



ESW-NUws



Engineers for a Sustainable World, Northwestern University Chapter www.eswnu.org

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Upcoming Events

ESW-NU Hosts Weekly Meetings:
Thursdays, 5:30-6:30
Location: Tech A230

Feb. 1
Shop Training

Feb. 8.
IDEA Class Project Updates

Become a National Member

Students: \$10
Professionals: \$45
www.eswusa.org

Support ESW-NU

If you would like to support ESW-NU please contact esw@northwestern.edu

"Since joining ESW-NU two and a half years ago it's been amazing how much we've grown as an organization. From weekly meetings averaging 10 people to recent numbers in the 40s to collaborations in Panama and blossoming local projects, it's really exciting to see that sustainability is becoming the "cool" thing to do."
-Anne Mikelonis
Co-President

Right: ESW members and community members work into the sunset on putting the solar panel in place.

If you have any questions or comments about this newsletter please contact Margaret Adsit at m-adsit@northwestern.edu



Engineers for a Sustainable World - NU

Bringing ESW into the community

Engineers for a Sustainable World (ESW-NU) is a non-for-profit organization that, according to its mission, "focuses on the challenges of long-term, sustainable development by seeking lasting solutions for reducing poverty, and by working to improve

environmental, social, and economic sustainability worldwide." This publication, the *ESW-NUws* aims to provide information about the happenings of ESW-NU as well as information on how readers can get involved with ESW and sustainability in the

Northwestern community. ESW-NU has three main focuses: international outreach, campus outreach, and community outreach. This issue focuses on ESW-NU's international outreach program in Panama.

Bringing Sustainability to Panama

For ten days, four Northwestern University students traveled through Panama on a humanitarian trip aimed at bringing electricity and clean water to rural towns in Panama during December of 2006.

The projects in Panama are as much a learning experience for the students as they are an international outreach program. "ESW is about creating opportunities for students to use their engineering talent to create solutions that remove barriers to sustainability," says Co-President Skander Spies. While promoting new sustainability methods and trying to improve people's lives, the students are also being exposed to real-life engineering problems and technologies.

"Once I got a chance to go there or even starting to work on the Panama pre-trip then I realized how much work it is and how much you can actually learn," said Ankur Asthana, 18, a McCormick School of Engineering freshman in biomedical engineering, who went on the Panama trip with

Jennifer Kessler, Eric Lai, and Laura MacDonald of ESW, as well as Adrian Jinich, a 2006 graduate of Northwestern University who acted as the interpreter for the group.

This experience and work accumulated over the ten days between three major stops in Panama.



Santo Domingo



"We do hope to go back there every time we have a trip to Panama, to make sure the system is working well and to maintain a relationship with the community." –Eric Lai



Top: A Santo Domingo community member, under the direction of Adrian Jinich, puts rubber on the bolts to prevent water from dripping through the roof.

Bottom: Adrian Jinich gave instructions on the hook up of the batteries to the solar charger.

Right: Santo Domingo community members held their first meeting in their newly lighted school.

The first four days of their trip were spent in Santo Domingo, a small ranching community in Panama. ESW has been working in Santo Domingo over the past two years through Northwestern's IDEA classes to design a system to bring solar powered electricity to the remote village. Their first project aimed at providing solar powered electricity to the local school so that the community could use the school during the evening.

"That was the main crux for the solar project...to get all the equipment we needed together and then start wiring and setting up two panels on the roof of the school, and using those two panels to generate enough electricity to recharge batteries that the community and school can use," said Eric Lai a senior in McCormick School of Engineering majoring in Electrical Engineering.

Their second project, bringing solar powered fencing to the ranchers of the community, was implemented last September when ESW was in Panama. The trip in December

checked the ranches to see if there were any problems with the systems.

"[We] made sure that the systems that were put into place last September were still working," said Lai, "this included making sure the panels were still in place, checking to see if the batteries were working well, checking to see if the charge controllers were still working."

While at the ranches, the students encountered a problem with some of the fence chargers not giving enough charge. After doing tests they discovered that something was shorting the electrified

lines to the ground. The fence lines were cleared and the students gave instructions on how to prevent this in the future.

If problems in the future occur, Lai worries that they won't be so easily fixed. At the end of 2006 the NGO working in Santo Domingo pulled out of the community due to lack of funding.

"We do hope to go back there every time we have a trip to Panama, to make sure the systems are working well and to maintain a relationship with the community" said Lai.



Smithsonian Tropical Research Institute

From Santo Domingo, the students moved on to the Smithsonian Tropical Research Institute (STRI) which had invited ESW-NU to create a solar power display in the Galeta Island Marine Education Center.

"They asked us to install a smaller scale solar system to provide electricity for a race track toy to have two little cars racing around a figure eight," said Lai. STRI provided most of the funding for the display, while the students provided the manpower.

The students set

up a race track run on a solar panel attached to the roof of the Galeta Island Education Center that was supplemented with an instructional poster about solar electricity. The most exciting event wasn't the first turn around the track, but rather the media attention they received.

"While we were there we were covered by the local news station talking about how the system works and what we [ESW] want to get out of it," Lai said. What ESW wants to get out of the display, explains Lai, is the

promotion of sustainable development and the increase of knowledge about solar power.



Portobelo

"Its dealing with infrastructure,...it's very deeply tied to the local conditions: the topography, the weather, the local people who are going to maintain it for twenty years,"

–Jennifer Kessler



Above: Jennifer Kessler and Laura MacDonald test water in the stream running through the Guinea neighborhood in Portobelo, Panama.

Right: Eric Lai and Ankur Asthana take suspended solids measurements from a septic tank in Portobelo, Panama.

Below: Laura MacDonald plays with the Santo Domingo community children.

But solar isn't the only project that ESW is working on. The second project, in the small coastal town of Portobelo, Panama, hopes to give clean water back to the community. Currently, a septic tank used for wastewater has filled up, leaving the sewage to overflow into the stream, which flows through the middle of the town. This is not only a health hazard but also detracts from tourism and may be causing some of the landmarks to deteriorate. ESW-NU is designing, as well as helping to find funding for, a new wastewater treatment plant.

"We are trying to clean up the raw wastewater that is currently discharged into the streams and in the bay, particularly in the Guinea neighborhood," said Jennifer Kessler, the Co-chair of the Panama Project for ESW-NU and a senior Environmental Engineer in the McCormick School of Engineering.

ESW-NU made their first contact with the NGO the Foundation for the Support of Social Development in Spring of 2005. Since then the project has slowly progressed with challenges often interfering with the changes.

"We don't have very strong support from the municipality so we've had to figure out how to work around that," said Kessler about the challenges ESW

faces in Portobelo. "We're trying to figure out how to make this really important service happen without any real support from the municipality. They're favorable to it but they don't have the capacity or motivation to do anything about it."

But the local government isn't the only challenge; the nature of the project itself is daunting.

"It's dealing with infrastructure, its not just a consumer product or modular system that you can design in the US and assemble in Panama, it's very deeply tied to the local conditions: the topography, the weather, the local people who are going to maintain it for twenty years," said Kessler. "It is a very complex thing and so one way we're trying to simplify it is by focusing on one neighborhood for now and hopefully that will be a pilot project that can be

replicated elsewhere in the town."

Despite the many challenges, Kessler said they achieved their main purpose for the trip. "We're to prepare for construction because we've been working on this project for a long time and we really want to finally move it ahead with implementation," said Kessler.

This facility would be a three component system that would purify the raw wastewater inflow to within Panamanian environmental regulations. "Because of our academic calendar and the climate in Panama it would probably be spaced out several months apart so we're looking at a couple years to have it all done, hopefully starting the first step this August," said Kessler.



ESW-NU in the Future

Future trips are already being planned for Panama to complete current projects and to start scoping out new ones. Kessler took her last trip to Panama through ESW in December, but the experiences and knowledge she has gained over the past one-and-a-half years has given her a lifelong focus.

"The whole experience has been motivating academically just to see the practical

applications of the stuff that I'm learning in class. And it has also made me realize that I enjoy working in that context doing something that's humanitarian and/or environmental," Kessler said. "I hope that this organization stays around and can provide the same thing for future students...to continue to benefit the communities that we are working in."

