



**Australian Government**  
**Bureau of Meteorology**

## La Niña continues to dominate in the Pacific

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One of the strongest La Niña events on record continues to influence the climate of the Pacific Basin.

Climate indicators of ENSO, including tropical cloud amount, the Southern Oscillation Index (SOI), trade winds and Pacific sea surface and sub-surface temperatures, all remain well in excess of La Niña thresholds. Most have exceeded these thresholds since the middle of 2010. The average August to December SOI (+21.1) has only been exceeded by the La Niña of 1917-18 (+24.4), with the 1975-76 La Niña value (+18.8) ranked third. Several other indices also suggest the La Niña events of 2010-11, 1975-76, 1917-18, 1955-56 and possibly 1988-89, rank closely in terms of the strongest events on record.

During La Niña events, tropical cyclone numbers are typically higher than normal during the November to April period, while summer daytime temperatures are often below average, particularly in areas experiencing excess rainfall.

The current event has contributed to the extremely high rainfall which has affected large parts of Australia during spring and summer, including recent widespread flooding in Queensland, New South Wales, Tasmania and Victoria. Long-range forecast models surveyed by the Bureau suggest that the La Niña is likely to persist into the southern hemisphere autumn season.

The influence of the Indian Ocean Dipole (IOD) on Australian rainfall is limited during the months from December through to April.

Next update expected by 2 February 2011 | [print version](#)

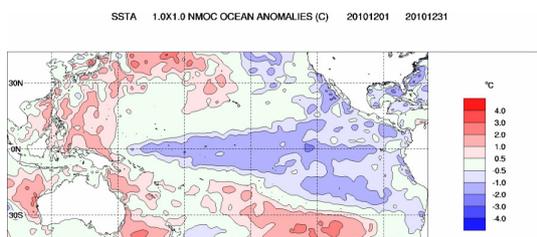
## Further Details

### Sea Surface Temperatures

#### Monthly sea surface temperatures:

Cool anomalies in the central and eastern tropical Pacific Ocean increased slightly during December. The sea surface temperature (SST) anomaly map for December shows anomalies more than 1 °C cooler than normal extending along the equator east of 160°E. The map shows a few small areas of the central and eastern Pacific where water was more than 2 °C cooler than normal. Over the past month, warm anomalies in the southern Maritime Continent region have cooled.

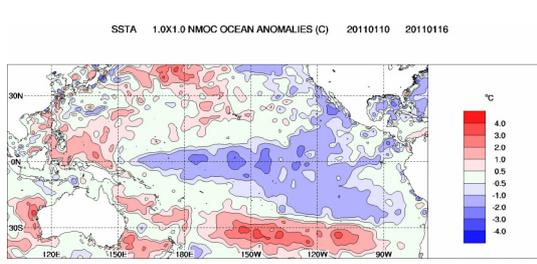
<a href="#">Index</a>	Nov	Dec	Temperature change
<a href="#">NINO3</a>	-1.3	-1.2	0.1 °C warmer
<a href="#">NINO3.4</a>	-1.3	-1.4	0.1 °C cooler
<a href="#">NINO4</a>	-1.1	-1.2	0.1 °C cooler



#### Weekly sea surface temperatures:

Sea surface temperatures (SST) in the equatorial Pacific Ocean have cooled slightly over the past two weeks. The weekly SST anomaly map for the week ending 16 January shows cool anomalies extending along the equator east of 160°E. Small areas of anomalies more than 2 °C cooler than normal have developed on the equator. All NINO indices displayed here have cooled, reflecting the further cooling in the eastern to central Pacific. On a weekly scale, areas of cool anomalies remain in parts of the Maritime Continent northwest of Australia.

<a href="#">Index</a>	Previous	Current	Temperature change (2 weeks)
<a href="#">NINO3</a>	-1.2	-1.3	0.1 °C cooler
<a href="#">NINO3.4</a>	-1.4	-1.7	0.3 °C cooler
<a href="#">NINO4</a>	-1.3	-1.5	0.2 °C cooler

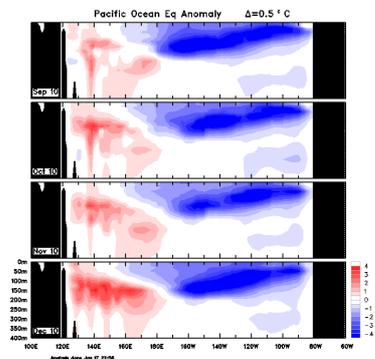


[An animation of recent SST changes](#) | [Weekly data graph](#)

### Pacific ocean sub-surface temperatures

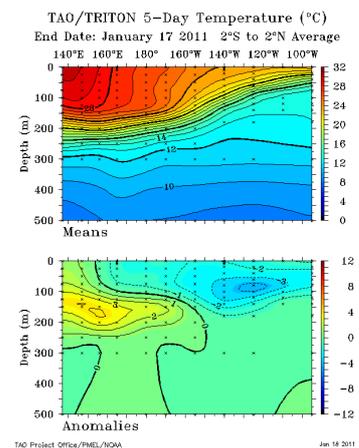
#### Monthly sub-surface:

The four-month sequence of sub-surface Pacific Ocean equatorial temperature anomalies, to 31 December, shows that a large volume of cooler than normal water has been evident below the surface of the tropical Pacific for many months. Sub-surface water in the central and eastern Pacific has remained cooler than usual during December, with central areas more than 4 °C cooler than usual. The sequence also shows that warm anomalies in the western Pacific have continued to develop over the last four months.



**Weekly sub-surface:**

The map for the 5 days ending 17 January shows a large volume of cooler than normal water below the surface of the tropical Pacific Ocean. When compared with two weeks ago, there has been a warming of both the cool anomalies in the eastern Pacific and the warm anomalies in the west. In the eastern Pacific Ocean, a large volume of sub-surface water is still more than 3 °C cooler than normal for this time of the year, on a weekly scale.



[Animation of recent sub-surface changes](#) | [Archive of sub-surface temperature charts](#)

**Southern Oscillation Index:**

The Southern Oscillation Index (SOI) remains strongly positive. The latest (17 January) 30-day SOI value is +26. The SOI has been consistently positive since early April.

Sustained positive values of the SOI above +8 may indicate a La Niña event, while sustained negative values below -8 may indicate an El Niño event. Values of between about +8 and -8 generally indicate neutral conditions.

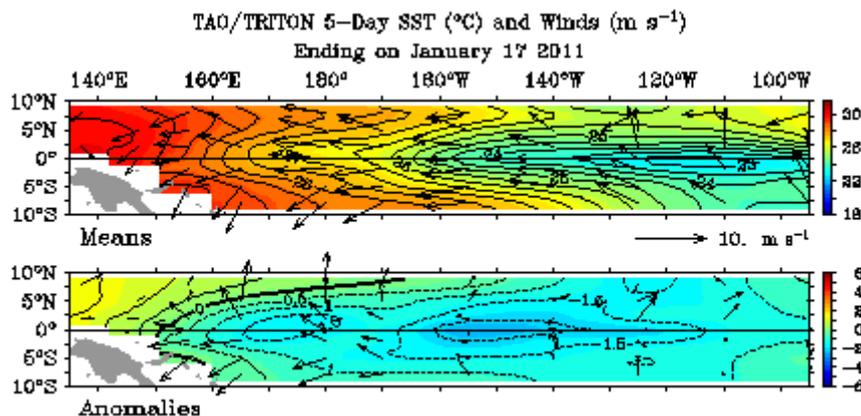


[Monthly graph](#) | [SOI table](#) | [SOI text](#)

**Trade winds:**

Trade winds are stronger than normal across the western and central equatorial Pacific. Trade winds have generally remained steady over the past two weeks, but have weakened further over the eastern tropical Pacific. The latest wind anomaly map for the 5 days ending 17 January is shown below.

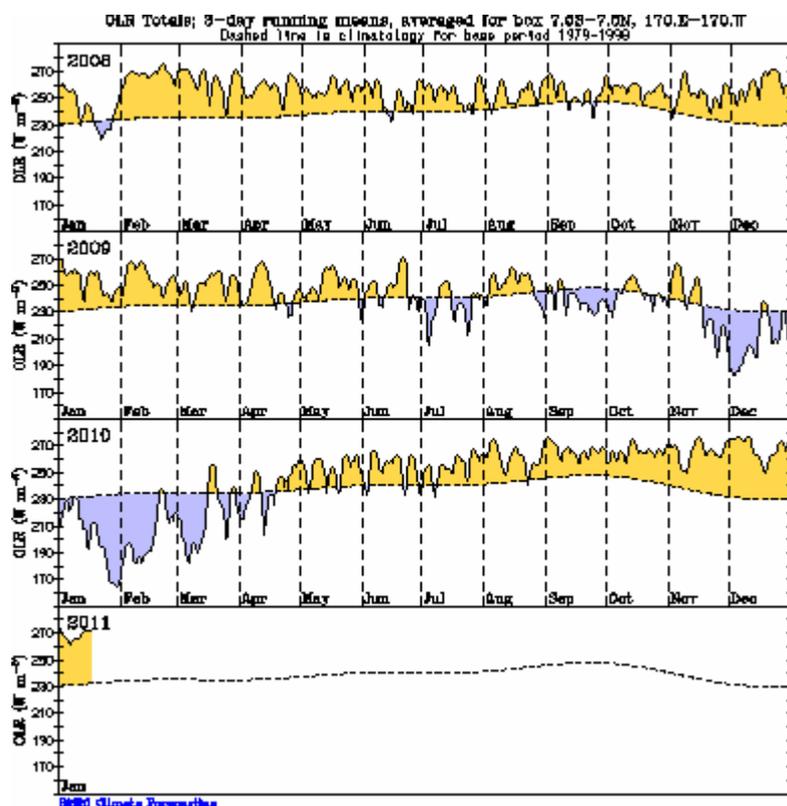
During La Niña events, there is a sustained strengthening of the trade winds across much of the tropical Pacific, while during El Niño events there is a sustained weakening of the trade winds.



### Cloudiness near the date-line:

Cloudiness near the date-line has continued to be strongly suppressed (below average) over the last two weeks. Cloudiness has generally been suppressed near the date-line since late April.

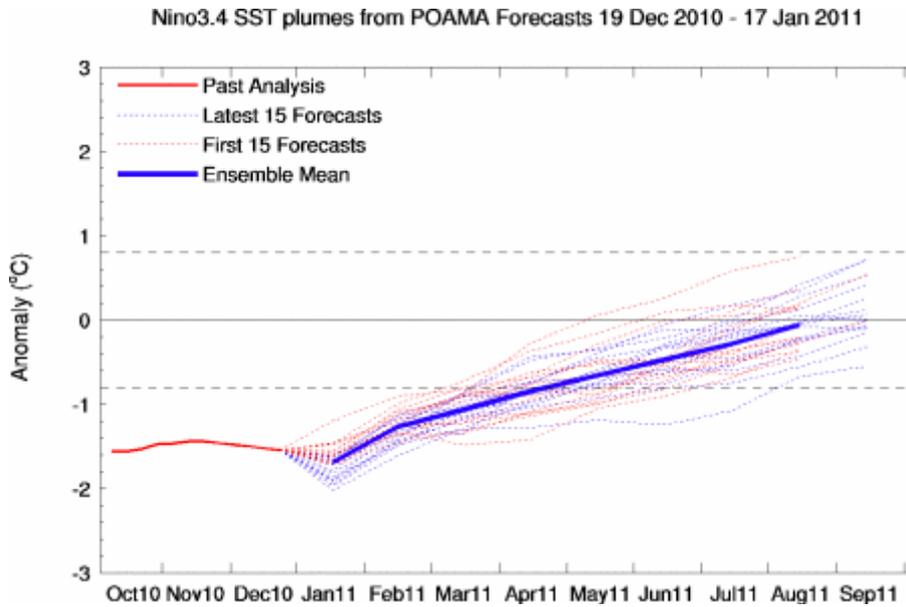
Cloudiness along the equator, near the date-line, is an important indicator of ENSO conditions, as it typically increases (negative OLR anomalies) near and to the east of the dateline during an El Niño event and decreases (positive OLR anomalies) during a La Niña event.



### Computer Models:

All leading international [climate models](#) surveyed by the Bureau predict surface temperatures in the tropical Pacific Ocean will remain at levels typical of a La Niña event throughout the first quarter of 2011. The majority of models surveyed indicate the event will gradually weaken, approaching neutral values by mid 2011.

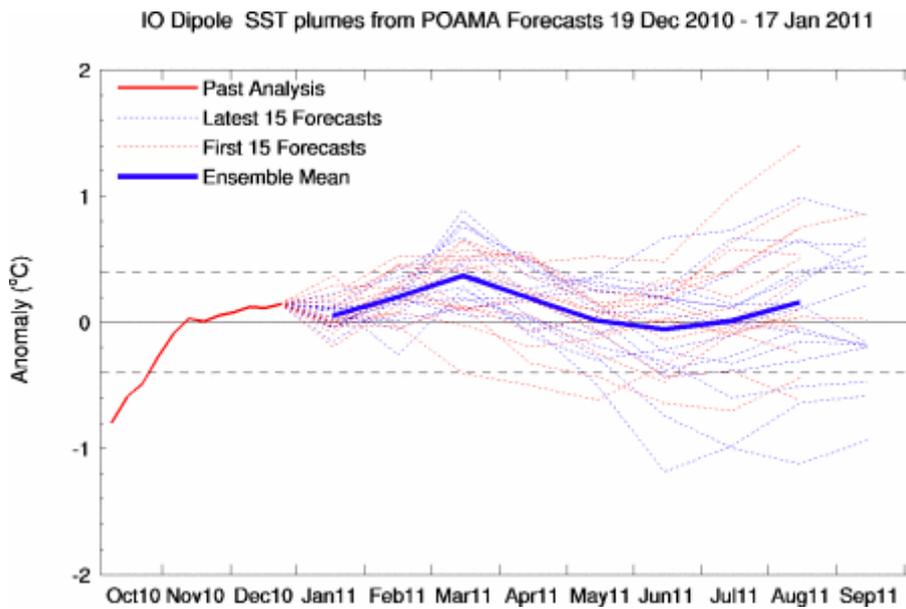
Recent forecasts from the [POAMA model](#), run daily at the Bureau of Meteorology, predict La Niña conditions will persist during the first quarter of 2011, but will gradually weaken with time as the central Pacific warms.



**Indian Ocean Dipole:**

The Indian Ocean Dipole (IOD) index has remained close to neutral over the past two weeks, which is typical for this time of year; the value for the week ending 16 January was near zero.

Recent forecasts from the [POAMA model](#), run daily at the Bureau of Meteorology, predict that the IOD index will remain in neutral territory during the first quarter of 2011.



[IOD time series](#) [IOD map](#) [IOD forecasts](#) [DMI values](#)

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