

**SERVICIO NACIONAL DE METEOROLOGIA E HIDROLOGIA
SENAMHI**

SENAMHI



**REPORT ON THE REGIONAL OCEANOGRAPHIC CRUISE
ON BOARD THE BIC JOSE OLAYA BALANDRA**

by **IMARPE**

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REGIONAL OCEANOGRAPHIC CRUISE BIC – JOSE OLAYA BALANDRA

I. INTRODUCTION

This oceanographic research cruise 0810-11 on board the BIC José Olaya Balandra, was carried out from October 23 to November 2, 2008; it covered the northern part of the Peruvian sea, collecting meteorological and oceanographic information in this area, and the atmospheric and ocean conditions in this region of the sea were analyzed. The research covered the area between 5 and 200 nautical miles (nm) offshore, sailing from Callao and starting at 09 ° to 5 ° S (Chimbote, to Paita).

The cruise organized by IMARPE is part of the ENFEN program and of the regional southeastern Pacific Ocean cruise, attended by participants from South American countries like Colombia, Ecuador, Peru and Chile, who made similar cruises, in order to obtain real-time information and analysis of the South Pacific ocean-atmospheric conditions.

II. OBJETIVES

The oceanographic cruise met the following objectives:

1. Assess weather conditions in the northern Peruvian sea.
2. Collect meteorological and oceanographic information in real time.
3. Evaluate the behavior of sea temperature (to determine warm events and / or cold events).

III. MATERIALS AND METHODOLOGY

MATERIALS AND EQUIPMENT

- Rosette (equipped with CTD and oxygen sensor)
- Niskin Bottles
- Standard Phytoplankton Net (75 micron mesh aperture).
- Standard Zooplankton Net (300 micron mesh aperture).
- Hensen Net (vertical drag from surface down to 50 m)
- Bongo Net (maximum 300m depth).
- Portasal Guildline Salinometer

- 301 salinity samples

METHODOLOGY

The methodology consisted of working in groups, a multidisciplinary work was carried out, the work was done in 3 shifts: 8 am to 12 m., 12 m. to 4p.m. and 4 to 8 p.m. covering 24 hours. The work was carried out day and night. The work specified below are those developed by Chemical Engineers, Biologists, Fishery, physicists, and oceanographers from IMARPE, the meteorologist from SENAMHI also participated in the sampling:

1. A total of 113 stations were checked, from which 49 were surface stations and 34 were hydrographic stations..

2. In order to elaborate the study on the sea surface layer, data on temperature, salinity, oxygen, nutrients, "a" chlorophyll , CO₂, phytoplankton and zooplankton were obtained (it was done by the Chemical Engineers) also, hourly data of temperature , atmospheric pressure, wind speed and direction and relative humidity were registered (carried out by the meteorologist)

3. The study of thermal and haline vertical structure based on the launch of the Rosetta, which is equipped with CTD and oxygen sensor, registered up to a maximum of 1000 m deep and up to 200 nautical miles (nm) off the coast.

4. Niskin bottles were launched in all hydrographic stations to a maximum depth of 500 m and standard depths in the 03 hydrographic profiles up to 200 nautical miles off Chimbote, Paita and Punta Falsa and in the Chicama profile up to 120 nautical miles.

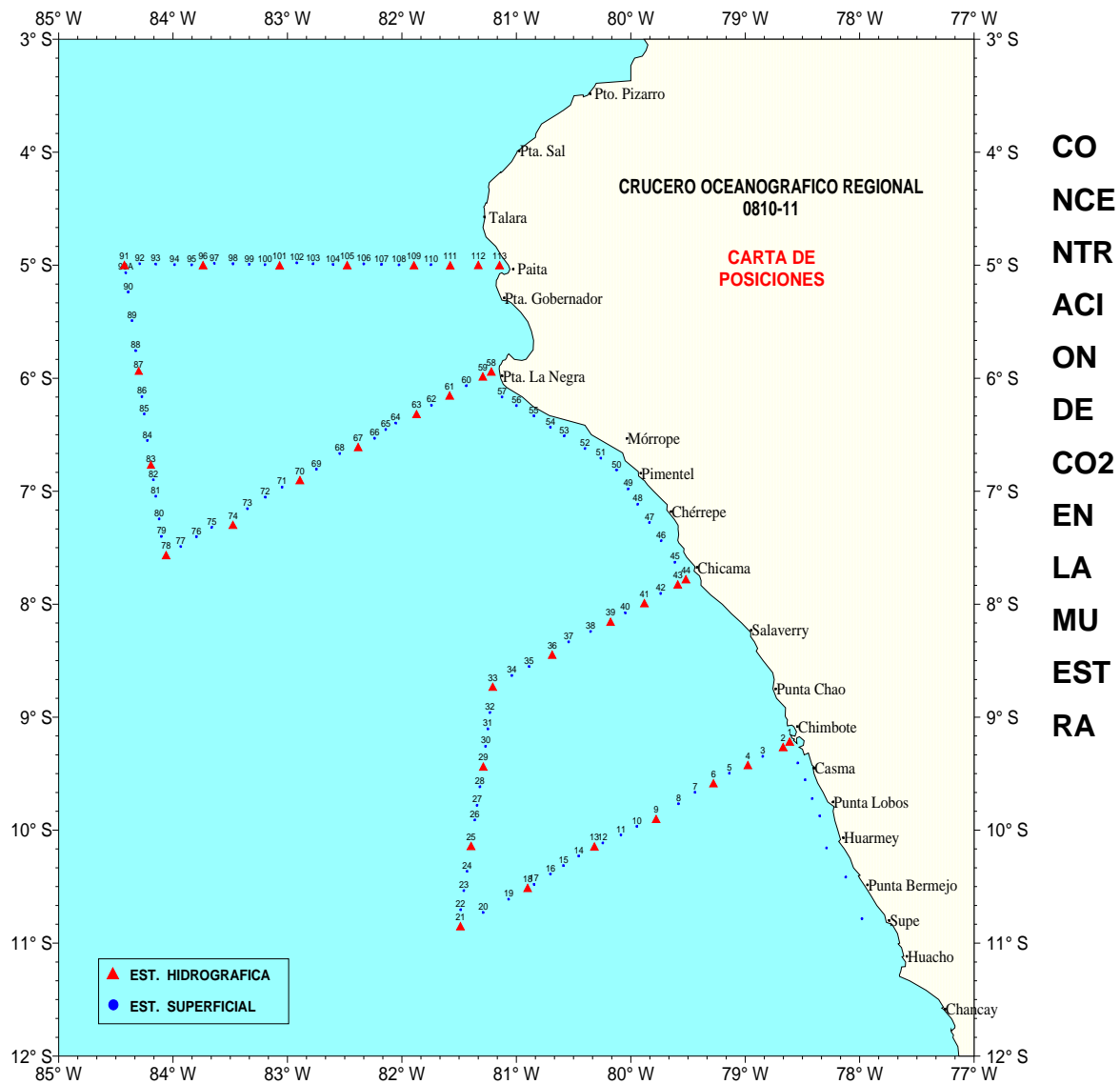
2. Samples of surface phytoplankton and zooplankton were collected using standard phytoplankton net (75 microns mesh aperture) and a standard zooplankton net (300 micron mesh aperture), also some launches were carried out using the Hensen net (vertical drag from the surface to 50 m) at determined spots..

6. Also, 14 vertical lauches were made using the Bongo net down to a máximum depth of 300m, in the established profiles.

CRUISER COURSE

The course of the BIC José Olaya Balandra in this expedition can be observed in the I **Map N°1**. The metoerological data were obtained form the automatic station.. The data registered in the automated stations were collected hourly.

Map N°1: Course of the BIC – JOSE OLAYA during the expedition showing the location of the oceanographic stations.



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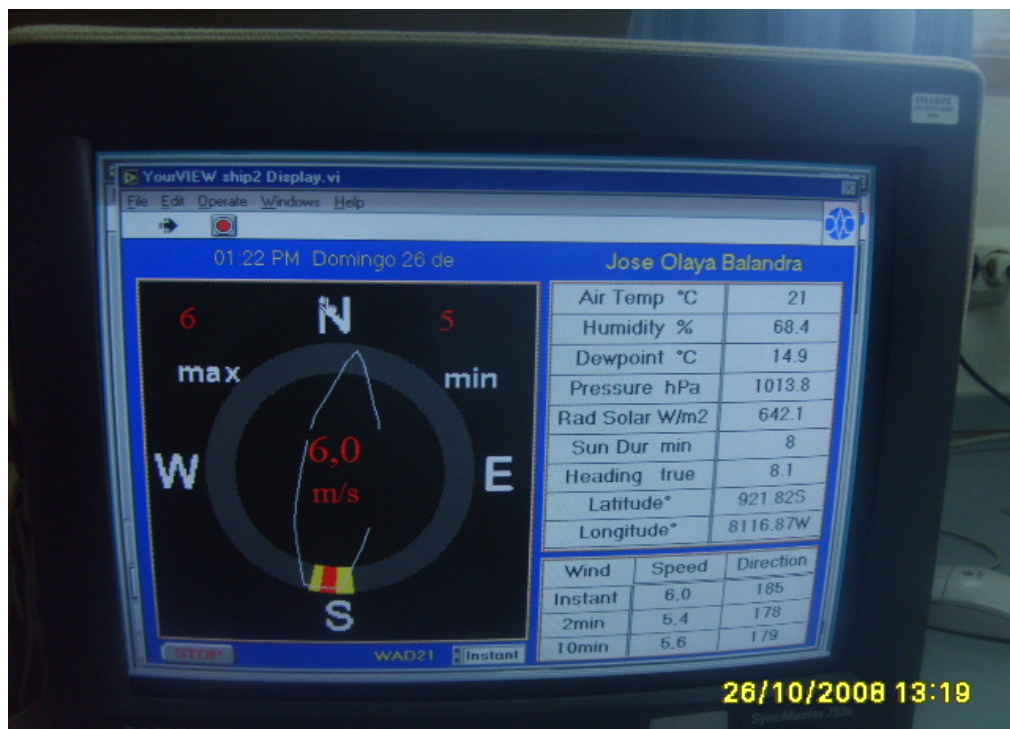


PORTASAL GUILDLINE





RECEPTION OF METEOROLOGICAL INFORMATION



Modern oceanographic instrument - ROSETTA



BONGO NET (máximum depth 300 ms).





BOTELLAS NISKIN



LANZANDO BOTELLAS NISKIN



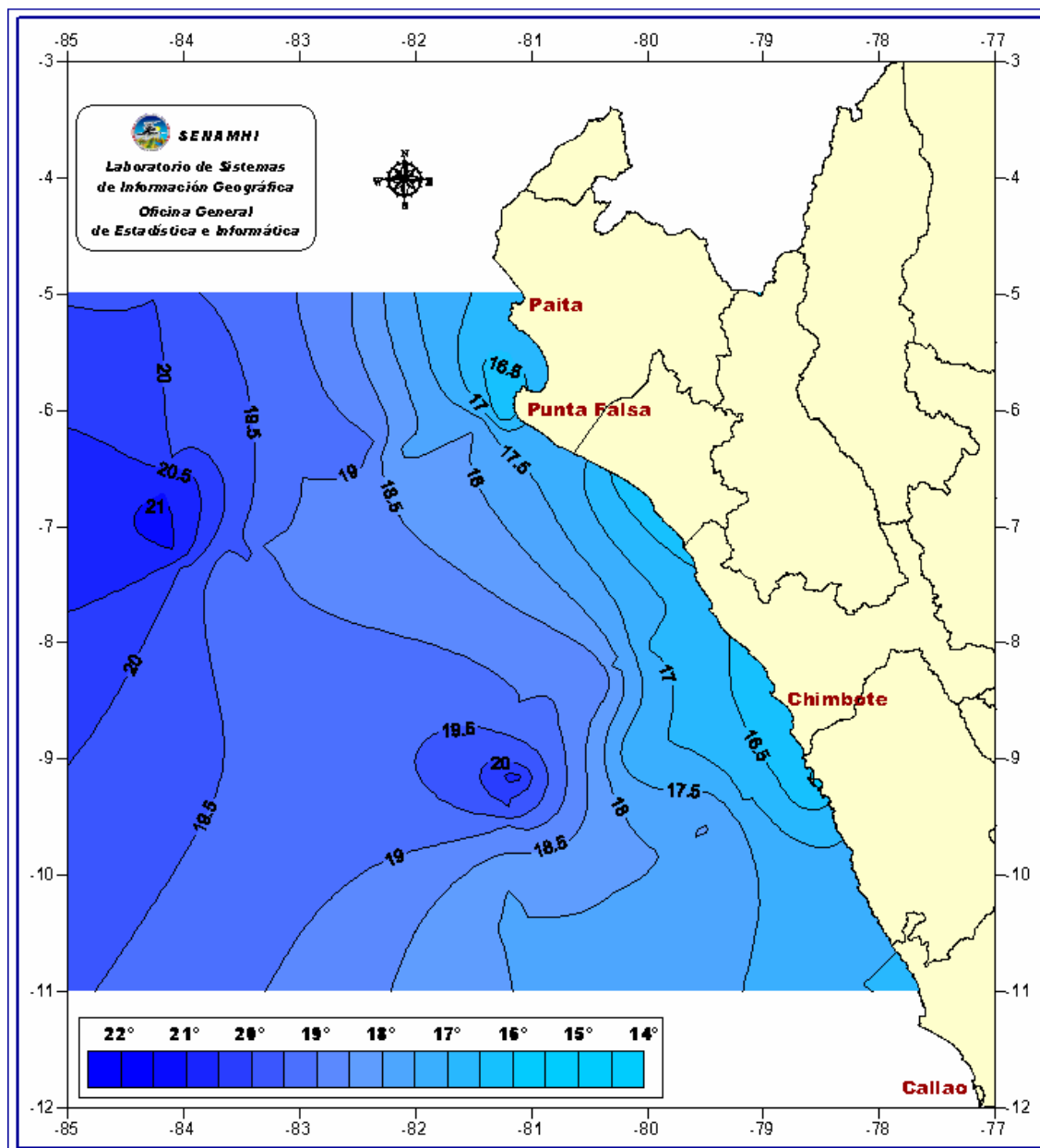
LANZAMIENTO DE LA ROSETA CON CTD (hasta 1000 m. de profundidad)



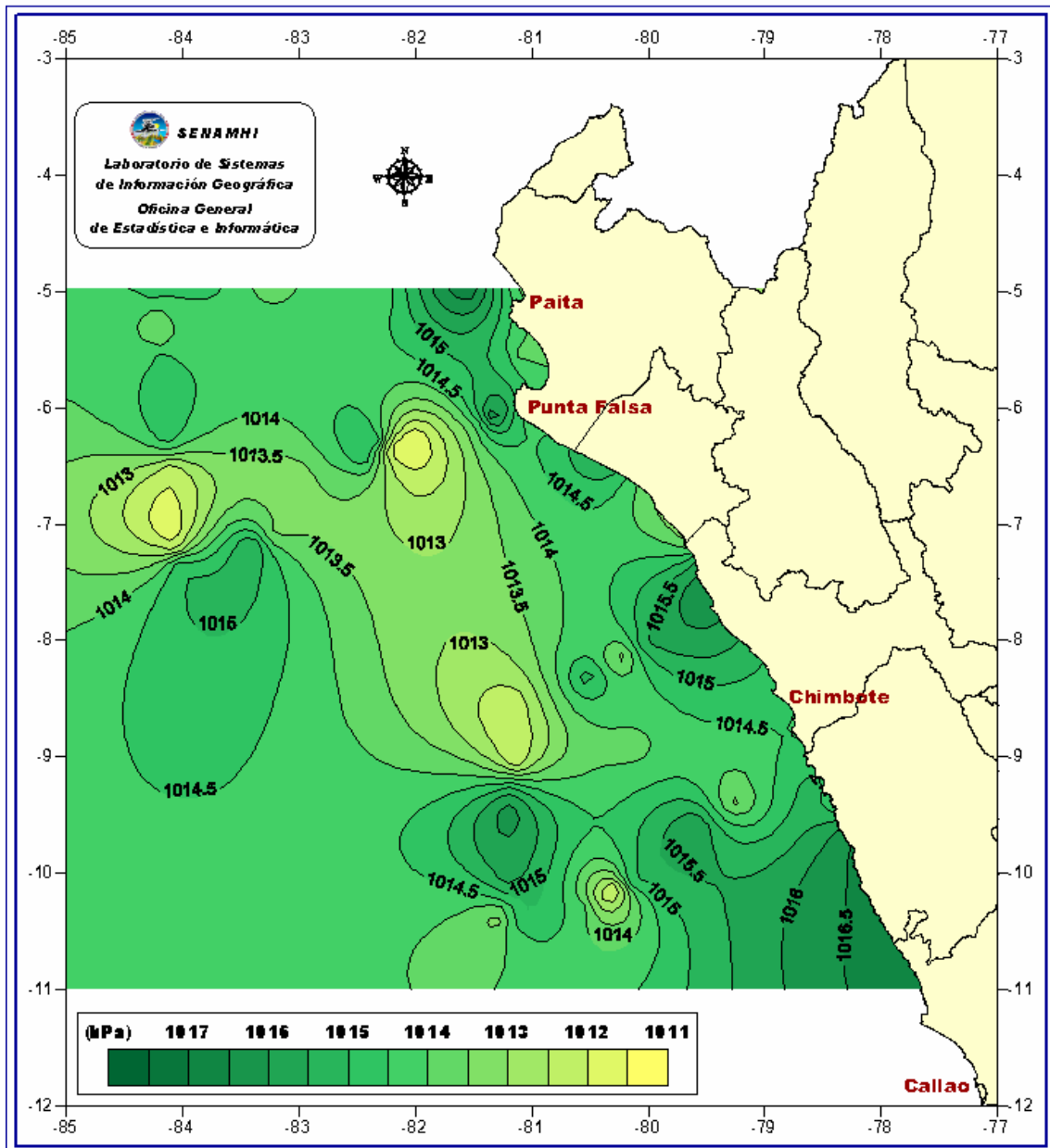
ESPECIALISTAS EN EL AREA

IV. RESULTADOS

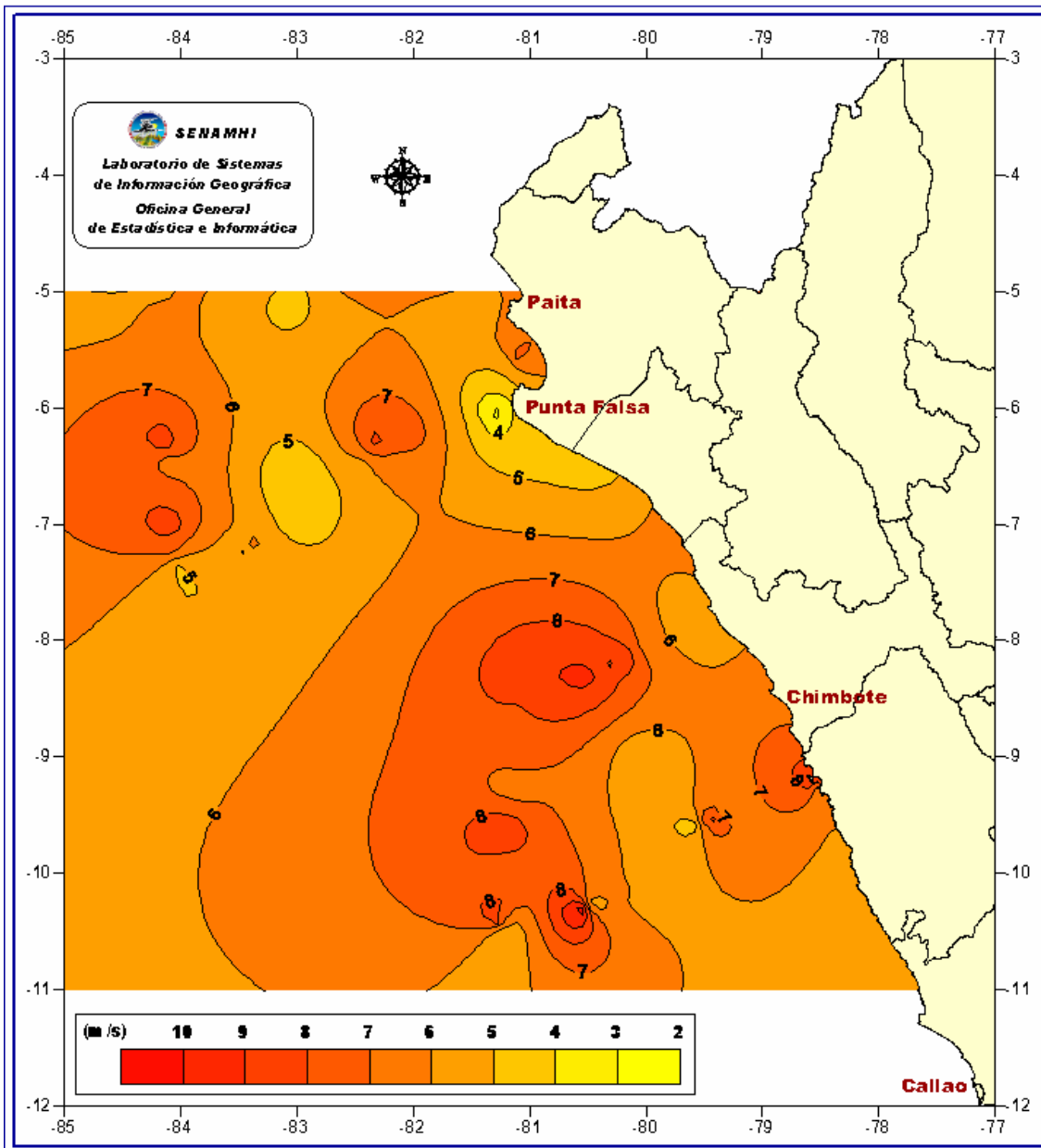
Distribución Espacial de la Temperatura del Aire (°C)



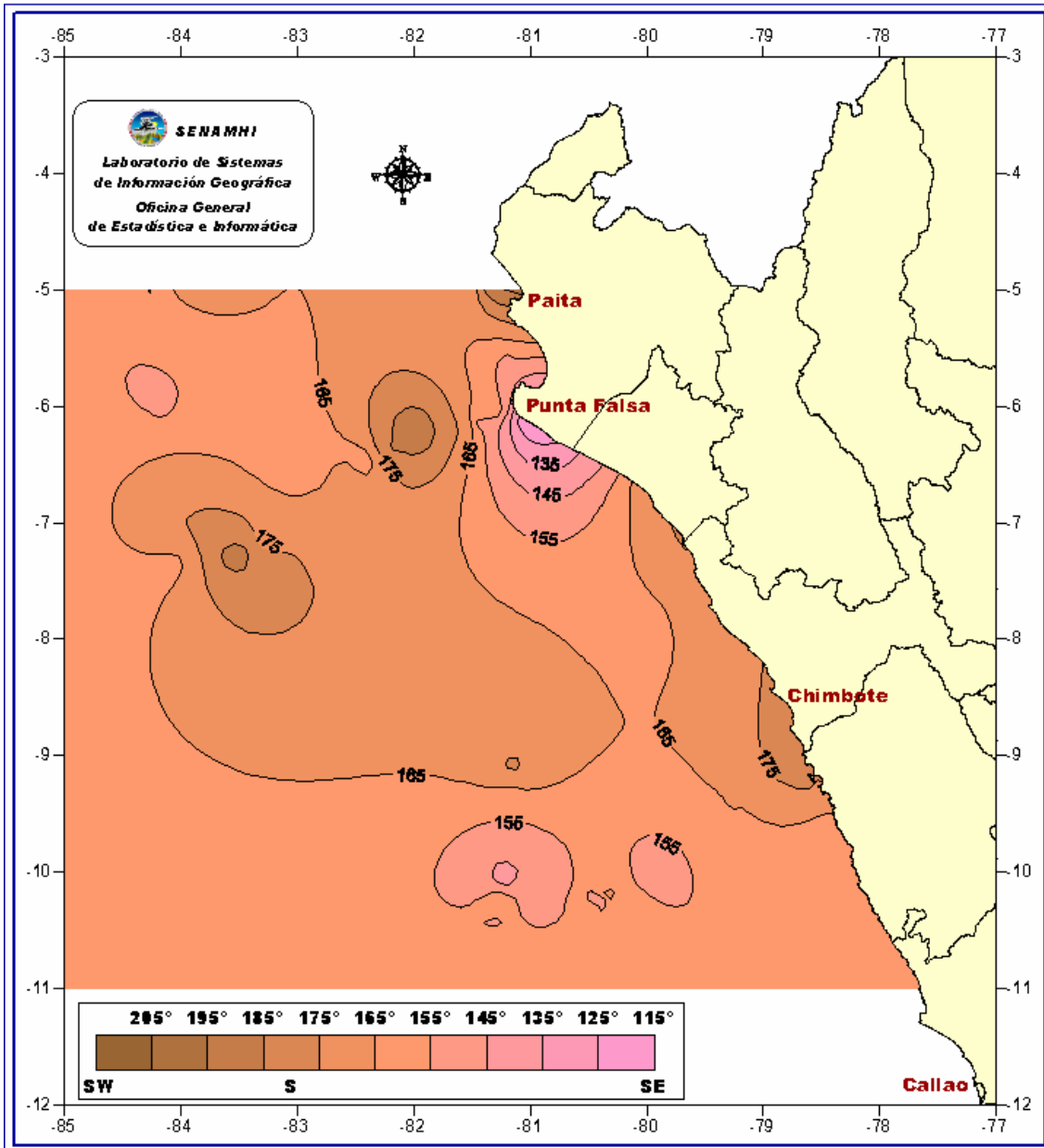
Distribución Espacial de la Presión (hPa)



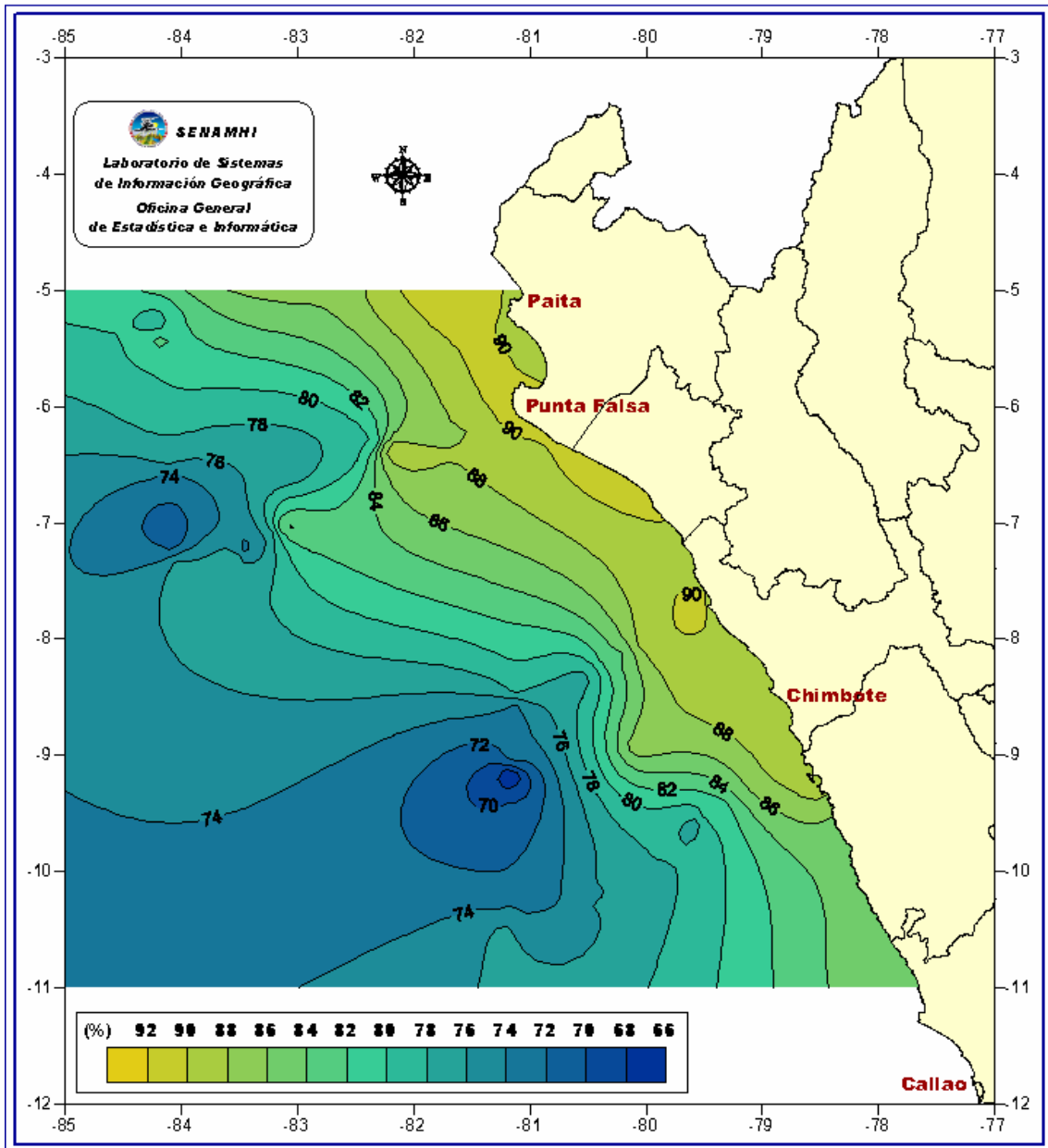
Distribución Espacial de la Velocidad del Viento (m/s)



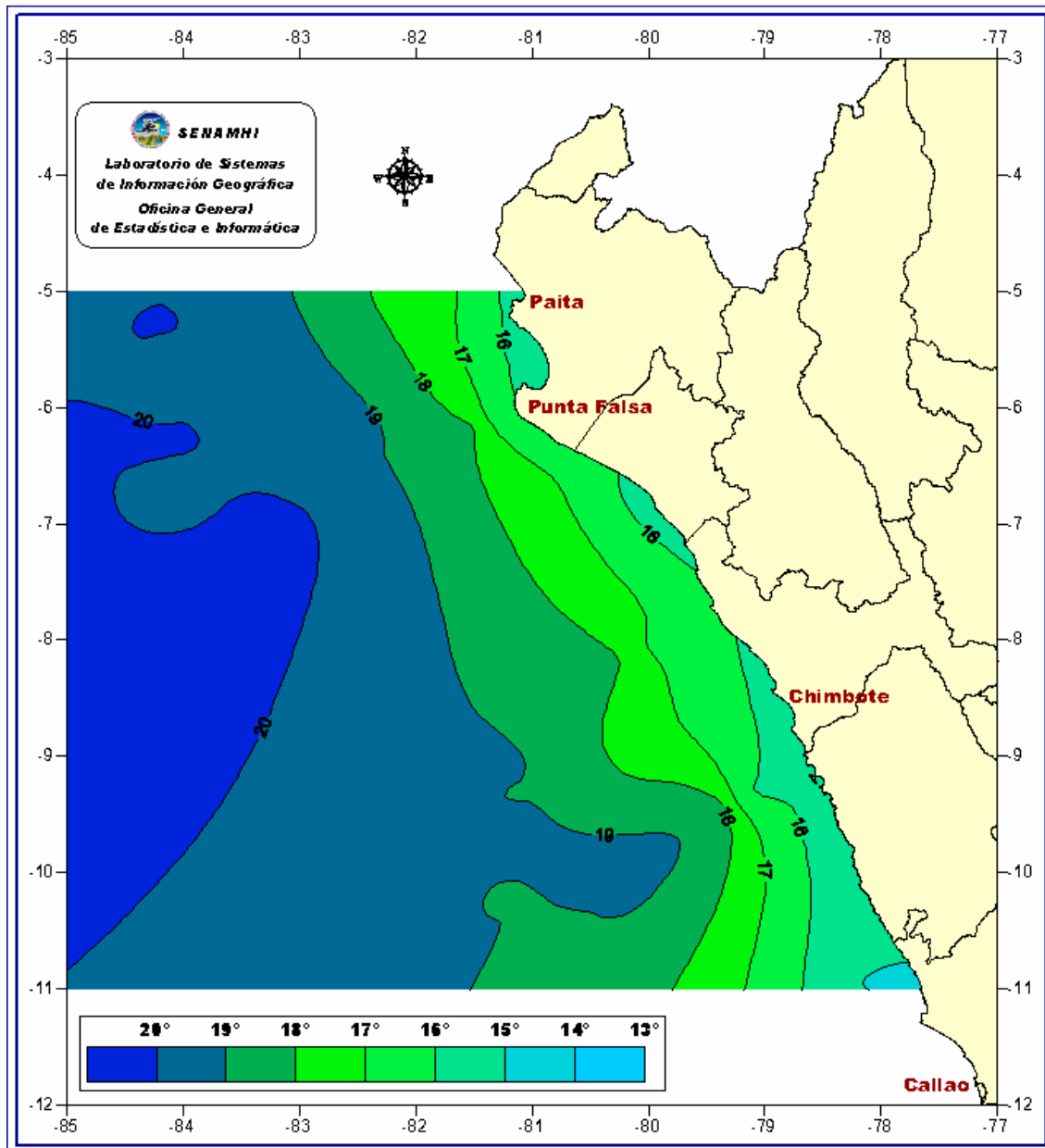
Distribución Espacial de la Dirección del Viento (°)



Distribución Espacial de la Humedad Relativa (%)



Distribución Espacial de la Temperatura del Agua (°C)



V. CONCLUSIONS

At meteorological level:

1. Low air temperature values were registered (16.5°C) in areas close to the coastline; while offshore, over 82°W , air temperature reached values over 20°C , at 84.5°W temperature reached 21°C . Also, in the northern part of the Peruvian sea a higher gradient of the isotherms was observed associated with a mixture of waters with different characteristics in this region.
2. Concerning atmospheric pressure, it showed values of 1014.5 to 1015.5 hPa closet o the coast, while at s 81°W offshore, two high pressure nucleus A1 and A2 were observed with values of 1015 hPa, at 7.5°South and 83.5°W and the other at 9.5°South and 81°W . At synoptic level, the South Pacific anticyclone moved towards the south.
3. The strongest winds occurred offshore with values from 7 to 8 m/s starting at 81°W , which is related to the isobars, that present a strong gradient in this area. Off Chimbote and Casma a nucleus of 8 m/s and off Punta Falsa of 4 m/s were observed, the speed decreased as we approached northward. Also, where strong gradients were observed, higher wind speed values were registered
4. The winds showed components form the south and southeast, associated with trade winds.
5. Concerning relative humidity, there is more humidity in the coastline (90%), it decreased offshore with values of 74% at 84°W and 7°S . and a nucleus of 70% at 81°W and 8°S .

At oceanographic level:

1. The isotherm of 16 °C prevails in the coastline, and as we went offshore sea temperature (SST) increased gradually, with 19 ° C between 80 and 82 ° W and it reached a maximum value of 20 ° C between 83 ° and 85 ° W offshore. (200 nautical miles); while to the South the isotherm reached 19°C close to the coastline.

VI. RECOMMENDATIONS

It is recommended, to continue participating in this kind of regional cruises, in order to contribute with the Meteorological and Oceanographic component. Also, in the collection of data in real time.