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Jim Miller Lends Geotechnical Expertise to EWB-UW Assessment Team

Principal Geological Engineer [Jim Miller, LG, PE, LEG](#) serves as a professional mentor to students in the University of Washington chapter of Engineers Without Borders (EWB-UW). [Engineers Without Borders \(EWB-USA\)](#) is a non-profit organization of student and professional engineers and scientists who design and develop sustainable engineering projects for communities in developing countries. GeoEngineers has been a corporate sponsor of EWB-USA since 2007.



Jim Miller takes measurements in one of the cooperative's tanks.

In late December, 2012, Jim accompanied three students to La Vega del Volcán, Guatemala to assess EWB-UW's proposed fishery improvement project there. The EWB-UW student team is comprised of group leader Hannah Snow, an undergraduate civil engineering student; Laurie Bazan, a bilingual pre-med student; and Charlie Waters, a graduate student in the UW Fisheries School of Aquatic and Fishery Sciences.

Getting from Guatemala City to the remote village of La Vega del Volcán (elevation of 8,250 feet) involved a grueling, three-day trip through mountainous terrain to the westernmost part of Guatemala, near the Mexican border. When the team finally arrived in the village, villagers invited them to stay in their small, simple homes. "I developed much greater appreciation for everything we take for granted in the USA, such as indoor plumbing, safe drinking water and our many conveniences," Jim said, adding that he was struck by the generosity and hospitality of his host family.

The next day, Jim, Hannah, Laurie and Charlie began their assessment work with a tour of the village and of the La Vega Trout Hatchery, built three years ago with the help of a non-governmental organization. The 24-family cooperative venture is intended to provide local employment, another source of nutrition to the village, and enough fish to sell to a ready commercial market in nearby Mexico.

La Vega's most abundant resource, clean water from natural springs, supplies the main hatchery facility and smaller family ponds. Unfortunately, the hatchery and family ponds are not producing the quantity of mature trout the cooperative needs to provide for the families and make the venture commercially viable. Upon inspection, one of the hatchery's problems was obvious—two of the concrete fish tanks had failed. Their end walls had blown out when the tanks were first filled with water. Jim explained that this was due to the poorly bonded, non-reinforced concrete from which the tanks were built.

The team examined the outdoor hatchery tanks and conditions inside the incubation building, identifying insufficient water flow and circulation and poor tank drainage as contributing factors for the poor fish-rearing conditions. They measured tank dimensions and water depths, determined water flow rates to the tanks, examined spring source conditions and made field determinations of water quality for the water sources that supply the tanks.

Commenting on the team's findings, Jim said, "Many of the changes needed at La Vega are not major. With the information we obtained, the cooperative can increase available water-supply volumes, improve water circulation, add partial shading to the fish-rearing tanks, modify egg handling practices and make incubator building improvements. With EWB sponsorship, EWB-UW could help the cooperative with more ambitious changes to the water supply system, improve the surface water collector, address drainage issues and improve egg tray management." The EWB team would create a sustainable, pump-free plan for the hatchery, designed to have minimal impact on the town's energy resources and provide more protein-rich food, revenue and local employment for the village.

The team returned to Seattle in early January and completed a technical report for the cooperative and community, which Laurie translated into Spanish. The EWB-UW team has submitted its final assessment trip report to EWB headquarters and is planning the details for a return trip to La Vega in September 2013.

