

**March – May 2015**

Issued: 27 February 2015

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## NIWA Outlook: March-May 2015

### Overview

Sea surface temperatures across the equatorial Pacific Ocean continued to reflect conditions between neutral and weak El Niño states during February 2015. Atmospheric patterns were mostly indicative of weak El Niño-like conditions.

International guidance indicates that the probability of El Niño conditions developing over the next three months (March – May 2015) is about 45%.

During March – May 2015, mean sea level pressures are expected to be slightly below normal over New Zealand and below normal to the north and east of the country. This pressure pattern is expected to be associated with anomalous flow from the easterly quarter.

Coastal waters are forecast to remain in the above normal range especially along the west coast of the country for the March – May 2015 period.

The official end of the 2014-2015 southwest Pacific Tropical Cyclone season is April 2015. The risk of having an ex-tropical system coming within 550km of the country during the forecast period (March – May 2015) remains slightly elevated compared to normal.

## Outlook Summary

March – May 2015 temperatures are about equally likely (40-45% chance) to be in the near average or above average range for all regions of New Zealand. As autumn progresses, cold snaps and frosts can be expected from time to time in some parts of the country.

March – May 2015 rainfall is equally likely (35-40% chance) to be in the near normal or above normal range in the east of the South Island, most likely (40% chance) to be near normal in the north and west of the South Island, and about equally likely (35-40%) to be in the near normal or below normal range for regions of the North Island.

March – May 2015 soil moisture levels and river flows are most likely (45-55% chance) to be below normal in the north and east of the North Island, and about equally likely (35-45% chance) to be in the near normal or below normal range in the west of the North Island and north and west of the South Island. In the east of the South Island, soil moisture levels are about equally likely (35-40% chance) to be in the near normal or below normal range and river flows are most likely (45% chance) to be below normal.

## Regional predictions for the March to May 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 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 (50-55% 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	45	25	20	15
Near average	40	35	30	30
Below average	15	40	50	55

### 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 (40-45% chance) to be in the near normal or below normal range.
- Soil moisture levels and river flows are about equally likely (40-45% chance) to be in the below normal or near normal range.

The full probability breakdown is:

	Temperature	Rainfall	Soil moisture	River flows
Above average	45	15	15	15
Near average	40	40	40	40
Below average	15	45	45	45

### Gisborne, Hawke's Bay, Wairarapa

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 (45% chance) to be in below normal range.

The full probability breakdown is:

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

### 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 (40% chance) to be in the near normal range.
- Soil moisture levels and river flows are about equally likely (35-40% 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	25
Near average	40	40	40	35
Below average	15	30	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 (40-45% chance) to be in the near average or above average range.
- Rainfall totals are most likely (40% chance) to be in the near normal range.
- Soil moisture levels and river flows are about equally likely (35-40% 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	25
Near average	40	40	40	35
Below average	15	30	40	40

### 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 above normal range.
- Soil moisture levels are about equally likely (35-40% 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.

The full probability breakdown is:

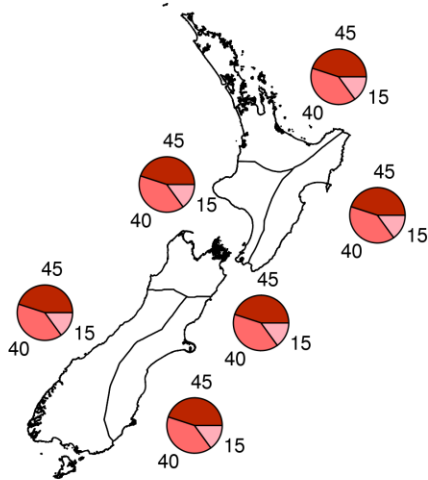
	Temperature	Rainfall	Soil moisture	River flows
Above average	45	40	25	25
Near average	40	35	35	30
Below average	15	25	40	45

Graphical representation of the regional probabilities

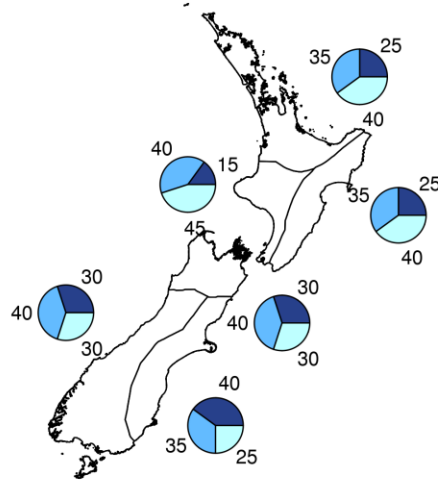
Outlook for March - May 2015



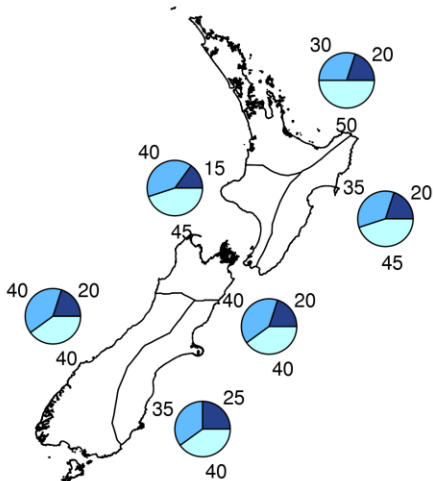
**Air Temperature**



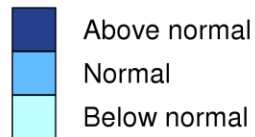
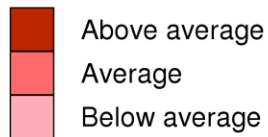
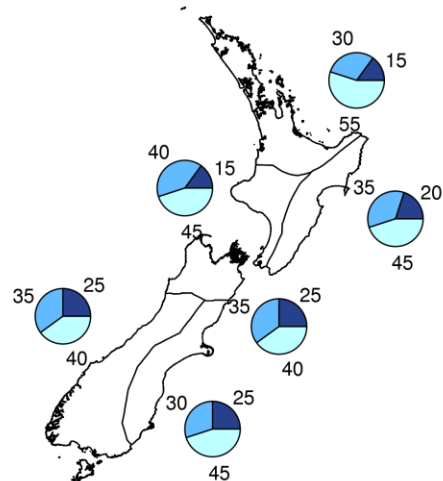
**Rainfall**



**Available Soil Moisture**



**River Flows**



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## Background

The Pacific Ocean continued to present conditions close to weak El Niño thresholds in February 2015. While atmospheric anomalies were also indicative of weak El Niño conditions, the patterns were not strong or totally consistent. The preliminary value for the Southern Oscillation Index (SOI) was slightly positive at the end of February (+0.1), reflecting mixed conditions across the Pacific as well as the passage of Tropical Cyclones Marcia and Lam over Northern Australia and the associated low pressures. This is not expected to persist with the SOI returning to negative values in the last few days.

Sea-Surface-Temperatures (SST) in the Pacific Ocean are warmer than normal in the central and western Pacific, and anomalies in the eastern Pacific have eased compared to previous months. Monthly SST anomalies are currently 0.43°C above normal in the NINO3.4 region. The NINO3 monthly value is +0.18°C and NINO4 (in the western Pacific) presents the largest anomalies with a monthly value of +0.87°C.

Sub-surface ocean temperature anomalies that were present in the Central Pacific at about 150m depth east of the international Dateline (centered around 160°W) have increased significantly to reach up to +4°C. Positive anomalies (~+2°C) are also present in the upper Ocean (~50m) off the South American coast. Positive upper ocean heat content anomalies (upper 300m of the Ocean) have spread further eastward compared to last month and now reach to about 120°W.

The latest TAO array observations show weak westerly wind anomalies along the equatorial Pacific west of the International Dateline. Large-scale enhanced convection was also present last month in the western Pacific west of the Dateline, but further west decreased convection occurred. This indicates a shift towards slightly more El Niño-like conditions. Meanwhile, the NASA ENSO Precipitation Index (ESPI) for the 30 days to 26 February was -0.06, reflecting neutral conditions.

International guidance indicates that the chances of an El Niño developing over the March – May 2015 season are of about 45%. This is lower than probabilities issued last month (~60%), however the likelihood for El Niño increases later during the year, to again reach about 60% over the June – August 2015 period.

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. The regional atmospheric circulation and rainfall outlook for March to May 2015 – as synthesized from various dynamical and statistical models – is not typical of El Niño conditions.

Waters surrounding New Zealand are warmer than average all around the country (the preliminary value is +0.7°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](#), where daily updates on climate maps are available. As of 26 February, below normal soil moisture conditions were recorded for most parts of New Zealand except for the extreme tips of the country (north of Northland and Southland). While dry conditions are “normal” for this time of the year, currently many regions have been undergoing drier than normal conditions. Even normal or above normal rainfall over the next three months are unlikely to return these soils to normal conditions.

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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.

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