

AVATIMIK KAMATTIARNIQ: ARCTIC ECOLOGY AND ENVIRONMENTAL STEWARDSHIP. By JORDON HOFFMAN with contributing authors NEIL CHRISTOPHER, PASCALE BAILLARGEON, CHRISTINA CLOW, JULIA LANDRY, SARAH YOUNG and LAURA EDLUND. Iqaluit: Nunavut Arctic College Media, 2016. ISBN 978-1-897568-48-4. 263 p., maps, colour illus., glossary, index. Hardbound. Cdn\$74.95.

Jordan Hoffman's text is a gorgeous and, more importantly, user-friendly text about Arctic ecology. The first thing that stood out to me was the title of the book: *Avatimik Kamattiarniq: Arctic Ecology, and Environmental Stewardship*, a book title created with two languages from different cultures. This title is a perfect representation of a text that masterfully couples both Western scientific approaches and Inuit wisdom to describe the science of ecology. The underlying theme throughout this book is developing respect, care, and understanding for the interconnectedness between living and non-living things and allowing this understanding to drive decisions regarding natural resources. The first part of the title, *Avatimik Kamattiarniq*, is an Inuit term for respect and care for the land, animals, and the environment. It is one of eight guiding principles that make up the Inuit *Qaujimaqatunqangit* (IQ)—the knowledge that has been passed down inter-generationally by Inuit (Government of Nunavut, 2013). The second part of the title, *Arctic Ecology and Environmental Stewardship*, is the study of relationships between living and non-living things for the responsible use and protection of the natural environment. Ultimately, each title emphasizes respect and care for the natural world, themes that reoccur in each chapter of the book.

Hoffman begins the book by pointing to the importance of humans within the natural world and our heavy influence on almost every organism currently alive. He emphasizes that humans are permanently intertwined with other elements of the world, all of which depend on each other for survival. The book stresses that in order to protect our environment, we need to understand the complex ecological relationships that exist. Well-timed "Why it matters: case studies" from local and global newspaper articles are used within each chapter to highlight the ways in which humans are impacting the environment. Arctic-focused topics within the case studies include sea ice melt (p. 6), threats to polar bear populations (p. 80), a decline of the caribou population (p. 102), vegetative growth trends in the Arctic (p. 156), and the drying up of Arctic ponds (p. 179). The local nature of these cases gives a personal touch to the topic and identifies value in local perspective and knowledge. While examples of why we should care about the current state of our climate and environment are commonly known (IPCC, 2018), Hoffman's unique approach stirs empathy in its readers. This is accomplished by presenting the view of traditional ecological knowledge [TEK: knowledge passed down from Indigenous cultures about their immediate surroundings (Ford and Martinez,

2000)] to a Western scientific approach. TEK has been used to improve our understanding of the connections and role we play in our environment. The use of TEK has been identified as important in the sustainable management of resources (Striplen and DeWeerd, 2002; Dowsley, 2009; Moller et al., 2009), development of environmental policy (Murray, 2000), and is also recognized as important to include in educational curricula (K-12 and post-secondary) (Kim and Dionne, 2014). As the world's attention is on environmental responsibility with an increasing awareness of the importance of TEK, Hoffman's book offers a timely educational resource. The book will invoke passion in students, while providing tangible methods to understand relationships and roles within the Arctic environment.

This publication is beautifully presented in 243 colorful pages containing many images of an idyllic Arctic setting that engage the imagination of the reader. The book is divided into eight chapters, each of which covers a major theme in ecology: "Ecology: The Study of Relationships in Nature," "Energy Flow and Food Webs," "Interactions among Organisms," "Populations," "Biomes," "Lake Ecology," "Snow Ecology," and "Evolution and Natural Selection." Within these chapters, classic ecological concepts such as predator-prey relationships, r/K selection theory, competition, biomes, and nutrient cycling are described clearly and concisely. When concepts are a bit more complicated, scientific graphics are used; for example, to show major air circulation patterns around the world (p.137). Hoffman avoids using standard ecological examples, preferring to describe ecological concepts using Arctic species and communities. For example, in the description of r- and K-strategists, he discusses polar bears and lemmings instead of the classic elephant and mouse example. These little details keep the student engaged in the happenings of the Arctic environment. Definitions fill the margins and can also be found easily in the glossary at the back. Case studies have a different format than the rest of the text, looking as though they came off the typewriter, which invokes the feeling that you are reading it right from the source. Finally, the lessons and activities at the end of each chapter are clearly presented and ready to use.

Accompanying the traditional chapter review questions were two different sets of activities. As an educator, I was particularly drawn to these activities, which were in a format that students could easily approach. The first set of chapter activities task students to take their new-found knowledge and play with it. They are required to do things such as create a Venn diagram with new vocabulary, interpret different diagrams, categorize different ecological situations, and conduct research on Arctic environments or animals. These are great activities that can be presented in a traditional classroom and give educators an opportunity to have students interact with chapters in a quick and meaningful way. The second set of activities are titled "concluding activities" and are designed to have students become environmental stewards. They are no longer asked to be observers of the information but to use it. Activities

include describing how they feel about certain ecological changes, which is of key importance as it begins the process of developing empathy for those who experience the Arctic environment daily. In order to advocate for an ecosystem like the Arctic, it is important to understand through empathy what the experience looks and feels like for those who live there. Students are then asked to research primary sources, create awareness campaigns, develop a plan to monitor local populations, and organize a conference with local guest speakers. The combination of these tasks encourages students to move beyond the role of the student and into the role of environmental steward.

The book's only shortcoming is that it ends quite abruptly. The last case study on hybrid bears (p. 243) was very interesting, but it was simply drawing on the content from that chapter. It would be nice to have a final chapter or activity that encourages students to take what they have learned and put together their new-found knowledge and passion by designing a learning experience. If not a whole chapter, perhaps the author could make simple suggestions on concluding activities that could incorporate aspects of learning from the whole text.

Overall, the science of ecology in the book is well written, easy to understand, and clearly presented. The images and examples paint a beautiful and sometimes sad picture of the Arctic. However, I believe the true value of this book is within its "Why it matters: case studies" and the concluding activities. These examples set this ecology text apart by moving students to think from different perspectives and determine how they fit into the picture. The activities draw on skills that have been identified as those that students need to acquire to be successful in an ever-changing world (P21, 2019), including communication, critical thinking, creativity, and collaboration. In a world where the environment is rapidly changing, this book is an excellent resource to have students thinking critically while also remaining respectful and empathetic to traditional ways and knowledge.

I would recommend this book to students in introductory ecology courses. Although the focus is the Arctic, the themes and lessons transcend to understanding relationships and interactions in any environment. This book provides a unique lens to the study of ecology, one that is vital to ecological understanding moving forward. The case studies are easy to read but give students many perspectives to consider, and the chapter activities get students doing their own research while encouraging them to get out in the community, learn from experts, and become their own environmental stewards. I would also recommend parts of this book to both middle school and high school science students. Although each chapter may not be relevant to every class, specific chapters and activities could be selected and presented to the students. As an educator, I believe that having students consider multiple perspectives and TEK within the realm of science from a young age will allow them to have more appreciation for the environment and encourage them to become stronger

environmental advocates in the future. This book will be a great tool to help them on this journey.

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