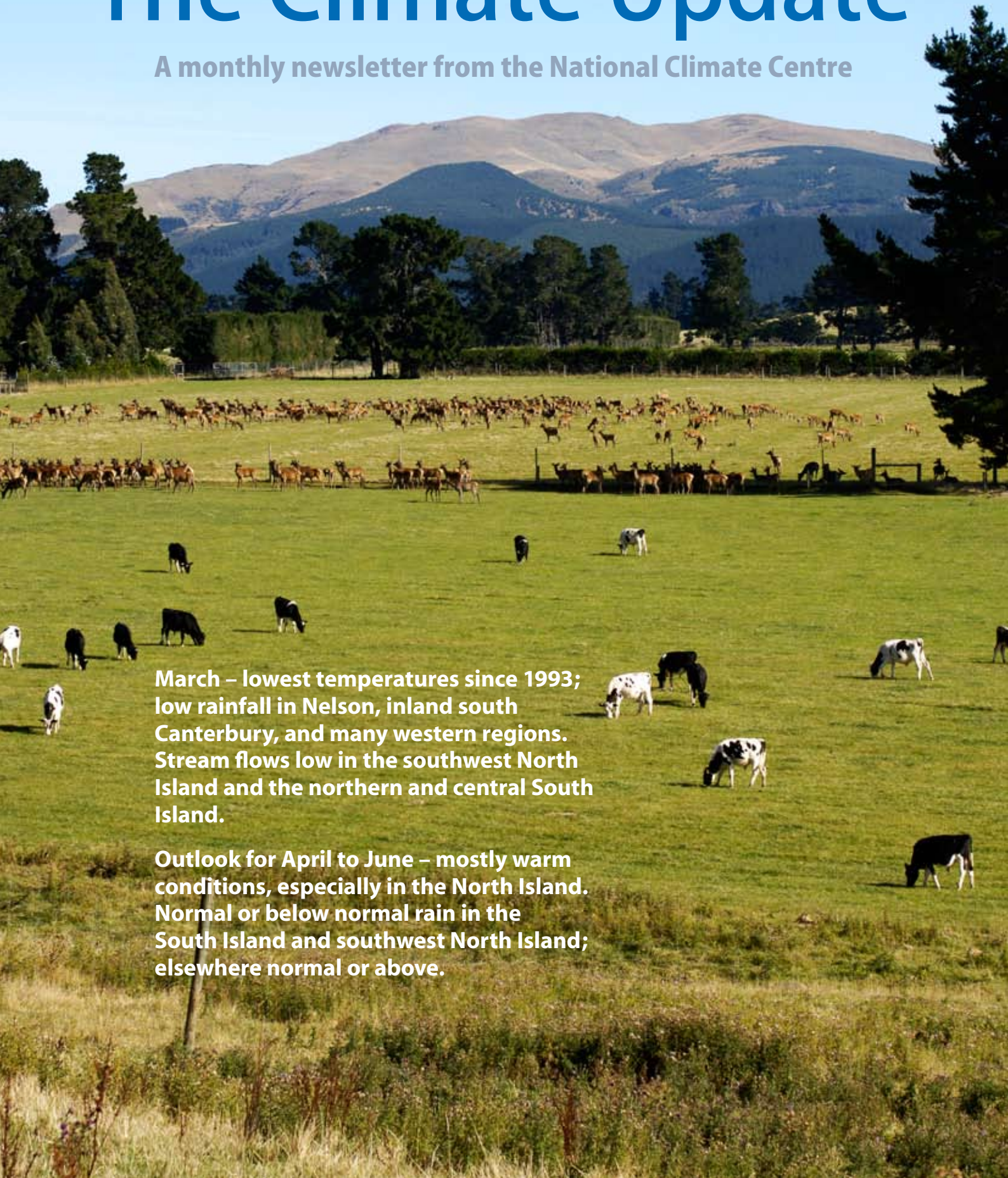
Number 82, 15 April 2006

NIWA
Taihoro Nukurangi

The Climate Update

A monthly newsletter from the National Climate Centre



March – lowest temperatures since 1993; low rainfall in Nelson, inland south Canterbury, and many western regions. Stream flows low in the southwest North Island and the northern and central South Island.

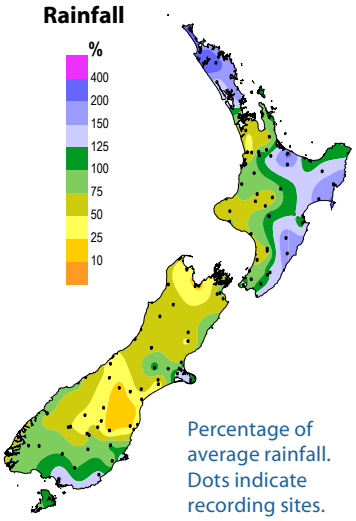
Outlook for April to June – mostly warm conditions, especially in the North Island. Normal or below normal rain in the South Island and southwest North Island; elsewhere normal or above.

New Zealand climate in March

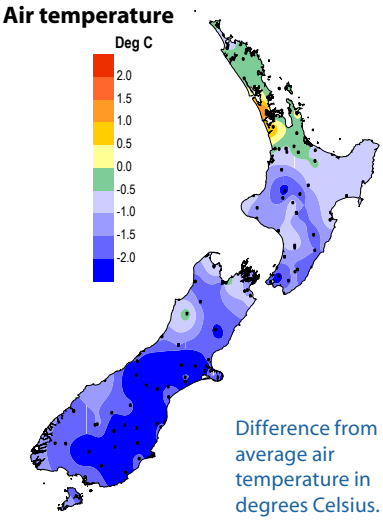
March was cold, with mean temperatures being the lowest since 1993. The national average temperature of 14.2 °C (almost 3.0 °C lower than in February) was 1.5 °C below the 1971–2000 normal.

Rainfall was above average in many northern and eastern parts of the North Island and in coastal Southland. Some high falls in Northland were associated with the passage of ex-tropical cyclone Wati. Elsewhere, rainfall was below normal in Nelson, inland south Canterbury, and many western regions.

For more information on the climate in March, visit the climate summaries page at www.niwascience.co.nz/ncc/cs/mclimsum_06_03



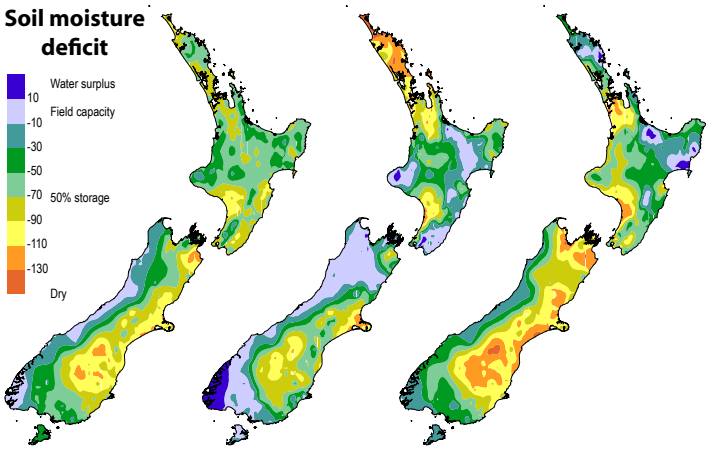
Percentage of average rainfall. Dots indicate recording sites.



Difference from average air temperature in degrees Celsius.

Soil moisture: persisting deficits

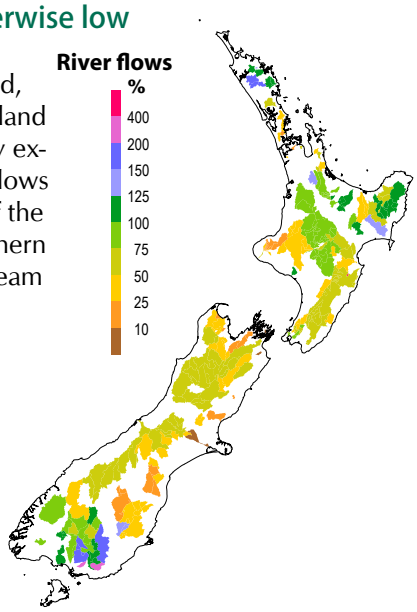
Significant soil moisture deficits persisted during the first three weeks of March in Northland, Auckland, and Gisborne, and continued for the rest of the month in Wanganui, Manawatu, Nelson, and the east of the South Island from Canterbury to Central Otago.



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

Isolated high flows; otherwise low

Above normal stream flows occurred in coastal Southland, and in the northern North Island regions that were affected by ex-tropical cyclone Wati. Low flows occurred in the southwest of the North Island and in the northern and central South Island. Stream flows were extremely low in Nelson and in central South Island catchments.



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

January to March: the climate we predicted and what happened

Rainfall

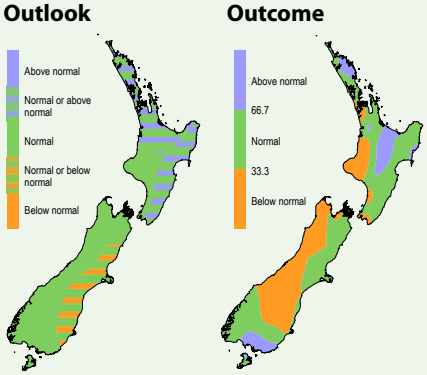
Rainfall was as predicted in many districts, but drier than predicted in western parts of the southern North Island and north and northwest of the South Island.

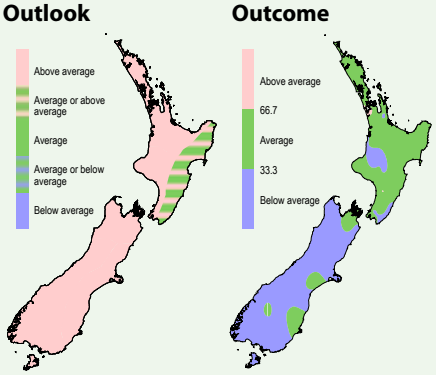
Air temperature

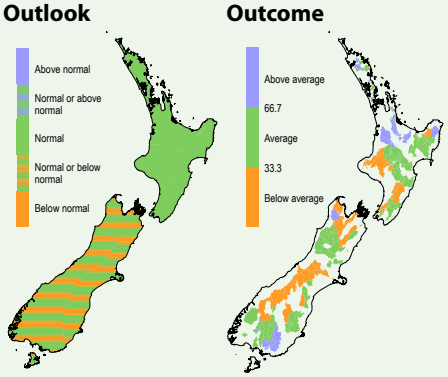
Air temperatures were as expected in the eastern North Island, but below predictions elsewhere.

River flows

Normal stream flows in much of the North Island and coastal Southland; below normal in Taranaki, Kapiti Coast, Nelson, and the central South Island.







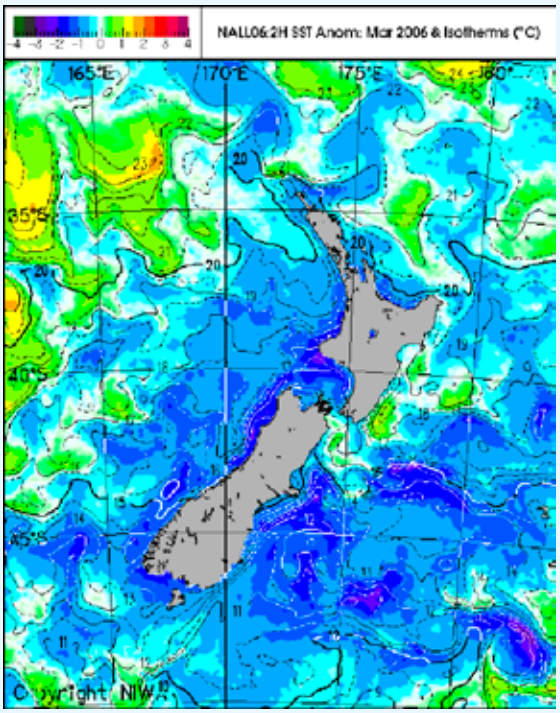
The three outcome maps give the tercile rankings of the rainfall totals, mean air temperatures, and mean river flows that eventuated from January to March, in comparison with the forecast conditions.

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 (SST) around New Zealand

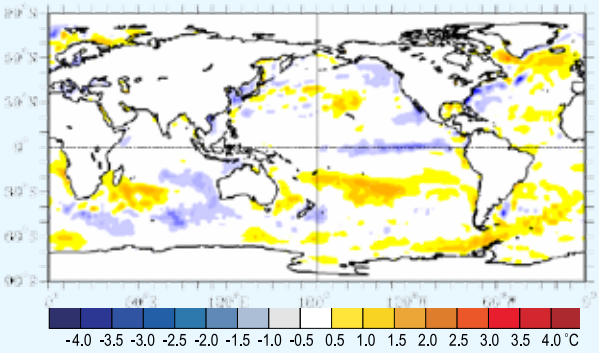
SST anomalies in the New Zealand region decreased markedly in March to +0.1 °C (from about +1.0 °C in February). The lower temperatures were associated with cool south to southwest air flows over the country. SST are expected to be near or above average until June.



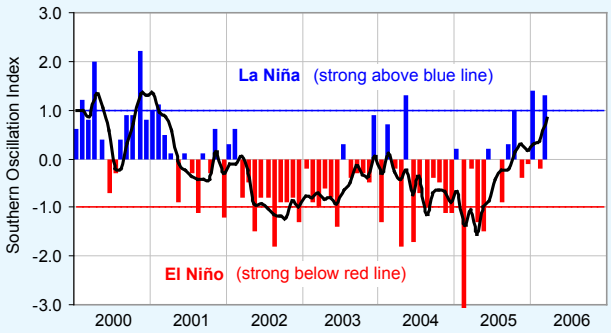
Average difference from normal March surface temperatures in the seas around New Zealand.

Weak La Niña

The tropical Pacific is in a weak La Niña state, but should ease to neutral conditions by winter 2006.



Difference from average global sea surface temperatures for March 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 dropped to +1.3 in March, with the three month January to March average at +0.8.

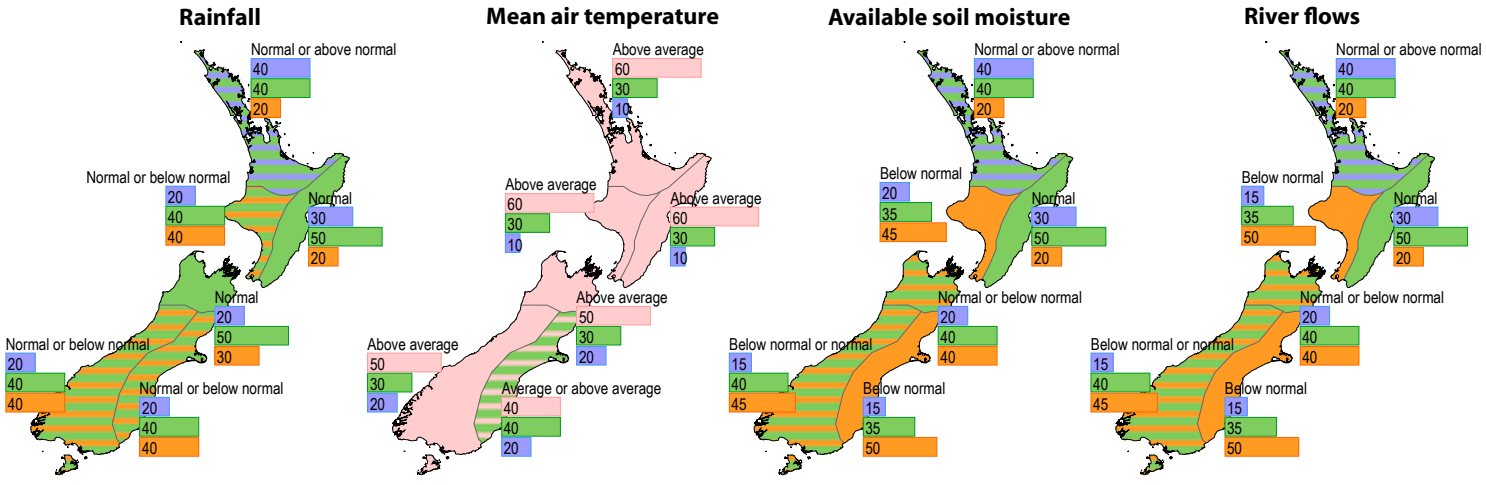
Outlook for April to June 2006

During the next three months atmospheric pressures are expected to be higher than normal to the east of the South Island, favouring a tendency for weaker than normal westerlies over New Zealand. Air temperatures are very likely to be above average in the North Island and are likely to be above average in most of the South Island.

Rainfall is likely to be normal or below normal in much of the South Island, and in the southwest North Island. Normal or above normal rainfall is likely for the northern North Island, with near normal falls likely in the east of the North Island.

Soil moisture levels and stream flows are likely to be normal or above normal in the northern North Island, normal in the southeast of the North Island, and below normal in the southwest.

In the South Island, normal or below normal soil moisture levels and stream flows are likely in the north, with drier than normal conditions elsewhere.



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).

Below normal

20 — 20% chance of above normal

30 — 30% chance of normal

50 — 50% chance of below normal

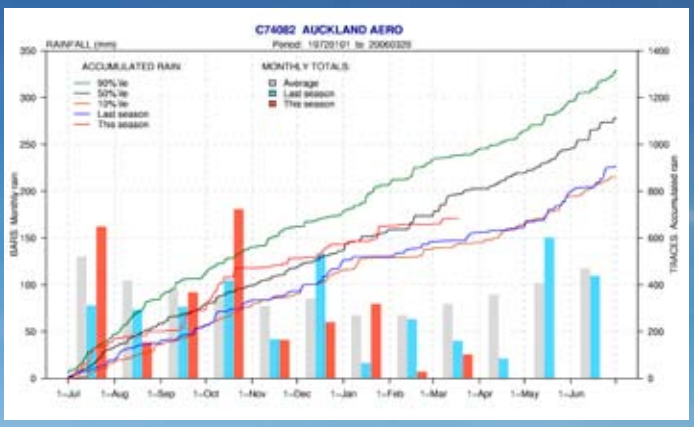
Introducing Climate Explorer http://climate-explorer.niwa.co.nz

Climate Explorer is NIWA's new web-based tool to help monitor the New Zealand climate. It makes available an array of climate analysis maps, data sets, and line plots that will enable viewers to understand background climate features, and to keep close tabs on how the current climate is progressing compared with last year or the historical mean.

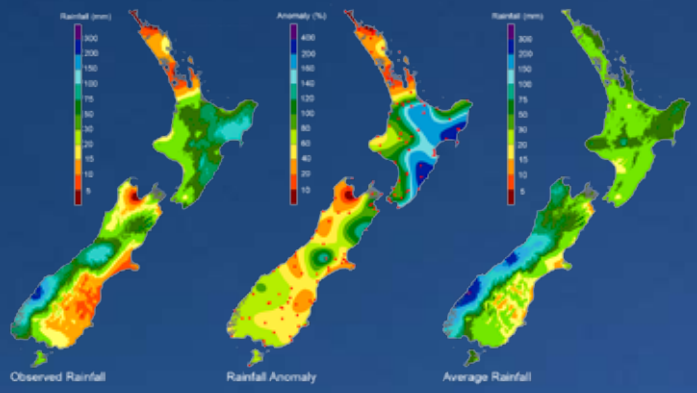
In addition to historical and current data, a powerful new service offered by Climate Explorer is probabilistic forecasts of weather anomalies for the next two weeks. These will provide valuable guidance to support planning for weather dependent activities.

Some examples from Climate Explorer are shown below. For more information, log into the web address given above, or contact Andrew Tait: a.tait@niwa.co.nz

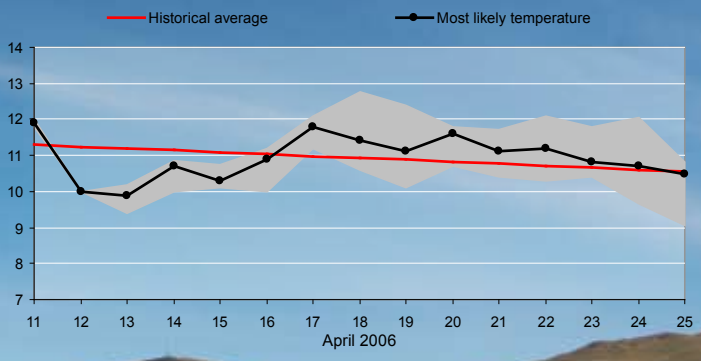
Below: Rainfall accumulation plots show the amount of rain that has fallen since 1 July in the current July to June growing season (red curve) compared to last season (blue curve) and the historical 90, 50, and 10 percentile accumulations. The vertical bars show the historical mean monthly rainfall (grey), and total rainfall for last season (light blue), and the current season (red).



Below: Rainfall maps show the amount of rain for the last 15 days or for the month to date. The maps give the historical normal rainfall for the period (left), the observed anomaly (centre), and the estimated rainfall occurrence in the period in the current year.



Below: Forecasts of likely climatic conditions over the next two weeks are created from multi-model runs for different weather parameters – in this example, the temperature of the earth at 10 cm depth. The red line represents the historical mean earth temperature for the period, and the thick black curve shows the median temperatures predicted by the models. The width of the grey band behind the black curve is a measure of the spread of forecast temperatures predicted by the models – the narrower the band, the better the agreement between models, and hence the more confident we can be about the forecast.



Next month's Update will give more details about Climate Explorer products.

Early autumn in mid Canterbury. Climate Explorer will assist farmers to recognise early signs of unusual climatic conditions.

Cover photo: *Alan Blacklock*

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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