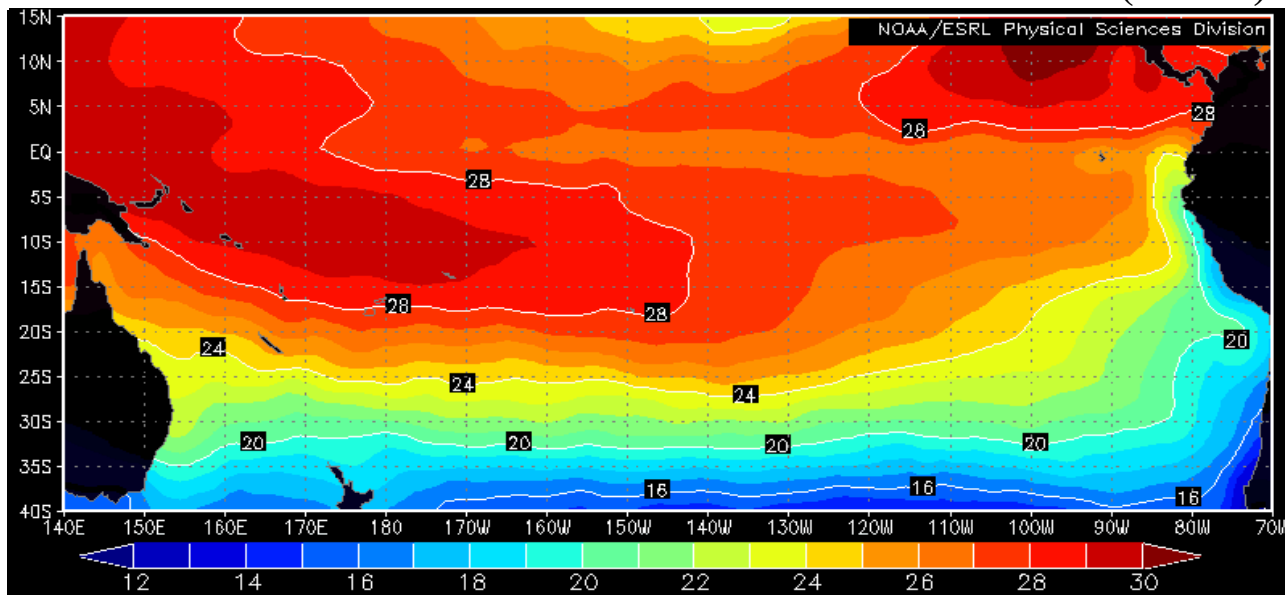


COMISIÓN PERMANENTE DEL PACÍFICO SUR (CPPS)



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

MAY 2008

BAC N° 212

ERFEN

(Estudio Regional del Fenómeno El Niño)

BOLETÍN DE ALERTA CLIMÁTICO *CLIMATE ALERT BULLETIN*



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DHN

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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 Central Equatorial Pacific Ocean continue during May exhibiting values of Sea surface Temperature slightly underneath its climatologic value, being observed in this occasion a strong tendency to reduction of the negative anomalies; prevailing during the last week of the month positive values of anomaly. In the “El Niño” regions the anomaly of the SST during the last week of May maintained the process of reduction of its values: In the region of the Western Pacific (“El Niño” Region 4) it was of 0,6°C, in the Central Pacific (“El Niño” Region 3,4) the anomaly was of 0.4°C, also in the region of the Eastern Pacific (“El Niño” Region 1+2) the anomaly was of 0.4°C. The subsurface thermal structure in the Central Equatorial Pacific presents a remarkable reduction of the water cloak with anomaly of -1.0°C, located between 130°W and 170°E, being at the moment bordered to first 70m. Below this layer in the level of the 170 ms a great warm nucleus with positive anomalies of until 4.0°C stays; also in the Eastern edge of the Equatorial Pacific, to the east of 110°W in the level of the 50 ms an intense warm nucleus with anomaly of 4°C appears. In May the Mean Sea Level in the South eastern Pacific was located on its normal patterns. Over against the coasts of Ecuador it was 16, 0 cm by on the average; throughout the Peruvian coast it continued presenting positive anomalies, being observed an increase around 7, 0 cm, with respect to the previous month. In front of Chile the level of the sea was characterized to present values near the historical average, with slight negative anomalies. The Index of Oscillation of the South in this month, after nine months to remain positive happened to the negative phase with a value of -0.3. The Intertropical Convergence Zone appeared in the Eastern sector of the Pacific with quite significant convective activity, being located its central axis between 3° and 6°N. Referring to rains, in Colombia during second half of the month rains intensified, which caused a big number of sidings and crescents sudden in the high river basins of the Andean system, as well as emergencias associated to floods. In the coast of Ecuador however rains were deficit in an 80%. In the North coast of Peru, during the first and last days of the month, isolate drizzles appeared. In Chile the precipitations surpassed the awaited average values in the central and south zone; the cities that showed the majors pluviometric positive anomalies were Valparaíso, Chillan, Concepción, Valdivia and Puerto Montt. As far as surface winds, in the region of the South eastern Pacific they appeared predominantly of the south-east south and; referring to the speeds generally they appeared fluctuating around its average value for the month. Taking into account the present thermal behaviour from the Equatorial Pacific Ocean, as well as the exits of several models of numerical simulation, are anticipated that, during the next month in the Eastern sector of the Pacific Ocean the Sea Surface Temperature will remain around the normal one; whereas the Central Equatorial Pacific Ocean continues falling towards normal values.

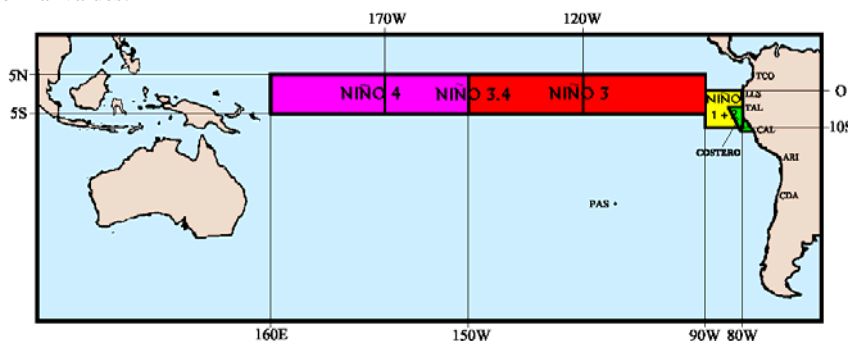


Figure 2.- Map indicating locations and codes of series. Rectangles show the average area of Sea Surface Temperature (SST °C)

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CLIMATE ALERT BULLETIN
BAC N° 212, MAY 2008**I. GLOBAL AND REGIONAL IMAGE**

In May, the Sea Surface Temperature (SST-TSM) in the Central Equatorial Pacific Ocean continued appearing below its climatologic value, although in this month the tendency to reduce so much the area was well-known as the value of the negative anomalies of the SST. In the "El Niño" regions the monthly anomaly of the SST for May maintained the tendency to reduce its values thus: in the region of the Western Pacific ("El Niño" Region 4) it happened of -1.0°C to -0.8°C , in the Central Pacific ("El Niño" Region 3.4) the anomaly happened of -0.8°C to -0.6°C ; in the region of the Eastern Pacific ("El Niño" Region 1+2) the anomalies were positive happening of 0.4°C to 0.1°C .

In the subsurface thermal structure in the Central Equatorial Pacific a reduction of the water cloak with anomaly of -1.0°C is observed, located between 130°W and 170°E , being at the moment reduced from the surface to the level of 70m. Below this layer to 170 ms of depth there is presents a warm nucleus with positive anomalies of until 4.0°C ; also in the Eastern edge of the Equatorial Pacific, to the east of 110°W in the level of the 50 ms, an intense warm nucleus with anomaly of 4.0°C appears.

The Mean Sea Level (MSL) in the South eastern Pacific during May was located on its normal patterns. Over Against the coasts of Ecuador it was 16. 0 cm by on the average; throughout the Peruvian coast it continued presenting positive anomalies, being observed an increase around 7, 0 cm, with respect to the previous month; the anomalies of the MSL fluctuated between 8.0 cm (San Juan) .y 15.0 cm (Lobos de Afuera). In front of Chile the level of the sea was characterized to present values near the historical average throughout the coast of the country, with negative anomalies that oscillated between -1.8 cm (Caldera, Valparaiso) and -3.8 cm (Talcahuano).

The Index of Oscillation of the South, after being in the positive phase by nine months consecutive, in May presented negative value of -0.3 which was regulated by the positive anomalies in Tahiti of 0.8 and in Darwin with 1.3.

The Intertropical Convergence Zone (ZCIT) appeared in the Eastern sector of the Pacific with significant convective activity, affecting mainly Colombia; the location of its central axis was between 3 and 6° of North latitude.

Referring to rains, in Colombia during second half of the month rains intensified, which caused a big number of slidings and crescents sudden in the high river basins of the Andean system, as well as emergencies associated to floods. In the coast of Ecuador however rains were deficit in an 80% in the central and south coast especially. In the North coast of Peru, during the first and last days of the month, isolated drizzles appeared, registering precipitations type plans in Talara, Paita and Chimbote; whereas, in Mollendo and Ilo only plans were registered during the first one and tenth day of the month. In Chile the precipitations surpassed the awaited average values in the central and south zone. The cities that showed the majors pluviometric positive anomalies surpassing 120 mm with respect to the average of the month were Valparaiso, Chillán, Concepción, Valdivia and Puerto Montt. The austral zone, between Coyhaique and Punta Arenas, was dominated by slight fallen water deficits.

As far as surface winds, in the region of the South eastern Pacific they appeared predominantly of the south and south-east, with speeds that generally fluctuated around the awaited average value for the month.

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

The Center for the Pollution Control of the Pacific (CCCP) and the Hydrology, Meteorology and Environmental Studies Institute (IDEAM) inform that during the first five days of May, the Intertropical Convergence Zone was

located in center of the country fluctuating between 3°N and 6°N, presenting a quite significant activity; the atmospheric circulation in height favoured the convective processes at surface level. In the later days until finalizing the first fortnight relatively stable atmospheric conditions appeared.

The entrance of the Tropical Waves of the East since second fortnight was the main meteorological system that influenced so that the rainy weather to a large extent of the national territory predominated. Three tropical waves moved by the national territory. The first between the 15 and 17; second, between the 20 and the 22; and third, between 25 and 27, being the two last ones, those of greater activity, due to they interacted with “vaguadas” associated to cold fronts of the North hemisphere, generating a well-known atmospheric instability in most of the country.

Thus, during second half of this month the winter season intensified, which caused a big number of slidings and crescents sudden in the high river basins of the Andean system, as well as emergencies associated to floods especially in the middle and low parts of the rivers Magdalena, Cauca, Atrato and Arauca; the situation has been very critical in the municipalities of Honda (Tolima), Dorada (Caldas) and Puerto Salgar (Cundinamarca) by a significant increase of the level of the Magdalena river. Except the Guajira and some precise zones of the south of the Huila, south east of Santander and Amazonian piedmont, generally, the registries show that the historical values of the month in a high percentage were surpassed, especially in ample sectors of the regions Andean and Pacific; it is worth to indicate the excesses observed in vast areas of Antioquia, Cundinamarca, Tolima, Eje Cafetero, Cauca, Valle, Nariño and Huila, where the totals of precipitation surpassed in more of a 40% the averages of the month.

It is also possible to emphasize, that at the end of the month a system of low pressure on the northwest of the Caribbean region and the passage of a tropical wave generated abundant rains in the Archipelago of San Andres and Providencia.

Until the end of May the report given by the Colombian government gives account of 207 affected municipalities, in 27 of the 32 departments of the country, with a tragic balance of 16 deads, 43 wounded, 5 disappearing, 25,000 damaged families, 381 destroyed houses, 12233 houses damaged and more than 130000 affected during the first winter season, from the 15 of March to the 28 of May of the present year. At this moment, they are in red alert status all the municipalities located on the middle and low part of the rivers Magdalena and Cauca which cross the country in sense south-north. The municipalities located in the middle part, such as Honda, Puerto Salgar, La Dorada and Gamarra, are flooded and begin to appear diseases and other complications generated by the permanence during several days of suspended waters. On the other hand important highways of the country remain blocked by continuous slidings; so it is the case of the highways Bogota-Villavicencio (that is a way to connect east of the country to the capital) and Bogota-Manizales, as well as the majority of the routes in Antioquia.

On the other hand it is anticipated that the winter reduces the coffee harvest in Colombia. As a result of its effects, for the second semester of the year esteem that the harvest will be reduced approximately in a 35%, in relation to the numbers of the 2007, that were of the order of 12.6 million bags (“sacks”, “sacos”). In center of the Andean region, important areas of farm have been devastated especially rice, yucca, maize (corn) and banana.

During the monitoring of May of 2008, realised by the Area of Operational Oceanography of the CCCP, the fixed station coastal N°5 located to 10 miles of the bay of Tumaco between the coordinates 78.51° and 2°N, it is possible to be observed that the registry of the SST for May, was of 27.9°C and 27.8°C for the first and second fortnight respectively, throwing a monthly average of 27.86°C. A positive anomaly at surface of 0.26°C appears, with respect to the historical average (March 2000 - May 2008), which is of 27.59°C.

In May, the thermocline for the first fortnight descended 7 meters with respect to the last registry from April, positioning itself on the 35 meters, and for the second fortnight it positioned approximately on the 40 meters. The isotherm of 15°C does not become visible for this month, whereas the isotherm of 27°C presents a fluctuation between the 31 and 34 meters of depth.

As far as the behaviour of the salinity, it registered at surface level a value of 31.59 and 31.83 ups for the first and second fortnight of May respectively, presenting a monthly average of 31.71. Appears a positive anomaly of 0.024 at surface level with respect to the historical average that is of 31.68.

The maximum value of salinity appeared in the first fortnight of the month, showing a value of 34.94 to a depth of 80 meters approximately. The halocline was positioned respectively for the first and second fortnight on the 37 and 42 meters

B. CONDITIONS IN THE ECUADORIAN COAST

The Oceanographic Institute of the Navy of Ecuador (INOCAR) reports that during May of 2008 the temperature of the air throughout the Ecuadorian coast fluctuated between 24.4°C and 26.9°C giving to anomalies between -0.8°C and 1.0°C. As far as the Sea Surface Temperature presented values between 25.8°C and 26.4°C which means anomalies of -0.8°C and 0.3°C respectively.

In May, the rain reduction in the Ecuadorian Coast generally meant a deficit from 80% to 85%, which would practically mean the conclusion of the humid time for the region.

Considering the present behaviour of the conditions ocean-atmospheric in front of Ecuador, within the own variability of the seasonal cycle of the region. The present conditions allow anticipating a decrease of rains in the entire region, without discarding that could have precipitations focused (north and inner of the region) with variable intensity.

As far as the temperature of the sea and the air in the Ecuadorian coast esteem that will maintain values slightly underneath the normal one hoped for June. As far as the temperature of the air, one anticipates significant fluctuations during the day.

C. CONDITIONS IN THE PERUVIAN COAST

The Direction of Hydrography and Navigation of Peru (DHN) informs that generally the SST in the Peruvian coast has presented a +/- 0.4°C variability, with respect to the previous month; where the negative anomalies have prevailed, with the exception of Talara, that presented a positive anomaly of +0.5° C. The negative anomalies of the SST fluctuated between -0.2°C (Paita) and -1.5°C (San Juan).

The Mean Sea Level (MSL) in the Peruvian coast continued presenting positive anomalies, being observed an increase around 7.0 cm with respect to the previous month. The anomalies of the MSL fluctuated between +8.0 cm (San Juan) y +15 cm (Lobos de Afuera).

Throughout the Peruvian coast the temperature of the air has diminished around 1, 0°C below the monthly average, with respect to the previous month, predominated the negative anomalies. The anomalies of the Air Temperature (AT) fluctuated between -0.7°C (Lobos de Afuera) and -2.7°C (Mollendo).

As far as rains in the north coast during the first and last days of the month, isolated drizzles appeared, registering precipitations type plans in Talara, Paita and Chimbote; whereas, in Mollendo and Ilo only plans were registered during the first one and tenth day of the month.

The winds throughout the Peruvian coast predominated of south direction; nevertheless, also they presented components of the south-east in the stations of Lobos de Afuera, San Juan and Mollendo, respectively. In relation to the wind speed, the positive anomalies predominated that fluctuated between 0.1 to 1.3 m/s; with the exception of Paita, Chimbote and Callao, that presented anomalies of -0.8, -0.2 and -0.5 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 level of the sea to monitoreo a series of oceanic and atmospheric variables. A description of the Sea Surface Temperature and the level of the sea between Arica (18°29'S) and Talcahuano (36°41'S) for May of 2008 is:

During this month, the SST continued showing a colder condition than the normal thing especially in the north zone of the country between Arica and Caldera; this sector demonstrated negative anomalies that oscillated between -1.7°C and -2.1°C. On the other hand, the north-center zone presented values near the historical average, with anomalies of -0.4°C in the station of Coquimbo, -0.3°C in Valparaiso and -0.5°C in Talcahuano.

The level of the sea was characterized to present values near the historical average throughout the coast of the country, with negative anomalies that oscillated between -1.8 cm (Caldera, Valparaiso) and -3.8 cm (Talcahuano). Nevertheless, it is possible to emphasize the positive anomaly of 0.1 cm that presented the station of Arica, value near to considered condition normal.

The Meteorological Direction of Chile (DMCh) shows that during May, the average temperature of the air presented negative anomalies superiors to 1.0°C, especially in the coastal zone of the north and center of the country, with maximum values in Arica (-2.5°C), Iquique (-2.2°C) and Antofagasta (-2.2°C). In the rest of the country dominated negative anomalies but of smaller intensity not surpassing the value of 1°C. Only Santiago was slightly warm with an anomaly of +0.4°C.

The maximum temperature of the air presented by second consecutive month the cooling that affected north coast of Chile, with negative anomalies between 1 and 2.5°C. In the central, South and austral zone dominated the negative anomalies, excluding Santiago, Osorno, Puerto Montt and Punta Arenas, that respectively registered slight warm anomalies whose values of the month were of 0.7, 0.6, 0.8 and 0.3°C respectively.

As far as the minimum air temperature, as much in the north zone as south and austral, they presented the majors cooling, with negative anomalies around 1.0°C. The central zone was characterized to be under conditions surroundings to the normal thing.

A well-known change of the atmospheric circulation in Chile was present during May and characterized by the weakening of the subtropical anticyclone of the South Pacific, and to a greater frontal activity in the central and south zone of the country associated to the intensification of the area of low pressures present in the zones of high altitudes to the south of 55°S.

The precipitations surpassed the awaited average values in the central and south zone. The cities that showed the majors pluviometric positive anomalies surpassing 120 mm with respect to the average of the month were Valparaiso, Chillán, Concepcion, Valdivia and Puerto Montt. The austral zone, between Coyhaique and Punta Arenas, was dominated by slight deficits.

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, esteem that during the next month the Central Equatorial Pacific still will maintain slight anomalies negative of the SST, conserving the predisposition to reduce so much the area as the value of the anomalies, tending to neutral conditions.

B. REGIONAL

In agreement with the pursuit of the ocean-atmospheric conditions in the south eastern 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 the SST in the Eastern Equatorial Pacific appears slightly on their average value; whereas in the coastal sector, next to South America, the SST will appear slightly below the waited for average value. A similar behaviour is expected with respect to the temperature of the air.

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
MAR 08	6.8	10.3	6.3	26.8	26.0	26.5	27.3	25.9	14.3	8.4	1.1
APR 08	6.0	9.5	5.4	27.4	26.8	27.2	25.9	23.0	13.1	9.9	0.6
MAY 08	5.1	8.9	5.7	27.9	27.2	27.1	24.4	21.6	13.3	12.2	-0.3

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	
MAR 08	27.3	27.4	19.8	19.3	17.4	16.0	18.1	14.6	
APR 08	28.3	25.8	16.3	17.2	16.5	15.3	15.5	12.9	
MAY 08	27.9	23.4	16.1	15.7	15.2	13.6	14.3	13.0	

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	
MAR 08	***	2669	1160	1644	706	1305	932	697	
APR 08	***	2645	1130	1603	686	1270	922	671	
MAY 08	***	2797	1160	1611	699	1242	896	722	

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
ABR	03	***	***	***	***	253.9	***
	08	***	***	***	***	258.5	***
	13	***	***	***	***	263.4	***
	18	***	***	***	***	273.3	***
	23	***	***	***	***	269.9	***
MAY	28	***	***	***	***	266.7	***
	03	***	20.6	16.5	***	277.4	116.9
	08	***	19.4	16.0	***	284.4	115.3
	13	***	19.9	16.4	***	275.5	115.7
	18	***	19.9	15.8	***	277.2	112.1
	23	***	20.4	15.7	***	280.0	113.1
	28	***	20.4	16.1	***	282.4	115.4

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

Note.

* Values revised

***. Information not received

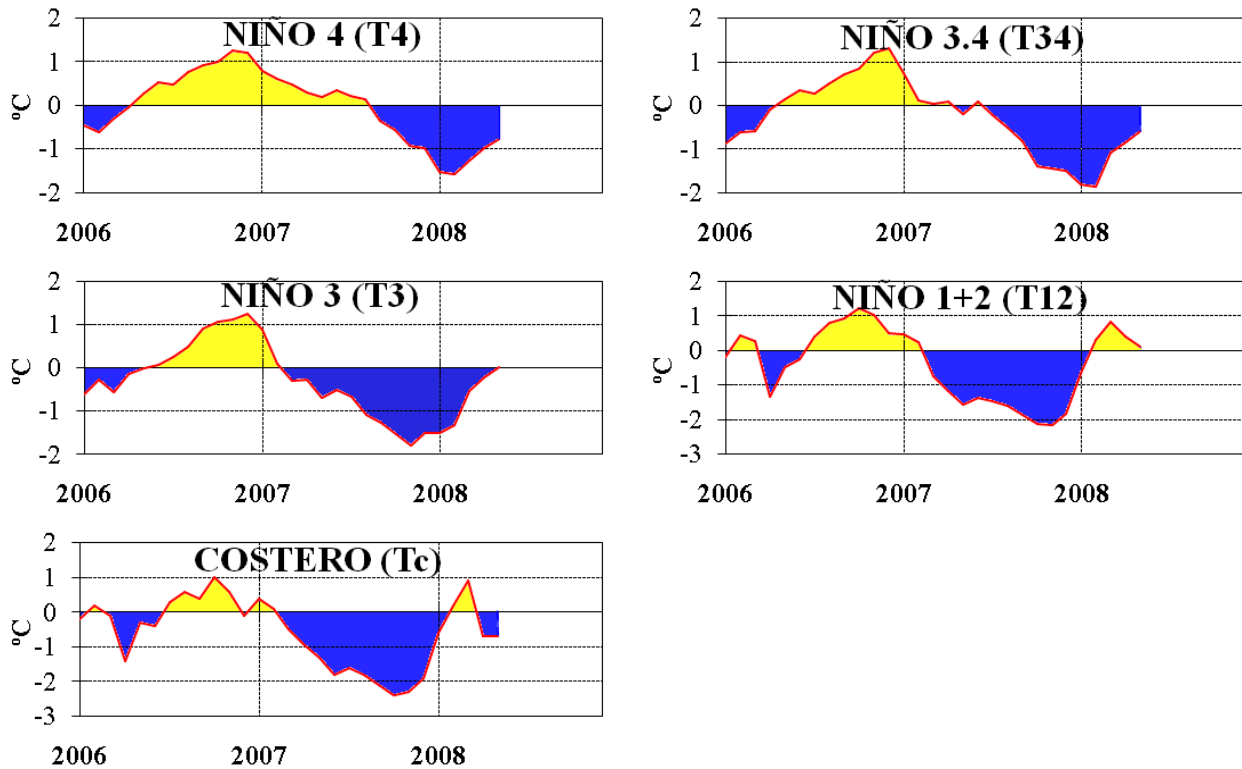


Figure 3.- Oceanic anomalies indices (Niño 4, Niño 3.4, Niño 3, Niño 1+2 and Tc). The location of the oceanic indices appears in figure 2. (Source: NCEP/NWS/NOAA/USA).

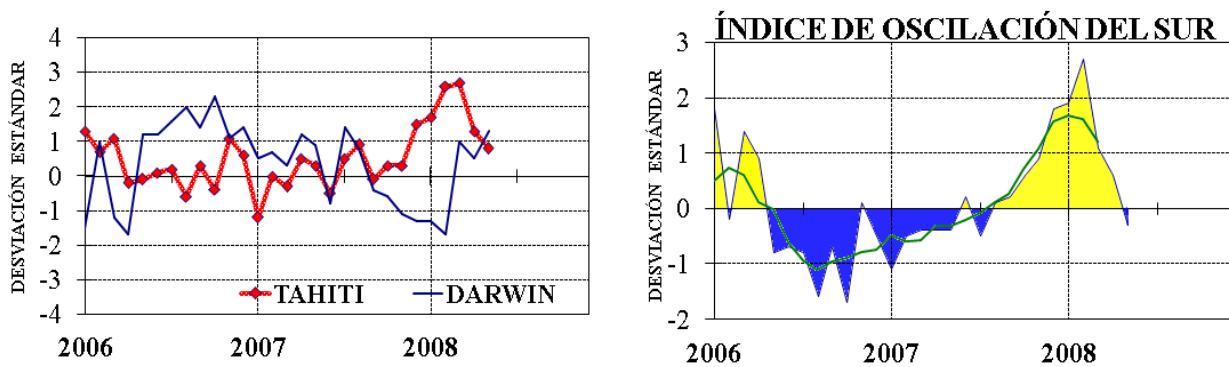


Figure 4.- Left Panel: Five-months running mean for atmospheric pressure anomalies in Tahiti and Darwin (mb). Right Panel: Southern Oscillation Index. (SOI) with monthly values and five-months running mean graphed as a green line. The SOI is based on the difference between standardized pressure values: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

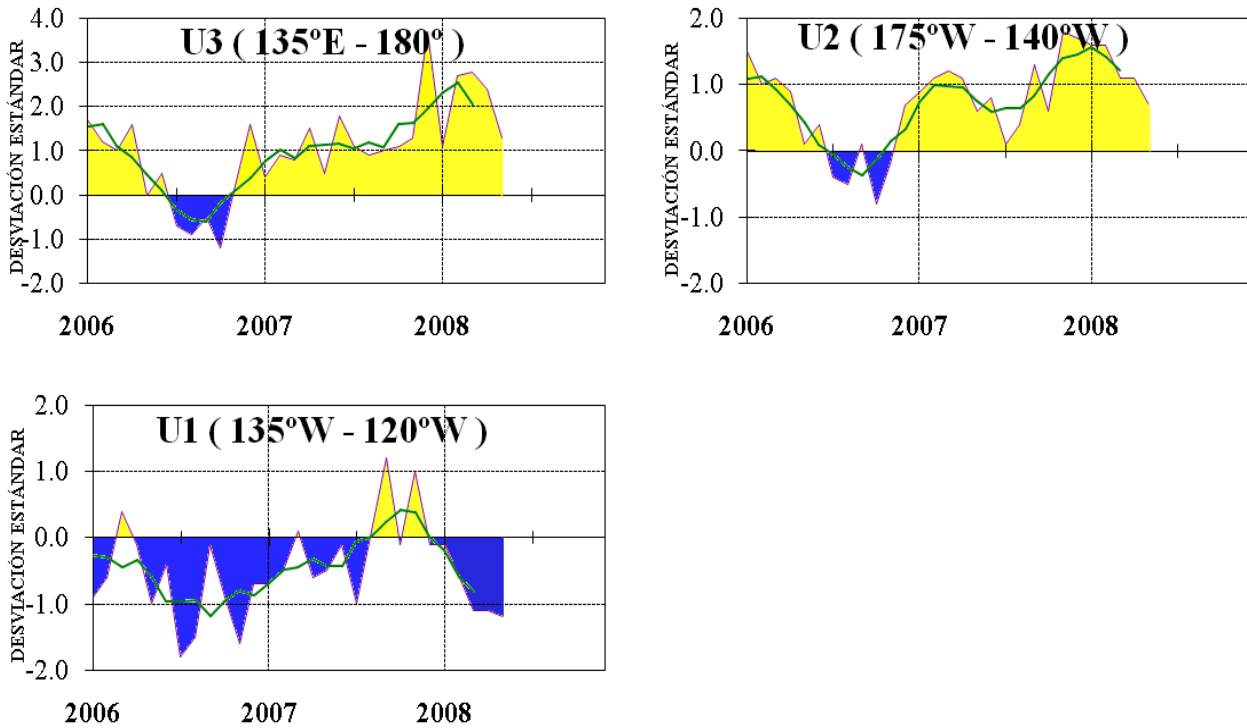


Figure 5.- Series and moving averages of five months of zonal wind standardized anomalies (m/s) averaged between 5°N and 5°S for three Equatorial zones: western (U3), central (U2) and eastern (U1). (Source: NCEP/NWS/NOAA/USA).

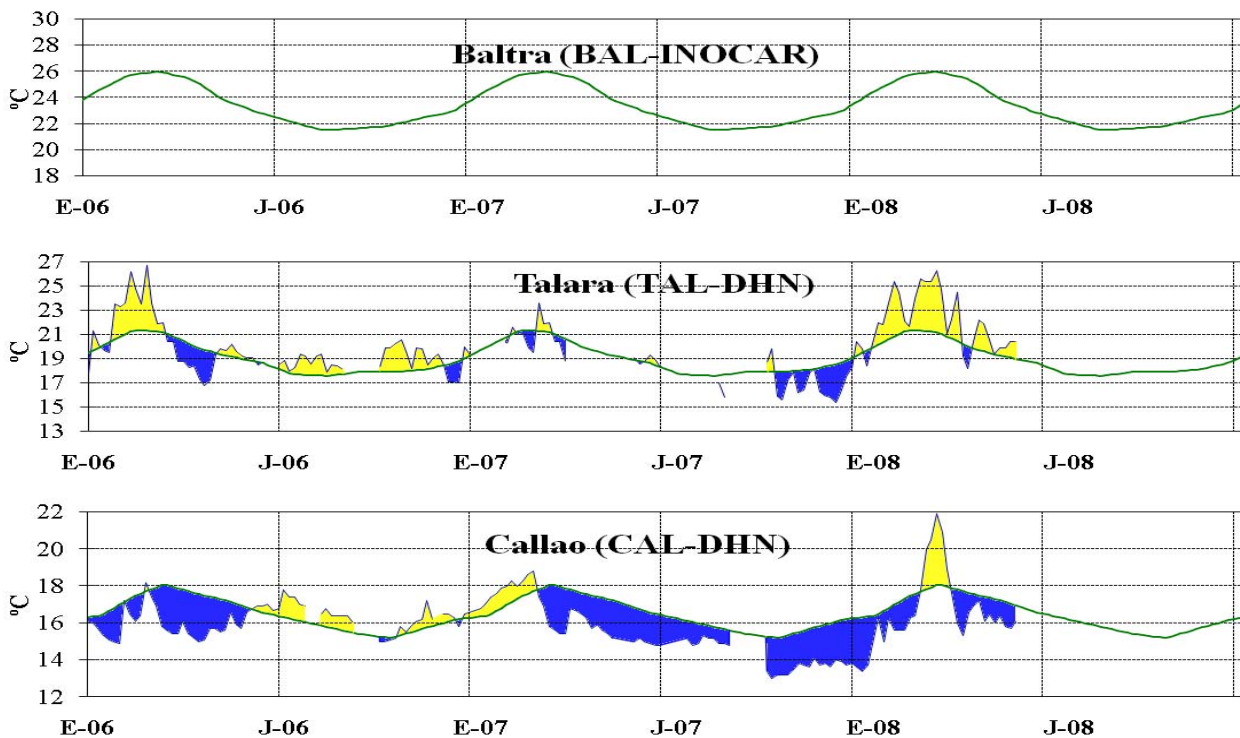


Figure 6.- Five day averages (pentads) of SST (°C) in Ports of Peru and Ecuador. The green curve indicates climatology. The location of oceanic indices appears in figure 1. (Source: NOAA/Atlantic Oceanographic and Meteorological Laboratory – Miami.)

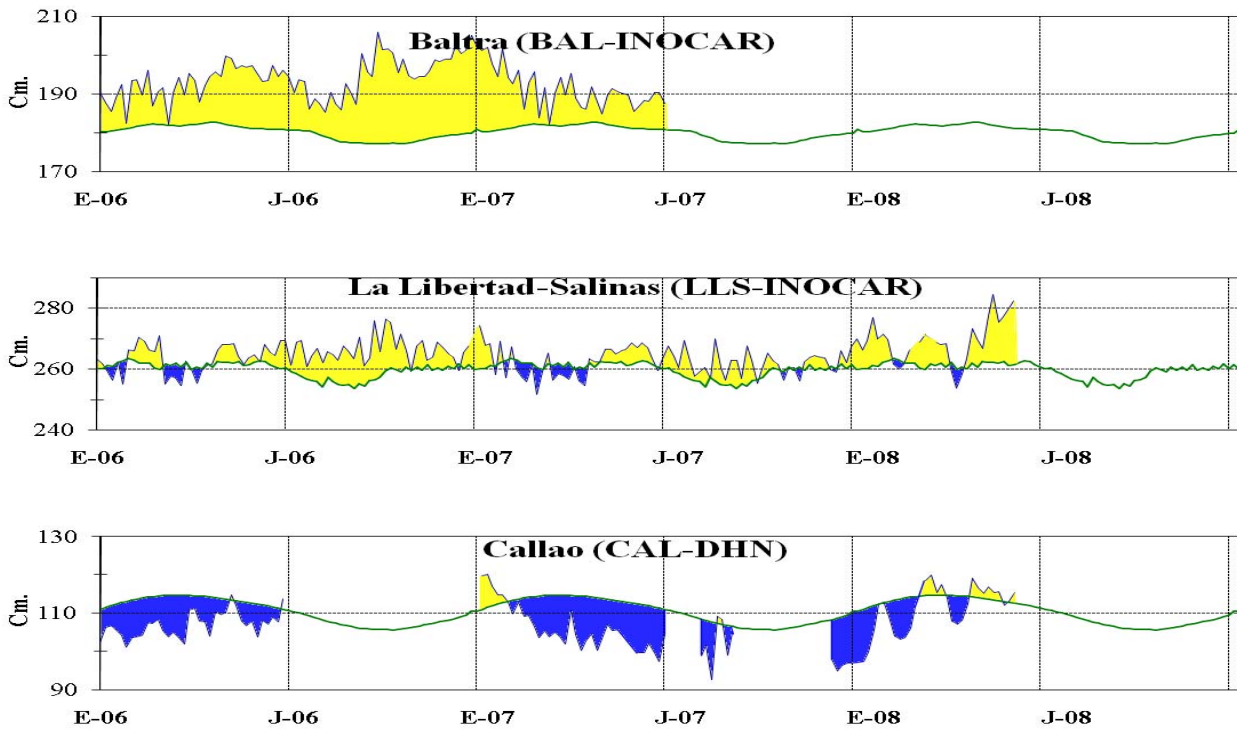


Figure 7.- Five-day running mean (pentads) of MSL (cm) in Ports of Peru and Ecuador. The green curve indicates climatology. The location of oceanic indices appears in figure 1. (Sources: NOAA/Atlantic Oceanographic and Meteorological Laboratory – Miami, e INOCAR).

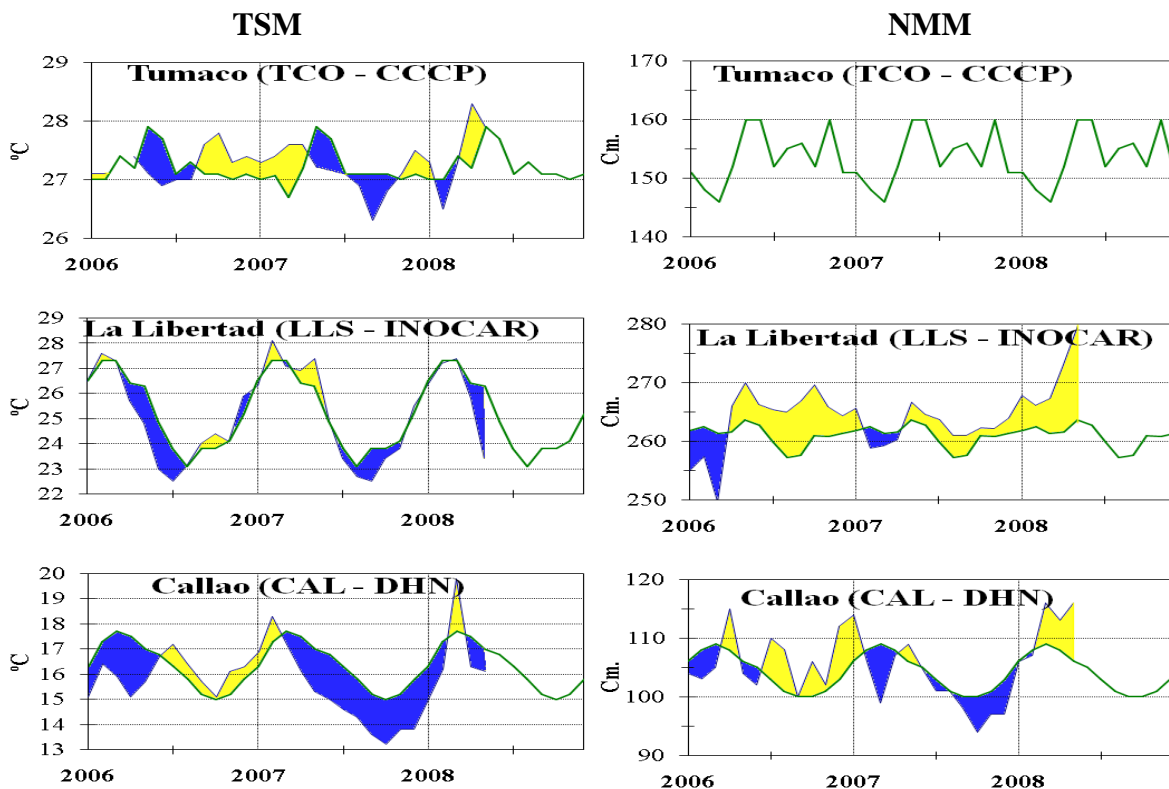


Figure 8a.- Monthly means of the SST (°C) and MSL (cm) in five stations of the ERFEN region. Green curve indicates historic monthly mean. The location of the stations appears in Figure 1. (Sources: CCCP, INOCAR y DHN).

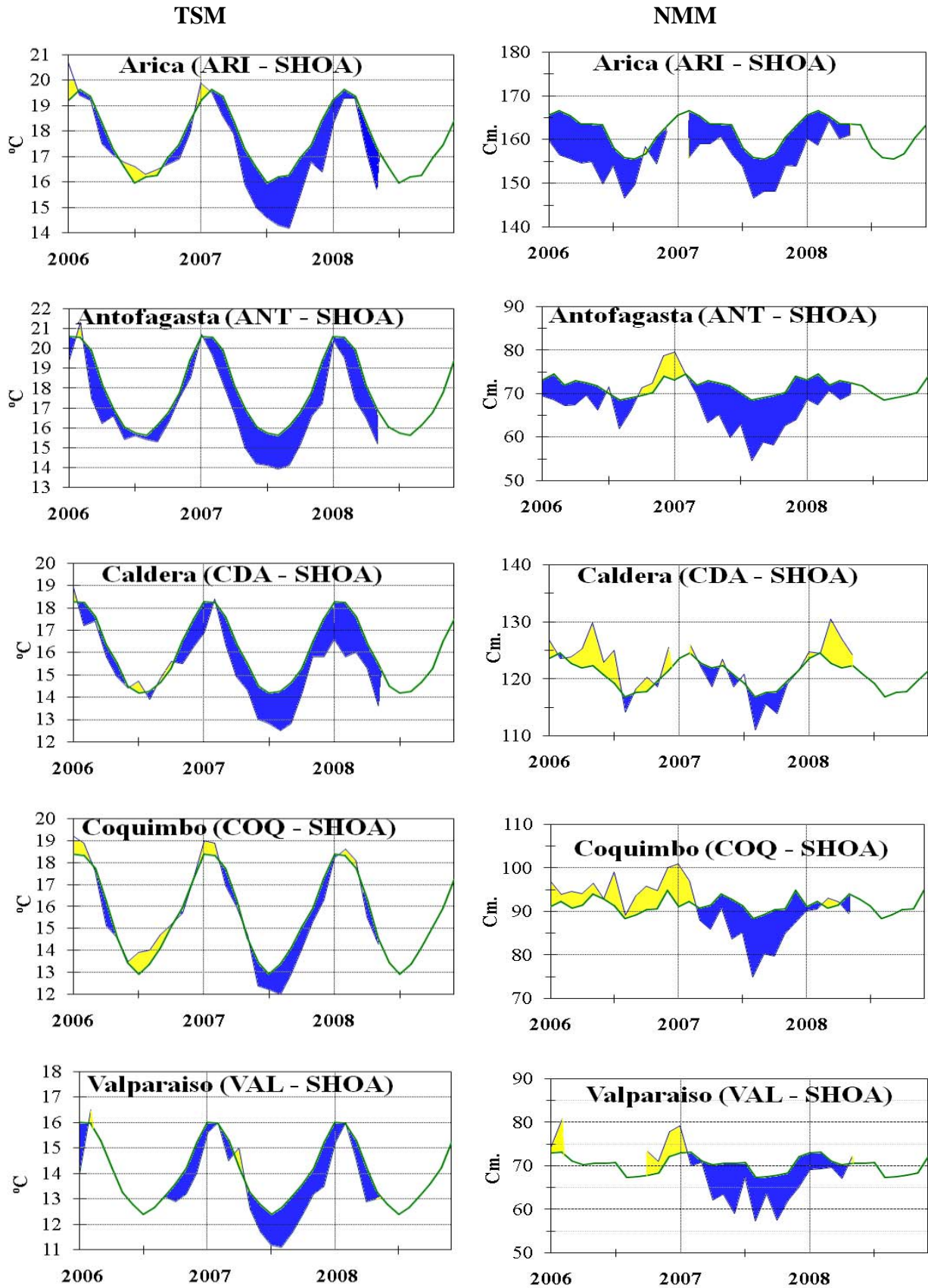


Figure 8b.- Monthly means of the SST (°C) and MSL (cm) in five stations of the ERFEN region. Green curve indicates historic monthly mean. The location of the stations appears in Figure 1. (Source: SHOA).

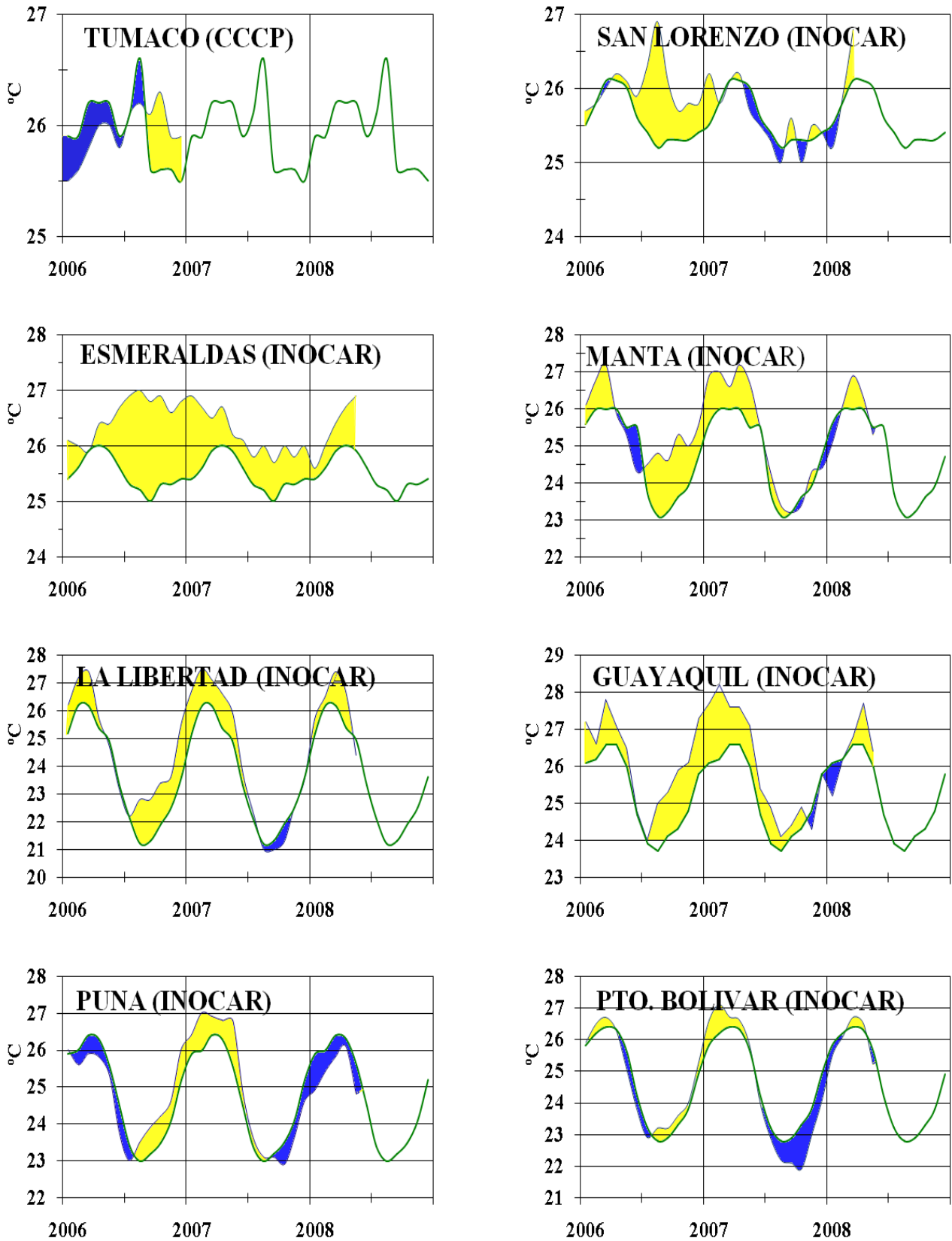


Figure 9a.- Monthly means of the air temperature (°C) in 8 stations of the ERFEN region. Green curve indicates historic monthly mean. The location of the stations appears in Figure 1. (Sources: CCCP & INOCAR).

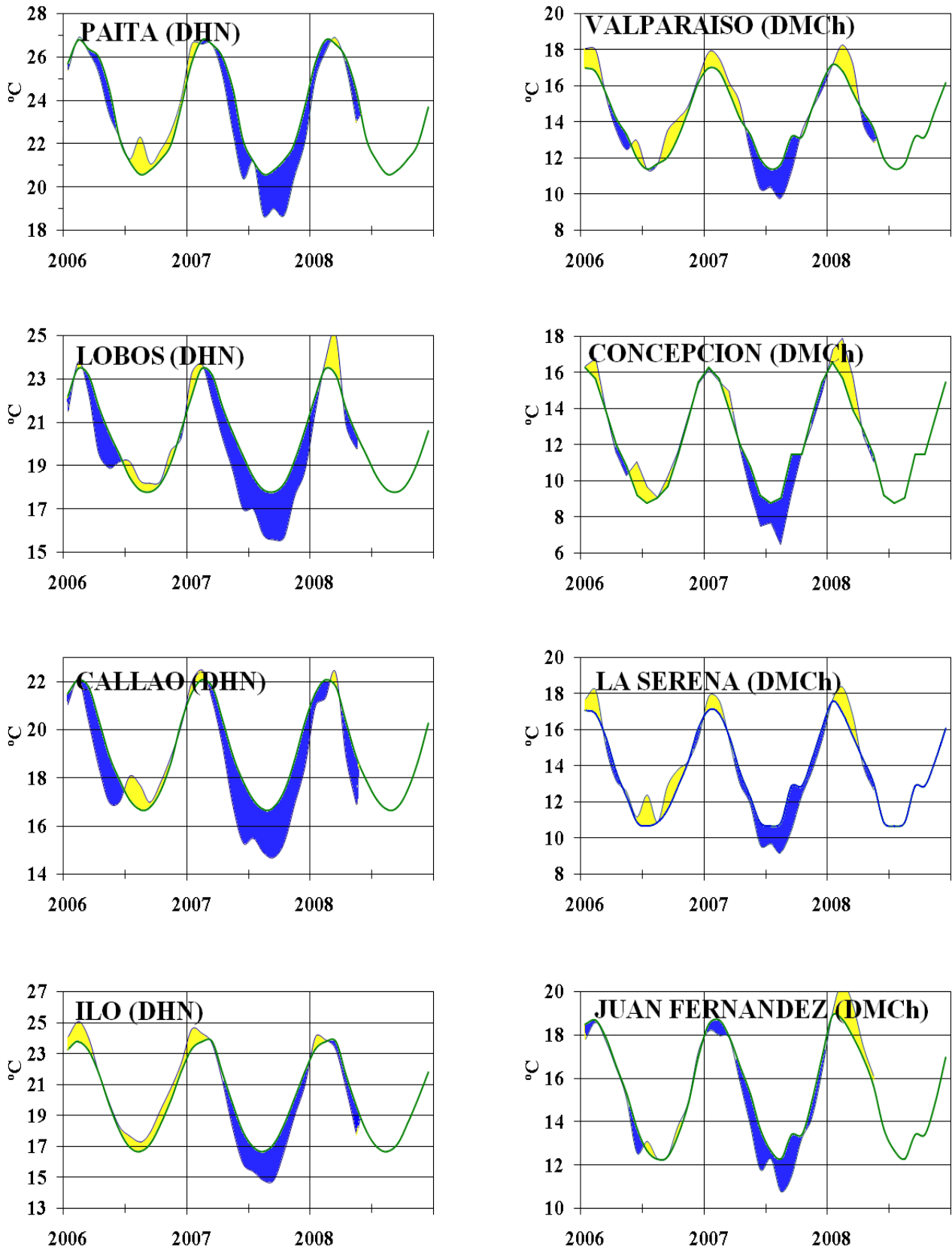


Figure 9b.- Monthly means of the AT (°C) in 10 stations of the ERFEN region. Green curve indicates historic monthly mean. The location of the stations appears in Figure 1. (Sources: DHN & DMCh).

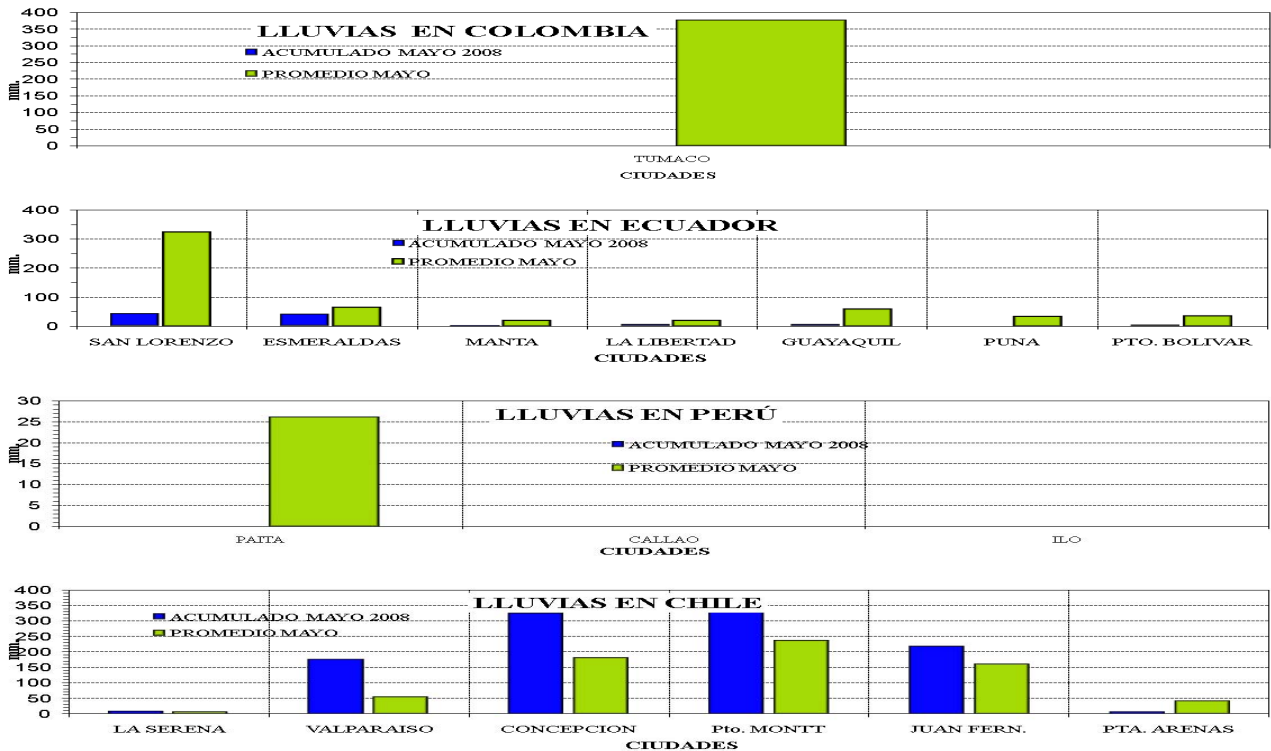
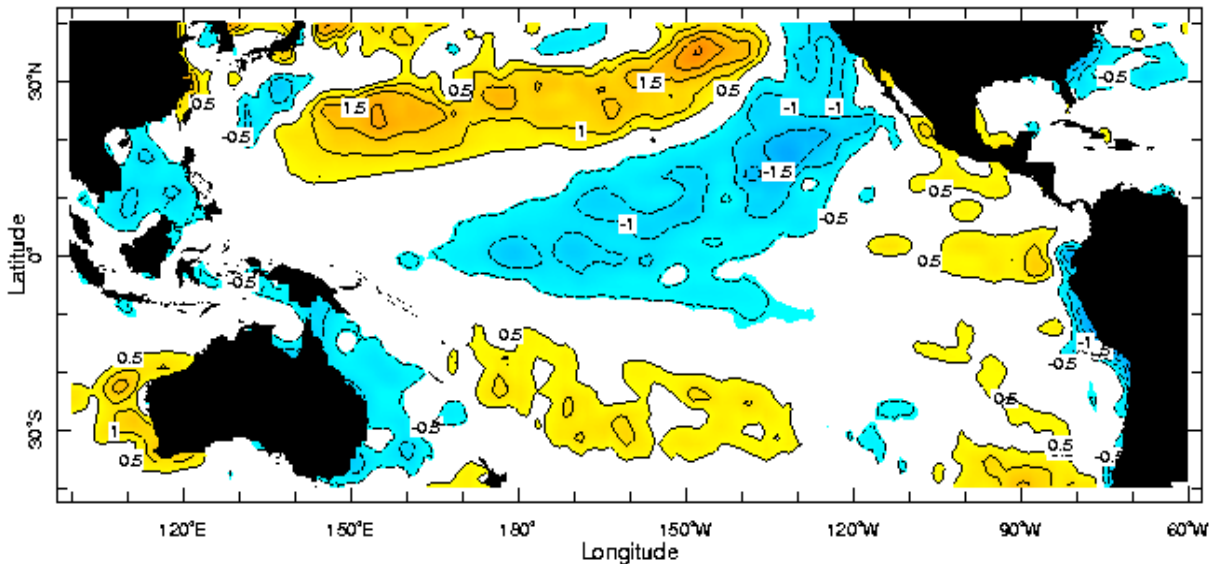


Figure 10.- Rains during May in the coastal stations of Colombia, Ecuador, Peru and Chile. Location of the stations appears in Figure 1. (Sources: CCCP, INOCAR, DHN & DMCh).

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

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