EYEWITNESS TO A MIRACLE

If you ask Frank Falcone, assistant professor of Civil and Environmental Engineering, he’ll tell you that God’s miracles have been at work in Panama. “For many years, the only freshwater well in central Panama existed on Father Wally Kasuboski’s property, a miraculous response to prayer,” says Falcone. In March 2013, during a particularly dry season in Torti, Panama, Falcone saw for himself a second miracle: a miraculous response to prayer. “They assume I must be crazy to suggest such a thing.” But that’s exactly what he, his fellow faculty and Villanova engineering students are prepared to provide.

Water Problems
Home to roughly 8,800 people and growing rapidly, the Chepo/Bayano region of Panama, about two hours from Panama City, faces numerous geographic and environmental challenges. None is more critical, however, than the need for access to clean water. High salinity levels in the region’s soil have left most ground water unfit to drink, and during the dry season, life nearly comes to a halt. Despite a rainy season that lasts from August until early December and generates 71 inches of water each year (as compared with rainfall of about 44 inches in the Philadelphia region), the village of Wacuco and nearby town of Torti have no reliable source of continuous clean water. The dry season impacts crops and livestock, affecting the villagers’ livelihoods, and many children often are too sick to come to school as the result of drinking unsanitary water.

“The villagers’ faces register complete disbelief when I tell them that it’s possible to have freshwater all year round,” says Assistant Professor Frank Falcone, AP, PE, ’70 CE, ’73 MSCE, a regular service-trip leader to the region. “They assume I must be crazy to suggest such a thing.” But that’s exactly what he, his fellow faculty and Villanova engineering students are prepared to provide.

Though the region has one rudimentary dam, a water resources master plan (WRMP) developed this past year by William Angiolillo ’12 CE, ’13 MSCE, with input from Ian Dardani ’13 ME, called for a second dam to meet the region’s demand. A potential location was identified on a map, but during the 2014 spring break trip, the Villanova team sent to evaluate it found the proposed site to be unsuitable from a geotechnical and accessibility standpoint. Civil and Environmental Engineering Professor Andrea Welker, PhD, and her colleague, Associate Professor Bridget Widrzak, PhD, ’00 CE, led a group of juniors and seniors involved in the project. “The students now are tasked with enhancing the existing dam, but we expect that one improved structure will provide enough clean water for the region for the next decade, even with accounting for population growth,” says Dr. Welker.

The dense jungle environment makes developing infrastructure, including water supply systems, difficult in central Panama.
INNOVATIVE PARTNERSHIPS ENHANCE THE LEARNING EXPERIENCE

For the spring semester, Associate Professor Bridget Wadzuk, PhD, ’00 CE and Professor Andrea Welker, PhD, teamed up with professional engineers from Schnabel Engineering, David B. Campbell CE ’76, MSCE ’81, PE, D.WRE, and Brian Crookston, PhD, PE, to deliver an innovative capstone design course in Geotechnical and Water Resources Engineering. The goal of the course was to design a second dam and foundations for a bridge in Panama, working with Father Wally Kanuski (see “Bringing Year-Round Water to Central Panama” on Page 9).

Schnabel Engineering, a firm recognized for its expertise in geotechnical, tunnel and dam engineering, first became involved with a Civil and Environmental Engineering capstone project two years ago, and just as they did then, the engineers came to every class (three hours each week). Dr. Crookston and Campbell even made themselves accessible to students via email. Given the challenges of the projects at hand, students both enjoyed and benefitted from working with these experienced professionals.

Dr. Welker notes that, in addition to their insight and guidance, having a professional partner for a capstone project provides invaluable access to real-world figures and data that would otherwise take years to complete (including boring logs, conceptual drawings, environmental assessments, etc.). She points out, “The class is only 14-weeks long, which doesn’t allow us the time to gather all the necessary data, but it’s important for the students to work with real drawings and figures, to face the constraints of the real world.”

During their visit, Falcone and Dr. Traver spent time with leaders from the City of Knowledge (COK), an enterprise and innovation zone for those interested in establishing schools or businesses in central Panama. The COK is in need of a stormwater management plan, a project Dr. Traver will undertake with students as part of the spring 2015 Water Resources capstone project.

Falcone and Dr. Traver also spent time with the Panama Canal Authority (ACP), which is undertaking an enormous expansion project that will effectively double the canal’s throughput capacity. The rapid changes occurring in Panama City make it an ideal time for Villanova students to pursue internships with ACP through a program Falcone and ACP’s then-CEO Alberto Aleman established in 2013.

The Universidad Católica Santa María La Antigua (USMA) in Panama City represents the most recent opportunity for collaboration. In addition to working with Villanova engineers on Panamanian projects, USMA particularly is interested in establishing a nursing school, and therefore, hopes to establish a relationship with Villanova’s College of Nursing.

Villanova University engineers are involved in multiple efforts in Panama, including service, academic partnerships, internships and capstone design projects. While on sabbatical during the spring 2014 semester, Dr. Traver made several visits to Panama to meet with USMA, COK and local engineering firms. The College, and the University as a whole, are looking forward a long-term relationship with this rapidly growing Central American country.

LESSTONS LEARNED AT VILLANOVA TAKE ALUMNI TO EAST AFRICA

Before coming to Villanova University in 1989, Dan Kane ’93 CE led no inclination to travel outside the United States. “I told friends I would visit another country only after seeing all 50 states,” he says. Despite not yet having traveled west of the Mississippi, in his junior year, a service break trip took Kane to Wacaco, Panama, and his worldview changed. The experience opened his eyes to the needs of others, an awakening that would inspire a lifelong journey of faith and service, which he shares with his wife and Civil Engineering classmate, Kim Binder Kane ’93.

After spending most of the past 20 years in the Washington, D.C. area with Dan working as a civil engineer, the Kanes made the life-changing decision to move to Uganda with their three children. In August 2014, Dan will begin work with Engineering Ministries International (eMi) to provide organizations helping to establish schools or businesses in central Panama. The COK is in need of a stormwater management plan, a project Dr. Traver will undertake with students as part of the spring 2015 Water Resources capstone project.

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Dan Kane ’93 CE and Kim Binder Kane ’93 CE are moving with their children to Uganda, where Dan will work with Engineering Ministries International.

“Villanova gave me the tools for building a successful career, and I have long believed in giving back: both to the school and to the students. Villanova engineers are well-educated in engineering theory and its applications, but just as importantly, Villanova builds their character.”

—Dave Campbell ’76 CE, ’81 MSCE, PE, D.WRE, director of Dam Engineering and winner of the Inaugural American Academy of Water Resources Engineers, Practitioner of the Year Award (2014)