



BOOK REVIEWS

Manual on the Use of Rock in Coastal and Shoreline Engineering, A. A. Balkema, 1991. 607 p. \$170.00.

This manual was prepared under a collaborative project carried out by CUR (the Netherlands Centre for Civil Engineering Research and Codes) and CIRIA (the UK Construction Industry Research and Information Association) during the period April 1988 to August 1991. The joint project was supported by the Netherlands and the UK governments. The manual was produced under the guidance of a joint Steering Committee comprising: M. E. Bramley (to September 1989), CIRIA; G. Stephenson (from October 1989), CIRIA; W. Leeuwestein, CUR; Secretary CUR-C67; K. W. Pilarczyk, Rijkswaterstaat; Chairman CUR-C67; and J. D. Simm, Robert West & Partners; Research Supervisor, CIRIA RP402.

The book has seven main chapters comprising an Introduction, and chapters on Planning and Designing, Materials, Physical Site Conditions and Data Collection, Physical Processes and Design Tools, Structures, and Maintenance. In addition there are seven appendixes out of which three are descriptions of rock specifications and standards, one on hydraulic data, one on instrumentation for the collection of geotechnical data, one on structure-monitoring techniques and finally one on European, British, Dutch legislation/authorities/designated sites relevant to environmental assessment of projects involving the use of rock in coastal and shoreline engineering.

The manual is well illustrated with 338 figures plus 44 in the appendixes, comprising diagrams, designs, and photos. It has 56 tables plus 86 "boxes" on design features. It is a monumental work by a great number of dedicated professionals, almost all Dutch or British, including government, companies and industries, plus one Canadian!

The strength of the book lies mainly in all aspects of materials and construction, and that should be understood literally. Here nothing seems to have been overlooked. The presentation is excellent, not the least Chapter 3 on Materials and Chapter 6 on Structures which include appendixes on selection and classification and testing

of materials, data collections, hydraulic and geotechnical aspects, monitoring and finally an appendix on laws.

It would be difficult to point out weaknesses in the above mentioned chapters or paragraphs which are well illustrated and further enlightened by tables and boxes including flow diagrams. The designer and the contractor will read them with pleasure and, probably, use them!

Other chapters are generally well written, but somewhat restricted by the limited distribution of authorships, geographically and by topics. This has put Americans, Canadians, Spaniards and Swedes (as examples) somewhat in the background, regardless of major contributions on wave mechanics, hydrodynamic interactions with structures of indisputable importance for stability of a mound structure. As a consequence the corresponding selection of wave data and analysis of same has been left without mentioning. The "replacement" is by a simplified "formula practice" as advocated in Chapter 5 and the corresponding omission of numerical models, apart from some scanty remarks. Wave groups are *e.g.* hardly mentioned (a few lines only) and not even found in the Index!! But they are still very important for the stability.

The references list 300 items, but suffer from the same shortcomings as mentioned above being (too) "domesticated." Regardless, it is a good book, which will serve designers and construction engineers for what it was intended to be, a manual.

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Climate Change and the Mediterranean, edited by L. Jeftic, J.D. Milliman, and G. Sestini, 1992. Edward Arnold, London, 673p., ISBN 0-340-55329-4.

A number of books have recently addressed the issue of greenhouse-gas induced global climate

warming. *Climatic Change and the Mediterranean* is the first in a series of regional studies sponsored by the United Nations Environmental Programme Oceans and Coastal Area Programme Activity Centre (UNEP OCA/PAC), in cooperation with the Intergovernmental Oceanographic Commission (IOC), and several other intergovernmental and non-governmental organizations. These regional studies are designed to investigate environmental and socio-economic impacts resulting from anticipated climate changes in the marine and adjacent coastal areas. They also propose appropriate policy options and responses, in order to mitigate potential negative consequences.

This book begins with an overview of the Mediterranean region, its marine and coastal environment, population, economic activities, resources and climate. The 15 chapters, comprising the rest of the book, examine a diverse range of subjects, including projected future regional climate change, historical and future sea levels, tectonics, hydrology, water resources, vegetation and land-use, soil degradation, and economic impacts. The last five chapters focus on selected areas in greater detail. Chapters 2, 8, and 9–15 are particularly relevant to the readers of this Journal.

T.M.L. Wigley (Chapter 1) reviews the background of GCM climate models and their limitations. For the Mediterranean region, the only consistent GCM result is that of an overall warming. J.D. Milliman (Chapter 2) briefly summarizes recent and projected sea-level trends, emphasizing the large variability caused by local land movements. N.C. Flemming (Chapter 8) expands this theme further, using archeological data from the last few thousand years. He has compiled reliable paleosea-level estimates and dates from at least 335 sites. The data suggest that the mean sea level has fluctuated by less than 30 cm within 200 year intervals, during the last 2,000 years, and that furthermore, each coastal region has a distinctly different mean rate of change and variability. Broad tectonic patterns are discerned, such as subsidence in the Gulf of Lions-Rhone delta region, and uplift in Tunisia, and to a lesser extent, in Syria. These patterns are generally consistent with known plate tectonic motions. Variability in earth movements over different time spans, however, makes direct comparisons difficult between the archeological data and recent tide-gauge measurements.

S. Jelgersma and G. Sestini (Chapter 9) intro-

duce the sequence of more detailed case studies, by discussing potential impacts of accelerated sea-level rise on coastal lowlands. They recommend zoning the lowlands into high, medium, and low risk categories, integrating environmental and socio-economic data into Geographical Information Systems (GIS), testing of sea-level rise scenarios against additional data to be collected at differing spatial scales, and evaluating the cost-effectiveness of shoreline protection, and also documenting historical storm frequencies and damages.

The remainder of the book is devoted to specific case studies from the Ebro delta (Spain), the Gulf of Lions (France), the Po delta and Venice (Italy), the inner Thermaikos Gulf (Greece), the Nile delta (Egypt) and the Tunesian coast. This set of papers presents regional descriptions of the environment, socio-demographics, and economy, that vary in their degree of comprehensiveness. However, given the uncertainty in GCM predictions (see Wigley, Chapter 1), the discussions on potential climate-induced effects are much more generalized, for example, changes of species in marine and lagoonal ecosystems, increased coastal erosion, greater frequency of high tide and storm surge events, and economic impacts within the immediate coastal zone, including beach resorts, tourism, and fisheries. Priorities will need to be established in deciding which areas should be protected. On the other hand, as Milliman et al. point out in the introductory overview, other human-related activities may have equal or greater impact than climate change on the future socio-economic situation in the endangered lowlands. Yet, this does not mean that strategies should not be implemented to mitigate anticipated consequences of future climate change.

This book will provide an informative summary of the study of projected climate change impacts on the Mediterranean region, particularly the ramifications of sea-level rise on the coastal environment and economy. The link between GCM predictions and consequent societal impacts will need to be strengthened as the climate models are refined. The book will be a useful addition to the collections of a broad range of scientists, including climatologists, geologists, ecologists, as well as coastal managers and economists.

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