
Birds and Climate Change: Advances in Ecological Research

Volume 35

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Source: The Condor, 108(1) : 244-245

Published By: American Ornithological Society

URL: [https://doi.org/10.1650/0010-5422\(2006\)108\[0244:BACCAI\]2.0](https://doi.org/10.1650/0010-5422(2006)108[0244:BACCAI]2.0)

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understanding how birds will respond to climate change. Part of the Advances in Ecological Research series, the chapters in this book are largely derived from a 2003 workshop on bird migration in relation to climate change. Reflecting these origins, this book places special emphasis on migratory behavior and ecology in relation to climate, but also covers timing of breeding, microevolution in response to climate change, population and community responses, and conservation. One of the strengths of this book is the breadth of topics covered in a relatively short volume.

Given that its topic is global environmental change, *Birds and Climate Change* has a heavy focus on Europe. This emphasis is reflected in the list of 21 authors, only one of whom comes from an institution outside of Europe. There is merit in this narrow geographic focus. The magnitude and even direction of climate change will differ among regions so it is reasonable to focus on a single region in attempting to assess the impacts of climate change. Nevertheless, the value of such a regional approach could be increased by placing the work in a broader, global context. In particular, the importance of the North Atlantic Oscillation in affecting European climate and its role in these studies is never adequately related to the larger picture of global climate change.

The chapters discussing migration tend to be narrowly focused. Chapters on timing of migration (Lehikoinen et al.) and the energetics of migration (Bairlein and Hüppop) are at their strongest when discussing the specifics of avian ecology, but the reader needs additional information to place these discussions in the broader context of global environmental change. Fiedler et al. present a case study of using banding data from three German banding stations to detect changes in migratory patterns. While this may be the most narrowly focused chapter, Fiedler et al. do provide a good overview of the types of changes that can be detected using these studies and highlight important factors for interpreting such large-scale data.

I found the chapters on breeding dates and performance (by Dunn) and on mistimed avian reproduction (by Visser et al.) to provide good reviews of the literature on the topic and clear discussions of a framework for studying the relationship between climate change and avian reproduction. Both chapters present a concise overview of their respective topics and provide sufficient context to explain the importance of the work.

Chapters on the control of the annual cycle by photoperiod (Coppack and Pulido), microevolutionary responses to climate change (Pulido and Berthold), population dynamics (Saether et al.), and geographic range, communities, and conservation (Böhning-Gaesa and Lemoine) all contain useful overviews of the basic biology supporting their respective topics and frameworks for how birds might respond to climate change. Researchers planning to pursue work in these areas will find these chapters to be helpful, though all are best read along with recent reviews of the literature or the appropriate sections of the Intergovernmental Panel on Climate Change assessments. Likewise, a chapter

Birds and Climate Change: Advances in Ecological Research, Volume 35.—edited by A. Møller, W. Fiedler, and P. Berthold. 2004. Elsevier Academic Press, New York. 272 pp. ISBN 0-12-013935-9. \$149.95 (cloth).

Few challenges in ecology and conservation loom as large as the need to forecast the responses of species, communities, and ecosystems to changing climatic conditions. Such forecasts require us to integrate the physiological, behavioral, ecological, and evolutionary responses of organisms to changes in climate while also considering other aspects of environmental change. The significant scientific challenges involved in attempting to forecast the ecological changes likely to occur as climate changes are set against the backdrop of heated policy debates surrounding the question of how societies should respond to climate change. The policy implications of these questions add urgency to the science, while also attracting additional levels of scrutiny to every aspect of research on climate change biology.

The edited volume *Birds and Climate Change* provides an overview of selected topics critical for

focusing on analysis and interpretation of long-term studies (Møller and Merilä) will be most useful if read in conjunction with recent reviews.

As a whole, the book would have benefited from adopting a consistent set of climate scenarios for discussions of future climate change. The efforts of the Intergovernmental Panel on Climate Change would provide an authoritative, relatively up-to-date basis for a discussion of how birds might respond to future climate change. While some of the chapters do make use of the most recent Intergovernmental Panel on Climate Change assessments in laying out the basis for their discussion, other chapters do not and would have benefited from the broader, global perspective provided by the assessment reports.

This is clearly a technical treatment of the topic of Birds and Climate Change so the general science reader may find it too narrowly focused. Scientists from related fields looking for a concise introduction to climate change biology as it relates to birds will find useful insights in many of these chapters, but the book does not provide the background needed to place these chapters in the broader context of climate change biology. Ornithologists working on topics covered by these chapters will find a useful view of how climate change might intersect with their research topics, especially if read in conjunction with other recent reviews and assessments of ecological impacts of climate change.

The scope of this book is likely to be most useful to individuals already working on climate change effects who are looking for a detailed treatment of the responses of European birds. The detailed examination of select topics and the regional focus will be most beneficial to these readers.

Specialists interested in the applications of climate change research to public policy may find some of the statements in this book jarring. I doubt the authors intend statements to be taken out of context, but all the same I was disturbed by statements such as "Most research on the effects of climate change is based on mere descriptions..." (p. 240) and "The effects of these changes on migratory birds are very speculative..." (p. 33). Individuals interested in the applications of this research may agree with the spirit of objective scientific critique no doubt intended by the authors, while wincing at presentation that sometimes reads like the writings of partisan climate change skeptics.

A more explicit discussion of the role of climate change biology research in environmental policy would greatly improve the usefulness of the science presented here. This is probably best demonstrated in the final chapter that outlines the editors' view of research needs in this area. The editors provide a broad range of questions that will interest academic avian biologists. While many of these research needs are justified from the standpoint of basic research, the topic cries out for a better link between research priorities and the needs of policy makers. Similarly, the approach advocated places an overemphasis on experimentation. While I agree with the limitations of observational studies, the authors seem to ignore the substantial difficulties involved in interpreting small-scale experiments in the context of global change.

This is acknowledged in an earlier chapter where Møller and Merilä concede that "the field is likely to proceed through combination of experimental and observational approaches" (p. 126).

Birds and Climate Change is at its best in helping scientists take advantage of "a unique opportunity to study the adaptation of organisms to their changing environments" (p. 244). Those seeking to understand and perhaps limit the impacts of human-caused environmental change on birds and other organisms can certainly benefit from the insight presented here. However, *Birds and Climate Change* does not function as a stand-alone guide to the topic.—JOHN P. MCCARTY, Department of Biology, University of Nebraska at Omaha, Omaha, NE 68182. E-mail: jmccarty@mail.unomaha.edu