



## Where I work Nicole Khan

Photographed by  
Suzanne Lee/Panos Pictures

**W**e often hear that sea levels will rise by a metre or two because of climate change. But that's a global estimate: if you're a city planner on, say, the China coast or in Miami, you want to know how sea level is going to change in your area. My work as a geologist helps us to predict future coastal changes by determining how much sea levels have risen and fallen in the past 1,000 years.

My team and I study soil samples collected from shorelines around the world. When we're not hampered by pandemic-related restrictions, we might spend two weeks knee-deep in mud, in a jungle gym of coastal mangroves. But the pandemic has limited us to our backyard, so to speak: in this picture, we're on a coastal mudflat in Hong Kong. Across the bay is the city of Shenzhen on mainland China. Both Shenzhen and Hong Kong are part of the Pearl River delta, where low-lying lands are at risk from rising seas.

I'm with my two graduate students, Howard Yu and Kayla Murai. We examine long, narrow samples of soil from deep in the ground that were collected with

the kind of sediment corer we're holding here. Because Earth formed in layers, the deeper we go, the further into the past we can explore. If we can identify features of these cores indicating that they were part of coastal environments such as mudflats and mangrove swamps during a particular era, we can map out where the shores used to be and how they changed over time.

For a coastal marker, Howard is using fossils of foraminifera, single-celled creatures with spiral shells, most of which live on, or inside, sea-floor sediment. We'll work out what kinds of foraminifera show up in modern-day mudflats, then look for them in archived sediment cores. That will allow us to fill a gap in our understanding of what the China coastline was like between 500 and 1,000 years ago.

I love this work because it's like being a detective: you collect something from the field, look at the evidence and unravel the story of what happened in the past.

**Nicole Khan** is a geologist at the University of Hong Kong. **Interview by Amber Dance.**