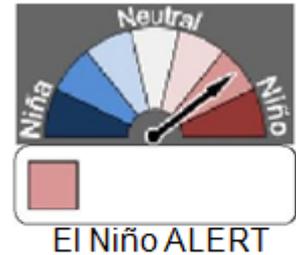


20-05-2014

ENSO Wrap-Up

Current state of the Pacific and Indian Ocean

The tropical Pacific Ocean continues a general trend toward El Niño, with just over half of the climate models surveyed by the Bureau suggesting El Niño thresholds will be exceeded by August. An El Niño ALERT remains in place, indicating at least a 70% chance of an El Niño developing in 2014.



ENSO Tracker

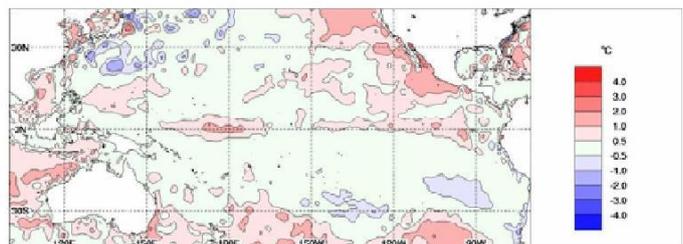
The tropical Pacific Ocean surface has warmed steadily since February, with sea surface temperature anomalies increasing by 0.5 to 1.0 °C. For El Niño to be established and maintained, the sea surface needs to warm further, and be accompanied by a persistent weakening of the trade winds and a consistent increase in cloudiness near the Date Line. In the past fortnight, trade winds have generally been near normal, though have weakened once again in recent days.

El Niño has impacts on many parts of the world, for example, below-average rainfall in the western Pacific and Indonesian regions and increased rainfall in the central and eastern Pacific. For Australia, El Niño is usually associated with below-average rainfall over southern and eastern inland Australia, with about two thirds of El Niño events since 1900 causing major drought over large 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, with two of the five models surveyed suggesting a positive IOD may develop during spring. Positive IOD events often coincide with El Niño and are typically associated with large parts of southern and central Australia experiencing lower rainfall than usual.

Monthly sea surface temperatures

Compared to March, the equatorial Pacific has warmed over the past month. The sea surface temperature (SST) anomaly map for April shows weak warm anomalies across most of the equatorial Pacific. The tropical Pacific has been slowly but steadily warming over the past few months, with the central Pacific warming by 0.6 °C since February.



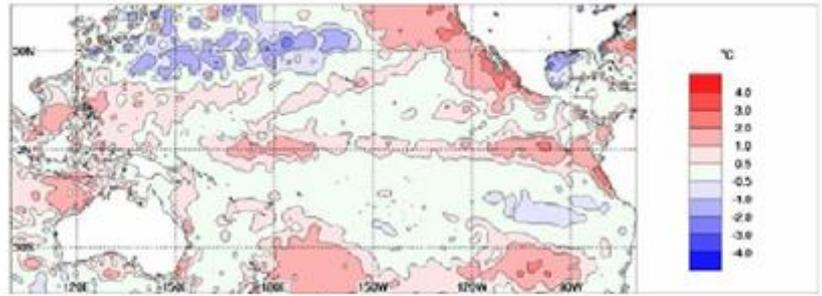
Index	March	April	Temperature change
NINO3	+0.1	+0.4	0.3 °C warmer
NINO3.4	0.0	+0.3	0.3 °C warmer
NINO4	+0.6	+0.5	0.1 °C cooler

Baseline period 1961–1990.

Weekly sea surface temperatures

The SST anomaly map for the week ending 18 May is similar to that of two weeks ago, although SSTs have warmed further in the far eastern equatorial tropical Pacific. Warm temperature anomalies are present along the equator from just east of Australia to the South American coast. This pattern is consistent with an emerging El Niño.

Waters surrounding Australia are generally warmer than average and have warmed again in the Great Australian Bight, compared to two weeks ago, while cooling slightly along the southeast coast.

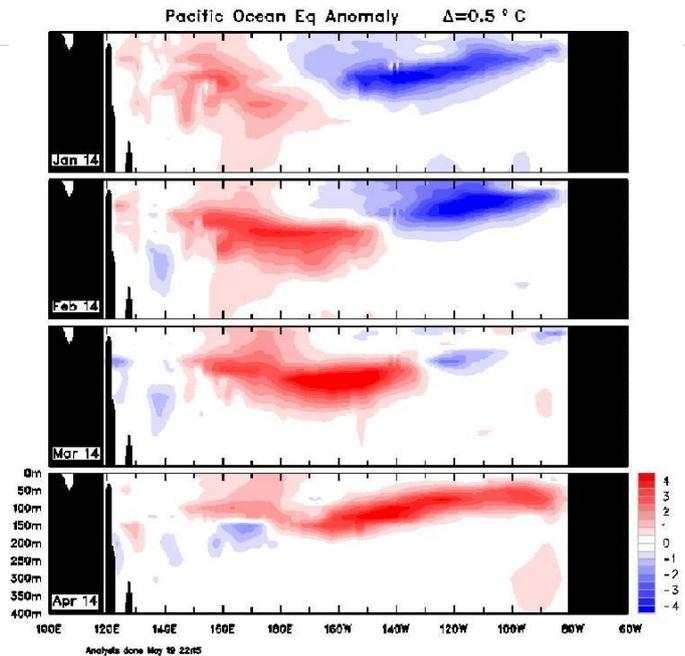


Index	Previous	Current	Temperature change (2 weeks)
NINO3	+0.6	+0.7	0.1 °C warmer
NINO3.4	+0.4	+0.5	0.1 °C warmer
NINO4	+0.7	+0.7	no change

Baseline period 1961 - 1990.

Monthly sub-surface temperatures

The four-month sequence of sub-surface temperature anomalies (to April) shows the development and eastward propagation of warmer than average water (known as a downwelling Kelvin wave event), which has now reached the eastern Pacific sub-surface. Waters are warmer than average across most of the sub-surface of the equatorial Pacific east of 160°E to a depth of around 150 m.



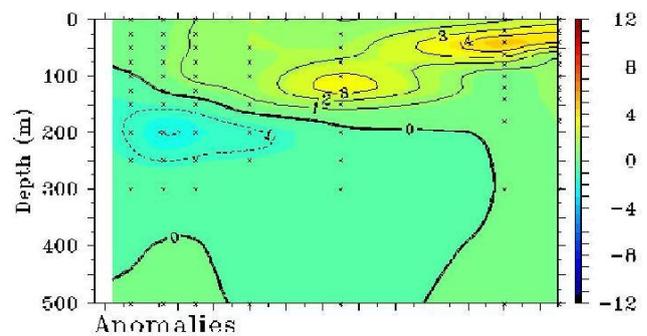
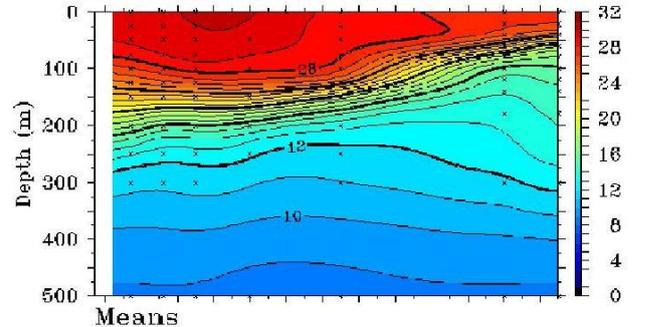
Weekly sub-surface temperatures

The sub-surface temperature map for the 5 days ending 18 May shows water in the sub-surface of the equatorial Pacific is generally warmer than average in the top 100 m. Water in an area of the sub-surface in the central equatorial Pacific is currently more than 3 °C above average around 100 m depth, while anomalies in excess of 4 °C above average are present nearer the surface of the far eastern equatorial Pacific.

The [animation of sub-surface temperature changes](#) shows the progression of the warmer waters across the Pacific (which is known as a Kelvin wave). Downwelling Kelvin wave events are driven by westerly winds over the western tropical Pacific. This pool of warmer-than-average sub-surface water is expected to cause a further warming at the surface of the central and eastern tropical Pacific, which is likely to contribute to the formation of an El Niño during winter.

TAO/TRITON 5-Day Temperature (°C)

End Date: May 18 2014 2°S to 2°N Average
140°E 160°E 180° 160°W 140°W 120°W 100°W



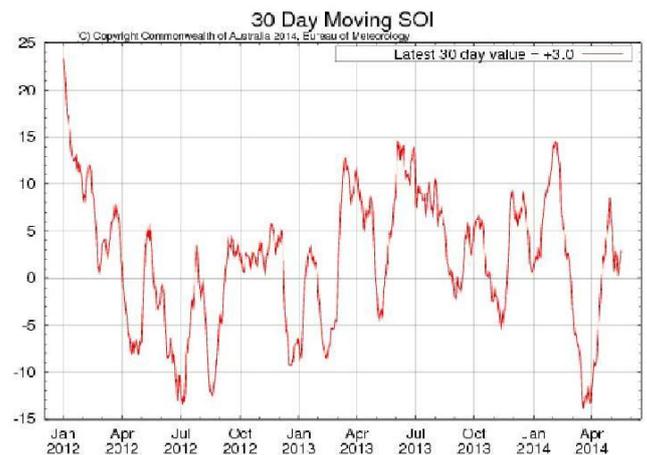
TAO Project Office/FME/NOAA

May 18 2014

Southern Oscillation Index

The Southern Oscillation Index (SOI) has remained within neutral values over the past two weeks. The latest approximate 30-day SOI value to 18 May is +3.0.

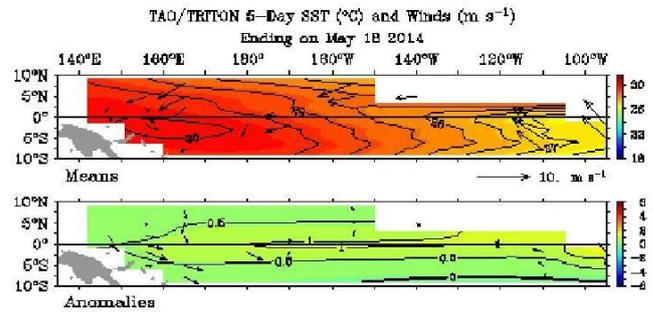
Sustained positive values of the SOI above +8 may indicate a La Niña event, while sustained negative values below -8 may indicate an El Niño event. Values of between about +8 and -8 generally indicate neutral conditions.



Trade winds

Westerly wind anomalies are present over the western equatorial Pacific, while trade winds are near-average along the equator in the central and eastern tropical Pacific (see anomaly map for the 5 days ending 18 May).

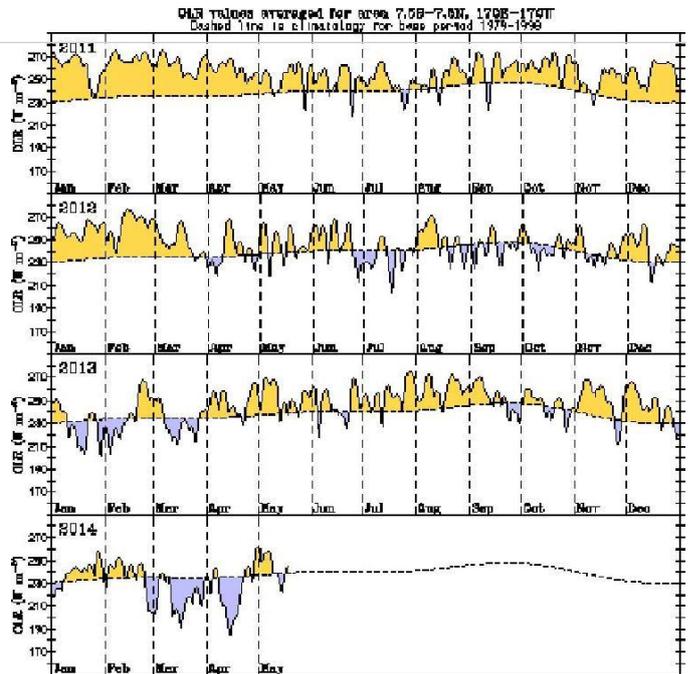
During La Niña events, there is a sustained strengthening of the trade winds across much of the tropical Pacific, while during El Niño events there is a sustained weakening of the trade winds.



Cloudiness near the Date Line

Cloudiness near the Date Line has continued to fluctuate around values close to the long-term average during 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.

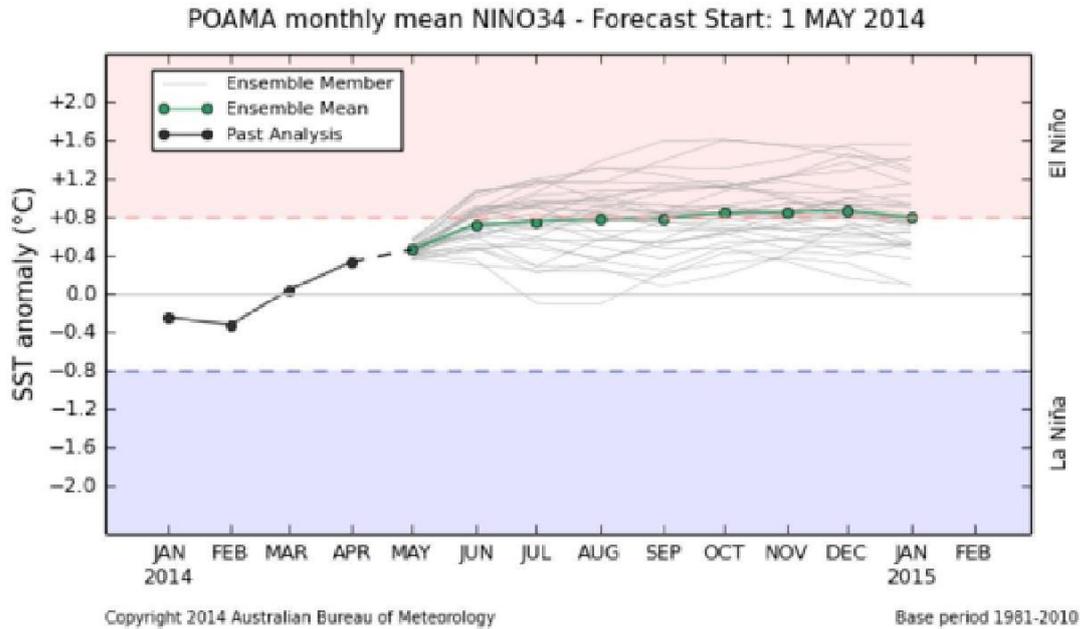




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Model outlooks

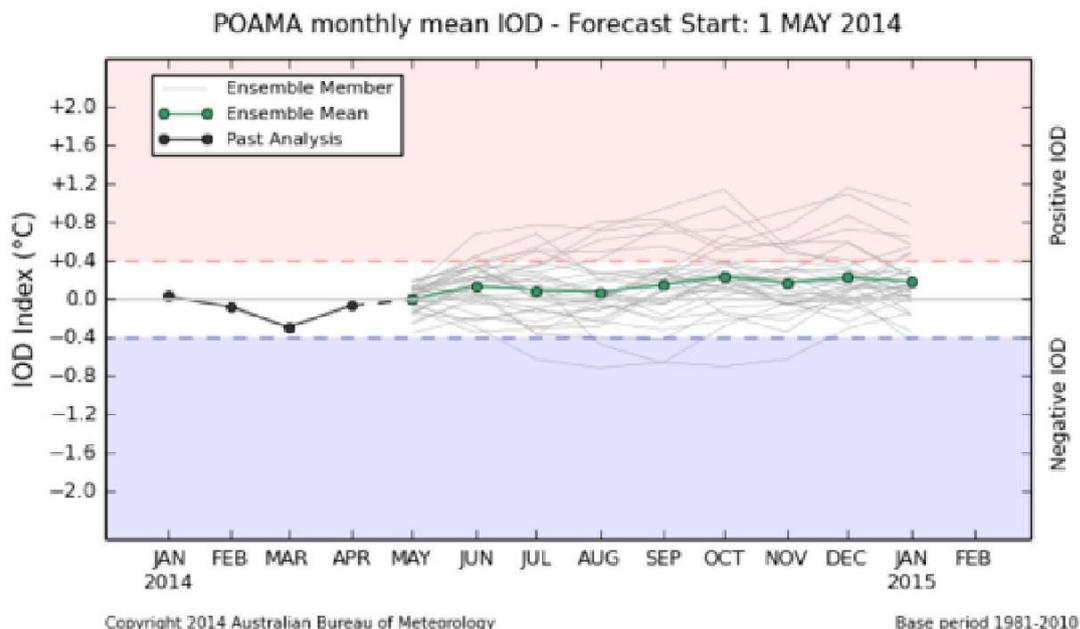
All international [climate models](#) surveyed by the Bureau indicate that SSTs in the equatorial Pacific Ocean are likely to continue to warm into winter. Despite two climate models easing their prediction slightly over the past month, all but one of the eight models surveyed indicate that the equatorial Pacific is likely to exceed El Niño thresholds during the southern hemisphere spring. Half of the models show SSTs in the central equatorial Pacific considerably warmer than the threshold values by mid-spring.



Indian Ocean Dipole

The Indian Ocean Dipole (IOD) remains neutral, with the latest weekly index value (18 May) 0.0 °C.

Climate models surveyed in the [model outlooks](#) favour neutral IOD values over the coming months, with a slight trend towards a positive IOD developing in 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.





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Effects on rainfall

- 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](#)

<http://www.bom.gov.au/climate/enso/tracker/#tabs=Summary>