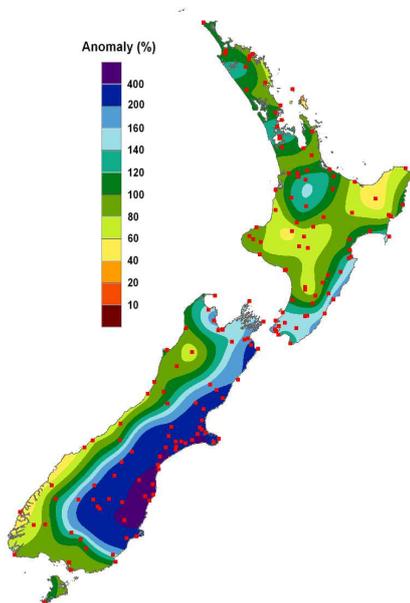


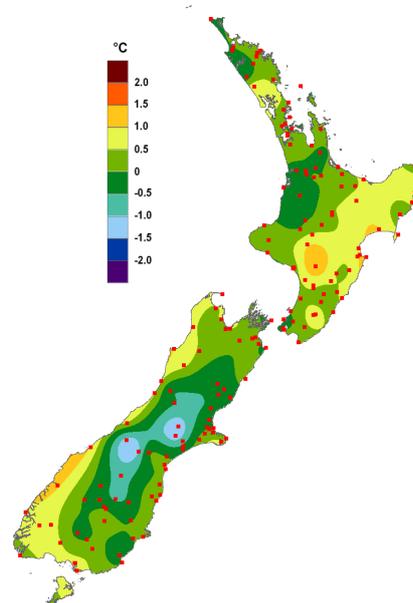
New Zealand Climate Update No 169, July 2013

Current climate – June 2013

June was characterised by lower pressures than normal across New Zealand and to the north and northeast of the country, with persistent high pressure centres south and southeast of Tasmania. This resulted in an anomalous east-southeasterly flow over the South Island, which contributed to well above normal rainfall totals recorded throughout areas to the east of the Southern Alps. Of particular note was the storm of 19-21 June, which brought the strongest sustained 10-minute winds that Wellington airport has seen since 1985. These strong winds resulted in widespread damage to infrastructure and vegetation in Wellington, and a loss of power for up to 30,000 homes. In addition, cold south-southeasterly winds associated with the storm resulted in a significant snowfall event across the South Island. Areas of the Mackenzie Country and the Maniototo bore the brunt of snowfalls, with unofficial reports of more than half a metre of snow. Most South Island ski areas received in excess of one metre of new snow by the end of the storm, with Mt Hutt inundated by an estimated new snowfall total approaching three metres.

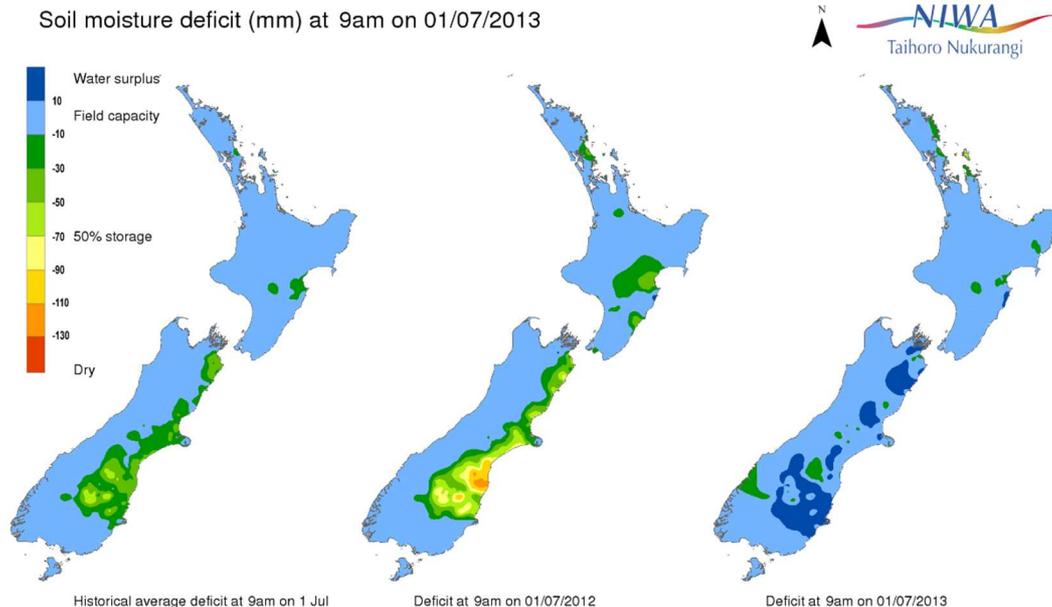


Percentage of normal rainfall, June 2013



Departure from average air temperature for June 2013

Soil moisture deficit (mm) at 9am on 01/07/2013



Historical average deficit at 9am on 1 Jul

Deficit at 9am on 01/07/2012

Deficit at 9am on 01/07/2013

End of month water balance in the pasture root zone for an average soil type, where the available water capacity is 150mm.

Rainfall

June was a relatively wet month for eastern and northern parts of the South Island, as well as southern and south-eastern parts of the North Island. Locations throughout Central Otago recorded their wettest June since respective records began, as did Timaru and Lincoln in Canterbury. Areas of North Otago, South and mid-Canterbury received more than 400 percent of June normal rainfall. More than 200 percent of June normal rainfall was recorded in parts of South Otago, Central Otago, Mackenzie Country, North Canterbury and Marlborough. Similarly, Nelson, Wellington and the Wairarapa Coast experienced well above normal rainfall for the month (greater than 150 percent of June normal rainfall), and above normal rainfall (between 120 and 150 percent of June normal rainfall) was recorded in parts of northern Southland and Waikato. In contrast, rainfall was below normal (50 to 79 percent of June normal rainfall) in parts of Fiordland, West Coast, Manawatu, inland Taranaki and eastern Bay of Plenty. As at 1 July, soil moisture levels across the majority of New Zealand had reached field capacity. Areas of Otago, Canterbury and Marlborough were wetter than normal for the time of year, and were also observing a soil water surplus. Below normal soil moisture deficit levels were observed in northern parts of the Coromandel Peninsula and Great Barrier Island.

Air temperature

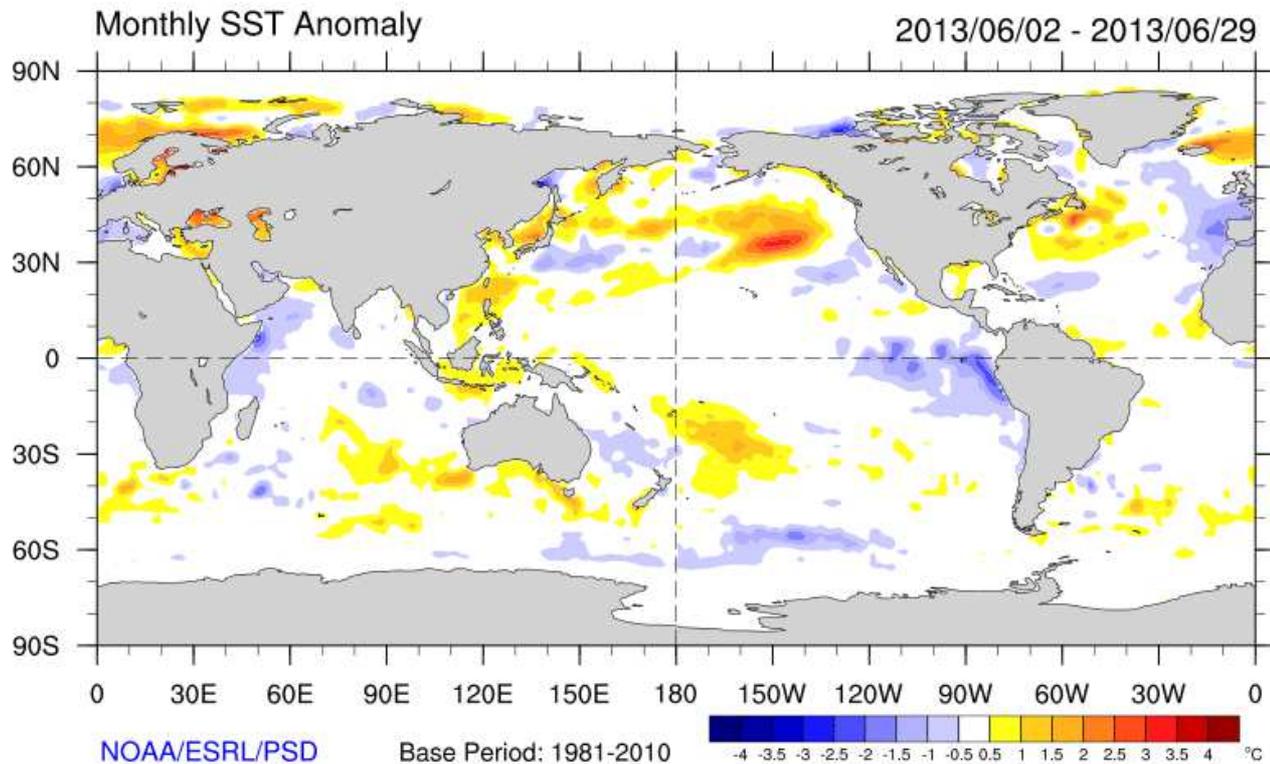
Mean temperatures for June were above average (0.5 to 1.2°C above the June average) across areas of southern and western Southland, Fiordland, Westland, Manawatu, Hawke's Bay, Gisborne and Bay of Plenty. June temperatures throughout inland Canterbury were below average (0.5 to 1.2°C below the June average). In general, June temperatures were near average throughout the remainder of the country (within 0.5°C of June average). The interim nation-wide average temperature in June 2013, using only six stations (most of the month was missing for Nelson owing to vandalism at the site) from NIWA's seven-station temperature series which begins in 1909 is 8.9°C, an anomaly of +0.4°C.

Sunshine

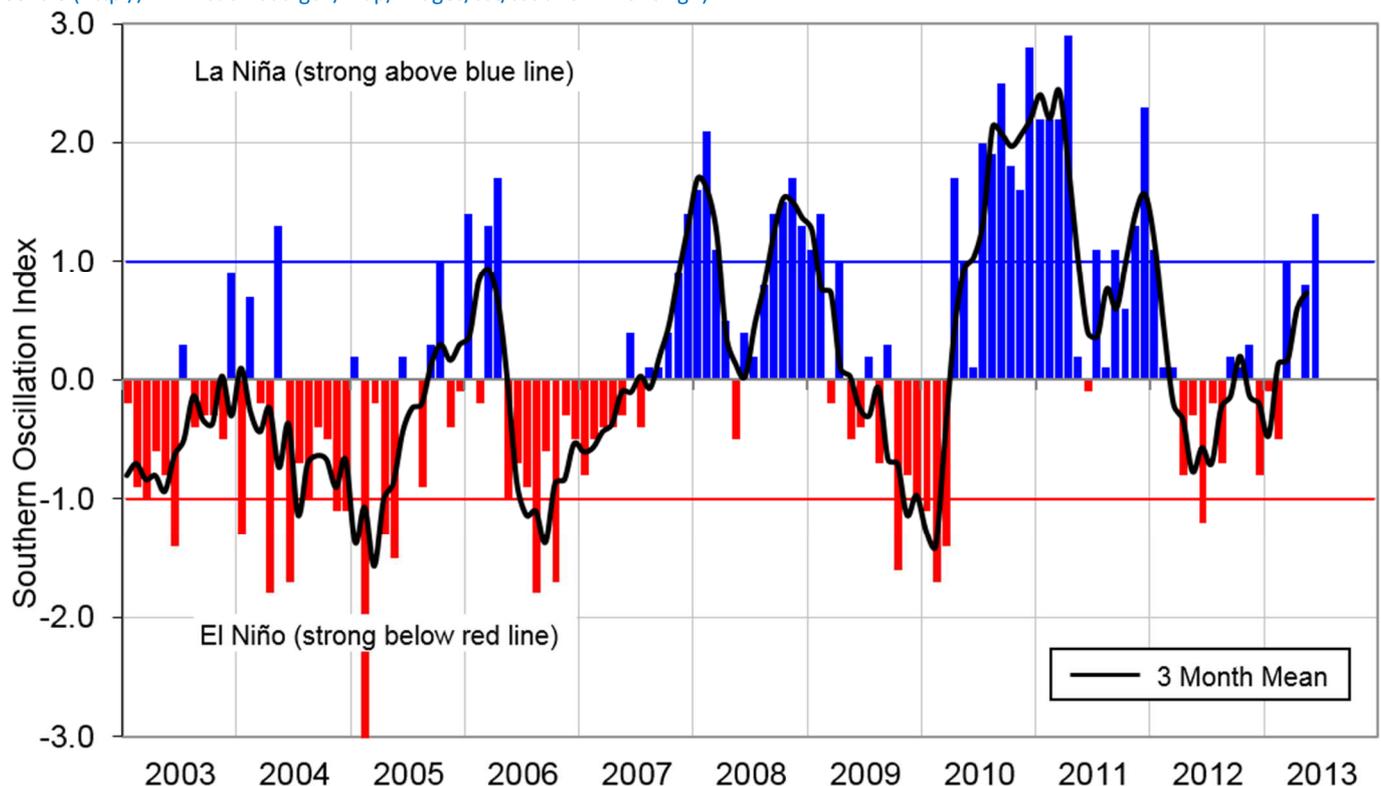
Sunshine hours for June were above normal (110 to 124 percent of June normal) for northern Manawatu and western Southland. Sunshine was well above normal (more than 125 percent of June normal) in Fiordland and southern Westland. Sunshine hours were below normal (75-90 percent of June normal) throughout areas of Otago, Marlborough, Tasman, Nelson, Wellington and coastal Taranaki. Of the available, regularly reporting sunshine observation sites, the sunniest four centres so far in 2013 (January to June) are: Whakatane (1435 hours), New Plymouth (1390 hours), Blenheim (1273 hours) and Paraparaumu (1261 hours).

Global setting

The equatorial Pacific Ocean remains in a neutral state (neither El Niño nor La Niña). International guidance indicates that these neutral conditions are likely to persist for at least the coming three months (July–September). For the New Zealand region, higher pressures than normal are forecast south of the country, with slightly lower pressures than normal in the north Tasman Sea. This circulation pattern is likely to produce a weak easterly flow anomaly over the country.



Differences from average global sea surface temperatures for 2nd of June to 29th of June 2013. Map courtesy of NOAA Climate Diagnostics Centre (<http://www.cdc.noaa.gov/map/images/sst/sst.anom.month.gif>).



Monthly values of the Southern Oscillation Index (SOI), a measure of changes in atmospheric pressures across the Pacific, and the 3-month mean (black line). SOI mean values: June SOI +1.4; April to June average +0.7.

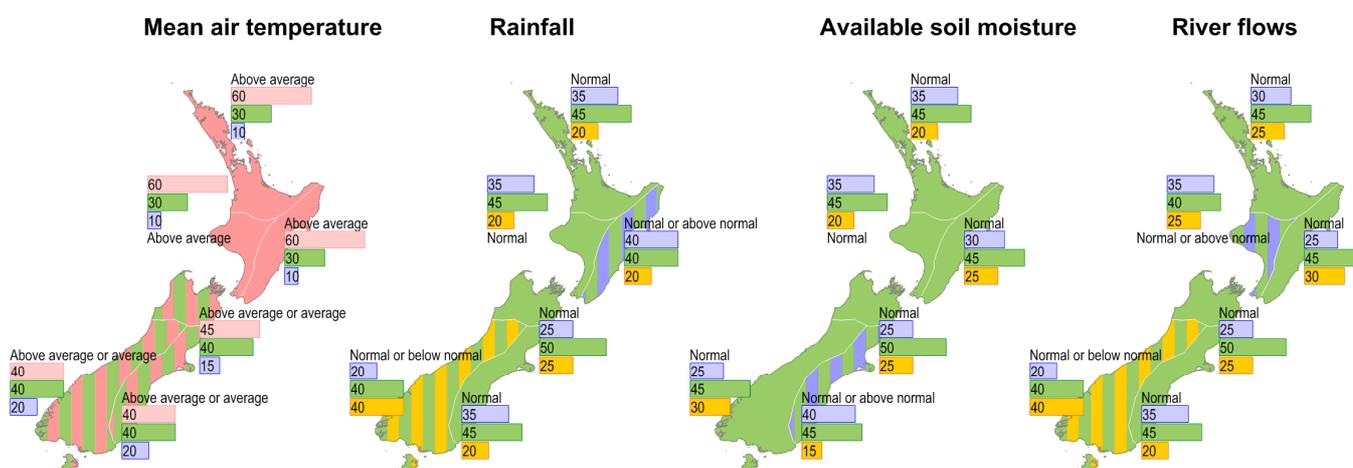
Outlook – July to September 2013

Temperatures late winter (July–September) temperatures are very likely to be above average in North Island regions, and likely to be average or above average in all South Island regions. Nevertheless, cold snaps, frost and snow conditions will of course still occur in many areas from time to time, as is typical of this time of year.

Rainfall for the July–September period as a whole is likely to be normal or above normal in the east of the North Island, normal or below normal in the west and south of the South Island, and in the near normal range for all other regions.

Soil moisture levels are likely to be normal or above normal in the east of the South Island, and near normal in other regions. **River flows** are likely to be normal or above normal in the southwest of the North Island, normal or below normal in the west and south of the South Island, and near normal in other regions.

Outlook for July–September 2013



Key to maps (example interpretation)

Below normal
 Upper tercile: 20% chance of above normal 20
 Middle tercile: 30% chance of normal 30
 Lower tercile: 50% chance of below normal 50

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

The climate we predicted (April to June) and what happened

Predicted rainfall: Rainfall is likely to be in the near normal range for all regions.

Outcome: Rainfall was above normal in Auckland, Waikato, Bay of Plenty, Taranaki, Wellington, Tasman, Marlborough, Canterbury and Otago regions. Normal rainfall few elsewhere.

Predicted air temperature: Temperatures are likely to be above average across the North Island, and are very likely to be above average across the South Island.

Outcome: Temperatures were indeed above average across most of the North Island but were near average over much of the South Island.

For more information about NIWA's climate work, visit:

www.niwa.co.nz/our-science/climate