

An aerial photograph of a coastal landscape. A wide, winding river or estuary flows through the center, surrounded by fields and some buildings. The colors are muted, with blues, greys, and earthy tones. The text is overlaid on a dark rectangular area in the upper half of the image.

ENCYCLOPEDIA *of* COASTAL SCIENCE

Edited by
Maurice L. Schwartz

 Springer

ENCYCLOPEDIA *of* EARTH SCIENCES SERIES

Contents

List of Contributors	xv	Asia, Middle East, Coastal Ecology and Geomorphology	71
Foreword	xxxiii	<i>Paul Santlaville and Abel Prieur</i>	
Preface	xxxv	Asia, Southern (see Indian Ocean Coasts)	83
Accretion and Erosion Waves on Beaches <i>Douglas L. Inman and Scott A. Jenkins</i>	1	Asteroid-Impact Coasts <i>Rhodes W. Fairbridge</i>	83
Africa, Coastal Ecology <i>Anton McLachlan</i>	4	Atlantic Ocean Islands, Coastal Ecology <i>Annie Mercier and Jean-François Hamel</i>	84
Africa, Coastal Geomorphology <i>Antony R. Orme</i>	9	Atlantic Ocean Islands, Coastal Geomorphology <i>Jim D. Hansom</i>	88
Airborne Laser Terrain Mapping and Light Detection and Ranging <i>Stephen P. Leatherman, Dean Whitman, and Keqi Zhang</i>	21	Atolls <i>David Hopley</i>	95
Algal Rims <i>Jacques Laborel</i>	24	Australia, Coastal Ecology <i>Karen S. Edyvane</i>	96
Alluvial-Plain Coasts <i>Daniel F. Belknap</i>	25	Australia, Coastal Geomorphology <i>Eric Bird</i>	110
Altimeter Surveys, Coastal Tides, and Shelf Circulation <i>Guoqi Han</i>	27	Barrier Islands <i>Miles O. Hayes</i>	117
Antarctica, Coastal Ecology and Geomorphology <i>Andrew McMinn</i>	28	Barrier <i>Eric Bird</i>	119
Aquaculture <i>Robert R. Stickney</i>	33	Barriers, Gravel (see Gravel Barriers)	120
Archaeological Site Location, Effect of Sea-Level Change <i>Melanie J. Stright</i>	38	Bars <i>Brian Greenwood</i>	120
Archaeology <i>Lucille Lewis Johnson</i>	40	Bay Beaches <i>Karl F. Nordstrom</i>	129
Arctic, Coastal Ecology <i>Jean-François Hamel and Annie Mercier</i>	45	Beach and Nearshore Instrumentation <i>Robin Davidson-Arnott</i>	130
Arctic, Coastal Geomorphology <i>H. Jesse Walker</i>	49	Beach Cusps (see Rhythmic Patterns)	138
Artificial Islands <i>Marcel J.F. Stive</i>	55	Beach Drain <i>Per Bruun</i>	138
Asia, Eastern, Coastal Ecology <i>Donald Macintosh</i>	56	Beach Erosion <i>Edward J. Anthony</i>	140
Asia, Eastern, Coastal Geomorphology <i>D. Eisma</i>	67	Beach Features <i>Michael J. Chrzastowski</i>	145
		Beach Nourishment <i>Charles W. Finkl and H. Jesse Walker</i>	147
		Beach Processes <i>John R. Dingle</i>	161

Beach Profile <i>Nicholas C. Kraus</i>	169	Central America (see Middle America)	227
Beach Rating (see Rating Beaches)	172	Chalk Coasts <i>Vincent May</i>	227
Beach Ridges <i>Ervin G. Otvos</i>	172	Changing Sea Levels <i>Nils-Axel Mörner</i>	229
Beach Safety (see Lifesaving and Beach Safety)	177	Cheniers <i>Ervin G. Otvos</i>	233
Beach Sediment Characteristics <i>Alan S. Trenhaile</i>	177	Classification of Coasts (see Holocene Coastal Geomorphology)	235
Beach Stratigraphy <i>Yoshiki Saito</i>	179	Cleaning Beaches <i>Niels West</i>	235
Beach Use and Behaviors <i>Niels West</i>	181	Cliffed Coasts <i>Alan S. Trenhaile</i>	237
Beachrock <i>Robert J. Turner</i>	183	Cliffs, Erosion Rates <i>Tsuguo Sunamura</i>	240
Beaufort Wind Scale <i>Dilip K. Barua</i>	186	Cliffs, Lithology versus Erosion Rates <i>Tsuguo Sunamura</i>	241
Bioconstruction <i>William T. Fox</i>	186	Climate Patterns in the Coastal Zone <i>Douglas L. Inman and Scott A. Jenkins</i>	243
Bioengineered Shore Protection <i>Kevin R. Hall</i>	188	Coastal Boundaries <i>Peter H.F. Graber</i>	246
Bioerosion <i>William T. Fox</i>	191	Coastal Changes, Gradual <i>B.G. Thom and P.J. Cowell</i>	251
Biogenous Coasts (see Vegetated Coasts)	192	Coastal Changes, Rapid <i>David B. Scott</i>	253
Biogeomorphology <i>Martin J. Baptist</i>	192	Coastal Climate <i>David Greenland</i>	255
Bioherms and Biostromes <i>Jacques Laborel</i>	194	Coastal Currents <i>Guy Gelfenbaum</i>	259
Black and Caspian Seas, Coastal Ecology and Geomorphology <i>Yuri Dolotov and Pavel Kaplin</i>	194	Coastal Engineering (see Shore Protection Structures; Navigation Structures)	260
Bluffs (see Cliffed Coasts)	203	Coastal Hoodoos <i>Shin Wang</i>	260
Bogs <i>Martyn Waller</i>	203	Coastal Lakes and Lagoons <i>George F. Oertel</i>	263
Boulder Barricades <i>Peter S. Rosen</i>	204	Coastal Modeling and Simulation <i>V. Chris Lakhan</i>	266
Boulder Beaches <i>John McKenna</i>	206	Coastal Processes (see Beach Processes)	270
Boulder Pavements <i>Jim D. Hansom</i>	208	Coastal Sedimentary Facies <i>H. Edward Clifton</i>	270
Bypassing at Littoral Drift Barriers <i>Per Bruun</i>	210	Coastal Soils <i>Charles W. Finkl</i>	278
Capping of Contaminated Coastal Areas <i>Ram K. Mohan</i>	216	Coastal Subsidence <i>Zhongyuan Chen and John Rybczyk</i>	302
Carbonate Sandy Beaches <i>Andrew D. Short</i>	218	Coastal Temperature Trends <i>George A. Maul</i>	304
Caribbean Islands, Coastal Ecology and Geomorphology <i>Gillian Cambers</i>	221	Coastal Upwelling and Downwelling <i>Dilip K. Barua</i>	306
Carrying Capacity in Coastal Areas <i>M. MacLeod and J. Andrew G. Cooper</i>	226	Coastal Warfare <i>Peter L. Guth</i>	308
Cays <i>David Hopley</i>	227	Coastal Wells <i>Yaacov Nir</i>	311

Coastal Wind Effects <i>Terry R. Healy</i>	312	Desalination <i>Bénédicte Cherbuy and Jean-Christophe Aznar</i>	378
Coastal Zone Management <i>Peter W. French</i>	313	Desert Coasts <i>Rodman E. Snead</i>	379
Coastline Changes <i>Eric Bird</i>	319	Dewatering (see Beach Drain)	387
Coasts, Coastlines, Shores, and Shorelines <i>George F. Oertel</i>	323	Developed Coasts <i>Nancy L. Jackson and Karl F. Nordstrom</i>	387
Cohesive Sediment Transport <i>Parmeshwar L. Shrestha and Alan F. Blumberg</i>	327	Dikes <i>Pieter G.E.F. Augustinus</i>	388
Computer Simulation (see Coastal Modeling and Simulation)	330	Dissipative Beaches <i>Douglas J. Sherman</i>	389
Conservation of Coastal Sites <i>Vincent May</i>	330	Dredging of Coastal Environments <i>Per Bruun</i>	390
Continental Shelves <i>A. W. Niedoroda</i>	337	Drift and Swash Alignments <i>Eric Bird</i>	395
Conversion Tables (see Appendix 1)	339	Driftwood <i>Thomas A. Terich</i>	397
Coral Reef Coasts <i>Charles R. C. Sheppard</i>	339	Dune Calcarenite (see Eolianite)	398
Coral Reef Islands <i>Gisèle Muller-Parker</i>	342	Dune Ridges <i>Terry R. Healy</i>	398
Coral Reefs <i>David Hopley</i>	343	Dynamic Equilibrium of Beaches <i>Robert G. Dean</i>	399
Coral Reefs, Emerged <i>David Hopley</i>	349	Economic Value of Beaches <i>William B. Stronge</i>	401
Cross-Shore Sediment Transport <i>Richard J. Seymour</i>	352	El Niño–Southern Oscillation (ENSO) <i>Henry F. Diaz</i>	403
Cross-Shore Variation of Grain Size on Beaches <i>Philip D. Osborne and David P. Simpson</i>	353	Endogenic and Exogenic Factors <i>Henry Bokuniewicz</i>	407
Cuspate Forelands <i>Stephen J. Craig-Smith</i>	354	Energy and Sediment Budgets of the Global Coastal Zone <i>Douglas L. Inman and Scott A. Jenkins</i>	408
Dalmatian Coasts <i>Dieter Kelletat</i>	356	Engineering Applications of Coastal Geomorphology <i>John R. C. Hsu</i>	415
Dams, Effect on Coasts <i>Jiyu Chen</i>	357	Environmental Quality <i>Michael J. Kennish</i>	419
Databases (see Appendix 4)	359	Eolianite <i>Eric Bird</i>	426
Dating (see Geochronology)	359	Eolian Processes <i>Patrick A. Hesp</i>	428
Datum (see Sea-Level Datums)	359	Erosion: Historical Analysis and Forecasting <i>Mark Crowell, Stephen P. Leatherman, and Bruce Douglas</i>	428
Debris (see Marine Debris—Onshore, Offshore, Seafloor Litter)	359	Erosion Processes <i>Michael R. Rampino</i>	432
Deltaic Ecology <i>John M. Rybczyk</i>	359	Estuaries, Anthropogenic Impacts <i>Michael J. Kennish</i>	434
Deltas <i>Shea Penland and Mark A. Kulp</i>	362	Estuaries <i>Terry R. Healy</i>	436
Demography of Coastal Populations <i>Iver W. Duedall and George A. Maul</i>	368	Eustasy <i>Vivian Gornitz</i>	439
Depth of Closure on Sandy Coasts <i>Andrew Morang and William A. Birkemeier</i>	374		
Depth of Disturbance <i>John P. Ahrens</i>	377		

Europe, Coastal Ecology <i>J. Pat Doody</i>	442	History, Coastal Protection <i>Roger H. Charlier</i>	526
Europe, Coastal Geomorphology <i>Dieter Kelleat and Anja Scheffers</i>	452	Holocene Coastal Geomorphology <i>Dieter Kelleat</i>	527
Faulted Coasts <i>Roland P. Paskoff</i>	463	Holocene Epoch <i>Neil Roberts</i>	529
Forecasting (see Erosion: Historical Analysis and Forecasting)	466	Honeycomb Weathering <i>George Mustoe</i>	529
Geochronology <i>Gerhard Schellmann and Helmut Brückner</i>	467	Hoodooos (see Coastal Hoodooos)	530
Geodesy <i>Michael P. Stewart</i>	472	Human Impact on Coasts <i>Richard A. Davis, Jr.</i>	530
Geographic Information Systems <i>Shawn M. Boeser</i>	472	Hydrology of the Coastal Zone <i>Diane Horn</i>	535
Geographical Coastal Zonality <i>Dieter H. Kelleat</i>	474	Ice-Bordered Coasts <i>H. Jesse Walker</i>	542
Geohydraulic Research Centers <i>James R. Houston</i>	477	Indian Ocean Coasts, Coastal Ecology <i>Baban Ingole</i>	546
Geotextile Applications <i>Ram K. Mohan and C.G.R. Nair</i>	479	Indian Ocean Coasts, Coastal Geomorphology <i>G.N. Nayak</i>	554
Glaciated Coasts <i>Daniel F. Belknap</i>	481	Indian Ocean Islands, Coastal Ecology and Geomorphology <i>M. Wafar, Sayeeda Wafar, and Prasanna Yennavar</i>	557
Global Positioning Systems <i>Shawn M. Boeser</i>	485	Ingression, Regression, and Transgression <i>Henry Bokuniewicz</i>	564
Global Vulnerability Analysis <i>Robert J. Nicholls and Frank M.J. Hoozemans</i>	486	Instrumentation (see Beach and Nearshore Instrumentation)	565
Global Warming (see Greenhouse Effect and Global Warming)	491	Isostasy <i>Kurt Lambeck</i>	565
Glossary of Coastal Geomorphology (see Appendix 5)	491	Jet Probes <i>Charles W. Finkl and Lindino A. Benedet</i>	572
Gravel Barriers <i>Julian D. Orford</i>	491	Journal Listing (see Appendix 2)	580
Gravel Beaches <i>David P. Simpson</i>	492	Karst Coasts <i>Roland P. Paskoff</i>	581
Greenhouse Effect and Global Warming <i>James G. Titus</i>	494	Klint <i>Anto Raukas</i>	586
Gross Transport <i>Richard J. Seymour</i>	502	Lagoons (see Coastal Lakes and Lagoons)	588
Ground-Penetrating Radar <i>Ilya Buynevich and Duncan M. FitzGerald</i>	503	Landslides (see Mass Wasting)	588
Groundwater (see Hydrology of the Coastal Zone)	507	Late Quaternary Marine Transgression <i>Nils-Axel Mörner</i>	588
Hazards (see Natural Hazards)	508	Lifesaving and Beach Safety <i>B. Chris Brewster</i>	589
Headland-Bay Beach <i>Luis J. Moreno</i>	508	Light Detection and Ranging (LIDAR) (see Airborne Laser Terrain Mapping)	592
Health Benefits <i>Roger H. Charlier and Marie-Claire P. Chaineux</i>	511	Litter (see Marine Debris)	592
Hindcasting (see Wave Hindcast)	515	Littoral <i>Henry Bokuniewicz</i>	592
History, Coastal Ecology <i>J. Pat Doody</i>	515	Littoral Cells <i>Douglas L. Inman</i>	594
History, Coastal Geomorphology <i>H. Jesse Walker and Molly McGraw</i>	519	Littoral Drift Gradient <i>Terry R. Healy</i>	599

Log-Spiral Beach (see Headland-Bay Beach)	600	Nearshore Wave Measurement <i>Ping Wang and Gregory W. Stone</i>	702
Longshore Sediment Transport <i>Richard J. Seymour</i>	600	Net Transport <i>Richard Seymour</i>	705
Machair <i>William Ritchie</i>	601	New Zealand, Coastal Ecology <i>Russell Cole and Conrad Pilditch</i>	705
Managed Retreat <i>William J. Neal, David M. Bush, and Orrin H. Pilkey</i>	602	New Zealand, Coastal Geomorphology and Oceanography	709
Management (see Coastal Zone Management)	606	<i>Terry R. Healy</i>	
Mangroves, Ecology <i>F. Blasco, M. Aizpuru, and J. Besnehard</i>	606	North America, Coastal Ecology <i>Michael S. Kearney and J. Court Stevenson</i>	714
Mangroves, Geomorphology <i>Eric Bird</i>	611	North America, Coastal Geomorphology <i>Douglas J. Sherman</i>	721
Mangroves, Remote Sensing <i>F. Blasco, M. Aizpura, and D. Din Ndongo</i>	614	Notches <i>Dieter H. Kelleter</i>	728
Mapping Shores and Coastal Terrain <i>Robert A. Morton</i>	618	Numerical Modeling <i>Magnus Larson</i>	730
Marine Debris—Onshore, Offshore, Seafloor Litter <i>A.T. Williams, D.T. Tudor and M.R. Gregory</i>	623	Oil Spills <i>Erich R. Gundlach</i>	734
Marine Parks <i>Vincent May</i>	628	Oil Spills, High-Energy Coasts <i>William Ritchie</i>	736
Marine Terraces <i>Paolo A. Pirazzoli</i>	632	Offshore Sand Banks and Linear Sand Ridges <i>Randolph A. McBride</i>	737
Mass Wasting <i>Alan S. Trenhaile</i>	633	Offshore Sand Sheets <i>Michael S. Fenster</i>	739
Meteorological Effects on Coasts <i>Gregory W. Stone and Robert A. Muller</i>	636	Organizations (see Appendix 3)	745
Microtidal Coasts <i>J. Andrew G. Cooper</i>	638	Pacific Ocean Islands, Coastal Ecology <i>Mark D. Merlin</i>	746
Middens (see Shell Middens)	639	Pacific Ocean Islands, Coastal Geomorphology <i>Patrick D. Nunn</i>	754
Middle America, Coastal Ecology and Geomorphology <i>Alejandro Yáñez-Arancibia</i>	639	Paleocoastlines <i>John C. Kraft</i>	757
Mining of Coastal Materials <i>W.R. Osterkamp and R.A. Morton</i>	645	Paraglacial Coasts <i>Donald L. Forbes</i>	760
Modeling Platforms, Terraces, and Coastal Evolution <i>Douglas L. Inman, Scott A. Jenkins, and Patricia M. Masters</i>	647	Peat <i>Ian Shennan</i>	762
Modes and Patterns of Shoreline Change <i>Francis A. Galgano and Stephen P. Leatherman</i>	651	Periglacial (see Ice-Bordered Coasts)	764
Monitoring Coastal Ecology <i>J. Pat Doody</i>	656	Photogrammetry <i>E. Robert Thieler and Cheryl J. Hapke</i>	764
Monitoring Coastal Geomorphology <i>Andrew Morang and Laurel T. Gorman</i>	663	Physical Models <i>Michael S. Bruno</i>	769
Muddy Coasts <i>Terry R. Healy</i>	674	Placer Deposits <i>Paul D. Komar</i>	771
Natural Hazards <i>Vivian Gornitz</i>	678	Pleistocene Epoch <i>Dieter H. Kelleter</i>	772
Navigation Structures <i>Nicholas C. Kraus</i>	684	Pluvial Lake Shore Deposits <i>Detlef A. Warnke and Hillert Ibbeken</i>	773
Nearshore Geomorphological Mapping <i>Charles W. Finkl</i>	685	Polders <i>Joost H.J. Terwindt</i>	778
Nearshore Sediment Transport Measurement <i>Ping Wang</i>	698	Pressure Gradient Force <i>George A. Maul</i>	780
		Profiling, Beach <i>Nicholas C. Kraus</i>	781

RADARSAT-2 <i>Gordon C. Staples</i>	784	Sediment Suspension by Waves <i>Rowland J. Atkins</i>	850
Rating Beaches <i>Stephen P. Leatherman</i>	785	Sediment Transport (see Cross-Shore Sediment Transport; Longshore Sediment Transport)	853
Reclamation <i>P.P. Wong</i>	791	Sedimentary Basins <i>Saskia Jelgersma</i>	853
Reefs, Non-Coral <i>William T. Fox</i>	795	Seismic Displacement <i>Paolo A. Pirazzoli</i>	859
Reflective Beaches <i>Douglas J. Sherman</i>	795	Sequence Stratigraphy <i>Arthur D. Donovan</i>	860
Remote Sensing of Coastal Environments <i>Elijah W. Ramsey III</i>	797	Setbacks <i>Michael S. Fenster</i>	863
Remote Sensing: Wetlands Classification <i>Victor Klemas</i>	804	Sharm Coasts <i>Dieter H. Kelletat</i>	867
Rhythmic Patterns <i>Paul D. Komar</i>	807	Shelf Processes <i>Alan W. Niedoroda</i>	867
Ria <i>Eric Bird</i>	810	Shell Middens <i>Sarah K. Campbell</i>	870
Rip Currents <i>Robert W. Brander</i>	811	Shingle Beach (see Gravel Beach)	873
Ripple Marks <i>Carl L. Amos and Patrick L. Friend</i>	813	Shore Platforms <i>Wayne Stephenson and Robert Kirk</i>	873
Rock Coast Processes <i>Alan S. Trenhaile</i>	815	Shore Protection Structures <i>Nicholas C. Kraus</i>	875
Salt Marsh <i>Terry R. Healy</i>	819	Shoreface <i>H. Edward Clifton</i>	877
Sampling Methods (see Monitoring, Coastal Ecology; Monitoring, Coastal Geomorphology)	820	Simple Beach and Surf Zone Models <i>John P. Ahrens</i>	881
Sand Rights <i>Katherine Stone, Orville Magoon, Billy Edge, and Lesley Ewing</i>	820	Sloughs (see Estuaries; Tidal Creeks)	883
Sandy Coasts <i>Andrew D. Short</i>	821	Small Islands <i>George Maul</i>	883
Scour and Burial of Objects in Shallow Water <i>Douglas L. Inman and Scott A. Jenkins</i>	825	Sociology, Beaches (see Beach Use and Behaviors)	888
Sea-Level Change (see Changing Sea Levels)	830	South America, Coastal Ecology <i>Simone Rabelo da Cunha, Omar Defeo, Anita de Alava, Rosana Moreira da Rocha, Beatrice Padovani Ferreira, Mauro Maida, Tognella-M.M.P. De-Rosa, Carlos Emilio Bemvenuti, Joel C. Creed and André S. Barreto</i>	888
Sea-Level Changes During the Last Millennium <i>Roland Gehrels</i>	830	South America, Coastal Geomorphology <i>Norbert P. Psuty and Chizuko Mizobe</i>	905
Sea-Level Datums (see Tidal Datums)	833	Spits <i>Takaaki Uda</i>	909
Sea-Level Indicators, Biologic <i>Jacques Laborel and Françoise Laborel-Deguen</i>	833	Storm Surge <i>Vivian Gornitz</i>	912
Sea-Level Indicators—Biological in Depositional Sequences <i>David B. Scott and Franco S. Mediolli</i>	835	Storms (see Meteorological Effects)	914
Sea-Level Indicators, Geomorphic <i>Paolo A. Pirazzoli</i>	836	Strandflat <i>Tormod Klemsdal</i>	914
Sea-Level Rise, Effect <i>James G. Titus</i>	838	Structures (see Shore Protection Structures; Navigation Structures)	915
Sediment Analysis and Classification (see Beach Sediment Characteristics)	846	Submarine Groundwater Discharge <i>Steven L. Krupa and Cynthia J. Gefvert</i>	915

Submerged Coasts <i>Wyss W.-S. Yim</i>	922	Trottoirs <i>David Hopley</i>	1017
Submerging Coasts <i>Paolo A. Pirazzoli</i>	924	Tsunamis <i>Alastair Dawson</i>	1017
Surf Modeling <i>Marshall D. Earle</i>	925	Uplift Coasts <i>Terry R. Healy</i>	1022
Surf Zone Processes <i>William R. Dally</i>	929	Vegetated Coasts <i>Denise J. Reed</i>	1024
Surfing <i>William R. Dally</i>	936	Vibracore <i>Charles W. Finkl and Syed Khalil</i>	1026
Synthetic Aperture Radar Systems <i>R. Keith Raney</i>	937	Vorticity <i>George A. Maul</i>	1036
Tafone <i>George Mustoe</i>	940	Volcanic Coasts <i>Terry R. Healy</i>	1038
Tectonics and Neotectonics <i>Paolo A. Pirazzoli</i>	941	Washover Effects <i>William Ritchie</i>	1041
Thalassostatic Terraces <i>Rhodes W. Fairbridge</i>	948	Warfare (see Coastal Warfare)	1043
Thalassotherapy (see Health Benefits)	949	Water Quality <i>Katherine Pond</i>	1043
Tidal Creeks <i>Terry R. Healy</i>	949	Wave and Tide-Dominated Coasts <i>Edward J. Anthony</i>	1046
Tidal Datums <i>Edward B. Hands</i>	950	Wave Climate <i>George Maul</i>	1049
Tidal Environments <i>B. W. Flemming</i>	954	Wave-Current Interaction <i>Patricia L. Wiberg</i>	1052
Tidal Inlets <i>Duncan M. FitzGerald</i>	958	Wave-Dominated Coasts <i>Miles O. Hayes</i>	1053
Tidal Flats <i>V. Semeniuk</i>	965	Wave Environments <i>Andrew D. Short</i>	1056
Tidal Flats, Open Ocean Coasts <i>Congxian Li, Ping Wang, and Daidu Fan</i>	975	Wave Focusing <i>Terry R. Healy</i>	1059
Tidal Power <i>Roger H. Charlier</i>	978	Wave Hindcasting <i>Dilip K. Barua</i>	1060
Tidal Prism <i>Terry M. Hume</i>	981	Wave Power <i>Roger H. Charlier</i>	1063
Tide-Dominated Coasts <i>Miles O. Hayes</i>	982	Wave Refraction Diagrams <i>Gerhard Masselink</i>	1065
Tide Gauges <i>Guy Woppelmann and Paolo A. Pirazzoli</i>	984	Waves <i>Gerhard Masselink</i>	1069
Tide Mill <i>Roger H. Charlier</i>	986	Weathering in the Coastal Zone <i>Rhodes W. Fairbridge</i>	1074
Tides <i>Bruce Parker</i>	987	Wetlands <i>Denise J. Reed</i>	1077
Time Series Modeling <i>V. Chris Lakhan</i>	996	Wetland Restoration <i>William Streever</i>	1081
Topic Categories (see Appendix 6)	1001	Appendix 1: Conversion Tables	1087
Tors <i>Maurice Schwartz</i>	1001	Appendix 2: Journals <i>Charles W. Finkl</i>	1089
Tourism and Coastal Development <i>Marc L. Miller and Nina P. Hadley</i>	1002	Appendix 3: Organizations <i>Charles W. Finkl</i>	1100
Tourism, Criteria for Coastal Sites <i>P.P. Wong</i>	1009		
Tracers <i>Paolo Ciavola</i>	1013		

Appendix 4: Databases
Pravin D. Kunte

1145

Appendix 6: Topic Categories
Maurice Schwartz

1193

Appendix 5: Glossary of Coastal Geomorphology
Eric Bird

1155

Index

1197