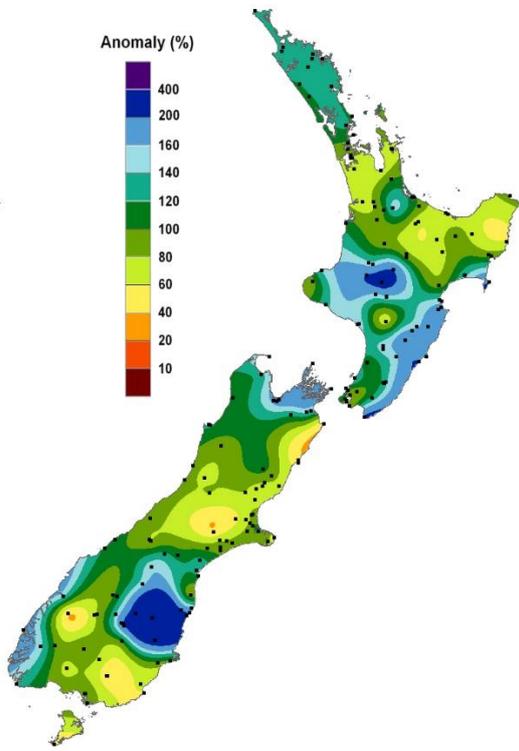


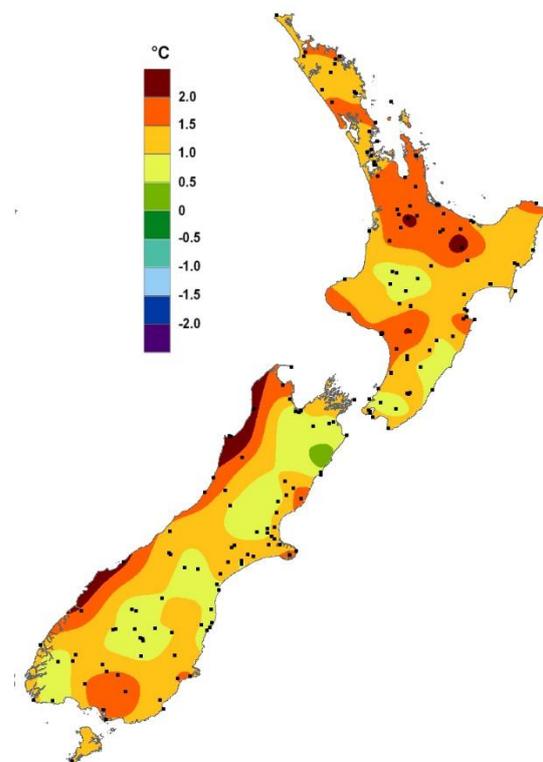
**New Zealand Climate Update No 226, April 2018**

**Current climate – March 2018**

March 2018 was characterised by significantly higher pressure than normal to the east of New Zealand. This pressure pattern, in concert with the decaying La Niña in the tropical Pacific, caused more northeasterly winds than usual over the country. These warm, humid air masses, combined with the remnants of the marine heatwave in the Tasman Sea, influenced higher than usual temperatures over New Zealand as well as some heavy rainfall events.

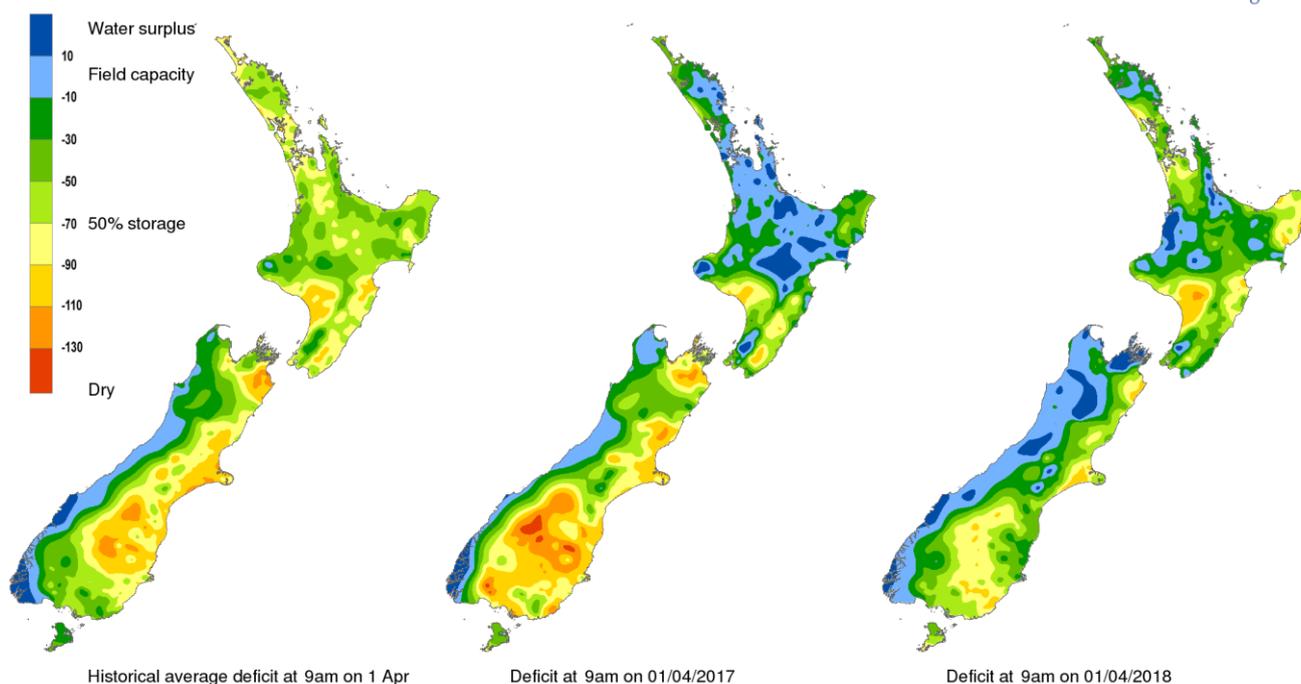


Percentage of normal rainfall for March 2018



Departure from average air temperature for March 2018

## Soil moisture deficit (mm) at 9am on 01/04/2018



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 well above normal (>149% of normal) in the central North Island, the eastern North Island (south of Napier), Kapiti Coast, Nelson, south Canterbury, north and central Otago, and Fiordland. Rainfall was above normal (120-149% of normal) in Northland, the southern half of the North Island, and Tasman. Below normal rainfall (50-79%) was experienced in isolated patches of Auckland, Waikato, Bay of Plenty, East Cape, Christchurch, Dunedin, and Southland. Near normal rainfall (80-119% of normal) was observed elsewhere.

**Temperature:** Mean temperatures were above average (0.51 to 1.20°C of average) or well above average (>1.20°C of average) across New Zealand, with isolated parts of Tasman and Southland experiencing near average temperatures (-0.50 to 0.50°C).

**Soil Moisture:** As of 31 March, soils were wetter than normal for the time of year across most of New Zealand. Soils were drier than normal in East Cape, Manawatu-Whanganui, eastern Southland, and Stewart Island.

## Global setting: March 2018

Weak La Niña conditions continued in the tropical Pacific during March 2018, but trends in low-level winds and in sub-surface ocean temperatures during the month indicate that the event is coming to an end.

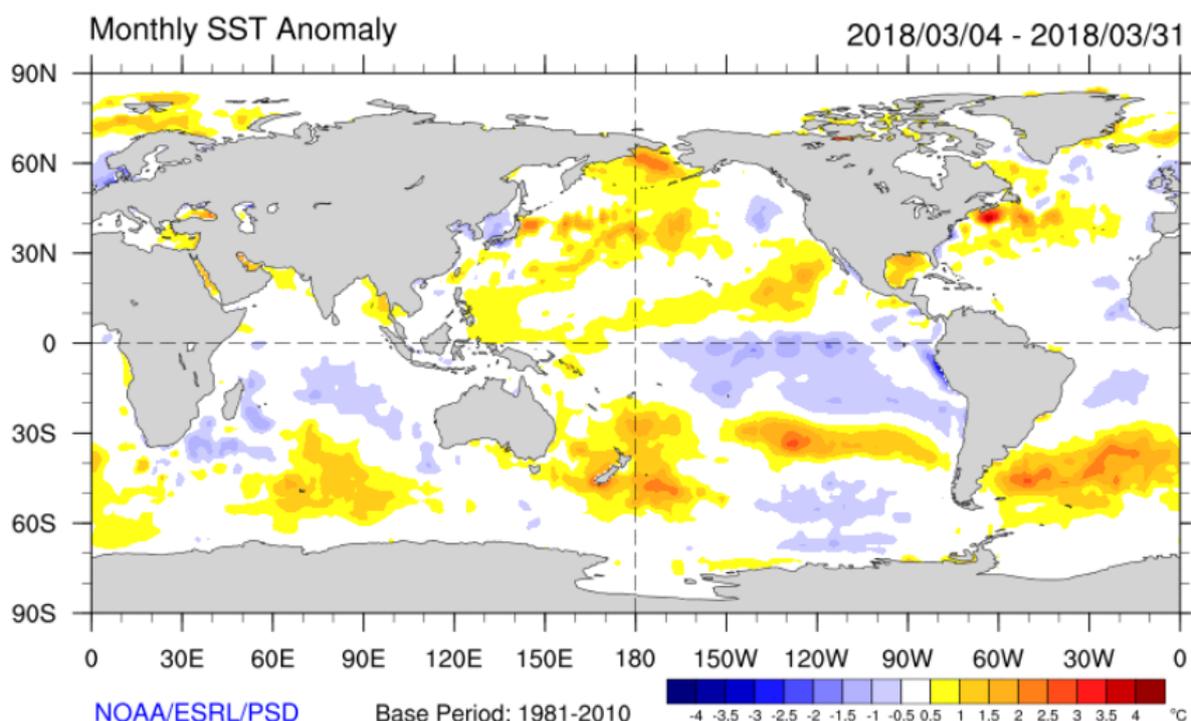
The consensus from international models is for the tropical Pacific to transition to an ENSO-neutral state over the next 3-month period (75% chance over April – June 2018). ENSO-neutral remains the most likely outcome over the late-winter season (July – September 2018). The forecast models predict about an equal chance of the Pacific remaining neutral or transitioning towards El Niño over the spring (September – November 2018).

Even though La Niña's influence will wane over the next three-month period, New Zealand's regional climate over April – June 2018 is expected to be driven by persistence of more northeasterly airflow than normal, and by the persistence of warm ocean waters that are present around the country. The northern Tasman Sea will remain unsettled, with lower pressures than normal, bringing the likelihood of significant rainfall events to the North Island and the upper South Island.

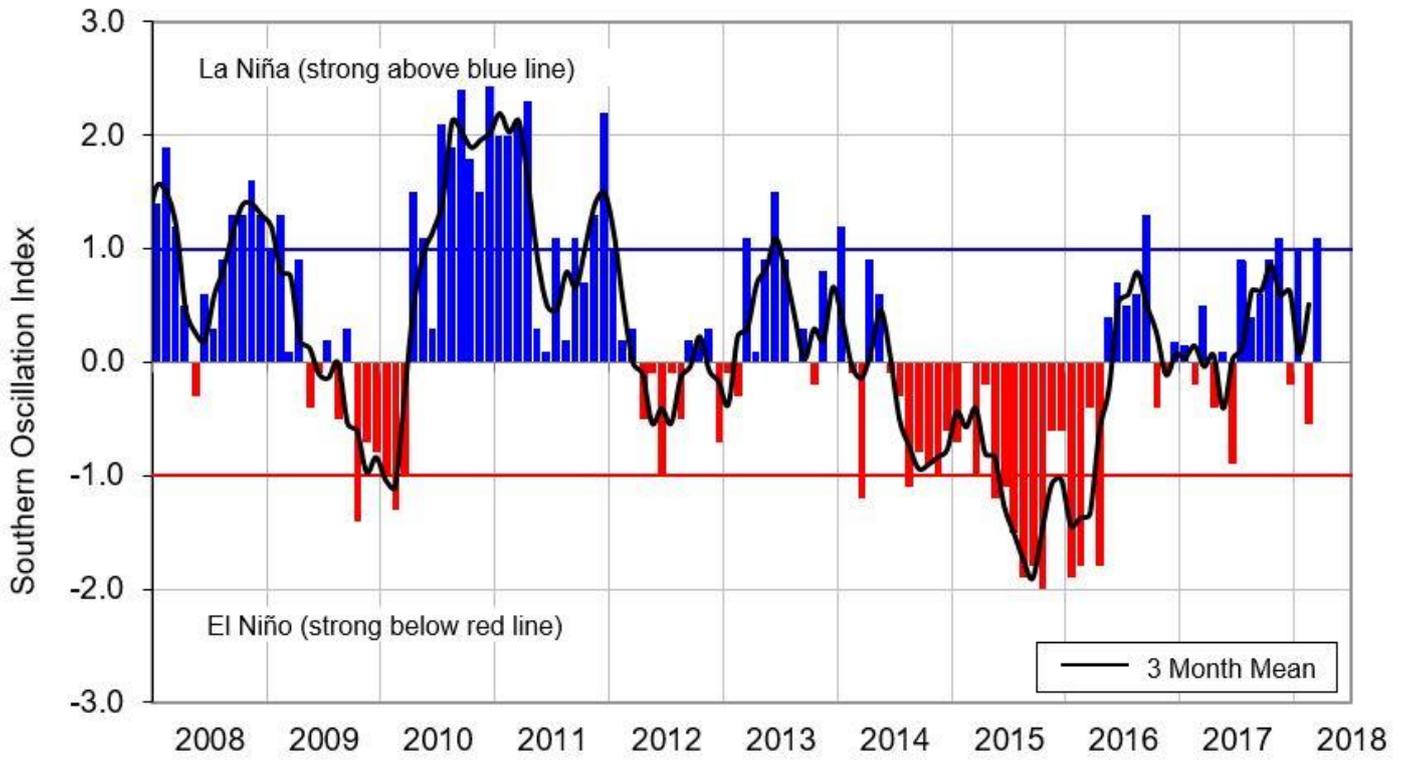
### Sea Surface Temperatures

Coastal waters remain much warmer than average all around New Zealand, in the Tasman Sea, and in the Southwest Pacific. However, the anomalies for coastal New Zealand continue to weaken from the peak reached in December 2017. The latest vertical profiles from the Argo floats in the Tasman Sea show that the surface layer is more well-mixed down to 60m in March (and about +1.0°C warmer than average), as opposed to the strong stratification and extreme warmth at the surface (+2.5°C) in the January 2018 profiles.

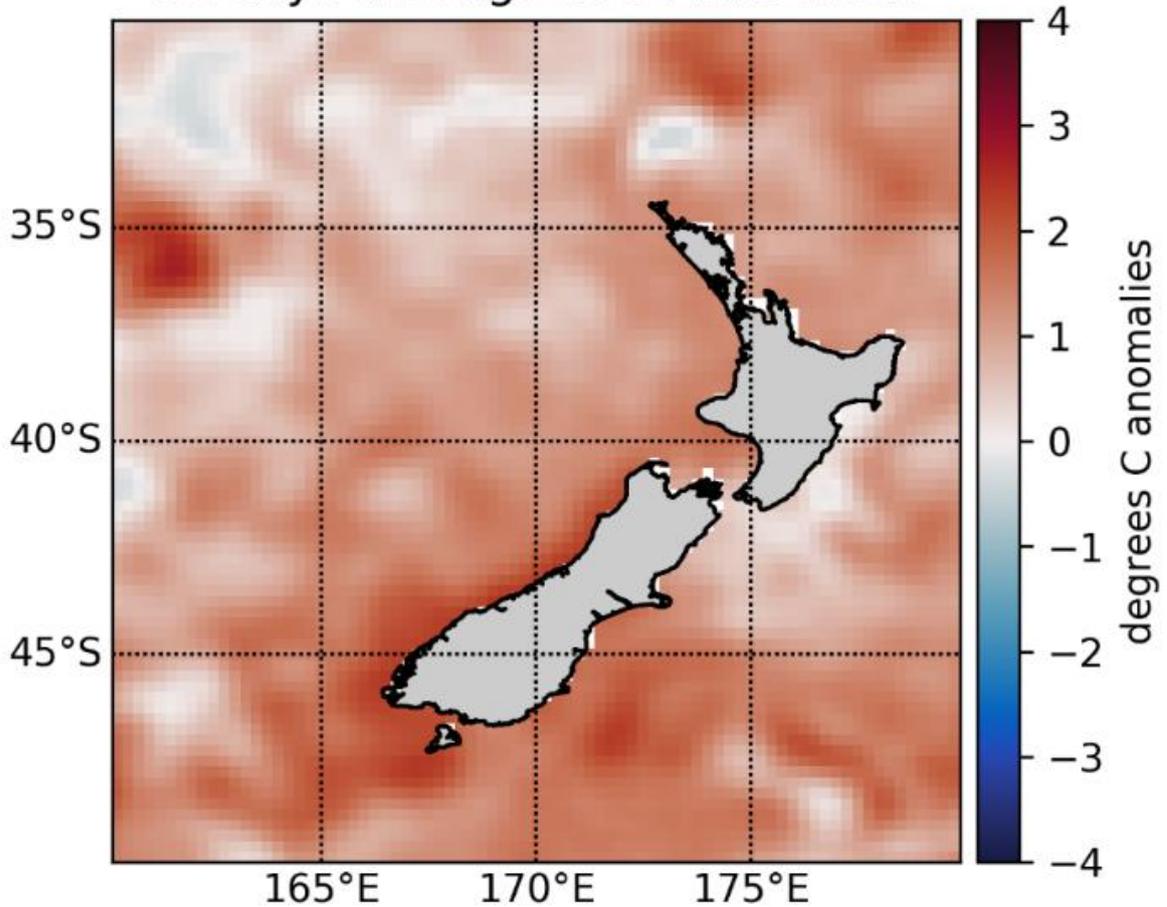
The warmest coastal anomalies (for the past three months) are around the west of the South Island, where they remain at least +2.0°C above normal. According to the dynamical models' forecasts, warmer than average SSTs are likely to persist for at least part of the next 3 months (April – June 2018).



Differences from average global sea surface temperatures for 4<sup>th</sup> – 31<sup>st</sup> March 2018. Map courtesy of NOAA Climate Diagnostics Centre (<http://www.cdc.noaa.gov/map/images/sst/sst.anom.month.gif>)



### 30 days average to 24 Mar 2018



## Outlook: April – June 2018

**Temperatures** are forecast to be above average for all regions of New Zealand with high confidence (60% chance). The warm ocean waters around the country are forecast to persist through the next three months, but by the end of winter are expected to return to near normal west of the country. Even though seasonal-average temperatures are very likely to be above normal, frosts will occur in cooler locations as late autumn progresses

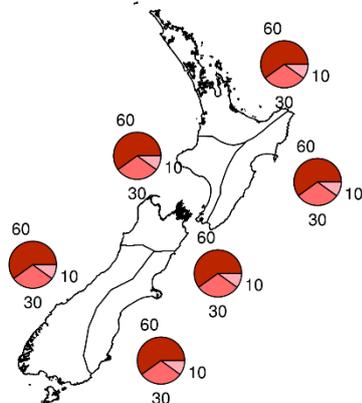
**Rainfall** rainfall totals are forecast to be above normal in the north and east of the North Island (45% chance), near normal in the west of the South Island (45% chance), and near normal (40% chance) or above normal (35 to 40% chance) in all other regions.

**Soil moisture levels and river flows** are forecast to be above normal in the north and east of the North Island and in the north of the South Island (45% chance), near normal (40% chance) or above normal (40% chance) in the west of the North Island, and near normal (45% chance) in the west and east of the South Island.

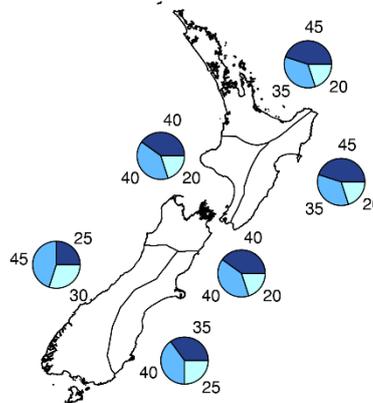
### Outlook for April - June 2018



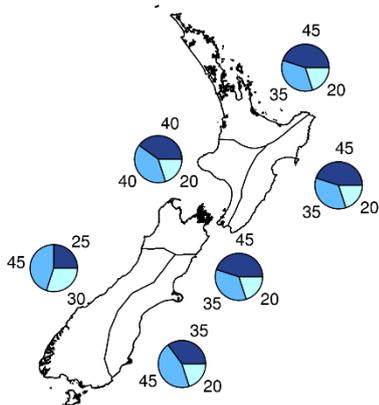
**Air Temperature**



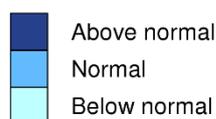
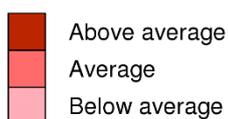
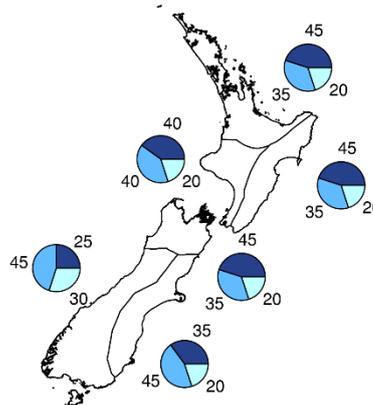
**Rainfall**



**Available Soil Moisture**



**River Flows**



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

## **The climate we predicted (January – March 2018) and what happened**

For January – March 2018, the atmospheric circulation around New Zealand was forecast to be characterized by higher pressures than normal east and south of the country, while lower pressure than normal was forecast over the Tasman Sea area, extending over the country. This pressure pattern was expected to be associated with unsettled conditions with periods of north-easterly quarter flow anomalies. Actual pressures were lower than normal to the west of the country resulting in more northeasterlies than normal across the country.

**Predicted air temperature:** January – March 2018 temperatures were forecast to be above average with high confidence for all regions of New Zealand.

**Outcome:** Actual temperatures were above average for all regions.

**Predicted rainfall:** January – March 2018 rainfall totals were most likely to be in the above normal range in the North Island and near normal or above normal in the South Island.

**Outcome:** Actual rainfall was above normal for much of the North Island as well as the north and east of the South Island. Rainfall was near normal for parts of Gisborne, the West Coast and much of Southland Hawke's Bay.

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

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