ENGINEERS WITHOUT BORDERS-USA
MISSOURI S&T STUDENT CHAPTER

2018 EWB-S&T Newsletter

Engineers Without Borders | Fall 2018 | Missouri S&T

Our Mission

EWB partners with developing communities to improve their quality of life through the implementation of sustainable, equitable and economical engineering projects. In the process of helping remote communities, EWB promotes the development of globally aware and internationally responsible engineers, students and professionals.

Student Spotlight

Why did you join Engineers Without Borders?

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Sierra Shields

Program Lead for the Agua Fria, Ecuador Team

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Student Spotlight cont.

I spent a summer in high school in Nicaragua and went on several mission trips to rural communities that had little or no access to clean water. Their houses were built from things they found at the garbage dump. Once I got back to the United States, I realized that I couldn't live my life knowing there were people living in desperate conditions, and not use my skills to help them. I chose to study engineering because there were programs like Engineers Without Borders where I could use my interest in science and hydrology to make a difference in other people's lives.

How has joining EWB affected your outlook on your day-to-day life?

Whenever you work daily to help provide a community with potable clean water, it is hard not to reflect on how easy your own life is. Working with Engineers Without Borders is a daily reminder that having a clean running tap is a luxury that most Americans take for granted.

What part of the upcoming trip to Agua Fria are you most excited about?

I am most excited to meet the community members of Agua Fria. I can't wait to hear their stories and spend time talking to them. I hope for our team to make strong connections with the community during this trip, and sustain that connection throughout our partnership.

2nd Annual Golf Tournament

Fundraising is the lifeblood of EWB. The brains and brawn are great, but it's money, Bolivianos, and Soles, that buy the cement that builds the designs our students spend so much time creating. The golf tournament in October has been one of EWB-S&T's most important fundraisers. The second annual EWB Golf Tournament took place on the sixth of this October, at St. James Golf Club. Teams of students and sponsors used this opportunity to compete against each other for the top spot. Overall, the event raised $270 towards our projects. What seems a modest amount of money to us has an impact in countries where $10 a day is a good working wage.

2019 Faculty and Staff Talent Show, Feb. 15th (save the date!)

The Faculty Talent Show is another of Engineers Without Borders' many fundraisers. The show consists of Missouri S&T's professors eager to show an audience their talents outside the classroom. In the past, the talent show has had acts that consist of musicians, comedians, actors, poets, and even a physics professor with pigs. Along with performances, the show includes a short presentation about Engineers Without Borders here at Missouri S&T, the current projects that are in progress, and even a raffle for a trip to Cancun. The funds raised from the show go towards the teams and their projects. The talents performed show a whole new side to Missouri S&T's faculty and allows students and other audience members to learn more about them. This coming year, the Faculty and Staff Talent Show will be taking place on February 15th at 7 pm in Leach Theatre on the Missouri S&T campus.

Montana-Cahill Challenge Grant

When students host a fundraising event, hundreds or even thousands of dollars are generated. That's important. Every dollar helps. Perhaps more important is the passion we have to help others. That selfless energy makes it easy to get in front of strangers and invite them to also help our communities. EWB S&T has been fortunate that many people do feel that same call to help.

The largest expression of that support is the Montana-Cahill challenge grant. The Montana-Cahill foundation, established by Peggy and Duane Montana, alumni of ChemE and Civil, respectively, set up a fund that will match up to $500,000 to support EWB-S&T over the next twenty years. An amazing gift of $250,000 by Rolla-native and S&T ME alum David Heikkinen, and Dr. Ann Rueff Heikkinen, halved the amount that needed to be raised. EWB-S&T founder Professor Rick Stephenson extended a match of $50,000, significantly increasing our donations. The challenge now stands at a bit over $100,000 still to be raised. We are excited to complete the challenge with the help of more passionate people like Peggy, Duane, Rick, Ann, and David, and then using it to improve the lives of tens of thousands of people who need bridges, latrines, and schools, but especially clean water.

Barbeques

Engineers Without Borders is always looking for different ways to raise money, and what better way than with food! The students of each program team volunteer for a couple of barbeques throughout the school year, and the money raised goes directly towards the S&T chapter to use for traveling and equipment for each team. The barbeques held so far in the Fall 2018 semester have raised almost $1000, which is 25% more than all the barbeques for the 2017-2018 school year. This just goes to show how hard the entire chapter is working to raise the money that supports our mission to change peoples' lives forever.

Get More Involved!

To donate online go to:

ewb.mst.edu/donate

What your donation goes towards:

$50 – provides a bio-sand water filter for one family

$80 – buys 100 feet of water distribution line

$300 – purchases 100 gallons of an installed water tank

$500 – underwrites one student's travel fees

$3,000 – drills 30 feet of a deep water well

$10,000 – purchases a water tank that can serve up to 500 people

Santiago, Honduras

Program Lead (past): Kelsey Bloom

Santiago, Honduras, home to approximately 10,000 people, is one of the largest communities Missouri S&T EWB has had the opportunity to partner with. Since our initial interaction with the community in 2007, our overarching goal has been to provide the community with 24/7 potable water. Since that first trip, the team identified and fixed many leaks in the existing system, implemented a chlorine disinfection system (which correlated with reduced incidents of Zika virus in the community), drilled wells, and expanded the water distribution system. The last time the Honduras team was able to travel was in May of 2016, when they installed a tie-in between the two major wells in the community. Events in 2016 led to the US State Department updating its travel warning and EWB-USA deciding that for the safety of volunteers, travel to Honduras was no longer allowed. Fortunately, the bulk of our work in Santiago was completed. Although hands-on involvement in Santiago ceased, we instead provide materials and detailed instructions on how to finalize the project. In the last few years, the team oversaw the completion of a 100,000-gallon water storage tank and was working on connecting the tank to the existing system. That new tank is expected to be connected to a well soon, which will finally achieve the capability for 24/7 water in Santiago.

Agua Fria, Ecuador

Program Lead: Sierra Shields

The State Department placed Honduras on a travel advisory, and students don't go where the State Department says no. Reluctantly wrapping up our work with Santiago, Engineers Without Borders-S&T found a new community to work with: Agua Fria, Ecuador, home to 250 residents. The student team has been actively working with a goal of successfully delivering clean water to this agricultural community. Agua Fria is sadly familiar with the impacts of lacking clean water. The community reports illness occurs due to this lack, including in small children. Trucks deliver water of questionable quality, but that water is better than raw river water. The first step to improved water in the community will be to identify and survey routes to potential water sources. Our S&T team divided into three sub-teams, mapping and modeling, sustainability, and construction. The community informs us of a nearby river and an unused spring. In January we plan to make our first trip, meeting the community, discussing and assessing their needs and capabilities, and performing land surveys to water sources. Since Agua Fria is a newly adopted community, no implementation has taken place yet, so in order to stay productive, side research on latrine systems is being conducted as a possible future project for the team. Where water flows, wastewater soon flows, too. The faculty and students of the Ecuador team are excited to continue their work in an effort to provide improved water to those in need.

Paraje Xecaxjoj, Guatemala

Program Lead: Mackenzie Settle

We're building a school for hundreds of children. That's not quite true – we're only designing, funding 95% of the costs, and inspecting construction. A Guatemalan contractor and the community will be placing concrete. This community of 1,500 people currently uses several sheds as the school building for all of their children. The Guatemala team is creating drawings and performing calculations for the new two-story elementary school building that will be constructed in Paraje Xecaxjoj (pronounced Par-ah-hey Check-ah-hoe; we are told it means 'the eagle sees the spicy vegetable below the mountain'). At present, S&T students working on the structural portion of the project have nearly finished all structural drawings and blueprints and are prepared to send them off for approval by EWB-USA. The electrical and civil sub-teams use these designs as references for their designs of electricity and the site work required for the project. Another sub-team is hard at work researching options to build a latrine system for the Guatemalan students. Finally, the translation sub-team is making headway in converting all final drawings and technical reports which will then be sent to our partner, EWB-Guatemala, so work can begin. The sub-teams are working in conjunction to write up implementation reports to prepare for the upcoming construction and travel phases of the project. After all of the design work is completed and EWB-USA approves the designs, a contractor will be hired by EWB-Guatemala. The Paraje Xecaxjoj team therefore plans to travel in summer of 2019 to assist with site work and to inspect construction.

Diez de Abril, Bolivia

Program Lead: Casey Hines

Sometimes a simple question leads to an interesting answer. "What do you call the community?", for example. The Diez de Abril team (formerly referred to as the Erquiz Oropeza team) is working with a community of around 350 people to provide a well and a water distribution system. Additionally, the team is working on developing a drainage design to mitigate significant erosion problems within the community. During the summer of 2018, the team traveled to Bolivia to install a water tank and gather survey data. The new water tank supplements two existing water tanks the community had. The erosion sub-team is now using the extensive survey data gathered this summer to handle stormwater that the Diez de Abril community experiences during the rainy season. Meanwhile, the distribution sub-team is using the survey data to develop a gravity-fed distribution system to deliver water from the existing storage tanks to individual houses in the community. That water will come from a well to be drilled in the community sending water up a supply line to those water storage tanks. A contract for drilling the well should be established between EIA, our partner in-country NGO, and a driller before Christmas. The Diez de Abril team plans to visit the community to implement the system in the summer of 2019.

Puerto Pando, Bolivia

Program Lead: Mark Echele

A bridge, a tank, and a large concrete cylinder. The Puerto Pando team has made amazing progress with this small agricultural community of about 100 people on the edge of the Amazon jungle. The team started working in 2016 with the people, who were in need of a new water storage system, a pipe bridge, and some sort of filtering system. Since partnering with the community, the team has worked diligently and made three trips to Bolivia. During the assessment trip, the first problem identified was that their existing pipes were too small, so the distribution system was replaced with a larger pipe. That replacement was challenging because of an arroyo (ditch) spanning nearly 130 feet, so now a student-designed suspension bridge does the job. The community installed a water storage tank, and in summer 2018 we all worked together to create the filtration system, which includes a slow sand filter, the tank of which is a twelve-foot tall, five-foot diameter cylinder. Slow sand filters are an old, low-tech drinking water treatment technology no longer common in the US. To get design advice, team member Rebecca Johnson found herself on the phone to the operator of one of the few still used, in a town in Alaska. Turns out a concrete cylinder is easy to design, a little harder to actually make.

With the water system complete, monitoring begins, and now the community has asked for latrines. The latrine assessment sub-team has been examining how badly a latrine system is needed in the community of Puerto Pando, or if another community is in a greater need of their help; Puerto Pando has some ability to build latrines themselves, and other communities have no water. At this stage, the local NGO helping us in Puerto Pando is conducting interviews with community members, asking questions the students have provided. From these interviews, the team hopes to identify what the community needs, and what Puerto Pando is capable of achieving without assistance. The monitoring and reporting sub-team is progressing on getting the Operations and Maintenance Manual completed. That manual is to be condensed and translated into Spanish for the community to use for maintenance and eventual repairs. The Puerto Pando team plans on traveling in the early summer of 2019 at least to monitor the water system, if not to also build latrines.