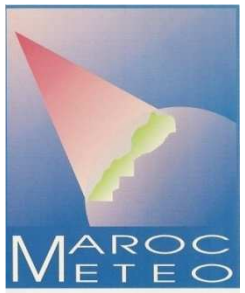


Direction de la Météorologie Nationale, Maroc

Production of Climate Outlouk and Climate monitoring in NA-RCC

Fatima Driouech

With thanks to Soumaya Ben Rached and Atika Kasmi

MedCof meeting, Belgrade 18-19 Novembre 2013

NA RCC Network Home page :

http://rccnara1.marocmeteo.ma

Welcome To North African Regional Climate Center Network Homepage

Home Add Favorites

Main Climate products

Long Range Forecast

Description
Seasonal Forecast

Climate Monitoring

link1
link2

Data Service

link1
link2

Training

Training in Tunisia
Training in Egypt

Research & Development

Climate scenarios

Algeria : National Office of Meteorology
Egypt : The Egyptian Meteorological Authority
Libya : National Meteorological Centre
Morocco : Moroccan Meteorological Service
Tunisia : National Institute of Meteorology

NEWS & EVENTS

- FORUM REGIONAL DE PREVISION CLIMATIQUE SAISONNIERES : PRESANORD-03 from 27 to 28 Septembre 2012; Tunis - Tunisia

MORE

- **WMO Regional Association I, North African RCC-Network. Implementation Plan (Abdalah MOKSSIT, April 2011).**
- **List of contact persons for NA RCC Network.**

Complementary products

Long Range Forecast

Seasonal Forecast

Climate Monitoring

Climate Diagnostics

Data Service

link1

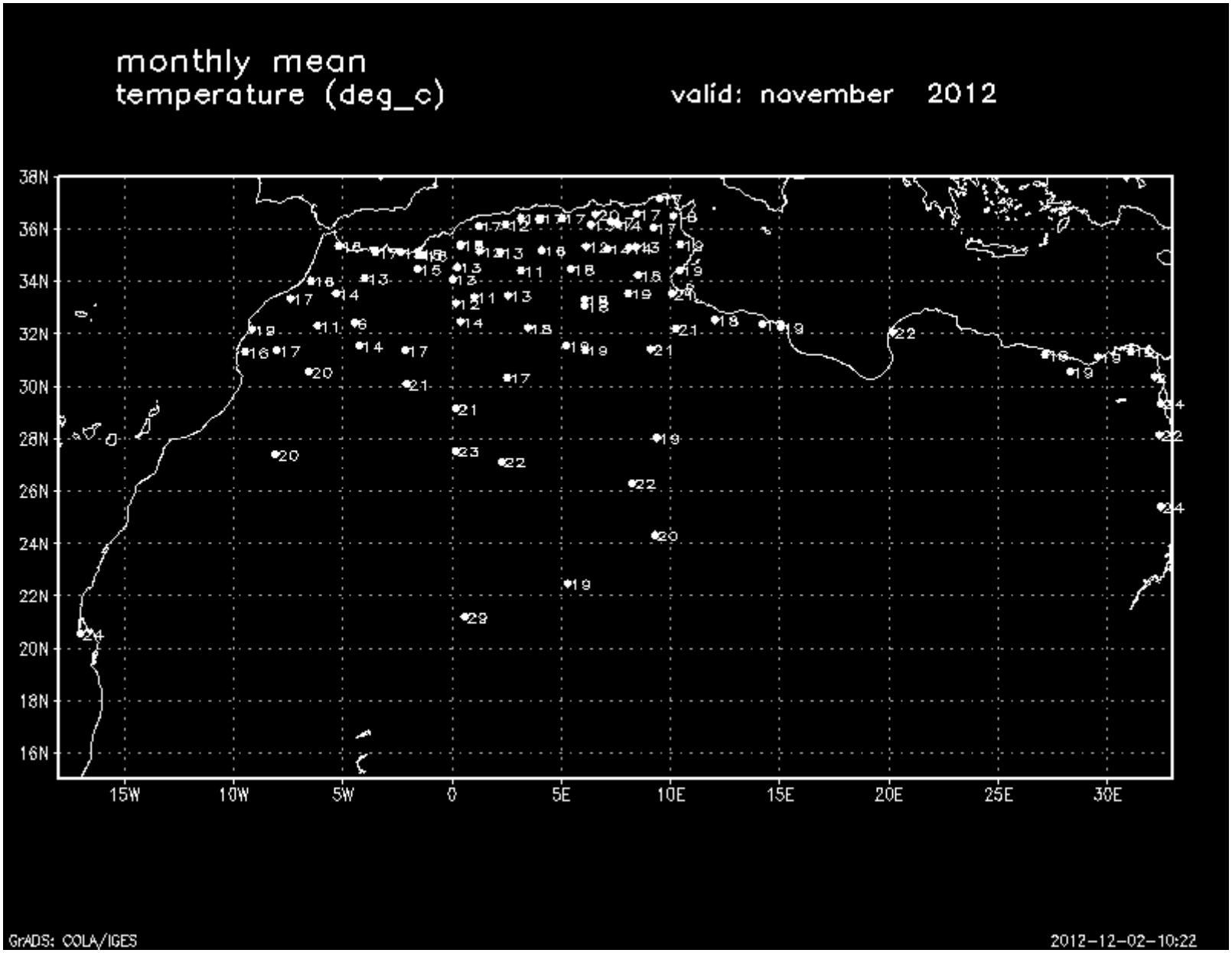
Training

link1

Research & Development

link1

NA RCC Network : from Algerian Node



NA RCC Network : Tunisia Contribution

Country	Algeria	Morocco	Egypt	Libya	Tunisia
Stations	- Annaba - Oran - Djelfa - Ghardaia - Tindouf - Tamanrasset - Algiers	- Marrakech - Tanger - Oujda - Agadir - Meknes - Ouarzazate	- Mers Matruh - Alexandria - luxor - Asswan - Cairo	- Benghazi - Sabha - Kufra - Tripoli - Sirte	- Tunis Carthage - Tabarka - Kairouan - Jerba - Tozeur - Remeda

Climate Monitoring

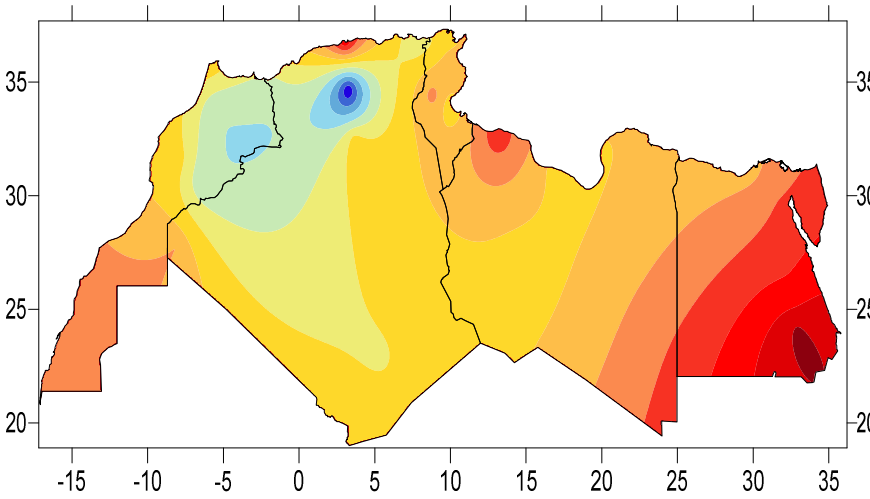
Monthly bulletin (January 2013)

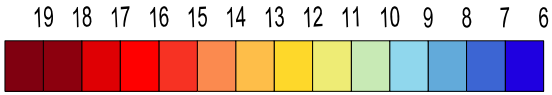
		Temp.(°C)		Precp.(mm)	
WMO No.	Station	Mean	dev	Mean	dev
6036000	Annaba	11.6	0.0	116.9	18.9
6049000	Oran	14.5	3.4	23.6	-36.4
6053500	Djelfa	6.0	1.0	28.1	-5.9
6056600	Ghardaia	12.5	1.6	0.6	-7.6
6065600	Tindouf	14.0	2.0	0	-3.0
6068000	Tamanrasset	11.9	-0.9	0	-3.0
6039001	Algiers	16.9	5.7	99.7	62.7
602300	Marrakech	12.5	0.3	8.2	-22.8
601010	Tanger	12.7	0.2	88.6	-26.4
601160	Oujda	10.4	0.6	58.3	33.3
602500	Agadir	12.8	-1.3	8.4	-33.6
601500	Meknes	10.2	0.0	116.0	43.0
602650	Ouarzazate	10.3	1.0	0.0	-12.0
623060	Mers Matruh	14.0	0.4	46.3	11.7
623180	Alexandria	13.7	0.3	106.0	54.0
624050	luxor	16.3	2.5	15.1	15.0
624140	Asswan	18.2	2.9	0.0	-0.1
623660	Cairo	15.0	1.4	8.9	2.8
620530	Benghazi	13.0	-3.0	20	-47.0
621240	Sabha	12.5	1.5	0	-1.5
622710	Kufra	14.6	2.6	0	-0.1
620100	Tripoli	13.2	1.2	52.3	-7.7
620190	Sirte	14.6	1.6	26.5	-3.5
607150	Tunis Carthage	12.8	1.3	65.4	6.1
607100	Tabarka	12.2	0.3	170.5	29.8
607350	Kairouan	13.7	2.1	11.2	-12.3
607690	Jerba	14.4	2.0	5.6	-22.4
607600	Tozeur	12.2	0.7	0.0	-13.4
607750	Remeda	13.7	2.2	3.6	-6.4

Climate Monitoring

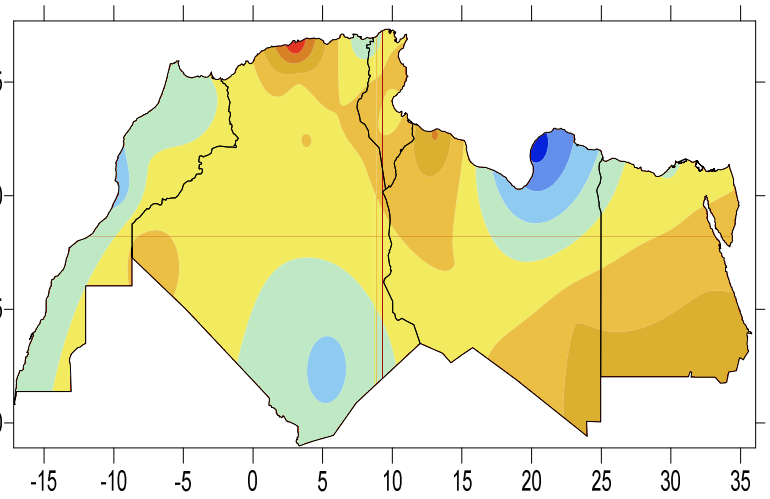
Monthly bulletin (January 2013)

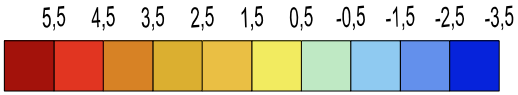
Temparature





Mean temperature (℃) January 2013



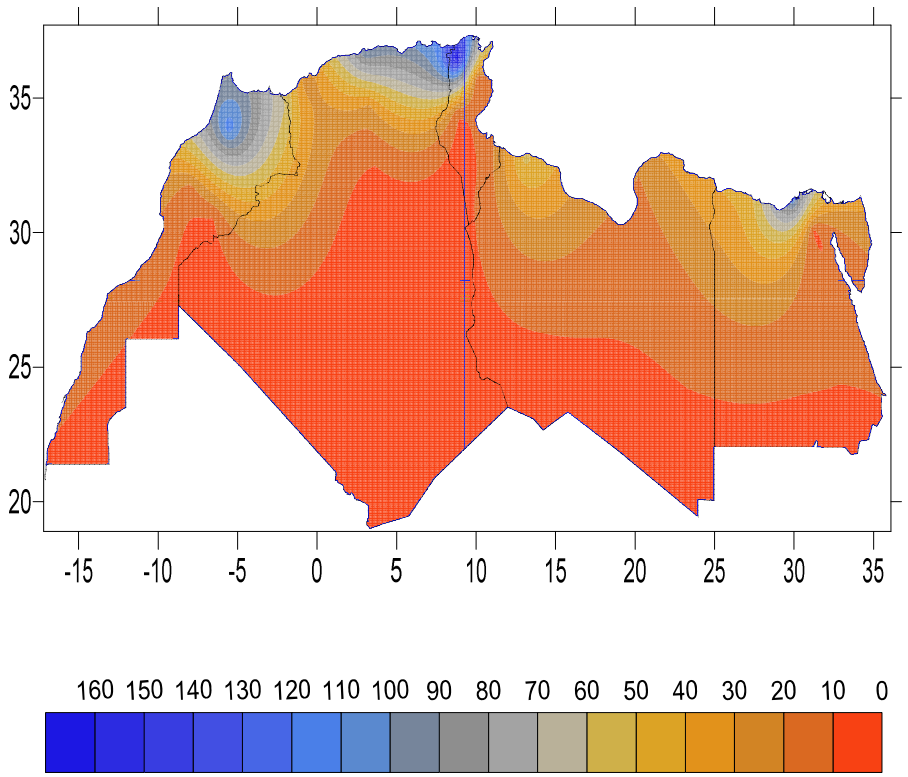


Temperature deviation (℃) in January 2013 (reference period 1961-1990)

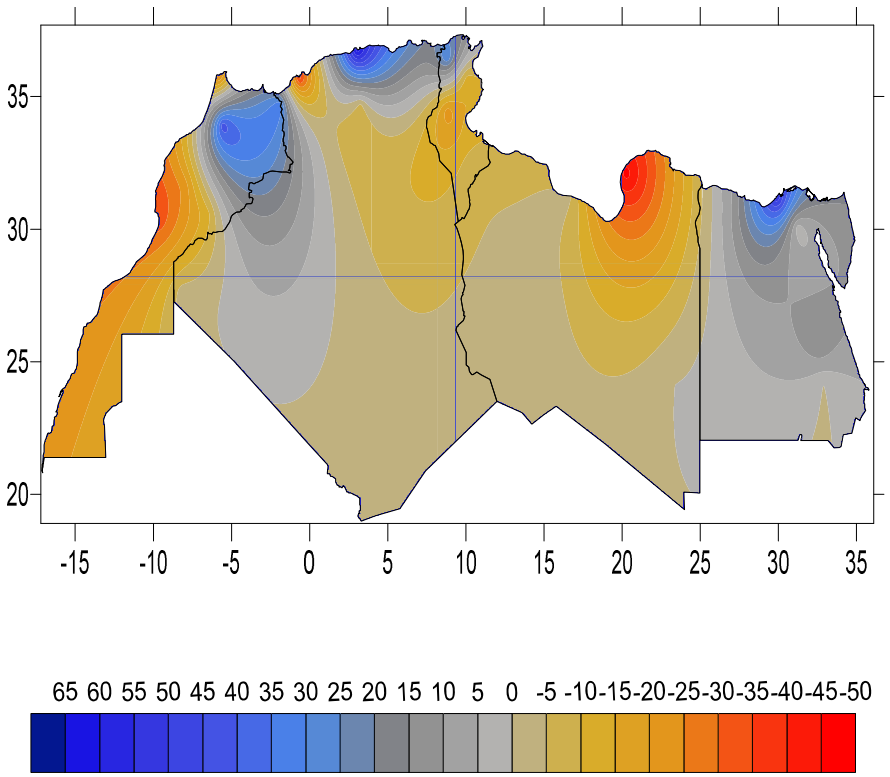
Climate Monitoring

Monthly bulletin (January 2013)

Precipitation



Mean of precipitation (mm) in January 2013

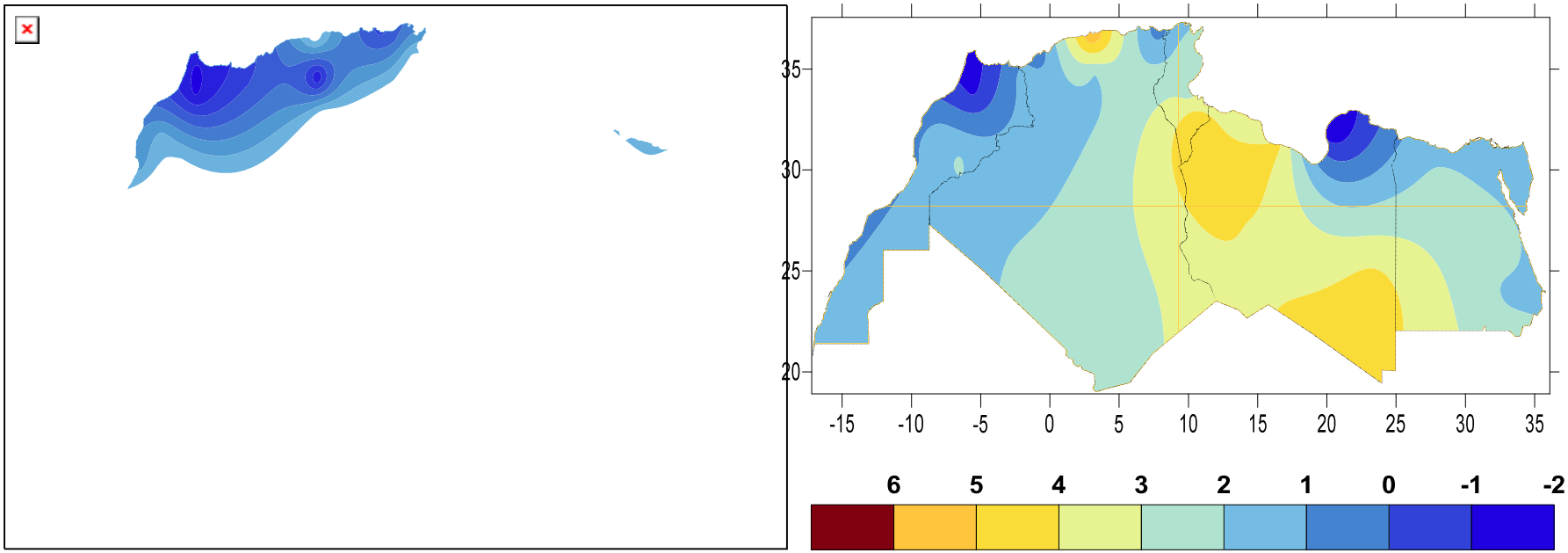


Anomaly precipitation in January 2013 (mm) (reference period 1961-1990)

Climate Monitoring

Seasonal bulletin (Spring 2013)

Temperature



Means and anomalies (℃) (reference period 1961-199 0) of temperature Spring 2013

Analyses océanographiques

Analyses atmosphériques

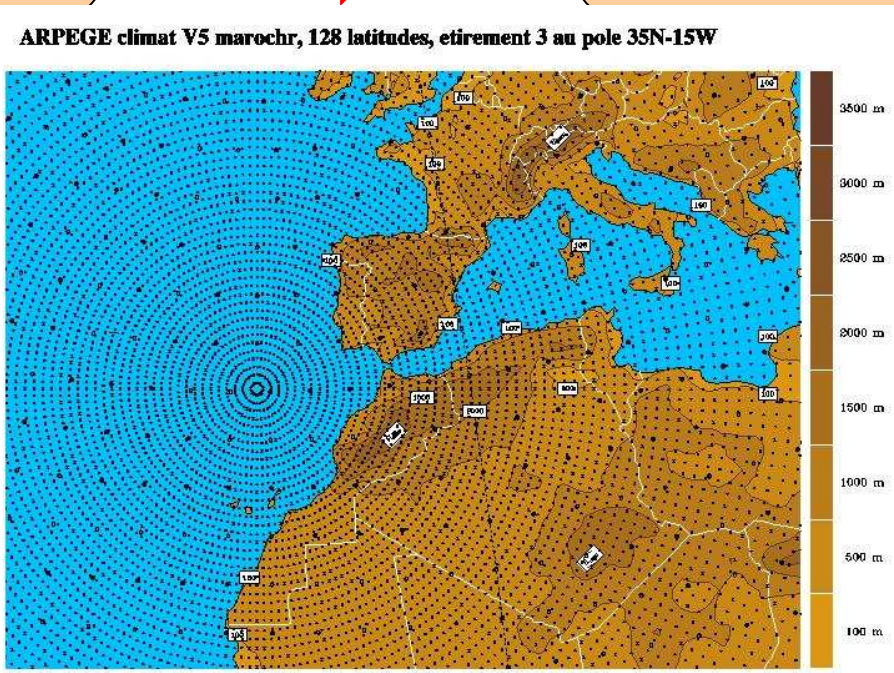
OPA/NEMO(3.2) : Ocean global circulation model

Coupler OASIS

ARPEGE-Climat V5: Atmospheric global circulation model

ARPEGE -Climat coupled model 27 members

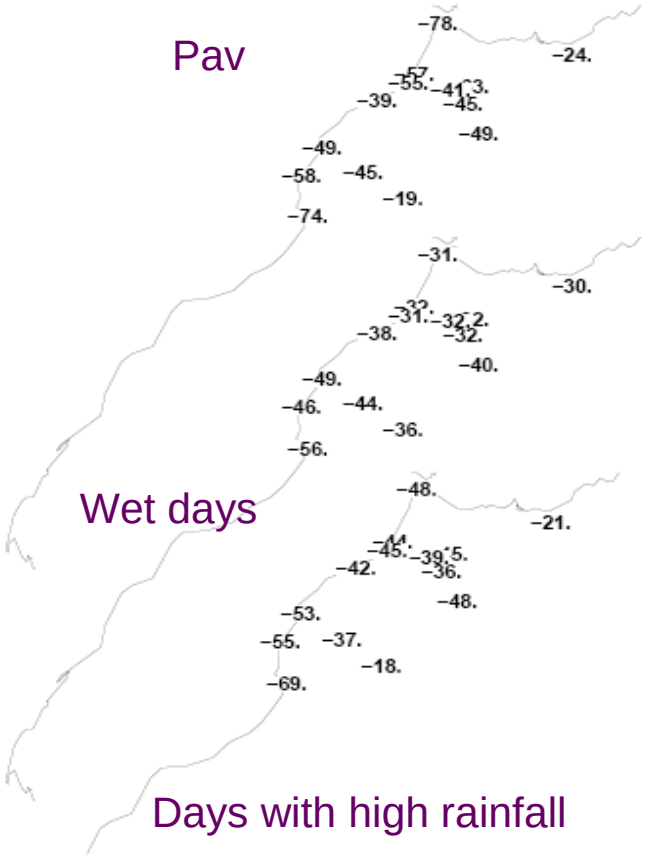
- 9 atmospheric initial conditions from ECMWF
- and 3 ocean initial conditions from Mercator

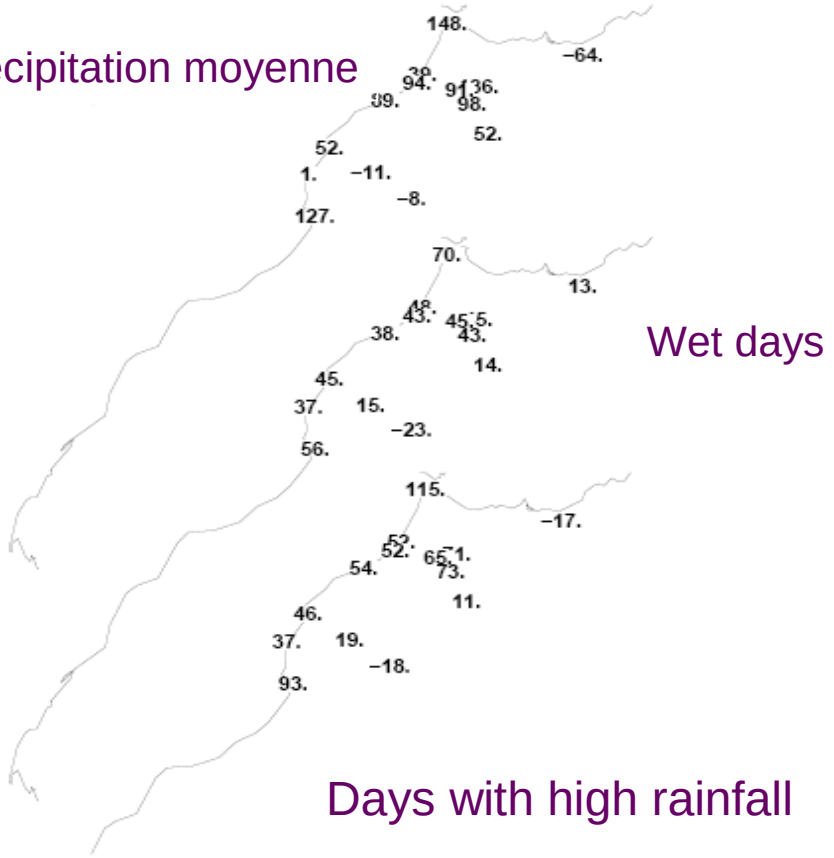


ARPEGE-Climat HR

Régime zonal (NAO+)

Anticyclone groenlandais (NAO-)

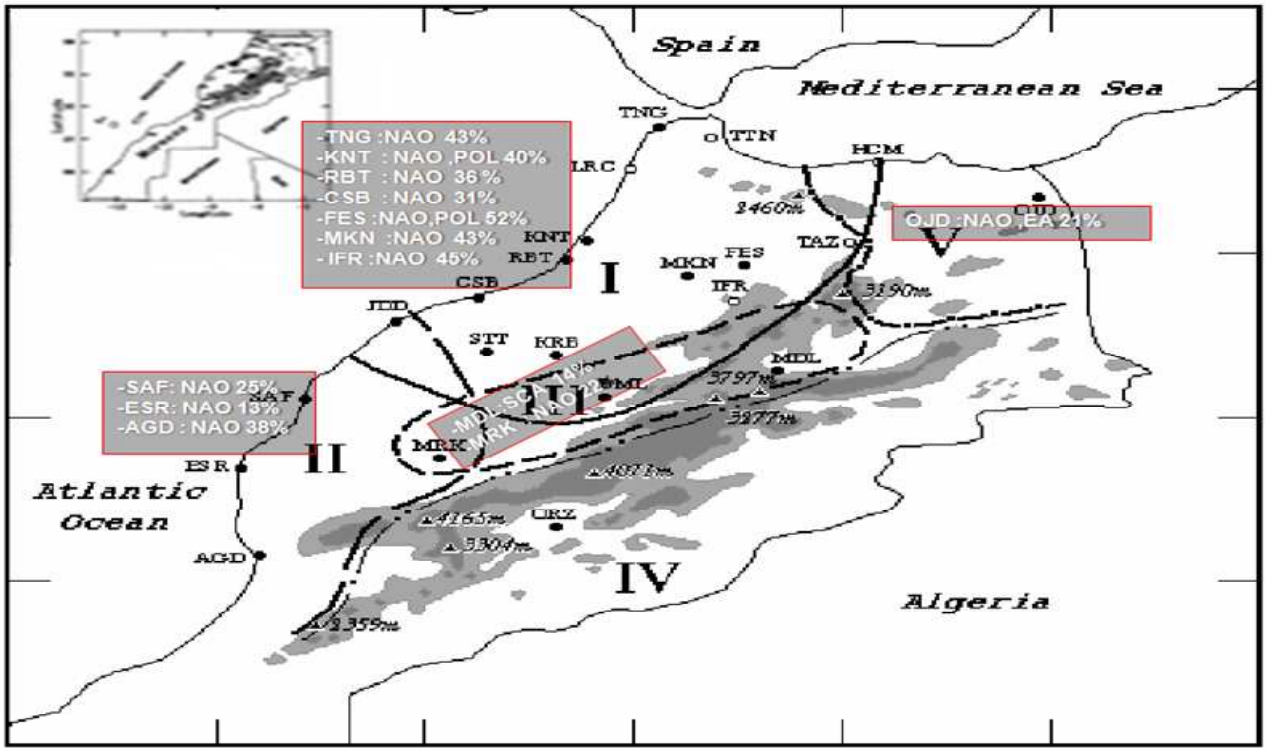




Observed relative changes (%) in mean precipitation , the frequency of wet days and the frequency of intense precipitation days for NAO+ and NAO- (Z500 weather regimes).

Driouech et al (2009)

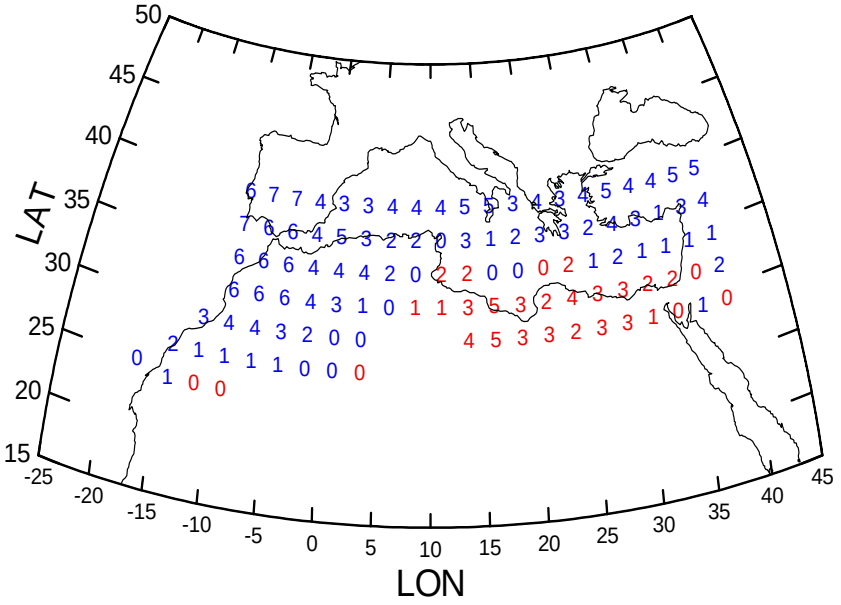
Saison d'hiver



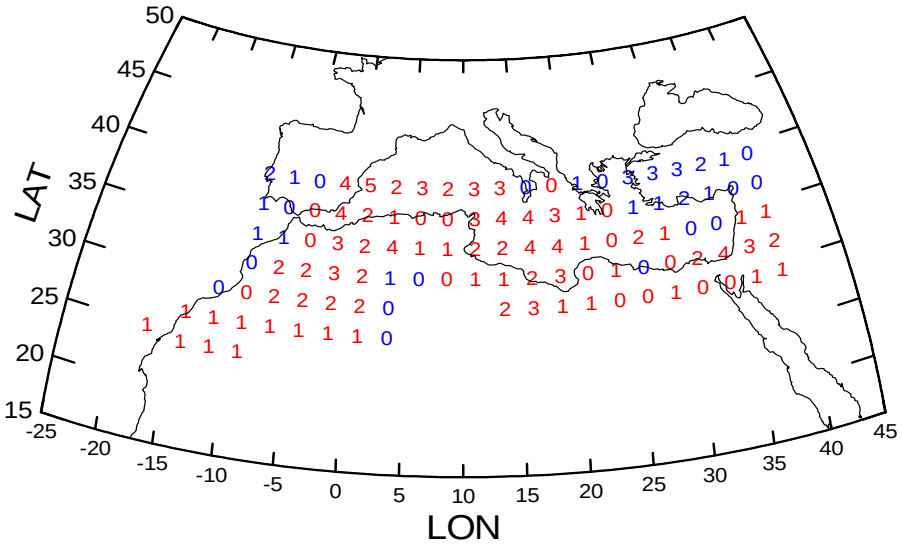
Thanks to Wafae Badi

-NAO est le plus prédominant: de 13% à 45%

Correlation (*10), Red = positive, Blue = negative



Jan-Feb NAO
Versus
Jan-Feb precipitation



Oct-Nov NAO
Versus
Oct-Nov precipitation

Taken from Neil Ward presentation done in Rabat, Morocco - November 15th, 2012

NAO seems to have an influence on temperature extremes
that relationships tend to be stronger with warm extremes than cool extremes.

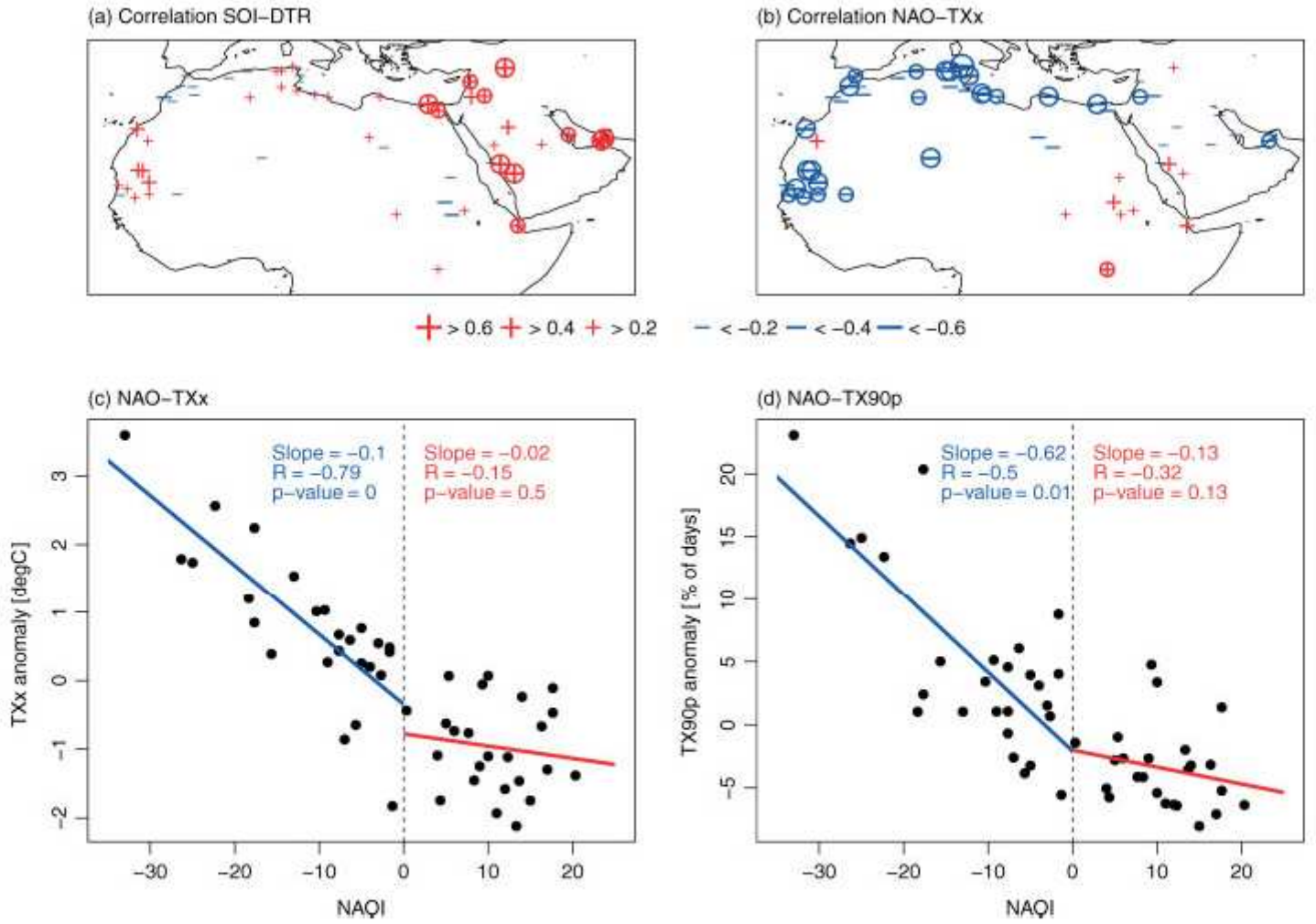
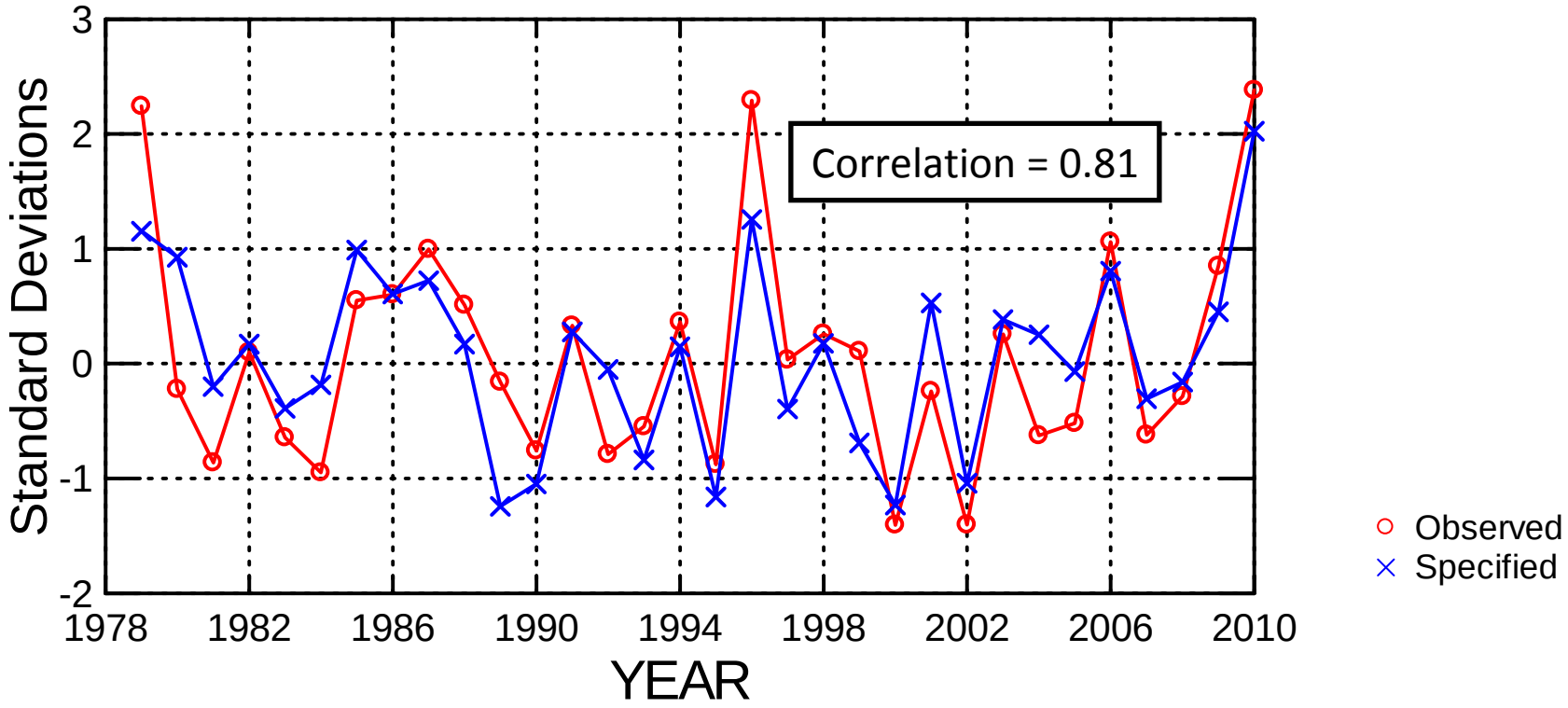


Figure 6. Relationship between chosen extreme indices and ENSO or NAO during boreal winter (DJF). (a) Spearman rank correlation between DTR and the SOI index, (b) correlation between TXx and NAO. + (−) indicate positive (negative) correlations. Significant correlations ($p \leq 0.05$) are marked with a circle. Correlations are calculated for as long as each station provides homogeneous data. (c) Scatter plot for de-trended area-average TXx anomalies during 1961–2010 in the western part of the investigation area (Mauritania, Morocco, Algeria, Tunisia, Libya) and NAO, (d) as (c) but for TX90p.

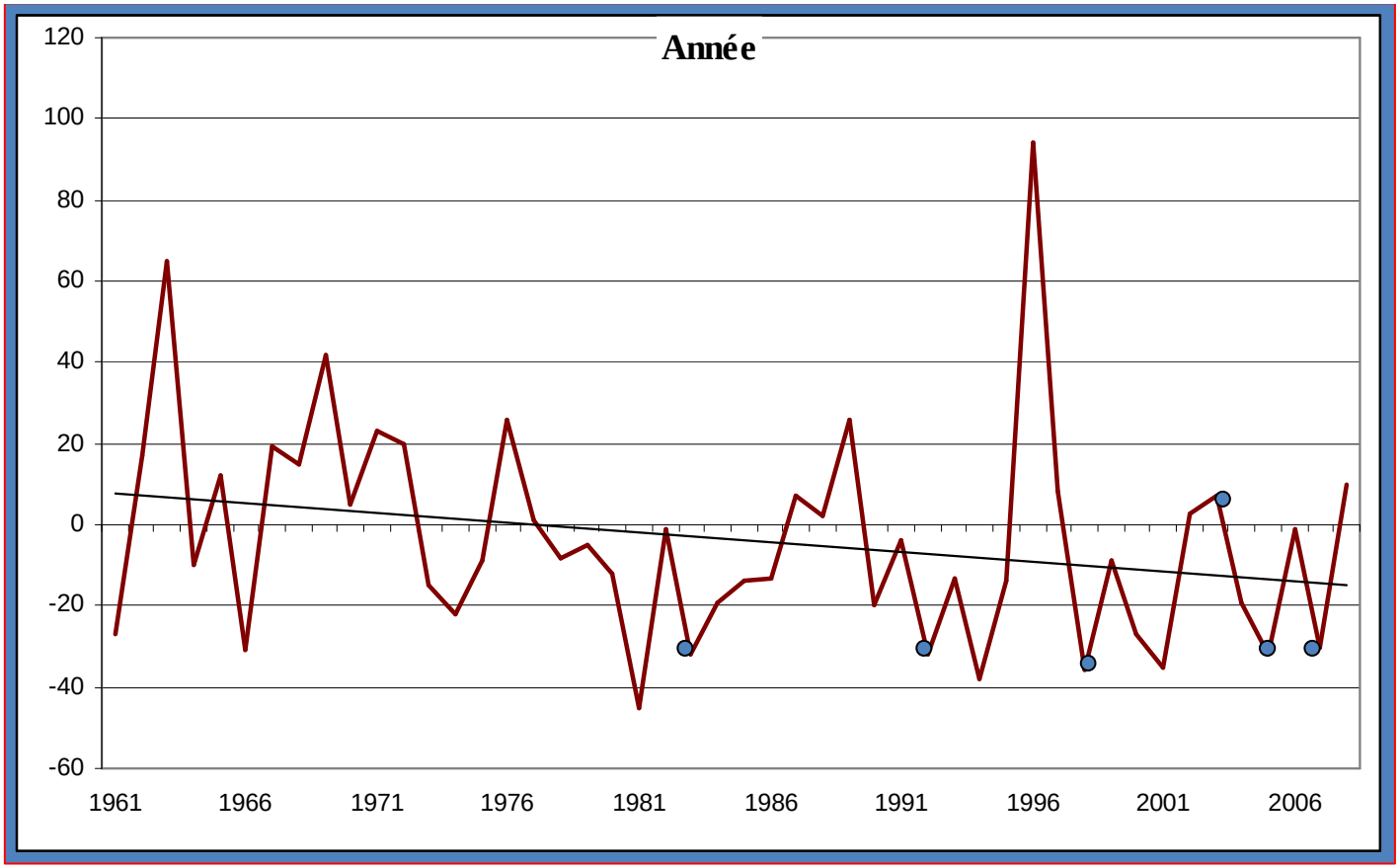
Donat et al (2013)

Regression Prediction of Jan-Feb Region 1 rainfall from
Jan-Feb values of NAO index and Scandinavian index



Rainfall region as given in previous slide
NAO and Scandinavian atmospheric mode indices from NOAA/CPC

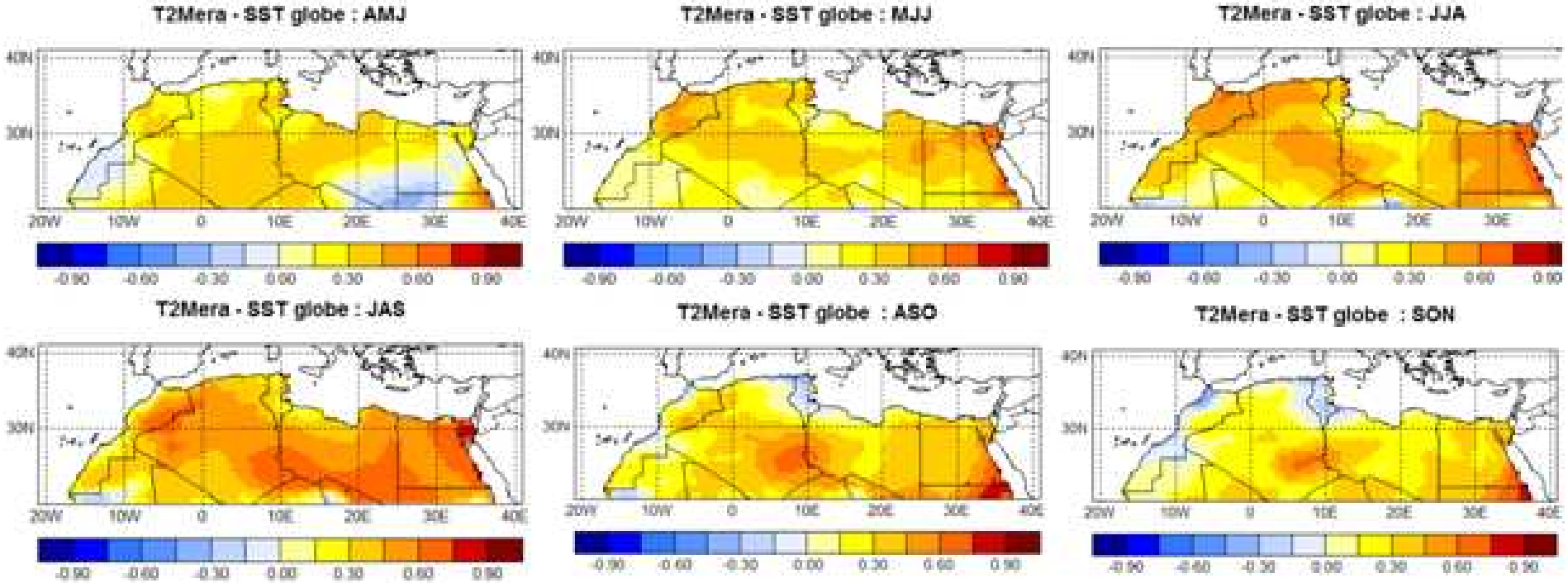
Taken from Neil Ward presentation done in Rabat, Morocco - November 15th, 2012



Nicholson and Kim (1997) and Ward et al. (1999) shows some influence of ENSO on north-west African rainfall: the positive phase leads to fewer precipitation in spring. Knippertz et al. (2003) for 1982-1983 and 1991-1992

The spring of the second year was dry in many Moroccan stations: 1983, 1992, 1998, 2003, 2005 et 2007 (driouech (2010))

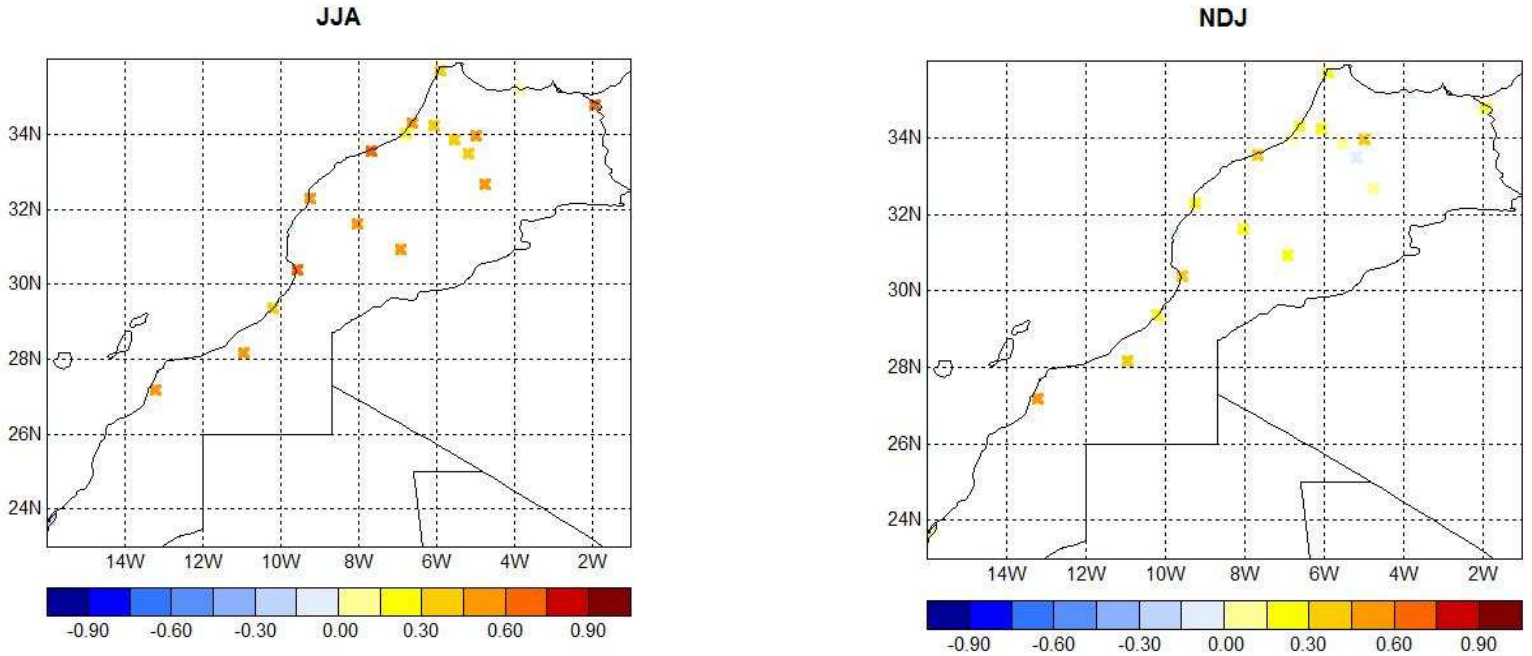
Correlation between observed and predicted air temperature based on SST



Corrélation entre les températures ERA-intérim et celles prévues par la méthode ACC appliquée sur la SST du globe et testée par la cross-validation. Les corrélations supérieures à 0.3 sont significatives à 90% par un t-test.

A. Kasmi, A Abdelaziz, T. Soubai

Impact SST du globe sur les températures à 2m issues de 20 stations synoptiques du MAROC



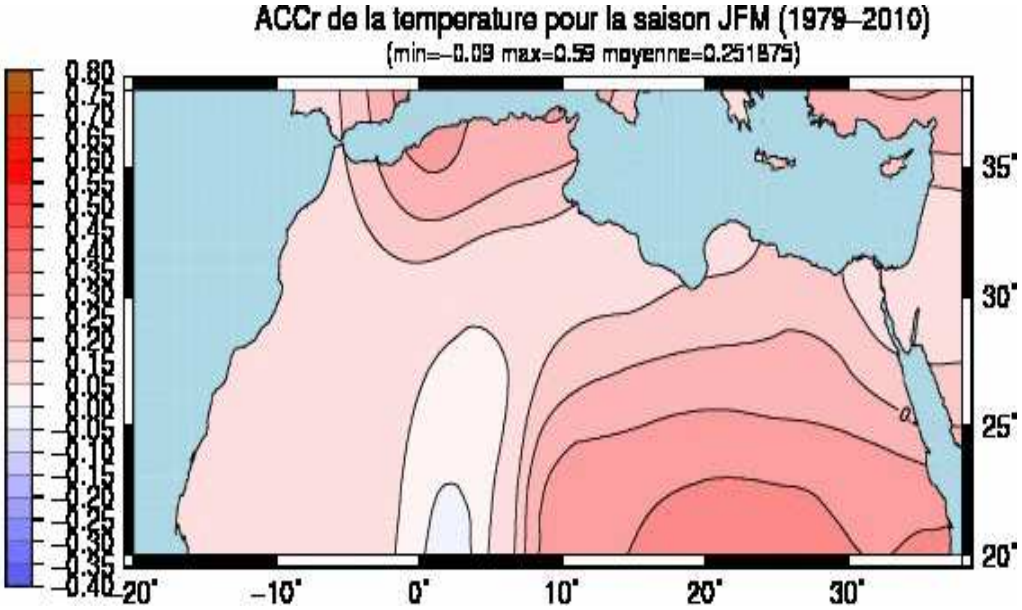
Champ de corrélation entre les températures synoptiques et celles prévues par la méthode RCP appliquée sur la SST du globe

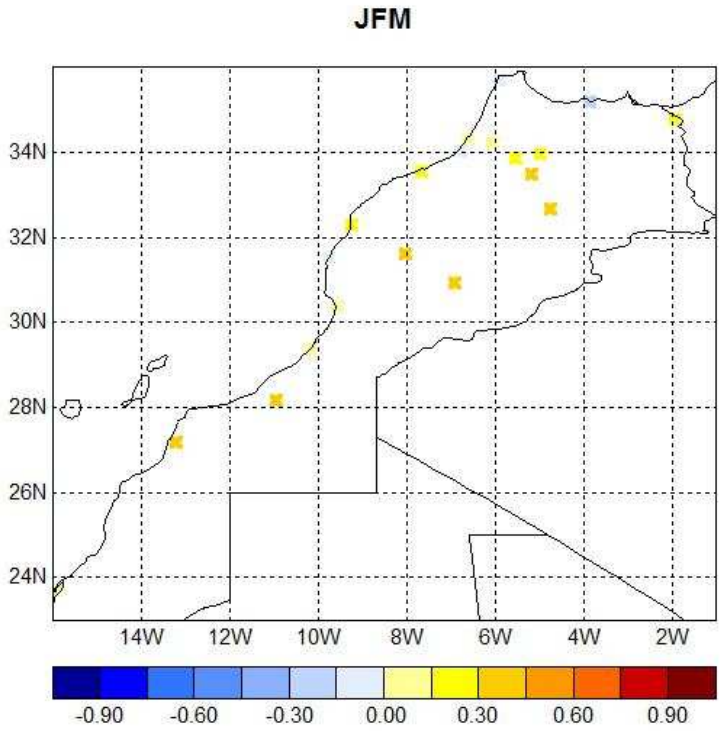
C/C :-La majorité des stations synoptiques ont manifesté une prévisibilité depuis le début MAM jusqu'à la fin de la période chaude (ASO)

-Alors que, pendant la période froide (de SON à FMA) la prévisibilité est généralement faible dans la plupart des stations.

A. Kasmi, A Abdelaziz, T. Soubai

Apport de l’adaptation statistique utilisant Z500 issue d’ARPEGE-Climat pour la T2m sur le Maroc

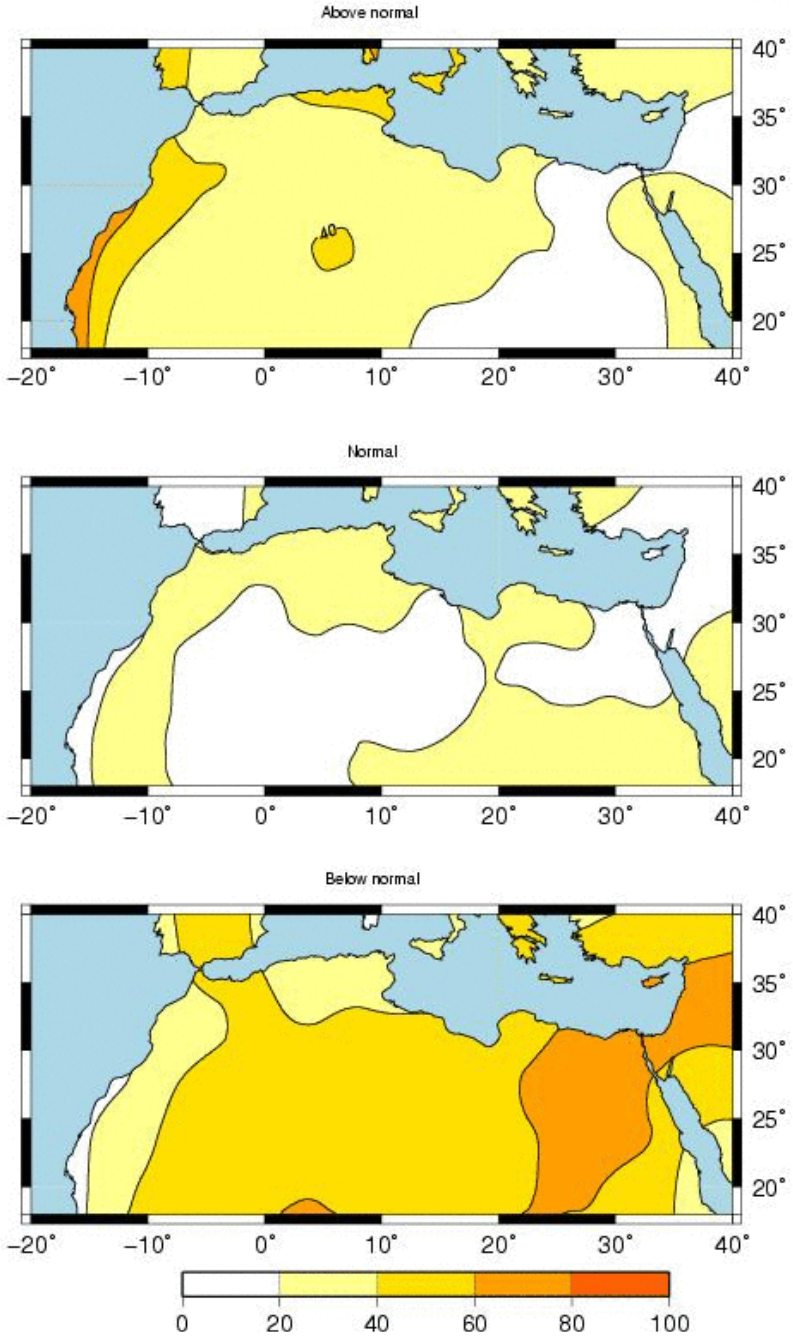




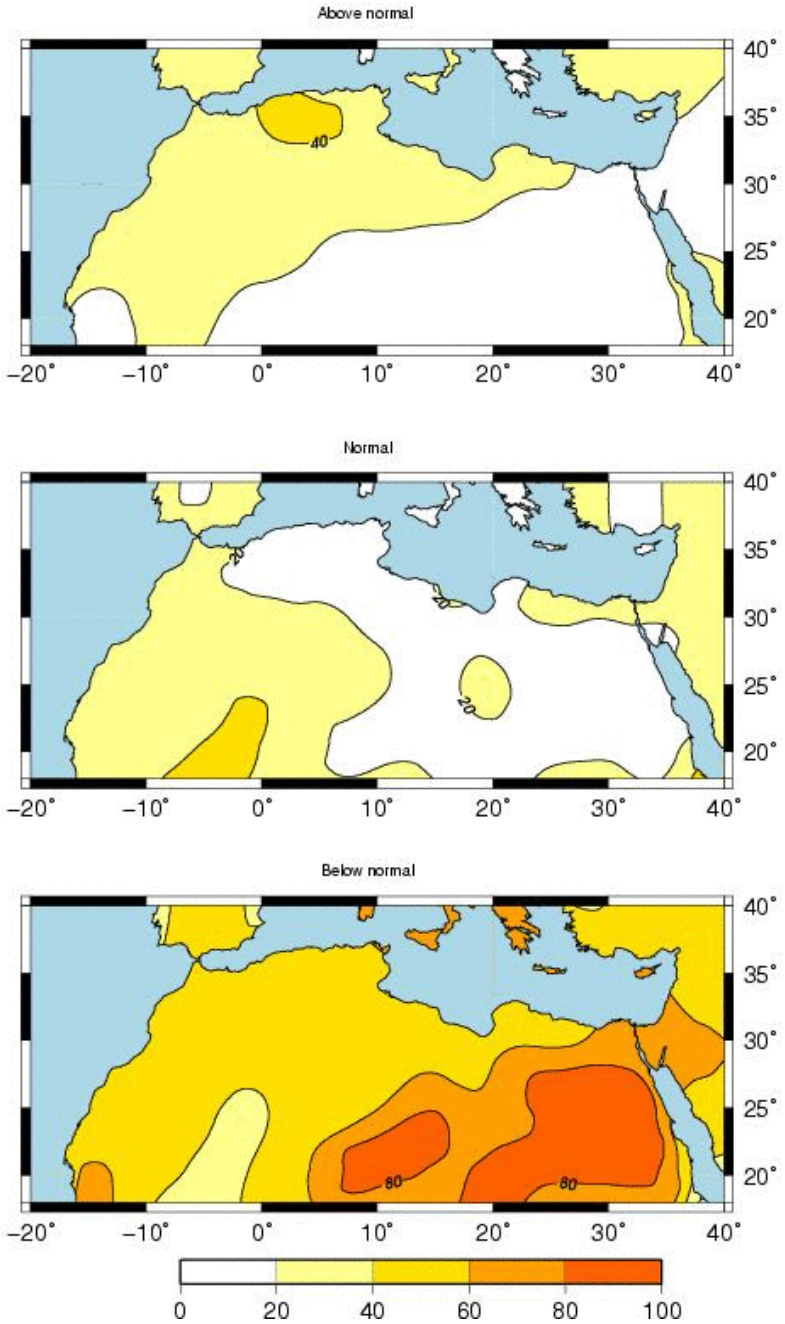
C/C : L’utilisation de l’adaptation statistique a permis d’améliorer la performance de la prévisibilité des températures à2m sur le Maroc pour les saisons JFM, FMA et MAM (fin d’hiver et printemps)

A. Kasmi, A Abdelaziz, T. Soubai

Probability of tercile category of 2m temperature for DJF 2013
(ARPEGE–Climat coupled model, issued NOVEMBER 2013)



Probability of tercile category of precipitation for DJF 2013
(ARPEGE–Climat coupled model, issued NOVEMBER 2013)



Organigramme
Coopération Internationale
Temps prévu
Climat
Produits et Services
Nos métiers
Recherche-Développement
Qualité d'air
Démarche Qualité
Charte d'audit interne
Météo de A à Z

North Africa RCC products
Seasonal forecast
Verification
Climate scenarios
Seasonal outlook

Outlook for November-December-January 2013/2014 over North Africa

The overall analysis of temperatures forecasts issued from different models for NDJ 2013/2014 shows probably normal to above normal conditions over Morocco, Libya and Egypt. No special scenario is found over Algeria and Tunisia. For precipitation, normal to below normal conditions are likely over North African countries except Egypt where normal to above normal conditions are more likely.

P.S: We note that seasonal forecasts issued from ARPEGE-Climat are given in probabilistic form from March 2013

Tables summarizing seasonal forecast for November-December-January 2013 in North Africa

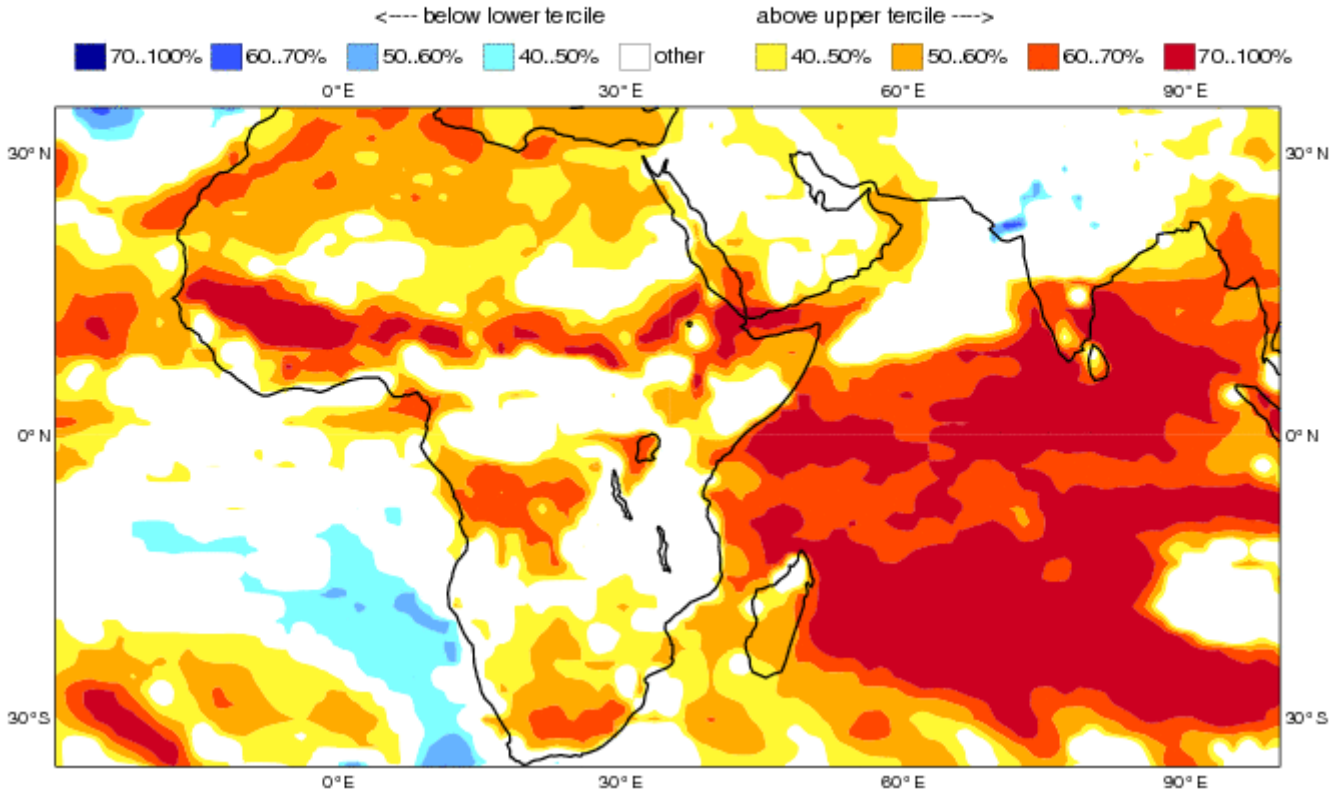
1- Seasonal temperatures forecast

Model	Morocco	Algeria	Tunisia	Libya	Egypt
ARPEGE-Climat	N / S			to	
ECMWF		N / S		to	to
UK Met-Office				to	to
Synthesis	Probably normal to above normal	No special scenario	No special scenario	Probably normal to above normal	Probably normal to above normal

With Thanks

ECMWF Seasonal Forecast
Prob(most likely category of 2m temperature)
Forecast start reference is 01/10/13
Ensemble size = 51, climate size = 450

System 4
DJF 2013/14

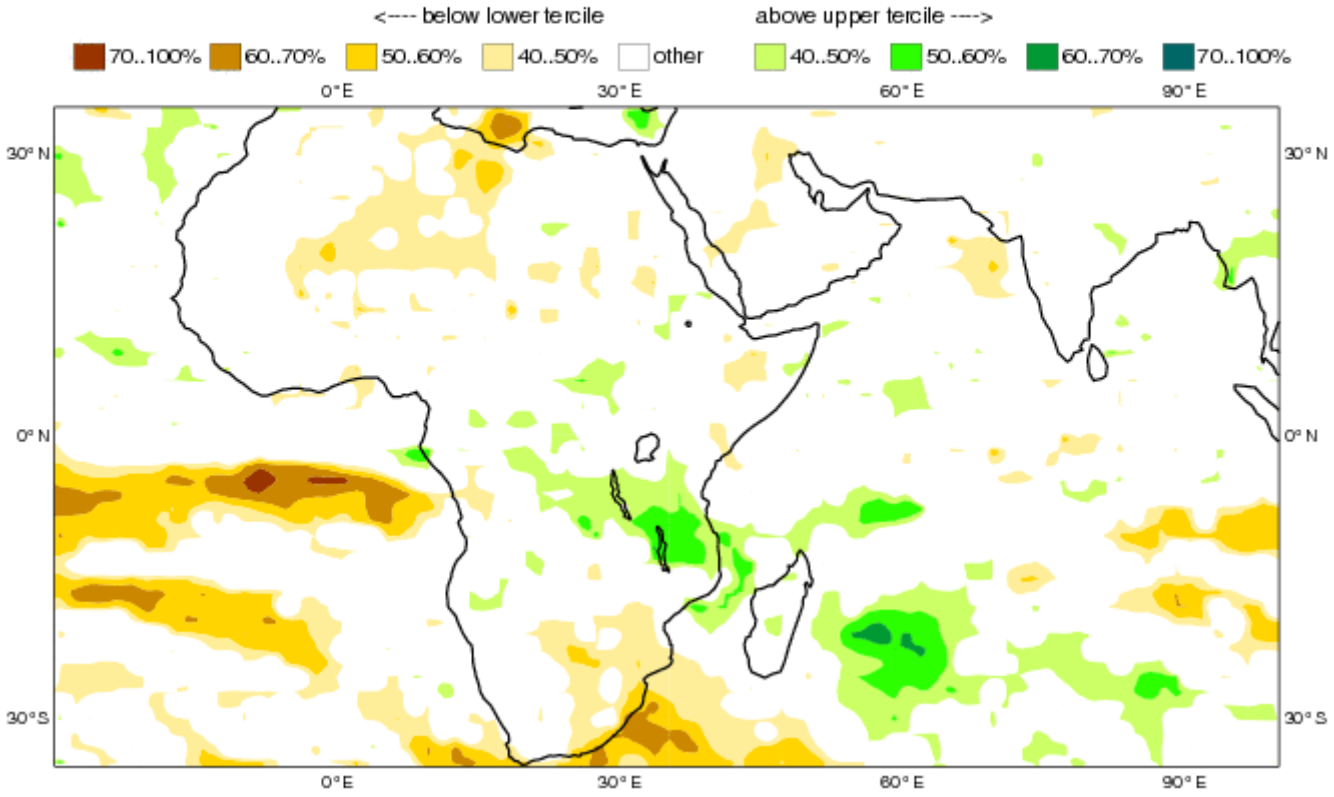


ECMWF Seasonal Forecast

Prob(most likely category of precipitation)

Forecast start reference is 01/10/13

Ensemble size = 51, climate size = 450

System 4

DJF 2013/14