Preface

This book is based on the results of two international workshops jointly funded by the US National Science Foundation and the National Development Program of Ireland. They brought together key experts from Europe, the United States, Canada, Africa, and Australia to examine state-of-the-art developments in coastal informatics (e.g., data portals, data/metadata vocabularies and ontologies, metadata creation/extraction/cross-walking tools, geographic and information management systems, grid computing) and coastal mapping (particularly via Internet map servers and web-based geographical information and analysis). The first workshop, held in Cork, Ireland in July 2006, enabled participants to examine state-of-the-art developments in coastal web atlases (CWAs), and to assess the potential and the limitations of selected CWAs from the United States and Europe. Participants also shared several case studies and lessons learned, and established key issues and recommendations related to the design, data requirements, technology and institutional capacity needed for these atlases. This necessitated an examination of best practices for achieving interoperability between CWAs, which led international participants to a second workshop entitled “Coastal Atlas Interoperability,” and held on the campus of Oregon State University in July 2007. At this second workshop, expert participants learned how to use controlled vocabularies and ontologies in order to build a common approach to managing and disseminating coastal data, maps and information, and concluded with the aim of designing and developing a demonstration interoperability prototype using the metadata catalogs of two mature atlases (the Oregon Coastal Atlas and the Marine Irish Digital Atlas).

The technical experts, scientists, decision makers and practitioners of the workshops in Ireland and Oregon decided to informally organize under the International Coastal Atlas Network (ICAN) and sought to continue the momentum with a third workshop. Based on the success of the group to this point, the European Environment Agency (EEA) sponsored and hosted this third event in 2008, at its headquarters in Copenhagen, Denmark, under the theme: “Federated Atlases: Building on the Interoperable Approach.” Workshop participants discussed the progress-to-date on the ICAN interoperability prototype and agreed upon future technical activities. The relevant policy context within which ICAN must operate was presented, along with an overview of a number of related coastal and marine information management projects that could inform ICAN developments. In addition, the workshop took place around a two-day conference on Coastal Atlas Development, organized by the EEA itself, whose objective was to inform EEA partners about the development of coastal atlases and the emergence of ICAN in light of relevant European policy developments in the maritime sphere.

By this time, CWAs in general and ICAN in particular had captured the interest of scores of local, state and national governments, non-governmental organizations, research institutes, and universities, as well NOAA, certainly the EEA, and the UNESCO Intergovernmental Oceanographic Commission.
Workshop participants therefore discussed ways of disseminating some of the wealth of knowledge and expertise that had been growing within the ICAN group (which now stands at over 35 organizations from over 10 countries). It was decided that one effective way to do this would be through the publication of a book to review and present the latest developments in the new emerging field of coastal web atlases, to share best practices and lessons learned through a series of case studies, to give practical guidance on geographic data management and documentation through standards-based metadata, as well as guidance on how to make underlying geographic databases interoperable. This current publication is the result. We hope that readers will find this book of practical use in web atlas design, development and implementation, and will thus improve their spatial thinking in the coastal context. Hence, rather than a lengthy theoretical treatise on basic and futuristic research questions and problems, the book has been prepared more as a concise, ready reference, with collections of subject-specific instructions where appropriate.

The prime audience for the book is coastal resource managers and consultants, coastal scientists, coastal technologists (e.g., information technologists, GIS specialists, software developers), government researchers, and graduate students. The book should be especially valuable to coastal resource managers who need to tackle such topic-based issues (explaining environmental concepts to the public and reaching them with current information has always been a difficult task).

The book may also be suitable for intermediate, advanced courses in coastal/marine GIS or coastal zone management (i.e., courses toward a related BS/BSc, MS/MSc or PhD degree, in the classroom, but also potentially for distance education as well). The material in the book and the dedicated website should allow students to familiarize themselves with what CWA (web GIS) technology is, what are the basics of related disciplines, and how to use physical environmental and biological data available in the atlases in order to develop specific GIS applications and models. Course instructors may use the contents of the dedicated website either to present ready-to-use applications or to use the variety of included data for building new GIS applications.

Further expected contributions of the book include:

- Wide data dissemination to enhance scientific and technological understanding. The book should be of great interest not only to the coastal/marine research and management community, but also to libraries, high schools, and outreach sites. Linkages in the book are made to parallel research in geographic information science, digital library development, and computer science. The presentation of lessons learned should help guide the development of new national and regional atlases, and improve decision-support systems.
- Advancing discovery and understanding; promoting teaching, training and learning through integration of research and education. The book may be useful as additional content to faculty course materials and to graduate research. We anticipate a number of student research topics and projects at both the M.S./M.Sc. and Ph.D. levels that may be aided by this book.
- Benefiting society. With the release of the Pew and U.S. Ocean Commission reports as well as the European Union Integrated Maritime Policy there is growing public awareness of the critical state of our coastal zones and fisheries. The book poses informatics solutions that seek to improve management practices and decision-making. Mapping plays a critical role in issues of national sovereignty, resource management, maritime safety, and hazard assessment.

This book is also accompanied by a dedicated website (International Coastal Atlas Network, http://ican.science.oregonstate.edu) which includes links to mature CWAs, and is building templates for CWA
design, snippets of scripts and programming routines to achieve interoperability with partner atlases, and several other resources mainly for online GIS developments and online data providers. We hope that you find it useful!

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