



fact file

The Shifting Sands Of Fraser Is.

QUEENSLAND: Fraser Island is the largest sand island in the world, stretching over 123 kilometres in length and 22 kilometres at its widest point. The highest dune is 244 metres, but most rise to between 100 and 200 metres above sea level. Drilling shows the sand extends to 100 metres below sea level in places. Most of the sand is made up of grains of quartz (silica) with less than two per cent being other minerals such as the heavy minerals ilmenite, rutile and zircon.

Fraser Island has been formed over hundreds of thousands of years as winds, waves and ocean currents have carried sands from the far south-east of Australia, and from as far away as Antarctica (but before Australian and Antarctica split from each other). This has been determined by measuring the ages of zircon grains that make up less than half of one percent of the sand on Fraser.

Some 700 million years ago Antarctica had mountain ranges which rival the modern-day Himalayas. These mountain ranges were eroded away with the resulting sand being transferred to what are now the sedimentary rocks in Victoria. These sandstone regions were, in turn, eroded away and the sand transported to the interior (Murray Basin), to the Sydney Basin (e.g. Hawkesbury Sandstone) and to the east Australian continental shelf.

For probably the last 50 million years, rivers have carried sands from south eastern Australia out to the continental shelf and in towards the land again in a zigzag pattern to form a string of sand islands along the Queensland coast. These reach from South Stradbroke Island, off the Gold Coast, to Fraser Island, just to the south of the Great Barrier Reef.

The largest of these islands, Fraser Island was formed as the sand was deposited over what was once a low, hilly terrain formed millions of years ago by volcanic activity. This terrain we know today as the rocky outcrops of Indian Head, Middle Rocks and Waddy Point.

Periodic changes in the earth's temperature have created changes in sea levels which have helped to form the island.

Falling sea levels increased the continental area and during these periods dune building was at its most prolific with sand sweeping across the island faster than plants could stabilise it.

This loose bare sand formed U or V-shaped parabolic dunes, which stabilised over time.



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The sandblows along the eastern coast of the island today are mobile but not from being replaced by sand from the beach, but from sand excavated by the prevailing south-easterly winds from deflation corridors.

These dunes progress across the island often burying forests and other plant communities. The rate of movement of the dunes each year depends on factors such as wind strength, the amount of moisture in the sand and plant colonisation. These dunes will gradually stop moving when they reach areas protected from the winds.

Vegetation finally stabilises the dunes. The young dunes behind the eastern beaches are colonised and stabilised by Spinifex grass and other coastal plants adapted to harsh salt and wind conditions. In the sheltered central regions of the island, where the dunes are stable and there are more nutrients for plant growth, diverse plant communities and rainforests are found.

The oldest dunes of Fraser Island (on the western side) have been exposed to seasons of weathering and erosion. Their characteristic bright white sand indicates a near complete leaching of nutrients and mineral compounds.

These dunes support the survivors of the Australian bush, hardy plants which have adapted to withstand poor conditions. These are open forest species such as the Eucalypts, Casuarinas, Acacias and Banksias.

This dynamic landscape has formed a series of overlapping sand dune systems dating back at least 700 000 years. The shifting sands of Fraser Island, and those of nearby Cooloola, have continually concealed and revealed a unique geological history. The dunes have the longest and most complete age sequence of coastal dune systems in the world.

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