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World Meteorological Organization

EL NIÑO/LA NIÑA UPDATE

Current Situation and Outlook

A La Niña event could, more likely than not, develop in the second half of 2007. The last WMO El Niño/La Niña Update in March 2007 also noted an enhanced likelihood of La Niña development, and conditions were moving quite rapidly in that direction until a reversal occurred during May and early June. There remains considerable uncertainty over the timing and magnitude of further cooling in the central and eastern Equatorial Pacific, and indeed there is a possibility that basin-wide conditions, despite some cooling, will on balance remain neutral through the remainder of 2007. Development of El Niño during the period is considered very unlikely.

Sea-surface temperature conditions are currently neutral across the tropical Pacific basin as a whole, though some cooler than normal surface waters are found along the western coast of South America. After some indications of the development of La Niña early in the year, conditions by the end of April indeed appeared to be on track for its fairly rapid onset. After sea-surface temperatures first became substantially cooler than normal in the far eastern Equatorial Pacific, the cooling became more widespread and surface conditions across much of the central and eastern Equatorial Pacific were approaching 0.5 degrees Celsius colder than normal during April. However, as can happen especially during this period, a fluctuation in near-surface winds over the subsequent few weeks caused the tropical Pacific ocean-atmosphere system to reverse the trajectory toward La Niña. This led to an increased uncertainty over whether a basin-wide La Niña event would develop.

During the break in the movement toward La Niña, through approximately May and early June, near-surface wind anomalies became westerly across much of the central and eastern Equatorial Pacific. Sea-surface temperatures returned to near or slightly warmer than normal over the central Equatorial Pacific, with cooler than normal surface waters observed in the eastern part.

During the middle and latter part of June, near-surface tropical Pacific wind conditions again became favourable for La Niña development. Furthermore, almost all dynamical forecast models indicate a very strong likelihood for La Niña development, suggesting that the large-scale ocean-atmosphere tropical Pacific system is conducive to such an outcome. Given the presence of cooler than normal conditions beneath the surface of the central and eastern Equatorial Pacific, and the

indications from dynamical forecast models, some cooling is expected in the central and eastern Equatorial Pacific over the next few months. However, the recent active pulsing of wind fluctuations on a timescale of a few weeks, and the ability of such fluctuations to influence the path of the system in recent months, leads to the current assessment of a substantial likelihood of either La Niña development or continuation of neutral conditions over the remainder of 2007. The balance of evidence would suggest a slightly higher likelihood for La Niña development. However, there are no indications at this time of it becoming an unusually strong event in terms of sea-surface temperatures.

It is important to consider that El Niño and La Niña are among a number of factors that can generate or trigger climate patterns to be expected over several months. Some of the current prevailing sea-surface temperature conditions over global oceans, also expected to influence weather patterns in the coming few months, are:

- In the North Atlantic, and especially noteworthy in the tropical North Atlantic, sea-surface temperature conditions are generally warmer than normal, which can have implications for the associated regional climate patterns. These effects would reinforce the patterns over tropical North Atlantic favoured by the development of a La Niña event;

- In the South Atlantic, off the western coast of southern Africa, a localized warming event in the Benguela Current has been underway with sea-surface temperatures having been more than 1.5 degrees Celsius warmer than normal; if this continues, it is expected to have implications for weather patterns over the next months in nearby continental regions;

- In the western Indian Ocean, sea-surface temperatures are warmer than normal, which is the opposite of that typically expected during a La Niña event. Thus, in addition to having potential influence on weather conditions now in nearby continental regions, if it persists, this situation combined with the development of a La Niña event may lead to climate patterns in the region that are atypical of a La Niña, or at least, there will be need for further expert evaluation of the two competing influences.

The above observations illustrate the need for detailed regional evaluations of prevailing conditions, combining the expected influences of El Niño/La Niña with those 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. More complete and region-specific information should therefore be consulted in detailed seasonal climate outlooks, as produced by the concerned National Meteorological and Hydrological Services at appropriate times.

In summary:

- In general, neutral or weak La Niña conditions have prevailed in the tropical Pacific during the first half of 2007;

- Movement toward a typical La Niña condition has been very unsteady during the March-June period. A strong break in the pathway toward La Niña occurred during May and early June, increasing uncertainty over whether a La Niña event would develop in 2007;

- Nonetheless, cool waters continue to be found beneath the central Equatorial Pacific, and forecast models continue to predict at least some surface cooling in the central and eastern Equatorial Pacific, with most dynamical models continuing to strongly favour La Niña development;

- While the fluctuating conditions in the Equatorial Pacific over the last few months tend to imply a possibility of neutral conditions continuing through the remainder of 2007, a La Niña event is considered, albeit slightly, more likely. Development of El Niño in 2007 is considered very unlikely;

- While it is possible that La Niña conditions may develop in the next 1-3 months, the timing and magnitude of such an event in 2007 continues to be uncertain, with no indications at this time of a particularly strong event in terms of sea-surface temperatures;

- In light of the above assessment, regions typically impacted by La Niña events are advised to take note of the continued enhanced risk of such an event this year.

The situation in the tropical Pacific will therefore 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 the respective 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 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 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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