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Georgia Southern University

Georgia Southern Professor studies debris flow in the Dolomite Alps

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From left to right: Dr. Matteo Berti (University of Bologna), Dr. Alesandro Simoni (University of Bologna), and Dr. Carlo Gregoretti (University of Padova), Dr. Jeff Underwood (Georgia Southern University)

Georgia Southern University Professor Dr. Jeff Underwood and a team of geologists specializing in debris flow research are currently working in the Dolomite Alps in Italy, installing an electric field meter (EMF) and rainfall gauges to better understand the types of rainfall events that trigger debris flows (landslides) in the area. Dr. Underwood is one of the first meteorologists to work on debris flows and his colleagues, Dr. Matteo Berti (University of Bologna), Dr. Alesandro Simoni (University of Bologna), and Dr. Carlo Gregoretti (University of Padova) are the three top debris flow researchers in the world.

The geologists study the how, why, when, and where of debris flows. Debris flows are catastrophic hydro-geological events characterized by debris (rocks, boulders, gravel, sand, trees, etc.) sliding down very steep slopes, because of the presence of water and gravity. Water (from rainfall) mobilize the debris and gravity does the rest. In 1963, a debris flow near the study site destroyed an entire town and killed 2,000 people in a matter of minutes.

Debris flows move very fast, 40 mph down slope, and therefore warnings are hard to develop. Together, Dr. Underwood and the team from Italy have installed both an EFM (electric field meter) and five new rainfall gauges to better understand the types of rainfall events that trigger debris flows in the Dolomite Alps. They are working in the Dolomites because the region has the highest frequency of debris flows on earth, due to the nature of dolomite, which is highly fractured and produces lots of loose material on steep slopes, along with a high frequency of thunderstorms in the region, it is proximal to both the Adriatic Sea and the Mediterranean Sea.

Currently, the team is conducting basic research on the relationship between the atmosphere and debris flow generation in the region. Ultimately, they hope to be able to develop much better debris flow warnings using storm characteristics such as number of lightning strikes prior to rainfall initiation and they hope to be able to determine if debris flows are becoming more or less frequent and intense with global climate change. This project, including the sensors and much of Dr. Underwood's travel, is sponsored by a grant from the Italian Ministero dell'istruzione, dell 'universita e dela ricerca.

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