

Connecting people and geology on volcanoes

July 31 2015, by Allison Mills



Landslides on the slopes of volcanoes threaten communities like this one in El Salvador. Credit: Michigan Tech, Jose Fredy Cruz Eruptions are not the only danger on volcano slopes, landslides are a major geohazard as well. Credit: Jose Fredy Cruz

In October 2011, heavy rainfall poured down the sides of El Salvador's San Vicente Volcano, nearly four feet of water in 12 days. Coffee plantation employees, working high up on the volcano's slope began noticing surface cracks forming on steep slopes and in coffee

plantations. Cracks herald landslides—places where the wet, heavy upper layers, saturated with water, slide over the less-permeable rocky layers underneath. The workers radioed downslope, keeping close tabs on the rainfall gauge network.

Luke Bowman was also there, helping direct radio calls and conducting fieldwork. Bowman, who recently defended his doctoral research in geology at Michigan Technological University, studies geohazards on San Vicente. *The Journal of Applied Volcanology* recently published some of his research, co-authored by Kari Henquinet, director of the Michigan Tech Peace Corps Master's International Program and a senior lecturer in the Department of Social Sciences. Their work combines traditional hazard assessments with social science techniques to develop a more in-depth understanding of the risks present at San Vicente Volcano in El Salvador.

San Vicente

Fire, brimstone and destruction dominate the portrayal of volcanoes around the world. But in reality, a number of people live on their slopes. For these communities, eruptions are only one of the risks—other geohazards like landslides (lahars) and flooding pose more frequent threats.

The 2011 rainstorms in El Salvador are a case in point as well as a testament to the importance of expanding geohazards studies to include the people they affect.

"In 2009, as heavy rains fell on San Vicente [volcano](#), most people were waiting for civil protection to issue a warning—and that warning never came," Bowman says, adding that a landslide crashed down the volcano that year, and many communities within the five municipalities that encompass the northern flank of the volcano were affected, with homes

and properties destroyed, infrastructure damaged and lives lost.

"Now, after significant changes in monitoring and reporting hazards, local residents are the ones who gather the rainfall rate data, who measure the cracks and who report it around the community to each other," Bowman says. "I think it gives people some say in the decisions being made."

Empowering communities is part of what Bowman hopes to do with his research, but he says it goes beyond just including local citizens in data gathering.

"No matter how good the science is, or how well we can predict where a hazard could occur, there's still a human component we shouldn't ignore," Bowman says, adding that local communities often have a stronger working knowledge of a place than outside researchers. He says researchers can be of greater help when they have a clearer understanding of the broader social and cultural context of geohazards.

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