

## News in focus

of people in each group becomes so small that the genetic linkages are very weak.

Dean Hamer, a retired geneticist in Haleiwa, Hawaii, who published some of the first studies on the genetics of sexual orientation, is disappointed with the study. Defining sexual orientation on the basis of a single same-sex encounter is not a useful way of categorizing people, he says, because many people who identify as heterosexual have experimented with a same-sex partner. Instead, he thinks the researchers have found genetic markers associated with openness to new experiences, which could explain the overlap between people who have had a homosexual partner and heterosexual people who have had many partners.

Zietsch says that risk-taking can explain

only part of the statistical link between markers associated with same-sex encounters and those associated with number of partners. And he admits that using a single homosexual experience as an indication of sexual orientation isn't ideal, but says that the UK Biobank didn't provide data on sexual attraction. Zietsch's previous research on data from 23andMe showed a strong genetic overlap between people who reported same-sex sexual experiences and those who reported same-sex attraction.

Hamer acknowledges that linking a complex behaviour to genetics is extremely difficult, but says he is glad the team is researching sexual orientation. "It's vastly understudied considering it's a driving force for the human race," he says. "It's a good question, they just didn't find an answer."

limited resources, so the community seismology project provides much-needed data. Its seismometers feed data into a system that displays the locations and magnitudes of Haitian earthquakes on a web-based portal in real time (see [go.nature.com/3zpxwvg](https://go.nature.com/3zpxwvg)).

"It's not professional equipment, and there are a lot of limitations," says Dominique Boisson, a geologist at the State University of Haiti in Port-au-Prince who helps to run the network. But "some results are very nice".

### Difficult work

The network underscores just how far seismology in Haiti has come in 11 years. When the 2010 earthquake struck near Port-au-Prince, the country had no seismologists and just one official seismic monitoring station, says Boisson. Now, there are several professional seismologists, as well as 7 stations in the official national network, which is operated by Haiti's Bureau of Mines and Energy, and 15 in the community-science network.

Within days of the big quake hitting on 14 August, teams of scientists and technicians were driving towards its epicentre, carrying seismometers and other instruments to measure how the ground was moving. Monitoring the ground with scientific instruments immediately after a quake allows researchers to better understand why the earthquake occurred and the future seismic risk. In 2010, it took weeks after the quake for foreign researchers to fly to Haiti and deploy instruments.

This year, many of those foreign teams are forbidden to travel to Haiti because of COVID-19 restrictions and political instability following the assassination in July of Haiti's president, Jovenel Moïse. Instead, the work is being led by Haitian seismologists, such as Steeve Symithe, also at the State University, who, before he went into the field, was streaming Facebook Live presentations about the science of the quake to the Haitian public.

Both the 2010 and the 2021 quakes happened in the Enriquillo–Plantain Garden fault zone, a tangle of fractures in Earth's crust where the North American and Caribbean tectonic plates slide past one another. It runs from west to east along Haiti's southern peninsula. The 2010 quake occurred on a previously unknown fault in that zone. The epicentre of the 2021 quake lies about 100 kilometres to the west, in the province of Nippes (see 'Tracking Haitian tremors').

At least 2,100 people died in the 14 August quake, although the total count has yet to be tallied. The US Geological Survey estimates that there might have been more than 10,000 deaths. Many survivors endured heavy winds and rain from a tropical storm as they tried to shelter outside. The scientists who travelled to the area spent a night in their cars as rain pelted down, softening the ground and

# HOME SEISMOMETERS PROVIDE CRUCIAL DATA ON HAITI'S QUAKE

A volunteer network helps to monitor aftershocks and illuminate the country's earthquake hazards.

By Alexandra Witze

**A** network of inexpensive seismometers, installed in living rooms, gardens and workplaces across Haiti, is helping scientists to unravel the inner workings of the magnitude-7.2 earthquake that devastated the southwestern part of the

Caribbean nation last month. Researchers launched the community-science effort after the country's previous major earthquake – a magnitude-7 tremor in 2010 that killed more than 100,000 people – and it has since helped to reveal details about Haiti's seismic activity.

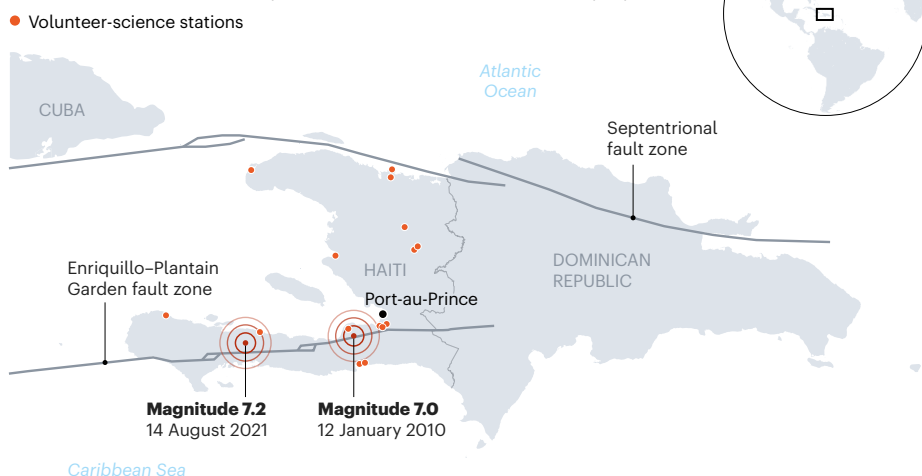
The country's official seismic monitoring stations are sometimes offline because of



Haiti's earthquake last month destroyed many buildings, including this church.

## TRACKING HAITIAN TREMORS

Low-cost seismometers hosted in people's homes and workplaces are contributing to the scientific understanding of the recent earthquake in Haiti. The community-based effort launched after a massive quake in 2010 killed more than 100,000 people.



generating landslides as aftershocks shook the ground, Boisson tells *Nature*. “It was pretty difficult” for them, he says.

### DIY seismology

The challenge of doing fieldwork in Haiti helped to inspire the creation of the community seismology project in 2019. That was when Eric Calais, a seismologist at the École Normale Supérieure in Paris who has studied Haiti’s earthquakes for years, happened across a company that sells seismic stations to hobbyists. Looking for ways around the national Haitian network’s intermittent data, he used leftover money from a grant to buy some stations. Known as Raspberry Shakes, they contain tiny accelerometers that detect when the ground trembles.

These US\$500 stations are not as sophisticated as Haiti’s official \$50,000 monitoring stations. “But when it comes to locating quakes, determining magnitude, doing basic seismology – they are really excellent,” says Calais. The team, which includes Calais, Boisson, Symithe and others, recruited people to host the stations. Boisson had one in his garden until he dismantled it to move it closer to the epicentre of the 14 August quake. The host who had the Raspberry Shake closest to the epicentre was chagrined that his station was offline during the quake; he immediately ran out and topped up his Internet plan, says Calais.

Funded by international supporters, Calais and his colleagues have kept the network of 15 stations operational for two years; they aim to ramp up to 50 or more stations soon. Community seismology networks have sprung up in other places around the world, but the Haiti network is unique in providing data in an area where few seismic data are otherwise collected, says Calais.

The Haitian community-seismology data feed into a nationwide experimental system

called Ayiti-Séismes, which is hosted at a website run by the Côte d’Azur University in Nice, France. Ayiti-Séismes also pulls data from official seismic stations in Haiti as well as those in nearby countries, including the Dominican Republic and Cuba. The result is a real-time map of aftershocks, blanketing southwestern Haiti in shades of red and orange. “The network is alive and well,” says Susan Hough, a seismologist at the US Geological Survey in

Pasadena, California, who has worked in Haiti for many years, including after the 2010 quake.

The quake’s epicentre is fairly close to quakes that occurred in 1952 and 1953, which were probably between magnitudes 5 and 6, says Calais. In terms of future risk, the Enriquillo-Plantain Garden fault zone could still yield another major quake. “In this area, we cannot say that it’s over,” says Boisson. Some speculate that the 2010 quake contributed to the recent one by transferring stress towards the region that just ruptured.

Boisson notes that many scientists have been worried about a different major geological region in Haiti’s north, known as the Septentrional fault zone; it unleashed a major quake in 1842. “After 2010, we thought it would be this fault” that would cause future quakes, he says. “And then it was in the south again.”

At least 600 aftershocks have been detected from the 14 August quake – compared with roughly 10 in the same time period after the 2010 quake, although there were undoubtedly more that were not detected, says Calais. “We now have very strong information about not only where the [14 August] quake occurred, but also how wide the rupture was, in which direction the fault was dipping,” he adds. “That’s essential” to understanding why the quake occurred, and what to expect in the future.

## AUSTRALIA’S CANE TOADS EVOLVED TO BE CANNIBALS AT FRIGHTENING SPEED

Study suggests that the noxious pests have become so numerous, they’ve developed a taste for each other.

By Max Kozlov

**T**he list of ‘deadly animals in Australia’ just got a little weirder. The cane toad, a toxic, invasive species notorious for devouring anything it can fit in its mouth – household rubbish, small rodents and even birds – has become highly cannibalistic in the 86 years since it was introduced to the continent, according to a study. Its counterparts in South America, where cane toads originated, are much less cannibalistic.

The discovery could help researchers to understand the evolutionary underpinnings of this uncommon and extreme behaviour. Scientists have seen cannibalism evolve in species before, says Volker Rudolf, a community ecologist at Rice University in Houston, Texas, who studies the phenomenon. But

what’s exciting about this work, he says, is that the researchers are almost seeing it “develop in front of their eyes”, given that the behaviour arose in less than 100 years – the blink of an eye by evolutionary standards.

“These toads have gotten to the point where their own worst enemy is themselves,” says Jayna DeVore, an invasive-species biologist at the Tietaroa Society, a non-profit organization in French Polynesia, and a co-author of the study, which was published on 23 August (J. L. DeVore *et al. Proc. Natl. Acad. Sci. USA* **118**, e2100765118; 2021).

Scientists estimate that there are well over 200 million of the amphibians in Australia. They have become so abundant, says DeVore, that they face more evolutionary pressure from each other, as they compete for resources, than from anything else in Australia.