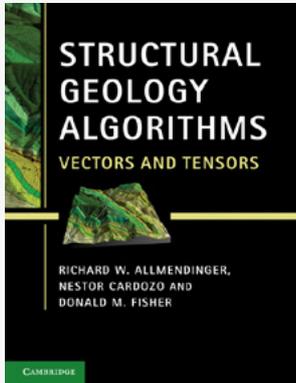




## Structural Geology Algorithms: Vectors and Tensors



By Richard W. Allmendinger,  
Nestor Cardozo, and Donald  
M. Fisher

CAMBRIDGE UNIVERSITY  
PRESS

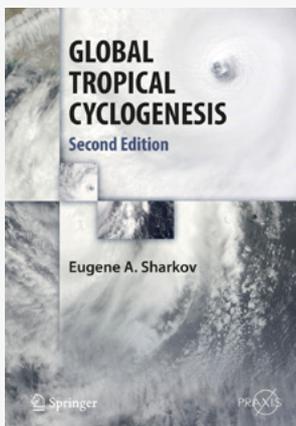
302 pages | Paperback  
1<sup>st</sup> edition | December 2011  
ISBN 978-1-10-740138-9

Price: £30.00 (~€37.00)

### Publisher's summary

State-of-the-art analysis of geological structures has become increasingly quantitative but traditionally, graphical methods are used in teaching. This innovative lab book provides a unified methodology for problem-solving in structural geology using linear algebra and computation. Assuming only limited mathematical training, the book begins with classic orientation problems and progresses to more fundamental topics of stress, strain and error propagation. It introduces linear algebra methods as the foundation for understanding vectors and tensors, and demonstrates the application of geometry and kinematics in geoscience without requiring students to take a supplementary mathematics course. All algorithms are illustrated with a suite of online MATLAB functions, allowing users to modify the code to solve their own structural problems. Containing 20 worked examples and over 60 exercises, this is the ideal lab book for advanced undergraduates or beginning graduate students. It will also provide professional structural geologists with a valuable reference and refresher for calculations.

## Global Tropical Cyclogenesis



By Eugene A. Sharkov

SPRINGER

604 pages | Hardcover  
2<sup>nd</sup> edition | December 2011  
ISBN 978-3-642-13295-7

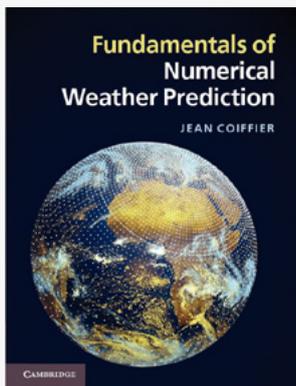
Price: €139.05

interactions between solar activity and global tropical cyclogenesis. These are all explained, together with the new scientific knowledge gained from the study of spatial-temporal properties of the global tropical cyclogenesis which affects satellite oceanography, atmosphere physics, ocean engineering, air-sea interaction and ocean remote sensing. Professor Sharkov gives findings from the Russian scientific airplane-based remote sensing expeditions to the Far East over the Pacific and the several scientific marine expeditions to the tropics as part of major research projects of the Russian Academy of Sciences. A principal feature of the book is the integrated description of spatial-temporal and structure properties of atmosphere catastrophes. Emphasis is placed on the physical aspects of breaking processes necessary to judge the possibilities and limitations of remote sensing methods in monitoring and mitigating natural hazards. The author includes numerous practice applications and illustrations taken from air-borne, ship-borne and laboratory up-to-date experiments. New chapters cover the possible impact of solar activity and effects of tropical cyclones on the upper atmosphere, time series and cumulative functions of global tropical cyclogenesis over 25 years, ionosphere and tropical cyclones activity, instability genesis in compress and saturated moist air atmosphere and complex satellite and in-situ 'Scenario-TC' and 'Global-RT' databases. A new Appendix gives quantitative data on spatio-temporal features of global and regional tropical cyclogenesis from 1983 to 2008.

### Publisher's summary

This book presents the first physical findings of an investigation into the spatio-temporal characteristics of the global tropical cyclogenesis. Since Global Tropical Cyclogenesis was first published in 2001, many important scientific results have been obtained using methods and techniques developed by the author, including: the detection of the global tropical cyclogenesis as a main element of poleward heat transport in the terrestrial atmosphere; the evolution tropical activity in equatorial precipitable water fields; and scales of

# Fundamentals of Numerical Weather Prediction



By Jean Coiffier

CAMBRIDGE UNIVERSITY PRESS

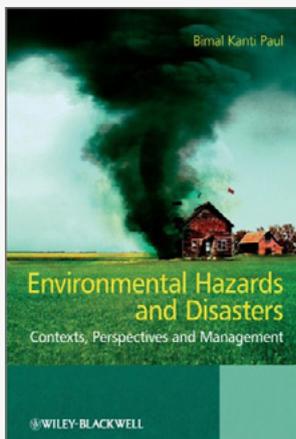
368 pages | Hardback  
1<sup>st</sup> edition | December 2011  
ISBN 978-1-10-700103-9

Price: £45.00 (~€55.00)

## Publisher's summary

Numerical models have become essential tools in environmental science, particularly in weather forecasting and climate prediction. This book provides a comprehensive overview of the techniques used in these fields, with emphasis on the design of the most recent numerical models of the atmosphere. It presents a short history of numerical weather prediction and its evolution, before describing the various model equations and how to solve them numerically. It outlines the main elements of a meteorological forecast suite, and the theory is illustrated throughout with practical examples of operational models and parameterisations of physical processes. This book is founded on the author's many years of experience, as a scientist at Météo-France and teaching university-level courses. It is a practical and accessible textbook for graduate courses and a handy resource for researchers and professionals in atmospheric physics, meteorology and climatology, as well as the related disciplines of fluid dynamics, hydrology and oceanography.

# Environmental Hazards and Disasters: Contexts, Perspectives and Management



By Bimal K. Paul

WILEY-BLACKWELL

334 pages | Softcover  
1<sup>st</sup> edition | November 2011  
ISBN 0-470-66001-5

Price: €48.90

In addition to scientific explanations of disastrous occurrences, people and governments of hazard-prone countries often have their own interpretations for why natural disasters occur. In such interpretations they often either blame others, in order to conceal their inability to protect themselves, or they blame themselves, attributing the events to either real or imagined misdeeds. The book contains a chapter devoted to the neglected topic of such reactions and explanations. Includes chapters on key topics such as the application of GIS in hazard studies; resiliency; disasters and poverty; climate change and sustainability and development.

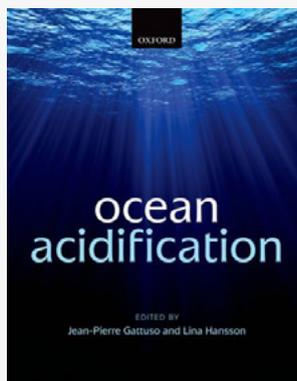
This book is designed as a primary text for an interdisciplinary course on hazards for upper-level undergraduate and Graduate students. Although not targeted for an introductory hazards course, students in such a course may find it very useful as well. Additionally, emergency managers, planners, and both public and private organisations involved in disaster response, and mitigation could benefit from this book along with hazard researchers. It not only includes traditional and popular hazard topics (e.g., disaster cycles, disaster relief, and risk and vulnerability), it also includes neglected topics, such as the positive impacts of disasters, disaster myths and different accounts of disasters, and disasters and gender. The book is for advanced undergraduates or beginning graduate students. It will also provide professional structural geologists with a valuable reference and refresher for calculations.

## Publisher's summary

Environmental Hazards and Disasters: Contexts, Perspectives and Management focuses on manifested threats to humans and their welfare as a result of natural disasters. The book uses an integrative approach to address sociocultural, political and physical components of the disaster process. Human and social vulnerability as well as risk to environmental hazards are explored within the comprehensive context of diverse natural hazards and disasters.

# Ocean Acidification

A review of the new book edited by Gattuso and Hansson



Edited by Jean-Pierre Gattuso and Lina Hansson

OXFORD UNIVERSITY PRESS

352 pages | Paperback  
1<sup>st</sup> edition | September 2011  
ISBN 978-0-19-959109-1

Price: £37.50 (~€46.00)

Ocean acidification refers to the decrease in the pH of the ocean, caused primarily by the uptake of atmospheric CO<sub>2</sub>. As industrialisation continues to increase CO<sub>2</sub> concentrations, the surface ocean is responding by taking up more of the gas. The ability to store significant quantities of anthropogenic CO<sub>2</sub> helps to slow the rate and extent of climate-change impacts, but with other consequences, especially for the ocean. CO<sub>2</sub> reacts with water and results in several chemical changes which lead to a reduction in surface-ocean pH and carbonate ion concentrations. This reaction between CO<sub>2</sub> and seawater is raising concerns for the biological, ecological, and biogeochemical health of the world's oceans. For example, increasing amounts of CO<sub>2</sub> within seawater can make life more difficult for marine organisms that live in shells made of calcium carbonate (CaCO<sub>3</sub>), such as clams, oysters and mussels, and for coral reefs, which are built of CaCO<sub>3</sub>. Therefore, ocean acidification has implications for a large number of scientific and socioeconomic subdisciplines. Since the rate of increase of atmospheric CO<sub>2</sub> emission is likely to be on the rise, it is important to improve the understanding of the impacts of ocean acidification, with the aim of educating the public and evaluating possible actions for reducing these impacts.

Research addressing the effects of elevated CO<sub>2</sub> on marine organisms and ecosystems has only recently emerged as a key research priority for marine science, and has begun to gain prominence in political agendas. With a considerable increase in the number of papers on ocean acidification over the last decade, it is an appropriate time to publish the first authoritative book on this interdisciplinary subject. Ocean Acidification provides a synthesis of knowledge on the topic, including research within the European Project on Ocean Acidification (EPOCA). The contributors provide an appraisal of recent understanding of the chemical, biological, biogeochemical, and societal implications of ocean acidification, with a focus on its impact on marine organisms and ecosystems. Also evaluated are the uncertainties, hazards, and thresholds related to ocean acidification at molecular, cellular, organismal, local, and global scales. The text identifies current gaps in the literature, and provides recommendations for future research and international coordination. The main focus of the book is on the component of pH reduction caused by human activity.

The text is edited by two EPOCA contributors: Jean-Pierre Gattuso, research professor at the Laboratoire d'Océanographie de

Villefranche, and Lina Hansson, project manager of EPOCA. They succeed in producing a synthesis of current understanding of ocean acidification by bringing together contributions from an esteemed list of authors, including coordinators of key national and international projects on ocean acidification.

This text touches upon all areas related to the history and recent research on ocean acidification and its consequences, and identifies the most pressing questions. It is structured in four parts: chemistry (chapters 2 and 3), biology and ecology (chapters 4-10), biogeochemistry (chapters 11 and 12), and social consequences of ocean acidification (chapters 13 and 14). Books comprised of a collection of research articles can often be disjointed and fail to provide sufficient background material. Here, however, the editors have avoided this by providing an introduction that describes the topic in a broad context, provides a history of ocean acidification research, and outlines potential social and political implications. Ocean Acidification ends with a summary chapter (chapter 15) which reviews key information provided by the preceding chapters, identifies what is known and unknown about the subject, identifies the ecosystems most at risk, and discusses prospects and recommendations for future research. The well-written chapters are coherently arranged, but can also be read largely independently of the rest of the book.

It is clear from the text that there is substantial evidence that seawater chemistry is changing due to rising atmospheric CO<sub>2</sub> concentrations, and that human activities are the root cause. A challenge in spreading the word about the possible impacts of ocean acidification is that the science can appear complex and confusing. This book helps to partly resolve this problem by providing information and answers to several of the common questions that are now being asked about ocean acidification. The content of the text is appropriate for graduate level students and professional researchers in oceanography and marine biology. It also contains information useful to those in the general marine science community who are interested in the significant impacts of ocean acidification, particularly those who work with the ecosystems which are identified as being most susceptible to ocean acidification: polar seas, the deep sea, and coral reefs. It is the unwritten rule of a book reviewer to complain about something and so I mention that, as someone with limited knowledge of chemistry, I did find some of the chemistry components hard to follow, and would recommend that a good understanding of chemistry is required to fully benefit from reading this book, especially the first few chapters.

It is difficult to predict what the future of the oceans in high CO<sub>2</sub> conditions will be, and there is a lot of research still to be done on the topic. Overall, Ocean Acidification provides an excellent summary of the current key knowledge of ocean acidification and will prove to be a very good reference for current researchers of the subject, and a must for those in the science community who have a keen interest in finding out more about this fascinating and important subject.

*Clare Green, postdoctoral researcher in climate modelling and oceanography at the School of Ocean Sciences, Bangor University*