

Berger (1977) as a successful example of community-based hearings. In the 1970s, the Canadian government initiated a plan to construct a gas pipeline along the Mackenzie Valley and river in the Northwest Territories. The local Inuvialuit and First Nations voiced their opposition to this process. The government responded by initiating a Royal Commission headed by Justice Thomas Berger (1977) to look into the matter. Berger and his colleagues went into the indigenous communities to listen to what the people had to say in their own terms. Berger recommended the government halt pipeline construction until the grievances of the indigenous peoples were heard. The result of the process was that the government of Canada followed the advice of the Berger inquiry, and the project had to be abandoned. Almost 40 years later, however, after much negotiation with the local residents affected, it is being reconsidered.

What would then be the next step after gaining international attention for the questions of Lokka and Porttipahta reservoirs in northern Finland? In Part III, Antti Aikio, a Sámi scholar at the University of Lapland in Finland, focuses on the legal issue of the Arctic indigenous peoples. He explores the legal processes bringing the Sámi customary law slowly onto an equal footing with the legal framework of the statutory law. In Part IV, written by Pekka Aikio and Tero Mustonen, the conclusions, solutions, and models are offered as next steps to start the long and difficult process of healing and decolonization. The measures suggested here include revisiting all relevant issues and reassessing their impact on the Sámi region, including assessment of further compensation. According to the authors, this process should include recognition of the conflict of interests between the Sámi and the state over land and water ownership, indigenous rights, and governance of the Finnish part of Sámi lands. The further measures would include a state apology regarding the cultural genocide and colonial acts perpetrated against the Sámi in Finland. Following the model of Berger et al. (1977), a full community-based hearing and documentation process regarding the construction of the reservoirs should be initiated and then widened further to address the whole Sámi situation in Finland.

A virtue of this book is that, in addition to republishing interviews with local inhabitants, it includes earlier unpublished material, such as information collected during the last decade in connection with the Arctic Climate Impact Assessment (ACIA; Huntington and Fox, 2005) and unique diary entries of Oula Aikio. Proper description of research methods and more specialized information about the informants would have been valuable knowledge for readers of this book, however. The book is published under the auspices of the United Nations Association of Finland through the "Global Citizens Platform" with Snowchange Cooperative and the local Sámi of Vuotso. Snowchange Cooperative is an independent nonprofit research and cultural organization that was started in 2000 to document and work with local and indigenous communities.

The authors have written a multidisciplinary, review-type book about the catastrophic effects of hydroelectric

development on subsistence economies such as reindeer herding, on languages, and on the traditional, age-old culture of local and indigenous communities in the North. The authors write that their aim is not to provide an extensive review of publications, but to highlight the main events in the region. They use purposefully forceful expressions and repetition as means to get readers to understand the price that local and indigenous communities and northern nature have paid for modernity. In my opinion, the authors have succeeded in doing this. The message of the book is clear. Although a bit repetitive and discursive, the book is a readable case study about the destructive effects of hydroelectric development on local communities for university students and researchers, particularly those in human geography, environmental ecology, and environmental and minority law. It is also good background reading for authorities and companies dealing with the use of land and natural resources. And it provides a good basis for discussion among those interested in issues related to global change, indigenous peoples, power relations, and participatory planning, not only in the Arctic, but elsewhere.

#### REFERENCES

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GLOSSARY OF GLACIER MASS BALANCE AND RELATED TERMS. Prepared by the WORKING GROUP ON MASS-BALANCE TERMINOLOGY AND METHODS OF THE INTERNATIONAL ASSOCIATION OF CRYOSPHERIC SCIENCES (IASC). Paris: UNESCO, 2011. IHP-V11 Technical Documents in Hydrology No. 86, IACS Contribution No. 2. Available online at <http://unesdoc.unesco.org/images/0019/001925/192525E.pdf>. 114 p., colour and b&w illus., appendices, bib., index. Softbound.

People have been interested in glaciers and their behavior for centuries. They have been measuring and observing changes in glacier mass for not much more than a hundred years.

Glacier mass balance, the focus of this glossary, is a measure of the change of mass of a glacier. It is measured and calculated from a strange collection of measurements and observations of mass inputs and outputs on the glacier,

over a period of time. The collection is strange because it includes apparently primitive measurements of melt and accumulation against stakes set in the glacier, thoughtful study and measurement in snow pits, careful and sophisticated interpretation of those measurements, and even more careful calculations based on them. The nature of the measurements and interpretation of them varies considerably from glacier to glacier and between climatic situations.

While properties such as glacier shape are nowadays monitored for thousands of glaciers, mass balance is regularly measured on less than 200 glaciers worldwide. This is a remarkable fact in this era of acute consciousness of climate change since changes in mass balance are a glacier's key response to changes of climate.

This publication of the International Association of Cryospheric Sciences (IACS) is the first attempt at redefining glacier mass balance terminology since the International Hydrological Decade (IHD) of the 1960s and 1970s. The years since the IHD have been ones of staggering change in glacier science and remote sensing of the earth's surface. Despite revisions of terminology and definitions over the years, it required great courage to undertake the comprehensive revision and update of a standard work on glacier mass balance that has stood up well since 1969.

The new glossary goes beyond measurement (there are standard works on glacier measurement) to include mass-balance terminology, formulations of mass balance, reporting of mass-balance data, and other topics, all relevant to modern mass-balance work. The book consists of a short, highly readable introduction dealing with these matters, followed by almost a hundred pages of equally readable (believe it or not) definitions. This is not a manual or a recipe for glacier mass-balance work; rather, it provides a modern frame of reference for people engaged in glacier mass balance research.

Many of the terms defined are what you would expect, for example "annual" (from a glacier's point of view), "ablation," "accumulation," "slush," "surge," and the like. These all deserve precise definition. But they also require careful thought within the context of the mass balance of a particular glacier. For example, I normally think of ablation as the equivalent in water of the melt of ice that I observe from stake measurements at the lower end of the glacier. In this glossary, the general definition of "ablation" is: "All processes that reduce the mass of the glacier" (p. 21). This makes anyone setting out on a glacier measuring program think. So does the more comprehensive definition of ablation (p. 21):

The main processes of ablation are *melting* and *calving* (or, when the glacier nourishes an *ice shelf*, *ice discharge* across the *grounding line*). On some glaciers *sublimation*, loss of *windborne snow* and *avalanching* are significant processes of ablation.

"Ablation", unqualified, is sometimes used as if it were a synonym of *surface ablation*, although *internal*

*ablation*, *basal ablation*, and *frontal ablation*, especially *calving*, can all be significant in some contexts.

The terms in italics are defined in the glossary.

Another example. Having drilled holes for thousands of them, I thought I had a good idea of what a stake is. The glossary devotes a page of text and a good diagram to the term "stake" in the mass balance context (p. 86). The pole that you drill into a glacier is a simple enough tool, but its use for measuring changes at the glacier surface requires careful thought about what changes at the glacier surface, in that particular situation, actually mean.

This sort of thing is not nit-picking. In a pleasant, readable way, it forces field and desk researchers to think carefully about their part of the glacier mass balance puzzle. This glossary goes beyond good definitions to the intellectual context of the term concerned.

I confess that I have never before read a glossary from cover to cover. I suspect that others with an interest in glaciers might find themselves reading, as well as consulting, this one.

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ACTS OF OCCUPATION: CANADA AND ARCTIC SOVEREIGNTY, 1918–25. By JANICE CAVELL and JEFF NOAKES. Vancouver, British Columbia: UBC Press. ISBN 978-0-7748-1868-1. xii + 333 p., maps, b&w illus., notes, bib., index. Hardbound, Cdn\$90.00; Softbound, Cdn\$34.95.

In *Acts of Occupation*, Janice Cavell and Jeff Noakes explore one of the most formative periods in the history of Canada's Arctic policy. In the first decades of the 20th century, explorers and government officials alike dreamed of discovering unknown islands in the Arctic Archipelago above North America—or even an entire continent somewhere near the North Pole. This wave of exploration and the attention to the Canadian Arctic Archipelago it sparked in countries like the United States and Denmark inspired grave sovereignty concerns in Ottawa. Between 1918 and 1925, the authors argue, the government finally took a sustained interest in the Arctic and developed a coherent policy with which to secure Canada's sovereignty over the region.

The catalyst for increased government activity in the Arctic was the Fifth Thule Expedition (1921–24) of Danish explorer Knud Rasmussen. In one of their most important contributions, Cavell and Noakes maintain that Rasmussen and the Danes actually posed no threat to Canadian sovereignty in the Arctic. Never did Rasmussen, or his supporters, deny Canadian sovereignty (even over Ellesmere