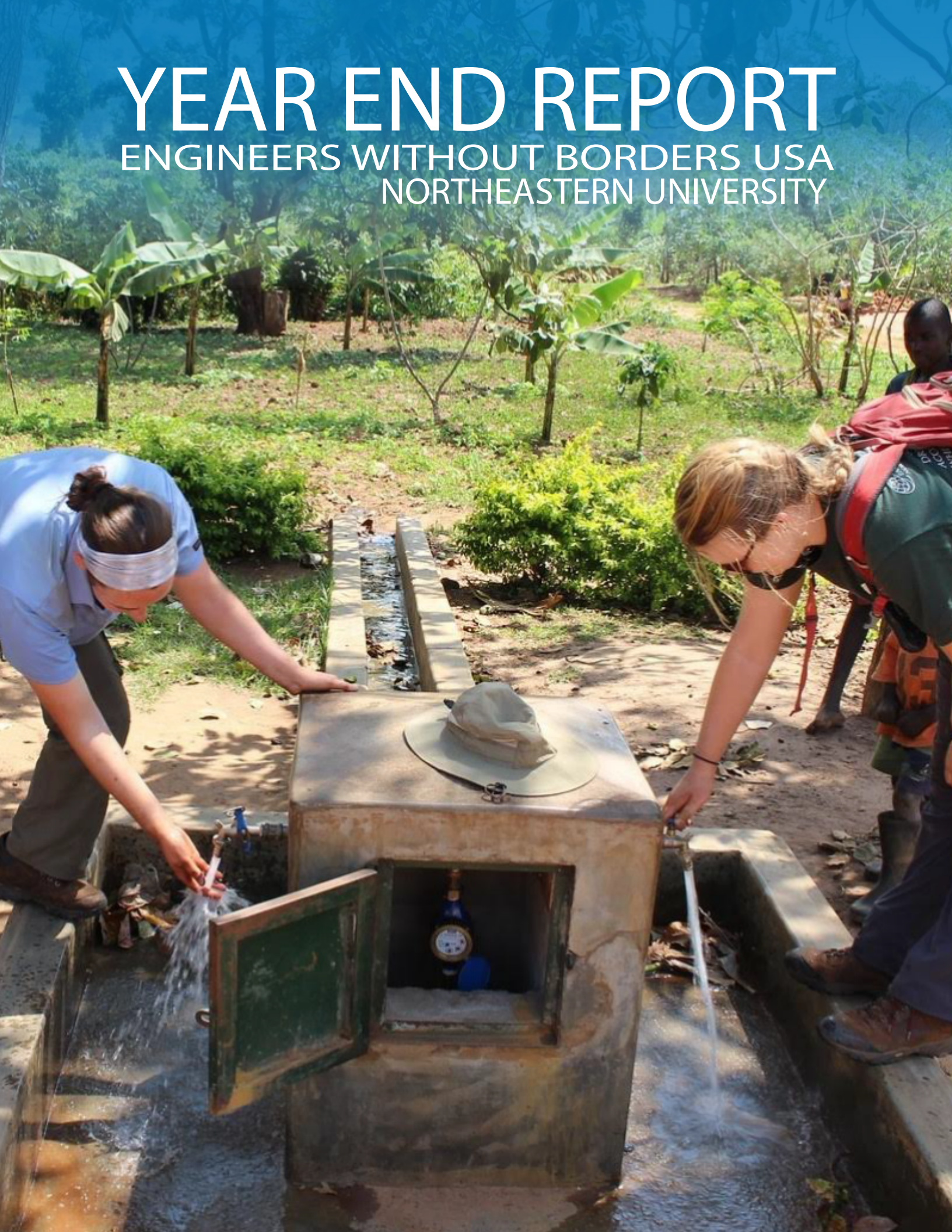
YEAR END REPORT

ENGINEERS WITHOUT BORDERS USA

NORTHEASTERN UNIVERSITY



VISION & MISSION

OUR VISION is a world in which the communities we serve have the capacity to sustaibably meet their basic human needs, and that our members have enriched global perspectives through the innovative professional educational opportunites that the EWB-USA program provides.

OUR MISSION: EWB-USA supports community-driven development programs worldwide by collaborating with local partners to design and implement sustainable engineering projects while creating transformative experiences and responsible leaders.

a letter from the

PRESIDENT

Dear friends,

2016 was an exciting year for EWB-USA NEU. We sent teams of students to all three of our partner communities in Panama, Honduras, and Uganda, with a total of 14 students traveling this year. The Uganda team returned to the community of Bbanda to continue monitoring and repairs of the up and running water system. Both the Panama and Honduras teams had assessment trips this year. This summer, a team of students will go to Las Delicias, Panama, and begin construction on the pipeline design that has been in the works all year. The Honduras program sent a team to continue collecting data, and is now working with that information to begin designing a water system to serve the communities of Ocotal and Potrerillos.

When EWB-USA NEU students are not in the field, they are working tirelessly in Boston. In addition to the work on our three water projects, this year, EWB-USA NEU was able to send eleven students to the Northeast Regional Conference hosted by Boston University to represent our chapter and learn from other groups. We were also able to share some of our own experiences, and two members of our team led a breakout session about challenges we've met along the way and how to tackle them. We also held our annual Bootcamp event for our students on campus as a chance for older members to pass on their knowledge and give everyone a more overhead view of our projects.

The success of our chapter this year and every year is due to the collaboration of so many people, and I want to take this opportunity to recognize and thank some of our biggest contributors. First, I would like to thank each and every one of our donors, without whom none of our designs would come to fruition. Thank you to our partner organizations, who endlessly support our projects both in Boston and in the field. I would also like to thank our mentors, who not only provide crucial engineering perspective, but also work endlessly to ensure that this is a valuable learning experience for our members. I want to thank our student members, all of whom are driven by the belief that reliable access to clean drinking water is a universal human right, and work around the clock to make this a reality. I also want to thank the communities of Ocotal, Las Delicias, and Bbanda for being such fantastic partners in these projects. Without the contributions from our partner communities, our projects would never be possible.

On a more personal level, I am incredibly grateful for all of the opportunities I have had through my years with EWB-USA NEU. I have not only been able to grow as an engineer, I have grown as a team member, a leader, and a person. I will take these experiences with me throughout my career and always remember the people I met and the lessons I learned.

Emily Katzner
President 2016 – 2017

OFFICERS

PRESIDENT
Emily Katzner

VP | ADMINISTRATION
Josephine Rosenthal

VP | DEVELOPMENT
Elaine Kehoe

SECRETARY
Nicolas Fong

TREASURER
Denzil Leach

PUBLIC RELATIONS & RECRUITMENT COORDINATOR
Róisín Floyd-O'Sullivan

HONDURAS PROGRAM DIRECTOR
Kelsey Shukis

HONDURAS DESIGN LEAD
Olivia Ahner

UGANDA PROGRAM DIRECTOR
Alina Rossi-Conaway

UGANDA DESIGN LEAD
Maria Franko

PANAMA PROGRAM DIRECTOR
Patrick Fitzgibbon

PANAMA DESIGN LEAD
Mollie Scott

UNIVERSITY RELATIONS
Sydney Kates

WEBMASTER
David Rosenberg

PANAMA

This year, the Panama program has made significant strides in moving forward with the Las Delicias Water Project. During the first half of 2016, the program prepared for a trip in August, when five students and a professional mentor, Mike Sanders, traveled to Las Delicias, Panama for the second Assessment Trip of the project.

The trip included a weeklong stay in the nearby town of Penonome, with the entirety of each working day spent in Las Delicias. While in Las Delicias, we built upon our existing relationship with the community to gather more information and data for the water system. The pressure coming out of the water taps at each home was measured, which created an opportunity to talk to the homeowners about their experience with the current water system.

On both Assessment Trips to Las Delicias, the team collected extensive elevation data around the community and the surrounding areas. Using this data, the team has been able to design a hydraulic model of the distribution system they will build on the next trip. Community input is a fundamental aspect of any EWB design, so meeting with the Water Board of Las Delicias was prioritized on the Assessment Trip. The primary outcome of these meetings was that the first phase of this project will be to rebuild the distribution aspect of the water system, as it was both the area of greatest need and the linchpin for further progress. Subsequent phases will include the addition of other water sources to the system and the construction of a new tank to meet the demand of a growing community.

Since the team's return from the Assessment Trip, we have focused our work on updating the existing map of the community with the data collected and then using that map to design the water distribution system. There were many obstacles along the way, including the mountainous topography of the community and the river that runs through it, but the team has worked hard to ensure that their design will serve every house in Las Delicias. This summer, a team of five students will again travel to Panama with their mentor, Mike Sanders, and construction will begin on the Las Delicias Water Distribution System.


UGANDA

In 2016, EWB-USA NEU's Uganda program worked to monitor the Bbanda Distribution System (BDS), the product of over eight years of sustained collaboration between the community of Bbanda and our chapter. The system, which provides clean water from a high flow-rate borehole to five tap stands throughout the community via a network of over 3 km of HDPE pipe, was commissioned for use in May of 2015.

The turning over of the BDS to the community marked a major milestone in the project's development, and the months that followed were critical to the BDS's long-term sustainability. As we all know, community ownership is absolutely paramount to the success of any EWB project; after all, it is their system, we just helped build it.

For Bbanda's community Water Board, the commissioning of the BDS presented the unfamiliar challenge of working together to collectively operate and maintain a community-wide water system. As one might expect, the Water Board initially struggled to effectively manage the system, and this unfortunately resulted in some system downtime. Unsatisfied with the BDS's operation, community members took the initiative to elect new Water Board leaders.Under this new leadership, the Water Board made great strides in increasing the reliability and efficiency of the BDS. On the August 2016 Monitoring & Evaluation Trip, EWB-USA NEU reviewed the financial records of the Water Board and found that they were maintaining accurate documentation. Additionally, the travel team observed the Water Board actively managing the system. The new Chairman of the Water Board, Godfrey Kiyingi, is a builder and has facilitated several repairs and improvements to the system.

On this August 2016 trip, the travel team also evaluated and improved BDS infrastructure. While in Bbanda, EWB-USA NEU was able to modify the tank level indicator to block debris from entering the tank, restore flow to a branch of the BDS, and perform tank repairs. The travel team investigated the extent to which the BDS storage tank was leaking, and performed minor repairs to reduce the amount of water being lost through the joint between the tank wall and tank floor.

Of course, there is still work to be done. Looking forward, EWB-USA NEU is working hard to repair existing tank leaks and pursue safe connection of the BDS pump to the electric grid; both of these measures are aimed at promoting overall system sustainability.

The BDS tank, a reinforced brick masonry tank, has been leaking since the commissioning of the system in May of 2015. Based on flow meter readings and reports from the community, EWB-USA NEU estimates that nearly 50% of the water being pumped into the tank is lost due to leaks. This water loss has resulted in loss of revenue for the Water Board and necessitated an increase in the fee per jerry can of water.

EWB-USA NEU, with the help of local partner DN Tanks, has developed a comprehensive tank repair plan to be implemented on the next Monitoring & Evaluation Trip to Bbanda. The travel team and the Water Board will oversee these repairs and continue to monitor the status of the system. Having completed a scale pilot test of the repair, EWB-USA NEU anticipates that the repairs will greatly decrease, if not fully stop, the tank leaks.

HONDURAS

In December 2016, a group of four students and a professional mentor traveled to Honduras to continue assessment for a water distribution system in the communities of Ocotal and Potrerillos, marking our second trip for this water project. This year, our professional mentor was Professor Peter Furth, a member of the Northeastern University Department of Civil and Environmental Engineering faculty.

During this trip, the team's focus was to build on the data collected on the first trip in 2015. This included building upon our working map of the communities and the surrounding area, measuring the elevations of the potential locations of key system components, and ensuring the water quality of the proposed water sources for the system. The data collected on these two assessment trips will allow the group to launch into the design phase of the project.

On this trip, the team also dedicated time to monitoring past projects. The communities of El Carrizalito and Los Planes, two of our past partner communities, had both reached out to us concerning some troubles they had encountered with their systems. In El Carrizalito, the pump had run into some electrical issues, and the vibration of the pump was tearing at its connection with the rest of the system. The team was happy to find that the Water Board in El Carrizalito had been able to work with the local pump provider to fix the electrical problem, and the team was able to temporarily fix the issue with the connection during the trip. Since their return, the team has been in contact with the community to ensure a more permanent solution to this problem. In Los Planes, the distribution system tank has been leaking, and limiting the amount of water available to the community. While in country, the travel team collected the data necessary to fix this issue, and is currently in contact with structural engineers to get the system running to its full capacity as soon as possible.

Currently, the design team is evaluating the many possible designs we could pursue for the system in Ocotal. There are many decisions to be made before a final design can be settled upon, and we want to ensure that this design prioritizes the sustainability and longevity of the water system. Reliable access to clean drinking water is a fundamental need, and it allows these communities to develop and grow. Our chapter has seen this over the last eleven years through our work with five other communities in the Yoro district of Honduras.

The December team's interactive meetings with the Water Board and community constituency solidified our cooperative relationship and furthered our understanding of the project's scope. We look forward to continuing to work with the communities of Ocotal and Potrerillos and are working hard on a design that will provide clean drinking water for many years to come.

NORTHEAST REGIONAL CONFERENCE

In October 2016, a group of eleven EWB-USA NEU members and our Uganda Program's Professional Mentor, Tim McGrath, attended the EWB-USA Northeast Regional Conference at Boston University (BU), hosted by the BU chapter. The event included informative seminars given by speakers with a variety of backgrounds, as well as opportunities to build networks and friendships.

The conference began Friday evening with a keynote address from BU Engineering Professor Herbert Voigt, Ph.D., followed by dinner and a poster and networking session where our members were able to learn about all the great work going on in other chapters. On Saturday morning, a second keynote address was given by EWB-USA Executive Director Cathy Leslie on the state of EWB-USA and some of its recent accomplishments. Our members learned about the important work EWB-USA is doing around the world and the organization's ambitious goals to reach more people and to make a greater impact in the coming years. For the rest of the conference, members enjoyed breakout information sessions on a wide variety of topics. One of the best-received presentations was one entitled "Designing Water Systems for Climate Change," which discussed how to adapt water systems to a changing environment and how to educate our partner communities about the impacts of climate change on their lives. Another standout was the Engineering Service Corps presentation. Members were exposed to the opportunities within EWB-USA that lie outside of the university chapters and offer opportunities for members to continue their involvement in world development. Our very own Uganda Program Leads, Maria Franko and Alina Rossi-Conaway, along with Uganda Program Mentor, Tim McGrath, presented an update relating to solving post-implementation problems in Bbanda, Uganda.

The weekend's events wrapped up with a final keynote speaker, Lionel Laroche from MultiCultural Business Solutions, who spoke about diversity and cultural differences that we may face in our professional work. At the end of the weekend, the group reconvened to share what we learned and how we can apply the techniques of other chapters at Northeastern. Every year, the regional conference is a perfect opportunity to get together with other chapters and exchange ideas and approaches to these projects. We all have so much to learn from each other, and we look forward to learning and sharing even more at the next conference!

BOOTCAMP

Every year, our chapter gets an influx of new students who are ready and excited to jump into our projects. Our annual Bootcamp event is a chance to equip these new members with the tools they will need to fully understand the EWB process and the engineering behind these designs. This year, on Saturday, October 15, 70 attendees came together for this event. Over the course of the day we went through the four phases of a project (assessment, design, implementation, monitoring) to simulate the experience of going through an entire project, compressed into one day. This helps new students gain the skills needed to design a water system, and helps older students to work on their leadership skills by guiding the process and answering questions.

To simulate the full project experience, we did a series of activities that corresponded to the different stages of a typical EWB water project. To begin, we simulated planning for an assessment trip. Students created a packing list and detailed schedule for the trip. This guided students to think about what sort of information would need to be collected in order to design and build a water system. The older students who led the activity helped with the brainstorming process and filled in the gaps to make sure the group fully understood the tasks involved for an assessment trip.

Before the design phase activity, our president, Emily Katzner, gave a lecture on hydraulics and the mechanics involved with designing a water system. Students then used what they learned to design a small system in a hypothetical community, making sure to include system components where needed to ensure proper water pressure. Next, to learn about the implementation phase of an EWB project, students went through an online simulation of an implementation trip. The simulation shows students the various obstacles that can appear during these trips, and the groups talked through how they would overcome these hurdles.

A crucial aspect of all of our projects is measuring the impact that they have on our partner communities. The method we use to track this impact is called PMEL (planning, monitoring, evaluation, and learning). Our vice-president of development, Elaine Kehoe, explained in detail what this means and how important it is to remember that our work isn't done when a distribution system is complete. We design these systems to last, and we need to make sure that they not only work on the day they're commissioned, but that they continue to work for years to come.

Our Bootcamp event has continued to expand each year. This event is an essential part of the training process for new students and is now being adopted by other EWB-USA chapters around the country to train their members.

SENIOR SPOTLIGHT
Sarah MacClellan

The dedication of our student members is such a significant driving factor to the success of all of our projects. As our chapter continues to grow, we have many members who have dedicated countless hours to our mission by the time that they graduate. This year, we would like to recognize a graduating senior who dedicated her energy and tremendous skills to our chapter. This year we would like to thank Sarah MacClellan for her contributions.

Sarah began her time with EWB as a member of the Honduras program, which at that point was one of only two projects our chapter was working on. In her third year at Northeastern University, Sarah was crucial to the creation of our newest project in Las Delicias, Panama. In addition to being on the first EWB travel team to Las Delicias, she was also a member of the travel team on the 2015 Implementation Trip to Bbanda, Uganda.

Sarah has been deeply dedicated to the Panama program ever since its creation, and helped motivate many students to join the new project. As design lead, she oversaw the preliminary designs of the system, including a map of the community, survey collection, and system requirements. She had a vision for the project and inspired others to believe in that future. The project in Las Delicias went from idea to construction in just over two years. Without Sarah's efforts this would not have been possible. Due to her designs, energy, and vision, the Panama program continues to flourish. She is justifiably proud to see how far the project has come since its creation and looks forward to continuing progress with the people of Las Delicias.

ALUMNI SPOTLIGHT
Matt Walsh

EWB-USA NEU would not be where it is today if it were not for the dedicated efforts of the students who came before us. As Northeastern's chapter continues to grow, we like to recognize alumni who have provided key service to the chapter and advanced its mission. This year we would like to thank Matt Walsh for his contributions.

Matt Walsh was a member of our Honduras program, and was involved in the creation of the Uganda program in 2009. He was on the first assessment trip to Bbanda, Uganda and an assessment trip to El Carrizalito, Honduras. After graduating, he continued to provide essential service to EWB, including returning on an implementation trip to Honduras during a time of political unrest when students couldn't travel. He and other alumni understood the importance of our projects and continued to give their time to the chapter. Although Matt wishes he could give more of his time to community service projects, he continues to support our chapter.

Matt is currently a Project Manager at Eckman Construction, and says that Engineers Without Borders has had a lasting impact on his career as an engineer. EWB supports the practical and hands-on approaches that are already part of the Northeastern University mentality, including applying academic knowledge to a real world scenario. Matt said that "EWB was the glue that helped me make the transition from student to engineer." In his experience, EWB not only provides real world experience, it also helps students make connections with employers.

As Matt looks back on his college days at Northeastern University, he had some words of wisdom for current students. Even though you can't keep in contact with all of the many people you meet in your life, it is important to try and stay in touch with as many people as you can. It is also extremely important to remember how much our mentors do for us and our projects. Matt would like to personally thank Dan Saulnier and Tim McGrath who he says "shaped my professional career more than anyone." As a final note, he recommended that students actively pursue experiences that foster their abilities to overcome challenges, develop skills, and create lasting memories. EWB is a great way to do this, but as students we have so many opportunities to try new things. Matt urges students to take these years to try something new! You never know what you will enjoy.

FINANCIALS

REVENUE

Corporate	$ 19,670.00
Personal	$ 17,689.91
Grants	$ 19,500.00
Student	$ 2,095.00
Total Revenue	$ 58,954.91

EXPENSE

Honduras	$ 6,868.27
Uganda	$ 13,515.52
Panama	$ 7,115.91
Student Betterment	$ 2,605.14
Other	$ 1,000.00
Total Expense	$ 34,897.93

PARTNERS

SUSTAINABLE HARVEST INTERNATIONAL

ACTS HONDURAS

VILLAGE FOCUS INTERNATIONAL

DONORS

GOLD SPONSORS

William J. Roache

The Scranton Fund

ers energy & resource solutions

ECKMAN CONSTRUCTION

TiePoint · bkm ENGINEERING, LLC

SIMPSON GUMPERTZ & HEGER
Engineering of Structures and Building Enclosures

SILVER SPONSORS

The Ford Family

The Crowley Family

GZA

BRONZE SPONSORS

The McGrath Family

Zeldin Family Foundation

Alfred Anderson

The Saulnier Family

Richard Scranton

Trimble

GE

CIVILized Solutions

www.ewb.neu.edu/donate

CONTACT US!

Facebook: EWB-Northeastern University

Instagram: @ewb_neu

Twitter: @EWBNEU

Website: www.ewb.neu.edu

Photos: ewbneu.smugmug.com

ENGINEERS WITHOUT BORDERS USA

Northeastern University Chapter