
World Meteorological Organization



EL NIÑO UPDATE

El Niño Update

Current Situation and Outlook

Sea-surface temperatures (SSTs) across a large area of the central equatorial Pacific were up to 1°C warmer than normal through the latter part of 2004 and into early 2005. Expert interpretation of recent tendencies in SSTs and model projections, however, suggest that the current situation is predominantly neutral. Although rapid development over the next few months towards El Niño or La Niña conditions is not likely, this is the time of year when rapid developments can and do occur. Some computer models are suggesting an elevated possibility of El Niño development, while a smaller set of models points to the possibility of La Niña development. Thus, compared to the last update in August 2004, when warming was considered likely for the remainder of 2004, evolution of the current situation is less certain. Careful monitoring and frequent updating of conditions are therefore warranted.

During the latter part of 2004 and early 2005, it is likely that some of the unusual climate patterns observed in the western equatorial Pacific region can be attributed, in part, to certain oceanic features. These include the warming in the central Pacific, the relatively neutral patterns in the western Pacific and the warmer than normal conditions in parts of the Indian Ocean. Many of these patterns, such as the drier than normal conditions across parts of the Maritime Continent and adjacent areas of SE Asia, and the above normal rainfall during October-December across parts of East Africa and the western Indian Ocean, extending to the southern rim of South Asia, were typical of an El Niño event.

Definitions based on central equatorial SSTs alone prompted some experts to categorize the recent period as an El Niño. However, the prolonged warmer than normal conditions in the central equatorial Pacific did not extend sufficiently far eastward in late 2004 and early 2005 to form the basin-wide structure typical of a well-defined El Niño event. Further, atmospheric conditions across much of the central and eastern Pacific that are characteristic of an El Niño, failed to materialize, leading some experts to conclude that the recent period did not qualify as an El Niño event. In spite of such uncertainty, the forecasting community's general expectation that some warming would prevail in the central and eastern equatorial Pacific, as

reported in the last El Niño Update (August 2004), was borne out and has contributed to successful seasonal climate forecasts during the period for some of the surrounding continental regions. The ambiguity over whether the recent period should or should not be classified as El Niño highlights the challenges in reaching consensus on an international scientific definition of El Niño and La Niña.

During early 2005 there was a slight reduction in the surface temperatures of the equatorial Pacific such that, as already noted, current conditions are predominantly neutral. Temperatures remain, however, well above normal in the central equatorial Pacific - a condition that has persisted since 2001 and, as such, is highly unusual. In contrast, sea-surface temperatures over a large area in the far eastern equatorial Pacific have remained near normal to cool since December 2002. Some surface warming in the eastern equatorial Pacific, particularly along the coast, is expected in the next several months, based upon the evolution of sub-surface conditions across the equatorial Pacific and projected atmospheric conditions. It is unclear, however, whether this warming will be sufficient in itself to cause a basin-wide El Niño. Most computer models and expert opinion suggest that, over the coming months, the development of El Niño conditions or the persistence of a neutral state are equally likely outcomes from the current prevailing situation. Development of La Niña is not considered likely.

When evaluating the range of climate patterns to expect over the coming seasons, it is important to recognize that regional climate fluctuations can be influenced by sea-surface temperature patterns in other tropical basins, particularly the tropical Atlantic and tropical Indian Oceans. It is therefore crucial to monitor the prevailing oceanic and atmospheric conditions in these basins. Observation of conditions at and beneath the ocean surface in these regions is in early development and therefore, as yet, there is incomplete understanding of the mechanisms of systematic sea-surface temperature changes in these ocean basins. Nonetheless, correlations between observed anomalies in the Atlantic or Indian Oceans and local and regional seasonal climate fluctuations are important factors in making detailed interpretations of possible regional consequences of the current state of the climate system. When considering response strategies, it is important to consult National Meteorological and Hydrological Services for local and regional information.

In summary:

- Warmer than normal sea surface temperatures (SSTs) prevailed in the central equatorial Pacific for much of 2004 and early 2005.
- The surface waters of the central Pacific have now been warmer than average since 2001 - such a prolonged period of warmth is highly unusual.
- Expert interpretation of recent tendencies in SSTs and model projections suggest that the current situation is predominantly neutral. Some warming at the surface in the eastern equatorial Pacific is, however, expected during the next several months, largely due to an eastward propagation of the sub-surface conditions observed in the Pacific Ocean. It is unclear at this time whether this warming will be sufficient in itself to cause a basin-wide El Niño.
- For the next several months, continuation of the currently neutral conditions or the development of basin-wide El Niño conditions are considered about equally likely outcomes. La Niña conditions are considered 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.

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. The El Niño phase of 2002-2003 was not as strong as that in 1997-1998. El Niño 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 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 computer 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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