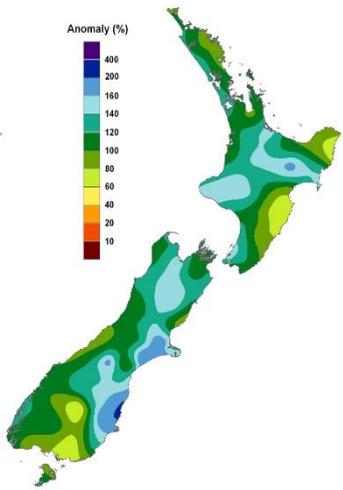


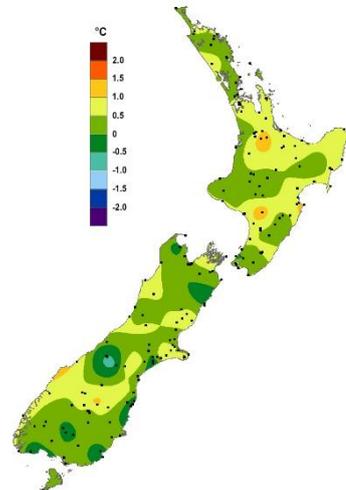
New Zealand Climate Update No 220, September 2017

Current climate – September 2017

September was characterised by lower than normal sea level pressure over the Tasman Sea and New Zealand, which resulted in regular bouts of rainfall moving across the country. This included an event on 6 September which produced heavy rain that trapped two tourists in their car in Waitomo.

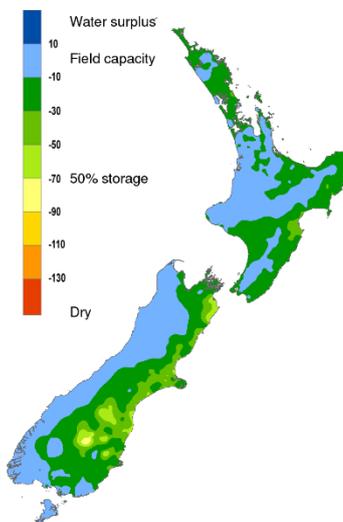


Percentage of normal rainfall for September 2017

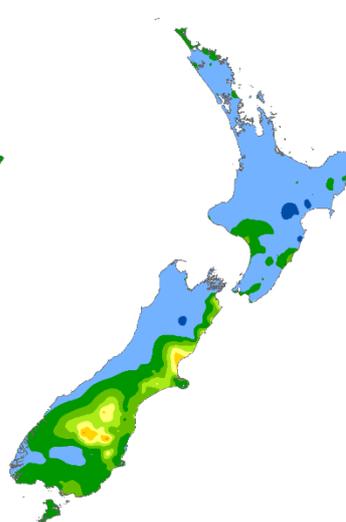


Departure from average air temperature for September 2017

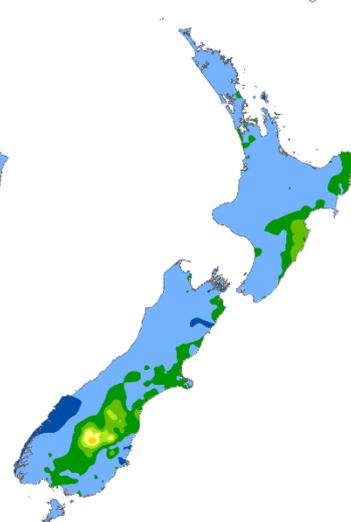
Soil moisture deficit (mm) at 9am on 01/10/2017



Historical average deficit at 9am on 1 Oct



Deficit at 9am on 01/10/2016



Deficit at 9am on 01/10/2017

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: September rainfall was well above normal (>149% of the September normal) or above normal (120-149% of the September normal) for large swaths of the North Island, including much of Waikato, western Bay of Plenty, Auckland, Manawatu-Whanganui, parts of Gisborne and Hawke's Bay, much of the northern half of the South Island, along with eastern Otago and western Southland. Below normal rainfall (50-79% of the September normal) was observed in central and southern Hawke's Bay, central Otago, and eastern Southland.

Temperature: September temperatures were near average (-0.50°C to +0.50°C of the September average) across large swaths of the country. Temperatures were above average (+0.51°C to +1.20°C of the September average) in parts of Auckland, Coromandel, northern and central Waikato, Gisborne, Hawke's Bay, southern Manawatu-Whanganui, northern Marlborough, northern Canterbury, and much of Otago. Well above average temperatures (>1.20°C of the September average) were observed in small pockets of Hawke's Bay, central Canterbury, and central Otago.

Sunshine: September sunshine hours were near normal (90-109% of the September normal) for much of the country. Above normal sunshine (110-125% of the September normal) was observed in parts of western Waikato and northern Manawatu-Whanganui, with below normal sunshine (75-89% of the September normal) in the lower North Island, interior Canterbury, and interior Otago. Isolated pockets of well below normal sunshine (<75% of the September normal) were observed in Wairarapa and central Canterbury.

Soil Moisture: As of 1 October 2017, soil moisture levels were near normal for a majority of the country. Soil moisture was slightly higher than normal for some coastal areas from Blenheim to Dunedin, as well as isolated pockets in Hawke's Bay and near Cape Reinga. Soil moisture was lower than normal in southern Hawke's Bay and Central Otago.

Global setting: September 2017

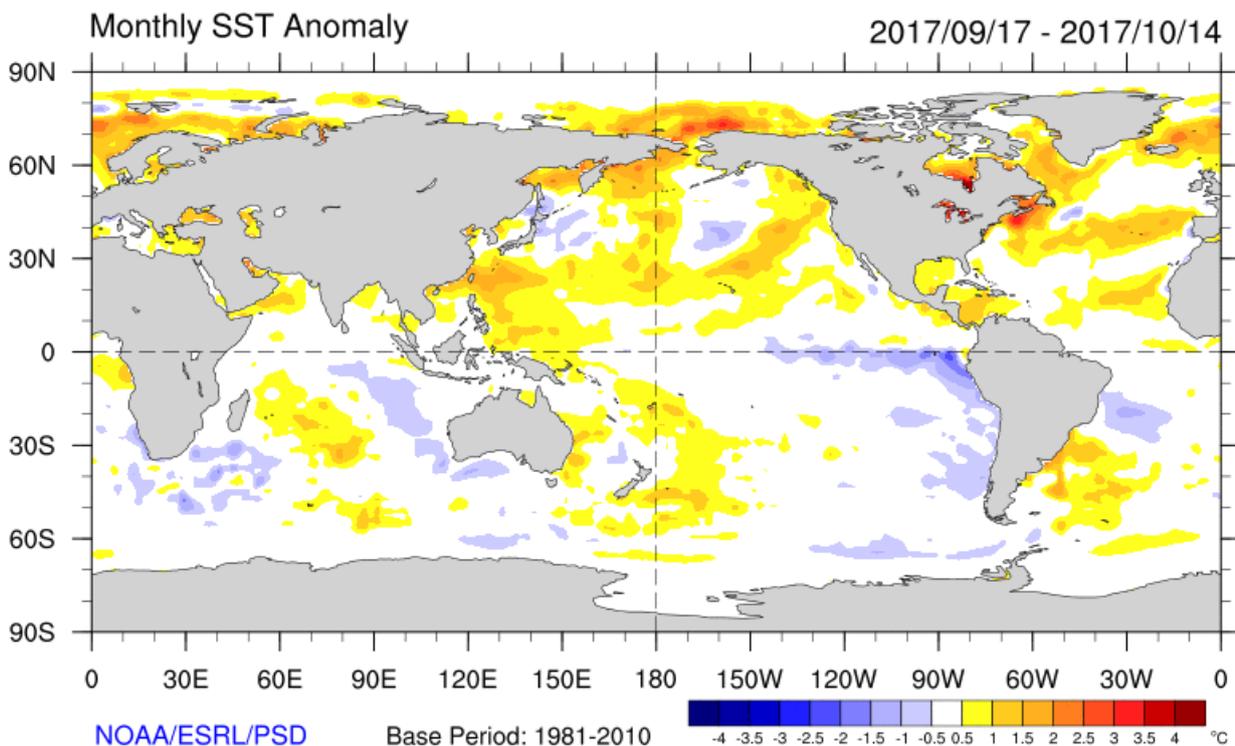
Many atmospheric and oceanic indicators in the tropical Pacific are on the La Niña side of neutral, although not yet strong enough to reach La Niña thresholds.

The Southern Oscillation Index has been positive for the past three months and is currently about +0.5. Tropical convection patterns show a La Niña pattern of enhanced rainfall over Indonesia and suppressed rainfall around the Dateline and eastwards. Sea surface temperatures in the central and eastern tropical Pacific have recently cooled to below normal, with the central Pacific NINO3.4 index at -0.3°C. Sub-surface tropical ocean temperatures are now more than 3°C below normal at about 100m depth and 140°W.

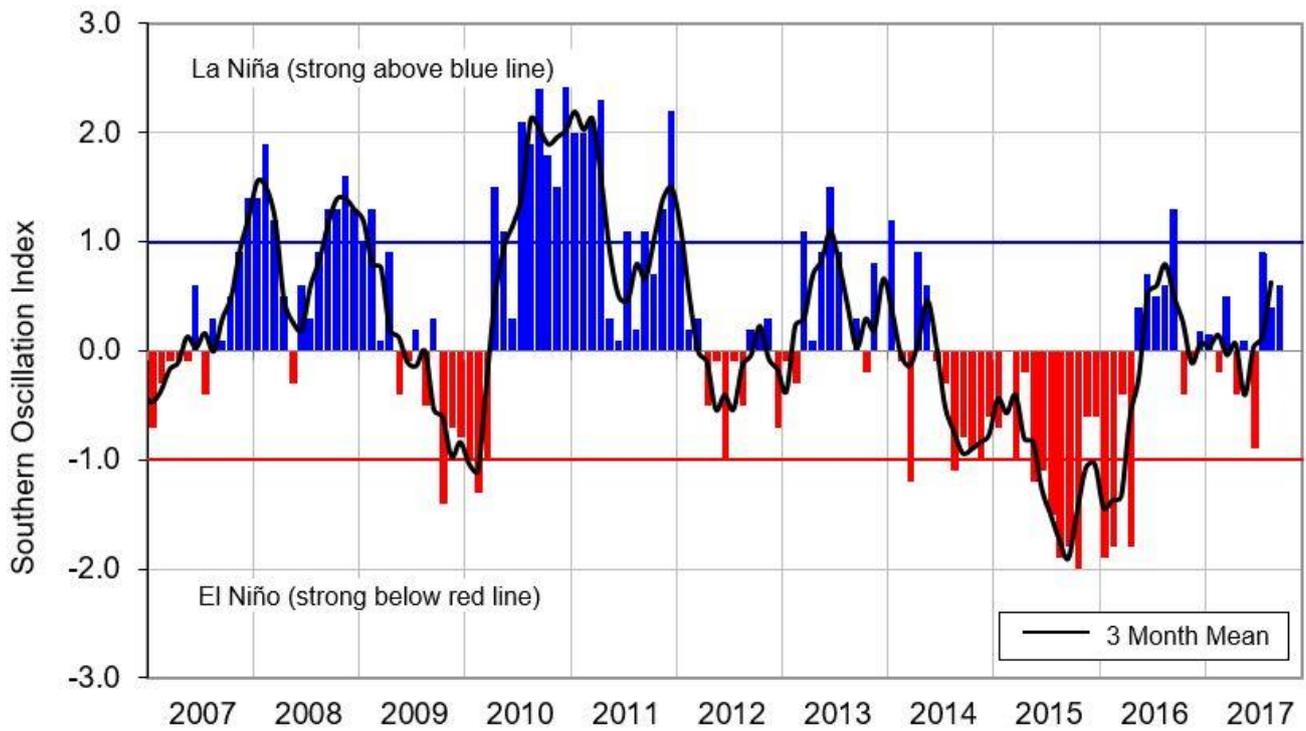
International forecast guidance has changed markedly in the past month. There is now a 50:50 split between the likelihood of La Niña and neutral conditions extending through to March 2018, with very little chance of El Niño development through this period.

Sea Surface Temperatures

Coastal waters remain generally warmer than average all around the country, although the anomaly in the “NZ box” (160°E-170°W, 30-45°S) has weakened from last month to its current value of about +0.3°C. Ocean waters are especially warm, relative to the average for this time of year, around the Chatham Islands and south of New Zealand. The dynamical models’ forecasts indicate that warmer than average SSTs around New Zealand are likely to persist over the October – December 2017 period.

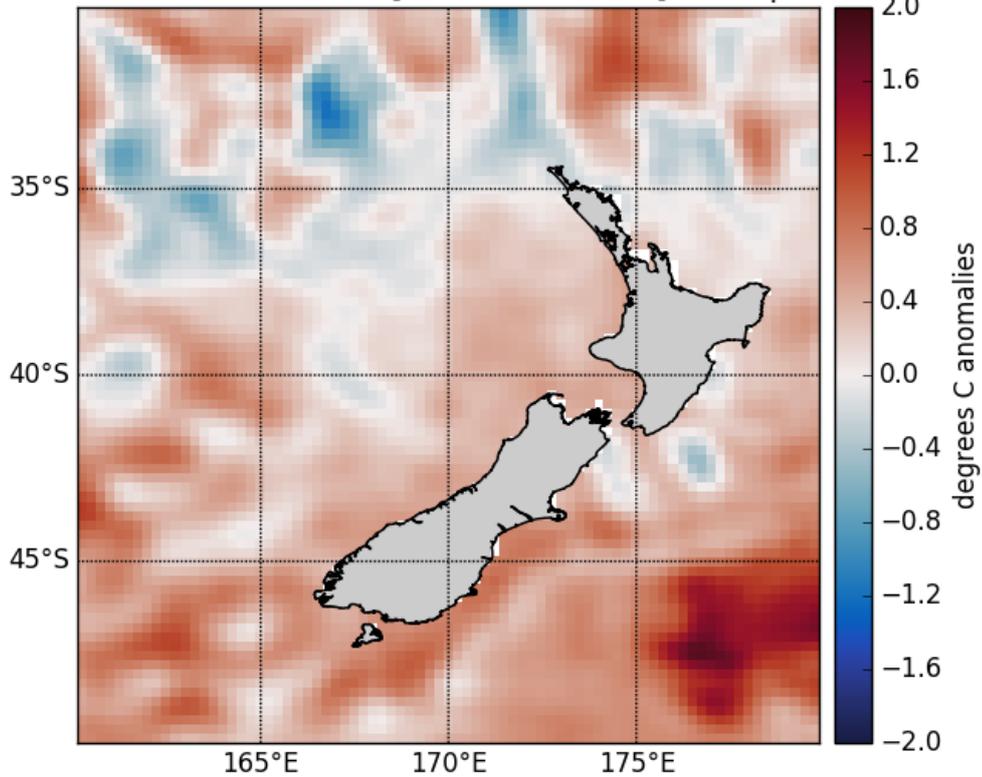


Differences from average global sea surface temperatures for 17 September – 14 October 2017. Map courtesy of NOAA Climate Diagnostics Centre (<http://www.cdc.noaa.gov/map/images/sst/sst.anom.month.gif>)



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: September SOI 0.6; July - September average 0.6

NOAA OISST anomalies [1981-2010 clim.] for Sep 2017



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

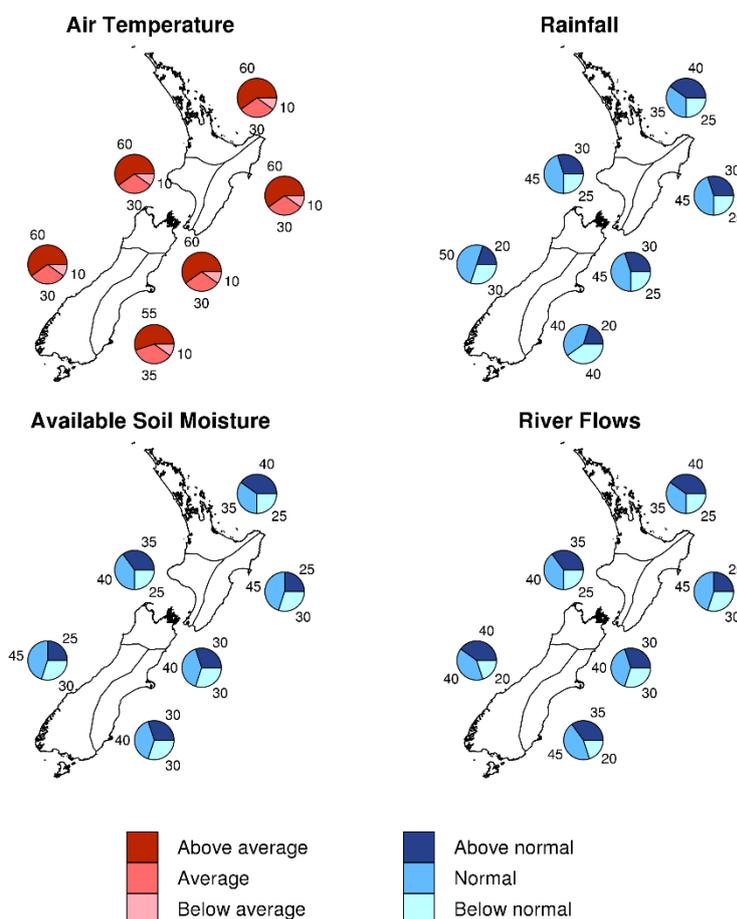
Outlook: October – December 2017

Temperatures are forecast to be above average for all regions of New Zealand (55% to 60% chance for above average temperatures). However, frosts and cool snaps could occur, especially early in the outlook period. Coastal water temperatures around New Zealand are forecast to remain above average over the next three-month period.

Rainfall totals are about equally likely to be normal (35% chance) or above normal (40% chance) for the north of the North Island, and most likely to be near normal (45% to 50% chance) for the remainder of the North Island and the north, west and south of the South Island. For the east of the South Island, rainfall is equally likely to be near normal (40% chance) or below normal (40% chance).

Soil moisture levels and river flows are about equally likely to be normal (35-40% chance) or above normal (35-40% chance) for the north and west of the North Island. For the west of the South Island, soil moisture levels are most likely to be near normal (45% chance), whereas river flows are equally likely to be near normal (40% chance) or above normal (40% chance). For all remaining regions, soil moisture levels and river flows are most likely to be near normal (40-45% chance).

Outlook for October - December 2017



Graphical representation of the regional probabilities, Seasonal Climate Outlook, October – December 2017.

The climate we predicted (July 2017 – September 2017) and what happened

The atmospheric circulation around New Zealand was forecast to be characterised by slightly higher than normal pressures southeast of the Chatham Islands, leading to weak easterly-quarter flow anomalies over the country. Actual pressures were lower than normal over and to the west of the country. This led to more westerly to north-westerly wind flows than normal.

Predicted air temperature: July – September 2017 temperatures were forecast to be near or above average for the west and east of the North Island, and above average, with high confidence, for all remaining regions of New Zealand.

Outcome: Actual temperatures were above average for large parts of Waikato, Bay of Plenty, Gisborne, Hawke's Bay and the West Coast. Temperature was near average elsewhere.

Predicted rainfall: July – September 2017 rainfall totals were forecast to be near or above normal for the east of the North Island, and near normal for the remaining regions of the country.

Outcome: Actual rainfall was above normal for western Northland and Auckland as well as large parts of Waikato, the Bay of Plenty, Taranaki, Manawatu-Whanganui, Wellington, Tasman, Nelson, Marlborough, Canterbury and Otago. Rainfall was below normal about coastal Gisborne, Hastings and Invercargill and near normal elsewhere.

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

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