World Meteorological Organization

EL NIÑO/LA NIÑA UPDATE

Current Situation and Outlook

A mature and strong El Niño is now present in the tropical Pacific Ocean. The majority of international climate outlook models suggest that the 2015-16 El Niño is likely to strengthen further before the end of the year. Models and expert opinion suggest that surface water temperatures in the east-central tropical Pacific Ocean are likely to exceed 2° Celsius above average, potentially placing this El Niño event among the four strongest events since 1950 (1972-73, 1982-83, 1997-98). National Meteorological and Hydrological Services and other agencies will continue to monitor the conditions over the tropical Pacific for further El Niño evolution and will assess the most likely local impacts.

During August, east-central tropical Pacific Ocean surface temperatures have ranged between +1.3° and +2.0° Celsius above average, exceeding El Niño thresholds by around 1 degree, indicating that the current El Niño is at a very significant level. Typically El Niño events peak late in the calendar year.

Atmospheric indicators of El Niño have maintained consistency and strengthened during recent months, with the Southern Oscillation Index below -1.5 most of the time since early July, indicating a robust coupling between the atmosphere and ocean as the event strengthens. Typical El Niño patterns of cloudiness and rainfall near and east of the international dateline developed during the second quarter of 2015 and have been well maintained, as has a weakening of the trade winds from the western to east-central Pacific. These patterns of cloudiness and rainfall are considered essential in triggering El Niño's global climate impacts. Historically, a mature El Niño event is likely to have maximum strength between October and January of the following year, and often to persist through much of the first quarter of that year before decaying.

During the last several months, temperatures below the surface of the tropical Pacific to the east of the international dateline have been substantially above average in response to persistent

episodes of significant weakening of the trade winds. The steady increase in sea surface temperatures, particularly in the eastern and far eastern tropical Pacific, is associated with the upper portion of this subsurface heat, as well as the weakened trade winds. The current excess subsurface heat has the potential to maintain or strengthen these above average sea surface temperatures in the coming months.

Currently, more than half of the dynamical prediction models surveyed predict sea surface temperatures in the east-central tropical Pacific to reach or exceed +2.0° Celsius above average between October and December. Statistical models are predicting a more conservative peak El Niño strength, with temperatures ranging between 1.5° and 2.0° Celsius above average. Taking into account both types of models and their known performance characteristics, there is a high likelihood that the current above-average ocean temperatures in the east-central tropical Pacific will at least be maintained, and more likely increase further in the coming months, attaining maximum levels that could place this El Niño event among the four strongest events since 1950. A careful watch will be maintained on the oceanic and atmospheric conditions over the tropical Pacific in the coming months to better assess the evolution of the strength of the event.

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 need to 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, and the Pacific Decadal Oscillation may impact the climate in the adjacent land areas. The current and emerging oceanic-atmospheric conditions in the Western Indian Ocean indicate a high likelihood of a positive Indian Ocean Dipole during the remainder of 2015. Also, the Pacific Decadal Oscillation has been in the positive phase since early 2014, which favours an Eastern Pacific El Niño, where the maximum SST anomalies are currently observed. Regionally and 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:

- As of August 2015, both the ocean and atmosphere over the tropical Pacific exhibit behaviour indicative of a strong El Niño;
- A majority of the models surveyed and expert opinion suggest the 2015-16 El Niño will strengthen further during the second half of 2015;
- The peak strength of this El Niño, expected sometime during October 2015 to January 2016, could potentially place it among the four strongest El Niño events since 1950.

- Impacts from this El Niño are already evident in some regions and will be more apparent for at least the next 4-8 months;
- El Niño events typically decline and then dissipate during the first and second quarters of the year following their formation. Note that impacts in some regions are still expected during the dissipation phase.

The situation in the tropical Pacific 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, please visit:

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

For information and web links to WMO Regional Climate Centres 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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