



## Where I work Karen Lloyd

I was working at the Woods Hole Oceanographic Institute (WHOI) in Massachusetts when freezers full of precious marine sediment cores – long cylinders of Earth’s crust – arrived from off the coast of Peru in April 2002. They had been taken from 100 metres below the sea floor, as part of the first ocean-drilling mission aimed at discovering what microorganisms exist inside the planet. It was incredibly exciting. I’ve been exploring ways to probe deep below Earth’s surface ever since.

In those initial samples, we found forms of microbial life that we never knew existed. But because they were so unique, we couldn’t learn much about their role deep inside Earth. So, in 2009, I accepted a postdoc at Aarhus University in Denmark aiming to extract and analyse entire genomes from marine-sediment samples. We found microbes that slowly break down proteins in dead organic material.

My WHOI colleague Peter Barry, a marine geochemist, and I received a grant in 2016 to sample the fluids that bubble up from the deep subsurface across a vast area. We’ve

been able to collect fluids from hot springs and volcanoes around the world, including those in Costa Rica, Panama, Argentina, Chile, Iceland and the United States. We now better understand these microbes’ contribution to the continual cycling of elements – including those that are essential for the planet’s functioning, such as oxygen, carbon and nitrogen.

In this image from March 2022, I am in a Chilean village where locals had built a pool around a natural hot spring. Everywhere we sample water, we share our data – on temperature, pH levels and alkalinity, for example – with the communities, providing valuable information on hot-spring safety.

Our goal is to build a data set that provides a global view of how microbes thrive in the extreme heat and salinity deep inside the planet. Every time I go on one of these trips, I can’t sleep past 4 a.m. because I am so eager to get into the field.

**Karen Lloyd** is a geomicrobiologist at the University of Tennessee in Knoxville. **Interview by Virginia Gewin.**

Photographed for *Nature*  
by Jacopo Pasotti.