

## Book review

### **Coastal Geomorphology – An Introduction** by Eric Bird (John Wiley and Sons 2000), ISBN 0-47-189977-1. \$76.50.

Meteorologists are constantly having to deal with matters coastal, whether it be ascertaining sea and swell conditions, storm surge, tsunami and indirectly erosion through climate change and sea-level rise. Hence an understanding of the geomorphology of coasts and the forces shaping coastal change, both long- and short-term, will be at times most useful for climatologists and meteorologists alike. Professionals in these disciplines are often asked to comment about the impact of future climate change and because sea-level has risen approximately 15 cm over the last century their attention will often be drawn to the impacts on coasts. After reading Bird's coastal geomorphology, these professionals will know that despite the worldwide trend not all coasts are experiencing rising sea-levels and that while beaches are likely to erode according to the Bruun Rule the beaches of coral cays in fact may expand because the biologically productive area of coral reefs is likely to increase with a rising sea-level. As an introductory compendium this book will serve as a very useful and readable text.

The layout of the book is logical. After the introductory chapter, Chapter 2 deals with coastal processes, such as the nature of waves, tides, surges, currents and near-shore circulation. Few books on coasts deal very effectively with the origin and processes of tides and especially why tides vary in height along different sections of coasts. Bird provides us with this information and explains why the northwest coast of Australia receives 11m tides and Sydney experiences a micro-tidal regime. Chapter 3 discusses the all important topic of sea-level change, both past, present and future and later in the book, in Chapter 12, Bird presents a most useful discussion about future coasts and in particular the impacts of sea-level rise and climate change upon coasts. With rising sea level, for example, tidal ranges may increase slightly in some regions and the two together will likely deepen the offshore profile allowing greater wave energy to strike the coast thereby exacerbating coastal erosion. In

some situations, however, a negative feedback is possible because increasing rainfall and/or storminess may result in increased sediment supply to the coast allowing the offshore profile to be maintained or even shallow thereby reducing the wave energy reaching the shoreline. Such information helps the reader to realise that while we hear constant doom and gloom about the impacts of future climate change there are in reality likely to be many variable situations and outcomes.

The intervening chapters provide a thorough precis of the origin and patterns of change of coastal landforms including coral reefs, beaches, estuaries and lagoons and deltas as well as rocky and cliffed shorelines. Each of these chapters also deals with the impact of humans on these features. One notable omission in this book is the lack of discussion or description of the role of coastal hazards. While it could be argued that a book on geomorphology need only deal with landforms and the processes that shape them it is also true that many coastal landforms are ephemeral at a recent geological time-scale. In some locations it is possible that some depositional landforms were originally emplaced by high magnitude events and it is also likely that in the past the same sorts of events removed coastal landforms in dramatic fashion. We frequently view coasts as changing in a gradual and relatively innocuous manner and for the majority of time this is most likely true. But as has been found with fluvial landforms the rare and extreme magnitude event should have a truly spectacular impact on coastal landforms. Minor criticisms aside, Eric Bird's Coastal Geomorphology expands upon his earlier versions of the book to provide us with more current information and likely future scenarios. It will serve meteorologists and climatologists well when they seek to brush up on their knowledge of coasts.

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