

lems in coastal engineering. Developed from more than 360 references in the coastal engineering literature, the text summarizes and interprets 60 years of knowledge evolved from physical modeling efforts worldwide. Divided into eight chapters and two appendices, the volume describes the physical and mathematical basis of coastal hydraulic models and discusses specific requirements for modeling coastal hydrodynamics, near-shore structures, movable-bed models, wave generation and instrumentation.

Chapter 1 presents a brief historical perspective of hydraulic modeling along with some modeling philosophy and definitions. Dimensional analysis is developed in Chapter 2 with identification of important dimensionless products in fluid mechanics. Similitude principles are discussed in Chapter 3, separating geometric, kinematic and dynamic considerations applied to hydraulic models. Fixed-bed hydrodynamic models are separated into short wave and long wave models in Chapter 4. Scaling requirements are derived from the equations of motion and mass conservation. Geometric distortion and scale effects are discussed. Chapter 5 is devoted to physical modeling of coastal structures. Rigid, compliant and rubble structures are considered with attention directed to scale selection and model verification. Movable-bed modeling is presented in Chapter 6 with separate discussions for bed load and suspended load models. The difficulties associated with these models are addressed. Distorted model interpretations and scale effects are discussed. Linear and finite amplitude wave generation algorithms are derived and presented in Chapter 7. Piston, hinge and variable draft wave makers are discussed. Regular, irregular and directional wave generation methods are covered in the discussion. This chapter incorporates the most detailed description of hydrodynamic control in the text. The final chapter, Chapter 8, is devoted to measurement methods for wave profiles, local velocity, force, mass transport and boundary location. Data analysis procedures, including those required for reflected wave evaluation, are summarized.

The narrative is modestly illustrated with 36 figures, 12 tables and 34 example problems. The print and illustrations are not of the quality found in many contemporary fluid mechanics texts, nevertheless, this is not a serious distraction from the highly useful information conveyed by the author. The strength of this book is the identification of similitude requirements, in terms of relevant di-

dimensionless products, for a variety of modeled coastal phenomena. Where complete similitude cannot be achieved, scale effects are identified and mitigation efforts are presented. This is a valuable source of information for physical modelers and for those who are dependent upon model results generated by others. It is an excellent graduate level text for coastal engineering students and an important resource for those who find computational models and field experiments inadequate to their needs.

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Coastal Stabilization; Innovative Concepts, Richard Silvester and John R. C. Hsu, 1993. Englewood Cliffs, New Jersey: Prentice Hall, 578p. ISBN 0-13-140310-9 (\$US96.00).

In its preface, the authors state that the book aims to summarize and present theory, physical models and sedimentary problems in a form useful for design engineers—with selections from both mathematical theory and descriptive accounts of nature. Unfortunately, the book falls short of the authors' admittedly lofty goal. The mathematical result of many theories are presented (some quite sophisticated) with little description as to their origin or limitations. Other important theories relevant to sediment transport are not mentioned. There is insufficient linkage between the theories and the natural-world examples and the design aspects of the book. Both the examples and design aspects are almost completely limited to crenulate and headland-dominated shorelines. The book offers 10 chapters (each with a list of references), an appendix and an index. The chapters are addressed individually below.

Chapter 1 introduces the concept of "static equilibrium" (which is given much credit). The authors note only weakly that this state of equilibrium is found only in pocket bays or along non-sedimentary coasts. Likewise, the authors fail to note that imitating nature in this regard by building structures to create pocket bays can result in adverse impacts to adjacent shorelines if the structures' barrier effects are not eliminated nor mitigated through advance nourishment.

Chapter 2, on waves, describes climatic and stochastic aspects, forecasting, kinematics, transformation, etc. in mostly general terms and with selected "bottom-line" results from various theories. An appendix gives functions of d/L (depth/wavelength) from linear theory which is similar to Table C-2 of the Shore Protection Manual. Despite their recognized importance to practical engineering design, wave groups, "freak" waves, setup, ship motions and harbor seiche are not mentioned.

Chapter 3, on beach processes, gives information on the development of beach profiles; however, very little is presented in regard to recent developments in predicting profile response to waves and water level, and no results are cited past 1990. Australian contributions are not noted, and the concept of equilibrium profiles is dealt with very loosely. Bar characteristics are mentioned. The section on "longshore drift" (central to the book's design aspects) covers 8 pages but gives little information of value for practical application, no recent results, and no mention of the cross-shore distribution of drift nor of the importance of net vs. gross drift rates. "Estuarine conditions" covers 25 pages, while "marine cliffs", of 6 pages, is better.

Chapter 4, on geomorphology of coasts, deals fairly exclusively with headland- and spiral-bay coastlines, and cites numerous empirical examples. Theoretical approaches (such as those of Kraus and Hansen, and others since 1987) are not mentioned. The sections on "barrier beaches" and "historic reviews" comprise only 9 of the chapter's 67 pages and are of little value. From a design aspect, the chapter's best contribution (and probably the book's as well) is the summary of crenulate bay shoreline geometry, in Table 4.2. A polynomial is recommended to "fit" the shoreline geometry (Eq. 4.4, p. 219); however, the results do not match the values in Table 4.2. Moreover, the authors never describe *which* shoreline the results apply to; *i.e.*, MHWL, MSL, MLWL, etc. When it comes to actually designing a pocket beach for construction, this detail is extremely important.

Chapter 5, on coastal defence, covers almost 70 pages and is mainly concerned with breakwater and groin structures which are difficult (or impossible) to permit in the United States. Shingle beaches, a relatively rare feature outside the U.K. and parts of Australia, are given much discussion. On the other hand, "beach nourishment" covers

only 8 pages. No information is given on design geometries or textural aspects. Renourished waterlines are reported to erode more swiftly than "normal" shorelines; but no mention is made of profile equilibration (or the fact that pre-project shorelines may be so over-eroded that their shoreline change rates are anything but normal). The Gold Coast of Australia, with one of the largest and most advanced beach nourishment programs in the world, is not mentioned.

Chapter 6, on headland control, devotes only 2 of its 45 pages to erosion downcoast of structures. No real mention is made of the importance of advance nourishment in conjunction with headland installation. Beach nourishment is afforded only 3 pages, and primarily cites the limited philosophies of Pilkey and Leonard.

Chapter 7, on effects on marine structures, gives considerable information on scour, but mentions no other effects. Chapter 8 presents "alternatives to normal breakwaters" with no preceding section on "normal breakwaters". Although berm breakwaters are mentioned, this chapter specifically focuses upon layouts of structures in accordance with headland control. Geotextiles are mentioned. "Design of units" deals mainly with concrete-filled bags and sausages. Submerged platforms are mentioned with no practical examples.

Chapter 9, on bypassing mechanisms, offers little information on existing and new practices. The well-known bypassing system at Nerang in Queensland, Australia; South Lake Worth Inlet, Florida; Indian River Inlet, Delaware; among others, are not mentioned. Fluidization is mentioned in one half page. Upcoast accretion is discussed but with no mention of downdrift erosion.

Chapter 10, "what direction coastal engineering", gives the authors' personal views and philosophies. These are clearly titled in favor of "headland controls" over "beach nourishment". The authors' presentation betrays an apparent lack of direct design experience with shorelines which require, or have undergone, actual beach restoration projects.

In conclusion, the book would far better serve its audience if it had been reduced in scope to address only the "innovative concepts" promoted by the authors. That is, the book fails to adequately present wave and littoral process theory (which is treated much better in other books), and to link these theories to nature and to design alternatives, as intended by the authors. The book fails to mention the last decade's important de-

velopments in subjects like beach profile and morphologic response, nourishment procedures, dredging equipment, impacts of inlets and structures, coastal management, and so on. Economic aspects, central to engineering design, are not mentioned at all.

The book is not suited for educational purposes due to its overemphasis of the authors' philosophies, uneven presentation (or omission) of theory, and unbalanced discussions of coastal engineering solutions. The selection of cited literature suffers from these problems as well. The book's emphasis on "spiral bays" is not complemented by a rational description of the specific littoral processes by which these bays form. Additionally, the graphs are of generally poor quality and are difficult to read, and there is no list of symbols.

The book's value lies in its numerous examples of spiral bays and headland-dominated shorelines. It offers a useful summary of shoreline geometry for these cases, although some details are omitted or in error. It can clearly be said that the book reflects the authors' great energy in promoting their beliefs.

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