



El Niño/La Niña Update

August 2019

Current Situation and Outlook

Sea surface temperatures in the tropical Pacific, which generally have been at borderline to weak El Niño levels since October 2018, returned to neutral levels in July. Atmospheric indicators also transitioned to neutral during recent months. WMO Global Producing Centers of Long Range Forecasts (GPCs-LRF) indicate that slightly above average sea surface temperatures are most likely for the rest of 2019 and into early 2020, but remaining within ENSO-neutral levels. Given current conditions and model outlooks, the chance of neutral conditions during September-November 2019 is estimated at about 60%, while chances for El Niño and La Niña are about 30% and 10%, respectively. Although neutral conditions are most likely through the December-February 2019-20 season, the chance for a return to El Niño rises slightly to 35%. National Meteorological and Hydrological Services will continue to closely monitor changes in the state of El Niño/Southern Oscillation (ENSO) over the coming months.

From October 2018 to June 2019, sea surface temperatures across the east-central tropical Pacific were at borderline to weak El Niño levels, and about half of the key atmospheric variables also exhibited El Niño-like patterns, some only intermittently. During July 2019, the tropical Pacific returned to a more clear-cut neutral ENSO state, ending the borderline to weak El Niño conditions that prevailed during 2018-19¹. This transition included a cooling of sea surface temperatures to below-average levels in the eastern tropical Pacific while maintaining above average in the central and west-central Pacific. The currently prevailing sea surface temperature pattern may also be considered to represent a central Pacific type of El Niño (also termed El Niño Modoki). The transition to neutral is also seen in the patterns of low-level winds, cloudiness and rainfall across the Pacific. For example, the enhanced rainfall, observed along the equator near the International Date Line during the first half of 2019, returned to average levels in July. The temperature of waters beneath the surface across the eastern tropical Pacific had already returned to average levels in May, after remaining mostly above average since April 2018.

Currently, the sea surface temperature in the east-central tropical Pacific is slightly above average but at an ENSO-neutral level, with more strongly above-average temperatures to the west and below-average temperatures to the east. Low-level winds across the basin are near-average, also cloudiness and rainfall patterns show a neutral pattern, though dry conditions continue over Indonesia (however, this is likely to be partly due to the influence of the ongoing positive Indian Ocean Dipole). Overall, the temperature of waters below the surface, extending to a depth of several hundred meters in the tropical Pacific, from the west-central Pacific eastward is near-average, with below-average sub-surface waters prevailing in the

¹ Due to differing criteria and thresholds, some forecasting centres considered the later part of this period to represent a weak El Niño event, while others considered it as only a warmish neutral period

eastern part of the basin and above-average sub-surface waters occupying the central portion. These oceanic patterns at deeper levels favour a continuation of ENSO-neutral sea surface temperatures, at least for the next two to three months.

About two-thirds of the models from WMO GPCs-LRF predict sea surface temperatures to continue at warm-neutral levels (anomalies between 0.1 and 0.5 degrees Celsius in the east-central tropical Pacific) through the September-November period, and just over half of them predict continuation of neutral conditions through December-February 2019-20. Among the relatively smaller number of models not predicting neutral ENSO, most indicate a redevelopment of weak El Niño, while very few indicate development of La Niña conditions. The percentage of models predicting a return to El Niño increases slightly, from 30% to 35%, between the September-November season and the following December-February season. Some models show that the tendency for eastward migration of the currently above-average surface and sub-surface waters in the central Pacific will be counteracted by the enhanced trade winds and near- or below-average water temperatures in the eastern Pacific, resulting in a continuation of just slightly above-average (and ENSO-neutral) waters in the east-central part of the basin that best represent the ENSO state. Toward the end of 2019 the chances for El Niño increase slightly with the further buildup of warmth in the central and west-central Pacific. The above scenario represents the average of the forecasts for the coming six months among the full set of models considered, and some amount of deviation from the average is seen in the individual model scenarios. Based on the model predictions and expert assessment, the probability for ENSO-neutral conditions to be maintained is estimated to be about 60% for the September-November season, with a probability of El Niño redevelopment at around 30%, and that for La Niña development at around 10%. For the December-February 2019-20 season, the probability for ENSO-neutral conditions is estimated to be around 55%, while that for El Niño development is around 35% and La Niña development remains near 10%.

It is important to note that El Niño and La Niña are not the only factors that drive global climate patterns, and that the strength of ENSO does not automatically correspond to the strength of its effects. At the regional level, seasonal outlooks need to assess the relative effects of both the ENSO state and other locally relevant climate drivers. For example, sea surface temperatures over 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:

- The borderline/weak El Niño conditions of 2018-19 have ended, and the tropical Pacific is currently ENSO-neutral.
- Model predictions and expert opinion indicate a 60% chance of ENSO-neutral conditions during September-November 2019, while the probability for El Niño is near 30%. For the December-February 2019-20 season, chances for neutral decrease to 55%, and the chance for El Niño increases slightly to 35%.
- Sea surface temperatures in the east-central Pacific Ocean are most likely to be within 0.1 to 0.5 degrees Celsius above average in the east-central tropical Pacific during the next six months.
- Over the course of the coming six months, there is a slight chance of 10% for the development of La Niña.

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 National Meteorological and Hydrological Services.

For web links of the National Meteorological Hydrological Services, please visit:

<https://public.wmo.int/en/about-us/members>

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

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

For information and web links to Regional Climate Outlook Forums (RCOFs) please visit:

<https://public.wmo.int/en/our-mandate/climate/regional-climate-outlook-products>

For the latest global seasonal forecast based on WMO Global Producing Centres of Long Range Forecasts, please visit:

<http://www.wmo.int/pages/prog/wcp/wcasp/LC-LRFMME/index.php>

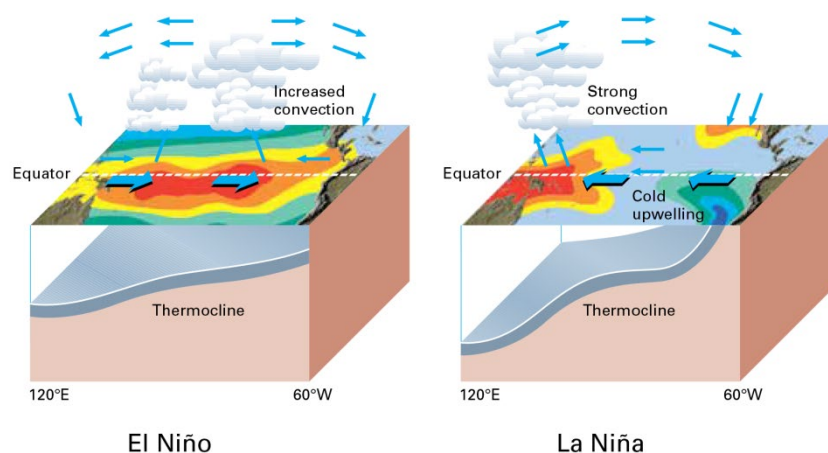
An archive of all WMO El Niño/La Niña Updates issued so far, including this one, is available at:

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

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El Niño/La Niña Background



Typical circulation patterns during El Niño/La Niña (Source: WMO, 2003, "Climate into the 21st Century").

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, sea surface temperatures 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 WMO.

WMO El Niño/La Niña Update

The WMO El Niño/La Niña Update is prepared on a quasi-regular basis (approximately every 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:
<https://public.wmo.int/en/our-mandate/climate/el-niñola-niña-update>