RA VI RCC Network

LRF Node

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MEDCOF-1 - Belgrade
14-19 November 2013

WMO RA VI
RCC Network

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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:

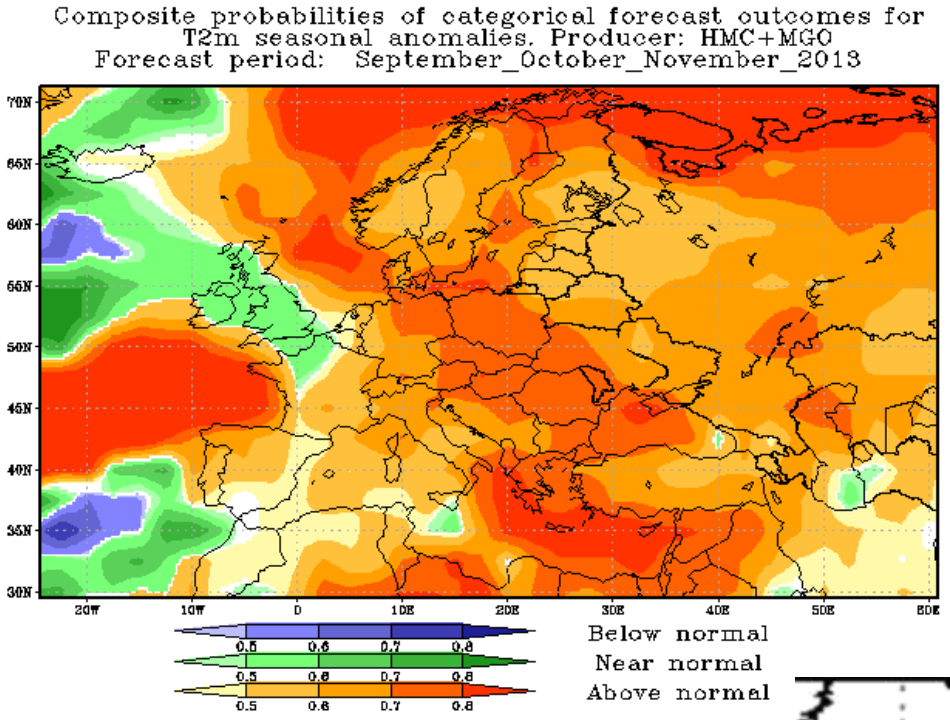
- Regional forecast products based on GPC data for National Meteorological Services of the region;
- Graphs and maps of the performance of GPCs' models;
- Monthly and quarterly bulletins analyzing and interpreting GPC products as well as;
- Regional and sub-regional seasonal outlooks;
- Forecast consistency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

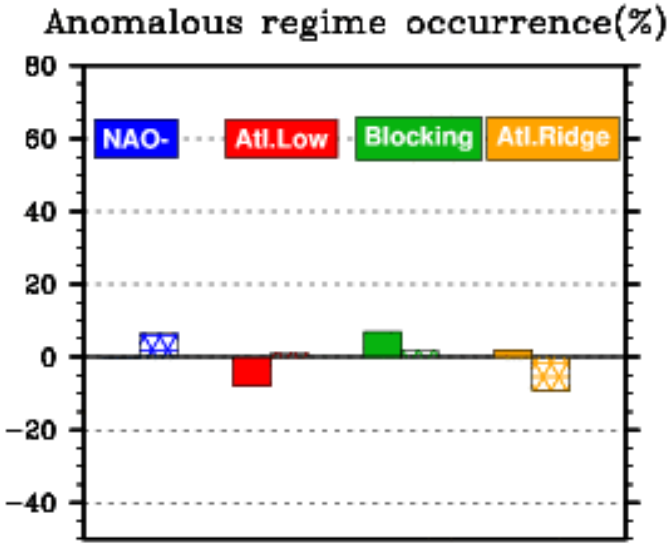
Foreseen products:

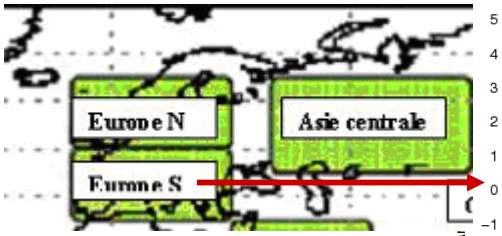
- Forecasts of subseasonal variability;
- LRF downscaling products;

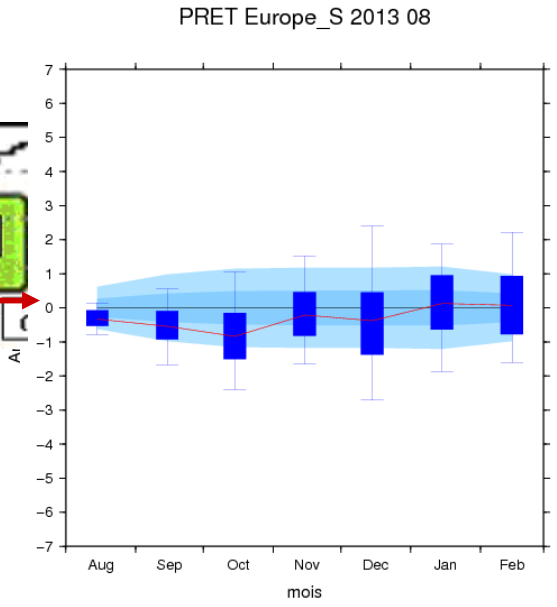
etc.

RA VI RCC Network LRF Node products examples for SON 2013









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

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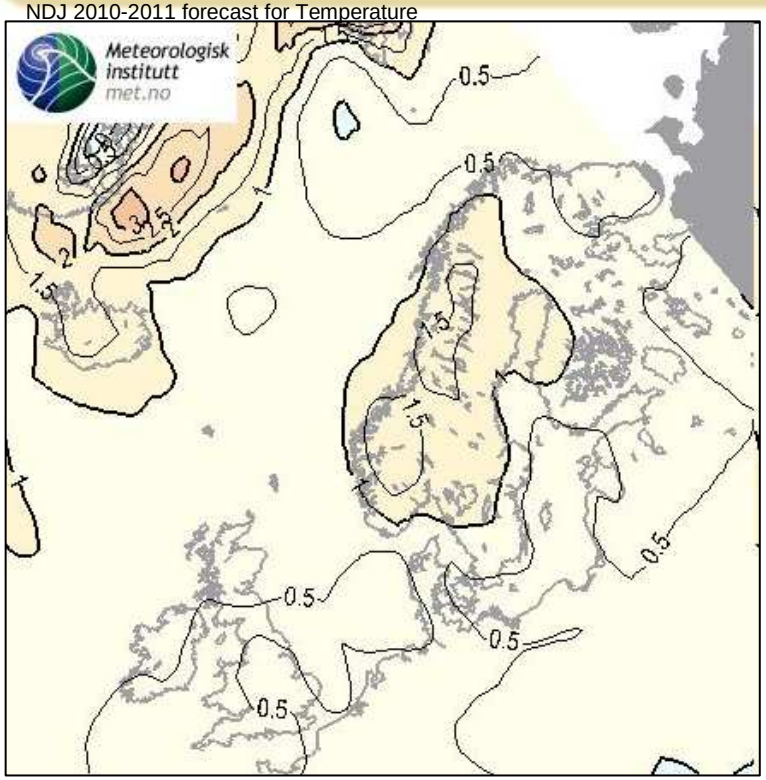
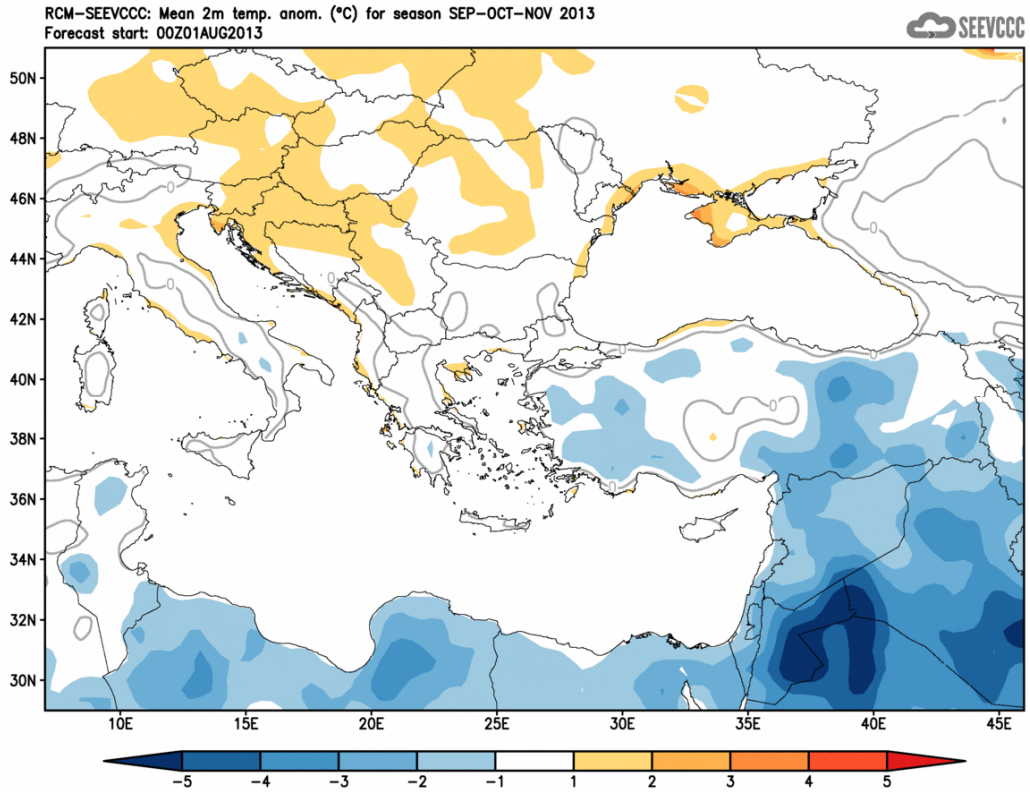
RA VI RCC Network LRF Node products other examples

NDJ 2010-2011 forecast for Temperature



Adaptation of LRF to Scandinavian regions



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					
MF					
Met Office					
CPC					
JMA					
synthesis					
LC-MME					
Eurosip					
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

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

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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),

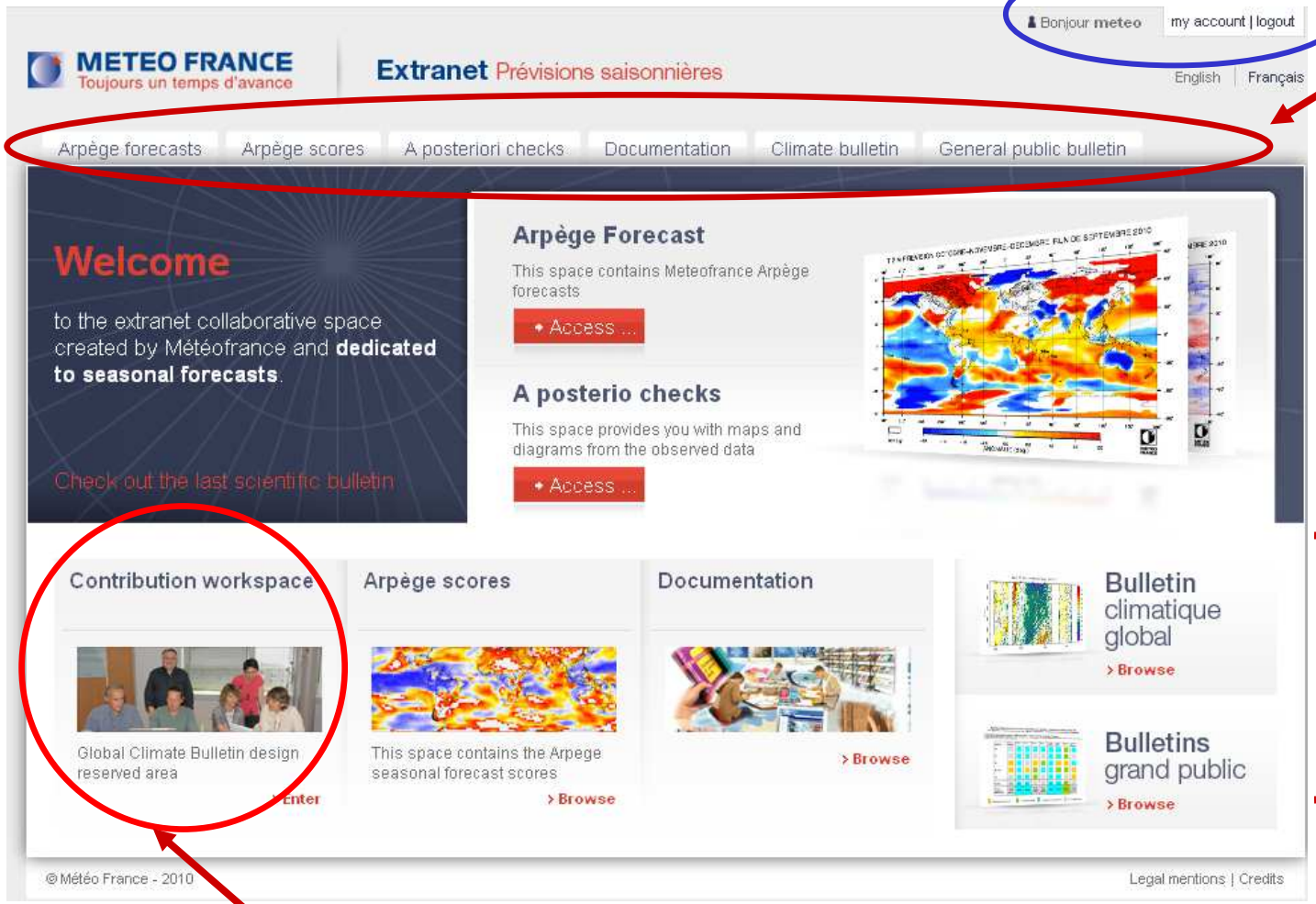
Availability dates :

- Begining 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

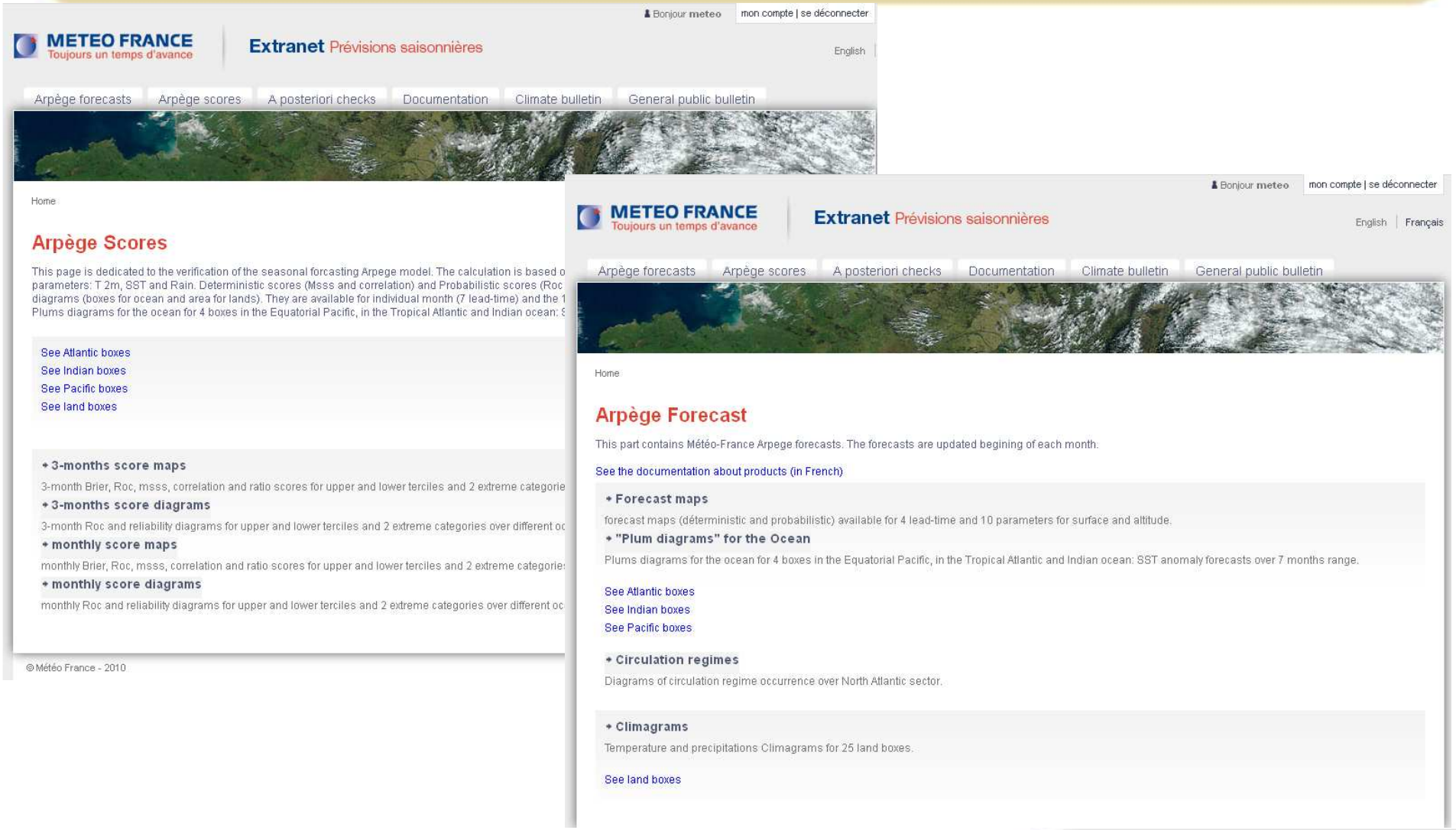
6 Menus



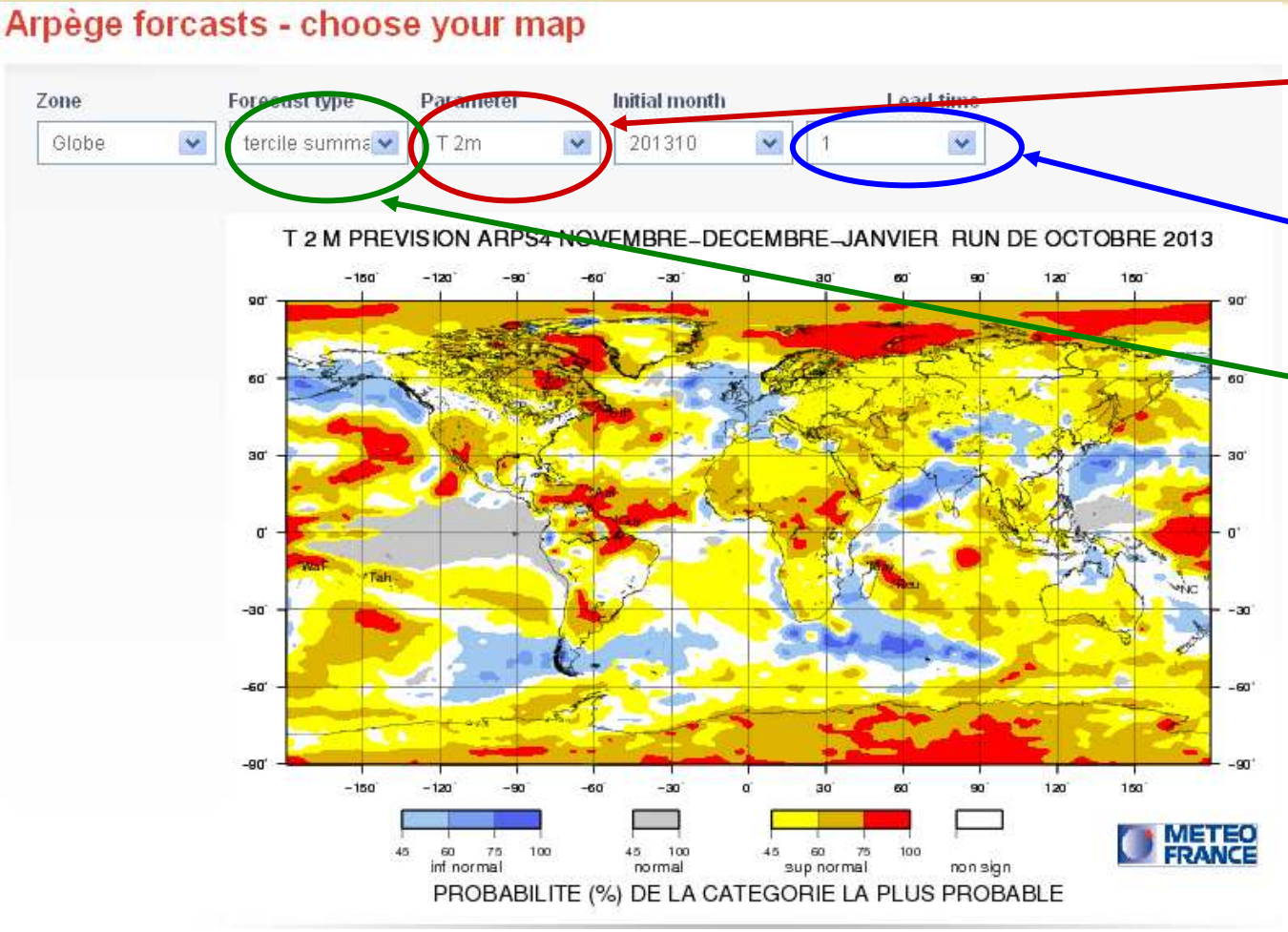
Bulletins

Working Space

Extranet : Forecast access



Extranet : Forecast access



12 parameters

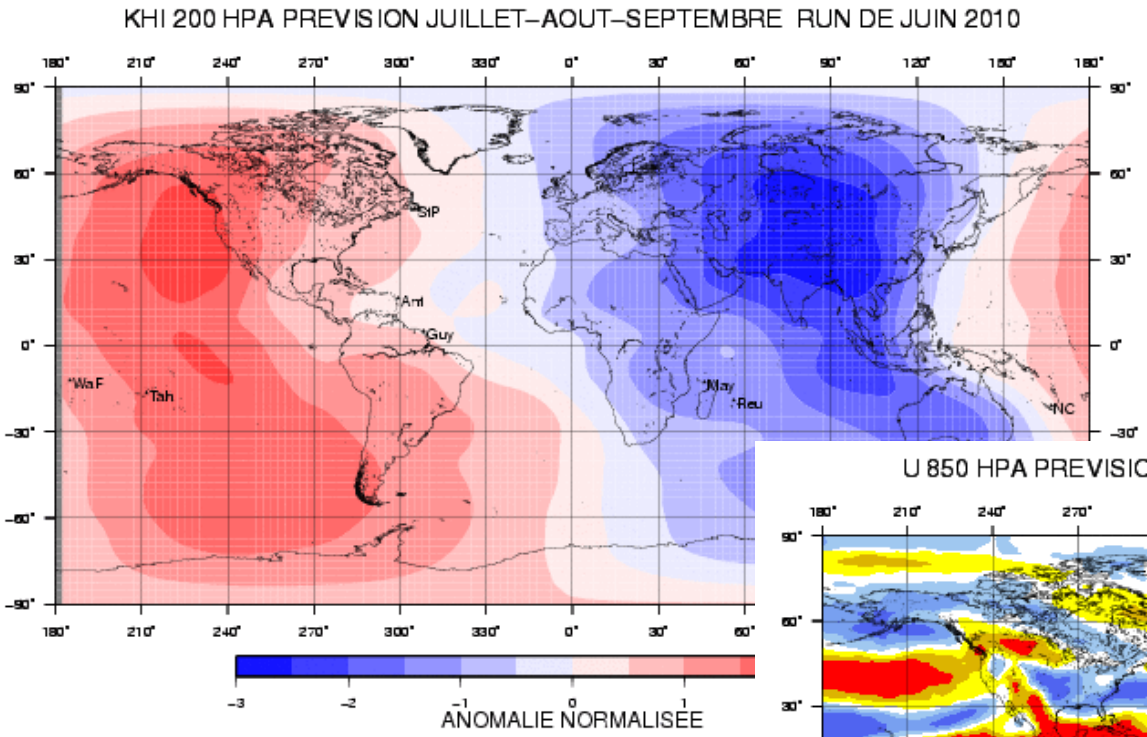
4 Lead-Time

5 Probabilistic products (Terciles + Extreme cat.)

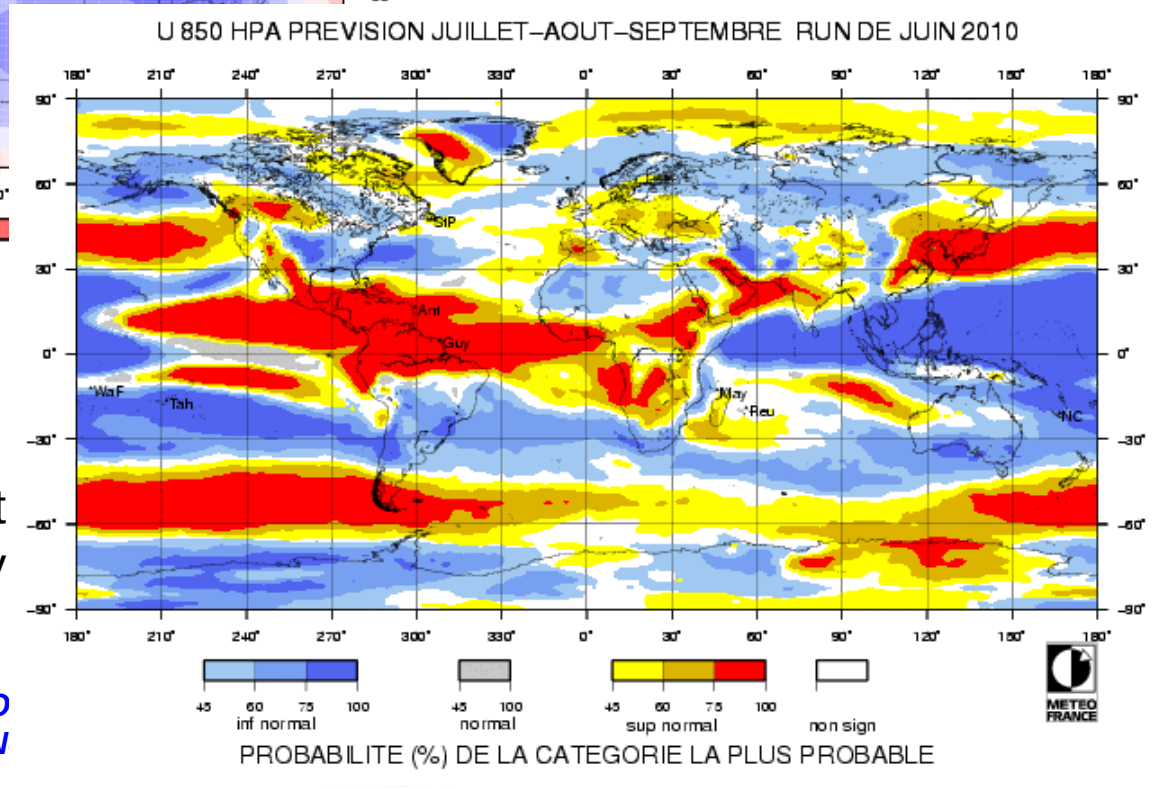
3 Deterministic products

Most likely category

Products : General Circulation
Velocity Potential 200 & U 850



Velocity Potential at 200 hPa
- Standardized Anomaly



U 850 hPa – Most Likely Category

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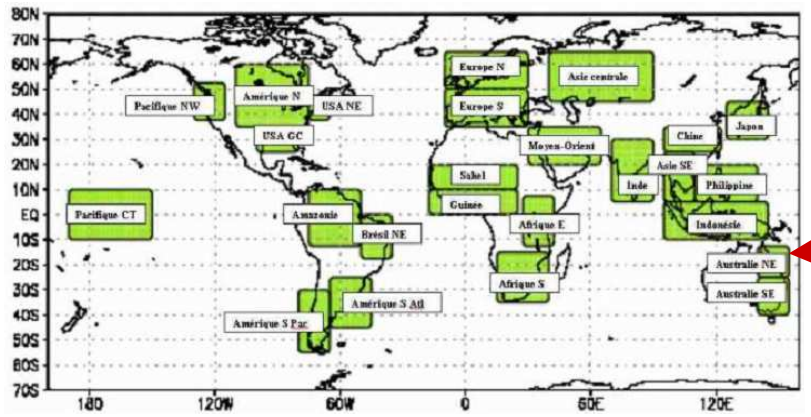
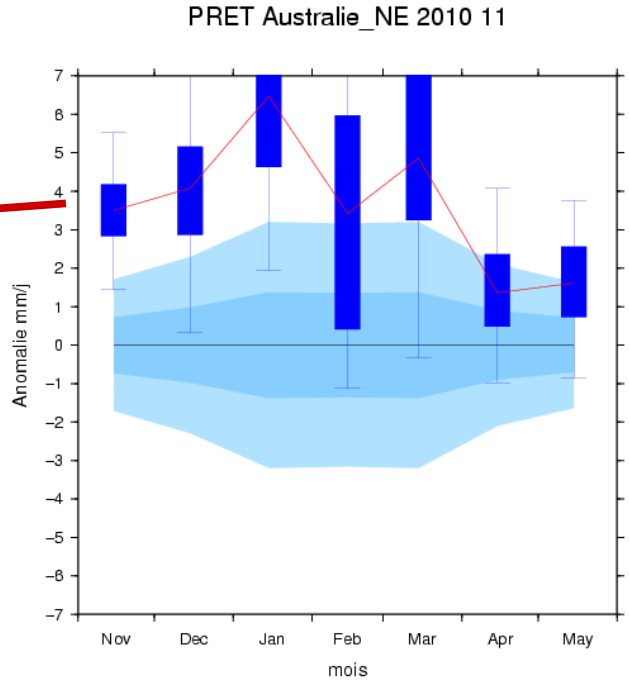
Additional Products

- **climagrams**





25 « land » boxes for T2m and RR

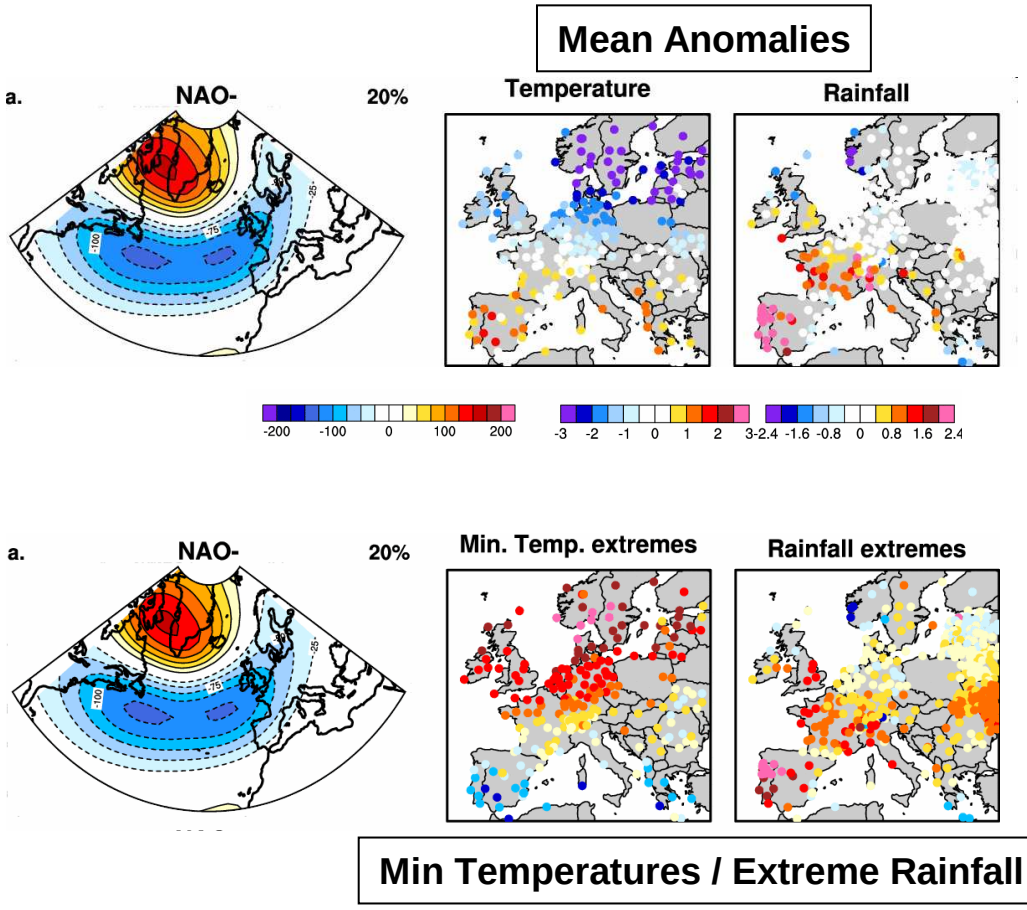
Same definition than ECMWF

Could be revisited

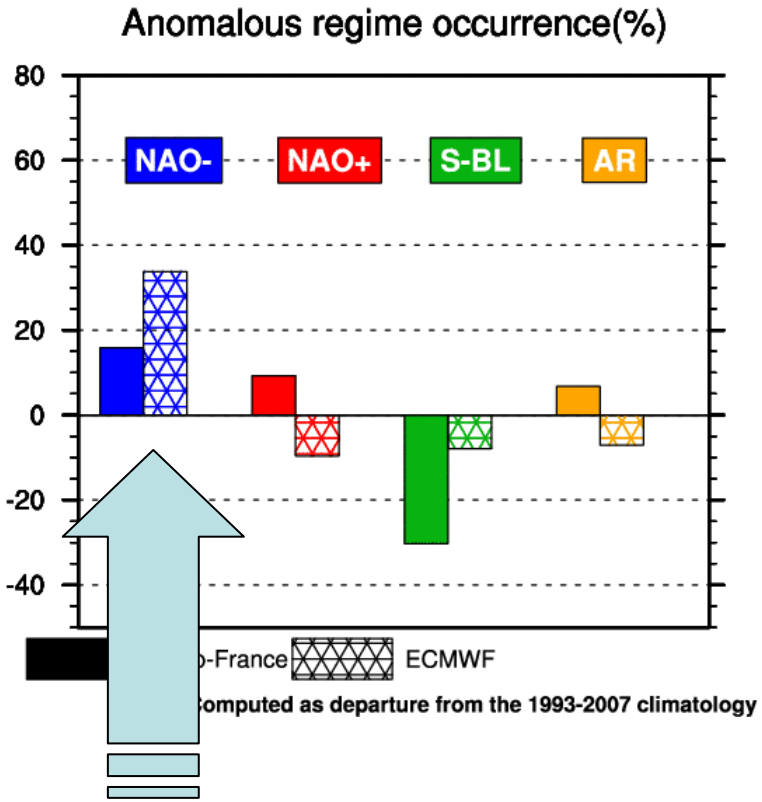
DJF 2010-2011 – Very Strong Niña

Additional Products : Circulation Regimes

- **Forecast Mode and use – Winter 2009 forecasts**



Min Temperatures / Extreme Rainfall



Increased Occurrence of NAO – regimes

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Products : Bulletins

GLOBAL CLIMATE BULLETIN
n°173 - NOVEMBER 2013

Table of Contents

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

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Toujours un temps d'avance

Products : Bulletins

GLOBAL CLIMATE BULLETIN
n°173 - NOVEMBER 2013

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Global Climate Bulletin n°173

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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

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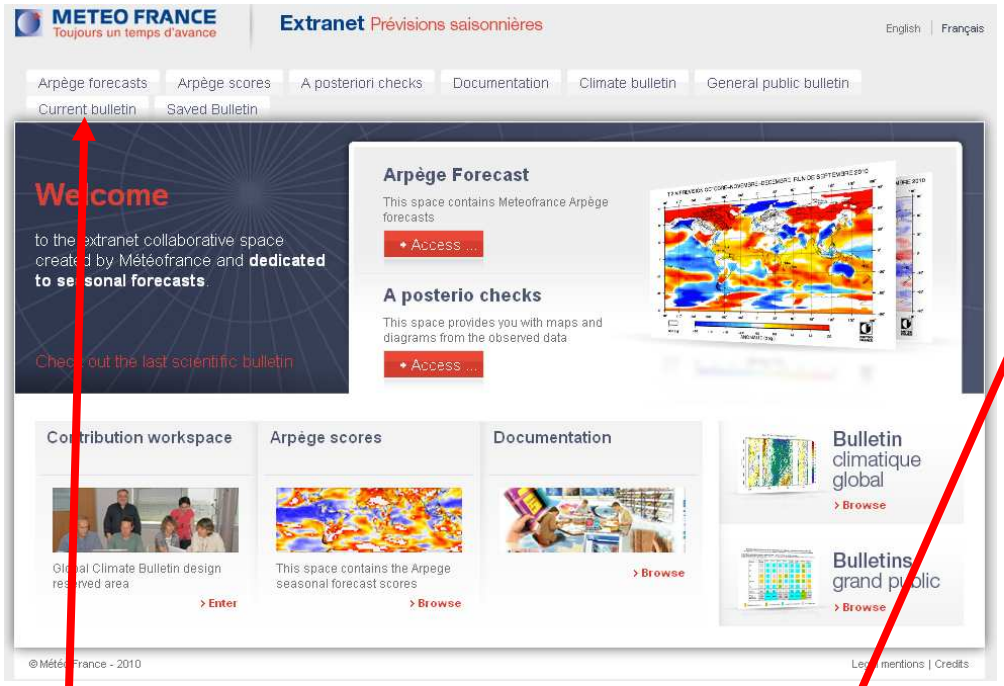
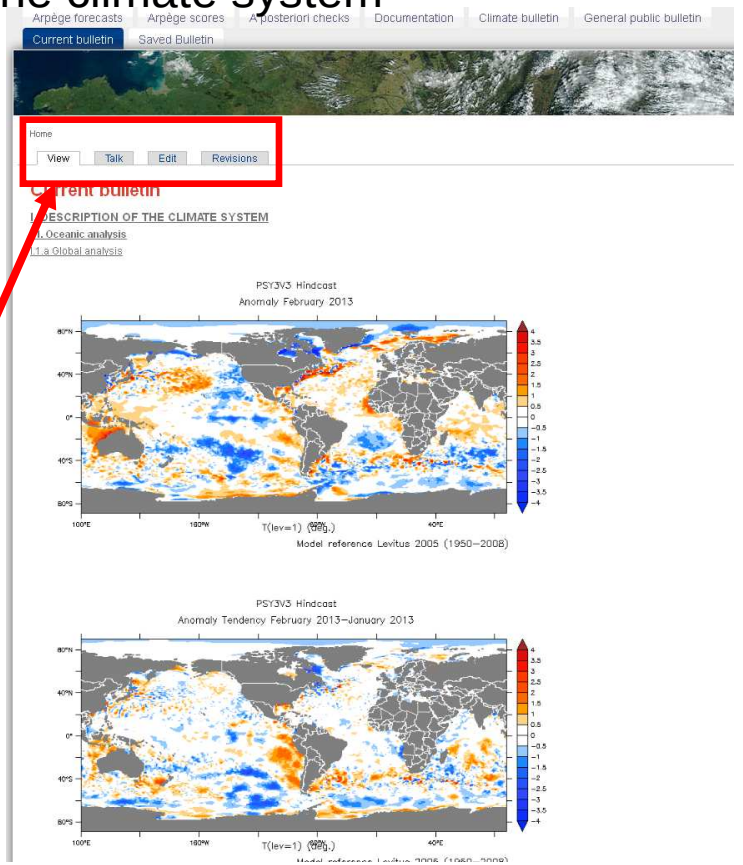
RCC Perspectives

- **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





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

Wiki page automatically updated (for most of the figures)

Bulletin and others

Bulletins : (possible) Briefing Recording

RCC Perspectives

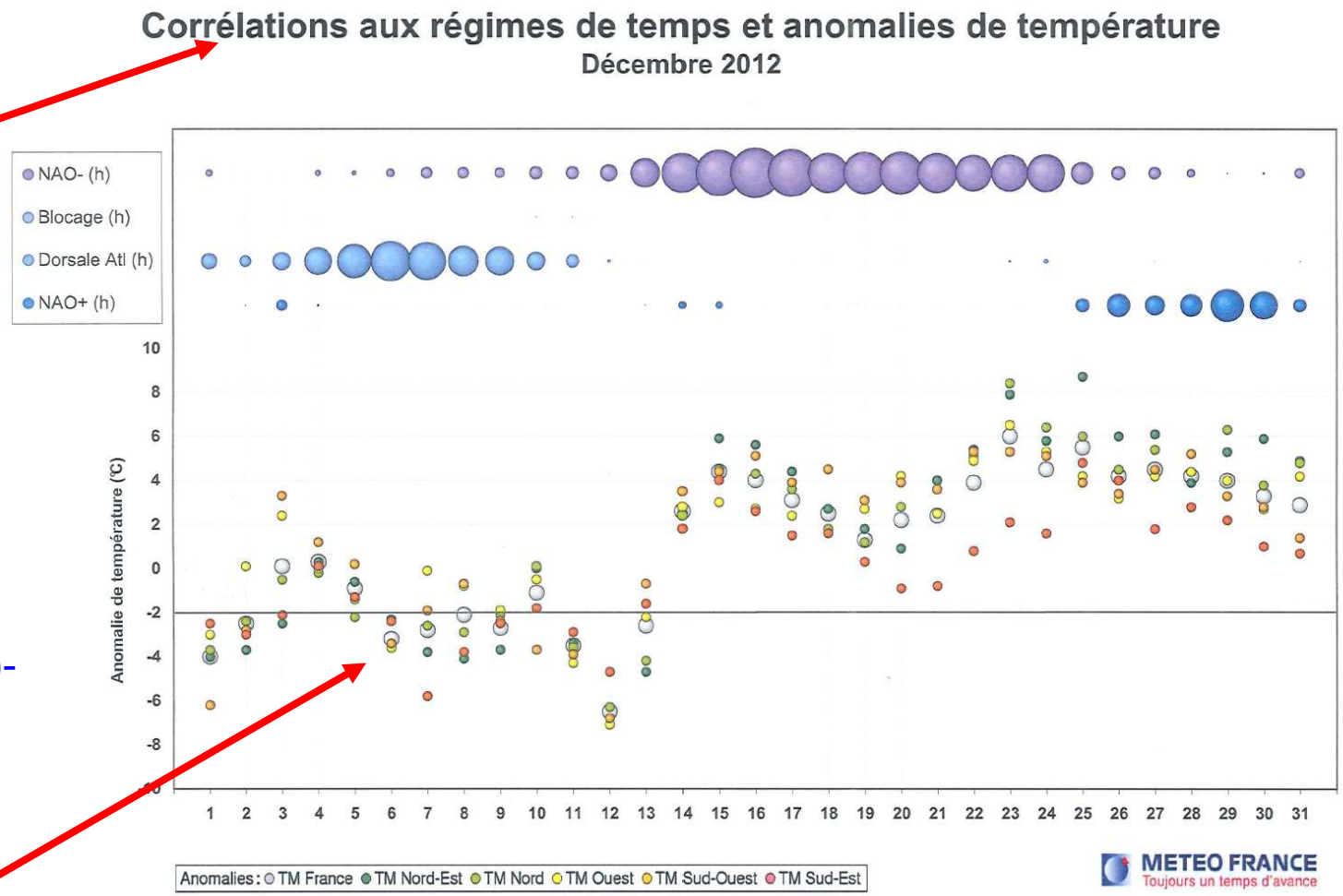
- **Monitoring and Forecast consistency**
  - *Sharing analysis of the climate system (monitoring and forecasts)*
  - General Circulation Indices and Circulation Regimes
  - *Extreme events*
  - *Sub-regional products*
  - *Predictability Diagnosis*
  - *Monitoring products*

Circulation regimes perspectives

Better use of the distance :

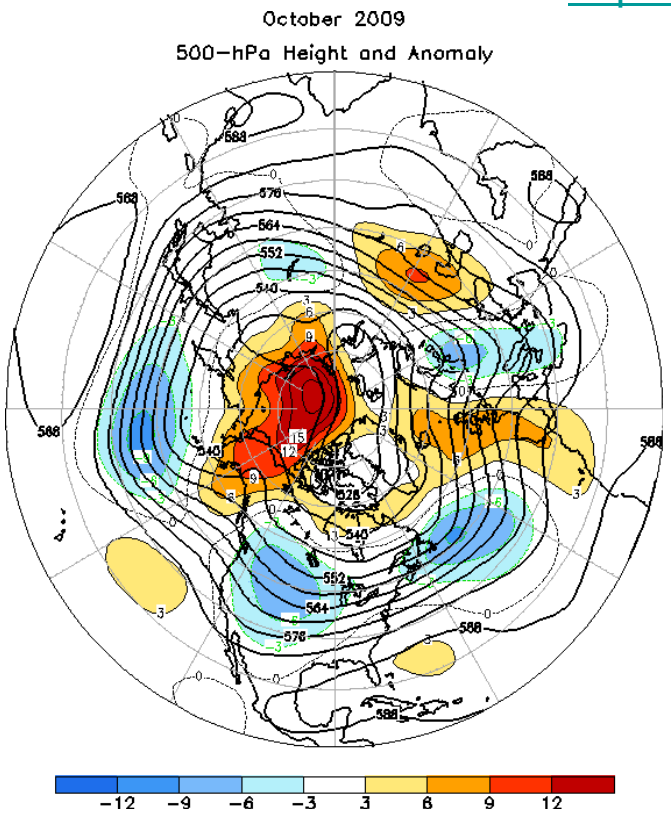
- Correlation
- Bias
- Amplitude

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.ldeo.columbia.edu/maproom/.Global/.Atm_Circulation/Monthly_Height.html

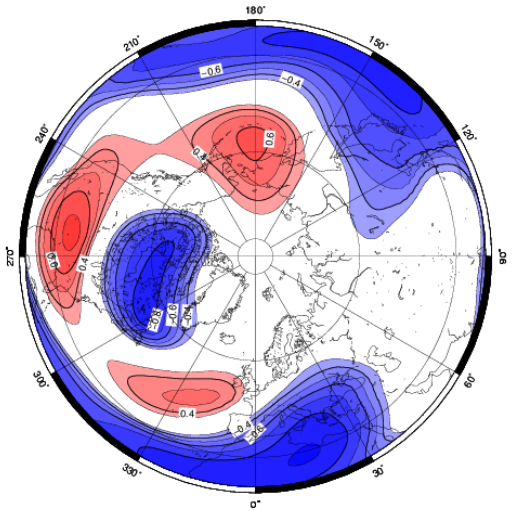
More information :

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

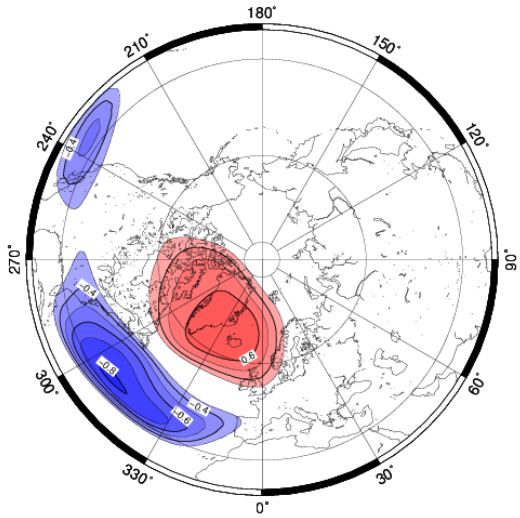


Explained Variance : 21,9 %

Correlation with NAO- : - 0,75

No correlation with NAO+

MODE 6 - MF



Explained Variance : 6,9 %

Correlation with NAO+ : - 0,85

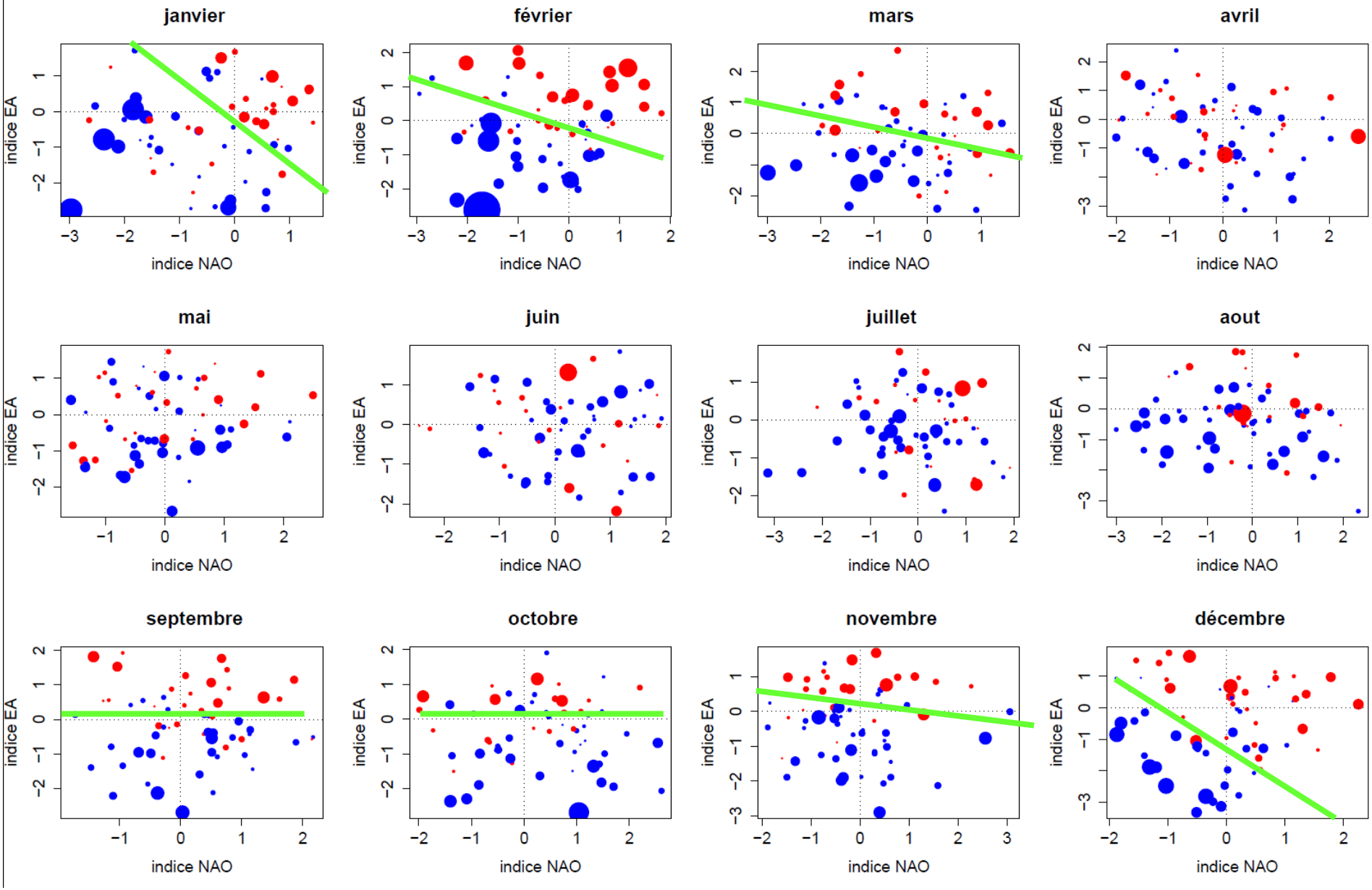
No correlation with NAO-

➢ 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

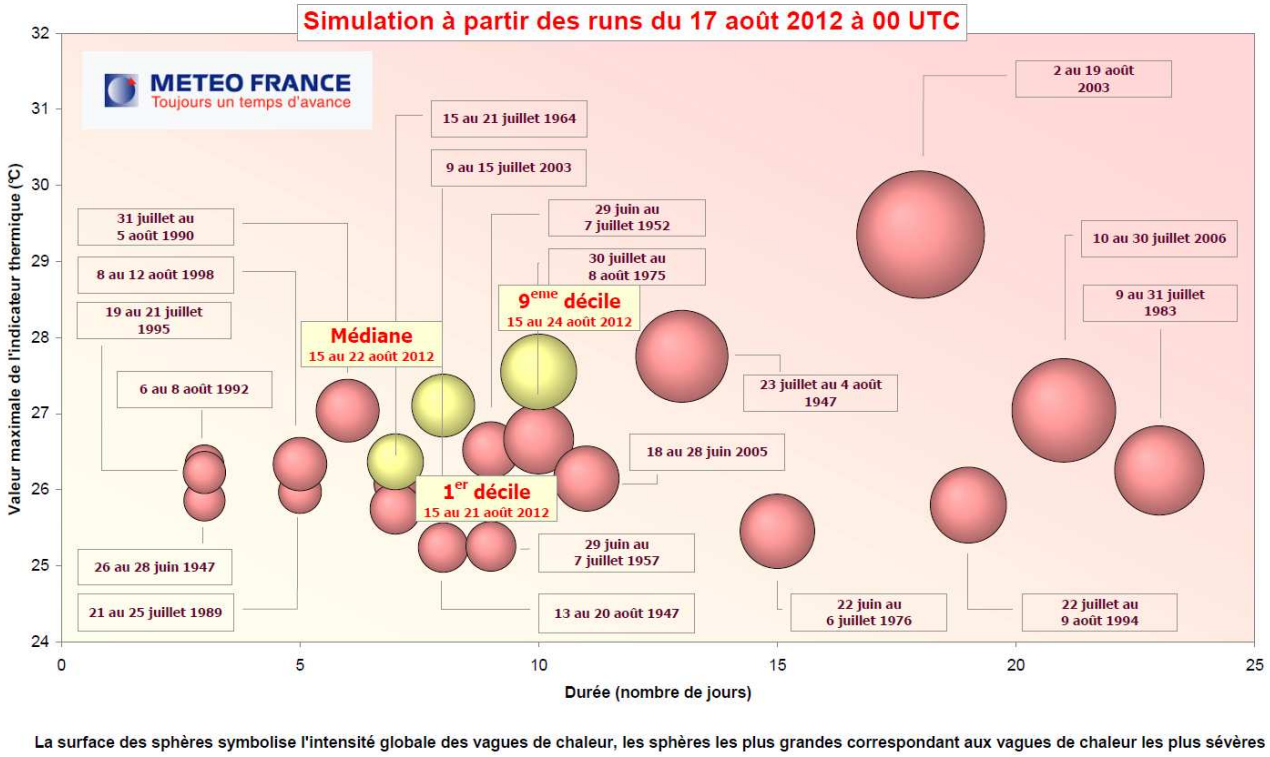
Merging monitoring and forecasting information

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

Extreme events

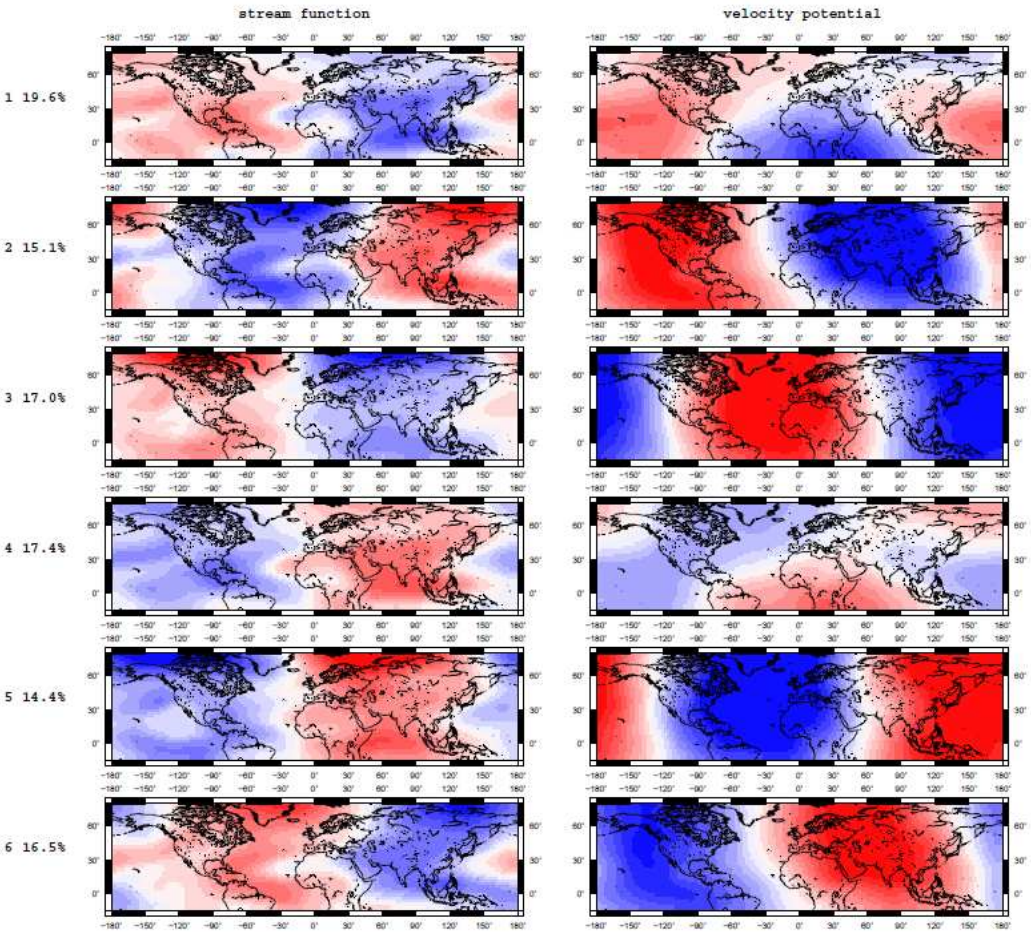
Heat Waves in France

(1947-2012)

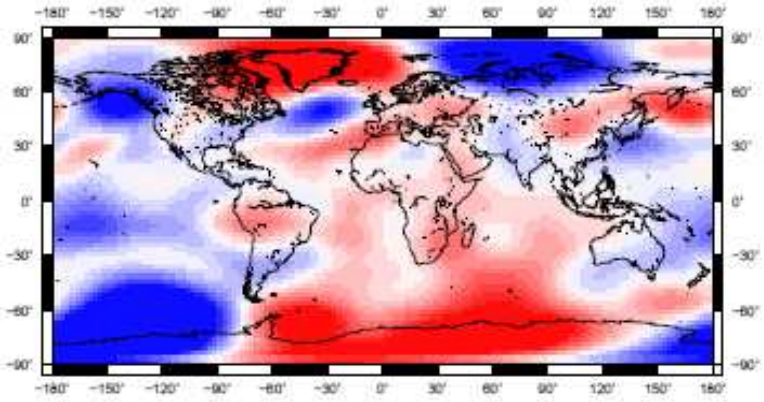


La surface des sphères symbolise l'intensité globale des vagues de chaleur, les sphères les plus grandes correspondant aux vagues de chaleur les plus sévères

RCC Perspectives



Psi and Khi 200 Circulation Regimes in SON



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% Boostrap	*(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

RCC Perspectives

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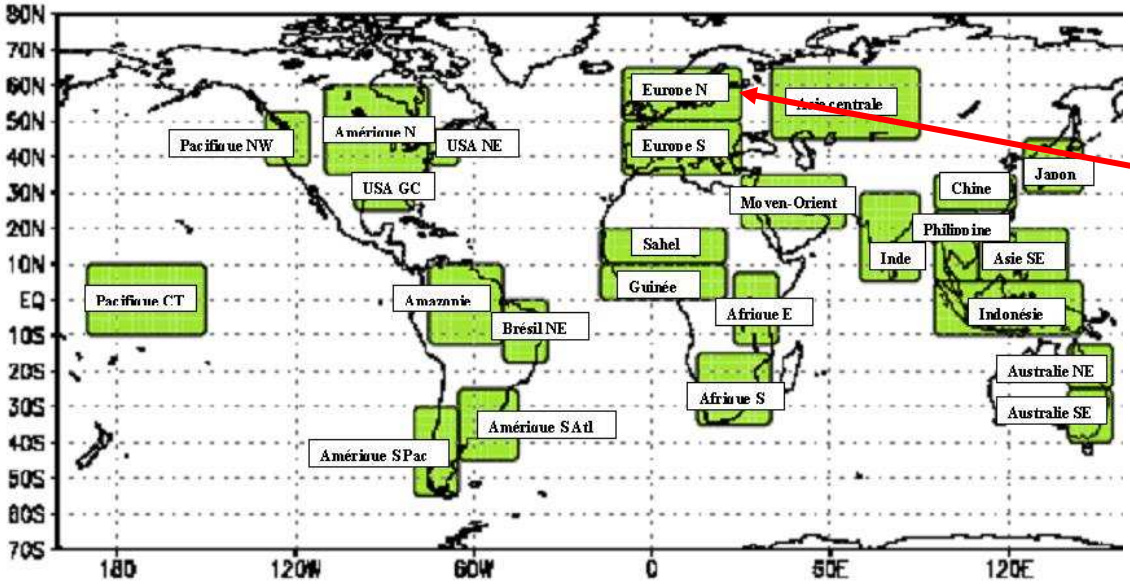
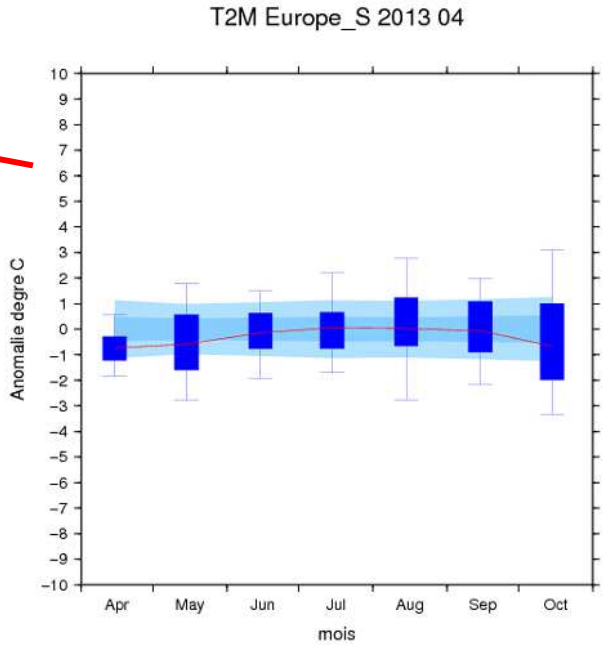
RCC Perspectives

- 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, Circurlation Regimes, …)





RCC Perspectives

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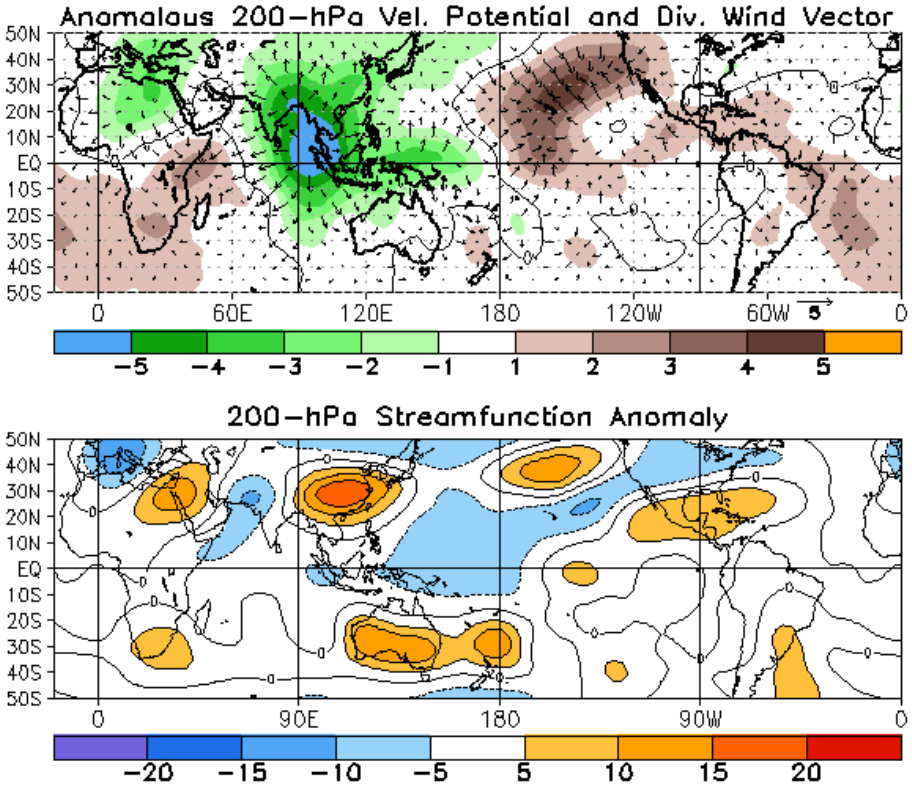
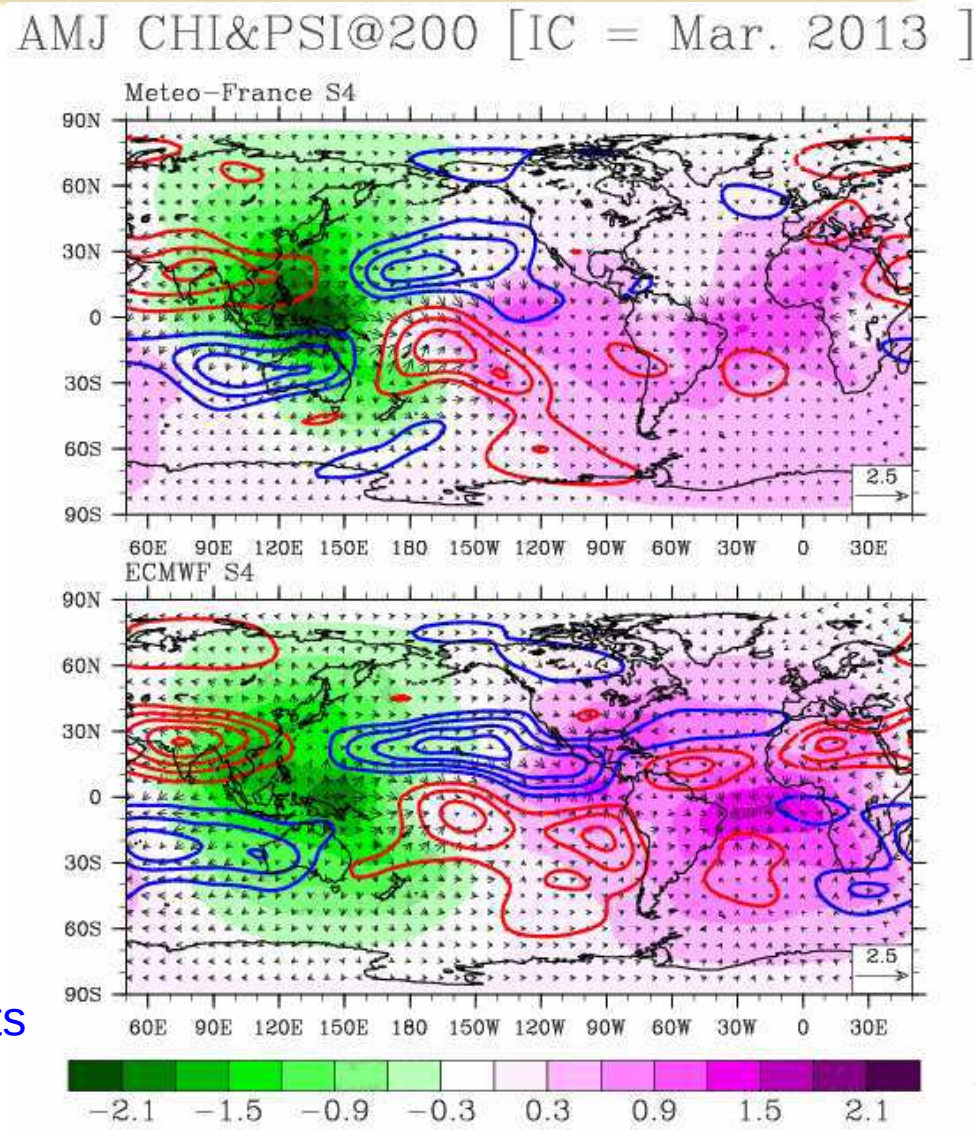
RCC Perspectives



February 2013 – NCEP analysis

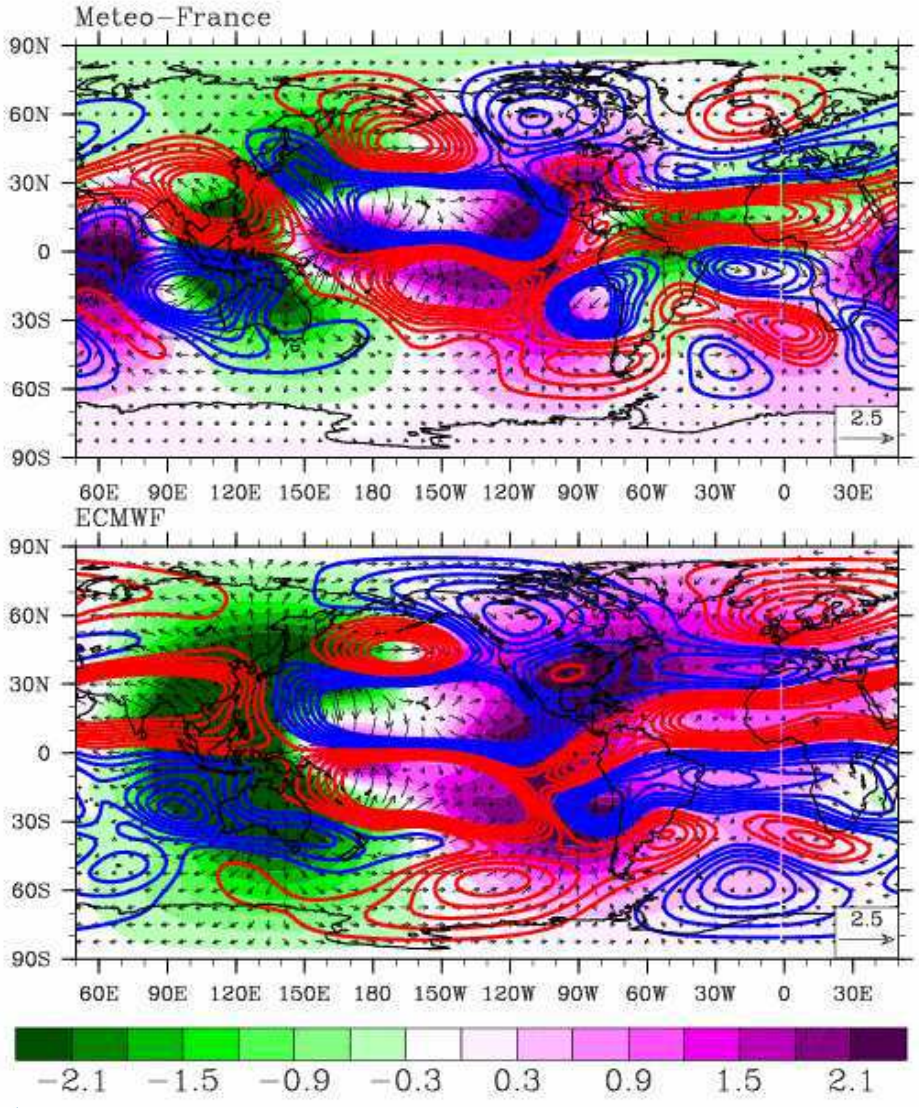


AMJ 2013 forecasts

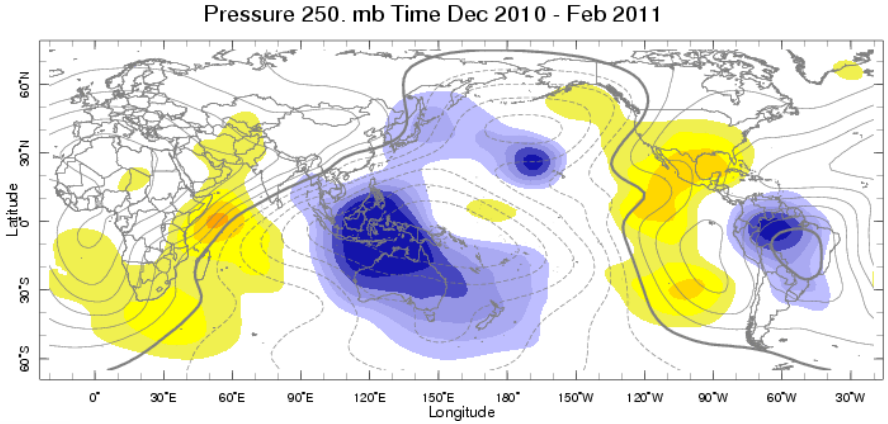
RCC Perspectives - DJF 2010-2011

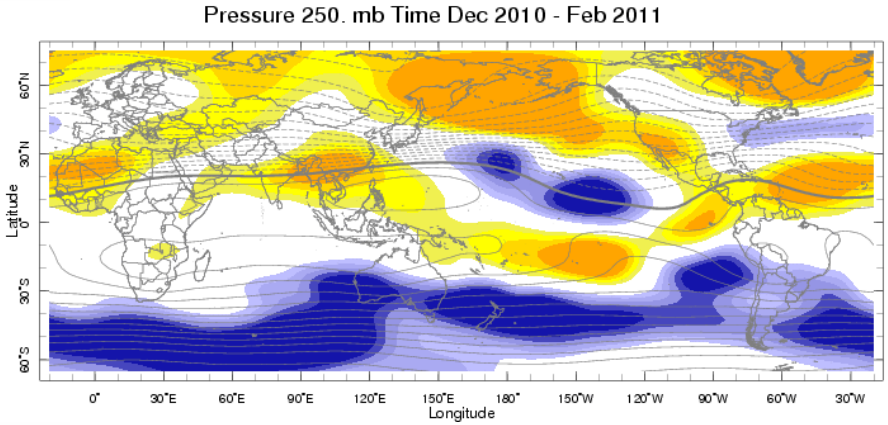
Seasonal Forecasts MF/ CEP (M+1) :

- Velocity Potential and Stream Function (High Troposphere)



Verification (Analyse) :





Take care with scales!

RCC Perspectives

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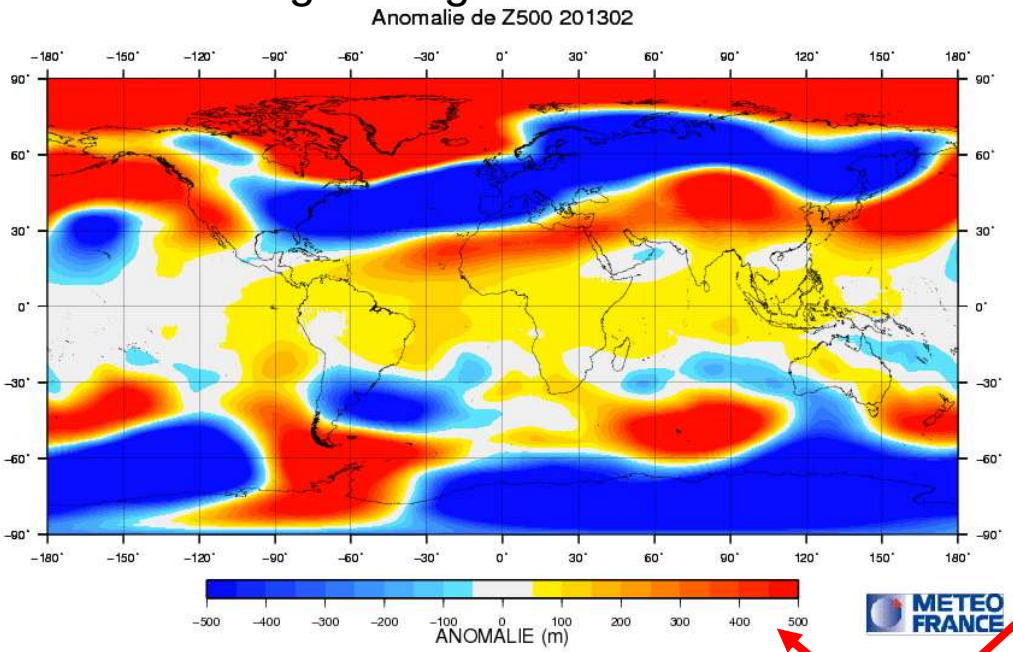
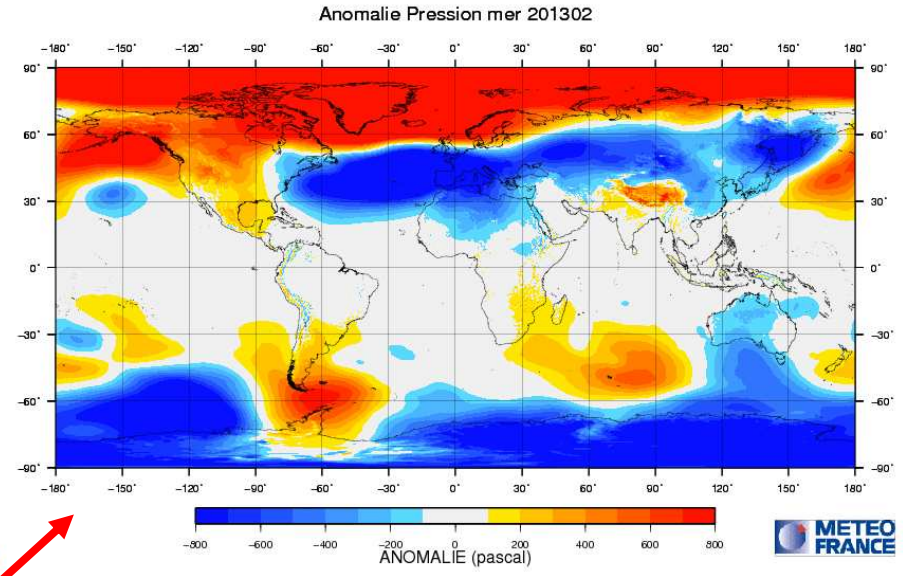
  - Monitoring products

RCC Perspectives

Monitoring : using model anomalies





- Which parameters ?
- Which baseline ?
- Which periods (month, season, …) ?
- …

Revisit of Model anomaly products

- ECMWF Operationnal analysis and ERA-Interim climatology

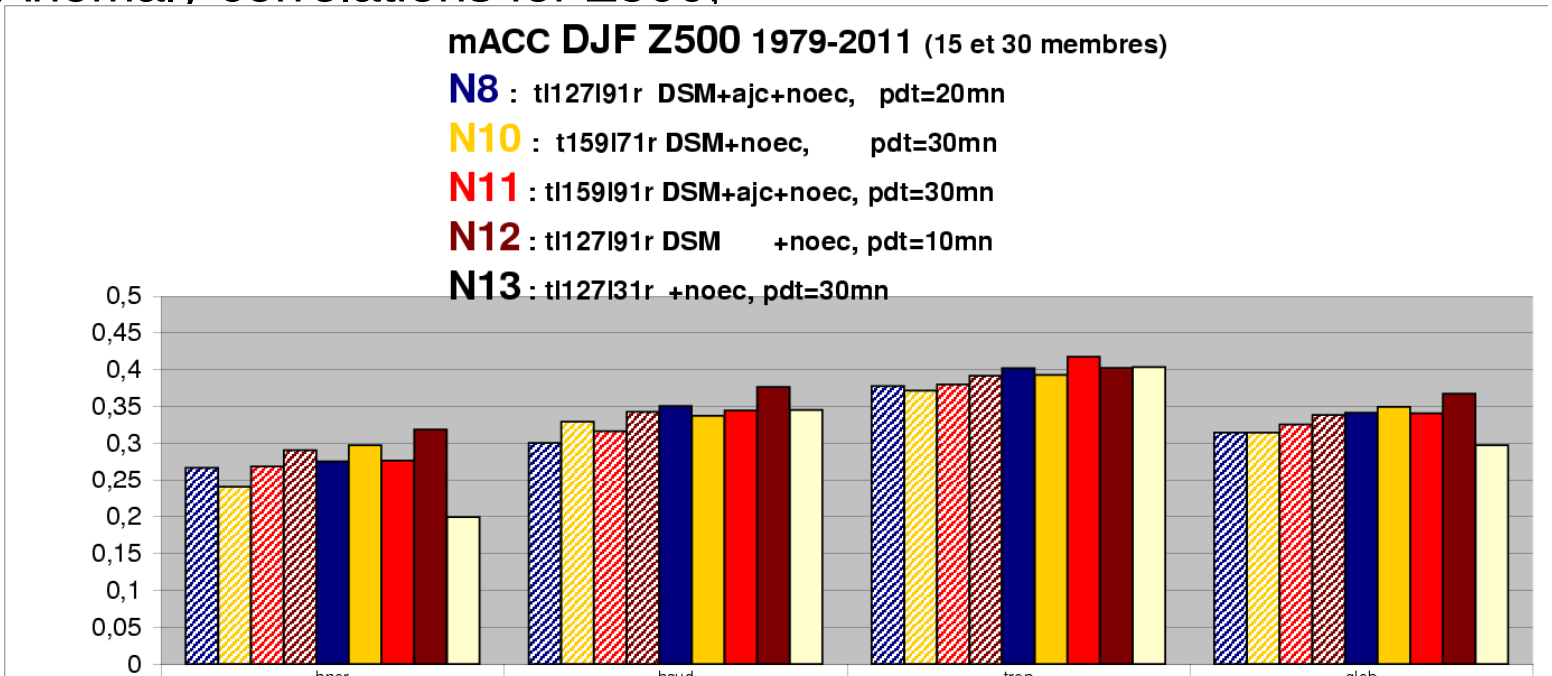
GPC evolutions

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,



	hnor	hsud	trop	glob
SYS5_N8(15)	0,267	0,301	0,378	0,315
SYS5_N10(15)	0,24	0,33	0,372	0,315
SYS5_N11(15)	0,269	0,317	0,38	0,326
SYS5_N12(15)	0,291	0,343	0,392	0,339
SYS5_N8(30)	0,276	0,351	0,402	0,342
SYS5_N10(30)	0,298	0,338	0,393	0,35
SYS5_N11(30)	0,277	0,345	0,418	0,341
SYS5_N12(30)	0,319	0,377	0,403	0,368
SYS5_N13(30)	0,199	0,346	0,404	0,298

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)

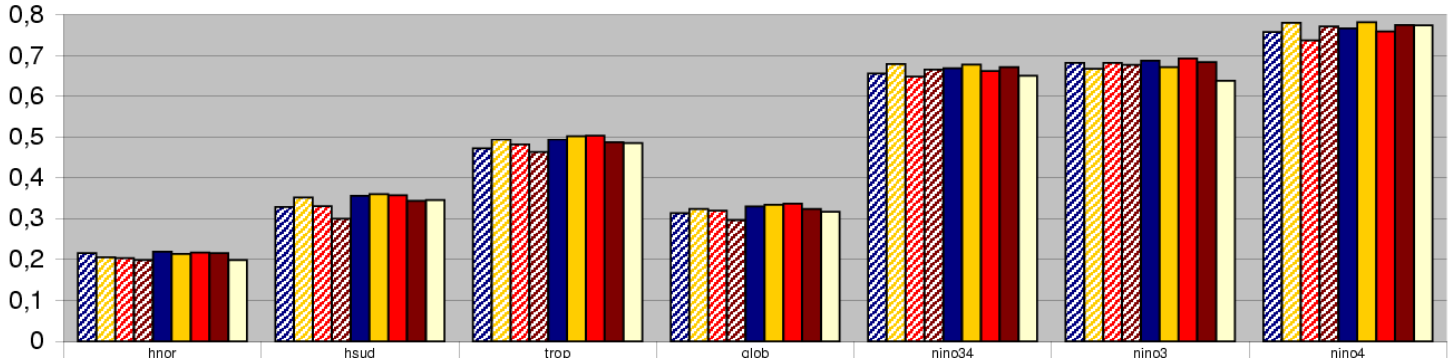
N8 : tl127l91r DSM+ajc+noec, pdt=20mn

N10 : t159l71r DSM+noec, pdt=30mn

N11 : tl159l91r DSM+ajc+noec, pdt=30mn

N12 : tl127l91r DSM +noec, pdt=10mn

N13 : tl127l31r +noec, pdt=30mn



	hnor	hsud	trop	glob	nino34	nino3	nino4
SYS5_N8(15)	0,215	0,328	0,471	0,313	0,656	0,682	0,758
SYS5_N10(15)	0,205	0,351	0,493	0,323	0,679	0,668	0,78
SYS5_N11(15)	0,203	0,33	0,48	0,319	0,649	0,682	0,737
SYS5_N12(15)	0,198	0,299	0,462	0,296	0,666	0,677	0,771
SYS5_N8(30)	0,219	0,355	0,493	0,329	0,669	0,687	0,767
SYS5_N10(30)	0,213	0,359	0,503	0,333	0,678	0,672	0,781
SYS5_N11(30)	0,216	0,356	0,504	0,336	0,662	0,693	0,759
SYS5_N12(30)	0,215	0,343	0,486	0,323	0,672	0,684	0,775
SYS5_N13(30)	0,198	0,345	0,484	0,316	0,651	0,638	0,774

Scores System 5 (development in progress)

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

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

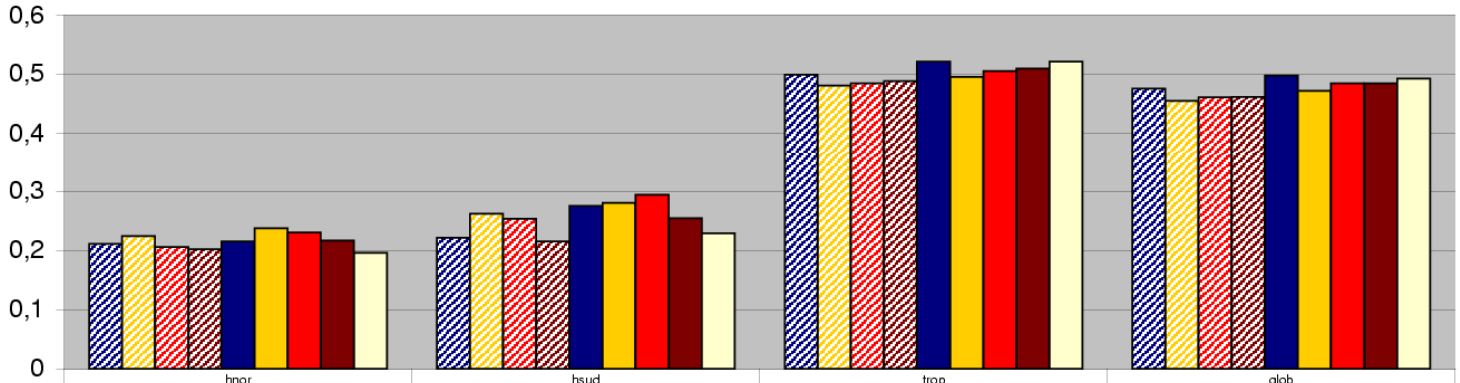
N8 : tl127l91r DSM+ajc+noec, pdt=20mn

N10 : t159l71r DSM+noec, pdt=30mn

N11 : tl159l91r DSM+ajc+noec, pdt=30mn

N12 : tl127l91r DSM +noec, pdt=10mn

N13 : tl127l31r +noec, pdt=30mn



	hnor	hsud	trop	glob
SYS5_N8(15)	0,211	0,221	0,499	0,475
SYS5_N10(15)	0,224	0,262	0,48	0,454
SYS5_N11(15)	0,206	0,253	0,484	0,46
SYS5_N12(15)	0,202	0,215	0,488	0,461
SYS5_N8(30)	0,215	0,275	0,521	0,497
SYS5_N10(30)	0,237	0,28	0,495	0,471
SYS5_N11(30)	0,23	0,294	0,505	0,484
SYS5_N12(30)	0,216	0,254	0,509	0,484
SYS5_N13(30)	0,196	0,229	0,521	0,492

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

METEO FRANCE
Toujours un temps d'avance