



Illustration by Fred Reibin

From Powder Turns to Snow-cloaked Trees

Learning from guides about snow accumulation in mountain forests

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I have been backcountry skiing for five and a half years now. It combines both my love of skiing with my passion for nature while building relationships along the way. I was a fortunate to be invited to go out backcountry skiing on Alberta's Icefields Parkway with one of my colleagues and their friend who was a new ski guide in the area.

On the trip, I took the opportunity to ask as many questions as possible to understand what they've been seeing in the snow on the mountains. I had been studying snow accumulation in mountain forests. Our research better informs models and theory on how snow transfers from the atmosphere to the ground and tree, then melts and evaporates again.

The ski guide shared many concerns about the uncertainty of snow on the mountains and summer wildfire smoke and how it would impact his job going forward. He and other guides have been seeing many changes in the snowpack on the mountains. He mostly spoke of the changing timing of snow and the likelihood of having good powder providing the great skiing the Canadian Rocky Mountains are famous for.

Overall, the amount of uncertainty they were experiencing was unprecedented. I could relate to the uncertainty. Many models of the spring snowmelt were no longer as reliable as they used to be and we've been working on accounting for the increased variability. Accurate predictions of snow accumulation and melt in the mountains depend on this. It's now more challenging to predict both the amount of snowfall and where the snow will fall.

The scientific work our Global Water Futures team had been doing took on a greater level of realism – I was meeting the people whose livelihood was depending on the mountain snowpack. I wondered how our research could better inform the guides and tourism industry to help them. We could potentially help them determine ski conditions as well as the risk of wildfires in the warm season.

This insight has left me curious as to how accurate the real-time reporting is now for helping wildfire experts to determine fire risk in a changing climate. Could they be experiencing the same level of uncertainty the ski guide and modellers have been? How can we better predict in the short term as well as in the long term?

I take these questions forward with me in my work.

Find out more

Bisset, Rosie; Floyd, Bill C.; Menounos, Brian; Bishop, Alison; Cebulski, Alex; Fisk, Griffin; Marchenko, Sergey; Marshall, Peter. 2022. Quantifying Spatio-Temporally Distributed Snow Density across Four Forested Mountain Watersheds in South-Western British Columbia. AGU Fall Meeting 2022, held in Chicago, IL, 12-16 December 2022, id. C33B-02.