



CLIMATE OUTLOOK FORUM

SEECOF-14, MEDCOF-5 & PRESANORD-9

November 23-26, 2015
Marrakech-Morocco

SUMMARY FROM RA1 RCC: LONG RANGE FORECAST

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OUTLINE

ANALYSIS OF CLIMATE VARIABILITY AND TREND

ANALYSIS OF CUMULATIVE DAILY ESTIMATED PRECIPITATION

ANALYSIS OF GLOBAL SSTS OF THE PAST MONTHS & OUTLOOK

GLOBAL AND AFRICAN PRECIPITATION

GENERAL CIRCULATION

GENERATION AND ANALYSIS OF STATISTICAL FORECAST WITH CLIMATE
PREDICABILITY TOOLS

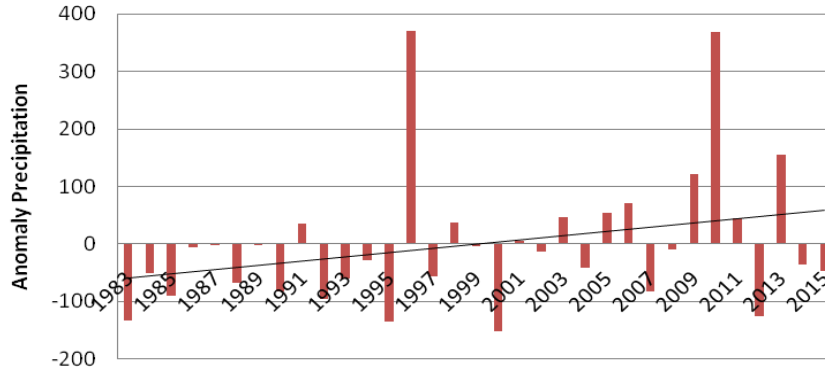
ANALOG YEARS PRECIPITATION IN PERCENT OF AVERAGE

MAIN RCC PRODUCTS

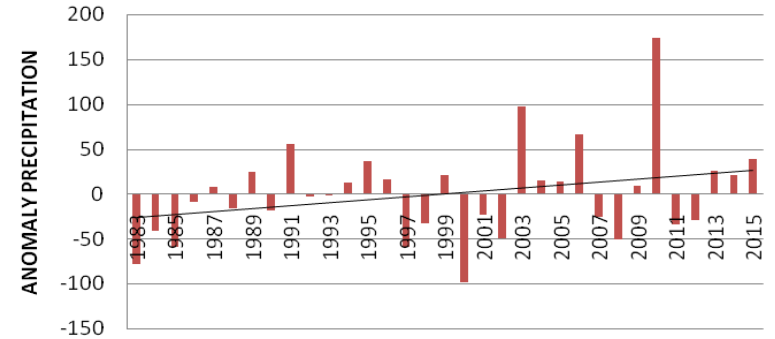
OTHERS PRODUCTS

ANALYSIS OF CLIMATE VARIABILITY AND TREND

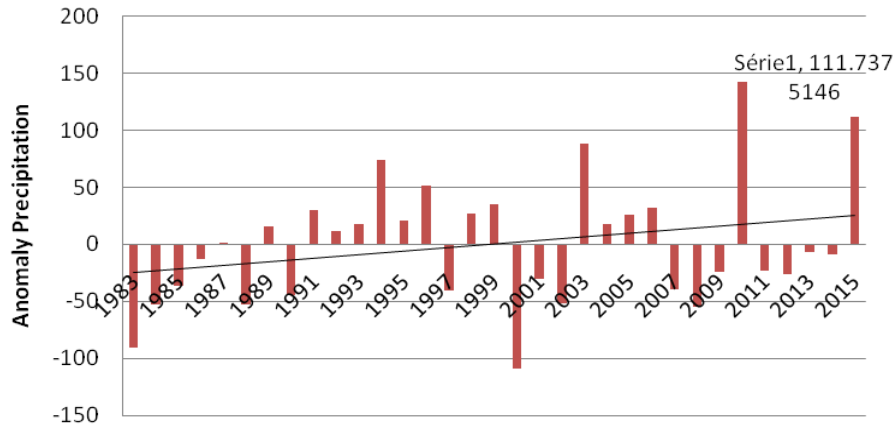
Tanger JFM



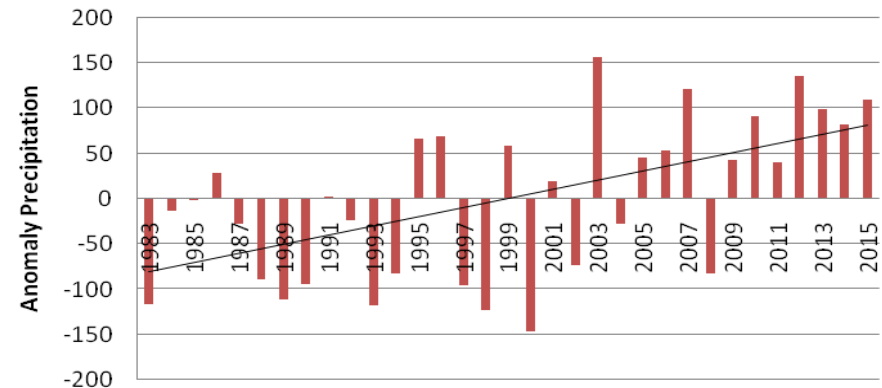
Nador JFM



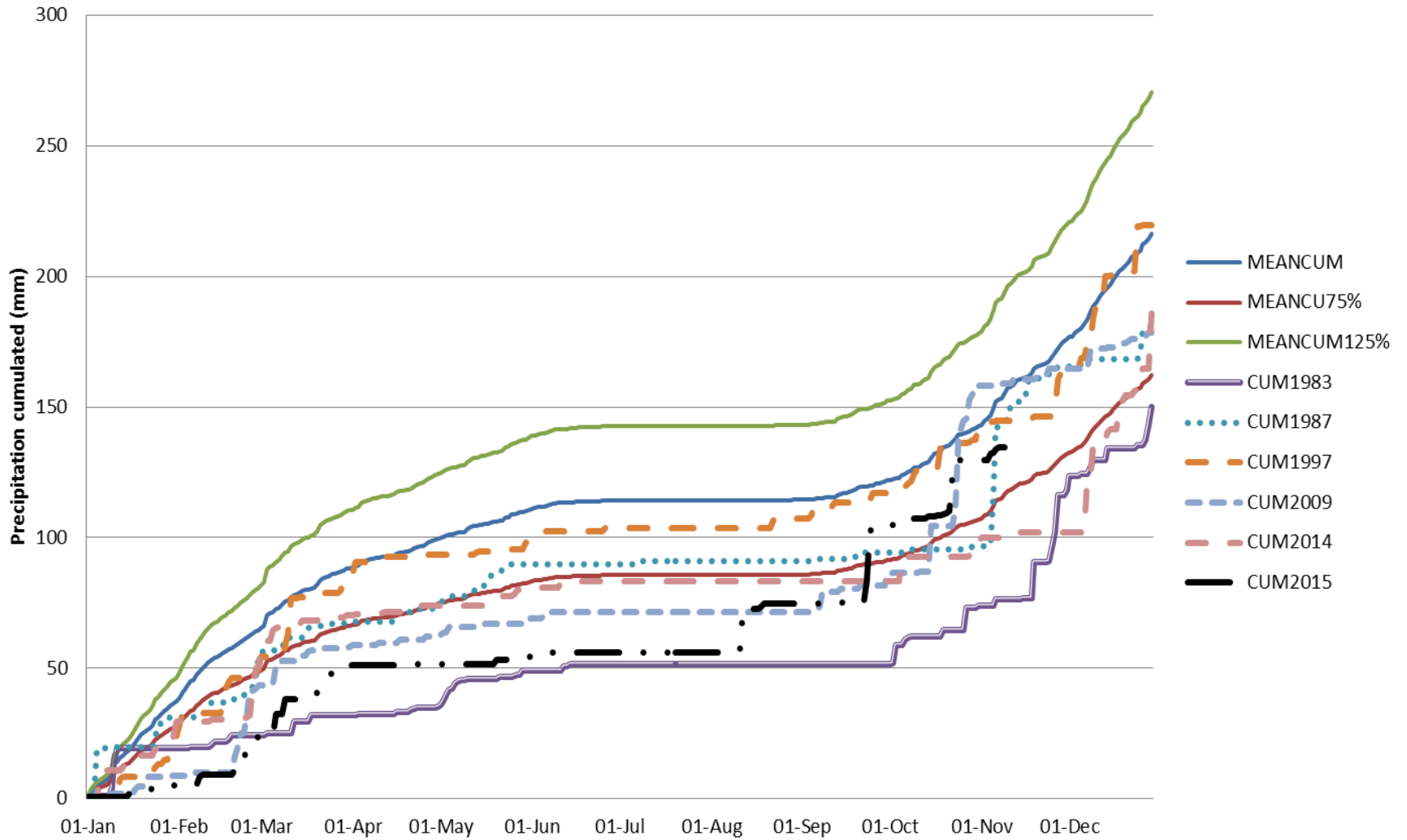
AL Hoceima JFM



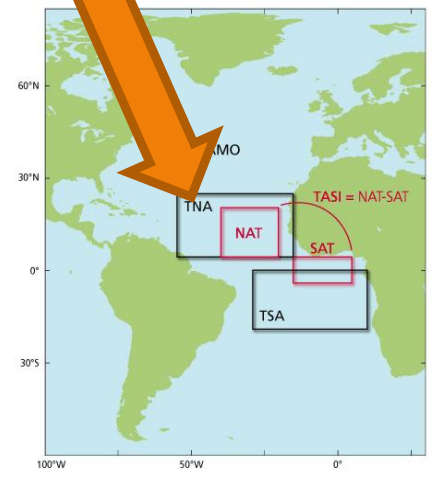
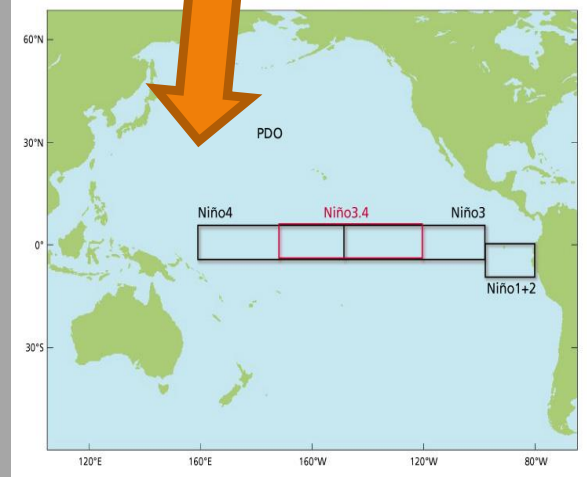
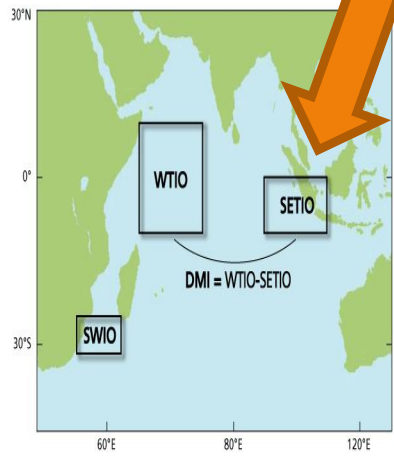
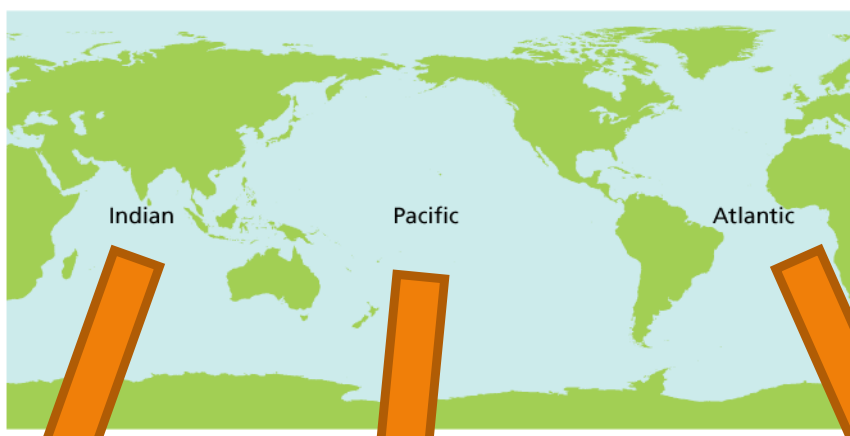
Alger JFM



Precipitation cumulated of Misrata



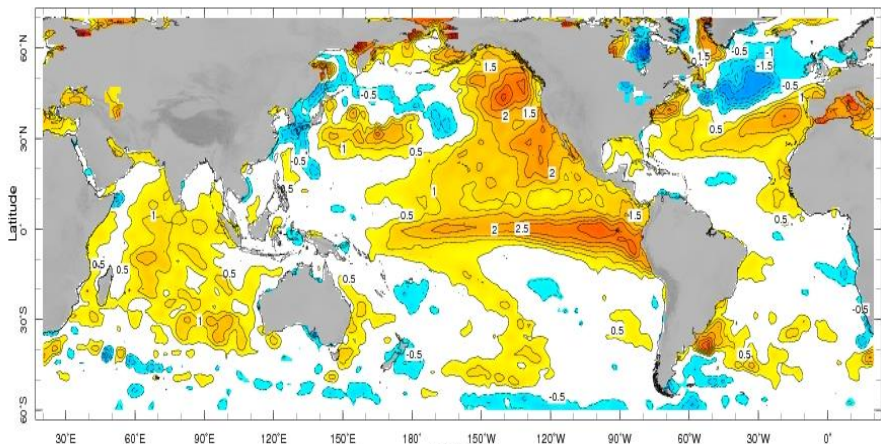
ANALYSIS OF GLOBAL SSTS OF THE PAST MONTHS & OUTLOOK



Analysis of global SSTs of the past few months

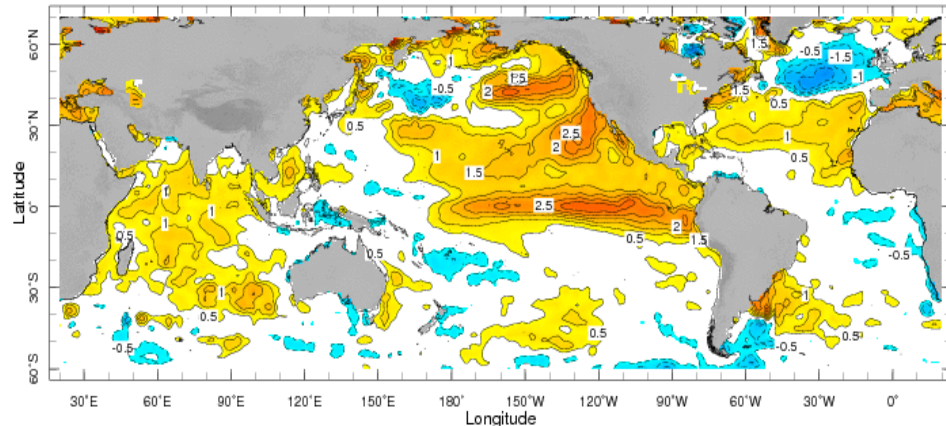
SST MONTHLY ANOMALY: JULY, AUG, SEP & OCT

Jul 2015



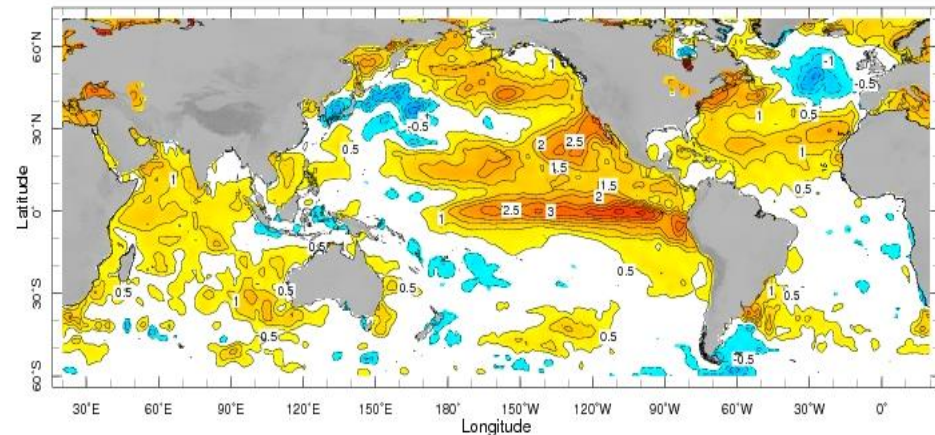
Sea Surface Temperature Anomaly

Aug 2015



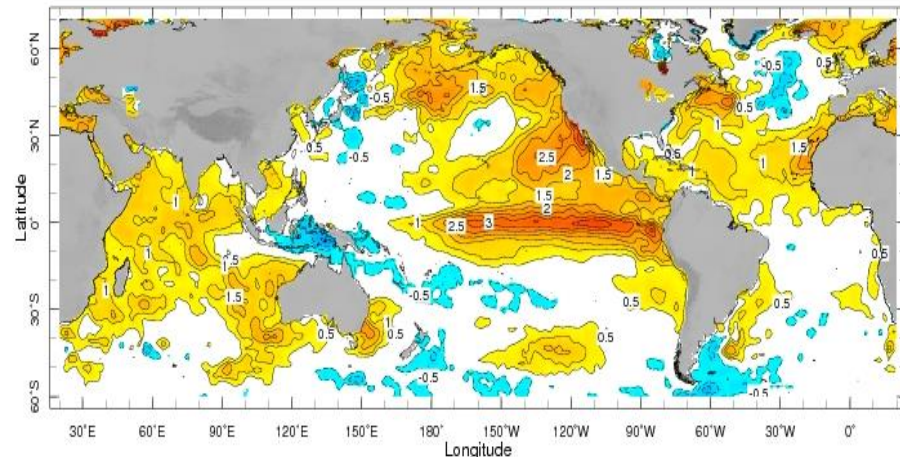
Sea Surface Temperature Anomaly

Sep 2015



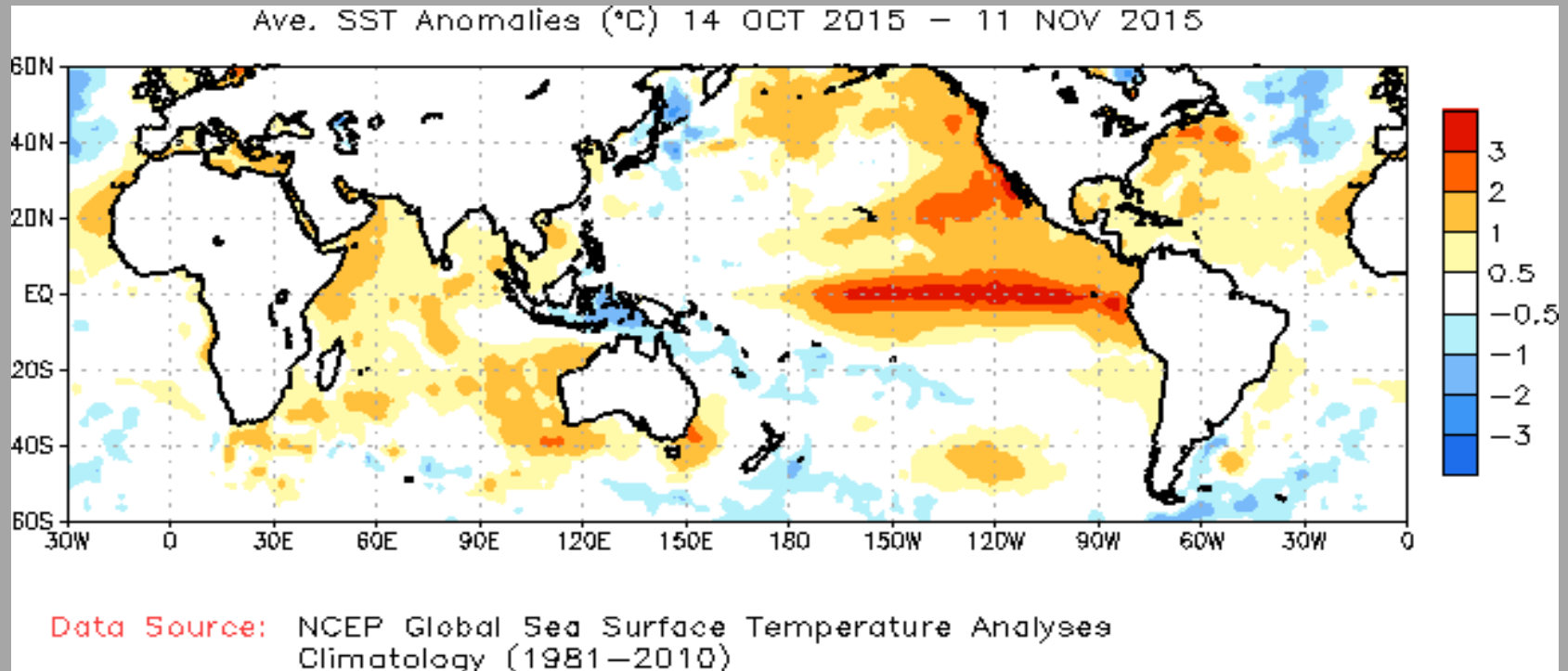
Longitude

Oct 2015



Longitude

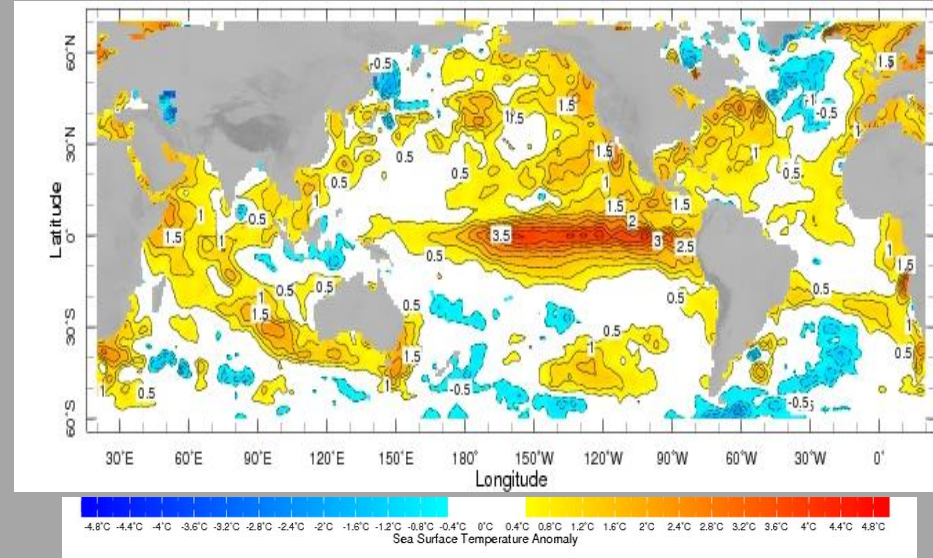
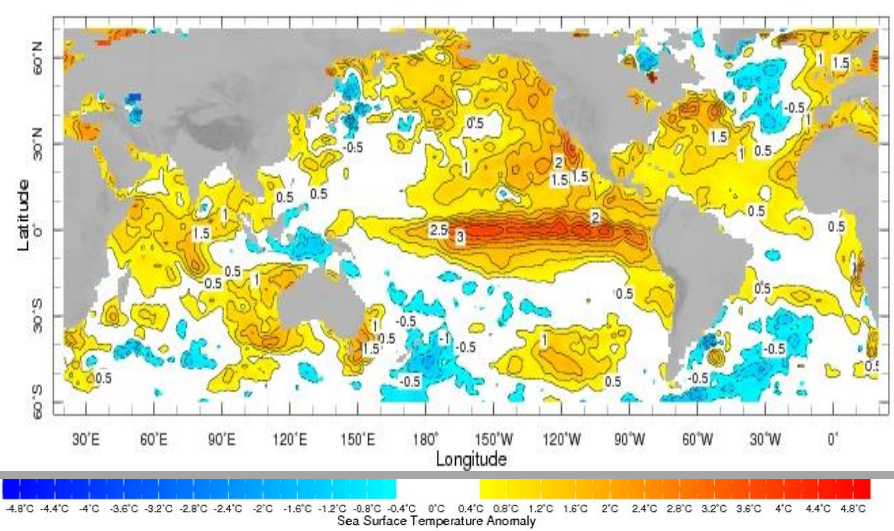
SST MONTHLY ANOMALY: CURENT SITUATION



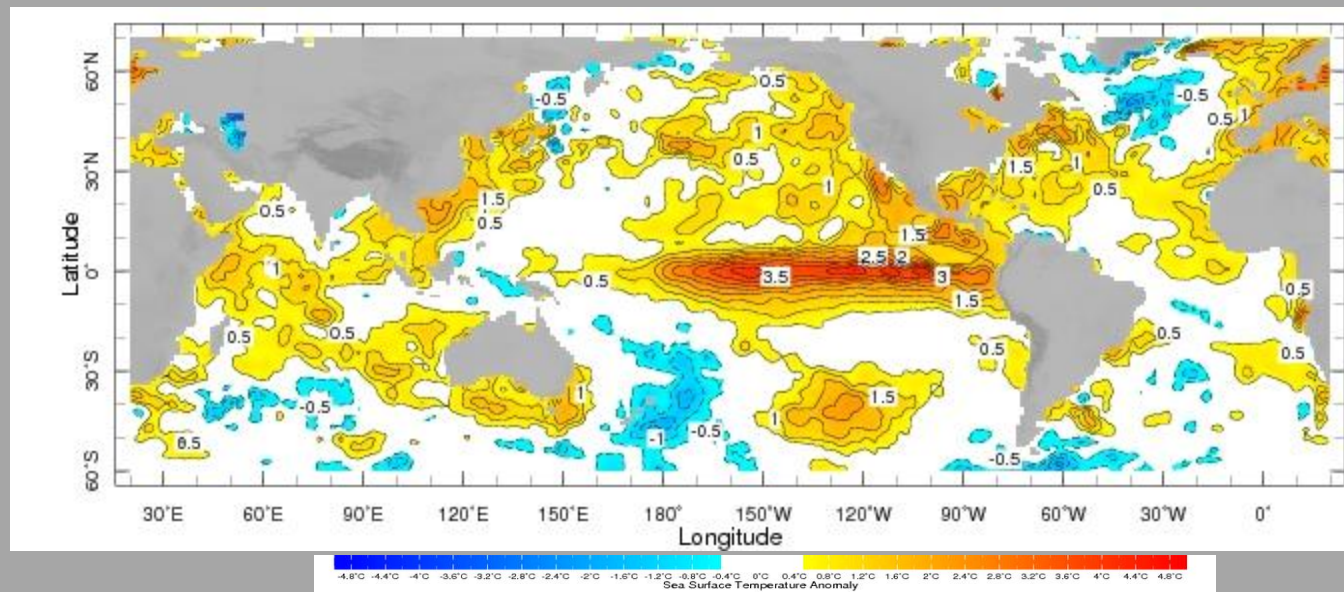
WEEKLY SST OBSERVED OF NOVEMBER 2015

Week 2 from 8 to 14 Nov 2015

Week 1 from 1-7 Nov 2015

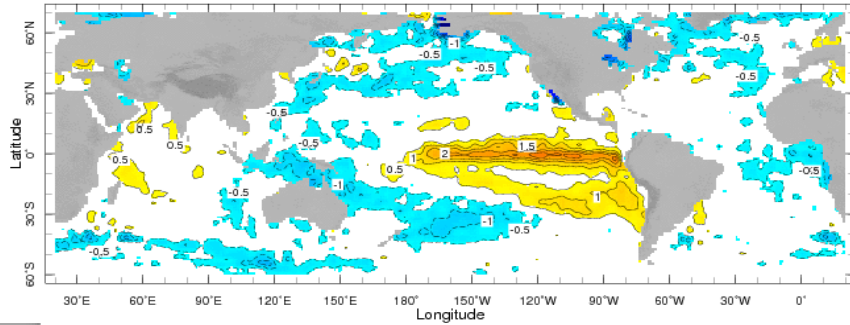


Week 1 from 11-21 Nov 2015

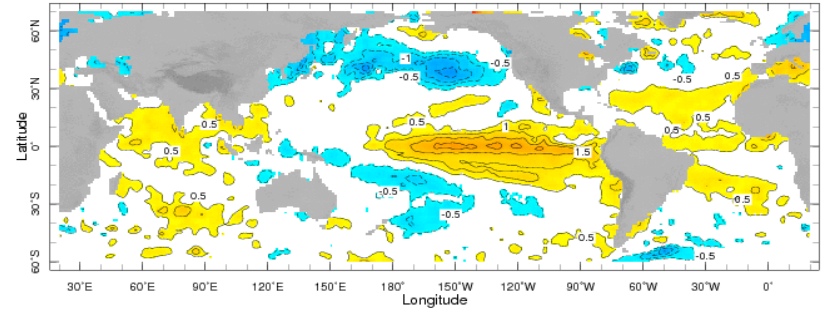


SST FOR ASO 1982, 1987, 1997, 2009

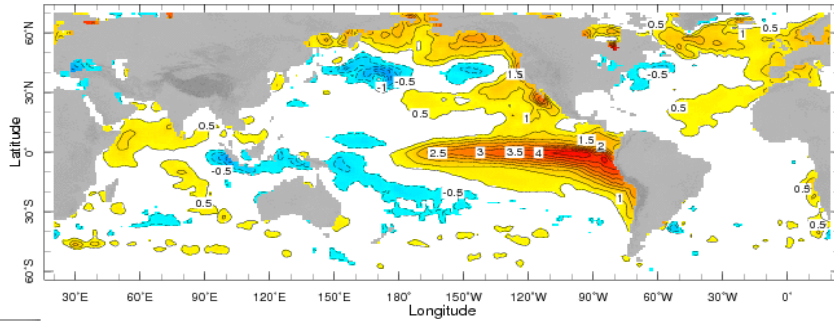
Aug-Oct 1982



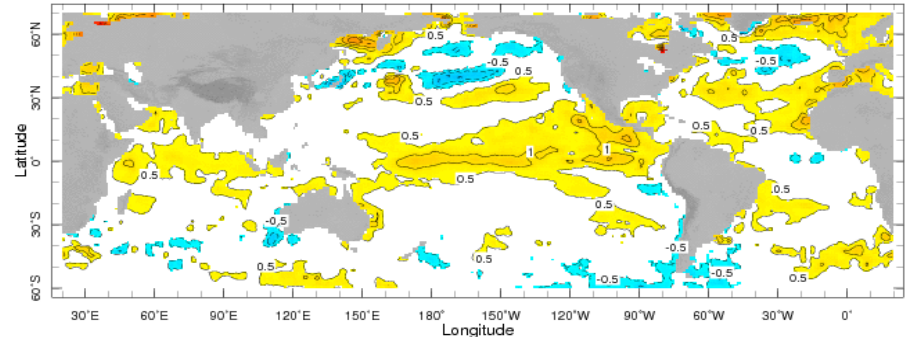
Aug-Oct 1987



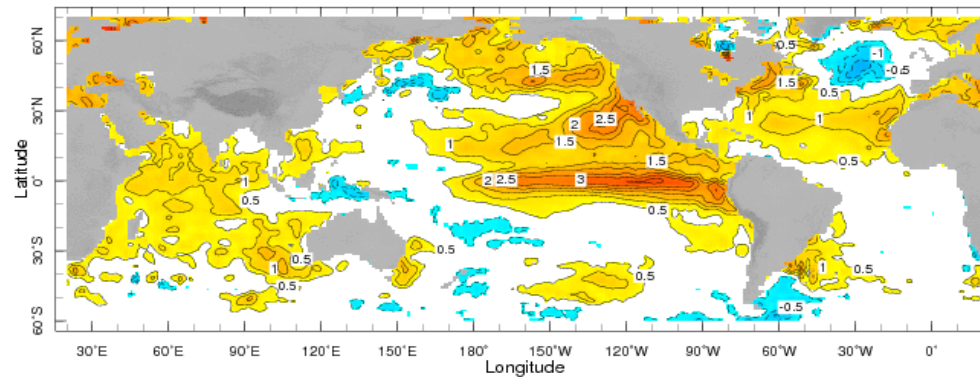
Aug-Oct 1997



Aug-Oct 2009

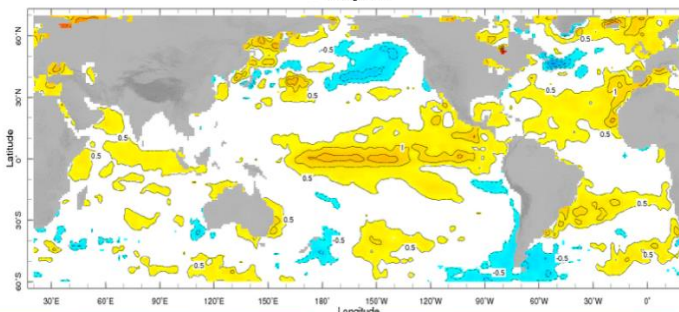
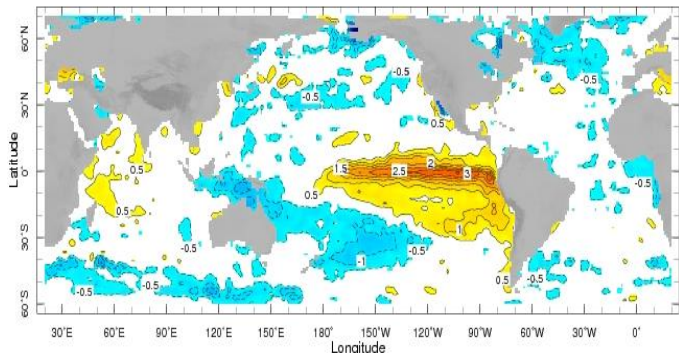


Aug-Oct 2015



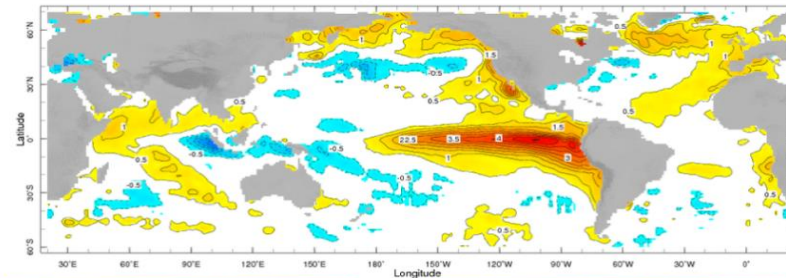
OBSERVED & FORECASTED SST FOR SON 1982, 1997, 2009

Sep-Nov 1982

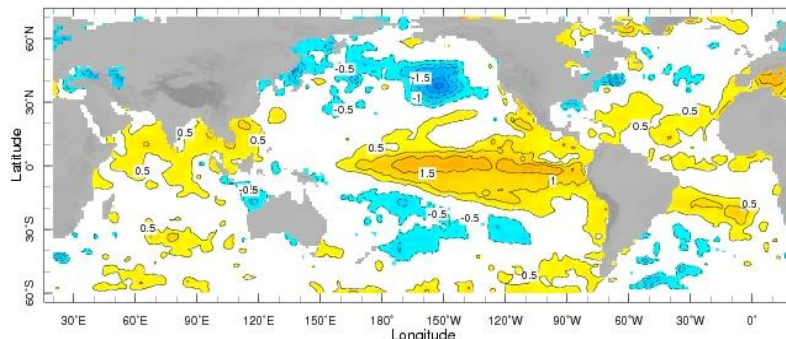


Sea Surface Temperature Anomaly

Sep-Nov 1997

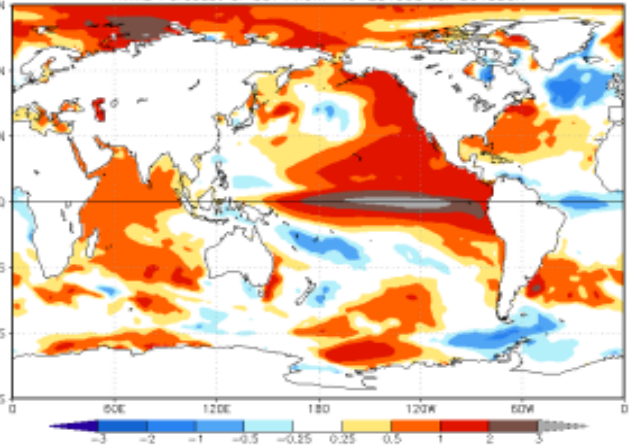


Sep-Nov 1987



Sea Surface Temperature Anomaly

NMME Forecast of SST Anom IC=201508 for 2015SON



EUROSIP multi-model seasonal forecast

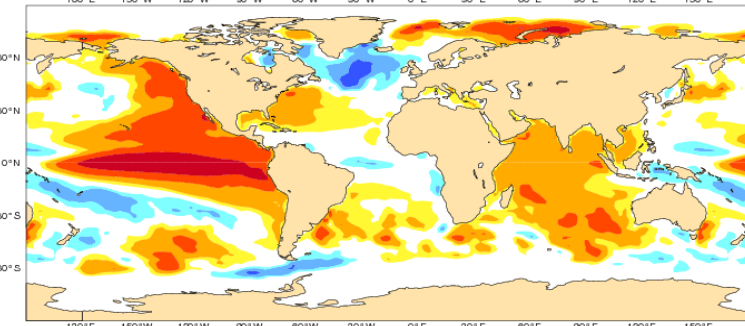
ECMWF/Met Office/Meteo-France/NCEP

Mean forecast SST anomaly

Forecast start reference is 01/08/15

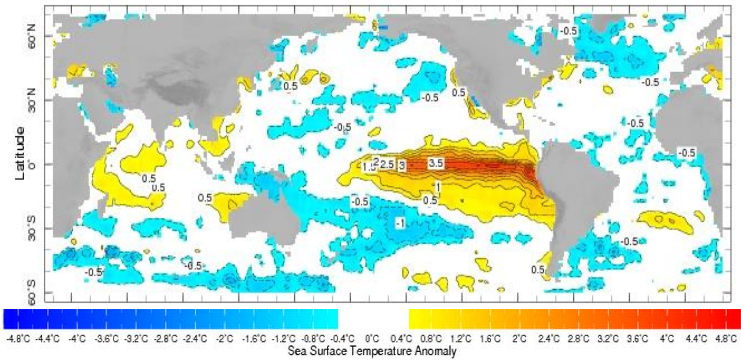
Variance-standardized mean

■ <-2.0
 ■ -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

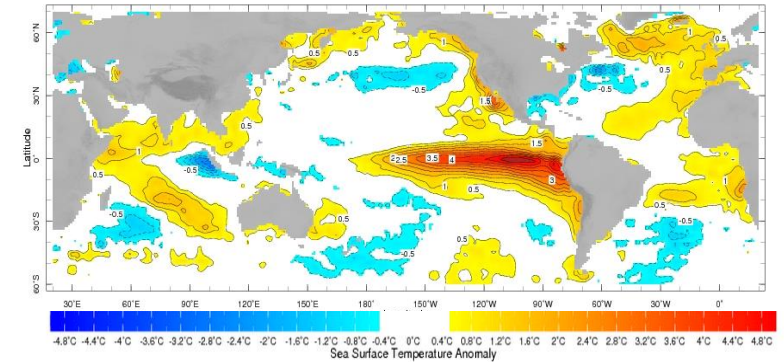


OBSERVED & FORECASTED SST FOR OND 1982, 1997, 2009

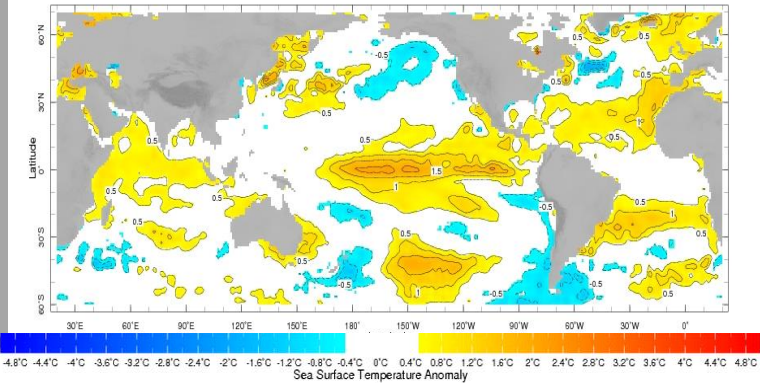
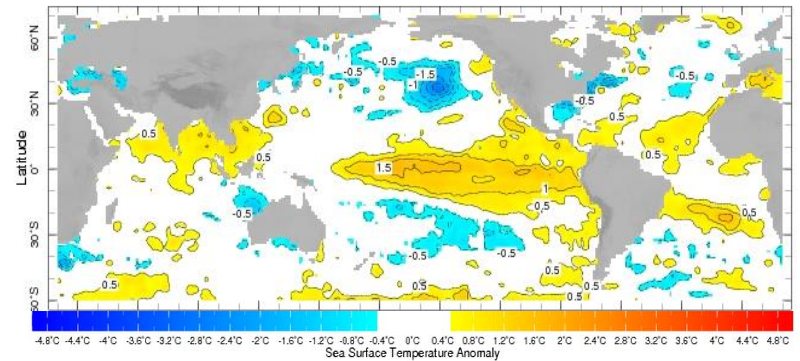
Oct-Dec 1982



Oct-Dec 1997



OCT-DEC 1997



EUROSIP multi-model seasonal forecast

Mean forecast SST anomaly

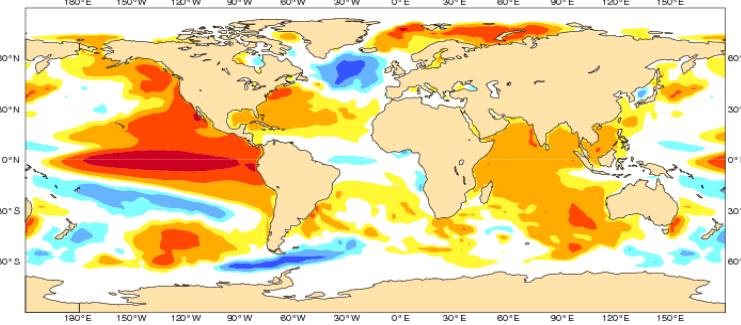
Forecast start reference is 01/09/15

Variance-standardized mean

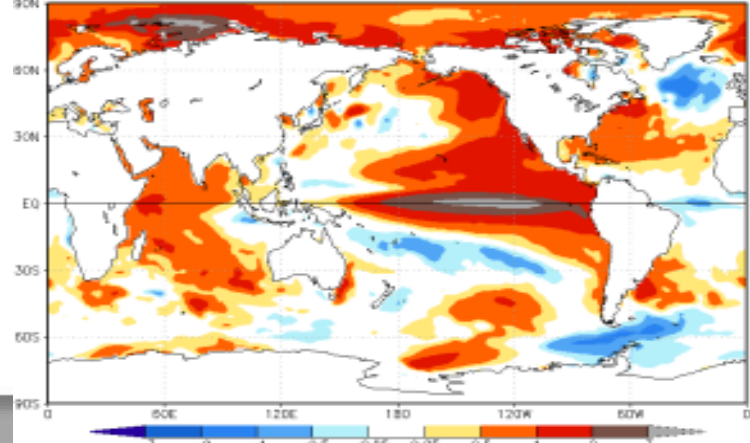
ECMWF/Met Office/Meteo-France/NCEP

OND 2015

■ <-2.0
 ■ -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

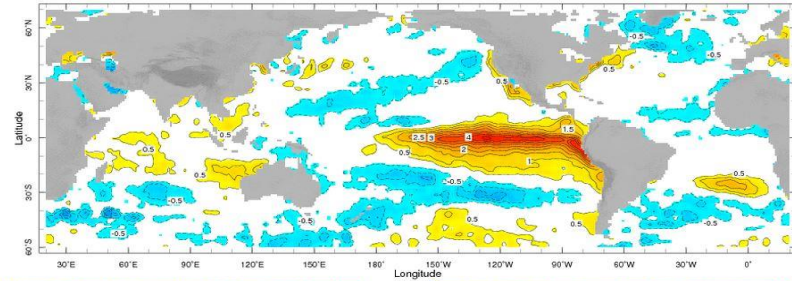


NMME Forecast of SST Anom. IC=201509 for 2015OND

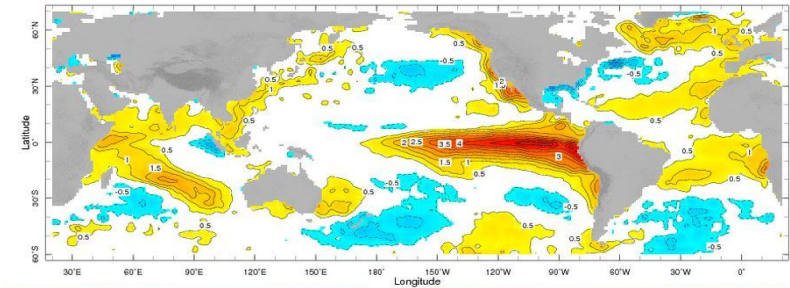


OBSERVED & FORECASTED SST FOR NDJ 1982, 1997, 2009

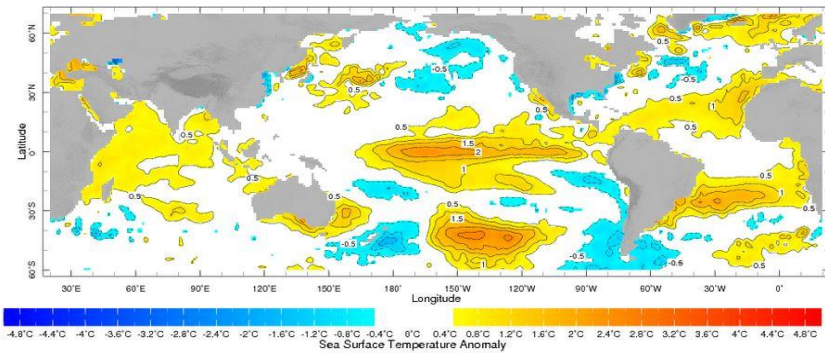
Nov 1982 - Jan 1983



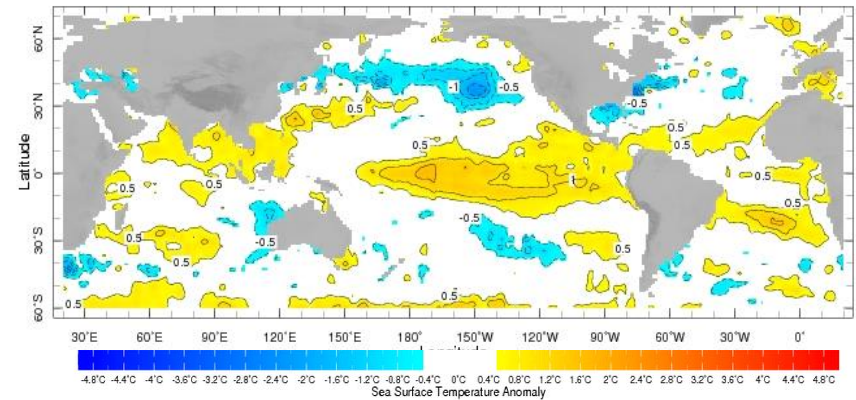
Nov 1997 - Jan 1998



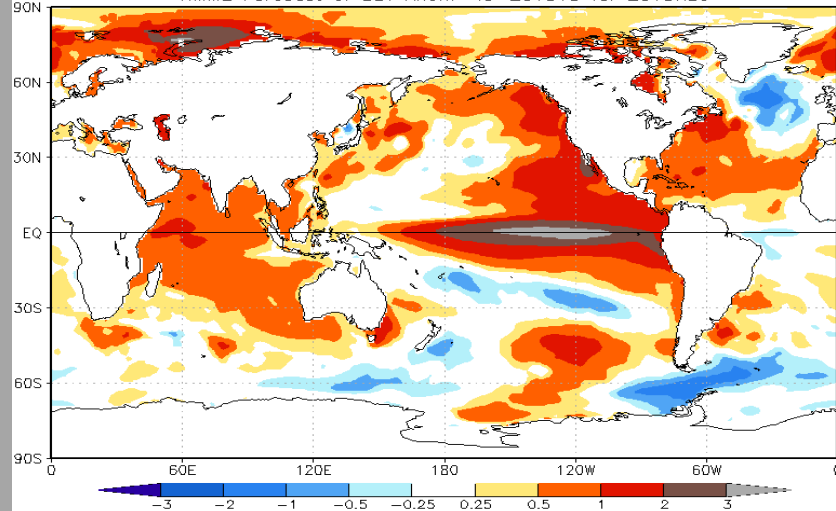
Nov 2009 - Jan 2010



Nov 1987 - Jan 1988



NMME Forecast of SST Anom IC=201510 for 2015NDJ



EUROSIP multi-model seasonal forecast

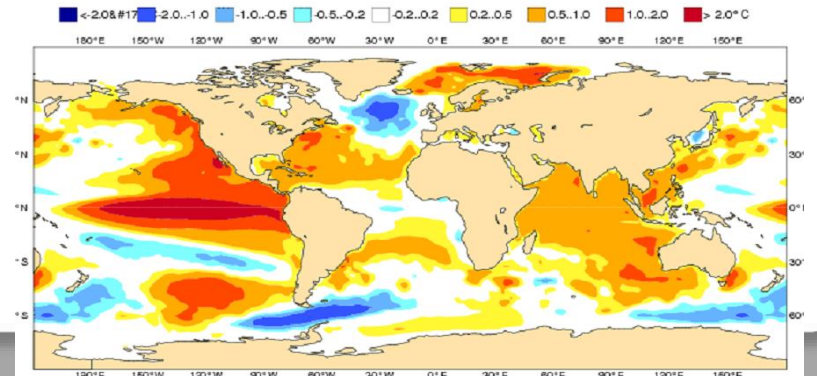
Mean forecast SST anomaly

Forecast start reference is 01/1/015

Variance-standardized mean

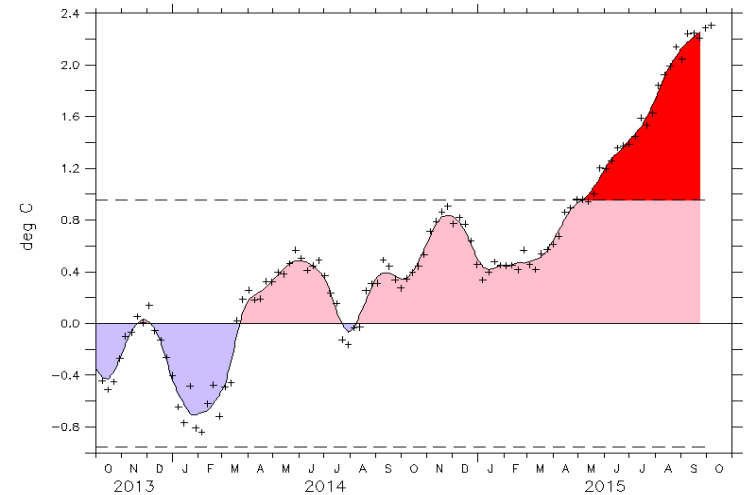
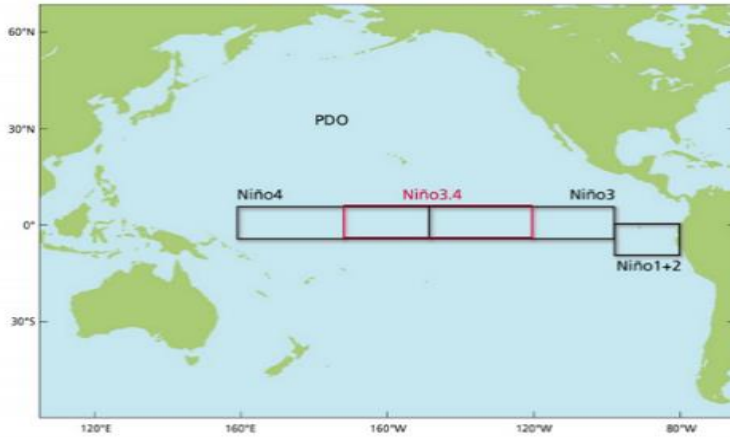
ECMWF/Met Office/Meteo-France/NCEP

NDJ 2015/16



Pacific Basin NINO3.4

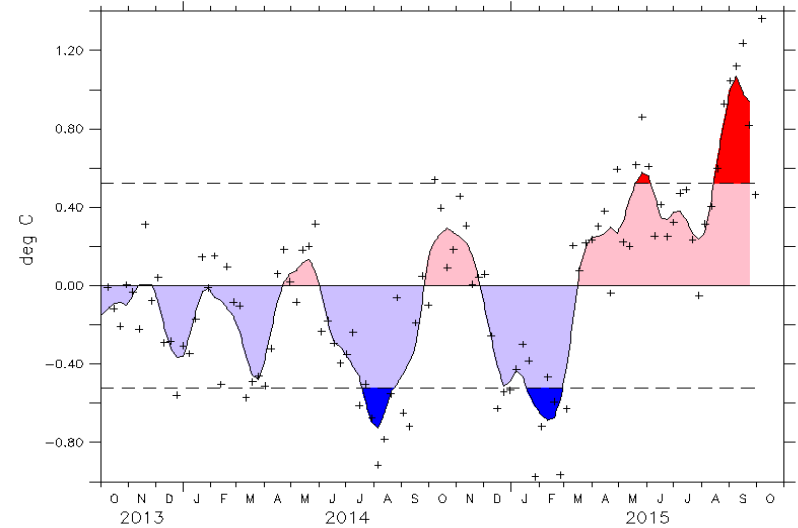
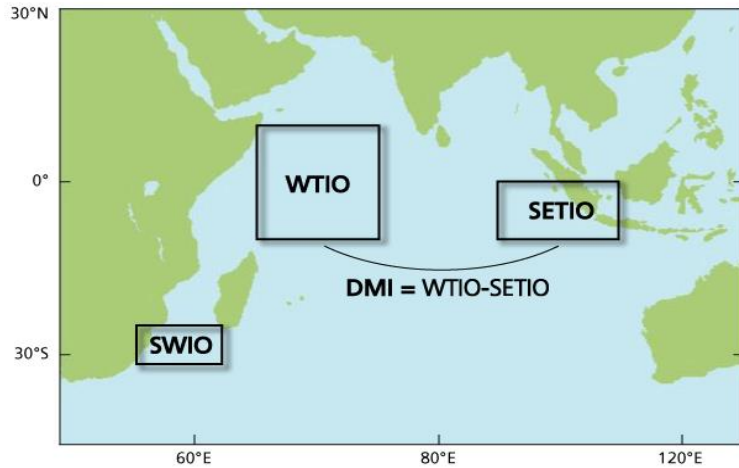
OOPC Observed SST timeseries to add



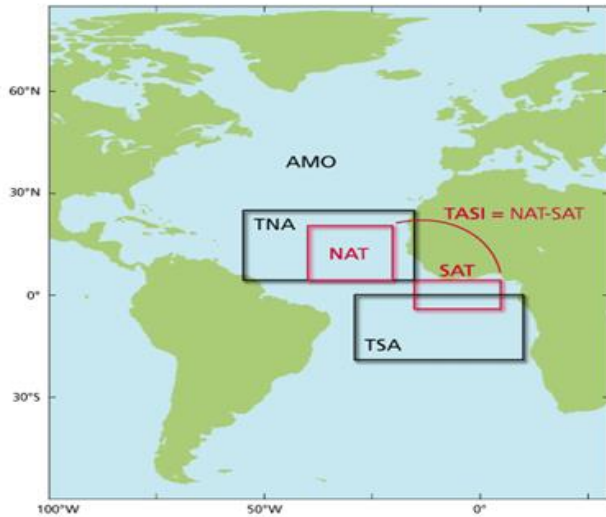
http://ioc-goos-oopc.org/state_of_the_ocean/sur/pac/nino3.4.php

http://old.ecmwf.int/products/forecasts/d/charts/seasonal/forecast/seasonal_range_forecast/group/Climagrams_sst!Sea%20Surface%20Temperature|NINO3.4|2015081/

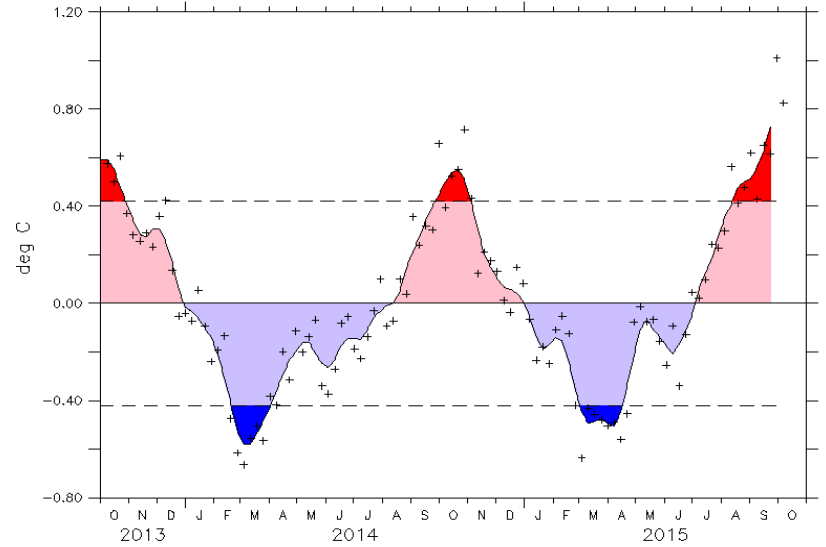
Indian Ocean Dipole



TELECONNECTIONS INDICES

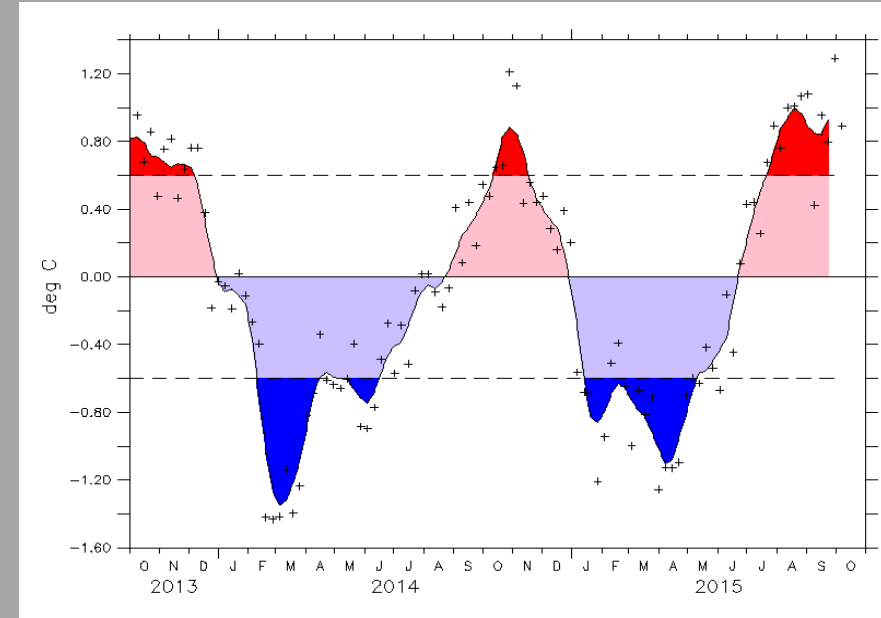
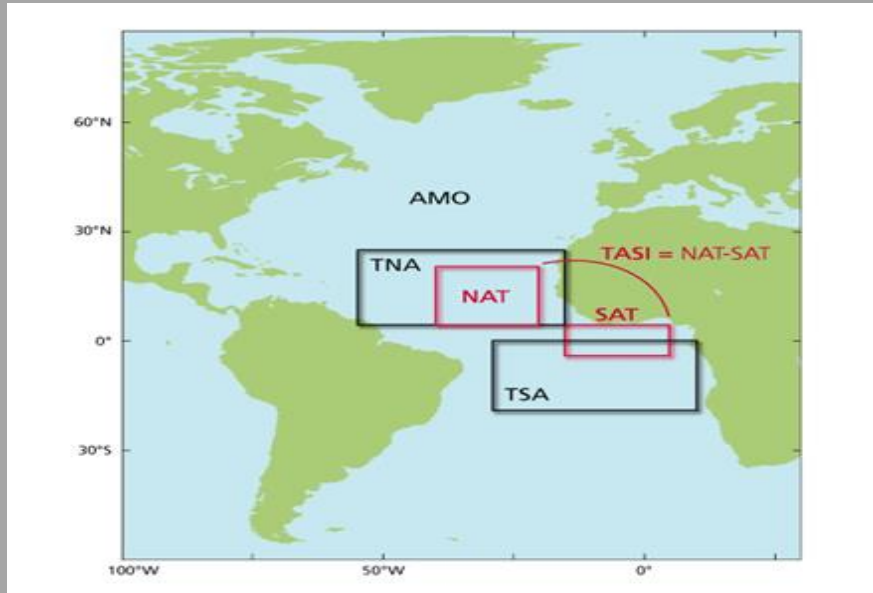


TNA



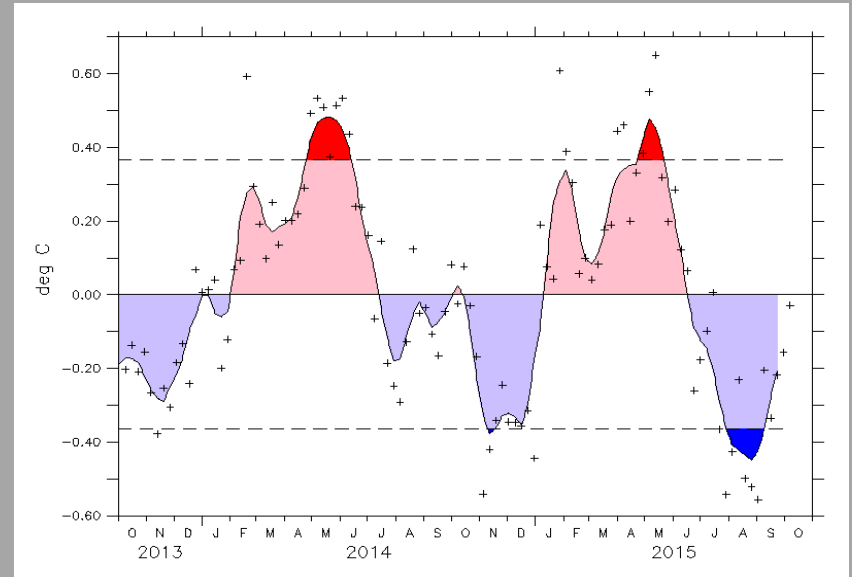
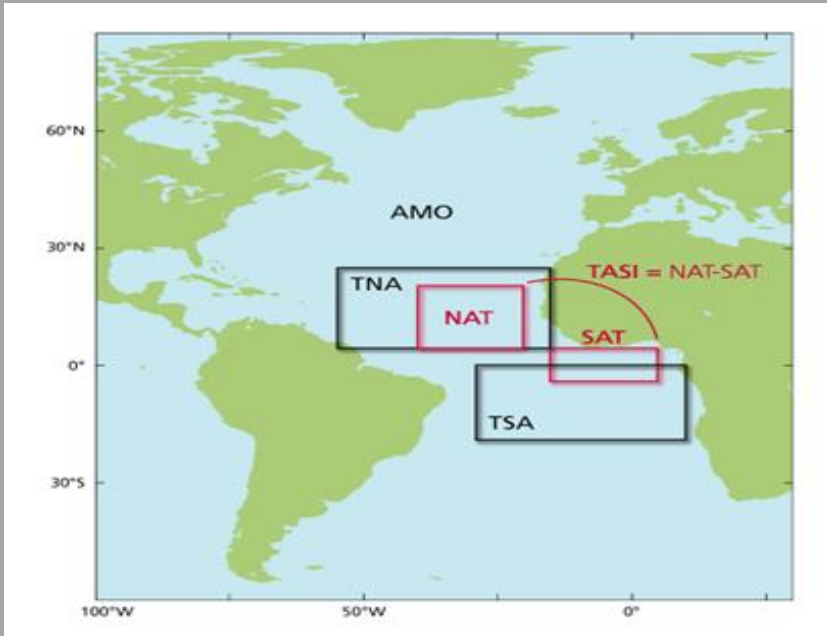
ATLANTIC BASIN INDEX

TASI



ATLANTIC BASIN INDEX

TSA



Historical El Niño and La Niña Episodes Based on the ONI computed using ERSST.v3b

El Niño

Highest ONI Value

JJA 1951 - DJF 1951/52	1.2
DJF 1952/53 - JFM 1954	0.8
MAM 1957 - JJA 1958	1.8
OND 1958 - FMA 1959	0.6
MJJ 1963 - JFM 1964	1.4
AMJ 1965 - MAM 1966	1.9
JAS 1968 - DJF 1969/70	1.1
AMJ 1972 - FMA 1973	2.1
ASO 1976 - JFM 1977	0.8
ASO 1977 - JFM 1978	0.8
AMJ 1982 - MJJ 1983	2.2
JAS 1986 - JFM 1988	1.6
AMJ 1991 - MJJ 1992	1.6
ASO 1994 - FMA 1995	1.2
AMJ 1997 - MAM 1998	2.4
AMJ 2002 - JFM 2003	1.3
JJA 2004 - DJF 2004/05	0.7
ASO 2006 - DJF 2006/07	1.0
JJA 2009 - MAM 2010	1.6

La Niña

Lowest ONI Value

ASO 1949 - JAS 1950	-1.4
SON 1950 - JFM 1951	-0.8
AMJ 1954 - NDJ 1956/57	-1.7
AMJ 1964 - DJF 1964/65	-0.8
JJA 1970 - DJF 1971/72	-1.3
AMJ 1973 - JJA 1974	-2.0
SON 1974 - MAM 1976	-1.7
ASO 1983 - DJF 1983/84	-0.9
SON 1984 - ASO 1985	-1.1
AMJ 1988 - AMJ 1989	-1.9
ASO 1995 - FMA 1996	-0.9
JJA 1998 - FMA 2001	-1.7
OND 2005 - FMA 2006	-0.9
JAS 2007 - MJJ 2008	-1.5
OND 2008 - FMA 2009	-0.8
JJA 2010 - MAM 2011	-1.5
ASO 2011 - FMA 2012	-1.0

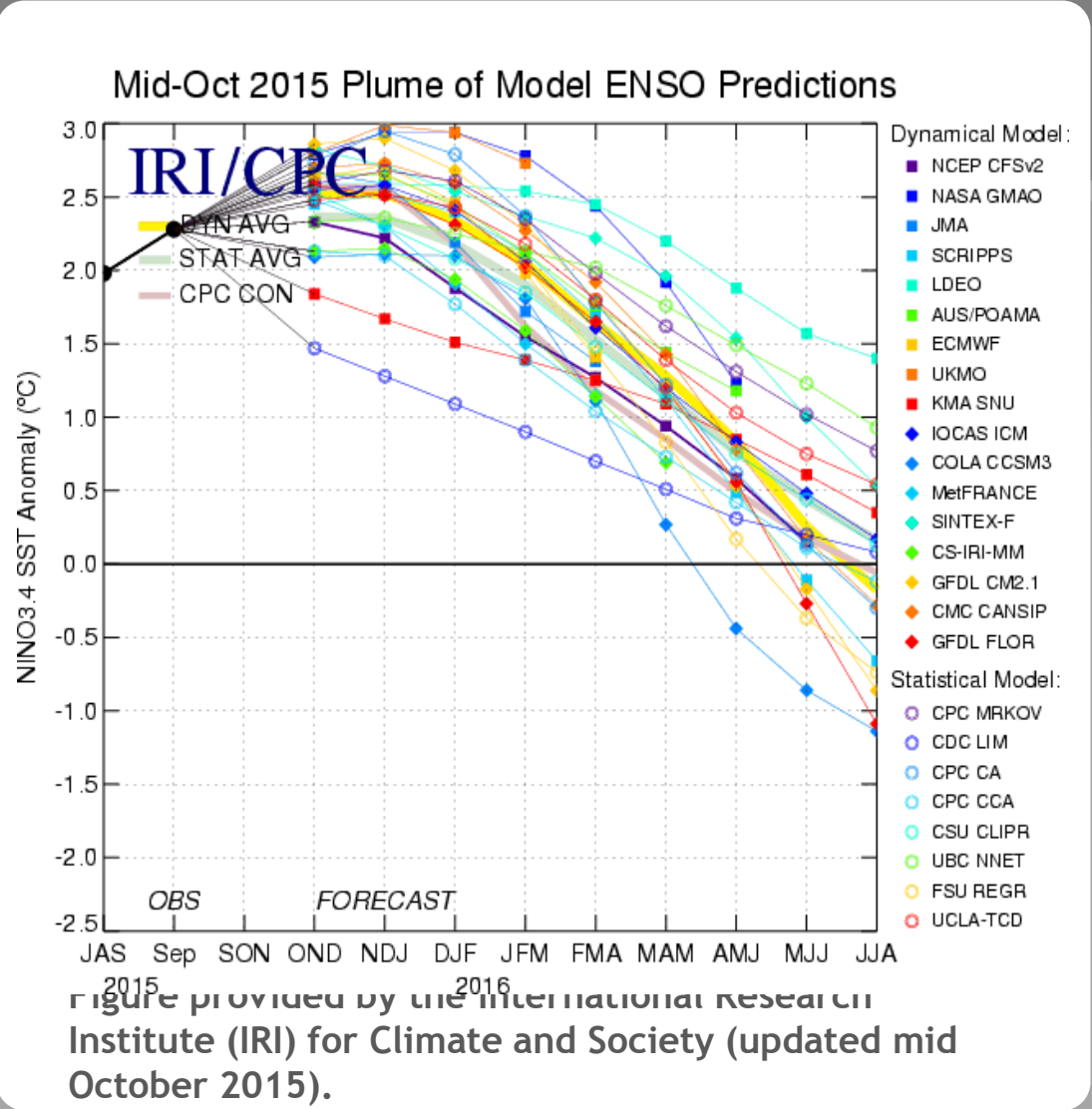
NOTE (Mar. 2012): The historical values of the ONI have slightly changed due to an update in the climatology. Please click [here](#) for more details on the methodology.

Historical El Niño and La Niña Episodes Based on the ONI computed using ERSST.v3b

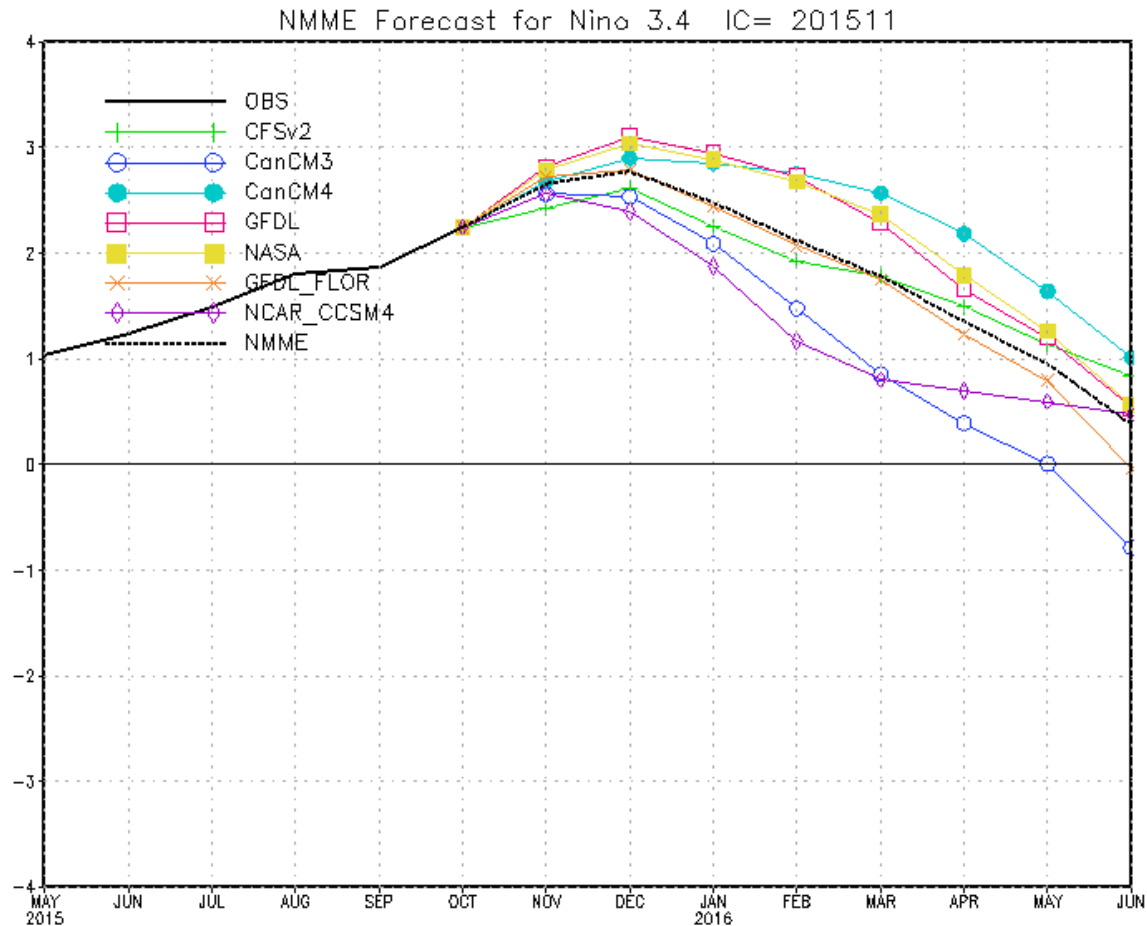
Recent Pacific warm (red) and cold (blue) episodes based on a threshold of +/- 0.5 °C for the Oceanic Niño Index (ONI) [3 month running mean of ERSST.v3b SST anomalies in the Niño 3.4 region (5N-5S, 120-170W)].

Year	DJF	JFM	FMA	MAM	AMJ	MJJ	JJA	JAS	ASO	SON	OND	NDJ
2002	-0.2	0.0	0.1	0.3	0.5	0.7	0.8	0.8	0.9	1.2	1.3	1.3
2003	1.1	0.8	0.4	0.0	-0.2	-0.1	0.2	0.4	0.4	0.4	0.4	0.3
2004	0.3	0.2	0.1	0.1	0.2	0.3	0.5	0.7	0.8	0.7	0.7	0.7
2005	0.6	0.4	0.3	0.3	0.3	0.3	0.2	0.1	0.0	-0.2	-0.5	-0.8
2006	-0.9	-0.7	-0.5	-0.3	0.0	0.1	0.2	0.3	0.5	0.8	1.0	1.0
2007	0.7	0.3	-0.1	-0.2	-0.3	-0.3	-0.4	-0.6	-0.8	-1.1	-1.2	-1.4
2008	-1.5	-1.5	-1.2	-0.9	-0.7	-0.5	-0.3	-0.2	-0.1	-0.2	-0.5	-0.7
2009	-0.8	-0.7	-0.5	-0.2	0.2	0.4	0.5	0.6	0.8	1.1	1.4	1.6
2010	1.6	1.3	1.0	0.6	0.1	-0.4	-0.9	-1.2	-1.4	-1.5	-1.5	-1.5
2011	-1.4	-1.2	-0.9	-0.6	-0.3	-0.2	-0.2	-0.4	-0.6	-0.8	-1.0	-1.0
2012	-0.9	-0.6	-0.5	-0.3	-0.2	0.0	0.1	0.4	0.5	0.6	0.2	-0.3
2013	-0.6	-0.6	-0.4	-0.2	-0.2	-0.3	-0.3	-0.3	-0.3	-0.2	-0.3	-0.4
2014	-0.5	-0.6	-0.4	-0.2	0	0	0	0	0.2	0.4	0.6	0.6
2015	0.5	0.4	0.5	0.7	0.9	1.0	1.2	1.5				

Most models predict ENSO-neutral (-0.5°C to +0.5°C) to continue through the Northern Hemisphere spring. After that, models predict either ENSO-neutral or El Niño (greater or equal to +0.5°C) during the rest of 2014.

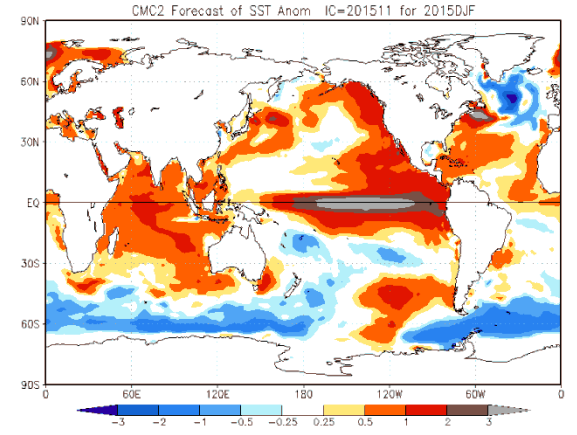
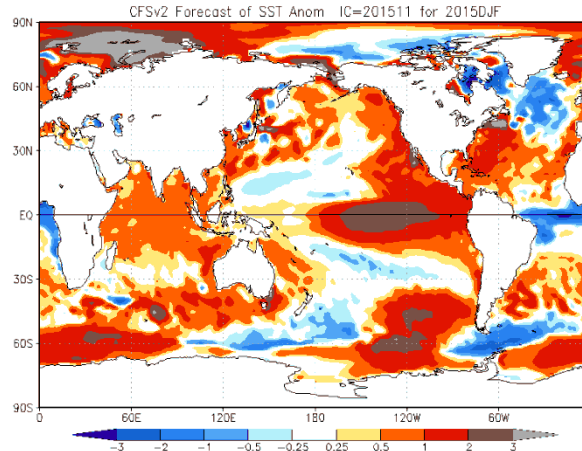
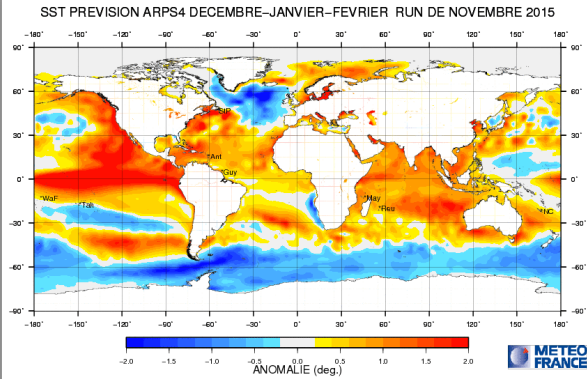


ENSO index expected to reach the El Nino threshold between 2015 & 2016

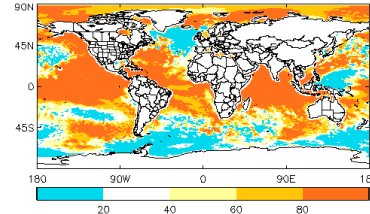


**ANALYSIS OF EACH GLOBAL PRODUCING CENTRES FOR
LONG RANGE FORECAST**

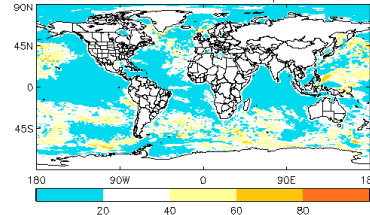
SST DJF 2015 FROM SINGLE MODELS



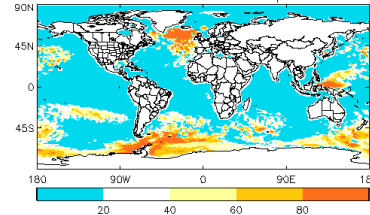
Probability of tercile categories Jan/Feb/Mar Issued Nov 2015
above-normal sea surface temperature



near-normal sea surface temperature

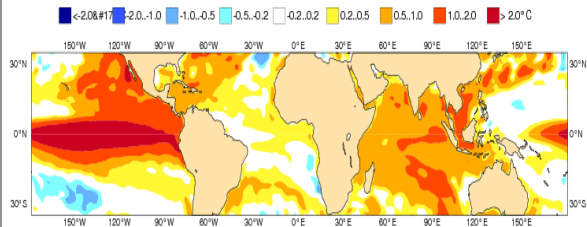


below-normal sea surface temperature



ECMWF Seasonal Forecast
Mean forecast SST anomaly
Forecast start reference is 01/11/15
Ensemble size = 51, climate size = 450

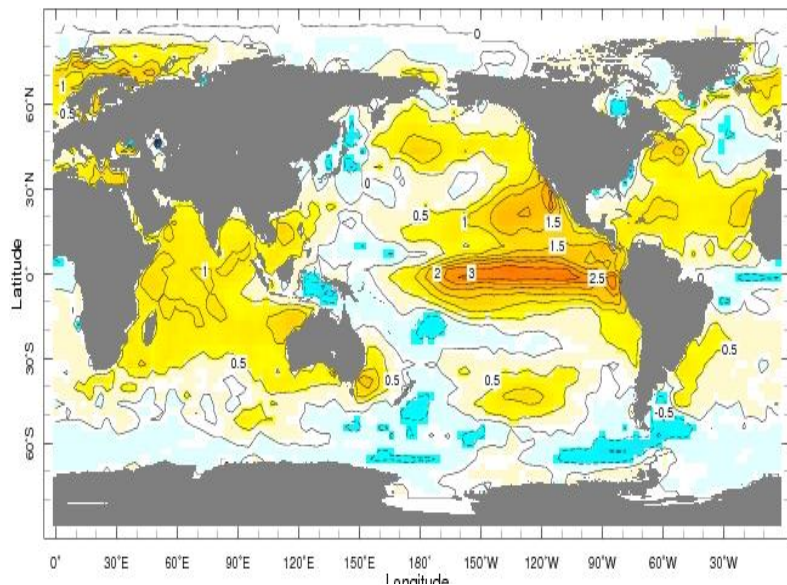
System 4
DJF 2015/16



**ANALYSIS OF EACH GLOBAL PRODUCING CENTRES FOR
LONG RANGE FORECAST**

SST DJF 2015 FROM MULTI-MODELS

Dec 2015 - Feb 2016 IRI seasonal Forecast SSTA issued 0000 1 Nov 2015

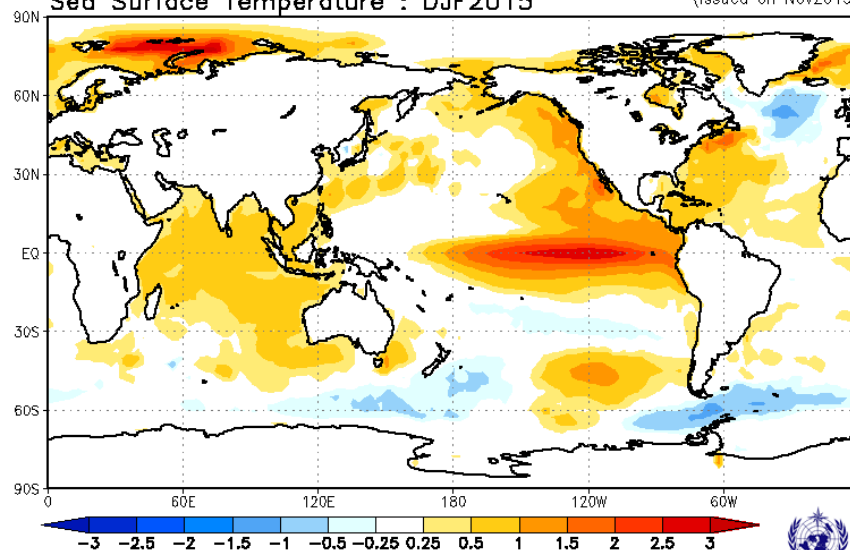


Simple Composite Map

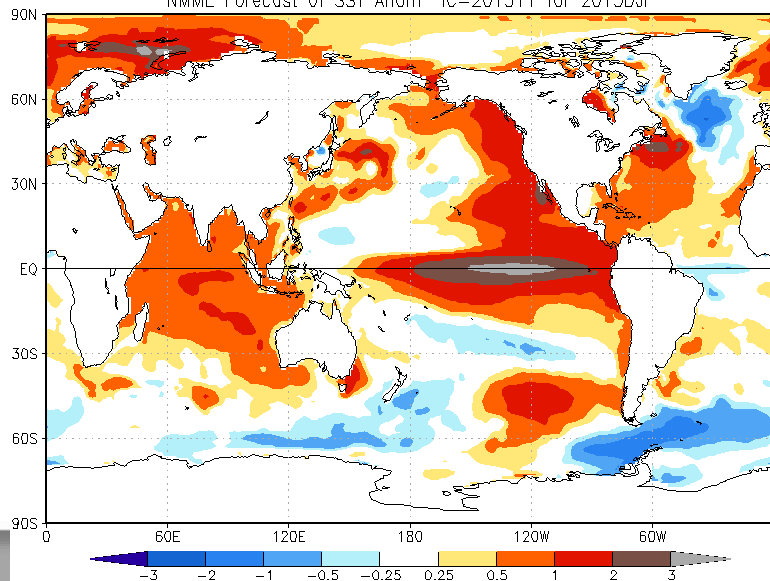
GPC_Seoul/GPC_Washington/GPC_Toulouse/GPC_Montreal/GPC_Melbourne/GPC_Exeter/GPC_ECMWF/GPC_Beijing
GPC_Pretoria/GPC_CPTEC

Sea Surface Temperature : DJF2015

(issued on Nov2015)



NMME Forecast of SST Anom IC=201511 for 2015DJF



Summary of past 3 to 4 months SSTs evolution over different basins and expected conditions for the coming 4 months

Pacific SSTs were above average across the central and eastern Pacific during past three months particularly sst anomaly have increased from September to early November 2015, this condition persist during coming four months.

The Tropical North Atlantic SSTs have been near to above average during the past few months. Models outputs and expert judgment predict a persistence of these conditions in the region during the coming few months.

The equatorial Atlantic SSTs have been near to above average from October 2015 to early November particularly over coastal part of gulf of Guinea. Most models and expert assessments are favorable for a persistence of this pattern.

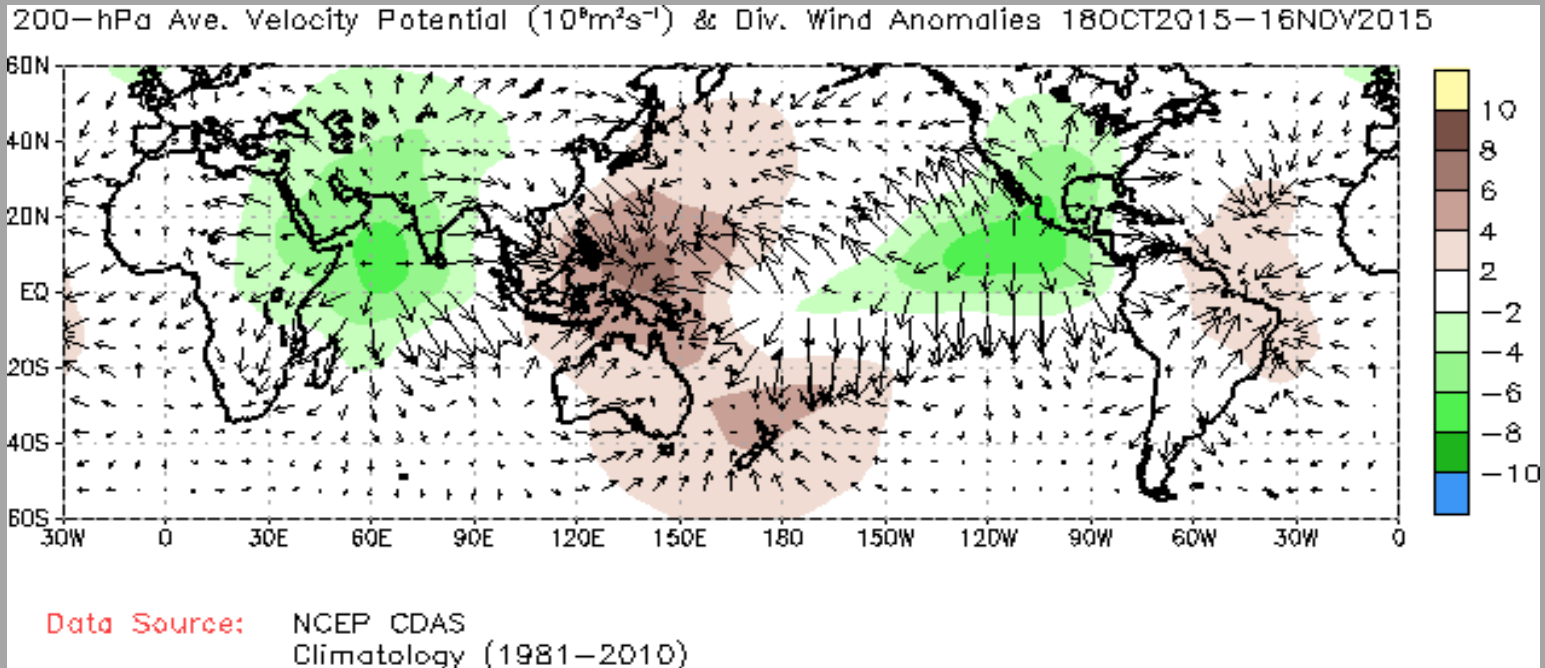
The tropical south Atlantic SSTs have been mostly near average during the past few months. This pattern is expected to evolve towards near to above average condition during the coming few months.

The Mediterranean Sea SSTs have been near to above average during past few months. Most models outputs and expert assessments are favorable for near to slightly above average condition during the coming months.

The equatorial and southern tropical Indian Ocean SSTs have been near to above average during the past few months. Most models and expert assessments are suggesting a above average condition of this pattern during the coming three to four months.

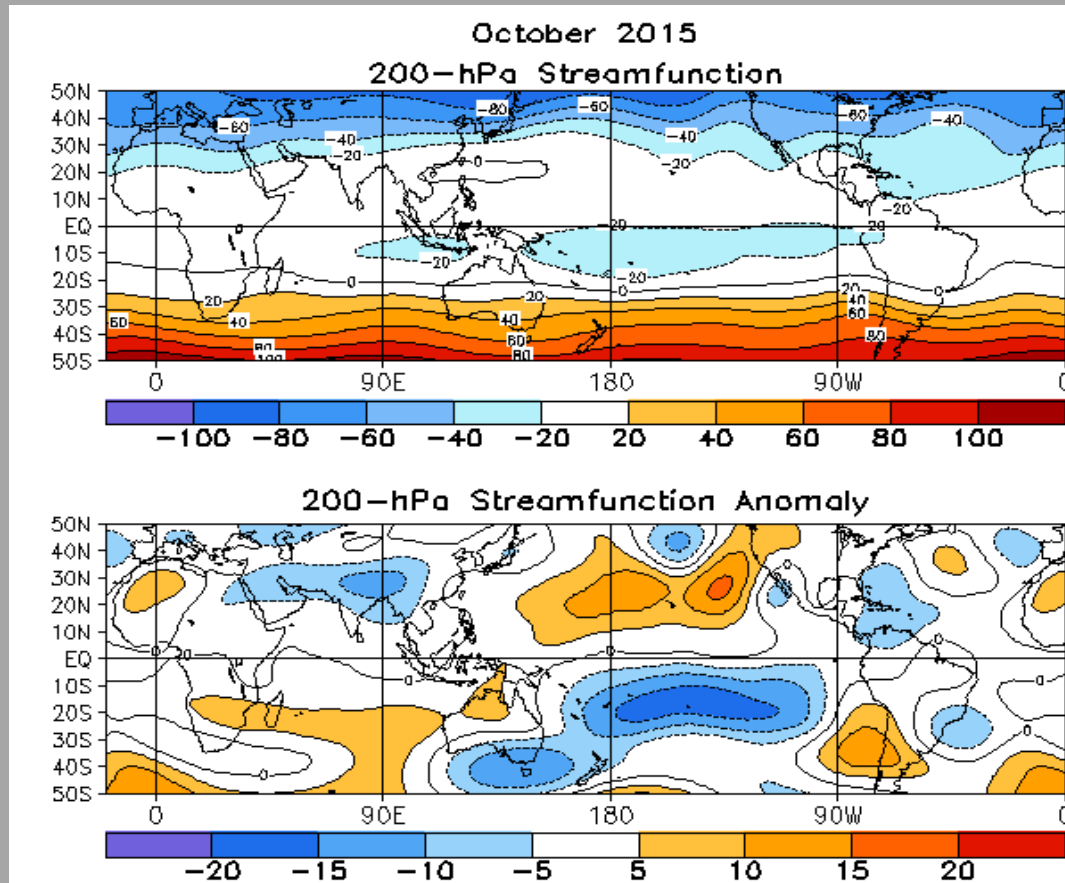
GENERAL CIRCULATION

Div. Wind Anomalies



GENERAL CIRCULATION

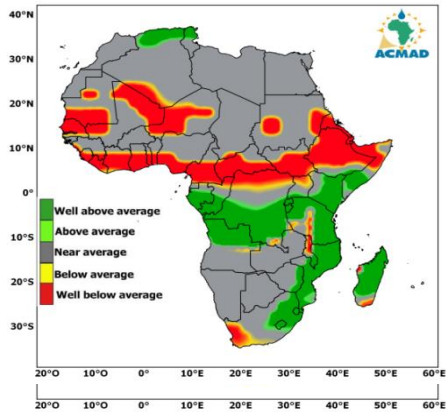
Streamfunction



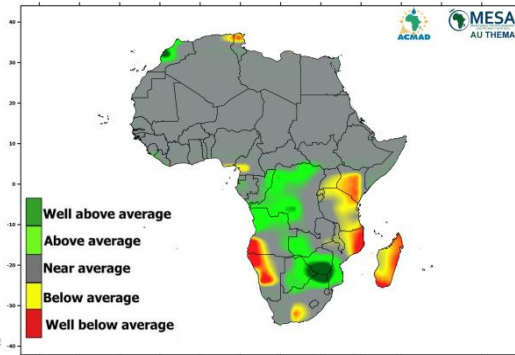
<http://www.cpc.ncep.noaa.gov/products/CDB/Tropics/figt22.shtml>

ANALOG YEARS PRECIPITATION IN PERCENT OF AVERAGE DJF & JFM 2015/2016

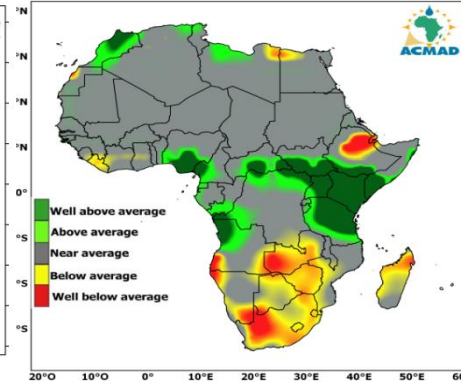
DJF 1982



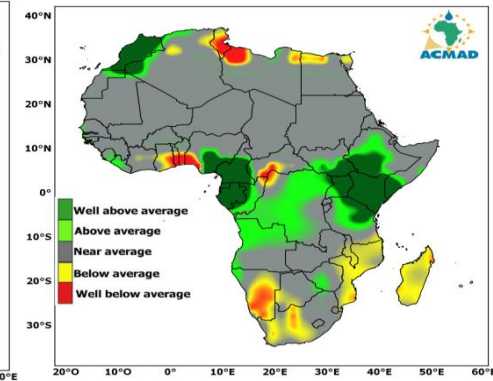
DJF 1987



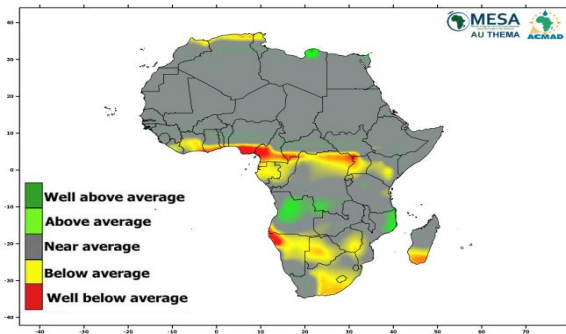
DJF 1997



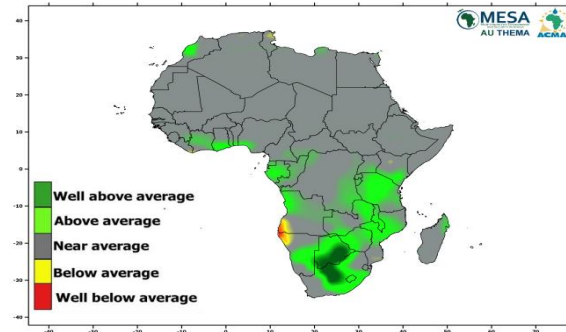
DJF 2009



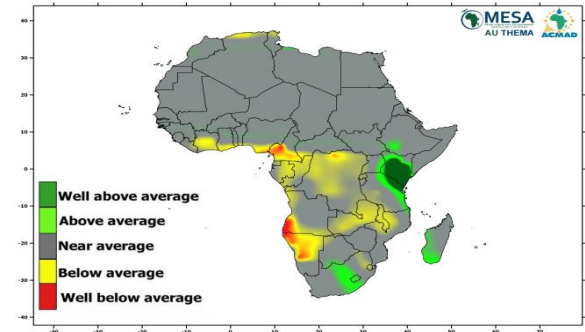
JFM 1983



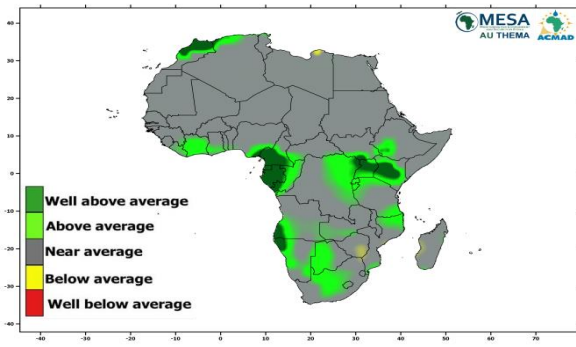
JFM 1988



JFM 1998



DJF 2009

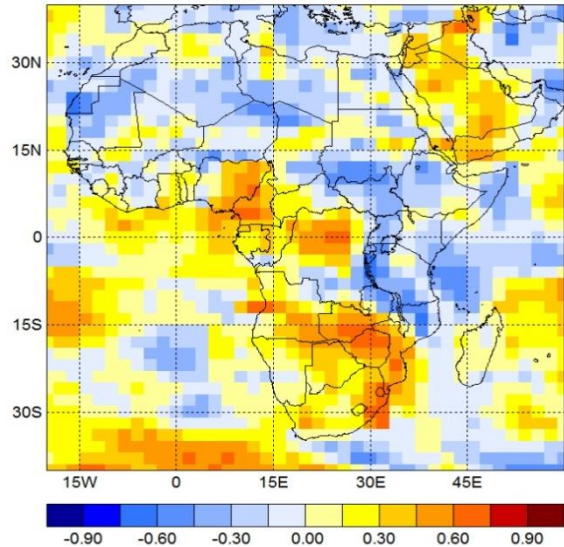


GENERATION AND ANALYSIS OF STATISTICAL FORECAST WITH CLIMATE PREDICABILITY TOOLS

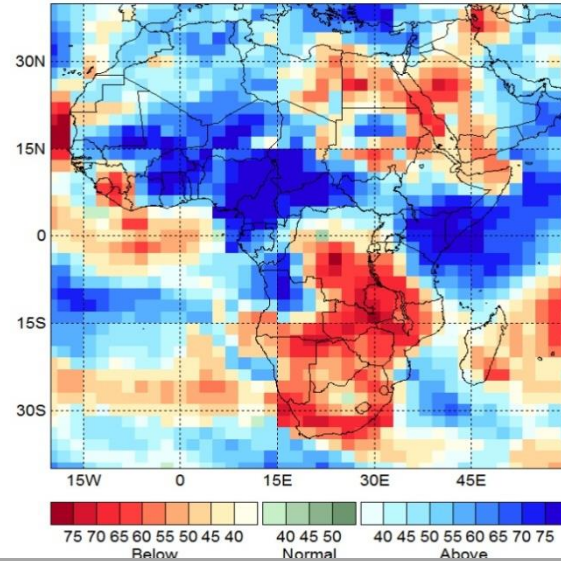
Forecast with CPT DJF 2015

PRECIPITATION FORECAST RUN BY NMME SST

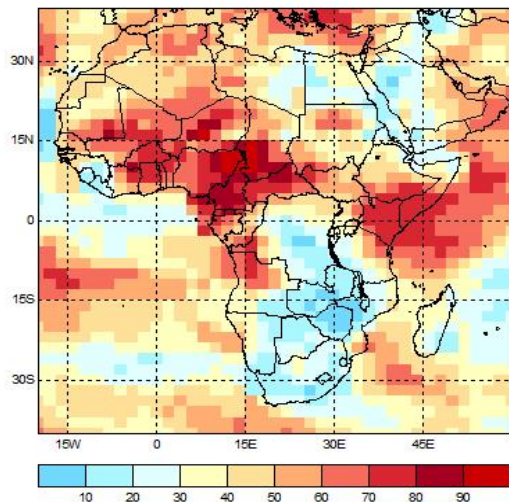
Correlation_SST_NMME_NOV_IC_DJF_1982-2010



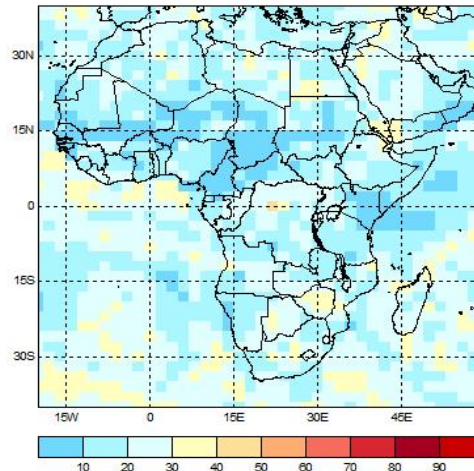
Probabilistic forecasts-SST-NMME-NOV-IC-DJF-2015-16



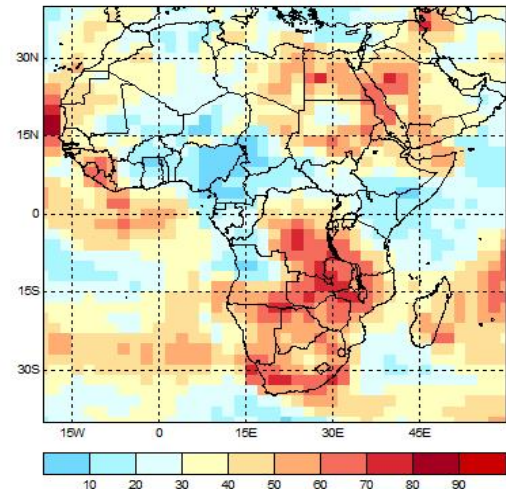
NMME-FCST-ABV-DJF



NMME-FCST-NOR-DJF

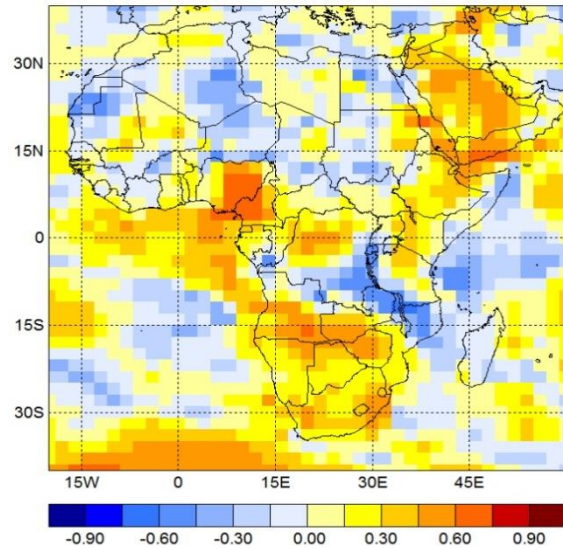


NMME-FCST-BLW-DJF

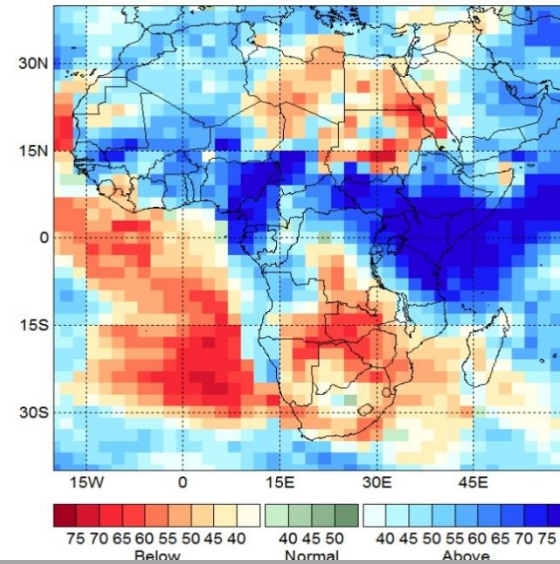


PRECIPITATION FORECAST RUN BY NCEP SST OBSERVED

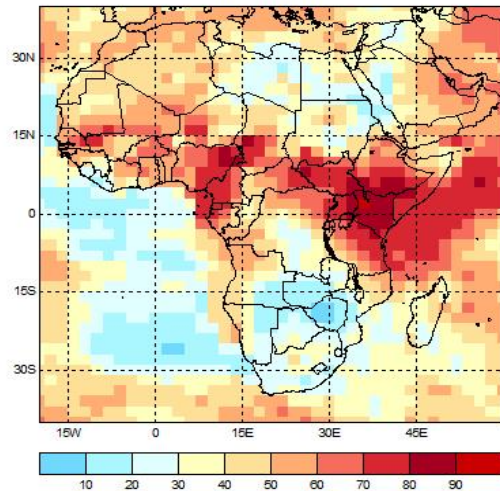
Correlation-SST-OBS-NCEP-IC-NOV-DJF-1982-2012



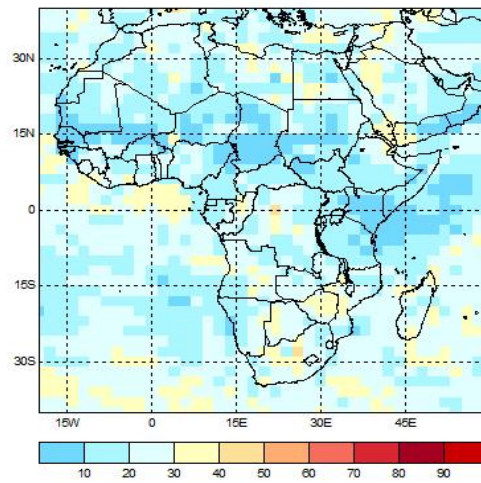
Probabilistic forecasts-SST-OBS-NCEP-DJF-2015



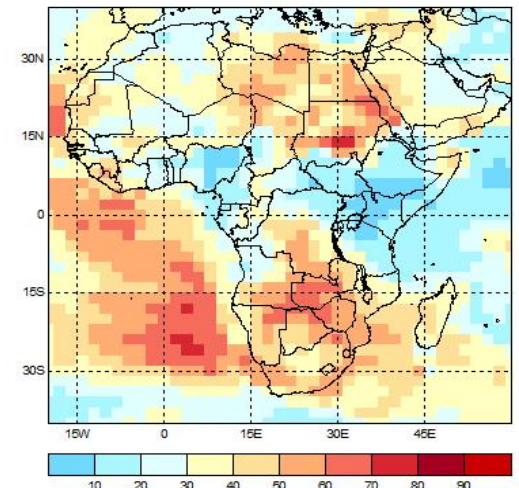
FCST-ABV



FCST-NOR

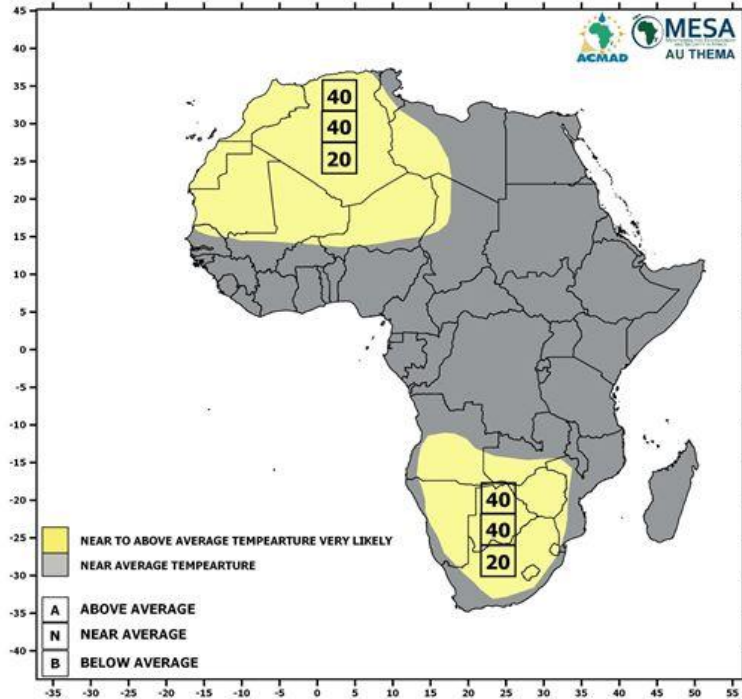


FCST-BLW

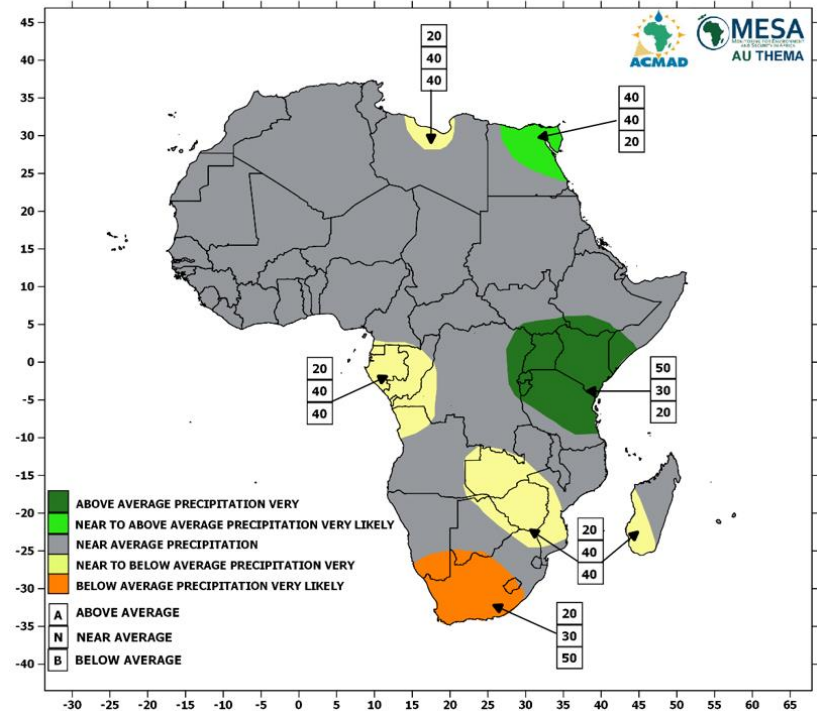


MAIN RCC PRODUCTS

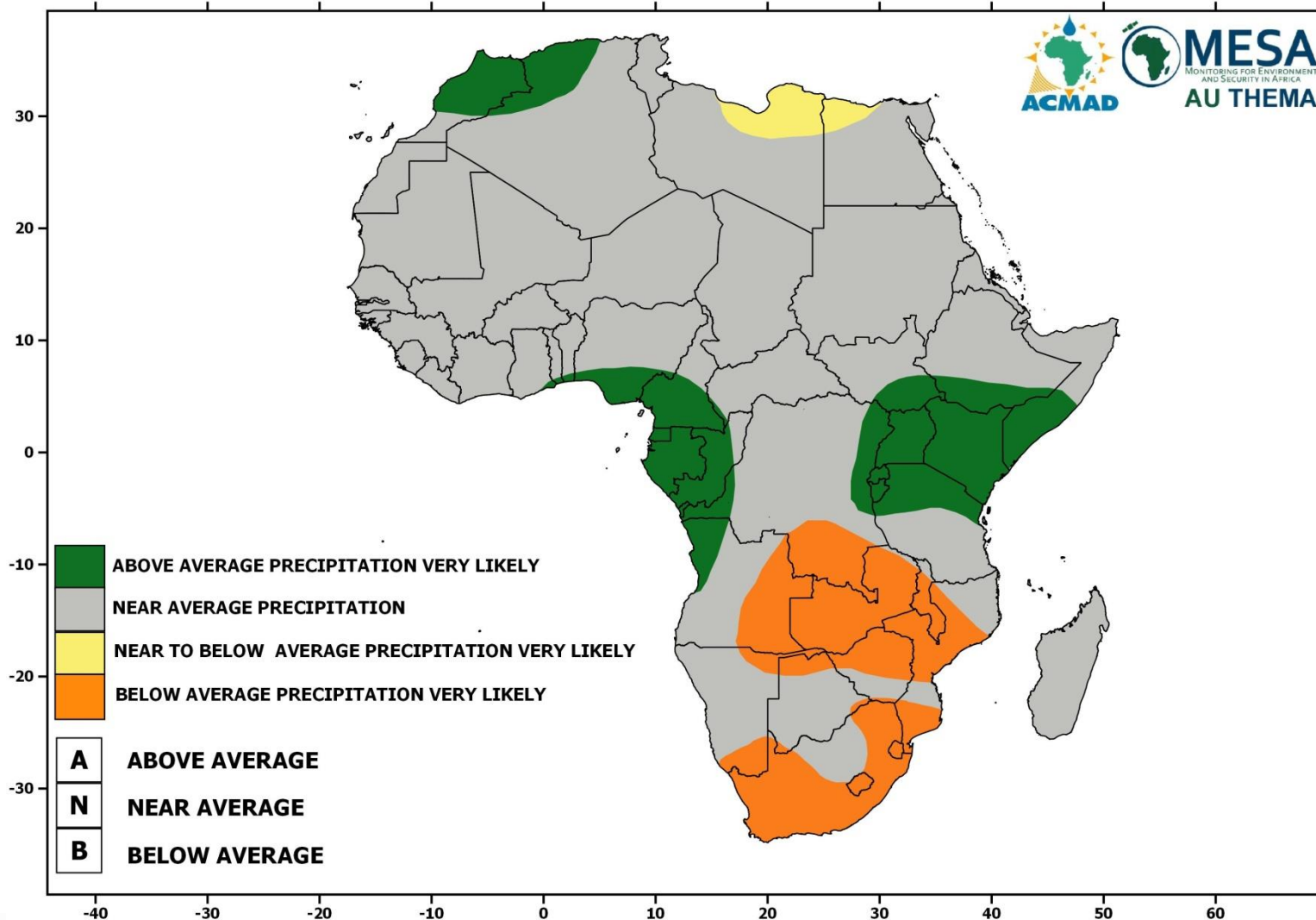
**SEASONAL TEMPERATURE FORECAST FOR NOVEMBER-DECEMBER-JANUARY 2015-2016
ISSUED ON OCTOBER 30, 2015**



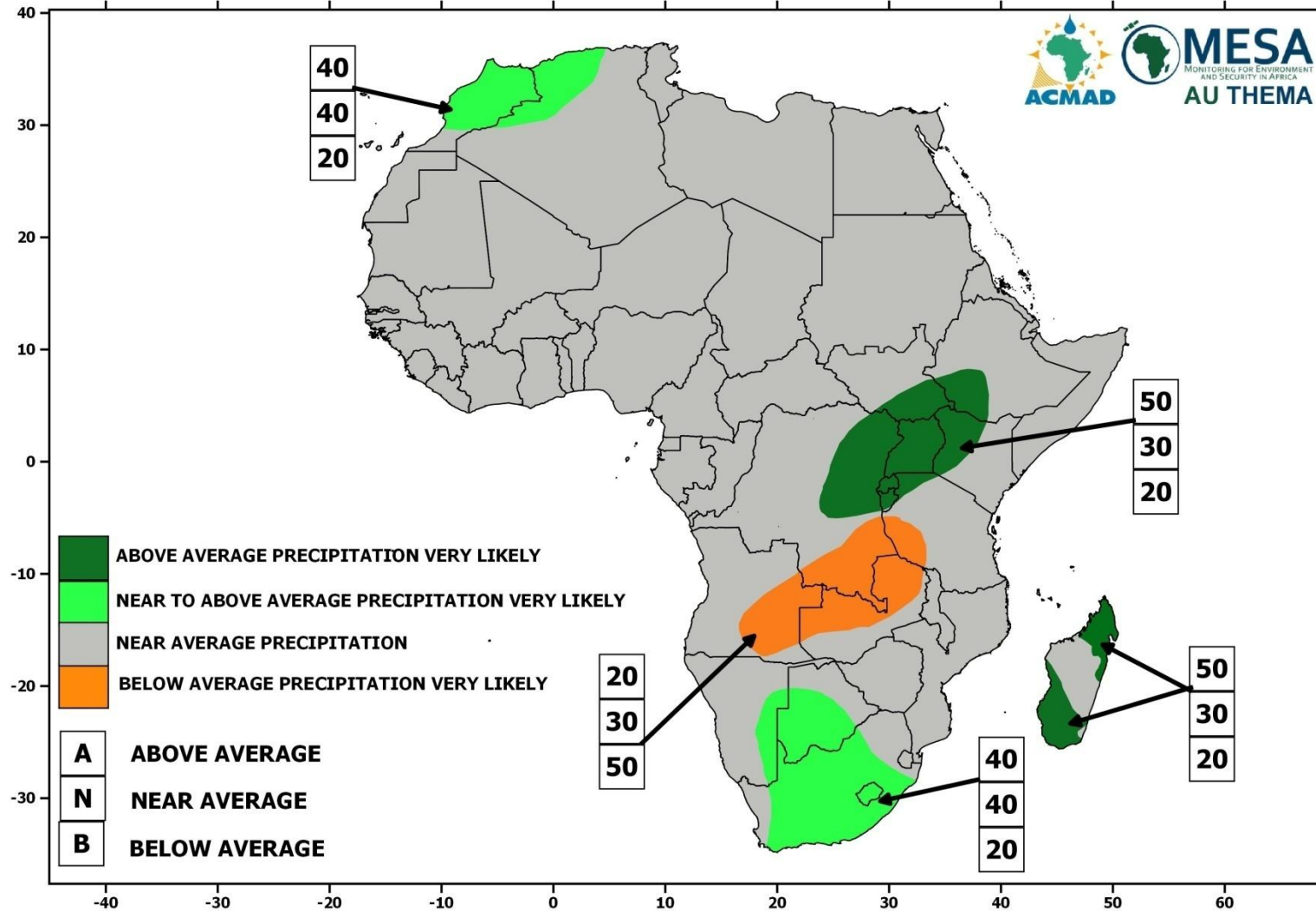
**SEASONAL PRECIPITATION FORECAST FOR NOVEMBER-DECEMBER-JANUARY 2015/2016
ISSUED ON OCTOBER 30, 2015**



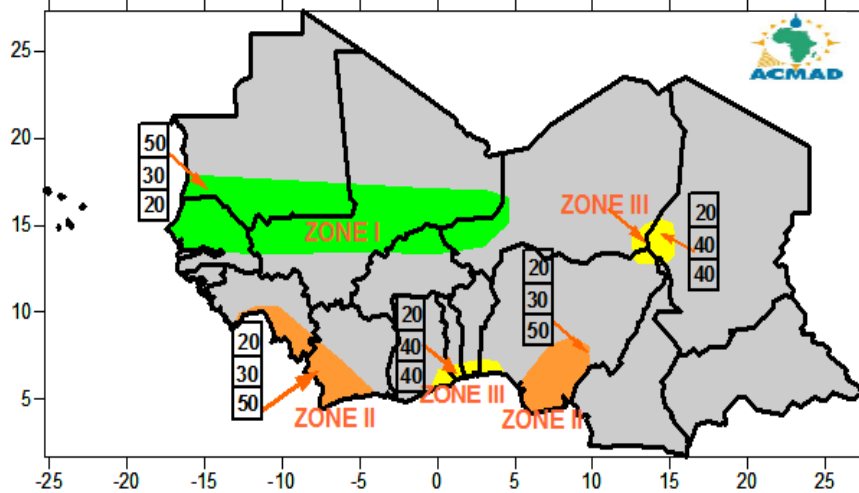
CONTINENTAL FORECAST FOR DJF 2015



CONTINENTAL FORECAST FOR JFM 2015

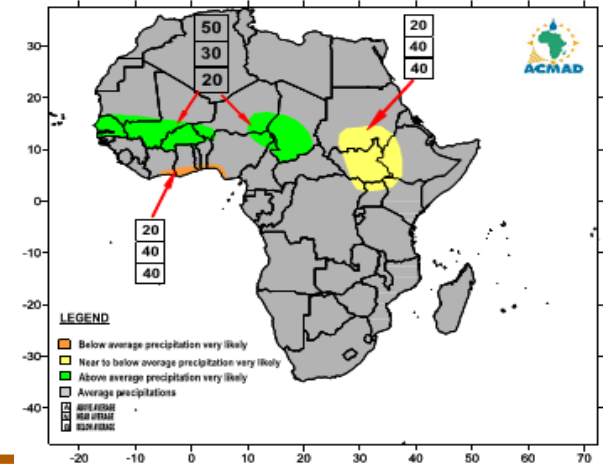


VISUAL EVALUATION OF LONG RANGE FORECAST & RCOF (PRESASS-02) FOR JULY-AUGUST-SEPTEMBER 2015

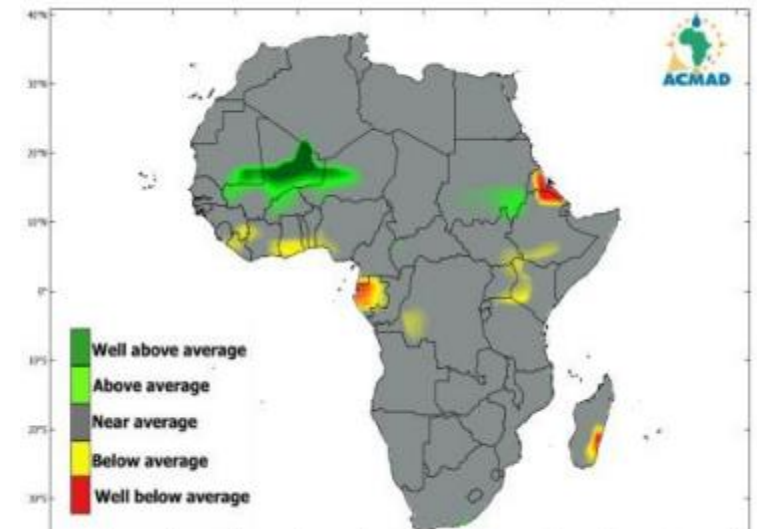
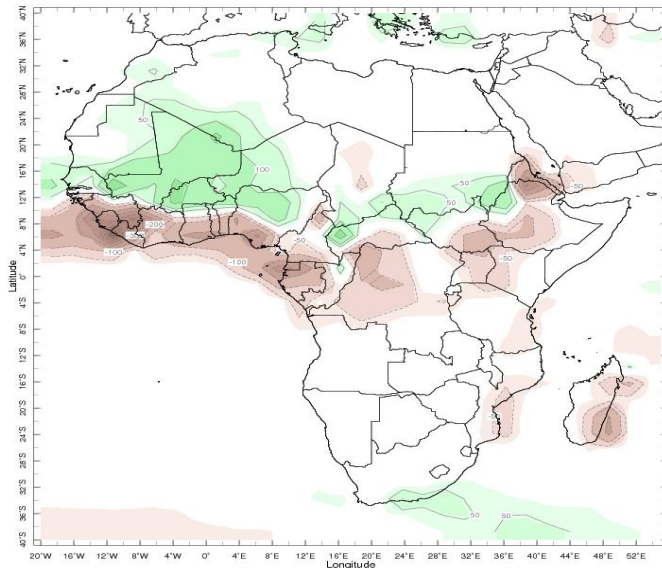


Observed JAS 2015 anomaly precipitation

SAISONNAL PRECIPITATION FORECAST FOR JULY-AUGUST-SEPTEMBER 2015 ISSUED ON JUNE,29 2015



Observed JAS 2015 precipitation in percent of average . 81-2010 reference period



AFRICAN REGIONAL CLIMATE CENTRE

DEMONSTRATION PHASE

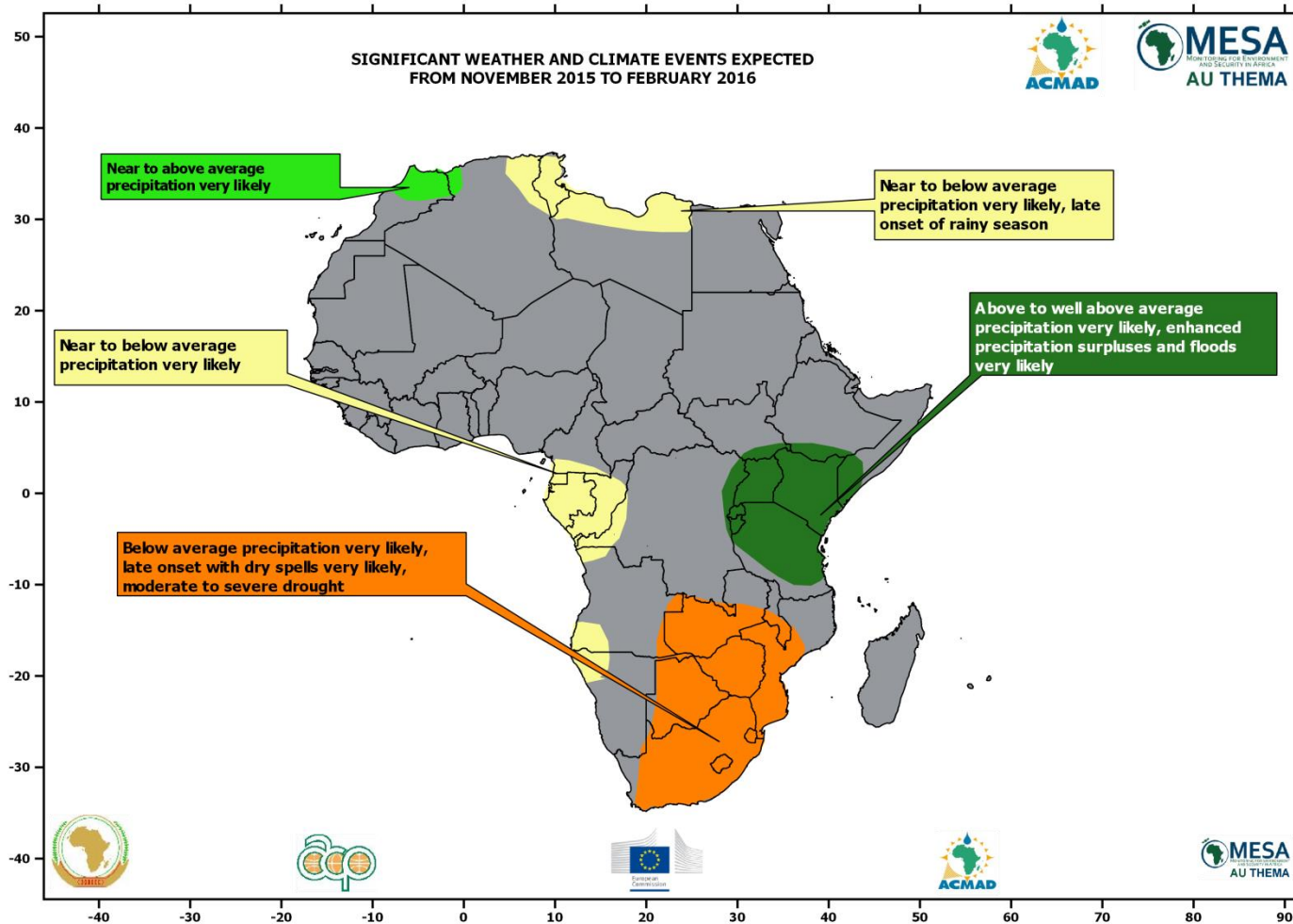
LONG RANGE FORECAST PRODUCT FOR AFRICA
VALID FOR MAY-JUNE-JULY
JUNE-JULY-AUGUST
AND JULY-AUGUST-SEPTEMBER
2014 SEASONS

<http://acmad.net/rcc/longrangebulletin.php>

Highlights

- Below to well below average precipitation is very likely over Guinea Conakry, Liberia, Sierra Leone, southern parts Senegal and Mali, northern half of DRC and adjacent areas in Ugandan and south Sudan, central and southern Ethiopia as well as northern Somalia from May to August 2014;
- Below to well below average precipitation is very likely from July to September 2014 in Mauritania, Senegal, Guinea, north western Cote d'Ivoire, parts of Western Niger and Sudan, northern half of Ethiopia and Somalia, Eritrea and south Eastern Madagascar;
- Near to above Average temperatures are expected across Africa from May to September 2014
- Irregular distribution of precipitation during the seasons is very likely with average to late onsets, dry spells and abnormal cessation.

OTHERS PRODUCTS: FROM ACMAD-MESA



**POLICY BRIEF AND STATEMENT FOR DECISION MAKERS ON
SIGNIFICANT WEATHER AND CLIMATE EVENTS EXPECTED WITH
POTENTIAL IMPACTS AND INITIAL RESPONSE MEASURES
FROM NOVEMBER 2015 TO FEBRUARY 2016**



Near to above average precipitation very likely

Near to below average precipitation very likely, late onset of rainy season

Near to below average precipitation very likely

Above to well above average precipitation very likely, enhanced precipitation surpluses and floods very likely

POTENTIAL IMPACT

Extensive erosion with landslides, destruction of infrastructures: Dams, water reservoirs, roads, buildings, farms and warehouses, as well as losses of lives and crops. Outbreaks of water borne diseases and malaria.

MEASURES

Improve the drainage system for protection against floods; Prepare for floods emergency; Take measures to ensure access to food production areas; Sensitize States disease surveillance services and NGOs to prepare drug stocks for use in case of outbreak of epidemics; Sensitize States services to protect water tables from diseases.

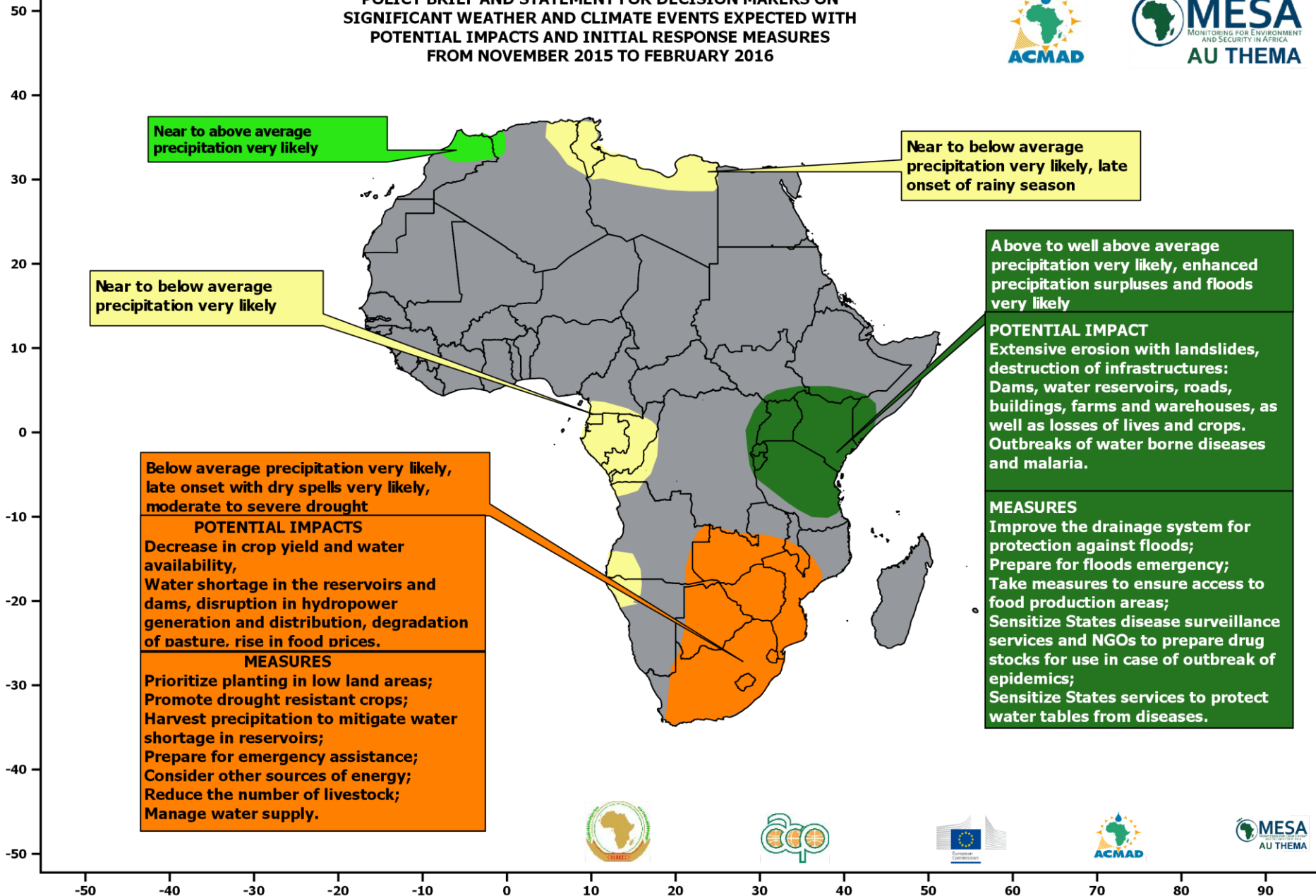
Below average precipitation very likely, late onset with dry spells very likely, moderate to severe drought

POTENTIAL IMPACTS

Decrease in crop yield and water availability, Water shortage in the reservoirs and dams, disruption in hydropower generation and distribution, degradation of pasture, rise in food prices.

MEASURES

Prioritize planting in low land areas; Promote drought resistant crops; Harvest precipitation to mitigate water shortage in reservoirs; Prepare for emergency assistance; Consider other sources of energy; Reduce the number of livestock; Manage water supply.



**END OF PRESENTATION
THANK YOU**