Catalogue of Indices and Definitions of El Niño and La Niña in Operational Use by WMO Members

WMO Commission for Climatology
Expert Team on El Niño and La Niña Definitions (2005)
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June 2006

The World Climate Programme (WCP) implemented by WMO in conjunction with other international organizations consists of four major components:

The World Climate Data and Monitoring Programme (WCDMP)
The World Climate Applications and Services Programme (WCASP)
The World Climate Impact Assessment and Response Strategies Programme (WCIRP)
The World Climate Research Programme (WCRP)

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NOTE

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Introduction

El Niño and La Niña mean different things to different countries, primarily due to the impacts each Member State experiences as a result of changes in the ocean and atmosphere originating in the tropical Pacific and subsequently extending to other parts of the world. In an historical context, El Niño was first referred to as the seasonal appearance of a current of warmer than usual water off the Peruvian coast, identified by local fisherman as the "El Niño current." This warm water generally occurs around Christmas, hence the name El Niño, or little boy, referring to the Christ Child. Every 2-7 years, a much larger anomaly (both in space and time) appears, and indeed the people of the west coast of South America experience significant impacts as a result of the warmer water, such as changes that affect the fishing industry and changes to local weather. El Niño sea surface warming is typically followed by either near-average sea surface temperatures (SST) or colder than average SSTs (La Niña, or little girl, also known as El Viejo, Anti-Niño, or anti El Niño).

El Niño and La Niña events have now been clearly identified as perturbations of the ocean-atmosphere system. In addition to changes in SSTs, there are typically changes in the strength and direction of the Trade winds. These changes are represented by the Southern Oscillation Index (SOI), which is defined as the normalized difference in surface pressure between Tahiti, French Polynesia, and Darwin, Australia (i.e. the sea-level pressure anomaly at Tahiti minus the sea-level pressure anomaly at Darwin, divided by the standard deviation of that quantity), and is a measure of the strength of the Trade winds. As El Niño and the Southern Oscillation are related, the two phrases are often combined as ENSO (El Niño-Southern Oscillation). An ENSO warm phase refers to an El Niño event, and an ENSO cold phase refers to a La Niña event.

Across the equatorial Pacific, according to the World Meteorological Organization (2003), during an El Niño event the easterly Trade winds weaken and the focus of convection and rainfall shifts eastward. In contrast, during a La Niña event, the Trade winds strengthen and convection is enhanced over the western part of the equatorial Pacific basin, in Asia and near Indonesia. These displacements of the atmospheric heat source overlaying the warmest water result in large changes in the global atmospheric circulation, which in turn force changes in weather in regions far removed from the tropical Pacific. The three phases of the El Niño-Southern Oscillation are shown in graphic form in WMO 2003 (section 2.15) and at the NOAA Pacific Marine Environmental Laboratory web page on El Niño at:
http://www.pmel.noaa.gov/tao/elnino/nino_normal.html

As a result of such atmospheric perturbations associated with ENSO events, various impacts are felt at different locations around the globe, and these regional impacts are dependent on the location, degree, and timing of the onset of the anomalous SSTs, and the intensity of the atmospheric response. Scientists, forecasters, policy-makers, decision-makers, the media, and many others in the international community often refer to El Niño (La Niña), but it is apparent that the major commonality in their references is anomalous warming (cooling) in the surface waters of the tropical Pacific.

Because of the potential confusion associated with the differing definitions in existence, a request was made at EC-LVI (2004) for the World Climate Programme (WCP) and the Commission for Climatology (CCl) to address the issue of El Niño and La Niña definitions. At the CCl Management Group Meeting in February 2005, the Expert Team (ET) on El Niño and La Niña Definitions was established under OPAG 2 (Monitoring and Analysis of Climate Variability and Change). The ET had international membership and was led by a representative from the United States, Dr Fiona Horsfall. Membership is listed in Appendix I. The Terms of Reference for the Team included the preparation of a catalogue of El Niño and La Niña indices and definitions used operationally by the WMO Members. The Team drafted a survey that was distributed by WMO to Members' Permanent Representatives requesting specific information on their use of indices and definitions of El Niño and La Niña. Responses to the survey were collected by WMO and forwarded to the ET for development of this catalogue.

This catalogue is intended to be used as a reference for stakeholders to clarify ambiguities surrounding discussions of El Niño and La Niña, and thus reduce the chance of misinterpretation of information relating to these events. It will facilitate discussion and action on regional cooperation prior to issuance of press releases, alerts and public communiqués.

Anticipated users of this catalogue include anyone interested in the occurrence of and impacts related to El Niño and La Niña events. Specifically, users include Member governments, their agencies and in particular their National Meteorological and Hydrological Services (NMHS), media, emergency managers, climate scientists, weather forecasters, hydrologists, academia, water managers, and a broad array of decision makers at international, national, regional, and local levels.

This catalogue contains a listing for each Member that responded to the survey. Some Members responded stating that they do not have indices and definitions for operational use, and that information is also included in this document. In addition, Members of Regional Association IV, which adopted a consensus definition at their 14th Session in Costa Rica in April 2005, have been included.

As this document frequently refers to the Niño regions, a graphic depicting them can be found in Appendix II. A list of selected resources with information on El Niño and La Niña can be found in Appendix III.

Indices and Definitions of El Niño and La Niña in Operational Use by WMO Members

Antigua and Barbuda

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2. **Official name of Indices and Definitions**
WMO Regional Association IV Consensus Index and definitions of El Niño and La Niña.

3. **Other Countries or territories with shared indices and definitions**
Members of Regional Association (RA) IV.

4. **Index (indices) in use operationally**
The RA IV index is defined as three-month averages of sea surface temperature departures from normal for a critical region of the equatorial Pacific (Niño3.4 region; 120°W-170°W, 5°N-5°S).

5. **Definition of El Niño in use operationally**
A phenomenon in the equatorial Pacific Ocean characterized by a positive sea surface temperature departure from normal (for the 1971-2000 base period) in the Niño3.4 region greater than or equal in magnitude to 0.5°C, averaged over three consecutive months.

6. **Definition of La Niña in use operationally**
A phenomenon in the equatorial Pacific Ocean characterized by a negative sea surface temperature departure from normal (for the 1971-2000 base period) in the Niño3.4 region greater than or equal in magnitude to 0.5°C, averaged over three consecutive months.

Argentina

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2. **Official name of Indices and Definitions**
N/A

3. **Other Countries or territories with shared indices and definitions**
Members of Regional Association III.

4. **Index (indices) in use operationally**
Argentina uses the indices determined by the US National Oceanic and Atmospheric Administration's (NOAA) Climate Prediction Center (the 3-month average sea surface temperature anomalies in the Niño3.4 region – ONI, Oceanic Niño Index) and the index proposed by the Japan Meteorological Agency (the 5-month average sea surface temperature anomalies in the region bound by 150°W-90°W, 4°N-4°S,). For an atmospheric indicator, we use the Southern Oscillation Index (SOI).

5. **Definition of El Niño in use operationally**
An oceanic-atmospheric interaction phenomenon characterized by the appearance of unusually high ocean surface temperatures in the central equatorial Pacific Ocean. We consider the 3-month average in the Niño3.4 region greater than or equal in magnitude to 0.5°C and a negative SOI.

6. **Definition of La Niña in use operationally**
An oceanic-atmospheric interaction phenomenon characterized by the appearance of unusually low ocean surface temperatures in the central equatorial Pacific Ocean. We consider the 3-month average in the Niño3.4 region less than or equal in magnitude to 0.5°C and a positive SOI.

Australia

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2. **Official name of Indices and Definitions**
   - Troup Southern Oscillation Index (SOI)
   - Niño1, 2, 3, 3.4, and 4 Sea Surface Temperature (SST) indices
   - Multivariate ENSO (El Niño-Southern Oscillation) index (MEI)

3. **Other Countries or territories with shared indices and definitions**
   These indices are used by multiple countries and territories.

4. **Index (indices) in use operationally**
   - Troup Southern Oscillation Index (SOI) - The standardized anomaly of the Mean Sea Level Pressure difference between Tahiti and Darwin.
   - Niño1, 2, 3, 3.4, and 4 Sea Surface Temperature (SST) indices.
   - Multivariate ENSO index (MEI) - A weighted average of the main ENSO features contained in six variables: sea-level pressure, the east-west and north-south components of the surface wind, SST, surface air temperature, and total amount of cloudiness.

5. **Definition of El Niño in use operationally**
   At present the Bureau of Meteorology does not employ formal definitions to trigger declarations of events at either end of the El Niño – La Niña cycle, but rather uses various indices as assessment tools. The assessment of El Niño/La Niña status is conducted within a scientific yet largely subjective framework and encompasses at least one formal meeting (The Monthly Climate Meeting) per month of operational and scientific staff to discuss the full range of analysis of the atmospheric and ocean state. This includes examination of the indices listed above, as well as proxy indicators such as trade winds, high cloud amount/outgoing longwave radiation, ocean subsurface temperatures, sea surface temperature distribution and model outputs. This assessment is used to develop the text for the Bureau's "ENSO wrap-up" discussion, updated weekly in times of El Niño development, and publicly available on the web (http://www.bom.gov.au/climate/enso).

6. **Definition of La Niña in use operationally**
   See above.

Austria

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2. **Official name of Indices and Definitions**
No indices or definitions for El Niño and La Niña in use.

3. **Other Countries or territories with shared indices and definitions**
N/A

4. **Index (indices) in use operationally**
N/A

5. **Definition of El Niño in use operationally**
N/A

6. **Definition of La Niña in use operationally**
N/A

Bahamas

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2. **Official name of Indices and Definitions**
WMO Regional Association IV Consensus Index and definitions of El Niño and La Niña.

3. **Other Countries or territories with shared indices and definitions**
Members of Regional Association (RA) IV.

4. **Index (indices) in use operationally**
The RA IV index is defined as three-month averages of sea surface temperature departures from normal for a critical region of the equatorial Pacific (Niño3.4 region; 120°W-170°W, 5°N-5°S).

5. **Definition of El Niño in use operationally**
A phenomenon in the equatorial Pacific Ocean characterized by a positive sea surface temperature departure from normal (for the 1971-2000 base period) in the Niño3.4 region greater than or equal in magnitude to 0.5°C, averaged over three consecutive months.

6. **Definition of La Niña in use operationally**
A phenomenon in the equatorial Pacific Ocean characterized by a negative sea surface temperature departure from normal (for the 1971-2000 base period) in the Niño3.4 region greater than or equal in magnitude to 0.5°C, averaged over three consecutive months.

Bangladesh

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2. **Official name of Indices and Definitions**
   SOI (Southern Oscillation Index) and Definition of El Niño & La Niña.

3. **Other Countries or territories with shared indices and definitions**
   India Meteorological Department (IMD) and Bureau of Meteorology (BoM) – Australia.

4. **Index (indices) in use operationally**
   Highly positive SOI (≥ 5) and highly negative SOI (≤ - 5) contribute excess and deficit rainfall respectively in monsoon.

5. **Definition of El Niño in use operationally**
   SOI ≥ 5 for consecutive three months.

6. **Definition of La Niña in use operationally**
   SOI ≤ -5 for consecutive three months.

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2. **Official name of Indices and Definitions**
WMO Regional Association IV Consensus Index and definitions of El Niño and La Niña.

3. **Other Countries or territories with shared indices and definitions**
Members of Regional Association (RA) IV.

4. **Index (indices) in use operationally**
The RA IV index is defined as three-month averages of sea surface temperature departures from normal for a critical region of the equatorial Pacific (Niño3.4 region; 120°W-170°W, 5°N-5°S).

5. **Definition of El Niño in use operationally**
A phenomenon in the equatorial Pacific Ocean characterized by a positive sea surface temperature departure from normal (for the 1971-2000 base period) in the Niño3.4 region greater than or equal in magnitude to 0.5°C, averaged over three consecutive months.

6. **Definition of La Niña in use operationally**
A phenomenon in the equatorial Pacific Ocean characterized by a negative sea surface temperature departure from normal (for the 1971-2000 base period) in the Niño3.4 region greater than or equal in magnitude to 0.5°C, averaged over three consecutive months.

Belize

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2. **Official name of Indices and Definitions**

WMO Regional Association IV Consensus Index and definitions of El Niño and La Niña.

3. **Other Countries or territories with shared indices and definitions**

Members of Regional Association (RA) IV.

4. **Index (indices) in use operationally**

The RA IV index is defined as three-month averages of sea surface temperature departures from normal for a critical region of the equatorial Pacific (Niño3.4 region; 120°W-170°W, 5°N-5°S).

5. **Definition of El Niño in use operationally**

A phenomenon in the equatorial Pacific Ocean characterized by a positive sea surface temperature departure from normal (for the 1971-2000 base period) in the Niño3.4 region greater than or equal in magnitude to 0.5°C, averaged over three consecutive months.

6. **Definition of La Niña in use operationally**

A phenomenon in the equatorial Pacific Ocean characterized by a negative sea surface temperature departure from normal (for the 1971-2000 base period) in the Niño3.4 region greater than or equal in magnitude to 0.5°C, averaged over three consecutive months.

Brazil

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2. **Official name of Indices and Definitions**

Southern Oscillation Index (SOI) and Definitions of El Niño and La Niña in region Niño3.4 and spatial distribution of sea surface temperature (SST) near Peruvian coast.

3. **Other Countries or territories with shared indices and definitions**

Members of Regional Association III.

4. **Index (indices) in use operationally**

SOI as calculated from the monthly or seasonal fluctuations in the air pressure difference between Tahiti and Darwin.

5. **Definition of El Niño in use operationally**

A phenomenon that takes place in the Equatorial Pacific Ocean, characterized by a positive sea surface temperature anomaly (as compared to the 1971-2000 SST mean), in excess of 0.5°C, averaged over three consecutive months in the Niño3.4 Region.

6. **Definition of La Niña in use operationally**

A phenomenon that takes place in the Equatorial Pacific Ocean, characterized by a negative sea surface temperature anomaly (related to the 1971-2000 mean), greater than or equal in magnitude to 0.5°C, averaged over three consecutive months in the Niño3.4 Region.

British Caribbean Territories (including Cayman Islands)

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2. **Official name of Indices and Definitions**
WMO Regional Association IV Consensus Index and definitions of El Niño and La Niña.

3. **Other Countries or territories with shared indices and definitions**
Members of Regional Association (RA) IV.

4. **Index (indices) in use operationally**
The RA IV index is defined as three-month averages of sea surface temperature departures from normal for a critical region of the equatorial Pacific (Niño3.4 region; 120°W-170°W, 5°N-5°S).

5. **Definition of El Niño in use operationally**
A phenomenon in the equatorial Pacific Ocean characterized by a positive sea surface temperature departure from normal (for the 1971-2000 base period) in the Niño3.4 region greater than or equal in magnitude to 0.5°C, averaged over three consecutive months.

6. **Definition of La Niña in use operationally**
A phenomenon in the equatorial Pacific Ocean characterized by a negative sea surface temperature departure from normal (for the 1971-2000 base period) in the Niño3.4 region greater than or equal in magnitude to 0.5°C, averaged over three consecutive months.

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2. **Official name of Indices and Definitions**

WMO Regional Association IV Consensus Index and definitions of El Niño and La Niña.

3. **Other Countries or territories with shared indices and definitions**

Members of Regional Association (RA) IV.

4. **Index (indices) in use operationally**

The RA IV index is defined as three-month averages of sea surface temperature departures from normal for a critical region of the equatorial Pacific (Niño3.4 region; 120°W-170°W, 5°N-5°S).

5. **Definition of El Niño in use operationally**

A phenomenon in the equatorial Pacific Ocean characterized by a positive sea surface temperature departure from normal (for the 1971-2000 base period) in the Niño3.4 region greater than or equal in magnitude to 0.5°C, averaged over three consecutive months.

6. **Definition of La Niña in use operationally**

A phenomenon in the equatorial Pacific Ocean characterized by a negative sea surface temperature departure from normal (for the 1971-2000 base period) in the Niño3.4 region greater than or equal in magnitude to 0.5°C, averaged over three consecutive months.

Chile

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2. **Official name of Indices and Definitions**

Chile uses the same indices and definitions adopted by Regional Association IV, as well as others.

3. **Other Countries or territories with shared indices and definitions**

Members of Regional Association III, especially the other countries within the Permanent Commission for the South Pacific (CPPS): Colombia, Ecuador, and Peru.

4. **Index (indices) in use operationally**

- Niño indices (Niño4, Niño3.4, Niño3 and Niño1+2).
- 850 hPa wind anomalies in the equatorial Pacific (160°E-140W and 150°W-160°W).
- Sea level pressure indices at seven Chilean stations between 18°S and 40°S.
- Southern Oscillation Index.
- Circulation patterns over the southeast Pacific and South America between 0°S and 80°S.

5. **Definition of El Niño in use operationally**

Chile issues El Niño advisories when the positive equatorial Pacific Ocean sea surface temperature departure from normal (for the 1971-2000 base period) in the Niño3.4 region is greater than or equal in magnitude to 0.5°C, averaged over three consecutive months. An El Niño episode is defined when these criteria are met for five consecutive overlapping seasons.

6. **Definition of La Niña in use operationally**

A phenomenon in the equatorial Pacific Ocean characterized by a negative sea surface temperature departure from normal (for the 1971-2000 base period) in the Niño3.4 region greater than or equal in magnitude to 0.5°C, occurring for three or more consecutive months.

China

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2. **Official name of Indices and Definitions**
   - Niño1+2, Niño3, Niño3.4, and Niño4.
   - NiñoZ (Niño1+2+3+4).
   - NiñoC (180°W-90°W,0°-10°S).

3. **Other Countries or territories with shared indices and definitions**

The indices Niño1+2, Niño3, and Niño4 are all widely used around the world.

4. **Index (indices) in use operationally**

All the Niño indices used in Section 2 above refer to the regional mean sea surface temperature anomalies (SSTA) relative to 1971-2000 averages. China also uses the SSTA of the Niño3 and Niño3.4 regions operationally, but pays more attention to the SSTA in NiñoZ.

5. **Definition of El Niño in use operationally**

A phenomenon in the equatorial Pacific Ocean characterized by a positive sea surface temperature departure from normal (based on 1971-2000 base period) in the NiñoZ region greater than or equal in magnitude to 0.5°C, for six consecutive months.

6. **Definition of La Niña in use operationally**

A phenomenon in the equatorial Pacific Ocean characterized by a negative sea surface temperature departure from normal (based on 1971-2000 base period) in the NiñoZ region less than or equal in magnitude to -0.5°C, for six consecutive months.

References:

Li, Xiaoyan and Panmao Zhai, 2000: On Indices and indicators of ENSO Episodes, Acta Meteorologica Sinica, 58: 102-109 (In Chinese with English Abstract).

Li, Xiaoyan, Panmao Zhai and Fumin Ren, 2005: Redefining ENSO Episodes Based on Changed Climate References, J. Tropical Meteorology, 11: 97-103.

Zhai, Panmao, Li, Xiaoyan, and Fumin Ren, 2003: El Niño, Meteorological Press, 180pp (In Chinese).

Colombia

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2. **Official name of Indices and Definitions**
WMO Regional Association IV Consensus Index and definitions of El Niño and La Niña, in addition to the Niño3 index.

3. **Other Countries or territories with shared indices and definitions**
Members of Regional Association (RA) IV

4. **Index (indices) in use operationally**
The RA IV index is defined as three-month averages of sea surface temperature departures from normal for a critical region of the equatorial Pacific (Niño3.4 region; 120°W-170°W, 5°N-5°S).

Additionally, Columbia considers sea surface temperature anomalies in the Niño3 region (90°W-150°W, 5°N-5°S).

5. **Definition of El Niño in use operationally**
A phenomenon in the equatorial Pacific Ocean characterized by a positive sea surface temperature departure from normal (for the 1971-2000 base period) in the Niño3.4 region greater than or equal in magnitude to 0.5°C, averaged over three consecutive months, and/or when the anomalies in the index regions are greater than or equal to one standard deviation above the mean for a period greater than three months.

6. **Definition of La Niña in use operationally**
A phenomenon in the equatorial Pacific Ocean characterized by a negative sea surface temperature departure from normal (for the 1971-2000 base period) in the Niño3.4 region greater than or equal in magnitude to 0.5°C, averaged over three consecutive months, and/or when the anomalies in the index regions are less than or equal to one standard deviation below the mean for a period greater than three months.

Costa Rica

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2. **Official name of Indices and Definitions**
WMO Regional Association IV Consensus Index and definitions of El Niño and La Niña.

3. **Other Countries or territories with shared indices and definitions**
Members of Regional Association (RA) IV.

4. **Index (indices) in use operationally**
The RA IV index is defined as three-month averages of sea surface temperature departures from normal for a critical region of the equatorial Pacific (Niño3.4 region; 120°W-170°W, 5°N-5°S).

5. **Definition of El Niño in use operationally**
A phenomenon in the equatorial Pacific Ocean characterized by a positive sea surface temperature departure from normal (for the 1971-2000 base period) in the Niño3.4 region greater than or equal in magnitude to 0.5°C, averaged over three consecutive months.

6. **Definition of La Niña in use operationally**
A phenomenon in the equatorial Pacific Ocean characterized by a negative sea surface temperature departure from normal (for the 1971-2000 base period) in the Niño3.4 region greater than or equal in magnitude to 0.5°C, averaged over three consecutive months.

Croatia

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2. **Official name of Indices and Definitions**

Croatia does not use El Niño indices operationally, but some research activities have been started to investigate if there is any ENSO (El Niño-Southern Oscillation) impact on Croatian territory. For this study, we are using Niño3 (150°W-90°W, 5°S-5°N) and Niño3.4 (120°W-170°W, 5°N-5°S) indices.

3. **Other Countries or territories with shared indices and definitions**

N/A

4. **Index (indices) in use operationally**

See Section 2 above.

5. **Definition of El Niño in use operationally**

El Niño is defined as a positive sea surface temperature departure from ECMWF (European Centre for Medium-Range Weather Forecasts) ERA40, in Niño3 or Niño3.4 region greater or equal in magnitude to 0.5°C (for moderate events), averaged over three consecutive months, and greater or equal to 1 standard deviation for strong events.

6. **Definition of La Niña in use operationally**

La Niña is defined as a negative sea-surface temperature departure from ECMWF ERA40, in Niño3 or Niño3.4 region greater or equal in magnitude to 0.5°C (for moderate events), averaged over three consecutive months, and greater or equal to 1 standard deviation for strong events.

Cuba

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2. **Official name of Indices and Definitions**
WMO Regional Association IV Consensus Index and definitions of El Niño and La Niña.

3. **Other Countries or territories with shared indices and definitions**
Members of Regional Association (RA) IV.

4. **Index (indices) in use operationally**
The RA IV index is defined as three-month averages of sea surface temperature departures from normal for a critical region of the equatorial Pacific (Niño3.4 region; 120°W-170°W, 5°N-5°S).

5. **Definition of El Niño in use operationally**
A phenomenon in the equatorial Pacific Ocean characterized by a positive sea surface temperature departure from normal (for the 1971-2000 base period) in the Niño3.4 region greater than or equal in magnitude to 0.5°C, averaged over three consecutive months.

6. **Definition of La Niña in use operationally**
A phenomenon in the equatorial Pacific Ocean characterized by a negative sea surface temperature departure from normal (for the 1971-2000 base period) in the Niño3.4 region greater than or equal in magnitude to 0.5°C, averaged over three consecutive months.

Denmark (including Faroe Islands, Greenland and surrounding waters)

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2. **Official name of Indices and Definitions**
None

3. **Other Countries or territories with shared indices and definitions**
The index and definitions used are the same as those in use in the United States of America.

4. **Index (indices) in use operationally**
The index is defined as three-month averages of sea surface temperature departures from normal for a critical region of the equatorial Pacific (Niño3.4 region; 120°W-170°W, 5°N-5°S).

5. **Definition of El Niño in use operationally**
A phenomenon in the equatorial Pacific Ocean characterized by a positive sea surface temperature departure from normal (for the 1971-2000 base period) in the Niño3.4 region greater than or equal in magnitude to 0.5°C, averaged over three consecutive months.

6. **Definition of La Niña in use operationally**
A phenomenon in the equatorial Pacific Ocean characterized by a negative sea surface temperature departure from normal (for the 1971-2000 base period) in the Niño3.4 region greater than or equal in magnitude to 0.5°C, averaged over three consecutive months.

Dominica

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2. **Official name of Indices and Definitions**
WMO Regional Association IV Consensus Index and definitions of El Niño and La Niña.

3. **Other Countries or territories with shared indices and definitions**
Members of Regional Association (RA) IV.

4. **Index (indices) in use operationally**
The RA IV index is defined as three-month averages of sea surface temperature departures from normal for a critical region of the equatorial Pacific (Niño3.4 region; 120°W-170°W, 5°N-5°S).

5. **Definition of El Niño in use operationally**
A phenomenon in the equatorial Pacific Ocean characterized by a positive sea surface temperature departure from normal (for the 1971-2000 base period) in the Niño3.4 region greater than or equal in magnitude to 0.5°C, averaged over three consecutive months.

6. **Definition of La Niña in use operationally**
A phenomenon in the equatorial Pacific Ocean characterized by a negative sea surface temperature departure from normal (for the 1971-2000 base period) in the Niño3.4 region greater than or equal in magnitude to 0.5°C, averaged over three consecutive months.

Dominican Republic

1. **Contact information**

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2. **Official name of Indices and Definitions**

WMO Regional Association IV Consensus Index and definitions of El Niño and La Niña.

3. **Other Countries or territories with shared indices and definitions**

Members of Regional Association (RA) IV.

4. **Index (indices) in use operationally**

The RA IV index is defined as three-month averages of sea surface temperature departures from normal for a critical region of the equatorial Pacific (Niño3.4 region; 120°W-170°W, 5°N-5°S).

5. **Definition of El Niño in use operationally**

A phenomenon in the equatorial Pacific Ocean characterized by a positive sea surface temperature departure from normal (for the 1971-2000 base period) in the Niño3.4 region greater than or equal in magnitude to 0.5°C, averaged over three consecutive months.

6. **Definition of La Niña in use operationally**

A phenomenon in the equatorial Pacific Ocean characterized by a negative sea surface temperature departure from normal (for the 1971-2000 base period) in the Niño3.4 region greater than or equal in magnitude to 0.5°C, averaged over three consecutive months.

Ecuador

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2. **Official name of Indices and Definitions**
WMO Regional Association III Index and definitions of El Niño and La Niña

3. **Other Countries or territories with shared indices and definitions**
Members of Regional Association III, especially Peru.

4. **Index (indices) in use operationally**
Niño1 (80°W-90°W, 0°S-5°S) and Niño2 (80°W-90°W, 5°S-10°S) three month mean variations in the sea surface temperature.

5. **Definition of El Niño in use operationally**
The ENSO (El Niño-Southern Oscillation) phenomenon is a perturbation of the coupled ocean-atmosphere system in the tropical Pacific, which has important global atmospheric consequences. El Niño is used to describe the warm phase of an ENSO episode, the oceanic El Niño that transcends the ocean and affects the atmospheric circulation over the equatorial Pacific, due to atmospheric-oceanic interactions inherent in the negative phase of the Southern Oscillation.

6. **Definition of La Niña in use operationally**
La Nina is defined as the appearance of cold waters in the equatorial Pacific that transcends its oceanic aspect and affects the atmospheric circulation over the equatorial Pacific, due to oceanic-atmospheric interactions during the positive phase of the Southern Oscillation.

El Salvador

1. **Contact information**
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   Servicio Nacional de Estudios Territoriales
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   SAN SALVADOR
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2. **Official name of Indices and Definitions**
   WMO Regional Association IV Consensus Index and definitions of El Niño and La Niña

3. **Other Countries or territories with shared indices and definitions**
   Members of Regional Association (RA) IV

4. **Index (indices) in use operationally**
   The RA IV index is defined as three-month averages of sea surface temperature departures from normal for a critical region of the equatorial Pacific (Niño 3.4 region; 120°W-170°W, 5°N-5°S).

5. **Definition of El Niño in use operationally**
   A phenomenon in the equatorial Pacific Ocean characterized by a positive sea surface temperature departure from normal (for the 1971-2000 base period) in the Niño3.4 region greater than or equal in magnitude to 0.5°C, averaged over three consecutive months.

6. **Definition of La Niña in use operationally**
   A phenomenon in the equatorial Pacific Ocean characterized by a negative sea surface temperature departure from normal (for the 1971-2000 base period) in the Niño3.4 region greater than or equal in magnitude to 0.5°C, averaged over three consecutive months.

Fiji

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2. **Official name of Indices and Definitions**
Fiji Meteorological Services uses the ICU (Island Climate Update) monthly teleconference organized by the NIWA (New Zealand) with regional experts from Australia, New Caledonia, Fiji, French Polynesia, Hawaï, IRI, and others, to determine a consensus about the observed and predicted ENSO phase.

3. **Other Countries or territories with shared indices and definitions**
Most of the Pacific Island countries refer to the ENSO (El Niño-Southern Oscillation) "Wrap Up" for updates which is available on the Bureau of Meteorology (Australia) website.

4. **Index (indices) in use operationally**
The Southern Oscillation (strength and direction) is measured by a simple index, the Southern Oscillation Index (SOI).

5. **Definition of El Niño in use operationally**
A sustained warming in excess of 1°C above normal, of the central and eastern tropical Pacific Ocean, typically centered around the Niño3 region. This warming is usually accompanied by negative values of the SOI, and a decrease in the strength of the Pacific Trade Winds.

6. **Definition of La Niña in use operationally**
A sustained cooling in excess of 1°C below normal, of the central and eastern tropical Pacific Ocean, typically centered around the Niño3 region. This cooling is usually accompanied by positive values of the SOI, and an increase in the strength of the Pacific Trade Winds.

Guatemala

1. **Contact information**

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2. **Official name of Indices and Definitions**

WMO Regional Association IV Consensus Index and definitions of El Niño and La Niña.

3. **Other Countries or territories with shared indices and definitions**

Members of Regional Association (RA) IV.

4. **Index (indices) in use operationally**

The RA IV index is defined as three-month averages of sea surface temperature departures from normal for a critical region of the equatorial Pacific (Niño3.4 region; 120°W-170°W, 5°N-5°S).

5. **Definition of El Niño in use operationally**

A phenomenon in the equatorial Pacific Ocean characterized by a positive sea surface temperature departure from normal (for the 1971-2000 base period) in the Niño3.4 region greater than or equal in magnitude to 0.5°C, averaged over three consecutive months.

6. **Definition of La Niña in use operationally**

A phenomenon in the equatorial Pacific Ocean characterized by a negative sea surface temperature departure from normal (for the 1971-2000 base period) in the Niño3.4 region greater than or equal in magnitude to 0.5°C, averaged over three consecutive months.

Haiti

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2. **Official name of Indices and Definitions**

WMO Regional Association IV Consensus Index and definitions of El Niño and La Niña.

3. **Other Countries or territories with shared indices and definitions**

Members of Regional Association (RA) IV.

4. **Index (indices) in use operationally**

The RA IV index is defined as three-month averages of sea surface temperature departures from normal for a critical region of the equatorial Pacific (Niño3.4 region; 120°W-170°W, 5°N-5°S).

5. **Definition of El Niño in use operationally**

A phenomenon in the equatorial Pacific Ocean characterized by a positive sea surface temperature departure from normal (for the 1971-2000 base period) in the Niño3.4 region greater than or equal in magnitude to 0.5°C, averaged over three consecutive months.

6. **Definition of La Niña in use operationally**

A phenomenon in the equatorial Pacific Ocean characterized by a negative sea surface temperature departure from normal (for the 1971-2000 base period) in the Niño3.4 region greater than or equal in magnitude to 0.5°C, averaged over three consecutive months.

Honduras

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2. **Official name of Indices and Definitions**
WMO Regional Association IV Consensus Index and definitions of El Niño and La Niña

3. **Other Countries or territories with shared indices and definitions**
Members of Regional Association (RA) IV

4. **Index (indices) in use operationally**
The RA IV index is defined as three-month averages of sea surface temperature departures from normal for a critical region of the equatorial Pacific (Niño 3.4 region; 120°W-170°W, 5°N-5°S). Departures from average sea-surface temperatures in this region result in the greatest impacts (precipitation events and departures from average temperatures) to Honduras.

5. **Definition of El Niño in use operationally**
A phenomenon in the equatorial Pacific Ocean characterized by a positive sea surface temperature departure from normal (for the 1971-2000 base period) in the Niño3.4 region greater than or equal in magnitude to 0.5°C, averaged over three consecutive months.

6. **Definition of La Niña in use operationally**
A phenomenon in the equatorial Pacific Ocean characterized by a negative sea surface temperature departure from normal (for the 1971-2000 base period) in the Niño3.4 region greater than or equal in magnitude to 0.5°C, averaged over three consecutive months.

Hungary

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2. **Official name of Indices and Definitions**
The Hungarian Republic does not use any indices and definitions of El Niño operationally.

3. **Other Countries or territories with shared indices and definitions**
N/A

4. **Index (indices) in use operationally**
See Section 2 above.

5. **Definition of El Niño in use operationally**
See Section 2 above.

6. **Definition of La Niña in use operationally**
See Section 2 above.

India

1. **Contact information**

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2. **Official name of Indices and Definitions**

No official name is given.

3. **Other Countries or territories with shared indices and definitions**

N/A

4. **Index (indices) in use operationally**

Analysis of past data suggested that variations of sea surface temperatures (SST) averaged over the Niño3.4 region (120°W-170°W, 5°N-5° S) have the highest statistically significant correlations with rainfall and climate anomalies over India. India Meteorological Department follows the El Niño index based on sea surface temperature (SST) anomalies averaged over the Niño3.4 region. For this analysis of El Niño classification, Extended Reconstructed SST (ERSST) data (prepared by NCEP, USA) of the resolution 10 x 10 Lat/Long are used.

Research groups at Indian Institute of Tropical Meteorology, Pune uses another El Niño index defined as follows:
Transpacific El Niño Index: Difference of SST anomalies over Niño4 (160°E-150°W, 5°N-5°S) and Niño(1+2) (90°W-80°W, 0°-5°S) regions.

5. **Definition of El Niño in use operationally**

An oceanographic phenomenon in the equatorial Pacific Ocean, characterized by a positive sea surface temperature departure from normal in the Niño3.4 region greater than or equal in magnitude to 0.5°C. The base period for the normal is 1971-2000. To classify as a full-fledged El Niño episode, this threshold must exceed for a period of at least 5 consecutive months.

6. **Definition of La Niña in use operationally**
   An oceanographic phenomenon in the equatorial Pacific Ocean, characterized by a negative sea surface temperature departure from normal in the Niño3.4 region greater than or equal in magnitude to 0.5°C. The base period for the normal is 1971-2000. To classify as a full-fledged La Niña episode, this threshold must exceed for a period of at least 5 consecutive months.

Jamaica

1. **Contact information**

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2. **Official name of Indices and Definitions**

WMO Regional Association IV Consensus Index and definitions of El Niño and La Niña.

3. **Other Countries or territories with shared indices and definitions**

Members of Regional Association (RA) IV.

4. **Index (indices) in use operationally**

The RA IV index is defined as three-month averages of sea surface temperature departures from normal for a critical region of the equatorial Pacific (Niño3.4 region; 120°W-170°W, 5°N-5°S).

5. **Definition of El Niño in use operationally**

A phenomenon in the equatorial Pacific Ocean characterized by a positive sea surface temperature departure from normal (for the 1971-2000 base period) in the Niño3.4 region greater than or equal in magnitude to 0.5°C, averaged over three consecutive months.

6. **Definition of La Niña in use operationally**

A phenomenon in the equatorial Pacific Ocean characterized by a negative sea surface temperature departure from normal (for the 1971-2000 base period) in the Niño3.4 region greater than or equal in magnitude to 0.5°C, averaged over three consecutive months.

Japan

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2. **Official name of Indices and Definitions**
El Niño Monitoring Index and El Niño Definition of the Japan Meteorological Agency (JMA).

3. **Other Countries or territories with shared indices and definitions**
None.

4. **Index (indices) in use operationally**
El Niño Monitoring Index of JMA is defined as five-month running mean sea surface temperature (SST) deviation from a sliding 30-year mean SST, e.g. 1976-2005 mean for 2006, averaged over Niño3 (5°N-5°S, 150°W-90°W).

5. **Definition of El Niño in use operationally**
JMA defines El Niño as an oceanic condition where the five-month running mean SST deviation in Niño3 continues +0.5°C or higher for six consecutive months or longer.

6. **Definition of La Niña in use operationally**
JMA defines La Niña as an oceanic condition where the five-month running mean SST deviation in Niño3 continues -0.5°C or lower for six consecutive months or longer.

Latvia

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2. **Official name of Indices and Definitions**
   Latvia has no official indices and definitions.

3. **Other Countries or territories with shared indices and definitions**
   N/A

4. **Index (indices) in use operationally**
   None.

5. **Definition of El Niño in use operationally**
   Definitions from the WMO No.182 are of use generally. The International Meteorological Vocabulary (WMO No. 182) defines El Niño as 'An anomalous warming of the ocean water off the west coast of South America, usually accompanied by heavy rainfall in the coastal region of Peru and Chile.'

6. **Definition of La Niña in use operationally**
   Definitions from the WMO No.182 are of use generally.

Macao, China

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2. **Official name of Indices and Definitions**
   N/A

3. **Other Countries or territories with shared indices and definitions**
   N/A

4. **Index (indices) in use operationally**
   N/A

5. **Definition of El Niño in use operationally**
   N/A

6. **Definition of La Niña in use operationally**
   N/A

Maldives

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2. **Official name of Indices and Definitions**
Republic of Maldives has no indices or definitions.

3. **Other Countries or territories with shared indices and definitions**
N/A

4. **Index (indices) in use operationally**
N/A

5. **Definition of El Niño in use operationally**
N/A

6. **Definition of La Niña in use operationally**
N/A

Mauritius

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2. **Official name of Indices and Definitions**
There is no index or definitions of El Niño for operational use for the Mauritian region.

3. **Other Countries or territories with shared indices and definitions**
N/A

4. **Index (indices) in use operationally**
N/A

5. **Definition of El Niño in use operationally**
N/A

6. **Definition of La Niña in use operationally**
N/A

Mexico

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2. **Official name of Indices and Definitions**

WMO Regional Association IV Consensus Index and definitions of El Niño and La Niña

3. **Other Countries or territories with shared indices and definitions**

Members of Regional Association (RA) IV.

4. **Index (indices) in use operationally**

The RA IV index is defined as three-month averages of sea surface temperature departures from normal for a critical region of the equatorial Pacific (Niño3.4 region; 120°W-170°W, 5°N-5°S).

5. **Definition of El Niño in use operationally**

A phenomenon in the equatorial Pacific Ocean characterized by a positive sea surface temperature departure from normal (for the 1971-2000 base period) in the Niño3.4 region greater than or equal in magnitude to 0.5°C, averaged over three consecutive months.

6. **Definition of La Niña in use operationally**

A phenomenon in the equatorial Pacific Ocean characterized by a negative sea surface temperature departure from normal (for the 1971-2000 base period) in the Niño3.4 region greater than or equal in magnitude to 0.5°C, averaged over three consecutive months.

Netherlands Antilles and Aruba

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2. **Official name of Indices and Definitions**
WMO Regional Association IV Consensus Index and definitions of El Niño and La Niña.

3. **Other Countries or territories with shared indices and definitions**
Members of Regional Association (RA) IV.

4. **Index (indices) in use operationally**
The RA IV index is defined as three-month averages of sea surface temperature departures from normal for a critical region of the equatorial Pacific (Niño3.4 region; 120°W-170°W, 5°N-5°S).

5. **Definition of El Niño in use operationally**
A phenomenon in the equatorial Pacific Ocean characterized by a positive sea surface temperature departure from normal (for the 1971-2000 base period) in the Niño3.4 region greater than or equal in magnitude to 0.5°C, averaged over three consecutive months.

6. **Definition of La Niña in use operationally**
A phenomenon in the equatorial Pacific Ocean characterized by a negative sea surface temperature departure from normal (for the 1971-2000 base period) in the Niño3.4 region greater than or equal in magnitude to 0.5°C, averaged over three consecutive months.

New Caledonia

1. **Contact information**
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   New Caledonia

2. **Official name of Indices and Definitions**
   - Southern Oscillation Index (SOI)
   - Multivariate ENSO (El Niño-Southern Oscillation) index (MEI)
   - Bivariate EnSo Timeseries (BEST)
   - SST anomalies (Niño3, Niño4, Niño3.4)

3. **Other Countries or territories with shared indices and definitions**
   Pacific Islands Countries, Australia and New Zealand.

4. **Index (indices) in use operationally**
   The following indices are considered in analyzing the ENSO phase:
   - Southern Oscillation Index (SOI) - Mean Sea Level Pressure difference between Tahiti and Darwin.
   - Multivariate ENSO index (MEI) - A weighted average of the main ENSO features contained in six variables: sea-level pressure, the east-west and north-south components of the surface wind, SST, surface air temperature, and total amount of cloudiness.
   - Bivariate EnSo Timeseries (BEST) - SST in Niño3.4 plus the opposite of the SOI.
   - SST anomalies (Niño3, Niño4, Niño3.4)

5. **Definition of El Niño in use operationally**
   New Caledonia uses the ICU (Island Climate Update) monthly teleconference organized by the NIWA (New Zealand) with regional experts from Australia, New Caledonia, Fiji, French Polynesia, Hawaï, IRI, and others, to determine a consensus of the observed and predicted ENSO phase. This expert discussion provides a regional consensus for a "one-voice message" to the media and public, as well as a response to the moving values of SST indices related to global warming that could lead to incorrect ENSO phase classifications that have strict thresholds.

   New Calendonia encourages other countries to participate in regional discussions as impacts can pose a need to classify ENSO phases, and impacts can be very different from one region to another.

6. **Definition of La Niña in use operationally**
   See Section 5 above.

New Zealand

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2. **Official name of Indices and Definitions**
   As described in Section 6 below we do not have a "formal" definition of El Niño and La Niña for use in our climate update and outlook statements. We seek a regional consensus with countries participating in the monthly "Island Climate Outlook" teleconference, which is based on several indicators.

3. **Other Countries or territories with shared indices and definitions**
   See Section 6 below.

4. **Index (indices) in use operationally**
   See Section 6 below.

5. **Definition of El Niño in use operationally**
   We make a subjective judgment based largely on the value of the Southern Oscillation Index (SOI), but considering other factors such as SST anomalies in the NINO regions, sub-surface anomalies in the equatorial eastern Pacific, and consensus of ENSO model predictions. These factors are discussed during the monthly "Island Climate Update" teleconference (see New Caledonia). We think it highly desirable to have a consensus between the countries involved in this teleconference so we don't confuse people in our region.

   For research work (such as analyses of rainfall patterns from past ENSO events) we generally use a definition from Dr. Kevin Trenberth: Periods of at least 6 consecutive months during which the 5-month running mean of the Niño3.4 temperature anomaly exceeds a threshold of ± 0.4°C. However this is an "a posteriori" research definition. For operational "climate outlook" purposes we can't wait until we have 6 months of 5-month running means exceeding the threshold.

6. **Definition of La Niña in use operationally**
   See Section 6 above.
   .

Nicaragua

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2. **Official name of Indices and Definitions**
WMO Regional Association IV Consensus Index and definitions of El Niño and La Niña.

3. **Other Countries or territories with shared indices and definitions**
Members of Regional Association (RA) IV.

4. **Index (indices) in use operationally**
The RA IV index is defined as three-month averages of sea surface temperature departures from normal for a critical region of the equatorial Pacific (Niño3.4 region; 120°W-170°W, 5°N-5°S).

5. **Definition of El Niño in use operationally**
A phenomenon in the equatorial Pacific Ocean characterized by a positive sea surface temperature departure from normal (for the 1971-2000 base period) in the Niño3.4 region greater than or equal in magnitude to 0.5°C, averaged over three consecutive months.

6. **Definition of La Niña in use operationally**
A phenomenon in the equatorial Pacific Ocean characterized by a negative sea surface temperature departure from normal (for the 1971-2000 base period) in the Niño3.4 region greater than or equal in magnitude to 0.5°C, averaged over three consecutive months.

Panama

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2. **Official name of Indices and Definitions**
   WMO Regional Association IV Consensus Index and definitions of El Niño and La Niña.

3. **Other Countries or territories with shared indices and definitions**
   Members of Regional Association (RA) IV.

4. **Index (indices) in use operationally**
   The RA IV index is defined as three-month averages of sea surface temperature departures from normal for a critical region of the equatorial Pacific (Niño3.4 region; 120°W-170°W, 5°N-5°S).

5. **Definition of El Niño in use operationally**
   A phenomenon in the equatorial Pacific Ocean characterized by a positive sea surface temperature departure from normal (for the 1971-2000 base period) in the Niño3.4 region greater than or equal in magnitude to 0.5°C, averaged over three consecutive months.

6. **Definition of La Niña in use operationally**
   A phenomenon in the equatorial Pacific Ocean characterized by a negative sea surface temperature departure from normal (for the 1971-2000 base period) in the Niño3.4 region greater than or equal in magnitude to 0.5°C, averaged over three consecutive months.

Paraguay

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   Dirección de Meteorología e Hidrología
   Avda. Mcal. López y 22 de Setiembre - 3er. Piso Edif. MDN
   Asunción
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2. **Official name of Indices and Definitions**
   Indices and definitions frequently used for El Niño and La Nina by WMO Regional Association (RA) III.

3. **Countries or territories with shared indices and definitions**
   Members of Regional Association III.

4. **Index (indices) in use operationally**
   The index most frequently used in RA III refers to the sea surface temperature anomalies in the Niño3.4 region (120°W-170°W, 5°N-5°S).

5. **Definition of El Niño in use operationally**
   Three or more consecutive months with mean sea surface temperature anomalies greater than or equal to +0.5°C in the Niño3.4 region (computed with respect to the 1971-2000 period).

6. **Definition of La Niña in use operationally**
   Three or more consecutive months with mean sea surface temperature anomalies less than or equal to –0.5°C in the Niño3.4 region (computed with respect to the 1971-2000 period).

Peru

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   Permanent Representative of Peru to WMO
   Servicio Nacional de Meteorología e Hidrología del Perú
   Lima
   Perú

2. **Official name of Indices and Definitions**
   Peru uses definitions and indices provided by the US National Oceanic and Atmospheric Administration (NOAA) in real time, and the SCOR WG 55 definition[*], which is used by the coastal South America countries that are part of ERFEN (Regional Study of the El Niño Phenomenon).

3. **Other Countries or territories with shared indices and definitions**
   Members of the Permanent Commission for the South Pacific (CPPS), and countries involved in ERFEN.

4. **Index (indices) in use operationally**
   - Sea surface temperature anomalies in the equatorial Pacific (Niño4, Niño3.4, Niño3, and Niño1+2) and at coastal stations;
   - Mean and anomalous subsurface temperatures in the equatorial Pacific and along the Peruvian coast;
   - Variations in the depth of the 15°C isotherm;
   - Longitudinal position of the 27°C and 28°C isotherms in sea surface temperatures;
   - Mean and anomalous low-level (below 850 hPa) zonal winds in the equatorial Pacific;
   - Pressure systems at 200 hPa near the Peruvian coast and tropical convection;
   - Others: OLR (outgoing longwave radiation); SOI (Tahiti-Darwin Southern Oscillation Index); MEI (Multivariate ENSO - El Niño-Southern Oscillation - Index); intensity and configuration of the South Pacific anticyclone and minimum air temperature along the coast; biological indicators of warm and cold waters between 50 and 100 nautical miles from the coast.

5. **Definition of El Niño in use operationally**
   - Positive sea surface temperature anomalies greater than 1°C in the Niño4, Niño3.4 and Niño3 regions and anomalies greater than 2°C in the Niño1+2 region and coastal areas;

[*] SCOR WG 55 definition (1983): El Niño is the appearance of anomalously warm water along the coast of Ecuador and Peru as far south as Lima (12°S). This means a normalized sea surface temperature (SST) anomaly exceeding one standard deviation for at least four (4) consecutive months. This normalized SST anomaly should occur at least at three (3) of five (5) Peruvian coastal stations.

- Positive subsurface temperature anomalies greater than 2°C in the central and eastern equatorial Pacific, and a depth greater than 100 m of the 15°C isotherm along the Peruvian coast;
- Eastward shift in the longitudinal position of the 27°C and 28°C SST isotherms;
- Madden Julian Oscillation;
- Equatorial westerly (low-level) wind events lasting at least five consecutive days;
- Persistence of positive 200-hPa heights over the central Equatorial Pacific;
- Negative sea level pressure anomalies along the Peruvian coast;
- Increased convective activity over the central and eastern equatorial Pacific;
- Weakening of the South Pacific anticyclone (negative SLP anomalies 5 hPa or more lasting at least 5 days) after an increase in SST in the central equatorial Pacific;
- Persistent shift in the South Pacific Convergence Zone (SPCZ) and biological indicators of warm waters within 50-100 miles of the Peruvian coast.

6. Definition of La Niña in use operationally

With respect to La Niña, the effects of cooling in the equatorial Pacific are not pronounced except for when the negative SST anomalies are less than –2°C in the central equatorial Pacific. The cooling usually manifests itself during winter, and is accompanied by a stronger South Pacific anticyclone, a westward shift in the SPCZ and biological indicators of cold water between 50 and 100 miles from the Peruvian coast.

Philippines

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   Philippines Atmospheric Geophysical and Astronomical Services Administration
   Permanent Representative of the Philippines with WMO

2. **Official name of Indices and Definitions**
   Adopted the WMO Regional Association IV Consensus Index and definitions of El Niño and La Niña.

3. **Other Countries or territories with shared indices and definitions**
   Members of Regional Association (RA) IV.

4. **Index (indices) in use operationally**
   The RA IV index is defined as three-month averages of sea surface temperature departures from normal for a critical region of the equatorial Pacific (Niño3.4 region; 120°W-170°W, 5°N-5°S). Departures from average sea-surface temperatures in this region result in adverse impacts in many areas of the Philippines.

5. **Definition of El Niño in use operationally**
   A phenomenon in the equatorial Pacific Ocean characterized by a positive sea surface temperature departure from normal (for the 1971-2000 base period) in the Niño3.4 region greater than or equal in magnitude to 0.5°C, averaged over three consecutive months. An episode is defined when the threshold is met for a minimum of five consecutive overlapping seasons.

6. **Definition of La Niña in use operationally**
   A phenomenon in the equatorial Pacific Ocean characterized by a negative sea surface temperature departure from normal (for the 1971-2000 base period) in the Niño3.4 region greater than or equal in magnitude to 0.5°C, averaged over three consecutive months. An episode is defined when the threshold is met for a minimum of five consecutive overlapping seasons.

Russian Federation

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2. **Official name of Indices and Definitions**

N/A

3. **Other Countries or territories with shared indices and definitions**

N/A.

4. **Index (indices) in use operationally**

Niño3 (5°S-5°N, 150°W-90°W)
Niño3.4 (5°S-5°N, 170°W-120°W)
Niño4 (5°S-5°N, 160°E-150°W)

5. **Definition of El Niño in use operationally**

A phenomenon in the equatorial Pacific Ocean characterized by a positive sea surface temperature anomaly (for the 1971-2000 base period) in the Niño3 region greater than or equal to +0.5°C, occurring for three or more consecutive months.

6. **Definition of La Niña in use operationally**

A phenomenon in the equatorial Pacific Ocean characterized by a negative sea surface temperature anomaly (for the 1971-2000 base period) in the Niño3 region less than or equal to -0.5°C, occurring for three or more consecutive months.

Saint Lucia

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2. **Official name of Indices and Definitions**
WMO Regional Association IV Consensus Index and definitions of El Niño and La Niña.

3. **Other Countries or territories with shared indices and definitions**
Members of Regional Association (RA) IV.

4. **Index (indices) in use operationally**
The RA IV index is defined as three-month averages of sea surface temperature departures from normal for a critical region of the equatorial Pacific (Niño3.4 region; 120°W-170°W, 5°N-5°S).

5. **Definition of El Niño in use operationally**
A phenomenon in the equatorial Pacific Ocean characterized by a positive sea surface temperature departure from normal (for the 1971-2000 base period) in the Niño3.4 region greater than or equal in magnitude to 0.5°C, averaged over three consecutive months.

6. **Definition of La Niña in use operationally**
A phenomenon in the equatorial Pacific Ocean characterized by a negative sea surface temperature departure from normal (for the 1971-2000 base period) in the Niño3.4 region greater than or equal in magnitude to 0.5°C, averaged over three consecutive months.

Singapore

1. **Contact information**
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   Director-General
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   Singapore

2. **Official name of Indices and Definitions**
   El Niño & La Niña Indices used by the Association of Southeast Asian Nations (ASEAN) Specialised Meteorological Centre.

3. **Other Countries or territories with shared indices and definitions**
   El Niño Outlook posted on ASEAN Specialised Meteorological Centre (ASMC) intranet for use by regional agencies in ASEAN.

4. **Index (indices) in use operationally**
   ASMC index is defined as three-month averages of sea surface temperature departures from normal for a critical region of the equatorial Pacific (Niño3.4 region; 120°W-170°W, 5°N-5°S). Departures from average sea surface temperatures in this region would result in the greatest impacts to ASEAN.

5. **Definition of El Niño in use operationally**
   A phenomenon in the equatorial Pacific Ocean characterized by a positive sea surface temperature departure from normal (for the 1971-2000 base period) in the Niño3.4 region greater than or equal in magnitude to 0.5°C, averaged over three consecutive months.

6. **Definition of La Niña in use operationally**
   A phenomenon in the equatorial Pacific Ocean characterized by a negative sea surface temperature departure from normal (for the 1971-2000 base period) in the Niño3.4 region greater than or equal in magnitude to 0.5°C, averaged over three consecutive months.

Slovakia

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2. **Official name of Indices and Definitions**
Slovakia does not use any predefined terminology in connection with El Niño and La Niña phenomena.

3. **Other Countries or territories with shared indices and definitions**
N/A

4. **Index (indices) in use operationally**
N/A

5. **Definition of El Niño in use operationally**
N/A

6. **Definition of La Niña in use operationally**
N/A

Sudan

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2. **Official name of Indices and Definitions**
WMO Regional Association I Consensus Index and definitions of El Niño and La Niña

3. **Other Countries or territories with shared indices and definitions**
Members of Regional Association (RA) I; Greater Horn of Africa countries (Intergovernmental Authority on Development (IGAD) countries).

4. **Index (indices) in use operationally**
The RAI index is defined as three-month averages of sea surface temperature departures from normal for a critical region of the equatorial Pacific and the Indian Ocean. There is no fixed area of Niño region yet identified which has an impact on the African Continent, but research is currently being done.

5. **Definition of El Niño in use operationally**
A phenomenon in the equatorial Pacific Ocean characterized by a positive sea surface temperature departure from normal (for the 1971-2000 base period). The specific Niño region is not yet identified.

6. **Definition of La Niña in use operationally**
A phenomenon in the equatorial Pacific Ocean characterized by a negative sea surface temperature departure from normal (for the 1971-2000 base period) greater than or equal in magnitude to 0.5°C, averaged over three consecutive months. The specific Niño region is not yet identified.

Sweden

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2. **Official name of Indices and Definitions**
Sweden has no indices or definitions.

3. **Other Countries or territories with shared indices and definitions**
N/A

4. **Index (indices) in use operationally**
N/A

5. **Definition of El Niño in use operationally**
N/A

6. **Definition of La Niña in use operationally**
N/A

Thailand

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2. **Official name of Indices and Definitions**
   Indices and Definitions of El Niño and La Niña

3. **Other Countries or territories with shared indices and definitions**
   United States of America, and thus Regional Association IV.

4. **Index (indices) in use operationally**
   The index is defined as three-month averages of sea-surface temperature departures from normal for a critical region of the equatorial Pacific (Nino 3.4 region; 120°W-170°W, 5°N-5°S).

5. **Definition of El Niño in use operationally**
   A phenomenon in the equatorial Pacific Ocean characterized by a positive sea surface temperature departure from normal (for the 1971-2000 base period) in the Niño3.4 region greater than or equal in magnitude to 0.5°C, averaged over three consecutive months.

6. **Definition of La Niña in use operationally**
   A phenomenon in the equatorial Pacific Ocean characterized by a negative sea surface temperature departure from normal (for the 1971-2000 base period) in the Niño3.4 region greater than or equal in magnitude to 0.5°C, averaged over three consecutive months.

Trinidad and Tobago

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2. **Official name of Indices and Definitions**
WMO Regional Association IV Consensus Index and definitions of El Niño and La Niña.

3. **Other Countries or territories with shared indices and definitions**
Members of Regional Association (RA) IV.

4. **Index (indices) in use operationally**
The RA IV index is defined as three-month averages of sea surface temperature departures from normal for a critical region of the equatorial Pacific (Niño3.4 region; 120°W-170°W, 5°N-5°S).

5. **Definition of El Niño in use operationally**
A phenomenon in the equatorial Pacific Ocean characterized by a positive sea surface temperature departure from normal (for the 1971-2000 base period) in the Niño3.4 region greater than or equal in magnitude to 0.5°C, averaged over three consecutive months.

6. **Definition of La Niña in use operationally**
A phenomenon in the equatorial Pacific Ocean characterized by a negative sea surface temperature departure from normal (for the 1971-2000 base period) in the Niño3.4 region greater than or equal in magnitude to 0.5°C, averaged over three consecutive months.

Tunisia

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2. **Official name of Indices and Definitions**
Regional Association (RA) I consensus indices and definitions of El Niño and La Niña.

3. **Other Countries or territories with shared indices and definitions**
Members of Regional Association I.

4. **Index (indices) in use operationally**
The indices used operationally in Tunisia are the monthly and seasonal sea surface temperature anomalies in the intertropical Pacific region defined by 75°W-151°W, 19°N-19°S. For this analysis, we use the Extended Reconstructed SST (ERSST) data available through the National Climatic Data Center (NCDC), Asheville, USA.

5. **Definition of El Niño in use operationally**
Research in statistical forecasting of monthly and seasonal precipitation has shown that El Niño and La Niña have a weak influence on precipitation in Tunisia. For this reason, we limit ourselves to the standards developed by WMO.

6. **Definition of La Niña in use operationally**
As is the case for El Niño, we limit ourselves to the standards developed by WMO.

Turkey

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2. **Official name of Indices and Definitions**
No indices and definitions used.

3. **Other Countries or territories with shared indices and definitions**
N/A

4. **Index (indices) in use operationally**
N/A

5. **Definition of El Niño in use operationally**
N/A

6. **Definition of La Niña in use operationally**
N/A

United Kingdom of Great Britain and Northern Ireland

1. **Contact information**

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2. **Official name of Indices and Definitions**

N/A

3. **Other Countries or territories with shared indices and definitions**

N/A

4. **Index (indices) in use operationally**

Niño3 (5°S-5°N, 150°W-90°W)
Niño3.4 (5°S-5°N, 170°W-120°W)
Niño4 (5°S-5°N, 160°E-150°W)

The Niño3 index is used for monitoring conditions in the equatorial Pacific Ocean. http://www.metoffice.gov.uk/research/hadleycentre/obsdata/climateindicators.html Graphical display of forecast trajectories of monthly average tropical Pacific sea surface temperature anomaly is available for regions Niño3, Niño3.4 and Niño4. The coupled GCM forecasts are updated every month and have a 6-month outlook. http://www.metoffice.gov.uk/research/seasonal/elnino/index.html

In addition, various indices representing El Niño/La Niña are used as predictors in regional, specific season, statistical forecasts. These are based on EOF analyses of either Pacific or global sea surface temperature on various timescales. Further details can be found at http://www.metoffice.gov.uk/research/seasonal/regional/index.html

5. **Definition of El Niño in use operationally**

The Met Office does not currently use an objective definition of El Niño or La Niña. Because links between El Niño/La Niña and European climate are weak it would be very difficult to define an index threshold that would be suitable or meaningful for the UK region. At present the Met Office prefers to provide information in the form of indices that can be interpreted for local application by forecast users.

6. **Definition of La Niña in use operationally**

See Section 5 above.

United States of America

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2. **Official name of Indices and Definitions**
WMO Regional Association IV Consensus Index and definitions of El Niño and La Niña.

3. **Other Countries or territories with shared indices and definitions**
Members of Regional Association (RA) IV.

4. **Index (indices) in use operationally**
The RA IV index is defined as three-month averages of sea surface temperature departures from normal for a critical region of the equatorial Pacific (Niño3.4 region; 120°W-170°W, 5°N-5°S).

5. **Definition of El Niño in use operationally**
A phenomenon in the equatorial Pacific Ocean characterized by a positive sea surface temperature departure from normal (for the 1971-2000 base period) in the Niño3.4 region greater than or equal in magnitude to 0.5°C, averaged over three consecutive months.

6. **Definition of La Niña in use operationally**
A phenomenon in the equatorial Pacific Ocean characterized by a negative sea surface temperature departure from normal (for the 1971-2000 base period) in the Niño3.4 region greater than or equal in magnitude to 0.5°C, averaged over three consecutive months.

Uruguay

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2. **Official name of Indices and Definitions**
Definitions and indices frequently used to describe El Niño and La Niña in WMO Regional Association (RA) III.

3. **Other Countries or territories with shared indices and definitions**
Members of Regional Association III.

4. **Index (indices) in use operationally**
The index within RA III that is most frequently used refers to the sea surface temperature (SST) anomalies in Niño 3.4 (120°W-170°W, 5°N-5°S).

5. **Definition of El Niño in use operationally**
Three or more consecutive months with mean SST anomalies in Niño 3.4 greater than or equal to +0.5C (anomalies computed with respect to the 1971-2000 period).

6. **Definition of La Niña in use operationally**
Three or more consecutive months with mean SST anomalies in Niño 3.4 less than or equal to -0.5C (anomalies computed with respect to the 1971-2000 period).

Venezuela

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2. **Official name of Indices and Definitions**
WMO Regional Association IV Consensus Index and definitions of El Niño and La Niña, and the Niño3 index.

3. **Other Countries or territories with shared indices and definitions**
Members of Regional Association (RA) IV, Ecuador, Peru, Columbia, Chile and Bolivia.

4. **Index (indices) in use operationally**
The RA IV index is defined as three-month averages of sea surface temperature departures from normal for a critical region of the equatorial Pacific (Niño3.4 region; 120°W-170°W, 5°N-5°S). Additionally, Venezuela considers sea surface temperature anomalies in the Niño3 region (90°W-150°W, 5°N-5°S).

5. **Definition of El Niño in use operationally**
A phenomenon in the equatorial Pacific Ocean characterized by a positive sea surface temperature departure from normal (for the 1971-2000 base period) in the Niño3.4 region greater than or equal in magnitude to 0.5°C, averaged over three consecutive months.

6. **Definition of La Niña in use operationally**
A phenomenon in the equatorial Pacific Ocean characterized by a negative sea surface temperature departure from normal (for the 1971-2000 base period) in the Niño3.4 region greater than or equal in magnitude to 0.5°C, averaged over three consecutive months.

Acknowledgments

The WMO Expert Team on El Niño/La Niña Definitions (2005) is particularly grateful to Thomas Peterson, NOAA, National Climatic Data Center, for his support on this project.

The Team also expresses thanks to Dr Vernon Kousky, NOAA, National Weather Service Climate Prediction Center, who translated from Spanish into English for the Team Chair.

Appendix I Team Members

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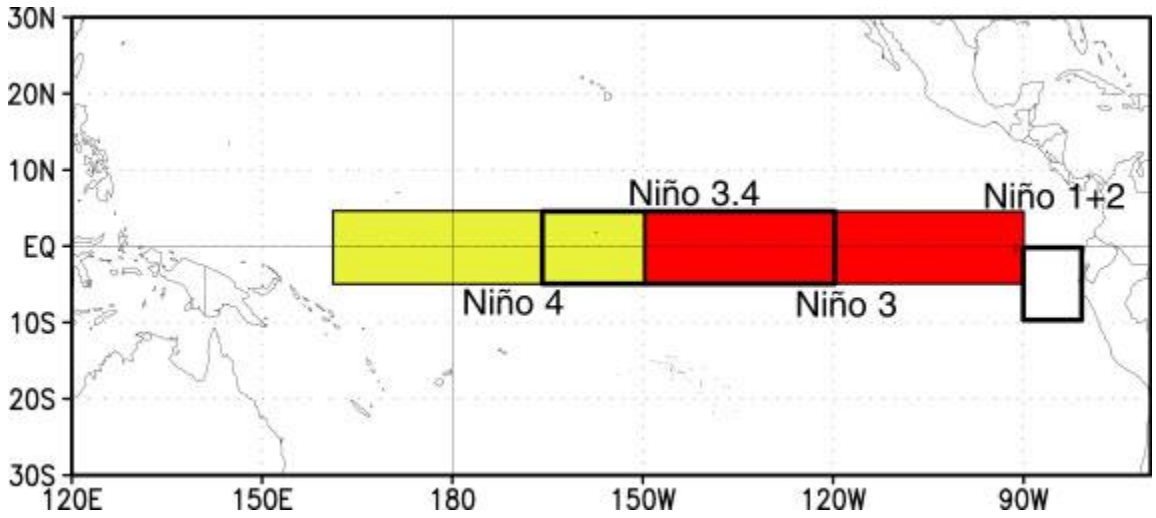
Appendix II Niño Regions



Graphical depiction of the four Niño regions.
Image from NOAA, National Weather Service, Climate Prediction Center

Appendix III Selected Resources

Glantz, Michael H., Ed., (2001), *Once Burned, Twice Shy? Lessons Learned from the 1997-98 El Niño*, The United Nations University.

WMO 1992: International Meteorological Vocabulary, WMO No. 182. Geneva, Switzerland.

WMO 1999: The 1997-1997 El Niño Event: A Scientific and Technical Retrospective (a contribution to the United Nations Task Force on El Niño for implementation of United Nations General Assembly Resolutions 52/200 and 53/185). WMO, IOC of UNESCO, UNEP and ICSU, Geneva, Switzerland.

WMO 2003: Climate: Into the 21st Century. Cambridge University Press, UK.

Australian Government, Bureau of Meteorology:

- ENSO Wrap-Up A regular commentary on the El Nino-Southern Oscillation (http://www.bom.gov.au/climate/enso/)
- Southern Oscillation Index (http://www.bom.gov.au/climate/current/soi2.shtml)
- El Niño - Detailed Australian Analysis (http://www.bom.gov.au/climate/enso/australia_detail.shtml)
- Climate Management Information for Rural Australia (http://www.longpaddock.qld.gov.au/)

Beijing Climate Center
- http://bcc.cma.gov.cn/en/

Centro Internacional par la Investigación del Fenómeno de El Niño (CIIFEN)
(the International Center on the El Niño Phenomenon)
- www.ciifen-int.org

Dirección Meteorológica de Chile
- El Niño - La Niña (http://www.meteochile.cl/nino_nina/nino_nina.html)

International Research Institute for Climate and Society
- ENSO Information (http://iri.columbia.edu/climate/ENSO/index.html)

Instituto Geofísico del Perú (IGP)
- http://www.met.igp.gob.pe/

Met Office, including the Hadley Centre for Climate Prediction and Research,
United Kingdom of Great Britain and Northern Ireland
- http://www.metoffice.gov.uk/research/hadleycentre/obsdata/climateindicators.html
- http://www.metoffice.gov.uk/research/seasonal/elnino/index.html
- http://www.metoffice.gov.uk/research/seasonal/regional/index.html

NOAA, United States of America
- Climate Prediction Center
    - El Niño – Southern Oscillation (http://www.cpc.noaa.gov/products/precip/CWlink/MJO/enso.shtml)
- Pacific Marine Environmental Laboratory
    - El Niño Theme Page (http://www.pmel.noaa.gov/tao/elnino/nino-home.html)
- Earth System Research Laboratory (ESRL)
    - El Niño / La Niña Animations (http://www.cdc.noaa.gov/map/clim/sst_olr/el_nino_anim.shtml)

Servicio Nacional de Meteorología e Hidrología del Perú
- El Fenómeno de “El Niño” (http://www.senamhi.gob.pe/elnino/index.php)