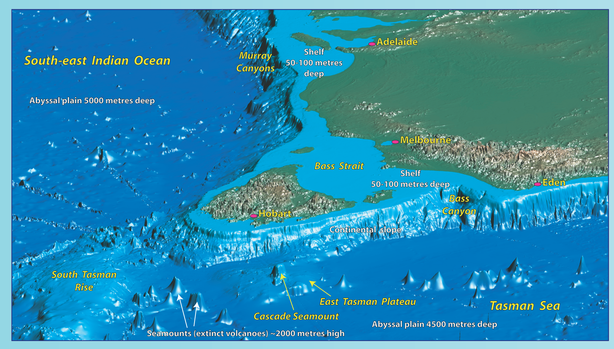
Australia's South-east Marine Region



National Significance

Most of our population lives along the 4000 km of Australia's south-east coastline. South-east Australia and its adjacent oceans are of great importance to the nation, economically and socially.

These marine areas support a broad range of thriving activities. Tourism, recreation, commercial fishing, petroleum exploration and production are industries vital to Australia's economic and social prosperity.

Most of the region's population would identify with its surfing beaches and vast deep blue oceans, but would be less familiar with the fascinating and spectacular submarine landscapes beneath the waves off south-east Australia.

Recent scientific exploration and mapping efforts have greatly increased our knowledge of the shape and character of the sea bed, its geology and the diverse ecosystems that it supports.

Modern seabed mapping systems now allow rapid and precise surveying of the sea floor. Since 1994, Geoscience Australia has used the latest sonar technology, known as "swath-mapping" or "multi-beam sonar mapping", to map offshore south-east Australia.

Swath-mapping involves sending sonar or sound waves from a research vessel to the sea floor. These waves then bounce back to receivers on the vessel and are used to create detailed computer-generated images, such as the one on this poster.

These maps are used by a variety of people to manage the marine environment and to help make informed decisions about its future.

Geological Evolution

The oceans off south-east Australia began to form 83 million years ago. The Tasman Sea was created as the Lord Howe Rise split off eastern Australia by continental drift, and the South-east Indian Ocean developed as Antarctica split from southern Australia.

The seafloor spreading that formed the Tasman Sea was rapid, but abruptly stopped 52 million years ago. The South-east Indian Ocean spreading was slow initially, but then sped up 43 million years ago, and continues to the present day. The 2 km high cliff on the western side of the South Tasman Rise is the scar left as Antarctica slid past to the south.

The South Tasman Rise and the East Tasman Plateau are continental fragments that broke off Tasmania during the rifting process. The summit area of the South Tasman Rise is 750 metres deep, while the upper part of the East Tasman Plateau lies mainly in water depths of 2500-3000 metres but is topped by a large volcano that erupted 35 million years ago. The top of this volcano, Cascade Seamount, is now 650 metres deep. Other nearby large submarine volcanoes and smaller cones probably formed at about the same time.

The continental slopes off south-east Australia are mostly steep and rugged, and have been incised by canyon systems. The most spectacular of these are the Murray Canyons off Kangaroo Island and Bass Canyon off Gippsland. These have canyon walls up to 2 km high, and are deeper than the Grand Canyon in the USA.

The relatively flat and shallow continental shelves extend up to 200 kilometres out from the coastlines. They are typically 50-100 metres deep, reaching 200 metres deep at the shelf edges. They are composed of sediment originating from rivers and also carbonate particles produced by marine organisms.

Cycles of sea-level change associated with global glaciations over the past 3 million years have bevelled the shelves to their present flat morphology. The shelves are now flooded following a 120 metre rise in sea-level after the last major ice-age 18,000 years ago. At that time Bass Strait was dry land.

References:

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