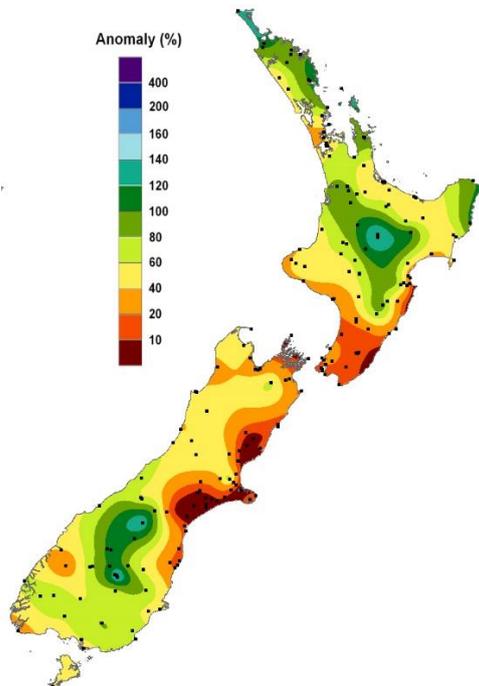


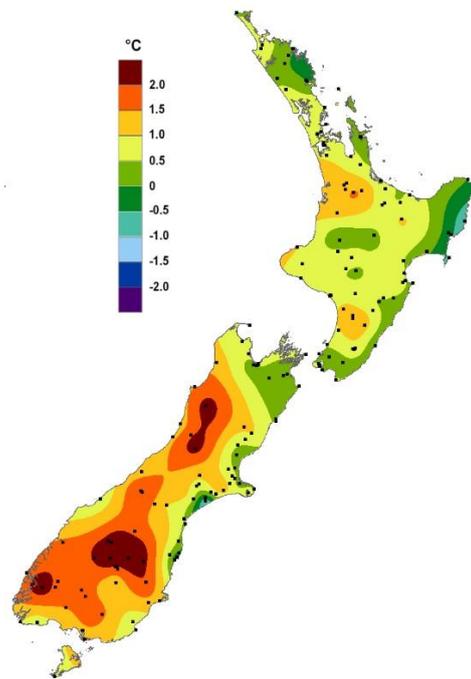
**New Zealand Climate Update No 222, November 2017**

**Current climate – November 2017**

November 2017 was characterised by higher than normal sea level pressure over New Zealand and the surrounding seas, particularly to the south of the country. This pressure setup, consistent with La Niña conditions, resulted in a long period of dry, settled, and very warm weather across the country during the second half of the month.

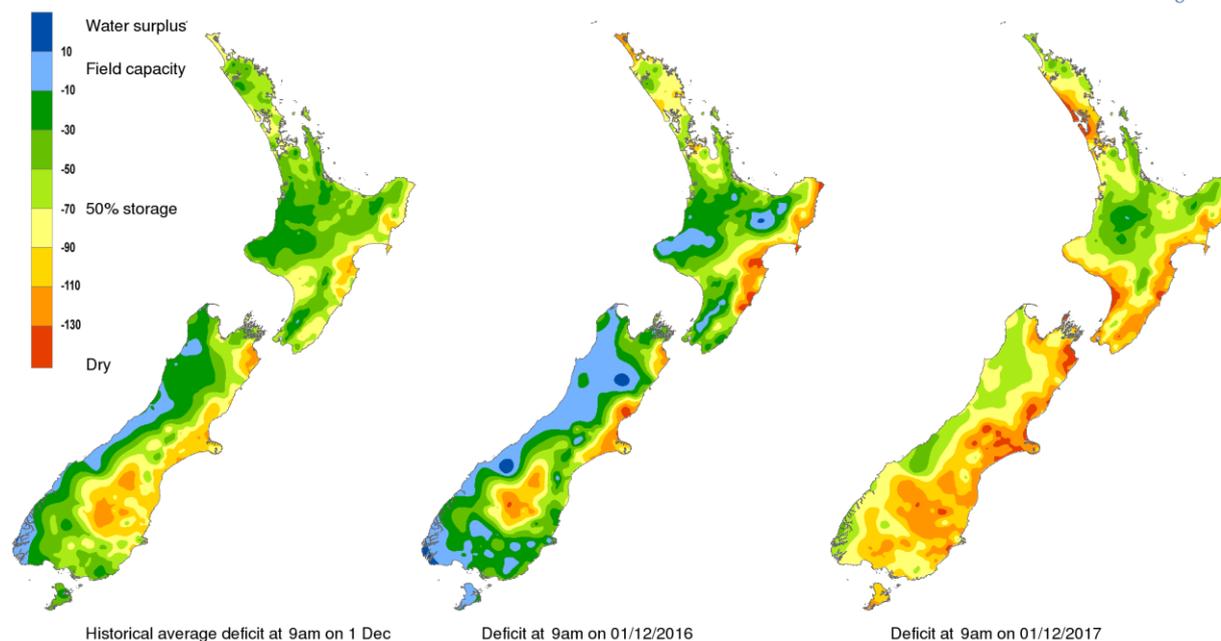


Percentage of normal rainfall for November 2017



Departure from average air temperature for November 2017

## Soil moisture deficit (mm) at 9am on 01/12/2017



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 below normal (<50% of normal) for much of Canterbury, the West Coast, Tasman, Nelson, Marlborough, Wellington, Wairarapa, Manawatu-Whanganui, parts of Hawke's Bay, Auckland, and Bay of Plenty. Isolated pockets of above normal (120-149% of normal) rainfall occurred in Northland, the Queenstown-Lakes District, and about Roxburgh (Central Otago). Rainfall was below normal (50-79% of normal) or below normal (80-119%) elsewhere.

**Temperature:** Temperatures were well above average (>1.20°C of average) in parts of Southland, interior Otago, interior Canterbury, the West Coast, and interior Waikato. Temperatures were above average (0.51-1.20°C above average) for most of the rest of the country, except for some eastern coastal areas of both Islands that recorded near (-0.50°C to +0.50°C of average) average temperatures.

**Sunshine:** Sunshine was well above normal (>125% of normal) or above normal (110-125% of normal) for much of the South Island and western North Island. Sunshine was near normal (90-110% of normal) for most other parts of the country, except for areas in Gisborne, Bay of Plenty, Coromandel Peninsula, and Northland where sunshine was below normal (75-89% of normal).

**Soil Moisture:** As of 1 December, soils were significantly drier than normal for the time of year across a large portion of the South Island, particularly in the west, as well as the lower and western North Island. Soil moisture was slightly below normal or near normal in Central Otago, the Central Plateau, Gisborne, Coromandel Peninsula, and northern Northland. Soil moisture was near or above normal in the Aupouri Peninsula and Great Barrier Island.

## Global setting: November 2017

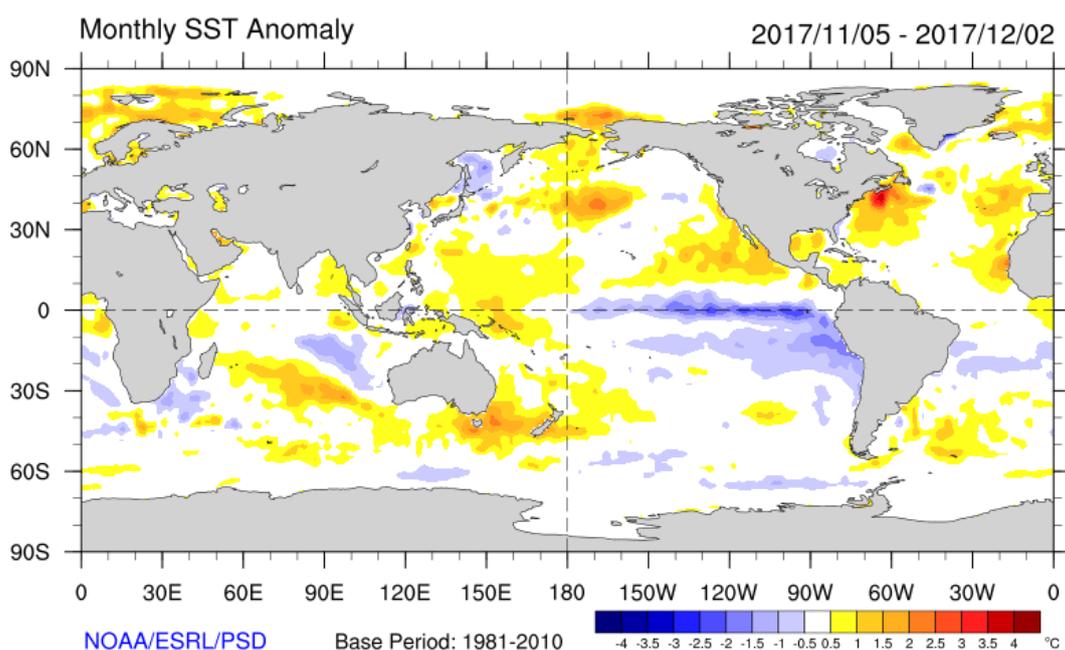
La Niña conditions are present in the tropical Pacific, as several conventional thresholds have been reached or are being approached. As of earlier this month, NOAA declared that weak La Niña conditions have emerged, while the Australian Bureau of Meteorology escalated their ENSO tracker to the “La Niña Alert” category. Sea surface temperatures (SSTs) in the eastern Equatorial Pacific Ocean have continued to cool with the most anomalously cool temperatures from about 140°W east to the South American coast. The NIWA Southern Oscillation Index has been positive since July 2017 and is currently at +0.9. Enhanced trade winds persist in the western equatorial Pacific Ocean and cooler than normal subsurface ocean waters present in the central Equatorial Pacific (at about 100m depth) have cooled further.

The consensus from international models is that the tropical Pacific Ocean will cool further for a portion of the next 3 months (December 2017 – February 2018), with La Niña conditions expected to continue over the same period (75% chance). However, the models indicate that La Niña is most likely (72% chance) to transition to ENSO neutral conditions over the March – May 2018 period. While this particular event is expected to remain in the weak category, it should be noted that the impacts of La Niña are not always proportional to its intensity.

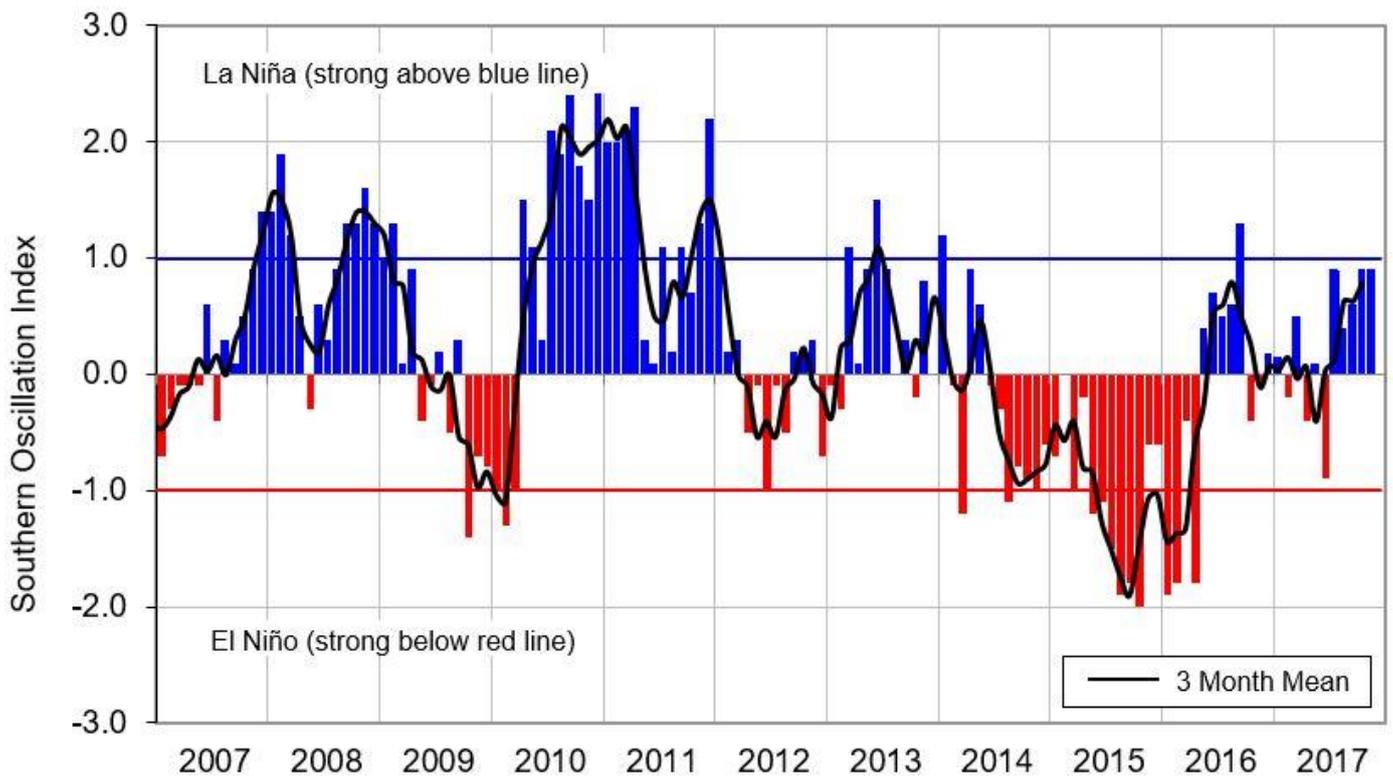
For December 2017 – February 2018, the atmospheric circulation around New Zealand is forecast to be characterised by higher pressure than normal to the south and southeast of the country, and lower pressure than normal to the north. This pressure pattern is expected to be associated with easterly to northeasterly flow anomalies, a pattern which is consistent with regional conditions typically observed during La Niña events.

### Sea Surface Temperatures

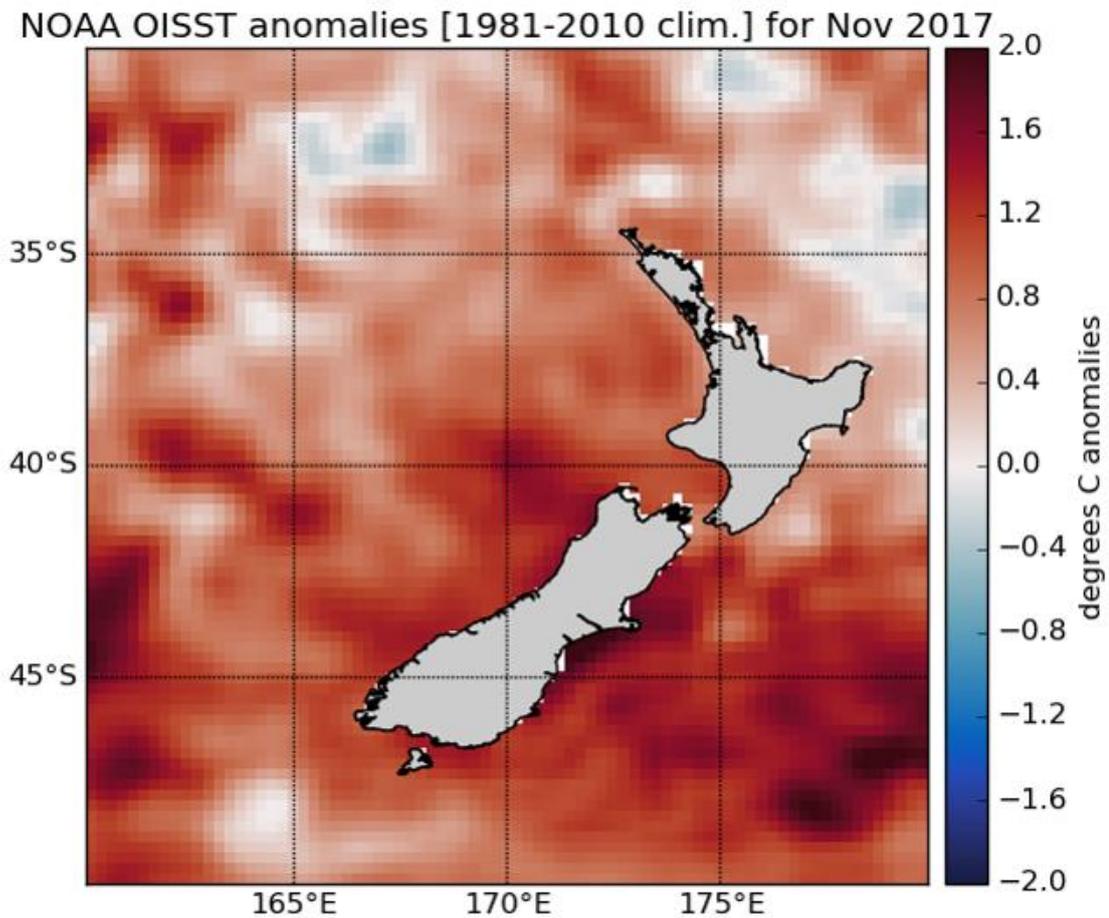
Coastal waters remain warmer than average around New Zealand, especially off the coast of the South Island, where the anomaly for the month of November (estimated using data to the 28<sup>th</sup> November) exceed +1°C. As a whole, warm anomalies have recently intensified, notably around the coasts of the South Island of the country. It can be noted that warmer than normal surface ocean waters around NZ and in the Tasman Sea are often associated with La Niña conditions.



Differences from average global sea surface temperatures for 5 November – 2 December 2017. 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: November SOI 0.9; September - November average 0.8



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

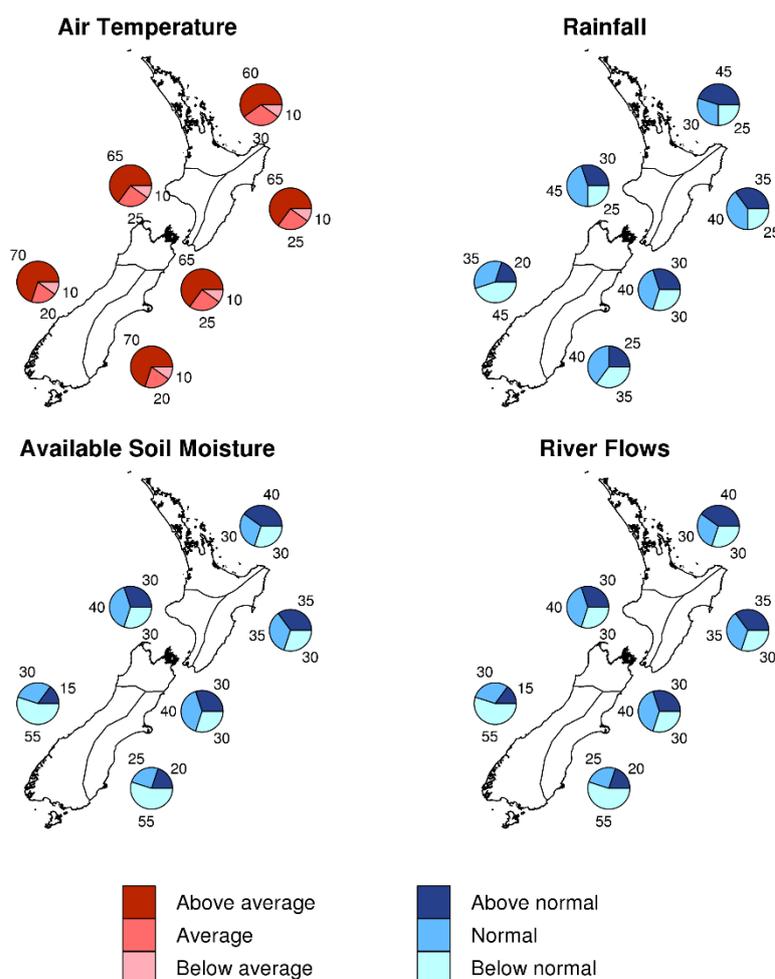
## Outlook: December 2017 – February 2018

**Temperatures** are forecast to be above average, with high confidence, for all regions of New Zealand (60% to 70% chance). Coastal water temperatures around New Zealand are forecast to remain above average over the next three-months period.

**Rainfall** rainfall totals are most likely (45% chance) to be above normal in the north of the North Island. Summer rainfall is about equally likely to be near normal (35% chance) or above normal (40% chance) for the east of the North Island. For the west of the North island, December 2017 – February 2018 rainfall amounts are most likely to be in the near normal range (45% chance). Near normal rainfall amounts are most likely for the north of the South Island (40% chance). Below normal rainfall is most likely for the west of the South Island (45% chance). Rainfall totals for the next three months are about equally likely to be below normal (35% chance) or near normal (40% chance) for the east of the South Island.

**Soil moisture levels and river flows** are most likely to be above normal (40% chance) in the north of the North Island and most likely (40% chance) to be near normal in the west of the North Island. Soil moisture levels and river flows are equally likely to be near normal (35% chance) or above normal (35% chance) in the east of the North Island. In the north of the South Island, soil moisture levels and river flows are most likely to be in the near normal range (40% chance) with below normal soil moisture levels and river flows most likely (55% chance) for the east and west of the South Island.

### Outlook for December 2017 - February 2018



Graphical representation of the regional probabilities, Seasonal Climate Outlook, December – February.

## **The climate we predicted (September 2017 – November 2017) and what happened**

For September – November 2017, the atmospheric circulation around New Zealand was forecast to be characterised by lower pressure than normal west of New Zealand and higher pressure than normal to the south and east of the country. This was expected to lead to northerly-quarter flow anomalies over the three months. Periodic easterly flow anomalies were also possible, consistent with a La Niña-like signal in the atmosphere. This type of atmospheric setup would lend itself to subtropical moisture connections associated with heavy rainfalls for New Zealand. Actual pressures were near normal around New Zealand with no significant air flow anomalies.

**Predicted air temperature:** September – November 2017 temperatures were forecast to be above average for all regions of New Zealand.

**Outcome:** Actual temperatures were near average for Northland, Auckland, western Waikato, Gisborne, Wellington and coastal margins of Marlborough and Canterbury. Temperatures were above average for the remainder of the country.

**Predicted rainfall:** September – November 2017 rainfall totals were about equally likely to be normal or above normal for the North Island and the north of the South Island and most likely to be near normal for all remaining regions of New Zealand.

**Outcome:** Actual rainfall was near normal for much of the North Island. The exceptions were coastal Bay of Plenty where above normal rainfall was recorded and parts of Wellington and Hawke's Bay where rainfall was below normal. In the South Island rainfall was near normal for the majority of Tasman, Marlborough and northern Canterbury and below normal for the remainder of the 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)