or pay little attention to the problem; instead, they dump garbage into wetlands, which shows that people's mindset toward protecting the environment is immature. This study aims to demonstrate the importance of protecting wetlands and how to do it. To answer this question, I learned to identify different invasive weeds and their characteristics from my site supervisor and literature review during my internship. The papers I looked up also show various methods to restore wetlands more efficiently, such as remote sensing techniques. I set up a simple experiment to test the growth rate of Eastern Red Cedar in the wetland. Though the result of my experiment does not show a positive correlation between living conditions and heights of Eastern Red Cedars, other crew members will keep working on this experiment. By doing so, we can learn how to help strengthen the ecosystem without wasting too much time, resources, and energy. The key findings of my project are the importance of being familiar with different noxious weeds, applying various methods to restore wetlands, raising people's

awareness of wetland restorations, and supporting environmental organizations. Wetlands are essential, not just for animals but also for human beings. Therefore, it is our responsibility to protect them from harm.

CONSERVE TO PRESERVE: HOW CITIES AND CITIZENS CAN COLLABORATE TO PROTECT WATER RESOURCES. **Session:** Day 2, In-Person
Lauren Church, @laurenchurch_, Program on the Environment, University of Washington
Site Supervisor: Kirsten Harma, Chehalis Basin Partnership
Faculty Advisor: Kristi Straus, Program on the Environment, University of Washington

Water is an indispensable resource, essential to human life and ecosystem vitality. Despite this, in many areas, there are evident impacts from climate change, such as longer, hotter, drier summer seasons and changing precipitation patterns. These climate changes paired with expanding populations are putting a strain on water resources such as those located in Washington, demonstrating a need for solutions. The purpose of this study was to understand how small cities such as Chehalis, Washington, can reduce water use through water conservation strategies. To accomplish this, I conducted research through public outreach, citizen surveys, expert interviews, and a literature review via an internship with the Chehalis Basin Partnership. Chehalis citizens were surveyed to understand their perceptions and preferences regarding different water conservation actions. Additionally, experts were interviewed to understand the successes and challenges of water conservation strategy implementation in cities near Chehalis. A thematic analysis of interviews along with current literature revealed four main important municipal water conservation actions which include water conservation plan development, water policy mechanisms, municipal infrastructure improvements, and public outreach and education. Further research determined how government and citizen-level action can be streamlined to successfully conserve water resources for both current and future needs. Addressing the pressing issues of water conservation requires cities to lead by example while including citizens and providing means for their engagement when implementing solutions. These results evoke findings important for cities, even those outside of Washington, to improve water conservation efforts and more broadly promote government-citizen collaboration in solving environmental issues.

MAKING FRUITFUL HABITATS: ESTABLISHING BEST PRACTICES FOR FRUIT GLEANING ORGANIZATIONS TO EASE THE EFFECTS OF CLIMATE CHANGE ON POLLINATORS.
Session: Day 1: B, Breakout Room: #2
Rachel Ellingwood, @ellinrac, Program on the Environment, University of Washington
Site Supervisor: Bennett Walkes, City Fruit
Faculty Advisor: Eli Wheat, Program on the Environment, University of Washington

Due to global climate change and its negative environmental impacts, pollinators have faced significant losses in population size and health. While there are some established practices for a variety of groups like orchardists and landowners to support pollinators, there are a lack of specific methods for the context of gleaning, which is the practice of collecting resources and then redistributing those resources to the community. The aim of this study was to explore the

intersection between the act of gleaning and the support of pollinators, specifically by examining what methods are currently being taken and what gaps exist in those efforts. I interned with City Fruit where I assisted in gleaning, distribution of fruit, and outreach events. I conducted a survey aimed at relevant groups that interact with pollinators, such as farmers, volunteers, tree stewards, and others. The questions gauged their interest and motivation towards assisting pollinators and determined their various pro-pollinator methods. Based on the survey results, guidelines for supporting pollinators were found to fall under four main categories: providing nesting resources, providing foraging resources, intentional management of the land, and spreading awareness about the issue. By creating these clear guidelines for gleaners, vital support is provided for local pollinators and food security is strengthened in the face of climate change, especially if these pro-pollinator suggestions are widespread and universal. Above all, these findings are representative of the idea that supporting at-risk species and populations due to climate change can take place in many different settings and niches.

GROWING RESILIENCY: APPROACHING YEAR-ROUND FOOD SECURITY IN THE GREATER SEATTLE AREA. Session: Day 1: B, Breakout Room: #3
Althea Ericksen, @altheaericksen1, Program on the Environment, University of Washington
Site Supervisor: Perry Acworth, The UW Farm
Faculty Advisor: Eli Wheat, Program on the Environment

Due to the increasing population, high cost of living, and changing food systems reviewing and improving access and quality of food, particularly fresh local produce is essential for the well-being of all communities. This aims to catalog barriers and successes of current food systems and potential transitions to a more resilient system. Methods to understand this issue included interviews with farmers and food banks in Western Washington, asking qualitative and quantitive questions to better encapsulate the many complexities. Relevant literature was also read and analyzed to help inform interviews and see academic perspectives on food system inadequacies. Lastly, a tangible aspect of my project was planning the planting of a heritage apple orchard at The UW Farm, to expand the growing season and offer a real-life example of creative solutions to food resilience, particularly in non-peak growing times of the year. Through my internship, the main barriers to achieving year-round food resilience were consistent communication between farmers and food banks, differing need times and production times, infrastructure to elongate the growing season, and labeling barriers to collaboration. These results suggest the need for greater systems in place to facilitate efficient coordination between farmers and food banks. Especially with a changing climate and changing growing regions creating flexible systems that adequately address the need for nutrient-dense food will only become more important.

SMALL BUT MIGHTY: FORAGE FISH SIGNAL THE NEED FOR SHORELINE RESTORATION IN THE PUGET SOUND. **Session:** Day 2, In-Person
Arianna Fardad, Program on The Environment, University of Washington
Site Supervisor: Bianca Perla, Vashon Nature Center
Faculty Advisor: Jason Toft, Principle Research Scientist, Wetland Ecosystem Team, UW School of Aquatic and Fishery Sciences

Environmental health indicators are species that can be analyzed to assess ecological functioning and health of a habitat. Forage fish species (Sand Lance and Surf Smelt) are designated environmental health indicators and are vital pieces of the puzzle for Puget Sound bottom-up trophic influences serving as major links between phytoplankton and iconic Puget Sound species such as salmon, seals, and orcas. Forage fish have specific spawning habitat requirements that have major impacts on their ability to withstand human lead artificial disturbances along shorelines such as bulkheads, seawalls, and riprap. The aim of this study is to analyze Sand Lance and Surf Smelt use of nearshore beach sites during reproductive cycles across three strata of natural, armored, and restored beach types; as well as assess how ecological restoration efforts may have an impact on forage fish spawning behavior. Data for this study was collected from a variety of field surveys at eight beach sites on Vashon Island in the Southern Puget Sound. Sediment data was analyzed using WDFW lab protocols to identify and quantify forage fish eggs to connect egg quantities to habitat features with a focus on sediment size and composition. Sand Lance and Surf Smelt were more commonly found spawning on sediment sizes within their previously understood requirement range, however, these species exhibited a level of resistance to sediment diameters outside of their optimal range. Restored and Natural sites did show signs of higher ecological functioning and health and therefore provide healthier habitats for Sand Lance and Surf Smelt. The results of this study have management implications by providing up-to-date information and research on how vital Puget Sound species interact with restoration sites and shoreline armoring and can lead to increased shoreline restoration along the highly altered coastline of the Puget Sound.

DON'T SAVE ALL THE TREES! ENSURING THE SURVIVAL OF PACIFIC NORTHWEST FORESTS THROUGH ECOLOGICALLY-FOCUSED THINNING TREATMENT.
Session: Day 1: B, Breakout Room: #4
Jessica Fragoso, @jessicanoemifr1, Program on the Environment, University of Washington
Site Supervisor: Rowan Braybrook, Northwest Natural Resource Group
Faculty Advisor: Ernesto Alvarado, School of Environmental and Forest Sciences, University of Washington

Historic, industrial-scale logging has changed Pacific Northwest landscape from diverse old-growth forests to now much younger, structurally simple forests. These altered forests prominently, that lack diversity in species, are much more susceptible to climate stressors. In the wake of increasingly hotter and drier summers, these younger trees must enter older seral stages (developmental tree stage), if they are to survive increasing climate stressors. The aim of this study was to determine the effectiveness of preserving soil moisture amongst several different rates of tree thinning treatment (removal of trees in an area), to support such forest development. As a forest soils science intern, soil moisture data via - volumetric water content

percentage (VWC %) - was collected through an electromagnetic probe known as the HydroSense (Version II). Findings from this this data collection and analysis reinforce ecological response to thinning forest sites at a rate of 50 – 70%. at retaining soil moisture amongst trees for them to development into older, more resilient trees. These results show that soil moisture is one of many factors that must be considered when addressing forest restoration. However, if this field is to holistically development into tangible forest restoration, cross-cultural collaboration must be at the forefront of federal and state agendas. Such conversation in natural resource management can help steward these altered forests in an age of warming climate and replace lost old-growth forests in a truly non-industrial relationship to our environment.

GOING WITH THE FLOW: HARNESSING SOCIAL NORMS FOR REUSABLE WATER BOTTLE ADOPTION. **Session:** Day 1: B, Breakout Room: #5

Amelie Gahagan, @GahaganAmelie, Program on the Environment, Foster School of Business, University of Washington
Site Supervisor: Liesel Hans, Alliance for Water Efficiency
Faculty Advisor: Sergey Rabotyagov, School of Environmental and Forest Sciences, University of Washington

The production and consumption of single-use water bottles harm human and wildlife health by leaching microplastics, depleting groundwater reserves, and contributing to climate change. By leveraging social influences and appealing to individuals' desire for social assimilation, organizations and individuals can foster greater participation in collective efforts to address these issues. This study aimed to explore social norms among students in Biological Sciences, Environmental Sciences, and Environmental Studies majors at the University of Washington to assist in influencing decision-makers and creating marketing strategies that can encourage individuals to utilize reusable water bottles over single-use alternatives. My internship with the Alliance for Water Efficiency centered around conducting a literature review on behavioral economics principles within the water sector and recommending ways to apply the findings. This literature review served as the foundation for my research, which involved designing and administering a survey to gauge trends and perceptions regarding water bottle use among students in environmentally related majors. The results show that all 45 respondents believed there was a culture or trend surrounding reusable water bottles. Additionally, most students who agreed that using a reusable water bottle was more socially acceptable than using a single-use one on their campus and within their social circle were likely to have their actions follow suit. These findings highlight that strong social norms exist and individual actions may be influenced by a perception of what is socially desirable. By examining how groups perceive sustainable behaviors, we can harness the power of social norms to encourage collective action.

CO-PRODUCING HOPE: EXPLORING THE BENEFITS AND CHALLENGES OF COMMUNITY-ENGAGED LEARNING IN UNIVERSITIES TO ENHANCE CLIMATE RESILIENCE.
Session: Day 2, In-Person
Isabella Garrido, @bella_capstone, Program on the Environment, University of Washington
Site Supervisor: Zackery Thill, Climate Impacts Group, University of Washington
Faculty Advisor: Megan Ybarra, Department of Geography, University of Washington

With the impending environmental degradation caused by climate change, it is vital communities have the capacity to adapt to increase their resilience. The purpose of this study was to evaluate the benefits and challenges of community-engaged learning in universities and understand how community-engaged learning could increase climate resilience in frontline communities. To accomplish this task, I worked with Climate Impacts Group (CIG) and the Northwest Climate Resilience Collaborative (NCRC), a NOAA-funded organization working towards assisting Tribes and frontline communities in improving their resilience to climate change. I assisted the NCRC with the foundation of their climate justice school, a program for youth passionate about climate justice and co-production. The goals of the summer school were informed by 16 informal interviews with students and faculty members and a survey with community-based organizations (CBOs). The results indicated that the benefits of community-engaged learning are diversifying student perspectives, improving science communication, and increasing community-integrated policy and research. However, some challenges are institutional barriers, inadequate resources, and insufficient time. Increasing environmental justice curriculum and community engagement in classrooms has the potential to increase communities' resilience to climate change by combining scientific problems and community problems to create a more holistic foundation for research and policy. These changes can increase community's public involvement, improve ethical pitfalls in policy and research, and create more opportunities to legitimize other community knowledge sources.

LEARNING TO LIVE IN A CHANGING WORLD: PLANNING AGAINST THE THREAT OF EXTREME HEAT. **Session:** Day 1: A, Breakout Room: # 3
Julian Gonzales, @JulianG1021, Julian Gonzales*, Program on the Environment, University of Washington
Site Supervisor: Jillian Edge, Public Health - Seattle & King County, Preparedness Section
Faculty Advisor: Jeremy Hess, Emergency Medicine, Environmental & Occupational Health Sciences, and Global Health, University of Washington

Over the years the progression of climate change has created extreme heat events that directly impact communities and their ability to prepare against the threat. These heat events are expected to continue to worsen in severity and impact those most vulnerable to heat, demonstrating a need for a solution. The purpose of this work was to find effective strategies that help to plan against the impacts that extreme heat has on those most vulnerable to the issue. To accomplish this, I aided Public Health - Seattle & King County in creating a web page with relevant information to be used by preparedness professionals to respond to an extreme heat event. I also communicated with a diverse range of professionals around planning for extreme heat and conducted a literature review around relevant information. Through this, I learned that many areas around the world are not properly prepared for the various effects of

extreme heat or have little to no preparedness plans in place in the case of an extreme heat event. Creating preparedness plans to be utilized in the case of an extreme heat event and incorporating action to serve those most vulnerable are important first steps to climate adaptation. Having preparedness plans in place can work to lessen the effects of climate change throughout King County and can also serve as a resource for other jurisdictions to use as an example to be better prepared for the future impacts due to climate change.

DAM! BRIDGING THE DAM: PERCEPTION AND APPROACHES TO BEAVER-RELATED RESTORATION WORK IN SCATTER CREEK. **Session:** Day 1: A, Breakout Room: #4
Florencia Gonzalez-Martinez, Program on the Environment, University of Washington
Site Supervisor: Kirsten Harma, Chehalis Basin Partnership and Chehalis Basin Lead Entity for Salmon Recovery, Watershed Coordinator
Faculty Advisor: Gunwha Oh, Department of Geography, University of Washington

The effects of climate change have caused an increase in dry summers in the State of Washington. This directly affects the difficulties of salmon migration and spawning habitat on Scatter Creek, a creek located south of Olympia and in the Tenino and Rochester areas. The study aims to understand factors that contribute to water flow during the summer in different locations on Scatter Creek. Citizen science and web GIS were used to visualize the patterns of water flow in Scatter Creeks throughout 2021, 2022, and 2023. Daily outreach emails were sent to volunteers to monitor, take pictures, and take notes of the water's presence and flow. Results show that hotter summer seasons decrease water flows. Areas that had beaver dams within their respective ecosystems had the ability to adapt to the threats of climate change. Allowing for yearly water flow even during hotter summer months. The significance of maintaining water flow regularly throughout the year allows salmon to thrive in their environment through constant waterway paths used for migration routes. Salmon hold importance to the ecosystem and have cultural significance to the locals and tribes. The Scatter Creek Wildlife Area lies within the traditional range of the Kwaiaik (Q'ʷay'áyiłq') or Upper Chehalis people (WDFW, 2020). For many years the Upper Chehalis people have survived on the natural resources from the rivers. The locals use the creek for recreational activities and agricultural usage. The creek is a significant source for both non-human and human usage

DRINKING RESPONSIBLY: THE ROLE OF SUPPLIER PERFORMANCE ASSESSMENTS IN COLLABORATIVE SUSTAINABLE SUPPLY CHAIN MANAGEMENT.
Session: Day 1: B, Breakout Room: # 6
Emma Haener, @EmmaHaener, Program on the Environment, University of Washington
Site Supervisor: Erik Throndsen, Talking Rain Beverage Company
Faculty Advisor: Ben Packard, EarthLab, University of Washington

Most companies' supply chains constitute a substantial source of environmental and social impacts, accounting for over 90% of their total greenhouse gas (GHG) emissions. The abundance of sustainable supply chain management (SSCM) literature developed in the past two decades has created challenges for companies seeking to integrate SSCM practices and

apply frameworks to their specific supply chain. Supplier sustainability assessments are frequently employed to quantify a supplier's sustainability performance across diverse sustainability aspects. However, companies underutilize supplier assessments as an effective supply chain management tool when they only focus on how their suppliers perform. Instead, businesses need to use supplier sustainability assessments to identify shared sustainability goals with suppliers and catalyze collaborative partnerships. The purpose of this study was to explore how supplier sustainability performance assessments can promote effective supply chain collaboration and how a firm's collaborative capabilities and general supply chain collaboration impact its success. This study conducted within a global beverage manufacturer, encompassed a literature review, the design and administration of a supplier sustainability assessment, and supplier interviews. The research reveals that collaborative relationships and a firm's collaborative capabilities significantly influence the success of supplier assessments in identifying collaborative opportunities. The study also highlights the importance of accurate assessment criteria, a commitment to collaborative sustainability goals, and enhanced technological capabilities in assessment tools. Ultimately, this research contributes to the field of sustainable supply chain management and collaboration by operationalizing supplier performance assessments as tools to promote collaboration and address sustainability challenges within global supply chains.

ROOTS OF CHANGE: ACTIONS PLANT CONSERVATORIES & BOTANICAL GARDENS CAN TAKE TO SHARE PLANT KNOWLEDGE IN MORE CULTURALLY INCLUSIVE WAYS.

Session: Day 1: A, Breakout Room: # 5
Patrick Harper, @patrickk_harper, Program on the Environment, Global and Regional Studies, University of Washington
Site Supervisor: KL Bentrup and Lauren Moore, Friends of the Conservatory
Faculty Advisor: Brittany Johnson, School of Environmental and Forest Sciences, University of Washington

Botanical gardens and plant conservatories, Plant Knowledge Institutions (PKIs), provide many educational enrichment opportunities for visitors, curating plant collections focused on preservation. However, PKIs have harmful histories based on colonist ideologies that have uprooted native plants from their endemic regions around the world, contributing to the erasure of Indigenous Knowledges within the realm of plant sciences. The purpose of the study was to develop ways PKIs could adopt more inclusive and ethical research methods to include more perspectives, knowledge, and history within these spaces. For my research efforts, I interned with Friends of the Conservatory creating informative profiles on plant species within their collection. Moreover, I compiled a list of 217 PKIs across America and created a survey to inquire about the efforts they have undertaken to foster cultural inclusivity and information accessibility within their institutions. I sent the survey to each institution and received a total of fifty-nine responses. PKIs included their efforts to increase information access to their collections: creating online tours and webinars, planning community programs with local organizations, and producing published resources throughout their institutions. Additionally, I compiled a literature review that delved into projects undertaken by Indigenous scholars that highlighted research methods utilizing Indigenous Knowledges-based research methods. Establishing knowledge-sharing ethical practices within PKIs such as PAR

(Participatory Action Research) and MEB (Multiple Evidence Based) research methods could be an important step to ensure that Indigenous Knowledges are included within PKIs with the approval and collaboration of the Indigenous communities that Indigenous Knowledges originate from.

FINDING BARRIERS TO USING SALVAGED LUMBER AND SOLUTIONS TO INCREASE USE IN KING COUNTY. **Session:** Day 1: A, Breakout Room: #6
Lauren Harris, Program on the Environment, Political Science, University of Washington
Site Supervisor: Kinley Deller and Alex Erzen, King County Solid Waste Division
Faculty Advisor: Indroneil Ganguly, School of Environmental and Forest Sciences, University of Washington

There is a lot of construction waste that goes into landfills; the construction industry produces about 15% of materials brought to site as waste (Akinade 2020). There are a lot of available materials that are wasted and could be reused, one of these types of materials is salvaged lumber. The aim of this study is to understand barriers to using salvaged lumber and finding solutions to these barriers for the aim of increasing use of salvaged lumber. Research was done by combining human subject research and a literature review; human subject research consisted of a survey and interviews contacted using a subject list provided by the GreenTools Division of the King County Solid Waste Division. Subjects were contacted using email and LinkedIn, surveys were conducted using Qualtrics, interviews were conducted on zoom. Findings show that the most significant barriers to using salvaged lumber fall into the following major categories: technology, regulatory, financial, and social. Solutions were found to address each barrier; some examples include better records of building construction, salvaged lumber warehouses to cut costs of processing and transportation, training to increase expertise, and increases in education about circularity. With more knowledge and ability to use salvaged lumber; there are implications for decreasing construction waste and increasing efficiency in materials used in the built environment, as well as increases in knowledge on sustainability.

URBANIZATION OR GENTRIFICATION? THE BENEFITS AND CHALLENGES OF EXPANDING LINK LIGHT RAIL IN SEATTLE. **Session:** Day 1: A, Breakout Room: #7
Palmer Holt, Program on the Environment, University of Washington
Site Supervisor: Keith Kyle, Seattle Subway Foundation
Faculty Advisor: Manish Chalana, Urban Design and Planning, University of Washington

Despite its popularity and carbon mitigation potential, adoption of Link Light Rail in Seattle has been slow, expensive, and detested among some groups. Marginalized communities worry about gentrification, and commercial entities resist development- citing lengthy construction periods and accessibility issues. Seattle's number one source of greenhouse gas emissions is automobiles. Automobiles are also noisy, dangerous, and can cause premature deaths from traffic accidents and pollution. This study was aimed at better understanding the socioecological benefits and challenges of connecting Seattle with reliable Light Rail Transit,

while exploring strategies to mitigate those challenges. Over the summer I interned with Seattle Subway, a nonprofit transit advocacy group, to produce a draft Environmental Impact Study (EIS) on expanding Link Light Rail to Ballard, with emphasis on residential and commercial impacts. I accomplished this by referencing Sound Transit's past EISs, attending weekly outreach events with Seattle Subway representatives, and conducting a literature review on Light Rail and sustainable development. Research shows that Light Rail, although capable of lowering emissions, noise, and traffic congestion, can also cause commercial and residential displacement, significant rises in housing costs, and lengthy construction periods making expansion unpopular among key stakeholders who often delay or cancel projects. Urgent legislative actions are needed to provide economic support to underserved communities in the path of Link Light Rail. Adding new construction regulations to protect local businesses and maintain accessibility could reduce business turnover. These actions, alongside advocacy, could help Seattle responsibly expand the Link Light Rail, lowering emissions and increasing mobility equity.

CREATE YOUR OWN PATH: FIVE WAYS TO HELP CHILDREN MAKE BETTER CONNECTIONS WITH THE ENVIRONMENT. **Session:** Day 2, In-Person
Olivia Johnson, @oliviajohnson, Program on the Environment, University of Washington
Site Supervisor: Amanda Hipp, Islandwood
Faculty Advisor: Eli Wheat, Program on the Environment, University of Washington

Environmental Education (EE) offers a foundation for children to learn about the natural world. Through games, crafts, exploration, and free form thinking they can make lifetime connections to the environment. This will help them shape ideas about how they can be environmental stewards but also how they are connected to the environment. Having children who can choose the way they want to learn helps them better understand the environment. This only happens when they are engaged in the curriculum with which they are interacting. The purpose of this study was to find differences in engagement of different (EE) curriculums through monitoring the engagement of a game and craft that have the same learning objectives. To accomplish this study, I monitored the engagement for eight weeks at Islandwood's summer camp. I created a spreadsheet that had questions that allowed me to see the differences of how children interacted with one another, the time they spent on the game or craft, body language and spoken word from them while completing the activity. The findings show that having curriculum for EE that includes teamwork, exploration, creativity, and paths for personal work helps create the longest period of time that students will be engaged with an activity. Engaging different pathways helps them create the connection with the environment. With the climate changing at a rapid rate, we need to adjust our curriculums to better suit our climate and children's needs and also the needs of children learning EE.

O, SOIL! WHAT O HORIZON THICKNESS CAN TELL US ABOUT SUMMER SOIL MOISTURE IN PACIFIC NORTHWEST FORESTS AMIDST GLOBAL WARMING.
Session: Day 1: B, Breakout Room: #7
Niki Kirihara, @nikiKirihara, Program on the Environment, University of Washington
Site Supervisor: Rowan Braybrook, Northwest Natural Resource Group
Faculty Advisor: Tim Billo, Program on the Environment, University of Washington

Rising global temperatures are rapidly impacting forests worldwide, and these changes are outpacing the adaptability of these ecosystems. Forests play a critical role in providing essential ecological services such as carbon sequestration, watershed protection, wildlife habitats, and natural resource production. However, these vital services are at risk due to the profound impacts of climate change. This research project is dedicated to enhancing forest resilience in the Pacific Northwest by investigating methods to optimize soil moisture levels over the summer. The primary focus is to understand the interactions between soil moisture in volumetric water content percentage (VWC%) and soil O horizon thickness in cm in relation to stand density and altitude. During my internship with the Northwest Natural Resource Group (NNRG) working on their climate resiliency project, I collected soil moisture and O horizon thickness data at the Nisqually Community Forest (NCF) and Taylor Mountain. I ran linear regression models to analyze the interactions between soil moisture content and O horizon thickness, looking at patterns across different stand densities at the NCF and trees per acre (TPA) at Taylor Mountain. The analysis unveiled minimal correlation between soil moisture and O horizon thickness at both sites. However, the data suggest that stand density may influence soil moisture retention during the summer. While this study does not establish causation, it offers valuable insights into potential management strategies and warrants further experimental investigation to fully elucidate the causal systems within these forest dynamics amidst climate change.

THE GREENEST BELT: UNDERSTANDING THE MOTIVATIONS AND BARRIERS TO ENVIRONMENTAL VOLUNTEERING IN URBAN GREEN SPACES.
Session: Day 1: A, Breakout Room: #8
Matthew Koay, Program on the Environment, University of Washington
Site Supervisor: Linda Becker, Friends of Harrison Ridge
Faculty Advisor: Tim Billo, Program on the Environment, University of Washington

Urban green spaces play a vital role in an increasingly industrialized world by acting as natural carbon sinks to reduce air pollution while also allowing individuals in the community to have a connection to nature in their own neighborhoods. Greenbelts, which are protected areas of open land, are one of the most common examples of these spaces, yet rely solely on volunteers and community efforts in order to maintain and improve them. The purpose of this study is to understand not only the motivating factors for long term forest stewards and first time volunteers, but the barriers to entry in regards to volunteering in order to ensure the continued maintenance and health of these spaces. To answer this question, I worked directly with the Friends of Harrison Ridge, a group of volunteers at a greenbelt in the Madison Valley neighborhood of Seattle, and surveyed and interviewed volunteers about what led them to volunteer and what prevented them from coming out more consistently. Through my research,

I found that the main motivating factors were the social aspect of group volunteer work as well as a perceived importance of the work being accomplished, whereas the most common barrier reported was the lack of transportation to the volunteer site. By highlighting these motivations and barriers, volunteer organizers can better target their projects to appeal to these motivators while offering solutions to these barriers so that more individuals can be better connected with the environment through volunteering.

REIMAGINING THE SOUND TRANSIT DISTRICT: HOW A REVISED FARE MODEL COULD TRANSFORM THE REGION'S RELIANCE ON PUBLIC TRANSPORTATION.
Session: Day 1: A, Breakout Room: #9
Mae Langford, Program on the Environment, University of Washington
Site Supervisor: Keith Kyle, Seattle Subway Foundation
Faculty Advisor: Tim Billo, Program on the Environment, University of Washington

The United States transportation sector is responsible for 28% of the nation's total greenhouse gas emissions, and private vehicle ownership is rising. An estimated 5.8 million people will live in the Seattle region in the next 30 years, and creating targeted equitable Light Rail expansion has more power than ever to create urban spaces where walking and transit are the most convenient modes of transportation. Without a fare model with rider benefits that ensure equity and affordability, however, riders can be priced out, or opt out of taking transit. The purpose of this study was to consider all the benefits and drawbacks of the fare-capping model, used by many major U.S. transit agencies, and consider its implications for application in the Sound Transit District. To accomplish this, I analyzed case studies from local and regional transit agencies that utilized this fare model and considered the following as my primary criterion: revenue recovery, ridership (current riders and new riders), and service and maintenance. Findings suggest that there are significant improvements for riders when fare capping is introduced including reduced financial burden, streamlined fare policies across agencies, standardizing revenue recovery, and increased engagement with transit. Although there is no single system that will satisfy all riders and their ability or willingness to pay, prioritizing a fare model that is simple, compatible with the entire Sound Transit district, and designed with rider benefits in mind is necessary for long-term ridership and engagement in transit.

USING REBATES TO PROTECT OUR WATERS: INCREASING EQUITABLE UTILIZATION IN THE RAINWISE REBATE PROGRAM FOR DISADVANTAGED COMMUNITIES.
Session: Day 1: A, Breakout Room: #10
Matthew Mason, Program on the Environment, University of Washington
Site Supervisor: Jenny Heins, Sustainable Ballard
Faculty Advisor: Sergey Rabotyagov, School of Environmental and Forest Sciences, University of Washington

A disproportional amount of white and higher-income homeowners utilize the RainWise rebate as lower-income populations still can't handle the upfront costs of the green stormwater infrastructure (GSI) projects that are covered. Fewer people using the rebate

means more stormwater is being drained into our sewage systems and overflowing into waterways. This study aimed to identify ways to increase the installations within disadvantaged communities to decrease stormwater entering our waterways. To accomplish this, I interviewed 12 customers and four community organizers familiar with the program to gain insights into the barriers to using the rebate and their solutions to increase equitable access to the program. The interview results indicate that the rebate is inherently inequitable as many people can't handle the upfront costs of the projects' thousands of dollars. Switching to a grant model or promoting grant options, rethinking outreach strategies towards disadvantaged communities, and expanding the eligibility requirements of RainWise are some changes to increase equity. To help renters interested in the program, RainWise reps talking directly to landlords to provide specialized information could be a potential solution. Through these pathways, more people can reap the benefits of having GSI. People with cisterns can collect water to water their gardens and save money on their water and sewage bills, while homeowners with rain gardens can have increased value in their property and the aesthetic of their yards. With more people, especially disadvantaged communities, installing GSI on private properties, the stormwater issue can be reduced to protect our waters.

NAVIGATING THE FUTURE: SUSTAINABLE LAND SURVEYING TECHNIQUES.

Session: Day 1: B, Breakout Room: #8
Darcy McCluskey, @darcy_mccluskey, Program of the Environment, Environmental Studies, University of Washington
Site Supervisor: Brian Belvis, 1 Alliance Geomatics
Faculty Advisor: Gerald Beltran, Sellen Construction and University of Washington

Traditional land surveying practices, while essential for land development and mapping, can exert a significant and often adverse impact on the environment, particularly in ecologically sensitive areas like wetlands and wildlife habitats. This paper serves as a bridge between the knowledge acquired during my internship and the subsequent synthesis of sustainable surveying practices in these fragile ecosystems. Motivated by the pressing environmental concerns associated with conventional land surveying techniques, this project aims to develop a comprehensive framework of environmentally sustainable surveying methods through rigorous research and hands-on experience. The focal point remains the reduction of land surveying activities environmental footprint within sensitive regions, with a particular emphasis on wetlands and wildlife habitats. Drawing from fieldwork, academic research, and real-world applications, this synthesis paper will provide a cohesive compilation of environmentally sustainable surveying techniques. This knowledge will serve as a valuable resource for professionals and organizations involved in land surveying, offering practical solutions to reduce the environmental impact of their activities. The research represents an integration of learned practices and emerging technologies that have the potential to make a substantial environmental difference in surveying operations. Ultimately, I aim to bridge the gap between the necessity for accurate geospatial data and the critical need for environmental preservation in ecologically delicate regions. By highlighting the significance of eco-conscious surveying practices and providing practical insights into their implementation, it offers a path forward for a more sustainable and harmonious coexistence between land surveying and the environment.

EVALUATING A RURAL COMMUNITY'S FOOD ENVIRONMENT: HOW FOOD ACCESS PROGRAMS AT A FARMERS MARKET CAN IMPROVE FOOD EQUITY.
Session: Day 1: B, Breakout Room: #9
Leila Misallati, Program on the Environment, University of Washington
Site Supervisor: Lindsay Gilliam, Carnation Farmers Market
Faculty Advisor: Eli Wheat, Program on the Environment, University of Washington

Food access programs at farmers markets are a great way to make accessing nutritious foods for people of all income levels easier. Farmers markets provide localized ways of purchasing fresher and more nutritious foods, but the perceived higher cost of food often keeps people in low-income households from attending. The Supplemental Nutrition Assistance Program (SNAP) aids many households that are low-income and food-insecure, and in recent years has been accepted at farmers markets as a resource for SNAP recipients. The purpose of this study was to identify barriers for community members that are food-insecure from attending the Carnation Farmers Market (CFM) in Carnation, WA. To accomplish this task, I monitored how many SNAP transactions were processed at each market, and took a survey on how SNAP shoppers had heard about this resource to see which ways of advertising were most effective. I created a flier to post at social services in the community like food banks, and shelters, and heard back from the managers at these locations to see the engagement with the flier. Findings show that SNAP shoppers at the CFM were most likely to know about the resource from past experiences using SNAP at any farmers market, and through word-of-mouth. SNAP shopper count at each market remained low throughout the season. There are several benefits to attending farmers markets including equity/inclusion, promoting community, and nutrition, but existing barriers including inconvenience and cost continue to inhibit attendance.

ENVIRONMENTAL EDUCATION: EXPANDING ACCESS HERE, THERE, AND EVERYWHERE.
Session: Day 1: A, Breakout Room: #11
Caitlin Naqvi, @NaqviCait, Program on the Environment, University of Washington
Site Supervisor: Julia Glassy, Fiddleheads Forest School, University of Washington Botanical Gardens
Faculty Advisor: Timothy Billo, Program on the Environment, University of Washington

Understanding and learning from our environment is a fundamental right, yet is often treated as a privilege. Environmental education (EE) offers a multitude of benefits ranging from individual welfare to broader cultivation of environmental stewardship. The aim of this study was to identify barriers to environmental education and generate solutions that schools, communities, and individuals can realistically implement. I completed an internship with Fiddleheads Forest School where I learned about creating curricula centered around the environment. I conducted six informational interviews with Fiddleheads staff and other experts in the field to learn about the barriers to EE and potential solutions that will increase access. I also completed a literature review where I gathered important context and background information regarding specific groups' experiences with and participation in EE. Through this research, I identified seven main barriers to environmental education. These obstacles extend across many communities, with each facing unique challenges respective to

their cultural and historical backgrounds. I formulated seven solutions in response to those barriers that can be reasonably executed on a small scale. Expanding access to environmental education will yield broad and profound benefits for communities historically deprived of such opportunities. We need a diverse body of voices in environmental movements because we are all impacted by the climate crisis, and we need a myriad of perspectives in order to move forward in the most effective, inclusive, and relevant way.

TRACKING THE TIDE: INVESTIGATING CRAB BIODIVERSITY AND SPAWN TIMING SHIFTS.
Session: Day 1: B, Breakout Room: # 10
Christine Nguyen, @ChristineSzR, Program on the Environment, University of Washington
Site Supervisor: Aeriel Wauhob, Highline MaST Center Aquarium
Faculty Advisor: John Horne, School of Aquatic and Fishery Sciences, University of Washington

Climate change has posed numerous challenges and effects on various aspects of the planet's ecosystem, which we believe may significantly impact the crab population. Crabs play a crucial role in the marine ecosystem by serving as both predators and prey, contributing to nutrient cycling, and influencing the structure and stability of coastal habitats. Their economic value and contribution to providing people with jobs and food are significant, therefore, understanding the status of these crustaceans will be essential for the scientific community, fisheries, and environmental organizations for management. The aim of this study was to assess changes in crab biodiversity and spawn timing of Poverty Bay from the Highline MaST Center Aquarium's previous two years of data. On set weekdays four days a week, data was collected from the aquarium's light trap each day to identify, count, and record when, how many crabs, and the kind of crabs we caught. This is then graphed with data visualizations to infer possible trends with the current and previous years' data to see any changes in biodiversity and spawn timing. It was found that biodiversity may have increased but requires a larger collection of data for accuracy and credibility in differences in identification expertise. Dungeness crabs have been observed to possibly have a change in later spawn timing with the opposite for shore crabs. Biodiversity data may be useful for ecosystem-based management while spawn timing will help commercial fisheries and environmental firms adapt and respond to established policies accordingly.

WORKING HARD OR HARDLY WORKING? HOW TO INCREASE EMPLOYEE ENGAGEMENT WITH SUSTAINABILITY. **Session:** Day 1: B, Breakout Room: # 11
Jen Ortiz, @JenO_capstone, Program on the Environment, University of Washington
Site Supervisor: Erik Throndsen, Talking Rain
Faculty Advisor: Fred Pursell, Foster School of Business, University of Washington

Companies are facing challenges in their business structure as more and more consumers and employees are looking for ethical and environmentally friendly places to shop and work at respectively. Companies have started taking a closer look at their external emissions, but they also need to take a look at their internal emissions to avoid greenwashing. External emissions are those that come from transportation and outsourcing. Internal emissions reduction has more to do with company values and culture than greenhouse gasses. The purpose of this

study was to figure out how companies can increase employee engagement with sustainability initiatives. To accomplish this task, I worked with a 3rd party gamification app to carry out my project, I conducted research on how other companies were tackling this issue, I conducted in-depth personal interviews with employees, and I met with company stakeholders. Findings show that employee input is most effective in employee engagement and employees were invested in the company's sustainability initiatives because they aligned with their own values. With real effort, companies can change their internal culture to one that encourages sustainable behavior for employees which will show consumers they're in it for the right reasons.

INTEGRATED IS BEST: HOW LIGHT RAIL AND BUSES WORKING IN CONJUNCTION WILL INCREASE THE USABILITY OF SEATTLE'S TRANSIT SYSTEM. **Session:** Day 2, In-Person
Jordan Priest, Program on the Environment, University of Washington
Site Supervisor: Arthur Bachus, Seattle Subway Foundation
Faculty Advisor: Lyle Bicknell, University of Washington

Public transportation plays a crucial role in urban cities, bridging the wealth gap, improving accessibility, and reducing carbon emissions from car pollution. Seattle, known for its traffic congestion, has recognized the importance of investing in public transportation, including the integration of light rail. There is currently one light rail line in operation in the city of Seattle, widely referred to as the "1-Line". There are ongoing advocacy efforts in the city to expand the reach of Seattle's currently lackluster public transportation network, yet advocates are often in disagreement about the best mode of transportation to invest in. Some argue that light rail is the most efficient way to move riders, while others claim that light rail stations harm vulnerable communities and that buses are more practical. As a result, many public transportation proposals have been blocked or stalled. The purpose of this study was to find out which public transportation mode (bus or light rail) is the most effective and sustainable for the city of Seattle. To accomplish this task I conducted an extensive literature review, interviewed experts in the field, and performed site surveys of local light rail stations and bus lines. Through my literature review and interviews I investigated indicators of a successful system, including network density, service level, and reliability, for both buses and light rail. Findings show that success indicators are the greatest in areas where light rail and buses work in conjunction and where both modes are running with frequency, consistency, and long hours.

TACKLING TRASH: UNDERSTANDING HUMAN WASTE BEHAVIOR IN HUSKY STADIUM.
Session: Day 2, In-Person
Riley Ramirez, Program on the Environment, University of Washington
Site Supervisor: Karen Baebler, UW Athletics
Faculty Advisor: Christian Primack Metcalfe, Foster School of Business, University of Washington

Landfilled waste has significant impacts on the environment and is a powerful driver of climate change. Over 100 million people attend sporting events each year, which leads to a significant

amount to waste being generated, even when waste prevention or diversion methods are in place. The aim of this study was to analyze the impact that informational signage has on human waste behavior and how that effects the diversion rate at Husky Stadium. To accomplish this, I interned with UW Athletics and conducted an observational intervention study at the first two games of the 2023 UW Football season. I recorded data on every three event attendees' disposal behavior, including factors such as the types of materials they discarded, the time spent disposing, if there was an appearance of thought, whether or not they sorted their materials, etc. Findings show that signage does not have a significant impact on waste disposal behavior. Confusion and convenience were the main underlying drivers that prevented individuals from properly disposing of their waste. Although informational signage is an essential educational measure for increasing waste diversion in a stadium, it will not be the driving factor in achieving zero waste. Rather, limiting concessions products to be reusable, compostable, or recyclable, as well as reducing the amount of different materials in the stream, will reduce the amount of waste sent to landfill and help Husky Stadium reach its waste diversion goal.

TRANSIT-ORIENTED-DEVELOPMENT (TOD): A BLESSING OR ROADMAP TO GENTRIFICATION?.
Session: Day 2, In-Person
Aliyah Recasner, @Aliyah_UW, Program on the Environment, University of Washington
Site Supervisor: Arthur Bachus, Seattle Subway Foundation
Faculty Advisor: Kessie Alexandre, Department of Geography, University of Washington

As the search for climate mitigation efforts continue in Seattle, it is imperative to look beyond environmental benefits alone. Historically, improvements in the transportation sector have disproportionately harmed those that were underrepresented in the first place whether it be short-term via displacement or decades-long gentrification. This study was meant to find the correlation between TOD and gentrification as well as local enthusiasm and concerns for the Link light rail in the Central District. To answer my questions, I conducted interviews with community leaders and organizations, business owners and gathered survey responses from individual residents. Additionally, I conducted research for effective advocacy for vulnerable communities, influences relating to infrastructure placement, and how this correlates with gentrification. I complied each peer reviewed journal into a bibliography for the purpose of answering my thesis question. The overarching issue identified within my internship and research is that there is a strong correlation between infrastructure development and gentrification. To combat this, there needs to be changes to the way we design stations and the housing projects in proximity to them and implement policy changes. These results are significant because green sustainable transit options can stem into an environmental justice issue. Seattle residents deserve to have their tax dollars spent in ways that better their lives; we have the potential to become a model city in how we remedy underdeveloped neighborhoods. Sustainability is only possible if all communities are uplifted.

OPPORTUNITIES FOR MINORITIES: HOW EXPANDING THE SCOPE OF ENVIRONMENTAL INTERNSHIPS CAN IMPROVE DIVERSITY. **Session:** Day 1: A, Breakout Room: # 12
Jaiden Reese, @jaidenreese22, Program on the Environment, University of Washington
Site Supervisor: Dan Tonnes, National Oceanic and Atmospheric Administration
Faculty Advisor: Kristie Ebi, Center for Health and the Global Environment, University of Washington

The diversity of the environmental field is lacking and recruitment efforts do not currently appeal to minorities due to there being no focus on their needs and interests. However, a diverse set of perspectives is essential to generating creative solutions to environmental problems. The purpose of this study was to find out what recruitment strategies appeal to different demographics so that changes in tactics could be made. Through my internship with the National Oceanic and Atmospheric Administration (NOAA), I administered surveys to investigate the question of what factors students consider when searching for an internship. I also conducted interviews to get a more in-depth look at individual experiences with NOAA and internships. In addition to that, I performed a literature review to find information on strategies that had not previously been considered. I found that students are mainly looking for work experience through internships and have fairly little knowledge of opportunities with NOAA outside of environmental majors. They also expressed difficulty with finding opportunities that applied to them. So to increase diversity in recruitment, more students should be made aware of opportunities, even those outside of environmental majors. The opportunities should also focus more on the specific features that minorities search for in internships, such as pay, particular work experience, and focus on issues related to communities they are part of, rather than more generalized projects that may not appeal to them specifically.

MYCO-FILTRATION FOR CLIMATE RESILIENCE AND CIRCULARITY.
Session: Day 2, In-Person
Keya Roy, @KeyaRRoy, Program on the Environment, University of Washington
Site Supervisor: Tatiana Brown, University of Washington Campus Sustainability Fund
Faculty Advisor: Ken Yocom, Landscape Architecture, University of Washington

As climate change intensifies wildfire smoke seasons in Western Washington, HEPA (High-Efficiency Particulate Air) filtration becomes crucial to protect humans, plants, wildlife, and ecosystems from hazardous smoke particles. However, the production of conventional synthetic HEPA filters generates toxic environmental pollution and drives climate change, thus creating the conditions for further wildfires. Furthermore, these synthetic HEPA filters cannot operate outdoors, leaving those without the privilege of indoor access vulnerable. Therefore, this project explores an alternative HEPA filter material that is inexpensive, sustainable, and outdoor-compatible: mycelium composites upcycled from regional mycocultural wastes. A study aimed to evaluate the optimal fungal species of upcycled mycelium composites for smoke particle filtration. First, interviews were conducted to ascertain the most frequently discarded fungal species of spent mycelium blocks by Western Washington mushroom farms. Next, mycelium composites of those fungal species and a synthetic storebought HEPA filter (control) were exposed to simulated wildfire smoke. Finally, microscope imaging was used to

compare their smoke particle filtration performances. Results indicate that of the fungal species of spent mycelium blocks most frequently discarded by regional mushroom farms, Hericium americanum mycelium composites exhibit the highest smoke particle filtration efficiency, roughly twice that of the synthetic HEPA filter. An outdoor air filtration structure prototype utilizing H. americanum mycelium composites was then developed and integrated into the landscape design produced during my capstone internship. This prototype will establish a precedent for this novel air filtration technology that holds the power to simultaneously promote climate resilience and repair waste relations within our region.

BRIDGING THE GAP BETWEEN TRADITIONAL WISDOM AND SCIENCTIFIC ADVANCEMENTS.
Session: Day 1: A, Breakout Room: #13
Ayana Sabbas, Program of the Environment, University of Washington
Site Supervisor: Jason Gobin and Melissa Gobin, Tulalip Tribes Natural Resources
Faculty Advisor: Charlotte Coté, Department of American Indian Studies, University of Washington.

Indigenous peoples have been excluded from the environmental conversation, overlooked and casted aside as their traditional wisdom is labelled as irrelevant, generally known, and dated. Although having this knowledge has been gathered over millennia and passed from generation to generation, its value is often overshadowed by western sciences. My research investigated and highlighted the importance of bridging the use of western science and traditional ecological knowledge in natural resource management. I conducted a literature review of scholarly sources that highlighted the value in creating a system that encourages cooperation between indigenous peoples and western science in the management of natural resources, as well as case studies of projects that incorporate traditional ecological knowledge into management practices. I also sought out first-hand insight and input from indigenous community members from the area I worked in, Tulalip WA, as well as speaking with the experts in Tulalip Tribes Natural Resources. The results from both all my research and findings were that there is a holistic perspective brought when bridging the two systems of knowledge as well as the importance of inclusivity in this field of environmental science. Increasing the cooperation between traditional knowledge keepers and natural resource managers creates inclusive management practices that not only protects resources for future generations but has the potential to benefit indigenous communities and protect their tribal rights and intellectual property.

CREATING FRUITFUL COMMUNITIES: IDENTIFYING BARRIERS AND SOLUTIONS TO ESTABLISHING AN EQUITABLE FOOD SYSTEM THROUGH URBAN AGRICULTURE.
Session: Day 1: B, Breakout Room: #12
Mya Sands, @myasando, Program on the Environment, University of Washington
Site Supervisor: Tiare Gill, City Fruit
Faculty Advisor: Eli Wheat, Program on the Environment, University of Washington

Food insecurity, or a limitation to adequate food or nutrition, is a prevalent issue today, impacting 1 in 9 households in the United States. Food insecurity is also twice as likely to affect

Black and Hispanic households and can lead to chronic illness and mental health issues. The purpose of this study was to identify if community-based urban agriculture can lower instances of food insecurity within urban environments, as well as the barriers and benefits to engaging in this form of agriculture. To accomplish this task, I worked with the nonprofit City Fruit where I attended volunteer and education events and created resources on fruit trees and food equity. I also conducted a literature review of community-based urban agriculture including its relationship to food insecurity, successful efforts, and barriers to participation. Additionally, I administered an online survey to understand community perceptions of the benefits and limitations to urban agriculture. Findings show that urban agriculture aids in lowering rates of food insecurity. Urban agriculture also provides communities with emotional, physical, and socio-ecological benefits. Major barriers to engaging in urban agriculture include large time commitments, a need for specialized agricultural knowledge, and a lack of support from city officials and agricultural agencies. Given that community-based urban agriculture both lowers rates of food insecurity and provides a multitude of benefits, local governments and agricultural institutions should prioritize and support its expansion. If the current rates of food insecurity are reduced, we can begin to create a more equitable society.

CIRCULAR ECONOMY ADOPTION IN CONSTRUCTION: STAKEHOLDER PERSPECTIVES AND STRATEGIES. **Session:** Day 1: A, Breakout Room: #14

Anna Schmitz, @AnnaSchmitz56, Program of the Environment, University of Washington
Site Supervisor: Kinley Deller, King County Solid Waste Division and Alex Erzen, King County Department of Natural Resources and Parks
Faculty Advisor: Ben Packard, EarthLab, University of Washington

Construction and demolition activities globally generate 600 million tons of waste, contributing significantly to environmental degradation and resource depletion. This waste can be effectively mitigated by adopting circular economy principles that prioritize the reduction and recycling of construction and demolition materials. The implementation of circular economy initiatives within the construction industry holds the potential to mitigate carbon emissions, foster local job creation, and reduce material costs. This study aims to provide a better understanding of how to engage stakeholders in circular economy efforts within the construction sector. To achieve this, I interned with King County's Solid Waste Division and conducted a comprehensive survey of local stakeholders to assess their interest in a Salvage Lumber Warehouse, a key element in their circular economy strategy. The findings reveal that a majority of stakeholders express a strong interest in participating in circular economy initiatives; however, they often lack adequate information on how to do so effectively. This knowledge gap highlights the need for improved awareness and education to facilitate their involvement. Furthermore, the survey results demonstrate that most stakeholders highly value the concept of a circular economy and believe that its implementation will enhance the value of their companies. This research emphasizes the importance of engaging construction industry stakeholders in circular economy efforts and highlights the potential benefits that can be realized through Salvage Lumber Warehouses and similar initiatives. It also emphasizes the significance of addressing information gaps and promoting awareness to create a more sustainable and economically viable construction industry.

CONVENTIONS, CARBON, AND CENTRALITY: METHODS FOR REDUCING EMISSIONS FROM TRAVEL IN THE EVENT AND CONVENTION INDUSTRY.
Session: Day 1: B, Breakout Room: #13
Erin Schobbe, @erinschobbe, Program on the Environment, University of Washington
Site Supervisor: Robert Gottschalk, AQ Green TeC
Faculty Advisor: Caitlin Ainsley, Department of Political Science, University of Washington

Up to 95% of the greenhouse gas (GHG) footprint of an in-person event or convention comes from participant travel. As the industry rebounds from Covid-19, it is important to consider creative ways of reducing emissions in this category to improve event sustainability and retain the benefits of in-person conferencing. The aim of this study was to investigate reduction opportunities for emissions from travel and propose sustainability strategies for event organizers. This was investigated through a case study on historical convention data with counterfactual scenarios, in addition to extensive academic research and hands-on experience in the industry working on carbon calculations at AQ Green TeC. Working with a large array of travel-related emissions data helped me learn carbon calculation methodology, as well as a sense for industry norms and opportunities for improvement. Through this study, I found that venue centrality in relation to participants' origin locations and opportunity for land travel over aviation were key to a carbon efficient event. Additionally, the opportunity for enhanced remote participation can allow for a large reduction in emissions from long-distance attendees, and improve the accessibility of the event. Reducing emissions from participant travel is key to carbon efficient events as it remains the largest category of emissions for most in-person events. Therefore, good travel data collection is imperative, and significant carbon reductions here contribute heavily to the sustainability of the event and convention industry as a whole.

DRIVING CHANGE: SOLAR-POWERED TRANSPORTATION PATH TO A CARBON-FREE FUTURE.
Session: Day 1: B, Breakout Room: #14
Eddie Shelton, Program of the Environment, University of Washington
Site Supervisor: Jaime Cantos, Merlin Solar
Faculty Advisor: Barry Erickson, Foster School of Business, University of Washington

Ground transportation is an integral part of our economy and daily lives, but it also contributes significantly to carbon emissions, fueling climate change. The transportation industry must transform to combat this pressing issue, and solar energy emerges as the pivotal solution. Solar power, a widely adopted source of clean energy in homes, commercial structures, and solar farms, holds the potential to revolutionize ground transportation and substantially reduce emissions. The primary aim of this study was to explore how solar energy can reshape transportation and propel us toward a 100% carbon-free future. This summer, I worked at Merlin Solar, a pioneering solar company that has developed flexible solar panels featuring a patented grid pattern technology. I conducted performance tests, comparing our panels to previous models and competitors. In addition to my Merlin Internship, I have had a role as an Aptera car ambassador, which has shed light on the immense promise of cars layered with solar panels. Aptera's solar electric car, designed strictly mathematically for maximum

efficiency, can be charged entirely through solar panels, producing zero emissions and requiring only one or two monthly charges. Merlin Solar's flexible panels can be seamlessly integrated into large vehicles, powering them while enabling refrigeration and eliminating the need for idling and jump-starting dead batteries. These innovations have the potential to make a significant impact on reducing carbon emissions from conventional vehicles. As climate change continues to advance, the emergence of these innovative solar transportation solutions offers hope for a sustainable and eco-friendly future.

SAVING THE ENDANGERED BLACK ABALONE: RECOMMENDATIONS FOR TRANSLOCATIONS AND CHARACTERIZING JUVENILE RECRUITMENT HABITAT.

Session: Day 2, In-Person
Tiffany Shin, @tiffanyshin6, Program on the Environment, Political Science, University of Washington
Site Supervisor: Susan Wang, National Marine Fisheries Service, West Coast Region
Faculty Advisor: Lawrence Watters, Visiting Faculty of the College of the Environment, University of Washington

Black abalone is an endangered species of marine snail found along the California coast in rocky intertidal and shallow subtidal reefs. In the 1980s to 2000s, the withering syndrome (bacterial disease) triggered mass mortality events throughout black abalone's range, and the population is still struggling to rebound. The purpose of this study was to work with NOAA Fisheries to recommend the best practices and methods for translocations and characterizing juvenile recruitment habitat in two white papers. To accomplish this task, I completed an expert elicitation, interviewing twelve black abalone experts. Expert interview responses and key lessons from literature were thematically organized and synthesized to inform effective methods and to identify research gaps. The concluded recommendations of the study were derived from analyzing these materials. Experts' opinions and literature revealed three main takeaways: (1) understanding how black abalone habitat contributes to translocation success, (2) clarifying experimental methodologies, and (3) developing a deeper understanding of the biotic and abiotic needs of juvenile abalone. Recommendations focused on restoration site selection criteria, challenges with tracking abalone movement and translocation success, improvements on tagging and monitoring methods, and the use of dedicated focused surveys and juvenile recruitment modules for studying reproduction and dispersal patterns. As a key species, black abalone restoration stabilizes California's intertidal ecosystem and encourages cultural development by near-shore activities and tribes. The methodology of this research, distilling expert perspectives and literature, is an effective method for creating a blueprint of ideal current methods and future research directions for endangered species protection globally.

THE ROLE OF SOCIAL NORMS IN WATER CONSERVATION BEHAVIOR INTERVENTIONS.
Session: Day 1: B, Breakout Room: #15
Rhea Shinde, @rheashinde2, Program on the Enviornment, Philosophy, University of Washington
Site Supervisor: Site supervisor: Liesel Hans, Alliance for Water Efficiency
Faculty Advisor: Salar Jahedi, Affiliate Professor, Economics, University of Washington and Principal Economist, Amazon

The U.S is facing a future of water shortages and heightened water vulnerability. Residential water use is one sector that offers potential for consumption improvements; behavior change interventions offer a new way forward in these efforts. Since behavior change has a large social component, the aim of this research was to understand how social norms impact the ways in which individuals think about water conservation. The internship portion of this project was completed with the Alliance for Water Efficiency and consisted of creating a literature review on applications of behavioral economic principles to water conservation efforts and constructing a list of recommendations on which principles were most applicable to the task. This research was supplemented by a survey designed to eke out Greater Seattle Area residents' perceptions and opinions about water use norms and behaviors. Water use social norms were found to be most prevalent to people already environmentally inclined. Additionally, people who report taking conservation actions around their home are also more likely to perceive conservation norms. Lastly, socially priming individuals made them more likely to perceive conservation norms. These results are significant in guiding how to choose the type of behavior interventions that will be most impactful in a given population. It also highlights the importance of paying attention to in-group norms when designing behavior interventions. For example, social comparisons are more likely to lead to decreases in water consumption in environmentally friendly areas, while more specific in-group norms may need to be leveraged for less pro-environment populations.

SOCIAL MEDIA FOR SOCIAL CHANGE: HOW NONPROFITS CAN USE SOCIAL MEDIA TO INCREASE STAKEHOLDER COMMUNICATIONS AND GAIN FUNDING.
Session: Day 1: A, Breakout Room: #15
Nina Shuken, Program on the Environment, University of Washington
Site Supervisor: Peter Donaldson, Sustainability Ambassadors
Faculty Advisor: Nives Dolsak, School of Marine and Environmental Affairs, University of Washington

Small environmental nonprofits do critical work in communities. Their efforts account for copious amounts of grassroots-level sustainable environmental action. Many nonprofits struggle with the same problem - funding. The purpose of this study was to examine how small environmental nonprofits can utilize social media efficiently when communicating their mission to stakeholders. It also aims to answer how this utilization of social media can lead to increased communication with stakeholders, and subsequently an increase in funding. In order to answer these questions, a multi-discipline study was conducted, spanning sustainability, marketing, communications, and economics. By compiling the most relevant research from across the fields, as well as observing and talking to experts, this study was able to put forth a

set of resources and guidelines that small environmental nonprofits can use to boost their social media presence. It was determined that delegation (forming a specific group for this need and assigning them jobs and responsibilities) would be an incredibly important tool, as the resources of small environmental nonprofits do not usually lend themselves to hiring marketing or social media managers. In addition to this, communication skills such as 2-way and values-based communication would increase the likelihood of stakeholders wanting to continue engaging with the mission of these nonprofits. By incorporating several fields of research, this study was able to compile the most efficient ways for small environmental nonprofits to be an active and present part of the community, while continuing to gain the resources that are necessary for their work.

HARVESTING SOLUTIONS: A STUDY OF BARRIERS TO ACCESS WITHIN ALTERNATIVE FOOD NETWORKS. **Session:** Day 1: B, Breakout Room: #16
Ella Simmons, @ell_a_simmon, Program on the Environment, University of Washington
Site Supervisor: Shannon Bly, Whidbey Island Grown
Faculty Advisor: Eli Wheat, Program on the Environment, University of Washington

Alternative Food Networks (AFNs) are an extremely valuable addition to local food systems. AFNs such as farmers markets and food hubs provide people with access to sustainable and fresh produce, stimulate the local economy, and are a major source of income for the producers. Despite the extensive benefits, the full potential of AFNs support for communities has not been realized. Significant barriers prevent both farmers, organizations, and customers from accessing the full range of advantages AFNs can provide. The purpose of this study is to identify and conceptualize the barriers to access within AFNs for both producers and organizational parties. To do this, I conducted interviews, reviewed literature, and gathered observation evidence with the following questions in mind: What factors contribute to the barriers to access in local food networks, specifically food hubs and farmers markets? How can these barriers be addressed and rectified? Ultimately, I discovered that there are many different dimensions of barriers such as regulations, timing, location and pricing. Governmental regulations, like zoning requirements, are hindering the development of AFNs and timing/locational aspects are keeping farmers away from valuable farm work. Additionally, the host organization, producer, and customer struggle with pricing disagreements. These aspects keep communities from experiencing the full benefits of these networks. To change this, each category of barrier needs to be addressed. Only then will AFNs reach their full potential and fill current gaps (food insecurity, high costs, excessive waste, ect.) in our food systems, like they were intended to do.

REGENERATING PACIFIC NORTHWEST SALMON HABITAT THROUGH RIPARIAN RESTORATION.
Session: Day 1: B, Breakout Room: # 17
Felicity Strzelec, @fsstrz, Program on the Environment, University of Washington
Site Supervisor: Whitney Neugebauer, Whale Scout
Faculty Advisor: Jason Toft, University of Washington School of Aquatic and Fishery Sciences

Salmon in the Pacific Northwest serve not only as an important keystone species but also provide local businesses, communities and tribal nations revenue through fisheries. Therefore, protecting the habitats of rivers and streams ensures that salmon can continue to provide for the ecosystems and people of Washington. However, in recent years, human developments such as urban areas, roads and dams are impeding and taking over salmon riverine habitat, thus making it increasingly difficult for salmon to migrate back to their spawning grounds. The purpose of this internship with the non-profit organization Whale Scout was to protect salmon habitat through restorating the riparian zones (vegetated areas adjacent to rivers and streams) of the Sammamish River and Bear Creek. The methods used to restore the riparian zone were invasive vegetation removal and native planting. Field monitoring of both sites was also carried out to document the growth and health of the restored areas. This study indicated that the native tree and shrub health and growth improved as invasive species were taken out. Consequently, the resorted riparian zones of the Sammamish River and Bear Creek were able to enhance salmon habitat by adding shade cover to make the water cool and providing woody debris and litter to help promote water filtration and important nutrient cycling. Ultimately, this study illuminates the benefits of native vegetation to salmon habitat, suggesting that riparian restoration can be an effective tool in protecting salmon populations of the Pacific Northwest.

TO BETTER SERVE OUR COMMUNITIES: INFORMING GOVERNMENT STAFF ON CONNECTIONS BETWEEN CLIMATE CHANGE AND SOCIAL JUSTICE.
Session: Day 2, In-Person
Lyn Tampi, @LynTampi, Program on the Environment, School of Public Health, University of Washington
Site Supervisor: Vicky Raya, King County Department of Natural Resources and Parks
Faculty Advisor: Meagan Doll, Department of Communication, University of Washington

Climate change will impact us all, but not in the same ways. Many climate action plans do not address this, and if they do, it is usually newly added. King County's Strategic Climate Action Plan is an example of this, addressing this issue in its latest iteration. However, knowledge on the section is limited among staff at King County. To increase awareness, I created a communication plan for my internship. I first gathered information by surveying and interviewing the staff working directly on projects in the section as well as surveying staff working indirectly in the section. I asked about their awareness on the topics, what they found important, and how to go about increasing awareness. From analyzing the results, I found there was a need to increase general awareness about connections between climate change and social justice. I also found that staff wanted to rely on current communication channels and materials before implementing new ones. In my plan, I created a schedule for implementing each of these materials while emphasizing discussions for people to learn from

each other. The implications of education on these topics includes increasing motivation in staff by having a better understanding of what the county is doing against climate change. Another implication is that staff will be more effective at their work, increasing their capacity. By understanding what the communities they work with are doing right now, staff are enabled to better serve their needs.

FROM FIELDS TO TABLES: THE POWER OF FOOD PRESERVATION IN GLEANING ORGANIZATIONS. **Session:** Day 2, In-Person
Ezra Thomason, @oliveplanter, Program on the Environment, University of Washington
Site Supervisor: Bennett Walkes, City Fruit
Faculty Advisor: Yona Sipos, Department of Environmental and Occupational Health Sciences, University of Washington

The seasonal nature of harvesting often constrains gleaning organizations from their goal of collecting excess fresh food from harvests, and food preservation offers the opportunity to establish a year-long approach. Gleaned fruit is typically distributed to food banks and charitable organizations that serve food-insecure populations, ensuring that surplus and excess produce does not go to waste and instead reaches those in need. Nevertheless, in the off-season, these food banks experience a shortage of nutritious fruit and other local produce, highlighting the potential role of food preservation methods in bridging this supply gap. The primary objective of this research was to identify optimal food preservation that balances nutrient retention of Vitamin B and C with efficiency gains in terms of time, space, and energy, particularly for smaller organizations. Through trials at home and scholarly research, I researched various methods of food preservation, namely dehydration, canning, and freezing. While at City Fruit, I encountered challenges integrating preservation with gleaning organizations, primarily stemming from time and space constraints during the harvest season. Consequently, from the study results, it became evident that smaller organizations should adopt a mix of canning and freezing methods for preservation, and dehydration was not a viable option due to health and safety laws. Food preservation can benefit the public and environmental health communities by increasing food security in food banks and reducing food waste during harvest season. Preservation also contributes to cost-efficiency and nutrient retention while supporting sustainable, community-driven initiatives.

DRY RIVER, WET EYES: AN EXPLORATION OF WHAT MAKES OR BREAKS COLLABORATION AS A TOOL FOR ENVIRONMENTAL PRACTITIONERS. **Session:** Day 1: A, Breakout Room: # 16
Gracie Thomsen, @gthomsenuw37, Program on the Environment, English
Site Supervisor: Alison Schweitzer and Mary Rabourn, King County Stormwater Services
Faculty Advisor: Yen-Chu Weng, Program on the Environment, University of Washington

Environmental practitioners on the front lines of environmental degradation face problems like harmful emotions as part of their job in the environmental field. These problems can place unnecessary and debilitating burdens upon practitioners that can sometimes feel quite isolating. When looking for a solution, I found that communal coping and collective action can

help relieve people's burdens, so I wondered how a similar concept, collaboration, could be used as a tool by practitioners to protect their mental health as well as progress their work. The aim of this study was to understand what makes or breaks collaboration as well as how positionality (age, race/ethnicity, gender, work position, work experience) can affect these collaborative connections. Interning with King County, I conducted semi-structured interviews and a survey. Through our research, we identified some of the ins and outs of collaboration. Practitioners enjoyed sharing different perspectives, better outcomes, and efficiency/success. However, collaboration does come with some downsides as the time it takes and the people involved don't always contribute to the experience. Practitioner's positionality and how they were treated/treated others was also confirmed as a barrier to connection, along with remote work. The implication of this research is that collaboration does ample good for environmental practitioners and their work and as such it is important to foster healthy collaboration within the environmental field. This research also highlights the importance of addressing how practitioners treat one another, as having safe and respectful connections is part of useful collaboration and overall well-being.

BEAVERS: AGRICULTURE'S FOE TURNED FRIEND. **Session:** Day 1: A, Breakout Room: # 17
Charlotte Till, @CharlotteTilll, Program on the Environment, Business Administration: Entrepreneurship, University of Washington
Site Supervisor: Linda Lyshall, Snohomish Conservation District
Faculty Advisor: Clare Ryan, Environmental and Forest Science, College of the Environment, University of Washington

Growing socioeconomic and climate change pressures will lead to a 20 percent net increase in global water requirements. Water availability and stability will decrease in the coming years, making innovative solutions essential to aiding agricultural irrigation needs. Traditional beaver management focuses on the removal and relocation of beavers, but these avenues are expensive and temporary, as beavers often return to the same areas. Beavers are environmental engineers, so improved management solutions are necessary to minimize human-beaver conflict to allow beavers to be part of the solution for increasing water quantity and quality. The aim of this study was to identify the best ways to reduce human-beaver conflicts in agriculture water systems to allow for coexistence in Snohomish County. To accomplish this, my research focused on reviewing literature and interviewing employees at Snohomish Conservation District to compile information and data about key environmental and human issues facing the county. Technologies like pond-levelers, culvert protection and tree caging control water levels and vegetation access without removing beavers altogether. My research found these methods are the best way to provide cost effective and long-term coexistence solutions. Pressures from human development and decreases in available land make it more important to find ways to coexist with wildlife. Beavers could provide a solution to irrigation increases in coming years, providing increased climate resilience and protections for other critically threatened habitats.

FROM THE GROUND UP: HOW TO INCORPORATE COMMUNITY VOICES ON ENVIRONMENTAL JUSTICE INTO THE NATIONAL ENVIRONMENTAL POLICY ACT. **Session:** Day 2, In-Person
Lucy Toner, @lucyjtoner, Program on the Environment, Law, Societies & Justice, University of Washington
Site Supervisor: Arthur Bachus, Seattle Subway Foundation
Faculty Advisor: Lawrence Watters, Guest Faculty in Environmental Law, University of Washington

Socioeconomic inequities frequently result in environmental injustices ranging from fewer parks and natural space to a lack of clean drinking water sources. These kinds of environmental injustices are directly influenced by the types of development projects in the area. Since the rise of the Environmental Justice (EJ) movement in the mid to late 20th century, the National Environmental Policy Act (NEPA) has been a vital tool for incorporating EJ into all development considerations. The aim of this study is to understand how communities would like to see EJ considered during federal and state development. To research this I worked with Seattle Subway Foundation on community outreach, which included interviews with community leaders in South Park Seattle, surveys from local residents, and attending community events such as Neighborhood Association Meetings. This research resulted in three main findings. First, community members were unclear on language – both how to define EJ and the language used in project descriptions – which contributed to a lack of confidence in providing their opinions. Secondly, community members want to be brought into the planning processes earlier when there is more flexibility in identifying harmful practices and providing the space for community members to advocate for alternatives. Finally, many community members suggested utilizing active community organizations, such as Neighborhood Associations, to reach the general population through established and trusted community groups directly. Overall, clear language, starting involvement earlier, and utilizing long-standing community connections are all vital to positive community development and preventing new or continued inequality.

BE A GOOD SPORT, DON'T FORGET TO SORT: BEST PRACTICES FOR WASTE DIVERSION PROGRAMS IN SPORTS STADIUMS. **Session:** Day 1: B, Breakout Room: # 18
Maysen Westling, Program on the Environment, University of Washington
Site Supervisor: Karen Baebler, University of Washington Athletics
Faculty Advisor: Kristi Straus, Program on the Environment, University of Washington

Waste contributes to environmental issues including greenhouse gas emissions, misuse of finite natural resources, and pollution that negatively impacts environmental and human health. While sports stadiums are a source of entertainment for many, they generate a substantial amount of waste. Currently, Husky Stadium diverts approximately 75% of its waste from the landfill using composting and recycling, however, increasing waste diversion can further reduce the environmental footprint of the facility. This study aims to identify strategies for the assessment and implementation of waste diversion in Husky Stadium to increase its waste diversion rate. To address this, I interned for UW Athletics and interviewed 15 operations and sustainability staff from the PAC-12 conference to collect data on barriers to implementation, methods for assessment of waste diversion programs, and solutions to

improve waste diversion efforts. Additionally, I conducted a literature review to examine how other stadiums implemented diversion strategies in their operations. Findings indicate that effective strategies for assessment include mapping high-traffic waste receptacles and conducting an analysis of greenhouse gas emissions. I also found that waste diversion rates can be increased by implementing strategies including utilizing visual sorting, educating fans and staff, and implementing innovative waste receptacle features. These findings are significant to my host organization because they allowed me to produce a summary of recommendations to be implemented in Husky Stadium and to be shared with other collegiate athletic programs. Utilizing these strategies is essential for improving waste diversion programs and reducing the impacts of sports facilities on the environment.

THE THREE C'S OF MARKETING TO UNDERSERVED COMMUNITIES: CONNECTION, COMMUNICATION, AND CULTURE. **Session:** Day 1: A, Breakout Room: # 18
Anna Marie Wing, @enviranna, Program on the Environment, University of Washington
Site Supervisor: Josh Epstein, NE Seattle Tool Library
Faculty Advisor: Rebakah Daro Minarchek, Integrated Social Sciences, International Studies, University of Washington

Underserved communities are often neglected from opportunities that could greatly benefit them due to poor marketing and outreach strategies that do not acknowledge the circumstances that these individuals are in. The purpose of this study was to understand what the best outreach practices are for reaching underserved communities so that nonprofit organizations can execute a meaningful marketing plan. To assist the Northeast Seattle Tool Library — a nonprofit sharing economy focused on increasing accessibility to tools — with this issue, I interviewed 11 nonprofits that have made the intentional effort to tailor their outreach to better reach these communities. After analyzing the answers from each of these organizations and comparing them with online literature, I found three prominent reoccurring ideas integral to appropriately reaching these diverse groups. The results indicated the importance of creating a genuine connection between nonprofits and their targeted underserved communities, which supported the other main ideas of overcoming communication barriers and utilizing culturally appropriate content. This information could inform other nonprofits so that they can utilize thoughtful marketing strategies to develop a relationship built on trust, which can encourage underserved communities to involve themselves in organizations that can assist them. Doing so helps to bridge the gap of inequality by supporting communities that might not otherwise have access to the offered resources of a nonprofit organization.

FROM DATA SCIENCE TO WORKFORCE DIVERSITY: REVOLUTIONIZING ENVIRONMENTAL RECRUITMENT STRATEGIES. **Session:** Day 1: A, Breakout Room: # 19
Shirley Yao, Program on the Environment, Information School, University of Washington
Site Supervisor: Dan Tonnes, National Oceanic and Atmospheric Administration
Faculty Advisor: Ott Toomet, Information School, University of Washington

Workforce diversity plays a pivotal role in the environmental sector and beyond, fostering creativity and equitable decision-making. However, women and minorities are more underrepresented in the environmental field compared to the mainstream workforce, with even fewer in federal agencies. The purpose of this study is to discover how the use of data science can enhance recruitment strategies to promote diversity in the environmental workforce. To accomplish this task, I interned with National Oceanic and Atmospheric Administration (NOAA) to create recruitment strategies that promote workforce diversity utilizing web searches to collect data on Washington State colleges, R programming for data analysis, and R Shiny for data visualization and hotspot analysis. My capstone internship revealed three key findings. First, data collection and analysis can build pattern identification of workforce diversity, aiding in strategy development. Second, data visualization facilitates effective communication of recruitment information to decision-makers and recruiters. Lastly, hotspot maps pinpoint recruitment hotspots, allowing for targeted recruitment efforts based on proximity. These three attributes of data science identified in my finding—data collection, data visualization, and hotspot mapping—serve as the foundation for enhancing recruitment strategies. They offer a blueprint for best practices in recruitment, benefiting NOAA and similar environmental agencies. Moreover, these findings bridge the knowledge gap on how data science can be leveraged to establish recruitment approaches that drive diversity and increase the representation of underrepresented groups within the broader environmental community.

SUSTAINABLE ONLINE PRODUCE: GREEN MARKETING & KEY VARIABLES INFLUENCING CONSUMER PURCHASING BEHAVIOR. **Session:** Day 1: B, Breakout Room: # 19
Serena Zheng, Program on the Environment, University of Washington
Site Supervisor: Josh DeWitt, Kitsap Fresh Local Food Online
Faculty Advisor: Betsy Sperry, Marketing and International Studies, Foster School of Business, University of Washington

Though expressing a growing interest in organic food, consumers are not translating this interest into actual purchases. Local organic food retailers, like Kitsap Fresh Local Food Online (KF), are grappling with stagnating sales, with some even falling below the breakeven point. It's imperative for these businesses to revamp marketing strategies to survive. Failing to raise sales could not only jeopardize the local economy but lead to a loss of a healthy, resilient, affordable, high-quality local food community. The purpose of this study is to find the key variables of green marketing that influence consumer purchasing behavior in the context of sustainable online produce. During my internship, I used literature review, marketing and demographic analysis, surveys, and interviews to answer my research question. I categorized KF buyers into four distinct groups based on their shopping frequencies, and executed tailored questionnaires to each group, focusing on their shopping behaviors. After analyzing 256 survey

responses, I conducted interviews with 9 consumers to gain more insights. I found that improving transparency of food production practices and clarifying details of the mission statement would be essential to solve this problem. My internship work including observations and recommendations to KF's marketing shows consumers want to establish relevant downward communication with the business. The findings can address consumers' concerns towards buying non organics because they identify transparency and details of consumption impact as primary buying motivations. They'll help businesses further by developing relevant marketing strategies, and ultimately boost sales and support local farmers and the economy.

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