Gallivanting around the Galápagos

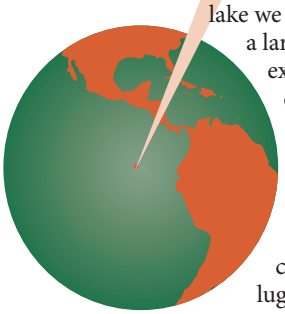
Jessica Conroy and colleagues braved mud and rain and got nipped by sea lions in an attempt to unravel the record of tropical Pacific climate change.

What was the objective of the work?
Continuous, high-resolution records of climate from the tropical Pacific Ocean are a rarity. Our main goal was to obtain an unbroken record of sea-surface temperature in the Galápagos Islands, in order to fill in some of the spatial and temporal gaps in our understanding of past tropical Pacific climate change. We had some ideas about climate proxies we could use prior to the expedition, but after talking with our collaborator, Miriam Steinitz-Kannan, who has been studying Galápagos diatoms for decades, we became especially excited about using a diatom record at El Junco Lake.

Why did you choose this particular location for the fieldwork?
Pioneer Paleoecologist Paul Colinvaux scientifically 'discovered' El Junco Lake in 1966. Prior to this, El Junco was not on any maps, because near-constant cloud cover hid it from aerial view. Very early on, Paul figured out that lake sediments here could tell a powerful story of tropical Pacific climate change. El Junco is like a natural precipitation gauge — if it rains, the lake level goes up, and if it doesn't rain, the lake level drops. Decades later, with modern techniques, we have capitalized on his discovery and the uniqueness of El Junco Lake.

What sorts of samples were you after?
Our main objective was to recover sediment cores from the bottom of the lake. We also took water, plankton and vegetation samples. Back in the lab we split open the cores and took samples of the sediment for radiometric dating, diatom analyses and other measurements.

Did you encounter any difficulties?
One of the greatest difficulties was getting to El Junco in the first place. To reach the lake we had to transport a large amount of expedition gear down to Ecuador, get through customs and then get out to the Galápagos Islands. More physically challenging was lugging some very heavy, unwieldy equipment up the outside of a volcanic crater; once at the top, we then had to slide down a muddy path. We were constantly wet, cold and muddy. At times it seemed hard to believe that we were on the Equator.



EL JUNCO SIGN: JONATHAN OVERPECK

Jessica Conroy and Jeremy Weiss before launching themselves down a mud slide.

Any near misses?
We hadn't tested all of our coring equipment before setting up at El Junco, which was supposed to be a test run before exploring another Galápagos lake. Luckily the coring apparatus worked well, and we were able to retrieve several metres of sediment.

What was the highlight of the expedition?
There were a few moments during our days at El Junco when the drizzle ceased and the fog cleared. These precious minutes gave us a chance to dry off a bit, and look out to the surrounding ocean below the crater. At these times I realized why this small, climate-sensitive lake surrounded by the big Pacific Ocean was so ideal for telling a story about tropical Pacific climate change. Plus, we were in the Galápagos, which are one of the world's true natural wonders.

Did you have encounters with dangerous animals?
No, most Galápagos animals are extremely tame, although we were verbally assaulted by a mother booby when we accidentally ventured too close to her nest. I was also nipped by a friendly sea lion.

Did the trip give you any ideas for future research projects?
Absolutely. It will be interesting to compare our diatom record with records from other lakes in the Galápagos. In particular, we have sediment cores from other Galápagos lakes that have clearly visible layers, which may represent individual years or El Niño and La Niña events. Extracting a climate signal from these lake sediments will be exciting, as we will have the temporal resolution to distinguish between interannual El Niño- and La Niña-related changes and longer-term variability, something we were unable to do with the El Junco record.

This is the backstory to the work by Jessica Conroy and co-workers, published on page 46 of this issue.