

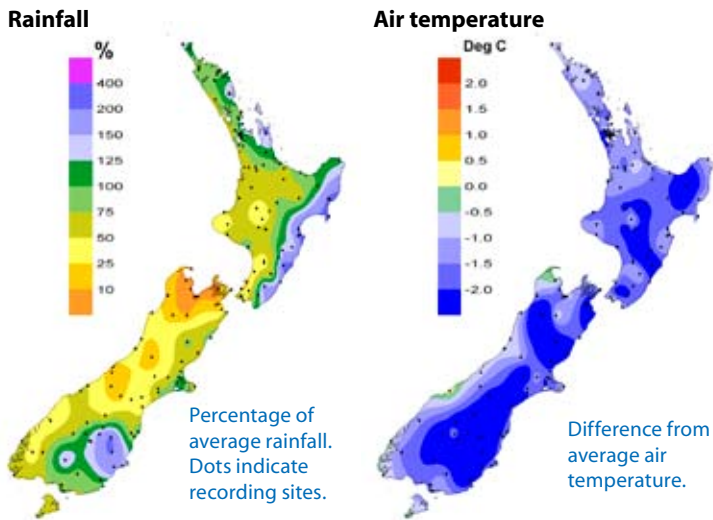
The Climate Update

A monthly newsletter from the National Climate Centre

May climate – very cold in inland areas of both islands especially at night; record low rainfall in central New Zealand and Tekapo. Low stream flows over most of the country.

Outlook for June to August – air temperatures are likely to be above average in the North Island, average or above in the north of the South Island, and near average elsewhere. Rainfall is expected to be near normal in all regions, except for normal or above normal rainfall in the east of the North Island, and normal or below normal rainfall in the southeast of the South Island.

New Zealand climate in May



During May, inland areas of much of New Zealand were very cold, especially at night. The national average temperature at 9.6 °C was 1.1 °C below average.

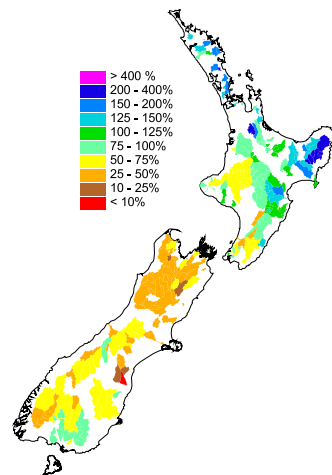
Record low rainfalls were recorded in Kapiti, Nelson and Marlborough, and the Tekapo basin; parts of Gisborne and Hawke's Bay recorded twice the normal May rainfall. It was very sunny in the west of both islands; sunshine hours were below average in Gisborne and Hawke's Bay.

For more information see www.niwascience.co.nz/ncc/cs/mclimsum_08_05

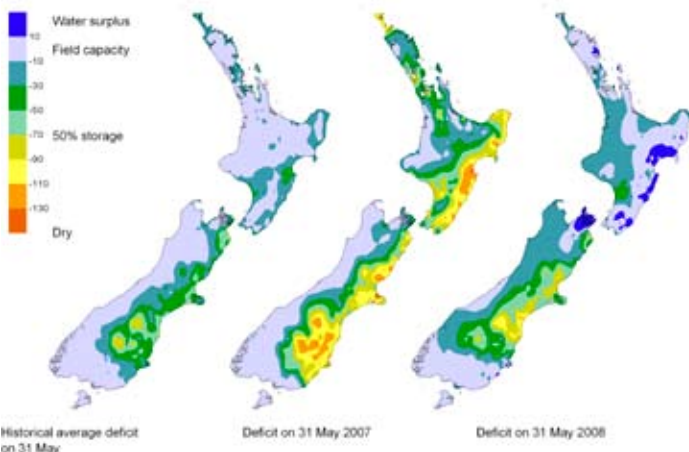
River flows

Stream flows were near normal in the northern North Island, and below normal in most other places.

Percentage of average May river and stream flows in monitored catchments. NIWA field teams, regional and district councils, and hydropower companies are thanked for providing data.



Soil moisture deficit



Water balance in the pasture root zone for an average soil type, where the available water capacity is taken to be 150 mm.

Soil moisture levels remained high during May over much of the North Island and north of the South Island. A low moisture zone persisted in South Canterbury–North Otago.

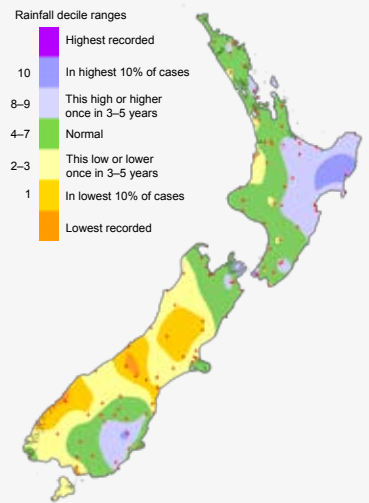
March to May — the climate we predicted and what actually happened

Rainfall

Predicted: Near normal rainfall in most places, but possibly above normal in Northland.

Outcome: Above normal rainfall in parts of eastern and northern New Zealand, and parts of Otago. Drier than usual over much of the South Island.

March to May rainfall

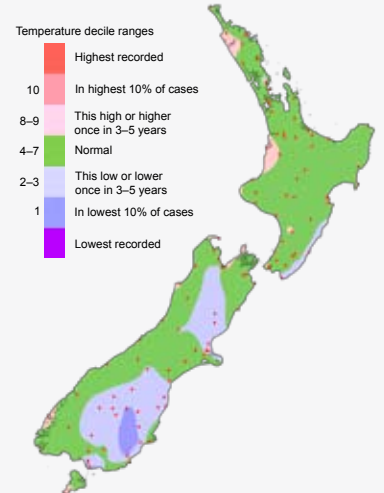


Air temperature

Predicted: Average or above average in western districts, near normal in the east.

Outcome: Most places had near average temperatures; cooler than normal in some eastern districts; warm spots in the west and north of the North Island and South Island.

March to May temperature

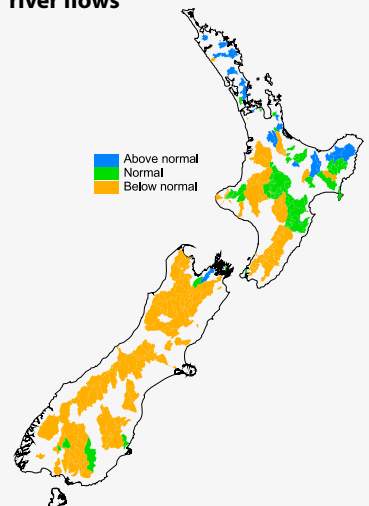


River flows

Predicted: Normal or below normal in the southwest North Island and the southern South Island, and normal elsewhere.

Outcome: Stream flows were above normal in the northern North Island, and below normal in most other locations.

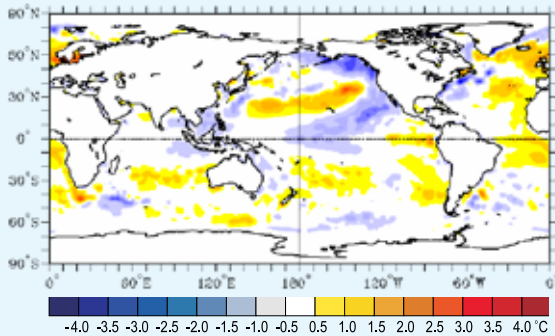
March to May river flows



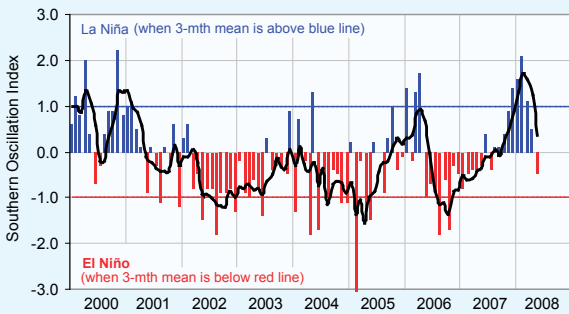
Global setting and climate outlook

La Niña weakening

La Niña conditions have continued to weaken during May, and overall the tropical Pacific ENSO indicators are close to neutral, although some remnants of La Niña persist. A positive sub-surface temperature anomaly persists west of the Date Line, and a new positive anomaly has developed near South America above 100 m. The SOI eased further in May and became slightly negative at -0.5 , with a 3-month March to May mean of $+0.4$. The near-equatorial trade winds weakened during the month.



Difference from average global sea surface temperatures for May 2008. Map courtesy of NOAA Climate Diagnostics Centre

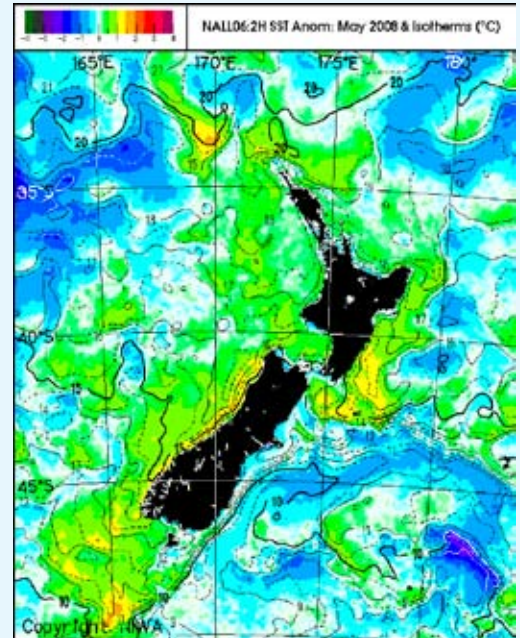


Monthly values of the Southern Oscillation Index (SOI), a measure of the changes in atmospheric pressures across the Pacific, and the three-month mean (black line).

SOI mean values:
 May: -0.5
 March to May: $+0.4$

Sea surface temperatures around New Zealand

Sea surface temperature (SST) anomalies in the New Zealand region remain above normal, as part of the remaining 'warm horseshoe' associated with La Niña in the southern extra-tropics. The May SST anomaly in the New Zealand box was around $+0.6$ °C, showing little change from $+0.7$ °C in April.



Differences from normal May surface temperatures in the seas around New Zealand.

Outlook for June to August 2008

In the New Zealand region, mean sea level pressures are expected to remain higher than normal to the south of the South Island and lower than normal to the northwest of New Zealand, with more winds from the northeast than normal over the country. Sea surface temperatures around New Zealand are expected to remain above normal.

Air temperatures are likely to be above average in the North Island, average or above in the north of the South Island, and near average

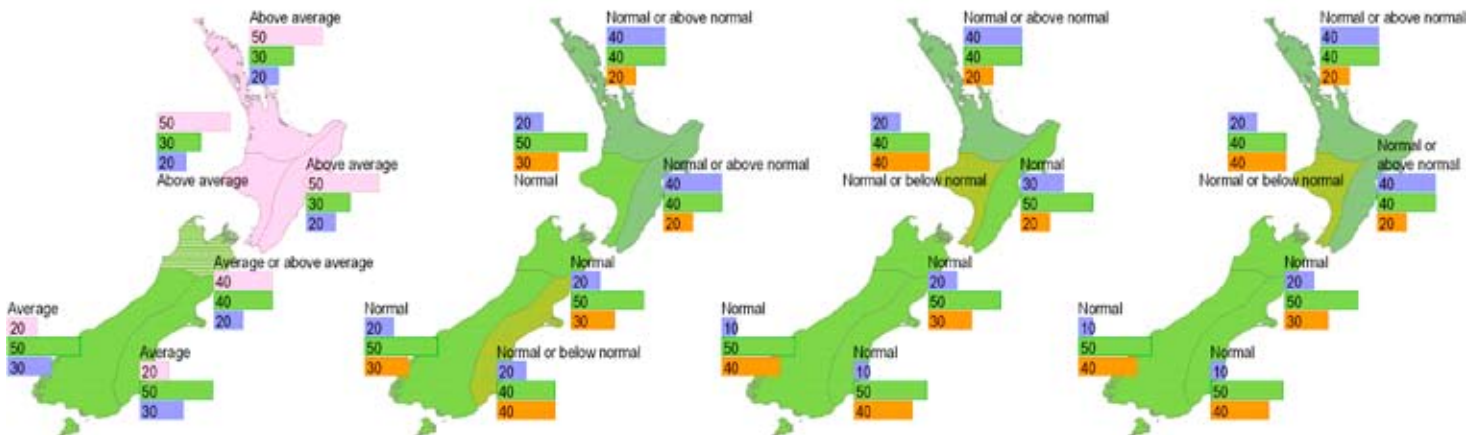
in the remainder of the South Island over winter. Rainfall is expected to be near normal in all regions, except for normal or above normal in the east of the North Island, and normal or below normal in the southeast of the South Island. Soil moisture levels and stream flows are expected to be normal or above normal in the north of the North Island, normal or below normal in the southwest of the North Island, and normal elsewhere, except for normal or above normal stream flows in the east of the North Island.

Mean air temperature

Rainfall

Available soil moisture

River flows



How to interpret these maps

In the example here the climate models suggest that below normal conditions are likely (50% chance), but, given the variable nature of the climate, the chance of normal or above normal conditions is also shown (30% and 20% respectively).

Below normal	20% chance of above normal
20	30% chance of normal
30	50% chance of below normal
50	

Samoa keeps a wary eye on the sea

Much of the population of Samoa lives on low lying coastal areas, and is vulnerable to extreme high tides, storm surges, and other coastal hazards.

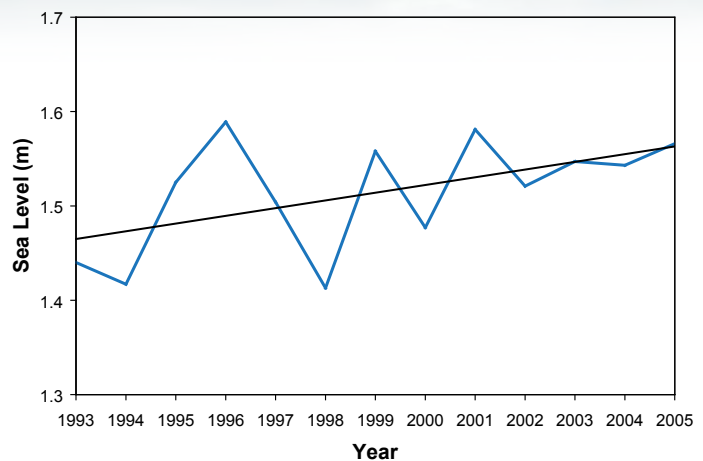
A Climate Risk Profile (CRP, see reference) prepared for Samoa in 2007 describes a number of present and future climate risks to Samoa, among which are:

- an observed average sea level rise of 5.2 mm/year, and
- an observed average maximum hourly sea level rising at a rate of 8.2 mm/year.

The adjacent figure, taken from the CRP report, shows average maximum hourly values of sea level for Apia, relative to an historical mean sea level.

Exceptionally high sea levels have caused flooding of coastal communities, accelerated coastal erosion, and salt water intrusion into groundwater. Some very high sea levels have been associated with El Niño events. Historical data show that an average hourly sea level height of 1.7 m above mean sea level is estimated to be a 1-in-40 year event. An hourly sea level of 1.8 m above the mean is estimated to occur only about once in 230 years.

The CRP notes the large interannual variability, but also a long-term trend of increasing average sea level. The report estimates that a mean sea level rise of 36 cm is likely by 2050, and that the frequency of high sea level events is likely to increase with climate change.



Average maximum hourly sea level relative to mean sea level for Apia, by year (1993 to 2005). Also shown is the linear trend in sea level over the same period (8.2 mm/yr). Reproduced from Young, 2007.

The cover picture of this publication shows a section of coastal protection work undertaken by the Government of Samoa, designed to protect coastal communities from current and future adverse coastal conditions.

Reference:
Climate Risk Profile for Samoa. Wairarapa J Young, Samoa Meteorological Division, Ministry of Natural Resources and Environment, Samoa. (March 2007).



Sea wall near Apia, Samoa – part of a coastal infrastructure management strategy that has been developed to protect vulnerable coastal communities.
Cover photo: Alan Porteous

The Climate Update is a monthly newsletter from NIWA's National Climate Centre, and is published by NIWA, Private Bag 14901, Wellington. It is also available on the web. Comments and ideas are welcome. Please contact Alan Porteous, Editor
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