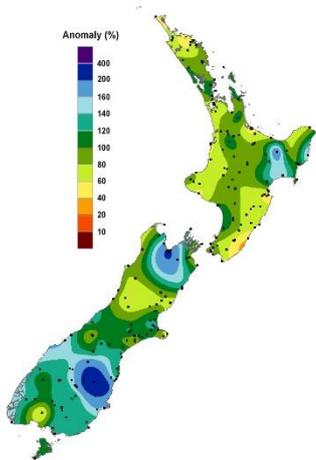


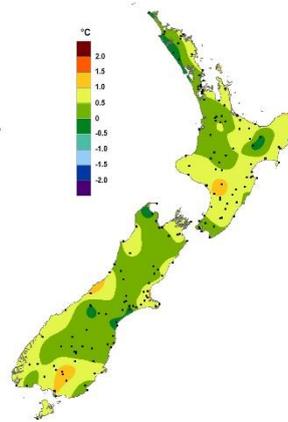
New Zealand Climate Update No 209, November 2016

Current climate – October 2016

During October 2016, mean sea-level pressures were much lower than normal over and to the southwest of New Zealand, which resulted in a prevalence of winds from a westerly direction. However, several storms during the month took shape south and east of the country, which resulted in periods of southerly and easterly wind flows as well.

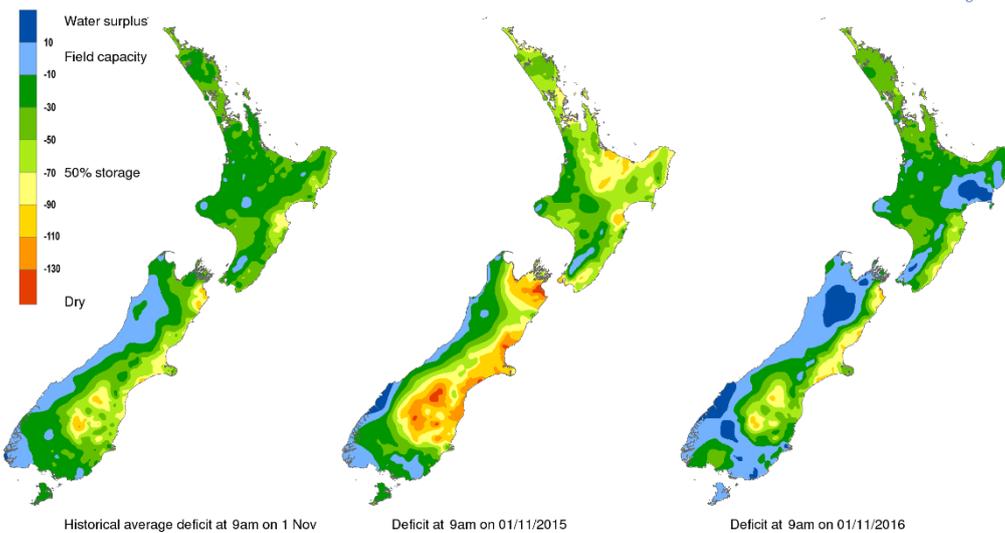


Percentage of normal rainfall for October 2016



Departure from average air temperature for October 2016

Soil moisture deficit (mm) at 9am on 01/11/2016



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: October rainfall was generally above normal (120-149%) or well above normal (> 149%) for much of the southern South Island, including Otago, Southland, southern Canterbury and southern Westland, in addition to Nelson, eastern Tasman, western Marlborough, coastal Gisborne and northern Hawke's Bay, and eastern Bay of Plenty. Rainfall was generally near normal (80-119%) or below normal (50-79%) for much of the remainder of the North Island and the central South Island north of Otago. However, rainfall was well below normal (< 50%) in coastal Wairarapa and isolated parts of the far North.

Air temperature: October temperatures were above average (+0.50°C to +1.20°C) throughout much of New Zealand. Temperatures were generally near average (-0.50 to +0.50°C) from western Northland to western Waikato, central Bay of Plenty, and from Tasman to central Otago.

Sunshine: October sunshine was below normal (75-89%) or well below normal (< 75%) in parts of the south-western North Island, central Canterbury and central Otago, whereas above normal (110-125%) sunshine was observed in western Northland, western Waikato, and parts of Westland. In addition, well above normal (> 125%) sunshine was experienced in far northern Northland.

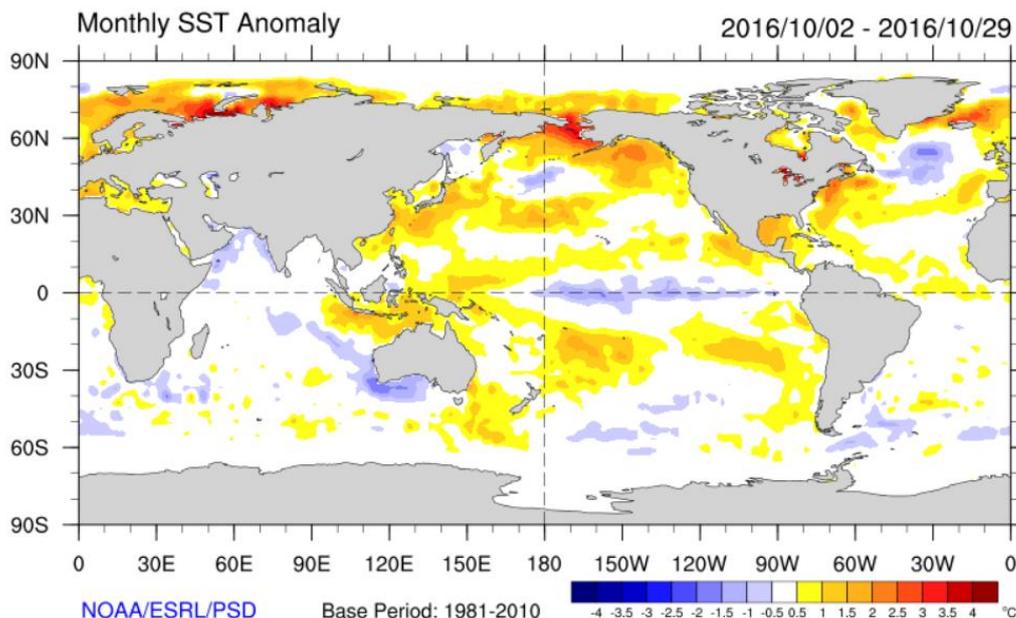
Soil Moisture: At the end of October 2016, soil moisture levels were much lower than normal for the time of year in coastal northern Canterbury and coastal Wairarapa. Soil moisture levels were above normal for the time of year in much of Gisborne and northern Hawke's Bay, Nelson, eastern Tasman, western Marlborough, and Fiordland east to coastal Otago. Soil moisture levels were near normal for the remainder of the country.

Global setting: October 2016

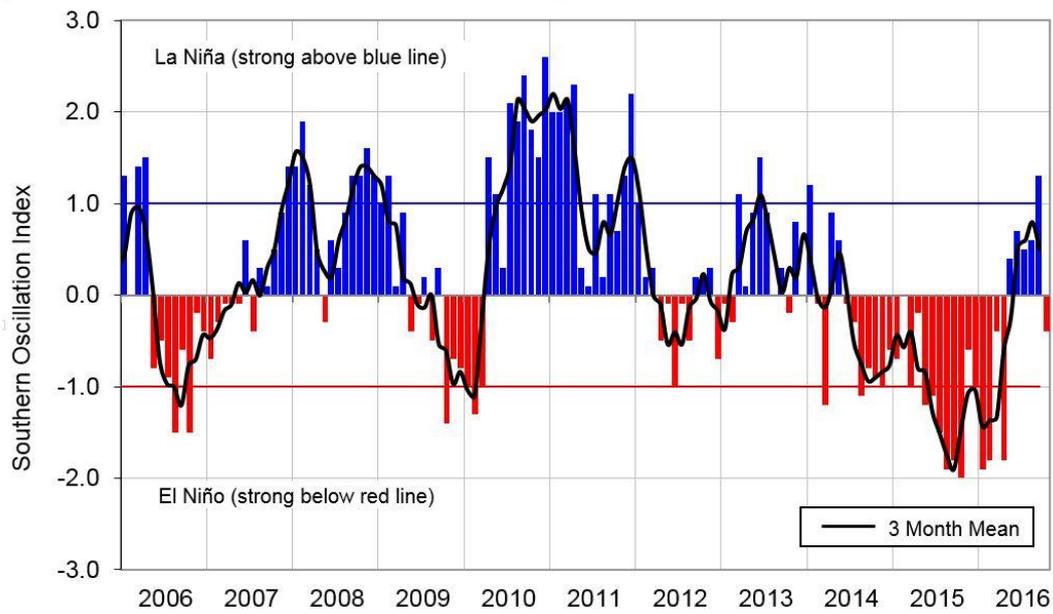
Sea surface temperatures (SSTs) in the central equatorial Pacific Ocean are below average, close to the threshold used to define La Niña events. Anomalously cold sub-surface waters are still present, but are now more confined to the central Pacific (near 140°W) than in previous months.

The atmospheric conditions are also mixed: stronger easterly trade winds in the west and enhanced convection over the Maritime Continent (islands of Indonesia and Papua New Guinea) are consistent with a weak La Niña. However, the Southern Oscillation Index (SOI) has dropped to weakly negative values which are indicative of ENSO-neutral conditions.

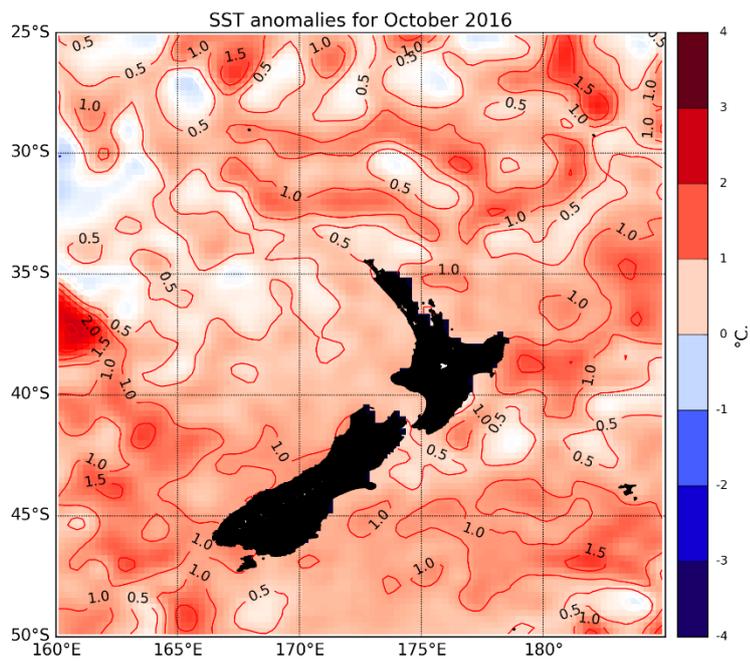
International guidance still slightly favours La Niña conditions (53% chance *versus* 46% for neutral) over the next three month period (November 2016 - January 2017). However, neutral conditions are now much more likely than La Niña by February – April 2017: 74% chance for neutral, and only 22% for La Niña. In summary, La Niña conditions are only slightly more likely than not over the next 3-month period, and become less likely as we progress into 2017. Despite the current borderline La Niña conditions and the only modest probability for La Niña to develop by the end of the year, the circulation pattern expected over the coming three months for the New Zealand region is broadly consistent with the typical La Niña signature: higher pressure than normal is forecast to the south and southeast of the country, while lower pressures than normal are forecast to the north of the New Zealand, leading to more persistent easterly or north-easterly airflow than normal.



Differences from average global sea surface temperatures for 2 October – 29 October 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: October SOI -0.4; August to October average 0.5.



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

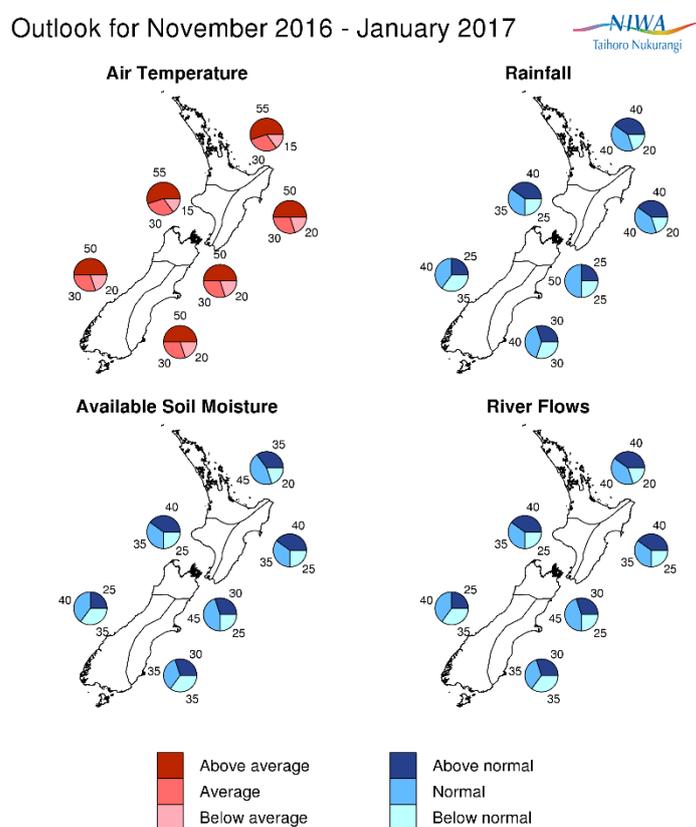
Outlook – November 2016 to January 2017

Temperatures are most likely to be above average (50-55% chance) for all regions of New Zealand.

Rainfall are about equally likely to be above normal (40% chance) or near normal (35-40% chance) throughout the North Island. In the north and east of the South Island, rainfall is most likely to be near normal (40-50%), whereas rainfall in the west and south of the South Island is about equally likely to be near normal (40% chance) or below normal (35% chance).

Soil moisture levels and River Flows are most likely to be near normal (45% chance) in the north of the North Island, whereas river flows are equally likely to be near normal (40% chance) or above normal (40% chance). In the remainder of the North Island, soil moisture and river flows are about equally likely to be above normal (40% chance) or near normal (35% chance). Near normal soil moisture levels and river flows are most likely (45% chance) in the north of the South Island. For the rest of the South Island, soil moisture and river flows are about equally likely to be near normal (35-40% chance) or below normal (35% chance).

Sea surface temperatures (SSTs) around New Zealand are forecast to remain near or above normal over the next three months.



Graphical representation of the regional probabilities, Seasonal Climate Outlook, November – January 2016.

The climate we predicted (August 2016 – October 2016) and what happened

Predicted rainfall: August – October 2016 rainfall totals were likely to be in the near normal or above normal range in the north and west of the North Island and the west of the South Island. Seasonal rainfall was most likely to be in the near normal range in the east of the North Island and the north of the South Island. In the east of the South Island, rainfall was likely to be near normal or below normal.

Outcome: Actual rainfall was near normal for much of the North Island, with the exception of Auckland, Hawke's Bay and parts of Gisborne, where above normal rainfall was observed. In the South Island, rainfall was largely below normal. The exceptions were Dunedin and Waitaki where above normal rainfall was observed and Tasman, Nelson, Marlborough where rainfall was near normal.

Predicted air temperature: July – September 2016 temperatures were very likely to be above average in all regions of the country.

Outcome: Actual seasonal temperatures were near normal for the much of the country. Slightly warmer than normal temperatures were recorded in eastern Northland, Thames-Coromandel, Central Otago and parts of Southland.

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

www.niwa.co.nz/our-science/climate