The International Research Institute for Climate and Society

A WHO Collaborating Centre for Climate-Sensitive Diseases

Emerging La Niña conditions in the equatorial Pacific:
Notes for the Health Community

Background.

A moderate La Niña has developed and is expected to last through at least February 2011. Given past experience, it is necessary to develop an action strategy to help manage the potential risks and reduce possible public health impacts globally, as well as at local and regional levels. La Niña events have been associated with heavy rainfall and increased chances of flooding in Southern Africa and parts of the Sahel. In 2000, devastating floods associated with La Niña affected 400,000 people in southern Africa, causing at least 96 deaths and leaving 32, 000 homeless. The current floods in West Africa are attributable to La Niña conditions. In Eastern Africa, La Niña conditions are associated with drier-than-normal conditions and an increased risk of drought. Dry conditions in Eastern Africa are also expected to persist into early 2011. Above-normal rainfall is also forecasted for much of south and Southeast Asia, particularly Indonesia (from September to December) and the Philippines (from October to February 2011). Monthly forecast updates are maintained by the IRI and regional rainfall forecast maps for monitoring weather forecasts are available at: http://iri.columbia.edu/ifrc/forecast/3munusualprecip.

This report provides information to assist monitoring of vulnerable communities and provide time sensitive information for interventions to reduce negative health impacts. It is prudent for health decision makers to follow the situation for any developments and monitor climate/weather forecasts as part of an early warning-early action approach. Resources and recommendations for monitoring the situation are presented below.

What is La Niña?

La Niña refers to a period of cooler than average Sea Surface Temperature (SST) in the eastern and central equatorial Pacific Ocean that occurs as part of natural climate variability. This situation is the opposite of the warming of the waters in this region that is typical of El Niño events.

In the last 25 years, 4 moderate to strong La Niña events have been experienced[1]. Its impacts may go unnoticed or even be beneficial in some parts of the world, but in other areas it has been associated with devastating floods or widespread drought. In Bangladesh, for example, La Niña has been implicated in 4 out of 6 devastating flood events documented since 1954. The prevailing La Niña conditions have resulted in the ongoing floods in Pakistan and West Africa.

Once developed, La Niña events typically persist for 9-12 months or longer, peaking sometime during December to February. Peak impacts do not necessarily coincide with the peak of the La Niña period and impacts occur typically during a region's main rainy season. The disruption of the rains, i.e. more rainfall or less rainfall than is usual, impacts on livelihoods, health, food security and safety. Because the progress and strength of the La Niña can be monitored, there is an opportunity to obtain probabilistic predictions of the climate into the year ahead that may be useful for planning and mitigating health outcomes associated with climatic extremes in the regions where La Niña has impacts.

Summary of emerging 2010 La Niña conditions

19 August 2010: Weak La Niña conditions emerged in mid-June 2010, and increased to moderate strength by mid-July. For the August-October season currently in progress, there is an approximately 96% probability for continuing La Niña conditions, and a 4% probability for returning to neutral ENSO conditions. Probabilities for La Niña conditions continue at more than 90% through the remainder of 2010 and in the 80%-90% range during the early months of 2011.

It is not anticipated, at the moment, that the current La Niña will be as strong as the two strongest events that have occurred in the 1980s and 1990s. However, the strength of a La Niña provides only a rough indication of how widespread and severe the associated impacts are likely to be on a global level and is less certain as an indicator of impacts in a local or regional level. It is therefore important to monitor the seasonal forecasts for your area of interest. The forecast incorporates factors from both La Niña and other elements of the climate system and its reliability increases with shorter lead times. Tools for monitoring updates on the strength of the La Niña can be found at: http://iri.columbia.edu/ENSO.

Rather than focusing on predicting specific events, response strategies need to focus on the multi-scale and diverse sources of national and local vulnerability to climatic extremes, and the potential of cascading interconnected impacts. For example, droughts may result in loss of hydropower and associated electricity available to health facilities; drought or flood triggered food insecurity can increase malnutrition and thus enhance vulnerability to infectious diseases, and damaged or poor

1 Past La Niña years and corresponding SST anomaly: 1988/98 (-2.0 deg. C), 1998/99 (-1.5 deg. C), 1999/2000 (-1.7 deg. C), 2007/08 (-1.4 deg. C).

sanitation can lead to increases in water-borne infectious diseases. Conversely, extended rainfall and floods may destroy roads and therefore restrict access to health facilities for those suffering from rainfall related diseases. This stocktaking of vulnerabilities and risks associated with floods, droughts or extreme temperatures can provide early warning of negative health outcomes that could result in, or promote, early action to reduce vulnerability and manage risks better.

As noted above, monitoring emerging climatic conditions offers the opportunity to improve risk management. With early warning, risks can be better anticipated and actions to reduce vulnerability and mitigate disasters undertaken more effectively. Based on current information, the following actions are recommended.

Recommendations for Action

1. Monitor monthly La Niña forecasts for Sept.- Dec. 2010 to follow developments in expected magnitude of the event.

Scientists will have a better sense of the likely magnitude of this event over the coming months, which can be helpful information for regions that tend to experience the same type of impacts during La Niña events (see "Available Climate Monitoring Resources" below). Monitoring will also provide information about expected skill of forthcoming seasonal climate forecasts. However, since the magnitude of a La Niña event does not necessarily indicate the magnitude or specific location of associated impacts, it is extremely important also to monitor observed and forecasted climate for your region as a standard of good practice for health preparedness. The best guidance is from regional forecasts that are available 4 months in advance of the season of interest. Additional information is available on the IRI website.

2. Monitor local rainfall forecasts.

Seasonal precipitation forecasts are available from global centres or national meteorological services. These forecasts should indicate how likely your region is to experience rainfall anomalies (e.g. below-average, near normal, or above-average rainfall) during the next 3-6 months. Weather forecasts with a lead-time of 2-5 days give reliable information on extreme events that can be used to mitigate disasters in many parts of the world. Most national meteorological services can provide regional rainfall forecasts on multiple timescales (seasonal, monthly, weekly, daily, etc.) and information about how the current La Niña and other climatic influences are likely to affect rainfall in your region.

Maps 1 and 2 on page 6 show the global forecasts for precipitation and extreme precipitation for the coming season (September to November 2010). These interactive maps are updated monthly and are available on IRI's web site (See section on resources below). Upcoming scheduled forecasts will be available at this site on September 16, October 21, November 18 and December 16.

3. Monitor weather/climate/environmental data in real-time.

Up to-date information on the actual rainfall/temperature situation along with associated impacts on environmental factors may be obtained via the Internet from reliable and appropriate sources (see links below) or be provided locally by national meteorological services or other appropriate agencies. Current and forecast information is always best understood in the context of historical data to highlight deviations from the expected conditions for a particular location).

4. Develop strategies and activate vulnerability reduction and response plans

I. Understand the nature of likely La Niña health risks

Review the evidence as to which populations or areas are known to be vulnerable to La Niña impacts or overall seasonal rainfall departures from average conditions. La Niña conditions in the tropical Pacific are associated with shifting rainfall patterns in certain regions of the world. Although the resulting rainfall patterns vary from one La Niña to the next, the strongest shifts are fairly consistent in the regions and seasons shown on map 3 on page 7. The creation of risk maps indicating most likely risk areas at the sub-national level will assist in preparedness and response planning. Dialogue with partner organizations at the local level, including the national meteorological agency to assess current risks. National climate and health working groups may be created to provide an appropriate forum for discussion.

Consult with external experts, if warranted, to learn from experiences in other countries or regions. Sharing information and accessing the latest scientific knowledge will help ensure that the health risks associated with La Niña events are managed in the most effective way possible.

II. Activate nationally and locally prepared response plans

(If the above monitoring indicates your area is likely to affected by La Niña related impacts)

Most countries have specific plans designed to reduce the impact of climate related hazards (droughts and floods) such as disaster risk reduction strategies, evacuation or epidemic preparedness plans, etc. These plans will need to be reviewed by the mandated agencies and, if warranted some aspects of the plans may be implemented prior to the actual occurrence of events based on the likelihood of occurrence of specific climatic events associated with La Niña. For example, reviews of contingency plans, medical stocks and availability of personnel are all important.

Given the uncertainties associated with any climate prediction the implementation of 'no regret' strategies (that are beneficial to health whether or not the specific predicted climate event occurs) should be prioritized. In particular, in areas where La Niña may be associated with diminished health risks, this is not an indication that diligence in disease control should be reduced in any way.

Climate related disasters can be of rapid onset, becoming widespread geographically within a short time period. Early coordination with government and humanitarian agencies that can provide immediate financial, technical and logistical support should occur, particularly in high-risk areas or zones already experiencing compound crises.

III. Develop effective communication strategies

Experience suggests that La Niña events and their potential impacts may be ignored or oversensationalized by the media. It is essential to establish clear messages that keep both response agencies and the public informed about potential rainfall anomalies, and keep the risks in perspective (given other societal challenges and the uncertainties associated with climate forecasts) if the health risks associated with La Niña are to be managed cost-effectively.

Available climate monitoring resources

1. MORE INFORMATION ON EL NIÑO AND TO MONITOR EL NIÑO FORECASTS:
http://iri.columbia.edu/ENSO

2. TO MONITOR SEASONAL RAINFALL FORECASTS:
http://iri.columbia.edu/climate/forecast/net

3. RESOURCES ON REGIONAL IMPACTS (GLOBAL INFLUENCES OF ENSO):
http://iri.columbia.edu/climate/ENSO/globalimpact/index.html

4. LINKS TO ADDITIONAL INFORMATION:

WHO fact sheet on Climate and Health
http://www.who.int/mediacentre/factsheets/fs266/en/

Centro Internacional para la Investigación del Fenómeno de El Niño
http://www.ciifen-int.org/

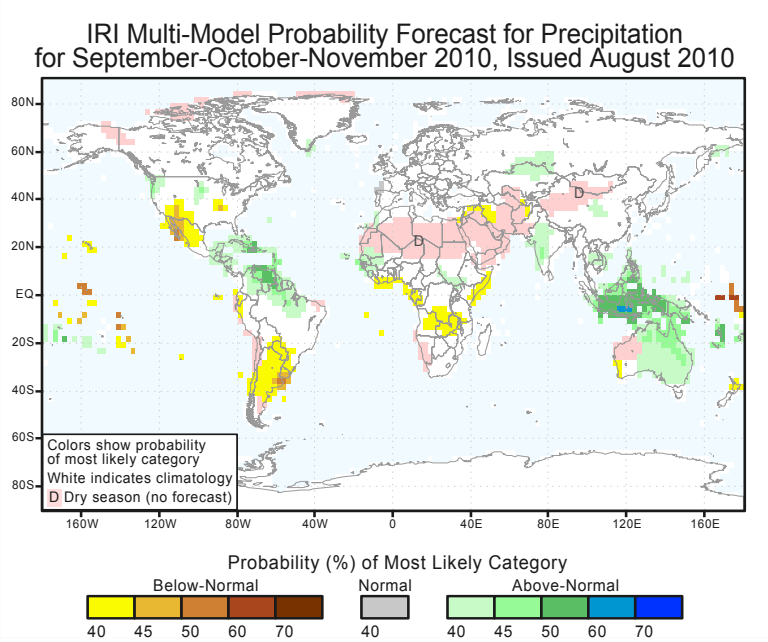
Climate and Infectious Diseases, Louise Kelly-Hope and Madeleine C. Thomson
http://tinyurl.com/Kelly-Hope-Thomson-2008

5. FOR INFORMATION ON TYPICALLY OCCURRING RAINFALL ANOMALIES THAT HAVE ACCOMPANIED PREVIOUS LA NIÑA CONDITIONS:
http://iri.columbia.edu/climate/ENSO/globalimpact/temp_precip/region_lanina.html

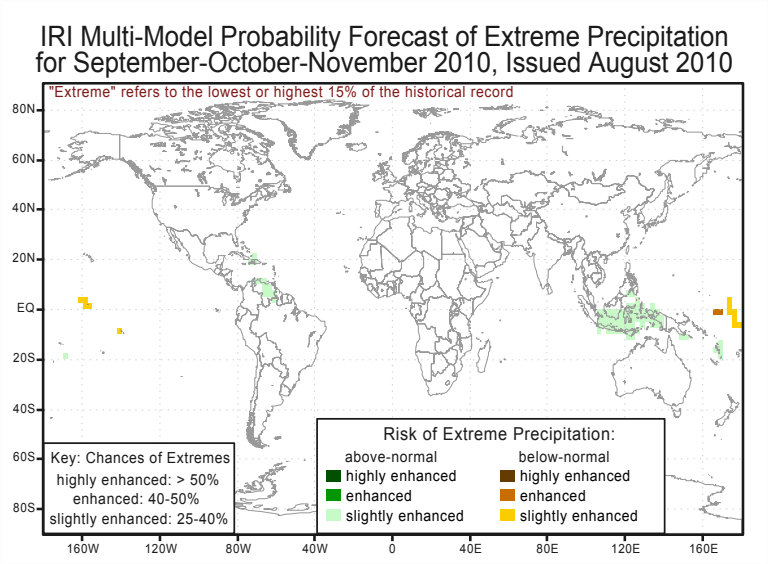
6. IRI'S INTERACTIVE MAP ROOM ON LA NIÑA-ASSOCIATED RAINFALL PROBABILITIES:

Maps 1 and 2 show where and how likely it is to be unusually wet or dry for the next three-month season during the La Niña event based on climate model predictions and conditions that have been observed historically. (These maps use historical information from La Niña events between 1950 and 2002 to show the chance of above or below average rainfall). The probabilities indicate the likelihood of rainfall being above, near average or below average. Higher probabilities show increased likelihood, but not how extreme the wet or dry conditions are likely to be. These probabilities apply over large areas and should not be used to predict local conditions at national level. To access the map room go to:
http://iri.columbia.edu/climate/forecast/net

Map 1

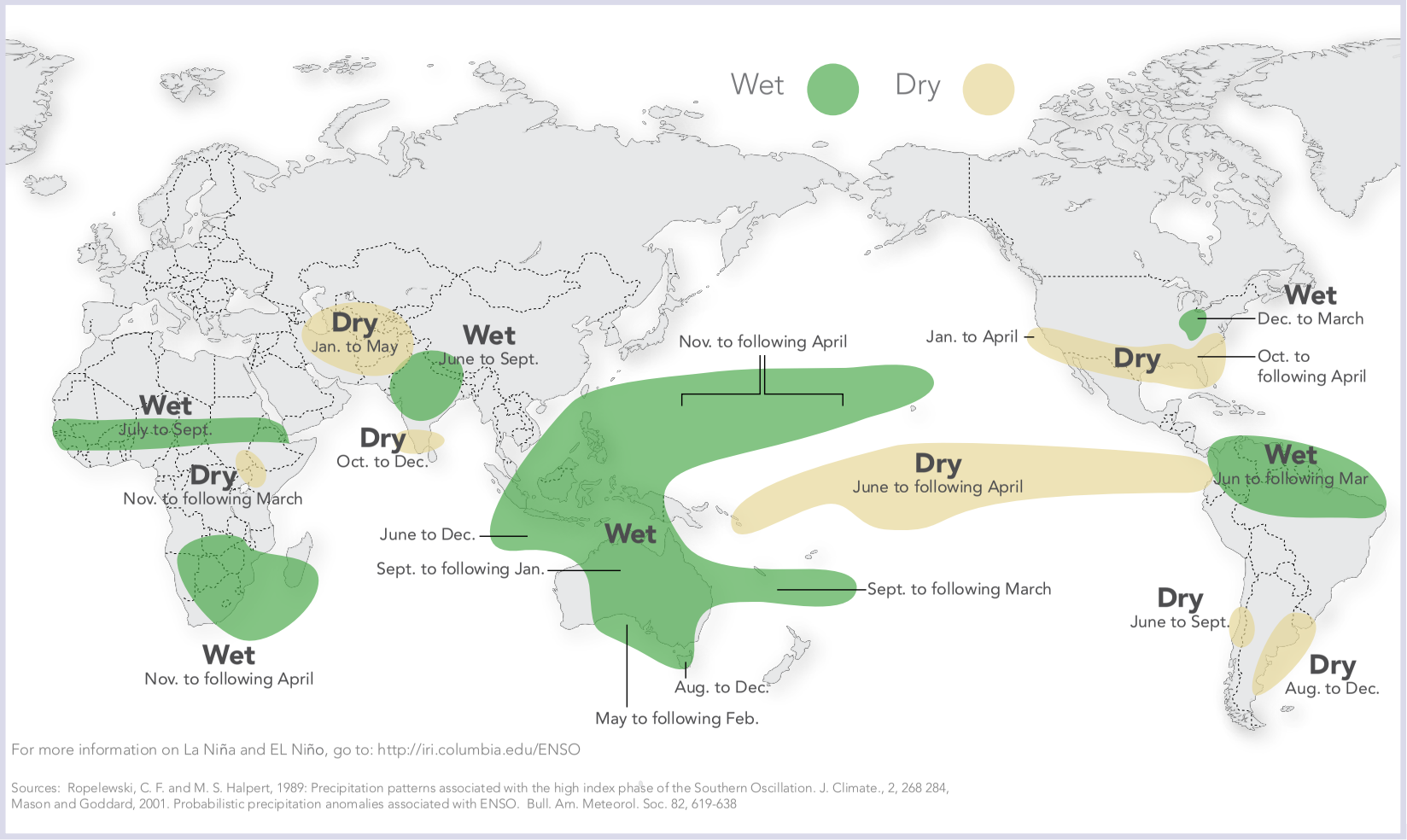


Map 2



La Niña and Rainfall

La Niña conditions in the tropical Pacific are known to shift rainfall patterns in many different parts of the world. Although varying somewhat from one La Niña to the next, the strongest shifts are fairly consistent in the regions and seasons shown on the map below.



For more information on La Niña and EL Niño, go to: http://iri.columbia.edu/ENSO

Sources: Ropelewski, C. F. and M. S. Halpert, 1989: Precipitation patterns associated with the high index phase of the Southern Oscillation. J. Climate., 2, 268 284, Mason and Goddard, 2001. Probabilistic precipitation anomalies associated with ENSO. Bull. Am. Meteorol. Soc. 82, 619-638