

April – June 2015

Issued: 2 April 2015

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NIWA Outlook: April-June 2015

Overview

Sea surface temperature anomalies in the tropical Pacific intensified significantly around the international Dateline during March 2015 and are currently showing a pattern consistent with weak El Niño conditions. Atmospheric patterns across the region were also generally consistent with weak El Niño anomalies.

International guidance indicates that the probability for conventional El Niño thresholds being crossed over the next three months (April – June 2015) is about 60%.

During April - June 2015, lower than normal mean sea level pressures are expected to the east and northeast of New Zealand with positive mean sea level pressure anomalies west of New Zealand. This circulation pattern is likely to produce anomalous westerly quarter wind flows.

Coastal waters are forecast to be in the near average or above average temperature range for the April – June 2015 period.

Outlook Summary

April – June 2015 temperatures are most likely (50% chance) to be in the above average range in the east and north of the North Island. For all remaining regions of New Zealand temperatures are about equally likely (35-45%) to be in the near average or above average range. As autumn progresses, cold snaps and frosts can still be expected from time to time in some parts of the country.

April – June 2015 rainfall is about equally likely (35-40% chance) to be in the near normal or above normal range in the west of the North Island. Rainfall totals for the season are about equally likely (35-40% chance) to be in the near normal or below normal range for the north and east of the North Island and the east of the South Island. In the north and west of the South Island, rainfall is most likely (45% chance) to be in the near normal range.

April – June 2015 soil moisture levels and river flows are most likely (55-60% chance) to be below normal in the east of the South Island. Soil moisture levels and river flows are most likely (45% chance) to be in the near normal range in the west of the North Island and west of the South Island. In the north and east of the North Island, soil moisture levels are about equally likely (40-45% chance) to be in the near normal or below normal range, while river flows are most likely (45-50% chance) to be in the below normal range. Soil moisture levels and river flows are equally likely (40% chance) to be in the near normal or below normal range for the north of the South Island.

Regional predictions for the April to June 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 about most likely (50% chance) to be in the above average range.
- Rainfall totals are about equally likely (35-40% chance) to be in the near normal or below normal range.
- Soil moisture levels are about equally likely (40% chance) to be in the near normal or below normal range
- River flows are most likely (45% chance) to be in the below normal range.

Other outcomes cannot be excluded. The full probability breakdown is:

| | Temperature | Rainfall | Soil moisture | River flows |
|---------------|-------------|----------|---------------|-------------|
| Above average | 50 | 25 | 20 | 20 |
| Near average | 40 | 40 | 40 | 35 |
| Below average | 10 | 35 | 40 | 45 |

Central North Island, Taranaki, Wanganui, Manawatu, Wellington

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

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

The full probability breakdown is:

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

Gisborne, Hawke's Bay, Wairarapa

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

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

The full probability breakdown is:

| | Temperature | Rainfall | Soil moisture | River flows |
|---------------|-------------|----------|---------------|-------------|
| Above average | 50 | 20 | 15 | 15 |
| Near average | 40 | 40 | 40 | 35 |
| Below average | 10 | 40 | 45 | 50 |

Nelson, Marlborough, Buller

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

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

The full probability breakdown is:

| | Temperature | Rainfall | Soil moisture | River flows |
|---------------|-------------|----------|---------------|-------------|
| Above average | 45 | 30 | 20 | 20 |
| Near average | 40 | 45 | 40 | 40 |
| Below average | 15 | 25 | 40 | 40 |

West Coast, Alps and foothills, inland Otago, Southland

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

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

The full probability breakdown is:

| | Temperature | Rainfall | Soil moisture | River flows |
|---------------|-------------|----------|---------------|-------------|
| Above average | 40 | 30 | 25 | 20 |
| Near average | 35 | 45 | 45 | 45 |
| Below average | 25 | 25 | 30 | 35 |

Coastal Canterbury, east Otago

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

- Temperatures are about equally likely (40-45% chance) to be in the near average or above average range.
- Rainfall totals are about equally likely (35-40% chance) to be in the near normal or below normal range.
- Soil moisture levels and river flows are most likely (55-60% chance) to be in the below normal range.

The full probability breakdown is:

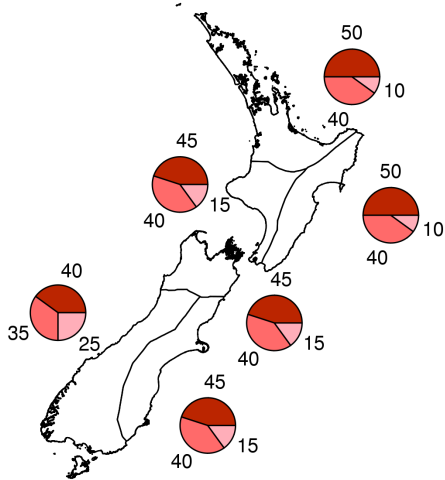
| | Temperature | Rainfall | Soil moisture | River flows |
|---------------|-------------|----------|---------------|-------------|
| Above average | 45 | 25 | 10 | 15 |
| Near average | 40 | 35 | 30 | 30 |
| Below average | 15 | 40 | 60 | 55 |

Graphical representation of the regional probabilities

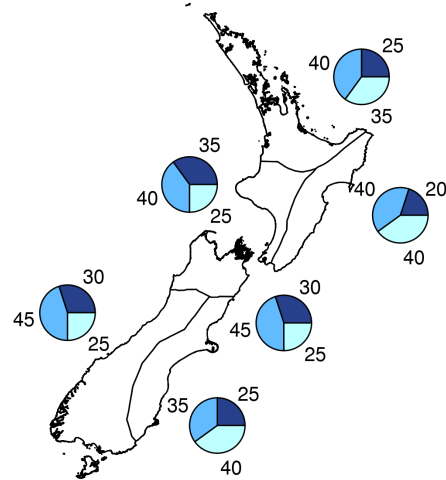
Outlook for April - June 2015



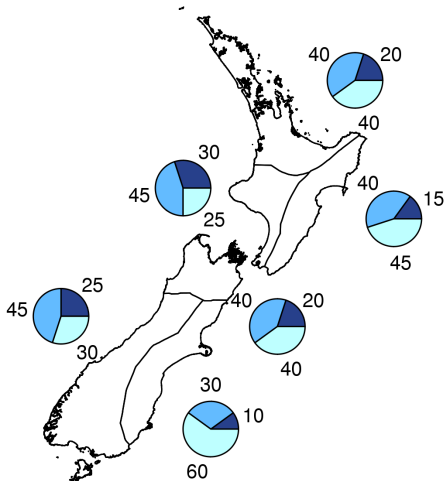
Air Temperature



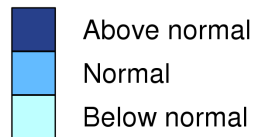
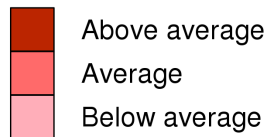
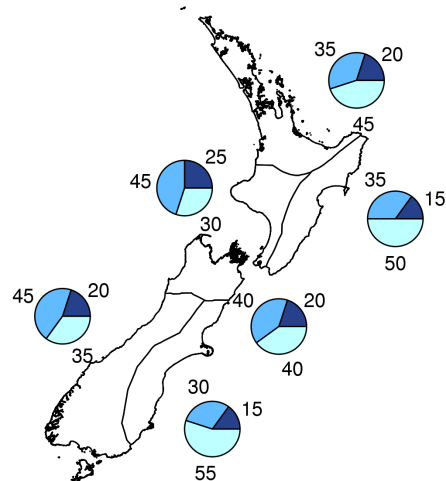
Rainfall



Available Soil Moisture



River Flows



Background

Sea surface temperature anomalies in the tropical Pacific intensified significantly around the international Dateline during March 2015 and are currently showing a pattern consistent with weak 'central Pacific' or 'Modoki' El Niño conditions¹. Atmospheric patterns were also consistent with weak El Niño conditions, with a negative Southern Oscillation Index value for March of -1.1 (preliminary value estimated the 31st of March) and strong positive convective anomalies around the international Dateline, signalling that the atmosphere has weakly coupled with the Ocean.

Monthly SST anomalies are currently 0.55°C above normal in the NINO3.4 region (values updated to 29 March). The NINO3 monthly value is +0.26°C and the NINO4 (in the west-central Pacific) monthly value is +1.05°C.

Sub-surface ocean temperature anomalies in the Central Pacific (around and east of the International Dateline) at about 150m depth have increased significantly to reach up to +5°C. Positive anomalies (~+3°C) have also propagated further eastward in the upper Ocean (~50m) off the South American coast. Positive upper ocean heat content anomalies (upper 300m of the Ocean) have also intensified just east of the international Dateline and now reach above +2°C.

The latest Tropical Atmosphere Ocean (TAO) array observations show strong westerly wind anomalies along the equatorial Pacific west of the International Dateline. The NASA ENSO (El Niño Southern Oscillation) Precipitation Index (ESPI) for the 30 days to 30 March was +0.86 (i.e. on the El Niño side of Neutral).

International guidance indicates that the chances for conventional El Niño thresholds to be crossed over the April – June 2015 season are about 60%. This probability increases later on to reach about 70% during the winter (July – September 2015).

For New Zealand, El Niño events are typically (but not always) associated with stronger and/or more frequent westerly winds. Such a climate pattern typically leads to drier conditions in eastern and northern areas and more rain in western areas of the country.

Waters surrounding New Zealand are slightly warmer than average around the country (the preliminary value is +0.4°C above normal) and are forecast to remain in the above normal range especially along the west coast of the country for the March – May 2015 period.

To find out more about normal conditions for this outlook period, refer to [NIWA's website](#).

¹ *Modoki* is a Japanese term meaning 'similar but different', and refers to a type of El Niño event where the maximum sea surface temperature anomalies is located in the central – rather than the eastern – Pacific Ocean. See [the JAMSTEC website](#) for more background and data.

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.

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