

The Mediterranean Sea: Its History and Present Challenges; Goffredo, S. and Dubinsky, Z. (eds.)

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Goffredo, S. and Dubinsky, Z. (eds.), 2014. *The Mediterranean Sea: Its History and Present Challenges*. Dordrecht, The Netherlands: Springer, 678p. 237 illustrations, 169 illustrations in color. ISBN 978-94-007-6704-1. \$179 hardcover. \$139 ebook.

The Mediterranean Sea is a great book that I very much enjoyed reviewing. The editors have done a superb job of bringing together an updated, multidisciplinary survey of the Mediterranean Sea as we know it today. The 40 chapters cover a diverse range of subjects that make the volume a very useful compendium. The overarching theme focuses on Mediterranean ecosystems as they possibly once were, as they are now, and how they might evolve within the purview of climate change. Although the direction and magnitude of climate change is speculative at best, the book tries to focus on likely future marine expressions and impacts resulting from variations in climatic regimes. Forecasting and predictions are presented, taking into account different future scenarios from the International Panel on Climate Change. The book posits that the main environmental changes will be seawater warming and acidification and thereby considers future effects on sensitive taxa, the balance between bioconstruction and bioerosion processes, and ecosystem-level changes and their socioeconomic consequences and opportunities.

The book begins by presenting a brief summary of the physical environment, indicating the birth of the Mediterranean Sea from a geologic and paleoceanographic point of view, from Tethys to the present; it subsequently moves to some of the salient myths and socioeconomic activities associated with humans' relationship to the Sea. Discussions of the rise of the Mediterranean as the cradle of Western civilization point to the importance of this region and relevance of the multidisciplinary approach that is deftly applied in this multiauthored work.

Because of the wide range of subjects included in this work, it is difficult to comment on each of them; it is perhaps most expedient to just list the chapters, as they themselves tell the story of content and scope. The four parts of the book organize the various chapters into cogent groups of thought and provide discipline to topics that could otherwise range quite freely. Chapters within the parts are arranged in a logical sequence, making for easy use of the book. A list of chapters in the four parts follows:

Part I: Geology, Chemical and Physical Oceanography

(1) The Geological Origins and Paleoceanographic History of the Mediterranean Region: Tethys to Present, (2) A Channeled Shelf Fan Initiated by Flooding of the Black Sea, (3) Past, Present and Future Patterns of the Thermohaline Circulation and Characteristic Water Masses of the Mediterranean Sea, (4) Past, Present and Future Patterns in the Nutrient Chemistry

of the Eastern Mediterranean, and (5) Marine Chemosynthesis in the Mediterranean Sea.

Part II: Ecology: Taxa and Trophic Levels

(6) Microbial Components, (7) The Mediterranean Sea—Primary Productivity, (8) Autochthonous Seaweeds, (9) Autochthonous Seagrasses, (10) Alien Benthic Algae and Seagrasses in the Mediterranean Sea and Their Connection to Global Warming, (11) The Zooplankton, (12) Zoobenthos, (13) Foraminifera, (14) Mediterranean Corals Through Time: from Miocene to Present, (15) Mediterranean Coral Population Dynamics: A Tale of 20 Years of Field Studies, (16) The Making of the Mediterranean Molluscan Biodiversity, (17) Recent Changes in the Distribution of Autochthonous Marine Molluscs in the Mediterranean Sea, (18) Advances in Predicting the Impacts of Global Warming on the Mussels *Mytilus Galloprovincialis* in the Mediterranean Sea, (19) Holoplanktonic Mollusca: Development in the Mediterranean Basin During the Last 30 Million Years and Their Future, (20) Ocean Acidification and Warming Effects on Crustacea: Possible Future Scenarios, (21) Bryozoan Constructions in a Changing Mediterranean Sea, (22) The Fishes of the Mediterranean: A Biota Under Siege, and (23) Physiological Responses of Marine Animals Towards Adaptation to Climate Changes.

Part III: Global Climate Change and Ecosystem Effects

(24) A Comparative Analysis of Trophic Structure and Functioning in Large-Scale Mediterranean Marine Ecosystems, (25) Bioconstructions in the Mediterranean: Present and Future, (26) Marine Bioerosion, (27) Metamorphoses: Bioinvasions in the Mediterranean Sea, (28) Future Trends of Mediterranean Biodiversity, and (29) Regime Shifts in the Marine Environment: How Do They Affect Ecosystem Services?

Part IV: Mediterranean Man and Sea: Myths, Origins, Challenges and Opportunities

(30) Mediterranean Culture and Climatic Change: Past Patterns and Future Trends, (31) The Mediterranean Human Population: An Anthropological Genetics Perspective, (32) The Mediterranean and the Voices Transported by Time, (33) Mediterranean Royal Purple: Biology Through Ritual, (34) Socioeconomic Aspects: Human Migrations, Tourism and Fisheries, (35) Effect of Climatic and Anthropogenic Disturbances on Sponge Fisheries, (36) Seafood Safety and Human Health Implications, (37) Mediterranean Aquaculture in a Changing Climate, (38) Climate Change, Extreme Weather Events and Health Effects, (39) Conflicts and Security Risks of Climate Change in the Mediterranean Region, and (40) Developing Resource Management and Marine Policy for the Eastern Mediterranean Sea.

As seen in the list of chapters, the book covers a lot of territory. As a result, the volume becomes an indispensable

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addition to multidisciplinary coverage of the science of the Mediterranean Sea, because the editors gathered leading authorities from the fields of marine biology, ecology, paleoclimatology, chemical and physical oceanography, zoology, botany, aquatic photosynthesis, socioeconomics, mariculture, Mediterranean history, and science of humanity. Although it is not possible to list all of the authors here, it must be said that the editors have done a very good job of maintaining a high level of scholarship and writing tone throughout the book. There is thus a seamless transition in writing styles between chapters while, at the same time, scientific and technical parlance has been maintained. This is not easy to do in a multiauthored work and is mentioned here as a credit to the editors and authors alike.

Each chapter is followed by its own list of citations. There are numerous color illustrations throughout the book in addition to line drawings and halftones. Tables and graphs help to illustrate selected points and are welcome in a volume of this sort. I was most pleased to find a comprehensive subject index that spanned 23 pages. Such a complete index adds to the value

of the volume as a reference text for researchers. Author affiliations are provided in the list of contributors in the front of the book, should a reader wish to contact any personally. The publisher handsomely prepared this large-format volume, which constitutes a major reference work: the semigloss paper is of good quality, and the book is sturdily bound. This volume is not part of a series; it is a result of the implementation of the European Union project "CoralWarm—Corals and Global Warming: The Mediterranean *versus* the Red Sea," a project funded by the European Research Council under the European Union's Seventh Framework Programme (FP7/2007-2013)/ERC grant agreement no. 249930 (www.CoralWarm.eu). This book belongs in university libraries and on the desks and bookshelves of all researchers interested in the Mediterranean Sea. It is a credit to the science and study of the Mediterranean Sea, and as such it makes an important contribution to the literature.

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