

# Shrubs lend an insight into a glacier's past

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(Phys.org)—The stems of shrubs have given researchers a window into a glacier's past, potentially allowing them to more accurately assess how they're set to change in the future.

Their findings have been published today in *Environmental Research Letters*, and show how a glacier's history of melting can be extended way past the instrumental record.

Much like the rings on a tree stump indicate how old it is, measuring the width of rings on the stem of a shrub can give a good indication of how well it has grown year on year. Under [extreme environmental conditions](#), such as those close to a glacier, a shrub's growth relies heavily on [summer temperatures](#), meaning the ring-width of a shrub can be used a proxy for glacial melting, which also relies heavily on summer temperatures.

Lead author of the study, Allan Buras, said: "In [warm summers](#), shrubs grow more compared to cold summers. In contrast, a glacier's summer mass balance is more negative in warm summers, meaning there is more melting compared to cold summers.

"Big rings in shrubs therefore indicate comparably warm summers, and thus a strongly negative summer mass balance – in other words, more melting."

The researchers, from the University of Greifswald, tested this theory on a local icecap in the Scandic Mountains of southern Norway. They took

24 samples of shrubs from a site close to the glacier and analysed their ring-widths.

Monthly precipitation and [temperature data](#) from a local climate station were retrieved from the Norwegian Meteorological Office, and the summer mass balance of the glacier, from 1963 to 2010, was retrieved from the existing literature.

Each of these data sets was then statistically tested to see if there was a correlation between them. The results showed a robust and reliable [correlation](#) between the ring-width of shrubs and the summer melting of the glacier.

"Our results show that it is possible to reconstruct glacier summer mass balance with shrub ring-width series and it is therefore theoretically possible to extend records of summer mass balance into the past," Buras continued.

The shrubs that were collected in the study were relatively young, only allowing for reliable reconstructions over the past 36 years, meaning they could not be used to extend the record of the glacier; however, the researchers are confident that this could have been achieved if longer-lived [shrubs](#) were selected.

Most of the available data on the mass balance of glaciers only spans several decades and there is some data missing, mainly because most glaciers are situated in hard-to-reach arctic and alpine areas.

With the possibility to extend the instrumental records of summer [mass balance](#), researchers may gain a better understanding of how [glaciers](#) behave in the summer, which they can use to calibrate and verify their existing models.

**More information:** Can shrubs help to reconstruct glacier retreats?  
Allan Buras et al 2012 *Environ. Res. Lett.* 7 044031.  
[iopscience.iop.org/1748-9326/7/4/044031/article](http://iopscience.iop.org/1748-9326/7/4/044031/article)

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