Introduction to Coastal Dynamics and Shoreline Protection

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WIT*PRESS* Southampton, Boston

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Published by

WIT Press
Ashurst Lodge, Ashurst, Southampton, SO40 7AA, UK
Tel: 44 (0) 238 029 3223; Fax: 44 (0) 238 029 2853
E-Mail: witpress@witpress.com
http://www.witpress.com

For USA, Canada and Mexico

WIT Press
25 Bridge Street, Billerica, MA 01821, USA
Tel: 978 667 5841; Fax: 978 667 7582
E-Mail: infousa@witpress.com
http://www.witpress.com

British Library Cataloguing-in-Publication Data

A Catalogue record for this book is available
from the British Library

ISBN: 1-84564-054-3

Printed in Great Britain by Cambridge Printing

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Preface

This book was developed from lecture notes for a course on Coastal Dynamics and Shoreline Protection addressed to students of Environmental Sciences. This is the reason why it is organized to introduce the reader to the fundamental principles of the topics treated in each chapter. It can be used as a training aid both for students and for practicing engineers, as almost every topic is developed with case studies.

The book, which deals primarily with sandy coastlines, is divided into three parts. In the first part, which is limited to Chapter 1 – Integrated approach to coastal dynamics, the reader is introduced to the approach of a coastal erosion and remediation study and to coastal management.

In the second part, the meteomarine factors cited in Chapter 1 are dealt with in some detail, together with the mechanisms of sediment transport. The topics addressed are, amongst others, linear and higher order waves, random waves and spectra, wave transformation in the coastal zone, water levels, short-term and long-term wave prediction, sediment transport, shoreline and beach profile modeling.

The third part deals with the choice between various protection systems and tries to give the reader some basic elements of hydraulic and structural design for both rigid structures and beach fills.

Acknowledgements have to be addressed to all the people who inspired me, in particular my father Edoardo for the first approach to the maritime structures, Giulio Scarsi and Laura Rebaudengo of Genoa University for their rigorous analytical approach to the maritime hydraulics.

Many thanks have to be addressed to all the students to whom I had the privilege of teaching the concepts reported in this book for more than 14 years, and to the University Parthenope of Naples where I currently teach the course on coastal dynamics and shoreline protection.

Additional thanks have to be addressed to the people who typed the manuscript for their patience and their contributions, especially Dr I. Ascione and Dr. E. Chianese.

Finally, particular thanks is due to my wife Maria Pia and my sons Edoardo Maria and Rossella who have given me total support and encouragement, and to whom this book is dedicated.

G. Benassai
Naples, 2006.