



# El Niño/La Niña Update

February 2019

## Current Situation and Outlook

**Sea surface temperatures in the east-central tropical Pacific were at or slightly below El Niño thresholds in January and February 2019, after maintaining weak El Niño levels during the last quarter of 2018. However, very few atmospheric indicators responded to the warmer than average sea surface temperatures until late January and February, when some finally reached weak El Niño levels in the central Pacific. Around two thirds of the models from WMO Global Producing Centres of Long Range Forecasts predict ocean temperatures to again reach weak El Niño levels during the second quarter of 2019. Given current conditions and model outlooks, the chance of an El Niño event to occur during March–May 2019 is estimated to be about 50–60%. The chance for a strong El Niño is low. The outlook for the second half of 2019 is currently uncertain. National Meteorological and Hydrological Services will continue to closely monitor changes in the state of ENSO over the coming months.**

From October to December 2018, sea surface temperatures across the east-central tropical Pacific were at weak El Niño levels. However, the atmosphere failed to respond to these warmer-than average sea surface temperatures, indicating a lack of the coupling of ocean and atmosphere needed to reinforce an El Niño event and to trigger the atmospheric circulation changes and climate impacts away from the tropics. Subsequently, sea surface temperatures cooled to slightly below El Niño thresholds during late January up to mid-February 2019. However, during February the atmosphere began to show some El Niño-like patterns, including weakened trade winds in the western and central tropical Pacific and above-average cloudiness and rainfall near the International Date Line. This could mean that coupling of the atmosphere to the warmed sea surface temperatures has commenced, increasing the chances of a weak El Niño being maintained in the coming few months.

The temperature of waters below the surface of the tropical Pacific, from the west-central Pacific eastward and extending to several to hundred meters below the surface, has been above average during most of 2018, continuing through to the present. This deeper warm water, which has extended to the surface at times, is a typical pre-cursor for El Niño events. Thus, the currently observed borderline El Niño-level sea surface temperatures are likely to continue, and may strengthen to weak El Niño levels during March and April.

Consistent with the likelihood of a return of the sea surface temperatures to weak El Niño levels, around two thirds of the model forecasts from WMO Global Producing Centres of Long Range Forecasts suggest that the recent coupling of the atmosphere to the ocean may sustain a weak El Niño into the second quarter of 2019. Model predictions of the strength of the El Niño, as characterized by the departures of sea surface temperatures in the east-central tropical Pacific, range from approximately 0.6 to 0.9 degrees Celsius above average during March-May. Based on the model predictions and expert assessment, the

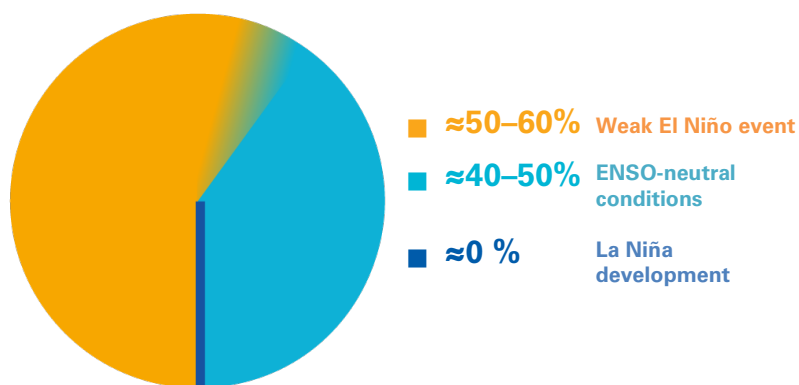
probability for an El Niño condition to occur is estimated at about 50–60% for March–May, and about 40–50% for June–August 2019. However, outlooks made at this time of the year are particularly uncertain beyond the second quarter and should be considered with caution. Even if ocean conditions do remain at El Niño levels for the next several months, the chance for a strong event (sea surface temperatures in the east-central tropical Pacific rising to at least 1.5 degrees Celsius above average) during this period is low.

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 El Niño/Southern Oscillation (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 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:

- Sea surface temperatures in the tropical Pacific Ocean were at or just below El Niño levels (depending on the thresholds applied) in January and early February 2019. Some El Niño-like atmospheric patterns also emerged around late January.
- Model predictions and expert opinion indicate a 50–60% chance that the ocean and atmosphere will couple, and a weak El Niño event will become established during the March–May 2019 season. While odds for El Niño drop below 50% for the following season of June–August, long-lead outlooks made at this time of year are particularly uncertain beyond the second quarter and should be considered with additional caution.
- Sea surface temperatures are expected to be about 0.6 to 0.9 degrees Celsius above average in the east-central tropical Pacific during the March–May 2019 season. A strong El Niño event appears unlikely.
- Through the first three quarters of 2019, the development of La Niña is highly unlikely and can be practically ruled out.

### ESTIMATED PROBABILITIES FOR MARCH–MAY 2019



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

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

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

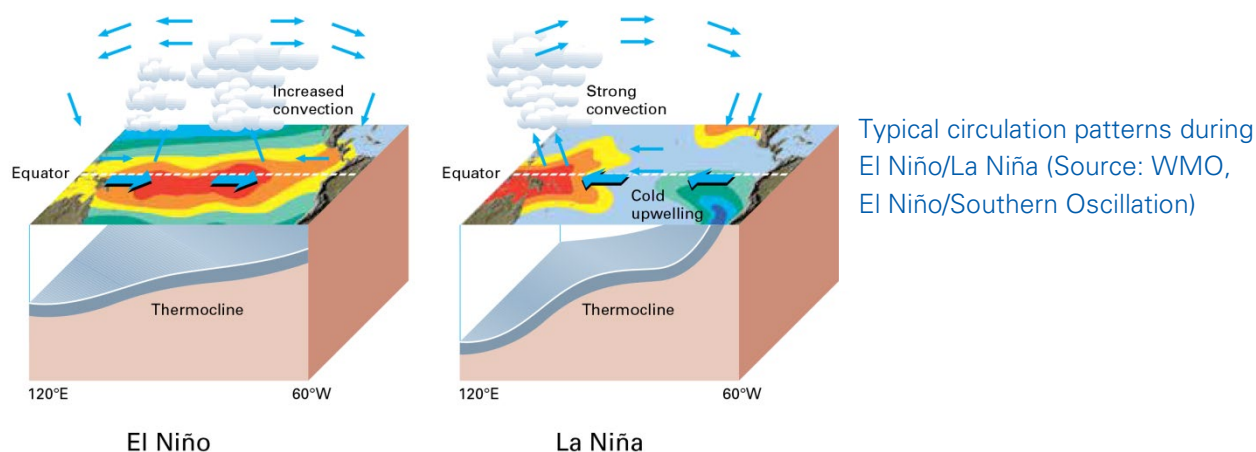
Multi-model ensemble long-range predictions of global precipitation and surface temperature patterns, based on WMO Global Producing Centres of Long Range Forecasts, are available at this link for the season March–May 2019:

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

## Acknowledgements

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## 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 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>