

Book review

Geographic Information Systems in Oceanography and Fisheries, edited by V. D. Valavanis
(London: Taylor and Francis, 2002). [Pp 209]. USD \$80, £45.00. ISBN 0 415 28463 5

It has to be said right at the outset that this is an excellent contribution to applications of Geographic Information Systems (GIS) to the fields of oceanography and marine sciences. This book is the outcome of a thoroughly researched GIS literature pertaining to oceanography and marine environment. It is well illustrated and contains a very useful and detailed list of references at the end of each chapter. The inclusion of two appendices containing macro routines in Arc Macro Language (AML) for use with any version of ESRI's Arc/Info GIS software is a brilliant idea. These appendices include AML routines and programs for a wide variety of GIS applications from downloading useful Advanced Very High Resolution Radiometer (AVHRR) sea surface temperature (SST) and SeaWiFS images and sonar sediment data to database design, data analysis, and integration. From every angle, this book is an excellent resource for oceanographic and fisheries professionals and researchers interested in depicting spatial relationships and contemplating management strategies for marine resources.

The book is organized into four sections spanning 209 pages. The text is very readable and the chapters are logically ordered and developed. The contents of each chapter are very detailed and they reflect the wealth of experience and knowledge that Valavanis has amassed over his research and professional career. In the first chapter, a detailed overview of marine GIS is presented. It includes a brief history of GIS applications on land-based resources, and an exhaustive and detailed review of marine and ocean resources. The author has put forth a list of possible elegant questions in search of spatial relationships in order to address marine- and ocean-related issues. The conceptual issues on marine spatial thinking and models of marine GIS development as well as related issues on scientific visualization systems are emphasized.

The second chapter focuses on GIS and oceanography. The chapter deals with the applications of GIS to address marine geology, coastal and ocean management issues and coastal zone dynamics. Environmental problems pertaining to ocean and marine resources such as oil spills, sea-level rising, natural and artificial reefs, wetland and watersheds, and submerged aquatic vegetation are addressed thoroughly. The author has presented a detailed review of oceanographic GIS initiatives and online GIS tools available to address these problems. An exhaustive review of online oceanographic data providers along with their Universal Resource Locator (URL) addresses brings a wealth of resources to marine and fisheries scientists. These online resources could be very useful to oceanographers and fisheries scientists all around the world. Furthermore, the measurement tools relating to upwelling events and gyres, SST and chlorophyll fronts, mapping of seabeds and classification of surface waters are highlighted. Valavanis focuses on the use of modern techniques and tools such as satellite and high-resolution imageries as well as sonar used currently in oceanographic and marine research. The lack of progress on addressing a three-dimensional view of marine data is emphasized. These are backed up with extensive literature searches and authentic citations.

The third chapter deals with GIS applications in fisheries resource management. At the beginning, the author highlights some of the GIS initiatives underway worldwide and emphasizes the importance of remote sensing and geospatial techniques for marine and inland fisheries. He focuses on how these technologies could help find benthic biomes, biogeochemically meaningful habitats, and habitat classifications and distributions in exclusive economic zones (EEZ). Numerous ongoing efforts and future GIS applications in modelling and forecasting changes in aquatic habitats, fish population abundance and fish sampling designs are cited. In addition, the table 3.2 (on pp. 135–137) contains authoritative sources of fisheries statistics and databases available on the World Wide Web (WWW). This online resource could prove to be an excellent resource for fisheries scientists, coastal

management professionals, and policy and decision makers worldwide. Furthermore, the use of GIS technologies in mapping of spawning grounds, migration corridors, and essential fish habitats are covered elegantly.

The fourth chapter titled 'Instead of an Epilogue' presents a crescendo for researchers and professionals in oceanic and fisheries science as a take-home message. Valavanis has modelled his style of writing to convey the message in a way that readily generates excitement in readers and inspires them to tackle the spatial complexities of oceanic and fisheries management in a GIS environment. I think this excitement could enhance the use of geospatial technologies in revealing the spatial relationships among a host of biotic–abiotic complexities pertaining to oceanic and aquatic ecosystems, and associated problems and issues at hand.

However, I think that, for each chapter, presenting a list of acronyms and their unabbreviated forms just before its introduction section could be helpful to those who are less familiar with the current terms used in geospatial technologies such as remote sensing and GIS. Some of the acronyms have been cited improperly, for example NOAA (National Oceanic and Atmospheric Administration) rather than National Oceanic and Atmospheric Administration (NOAA). A minor typing and/or grammatical error crept in on p. 186 (*are* in the seventh line from the bottom of the second paragraph).

This book is both timely and original. The book is one of its kind, and it has invaluable literature resources that could serve as reference guide to potential spatial problem-solving tools for marine and oceanographic studies and research work. The examination of the 'Contents' pages of this book gives an insight into the extraordinary breadth of subject matter covered by the author. The greatest strength of this book is the huge range of appropriate research materials that the author has gathered together. Additionally, data sources are explored, and potential methods of adopting GIS for management purposes are discussed. The book is invaluable to oceanic and marine science researchers and professionals. It is an excellent contribution to both the fisheries and oceanographic environmental studies.

This book is an authoritative work and an excellent resource for coastal and ocean scientists. The paragraph on the back of the cover correctly certifies this fact by stating: 'Anyone with interests in marine GIS development, physical and biological oceanography, fisheries and information based proposals for ocean and fisheries resource management will find this book useful.' Furthermore, Professor Geoff Meaden of Canterbury (UK) rightly has noted in his preface: 'Simply finding all of this source material was a notable achievement, and if the reader wished to get added utility from the book, he/she might approach Valavanis for insights into his information search mechanisms!' I personally feel that the book has fulfilled its objective of illustrating the potentials of GIS-based analyses and applications in addressing confronting issues encountered in dealing with the spatial complexities of oceanic biological systems and its resources management.

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