



World Meteorological Organization

# EL NIÑO/LA NIÑA UPDATE

## Current Situation and Outlook

***La Niña conditions continued across most of the tropical Pacific into early May 2011. After peaking in strength around January 2011, the oceanic components of the episode weakened considerably, with a warming of the equatorial Pacific Ocean during March and April, approaching neutral conditions by mid-May. Despite this warming, the atmospheric indicators remained at near record La Niña levels during April, weakening only in early May, suggesting that some La Niña impacts may continue into June. This time of the year is known to be particularly marked by low forecast skill, but neutral conditions are considered the most likely scenario for at least the season ahead. Development of El Niño or re-development of La Niña is not considered likely for the middle part of the year. Further developments during May and June are expected to enable a clearer outlook for the second half of the year.***

The 2010/11 La Niña episode began in mid-July 2010, and has still not completely dissipated as of mid-May 2011. Sea surface temperatures in the central equatorial Pacific were about 1.5 degrees Celsius colder than average over the period September 2010 to early March 2011, indicating a moderately strong La Niña event. However, the atmospheric aspects of the event have shown this episode to be one of the strongest of the last century. Typically during La Niña events, cool sea surface temperatures extended across the eastern Equatorial Pacific to the South American coastline. This time, from about February to the present, sea surface temperatures close to the South American coastline became near to above average, ending the La Niña climate effects in the surrounding region. However, the large area of cool surface waters over the bulk of the central and eastern equatorial Pacific, combined with warm conditions in the equatorial western Pacific, represented a strong La Niña forcing on the global atmosphere, with many climate patterns approximately matching those typically associated with La Niña events during these months, both in the vicinity of, and remote from, the tropical Pacific. The atmospheric aspects of this La Niña, such as enhanced trade winds in the western and central part of the Pacific basin and the Southern Oscillation Index, were near record levels from September 2010 through the end of April 2011, and have only very recently begun weakening substantially. In association with these atmospheric conditions, disastrously wet conditions were experienced in parts of northern and eastern Australia, Indonesia, Southeast Asia, and portions of northern South America (e.g., Colombia) in late 2010 and/or early 2011.

Between February and April 2011 a gradual weakening of the oceanic aspects of the La Niña event occurred. The areal extent of cool surface water contracted with waters below 1 degree Celsius of the long-term average confined mainly to the central equatorial Pacific. During April and early May the event has appeared to be in a holding pattern, with SSTs remaining slightly cooler than one-half degree below average in the central Pacific. The consensus from prediction models and expert interpretation is that near-neutral conditions are the most likely pattern for mid-year or shortly thereafter. However, climate conditions over the next 1 to 2 months may continue to be La Nina-like for some regions, because the atmospheric aspects of the event may decay more slowly than the cool tropical Pacific waters, particularly for this La Niña in which the atmospheric indicators have maintained considerably greater strength than the oceanic ones. Therefore, users should consult detailed seasonal forecasts for regions of interest with this possible lagging of the climate effects in mind.

The March-June period is historically favoured for dissipation of existing El Niño and La Niña events, or development of new El Niño and La Niña events. Rapid development of a new event now appears unlikely through to the middle part of 2011. Events can also develop during the second half of the year, and forecasters are assessing the likelihood of such developments during the second half of 2011. The pattern of above average sea temperatures below the surface in the tropical Pacific suggests a possibility for El Niño development. However, the lingering atmospheric signature of the existing La Niña could, through atmosphere-ocean coupling processes, counter the effects of the subsurface oceanic conditions, and even lead to a return to La Niña conditions later in the year. Both of these scenarios need to be carefully monitored over the coming months before a more concrete risk assessment will become possible. Overall, forecast models indicate a range of possible outcomes for the second half of 2011, generally favouring near-neutral conditions, but not ruling out the presence of either El Niño or La Niña, suggesting the ocean-atmosphere system is free to evolve in any of several directions at this time of the year. In such a situation, the most likely outcome for the second half of 2011 is viewed to be near-neutral, but with close monitoring required for any more definite signs of future developments.

It is important to recognize that other factors influence seasonal climatic patterns in addition to El Niño and La Niña. There is need for detailed regional evaluations of prevailing conditions, combining expected El Niño/La Niña influences with influences from other geographic regions, to arrive at the best estimates of the weather patterns to expect regionally and locally over the coming months. 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 La Niña event of moderately strong intensity continued through the first quarter of 2011 in the oceans, and very strong intensity in the atmosphere.
- The La Niña event has been weakening in the oceans since about February, but is only now in the process of ending in mid-May. The atmospheric aspects of the event remained very strong through the end of April, and only now are finally weakening.
- Near-neutral conditions are considered the most likely outcome for mid-year 2011.

- In considering expected climate over coming months, it is important to recognize that atmospheric patterns typical of La Niña may in some regions continue for a couple of months after the decay of the cool waters in the tropical Pacific. Detailed seasonal forecasts should be consulted with these possible residual climate effects in mind.
- Looking ahead beyond mid-year 2011, there are currently no clear indications for enhanced risk of El Niño or La Niña in the second half of 2011. The ocean-atmosphere system is quite sensitive and flexible at this time of year. Monitoring for another 1 to 2 months is required to more firmly establish the direction of evolution of the system. Accordingly, near-neutral conditions are currently considered the most likely outcome for the second half of 2011.

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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