



# African Regional Climate Centre Demonstration phase Long range forecasting products

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*<http://www.acmad.net/rcc/index.php>*

*Presenters:*

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*-- MBAIGUEDEM MIAMBAYE, Climate applications Specialist, CED/ACMAD*



# OUTLINE



- ✓ <http://www.acmad.net/rcc/longerange.php>
- ✓ Practical procedure for long range forecasting for RCCs
- ✓ Performance of statistical and dynamical LRF systems
- ✓ Regional seasonal climate outlooks
- ✓ Consensus Regional Climate outlook Forum products
- ✓ Verification products
  
- ✓ CONCLUSIONS

# RCC LRF Webpage,

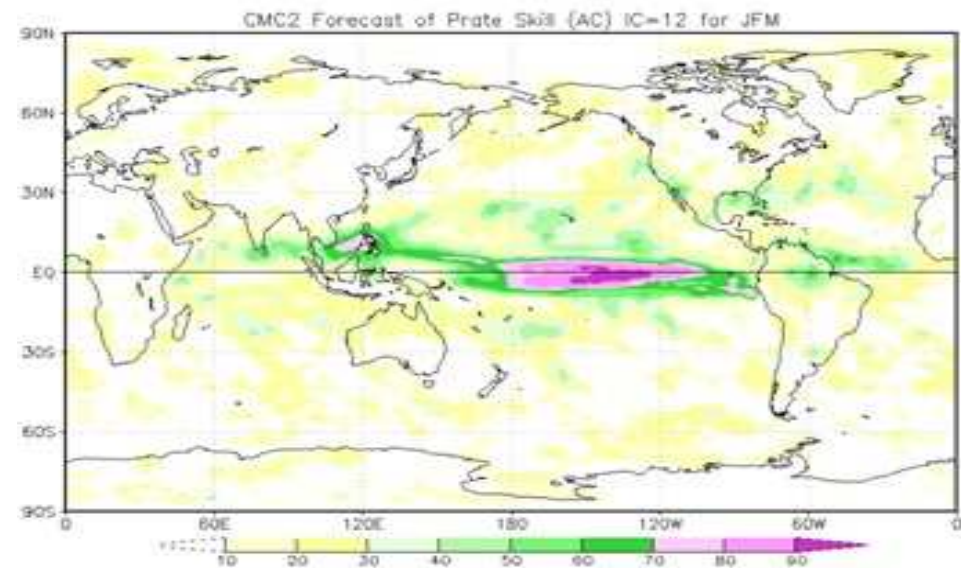
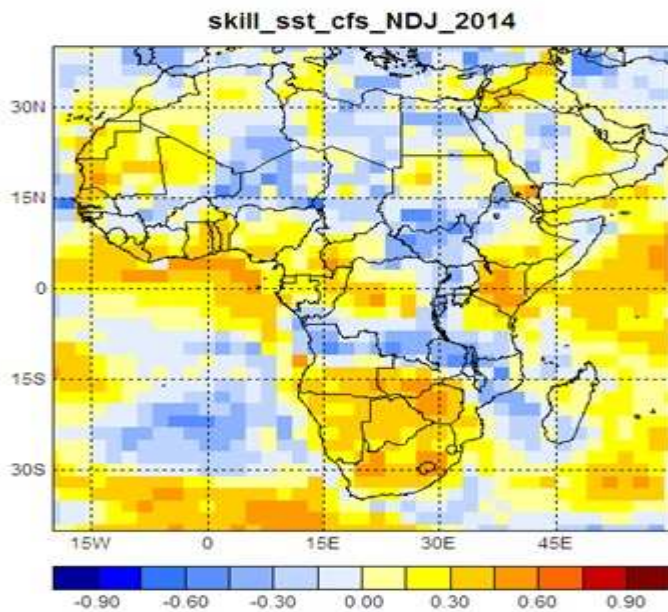
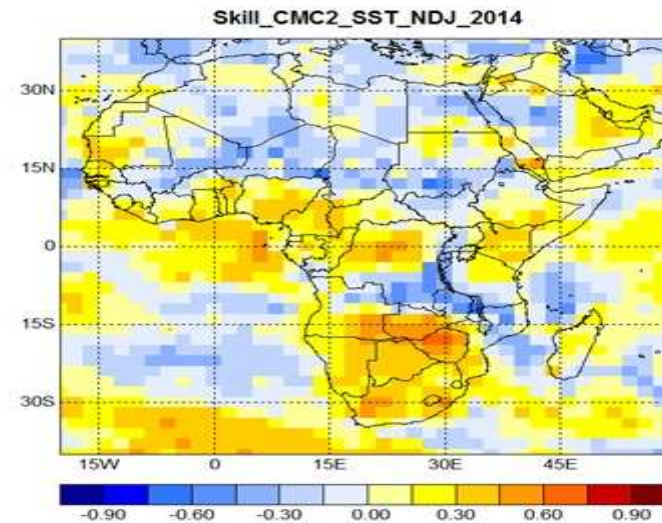
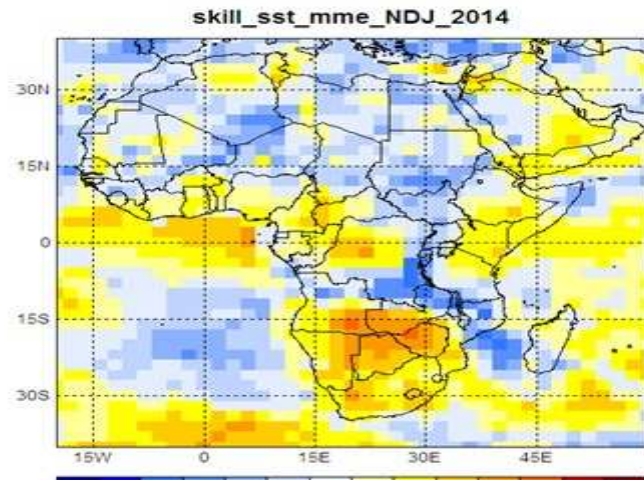
<http://www.acmad.net/rcc/longerange.php>

The screenshot shows a web browser window displaying the African Regional Climate Centre (RCC) Long Range Forecasting webpage. The browser's address bar shows the URL [www.acmad.net/rcc/longerange.php](http://www.acmad.net/rcc/longerange.php). The page features the ACMAD logo on the left and the WHO OMM logo on the right. A navigation menu on the left includes links for Homepage, Data Services, Climate Monitoring, Long Range Forecasting Function, Training, Highly recommended Function, and Coordination. A Contact section provides the address: 55, Avenue des ministères PPL6 BP: 13 184 Niamey - Niger, along with telephone and fax numbers, and an email address: [dgacmad@acmad.net](mailto:dgacmad@acmad.net). The Longest New section reports on the 8th Forum on Seasonal Climate Forecasts for central Africa countries, PRESAC-08, held in Kinshasa, Democratic Republic of Congo, from 22 to 26 September 2014. The main content area is titled "Longe range Forecasting" and describes the African RCC's role in collecting and processing data from Global Producing Centres for Long Range Forecasting (GPC-LRF). Below this, a section titled "Longe Range Forecasting Function" contains a table with two columns: Activities and Products.

Activities	Products
Interpretation and assessment of Global products and distribution of results to Globals center	Maps and Graphs of statistical and dynamical models performance
Generation of regional products including seasonal outlooks	Maps of tailored precipitation and temperature forecasts
Generation of consensus statement on regional forecasts	Consensus statements for the region and sub-regions
Verification products	Graphs and maps for verification of forecasts and outlooks
Development of a webportal	All products and datasets related to RCC functions

The browser's taskbar at the bottom shows the date and time as 19:21 on 16/11/2014, along with various application icons and system tray icons.

# Skill (correlation) of statistical and dynamical models



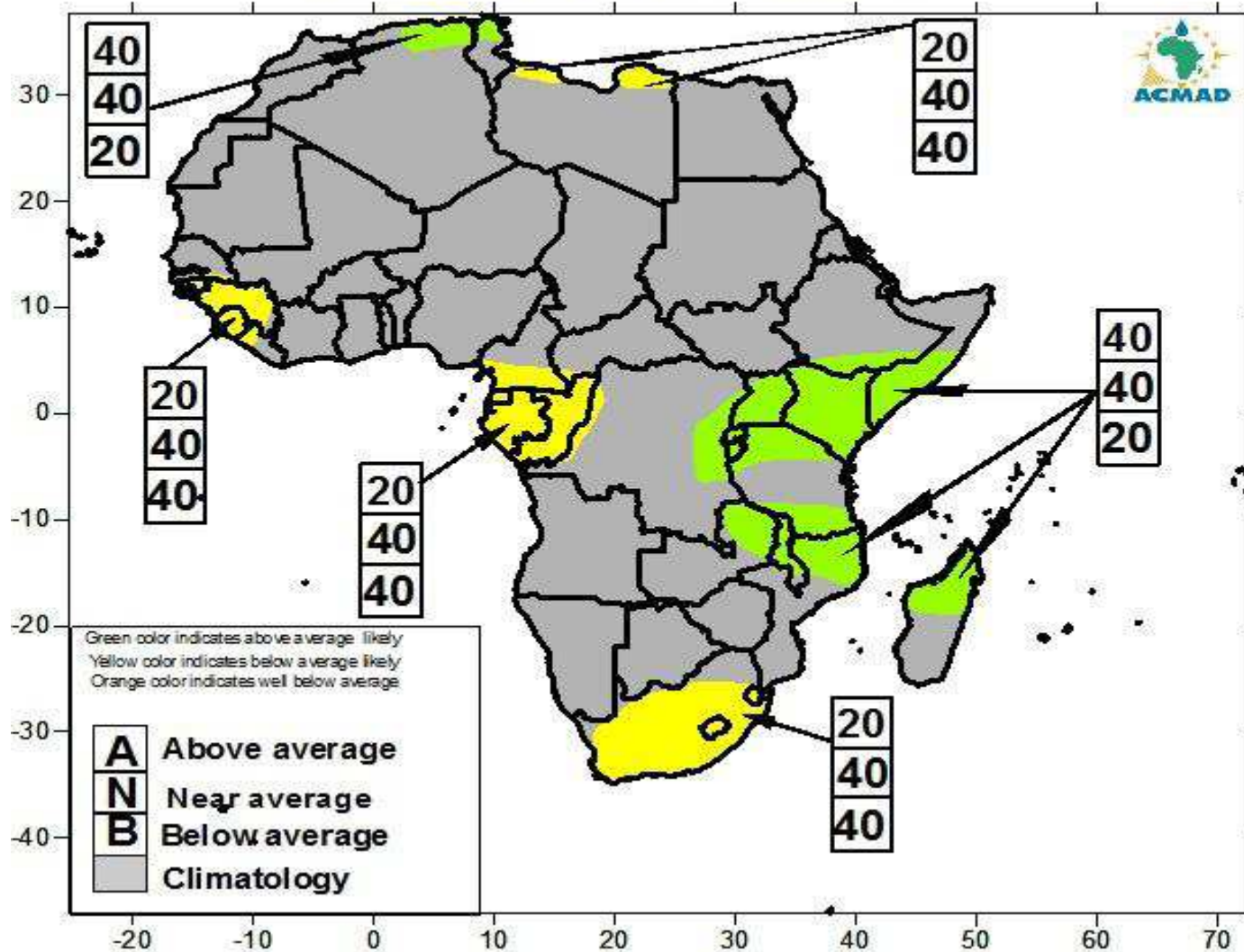


# 9 STEPS FOR SEASONAL FORECASTING

- 1- Analysis of climate variability and trends for the target seasons
- 2- Selection of wet ( seasonal precipitation total  $\geq 125\%$  of average) and dry years (seasonal precipitation total  $\leq 75\%$  of average) from your country's station time series
- 3- Global SST Composite analysis for wet and dry years
- 4- Analysis of cumulative daily station precipitation for dry years and wet years at each station or region in the country ( with Microsoft excel)
- 5- Generation and analysis of Statistical forecasts with Climate Predictability Tools (CPT)
- 6- Identification of analog years based on SST behavior ( in the ENSO, tropical Atlantic and Indian Ocean regions) and analysis of related precipitation and temperatures patterns
- 7- Analysis of each Global Producing Centre's for Long Range Forecasts products ( Single model ensemble approach)
- 8 Analysis of WMO Lead Centre for Long Range Forecasts multimodel Products ( Multimodel ensemble approach)
- 9- Combination of outputs from step 1 to step 8 and generation of the consensus for regions and the countries.

# SEASONAL FORECAST FOR OND 2014 MADE ON SEPTEMBER 30, 2014


## SEASONAL PRECIPITATION FORECAST FOR OCT-NOV-DEC 2014 ISSUED ON SEPTEMBER 30, 2014




Concesus statement x

www.acmad.net/rcc/concensus.php

Applications file:///C:/Users/HP/... Google GPC Lead centers Yahoo! Longe range imu315.infomaniak... regionale indice African RCC pilot de... International Resear... training climate data



# African Regional Climate Centre



- Homepage
- Data Services
- Climate Monitoring
- Long Range Forecasting Function
- Training
- Highly recommended Function
- Coordination

### Contact

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Niamey - Niger Tel: +227 20 73 49 92 Fax:  
2272072327  
Email:  
dgacmad@acmad.net dgacmad@acmad.org  
site web: www.acmad.net

### Lastest New

The 8th Forum on Seasonal Climate Forecasts for central Africa countries, PRESAC-08 was held in KINSHASA (Democratic Republic of Congo) from 22 to 26 September 2014

The African Centre of Meteorological Applications for Development (ACMAD) and METELSAT organized the PRESAC-08. This Forum to improve understand and exchange

### Consensus statements for the region and sub-regions

In a collaborative endeavor involving discussions and exchanges with country experts of a target sub-region, the African RCC produces Consensus Long Range Forecasts during the so-called Regional Climate Outlook Forums (RCOFs). RCC forecasts products assessments from climate service provider and end-users perspectives are published.

**PRESAQ:** Seasonal Climate Outlook Bulletin in West Africa, Chad AND Cameroon

**PRESAC:** Seasonal Climate Outlook Bulletin in Centrale Africa

**PRESANORD:** Seasonal Climate Outlook Bulletin in North Africa

**PRESAOI:** Statement from the Second South West Indian Ocean Regional Climate Outlook

**PRESAGG:** Seasonal Climate Outlook bulletin over the Gulf of Guinea contries of Africa

**PRESASS:** Seasonal Climate Outlook Bulletin Over the Soudano-Sahelian Region of Africa

ACMAD\_Bulletin\_pre...pdf ACMAD\_bulletin\_de...pdf ACMAD\_monthly\_b...pdf

Afficher tous les téléchargements...

information\_participants\_Antalya-AHdraft

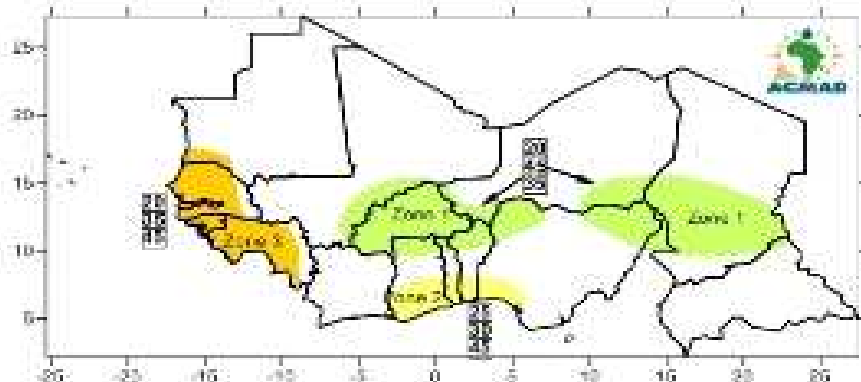
FR 19:44 16/11/2014

# RCOF products for Sahel, Gulf of Guinea, Central Africa, Indian Ocean Regions

SEASONAL PRECIPITATION FORECAST FOR JULY-AUGUST-SEPT 2014

ISSUED ON APRIL 30 2014

PREVISION CLIMATIQUE SAISONNIERE DES PRECIPITATIONS  
DE JUILLET-AOÛT-SEPT 2014, ELABOREE LE 30 AVRIL 2014



LEGENDE

S SUPÉRIEURE À LA MOYENNE  
M MOYENNE  
I INFÉRIEURE À LA MOYENNE

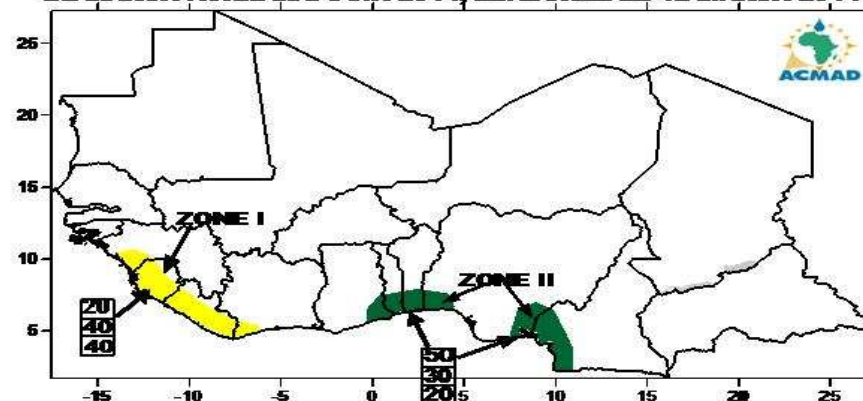
LEGEND

A ABOVE AVERAGE  
N NEAR AVERAGE  
B BELOW AVERAGE

SEASONAL PRECIPITATION FORECAST FOR MARCH-APRIL-MAY 2014

ISSUED ON MARCH 12 2014

PREVISION CLIMATIQUE SAISONNIERE DES PRECIPITATIONS  
DE MARCH-AVRIL-MAI-JUIN 2014, ELABOREE LE 12 MARCH 2014



LEGENDE

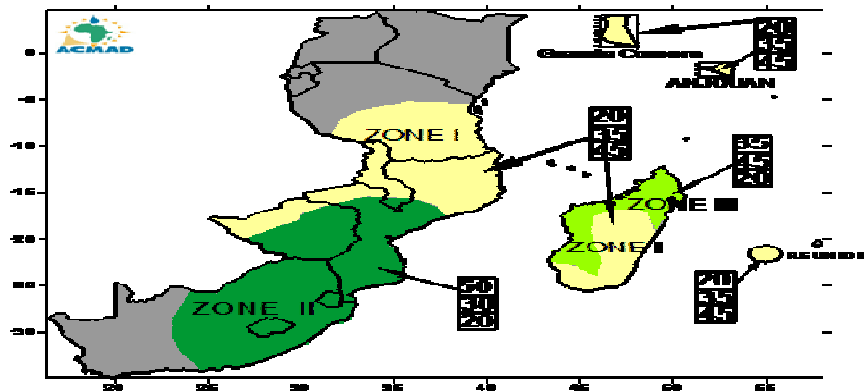
S SUPÉRIEURE À LA NORMALE  
N NORMALE  
I INFÉRIEURE À LA NORMALE

LEGEND

A ABOVE NORMAL  
N NORMAL  
B BELOW NORMAL

SEASONAL PRECIPITATION FORECAST FOR SOUTH WEST INDIAN OCEAN BASIN  
VALID FOR NOVEMBER-DECEMBER-JANUARY 2013-2014  
ISSUED ON OCTOBER 30 2013

PREVISION CLIMATIQUE SAISONNIERE DES PRECIPITATIONS  
DE NOVEMBRE-DECEMBRE-JANVIER 2013-2014, ELABOREE LE 30 OCTOBRE 2013



LEGENDE

S SUPÉRIEURE À LA MOYENNE  
M MOYENNE  
I INFÉRIEURE À LA MOYENNE

LEGEND

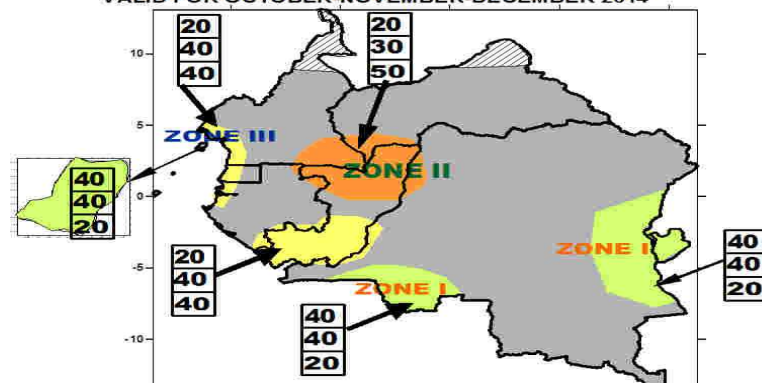
A ABOVE AVERAGE  
N NEAR AVERAGE  
B BELOW AVERAGE

CLIMATOLOGIE

CLIMATOLOGIE

PREVISION CLIMATIQUE SAISONNIERE  
VALABLE POUR LA PERIODE OCTOBRE-NOVEMBRE-DECEMBRE 2014  
EN AFRIQUE CENTRALE

REGIONAL CLIMATE OUTLOOK FOR CENTRAL AFRICA  
VALID FOR OCTOBER-NOVEMBER-DECEMBER 2014



S

SUPÉRIEURE À LA MOYENNE SAISONNIERE

M

MOYENNE

I

INFÉRIEURE À LA MOYENNE SAISONNIERE

CLIMATOLOGIE

CLIMATOLOGIE

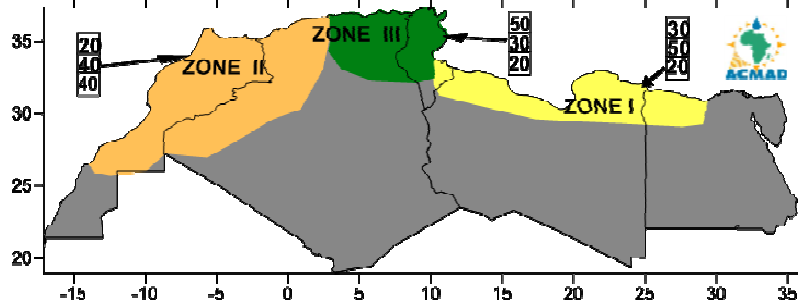
CLIMATOLOGIE

ZONE HORS SAISON



# Consensus Regional Climate Outlook Forum Products

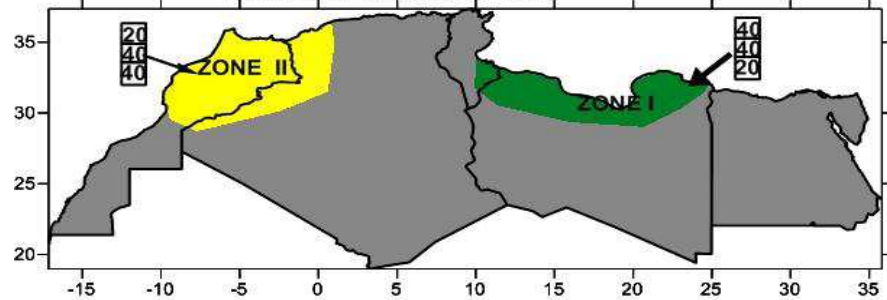
**SEASONAL PRECIPITATION FORECAST  
VALID FOR DECEMBER-JANUARY-FEBRUARY 2013-2014 NORTH AFRICA  
ISSUED ON NOVEMBER 30, 2013**



Green color indicates above normal precipitation more likely  
 Yellow color indicates below normal to normal precipitation more likely  
 Grey color indicates climatology

**A** Above Normal  
**N** Normal  
**B** Below Normal  
 Grey Climatology or desert area

**SEASONAL PRECIPITATION FORECAST  
VALID FOR MARCH-APRIL-MAY 2014 NORTH AFRICA  
ISSUED ON MARCH, 05 2014**

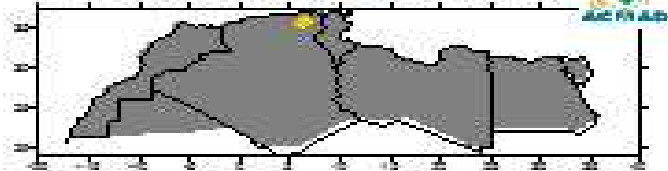


Green color indicates above average precipitation more likely  
 Yellow color indicates below average to near average precipitation more likely  
 Grey color indicates climatology

**A** Above average  
**N** Near average  
**B** Below average  
 Grey Climatology or desert area



**RAINFALL DECEMBER-JANUARY-FEBRUARY**



Well above average  
 Above average  
 Near average  
 Below average  
 Well below average

**RAINFALL MARCH-APRIL-MAY 2014**



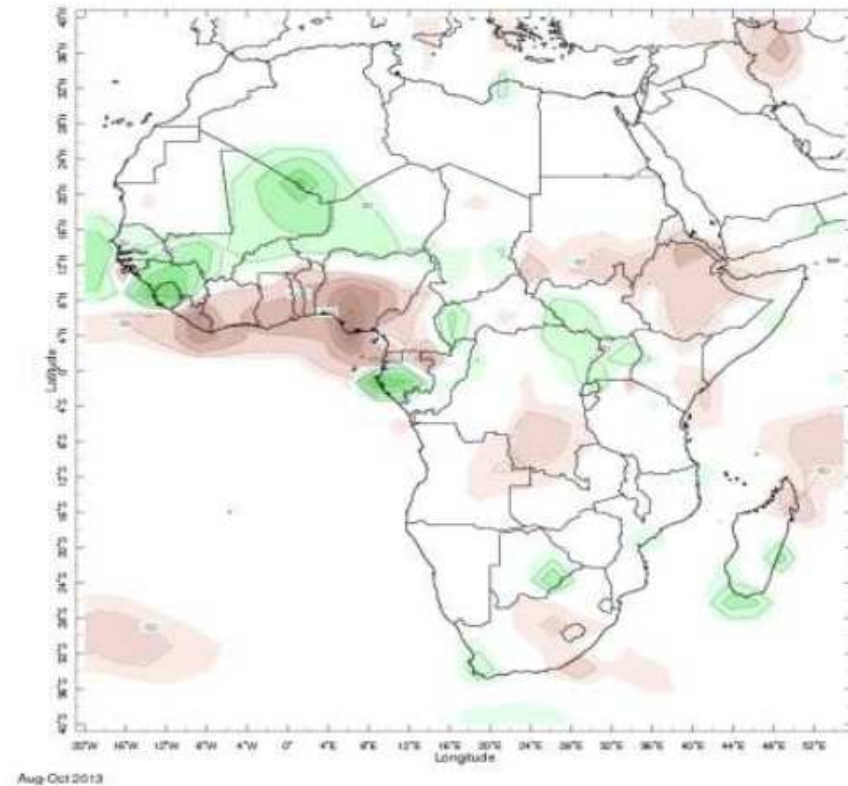
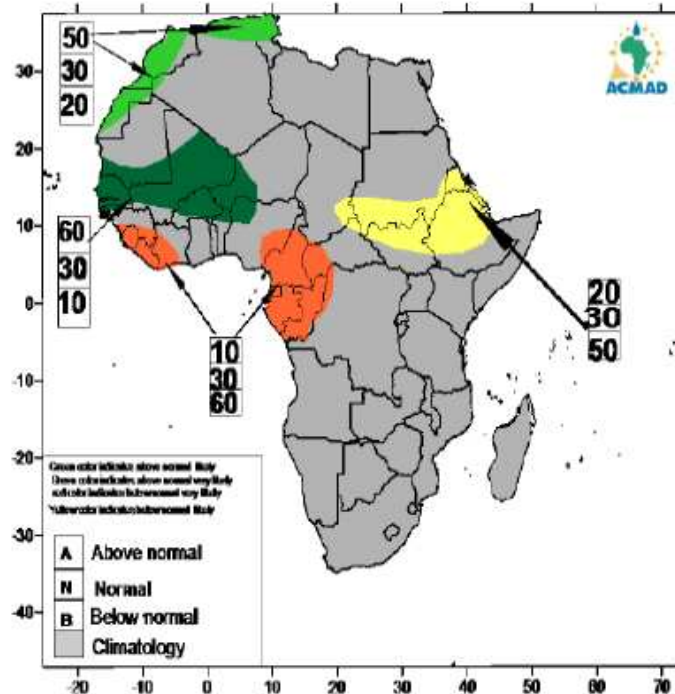
Well above average  
 Above average  
 Near average  
 Below average  
 Well below average



# Long range Forecasts Verification

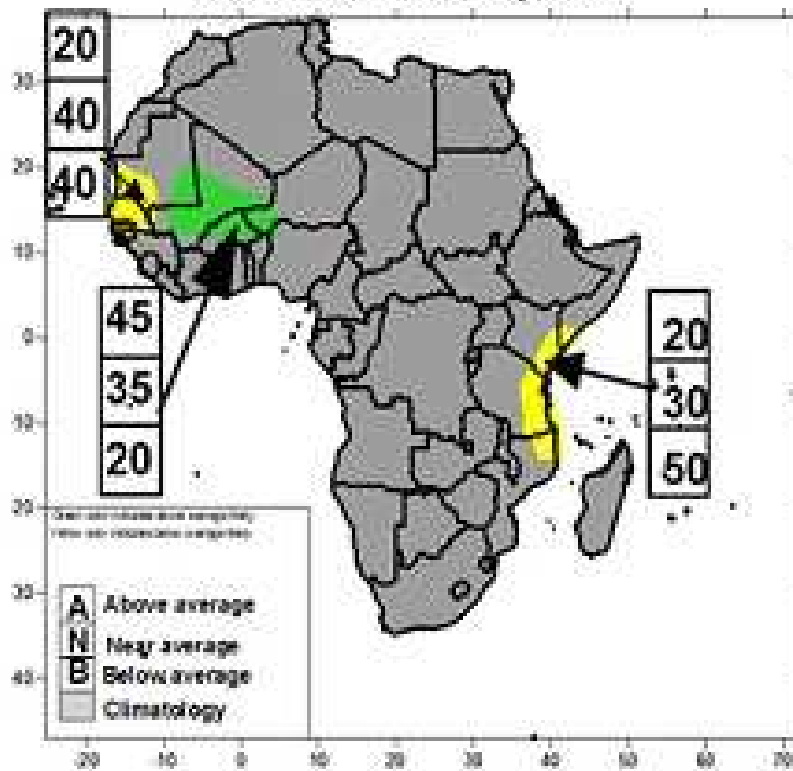
## Visual Evaluation of ACMAD Long Range forecasts for Aug-Oct 2013

### SEASONAL PRECIPITATION FORECAST FOR AUGUST- SEPTEMBER-OCTOBER 2013 ISSUED ON JULY 31 2013

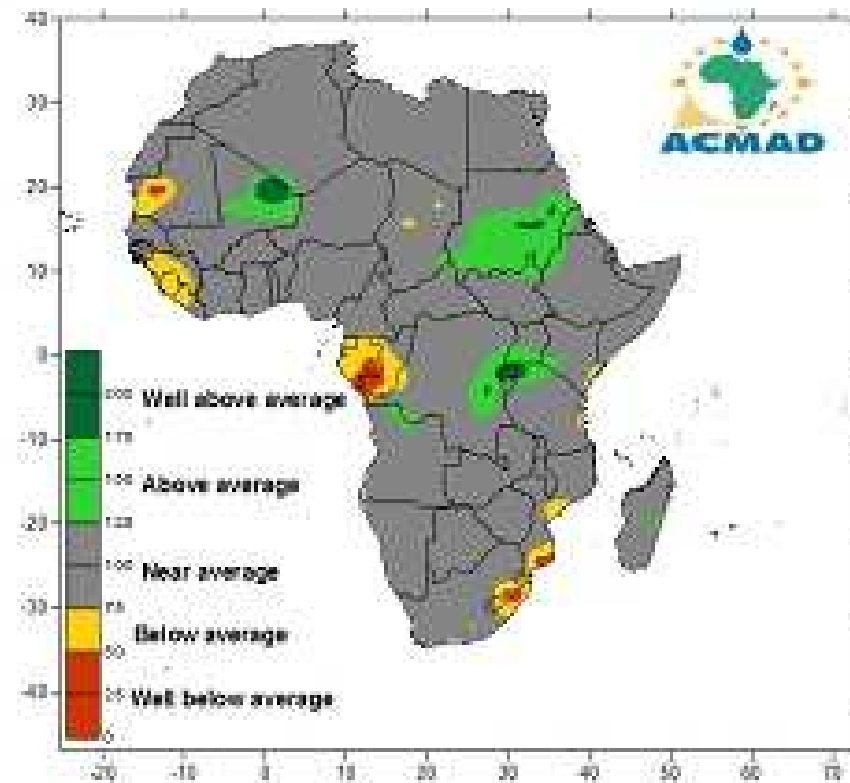


# Long Range Forecast Verification

SEASONAL PRECIPITATION FORECAST  
FOR JULY-AUGUST-SEPTEMBER  
ISSUED ON JUNE 26, 2014



PRECIPITATION IN PERCENTAGE OF AVERAGE  
FOR JULY-AUGUST-SEPTEMBER 2014

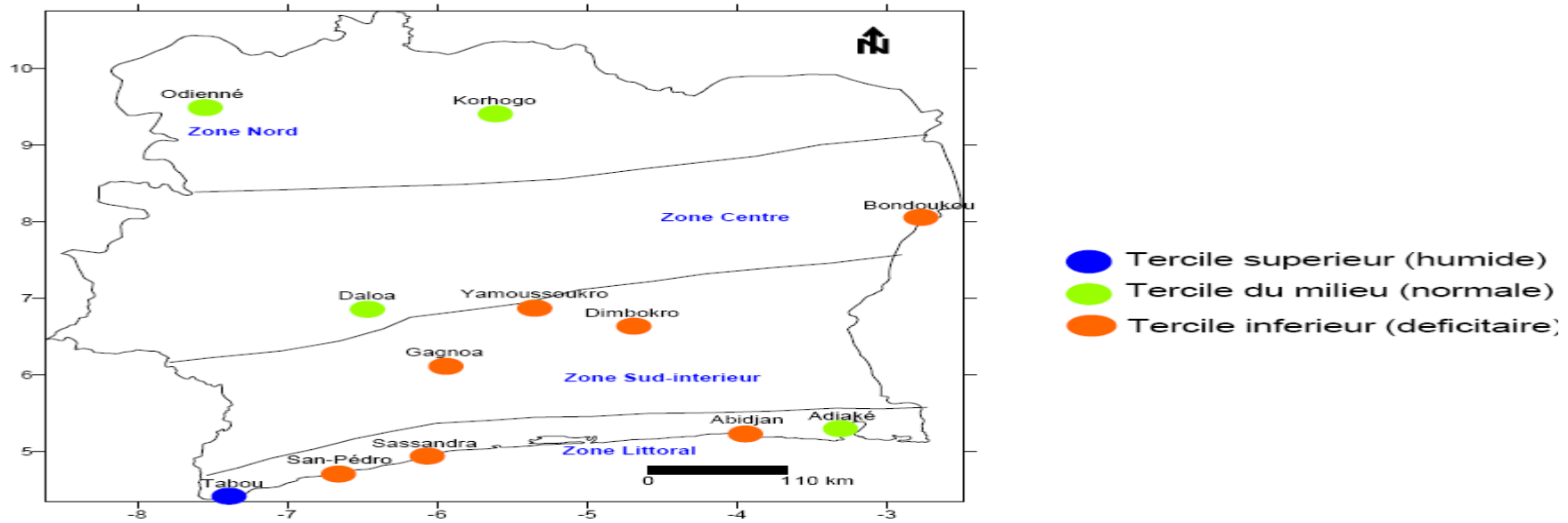


## SEASONAL FORECAST VERIFICATION AT COUNTRY LEVEL ( CASE OF IVOIRY COAST)

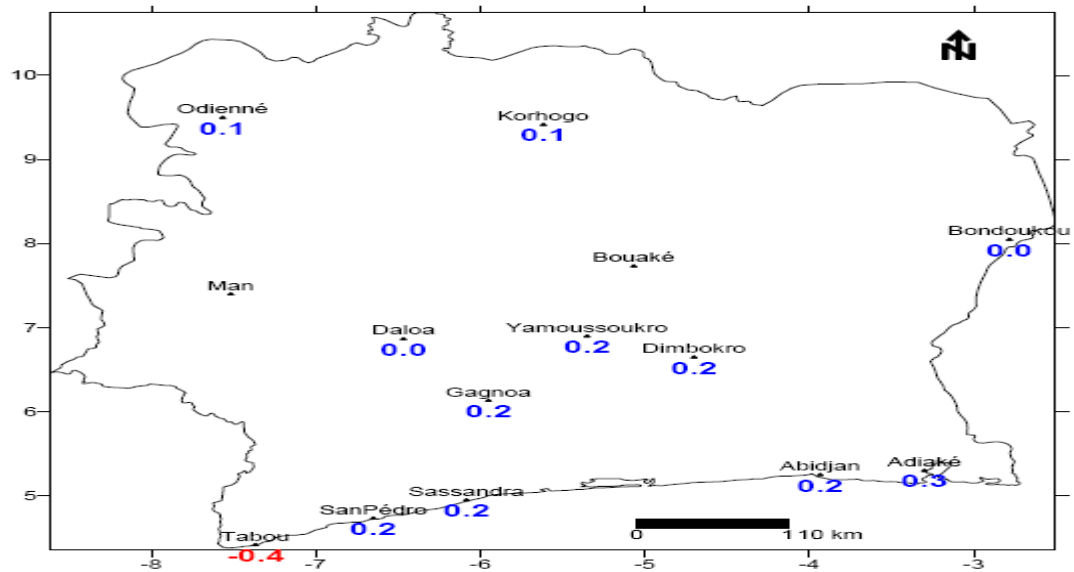
Tableau 1: Caractérisation de l'observation de JAS 2013 et vérification de la prévision JAS 2013 par zone climatique

<b>Zones climatiques</b>	<b>Nord</b>	<b>Centre</b>	<b>Sud-Intérieur</b>	<b>Littoral</b>
<b>Limites des terciles normales 1971-2000 (mm)</b>	499,0 ; 990,5	332,5 ; 660,0	209,6 ; 416,0	211,7 ; 420,3
<b>Cumul JAS 2013 (mm)</b>	867,1	343,4	168,8	256,5
<b>Catégorie de l'observation 2013</b>	Normale	Normale	Déficitaire	Normale
<b>Catégorie Prévision PRESAO-16</b>	Normale à humide	Climatologie	Déficitaire	Déficitaire
<b>Conformité</b>	Oui	Oui	Oui	Non





**Figure 1:** Caractérisation des pluies de JAS 2013 à la normale 1971-2000

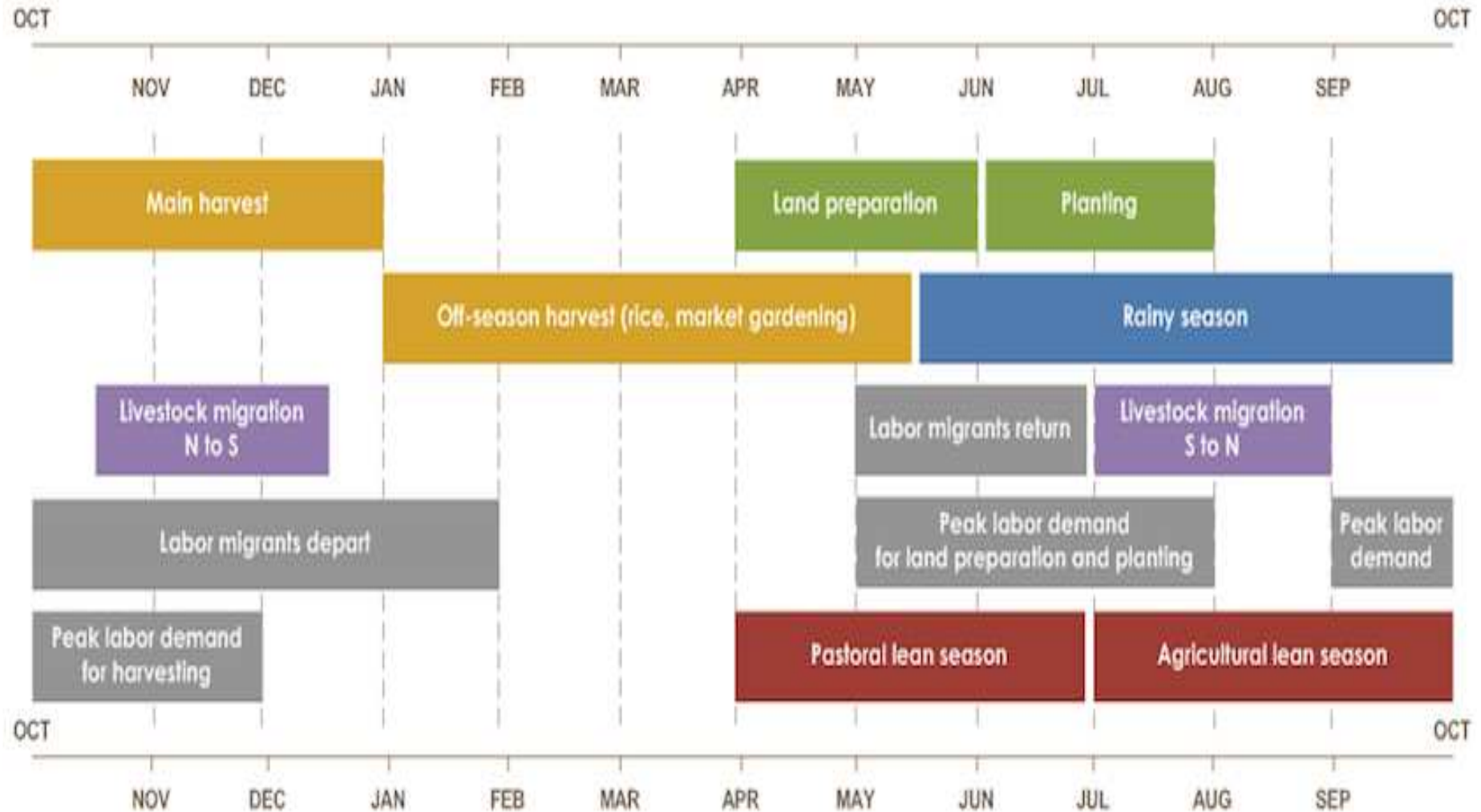


**Figure 2 :** RPSS de JAS 2013 des différentes localités

## From RCC LRF Products to Climate Services:

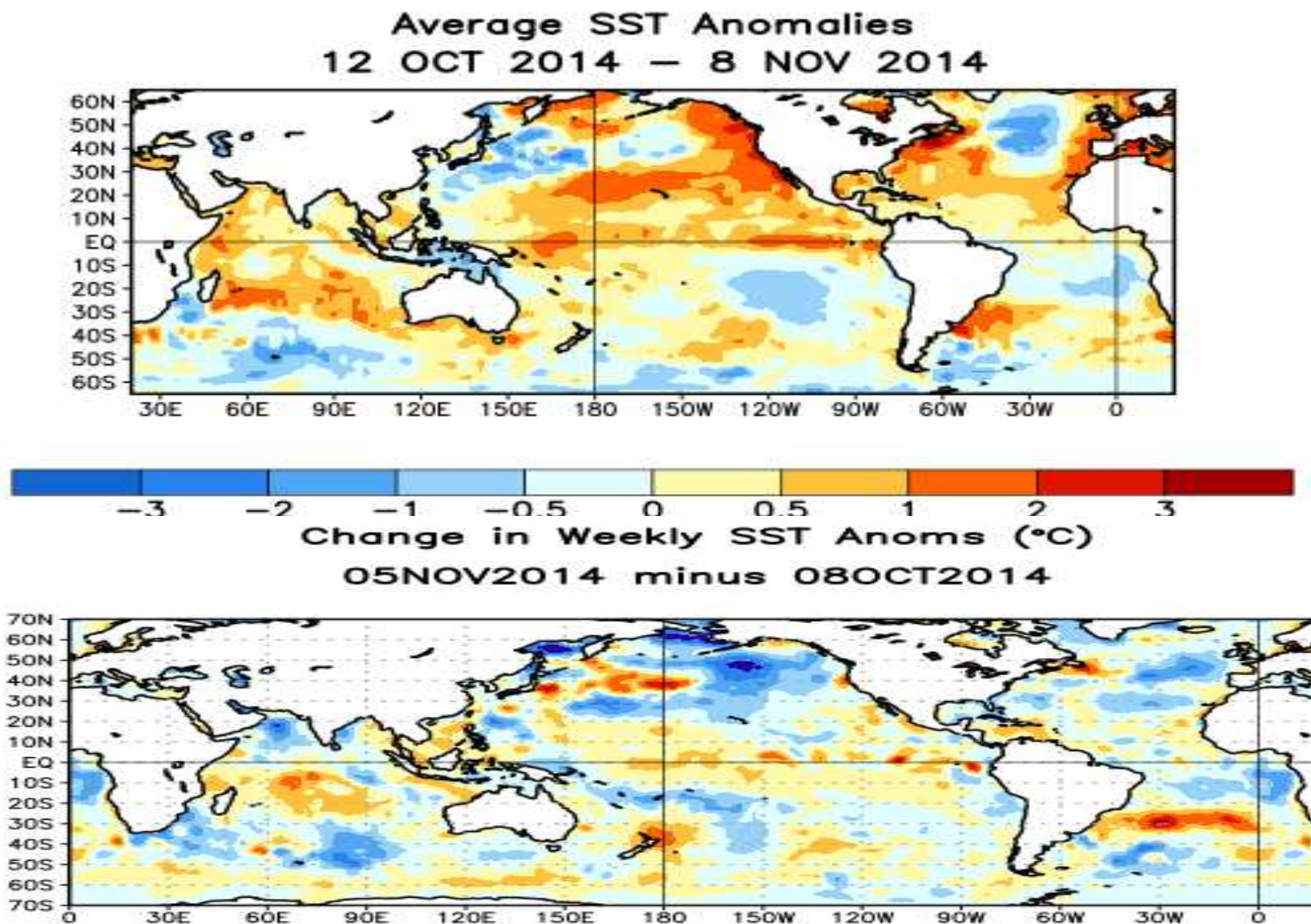
### Sample Agriculture Calendar from Mali

**With climate variability and change, this calendar is to be adjusted every year depending on seasonal climate**



During the last four weeks:

- Equatorial SSTs were above-average across the Pacific and western Indian Ocean and below-average (upper panel);
- Positive changes in equatorial SSTAs are noted in central and eastern Pacific (lower panel)



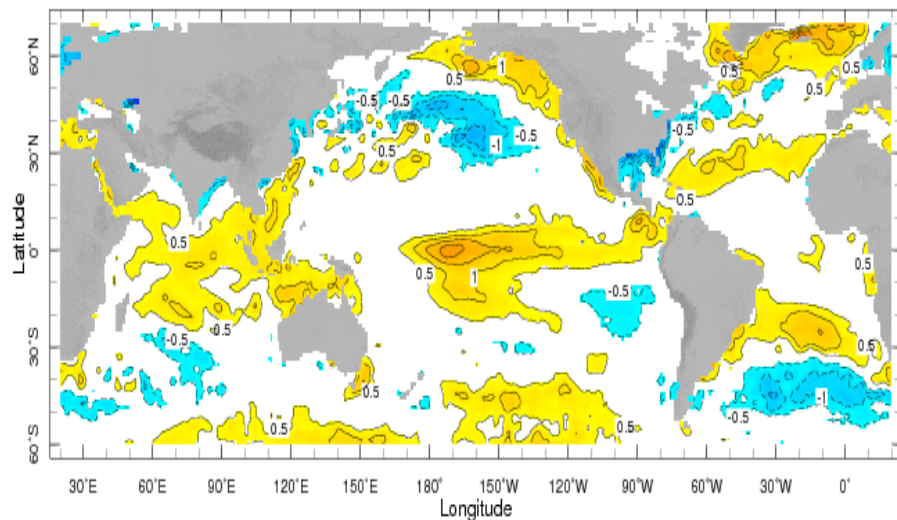
EL NINO YEARS IN RED ( 2002/03 (2); 2004/05, 2006/07 (1); 2009/10)

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	-0.6	-0.6	-0.5	-0.1	0.1	0.1	0.0	0.0	0.2			

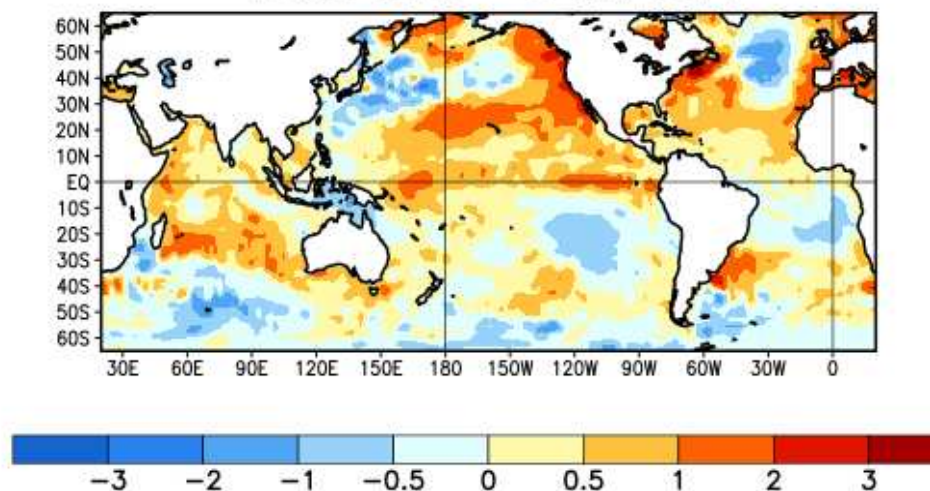




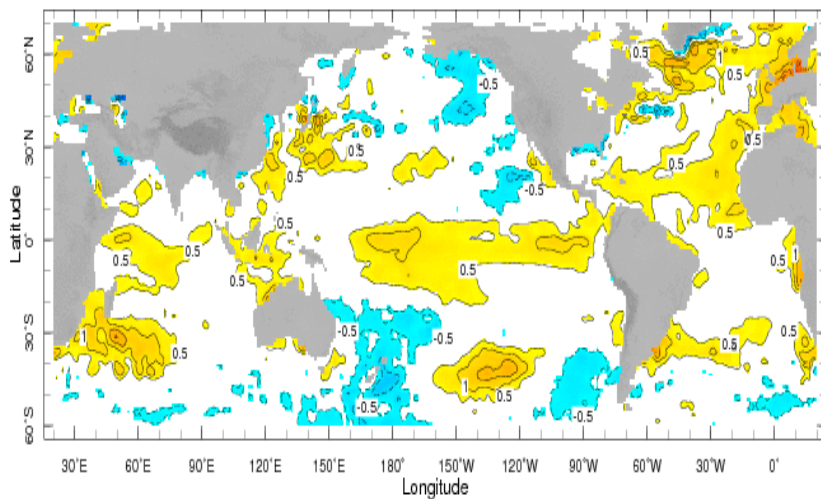
Dec 2002 - Feb 2003



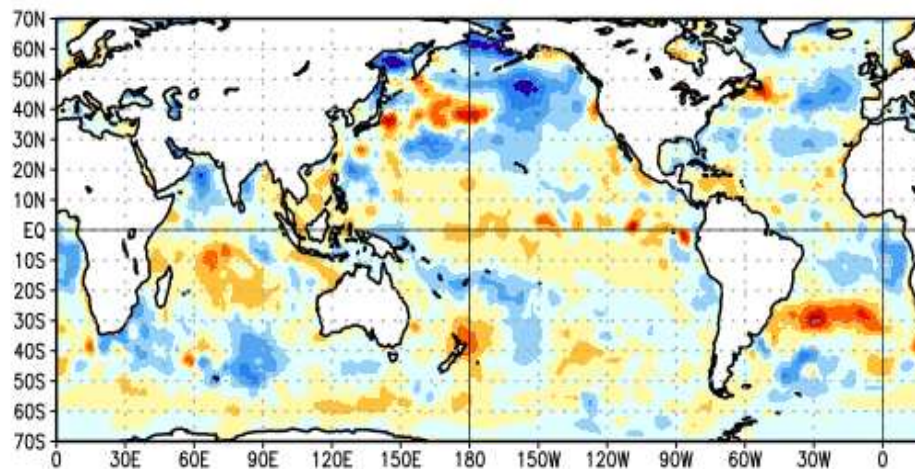
Average SST Anomalies  
12 OCT 2014 - 8 NOV 2014



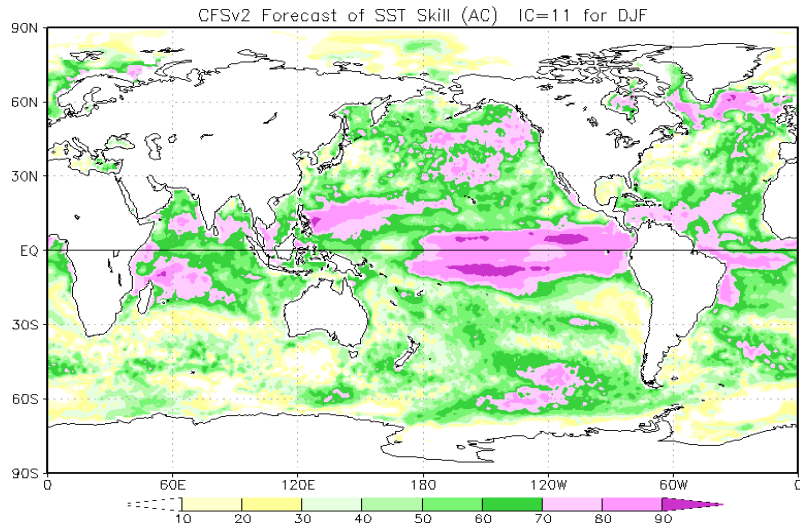
Dec 2006 - Feb 2007



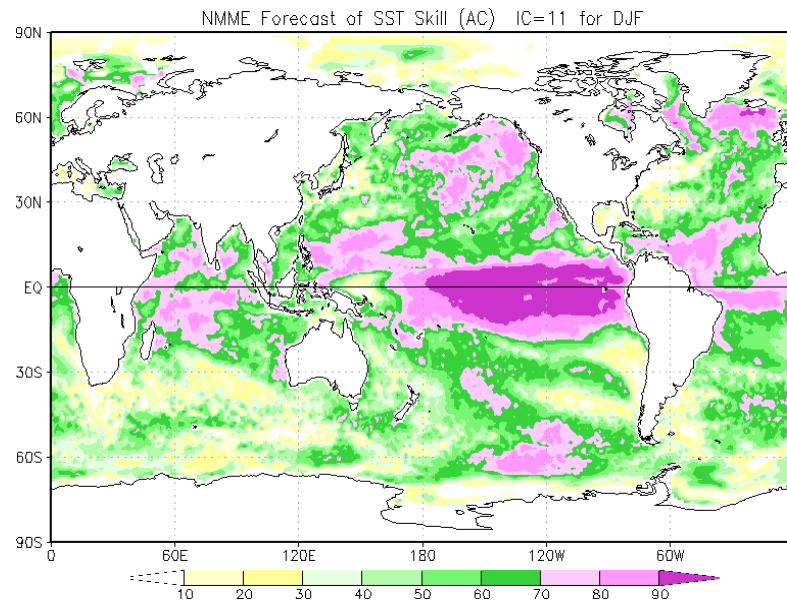
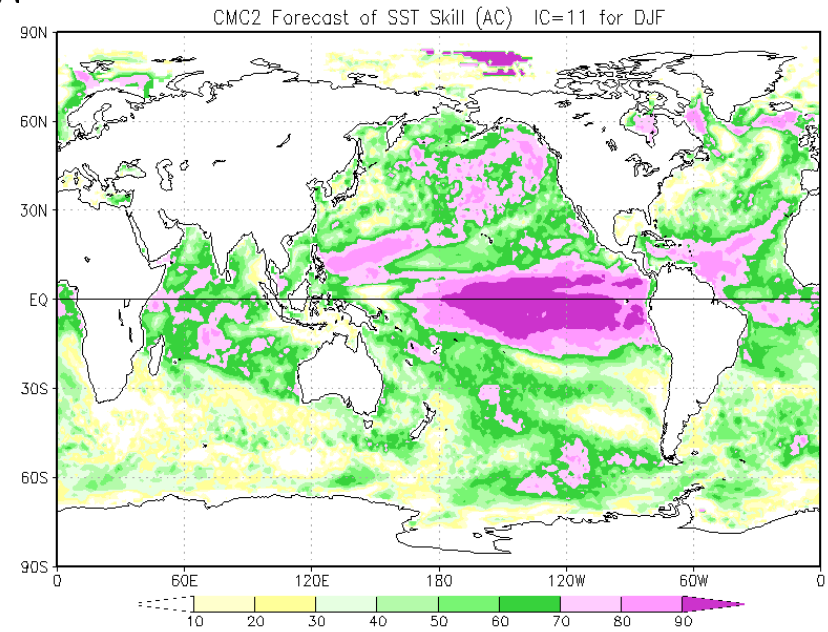
Change in Weekly SST Anoms (°C)  
05NOV2014 minus 08OCT2014



## I.2.1 Skill SST DJF2014



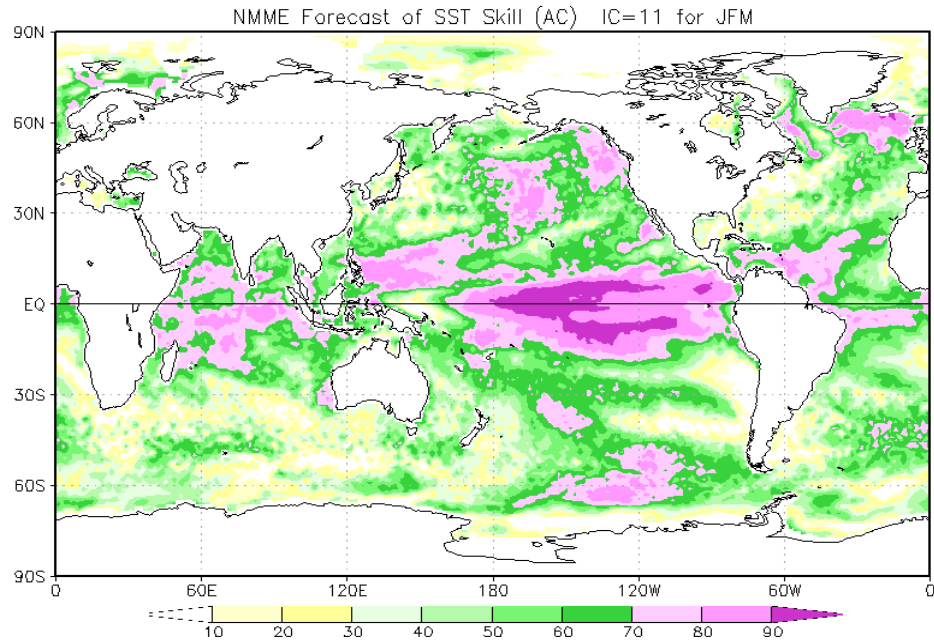
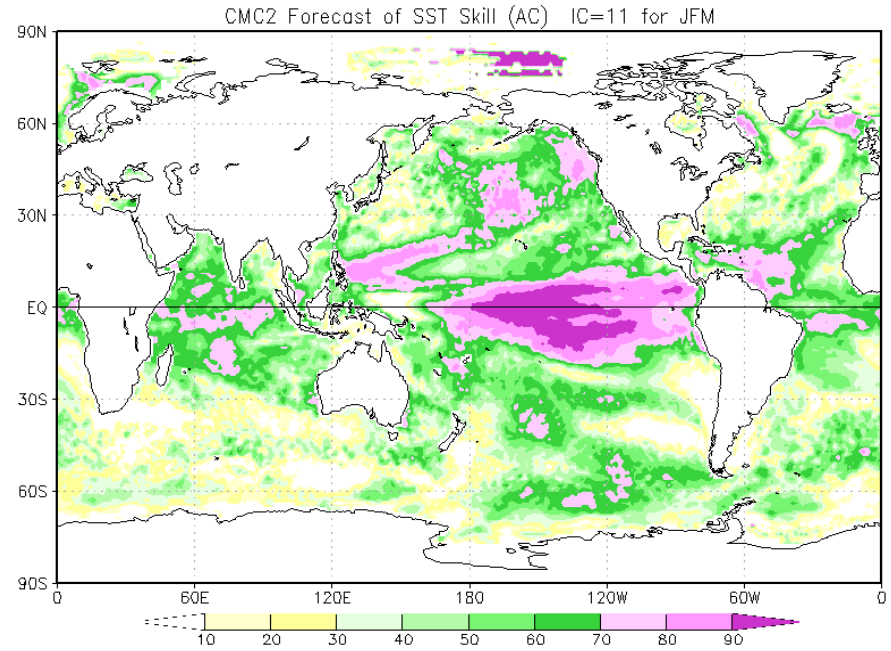
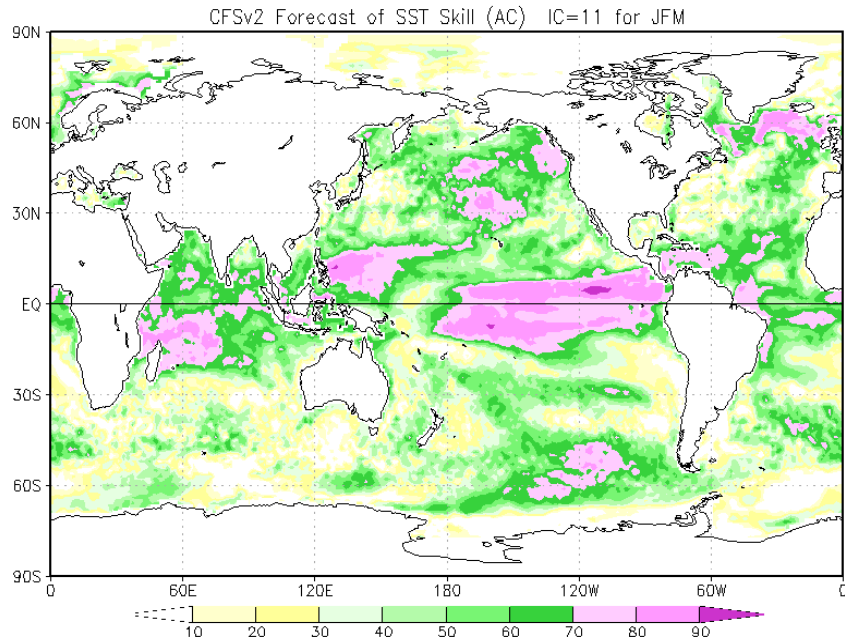
## I.2 SST FORECASTS





# I.2 SST FORECASTS

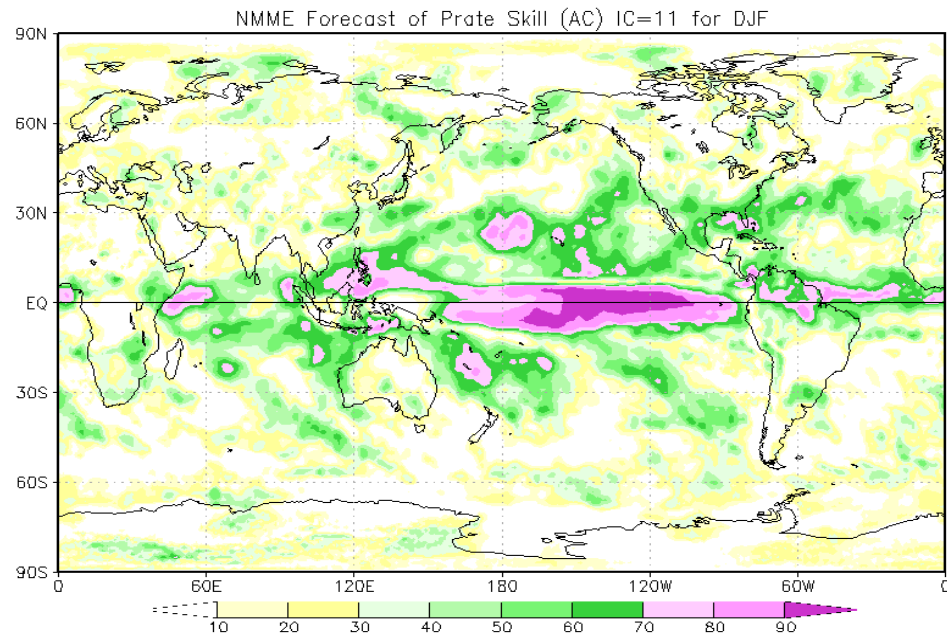
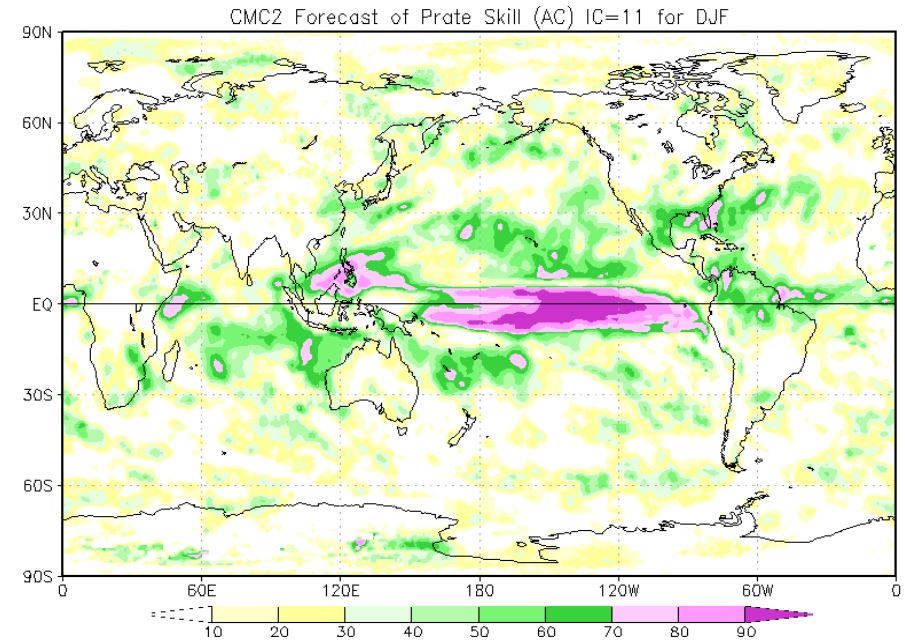
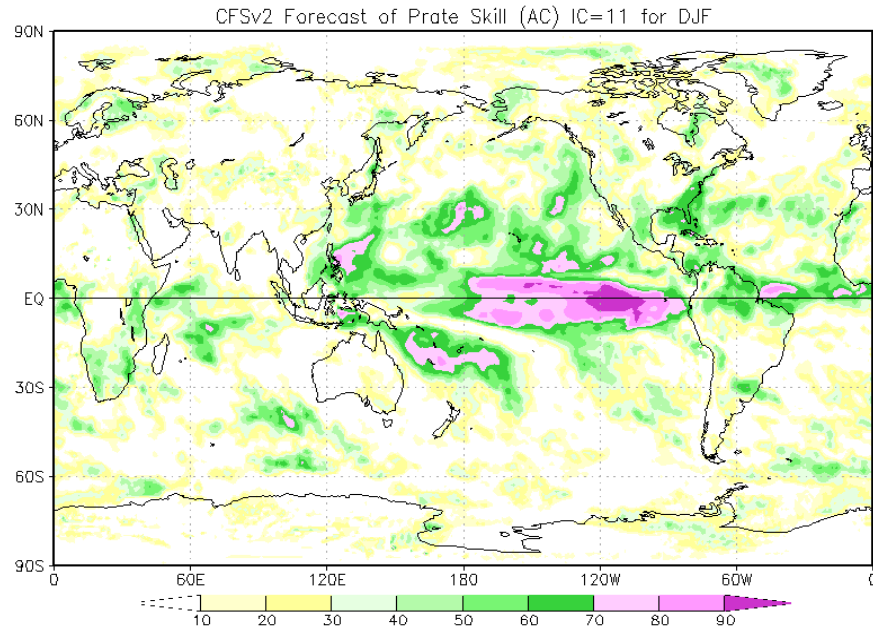
## I.2.1 Skill SST JFM 2014



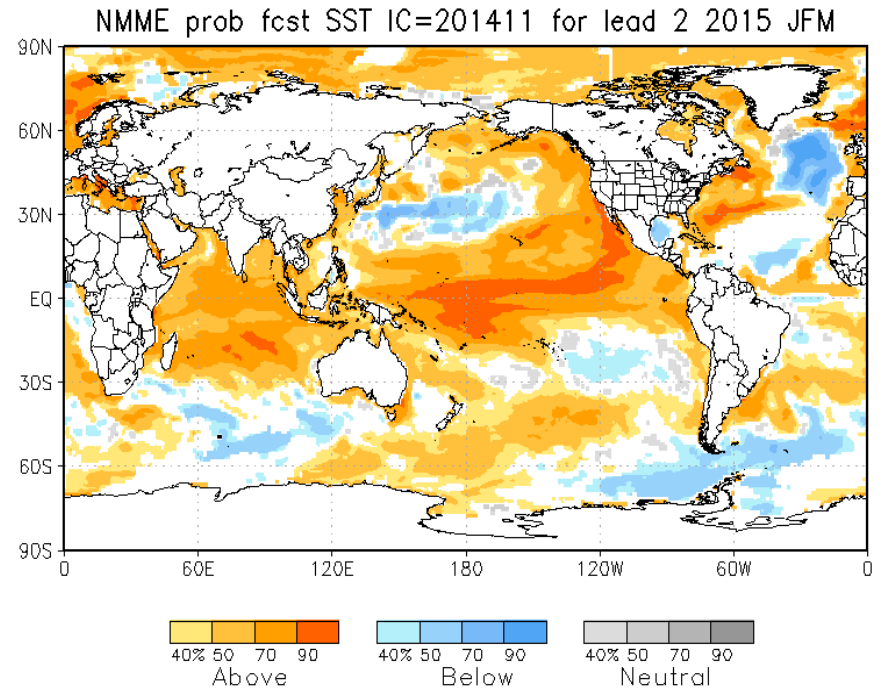
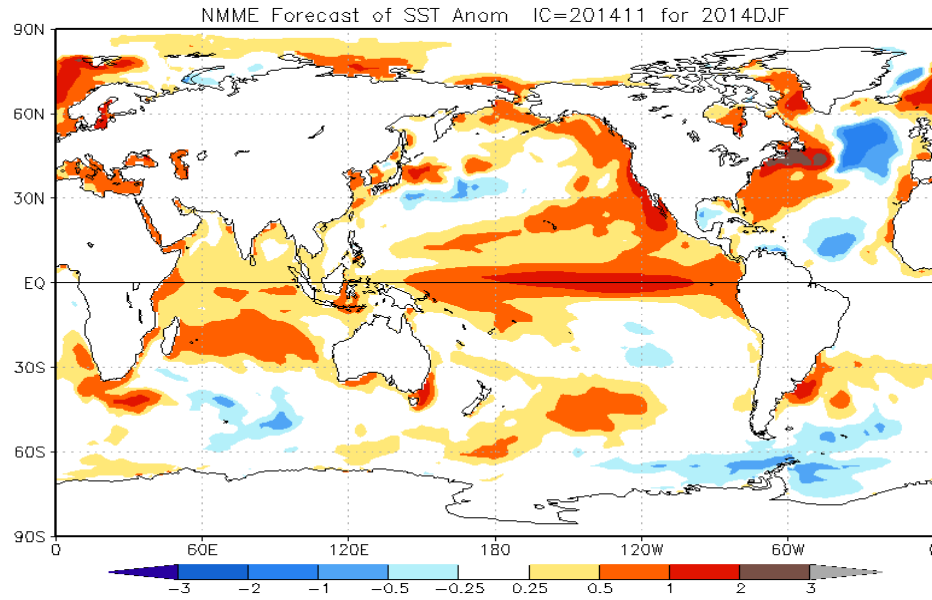


## IV.2 .1 Skill DJF 2014

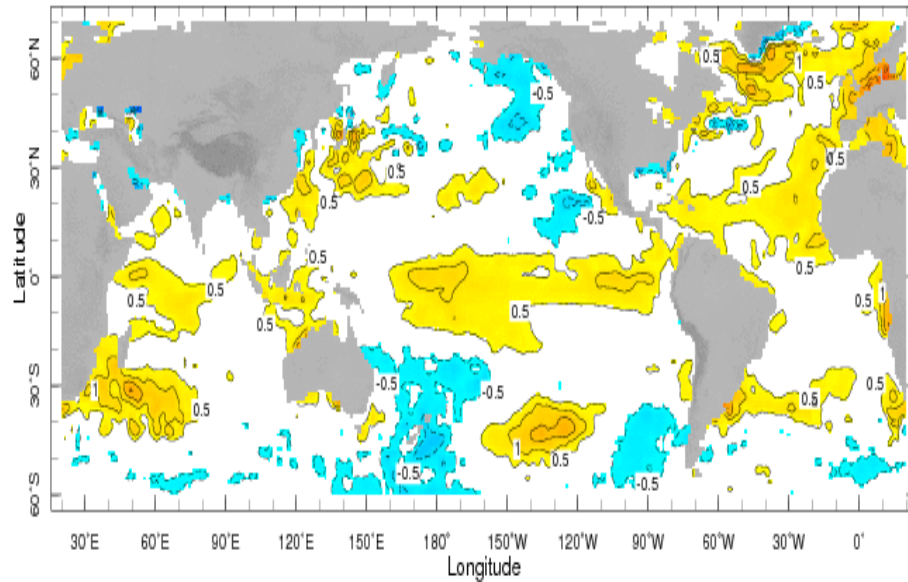
## IV.2 PRECIPITATION FORECAST



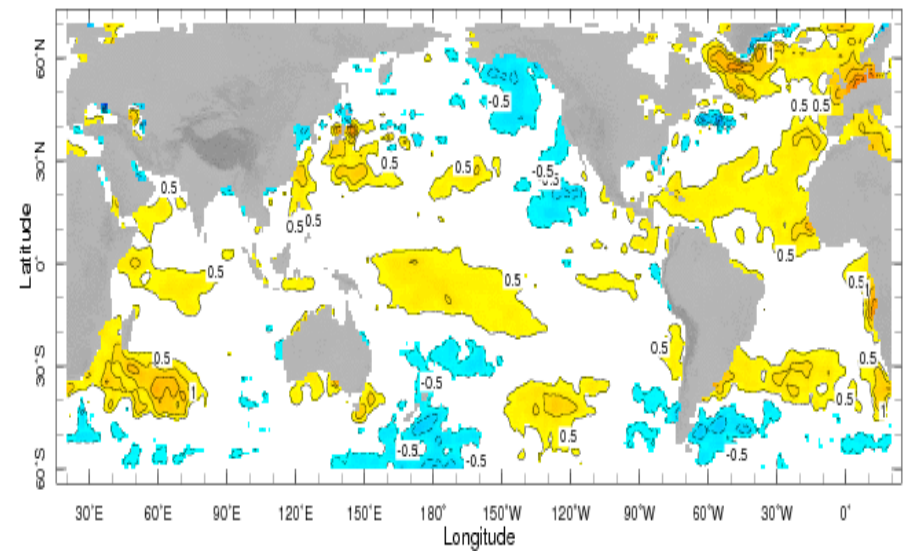
## I.2.2 FORECASTS SST D JF 2014



Dec 2006 - Feb 2007



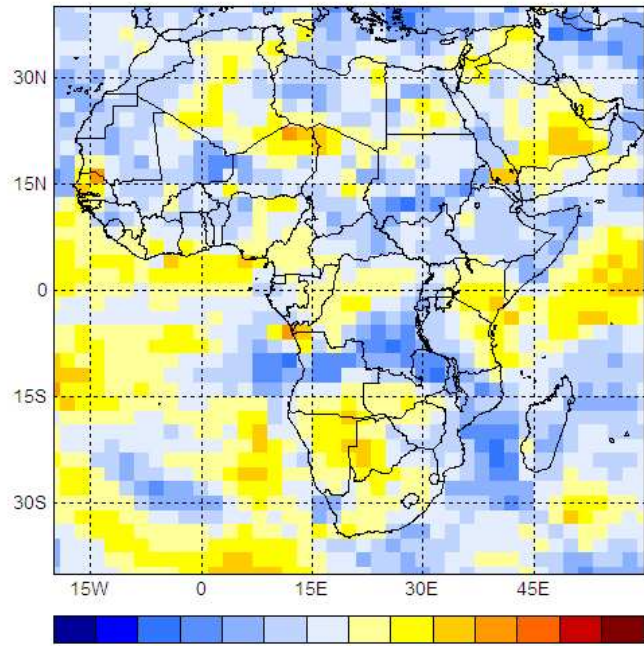
Jan-Mar 2007



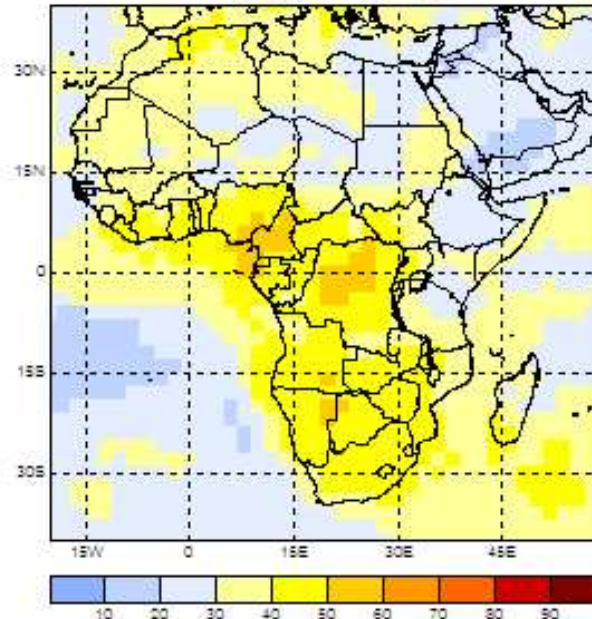


# NMME\_SST\_DJF\_2014

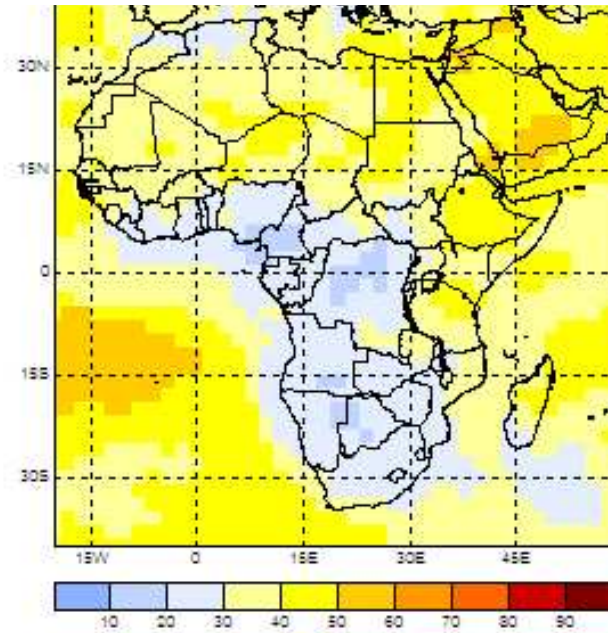
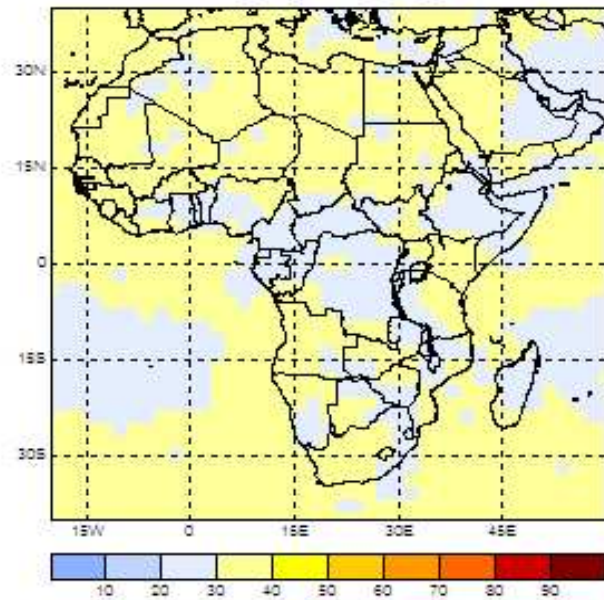
skill\_sst\_nmme\_DJF\_2014



Above\_sst\_nmme\_DJF\_2014

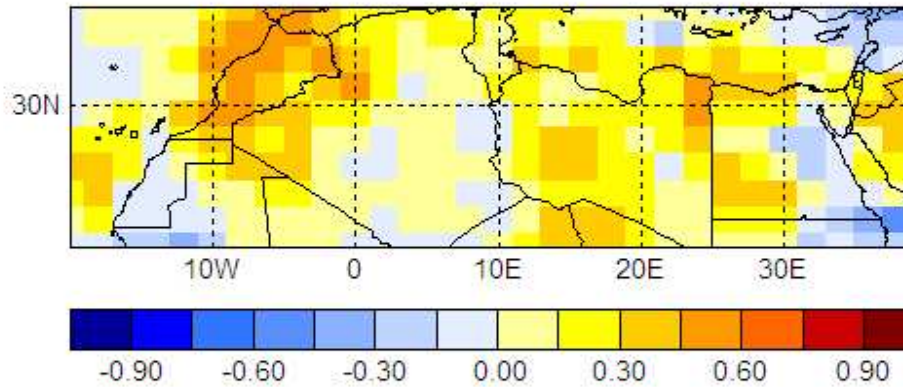


Normal\_sst\_nmme\_DJF\_2014

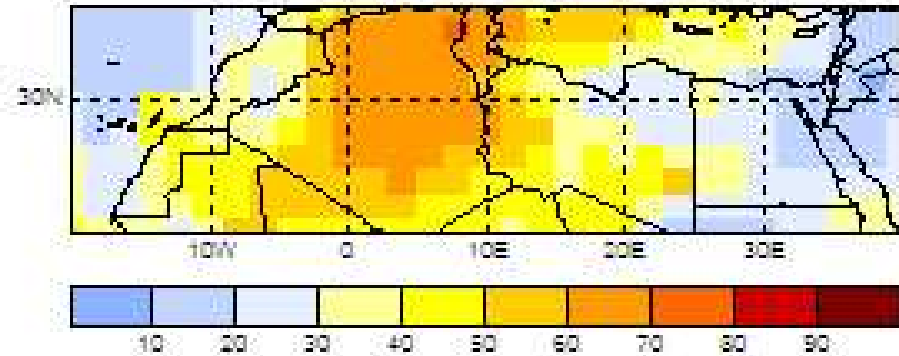


# CFS\_SST\_DJF\_2014 NORTHERN AFRICA

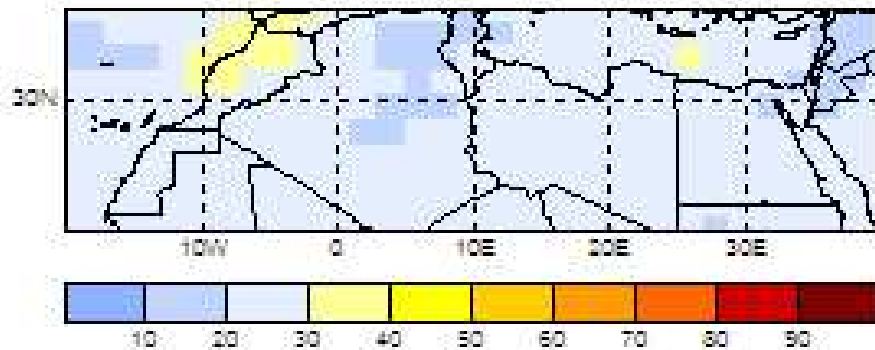
skill\_sst\_cfs\_DJF\_2014



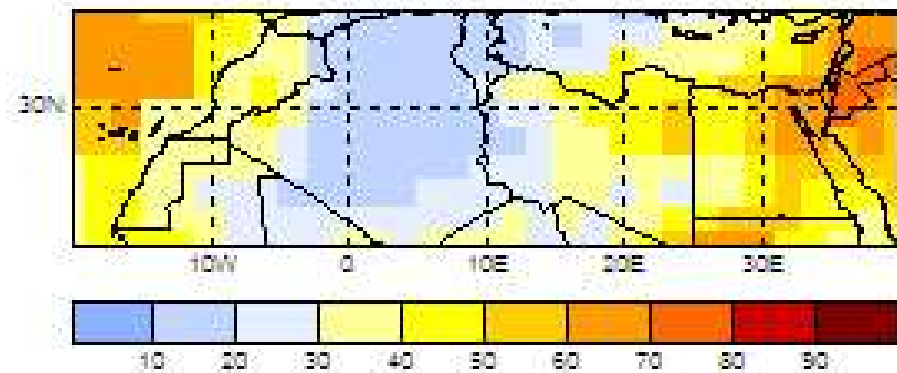
Above\_sst\_cfs\_DJF\_2014



Normal\_sst\_cfs\_DJF\_2014

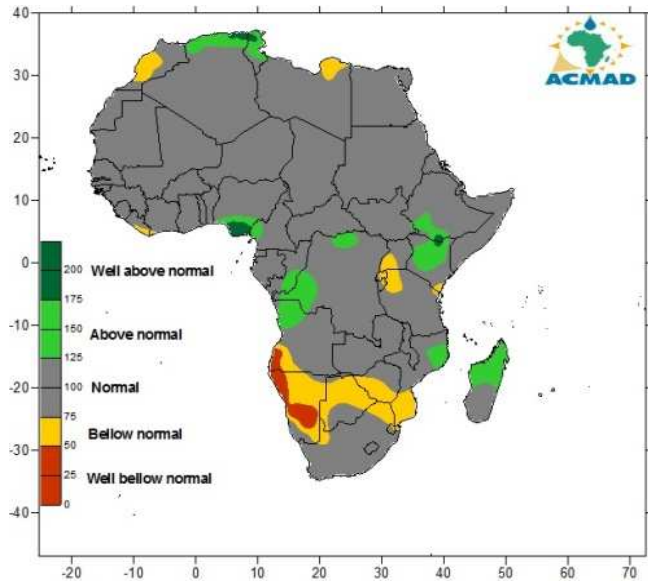


Below\_sst\_cfs\_DJF\_2014

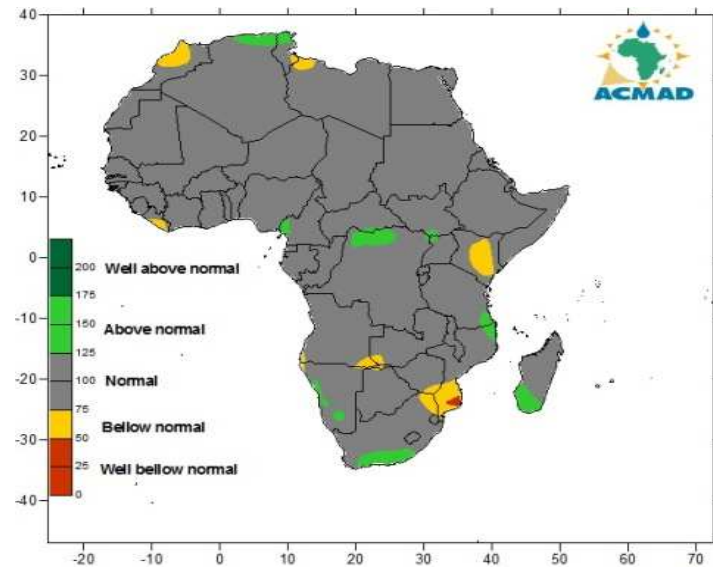




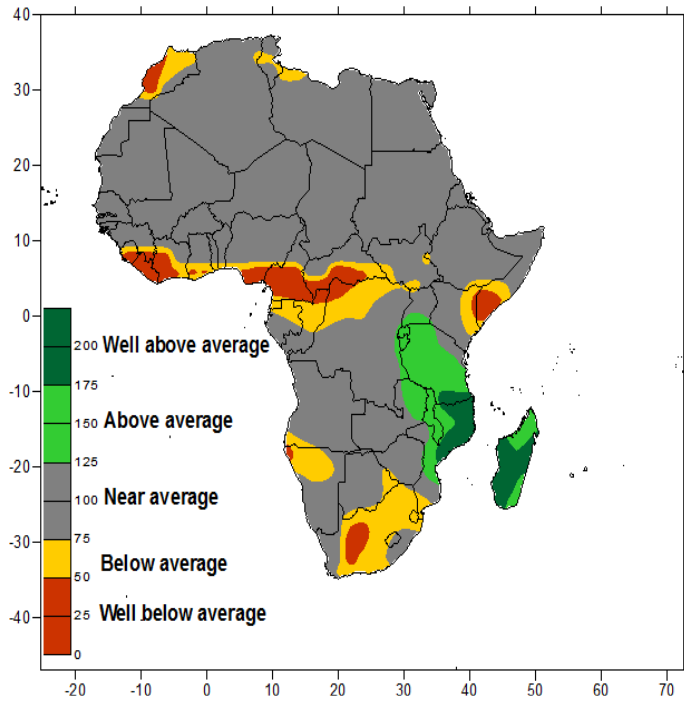
**DJF 2002/03**



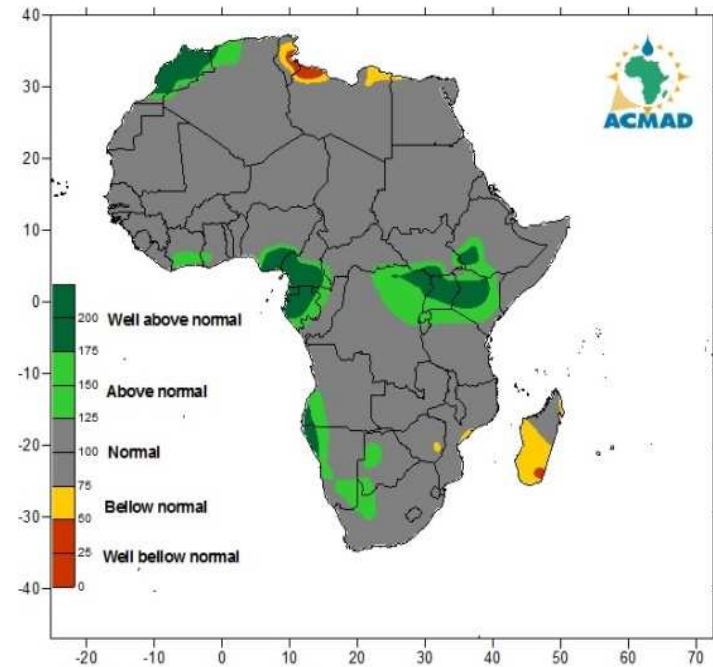
**DJF 2004/05**



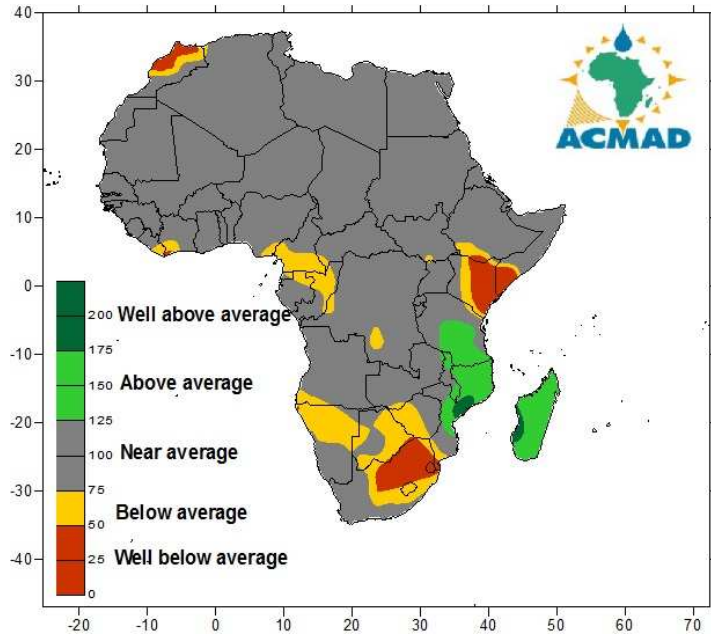
**DJF 2006/07**



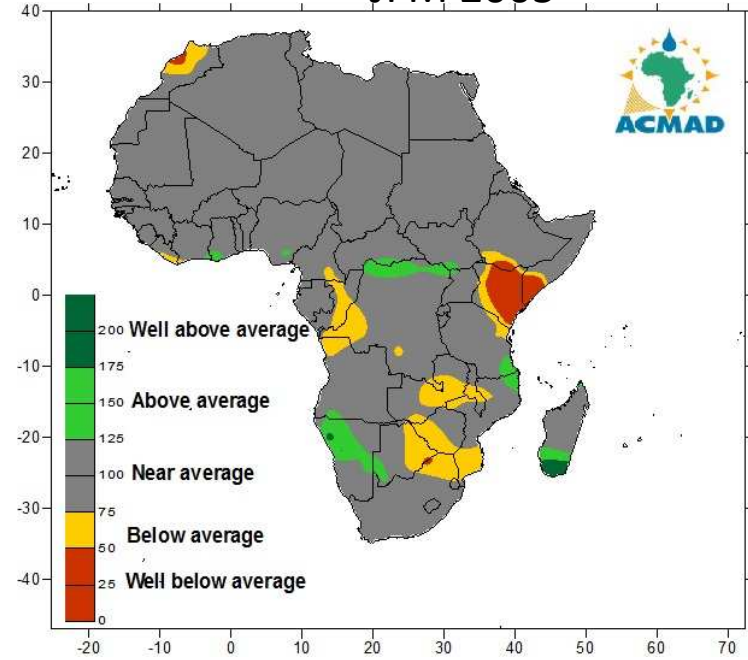
**DJF 2009/10**



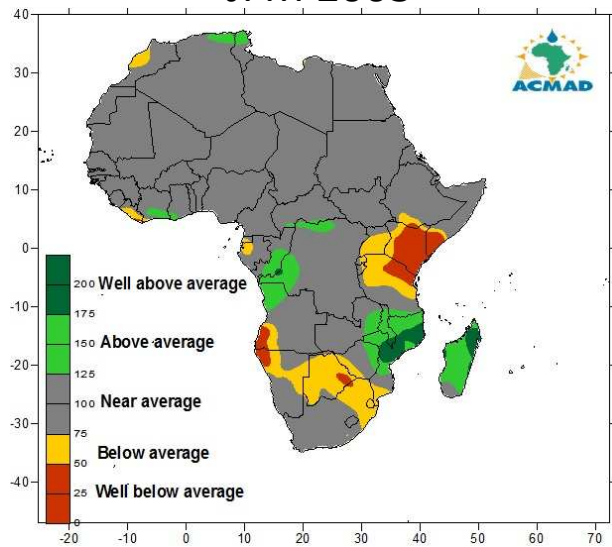
JFM 2007



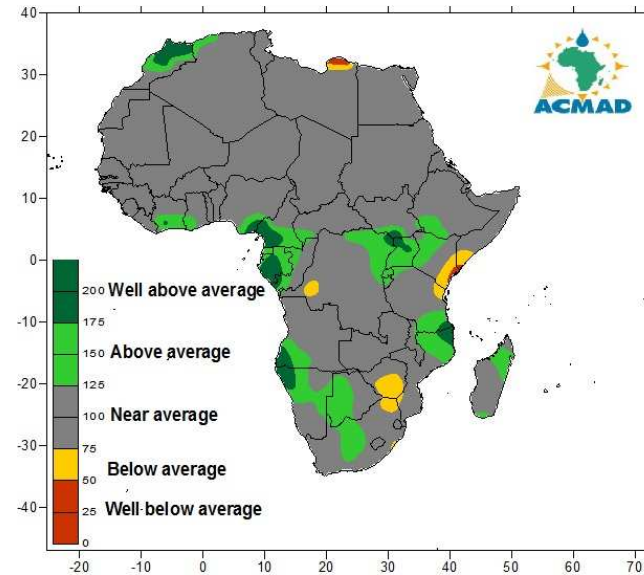
JFM 2005



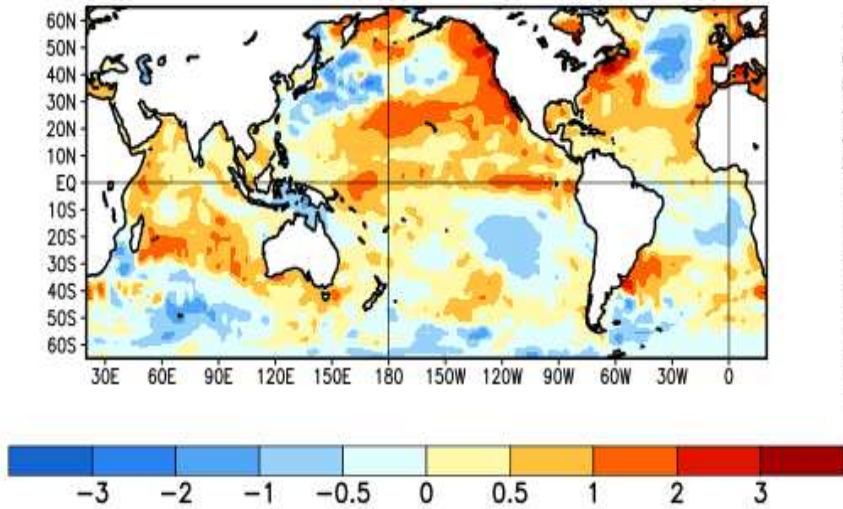
JFM 2003



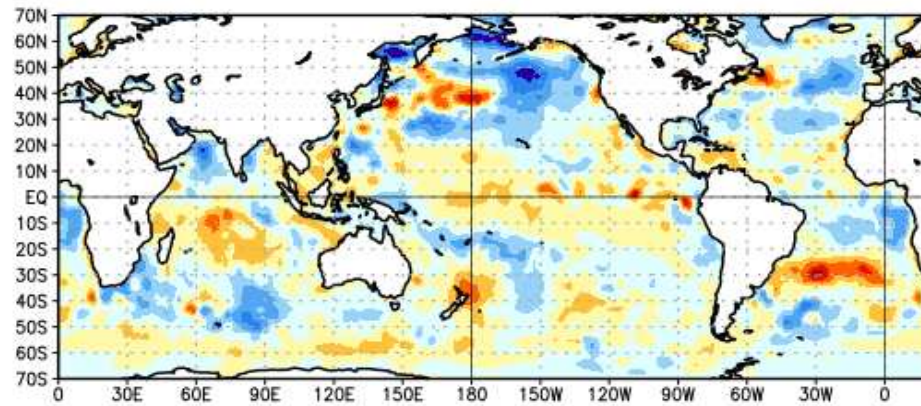
JFM 2010



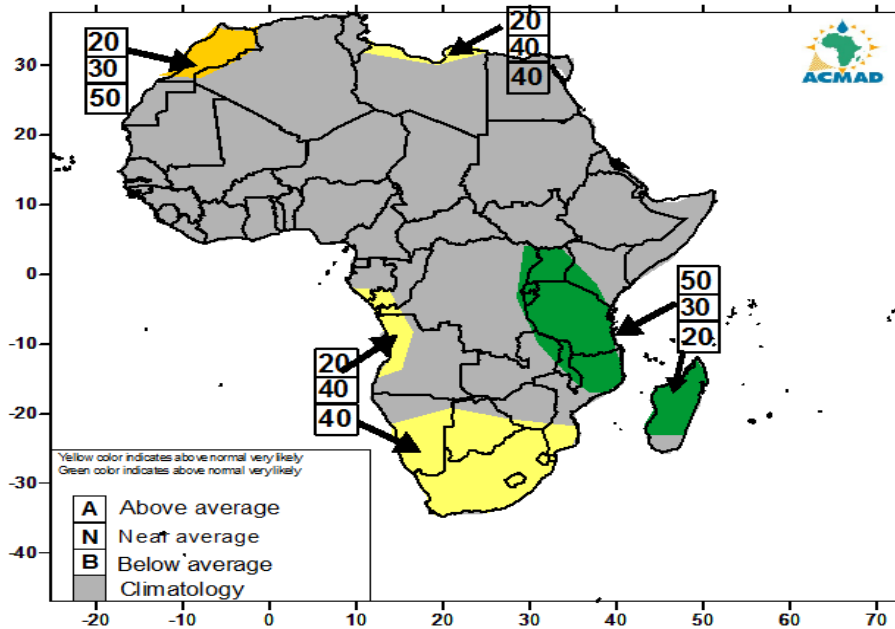
**Average SST Anomalies**  
12 OCT 2014 – 8 NOV 2014



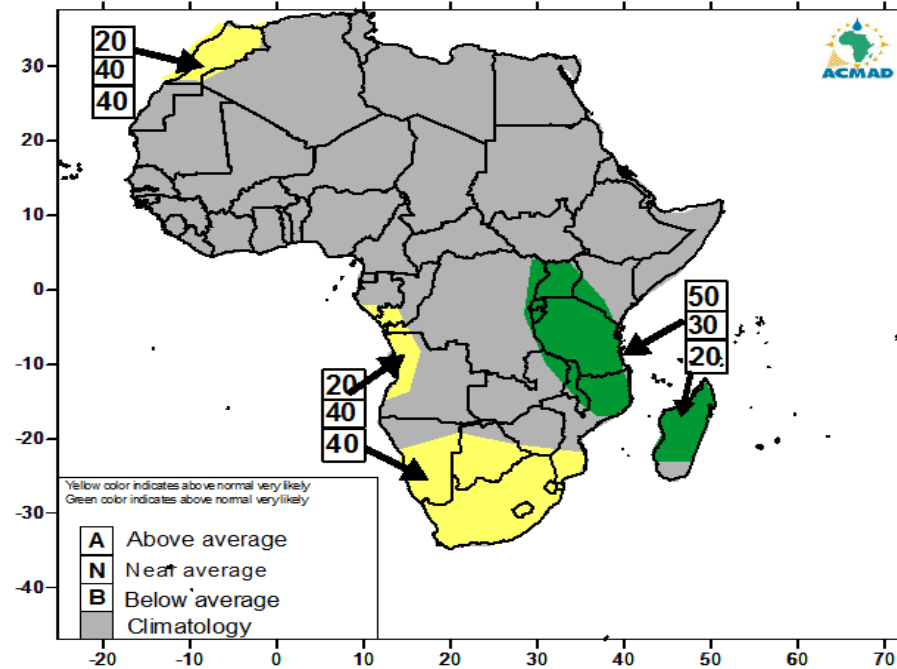
**Change in Weekly SST Anoms (°C)**  
05NOV2014 minus 08OCT2014



**SEASONAL PRECIPITATION FORECAST**  
FOR December-January-February 2014  
ISSUED ON November 15 2014



**SEASONAL PRECIPITATION FORECAST**  
FOR January-February-March 2014  
ISSUED ON November 15 2014





## Concluding Remarks



- ✓ **Expansion of RCC LRF products based on user requirements leading to climate Services with the GFCS.**
  
- ✓ **Partnerships with RCCs and GPCs in Europe, Asia and America should be strengthened to share data, products, software and hardware, best practices and standards**
  
- ✓ **Sustainability of the RCC will required a minimum of about 5 experts for optimal operation of the LRF and training function with US\$ 2500 000 as cost estimate per annum.**
  
- ✓ **Scientific and technical partners(UK Met office, Meteo France, DWD, AEMet-Spain, ECMWF, IRI at Columbia University, NOAA/NCEP/CPC and WMO) for climate service development will continue to be mobilized**
  
- ✓ **Support from the African development Bank, the World Bank, EU through EDF, other bilateral and multilateral cooperation programmes will be required to complement countries contribution for the operations of the RCC.**