NEW ZEALAND

Climate Update

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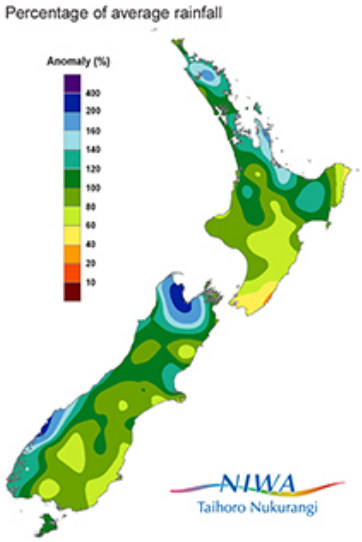
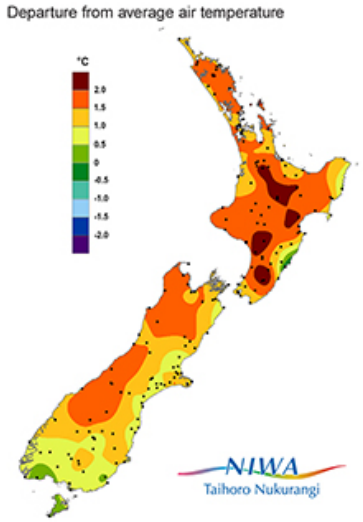
New Zealand Climate Update No 202, April 2016

Current climate – March 2016

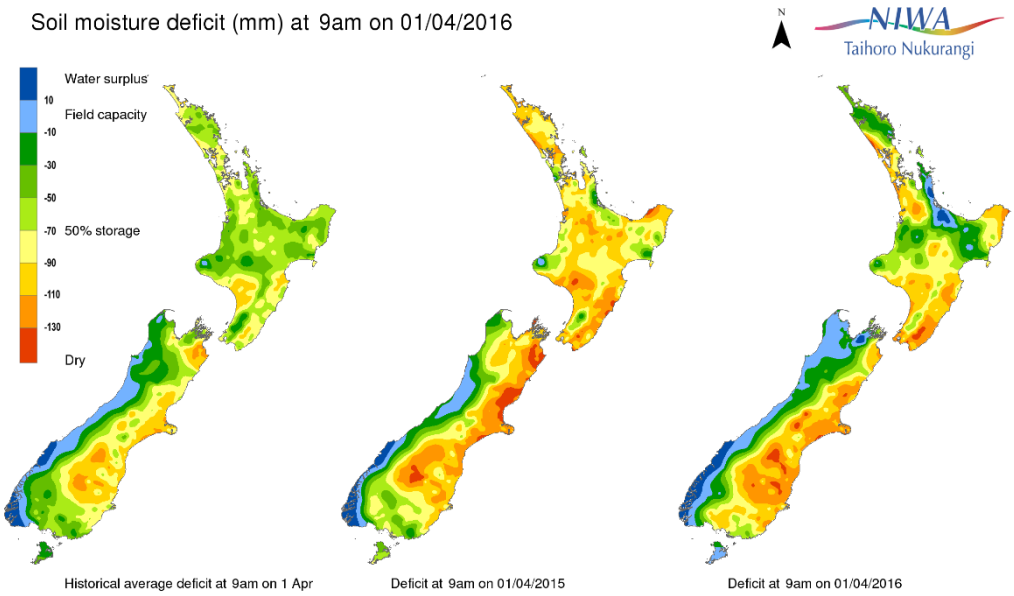
During March 2016, El Niño conditions prevailed in the tropical Pacific but continued to weaken. Typically, more westerly to south-westerly air flows over New Zealand are associated with El Niño during the autumn season. However, this was not the case this month as significantly higher than normal pressure was present to the east of New Zealand and extended over the country. This pressure pattern produced more north-easterly winds than usual over New Zealand.



Percentage of normal rainfall for March 2016



Departure from average air temperature for March 2016



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

Rainfall: Rainfall was more than double (>200%) the March normal in Nelson and Tasman. Takaka experienced its wettest March on record. Rainfall was also well above normal (>149% of March normal) in parts of Northland, the Coromandel Peninsula, western Bay of Plenty, Rotorua, Whanganui, and the west coast of the South Island. Conversely, rainfall was well below normal (<50% of March normal) for southern Northland, parts of Auckland, around Hamilton, the greater Wellington region, Banks Peninsula, coastal Otago (including Dunedin), and Invercargill.

Air temperature: The increased prevalence of air flow from the northeast during March caused warm, tropically-derived air masses to travel over New Zealand. Most of the country, but particularly the North Island, recorded well above average (>1.20°C above March average) or above average (+0.51°C to +1.20°C above March average) temperatures for the month. Parts of Northland, Waikato, Manawatu-Whanganui, and Westland recorded more than 2.0°C above the March average. Remarkably, almost every climate station around the country recorded above average or well above average mean temperatures for March.

Sunshine Sunshine was generally near normal (90-109%) for most of the country, with pockets of above normal sunshine (110-125%) in northern areas and below normal sunshine (75-89%) in western and southern parts of the South Island.

Soil Moisture: As at 1 April 2016, soil moisture levels were above normal for the time of year for parts of Northland, Coromandel Peninsula, Bay of Plenty, eastern Waikato, northern Hawke's Bay, Nelson, Tasman, Fiordland, and Stewart Island. Drier than normal soils were evident for the remainder of the North Island and the eastern and southern South Island, in particular for Southland.

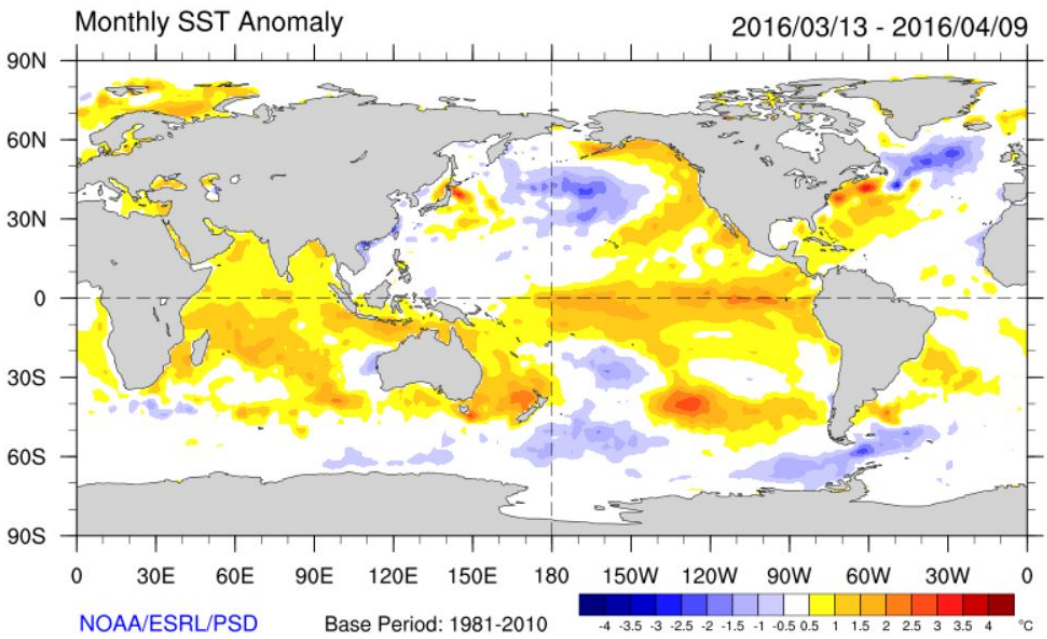
Global setting

El Niño conditions continued in the Tropical Pacific during March 2016, but the current event has clearly entered its decaying phase.

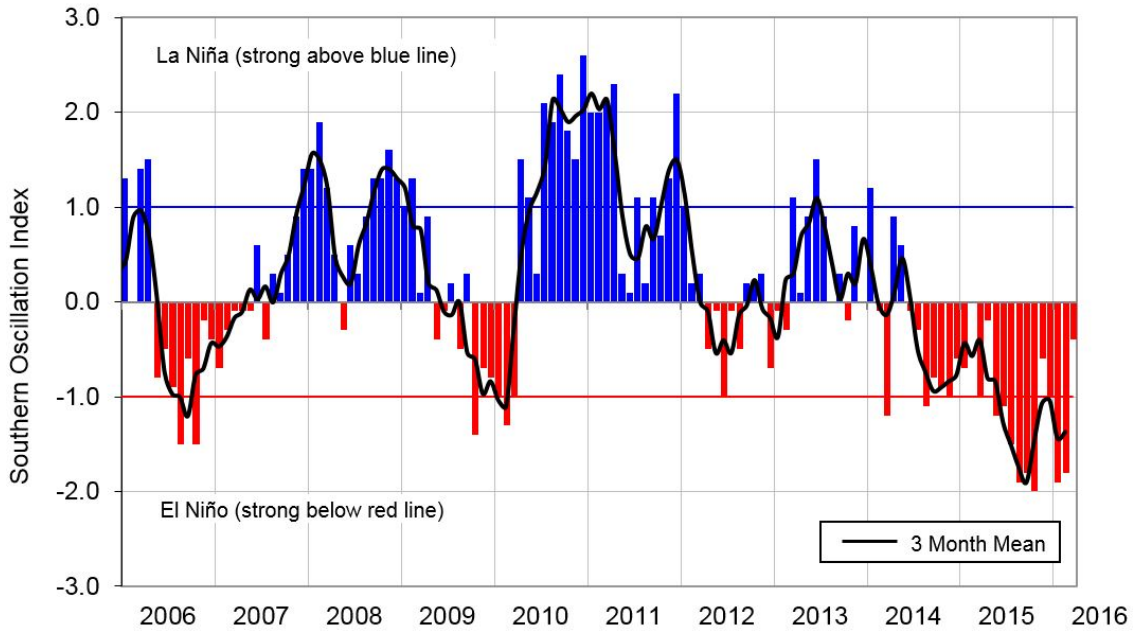
Sea surface temperature (SST) anomalies in the central and eastern Equatorial Pacific weakened further in March, with all SST indices now much weaker than 2°C above normal. The warmer sub-surface temperature anomalies across the eastern pacific have also weakened, while deeper cooler waters have spread eastward from the western Pacific. These changes in sub-surface temperatures make it very likely that the current SST anomalies will retreat further towards average in the next few months. Meanwhile, the Southern Oscillation Index (SOI) also weakened over March 2016 and the latest value (estimated on the 30th of March) is about -0.5.

International guidance indicates that El Niño is likely to weaken further over the next three months (April – June 2016) and the forecast is for a return to normal conditions or a transition toward La Niña by July – September 2016. La Niña conditions become increasingly likely towards the end of 2016 (over 45% chance for October – December 2016).

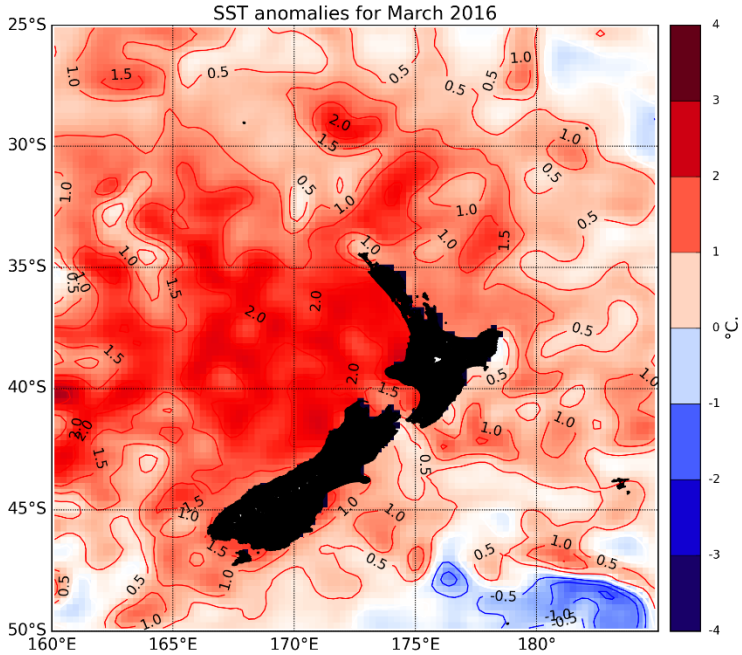
For April -June 2016, above normal pressure is forecast to the north of New Zealand. This circulation pattern is likely to be accompanied by weak anomalous westerly wind flow.



Differences from average global sea surface temperatures for 13 March 2016 – 9 April 2016. 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 -0.4; January to March average -1.4.



Differences from average March surface temperatures in the seas around New Zealand.

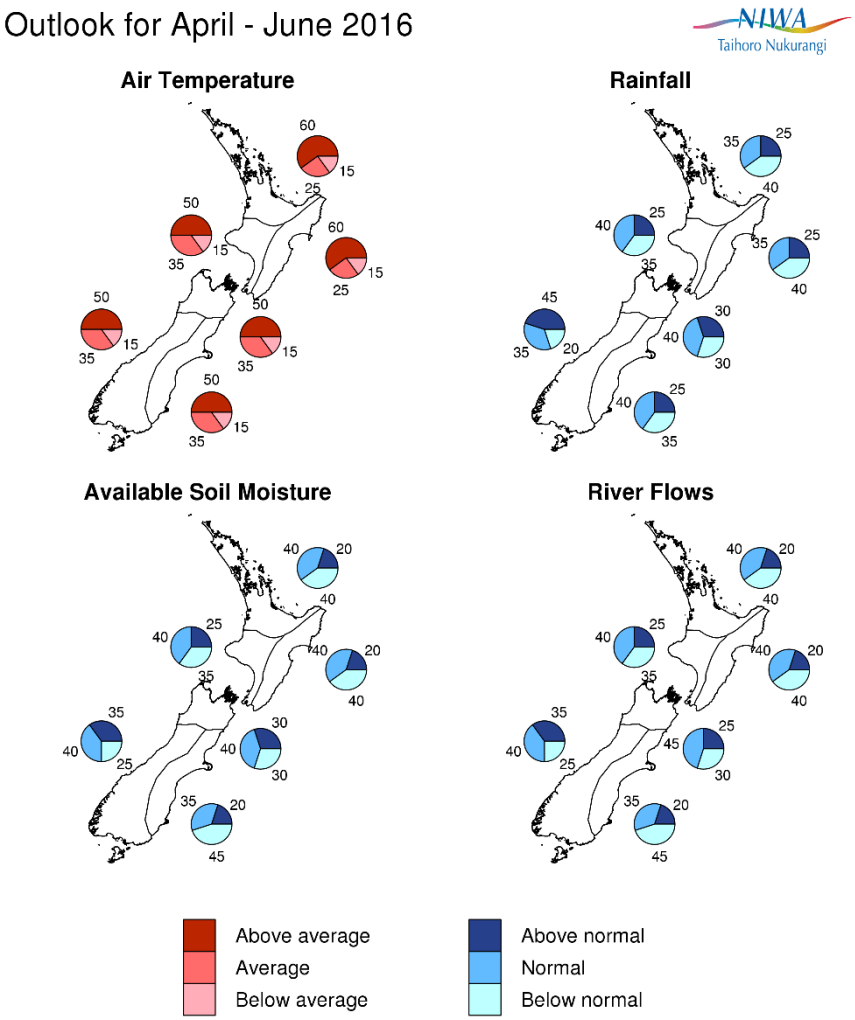
Outlook – April 2016 to June 2016

Temperatures are most likely (50 to 60 % chance) to be above average for all regions of New Zealand. Nevertheless, as we reach into winter, frosts are likely to occur from time to time in cooler locations.

Rainfall is about equally likely to be in the below normal (35-40% chance) or near normal (35-40% chance) range in all regions of the North Island and the east of the South Island. Near normal rainfall is most likely (40% chance) in the north of the South Island. In the west of the South Island, seasonal rainfall totals are most likely to be above normal (45% chance).

Soil moisture levels and River Flows are about equally likely to be in the below normal (35-45% chance) or normal range (40% chance) for the North Island. In the north of the South Island, soil moisture levels and river flows are most likely (40-45% chance) to be in the near normal range. Seasonal soil moisture levels and river flows are both most likely (45% chance) to be below normal in the east of the South Island, and about equally likely to be normal (40% chance) or above normal (35% chance) in the west of the South Island.

Sea surface temperatures (SSTs) aound New Zealand are forecast to be above average, particularly to the west of the country.



Graphical representation of the regional probabilities, Seasonal Climate Outlook, April – June 2016.

The climate we predicted (January 2016 – March 2016) and what happened

Predicted rainfall: January - March 2016 rainfall was most likely to be below normal for the north of the North Island. Seasonal rainfall totals were about equally likely to be near normal or below normal for the remaining regions of the North Island and the north and east of the South Island. January - March 2016 rainfall was most likely to be above normal for the west of the South Island.

Outcome: Actual rainfall was above normal in several districts including: The Far North, Auckland, Thames-Coromandel, Hauraki as well as the Bay of Plenty, Nelson, Tasman and Marlborough regions. Conversely, seasonal rainfall was below normal from Central Hawkes Bay south through to Wellington.

Predicted air temperature: January - March 2016 temperatures were most likely to be above average for the east of the North Island. Temperatures were about equally likely to be near average or above average for all remaining regions of the country.

Outcome: Actual seasonal temperatures were above average for virtually the entire country with the exception of Stuart Island where seasonal temperature was near average. Temperature anomalies in excess of 2°C above normal were recorded at several locations in the central North Island.

Predicted air pressure: January-March 2016, above normal pressure was forecast to the north of New Zealand, while below normal pressure was expected to the south of the country. This circulation pattern was likely to be accompanied by anomalous westerly wind flows – a signature consistent with El Niño.

Outcome: Actual pressures were above normal over and to the east of New Zealand. This pressure set-up resulted in north-easterly flow anomalies over the North Island and north-westerly flow anomalies over the South Island.

For more information about NIWA's climate work, visit: www.niwa.co.nz/our-science/climate