



DISTRIBUTIONS

PROGRAM UPDATE UGANDA

By: Kimberly Kuhn
Uganda Program Director

This summer and fall, the Uganda program has continued to hold weekly, remote meetings to continue design work for the Nakyenyi Water Project. Our ultimate goal to design a gravity-fed water distribution system remains intact, despite delaying future trips until COVID-19 travel restrictions are lifted. Over the summer, we assessed different options for our transmission main design. To satisfy the system hydraulics, we considered lowering the elevation of the water storage tank, using different pipe materials, and adding a transfer pump. Ultimately, we decided to pump water from our well to a high point in the community, using 75mm PN-16 HDPE pipes.



Water quality sample taken by Spencer Evert during the December 2019 Implementation Trip

In February, the results of our water quality test from our newly-drilled well showed high levels of fecal coliforms. We immediately instructed the Water Board, our community-based organization, to dismantle the hand pump to prevent the community from drinking potentially contaminated water. Unsure if the water quality results were due to faulty sampling tactics, we asked the EWB Uganda in-country office to collect another water sample. Unfortunately, local COVID-19 travel restrictions delayed the in-country office from traveling to the community to

collect a water sample. This August, the in-country office was finally able to travel to the Nakyenyi to collect another water quality sample and meet with the Water Board. The new water quality test showed zero levels of fecal coliforms but indicated moderate levels of iron and manganese. While iron and manganese do not have the same health risks as organic matter contaminants, we are currently working with the in-country office and local water experts to determine if the content of these metals is safe for consumption.

This fall, our program has embarked on several design tasks for the community-wide distribution system. We're re-assessing the demand for the system so that it is in accordance with design standards issued by the Ugandan Ministry of Water. We've narrowed our submersible pump selection to a few candidates and are finalizing the hydraulics of our transmission main design. We've also begun pump house designs, modeling water storage tank levels, and hydraulic calculations for the distribution mains.

2020 has posed many new challenges for the Uganda Program. After switching to remote meetings in March, the program has successfully held weekly meetings over Microsoft Teams. We were fortunate to have a group of students who met each week over the summer to work on the project. Their dedication prevailed through the fall as we welcomed new members. Despite uncertainty, we're excited to have so many new members who actively participate and contribute to the project design.



Surveying by Emily Moore and Will Kovarik during the Implementation Trip—which was used for our hydraulic calculations



PROGRAM UPDATE

PANAMA

By: Alyssa Dubois
Panama Program Director

The Panama program has made considerable progress in both the Las Delicias and La Pedregosa water projects since the spring semester. In Las Delicias, members of the community spent the summer working on the final construction phase of the project, which will pipe in more drinking water to their distribution system from a new source. Despite unforeseen delays from the pandemic, community leaders have been able to organize volunteers to help out with construction and make substantial progress towards completing the transmission main pipeline, all while working under new social distancing and mask guidelines. They have been sending us updates over text since our trip in March, keeping us in the loop and sending photos of the construction progress. After finishing the new transmission main, they plan to make a few small repairs to the piping in two of the tanks in the system to eliminate minor leaks before the project is finally complete.

Members of EWB working on the Las Delicias project are compiling an operation and maintenance manual for the distribution system once it is finished. This will include maps and designs for the system, as well as instructions for cleaning, repairs, and replacements for each component, such that members of the community have a functioning system for the system's projected 50-year lifespan.

In La Pedregosa, the Water Board and NGO partners have been coordinating with us to collect data remotely and begin the next phase of the project. Over the summer, members of EWB completed an Alternative Analysis report for the La Pedregosa project, in which they evaluated a variety of solutions to the seasonal drought that causes a drinking water shortage. They came to the conclusion that the most cost-effective and generative design involves drilling a well in the community and installing a solar-powered pump. We are looking to complete the first phase of construction—drilling a well—remotely during the spring of next year, with oversight from our NGO.

An internal design group has collected rainfall, geospatial, and geologic data about the region of La Pedregosa from a variety of remote sources, which will aid us in the design of the system by predicting groundwater levels and soil

composition. Another group is working on the design for the first phase of construction—drilling a well. Other members are designing a pump and solar system for the well after it is drilled, which will be implemented during the second phase of construction. Lastly, another group is working on the final phase of construction by designing a large tank that will integrate into the existing distribution system and provide more water storage for the community.

Although the pandemic has been preventing in-person meetings and travel, we have had a successful summer and fall thanks to help from our partner communities and NGO, as well as our dedicated team members that participate from around the country for online meetings each week. We are looking forward to seeing more progress on these projects happen remotely!



Progress of trenching and laying pipe for new transmission main



Trenched pipe route going from a new source to the storage tank

PROGRAM UPDATE GUATEMALA

By: Max Magee and Emma Spurgat
Guatemala Program Director

Ever since the COVID-19 outbreak last spring, the Guatemala Program has worked diligently to adapt to the new normal of remote work, both in meetings and in project implementation. The program's first implementation trip, slated for early April, was cancelled as a result of the pandemic in early March. We quickly shifted to virtual meetings over Microsoft Teams when Northeastern shifted online in order to continue design progress and begin planning remote implementation.

Our plans for remote construction have highlighted the importance of clearly communicating our design choices. The cancellation of the implementation trip allowed for the structural group to complete a more thorough round of edits based on the suggestions of EWB-Guatemala in-country office review, keeping in mind the fully remote implementation of this phase. Calculations were updated based on the advice of experienced engineers to ensure that the structure can reliably live up to our community agreement.

Additionally, the structural team updated the school building drawing set to address reviewer concerns and improve formatting. Furthermore, we worked over the summer to plan remote implementation for Phase 1 of the project. This form of implementation involves an in-country engineering review and progress updates.

Phase 2 of the project consists of the design of a bathroom structure and wastewater management system. This Phase was initially divided into five groups but thanks to the progress made last semester we were able to consolidate this phase to three groups. These groups focus on bathroom structural design, greywater management, and leach field

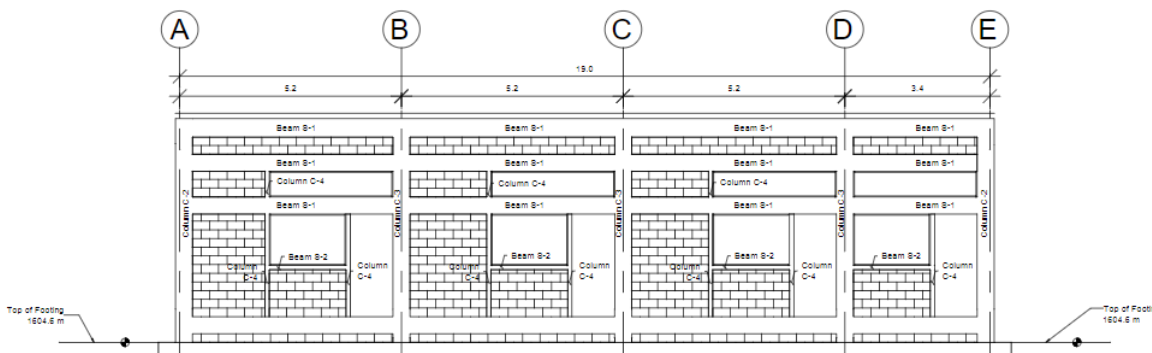
design. By separating the greywater from the black water, we hope to be able to clean the greywater for reuse in irrigation and reduce the size of the septic system.

This semester, the greywater group is working to determine if the wastewater produced by the kitchen and hand washing stations can be effectively reused. The additional cost of a greywater filtering system will be weighed against the benefit of reused water and a smaller septic system to inform our Phase 2 direction. If greywater recycling is determined to be ineffective, we will route all waste water to the septic tank and leach field.

Our leach field design team has been building on initial calculations to determine the ideal location and configuration of the leach field. The ground slope and soil composition play a big role in effective wastewater dispersal. We have been working with the in-country office on requests for soil tests and surveying to be performed in the community to ensure that proper filtration takes place.

This past semester, our bathroom structural design group has been hard at work transitioning a general design concept into structural drawings. Determining the forces on the structure is the first step to ensure reliability and inform design choices. Using work done on the school structure and relevant standards, the team has been making the initial design choices and developing a model for future calculations.

These last few weeks have been very exciting as the final drawing package for Phase 1 was sent in for review by EWB-USA. Due to the COVID delay, we will work closely with our reviewer to address all comments as soon as possible. Once we obtain design approval from EWB-USA, we will move forward with purchasing materials and break ground remotely with support from the community organization COCODE and the in-country office.



*Structural drawing
of the school front
in Guatemala!*

MEMBER SPOTLIGHT



Uganda Spotlight

Isabella Olivia is a third-year, environmental engineering student and has been involved with the Uganda Program since her freshman year. She joined because she wanted to apply what she was learning in her classes to a project that could have a meaningful impact.

She started off in the GIS & Mapping group her freshman year and the hydraulics group her sophomore year. Isabella has stuck with EWB during the pandemic, attending weekly meetings over the summer. She helped model different design options for the transmission main in WaterGems. As a third-year, she is leading the Distribution Group, where they are working to design the hydraulics for the distribution mains of the Nakyenyi Water project. Isabella said that “the best part of being in EWB has definitely been the people that I’ve met because I get along well with everyone in the club and everyone is so sweet and welcoming!”

We’re lucky to have Isabella in our program! It’s thanks to loyal members like her that we are able to continue design work through any challenge.

–By Kimberly Kuhn



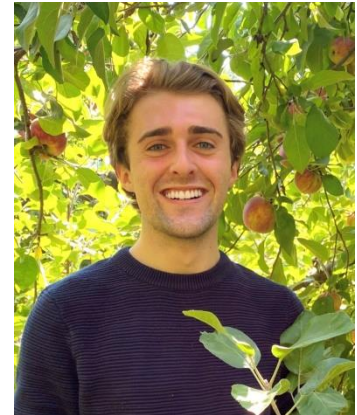
Panama Spotlight

PJ Doran is a second year studying chemical engineering and has been involved with EWB since his first semester where he contributed immensely to the La Pedregosa project by researching their current system and helping model its hydraulics. Before the last trip, PJ helped design an air-release valve that was used in the last phase of the Las Delicias water project.

Since then, PJ has been using his background in contracts to draft written agreements that will be used during the construction of the La Pedregosa project. He is also researching source capture methods and creating a reference for building effective drinking water captures.

PJ’s enthusiasm and wide variety of skills have made him a great contributor to our program. He says that he loves working in EWB “because of the role [he gets] to play in having a huge impact for good on the people of Panama who are so deserving and who would otherwise be easy to forget about. [He] also [loves] working with such a fantastic team of friendly, devoted students.” Thanks for all your hard work, PJ!

–By Alyssa DuBois



Guatemala Spotlight

TJ Cahill has gone above and beyond in his time with the Guatemala Program and has been invaluable with this semester's transition to remote work. TJ is a third year mechanical engineering student who joined the Guatemala program his freshman year. He has taken on many roles within the Guatemala program and the EWB-NEU executive board, ensuring our chapters success.

TJ started out working on foundation analysis for our school building. The school's location on a sloped hillside led to construction challenges. TJ then transitioned to work on Phase II of the project, specifically with the leach field designs. His initiative and hard work resulted in him becoming a leach field group lead, and helped plans evolve to drawing sets from basic concepts.

TJ believes that “EWB was a perfect way to keep that sense of volunteerism going and make an even greater impact on people’s lives”. From a career perspective, he has found that the program “has really allowed [him] to learn from other student members, professional engineers, and allowed [him] to even communicate with engineers and community members in the community.” Despite the setback of the cancelled implementation trip, TJ is excited to see this project through and continue to help our chapter. Thank you for all your hard work TJ!

–By Max Magee

FUNDRAISING

By: TJ Cahill

The Northeastern University Chapter of EWB-USA (EWB-USA NEU) prides itself on its strong fundraising program, which allows us to support three thriving infrastructure projects around the world. Effective fundraising is crucial to maintain strong relationships and sustainable projects in our partner communities, as well as our ability to retain members and mold them into future engineers. Our three main sources of funding are corporate donations, personal donations, and grants.

Northeastern University continues to expand and develop its co-op program, which epitomizes experiential learning. This program significantly enhances EWB-USA NEU's ability to build and sustain important relationships with engineering firms in the Greater Boston area.



We've even been able to do fun food related fundraising including at local Boston businesses like Chatime!

Annually, members of our chapter present at more than 10 companies explaining our mission and the progress on each of our projects. These presentations are also opportunities for students to share transformative personal experiences and tangible community impacts, both of which are only realized with the financial support we receive from our corporate sponsors. This year, all donor presentations were delivered virtually due to the COVID-19 pandemic. As our students continue to pursue new co-op opportunities, we are actively seeking to expand our network of corporate relationships.

Personal donations are also significant to our fundraising capacity. Our network of generous alumni, families, faculty, and friends allow our chapter to continue providing the support that our partner communities deserve. Many of our personal sponsors are reached via our Year End Giving Campaign. No matter the amount, every donation counts, and this is demonstrated by the fact that personal donations rival our corporate sponsorships in terms of yearly revenue.

Furthermore, EWB-USA NEU continues to apply for grants through both the University and its College of Engineering, as well as externally. Grants such as the Dean Scranton Fund are vital to our ability to continue sending students to our partner communities each year, and our chapter is actively seeking more grants to secure additional funding. In fact, during this semester each program has organized a specific group dedicated to grant-writing and other fundraising efforts. Our members learn important grant-writing skills and strategies, and with the help of our senior members and faculty advisors we are consistently able to compose strong proposals and reports. Bimonthly financial meetings ensure that grant groups stay on track and finances are properly managed.

Our fundraising efforts would not be successful without the support of many committed student members, among both the Executive Board and Grant Groups. We'd like to thank those students who have specifically been involved with the finance team and attended any finance meetings. The dedication of both our Executive Board members and our Faculty Advisor, Jess Ormsby, ensure that we continue to provide the highest level of service to both our students and our partner communities.

EWB TRANSITION TO REMOTE WORKING

By: Tracy Qiu

Many unprecedented circumstances arose this past year, but through all the uncertainties, EWB quickly adapted to the remote environment. Shortly after the Northeastern campus was closed, EWB resumed with our regular meetings virtually. We picked back up right where we left off and utilized Microsoft Teams which allowed us to meet as a whole program and as subgroups, exactly as we would in person.

Each program continued to meet at their regular meeting times and was able to continue through the summer. Typically, member retention is lower throughout the summer because only people on campus for summer classes or co-op would attend, but this past summer, more people were able to attend the remote meetings. This made for a very efficient and productive summer that also helped us keep each other sane through the challenges of quarantine.

EWB members continued to foster a sense of community by not only directing our meetings towards our work, but also creating a safe space to talk about everything unfolding during the pandemic. Our programs hosted

game nights and also held Diversity, Equity, and Inclusion (DEI) meetings to create safe spaces for discussing everything happening during the global pandemic. In light of the murder of George Floyd that highlighted the institutional racism that has been engrained in our country, our organization committed to not just solidarity but concrete action. During our DEI meetings, we discuss how our organization can take an active part in promoting diversity, fight for justice, and dismantle white privilege that our organization has benefitted from. As a club, we strive to empower not only our partner communities abroad, but also each other and our Northeastern community.

Throughout the summer, members met regularly for their program meetings as well as for DEI meetings and social hours. So when it came time for the fall semester to start, our organization was very prepared for working remotely. We continue to strive towards creating an inclusive and welcoming environment, especially for students new to Northeastern. The fall semester has been going strong and our members are working diligently to remotely implement the projects by maintaining strong relationships with our partners in Uganda, Panama, and Guatemala. The dedication and hard work of all EWB members has made it possible for such a smooth transition to remote work. Thank you to all our members, donors, mentors, and in country partners who have made remote collaboration possible and we hope to see you all in person soon!

EWB NEU OFFICERS

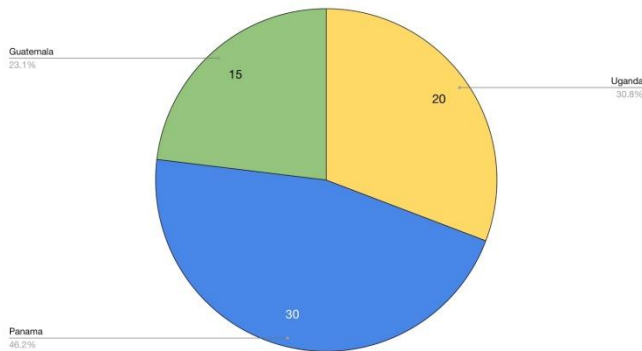
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PR & RECRUITMENT

By: Simone Atwa

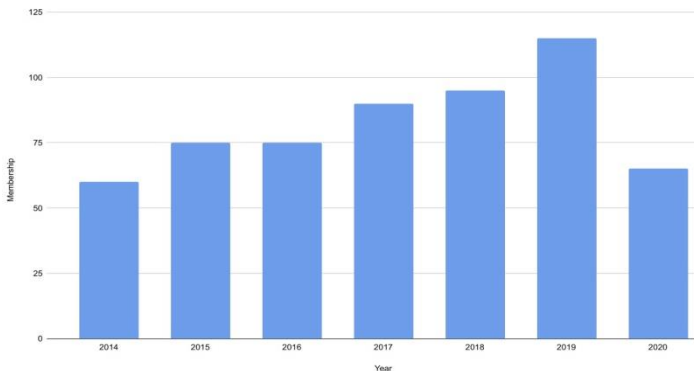
The best part of Engineers Without Borders is the people that comprise this club. Despite a global pandemic, our members made sure that nothing could get in the way of the work we do. This meant that despite the need to go virtual, our events and meetings still took place as usual. From our Summer Virtual Series and Fall Fest club fairs that welcomed incoming students, to our virtual weekly Teams meetings that progress our engineering ideas, our club has adapted to the times. On top of this, we've been able to continue our merchandise sales and fundraisers with local businesses to keep our attendees engaged. As you can see, the show must go on!

EWB-USA NEU Fall 2020 Membership Breakdown



With almost 200 new people signing up for mailing lists for our individual programs we have been able to keep our community alive at Northeastern University. This would not have been made possible without the hard work and determined personalities of our E-board officers and professional mentors—a huge thank you” to them. If you'd like to keep up to date on any new upcoming events, fundraisers, or EWB happenings, make sure to browse our website (www.ewb.neu.edu), our Instagram (@ewbneu), our Twitter (@EWBNEU), and our Facebook (@ewbnortheastern)!

Membership by Year



Thank you to our Professional Mentors!



Ron Burns and Zach Lozon – Guatemala



Mike Sanders and Maria Franko – Panama



Kelsey Dunn, Tim McGrath, and Bill Clunie – Uganda

Thank you to all our supporters big and small!

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below on how to donate.**

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