BOOK REVIEW

Haszpra, László (editor), 2011: **Atmospheric Greenhouse Gases: The Hungarian Perspective**. Springer, Dordrecht – Heidelberg – London – New York. 393 pages, with nearly 120 figures and 50 tables (ISBN 978-90-481-9949-5).

Human induced global climate change is one of the biggest challenges humankind faces today. Increasing amount of atmospheric greenhouse gases play a crucial role in the evolution of the climate. Without the understanding of the contributing processes, feedbacks, and interactions we cannot predict the future changes and develop effective mitigation/adaptation strategies. To decrease the uncertainty of the global studies, detailed regional studies are needed surveying the regional characteristics of the atmospheric greenhouse gas budget and the influencing factors. The book covers a coherent subset of the Hungarian climate change oriented research that is directly related to greenhouse gases.

The 16 chapters written by 44 Hungarian and foreign authors are grouped into four parts. The first part of the book covers the atmospheric trends and fluctuations of the major greenhouse gases as observed in Hungary. Here, first, the interested readers can get acquainted with the history and technical background of the Hungarian atmospheric greenhouse gas measurements. The following two chapters present the concentration trends, seasonal and diurnal variations, as well as the characteristic changes observed during the measurement period. For these studies impressive 17–30 years long data series were available.

The second and third parts of the book deal with the exchange of greenhouse gases between the biosphere (including the soil) and the atmosphere. The response of the biosphere is an important feedback in the climate system. In the case of carbon dioxide and methane it can act as both a net source and a net sink depending on climate. Biospheric nitrous oxide emission also depends on climate. In turn, the greenhouse gas budget of the biosphere influences the climate through the control on the atmospheric greenhouse effect.

The first of these two parts covers the measurements, while the other focuses on the mathematical modeling of the processes. Both parts follow the same structure. They start with an introductory chapter presenting the measurement/modeling methods, then they discuss the grasslands, the forests, and the arable lands in separate chapters. The part on modeling finishes with a summary chapter giving the overall biospheric greenhouse gas budget of Hungary.

Atmospheric greenhouse gases cannot be discussed without mentioning the anthropogenic contribution. The three chapters of the last part of the book present the effect of the anthropogenic perturbation of the biosphere, the contribution of the different industrial processes (energy production, waste management, etc.) giving also a methodological introduction to the emission estimations. The authors also review the trends in the Hungarian greenhouse gas emissions.

This book of 393 pages calls the attention to the regional properties, which may modulate the European scale or global picture on the variation of atmospheric greenhouse gases. Although, the book is intended primarily for scientists studying the atmospheric and biospheric greenhouse gas budgets, most of the topics are general enough also for students studying geosciences, ecology, or environmental sciences to get an overview on a part of atmospheric greenhouse gas budget research.

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