



ENGINEERS WITHOUT BORDERS USA
Northeastern University Chapter

YEAR END REPORT 2022

ENGINEERS WITHOUT BORDERS NORTHEASTERN

Mission Statement

Engineers Without Borders USA Northeastern (EWB USA-NEU) aids communities in developing countries by using engineering solutions to address basic human needs, such as the need for potable water – all the while supplying our student members with educational, transformative experiences.

Vision

EWB-USA's vision is a world in which every community has the capacity to sustainably meet their basic human needs.

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Panama Design Lead
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Uganda
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Panama
Mike Sanders, Brandon Hornak, Emily Korot

Faculty Advisors

Jessica Ormsby
Prof. Annalisa Onnis-Hayden
Prof. Amy Mueller



A LETTER FROM THE PRESIDENT

Dear Friends and Supporters,



In 2021, our chapter witnessed a gradual return to normalcy after working remotely for nearly a year. In the Fall of 2021, students resumed in-person meetings and social distancing measures began to loosen. Last December, EWB-USA NEU held its annual Donor Reception, an event that had been put on pause since 2019. Throughout the year, our three programs worked tirelessly. The Guatemala program found success in their remote implementation of a school building in the community of Chuixil, the Uganda program solidified their designs for a solar powered water distribution system in the community of Nakyenyi, and the Panama program closely monitored the completed water distribution system in the community of Las Delicias while finalizing designs for a borehole to be drilled in the neighboring community of La Pedregosa.



In many ways, 2022 was a time of reconnection: reconnection within our chapter, to our partner communities, and to our supporters.

This Fall, our E-board has participated in three club fairs and facilitated outreach to first year students through Northeastern's GE1000 classes to bolster membership. Members have enjoyed both technical and social events throughout the semester including our annual Bootcamp, General Body meetings, survey trainings, and internal events such as volleyball at the Willis courts.

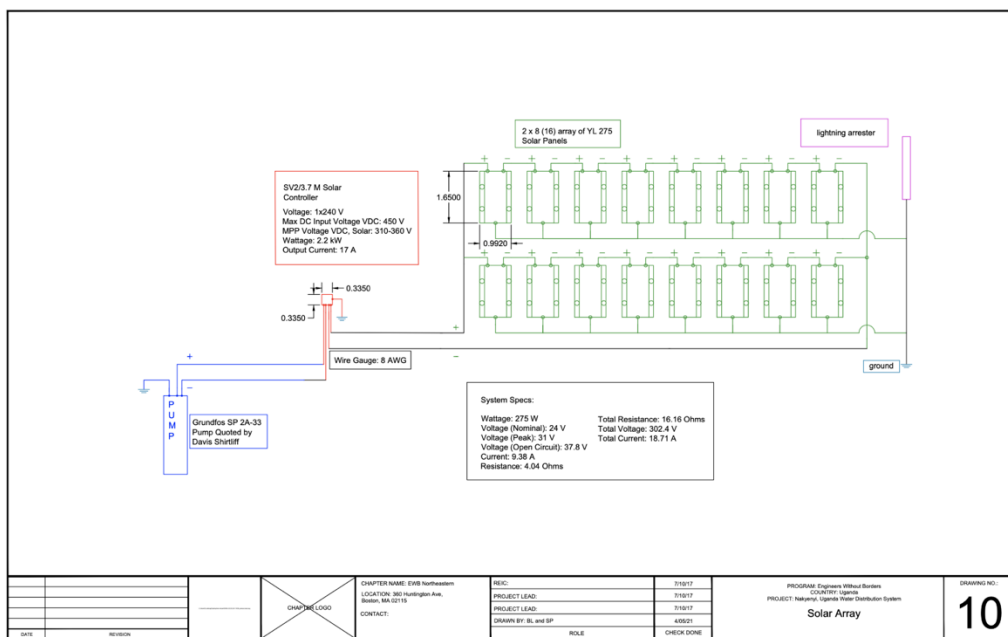
As we approach the end of 2022, we are thrilled to send off our first travel team since March 2020 to Panama for an assessment and monitoring trip of our partner communities La Pedregosa and Las Delicias. This highly anticipated, in-person reunion with one of our community partners will initiate the beginning of a year where we plan to have each of our programs travel: our Guatemala program is planning an implementation trip for a three stall bathroom structure in Chuixil, and our Uganda program is planning an implementation trip for storage tanks, a pump, and a transmission main in Nakyenyi.

None of these achievements would be possible without the support of our donors, mentors, and faculty advisors. We thank you for your continuous generosity towards EWB-USA NEU and our partner communities of Las Delicias, La Pedregosa, Chuixil, and Nakyenyi. We're looking forward to the year ahead and are delighted to share the impact of your efforts with you.

William Kovarik President 2021-2022
Rachel Cohen President 2022-2023

UGANDA

With an upcoming implementation trip on the horizon within the first half of 2023, it is imperative that the Uganda program maintains prosperous, positive relationships with all community partners. One example of how we have ensured this is through the transition from our past non-governmental organization (NGO), BUSODA, to a new partner that better suits the needs of our community. The Lwengo Rural Development Support Organization (LWERUDES0), has a long history of aiding the Nakyenyi community, specifically pertaining to the development of healthcare and educational access since 2006. Their partnership is set to be a wonderful asset to our project as they will aid us in our mission to provide sustainable and equitable access to water for the Nakyenyi community. Additionally, our recent meetings with the in-country EWB-USA office and Nakyenyi Water Board have allowed plans for our upcoming trip to come to fruition.



Technical CAD drawing of the solar array for the distribution system.

As the preceding suggests, the Uganda program is eagerly anticipating an overdue in-country implementation trip to execute aspects of the design that we have completed this past year. With a detailed design report under review by our professional mentor and in-country office, we have now been able to shift our primary focus to travel preparation. Our trip will consist of the replacement of the hand pump currently placed in our borehole drilled in December 2019 with a new submersible pump. This pump will be powered by a 16-panel solar array and direct water into two 10,000 liter storage tanks, all of which were designed by our team. While starting to coordinate with the in-country office to identify feasible contractors and the materials needed, we have started to work on finalizing a travel team and preparing the travel paperwork.

In addition to our hard work with the design of the water distribution project, the Uganda program’s financial team has been diligent in securing funding for our work. Despite a tight time constraint, our team shone under pressure and produced a winning bid for a \$2,000 grant from generous donors Pratt & Whitney. This funding will serve us immensely in providing our travel team with the supplies they need to implement our design in the Nakyenyi community.

While the Uganda program has been dedicated towards tasks at hand, we make sure to set aside time in our busy schedules to have some fun. With member recruitment and retention complicated by the recent pandemic, we have placed a focus on making sure that members are able to foster genuine friendships with one another and spend time bonding over non-engineering related topics (in what we call “EWB bonding”). Recently, we held a pumpkin decorating competition to get our members in the holiday spirit, and a new first-year member blew out the competition with their “Spongebob” themed pumpkin. This freshman was one of the multiple new members who decided to join after a successful recruitment campaign by our senior members in first-year advisory classes where multiple members volunteered to share their experiences with the Uganda program. As a result, many new young members in the club are now getting to take part in the EWB experience from the very start of their undergraduate careers.



A pumpkin painting social event we had this semester!

Article by: Tracy Qiu & Ben Lanava

PANAMA

Over the course of the past year, the Panama Program has overcome lasting challenges of the COVID-19 Pandemic. The relaxation of covid restrictions on campus and increased recruitment efforts have allowed the program's membership to grow back to its size prior to the pandemic. The student body consists of 25-30 engaged members, excited to make a lasting impact on our partner communities. The program is running smoothly with weekly meetings consisting of group work in structural, solar, administrative, and grant sub teams.

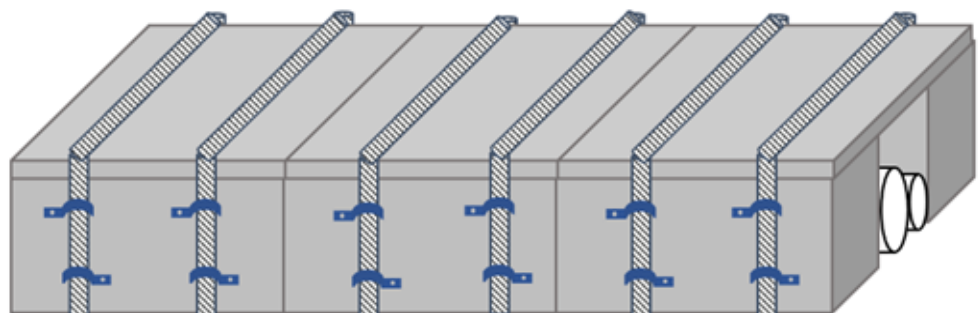


Our retention of these new members is a testament to the benefits the program provides them with, including their commitment to use their engineering knowledge to improve the lives of others. Our increased membership has also helped us accomplish significant milestones for both of our projects in La Pedregosa and Las Delicias.

Panama program working in sub teams at our weekly meetings!

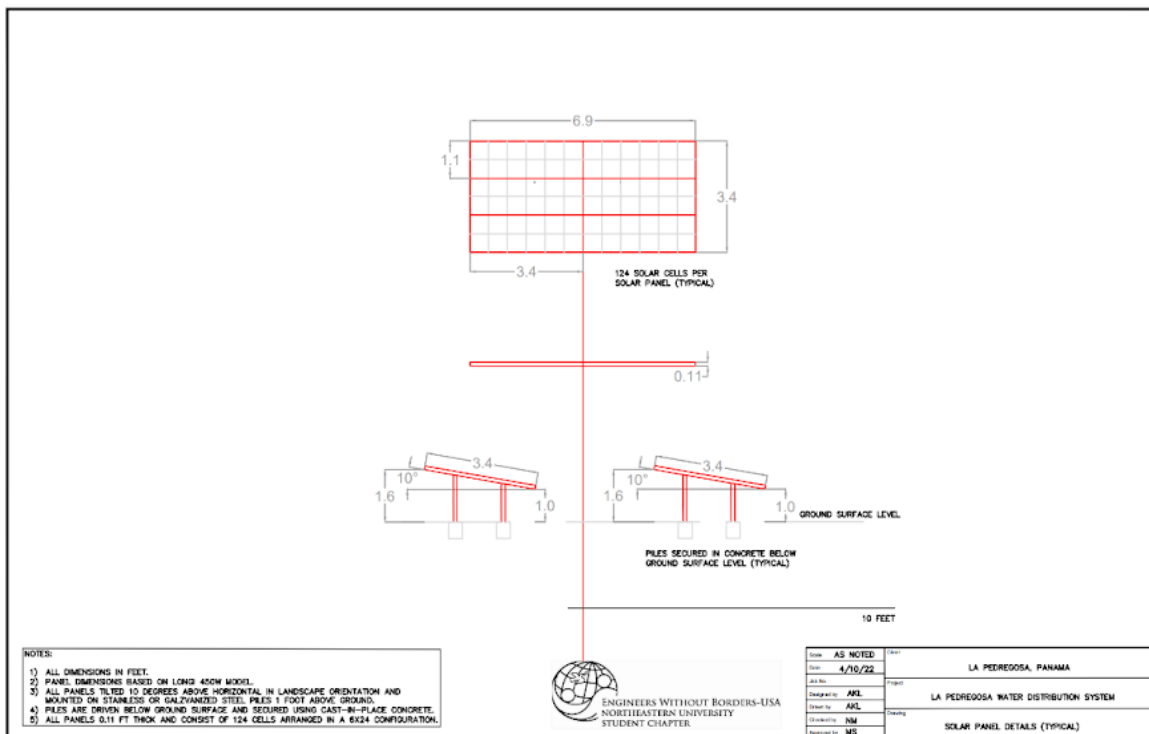
In mid-December, we will be traveling to both of the communities in Panama, marking the first travel expedition for EWB-USA NEU since March 2020. The Las Delicias segment of travel will be focused on monitoring and evaluating the water distribution system designed by the Panama Program, first commissioned in 2018. Recently, the Panama program designed and delivered a manual for a structural improvement to a portion of the piping system that crosses over a bridge vulnerable to intense flooding and damage.

CAD depiction of rebar-enforced structural improvement for exposed transmission main bridge crossing in Las Delcias.



The structural design will be implemented in the coming weeks and its status will be monitored during the visit. On the trip to Las Delicias, we will also be bringing a finalized operations and maintenance manual for the system, which was also finished this year. This will ensure that the community is fully equipped to be successful in obtaining clean water for the designed 50 year minimum project lifespan through maintenance and operation of the system. So far, the community is very happy with the completed water system, and we look forward to staying in touch with community officials after closing out the project.

The second component of travel will consist of an assessment trip to La Pedregosa. Since the first assessment trip, we have completed a thorough alternatives analysis of the problem and begun design phases for implementations consisting of borehole drilling, solar panel installation, and tank construction. These design plans will guide our assessment plans to collect all required data and maximize the trip's efficiency. For example, sites will be assessed for feasibility of solar panel and tank installation based on requirements outlined by recent designs for water tank structure and solar panel array sizing. Most importantly, the in-person trip will allow us to further strengthen our relationship with the members of the La Pedregosa and Las Delicias communities to ensure future success of our partnership.



Solar Array Technical Design for Panama

Article by: Michael Stamm & Nick Muellers

GUATEMALA

This past year has been lively for the Guatemala Program! The preceding twelve months have been packed with design work, report writing, and trip planning. Furthermore, more than ten eager new students have joined our project.

Chuxil, Guatemala holds a vibrant community (199 people including 41 school-age children) that started out with a school constructed of bamboo walls and a tin roof. They now have a safe, fully established concrete building with plans for electricity, an access gravel road, and a bathroom to be implemented in Phase II. The community members are a key part of our partnership and pivotal in giving their youth access to education. We are extremely hopeful for our continued partnership as we proceed with Phase II of our project.

Since the completion of the school building last year, remote implementation has been taking place to complete our three-stall bathroom and leach field. While discussing our initial plan to use a leach field for Phase II of our project, we found that the design was not as successful as anticipated. Therefore, we took input from our in-country officers to understand which materials and methods they were comfortable working with. By doing so, we developed a new design for our wastewater system that both resolved our design conflicts and created a design that the community felt most content with. Now, our focus has shifted to develop a final design—using leach pits to handle the wastewater—for the community to approve.

Additionally, the Guatemala program implemented an interactive start to each meeting that focuses on community building as well as a better understanding of what Engineers Without Borders truly is. Typically, we begin our meetings with something fun and educational such as trivia, a crossword, or EWB cultural awareness videos. This has been a resourceful way for us to engage new members and form lasting bonds within the team. We then break into our structural and wastewater groups to advance our designs where each team has been diligently working to become increasingly proficient with various drafting software. The structural team is finishing up the final design packet for Phase II which will include the bathroom structure and the wastewater system.

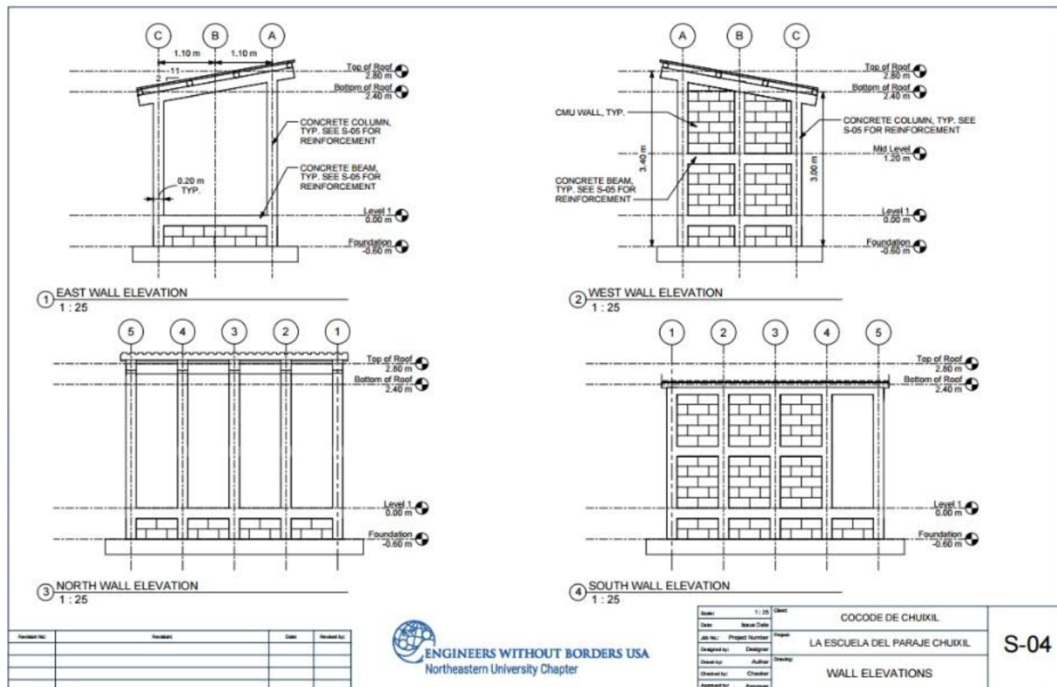
Internal Holiday event making gingerbread houses!



While the pandemic halted our plans for travel, we are expected to travel this coming summer. To plan for implementation, we utilize the recommendations of the in-country office and our mentors to complete all necessary training and reports successfully. Our communication with the in-country office chiefly takes place through email, volunteer village, and video call software. In these meetings, we discuss necessary administrative businesses such as budget, construction approaches, and schedules. We also use them as a liaison for the community. Our communication with the community is an essential part of the success of our project, so we value its importance and strive to keep a strong connection. For example, over the course of Phase I of the project, we learned how to better communicate any issues that arose from budgetary to design conflicts.

The Guatemala Program has a lot to look forward to in the coming year! We plan to travel in May to perform a continued implementation and monitoring trip. This will be the first time since 2018 that the program has gotten to visit the community. In preparation for travel, our team will participate in various training activities such as survey training and cultural awareness training. In addition, we plan to have a mix of internal and external events to better cultivate a strong team with a good understanding of EWB's values. With how positive and productive the year of 2022 was for the program, we are looking forward to even more growth and excitement in 2023!

Structural CAD Drawing of the School Building Walls



Article by: Nazira Cisse and Vaani Aggarwal

Bootcamp!

For almost a decade, EWB-USA NEU's day-long training workshop known as "Bootcamp" has been instrumental in the club's knowledge transfer to new members. After a year of bootcamp being cancelled followed by a year of online bootcamp, we were finally back in person!

During the workshop, program leadership presented a mini crash course on each phase of the EWB project cycle: Assessment, Design and Implementation, and Monitoring and Evaluation. This involved diving deep into how each phase is important to the sustainability and community engagement of our projects. The leads also discussed Planning, Monitoring, Evaluation, and Learning (PMEL), hydraulic and structural design, grant writing, and sustainability.

Before the lunch break, everyone participated in an icebreaker in which two groups were formed based on which hemisphere (Eastern versus Western) the new members would want to travel to in the world. As the majority of the members were new, the groups were tasked to find commonalities among everyone in the group. This was no easy feat, but both groups were able to find over ten things in common! Some of the commonalities were: all members having gone through a silly bandz phase, all prefer Nike over Adidas, all have hit their ankle with a Razor Scooter at least once, and all have played an instrument.

After lunch, we had former members from the inception of the EWB USA-NEU chapter come in for a guest lecture! Andrew Rohrman and Elisa Arriaga (shown on the right), who were both leads for the Uganda and Honduras projects respectively, presented on their own time in EWB and how it helped them in their professional careers by discussing past and current company projects. They introduced additional civil and environmental engineering fields that EWB members could pursue. We are very thankful that they took the time out of their Saturday to help empower the next generation of EWB members.



Following the guest presentation, new members split into four groups to gain a deeper understanding of hydraulics, grant writing, PMEL, and sustainability within a project. During these in-depth sessions, the new members learned how to calculate hydraulics of a project, write more niche and evocative grants, create PMEL surveys, and learn more about the culture and community within each of our programs.

By the end of Bootcamp, new members had acquired important engineering skills and even existing members left with new insights and skills. Thank you to all those who led and participated in this year's Bootcamp!



Presenters and members at Bootcamp!

Recruitment

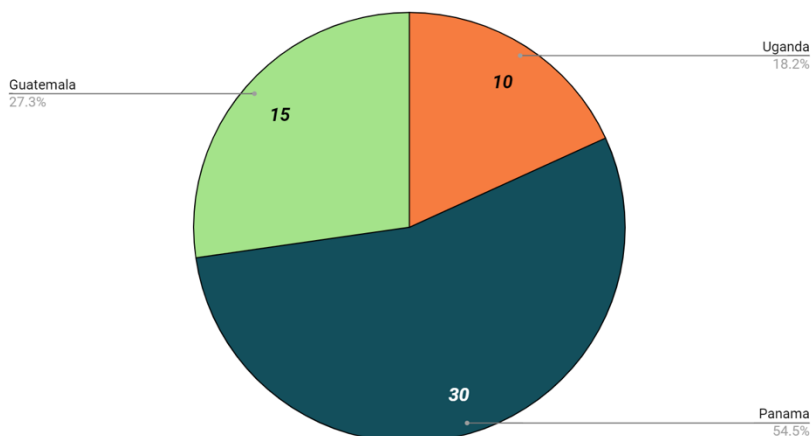
EWB-USA NEU is always striving to gain new members. In the fall, there are plenty of new students on campus and many opportunities for member recruitment. We recruited at several different events, including virtual and in-person Fall Fests, COE club fairs, and the Civil and Environmental Engineering second-year welcome. Additionally, we have spoken at a Society of Women Engineers meeting and in first-year engineering classes to continue to recruit more members. So far, we have had over 200 students interested in either of our water distribution projects in Nakyenyi, Uganda, and La Pedregosa, Panama, or our structural project in Chuixil, Guatemala. Right now is an especially exciting time for new members to join as all three projects are planning to travel this academic year.

Each of our programs meet once a week, so students with busy schedules have plenty of opportunities to get involved. We are also looking into offering virtual meetings on a different day of the week, for anyone who cannot attend the designated once-a-week meeting. In addition, the Northeastern EWB community is incorporating more social and educational meetings. This past semester, we have held various bonding events such as an EWB volleyball game, an EWB picnic, and a scavenger hunt. We also had our annual EWB Bootcamp!, an event where we discussed different areas of the club, taught technical skills to new members and had two



Tabling at one of our outreach events this fall!

EWB-USA NEU Fall 2022 Membership Breakdown



guest speakers present. From these types of events, members across different programs have an opportunity to network and learn more about what our chapter as a whole is working towards.

Make sure to stay updated with EWB-NEU through our Instagram (@ewbneu), Twitter (@EWBNEU), and Facebook (@ewbnortheastern)!

Article by: Halle Weissman & Bianca Dimailig

Finance Update

Fundraising is a critical part of the work that the EWB-USA NEU implements to support our various global infrastructure projects. As 95% of project costs are expected to be covered by EWB-USA NEU, it is essential that we constantly strive to reach our financial goals. Our funding allows us to best serve our partner communities and come from three main sources: corporate donations, personal donations, and grants.

Corporate partnerships are crucial to EWB-USA NEU, and we are incredibly appreciative to all of the companies that have supported us throughout the years. Each year, our members present to over ten companies to update existing partners of new endeavors, and build new relations with other corporations. This year we were able to give a few corporate presentations in the spring and are working on expanding our list even more this upcoming calendar year!

In addition to corporate partnerships, we also connect with local businesses such as Chatime and Panera. These collaborations consist of EWB-USA NEU receiving a percentage of the establishment's revenue for a given timeframe while EWB-USA NEU helps advertise and gain customers for a harmonious partnership.

EWB-USA NEU's work is also supported by external grants. Our programs have designated grant groups in charge of the research and application to these funds. Students in these groups gain technical writing skills alongside a deeper

knowledge of the projects. This fall, Panama is working on grants from the Suez Foundation, the International Foundation, and the Scranton Fund while Uganda is pursuing the Addax and Oryx Foundation grants. To aid grants, chapter-wide finance meetings are held on a bi-weekly basis to work on fundraising, expanding writing skills, and provide updates on financial activities.

Every year, our personal donations match or exceed that of our corporate donations—showing commitment from our own community here in Boston. Every December, the Year End Giving Campaign takes place, which is our end-of-year push for fundraising. This campaign enables us to reach our personal donors including family, friends, students, and alumni. Our goal for this year is to raise \$5,000 to support the upcoming travel many of our programs are planning in the coming six months, the first ones to occur since before the beginning of the COVID-19 pandemic in March of 2020.

EWB-USA NEU hosted the annual Donor Reception on December 7th, 2022 to thank all our generous donors. These events continue to allow us to maintain relationships with donors, recent alumni, and mentors who have provided technical assistance.

None of the fundraising we do would be possible without our wonderful donors, members, and mentors.

Article by: Christopher Schmidt & InJun Jeon

Thank you to our Donors!

GOLD (\$5,000+)



Timothy McGrath and Roberta Ferriani

Thomas and Heather Ford

Northeastern CEM

SILVER (\$2,500+)

Crowley Family



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Jessica Ormsby	Helena Hollauer	Alyssa DuBois	Teofilo Carbonell

FINANCIAL SUMMARY

Quarter 4 2021 through Quarter 3 2022

EXPENSES

UGANDA: \$0

GUATEMALA: \$10,538.94

PANAMA: \$75.00

STUDENT BETTERMENT: \$948.06

ADMINISTRATIVE: \$2,494.55

TOTAL: \$14,056.55

REVENUES

CORPORATE DONATIONS: \$7,050

PERSONAL DONATIONS: \$20,734

GRANTS: \$15,500

STUDENT CONTRIBUTIONS: \$1,400

OTHER: \$825

TOTAL: \$45,509



THANK YOU TO OUR PARTNERS!

Each of our EWB-USA NEU programs work in partnership with an in-country office or NGO to facilitate communication with our partner communities and provide assistance and support during our trips. Without the work of these organizations our projects would not be successful, and we thank them for all they do!

Guatemala Country Office of EWB-USA:

The Guatemala Country Office of EWB-USA currently works with communities on more than 60 projects in Guatemala, with a combined estimated reach of 125,000 beneficiaries. The EWB-USA Guatemala Country Office supports our Guatemala Program.



Sustainable Harvest International (SHI):

SHI's mission is to preserve the environment by partnering with families to improve well-being through sustainable farming. SHI supports our Panama Program.

Lwengo Rural Development Support Organization (LWERUDES0):

LWERUDES0 mission is to help communities in the Lwengo region of Uganda strive for their survival, growth, and development. LWERUDES0 supports our Uganda Program.



We could not do all that we do without the support of our donors. Donations are always encouraged and welcome in any amount. Thank you to everyone who donated this year!

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This publication is dedicated in memoriam to one of the most dedicated members,

Sam Hemphill

Please consider supporting her memory through her artwork on the website:

www.SamScribbler.com



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Northeastern University Chapter

