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Atlas of Antarctica: Topographic Maps from Geostatistical Analysis of Satellite Radar Altimetry Data

2004. XVI, Springer-Verlag, 364 pp., 169 illus., folded map and CD-ROM; Hardcover USD 159.00; EUR 149.95 (without sales tax); ISBN 3-540-43457-7

Despite the progress made in the last two decades, Antarctica still captures the imagination of scientists and the public, and is still perceived as being a very remote and unexplored continent. In fact, parts of the Antarctic coastline have been mapped in great detail in the nineteenth century, and overland traverses and inland research stations established over the last 50 years have provided a great deal of information on the topography of the interior parts of the continent. Although the book is not an ''atlas'' of Antarctica in a conventional sense, it provides accurate data and information on the altimetry of Antarctica, and some examples of how this data can be used to monitor temporal changes in Antarctic ice surface topography.

The first of four sections, Motivations and Methods, is organized in three different parts: A) The Antarctic Ice Sheet and its Role in the Global System; B) Satellite Remote Sensing; and C) Data Analysis Methods Applied in the Antarctic Atlas. Part A provides a very brief overview of the main geographic and glaciologic provinces of Antarctica, an introduction to the role that the Antarctic ice sheet plays in the global climatic system, and an explanation of the modeling approach used in the book. Part B opens with an ''Overview of Ice Sheet Observations by Satellite'' and a list of ''Satellite Missions with Radar Altimetry Observations'' focuses on a summary of the radar measurements principles, useful for those readers who are not familiar with satellite data altimetry. Part C deals with the specific principles and methods of data correction and processing applied in this atlas, and illustrates the main features of a computer program, TRANSVIEW, developed by the author specifically to resolve distortion problems encountered by the conventional UTM projection. Overall, it provides an exhaustive introduction to the book and summary of the methods applied to derive the atlas maps.

The second section (Part D: Atlas Maps) is a list of 1:5,000,000 maps covering the whole Antarctic continent. Each map is accompanied by a brief, but useful and comprehensive description of its main geographic features, and some notes on exploration history. Despite the comprehensive coverage, many of the maps are difficult to read, as locality names and contour interval values are often crammed together into relatively small figures, and model artifacts often produce non-existing linear features along the coastlines. The scale of the maps makes it impossible to distinguish any details of the coastlines, and researchers who are not specifically interested in cartography are left wondering about the use of these maps when compared to the more detailed topographic maps already available for the continent. It would have been useful to show some of the existing maps next to these new maps, and point out any differences. It would also have been useful to mark on the maps the location of research stations and of the main ice traverses, and include in the reference the long list of available topographic maps.

The third section (Applications) illustrates an example of how the geostatistical approach and data presented in the atlas can be used to monitor changes in the mass and shape of prominent features such as the Lambert Glacier (Part E: Monitoring Changes in Antarctic Ice Surface Topography). Changes in the position of the Lambert Glacier grounding line over the period from 1978 to 1989 are derived from visual comparison of maps produced from digital terrain models. As for the pervious section, a set of 1:3,000,000 maps is reported and evaluated, elevation changes are calculated and discussed, and results are compared with other existing maps of the area. The possibility that the Lambert Glacier be a ''surge-type'' glacier is also evaluated. Detailed maps of selected Antarctic glaciers are presented in part F (Detailed Studies of Selected Antarctic Outlet Glaciers and Ice Shelves), and additional maps of the Lambert Glacier/Amery Ice Shelf, obtained using SAR and Radar Altimetry Data, are discussed in Part G.

The fourth section of the book (Part H) consists of a list of references and several appendices that include a useful glossary of glaciological terms, a short index of place names, and a very short list of selected Antarctic expeditions.

The enclosed CD-ROM contains all the atlas maps and elevation data, in a format that can be opened using any computer platform and text editing and plotting software. Unlike in the printed version, the resolution and quality of the maps are excellent.

There are certainly convincing cartographic and glaciological reasons that justify the need for this ''atlas'', and the discussion of how the data and models presented here can contribute to the debate on global change is intriguing. Those seeking detailed information on the topography and bathymetry of coastal areas, geographic and geological features, and Antarctic place names, will find very little in this volume.

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Morgan, R.P.C.:

Soil Erosion and Conservation, 3rd edition

2005. Blackwell Science, 304 pp.; USD 64.95, GBP 29.95; ISBN 1-4051-1781-8

A textbook in its third edition (first published in 1986) should be so well known that further reviews may be unnecessary. Nevertheless, we present this work to our readers. Morgan's book is probably *the primer* on this topic and its rather dynamic development. The increasing awareness for the importance of the topic certainly justifies an updated and revised edition.

The book is organized in twelve chapters, followed by an impressive list of references (34 pages), acknowledgements, and a 6-page index. Every chapter yields a didactical box, highlighting a particularly important aspect of that chapter. The first chapter describes the global context of soil erosion and sets the stage for the increasing relevance of the topic. Chapter 2 introduces the processes and mechanics of soil erosion, and the third chapter the factors influencing erosion, e.g., rainfall, erodibility, slope characteristics, and plant cover. Chapter 4 discusses erosion hazard assessment, followed by the measurement of soil erosion in chapter 5. The sixth chapter is dedicated to modelling soil erosion, its ''box'' to the uncertainty in model predictions. Chapter 7 presents strategies for erosion control and chapter 8: related crop and vegetation management. The ninth chapter discusses soil management, here mostly related to tillage methods. The tenth chapter demonstrates mechanical methods of erosion control (landscaping, terracing etc.). After those more physical ''problems'', the chapter 11 talks about the implementation of soil erosion prevention, and therefore, about the socio-economic context and legislative necessities that support or hinder erosion protection. The concluding chapter 12, entitled ''The Way Ahead'' continues that discussion and strongly argues for major improvements in global soil protection – suggesting a matrix for logical framework analysis.

The book is clearly organized and well-written. Figures and tables are helpful, clear and can be used for class-room purposes without much need for modification. The material helps both students and practitioners to learn and enhance their knowledge on erosion control and soil conservation practice. Although there is emphasis on older works and a noticeable weakness in a more comprehensive inclusion and evaluation of the more recent publications and developments, this is a fine book that can only be recommended further.

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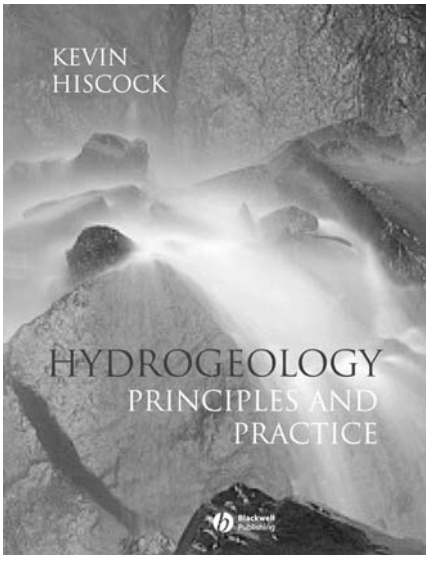
Hiscock, K.:

Hydrogeology: Principles and Practice

2005, Blackwell Publishing, 216 figs., 80 tables, 389 pp.; Paperback USD 74.95, GBP 34,95; ISBN 0-632-05763-7

Kevin Hiscock is a senior lecturer in the School of Environmental Sciences at the University of East Anglia. He has over 20 years' experience in teaching and research in hydrogeology, with interdisciplinary interests in hydrochemistry, environmental isotopes and groundwater resources management. In this book he gives a comprehensive introduction to the study of hydrogeology and the significance of groundwater in the terrestrial aquatic environment.



The first three chapters (117 pages) introduce and explain the fundamental physical and chemical principles of hydrogeology. A significant feature of the book is chapter 4 (18 pages) on the application of environmental isotopes and noble gases in the interpretation of aquifer evolution. Isotope techniques are becoming more and more important in hydrogeologic practice. Chapter 5 explores groundwater investigation techniques (56 pages). The two following chapters are dedicated to groundwater quality and contaminant hydrogeology (chapter 6, 51 pages) and groundwater pollution remediation and protection (chapter 7, 27 pages). The final chapter 8 shows the need for groundwater resources and environmental management (39 pages). The following 10 appendices provide the reader with additional information such as conversion factors, the geological timetable, drinking water quality standards, and last but not least, review questions and exercises.

Each chapter concludes with suggestions for ''further reading'', irrespective of the long list of references and sources.

The Author's *didactical boxes* are engrossing—giving practical exam-

ples and illustrating international case studies dealing with the aqueducts of ancient Rome, land subsidence in California, microbial mediated denitrification, dye tracer test in limestone aquifers, saltwater intrusion in Spain, arsenic pollution in southern Bangladesh, riverbank filtration on the River Rhine, and, and, and... Altogether there are 49 of these interesting *boxes*, which keep the reader highly absorbed and deepen the understanding of the various topics that Hiscock has explained theoretically beforehand.

Kevin Hiscock received two awards: in 1996 the Young Authors' Award of the *Quarterly Journal of Engineering Geology* and in 2000 an award for "excellence in contributions to applied and economic aspects of the science" by the Geological Society of London. Hiscock talents are reflected in this highly engaging and understandable book that gives support to all those having to deal with practical problems facing the hydrogeologist.

Hydrogeology: Principles and Practice is essential reading for those studying earth and environmental sciences. It is also recommended to hydrogeologists in private enterprises and within public administration.

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