

April – June 2016

Issued: 1 April 2016

Hold mouse over links and press **ctrl + left click** to jump to the information you require:[Overview](#)**Regional predictions for the next three months:**[Northland, Auckland, Waikato, Bay of Plenty](#)[Central North Island, Taranaki, Wanganui, Manawatu, Wellington](#)[Gisborne, Hawke's Bay, Wairarapa](#)[Nelson, Marlborough, Buller](#)[West Coast, Alps and foothills, inland Otago and Southland](#)[Coastal Canterbury, east Otago](#)[Background](#)[Contacts](#)[Notes to reporters and editors](#)

NIWA Outlook: April - June 2016

Overview

El Niño conditions continued in the Tropical Pacific during March 2016, but the current event has clearly entered its decaying phase. Sea surface temperature (SST) anomalies in the central and eastern Equatorial Pacific weakened further in March, with all SST indices now much weaker than 2°C above normal. The warmer sub-surface temperature anomalies across the eastern Pacific have also weakened, while deeper cooler waters have spread eastward from the western Pacific. These changes in sub-surface temperatures make it very likely that the current SST anomalies will retreat further towards average in the next few months. Meanwhile, the Southern Oscillation Index (SOI) also weakened over March 2016 and the latest value (estimated on the 30th of March) is about -0.5.

International guidance indicates that El Niño is likely to weaken further over the next three months (April – June 2016) and the forecast is for a return to normal conditions or a transition toward La Niña by July – September 2016. La Niña conditions become increasingly likely towards the end of 2016 (over 45% chance for October – December 2016).

For April – June 2016, above normal pressure is forecast to the north of New Zealand. This circulation pattern is likely to be accompanied by weak anomalous westerly wind flow.

Outlook Summary

April - June 2016 temperatures are most likely (50 to 60 % chance) to be above average for all regions of New Zealand. Nevertheless, as we reach into winter, frosts are likely to occur from time to time in cooler locations. Sea surface temperatures around New Zealand are forecast to be above average, particularly to the west of the country.

April – June 2016 rainfall is about equally likely to be in the below normal (35-40% chance) or near normal (35-40% chance) range in all regions of the North Island and the east of the South Island. Near normal rainfall is most likely (40% chance) in the north of the South Island. In the west of the South Island, seasonal rainfall totals are most likely to be above normal (45% chance).

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

Regional predictions for the April – June 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 most likely to be above average (60% chance).
- Rainfall totals are about equally likely to be below normal (40% chance) or near normal (35% chance).
- Soil moisture levels and river flows are equally likely (40% chance) to be near or below normal.

The full probability breakdown is:

	Temperature	Rainfall	Soil moisture	River flows
Above average	60	25	20	20
Near average	25	35	40	40
Below average	15	40	40	40

Central North Island, Taranaki, Wanganui, Manawatu, Wellington

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

- Temperatures are most likely to be above average (50% chance).

- Rainfall totals, soil moisture levels and river flows are all 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	50	25	25	25
Near average	35	40	40	40
Below average	15	35	35	35

Gisborne, Hawke's Bay, Wairarapa

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

- Temperatures are most likely to be above average (60% chance).
- Rainfall totals are about equally likely to be below normal (40% chance) or near normal (35% chance).
- Soil moisture levels and river flows are equally likely (40% chance) to be near or below normal.

The full probability breakdown is:

	Temperature	Rainfall	Soil moisture	River flows
Above average	60	25	20	20
Near average	25	35	40	40
Below average	15	40	40	40

Nelson, Marlborough, Buller

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

- Temperatures are most likely to be above average (50% chance).
- Rainfall totals, soil moisture levels and river flows are all most likely to be in the near normal range (40 to 45% chance).
- Note that this outcome is for the north of the South Island region as a whole, but there was some indication that the region could be split between a wetter than normal western side and drier than normal eastern side.

The full probability breakdown is:

	Temperature	Rainfall	Soil moisture	River flows
Above average	50	30	30	25
Near average	35	40	40	45
Below average	15	30	30	30

West Coast, Alps and foothills, inland Otago, Southland

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

- Temperatures are most likely to be above average (50% chance).
- Rainfall totals are most likely to be in the above normal range (45% chance).
- Soil moisture levels and river flows are about equally likely to be in the near normal range (40% chance) or above normal range (35% chance).

The full probability breakdown is:

	Temperature	Rainfall	Soil moisture	River flows
Above average	50	45	35	35
Near average	35	35	40	40
Below average	15	20	25	25

Coastal Canterbury, east Otago

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

- Temperatures are most likely to be above average (50% chance).
- Rainfall totals are about equally likely to be near normal (40% chance) or below normal (35% chance).
- Soil moisture levels and river flows are most likely (45% chance) to be in the below normal range.

The full probability breakdown is:

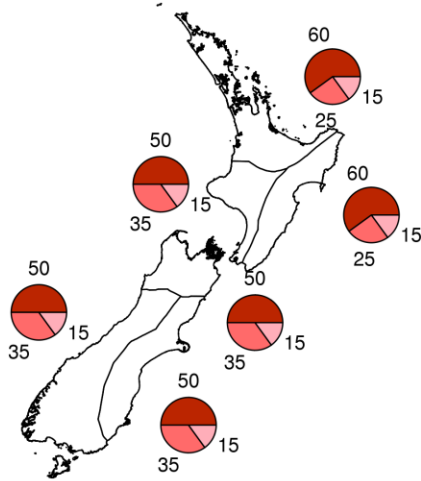
	Temperature	Rainfall	Soil moisture	River flows
Above average	50	25	20	20
Near average	35	40	35	35
Below average	15	35	45	45

Graphical representation of the regional probabilities

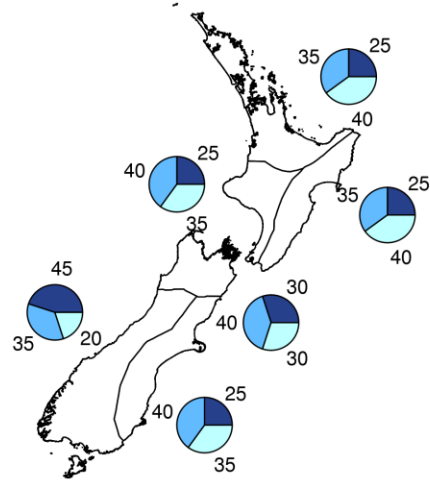
Outlook for April - June 2016



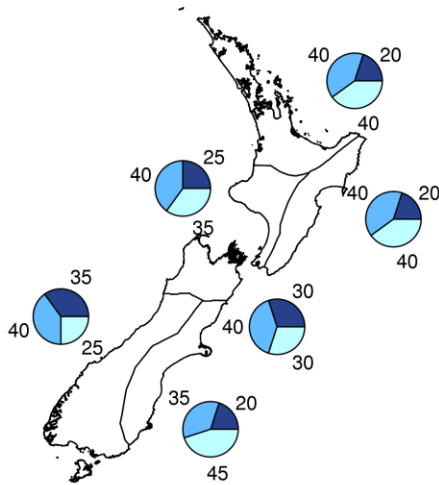
Air Temperature



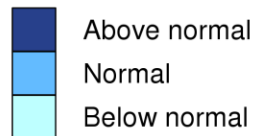
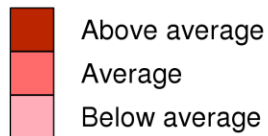
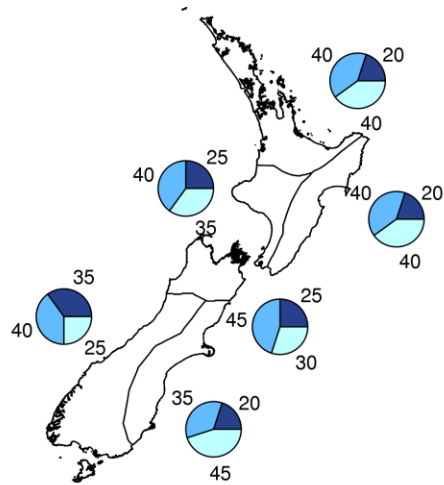
Rainfall



Available Soil Moisture



River Flows



Background

El Niño conditions continued in the Tropical Pacific during March 2016, but the current event has clearly entered its decaying phase. Sea surface temperature (SST) anomalies in the central and eastern Equatorial Pacific weakened further in March, with all NINO SST indices now well below the +2°C mark. The warmer sub-surface ocean temperature anomalies across the eastern Pacific have also weakened and shoaled substantially, and now barely exceed +2°C in the first 50m of the ocean east of about 130°W, while deeper cooler waters have spread eastward from the western Pacific. These changes in sub-surface temperatures make it very likely that the current SST anomalies will retreat further towards average in the next few months. Meanwhile, the Southern Oscillation Index (SOI) also weakened over March 2016 and the latest value (estimated on the 30th of March) is about -0.5. The strong westerly wind anomalies (weaker easterly trade-winds) that dominated the western and central Pacific until the beginning of 2016 have now almost dissipated. While convective activity and rainfall remains higher than normal in the Equatorial central and eastern Pacific, the dry conditions that affected the Maritime Continent have weakened significantly.

International guidance indicates that El Niño conditions are very likely (80% chance) to continue over the next three months (April – June 2016) as a whole, but all models forecast El Niño to weaken further over the same period. A return to normal conditions (49% chance) or a transition to La Niña (40% chance) is expected by July – September 2016. La Niña conditions become increasingly likely towards the end of 2016 (over 45% chance for October – December 2016).

Waters surrounding New Zealand are currently much warmer to normal, especially off the west coast of the country. Ocean models suggest that coastal waters will remain warmer than normal in April – June 2016.

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

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
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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