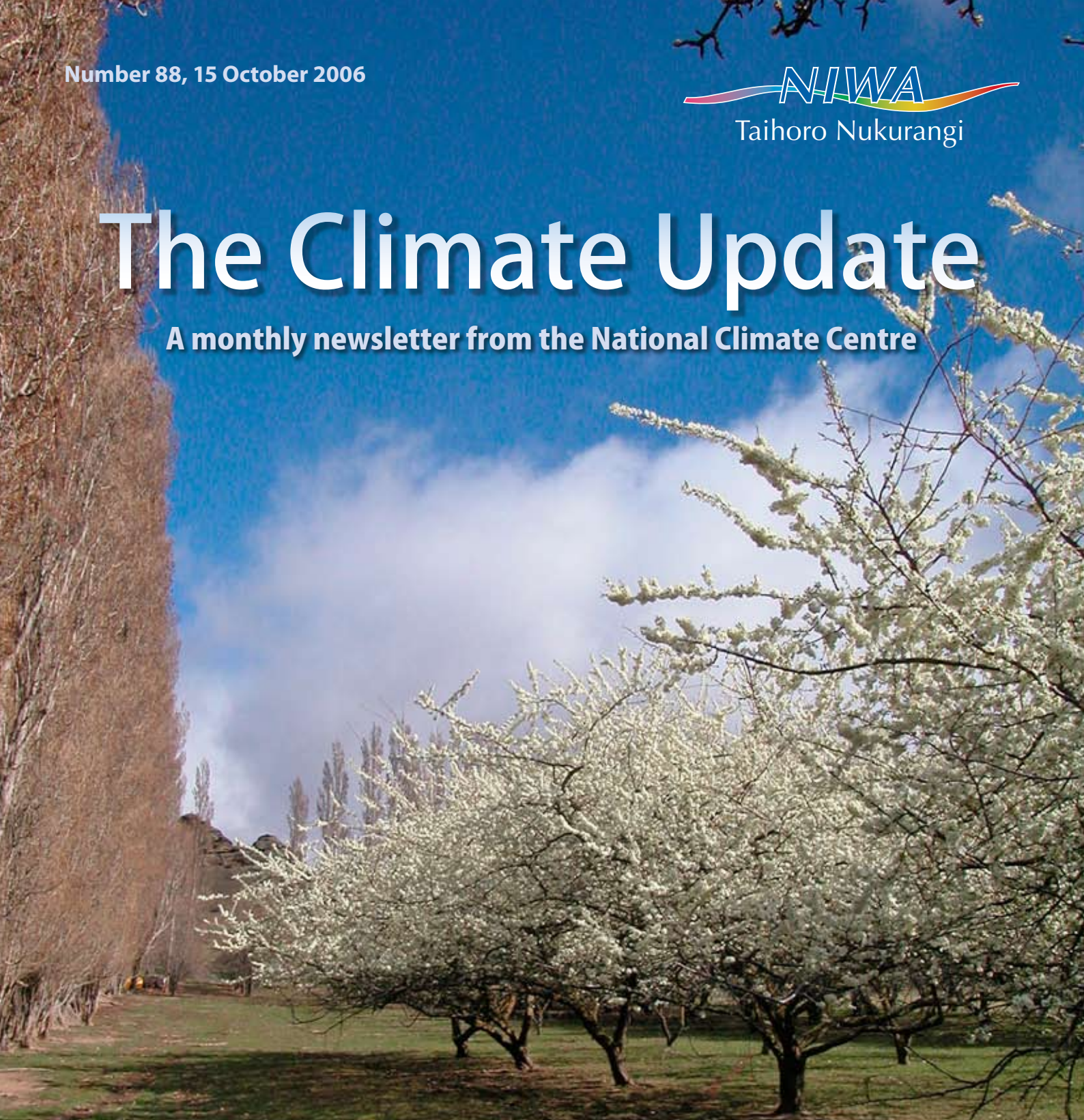
Number 88, 15 October 2006

NIWA
Taihoro Nukurangi

The Climate Update

A monthly newsletter from the National Climate Centre



September was a month of climate extremes with record low rainfall and high mean temperatures at many locations. Stream flows were low over most of the country, but high in the southwest of the South Island.

Outlook for October to December – a weak to moderate El Niño will have some influence on the climate of spring and summer, with increased south westerlies. It is likely to be cooler and wetter than normal in the west of the South Island, with normal or below normal rain in the north and east of the country.

New Zealand climate in September

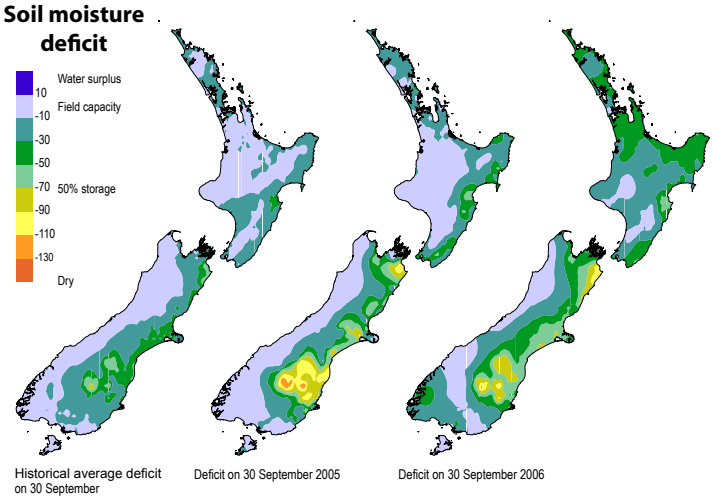
September was a month of climate extremes with record low rainfall and high mean temperatures at many locations. Rainfall was low throughout much of New Zealand, especially in the east from Wairarapa to Canterbury. Some Canterbury locations recorded 10% of normal rainfall or less.

It was the third warmest September on record, with a national average temperature of 11.6 °C, 1.2 °C above normal. Temperatures were especially high in the east from Marlborough to Otago.

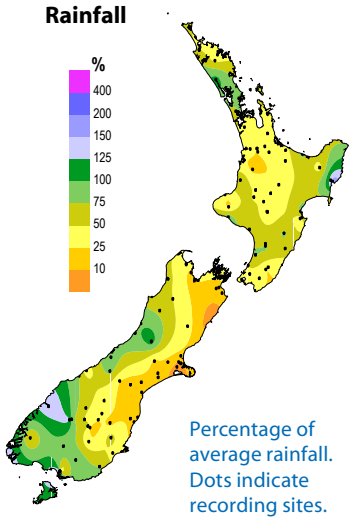
For more information on the climate in September 2006, visit the climate summaries page at www.niwascience.co.nz/ncc/cs/mclimsum_06_09

Lower soil moisture storage

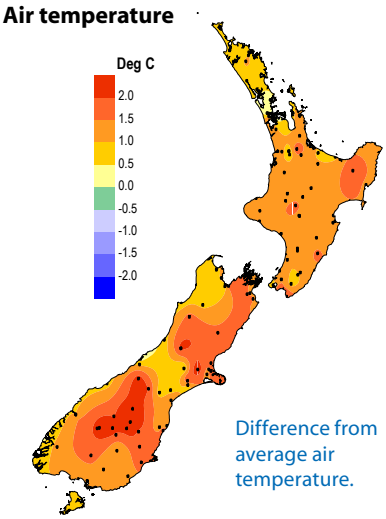
During September, there was a net loss of moisture in soils across most of the country, but particularly in the north and east of the North Island, and in Nelson, the South Island east coast, and inland Otago.



Water balance in the pasture root zone for an average soil type, where the available water capacity is taken to be 150 mm.



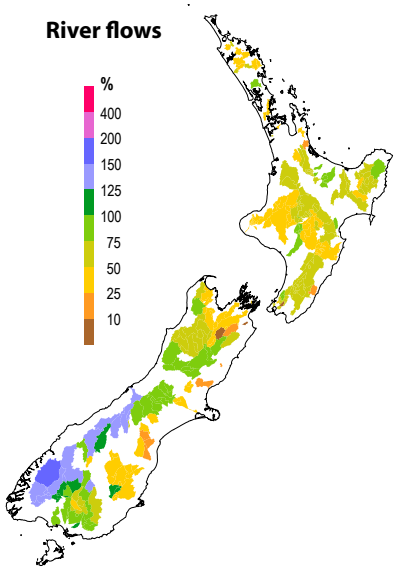
Percentage of average rainfall. Dots indicate recording sites.



Difference from average air temperature.

Mostly low river and stream flows

September stream flows were below normal over most of the country, but above normal flows occurred in the southwest of the South Island.



Percentage of average September river and stream flows at monitored catchments. NIWA field teams, regional and district councils, and hydropower companies are thanked for providing data.

July to September – the climate we predicted and what happened

Rainfall

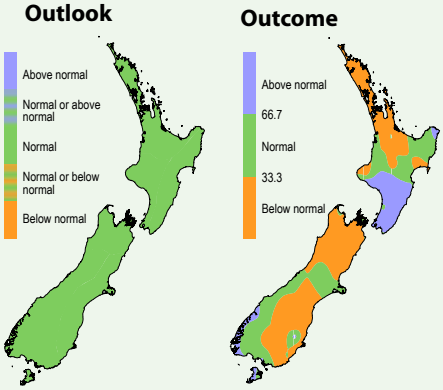
Rainfall was lower than expected in the north of the North Island, and in the north and east of the South Island. More rain fell in the southern North Island than predicted.

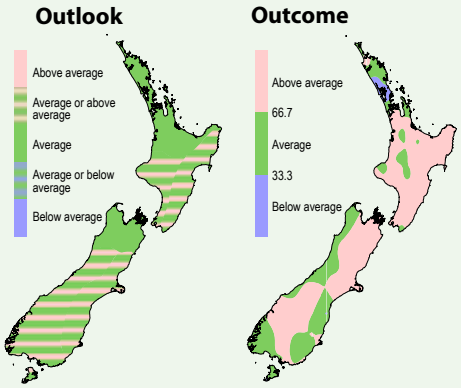
Air temperature

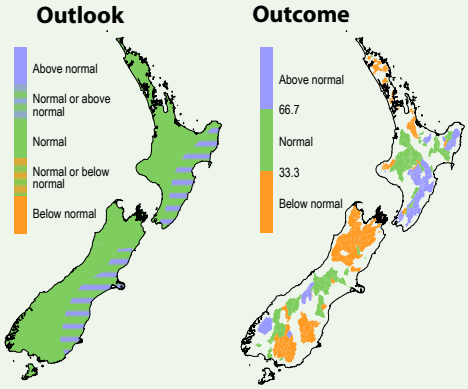
The temperature outlook was correct in most regions, apart from the warmer than expected conditions in the north of the South Island.

River flows

North Island stream flows were above normal in the east, and normal in central areas, as predicted, but below normal in the north. South Island stream flows were lower than predicted in the north and in Otago.







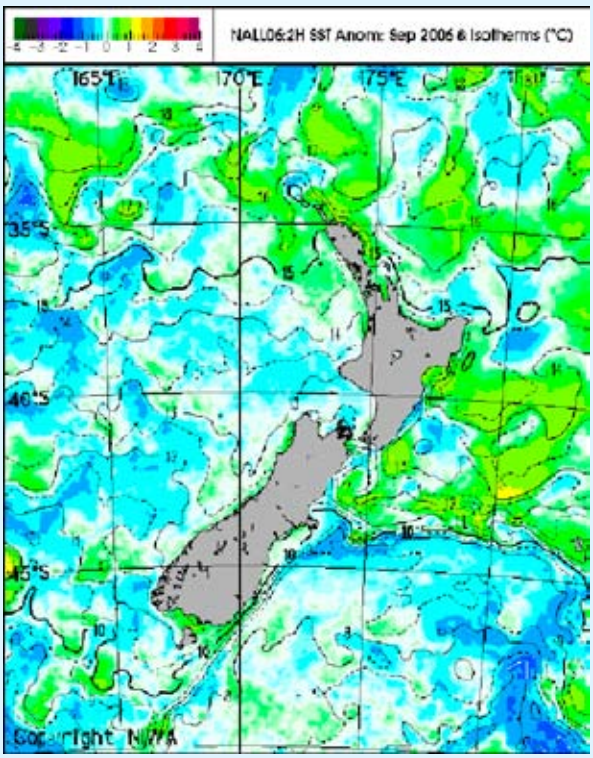
The three outcome maps give the tercile rankings of the rainfall totals, mean air temperatures, and mean river flows that eventuated from July to September, in comparison with the forecast conditions.

As an approximate guide, middle tercile rainfalls typically range from 80% to 115% of the historical normal, and middle tercile temperatures range about the average by plus or minus 0.5 °C.

Global setting and climate outlook

Sea surface temperatures around New Zealand

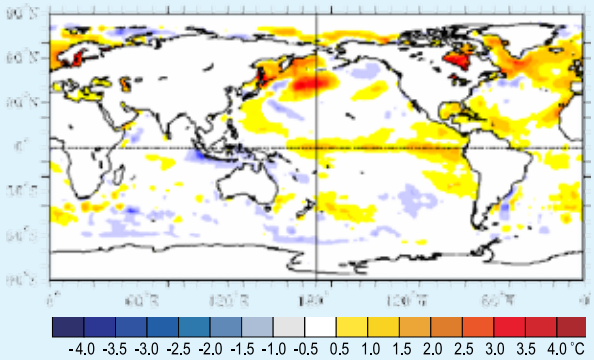
Sea surface temperatures in the New Zealand region were, on average, 0.2 °C above normal in September (up from near normal in August), with a July to September average also of 0.2 °C above normal. Positive anomalies (differences from normal) continue to exist east of New Zealand, with negative anomalies in the central and north Tasman Sea.



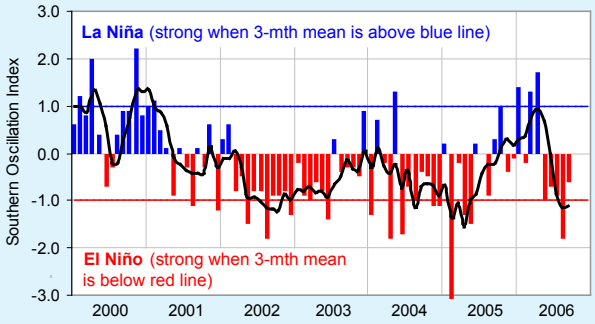
Difference from normal September surface temperatures in the seas around New Zealand.

Weak to moderate El Niño in place

Climate patterns across the equatorial Pacific over the last 1–2 months have developed an increased tendency toward El Niño conditions. A weak to moderate Pacific-wide El Niño may persist into early 2007. The situation will clarify in the next 1–2 months.



Difference from average global sea surface temperatures for September 2006. Map courtesy of NOAA Climate Diagnostics Center.



Monthly values of the Southern Oscillation Index (SOI), a measure of the changes in atmospheric pressures across the Pacific, and the three-month mean (black line). The SOI continues to remain negative (now five consecutive months) with a value of –0.5 for September, and an average of -1.1 for July to September.

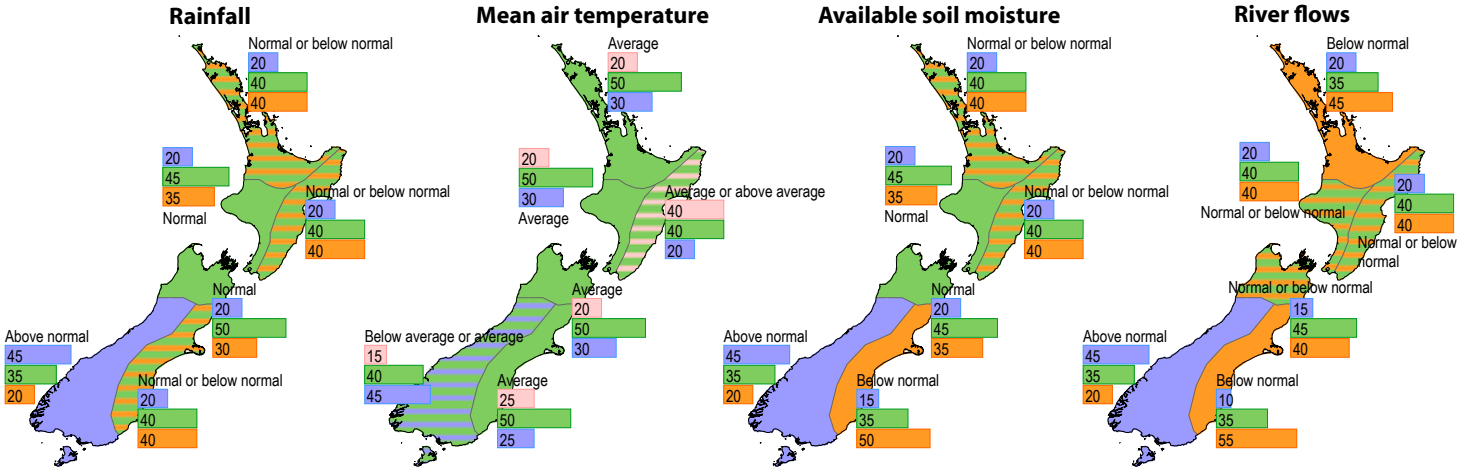
Outlook for October to December 2006

The present weak to moderate El Niño will have some influence on New Zealand climate over the remainder of spring and into summer 2006–07, with probably more south-westerly quarter airflow than usual over the country during October to December.

Air temperatures are likely to be average in all regions, except for below average or average in the west of the South Island and average or above average in the east of the North Island.

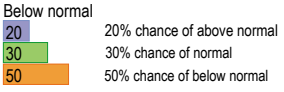
Rainfalls are likely to be normal or below normal in the north and east of the North Island and the east of the South Island. Above normal rainfall is likely in the west of the South Island with normal rainfall elsewhere.

Normal or below normal soil moisture levels are expected in most areas, except in the west and south of the South Island.



How to interpret these maps

In the example here the climate models suggest that below average conditions are likely (50% chance), but, given the variable nature of the climate, the chance of normal or above normal conditions is also shown (30% and 20% respectively).

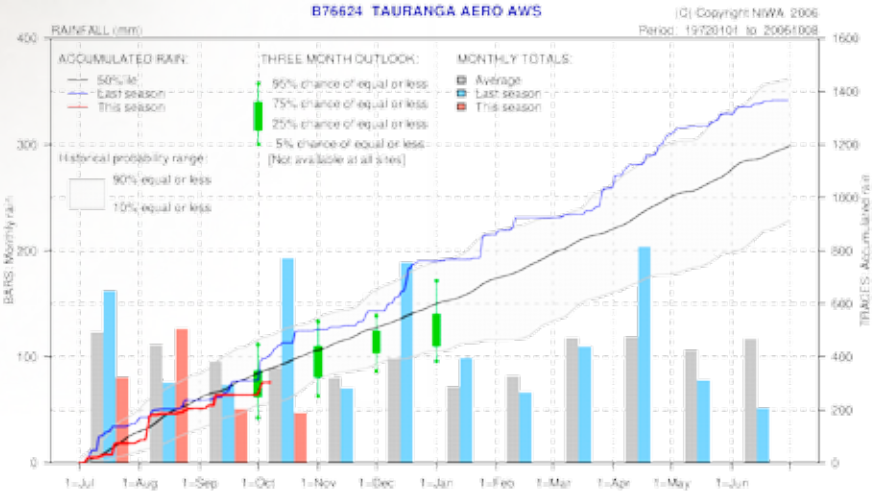


ClimateExplorer http://climate-explorer.niwa.co.nz

The August 2006 issue of this publication informed readers of the addition of forecast symbols to the accumulated rainfall plots appearing on the ClimateExplorer web page. The examples from ClimateExplorer below, show these forecasts, displayed by the green 'box and whisker' symbols, for the three month periods ending on 30 September, 31 October, 30 November and 31 December respectively.

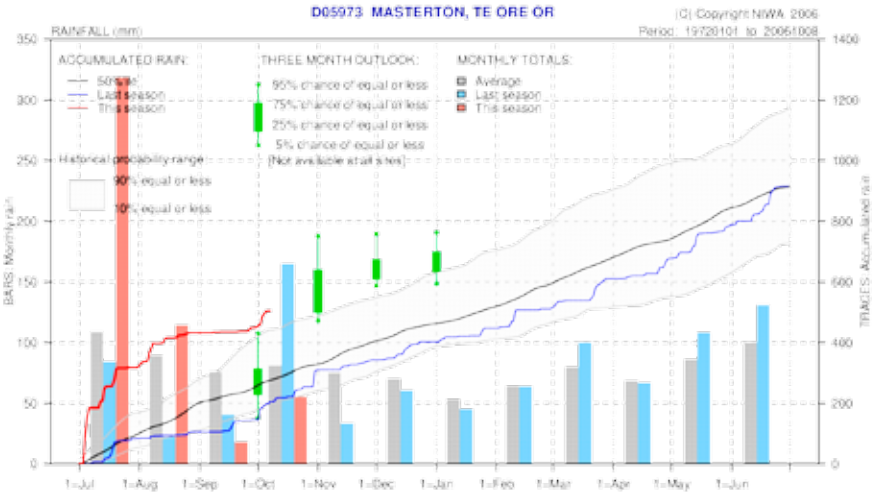
As each new forecast is added, previous forecasts remain to reveal how closely (or otherwise) rainfall accumulations compare with predictions. Outcomes for the end of the first forecast period, July to September, can now be seen on Climate Explorer.

The outlook for Tauranga Airport (upper figure) gave a 50% chance of total rain from 1 July to 30 September being between approximately 250 and 350 mm (reading from the right-hand vertical scale), with about a 75% chance of being normal or below.



As it turned out, July was drier than normal, August wetter, and September drier, but the overall total was in line with the outlook.

Other outlooks were not so successful, for example at Masterton (lower figure). The actual rainfall accumulation, shown by the red curve, passes above the symbol for the July to September rainfall. The chance of this occurring, given the rainfall history at Masterton, and the seasonal expectation, was estimated in early July to be less than 5%. The figure provides a useful illustration that seasonal climate forecasts cannot pick individual rainfall events, although these often have a major influence on the seasonal outcome. Only after a number of seasonal outlooks have been verified can we assess how skilful the forecast accumulation probabilities are.



Note that the next forecast symbol in the series, shown on 1 November, is for the expected total rainfall from 1 August to 30 October, added to the total already accumulated by 31 July. And so on.

Results at other sites can be viewed on ClimateExplorer.

For more information, and to obtain an annual subscription for all updated products, please contact explorerhelp@niwa.co.nz.

Take advantage of our 3-month free trial subscription offer - contact Andrew Tait, a.tait@niwa.co.nz

Spring blossom in Otago, where September was mostly dry and warm.

Cover photo: *Steve Le Gal*

The Climate Update is a monthly newsletter from NIWA's National Climate Centre, and is published by NIWA, Private Bag 14901, Wellington. It is also available on the web. Comments and ideas are welcome. Please contact Alan Porteous, Editor
Email: ncc@niwa.co.nz
Phone: 0-4-386 0300.
Visit our webpage: www.niwa.co.nz