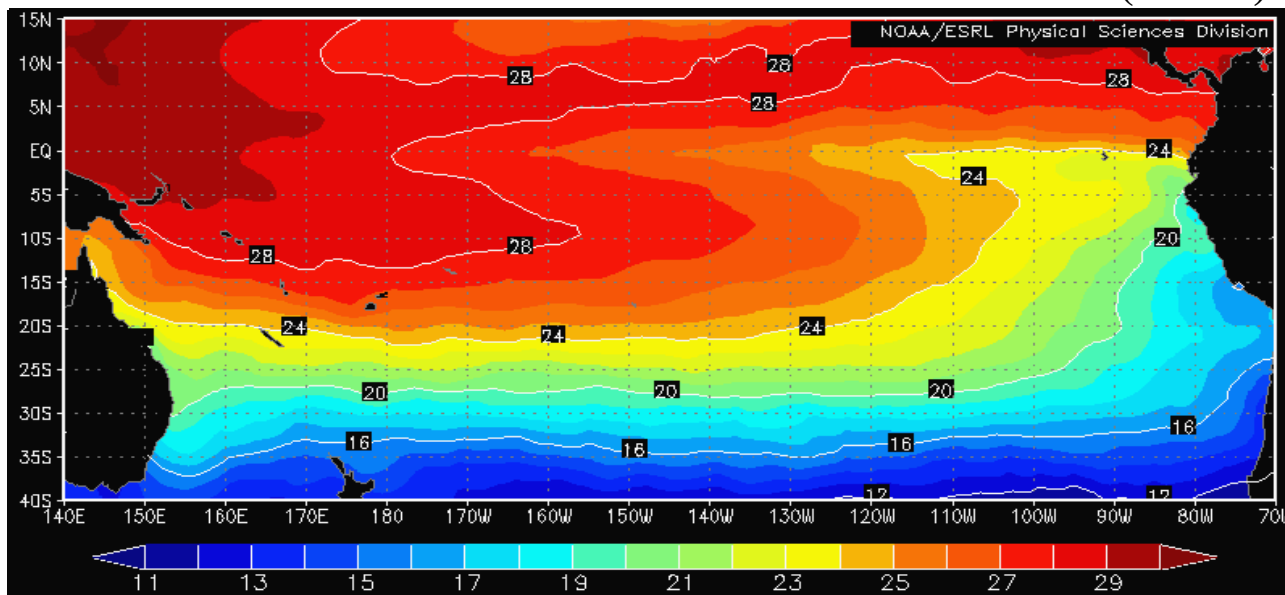


COMISIÓN PERMANENTE DEL PACÍFICO SUR (CPPS)



Sea Surface Temperature, August 2008, NOAA-CIRES/Climate Diagnostic Center

AUGUST 2008

BAC N° 215

ERFEN

(Estudio Regional del Fenómeno El Niño)

BOLETÍN DE ALERTA CLIMÁTICO *CLIMATE ALERT BULLETIN*



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COMISIÓN PERMANENTE DEL PACÍFICO SUR
SECRETARÍA GENERAL
GUAYAQUIL, ECUADOR



The Boletín de Alerta Climático (BAC) is a monthly publication of the CPPS in which the oceanic and atmospheric conditions of the region of the Southeastern Pacific within the Regional Study of El Niño (ERFEN) are analyzed. The digital version of the BAC is available from the 15 of every month in the pages Web of the CPPS: <http://www.cpps-int.org> and of the INOCAR: <http://www.inocar.mil.ec>

The suggestions, commentaries or scientific information will be welcome to the electronic mails: dircient@cpps-int.org; nino@inocar.mil.ec, (Group BAC ECUADOR), or by means of written communication directed to the seat of the Permanent Commission for the South Pacific, General Secretariat, Complex Albán Borja, Building CLASSIC, 2nd floor, Guayaquil-Ecuador, FAX: (593)4-2221201.

Figure 1.- Shore stations locations in the Southeast Pacific region.

EXECUTIVE SUMMARY

The Equatorial Pacific Ocean during August presented a deceleration of the heating of waters, showing in this occasion a light increased of the area with negative anomaly of -1.0°C, in centre of the equatorial Pacific region. Towards the Eastern edge of the Pacific the positive anomalies continued present, being at surface of until 1°C, and showing slight tendency to reduce these values.

The anomaly of the Sea Surface Temperature during the last week of August in the “El Niño” regions presented the following values; in the region of the Western Pacific (“El Niño” Region 4) it was of -0.4°C; in the Central Pacific (“El Niño” Region 3.4) the anomaly was of -0.1°C and; in the region of the Eastern Pacific (El Niño” Region 1+2) it was of 0, 7°C. At Subsurface the thermal structure in the Central Equatorial Pacific clearly shows to a reduction or deceleration of the process of heating observed during the previous months, being now evident the location of a water cell with negative anomaly of -1°C, located between 140°W and the line of date and from the surface to the 100 ms of depth, reactivating slightly the cooling in this part of the Pacific.

During this month the Mean Sea Level in the Southeastern Pacific presented a tendency to oscillate around its normal patterns. In front of Ecuador’s coast the Level of the Sea continued presenting positive anomalies between 5 and 8 cm. In the Peruvian coast it continued presenting positive anomalies that fluctuated between +3.0 cm and +9.0 cm. In Chile the behaviour of the level of the sea, unlike the observed thing in July, presented one slight negative tendency, being considered this diminution like within the normal conditions, since the values of anomaly did not surpass the -8 cm. The Index of Oscillation of the South stayed in its positive phase by third consecutive month and in this occasion the value was of 0.8. The central axis of the Intertropical Convergence Zone in the Eastern sector of the Pacific was located between 7 and 10° of North latitude with regulating convective activity; during two last days of the month the passage of a tropical wave of the East interacted with the Intertropical Convergence Zone, generating precipitation on Colombia. As far as surface winds, in the region of the Southeastern Pacific they appeared predominantly of the south and south-east; as far as the speeds generally they appeared fluctuating around or slightly on the average value for the month. Taking into account the present thermal behaviour from the Equatorial Pacific Ocean, as well as showing of several models of numerical simulation are anticipated that during the next month the Sea Surface Temperature in the Eastern sector of the Equatorial Pacific Ocean will continue slightly on its normal value.

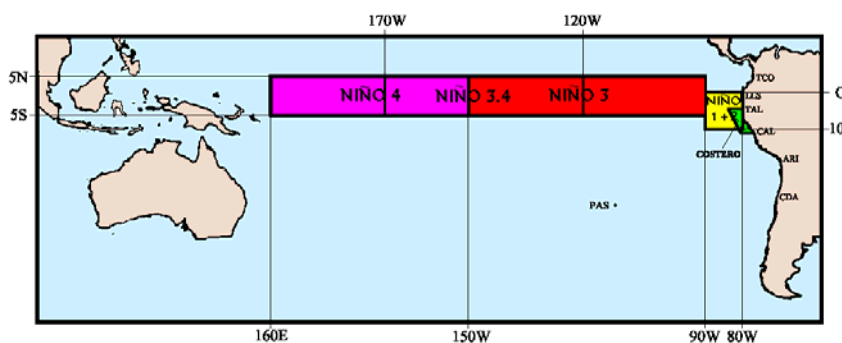


Figure 2.- Map indicating locations and codes of series. Rectangles show the average area of Sea Surface Temperature (SST °C)

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CLIMATE ALERT BULLETIN
BAC N° 215, AUGUST 2008**I. GLOBAL AND REGIONAL IMAGE**

During August the Sea Surface Temperature (SST-TSM) in the Central Equatorial Pacific Ocean experimented, during the last week of the month, a deceleration in the process of heating of the sea. Nevertheless the monthly anomaly of the SST for August in the “El Niño” regions stayed in positive values, with the exception of “El Niño” region 4 where still negative values are observed: In the region of the Western Pacific (“El Niño” Region 4) it happened of -0.3 to -0.2°C; in the Central Pacific (“El Niño” Region 3, 4) the anomaly happened of 0.1 to 0.2°C; in the region of the Eastern Pacific (“El Niño” Region 1+2) the anomalies happened of 0, 8 to 1.0°C.

The subsurface thermal structure of the Central Equatorial Pacific maintains the water cell with negative anomaly of -1.0°C, having increased its size during the month, reaching from the surface to the depth of 100m and between 170°E and 150°W approximately. In the Eastern edge of the Equatorial Pacific, to the east of 100°W and near the surface, it continues persisting a warm nucleus with anomaly of 2.0°C.

The Mean Sea Level (MSL - NMM) in the Southeastern Pacific during August presented certain tendency to distribute around its normal patterns; in front of Ecuador’s coast the Level of the Sea continued presenting positive anomalies between 5 and 8 cm, also in the Peruvian coast it continued presenting positive anomalies that fluctuated between +3.0 cm and +9.0 cm. In Chile behaviour of the level of the sea, unlike the observed in July, presented slight negative tendency, being considered this diminution like within the normal since the values of anomaly did not surpass the -8 cm.

The Index of Oscillation of the South (IOS) like in the previous month, it continued in his positive phase by third consecutive month but with greater magnitude, reaching the value of 0.8. The stations of Tahiti and Darwin respectively showed positive anomalies of pressure of 0.9 and 2.2. The central axis of the Intertropical Convergence Zone (ITCZ) appeared in the Eastern sector of the Pacific between 7 and 10°N with significant convective activity, interacting with tropical waves of the East, with affectation to Colombia.

As far as surface winds, in the region of the Southeastern Pacific they appeared predominantly of the south and south-east with speeds that were slightly on the average value waited for the month in 1.0 m/s. towards the north of the latitude 3°S was observed a weakening of trade winds, considered like atypical for the time.

II. NATIONAL IMAGE**A. CONDITIONS IN THE COLOMBIAN COAST**

The Institute of Hydrology, Meteorology and Environmental Studies (IDEAM) informs that during the first fortnight of the month some tropical waves of the East journeyed by the Colombian

Caribbean, but its intensity and influences in the behaviour of the rain of the country was not as determining as the happened thing in the previous months. At the beginning of the second fortnight the season of hurricanes in the Caribbean Sea intensified (especially towards end of the month), the tropical waves of the East formed more to the north and some of these became tropical revolving storms, is as well as day 16 forms tropical storm FAY, 26 hurricane GUSTAV and day 28 HANNA. The mentioned tropical revolving storms did not represent direct threat on the Colombian territory, but indirectly the cloudy bands associated to these systems were located on a big part of the Caribbean and Pacific regions, and in centre and north of the Andean region, increasing rains in these zones, especially when they interacted with the ITCZ, which constantly was laid out towards the north, being located generally between 9 and 10°N; during two last days of the month the passage of a tropical wave of the East also interacted with the ITCZ generating important volumes of precipitation.

The trade winds presented an atypical weakening for the time, which resulted in a greater concentration of the cloudiness and volumes of rain over the averages in ample sectors of the Caribbean, Pacific and Andean regions. On the other hand, in the east of the country (Orinoquía and Amazonia) light deficits were registered at general level. Again the high excess in the amounts of rain stands out (greater to 50%) in relation to the averages for the month, registered in a big part of the Andean departments, which reactivated the threat by earth sliding, as well as the risk by floods in some sectors of the more important hydrographic river basins of the country (Half and Under Magdalena – Under Cauca).

The Center for the Pollution Control of the Pacific (CCCP) shows that during the monitoring of 2008 August, realised by the Area of Operational Oceanography of the CCCP, the fixed coastal station N° 5 located to 10 miles of the bay of Tumaco between the coordinates 78.51° W and 2°N, can be observed that the registry of SST for the month were of 27.5°C and 27.27°C for the first and second fortnight respectively, throwing a monthly average of 27.38°C. A positive anomaly at surface of 0.27 °C appears with respect to the historical average (July 1999 - August 2008), which is of 27.11 °C.

In August, the thermocline for the first fortnight descended 5 meters with respect to the last registry from June of 2008, positioning on the 37 meters, and for the second fortnight it was positioned approximately on the 36 meters. The isotherm of 15°C did not become visible during this month.

As far as the behaviour of the salinity, it respectively registered at surface value of 30.79 and 31.14 ups for the first and second fortnight of August, presenting a monthly average of 30.69. A negative anomaly of -1.11 appears at surface with respect to the historical average that is of 31.80 ups.

The maximum value of salinity appeared in the second fortnight of the month, presenting a value of 35.35 to a depth of approximately 50 meters. The halocline was positioned respectively for the first and second fortnight on the 38 and 37 meters.

B. CONDITIONS IN THE ECUADORIAN COAST

The Oceanographic Institute of the Navy of Ecuador (INOCAR) reports that during August 2008 temperature of the air (AT) throughout the Ecuadorian coast fluctuated between 23.0°C and 26.0°C what mean anomalies between -0.2°C and 1.21°C. The SST presented values between 23.0°C and 26.5°C giving anomalies of 0.1°C and 0.9°C.

Rains of August in the Ecuadorian Coast appeared around their climatologic values, between 5 and 30 mm, except towards interior of the region, where the biggest precipitations occurred.

Considering present behaviour of the ocean-atmospheric conditions in front of Ecuador, it is anticipated that precipitations appear around their minimum values for the Ecuadorian coast. About Sea and Air temperature in the Ecuadorian coast esteem that will continue present values slightly on the normal.

C. CONDITIONS IN THE PERUVIAN COAST

The Direction of Hydrography and Navigation of Peru (DHN) declares that generally, in the Peruvian coast, a reduction in the anomalies of the SST was registered minor of 1°C with respect to previous month, predominating positive anomalies; with exception of San Juan that presented an anomaly of -0.1°C. The maximum anomaly appeared in the northern station of Lobos de Afuera (+1.7°C), whereas minimum anomaly was registered in Mollendo (+0.3° C).

The MSL throughout Peruvian coast continued presenting positive anomalies, being observed generally a reduction around 4 cm, with respect to previous month. The anomalies of MSL fluctuated between +3 cm (San Juan) and +9 cm (Paita); whereas Mollendo presented behaviour similar to its normal.

Throughout Peruvian coast, AT has registered a variability of +/-0.4° C, with respect to previous month, prevailing positive anomalies, with exception of San Juan and Mollendo stations with anomalies of -1.5 and -0.2°C, respectively. The anomalies of the AT fluctuated between +0.1°C (ILO) and + 1.1° C (Lobos de Afuera).

In the North coast, in the stations of Talara, Paita and Lobos de Afuera, registered drizzles isolated during second and fourth week of the month, with an accumulated of 0. 2 and 4.4 mm, respectively. In the central coast, drizzles isolated during first and fourth week were registered, with accumulated precipitations of 0. 9 and 0.6 mm; whereas in the south, drizzles were registered during days 4.5, 18.19 and 20 of the month, with accumulated precipitations of 1.0 mm. Throughout Peruvian coast winds of South and South-east direction appeared. In relation to the wind speed, positive anomalies predominated that fluctuated between 0.2 to 1.5 m/s; with exception of Paita and Callao that presented anomalies of -1.9 and -0.1 m/s, respectively.

D. CONDITIONS IN THE CHILEAN COAST

The Hydrographic and Oceanographic Service of the Navy of Chile (SHOA) maintains throughout the coast a network of stations of sea level to monitor a series of oceanic and atmospheric variables. A description of the Sea Surface Temperature and sea level between Arica (18°29'S) and Talcahuano (36°41'S) for August 2008 is:

In the case of SST is observed that cold condition developed from mid 2007 throughout North and Centre-South coast of the country, has been debilitated considerably and negative anomalies have reached a normal condition, with values that fluctuate between -0.5 and 0.1°C. The Sea Level behaviour, unlike the observed thing in July, presented slight negative tendency, nevertheless, this diminution can be considered within the normal, since values of anomaly did not surpass the -8 cm. Specifically, North zone between Arica and Caldera registered negative anomalies of -4 cm,

whereas the South Centre zone between Coquimbo and Talcahuano presented values between -5.2 and -7.5 cm.

The data of SST and MSL described previously for the North and the Centre-South zone of Chile are coherent with the developed neutral conditions in the tropical Pacific in the month of August 2008.

The Meteorological Direction of Chile (DMCh) manifest that during August the air average temperature between regions of Arica and Puerto Montt appeared around the normal (anomalies between +/- 0.5°C with respect to climatologic averages). Only Austral region, between Coyhaique and Punta Arenas, was slightly colder with negative anomalies between 1.1 and 1.4°C. The maximum temperature appeared in most of the country with negative anomalies (cooling of the air), especially in the South and Austral region, with values majors that -1°C in Temuco, Puerto Montt, Balmaceda and Punta Arenas. A smoother cooling, with negatives anomalies smaller than -0.4°C were observed in the North coast, between Arica and La Serena. Only Central region of the territory indicated a heating, as much in the coast as in the interior, being maximum anomaly of +0.9°C in Valparaiso.

The minimum temperature showed to an increase with respect to its average values in North, Central and South region, between Arica and Puerto Montt, being positive principles anomalies (heating of the air) in Valdivia and Osorno, with +1.6°C. Only the Austral region, between Coyhaique and Balmaceda, was abnormally cold, with negative anomalies between -1.2 and -1.5°C

The dominant cyclonal circulation and pressure weakening, especially to the south of Concepcion, including Juan Fernandez, next to an increase of the frontal activity, stayed with negative anomalies by on -4hPa and surplus of precipitation to a large extent of Central and South zone of the country.

The precipitations surpassed average values of the month between La Serena and Puerto Montt, being the cities of Valparaiso, Temuco and Puerto Montt those that registered the principles pluviometric anomalies of the month with respect to average precipitation of August, with 107, 158 and 276 mm respectively. The maximum by day was observed day 15 in Valparaiso, with 103 mm.

III. PERSPECTIVE

A. GLOBAL

Taking into account present predictions from several numerical models, as well as behaviour of the main oceanic and atmospheric indicators, is anticipated that during next month to a large extent of Eastern Equatorial Pacific positive anomalies of SST will continue present, although hopes that they remain certain areas of the Central and Western Pacific with negative anomalies.

B. REGIONAL

In agreement with the pursuit of ocean-atmospheric conditions in the Southeastern Pacific Ocean, executed by Program ERFEN (integrated by National Committees ERFEN of Chile, Colombia, Ecuador and Peru), and coordinated by the CPPS, it is not anticipated for the next month great changes in the superficial thermal structure in the sector of the Eastern Pacific, hoping that Air Temperature as SST appear slightly on their average value of the month, with tendency to reduce values of positive anomaly.

TABLE 1

LARGE SCALE DATA: From left to right, monthly median for the last three months of the zonal wind component at lower levels (U3, U2, U1 in the Equatorial Pacific central western, central and central eastern, respectively in m/s with positive values from East to West). SST (T4,T3.4,T3,T1+2,Tc corresponding to the Equatorial Pacific central western, central and central eastern, close to the coast and the coastal area, Talara-Callao, respectively: in °C), atmospheric pressures in Tahiti (Tht) and Darwin (Dwn), expressed in an excess over 1000 Hpa and South Oscillation Index (SOI).

MONTH	ZONAL WIND			NIÑO REGION SST					ATMOSPHERIC PRESSURE		
	WEST.	CENT.	EAST.	T4	T3.4	T3	T1+2	Tc	Tht	Dwn	IOS
JUN 08	6.2	9.1	6.8	28.1	27.2	26.6	23.7	20.9	14.9	13.1	0.3
JUL 08	6.6	8.6	7.6	28.2	27.2	26.1	22.6	20.4	14.7	13.4	0.2
AUG 08	6.8	8.8	7.0	28.2	27.0	25.7	21.8	***	16.6	13.5	0.8

Source: NCEP/NWS/NOAA/USA.

TABLE 2

COASTAL OCEAN DATA OF THE ERFEN REGION: Monthly medians of the last three Months for Sea Surface Temperatures (SST) in degrees °C. Stations: Tumaco (TCO), La Libertad-Salinas (LLS), Callao (CAL), Arica (ARI), Antofagasta (ANT), Caldera (CDA), Coquimbo (COQ) and Valparaíso (VAL).

Sea Surface Temperature (SST)									
MONTH	TCO	LLS	CAL	ARI	ANT	CDA	COQ	VAL	
JUN 08	27.6	23.3	16.8	15.9	14.8	13.3	12.8	12.2	
JUL 08	27.4	23.7	17.6	16.0	15.2	13.8	13.0	12.1	
AUG 08	27.4	23.3	16.9	16.1	15.5	13.8	13.4	12.1	

Source: CCCP (Colombia), INOCAR (Ecuador), DHN (Perú), SHOA (Chile).

TABLE 3

COASTAL OCEAN DATA OF THE ERFEN REGION: Monthly medians of the last three Months for the Mean Sea Level (MSL) in mm. Stations: Tumaco (TCO), La Libertad-Salinas (LLS), Callao (CAL), Arica (ARI), Caldera (CDA), Coquimbo (COQ) and Valparaíso (VAL).

Mean Sea Level (MSL)									
MONTH	TCO	LLS	CAL	ARI	ANT	CDA	COQ	VAL	
JUN 08	***	2767	1170	1555	661	1215	871	693	
JUL 08	***	***	1130	1561	703	1228	889	704	
AUG 08	***	2704	1070	1507	620	1176	828	625	

Source: CCCP (Colombia), INOCAR (Ecuador), DHN (Perú), SHOA (Chile).

TABLE 4

COAST OCEANIC DATA OF THE ERFEN REGION: Five-day averages (Pentads) of SST (°C) and MSL (mm)

PENTADS	Sea Surface Temperature (SST)			Mean Sea Level (MSL)		
	BALTRA	TALARA	CALLAO	BALTRA	LLS (INOCAR)	CALLAO
JUL 02	***	***	***	***	***	***
07	***	***	***	***	***	***
12	***	***	***	***	***	***
17	***	***	***	***	***	***
22	***	***	***	***	***	***
27	***	***	***	***	***	***
AUG 01	***	19.2	17.6	***	274.8	110.6
06	***	18.8	17.2	***	275.6	105.9
11	***	19.2	17.3	***	268.6	111.9
16	***	19.1	16.7	***	269.4	106.0
21	***	18.2	16.7	***	270.0	105.0
26	***	17.5	16.5	***	263.0	106.5
31	***	17.8	16.5	***	270.7	110.6

Source: NOAA/Atlantic Oceanographic and Meteorological Laboratory – Miami.

Note.

* Values revised

***. Information not received

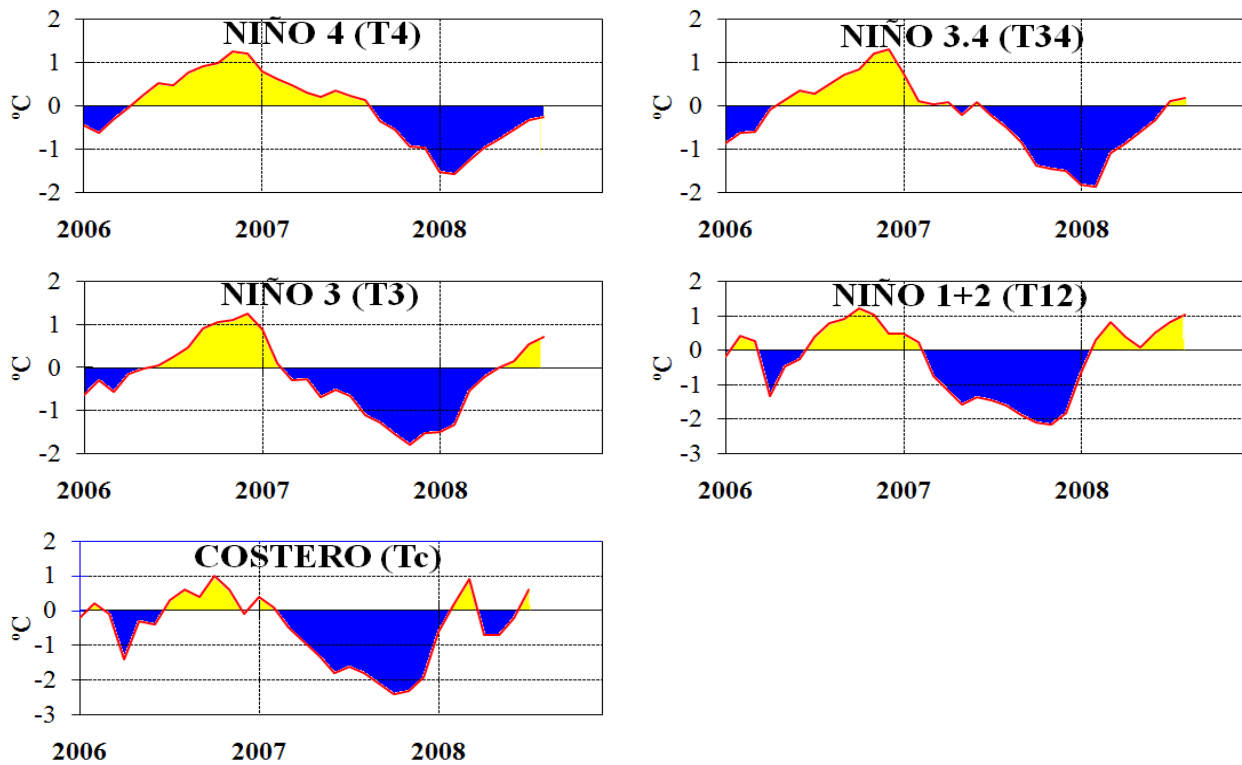


Figure 3.- Oceanic anomalies indices (Niño 4, Niño 3.4, Niño 3, Niño 1+2 and Tc). The location of the oceanic indices appears in figure 2. (Source: NCEP/NWS/NOAA/USA).

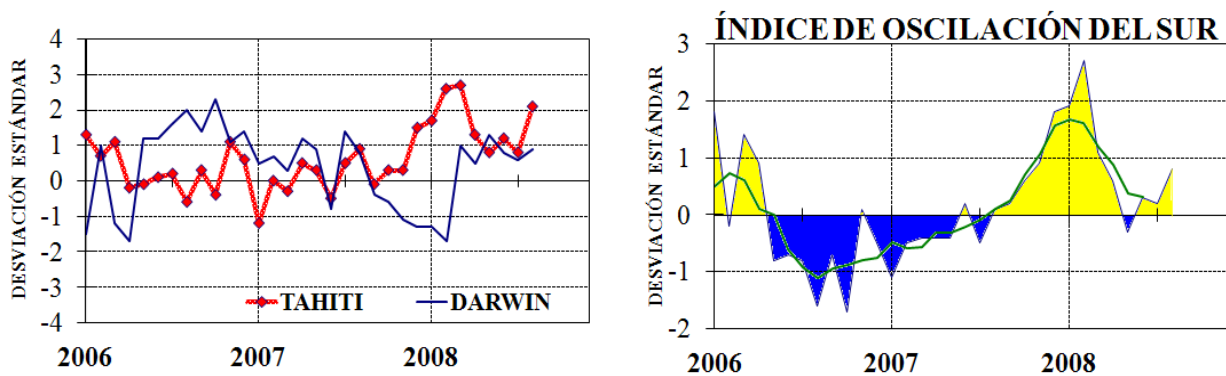


Figure 4.- Left Panel: Five-months running mean for atmospheric pressure anomalies in Tahiti and Darwin (mb). Right Panel: Southern Oscillation Index. (SOI) with monthly values and five-months running mean graphed as a green line. The SOI is based on the difference between standardized pressure values: Tahiti minus Darwin. The differences are also standardized for standard deviation of yearly values. (Source: NCEP/NWS/NOAA/USA).

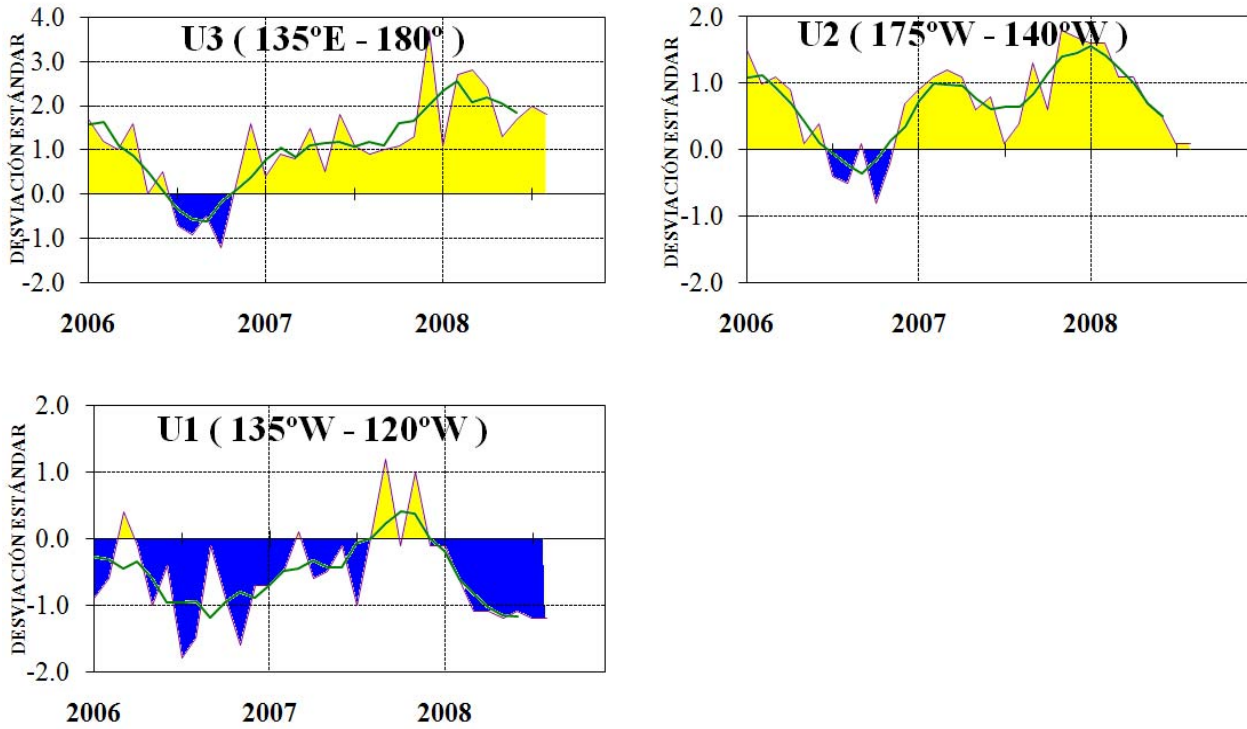


Figure 5.- Series and moving averages of five months of zonal wind standardized anomalies (m/s) averaged between 5°N and 5°S for three Equatorial zones: western (U3), central (U2) and eastern (U1). (Source: NCEP/NWS/NOAA/USA).

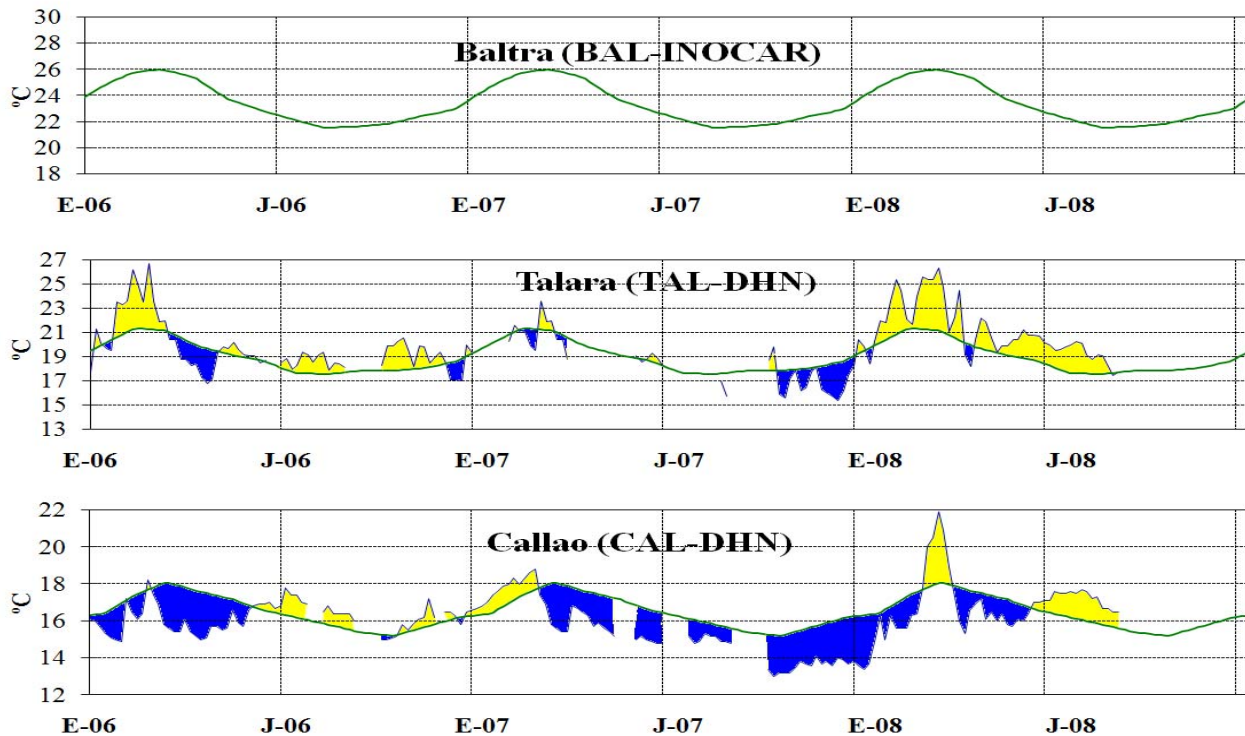


Figure 6.- Five day averages (pentads) of SST (°C) in Ports of Peru and Ecuador. The green curve indicates climatology. The location of oceanic indices appears in figure 1. (Source: NOAA/Atlantic Oceanographic and Meteorological Laboratory – Miami.)

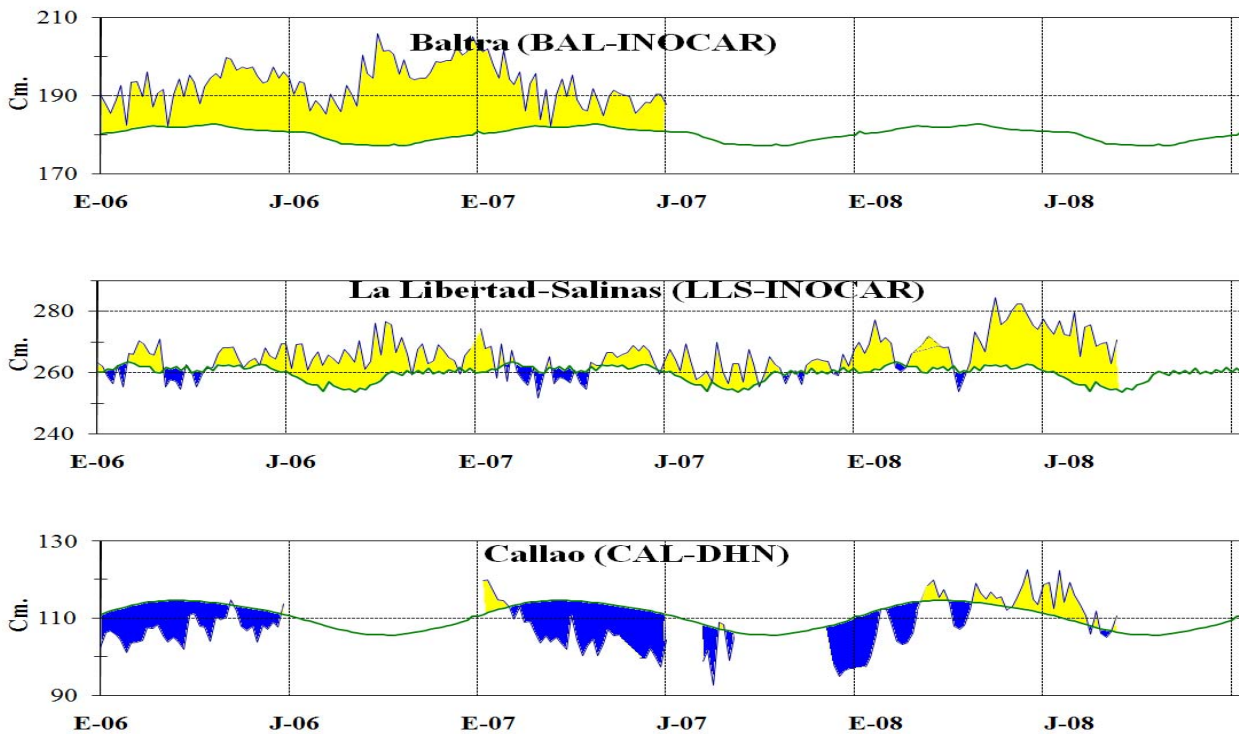


Figure 7.- Five-day running mean (pentads) of MSL (cm) in Ports of Peru and Ecuador. The green curve indicates climatology. The location of oceanic indices appears in figure 1. (Sources: NOAA/Atlantic Oceanographic and Meteorological Laboratory – Miami, e INOCAR).

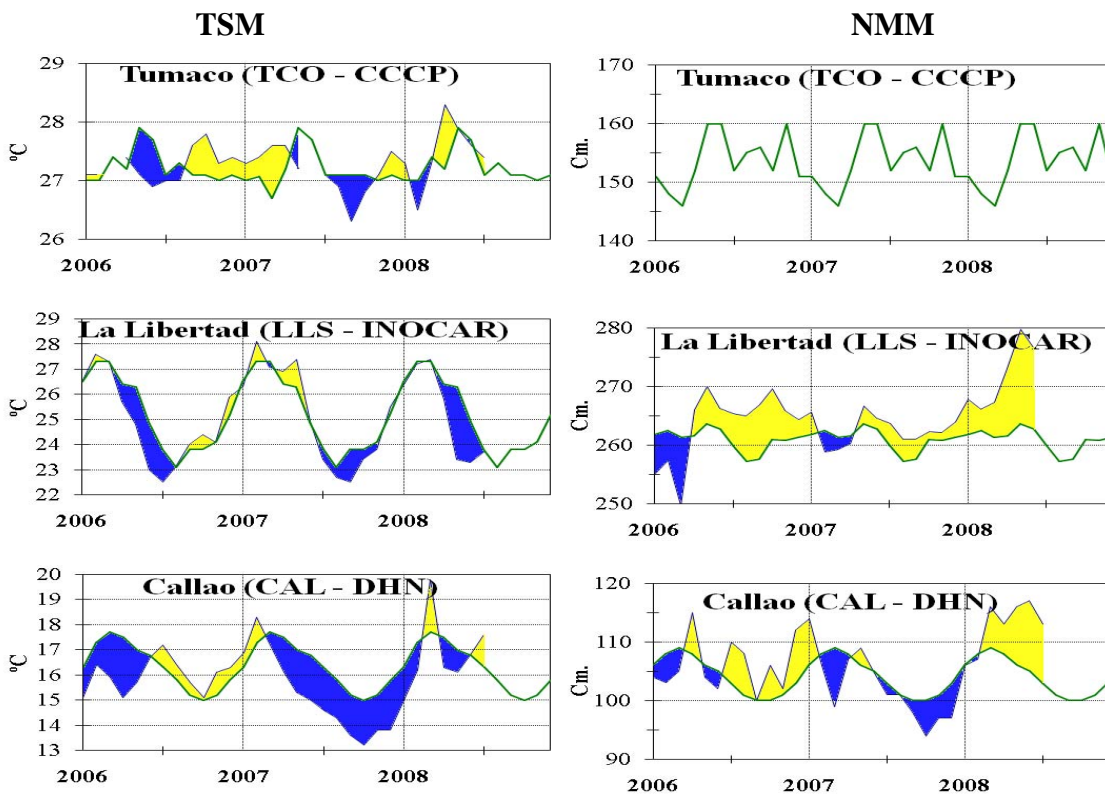


Figure 8a.- Monthly means of the SST (°C) and MSL (cm) in five stations of the ERFEN region. Green curve indicates historic monthly mean. The location of the stations appears in Figure 1. (Sources: CCCP, INOCAR y DHN).

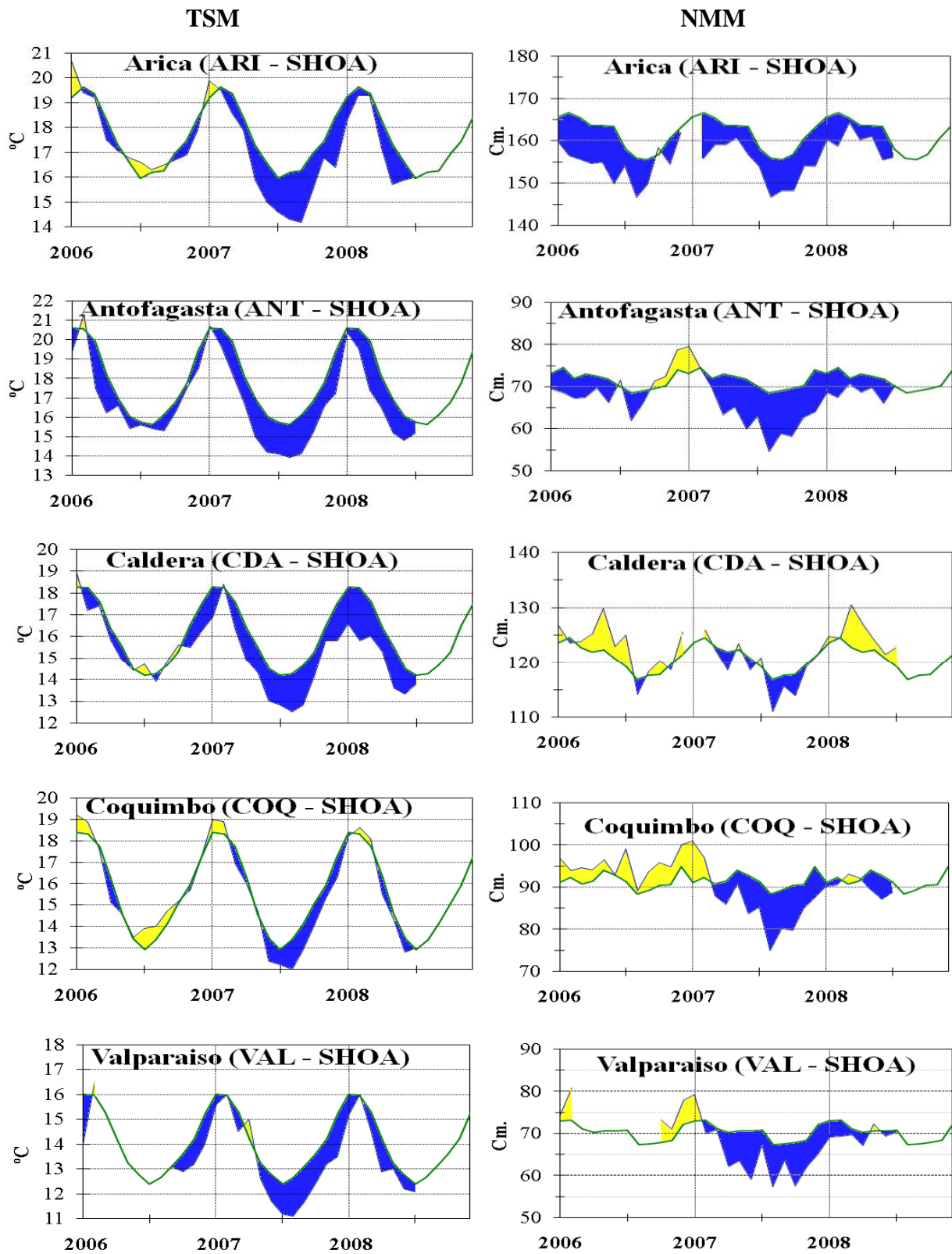


Figure 8b.- Monthly means of the SST (°C) and MSL (cm) in five stations of the ERFEN region. Green curve indicates historic monthly mean. The location of the stations appears in Figure 1. (Source: SHOA).

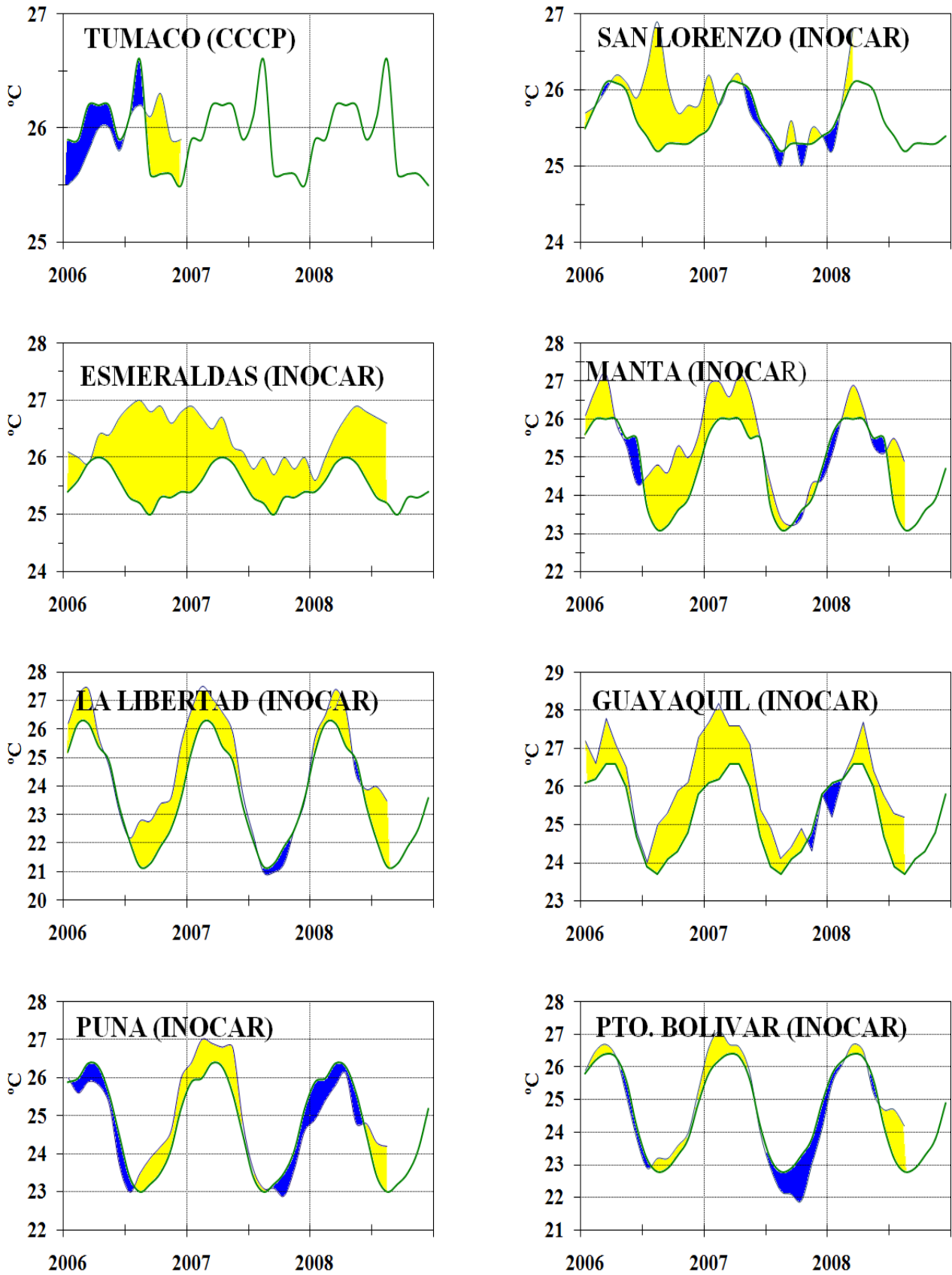


Figure 9a.- Monthly means of the air temperature (°C) in 8 stations of the ERFEN region. Green curve indicates historic monthly mean. The location of the stations appears in Figure 1. (Sources: CCCP & INOCAR).

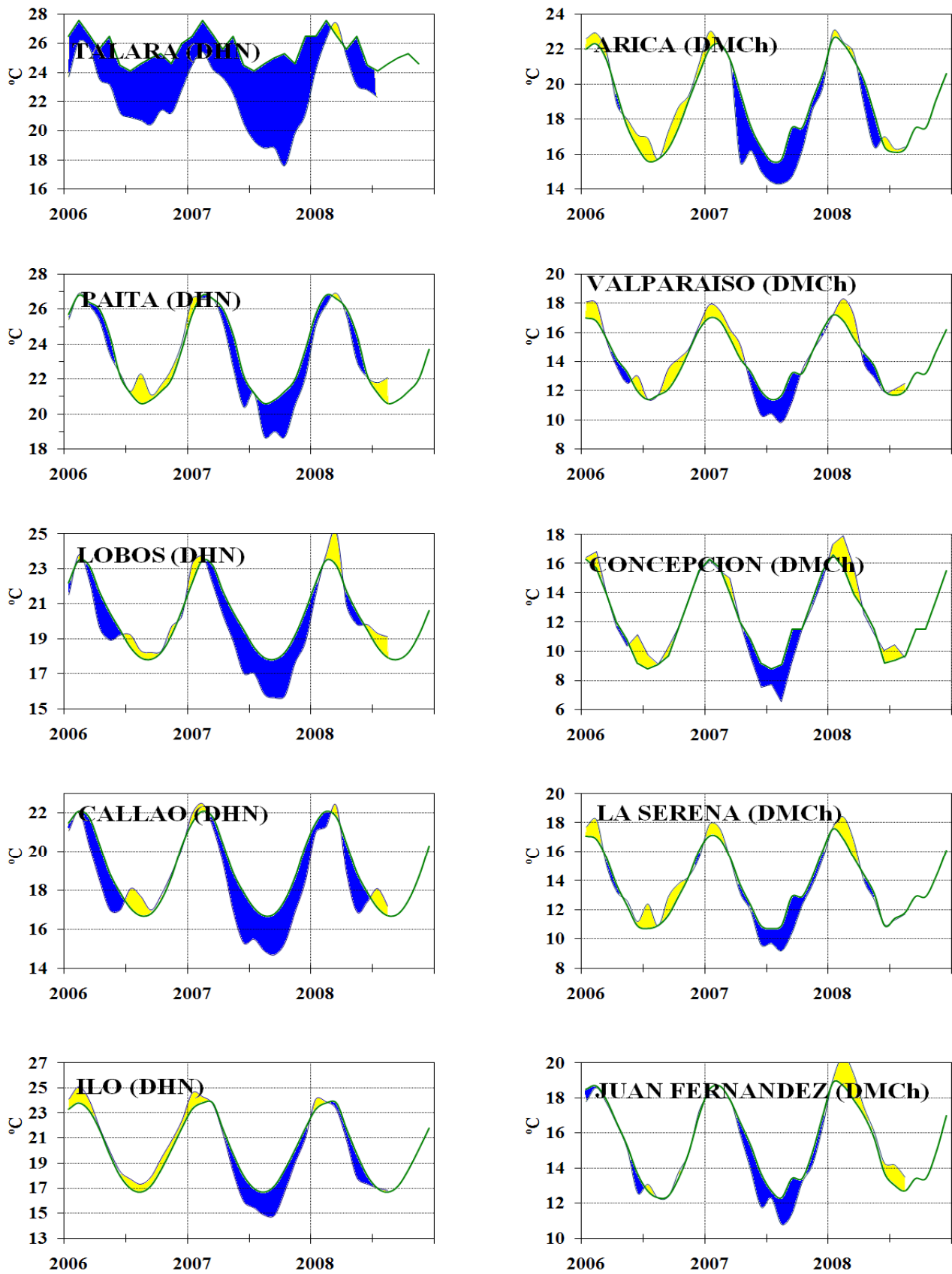


Figure 9b.- Monthly means of the AT (°C) in 10 stations of the ERFEN region. Green curve indicates historic monthly mean. The location of the stations appears in Figure 1. (Sources: DHN & DMCh).

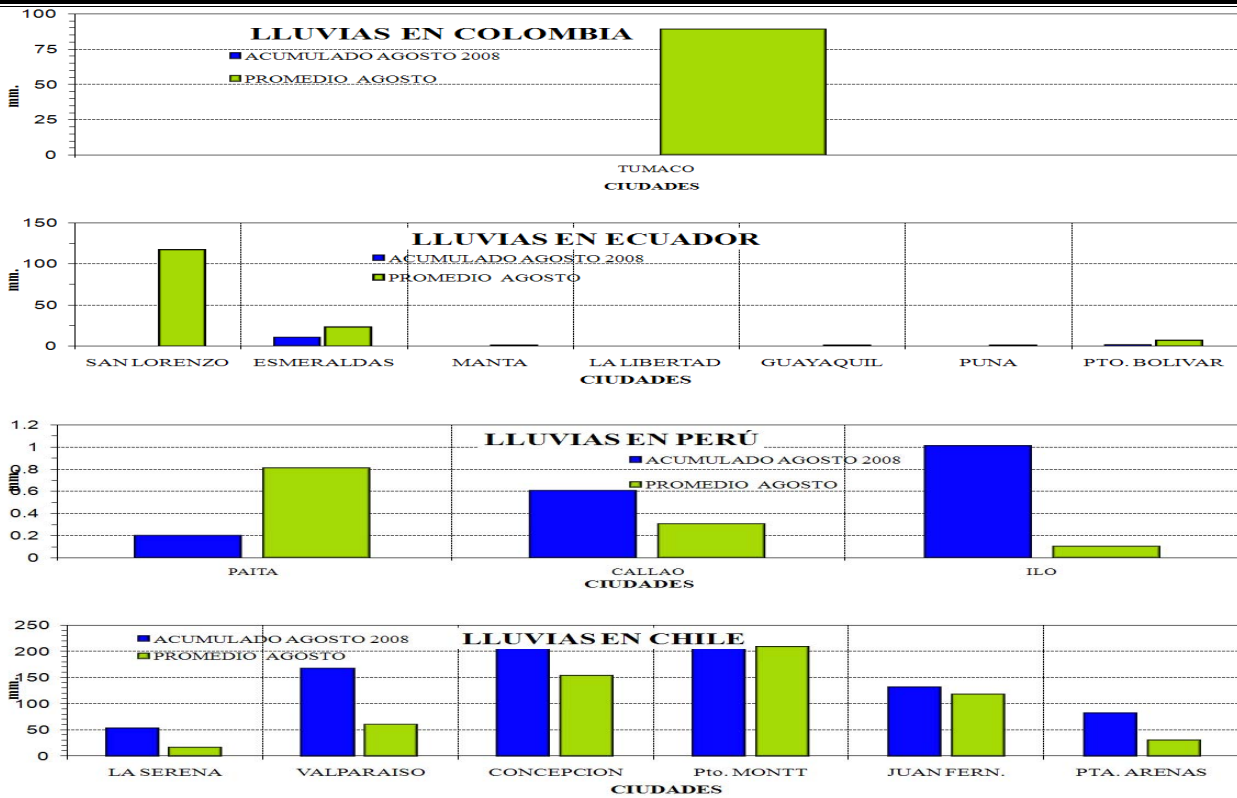
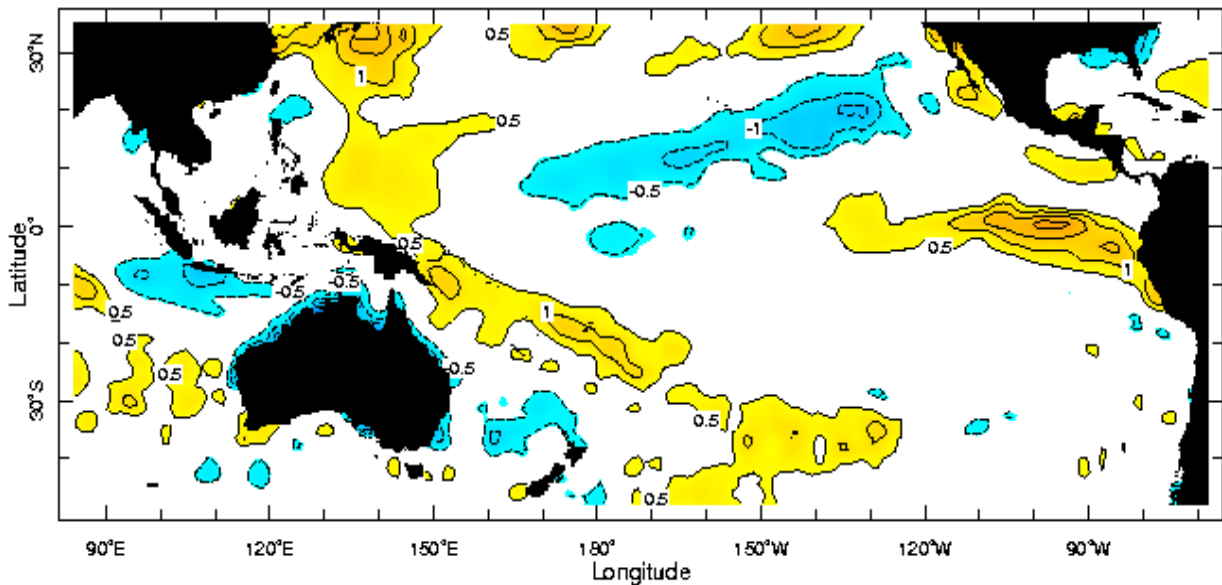


Figure 10.- Rains during August in the coastal stations of Colombia, Ecuador, Peru and Chile. Location of the stations appears in Figure 1. (Sources: CCCP, INOCAR, DHN & DMCh).

**Anomía de la Temperatura Superficial del Mar (°C)
Agosto 2008**



Aug 2008

Figure 11.- Sea Surface Temperature Anomalies (°C) August 2008. (Source: International Research Institute for Climate and Society)

EDITED IN THE OCEANOGRAPHIC INSTITUTE OF THE NAVY OF ECUADOR

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