

cycle to be monitored by GEOSAT satellite altimetry. A paper by Koblinsky *et al.* compares 42 oceanic island tide gauges (to avoid continental coastal bias effect, "aliasing") with the altimetry, spanning those two years. The two are comparable, with monthly variations often exceeding 6 cm, and disclosing the seasonal undulations relating to the Asiatic monsoon, the seasonal expansion and contraction of the water bodies on the west sides of mid-latitude oceans and the wind-forcing of the equatorial Pacific. The TOPEX/Poseidon Mission should, within the next decade, vastly expand our knowledge of this area.

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Coastal Dunes: Form and Process, edited by Karl Nordstrom, Norbert Psuty, and W. Carter, 1990. John Wiley & Sons, Chichester, 392p. ISBN 0-471-91842-3 (\$145).

According to the publisher this is a "state-of-the-science" volume from twenty-two international contributors, dealing with parts of Australia, Britain, Ireland, United States, Canada, Israel, Japan, Poland and South Africa. A useful introduction is provided by the editors touching lightly on global distribution (with map), geomorphology and human interactions. Curiously, their map and discussion omit entirely the interesting dunes of the Arctic regions as well as those of oceanic islands, *e.g.* the Bahamas, Bermuda, the Canary Islands, St. Helena, Ascension, Hawaii—even Madagascar (!)—while they gratuitously introduce on the map three totally imaginary islands off S.E. Australia.

Section I deals with eolian transport and sedimentation, with five chapters which reflect the pioneering work of Bagnold and develop an appreciable volume of new quantitative and experimental data. Section II turns to the beach-dune interaction (chapters 6–11), with attention to such things as vegetation and spray.

Section III undertakes the more challenging problems of "secondary" dunes and dune fields. Three chapters introduce three distinctive areas with a high degree of competence: Australian examples (Help and Thom), the Polish Baltic (Bo-

rónka), and the Morro dunes of California (Orme). In each case there are examples of mid-to-late Holocene cycles of dune growth and stabilization or erosion. The first of them contains an all-too-brief review of the world's transgressive dune fields. Causality is only touched on briefly: storm-frequency, sea-level change, isostatic motions, and so on.

The final section, IV, deals with effects of human development (chapters 15 and 16) and a short consideration by the editors of directions for future research (chapter 17). This section should prove to be extremely useful to those concerned with environmental management.

The volume as a whole is well produced, with plenty of useful figures, although some were over-reduced and disclosed a lack of foresight (and/or) ruthless editorial supervision. There is an excellent index, but the publishers have regrettably set far too high a price on the volume for it to get the large sales it deserves.

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California's Coastal Hazards: A Critical Assessment of Existing Land-Use Policies and Practices, by G. B. Griggs, J. E. Pepper and M. E. Jordan, 1992. California Policy Seminar Research Report, University of California, Berkeley, 224p.

As population expansion and overdevelopment of the coastal areas increase, there is a growing awareness of the dangers incurred by occupying a dynamic zone that is subject to the forces of storms, tides and waves as well as other natural phenomena more common in California—earthquakes, tsunamis, and cliff or bluff retreat. In California, the population has more than doubled between 1950 and 1980. At present, around 80% of the population lives within 30 miles of the shore, and this proportion is expected to rise in the near future. This rapid growth has taken place during a period of relative calm in storm activity. Since then, storm frequency and severity have increased significantly. Both factors—shoreline development and climatic deterioration—have contributed to the need for a coherent coastal hazards policy.

This research report, published by the California Policy Seminar, a joint program between the state government and the University of California, provides background information behind the conflict between oceanfront development and coastal hazards, and reviews the state and local policies and responses to this problem. The report is organized into five major sections. Part One examines the natural processes affecting the shoreline, hazards associated with human occupancy, protective strategies and their limitations. Part Two reviews the history of state-level coastal planning and policy, emphasizing the important Coastal Act of 1976. Part Three assesses implementation of the California Coastal Act with respect to coastal hazards on the local level, and Part Four examines similar responses on the state level. Part Five offers recommendations designed to strengthen state policies dealing with coastal hazards.

Prior to the California Coastal Act of 1976, the California Department of Navigation and Ocean Development had classified the shoreline according to physical attributes, including extent of erosion and exposure to the open sea. Although California had policies concerning geological hazards, these dealt primarily with earthquake hazards, landslides, and flooding, but not specifically with coastal erosion storm-wave damage. The Coastal Act of 1976 was designed, in part, to encourage new development mainly near existing urban and built-up areas, and also away from hazardous environments. Interpretative Guidelines were also issued to assist local governments in carrying out provisions of the Act. Griggs *et al.* critically review the Coastal Act and accompanying Guidelines and point out numerous shortcomings. The Coastal Act is vague on development in beach and back-beach environments, and on coastal flooding from high storm-tides and waves. A 1982 amendment to the Coastal Act called for establishment of a Coastal Resource Information Center to collect and integrate coastal data for policy-making. It also required preparation of a California Coastal Resources Guide. While the latter was published in 1987, the Center was never established, due to budgetary constraints.

A major existing problem is that data on coastal hazards remain dispersed and uncoordinated. Furthermore, a coherent statewide coastal hazards policy is lacking because of overlapping jurisdictions, diverse sources and types of data, and non-uniform standards in designating hazardous

zones and in implementing the provisions of the Coastal Act.

Griggs *et al.* conclude with a set of 10 recommendations implying a basic change of direction—avoiding siting new developments in hazardous zones, phasing out hard protective structures, designating Coastal Hazards Zones, and requiring detailed geologic or geotechnical reports, conforming to state standards, for any projects in such zones. Their last recommendation—to develop a statewide Coastal Hazards Information System, to be used by government planning agencies as well as property owners—should have been given higher priority, inasmuch as it would serve as the primary basis for decision-making and project evaluation. This report, while primarily intended to recommend changes and improvements to existing coastal legislation and policies in California, will also provide useful guidelines for analogous efforts in other coastal states confronting similar problems.

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Beaches: Forms and Process, by J. Hardisty, 1990. Unwin Hyman, London, 324p. ISBN 0-04-445219-5.

This is a timely contribution to coastal engineering science that examines the entire issue of beach profile response to oceanic forcing from a somewhat unconventional perspective. I am not certain whether the work would classify as a "monograph," since diverse subjects in coastal engineering are covered towards the ultimate goal of explaining beach response. Furthermore, this work is a textbook meant to explain the basis of the numerical code, SLOPES. Chapters are accordingly arranged; the first four are introductory, followed by four each on hydrodynamics, sediment dynamics, morphodynamics and numerical modeling.

A fairly significant portion of the book is a recapitulation of coastal engineering principles and data available in other textbooks and some important papers that the author has cited. The difference is that in this case the review is limited