



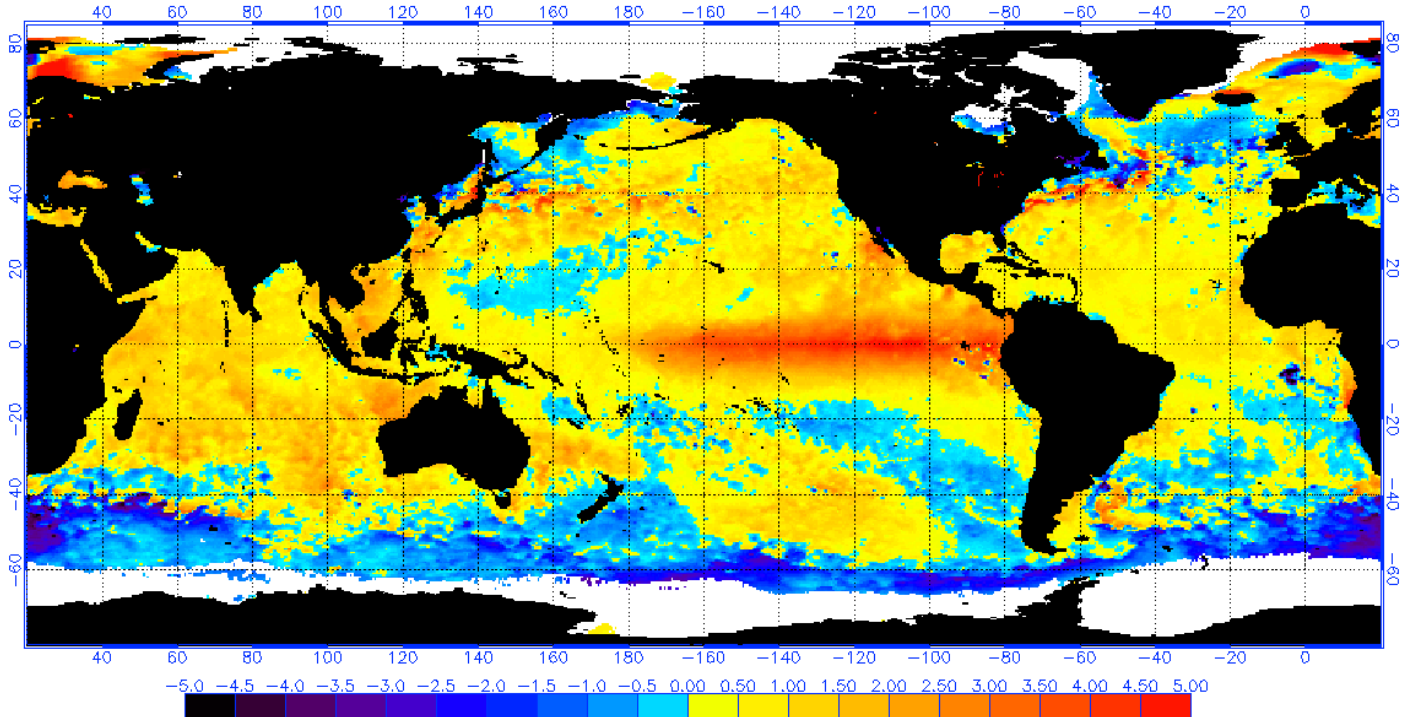
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**Extreme Events
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FLORIDA INTERNATIONAL UNIVERSITY

NOAA/NESDIS 50 KM GLOBAL ANALYSIS: SST Anomaly (degrees C), 11/30/2015
(white regions indicate sea-ice)



El Niño Southern Oscillation (ENSO) 2015–16

Latin American and Caribbean Region

Disaster Risk Reduction Program

Extreme Events Institute

Florida International University

FIU-DRR Report no. 4 (February & March 2016)

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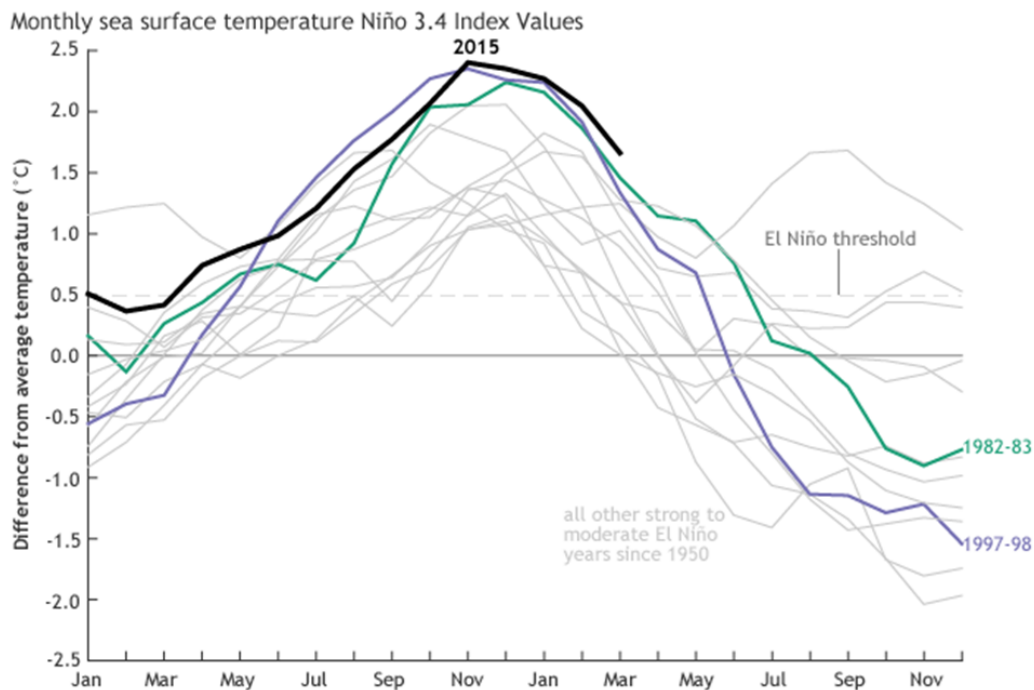
El Niño Southern Oscillation (ENSO) 2015–16

Latin American and Caribbean Region

Report no. 3, January 2016

INTRODUCTION

During February 2016, the average anomaly in the Niño3.4 region showed a strong El Niño at 2.0° C; in March it dropped to 1.6°C, maintaining a strong El Niño [1] [2] [3].



Monthly sea surface temperature in the Niño3.4 region of the tropical Pacific compared to the long-term average for all moderate-to-strong El Niño years since 1950, showing how 2015/16 (black line) compares to other strong events.

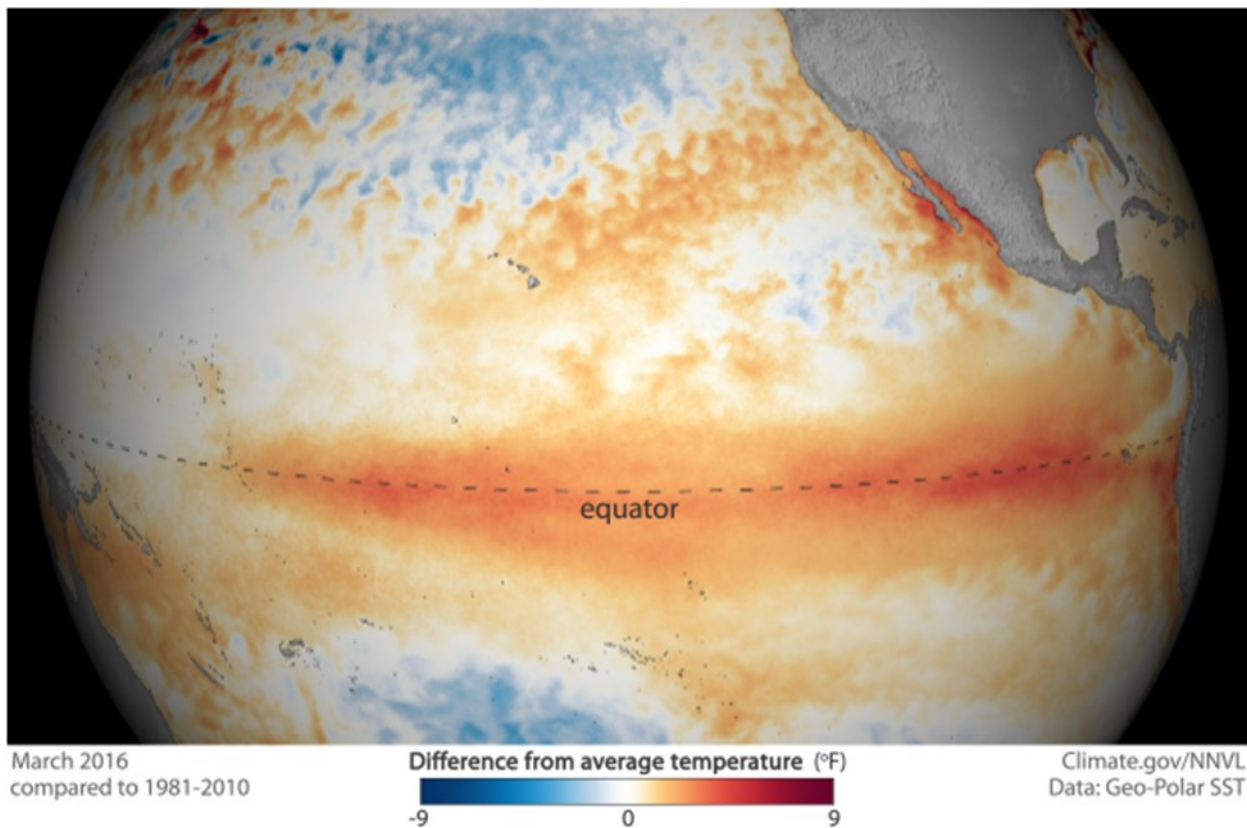
Credit: Climate.gov

Thus, El Niño continues to persist strongly, and is expected to linger on through spring and early summer of the Northern Hemisphere in 2016. Although poised towards a gradual decline, most models surveyed and expert opinion suggest that the El Niño will remain strong in the first quarter of 2016. It is expected to transition to ENSO-neutral well into the second quarter [4].

Heat content in the central Pacific dropped below average in March for the first time in a year. Sea surface temperatures in the Niño3.4 region are expected to drop below the El Niño threshold that is 0.5° C above the long-term average, in the late spring or early summer [1]. This when a transition to ENSO-neutral will be experienced. Meanwhile, NOAA has also issued a La Niña Watch as conditions for the phenomenon to emerge is likely within the second half of the year [1] [2].

La Niña usually implies cooler-than-average surface waters in the tropical central and eastern Pacific: the opposite of El Niño. It often, though not certainly, follows El Niño. Both the 1972-73 and 1997-98 El Niños were followed by a quick transition to long-lasting, strong La Niña conditions. On the other hand, sea surface temperatures following the 1982-83 El Niño bounced around just a bit below zero for more than a year, before settling into a moderate La Niña in the fall of 1984. This time, however, all models predict a transition to La Niña in the second half of the year [1].

For the upcoming April–June 2016 period, the forecast shows a strong likelihood of drier-than-normal conditions over areas of northern South America. Parts of southeastern South America as well as coastal Ecuador show high chances of above-average precipitation. Central southwest Asia as well as Alaska and the southern US show a slightly elevated chance of above-average precipitation [3].



References:

[1] <https://www.climate.gov/enso>

[2] http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/enso_advisory/ensodisc.html

[3] <http://iri.columbia.edu/news/march-climate-briefing-el-nino-impacts-still-likely/>

[4] http://www.wmo.int/pages/prog/wcp/wcasp/enso_update_latest.html

Regional Outlook by Country

Introduction

According to the April report of the International Center for Research of El Niño Phenomenon (CIIFEN), the El Niño event continues to influence the climate, as it goes through a declining period. During March, the anomalies experienced a decline in sea surface temperatures (TSM), with anomalies of -1°C in Panama and Colombian coasts; in the north regions of the Caribbean and the Gulf of Mexico, TSM anomalies were small or normal levels. According to global predicting models, El Niño may have reached maximum intensity in December with an influence until April 2016, after which it is predicted to decrease. Climate regional predictions consider that during the March-May, 2016 period, there will be greater probabilities of precipitations over normal levels in southeast South America, particularly in the center of Chile, Uruguay, Paraguay, north of Argentina, and coast of Ecuador. On the contrary, precipitations below normal levels are expected in Central America, regions of Venezuela, north of Colombia, northeast of Brazil, and north of Chile.

Source: http://www.ciifen.org/index.php?option=com_content&view=article&id=1387&catid=78&Itemid=95&lang=en

Bolivia – SENAMHI - <http://www.senamhi.gob.bo/>

The National Service of Meteorology and Hydrology of Bolivia indicates that El Niño conditions are still present in region 3.4, and sea surface temperatures (TSM) show positive thermal anomalies in most of the Pacific ocean with a gradual weakening. The report predicts a transition to a neutral El Niño phenomenon toward the end of autumn or beginning of winter 2016 (June-July). The report indicates a 50% probability of developing La Niña conditions by Spring 2016.

During the month of March 2016, rainfall patterns had the following characteristics:

1) Excess of rainfall in: San Borja, Reyes, San Joaquín, San Ramón, Santa Ana, San Matías, El Trompillo and San José de Chiquitos, and 2) Deficit of rainfall in: La Paz-Centro, Oruro, Potosí, Cochabamba, Vallegrande, Sucre, Tarija, Bermejo, Camiri, Villamontes, Yacuiba, Cobija, Riberalta, Guajaramerin, Magdalena, San Ignacio de Moxos, Trinidad, Ascensión de Guarayos, San Javier Concepción, San Ignacio de Velasco, Viru Viru, Robore and Puerto Suárez.

Source: http://www.senamhi.gob.bo/meteorologia/enso/2016/BOLETIN_ENSO_ABRIL_2016.pdf

COLOMBIA – IDEAM - <http://www.ideam.gov.co/>

The Institute of Hydrology, Meteorology and Environmental Studies (IDEAM), based on own analysis and international models of prediction, indicate in their April report that warming conditions in the tropical Pacific are maintained, associated to ENSO phenomenon in its transition from moderate to weak. The report also estimates neutral conditions by mid-year. In the short and medium term, the Institute does not consider the probability of La Niña phenomenon. However, there is a 70% chance of that phenomenon for the last trimester of 2016, expecting probable ‘cooling’ conditions of the tropical Pacific that could favor a second season of rainfall over normal levels.

During the past month of February, positive anomalies of about 2°C of sea surface temperatures (TSM) were observed in most of the center and east of the tropical Pacific Ocean. These values are compared with previous months, indicating a decrease of 'warming' conditions indicating a decline in El Niño phenomenon in most of the basin.

The report indicates that according to the Oceanic Index El Niño (ONI), the current phenomenon can be placed as the second most intense event since 1950, with quarter values dec-2015/feb-2016 at +2,2°C, indicating a strong El Niño. The Multivariate Index (MEI) places El Niño phenomenon as one of the strongest since 1950, with maximum values similar to the 1997-98 and 1982-83 events.

The IDEAM indicates that it is highly probable that El Niño phenomenon may have reached maximum intensity between December 2015 and January 2016, due to the advance of cold waters from the west, the slight decrease of sea surface temperatures and the variations in wind patterns. However, the report indicates that still, a central-east part of the basin, continues with warm waters in the tropical Pacific, which could generate further impacts in upcoming months. Predictions give a 745 probability of El Niño conditions until mid-May. An important decrease of rainfall and high temperatures were observed in the Andean, Caribbean, and Orinoquia regions. It is worth noting, that the past month of February represented the highest temperatures registered at a global level by a wide margin, setting the record as the warmest

month of the last 100 years. The deficit in rainfall affected great areas of Orinoquia, parts of Arauca, Casanare and Meta, and a great part of the Caribbean region, such as Cesar, Bolívar, Córdoba, as well as north of Santander, Tolima, Nariño and Cauca. On the contrary, there were moderate excess of rainfall in south areas of the Amazonian region.

Sources: <http://www.ideam.gov.co/>

Metorology Center of Australia BOM

International Research Institute for Climate and Society - IRI

PERU-SENAMHI-OCTUBRE 2015 - <http://www.senamhi.gob.pe/>

The Multisectoral Committee in charge of the National Study of El Niño phenomenon (ENFEN) maintains the alert warning with respect to coastal El Niño event, that generates warming conditions since autumn 2015. The institution notes the continuation of the declining phase of coastal El Niño. According to the April report, the anomaly of sea surface temperatures (TSM) in the Central Equator Pacific (Niño 3.4) decreased to +1,7°C. Similarly, convective activity, warming conditions at the ocean interior and the anomaly of western winds, has also been reduced. The results that confirm that coastal El Niño reached a moderate magnitude during the summer (dic-2015/mar-2016) can be observed in the updating of coastal El Niño Index (ICENTmp) for the months of March and April, with +1,14°C (moderate warming condition) and +0,78°C (weak warming condition).

The ENFEN estimates that during the month of April, a cold Kelvin wave will arrive to Peruvian coasts, which will contribute to the normalization of oceanographic conditions, even though temperature fluctuation anomalies are not ruled out, due to wind behavior and the arrival of a warm and weak Kelvin wave. This adds to the predictions of levels of rainfall that continue to decrease in the north coast by the end of April, due to the seasonal behavior and a decline of coastal El Niño. The Multisectoral Committee ENFEN considers that the end of coastal el Niño phenomenon will occur during the autumn, with neutral conditions during the winter.

Sources: <http://www.senamhi.gob.pe/load/file/02204SENA-56.pdf>; <http://www.senamhi.gob.pe/>

PANAMA – HIDROMET - <http://www.hidromet.com.pa/index.php>

According to Hidromet in Panama, it is expected that El Niño phenomenon will continue strong during the winter of 2015-2016 in the northern hemisphere (Source: CPC/NCEP/NWS – 14/1/2016). The report notes that the scenario will be within the normal ranges within the climate characteristics of each region for the month of February, even though sporadic precipitations could occur due to cold fronts that may impact in colder temperatures that are not common in the country's dry season.

For the month of April, it is estimated the transition between dry and rainy season in Pacific watershed, with a sustained weakening of trade winds and greater predominance of southwest humid winds. The breeze of the Pacific watershed is one of the key factors in the level of rainfall.

ECUADOR – ERFEN - <http://www.inocar.mil.ec/erfen/>

The Madden Julian Oscillation (MJO) with a convective phase until March 2016, determines a possible increase in the intensity of rainfall, particularly in regions that are located at the interior of the coast. The insular region is expected to have rainfall of variable intensity, due to the influence of intertropical convergence zone. This phase could activate the south arm of the Intertropical Convergence Zone (ZCIT) generating precipitations of variable intensity in regions of the Guayas and El Oro provinces.

For the February/March/April quarter, it is estimated significant probabilities of rainfall over normal levels for most of the coast; with the exception of the center-south region of Manabí. The insular region expects high rainfall probabilities over normal averages.

The statistical and dynamic models in El Niño region 1+2 (90° O - 80° O and 0-10°S) indicate that temperature anomalies for the region maintain their tendency to decrease. For the second semester of the year, normal to slightly cold conditions are predicted.

For the region El Niño 3 (150° O - 90° O and 10 ° S), even though positive temperature anomalies show a decrease, they have been around 3° C during the last months and would continue to decrease to around 1.5° C during the first quarter of 2016. During the second quarter, positive anomalies are expected to decrease, with normal conditions of the second semester of the year.

Source: <http://www.inocar.mil.ec/erfen/>