Lake Mud Detectives: Investigating past environmental change of tropical crater lakes

Over 80 small crater lakes in western Uganda provide water resources for rural communities and a home to wildlife. Unfortunately, the lakes face increasing pressure from human activities, such as deforestation to make room for growing crops, and climate change.

Why?

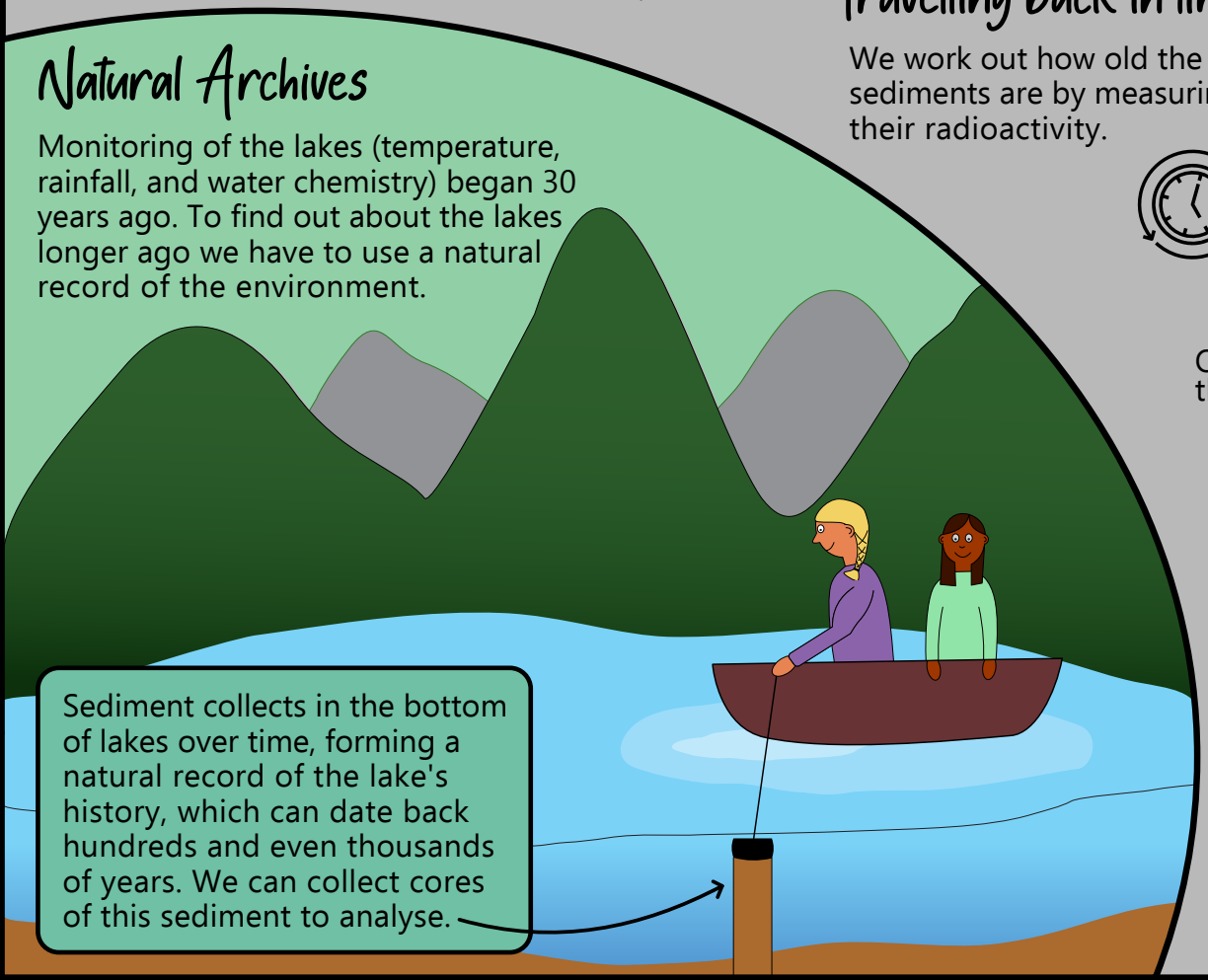
Understanding the lakes' response to past changes helps us predict how they will respond to current and future pressures, and inform sustainable management.

What are environmental proxies?

Proxies are environmental clues to the past, preserved in the lake sediments. They give us information about the lake and wider environment at the time that they were preserved.

Natural Archives

Monitoring of the lakes (temperature, rainfall, and water chemistry) began 30 years ago. To find out about the lakes longer ago we have to use a natural record of the environment.



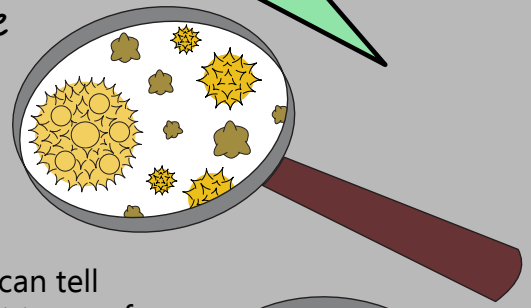
Sediment collects in the bottom of lakes over time, forming a natural record of the lake's history, which can date back hundreds and even thousands of years. We can collect cores of this sediment to analyse.

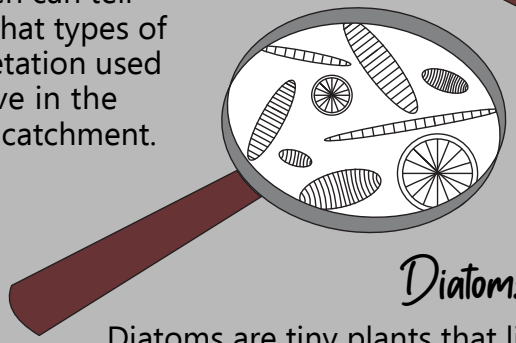
Travelling back in time

We work out how old the sediments are by measuring their radioactivity.

Pollen

Pollen can tell us what types of vegetation used to live in the lake catchment.





Diatoms

Diatoms are tiny plants that live in all water bodies. The species present in the sediment tell us about the lake water chemistry when they were alive.

Geochemistry

The chemical fingerprint of the mud can tell us about the lake and the climate when it formed.

Reconstructing the Past

By analysing these 'clues', we can build up a picture of the lakes' past environments, and tell a story of their past, like detectives at a crime scene working out what happened from a few clues left behind.