

Coast Bordeaux 2017

On the local El Niño observed in Peru
after the monster El Niño in 2017

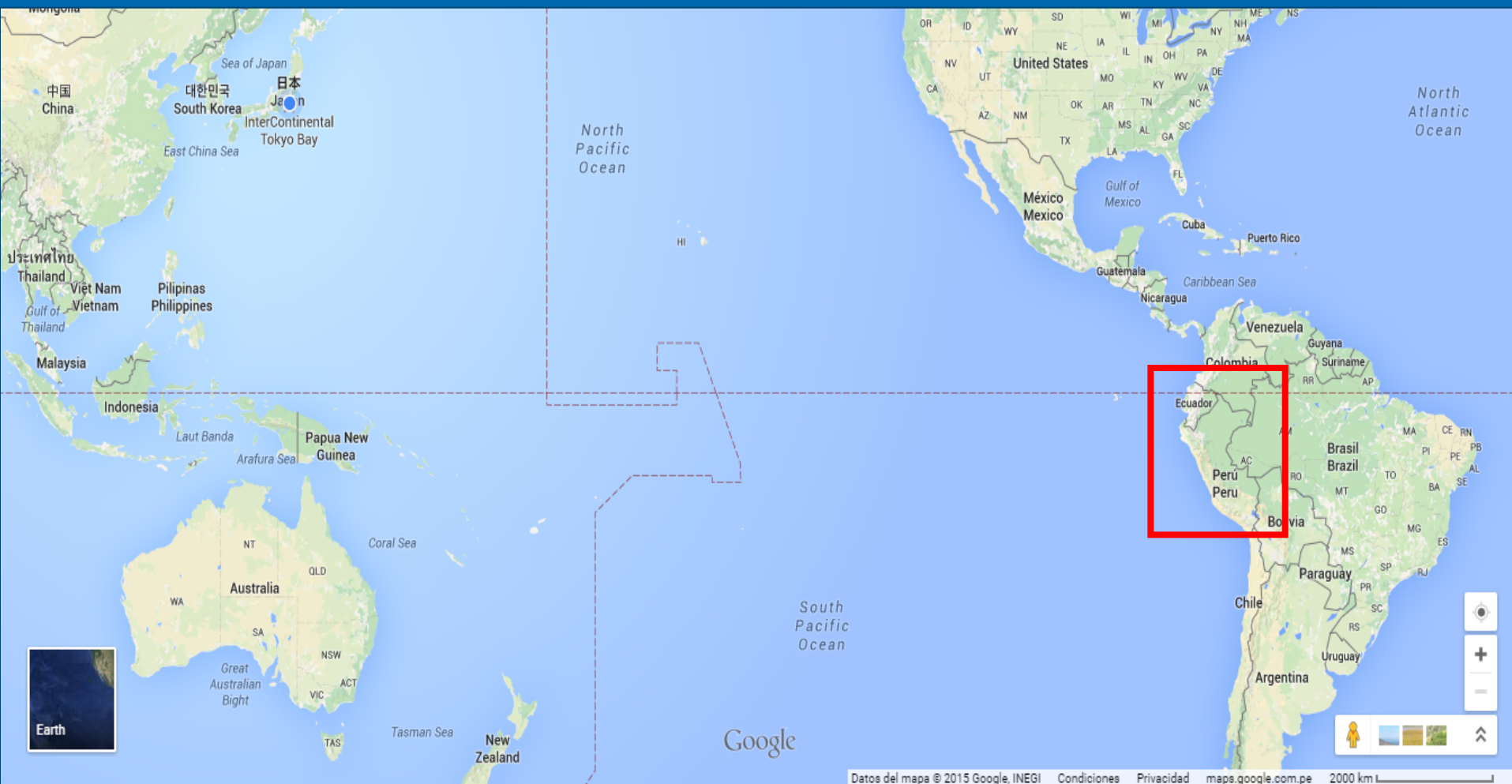
Masato KOBAYASHI*, Luis A. ICOCHEA**
and Gandy M. ROSALES***

* Yokohama College of Commerce, Japan

** National Agrarian University of La Molina, Peru

*** Tokyo University of Marine Science and Technology, Japan

November 8, 2017



Peru

$0^{\circ} \sim 18^{\circ}\text{S}$

$69^{\circ}\text{W} \sim 81^{\circ}\text{W}$

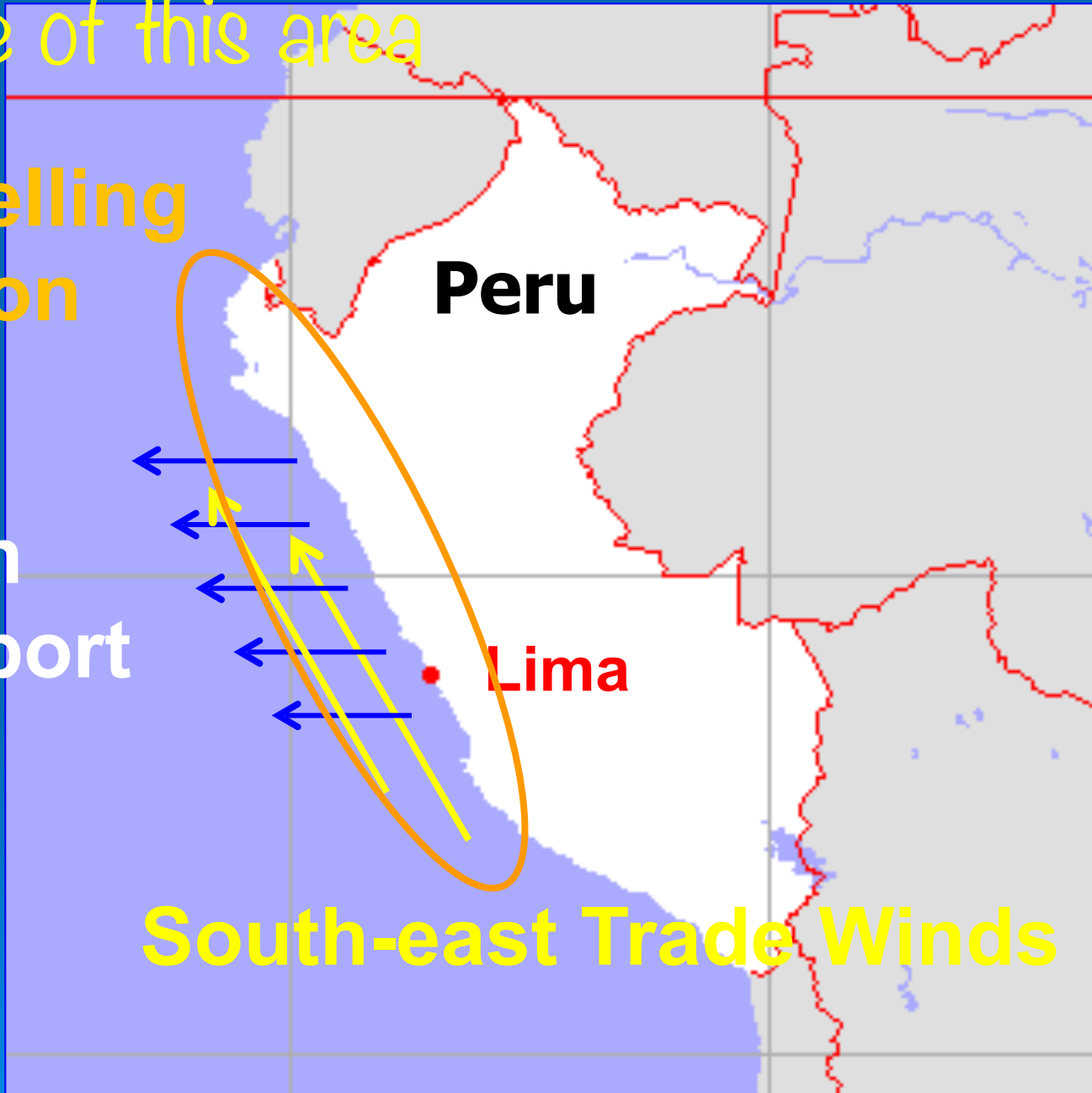


Feature of this area

Upwelling
Region

Ekman
Transport

South-east Trade Winds



What is the local El Niño?

✓ niño: boy

El Niño: infant Jesus Christ (special boy)

✓ Around the Christmas in December, the warm sea water came to the coast of Peru from the north Equatorial region. Fishermen called this current “Corriente del Niño” (Current of Niño).

✓ As this current gave people some gifts, they called this the infant Jesus Christ.

What are gifts from Jesus Christ?

- ✓ For fishermen

They could get tuna, bonito and dolphinfish instead of anchovy.

- ✓ For farmers

The rain growing plants came down.

- ✓ But, recently

El Niño became the Hoodoo who brought many disaster.







The purpose of our study

- ✓ Focusing on the local El Niño in the coast of Peru, monitoring of the fluctuation of the warm sea water coming from the Equatorial region.

In this symposium

- ✓ As a part of results, the local El Niño occurred after the monster El Niño in 2017 is introduced.

The Monster El Niño occurred
in the period from May 2014
to March 2016.

This event brought many heavy
disasters in Peru.

The background of the slide is a solid blue color. In the bottom right corner, there are several concentric white circles of varying sizes, resembling ripples on water. These ripples are positioned behind the text of the second paragraph.

“RPP Noticias” News in Peru

“Huanchaco in emergency declared for strong tides”

March 23, 2015



The screenshot shows the RPP Noticias website interface. At the top is a red header with the RPP logo and the word "Nacional". Below this is a navigation bar with links for PORTADA, ROTAFONO, POLÍTICA, DEPORTES, ESPECTÁCULOS, PERÚ, MUNDO, and E. Below the navigation bar is a sub-header with "Portada" and "Nacional" tabs. The main headline reads "Huanchaco en emergencia por fuerte oleaje que destruyó malecón". Below the headline is the date and time: "Lunes, 23 de Marzo 2015 | 12:13 pm". The main image shows a beach with debris and a building. A yellow banner at the bottom of the image reads "DECLARAN EN EMERGENCIA EL BALNEARIO DE HUANCHACO". Below the image is the credit line "Créditos: RPP/Rolando Gonzales". At the very bottom is a small text line: "Por unanimidad, Concejo Distrital de Huanchaco declara a balneario en emergencia."

RPP Noticias

Nacional

PORTADA ROTAFONO POLÍTICA DEPORTES ESPECTÁCULOS PERÚ MUNDO E

Portada Nacional

Huanchaco en emergencia por fuerte oleaje que destruyó malecón

Lunes, 23 de Marzo 2015 | 12:13 pm



RPP Noticias

DECLARAN EN EMERGENCIA EL BALNEARIO DE HUANCHACO

Créditos: RPP/Rolando Gonzales

Por unanimidad, Concejo Distrital de Huanchaco declara a balneario en emergencia.

“El Comercio”: El Comercio News in Peru

“Strong tides destroy Malabrigo pier.”

March 26, 2015

WhatsApp: fuerte oleaje | Fuerter vientos: suspender

elcomercio.pe/whatsapp/sucesos/whatsapp-fuerte-oleaje-destruyo-muelle-malabrigo-fotos-noticia-1800277/1

Aplicaciones ENSO R Oceanografia Etiqueta #ClimateDy... international confer... ECOPATH Revistas Cientificas I... otros Cambio Climatico Inicio DIARIOS LOCALES SENAMHI




El Comercio POLÍTICA ECONOMÍA OPINIÓN LIMA PERÚ MUNDO TECNO CIENCIAS GASTRONOMÍA LUCES TV+ DEPORTE **PLAY**

El Comercio WASAP Jueves 26 de marzo del 2015 15:31 | 1 Comentarios

WhatsApp: fuerte oleaje destruyó muelle de Malabrigo [FOTOS]

1 de 9

f t g+



Comparte una
Coca-Cola con tu

Amor

Escritorio 11:10 p. m. 12/08/2015



Before the Monster



Photos in August 2, 2015

“Pisco: increased sea temperature kills scallops”

(*Argopecten purpuratus*)

March 26, 2015



Recibidos (38.364) - licoci x Outlook.com - gandhirq1 x Google Traductor x Pisco: elevada temperatur x Noticias del Peru y del Mu x

www.rpp.com.pe/2015-03-26-pisco-elevada-temperatura-causo-muerte-de-conchas-de-abanico-noticia_781557.html

Aplicaciones ENSO R Oceanografía Etiqueta #ClimateDy... international confer... ECOPATH Revistas Cientificas L... otros Cambio Climatico Inicio DIARIOS LOCALES SENAMHI

Pisco: elevada temperatura causó muerte de conchas de abanico

Jueves, 26 de Marzo 2015 | 10:44 am



Créditos: RPP/Ángel Camacho/Referencial

El incremento de la temperatura del agua de mar frente a Pisco originó la muerte del recurso.

Titulares de Portada

MTC espera terminar hoy limpieza de Carretera Central y reabrir el tránsito

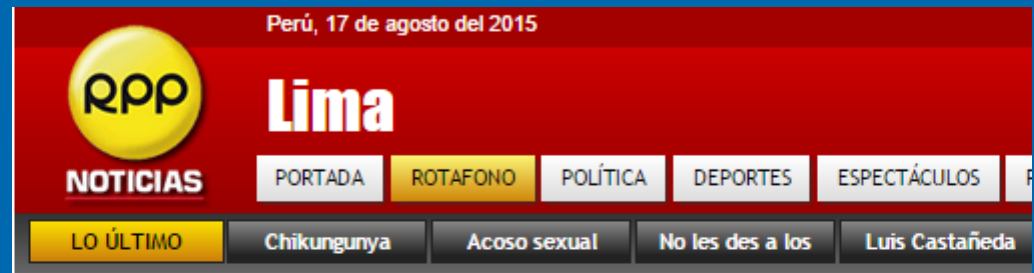


Esperando syndication.twitter.com...

Escritorio 11:36 p. m. 17/08/2015

“Not enough food kills sea birds along peruvian coast.”

June 20, 2015



Recibidos (38.364) - licod... Outlook.com - gandhirq... Google Traductor... Aves encontradas sin vida... Noticias del Peru y del Mu...

www.rpp.com.pe/2015-06-20-aves-encontradas-sin-vida-en-litoral-murieron-por-ahogamiento-noticia_809310.html

Aplicaciones ENSO R Oceanografía Etiqueta #ClimateDy... international confer... ECOPATH Revistas Científicas I... otros Cambio Climático Inicio DIARIOS LOCALES SENAMHI

Aves encontradas sin vida en litoral murieron por ahogamiento

Sábado, 20 de Junio 2015 | 8:02 pm



Créditos: Andina

Según una investigación, las aves y los pescadores se encuentran buscando anchoveta al mismo tiempo, y como consecuencia muchas de ellas se enredan con las redes, ocasionando su muerte por ahogamiento.

ESAN Maestría en Finanzas

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San Isidro Aquí me Quedo PORTOBELLO

Increíble proyecto exclusivo en pleno San Isidro, tres dormitorios, techos altos, ascensor directo y Arq. de Mario Lara
www.portobello.pe

Escritorio 11:29 p. m. 17/08/2015



(In Lambayeque by IMARPE)

“El Comercio”: El Comercio News in Peru

“Huaico in Chosica
(Lima East): Rain and
landslides on streets”

March 23, 2015

Source: EL COMERCIO



El Comercio POLÍTICA ECONOMÍA OPINIÓN LIMA PERÚ MUNDO TECNO CIENCIA

LUNES 23 DE MARZO DEL 2015 | 16:32

Huaico en Chosica: lluvias y deslizamientos inundan las calles

Los aniegos se produjeron a la altura del kilómetro 36 de la Carretera Central. Escolares y vecinos tuvieron que refugiarse

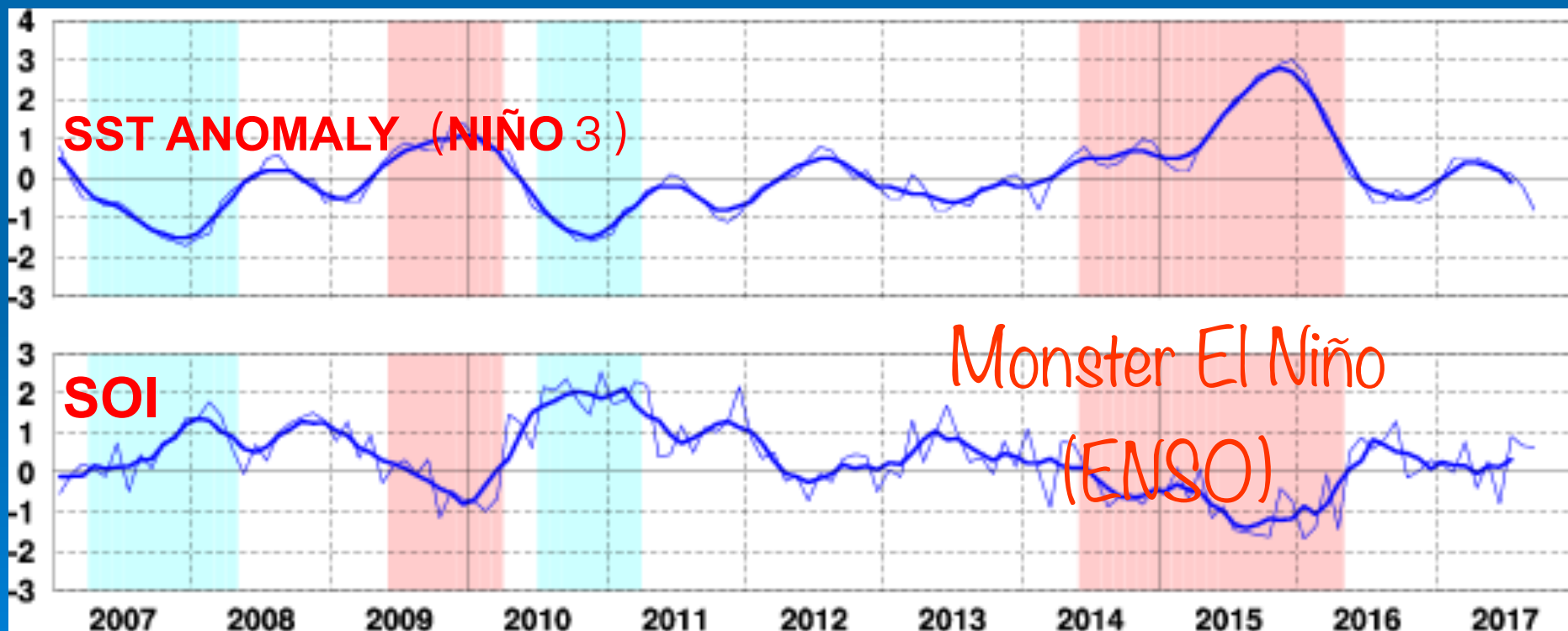
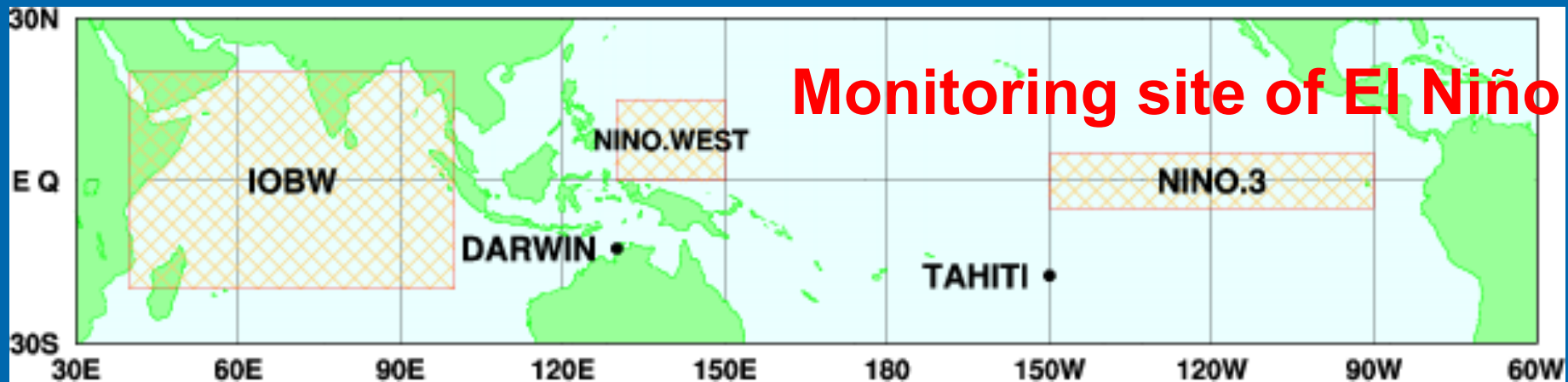




Strong Rainfall in Chulucanas (Piura) **About 7 hours raining**

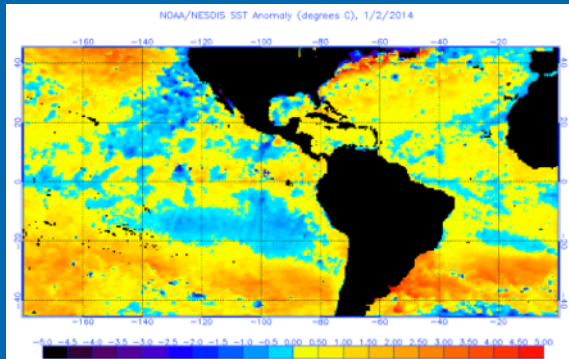
Date: 25/01/2016

Source: EL COMERCIO NEWS

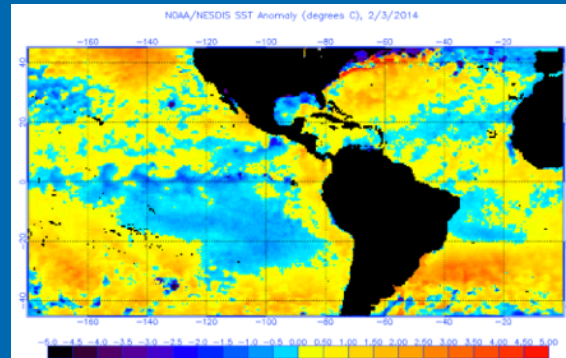


After Japan Meteorological Agency, Nov., 2017

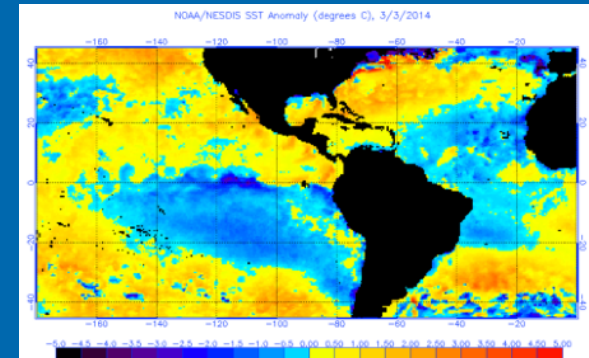
NOAA/NESDIS SST Anomaly 2014



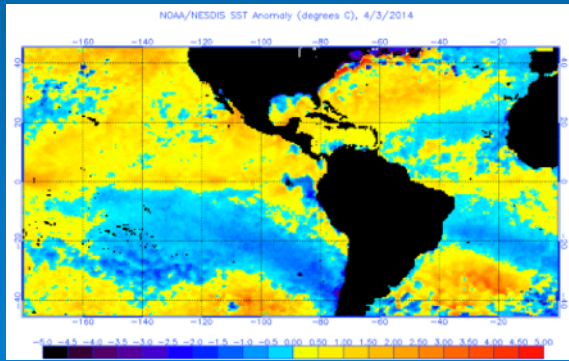
Jan., 2



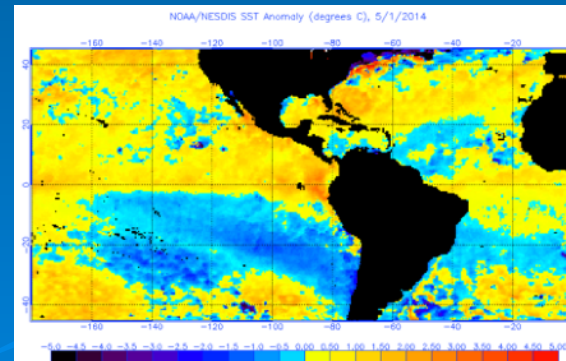
Feb., 3



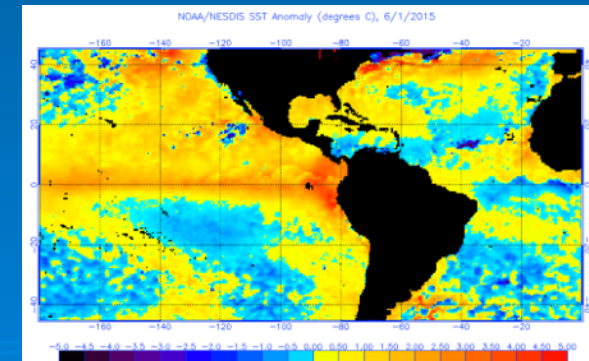
Mar., 3



Apr., 3

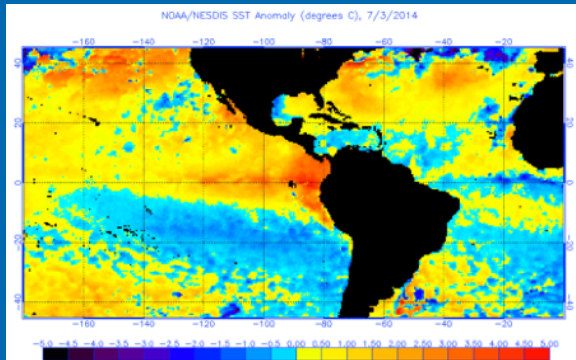


May, 1

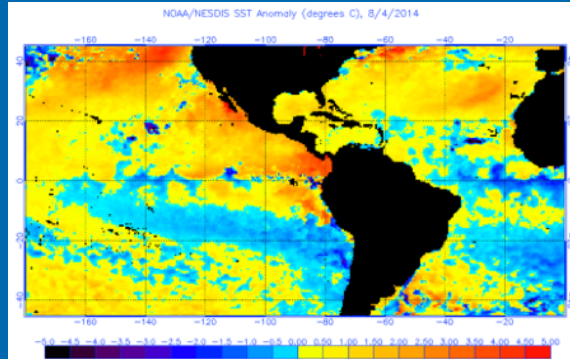


Jun., 2

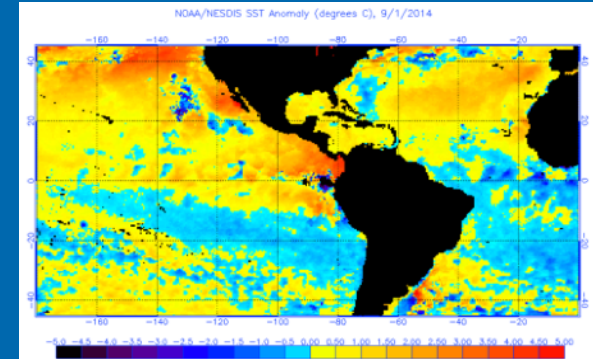
NOAA/NESDIS SST Anomaly 2014



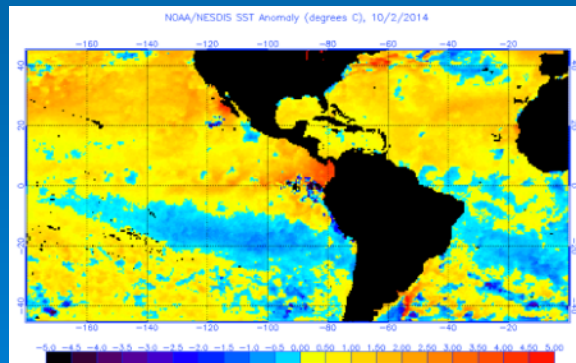
Jul., 3



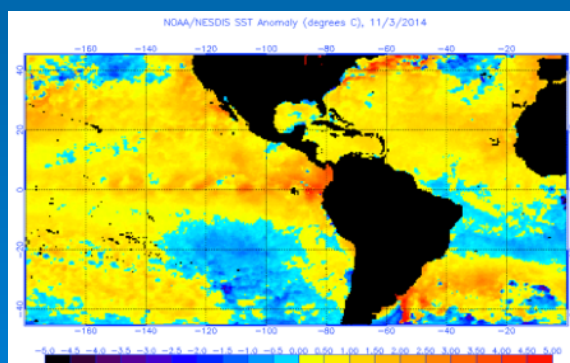
Aug., 4



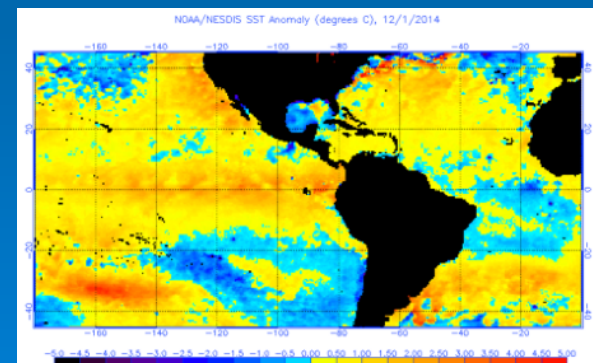
Sep., 1



Oct., 2

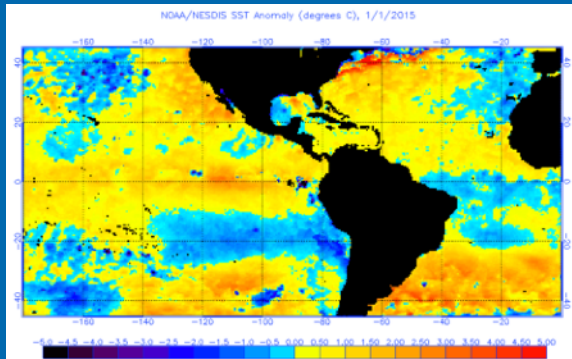


Nov., 3

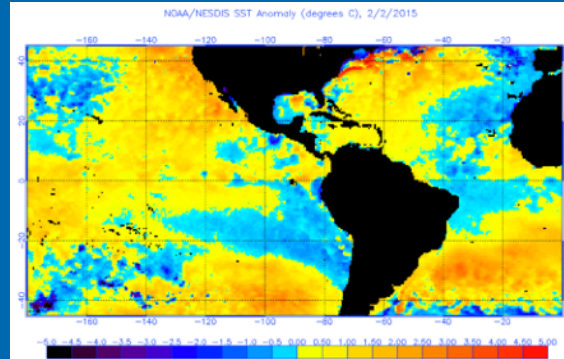


Dec., 1

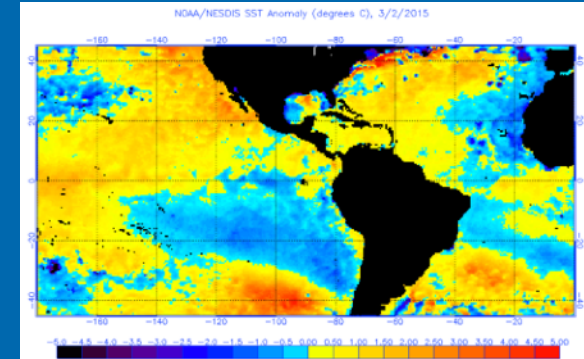
NOAA/NESDIS SST Anomaly 2015



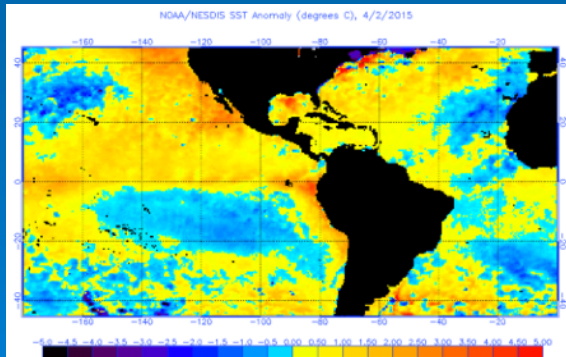
Jan., 1



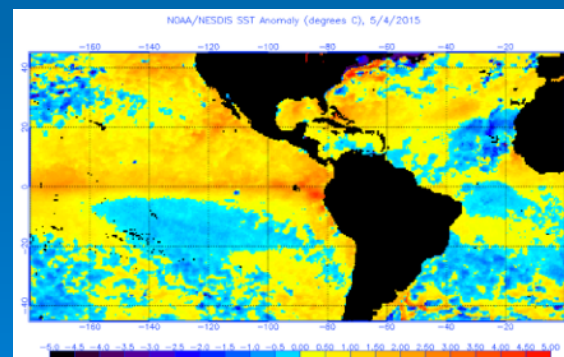
Feb., 2



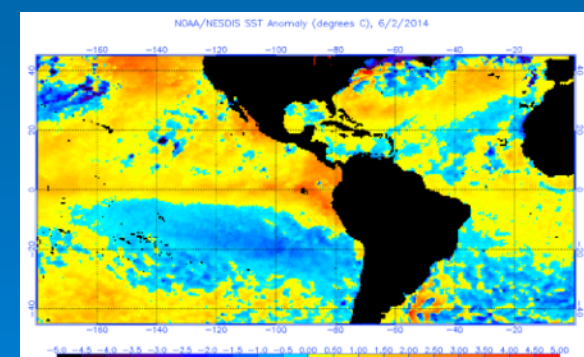
Mar., 2



Apr., 2

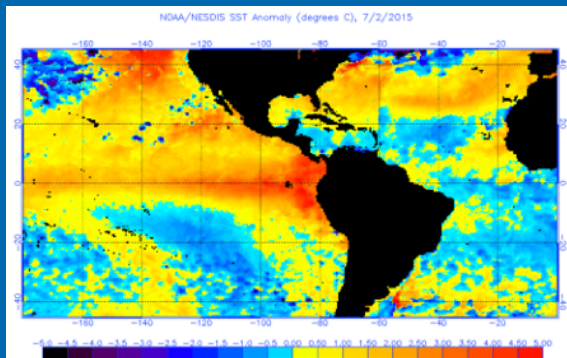


May, 1

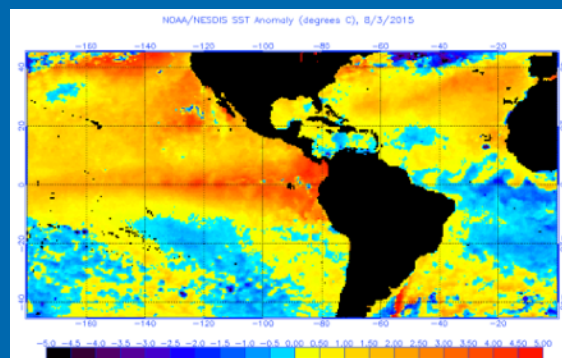


Jun., 2

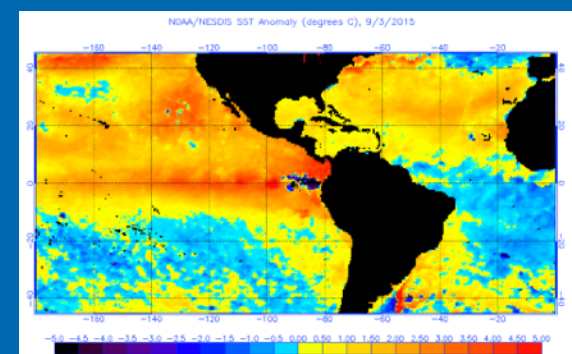
NOAA/NESDIS SST Anomaly 2015



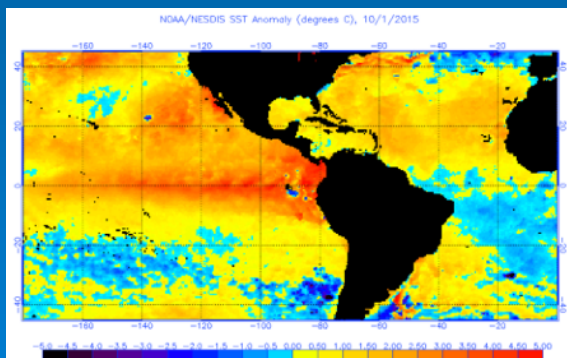
Jul., 2



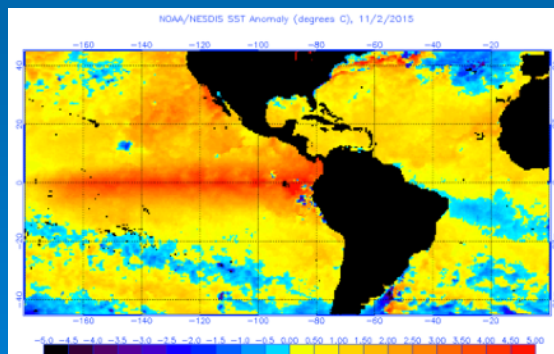
Aug., 3



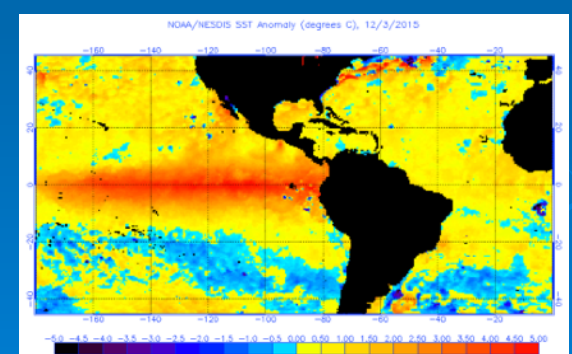
Sep., 3



Oct., 1

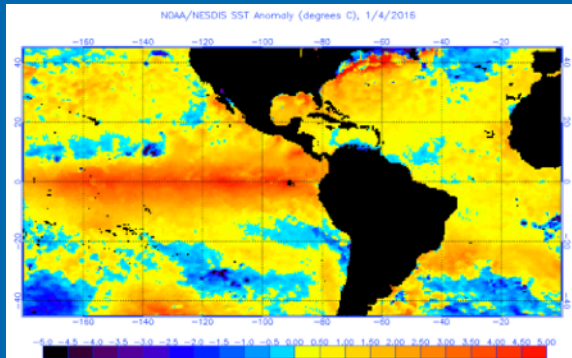


Nov., 2

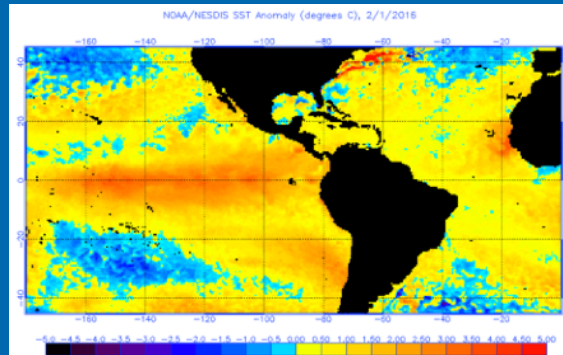


Dec., 3

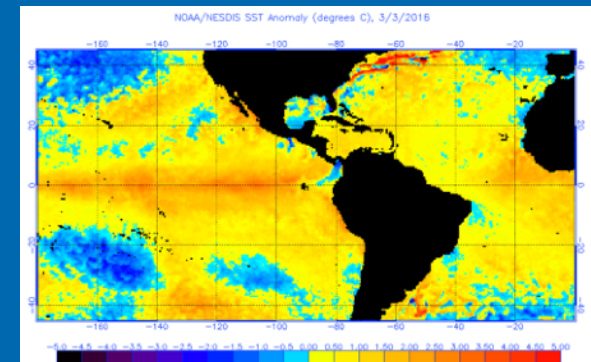
NOAA/NESDIS SST Anomaly 2016



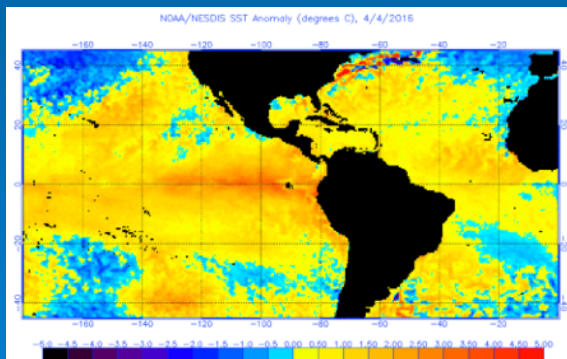
Jan., 4



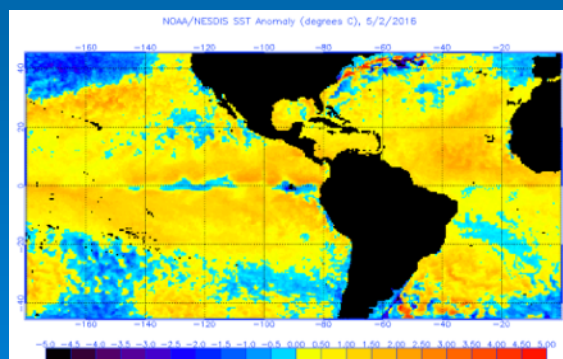
Feb., 1



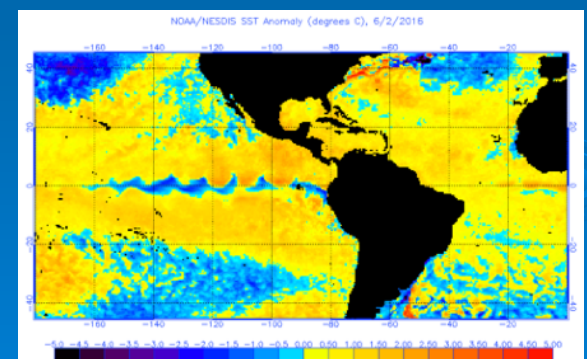
Mar., 3



Apr., 4



May 2



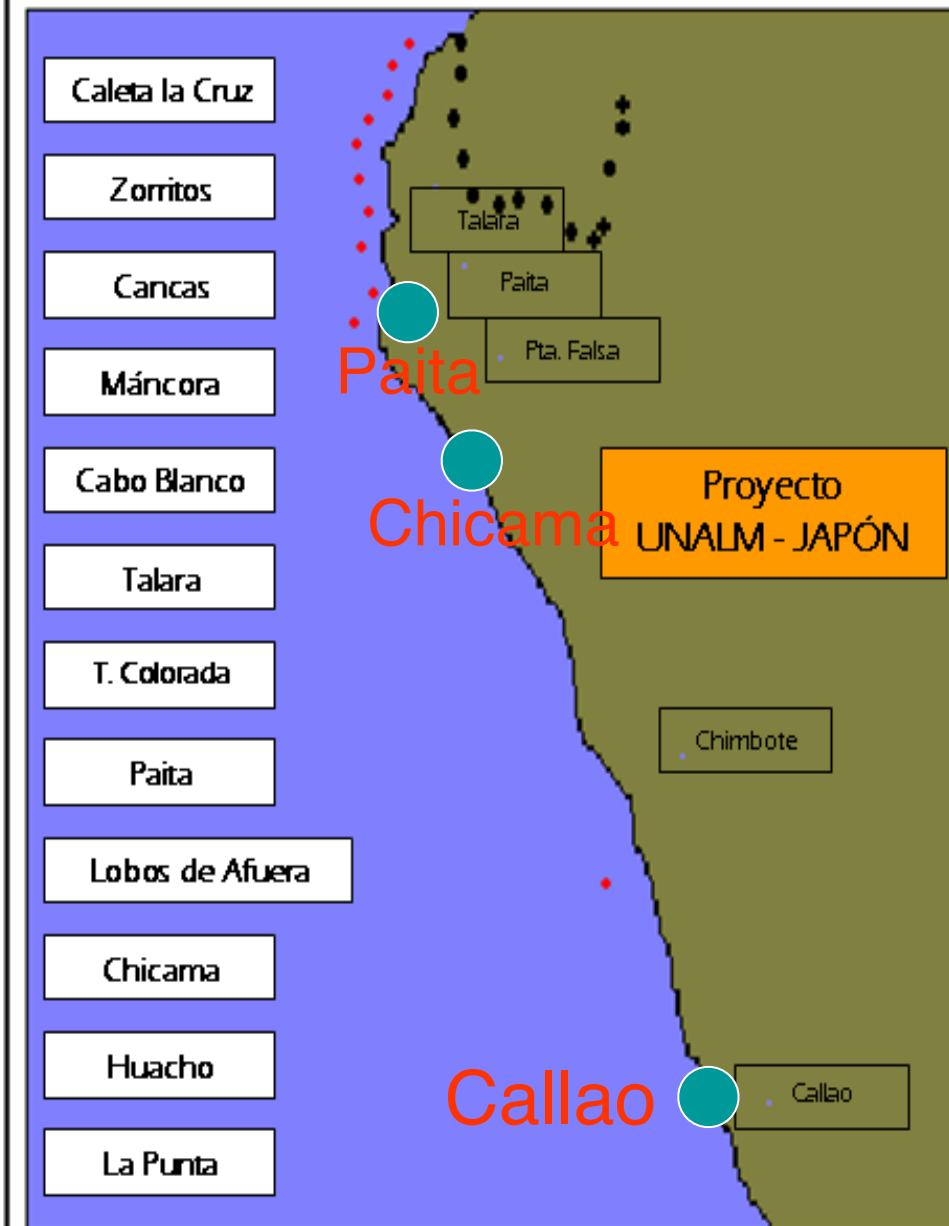
Jun., 2

Observation

- ✓ **Data logger:** HOBO Water Temp Pro v2 (U22-001, 30mm ϕ ×114mm, 42g)
- ✓ **Accuracy:** $\pm 0.2^{\circ}\text{C}$
- ✓ **Measuring site:** 9 sites from Pisco (south of Lima) to Acapulco (close to Ecuador); about 1400km long
- ✓ **Setting place and depth:** setting by divers at the depth of 2m to 6m near the bottom in the top of the pier
- ✓ **Starting date:** from February 21, 2005
- ✓ **Data collection:** about every 6 months
- ✓ **Measuring interval:** 15 minutes
- ✓ **Lost loggers:** more than 10

Sensores de Temperatura

Marzo 2005 a Agosto 2006

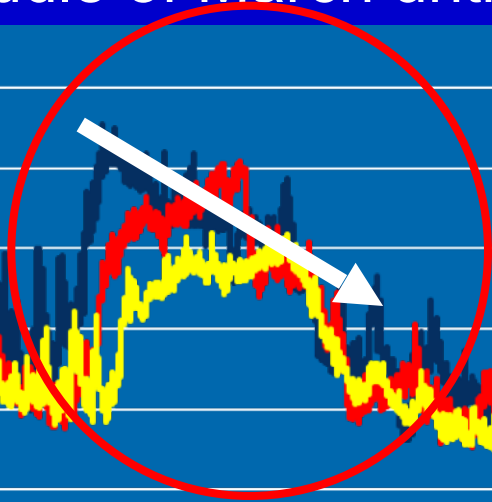


11.4 cm

(°C) Fluctuation of water temperature

Water temperature was up 4°C to 8°C from north to south after the middle of March until late June.

— Callao



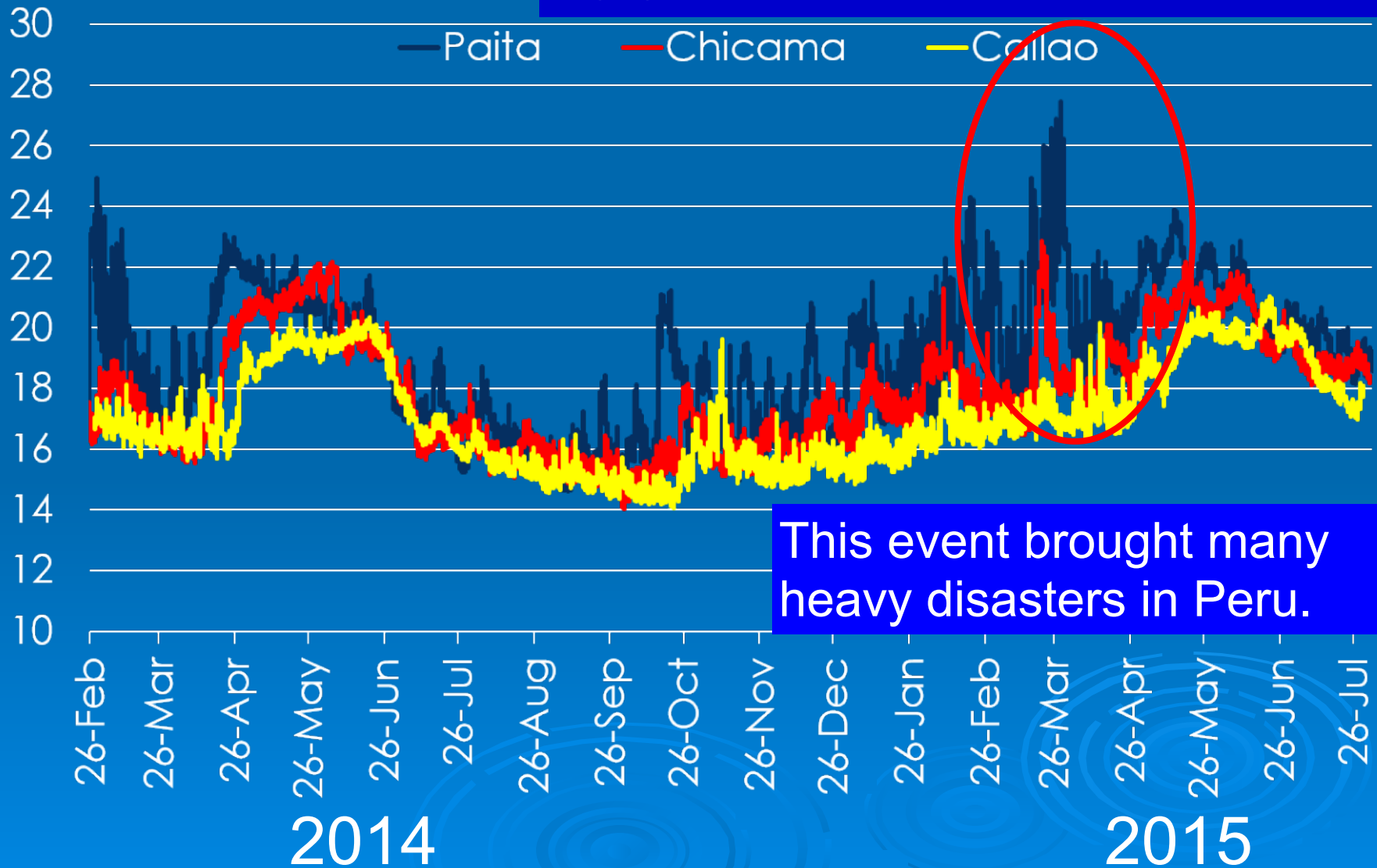
In the north area, risings in water temperature were appeared frequently after July.

26-Feb 26-Mar 26-Apr 26-May 26-Jun 26-Jul

2014

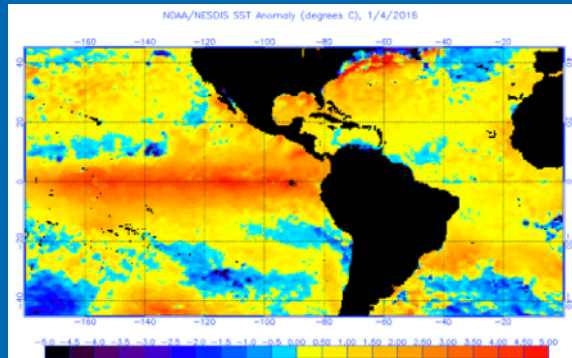
2015

Rapid risings from 5 to 10°C in water temperature during the middle to late March.

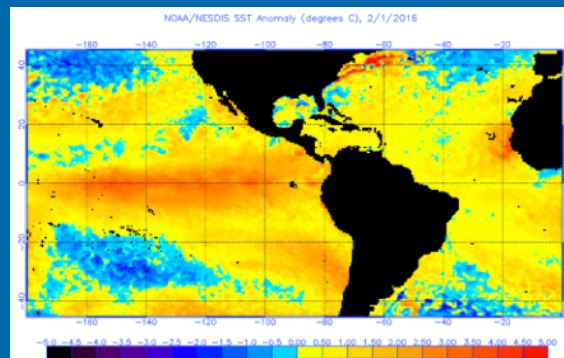


This event brought many heavy disasters in Peru.

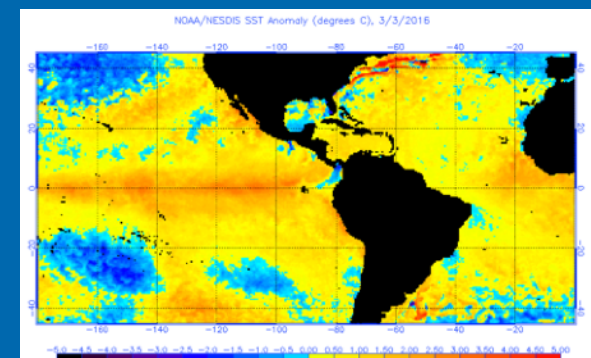
NOAA/NESDIS SST Anomaly 2016



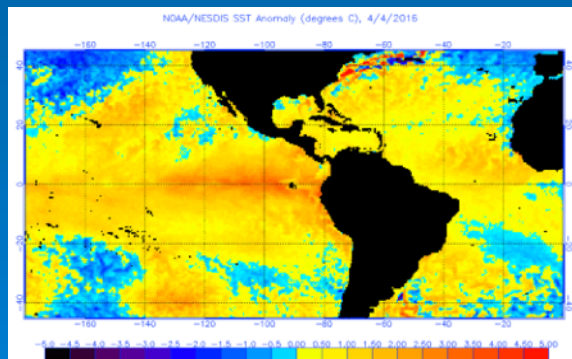
Jan., 4



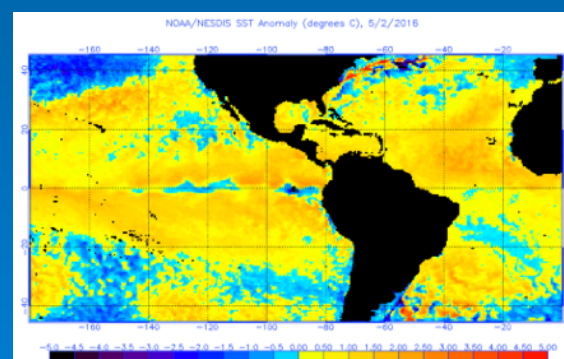
Feb., 1



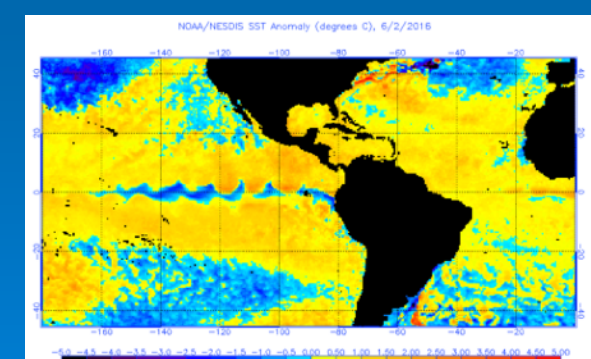
Mar., 3



Apr., 4

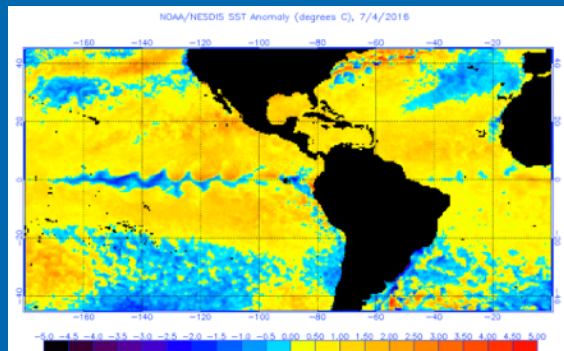


May 2

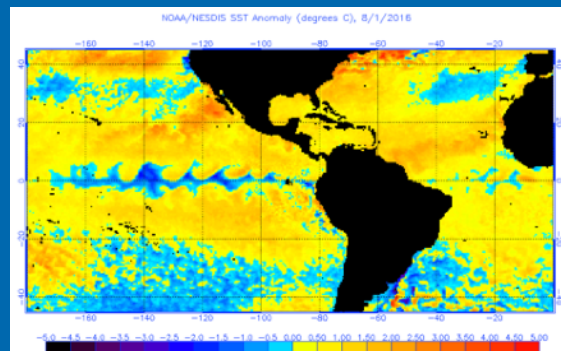


Jun., 2

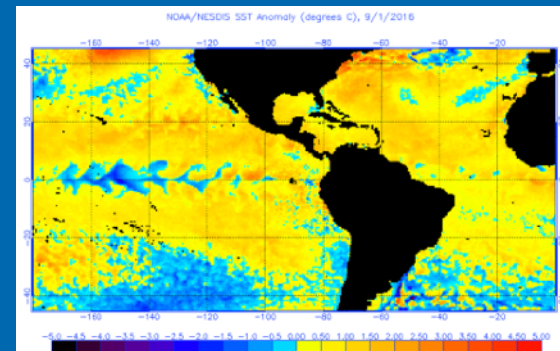
NOAA/NESDIS SST Anomaly 2016



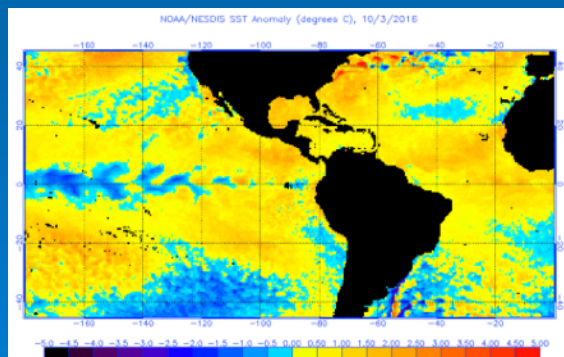
Jul., 4



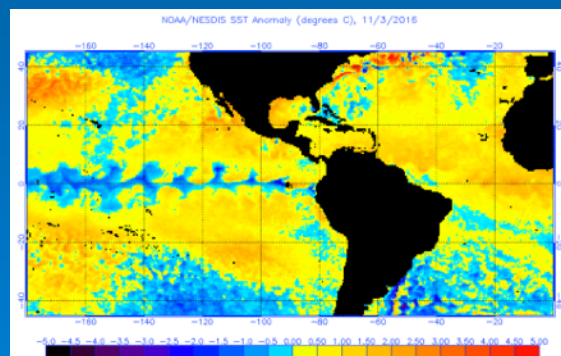
Aug., 1



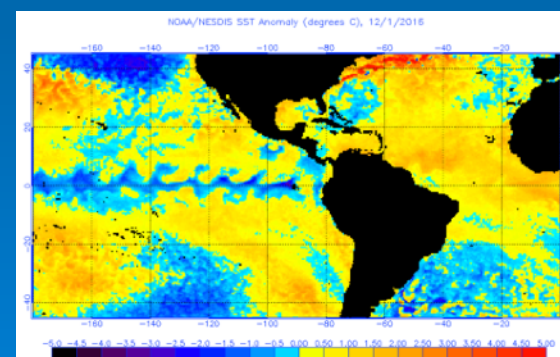
Sep., 1



Oct., 3

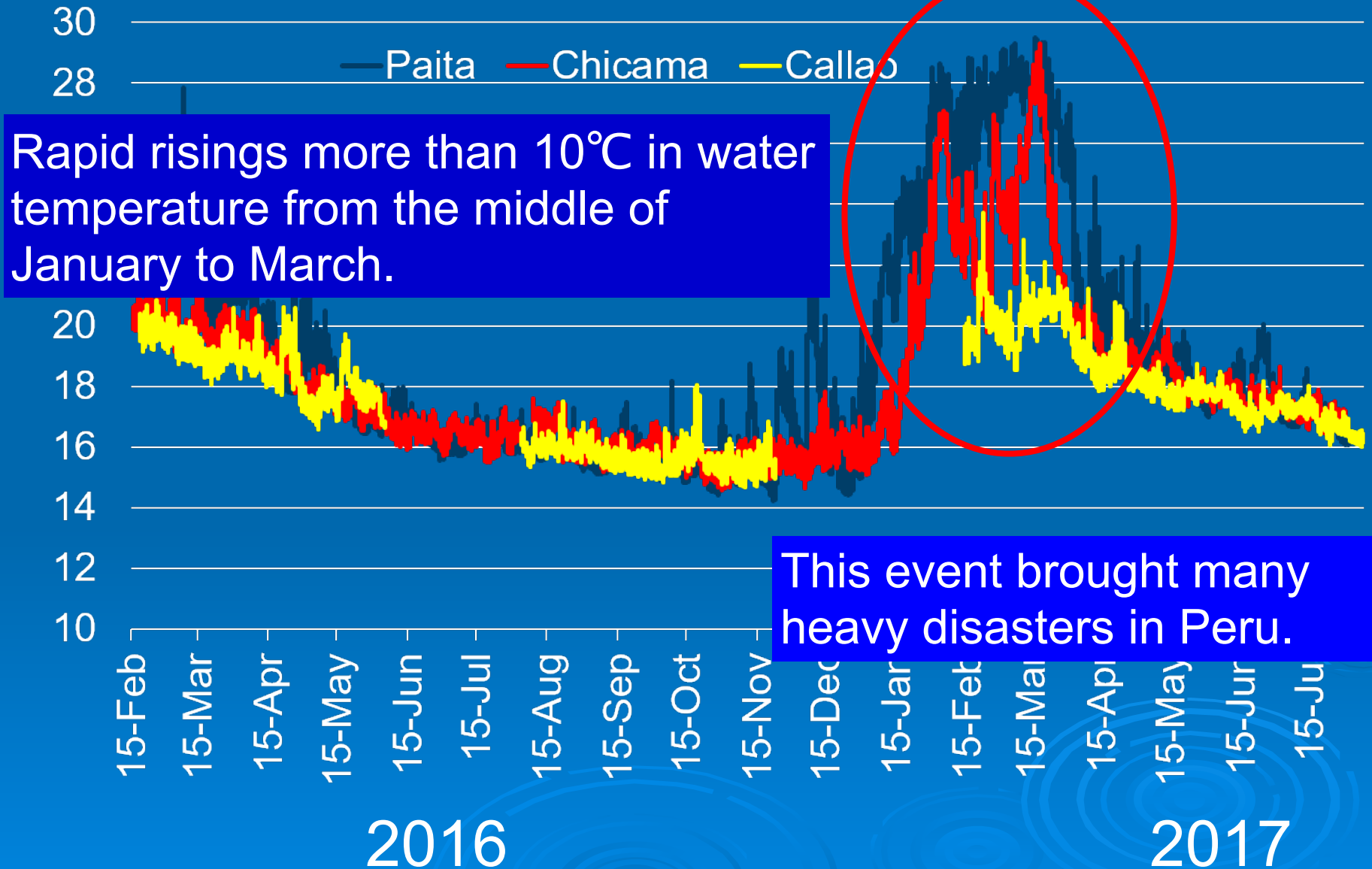


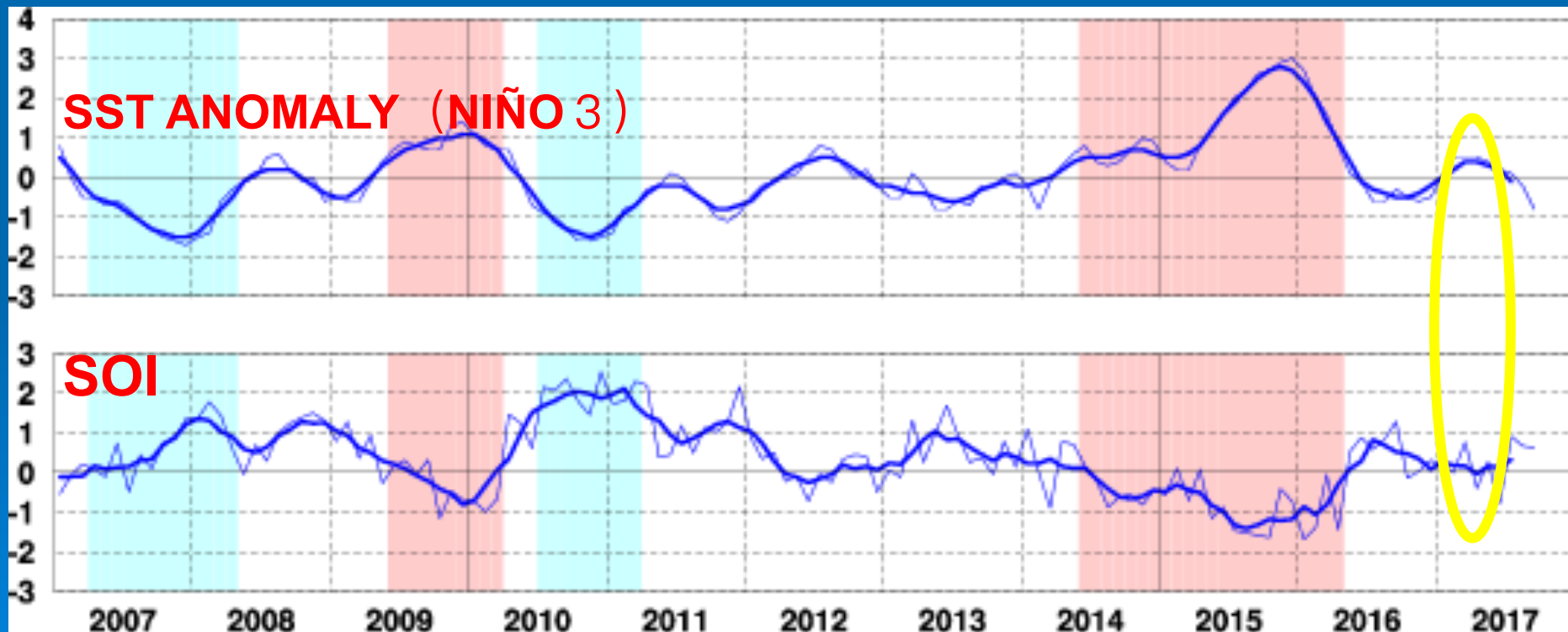
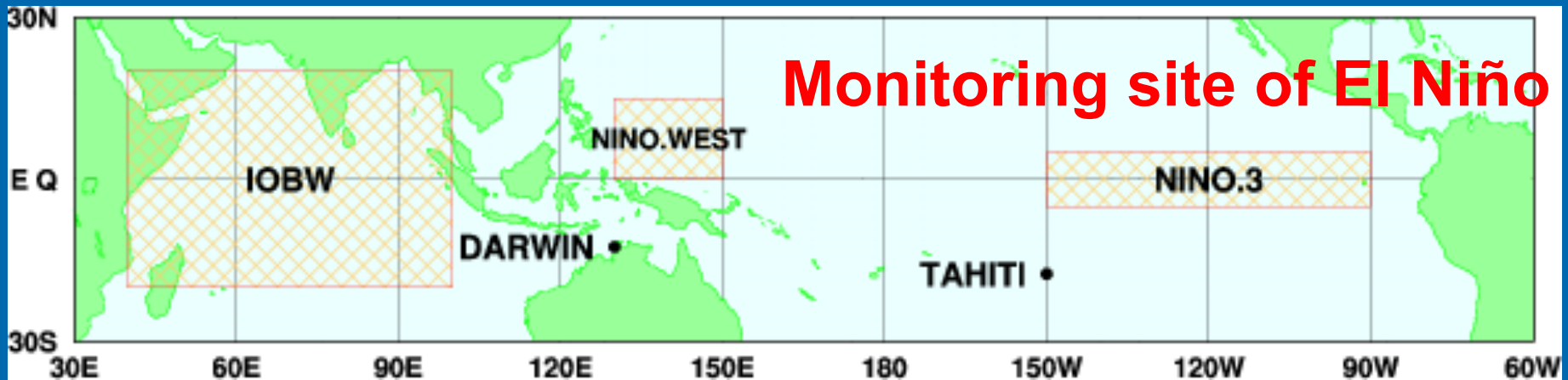
Nov., 3



Dec., 1

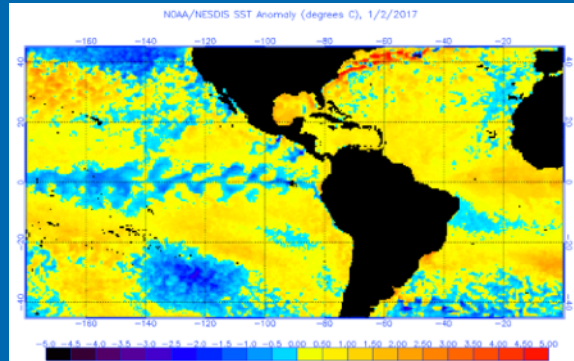
Fluctuation of Water Temperature



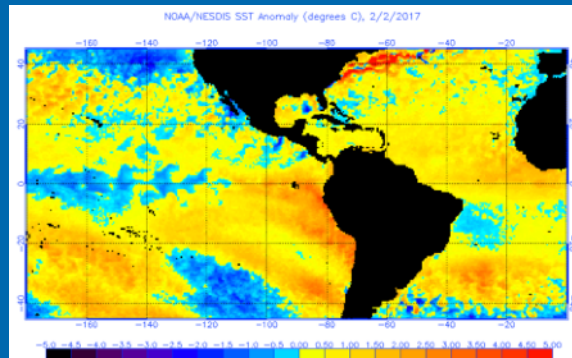


After Japan Meteorological Agency, Nov., 2017

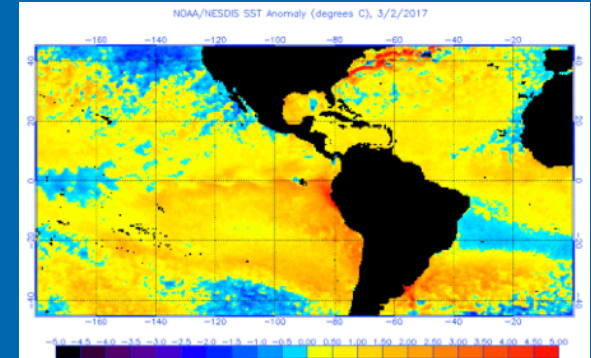
NOAA/NESDIS SST Anomaly 2017



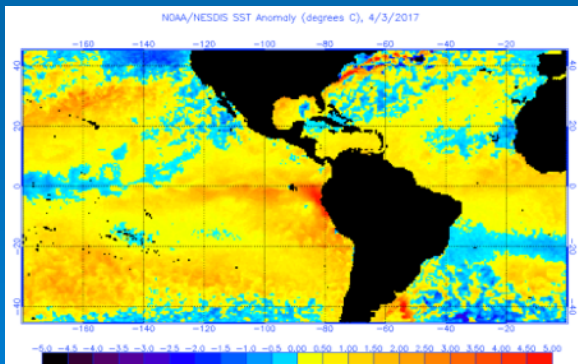
Jan., 2



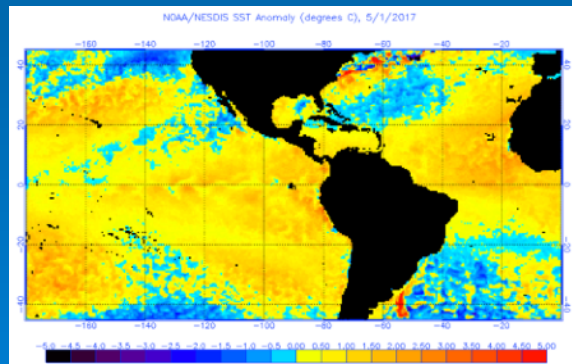
Feb., 2



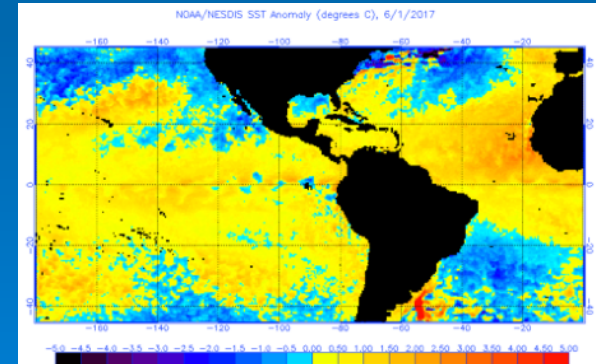
Mar., 2



Apr., 3

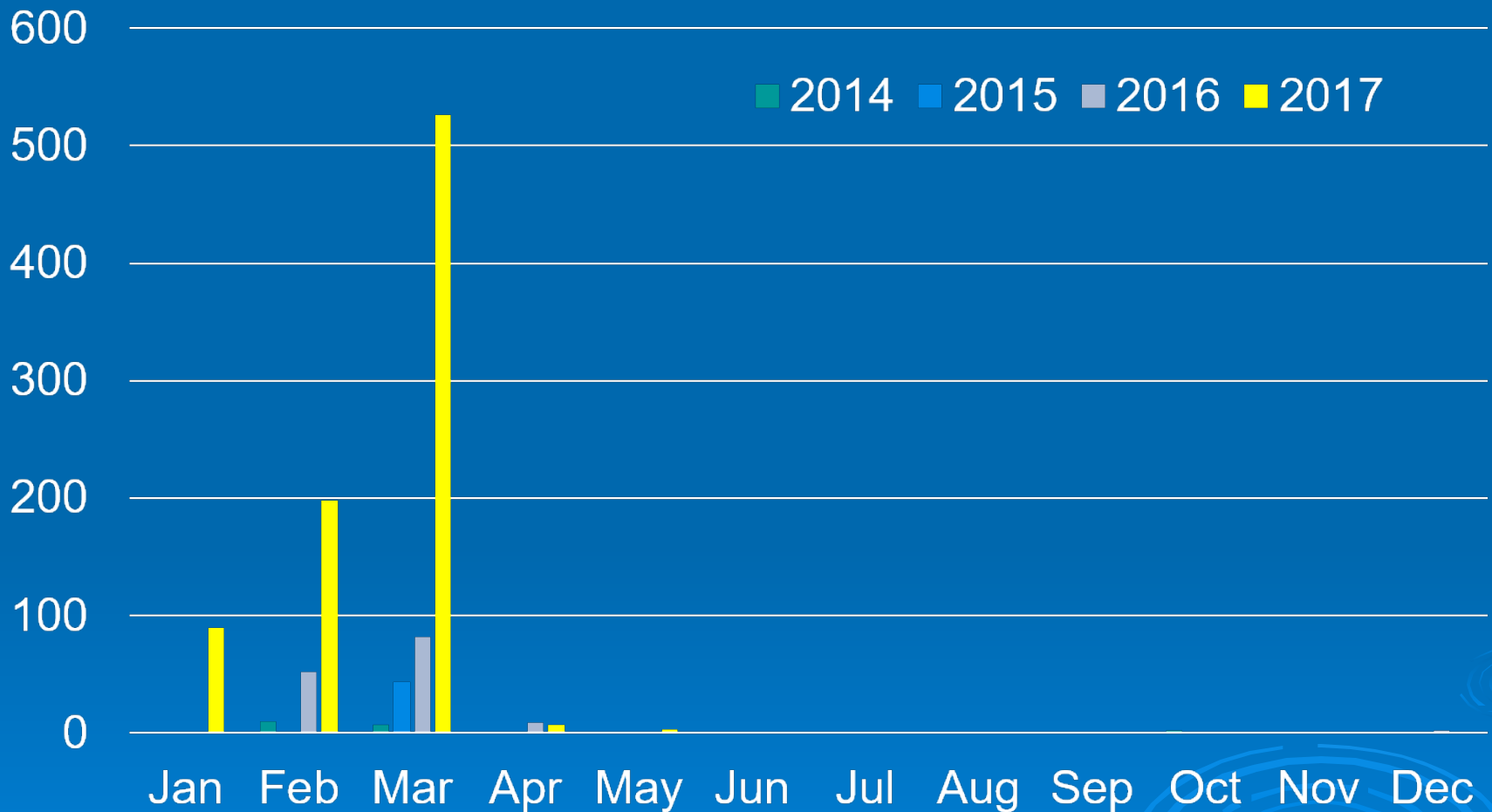


May 1



Jun., 1

Monthly Precipitation in Piura






Photos in Chiclayo in Feb., 4-5, 2017

Conclusion

- ✓ After the monster El Niño (from May 2014 to March 2016), the local El Niño in the coast of Peru occurred in January to March in 2017.
- ✓ This event brought many heavy disasters, especially heavy rain in Peruvian coast.
- ✓ The monster El Niño was appeared in the offshore monitoring site, but the local El Niño was not.
- ✓ Because the local El Niño occurred in just coastal area.
- ✓ It is suggested that the mechanism of occurrence is different in each other.
- ✓ In contrast with the monster El Niño being called ENSO (El Niño and Southern Oscillation), the local El Niño occurred in Peruvian coast should be called El Niño.



Merci beaucoup.

ありがとうございました。