



World Meteorological Organization

EL NIÑO/LA NIÑA UPDATE

Current Situation and Outlook

The strong 2015-16 El Niño ended in May 2016. Since then, the El Niño/Southern Oscillation (ENSO) indicators have remained at neutral levels. Climate models indicate that La Niña development is possible in the third quarter of 2016. If such an event does develop, current predictions indicate it is likely to be weak – for example, not nearly as strong as the most recent moderate/strong La Niña event of 2010-11. National Meteorological and Hydrological Services will continue to closely monitor changes in the state of ENSO over the coming months.

Ocean temperatures in the central and eastern tropical Pacific Ocean have been cooling since November 2015, reaching near-average values during June and July 2016. The most recent values of sea surface temperatures in the region are slightly below long-period average, ranging from -0.6° to 0° Celsius. Atmospheric indicators that had shown strong El Niño patterns early in 2016 returned to near-average in June and July. Such indicators include the sea level atmospheric pressure across the central and eastern Pacific Ocean, the low-level Pacific trade winds, and patterns of cloudiness and rainfall across the tropical Pacific Ocean.

Since April 2016, temperatures below the surface of the tropical Pacific near and to the east of the International Date Line have become below average, as cool waters at depth in the western and central equatorial Pacific Ocean have expanded eastward and towards the surface. Surface waters in the central Pacific currently remain near to slightly above average, while below-average sea temperatures exist at shallow depths, suggesting that the surface waters may cool further in the coming

months. Historically, La Niña has followed several – but not all – strong El Niño events, including the record El Niño of 1997-98.

Most dynamical and statistical prediction models surveyed predict 3-month average sea surface temperatures in the east-central tropical Pacific Ocean to cool further in the coming months, with many models predicting temperatures to be in the range of 0.3° to 0.8° Celsius below average during the overlapping three-month periods of July-September and August-October. More than half of the models predict east-central tropical Pacific Ocean temperatures to be 0.5° Celsius or more below average for the fourth quarter of 2016, indicative of weak La Niña conditions. Over the past month, a number of models have downgraded their outlook for La Niña, with the average predicted strength now only marginally exceeding thresholds, with sea surface temperatures ranging between 0.5° and 1.0° Celsius below average in the east-central tropical Pacific Ocean. However, a few models predict peak La Niña strength at more than 1.0° Celsius below average, while a few predict only cool-neutral conditions (weaker than 0.5° Celsius below average). This variation among the model predictions indicates some uncertainty about the occurrence and peak strength of any potential La Niña. Current estimations of probabilities for a La Niña event in 2016 range from 50 to 65%, with an average near 55-60%.

With below-average temperatures in the waters below the surface of the central and eastern tropical Pacific, and slightly below-average temperatures at the surface, La Niña growth depends on an increase in the strength of the trade winds, which so far have remained only near-average. Most prediction models indicate that some degree of strengthening trade winds may occur in the coming months. None of the models indicate more than a very small chance for a re-development of El Niño during 2016.

A careful watch will be maintained on the oceanic and atmospheric conditions in the tropical Pacific Ocean in the coming months to assess the possible transition to La Niña.

It is important to note that El Niño and La Niña are not the only factors that drive global climate patterns. Further, the strength of an El Niño event may not necessarily closely correspond to its climate impacts occurring in various regions of the world. At the regional level, seasonal outlooks need to assess the relative impacts of both the El Niño or La Niña state and other locally relevant climate drivers. For example, the sea surface temperature of the Indian Ocean, the southeastern Pacific Ocean and the

Tropical Atlantic Ocean are also known to influence the climate in the adjacent land areas. Regionally and locally applicable information is available via regional and national seasonal climate outlooks, such as those produced by WMO Regional Climate Centres (RCCs), Regional Climate Outlook Forums (RCOFs) and National Meteorological and Hydrological Services (NMHSs).

In summary:

- ENSO-neutral conditions have persisted since the end of the strong El Niño in May.
- The majority of the models surveyed and expert opinion suggest La Niña development is possible in the third quarter of 2016, with about a 50-65% probability, lasting through the remainder of 2016.
- The most likely strength of a La Niña, should it develop, is weak.
- There is virtually no chance of El Niño re-development in 2016.

The state of ENSO will continue to be carefully monitored. More detailed interpretations of regional climate variability will be generated routinely by the climate forecasting community over the coming months and will be made available through the National Meteorological and Hydrological Services. For web links of the National Meteorological Hydrological Services, please visit:

http://www.wmo.int/pages/members/members_en.html

For information and web links to WMO Regional Climate Centres please visit:

<http://www.wmo.int/pages/prog/wcp/wcasp/RCCs.html>

El Niño/La Niña Background

Climate Patterns in the Pacific

Research conducted over recent decades has shed considerable light on the important role played by interactions between the atmosphere and ocean in the tropical belt of the Pacific Ocean in altering global weather and climate patterns. During El Niño events, for example, sea temperatures at the surface in the central and eastern tropical Pacific Ocean become substantially warmer than normal. In contrast, during La Niña events, the sea surface temperatures in these regions become colder than normal. These temperature changes are strongly linked to major climate fluctuations around the globe and, once initiated such events can last for 12 months or more. The strong El Niño event of 1997-1998 was followed by a prolonged La Niña phase that extended from mid-1998 to early 2001. El Niño/La Niña events change the likelihood of particular climate patterns around the globe, but the outcomes of each event are never exactly the same. Furthermore, while there is generally a relationship between the global impacts of an El Niño/La Niña event and its intensity, there is always potential for an event to generate serious impacts in some regions irrespective of its intensity.

Forecasting and Monitoring the El Niño/La Niña Phenomenon

The forecasting of Pacific Ocean developments is undertaken in a number of ways. Complex dynamical models project the evolution of the tropical Pacific Ocean from its currently observed state. Statistical forecast models can also capture some of the precursors of such developments. Expert analysis of the current situation adds further value, especially in interpreting the implications of the evolving situation below the ocean surface. All forecast methods try to incorporate the effects of ocean-atmosphere interactions within the climate system.

The meteorological and oceanographic data that allow El Niño and La Niña episodes to be monitored and forecast are drawn from national and international observing systems. The exchange and processing of the data are carried out under programmes coordinated by the World Meteorological Organization (WMO).

WMO El Niño/La Niña Update

WMO El Niño/La Niña Update is prepared on a quasi-regular basis (approximately every in three months) through a collaborative effort between WMO and the International Research Institute for Climate and Society (IRI) as a contribution to the United Nations Inter-Agency Task Force on Natural Disaster Reduction. It is based on contributions from the leading centres around the world monitoring and predicting this phenomenon and expert consensus facilitated by WMO and IRI. For more information on the Update and related aspects, please visit:

http://www.wmo.int/pages/prog/wcp/wcasp/wcasp_home_en.html

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