



**August – October 2016**  
2016

Issued: 29 July

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## NIWA Outlook: August - October 2016

### Overview

ENSO (El Niño – Southern Oscillation) neutral conditions are currently present in the tropical Pacific: Sea surface temperatures (SSTs) along the eastern equatorial Pacific are near or slightly below normal, and the atmospheric conditions over the tropical Pacific are generally consistent with an ENSO-neutral state. As a whole the tropical ocean-atmosphere system still shows a leaning towards La Niña, but with a slight weakening of the signals that were observed last month (June 2016).

The Southern Oscillation Index (SOI) is currently slightly positive but well within the neutral range. Slightly enhanced trade-winds are present in the western and central Pacific west of about 150°W. The subsurface ocean remains cooler than normal in the central and eastern Pacific, however these anomalies have weakened compared to last month.

International guidance still favours development of La Niña conditions (50% chance) over the next three month period (August – October 2016), but note that this probability is lower than this time last month. The likelihood of La Niña conditions becoming established in the Pacific increases slightly later on, reaching 55% in November – January 2016/2017. In summary, both the current state and recent evolution of the ocean-atmosphere system in the Pacific, as well as the models' forecasts, suggest that this La Niña event, if it develops, will be characterized by a relatively late onset, short duration and weak amplitude.

For August - October 2016, there is no clear guidance or indication on seasonal airflow anomaly. However, weak anomalously low pressures are forecast around New Zealand and are likely to be accompanied with unsettled conditions. Anomalously high ocean temperatures around the country mean warmer and more humid air masses are likely to affect New Zealand, especially the North Island. Consequently, there remains an elevated risk for significant rainfall events and severe storms.

## Outlook Summary

August – October 2016 temperatures are very likely (65-70% chance) to be above average in all regions of the country. Nevertheless, frosts and cold snaps will occur from time to time in cooler locations. Sea surface temperatures are forecast to remain above normal over the next three months, especially to the west of New Zealand.

August – October 2016 rainfall totals are about equally likely to be in the near normal range (40% chance) or above normal (35-40% chance) range in the north and west of the North Island and the west of the South Island. Seasonal rainfall is most likely (40% chance) 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 for the August – October 2016 period is about equally likely to be near normal (40% chance) or below normal (35% chance).

August - October 2016 soil moisture levels and river flows are most likely (45% chance) to be below normal in the east of the South Island. In the north of the North Island, soil moisture levels and river flows are about equally likely to be in the near normal range (35-40% chance) or above normal range (35% chance). In the west of the North Island, soil moisture levels are about equally likely to be near normal (40% chance) or above normal (35% chance), and river flows are most likely to be in the near normal range (40% chance). Seasonal soil moisture levels and river flows are about equally likely to be near normal (35-40% chance) or below normal (35% chance) in the east of the North Island and the north of the South Island. In the west of the South Island, soil moisture levels are most likely to be near normal (40% chance) while river flows are about equally likely to be near normal (40% chance) or above normal (35% chance).

## Regional predictions for the August – October 2016 season

### Northland, Auckland, Waikato, Bay of Plenty

The table below shows the probabilities (or percent chances) for each of three categories: above average, near average, and below average. In the absence of any forecast guidance there would be an equal likelihood (33% chance) of the outcome being in any one of the three categories. Forecast information from local and global guidance models is used to indicate the deviation from equal chance expected for the coming three month period, with the following outcomes the *most likely* (but not certain) for this region:

- Temperatures are very likely to be above average (70% chance).
- Rainfall totals are equally likely (40% chance) to be above normal or near normal.
- Soil moisture levels are equally likely (35% chance) to be in the near normal or above normal range.

- River flows are about equally likely to be near normal (40% chance) or above normal (35% chance).

The full probability breakdown is:

	Temperature	Rainfall	Soil moisture	River flows
Above average	70	40	35	35
Near average	20	40	35	40
Below average	10	20	30	25

### **Central North Island, Taranaki, Wanganui, Manawatu, Wellington**

Probabilities are assigned in three categories: above average, near average, and below average.

- Temperatures are very likely to be above average (65% chance).
- Rainfall totals are equally likely (40% chance) to be near normal or above normal.
- Soil moisture levels are about equally likely to be in the near normal (40% chance) or above normal (35% chance) range.
- River flows are most likely (40% chance) to be in the near normal range.

The full probability breakdown is:

	Temperature	Rainfall	Soil moisture	River flows
Above average	65	40	35	30
Near average	25	40	40	40
Below average	10	20	25	30

### **Gisborne, Hawke's Bay, Wairarapa**

Probabilities are assigned in three categories: above average, near average, and below average.

- Temperatures are very likely to be above average (70% chance).
- Rainfall totals are most likely (40% chance) to be in the near normal range.
- Soil moisture levels and river flows are about equally likely to be near normal (40% chance) or below normal (35% chance).

The full probability breakdown is:

	Temperature	Rainfall	Soil moisture	River flows
Above average	70	30	25	25
Near average	20	40	40	40
Below average	10	30	35	35

### **Nelson, Marlborough, Buller**

Probabilities are assigned in three categories: above average, near average, and below average.

- Temperatures are very likely to be above average (70% chance).
- Rainfall totals are most likely (40% chance) to be in the near normal range.
- Soil moisture levels are equally likely (35% chance) to be in the near normal or below normal range.
- River flows are about equally likely to be in the near normal (40% chance) or below normal (35% chance) range.

The full probability breakdown is:

	Temperature	Rainfall	Soil moisture	River flows
Above average	70	30	30	25
Near average	20	40	35	40
Below average	10	30	35	35

### **West Coast, Alps and foothills, inland Otago, Southland**

Probabilities are assigned in three categories: above average, near average, and below average.

- Temperatures are very likely to be above average (65% chance).
- Rainfall totals and river flows are about equally likely to be near normal (40% chance) or above normal (35% chance).
- Soil moisture levels are most likely (40% chance) to be in the near normal range.

The full probability breakdown is:

	Temperature	Rainfall	Soil moisture	River flows
Above average	65	35	30	35
Near average	25	40	40	40
Below average	10	25	30	25

### **Coastal Canterbury, east Otago**

Probabilities are assigned in three categories: above average, near average, and below average.

- Temperatures are very likely to be above average (65% chance).
- Rainfall totals are about equally likely to be normal (40% chance) or below normal (35% chance).
- Soil moisture levels and river flows are most likely to be in the below normal range (45% chance)

The full probability breakdown is:

	Temperature	Rainfall	Soil moisture	River flows
Above average	65	25	20	20
Near average	25	40	35	35

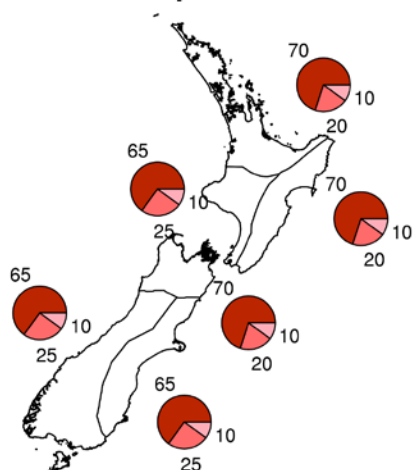
Below average	10	35	45	45
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## Graphical representation of the regional probabilities

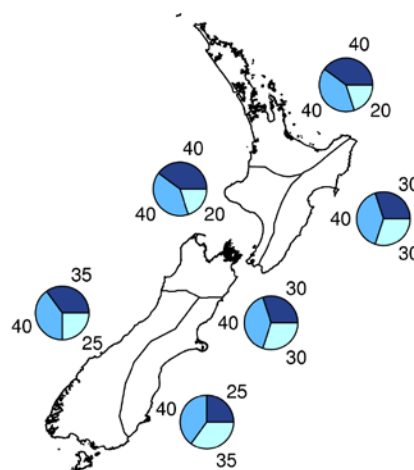
### Outlook for August - October 2016



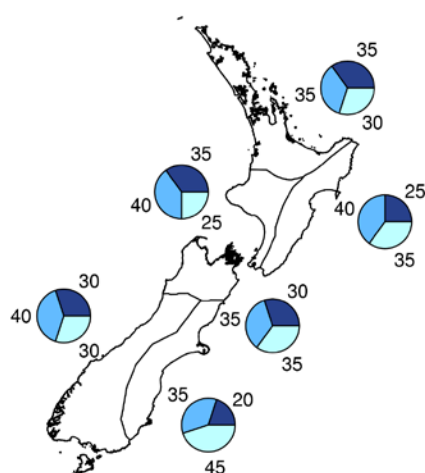
#### Air Temperature



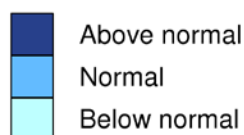
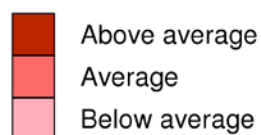
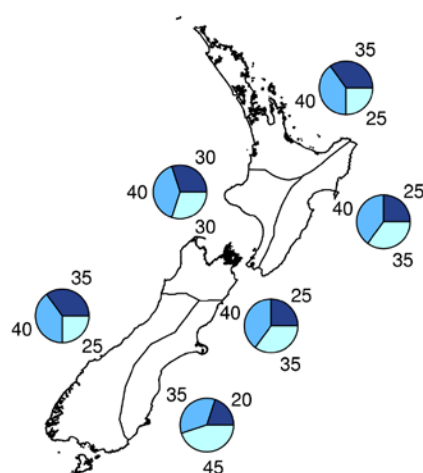
#### Rainfall



#### Available Soil Moisture



#### River Flows



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## Background

Sea surface temperatures (SSTs) are near to below average across the eastern Equatorial Pacific ocean. Cooler than normal sub-surface ocean waters have remained stable or weakened slightly in the central Equatorial Pacific.

The Southern Oscillation Index (SOI) is currently slightly positive [ $+0.3$ , value estimated before end of month]. Trade winds are slightly stronger than normal in the central and western Pacific (west of about  $150^{\circ}\text{W}$ ). The Intertropical Convergence Zone (ITCZ) was displaced north of its climatological position along the Equator in the central Pacific. Convection and rainfall was below normal in some parts of the western Pacific (*e.g.* Micronesia), but generally the Maritime Continent (*e.g.* Indonesia and Papua New Guinea) experienced above normal rainfall and convective activity.

Collectively, these oceanic and atmospheric signals indicate ENSO-neutral conditions. As a whole the tropical ocean-atmosphere system still shows a leaning towards La Niña, but with a slight weakening of the signals that were observed last month (June 2016).

The international guidance still indicate that a transition towards La Niña is the most likely outcome (50% chance) over the next three months (August – October 2016), but this probability is lower than the one that was issued last month. Chances for La Niña becoming established increases later in 2016 to reach about 55% for the November 2015 – January 2017 period. Current ocean – atmosphere conditions and models' forecasts suggest that if La Niña indeed develops, it will remain in the weak category.

Waters surrounding New Zealand remain exceptionally warm, and ocean models predict that these warm conditions will persist through August – October 2016. These warmer regional sea surface temperatures will remain a major driving force for New Zealand's climate over the coming season. In addition, warmer than average sea surface temperatures in the eastern Indian Ocean may lend to increased rising motion and moisture in the atmosphere. Thus, storms that track eastward across Australia and toward New Zealand from this region may have more moisture (fuel) or have more of a tropical connection than usual.

To find out more about normal conditions for this outlook period, refer to [NIWA's website](#), where daily updates on climate maps are available.

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## For comment, please contact

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## Notes to reporters and editors

1. NIWA's outlooks indicate the likelihood of climate conditions being at, above, or below average for the season as a whole. They are not 'weather forecasts'. It is not possible to forecast precise weather conditions three months ahead of time.
2. The outlooks are the result of the expert judgment of NIWA's climate scientists. They take into account observations of atmospheric and ocean conditions and output from global and local climate models. The presence of El Niño or La Niña conditions and the sea surface temperatures around New Zealand can be a useful indicator of likely overall climate conditions for a season.
3. The outlooks state the probability for above average conditions, near average conditions, and below average conditions for rainfall, temperature, soil moisture, and river flows. For example, for winter (June–July–August) 2007, for all the North Island, we assigned the following probabilities for temperature:
  - Above average: 60 per cent
  - Near average: 30 per cent
  - Below average: 10 per centWe therefore concluded that above average temperatures were very likely.
4. This three-way probability means that a random choice would be correct only 33 per cent (or one-third) of the time. It would be like randomly throwing a dart at a board divided into three equal parts, or throwing a dice with three numbers on it. An analogy with coin tossing (a two-way probability) is not correct.
5. A 50 per cent 'hit rate' is substantially better than guesswork, and comparable with the skill level of the best overseas climate outlooks. See, for example, analysis of global outlooks issued by the International Research Institute for Climate and Society based in the US published in the Bulletin of the American Meteorological Society (Goddard, L., A. G. Barnston, and S. J. Mason, 2003: Evaluation of the IRI's "net assessment" seasonal climate forecasts 1997–2001. *Bull. Amer. Meteor. Soc.*, 84, 1761–1781).
6. Each month, NIWA publishes an analysis of how well its outlooks perform. This is available online and is sent to about 3500 recipients of NIWA's newsletters, including many farmers. See [www.niwa.co.nz/our-science/climate/publications/all/cu](http://www.niwa.co.nz/our-science/climate/publications/all/cu)
7. All outlooks are for the three months as a whole. There will inevitably be wet and dry days, and hot and cold days, within a season. The exact range in temperature and rainfall within each of the three categories varies with location and season. However, as a guide, the "near average" or middle category for the temperature predictions includes deviations up to  $\pm 0.5^{\circ}\text{C}$  for the long-term mean, whereas for rainfall the "near normal" category lies between approximately 80 per cent and 115 per cent of the long-term mean.
8. The seasonal climate outlooks are an output of a scientific research programme, supplemented by NIWA's Capability Funding. NIWA does not have a government contract to produce these outlooks.
9. Where probabilities are within 5% of one another, the term "about equally" is used.

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