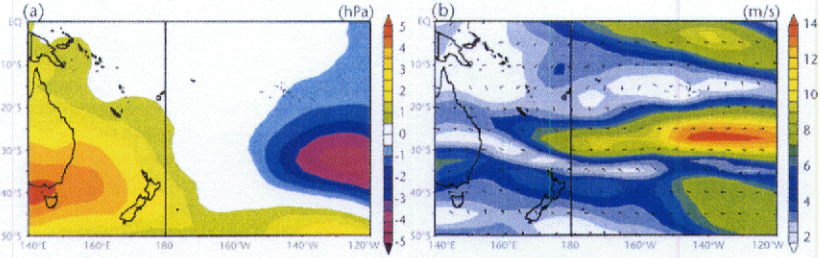

Figure II.51
Maps of a) sea level pressure anomaly; and b) high atmosphere (250 hPa is approximately 10.5 km) wind anomaly for June to August of 1997.
(NOAA/CDC, USA)

South-West Pacific

The climate of the South-West Pacific Ocean is extremely variable from year to year and the variability is linked to the El Niño/Southern Oscillation. Reports from as early as the latter half of the nineteenth century note the tendency for prolonged dry conditions to prevail simultaneously across many parts of Australia, New Zealand and the islands of the South-West Pacific Ocean to the Date Line. For example, contemporary descriptions of the droughts of 1877–78 and the very wet conditions experienced during 1871 reflect the broad climate controls operating to modulate seasonal weather patterns. East of the International Date Line there are also broad controls but the phase is reversed — rain and tropical storms are more frequent during El Niño events but are suppressed during periods when the SOI is positive.

Significant climate anomalies over the region of the South-West Pacific Ocean were:

- Blocking high pressure systems over southeastern Australia during the Southern Hemisphere winter and spring and abnormally persistent westerly winds across New Zealand;
- Reduced rainfall away from the equator, particularly westward of the International Date Line; and
- Increased frequency of tropical storms and cyclones east of the International Date Line.

The "wet season" of northern Australia and the tropical islands of the South-West Pacific lasts from approximately November to March and corresponds to the period of warmest ocean temperatures and maximum solar heating during the Southern Hemisphere summer. This is also the period when tropical storms and cyclones can be expected over the warm waters of the South Pacific Ocean and the Coral Sea. Southeastern Australia and New Zealand, in the more temperate mid-latitudes, also expect to receive rainfall during the summer months. The Pacific Islands and the coastal parts of northern Australia can receive rainfall during the remainder of the year as a consequence of showers developing in the prevailing Southeast Trade Winds. Southeastern Australia and New Zealand come under the influence of mid-latitude cyclones and fronts during winter as the westerly wind flow moves northward.

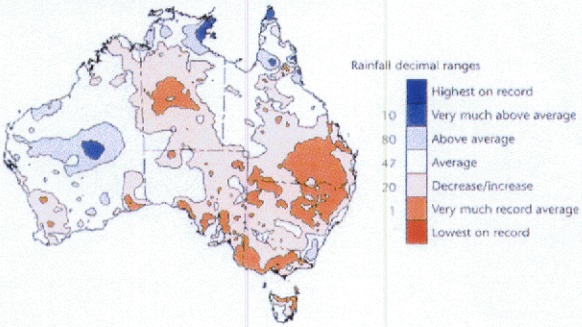

Figure II.52
Map of June to August 1997 rainfall deciles over Australia showing the extensive area with below and very much below average rainfall.
(BOM/NCC, Australia)

May–October 1997

The atmospheric circulation over the South-West Pacific Ocean underwent significant change following the onset of the El Niño event during the Southern Hemisphere autumn of 1997. Surface high pressure systems tended to "block" over southeastern Australia and sea level pressure was generally lower than normal over the central South Pacific Ocean in the region of Polynesia (Figure II.51a). The pattern of winter sea level pressure anomaly is typical for an El Niño event and is consistent with the negative values of the SOI (lower pressure over Tahiti and higher pressure over Darwin) that had become established and persisted during the period. At the same time the subtropical jetstream in the high atmosphere strengthened and moved further eastward with a maximum wind anomaly in the region of the central South Pacific Ocean (Figure II.51b).