



Emerging El Niño conditions in the equatorial Pacific:

Notes for the Health Community

Background.

Recent IRI and WMO forecasts point to a higher-than-normal probability (about 80 to 85%) of at least a 'weak' El Niño from September to December 2009. The expected magnitude of this event is weak to moderate, but given recent experience it is necessary to develop an action strategy to help manage the potential risks and reduce impacts, both globally and at a local level.

This report provides an update of the evolution of the emerging El Niño conditions in the Equatorial Pacific for the health sector. Previous El Niño episodes have been associated with negative global climatic and socio-economic impacts in particular regions, including public health impacts, such as outbreaks of rift valley fever, dengue and malaria, as well as climate effects, such as severe flooding, and drought etc. 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 El Niño?

El Niño refers to warming in the eastern and central equatorial Pacific Ocean that happens once every 3-7 years. Widespread warming of waters in this region can cause the trade winds (the prevailing pattern of easterly winds found in the tropics near the equator) to weaken or even change direction. When trade winds change, rainfall patterns worldwide can shift. These shifts can initiate a chain of interactions in the global climate, causing parts of the globe to receive levels of rainfall that are much higher than usual for the region, while other places lack the rainfall they usually receive. These are known as rainfall anomalies.

Precipitation related disasters are not necessarily more numerous or extreme under El Niño con-

ditions at the global level; however, they may be in certain locations – e.g. southern and eastern Africa, Indonesia, Peru etc. Because El Niño events enhance the predictability of rainfall around the globe, there is now an opportunity to obtain probabilistic predictions of the climate in the year ahead that may be useful for planning and mitigating health outcomes associated with climatic extremes.

Summary of emerging 2009 El Niño conditions

The risks/impacts of even a moderate El Niño in an interconnected world are not certain; i.e. a strong El Niño (while associated with better predictability) is not necessarily associated with more severe impacts and likewise a weak El Niño does not imply an absence of or fewer impacts. For example, South Africa and India, both of which would anticipate drought during El Niño, had near normal rains during the very strong 1997-98 El Niño event. Similarly, moderate strength El Niño events have coincided with very large magnitude regional impacts. Only 15-25% of the earth's land area has a statistically significant recurrence of impacts associated with El Niño events in any particular season. Even in those significant regions, rainfall anomalies will not necessarily be experienced similarly from one El Niño to another.

Rather than focussing on the precise predictability of 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 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 stock taking of vulnerabilities and risks associated with floods, droughts or extreme temperatures can provide early warning of negative health outcomes which could result in and promote early action to reduce vulnerability and better manage risks.

In light of the above, and given the current global economic crisis, rising food costs and political instability in many parts of the world, impacts from the current El Niño could be more serious than might otherwise be anticipated. More information on past health impacts of El Niño are available on the World Health Organization's web site.

(see: <http://www.who.int/mediacentre/factsheets/fs192/en/>)

As noted above, El Niño years offer the opportunity to improve risk management because predictions of rainfall anomalies are more confident. With better predictability providing earlier warning, risks can be better measured 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 El Niño forecasts for August and September 2009 to follow developments in the 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 some regions that tend to experience the same type of impact during El Niño years (see Resources on Regional Impacts below). It will also inform the expected skill of forthcoming seasonal climate forecasts. However, since the magnitude of an El Niño event does not necessarily indicate the magnitude or specific location of associated impacts, it is extremely important to monitor observed and forecasted climate as a standard of good practice for health preparedness. The best guidance is from 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 (the skill of which is enhanced during El Niño events) are available from global centres or locally provided. These forecasts should indicate how likely your region is to experience rainfall anomalies (that is below-normal, normal, or above-normal) during the next three to six months. Weather forecasts from 2-5 days give highly accurate 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 2009 El Niño and other influences are likely to affect rainfall in your region.

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

1. Understand the nature of likely El Niño health risks

Review the evidence as to which populations or areas are known to be vulnerable to impacts of

extreme weather events. 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 El Niño 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 be affected by el Niño 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 events occurring based on the likelihood of occurrence of specific climatic events associated with El Niño. 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 prioritised.

Given that climate (weather?) related disasters can have rapid onset and be widespread geographically. 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 El Niño events and their potential impacts may be either ignored or over-sensationalised 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 El Niño are to be managed cost-effectively.

Agencies should be discouraged from sensationalising the current situation, but use this opportunity of available information to improve health preparedness and emergency response activities.

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:

<http://iri.columbia.edu/climate/ENSO/globalimpact/index.html>

4. LINKS TO ADDITIONAL INFORMATION:

WHO fact sheet on El Niño and Health

<http://www.who.int/mediacentre/factsheets/fs192/en/>

WHO fact sheet on Climate and Health

<http://www.who.int/mediacentre/factsheets/fs266/en/>

Earth Observatory feature on El Niño

http://earthobservatory.nasa.gov/Features/ElNino/el_nino2.php

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. IRI'S INTERACTIVE MAP ROOM ON EL NIÑO-ASSOCIATED RAINFALL PROBABILITIES:

The following maps show where and how likely it is to be unusually wet or dry for the selected three-month season during El Niño events based on historical conditions.

These maps use historical information from El Niño events between 1950 and 2002 to show the chance of above or below average rain during a “typical” El Niño. The probability indicates the likelihood of rain being above or below normal. Higher probabilities show increased likelihood, not how extreme the wet or dry conditions are likely to be. These probabilities apply over large areas and should not be used for local conditions. To access the map room go to:

<http://tinyurl.com/ENSO-rain-proball-2p5-drymask> (2.5 degree data)

<http://tinyurl.com/ENSO-rain-proball-0-5-drymask> (0.5 degree data)

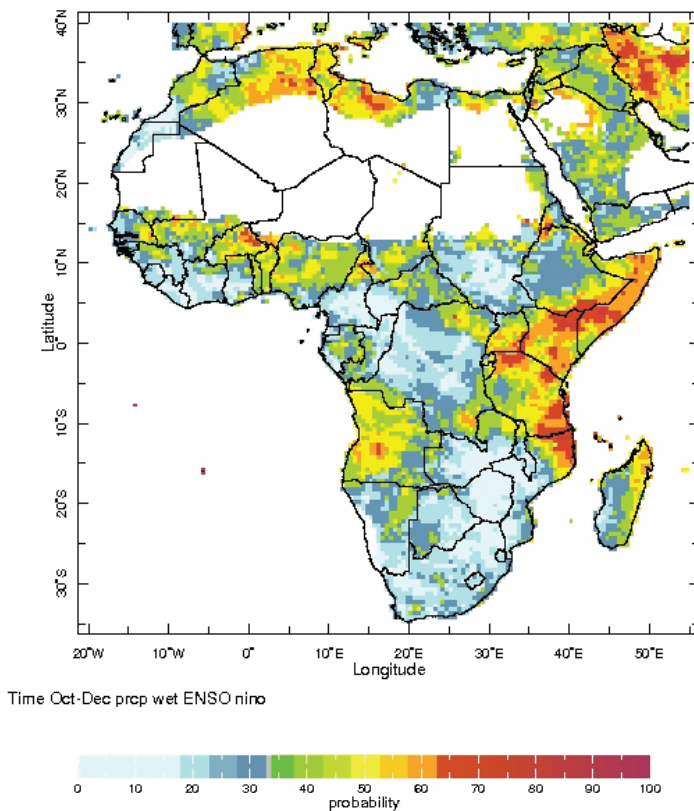
Interactive features: Above the maps are interactive options labeled **Prcp**, **ENSO**, and **Time**.

Prcp: choose wet, normal or dry conditions. **ENSO:** choose probabilities for either El Niño or La Niña events. **Time:** choose the 3-month season to display.

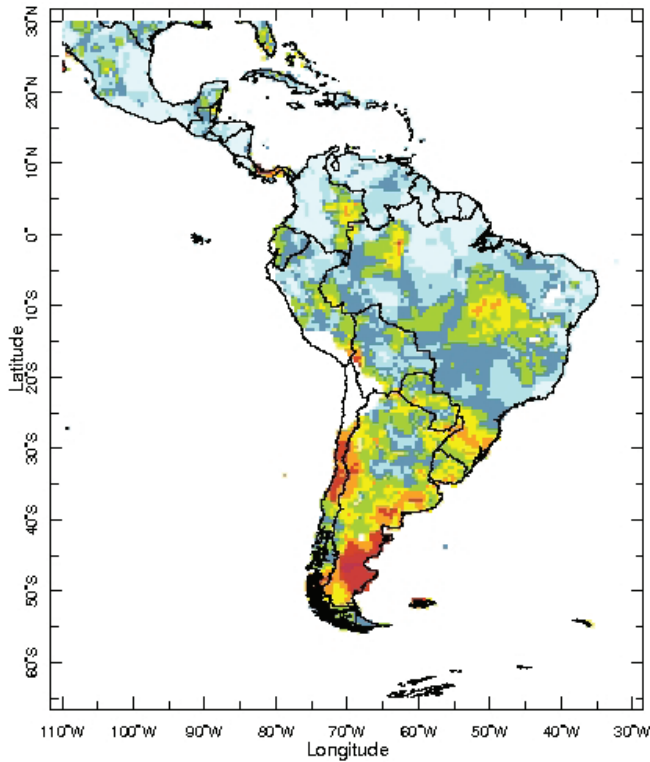
Zoom into certain areas by drawing a box over the area of interest with the mouse or updating the latitude and longitude and clicking the “redraw” button. To only view the areas where there is an extremely high chance (>90% statistical significance) of a precipitation anomaly during El Niño events for a specified time period go to:

<http://tinyurl.com/ENSO-rain-prob90-2p5-drymask> (2.5 degree data)

<http://tinyurl.com/ENSO-rain-prob90-0-5-drymask> (0.5 degree data)

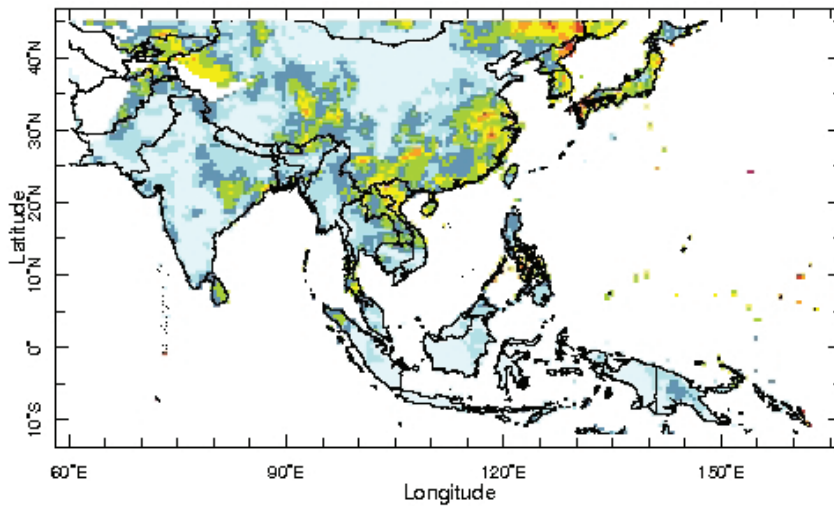


Map of the probability of above-normal precipitation conditions for Africa in the Oct-Nov-Dec season during an El Niño episode. Red areas indicate a strong chance of wetter-than-normal conditions. White over land indicates areas and seasons that are normally extremely dry and have been masked out.

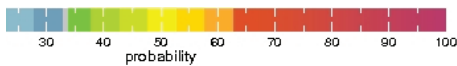


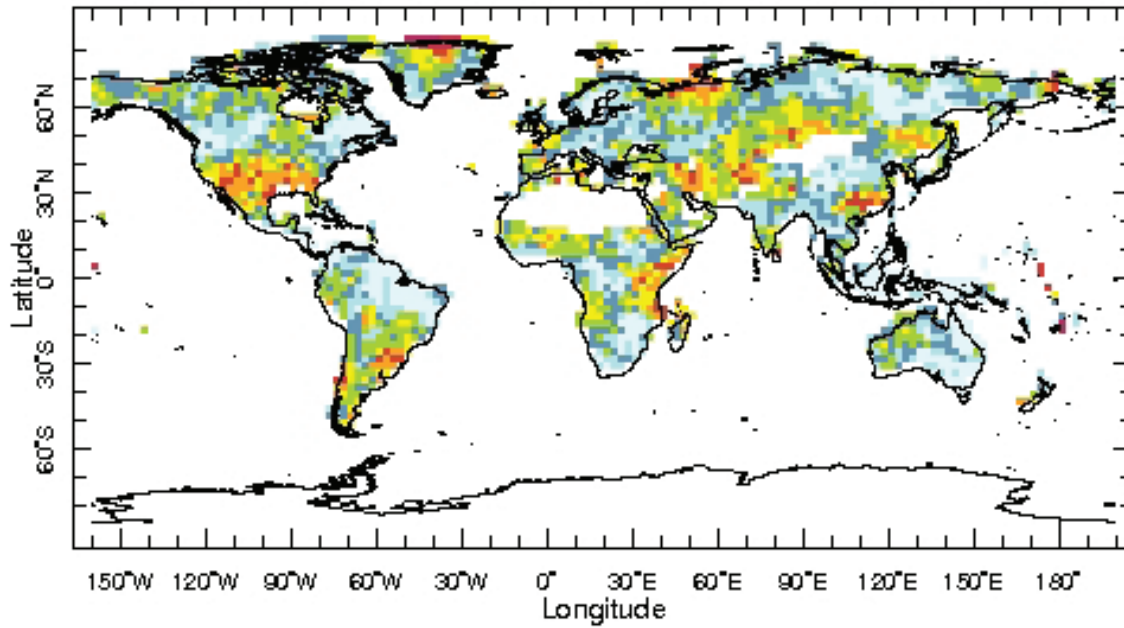
Maps of the probability of above-normal precipitation conditions for Asia and Latin America for the Jul-Aug-Sep season during El Niño episodes. Red areas indicate a strong chance of wetter-than-normal conditions. White over land indicates areas and seasons that are normally extremely dry and have been masked out.

Time Jul-Sep prcp wet ENSO nino

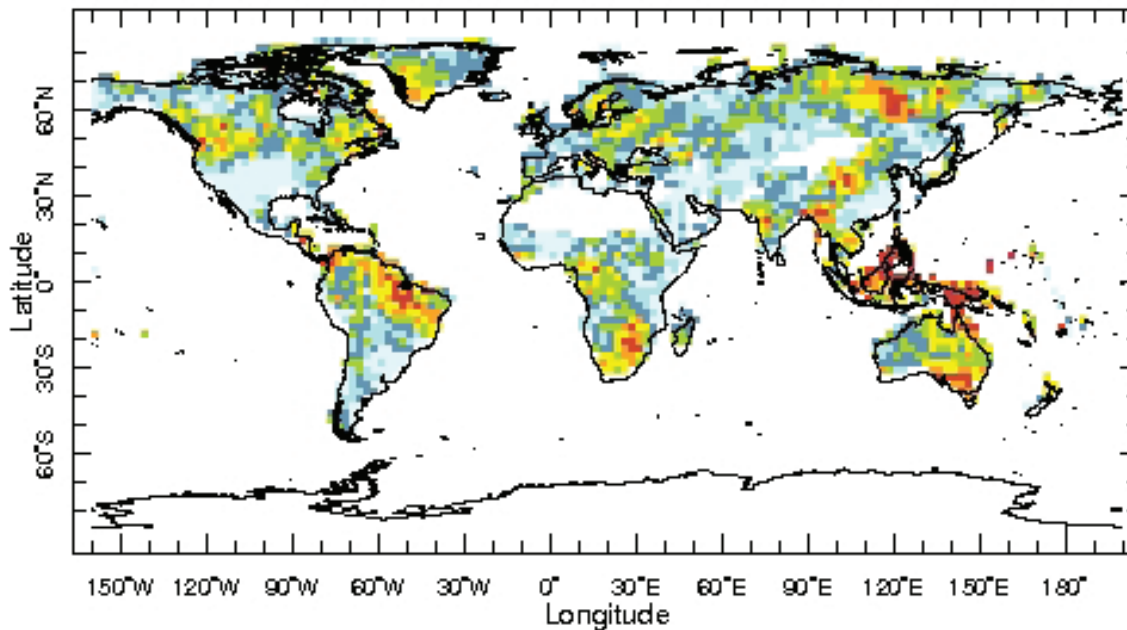


Time Jul-Sep prcp wet ENSO nino

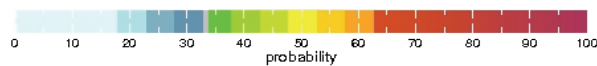




Time Oct-Dec prcp wet ENSO nino



Time Oct-Dec prcp dry ENSO nino

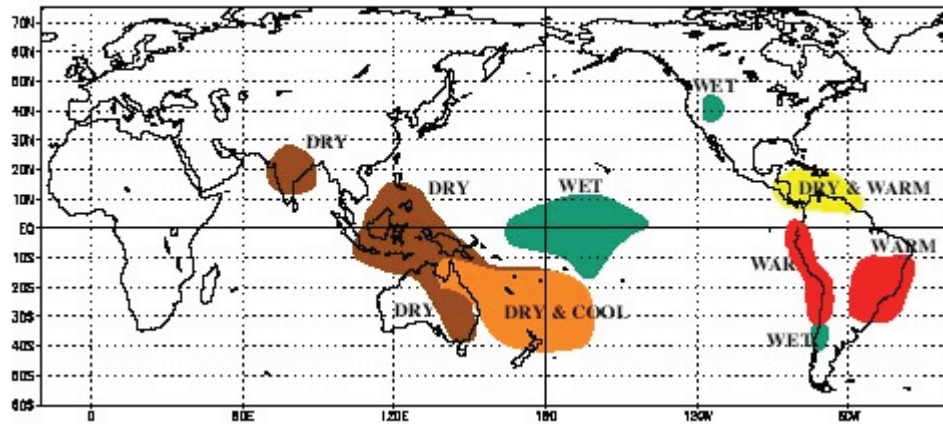


These maps show the probability of an area experiencing rainfall that is either above-normal (top) or below-normal (bottom) during El Niño events for October to December. In the top map, red areas indicate a strong chance of wetter-than-normal conditions, whereas in the bottom map they indicate a strong chance of drier-than-normal conditions. White over land indicates areas and seasons that are normally extremely dry and have been masked out.

6. FOR INFORMATION ON TYPICALLY OCCURRING RAINFALL ANOMALIES THAT HAVE ACCOMPANIED EL NIÑO CONDITIONS:

http://iri.columbia.edu/climate/ENSO/globalimpact/temp_precip/region_elnino.html

WARM EPISODE RELATIONSHIPS JUNE - AUGUST



WARM EPISODE RELATIONSHIPS DECEMBER - FEBRUARY

