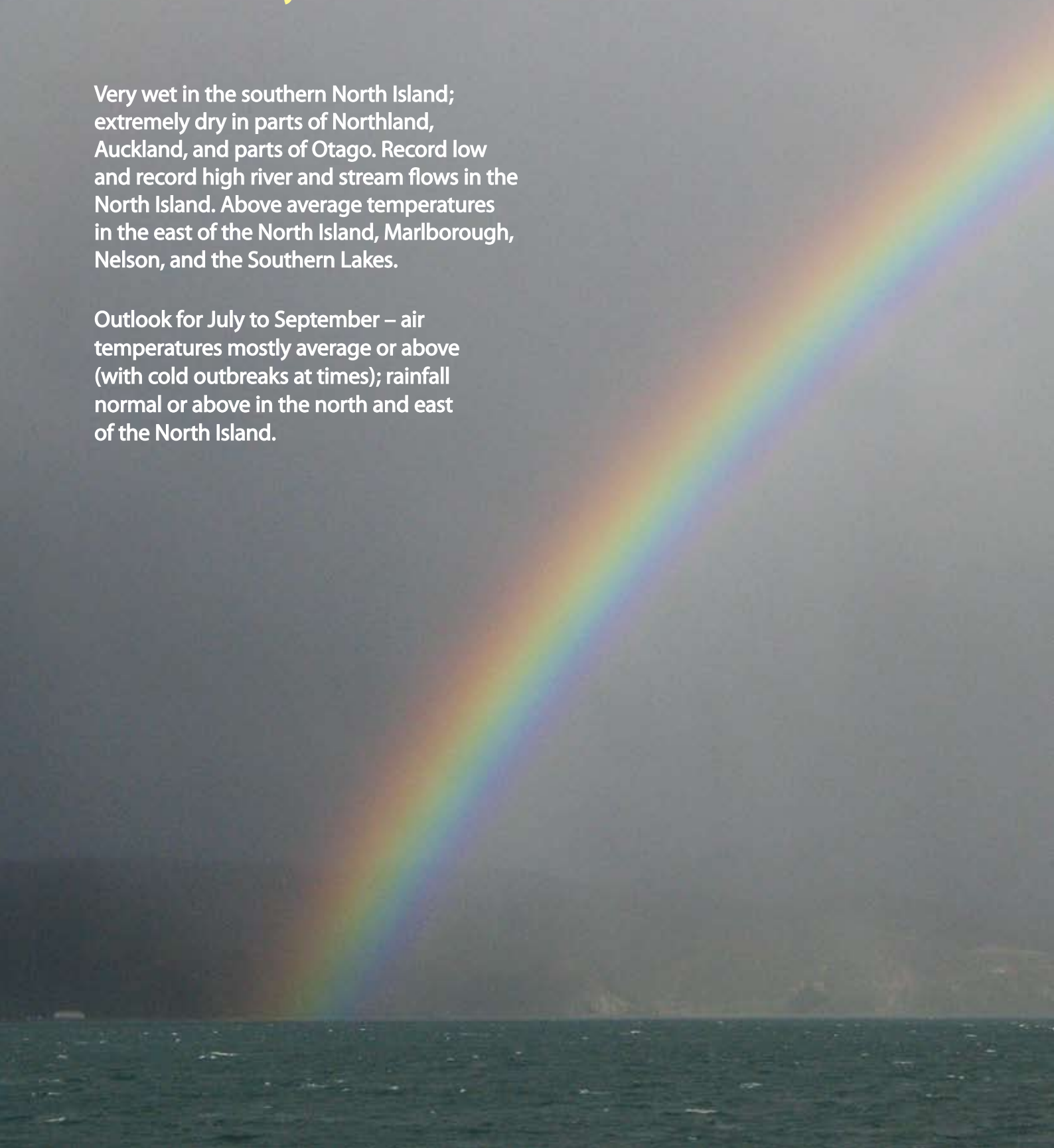


The Climate Update

A monthly newsletter from the National Climate Centre

Very wet in the southern North Island; extremely dry in parts of Northland, Auckland, and parts of Otago. Record low and record high river and stream flows in the North Island. Above average temperatures in the east of the North Island, Marlborough, Nelson, and the Southern Lakes.

Outlook for July to September – air temperatures mostly average or above (with cold outbreaks at times); rainfall normal or above in the north and east of the North Island.



New Zealand climate in July

July, normally the coldest month of the year, was warmer than June, providing a reprieve from the very cold start to winter. The national average temperature of 8.2 °C was 0.3 °C above the 1971–2000 normal. July temperatures were above average in the east of the North Island, Marlborough, Nelson, and Southern Lakes, and below average in Northland, inland South Canterbury, and North Otago.

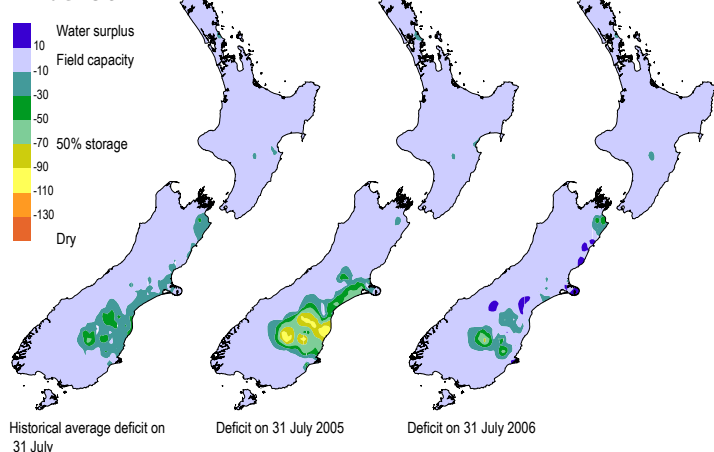
High rainfalls were recorded across much of the southern North Island, where in some places it was the wettest July in more than 30 years. Otago and Northland were drier than usual.

For more information on the climate in July 2006, visit the climate summaries page at www.niwasience.co.nz/ncc/cs/mclimsum_06_07

Soils remain wet

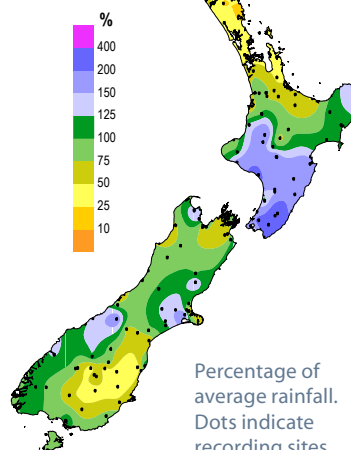
Soils across the country were mostly at or above field capacity at the end of the month, with particularly wet conditions in parts of Canterbury.

Soil moisture deficit

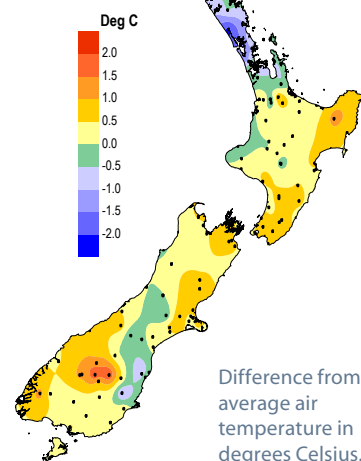


Water balance in the pasture root zone for an average soil type where the available water capacity is taken to be 150 mm.

Rainfall



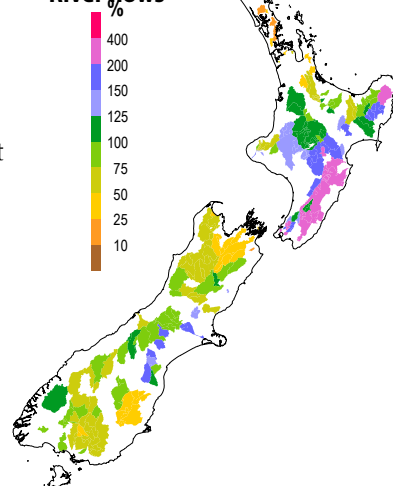
Air temperature



Record flows

Record low stream flows in Northland and Auckland contrasted with record high stream flows in the east and south of the North Island. South Island stream flows were above normal in the east and normal to below normal elsewhere.

River flows



May to July: the climate we predicted and what happened

Rainfall

High rainfalls occurred in the eastern North Island and in Canterbury as predicted. It was drier than expected in Northland and in the southern South Island.

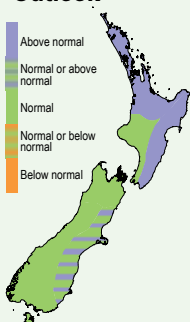
Air temperature

Air temperatures were mostly lower than predicted in the west and north of the North Island, and in western, central, and southern parts of the South Island. Elsewhere temperatures were near average in line with predictions.

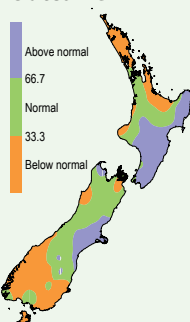
River flows

Stream flows were above normal in the east of the North Island, and normal to above normal in the north and southwest of the North Island and the east of the South Island. Near normal stream flows occurred elsewhere in the South Island.

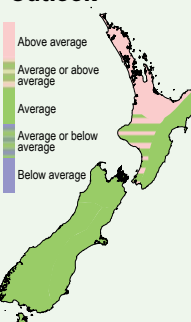
Outlook



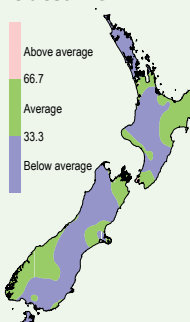
Outcome



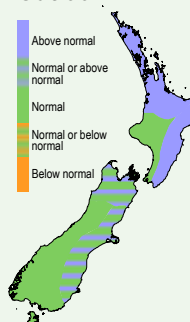
Outlook



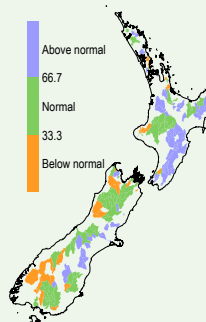
Outcome



Outlook



Outcome



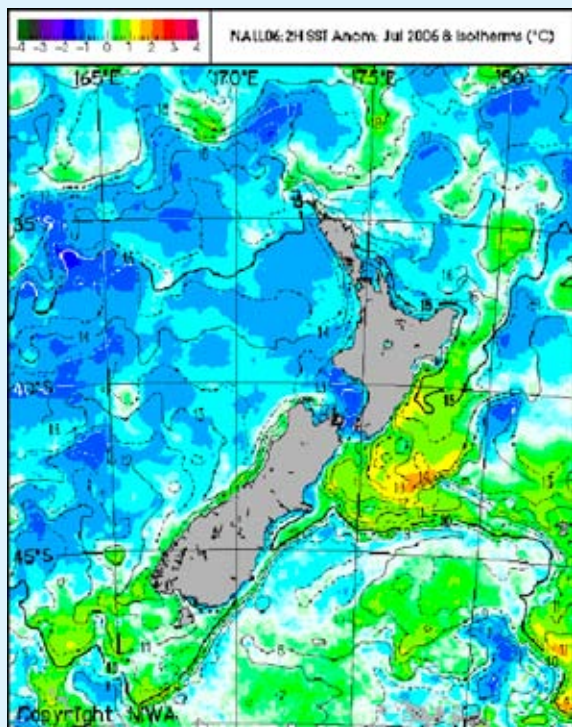
The three outcome maps give the tercile rankings of the rainfall totals, mean air temperatures, and mean river flows that eventuated from May to July, in comparison with the forecast conditions.

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

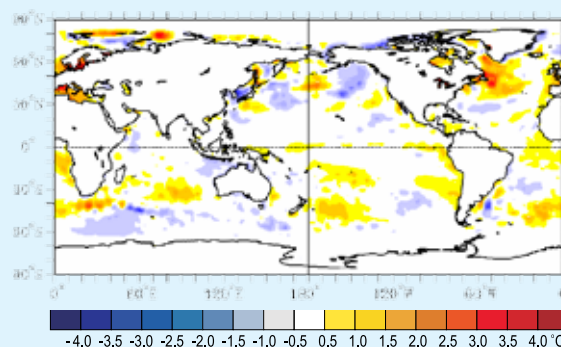
Sea surface temperature anomalies in the New Zealand region were near $+0.3^{\circ}\text{C}$ in July, as they were in June, with a May to July average also at $+0.3^{\circ}\text{C}$. The largest positive anomalies still lie east of New Zealand, with little change in the last month. Sea surface temperatures are expected to be a little below average in the Tasman, and a little above average east of the country.



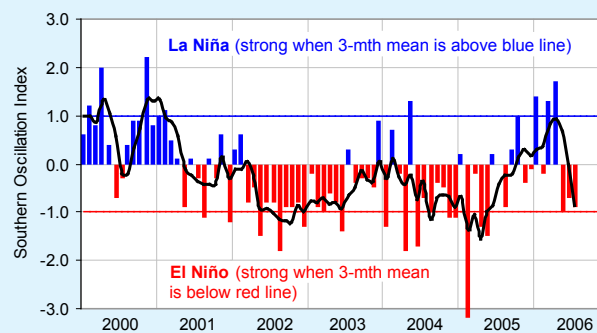
Average difference from normal July surface temperatures in the seas around New Zealand.

ENSO remains neutral, with SOI weakly negative

The tropical Pacific remains in a neutral state, though there has been continued warming in the upper layers of the Equatorial Pacific Ocean the past two months. Equatorial Pacific sea surface temperatures are now higher than normal across much of the Pacific basin.



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



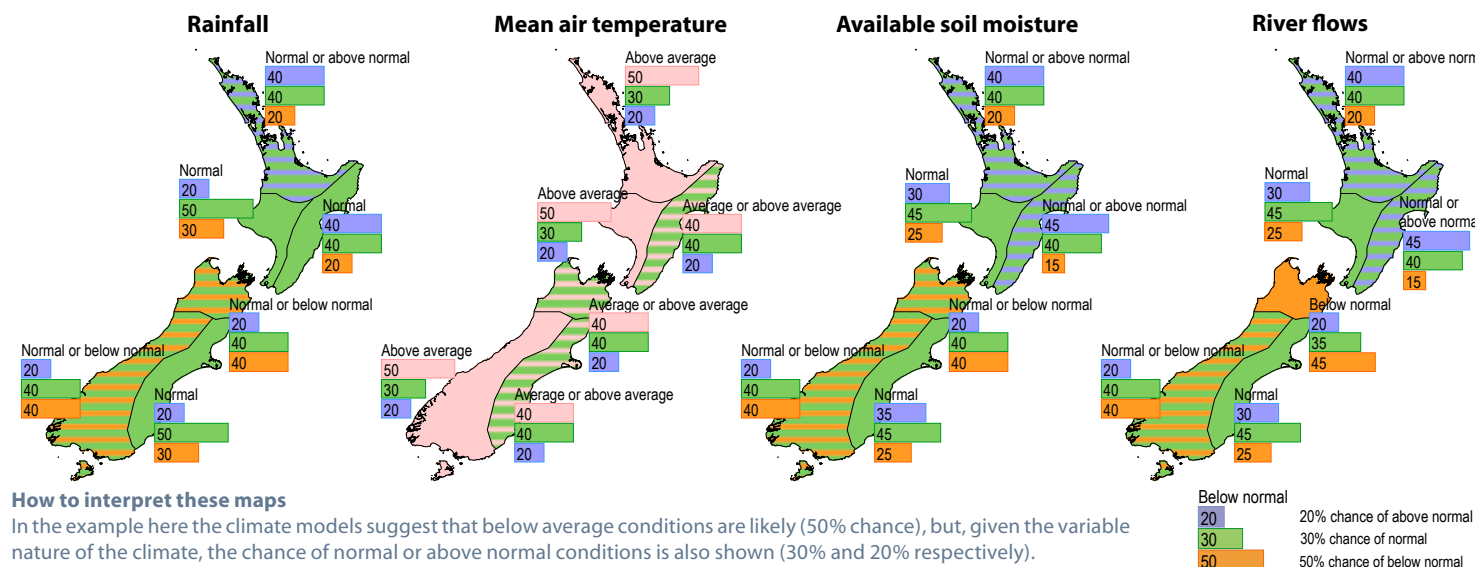
Monthly values of the Southern Oscillation Index (SOI), a measure of the changes in atmospheric pressures across the Pacific, and the three-month mean (black line). The SOI fell slightly to -0.9 in July, from -0.7 in June. The three month May to July average was -0.9

Outlook for August to October 2006

Atmospheric pressures are likely to be above normal in the New Zealand region, with a tendency towards weakened westerly winds.

Air temperatures are likely to be average or above average in all regions. Despite this expectation, cold outbreaks will occur at times.

Rainfalls are likely to be normal or above normal in the north and east of the North Island, normal or below normal in the north and west of the South Island, while near normal rainfall is the most likely outcome elsewhere. Normal or above normal soil moisture levels and stream flows are likely in the North Island, with normal or below normal soil moisture levels and stream flows likely in the South Island.



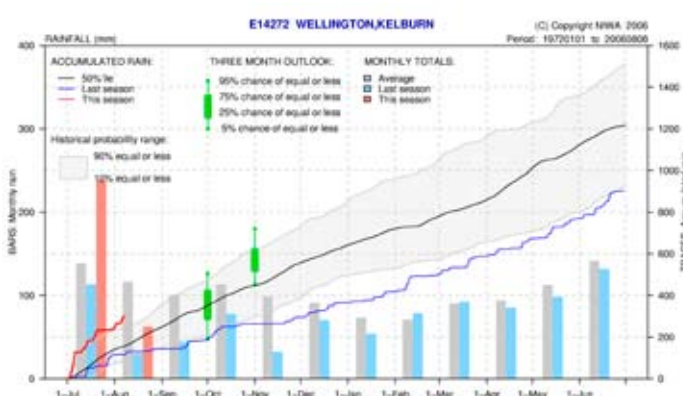
Climate Explorer <http://climate-explorer.niwa.co.nz>

Seasonal rainfall probabilities

Rainfall information will appear in a new format this month on Climate Explorer.

As well as the day by day rainfall accumulation and monthly totals that have been shown previously on figures similar to the one below, the new figures will include site-specific outlooks of three month rainfall accumulations.

In the figure below, monthly rainfall totals are shown by the vertical bars – grey for historical average month total, blue for last season (in this case July 2005 to June 2006), and red for the current season, starting with July 2006. The monthly totals can be read from the left hand vertical scale.



Forecast symbols

The new feature of these graphs is the presentation of seasonal rainfall outlooks, shown by green 'box and whisker' symbols. The figure above shows symbols at 1 October and 1 November, representing seasonal rainfall outlooks for July–September and August–October respectively. The symbols indicate the expected total rainfall from 1 July until the end of each forecast period; in the example above, the most recent forecast period ends on 31 October, indicated by the positioning of the symbol at 1 November.

The gradations on the symbols, i.e., the ends of the 'box' and 'whisker' segments, indicate the 5, 25, 75, and 95% probabilities of accumulated rainfall totals for the current three month forecast period. These 'probable' totals are added to the amount of rain already measured before the forecast period; the resulting sum of the measured and forecast rainfall determines the position of the forecast symbols on the figure. In the example figure given above for Wellington, a symbol shown at 1 November represents a forecast of near normal rainfall for August to October (see the outlook maps on page 3 of this publication) added to the rainfall total at the end of July of about 240 mm.

As each new forecast is added, the figure will reveal how closely (or otherwise) rainfall accumulations follow the seasonal outlooks.

It is important always to remember that seasonal outlooks like this can not forecast individual rainfall events or the length of dry periods. These may in the end have strong influences on seasonal outcomes. Seasonal forecasts can at best provide the general 'flavour' of the coming three months.



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Andrew Tait, a.tait@niwa.co.nz



Rainbow over Wellington Harbour. Seasonal rainfall outlooks predict the chances of a range of three-month rain totals, not individual events.

Cover photo: Wendy St George

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
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