

RA VI RCC Network

LRF Node

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*MEDCOF-1 - Belgrade
14-19 November 2013*

Members of the RCC Network (RA VI) Node on Long-range Forecasting

Leading institutions:

- **Météo-France and Roshydromet**

Participants:

- **Météo-France;**
- **Roshydromet;**
- **Norwegian Meteorological Institute;**
- **Republic Hydrometeorological Service of Serbia (RHMSS);**
- **Turkish State Meteorological Service**

Services provided by the RA VI RCC Network LRF Node

In the framework of GFCS the RCC Node on Long-range Forecasting provides operational services related to seasonal to inter-annual forecasts by interpreting products from GPCs, generating relevant regional and sub-regional products.

Service overview:

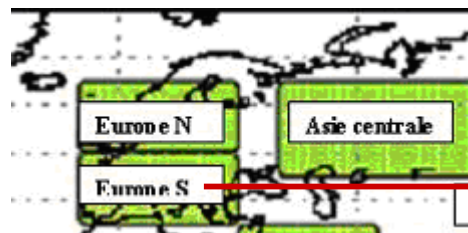
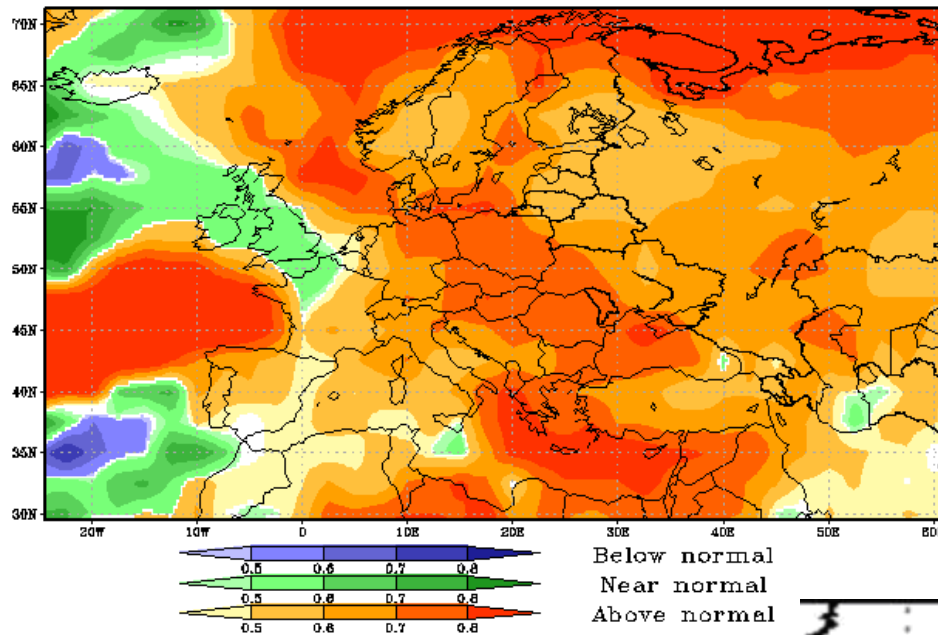
- Regional forecast products based on GPC data for National Meteorological Services of the region;
- Graphs and maps of the performance of GPCs' models;
- Monthly and quarterly bulletins analyzing and interpreting GPC products as well as;
- Regional and sub-regional seasonal outlooks;
- Forecast consistency statements;
- Verification datasets.

Foreseen products:

- Forecasts of subseasonal variability;
 - LRF downscaling products;
- etc.

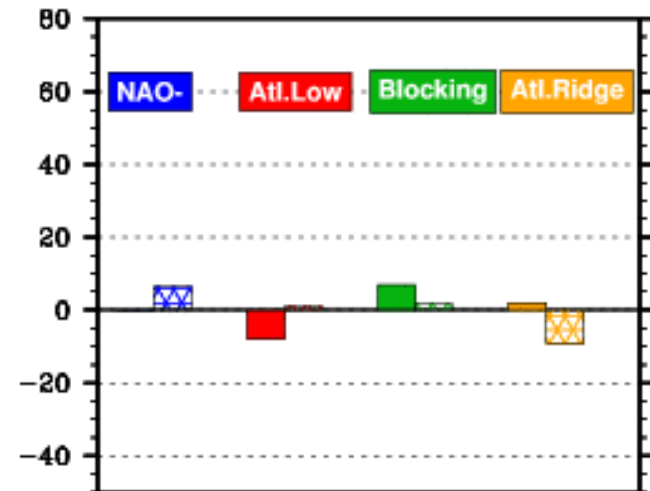
RA VI RCC Network LRF Node products examples for SON 2013

Composite probabilities of categorical forecast outcomes for T2m seasonal anomalies. Producer: HMC+MGO
Forecast period: September_October_November_2013

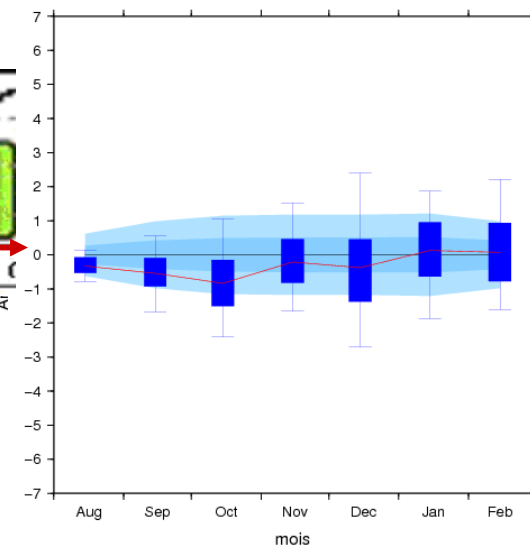


The LRF Node provides products relevant and/or tailored for the RA VI

Anomalous regime occurrence(%)

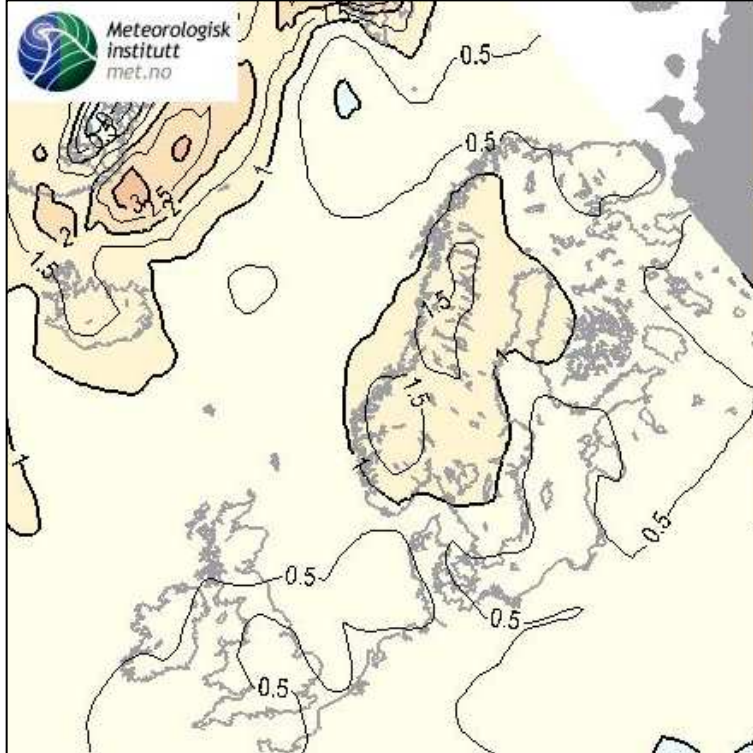


PRET Europe_S 2013 08



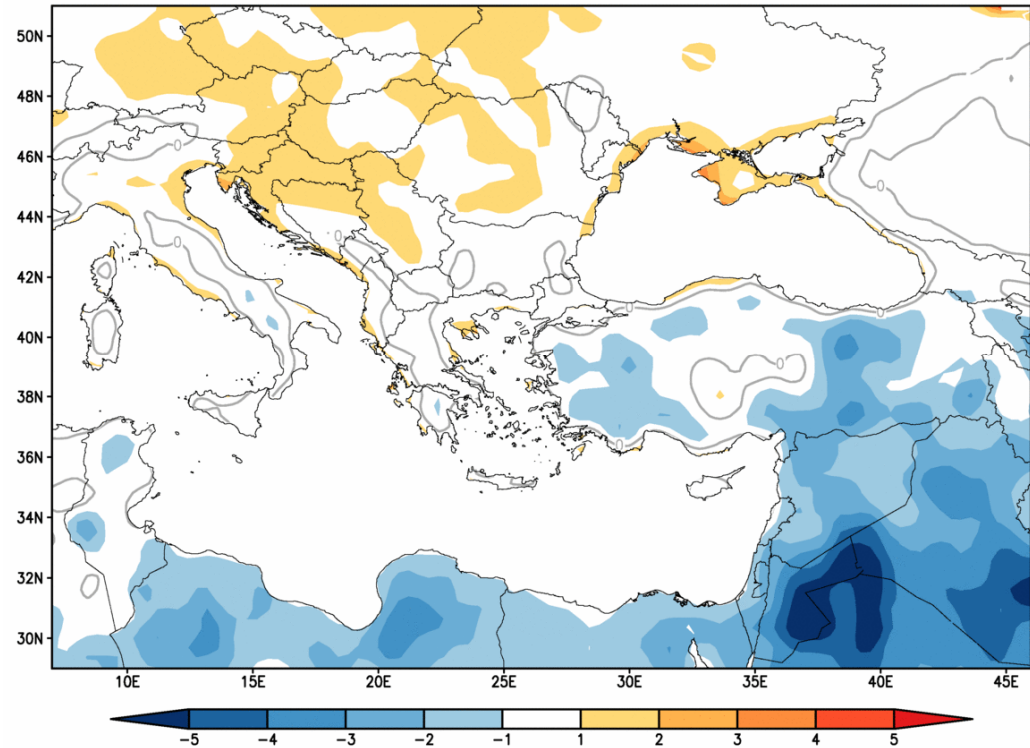
RA VI RCC Network LRF Node products other examples

NDJ 2010-2011 forecast for Temperature



Adaptation of LRF to Scandinavian regions

RCM-SEEVCCC: Mean 2m temp. anom. (°C) for season SEP-OCT-NOV 2013
Forecast start: 00Z01AUG2013



Regional dynamical downscaling using fully coupled atmosphere-ocean Regional Climate Model for South-Eastern regions

The LRF Node provides products relevant and/or tailored for the RA VI

RA VI RCC Network LRF Node products

MODELS	Northern Europe	Southern Europe	Central Europe	Eastern Europe	SEE Region
CEP	Grey	Grey	Yellow	Yellow	Yellow
MF	Yellow	Yellow	Yellow	Grey	Yellow
Met Office	Yellow	Grey	Yellow	Yellow	Yellow
CPC	Yellow	Grey	Grey	Grey	Yellow
JMA	Grey	Grey	Grey	Grey	Yellow
synthesis	Yellow	Grey	Yellow	Grey	Yellow
LC-MME	Grey	Grey	Grey	Grey	Grey
Eurosip	Yellow	Grey	Yellow	Yellow	Yellow
privileged scenario by RCC-LRF node	no privileged scenario	no privileged scenario	above normal	above normal	above normal

above normal
normal
below normal
no privileged scenario

The LRF Node also provides :

- Outlooks for RA VI sub-regions
- Active support for the Regional Climate Outlook Forums in RA-VI (SEECOF, NEACOF) including new developments (MedCOF issues)

SEECOF 8 (Left) and NEACOF 4 (right) participants



RCC Network

Belgrade
14-19 November 2013

Accessing products and services of the RA VI RCC Network LRF Node

A **catalog of delivered products** is available on the RA VI RCC network web site

RCC Network **products and services** are **accessible online** at www.rccra6.org and at the web-sites of the LRF Node members.

The products are also accessible via the metadata incorporated in the WMO Information System (WIS) and available online through established Global Information Services Centres (GISCs).

A **user name and password** may be required to access some products and services (see information on RA VI RCC Network web site). Users needing access to these products should contact their NMHS.

Operations : LRF Node in Toulouse

METEO-FRANCE

GPC/LRF Node RCC Toulouse

■ Operationnal Forecasting Suite (System 4)

- Distributed Forecasting suite, coupled model (Arpège *T127L31*) for atmosphere and *NEMO 1°* grid for the ocean)
- ECMWF atmospheric (and surface) analysis – Mercator oceanic analysis
- Hindcast *1991-2010 – 15 members*
- Operations : 7 month range forecast - 51 members
10 atmospheric * 5 oceanic Initial Conditions (+ 1 member)

■ Products

- Issuance at the beginning of the current month
 - ✓ commitment for the 8th at the latest
- Dedicated Web site
 - ✓ password protected – access granted on request under the WMO umbrella

Dissemination

■ External :

- Password protected ftp site <http://elaboration.seasonal.meteo.fr>
(on request under the WMO umbrella),
- ECMWF facilities (Euro-Sip MME, RCCs),

■ Availability dates :

- Beginning of the month in Toulouse,
- 15th of the month at ECMWF (within the Euro-Sip MME),
- GCB provided at the end of the month at the latest,

Extranet dedicated to Seasonal Forecasts

Login and password on request

6 Menus

METEO FRANCE
Toujours un temps d'avance

Extranet Prévisions saisonnières

Bonjour meteo my account | logout

English Français

Arpège forecasts Arpège scores A posteriori checks Documentation Climate bulletin General public bulletin

Welcome
to the extranet collaborative space created by MétéoFrance and **dedicated to seasonal forecasts.**
Check out the last scientific bulletin

Arpège Forecast
This space contains MétéoFrance Arpège forecasts
[Access ...](#)

A posteriori checks
This space provides you with maps and diagrams from the observed data
[Access ...](#)

Contribution workspace
Global Climate Bulletin design reserved area
[enter](#)

Arpège scores
This space contains the Arpege seasonal forecast scores
[Browse](#)

Documentation
[Browse](#)

Bulletin climatique global
[Browse](#)

Bulletins grand public
[Browse](#)

© Météo France - 2010 Legal mentions | Credits

Working Space

Extranet : Forecast access

Bonjour meteo | mon compte | se déconnecter

METEO FRANCE
Toujours un temps d'avance

Extranet Prévisions saisonnières

English

Arpège forecasts | Arpège scores | A posteriori checks | Documentation | Climate bulletin | General public bulletin

Home

Arpège Scores

This page is dedicated to the verification of the seasonal forecasting Arpege model. The calculation is based on parameters: T 2m, SST and Rain. Deterministic scores (Msss and correlation) and Probabilistic scores (Roc diagrams (boxes for ocean and area for lands). They are available for individual month (7 lead-time) and the 1 Plums diagrams for the ocean for 4 boxes in the Equatorial Pacific, in the Tropical Atlantic and Indian ocean.

- [See Atlantic boxes](#)
- [See Indian boxes](#)
- [See Pacific boxes](#)
- [See land boxes](#)

+ 3-months score maps
3-month Brier, Roc, msss, correlation and ratio scores for upper and lower terciles and 2 extreme categorie

+ 3-months score diagrams
3-month Roc and reliability diagrams for upper and lower terciles and 2 extreme categorie over different oc

+ monthly score maps
monthly Brier, Roc, msss, correlation and ratio scores for upper and lower terciles and 2 extreme categorie:

+ monthly score diagrams
monthly Roc and reliability diagrams for upper and lower terciles and 2 extreme categorie over different oc

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Bonjour meteo | mon compte | se déconnecter

METEO FRANCE
Toujours un temps d'avance

Extranet Prévisions saisonnières

English | Français

Arpège forecasts | Arpège scores | A posteriori checks | Documentation | Climate bulletin | General public bulletin

Home

Arpège Forecast

This part contains Météo-France Arpege forecasts. The forecasts are updated beginning of each month.

[See the documentation about products \(In French\)](#)

- + Forecast maps**
forecast maps (deterministic and probabilistic) available for 4 lead-time and 10 parameters for surface and altitude.
- + "Plum diagrams" for the Ocean**
Plums diagrams for the ocean for 4 boxes in the Equatorial Pacific, in the Tropical Atlantic and Indian ocean: SST anomaly forecasts over 7 months range.

[See Atlantic boxes](#)
[See Indian boxes](#)
[See Pacific boxes](#)

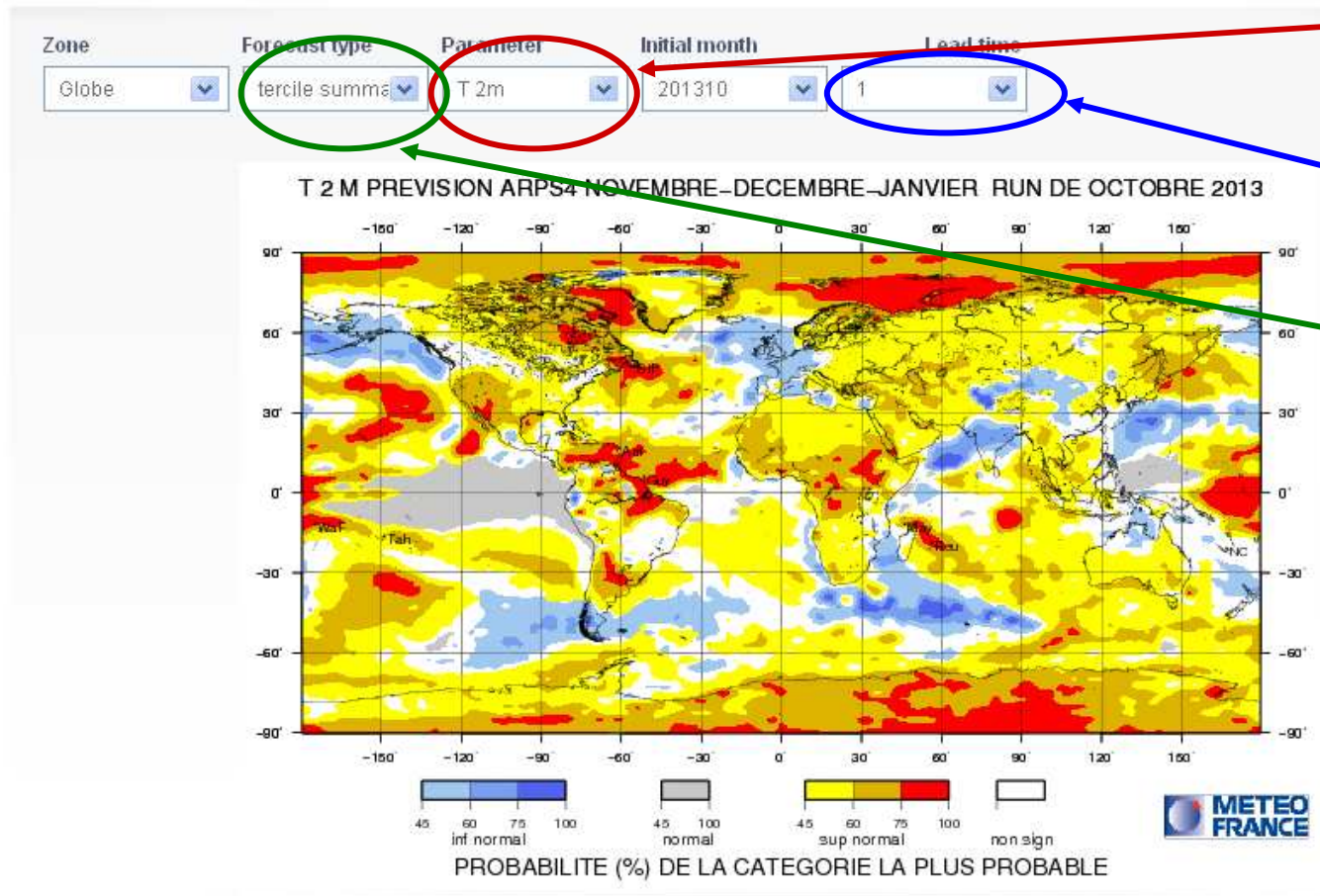
- + Circulation regimes**
Diagrams of circulation regime occurrence over North Atlantic sector.

- + Climagrams**
Temperature and precipitations Climagrams for 25 land boxes.

[See land boxes](#)

Extranet : Forecast access

Arpège forecasts - choose your map



12 parameters

4 Lead-Time

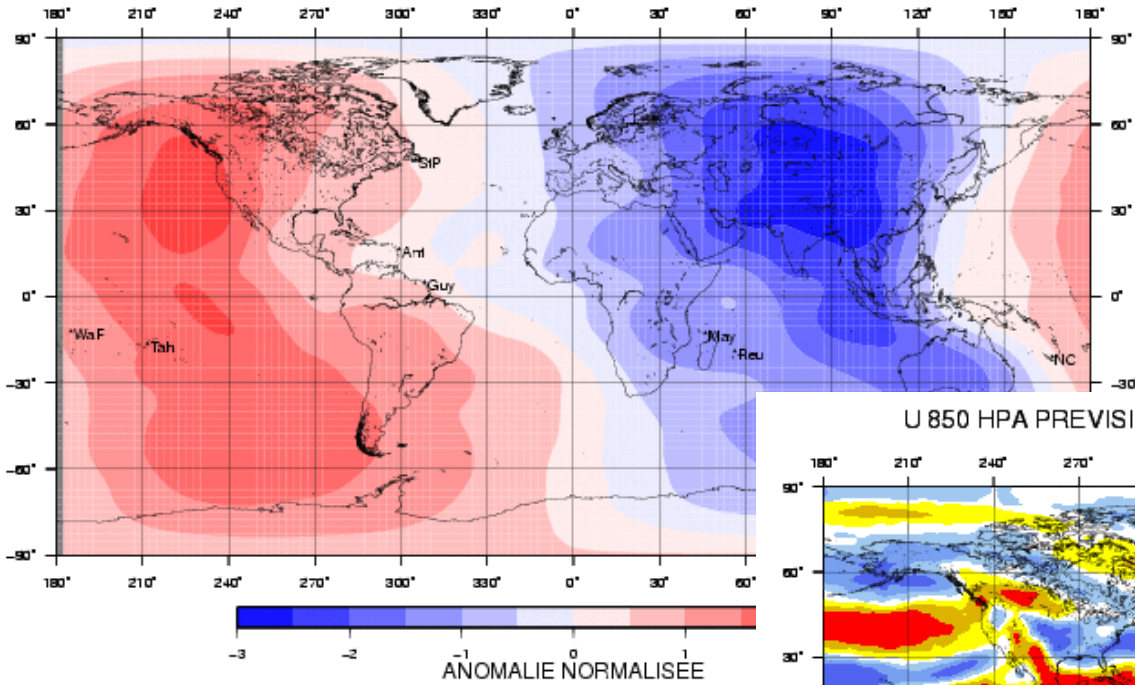
5 Probabilistic products (Terciles + Extreme cat.)

3 Deterministic products

Most likely category

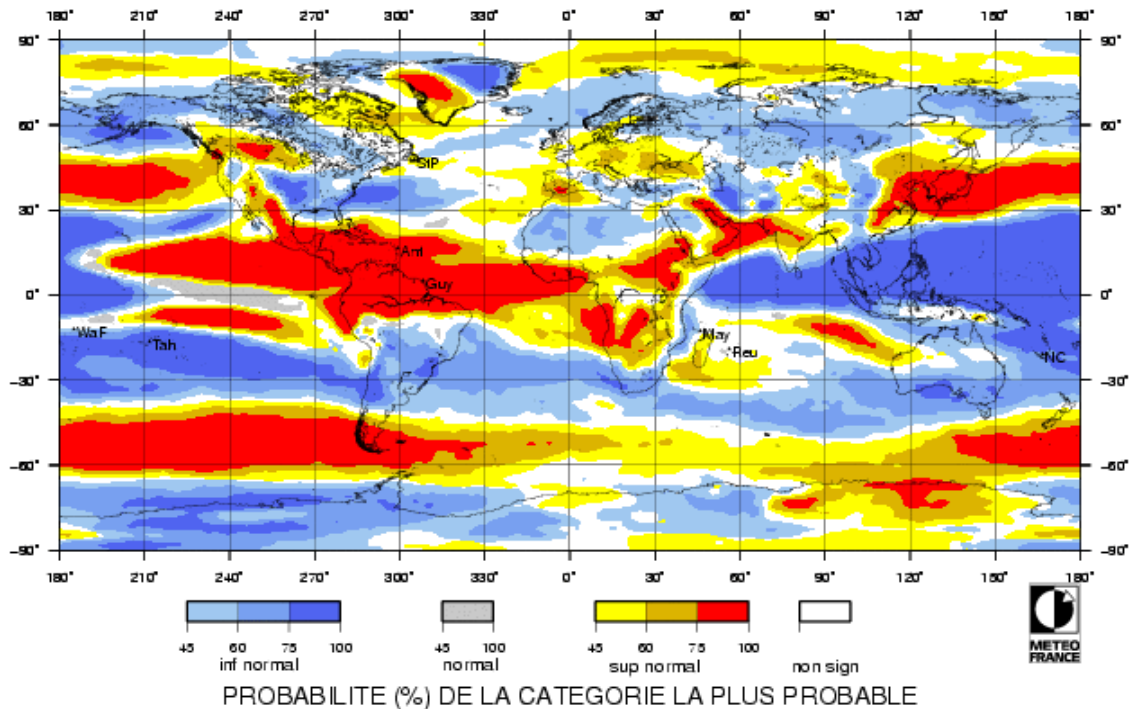
Products : General Circulation Velocity Potential 200 & U 850

KHI 200 HPA PREVISION JUILLET-AOUT-SEPTEMBRE RUN DE JUIN 2010



Velocity Potential at 200 hPa
- Standardized Anomaly

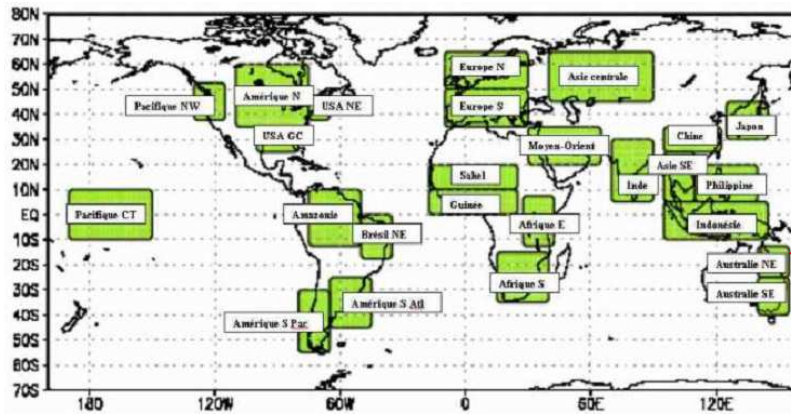
U 850 HPA PREVISION JUILLET-AOUT-SEPTEMBRE RUN DE JUIN 2010



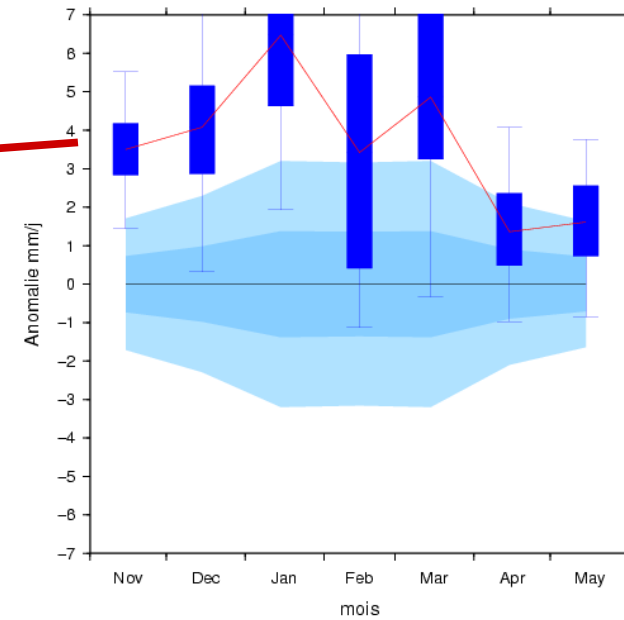
U 850 hPa – Most Likely Category

Additional Products

climagrams



PRET Australie_NE 2010 11



25 « land » boxes for T2m and RR

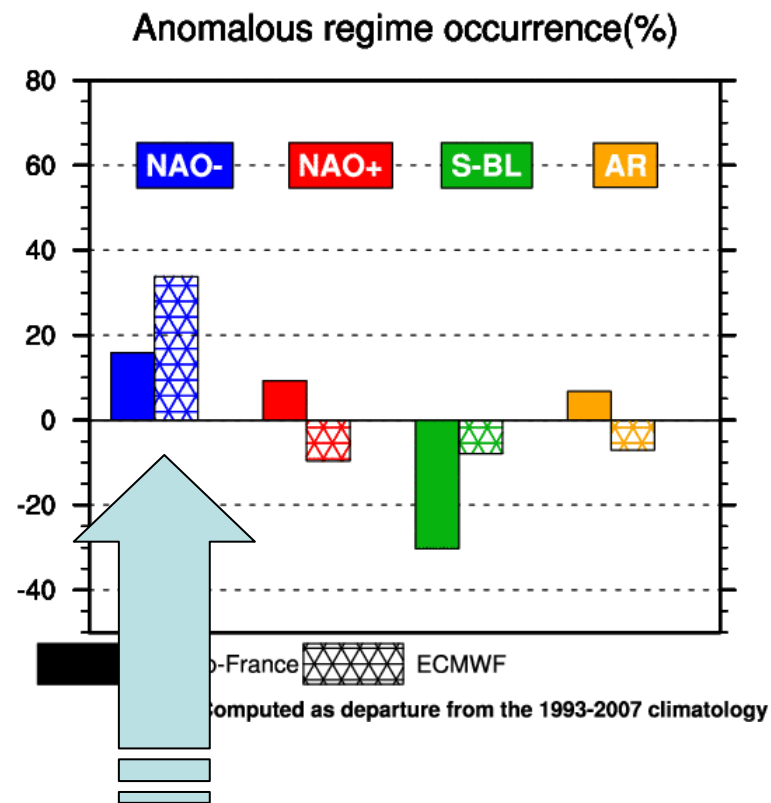
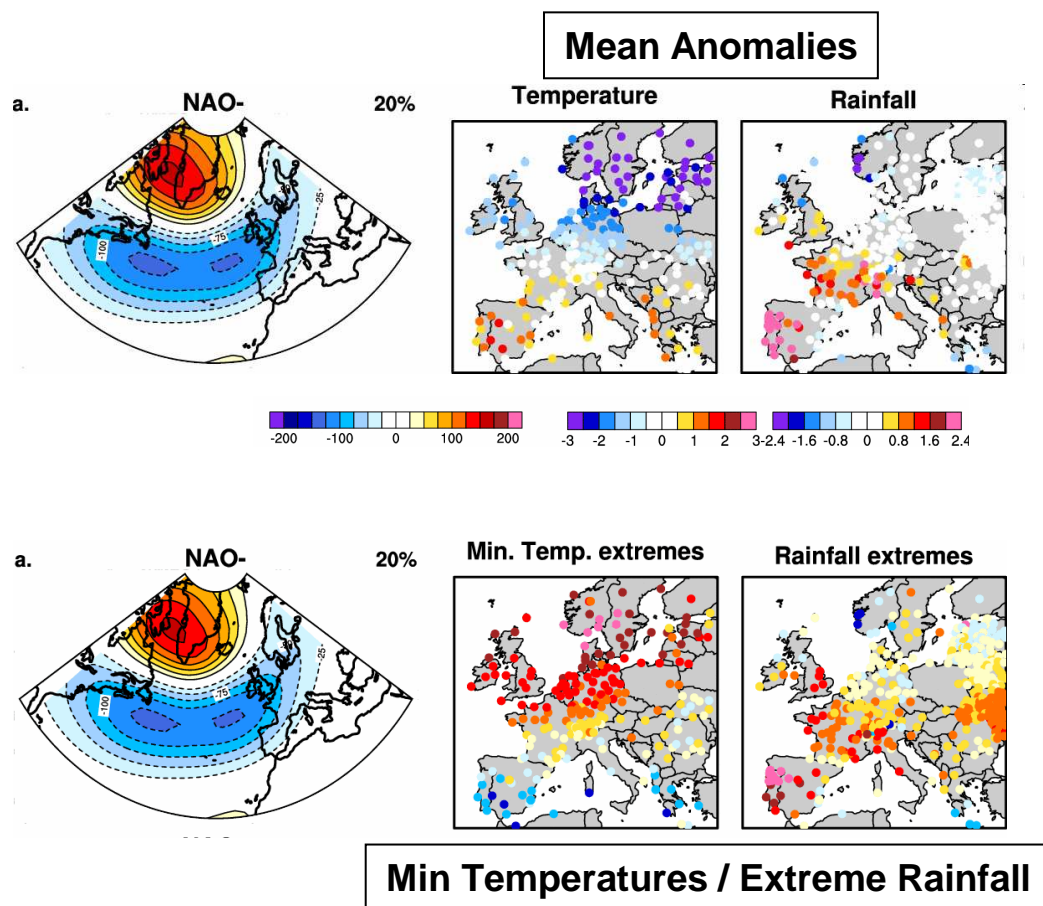
Same definition than ECMWF

Could be revisited

DJF 2010-2011 – Very Strong Niña

Additional Products : Circulation Regimes

- Forecast Mode and use – Winter 2009 forecasts



Increased Occurrence of NAO – regimes



GLOBAL CLIMATE BULLETIN
n°173 - NOVEMBER 2013

Products : Bulletins

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Global Climate Bulletin n°173
(issued end of October)
September 2013 observations

Soon

Global Climate Bulletin n°174
(issued end of November)
October 2013 observations



GLOBAL CLIMATE BULLETIN
n°173 - NOVEMBER 2013

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Products : Bulletins

Global Climate Bulletin n°173 (issued end of October) September 2013 observations NDJ 2013 forecasts

MODELS	Northern Europe	Southern Europe	Central Europe	Eastern Europe	SEE Region
CEP					
MF					
Met Office					
CPC					
JMA					
synthesis					
LC-MME					
Eurosip					
privileged scenario by RCC-LRF node	no privileged scenario	no privileged scenario	no privileged scenario	above normal	above normal

Expertised scenarios – sub-regional

GPC/LRF Node RCC Toulouse

■ Additional contribution

- MEDCOF
 - ✓ Promotion and participation to the dedicated scoping meeting (June 2013 – Madrid)
 - ✓ Participation to the Interim Management Team
 - ✓ Participation to the first MEDCOF (Belgrade – mid-November)
- COFs participation
- Guide on downscaling of Seasonal Forecasts for RCOFs
 - ✓ Preliminary version based on the SWIOCOF experience

■ News

- Model change for operations in January 2013 (System 4)
- Activation of the Wiki page on the dedicated Web site
 - ✓ Password protected – access granted on request under the WMO umbrella
 - ✓ First try with DWD (on the Monitoring part) mid-october

RCC perspectives

METEO-FRANCE

RCC Perspectives

■ Monitoring and Forecast consistency

- Sharing analysis and possible evolutions of the climate system (monitoring and forecasts)
- *General Circulation Indices*
- *Extreme events*
- *Sub-regional products*
- *Predictability Diagnosis*
- *Monitoring products*

RCC Perspectives

Forecasting & Monitoring : sharing analysis of the climate system

The screenshot shows the METEO FRANCE Extranet interface. At the top, there are navigation tabs for 'Arpège forecasts', 'Arpège scores', 'A posteriori checks', 'Documentation', 'Climate bulletin', and 'General public bulletin'. Below these, there are sub-tabs for 'Current bulletin' and 'Saved Bulletin'. The main content area features a 'Welcome' message, an 'Arpège Forecast' section with an 'Access' button, and an 'A posteriori checks' section with an 'Access' button. There are also sections for 'Contribution workspace', 'Arpège scores', 'Documentation', 'Bulletin climatique global', and 'Bulletins grand public'. A red arrow points from the 'Current bulletin' tab to the 'View' button in the draft view.

Access to the draft of the bulletin allowing to share figures, comments, ...

The screenshot shows a draft view of a climate bulletin. At the top, there are navigation tabs for 'Current bulletin' and 'Saved Bulletin'. Below these, there is a 'Home' section with 'View', 'Talk', 'Edit', and 'Revisions' buttons. The main content area features a 'DESCRIPTION OF THE CLIMATE SYSTEM' section with sub-sections for 'Oceanic analysis' and 'Global analysis'. There are two global maps showing temperature anomalies. The top map is titled 'PSY3V3 Hindcast Anomaly February 2013' and the bottom map is titled 'PSY3V3 Hindcast Anomaly Tendency February 2013-January 2013'. Both maps show temperature anomalies at level 1 (999h) with a color scale from -4 to 3.5. A red arrow points from the 'View' button to the draft content.

Wiki page automatically updated (for most of the figures)

Bulletin and others

Bulletins : (possible) Briefing Recording



Arborescence parcourue : Accueil > Production

Les présentations "SPEECHI"

Retour niveau supérieur

► Briefing prévision saisonnière

Briefing du 15 janvier 2010 par Jean-Pierre CERON

Briefing du 5 février 2010 par François VINIT

Briefing du 5 mars 2010 par Christophe CASSOU

Briefing du 2 avril 2010 par François VINIT


Briefing du 7 mai 2010 par Yves TOURRE

Briefing du 4 juin 2010 par Christophe Cassou

Climascope | Climsol | Okapi | Cat-cms | Rhapsodie | BDEM

OGEDOC | OGEDOC NAT | AMELIO | AM

Briefing Prévision Saisonnière



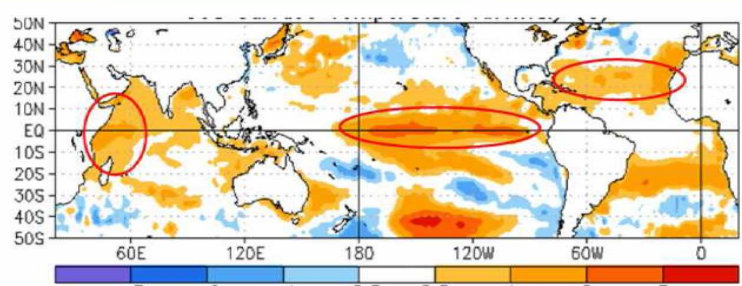
Jean-Pierre Caron
jean-pierre.caron@meteo.fr
Durée : 17 m 6 s

Briefing Prévision Saisonnière

- L'état du système climatique en Novembre
- L'état du système climatique en Novembre
- La circulation générale en Novembre
- La circulation générale en Novembre
- La circulation générale en Novembre
- La circulation générale en Novembre
- Les Prévisions de SST JFM
- Les Prévisions de SST JFM
- Les Prévisions de Circulation Générale
- Les Prévisions de température JFM
- Les Prévisions de précipitations JFM
- Les Prévisions de Circulation Générale
- Géopotential à 500 hpa
- Les régimes de temps
- Qu'est ce que la NAO - ?
- Les NAO- de l'hiver 2009-2010
- Synthèse

3/18 00:53 / 01:21

L'état du système climatique en Novembre



Océan Indien chaud à l'Ouest

El Niño à maturité et développement d'une langue froide à l'Est (Sud)

Atlantique tropical chaud

METEO FRANCE
Toujours un temps d'avance

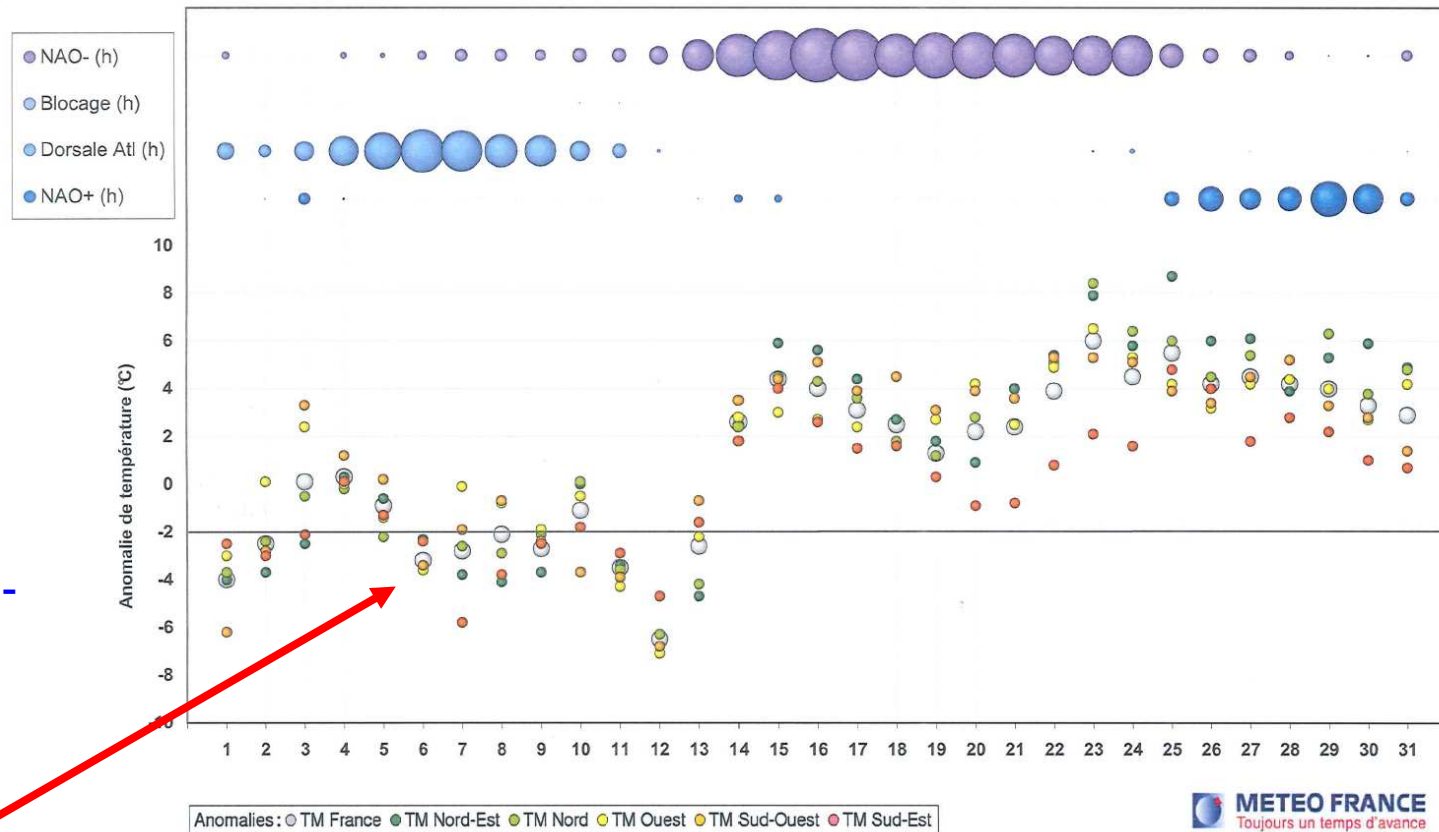
RCC Perspectives

■ Monitoring and Forecast consistency

- *Sharing analysis of the climate system (monitoring and forecasts)*
- General Circulation Indices and Circulation Regimes
- *Extreme events*
- *Sub-regional products*
- *Predictability Diagnosis*
- *Monitoring products*

Circulation regimes perspectives

Corrélations aux régimes de temps et anomalies de température
 Décembre 2012



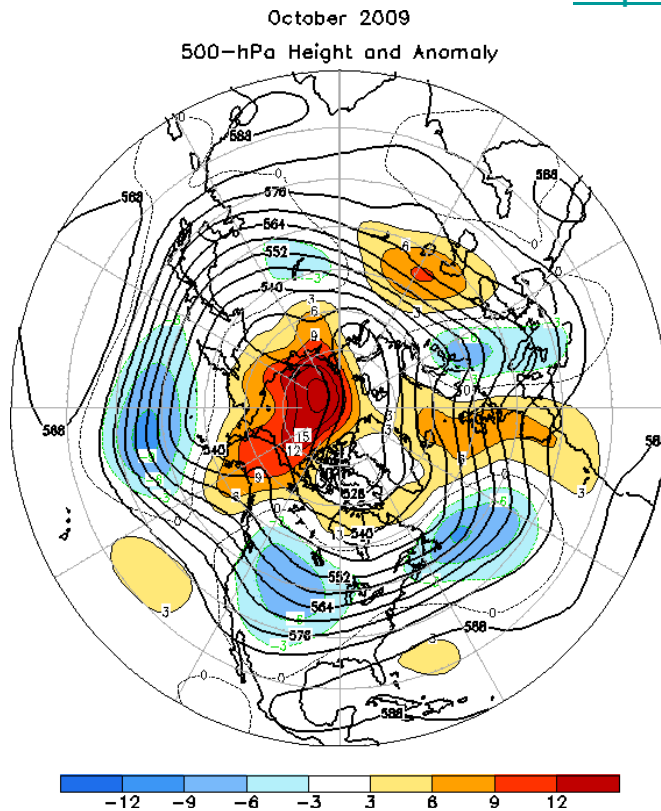
Better use of the distance :

- Correlation
- Bias
- Amplitude

Common regional and sub-regional indices to look at both in Monitoring and Forecasting modes

General Circulation Indices

<http://www.cpc.ncep.noaa.gov/products/CDB/Extratropics/table3.shtml>



MONTH	NAO	EA	WP	EP-NP	PNA	TNH	EATL/WRUS	SCAND	POLEUR
OCT 09	-1,0	1,4	-2,4	0,7	0,4	---	-0,1	-0,9	-2,6
SEP 09	1,5	0,9	-0,7	-1,7	1,3	---	-0,5	-0,8	0,9
AUG 09	-0,2	2,6	0,3	-2,3	0,6	---	-0,5	-0,5	0,2
JUL 09	-2,2	1,0	0,5	1,4	1,2	---	0,3	-1,0	-0,5
JUN 09	-1,2	-1,0	-1,6	-0,1	0,4	---	0,7	-0,1	0,2
MAY 09	1,7	1,5	-1,2	1,6	-0,6	---	0,2	0,2	-0,8
APR 09	-0,2	0,7	-0,1	0,6	0,2	---	1,4	-0,2	1,8
MAR 09	0,6	-0,9	0,4	-1,0	-1,0	---	0,1	-0,7	-0,9
FEB 09	0,1	-0,5	2,2	0,6	-0,9	0,4	-0,8	0,6	-0,4
JAN 09	0,0	1,6	0,4	-0,3	0,6	1,9	-1,4	-0,1	0,3
DEC 08	-0,3	-0,6	1,1	---	-1,4	2,1	-1,5	0,1	-0,8
NOV 08	-0,3	-0,5	0,3	0,8	1,1	---	-1,0	-1,0	0,3
OCT 08	0,0	0,5	-0,1	-1,2	0,9	---	-1,3	-1,1	1,4
SEP 08	1,0	0,0	-0,6	-0,7	1,1	---	-0,9	1,1	-0,1

http://iridl.Ideo.columbia.edu/maproom/.Global/.Atm_Circulation/Monthly_Height.html

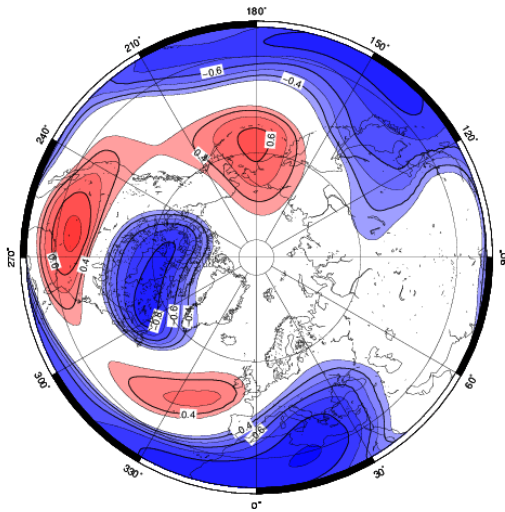
More information :

<http://www.cpc.ncep.noaa.gov/data/teledoc/telecontents.shtml>

Relationship regimes / variability modes

- Decomposition in terms of variability modes for December and the MF ensemble mean
- EOF analysis and varimax rotation (Linear method)

MODE 1 - MF

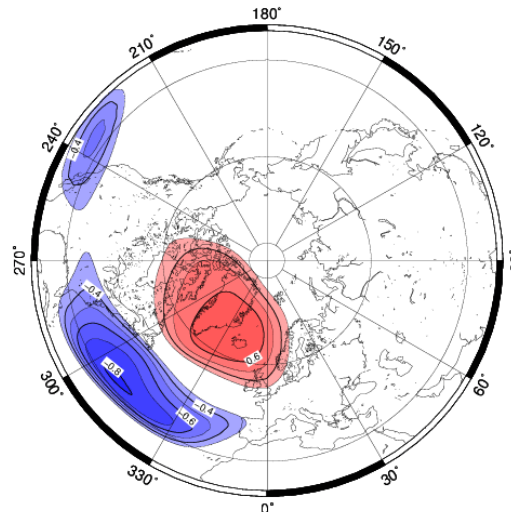


Explained Variance : 21,9 %

Correlation with NAO- : - 0,75

No correlation with NAO+

MODE 6 - MF



Explained Variance : 6,9 %

Correlation with NAO+ : - 0,85

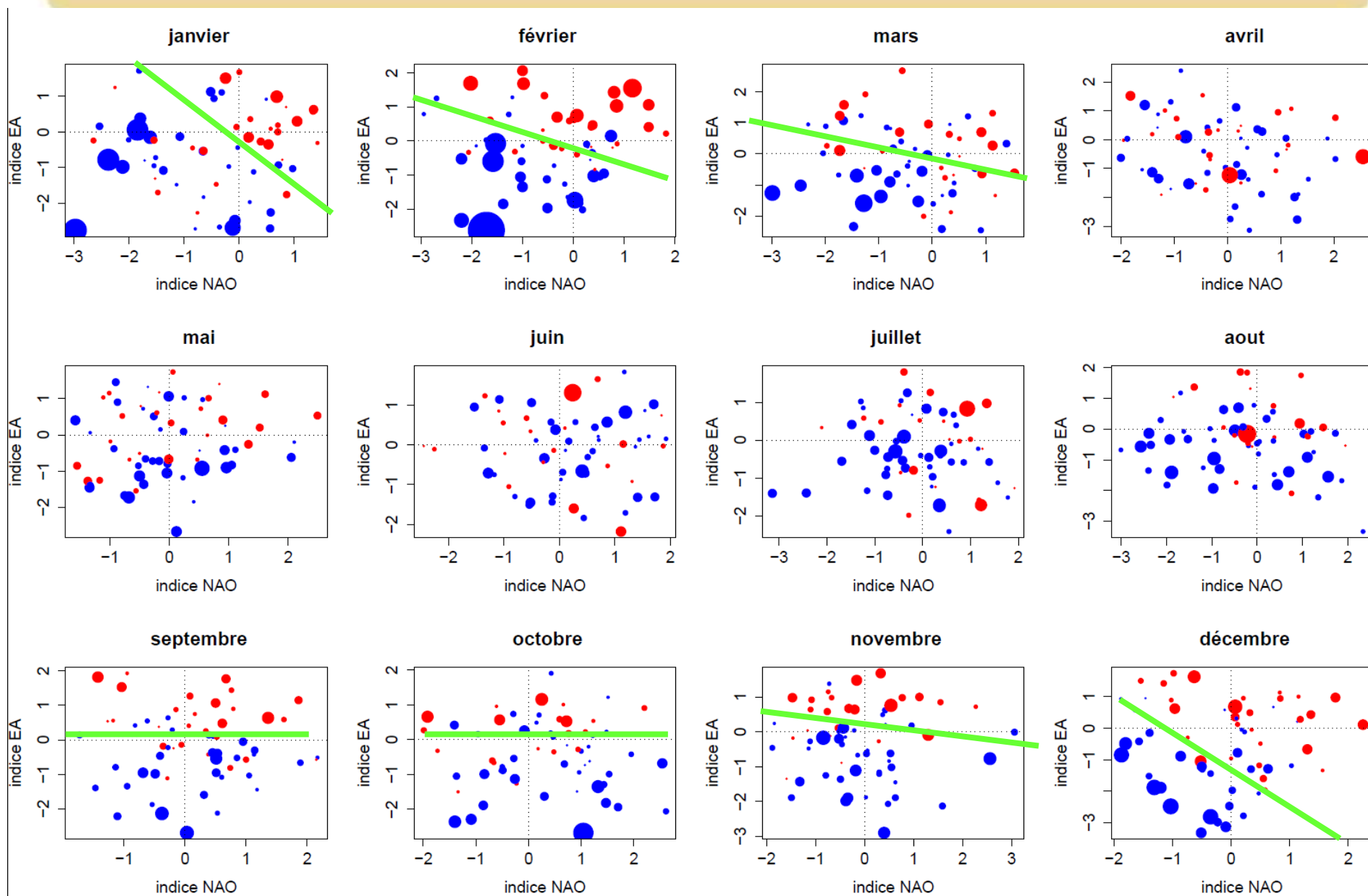
No correlation with NAO-

➤ Mode 1 is the more correlated to ENSO

➤ Mode 1 is related to NAO- occurrences

➤ the only regime not related to Mode 1 is NAO+ (strongly related to Mode 6)

Use of GC Indices



RCC Perspectives

■ Monitoring and Forecast consistency

- *Sharing analysis of the climate system (monitoring and forecasts)*
- *General Circulation Indices*
- **Extreme events**
- *Sub-regional products*
- *Predictability Diagnosis*
- *Monitoring products*

RCC Perspectives

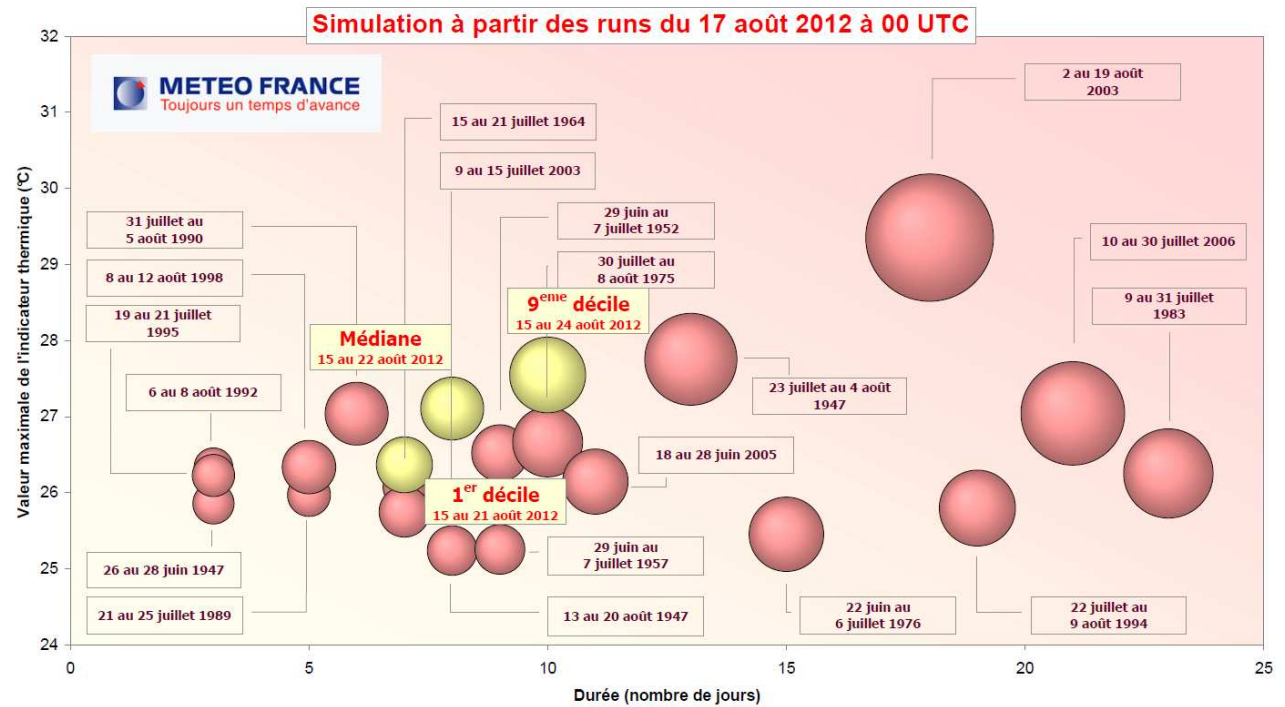
■ Merging monitoring and forecasting information

- Better coordination
- Which forecast ?
- Which baseline ?
- Useful for CW ?
- ...

Extreme events

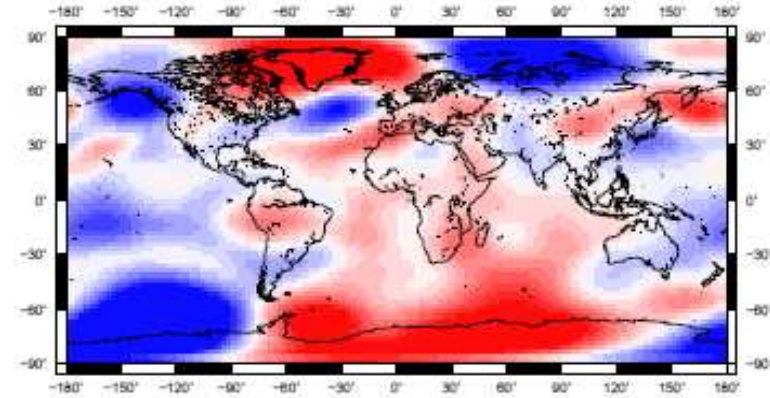
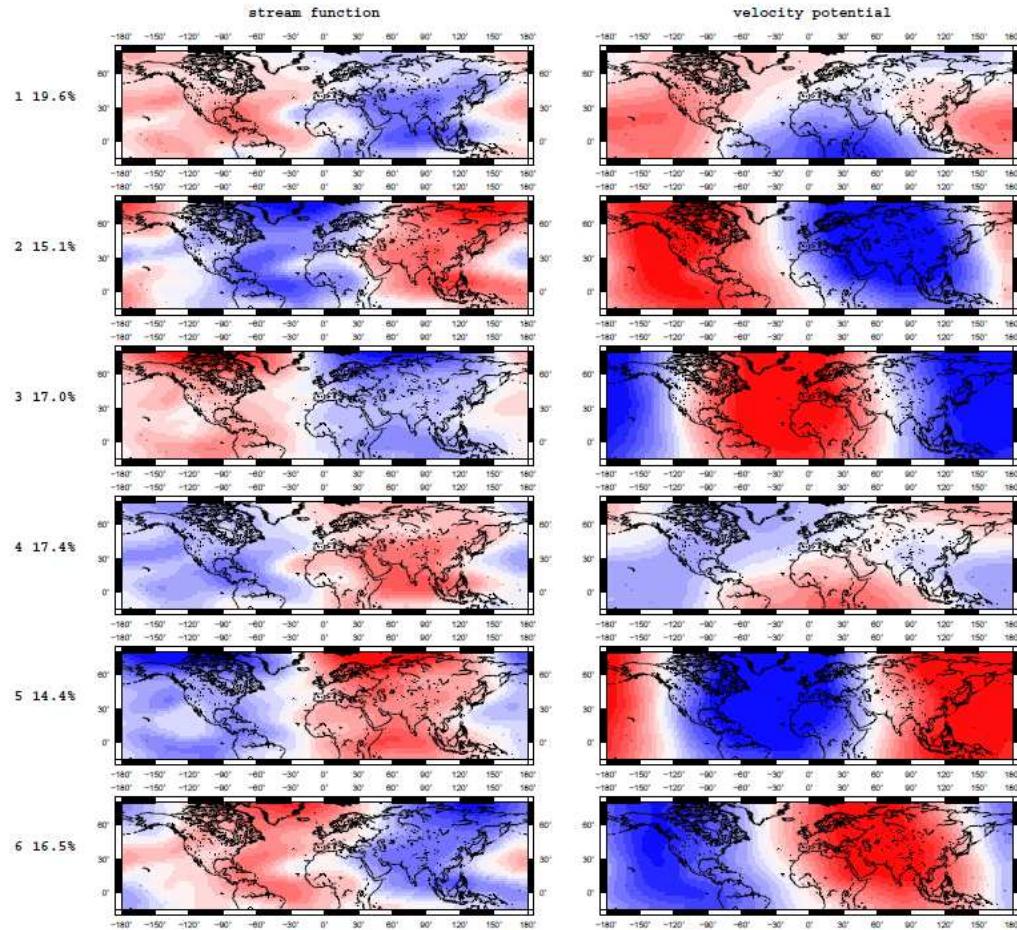
Heat Waves in France

(1947-2012)



La surface des sphères symbolise l'intensité globale des vagues de chaleur, les sphères les plus grandes correspondant aux vagues de chaleur les plus sévères

RCC Perspectives



Psi 200 Composite for years with a high number of HPE

	MF	EC	MED	NPIR
ROC (area)	0.62	0.71	0.68	0.77
95% Bootstrap	(0.37, 0.83)	(0.48, 0.90)	(0.41, 0.92)	(0.56, 0.94)

ROC area for years with a high number of HPE

Extreme events

Psi and Khi 200 Circulation Regimes in SON

RCC Perspectives

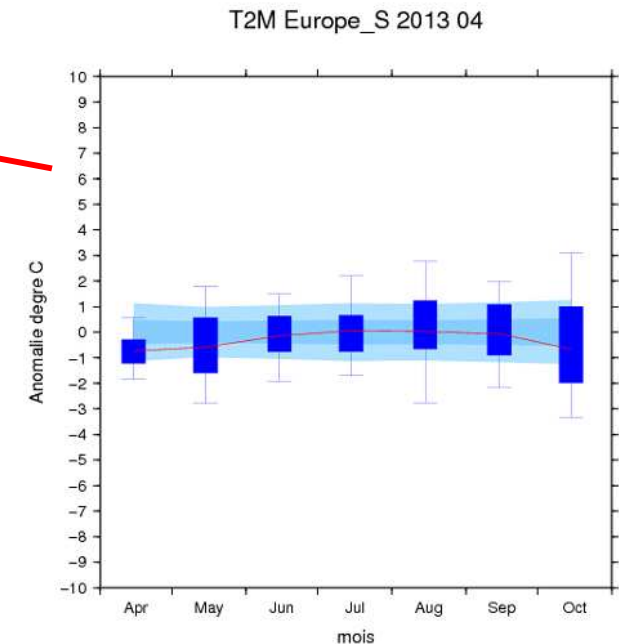
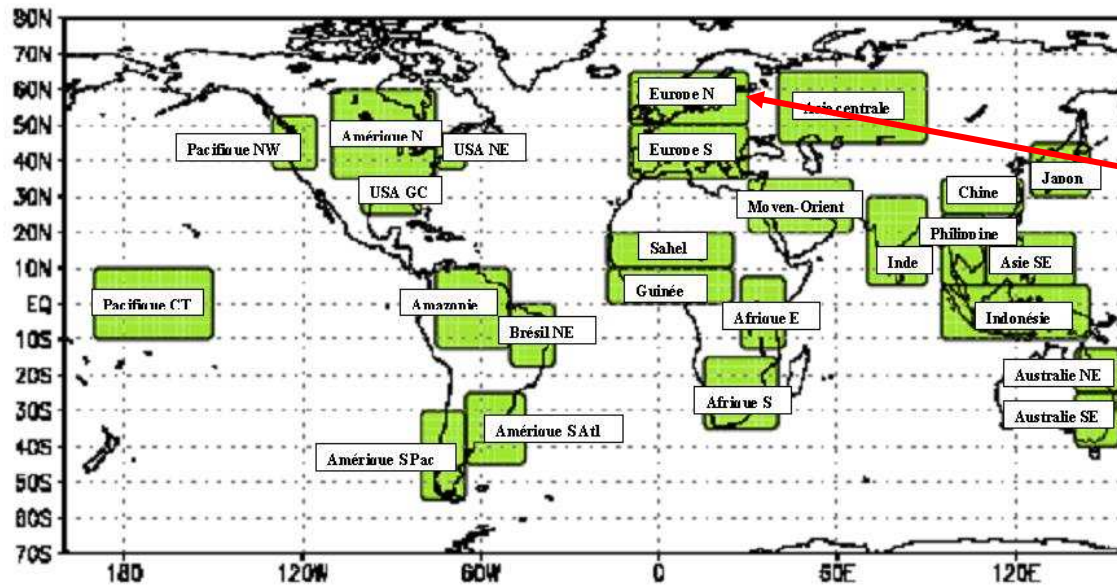
■ Monitoring and Forecast consistency

- *Sharing analysis of the climate system (monitoring and forecasts)*
- *General Circulation Indices*
- *Extreme events*
- **Sub-regional products**
- *Predictability Diagnosis*
- *Monitoring products*

RCC Perspectives

■ Sub Regional Products

- E-Obs dataset (or other) for monitoring and downscaling
 - Gridded dataset at the relevant mesh (0.5° ?)
 - Design of relevant Sub-Regional Boxes
 - Set up of corresponding studies (CG Indices, Circulation Regimes, ...)

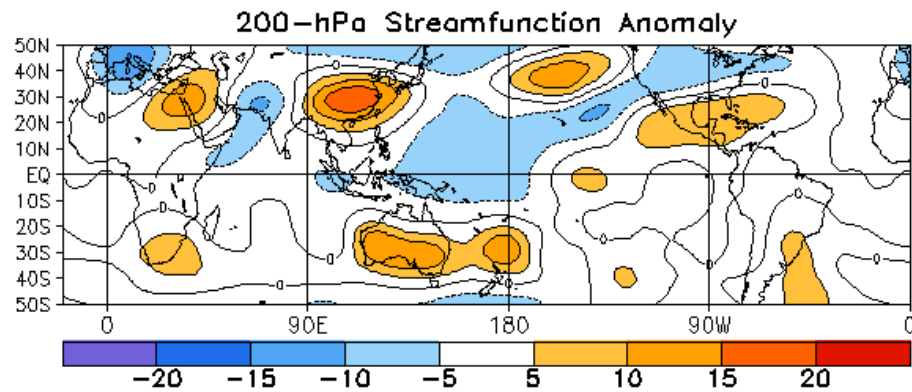
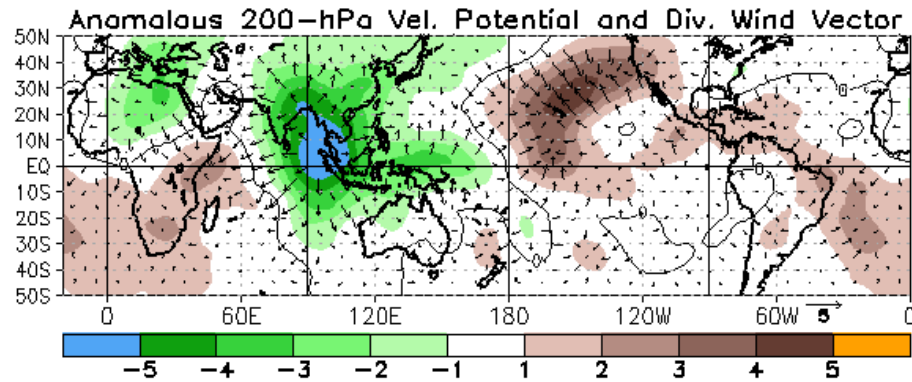


RCC Perspectives

■ Monitoring and Forecast consistency

- *Sharing analysis of the climate system (monitoring and forecasts)*
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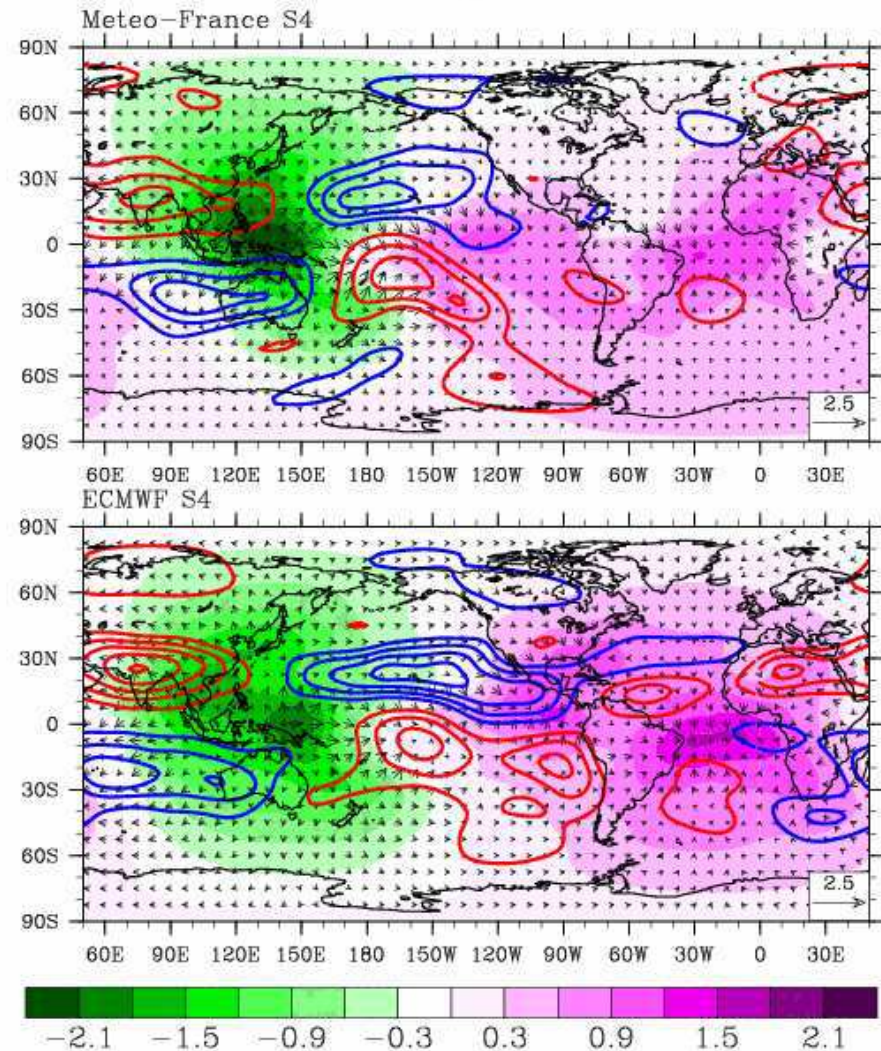
RCC Perspectives



February 2013 – NCEP analysis

AMJ 2013 forecasts

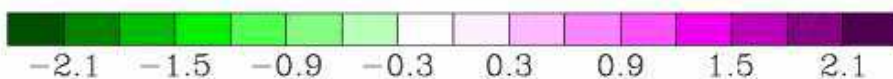
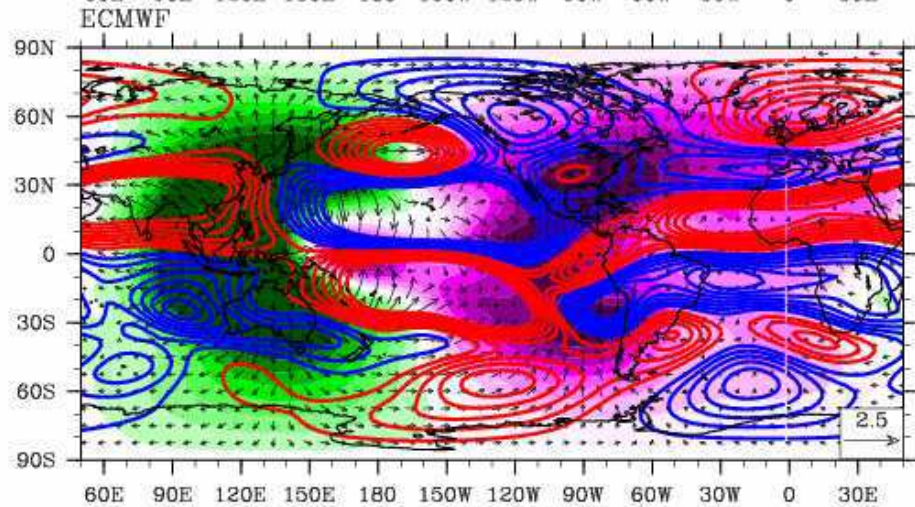
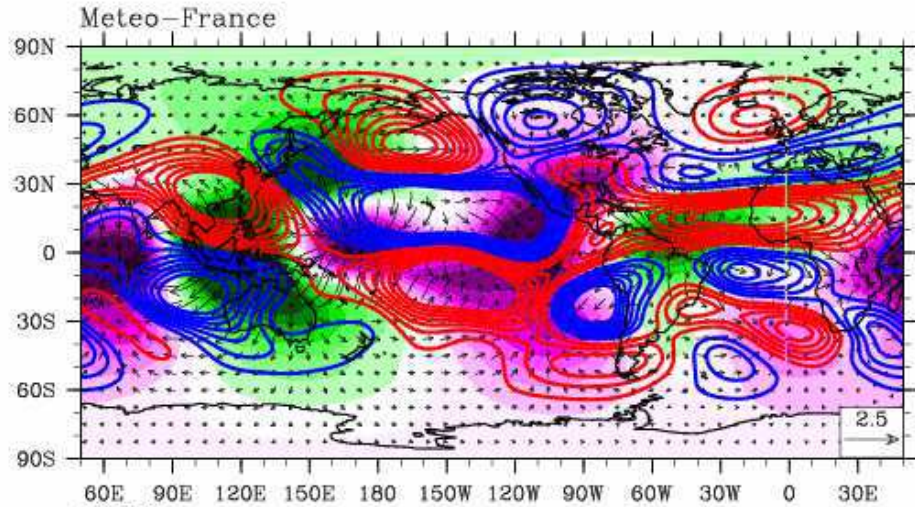
AMJ CHI&PSI@200 [IC = Mar. 2013]



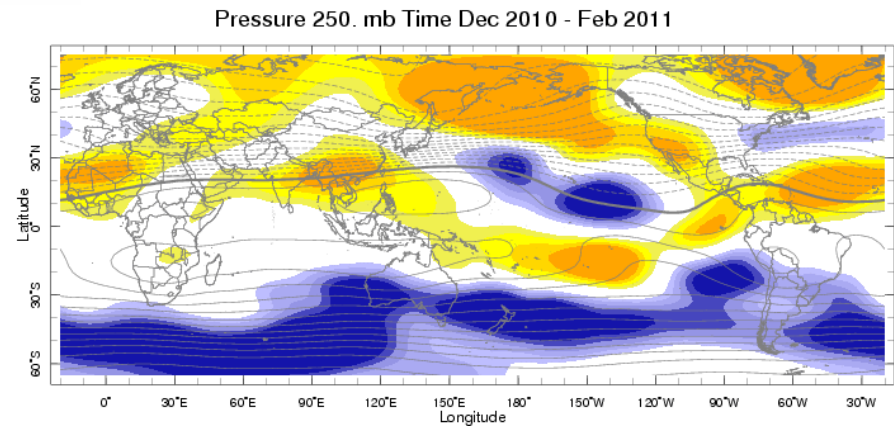
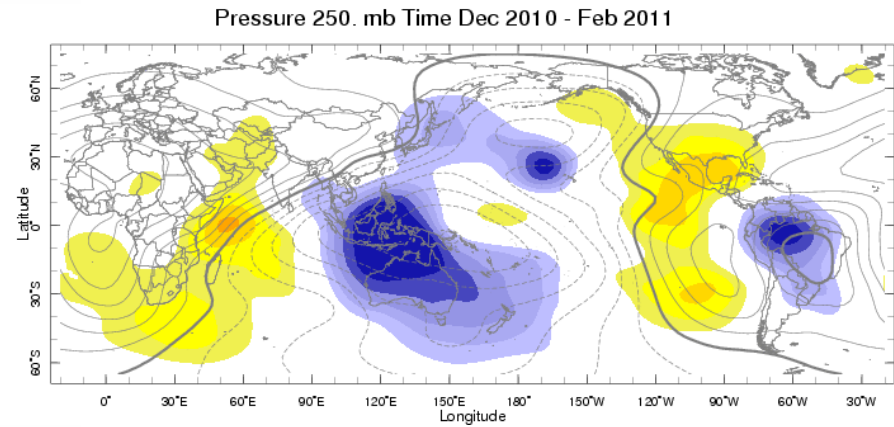
RCC Perspectives - DJF 2010-2011

Seasonal Forecasts MF/ CEP (M+1) :

- Velocity Potential and Stream Function (High Troposphere)



Verification (Analyse) :



Take care with scales!
toujours un temps d'avance

RCC Perspectives

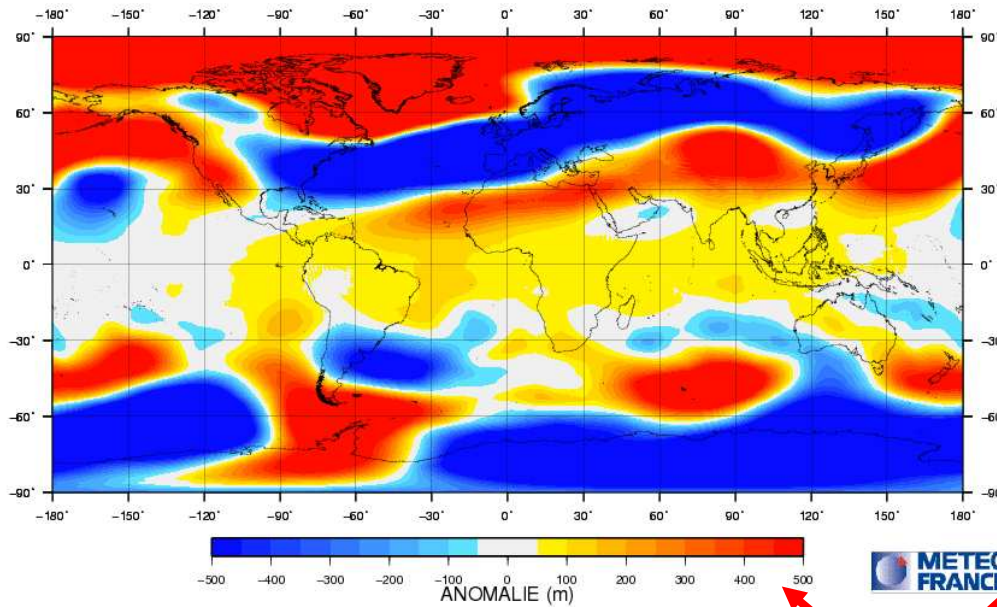
■ Monitoring and Forecast consistency

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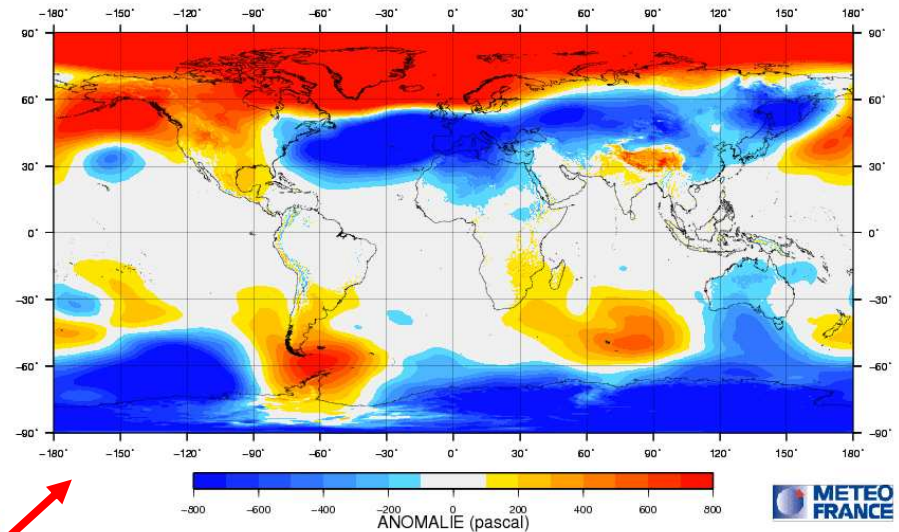
RCC Perspectives

Monitoring : using model anomalies

Anomalie de Z500 201302



Anomalie Pression mer 201302



- Which parameters ?
 - Which baseline ?
 - Which periods (month, season, ...) ?
- Revisit of Model anomaly products
- ECMWF Operationnal analysis and ERA-Interim climatology

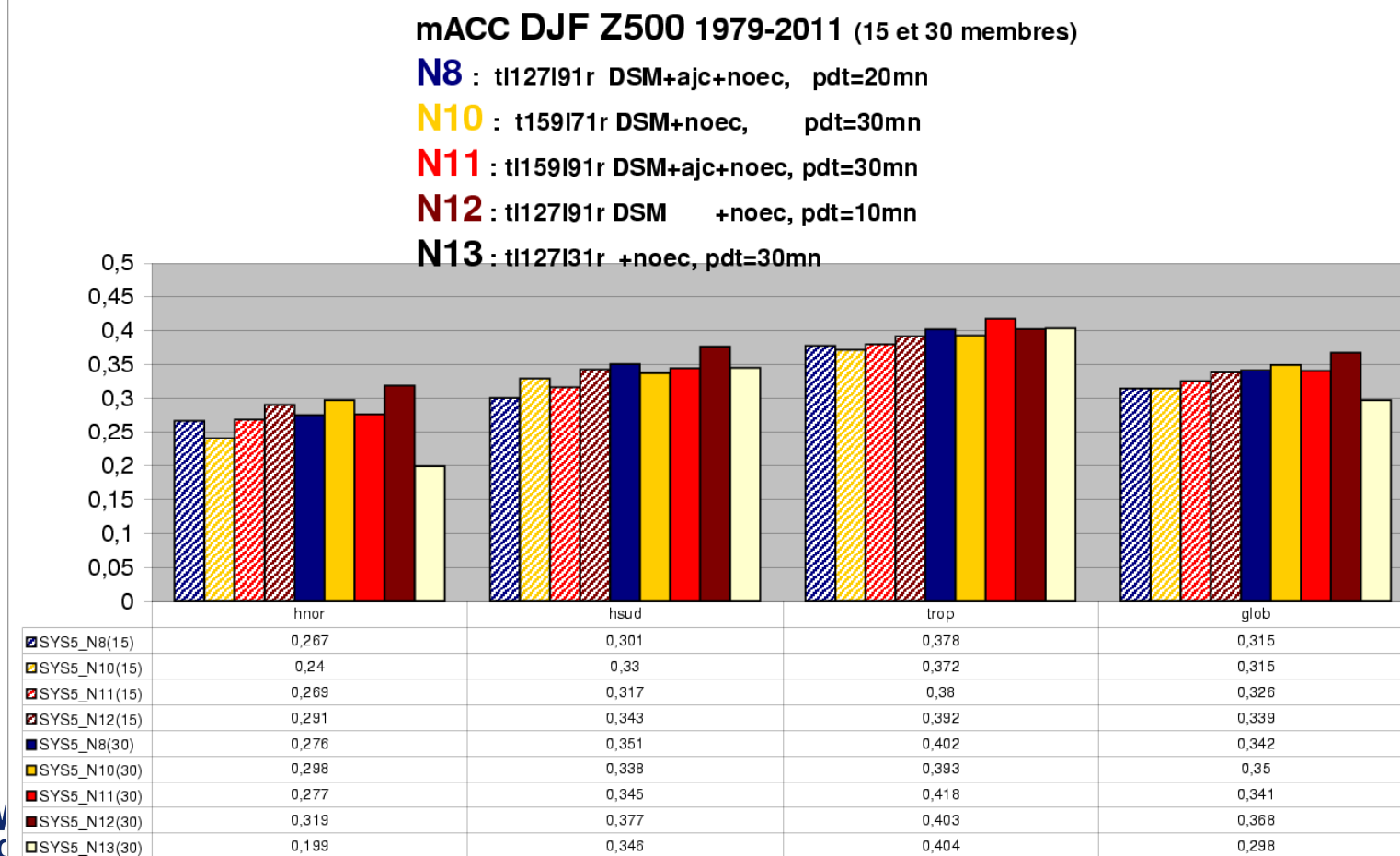
GPC evolutions

■ Coupled Model version 6 (System 5)

- Version close to the IPCC-AR5 version (consistency with Decadal Forecasts)
- Atmosphere : Arpege version 6.i,
- Ocean : NEMO (free elevation at the surface),
- Mercator Ocean analysis and Reanalysis: 1979 – 2010,
- Some options remain open,
- Availability for operations : targetted for 2015 (developements in progress)

Scores System 5 (development in progress)

- Hindcast over 1979 - 2011 (DJF and JJA)15 , and 30 members
- Different options tested (DSM, Ajc, Ecume, Resolution, Time Step)
- Anomaly correlations for Z500,



Scores System 5 (development in progress)

- Hindcast over 1979 - 2011 (DJF and JJA)15 , and 30 members
- Different options tested
- Anomaly correlations for T2m

mACC DJF TSUR 1979-2011 (15 et 30 membres)

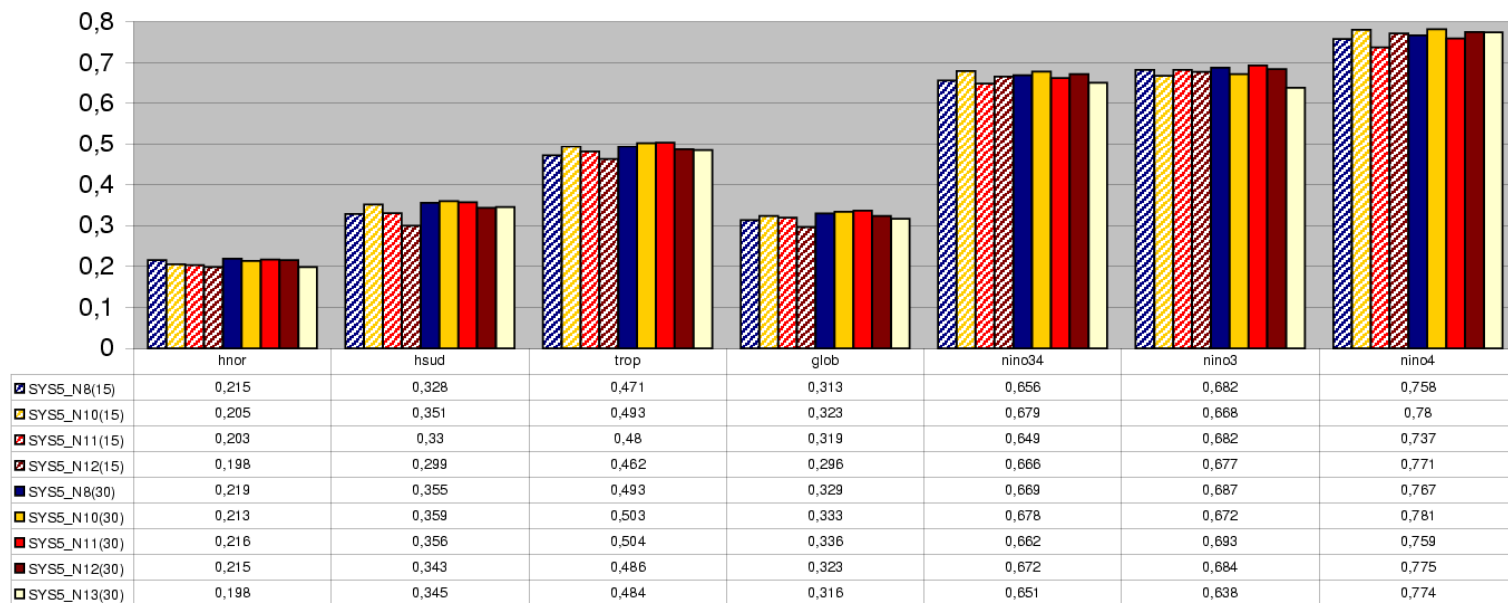
N8 : t1127I91r DSM+ajc+noec, pdt=20mn

N10 : t159I71r DSM+noec, pdt=30mn

N11 : t1159I91r DSM+ajc+noec, pdt=30mn

N12 : t1127I91r DSM +noec, pdt=10mn

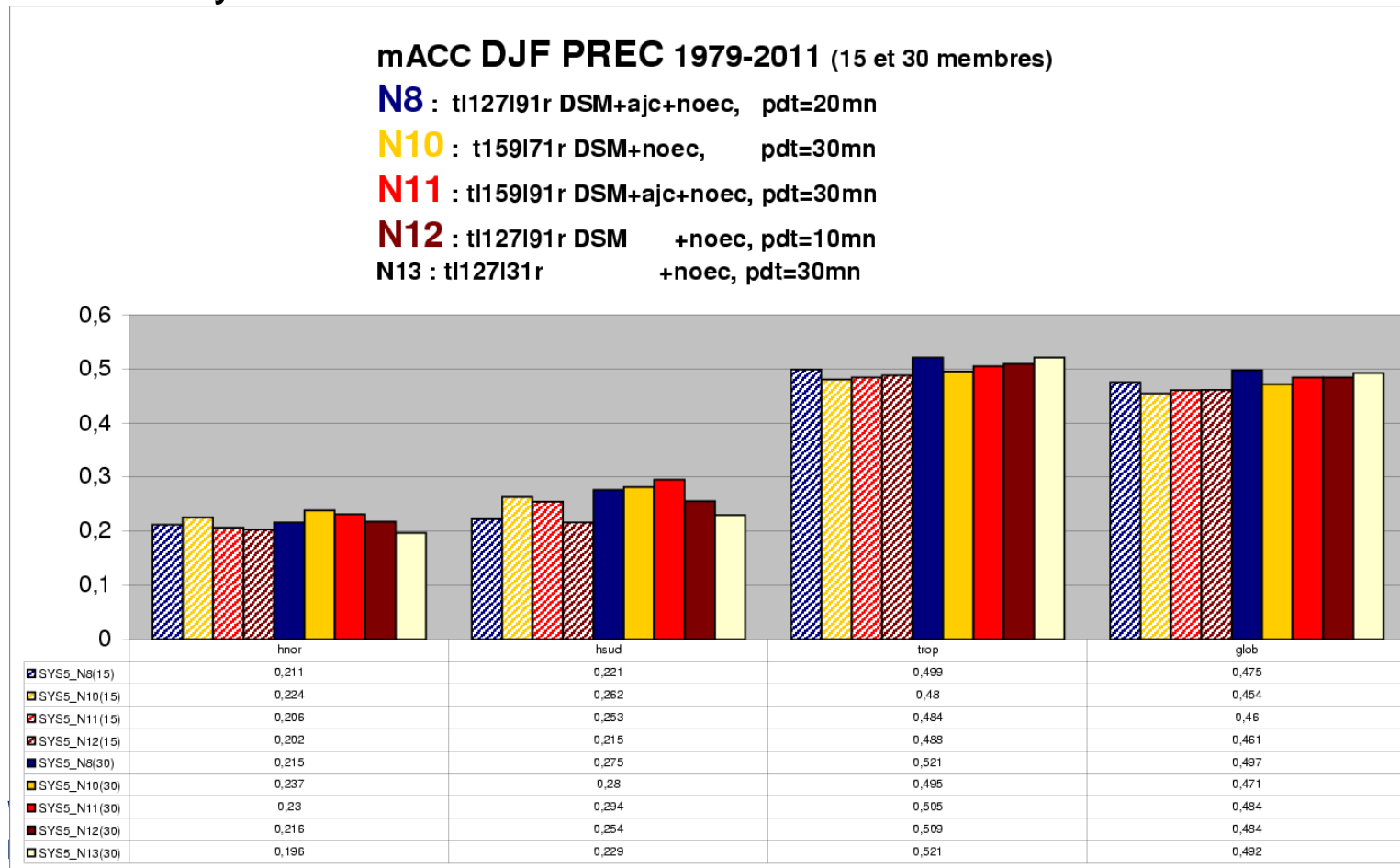
N13 : t1127I31r +noec, pdt=30mn



VR

Scores System 5 (development in progress)

- Hindcast over 1979 - 2011 (DJF and JJA)15 , and 30 members
- Different options tested
- Anomaly correlation for Rainfall



GPC evolutions

■ Coupled Model version 6 (System 5)

- Atmosphere : Arpege 6.i, T127 L91 (configuration close to N12),
 - Ocean : NEMO (1° resolution, free elevation at the surface),
 - Stochastic Dynamic, Stratosphere
 - Sea-Ice : Gelato model,
 - Surface : Surfex model,
 - Some options remain open,
- Development of the post-processing at the full resolution

How to improve RCC products and services ?

■ Large Scale information to work on

- MME issues
- Circulation regimes vs Variability modes
- Climate trend and Seasonal forecast
- Intraseasonal information (including MJO, monthly desegregation of LRF, ...)
- Other parameters to be investigated (extreme events, Psi and Khi parameters, ...)
- Prediction of the predictability

■ RCC action plan to develop

- Identified actions (People in charge, Milestone, Follow-up...),
- General strategy (especially with respect of UE and European institutional users)
- Language barrier to address (see recent NEACOF)

RCC coordination meeting



Thank you for attention