

# Reviews

## CLIMATE CHANGE: THE SCIENCE, IMPACT

and Solutions 2<sup>nd</sup> edition

A. Barrie Pittock  
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In this textbook, written by Dr. Barrie Pittock and published in 2009 (2<sup>nd</sup> edition), one will find a review of climate change science (especially as it relates to recent global warming), its impacts on natural and human systems, and a review of strategies for mitigation against climate change. The author, now retired, is the former head of the Climate Impact Group at Australia's national government body for scientific research, the Commonwealth Scientific and Industrial Research Organisation (CSIRO). His academic training was in physics, and he has been the author of other climate change textbooks as well as a broad range of peer-reviewed journal articles dealing with topics ranging from the effects of solar variability on earth's climate to the influence of climate change on coral reefs. His long and productive career in climate change science and in government has certainly qualified him to write a textbook of such wide scope.

The textbook, a paperback, consists of twelve chapters which are divided into three broad themes. The first theme (chapters 1 – 4) focuses on the science behind climate change. In the first chapter, Dr. Pittock provides a range of evidence for recent climate changes worldwide, such as information on glacier retreat and sea level rise. Chapter 2 (“Learning from the Past”) is a review of past climate changes inferred from the geological record over a variety of timescales. This is a good chapter and he does well in summarizing a huge and complex set of knowledge in a short space. Chapters 3 and 4 focus on future projections and the uncertainties with them—both important topics given the attention these areas receive from the public and media.

The second theme, climate impacts, is discussed in chapters 6 and 7. Here, Dr. Pittock discusses concepts such as climate thresholds—the idea that large-scale impacts can occur once a certain temperature or level of carbon dioxide is exceeded—and the risks faced from extreme climate events such as floods and ENSO. A short section is devoted to adaptation, including its costs, benefits, and implementation.

The third theme of the book (chapters 8 – 12) discusses climate change mitigation and delves into the politics behind these issues. Chapter 8 reviews a range of alternative energy options, such as solar, wind, and nuclear power, and briefly discusses geoengineering possibilities. Chapter 9 places ongoing climate change into a broader context, examining issues such as the relationship between climate and pollution, increasing population, and freshwater availability. Finally, chapters 10 and 11 discuss the political and policy issues associated with climate change,

such as the roles that governments and NGOs should have in helping to enact mitigation efforts. The Kyoto Protocol is also discussed, along with how climate change will affect different regions around the world.

The textbook is well written and contains numerous examples. The level of the book is appropriate for an introductory course (perhaps 2<sup>nd</sup> or 3<sup>rd</sup> year undergraduate) in climate change and will also be of interest to members of the general public who have an interest in the topic. As someone who instructs a 3<sup>rd</sup> year undergraduate course in climate change science, I would probably choose another textbook for my course, as the chapters that focus on the science behind climate change are somewhat basic, but this would be a good text for a course that deals more with climate change from the social science point of view (i.e., impacts on humans, mitigation, and governance). Another positive aspect of the book is that it is very well referenced, with detailed annotations, links to websites, and a wide range of recent scientific articles provided. In fact, this may be the strongest aspect of the book: it serves as an excellent starting point to guide the reader to more detailed material.

Despite the breadth of information available, the textbook is unfortunately poorly illustrated. There are a number of black and white photos, but these have not been reproduced as large as they should be, making it difficult to see important details (e.g., the glacier in Figure 2, page 6; and the ice core in Figure 9, page 30). The tables are well done (although this is not a difficult task), but a number of figures are poorly rendered and are therefore difficult to read (e.g., projected precipitation values in Figure 17, page 83). I assume the book was printed in black and white in order to keep the cost down, although it could be improved by enlarging and sharpening many of the existing figures. In addition, figures, photos, and tables are rare in the last half of the text, especially in the mitigation chapter. A future edition, if one is produced, should add more visual information, even if it means replacing some of the text. Finally, the glossary at the end of the book is useful, although it could probably be expanded.

In summary, this is a good contribution to the existing body of literature, and a few small improvements would turn it into a very good textbook.