

Melting ice reveals millennia-old forest buried in the Rocky mountains

Trees dating back almost 6000 years have come to scientists' attention due to ice melting in the Rocky mountains, offering a "time capsule" into the past

By [Taylor Mitchell Brown](#) on January 13, 2025



The uncovered whitebark pine trees. Gregory Pederson

A 5900-year-old whitebark pine forest has been discovered due to the melting of alpine ice in the Rocky mountains. Scientists found more than 30 [trees](#) approximately 3100 metres above sea level – 180 metres higher than the present tree line – while carrying out an archaeological survey on the Beartooth plateau in Wyoming.

This “offers us a window into past conditions at high elevations”, says [Cathy Whitlock](#) at Montana State University. Whitebark pine (*Pinus albicaulis*) don’t grow at this elevation now, so these ones had to grow at a time when the climate was warmer, she says.

To understand the history of the lost forest, Whitlock’s team analysed their rings and used carbon dating to age it. They found that the trees lived 5950 to 5440 years ago, a period of steadily decreasing temperatures.

Ice core data from places like Antarctica and Greenland suggest that these falling temperatures were influenced by centuries-long volcanic eruptions in the northern hemisphere. These produced enough aerial sediment to cut sunlight and lower global temperatures until the [environment](#) was too cold for these higher-elevation trees to survive.

While laying flat, the newly discovered trees are in exceptional condition, indicating that they were rapidly preserved after death. Although they lack evidence of being covered by avalanches, they show marks that align with the expansion of the present ice patch.

Climate models suggest that additional sustained volcanic eruptions in Iceland produced further drops in temperature 5100 years ago, says team member [Joe McConnell](#) at the Desert Research Institute in Nevada. These lower temperatures expanded the ice patch and ensured “the fallen trees were entombed in ice and protected from the elements for the next 5000 years”, he says.

Only in the past few decades have temperatures risen enough to release the trees from their icy crypt. The current tree line is “likely to shift upslope with increasing temperatures in the coming decades”, says Whitlock.

“This discovery was possible because of anthropogenic climate change – rising temperatures are now exposing areas that have been buried by ice for millennia,” she says. “While such discoveries are scientifically interesting, they are also a sad reminder of how fragile alpine ecosystems are to climate change.”

“The study is a very elegant and careful use of a valuable ‘time capsule’ that tells us not only about these mountain forests 6000 years ago, but about the climate conditions that allowed them to exist,” says [Kevin Anchukaitis](#) at the University of Arizona.

These trees aren’t the first such finding researchers have unearthed from Rocky mountain ice patches. Previous work found “fragments of wooden shafts used for arrows and darts”, says Whitlock. One shaft was radiocarbon dated to more than 10,000 years ago, “telling us that people have been hunting in high-elevation environments for millennia”, she says.

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