



# The Dynamics of Coastal Models

By Clifford J. Hearn

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Coastal basins are defined as estuaries, lagoons, and embayments. This book deals with the science of coastal basins using simple models, many of which are presented in either analytical form or Microsoft Excel or MATLAB. The book introduces simple hydrodynamics and its applications, from the use of simple box and one-dimensional models to flow over coral reefs. The book also emphasizes models as a scientific tool in our understanding of coasts, and introduces the value of the most modern flexible mesh combined wave-current models. Examples from shallow basins around the world illustrate the wonders of the scientific method and the power of simple dynamics. This book is ideal for use as an advanced textbook for graduate students and as an introduction to the topic for researchers, especially those from other fields of science needing a basic understanding of the basic ideas of the dynamics of coastal basins.

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### Editorial Review

#### From the Author

The 'Dynamics of Coastal Models' grew out of lecture courses and research projects in the US and Australia. Its primary purpose is to help students and researchers who have no prior knowledge of modeling in coastal systems. So, the book starts from elementary principles and works its way through to some more sophisticated applications.

The work 'model' now has a huge range of meanings. As used in this book it means 'conceptual and theoretical ideas' expressed either mathematically or numerically. The word 'coastal' is used to mean the 'coastal ocean' including bays, estuaries, reefs and lagoons. I have not included material on the continental shelf, or regional oceans, although there are occasional models for continental seas such as the 'u cubed upon h' law for seasonal fronts in macro-tidal seas. Use of the word 'coastal' is not intended to imply that I deal in any detail with 'near-shore' systems.

One of the most popular quoted chapters is that concerning coral reefs and coral reef hydrodynamics. Indeed the book contains much original material on roughness and modeling reefs which is still unavailable from most other sources.

#### About the Author

Clifford Hearn is Director of the Tampa Bay Modeling Program for the United State Geological Survey.

### Users Review

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##### **Eden Davis:**

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