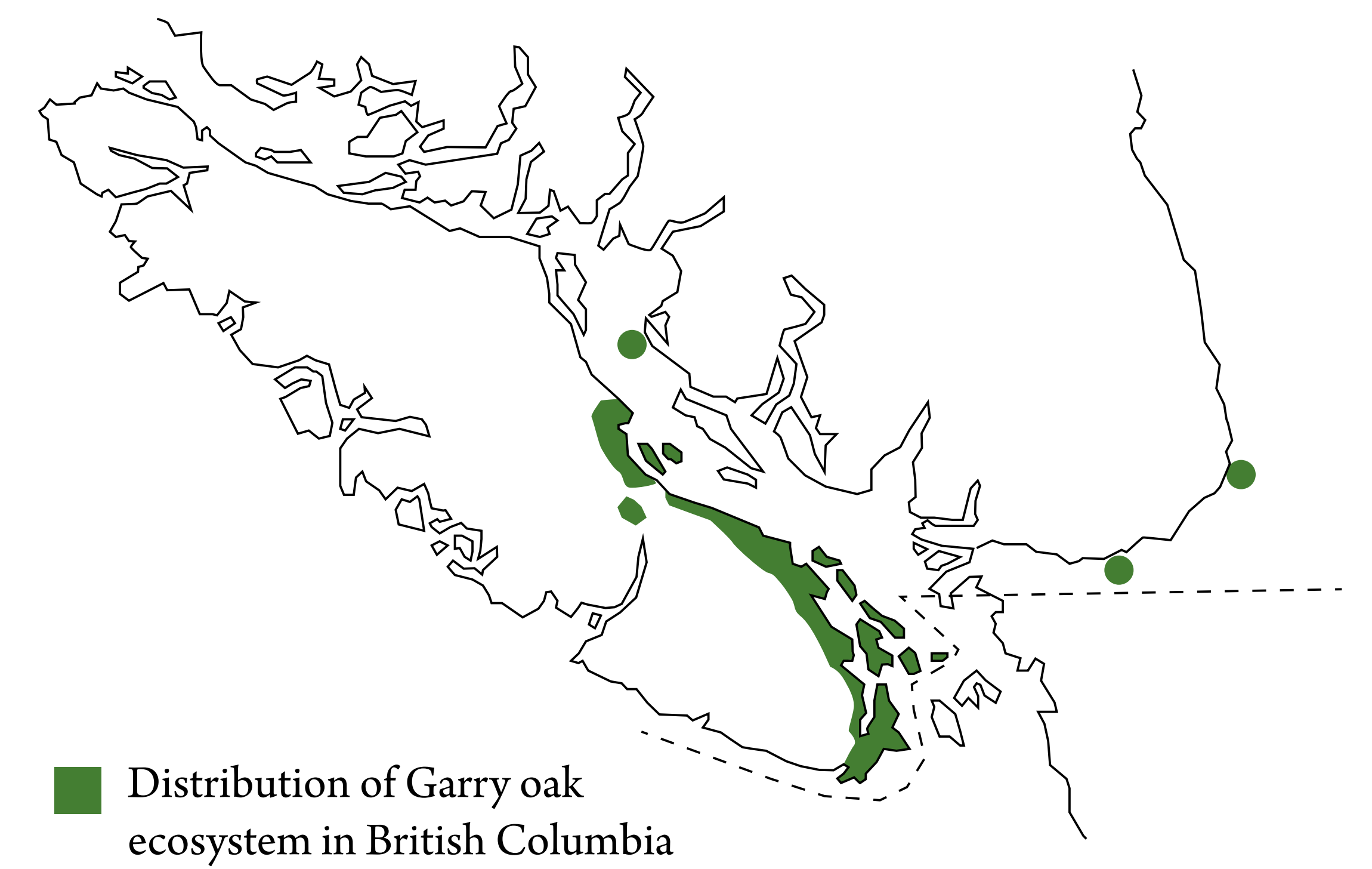# How do you know what organisms lived in an area before there were photographs or written records?

Derek Tan

Jenny McCune

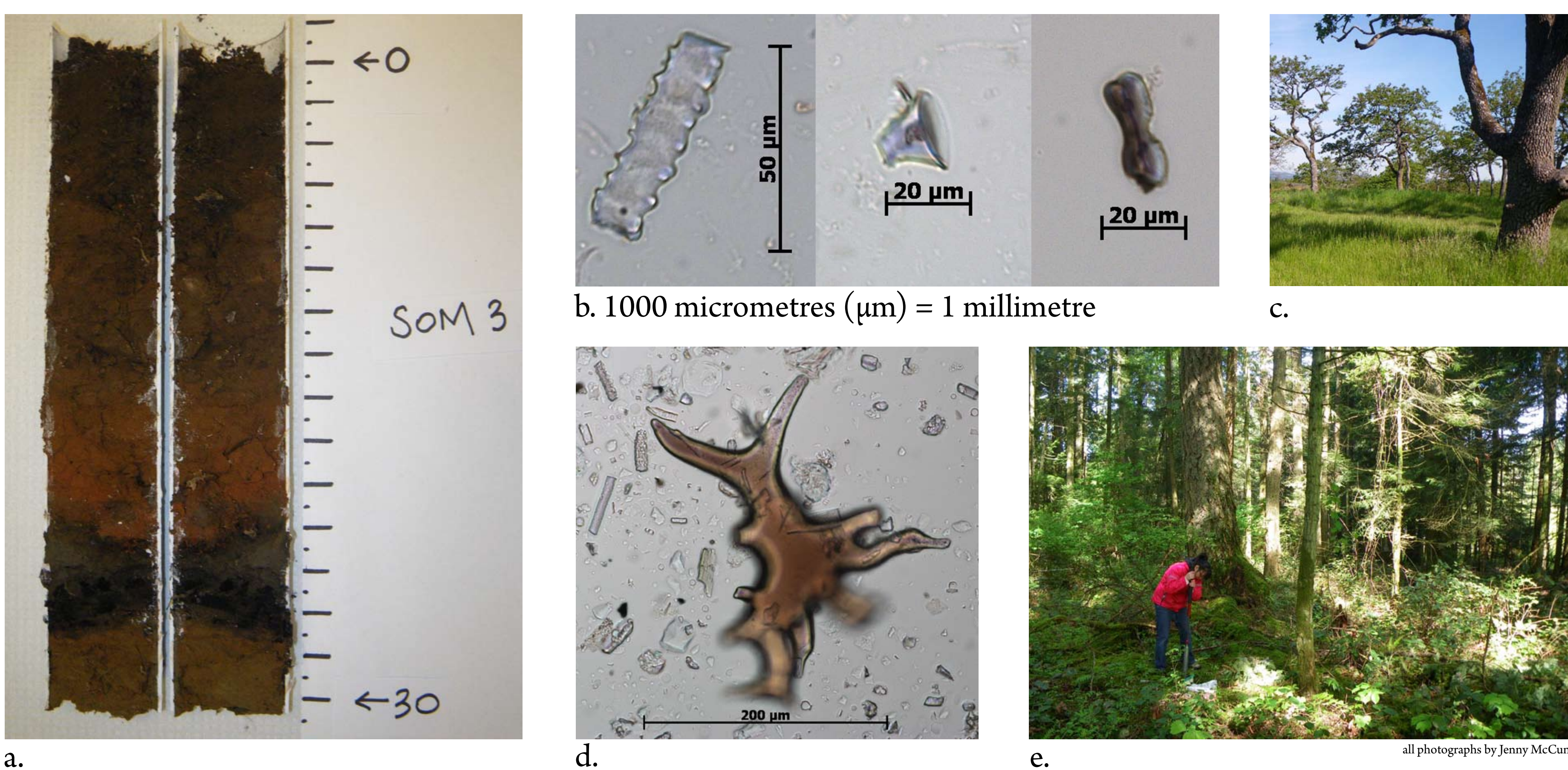Distribution of Garry oak ecosystem in British Columbia

Jenny McCune studies the Garry oak ecosystem which, in British Columbia, is only found in a narrow range in the southwestern corner of the province. Garry oaks are the only type of oak tree native to BC and their habitat hosts a diverse range of interdependent organisms.

Human impacts, such as land development and agriculture, have reduced the area of Garry oak ecosystems. But how widespread were Garry oak ecosystems in the past?

Researchers can use multiple methods to answer the same question. Historical land surveys, written accounts, and ethnographic studies give insight into what the plant community looked like in the recent past. To go further, researchers like Jenny use paleoecology to look back thousands of years in time.

As plants decompose on the ground, they form layers of soil that contain evidence of what types of plants were nearby at that time. By extracting a cylinder-shaped sample going down through these layers, changes in the plant communities can be seen.

Some plants have characteristic pollen shapes. Others have distinctive *phytoliths*, the remains of very small mineral deposits that were once inside the plant. Long-term shifts in plant community composition can be reconstructed by looking at the ratio of these plant traces.

This information tells us that oak trees were dominant in the area starting 8,000 years ago and conifers, like Douglas-fir, became more common starting 6,000 years ago, associated with a change to a cooler, wetter climate.

b. 1000 micrometres (µm) = 1 millimetre
c.
a.
d.
e.
all photographs by Jenny McCune

Different layers within a soil sample (a) can tell you what kind of plants were in an area through time. Phytoliths from grasses (b) indicate the more open Garry oak ecosystem. Douglas-fir phytoliths (d) suggest coniferous forests (e).

From historical data, we know the prevalence of Garry oak ecosystems has declined sharply after European contact. Through this kind of research, we can better understand the factors which will influence the future of this endangered ecosystem.