

1. INTRODUCTION

The mainland coast of the Eyre Peninsula extends for 1640 km from 40 km south of Whyalla to Wilson Bluff on the Western Australian border (Fig. 1.1). It is the longest coastal province in South Australia and together with 78 islands surrounding the peninsula it contains a considerable variety of coastal processes and resultant morphologies. Morphologies range from low energy tidal flats, through, with increasing wave energy, to cheniers, beach ridges, sandflats, foredune ridges, primary and secondary transgressive barriers, including cliff top dunes; and bedrock and calcarenite cliffs. The range in morphologies is a product of the major marine and atmospheric processes - the westerly winds and prevailing south west swell, and their impact on the bedrock geology and Pleistocene calcarenite, together with the massive input of Holocene marine carbonate sediments. The degree of wind-wave influence is controlled by coast orientation and nearshore wave refraction and attenuation. Regional and intraregional variation in these three around the peninsula produces a highly variable coastline. The longest uniform section is the 179 km of Tertiary limestone cliffs along the Nullabor Plain. Elsewhere bedrock and calcarenite cliffs (1% and 55% of coast respectively) alternate and overlap with sandy beaches (60%), sandflats (32%), beach ridges (4%) and open coast mangrove flats (1.5%). In addition, foredunes and transgressive dunes back 65% of the coast. Clifftop dunes occur along 22% and shore platforms and reefs along 27 and 31% respectively. Finally several large coastal bays and the offshore islands are located around the coast.

This report is structured in three parts. Section 2 covers the background environmental parameters - geology, climate, waves and tides; Section 3 presents models of the major rocky and sandy shorefaces around the coast; while Section 4 gives a detailed description of the morphodynamics of the eight provinces and 58 subprovinces that make up the coast (Fig. 1.1).

The study is based on analysis of 1:40,000 colour air photos (enlarged to 1:10,000) and 1:50,000 topographic maps of the entire coast, and four field trips totalling eight weeks, during 1984-85, when the entire coast was visited. All field surveys and sediment data, together with the results of radiocarbon dating of samples is presented either in the text or appendices. A Glossary to Terms is given in Appendix 6.1.

The aim of this report is to both describe the geomorphology of the coast, including the dynamic processes that have contributed to the present morphology, hence morphology and dynamics or morphodynamics (see Wright and Thom, 1977); and to assess the impact of the Holocene sea-level transgression, and to a lesser degree the Pleistocene transgressions, on coastal evolution.

Given that this is the first morphodynamic assessment of the coast and that very little has previously been written about any of the coast, this report at best hopes to achieve a first order overview of the morphology coupled with first order models of the major modes of Quaternary evolution of the coast. The comprehensive investigation of this coast, and the ramifications for both morphodynamic and Quaternary studies await more detailed investigations. Hopefully this report will provide a basis upon which further investigations can build.

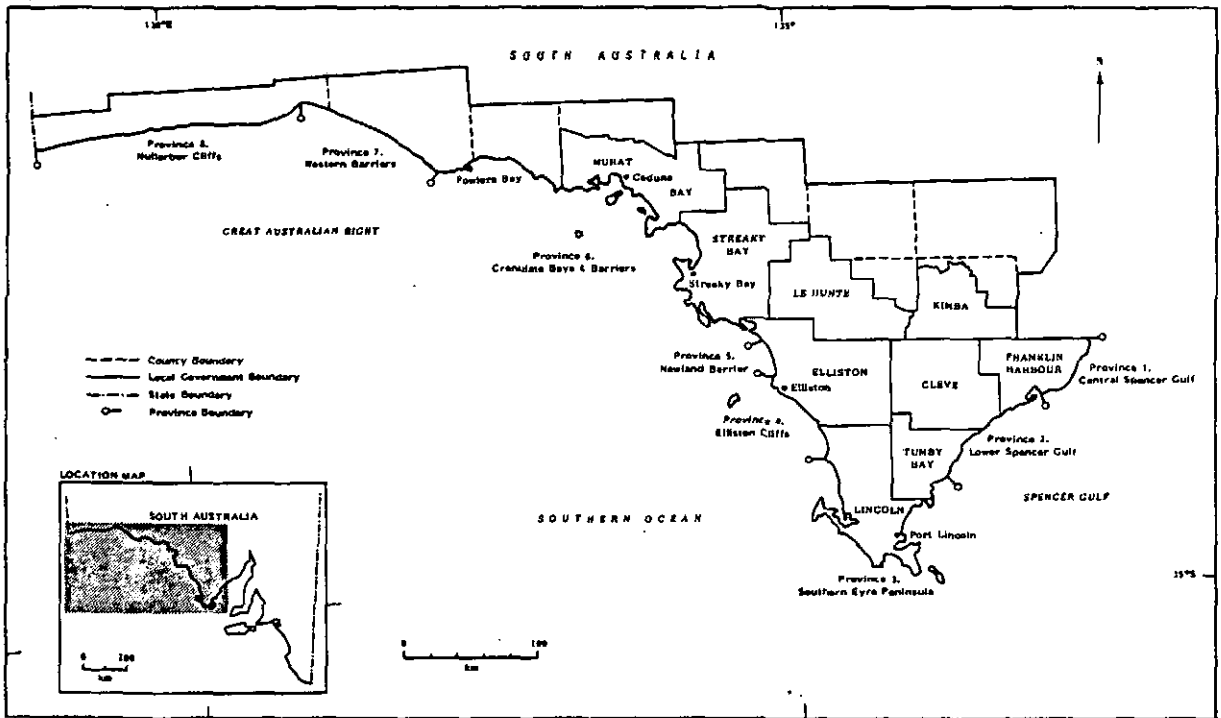


Figure 1.1

A map of the Eyre Peninsula showing the location of the eight coastal provinces and major landmarks and locations.