

An aerial photograph of a mountain town, likely in the Alps, with a dense cluster of buildings and a church spire. The town is surrounded by green slopes and partially obscured by low-hanging clouds. Overlaid on the bottom left of the image is a white weather map showing isobars (lines of equal pressure) and wind vectors (arrows). The isobars are labeled with values such as 1010, 1015, 1020, 1025, 1030, 1035, and 1040. Wind vectors are shown as arrows with small circles at their tails, indicating the direction and relative strength of the wind. The background of the slide is a deep blue gradient.

Regional climate models & Climatology at Météo-France.

Dr Philippe Dandin
Direction de la Climatologie
Météo-France

SEE VCCC
RHMSS, Belgrade, Serbia
11-13 April 2011



METEO FRANCE
Toujours un temps d'avance

1. Climate modelling at Météo-France

- Global, Regional
- Applications, including LRF

2. RA VI Regional Climate Center, LRF node

- Status
- Rationale

3. Past and present climate, keys to the future

- A link to climatology

1. Climate modelling at Météo-France

- Global, Regional
- Applications, including LRF

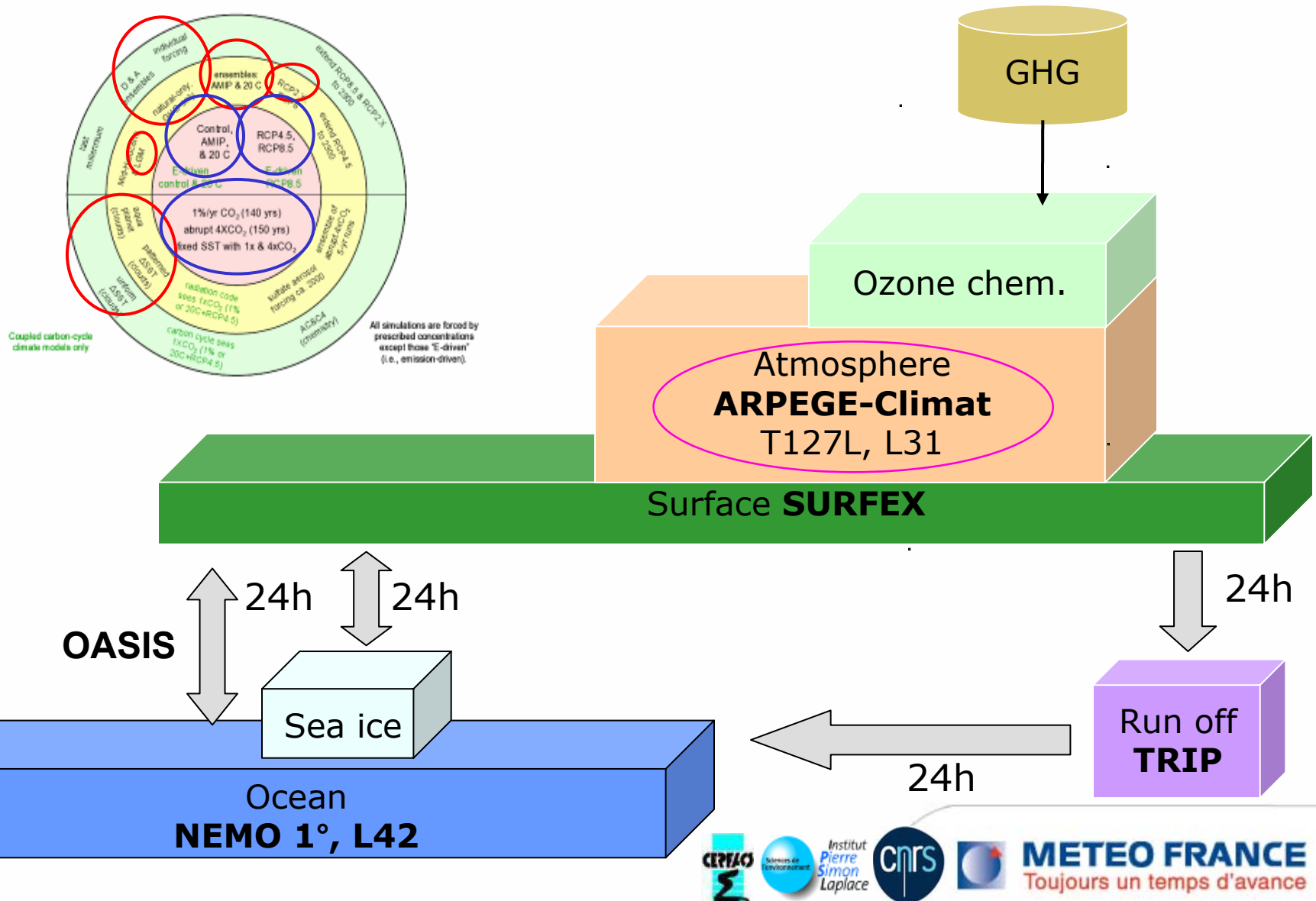
2. RA VI Regional Climate Center, LRF node

- Status
- Rationale

3. Past and present climate, keys to the future

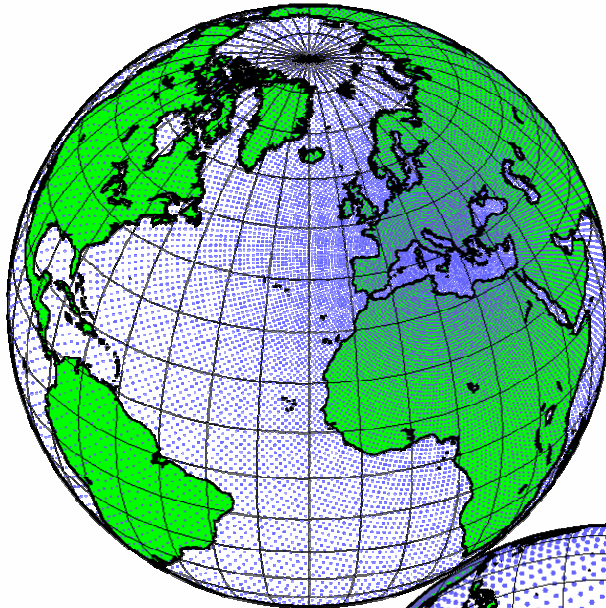
- A link to climatology

CNRM - CM5 for IPCC AR5

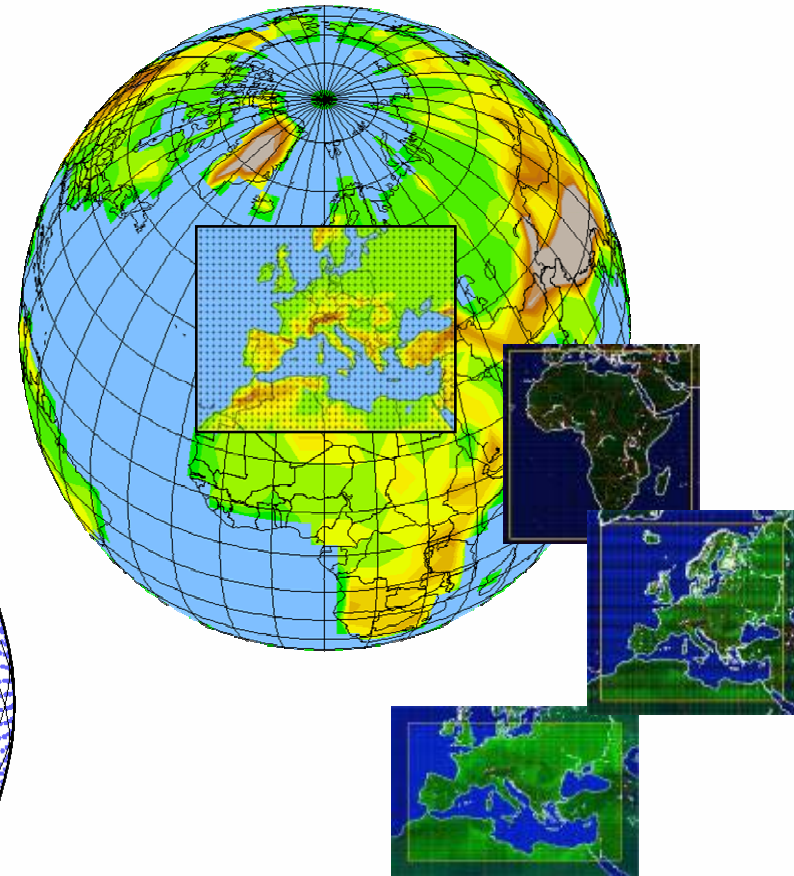
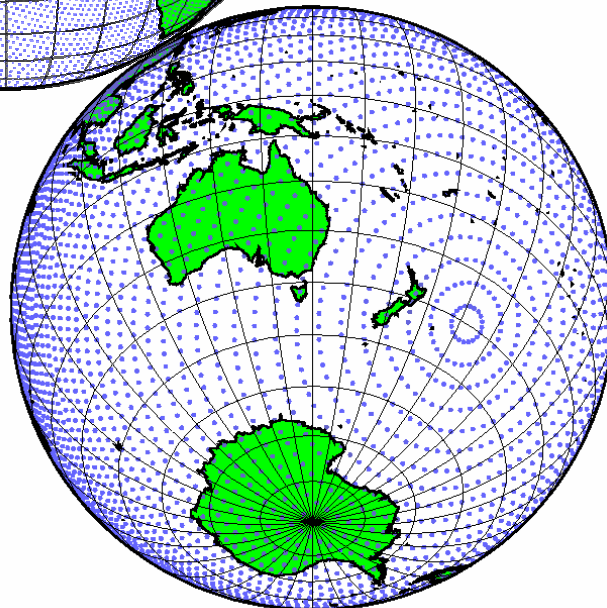


The Arpege – Aladin suite: Global to regional models

Aladin-climat, LAM



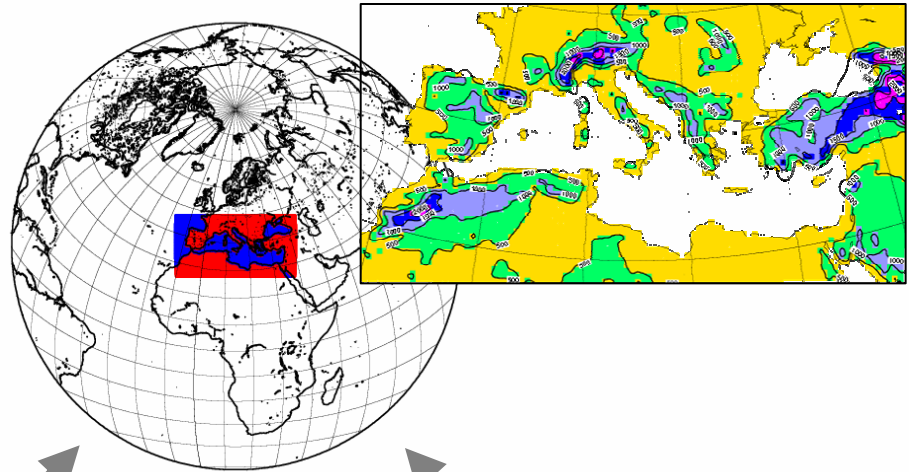
Arpege-climat,
stretched grid,
pole moved





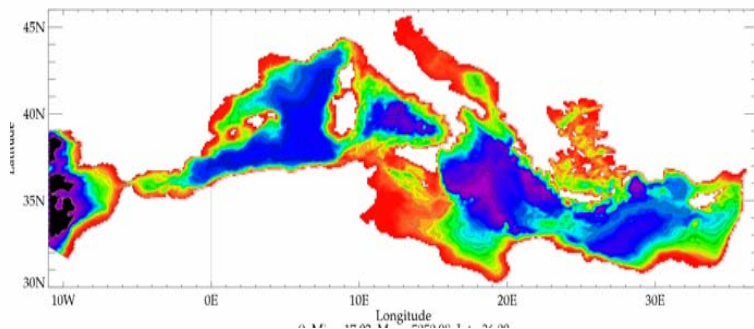
Regional scenarios for the Euro-Mediterranean area

ALADIN-Climat v5,
MED50, 50 km
+ SURFEX/ISBA
surface-vegetation-hydrology

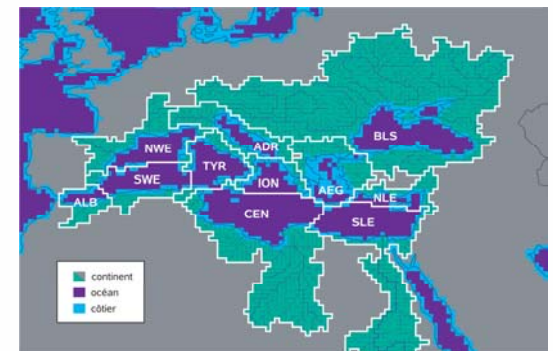


TRIP river model

Daily coupling



NEMOv2-MED8
10 km



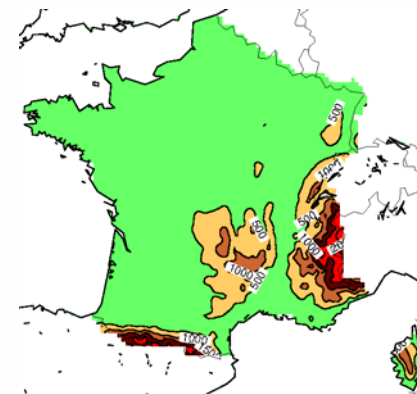
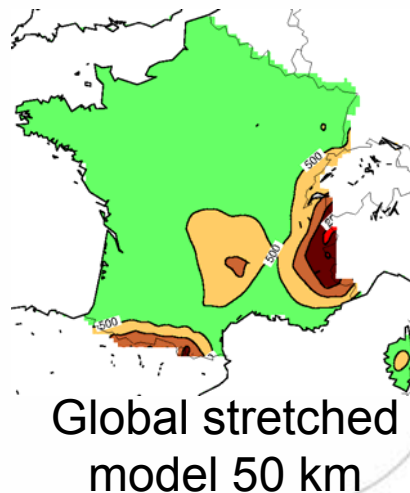
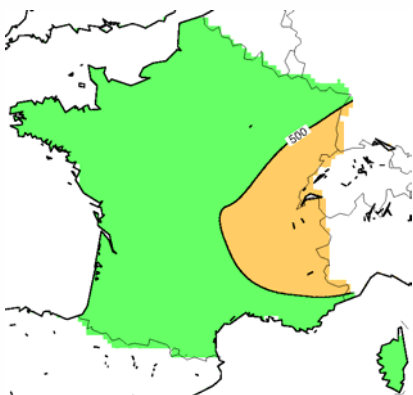
More resolution over France for impacts' studies

Regionalization's techniques:

- Statistical: e.g. weather regimes
- Variable mesh global model (stretched grid): Arpege-Climat
- LAM, embedded in a GCM: Aladin-Climat
- Mix (dynamical / statistical): e.g. Cyprim project

Impact of CC in mountains (Scampei project, M. Déqué)

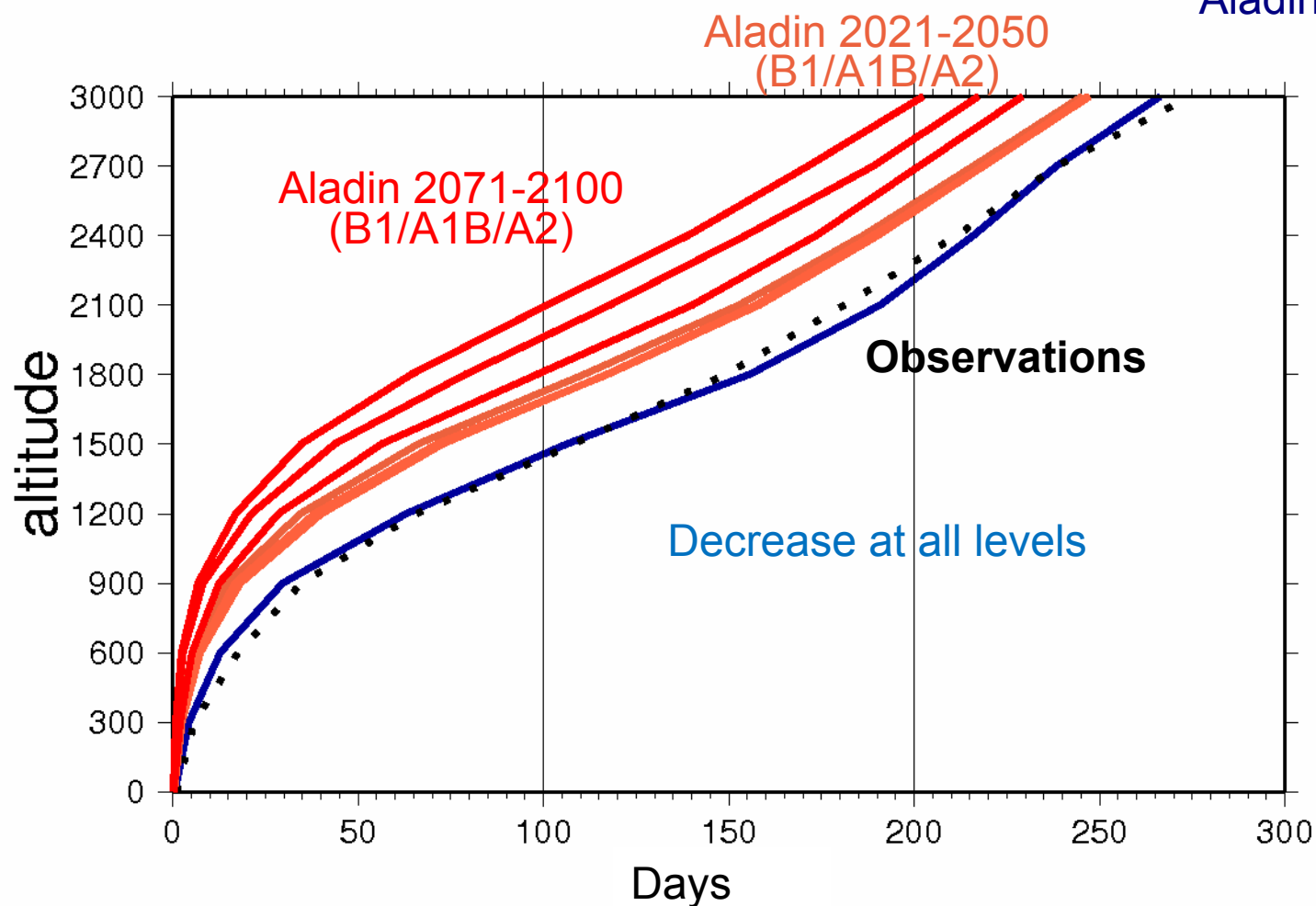
- Observation SAFRAN 8 km (8 variables)
- Statistical adaptation (quantiles correction, analogues)
- Soil/snow/vegetation ISBA / ES
- Snow model CROCUS



LAM 12 km

Number of days with snow on ground / year

Aladin 1961-90



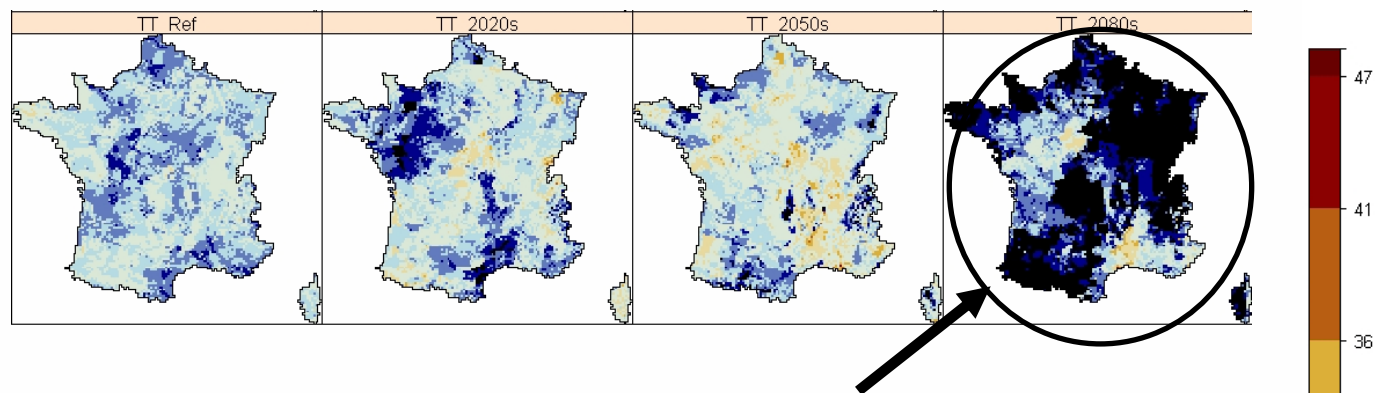
Impact of CC on water resource & droughts

Evolution of
the number of events
(ref present climate)

Scenarios to force
ISBA-MODCOU (8 km)

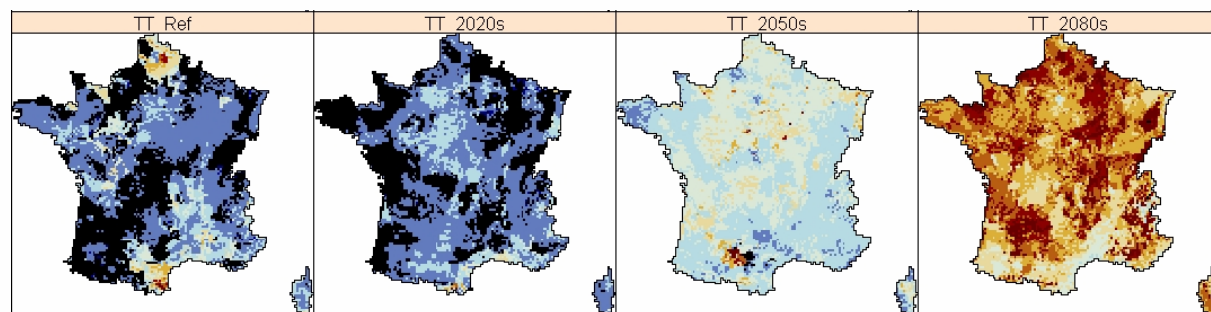
(soil-vegetation-hydrology)

Indices: SPI, SSWI...



Continuous drought > 30 years...

Evolution of magnitude
(ref 21st century climate)



Work on water resource seen as a critical need
reanalysis 1958-present, daily monitoring, LRF...



METEO FRANCE



ClimSec project, DCLim



METEO FRANCE
Toujours un temps d'avanc

1. Climate modelling at Météo-France

- Global, Regional
- Applications, including LRF

2. RA VI Regional Climate Center, LRF node

- Status
- Rationale

3. Past and present climate, keys to the future

- A link to climatology

The seasonal forecasting system

EuroSip system 3



Since May 2008

Arpege/IFS cycle 24 TL63L31

Ocean ORCA (no sea-ice) 2°x2°

Mercator ocean analyses

Hindcast 1979-2007

Ops: 7 months forecast – 41 runs

EuroSip system 4 (plan)

Based on Météo-France IPCC-AR5 version,
compatible with decadal forecasts

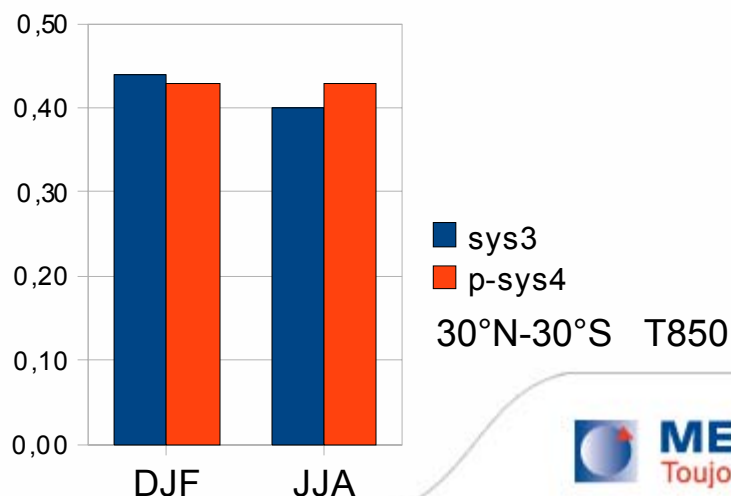
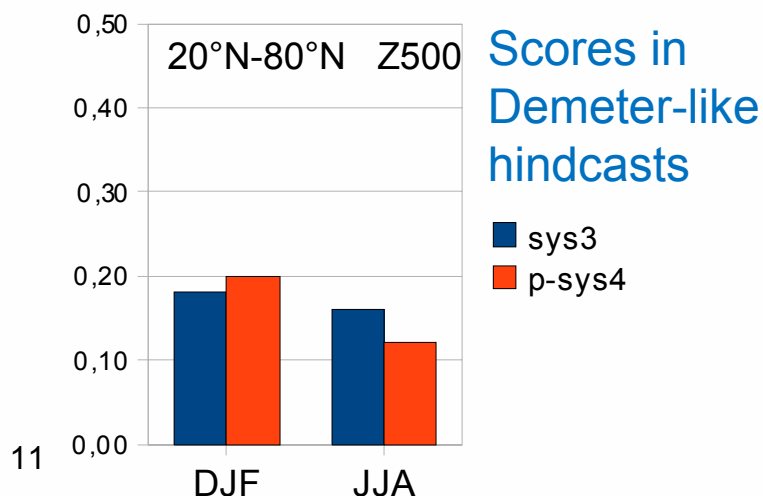
Arpege/IFS cycle 32 TL127L31

Ocean NEMO 1°x1° + Sea-ice GELATO

Mercator ocean analyses

Some options remain open till mid-2011

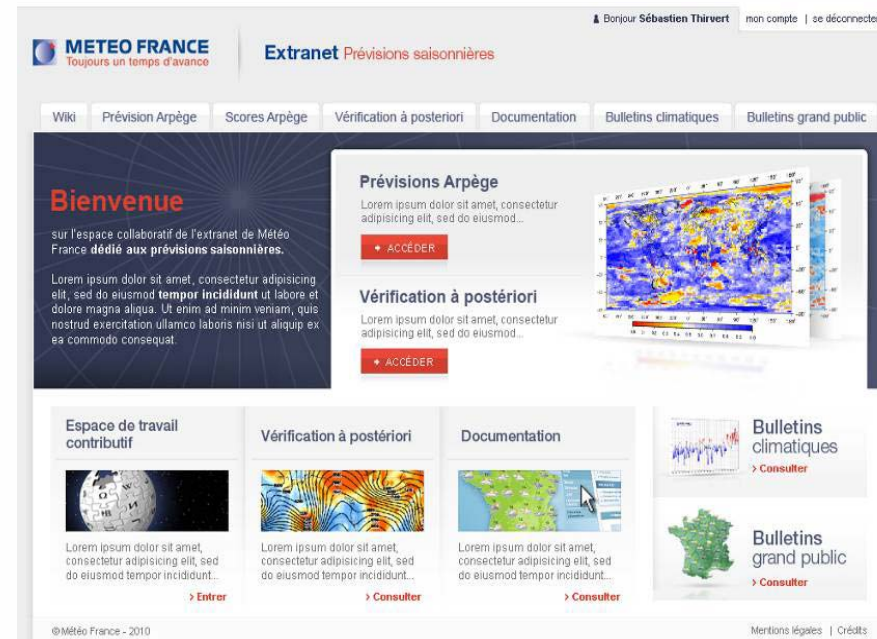
Operational production: mid-2012



METEO FRANCE
Toujours un temps d'avance

RCC Seasonal Forecasting

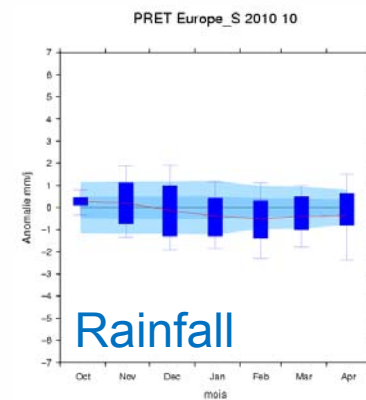
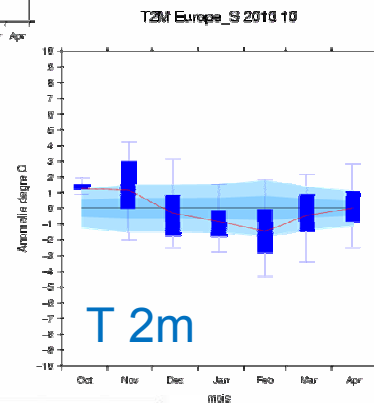
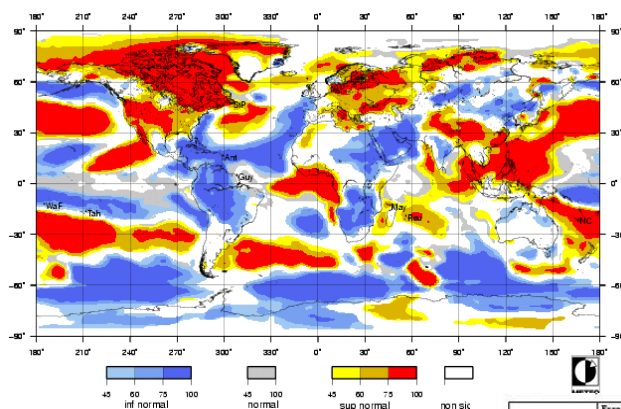
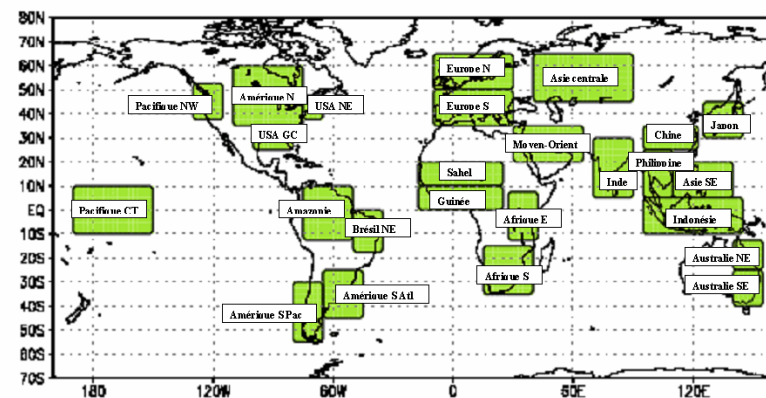
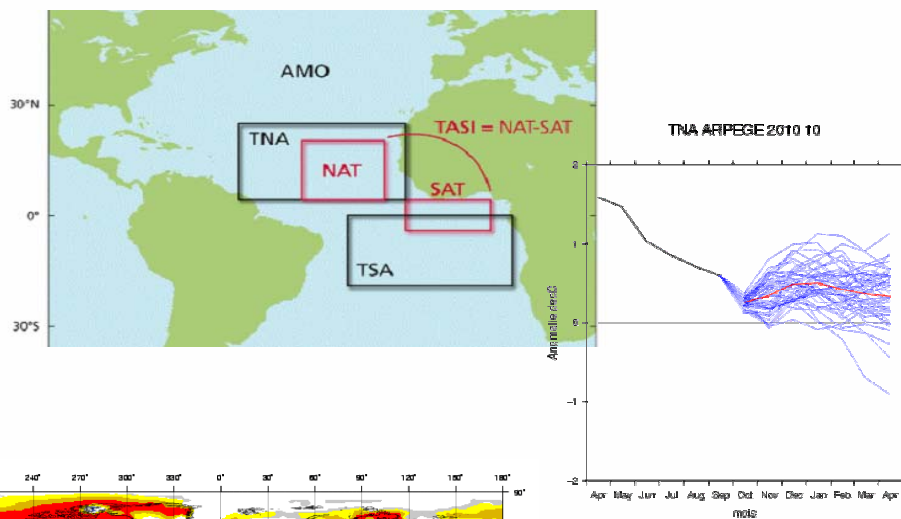
1. Glob. Production Center & RA VI RCC co-leader for Long Range Forecasting
 - A monthly set of products
2. Operational interpretation and forecast performance of GPCs products
 - Graphs and Maps of SVS scores;
 - Global Climate Bulletins
3. Tailored products & verification datasets
 - Specific boxes; Circulation regimes; Euro-Sip; GPCs
4. Consensus statements
 - Global Climate Bulletin; Web teleconference (2/year?)



RCC elaboration web site

<http://elaboration.seasonal.meteo.fr>

Global Production Centre & RCC Products

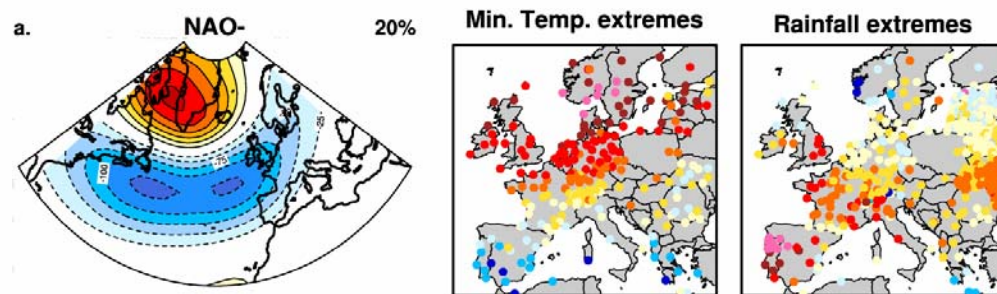
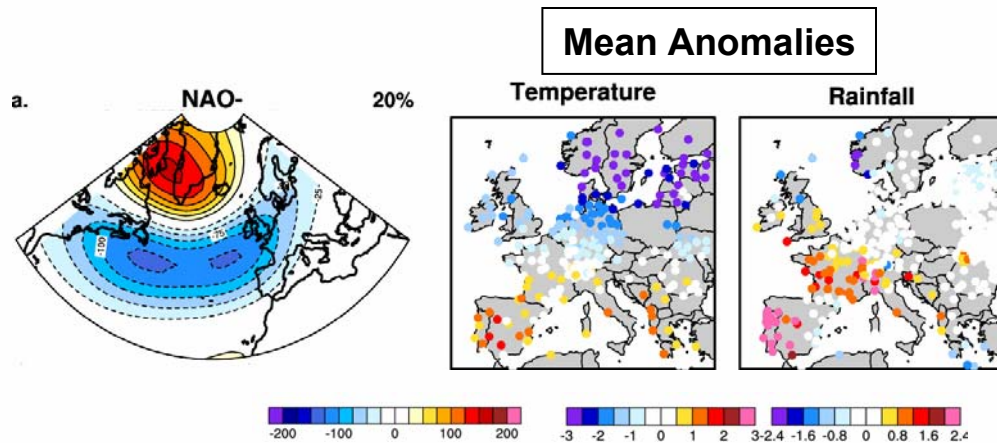


MODELES	France Métropole	Australie	Guyane	Reunion	Mayotte	Nouvelle- Calédonie	Wallis et Futuna	Polynésie	St Pierre et Miquelon
CEP									
ISI									
MF									
Met Office									
JMA									
Synthèse				(5/5)	(5/5)	(4/5)	(4/5)	(4/5)	(5/5)
Scénario privilegié par Météo-France	Pas de scénario privilegié	Pas de scénario privilegié	Pas de scénario privilegié	Chaud	Chaud	Chaud	Chaud	Chaud	Chaud

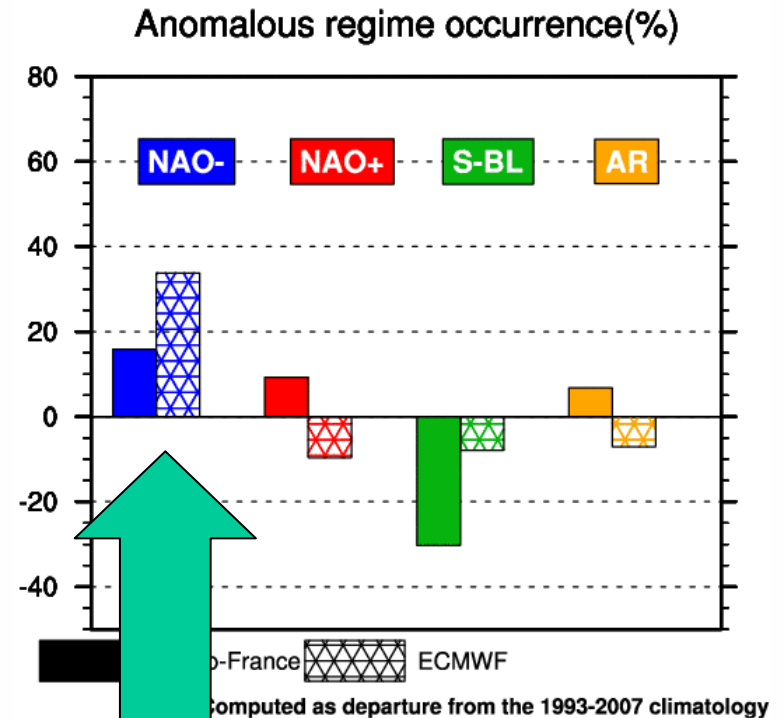
■ T inférieure à la normale (froid)
 ■ T proche de la normale
 ■ T supérieure à la normale (chaud)
 ■ Pas de scénario privilégié

Products: Circulation Regimes

Forecast Mode and use – Winter 2009 forecasts



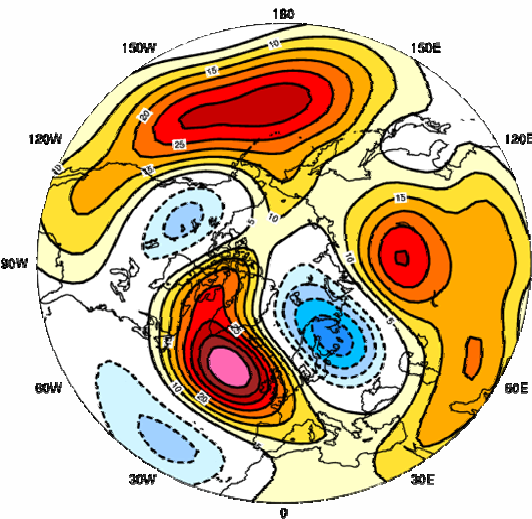
Min Temperatures / Extreme Rainfall



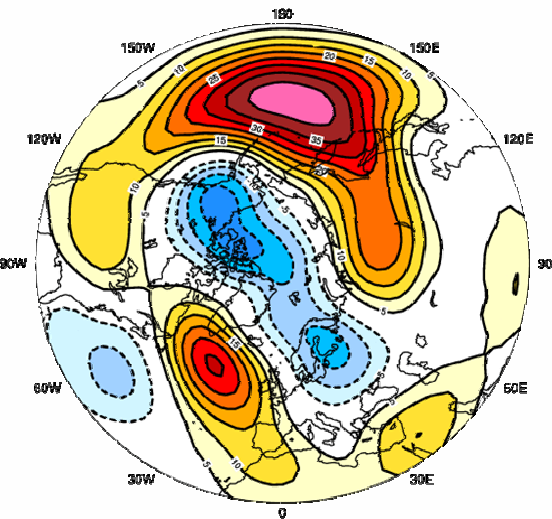
Increased Occurrence of NAO – regimes

RCC analysis & elaboration of the Global Climate Bull.

Météo-France



ECMWF



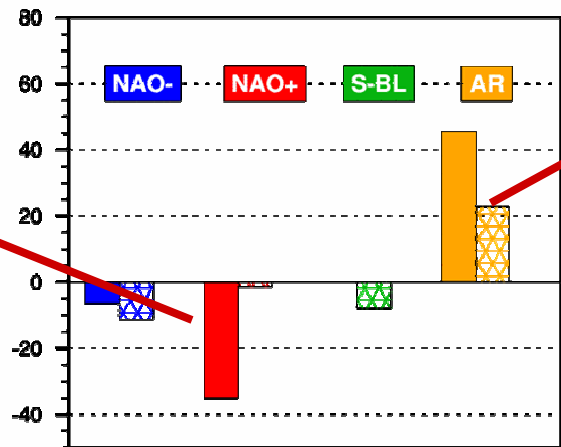
Good consistency between MF and ECMWF responses to Pacific and Atlantic Tropical forcings: **AR predominant**

Consistent signal with a warm Tropical North Atlantic



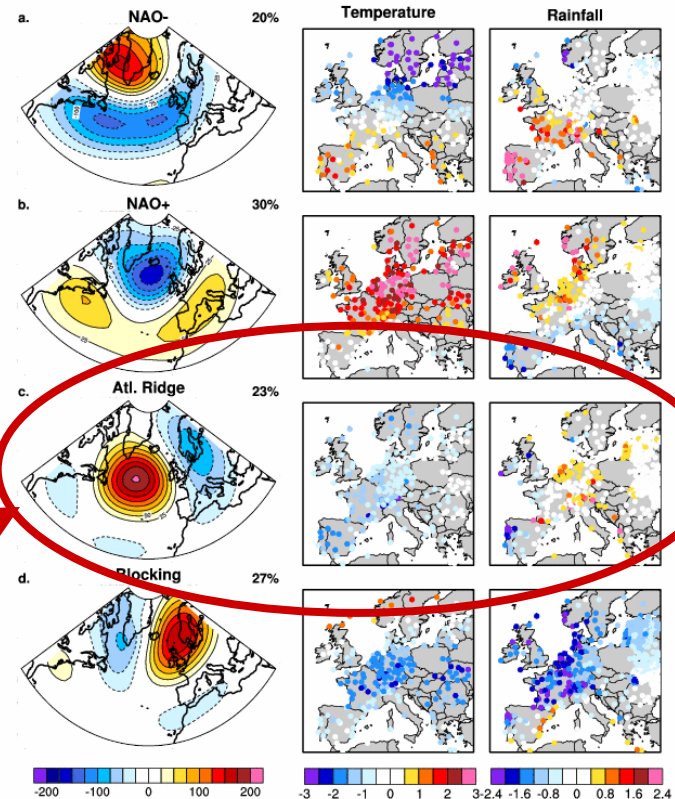
RCC
Bulletin

Anomalous regime occurrence(%)



■ Météo-France ■ ECMWF

Computed as departure from the 1993-2007 climatology



1. Climate modelling at Météo-France

- Global, Regional
- Applications, including LRF

2. RA VI Regional Climate Center, LRF node

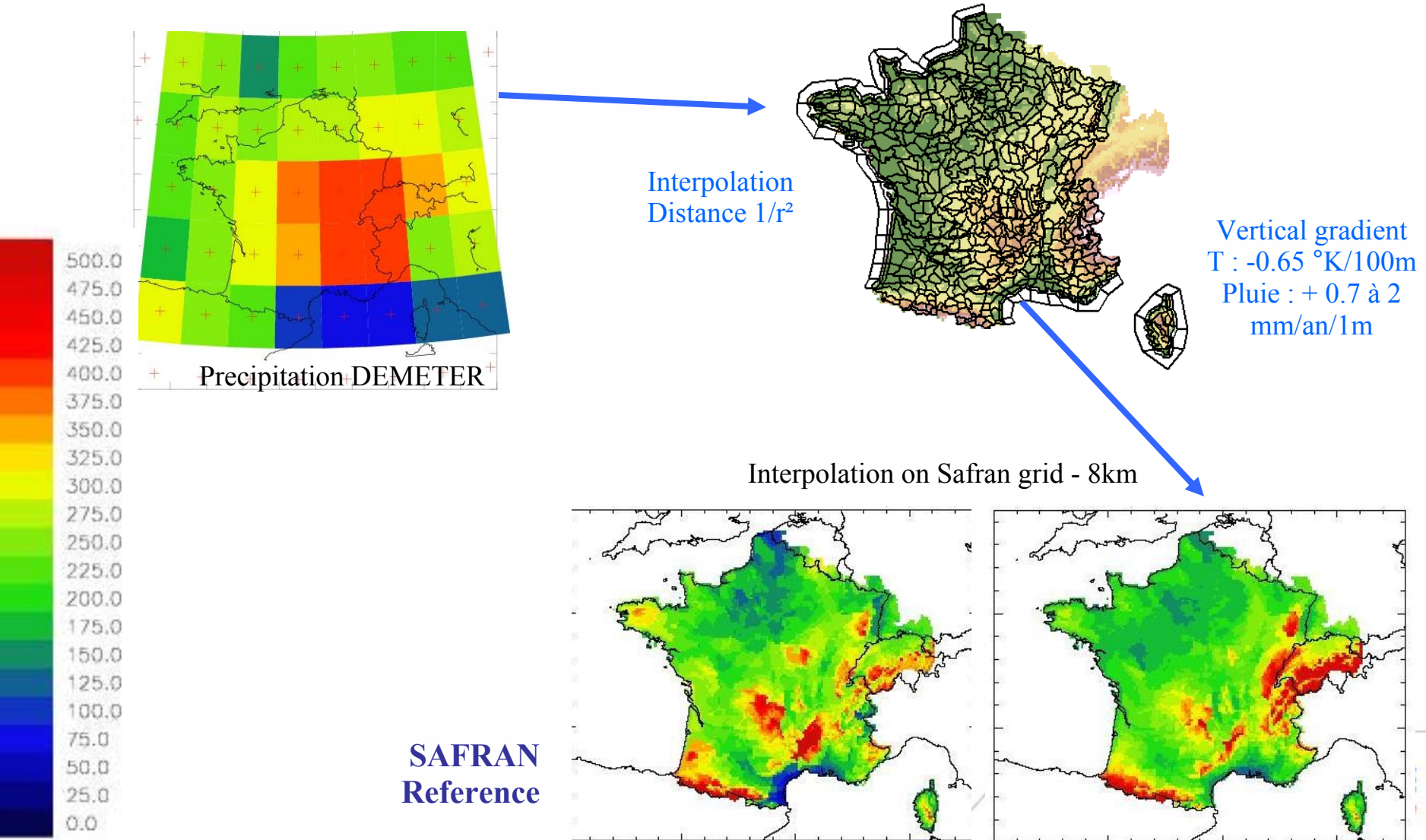
- Status
- Rationale

3. Past and present climate, keys to the future

- A link to climatology

Downscaling, statistical correction...

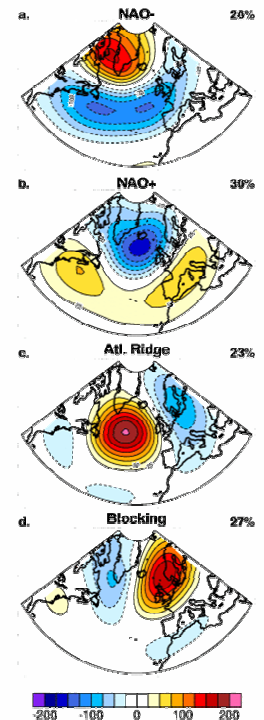
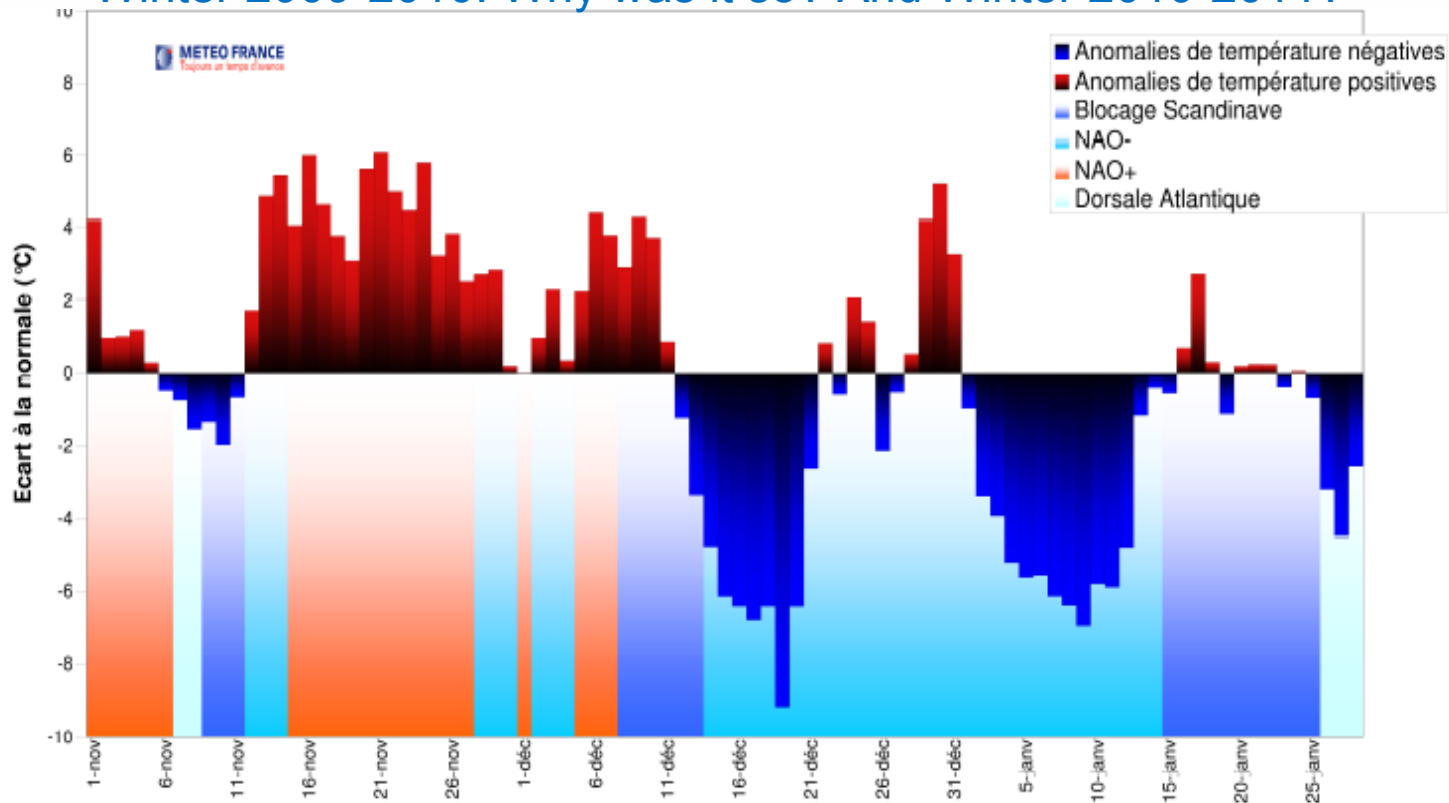
Models processing with the old toolbox: weather regimes, Q/Q...



A transition from description to dynamics

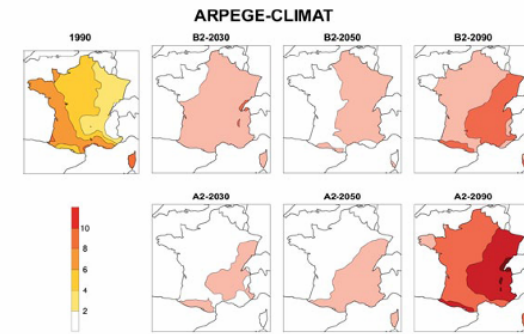
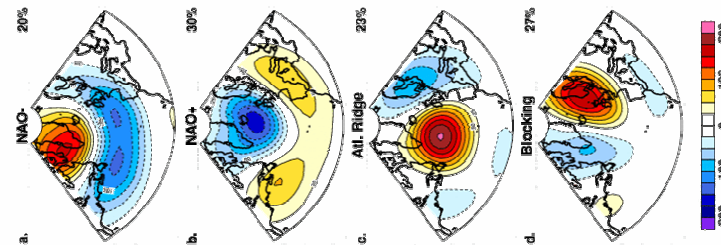
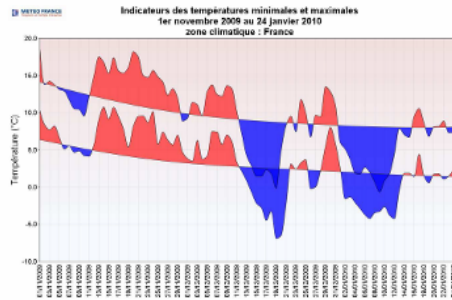
Daily mean T anomaly (vs 1971-2000) & weather regimes.
1st Nov 2009 to 28 Jan 2010.

Winter 2009-2010: Why was it so? And Winter 2010-2011?



Seasonal forecasting also as a mean to train to climate sciences

Climate change, adaptation, impacts, variability, detection, downscaling, extremes, risks??? A single science...



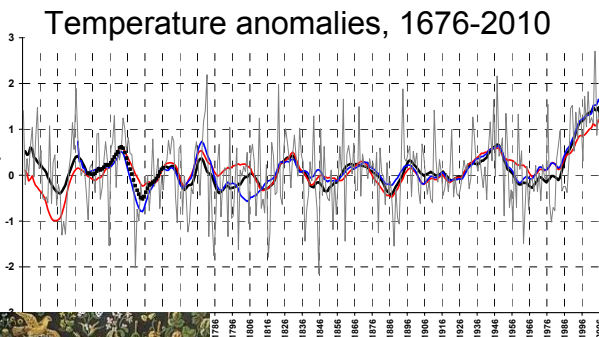
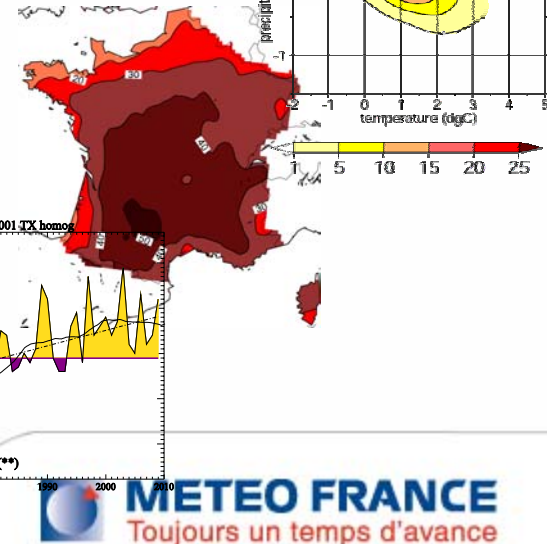
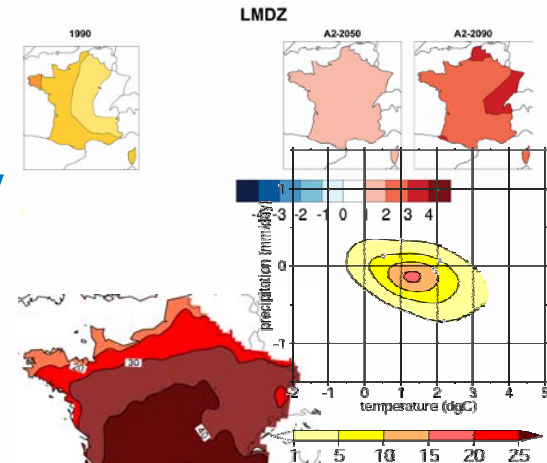
Observation are critical & vital.

- The obs. network...

We need data, & quality.

We need the good old climatology
and climate modelling together.

- Data rescue
- Quality controls
- Homogenisation
- Weather regimes...



MÉMOIRES
SUR
LA MÉTÉOROLOGIE,
Pour servir de Suite & de Supplément
AU TRAITÉ DE MÉTÉOROLOGIE,
publié en 1774.

Par le P. COTTE, Prêtre de l'Oratoire, Chanoine de l'Eglise Cathédrale de Laon, Correspondant de l'Académie Royale de Siens, de Paris, Membre de la Société Royale de Médecin de Paris, de l'Académie Royale des Belles-Lettres, Sciences & Arts de Bordeaux; de la Société Électorale Météorologique Palatine, établie à Mannheim, Secrétaire perpétuel de la Société Royale d'Agriculture de Laon.

Tome Second.

A PARIS,
DE L'IMPRIMERIE ROYALE.
M. DCCLXXXVIII.

[illegible]



Thank you
Philippe.Dandin@meteo.fr

CNRM
Michel.Deque@meteo.fr

DClim
Jean-Pierre.Ceron@meteo.fr



METEO FRANCE
Toujours un temps d'avance