

**October-December 2013**

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## NIWA Outlook: October–November–December 2013

### Overview

The equatorial Pacific Ocean continues in a neutral state (neither El Niño nor La Niña), with recent cooler-than-normal sea-surface conditions (La Niña-like) in the eastern tropical Pacific having weakened. International guidance indicates that ENSO-neutral conditions are the most likely outcome for the next three months (October–December).

In the New Zealand region, higher pressures than normal are forecast to south of the country and lower pressures than normal are forecast in the Australian Bight extending eastwards into the central Tasman. This circulation pattern is expected to produce northerly quarter flows over the north of the country, and a slightly enhanced easterly flow over the lower South Island.

After another warm quarter, near or above average temperatures are expected to continue across the country for the coming three months. However, frosts may occur in some areas from time to time. Sea surface temperatures are expected to remain above average overall around New Zealand.

### Outlook Summary

Temperatures over the October - December period as a whole are most likely (50% chance) to be above average in the east of the North Island and the north of the South Island. In all other regions, average or above average temperatures have near equal likelihood of occurring. The chances of below normal temperatures across all regions is 10-20%.

Rainfall totals over the October - December period as a whole are equally likely (40% chance) to be normal or above normal in the north of the North Island, and less likely (20 % chance) to be below normal. For all remaining regions of New Zealand, near normal rainfall totals are most likely (45-50% chance).

Soil moisture levels are equally likely (40% chance) to be normal or above normal in the north of the North Island, and most likely to be near normal for all other regions (40-50% chance).

River flows are equally likely (40% chance) to be normal or above normal in the north of the North Island, and most likely to be near normal for all remaining regions (45% chance).

## Regional predictions for the October to December 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 equally likely (45% chance) to be in the near average or above average range.
- Rainfall totals are equally likely (40%) to be in the near normal or above normal range.
- Soil moisture levels are equally likely (40%) to be in the near normal or above normal range.
- River flows are equally likely (40%) to be in the near normal or above normal range.

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

	Temperature	Rainfall	Soil moisture	River flows
Above average	45	40	40	40
Near average	45	40	40	40
Below average	10	20	20	20

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

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

- Temperatures are equally likely (40% chance) to be in the near average or above average range.
- Rainfall totals are most likely (50% chance) to be in the normal range
- Soil moisture levels are most likely (45% chance) to be in the near normal range.
- 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	35	35
Near average	40	50	45	45
Below average	20	20	20	20

### **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 most likely (45% chance) to be in the near normal range.
- Soil moisture levels are most likely (40% chance) to be in the near normal range.
- 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	50	25	30	25
Near average	40	45	40	45
Below average	10	30	30	30

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

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, soil moisture and river flows are most likely (45-50% chance) to be in the near normal range.

The full probability breakdown is:

	Temperature	Rainfall	Soil moisture	River flows
Above average	50	30	30	30
Near average	30	50	50	45
Below average	20	20	20	25

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

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

- Temperatures are equally likely (40% chance) to be in the near average or above average range.

- Rainfall, soil moisture 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	30	30
Near average	40	45	45	45
Below average	20	25	25	25

### Coastal Canterbury, east Otago

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

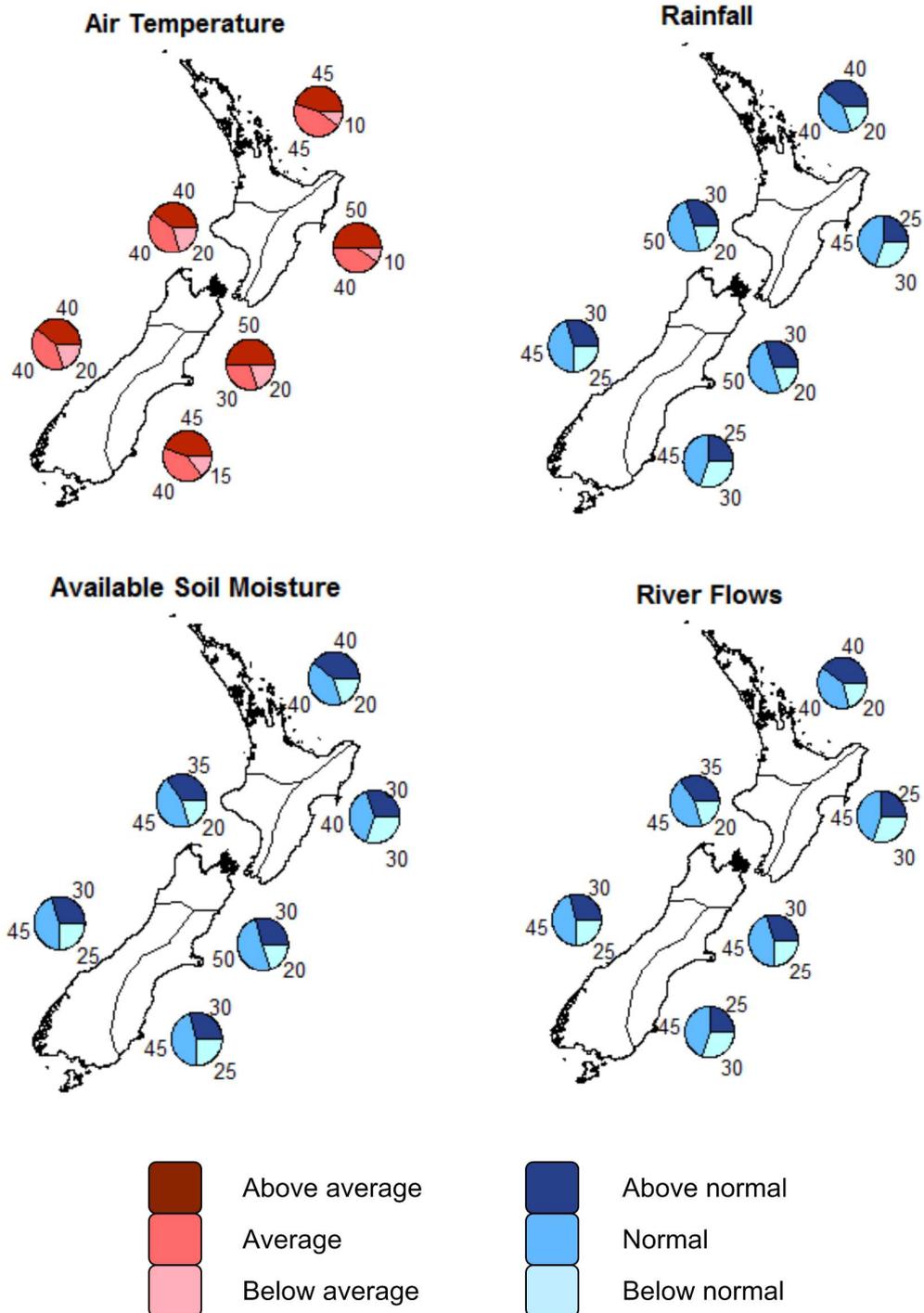
- Temperatures are most likely (40-45% chance) to be in the near average or above average ranges.
- Rainfall, soil moisture and river flows are most likely (45% chance) to be in the near normal range.

The full probability breakdown is:

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

Graphical representation of the regional probabilities

## Outlook for October-December 2013



Note: A new colour scheme is being trialled this month – aimed at making the regional probabilities more legible to those with certain forms of colour blindness.

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## Background

The NIWA Southern Oscillation Index for September is +0.5. This brings the 3-month July-August-September value to +0.4. Recent cooler-than-normal sea-surface conditions (La Niña-like) in the eastern tropical Pacific have weakened, as too have warmer than normal sea-surface temperatures to the west. Other ENSO indicators, such as low level winds in the tropical Pacific and upper ocean heat content, are also weak. Climate models indicate this neutral state is very likely (about 90% chance) to continue through to the end of 2014.

The monthly sea surface temperature anomaly for New Zealand was approximately +0.4°C in September. This is the 9<sup>th</sup> consecutive month that SST's have been warmer than normal around New Zealand, although there appears to be some weakening of both warmer waters close to the coast and patches of cooler water in the north Tasman. The large region of warmer than normal water to the northeast of New Zealand has also weakened slightly. In contrast, warm anomalies off the New South Wales coast have intensified.

For the coming tropical cyclone season (November – April), the risk of an ex-Tropical Cyclone (ETC) approaching New Zealand is expected to be close to normal. Based on the long-term record, ETCs come within 550km of New Zealand for 9 out of every 10 years (averaging close to one event per year). These systems typically occur during the latter part of the Tropical Cyclone season (February – April). For ENSO-neutral years, ETCs are twice as likely to pass to the east of Auckland than west of the city.

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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.

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