

Preface

Coastal areas, by virtual of their position at the interface between truly terrestrial ecosystems and aquatic systems, belong to the most dynamic and fascinating ecosystems on Earth. They are among the most productive ecosystems on our home planet, providing numerous ecological, economic, cultural, and aesthetic benefits and services. Meanwhile, they are also the foci of human settlement, industry, and tourism. Because of large population and intense development, global coastal ecosystems are under strain as never before and there is a strong need for environmental monitoring and assessment in order to manage and protect these sensitive areas more effectively. This in turn requires reliable information bases and capable analytical techniques. Conventional field-based survey and mapping methods are still vital but often logistically constrained. Because of cost-effectiveness and technological soundness, remote sensing and geospatial technologies have increasingly been used to develop useful sources of information that support decision making as related to many coastal applications. But coastal areas comprise complex, dynamic landscapes, thus challenging the applicability and robustness of these methods and technologies. Encouragingly, recent innovations in data, technologies, and theories in the wider arena of remote sensing and geospatial technologies have provided scientists with invaluable opportunities to advance the studies on the coastal environment.

Within the above context, a book on coastal ecosystems is timely. This book focuses on the development of remote sensing and related geospatial technologies for monitoring, synthesis and modeling in the coastal environment. The book is divided into three major parts. The first part examines several conceptual and technical issues of applying remote sensing and geospatial technologies in the coastal environment. The second part showcases some latest development in the use of remote sensing and geospatial technologies for coastal ecosystem assessment and management with emphasis on coastal waters, submerged aquatic vegetation, benthic habitats, shorelines, coastal wetlands and watersheds. The last part details a watershed-wide synthetic approach that links upstream stressors with downstream responses for integrated coastal ecosystem assessment and management.

This book is the result of an extensive research by interdisciplinary experts, and will appeal to students and professionals dealing with not only remote sensing, geospatial technologies and coastal science but also oceanography, ecology, environmental science, natural resources management, geography and hydrology in the academic, governmental and business sectors. The Editor is grateful to all the contributing authors and anonymous reviewers for their time, talents and energies and for keeping to a strict timeline and to staff at Springer-Verlag, especially Agata Oelschlaeger and Christian Witschel, for their encouragement, patience and support. Acknowledgements are due to Tingting Zhao and Libin Zhou for manuscript proofreading and to my wife Xiaode Deng and my son Le Yang for their patience and love. Lastly, the Editor would like to dedicate this book to the late Professor C. P. Lo who offered brilliant guidance and boundless encouragement over many years of my professional career.

Tallahassee, Florida

Xiaojun Yang



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