Australian Government
Bureau of Meteorology

La Niña persists in the Pacific

Issued on Wednesday 24 November | Product Code IDCKGEWWOO

La Niña conditions have weakened slightly but remain firm across the tropical Pacific. Long-range models surveyed by the Bureau suggest that this La Niña event will persist through the southern hemisphere summer and into the first quarter of 2011.

All ENSO indicators remain above La Niña thresholds. The surface of the tropical Pacific Ocean has warmed slightly, however it still remains significantly cooler than average for this time of year. Below the surface of the Pacific Ocean, temperatures are up to 4°C cooler than normal in the central and eastern part of the Pacific Ocean, while the western Pacific continues to warm. The SOI has fallen, but has remained strongly positive. Trade winds have strengthened and remain stronger than average across the central and western equatorial Pacific. Cloudiness near the date-line continues to be suppressed.

La Niña periods are generally associated with above normal rainfall during the second half of the year across large parts of Australia, most notably eastern and northern regions. The 2010 event has contributed to Australia's wettest August to October period on record. 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 Indian Ocean Dipole is following its normal cycle of decay in the late spring/early summer period, and the IOD index is currently neutral.

Next update expected by 8 December 2010 | print version

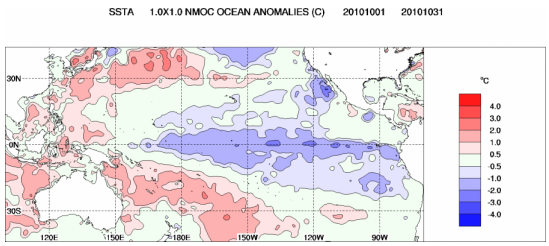
Further Details

Sea Surface Temperatures

Monthly sea surface temperatures:

Steady cooling of the central and eastern tropical Pacific Ocean, which has been progressing since January 2010, continued during October. The sea surface temperature (SST) anomaly map for October shows anomalies more than 1°C cooler than normal extending along the equator east of 160°E. The map shows small areas of water in the central and eastern Pacific where water was more than 2°C cooler than normal. The warm anomalies in the Maritime Continent region cooled slightly during October.

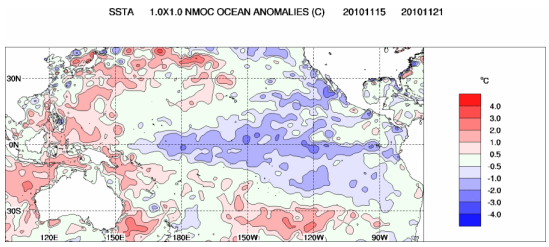
Index	Sep	Oct	Temperature change
Nino 3	−0.9	−1.2	0.3°C cooler
Nino 3.4	−1.3	−1.4	0.1°C cooler
Nino 4	−1.2	−1.2	no change



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 21 November shows cool anomalies extending along the equator east of 160°E. While the area of anomalies more than 1°C cooler than normal has contracted slightly over the last fortnight, small areas more than 2°C cooler than normal for this time of the year are still present. Warm anomalies remain evident in the Maritime Continent region.

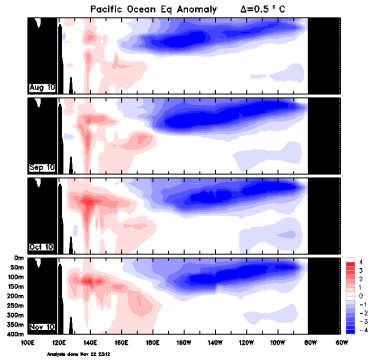
Index	Previous	Current	Temperature change (2 weeks)
Nino 3	−1.4	−1.1	0.3°C warmer
Nino 3.4	−1.3	−1.4	0.1°C cooler
Nino 4	−1.3	−1.1	0.2°C warmer



An animation of recent SST changes | Weekly data graph

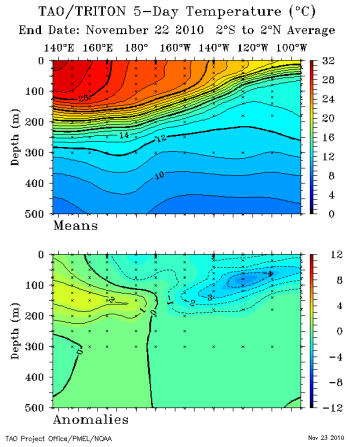
Pacific ocean sub-surface temperatures

Monthly sub-surface:



The four-month sequence of sub-surface Pacific Ocean equatorial temperature anomalies, to 22 November, 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 November, with central areas more than 4°C cooler than usual. The sequence also shows that the warm anomalies in the western Pacific have continued to develop over the last four months.

Weekly sub-surface:



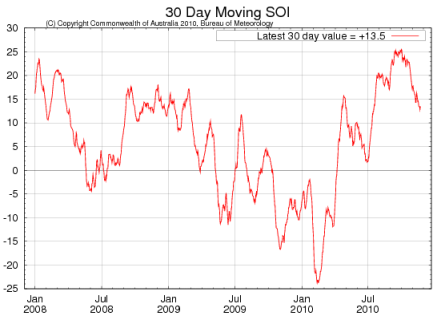
The map for the 5 days ending 22 November shows a large volume of cooler than normal water below the surface of the tropical Pacific Ocean. In the eastern Pacific, the sub-surface of the ocean is more than 4°C cooler than normal for this time of the year, on a weekly scale. When compared with two weeks ago, there has been a slight cooling.

Animation of recent sub-surface changes | Archive of sub-surface temperature charts

Southern Oscillation Index:

The Southern Oscillation Index (SOI) has fallen, but remained strongly positive over the last two weeks. The latest (22 November) 30-day SOI value is +14. 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.

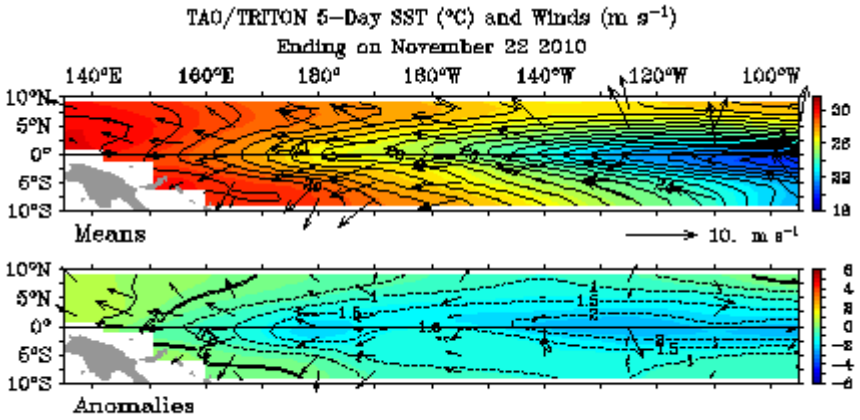


Monthly graph | SOI table | SOI text

Trade winds:

Trade winds have strengthened over the past two weeks and are stronger than normal across most of the equatorial Pacific, particularly over the western and central tropical Pacific. The latest wind anomaly map for the 5 days ending 22 November is shown below.

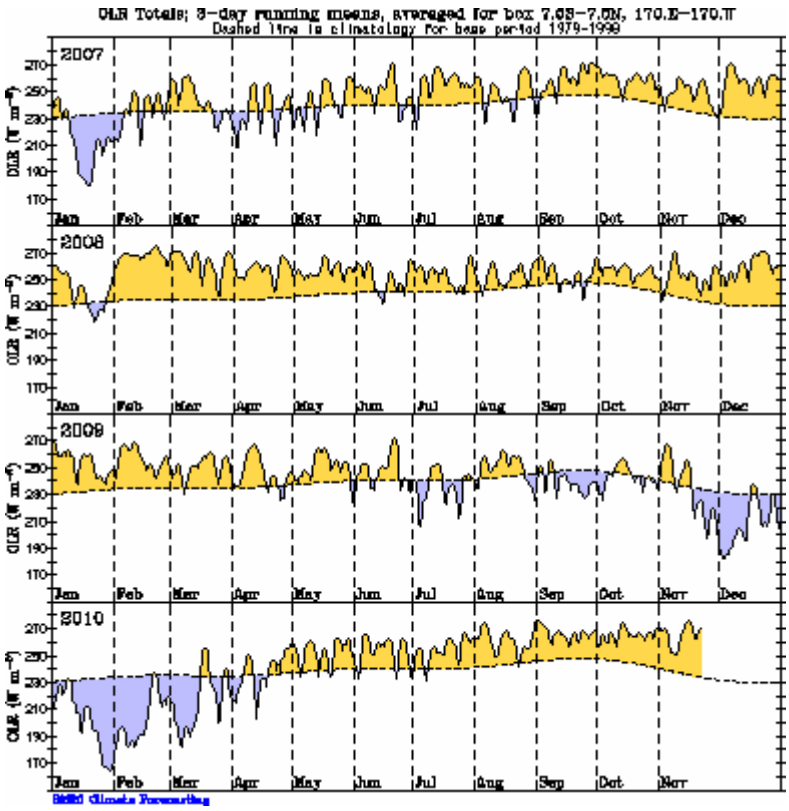
During La Niña events, there is a sustained strengthening of the trade winds across much of the tropical Pacific, while during El Niño events there is a sustained weakening of the trade winds.



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.

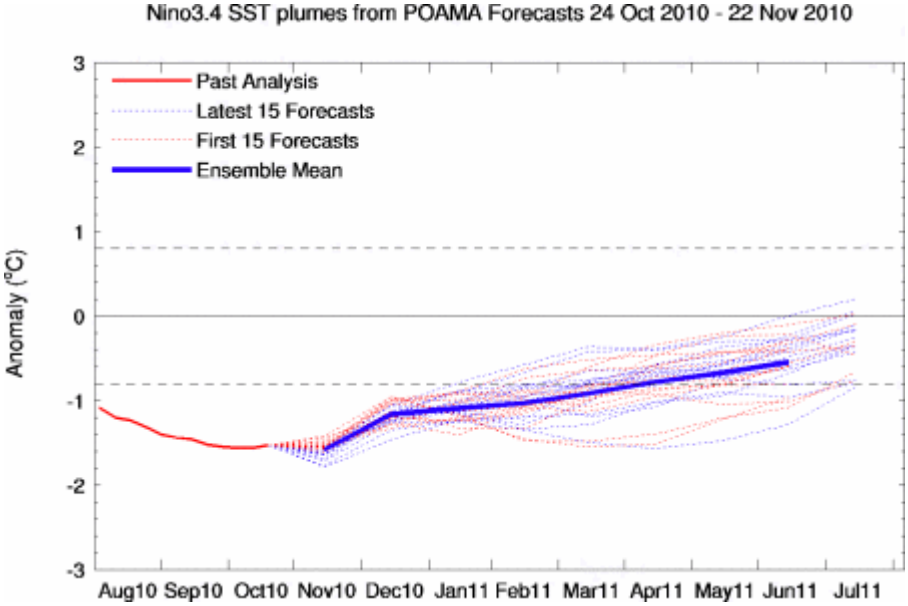
Cloudiness along the equator, near the date-line, is an important indicator of ENSO conditions, as it typically increases (negative OLR anomalies) near and to the east of the dateline during an El Niño event and decreases (positive OLR anomalies) during a La Niña event.



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 through the remainder of 2010. The majority of the models indicate the event will persist, though gradually weaken, during the first quarter of 2011.

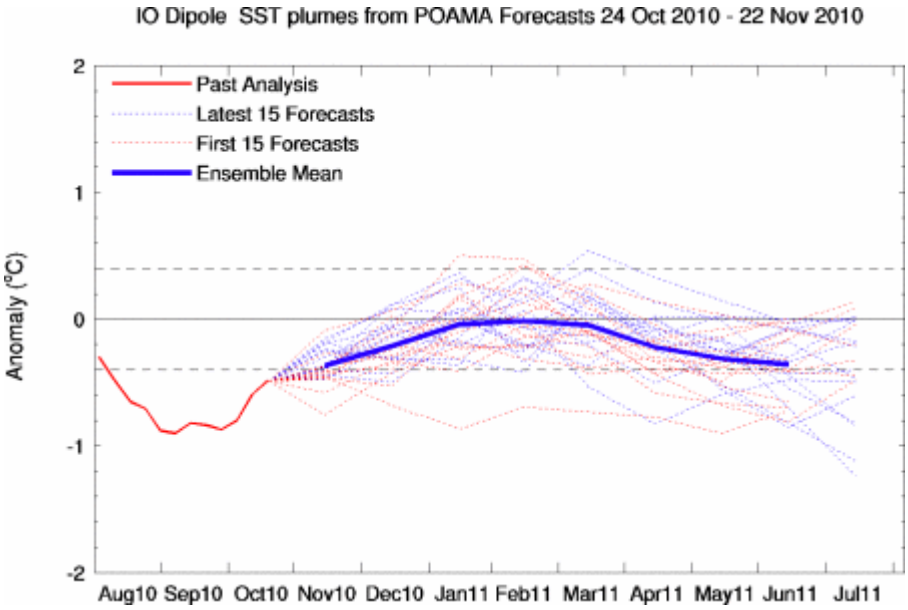
Recent forecasts from the POAMA model, run daily at the Bureau of Meteorology, predict La Niña conditions will persist into the first quarter of 2011, but will gradually weaken with time as the central Pacific warms.



Indian Ocean Dipole:

The Indian Ocean Dipole (IOD) index has fluctuated around neutral values over the past two weeks; the value for the week ending 21 November was +0.1. The negative IOD event continues to decay as the monsoon trough moves southwards into the southern hemisphere over the eastern Indian Ocean.

Recent forecasts from the POAMA model, run daily at the Bureau of Meteorology, predict that the IOD index will remain in neutral territory over the coming summer and into the first quarter of 2011. IOD events usually decay in the months of November and December with the onset of the Australian monsoon.



IOD map | IOD forecasts | DMI values