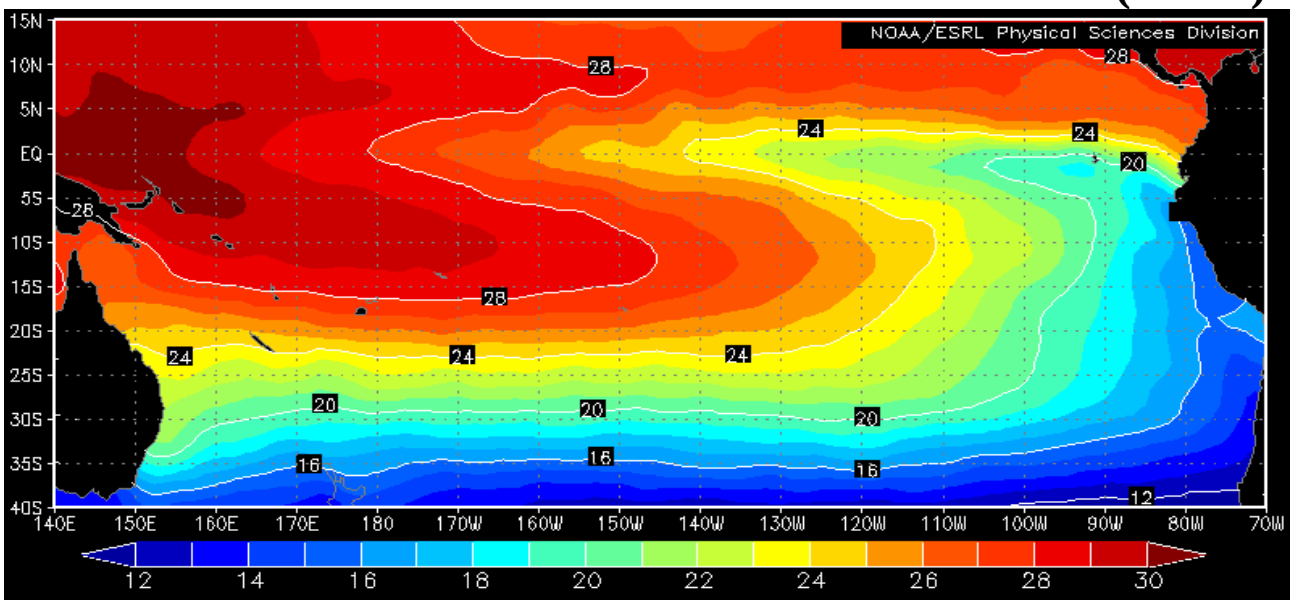
COMISIÓN PERMANENTE DEL PACÍFICO SUR (CPPS)



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

OCTOBER 2007 BAC N° 205

ERFEN

(Estudio Regional del Fenómeno El Niño)

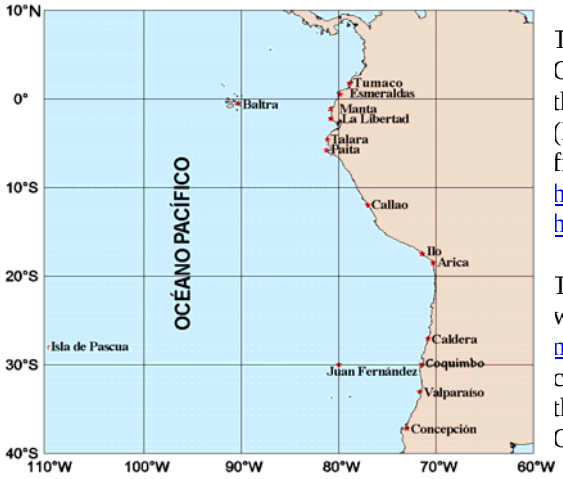
BOLETÍN DE ALERTA CLIMÁTICO

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

October was characterized by the permanence of the cold conditions in the region of the equatorial Pacific, continuing with the development of the cold event "La Niña"; this cooling comes presenting more intense in the center and eastern edge, diminishing the negative anomalies of the sea temperature towards the western sector of the Pacific Ocean.

The temperature of the sea during the last week of October exhibited anomalies of -0.6ºC in the Western Pacific, -1.7ºC for the Central Pacific and -1.6ºC in the Eastern Pacific.

Surface winds, in the region of the Southeastern Pacific showed the predominance of winds from the south and Southeastern with speeds fluctuating around the normal range for the date.

The Southern Oscillation Index, by third consecutive months presents positive values being in this occasion of 0.6.

During October the Mean Sea Level in the Southeastern Pacific, fluctuated near its normal patterns, except in the coasts of Ecuador, where it was 2.0 cm on the average, in Peru fluctuated between -3.0 (Talara, Paita and Matarani) and -6.0 cm (Chimbote and Callao) and in Chile stayed the previously observed behaviour, with anomalies that fluctuated between -6,8 cm and -13.5 cm

Taking into account the present thermal behaviour from the Equatorial Pacific Ocean, as well as the outputs of several numerical models, is anticipated that, during the next month in the Eastern and Central sector of the Pacific the sea temperature would continue below its normal value.

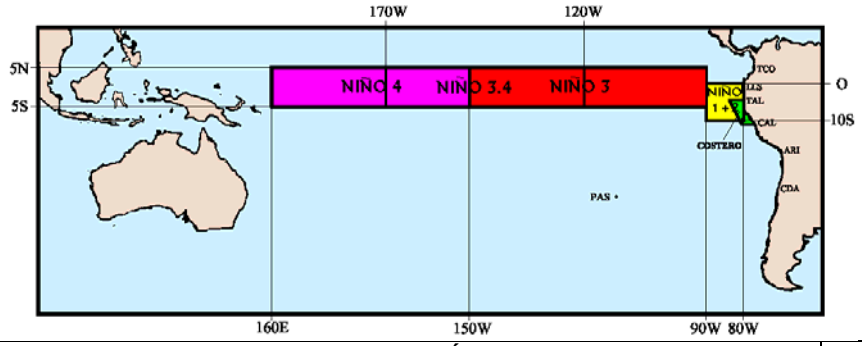


Figure 2.- Map indicating locations and codes of series. Rectangles show the average area of Sea Surface Temperature (SST °C)

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Permanent Commission
for the South Pacific (CPPS)

CLIMATE ALERT BULLETIN
BAC Nº 205, OCTOBER 2007

I. GLOBAL AND REGIONAL IMAGE

The Equatorial Pacific Ocean was characterized during October by the maintenance of the process of cooling of the Sea Surface Temperature (SST), particularly in the Eastern and Central sector of the Equatorial Pacific, reaching values of anomaly about -2.5ºC in the region of the Southeastern Pacific. The monthly anomalies of the SST in the "El Niño" regions continue showing a generalized cooling. This confirmed the development of the cold event "La Niña", whose values for October with respect to previous month In the Western Pacific region ("El Niño" Region 4) were -0.3ºC to -0.5ºC, in the Central Pacific ("El Niño" Region 3.4) the anomaly was -0.8ºC to -1.4ºC and in Eastern Pacific ("El Niño" Region 1+2), was -1,9ºC to -2.3ºC.

At subsurface level, the behaviour of the thermal structure during October in the Eastern Equatorial Pacific presented negative anomalies until -4,0ºC that were located in the level of the 150 m between 100ºW and 140ºW. Nevertheless, to the west of the date line, at the level of 120m, a small core with positive anomalies until 2, 0ºC appears.

The Mean Sea Level (MSL) in the Southeastern Pacific during october fluctuated near its normal patterns for the month: In front of the coasts of Ecuador was 2.0 cm on the average, in Peru fluctuated between -3, 0 (Talara, Paita and Matarani) and -6,0cm (Chimbote and Callao) and in Chile stayed the behaviour observed from year beginnings, with negative anomalies that fluctuated between -6, 8 cm and -13, 5 cm.

The Southern Oscillation Index (SOI) continued by third consecutive month in the positive phase, with a value of 0, 6. With respect to the atmospheric anomalies of pressure, Tahiti and Darwin reached values of 0, 3 and -0, 6 respectively.

During the month reactivated the frequency and intensity of tropical waves from the East to its pass by Colombia, changing the configuration of winds in low levels, generating greater instability. The Intertropical Convergence Zone (ITCZ-ZCIT) in the Eastern Pacific Ocean appeared like a cloudy band with its central axis located around 10ºN, with presence of convective activity cells; that exerted his greater influence on the region of Central America, North of Colombia and The Caribbean.

With respect to rains, when finalizing the month the cloudy bands associated with the tropical storm Noel caused strong rains, creating emergencies in several Colombian cities like Cartagena and the Sierra Nevada of Santa Marta, as well as a strong atmospheric instability in the center of the Andean region of that country. In Ecuador rains were deficit, stayed the presence of cloudiness in low levels, weak and occasional drizzles in the coastal zone as well as rains in the North zone were registered (1ºN); in Peru during the month in all coast intermittent drizzles were registered; in Chile continued during October the rain deficit in the central zone, until approximately 39°S, with negative anomalies of up to 35, 0 mm below the normal of the month. Towards the south of 39°S, an increase with surplus of up to 50 mm in Coyhaique (45ºS) is registered.

With respect to surface winds, predominated from the South and Southeast; with speeds which fluctuated around its normal monthly value in approximately 0.5 m/s.

II. NATIONAL IMAGE

A. CONDITIONS IN THE COLOMBIAN COAST

The Center for Pollution Control of the Pacific (CCCP) and the Hydrology, Meteorology and Environmental Studies (IDEAM), informs that at beginnings of October the second rainy season in the center of the Andean region settled down, the anticyclonal systems of the north hemisphere began to be debilitated, predominating systems of low pressure in the Caribbean sea. During the month, reactivated the frequency and intensity of tropical waves from the East to his passage to the north of the country, which changed the configuration of winds in low levels of the atmosphere, generating towards the interior of the national territory greater confluence and instability. Some cold fronts that moved from the east coast of the United States towards the West of the Caribbean sea and some tropical waves of the East activated the Intertropical Convergence Zone that was located around 10°N during most of the month. When finalizing the month, the cloudy bands associated to the tropical storm Noel, which formed Sunday 28, they caused strong rains in the center of the Caribbean coast creating emergencies in Cartagena and the Sierra Nevada of Santa Marta, as well as a strong atmospheric instability in the center of the Andean region.

In the biweekly samplings made to the coastal fixed station located to 10 miles of the bay of Tumaco in the coordinates 78, 51ºW and 2ºN, that was made during October of 2007, by the Area of Operational Oceanography of the CCCP, it is observed that the superficial layer registered a temperature average of 26, 78°C and a negative anomaly at surface level of -0, 34°C with respect to the monthly historical average of the lapse between 1999 and 2007.

The behaviour of ascent of the thermocline continues in the first fortnight approximately until the 35 meters, 12 meters more in relation to the second fortnight of September. In the second fortnight of the month a normal behaviour was observed and a reduction is registered approximately until the 43 meters, indicating therefore the warm water presence.

As far as the behaviour of the salinity registered a value monthly average of 33.30 ups, throwing a positive anomaly of 1, 96 ups at surface level, with respect to the monthly historical average of 1999 - 2007.

The maximum value of salinity of the month was of 34.98 ups and it appeared to an approximated depth of 88 ms. It appears a reduction of the halocline of approximately 10 m in average with respect to the first fortnight, this reduction corresponds to the warmer water appearance.

B. CONDITIONS IN THE ECUADORIAN COAST

The Oceanographic Institute of the Navy of Ecuador (INOCAR), reports that, during October of 2007 the wind presence from the south stayed with great incidence in the central and South zone of the Coast, transporting to the region cold air masses, that was demonstrated in the reduction of the temperature of the air (22,0ºC) in the region, whereas in the north the temperature of the air was quite more warm (26,1ºC), with presence of slight and brief precipitation, as drizzles.

October is considered as the last month of the dry season of the Ecuadorian coast, characterized by the presence of mini rains and temperature of the sea and the air, slightly below its normal value. In the present month the wind presence from the south and southwest and the cold air transport on the region, exerting great influence on the South and central coast, in addition the Trade winds to the Southeastern that influenced the Galápagos Islands.

The presence of cloudiness in low levels, has caused fogs and drizzles in the coastal zone; as well as occasional weak rains in the North inner zone, in any case with accumulated amount below the normal range for the period.

The variation of the temperature of the air in the Coast was irregular, oscillating between values slightly above the average to the north (+0, 8°C in Emeralds 1ºN) and below normal in the center and the south (-1, 6°C in La Libertad 2ºS).

The Sea Surface Temperature also continued, in general terms, with values slightly superior to the normal in the North coast of Ecuador (+0,6°C in Esmeraldas 1ºN) and below the normal in -1,0°C in the south coast (3ºS); in the Galápagos region it was of approximately -1,5ºC.

Considering the present behaviour of the ocean-atmospheric conditions, it would be expected that in the Ecuadorian coast the precipitations (rains and drizzles) continue minimum, with accumulated values underneath its normal for November 2007. In the Galápagos Islands precipitations would continue deficit.

It will stay the situation of stability for most of the Coastal Region and Galápagos Islands; this is cold air, cloudiness in low levels that dissipate during the day, drizzles, and occasional fogs in sectors of the coastal zone and even weak rains especially in the North coast.

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 light variations of +/- 0,4º C. The anomalies of the SST fluctuated between -0, 3 (Paita) and -2, 1ºC (San Juan and Ilo).

The Mean sea level (MSL) throughout the Peruvian coast presented negative anomalies, whose values diminished in average 3, 0 cm. with respect to the previous month. The values of the anomalies fluctuated between -3, 0 cm. (Talara, Paita and Matarani) and -6, 0 cm. (Chimbote and Callao).

The temperature of the air also stayed below the monthly average being appraised in the coast conditions more cold in the north and center zones, diminishing around 0,7ºC; whereas in the south zone an increase average of 0,4ºC was observed, with respect to the previous month. The Maximum negative anomaly appeared in the station of Paita (-2, 6ºC), whereas, the minimum anomaly appeared in San Juan (-1, 7°C).

In all coast, only intermittent drizzle were registered during the month.

Throughout the Peruvian coast winds from south direction predominated, with the exception of the stations of Lobos de Afuera and Mollendo, in which winds from the south-eastern appeared. In relation to the wind speed, the anomalies were positive, fluctuating between +0.1 to +1.0 m/s; with the exception of Paita that presented a negative anomaly of -1, 7 m/s.

D. CONDITIONS IN THE CHILEAN COAST

The Hydrographical and Oceanographic Service of the Navy of Chile (SHOA) maintains throughout the coast a network of stations of level of the sea to supervise a series of oceanic and atmospheric variables. Above appears a description of the sea surface temperature and the sea level between Arica (18º29'S) and Talcahuano (36º41'S) for the month of October 2007.

During this month, the SST was characterized by presenting a slight tendency to the increase that did not imply positive values of anomalies, since it continued the cold condition observed during the last months in the entire north coast and the center-south of the country. Specifically negative anomalies with values between -0, 6 and -1, 7°C were registered, appearing the greater differences in the stations of Arica -1, 7°C and Antofagasta -1, 4°C.

The sea level maintained the behaviour observed from the beginning of the year, with negative anomalies that fluctuated between -6,8 cm and -13,5 cm. In the case of this variable, the greater differences registered in the stations of the center-south zone (Valparaiso and Talcahuano) with values of the order of 13 cm below the historical average.

The data of SST and Sea Level (SL) described previously for the north zone and the center-south of Chile are coherent with cold conditions developed in the tropical Pacific.

The Meteorological Direction of Chile (DMCh) shows that during October, the average temperatures of the air were below the normal on the North and south-austral zones of the country.

On the north zone of the country, as much minimum temperatures as maximum temperatures of the air registered a cooling similar to the presented during the last months. The maximum temperatures presented a decrease of until -2,5°C in Arica (18°S), whereas the minimum temperatures register a decrease of until -0,6°C in Antofagasta (23°S).

The central zone of the country registered an increase in the maximum temperatures, reaching a heating of to -1, 2°C in Curicó (34°S). In addition, the minimum temperatures registered negative anomalies between regions IV and Metropolitan (29°S - 33°S).

On the south zones a cooling in the maximum temperatures of until -0,9°C was registered, whereas the austral region had a behaviour near the normal pattern. The minimum temperatures presented a slight increase of until +1,2°C in Osorno (40°S), whereas on the austral end of the country negative anomalies of until -1,0°C in Balmaceda were registered (45°S).

The behaviour of the atmospheric pressure at mean sea level during October presented behaviour near normal in great part of the country, with exception of the region located to south of 40°S, in which a greater persistence of low pressures was observed, registering in the monitoring stations negative anomalies of up to 6.4 hPa (Punta Arenas). This condition favoured to an increase in precipitations on the region.

The central zone until approximately 39°S continued registering a deficit in precipitations, with negative anomalies of up to 35, 0 mm below the normal precipitation of the month. Towards the south of 39°S, an increase in the rains regime is registered, reached a surplus of up to 50 mm approximately in Coyhaique (45°S).

III. PERSPECTIVE

A. GLOBAL

Taking into account the present predictions from several numerical models, as well as the behaviour of the main oceanic and atmospheric indicators, it is considered that the Equatorial Pacific during the next month would continue presenting cold conditions typical of the event “La Niña”, particularly in the region of the Eastern and coastal Equatorial Pacific.

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, it is anticipated that during the next month will continue the cooling of the SST in the Eastern and Coastal Equatorial Pacific, like the temperature of the air, that will present values below its normal pattern, particularly from the coasts from Chile to the south of Ecuador.

As far as the Sea Level would also continue fluctuating around its average value, with some tendency to maintain the negative anomalies, particularly in front of Chile. With respect to rains, they will present a slightly deficit distribution for the time, for the pacific coast of Colombia and north coast of Ecuador; whereas for the rest of the region the tendency of precipitations is to stay below the normal value.

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**
AUG 07	4.9	9.5	9.4	28.6	26.2	23.9	19.2	17.1	15.4	13.4	0.1
SEP 07	4.7	11.2	10.0	28.1	25.8	23.6	18.6	16.4	14.2	11.5	0.2
OCT 07	3.7	8.7	7.9	27.8	25.2	23.4	18.6	16.4	14.0	10.0	0.6

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**
AUG 07	26.9	22.7	14.3	14.3	13.9	12.5	12.0	11.1
SEP 07	26.3	22.5	13.6	14.2	14.1	12.8	12.9	11.7
OCT 07	26.8	23.4	13.2	15.4	15.2	14.2	14.1	12.4

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**
AUG 07	***	2610	1010	1512	546	1111	750	574
SEP 07	***	2610	980	1482	589	1156	803	636
OCT 07	***	2623	940	1482	581	1139	798	575

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**
SEP	05	***	***	***	***	263.0	***
	10	***	***	***	***	257.0	***
	15	***	***	***	***	267.5	***
	20	***	***	***	***	263.0	***
	25	***	***	***	***	255.5	***
	30	***	***	***	***	260.0	***
OCT	05	***	18.7	13.4	***	265.2	***
	10	***	19.8	13.0	***	262.7	***
	15	***	15.9	13.2	***	261.6	***
	20	***	15.6	13.2	***	256.4	***
	25	***	17.2	13.2	***	260.3	***
	30	***	17.9	13.5	***	260.5	***

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

Note.

* Values revised

***. Information not received

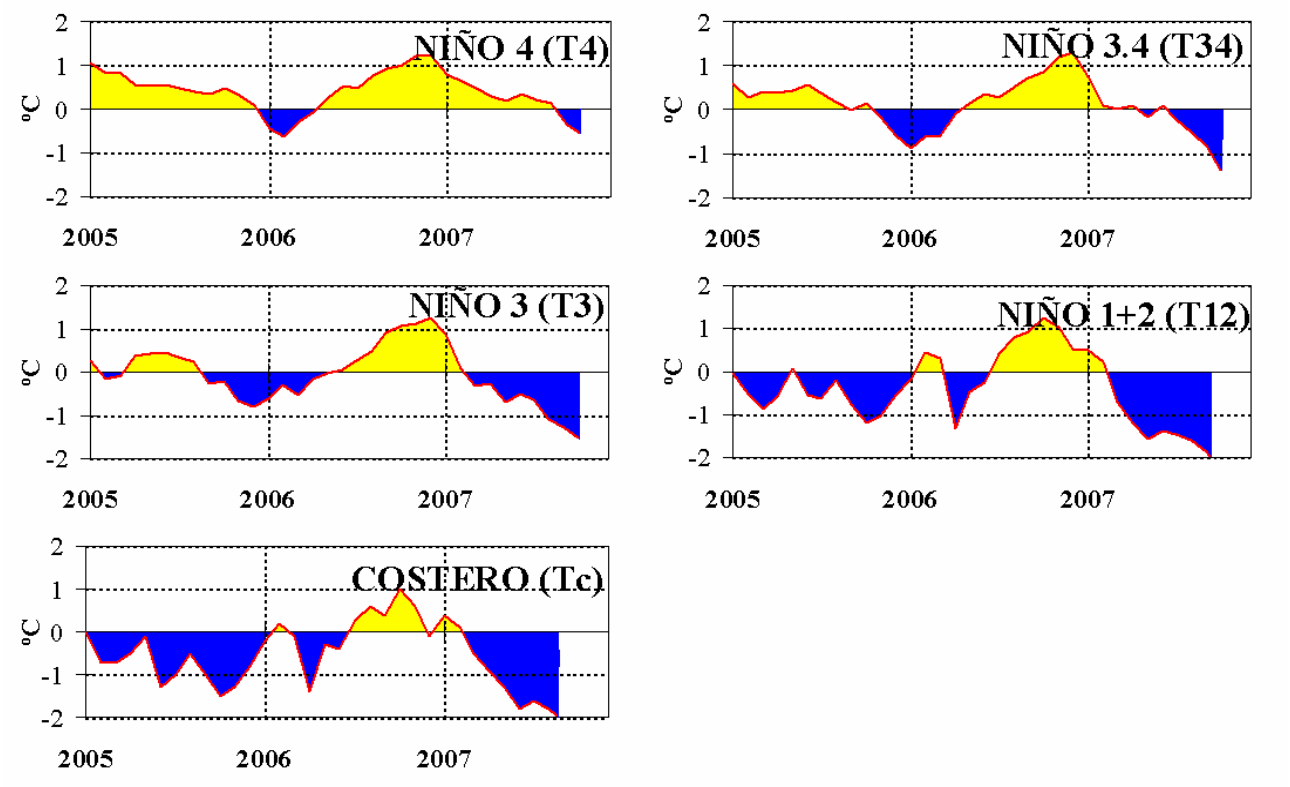


Figure 3.- Oceanic anomalies indices (Niño 4, Niño 3.4, Niño 3, Niño 1+2 and Tc). The location of the oceanic indices appears in figure 2.
(Source: NCEP/NWS/NOAA/USA).

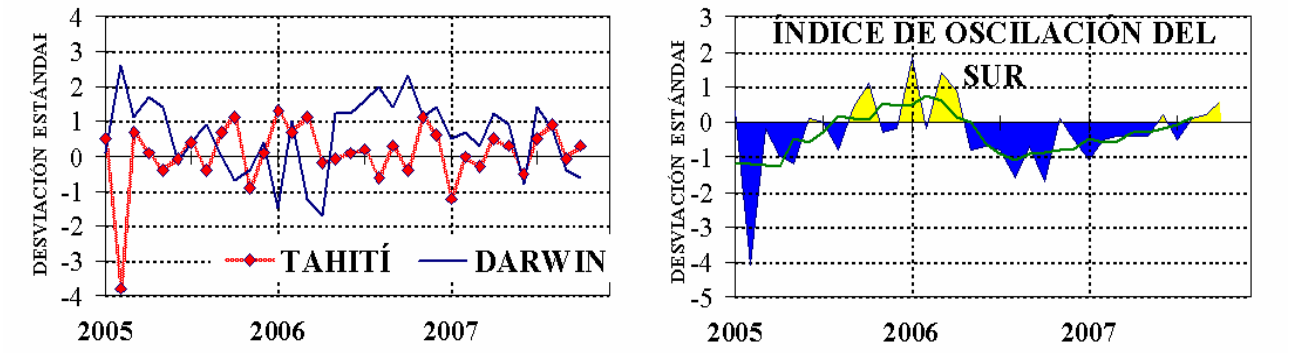


Figure 4.- Left Panel: Five-months running mean for atmospheric pressure anomalies in Tahiti and Darwin (mb). Right Panel: Southern Oscillation Index. (SOI) with monthly values and five-months running mean graphed as a green line. The SOI is based on the difference between standardized pressure values: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

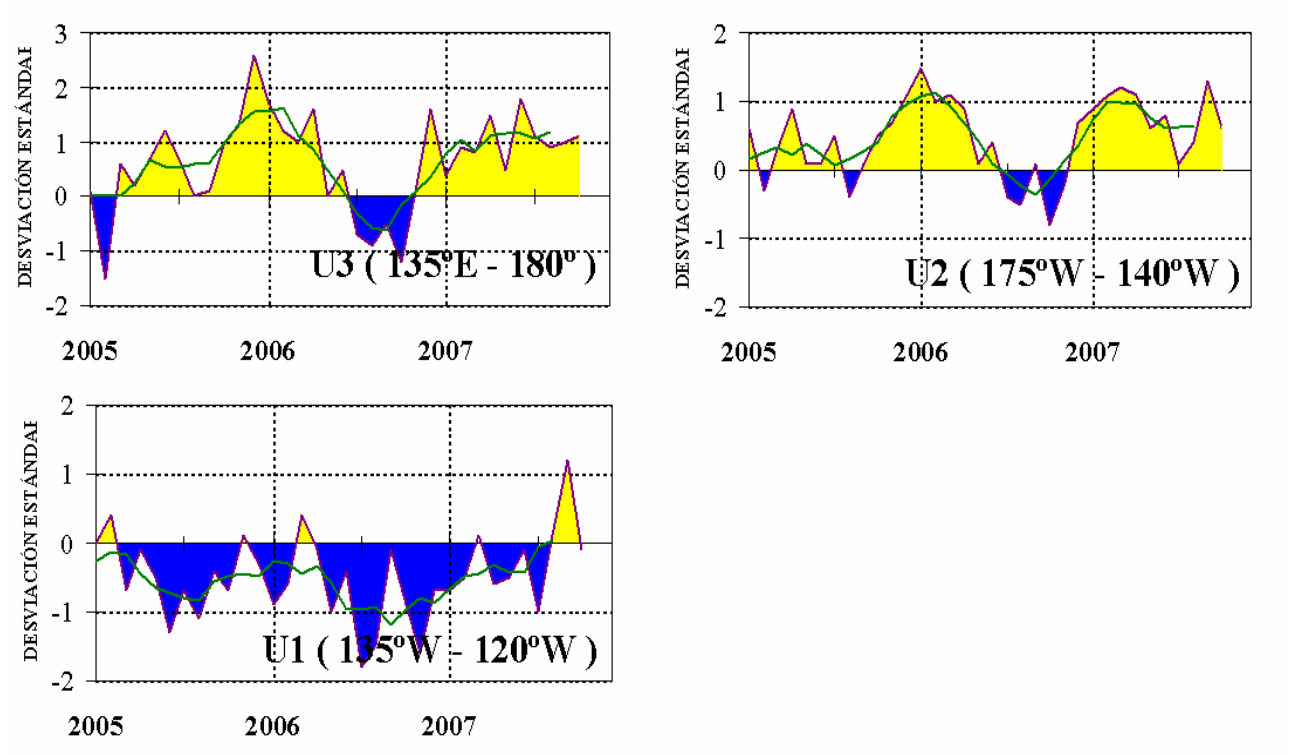


Figure 5.- Series and moving averages of five months of zonal wind standardized anomalies (m/s) averaged between 5°N and 5°S for three Equatorial zones: western (U3), central (U2) and eastern (U1). (Source: NCEP/NWS/NOAA/USA).

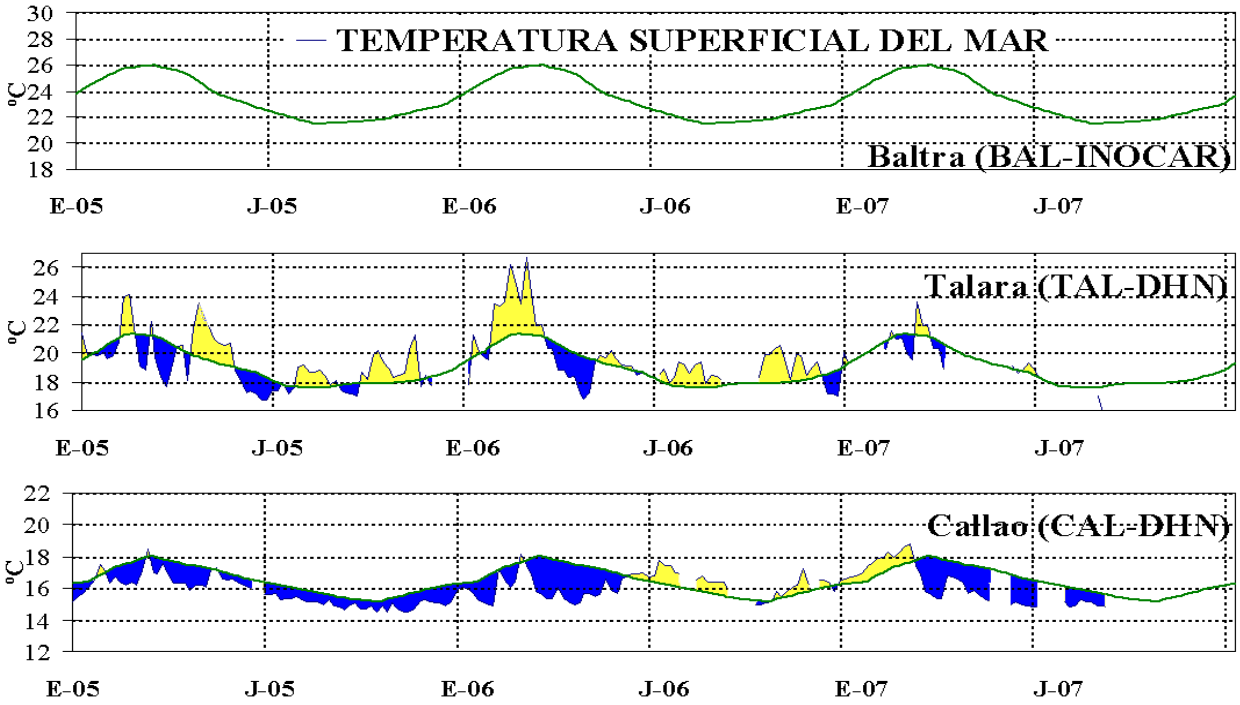


Figure 6.- Five day averages (pentads) of SST (°C) in Ports of Peru and Ecuador. The green curve indicates climatology. The location of oceanic indices appears in figure 1.
(Source: NOAA/Atlantic Oceanographic and Meteorological Laboratory – Miami.)

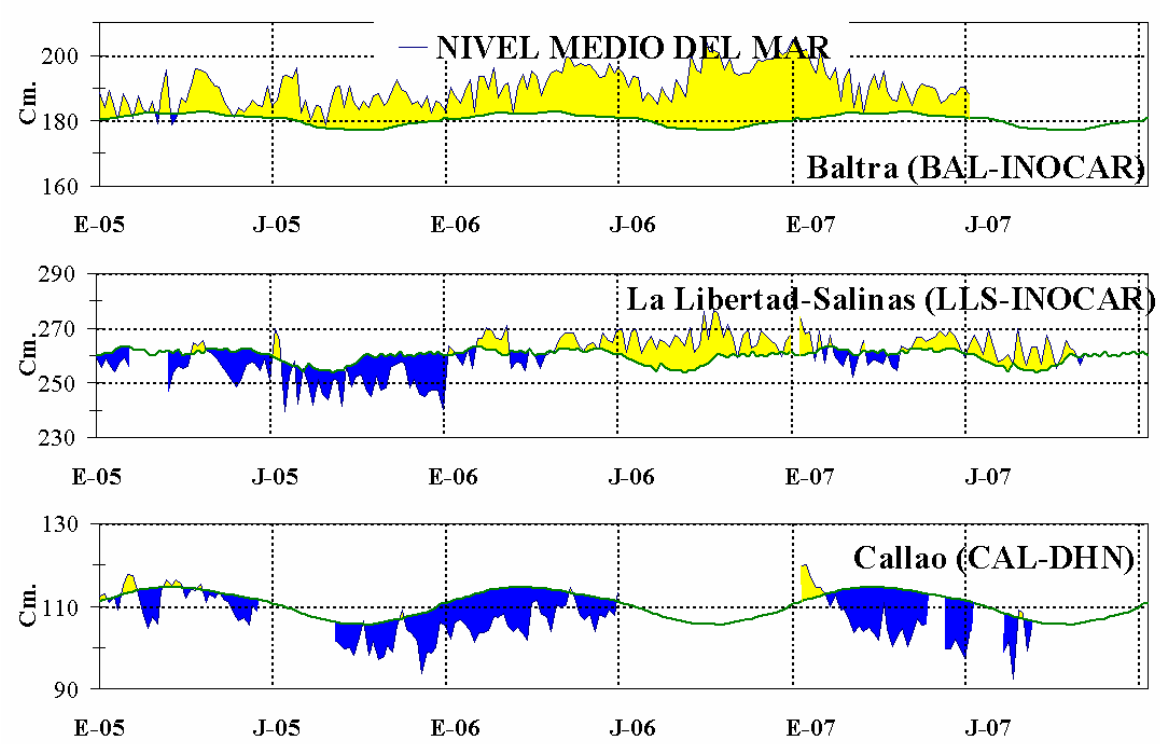


Figure 7.- Five-day running mean (pentads) of MSL (cm) in Ports of Peru and Ecuador. The green curve indicates climatology. The location of oceanic indices appears in figure 1.
(Sources: NOAA/Atlantic Oceanographic and Meteorological Laboratory – Miami, e INOCAR).

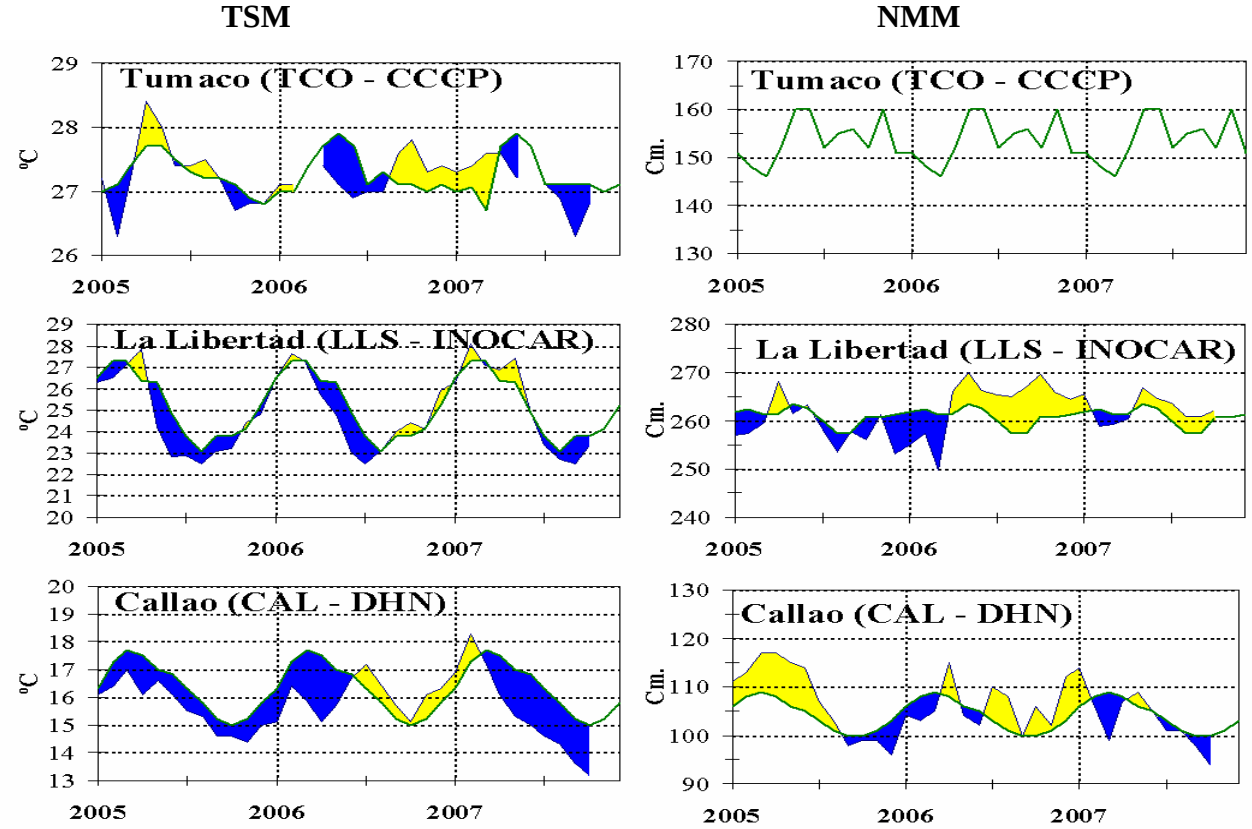


Figure 8a.- Monthly means of the SST (ºC) and MSL (cm) in five stations of the ERFEN region. Green curve indicates historic monthly mean. The location of the stations appears in Figure 1.
(Sources: CCCP, INOCAR y DHN).

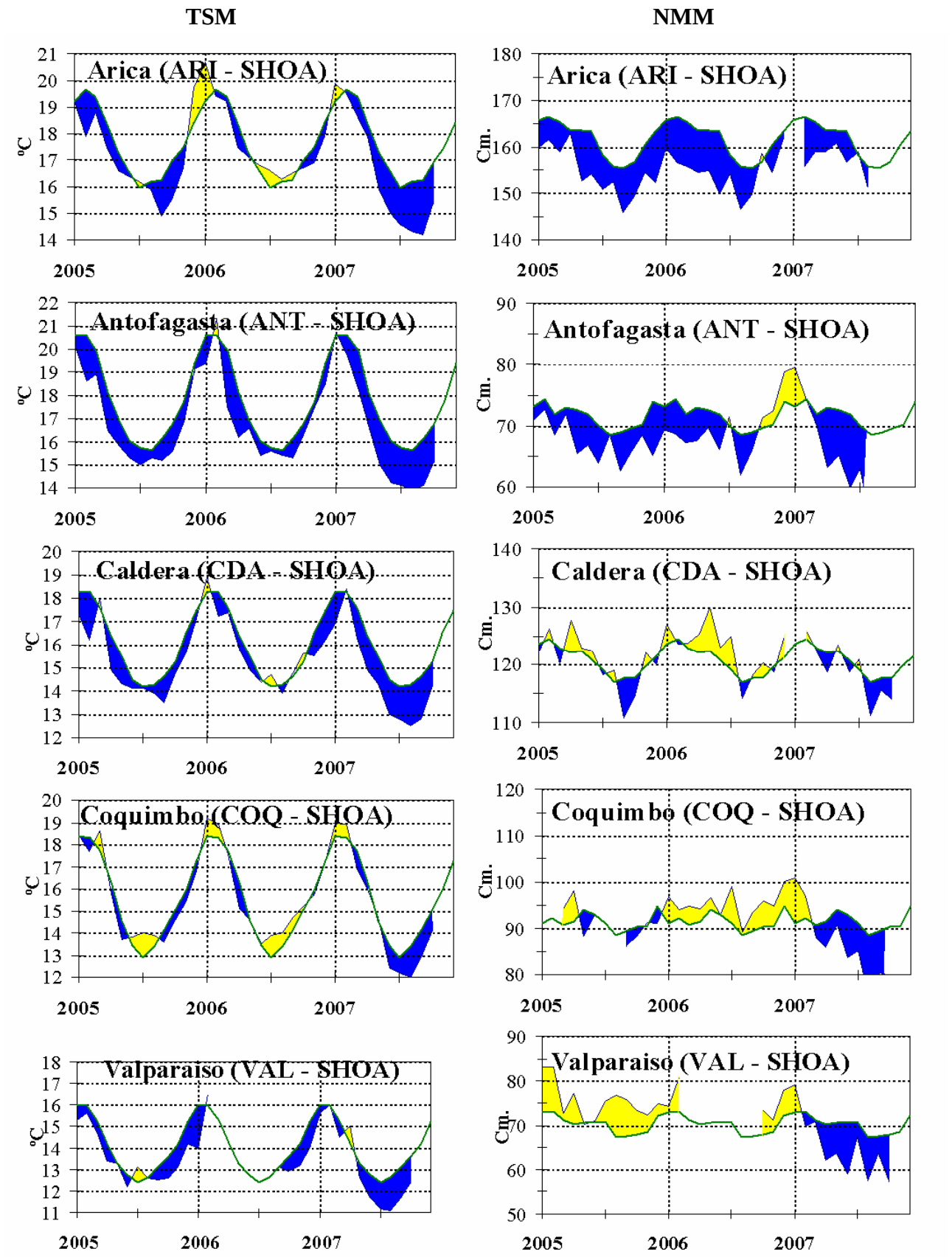


Figure 8b.- Monthly means of the SST (ºC) and MSL (cm) in five stations of the ERFEN region. Green curve indicates historic monthly mean. The location of the stations appears in Figure 1. (Source: SHOA).

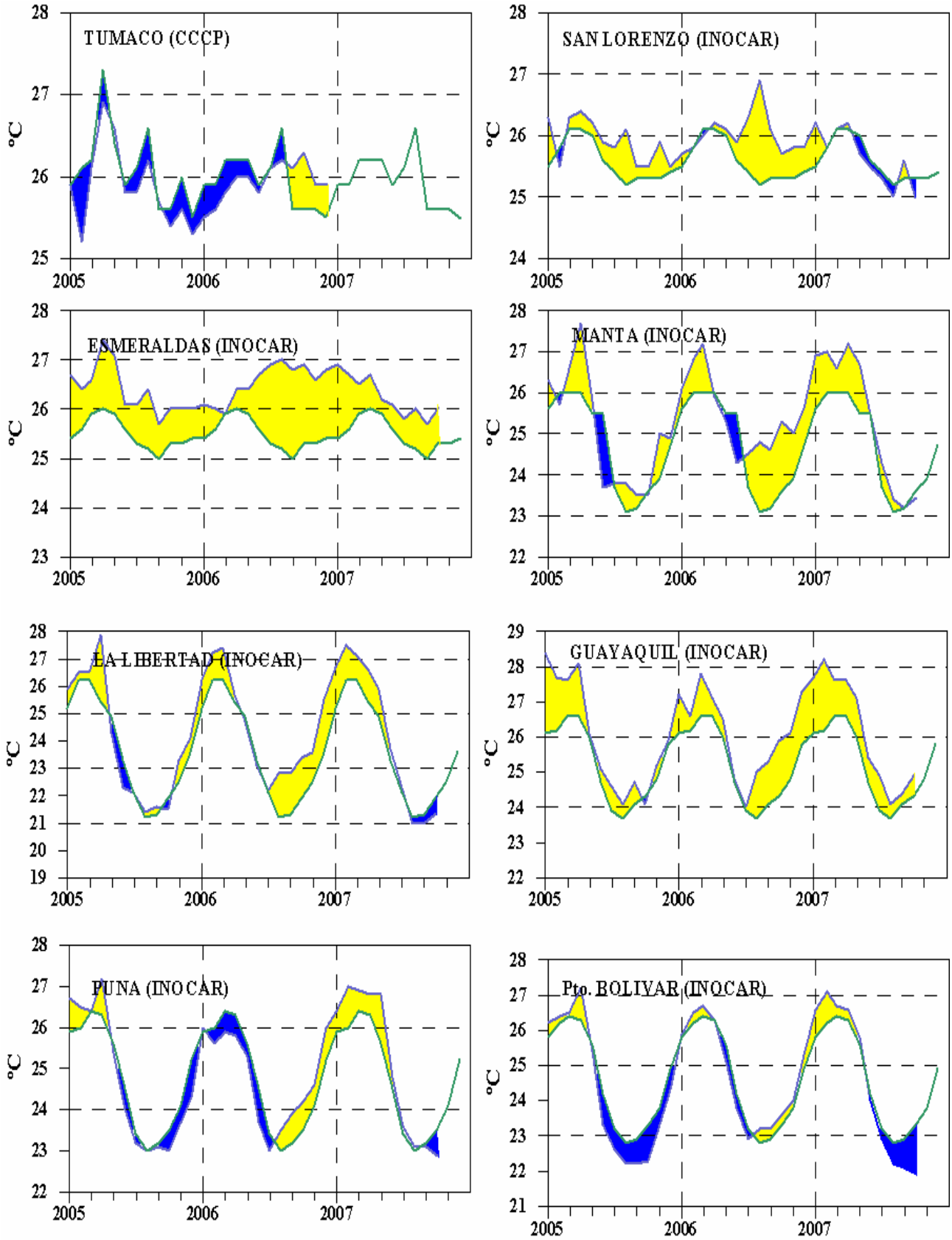


Figure 9a.- Monthly means of the AT (ºC) in 8 stations of the ERFEN region. Green curve indicates historic monthly mean. The location of the stations appears in Figure 1.
(Sources: CCCP & INOCAR).

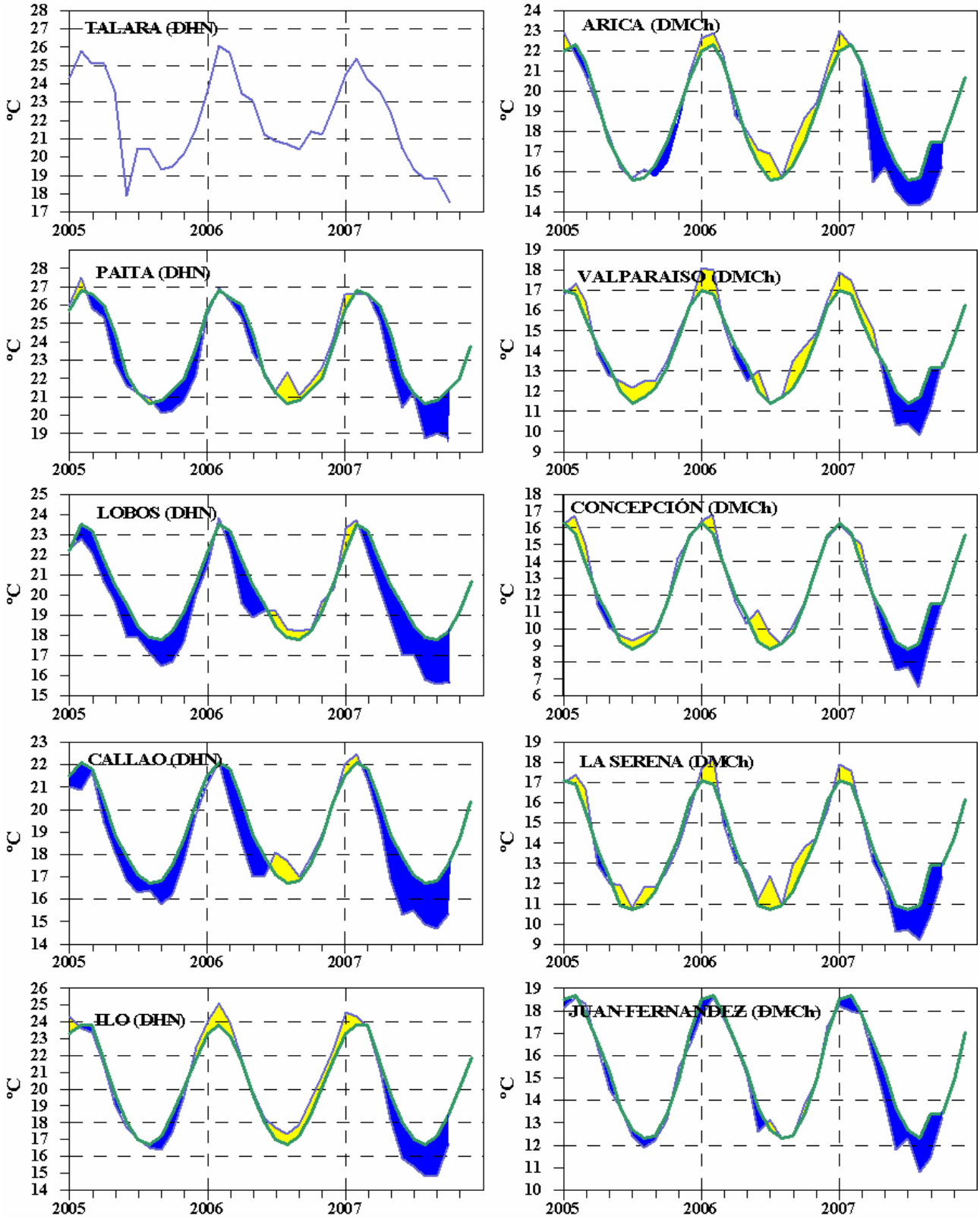


Figure 9b.- Monthly means of the AT (ºC) in 10 stations of the ERFEN region. Green curve indicates historic monthly mean. The location of the stations appears in Figure 1.
(Sources: DHN & DMCh).

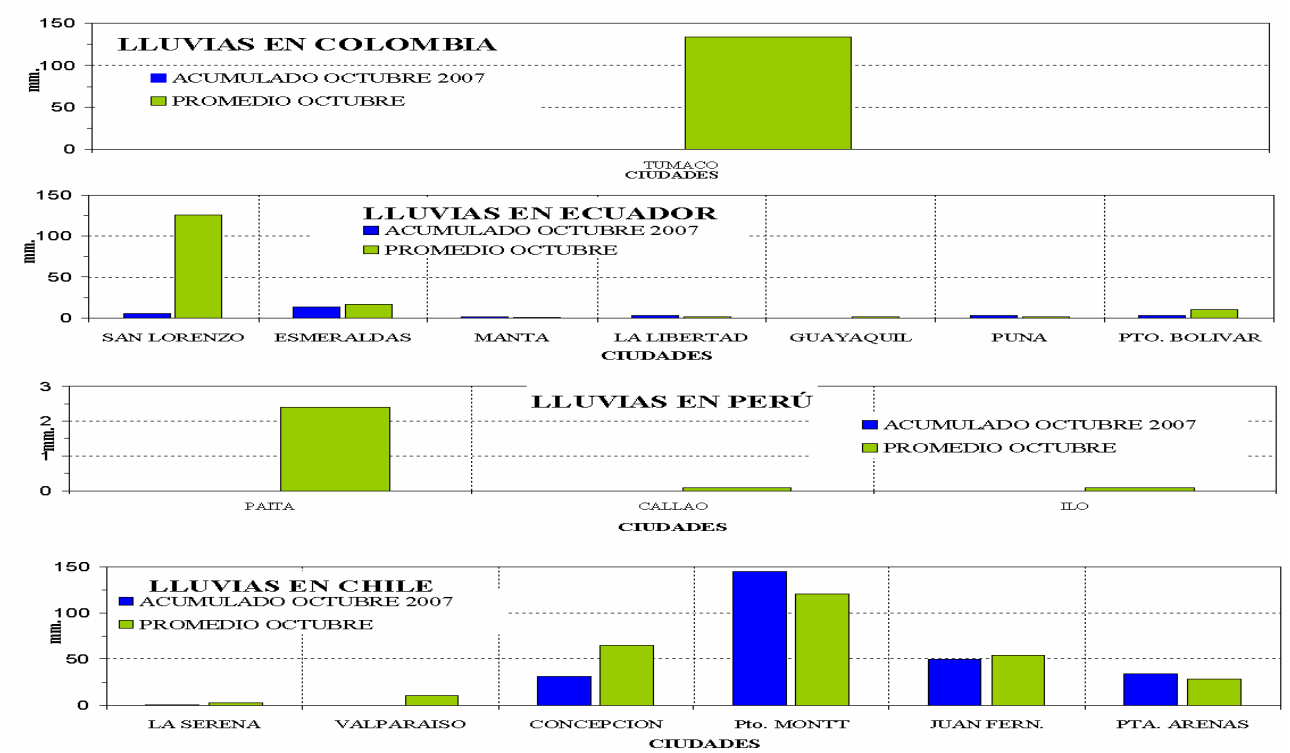


Figure 10.- Rains during October in the coastal stations of Colombia, Ecuador, Peru and Chile. Location of the stations appears in Figure 1.
(Sources: CCCP, INOCAR, DHN & DMCh).

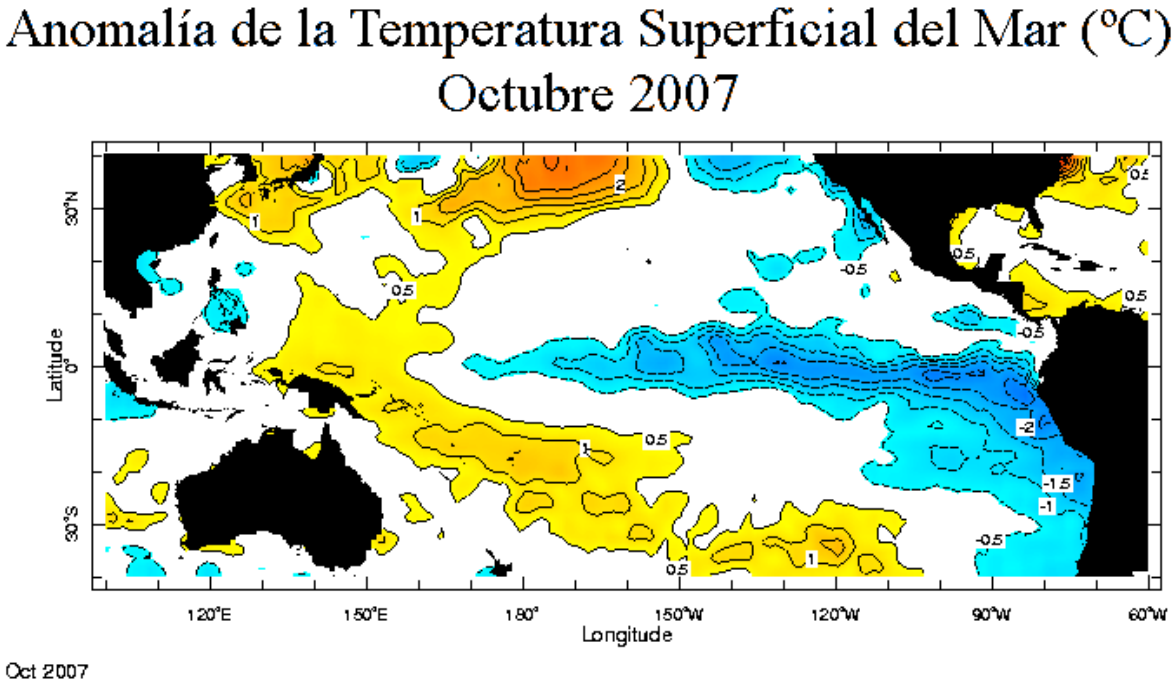
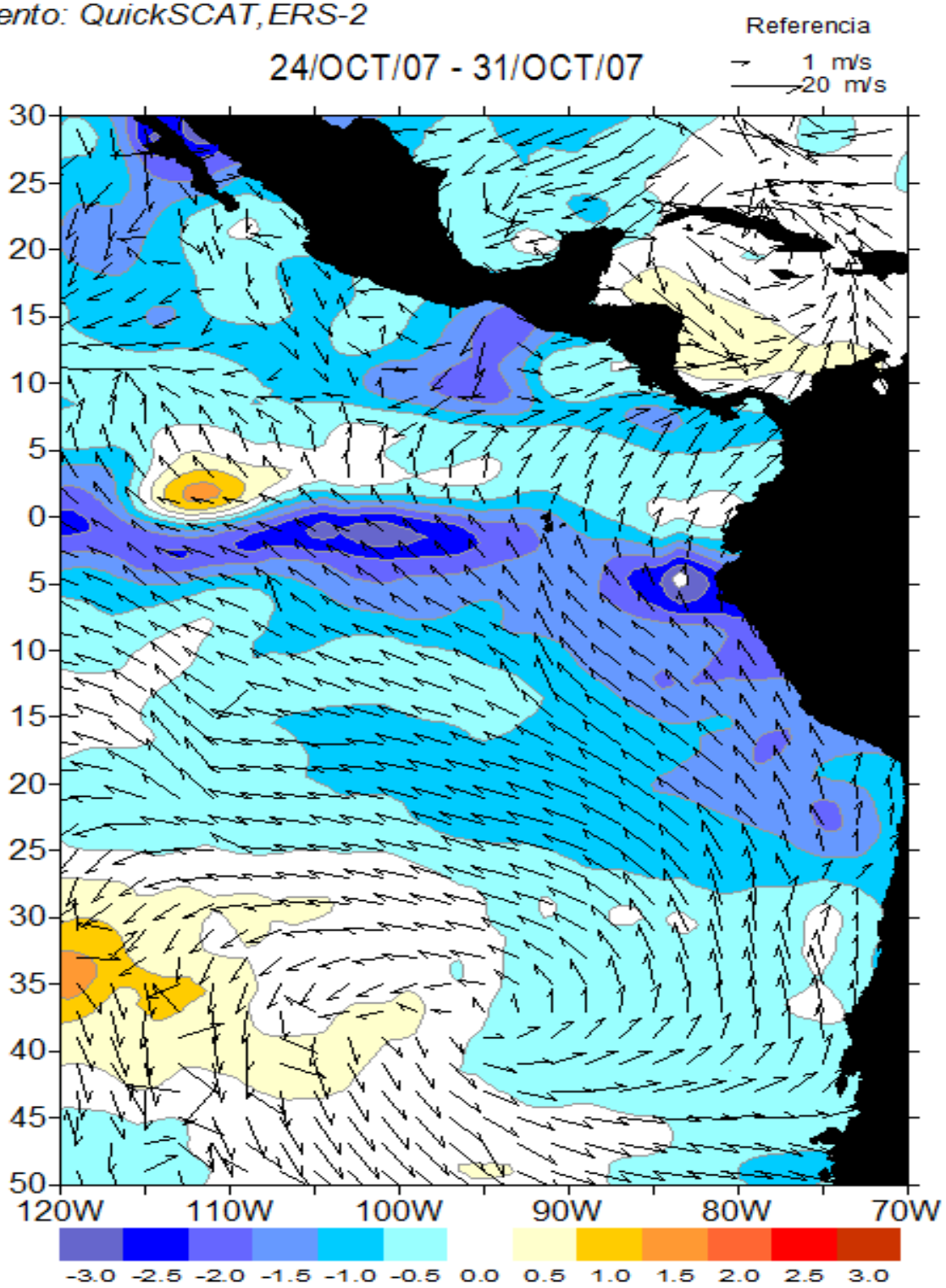


Figure 11.- Sea Surface Temperature Anomalies (ºC) October 2007.
(Source: International Research Institute for Climate and Society)

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.
Procesamiento: INOCAR - CIIFEN, 2007

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