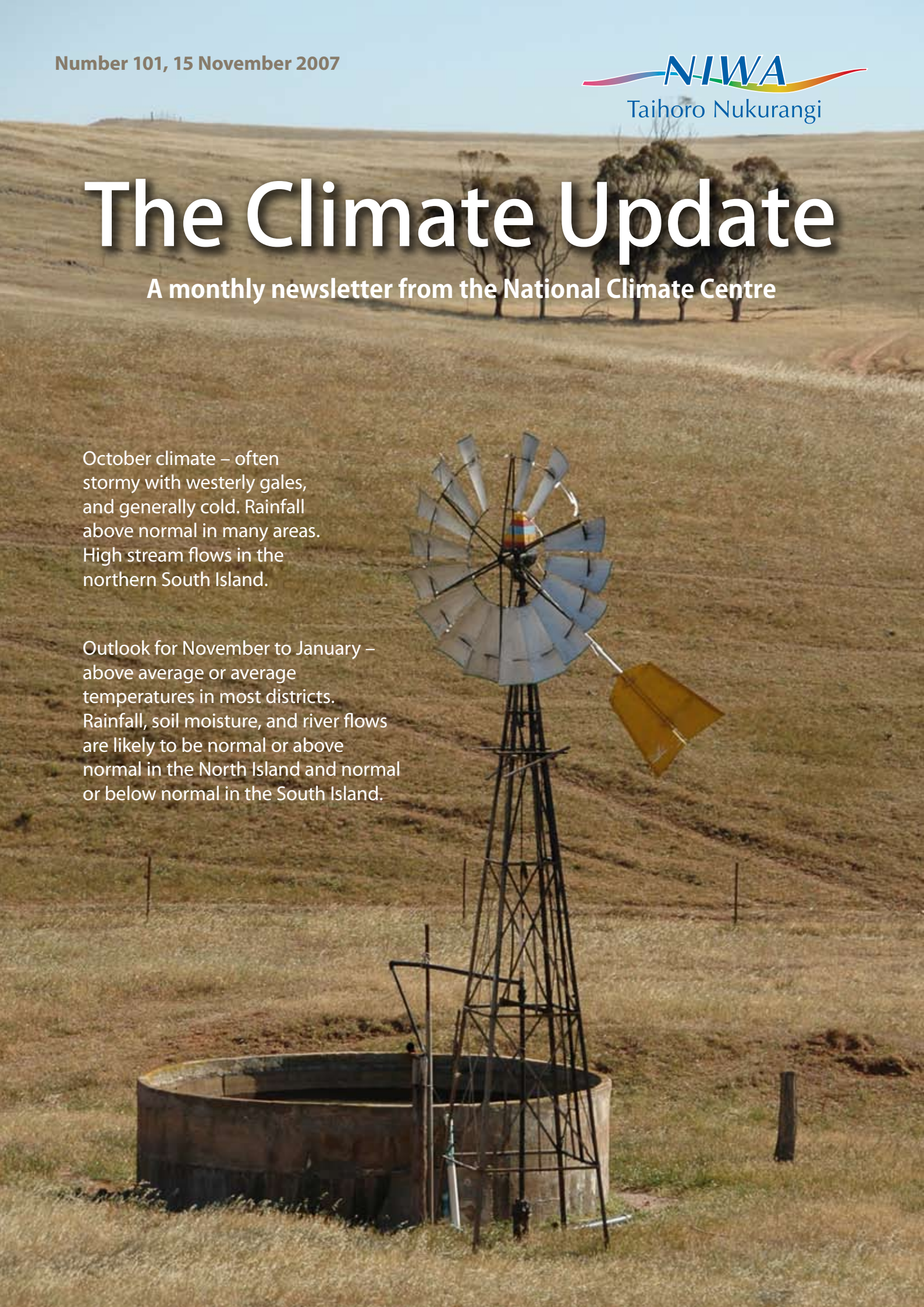
Number 101, 15 November 2007

NIWA
Taihoro Nukurangi

The Climate Update

A monthly newsletter from the National Climate Centre

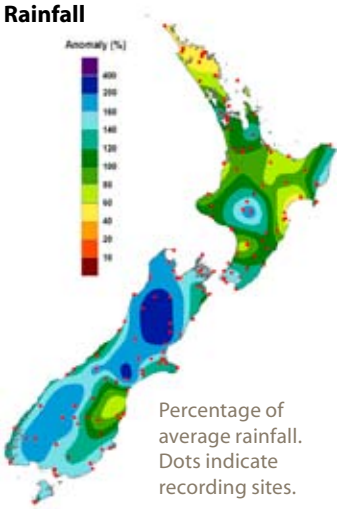


October climate – often stormy with westerly gales, and generally cold. Rainfall above normal in many areas. High stream flows in the northern South Island.

Outlook for November to January – above average or average temperatures in most districts. Rainfall, soil moisture, and river flows are likely to be normal or above normal in the North Island and normal or below normal in the South Island.

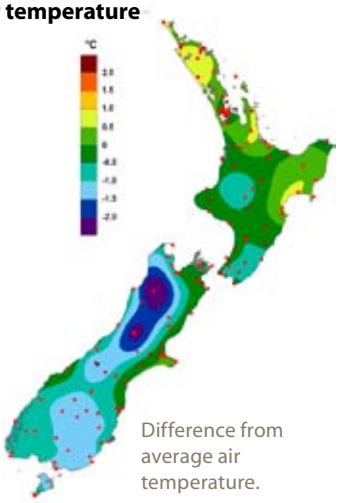
New Zealand climate in October

Rainfall



Percentage of average rainfall. Dots indicate recording sites.

Air temperature



Difference from average air temperature.

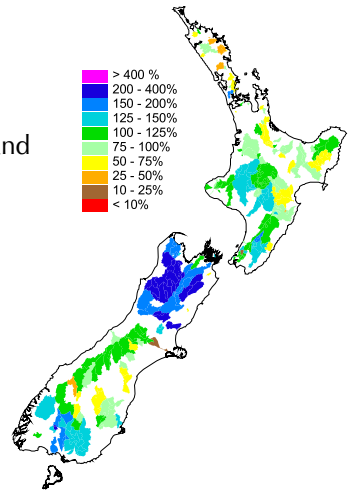
October 2007 was stormy and generally cold with deep depressions tracking south of New Zealand and frequent westerly gales. Temperature anomalies were positive in the north and negative in the south of the country. The national average temperature of 11.7 ºC was 0.5 °C below average.

Rainfall was almost 200% of normal in parts of the northwest of the South Island, and in inland parts of north Canterbury, and above normal in many other regions.

For more information see www.niwascience.co.nz/ncc/cs/mclimsum_07_10

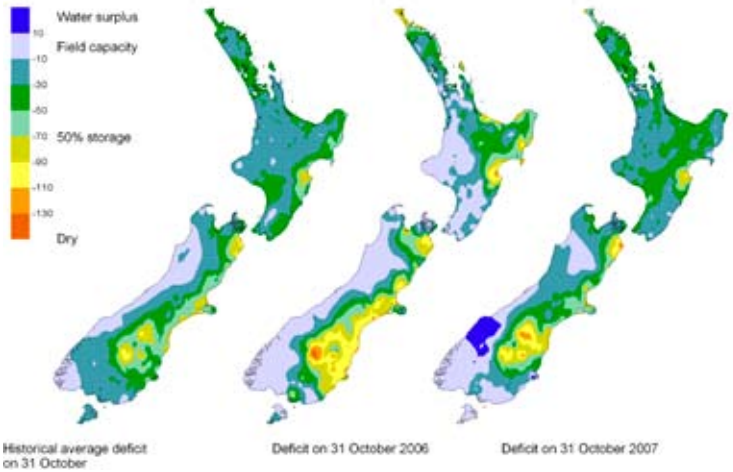
River flows

Stream flows were well above normal in the southwest of the North Island and the northern and southern South Island and near normal elsewhere.



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

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.

Soil moisture exceeded field capacity in Fiordland, Gisborne, and Wairarapa. Moisture deficits of more than 110 mm occurred toward the end of the month in parts of Marlborough and Central Otago.

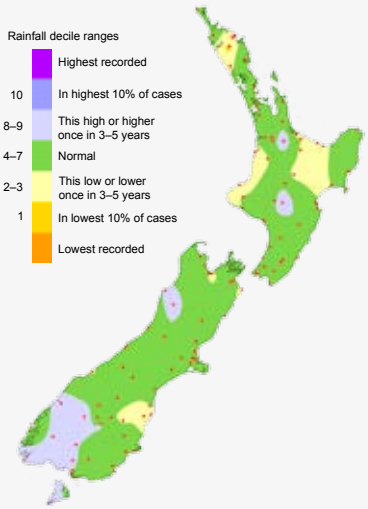
August to October – the climate we predicted and what happened

Rainfall

Predicted: Normal or above normal rainfall in the north of the North Island, normal in the east of the North Island, and normal or below normal elsewhere.

Outcome: Mostly normal, with some areas below normal in Northland, Bay of Plenty, Hawke's Bay, coastal north Taranaki and Otago; above normal in the southwest of the South Island.

August to October rainfall

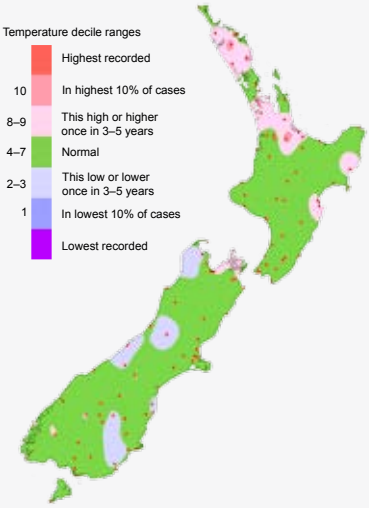


Air temperature

Predicted: Average or above average in the North Island and southwest of the South Island, average in the north of the South Island, and below average or average in the east of the South Island apart from Marlborough.

Outcome: Average or above average in the north and east of the North Island, and average elsewhere. In the South Island mostly average with some cool areas.

August to October temperature

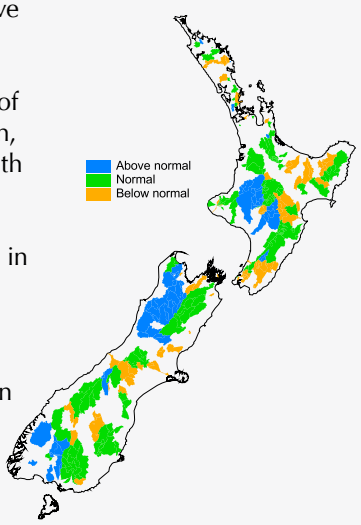


River flows

Predicted: Normal or above normal in the north of the North Island, normal or below normal in the west of the North Island, and north, west, and south of the South Island, normal in the east of the North Island, below normal in Canterbury, and in North and East Otago.

Outcome: River flows were above normal in Nelson, Buller, and western Southland, below normal in the North Island East Cape region and near normal in other locations.

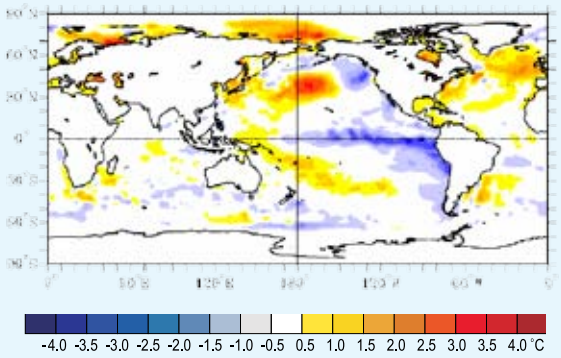
August to October river flows



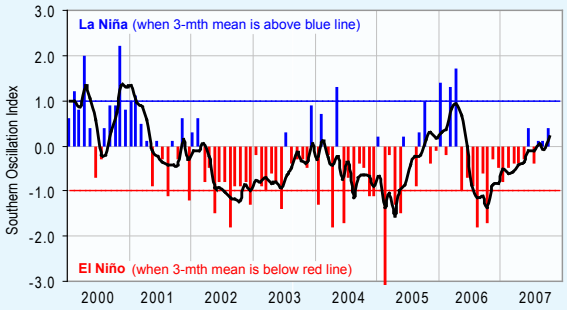
Global setting and climate outlook

La Niña to stay for summer

La Niña conditions are well-established in the central and eastern equatorial Pacific, and are expected to persist through to the end of summer 2007–08. The pattern of sea surface temperature (SST) anomalies in the tropical Pacific now exhibits a clear La Niña signature, with a well-developed cold tongue extending from the South American coast to the Date Line. However, SST anomalies remain small or slightly negative in the Indonesian region.



Difference from average global sea surface temperatures for October 2007. Map courtesy of NOAA Climate Diagnostics Centre.

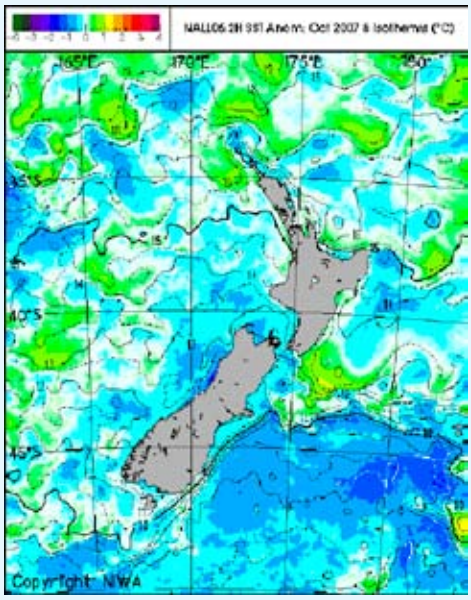


Monthly values of the Southern Oscillation Index (SOI), a measure of the changes in atmospheric pressures across the Pacific, and the three-month mean (black line).

SOI mean values:
October: +0.4
August to October: +0.2

Sea surface temperatures around New Zealand

Sea surface temperature (SST) anomalies in the New Zealand region went slightly negative overall for October at −0.1 °C, with the August to October average anomaly about +0.2 °C. At the end of October, SST anomalies were negative south of Chatham Rise and southeast of the South Island but were near zero elsewhere. During summer, SSTs are expected to be above normal around the North Island and near normal around the South Island.



Differences from normal October surface temperatures in the seas around New Zealand.

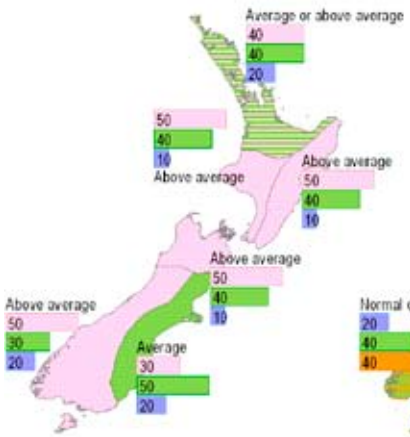
Outlook for November 2007 to January 2008

Over the early summer, mean sea level pressures are expected to be higher than normal to the south of New Zealand, with weaker than normal westerly winds across much of the country.

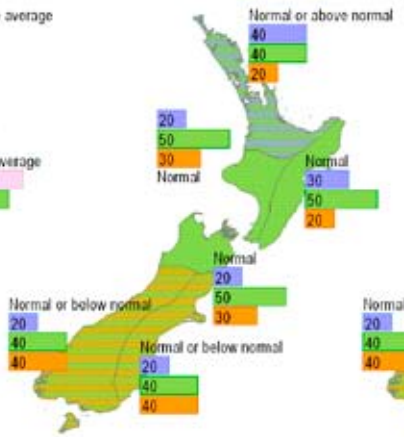
Air temperatures are likely to be above average or average in all districts. Rainfall is expected to be normal or above normal in the northern North Island, normal or below normal over most of the South Island, and near normal elsewhere. Normal or above normal soil moisture levels and stream flows are likely in the northern North Island; normal or below normal conditions are likely in the west, south, and east of the South Island, and normal conditions elsewhere.

There is a slightly lower than normal chance of an ex-tropical cyclone passing within 500 km New Zealand during November to May. Should such a cyclone approach New Zealand, the regions most at risk are the north and northeast of the North Island.

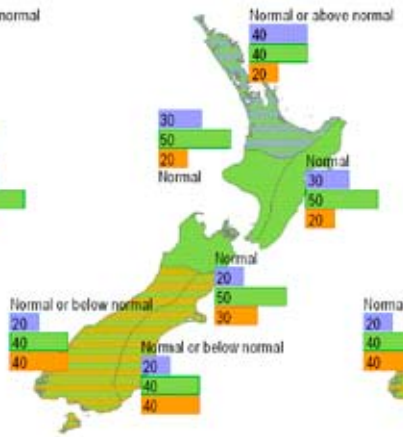
Mean air temperature



Rainfall



Available soil moisture



River flows

How to interpret these maps

In the example here the climate models suggest that below normal 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

The Australian drought

Murray-Darling Basin Commission (MDBC) warns of deepening drought

The Murray-Darling Basin, stretching across South Australia, Victoria, New South Wales, and Queensland, is in area about four times the size of New Zealand. The Basin comprises the catchments of the River Murray, the Darling River, and their tributaries.

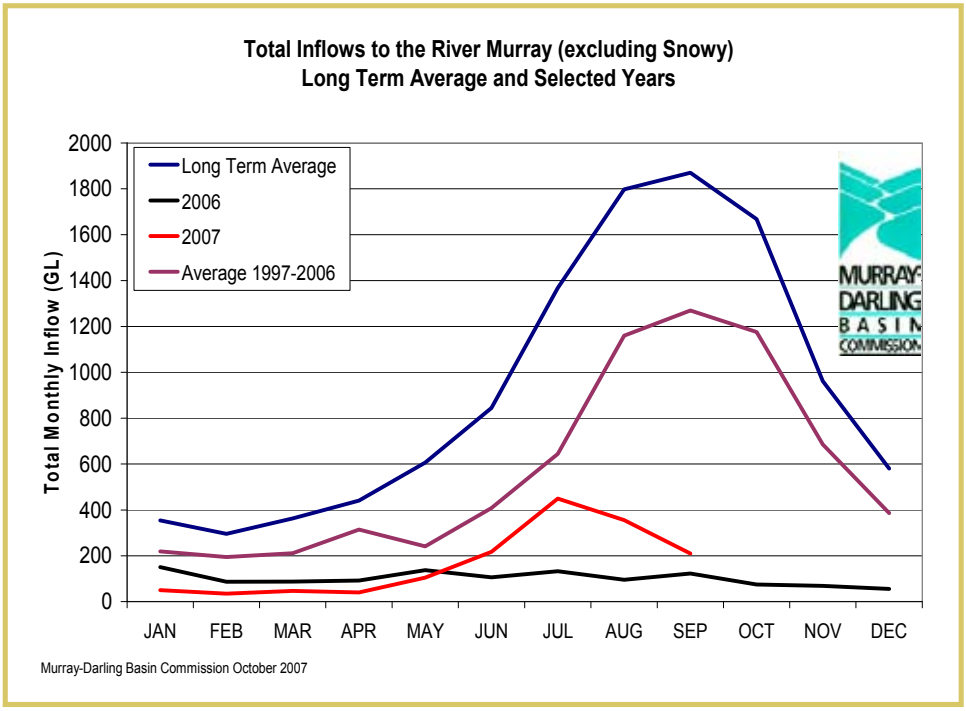
With over 40% of all crops grown commercially in Australia, the Basin is considered Australia's most important agricultural region, and has a population of about two million people.

The MDBC, in its October Drought Update, warns that recent low rainfall has lead to some of the lowest water inflows on record into the Murray-Darling system.

According to Australia's Bureau of Meteorology, large parts of southern and eastern Australia have seen persistent dry conditions since October 1996, a total of eleven years. The Bureau stated that 2007 was the first year in the meteorological record dating from 1900 that an El Niño drought in the Murray-Darling Basin has not been followed by at least one three-month period with above normal rainfall by the end of the following winter.

The Drought Update continues, 'As a result of the below average rainfall in the main catchment area during August, Murray System inflows for August were only 360 gigalitres (GL), which is well below the long term August average of 1570 GL. The dry weather persisted throughout September, with inflows of about 210 GL, compared to the long term September average of 1610 GL (see figure below). Monthly inflows have now been below average for the last 24 months.'

A more recent report by MDBC states that during the month of October, rainfall was below average throughout the southern half of the Basin and close to average in the north. The October inflow for the River Murray System was 187 GL, which equals a flow rate of 70 cubic metres per second (m^3/s). This ranks between the mean flow for New Zealand's Mataura River (66 m^3/s) and Mohaka River (75 m^3/s). The inflow was also slightly lower than September (210 GL) and well below the long term average for October of 1420 GL.



Courtesy of Murray-Darling Basin Commission – used with permission

For further reading on the River Murray System see the full Drought Update at:
http://www.mdbc.gov.au/_data/page/1366/RMSystem_Drought_Update10_October07.pdf

For more information on New Zealand climate, see: http://www.niwascience.co.nz/ncc/

Daily updates of rainfall and air temperature maps are available on: http://climate-explorer.niwa.co.nz/

South Australian bore well. Slashed water allocations due to the lack of rain have increased farmers' reliance on bore water. All of Victoria's farmland was declared drought-affected in October.

Cover photo:
Alan Porteous

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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