provided. Aside from these minor shortcomings, the book is both useful and readable.

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Expected Effects of Climate Change on Marine Coastal Ecosystems, J.J. Beukema, W.J. Wolff, and J.J.W.M. Brouns (eds.), 1988. Dordrecht, The Netherlands: Kluwer Academic Publishers, Developments in Hydrobiology 57, 221p. ISBN 0-7923-0697-X.

Coastal ecosystems are particularly vulnerable to future climate change because they face inundation or increased salinity as well as exposure to increased levels of CO_2, UV-B radiation (due to stratospheric ozone depletion by chlorofluorocarbons), and higher temperatures. The potential consequences of these climate changes on coastal ecosystems formed the theme of a workshop held in Texel, The Netherlands, from 11 to 15 November, 1988, attended by a group of 30 scientists from 13 countries, covering the fields of biology, ecology, geology and climatology.

The Expected Effects of Climatic Change on Marine Coastal Ecosystems constitutes a collection of 23 papers, representing the proceedings of this workshop. The book begins with an overview of the causes of climate change (Hekstra), and reviews various anticipatory approaches, for example: General Circulation Models (GCM's), construction of regional scenarios, and studies of past climates as analogs (see papers by DeBoois, also Goodess and Palutikof). The book is further divided into several sections dealing with ecosystems responses to elevated carbon dioxide levels (3 papers), to temperature changes (6 papers), sea level rise (9 papers), and UV-B radiation increases (2 papers). Long utilizes mathematical models to investigate light interception and conversion efficiency in salt-marsh grasses. Field studies and geographical or historical analogs are more common anticipatory approaches. Field observations have been made on winter temperature responses of benthic animals (Beukema), thermal tolerance limits of bivalves (Wilson), salinity changes on salt-marsh zonation (Huiskes), and on accretion rates (Dijkema *et al.*). Potential consequences of UV-B radiation on aquatic coastal ecosystems are reviewed by Kramer, and on salt-marsh vegetation by Van de Staaij *et al.*

Past and present latitudinal ranges of seaweed species are utilized to project future climate responses (Van Hoek *et al.*). A similar study, but more focused on Western Europe is summarized by Breeman. A regional scenario of temperature increase equivalent to that now existing between The Netherlands and France is used to predict eventual bottom faunal changes in Holland (De Vooys).

Historical rises in sea level, both during the Holocene post-glacial transgression, and the last few centuries are explored in a series of papers. Day and Templet cite the Mississippi Delta, with its nearly 6–10 times global average sea level rise, as an analog for the future of other vulnerable coastal areas. The situation in Louisiana may be somewhat unique, because subsidence and wetlands losses have been aggravated by other anthropogenic activities, such as sediment deprivation due to construction of upstream dams, and reduction of seasonal sediment influx during floods, by dikes, canal and jetty construction. Morphological changes associated with sea level rise are detailed in papers by Christiansen and Bowman, Misdorp *et al.*, and Westerhoff and Cleveringa. Siefert presents evidence for recent sea level rise along the German Atlantic coast, and a marked increase in the tidal range in recent decades, possibly due to dredging.

The papers presented in this book are largely drawn from studies in Western Europe, particularly The Netherlands, thus possibly limiting the global applicability of the findings. While there may be a dearth of coastal data, the relevance of agricultural studies to coastal ecosystems (*e.g.*, Overdieck) may be questioned. Tables are often reduced beyond easy legibility. Typographical errors are not uncommon. Nevertheless, this series of papers present useful results that can be added to the growing literature on the potential impacts of climate change, especially in the coastal zone.

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World Atlas of Holocene Sea-Level Changes, P.A. Pirazzoli, assisted by J. Pluet, 1991. Amsterdam: Elsevier Science Publishers, B. V., Oceanography Series, 300p. ISBN 0-444-8906-6.

Until the late 1970's, Holocene sea-level studies were directed towards establishing a single uni-