

## BEACH AND DUNE RESTORATION

This book analyzes the tradeoffs involved in restoring beaches and dunes on intensively developed coasts, the most effective approaches to use, and the ways to educate and involve stakeholders. It identifies restoration strategies that can be employed to enhance natural processes and make coastal landforms more dynamic while maintaining their value for shore protection. In addition to ecological values, the concept of restoration is expanded to include physical, economic, social and ethical principles, and ideals. Compromise management solutions are suggested to accommodate the needs of many different user groups, including municipal managers and individual property owners, whose role has remained unassessed by existing publications on the same issue. The means of overcoming inertia or antagonism to environmentally friendly actions are also discussed. The book is written for coastal scientists, engineers, planners and managers, and also serves as a useful supplementary reference text for courses dealing with issues in coastal management, ecology and environmental ethics.

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## Preface

This book is about restoring landforms and enhancing their functions and services on intensively developed coasts. It is a follow-up to my book *Beaches and Dunes of Developed Coasts*, which identified the many ways beaches and dunes are transformed by human actions and the differences between natural landforms and the human artifacts that replace them. In writing that book, it became obvious that many transformations of the coastal landscape, even those involving construction of new landforms, were being done with little thought given both to the accompanying environmental losses and the potential opportunities for achieving new environmental gains. Traditional beach and dune building practices emphasize the use of landforms for protection and recreation, but that does not preclude adding new natural resource values compatible with those uses. In many cases, the modification of traditional shore protection projects to achieve nature goals can be accomplished with little change in design or cost. I acknowledge that human-use functions will be the driving forces for managing beaches in developed areas, so a return to a condition of pristine nature is not an option. Restored landforms and habitats will be subject to direct human use or indirect effects resulting from land uses in adjacent areas, and these landforms may require periodic human adjustments to survive. The impossibility of returning to pristine nature should not deter efforts to regain elements of the natural environment and reverse the trend toward environmental loss.

The great competition for space near the land–ocean interface and the increasing demands of different interest groups on the new resources made available by constructing beaches and dunes require evaluation of the new environments in a framework that considers physical, biological, and social goals and objectives, and the tradeoffs and compromises involved. This focus on compromise and the need to accommodate different user groups, including shorefront residents and tourists, is another distinguishing characteristic of this book. My working assumption is that some nature is better than none, even if it is imperfect, providing that no better

option is available given the economic or political climate at the time. I consider this assumption valid if the restored environments are considered interim states that will be improved as natural features become more acceptable to stakeholders and greater resources are devoted to improving them.

This book is not a manual of procedures for building beaches and dunes. Numerous books and technical reports provide practical guidelines for emplacing sediment, installing sand-trapping fences, and planting dunes (e.g. CERC 1984; Ranwell and Boar 1986; Technische Adviescommissie voor de Waterkeringen 1995; Dean 2002; US Army Corps of Engineers 2002), and there are many information sheets produced by government departments and environmental commissions, such as the outstanding series of leaflets produced by the Beach Protection Authority of Queensland. Most guidelines, and the studies on which they are based, focus on how to build landforms and habitats rather than how they can or should evolve as natural systems after they are constructed. The principal difference between this book and previous books on beach and dune management is the emphasis on trying to find ways to modify existing practices to enhance natural processes and make landforms more dynamic while maintaining their function as shore protection structures and managing them as natural features after construction. It is intended to be a companion volume to design manuals rather than a substitute for them.



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