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Nota di contenuto	Contents; Preface; The Editor; Contributors; 1. Impact of the Delta Works on the Recent Developments in Coastal Engineering Krystian W. Pilarczyk; 1.1. Introduction; 1.2. History; 1.3. Delta Works; 1.3.1. The Delta Project; 1.3.2. The Eastern Scheldt (Oosterschelde); 1.3.3. The Storm-Surge Barrier; 1.3.3.1. Eastern scheldt project; 1.3.3.2. Significance of the delta works; 1.3.3.3. Maeslant barrier: New storm-surge barrier at Rotterdam; 1.4. Contribution Delta Works to Developments in Hydraulic and Coastal Engineering; 1.4.1. Design Methodology and Innovative Execution 1.4.2. Closure Techniques: Sand Closures1.4.3. Scour and Bottom Protection; 1.4.4. Stability of Cover Layers; 1.4.4.1. Rubble structures and riprap; 1.4.4.2. Block revetments; 1.4.5. Filters; 1.4.6. Navigation Channels and Bank Protection; 1.4.7. Freshwater-Saltwater Separation Systems; 1.4.8. Materials and Systems; 1.4.8.1. Waste and industrial by-products as alternative materials; 1.4.8.2. Geosynthetics and geosystems; 1.5. Conclusions; References; 2. Coastal Structures in International Perspective Krystian W. Pilarczyk; 2.1. Introduction; 2.2. Problem Identification and Design Process

2.3. Developments and Future Needs in Policies and Design Philosophies 2.3.1. Level of Protection; 2.3.2. Design Life; 2.3.3. Failure Modes and Partial Safety Factors; 2.3.4. Flood Protection and Management: Comparative Study for the North Sea Coast; 2.4. Manuals and Codes; 2.4.1. Future Design Requirements (Codes); 2.5. Design Techniques; 2.5.1. Design Methodology; 2.5.2. Level I Tools (Rules of Thumb); 2.5.3. Level III Tools (Models) and Input Parameters; 2.5.3.1. Models for input parameters; 2.5.4. Stability of Cover Layers: Some Examples; 2.5.5. Verification of Design 2.6. Developments in Materials and Systems: Some Examples 2.6.1. Wastes and Industrial by-Products as Alternative Materials; 2.6.2. Geosynthetics and Durability; 2.6.3. Geosystems; 2.7. Technology Transfer, Capacity Building, and International Cooperation; 2.8. Conclusions and Recommendations; References; 3. Coastal Structures: Action from Waves and Ice Alf Tørum; 3.1. Introduction; 3.2. Different Types of Breakwaters; 3.3. Rubble-Mound Breakwater Hydraulics; 3.3.1. General Discussion on Rubble-Mound Breakwater Stability; 3.3.2. Conventional Rubble-Mound Breakwaters with Rock Armor 3.3.2.1. Derivation of some breakwater stability formulae 3.3.2.2. Stability of breakwater armor layers; 3.3.2.2.1. Hudson Formula; 3.3.2.2.2. van der Meer Formulae; 3.3.2.2.3. van Gent et al.'s Formula; 3.3.3. Oblique Wave Attack; 3.3.4. Stability of Breakwater Head; 3.3.5. Stability of the Breakwater Toe; 3.3.6. Filter Layers; 3.3.7. Wave Overtopping; 3.3.8. Wave Forces on Wave Crest Screens; 3.3.9. Conventional Rubble-Mound Breakwaters with Concrete Armor Units; 3.3.9.1. Coreloc , one layer; 3.3.9.2. Cubes and tetrapods in two layers; 3.3.9.3. Accropodes R , one layer 3.3.10. Berm Breakwaters

## Sommario/riassunto

Successful coastal and ocean engineering projects rely on practical experience with technical tools and knowledge available to the engineer. Often, problems arise from projects that are too complex for theoretical description, which require that engineers exercise sound judgment in addition to reliance on past practical experience. This book focuses on the latest technology applied in design and construction, effective engineering methodology, unique projects and problems, design and construction challenges, and other lessons learned. In addition, unique practices in planning, design, construc