Current Situation and Outlook

The first "triple dip" La Niña of the 21st century, which began in September 2020 with a brief break in the boreal summer of 2021, is gradually weakening. WMO Global Producing Centres of Long-Range Forecasts predict that there is a 90% chance for a transition to ENSO-neutral during March-May 2023, while there is a small chance of about 10% for La Niña to continue further. ENSO-neutral conditions are likely to persist thereafter, with the chances progressively decreasing to about 80% in April-June, and 60% in May-July. The chances of El Niño developing gradually increase from 15% in April-June, to 35% in May-July, reaching significantly higher chances of around 55% during June-August. Due to the low performance of seasonal forecast models at this time of year, commonly known as the Northern Hemisphere "spring predictability barrier", it is critical to interpret long-range ENSO forecasts with caution. National Meteorological and Hydrological Services (NMHSs) will closely monitor changes in the state of ENSO over the coming months and provide updated outlooks, as needed.

As of mid-February 2023, La Niña conditions continued to prevail in the tropical Pacific. However, sea surface temperatures and other atmospheric and oceanic indicators in the tropical Pacific are now consistent with a weakening La Niña. In the atmosphere, convective activity over the equatorial Pacific near the date line continues to be below normal. The Southern Oscillation Index (SOI: defined by the standardized Tahiti minus Darwin sea-level pressure difference), which had shown a significant decrease in January 2023, is still positive and consistent with La Niña. Easterly winds in the lower troposphere (i.e., trade winds) over the western equatorial Pacific remain stronger than normal, while being near normal in the eastern Pacific. Upper-level (200-hPa)

westerly winds anomalies are observed across the central and east-central equatorial Pacific. The positive sub-surface temperatures have expanded eastward (up to 130°W), though remaining mostly at deeper levels (100 to 250 meters), except near the surface in the eastern Pacific Ocean (100°W to 80°W). Cold sub-surface temperature anomalies have weakened and are located mostly from 120°W to 80°W at depths of around 50 to 100 meters; however, weak negative anomalies continue to prevail near the surface in the central and western equatorial Pacific Ocean. Overall, the observed oceanic and most atmospheric conditions indicate a gradually weakening La Niña in the Pacific.

Using the recent observations as the starting point for their dynamical seasonal prediction systems, the WMO Global Producing Centres of Long-Range Forecasts routinely issue global-scale climate forecasts for the coming months. Their latest forecasts and expert assessment indicate that there is a high probability for the sea surface temperature anomalies in the central and eastern equatorial Pacific to weaken further and to reach and remain in ENSO-neutral conditions during the next three overlapping seasons: March-May (90% chance), April-June (80% chance), and May-July (60% chance). There is a very low (10%) probability of La Niña continuing in March-May 2023, which further decreases to around 5% during rest of the forecast period. The likelihood of El Niño developing gradually increases from 15% in April-June to 35% during May-July. A transition from ENSO-neutral to El Niño, is suggested by the models during June-August with around 55% chance, although it should be pointed out that uncertainty in the long-lead forecasts is usually greater when predictions go through spring. This tendency, referred to as the 'spring predictability barrier', reflects the somewhat lower skill in predicting the ENSO phase transitions that often occur at this time of year.

It is important to note that El Niño and La Niña are not the only factors that drive global and regional climate patterns, and further 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 multi-year La Niña conditions, which began in September 2020 with a brief break in the boreal summer of 2021, are now gradually weakening. This is the first "triple dip" La Niña of the 21st century.
- Model predictions and expert assessment indicate a high probability of return to ENSO-neutral conditions during March-May (90% chance), persisting through April-June (80% chance) and May-July (60% chance).
- The decreasing probabilities for ENSO-neutral conditions toward May-July can be seen as a potential precursor for El Niño to develop, the chances for which at this time are about 15% in April-June and 35% in May-July.
- Long-lead forecasts for June-August indicate a much higher chance (55%) of El Niño developing but are subject to high uncertainty associated with predictions this time of the year (the so-called spring predictability barrier).
- The probability of La Niña continuing during March-May 2023 is 10%, which further decreases to 5% for the remainder of the forecast period.

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

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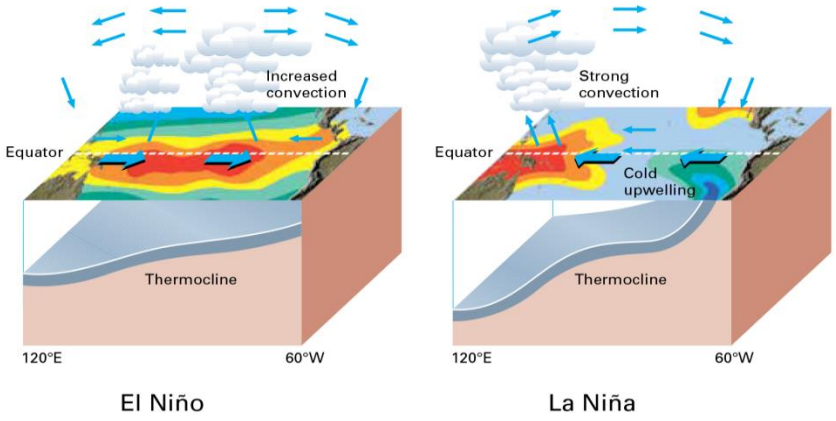
El Niño/La Niña Background



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