

ARCTIC CRASHES: PEOPLE AND ANIMALS IN THE CHANGING NORTH. Edited by IGOR KRUPNIK and ARON L. CROWELL. Washington, D.C.: Smithsonian Institution Scholarly Press, 2020. ISBN 978-1-944466-34-3. 555 p., maps, b&w and colour illus., bib., index. Hardbound Cdn\$47.00.

Arctic Crashes compiles the main outcomes of an international study led by the Smithsonian Institution during 2014–16 focused on the rapid collapses of Arctic animal populations or their distributional ranges due to human impacts or natural cycles of climate and abundance.

Igor Krupnik and Aron Crowell have assembled a fascinating collection of 25 invited chapters written by 35 contributors and organized into four principal sections: archaeological models; cultural synergies; biological interpretations; and the commercial hunting era. Species covered include seals, walrus, beluga, narwhal, bowhead whale, polar bear, caribou, and cod. All contributors to *Arctic Crashes* were challenged to address two questions: first, what role have humans played in causing population crashes and range shifts, and second, are contemporary changes unprecedented? *Arctic Crashes* brings together scholars with expertise in different disciplines, including biology, wildlife management, archaeology, anthropology, and Indigenous knowledge, to share their perspectives and to reflect on ways that their separate local or species-focused studies might contribute new insights.

For all species discussed in this volume, the background of environmental change and human harvest provides the context for interpreting changing wildlife numbers and distributions across time and space. For example, Max Friesen (Chapter 4) reconstructed caribou presence over the past millennia from the Iqaluktuuq region on southeastern Victoria Island using faunal specimens from semi-subterranean Thule houses and earlier sites. This evidence suggests that, on Victoria Island, caribou herds appear to have been relatively immune to extremes of population variability in the past, and that the recent crash of the Dolphin and Union caribou herd might be caused by natural events such as extreme weather, climate warming, disease, and predation, factors that are the focus of contemporary studies. However, Friesen could not exclude other historical factors to explain changes in caribou numbers, including the introduction of firearms or the establishment of regional centers such as Cambridge Bay. A very different but highly complementary approach is described by Karen Mager (Chapter 17) where she uses genetics to examine the interplay between caribou herd declines and recovery, their behaviour, and space use in Alaska. The application of different methodologies across disciplines is one of the strengths of *Arctic Crashes*.

One recurrent theme throughout the volume is the interplay between Indigenous knowledge and scientific research. The establishment of land claims and co-management boards across the North has increased local self-determination, and is consistent with the principles

of the United Nations Declaration on the Rights of Indigenous Peoples, but there is still a need to recognize that Indigenous knowledge about Arctic species is a deep and intergenerational form of science and needs to be included at all levels of decision making. For example, the volume presents evidence that Indigenous Peoples do not fully share the concern that the advent of the Anthropocene and human-induced global warming will lead to the imminent extinction of many Arctic species. Chapter 12 (Martin Nweeia et al.) is particularly illuminating in this respect. Inuit hunters and scientific researchers disagree about the status and size of narwhal populations in Baffin Bay, and this chapter outlines how partners with differing frames of knowledge can work together to achieve insight and understanding that equally respects different ways of knowing. In this case, knowledge from expert hunters on Baffin Island and Greenland was essential in determining that narwhal populations were generally stable and sustainable.

Several chapters also provide evidence of the dramatic impacts of commercial harvesting. I was familiar with some of these stories, but I had not previously read about the extirpation of Atlantic walrus in the Gulf of St. Lawrence (Moirra McCaffrey, Chapter 22). Indigenous people hunted walrus there over millennia, but by the late 1500's Basque, French, English, and later American hunters were killing large numbers of animals for ivory, hides, and walrus oil. The walrus were all gone by 1800, and while climate and other ecological factors may have had an influence, overharvesting caused an irreversible population crash.

One consistent theme throughout the examples presented in *Arctic Crashes* is that most change in wildlife populations is local, and consequently Indigenous experts are reluctant to extrapolate their knowledge to other areas or make long-term predictions about animal abundance. Climate, sea ice, animal health, and population changes vary widely, as do people's perceptions of them. Indeed, we all should probably be cautious about extrapolating conclusions from one study and one place to another. Nevertheless, there is no question that current rates of Arctic climate change will challenge our understanding of what is "normal" and redefine the limits of resilience for people, societies, and animals in the Arctic.

The writing in *Arctic Crashes* is evenly edited, accessible, and engaging. Each chapter is illustrated with typically half a dozen high quality colour photographs, charts, or maps, which complement the text nicely, and there are 95 pages of references and a sufficient index to cross-reference material across chapters. Each chapter can be read individually or from cover to cover, and while intended for Arctic scholars and wildlife experts, many readers with no prior connection to this topic will not be frustrated by the terminology. This book would also be very suitable as a course text to compliment studies of Arctic wildlife co-management, ecology, environmental history, and the impacts of climate change.

As a student of Arctic terrestrial ecology in the 1980's, my bookshelf was occupied by volumes that described mostly

southern and settler perspectives (for example, Harper, 1955; Barr, 1991). It was only much later that I read and began to incorporate perspectives from Indigenous observations and knowledge (e.g. Oskal et al., 2009; Burch, 2012) into my understanding of species dynamics. *Arctic Crashes* is the book I wish had been available 40 years ago, and I highly recommend it to everyone interested in the ecology and management of Arctic wildlife, past, present and future, through an inclusive lens of human-animal relations.

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MOUNT LOGAN & THE ICEFIELDS: YUKON FLYING ADVENTURES. By ANDREW WILLIAMS. Whitehorse, Yukon: MacBride Museum. 2021. ISBN 9780986764943. 142 p., maps, b&w and colour illus., notes. Softbound. Cdn\$45.00.

The aviation history of the high icefields, situated along the Yukon border with Alaska and including Mt. Logan, is among the most intriguing and least documented of Canada's national stories. While this unusual and wonderful book does not purport to be a history, it presents a first-hand account by one of its leading figures. The book came together through a public talk by Andy Williams at the MacBride Museum in Whitehorse and the determination of the museum's director, Patricia Cuning, who edited and augmented the text. Williams, as described in Cuning's preface, is "an Ex Royal Marine Commando, an Antarctic surveyor, a research station manager on two continents, and a mountain climber. He is also one of

the most experienced mountain flyers [who] flew Logan and the Icefields for over forty years." The book has an abundance of colour photographs and the gloss of a coffee table book but is more than that: Williams writes well and has good stories to tell. Some of the photos are exceptional, including many by Lance Goodwin, Williams's late son-in-law. Others are grainy and journalistic, taken by amateur photographers with the cameras and films at hand. These images show early aircraft landings on glaciers, profoundly damaged planes, scientists and climbers at work, and views of camp life. The book is a compendium rather than a linear narrative. Individual sections, sprinkled with anecdotes, can be read at random with little confusion and no loss of enjoyment.

A flight into the St. Elias Mountains is never a lighthearted pleasure trip, but one requiring careful planning and steely nerves. The weather can be fierce and there are few good choices for unplanned landings. For decades the impetus for air travel in these mountains has been to support scientific and mountaineering expeditions. Thus, the aviation history is inextricably linked with the scientific and mountaineering histories. In the early years these histories were unified by the towering figures of Bradford Washburn and Walter Wood. Separately, Washburn and Wood did many first ascents in the Icefield Ranges. Washburn went on to found the Boston Museum of Science and Wood led scientific expeditions, culminating in the Icefield Ranges Research Project, sponsored by the Arctic Institute of North America (AINA) and the American Geographical Society.

Aircraft support for scientific work in the icefields began with Project Snow Cornice (1948–51) organized by Walter Wood and backed by AINA. The field site was on a high snowfield of Seward Glacier, near the flanks of Mt. Vancouver, where ski-equipped aircraft could be safely landed—although not always. Few, nowadays, would think of landing a light plane as an experiment but this was certainly the case for glacier pilots. Mainly it was the planes that received the damage, and the pilots needed all their courage and ingenuity to save their aircraft and limp them back to safety.

The High Altitude Physiology Study (HAPS) led by Charles Houston, famous for his early climbs on K2 and his contributions to mountain medicine, was the catalyst for most of the flying adventures described in *Mount Logan and the Icefields*. HAPS ran from 1967–80 and was based at AINA's Kluane Lake Research Station (KLRS) on the Alaska Highway near Silver City, Yukon. The project involved moving volunteer "subjects" to a rudimentary camp at 5250 m (17,500 ft) on a high icefield of Mt Logan and, using laboratory-grade medical equipment, measure the effects of elevation on these subjects. This sounds scientifically challenging but the greater challenge was logistic: how safely to move scientists, subjects, and tons of equipment to an elevation that was far above the reach of helicopters of the day and well above the accepted range for fixed-wing aircraft.