

# READINGS

## BOOK REVIEWS

### GLOBAL ENVIRONMENTAL CHANGE AND LAND USE

A. J. Dolman, A. Verhagen, and C. A. Rovers, Eds., 2003, 210 pp., \$55.00, hardbound, Kluwer Academic, ISBN 1-4020-1346-9

This book, completed in early 2002 and published in 2003, focuses on the contributions of the Netherlands National Research Programme on the topic of global environmental change as influenced by land-use change, and places their work in a global context. This group has been a leader in this research area; therefore, this book is an internationally valuable reference source.

The text is segmented into eight chapters that are written by one or more authors. Chapter 1 gives an overview of the topics of land use and global environmental change. Among its important summaries is the large fraction of the Earth's land surface that has been altered by human activities. Concurrent with land surface changes have been human disturbances to the global geochemical cycles, including the well-mixed greenhouse gases ( $\text{CO}_2$ ,  $\text{CH}_4$ ,  $\text{N}_2\text{O}$ ), but also a variety of other chemical species and effects, such as nitrogen deposition.

Chapters 2 and 3 discuss the multidimensional character of land-use change, including micro- and macro-level analyses. The modeling of land-use change is discussed, including economic and other forcings of land-use change. This chapter is particularly valuable for atmospheric scientists, hydrologists, and ecologists who want to learn more about the important role of land-use change on the climate system. Chapter 3 also discusses policies to mitigate climate change through land use. One issue I have with this section is the lack of discussion of how the mitigation process itself can feed back to alter the water and energy budget of the atmosphere, as discussed in chapter 4.

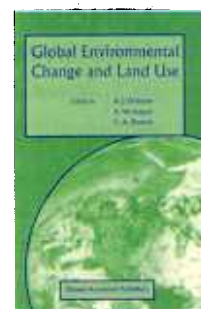
Chapter 4 introduces the very important concept that the Earth's land cover and vegetation interact within the climate system across diverse space and time scales. This topic is very well overviewed in this chapter, including a discussion of land-use change effects in the Amazon and in the Sahel region of Africa. One disagreement I have is their conclusion of

"weak coupling" with biogeochemical and soil chemical processes, which they state is important on "very long time scales: one to several hundreds of years." As shown by Lu et al. (2001), for example, using a coupled atmosphere-ecological modeling system, these feedbacks can occur on monthly and shorter time scales, at least in grasslands.

Chapter 5 focuses on terrestrial carbon sources. Since the researchers who coauthor this chapter are world-recognized leaders on this subject, the text is a very informative current summary of the global carbon budget as influenced by land-surface processes. Chapter 6 extends the discussion of budgets to the hydrologic cycle, including the effect of land-surface changes, such as deforestation and reforestation. One comment is that the authors separate the terms "climate" and "hydrology," when—as they clearly demonstrate in chapter 4—hydrological processes are an integral component of climate.

A study of the role of land in West Africa, with a focus on food security, is provided in chapter 7. Unfortunately, part of the chapter relies too heavily on general circulation model results as predictions (out to 2050), rather than a more comprehensive assessment of vulnerability of West Africa to the entire spectrum of climate risks to food. Nonetheless, if one interprets these results as sensitivity analyses, the chapter provides important insight into the climate risks that face the food supply in this region. The general topic of food security in this chapter is very informative and will help educate the reader on the complexity of this topic.

The final chapter discusses the use of renewable energy sources. This section provides an interesting summary of energy supply on a global scale and for the Netherlands.



I found this book valuable in summarizing the research activities of an internationally respected group of researchers on the influence of the land in Earth system science. Scientists who work on land-atmosphere interactions will find this book a valuable reference source. The book will also complement the new International Geosphere-Biosphere Programme book (Kabat et al. 2004) on the role of land in the climate system, where concepts presented in *Global Environmental Change and Land Use* are expanded on and presented in more detail. Both books should be in the libraries of climate scientists and policy makers.

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## REFERENCES

- Kabat, P., and Coeditors, 2004: *Vegetation, Water, Humans and the Climate: A New Perspective on an Interactive System*. Springer-Verlag, in press.
- Lu, L., R. A. Pielke Sr., G. E. Liston, W. J. Parton, D. Ojima, and M. Hartman, 2001: Implementation of a two-way interactive atmospheric and ecological model and its application to the central United States. *J. Climate*, **14**, 900–919.

## ATMOSPHERIC CHEMISTRY IN A CHANGING WORLD: AN INTEGRATION AND SYNTHESIS OF A DECADE OF TROPOSPHERIC CHEMISTRY RESEARCH

Guy P. Brasseur, Ronald G. Prinn, and Alexander A. P. Pszenny, Eds., 2003, 300 pp., \$119.00, hardbound, Springer-Verlag, ISBN 3-540-43050-4

Being an atmospheric chemist and teaching this subject in the classroom, I am always interested in new books about this topic. Therefore it was with some anticipation that I started reading the book *Atmospheric Chemistry in a Changing World*, as it promised to be “An Integration and Synthesis of a Decade of Tropospheric Chemistry Research,” as stated in the subtitle. The book is written by a large group of authors, and summarizes the recent research

findings in the field of tropospheric chemistry under the umbrella of the international global atmospheric chemistry project (IGAC). It is an excellent resource for any atmospheric scientist and provides a very comprehensive reference list. However, it is not intended for the beginner, as it requires from the reader a certain knowledge of the field. The book is divided into seven chapters in the attempt to cover each aspect of tropospheric chemistry by an appropriate team of