CHAPTER 5

COASTAL EVOLUTION
IN THE ASIA-PACIFIC REGION

PATRICK D. NUNN1 AND ROSELYN KUMAR2
1Department of Geography, The University of the South Pacific, Fiji
2Institute of Applied Sciences, The University of the South Pacific, Fiji

5.1 INTRODUCTION

As in most parts of the world, the proportion of coastal lands (relative to non-coastal lands) varies immensely throughout the Asia-Pacific region. For example, in some of the most distant parts of this vast region such as the tropical Indian Ocean or Pacific Islands, every piece of land is coastal in the sense that it is affected directly by coastal processes. Yet for the largest land areas in the region, coasts by any definition comprise only a small proportion of the total land area. Such statements may be misleading, however, because, in terms of their importance to humans as locations for settlement, economic activities, and food production, coasts are generally more valuable than most other land areas of comparable size in the Asia-Pacific region. At the same time, coasts are more vulnerable to change than other land types, whose degree of natural resilience is commonly greater.

As elsewhere in the world, the positions and the characters of Asia-Pacific coasts have changed through time. These changes have sometimes brought about profound alterations to the lifestyles of coastal-dwelling humans in the region, yet also presented new opportunities for their descendants. In the same way, it is clear that changes within the past 100 years — a time of unprecedented increases in human population pressure on most parts of the Asia-Pacific coastal zone — have been more rapid than at most earlier times, causing widespread disruption to human lifestyles and posing significant challenges for the next hundred years; challenges this book is trying to help solve.

Coastal changes can occur at a variety of scales, but it is useful, when assessing coastal history, to separate local from regional changes. Local changes may be unique
and present problems that arise from a distinct set of circumstances, which may have little relevance to what is happening in other areas. There is little scope to ponder such local changes in a book that considers the entire Asia-Pacific coastal zone. Of far greater importance are regional changes, usually arising from climatic or environmental drivers that have similar effects across large regions. By studying such changes, even at a local scale, it is often possible to identify commonalities that are relevant to many other geographical situations.

In the following subsections (5.1.1–5.1.2), the distribution and nature of coasts in the Asia-Pacific region is discussed. There follows a section in which we look at the principal natural drivers of coastal change in this region (section 5.2). Readers should note that a discussion of humans – important as agents of coastal change in only comparatively recent times – is given in Chapter 6. Next is a summary of the history of coasts in the Asia-Pacific region (section 5.3). We then review existing research on the Asia-Pacific coastal zone by theme and by region, giving particular emphasis to research gaps (sections 5.4–5.6).

5.1.1 Asia-Pacific Coasts Discussed in this Chapter

For the purposes of this book, the vast Asia-Pacific region extends from the Pakistani/Iranian coastal border in the west to the Russian coast just north of Japan and includes the island archipelagos of Southeast Asia, Melanesia and Remote Oceania as far east as French Polynesia and adjacent island groups (Figure 1.2). However, for ease of discussion this chapter focuses on a more limited geography. It covers coasts that span ten countries on the Asian mainland (Bangladesh, Burma, Thailand, Malaysia, Singapore, Cambodia, Vietnam, South Korea, North Korea and China) and 24 on islands (Indonesia, Brunei, Philippines, Taiwan, Japan, Papua New Guinea, Solomon Islands, Vanuatu, New Caledonia, Nauru, Palau, Federated States of Micronesia, Northern Marianas Islands, Marshall Islands, Kiribati, Tuvalu, Fiji, Tonga, Wallis and Futuna, Samoa, Tokelau, Niue, Cook Islands and French Polynesia).

For both convenience of discussion and pragmatic reasons involving climate and the nature of particular characteristics (see following subsection), the coasts of this region are divided into three groups. The Southeast Asia group comprises seven continental countries (Bangladesh, Burma, Thailand, Malaysia, Singapore, Cambodia, and Vietnam), the East Asia group three continental countries (South Korea, North Korea and China), and the Asia-Pacific Islands group the 24 island countries mentioned above.

The proportion of coasts in these countries varies (Table 5.1). In China, for example, a country of 9.5 million km$^2$, coasts account for less than 1% of the land area; whereas in Indonesia, a country of some 1.9 million km$^2$, coasts comprise about 3% of the land area, and in archipelagic French Polynesia the figure is close to 70%. The degree of importance of the coast varies between countries of this region. In both China and Indonesia, for instance, the largest cities are along the coast, but in China there is understandably a greater proportion of the total