## Marine and Coastal

## Geographical Information Systems

Saranaree University of Technology





Down

Dawn Wright Darius Bartlett



## **Contents**

		Series Introduction Foreword, Michael F. Goodchild Preface Contributors	xi xiii xvii xix
	1	Down to the Sea in Ships: The Emergence of Marine GIS Dawn J. Wright	1
	2	Working on the Frontiers of Science: Applying GIS to the Coastal Zone  Darius J. Bartlett	11
PART	I	CONCEPTUAL/TECHNICAL ISSUES	
	3	Data Models for Marine and Coastal Geographic Information Systems  Rongxing Li	25
	4	An Algorithmic Approach to Marine GIS Christopher Gold	37
	5	Representation of Variability in Marine Environmental Data  Anne Lucas	53
	6	Applying Spatio-Temporal Concepts to Correlative Data Analysis Herman Varma	75

viii			Contents
	7	Linear Reference Data Models and Dynamic Segmentation: Application to Coastal and Marine Data Andrew G. Sherin	95
	8	Spatial Reasoning for Marine Geology and Geophysics Dawn J. Wright	117
	9	2.5- and 3-D GIS for Coastal Geomorphology Jonathan Raper	129
PART	п	APPLICATIONS	
	10	Real-time GIS for Marine Applications Gerald A. Hatcher, Jr. and Norman Maher	137
	11	Electronic Chart Display and Information Systems (ECDIS): State-of-the-art in Nautical Charting Robert Ward, Chris Roberts, and Ron Furness	149
	12	The National Oceanic and Atmospheric Administration's Vents Program GIS: Integration, Analysis, and Distribution of Multidisciplinary Oceanographic Data Christopher G. Fox and Andra M. Bobbitt	163
	13	Integrated Geographical and Environmental Remotely- sensed Data on Marginal and Enclosed Basins: The Mediterranean Case Vittorio Barale	177
	14	Mapping Submarine Slope Failures Brian G. McAdoo	189
	15	Applications of GIS to Fisheries Management Geoff J. Meaden	205
	16	A User-Friendly Marine GIS for Multi-dimensional Visualisation Yafang Su	227
	17	Active Tectonics: Data Acquisition and Analysis with Marine GIS  Chris Goldfinger	237

317

PART	Ш	INSTITUTIONAL ISSUES	
	18	Managing Marine and Coastal Data Sources: A National Oceanographic Data Centre Perspective on GIS Bronwyn Cahill, Theresa Kennedy, and Orla Ní Cheileachair	255
	19	Significance of Coastal and Marine Geographic Information Systems within the Context of the United States National Geospatial Data Policies  Millington Lockwood and Cindy Fowler	261
	20	GIS Applications to Maritime Boundary Delimitation Harold Palmer and Lorin Pruett	279
	21	Information Quality Considerations for Coastal Data Nancy von Meyer, Kenneth E. Foote, and Donald J. Huebner	295
	22	Epilogue Darius J. Bartlett and Dawn J. Wright	309
		Index	217