



July – September 2020

Issued: 1 July 2020

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## NIWA Outlook: July – September 2020

### Outlook Summary

- Ocean temperatures in the central Pacific continued to cool during June and are slightly below average for the time of year. Oceanic La Niña conditions (47% chance) and ENSO-neutral conditions (51% chance) are about equally likely for the next three months.
- NIWA’s criteria for a “La Niña watch” have been met. A La Niña watch is issued when ocean waters become unusually cool in the equatorial Pacific, trade winds have increased in strength, and there is an expectation for these conditions to continue for at least several months.
- July – September 2020 air pressure is forecast to be higher than normal to the north of New Zealand. Although westerly quarter air flow anomalies are expected for the season as a whole, the potential development of La Niña can influence periodic northeasterly quarter winds throughout the season.
- During periods of northeasterly winds, the chance for moist, subtropical low pressure systems (similar to those experienced in late June) is expected to increase.
- Air temperatures are most likely to be above average in the east of the North Island and about equally likely to be near average or above average in all other regions. Frosts are likely in typically colder locations.

- Rainfall is about equally likely to be near normal or below normal in the west of the South Island, about equally likely to be near normal or above normal in the east of the North Island, and most likely to be near normal in all other regions.

July – September 2020 air temperatures are most likely to be above average (50% chance) in the east of the North Island and about equally likely to be near average (40%) or above average (40-45% chance) in all other regions.

July – September 2020 rainfall is about equally likely to be near normal (40% chance) or below normal (35% chance) in the west of the South Island and about equally likely to be near normal (40% chance) or above normal (35% chance) in the east of the North Island. Near normal rainfall is most likely in all other regions (45% chance).

July – September 2020 soil moisture levels and river flows are about equally likely to be near normal (40% chance) or below normal (35-45% chance) in the east and west of the South Island. In the north of the South Island, soil moisture levels are equally likely to be near normal (40% chance) or below normal (40% chance) while river flows are most likely to be near normal (45% chance). All North Island regions are most likely to have near normal soil moisture levels and river flows (45% chance).

## Regional predictions for July – September 2020

### 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 to be near average (40% chance) or above average (45% chance).
- Rainfall totals are most likely to be near normal (45% chance).
- Soil moisture levels and river flows are most likely to be near normal (45% chance).

The full probability breakdown is:

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

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

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

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

The full probability breakdown is:

	Temperature	Rainfall	Soil moisture	River flows
Above average	45	25	20	20
Near average	40	45	45	45
Below average	15	30	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 (50% chance).
- Rainfall totals are about equally likely to be near normal (40% chance) or above normal (35% chance).
- Soil moisture levels and river flows are most likely to be near normal (45% chance).

The full probability breakdown is:

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

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

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

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

The full probability breakdown is:

	Temperature	Rainfall	Soil moisture	River flows
Above average	45	30	20	20
Near average	40	45	40	45
Below average	15	25	40	35

### 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 to be near average (40% chance) or above average (40% 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 about equally likely to be near normal (40% chance) or below normal (45% chance).

The full probability breakdown is:

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

### Coastal Canterbury, east Otago

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

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

The full probability breakdown is:

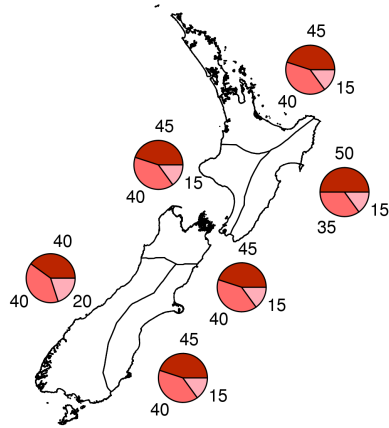
	Temperature	Rainfall	Soil moisture	River flows
Above average	45	25	25	20
Near average	40	45	40	40
Below average	15	30	35	40

# Graphical representation of the regional probabilities

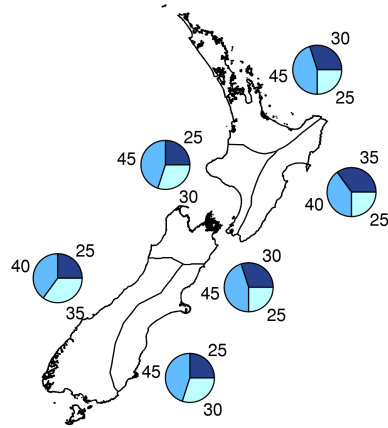
## Outlook for July - September 2020



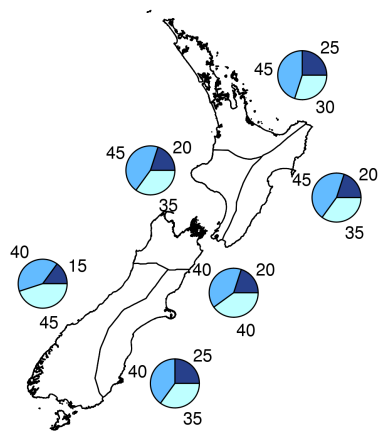
**Air Temperature**



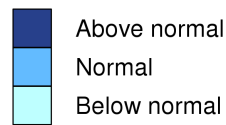
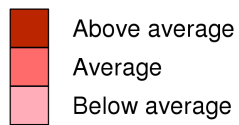
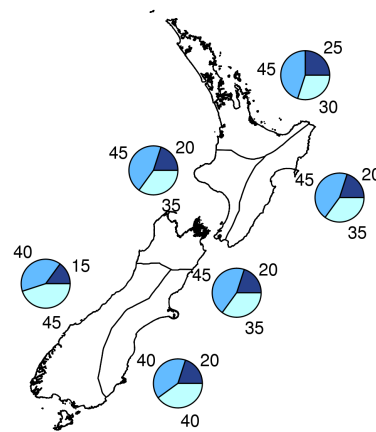
**Rainfall**



**Available Soil Moisture**



**River Flows**



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## Background

The NINO3.4 Index anomaly (in the central Pacific) for June 2020 (to the 28<sup>th</sup>) was  $-0.12^{\circ}\text{C}$ ; the April to June trend was  $-0.66^{\circ}\text{C}$ . The NINO 1+2 Index decreased to  $-0.57^{\circ}\text{C}$  while the NINO4 region remained slightly warmer than average at  $+0.30^{\circ}\text{C}$ .

Upper-oceanic heat content again decreased notably across the east-central equatorial Pacific during June. In the subsurface ocean, cooler than average conditions pushed eastward with widespread anomalies of  $-0.5$  to  $-2.0^{\circ}\text{C}$ . Meanwhile, warmth increased slightly at depth in the western Pacific. At this stage, the anomalies are consistent with developing canonical oceanic La Niña conditions.

Trade winds during June were stronger than normal in the east-central Pacific. This is expected to continue over the next three months and should lead to additional cooling in the ocean.

According to the consensus from international models, La Niña (47% chance) and ENSO-neutral (51% chance) are about equally likely for the July-September period. Compared to last month's outlook, the odds for La Niña have increased notably.

On average, La Niña is associated with more northeasterly winds in New Zealand and wetter conditions in the north and east but drier conditions in the south and west.

During June, New Zealand's coastal water temperature anomalies increased in all six climate regions. Above average ocean temperatures will likely modify colder air masses as they move toward New Zealand from the Southern Ocean.

New Zealand Coastal Sea Surface Temperatures during June 2020 (to the 29<sup>th</sup>):

North NI	West NI	East NI	North SI	West SI	East SI
$+0.50^{\circ}\text{C}$	$+0.50^{\circ}\text{C}$	$+0.32^{\circ}\text{C}$	$+0.48^{\circ}\text{C}$	$+0.72^{\circ}\text{C}$	$+0.66^{\circ}\text{C}$

The Southern Annular Mode (SAM) was strongly positive for the first three weeks of June before becoming negative. The SAM is forecast to remain negative in early July and will be associated with several rounds of unsettled weather.

The Madden-Julian Oscillation (MJO) was convectively active over the eastern hemisphere during June, with anomalous rising motion centred over Africa and the western Indian Ocean and sinking motion across the tropical Pacific.

During the next 1-2 months, the MJO will likely be most active over Africa and the western Indian Ocean and occasionally active over the Maritime Continent, north of Australia. The latter is consistent with an atmosphere system that is transitioning toward La Niña.

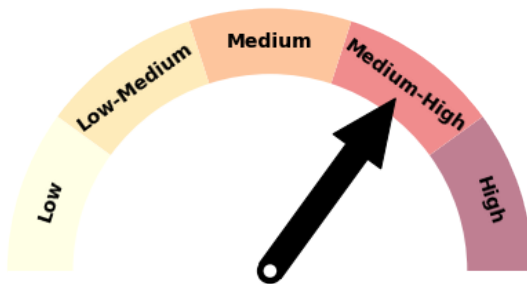
For New Zealand, during periods of the aforementioned activity over the Maritime Continent, chances for moist, subtropical northeasterly winds (similar to those experienced in late June) will increase. Otherwise, westerly quarter winds are expected to prevail, like what is forecast during the first half of July.

Over the next three months, global climate drivers are expected to continue to transition away from the pattern that caused widespread very dry conditions at the start of 2020.

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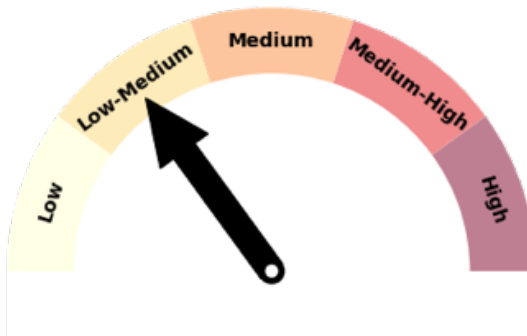
## Forecast Confidence

### Temperature



Forecast confidence for temperature is medium to high. There is widespread model agreement that a colder than average end to winter and start to spring is unlikely. Near coastal sea surface temperatures increased during June and should modify colder air masses as they emerge from the south.

### Rainfall



Forecast confidence for rainfall is low to medium. Spread in climate model guidance for rainfall during this three-month period is likely partially attributable to the potential emergence (or lack thereof) of La Niña conditions. La Niña, should it develop, would represent a transition away from the climate drivers that caused widespread very dry conditions at the start of 2020.

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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' as it is not possible to forecast precise weather conditions three months in advance.
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. When a particular probability reaches or exceeds 60%, we conclude it is “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.
5. 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 80 per cent and 120 per cent of the long-term mean.
6. The seasonal climate outlooks are an output of *predicting climate variability and change*, a scientific research programme.
7. Where probabilities are within 5% of one another, the term “about equally” is used.
8. The forecast confidence meter for temperature and rainfall represents the expert judgement of NIWA’s climate scientists. It aims to synthesize various forecast elements, such as global and local climate drivers, in order to clearly communicate forecaster confidence.

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