

COMITÉ MULTISECTORIAL ENCARGADO DEL ESTUDIO NACIONAL DEL FENÓMENO EL NIÑO



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OPERATIONAL DEFINITION OF EL NIÑO AND LA NIÑA EVENTS IN THE COAST OF PERU AND THEIR MAGNITUDES

Technical Committee of the National Study of El Niño Phenomenon (ENFEN)

Lima, April 9, 2012

1. Coastal El Niño Index ("Índice Costero El Niño"; ICEN)

Consists in the 3-month running mean of monthly sea surface temperature (SST) anomalies in the Niño 1+2 region. The anomalies are calculated using the monthly climatology for the 1981-2010 base period. The Niño 1+2 data is obtained from the absolute SST from the NOAA ERSST v3b product for this region, which can be downloaded from the web from: <http://www.cpc.ncep.noaa.gov/data/indices/ersst3b.nino.mth.ascii>

If necessary for real-time calculation and use, an approximate value ICENtmp can be temporarily used, which is calculated similarly to ICEN but replacing the unavailable observed monthly data with averaged observed weekly values and monthly forecasts agreed by the ENFEN Technical Committee. This index is transitory and should be replaced by the corresponding value of ICEN once the necessary data is available.

2. Categories

Each month is assigned a category. The category of "cold conditions" includes the following magnitudes: "weak", "moderate", and "strong". The category of "warm conditions" includes the following magnitudes: "weak", "moderate", "strong" and "extraordinary". The categories with their magnitudes are assigned according to the corresponding ICEN value and the criteria in Table 1.

Table 1.

Category	ICEN
Strong cold conditions	Less than -1.4
Moderate cold conditions	More or equal to -1.4 and less than -1.2
Weak cold conditions	More or equal to -1.2 and less than -1.0
Neutral conditions	More or equal to -1.0 and less or equal to 0.4
Weak warm conditions	More than 0.4 and less or equal to 1.0
Moderate warm conditions	More than 1.0 and less or equal to 1.7
Strong warm conditions	More than 1.7 and less or equal to 3.0
Extraordinary warm conditions	More than 3.0

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3. Identification of "events"

The following criteria are followed for the identification of El Niño and La Niña events and their magnitudes:

- A "La Niña event in the coast of Peru" (or similar expression) is the period in which ICEN indicates "cold conditions" for at least three (3) consecutive months. The magnitude of this event is the largest reached or exceeded by at least three (3) months during the event.
- An "El Niño event in the coast of Peru" (or similar expression) is the period in which ICEN indicates "warm conditions" for at least three (3) consecutive months. The magnitude of this event is the largest reached or exceeded by at least three (3) months during the event.

4. Results

Applying the criteria in the previous sections to the data of the period 1950-2011, lists of El Niño and La Niña events in the coast of Peru are obtained and are indicated in Tables 2 and 3, respectively. The ICEN time series, with the events highlighted, is presented in Figure 1.

Table 2. El Niño in the coast of Peru

Start year	Start month	End year	End final	Duration (months)	Magnitude
1951	5	1951	10	6	Moderate
1953	3	1953	6	4	Weak
1957	3	1958	5	15	Moderate
1965	3	1965	10	8	Moderate
1969	4	1969	7	4	Moderate
1972	3	1973	2	12	Strong
1976	5	1976	10	6	Weak
1982	7	1983	11	17	Extraordinary
1986	12	1987	12	13	Moderate
1991	10	1992	6	9	Moderate
1993	3	1993	9	7	Weak
1994	11	1995	1	3	Weak
1997	3	1998	9	19	Extraordinary
2002	3	2002	5	3	Weak
2002	9	2003	1	5	Weak
2003	11	2004	1	3	Weak
2004	10	2004	12	3	Weak
2006	8	2007	2	7	Moderate
2008	7	2008	9	3	Weak
2009	5	2009	10	6	Weak

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Table 3. La Niña in the coast of Perú

Start year	Start month	End year	End final	Duration (months)	Magnitude
1950	2	1950	12	11	Strong
1952	8	1952	10	3	Weak
1954	1	1956	2	26	Strong
1956	9	1956	12	4	Moderate
1960	5	1960	7	3	Weak
1961	6	1961	10	5	Weak
1962	2	1962	8	7	Strong
1964	3	1964	11	9	Strong
1966	4	1966	7	4	Moderate
1967	7	1968	6	12	Strong
1970	4	1971	11	20	Strong
1973	5	1974	2	10	Moderate
1974	10	1975	1	4	Moderate
1975	7	1976	1	7	Strong
1978	4	1978	9	6	Weak
1985	2	1985	9	8	Moderate
1988	5	1988	10	6	Strong
1996	4	1996	7	4	Weak
2001	9	2001	12	4	Weak
2007	5	2007	12	8	Strong
2010	8	2010	11	4	Moderate

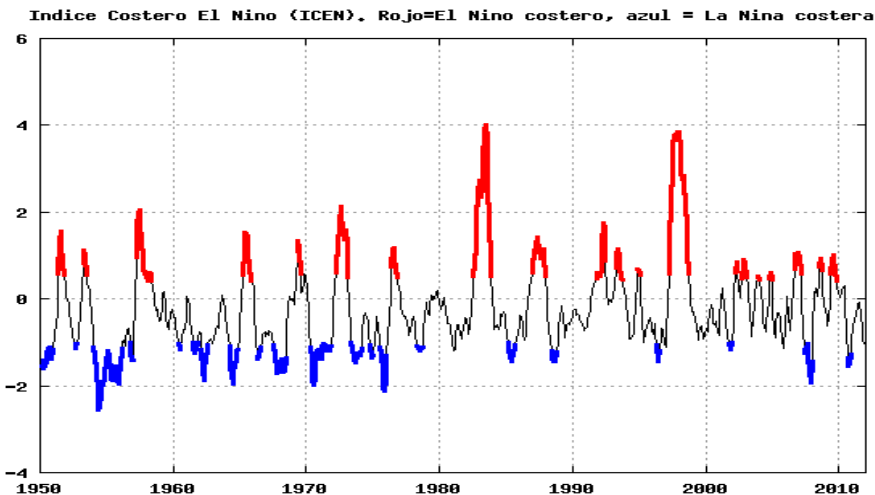


Figure 1. Coastal El Niño Index (ICEN). Coastal El Niño and La Niña events are indicated in red and blue, respectively.