

Monitoreo y pronóstico de El Niño Setiembre 2016

Comité Técnico ENFEN

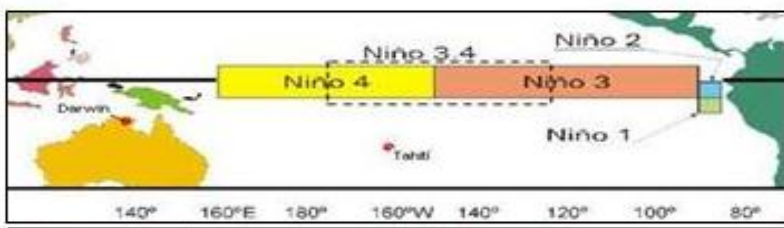
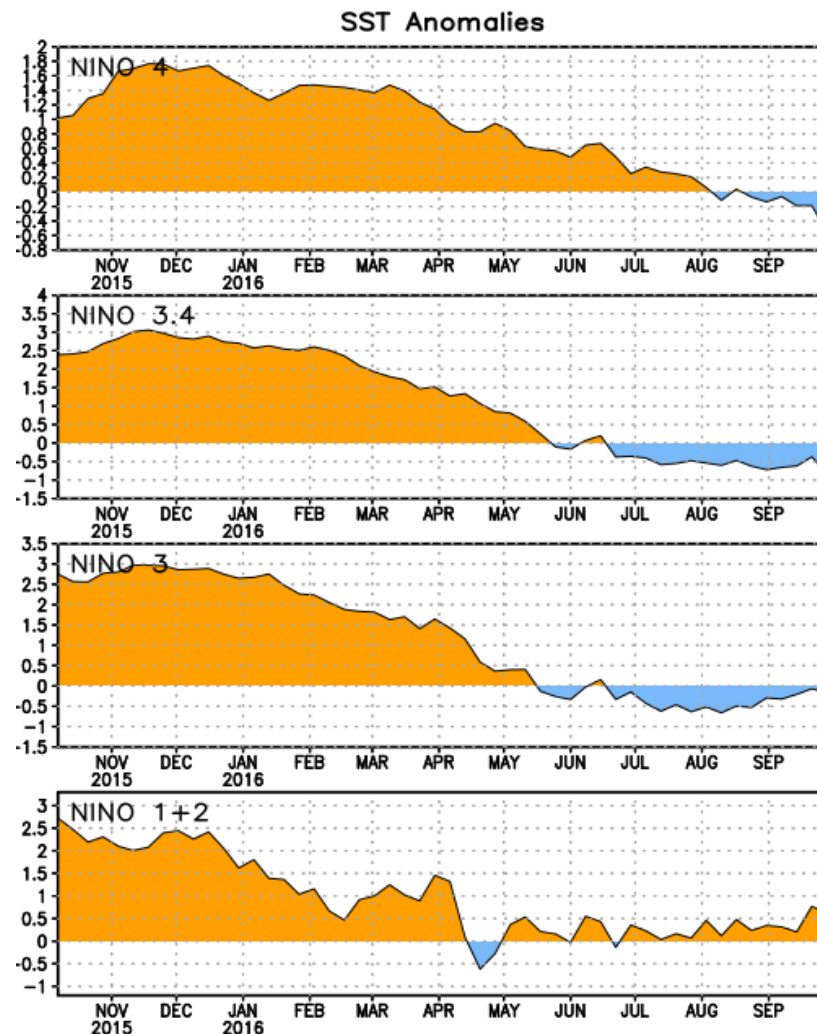
07 de octubre de 2016



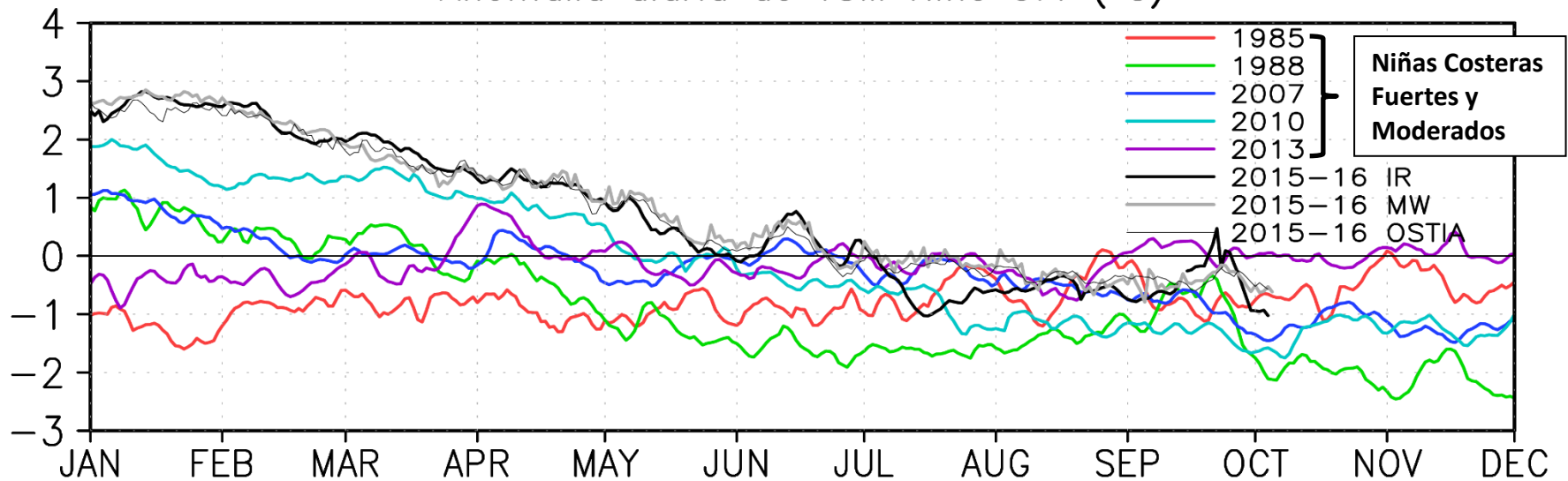
ANOMALÍAS DE LA TEMPERATURA SUPERFICIAL DEL MAR POR REGIONES NIÑO EN EL PACÍFICO ECUATORIAL

Regiones Niño	ATSM (Semanales)			
	Niño 1+2	Niño 3	Niño 3.4	Niño 4
07-sep-16	20.8 0.3	24.6 -0.3	26.1 -0.7	28.6 -0.1
14-sep-16	20.6 0.2	24.7 -0.2	26.1 -0.6	28.5 -0.2
21-sep-16	21.2 0.8	24.8 -0.1	26.3 -0.4	28.5 -0.2
28-sep-16	21.2 0.6	24.7 -0.2	25.9 -0.8	28.1 -0.5
Prom.T.	0.47	-0.20	-0.62	-0.25

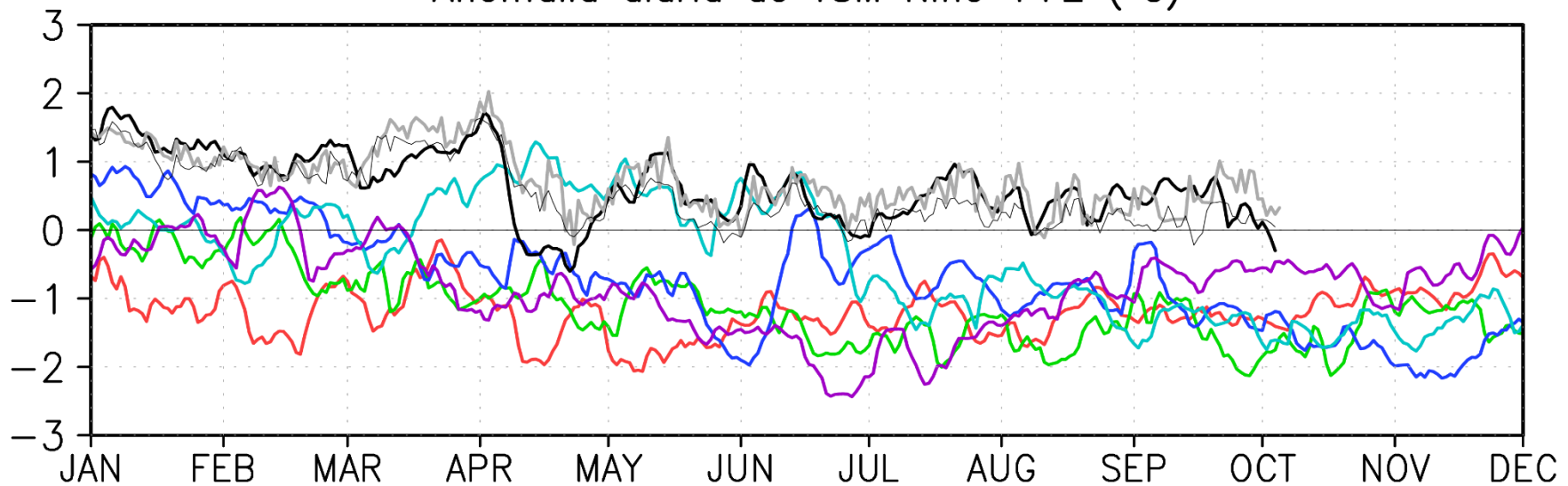
Promedios mensuales 2015						
Regiones Niño	ATSM					
	Niño 1+2		Niño 3		Niño 3.4	
Ago.2016	0.4	21.0	-0.5	24.5	-0.5	26.3
Jul.2016	0.2	21.8	-0.5	25.1	-0.5	26.7
Jun.2016	0.3	23.2	-0.1	26.3	-0.1	27.5
May.2016	0.3	24.6	0.0	27.1	0.3	28.2
Abr.2016	0.2	25.8	0.8	28.3	1.1	28.8
Mar.2016	0.9	27.6	1.6	28.7	1.7	28.9
Feb.2016	0.7	26.8	1.9	28.4	2.4	29.1
Ene.2016	1.4	25.9	2.6	28.2	2.6	29.2



Anomalia diaria de TSM Nino 3.4 (°C)



Anomalia diaria de TSM Nino 1+2 (°C)



Datos: NOAA Hires OI SST, RSS MW SST, Procesamiento:IGP.

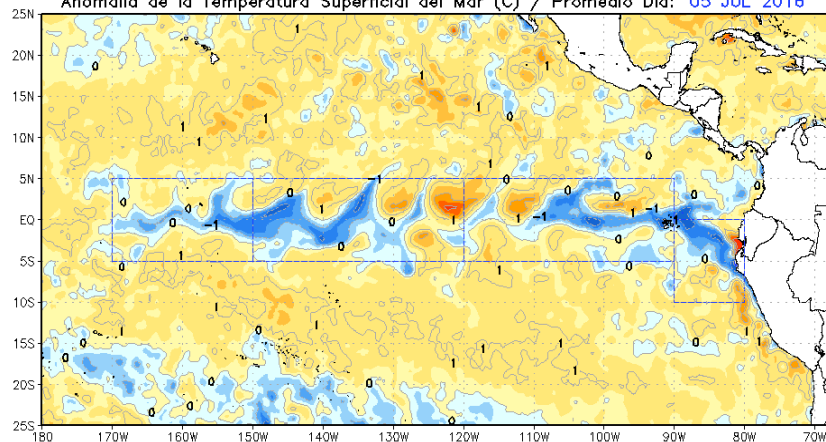
Ultimo dato-MW: 04OCT2016
 Ultimo dato-OISST: 03OCT2016
 Ultimo dato-OSTIA: 04OCT2016



ANOMALÍAS DE LA TEMPERATURA SUPERFICIAL DEL MAR EN EL PACÍFICO ECUATORIAL

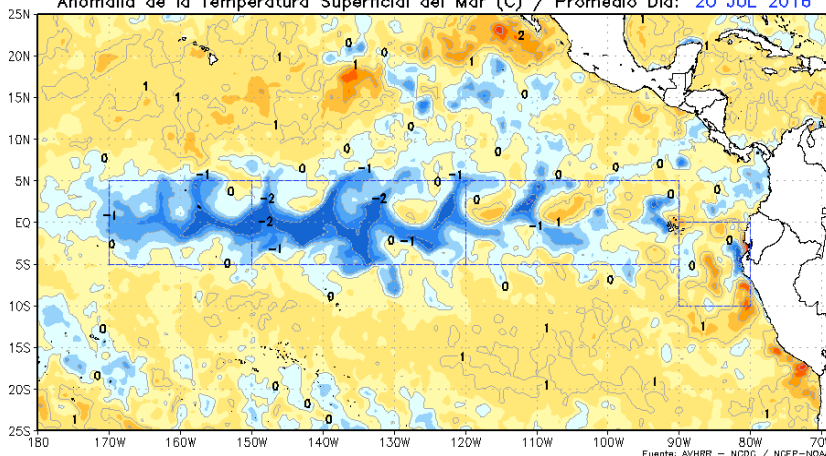
DIRECCION DE HIDROGRAFIA Y NAVEGACION
DPTO OCEANOGRAFIA – DIV METEOROLOGIA

Anomalia de la Temperatura Superficial del Mar (C) / Promedio Día: 05 JUL 2016



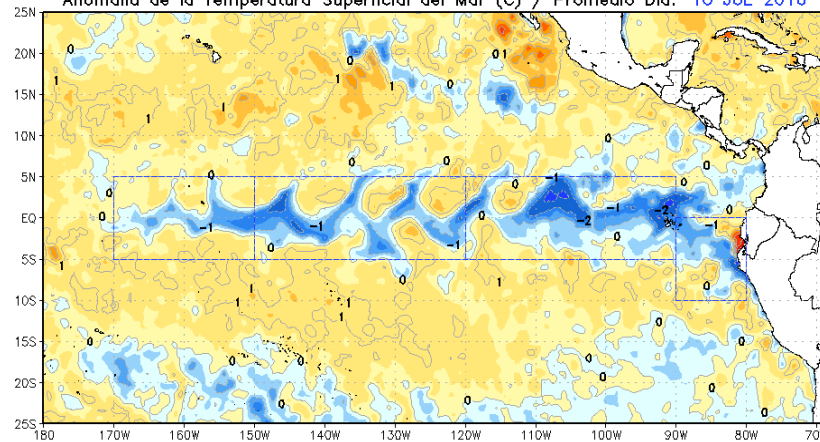
DIRECCION DE HIDROGRAFIA Y NAVEGACION
DPTO OCEANOGRAFIA – DIV METEOROLOGIA

Anomalia de la Temperatura Superficial del Mar (C) / Promedio Día: 20 JUL 2016



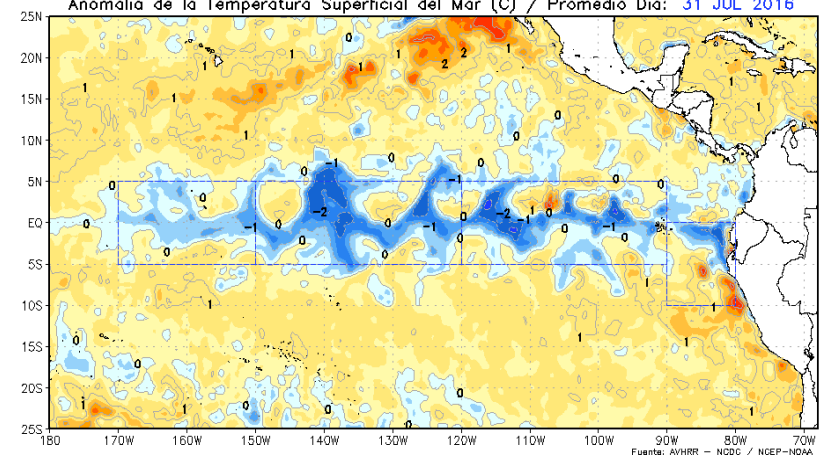
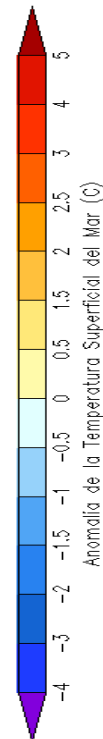
DIRECCION DE HIDROGRAFIA Y NAVEGACION
DPTO OCEANOGRAFIA – DIV METEOROLOGIA

Anomalia de la Temperatura Superficial del Mar (C) / Promedio Día: 10 JUL 2016



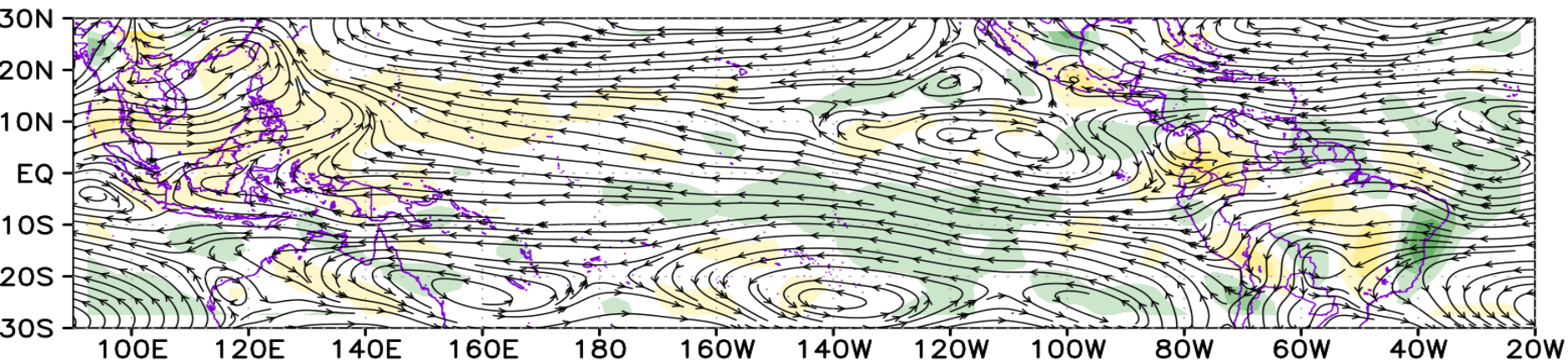
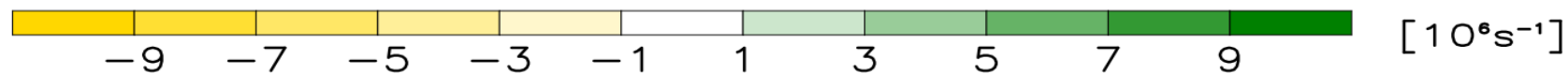
DIRECCION DE HIDROGRAFIA Y NAVEGACION
DPTO OCEANOGRAFIA – DIV METEOROLOGIA

Anomalia de la Temperatura Superficial del Mar (C) / Promedio Día: 31 JUL 2016

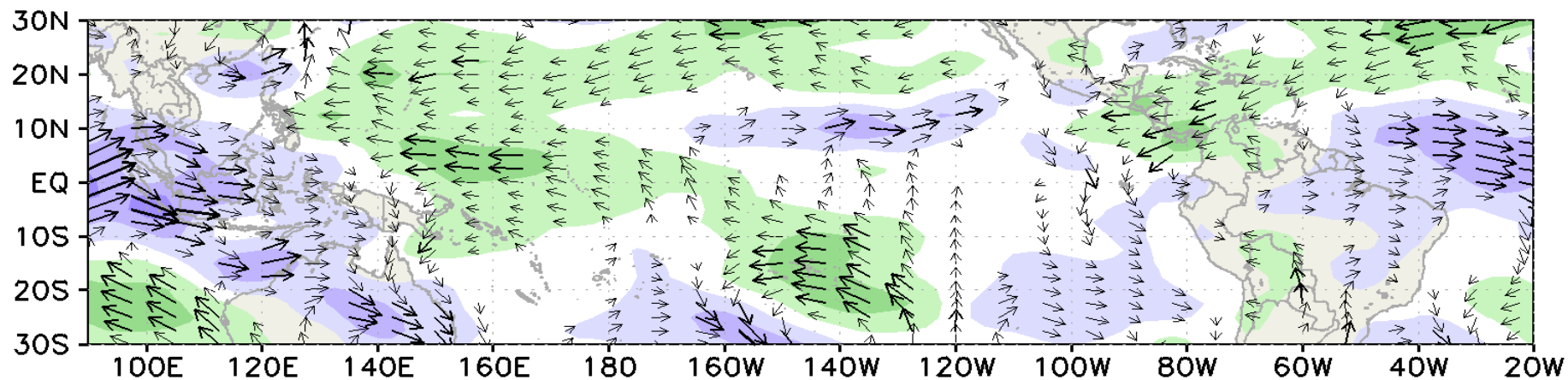
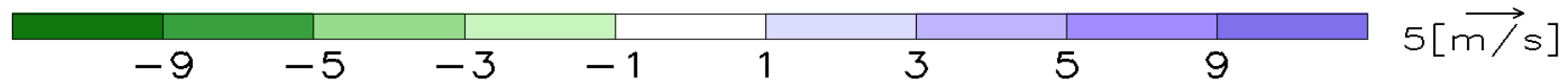


VIENTOS A 850hPa

VIENTO PROMEDIO a 850hPa SETIEMBRE 2016
NCEP-NOAA / SENAMHI -DCL

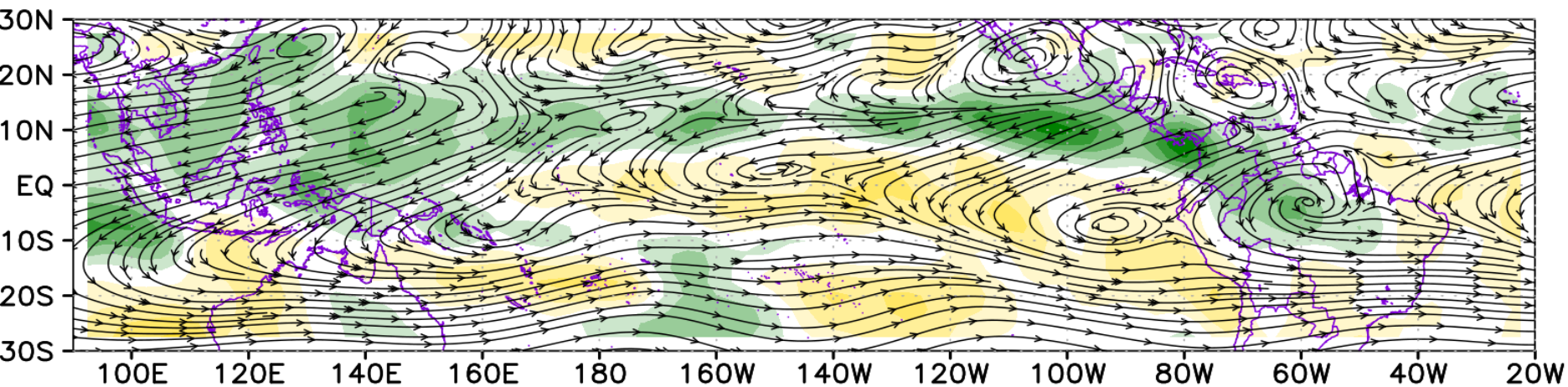
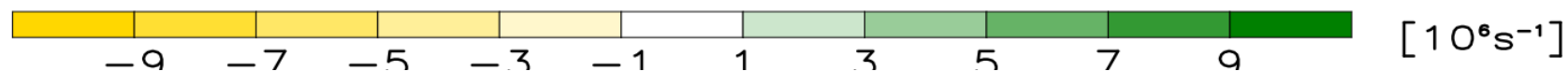


ANOMALIA DE VIENTO a 850hPa SETIEMBRE 2016
NCEP-NOAA / SENAMHI -DCL

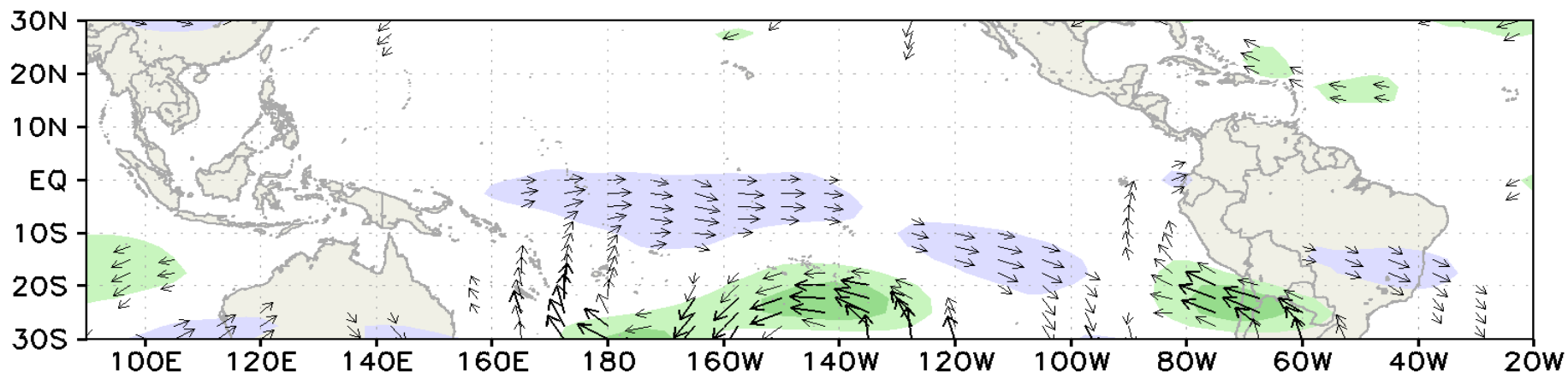
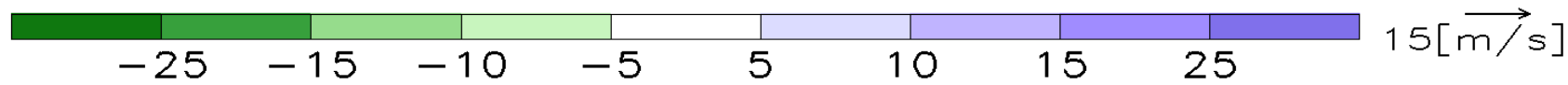


VIENTOS A 200Pa

VIENTO PROMEDIO a 200hPa SETIEMBRE 2016
NCEP-NOAA / SENAMHI -DCL

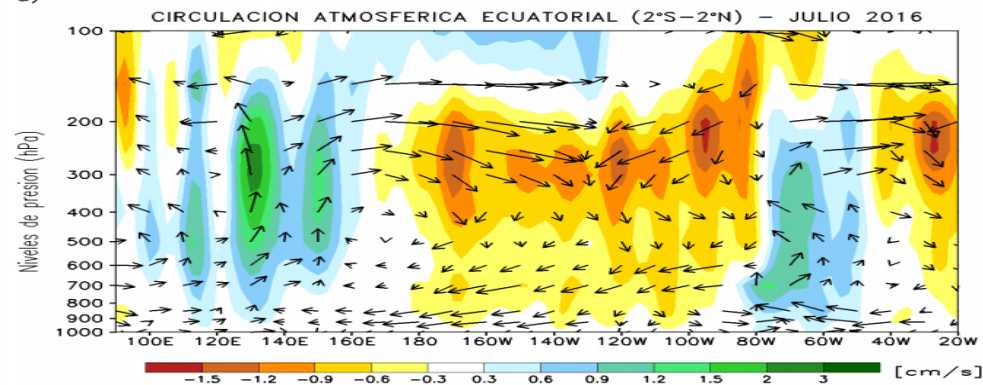
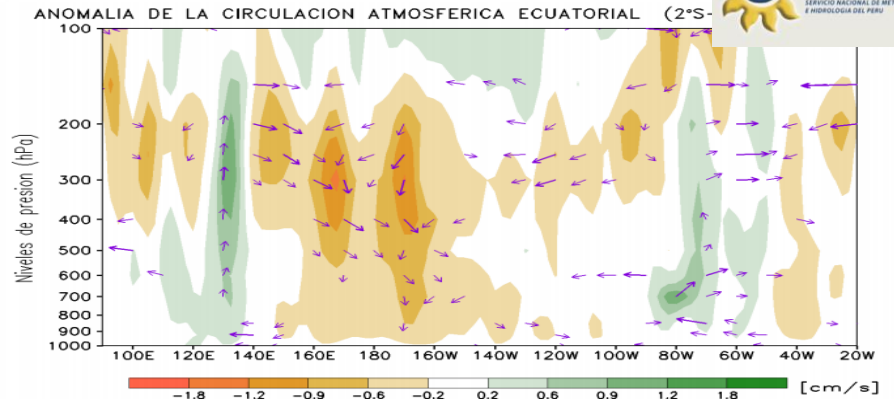
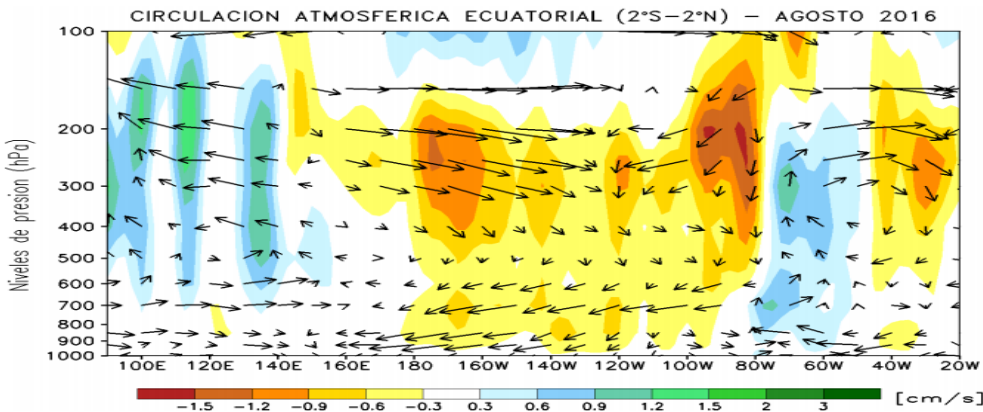
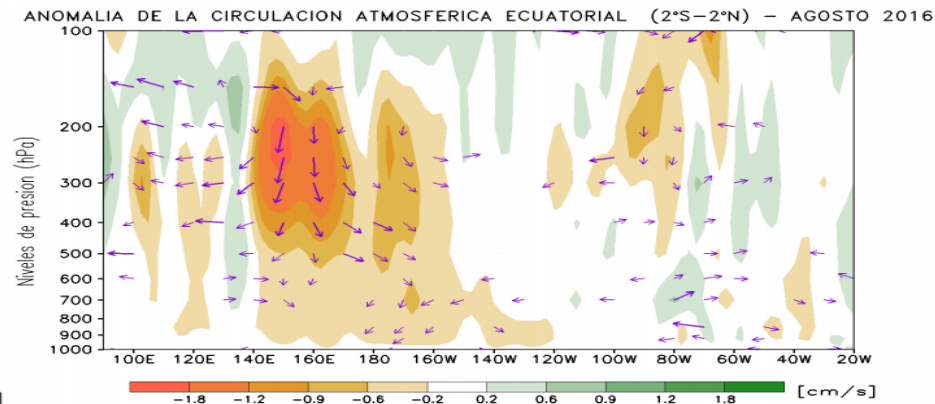


ANOMALIA DE VIENTO a 200hPa SETIEMBRE 2016
NCEP-NOAA / SENAMHI -DCL

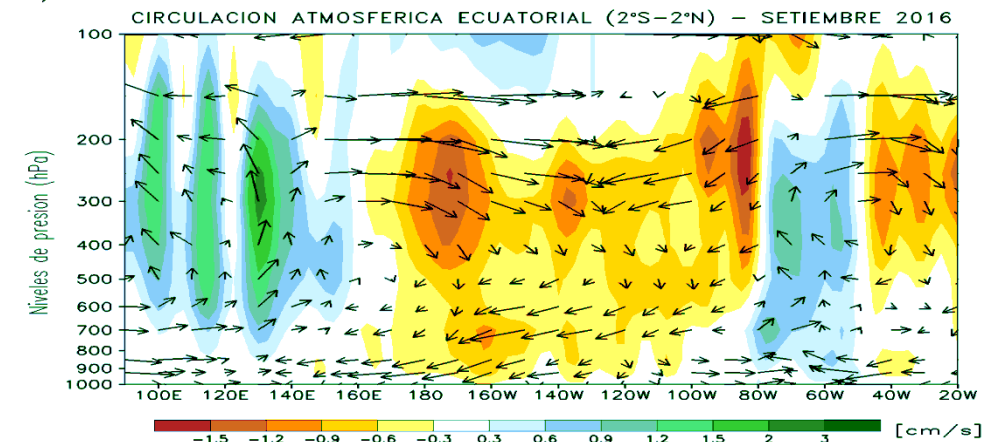
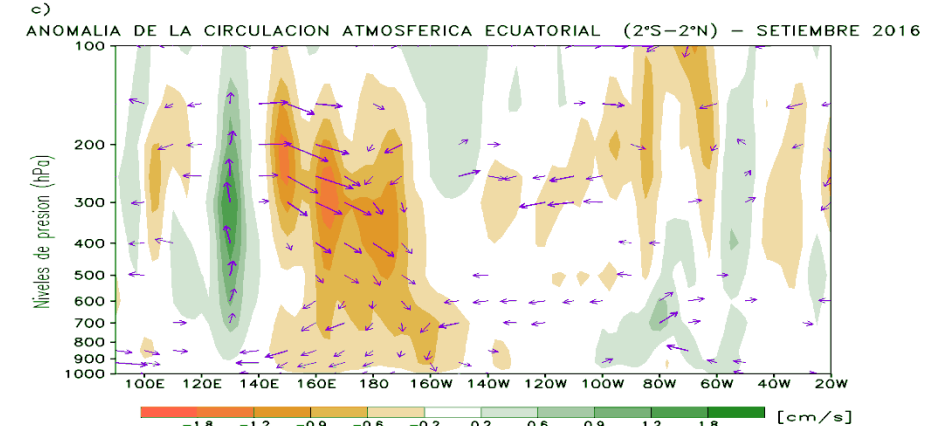


MONITOREO DE LA CIRCULACION ATMOSF. EC. 5°N-5°S

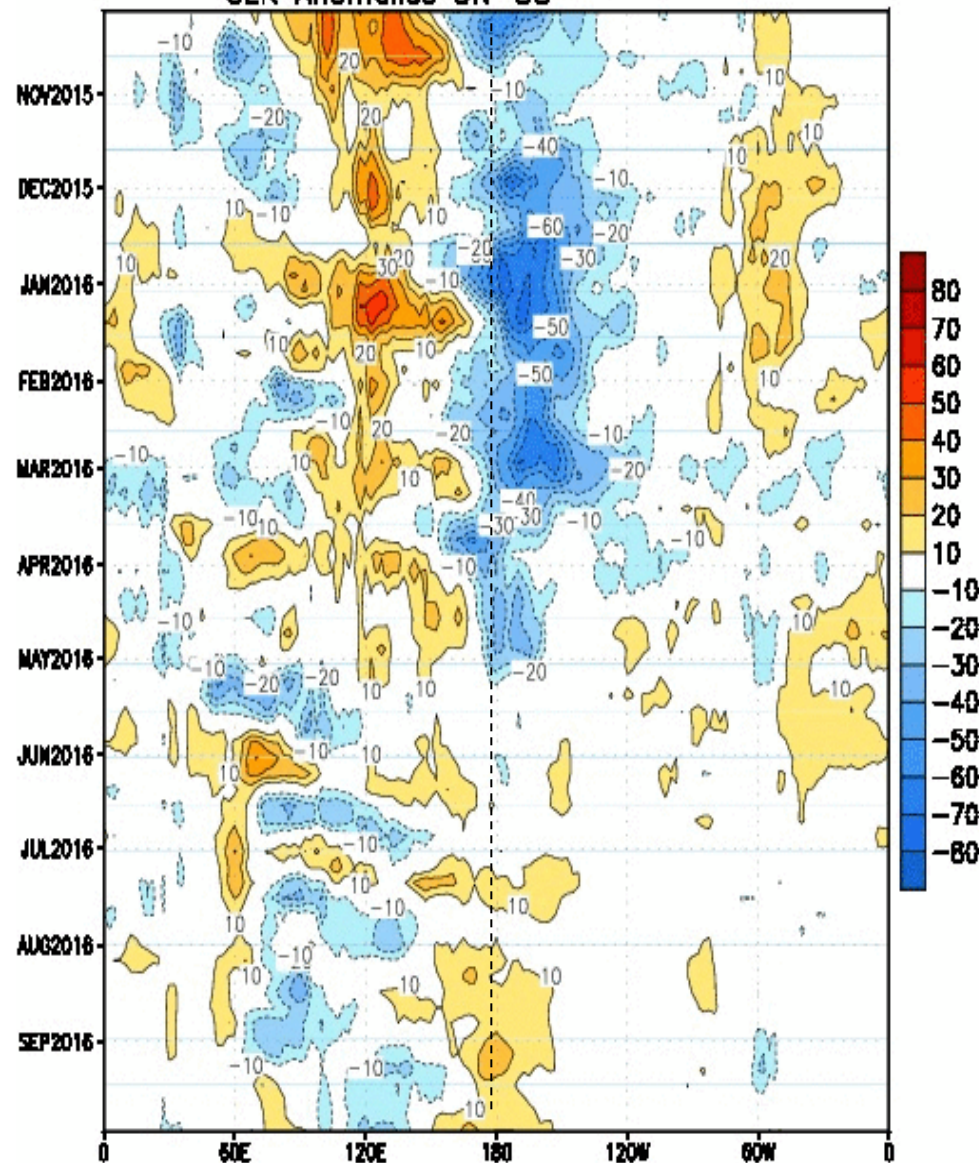
a)



a)



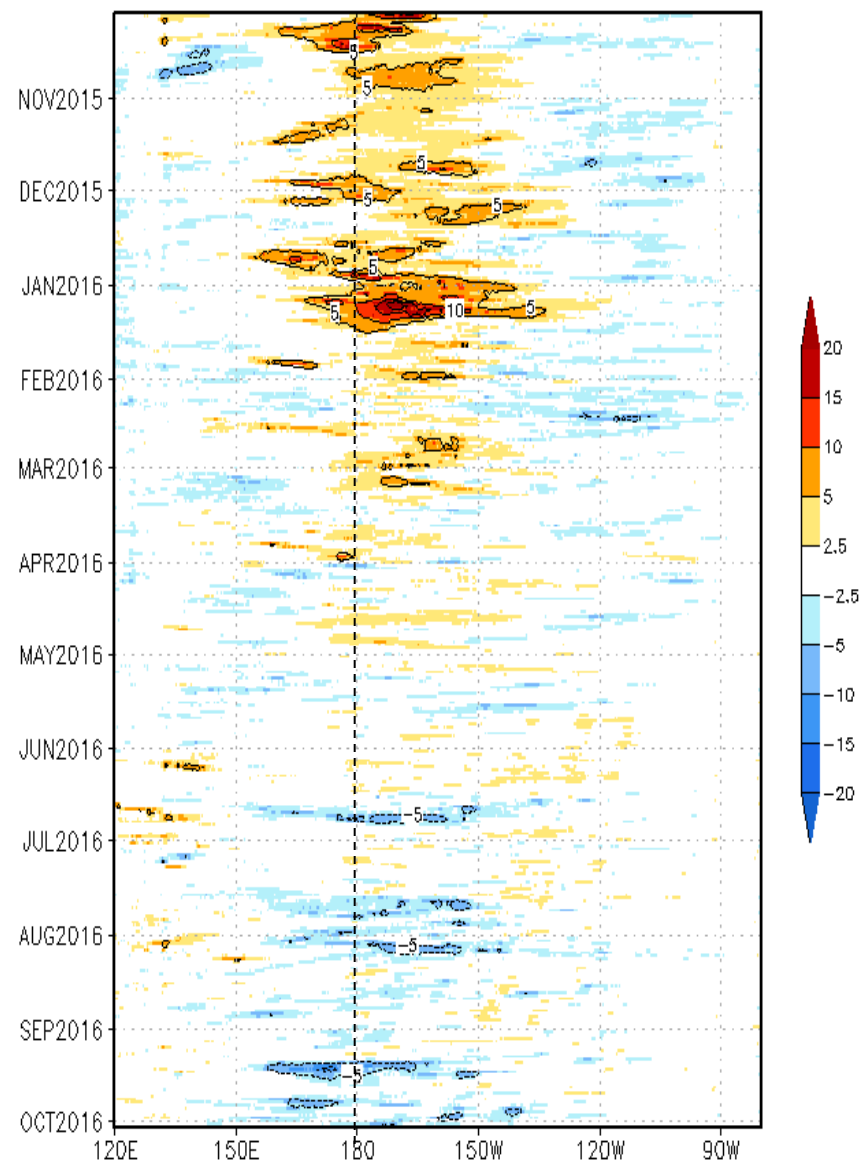
OLR Anomalies 5N-5S



Data updated through 30 SEP 2016

CLIMATE PREDICTION CENTER/NCEP

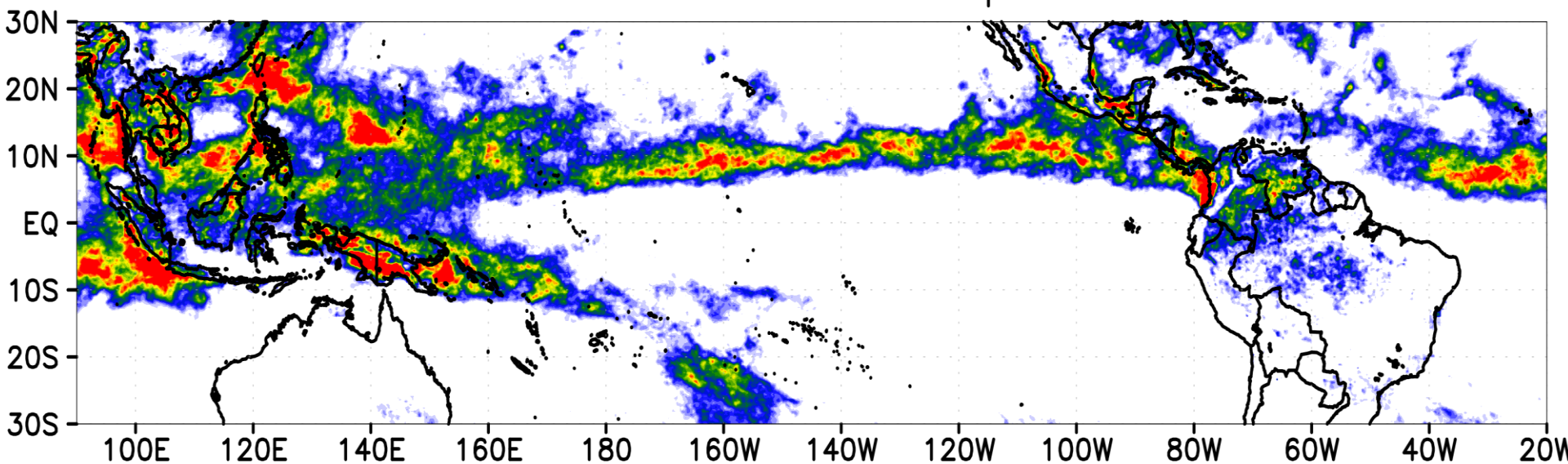
Anomalia de esfuerzo de viento zonal (10^2Nm^{-2}) promediada entre 2S y 2N



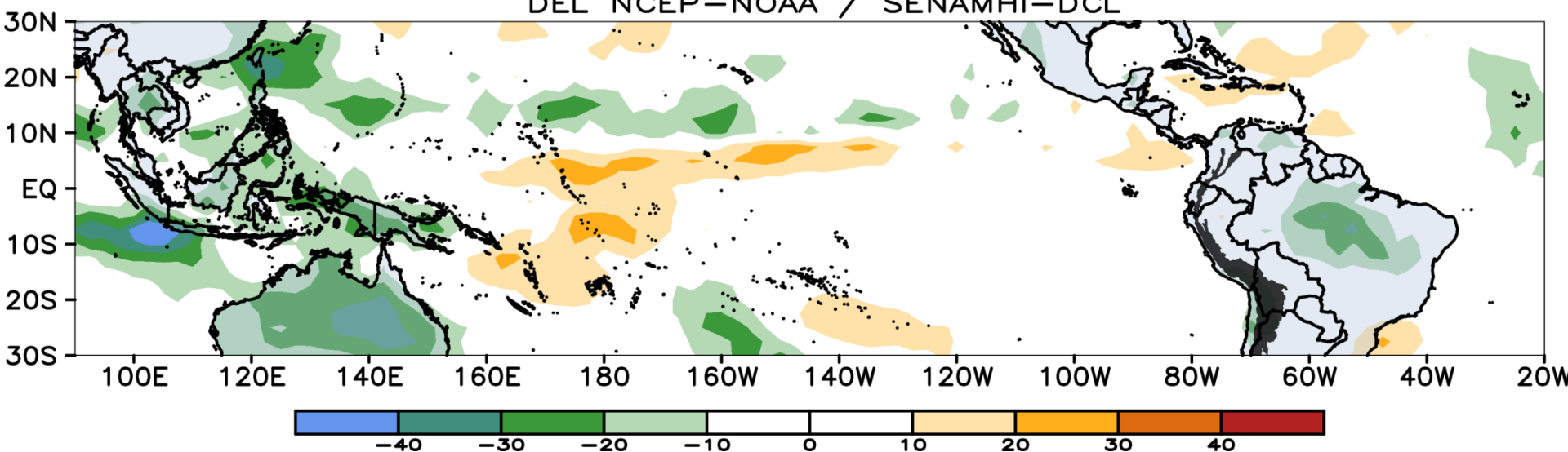
Datos ASCAT, Procesamiento:IGP, Ultimo dato:03Oct2016
Clim corregida con ERA

CONVECCIÓN & PRECIPITACIÓN

PRECIPITACION ACUMULADA | SEP 2016

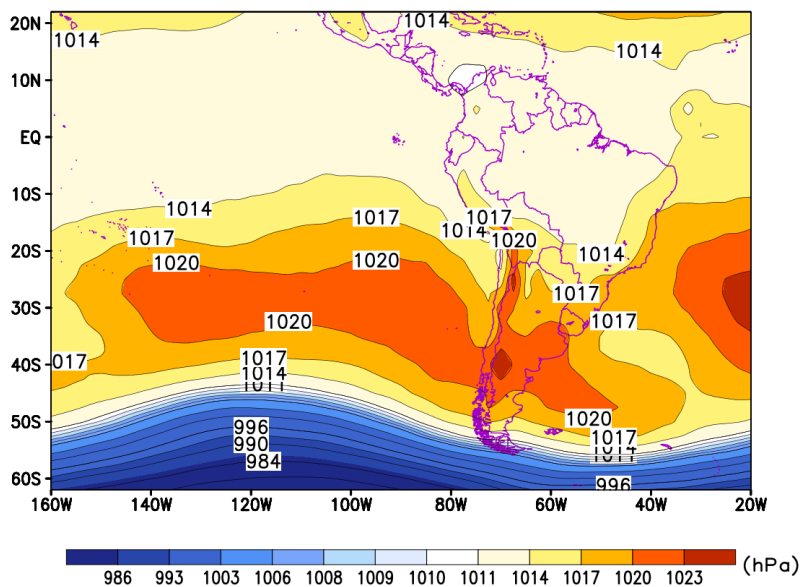


Anomalia de Radiacion Onda Larga Pacifico Ecuatorial SETIEMBRE-2016
DEL NCEP-NOAA / SENAMHI-DCL

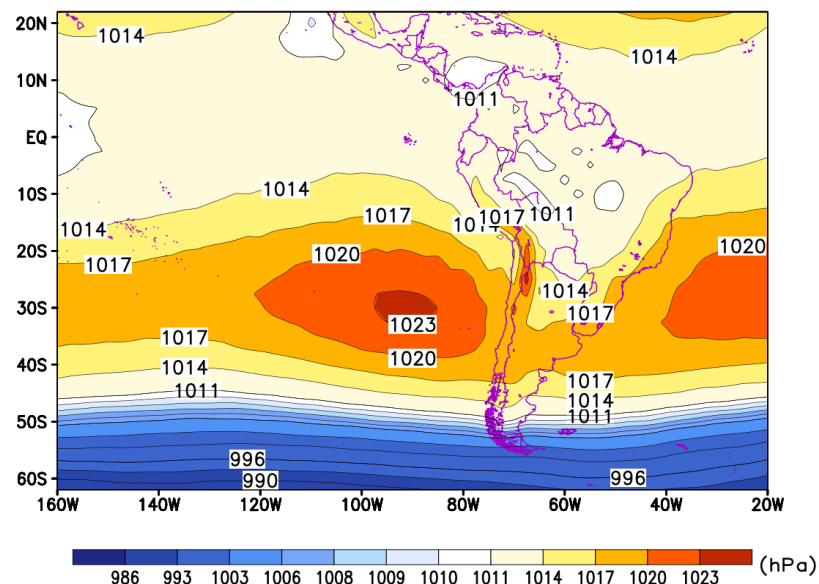


CAMPOS DE PRESIONES

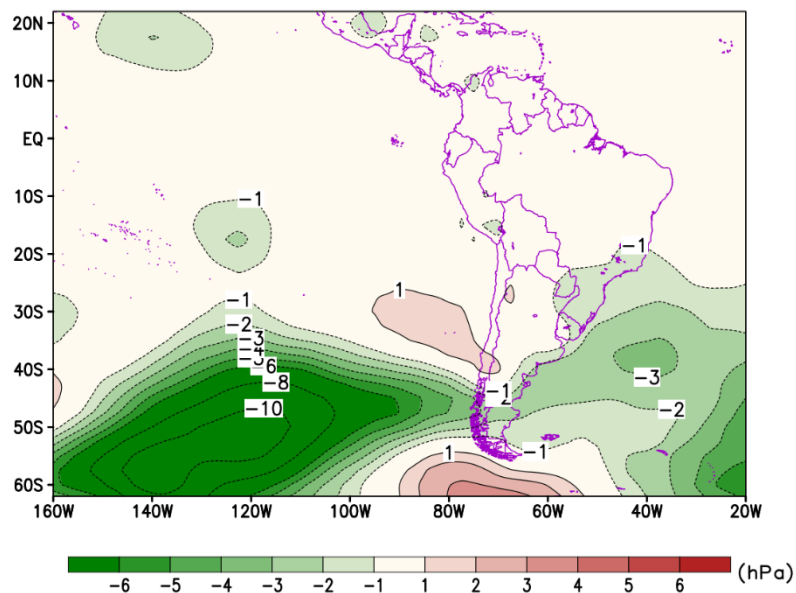
PRESION A NIVEL DEL MAR – 2016 SETIEMBRE



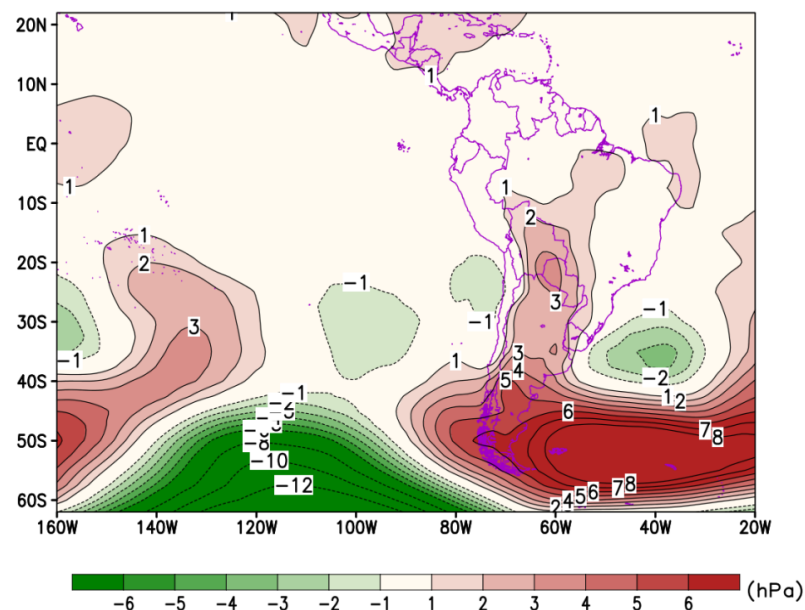
CLIMATOLOGIA DE LA PRESION A NIVEL DEL MAR – SETIEMBRE



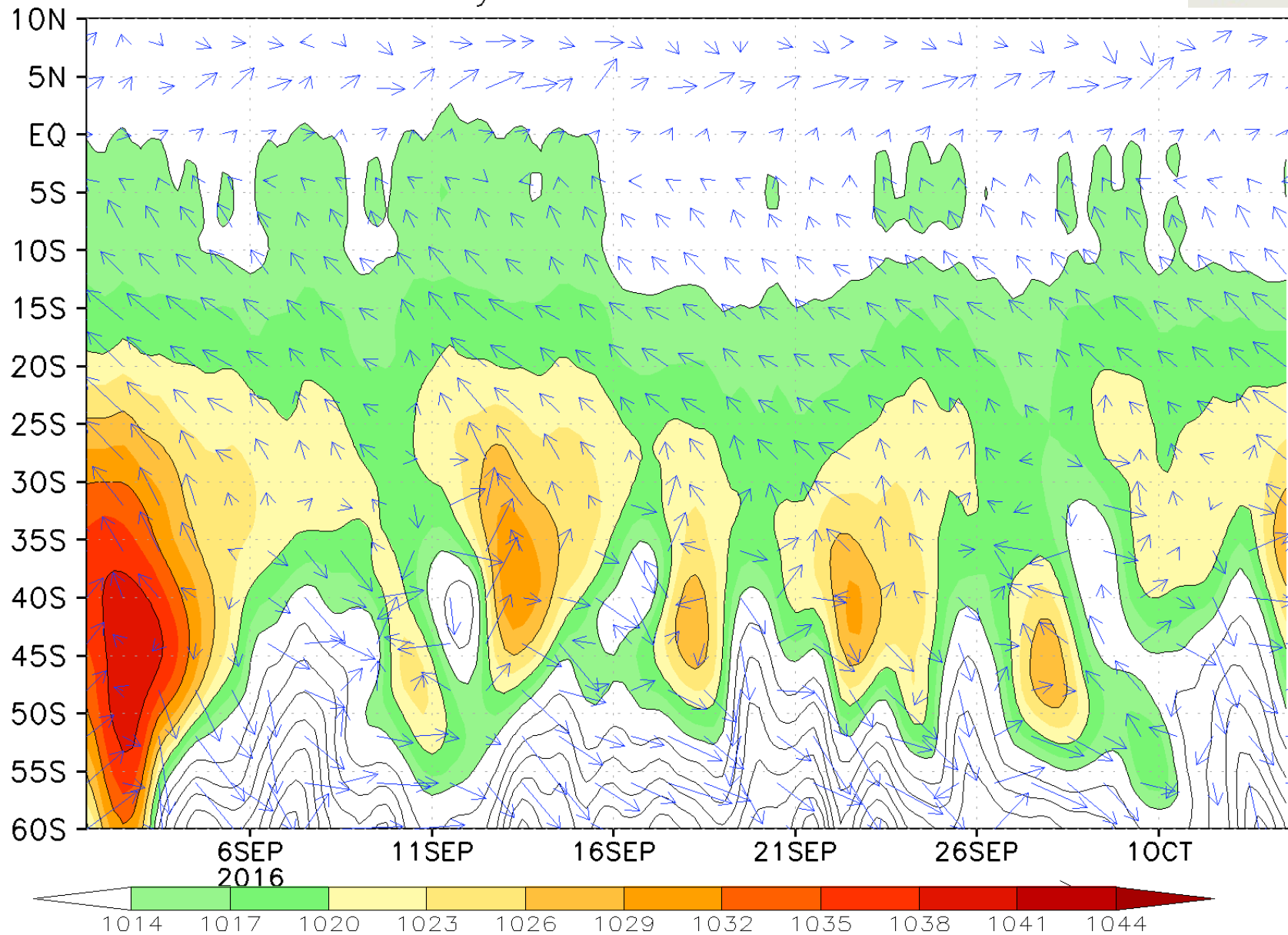
ANOMALIA DE LA PRESION A NIVEL DEL MAR – 2016 AGOSTO



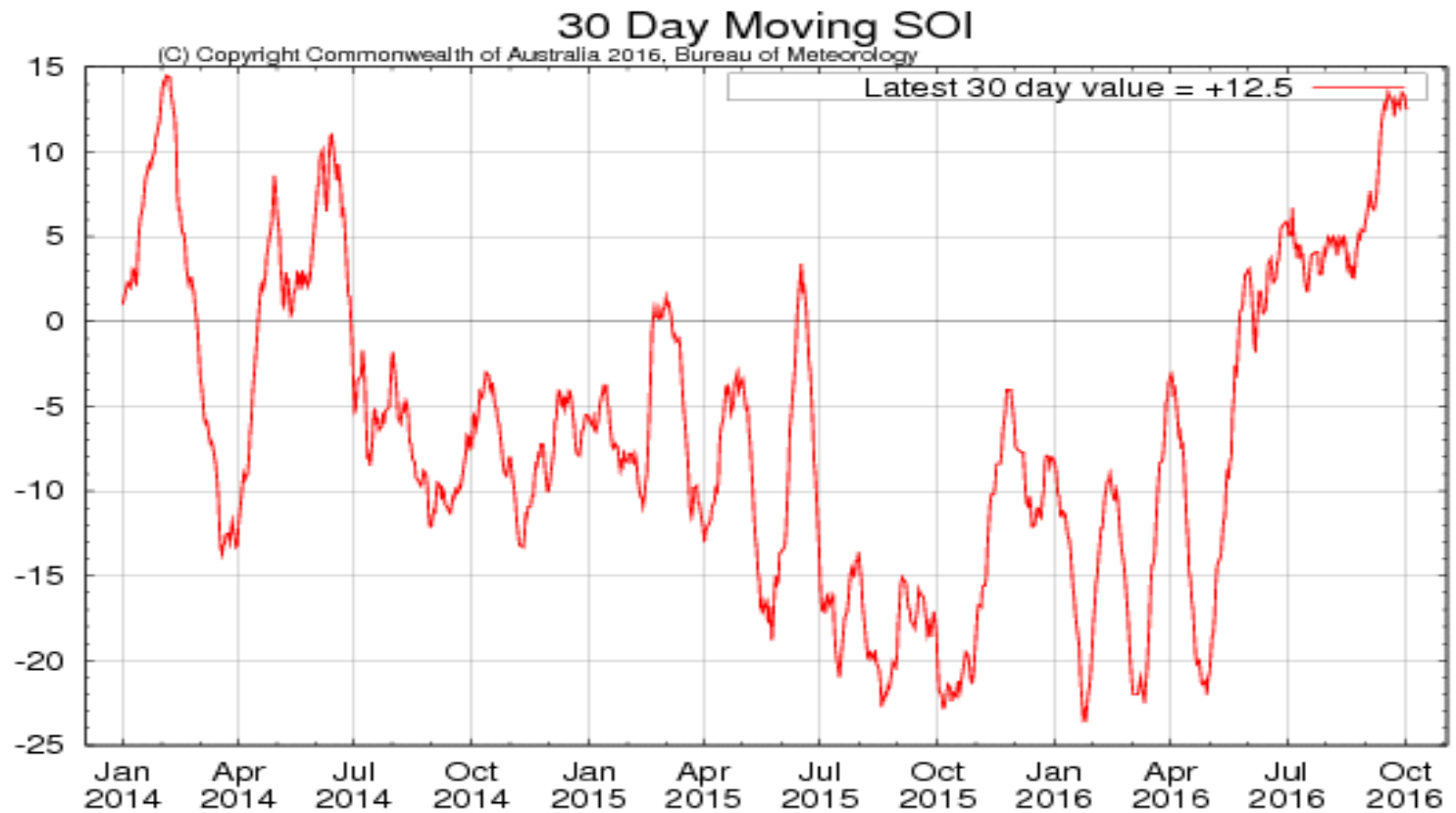
ANOMALIA DE LA PRESION A NIVEL DEL MAR – 2016 SETIEMBRE



PRESION y VIENTO 1000hPa SEP2016

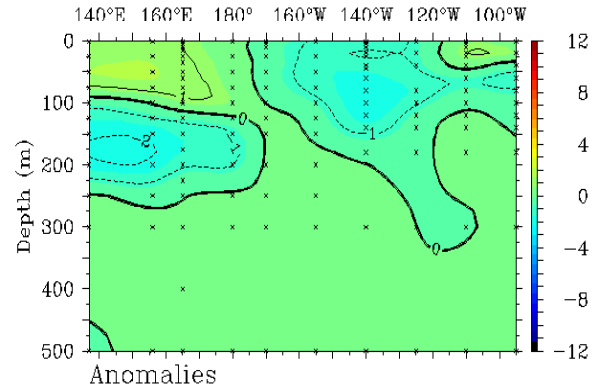


INDICE IOS



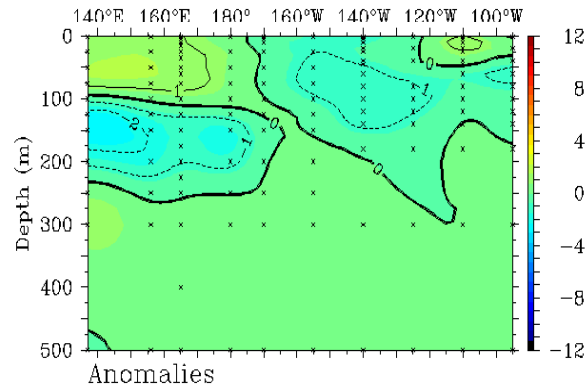
Anomalía de la Temperatura sub-superficial en el Pacífico Ecuatorial

TAO/TRITON 5-Day Mean Temperatures (°C)
Ending on September 9 2016 2°S to 2°N Average



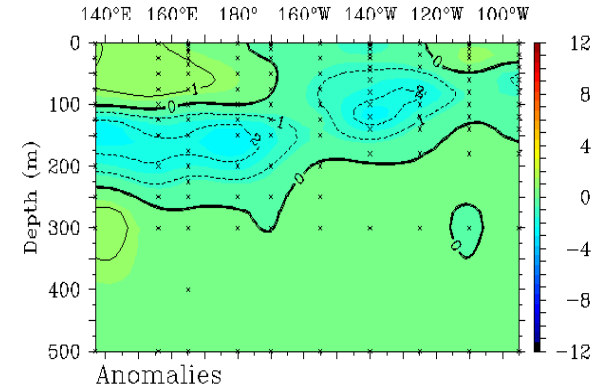
TAO Project Office/PMEL/NOAA Oct 5 2016

TAO/TRITON 5-Day Mean Temperatures (°C)
Ending on September 14 2016 2°S to 2°N Average



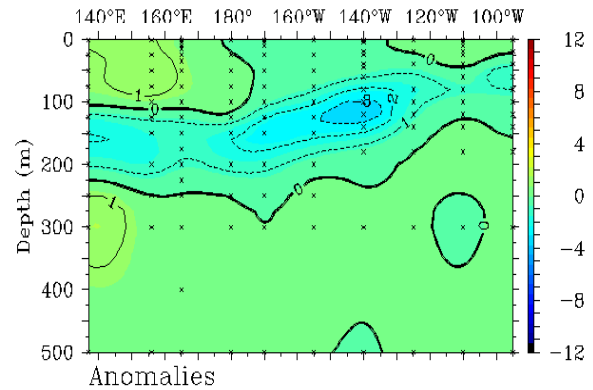
TAO Project Office/PMEL/NOAA Oct 5 2016

TAO/TRITON 5-Day Mean Temperatures (°C)
Ending on September 19 2016 2°S to 2°N Average



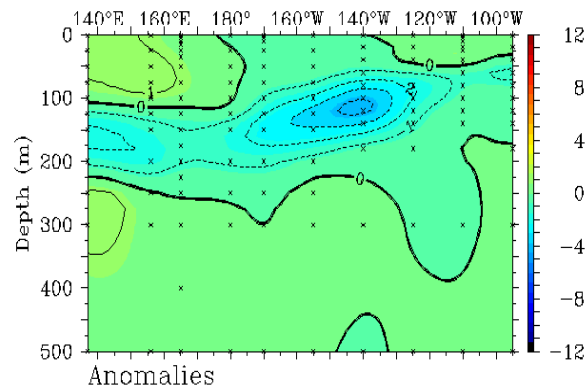
TAO Project Office/PMEL/NOAA Oct 5 2016

TAO/TRITON 5-Day Mean Temperatures (°C)
Ending on September 24 2016 2°S to 2°N Average



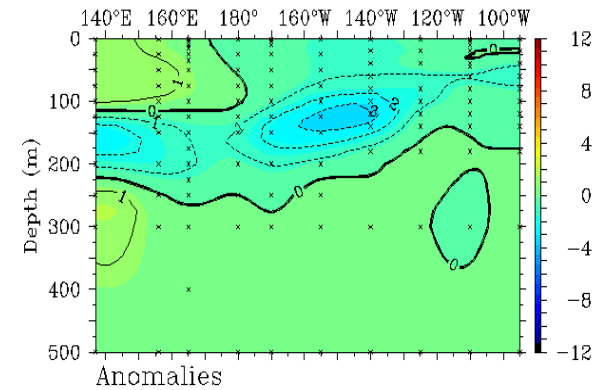
TAO Project Office/PMEL/NOAA Oct 5 2016

TAO/TRITON 5-Day Mean Temperatures (°C)
Ending on September 29 2016 2°S to 2°N Average



TAO Project Office/PMEL/NOAA Oct 5 2016

TAO/TRITON 5-Day Mean Temperatures (°C)
Ending on October 4 2016 2°S to 2°N Average



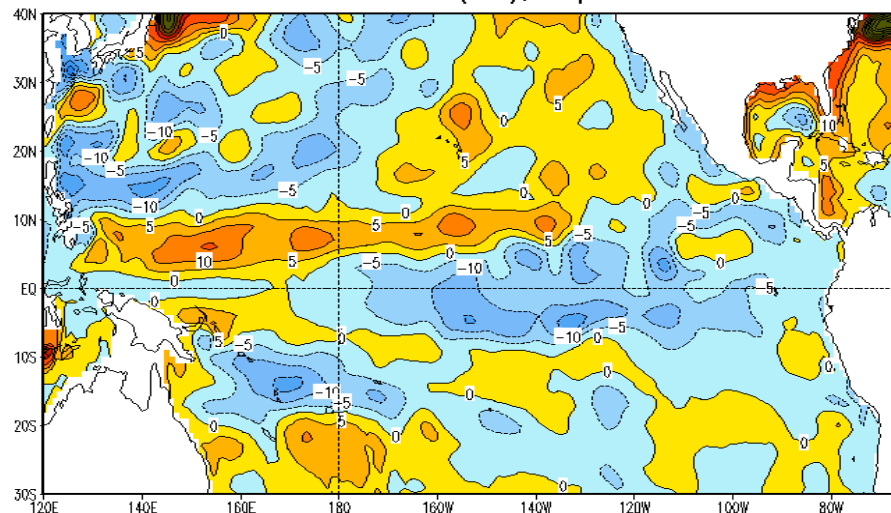
TAO Project Office/PMEL/NOAA Oct 5 2016

Fuente: PMEL/TAO/TRITON NOAA

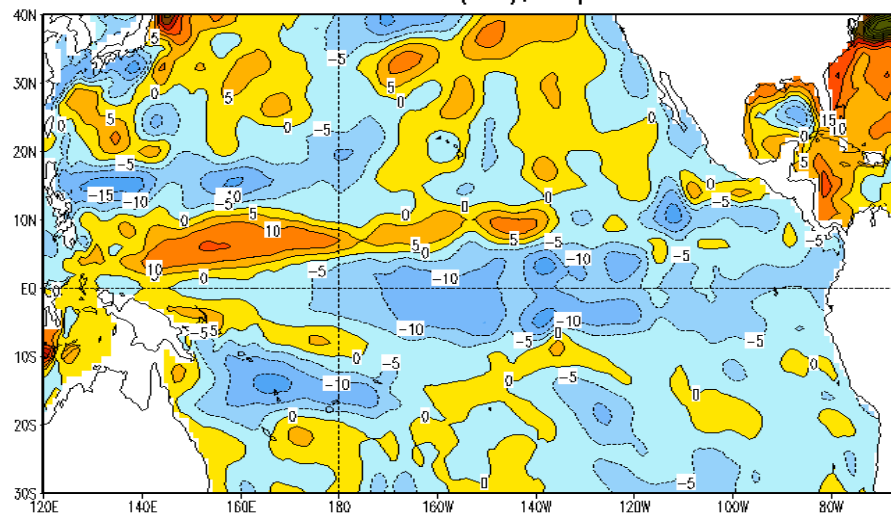
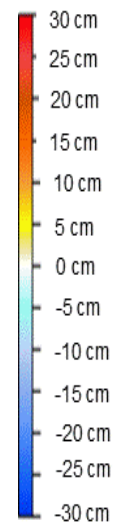


ANOMALÍAS DEL NIVEL DEL MAR EN EL PACÍFICO TROPICAL

Sea Level Anom (cm), Sep 05 2016

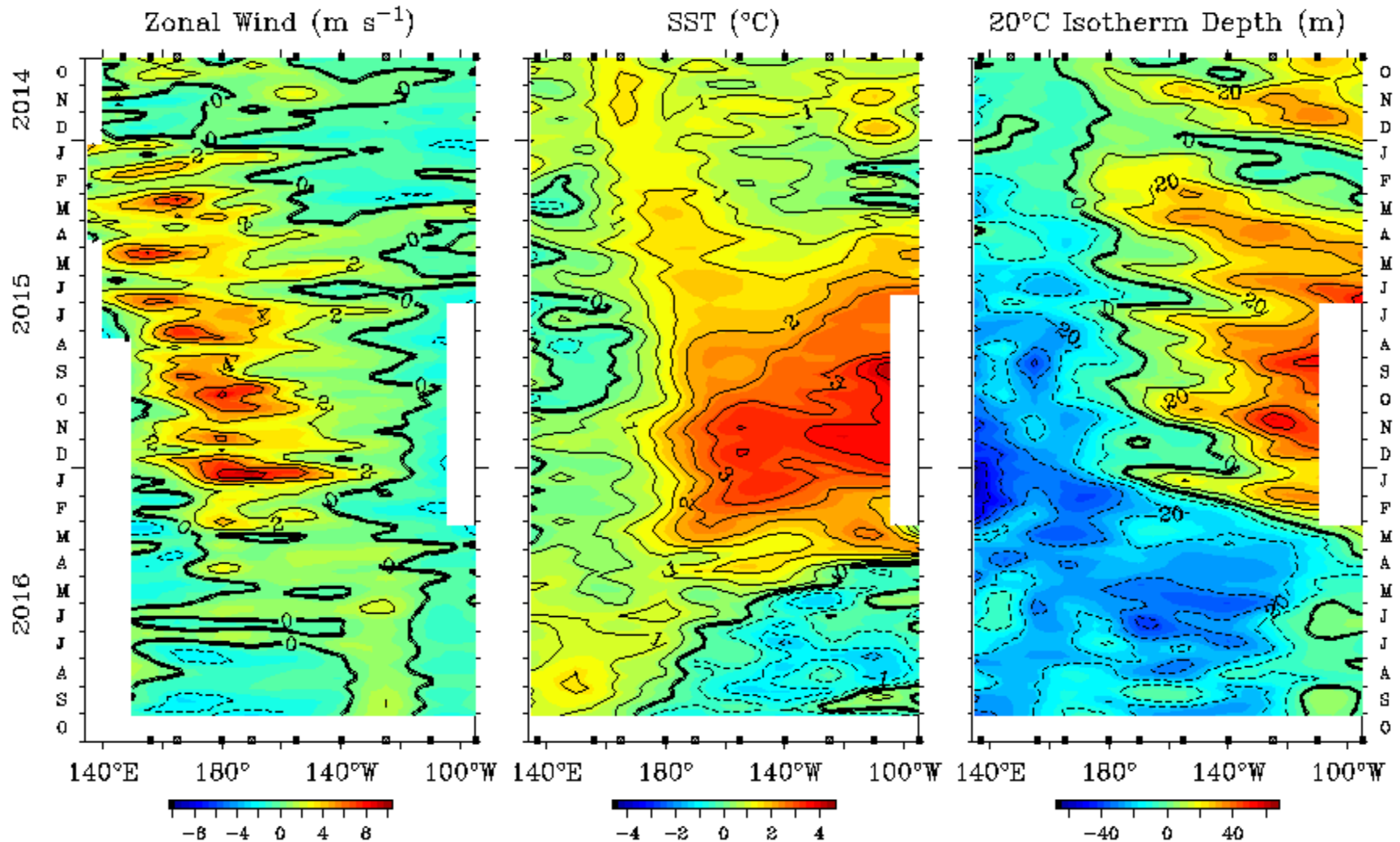


Sea Level Anom (cm), Sep 30 2016

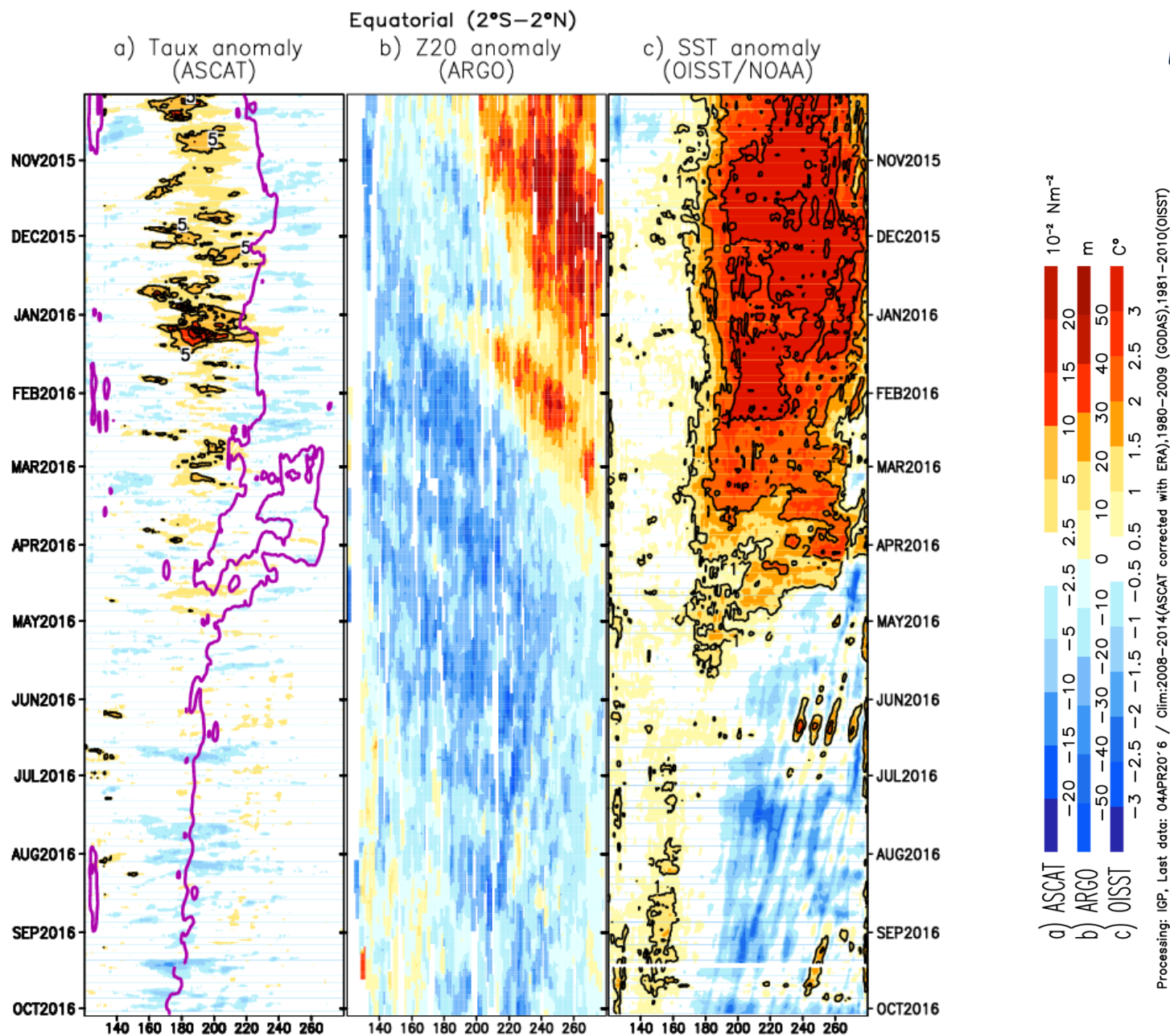


TAO a lo largo de la línea ecuatorial

Five Day Zonal Wind, SST, and 20°C Isotherm Depth Anomalies 2°S to 2°N Average



Esfuerzo de viento, termoclina y ATSM en la línea ecuatorial

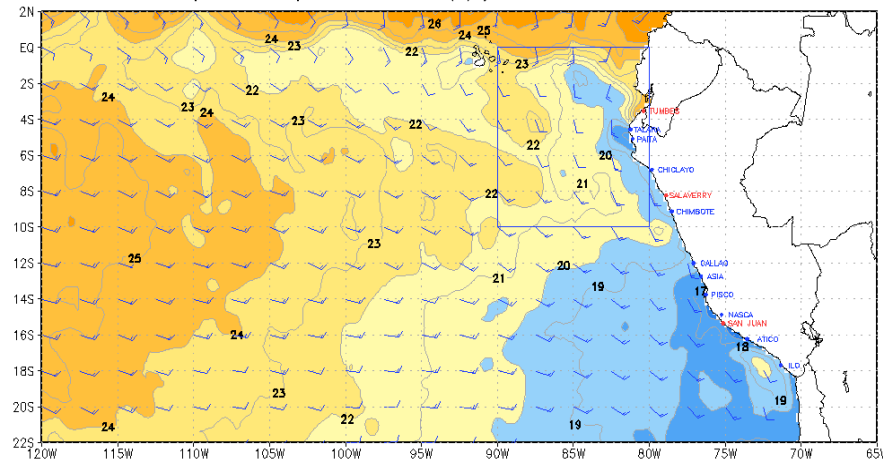




TEMPERATURA SUPERFICIAL DEL MAR EN EL PACÍFICO SUDORIENTAL

DIRECCION DE HIDROGRAFIA Y NAVEGACION
DPTO OCEANOGRAFIA – DIV METEOROLOGIA

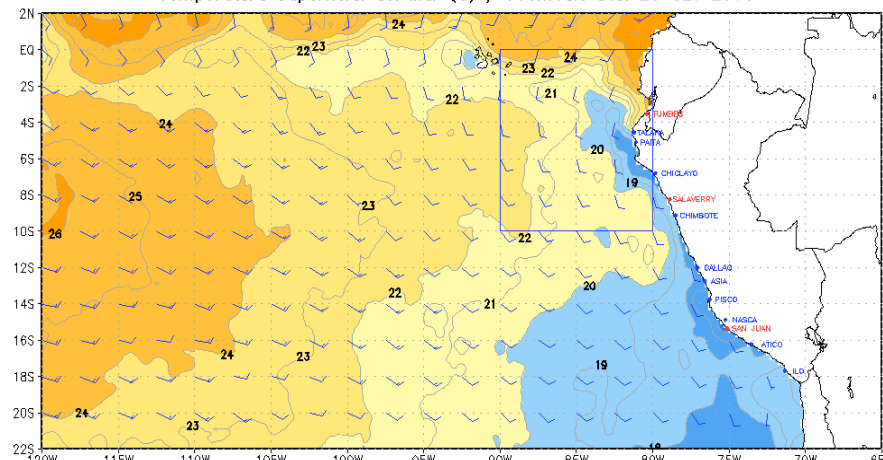
Temperatura Superficial del Mar (C) / Promedio Dia: 31 AGO 2016



Fuente: AVHRR – NCDC / NCEP–NOAA

DIRECCION DE HIDROGRAFIA Y NAVEGACION
DPTO OCEANOGRAFIA – DIV METEOROLOGIA

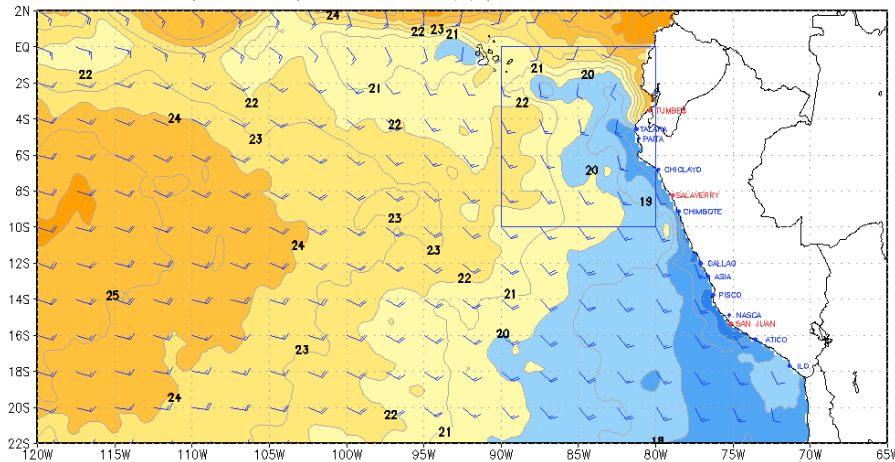
Temperatura Superficial del Mar (C) / Promedio Dia: 20 SET 2016



Fuente: AVHRR – NCDC / NCEP–NOAA

DIRECCION DE HIDROGRAFIA Y NAVEGACION
DPTO OCEANOGRAFIA – DIV METEOROLOGIA

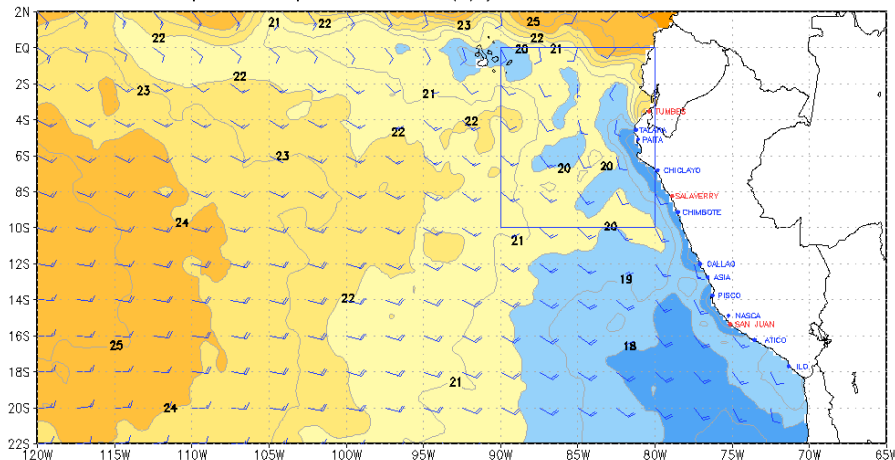
Temperatura Superficial del Mar (C) / Promedio Dia: 11 SET 2016



Fuente: AVHRR – NCDC / NCEP–NOAA

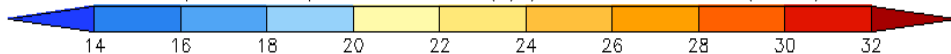
DIRECCION DE HIDROGRAFIA Y NAVEGACION
DPTO OCEANOGRAFIA – DIV METEOROLOGIA

Temperatura Superficial del Mar (C) / Promedio Dia: 04 OCT 2016



Fuente: AVHRR – NCDC / NCEP–NOAA

Temperatura Superficial del Mar (C) / Barbas de viento (nudos)



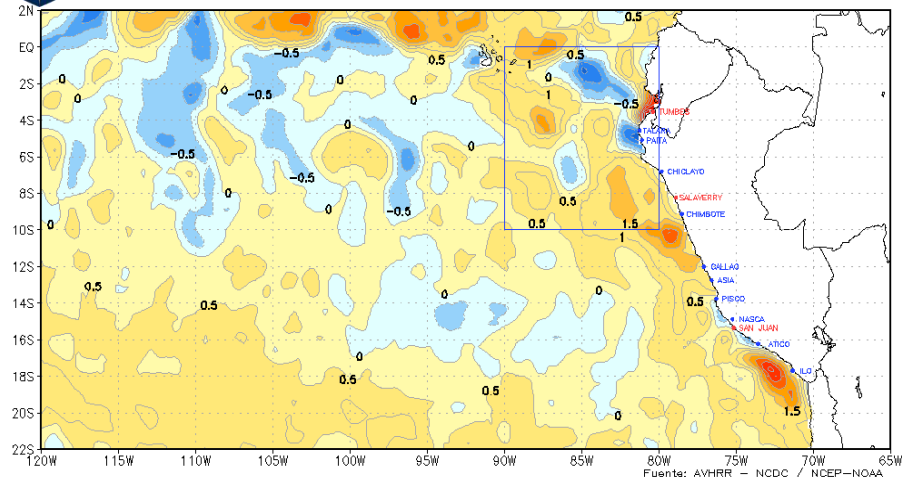
Fuente: Gráficos DHN, Datos NCEP/NOAA



ANOMALÍAS DE LA TEMPERATURA SUPERFICIAL DEL MAR EN EL PACÍFICO SUDORIENTAL

DIRECCION DE HIDROGRAFIA Y NAVEGACION
DPTO OCEANOGRAFIA – DIV METEOROLOGIA

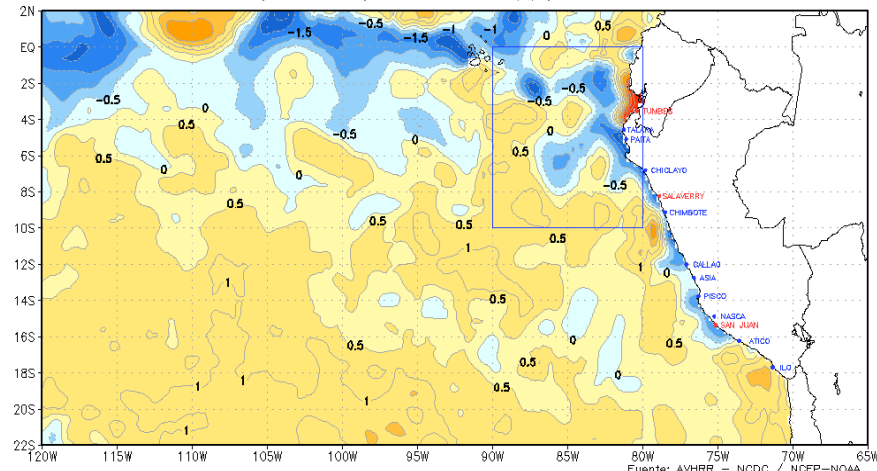
Anomalia de la Temperatura Superficial del Mar (C) / Promedio Dia: 31 AGO 2016



DIRECCION DE HIDROGRAFIA Y NAVEGACION
DPTO OCEANOGRAFIA – DIV METEOROLOGIA

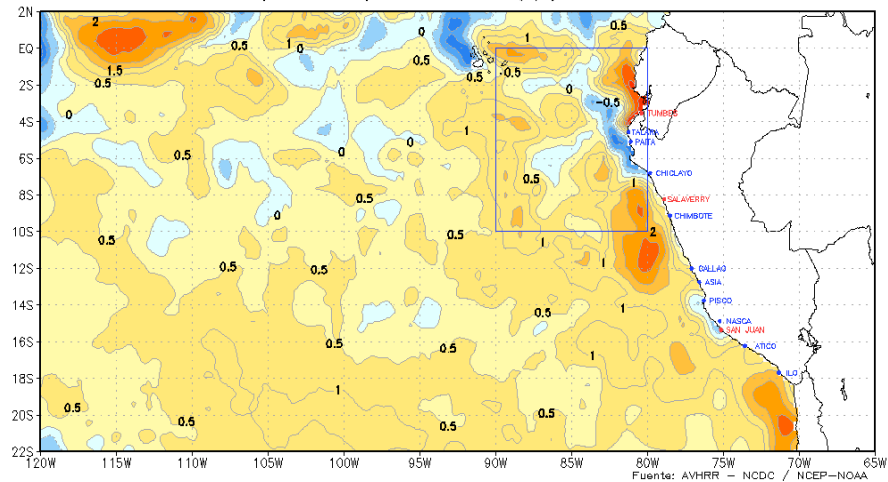
DIRECCION DE HIDROGRAFIA Y NAVEGACION
DPTO OCEANOGRAFIA – DIV METEOROLOGIA

Anomalia de la Temperatura Superficial del Mar (C) / Promedio Dia: 11 SET 2016

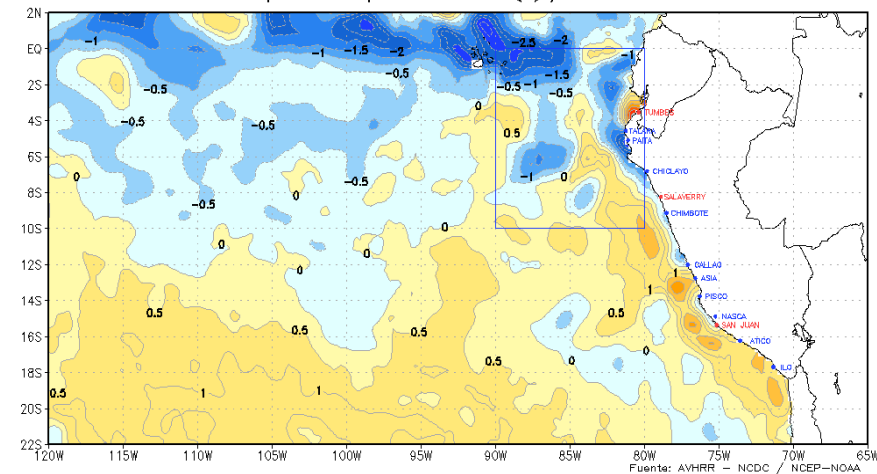


DIRECCION DE HIDROGRAFIA Y NAVEGACION
DPTO OCEANOGRAFIA – DIV METEOROLOGIA

Anomalia de la Temperatura Superficial del Mar (C) / Promedio Dia: 20 SET 2016



Anomalia de la Temperatura Superficial del Mar (C) / Promedio Dia: 04 OCT 2016



Anomalia de la Temperatura Superficial del Mar (C)



Valores del Índice Costero El Niño

El Niño
costero
duró hasta
junio →

Mes	ICEN	Categoría
12/2015	2.07	Cálida Fuerte
01/2016	1.77	Cálida fuerte
02/2016	1.49	Cálida Moderada
03/2016	1.07	Cálida Moderada
04/2016	0.77	Cálida Débil
05/2016	0.54	Cálida Débil
06/2016	0.43	Cálida Débil
07/2016	0.29	Neutra
08/2016	0.17	Neutra

Mes	ICENtmp	Categoría
09/2016	0.18*	Neutra
10/2016	0.25**	Neutra

* Se usaron los datos de (Ago. Set 2016) ERSST3v, (Oct. 2016) NMME.

** Se usaron los datos de (Set. 2016) ERSST3v, (Oct., Nov. 2016) NMME
NMME CI 2016 08

Valores del Oceanic Niño Index (ONI)

Mes	ONI	Categoría
12/2015	2.27	Cálida Muy fuerte
01/2016	2.22	Cálida Muy fuerte
02/2016	1.99	Cálida Fuerte
03/2016	1.58	Cálida Fuerte
04/2016	1.09	Cálida Moderada
05/2016	0.60	Cálida Débil
06/2016	0.10	Neutra
07/2016	-0.32	Neutra
08/2016	-0.54	Fría débil

El Niño en
el Pacífico
Central →
duró hasta
mayo

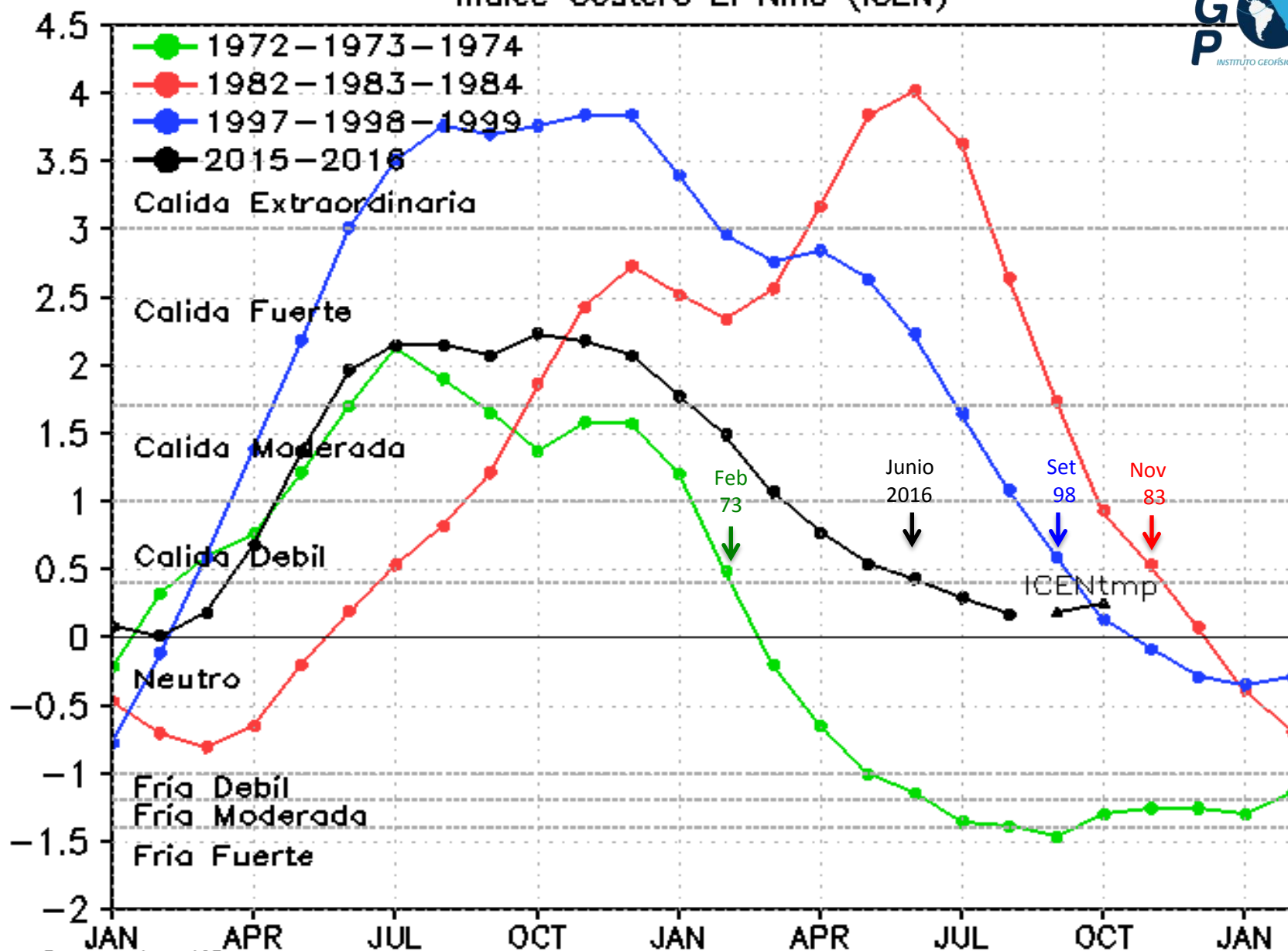
<http://www.cpc.ncep.noaa.gov/data/indices/oni.ascii.txt>

Mes	ONItmp	Categoría
09/2016	-0.54*	Fría débil
10/2016	-0.42**	Neutra

* Se usaron los datos de (Ago. Set 2016) ERSST4, (Oct. 2016) NMME (CI 2016 09).

** Se usaron los datos de (Set. 2016) ERSST4, (Oct. Nov 2016) NMME (CI 2016 09)

Indice Costero El Niño (ICEN)

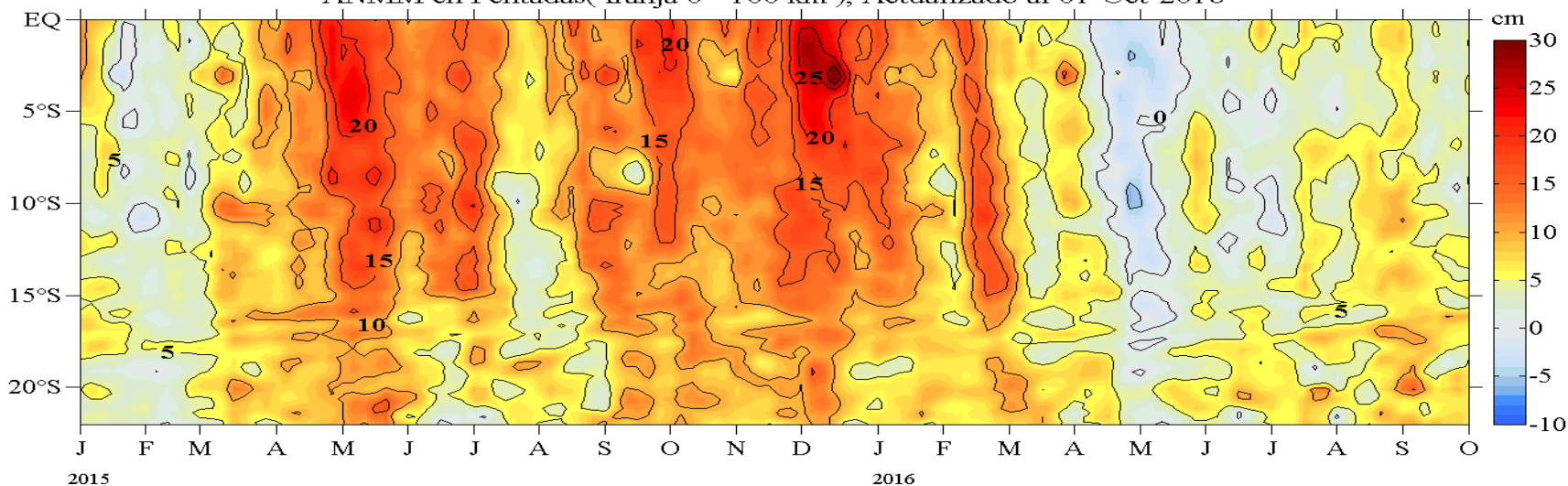


Preparacion: IGP.

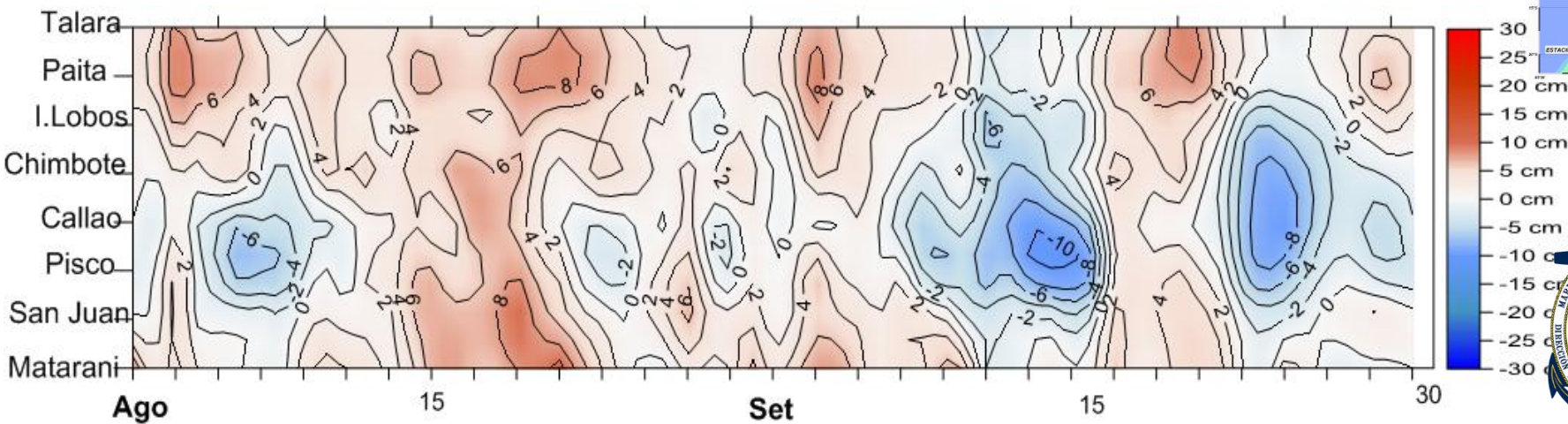
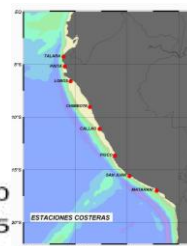
Actualizado: 05-09-2016.

ANOMALÍAS DEL NIVEL MEDIO DEL MAR EN EL LITORAL PERUANO

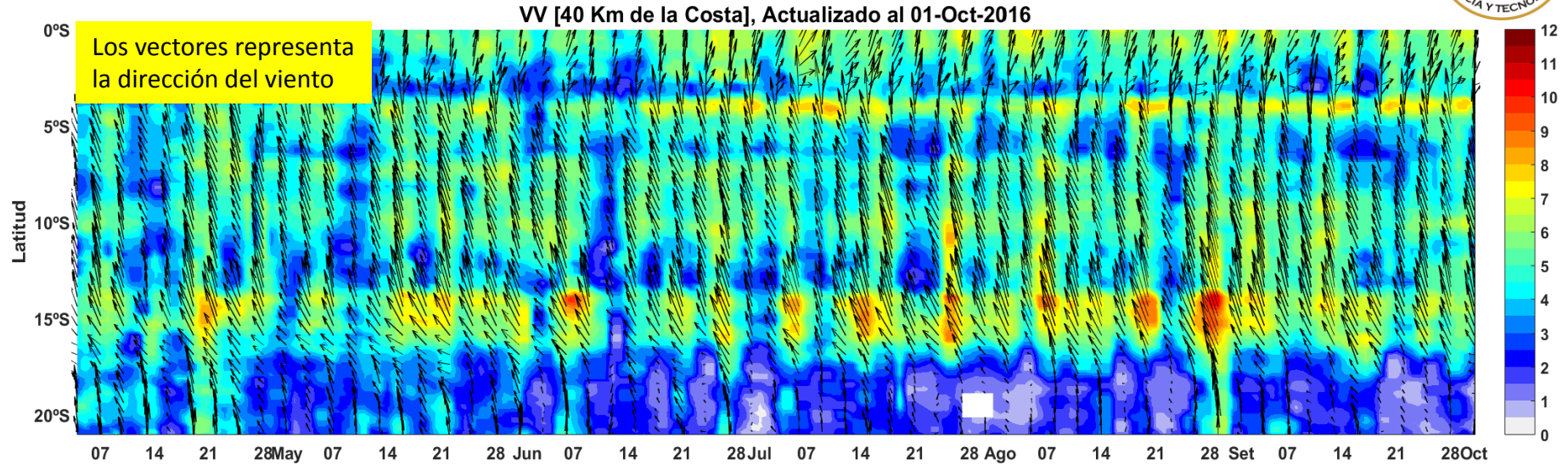
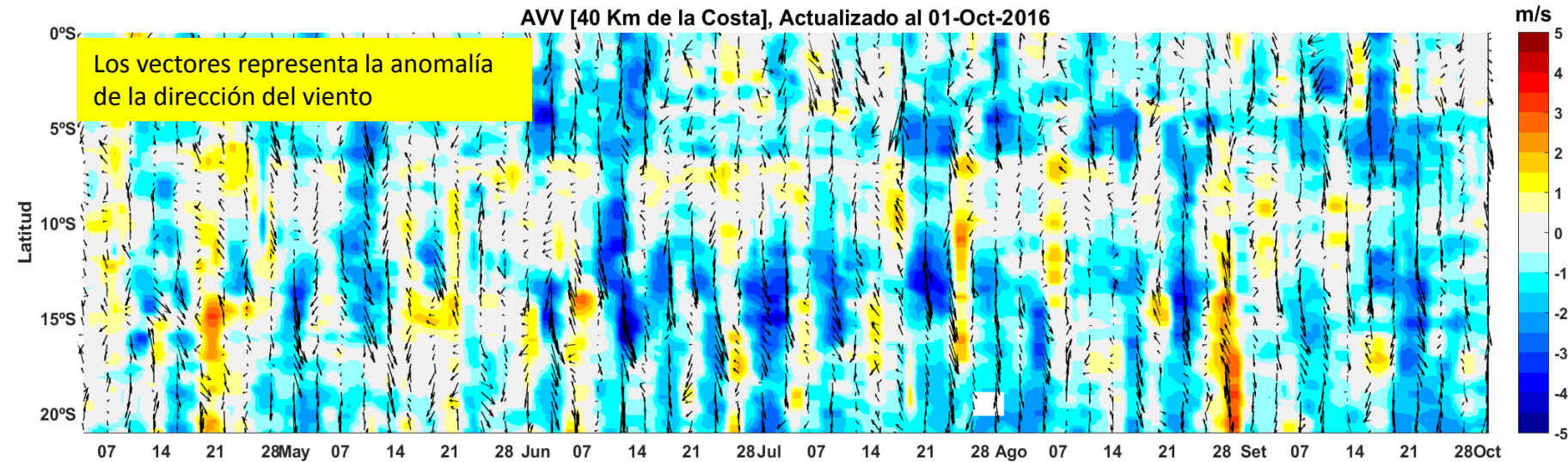
ANMM en Pentadas(franja 0 - 100 km), Actualizado al 01-Oct-2016



Fuente: CMEMS/ Procesado por Laboratorio de Hidro-Física marina/ IMARPE



Velocidad y Anomalías del Viento

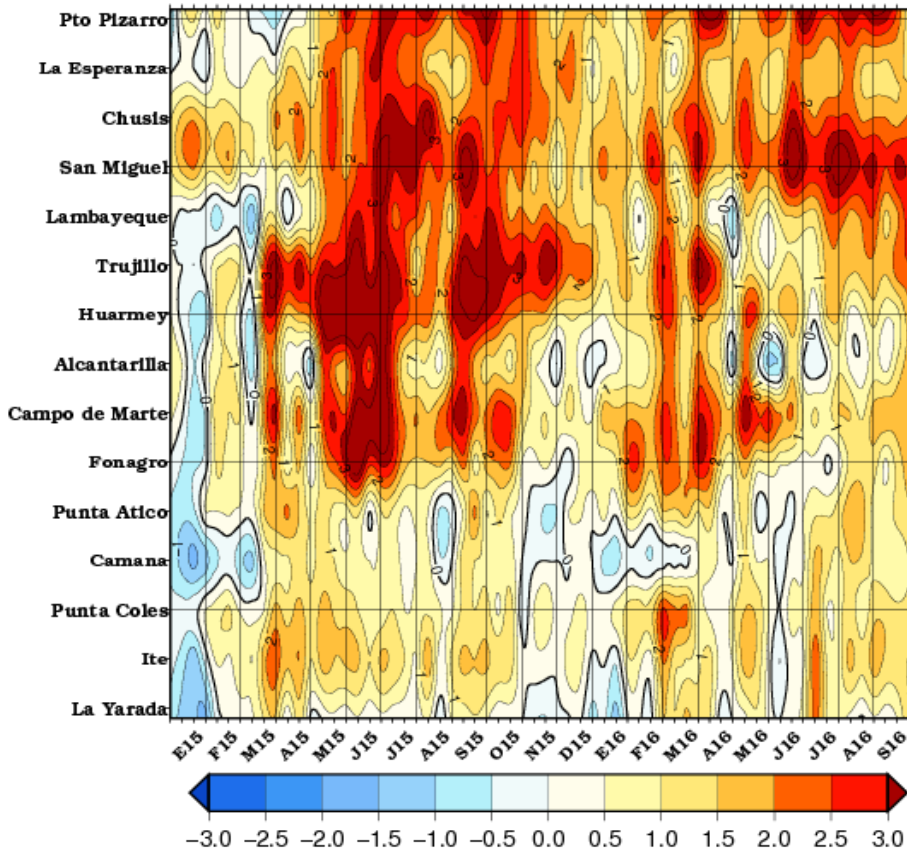


Viento Satelital (40 Km frente a la costa del Perú): a) Velocidad del viento (m/s), b) Anomalía de la velocidad del viento (m/s).

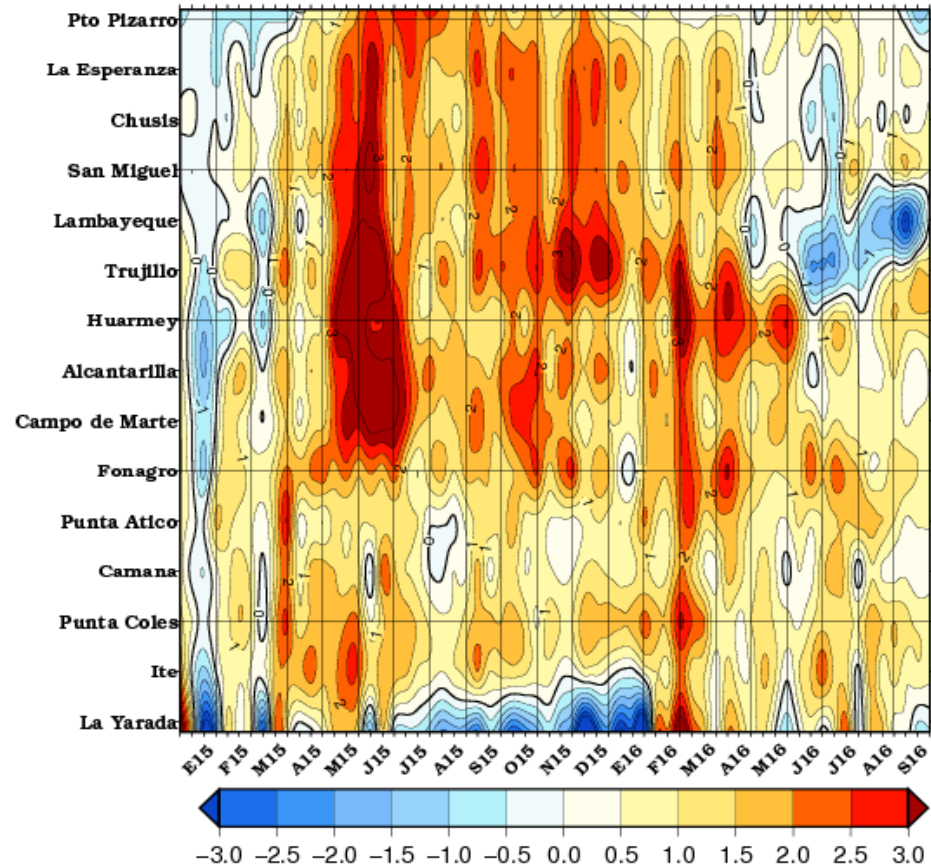
Fuente: Satélite ASCAT, Procesamiento: Laboratorio de Hidro-Física Marina, IMARPE

TEMPERATURAS EXTREMAS DEL AIRE

Anomalías de la
Temperatura Máxima



Anomalía de la
Temperatura Mínima



TEMPERATURAS EXTREMAS DEL AIRE

Figura 1

Distribución de las estaciones meteorológicas en el litoral peruano

ANOMALIAS PROMEDIO TEMPERATURA MÁXIMA

Estación	ENE	FEB	MAR	ABR	MAY	JUN	JUL	AGO	SEPT
Costa Norte	1.4	1.7	1.9	1.5	1.6	2.1	2.2	2.4	2.1
Costa Centro	1.0	1.7	2.0	1.3	1.8	1.2	0.8	0.8	1.2
Costa Sur	0.3	1.0	1.4	0.7	0.9	0.5	1.0	1.2	1.1

ANOMALIAS PROMEDIO TEMPERATURA MÍNIMA

Estación	ENE	FEB	MAR	ABR	MAY	JUN	JUL	AGO	SEPT
Costa Norte	1.6	1.5	1.2	1.0	0.4	0.2	0.0	0.0	0.1
Costa Centro	1.0	2.0	1.8	2.1	1.9	0.5	0.7	0.8	1.0
Costa Sur	0.2	1.8	1.5	1.3	0.7	0.9	1.2	1.1	0.8

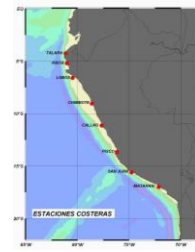
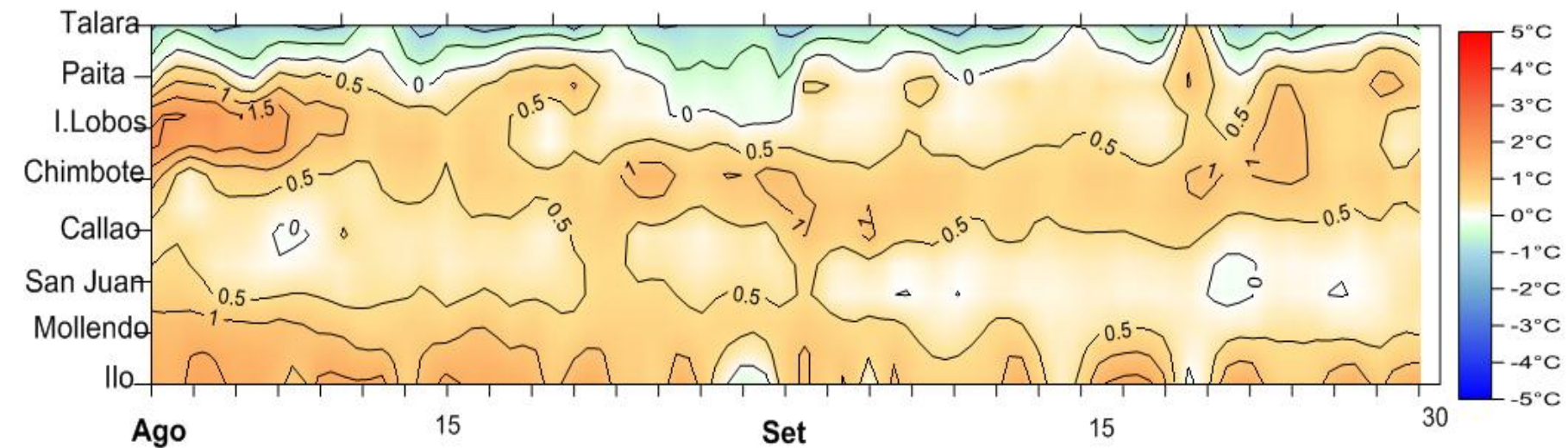
Estación	DIC_2015	ENE	FEB	MAR	ABR	MAY	JUN	JUL	AGO	SEPT
Puerto Pizarro	1.7	1.1	1.9	2.1	2.7	2.1	2.7	2.6	3.1	2.4
La Esperanza	1.4	1.2	1.3	1.2	1.4	1.7	2.1	1.7	1.7	1.5
Chusis	1.6	1.5	1.7	2.4	1.7	2.1	2.5	2.3	2.1	2.0
San Miguel	1.5	1.8	2.3	1.9	1.8	2.3	3.3	3.3	3.3	2.9
Lambayeque	1.5	1.3	1.1	1.5	-0.1	0.9	1.4	1.9	2.1	1.8
Trujillo	2.2	1.4	1.8	2.3	1.7	0.8	0.9	1.4	2.0	1.9
Huarmey	1.0	1.0	1.8	2.2	1.1	2.0	1.6	1.1	0.7	0.8
Alcantarilla	0.2	0.3	1.2	1.8	0.7	0.5	0.2	0.2	0.4	0.9
Campo de Marte	0.8	1.7	2.0	2.1	2.1	2.9	1.6	1.2	1.4	1.8
Fonagro	0.4	1.3	2.2	2.5	1.5	1.3	0.5	0.1	1.2	0.8
Punta Atico	0.4	0.7	1.0	1.5	0.7	0.4	0.2	1.0	1.5	1.3
Camana	-0.2	-0.6	-0.4	0.1	0.4	0.7	0.1	1.2	1.3	0.8
Punta Coles	0.4	0.8	1.7	1.8	0.5	1.2	0.5	1.0	1.0	1.6
Ite	0.5	0.2	1.0	1.0	0.7	1.2	1.2	1.3	1.5	1.6
La Yarada	-0.1	-0.4	0.6	1.2	0.4	0.6	0.4	1.2	0.5	0.6

Estación	DIC_2015	ENE	FEB	MAR	ABR	MAY	JUN	JUL	AGO	SEPT
Puerto Pizarro	1.5	0.7	0.7	0.5	0.4	0.7	0.6	0.7	0.2	-0.6
La Esperanza	2.2	1.8	1.3	1.2	0.9	0.4	0.3	0.4	0.3	0.7
Chusis	2.2	1.4	1.4	1.2	1.0	0.1	-0.2	-0.1	0.2	0.3
San Miguel	2.2	1.7	1.6	1.7	1.4	0.7	0.4	0.7	0.7	1.4
Lambayeque	2.4	1.8	1.5	1.2	0.4	0.0	-0.4	-0.6	-1.9	-1.9
Trujillo	3.1	2.0	2.6	1.4	1.7	0.5	-1.4	-1.3	0.2	0.9
Huarmey	1.4	1.1	2.1	2.3	2.7	2.6	0.9	1.0	1.0	1.6
Alcantarilla	1.9	0.8	2.1	1.8	1.7	1.5	0.3	0.8	0.6	0.5
Campo de Marte	0.9	1.2	1.9	1.4	2.0	1.5	0.3	0.2	0.8	0.8
Fonagro	1.6	0.5	1.9	2.3	2.3	1.1	1.7	1.9	0.8	1.4
Punta Atico	0.8	1.4	1.4	1.9	1.3	0.6	0.9	1.6	1.5	0.9
Camana	1.0	0.8	1.3	0.7	1.2	0.6	0.7	0.9	0.5	0.3
Punta Coles	1.7	1.8	2.2	1.8	0.7	0.9	0.9	1.2	1.6	1.2
Ite	0.6	0.1	1.4	0.9	0.8	0.9	0.6	0.8	1.2	1.0
La Yarada	-2.9	-3.3	2.5	1.5	1.3	0.2	0.4	0.9	1.1	0.2





ANOMALÍAS DE LA TEMPERATURA SUPERFICIAL DEL MAR EN EL LITORAL PERUANO



Estación	ATSM (																		
	°C)										2016								
	Ma r.	Abr.	May.	Jun.	Jul.	Ago.	Set.	Oct.	Nov.	Dic.	Ene	Feb	Mar.	Abr.	May.	Jun.	Jul.	Ago.	Set.
Talara	-0.1	1.1	3	2.6	2.5	1.2	2.5	3.2	3.0	3.1	1.3	-0.8	0.2	0.2	-0.9	-1.9	-1.4	-0.9	-0.7
Paíta	0.3	0.6	3.7	3.2	2.8	2.1	3.2	3.2	2.8	4.6	1.6	-0.1	0.8	0.7	0.2	0.1	0.0	0.3	0.6
Isla Lobos de Afuera	-0.4	0.6	2.2	3.4	2.4	1.4	2.1	2.4	1.7	2.7	2.4	0.5	1.0	0.9	-0.3	0.9	0.6	0.8	0.3
Chimbote	-0.6	-0.6	2.5	4.6	2.5	2.2	2.4	2	1.3	1.5	2.7	1.5	1.3	0.7	0.7	0.1	0.4	0.8	0.9
Callao	-0.4	0.1	2.5	3.2	2.1	1.7	1.8	2.1	2.2	3.1	3.5	2.9	1.7	1.7	1.1	0.5	0.3	0.3	0.5
San Juan	0.1	0.3	0.8	1.6	0.8	1	1.1	1	1.7	1.7	2.0	1.8	1.4	1.6	0.6	0.1	0.4	0.4	0.1
Mollendo	0.5	0.7	1.2	1.7	1.5	0.8	2.3	1.5	1.0	1.2	2.3	2.4	1.9	0.8	1.0	0.7	0.9	0.9	0.5
Ilo	0.8	0.5	1.1	1.6	1.9	0.7	1.8	1.5	1.1	1.7	2.0	2.5	1.8	0.7	0.4	0.5	0.6	1.1	1.0

MONITOREO DE TSM Y ATSM, A TRAVÉS DE REGISTROS *IN SITU* Y OBSERVACIONES VÍA SATELÍ (setiembre 2016)

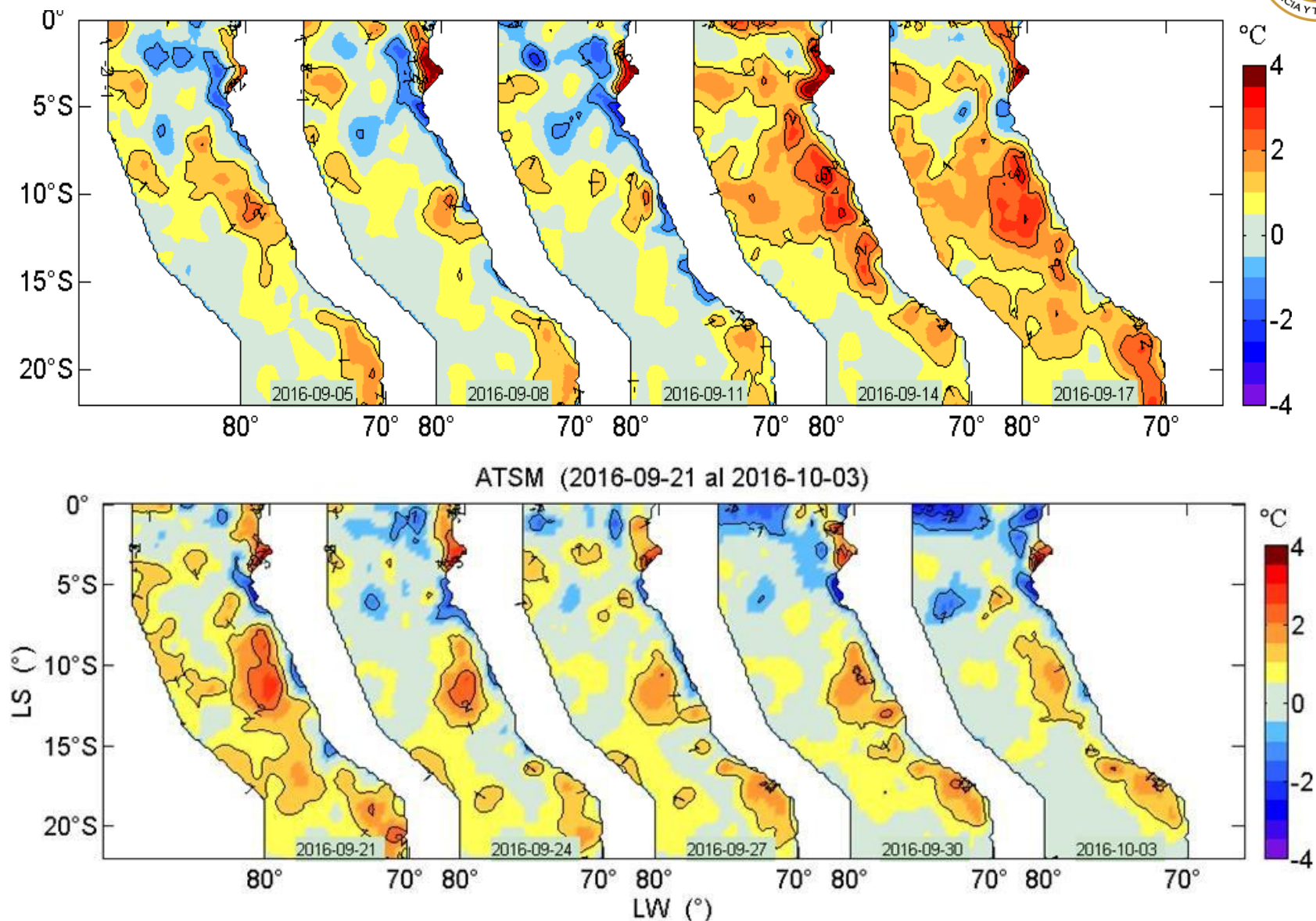
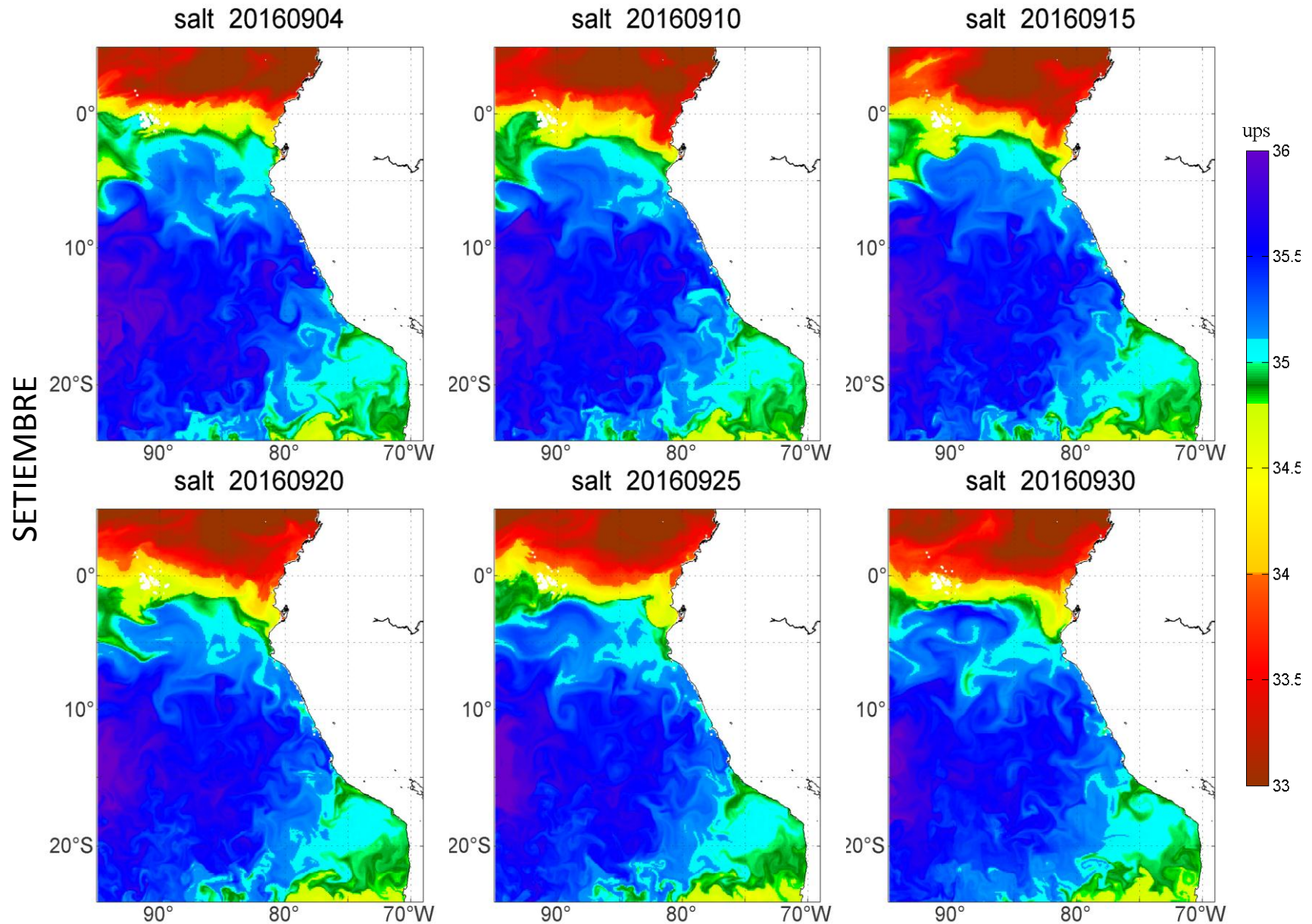
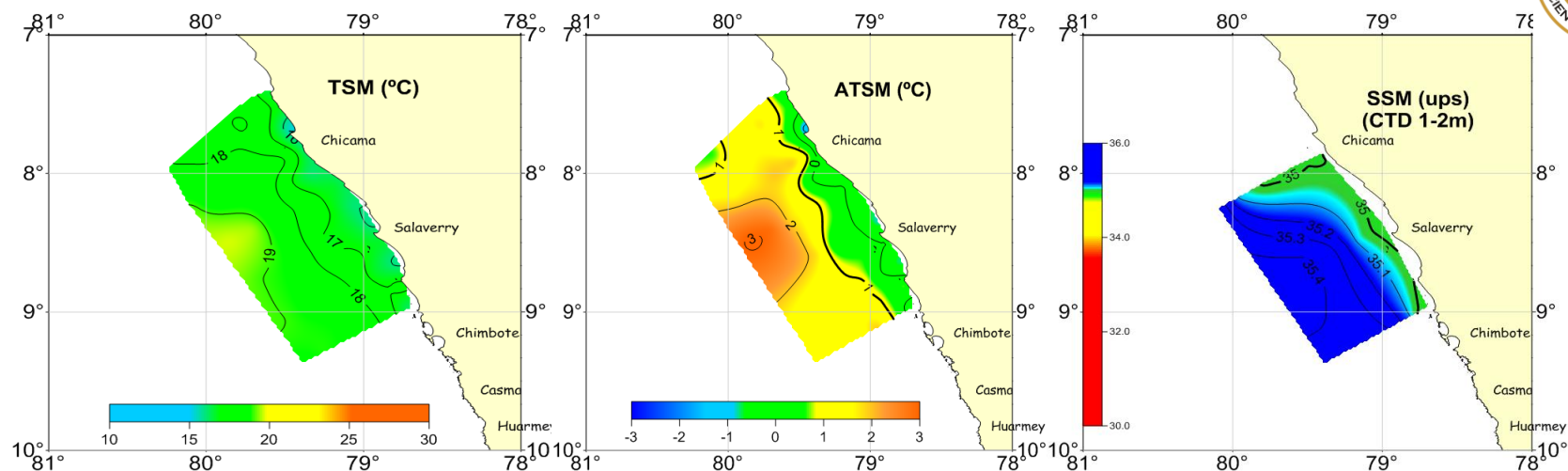


Figura. Anomalías de la temperatura superficial del agua ($^{\circ}$ C) en el mar peruano, cada tres días para setiembre de 2016. Datos: AVHRR/NOAA. Procesamiento: IMARPE.

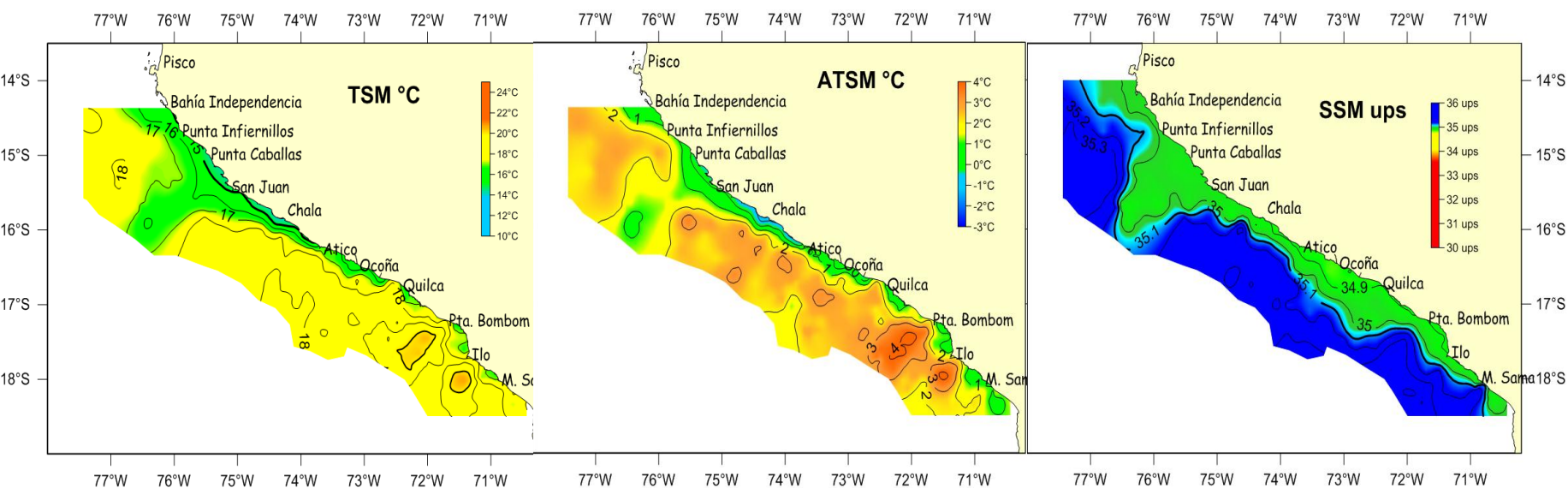
Distribución espacial de Salinidad Superficial del Mar (HYCOM), los días 04, 10, 15, 20, 25 y 30 de setiembre del 2016



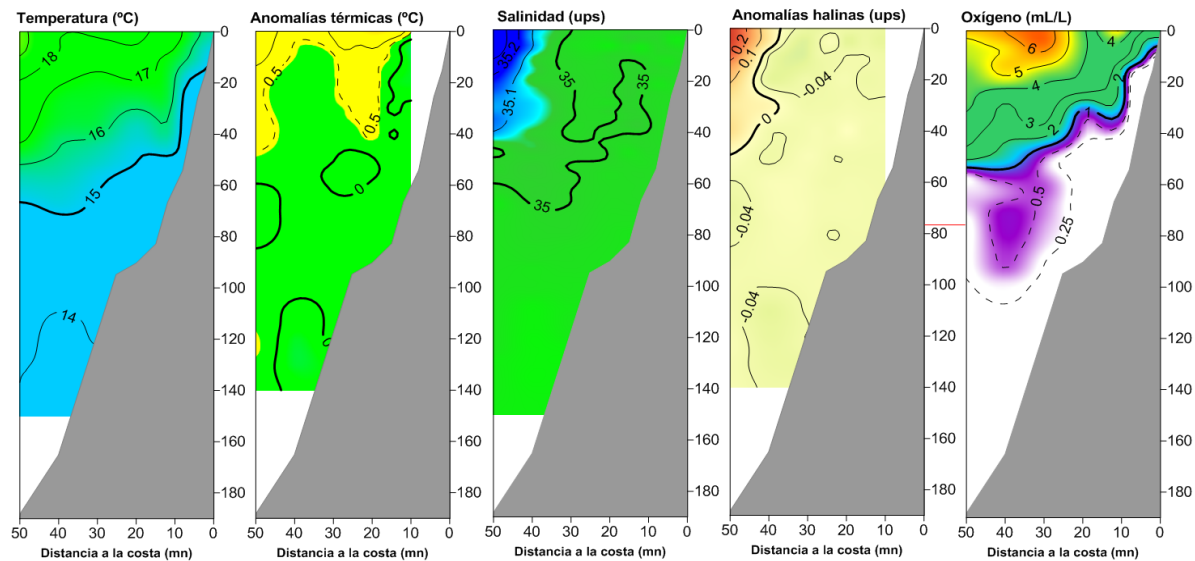
Seguimiento Larval 1609 BIC IMARPE V (16-24 de setiembre del 2016)



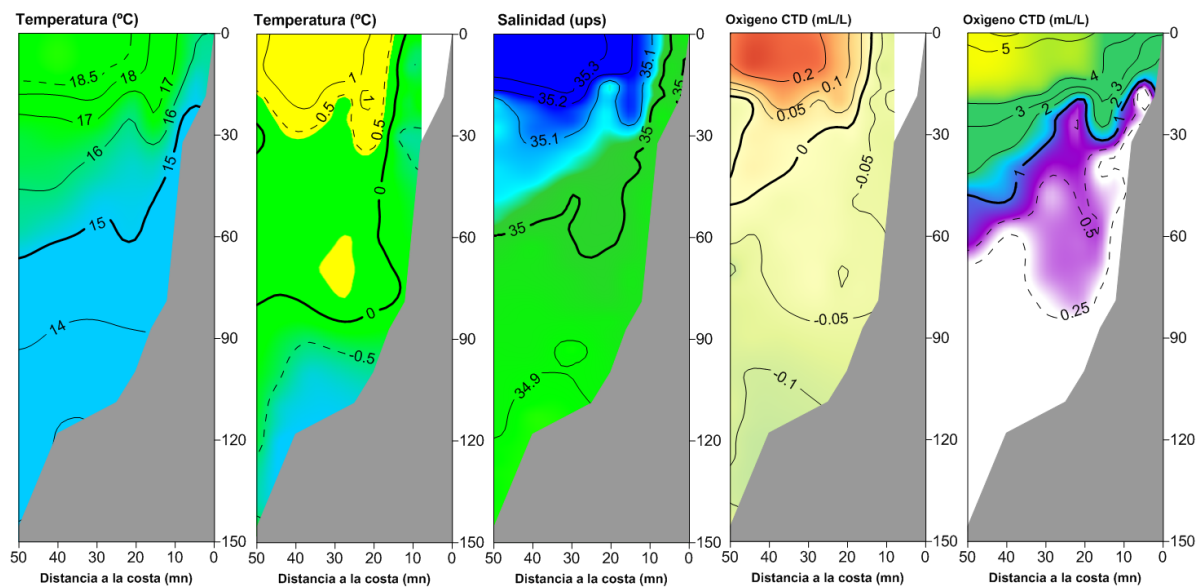
Crucero Evaluación de Recursos Pelágicos (15 setiembre- 3 octubre 2016)



SEGUIMIENTO LARVAL 1609
Sección Chicama (21 setiembre 2016)
L/C IMARPE V.



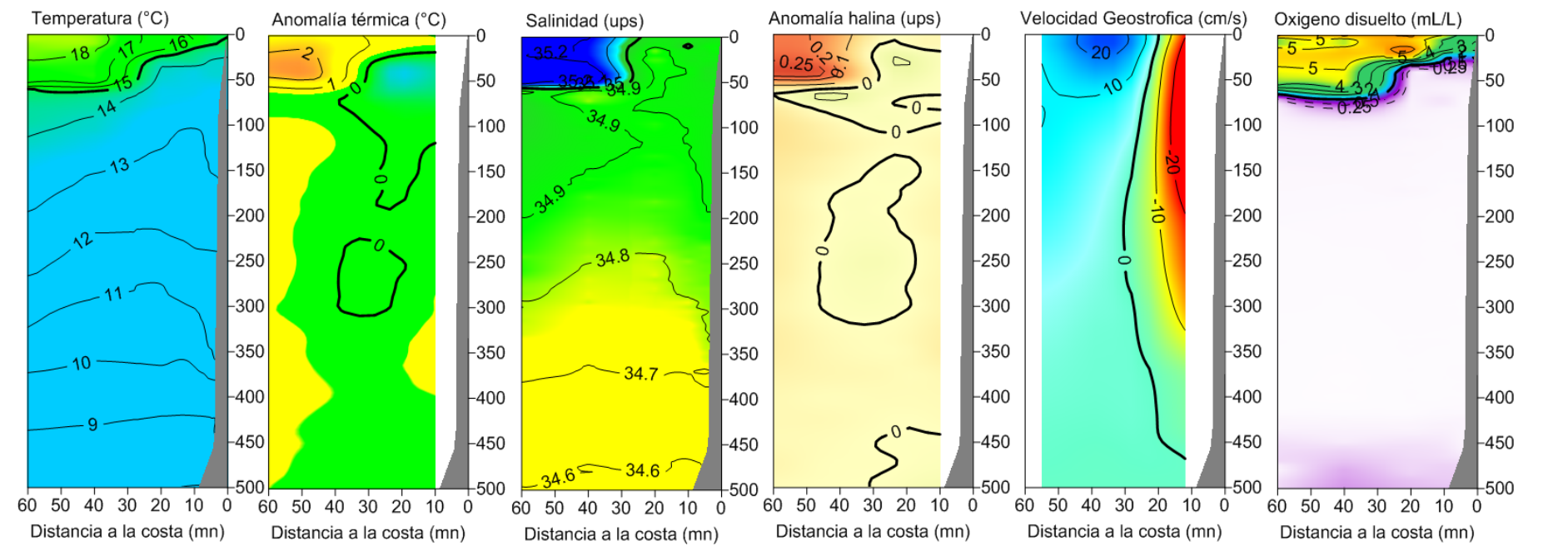
Sección Chimbote (18-19 setiembre 2016)
L/C IMARPE V.



CRUCERO PELAGICO 1609-10



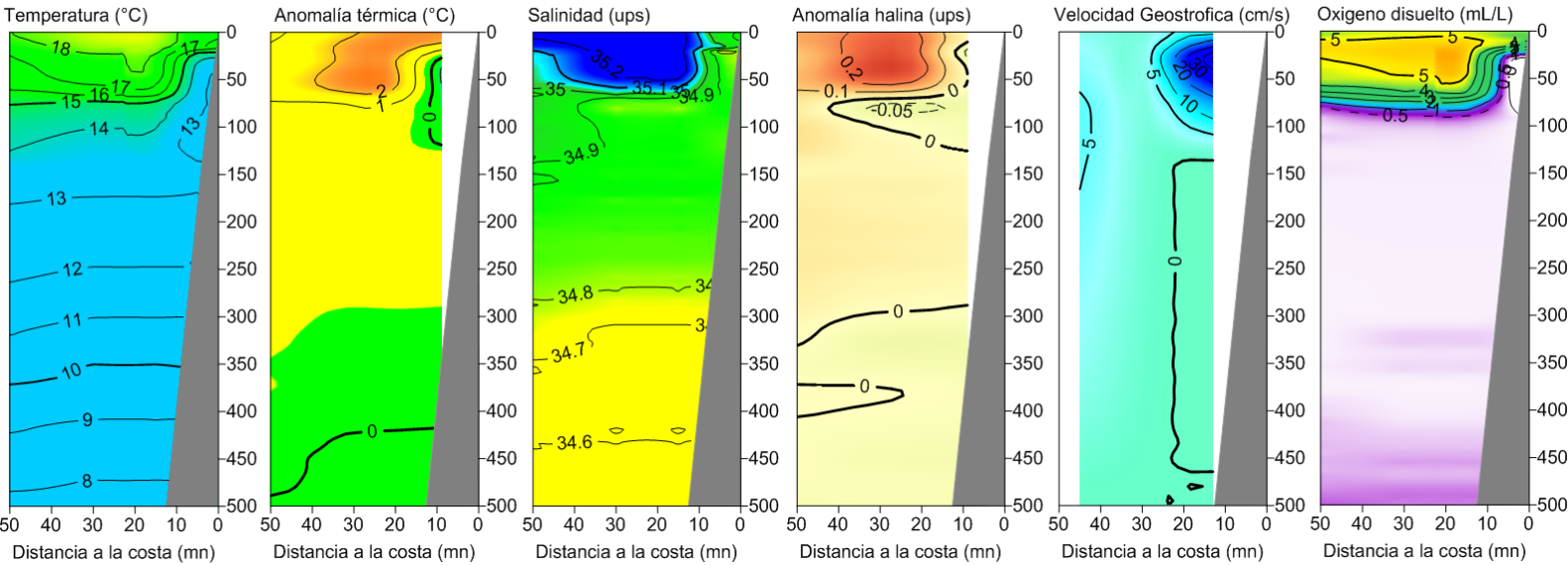
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Sección San Juan (27-28 setiembre 2016)



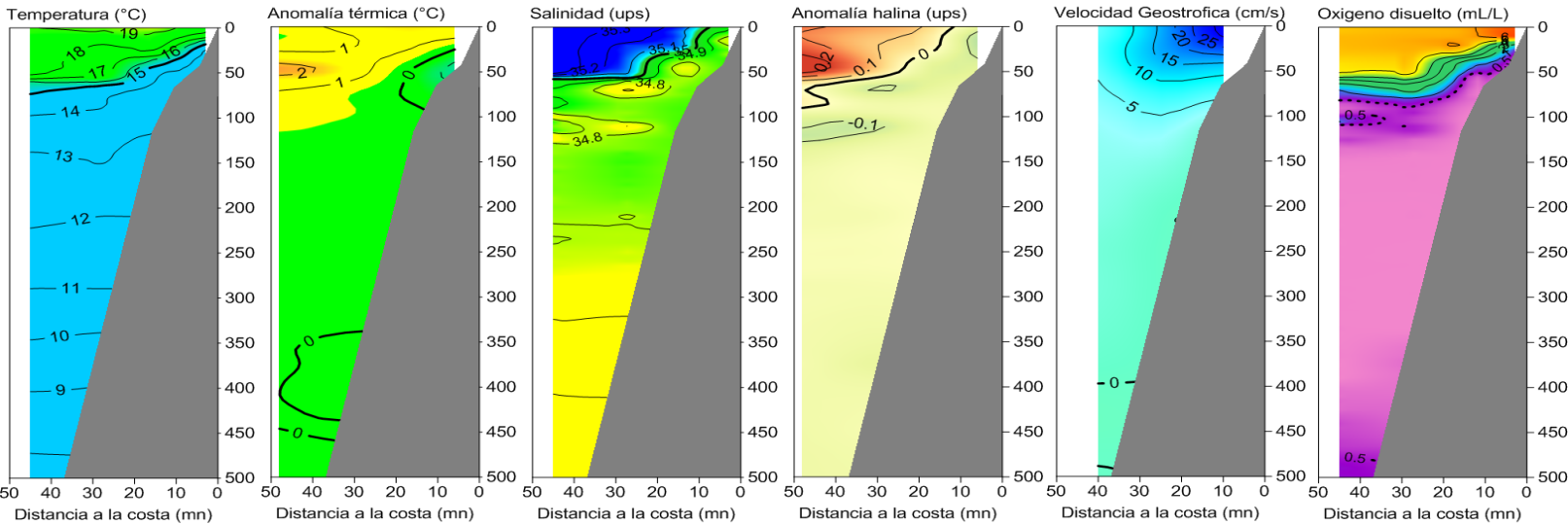
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Cr. Pelágico 1609-10 BIC Olaya
Sección Atico (25 setiembre 2016)



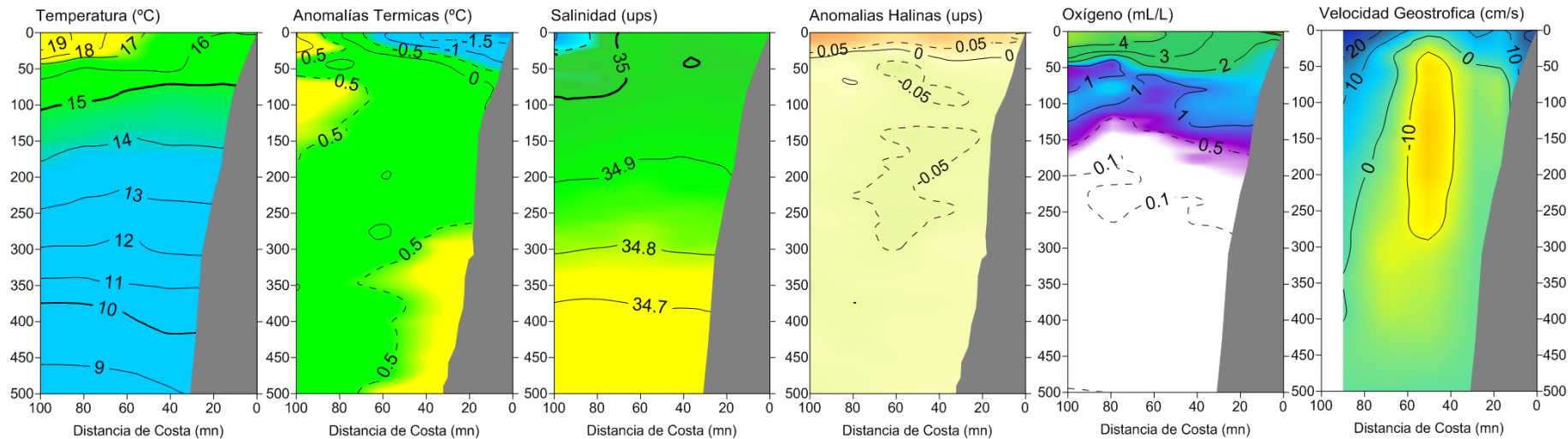
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Sección Ilo (21 setiembre 2016)



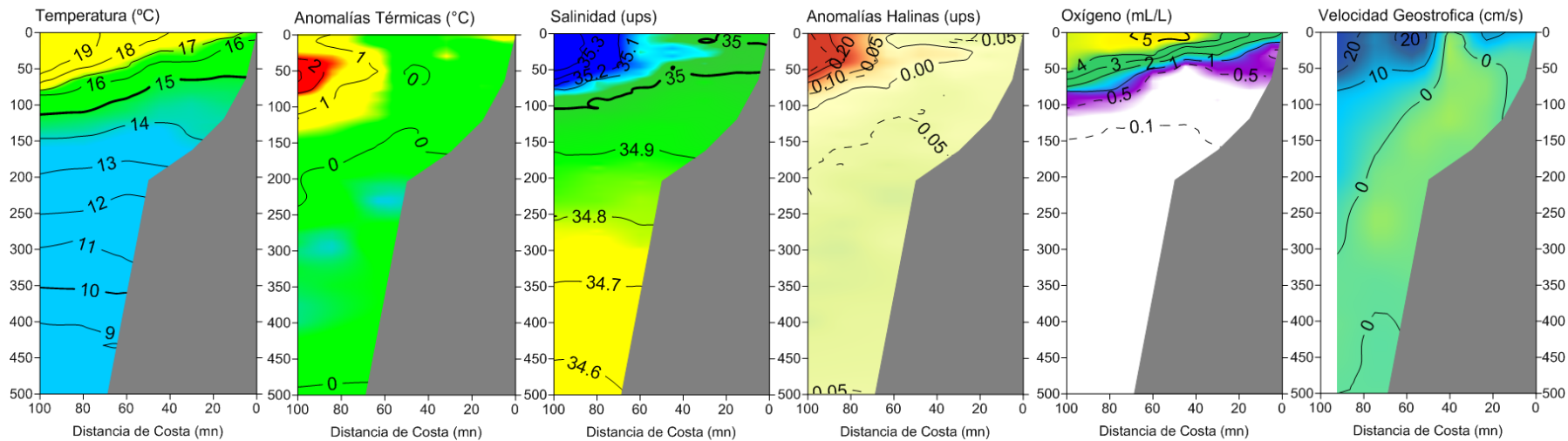
LÍNEAS MONITOREO BIO-OCEANOGRÁFICO



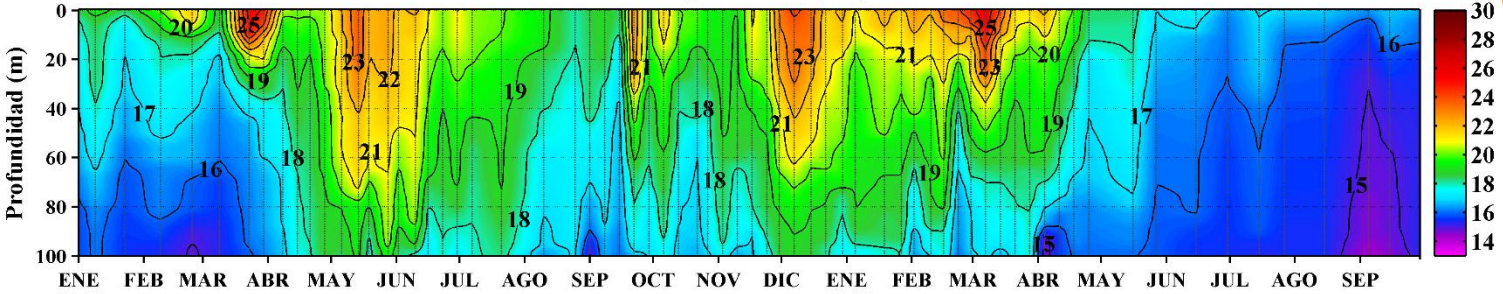
SECCION PAITA (03-04/10/2016)



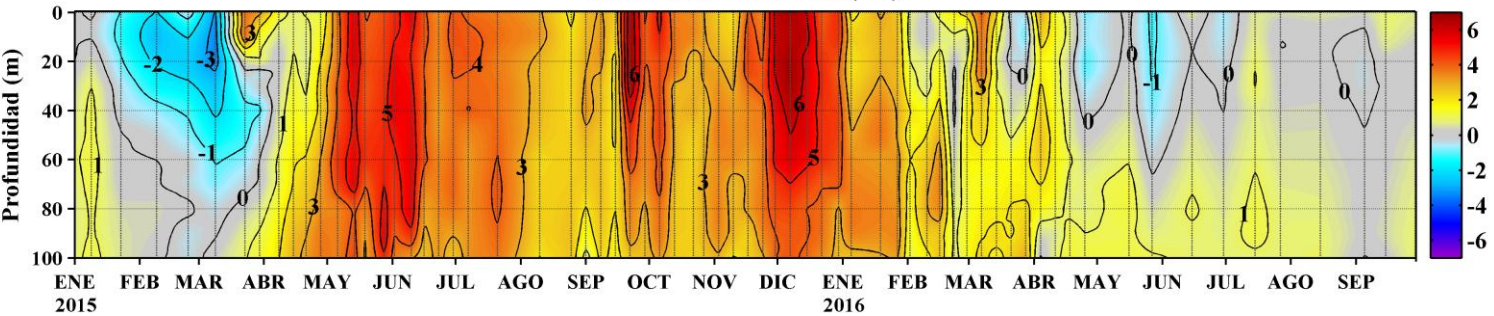
SECCION CHICAMA (01-02/10/2016)



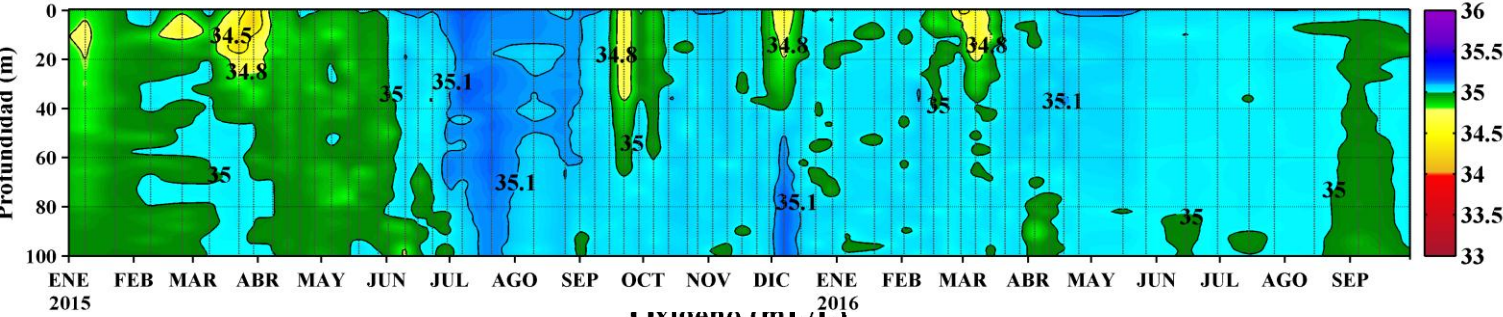
Temperatura (°C)



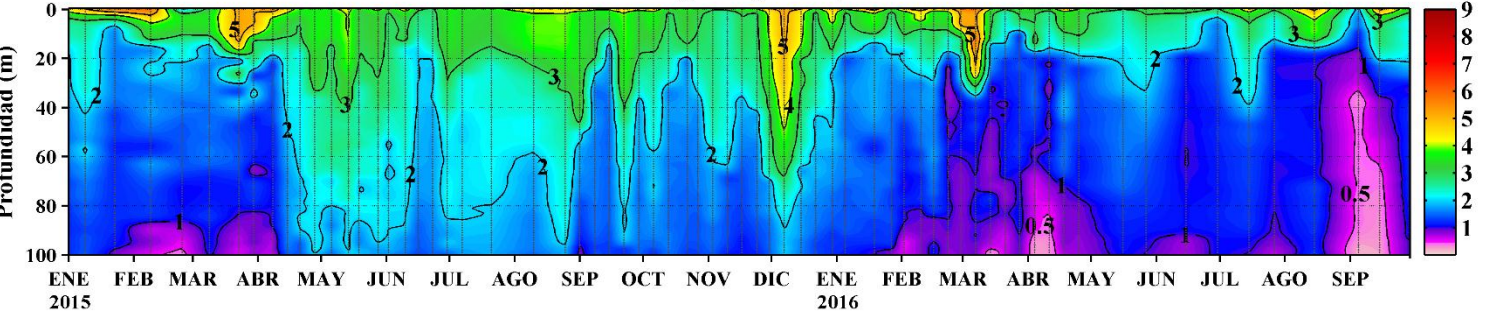
Anomalia Térmica (°C)



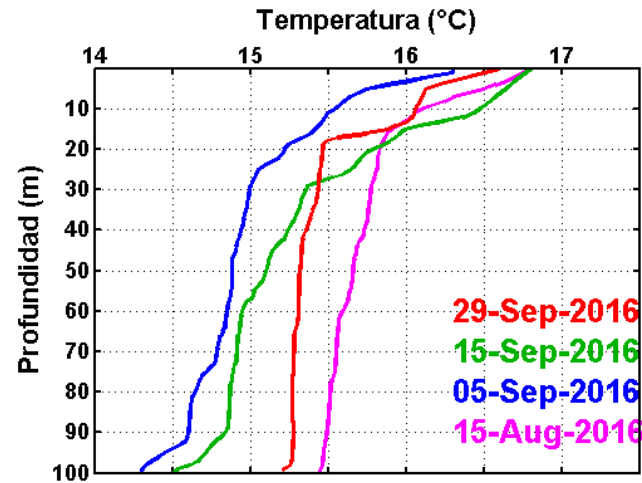
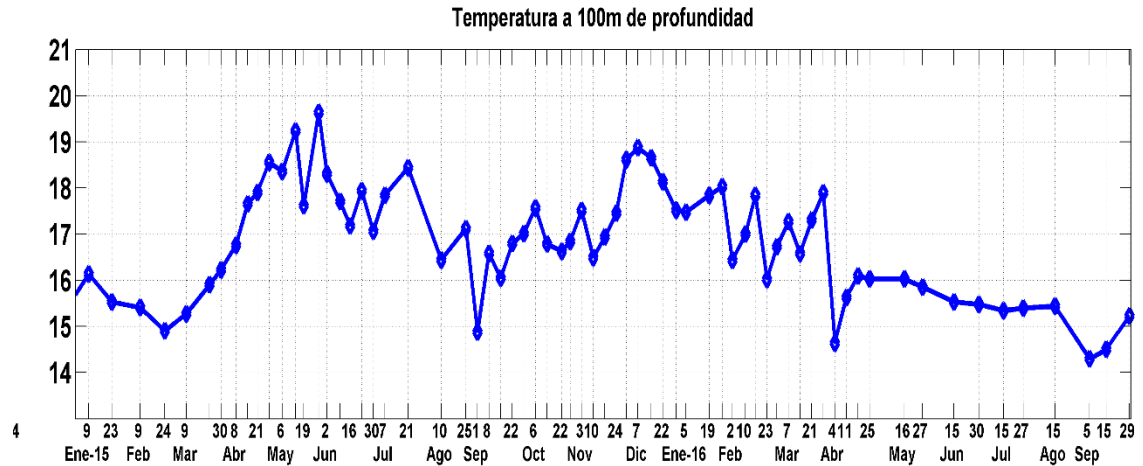
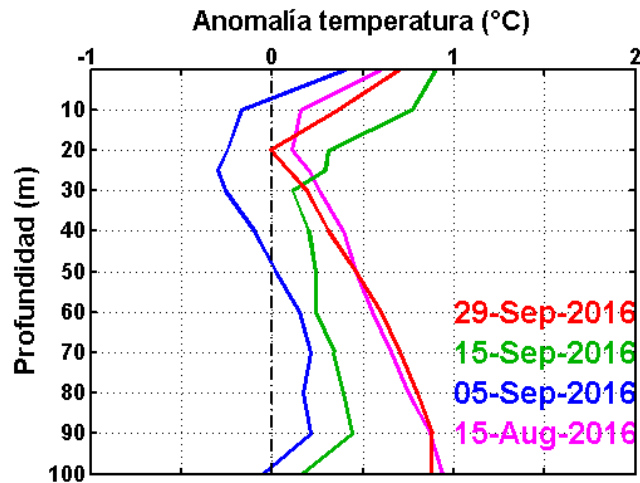
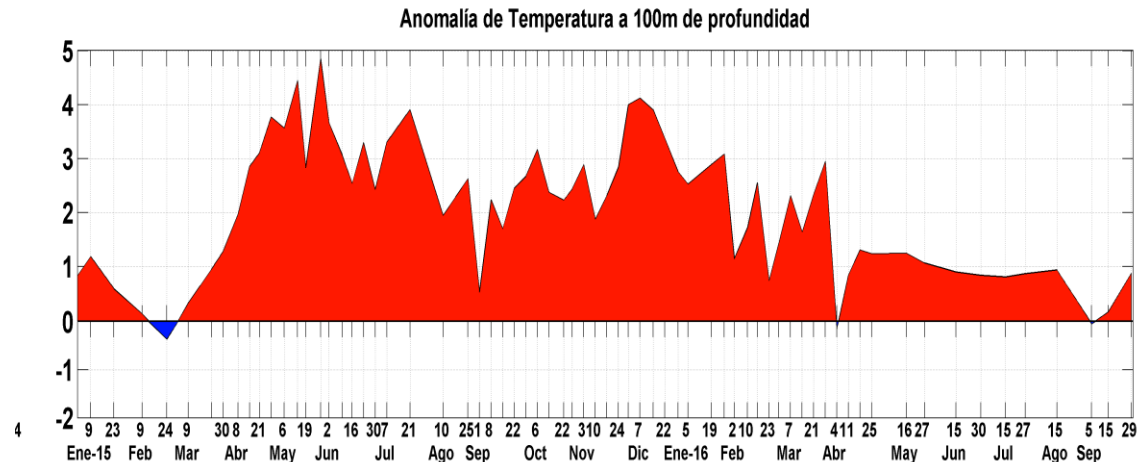
Salinidad (ups)



Oxígeno (mL/L)



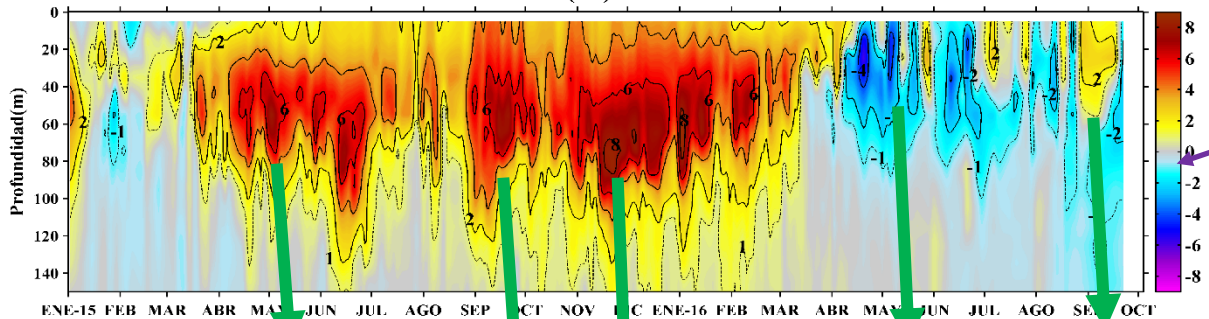
PERFILES DE TEMPERATURA Y ANOMALÍA EN EL PUNTO FIJO DE PAITA



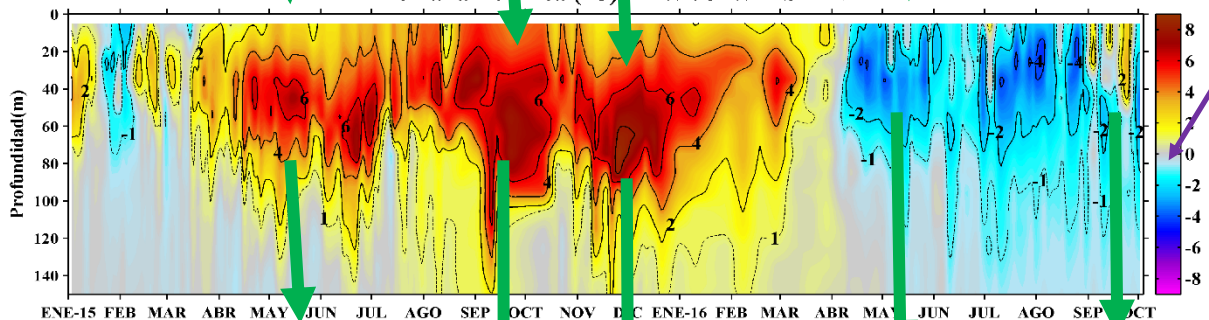
Serie de tiempo de temperatura a 100 m de profundidad y anomalía de temperatura a 100 m de enero de 2015 a septiembre de 2016, calculado con la base los datos históricos de MBARI (1994-2010).

SERIE DE TIEMPO DE ANOMALÍA TÉRMICA USANDO DATOS ARGOS (ENERO 2015 - 04 DE OCTUBRE 2016), CLIMATOLOGÍA GODAS (1993-2015) Y PUNTO FIJO DE PAITA (ENERO 2015 – 29 DE SEPTIEMBRE DE 2016)

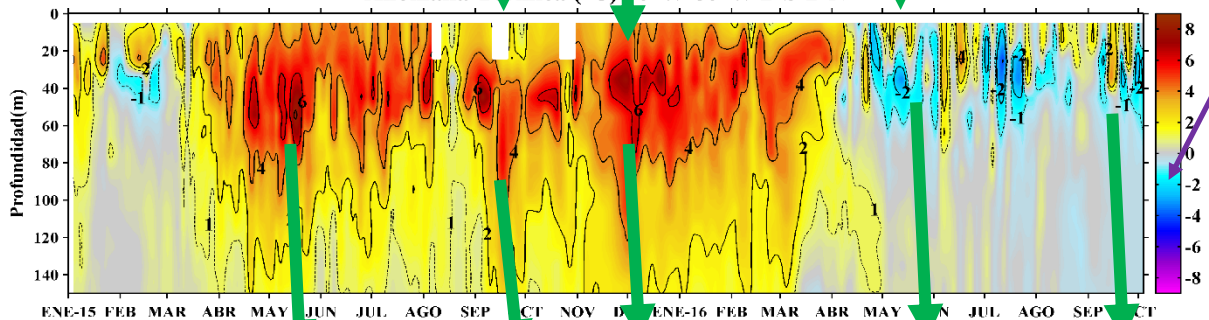
Anomalia Térmica (°C) 102°W-98°W 2°S-2°N



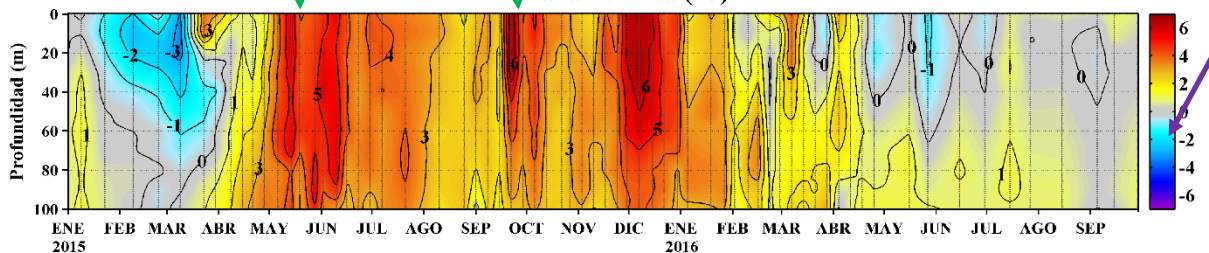
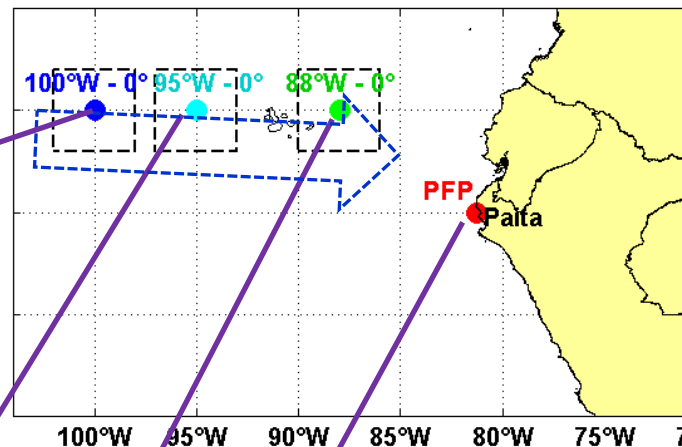
Anomalia Térmica (°C) 97°W-93°W 2°S-2°N



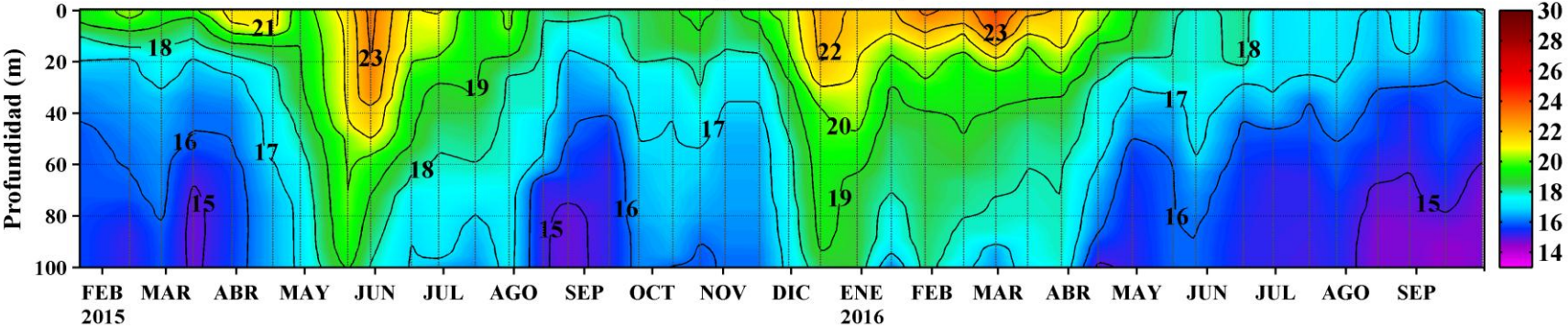
Anomalia Térmica (°C) 90°W-86°W 2°S-2°N



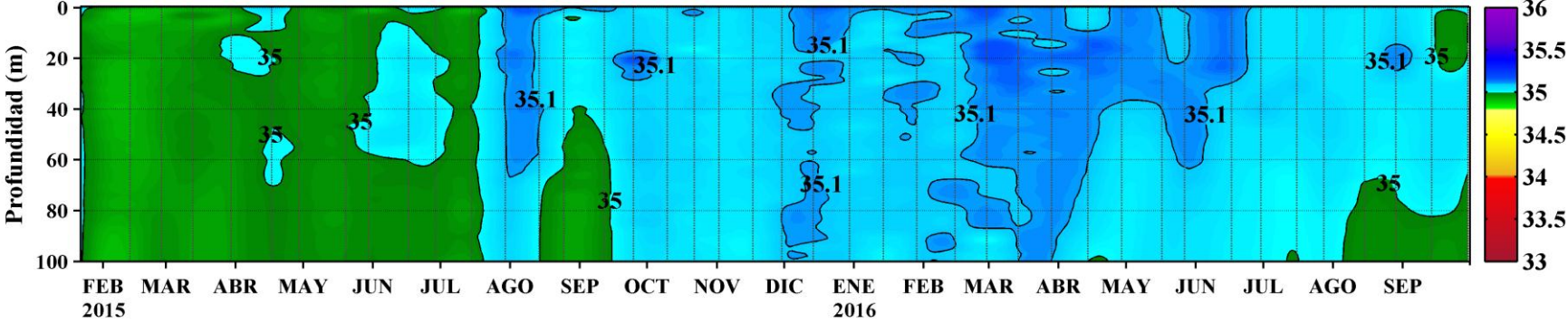
Anomalia Térmica (°C)



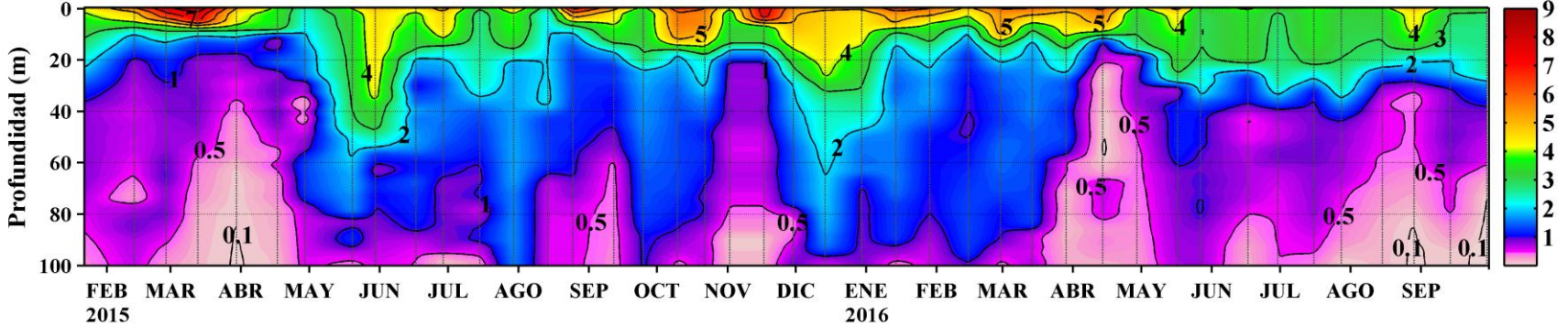
Temperatura (°C)

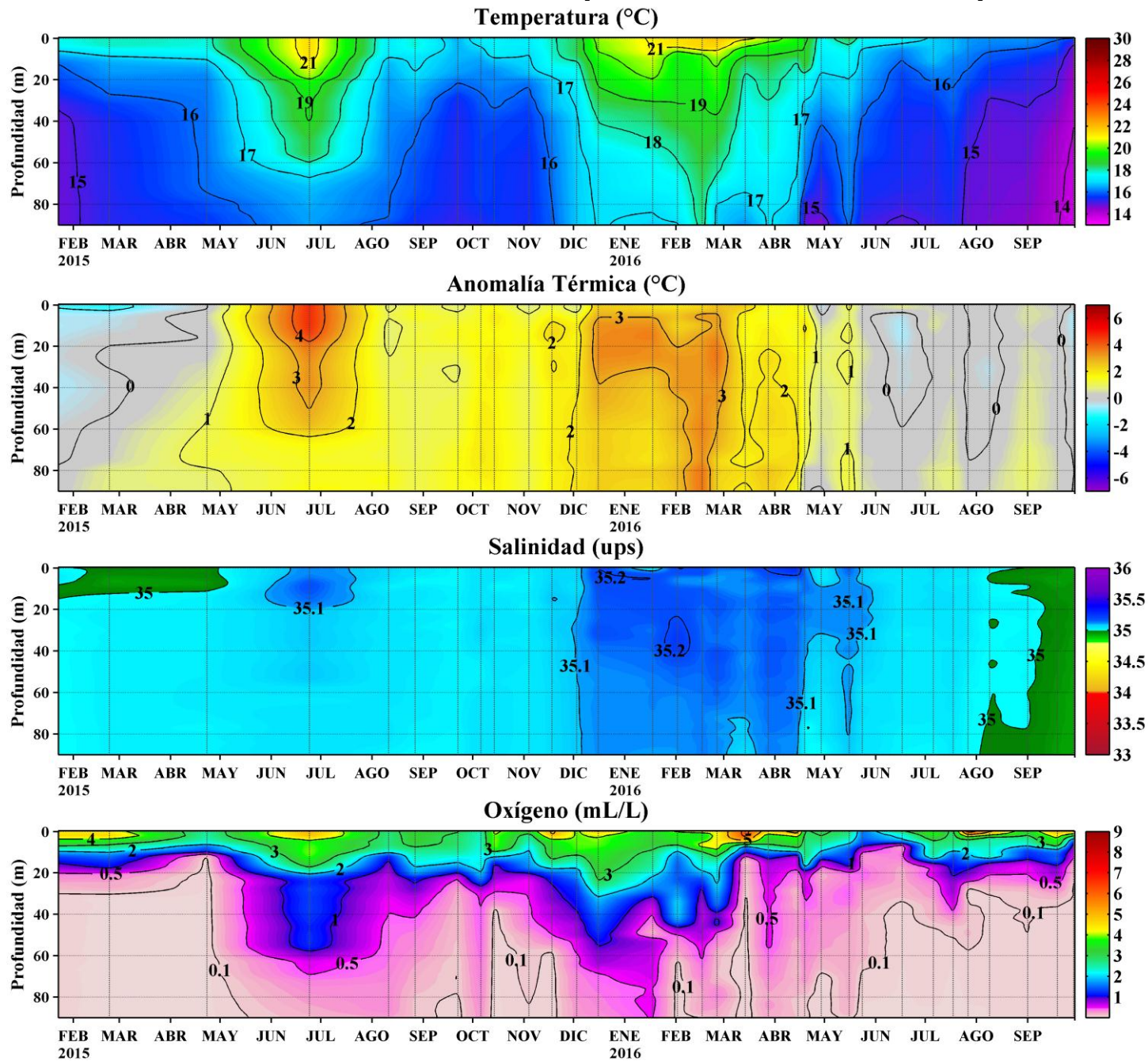


Salinidad (ups)

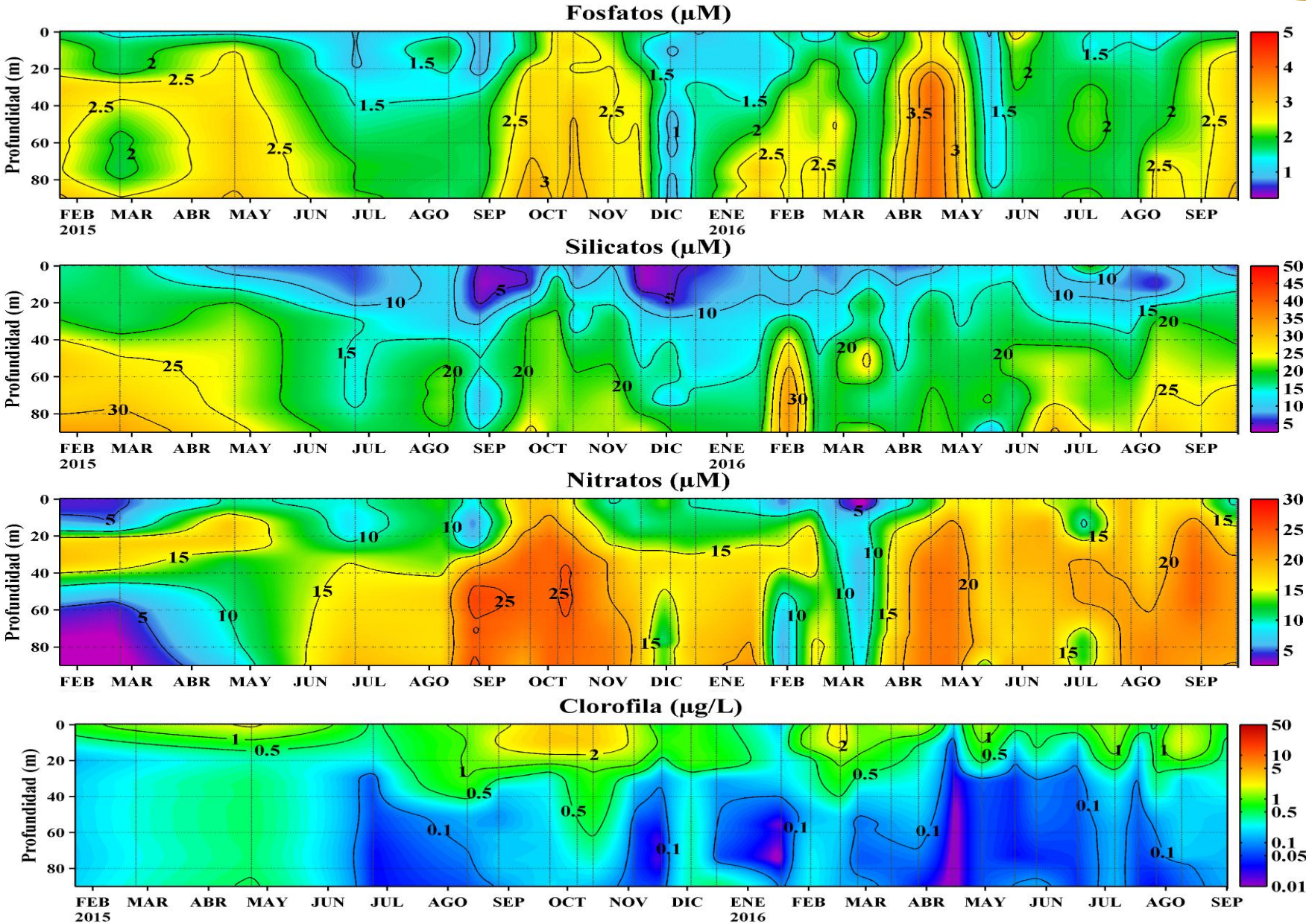


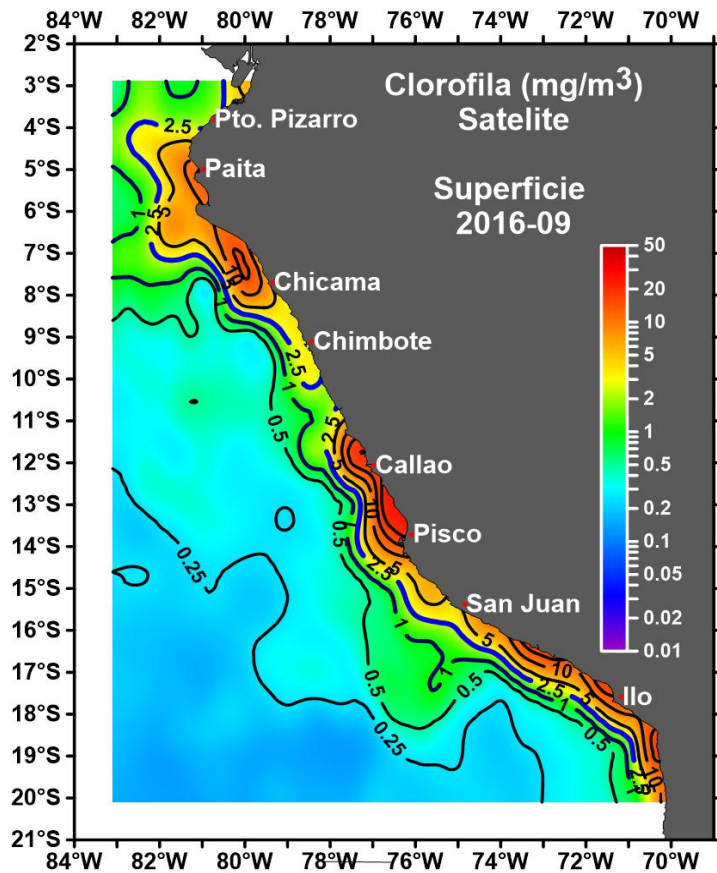
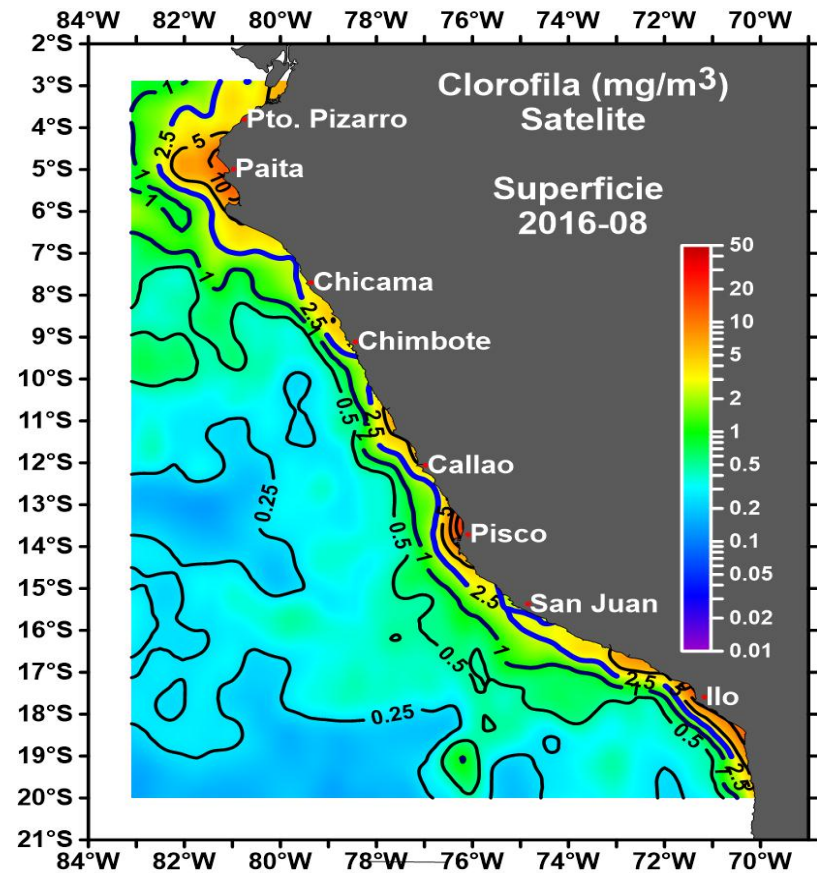
Oxígeno (mL/L)





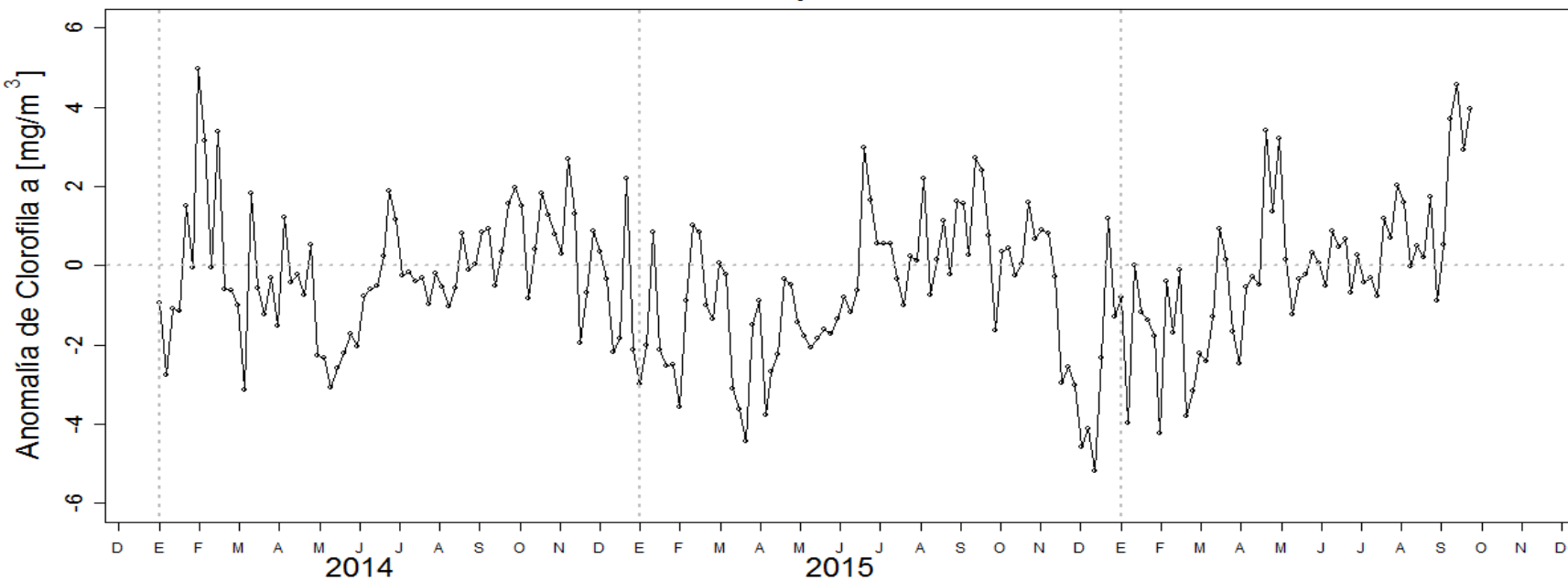
PUNTO FIJO DE CALLAO (19 DE SEPTIEMBRE 2016)



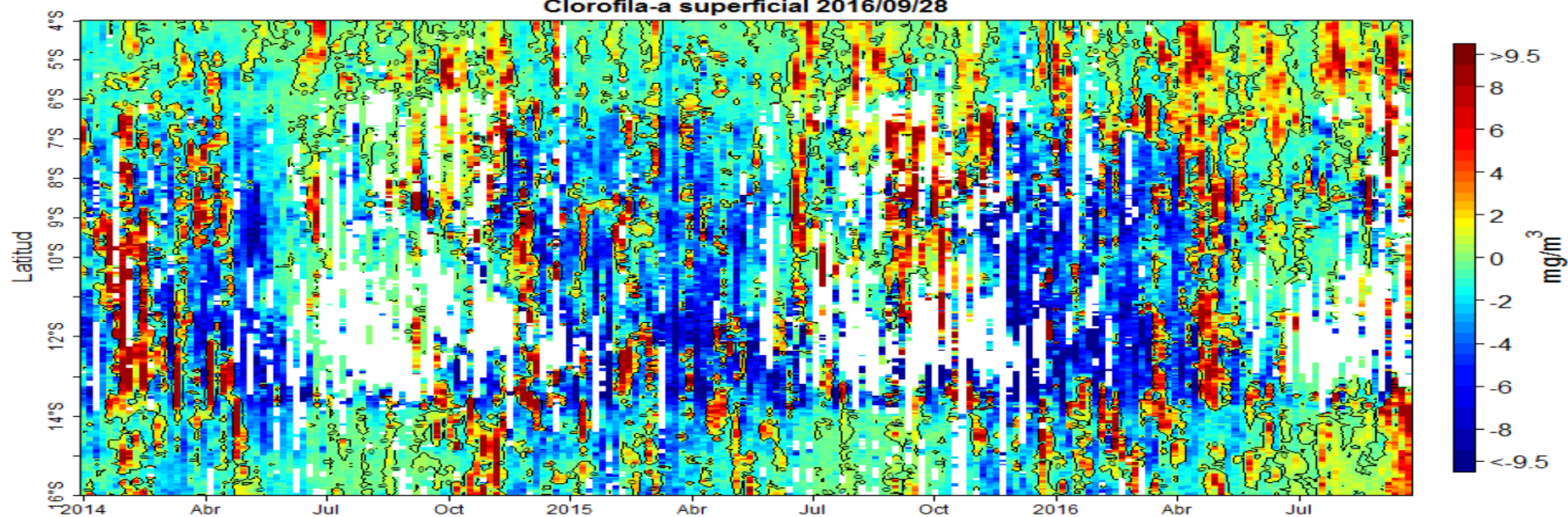


De agosto a septiembre 2016 se visualiza el incremento estacional de la productividad, destacando las zonas de Chicama, Pisco a Callao y al sur de San Juan.

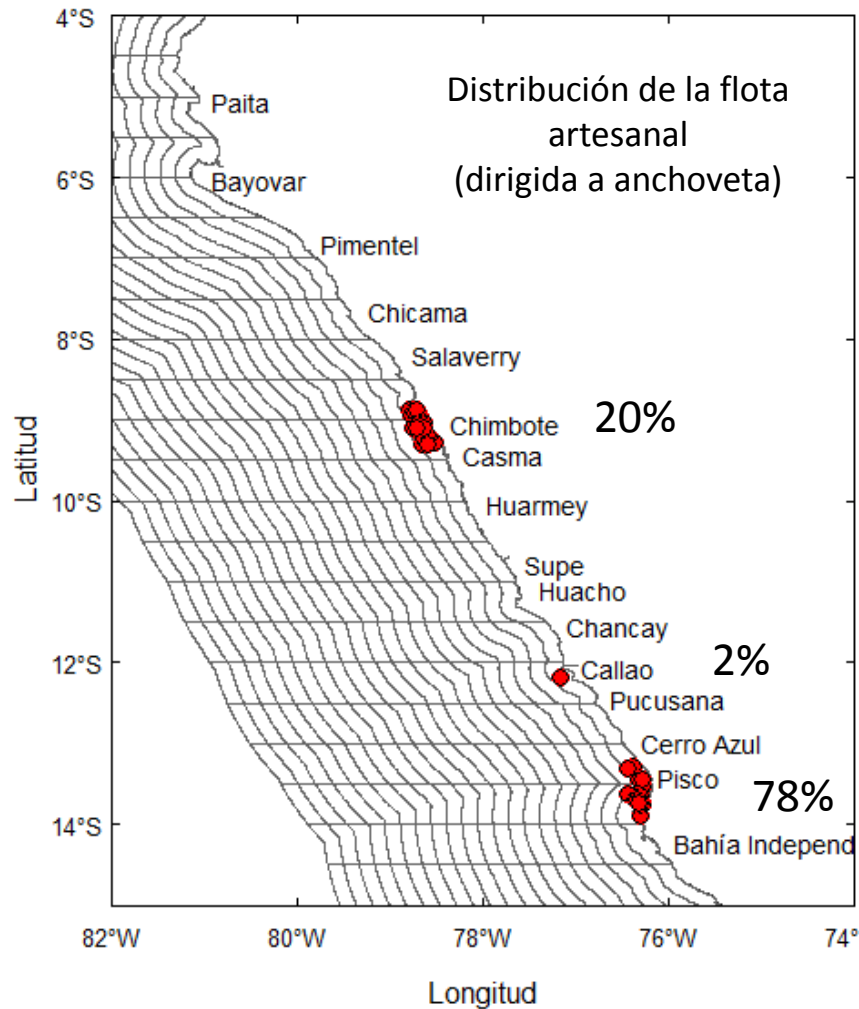
Clorofila-a superficial 2016/09/28



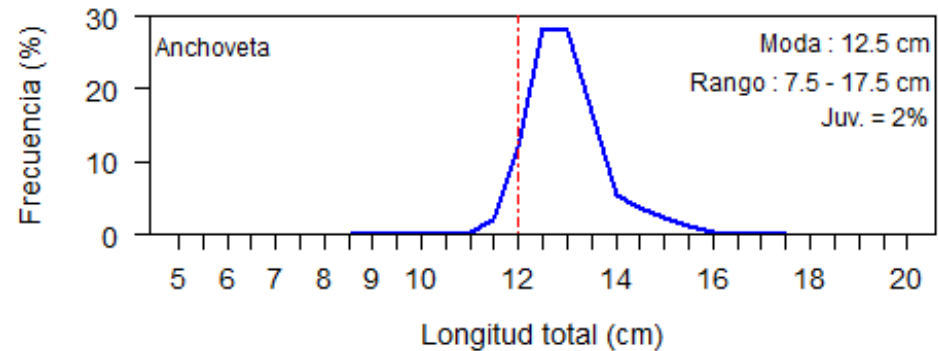
Clorofila-a superficial 2016/09/28



Desembarque de anchoveta por la flota artesanal en la región Norte - centro

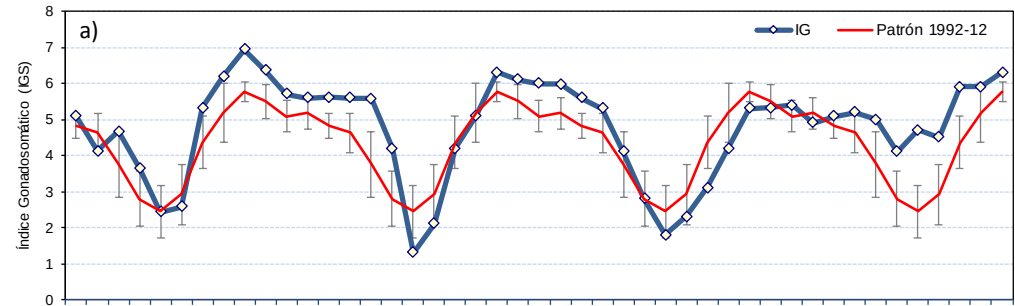


Desembarque_{Set} : 1 393 toneladas

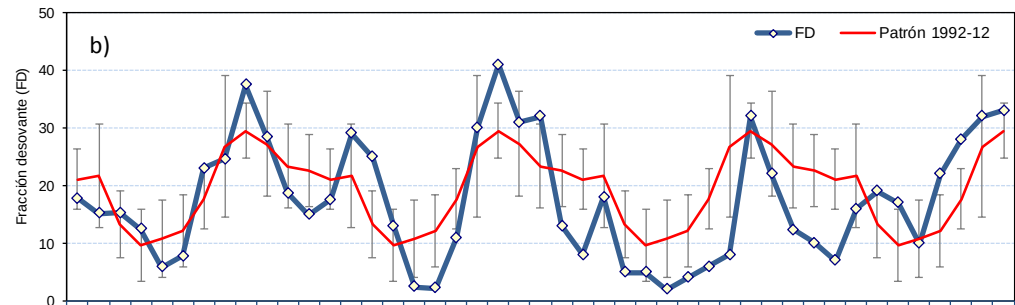


Estado reproductivo de la anchoveta (Al 15 Setiembre 2016)

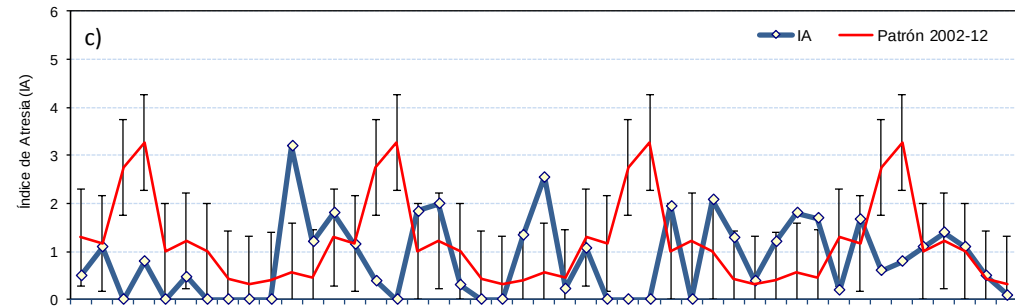
Índice Gonadosomático



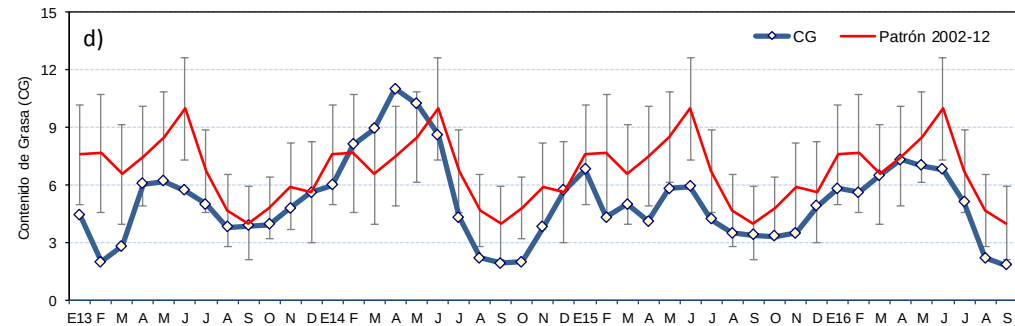
Fracción Desovante



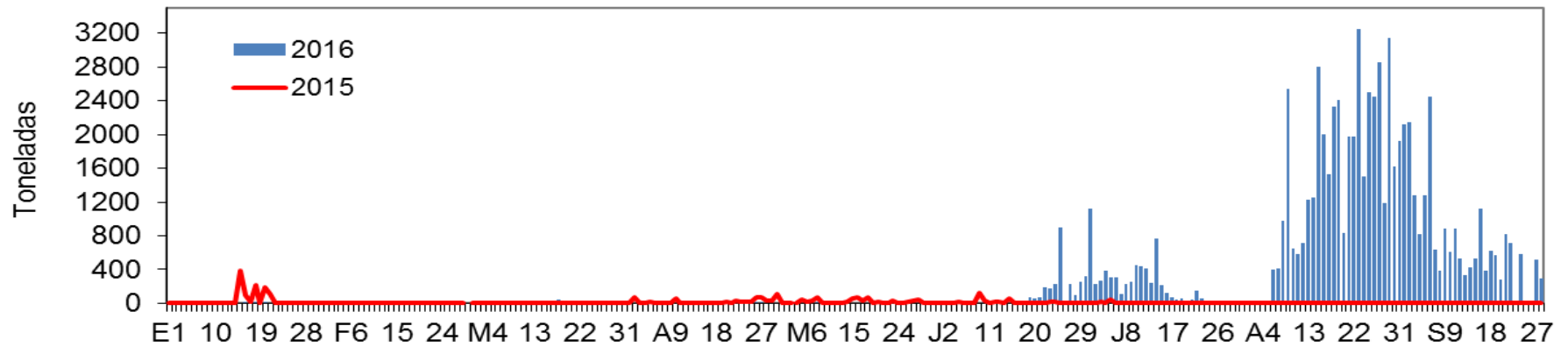
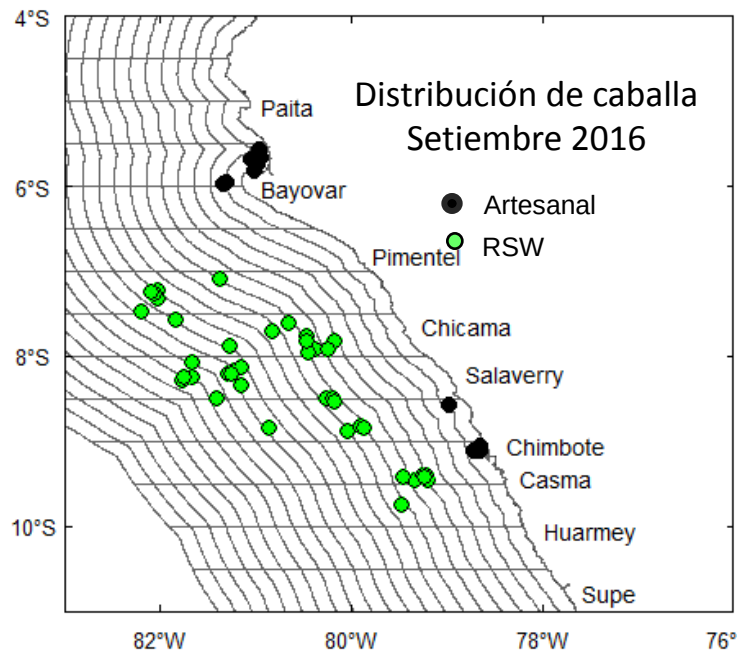
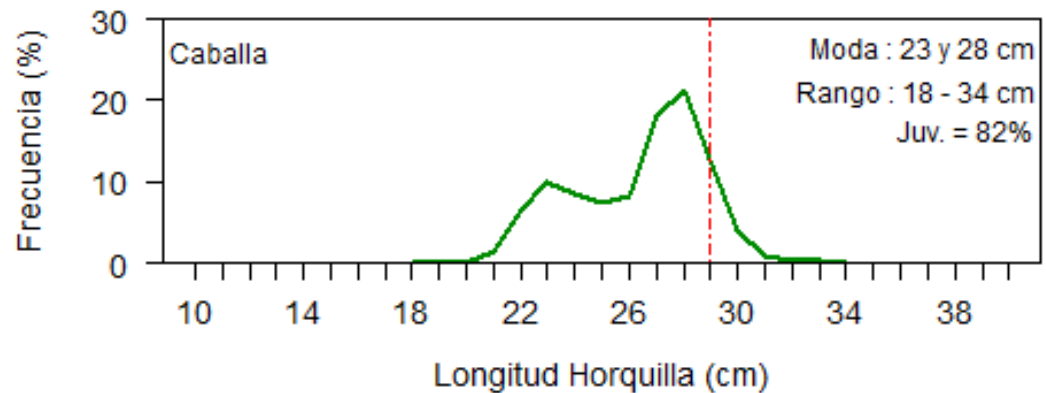
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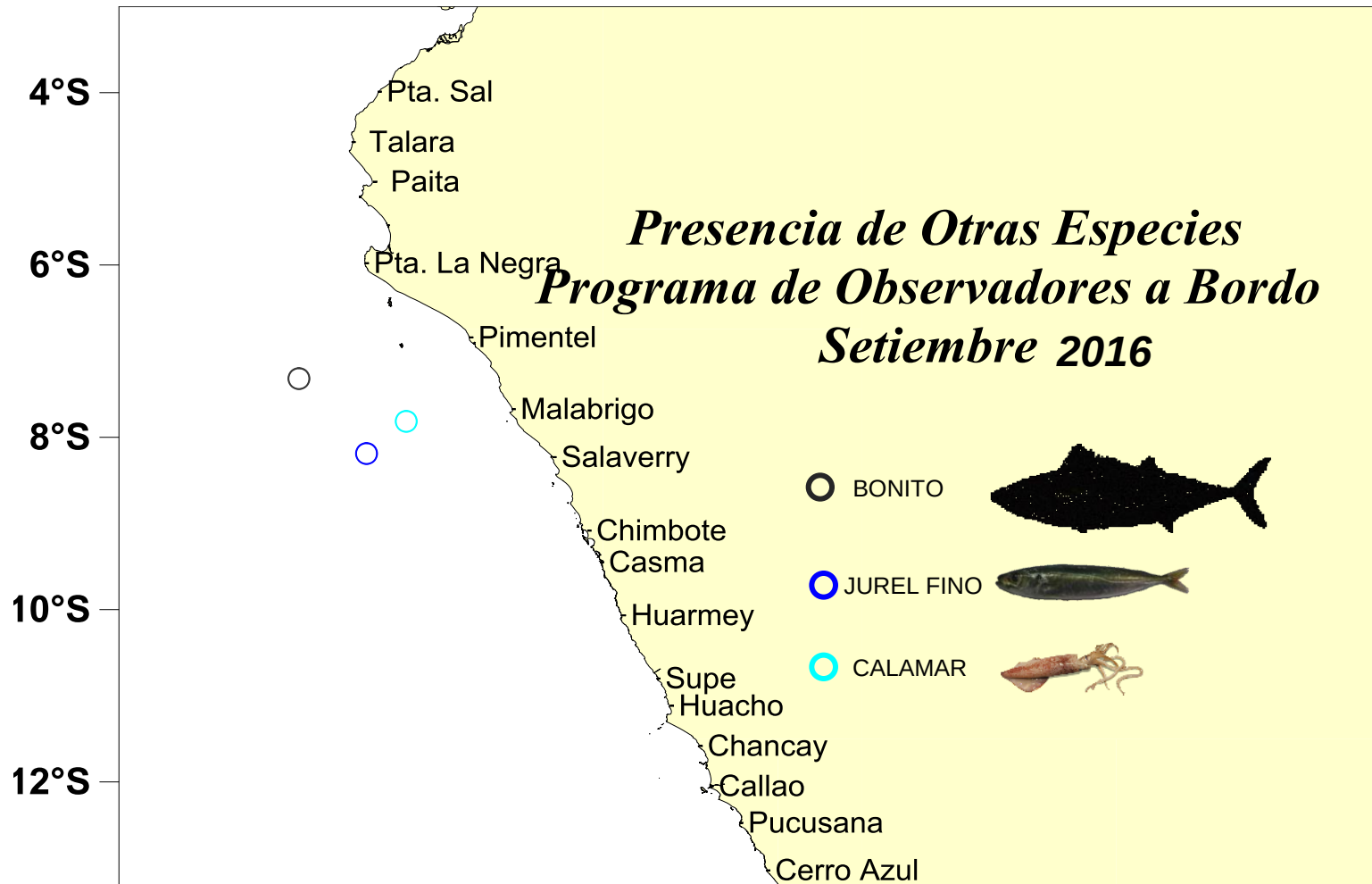
Contenido Graso



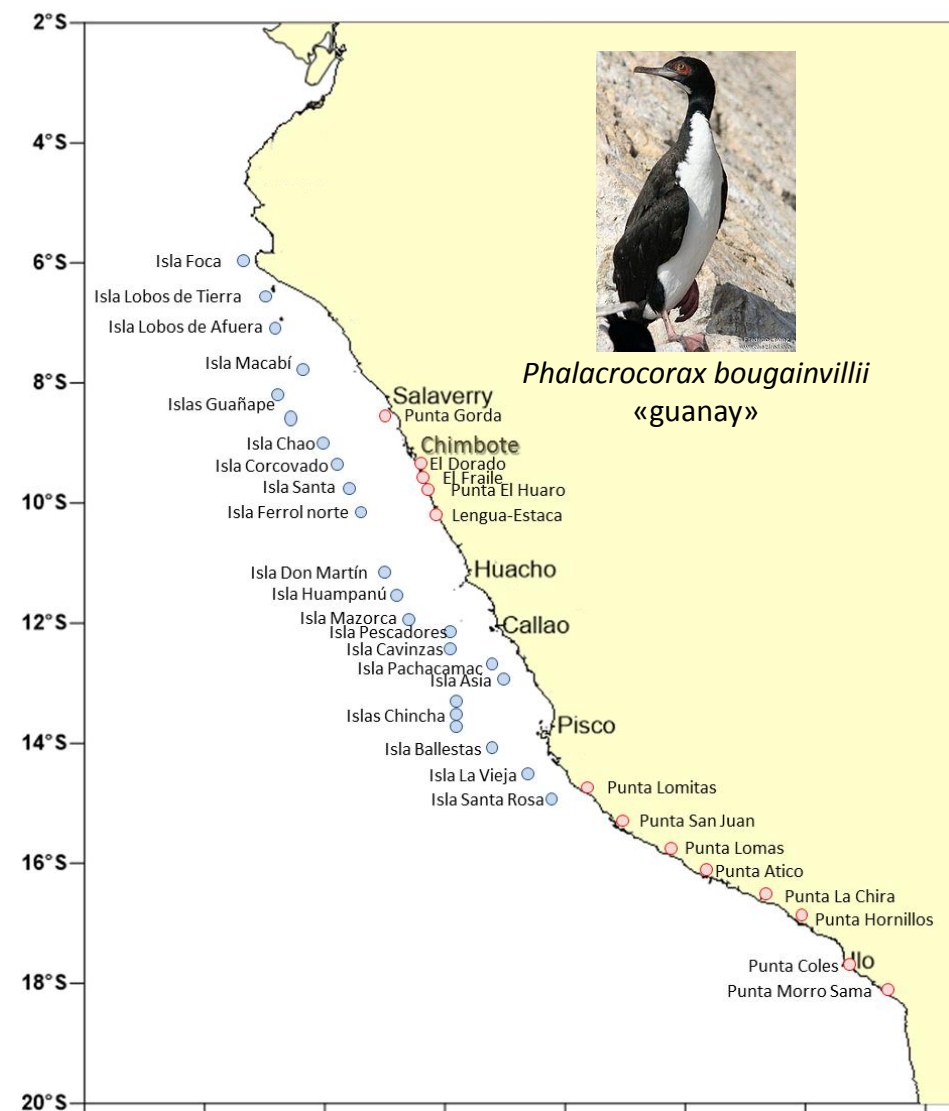
Otras especies: Caballa



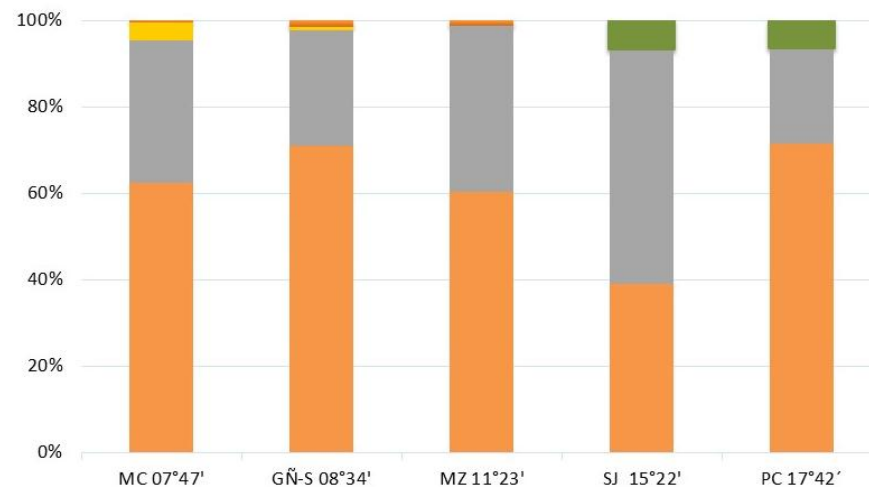
Otras especies



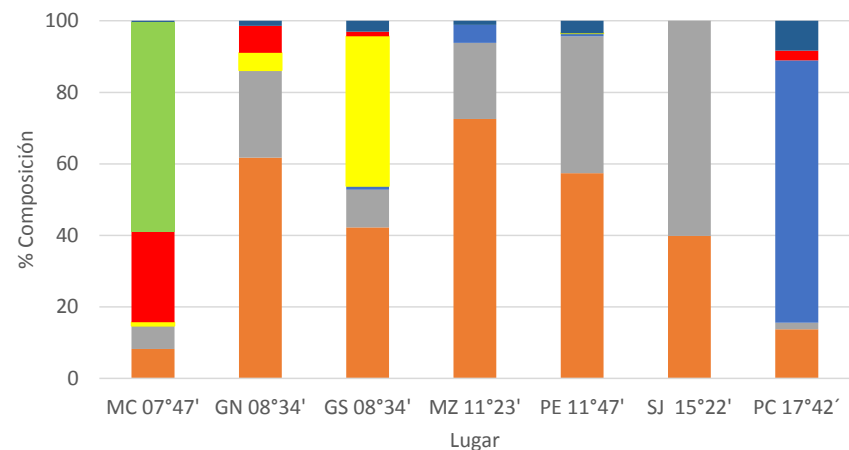
Cambios en la dieta de guanay



Composición patrón

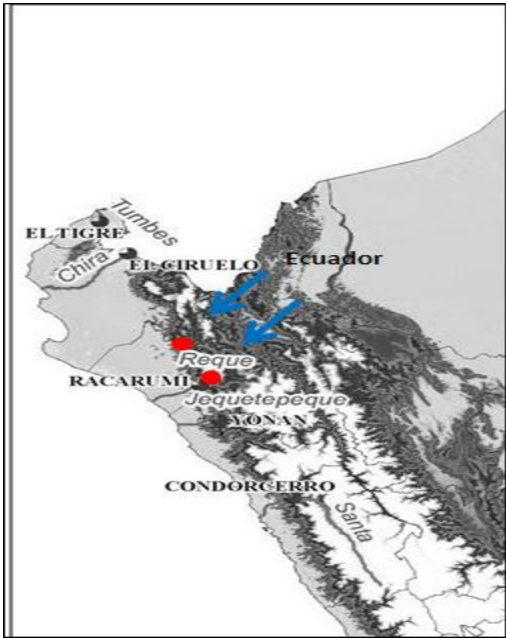
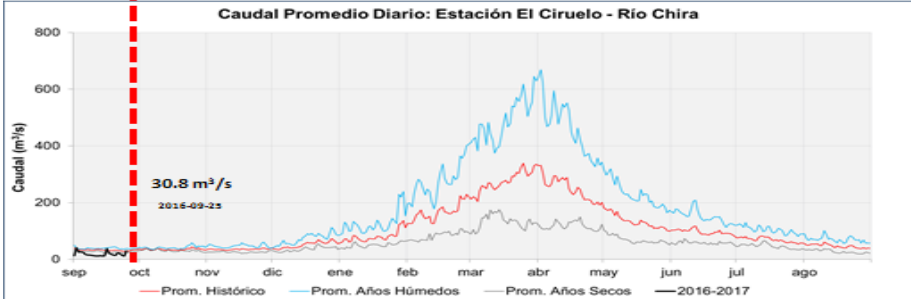
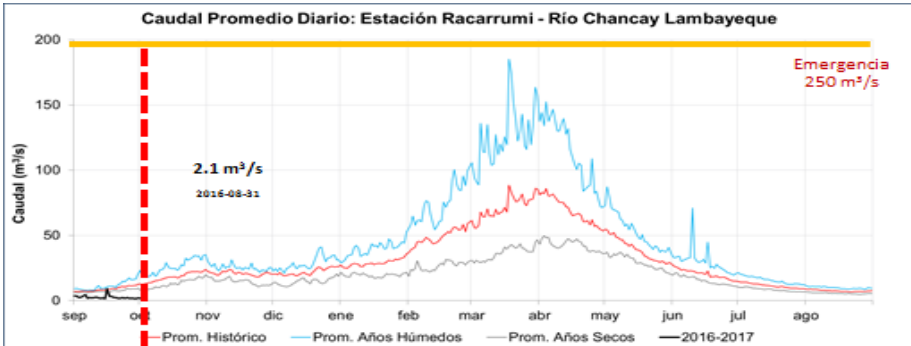


Setiembre 2016

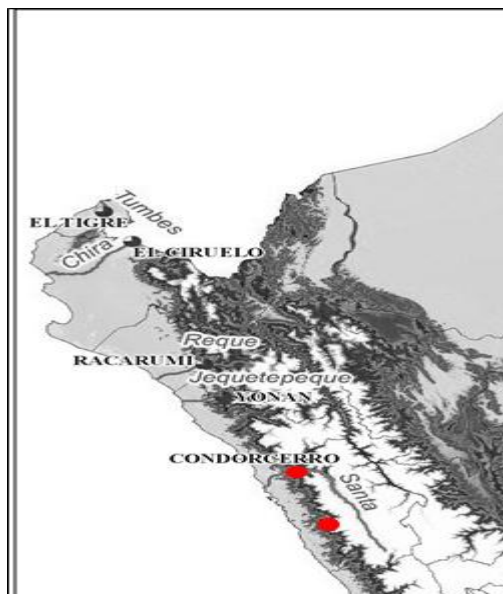
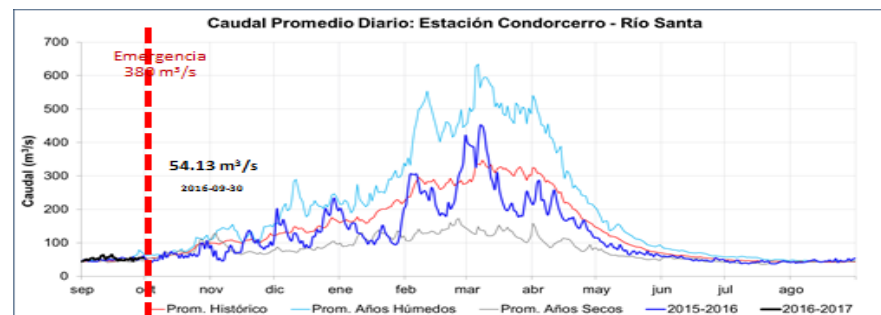
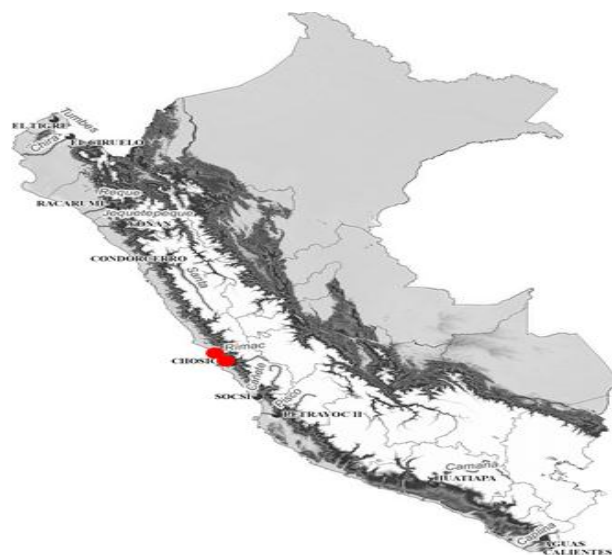


■ Anchoveta
 ■ Peladilla
 ■ Camotillo
 ■ Cabinza
 ■ Merluza
 ■ Otros

Región hidrográfica Pacífico – Ríos Costa Norte



Región hidrográfica Pacífico – Ríos Costa Centro



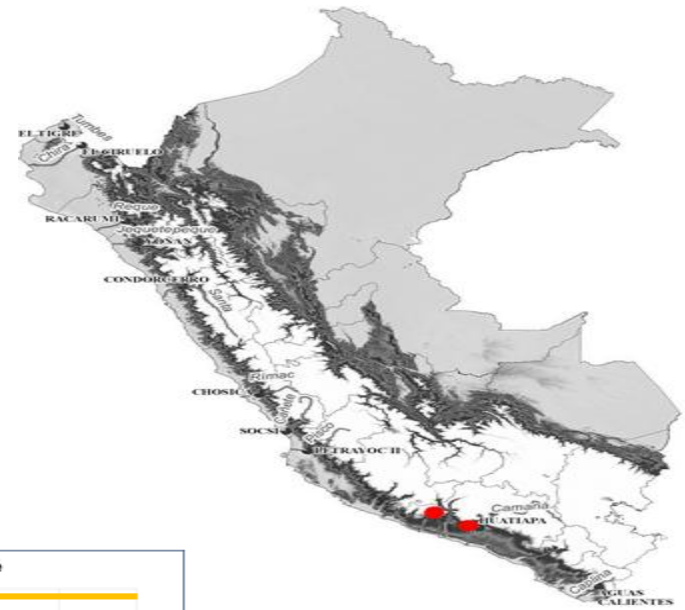
Ríos de vertiente Pacífico – Sur

Caudal Promedio Diario: Estación Huatiapa - Río Majes



19.6 m³/s

2016-09-30



Caudal Promedio Diario: Estación Puente Huancané - Río Huancané



Caudal Promedio Diario: Estación Puente Carretera Ramis - Río Ramis



Ríos región
hidrográfica del
Titicaca

Resumen del estado de los principales embalses. Setiembre 2016.

Zona	Nombre del Reservorio	Fecha Reporte	Departamento de Influencia	Área Bajo Riego (ha)	Capacidad Hidráulica (hm³)		Capacidad Hidráulica Almacenada (%)
					Útil	Almacenada	
Costa - Norte	POECHOS	30-sep	Piura	93,240	396.1	42.7	10.8
	SAN LORENZO	30-sep	Piura	42,530	193.0	86.7	44.9
	TINAJONES	30-sep	Lambayeque	87,600	319.0	50.7	15.9
	GALLITO CIEGO	30-sep	La Libertad	55,700	366.0	192.8	52.7
Costa - Centro	VICONGA	30-sep	Lima	24,970	30.0	0.3	0.9
Costa - Sur	CHOCLOCOCHA	30-sep	Ica	23,000	131.1	74.3	56.7
	CONDOROMA	30-sep	Arequipa	20,810	259.0	120.6	46.6
	EL PAÑE	30-sep	Arequipa	27,060	99.6	7.2	7.3
	LOS ESPAÑOLES	30-sep	Arequipa		9.1	3.3	36.7
	PILLONES	30-sep	Arequipa		76.9	56.8	73.8
	EL FRAYLE	30-sep	Arequipa		127.2	70.9	55.7
	AGUADA BLANCA	30-sep	Arequipa		30.4	27.1	89.0
	CHALHUANCA	30-sep	Arequipa		25.2	14.9	59.2
	BAMPUTAÑE	30-sep	Puno		40.0	7.5	18.9
	PASTO GRANDE	30-sep	Moquegua	3,500	175.0	65.5	37.4
	PAUCARANI	30-sep	Tacna	1,700	10.5	4.0	37.9
	ARICOTA	30-sep	Tacna	3,200	260.0	180.2	69.3
	JARUMAS	14-sep	Tacna	4,000	12.5	10.0	79.6
Sierra - Centro	CUCHOQUESERA	30-sep	Ayacucho	19,200	60.0	20.2	33.7
Sierra - Sur	LAGUNILLAS	30-sep	Puno	5,000	500.0	404.5	80.9

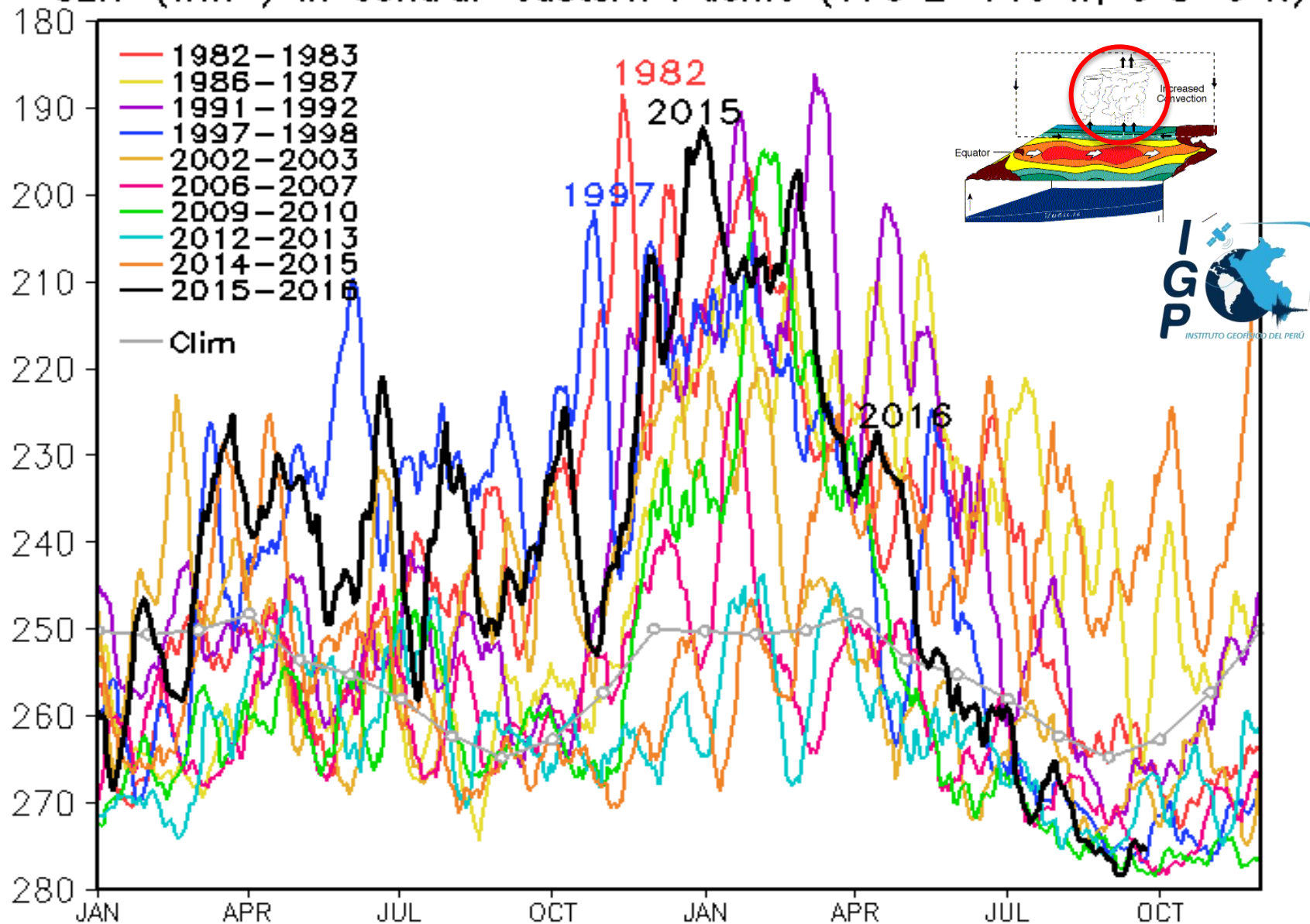
Las reservas hídricas en la costa norte promedian el 46% respecto a la capacidad hidráulica de los principales embalses, disminuyendo en relación al reporte anterior.

En el sur, el sistema hidráulico Colca – Chili (Arequipa) operan en promedio al 48%, mostrando en su mayoría hidrogramas descendentes,. En Pasto Grande (Moquegua), el nivel llegó hasta el 37%. Los de Tacna (Aricota, Jarumas y Paucarani) están en promedio al 62% de su capacidad hidráulica.

Perspectivas

Acoplamiento al Pacífico central-oriental (L'Heureux et al 2015)

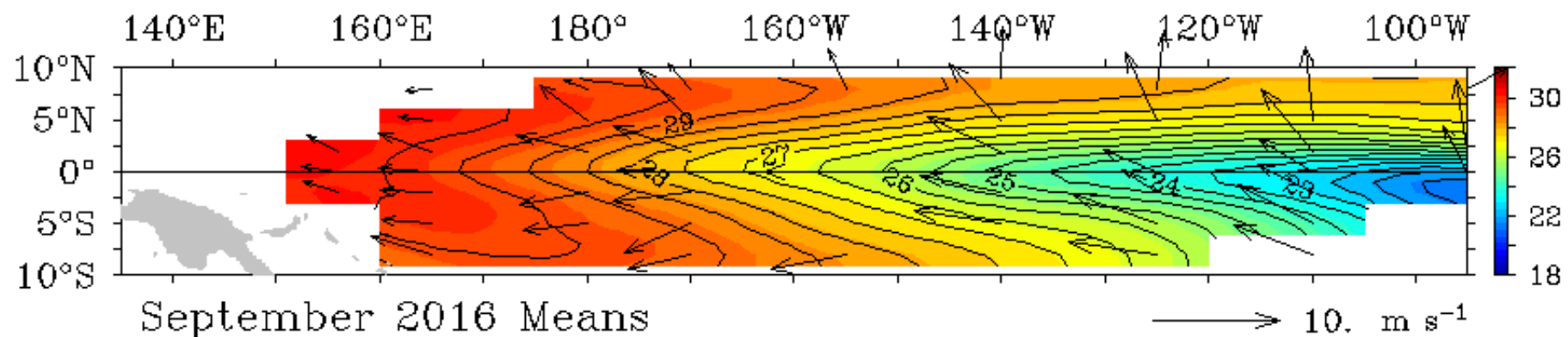
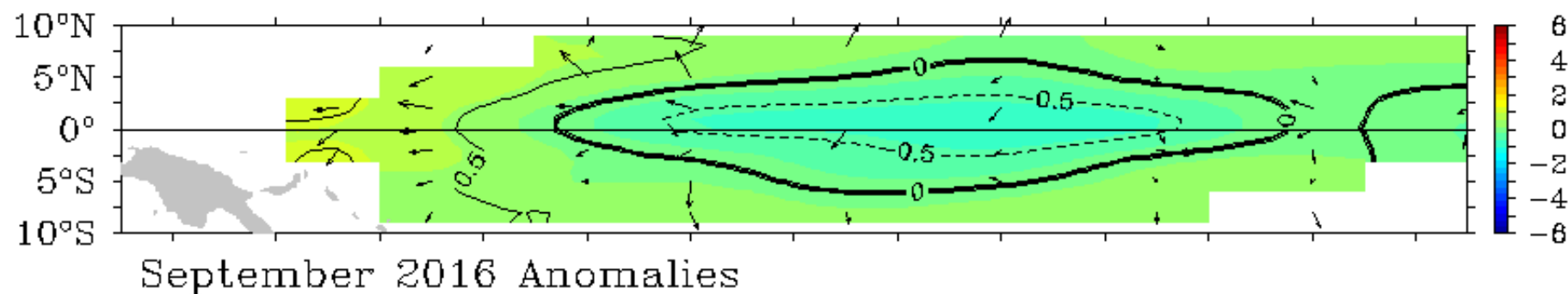
OLR* (Wm^{-2}) in central-eastern Pacific ($170^{\circ}\text{E}-140^{\circ}\text{W}$, $5^{\circ}\text{S}-5^{\circ}\text{N}$)



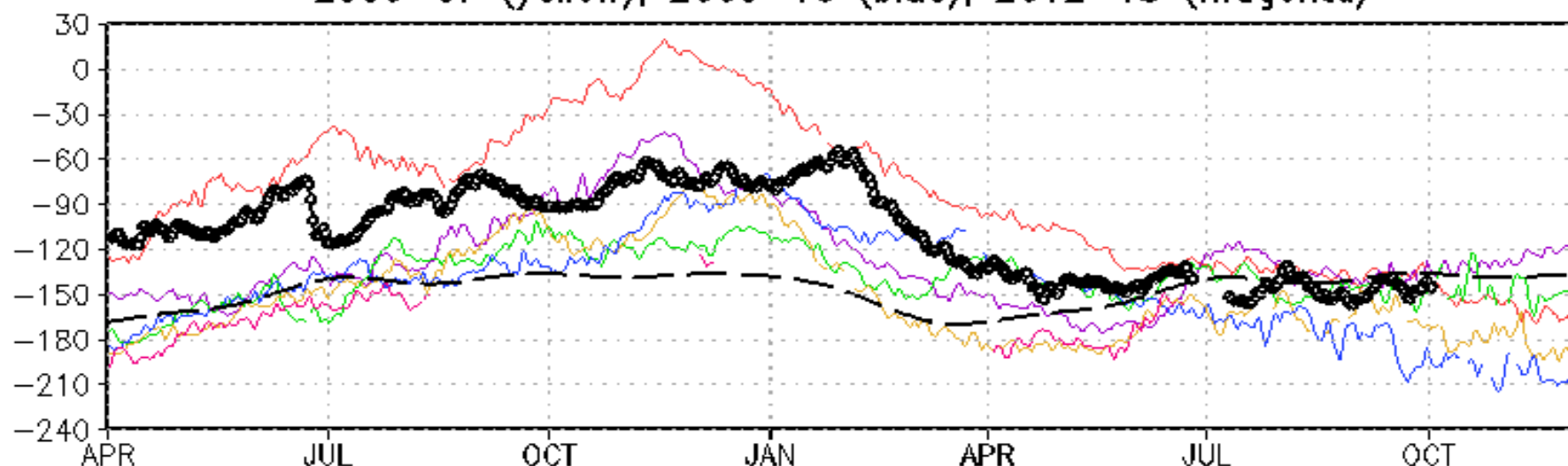
* 15-day running mean. Data: ESRL/NOAA, Processing: IGP

Last data: 03OCT2016

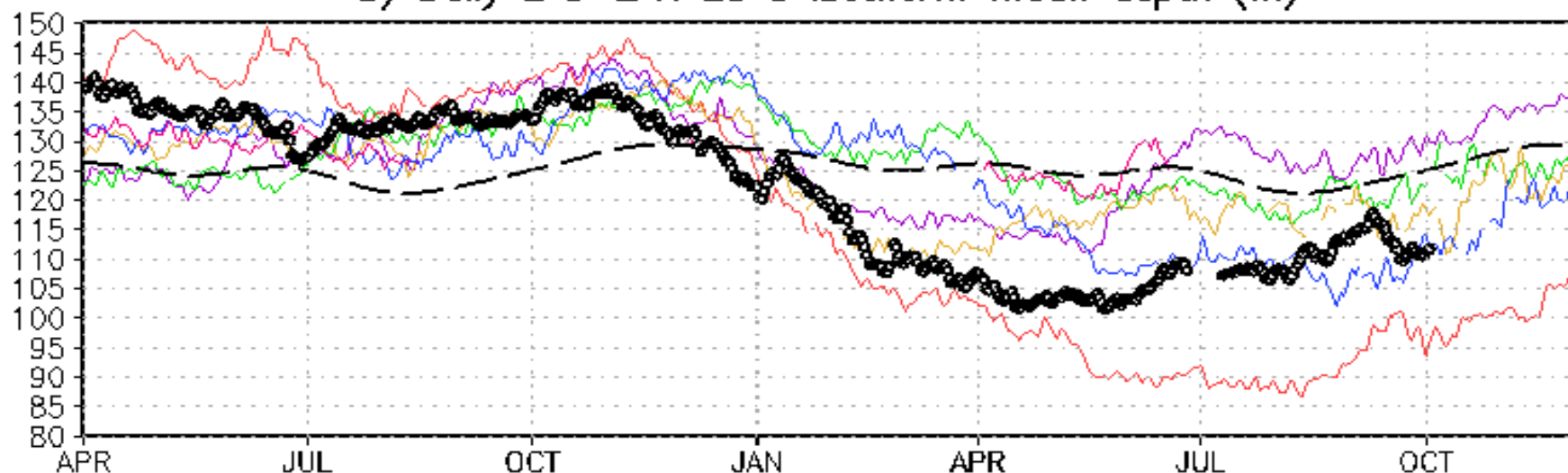
TAO/TRITON Monthly Mean SST ($^{\circ}\text{C}$) and Winds (m s^{-1})



a) Daily 2°S–2°N 20°C isotherm tilt* (m): 2015 (black), 1997–98 (red), 2002–03 (purple), 2004–05 (green), 2006–07 (yellow), 2009–10 (blue), 2012–13 (magenta)



b) Daily 2°S–2°N 20°C isotherm mean depth (m)

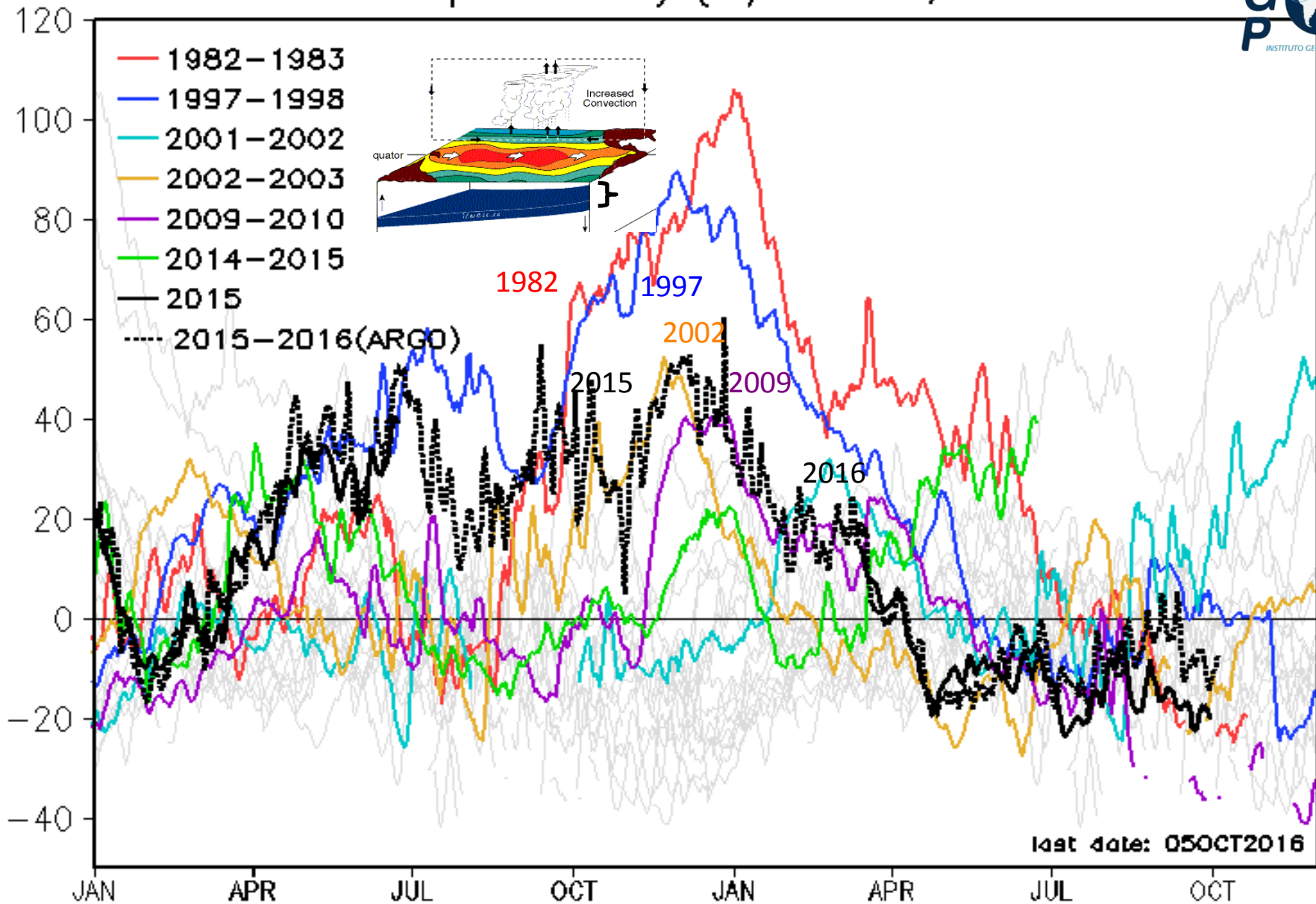


* Zonal depth difference from linear regression fit to longitude (137°E–95°W)

Only for days with at least 10 out of 11 lon. 1–2–1 smoothing. Clim dashed (1993–2012)

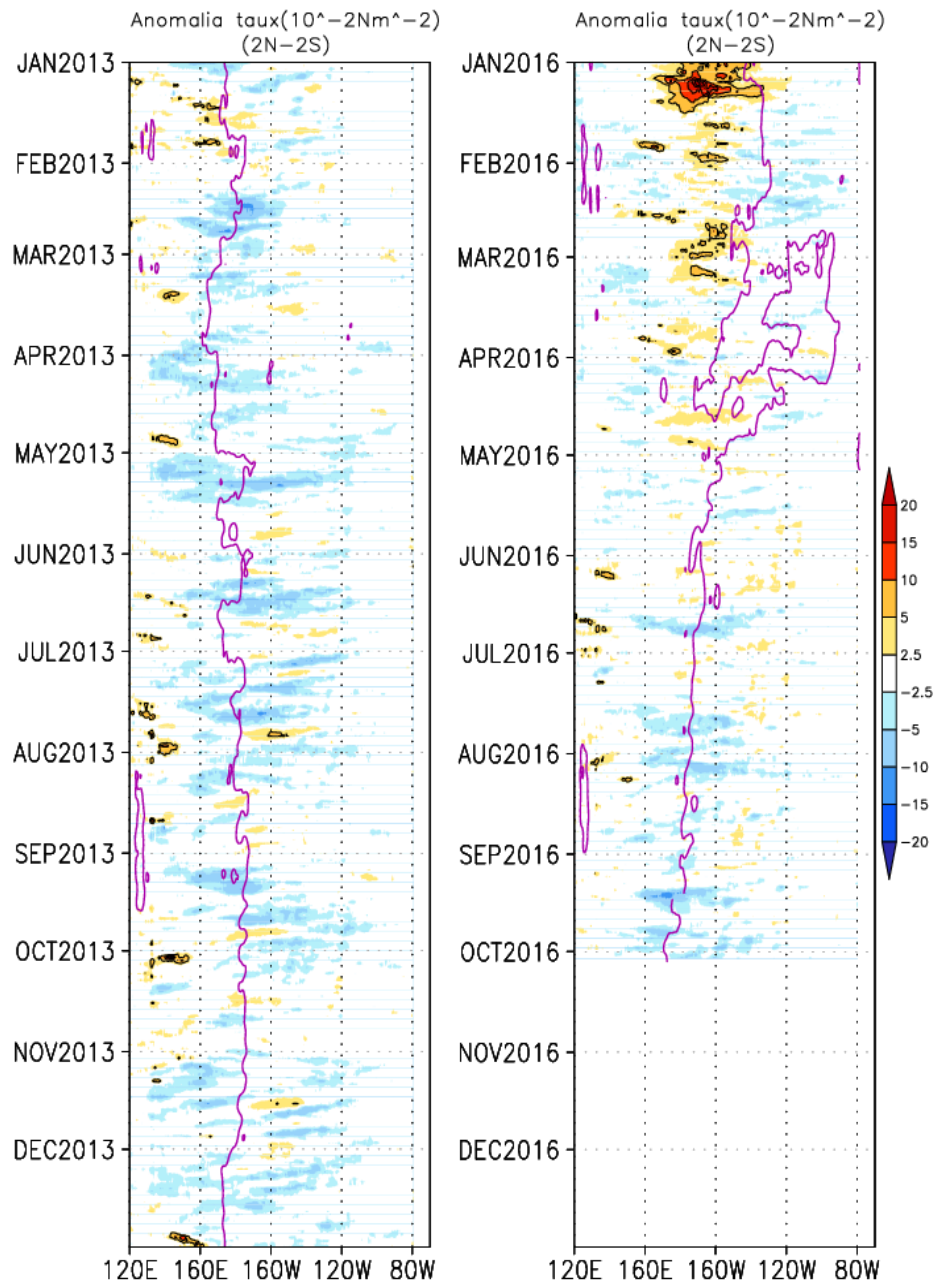
Data: TAO/TRITON (last: 03OCT2016). Processing: @KTakahashiG (IGP)

20°C depth anomaly (m) at 95°W, 2°S–2°N

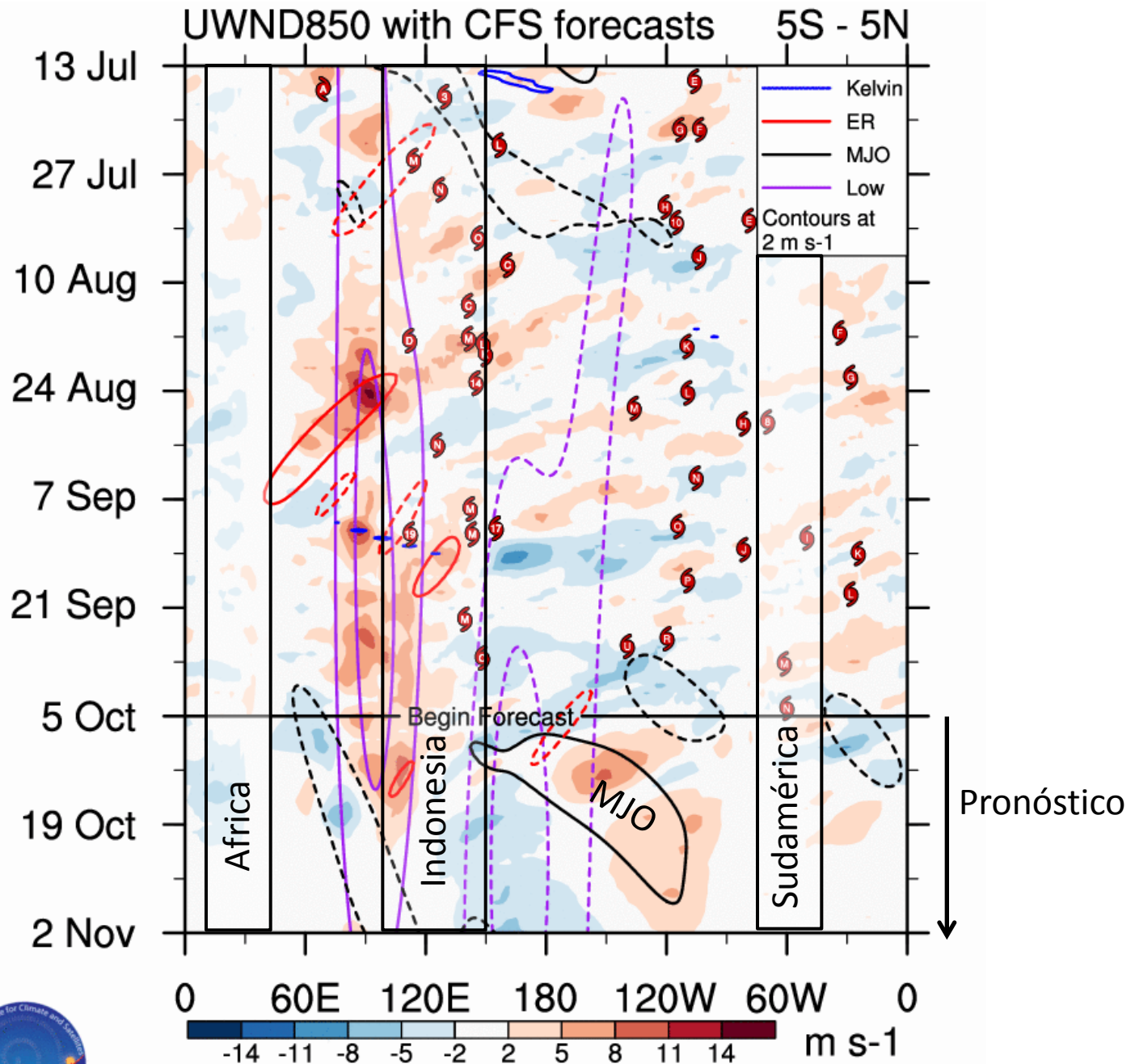


5 day running mean. Data: TAO/TRITON (PMEL) and ARGO (100°W – 90°W), Processing: IGP

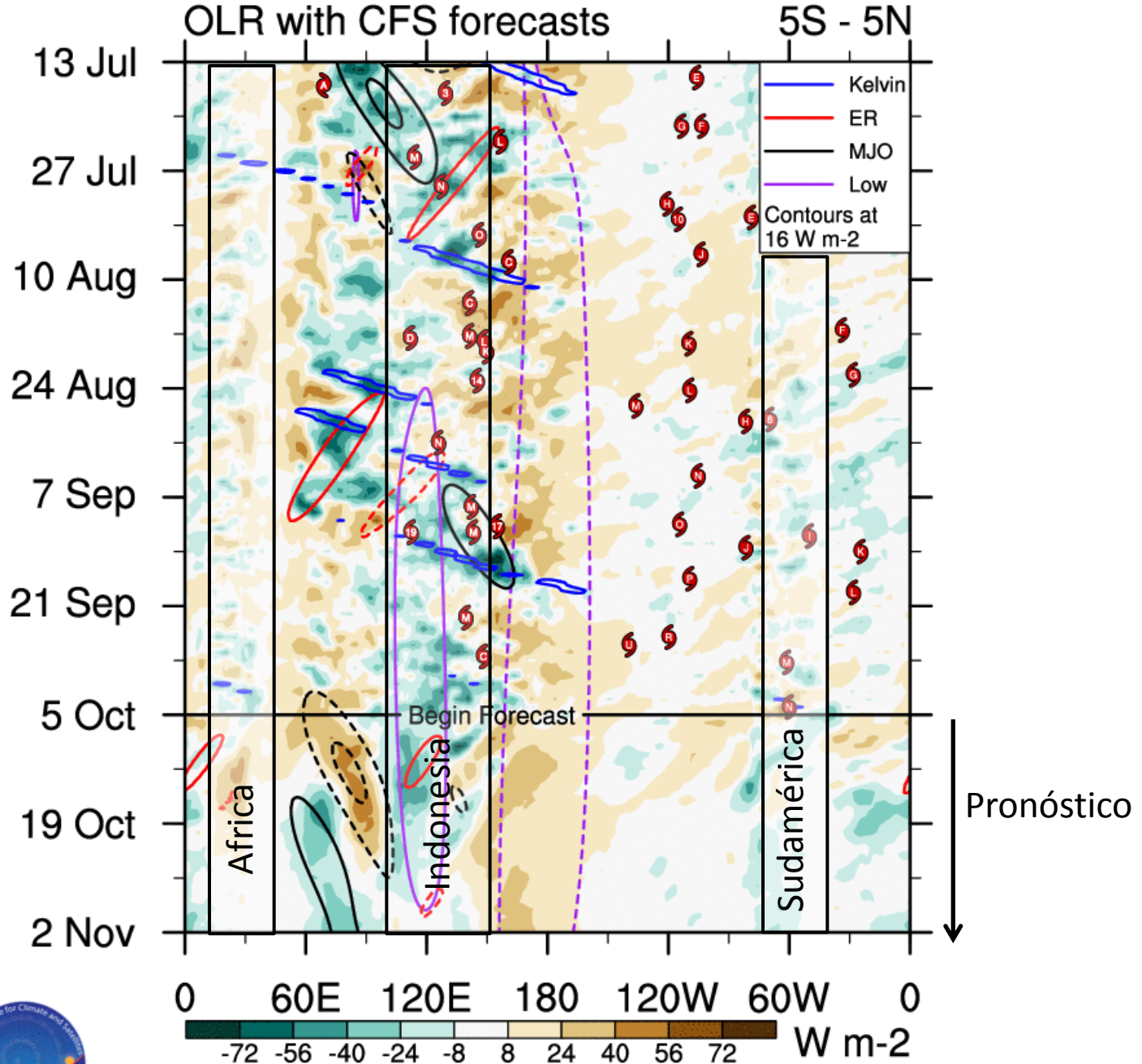
La Niña
costera
fuerte 2013



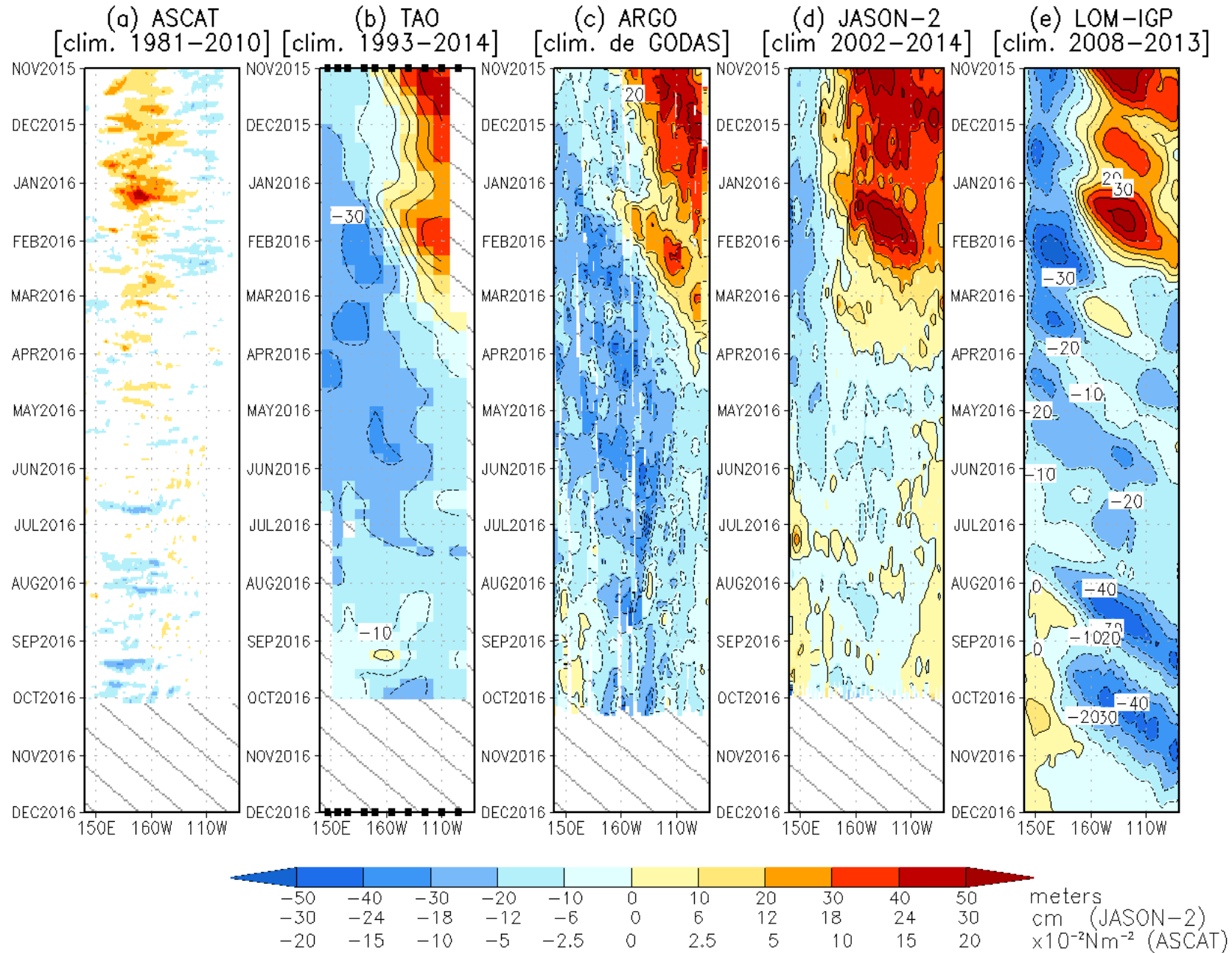
Viento zonal ecuatorial en 850 Pa



Convección (ROL) ecuatorial

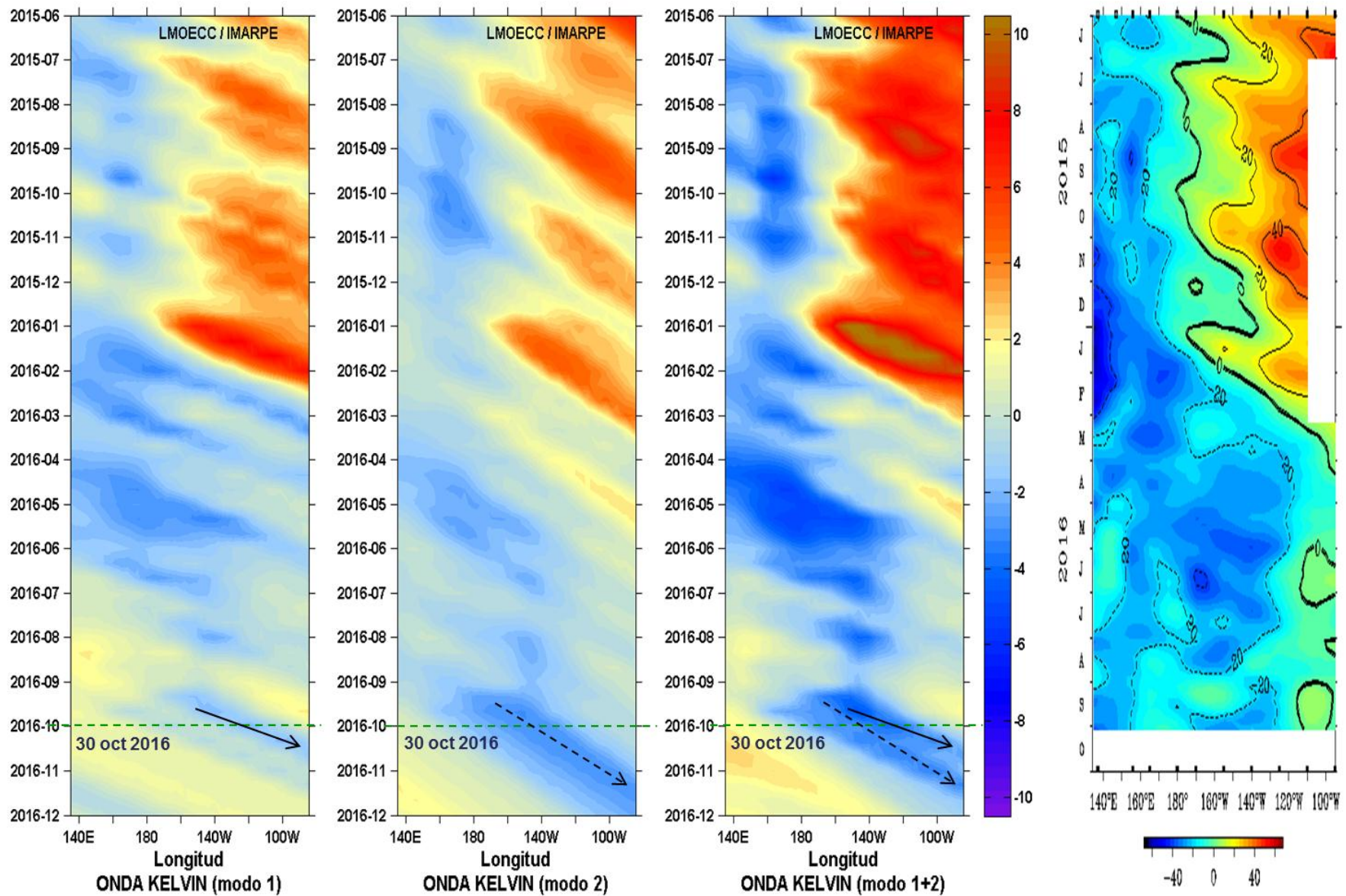


Simulación de la propagación de las ondas Kelvin Ecuatoriales



Kelvin + Rossby

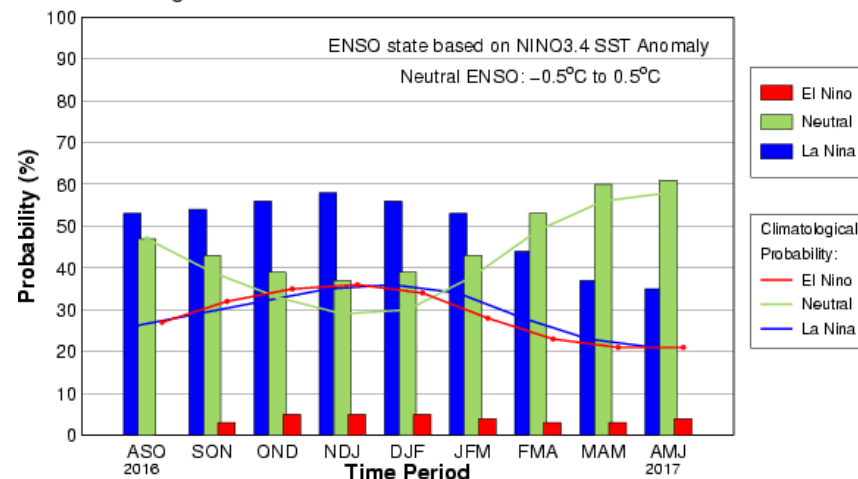
Simulación de la propagación de las ondas Kelvin Ecuatoriales



Probabilidades de El Niño según solo según porcentaje de **modelos** (IRI)

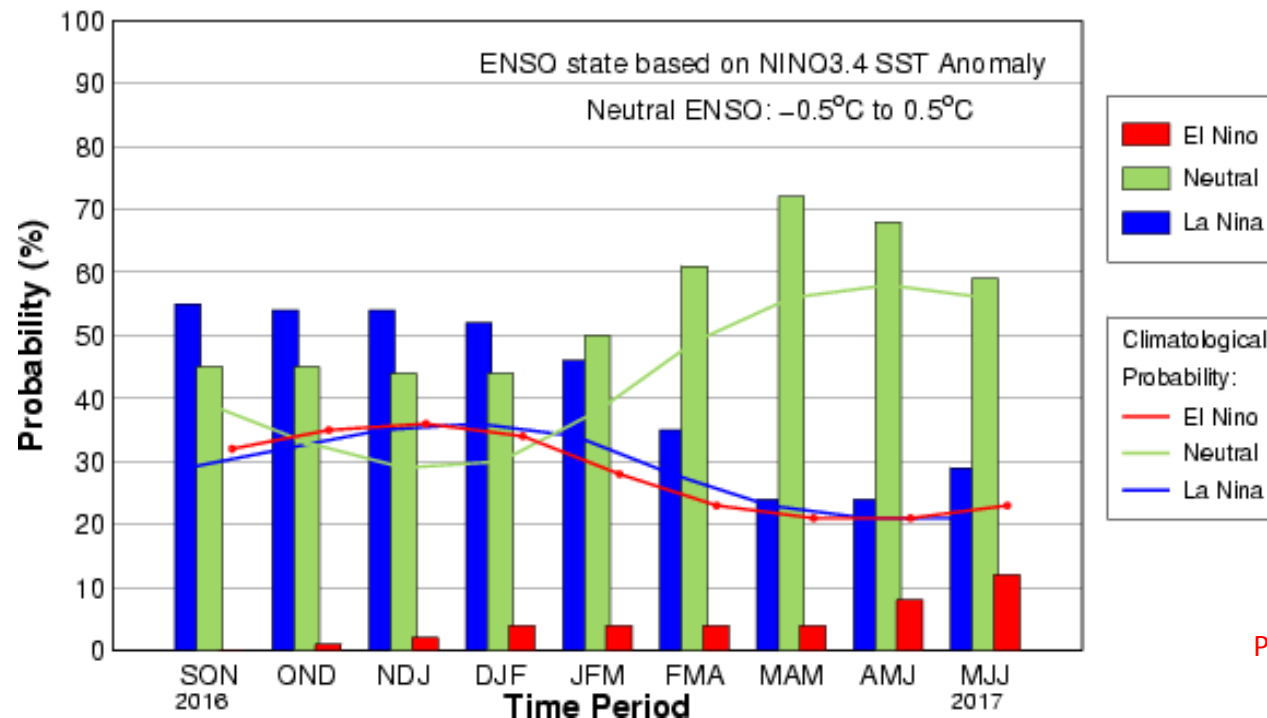
Corrida del mes anterior

Mid-Aug IRI/CPC Model-Based Probabilistic ENSO Forecast



Corrida reciente

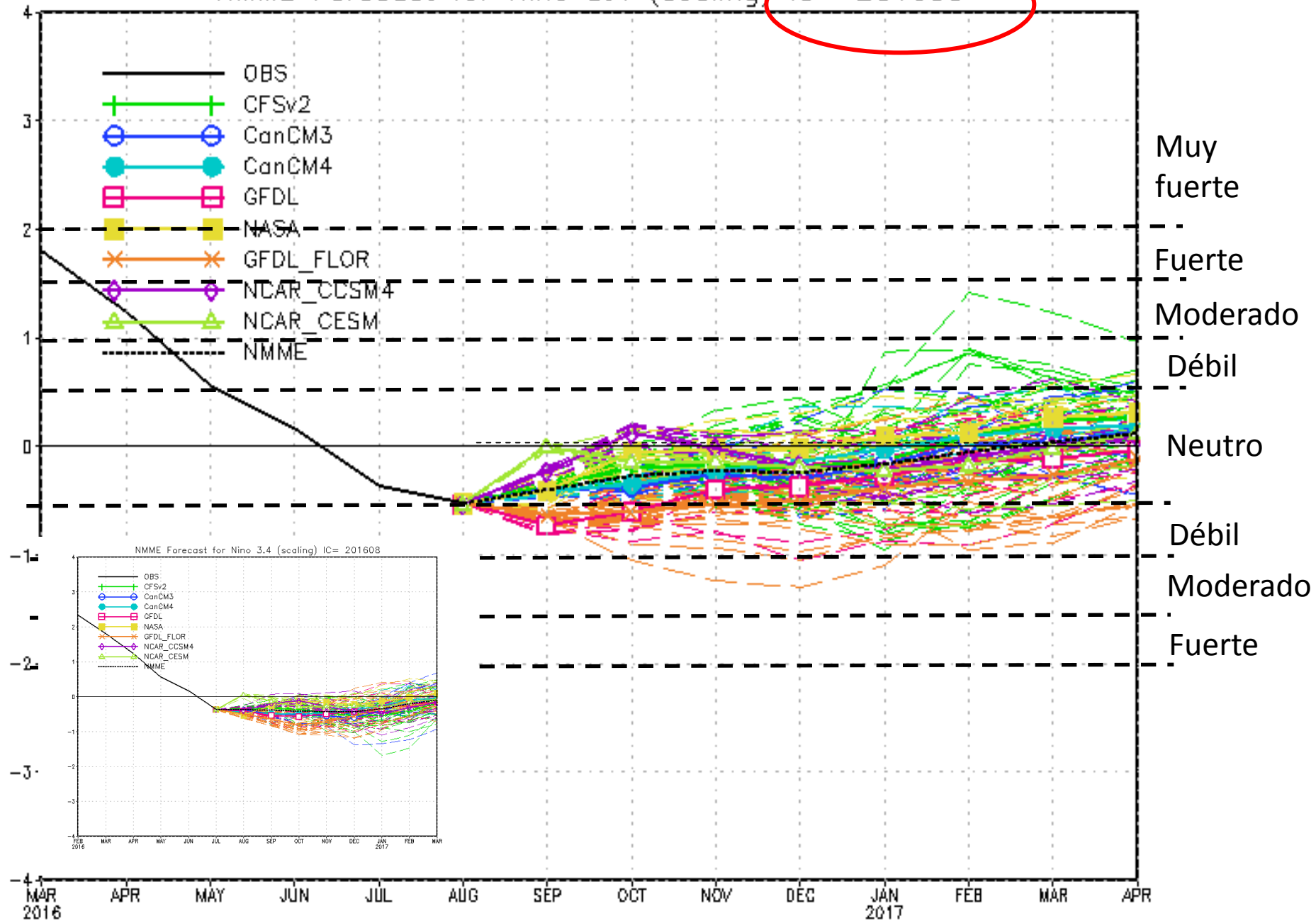
Mid-Sep IRI/CPC Model-Based Probabilistic ENSO Forecast



Según la evaluación NOAA/IRI, la probabilidad de La Niña en el Pacífico central es de 54% para noviembre, 54% para diciembre y 52% para enero de 2017.

Publicado 15 de setiembre de 2016

NMME Forecast for Nino 3.4 (scaling) IC= 201609



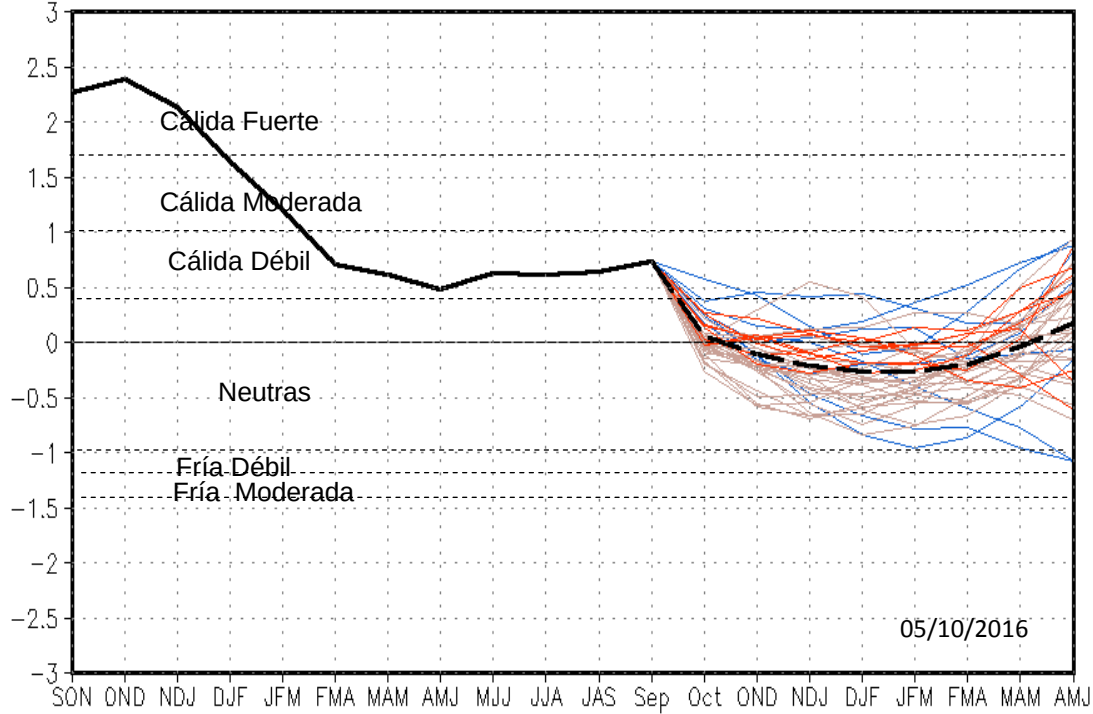
Pronóstico Niño 1+2 de CFS2



NWS/NCEP/CPC

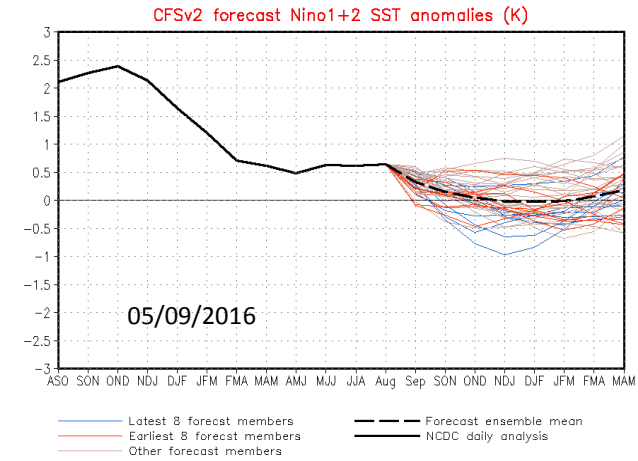
Last update: Wed Oct 5 2016
Initial conditions: 24Sep2016–30Oct2016

CFSv2 forecast Nino1+2 SST anomalies (K)



NWS/NCEP/CPC

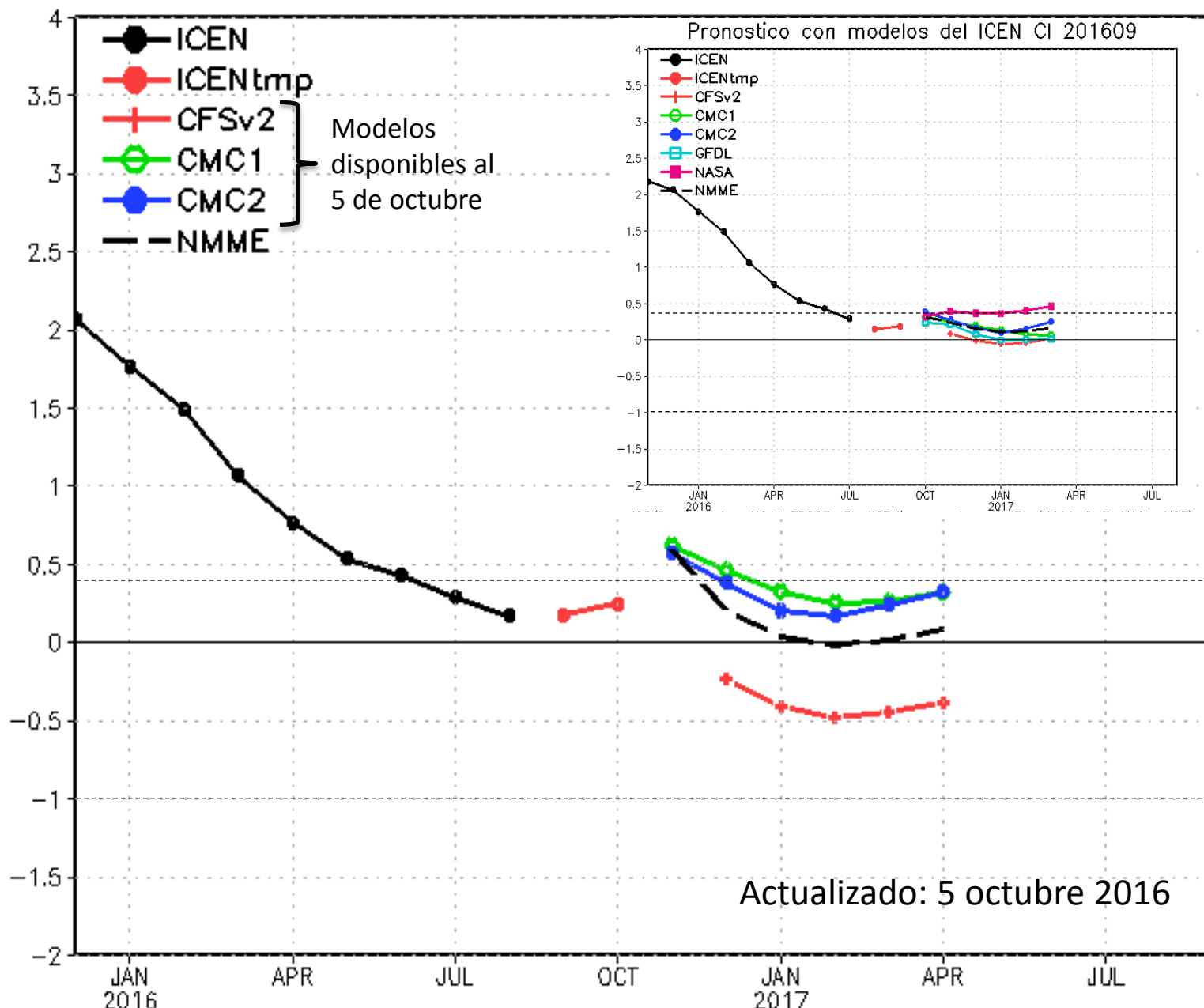
Last update: Mon Sep 5 2016
Initial conditions: 25Aug2016–30Sep2016



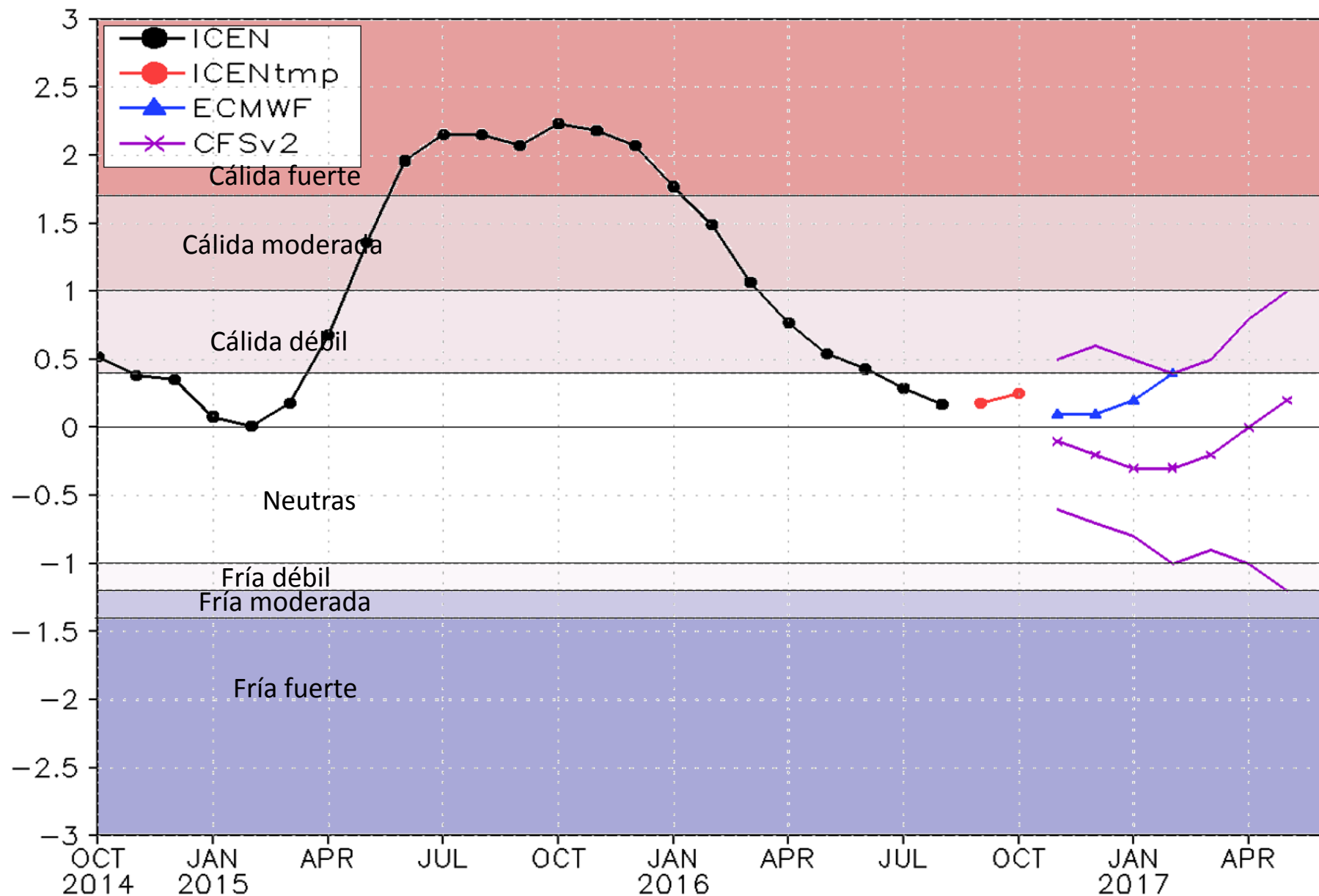
Corrida anterior

Corrida actual

Pronostico con modelos del ICEN CI 201610



Prónoſtico con modelos del ICEN



Nota: Las líneas delgadas en los pronósticos indican los máximos y mínimos en los "ensembles" de CFS2. Para ECMWF no se cuenta con datos del "ensemble".
ECMWF, tiene condiciones iniciales el mes de setiembre

Pronósticos de ICEN por modelos de NMME (promedios trimestrales de los

CI 2016 08

pronósticos de las anomalías en Niño 1+2)

Modelo	JAS	ASO	SON	OND	NDE	DEF	EFM
CFS2	0.15	0.06	0.03	-0.06	-0.15	-0.24	-0.30
CMC1	0.22	0.23	0.28	0.14	0.05	-0.01	-0.03
CMC2	0.16	0.15	0.20	0.10	0.06	0.03	0.05
GFDL	0.19	0.36	0.52	0.47	0.26	0.08	0.04
NASA	0.13	0.15	0.22	0.22	0.17	0.14	0.26
GFDL_FLOR	0.16	0.14	0.12	0.03	0.03	0.08	0.13
NCAR_CCSCM4	0.21	0.30	0.44	0.44	0.38	0.29	0.17
NMME	0.17	0.20	0.26	0.19	0.11	0.05	0.05
ECMWF			0.20	0.30	0.30	0.20	
ICENtmp	0.18						

CI 2016 09

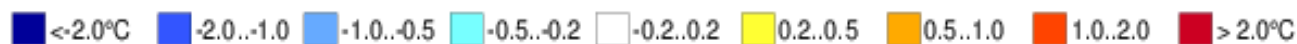
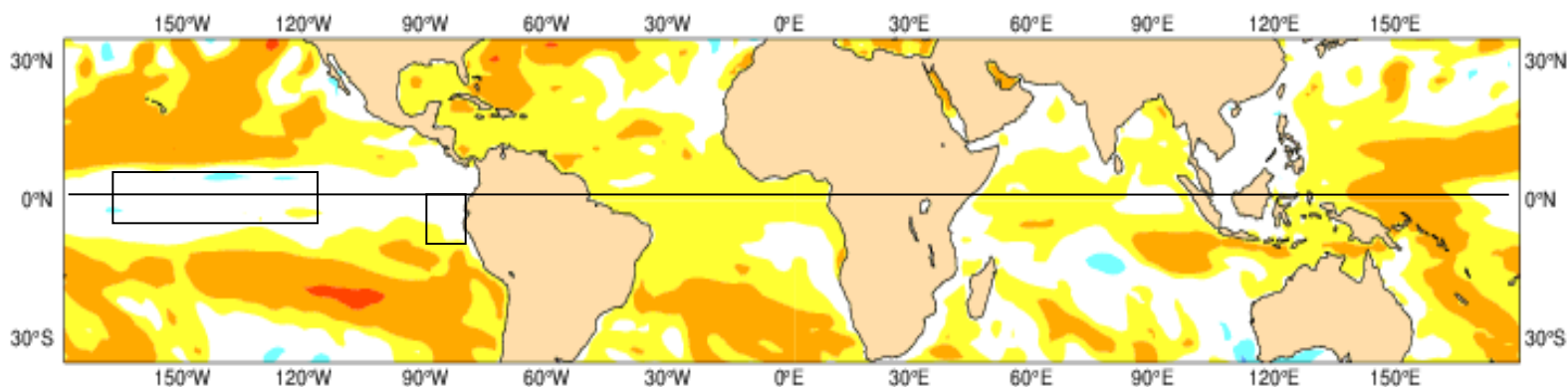
Modelo	ASO	SON	OND	NDE	DEF	EFM	FMA
CFS2		0.31	0.09	-0.01	-0.06	-0.04	0.03
CMC1		0.32	0.25	0.20	0.14	0.08	0.07
CMC2		0.38	0.27	0.16	0.10	0.15	0.25
GFDL		0.24	0.22	0.08	0.00	0.01	0.02
NASA		0.33	0.39	0.37	0.36	0.40	0.47
GFDL_FLOR A06		0.10	0.17	0.18	0.14	0.04	-0.02
NCAR_CCM4		0.39	0.51	0.60	0.54	0.42	0.31
NMME		0.30	0.27	0.23	0.17	0.15	0.16
ECMWF							
ICENtmp	0.18						

ECMWF Seasonal Forecast
 Mean forecast SST anomaly
 Forecast start reference is 01/09/16
 Ensemble size = 51, climate size = 450

NDE 2016/17

System 4
 NDJ 2016/17

ECMWF



Pac. Cen.
 0 ° C

Pac. Or.
 0.1°C

CFS2

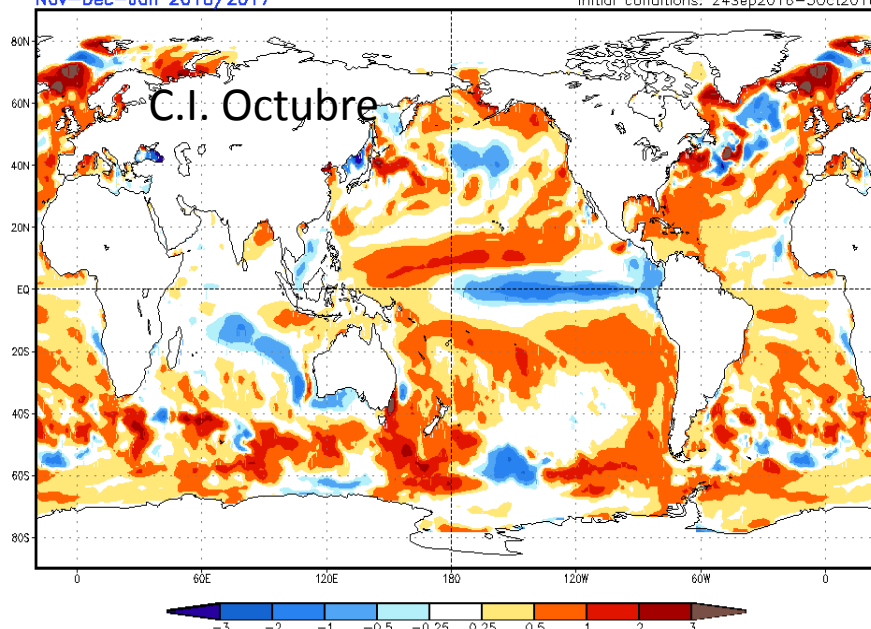
CFSv2 seasonal SST anomalies (K)



NWS/NCEP/CPC

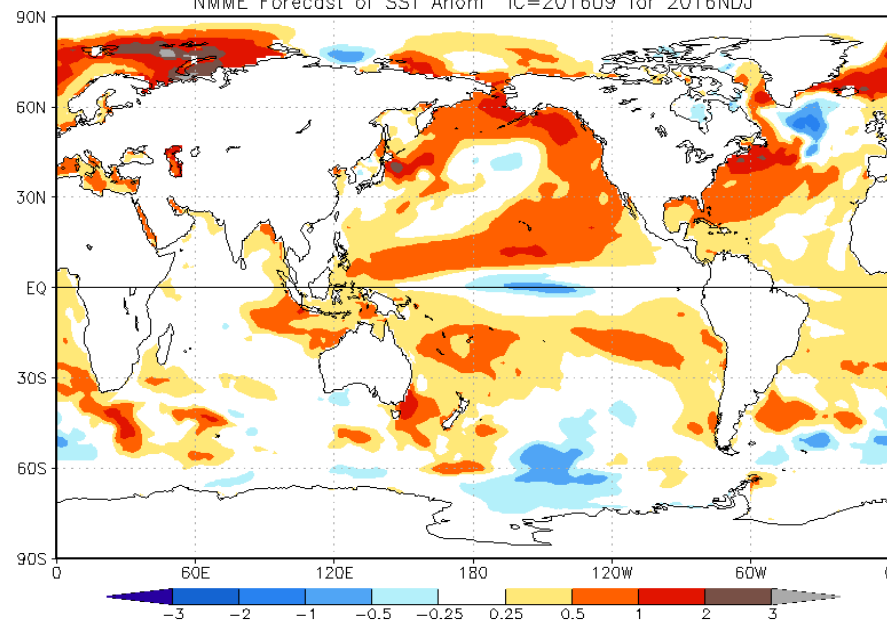
Nov-Dec-Jan 2016/2017

Initial conditions: 24Sep2016-30Oct2016



NMME

NMME Forecast of SST Anom IC=201609 for 2016NDJ

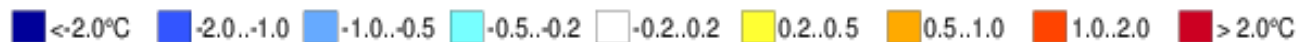
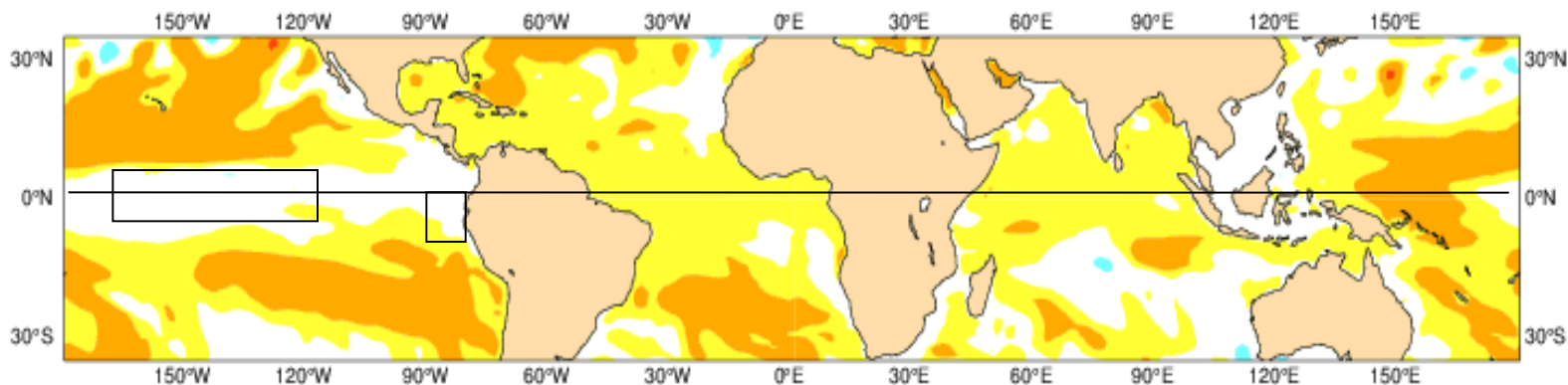


ECMWF Seasonal Forecast
Mean forecast SST anomaly
Forecast start reference is 01/09/16
Ensemble size = 51, climate size = 450

DEF 2016/17

System 4
DJF 2016/17

ECMWF



Pac. Cen.
0.1 ° C

Pac. Or.
0.2°C

CFS2

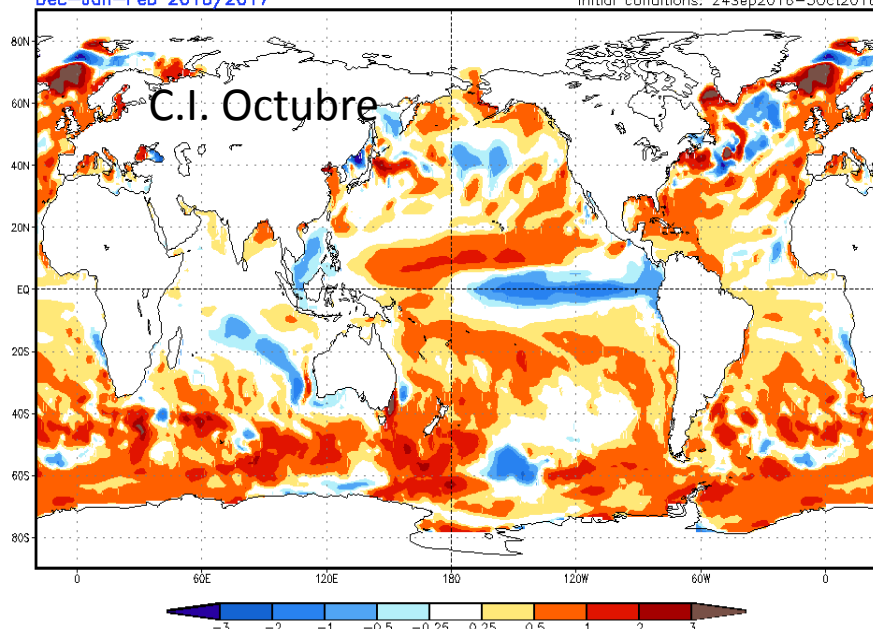
CFSv2 seasonal SST anomalies (K)



NWS/NCEP/CPC

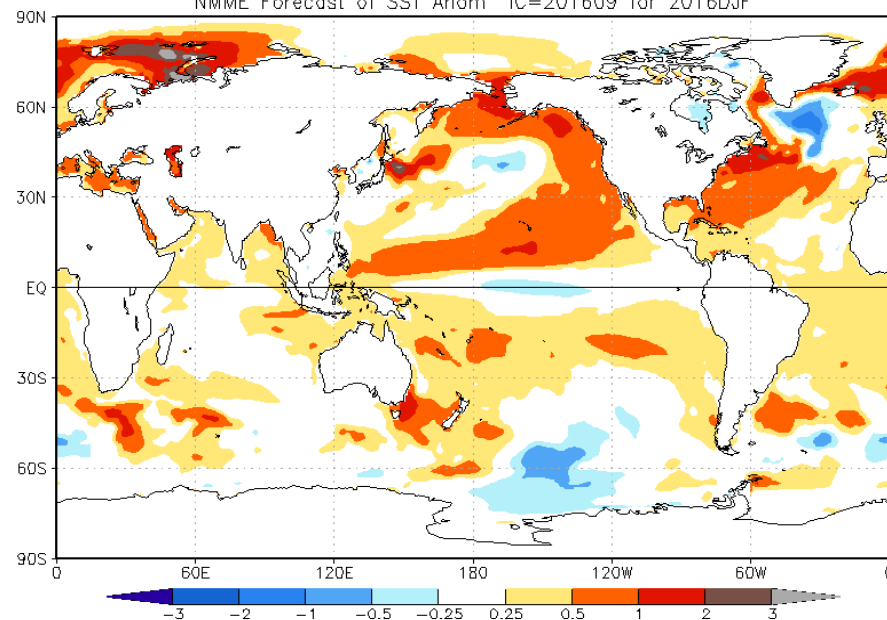
Dec-Jan-Feb 2016/2017

Initial conditions: 24Sep2016-30Oct2016



NMME

NMME Forecast of SST Anom IC=201609 for 2016DJF



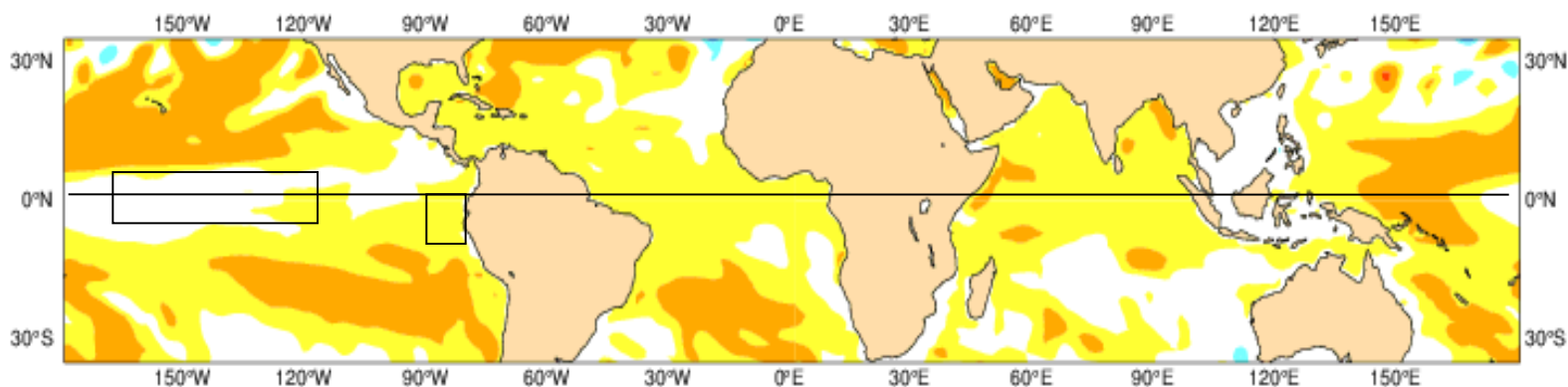
ECMWF Seasonal Forecast
Mean forecast SST anomaly
Forecast start reference is 01/09/16
Ensemble size = 51, climate size = 450

EFM 2016/17

System 4
JFM 2017

ECMWF

■ <-2.0°C
 ■ -2.0..-1.0
 ■ -1.0..-0.5
 ■ -0.5..-0.2
 ■ -0.2..0.2
 ■ 0.2..0.5
 ■ 0.5..1.0
 ■ 1.0..2.0
 ■ > 2.0°C



Pac. Cen.
0.2 °C

Pac. Or.
0.4°C

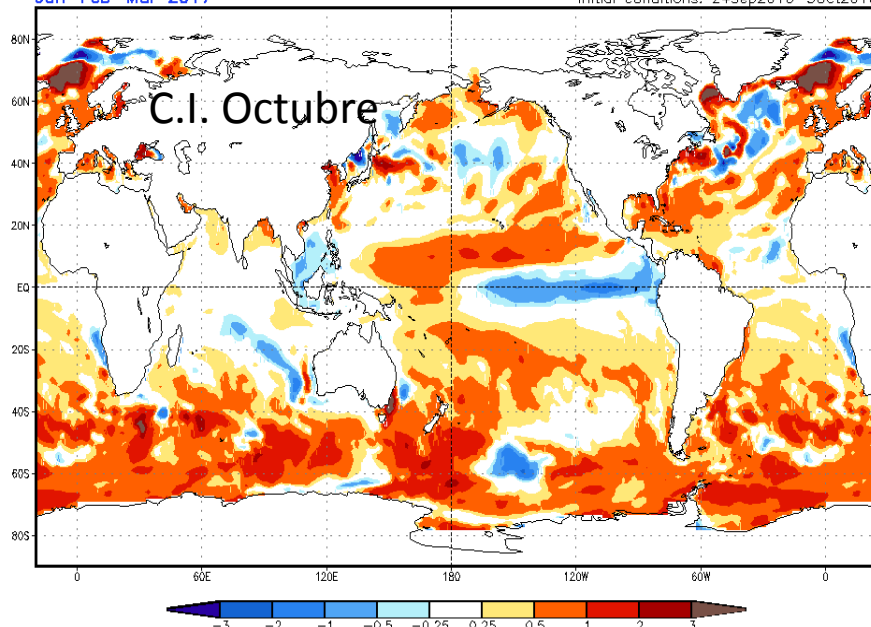
CFS2

CFSv2 seasonal SST anomalies (K)

NWS/NCEP/CPC

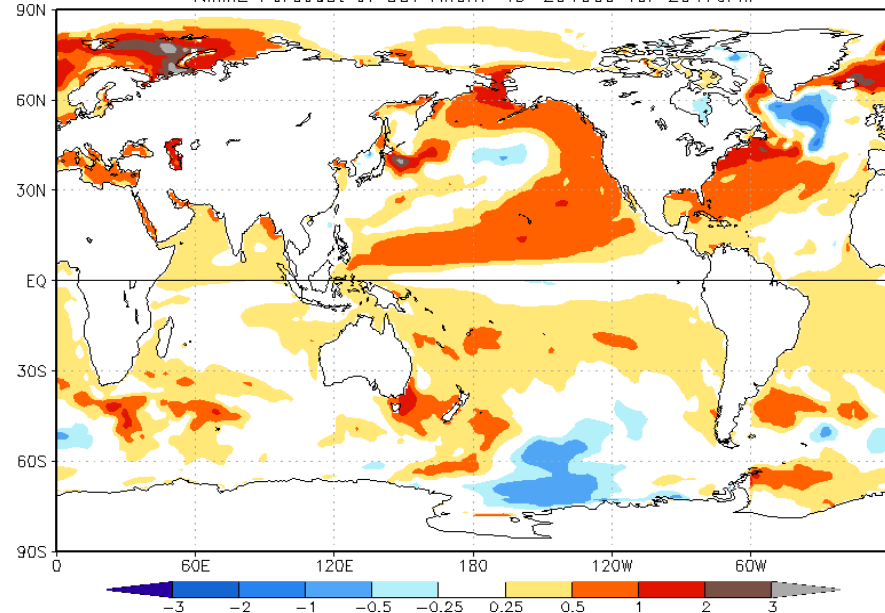
Jan-Feb-Mar 2017

Initial conditions: 24Sep2016-30Oct2016



NMME

NMME Forecast of SST Anom IC=201609 for 2017JFM



^ Pacífico Central (Niño 3.4)

Magnitud del evento durante Diciembre 2016-marzo 2017	Probabilidad de ocurrencia
La Niña moderado-fuerte	1%
La Niña débil	28%
Neutro	65%
El Niño débil	5%
El Niño moderado-fuerte-extraordinario	1%

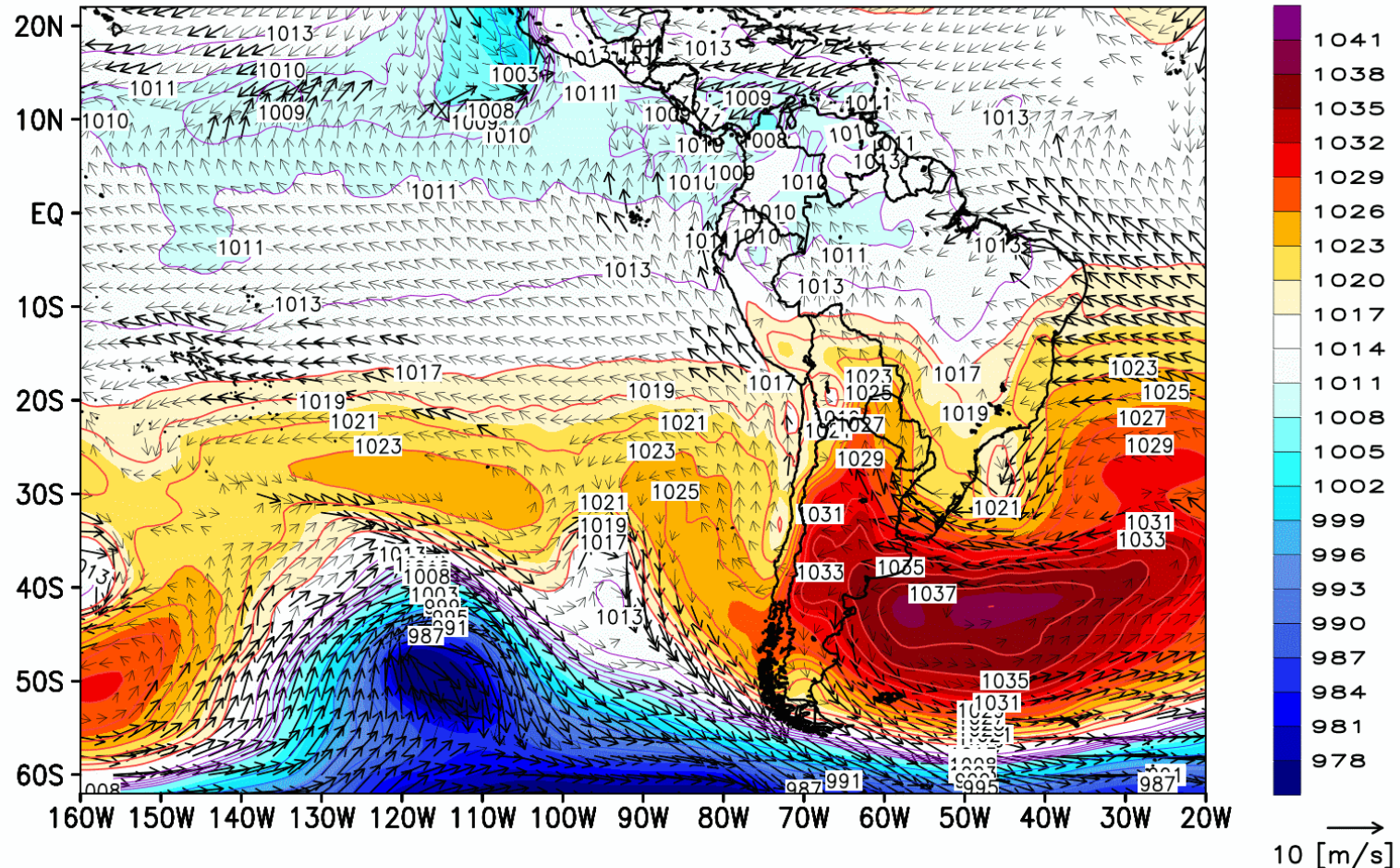
^ Pacífico Oriental (Niño 1+2)

Magnitud del evento durante Diciembre 2016-marzo 2017	Probabilidad de ocurrencia
La Niña moderado-fuerte	1%
La Niña débil	15%
Neutro	74%
El Niño débil	9%
El Niño moderado-fuerte-extraordinario	1%

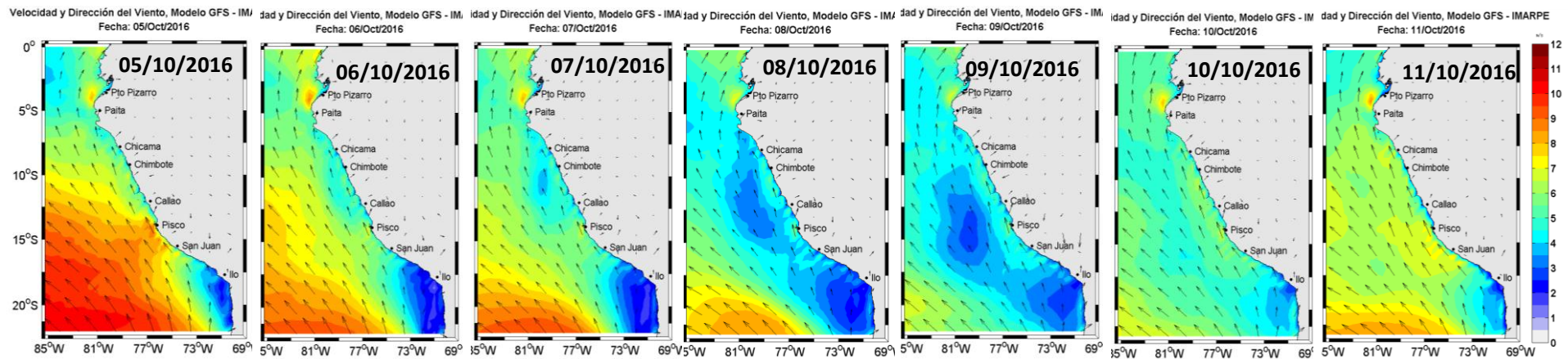
PRONOSTICO APS

www.gif-animator.com - UNREGISTERED

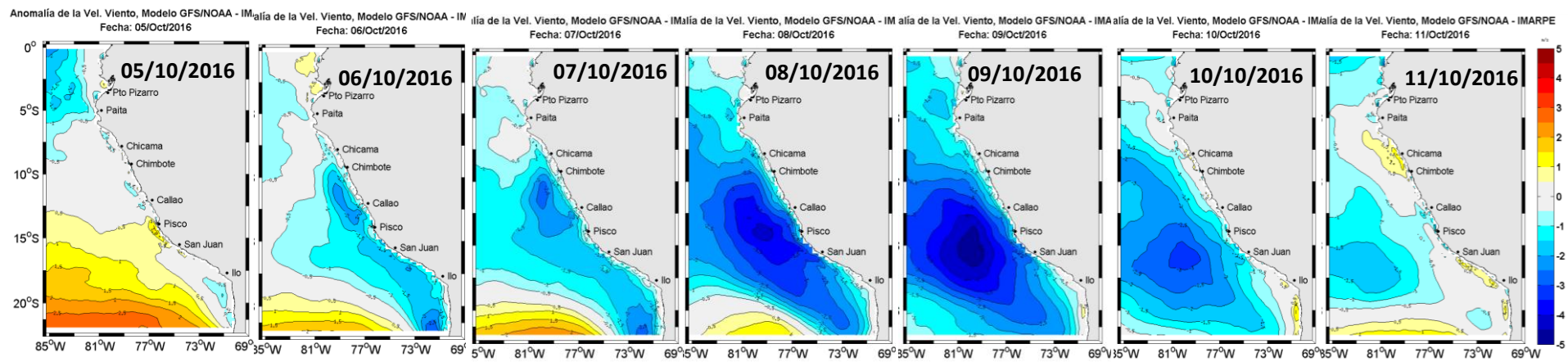
Wind 975 Hpa (m/s) – Mean Sea Level Pressure Reduced(Hpa)
ANALISIS: 0000Z 05/SEP/2016 VALIDO: 0000Z 05/SEP/2016



Mapas del Pronóstico de la Velocidad (Modelo GFS)

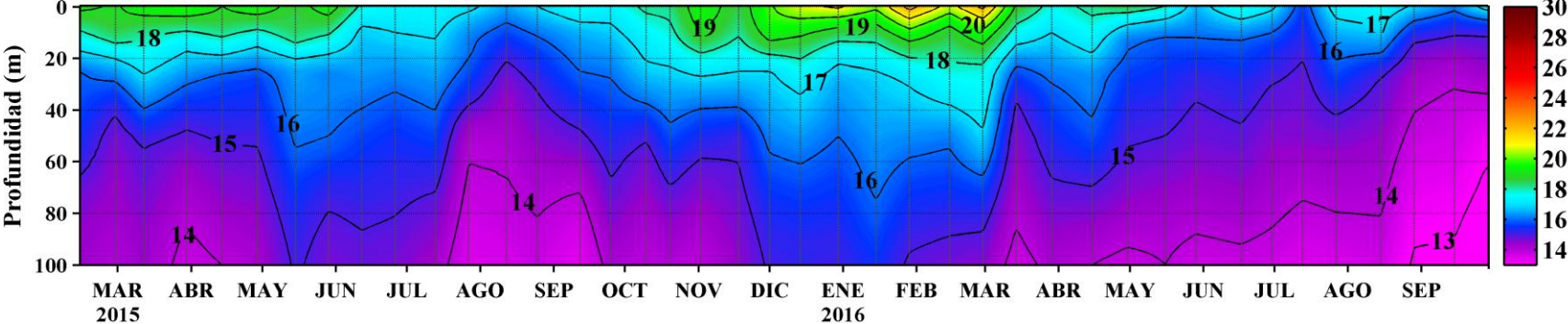


Anomalía del Pronóstico de la Velocidad (Modelo GFS)

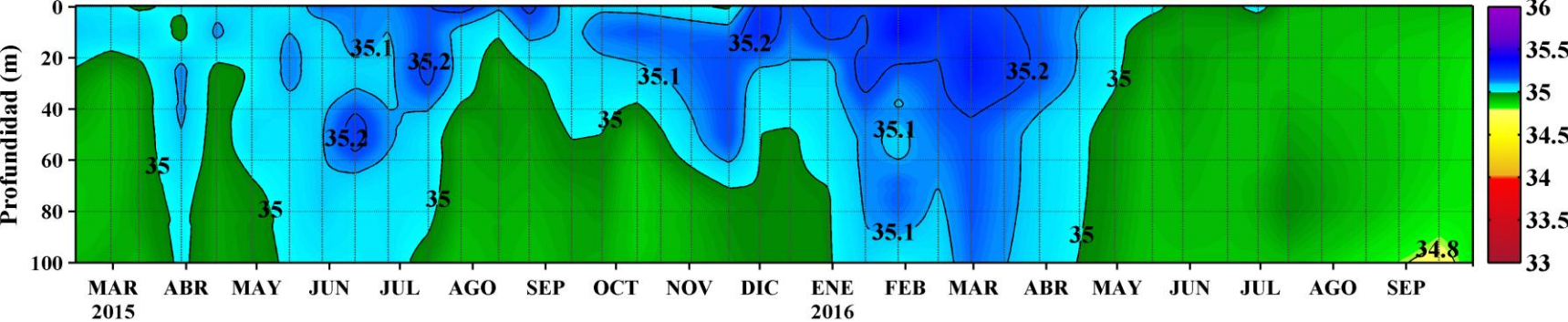


PUNTO FIJO DE ILO (29 DE SEPTIEMBRE 2016)

Temperatura (°C)



Salinidad (ups)



Oxígeno (mL/L)

