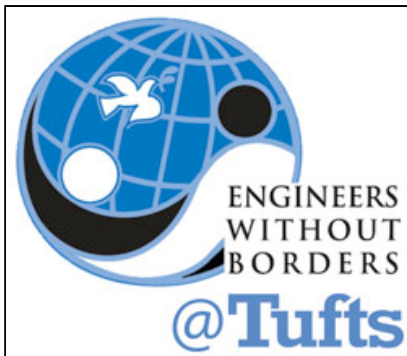


Program Summary 2007-2008: Engineers Without Borders -Tufts



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About

Engineers Without Borders - USA (EWB-USA) is a non-profit humanitarian organization established to partner with developing communities worldwide in order to improve their quality of life. This partnership involves the implementation of sustainable engineering projects, while involving and training internationally responsible engineers and engineering students. The Tufts undergraduate chapter of Engineers Without Borders (EWB-Tufts) was formed in 2005 as a collaboration between the Institute for Global Leadership and the School of Engineering to facilitate university student participation in international sustainable development projects. EWB-Tufts' first project was in the small Himalayan village of Gyapthang, in the Tibetan Autonomous Region, where they worked with the community to introduce a solar cooker and a closed, self-composting latrine. After the Tibet project, EWB-Tufts focused its efforts on helping small communities in Ecuador and El Salvador improve local access to safe drinking water. In El Salvador, EWB-Tufts members have been working with the community of Arada Vieja and Epilogos, a NH-based NGO, to implement a sustainable water filtration and distribution system. In Ecuador, the group has partnered with the NGO Fundación Brethren y Unida (FBU) to help a small community in the Sierra Region of Ecuador develop environmentally friendly technologies to increase local access to clean water.

Mission

It is the mission of the Tufts Chapter of Engineers Without Borders, in partnership with the national organization, to design sustainable development projects for communities around the world, to engage liberal arts and engineering students, faculty and campus in the process, and ultimately aim the skills and abilities of its members to develop those of another culture for the purpose of improving standards of living, empowering communities and developing socially and globally responsible engineers and citizens.

Goals

1. Provide Tufts liberal arts and engineering students with opportunities to gain practical experience in designing, planning, and implementing community-based engineering interventions in the developing world

2. Provide technical, research and labor support for community development projects in partner communities

Year In Review

Fall 2007

This semester, Tufts EWB focused on the two ongoing projects in El Salvador and Ecuador. Both projects are nearing the end of their proposed timeline, so planning was not only for the upcoming trips, but also for future projects. Outside events, such as Community Day and the Project Exposition, were held as usual, to generate interest around campus and in the surrounding community. The El Salvador team spent the semester designing a concrete lid for the spring box the community uses for its water source. Energy was put into ensuring the lid would seal off the spring box from outside contaminants as much as possible, as well as have the strength to withstand the elements. A team of six students and one professor traveled over semester break to implement this part of the project. The Ecuador project prepared for their winter trip during the semester. It was not known if there would be future trips for this team, so emphasis was placed on gathering extensive water quality data that could be compiled for the community to use in the future. A team of three students and one adviser traveled over winter break.

General Interest Meeting (Sept. 12, 2007)

Over forty new students turned out to learn about EWB's projects in Ecuador and El Salvador. Past trips, on-campus activities, and group goals were presented by members of each of the two projects.

Potters For Peace (Sept. 27, 2007)

Ron Rivera, international coordinator of Potters for Peace, presented on ceramic filter technology. Potters For Peace is a U.S.-based non-profit whose goals are to offer support, solidarity and friendship to developing world potters; assist with appropriate technologies sustained using local skills and materials; help preserve cultural traditions; and assist in marketing locally, regionally and internationally. (www.pottersforpeace.org)

Community Day (Sept. 30, 2007)

Tufts students, faculty, and staff came together with members of the community to share the research and education taking place across the university. EWB-Tufts presented its projects and activities to generate interest in the group and raise awareness about the issues EWB-Tufts seeks to address.

Project Exposition (Oct. 12, 2007)

Members of the EWB-Tufts Executive Board and project leaders presented summer trip progress to parents, faculty, and students. A general EWB overview was given, as well as summaries of past trips for each of the projects, but focus was on the most recent trips to show parents and interested students the organization is still active.

Prototype Build Session (Oct. 27, 2007)

Students from the El Salvador project team began work to rebuild last year's slow sand filter prototype. The goal of the prototype is to get students acquainted with the technology to prepare them for future trips, as well as to model the filters in order to get data on flow rate and other variables that could be changed in the field to increase effectiveness.

Faculty Project Review Session (Nov. 16, 2007)

Students presented proposed objectives and designs for their upcoming project trips to their faculty advisers. The faculty were encouraged to use their professional opinions and assist in the final designs to ensure all goals were met and no problems were visible.

EWB-USA Project Review (Nov. 18, 2007)

EWB-Tufts students presented their projects to the Technical Advisory Committee of Engineers Without Borders-USA for review and approval to carry out the project. A team of engineers and advisors commented on the proposed plans and gave suggestions on how to improve designs. Both teams were approved to travel.

Spring 2008

Following the January trips to Ecuador and El Salvador, Tufts EWB began looking at the closing process for the Ecuador project and the new community health elements of the El Salvador project. In Ecuador, the community made progress during the fall by using the water quality data to secure funds and begin work on a slow-sand filter. With these advancements, the Ecuador group decided to focus on a final trip in the 2008-2009 academic year to perform water quality testing on the new filter and conduct surveys to monitor the filter's impact on community health and perspectives. With all construction completed, the El Salvador group focused this semester on improving another tank lid to ensure that contaminants do not enter the water in the middle of the system. The group also worked on expanding community awareness on issues such as personal hygiene.

With the Ecuador group in the final stage, the organization made a call for new project proposals at the spring general interest meeting. Three students, who traveled to Haiti during the January break through IGL funding, proposed beginning a project in Balan, Haiti. After meeting with the students and three Haitian students from Balan, Tufts EWB decided to pursue a summer assessment trip. The following months were spent in preparation to assess five main factors: irrigation, infrastructure, agricultural technology/soil quality, water quality and access, and community health. Four engineering students and four liberal arts students will travel to Balan during the summer of 2008.

The EWB Local Outreach Initiative has also had a busy semester due to involvement with a number of activities and events on and off campus. We have continued our partnership with the Forestdale School in Malden, regularly visiting a fourth grade classroom to teach science lessons. We are also planning a workshop on the Scientific Method for a third grade class. The Center for Engineering Educational Outreach (CEEO) recently hosted a group of ninth grade students from the Boston Arts Academy and approached us to talk with them about our experiences in EWB. EWB members gave presentations to two different groups of students showing videos, pictures, and showcasing the technologies we use on our projects. Beyond the continued work in the classroom, the local outreach group also participated in Kid's Day. With the help of funding from the Energy Security Initiative, students created a green energy activity where kids could pedal a stationary bicycle to generate enough electricity to turn on a light bulb.

El Cristal, Ecuador (January 3-24, 2008)



The Ecuador project is now in its final stage. Students Brittany Wright, Julia Green and Amy Piscopo traveled with Tufts EWB alumnus Jonathan Crocker to El Cristal, Ecuador in January 2008 in order to perform water quality tests on two of the main water systems and provide the results to the community. While in El Cristal, the travel team learned that in the fall of 2007 the local water board had used the water quality data from the August trip to apply to the municipal government of Cotacachi for funding to install a slow-sand filter in the main system. They successfully secured grants to convert existing tanks of the main water system to a slow-sand filter during the fall. The tanks have been resurfaced, new piping connections added and valves replaced. Due to poor road conditions, the filters will not be completed until the rainy season ends. With the news of the slow-sand filter, the January travel team focused on testing the two smaller water systems. Community members hope to use January water test results to apply for additional funding. The Ecuador project team is hoping to do a final trip within the next year, once the slow-sand filters are running, in order to perform water quality tests to verify that the filters function

properly.

Arada Vieja, El Salvador (January 3-16, 2008)



Over winter break, a team of six Tufts EWB members traveled with Professor Durant to El Salvador to continue work in Arada Vieja. The team included seniors Jonathan Zack and Sara Jackson, juniors Russell Hyatt, Jon Gregorowicz, and Kate Siegel, and sophomore Lauren Morris. This group, representing engineers and community health majors, focused their efforts on the construction of a permanent lid for the spring box located at the beginning of the water system. Prior to lid construction, the spring box was open to the air and thus polluted with algae, bacteria, garbage, and insects. The lid was constructed with an L-shape design and built-in manhole that allows for easy access to the spring box for routine cleaning. In

addition, a diversion ditch was dug around the spring box to prevent rainwater runoff from entering the system. The team focused heavily on health surveys, as a new health survey was formed during the fall semester that was more data oriented to better facilitate comparisons between trips. On the trip, the team also did multiple water quality tests, testing not only for bacteria, but iron, phosphates, nitrates, turbidity, and pH. The results were astounding. All three filters were fully working at reducing the bacteria count from over 50 counts of total coliform to 0 per milliliter of water. Future trips will focus on ensuring it will stay this way.

San Jose Villanueva, El Salvador

During the winter 2008 trip to San Jose Villanueva, El Salvador, Tufts Engineers Without Borders learned of the need for a bridge in an area of town where the road is prone to flooding and impassable by pedestrians and vehicles during the rainy season. Mike Jenkins, head of the NGO with which Tufts EWB partners in El Salvador, alerted the EWB January travel team to the situation and brought the team to visit the site. Among local community members, there was widespread desire to construct a bridge, but insufficient funds with which to pay for the bridge design. After returning from the trip, Prof. John Durant presented the bridge design project to a Spring 2008 Civil and Environmental Engineering (CEE-81) class. Antoine Debiais, Allison McCarthy, Courtland Hemphill, and Jason Varney accepted the project and with it, the responsibility of generating a feasible preliminary bridge design for the site under the supervision of Salim Ayas, P.E. The students wrote proposals for the Dean's Grant and the Undergraduate Research Fund and received enough financial support to take an exploratory trip to the bridge site. The trip allowed them to conduct a site survey, familiarize themselves with common building practices, and acquire copies of local codes and a hydraulic and geotechnical report for the site. After returning from El Salvador, they conducted a bridge type study. They are currently finalizing designs in preparation for a final recommendation and preliminary design package that can be used by the community of El Matazano to raise funds for the construction of the bridge.

Strategic Direction

In the upcoming year, Tufts EWB will be focusing on how to successfully conclude a project and ensure its sustainability. As a result of the community's action in Ecuador, the group will return for a final trip during the next academic year to assess the slow-sand filter and monitor the impact on the community. The El Salvador group will continue to monitor the slow-sand filters, conduct community health surveys, and lead educational workshops in Arada Vieja. Due to the strong relationship with the local NGO, the El Salvador group will look into possible projects in neighboring villages. Taking on a project in the area would allow travel teams to continue to monitor the slow-sand filters of Arada Vieja and assist in any future maintenance.

On the assessment trip scheduled for this summer, the Haiti group will look into five major issues that the people of Balan face. The data collected through field measurements, conversations, and surveys should provide the information necessary to determine if this project is within EWB's scope. If feasible, we also

hope to gain from this trip a focused objective in order to undertake the challenges of one of the five issues. EWB is also planning more local initiatives for the upcoming year. EWB Boston and other Boston-area university chapters have expressed interest in establishing a consortium to share technical knowledge, fundraising ideas, and abroad experiences. As one of the oldest chapters in the area, EWB-Tufts hopes to conduct workshops using its on-campus slow-sand filter prototypes. Beyond EWB's continued local initiatives in elementary school classrooms and at on campus events such as Kid's Day, it will begin to incorporate EWB in the freshmen curriculum through an Explorations course. Freshmen will not only be prepared to be active members of the organization, but will also develop the general skills necessary to assess and approach international service projects.

Explorations Course

For the Fall 2008 Semester, Engineers Without Borders is working with the Tufts Experimental College to teach a first-year Explorations class. The EWB class will introduce both Engineers and Liberal Arts Students to the themes and topics of EWB, by working through all of the steps of project development and assessment. Beginning with general questions about the purpose of short-term service trips and community work, and integrating the experience and knowledge from Tufts' four past and present projects, the class will teach students about the complexity of sustainable community work abroad. Brittany Wright and Adam White will teach the class, with assistance from the former president Allison Schuster, though various members of EWB and Tufts faculty will be invited in as guest lecturers and project advisers. The class will be open to seven Engineering and seven Liberal Arts first-years to diversify and grow Tufts' Engineers Without Borders for the future.

Meet The Members

Allison Schuster ('09), *Political Science*
President

Maris Mann-Stadt ('10), *Environmental Engineering*
Secretary

Nathan Ladd ('08), *Computer Science*
Local Outreach Coordinator

Jonathan Gregorowicz ('09), *Civil Engineering*,
El Salvador Co-Leader

Eloy Montenegro ('09), *Civil Engineering*,
Ecuador Co-Leader

Jesus Sanchez ('10), *Civil & Environmental Engineering*
Graduate Advisor

Jon Zack ('08), *School of Engineering*

Lindsay Forsys ('09), *Chemical Engineering*

Russell Hyatt ('09), *Engineering Science*

Christine Thornton ('09), *Environmental Engineering*

Emily Gianetta ('10), *International Relations*

Bill O'Connor ('10), *Quantitative Economics*

Kate Siegel ('09), *Mechanical Engineering*
Vice President

Julia Green ('08), *Civil Engineering*
Treasurer

Ilya Josefson ('08), *Mechanical Engineering*
El Salvador Co-Leader

Nicole Lane ('09), *Sociology*,
Ecuador Co-Leader

Brittany Wright ('09), *Mechanical Engineering*,
Ecuador Co-Leader

Lars Hanson ('08), *Civil & Environmental Engineering*

Joel Alcon ('09), *Psychology*

Juliana Guzman ('09), *Civil Engineering*

Kerri Martin ('09), *Mechanical Engineering*

Sabina Carlson ('10), *Peace & Justice Studies*

Chen-I Lin ('10), *Civil & Environmental Engineering (PhD program)*

Emily Lad ('11), *Undeclared*