



El Niño/La Niña Update

September 2018

Current Situation and Outlook

Sea surface temperatures in the east-central tropical Pacific as well as most of the overlying atmospheric indicators show that ENSO-neutral conditions (neither El Niño nor La Niña) continue to prevail. However, most dynamical and statistical forecast models suggest an imminent warming of the tropical Pacific, reaching a weak El Niño level by the fourth quarter of the year. The chance of El Niño is about 70%, with uncertain strength, as model predictions range from ENSO-neutral to a moderate strength El Niño. National Meteorological and Hydrological Services will continue to closely monitor changes in the state of ENSO over the coming months.

Since April 2018, sea surface temperatures across the east-central tropical Pacific have been at neutral levels, and the atmospheric indicators of the ENSO state have also suggested mainly neutral conditions. For example, upper level winds, cloudiness patterns and sea level pressure patterns continue to reflect neutral conditions. During the last several weeks, however, low-level winds in the west tropical Pacific Ocean have been anomalously westerly, which is an indicator of the possible coming onset of El Niño conditions.

The temperature of the waters at depth, from the central Pacific eastward and extending several hundred meters below the surface, have been moderately above average since April 2018. The waters at depth often provide an indication of the coming ENSO conditions at the surface, and suggest that the currently neutral sea surface temperatures may warm during September and into the fourth quarter of 2018, possibly reaching El Niño levels by the fourth quarter. The above-average water below the surface already extends to the surface in parts of the east-central tropical Pacific, causing warming of the sea surface, although not yet sufficiently to reach the El Niño threshold.

About three-quarters of the models surveyed predict that sea surface temperatures in the east-central tropical Pacific Ocean will warm to weak El Niño levels beginning late in the third or the fourth quarter of 2018. The time frame of this warming includes the immediate upcoming period of September-November. There is some uncertainty in these model predictions, as indicated by the forecasts ranging from a lack of an El Niño to a moderately strong El Niño event. The average prediction is for sea surface temperatures in the east-central tropical Pacific to warm to approximately 0.6 to 1.2 degrees Celsius above average during the period November 2018 through January 2019. Based on the model predictions and expert assessment, the probability for the development of El Niño is considered to be about 70% for September through the end of 2018 and into early 2019. This probability implies that El Niño development is more than twice as

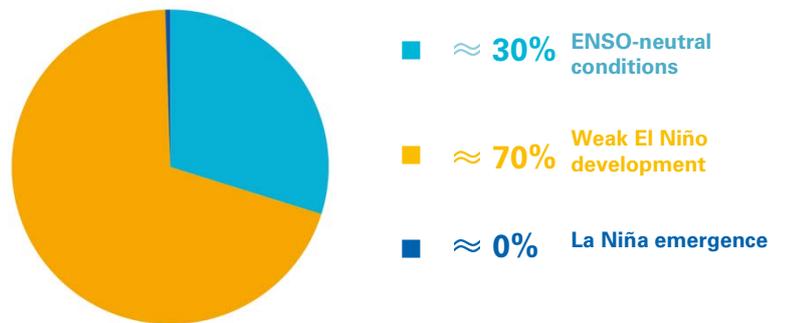
likely as a continuation of neutral conditions through the end of this period. If El Niño does emerge, its strength is currently uncertain but a strong event appears unlikely.

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 take into account the relative effects of both the El Niño/Southern Oscillation state and other locally relevant climate drivers. For example, sea surface temperatures 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

- Conditions in the ocean and atmosphere in the tropical Pacific have remained neutral since April 2018;
- Model predictions and expert opinion indicate that El Niño/Southern Oscillation conditions are about 70% likely to reach weak El Niño levels by the fourth quarter of 2018 and into the Northern Hemisphere winter 2018-19;
- While predictions of El Niño and La Niña have relatively high confidence at this time of the year, some uncertainty is reflected by the broad range of model forecasts currently available, which generally indicate the sea surface temperatures to be 0.6 to 1.2 degrees Celsius above average in the east-central tropical Pacific during the period of November 2018 through January 2019. A strong El Niño event appears unlikely.
- Through Northern Hemisphere winter 2018-19, the development of La Niña can be practically ruled out.

ESTIMATED PROBABILITIES
FOR THE FORTH QUARTER OF 2018



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>

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

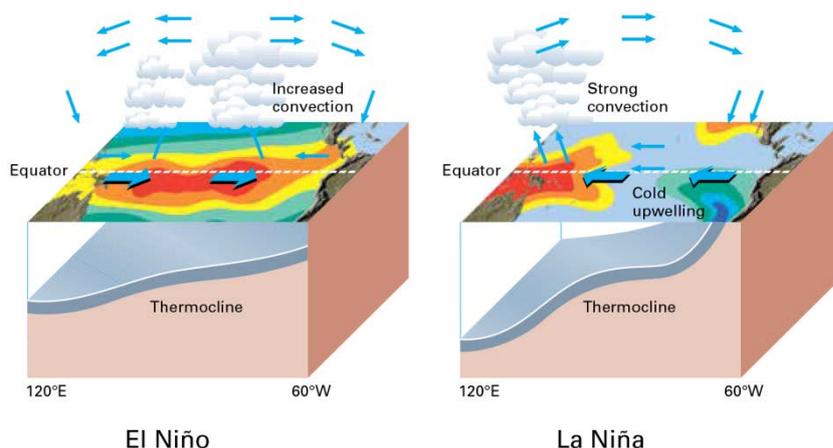
Multi-model ensemble long-range predictions of global precipitation and surface temperature patterns, based on WMO Global Producing Centres of Long Range Forecasts, are available at this link for the season September through November 2018:

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

Acknowledgements

The WMO El Niño/La Niña Update is prepared through a collaborative effort between the WMO and the International Research Institute for Climate and Society (IRI), USA, and is based on contributions from experts worldwide, inter alia, of the following institutions: African Centre of Meteorological Applications for Development (ACMAD), Armenian State Hydrometeorological and Monitoring Service (ARMSTATEHYDROMET), Asia-Pacific Economic Cooperation (APEC) Climate Centre (APCC), Australian Bureau of Meteorology (BoM), Australian Centre for Sustainable Catchments of the University of Southern Queensland, Badan Meteorologi Klimatologi dan Geofisika (BMKG) – the Meteorological, Climatological and Geophysical Agency of Indonesia, Centro Internacional para la Investigación del Fenómeno El Niño (CIIFEN), China Meteorological Administration (CMA), Climate Prediction Center (CPC) and Pacific ENSO Applications Centre (PEAC) of the National Oceanic and Atmospheric Administration (NOAA) of the United States of America (USA), Climate Variability and Predictability (CLIVAR) project of the World Climate Research Programme (WCRP), Comisión Permanente del Pacífico Sur (CPPS), El Comité Multisectorial Encargado del Estudio Nacional del Fenómeno El Niño (ENFEN) of Peru, European Centre for Medium Range Weather Forecasts (ECMWF), Météo-France, Fiji Meteorological Service, IGAD (Inter-Governmental Authority on Development) Climate Prediction and Applications Centre (ICPAC), Instituto Nacional de Meteorología e Hidrología (INAMHI) of Ecuador, the IRI, Japan Meteorological Agency (JMA), Korea Meteorological Administration (KMA), Mauritius Meteorological Services (MMS), Met Office in the United Kingdom (UKMO), National Center for Atmospheric Research (NCAR) of the USA, Southern African Development Community Climate Services Centre (SADC-CSC), Tasmanian Institute of Agriculture, Australia, and the University of Colorado, USA.

El Niño/La Niña Background



Typical circulation patterns during El Niño/La Niña (Source: WMO, El Niño/Southern Oscillation)

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 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:
www.wmo.int/pages/prog/wcp/wcasp/enso_update_latest.html