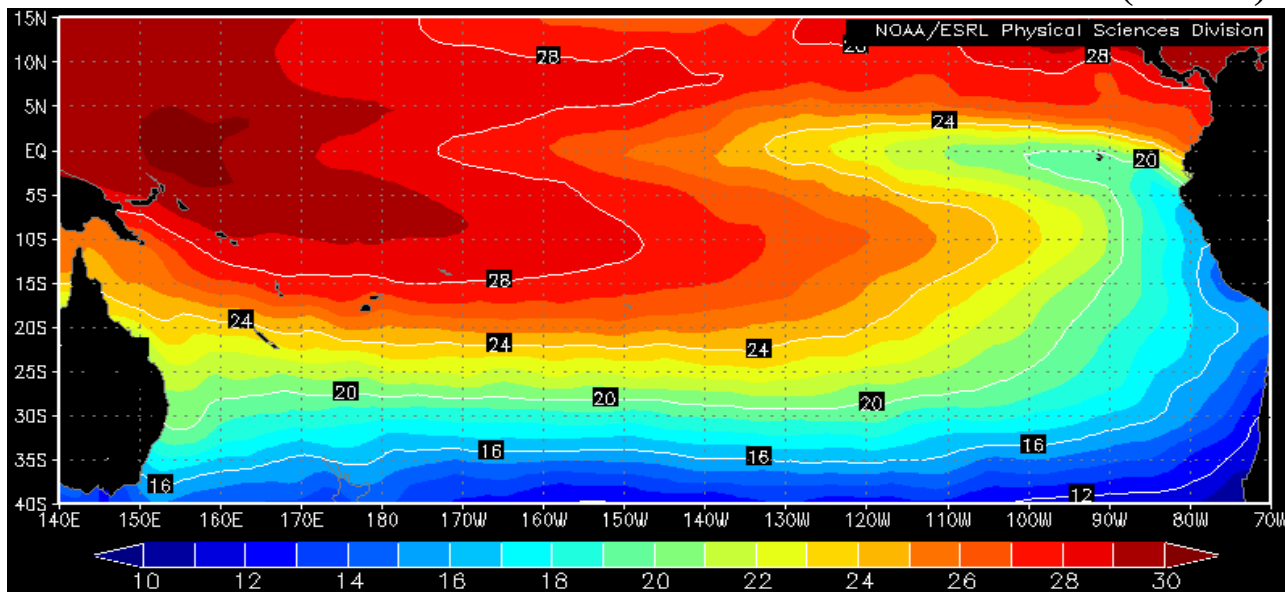


COMISIÓN PERMANENTE DEL PACÍFICO SUR (CPPS)



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

AUGUST 2007

BAC N° 203

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

August characterized by the reactivation of the observed cooling previous weeks in all “El Niño” regions; being more well-known in the sector of the Equatorial Pacific from the Eastern edge to 160°W approximately.

The temperature of the sea during the last week of August exhibited anomalies of 0,0°C in the Western Pacific, -1,2°C for the Central Pacific and of -2,3°C in the Eastern Pacific, staying the condition of neutrality for the Equatorial Pacific with noticeable tendency towards could conditions.

In relation to surface winds, the winds of the south and Southeaster with speeds superior to the normal rank for the date, between 1.0 to 2.2 m/s, predominated in the region of the Southeaster Pacific.

The Index of Oscillation of the South, after remaining by a brief period (the previous month) in the negative phase, in August happened slightly to positive values with 0,1.

During this month the Mean Sea Level in the Southeaster Pacific, 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 stay mainly, with fluctuations between -2,8 cm (Arica) and -16,3 cm (Talcahuano).

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

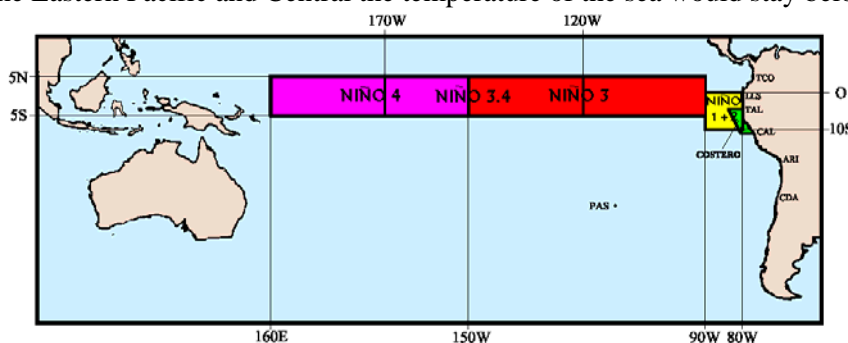


Figure 2.- Map indicating locations and codes of series. Rectangles show the average area of Sea Surface Temperature (SST °C)

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CLIMATE ALERT BULLETIN
BAC N° 203, AUGUST 2007**I. GLOBAL AND REGIONAL IMAGE**

The Equatorial Pacific Ocean during August was characterized by the maintenance, and at some moments the fortification of the process of cooling of the Sea Surface Temperature (SST), particularly in the Western sector of the Equatorial Pacific, reaching the SST values of anomaly of to $-2,3^{\circ}\text{C}$ in the region of the Southeastern Pacific. The monthly anomaly of the SST in "El Niño" regions presented a slight and generalized cooling, whose values for August with respect to previous month in the Western Pacific region ("El Niño" Region 4) happened of $0,2^{\circ}$ to $0,1^{\circ}\text{C}$, in the Central Pacific ("El Niño" Region 3,4) the anomaly happened of $-0,3^{\circ}$ to $-0,5^{\circ}\text{C}$ and in Eastern Pacific ("El Niño" Region 1+2) it happened of $-1,5^{\circ}\text{C}$ to $-1,6^{\circ}\text{C}$.

At subsurface level, the behaviour of the thermal structure during August in the Eastern Equatorial Pacific was enough similar to the happened in the previous month, appearing negative anomalies of until $-3,0^{\circ}\text{C}$ that reached the level of the 150 ms and until 170°W . At the end of the month, in the Eastern edge of the Pacific, a slight increase of the anomalies appeared, arriving to appear a small subsurface patch with positive anomaly ($0,5^{\circ}\text{C}$). On the other hand in the Western margin of the Pacific, the water body with positive anomalies ($1,0^{\circ}\text{C}$), deepened at the level of the 200 m, moving towards the East reaching the line of date in the Pacific.

The Mean sea level (MSL) in the Southeaster Pacific during August fluctuated near its normal patterns for the month; thus, as opposed to the coasts of Ecuador it was 4.0 cm on the average, in Peru $-0,5\text{cm}$ and in Chile the negative anomalies persist, with fluctuations between $-2,8\text{ cm}$ (Arica) and $-16,3\text{ cm}$ (Talcahuano).

The South Oscillation Index (SOI) was located in the positive phase, with a value of 0,1. With respect to the atmospheric anomalies of pressure, Tahiti and Darwin reached values of 0,9 and 0,8 respectively.

The Intertropical Convergence Zone (ITCZ), in the Eastern Pacific Ocean, appeared like a cloudy band, with its central axis located around 10°N , with presence of convective cells of great activity during most of the month, doing greater influence on the Central America region, North of Colombia and the Caribbean.

With respect to rains, during August it continued the activity of the tropical waves of the East, which in interaction with the ITCZ, were decisive factors in the behaviour of rains during the month in Colombia, generating emergencies by floods, in the low parts of the river basins of the rivers Magdalena and Cauca mainly. It is important to emphasize the presence of centres of low pressure in the north of Colombia that cooperated for the increase of precipitations; in Ecuador appeared sporadic episodes of rains in the North region that did not exceed the own normal value for the month, being deficit in most of the coastal region; in Peru, only in the Callao plans by intermittent drizzles were registered during the first and third week of the month; in Chile by fourth consecutive month the rain deficit profile stays, being of greater intensity in the centre-south zone of the country.

With respect to surface winds, they predominated of the South and the Southeaster; with speeds that fluctuated on the normal value of the month in approximately 1.0 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 Institute (IDEAM) inform that during August it continued the activity of the tropical waves of the East, which in interaction with the ITCZ, were decisive factors in the behaviour of rains over the historical values during the month; which generated emergencies by floods in the low parts of the river basins of the rivers Magdalena, Cauca, Sinú and Atrato, mainly. In addition to the previous thing, it is important to emphasize the presence of centres of low pressure in sectors of the north of the country, during some days of the month, which also contributed so that excessive volumes of rains were registered. On the contrary, on the east of the national territory, amounts of rain below the historical values were registered; the location of the ITCZ a little more to the north of the usual for this time, added to humidity minor entered from Brazil, influenced so that deficit amounts in these zones of the country. At general level, the ITCZ was located around 10°N, with significant convective activity during good part of the month.

During the monitored made by the Area of Operational Oceanography of the CCCP in August of 2007, to the fixed coastal station number five (05), located to 10 miles of the bay of Tumaco between the coordinates 01°55'41.9"N and 78°51'40.9"W, respectively obtained a registry of the SST for the first and second fortnight of 26,8° and 27,1°C, with a monthly average of 26,9°C and at surface level one anomaly of -0,1°C, with respect to the historical average (July 1999 - August 2007), which is of 27,1°C.

During August, the termocline for the first fortnight descended 25 ms with respect to the last registry from July, being located on the 75 ms approximately, and for the second fortnight it was positioned approximately on the 38 ms, raising 30 ms with respect to the first fortnight. The isotherm of the 15 °C was approximately located between the 60 ms and the 110 ms of depth.

Salinity at superficial level registered values of 32,62 and 31,62 UPS for the first and second fortnight of August respectively, throwing a monthly average of 31,62 and appeared an anomaly of -0,59 at superficial level with respect to the historical average that is of 32,22. The maximum value of salinity appeared in the first fortnight of August, throwing a value of 34,99 to approximately depth of 97 ms. The halocline oscillated respectively between the 35 and 75m for the first and second fortnight.

B. CONDITIONS IN THE ECUADORIAN COAST

The Oceanographic Institute of the Ecuadorian Navy (INOCAR), reports that, August of 2007 the originating wind presence of the south affected the central and South zone of the Coast, transporting to the region cold air masses, that was reflected in the reduction of the temperature of the air (21,0°C) in the South coast, whereas in the north the air temperature (AT) was a little warmer (26,0°C), with precipitation presence slight and brief.

The period of June to November is known like the dry station of the Ecuadorian coast, characterized in little rains and reduction of the temperature of the sea and the air, particularly between August and September. During August of 2007 slight precipitations were registered, being something more abundant those produced towards the north of the Ecuadorian coast (1°N). In general terms accumulated rain during August, on the Coastal and Insular region, was deficit.

The Temperature of the air during this month was characterized to present two scenes; under the normal one (-2,4°C) in the South coast and on the normal one (0,7°C) in the north coast. Of equal way the SST presented values on the normal one (0,7°C) in the north coast, decreasing the anomalies as advances towards the south of the Ecuadorian coast, arriving at -0,5°C in the South border.

Considering the present behaviour of the ocean-atmospheric conditions, it would be expected for September of 2007 that in the Ecuadorian coast, the precipitations (rains and drizzles) are little, according to the typical thing of the seasonal condition, with accumulated values near its 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 0° of latitude, whereas in the Galápagos Islands they would stay below its normal one.

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 a slight reduction of its values towards conditions more cold, where the most significant change appeared in Paita and Chimbote. The anomalies of the SST fluctuated between -0,7°C (Talara) and -1,8°C (Ilo).

The Mean Sea Level throughout the Peruvian coast presented in general negative anomalies, with the exception of Paita and Callao that presented values similar to the one of their normal ones of the month. The values of the anomalies diminished in average 0,02 m with respect to the previous month and fluctuated between 0,0 cm (Paita and Callao) and -5,0 cm (San Juan and Matarani).

The temperature of the air also stayed below the monthly average, being appraised in the coast conditions more cold; where the most significant changes appeared in the North zone, diminishing around 1,0°C, with respect to the previous month. The Maxima negative anomaly appeared in the station of San Juan (-2,3°C); whereas, the minimum anomaly appeared in the Callao (-1,8°C).

With respect to rains during the month, only in the Callao plans by intermittent drizzles were registered during the first and third week of the month.

Throughout the Peruvian coast winds of South direction predominated; with the exception of the station of Mollendo, in which winds of the Southeastern appeared. In relation to the wind speed, the positive anomalies predominated, that fluctuated between +0.2 m/s and +2.2 m/s; with the exception of Paita, that presented -1,3 m/s anomaly.

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 a series of oceanic and atmospheric variables. Next, it appears a description of the sea surface temperature and the level of the sea between Arica (18°29'S) and Talcahuano (36°41'S) for August of 2007.

During this month it continued the reduction of the values of SST observed from June in the north zone and the centre-south of the country (Arica to Talcahuano), which was reflected in negative anomalies that fluctuated between -1,3°C and -2,1°C. It is possible to emphasize, that the coldest zone appeared towards the North sector of Chile with an anomaly -2,1°C in Arica and -1,8°C in Caldera. The centre-south zone registered values of the order of -1,5°C (Valparaiso and Talcahuano).

Behaviour of level of sea like the observed thing for the SST was characterized to present a negative tendency with values of anomalies that oscillated between -2,8 cm (Arica) and -16,3 cm (Talcahuano).

The data of temperature and level of the sea, described previously for August in the North zone and the centre-south of Chile, are coherent to could conditions developed in the Tropical Pacific.

The Meteorological Direction of Chile (DMCh) shows that in August the average temperature of the air, was characterized by the presence of negative anomalies to a large extent of Chile, being the centre-south zone, between Concepcion and Port Montt, the one that presented the greater cooling, with anomalies between -2,0 and -3,0°C. Contrary, the Austral zone presented slight heatings with positive anomalies in Punta Arenas of 1,2°C.

The Maxima temperature average reached its greater cooling in the North coast of Chile, between Arica and Antofagasta, whose negative anomalies were near -3,0°C. In central and south zones, between Serena and Puerto Montt, negative anomalies of smaller magnitude were observed, with values between -1,0 and -2,0°C. The Austral zone, between Coyhaique and Punta Arenas, presented positive anomalies that surpassed the monthly average, with values between 0,6 and 1,4°C.

The minimum temperature average, especially in the centre-south zone, between Chillán and Puerto Montt was the one that presented the greater reductions, with anomalies that oscillated between -3,0 and -4,0°C. Only Punta Arenas reached a positive anomaly of +0,8°C.

The circulation pattern characterized itself by the presence of positive anomalies of the pressure at Mean Sea Level that dominated a vast region of the Southeaster Pacific. This condition, associated to the intensification of the Subtropical Anticyclone of the South Pacific, originated a nucleus of Maxima positive anomaly that reached to +10 hPa and it was located in the oceanic region to 35°S and 110°W. The station of Pascua Island registered an average anomaly of +7,7 hPa, whereas the Chilean continental stations, also with positive anomalies of the pressure, reached a smaller magnitude. For example, the North zone, between Arica and Antofagasta, was between 1 and 2 hPa; the Central zone, between 2 and 3 hPa; the South zone, between 3 and 4 hPa and the Austral zone, until Balmaceda, arrived at a +5hPa of anomaly. In the Austral zone, to the south of 55°S, negative anomalies dominated associate to a greater frequency of frontal systems and centres of low pressure.

By fourth consecutive month it appears to a large extent of Chile a profile with deficit of rains, with the greater reduction observed in the Centre-South zone, between Chillán and Balmaceda. The greater fallen water deficit was located in Port Montt (-60 mm) and Coyhaique (-90 mm).

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, is considered that the Equatorial Pacific during the next weeks would continue presenting certain neutrality with noticeable tendency towards a cold period, particularly in 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 Committees National ERFEN of Chile, Colombia, Ecuador and Peru), and coordinated by the CPPS, it is anticipated that during the next month the cooling of the SST in the Eastern and coastal Equatorial Pacific would stay, like the temperature of the air, that will present values below its normal one, particularly from the coasts from Chile to the south of Ecuador.

In reference to the level of the sea, it would continue fluctuating around its average value, with certain tendency to maintain the negative anomalies in front of Chile. 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 of precipitations is below the normal line, in special the central coast of Chile.

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 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
AUG 07	4.9	9.5	9.4	28.6	26.2	23.9	19.2	17.1	15.4	13.4	0.1

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	
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	
AUG 07	26.9	22.7	14.3	14.3	13.9	12.5	12.0	11.1	

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 07	***	2646	1050	1566	599	1187	838	590	
JUL 07	***	2637	1010	1590	629	1209	852	674	
AUG 07	***	2610	1010	1512	546	1111	750	574	

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 Ssurface Temperature (SST)			Mean Sea Level (MSL)		
		BALTRA	TALARA	CALLAO	BALTRA	LLS (INOCAR)	CALLAO
JUL	02	***	***	***	***	267.5	***
	07	***	***	***	***	264.3	***
	12	***	***	***	***	260.5	***
	17	***	***	***	***	269.5	***
	22	***	***	***	***	264.0	***
	27	***	***	***	***	257.8	***
AUG	01	***	16.90	14.90	***	259.0	98.9
	06	***	***	15.30	***	260.5	101.8
	11	***	***	15.20	***	257.0	92.6
	16	***	***	15.20	***	270.0	109.1
	21	***	17.00	14.90	***	260.5	108.4
	26	***	15.80	14.90	***	256.5	99.1
	31	***	***	14.80	***	263.0	105.1

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

Note.

* Values revised

***. Information not received

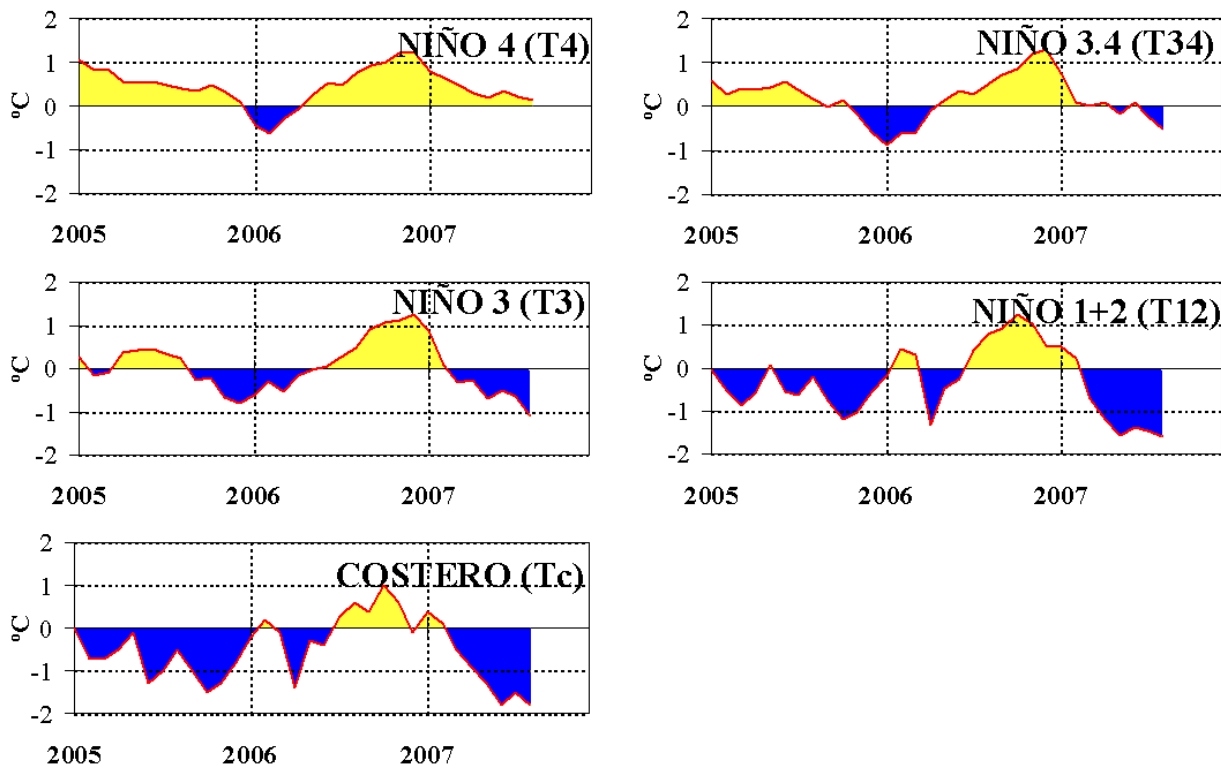


Figure 3.- Oceanic anomalies indices (Niño 4, Niño 3.4, Niño 3, Niño 1+2 and Tc). The location of the oceanic indices appears in figure 2. (Source: NCEP/NWS/NOAA/USA).

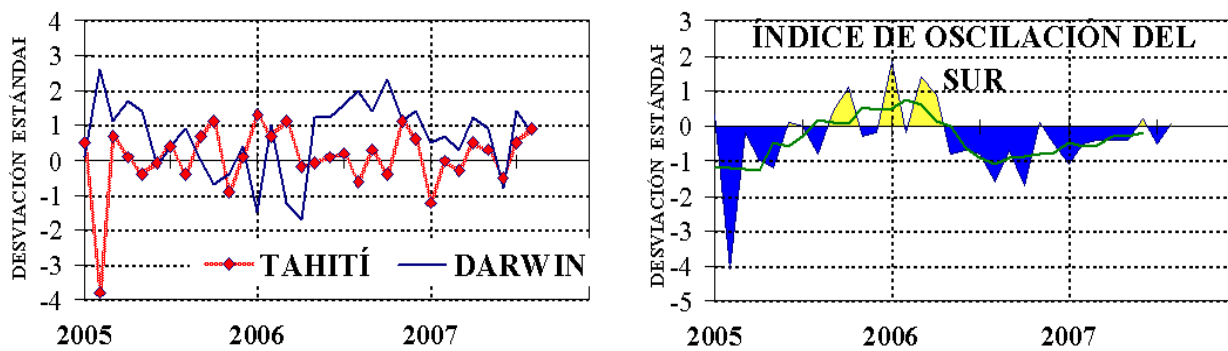


Figure 4.- Left Panel: Five-months running mean for atmospheric pressure anomalies in Tahiti and Darwin (mb). Right Panel: Southern Oscillation Index (SOI) with monthly values and five-months running mean graphed as a green line. The SOI is based on the difference between standardized pressure values: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

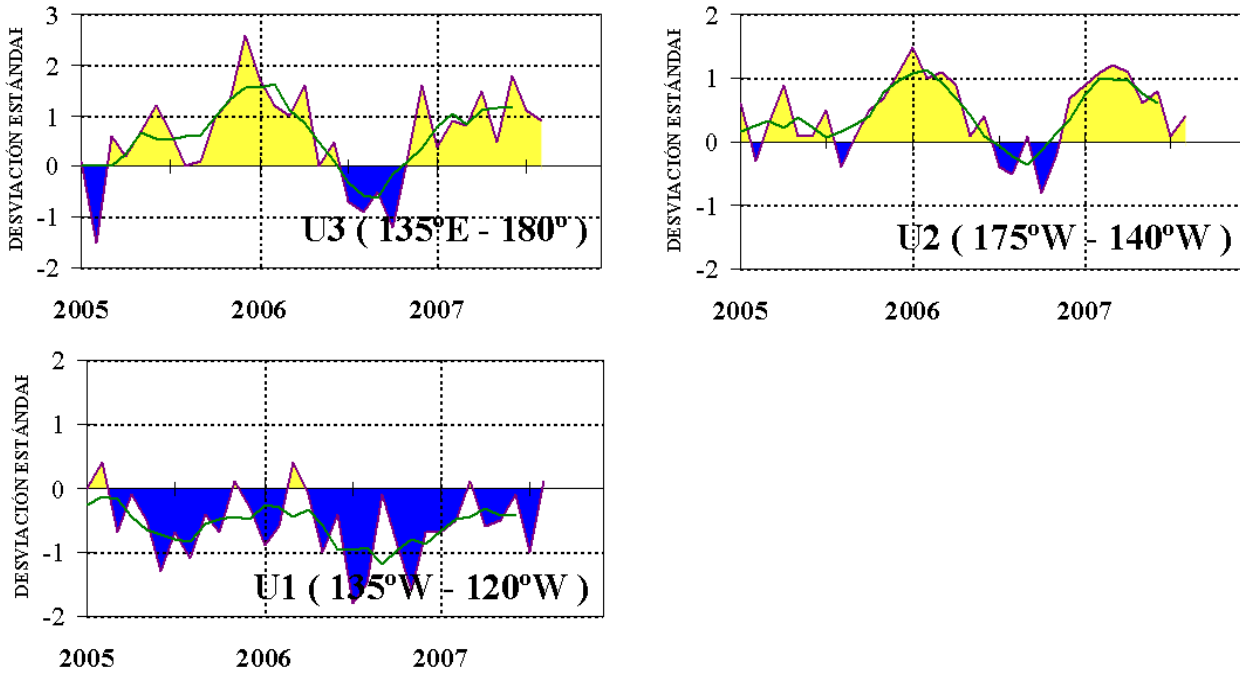


Figure 5.- Series and moving averages of five months of zonal wind standardized anomalies (m/s) averaged between 5°N and 5°S for three Equatorial zones: western (U3), central (U2) and eastern (U1). (Source: NCEP/NWS/NOAA/USA).

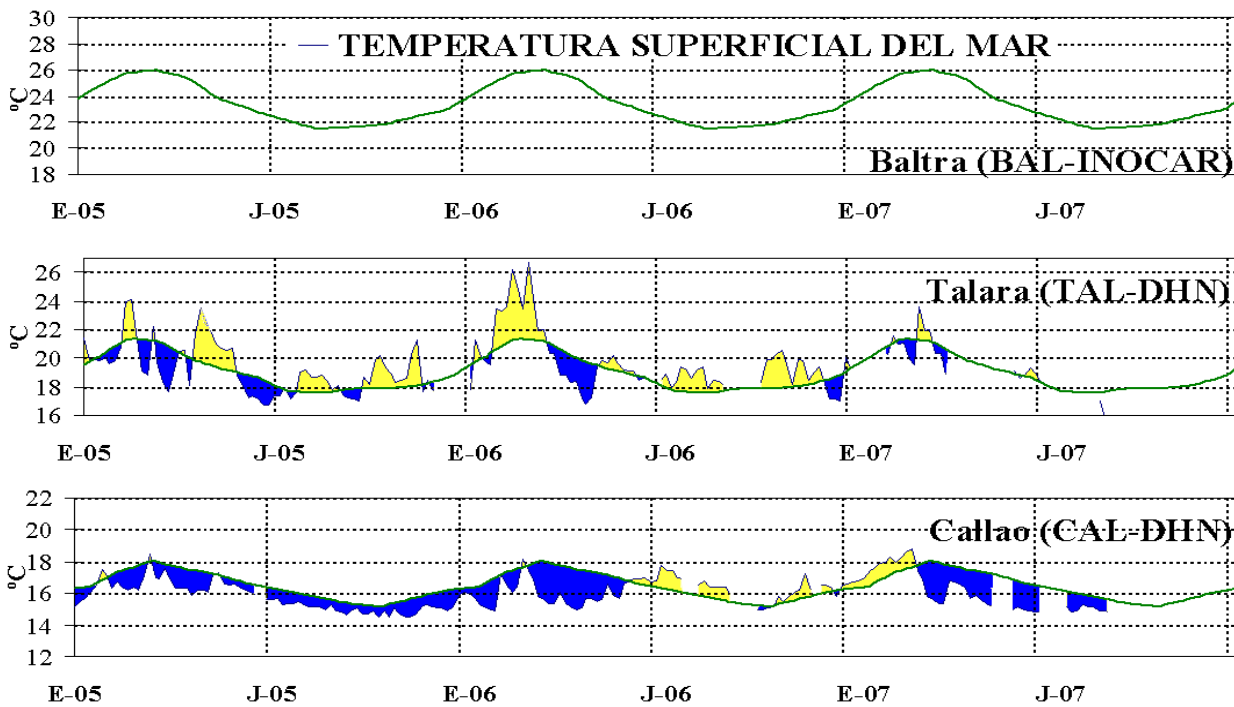


Figure 6.- Five day averages (pentads) of SST (°C) in Ports of Peru and Ecuador. The green curve indicates climatology. The location of oceanic indices appears in figure 1. (Source: NOAA/Atlantic Oceanographic and Meteorological Laboratory – Miami.)

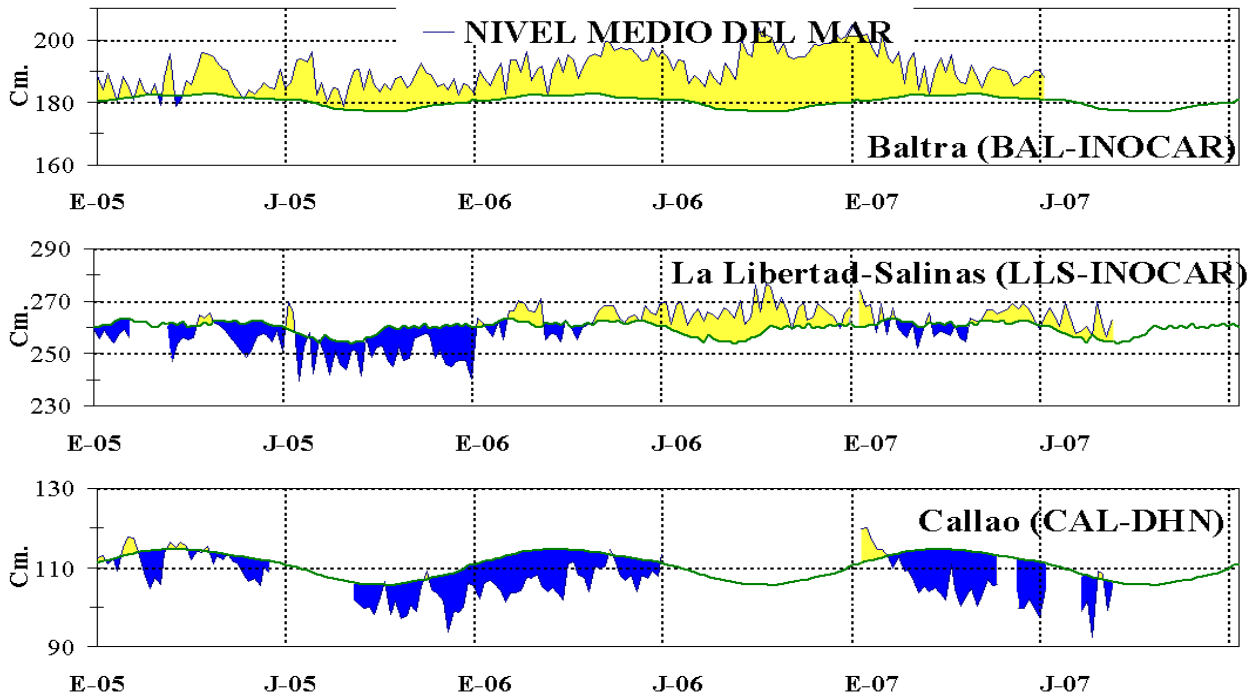


Figure 7.- Five-day running mean (pentads) of MSL (cm) in Ports of Peru and Ecuador. The green curve indicates climatology. The location of oceanic indices appears in figure 1. (Sources: NOAA/Atlantic Oceanographic and Meteorological Laboratory – Miami, e INOCAR).

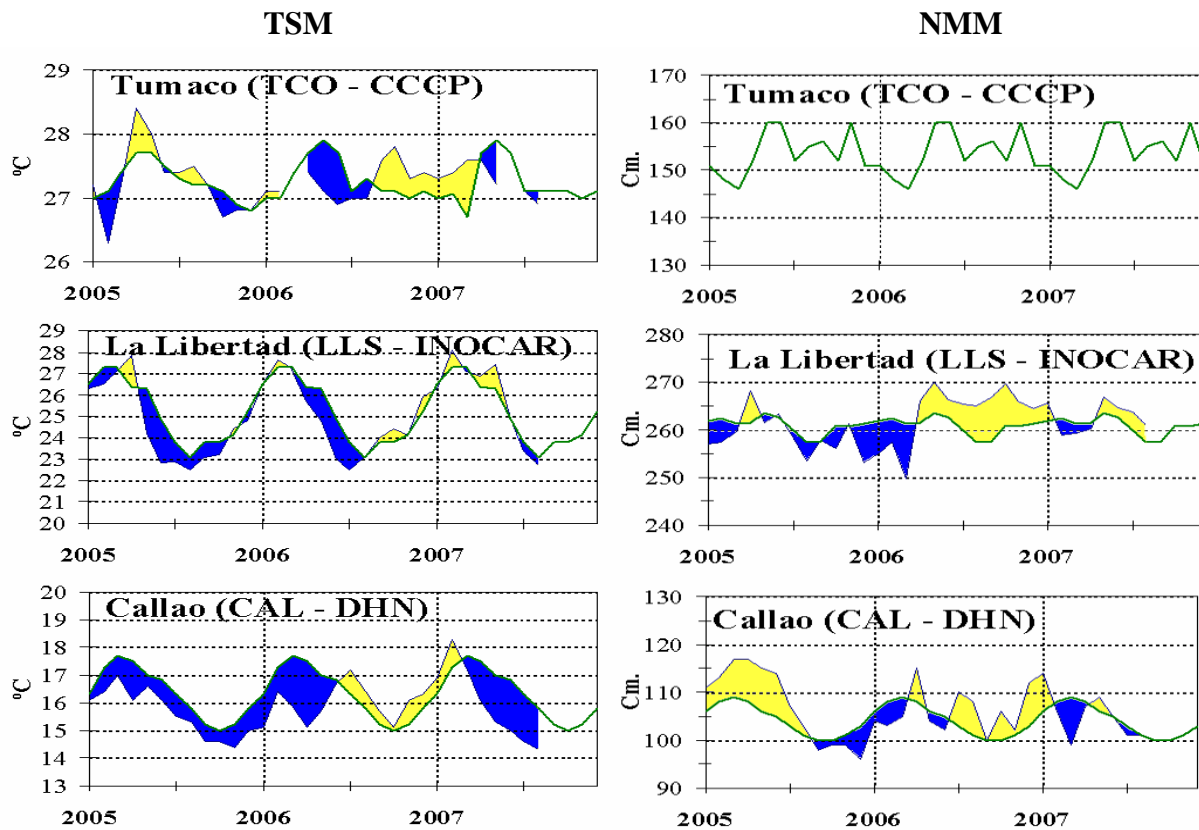


Figure 8a.- Monthly means of the SST (°C) and MSL (cm) in five stations of the ERFEN region. Green curve indicates historic monthly mean. The location of the stations appears in Figure 1. (Sources: CCCP, INOCAR y DHN).

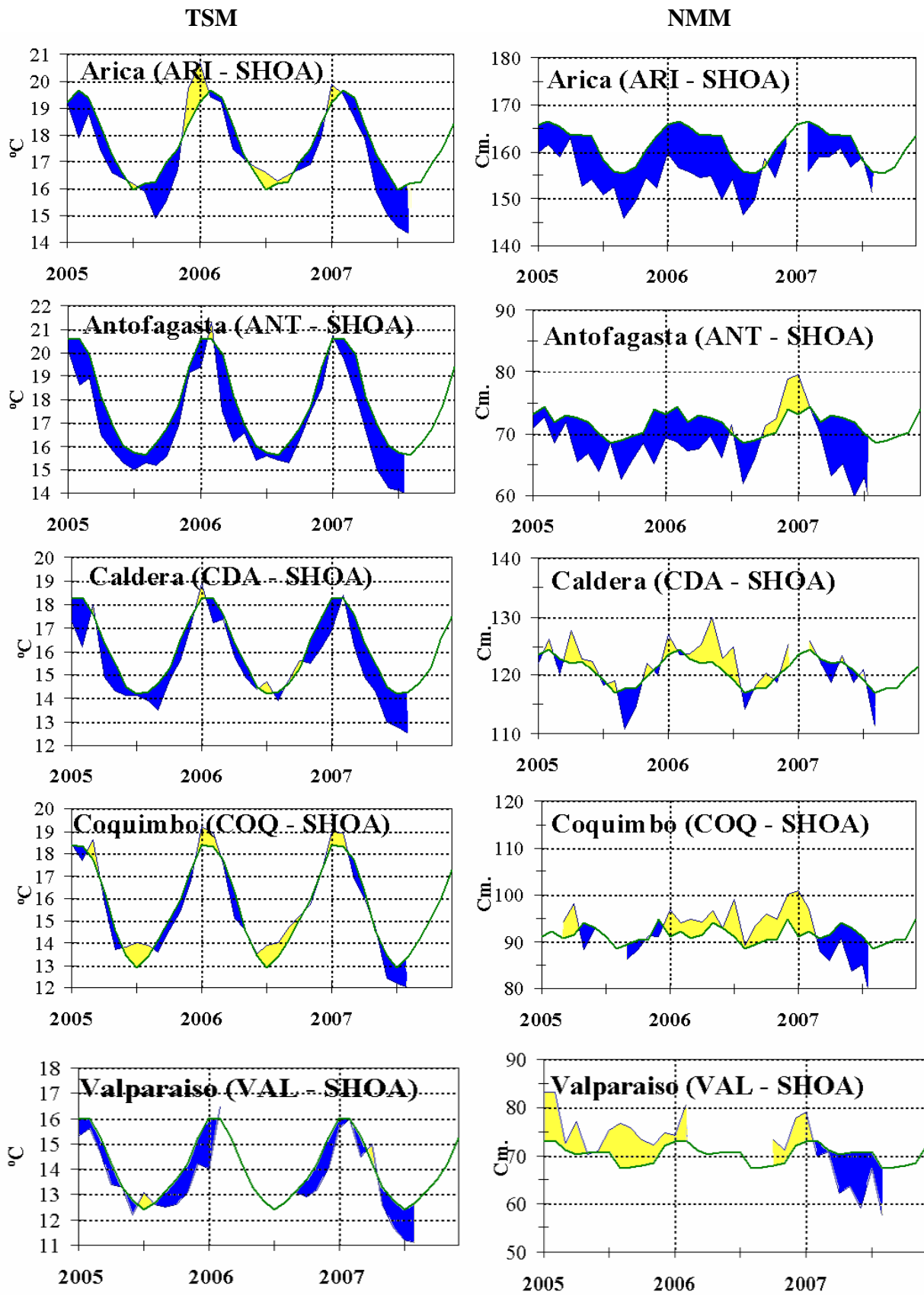


Figure 8b.- Monthly means of the SST (°C) and MSL (cm) in five stations of the ERFEN region. Green curve indicates historic monthly mean. The location of the stations appears in Figure 1. (Source: SHOA).

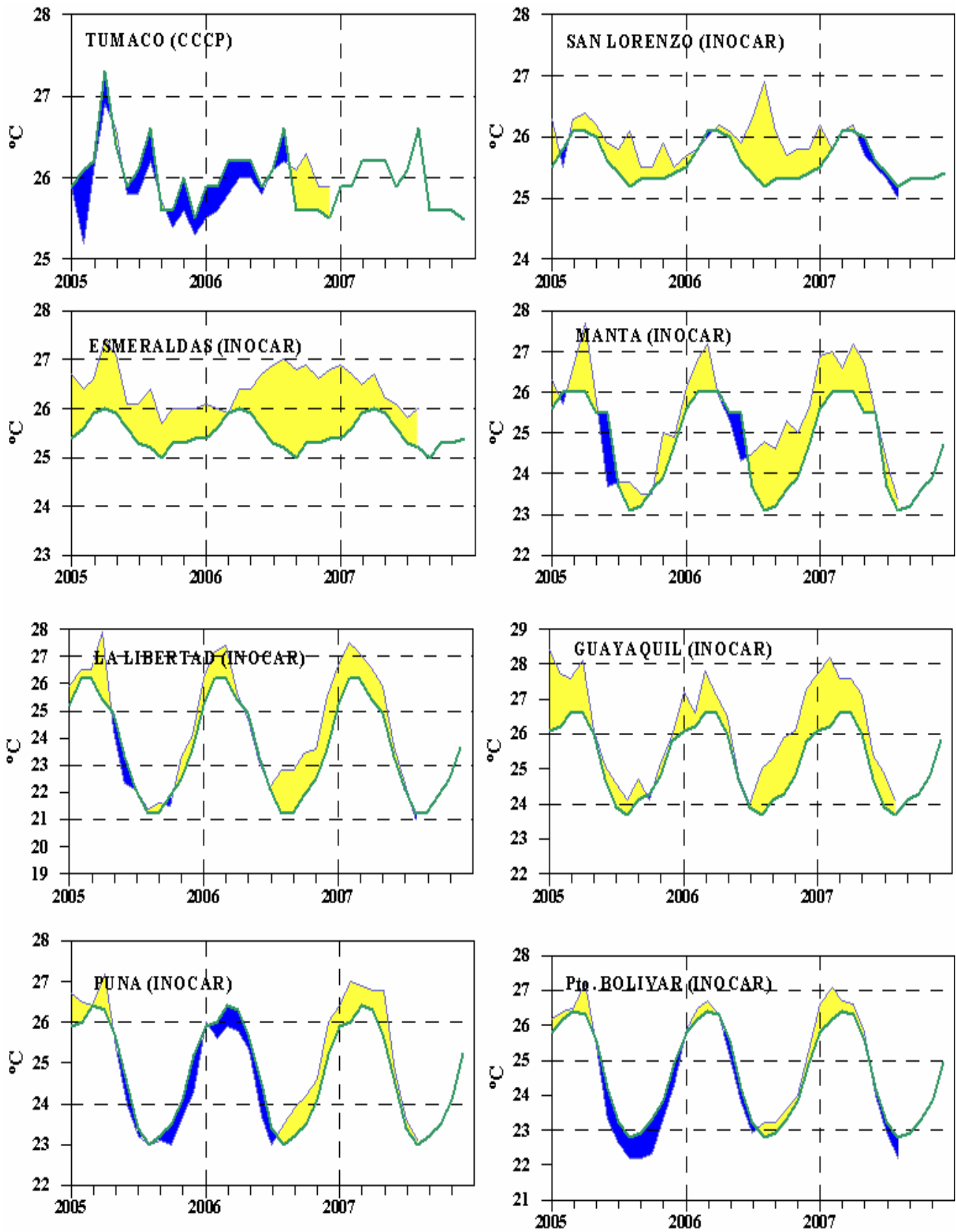


Figure 9a.- Monthly means of the AT (°C) in 8 stations of the ERFEN region. Green curve indicates historic monthly mean. The location of the stations appears in Figure 1. (Sources: CCCP & INOCAR).

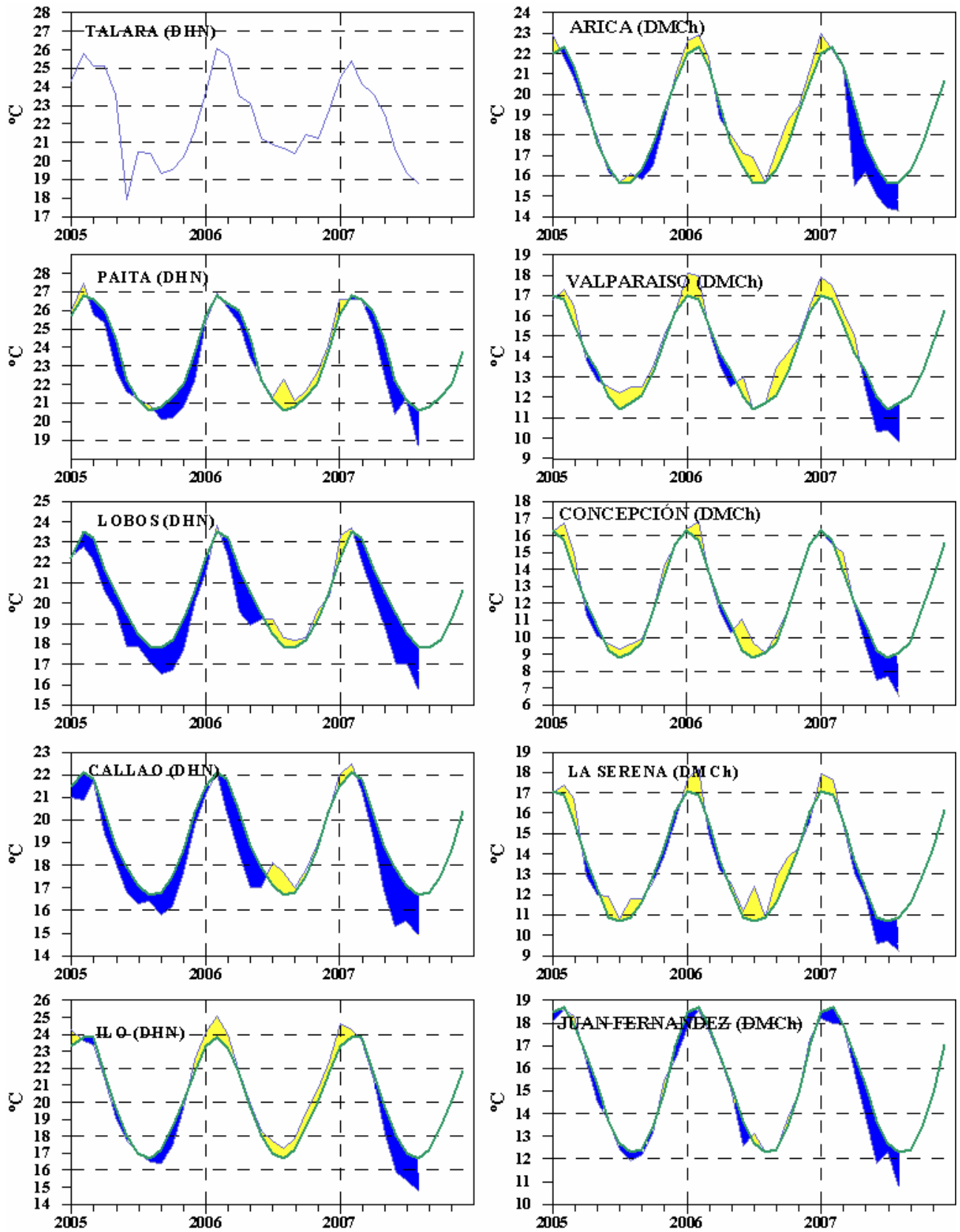


Figure 9b.- Monthly means of the AT (°C) in 10 stations of the ERFEN region. Green curve indicates historic monthly mean. The location of the stations appears in Figure 1. (Sources: DHN & DMCh).

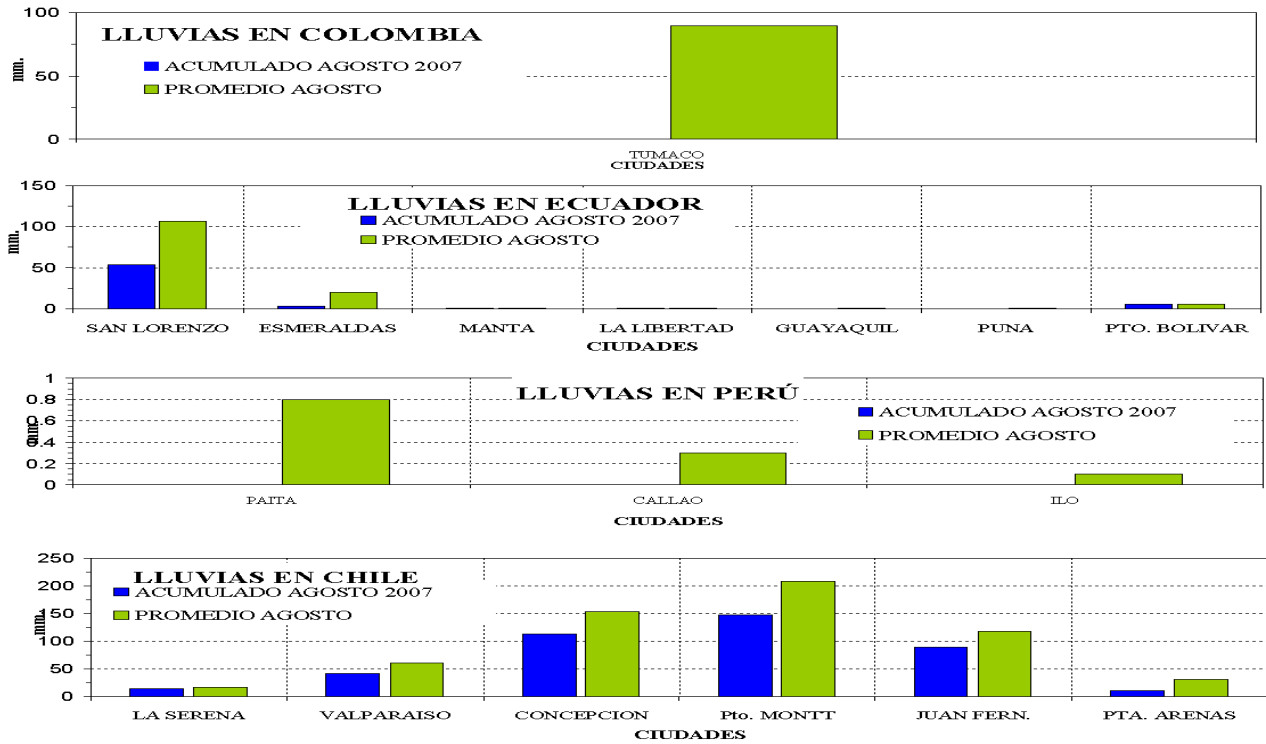
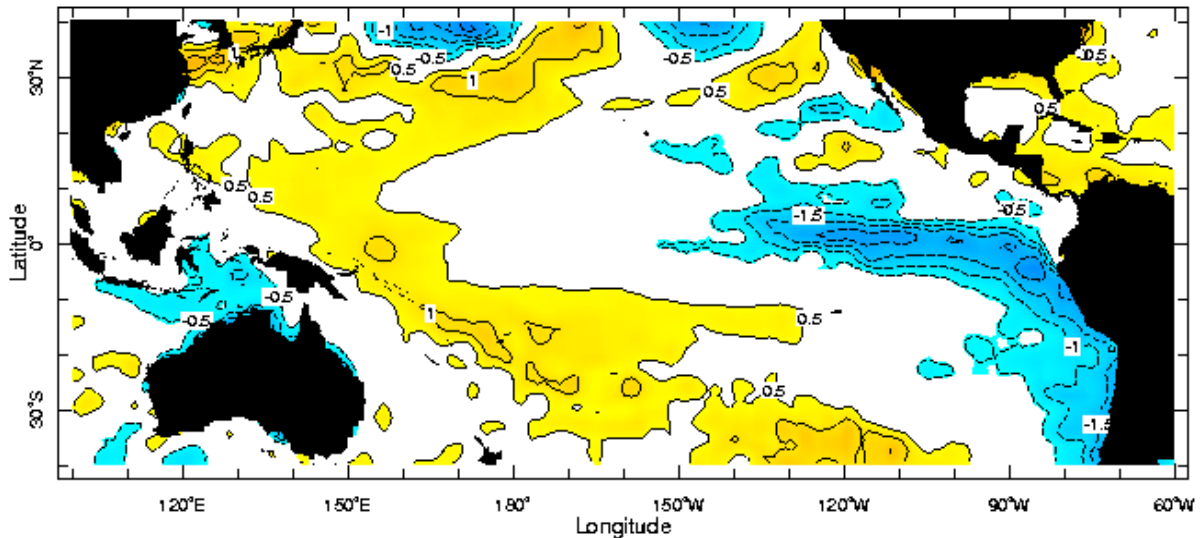


Figure 10.- Rains during august in the coastal stations of Colombia, Ecuador, Peru and Chile. Location of the stations appears in Figure 1.
(Sources: CCCP, INOCAR, DHN & DMCh).

Sea Surface Temperature Anomaly (°C) August 2007



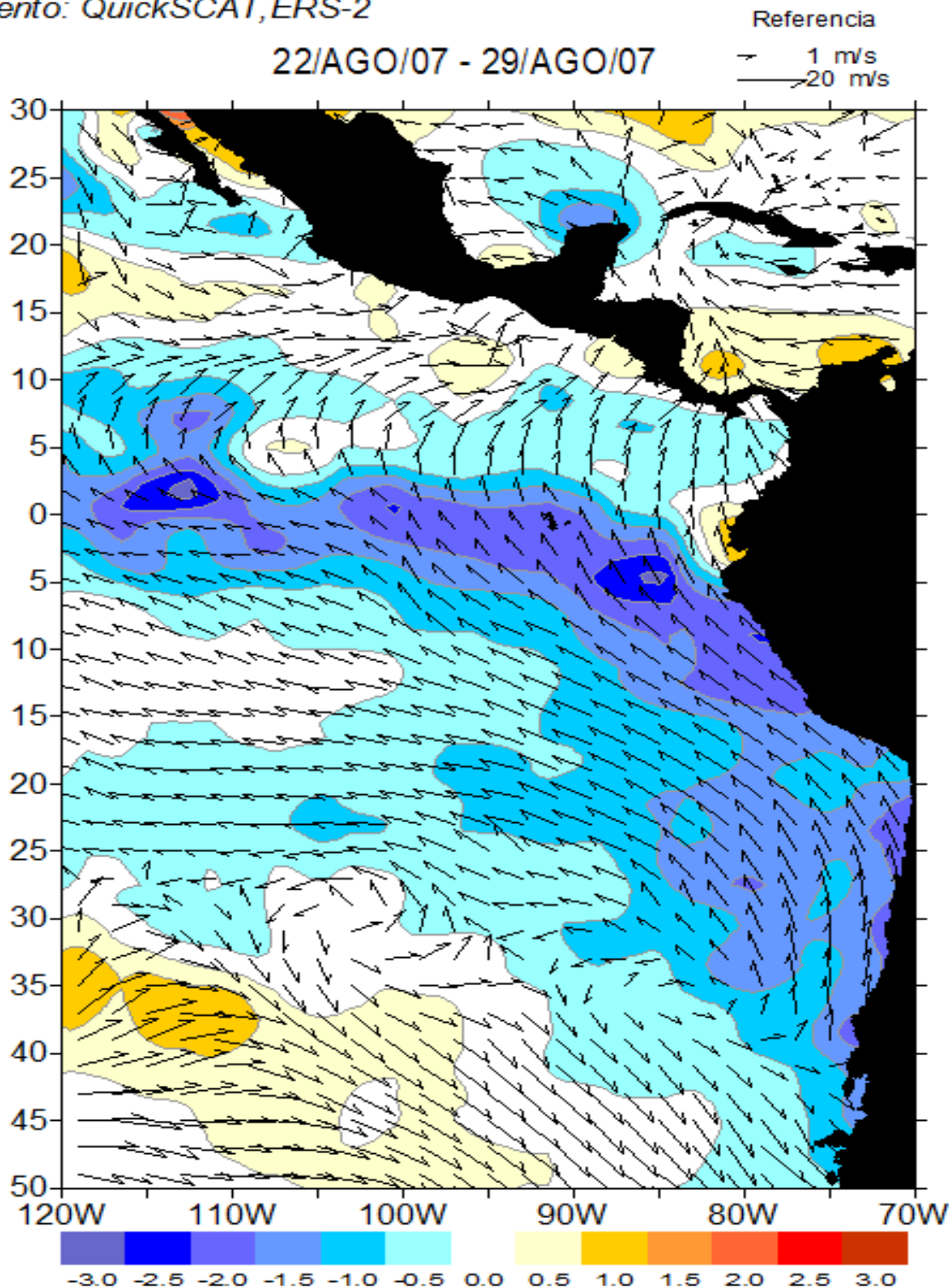
Aug 2007

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

Anomalia 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

EDITED IN THE OCEANOGRAPHIC INSTITUTE OF THE NAVY OF ECUADOR

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