



World Meteorological Organization

EL NIÑO/LA NIÑA UPDATE

Current Situation and Outlook

La Niña conditions are now well established across the central and eastern Equatorial Pacific. The magnitude of the current sea surface temperature departures from normal in the central and eastern Equatorial Pacific are in the middle-range of La Niña events found in the historical record. La Niña conditions are most likely to continue at least through the first quarter of 2008. Each La Niña event is different in some respect from the other events, but some, like this one, are more different from the others. The most substantial difference for this event is that sea surface temperatures currently across the north of Australia to the Indian Ocean continue to be cooler than normal, contrary to those generally found in most La Niña events. In addition, the sequence leading up to this event has been unusual, with La Niña conditions established only after a break in movement to such conditions during April-June. For management of climate risks and climate-related risks during this event, it is therefore critical to recognize the specific aspects of the current evolving situation and consult regional seasonal climate outlooks that factor in both the prevailing La Niña conditions, and other aspects of the climate system, such as the unusual conditions prevailing in the Indian Ocean.

Very clear La Niña conditions are now present in the central and eastern Equatorial Pacific, where sea surface temperatures are now about 1.5 degrees Celsius colder than normal. The atmosphere in this region is now closely coupled to this sea surface temperature pattern, with trade winds strengthened and cloudiness reduced.

Below the surface of the central and eastern Equatorial Pacific, conditions also reflect the presence of La Niña. Water just below the surface is typically 1 to 3 degrees Celsius colder than normal, and seems primed to reinforce the already cold waters at the ocean surface. Almost all forecast models interpret the current situation as one that is ready to sustain a La Niña event for the next 3-6 months into the first quarter of 2008.

While the increasing possibility of this La Niña development has been reported throughout 2007, the actual development occurred in two phases. Developments early in the year hinted at a La Niña event, but the situation stalled during April-June. Then, during July-September, developments surged again toward La Niña conditions. The pause during April-June suggests that the development of this event

has been unusual and somewhat delayed compared to the majority of La Niña events that show initial indications earlier in the year.

Expectations for climate patterns over continental areas need to bear in mind the unusual timing of the event, and the conditions prevailing elsewhere outside the central and eastern Equatorial Pacific. La Niña events are typically associated with warmer than normal sea surface temperature conditions in the western equatorial Pacific. However, substantially warmer than normal conditions are currently confined to a zone located between 150 degrees east to the date line, and conditions have actually become colder than normal to the west of 130 degrees east. Indeed, it is noted that colder than normal waters have been generally present to the north of Australia, around many of the western islands of Indonesia, and in the eastern Equatorial Indian Ocean, while warmer than normal waters continue to be found in the western Equatorial Indian Ocean. The sea surface temperature patterns in the Indian Ocean are similar to those associated with a positive phase of the Indian Ocean Dipole, a recently documented mode of the climate system. A positive phase of the Indian Ocean Dipole is characterized by the presence of cooler-than-normal sea surface temperatures in the eastern equatorial Indian Ocean, near Indonesia and Australia, and warmer-than-normal sea surface temperatures in western equatorial Indian Ocean, near Madagascar. A negative phase of the Indian Ocean Dipole has the opposite features. The Indian Ocean Dipole is currently the subject of research by several groups around the world. As long as this situation continues, it is expected to lead to unusual climate patterns in surrounding continental regions, ones that are atypical of La Niña. For example, rains have been unusually heavy in parts of eastern Africa, while dry conditions have persisted in many parts of Australia.

Nonetheless, the presence of La Niña represents a significant climate factor. The magnitude of the current sea surface temperature departures from normal in the central and eastern Equatorial Pacific are in the middle-range of La Niña events found in the historical record. Such events are known to have been associated with major climate impacts. Regions typically impacted by La Niña events should therefore consult the climate forecasts for their location and consider the appropriate risk management strategies.

The above observations illustrate the 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. 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:

- La Niña conditions are present in the central and eastern equatorial Pacific;
- The current La Niña is expected to continue at least until the first quarter of 2008. Beyond that time, the evolution of El Niño/La Niña cycle is uncertain, and there is no information to suggest any altered likelihood of La Niña, El Niño or neutral conditions;

- This La Niña event has unfolded with unusual timing, compared to most La Niña events. This may be one of the factors for climate patterns to differ from those typically observed during La Niña events;
- Furthermore, from north of Australia to the Indian Ocean, sea surface temperature departures from normal are currently opposite to those usually found during a basin-wide La Niña. Thus, this La Niña situation in particular, requires careful consultation of geographically specific climate outlooks, in order to arrive at the best information for management of climate and climate-related risks.

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.

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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