

**GOVERNO DO
ESTADO DO CEARÁ**
Secretaria dos Recursos Hídricos

10ª Reunião Itinerante do Comitê Integrado de Convivência
com a Seca do Estado do Ceará
Sobral (CE) – 18/12/2017

Tendências Climáticas para 2018

Meiry Sakamoto



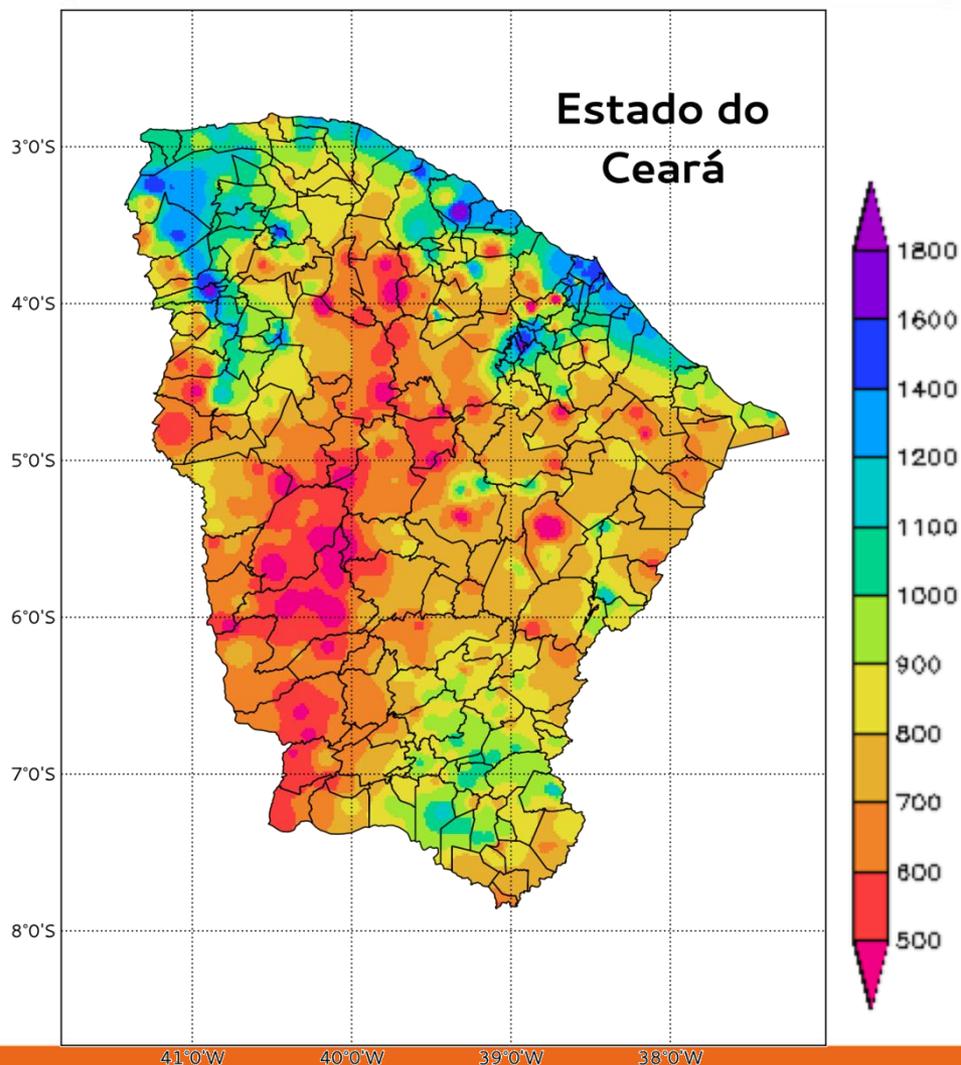
Aspectos Climáticos

Ceará

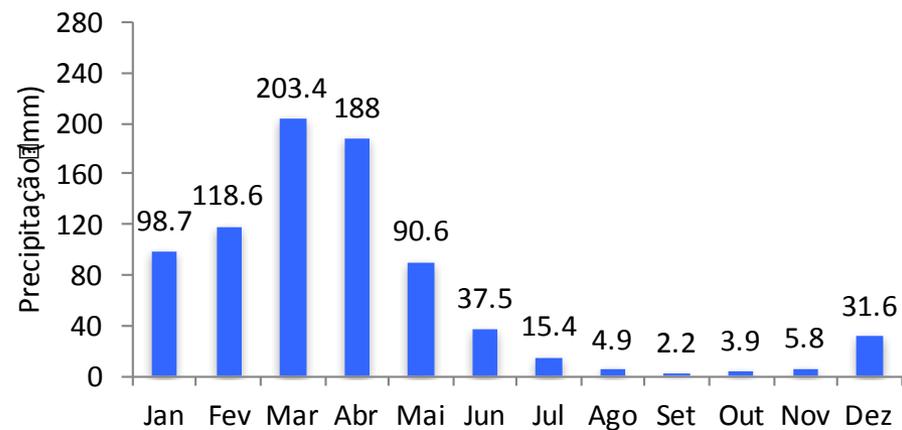
Sobral



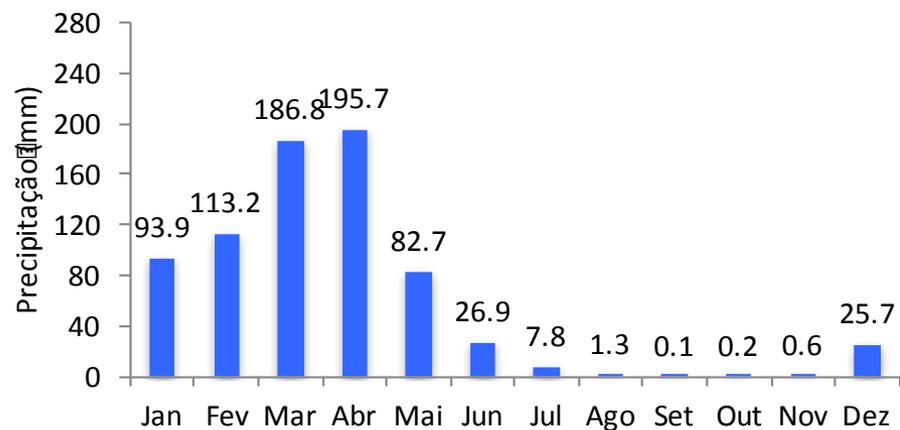
Aspectos do Clima no Ceará



Estado do Ceará



Sobral

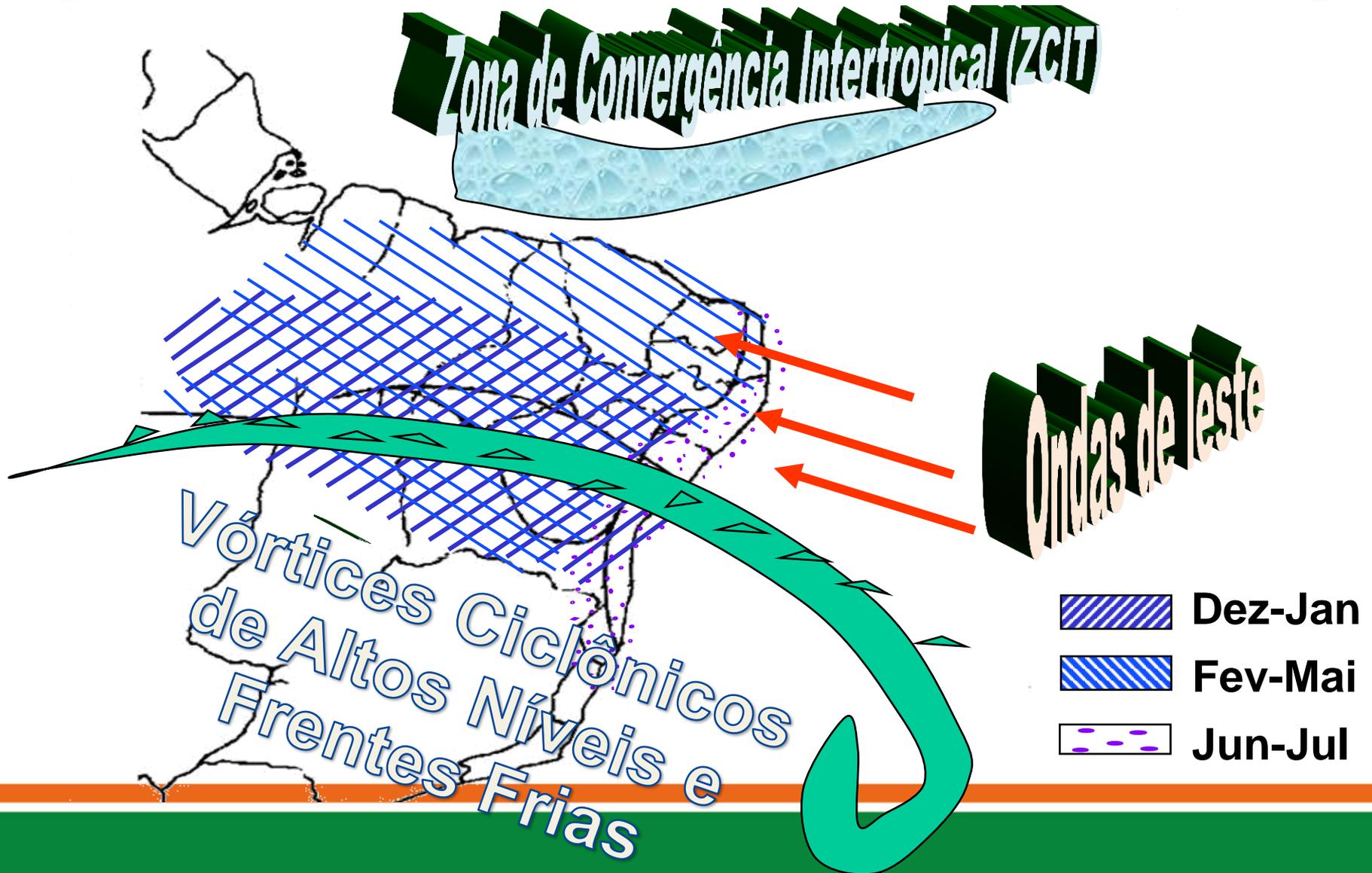


Atmosfera e Oceano

Sistemas Meteorológicos Influência dos Oceanos

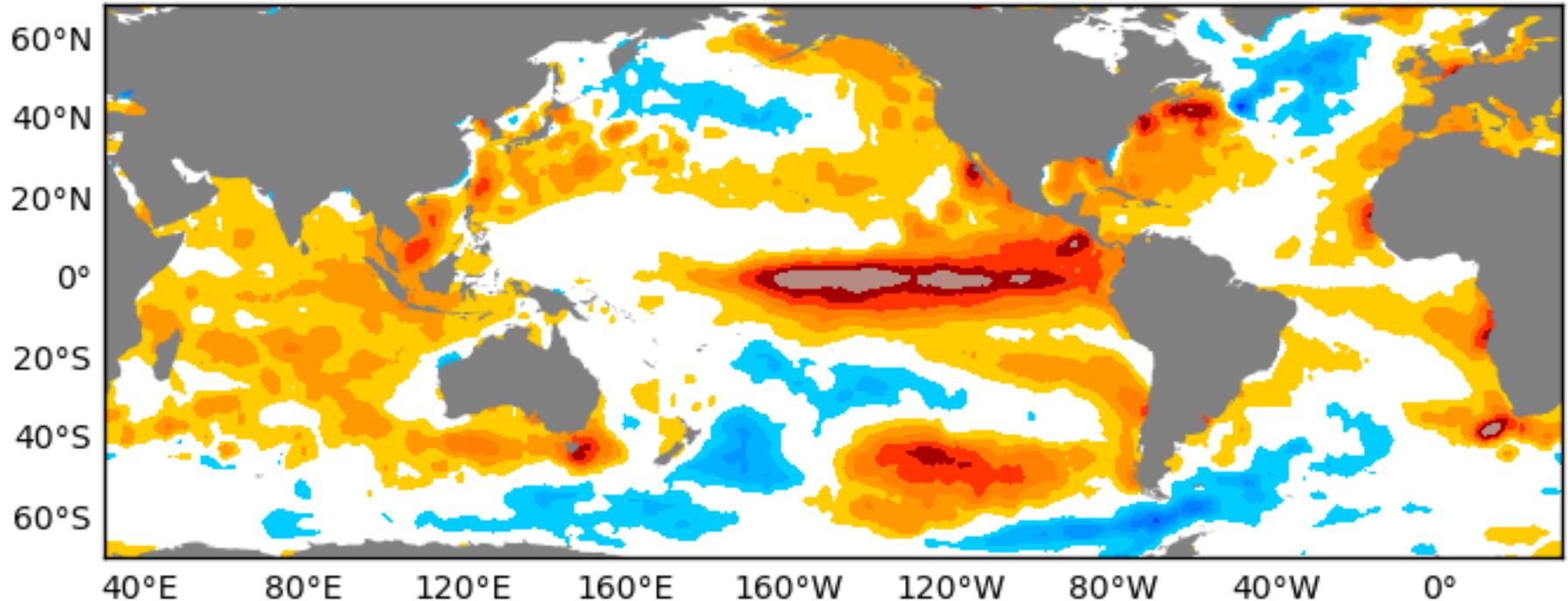


Principais Sistemas Meteorológicos



Influência do Oceano Pacífico – El Niño

Média Mensal da Anomalia de TSM
01/2016

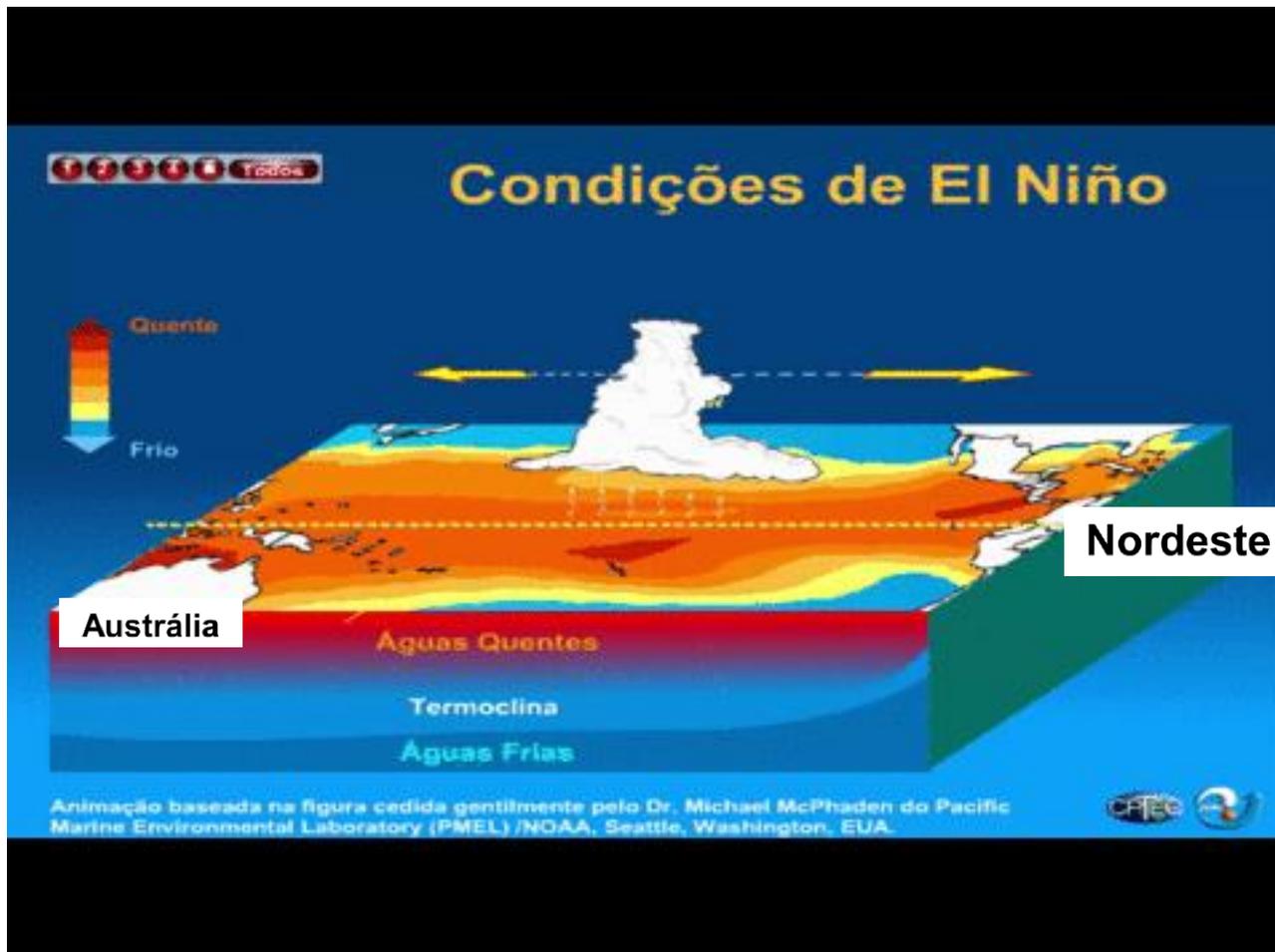


-3.0 -2.5 -2.0 -1.5 -1.0 -0.5 0.0 0.5 1.0 1.5 2.0 2.5 3.0

Anomalia TSM (°C)

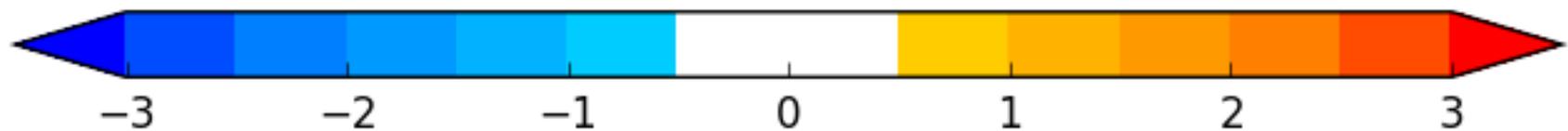
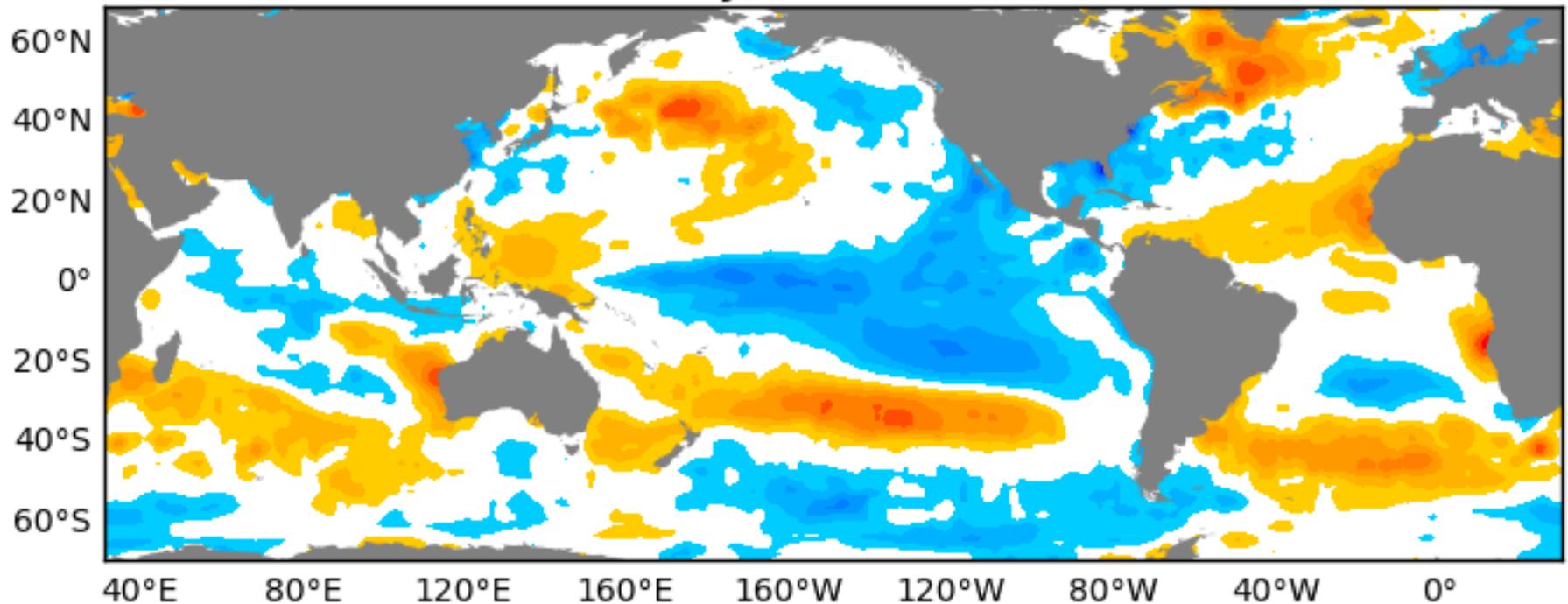
Fonte: NOAA/OAR/ESRL PSD
Elaboração: FUNCEME

Influência do Oceano Pacífico – El Niño



Influência do Oceano Pacífico - La Niña

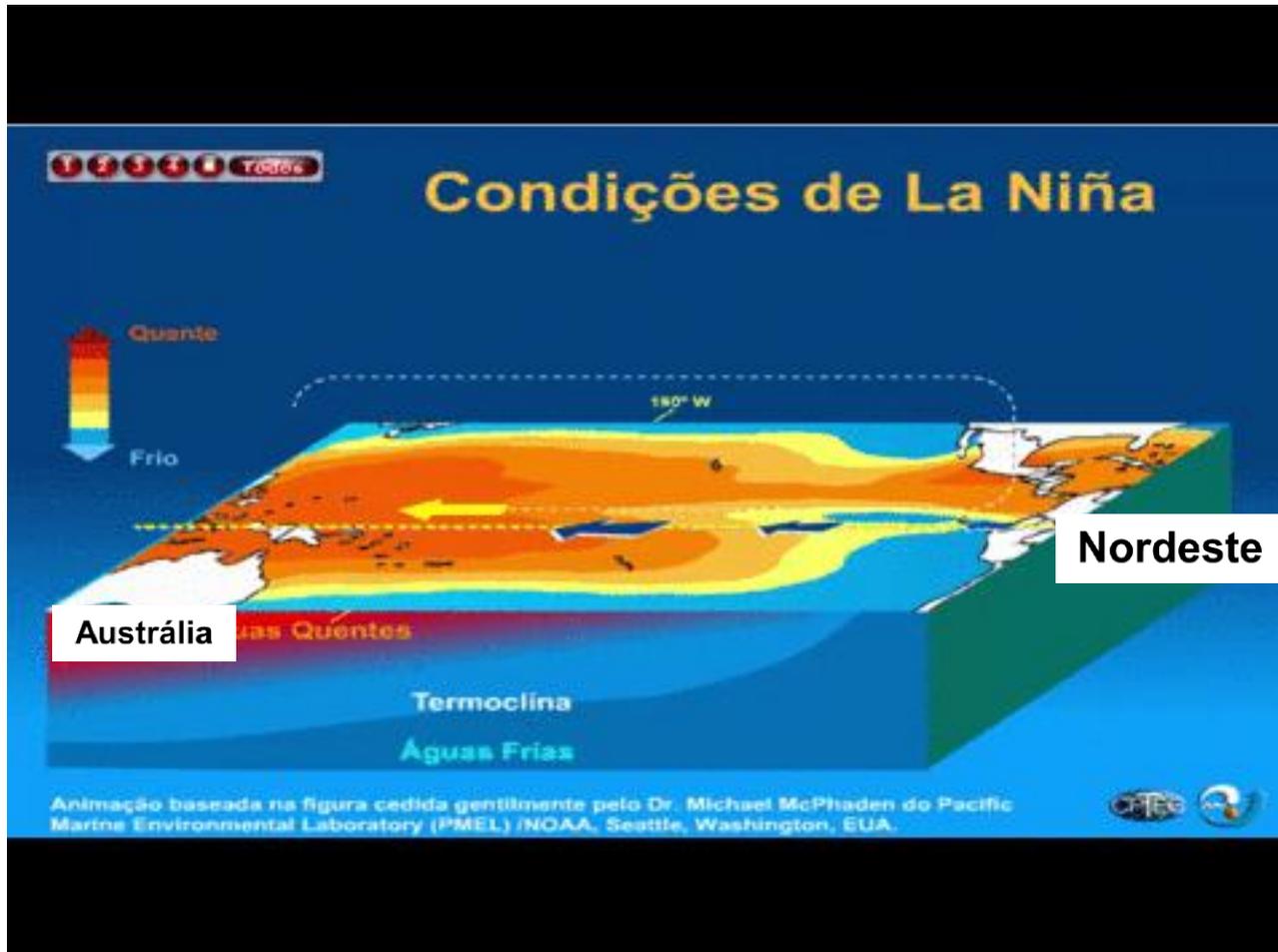
Média Mensal da Anomalia de TSM
Jan/2011



Fonte: NOAA/OAR/ESRL PSD
Elaboração: FUNCEME

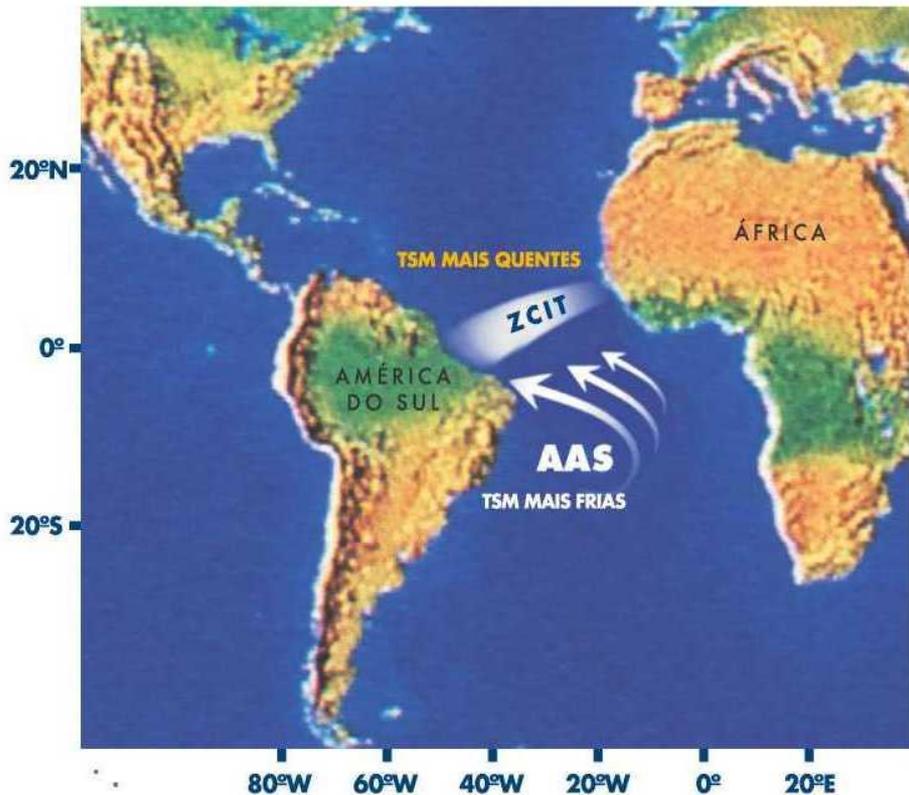
Anomalia TSM (°C)

Influência do Oceano Pacífico – La Niña

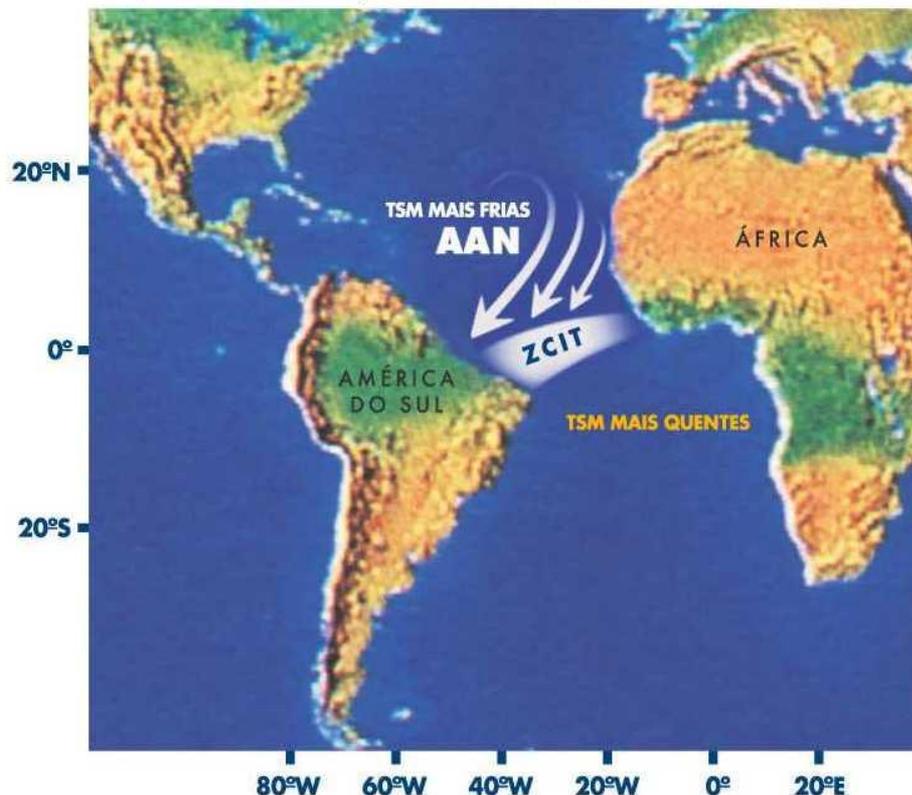


Influência do Oceano Atlântico

ANO SECO OU MUITO SECO

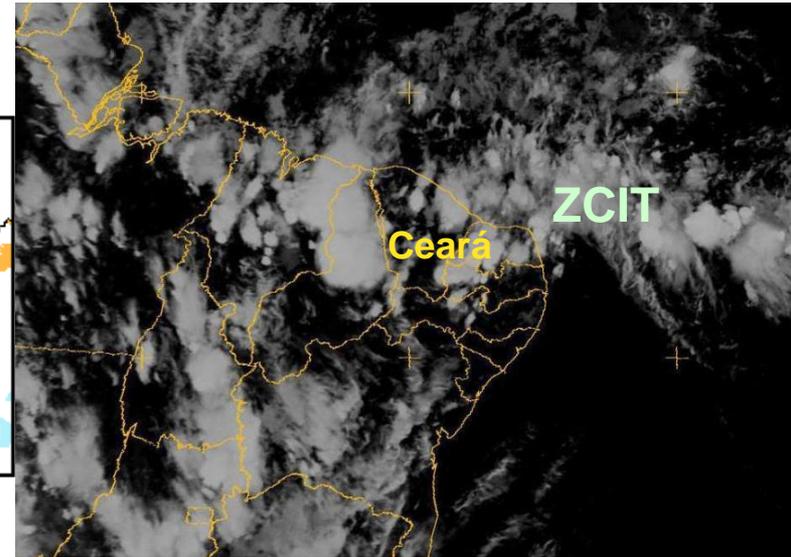
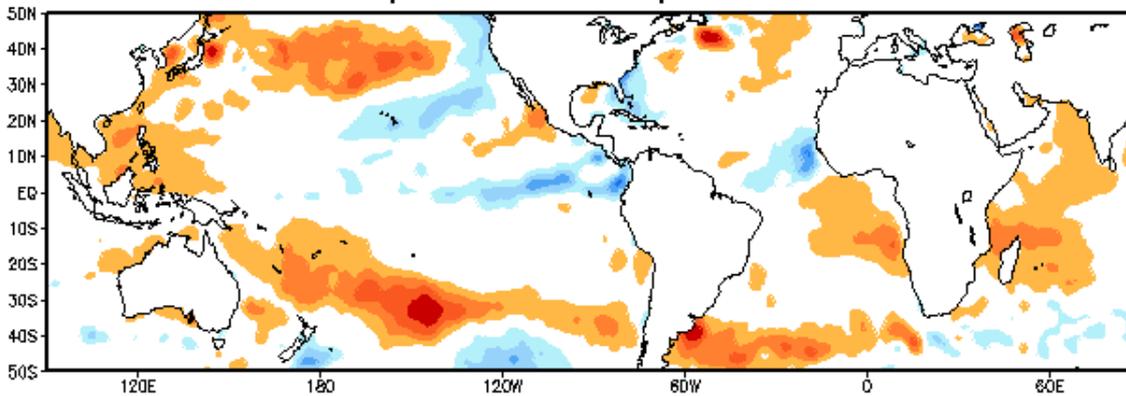


ANO NORMAL, CHUVOSO OU MUITO CHUVOSO



Influência do Oceano Atlântico

Anomalia de Temperatura da Superfície do Mar MAR2009



Chuva Observada

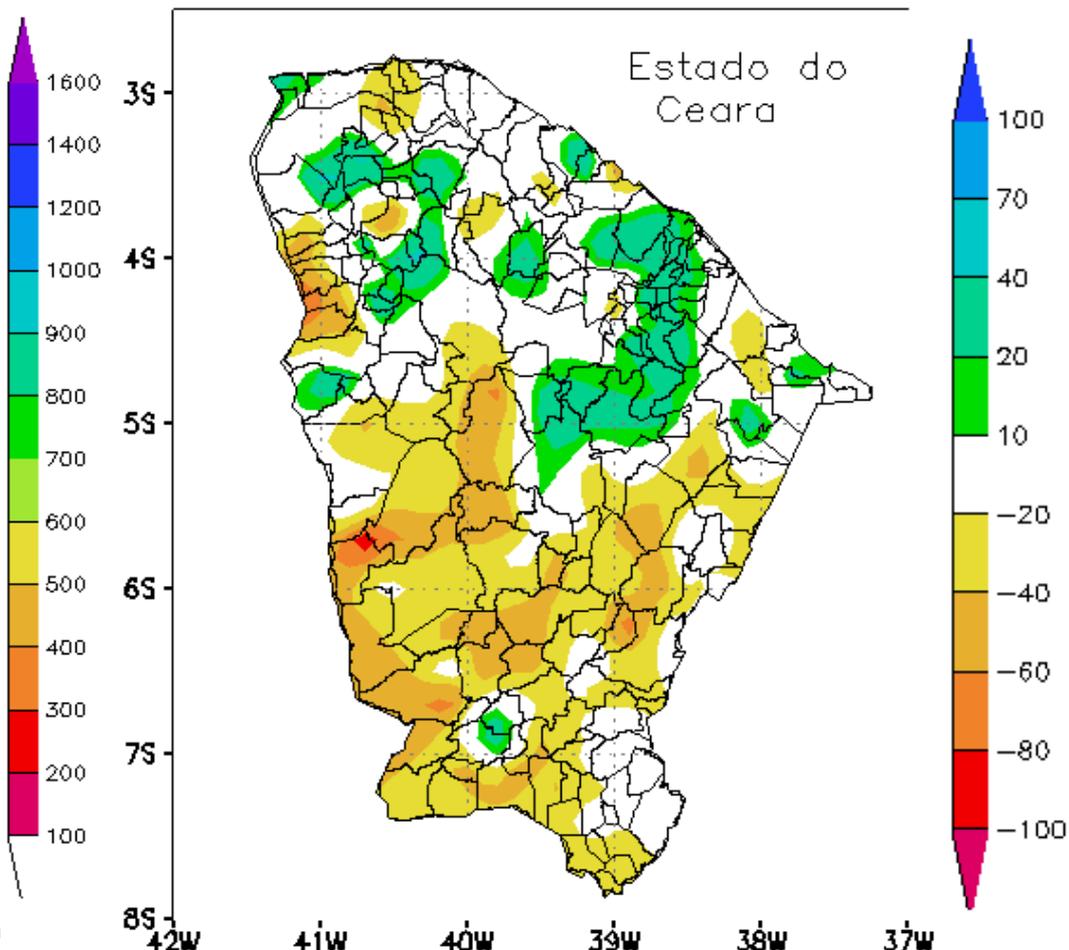
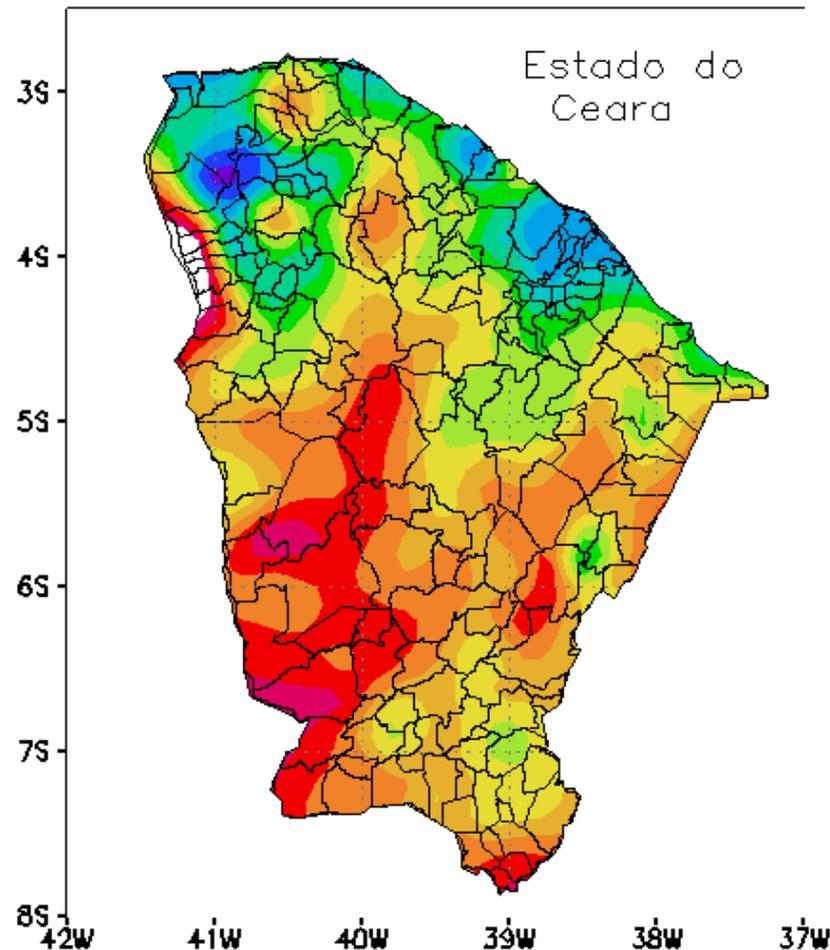
Histórico do Ceará



Quadra Chuvosa de 2017 (Fevereiro a Maio)

Precipitacao Observada (mm)
Período: 01/02/2017 a 31/05/2017

Desvio Percentual (%)
Período: 01/02/2017 a 31/05/2017



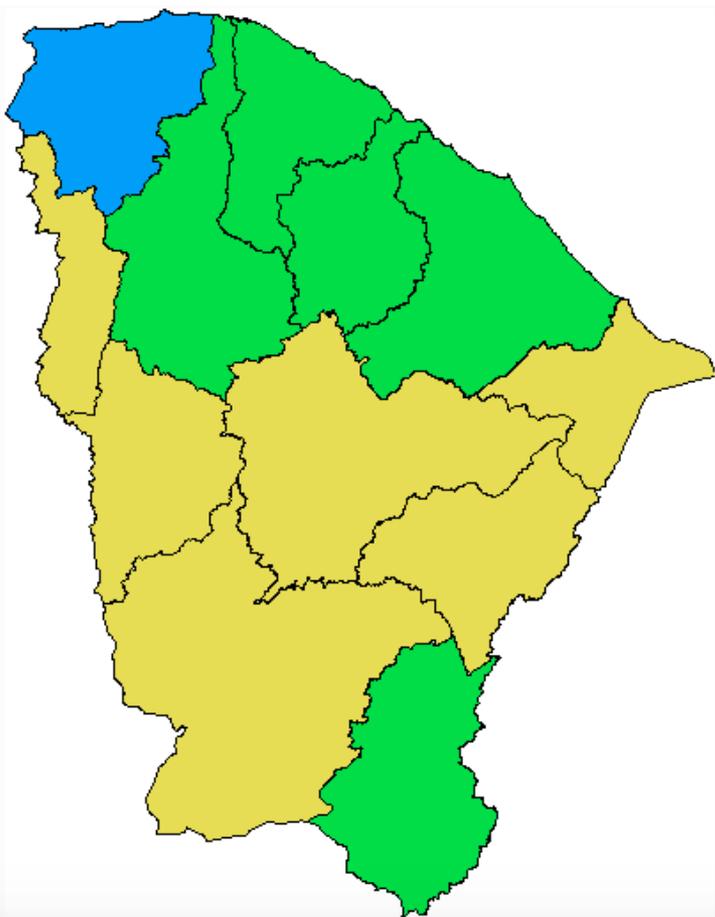
Estado do Ceará	Normal (mm)	Observado (mm)	Desvio (%)
Estado do Ceará	600.7	554.5	-7.7

Categoria		
Abaixo da média	Em torno da média	Acima da média
0 a 505.6mm	505.6 a 695.8mm	acima de 695.8mm

Bacias Hidrográficas – Ano de 2017

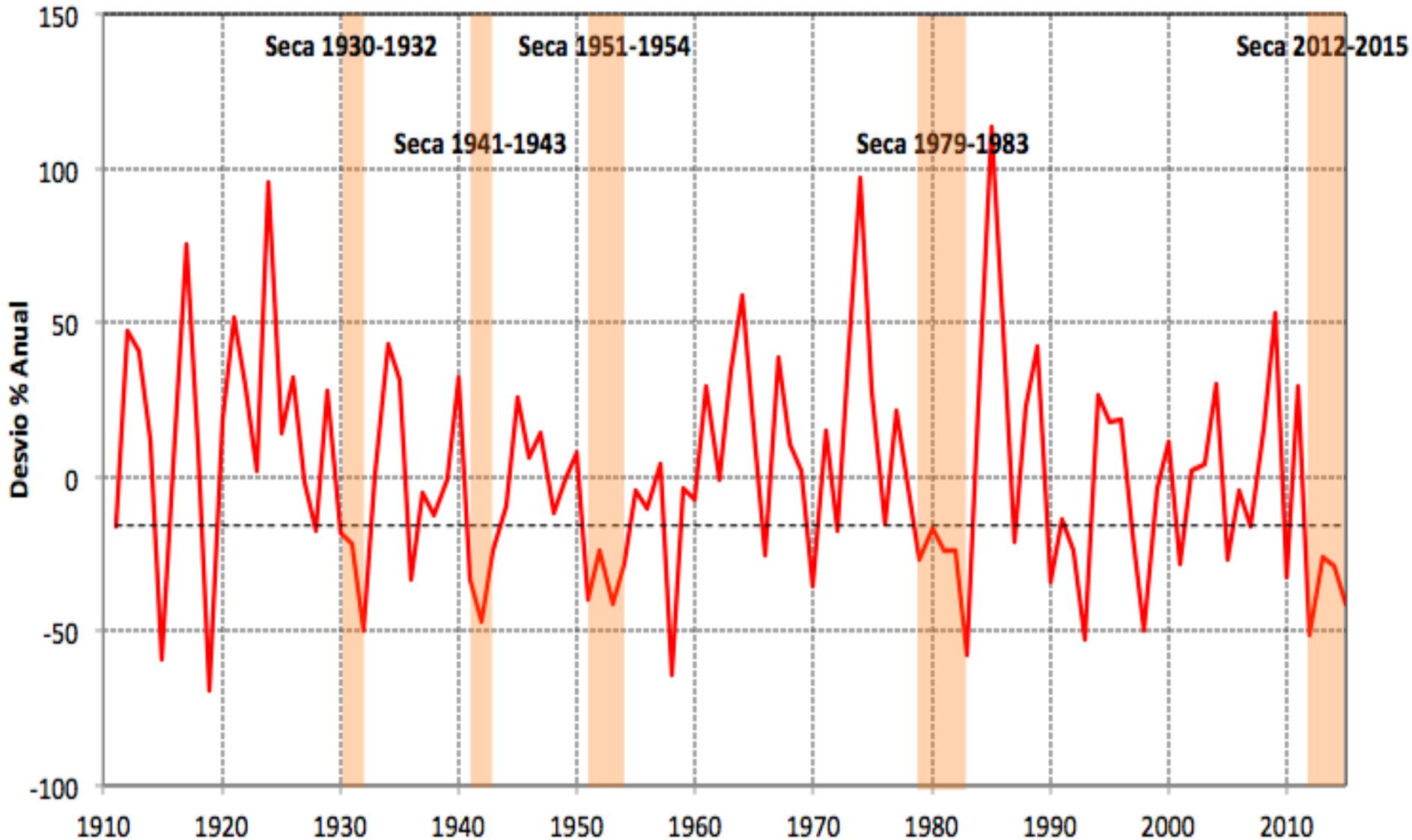
Chuva Anual (mm)

■ Acima de 1600.0mm
 ■ De 1300.1 a 1600.0mm
 ■ De 1000.1 a 1300.0mm
 ■ De 700.1 a 1000.0mm
 ■ De 400.1 a 700.0mm
 ■ De 200.1 a 400.0mm
 De 0.0 a 200mm
 ■ Sem Informação



Bacia Hidrográfica	Normal Climatológica (mm)	Observado (mm)	Desvio (%)
Metropolitana	947.7	992.4	4.7
Coreau	1070.0	1074.9	0.5
Curu	711.7	703.6	-1.1
Baixo Aguaribe	707.3	690.4	-2.4
Acaraú	807.3	764.8	-5.3
Litoral	860.1	816.9	-5.0
Banabuiú	681.9	593.3	-13.0
Salgado	883.3	711.4	-19.5
Serra da Biapaba	746.9	560.9	-24.9
Médio Aguaribe	742.0	540.1	-27.2
Alto Aguaribe	675.7	442.4	-34.5
Sertões de Crateús	646.8	415.8	-35.7

Chuva no Ceará (1910-2015)

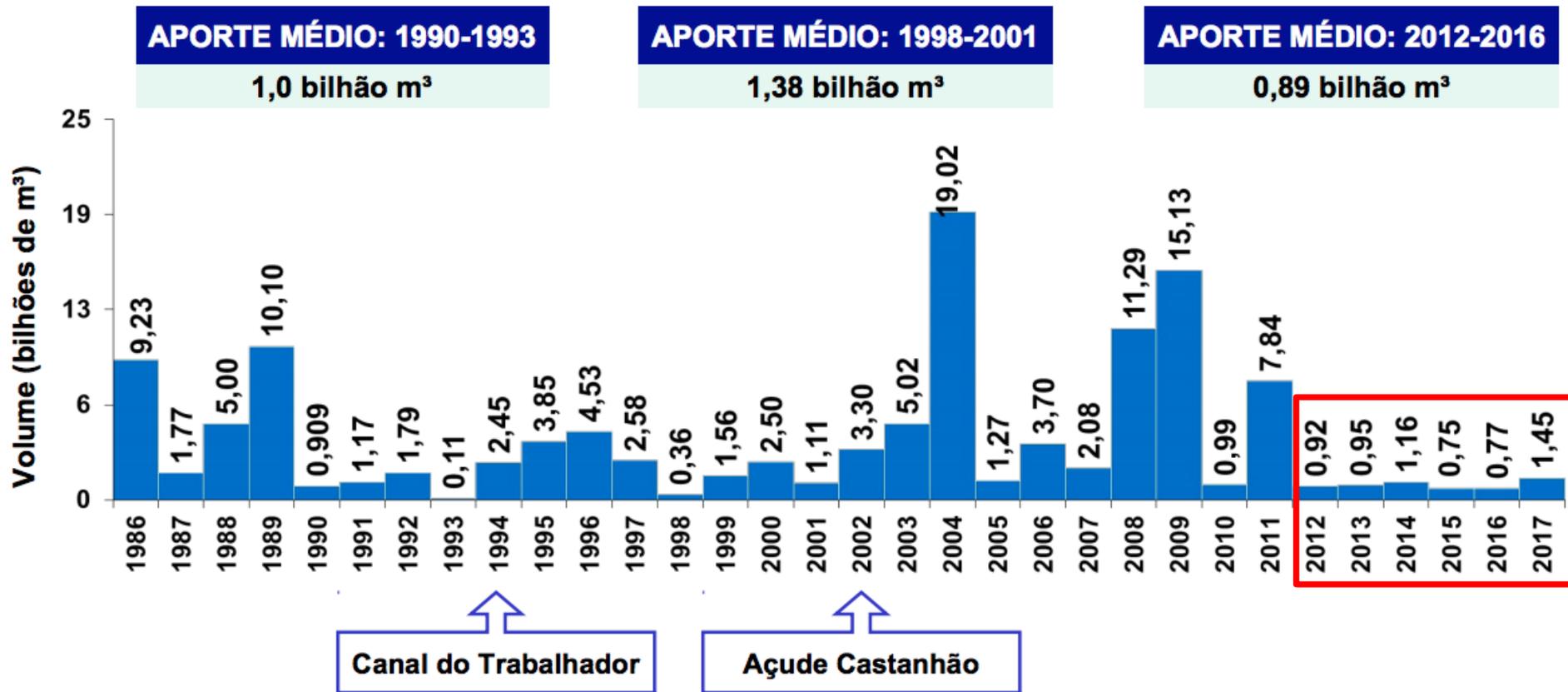


Impacto

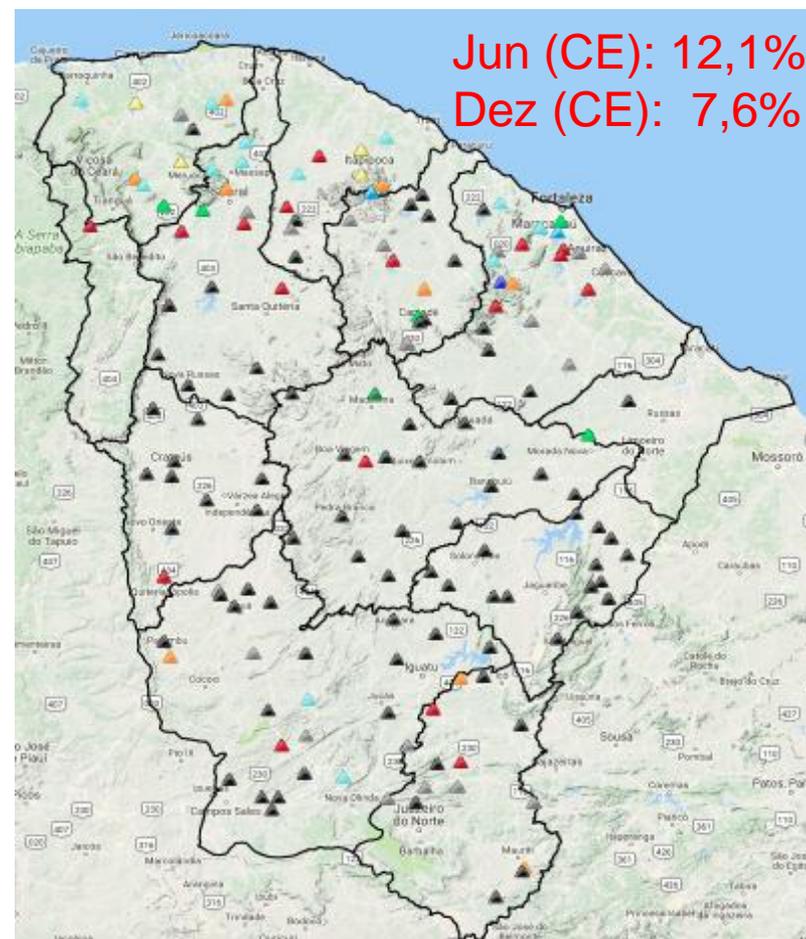
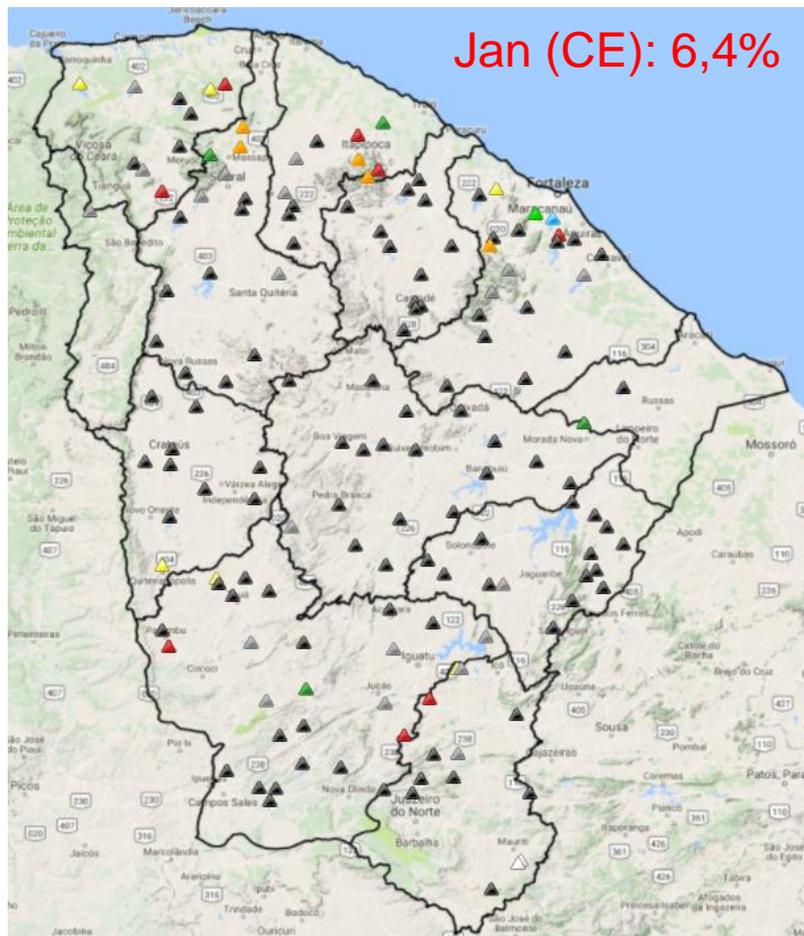
Aporte Hídrico Situação dos Açudes



Aporte Hídrico (1986-2017)

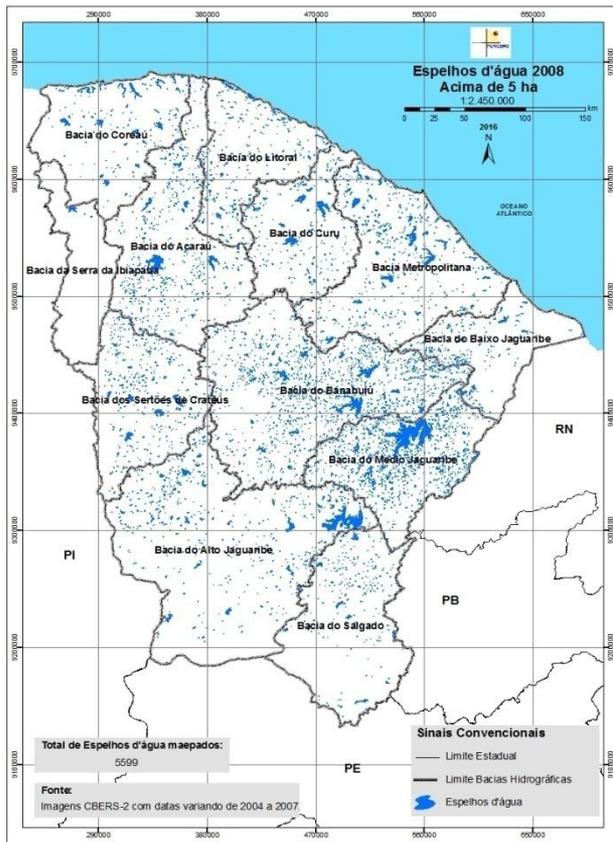


Volume dos reservatórios: 01/01/17 e 17/12/2017



Espelhos D'Água

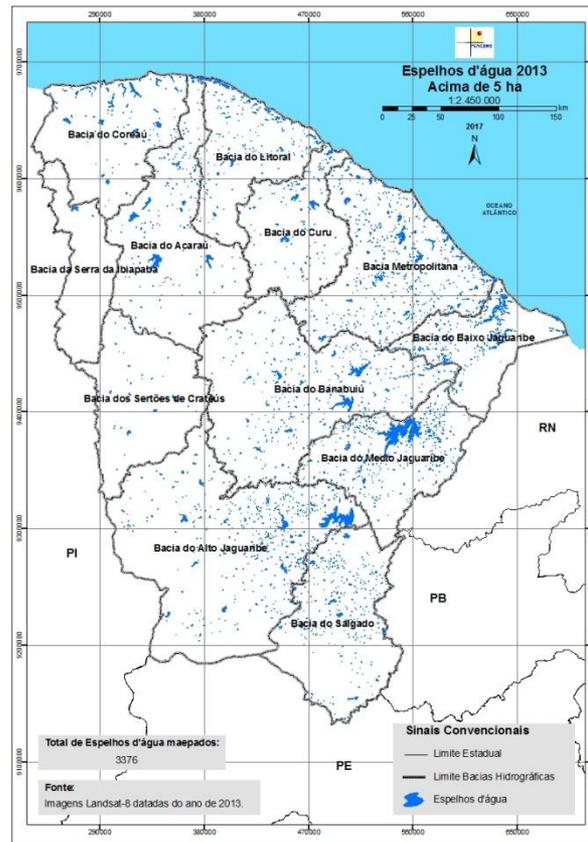
ESPELHOS D'ÁGUA CEARÁ - 2008



1.354 espelhos acima de 20ha

5.599 espelhos acima de 5ha

ESPELHOS D'ÁGUA CEARÁ - 2013



778 espelhos acima de 20ha

3.376 espelhos acima de 5ha

ESPELHOS D'ÁGUA CEARÁ - 2016



348 espelhos acima de 20ha

1.466 espelhos acima de 5ha

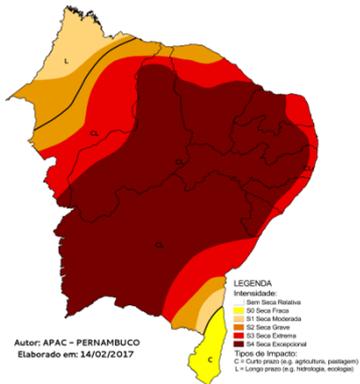
Espelhos d'água acima de 0,5ha 2013 = 28.195

Espelhos d'água acima de 0,5ha 2016 = 9.303

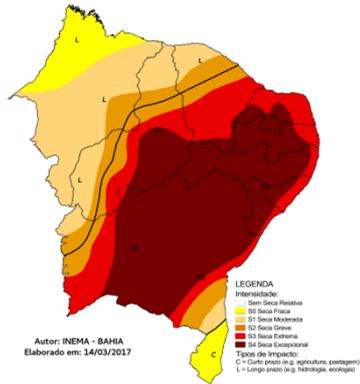


Monitor de Secas do Nordeste - Ano de 2017

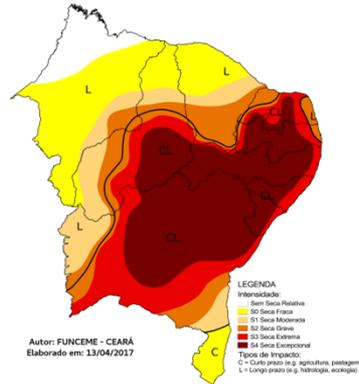
Monitor de Secas
Janeiro/2017



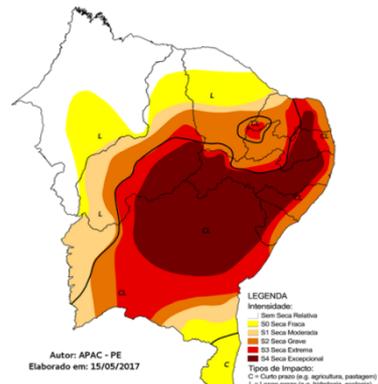
Monitor de Secas
Fevereiro/2017



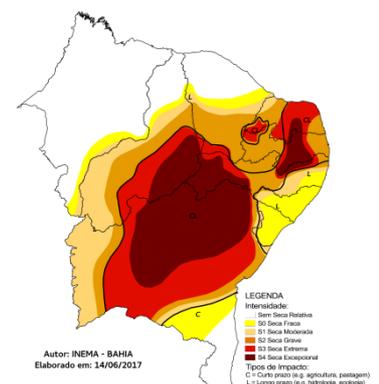
Monitor de Secas
Março/2017



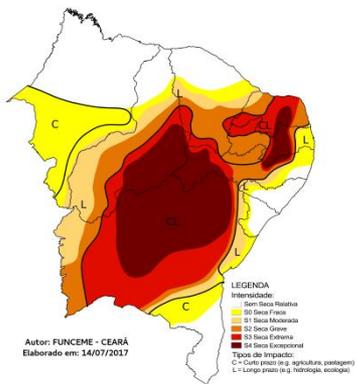
Monitor de Secas
Abril/2017



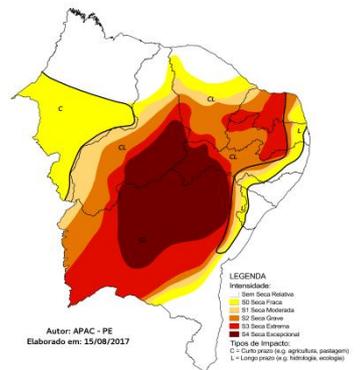
Monitor de Secas
Maio/2017



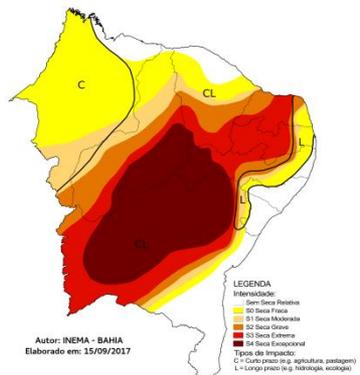
Monitor de Secas
Junho/2017



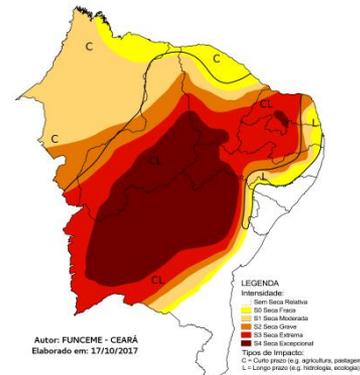
Monitor de Secas
Julho/2017



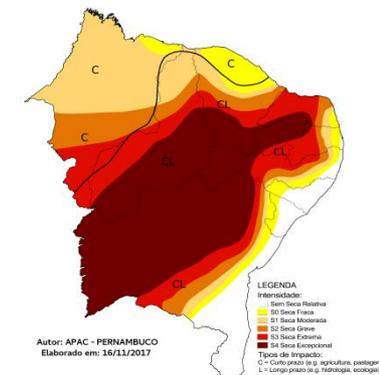
Monitor de Secas
Agosto/2017



Monitor de Secas
Setembro/2017



Monitor de Secas
Outubro/2017



2018

Tendências Climáticas

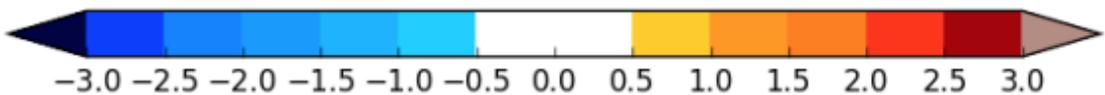
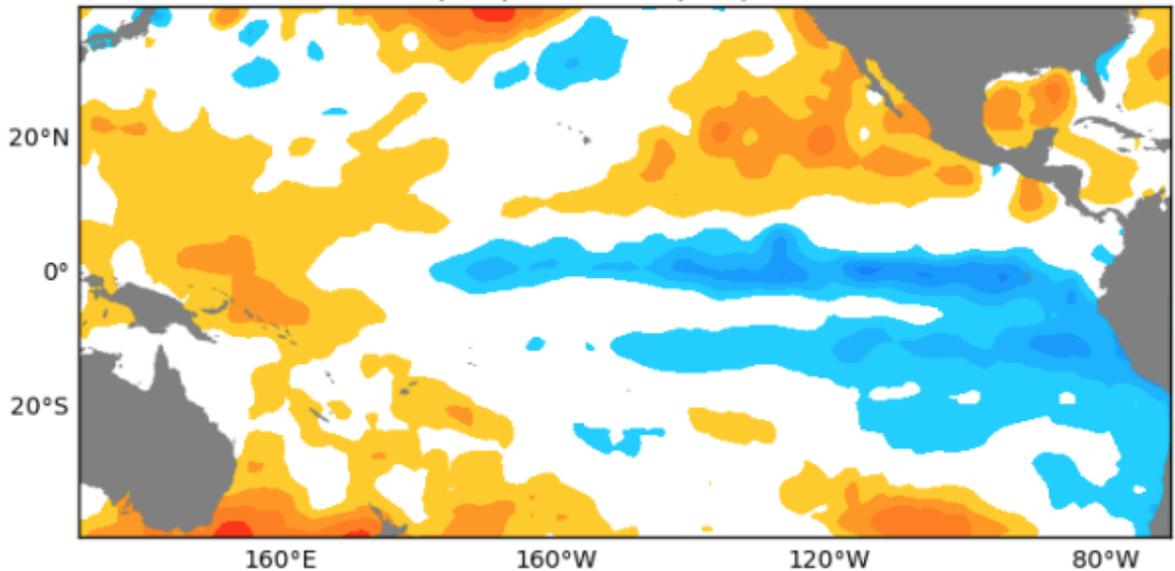


Condições Oceânicas



Anomalia da Temperatura da Superfície do Mar – Pacífico

Média da Anomalia de TSM das últimas quatro semanas
15/11/2017:06/12/2017

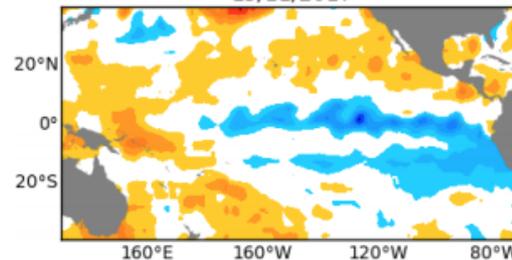


Fonte: NOAA/OAR/ESRL PSD
Elaboração: FUNCEME

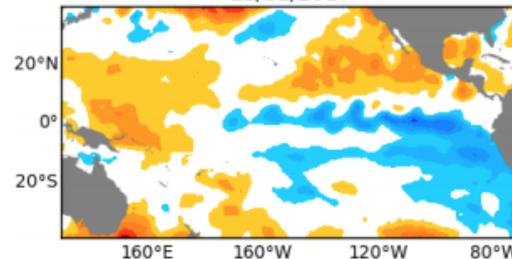
Anomalia TSM (°C)

Anomalia Semanal de TSM

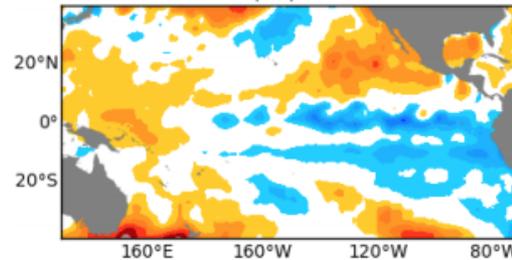
15/11/2017



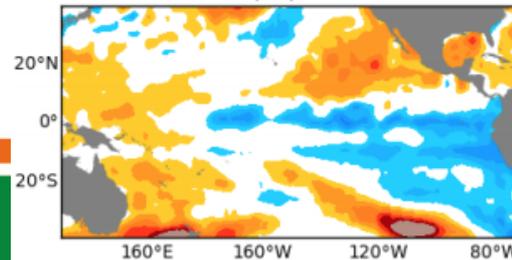
22/11/2017



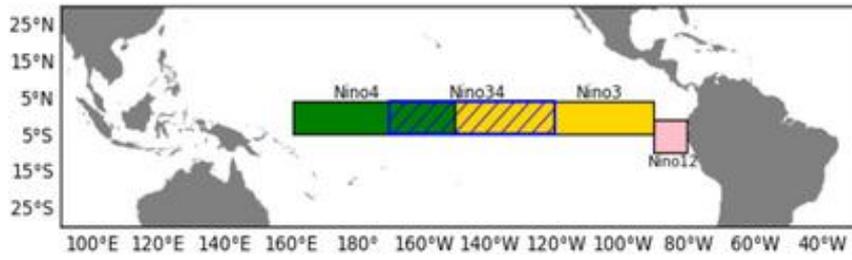
29/11/2017



06/12/2017



Anomalia TSM (°C)



Oceanic Niño Index (ONI - NOAA)

Year	DJF	JFM	FMA	MAM	AMJ	MJJ	JJA	JAS	ASO	SON	OND	NDJ
2010	1.5	1.3	0.9	0.4	-0.1	-0.6	-1.0	-1.4	-1.6	-1.7	-1.7	-1.6
2011	-1.4	-1.1	-0.8	-0.6	-0.5	-0.4	-0.5	-0.7	-0.9	-1.1	-1.1	-1.0
2012	-0.8	-0.6	-0.5	-0.4	-0.2	0.1	0.3	0.3	0.3	0.2	0.0	-0.2
2013	-0.4	-0.3	-0.2	-0.2	-0.3	-0.3	-0.4	-0.4	-0.3	-0.2	-0.2	-0.3
2014	-0.4	-0.4	-0.2	0.1	0.3	0.2	0.1	0.0	0.2	0.4	0.6	0.7
2015	0.6	0.6	0.6	0.8	1.0	1.2	1.5	1.8	2.1	2.4	2.5	2.6
2016	2.5	2.2	1.7	1.0	0.5	0.0	-0.3	-0.6	-0.7	-0.7	-0.7	-0.6
2017	-0.3	-0.1	0.1	0.3	0.4	0.4	0.1	-0.2	-0.4	-0.7		

Até outubro de 2017 La Niña ainda não configurada!

Média de Modelos

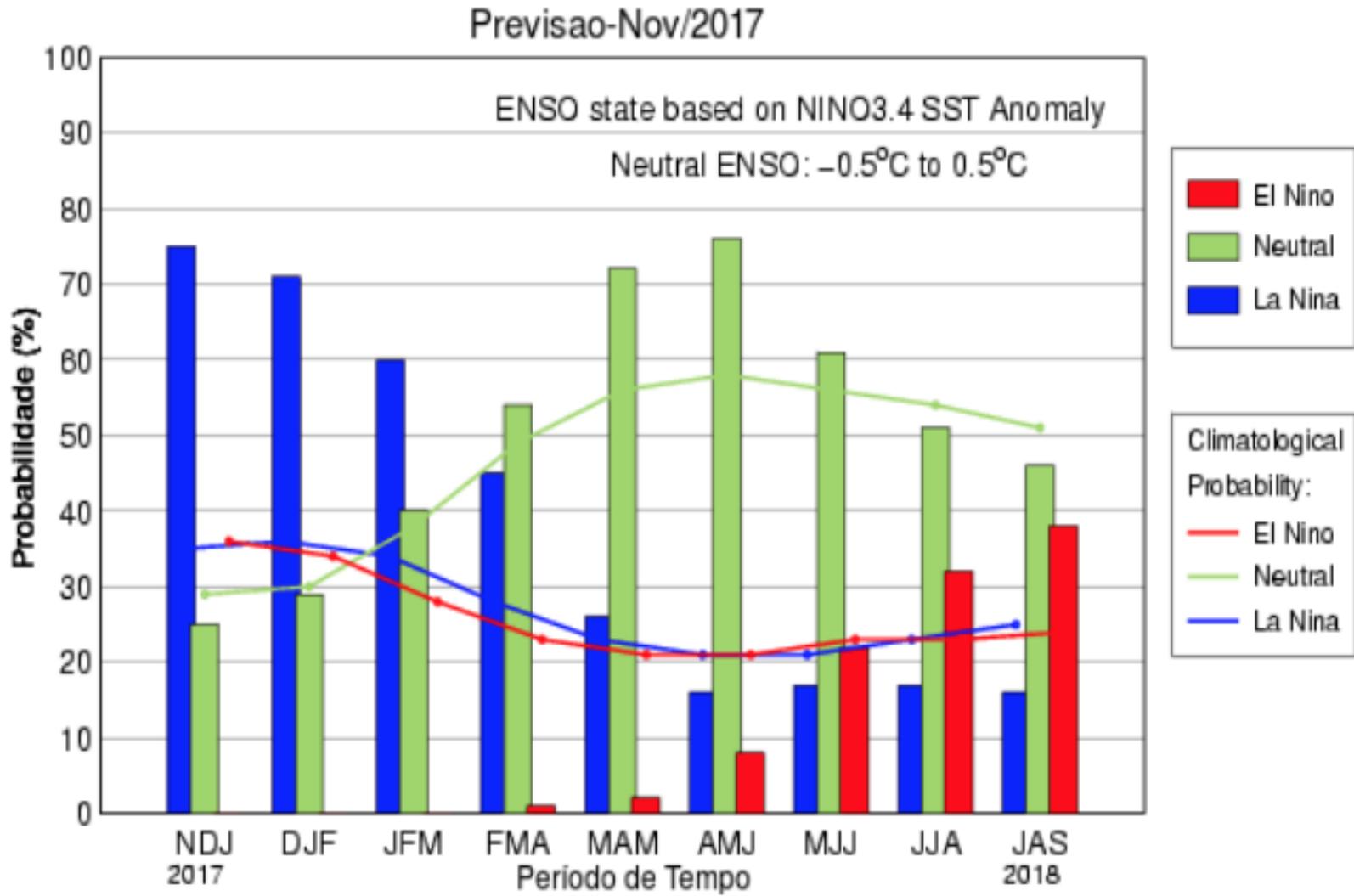
Seasons (2017-2018)

OND	NDJ	DJF	JFM	FMA	MAM	AMJ	MJJ	JJA
-0.7	-0.7	-0.7	-0.6	-0.4	-0.2	-0.1	0.1	0.2

Previsão de La Niña fraca!

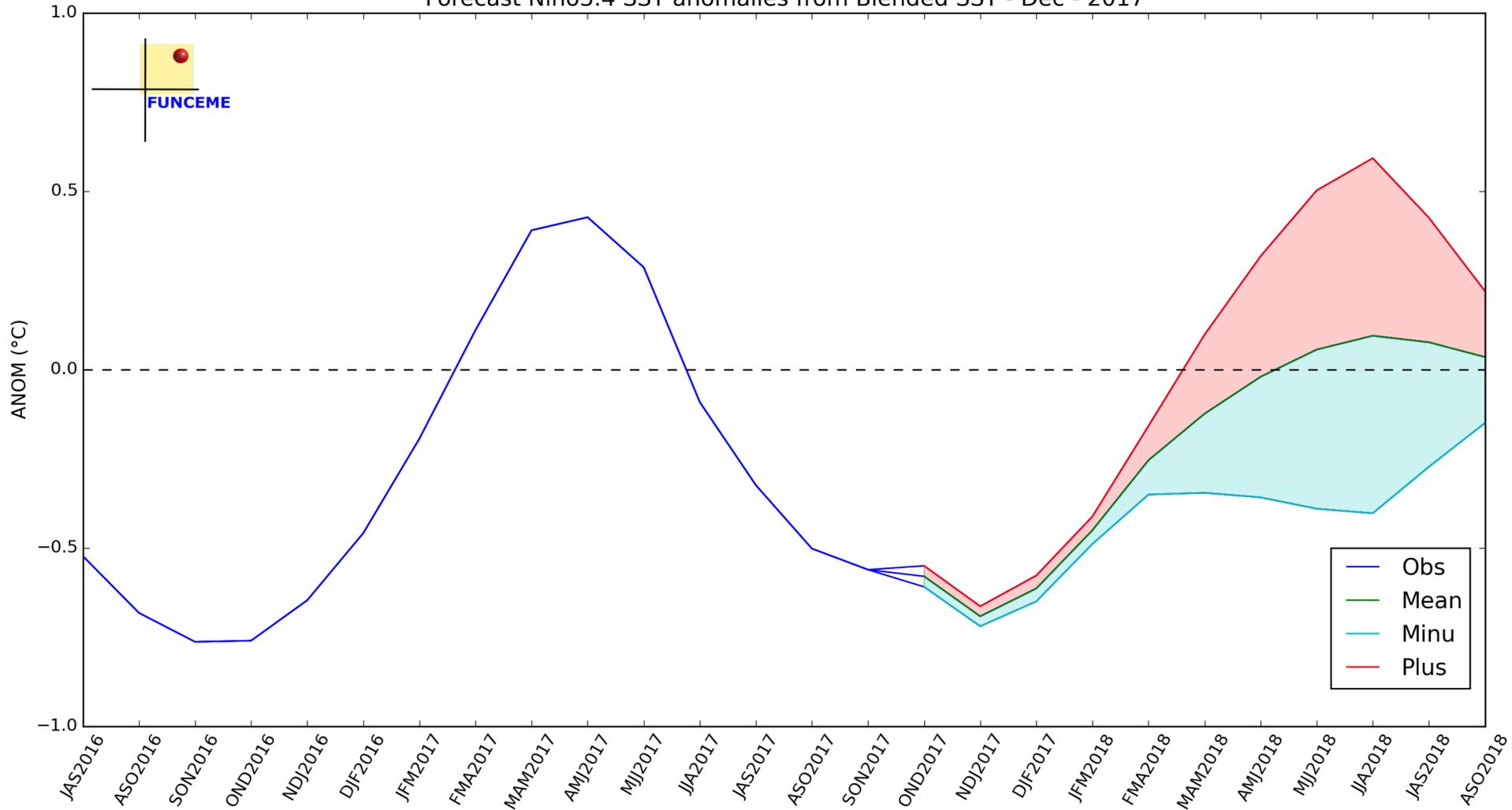


Previsão para o Oceano Pacífico



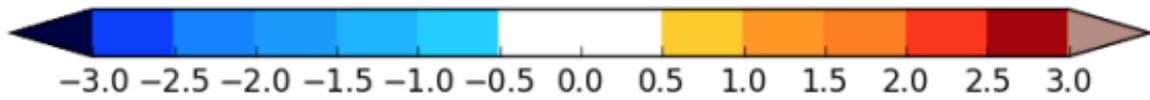
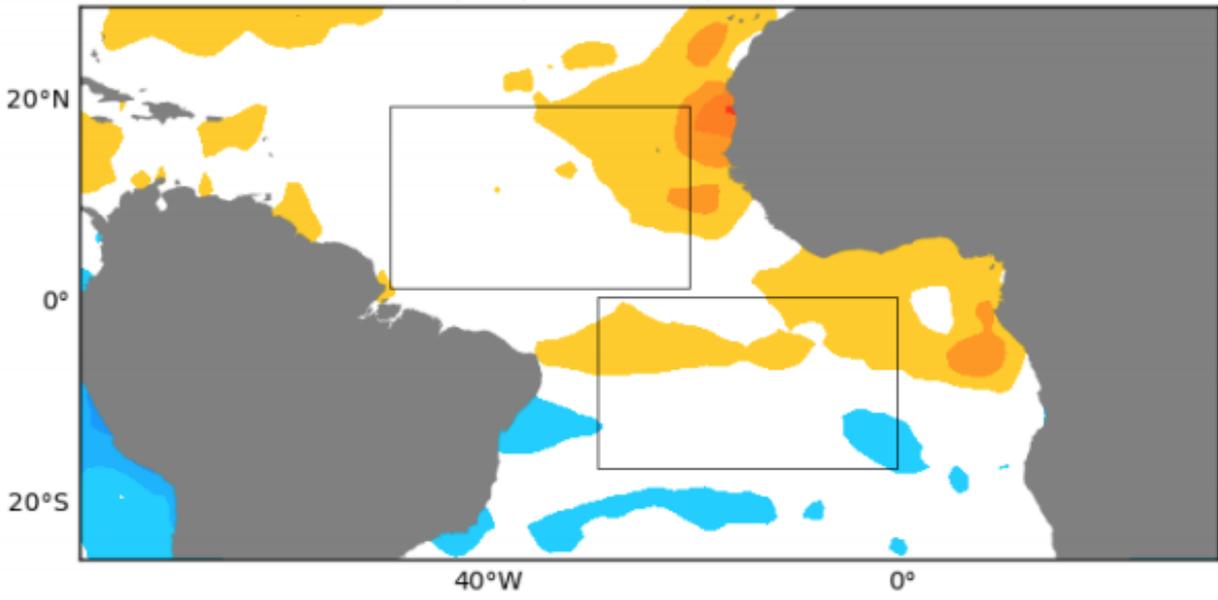
Previsão para o Oceano Pacífico

Forecast Nino3.4 SST anomalies from Blended SST - Dec - 2017



Anomalia da Temperatura da Superfície do Mar – Atlântico

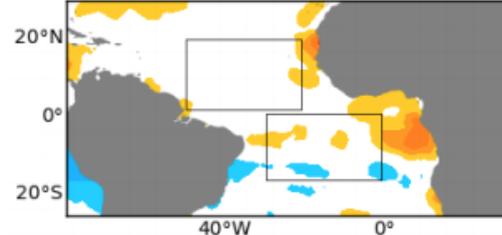
Média da Anomalia de TSM das últimas quatro semanas
15/11/2017:06/12/2017



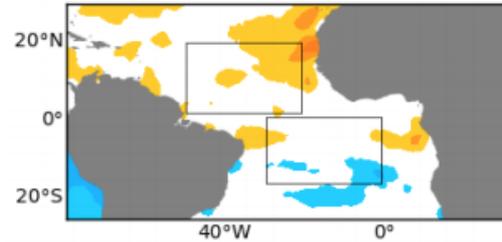
Fonte: NOAA/OAR/ESRL PSD
Elaboração: FUNCEME

Anomalia Semanal de TSM

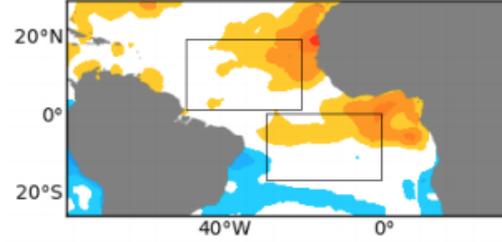
15/11/2017



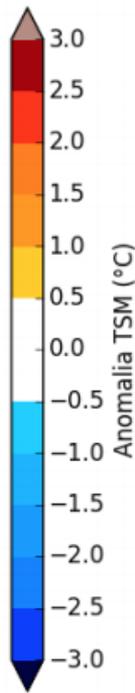
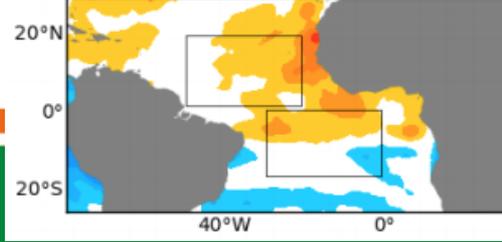
22/11/2017



29/11/2017

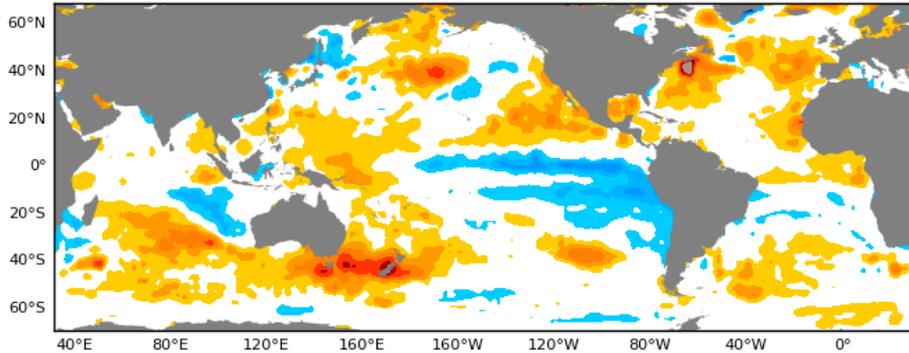


06/12/2017

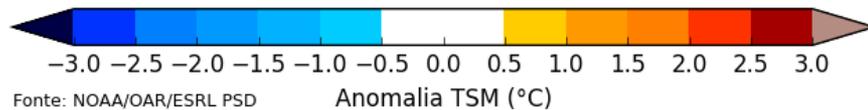
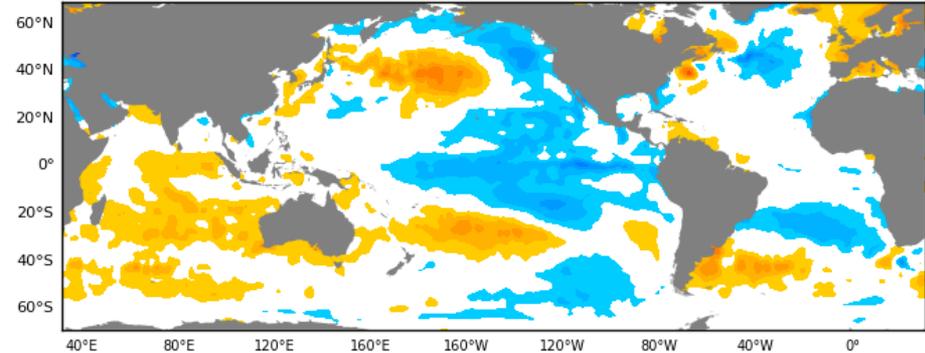


Anomalia de TSM (49ª semana) 2017, 2011, 2007, 2008

Média da Anomalia de TSM das últimas quatro semanas
15/11/2017:06/12/2017

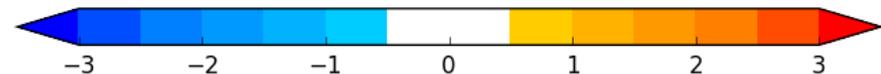


Média da Anomalia de TSM das últimas quatro semanas
16/11/2011:07/12/2011



Fonte: NOAA/OAR/ESRL PSD
Elaboração: FUNCEME

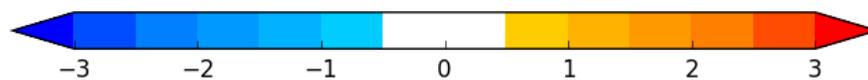
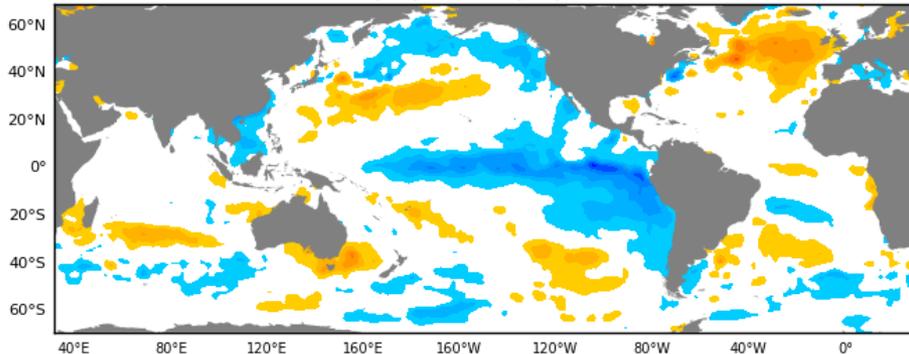
Anomalia TSM (°C)



Fonte: NOAA/OAR/ESRL PSD
Elaboração: FUNCEME

Anomalia TSM (°C)

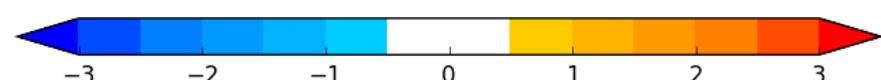
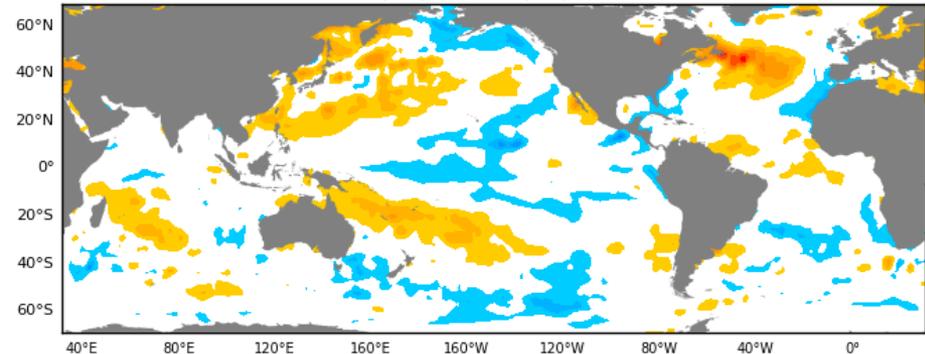
Média da Anomalia de TSM das últimas quatro semanas
14/11/2007:05/12/2007



Fonte: NOAA/OAR/ESRL PSD
Elaboração: FUNCEME

Anomalia TSM (°C)

Média da Anomalia de TSM das últimas quatro semanas
12/11/2008:03/12/2008



Fonte: NOAA/OAR/ESRL PSD
Elaboração: FUNCEME

Anomalia TSM (°C)

Imagem de Satélite do dia 17/12/2017 (20h30)

