

# ***Seasonal Forecast***

***December-January-February***

***2015-2016***

***Italian Air Force***

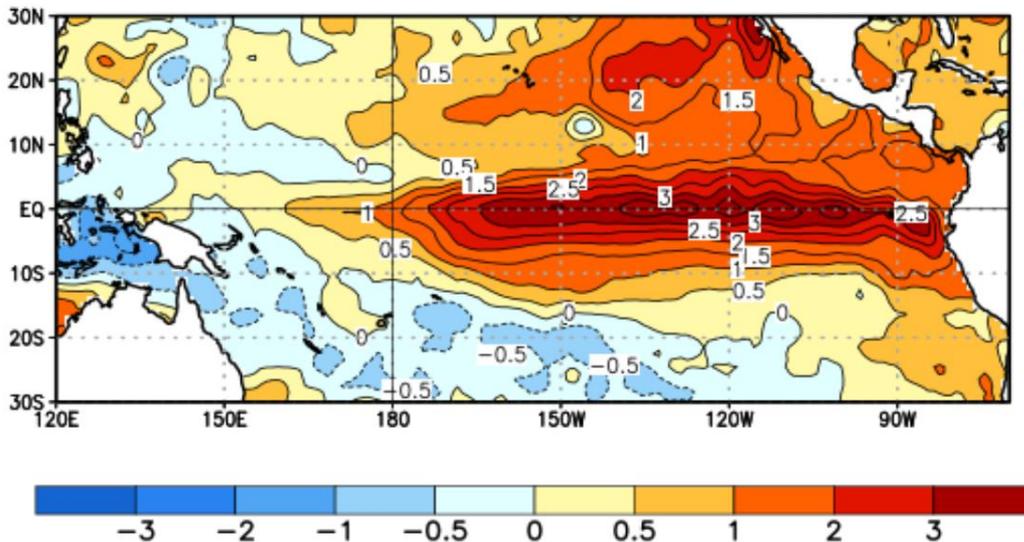
***Operational Center for Meteorology  
(COMet)***



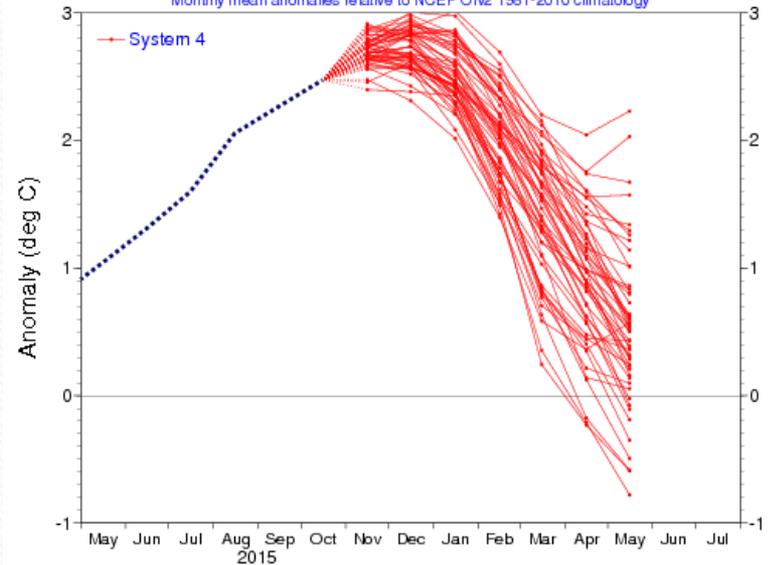
# Status of Climate

El Niño conditions are currently present. There is a great chance that ENSO will continue during Northern Hemisphere winter 2015-16, and then gradually weakening on next spring.

Average SST Anomalies  
18 OCT 2015 – 14 NOV 2015

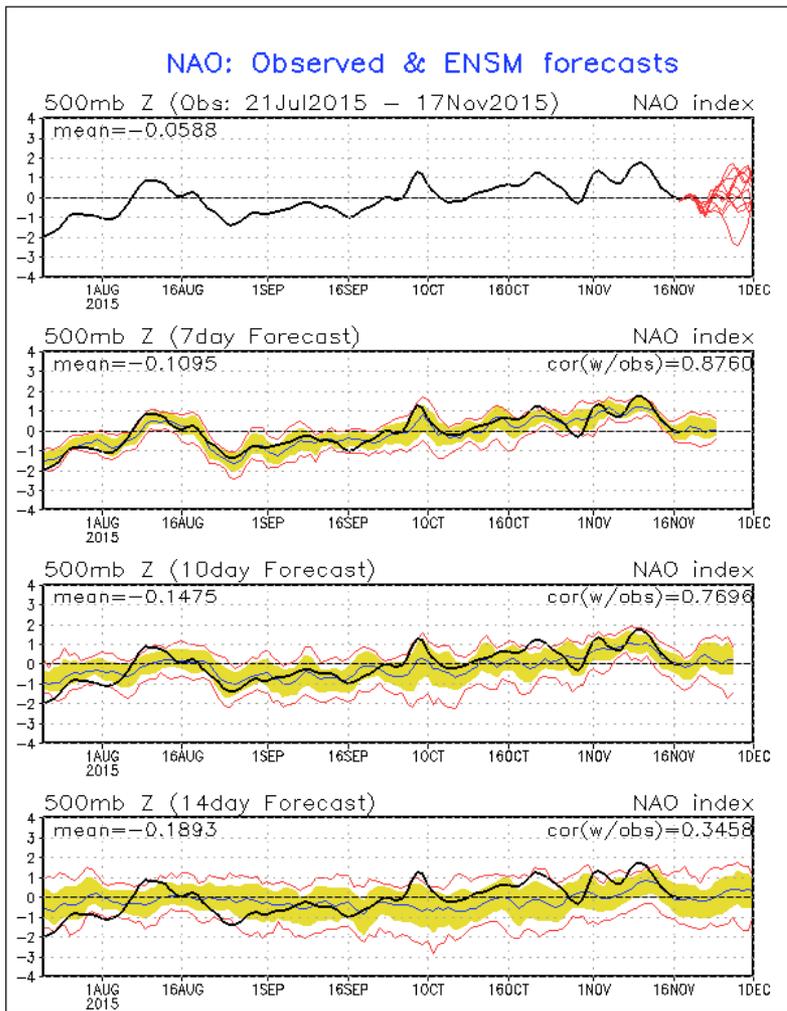


NINO3.4 SST anomaly plume  
ECMWF forecast from 1 Nov 2015  
Monthly mean anomalies relative to NCEP OIv2 1981-2010 climatology

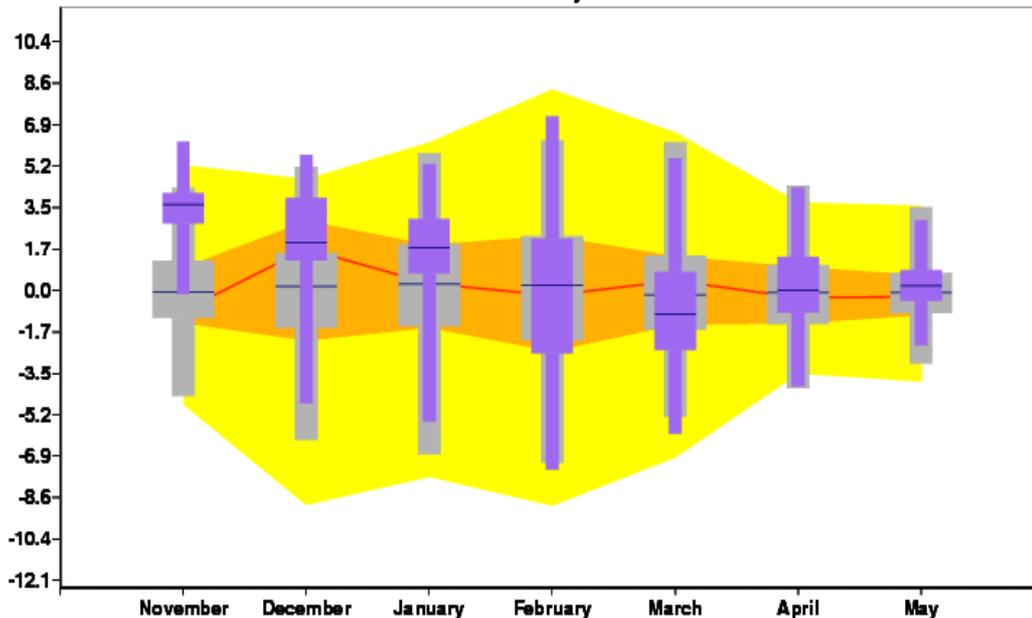


# NAO index

Taking into account the low predictability of the North Atlantic Oscillation, seasonal outlook for monthly mean NAO index indicates positive values for December and January, with higher probability of neutral values in the last month of the winter.



**North Atlantic Oscillation**  
Forecast initial date: 20151101  
Ensemble size: Forecast=51 Model climate=450 Analysis climate=30



# *Seasonal Forecast at ITAF – COMet 1*

The post-processing MOS system in use at *ITAF COMet*, called

**SIBILLA**

(*Statistical Integrated Bayesian Information system for Large to Local Area analysis*),

combines ECMWF SYSTEM4 fields with

*E-OBS* or *ERA-Interim* datasets.

# Seasonal Forecast at ITAF – COMet 2

For this outlook, in particular, the following arrangements were used:

- **SIBILLA-ERA**

input data ECMWF System4 (S4) fields and ERA-interim re-analysis

output data **2mT** mean seasonal values over the MedCOF area

- **SIBILLA-EOBS**

input data ECMWF System4 (S4) fields and E-OBS gridded dataset

output data **2mT** and **Total Precipitation** mean seasonal values over ITALY

## ***Seasonal Forecast at ITAF – COMet 3***

In the following, *SYSTEM4*, *SIBILLA-ERA* and *SIBILLA-EOBS*

seasonal maps are shown,

but, in some cases, a disaggregation of the information content

on a monthly basis is provided as well.

# System4 - DJF MSLP seasonal prob chart

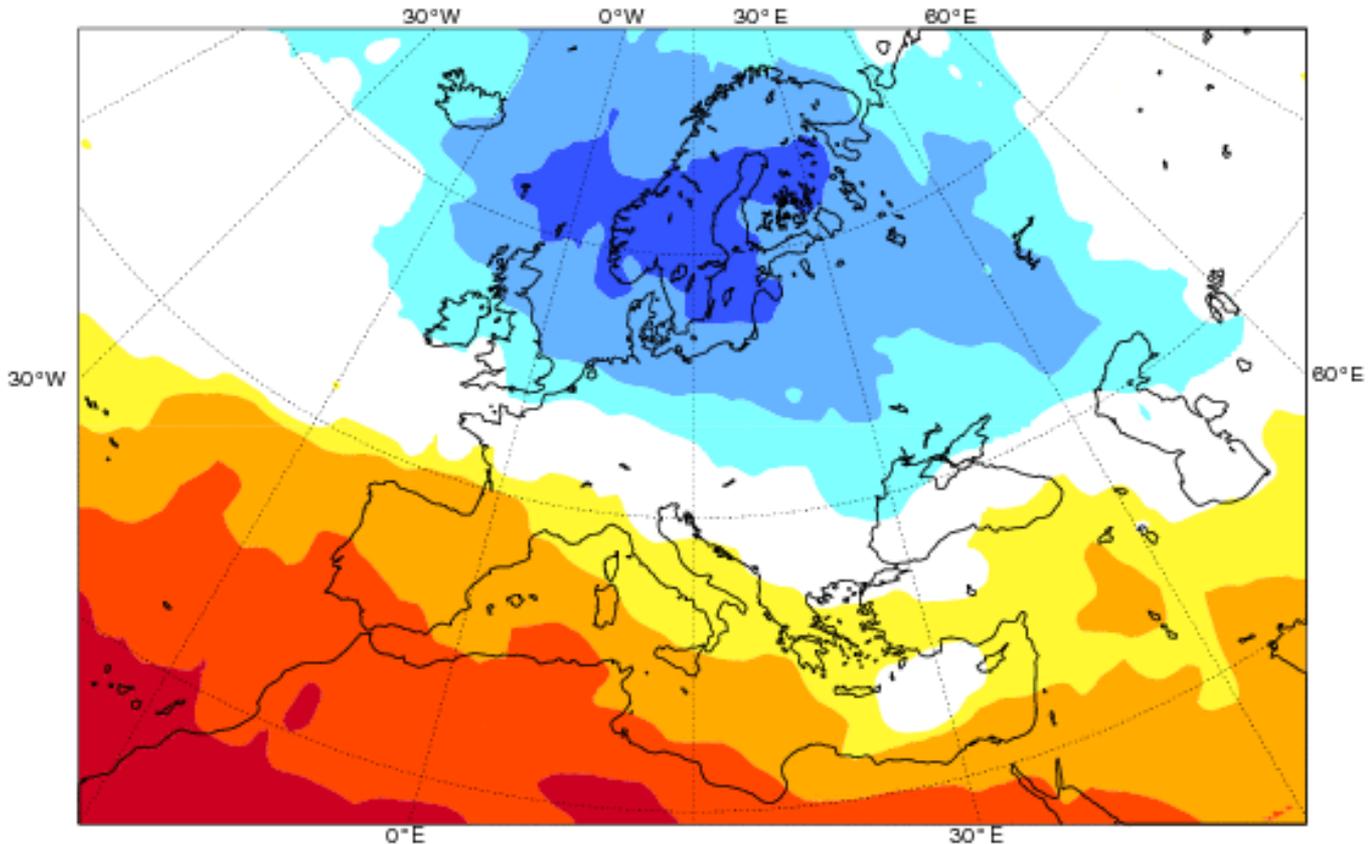
(reference period 1981-2010)

ECMWF Seasonal Forecast  
Prob(most likely category of MSLP)

Forecast start reference is 01/11/15

Ensemble size = 51, climate size = 450

System 4  
DJF 2015/16



# System4 - DJF MSLP seasonal anomaly chart

(reference period 1981-2010)

ECMWF Seasonal Forecast  
Mean MSLP anomaly

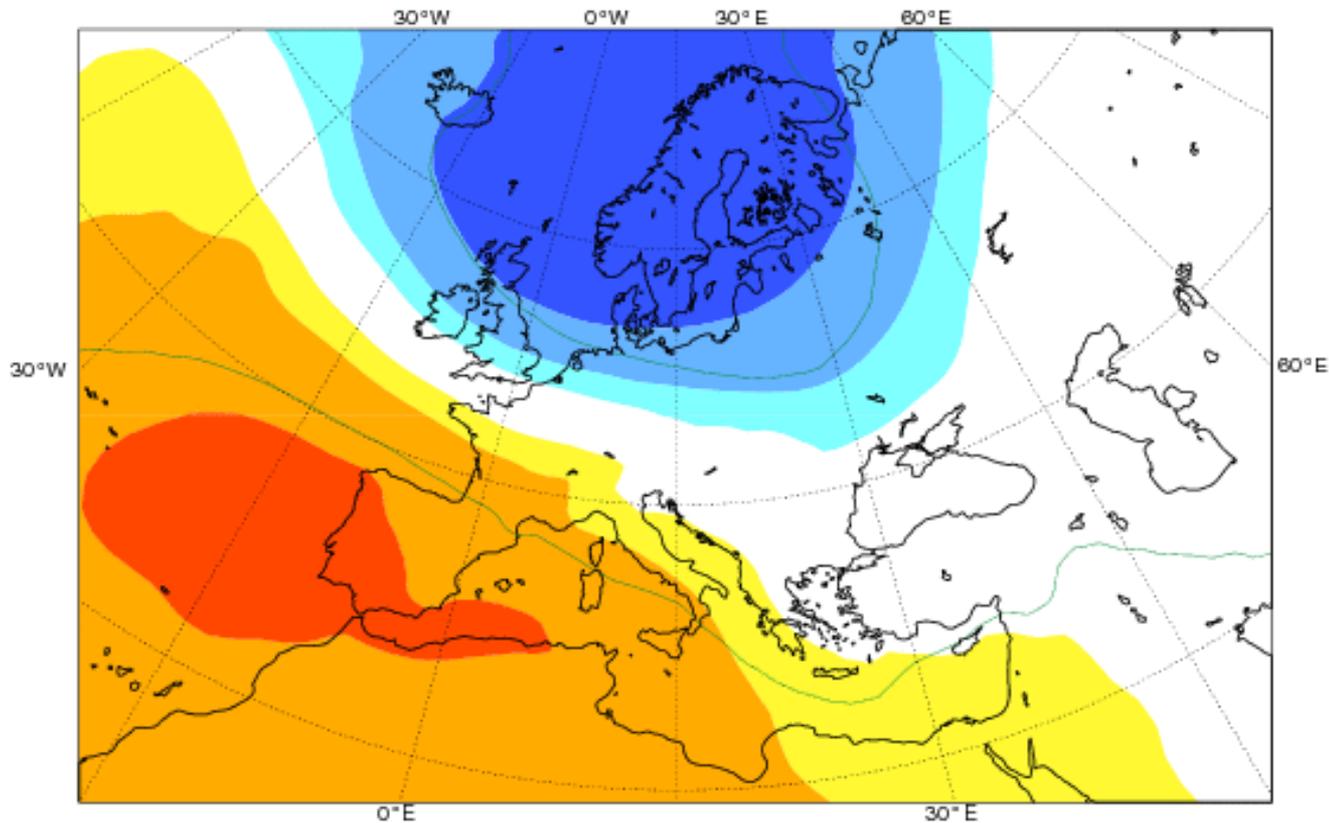
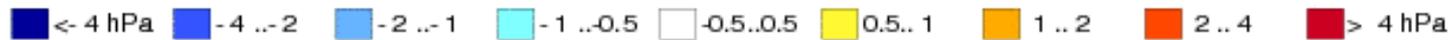
Forecast start reference is 01/11/15

Ensemble size = 51, climate size = 450

System 4

DJF 2015/16

Solid contour at 1% significance level

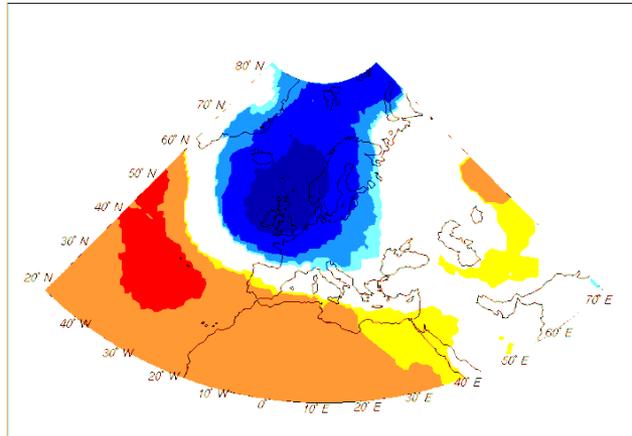


# System4 - DJF MSLP monthly anomaly charts

(reference period 1981-2010)

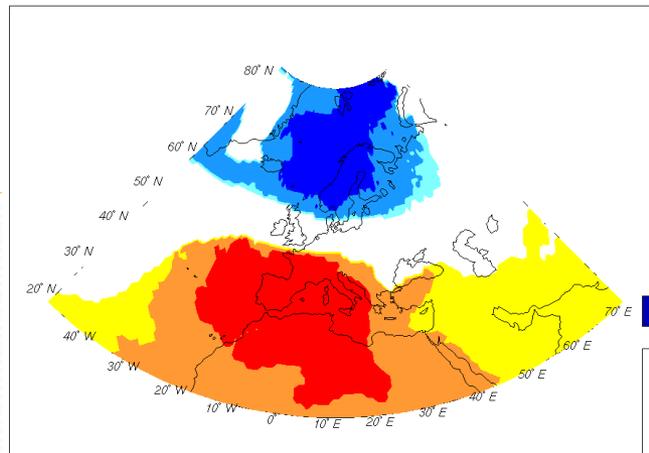
mean sea level pressure anomaly Dec 2015

<4hPa -4..-2 -2..-1 -1..-0.5 -0.5..0.5 0.5..1 1..2 2..4 >4hPa



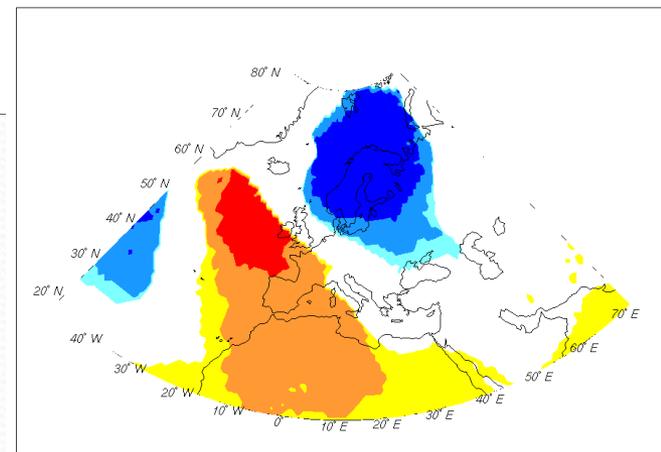
mean sea level pressure anomaly Jan 2015

<4hPa -4..-2 -2..-1 -1..-0.5 -0.5..0.5 0.5..1 1..2 2..4 >4hPa



mean sea level pressure anomaly Feb 2015

<4hPa -4..-2 -2..-1 -1..-0.5 -0.5..0.5 0.5..1 1..2 2..4 >4hPa



## DJF *MSLP* pattern - 1

Seasonal maps show a negative anomaly centered over the Scandinavian peninsula and a strong positive anomaly extended from Atlantic Ocean to South-Eastern Europe, crossing meridional Europe and North Africa.

This configuration has some typical features of a positive-NAO pattern, with moist weather over northern Europe and drier and mild conditions over southern Europe.

## DJF *MSLP* pattern - 2

The position of MSLP anomalies, with central and south-eastern European countries uncovered by a positive signal, could let weather conditions characterized by relatively high probability of cold outbreaks.

Moreover, during strong El Nino events an higher probability of sudden stratospheric warmings was statistically observed, with associated abrupt changes in northern emisphere weather patterns and intrusions of cold air masses over Mediterranean area.

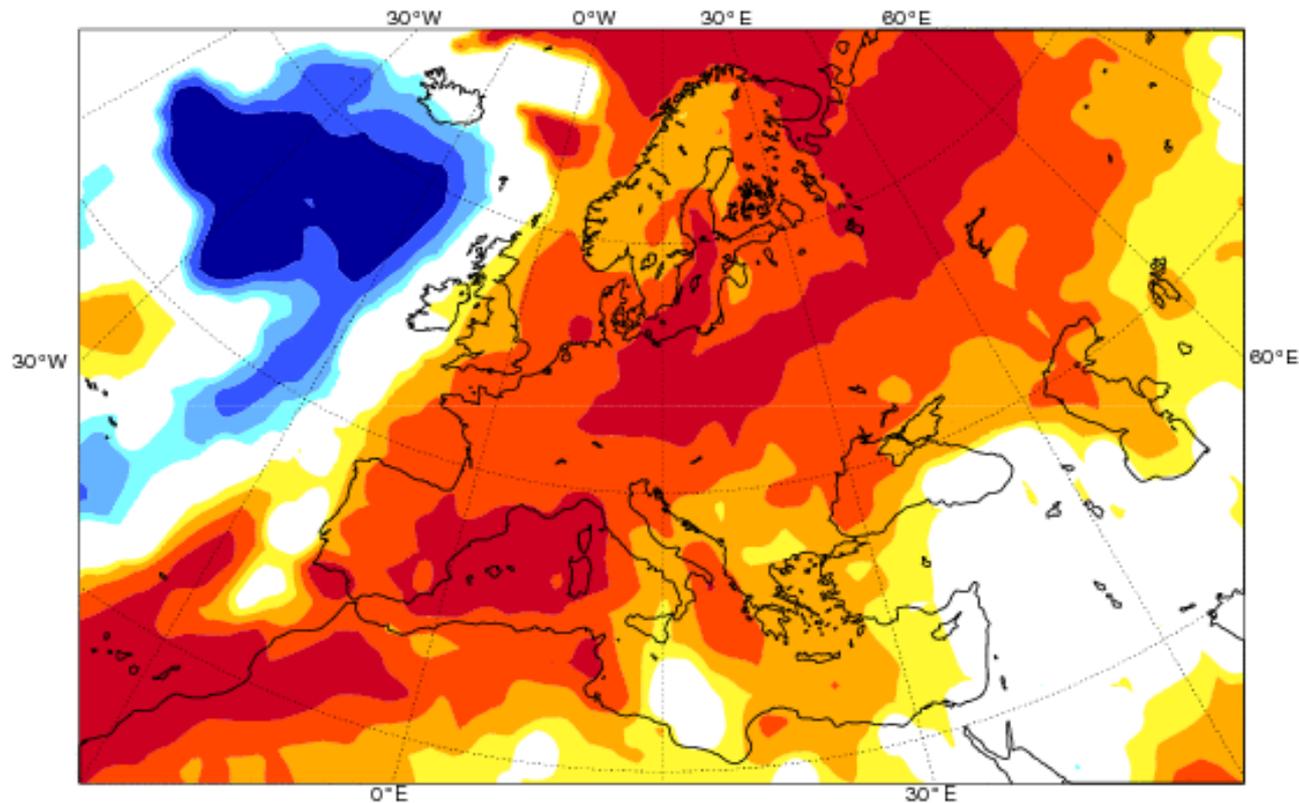
This is the reason why, due to the strong El Nino event currently in progress, this possibility cannot be a-priori excluded.

# System4 - DJF T2m seasonal prob chart

(reference period 1981-2010)

ECMWF Seasonal Forecast  
Prob(most likely category of 2m temperature)  
Forecast start reference is 01/11/15  
Ensemble size = 51 , climate size = 450

System 4  
DJF 2015/16



# System4 - DJF T2m seasonal anomaly chart

(reference period 1981-2010)

System 4

DJF 2015/16

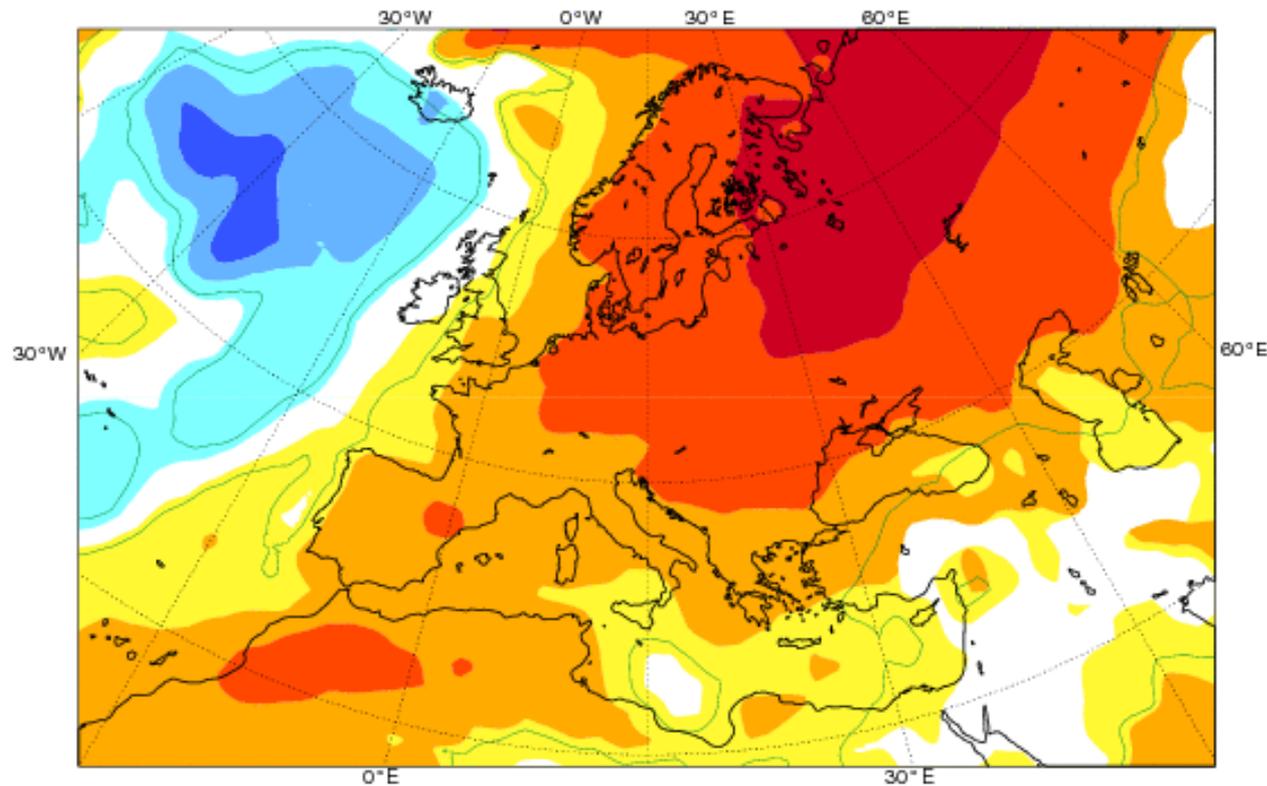
Shaded areas significant at 10% level

Solid contour at 1% level

ECMWF Seasonal Forecast  
Mean 2m temperature anomaly

Forecast start reference is 01/11/15

Ensemble size = 51, climate size = 450

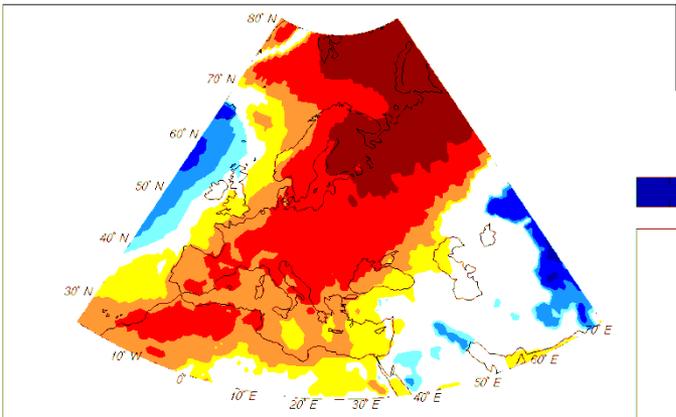


# System4 - DJF T2m monthly anomaly charts

(reference period 1981-2010)

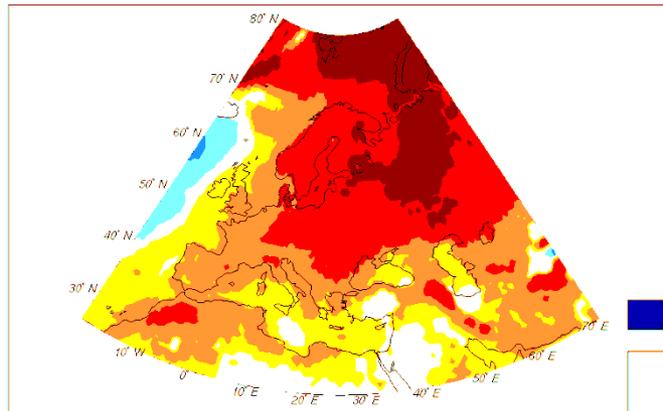
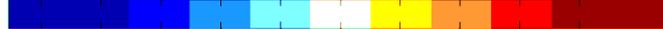
mean 2m temp anomaly Dec 2015

<-2.0K -2.0..-1.0 -1.0..-0.5 -0.5..0 No Signal 0.05 0.5..1.0 1.0..2.0 >2.0K



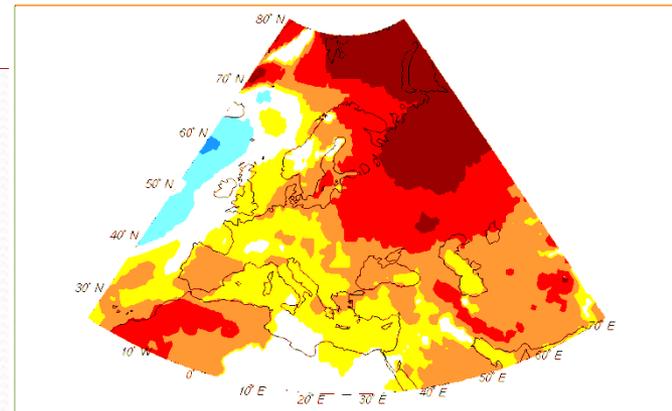
mean 2m temp anomaly Jan 2015

<-2.0K -2.0..-1.0 -1.0..-0.5 -0.5..0 No Signal 0.05 0.5..1.0 1.0..2.0 >2.0K



mean 2m temp anomaly Feb 2015

<-2.0K -2.0..-1.0 -1.0..-0.5 -0.5..0 No Signal 0.05 0.5..1.0 1.0..2.0 >2.0K

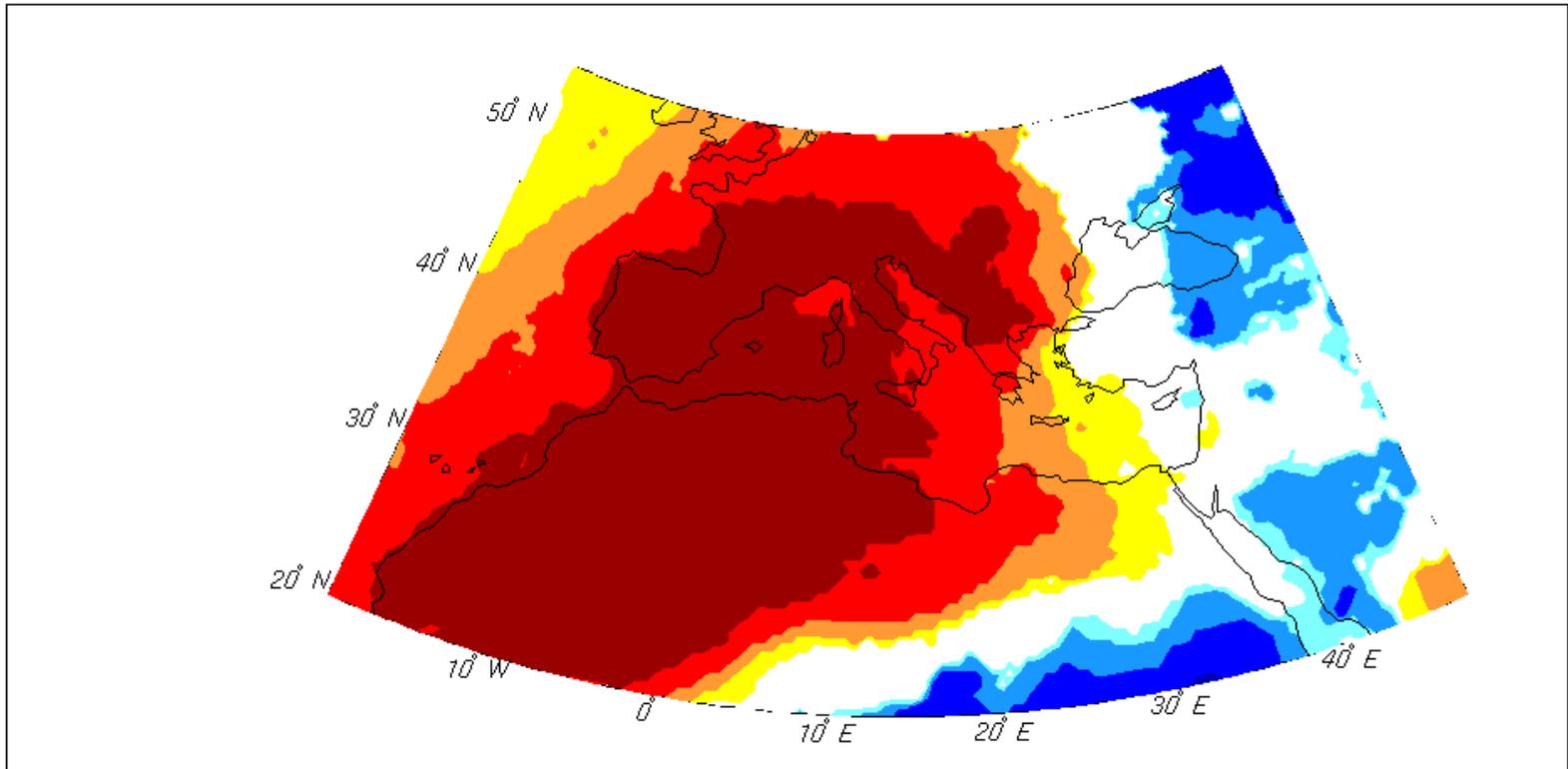
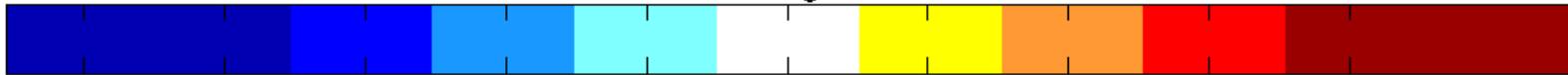


# SIBILLA-ERA - DJF Mean T2m seasonal anomaly chart

(reference period 1981-2010)

## Ensemble mean Anomaly DJF 2015, mean 2m temp

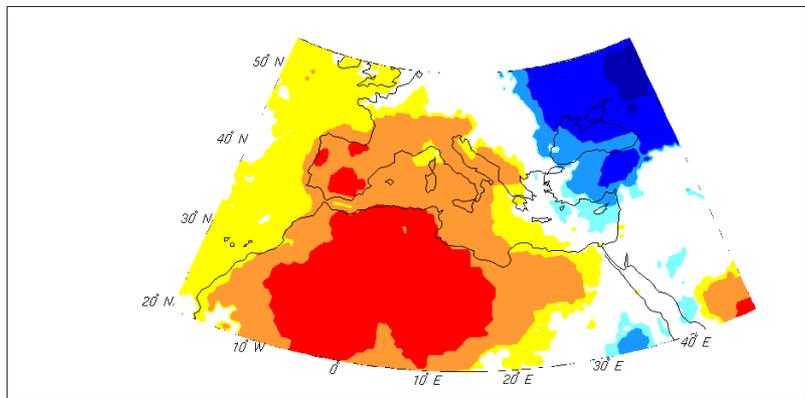
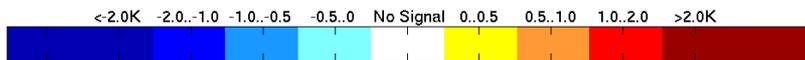
<-2.0K -2.0..-1.0 -1.0..-0.5 -0.5..0 No Signal 0..0.5 0.5..1.0 1.0..2.0 >2.0K



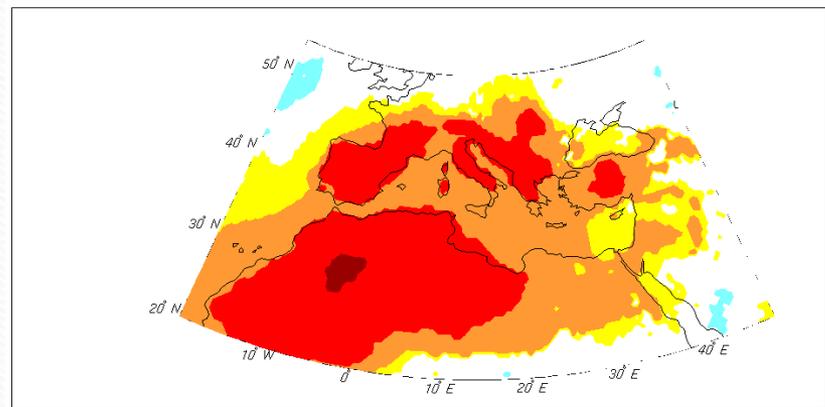
# SIBILLA-ERA – DJF Mean T2m monthly anomaly charts

(reference period 1981-2010)

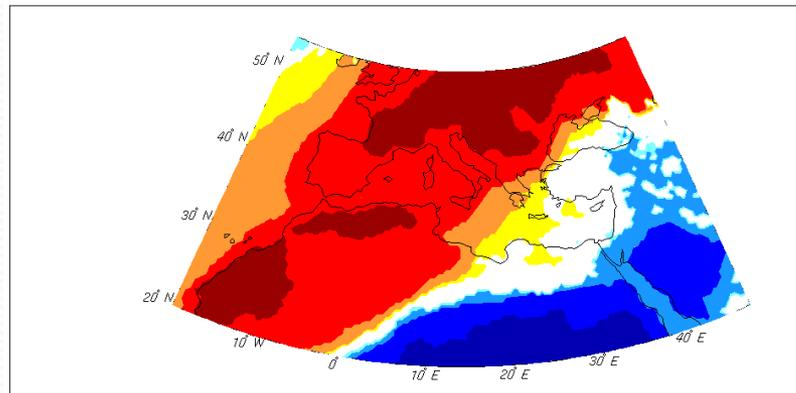
Ensemble mean Anomaly Dec 2015, mean 2m temp



Ensemble mean Anomaly Jan 2015, mean 2m temp



Ensemble mean Anomaly Feb 2015, mean 2m temp



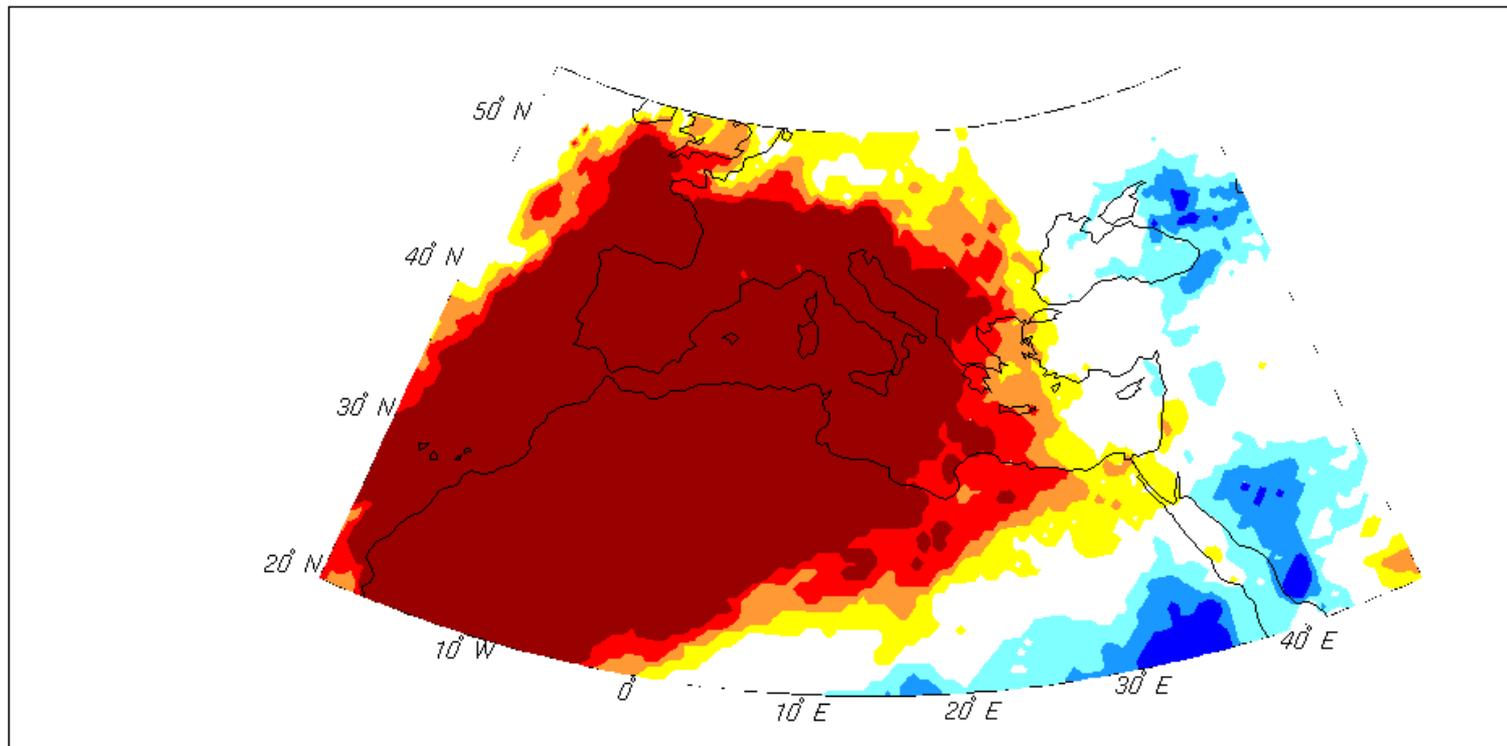
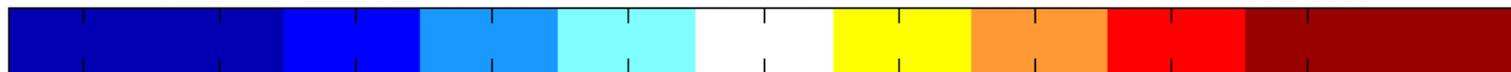
# SIBILLA-ERA - DJF Mean T2m seasonal prob chart

(reference period 1981-2010)

## Tercile summary DJF 2015, mean 2m temp

<----Below lower tercile      Above upper tercile---->

70..100% 60..70% 50..60% 40..50% Other 40..50% 50..60% 60..70% 70..100%



# DJF Mean T2m – seasonal anomaly charts

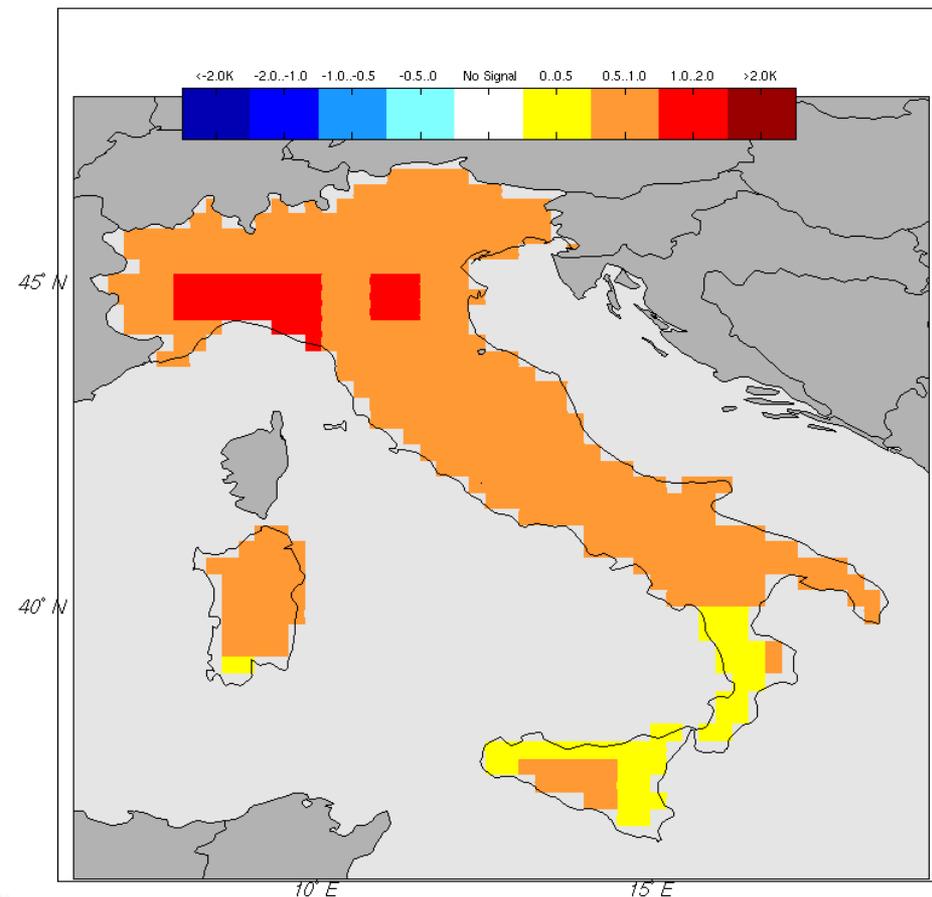
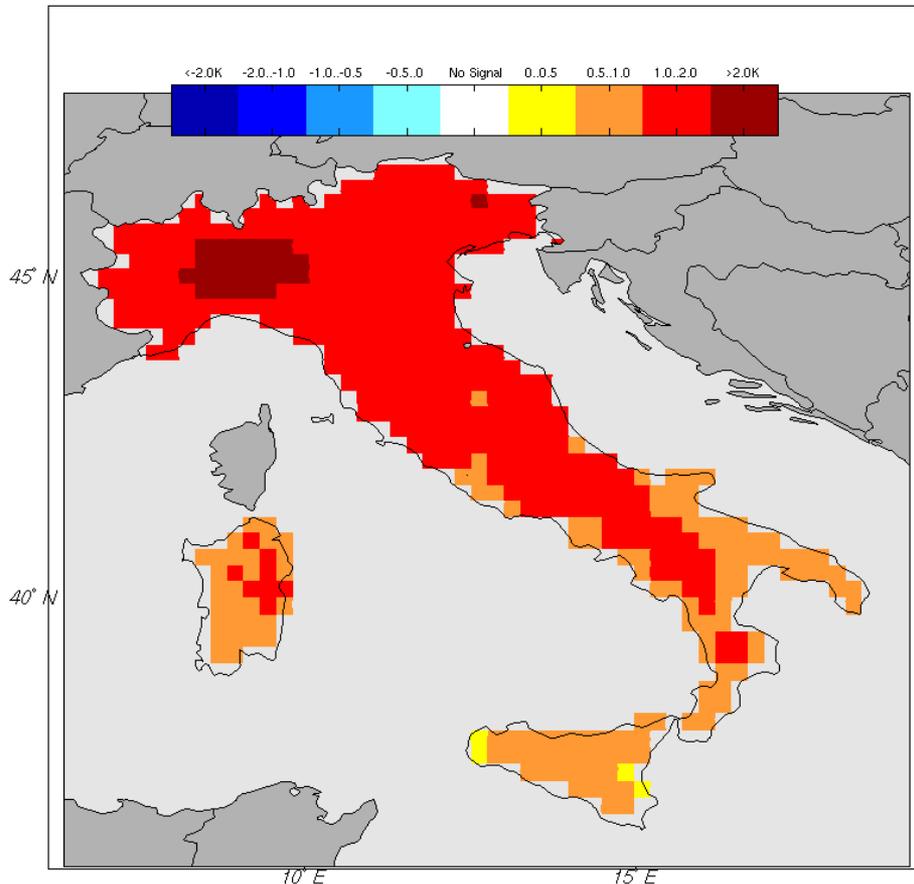
(reference period 1981-2010)

**SIBILLA-EOBS (MOS)**

**System4 Direct Model Output**

Ensemble mean Anomaly DJF 2015, mean 2m temp

mean 2m temp anomaly DJF 2015



# DJF Mean T2m seasonal prob charts

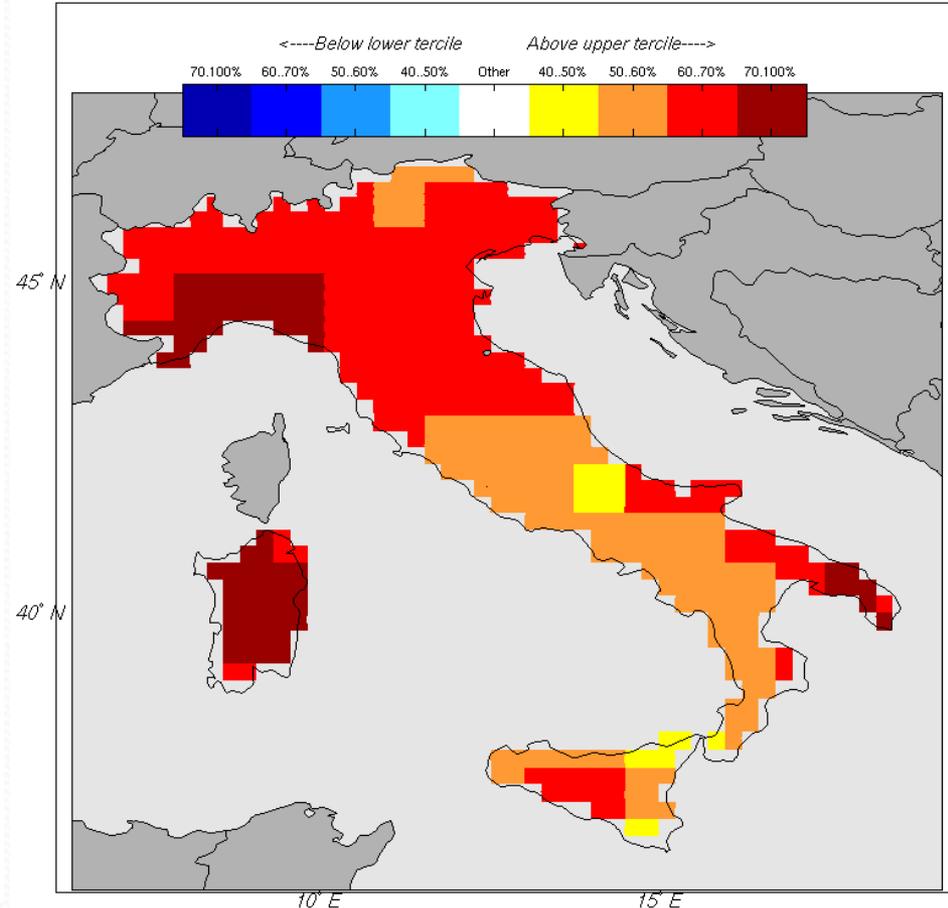
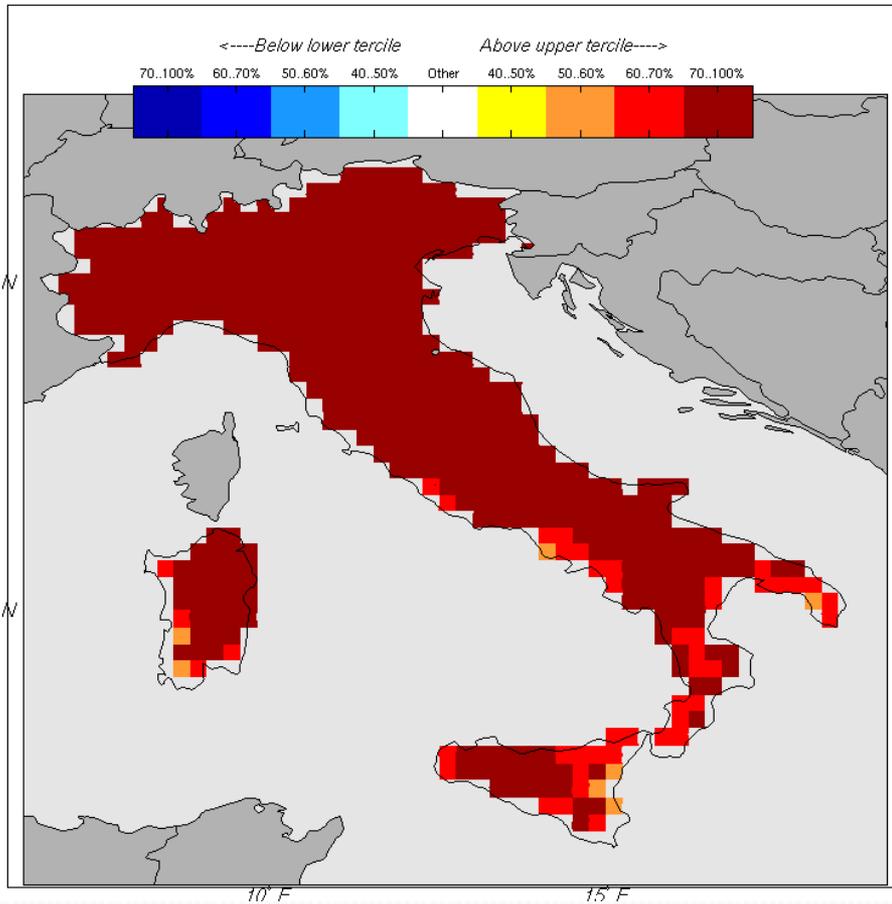
(reference period 1981-2010)

## SIBILLA-EOBS (MOS)

## System4 Direct Model Output

Tercile summary DJF 2015, mean 2m temp

Tercile summary of mean 2m temp DJF 2015



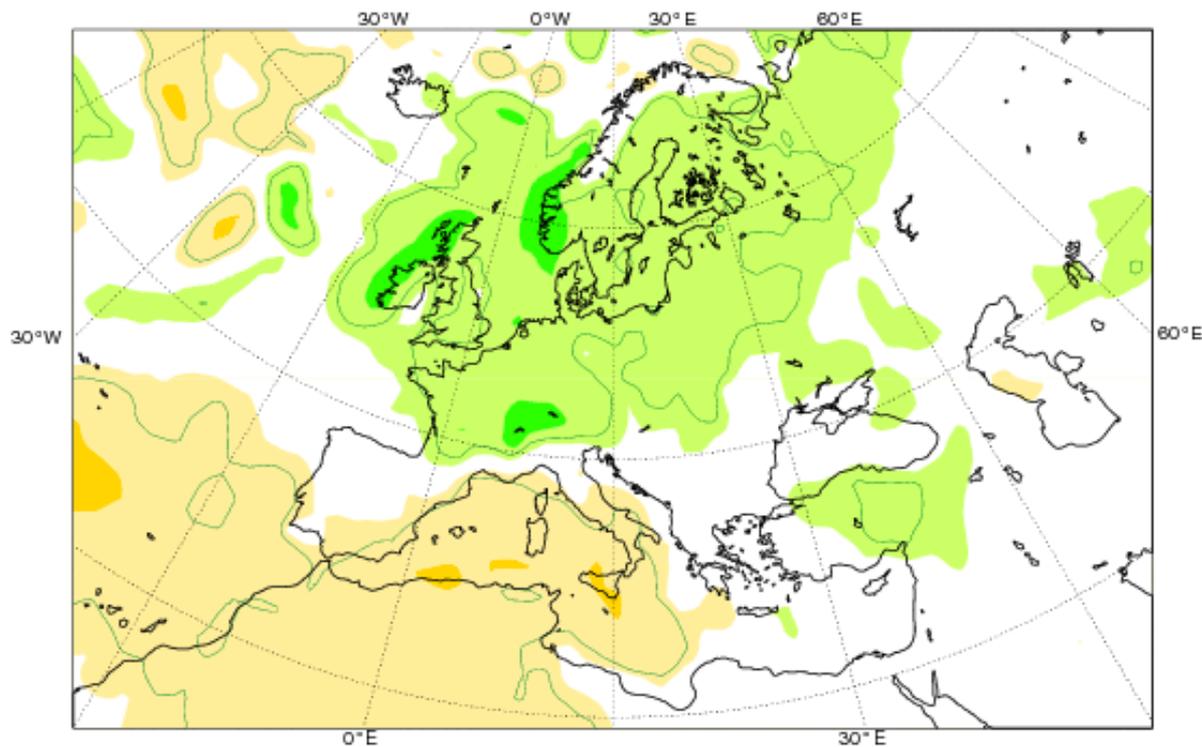
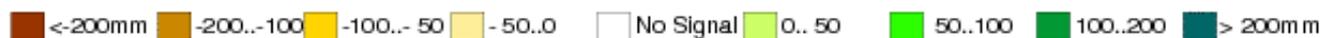
# System4 - DJF Total Precipitation

## seasonal anomaly chart

(reference period 1981-2010)

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

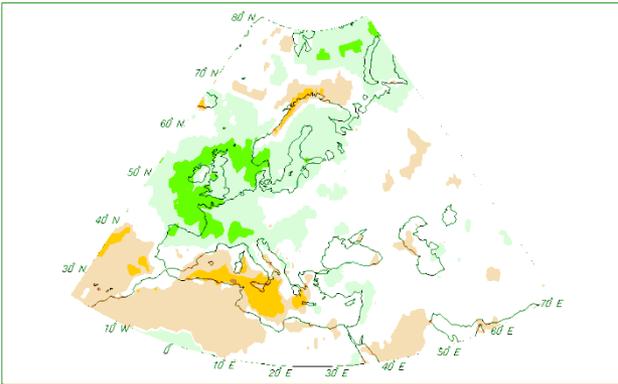
System 4  
DJF 2015/16  
Shaded areas significant at 10% level  
Solid contour at 1% level



# System4 - Total Precipitation monthly anomaly chart (reference period 1981-2010)

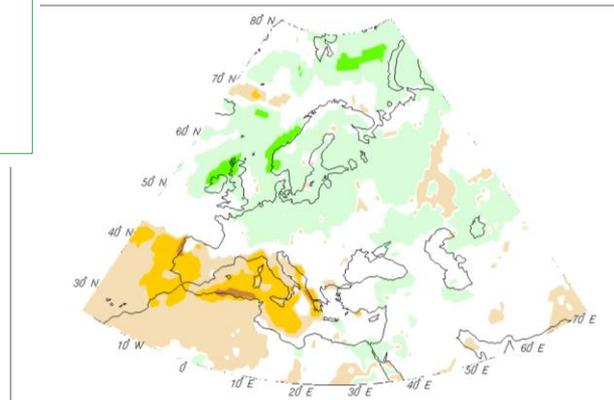
total precipitation anomaly Dec 2015

<200mm -200..-100 -100..-50 -50..0 No Signal 0..50 50..100 100..200 >200mm



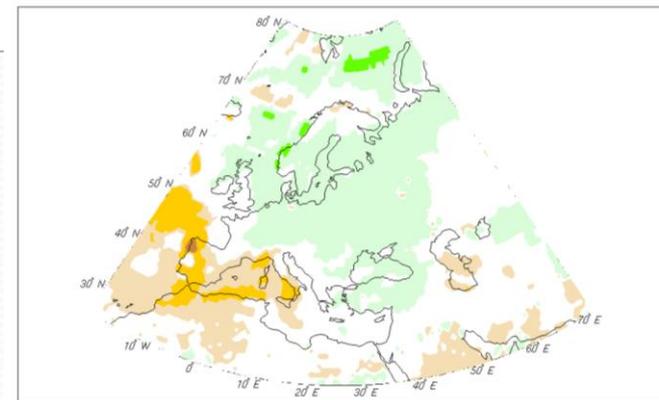
total precipitation anomaly Jan 2015

<200mm -200..-100 -100..-50 -50..0 No Signal 0..50 50..100 100..200 >200mm



total precipitation anomaly Feb 2015

<200mm -200..-100 -100..-50 -50..0 No Signal 0..50 50..100 100..200 >200mm

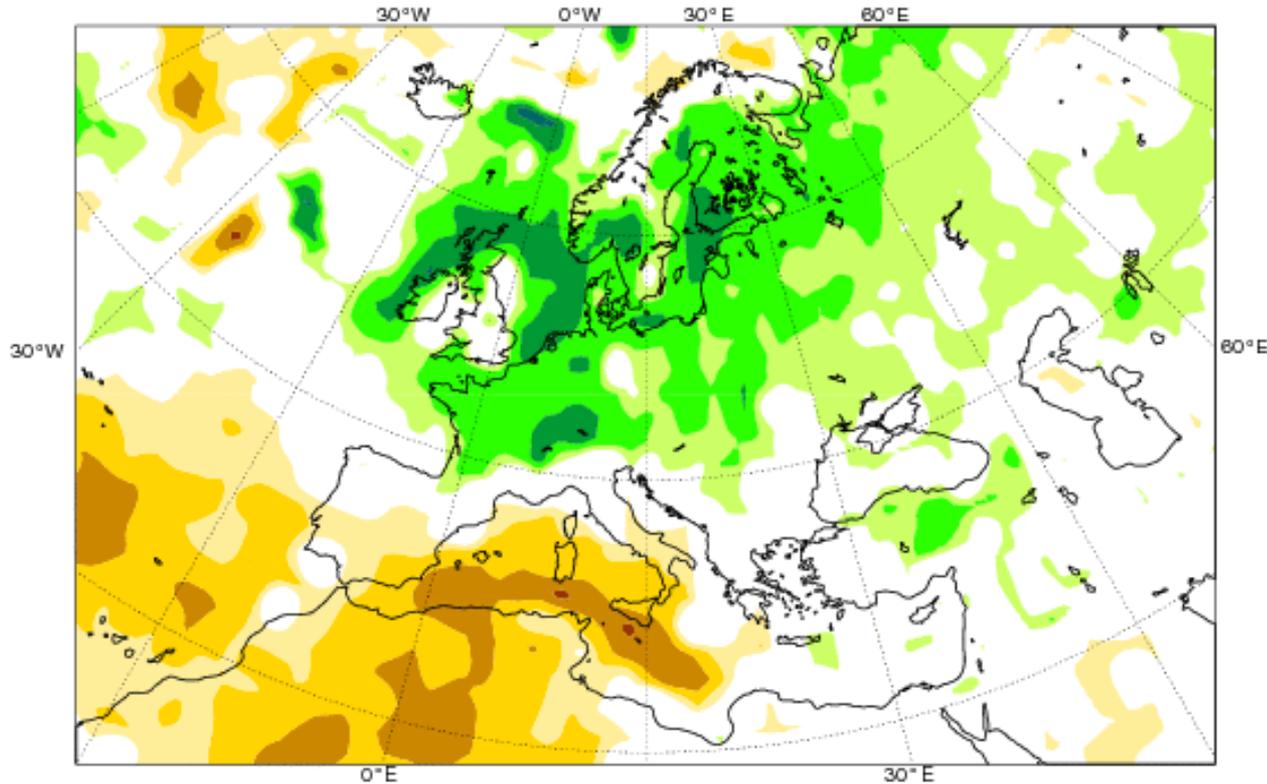


# System4 - DJF Total precipitation seasonal prob chart

(reference period 1981-2010)

ECMWF Seasonal Forecast  
Prob(most likely category of precipitation)  
Forecast start reference is 01/11/15  
Ensemble size = 51, climate size = 450

System 4  
DJF 2015/16



# DJF Total Precipitation seasonal anomaly charts

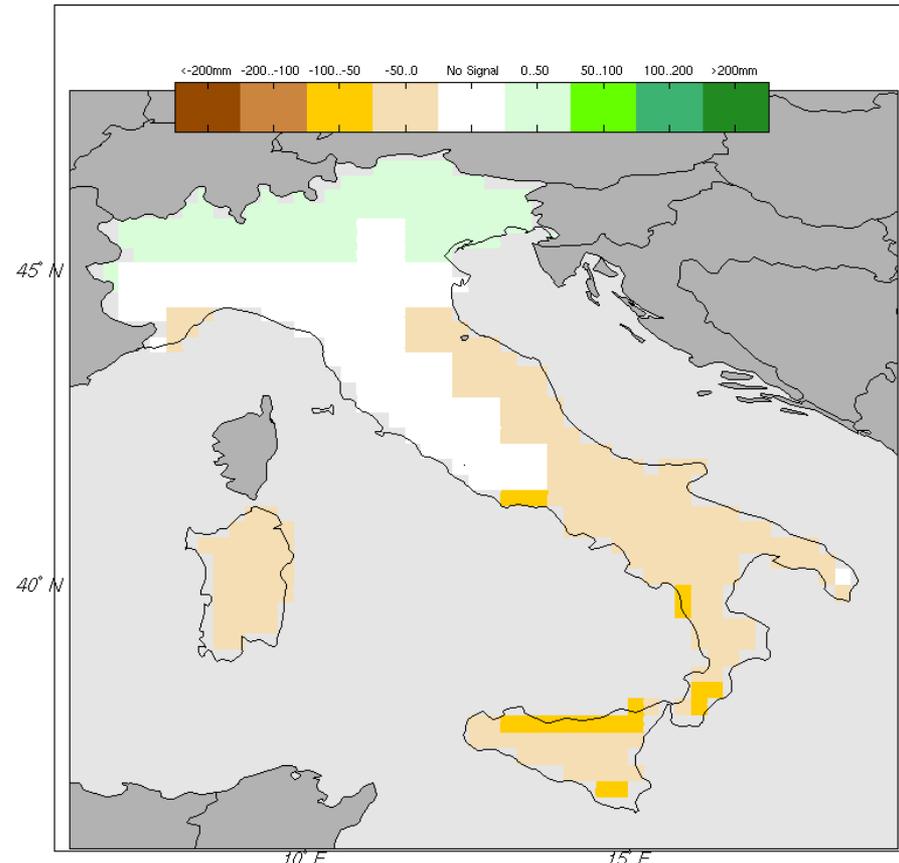
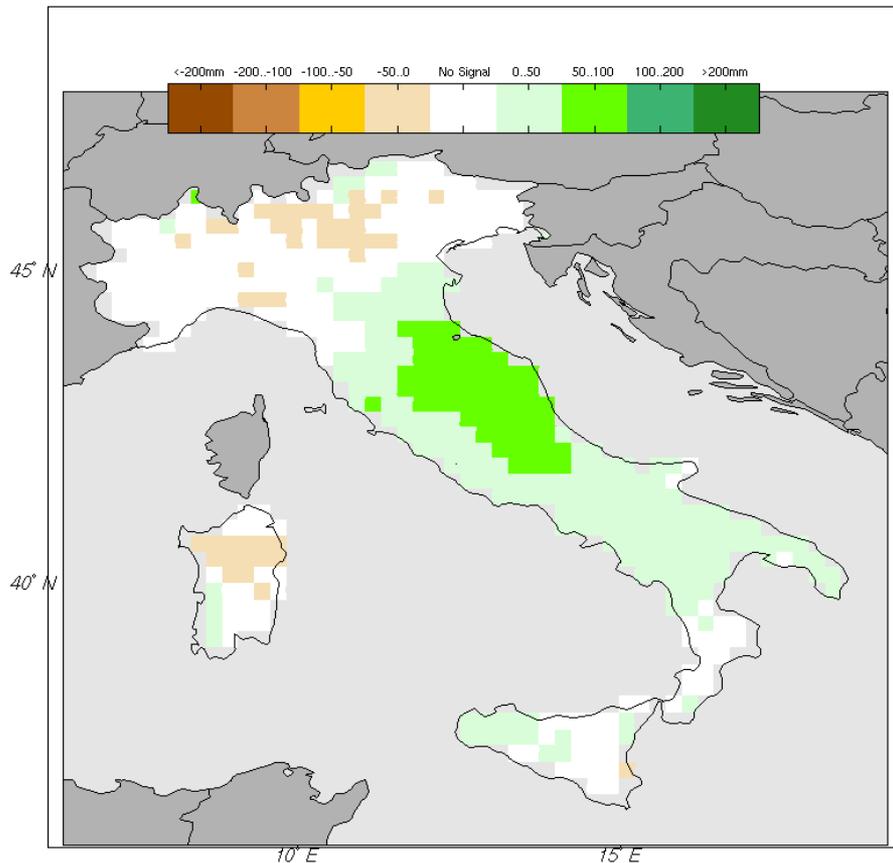
(reference period 1981-2010)

**SIBILLA-EOBS (MOS)**

**System4 Direct Model Output**

**Ensemble mean Anomaly DJF 2015, total precipitation**

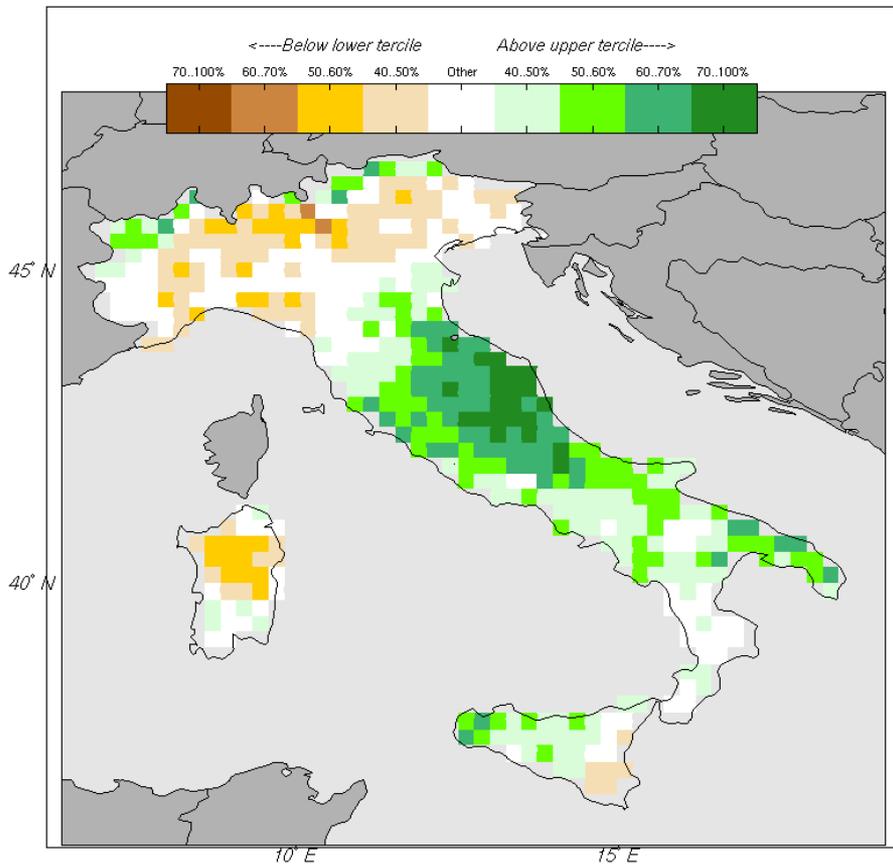
**total precipitation anomaly DJF 2015**



# DJF Total Precipitation seasonal prob charts (reference period 1981-2010)

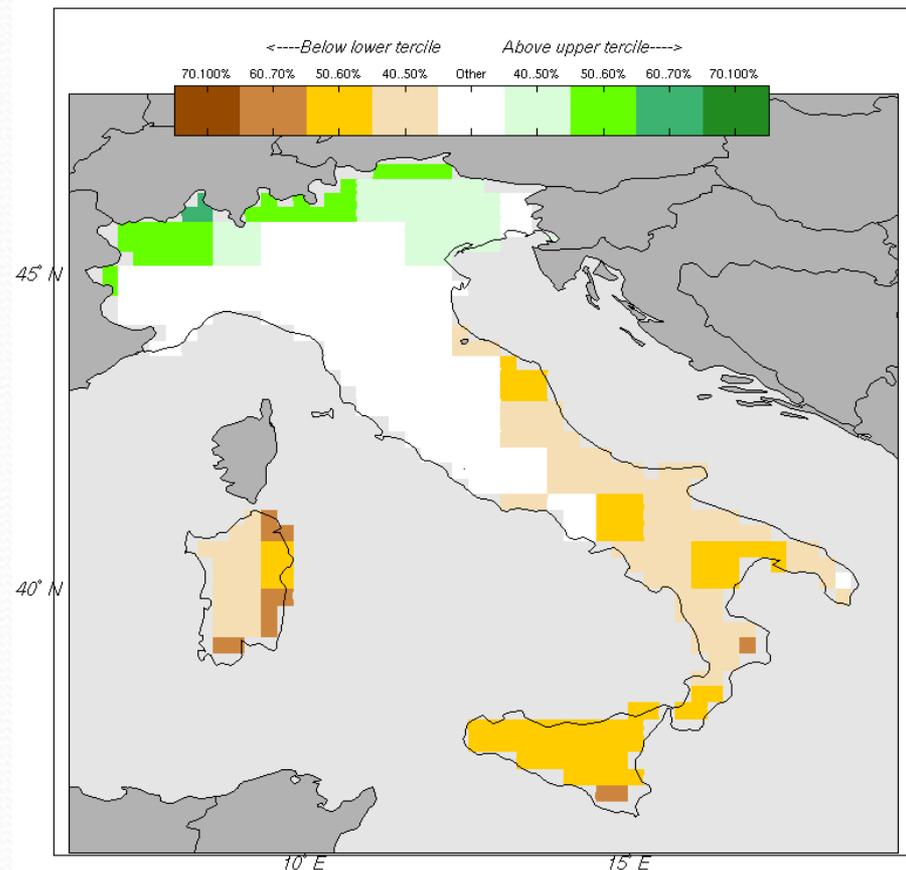
## SIBILLA-EOBS (MOS)

Tercile summary DJF 2015, total precipitation



## System4 Direct Model Output

Tercile summary of total precipitation DJF 2015



# DJF 2015-2016 ITAF-COMet final outlook - 1

## T2m

		X < 33p	33p < X < 66p	X > 66p	
<b>MedCOF Scenario</b>					
West		10	20	70	
Center		10	30	60	
East		20	50	30	
<b>ITALY</b>					
North		10	20	70	
Center		10	20	70	
South		10	25	65	

## Precipitation

		X < 33p	33p < X < 66p	X > 66p	
<b>MedCOF Scenario</b>					
West		40	30	30	
Center		40	30	30	
East		30	40	30	
<b>ITALY</b>					
North		40	30	30	
Center		30	30	40	
South		30	40	30	

# **DJF 2015-2016 ITAF-COMet final outlook - 2**

## **T2M**

The MSLP anomaly pattern in DJF seasonal projections is, most likely, at the origin of positive anomalies of temperature over large part of Europe. In particular, there is a strong probability of higher than normal temperatures over western and central part of Mediterranean area. On the contrary, a different situation could be possible over eastern countries.

## **Total Precipitation**

Making the necessary premise about the poor predictability of this parameter, our outlook indicates a slightly drier than normal conditions over western and central countries of the Mediterranean area.

Conversely, over eastern countries of MedCOF area normal conditions seem to be more likely.