



**MUDDY RIVER POSTER SESSION
APRIL 14, 2020**

ABSTRACTS
arranged by breakout room

GRETA THUNBERG ROOM: SUSTAINABILITY

1. Boston Building Resources

Josey Wermuth--MassArt, Luc Miglin--MassArt, Zachary Gaudet--Wentworth

Boston Building Resources is an organization based in Roxbury, MA that specializes in sustainable home improvement. Boston Building Resources is committed to the recycling and reuse of building materials such as cabinets, doors, windows etc. Boston Building Resources has a focus on waste reduction, whether it is accepting donations of building materials so they do not end up in landfills, or teaching how to best conserve energy in home improvement projects. The organization consists of two parts: a Re-Use Store, and a Co-Op. The Reuse Center's products are materials donated by homeowners and contractors doing renovations, additions and even new constructions. Materials go through a thorough vetting/testing process to ensure quality and worth. Brand is also an important factor in determining what materials are of value. If not for the Reuse Center, materials would be discarded. Products are typically 30-60% of list retail prices. In addition to the initial price drop is the price drop system, where after 3 weeks a 10% reduction is applied, 5 weeks a 20% reduction, and after 7 weeks, a 30% reduction. The Co-op Center sells brand new products that are sourced from local manufacturers. Along with educating their clients about how to take care of their homes, they also provide older hardware for repairs that you cannot get in stores easily. BBR also offers workshops to educate homeowners about DIY projects they can do to save time and money. Our job as a community partner was to review their blog and extract information that is worth restating in tweets and Facebook posts. We helped make old articles relevant to readers and helped draw more internet traffic to the BBR's website.

2. Energy and Utilities

John Hawat, Jack Murphy, Shannon Cullen--all Wentworth Institute of Technology

The purpose of this poster is to identify and characterize Wentworth Institute of Technologies vulnerabilities in terms of energy/utilities; specifically, the poster will demonstrate our research in this aspect of WIT's campus infrastructure in hopes of determining the features that are at risk and how climate change will affect this feature. Furthermore, it appears that WIT's energy/utilities vulnerabilities include; the on campus Power Plant, Academic buildings, Residence Halls, Low-rise apartments, Mixed Use (Beatty Hall and Ira Allen), Athletic, and Service buildings. Upon research, it is clear that the top three vulnerabilities are Beatty Hall, 555 Huntington Ave, and 610 Huntington Ave which consume the most electricity out of all other buildings. All of Wentworth's buildings are at risk; however, the building with the highest risk would be the Power Plant. Riverstone Sustainability conducted an energy benchmarking study to assist WIT in profiling each building energy use patterns and prioritizing energy. By using the building comparisons, graphs, and information collected through the electricity meters from Eversource and Eneroc on these buildings the poster will reflect these findings along with how changes can be made to make the buildings more sustainable. The Power Plant, CHP (Combined Heat & Power) lessens the demand from the regional electric grid by capturing waste from combustion to heat the buildings. However, climate change can lead to sea level rise and extreme storms that will cause flooding. If WIT doesn't become more resilient in its energy/utility usage and powering than within the next 10 years power outages will lead to huge health concerns as heat waves will demand the need for more cooling of buildings. Therefore, we aim to raise the level of the powerplant and have it be battery powered which could be more sustainable in emergency conditions. Overall, WIT should be involved in setting up a separate generator system and creating enough power that can power these buildings using the knowledge of the data gathered in the Benchmarking study and knowledge of WIT's current resilient/sustainable practices in terms of generators in case of an emergency.

3. Existing Buildings

Delaney Blanchette, Terris Reddick and Keara Washburn--all Wentworth Institute of Technology

The purpose of our study was to examine the existing buildings around Wentworth's campus and how they will be affected by Climate Change. Climate Change can lead to many problems such as flooding from increased rainwater, rising sea levels, extreme temperature changes, and changes in local wildlife. Out of all of these effects, our group primarily focused on the effects of flooding and promoting thermal comfort from increased temperatures.

We researched the different effects of flooding and increased temperatures and how they would affect the different buildings around campus. We found that the buildings that do not have adequate ventilation and/or HVAC systems against environmental heat such as direct sunlight, or any heat coming from the inside (electronics, appliances, residents) can lead to an increase in interior temperature. Buildings that have prolonged contact with any flood/rainwater may

sustain damage to necessary systems (HVAC systems, boilers, sewage pipes, servers, etc.) that are stored in the basement. If there is no basement, the water will degrade the base foundation and flood the first floor leading to more personal property damage.

We categorized these buildings based on a low, moderate, and high-risk scale based on a series of factors: Historical background, the building's ability to withstand increased temperatures and flooding, and the ability to refit these buildings properly. As a group, we strategized preventative measures as well as established renovation standards. These renovation standards are based on guidelines set by the BPDA resilience guidelines for environmental protection: Prioritization on adequate ventilation, prevention of flood water entering buildings, and a Plan B prevention for basements of moving equipment to higher levels.

4. IT Infrastructure Resilience at WIT

Misha Kharitonov, Kevin M. Humphreys, Cuong Le--all Wentworth Institute of Technology

The Information Technology infrastructure at Wentworth is the backbone of our ability to learn. The resilience of the students ability to access its resources is imperative to classes running under normal circumstances, and in situations where members of the community cannot access campus on a regular basis it becomes even more essential. Under recent circumstances due to the spread of COVID-19 in the U.S the Wentworth community has experienced first hand what it is like to have to deal with an entirely remote campus. While this event has no direct relation to climate change, we as a community can analyze how prepared our IT infrastructure was for such an event and how we can work on improving it. Through this experience we have seen that Wentworth was not prepared enough for the current events that led to the transition to online classes. Many of the teachers did not have a curriculum that was easily presentable online. Students had no way to access licenses for software. Zoom license counts couldn't support all teachers moving their lectures online. On top of all those, we had no direct way to contact DTS. Events such as coastal flooding due to climate change could easily push us out of our campus again if trends continue. Wentworth must use this outbreak as a wake-up call to implement measures to make sure that any transition to remote learning is as seamless as possible.

5. New Construction Resilience in Buildings

Sunny Lee, Jasmine Zeringue, Justin Di Platzi--all Wentworth Institute of Technology

As weather gets more and more harsh and climate change is the worst it has ever been, old buildings are more susceptible to being damaged by extreme weather and flooding. Building buildings in a new and more sustainable way will ensure those buildings are resilient and efficient enough in the distant future. As climate change progresses, extreme weather will become more prevalent, making buildings which were not built for resiliency very susceptible to damage over time. Practicing resiliency to extreme weather is going to be crucial to keeping buildings standing as climate change increasingly get worse. Putting the HVAC system on the

top floor instead of the basement to prevent the HVAC system from flooding is just one example of how building with resiliency in mind can make certain buildings are resilient in the future. Efficiency and sustainability in construction and building is also very important in making sure buildings are resilient to change. As energy becomes more and more scarce, buildings need to be as efficient as possible to reduce the amount of energy being used. Certain methods such as passive house could decrease the amount of energy a building uses by a great deal, as heating and cooling make up a large portion of the energy a building uses. Another way to combat the scarce amount of energy we currently have is to incorporate sustainable energy resources. Solar panels are becoming increasingly efficient as technology progresses and more research is put into them. Incorporating them on every building will significantly reduce the amount of energy which needs to be made to the masses. Buying from a sustainable energy source is another great way to keep buildings sustainable.

E. O. WILSON ROOM: THE ENVIRONMENT

1. Mystic River Watershed Association: Trees Medford

Kalei Porter--Simmons, Amber Nobbs--Simmons

We worked with Trees Medford, who is a partner of the Mystic River Watershed Association. Trees Medford has previously worked to increase the number of trees in the city of Medford, but they had not yet had the opportunity to complete a comprehensive street tree inventory. The benefits to a tree inventory include knowledge of where empty planters are, the health of trees, and other aspects that are necessary to plan for a community's future. Our task was to research other tree inventory projects in MA (Boston and Sommerville) and prepare a written report for Trees Medford. Our report includes information on how these cities were able to utilise financial resources and volunteer labor to complete their inventories. Trees Medford's plans are to use our report to create an action plan in conjunction with Medford city government officials to complete a street tree inventory.

2. Pollinator Project

Racheal Rodman--Simmons, Ellen Langford--Simmons, Jessica Cobb--Simmons, Marissa Giampietro--MassArt

Through our collaborative research, we have determined that iNaturalist and EDDMapS are the best platforms to aid in citizen science efforts focused on assisting the monarch population in New England via identification and removal of Black Swallow-wort and European (Pale) Swallow-wort. We collectively analyzed both platforms and determined that iNaturalist was the most accessible to use for identifying and tracking monarchs and that EDDMapS is the best platform for positive identification of invasive species, as well as documenting their removal. We believe that these tools provide the best option to help with further research-grade studies. The

goal of our project was to analyze several platforms which tracked monarch butterfly patterns and populations, as well as the spread of invasive Black and Pale Swallow-wort. We found that many of the alternative platforms used were unable to track monarch absence data (i.e., unable to evince a decline in the monarch population from year to year). This can be confusing or misleading for the average citizen scientist when analyzing this data, because a lack of data does not always mean that the population has experienced a decrease in numbers. Additionally, our group created an informative pamphlet to aid the Pollinator Protection and Pod Patrol organization in raising awareness and recruiting citizen scientists to assist within the greater Boston area. We decided as a group that iNaturalist is a popular and easy-to-use platform to introduce citizen scientists to tracking monarchs in their local area, and EDDMapS can additionally be introduced within larger citizen science (i.e., group) efforts to aid in recording the identification and removal of these two invasive species which pose a significant threat to monarchs.

3. Climate Café

Caroline Bradley--MassArt, Madeline Dixon--Simmons, Julia Sherwood--MassArt, Katherine Shapiro--Simmons

The Climate Café model presented people with a judgement-free way to talk about climate change. In so doing, they were able to discuss climate issues they cared about and gained valuable knowledge from others in their community. Our Climate Café was sponsored by Mass Audubon, which popularized the idea in the Boston area. Mass Audubon works to connect people with nature, educate, and spark action in conservation. Our Climate Café was focused on food accessibility and food shortages within the Boston community. In relation to climate change, we considered the topic of food to be vital because of our constantly changing climate. In light of the COVID-19 pandemic this spring, this became an all-virtual Climate Café event, held via Zoom. It seemed particularly important to keep this event on the calendar, even virtually, as COVID-19 has itself had a significant impact on food security and our food system.

4. Health Risks in relation to Climate Change

Kaci Berche, Cassie Cordeiro, Xi Xi Lin--all Wentworth Institute of Technology

Over the past decades, climate change has led to high temperatures and rising sea levels, which in turn causes extreme weather events and floods. The accumulating quantities of greenhouse gases in the atmosphere cause a variety of physical and mental health issues for the human population. On the physical end, climate change will cause extreme heat, which can lead to heat strokes. Additionally, sudden changes in temperature can increase a person's chance of having certain illnesses such as the flu, norovirus, and respiratory conditions like sinusitis, allergies, and asthma. The fluctuations in temperature will worsen the conditions for those with preexisting respiratory health issues. Changes to the climate in a particular region could potentially have an effect on insect and animal populations leading to higher transmissions of disease, such as Triple E found on the east coast. Changes within the

atmosphere will also have an adverse mental health impact on the population. Crime could increase with rising temperatures, heat waves could increase our stress levels, and the inconsistency of seasons could bring about seasonal depression amongst the vulnerable population. The stress of climate change itself can cause anxiety, and in case of an illness or global pandemic, create chaos and emotional distress. Some of our strategies to mitigate health risks are reducing health insurance costs, implementing proper ventilation in buildings to improve air quality, cleaning and disinfecting surfaces and objects regularly, providing access to recreational outdoor spaces, and creating communities that speak openly to address these issues on campus.

5. Muddy Water Initiative Survey

Fiona Devine--Simmons, Isis Rivera--Simmons, George Ruci--Wentworth, Sam Woodman--Emmanuel

The Muddy River is one of the top two most polluted tributaries of the Charles River and a critical link in Boston's flood control system. The Muddy Water Initiative is a Boston-based community organization that focuses its efforts on advocacy for the Muddy River. We researched the environmental factors that impact the Muddy River. Additionally, we identified the pollutants that negatively affect the river, such as E. coli from the local goose population, phosphorus, and nitrogen. Furthermore, we investigated possible solutions, such as the use of a substance called Biochar to safely clean the river. We identified the community groups that are involved in the Muddy River's health and their goals and active projects. We discovered that the goose population increases the amount of E. coli in the water. Our team suggests a pilot project using Biochar as an efficient, safe way to cut down on E. coli, phosphorus, and even pesticides. Additionally, we found that there are more than 35 community groups working to maintain the Muddy River's health. Ultimately, our findings can be utilized to create a large collaboration between our community partner and other groups to increase the health and the water quality of the Muddy River for years to come.

BILL MCKIBBEN ROOM: CULTURES OF SUSTAINABILITY

1. 826 Boston: Environmental Partnerships through Education

Leanne Moore--MassArt, Lucy Glover--MassArt, Gian Franco Vendrame Quevedo--Wentworth

Education is a fundamental element of our response to climate change, by helping children to understand the impact of global warming and changes to their environment, but also by helping them to address the impacts of climate change and adjust their attitudes and behaviors to adapt to a future of preventing more damage, and restoring what we have previously diminished. 826 Boston supports this essential value through their mission of providing outlets for students to share their ideas and strengthen their communication skills, setting them up for future success

in school and life. Throughout our partnership, we worked with young students of various ages, and helped them with their environmental projects, or just acted as classroom aids to support their learning and answer questions if the need arose. This gave us a chance to form personal relationships with students, and also to learn about how climate change affects their lives. Many young students recognize the negative effects of climate change, but cannot individually find a connection between what is going on and how it may personally affect their lives and actions. Environmental education is so crucial, especially with young children, as they are our future, and they are the ones who will unfortunately have to deal with the catastrophic consequences if we do not address climate change. 826 Boston maintains an essential service through connecting those of the community with current students who might traditionally be underserved, and provides them with not only an opportunity for one-on-one help, but also to learn from each volunteer's personal life experiences, and use their help and advice to improve their futures.

2. Greening Rozzie

Angelina Richardson--MassArt, Matthew Zeleznik--MassArt, Hailey Nolette--Emmanuel

The mission of Greening Rozzie is to make Roslindale a more sustainable community by connecting with local businesses and setting a plan for waste reduction. Greening Rozzie directly advocates for sustainability in this urban setting by planting trees, informing the public on water conservation and energy consumption with the help of wind power and solar panels. As a group, we talked to local businesses in an effort to minimize their plastic impact on the environment and increase their environmental awareness through the BYOC (Bring Your Own Container) campaign. This is a local grassroots program designed to provide an easy path to environmental stewardship for everyday shoppers and businesses. Together we recruited five businesses to join the BYOC initiative and consulted established participants on visible consumer impact. According to the owners, the reusable containers promotion did not have as profound an impact as initially expected, however, they claim there were a number of inspired customers. We spent the day debriefing vendors on the BYOC initiative and encouraging continued or new participation by bringing color to the windows with stickers and flyers. There, in clear-cut language, we advertise the non-profit BYOC project. In response to this motivating work, we decided upon a poster as the most succinct method to document this war against plastic and the real-world effects, seen in person. To further spread the word and hopefully mobilize more businesses, with the photos we gathered, we created social media posts of our work-in-progress. Through online interaction, we hope that the movement will snowball from Roslindale into neighboring communities.

3. Muddy Water Initiative: Walk, Run, Roll

Runming Dai--MassArt, Meredith DiSessa--MassArt, Cole Rich--Emmanuel

The Muddy Water Initiative: Walk, Run, Roll serving learning group this semester aims to design a sustainability campaign that allows runners, walkers and people with mobility limitations to participate. This event wants to draw attention to the Muddy River ecosystem and the efforts currently being conducted to conserve it. Our event aims to be friendly, inviting and sustainable for all members of the Boston community with a specific focus on those who reside near the Muddy River. This event is geared towards those who are passionate about the sustainability of the environment. Last but not least, we also want to reach out to the mobility impaired community and get them involved. One of co-founders of the Muddy Water Initiative Jacqueline Royce was unfortunately struck by a truck on the way to a meeting and was left mobility impaired. The "Roll" in our campaign title aims to be inclusive of the mobility impaired community in honor of Jacqueline. With this in mind, our project focused on creating a website and marketing the Muddy Water Initiative.

4. Revision Urban Farm

Michael Riley--Wentworth, Nicholas Kahn--Wentworth, Journey Temple--MassArt

With the help of ReVision Urban Farms' Todd Sandstrum, College of the Fenway students Journey Temple, Michael Riley, and Nicholas Kahn were able to design both raised beds for planting asparagus and strawberries as well as stackable potato towers that maximize yield for a small area of production. Starting by visiting the farm to take a look at the area and learning about its impact, Todd explained the social programs that the farm impacts. It both sells flowers for upkeep and grows plants to feed about 150 women and children that use daycare services while they seek jobs. The potato planters alone could provide as much as a year of servings throughout their lifetime. The strawberry and asparagus planters are also used as an educational community outreach opportunity. They are designed in such a way that children can reach them in order to tend and water the plants and learn about our agricultural and food system. Overall, the impact of these projects on the farm and community are immeasurable and can lead to better lives for struggling families. It also promotes an environmentally friendly farming agenda where more farms are introduced to cities in order to bring about a brighter, greener future. In this learning opportunity, the college students were also able to gain a better understanding of agriculture and its socioeconomic impacts. Together, the project had an overall positive impact despite being cut short from being able to offer manual labor in building the planters, and the future impact of the farm looks good.

5. Urban Food Project

Keaton Bergeron--Emmanuel, Molly Skeffington--Simmons, Alexis Cruz--Simmons, Chrisly Biqiku--MassArt

The Urban Food Project (UFP) is an organization dedicated to relieving and helping with issues of food justice, food education, and food sovereignty in urban areas, specifically in Boston. To do so, Urban Food Project has three pillars- education, outreach, and gardening. The education pillar's main service is teaching bi-weekly food-centered classes to the students at Mission Grammar School, in the Mission Hill neighborhood of Boston. The outreach pillar helps the Fenway community be more sustainable and completes services such as food runs in the greater Boston area. Finally, the gardening pillar operates Emmanuel's greenhouse and Notre Dame Campus garden, growing and donating much of the food produced. The goal of our project was to assist the Urban Food Project in achieving any of the three pillars. The majority of our work this semester centered on the outreach pillar. Our group assisted in weekly food rescues where we gathered the food that was leftover at the days end from Pret a Manger, a restaurant in the Longwood area, and delivered it to St. Francis House, a non-profit, daytime shelter downtown. The food rescues divert food from the landfill and deliver it to those who need it most. This effort both works to solve food waste and food insecurity. In addition, the food transported from Pret provides fresh food to those in need, a more nutritious alternative to food commonly available in community centers. Our poster will demonstrate the goals of Urban Food Project to educate the community on the work done and opportunities to help in the future.

RACHEL CARSON ROOM: WATER

1. Landscape and Hardscape

Rebecca Vooyo, Kevin Tan, Kevin Xiao--all Wentworth Institute of Technology

In order to understand how Wentworth's landscape will be affected by climate change throughout the next 50 years, we utilized flood and heat maps of the campus. The flood map revealed that the Beatty Quad, West Lot and surrounding streets would be most affected over time. Since parking lots and walkways would be most affected one of the first steps is switching to porous pavement. Lining the edge of these areas with stone basins and rain gardens will allow for redirection of excess rain water. This can be further enhanced by planting vegetation along the edge of these basins.

A heat map revealed that the Wentworth Campus as a whole was at risk of high temperature increase, with the Annex building and Wentworth field receiving the most risk. The first solution Wentworth can consider is creating green roofs as well as shade plantings to absorb some of that heat. This would also help with absorbing storm water. Another solution is integrating "cool

roofs” to reflect some of that sunlight. Another method to reduce heat is using “cool” pavements or pavement finishes.

2. Emergency Planning & Communications

Jasmine Andrade, Nova Trauben, and Ryan Maresca--all Wentworth Institute of Technology

The Coronaviruses (CoV) is “a virus that causes illness ranging from the common cold to more severe diseases such as Middle East Respiratory Syndrome (MERS-CoV) and Severe Acute Respiratory Syndrome (SARS-CoV).” [1] The Coronavirus disease (COVID-19) strain was discovered in 2019 and became a widespread pandemic in quarter 1 of 2020 impacting the global and local governance structure. The pandemic forced officials to respond quickly and coordinate emergency planning and communications to communities around the world. The pandemic directly impacted colleges and universities altering the campus living and learning environment. As of March 31st, 2020 the Coronavirus pandemic in the United States has over 177,452+ confirmed cases and 3,400+ deaths [2]. The pandemic is located in over 180 countries, areas and territories [2] providing a model example for how crisis communications planning and preparedness programs are essential to the livelihood of communities that are severely threatened by public health extremities such as Climate Change. This project explores the mass communication structure utilized by Wentworth Institute of Technology through the lens of the students impacted by the Coronavirus pandemic. The research highlights how the Coronaviruses pandemic and related communication affects last minute travel arrangements, in which communication techniques play into community fear, possibly causing excess traffic and stalling of vehicles. The mass emergency planning and communications strategies by the local and federal governments has potential help prevent this fear. An interactive timeline of all Coronavirus related messages sent to students are analyzed and interpreted to provide a glimpse into the effectiveness of Wentworth’s emergency planning and communications strategies, while also providing a look into the improvements needed for future Climate change crises.

SOURCES [1] “Coronavirus.” World Health Organization, World Health Organization, www.who.int/health-topics/coronavirus/coronavirus. [2] Center for Systems Science and Engineering (CSSE) at Johns Hopkins University (JHU). Coronavirus COVID-19 Global Cases by the Center for Systems Science and Engineering (CSSE), 31 Mar. 2020, www.arcgis.com/apps/opsdashboard/index.html#/bda7594740fd40299423467b48e9ecf6.

3. Rising Seas and Sustainable Transportation

Steven D’Onfro and Catherine Roden--both Wentworth Institute of Technology

In the conversation of climate change, an important at-risk sector that should not be overlooked is transportation. In Boston, some of the main forms of transportation are trains, busses, and personal vehicles. These forms of travel are facing an increasing probability of being negatively impacted by things such as sea level rise. According to the Climate Ready Boston Vulnerability

Assessment, there are currently twelve MBTA stations that are facing exposure to sea level rise impacts in the near future, with that number increasing to a third of stations as soon as the 2070s. Sea level rise late in the century will also cause coastal and riverine flooding during storms and high tides, which will cause large-scale flooding in many neighborhoods throughout Boston. This will have a direct impact on many roadways that are used by public busses and commuters. The Wentworth student body is particularly susceptible to transportation issues stemming from sea level rise because 50% of undergraduate students commute to campus. One way to reduce the impact sea level rise has on commuters would be to make them less dependent on public transportation. This could be achieved by building a secure storage facility for electric scooters and longboards with charging stations inside. This would hopefully entice more people to use e-vehicles to commute to campus, instead of public transportation. Additionally, as is being observed currently with the switch to online classes due to the Coronavirus pandemic, an increase in courses that are offered online could significantly reduce the number of people commuting to campus every day.

4. Mystic River Watershed Association: Running with the Fishes

Courtney DiPietro--MassArt, Fox Dolber--MassArt, Emily Robinson--Simmons, Kevin MacDonald--MassArt

The Mystic River Watershed Association is an environmental organization working to protect waterways, parks, habitats and native species in the greater-Boston area. The organization is involved in a wide variety of projects focusing on climate resilience, education, habitat preservation, and promoting community involvement. Every year the Mystic River Watershed Association hosts their Herring Run and Paddle, a combination 5K run and three paddling races, intended to bring together the community for a day of activity and to promote awareness about the river herring migration. This service learning project was focused on helping the association plan and prepare for this year's Herring Run and Paddle event scheduled for May 7th. The group worked with Erica Wood, Mystic River Watershed Association's community outreach manager, who is the individual responsible for planning and orchestrating this annual event. The Environmental Forum team worked with Erica to relieve some of her workload; they reached out to potential prize donors, developed a social media identity for the race, and promoted the organization itself.

5. Stormwater Proposal

Cameron Stewart, Sohaib Shah, Jack Sciarabba--all Wentworth Institute of Technology

Resiliency is an ever growing topic among many communities in the Boston area. On and around the Wentworth community there are numerous strategies in place to mitigate the effects of climate change. In order to help make the Wentworth community more resilient, the first step is to analyze what Wentworth currently does. Presently there are multiple bioswales across campus, along with porous pavement technology implemented on the Pike. These passive strategies help reduce stormwater pollution, and reduce flooding along the Charles, and Muddy

rivers. Due to the growing magnitude of climate change effects upon the earth, there are multiple technologies Wentworth could implement to lessen the impact on the environment. The first strategy we are proposing is the use of a cistern, which would be located under the West Parking Lot. The cistern is used as a centralized containment system for the stormwater that falls upon Wentworth's campus. The second strategy we are proposing is a roof stormwater collection system. This will work with Wentworth's existing stormwater infrastructure such as gutters and downspouts, but redirect it. The use of roof-based water collection systems in tandem with a cistern could provide a locally sourced and more efficient water supply on campus. This water, once treated, could be used across campus in the lawn-sprinkler systems, as well as hydronic heating and cooling systems in order to lower Wentworth's water usage. The existing stormwater mitigation strategies mentioned earlier, such as bioswales, will also be expanded to operate more efficiently and reduce regular flooding.



RECIPIENTS OF 2019-2020 MINI GRANTS

1. Bee Hotels

Arielle Wilson--MassArt

The population of natural pollinators have been declining steadily for years. Habitat loss is one of the driving factors in insect losses, therefore, we can help native pollinators in Boston by providing bee hotels. Bee hotels can provide space for solitary bees to nest in and they can help give back to our environment in a positive, fun way, while helping improve urban ecology. I am creating Bee Hotels to host native pollinators, like mason bees and bumblebees, to help them reproduce and grow in an urban environment. I am creating three bee hotels for Boston, made of wood that is hand carved into three foot mushrooms. These mushrooms will sit on the ground in community gardens around Boston, the mushroom cap acting as protection from New England weather, keeping the bees safe and dry. Due to the Corona Virus this has slowed down my process, and I had to make many changes to the design, and materials to adapt to our new situation. Studying the bees and making sure their larvae are healthy will help me ensure that the Bee Hotels are as successful as possible. Through this project I will help the solitary pollinators by giving them a safe place to live, as well as bring awareness to this issue and get people involved in sustainability practices that the average person can do to help.

2. The Influence of Water Availability on Co-invader Interactions: Oriental Bittersweet and Japanese Barberry

Aurora Goodland, Viktor Grigoryan, Vikki Rodgers and Anna Aguilera--all Simmons University

Invasive species are notorious for their negative impact on native biodiversity, often placing stress on communities that have co-evolved for hundreds of years. Considering that several invasive species are found at any given invasion site, it is important to consider how the competitive interaction between invasives can shape community structures. This study looks at the interaction between two invasive plants, Oriental bittersweet and Japanese barberry, which are often found growing together in Massachusetts. Specifically, the impact of interspecific versus intraspecific competition on the growth of each invader is compared using data from a field experiment in Waltham. Moreover, this study considers whether or not this interaction would become exacerbated or altered in drought conditions by implementing varying water treatments (ambient, semi-drought and drought). Our data reveals that while Japanese barberry grows significantly less in drought conditions, Oriental bittersweet is able to thrive despite any water limitations. Further, we suggest that in drought conditions, both species are more successful when growing in interspecific as opposed to intraspecific treatments. Moving forward, we hope to construct a mathematical model, the mathematical analysis of which will predict if the long term interaction between these plants would result in competitive coexistence or exclusion. Overall, with the foreboding inevitability of climate change, it is especially important for us to conserve healthy ecosystems in order to maximize their resilience. By understanding how these particular co-invaders interact, we can better conceptualize how to take targeted action in order to restore local areas.

3. RepharmMe

Kristin Kim, Sarah Sohn, Allen Amedume, Emma Giddens, Marina Youssef, Lawrence Dahm, Junyup Song, Jiarui Zhang, Adarema Opara--all MCPHS

The city of Boston alone holds over fifty retail community pharmacies, including CVS, Walgreens, and various independent pharmacies. The close proximity of these pharmacies from major healthcare institutions and providers leads to increased prescriptions and patients at the community pharmacy-level. On a daily basis, each pharmacy receives anywhere between 200-500 prescriptions a day. Depending on the quantity required, patients' prescriptions require the usage of multiple medication stock bottles, generating tons of plastic waste. Although the medication stock bottles are made of high quality plastic that can be recycled into secondary products, the perceived decrease in efficiency at the community-level causes these bottles to be sent along with general trash, rather than being separated. As United States generates over 40 million tons of plastic waste annually, the pharmaceutical industry's contribution to those values cannot be underestimated.

RepharmMe aims to address the need for proper disposal of plastic waste generated by pharmacies to decrease the healthcare industry's overall carbon footprint. Our company will act as the middle man between community pharmacies and the creation of secondary plastic materials to then be utilized at the pharmacy-level. RepharmMe's services will ultimately lead to the replacement of all paper supplies with synthetic plastic paper made from the medication bottles collected. The synthetic plastic paper will be used for all paper material including patient labels, leaflets, medication guides, etc. RepharmMe will be contracted with Polyart®, a company that already produces the synthetic paper, to provide them with medication stock bottles to contribute to their supply. In return, RepharmMe will receive price incentives to purchase the produced paper, which will be distributed to the retail pharmacies by RepharmMe's internal services. RepharmMe directly addresses the extent of the pharmaceutical industry's carbon footprint, while also addressing Polyart®'s interest of utilizing recycled material to produce the products.

Large retail pharmacies have been reluctant in implementing recycling procedures due to the perceived decrease in efficiency and increase costs at the pharmacy-level. RepharmMe directly addresses the concern by providing the friendly service of the collection, shipment, and receipt of the synthetic paper. RepharmMe's services not only benefits the carbon footprint of the industry, but also allows for large retail pharmacies to receive tax incentives for implementing eco-friendly products. Our company aims to put a stop on the ongoing generation of plastic waste, while also allowing large retail pharmacies to have an eco-friendly public image by using RepharmMe's convenient service. We aim to target large retail pharmacies located in the Greater Boston region and continue to expand our services by securing more contracts outside of the region.