ENGINEERS WITHOUT BORDERS USA- WASHINGTON DC PROFESSIONAL CHAPTER

2013 Annual Report

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Letter from the President

Dear Colleagues and Friends,

Since our founding in 2005, the Engineers Without Borders USA Washington DC Professional Chapter (EWB-DC) has brought together an enthusiastic team of diverse professional volunteers to form long-term partnerships with developing communities to design and implement sustainable engineering projects that address critical infrastructure needs. At a time when nearly one third of the earth's population lacks access to basic resources such as clean drinking water, adequate sanitation, and reliable roads to schools and markets, this work is of vital importance.

The past year marked many exciting achievements for EWB-DC. Nine years after our founding, we continue to press ahead with new collaborations with our first partner community, Santa Clara, El Salvador. We simultaneously completed the two-phase assessment process for water supply system design in the town of Mbokop, Cameroon and launched our third community partnership with Hato Rincón, Panama to complete the design and construction of an education and technology center.

Through strong grant writing, online campaigns, membership contributions, and grass-roots events, our teams have succeeded in raising more than enough funds to achieve all planned project objectives. Thanks to these fundraising efforts our chapter finished the year on an excellent financial footing. Although every member of our chapter is a volunteer and overhead is a negligible amount of our chapter expenses, it takes significant resources to complete infrastructure projects abroad, so we are immensely grateful for the generous contributions of our many supporters.

The engineers, scientists, public health professionals, and others who comprise our project teams demonstrate a persistent commitment to building strong connections with our partner communities and equally durable engineering projects. In recognition of the accomplishments that we have partnered with our communities to achieve, and for the professional mentorship that EWB-DC has provided to university chapters in the DC area, we were honored to receive the 2013-2014 Premier Chapter Award for the Engineers Without Borders Southeast Region at the fall 2013 conference in Atlanta.

All three EWB-DC programs are moving forward with strong momentum, and I am tremendously excited by the opportunities that lie ahead in the coming year. I am thankful and inspired to be a part of this caring, talented, and driven group and to witness the impact of the work that our teams complete.

Sincerely,

Jonathan Mead

Mission and Vision

Our mission: Engineers Without Borders USA (EWB-USA) is a nonprofit humanitarian organization established to support community-driven development programs worldwide through partnerships that design and implement sustainable engineering projects, while creating transformative experiences that enrich global perspectives and create responsible leaders.

Our vision: EWB-USA's vision is a world in which the communities we serve have the capacity to sustainably meet their basic human needs. Today, more than two billion people lack access to the most basic things -- clean drinking water, adequate sanitation, reliable passage to local markets and more.

Since its incorporation in 2002, EWB-USA has grown from a handful of passionate individuals to an organization of more than 13,800 members who have impacted more than 2.5 million lives across the world. The members, located in both professional and student chapters across the US, work with communities to find appropriate technological solutions for community-driven development.

EWB-USA partners with communities on projects of varying scopes to address local needs and improve the quality of life of those directly and indirectly affected. The seven project types employed by EWB-USA are:

- Water Supply
- Sanitation
- Energy
- Agriculture
- Civil works
- Structures
- Information Systems

Program Development

EWB-USA is founded on sustainable and community-driven program development. All EWB-USA programs are initiated from the community level, and are contingent on the assessment of local needs prior to any design or implementation. Communities contact EWB-USA with an application for support, and individual EWB-USA chapters then apply to adopt a program for which they match the technical and membership expertise to successfully execute the implementation of projects that fulfill the chosen community's needs.

Partnership

EWB-USA's corporate partners are investing in the growth and sustainability of EWB-USA programs and community partnerships. EWB-USA partner organizations include:

AECOM

Antea Group

ARUP

ASCE (American Society of Civil Engineers)

Bechtel

Bentley Systems, Incorporated

Black & Veatch

Boeing

Brown and Caldwell

CDM Smith

CH2M Hill

CSG (Contract Solutions Group)

Gannett Fleming

GeoEngineers

Google

ITT Corporation

Kleinfelder

Knovel

MWH Global, Inc.

Penetron

Stanley Consultants Inc.

Tetratech

Terracon

The Louis Berger Group Inc.

United Airlines

ENGINEERS WITHOUT BORDERS USA WASHINGTON, DC PROFESSIONAL CHAPTER (EWB-DC)

Chapter History

Founded in 2005, EWB-DC spreads both the vision and the mission of EWB-USA by partnering with disadvantaged communities to improve their quality of life through environmentally and economically sustainable engineering projects. EWB-DC engages developing communities in resolving particular infrastructure needs that the community itself has identified. Projects include, but are not limited to, the design and construction of water distribution, wastewater treatment, sanitation, energy, and shelter systems. The overall objective of every project is to incorporate and train the community in all phases of the sustainable projects to ensure ownership, appropriateness, and long-term effectiveness.

EWB-DC has active projects in three countries: El Salvador, Cameroon, and Panama. The chapter's first project was a potable water system in Santa Clara, El Salvador. Work began in Santa Clara in 2006 and culminated in 2012 with the switching on of the water system. EWB-DC continues to work in Santa Clara monitoring the water system and recently began a new eco-stove project in the community.

Also in 2012, EWB-DC began a partnership with the community of Mbokop in the Northwest region of Cameroon. The community identified potable water as their first priority and EWB-DC traveled to Cameroon twice in 2013 to perform assessments toward the eventual implementation of a water system, which is intended to begin in late 2014.

EWB-DC launched its newest project in 2013 by partnering with the community of Hato Rincón in Panama. The chapter plans to make its first trip to the community in early 2014 to assess the community's request to construct a technology center including a structure, renewable power source(s), computer equipment, and the necessary training to ensure the project's sustainability.

Chapter Profile

Chapter Leadership

Chapter Officers

Jonathan Mead, *President*
Ben Hsu, *Vice President*
Marie Hoffman, *Treasurer*
Shane Trexler, *Secretary*

Project Leads

El Salvador
Angeline Cione

Cameroon
Lisa Biddle
Rahul Mitra

Panama
Mohamed Abdelmoneim
Rahul Mitra
Nina Rodriguez

Membership

Professional Experience

The EWB-DC chapter is comprised of individuals from a diverse array of professions including: engineering, geology, public/global health, international development, finance, and many more. Its members are employed in the government, private, and non-profit sectors and bring a wealth of practical skills and knowledge, making the composition of each project team unique. Chapter members are at various stages of their careers ranging from recent graduates seeking hands-on experience, to seasoned professionals with a desire to apply their expertise to new areas, all with a common goal of bettering the lives of those in the communities currently being supported by the chapter.

Member Spotlights

Stephanie Chester; *Cameroon Program*

I am originally from Atlanta, GA and moved to DC in 2009. My favorite things to do are to travel, spend as much time as possible outdoors when the weather is warm, hang out with my husband and new puppy, and downhill ski in the winter. I have been a member of EWB since 2011, and I joined because I saw the DC Professional Chapter as being a trail blazer in recognizing how public health and engineering practices are complementary and when combined can lead to greater impact.

I am a microbiologist by training and have my Master of Public Health in Microbiology and Emerging Infectious Diseases. In my professional life I am an Influenza Program Senior Specialist at the Association of Public Health Laboratories, and as a volunteer with EWB, I am one of the public health leads on the Mbokop, Cameroon project. To date my primary focus has been developing public health data collection tools (e.g. surveys) and strategizing a long term data collection plan to aid in educational initiatives and impact monitoring. What I appreciate most about EWB is the focus on community involvement and having the community drive decisions and project direction. I strongly feel that this model supports greater ownership in the community and improves sustainability.

Andres Salazar; *El Salvador Program*

I was born in Panama to a Cuban mother and Panamanian father, but I grew up between Puerto Rico and Panama, enjoying the benefits of the tropical lifestyle. I then moved to Atlanta, GA. to pursue an Industrial Engineering bachelor's degree from The Georgia Institute of Technology, and upon graduation I moved to Washington, DC where I currently live and work. I have been an EWB member for just over one year. I have always had an interest in supporting community and international development efforts, and expressed this to a friend who then invited me to one of the DC Chapter meetings. I have been working with the Santa Clara team since I joined EWB, developing a strategy to implement "clean cook stoves" for the Santa Clara community, and designing prototypes that improve current cooking conditions, such as reducing fuel

consumption (wood) and concentration of fine particulate matter (PM2.5), and improving heat efficiency. Aside from this, I was a driver and supporter of the pollutant monitoring task for one of the assessment trips in the community.

My favorite part of EWB is being able to work collaboratively as a team to actually make a difference in the world and create a positive impact on communities with limited resources. EWB makes a difference by improving the quality of life for people around the world living in areas of need. As an organization, it groups talent and dedication, and delivers great, tangible solutions to tough problems present in areas of need.

Frances Anne *Panama Program*

My name is Frances Anne Tosto and I am a sophomore Biomedical Engineering student at The Catholic University of America. This is my second year involved with EWB. I joined the EWB chapter at my university in the fall of 2012 and became involved with EWB-DC's CREER Program this past October.

I decided to join EWB because giving back and helping others in need has always been important to me. I find that EWB is a special organization because it offers a unique opportunity to be able to combine my passions of engineering and service work. I can't think of a better way to put my expanding engineering skill sets to use than to help improve the lives of people in developing countries around the world.

I have really enjoyed working on the CREER Project thus far, helping with the Educational and Community aspect of the project. I am looking forward to helping make the Educational Resource Center for the community of Hato Rincón a reality. My favorite part of being involved in EWB is meeting and working with such incredible people. I have been inspired by both the community members I met in Hato Rincón and by the other extremely dedicated engineers on the CREER team.

Mentoring and Membership Development

In addition to contributions on project teams, EWB-DC members take an active role in the local community and participate in volunteering and mentoring opportunities throughout the DC region.

Members of EWB-DC mentor EWB student chapters in the area by providing technical and professional expertise as well as serving as official mentors by traveling on project trips. EWB-DC members have established relationships with EWB student chapters of the following universities: Catholic University, George Mason University, George Washington University, and Montgomery College.

EWB-DC Members also serve in national EWB leadership roles. EWB-DC members currently serve as the EWB-USA DC State Representative and the EWB-USA Southeast Region Vice-President.

Active Programs

Programs		Year Initiated	Project Phase
Santa Clara, El Salvador	Clean Water Supply	2006	Monitoring
	Clean Burning Stoves	2013	Assessment
Mbokop, Cameroon	Clean Water Supply	2012	Design
Hato Rincón, Panama	Technology Center	2013	Assessment

Awards and Honors

Awards:

Southeast Region-- Premier Chapter: *Each year the EWB-USA Premier Chapter Awards recognize outstanding EWB-USA student and professional chapters that meet the ideals of a successful EWB-USA chapter. These ideals include excellence in organization, fundraising and public relations, engagement in mentor/mentee relationship and chapter and regional participation.*

Grants & Scholarships:

CDM Smith--$6,100

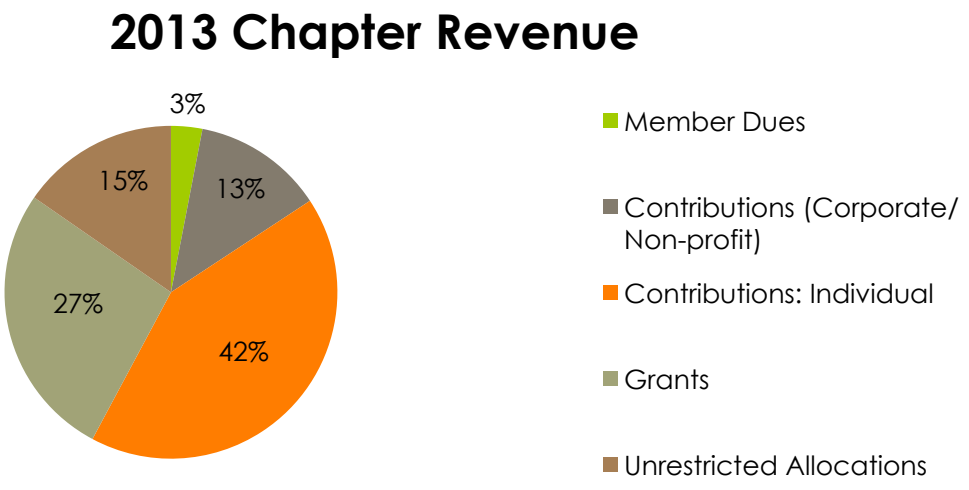
Bechtel-- $5,000

Nick Pippen Scholarship-- $2,500

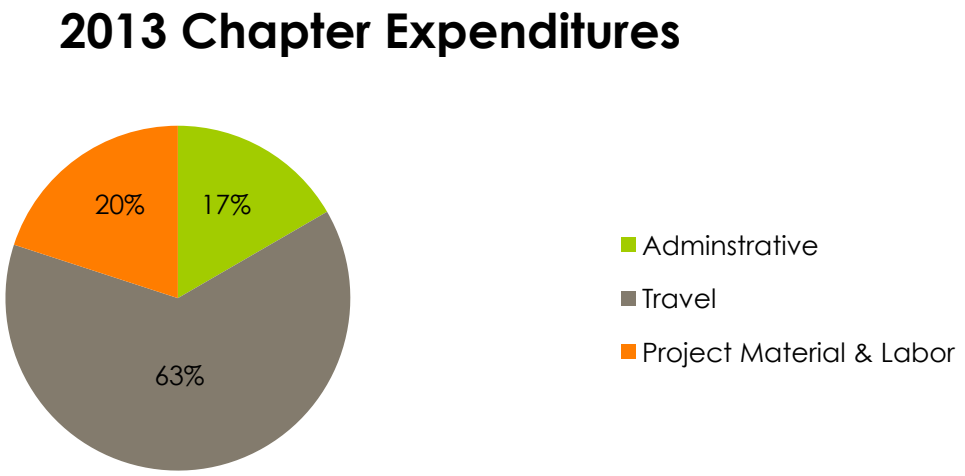
Lauring Wolcott-- $1,500

Financials

As evidenced in the chapter revenue graphic, EWB-DC is fortunate to receive support from a diverse array of sources, and in particular a breadth of individual donors that have been dedicated to supporting its projects. In an effort to balance its funding sources, the chapter is always seeking new funding opportunities, and strives to increase the number of fundraisers and grants applied for in the coming year. While much of the chapter's expenses were allocated to travel in 2013, as projects in Cameroon and Panama move into the implementation phase, project material and labor expenses are expected to increase while administrative expenses are kept to a minimum.



* Unrestricted allocations are funds that are currently allocated to projects but are available for general chapter use.



EWB-DC ACTIVE PROGRAMS

Santa Clara, El Salvador

Community Profile

Santa Clara is a rural community of approximately 3,000 people and 400 households, spanning approximately 4 square kilometers. The majority of people are subsistence farmers, primarily growing corn and beans. The typical household size is approximately five people, with the mother or grandmother as the primary cook for the household. Diets typically consist of corn tortillas, beans, and soups of chicken, and seasonal vegetables (e.g., squashes, greens, green beans) or fruits.

Women cook in kitchens over an open fire, using wood as fuel. Wood is either purchased or gathered by family members, and is usually taken from a wooded hill in the community. Most kitchens are inside the house, with a small space between the top of the walls and the roof, and some small holes in the walls, to allow the smoke out. A few kitchens are located just outside the house, employing the side of the house as a wall and a piece of corrugated tin for a roof. Even in the outdoor kitchens, smoke blows into and throughout the house and the cook has high smoke exposure because she is standing over the fire. In both the indoor and outdoor kitchens, the roof and walls are covered with soot; an indicator of poor air quality.

Deforestation is a growing problem in the country, only worsening as the population grows and the need for firewood for cooking increases accordingly. Most roads are between two to five meters below the land surrounding the roads, due to the increased rates of erosion that have been seen in the past decades.

Community Needs

Since beginning to work with the community of Santa Clara, the main priority was implementing a potable water system to bring running water to households. This priority has shifted since the water system was turned on, increasing the number of community members who now have access to clean drinking water. The need for a clean-burning stove was revealed in the original community needs assessment in 2006-2007, and the interest for reducing smoke from stoves has continued to be articulated on various trips. The previous

trip, which was the original assessment trip for the stoves project, confirmed the community's concern about smoke from stoves and verified the importance of continuing with the clean-burning stove project.

WATER SYSTEM PROJECT

The potable water project in Santa Clara began in 2006 with a needs assessment of the community, and since then, EWB-DC has worked with the community to implement a potable water system and a sanitation education program. As a part of the program health promoters visit households and encourage good sanitation practices as well as assist with operation of the potable water system. The potable water system was completed in 2012, and EWB-DC is now monitoring the water system and providing consultative support for the system. An example of this is that EWB-DC conducted a financial audit of the system, inspected key system components (e.g., valves, tank, VFD), and provided recommendations to the community during a monitoring trip.

2013 Accomplishments

Ongoing monitoring of the community-owned and operated water system
Development of Chlorine education session with health community health promoter
Consultation with community leaders on strategies for system financial sustainability
Community monitoring of Water System through log book and posters for daily monitoring of chlorine additions, chlorine readings, pump run times, and a maintenance checklist

Program *Goals and Objectives*

The ongoing goals for the water project are to continue to monitor the water quality; continue with efforts to educate about chlorine treatment; and to monitor and assist with the continued implementation of the financial tracking strategy that was established last year. All of these efforts together will ensure the sustainability of the project.

Program Status

The water system and the monitoring system are in place. Monitoring

continues of both the physical elements of the project as well as the administrative and day-to-day operational components.

2014 and Future Steps

In 2014, EWB-DC will continue to assist in assessing and monitoring the implemented water system. The community owns and operates the water system and has elected a water board to oversee operation of the system. The water system is sustained by collecting fees from the users and using those fees to pay operational fees and maintenance. EWB-DC's role with the water system is to provide technical assistance as needed or requested. We are also funding a health promoter until the Ministry of Health provides funding for one, which is expected in 2014.

CLEAN BURNING STOVE PROJECT

EWB-DC is initiating a clean-burning stoves project based on data collected on the first assessment trip in January 2013. The first assessment trip provided valuable data on current cooking practices and corroborated the community's interest and desire for a clean-burning stoves project. In the summer of 2013, the EWB team returned to Santa Clara to continue their assessment and data collection for the first phase of the project. For this phase, they performed indoor air quality monitoring and collected additional survey data from households about stove designs. The 2013 EWB travel team members included: Angeline Cione; Jessica Forrest; Fred Kukelhaus; and Monica Louie.

Program Goals and Objectives

The goals of the clean stoves project are to develop a stove design that reduces the amount of fuel (firewood) used for cooking and reduces the amount of smoke the women and children are exposed to, while meeting the cooking needs of the community.

Program Status

Based on information gathered during the most recent trip, the team continues to research the best designs that combine fuel efficiency and clean combustion or venting, as well as designs that meet the customary needs of the

community. An additional part of the assessment is looking into the availability of inexpensive types of stoves, and exploring the possibility of at least partial donations for the least fortunate members of the community. A further consideration will be the identification of potential leaders that can learn how to use, maintain, and repair new stoves, and teach and monitor others in turn.

2013 Accomplishments

Quantitative data collection of indoor air quality from pollutant monitors and survey data
Health promoter training to facilitate continued data collection
Identification of material availability and cost
Investigation and elimination of a rooftop whirly bird ventilator as an alternative for improved airflow

Minimal fundraising through EWB will be needed for this project because of most of the funding will come through long term funding arrangements with the community.

2014 and Future Steps

The stoves project will take place under an agreement similar to that of the water system project, in which EWB-DC acts in a consultative role, providing engineering and health assessments, recommended stove designs, and technical assistance. EWB-DC is analyzing implementation strategies, but we expect that individuals will pay most or all of the cost for stove materials, while EWB-DC provides designs, trainings, recommendations, and assistance connecting the community with local resources.

The two challenges moving forward will be (1) for the team to develop and test the most feasible technical designs to meet the community's needs, and (2) to the best implementation strategy moving forward. This project differs from the water project because the technical product is not a centralized community-owned technology, but rather a distributed technology where the ideal specifications may differ from household to household, and therefore a few different designs may be the appropriate solution. An additional challenge will be to develop a strategy so that all 350-400 households have equal access to EWB-DC's contributions (designs, recommendations, training, and any material contributions).

The next steps include developing prototypes of a few different designs, testing them in the US, and developing a plan to build the most feasible designs as a pilot project on the next trip.

EWB-DC ACTIVE PROGRAMS (CONTINUED)

Mbokop, Cameroon

WATER SYSTEM PROJECT

Community Profile and Project Request

Nestled in the mountains of the Cameroon's Northwest region, the rural village of Mbokop is home to roughly 2,200 people, four different tribes each with its own language, and two major religions. This diverse community supports itself through subsistence farming and herding livestock, but lacks basic services such as clean water, proper sanitation, and electricity.

2013 Accomplishments

Conducted 12 community focus groups, 15 in-depth interviews, and 103 household surveys
Collected GIS data and created community maps to aid public health program and water infrastructure planning
Confirmed that there is a viable spring source that can be utilized to provide water to the Mangi settlement
Performed topographic survey for the1.5 miles of waterpiping

Currently, the community's drinking water supply comes from two main sources, a spring box and surface water streams. There is an existing spring box and piping to two standpipes in one segment of the community. However, the water does not flow year-round, there are concerns about water quality, and the water is not distributed to a point convenient for

utilization by all households.

In early 2012, the Mbokop community contacted EWB-USA to assist with the implementation of basic infrastructure projects with the help of Pastor Yusinyu "Julius," a pastor from nearby Ntisaw Missions with over five years of experience working with the University of Illinois Urbana Champaign (UIUC) student chapter in his own community. The initial project application emphasized the need for potable water as well as sanitation infrastructure, electricity, agricultural development, and construction of a school building

2013 Highlights: Assessment Trips I & II

EWB-DC took ownership of the project in May 2012, and spent the next several months forming a team and preparing for an initial assessment trip in March 2013 where they would meet with community members and leaders, and work to assess and prioritize its needs firsthand. In addition, the team collected basic water quality and flow rate data, as well as GPS data to map the layout of the community. Through focus groups and interviews, they were able to understand the state of public health in Mbokop and gauge the community's understanding of health and hygiene.

A second assessment trip took place in November 2013 in order to allow for further community and NGO partnership development, consultation on the overall plan for implementing water solutions, and delineation of parties' roles and responsibilities. This trip also served as a key opportunity for data collection and initial public health education efforts. The water team collected data required for the implementation of the first water system in the Mangi settlement, including water source identification, water quality and flow rate, and a topographical survey of the terrain. The public health team conducted a household survey in order to help establish measurable baseline data and quantify the public health needs of the community. This baseline information will allow the team to generate metrics by which the water project impacts can be measured and tracked over time.

2014 Next Steps & Beyond

As the project moves past the assessment phase and into the implementation phase, the team will spend much of 2014 preparing an alternatives analysis and creating the engineering design for the proposed water system. The primary goal of the project is to have a functioning water system in Mangi settlement with the eventual goal of improving the supply of water to additional settlements within Mbokop.

Team Profile

The EWB-DC Cameroon team comprises three areas of expertise:

Water- development of a suitable water system for the community

Public Health & Education- assessing community health and health knowledge, and reinforcing good health and sanitation practices

Fundraising- resource to acquisition to support project activities including travel and implementation.

EWB-DC ACTIVE PROGRAMS (CONTINUED)

Hato Rincón, Panama

TECHNOLOGY CENTER PROJECT

Community Profile

Hato Rincón is an isolated community that lies within the largest indigenous territory of Panama, the Ngöbe-Buglé group. Located in the mountainous district of Jädeberi, it is home to 316 residents, consisting mostly of farmers and artisans, and is the largest community in the district. Rincón possesses both a primary and secondary school; however, educational opportunities, such as access to computers, are very limited, leaving the community at a great disadvantage. Not only are students at a disadvantage when applying to high schools or other institutions of higher education, the community as a whole is stifled in its development. Without computers and access to Internet, information pertaining to optimal practices in sustainable development from other regions, national and international current events, modern science, and international funding sources and opportunities are restricted to what is broadcast on the radio.

2013 Accomplishments

Project Approved in June 2013
Core EWB-DC Project Team formed (Structure, Energy, Education)
Collaborative relationship established with in-country contacts and community
Preparation and research for Assessment Trip 1

Program Initiation

In 2011, Rincón learned of Engineers Without Borders through EWB-DC member and Cameroon and CREER project lead, Rahul Mitra, during a previous Panama visit. Soon after, in early 2013, the community reached out to EWB requesting engineering expertise and aid in the construction of a computer center to supplement their community's development and provide a means to document their indigenous culture. Since the project's approval in June 2013,

members of the CREER (Centro de Recursos Educativos en Rincón or the Educational Resource Center in Rincón) project team have been avidly preparing for the first assessment trip, where eight members, including other project lead Nina Rodriguez, will travel to Rincón in March of 2014.

Program Goals and Objectives

Through the construction of this educational resource center, equipped with internet-enabled computers, the CREER project aims to improve development of this community by aiding the quality of education and the prospect of continued education, bettering the community's access to global news, information, and development, and providing a means of improved intra-country communication to both government and nongovernmental organizations.

Project Team

The EWB-DC Panama Team comprises three areas of expertise:

- Structure: Construction of a computer center with library and meeting space
- Energy: Development of an alternative source as the community is not connected to a power grid
- Education: Teaching the community how to use and maintain computers

2014 Next Steps and Future of the Project

The March 2014 assessment trip will provide an opportunity to gain a greater insight into the community's needs and priorities, as well as lay the foundation for a partnership with Rincón and the primary in-country NGO, Alianza para la Conservacion y el Desarrollo (ACD). In addition to a greater comprehension of the economic and educational state of the community, other essential project data will be collected detailing site resources and land surveys needed to determine potential energy sources, a location for the community center, and any constraints that may be encountered.

The data gathered during the first assessment trip will help the CREER team shape an effective education program suited to Rincón and the community's needs, and determine the next steps in designing a secure community structure for a finished project that will be both sustainable and beneficial throughout future years.