



# El Niño/La Niña Update

## September 2021

### Current Situation and Outlook

***Following the 2020-2021 La Niña event the Tropical Pacific has been ENSO-neutral according to both oceanic and atmospheric indicators since about May 2021. The latest forecasts from the WMO Global Producing Centres of Long-Range Forecasts suggest that either the cool side of ENSO-neutral conditions continue or that La Niña conditions return near the end of the year: with a 60% chance of ENSO-neutral and 40% for La Niña for September-November, and equal chances of ENSO-neutral and La-Nina re-emergence in October-December and November-January. The models favor ENSO-neutral again in 2022. National Meteorological and Hydrological Services will closely monitor changes in the state of El Niño/Southern Oscillation (ENSO) over the coming months and provide updated outlooks.***

A moderate-strength La Niña event took place from August 2020 through May 2021, according to both atmospheric and oceanic indicators. Since then, the La Niña conditions have abated and the tropical Pacific has been ENSO-neutral, though on its relatively cooler side. During late July/early August 2021, the sea surface temperatures were close to the La Niña threshold (0.5°C below normal), and recent weekly values suggest further cooling that could potentially result in the re-emergence of La Niña conditions. Sub-surface temperature anomalies are currently below average in the eastern Pacific, and they have supported the recent cooling seen at the surface. During July, the surface wind anomalies were easterly across much of the near-equatorial Pacific, though they are still relatively weak. Similarly, the upper-level westerlies strengthened during July and became more coherent. These circulation anomalies have also supported the recent cooling of equatorial Pacific sea surface temperatures.

The pattern of recent precipitation anomalies in the Pacific region is largely consistent with ENSO-neutral conditions. However, near the equator above-normal precipitation is found near Indonesia and below-normal in the western Pacific; a pattern that weakly resembles the rainfall response to a developing La Niña. The Southern Oscillation Index (represented by standardized Tahiti minus Darwin sea-level pressure difference) increased dramatically in late July/early August to levels consistent with La Niña. By late August, however, the Southern Oscillation Index has returned to the neutral range, though still on the high side of neutral. These ocean patterns and corresponding atmospheric anomalies suggest the possibility of a re-emergence of La Niña in the coming months.

Using the recent observations during July and August as the starting point for their climate models, the WMO Global Producing Centres of Long-Range Forecasts have produced global-scale forecasts for the coming months. The predictions for September-November 2021 indicate a 60% likelihood that ENSO-neutral conditions will continue, with the likelihood for La Niña at 40%; no model predicts development of El Niño conditions at this time. The range of possible central-eastern Pacific sea surface temperature anomalies predicted for September-November 2021 span the values of -1.0 to +0.0 degrees Celsius. In the October-December 2021 and November-January 2021/2022 seasons the models are split 50-50 between the likelihood of ENSO-neutral and La Niña conditions, and central-eastern Pacific sea surface temperature values are predicted to be within -1.1 to +0.1 degrees Celsius deviation from average. In December-February a slightly enhanced likelihood of La Niña conditions is predicted, shifting the odds to 60% for La Niña conditions, 30% for ENSO-neutral, and 10% for El Niño conditions.

It is important to note that El Niño and La Niña are not the only factors that drive global and regional climate patterns, and that the magnitudes of ENSO indicators do not directly correspond to the magnitudes of their effects. At the regional level, seasonal outlooks need to assess the relative effects of both the ENSO state and other locally relevant climate drivers. Regionally and locally applicable information is made 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 tropical Pacific has been ENSO-neutral since May 2021, based on both oceanic and atmospheric indicators.
- Model predictions and expert assessment favor the continuation of the cool side of ENSO-neutral through September-November 2021 with 60% likelihood, and 40% likelihood for the re-emergence of La Niña conditions. Those probabilities shift to 50%-50% for the October-December 2021 and November-January 2021/2022 seasons.
- In December-February 2021/2022, the odds shift to 60% for La Niña conditions, 30% for ENSO-neutral, and 10% for El Niño conditions.
- Sea surface temperatures in the eastern-central Pacific are predicted to be below-average to average during September-November 2021, in the range of -1.0 to +0.0 degrees Celsius. For October-December 2021, they are predicted to range from -1.1 to +0.1 degrees Celsius deviation from the average.

The state of ENSO will continue to be carefully monitored by WMO Members and partners. More detailed interpretations of the implications for regional climate variability will be carried out 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:

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

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

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

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 Climate Update (GSCU) based on WMO Global Producing Centres of Long-Range Forecasts, please visit:

<https://www.wmolc.org/gscuBoard/list>

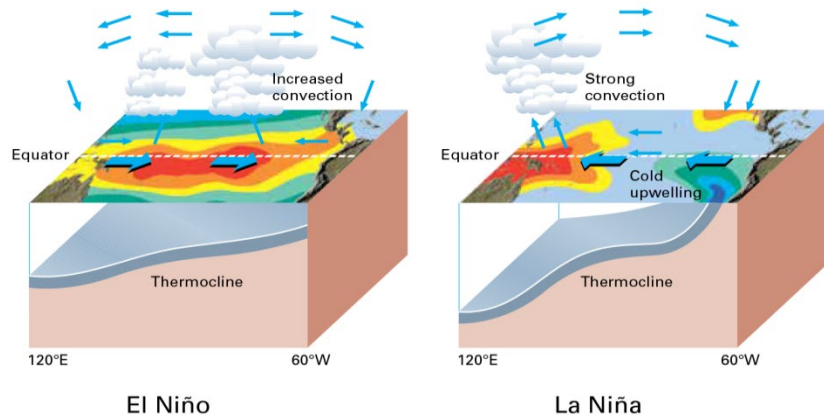
An archive of all WMO El Niño/La Niña Updates issued so far, including this one, is available at:

<https://community.wmo.int/activity-areas/climate/wmo-el-ninola-nina-updates>

## Acknowledgements

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## El Niño/La Niña Background



Typical circulation patterns during El Niño/La Niña (Source: WMO, 2003, "Climate into the 21<sup>st</sup> 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>