

Engineers Without Borders

Lehigh University Chapter Newsletter - Fall 2019

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2019 EWB-USA Conference

This past November, three members of the chapter, President Praveen Joseph, Vice President Jacob DeWitt, and Project Manager Isabel Steinthal traveled to the 2019 EWB-USA Conference in Pittsburgh, Pennsylvania. The conference is EWB USA's premier annual event, focusing on engaging discussions among industry leaders, educational opportunities about complex global engineering challenges, and networking with others who share a passion for driving a socially minded engineering future. "It was a great chance to gain insight from experienced professionals and other successful student chapters. It should be a great chance to bring some positive change to our club," says Jacob DeWitt. While in attendance at the conference, our chapter members got a chance to network with both engineering professionals and students, and bond more with the Lehigh Valley professional chapter and the Lafayette College student chapter. They also attended talks about integrating the United Nations sustainable development goals into our projects, navigating community relationships, and new member onboarding and retention. Isabel, Praveen, and Jacob also got tips about surveying in the Dominican Republic and how to reimagine the chapter's digital media portfolio. "My favorite part was listening to the keynote speaker talk about his career journey because it gave me more inspiration to pursue a career in aerospace," quotes Isabel Steinthal. We're so glad the conference was close enough for some of our chapter members to go and experience such an amazing opportunity.



From Left to Right: Isabel Steinthal '20, Jacob DeWitt '21, and Praveen Joseph '20

Social Class Updates

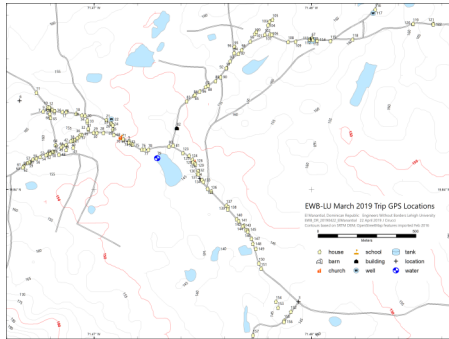
This semester, Social Class Manager Aly Duffin primarily focused on finding a new advisor, and we are thrilled to announce that Dr. Karen Pooley has joined the chapter as the new social class advisor.

Dr. Pooley is a political science professor at Lehigh University and the director of the environmental policy graduate program. Her work primarily concerns city planning, housing and community development, and neighborhood revitalization.

We are so excited to see what she will bring to EWB as a chapter!

Project Class Updates

Water Supply



The El Manantial layout map used to create the different distribution pathways

Goals: The goal of this group is to provide residents of El Manantial with a reliable and drinkable water source. This semester, the group focused on determining the best possible options for tank locations and water distribution pathways based on elevation data and the community layout of El Manantial.

The team created two different maps displaying possible tank locations and pipe pathways for the distribution systems. Due to how spread out the community is, investigations on the use of tap stands as an alternative to connecting every house to the distribution system began.

Next steps include beginning work on energy calculations and continuing research on tap stands.

Bethlehem Community Gardens



Goals: To create a better water distribution system for the Lehigh Community Gardens located on Goodman Campus that includes spigots or hydrants around the garden, a shutoff system, and a locking system.

The team created a layout that includes an elevated tank, pipe layouts, and yard hydrants. Flow rate and hydrant output were calculated, and a cost estimate that includes materials and the locking system was proposed.

Next steps include investigating the structural stability of the water tank support and brainstorming the application of the project.

The Community Garden located on Goodman Campus

Water Purification



Goals: The group initially focused on research and purification methods, specifically high salinity as that is the main concern for the wells in El Manantial.

The group shifted focus to form protocols for testing methods specifically focused on conductivity and E. coli/total coliforms.

The team researched contaminants that could effect the wells in El Manantial and performed an Aquagenx test for E. coli and total coliforms in a laboratory. Next steps include refining the protocol for Aquagenx testing and performing more tests in the laboratory and out in the field.

An Aquagenx test showing the color difference between a control sample, shown above, and a positive sample, shown below

Water Systems Reliability

Goals: Due to the recent cracking to the tank in Cebadilla, this group investigated what causes systems to fail and the consequences of these failures.

The group researched three case studies including the tank in Cebadilla to examine the physical failures, quality failures, and hydraulic failures that impacted the system and what the chapter can learn from the experience.

The major lessons that are relevant to our chapter's projects include accurate determination of pump flow calculations and proper water quality control.

The cracked water tank in Cebadilla



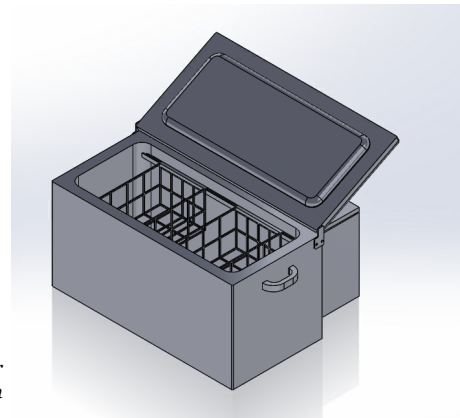
Chill Challenge

Goals: To create a proposal for a refrigerator design powered by off-grid energy options as part of an EWB-USA national contest.

After conducting research and gaining insight from the members who traveled to the EWB National Conference, the group designed a refrigerator powered by burning biogas and vapor compression.

Next steps include submitting the proposal to EWB Nationals for review and designing a prototype if the proposal is chosen.

Solidworks model of the refrigerator designed by the Chill Challenge team



A Letter from the President Regarding Travel

Hello to Friends and Alumni of EWB-Lehigh,

The 2019 Fall Semester has allowed us to lay the groundwork for upcoming travel that will shape our chapter's impact in the near future. This past summer, EWB Nationals lifted the travel ban to Nicaragua. This development has allowed us to continue our operations in the community of Cebadilla. We are currently planning our second official monitoring trip March, 2020 to Cebadilla. This trip will focus on the current reliability of the water distribution system, which was implemented in the Summer of 2016. There were reports of cracks in the water tank this past summer, which have since been repaired using emergency funds. The system's check valve is causing pump discharge issues and must still be assessed with the assistance of local technicians. The trip will also be used to assess the feasibility of continuing a potential culvert bridge project, as well as water quality testing of conductivity and coliforms in the system.

Another trip currently being planned is to the community of El Manantial in the Dominican Republic. The goal of this trip would be to establish a community agreement to begin a water distribution system. Additionally, meeting with a hydrogeologist would give us information on the water table in the surrounding community in order to select a location for the well. We continue to maintain a strong relationship with the Lehigh Valley Professional Chapter and Lafayette Student Chapter, and recently had our annual Tri-Chapter Meeting. We are still in talks with the Dean of the P.C. Rossin College to build a partnership in which travel and technical assessment fees would be accommodated for by the College. EWB Nationals has recently announced their plans for EWB 2.0, in which they will commit to covering 30% of all project costs in the near future. We are very excited for this coming year and are thankful for all who have supported us to this point. We hope you will donate so we can continue to sustainably impact our communities in Nicaragua and the Dominican Republic.

Best Regards,

Praveen Joseph, EWB President

Outreach Committee Updates

Outreach committee continued to host water filtration lessons at Broughal Middle School to teach kids about the importance of clean water and how to purify water. In addition, Engineers Without Borders participated in Spooktacular, an annual event hosted by the Lehigh Community Service office with Halloween themed activities for local families to come and enjoy. Recently, the committee has begun work on creating a free little library as part of a beautification project to make South Bethlehem more homey and encourage travel to different places around the city. The free little library will be placed in Yosko Park and will allow people to exchange books with other members of the community. Initial designs for the library are currently in progress.



Our table at Spooktacular

Fundraising Committee Updates

Over the course of this semester, the club has hosted several fundraisers at local restaurants including Playa Bowls, El Jefe's, and Deja Brew. We also did a delivery bake sale where we delivered donated baked goods directly to patron's doors. Through these efforts, the club raised around \$250. Fundraising chair Gabby Alves did a fantastic job getting over 400 baked goods donated for the delivery bake sale. Upcoming efforts include applying for a crowdfunding campaign which will go live in February.

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