

required course textbook. Dunlap's 1981 publication tells the real DDT story far better. A less biased selection of readings for the present book would have told a more accurate story. The implication that emotional, uninformed environmentalists prevent power plants and oil refineries from being built would not be included.

CHARLES F. WURSTER, *Marine Sciences Research Center, Stony Brook University, Stony Brook, New York*

**BIOLOGICAL MONITORING: THEORY AND APPLICATIONS: BIOINDICATORS AND BIOMARKERS FOR ENVIRONMENTAL QUALITY AND HUMAN EXPOSURE ASSESSMENT.** *The Sustainable World, Volume 17.*

*Edited by M. E. Conti. Southampton (United Kingdom) and Billerica (Massachusetts): WIT Press. \$168.00. xix + 228 p.; ill.; index. ISBN: 978-1-84564-002-6. 2008.*

As indicated by its subtitle, the content of this book is quite broad, ranging in scale from genetics to ecological communities, and from algae to humans, for a wide range of contaminants. Early chapters provide a clear, informative overview: Chapter 1 reviews theory and basic concepts of biological monitoring and Chapter 2 describes different types of biomarkers, including DNA or mRNA alterations, protein responses, and immunological and physiological biomarkers. This chapter also presents the interesting multiple response concept, where a battery of biomarkers can be used to determine the health of an organism and the risk level for a population. The three following chapters address specific ecosystems or organisms: freshwater biomonitoring, marine organisms, and lichens as biomonitors. Chapter 3 is a brief review of the wide topic of biomonitoring of the freshwater environment. It mainly covers community-level index approaches for plants, invertebrates, and fish, and also discusses functional indicators, using mostly European examples. Bioaccumulation of heavy metals in algae dominates the chapter on marine organisms. At 51 pages, the longest in the book, the chapter on lichens as bioindicators of air pollution is particularly comprehensive, and includes an extensive reference list.

Perhaps the most useful section of the book is Chapter 6 (Biomarkers for Human Biomonitoring), which is arranged by contaminant. For each of the 16 contaminants considered, sub-headings for biomarkers of exposure, effect, and susceptibility are presented in a parallel format that makes this section highly accessible. The final chapter on multivariate approaches to biomonitoring studies includes principal components analysis, discriminant analysis, and the Hotelling's  $T^2$  test. This is a specific application for accumulation of heavy metals in two mollusk

species, rather than a review of techniques; other ordination, classification, regression, and recursive partitioning techniques should also be considered when analyzing biological monitoring data. One difficulty is the book's limited index, which contains few entries for specific contaminants or organisms. Although this volume lacks depth in some areas—terrestrial indicators, for example—it is well written and would serve as an informative reference inclusive of a broad range of topics, or as an appropriate textbook for mid-level to advanced study of biological monitoring.

BRENDA RASHLEIGH, *National Exposure Research Laboratory, U. S. Environmental Protection Agency, Atlanta, Georgia*

**HUMAN IMPACTS ON ANCIENT MARINE ECOSYSTEMS: A GLOBAL PERSPECTIVE.**

*Edited by Torben C. Rick and Jon M. Erlandson. Berkeley (California): University of California Press. \$60.00. x + 319 p.; ill.; index. ISBN: 978-0-520-25343-8. 2008.*

The current and pending collapse of many of the world's fisheries, and the accelerating degradation of diversity and function of ocean habitats, demands that scientists develop better frameworks for evaluating human impacts on marine systems. Identifying appropriate baselines for current and future marine conservation and management cannot be done without a grasp of the history of such interactions. This excellent edited volume provides an important foundation for understanding the impacts of prehistoric and historic humans on marine coastal ecosystems through hunting, gathering, and other extractive activities.

The editors bring together 11 case studies that represent the interdisciplinary expertise of archeologists, marine ecologists, and environmental scientists on the deep history, typically the last 10,000 years, of particular coastal marine systems. Five chapters focus on Pacific Ocean ecosystems, including South Polynesia and western coast of North and South America from the Aleutian Islands to Peru. Another six chapters focus on Atlantic Ocean ecosystems, from the West Indies and Maine to the North Atlantic and North Sea to the Strait of Gibraltar and the west coast of South Africa. This volume feels more unified than most other edited volumes because each case study explicitly uses several ecological concepts as shared lenses through which to evaluate human impacts. Particular attention is paid to resource depletion, size and age changes in populations, geographic range changes, trophic cascades, and fishing down food webs. The

case studies are bookended by overview chapters by the editors; the final chapter is a particularly well-written synthesis and would be useful to read before and after the case studies. Chapter 10, Historical Ecology of the North Sea Basin, provides a useful summary of the utility and limitations of various archeological methods.

Even in prehistoric times, humans clearly had a variety of complex interactions with marine ecosystems, although these chapters show that impacts can be hard to pinpoint in the archeological record or untangle from the environmental context. This volume will help inspire the next generation of interdisciplinary research in this area, from data collection to analysis and modeling tools. It should be read by anyone interested in coupled human-natural systems, including archeologists, ecologists, environmental scientists, historians, marine conservationists, fisheries managers, and policymakers.

JENNIFER A. DUNNE, *Santa Fe Institute, Santa Fe, New Mexico*

**MITIGATING IMPACTS OF NATURAL HAZARDS ON FISHERY ECOSYSTEMS.** *Based on a symposium held in San Francisco, California, 5–6 September 2007. American Fisheries Society Symposium, Volume 64.*

*Edited by Katherine D. McLaughlin. Bethesda (Maryland): American Fisheries Society. \$60.00. xviii + 446 p.; ill.; no index. ISBN: 978-1-934874-01-1. 2008.*

Stuff happens, even to fishery ecosystems. Not only must many fish populations withstand overfishing and habitat degradation, but these nearly steady stresses may be punctuated by forceful natural hazards of varied duration. The list is worrying, and includes tsunamis, volcanic eruptions, hurricanes and other coastal storms, stormwater runoff, harmful algal blooms, and hypoxia, as well as these (and other) events in multiple forms.

Because of their episodic nature, these events do not receive the sustained research and management attention as do the chronic forces that compromise fisheries. This volume is based on a 2007 symposium designed to place these rare but inevitable dangers within a broader framework. Its skeleton is logical—within each section (by hazard) comes pre-hazard planning and ecosystem-response forecasting, the immediate response to the events, the planning of recovery actions and, finally, the implementation of those actions.

The authors stress the inclusion of humans in fishery ecosystems. Fishers have huge influence on these ecosystems prior to disaster, but they may suffer enormous consequences afterward, even

more than the ecosystem itself. When Hurricane Katrina and its sister, Rita, together ravaged 200 miles of Gulf coastline in 2005, 85% of the fishing fleet was disabled, nearly the entire fishery support system—supply, purchase, and processing—collapsed, and some fishers lost homes and family members. However, the less-than-effective governmental response caused many victims to give up the fishery lives that their families had followed for three or four generations.

Because it is largely based on papers that cover case histories, this volume does not represent an exhaustive view of all the potential impacts of every natural hazard possible. But it does provide a set of interesting real-world examples. And from these are offered a distillation for improvements to society's responses: calls for better monitoring systems, improved communications, the need to rectify vulnerable preexisting conditions and to encourage ecosystem resilience, and to use those disasters that do occur to leverage change so that the impacts of future events are sharply reduced.

JOHN WALDMAN, *Biology, Queens College, City University of New York, Flushing, New York*

**RECONCILING FISHERIES WITH CONSERVATION: PROCEEDINGS OF THE FOURTH WORLD FISHERIES CONGRESS, VOLUMES I AND II.** *Based on a symposium held in Vancouver, British Columbia, Canada, 2–6 May 2004. American Fisheries Society Symposium, Volume 49.*

*Edited by Jennifer Nielsen, Julian J. Dodson, Kevin Friedland, Troy R. Hamon, Jack Musick, and Eric Verspoor. Bethesda (Maryland): American Fisheries Society. \$75.00 (paper). (I) xvi + 942 p.; ill.; no index. (II) xii + pp. 943–1946; ill.; no index.*

ISBN: 978-1-888569-80-3 (two-volume set). 2008.

This two-volume collection of papers from a symposium held in 2004 focuses on reconciling fisheries with conservation. The proceedings are organized around four major questions, each anchored on the symposium's theme: What should we care about? (36 papers); Who owns the fish and what are they worth to society? (22 papers); Can we get more fish or benefit from fisheries? (20 papers); and How can we manage aquatic ecosystems? (36 papers). Two additional sections (36 papers) on examples from marine and freshwater habitats complete the proceedings apart from a useful reflective epilogue on whether the Congress delivered.

The editors had an unenviable task with such a diversity of papers that varied in their relevance to the theme. There was, of course, general acceptance among the contributors that the majority of harvested species, from shrimp to tuna, have been seriously depleted as a consequence of overharvest and habitat degradation. Solutions were diverse and