



METADATA

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Abstract

This book is an attempt to create a digital textbook in the Greek language, introducing undergraduate and postgraduate students to the science of Climate Change. It was developed within the framework of the "Kallipos+" initiative, titled "Greek Academic Electronic Textbooks and Supplements," with the aim of introducing electronic, interactive, multimedia textbooks into Higher Education. Therefore, it is targeted towards students in Geography or in Earth and Environmental Sciences Departments. Its goal is to comprehend all the natural and dynamic processes related to the contemporary issue of global warming and climate change. However, it can also serve as a guide for anyone involved in climate change and its impacts on the biosphere. The topics of the textbook were selected with the aim of providing comprehensive coverage of the subject of global warming in an educationally coherent manner for students and reader-friendly for the general audience. The textbook consists of three thematic topics, including: (a) an introduction to the basic concepts of climate change (physical climatology, climatic phenomena, and climate variability), (b) the physicochemical processes of the climate system (radiation balance,

carbon cycle, aerosols, and the greenhouse effect phenomenon), and (c) climate projections with open issues and uncertainties. The material of the eight chapters is structured to correspond to 13 teaching weeks of undergraduate and postgraduate courses. Some chapters may require more lectures for their completion. A significant part includes applications and exercises, both theoretically and in the laboratory, accompanied by various climate metadata. The new textbook includes, for the first time, an appendix of instructions for using the free software IDV (<https://www.unidata.ucar.edu/software/idv/>), for its application in visualizing and analyzing climate data and applications. The content of the appendix is expected to support students' technical skills in managing climate data. More than 75 questions and exercises are included at the end of the chapters to help the students to understand the meaning and the application of basic physical principles. The answers and the solutions of most of them are incorporated into the text. The entire material of this book can be covered in one or in multiple semesters depending on the character of the undergraduate/postgraduate course and the option of the instructor.

