

## **Climate Change in Wildlands: Pioneering Approaches to Science and Management**

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Source: Mountain Research and Development, 38(1) : 90-91

Published By: International Mountain Society

URL: <https://doi.org/10.1659/mrd.mm219>

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## Climate Change in Wildlands: Pioneering Approaches to Science and Management

Edited by Andrew J. Hansen, William B. Monahan, David M. Theobald, and S. Thomas Olliff. Washington, DC: Island Press, 2016. xiv + 391 pp. Hardcover: US\$ 70.00, ISBN 9781610917117. Softcover: US\$ 35.00, ISBN 9781610917124. E-book: US\$ 34.99, ISBN 9781610917131.

I was initially quite puzzled when I received this book. It appeared to be totally irrelevant to a European, since we hardly have any “wildlands,” and the subtitle, “Pioneering Approaches to Science and Management,” appeared self-contradictory, as true wildlands are not managed. So what might this be? My skepticism vanished quickly when I realized that the book is about the management of rural areas and reserves in the face of climate change. As such, I think it is a landmark volume that pulls together many highly useful insights from a long-term project, the “Landscape Climate Change Vulnerability Project” (LCCVP), and 2 of its key case studies, the Great Northern “Landscape Conservation Cooperative” (LCC) and the Appalachian LCC. Readers first have to acquaint themselves with these (and other) relatively cumbersome terms and acronyms that are used throughout the book. One gets used to them.

The book features 17 chapters written by different groups of authors and is structured into 4 major parts. It starts off with a chapter on the rationale behind studying climate change in “wildlands,” providing the background of the LCCVP project and presenting an overview of the 2 case studies as well as the book as a whole.

The first major part of the book consists of 2 chapters. First, it

provides the theoretical framework for climate change adaptation studies, with a very accessible explanation of the adaptation framework as well as the concept of vulnerability according to the Intergovernmental Panel on Climate Change (IPCC). Second, it provides a highly interesting and comprehensive account of the stumbling blocks that need to be overcome when attempting to integrate science into management. This is not a theoretical consideration but clearly derives from (difficult) experiences in the context of the project upon which this book focuses.

The second major part of the book deals with climate and land use changes as important driving forces of ecosystem change. It partly looks back into the deep past (paleo-ecology) but does so to highly different degrees for the 2 case studies. This is a general feature (or problem?) of the book: some chapters are set up as twins to evaluate the 2 case studies; some chapters deal with both case studies in an integrated way; and some chapters refer to them only tangentially. This is at times confusing, but probably it simply reflects the depth of the available material and expertise in the consortium.

The third part presents studies investigating ecological consequences and vulnerabilities, strongly relying on various types of species distribution models. It is the sequence of these 6 chapters—which constitute the bulk of the book—that I found most confusing. The first was clearly distinct, focusing on hydrology and carbon relations. The following 4 chapters, however, appeared to be partly redundant because they treat very similar subjects and are not consistently labeled: the distinction between the focus on “tree species,” “vegetation (communities),” “national parks,” and “biome types” is not fully matched by the contents of the respective chapters. However, all chapters are carefully written and

provide much useful information, including a good consideration of uncertainties. The section concludes with a highly specific case, salmonid fish, looking at both case studies.

Two hundred and fifty-eight pages into the volume, management has been touched upon only lightly. Fortunately, the final 4 chapters deal with the management implications of all the information to which readers have been exposed. The first chapter of this last section provides the theoretical background by very systematically explaining the framework for identifying climate adaptation options, based on a range of concepts from the literature. An important notion arising from the book is that, even in the absence of any formal framework for the identification of adaptation options, true climate adaptation may be achieved—although a clear framework will certainly help to ease the process. The following 3 chapters focus on Rocky Mountain National Park and the Greater Yellowstone Ecosystem in the United States, albeit at different levels of organization. One chapter emphasizes adaptive management in Rocky Mountain National Park as an administrative unit: it presents a unique account of the challenges and hurdles to be overcome at the interface between science and public perception of the land, where adaptive management practices sometimes contradict common sense and need to be carefully explained to the public. Another chapter offers a case study of a single species, whitebark pine, and can be viewed as a model example of how to deal with an emblematic species that has become highly endangered because of several coacting factors—a template to consider when focusing on other species. Last, there is a chapter on the success of management practices in the Greater Yellowstone Ecosystem. These chapters are highly informative and well written, although it is a true pity that the Appalachian LCC is entirely absent.

The volume ends with a synthesis chapter that pulls together major “lessons learned.” It may be a good strategy for readers to start with this chapter and then dig into the other chapters (which are referenced rather consistently in the synthesis chapter), because one wonders exactly how the authors come to certain conclusions.

The language in all chapters is largely scientific, providing a useful amount of references to the literature. As such, the volume is certainly of value to scientists, although I assume it was written mostly with a management audience in mind. The administrative context is largely specific to the United States (and perhaps Canada), but I feel that comparable conglomerates of

agencies are interacting (and need to interact) in the context of the management of other “wildlands” throughout the world. As such, the focus on these 2 case studies should not be detrimental to the generality of the findings.

The book breathes the spirit of the early 2010s and refers to several acts and ordinances that formed the basis of the work. Meanwhile, the winds have changed, as “climate change” is about to go extinct in US government language. Whether the findings of this book can be used as templates to follow (or at least learn from) for the management of other areas in the United States is currently uncertain, but it would be a mistake to shelve them. I greatly enjoyed

reading the book and recommend it to both scientists and natural resource managers within and outside the United States. And the current government in Washington should read it as well—it’s convincing.

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