Australian Government
Bureau of Meteorology

# Tropical Pacific remains neutral; ocean warming slowly

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Tropical Pacific climate indicators remain at neutral values for this time of the year. This includes the Southern Oscillation Index (SOI), trade winds, cloudiness, and sea surface temperatures. Ocean temperatures below the surface are currently warmer than average in the central and western Pacific on a monthly scale, with the eastern subsurface Pacific closer to normal, but slowly warming.

Climate models surveyed by the Bureau of Meteorology show that the tropical Pacific Ocean is likely to warm further over the coming months. All seven models surveyed indicate conditions are likely to approach, or possibly exceed, El Niño thresholds during the late winter to early spring period. Large parts of eastern Australia are typically drier and warmer than normal in winter/spring as El Niño events develop. No climate models favour a return to La Niña.

While the Indian Ocean Dipole (IOD) is currently considered neutral, the IOD index has been positive for the past three weeks. About half of the current POAMA outlooks show sustained positive levels in 2012.

**Next update expected by 19 June 2012** | print version

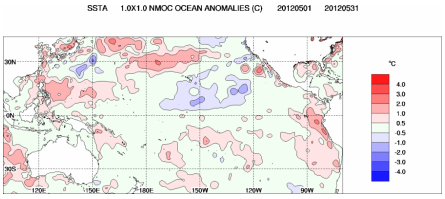
## Further Details

### Sea Surface Temperatures

#### Monthly sea surface temperatures:

After warming during April, sea surface temperatures (SSTs) in the central and eastern equatorial Pacific Ocean cooled slightly during May. The SST anomaly map for May shows SSTs remain near normal across most of the tropical Pacific, although the area of weak cool anomalies north of the equator has increased marginally in size. Warm anomalies in the far eastern Pacific have decreased in size during May, with water along the coast of South America more than 2 ℃ warmer than usual. In the west, warm anomalies north of the Maritime Continent have strengthened, with the warmest water east of the Philippines.

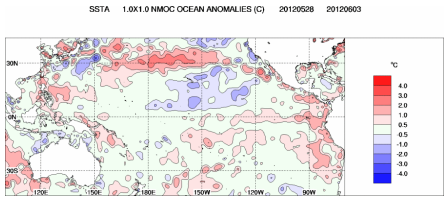
| Index | April | May | Temperature change |
|---|---|---|---|
| NINO3 | +0.3 | +0.3 | no change |
| NINO3.4 | –0.2 | 0.0 | 0.2 ℃ warmer |
| NINO4 | –0.1 | –0.1 | no change |




#### Weekly sea surface temperatures:

The distribution of warm and cool sea-surface temperature (SST) anomalies across the tropical Pacific Ocean generally remains similar to that of two weeks ago. Warm anomalies along the equator in the eastern Pacific continue to develop; the SST anomaly map for the week ending 3 June shows warm anomalies adjacent to the South American coast, extending along the equator between South America and about 130°W, and south of the equator in the central Pacific as well as around parts of the Maritime Continent. An area of weak cool anomalies remain north of the equator in the central Pacific, while tropical SSTs between about 150°W and the Maritime Continent are average for this time of the year.

| Index | Previous | Current | Temperature change (2 weeks) |
|---|---|---|---|
| NINO3 | +0.3 | +0.4 | 0.1 ℃ warmer |
| NINO3.4 | –0.1 | +0.2 | 0.3 ℃ warmer |
| NINO4 | –0.1 | 0.0 | 0.1 ℃ warmer |

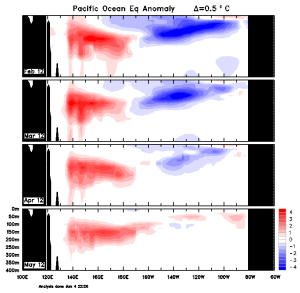



An animation of recent SST changes | Weekly data graph

### Pacific ocean sub-surface temperatures

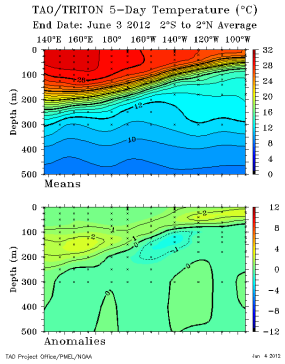
#### Monthly sub-surface:

The four-month sequence of sub-surface Pacific Ocean equatorial temperature anomalies to May shows an absence of cool anomalies in the sub-surface of the eastern Pacific and a decrease in the strength of warm anomalies in the western Pacific. Water between about 160°E and the Date Line is more than 3 ℃ warmer than average.




## Weekly sub-surface:

The pattern of subsurface temperature anomalies remains generally similar to that from two weeks ago. The map for the 5 days ending 3 June shows subsurface warm anomalies across the entire equatorial Pacific; volumes of water more than 2 ℃ warmer than usual are present in both the western and eastern equatorial Pacific, with the anomalies being somewhat deeper in the west.

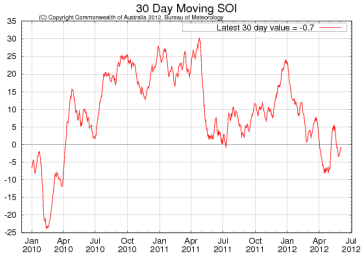



Animation of recent sub-surface changes | Archive of sub-surface temperature charts

## Southern Oscillation Index:

Values of the Southern Oscillation Index (SOI) have remained on the negative side of neutral over the past two weeks. The latest (3 June) 30-day SOI value is −0.7.

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.

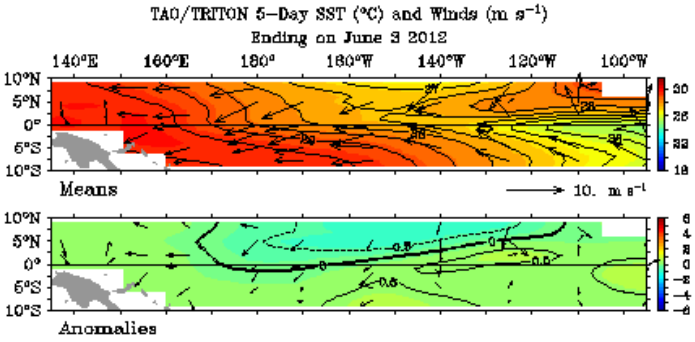



Monthly graph | SOI table | SOI text

## Trade winds:

Trade winds have strengthened during the past fortnight and easterly anomalies cover the tropical Pacific west of 140 °W. Weak westerly wind anomalies have also emerged north of the equator in the eastern Pacific (see wind anomaly map for the 5 days ending 3 June).

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.

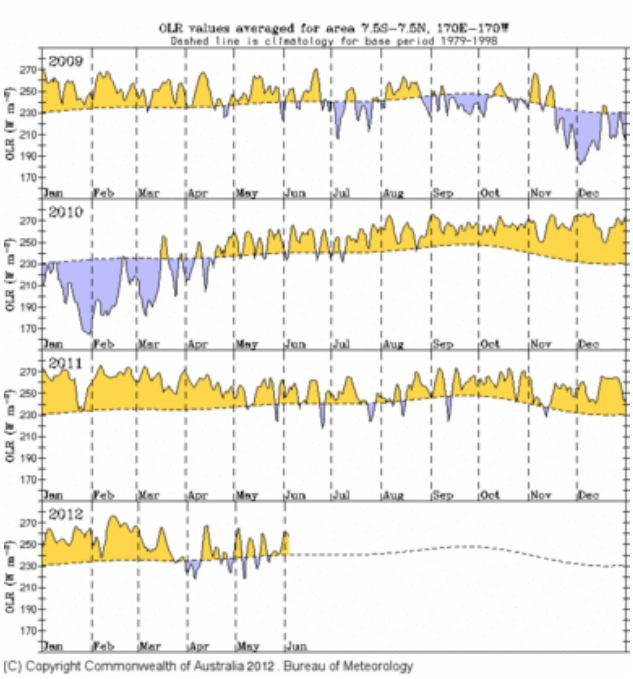



## Cloudiness near the Date Line:

Cloudiness near the Date Line continues to fluctuate, but has remained suppressed over the past two weeks.

Cloudiness along the equator, near the Date Line, is an important indicator of ENSO conditions, as it

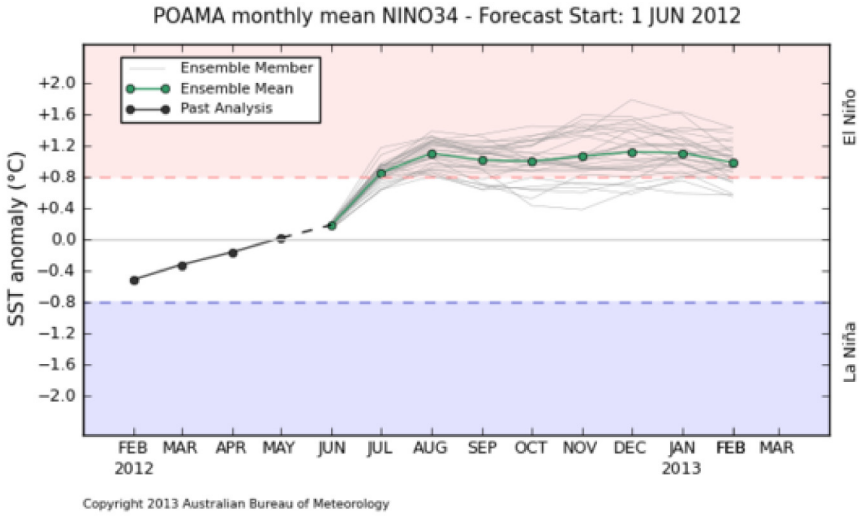
typically increases (negative OLR anomalies) near and to the east of the Date Line during an El Niño event and decreases (positive OLR anomalies) during a La Niña event.





## Climate Models:

The majority of international climate models surveyed by the Bureau predict that the equatorial Pacific Ocean is likely to reach El Niño thresholds before or during the first half of spring. A few climate models still indicate that conditions on the warm side of neutral are the more likely outcome for spring.

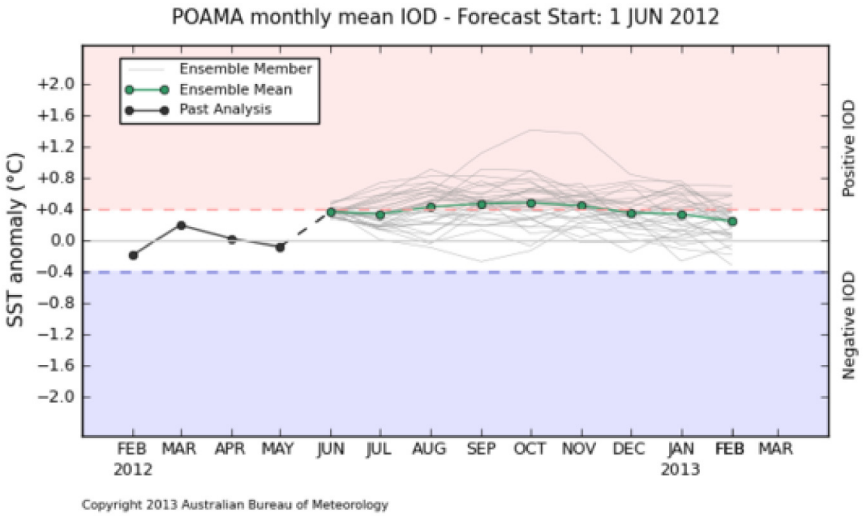




## Indian Ocean Dipole:

Values of the IOD index have been within positive territory for three weeks. If the current SST pattern in the Indian Ocean is sustained or enhanced, a positive IOD event will be considered to be established. The latest IOD index value is +0.8 for the week ending 3 June.

Recent forecasts from the POAMA model show a degree of spread around positive threshold values, indicating the possibility of a weak positive IOD event during winter and spring. Late autumn to early winter is typically the time when IOD events may begin to have an impact upon Australia.




IOD time series IOD map IOD forecasts DMI values

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