



Produced in collaboration with

IRI

International Research Institute
For Climate Prediction

World Meteorological Organization

EL-NIÑO OUTLOOK

El Niño Outlook

Current Situation and Outlook

Historical records show the March-June period to be a favoured one for transitions to El Niño or La Niña, and hence considerable discussion can be expected around this time of the year. Earlier statements this year have discussed how most expert opinions were considering the large-scale situation to be favourable for El Niño development in 2002. The last statement issued on 27 March reported that most opinions indicated the development of El Niño as being more likely than not, but emphasizing that considerable uncertainty remained.

Through April and the early weeks of May, conditions in the tropical Pacific remained favourable for El Niño, and indeed El Niño-like weather events have been reported in several South American countries bordering the Pacific. However, developments that would herald a decisive swing towards a basin-wide El Niño event remained absent. Towards the end of May, a significant development in surface winds in the Equatorial Pacific emerged, with westerly anomalies extending all the way across the Equatorial Pacific leading to a substantial ocean response. Sea-surface temperatures are now over 1 deg. C above normal along the Equator across much of the central and eastern tropical Pacific.

This development represents a significant progression towards the formation of a basin-wide El Niño event. However, most expert interpretations of the current situation and of the forecasts from computer models, continue to emphasize uncertainty on how the system will evolve from here on. The climate system may not yet have evolved into a coupled state typical of a sustained warming that would correspond over the coming months to El Niño, allowing nature the option of taking a range of paths from the current situation. Most analyses of available forecasts, nevertheless, lay emphasis on the range of possibilities being generally in the above normal range, i.e. the expectations are for equatorial sea surface temperature in the central and eastern Pacific to be warmer than normal by around 1deg. C through the Northern Hemisphere summer and autumn (June-November). This outcome would correspond to a relatively weak El Niño-like forcing on the climate system. By way of comparison, during the very strong El Niño event of 1997/98, sea temperatures were several degrees above normal across much of the tropical Pacific.

If relatively weak warming does prevail through the coming months, a tendency can be anticipated for impacts to be consistent with those associated with previous El Niño events. These impacts could, for example, include more storm activity in the central and eastern Pacific and a suppression of tropical storm activity in the Atlantic and western Pacific. However, as the current predictions point to an event less intense overall than that of 1997/98, assessments of the likely impacts of the evolving situation should not be based directly on the impacts resulting from the climate anomalies

observed during the 1997/98 El Niño event. Furthermore, other factors can influence the climate in any given region. Regional and national interpretations of anticipated climate anomalies will be made available through National Meteorological Services.

While March to June is the most favoured time of year for El Niño development, the September to November period has also seen some substantial developments in the historical records and is generally considered to be the second most favoured time. Therefore forecasters do not rule out the possibility that any weak or moderate warming prevailing during the coming months could further intensify in later months.

Even if basin-wide El Niño conditions do not develop, it is still possible for significant climate fluctuations to occur for other reasons in the next several months in different parts of the globe, including the Pacific. Seasonal climate fluctuations have many causes, involving patterns of SST beyond the Pacific and factors other than sea-surface temperature. For example, regional climate fluctuations can be driven by SST patterns in the tropical Atlantic and tropical Indian Oceans. However, forecasts of SST patterns in these ocean basins currently have very limited skill. This is largely due to inadequate observations of conditions beneath the ocean surface, and the lack of understanding of the mechanisms of systematic SST changes in these ocean basins.

In summary:

- Since the last statement issued on 27 March 2002, little change occurred in the state of the tropical Pacific until late May.
- In late May, westerly wind anomalies extended across the whole Equatorial Pacific and the ocean has responded, with warmer than normal water at the surface now being observed across much of the Equatorial Pacific.
- Different computer models still vary on the pace of development of further warming, and generally indicate conditions that would amount to consolidation of the weak warming conditions currently present into a weak El Niño, rather than development into a strong El Niño during the June to November period.
- In interpreting the computer models and the existing observed conditions, expert opinions continue to vary on the degree of certainty that Pacific basin-wide El Niño conditions will prevail in the tropical Pacific in the coming months. Nevertheless, almost all do see a high likelihood of warmer than normal conditions of some magnitude in the tropical Pacific during the June to November period. This warming will probably be sufficient to be categorized as an El Niño event by most measures. However, the magnitude of the warming is not expected to be strong during the coming months, which would lead to a conclusion that the overall impact of the event would be less than that of the 1997/98 event. Nonetheless, the potential remains for severe impacts in particular regions.
- Even if developments remain weak through June-August, forecasters do not rule out the possibility of further development into a more substantial El Niño event later in the year.
- Overall, conditions continue to remain favourable for further El Niño development.

The situation in the tropical Pacific will continue to be carefully monitored and further advisories will be issued. More detailed interpretations for regional climate fluctuations are likely to be generated routinely by the climate forecasting community over the coming months and will be made available through National Meteorological Services.

Climate Patterns in the Pacific

Research conducted over the past few decades has thrown 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 temperature at the surface in the central and eastern tropical Pacific Ocean becomes substantially higher than normal. During La Niña events, the sea surface temperatures in these regions become lower than normal. These temperature changes can drive major climate fluctuations around the

globe and once initiated, such events can last for 12 months or more. The last El Niño event occurred during 1997-1998 and 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 events 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 particular regions irrespective of its intensity.

Monitoring and Forecasting 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.

Acknowledgements

This El Niño Outlook statement has been prepared as a collaborative effort between the World Meteorological Organization and the International Research Institute for Climate Prediction (IRI) as a contribution to the United Nations Interagency Task Force on Natural Disaster Reduction. It has drawn on contributions from the Australian Bureau of Meteorology, China Meteorological Administration, European Centre for Medium Range Weather Forecasts, IRI, Japan Meteorological Agency, Korea Meteorological Administration, National Institute of Water and Atmospheric Research in New Zealand, Met Office United Kingdom, United States Climate Prediction Center, Center for Ocean-Land-Atmosphere Studies, and the Climate Variability and Predictability (CLIVAR) Project of the World Climate Research Programme.