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CITATION

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Our Changing Planet: The View from Space

Edited by Michael D. King, Claire L. Parkinson, Kim C. Partington, and Robin G. Williams, Cambridge University Press, 2007, 390 pages, ISBN 978-0-521-82870-3, Hardcover, $45 US

REVIEWED BY TOM GARRISON

In his lengthy foreword, astronaut Piers Sellers sets the tone for this beautiful book: "…there are dozens of beautiful coffee table books out there full of Earth images. I should know; I have a stack of them at home… But this book is more than just a succession of attractive images; it penetrates deeply into the science of what is being observed; not just the what, but also the how, the why, the where and when." Exactly! Here is a superb summary of the present state of Earth systems science by some of the planet's most effective practitioners of remote sensing and analysis.

Interestingly, a superficially similar book (*The Home Planet*, edited by Kevin Kelley and published in 1988 by Addison-Wesley) also contains a preface written by an astronaut of a previous generation of spacefarers, Russell Schweickart. Few groups of scientists have access to so broad a view, so this coincidence is not surprising. What is surprising, though, is the newer book's ability to explain the depth, variety, and importance of nearly 20 years of planetary research. *Our Changing Planet*, as its title implies, is rich in explanatory graphics, charts, and superimposed images of the present state of the Anthropocene Epoch.

Assembling this sort of compendium runs the risk of fragmenting the information into unrelated bits. No problem here—the editors have selected a Who's Who of specialists in oceanography, meteorology, biology, economics, climate dynamics, and other fields to guide the way (the contributors and their affiliations are listed in an appendix). The book is divided into six sections: The Dynamic Atmosphere, The Vital Land, The Restless Ocean, The Frozen Caps, and Evidence of our Tenure. An epilogue by Sellers rounds out the text.

Reading the list of contributors is like encountering a bunch of old friends at a dinner party, each having brought a fresh story to share. Because I write college textbooks, I consider myself fairly up-to-date in the art of explanatory graphics, but images by William Haxby (the Florida coast after a 5-m rise in sea level), David K. Woolf and Ian S. Robinson (significant wave height in the Atlantic using data from *Poseidon-2*), David Sandwell (plate dynamics), Steven Platnick (MODIS/Terra images of ship tracks), and François Parthoit (oil spills imaged by ENVISAT)—just to name a few—were especially compelling.

The section that makes this book much more than a compendium of truly beautiful images and excellent graphic

UPCOMING BOOK REVIEWS

An Introduction to Ocean Turbulence
by S.A. Thorpe, Cambridge University Press, 240 pages

Chemical Oceanography and the Marine Carbon Cycle
by Steven R. Emerson and John L. Hedges, Cambridge University Press, 453 pages

Climate Change: A Multidisciplinary Approach
by William James Burroughs, Cambridge University Press, 378 pages

The Dynamics of Coastal Models
by Clifford J. Hearn, Cambridge University Press, 488 pages

Microbial Ecology of the Oceans (Second Edition)
edited by David L. Kirchman, Wiley, 593 pages

Oceans Past: Management Insights from the History of Marine Animal Populations
by David J. Starkey, Paul Holm, and Michaela Barnard, Earthscan, 223 pages

Tides of History: Ocean Science and Her Majesty's Navy
by Michael S. Reidy, University of Chicago Press, 392 pages

presentations is the last: Evidence of Our Tenure. Garrett Hardin would have been impressed—nowhere is the Tragedy of the Commons more evident than here. Of particular personal interest is the section by Karen Seto on the Urbanization of China's Pearl River Delta. The astonishing transformation in little more than a decade of this fertile area into the world's factory floor is shown in a pair of *Landsat-5* images that defy description. Just out of view (to the south) is the Hong Kong airport, the world's largest landfill project until the advent of The Palm and adjacent structures in Dubai (also shown in this book). Having watched the explosive growth of Dongguan since 2000, I can attest to the mixed effects of rapid urbanization. Equally dramatic *Landsat-7* images document the tragic loss of the Iraqi marshes, the destruction of the Aral Sea, and the desiccation of Lake Chad. No one can look at these matchless images and remain unmoved.

In his epilogue, astronaut Sellers says this book is equivalent to a medical report on the health of the Earth: "…like a doctor gently warning his patient about early signs of problems due to overindulgence, the satellite data tell us clearly where we should be careful… Something must be done, and a good first step is to raise public awareness of the problem." To which I can only heartily agree. Much of what I have learned in this remarkable book will find its way into my lectures and texts, and I can only thank the editors for the skill and balance demonstrated in their selection of contributors and topics. A clear appendix by Michael King on satellites and remote sensing wraps up this unique work.

Here is a call to action in the clearest sense. In a perfect world, every science educator would receive a copy of this book and pass its fundamental message along to his and her students. We have much to do!

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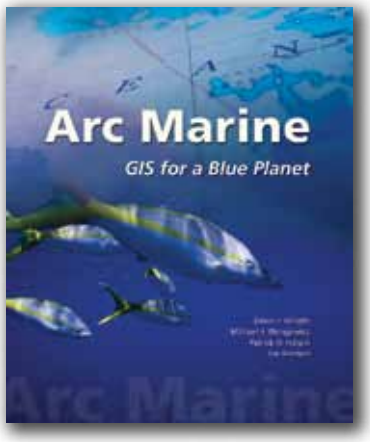
Arc Marine: GIS For a Blue Planet

By Dawn J. Wright, Michael J. Blongewicz, Patrick N. Halpin, and Joe Breman, ESRI Press, 2007, 216 pages, ISBN 978-1-58948-017-9, Softcover, $47.95 US

REVIEWED BY PETER WADHAMS



This interesting and useful manual is meant to provide the background and context for a set of software that assists marine scientists to carry out GIS (Geographical Information System) analysis of multiple marine data sets. For most of its history, marine science suffered from the problem of data sparseness. When the shipborne oceanographic station (taking 12 hours or more for a shallow and deep cast using Nansen bottles) was the main means of gaining knowledge about the nature of the ocean, knowledge grew very slowly. It was thought valid to create oceanographic atlases, to which every expedition would contribute new data, in the belief that data from different years and seasons could be combined to gradually build up a three-dimensional map of an unchanging ocean. Now we know better, but our recognition of the rapidly changing nature of the ocean has come about only because of the advent of a host of new oceanographic measurement techniques that generate data at unprecedented rates, both in space and time. Given that a typical oceanographic survey may involve the use of a large number of such techniques to map several different ocean parameters simultaneously, we are reaching the point of data overload, where instead of being data sparse, the ocean becomes too data rich for us to fully understand the picture built up by the measurement systems and especially the relationships among different ocean parameters.

In terrestrial surveying, the GIS field grew up in order to map a variety of parameters layered on top of one another in a systematic spatio-temporal way that brings out correlations and enables us to make full use of the massive data-