Preface

Although coastal and ocean engineering is a very ancient field with the construction of Port A-ur near the mouth of the Nile in 3,000 BC, significant advances in this field have been made in the last several decades. The rise of interest in this field can be seen from the number of attendees by academics and practitioners in international conferences. The first International Conference on Coastal Engineering was held in Long Beach, California in 1950 with less than 100 people. When the same conference was held in San Diego, California, in 2006, over 1000 delegates attended. In the last several decades, the world has seen significant coastal and ocean engineering projects, one of which is the Delta Project in the Netherlands. This project was designed to shorten and strengthen the total length of coast and dykes washed by the sea by closing off the sea arms in the Delta region. Other noteworthy coastal engineering projects include the Kansai Airport Project in Japan and, in recent years, the construction of mobile barriers at inlets to regulate tides in the Venice Lagoon known as the Venice Project. Interest in coastal and ocean engineering has arisen in recent years as humankind experiences coastal disasters that derive from coastal storm, hurricane and coastal flooding and seismic activities such as tsunamis, and the impacts of climate change which result in sea-level rise. The tsunami activity in Sumatra in December 2004 affected countries throughout the Indian Ocean and resulted in the loss of thousands of lives. Hurricane Katrina in New Orleans also claimed many lives with property damage exceeding $63 billion. Global warming and sea-level rise will affect shoreline retreats, inundate low coastal areas, damage coastal structures, and accelerate beach erosion. The need for better understanding of our coastal and ocean environment has risen considerably in recent years.

This handbook contains a comprehensive compilation of topics that are the forefronts of many technical advances in ocean waves, coastal and ocean engineering. It represents the most comprehensive reference available on coastal and ocean engineering to date, and it also provides the most up-to-date technical advances and latest research findings on coastal and ocean engineering. More than 70 internationally recognized authorities in the field of coastal and ocean engineering contributed papers on their areas of expertise to this handbook. These international luminaries are from highly respected universities and renowned research and consulting organizations from all over the world.

This handbook provides a comprehensive overview of shallow-water waves, water-level fluctuations, coastal and offshore structures, ports and harbors, coastal sediment processes, environmental problems, sustainable coastal development, coastal hazards, physical modeling, and coastal engineering practice and education. This book is an essential source of reference for professionals and researchers in the areas of coastal engineering, ocean engineering, oceanography, meteorology, and civil engineering, and as a text for graduate students in these fields. This handbook will be of immediate, practical use to coastal, ocean, civil, geotechnical, and structural engineers, and coastal planners and managers as well as marine biologists and oceanographers. It will also be an excellent source book for educational and teaching purposes, and would be a good reference book for any technical library.

I would like to express my indebtedness to those who guided me and supported me as a mentor and a colleague throughout my professional life. They are:

Professor Robert L. Wiegel, University of California, Berkeley
Professor Joe W. Johnson, University of California Berkeley
Professor Robert G. Dean, University of Florida
Professor Fredric Raichlen, California Institute of Technology
Professor Raymond C. Binder, University of Southern California
Professor Shoshichiro Nagai, Osaka City University
Dr Basil Wilson, Science Engineering Associates
Dr Lars Skjelbreia, Science Engineering Associates
Dr Bernard LeMehaute, University of Miami
Professor Richard Silvester, University of Western Australia
Mr Orville T. Magoon, Coastal Zone Foundation
Professor Billy L. Edge, Texas A&M University
Professor Michael E. McCormick, US Naval Academy
Professor Yoshimi Goda, Yokohama National University and ECOH Corporation
Professor Philip L.F. Liu, Cornell University
Professor Forrest M. Holly, The University of Iowa
Dr Etienne Mansard, National Research Council, Canada
Professor J. Richard Weggel, Drexel University
Mr Ronald M. Noble, Noble Consultants, Inc.

I also wish to express my indebtedness to those who nurtured me from my early teen years and changed my course of life. They are:

Dr Helen Miller Bailey, East Los Angeles College
Mr H. Karl Bouvier, Jet Propulsion Laboratory

I extend my gratitude to my wife, Janet, for her constant support, encouragement, patience, and understanding while I was undertaking this task and to my daughter, Susan Calix, for proofreading some of the materials.

Finally, I wish to express my deep appreciation to Ms Kimberley Chua of World Scientific Publishing Company who gave me invaluable support and encouragement from the inception of this handbook to its realization.

Young C. Kim
Los Angeles, California
January 2008