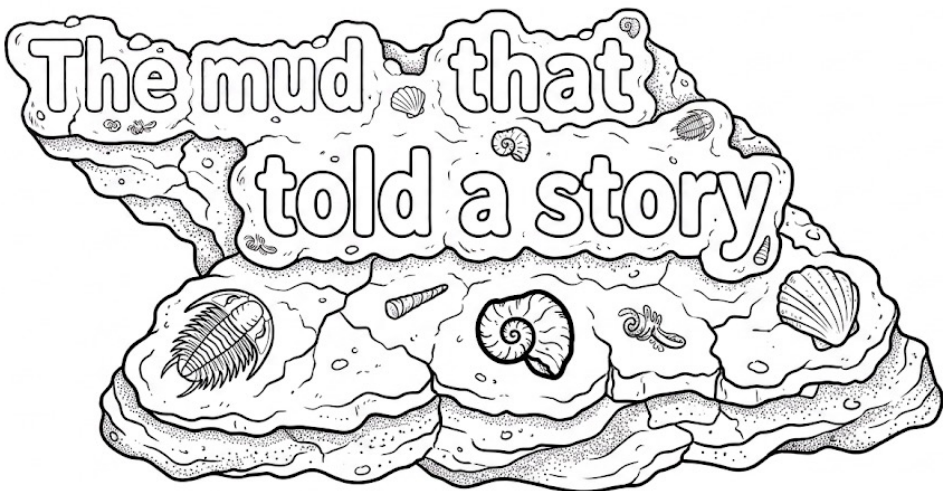
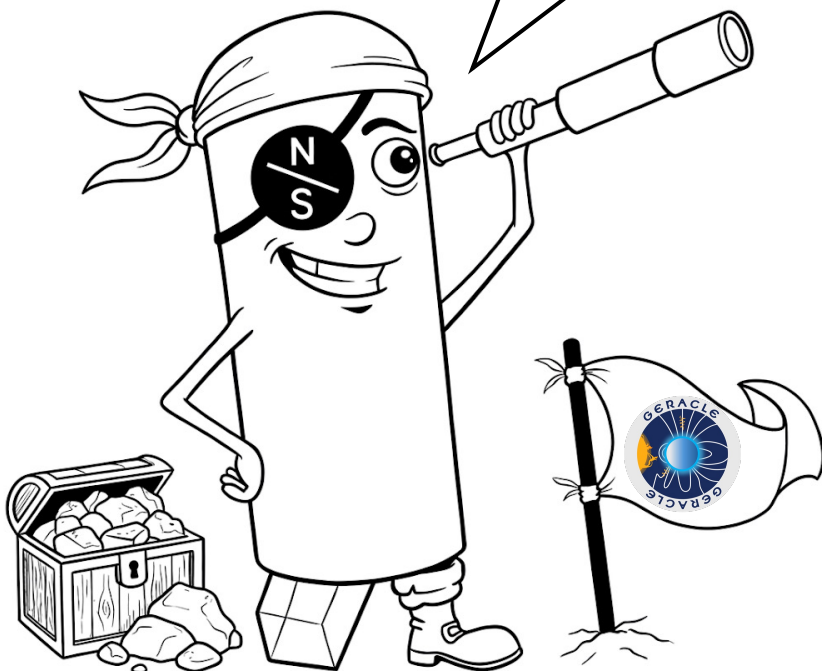




Hi, I'm Cory.
Let me tell you a story...



Far out on the blue sea sailed the ship *Curious*, searching for secrets buried in the ocean floor.

"Ready the corer!" called Captain Nour.

Down went the long metal tube. Through sunlit water at the top and then cool green water below. At last, it reached the dark, silent seafloor where mud had settled for millions of years.

Ka-chunk! The tube sank into the soft mud.

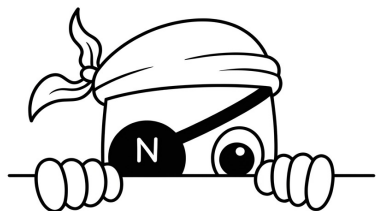
"Pull it up!"

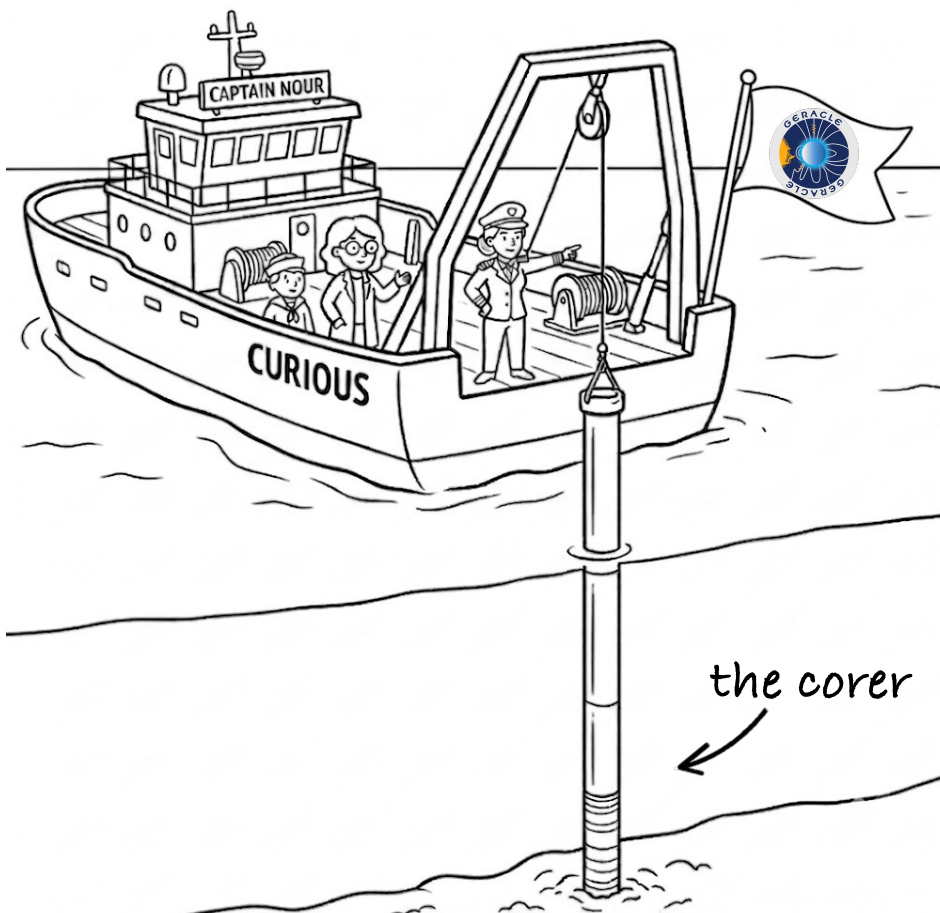
The crew cranked the winch, and up came the corer, packed with layer upon layer of mud. A stripy cake made by time itself.

"This mud remembers things" said Dr. Mika "Old magnetic fields, ancient volcanoes, tiny sea creatures."

Young sailor Luca squinted at it. "It just looks like mud."

Dr. Mika smiled. **"Hiding in plain sight. That's the best kind of magic."** They capped the tube, labeled it, and sailed for shore.





In a bright lab, Dr. Mika laid the tube on a table with a wire that could slice it like butter.

"We split it in the middle," she told Luca. "The working half we study. The archive half goes into the cold storage, for scientists that are not even born yet."

Zzzip. The core opened, showing its striped layers for the first time.

"It's like a diary locked for a million years." said Luca

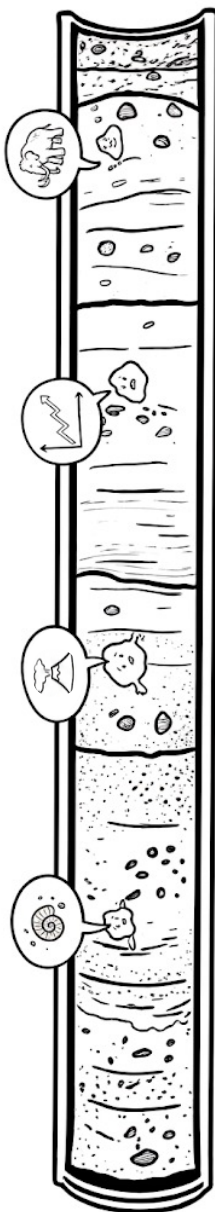
"And now," said Dr. Mika, "we get to read it."



for later



ARCHIVE



WORKING



for now

Along the working half, Dr. Mika pressed small plastic cubes into the mud, one after another, like planting seeds in a row.

"Each cube is a sample," she explained. "Some for magnetism, some for climate – for example temperatures or ocean chemistry in the past. It's all hiding in here."

Tray after tray of labeled cubes were carried off in different directions.





The magnetic samples went into a hushed, special room.

"Our machine is very sensitive," said Dr. Mika, placing a sample into a humming magnetometer.

"It listens for tiny magnetic whispers left by mineral grains. When the mud was soft, those grains pointed toward magnetic north. When it settled, the grains froze in place, like a photograph of the Earth's magnetic field."

Slowly, a wiggly line appeared on the screen. Studying it, she pointed to a different dips and explained:

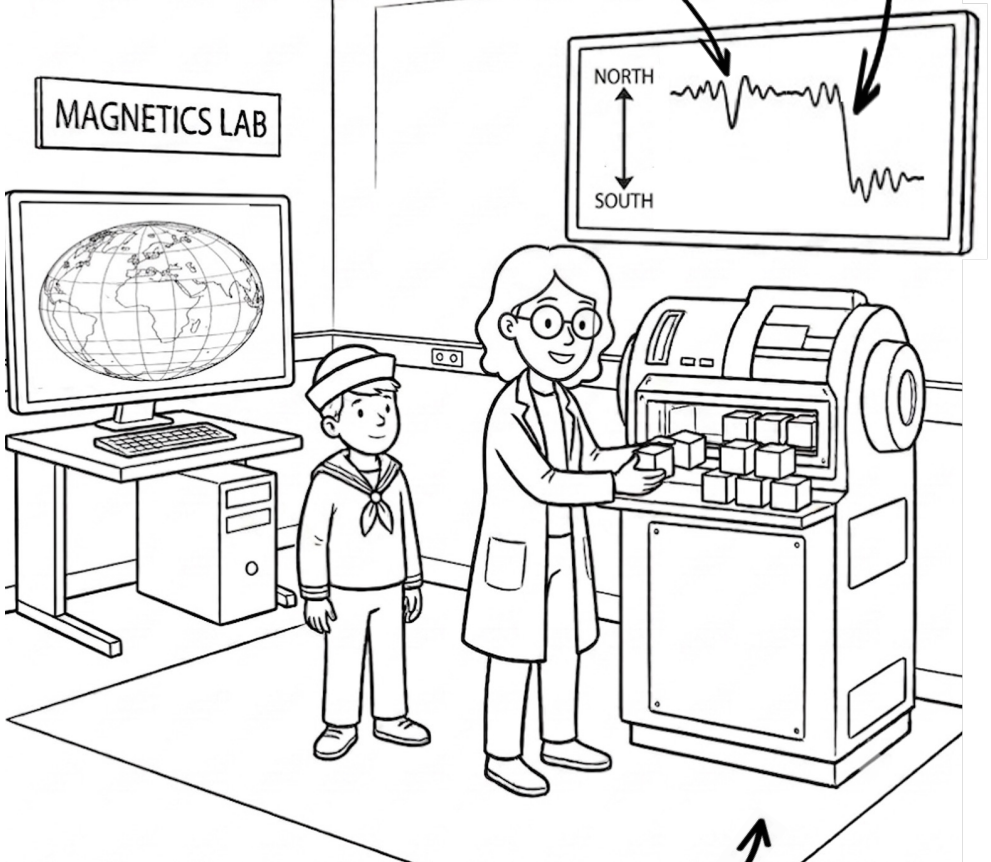
"Here we can see times when the magnetic field changed. Sometimes we name them after the place they were first found. Here for example is the **Laschamps excursion**, a time when the magnetic field wandered, but returned to normal afterwards. It happened 40 thousand years ago and is named after a place in France where it was first found in volcanic samples."

Then a bigger change entirely. "Sometimes we name them after important scientists. This is the **Matuyama-Brunhes reversal**. Here the whole field flipped upside down, north to south, for thousands of years before flipping back. It is named after a Japanese and a French scientist and happened almost 1 million years ago."

Luca's eyes went wide. "**The Earth's compass just... flips?"**

"Sometimes," said Dr. Mika. "And this mud remembered it."

Matuyama-Brunhes
Laschamps



the magnetometer

The scientists sent their findings to the modelers.
Puzzle-builders who fit together mud clues from the
oceans worldwide.

"We use clues like yours to build a picture of how
Earth's magnetic field has changed," one explained.

Piece by piece, the picture grew. Wobbles and flips
recorded across millions of years.

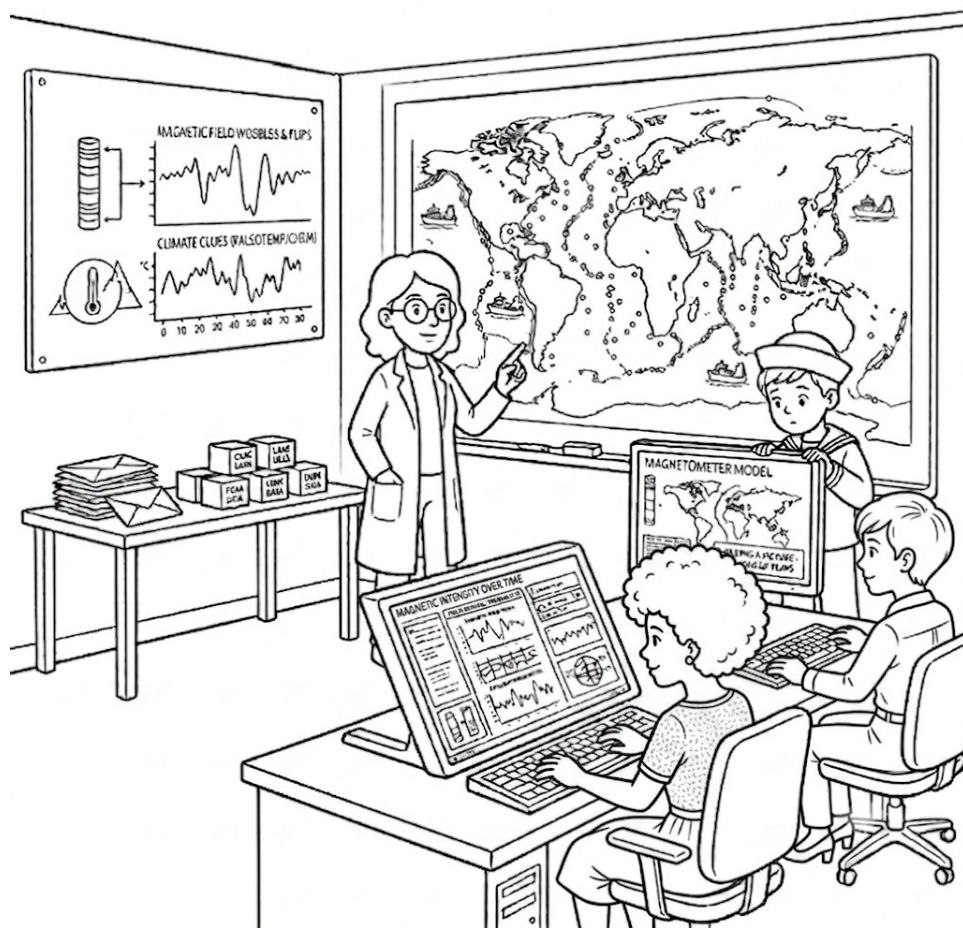
Placed beside the climate clues from the same mud,
the two stories lined up perfectly.

"This is how we learn about our planet's past," said Dr.
Mika, "from thousands of tiny clues, coming together."

Luca looked at the little cube that once was just a
scoop of mud.

**"I guess mud really is magic." they said. "You just have
to know how to listen."**







LEARN MORE

This coloring book was created by Rahel Paasch, Pablo Rivera, Louise Dauchy-Tric and Karina Wilgan within the GERACLE project at GFZ Helmholtz Centre for Geosciences.

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