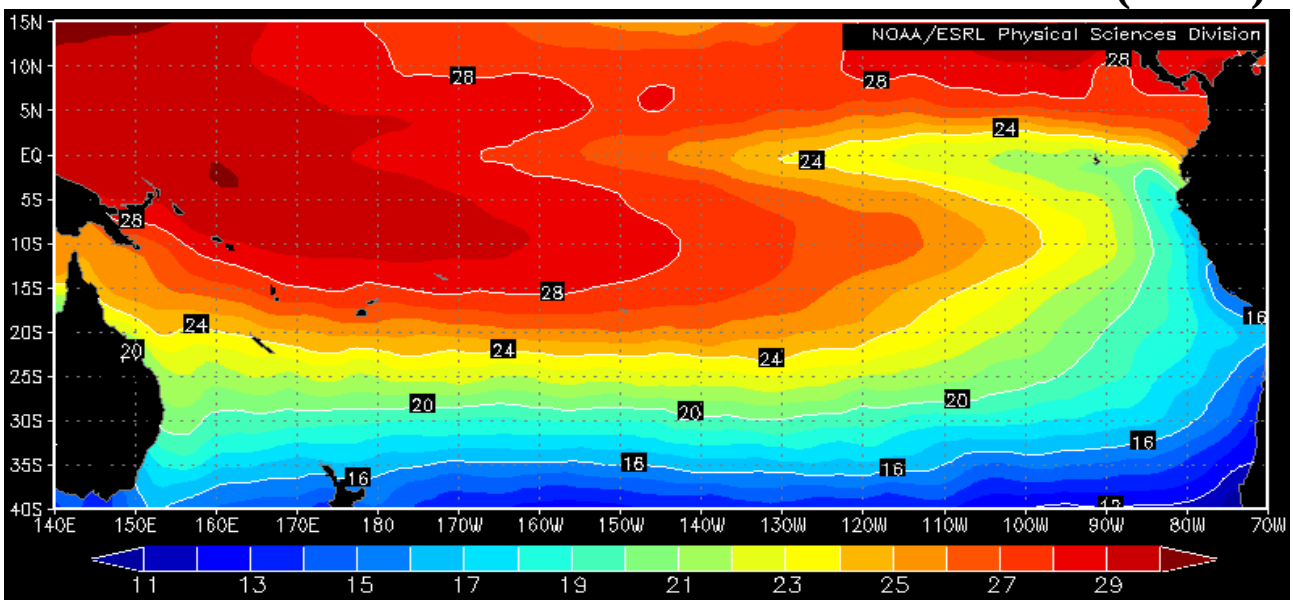
COMISIÓN PERMANENTE DEL PACÍFICO SUR (CPPS)



Sea Surface Temperature, July 2007, NOAA-CIRES/Climate Diagnostic Center

JULY 2007 BAC N° 202

ERFEN

(Estudio Regional del Fenómeno El Niño)

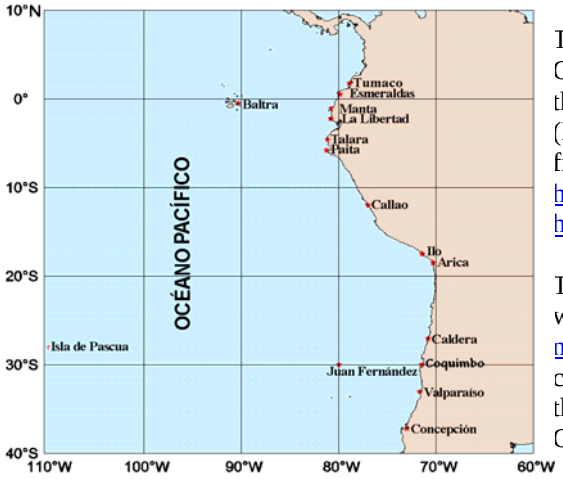
BOLETÍN DE ALERTA CLIMÁTICO

CLIMATE ALERT BULLETIN

OMM **CPPS** **COI**

COLOMBIA	ECUADOR	PERÚ	CHILE
CCCP	INOCAR	DHN	SHOA

COMISIÓN PERMANENTE DEL PACÍFICO SUR
SECRETARIA 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

Beginnings of July it was observed a slight deceleration of the observed cooling previous weeks in the "El Niño" regions, which was more well-known in the western edge of the Pacific. Towards second half of the month, an intensification of the cooling throughout the equatorial strip of the Pacific is observed again; this behavior of the surface temperature of the sea was very similar of the previous month.

The anomalies of the temperature of the sea during the last week of July were of 0,2ºC in the Western Pacific, -1,2ºC for the Central Pacific and of -1,7ºC in the Eastern end, condition that would maintain in the Equatorial Pacific characteristic between neutral and cold.

As far as winds of surface in the Southeastern Pacific they appeared with speeds that fluctuated within the normal rank for the date. As far as their direction the winds of the south and southeastern predominated in the entire region.

The Index of Oscillation of the South, after remaining by a brief period (the previous month) in the positive phase, in July happened again to negative values with -0,5.

The mean sea level was characterized to fluctuate closely together in the coasts of Ecuador and Peru of its normal patterns for the month with slight variations; in Chile the negative anomalies persist mainly, with fluctuations between -2,1 (Caldera) and -6,1 cm (Antofagasta).

Taking into account the present cooling from the Equatorial Pacific Ocean, as well as the results of several models of numerical simulation, are anticipated that during next two months in the sector of the Eastern Pacific and Central the temperature of the sea would continue below its normal value.

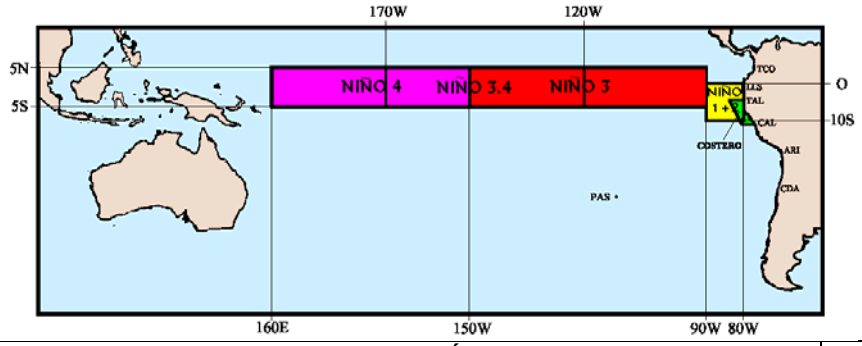


Figure 2.- Map indicating locations and codes of series. Rectangles show the average area of Sea Surface Temperature (SST °C)

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Permanent Commission
for the South Pacific (CPPS)

CLIMATE ALERT BULLETIN
BAC Nº 202, JULY 2007

I. GLOBAL AND REGIONAL IMAGE

Beginnings of July the Equatorial Pacific Ocean showed a slight deceleration in the process of cooling of the Surface Temperature of the Sea (SST), particularly in the western sector of the Equatorial Pacific; later, in the middle of month, the cooling is started again reaching the SST values of anomaly of -2,0ºC in the region of the Southeastern Pacific. The monthly anomaly of the SST in the "El Niño" regions thus shows to a very small increase of the negative anomalies during July with respect to the previous month, for the region of the Western Pacific ("El Niño" Region 4) the monthly value of the anomaly happened to 0,3 to 0,2ºC, in the Central Pacific ("El Niño" Region 3,4) the anomaly happened of 0,1 to -0,2ºC and in Eastern Pacific ("El Niño" Region 1+2), it happened of -1,4 to -1,5ºC.

In the Eastern equatorial Pacific during July, at subsurface level, below the termocline, it continued appearing a slight weakening of the water body with negative anomalies, arriving even by the end of month, in the Eastern edge, to present a small patch with positive anomaly (0,5ºC). On the other hand in the western margin of the Pacific, the water body with positive anomalies (1,0ºC) located on the termocline, moved towards the line of date in the Pacific.

The mean sea level (MSL) in the Southeastern Pacific during July, fluctuated near its normal patterns for the month; as opposed to the coasts of Ecuador it was 4,0 cm on the average, in Peru fluctuated ± 3,0 cm around the average and in Chile the negative anomalies persist mainly, with fluctuations between -2,1 (Caldera) to -6,1 cm (Antofagasta).

The Index of Oscillation of the South (IOS), happened again to the negative phase, with a value of -0,5. With respect to the atmospheric anomalies of pressure, Tahiti and Darwin reached values of 0,5 and 1,4 respectively, indicating with respect to the previous month a predominance of high pressures in the basin of the Subtropical Pacific.

The Zone of Intertropical Convergence (ZITC), in the Eastern Pacific Ocean, appeared like a cloudy band, with its central axis located around 10ºN, with presence of convective cells of regulating activity, with influence on the region of Central America and the Caribbean.

Similar to the happened thing in the previous month, the continuous advance of tropical waves of the east altered the tropical flow, generating a displacement of the ZITC towards the north.

As far as surface winds they predominated of the South and the Southeastern; with speeds that fluctuated around the normal value of the month.

With respect to rains, they were significant in the Caribbean region and North Andean region, which originated situations of emergency by the underflow of several of the rivers in these zones of Colombia; in the Orinoquia, the own precipitations of the rainy season in this region, were not so intense; in Ecuador sporadic episodes of rains in the North region appeared, that did not exceed the own normal value for the month; in Peru, only in the Callao very low were registered during the first days of the second fortnight of the month; in Chile during the month a deficit of precipitations

throughout all the country, associated to the greater frequency of high pressures was registered on their zones the center-south.

II. NATIONAL IMAGE

A. CONDITIONS IN THE COLOMBIAN COAST

The Center Control Contamination of the Pacific (CCCP) and the Institute of Hydrology, Meteorology and Environmental Studies (IDEAM), inform that July was characterized by the passage of tropical waves of the East on the North of the national territory. A slight displacement of the anticyclonal system of the Caribbean Sea towards higher latitudes, allowed that the waves moved a little more towards the North, interacting constantly with the ZITC; sometimes this interaction, generated centers of low pressure on the northwest of the country, and with it, significant precipitations in the region of the Caribbean and north of the Andean, which originated situations of emergency by the underflow of several of the rivers in these zones of the country. In the Orinoquia, although they continued the precipitations, own of the rainy season in this region, they were not so intense, due to the configuration and wind speed of the East, registered during the month. The ZITC oscillated between the 8 and 10°N during good part of July.

During the monitored of 2007 July, made by the area of Operational Oceanography of the CCCP to the fixed station coastal Nº 5 located to 10 miles of the Bay of Tumaco between the coordinates 78.51º W and 2º N, could be observed that the registry of the SST for July was of 27,1ºC. A positive anomaly at superficial level of 0,02°C appeared, with respect to the historical average (July 1999 - July 2007), which is of 27,1ºC, which indicates normal conditions for this month of the year.

On the other hand the termocline descended 3 meters with respect to the last registry from the month, positioning itself on the 51 ms. The isotherm of 15ºC is made visible for this month from the 55 until the 85 ms of depth, thus obtaining respectively negative anomalies of -2,0 and -0,8ºC.

As far as the behavior of the salinity, a value of 31,6 ups was registered at superficial level, which represents a diminution of -0,6 ups surface level with respect to the historical average that is of 32,2 ups. The maximum value of salinity of the month was of 35,01 ups and it was registered approximately to a depth of 58 ms. The halocline was positioned approximately on the 50 ms and the isohaline of 34 and 35 ups were registered respectively to the 50 and 81 ms.

B. CONDITIONS IN THE ECUADORIAN COAST

The Oceanographic Institute of the Navy of Ecuador (INOCAR), reports that, 2007 July the originating wind presence of the south affected the central and south zone of the Coast, transporting to the region air could masses, which was reflected in the reduction of the temperature of the air (22,3ºC) in the south coast, whereas in the north the temperature of the air (AT) was a little warmer (25,3ºC), with slight and brief precipitation presence.

During July, accumulated rain on the Coastal and Insular Region appeared slightly deficit, since seasonally these months are of little rains.

The AT during this month in all the Region appeared fluctuating around the average, with anomalies of values ±0,3ºC.

The SST, during the month presented values on the normal (0,5ºC) in the north coast, decreasing the anomalies as advances towards the south of the Ecuadorian coast, arriving at -0,8ºC in the South border.

Considering the present behavior of the ocean-atmospheric conditions, it would be expected for August 2007 that in the Ecuadorian coast, the precipitations (rains and drizzles) are little, according to the typical thing of the dry station, with accumulated values near his normal ones. In the Galápagos Islands, the precipitations would continue deficit.

With respect to AT and SST they would stay fluctuating around the rank of normality with tendency to the reduction, particularly towards the south of 0º of latitude, whereas in the Galápagos Islands one stays below his normal.

C. CONDITIONS IN THE PERUVIAN COAST

The Direction of Hydrography and Navigation of Peru (DHN) informs that in all Peruvian coast the registries of the SST continued below the monthly average, being observed in general an increase of its values towards conditions less cold, where the most significant change appeared in Chimbote. The anomalies of the SST fluctuated between -0,6 (Talara) and -1,6ºC (Callao).

The MSL throughout the Peruvian coast, presented values very near their normal ones of variability corresponding to the month of July, being appraised in general, slight variations of +/-3,0 cm, with respect to the previous month. The minimum anomaly appeared in the station of Callao (-2,0 cm), and the Maxima anomaly in the stations of Paita and San Juan (3.0 cm).

The temperature of the air also stayed below the monthly average, being appraised in the coast, conditions less cold; where the most significant changes appeared in the North zone and the Callao, increasing around of 1,0ºC, respect to previous month. The Maxima negative anomaly appeared in the station of Chimbote (-2,3º C); whereas, in Paita the anomaly was 0,0°C.

In the month, only in the Callao plans were registered during the first days of the second fortnight of the month. Throughout the Peruvian coast winds of South direction predominated; with the exception of the stations Talara, Chimbote and Mollendo, in which winds of the Southeastern predominated. In relation to the wind speed, negative anomalies predominated; with the exception of Chimbote and Ilo, with positive anomalies respectively of 0,5 and 1,4 m/s and 0,0 in Mollendo.

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 level of the sea to supervise series of oceanic and atmospheric variables. Next a description of surface temperature of the sea and the level of the sea between Arica (18º29'S) and Talcahuano (36º41'S) for 2007 July appears.

In the case of the SST, like the happened thing in June, the negative anomalies for the zone stayed north-center of the country (Arica to Talcahuano), with values that fluctuated between the -0,7 and -1,8°C. The north zone was characterized to register the greater differences, oscillating between -1,4 (Caldera) and -1,8ºC (Arica). Whereas, in the zone the center-south, the anomalies oscillated between -0,7 (Coquimbo) and -1,2ºC (Valparaiso).

The behavior of the level of the sea was characterized to present a positive tendency, persisting mainly the values of negative anomalies, with fluctuations between -2,1 (Caldera) and -6,1 cm (Antofagasta). It is possible to emphasize that the station of Arica was the unique one that registered a positive value of 3,0 cm on the historical average.

The Meteorological Direction of Chile (DMCh) shows that the month of July was characterized being a cold month to a large extent of the country, with a generalized reduction so much of the maximum temperatures as minimum. The north zone of the country registered a reduction of the maximum temperatures of the air of until -2,5°C in Arica (18°S). The minimum temperatures registered negative anomalies of until -0,4°C.

The central zone of the country, presented negative anomalies of until -1,4°C under the normal thing in the maximum temperatures. In as much, the minimum temperatures showed a reduction of until -1,0°C in Conception (36°S).

On the South and austral zones a slight increase in the maximum temperatures was observed the south of 45°S specially, with anomalies of until 0,7°C. Nevertheless, the minimum temperatures showed a reduction like the rest of the country, with the exception of Punta Arenas that registered an increase of 0,5°C.

The pressure at mean sea level during July was characterized to present a greater persistence of pressures by on the normal thing, especially on the zones center and the south of the country, favoring the precipitation deficit in the region. The monitored stations registered positive anomalies, specially on the central zone, in where they emphasize the anomalies of up to 3,5 and 3,0 hPa, of the stations of Santiago (33°S) and Conception (36°S), respectively.

During July a deficit of precipitations throughout all the country, associated to the greater frequency of high pressures was registered on the zones the center-south of the country. According to the monitored stations, between Valparaiso and Concepcion anomalies of up to -94 mm with respect to the normal thing are observed, like in the region between Valdivia and Balmaceda where anomalies of up to -91 mm were registered (Balmaceda).

III. PERSPECTIVE

A. GLOBAL

Taking into account the predictions from several numerical models, as well as the present behavior of the main oceanic and atmospheric indicators in the Tropical Pacific Ocean, it is considered that the Equatorial Pacific would continue in neutral condition, with certain tendency to a cold period in the Eastern and coastal Equatorial Pacific for the next months.

B. REGIONAL

In agreement with the pursuit of the 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, esteem that during the next month, would stay the cooling of the SST in the Eastern and coastal Equatorial Pacific, whereas the temperature of the air would exhibit values around its normal one; as far as the SML it would also continue fluctuating around his average value, with certain tendency to maintain in front of Chile negative anomalies. With respect to rains, they will present an accumulated agreed distribution to the normal ones of the time, especially for the pacific coast of Colombia and north coast of Ecuador; whereas for the rest of the region the tendency is of precipitations below the normal.

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).

	ZONAL WIND			NIÑO REGION SST					ATMOSPHERIC PRESSURE		
MONTH	WEST.	CENT.	EAST.	T4	T3.4	T3	T1+2	Tc	Tht	Dwn	IOS
MAY 07	3.6	8.7	6.9	28.8	27.6	26.4	22.8	21.0	12.8	11.8	-0.4
JUN 07	6.4	10.0	8.6	29.0	27.6	25.9	21.7	19.3	13.2	11.5	0.2
JUL 07	4.9	8.5	7.9	28.8	26.9	24.9	20.4	18.3	14.4	14.2	-0.5

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 Ssurface Temperature (SST)								
MONTH	TCO	LLS	CAL	ARI	ANT	CDA	COQ	VAL
MAY 07	27.2	27.4	15.3	15.9	15.0	14.3*	14.7	12.6
JUN 07	***	24.9	15.0	15.0	14.2	13.0	12.4	11.7
JUL 07	27.1	23.4	14.7	14.6	14.1	12.8	12.2	11.2

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
MAY 07	***	2667	1090	160.8	652	1235	909	635
JUN 07	***	2646	1050	1566	599	1187	838	590
JUL 07	***	2637	1010	1590	629	1209	852	674

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

TABLE 4

COAST OCEANIC DATA OF THE ERFEN REGION: Five–day averages (Pentads) of SST (ºC) and MSL (mm)

		Sea Ssurface Temperature (SST)			Mean Sea Level (MSL)		
PENTADS		BALTRA	TALARA	CALLAO	BALTRA	LLS (INOCAR)	CALLAO
JUN	02	***	19.10	15.00	186.6	267.0	99.7
	07	***	18.60	15.20	188.3	268.8	99.7
	12	***	18.80	15.00	188.2	267.0	102.2
	17	***	19.30	14.90	190.3	263.5	99.7
	22	***	18.90	14.80	190.3	259.5	97.4
	27	***	18.30	14.80	187.6	263.5	104.5
JUL	02	***	***	***	***	267.5	***
	07	***	***	***	***	264.3	***
	12	***	***	***	***	260.5	***
	17	***	***	***	***	269.5	***
	22	***	***	***	***	264.0	***
	27	***	***	***	***	257.8	***

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

Note.

* Values revised

***. Information not received

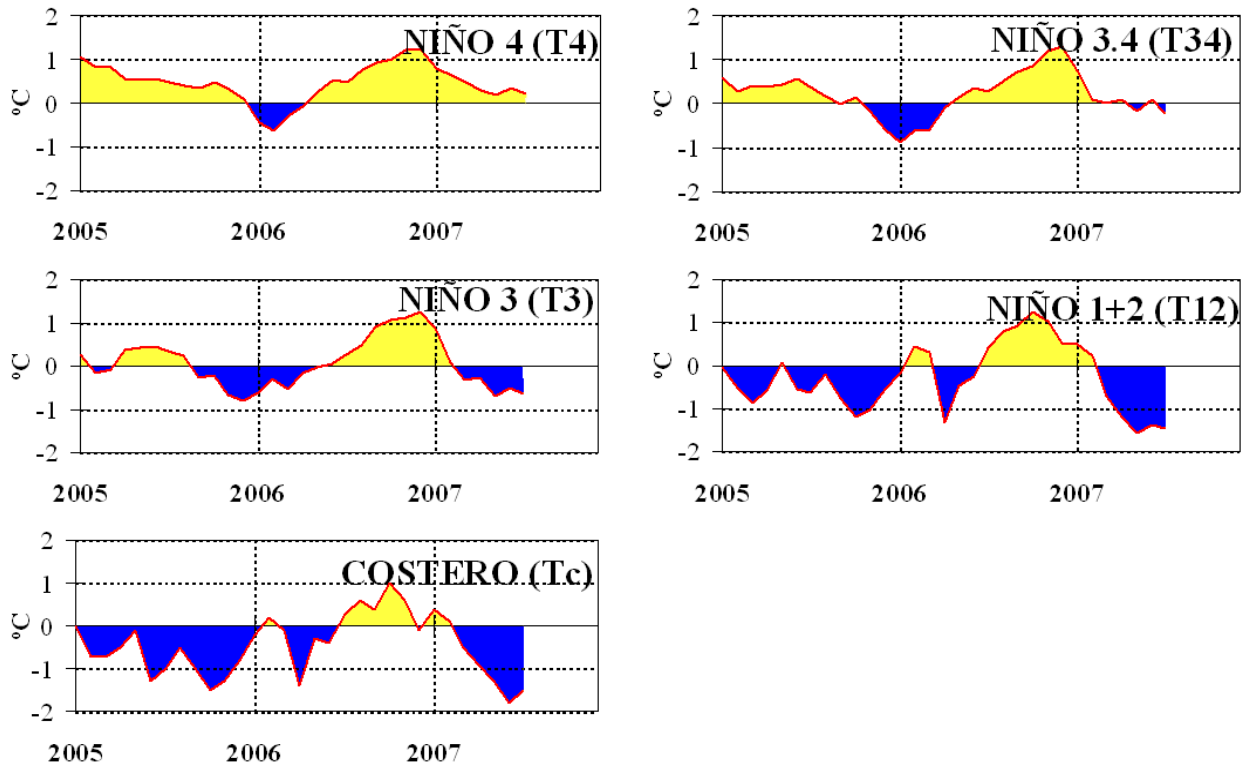


Figure 3.- Oceanic anomalies indices (Niño 4, Niño 3.4, Niño 3, Niño 1+2 and Tc). The location of the oceanic indices appears in figure 2.
(Source: NCEP/NWS/NOAA/USA).

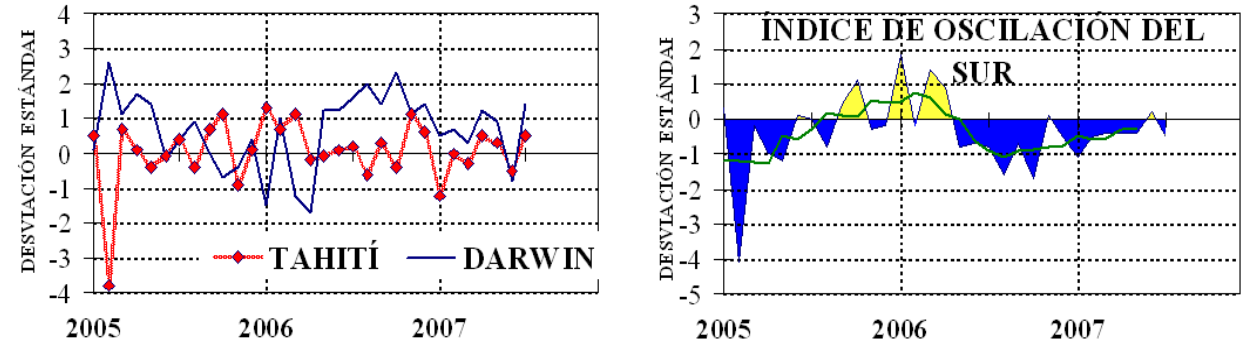


Figure 4.- Left Panel: Five-months running mean for atmospheric pressure anomalies in Tahiti and Darwin (mb). Right Panel: Southern Oscillation Index. (SOI) with monthly values and five-months running mean graphed as a green line. The SOI is based on the difference between standardized pressure values: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

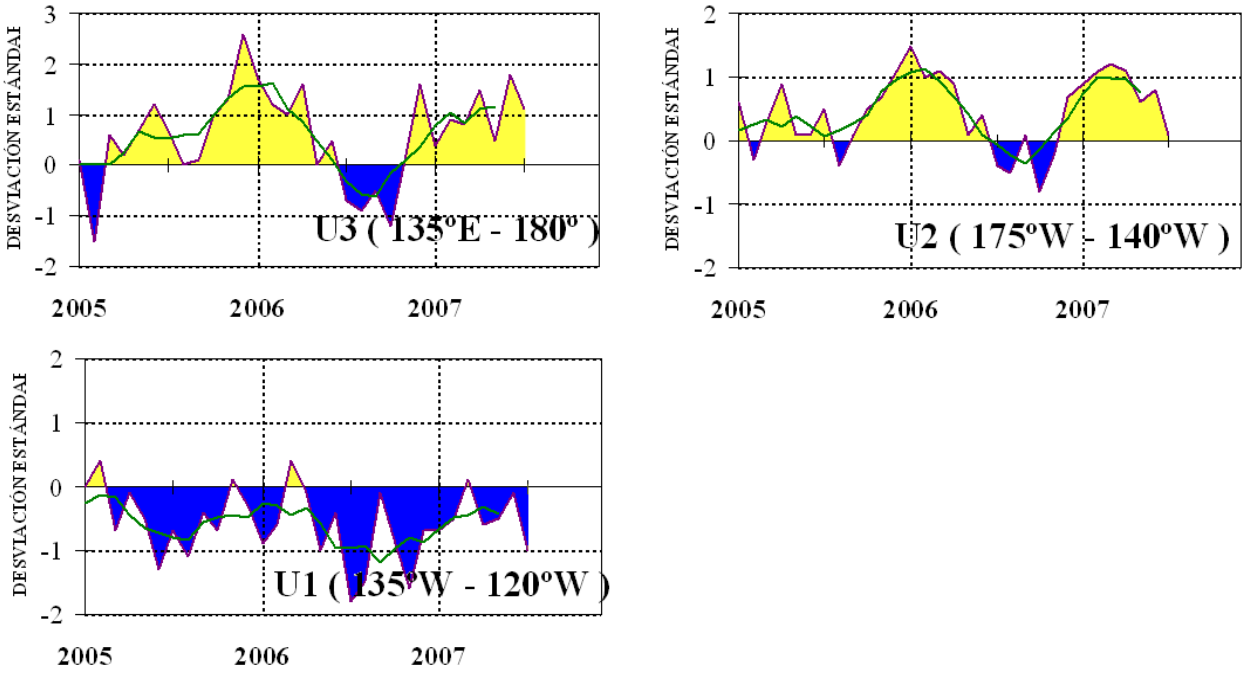


Figure 5.- Series and moving averages of five months of zonal wind standardized anomalies (m/s) averaged between 5°N and 5°S for three Equatorial zones: western (U3), central (U2) and eastern (U1). (Source: NCEP/NWS/NOAA/USA).

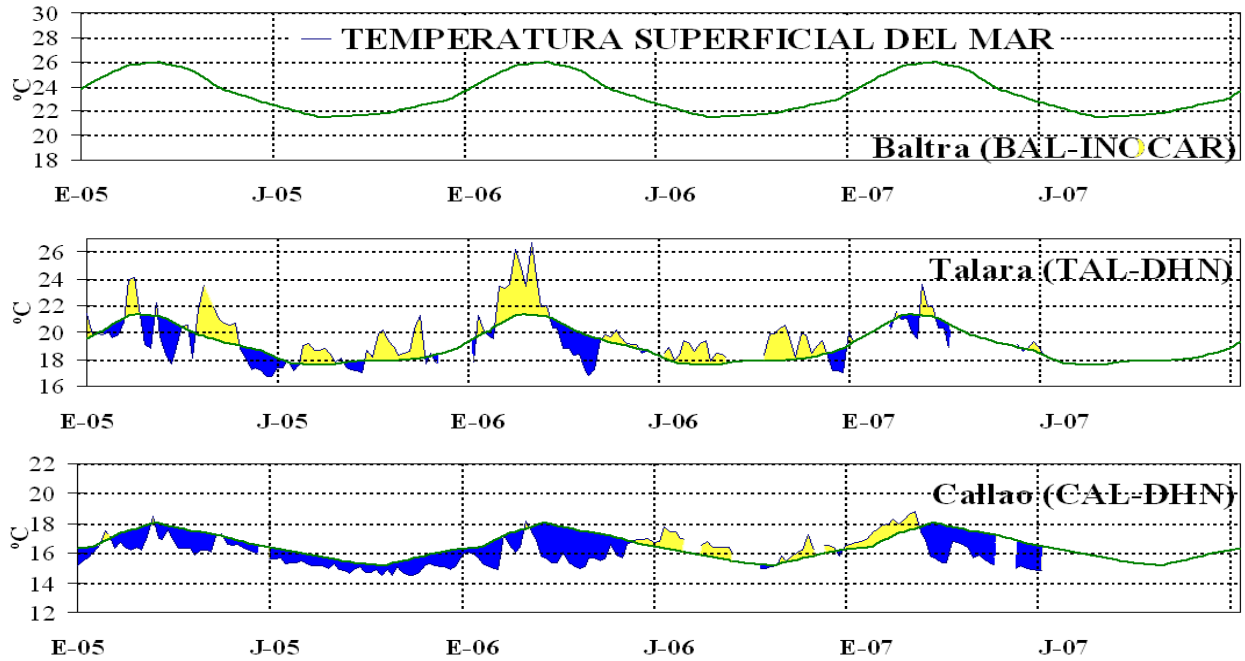


Figure 6.- Five day averages (pentads) of SST (°C) in Ports of Peru and Ecuador. The green curve indicates climatology. The location of oceanic indices appears in figure 1.
(Source: NOAA/Atlantic Oceanographic and Meteorological Laboratory – Miami.)

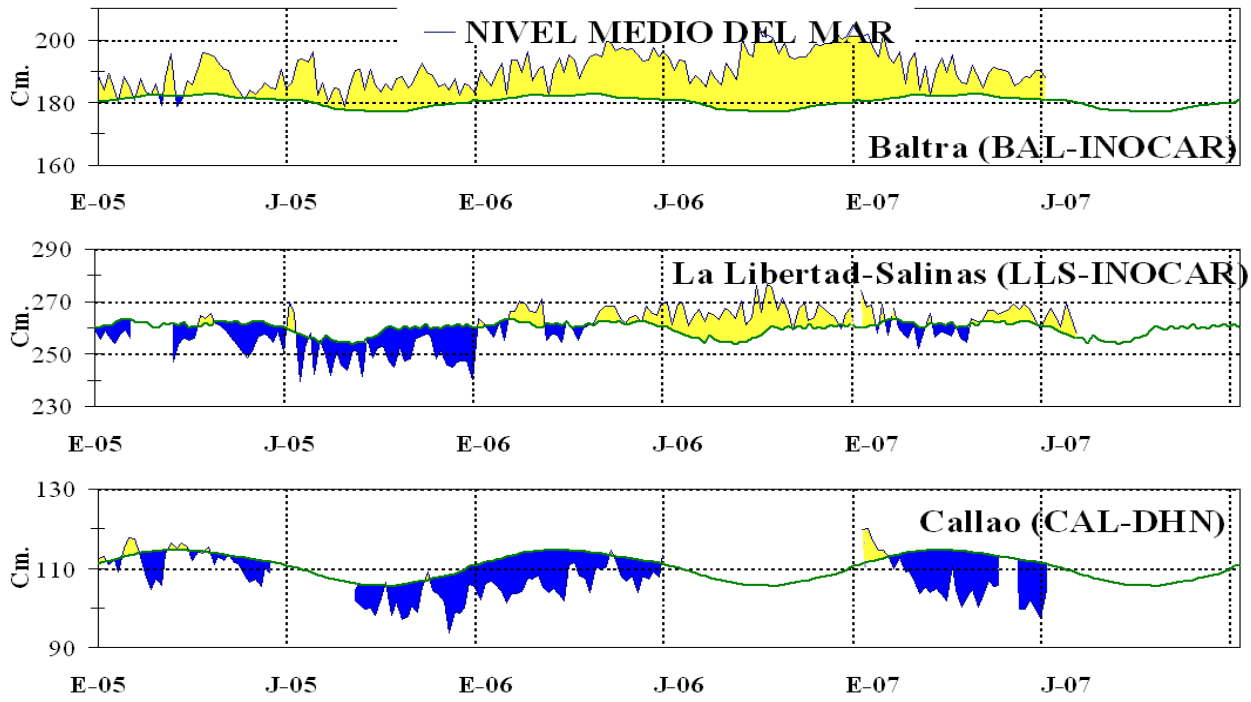


Figure 7.- Five-day running mean (pentads) of MSL (cm) in Ports of Peru and Ecuador. The green curve indicates climatology. The location of oceanic indices appears in figure 1.
(Sources: NOAA/Atlantic Oceanographic and Meteorological Laboratory – Miami, e INOCAR).

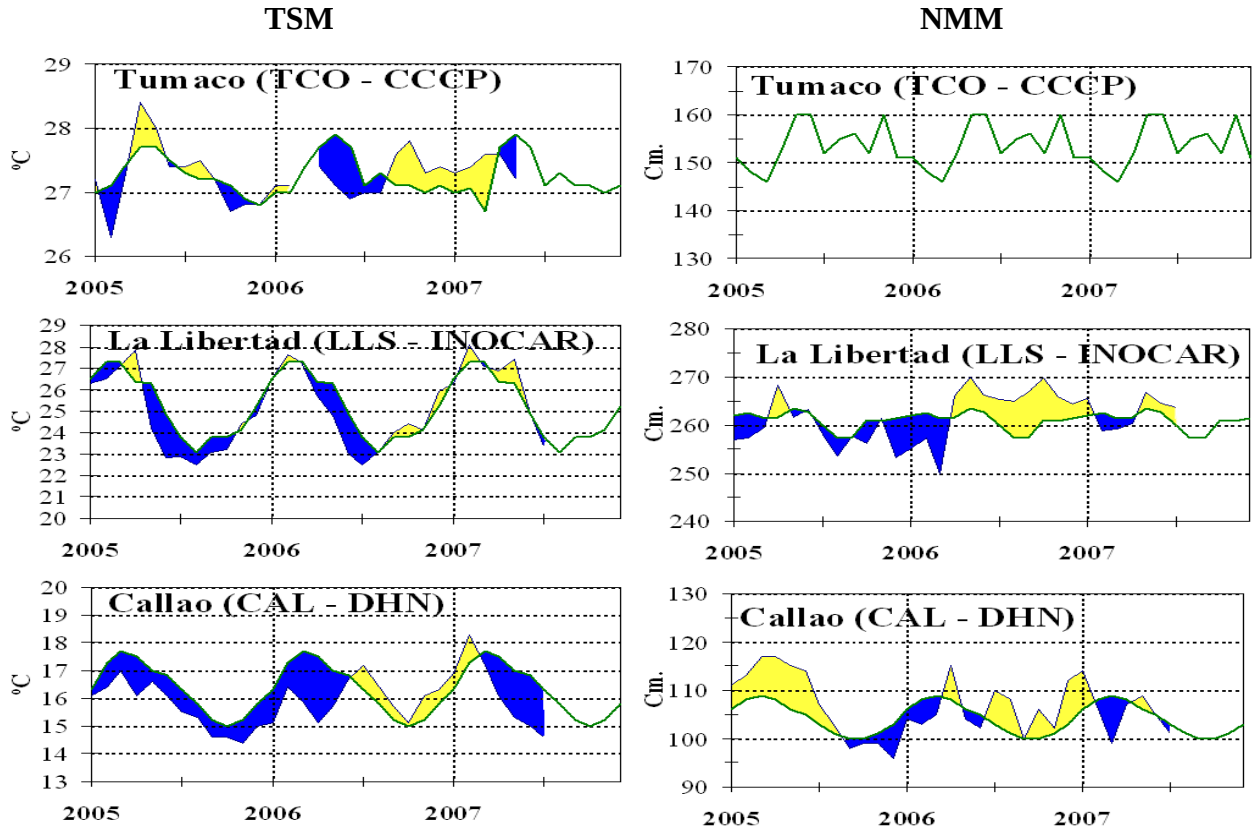


Figure 8a.- Monthly means of the SST (ºC) and MSL (cm) in five stations of the ERFEN region. Green curve indicates historic monthly mean. The location of the stations appears in Figure 1.
(Sources: CCCP, INOCAR y DHN).

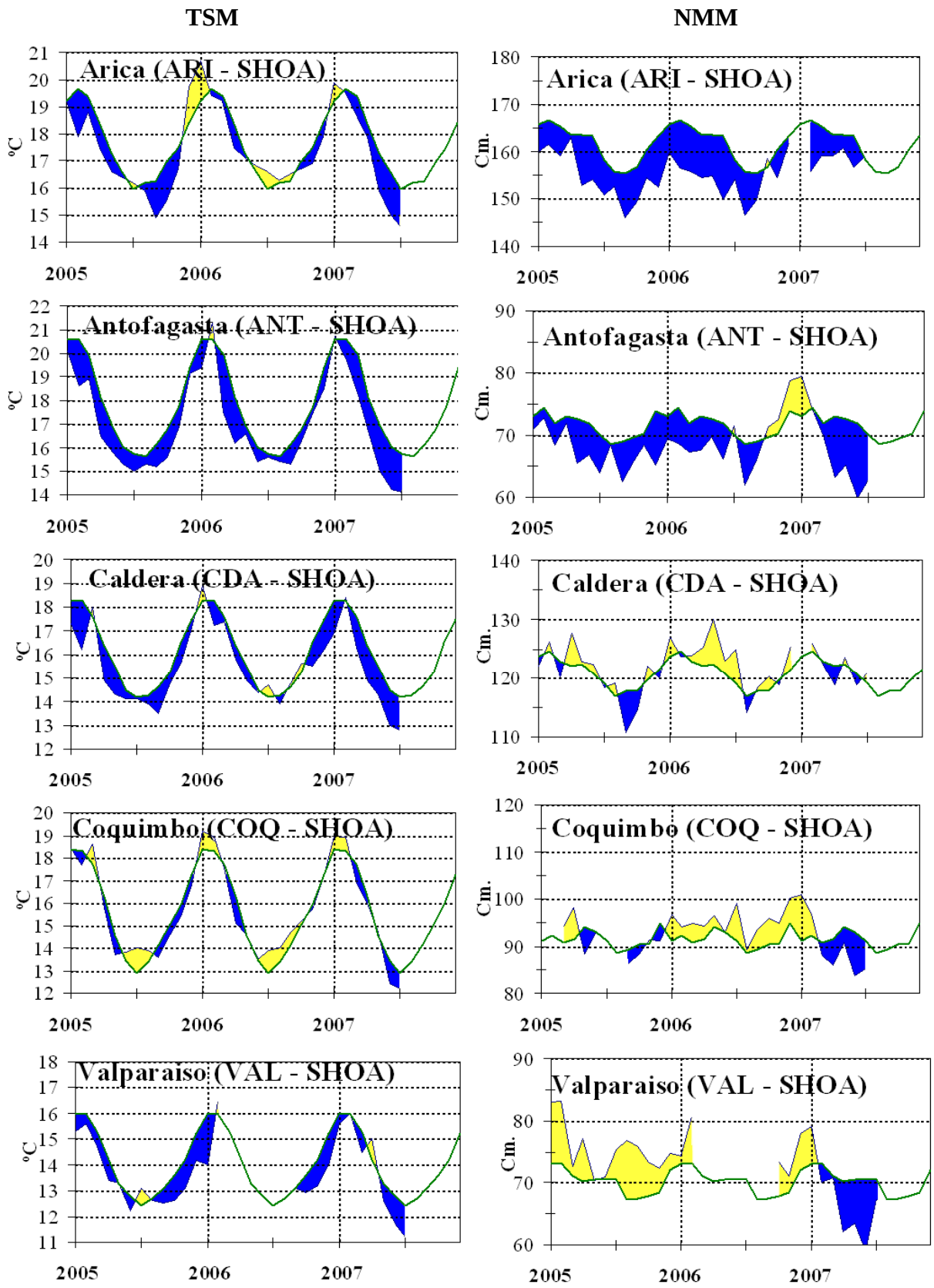


Figure 8b.- Monthly means of the SST (ºC) and MSL (cm) in five stations of the ERFEN region. Green curve indicates historic monthly mean. The location of the stations appears in Figure 1. (Source: SHOA).

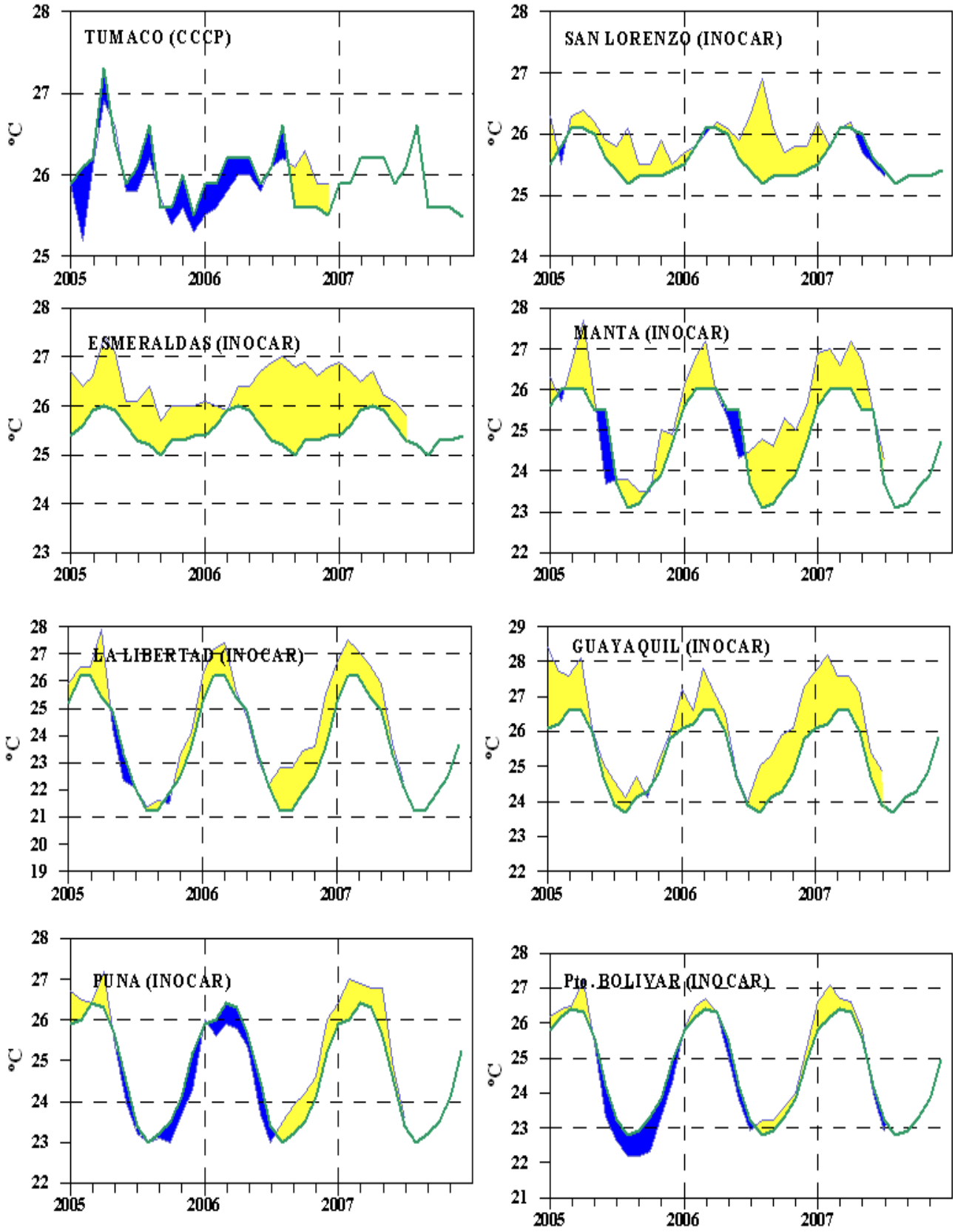


Figure 9a.- Monthly means of the AT (ºC) in 8 stations of the ERFEN region. Green curve indicates historic monthly mean. The location of the stations appears in Figure 1.
(Sources: CCCP & INOCAR).

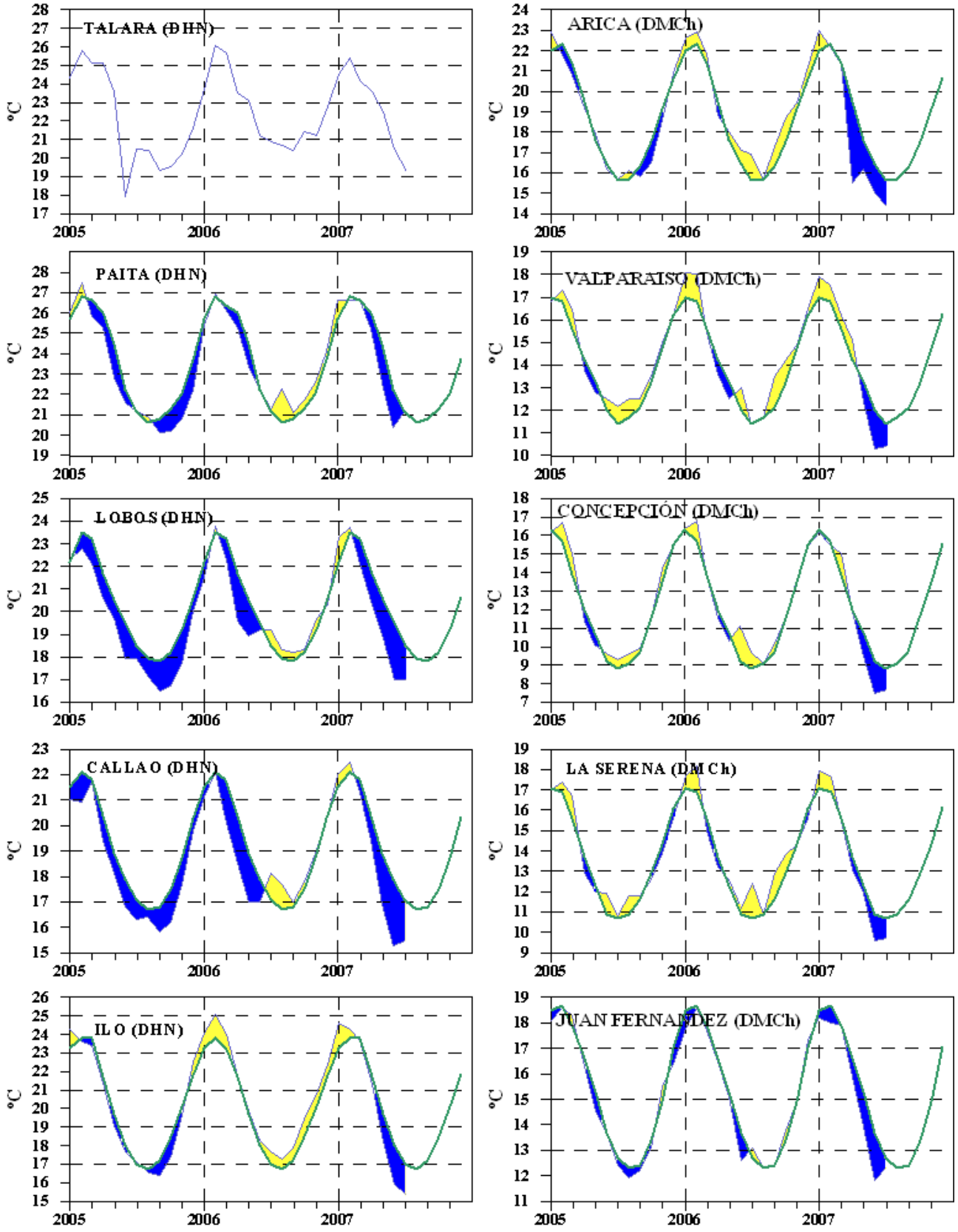


Figure 9b.- Monthly means of the AT (ºC) in 10 stations of the ERFEN region. Green curve indicates historic monthly mean. The location of the stations appears in Figure 1.
(Sources: DHN & DMCh).

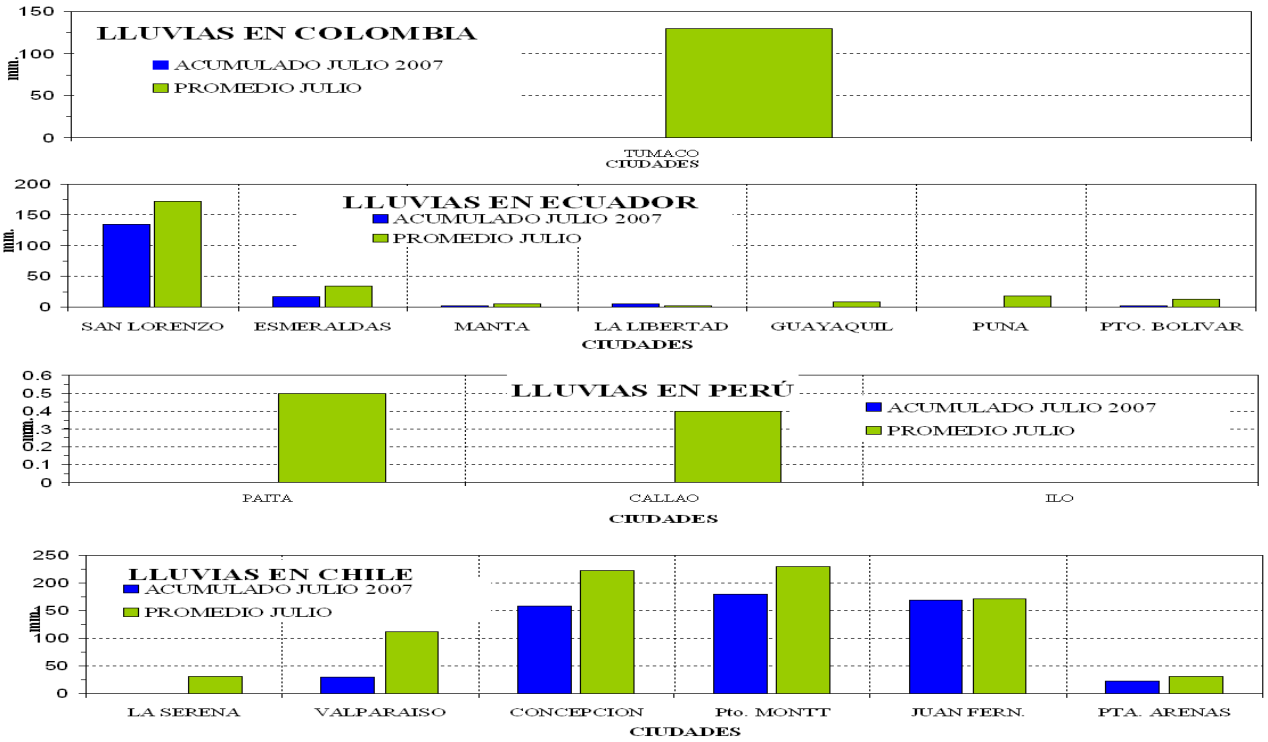


Figure 10.- Rains during the month of July in the coastal stations of Colombia, Ecuador, Peru and Chile. Location of the stations appears in Figure 1.
(Sources: CCCP, INOCAR, DHN & DMCh).

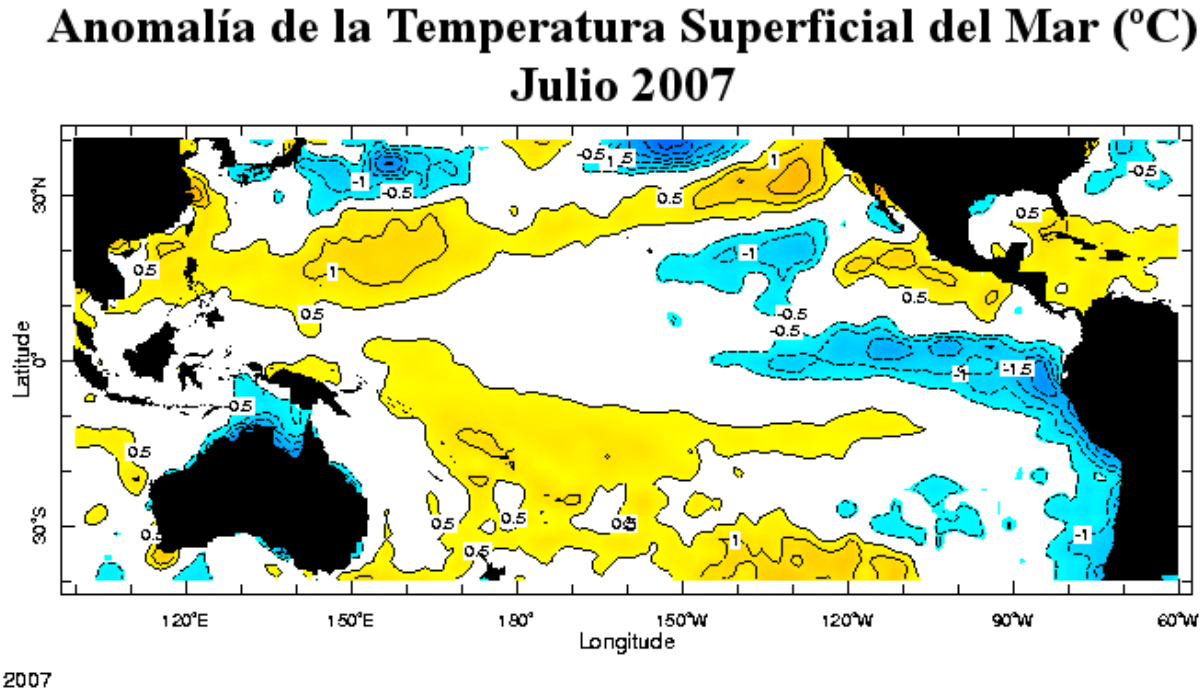
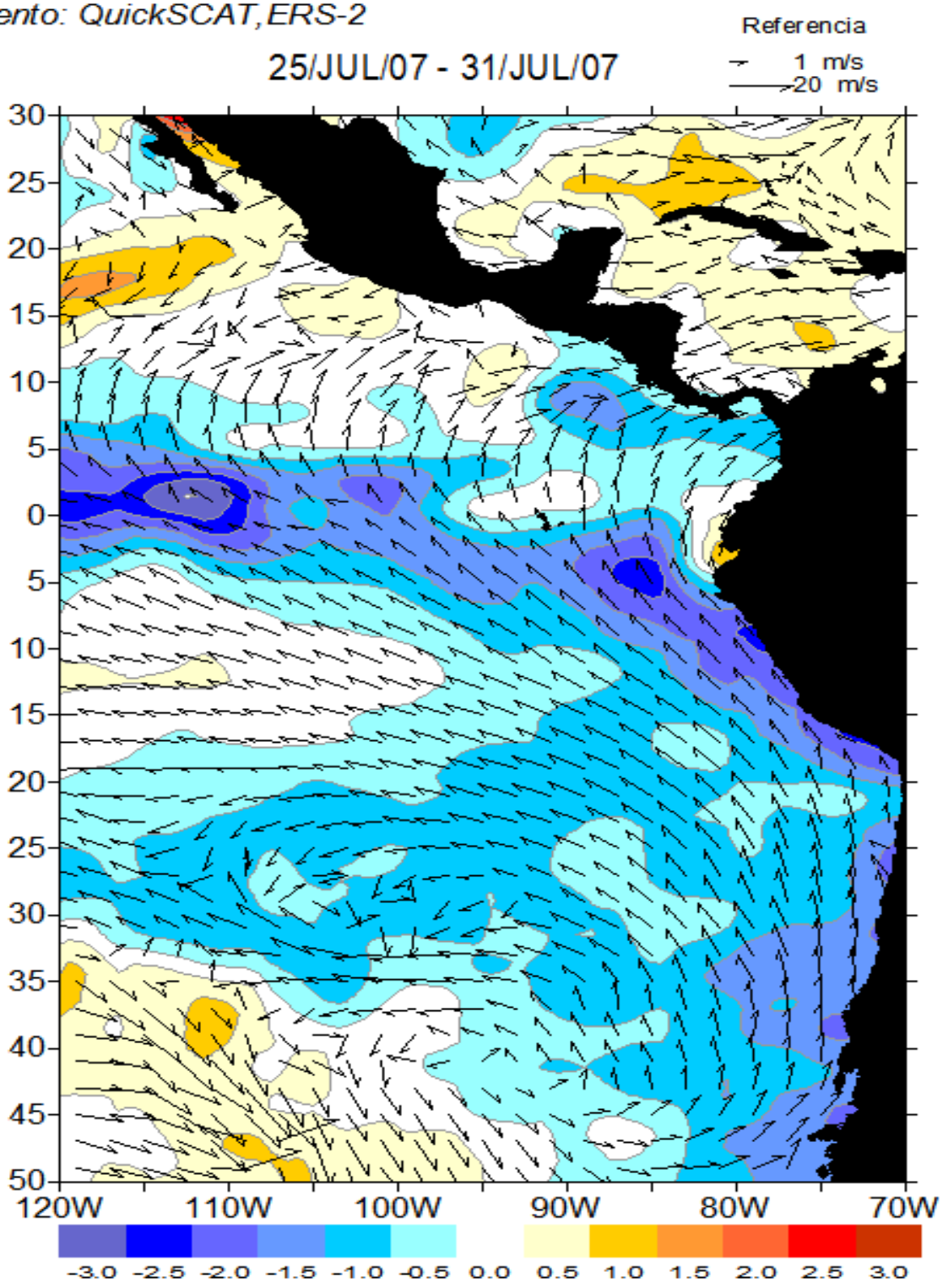


Figure 11.- Sea Surface Temperature Anomalies (ºC) July 2007.
(Source: International Research Institute for Climate and Society)

Anomalía de Temperatura Superficial del Mar y Viento Superficial

Climatología: Reynolds OI (AVHRR / TSM In-Situ) Resolución: 0.5°
Viento: QuickSCAT, ERS-2



Fuente: NCEP/NOAA - CoastWatch.
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