



## ENSO Wrap-Up

### Current state of the Pacific and Indian Ocean

## Some more El Niño-like patterns emerge, but no El Niño yet.

Issued on Tuesday 1 July 2014 | Product Code IDCKGEWW00

While the tropical Pacific Ocean surface temperature is currently at levels typically associated with a weak El Niño, waters below the surface have cooled and atmospheric patterns continue to remain neutral.

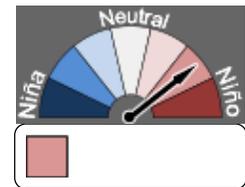
However, over the past fortnight changes have occurred in the atmosphere that may be a response to the warm surface waters—the Southern Oscillation Index has dropped by over 10 points, and weakened trade winds have re-appeared. These changes would need to persist for several weeks in order for an El Niño to be considered established, and it remains possible they are simply related to shorter term weather variability.

Climate models surveyed by the Bureau continue to indicate that El Niño is likely to develop by spring 2014. The Bureau's ENSO Tracker remains at El Niño ALERT, indicating at least a 70% chance of El Niño developing in 2014.

For Australia, El Niño is often associated with below-average rainfall over southern and eastern inland areas and above-average daytime temperatures over southern parts of the continent.

The Indian Ocean Dipole (IOD) is currently neutral. Model outlooks suggest the IOD is most likely to remain neutral through winter and spring. The likelihood of a positive IOD event increases with El Niño. Positive IOD events are typically associated with large parts of southern and central Australia experiencing lower rainfall than usual.

Next update expected on 15 July 2014 | [print version](#)



El Niño ALERT

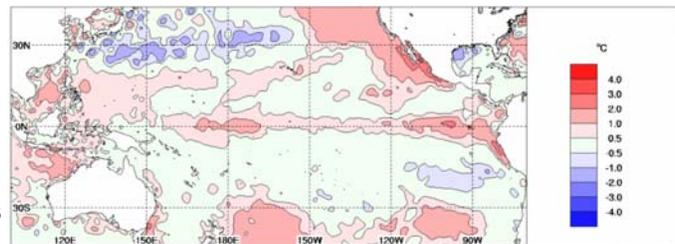
### ENSO Tracker

(or click graphic)

[Currents of change:  
Tracking the El  
Niño/La Niña cycle  
\(Bureau blog article\)](#)

## Monthly sea surface temperatures

The equatorial Pacific continued to warm during May. The sea surface temperature (SST) anomaly map for May shows warm anomalies are present in the Pacific along nearly the entire equator as well as to Australia's northwest and around much of the Maritime Continent to Australia's north. Compared to last month, anomalies in the eastern tropical Pacific and around the Date line have shown the most warming.

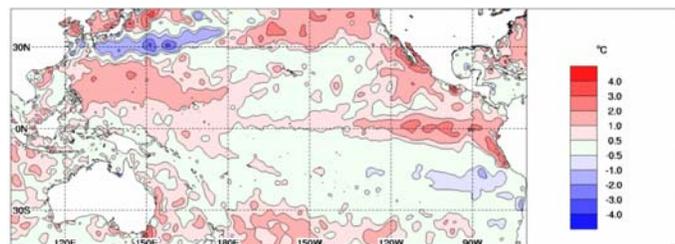


Index	April	May	Temperature change
NINO3	+0.4	+0.7	0.3 °C warmer
NINO3.4	+0.3	+0.5	0.2 °C warmer
NINO4	+0.5	+0.7	0.2 °C warmer

Baseline period 1961–1990.

## Weekly sea surface temperatures

Warm SST anomalies are in place across the entire tropical Pacific Ocean, with further warming in the eastern tropical Pacific over the past two weeks. Over the Pacific Basin, positive anomalies remain evident across large areas north of the equator in both the East China Sea in the west and along the North American coastline in the east (see SST anomaly map for the week ending 29 June). Warm anomalies also extend into the Indian Ocean.



Index	Previous	Current	Temperature change (2 weeks)
NINO3	+0.8	+1.1	0.3 °C warmer
NINO3.4	+0.4	+0.5	0.1 °C warmer
NINO4	+0.6	+0.5	0.1 °C cooler

Baseline period 1961–1990.

See also:

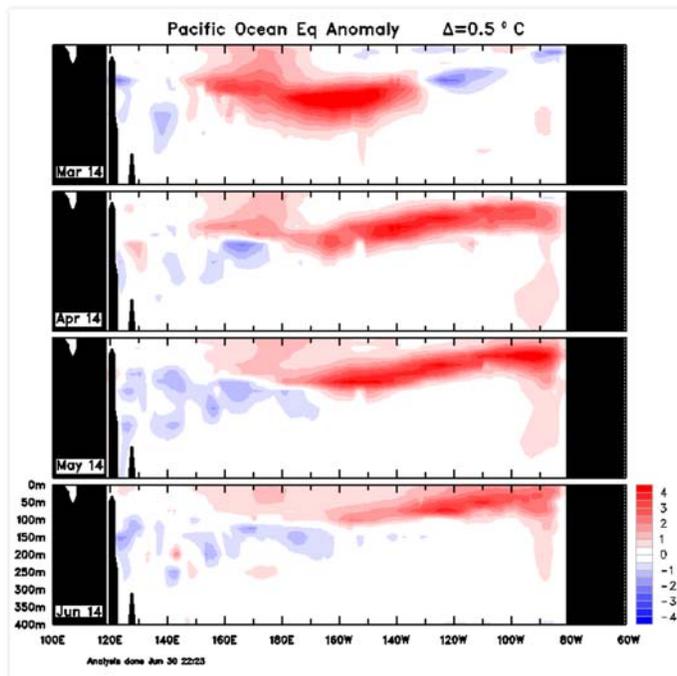
[Animation of recent SST changes](#)

[Weekly index values](#)

[Map of NINO regions](#)

## Monthly sub-surface temperatures

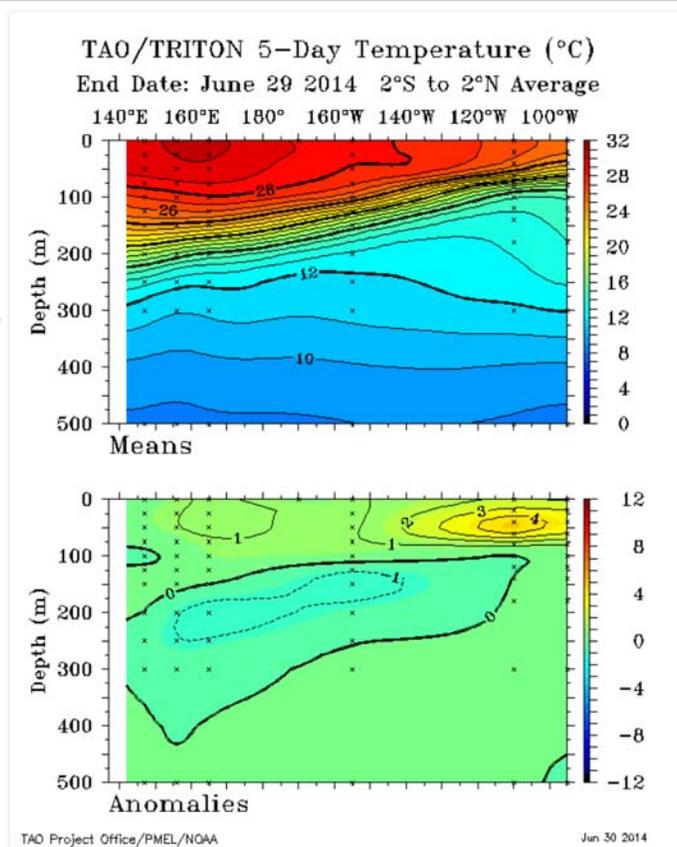
The four-month sequence of sub-surface temperature anomalies (to June) shows warm temperature anomalies across the top 100 m of the equatorial Pacific between the Date Line and the South American coast. Some cooling of the central and eastern equatorial Pacific has taken place over the past month, but sub-surface waters remain more than 3 °C warmer than average in a large part of the eastern equatorial Pacific.



## 5-day sub-surface temperatures

The sub-surface temperature map for the 5 days ending 29 June shows waters in the eastern equatorial Pacific are warmer than average in the top 100 m. Water in part of this area is more than 4 °C warmer than average. Elsewhere, sub-surface temperatures are generally near average.

As shown in the [animation of sub-surface temperature changes](#), this pool of warmer-than-average sub-surface water has been present in the eastern tropical Pacific for a number of weeks and is likely to sustain the surface warming in the region during winter. However, over the past two months there has been an overall reduction in the area of sub-surface water that is very much warmer than average.



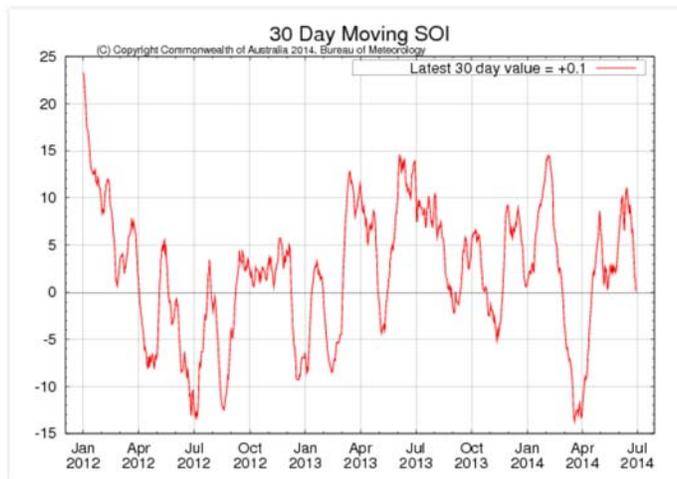
**See also:** [Animation of recent sub-surface temperature changes](#)

[Archive of sub-surface temperature charts](#)

## Southern Oscillation Index

The Southern Oscillation Index (SOI) has fallen over the past two weeks to neutral values. The latest approximate 30-day SOI value to 29 June is +0.1, a fall of over 10 points since the previous ENSO Wrap-Up.

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.



See also:

[Monthly SOI graph](#)

[Table of monthly SOI values](#)

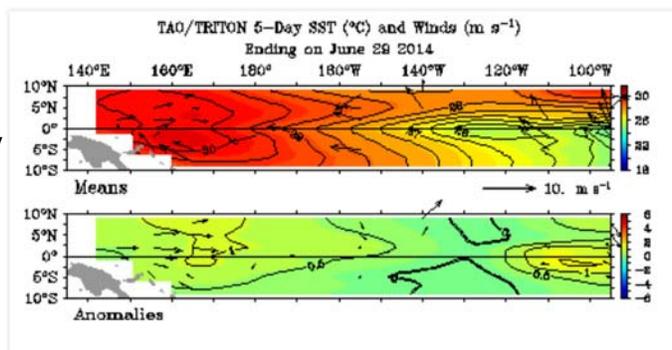
[30-day SOI values](#)

## Trade winds

Westerly wind anomalies are present over the western tropical Pacific and near-average across the remainder of the tropical Pacific (see anomaly map for the 5 days ending 29 June). If these westerly winds continued they could drive further warming of surface waters in the central and eastern Pacific, and may be a sign that the atmosphere could be falling into alignment with the signs of a developing El Niño in the ocean.

However, in recent weeks the Madden–Julian Oscillation (MJO) has moved from phase 4 (eastern Indian Ocean), which favours easterly wind anomalies over the tropical Pacific, to phase 6 and 7 (western Pacific), which favours westerly wind anomalies. This may be contributing to the current atmospheric pattern, which appears more El Niño-like than in recent weeks. Once the MJO event passes, it will be more apparent how coupled the ENSO system has become.

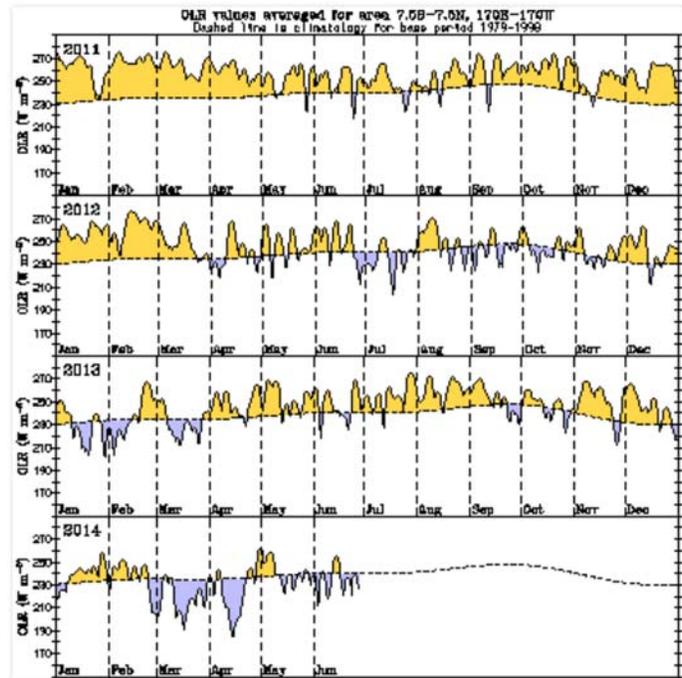
During La Niña events, there is a sustained strengthening of the trade winds across much of the tropical Pacific, while during El Niño events there is a sustained weakening of the trade winds.



### Cloudiness near the Date Line

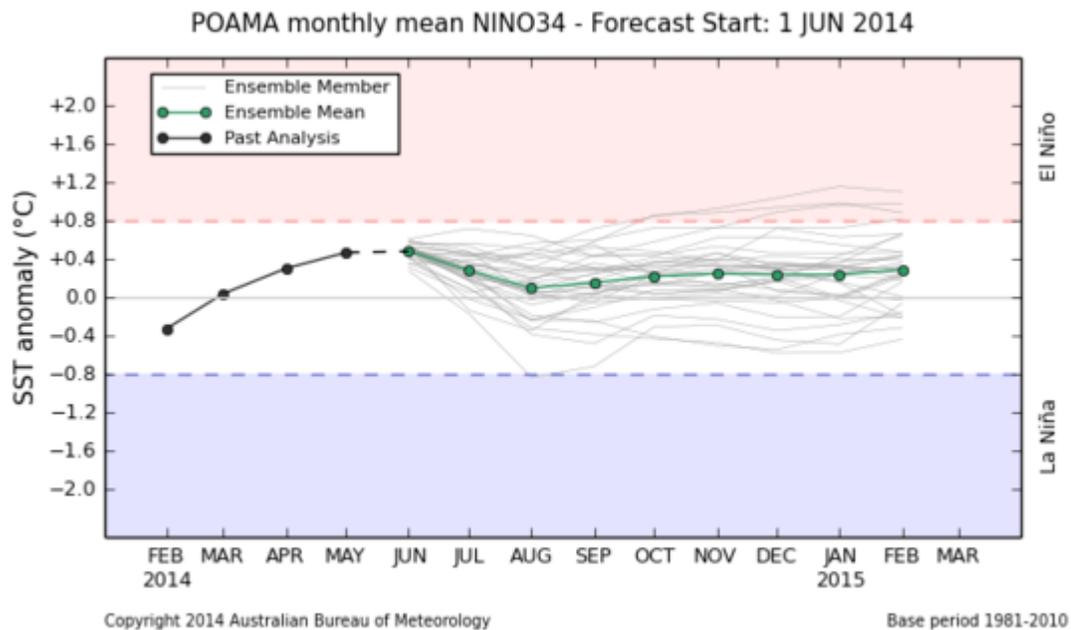
Cloudiness near the Date Line has continued to fluctuate around the long-term average during the past two weeks, but has generally been slightly above average. Again, this may be due in part to the passing of the MJO event currently underway in the Pacific.

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.



## Model outlooks

Most international [climate models](#) surveyed by the Bureau indicate that SSTs in the equatorial Pacific Ocean are likely to warm further over the coming months. Despite some easing in the predictions of how much the equatorial Pacific will warm by, the majority of the surveyed models indicate that sea surface temperatures in the equatorial Pacific are likely to exceed El Niño thresholds before or during the southern hemisphere spring.



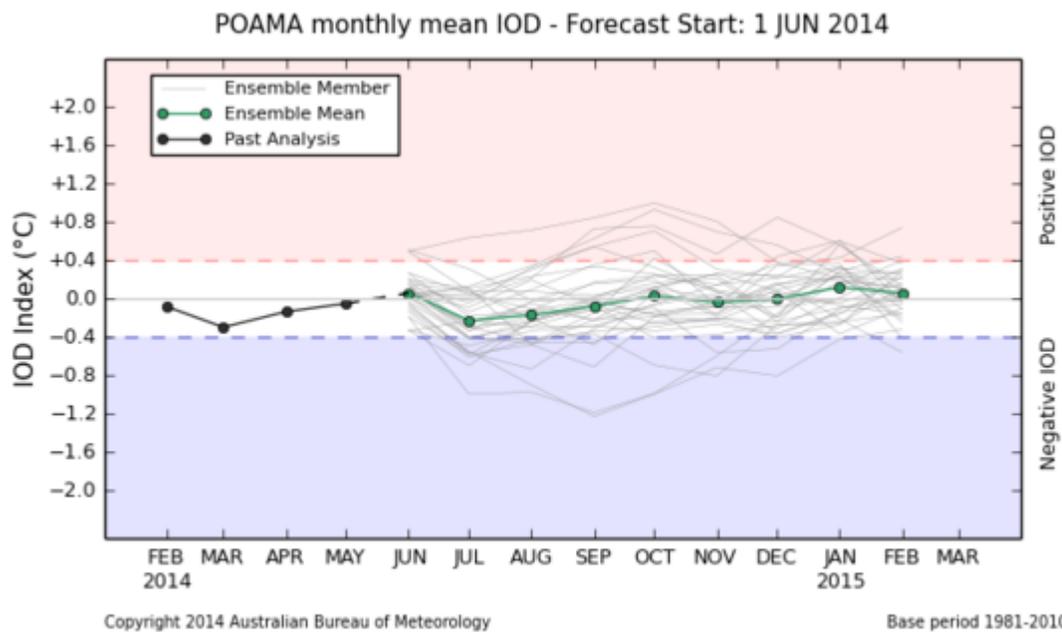
See also:

[Climate model summary](#)

## Indian Ocean Dipole

The Indian Ocean Dipole (IOD) has recorded negative values for three weeks, with the latest weekly index value (29 June)  $-0.7$  °C. Waters to the northwest of Australia and south of Indonesia are warmer than average while sea surface temperatures in the Arabian Sea are near average.

Climate models surveyed in the [model outlooks](#) favour neutral IOD values over the coming months, though one model reaches positive IOD levels in the spring. The chance of a positive IOD event is elevated during an El Niño. Positive IOD events often coincide with El Niño and are typically associated with lower than average winter and spring rainfall over parts of southern and central Australia.



See also:

[POAMA model](#)

[IOD time series](#)

[Map of IOD regions](#)

[IOD forecasts](#)

[Weekly IOD values](#)

## Effects on rainfall

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- Pacific Ocean: El Niño and La Niña (ENSO)
  - [Average rainfall patterns during El Niño](#)
  - [Average rainfall patterns during La Niña](#)
  - [Past El Niño events](#)
  - [Past La Niña events](#)
  - [About the 2010–11 and 2011–12 La Niña events](#)
- Indian Ocean: Indian Ocean Dipole (IOD)
  - [Average rainfall patterns during negative IOD years](#)
  - [Average rainfall patterns during positive IOD years](#)

### About climate influences

- [Australian climate Influences](#)

### Related information

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- [Tropical \(MJO\) monitoring](#)
- [Sea temperature analysis](#)
- [Out-going longwave radiation maps](#)

### International sites

- [TAO/TRITON data](#)
- [World Meteorological Organization El Niño/La Niña Update](#)

## Archive

- [Previous ENSO Wrap-Ups](#)

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