



World Meteorological Organization

# EL NIÑO/LA NIÑA UPDATE

## Current Situation and Outlook

***Neutral conditions have prevailed over the tropical Pacific, following the dissipation of the 2010-11 La Niña event by early May 2011. However, a few weak remnants of La Niña have persisted, particularly in some atmospheric features, and in recent weeks the surface as well as sub-surface waters in the eastern and central tropical Pacific Ocean have also cooled. Model forecasts and expert interpretation suggest persistence of near-neutral conditions or the re-emergence of La Niña conditions as the possible scenarios for the remainder of 2011. If a La Niña event does indeed occur, current indications are that it would be considerably weaker than the 2010-11 La Niña event. Development of El Niño, however, is considered very unlikely. National Meteorological and Hydrological Services will continue to monitor Pacific Ocean conditions closely over the coming months to assess the likelihood of any re-emergence of La Niña conditions.***

A La Niña event of moderate to strong intensity dominated in the central equatorial Pacific during the period of September 2010 to February 2011. Between February and April 2011 a gradual weakening of the oceanic aspects of the La Niña event occurred. Since May 2011 the ocean and atmosphere have been in a neutral state, though some La Niña features persisted in the tropical Pacific atmospheric circulation – particularly, enhanced upper level westerly wind anomalies. From about March to July 2011, tropical Pacific subsurface heat content became slightly warmer than normal, with implications for a possible transition to warm-neutral or even weak El Niño conditions for the remainder of the year. However, this positive heat content anomaly has now ended and reversed to slightly cooler than normal heat content for this time of the year. A pocket of moderate negative sea temperature anomaly has now re-developed at deeper levels in the east-central tropical Pacific, associated with a decrease in the thermocline depth. Sea surface temperatures in the east-central tropical Pacific returned to near-average during June and early July, but in the last several weeks have cooled to slightly below average levels, and are now near the borderline of ENSO-neutral and weak La Niña.

Although the period of April-June is historically favoured for transitions and development of new El Niño and La Niña events, new events can also develop during the third quarter of the year. Presently, rapid development of such an event appears unlikely. However, observations during the recent weeks have drifted toward the cool side of neutral in terms of atmospheric circulation, sea surface temperature, and subsurface ocean temperature. Together, these changes indicate a shift in the odds of weak La Niña forming during the forthcoming months. Overall, the complete set of forecast models indicates a range of possible outcomes for the remainder of 2011. Their consensus continues to favour near-

neutral conditions, but only by a small margin over weak La Niña conditions. Given the current uncertainty, close monitoring is required for any firmer signs of possible future developments.

It is always important to recognize that other factors influence seasonal climatic patterns in addition to El Niño and La Niña. There is a need for detailed regional evaluations of prevailing conditions, combining expected El Niño/La Niña influences with influences from other geographic regions as well, to arrive at the best estimates of the weather patterns to expect regionally and locally over the coming months. One noteworthy aspect is the current warmer than normal sea surface temperatures in the western equatorial Indian Ocean. This requires careful monitoring, along with conditions in the tropical eastern Indian Ocean, as these can strongly influence surrounding continental climate patterns. Locally applicable information should therefore be consulted in detailed regional/national seasonal climate outlooks, such as those produced by Regional Climate Outlook Forums (RCOFs) and National Meteorological and Hydrological Services (NMHSs).

In summary:

- A moderate to strong La Niña event ended in the middle of the second quarter of 2011;
- Neutral conditions have prevailed from May to August, although a few weak remnants of La Niña features continued in the tropical Pacific atmospheric circulation;
- During the most recent several weeks, some cooling has been observed in the tropical Pacific sea surface temperature and in the eastern Pacific subsurface sea temperature which, along with the associated atmospheric circulation patterns, indicate signs of a possible return to weak La Niña conditions;
- Persistence of near-neutral conditions or the re-emergence of weak La Niña conditions are considered to be the possible scenarios for the remainder of 2011; development of El Niño is considered very unlikely.

The situation in the tropical Pacific will continue to be carefully monitored. More detailed interpretations of regional climate fluctuations 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 Services, please visit:

[http://www.wmo.int/pages/members/members\\_en.html](http://www.wmo.int/pages/members/members_en.html).

## ***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 higher than normal. In contrast, during La Niña events, the sea surface temperatures in these regions become lower 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 World Meteorological Organization.

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