WEATHER CLIMATE WATER

WORLD
METEOROLOGICAL
ORGANIZATION

El Niño/La Niña Update

November 2019

Current Situation and Outlook

Sea surface temperatures in the tropical Pacific have been neutral with respect to the El Niño-Southern Oscillation (signifying that neither El Niño nor La Niña have prevailed) since July 2019. During October and early November, sea surface temperatures warmed to near El Niño levels, but most tropical Pacific atmospheric indicators have remained neutral. WMO Global Producing Centres of Long-range Forecasts (GPCs-LRF) indicate that sea surface temperatures are most likely to return to near-average levels after November and remain at ENSO-neutral levels into the first half of 2020. Given current conditions and model outlooks, the chance of ENSO-neutral conditions prevailing during the period December 2019 through February 2020 is estimated at about 65%, while the chances for El Niño and La Niña are 30% and 5%, respectively. Considering the increased uncertainty in long-range forecasts during the coming seasons, National Meteorological and Hydrological Services will continue to closely monitor changes in the state of El Niño/Southern Oscillation (ENSO) over the coming months.

Since July 2019, tropical Pacific sea surface temperatures have remained, for the most part, ENSO-neutral (i.e., neither El Niño nor La Niña conditions were considered to have occurred). ENSO-neutral conditions have also been observed in atmospheric indicators such as the patterns of low-level winds, and the patterns of cloudiness and rainfall across the tropical Pacific. October 2019 saw a weakening of trade winds and an increase in sea surface temperatures towards El Niño thresholds, but these excursions from average levels are considered to be related to sub-seasonal variability rather than a sustained change that can be attributed to a more slowly evolving underlying ENSO condition. Sub-surface water temperatures in the eastern tropical Pacific, near average over the past few months, have temporarily warmed during October in association with the above-mentioned warming of surface waters. These sub-surface water temperatures dropped to average levels again in mid-November.

Sea surface temperatures in the east-central tropical Pacific Ocean are still slightly above average but remain within the range of ENSO-neutral conditions, with temperatures in the western tropical Pacific being even more above average. Low-level and upper level winds across the basin are near-average, and cloudiness and rainfall patterns show a neutral ENSO pattern with less cloudiness and rainfall near the International Date Line and over Indonesia. This continuing dryness over Indonesia is most probably related to an ongoing positive Indian Ocean Dipole. Overall, considering the temperature of waters at and below the surface, and the patterns of winds and cloudiness across the tropical Pacific, an ENSO-neutral state is likely to continue for at least the next two months.

Approximately three-quarters of the models from WMO GPCs-LRF predict that sea surface temperatures will continue at neutral to slightly warm levels (ranging from 0.1 degrees Celsius below average to 0.5 degrees Celsius above average in the east-central tropical Pacific) for the December-February period, and about two-thirds of the models predict a continuation of neutral conditions through March-May 2020 (sea surface temperatures ranging from 0.3 degrees Celsius below average to 0.5 degrees Celsius above average). For the models not predicting neutral ENSO, most indicate weak El Niño conditions rather than weak La Niña conditions, particularly for the nearer-term months of December through February. Based on the model predictions and the experts' assessments, the likelihood of ENSO-neutral conditions prevailing is

estimated to be about 65% for the December-February 2019-20 season, with the probability of an El Niño development at 30%, and that of a La Niña development near 5%. For the March-May 2020 season, the likelihood of maintaining ENSO-neutral drops slightly to near 60%, while that for El Niño development is 25% and La Niña development is 15%. These longer-range forecasts are more uncertain when one takes the approaching boreal spring season into account, the so-called "spring predictability barrier", past which skilful predictions become more difficult, causing the forecast probabilities to show less confidence.

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. On a 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 south-eastern Pacific Ocean and the tropical Atlantic Ocean also influence the climate in adjacent land areas. In particular, the ongoing positive Indian Ocean Dipole may continue to have regional impacts. 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).
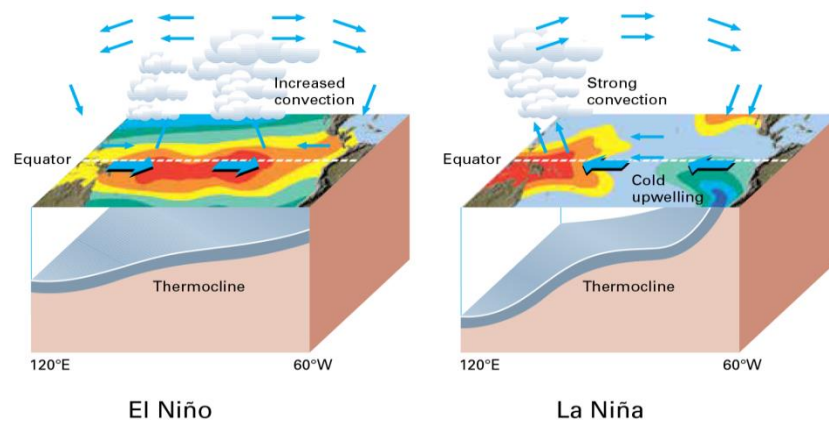
In summary:

- Since July 2019, the tropical Pacific has been in an ENSO-neutral state. During October and early November, a temporary warming of the waters occurred. This is being attributed to sub-seasonal variability and not the onset of an El Niño.

- Model predictions and expert opinion indicate a 65% chance of ENSO-neutral conditions continuing during December-February 2019-20, while the probability for El Niño is near 30%. For the March-May 2020 season, the chance for ENSO-neutral is 60%, El Niño is 25% and La Niña is 15%.

- Sea surface temperature anomalies in the east-central Pacific Ocean are most likely to be in the range from 0.1 degrees Celsius below average to 0.5 degrees Celsius above average during December-February 2019-20.

- 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

Acknowledgements

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, 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 the middle of 1998 to early 2001. El Niño/La Niña events change the likelihood of various climate patterns around the globe, but the outcomes of each event are never 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 done in several 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 situation evolving 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 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 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