

Mountains signalling disappearance of glacier-fed rivers

May 29 2018, by Michael Brown



Drastic and rapid ecological changes like the drying up of the Slims River in the Yukon will get more common, say the U of A researchers who compiled an updated report on the health of mountain regions in northwestern Canada.

Credit: University of Alberta

A call for policy-makers to begin planning for the inevitable disappearance of glacier-fed rivers is one of the highlights of a no-holds-barred, University of Alberta-led accounting of the health of Canada's mountains.

The 2018 [State of the Mountains Report](#) is a collection of expert summaries written to raise awareness about the ways a changing climate is transforming the alpine, put together by U of A [mountain](#) historian Zac Robinson, mountain ecology researcher David Hik and Lael Parrott from the University of British Columbia.

"Mountains are sentinels for larger global change," said Robinson. "The change is alarming, but I'm optimistic because mountains are adored by people everywhere. That's hopeful because people are paying attention to these types of things."

In a more shocking example of the ravages of climate change, the report recounts the infamous Slims River (Ä'äy Chù) Piracy Event in southwestern Yukon. In the spring of 2016, the Slims River, a major source of water for Kluane Lake (Lhù'ààn Mǎn), effectively ran dry after the Kaskawulsh Glacier receded to the point that its dwindling meltwaters began flowing in a different direction. By August, the 81-kilometre-long Kluane Lake was a metre lower than its previous record low.

"This is one stark example of a very big drainage system that utterly and permanently reorganized itself in a single season," said Robinson.

"Kluane Lake is a massive lake that isn't being fed any longer and is seeing its levels dropping. What does that do to the ecosystem and the communities on that lake that depend on that water?"

It's the kind of event Hik said is going to happen again and again, and not just in the big glaciated regions of the St. Elias Mountains in the Yukon. Glaciologists predict the Rocky Mountains will lose 80 per cent of their glaciated terrain over the next 50 years, he noted.

"The stored legacy of water in glaciers is something we've depended on to feed the big mountain rivers that spread out across the prairies or the

salmon rivers on the West Coast or feed the Arctic Ocean. That's going to change," said Hik, adding coming water shortages lead a list of pending extreme-weather calamities that includes flooding and wildfires. "What information do we need and what do we need to know to mitigate against potential problems?"

Documenting the impact

The report is a long-awaited follow-up to a similar effort put out in 2011, which summarized research being carried out across the country that highlighted the startling impacts of [climate change](#) on the alpine environment in the glaciers of southern Alberta and B.C.

"At the time it was quite jarring in a good way, but it was a one-off thing. Ever since, people have wanted more," said Robinson.

The report's revival came from a recent survey of the Alpine Club of Canada's 15,000 members, who uniformly called for the club to promote conservation and awareness around environmental issues that are happening in the alpine. In fact, the 2018 State of the Mountains Report was produced for the ACC, in partnership with the Royal Canadian Geographic Society.

Not only was the ACC's membership excited about the project, Robinson said, but mountain researchers from across the country also reached out to see how they could be of service. Besides Hik and Robinson, U of A researchers with a stake in the report include Martin Sharp and Alison Criscitiello, who are heading up the Canadian Ice Core Archive, and Stephen Slemmon, who co-wrote a piece for the report titled "Mountain Writing, Film, and Digital Media in Canada."

Building an alpine research archive

But rather than a simple update on the changes of the same parameters, variables and features, Hik said the editing team opted for a project that was narrower in scope but produced annually.

He said the report is focusing on changes that are happening in mountain hydrology, tourism, avalanche prediction, birds and mammals, and treelines. Next year, a new collection of researchers will provide updates on changes to a different set of mountain characteristics and the downstream fallout.

"We're not professing to share it all or show it all, but once we start getting into it year after year, we're hoping to build up a good archive of what's going on with the sole purpose to educate the wider public and people who love and care about mountains," he said.

Hik said he hopes the report drives people to other resources, like the U of A's massive open online course, Mountains 101, and becomes a force for change.

"The advantage of having a document like this is it can be used to garner support for things like flood mitigation, limits on urban development or even the way to manage tourism across multiple jurisdictions," said Hik, adding the relevant government ministries are aware of the report and have been receptive to this relatively concise high-level format of documenting and reporting the changes in mountain places.

"We don't want to document the end of the world, but what we want to do is raise awareness about what we do know at present, and what the consequences will be. With a little lead time you can plan and adapt to change."

The report is available on the [Alpine Club of Canada website](#). The "On the Map" pages in the May-June 2018 issue of Canadian Geographic

complement the material in this [report](#).

Provided by University of Alberta

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