“Lake records of climate change”

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To understand our present climate and the changes that humans are causing, it is imperative that we know how past climate has changed. Although many environments record past climate change, e.g. oceans, corals, cave deposits and tree rings, lakes offer an opportunity to understand how climate has impacted one of man’s primary needs – accessible fresh water.

The floor of a lake is composed of a stacked sequence of sediments that have accumulated over time. These sediments record both what the lake has experienced, that is, what has happened within the lake, but also what the environment surrounding the lake has experienced.

Under the effects of a changing climate, the water of a lake will change its chemistry, with drying conditions resulting in the lake water becoming more shallow and salty and in wet conditions the water becoming less salty and deeper. This change in saltiness dictates what sorts of animals and plants can survive in the lake. Many of these plants and animals leave fossils as they complete their life cycles and these fossils can indicate the water conditions when the animals and plants were alive. Similarly, the animals and plants take up the chemistry of the water and store these elements in their body walls. Geochemical analysis of plant and animal fossils can also provide detailed information about changes in water chemistry through time.

Climate change can significantly affect the landscape surrounding lakes, causing plant communities to change, forest fires to burn vegetation and flooding that brings sediment from different sources into the lakes. All of these changes can be recorded in lake sediments.

In this presentation, I will discuss a few examples of these processes and show how we can reconstruct past climate change, and in particular droughts and floods using records from lakes.