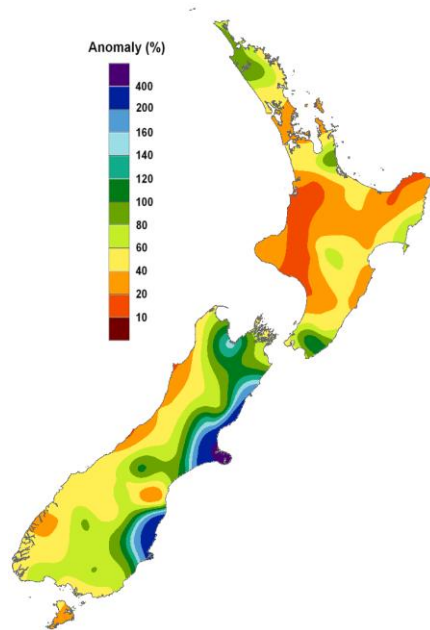


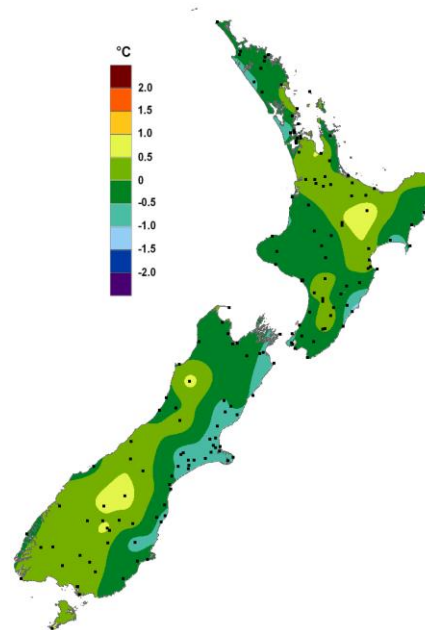
## New Zealand Climate Update No 178, April 2014

### Current climate – March 2014

March 2014 was characterised by anomalously high pressure over much of New Zealand, and in particular, over the South Island. In spite of the overall surface pressure regime being abnormally high, there were periods of lower pressure, which contributed to the occurrence of a few moderate-to-heavy rainfall events during the month.

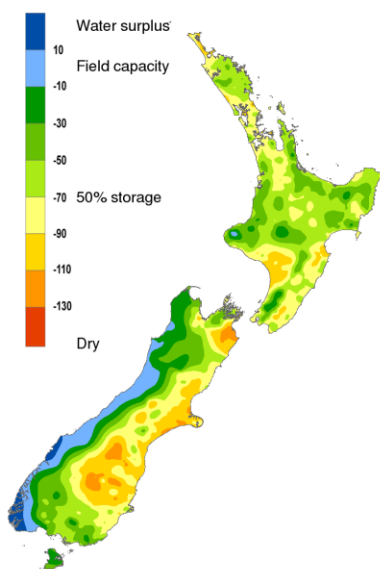


Percentage of normal rainfall, March 2014

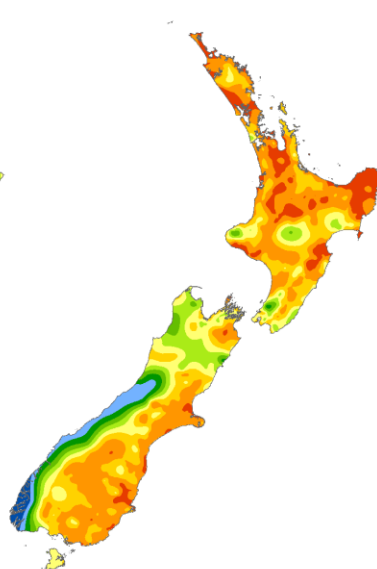


Departure from average air temperature for March 2014

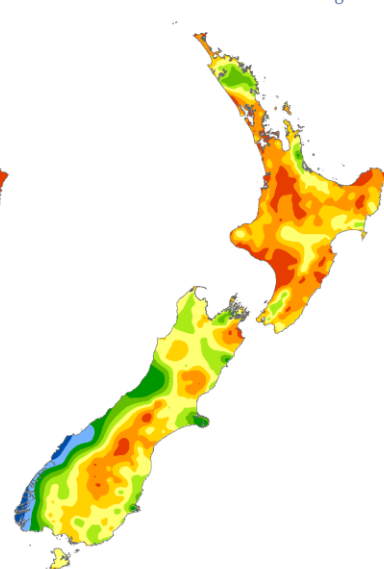
Soil moisture deficit (mm) at 9am on 31/03/2014



Historical average deficit at 9am on 31 Mar



Deficit at 9am on 31/03/2013



Deficit at 9am on 31/03/2014



## Rainfall

For the most part, with regards to rainfall on the North Island, March picked up where February ended as abnormally dry conditions were experienced for the start of autumn. Well below normal rainfall (less than 50% of March normal) occurred for a sizeable part of the North Island between the Manawatu-Wanganui and Auckland regions. In fact, numerous locations placed in their top three for driest March on record. This includes Hamilton, which experienced its second driest March on record with only 6 mm of rain accumulating for the month (records go back to 1935). There were patches of near normal (within 20% of normal) rainfall on the North Island including the Wellington and eastern Hawke's Bay regions. Isolated areas of above rainfall (120-149% of normal) or well above normal rainfall (more than 149% of March normal) occurred on the hills around the Coromandel Peninsula, largely due to the impacts of ex-tropical cyclone Lusi during the middle part of the month.

On the South Island, the vast majority of the West Coast, Fiordland and Stewart Island recorded below normal rainfall (50-79% of March normal) or well below normal rainfall. Conversely, above normal to well above normal rainfall was experienced for eastern areas of the Canterbury and Otago regions, where Christchurch and Dunedin reported well above March rainfall. In fact, Christchurch (Riccarton) endured its wettest March on record (records go back to 1863). Additionally, of the 200mm that fell during the month at Christchurch (Riccarton), 123mm accumulated in one day (4 March), which is now the greatest one day March rainfall on record for the city. Otherwise, near normal rainfall was the theme for much of the central portion of the South Island.

## Air temperature

Temperatures during the first month of autumn in New Zealand were near average (within 0.5°C of March average) for a large part of the country. Notable exceptions include pockets of below average temperatures (0.5-1.2°C below March average) for coastal areas from the southern Gisborne, northern Hawke's Bay and far southeast coastal Manawatu-Wanganui regions. The March temperature regime for South Island was comparable to the North Island with near average values for March. One exception, however, was a sizeable area of below average temperatures along coastal sections of the South Island from the Marlborough region south through to the northern Otago region. Within this zone there were even spotty areas of well below normal temperatures (greater than 1.2°C below March average) particularly in and around the Banks Peninsula. The nation-wide average temperature in March 2014 was 15.3°C (0.5°C below the 1971-2000 March average from NIWA's seven station temperature series which begins in 1909).

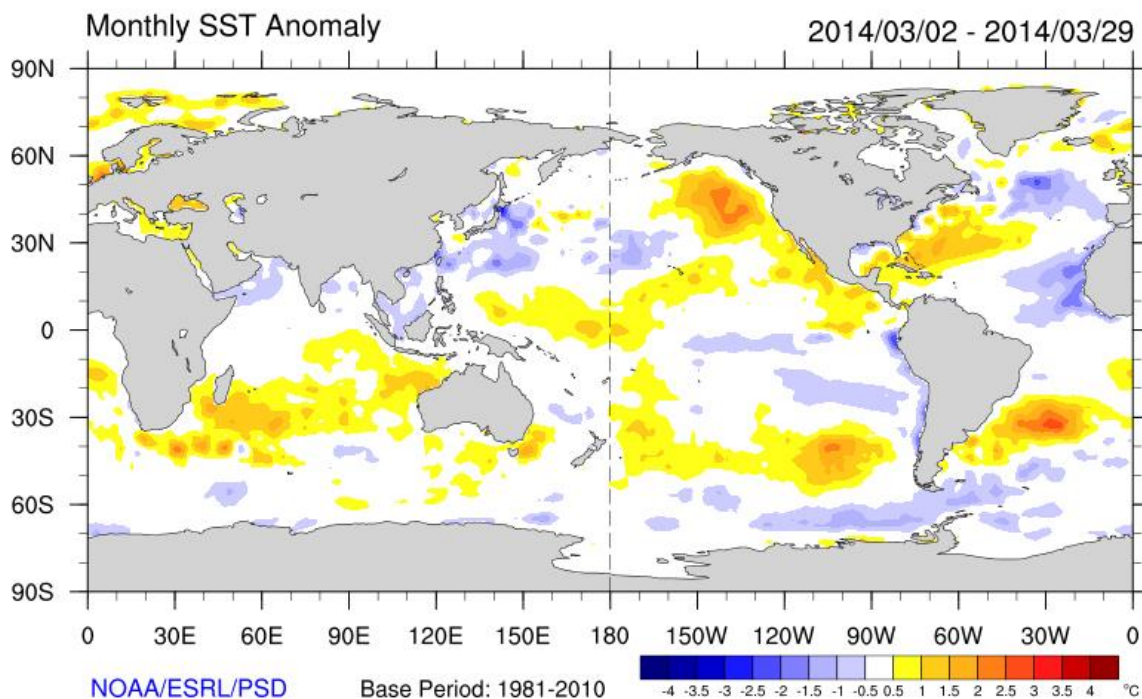
## Sunshine

The lack of rainfall for much of the North Island was combined with an abundance of early autumn sunshine for much of the island. In fact, above normal sunshine (110-124% of March normal) was recorded from the Auckland region south through much of interior and eastern portions of the North Island. It was an especially bright start to autumn for the Waikato region where well above normal sunshine (more than 125% of March normal) occurred. Slightly below normal sunshine was experienced in Wellington. For the South Island, near normal sunshine occurred (within 10% of March normal) for most areas. Outliers include Dunedin and north-central portions of the South Island where sunshine was above normal.

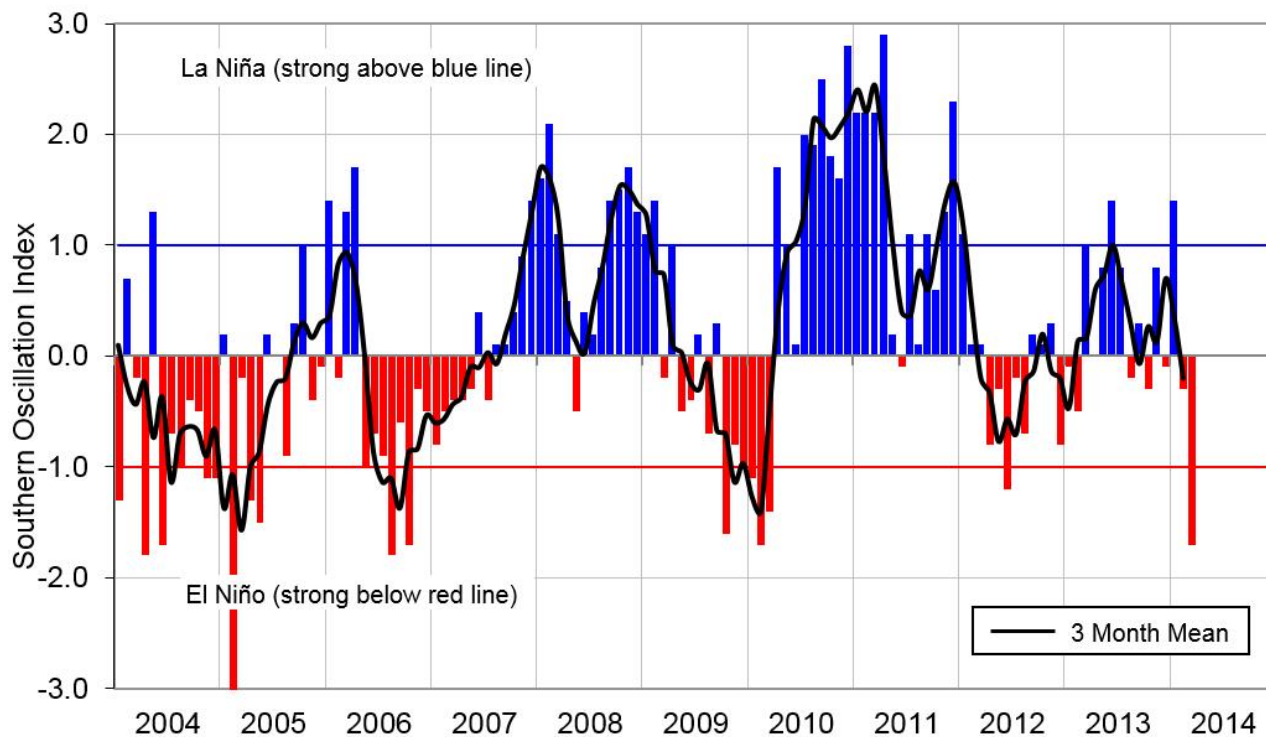
## Global setting

The equatorial Pacific Ocean continued in a neutral ENSO-state (neither El Niño nor La Niña) in March 2014. While the Pacific east of the Dateline remains slightly cooler than normal, warmer than normal sea-surface temperatures have appeared off the South American near the Equator. Subsurface measurements show the Ocean is storing a large amount of anomalous heat at depth. International guidance indicates that ENSO-neutral conditions are the most likely outcome for April-June 2014, however in the following season the probability of El Niño increases to about 50% chance.

During April–June 2014, mean sea level pressures are expected to be higher than normal to the south and east of the country, with lower pressures than normal to the north of New Zealand. These anomalies are expected to be accompanied by weak easterly flow anomalies and perturbed conditions from time to time.



Differences from average global sea surface temperatures for 2nd of March 2014 to 29th of March 2014. 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: March SOI -1.7; January to March average -0.2

## Outlook – April to June 2014

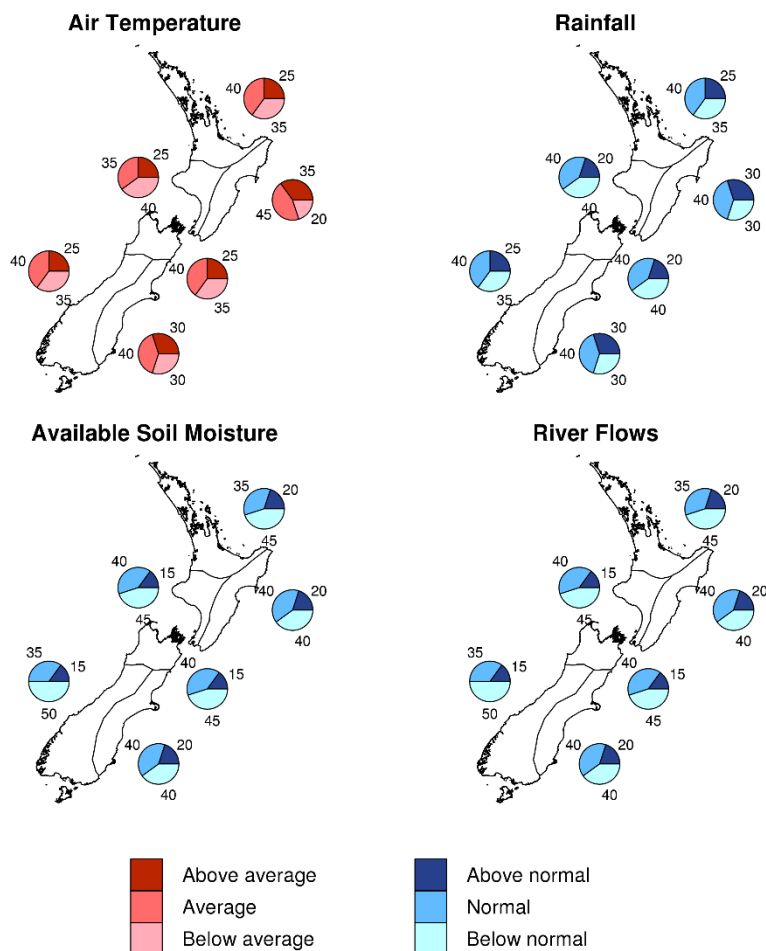
April–June **temperatures** are forecast to be average or below average for the north and west of both Islands. Average temperatures are most likely for the east of the North Island and the east of the South Island. Cold snaps and frosts can be expected in some parts of the country as autumn progresses.

April–June **rainfall** is likely to be near normal or below normal for the north and west of the North Island and north and west of the South Island. For the eastern regions of both Islands, rainfall is most likely to be in the near-normal range.

**Soil moisture** levels and river flows are most likely to be in the below normal range for the north of the North Island and the west of the South Island. Near normal or below normal soil moisture levels and river flows are forecast for the remaining regions of New Zealand.

For the remainder of the **tropical cyclone** season (through the end of April), the risk of an Ex-Tropical Cyclone (ETC) approaching New Zealand is expected to be close to normal. Based on the long-term record, ETCs come within 550km of New Zealand for 9 out of every 10 years. While the most common time when these storm systems approach New Zealand typically occurs during February-March, late season ETCs have occurred in the past and cannot be ruled out.

### Outlook for April - June 2014



Graphical representation of the regional probabilities, Seasonal Climate Outlook, April - June 2014.

## The climate we predicted (January to March) and what happened

**Predicted rainfall:** Rainfall is forecast to be equally likely (40% chance) to be normal or above normal in the north of the North Island, and normal or below normal in Nelson-Marlborough. In all other regions, the 3-month rainfall totals are most likely (45-50% chance) to be in the near normal category.

**Outcome:** Actual rainfall for the forecast period was drier than expected across all regions of the North Island, with rainfall totals less than 40% of normal recorded across the Waitomo, Matamata-Piako, South Waikato, Ruapehu, Taupo, Rotorua and Whakatane Districts. Lower than normal rainfalls (between 80-60% of normal) were also observed across many areas of the South Island. In contrast, pockets of above normal rainfall (>120% normal) were recorded across the coastal fringes of the Districts of Christchurch City, Banks Peninsula and Waitaki.

**Predicted air temperature:** Temperatures are most likely (50% chance) to be above average for North Island regions, and equally likely (40% chance) to be average or above average for South Island regions.

**Outcome:** Actual temperatures for the forecast period were normal for many parts of the North Island with areas of below normal temperatures recorded in the Far North, Kaipara, Whitianga, Otorohanga, Rotorua, Waitomo, Wairoa, New Plymouth, Ruapehu, Central Hawkes Bay and coastal areas of the Wellington Region. In the South Island, cooler than normal temperatures were also recorded in the Tasman, Marlborough, Westland, Hurunui, Selwyn, Ashburton, Dunedin City and Clutha Districts as well as western areas of Southland. Temperatures were near normal in other areas of the South Island.

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

[www.niwa.co.nz/our-science/climate](http://www.niwa.co.nz/our-science/climate)