Australian Government
Bureau of Meteorology

Increasing risk of El Niño in 2012

Issued on Tuesday 3 July | Product Code IDCKGEWWOO

Climate indicators continue to show a shift towards El Niño, in line with most model predictions. Eastern and central tropical Pacific Ocean temperatures have continued to warm over the past fortnight, while trade winds have remained weaker than normal. Likewise, the Southern Oscillation Index (SOI) has become more strongly negative over the past month.

Tropical Pacific Ocean observations are consistent with previous and current climate model forecasts, which have indicated that the tropical Pacific may approach or exceed El Niño thresholds sometime between mid-winter and spring 2012.

During El Niño events, large parts of eastern Australia are typically drier than normal during winter and spring, while southern Australian daytime temperatures tend to be warmer. However, El Niño does not guarantee widespread dry conditions.

The Indian Ocean Dipole (IOD) is currently neutral. About half of the outlooks from POAMA, the Bureau's climate model, indicate the possibility of a weak positive IOD event developing during winter or spring. Should a positive IOD event eventuate with an El Niño event, this increases the likelihood of dry conditions over southern Australia.

Next update expected by 17 July 2012 | print version

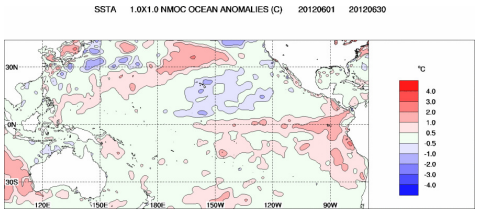
Further Details

Sea Surface Temperatures

Monthly sea surface temperatures:

Sea surface temperatures (SSTs) in the central and eastern equatorial Pacific Ocean warmed during June. Water in the far eastern equatorial Pacific is more than 1 °C warmer than usual. The SST anomaly map for June shows SSTs remain near average across the western half of the tropical Pacific, and the area of weak cool anomalies north of the equator also remains similar to the previous month. Warm anomalies in the far western Pacific north of the Maritime Continent have also decreased.

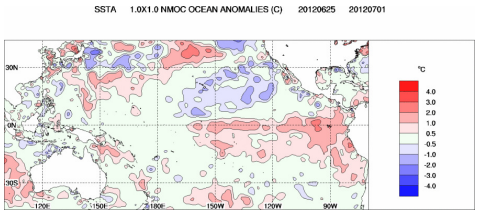
Index	May	June	Temperature change
NINO3	+0.3	+0.8	0.4 °C warmer
NINO3.4	0.0	+0.4	0.4 °C warmer
NINO4	−0.1	+0.1	0.2 °C warmer



Weekly sea surface temperatures:

Warm sea-surface temperature (SST) anomalies in the eastern tropical Pacific have increased when compared to two weeks ago. The SST anomaly map for the week ending 1 July shows warm anomalies extend along the equator in a broad band between the South American coast and about 160°W. Tropical SSTs in the western Pacific are near average for this time of the year.

Index	Previous	Current	Temperature change (2 weeks)
NINO3	+0.7	+1.0	0.3 °C warmer
NINO3.4	+0.4	+0.7	0.3 °C warmer
NINO4	+0.1	+0.2	0.1 °C warmer

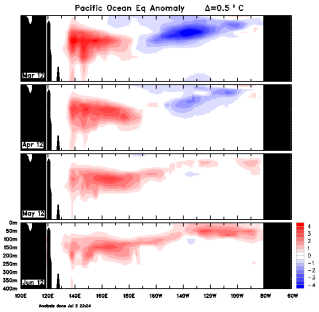


An animation of recent SST changes | Weekly data graph

Pacific ocean sub-surface temperatures

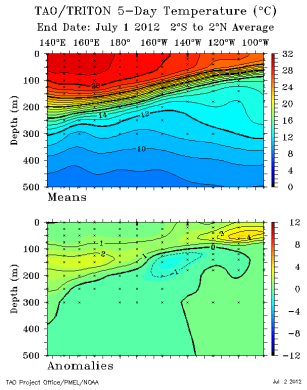
Monthly sub-surface:

The four-month sequence (to the end of June) of sub-surface temperature anomalies in the equatorial Pacific Ocean shows the development of warm anomalies in the sub-surface of the eastern Pacific and a decrease in the strength of warm anomalies in the western Pacific. Warm anomalies are currently in place across the sub-surface of the entire Pacific; water in areas of the sub-surface in both the eastern and western Pacific is 2 to 3 ℃ warmer than average.



Weekly sub-surface:

The pattern of sub-surface temperature anomalies remains generally similar to that from two weeks ago. The map for the 5 days ending 1 July shows subsurface warm anomalies across the entire equatorial Pacific; a small volume of water more than 4 ℃ warmer than usual is present in the shallow sub-surface of the eastern equatorial Pacific, while weaker warm anomalies are present deeper in the west.

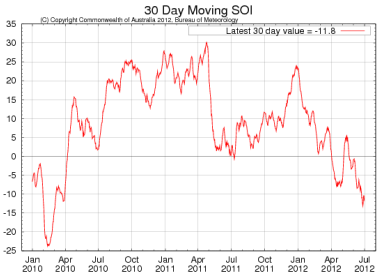


Animation of recent sub-surface changes | Archive of sub-surface temperature charts

Southern Oscillation Index:

The Southern Oscillation Index (SOI) has continued to fall steadily over the past two weeks. The latest (1 July) 30-day SOI value is −11.8, within values indicative of an El Niño.

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.

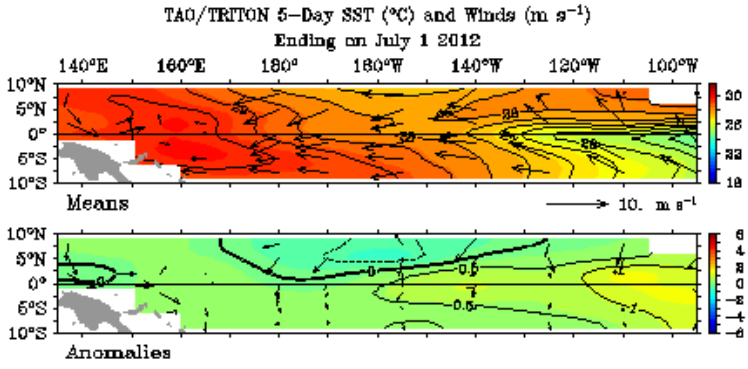


Monthly graph | SOI table | SOI text

Trade winds:

Trade winds are generally near average over the central and eastern tropical Pacific (see wind anomaly map for the 5 days ending 1 July). Westerly wind anomalies have been evident in the far western tropical Pacific for a number of weeks, and in fact, during the past two weeks the usual easterly trade winds have been replaced by westerly winds in this area.

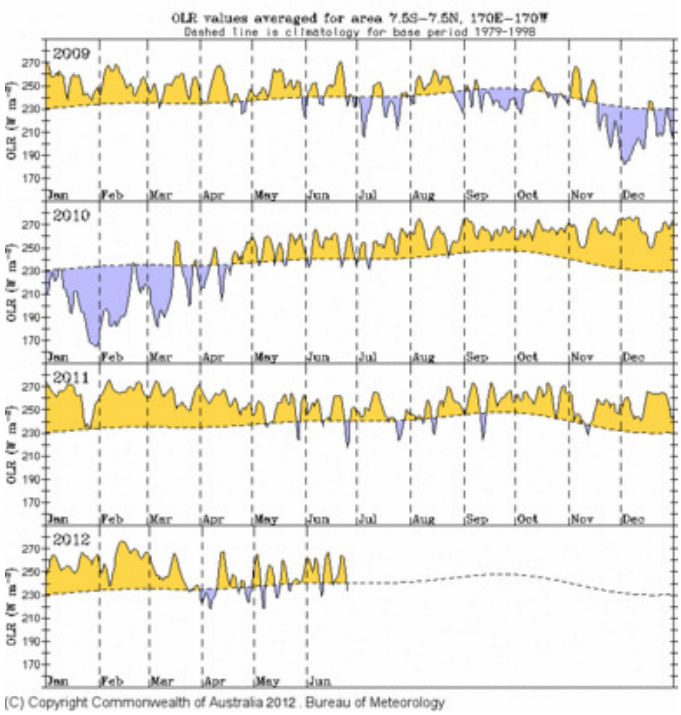
During La Niña events, there is a sustained strengthening of the trade winds across much of the tropical Pacific, while during El Niño events there is a sustained weakening of the trade winds.



Cloudiness near the Date Line:

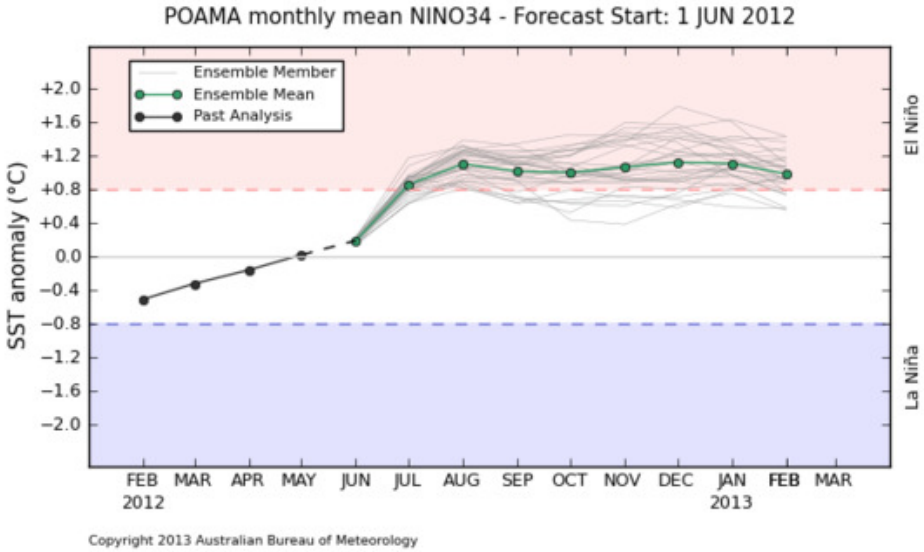
Cloudiness near the Date Line continues to fluctuate, but generally remained suppressed throughout the month of June.

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



Climate Models:

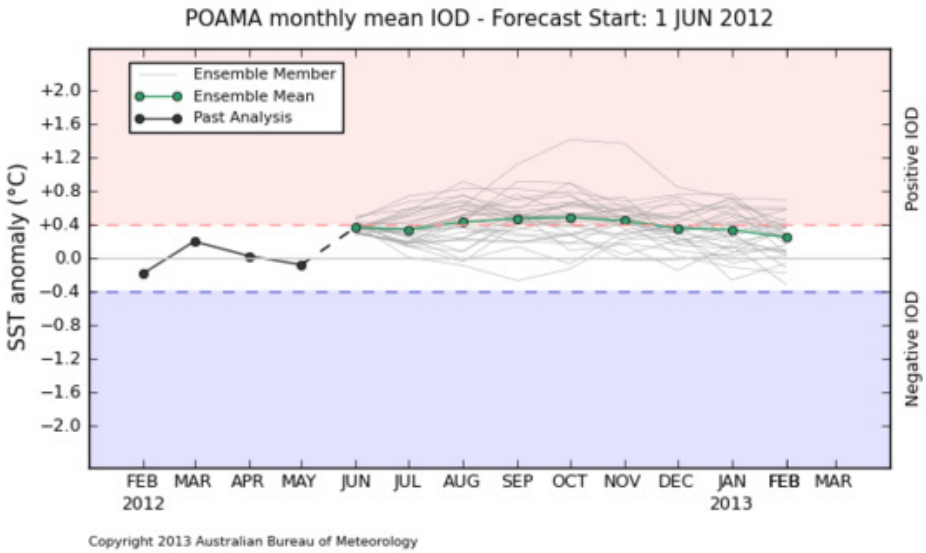
All of the international climate models surveyed by the Bureau, except one, predict that the equatorial Pacific Ocean is likely to reach El Niño thresholds sometime between mid-winter and spring 2012. Some models still show a large spread in their forecasts, indicating uncertainty in the extent of warming expected in the tropical Pacific during coming months.



Indian Ocean Dipole:

Values of the IOD index have remained neutral over the past two weeks. The latest IOD index value is +0.14 for the week ending 1 July.

Recent forecasts from the POAMA model continue to show a degree of spread around positive threshold values, indicating some possibility of a weak positive IOD event remains for winter and spring.



IOD time series IOD map IOD forecasts DMI values

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