

Researcher follows evolution of landforms

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Pictured out in the field, Nicole Gasparini, associate professor in the Tulane Department of Earth and Environmental Sciences, wants to show that chemical weathering plays a major role in erosion. (Photo from Nicole Gasparini)

It's called a Schmidt hammer, and for the past eight years, it has been a critical tool in the research of Nicole Gasparini, an associate professor in the Tulane [Department of Earth and Environmental Sciences](#).

Also known as a Swiss hammer, it measures the elastic properties or strength of concrete or rock. [Gasparini](#) is a geomorphologist, a scientist who studies the evolution and configuration of landforms. She has been using the device to gain a better understanding of bedrock river erosion.

Her work, published in the science journal [Nature](#), led her and her team of researchers to the Kohala Peninsula on the Big Island of Hawaii where the bedrock is made exclusively of basalt, a kind of volcanic rock.

“What we showed is that the more rainfall you have, the more chemical weathering you have. The weaker the rock becomes, the easier it is to erode,” says Gasparini. “No one has really shown that in the context of bedrock rivers.”

To come to those conclusions, Gasparini and the research team used Schmidt hammers to gauge the compressive strength of bedrock in rivers across the Kohala Peninsula. They collected rock samples along both the dry and wet sides of the peninsula and brought them back to the laboratory for further study.

“Geologists have long hypothesized that climate is an important control on how landscapes evolve,” she says. “Yet the link between climate and bedrock river erosion has been difficult to pin down. This work identifies a mechanism for this link.”

Gasparini conducted the research with Joel Johnson, assistant professor of geology at the University of Texas; Brendan Murphy, a doctoral student in geosciences at the University of Texas; and Leonard Sklar, associate professor of geology of San Francisco State University.

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