

Haiti's Geology Slowly Giving Up Its Secrets

by Richard Harris

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Researchers studying the origin of the recent deadly earthquake have found signs of an actual fault rupture offshore, and figured out what triggered a small tsunami. But not all the causes of the natural disaster were, in fact, natural.

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GUY RAZ, host:

Geologists working in Haiti say they've been able to trace the exact location of the earthquake fault that gave way on January 12th and killed more than 200,000 people. They've also discovered that decades of deforestation in Haiti actually contributed to the earthquake's toll along the coastline to a surprising chain of events.

NPR's Richard Harris reports.

RICHARD HARRIS: Scientists get an immediate glimpse of the nature of any large quake by looking at the seismic waves that bounce around the world. But to get the full story, scientists need to get on the ground and, in this case, also onto the sea.

Sean Gulick is aboard the National Science Foundation's research vessel Endeavor, hogging the Haitian coastline. And earlier this week, he found what he thinks is the smoking gun from the January quake.

Dr. SEAN GULICK (Research Scientist, University of Texas, Austin): We're seeing what looks like very active breaks and it's a very high resolution data that comes right up to the sea floor. So, we're pretty darn certain that that is the break from this event.

HARRIS: Gulick and his colleagues had been mapping out the Enriquillo fault line as part of a project to understand when it's likely to give way again with another large quake. The fault tells a curious story, neither the coast nor the fault line follows a straight line.

Dr. GULICK: It's kind of playing peek-a-boo with the coast, sometimes, it's a little bit offshore and sometimes, it comes back onshore.

HARRIS: And he says that pattern helps explain the dramatic geologic features that have built up over the eons along the coast, west of Port-au-Prince.

Dr. GULICK: So this very high peaks right up against the water and also nice clean cut phase depending on whether the fault is kind of jogging outward or jogging inward.

HARRIS: These natural features also explain some of the odd effects of the January quake. For example, some coral reefs have been pushed all the way out of the water, while others have sunk beneath the surface. The ground didn't just slide side to side. When the fault bends a little, it caused the ground to rise or fall.

And human activity has also shaped the coastline and in unfortunate ways. As people in the highlands chopped down much of Haiti's forests over the years, that unleashed a huge amount of sediment that has washed down the rivers and into the coastal base, actually building up deltas composed of loose and weak dirt. Gulick says people have built homes there.

Dr. GULICK: In places where the houses are built near where the small rivers are coming out or built onto the deltas and there's lots of loose soil, there's been very much enhanced damage.

HARRIS: Loose sediments can literally liquefy during a quake and there's evidence of that in Haiti. Gulick's colleague, Paul Mann, who's also from the University of Texas at Austin, takes up the story from here.

Dr. PAUL MANN (Senior Research Scientist, University of Texas, Austin): I'm in Haiti, standing very close to the fault that we've been working on.

HARRIS: Mann has been working with a team of scientists onshore. Among other things, he's been looking at a local tsunami that happened during the quake. He says that surprise wave was apparently triggered by a landslide in these loose soils.

Dr. MANN: During the January event, this was shaken very strongly causing the deltas to undergo what we call a lateral spread. In other words, part of this went off in the deep water.

HARRIS: Eyewitnesses said the water level in the bay dropped, apparently as a result of this underwater landslide. And then, it rose up.

Dr. MANN: And actually, some people in this neighborhood were killed by the waters that came rushing back.

HARRIS: That was arguably a man-made disaster caused ultimately by deforestation years ago and miles away.

Richard Harris, NPR News.

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