



June – August 2015
2015

Issued: 29 May

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NIWA Outlook: June-August 2015

Overview

An El Niño event is now under way in the tropical Pacific. In the second half of May, the Pacific trade winds weakened substantially and the Southern Oscillation Index (SOI) dropped below -1, indicating coupling had been achieved between the warmer sea surface temperatures and the overlying atmospheric circulation.

International guidance indicates that El Niño conditions are very likely (90% chance) to continue over the next three months period (June – August 2015). The likelihood of El Niño persisting or strengthening as we reach into spring is also very high (above 80%).

During June – August 2015, above normal pressure is forecast to the west of New Zealand, while below normal pressure is expected to the northeast of the country. This circulation pattern is likely to be accompanied with anomalous westerly to southwesterly wind flows.

Sea surface temperatures for the coming three months are expected to be near average around the coasts of New Zealand.

Outlook Summary

June – August 2015 temperatures are about equally likely (35 to 45% chance) to be average or above average in all regions of New Zealand except in the north of the North Island, where temperatures for the next three months as a whole are most likely (45 % chance) to be in the near normal range. Note that cold snaps and frosts are to be expected in some parts of the country as we progress into winter.

June – August 2015 rainfall totals are about equally likely (35-40% chance) to be in the near normal or below normal range for all regions of New Zealand except for the west of the South Island, where near normal rainfall is the most likely outcome (50% chance).

Soil moisture and river flow are most likely (50 % chance) to be below normal in the east of the South Island and about equally likely (35-40% chance) to be below normal or near normal in the north and east of the North Island. In the west of the North Island and the north of the South Island, soil moisture levels are most likely (40 % chance) to be in the near normal range, while river flows are about equally likely (35-40% chance) to be in the near normal or below normal range. Soil moisture levels and river flows are about equally likely (35-40% chance) to be in the near normal or above normal range in the west of the South Island.

Regional predictions for the June to August 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 (45% chance) to be near average.
- Rainfall totals, soil moisture levels and river flows are about equally likely (35-40% chance) to be in the normal or below normal range.

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

	Temperature	Rainfall	Soil moisture	River flows
Above average	35	25	25	25
Near average	45	35	35	35
Below average	20	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 about equally likely (35-40% chance) to be near or above average.
- Rainfall totals and river flows are about equally likely (35-40% chance) to be in the below normal or near normal range.
- 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	35	25	30	25
Near average	40	35	40	40
Below average	25	40	30	35

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 average or above average.
- Rainfall totals are about equally likely (35-40% chance) to be in the below normal or 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	40	25	20	20
Near average	45	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 about equally likely (35-40% chance) to be near average or above average.
- Rainfall totals and river flows are about equally likely (35-40% chance) to be in the below normal or near normal range.
- 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	35	25	30	25
Near average	40	35	40	40
40Below average	25	40	30	35

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 (50% 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 above normal range.

The full probability breakdown is:

	Temperature	Rainfall	Soil moisture	River flows
Above average	35	30	35	35
Near average	40	50	40	40
Below average	25	20	25	25

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 equally likely (40% chance) to be in the near normal or below normal range.
- Soil moisture levels and river flows are most likely (50% chance) to be in the below normal range.

The full probability breakdown is:

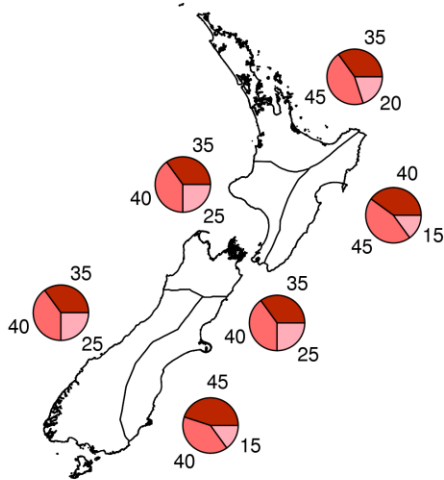
	Temperature	Rainfall	Soil moisture	River flows
Above average	45	20	15	15
Near average	40	40	35	35
Below average	15	40	50	50

Graphical representation of the regional probabilities

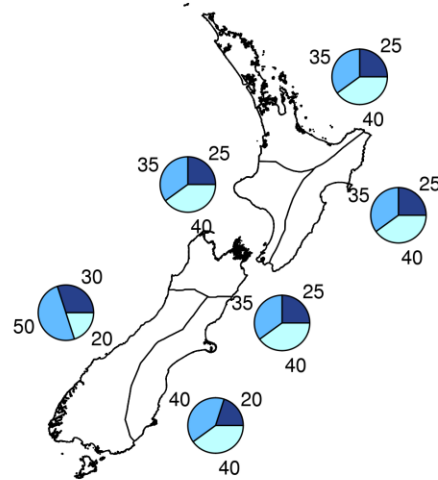
Outlook for June - August 2015



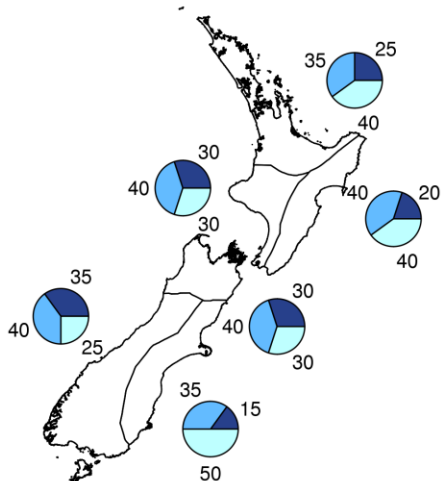
Air Temperature



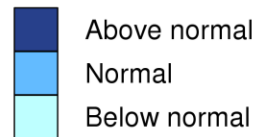
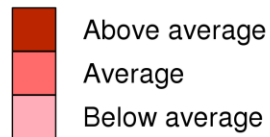
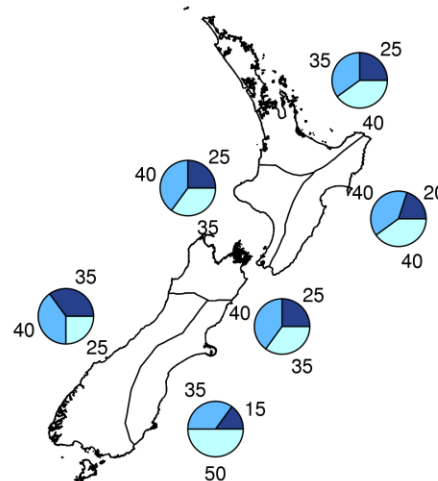
Rainfall



Available Soil Moisture



River Flows



Background

El Niño conditions became established in May 2015. In the second half of May, the Pacific trade winds weakened substantially and the Southern Oscillation Index (SOI) dropped below -1, indicating coupling had been achieved between the warmer sea surface temperatures and the overlying atmospheric circulation.

Convection and rainfall anomalies along the Equator are also indicative of an active coupling between the Ocean and the Atmosphere: the Inter-Tropical Convergence Zone (ITCZ) in particular was more intense than normal around and to the east of the International Dateline, while the Maritime Continent experienced much drier conditions than normal.

Collectively these signals clearly indicate El Niño became fully established in the tropical Pacific in May of 2015.

International guidance indicates that El Niño conditions are very likely (90% chance) to continue over the next three months period (June – August 2015). The likelihood of El Niño persisting or strengthening as we reach into spring is also very high (above 80%).

Note that El Niño events are typically (but not always) associated with stronger and/or more frequent southerly winds during the winter in New Zealand. Such a circulation pattern typically leads to cooler conditions in most regions of the country. Despite the forecast for El Niño to continue over the next three months, regional atmospheric circulation is expected to present more westerlies to southwesterlies, and the temperature outlook - as synthesized from various dynamical and statistical models - indicates that average or above average temperatures are likely in most regions.

Waters surrounding New Zealand remain slightly warmer than average. Ocean models forecasts indicate that SSTs are likely to be close to normal around the country over the next three months.

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.

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