

# Shrub reveals the secrets of climate change

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Dr. Keith McDougall and Dr. Matthew Brookhouse examine the growth rings of a mountain plum pine.

(PhysOrg.com) -- In an Australian first, scientists from The Australian National University and the NSW Office of Environment and Heritage have uncovered a new way of identifying 300 years of climatic changes in the Australian Alps by looking at the growth rings of a sturdy, long-lived alpine shrub.

Mountain plum pine is found in the incredibly harsh and constantly cool Australian [Alps](#) where annual growth is very slow at less than 1 millimetre in diameter.

Dr. Matthew Brookhouse from ANU said the 2003 bushfires led to the investigation into the native shrub, which can live for up to 600 years.

“Prior to the devastating fires, most mountain plum pines were so old that the idea of cutting them up for analysis was not even considered. But the fires killed many plants that were centuries old and we found that they only regenerated from seed in the soil,” he said.

“With large numbers of dead plum pines available, we gathered cross sections and discovered that the growth rings could be used to reconstruct past climate, even though Australian plants had long been thought to be poor for this purpose.

“We cross referenced rings from Mt. Blue Cow in Kosciuszko National Park samples and found that in years with a lot of snow, the plants had narrow growth rings, so growth was directly related to temperature in the growing season.”

A narrow series of rings in all samples in the 1950s and 1960s reveal big snow years, especially in 1960, and in 1923, which was probably the biggest snow year of the 20th Century.

OEH botanist Dr. Keith McDougall said the discovery made the mountain plum pine a very useful tool.

“The process of measuring the width of growth rings is painstaking. Each stem has to be polished to a mirror-like surface and then examined microscopically, however, we’ve successfully measured about 50 cross-sections so far,” he said.

“With funding from the Australian Alps Liaison Committee we’ve extended our work throughout the Snowy Mountains and to alpine areas in Victoria and the ACT, with the aim of reconstructing the climate of the Alps for the past 300-400 years and to determine historic fire frequencies.

“A strong relationship between mountain plum pine growth and snow cover means we may be able to estimate annual snow conditions well before European settlement, which is important because it will tell us whether the current declining snow conditions have precedent.

“If there have been other periods of low [snow](#) cover, the plants and animals of the Alps may have the resilience to get through the immediate effects of climate change or, if not, they may be the first threatened.”

Provided by Australian National University

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