



## Strong La Niña event continues in the Pacific

Issued on Wednesday 22 December | Product Code IDCKGEW00

La Niña conditions remain firmly in place across the tropical Pacific, though the majority of long-range models surveyed by the Bureau suggest this event may be near its peak. With a gradual decline likely, it is expected that the current La Niña event will persist through the first quarter of 2011.

All climate indicators of ENSO remain above La Niña thresholds. Despite a slight warming of the tropical Pacific Ocean over the last fortnight; a large pool of cooler than normal water remains below the surface in the central and eastern Pacific, with temperatures up to 4 °C cooler than normal: comparable to the La Niña event of 1988. In response, the trade winds remain stronger than average across the central and western equatorial Pacific, cloudiness near the date-line remains strongly suppressed, and the Southern Oscillation Index (SOI) remains in the top 5% of historical values.

La Niña periods are generally associated with above normal winter, spring and summer rainfall, particularly over eastern and northern Australia. Night time temperatures during La Niña periods are historically warmer than average and Tropical Cyclone occurrence for northern Australia is typically higher than normal during the cyclone season (November-April).

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 5 January 2011 | [print version](#)

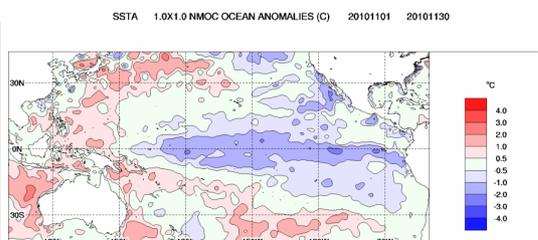
## Further Details

### Sea Surface Temperatures

#### Monthly sea surface temperatures:

Cool anomalies in the central and eastern tropical Pacific Ocean generally remained steady during November. The sea surface temperature (SST) anomaly map for November 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 Maritime Continent region have continued to cool.

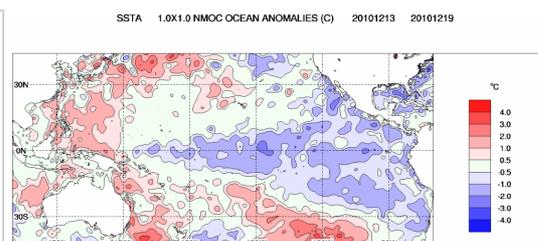
<a href="#">Index</a>	Oct	Nov	Temperature change
<a href="#">Nino 3</a>	-1.2	-1.3	0.1 °C cooler
<a href="#">Nino 3.4</a>	-1.4	-1.3	0.1 °C warmer
<a href="#">Nino 4</a>	-1.2	-1.1	0.1 °C warmer



#### Weekly sea surface temperatures:

Sea surface temperatures (SST) in the equatorial Pacific Ocean have warmed slightly over the past two weeks. The weekly SST anomaly map for the week ending 19 December shows cool anomalies extending along the equator east of 160 °E. The extent of anomalies more than 1 °C cooler than normal for this time of the year has contracted over the last fortnight, and all NINO indices have warmed slightly. Small areas of SSTs more than 2 °C cooler than normal are still present. Compared with two weeks ago, warm anomalies in the area of the Maritime Continent northwest of Australia have cooled.

<a href="#">Index</a>	Previous	Current	Temperature change (2 weeks)
<a href="#">Nino 3</a>	-1.3	-1.2	0.1 °C warmer
<a href="#">Nino 3.4</a>	-1.4	-1.3	0.1 °C warmer
<a href="#">Nino 4</a>	-1.2	-1.0	0.2 °C warmer

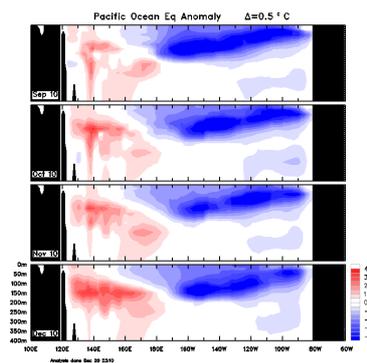


[An animation of recent SST changes](#) | [Weekly data graph](#)

## Pacific ocean sub-surface temperatures

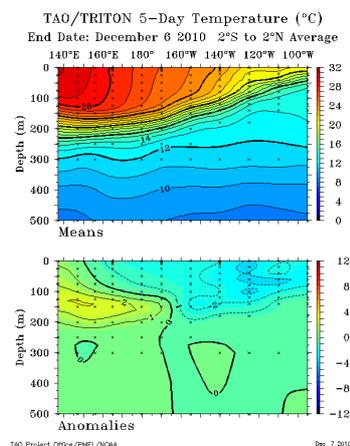
### Monthly sub-surface:

The four-month sequence of sub-surface Pacific Ocean equatorial temperature anomalies, to 22 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 20 December 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 cooling in the eastern Pacific and a warming in the west. In the eastern Pacific Ocean, areas of sub-surface water are more than 4 °C cooler than normal for this time of the year, on a weekly scale.

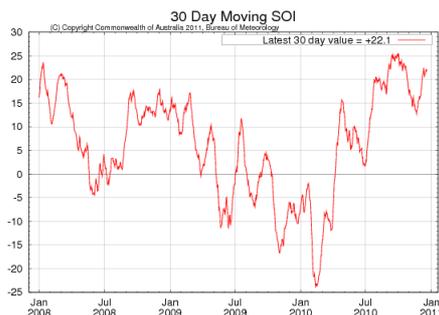


[Animation of recent sub-surface changes](#) | [Archive of sub-surface temperature charts](#)

### Southern Oscillation Index:

The Southern Oscillation Index (SOI) has fluctuated, but has remained strongly positive over the past two weeks. The latest (20 December) 30-day SOI value is +22. 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.

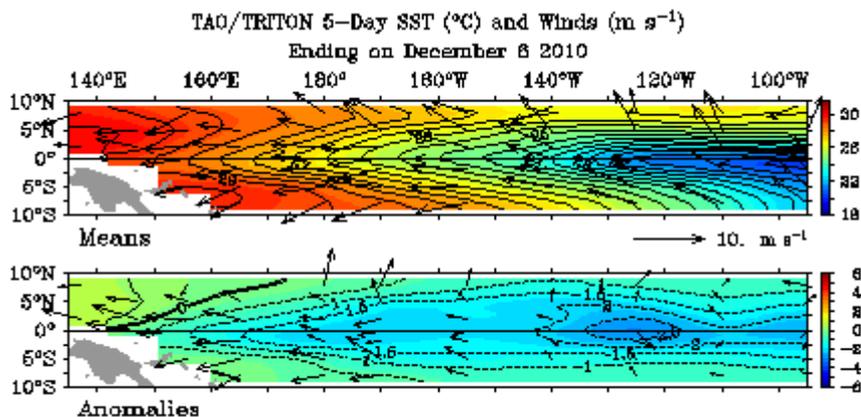


[Monthly graph](#) | [SOI table](#) | [SOI text](#)

### Trade winds:

Trade winds are stronger than normal across the western and central equatorial Pacific. Over the past two weeks, trade winds have weakened slightly over the western tropical Pacific. The latest wind anomaly map for the 5 days ending 20 December is shown below.

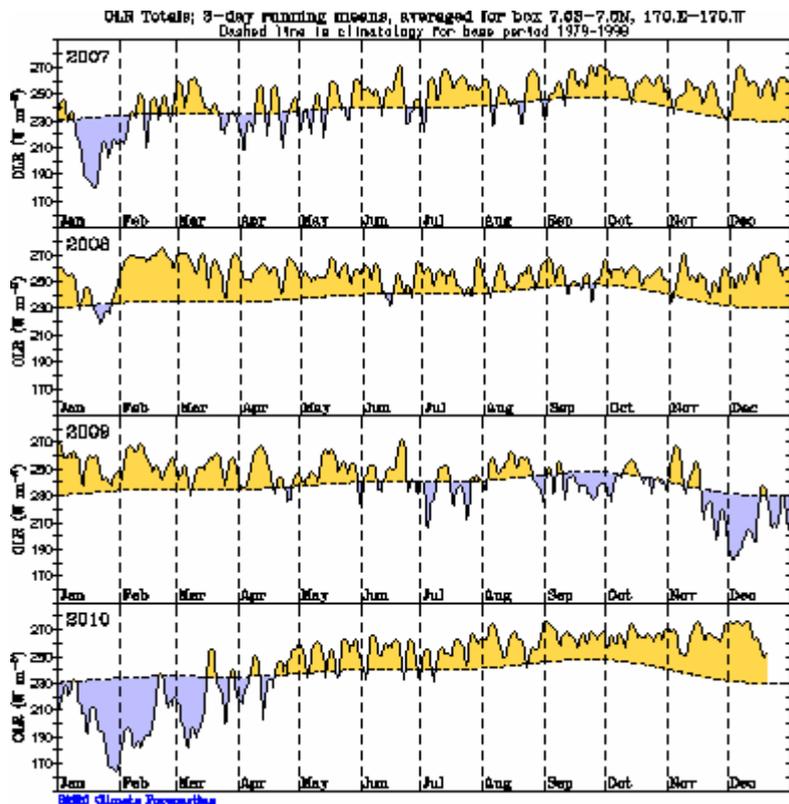
During La Niña events, there is a sustained strengthening of the trade winds across much of the tropical Pacific, while during El Niño events there is a sustained weakening of the trade winds.



**Cloudiness near the date-line:**

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

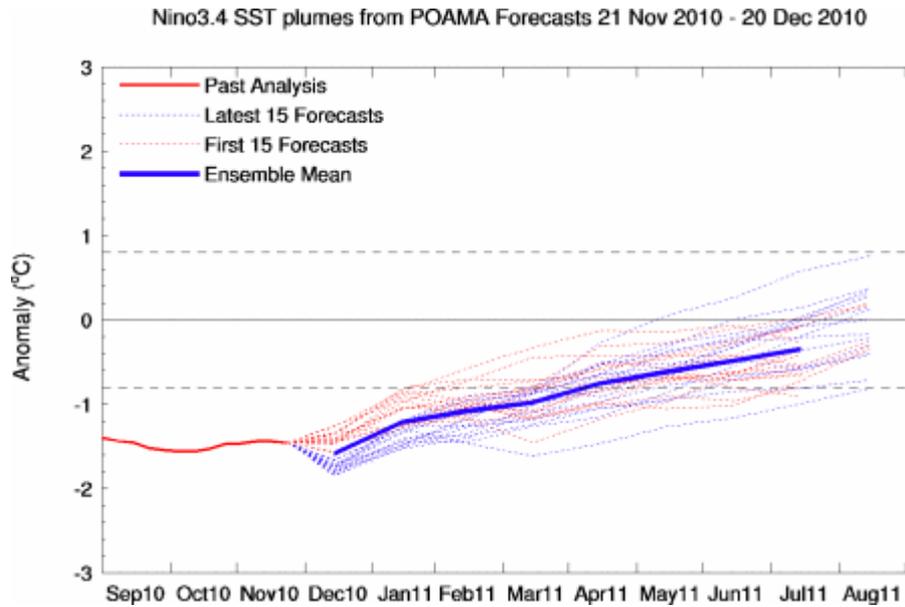
Cloudiness along the equator, near the date-line, is an important indicator of ENSO conditions, as it typically increases (negative OLR anomalies) near and to the east of the dateline during an El Niño event and decreases (positive OLR anomalies) during a La Niña event.



**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 remainder of the southern hemisphere summer. The majority of the models indicate the event will gradually begin to weaken as the central Pacific warms, further into 2011.

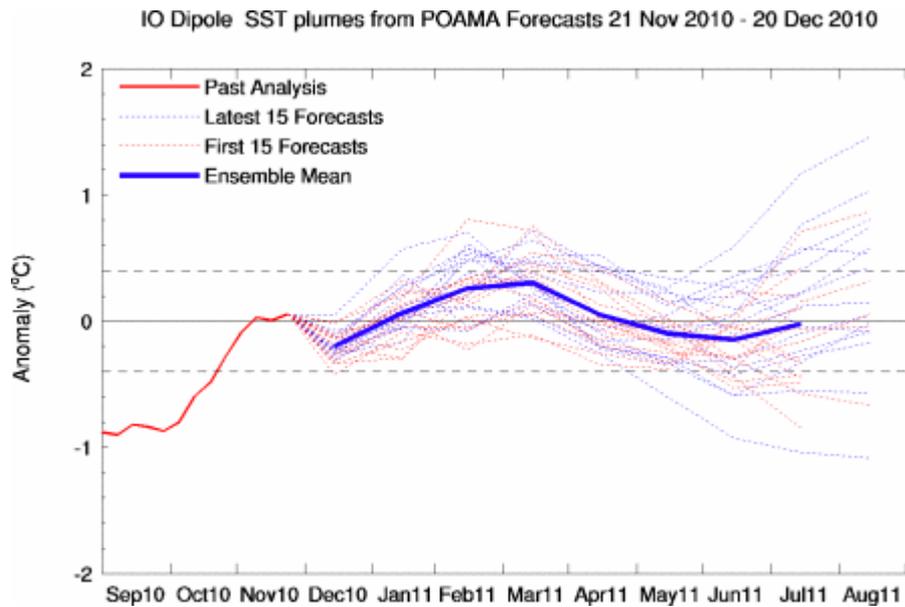
Recent forecasts from the [POAMA model](#), run daily at the Bureau of Meteorology, predict La Niña conditions will persist during the first quarter of 2011, but will gradually weaken with time as the central Pacific warms.



**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 19 December 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 map](#) | [IOD forecasts](#) | [DMI values](#)

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