4 December 2014

World Meteorological Organization

EL NIÑO/LA NIÑA UPDATE

Current Situation and Outlook

Steady warming of the tropical Pacific Ocean over the past two months has resulted in ocean surface temperatures reaching weak El Niño levels. However, the overlying atmosphere is showing a mix of responses, with some indicators exceeding El Nino thresholds, while others remain neutral. Models and expert opinion suggest there is approximately a 70% chance that a weak El Niño event will become established before the end of February 2015. If an event does occur, it is most likely to be weak and persist for the first quarter of 2015. Some El Nino-like impacts have already been observed in several countries, and impacts in other areas may develop regardless of whether an El Nino becomes fully established. National Meteorological and Hydrological Services and other agencies will continue to monitor Pacific Ocean conditions for further El Niño developments, and will assess the most likely local impacts.

In early November, after more than 5 months of warm-neutral to borderline El Niño levels, sea surface temperatures in the east-central tropical Pacific Ocean reached weak El Niño levels. However, despite this oceanic warming, only some of the atmospheric indicators of El Niño have appeared. El Niño is typically associated with and amplified by a difference in the atmospheric pressure between the eastern and western tropical Pacific, and changes in the cloudiness, upper level winds, low level winds, and rainfall across the tropical Pacific. All of these indicators reflect large scale changes in the atmospheric state, which in turn has connections to global weather patterns. At present, the observed changes in these atmospheric indicators are mixed, with some reaching El Nino levels (e.g. surface pressure, upper level winds and, sporadically, the lower level winds) but others remaining closer to normal (most notably, the cloudiness and rainfall patterns). However, heat stored below the surface of the tropical Pacific has clearly increased during November, meaning additional warming of the sea surface is possible in the coming few months. Likewise, average to cooler-than-average ocean temperatures in the far western tropical Pacific combined with increasing eastward positive sea surface temperature anomalies mean west-to-east differences in sea surface temperature anomaly are becoming more El Niño-like than they have been since the possibility of an El Nino first emerged in March/April 2014. Furthermore, some El Nino-like impacts are being observed in parts of South America, Australia, New Zealand, Asia and Africa.

The latest outlooks from climate models and expert opinion favour a weak El Niño in both the ocean and atmosphere during the current season of November 2014 to January 2015, lasting through the northern winter (December to February) and well into the first quarter of 2015. International climate model outlooks suggest a 70% to 75% chance of El Niño during the December to March period. Models also indicate that if an event occurs, it is likely to be weak, though a moderate strength event cannot be completely ruled out. A strong event appears very unlikely. If an El Niño event does occur, the earlier that above-average cloudiness and rainfall

appear in the central tropical Pacific Ocean, the greater the likelihood that the event will continue through the first quarter of 2015.

It is important to note that El Niño and La Niña are not the only factors that drive global climate patterns. At the regional level, seasonal outlooks assess the relative impacts of both the El Niño/La Niña state and other locally relevant climate drivers. For example, the state of the Indian Ocean Dipole, or the Tropical Atlantic SST Dipole, may impact the climate in the adjacent land areas. Locally applicable information is available via regional/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:

- Tropical Pacific Ocean surface temperature anomalies exceeded the threshold for a weak El Niño during November, with values of 0.5 to 1.0 degrees Celsius above normal. Some atmospheric indicators have also become indicative of weak El Niño, while others have remained neutral throughout the recent several months;
- Important atmospheric variables that have not shown a pattern indicative of El Niño are cloudiness and rainfall, which have remained near average across the central and eastern tropical Pacific.
- As of mid-November 2014, model outlooks suggested an approximately 70-75% chance that oceanic warming will exceed El Niño thresholds during December to March;
- Although a range of outcomes is possible, models surveyed and expert opinion favour a weak event, with smaller chances for a near-miss or a moderate strength event. A strong event appears very unlikely.
- Regardless of whether or not this event fully develops, some impacts are still likely to be felt.

The situation in the tropical Pacific and Indian Ocean will continue to be carefully monitored. More detailed interpretations of regional climate variability will be generated 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 (NMHSs), please visit:

http://www.wmo.int/pages/members/members_en.html

For information on WMO Regional Climate Centres (RCCs) and links please visit:

http://www.wmo.int/pages/prog/wcp/wcasp/RCCs.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 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 World Meteorological Organization (WMO).

WMO El Niño/La Niña Update

WMO El Niño/La Niña Update is prepared on a quasi-regular basis (approximately once in 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:

http://www.wmo.int/pages/prog/wcp/wcasp/wcasp_home_en.html

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