GLOBAL CLIMATE BULLETIN
n°170 - AUGUST 2013

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I. DESCRIPTION OF THE CLIMATE SYSTEM (JUNE 2013)

I.1. OCEANIC ANALYSIS

I.1.a Global Analysis

At the Surface (fig. 1) :
Globally, little evolution in tropical regions.
For the Pacific : persistent warm anomaly over the maritime continent, stronger to the north of equator.. This anomaly extends along the SPCZ.
In the equatorial waveguide (120W 100W), back to neutral conditions, due to the advection of a subsurface warm anomaly (cf fig.4). To be quoted in the June cross-section (fig 4, right), a new cold anomaly (around 180-160W, 150m immersion) that is interesting to follow for ENSO evolution.
Along the Peruvian coasts, back to cold conditions.

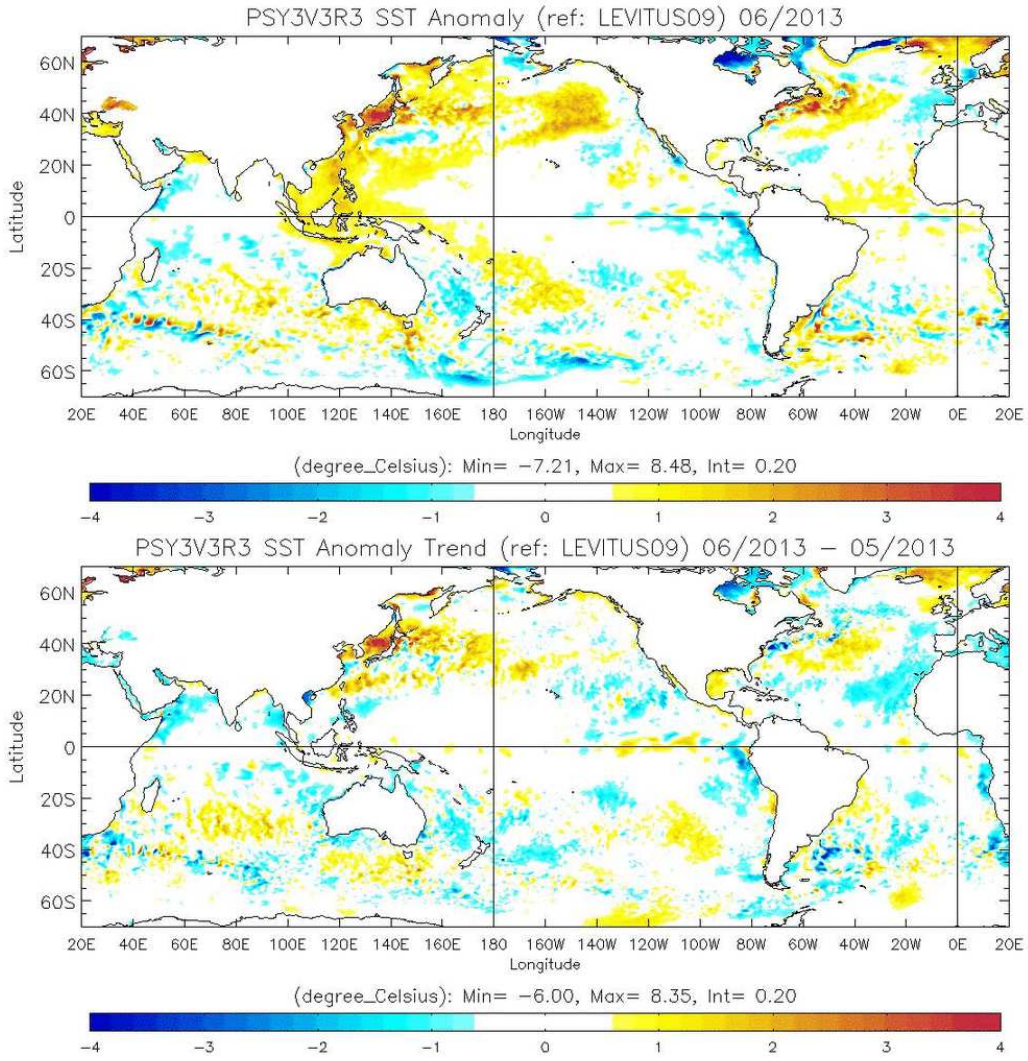


fig.1: top : SSTs Anomalies (°C) (reference 1950-2008); bottom : SST tendency (current – previous month)
http://bcg.mercator-ocean.fr/

For the Atlantic : very little evolution in the Tropics ; Neutral conditions along the equatorial waveguide. Some cooling in the northern tropical Atlantic, but globally this area keeps warmer than normal conditions (cf TNA and NAT boxes).
In the Indian Ocean : very little evolution in the Tropics. Slightly negative or neutral anomalies in the western part, positive anomalies in the eastern part. Consequently the DMI is still lightly negative.

In subsurface (fig.2) :
In the Pacific : in the equatorial band (10°N-10°S), heat content anomalies mostly negative East to the dateline and positive West to this limit. Note the positive anomalies in the most Western part off equator (in the Northern hemisphere between 10°N and 20°N) which extends toward the mid-latitudes (East to the dateline). In the SPCZ region positive anomaly extends South-East toward mid-latitudes. In the mid/high latitudes of the Northern hemisphere, great consistency with the surface signal (and similar pattern than for the Tropics).
In the Atlantic : in the equatorial waveguide and along the western coast of the African continent little anomalies. Persistence of the strong positive anomaly in the North-Eastern part of the basin (close to the sub-topics) up to the equatorial region. Over South Tropics the heat content anomalies are mostly positive.
In the Indian Ocean : heat content mostly consistent with SSTs, especially close to the maritime continent and Australia.

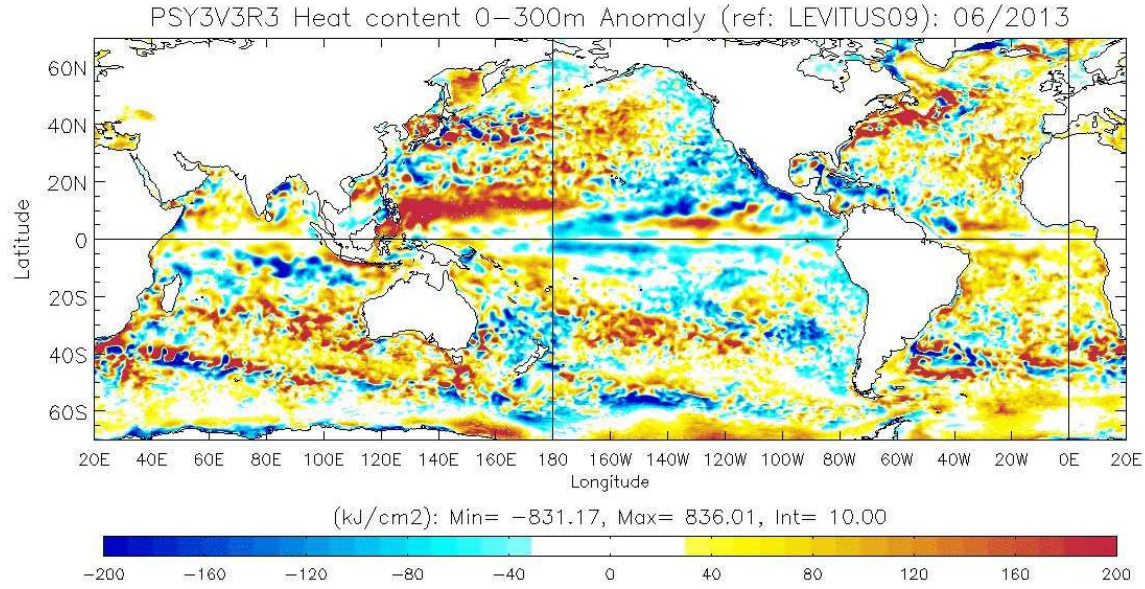


fig.2: map of Heat Content Anomalies (first 300m) (in kJ/cm^2). (reference 1950-2008) http://bcg.mercator-ocean.fr/

I.1.b Pacific Basin (fig. 3, 4 and 5)

A dipole pattern is visible with positive anomalies on the western side, close to normal in the Central and negative anomaly in the most Eastern part. Very little trade wind anomalies over most of the basin. The SOI is still positive (+1.2) consistently with the dipole pattern.

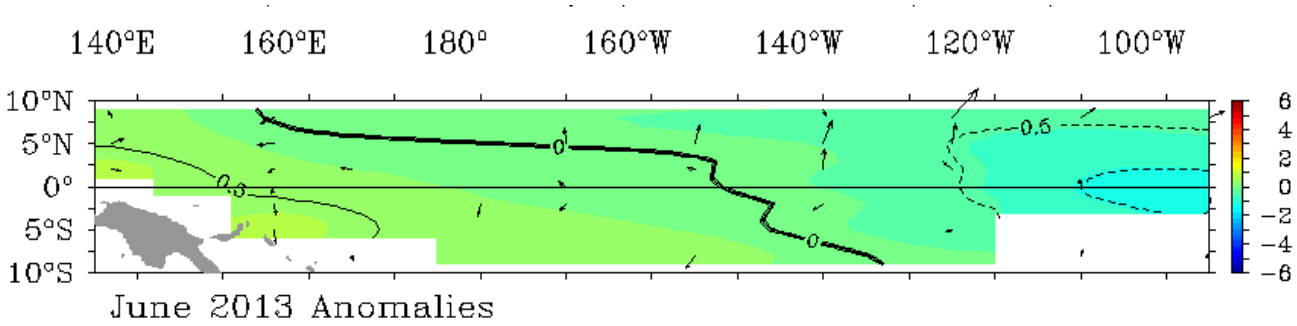


fig.3: SST Anomalies and Wind anomalies over the Equatorial Pacific from TAO/TRITON. http://www.pmel.noaa.gov/tao/jsdisplay/monthly-summary/monthly-summary.html

In the Niño boxes (4, 3.4, 3 et 1+2 ; see definition in Annex) the SST anomalies illustrate the neutral conditions in the Pacific. The monthly averages are respectively -0,3°C, -0,1°C, -0,8°C and -1,9°C from West to East.

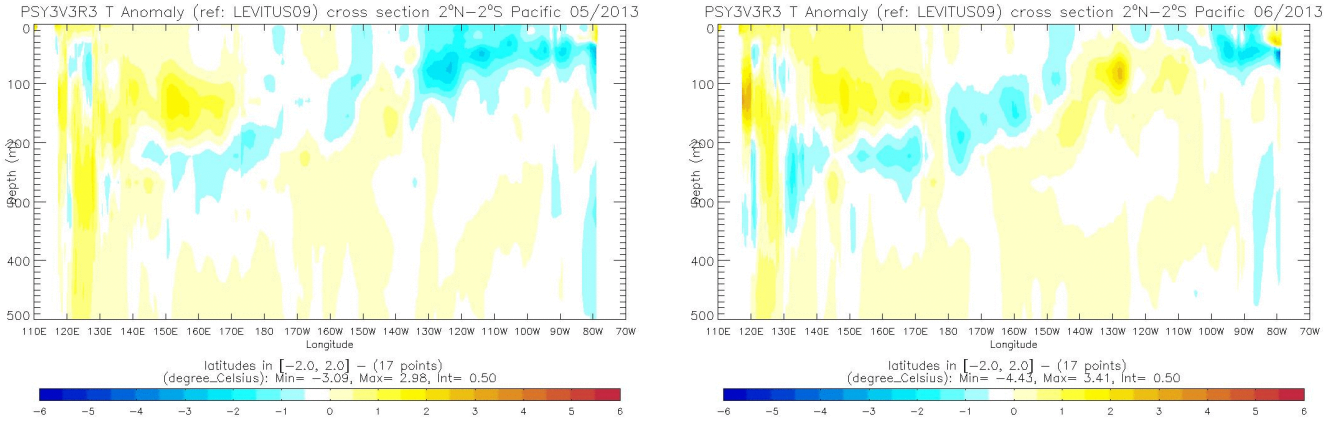


fig.4: Oceanic temperature anomaly in the first *500 metres* in the Equatorial Pacific, in previous month (left) and current month (right) http://bcg.mercator-ocean.fr/

In the equatorial waveguide (fig. 4) : still traces of propagation of Kelvin waves under the surface (colder than normal) in June from West to East. This signal is to be carefully monitored with respect of next months and possible evolution for the end of this year.
The thermocline structure (fig. 5) : some weak traces of wave propagation signal of both anomalies as already pointed out in the previous comment.

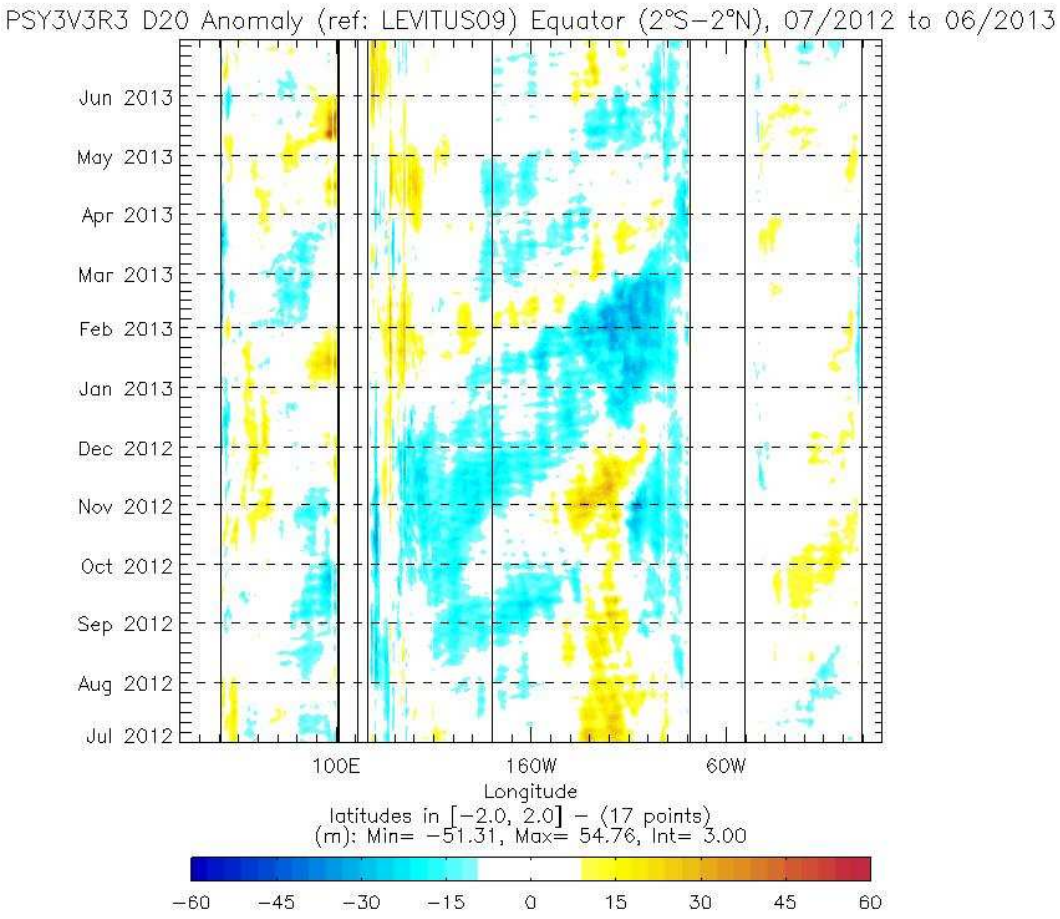


fig.5: Hovmüller diagram of Thermocline Depth Anomalies (m) (depth of the 20°C isotherm) along the equator for all oceanic basins over a 24 month period. http://bcg.mercator-ocean.fr/

I.1.c Atlantic Basin

Northern Tropical Atlantic : mostly warmer than normal and little evolutions.
Equatorial waveguide : very weak dipole structure (slightly cooler than normal on East and warmer than normal on West), with without trace of wave propagation. Guinean Gulf close to normal.
The Southern Tropical Atlantic : Close to normal and little evolutions.

I.1.d Indian Basin

Southern Tropical Indian Ocean : mostly cooling on the Eastern side (west of Australia). Still warmer than normal between Australia and the maritime continent.
Equatorial waveguide : no significant evolution. The DMI is still negative.
Northern Tropical Indian Ocean : some cooling in Arabian sea, that is now colder than normal.

I.2. ATMOSPHERE

I.2.a Atmosphere : General Circulation

Velocity Potential Anomaly field in the high troposphere (fig. 6 – insight into Hadley-Walker circulation anomalies) : quite fragmented cells, related to large variability during this month, mainly due to MJO activity (in the Tropics) as there is only little SST forcing and partly related to mid-latitude atmospheric activity. The main points are:

- On the Pacific and on the Indian ocean: divergent circulation anomalies (upward anomaly motion) centered on the maritime continent (related to warm SST anomalies + MJO activity during the 2nd decade of June). Convergent circulation anomaly (downward anomaly motion)on the Western Indian Ocean. This configuration is consistent with DMI negative value.
- On the Atlantic : Divergent circulation anomalies (downward anomaly motion) over Tropical Atlantic (both Northern and Southern). A positive anomaly (upward anomaly motion) over West Africa, clearly related to MJO activity. In the Southern hemisphere, to be quoted the negative anomaly in the vicinity of Amazonian regions.

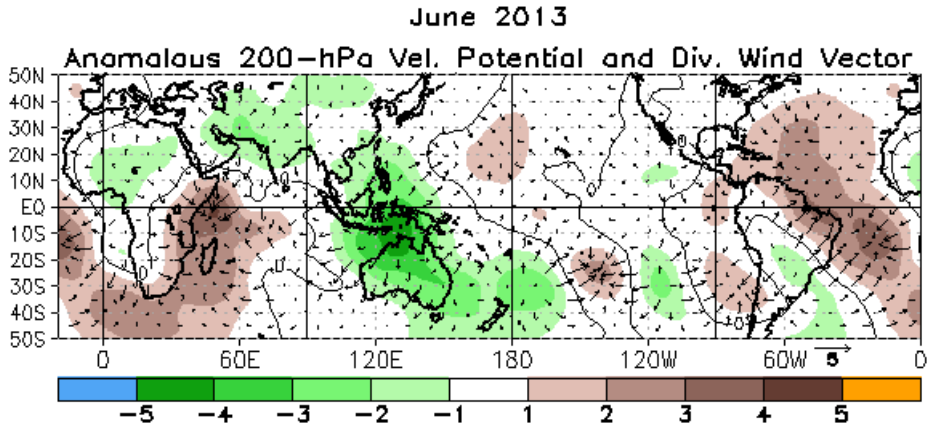


fig.6: Velocity Potential Anomalies at 200 hPa and associated divergent circulation. Green (brown) indicates a divergence-upward anomaly (convergence-downward anomaly).
http://www.cpc.ncep.noaa.gov/products/CDB/Tropics/figt24.shtml

Stream Function anomalies in the high troposphere (fig. 7 – insight into teleconnection patterns tropically forced) : the strongest signal is likely related to Sub-Tropics/Mid-Latitude activity. The Tropical Velocity Potential anomalies seem to have little impact onto the atmosphere of the mid-latitudes and even in the Tropics.

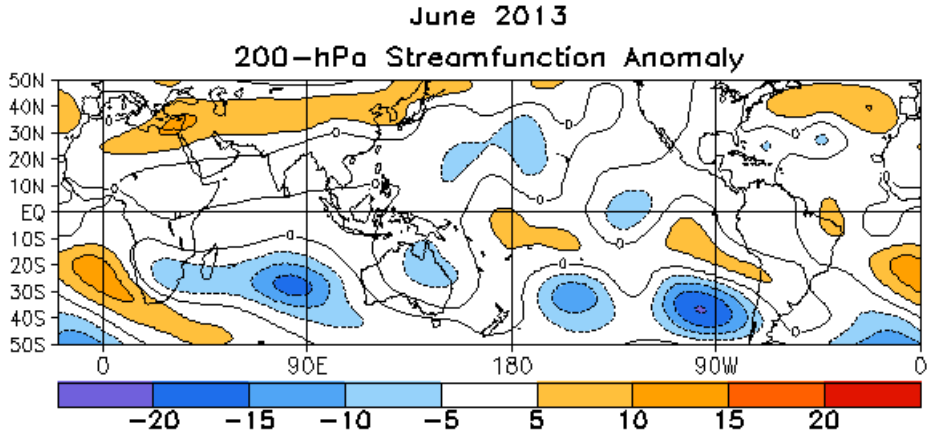


fig.7: Stream Function Anomalies at 200 hPa.
http://www.cpc.ncep.noaa.gov/products/CDB/Tropics/figt22.shtml

Geopotential height at 500 hPa (fig. 8 – insight into mid-latitude general circulation) : Consistently with the previous analysis, there is only little anomalies coming from the Tropics. The greatest anomalies are observed in the High and mid-latitudes of the Pacific and across the Atlantic. Over the Western façade of Europe the anomaly is consistent with disturbed summer circulation observed. The main active modes are the EP-NP (1.7) and, over Europe, the East/Atlantic West Russia mode (-2.3). The NAO is still on the positive side (+0.8).

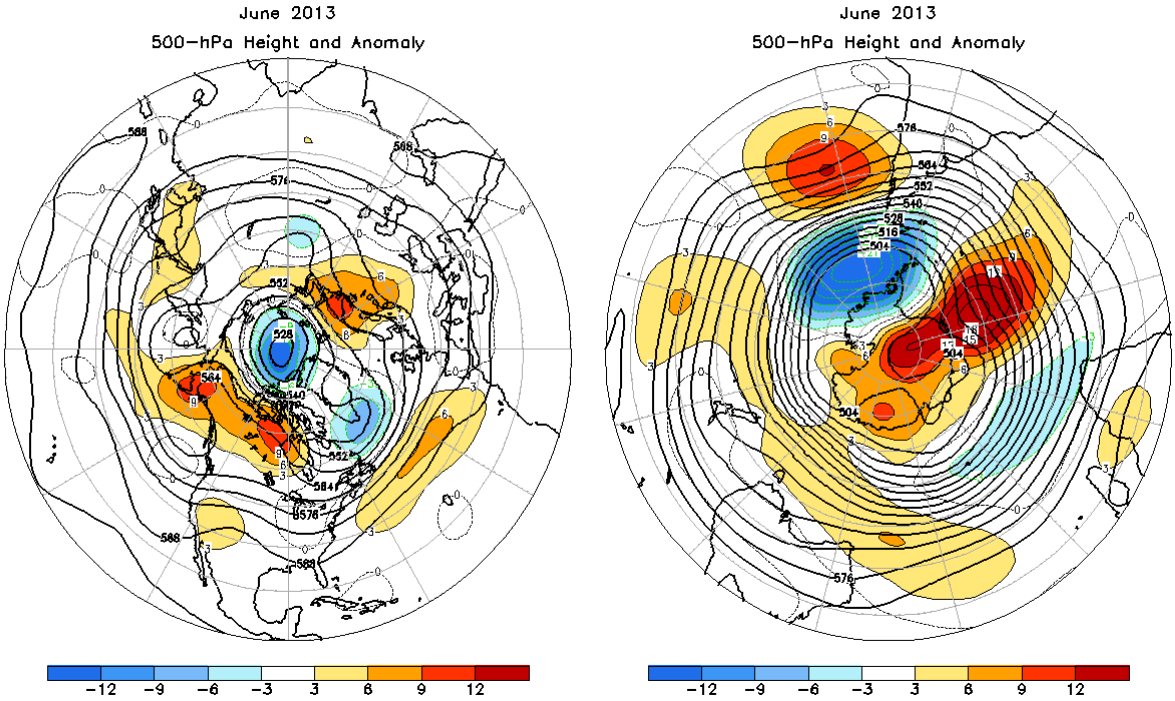


fig.8: Anomalies of Geopotential height at 500hPa (left North Hemisphere http://www.cpc.ncep.noaa.gov/products/CDB/Extratropics/fige9.shtml, and right South Hemisphere http://www.cpc.ncep.noaa.gov/products/CDB/Extratropics/fige15.shtml)

Evolution of the main atmospheric indices for the Northern Hemisphere for the last 6 months :

MONTH	NAO	EA	WP	EP-NP	PNA	TNH	EATL/WRUS	SCAND	POLEUR
JUN 13	**0.8**	**0.7**	**-0.5**	**1.7**	**-0.4**	**---**	**-2.3**	**0.3**	**0.0**
MAY 13	0.6	0.1	-1.1	-0.3	-0.2	---	-2.1	0.5	0.0
APR 13	0.6	1.3	-1.9	1.2	-1.8	---	-0.4	-1.1	-1.6
MAR 13	-2.1	-0.2	0.6	0.7	-0.3	---	2.3	-0.6	-1.9
FEB 13	-1.0	0.1	1.5	-0.9	0.3	0.9	-1.3	1.0	0.3

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

I.2.b Precipitation

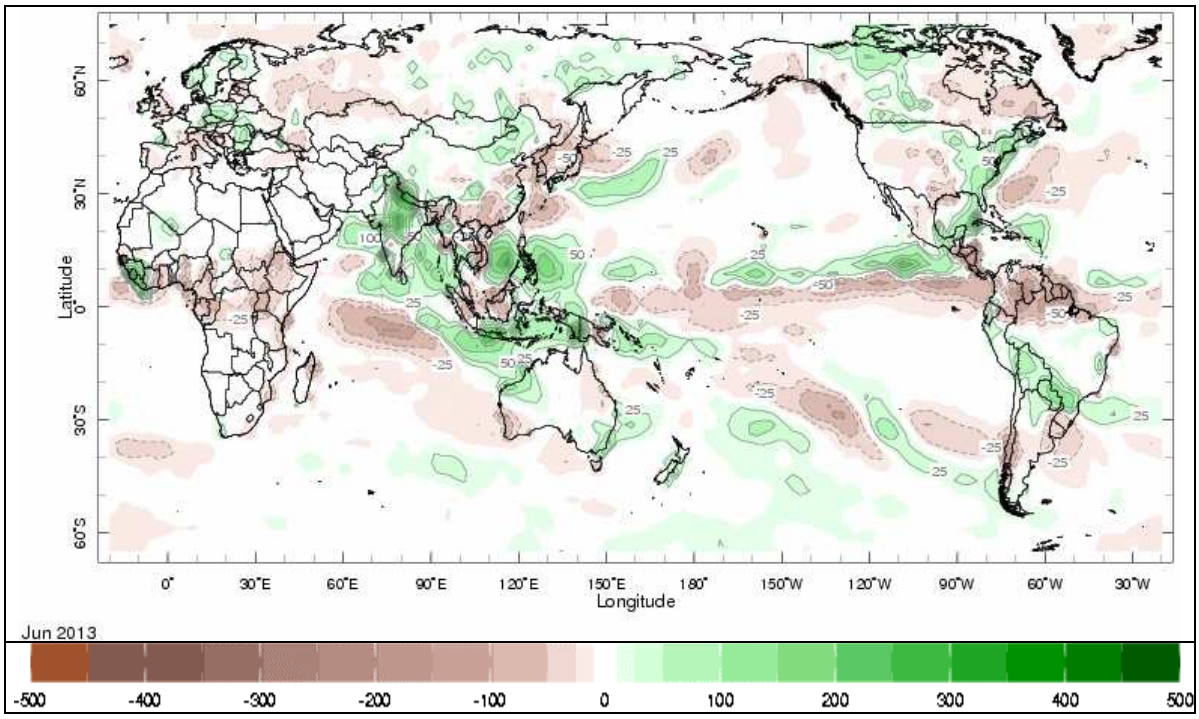


fig.9: Rainfall Anomalies (in mm) (departure to the 1979-2000 normal) – Green corresponds to above normal rainfall while brown indicates below normal rainfall.
http://iridl.ldeo.columbia.edu/maproom/.Global/.Precipitation/

Tropical regions : good consistency with the velocity potential anomalies, particularly over maritime continent (+), South America (- to the north, + to the south of Brazil), Eastern Africa
Mid-latitudes : globally positive anomalies over Europe, negative over west Russia.

I.2.cTemperature

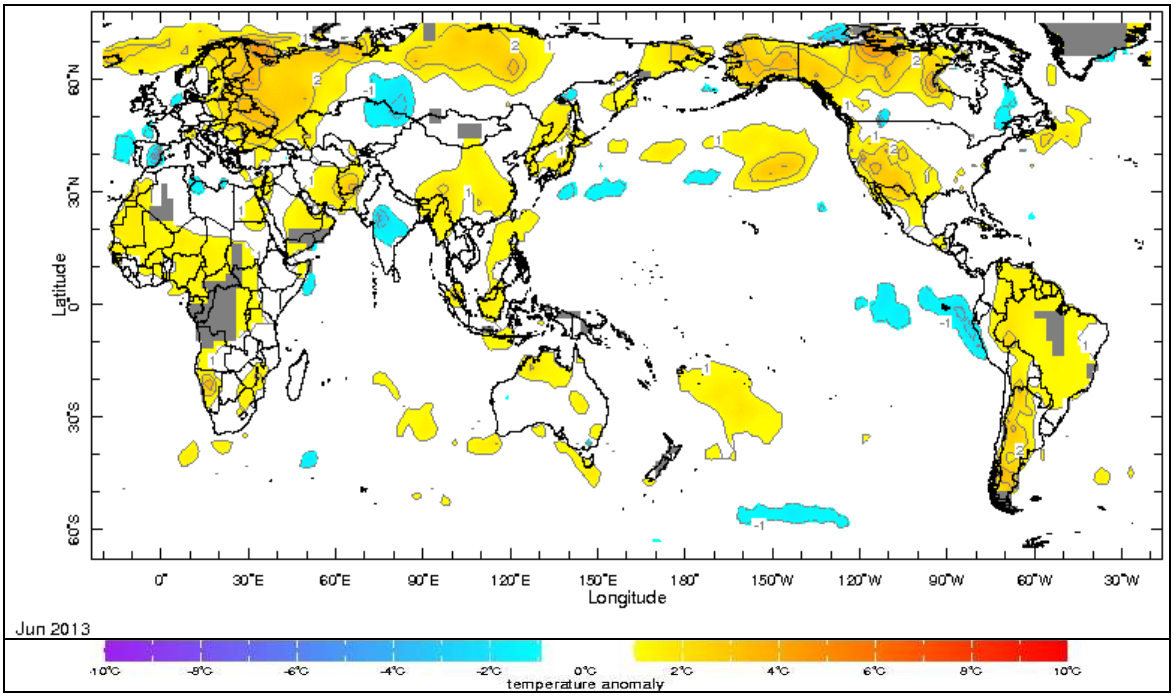


fig.10: Temperature Anomalies (in °C) (departure to the 1979-2000 normal)
http://iridl.ldeo.columbia.edu/maproom/.Global/.Atm_Temp/Anomaly.html

Strong contrast between West and East of Europe (consistent with Z500 anomaly field).
Stronger anomalies are positive and concern Siberia, North-western Canada; Alaska and Western US.

I.2.d Sea Ice

In Arctic (fig. 11 - left) : well below normal sea-ice extension especially over the Atlantic side.
In Antarctic (fig. 11 - right) : well above normal sea-ice extension anomaly with some large regional modulation.

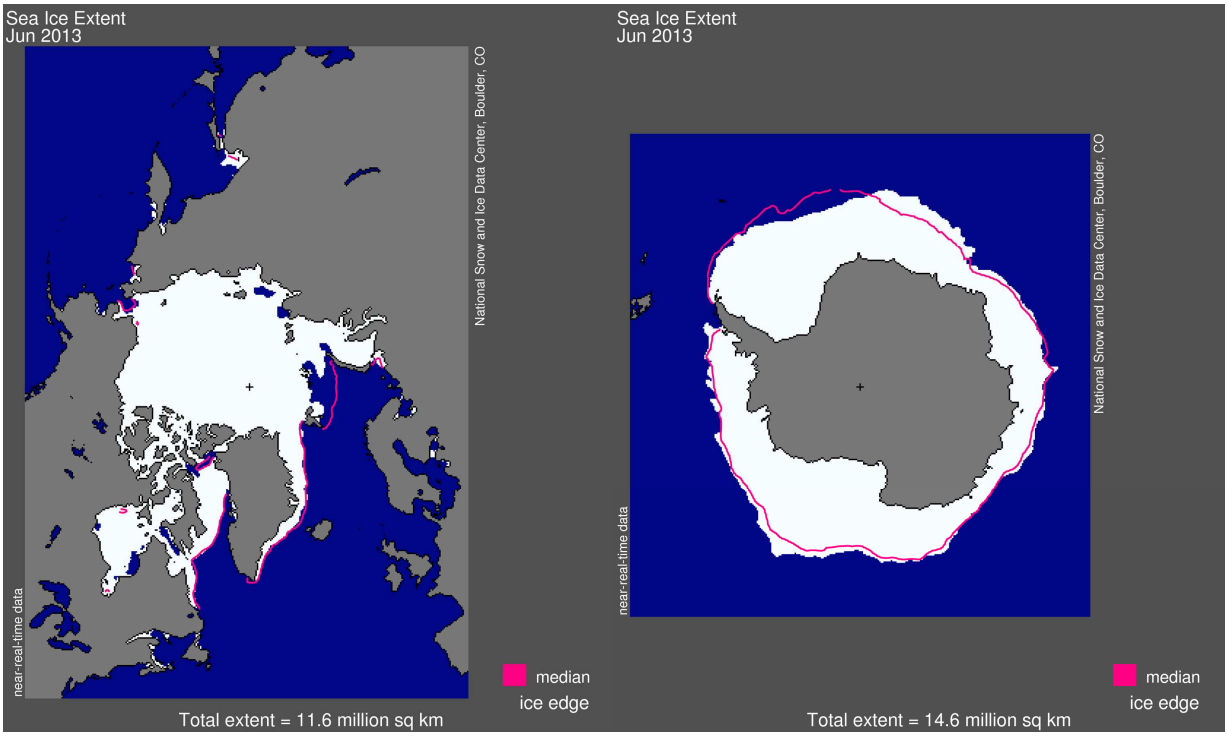


fig.11: Sea-Ice extension in Arctic (left), and in Antarctic (right). The pink line indicates the averaged extension (for the 1979-2000 period). http://nsidc.org/data/seaice_index/

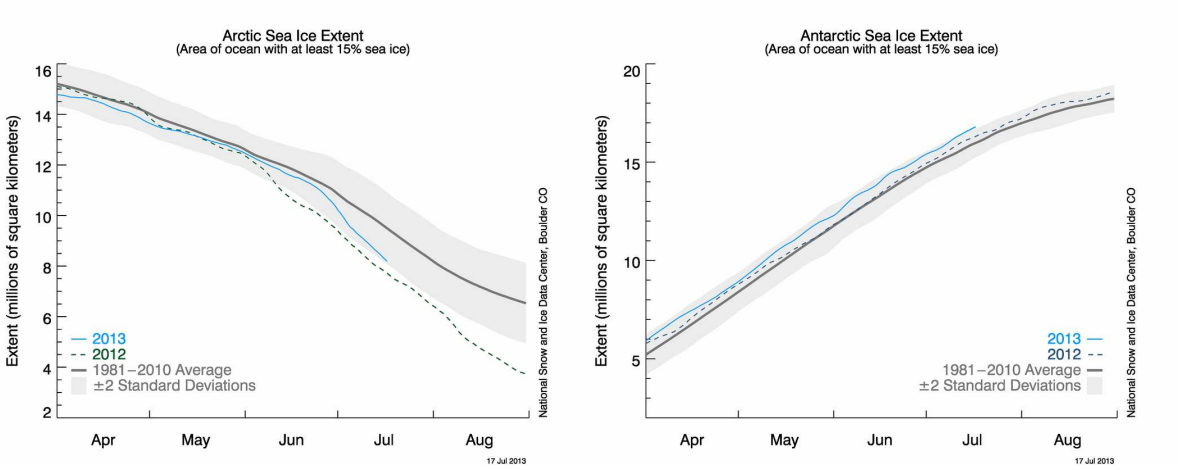


fig. 9bis : Sea-Ice extension evolution from NSIDC
http://nsidc.org/data/seaice_index/images/daily_images/N_stddev_timeseries.png

II.SEASONAL FORECASTS FOR ASO FROM DYNAMICAL MODELS

II.1. OCEANIC FORECASTS

II.1.a Sea Surface Température (SST)

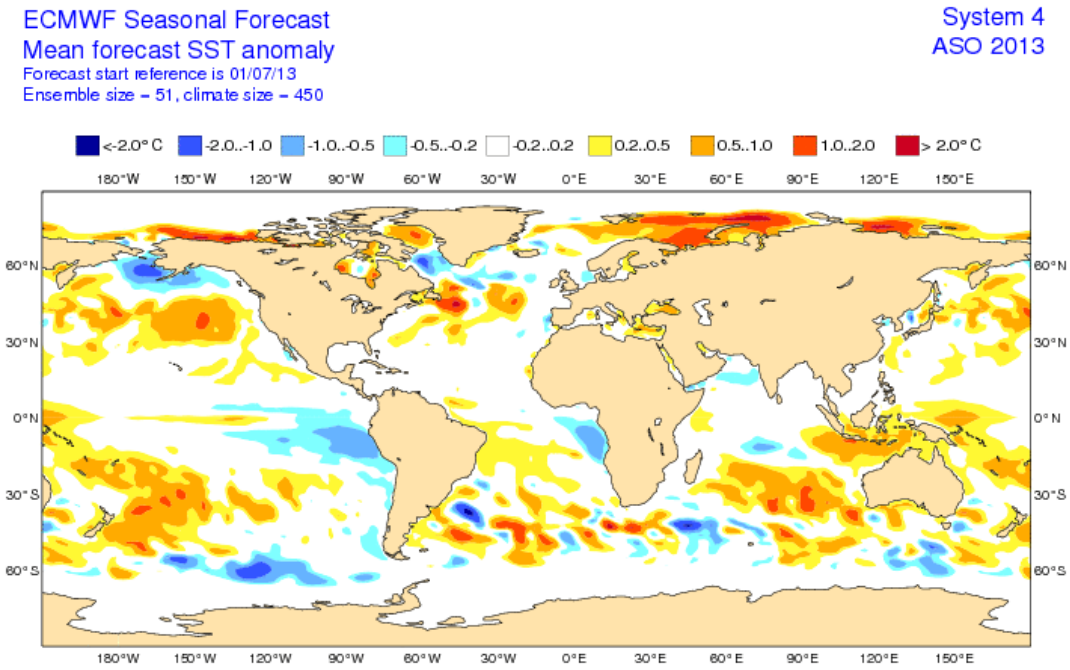


fig.12: SST anomaly forecast (in °C) from ECMWF for ASO, issued in July.
http://www.ecmwf.int/products/forecasts/d/charts/seasonal/forecast/seasonal_range_forecast/group/

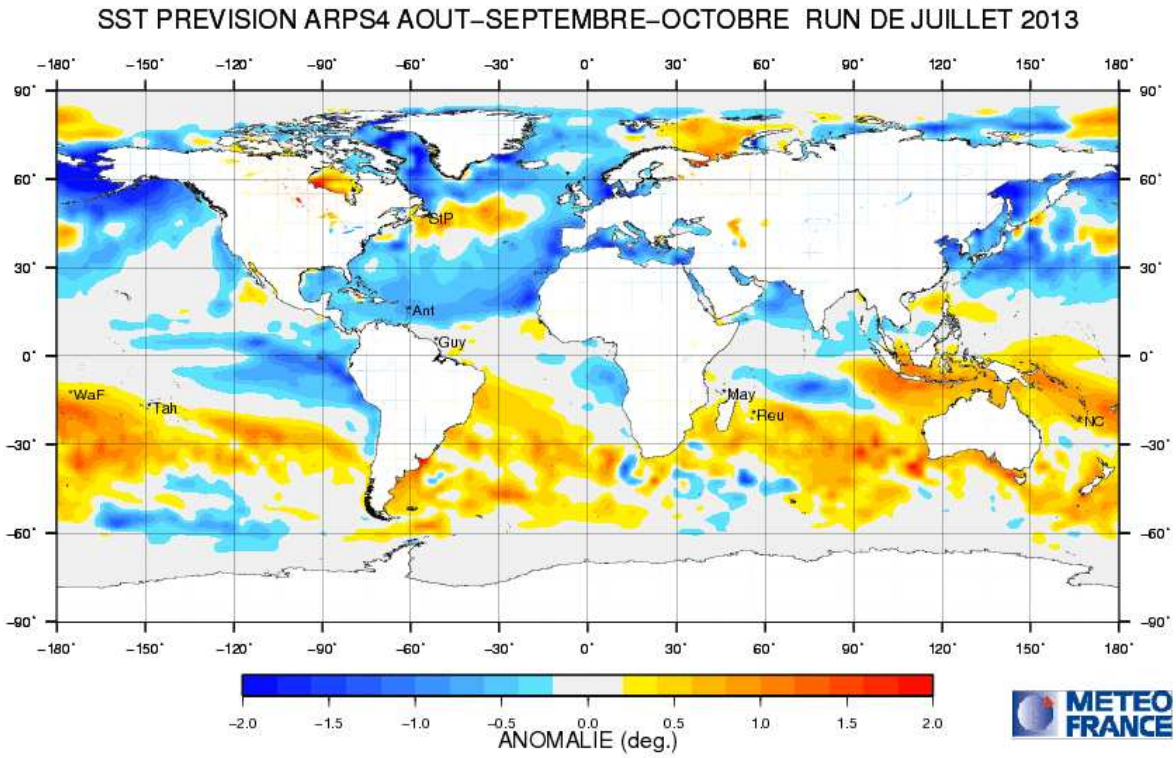


fig.13: SST Anomaly forecast (recalibrated with respect of observation) from Météo-France for ASO, issued in July. http://elaboration.seasonal.meteo.fr/

For the 2 individual models :
The main difference is seen over the Tropical North Atlantic and then in the mid-latitudes of the Northern Pacific whatever the differences in the post-processing of the anomalies (including reference period for the hindcast ; 81-2010 for ECMWF and 91-2010 for MF system 4).
Pacific : along the equator the conditions are quite similar in both models with cold conditions on the most eastern side and some warmer than normal conditions in the western part of the basin. The differences in the equatorial and central part of the basins are likely related to the difference in the hindcast periods.
Atlantic : in both model consistency in Southern Tropical (and sub-tropical) Atlantic. There is more differences on the Northern Hemisphere from the Caribbean up to the western façade of Europe (mostly neutral in ECMWF and mostly colder than normal in MF). In both models a positive anomaly close to New Foundland. The difference is very likely not only related to the hindcast issue.
Indian Ocean : consistent forecast in both models. East to 90°E warmer than normal conditions especially in the vicinity of the maritime continent and Australia. Mostly Colder than normal conditions in the Western Tropical part (North to Madagascar).
In Euro-SIP :
Some robust patterns appear in the tropics and across the Atlantic.
Pacific : Equatorial waveguide : close to normal excepted over the most Western and most Eastern part of the basin (respectively weak positive and negative anomalies). Cold anomaly along the coast of South America. Quite consistent patterns in the sub-tropics and the mid-latitudes of both hemispheres, especially the warmer than normal conditions over the Southern Pacific.
Atlantic : Weak signal over the Tropics and sub-tropics (both South and North). The main evolution compared to the last month forecasts concern the northern tropical region (from the Caribbean up to Spain): the cold signal has disappeared, no more anomaly with the new forecasts.
Indian Ocean : weak signal over most of the basin to the exception of warmer than normal conditions on the South and Eastern part of the basin, especially close to the maritime continent.

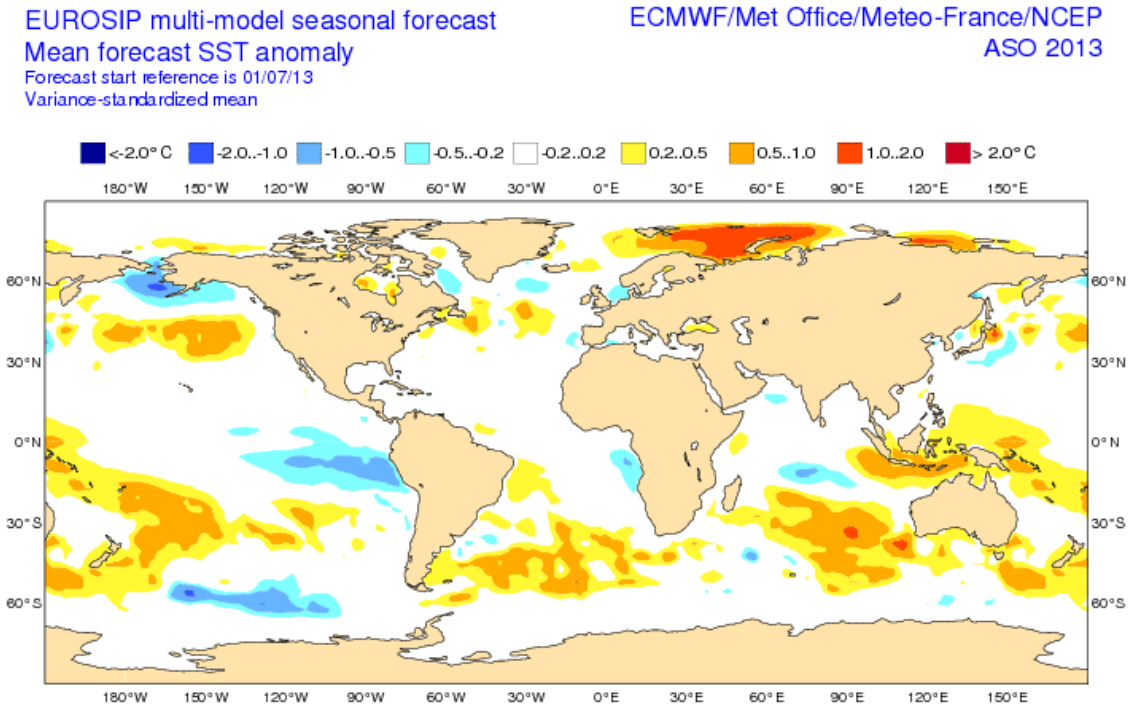


fig.14: SST Forecasted anomaly (in °C) from Euro-SIP for ASO, issued in July.

II.1.b ENSO Forecast :

Forecasted Phase for ASO : neutral

For ASO : the majority of the models indicate close to neutral conditions for the targeted period despite some are close to both Niña and Niño thresholds (a majority forecasts slightly negative conditions). Most of the dynamical models show a tendency to a slight warming on time.

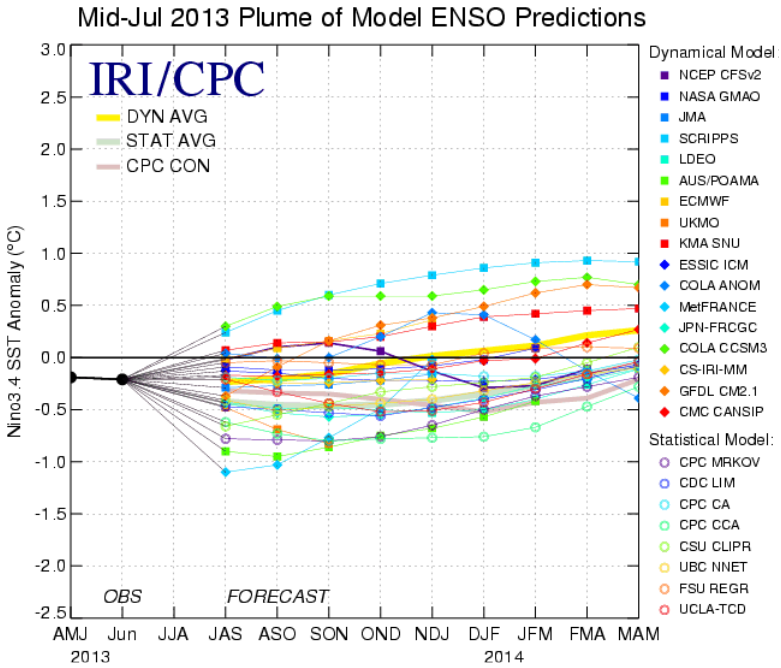


fig.15: Synthesis of Niño 3.4 forecasts (120° to 165°W) issued in July by BoM :
http://iri.columbia.edu/climate/ENSO/currentinfo/SST_table.html

Plumes from Météo-France and ECMWF for the 3 Niño boxes (see definition in Annex – fig. 16) :
In both models and on average, the prevailing conditions are in the normal range for ASO. Both models are indicating a progressive warming. One can notice that also in both models the spread dramatically increases from the Center up to the East of the basin and in time (very likely in relationship with the actual prevailing conditions). Some members are close to La Niña conditions while somothers are close to El Niño conditions. In EuroSIP Plumes, close to normal conditions on average and large spread indicate a large uncertainty.

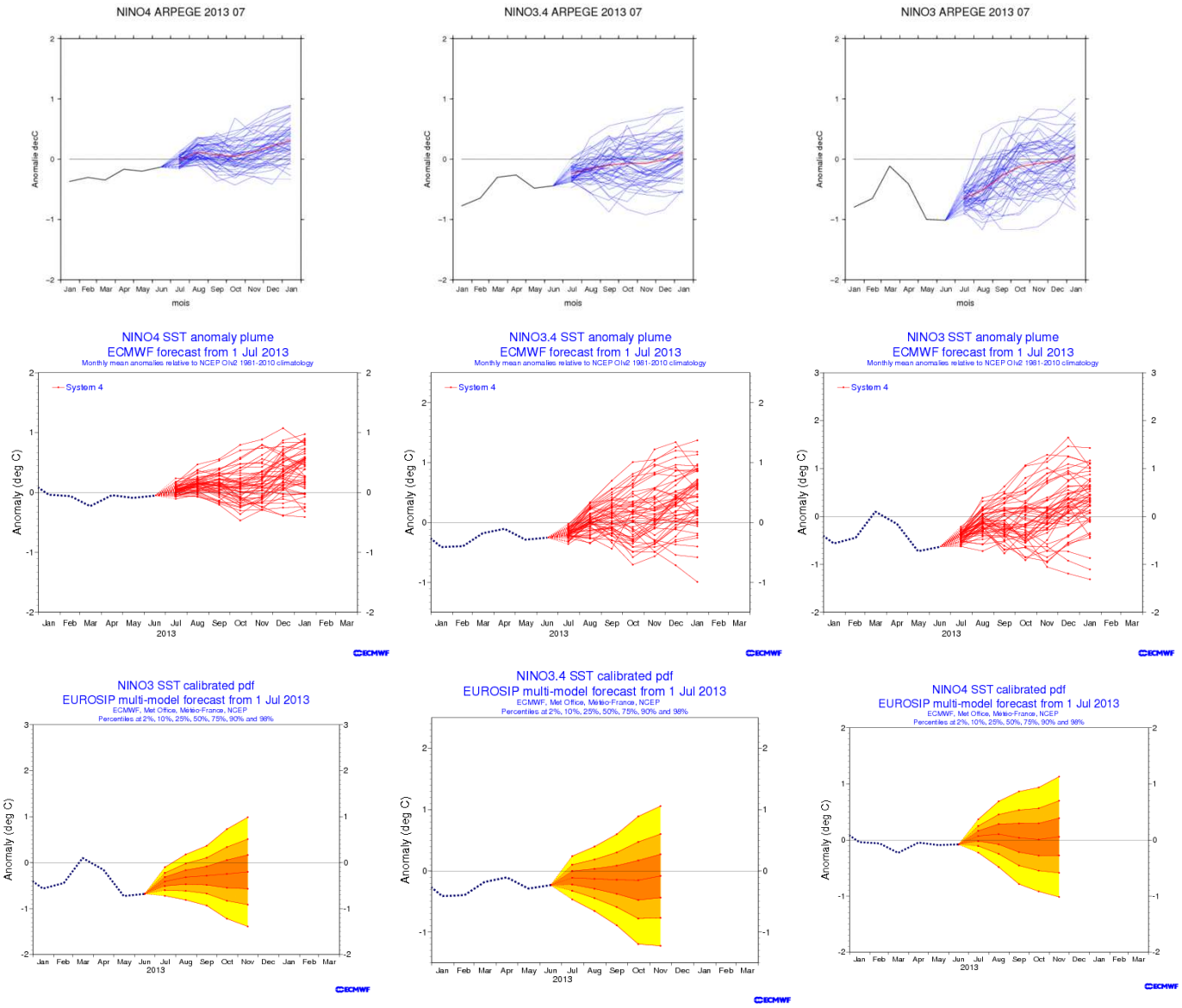


fig.16: SST anomaly forecasts in the Niño boxes from Météo-France (top) and ECMWF (middle) - monthly mean for individual members - and EuroSIP (bottom) – recalibrated distributions - issued in July (http://www.ecmwf.int/)

II.1.c Atlantic Ocean forecasts :

Forecasted Phase: *close to normal in both Tropics*

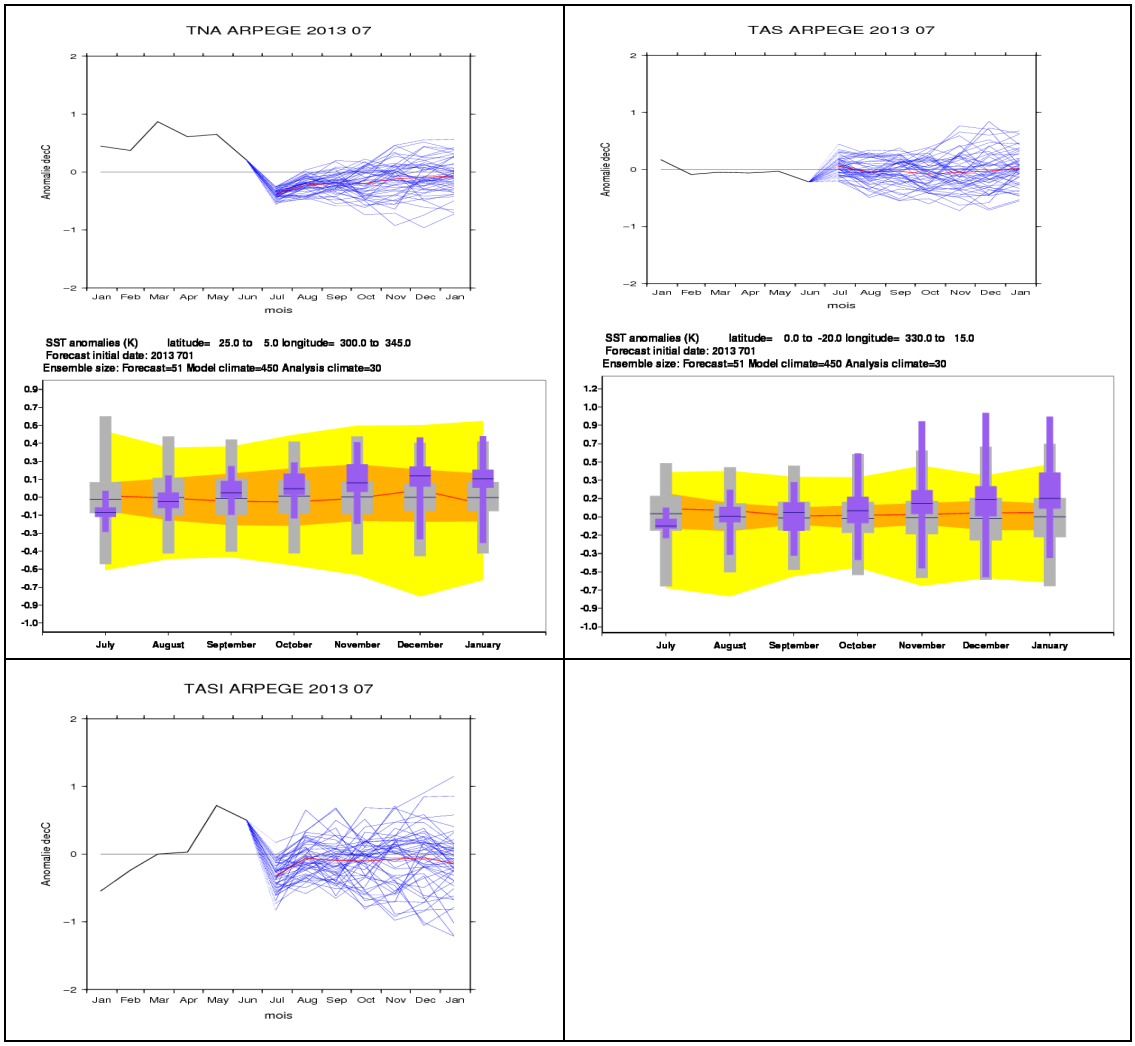
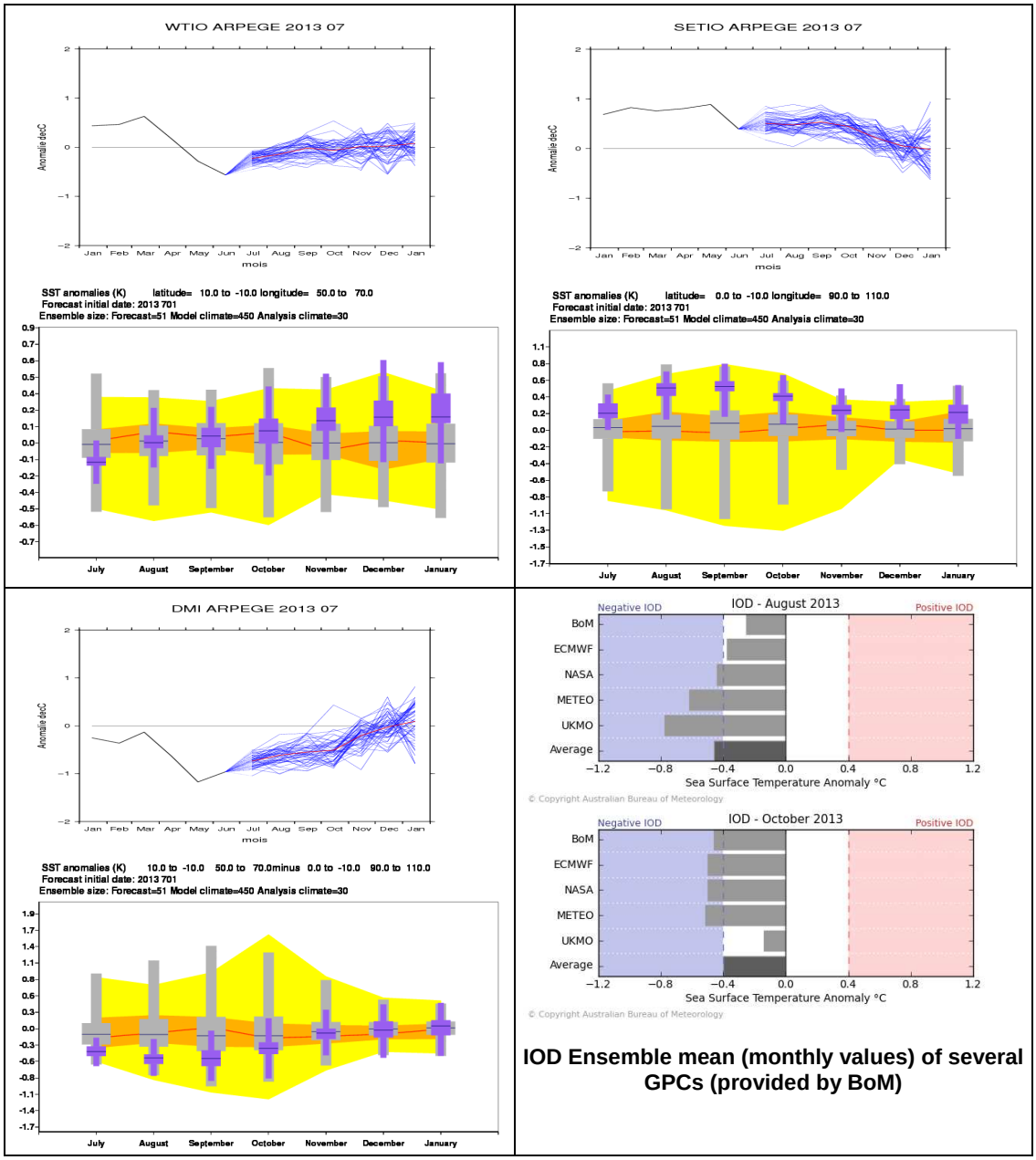


fig.17: SSTs anomaly forecasts in the Atlantic Ocean boxes from Météo-France and ECMWF, issued in July, plumes / climagrams correspond to 51 members and monthly means.

North Tropical Atlantic : Close to normal conditions in ECMWF and slightly colder than normal in MF. So taking into account the difference in hindcast periods it could be reasonably consistent (and with a reasonable spread).
South Tropical Atlantic : in both models close to normal conditions.
The inter-hemispheric SST gradient should be slightly positive (especially looking to ECMWF forecast) but the spread is quite large.
TASI : the TASI index is slightly negative in ASO for MF. However the spread is large and there is the hindcast issue.

II.1.d Indian Ocean forecasts :

Forecasted Phase: *IOD on the negative side*



IOD Ensemble mean (monthly values) of several GPCs (provided by BoM)

fig.18: SSTs anomaly forecasts in the Indian Ocean boxes from Météo-France and ECMWF, issued in July, plumes / climagrams correspond to 51 members and monthly means.

In WTIO : Consistent signal in both models in terms of evolutions. (Slightly in MF) Colder than normal conditions moving to close to normal conditions; both models with reasonable spread and stable conditions along the whole period.

In SETIO : Above normal conditions in both models consistently with the Western Pacific SSTs behaviour. Consistent signal in ECMWF and little spread in both models.

DMI (IOD) : Negative phase of the IOD in both models (in relationship with SETIO evolutions) and little spread in ECMWF. This tendency is confirmed by other models.

II.2. GENERAL CIRCULATION FORECAST

II.2.a Global Forecast

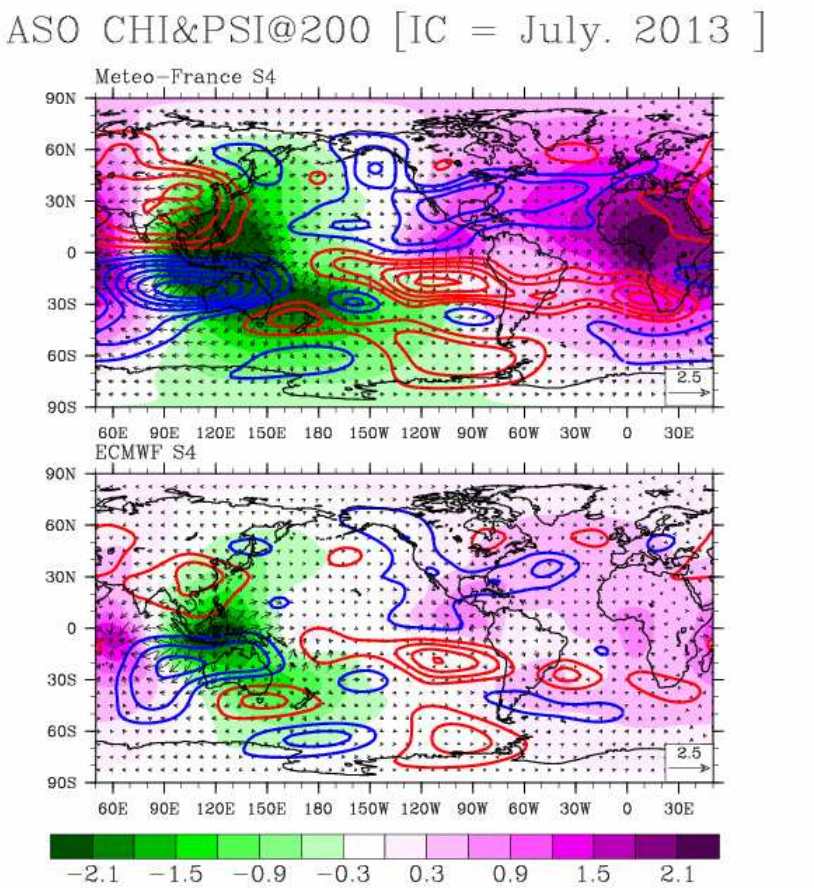


fig.19: Velocity Potential anomaly field χ (shaded area – green negative anomaly and pink positive anomaly), associated Divergent Circulation anomaly (arrows) and Stream Function anomaly ψ (isolines – red positive and blue negative) at 200 hPa for ASO, issued in July by Météo-France (top) and ECMWF (bottom).

Velocity potential anomaly and Stream Function anomaly fields (cf. fig. 19 – insight into Hadley-Walker circulation anomalies and teleconnection patterns tropically forced) :

There is globally a good consistency between the 2 models for the large scale structures, in tropical regions and even in mid-latitude regions.

The main upward anomaly pole (in green) is centered over the maritime continent/Eastern Indian Ocean, and spreads over a large area (consistent with SST forecast). Off equator in both hemisphere, there is a dipole of anti-cyclonic streamfunction anomaly. The signal seems to weakly propagate beyond tropics.

Moreover, models agree on weak downward anomalies over Eastern Pacific and over Western Indian Ocean, both consistent with SST. The one over Eastern Pacific gives rise to a cyclonic dipole (cf streamfunction field) on both sides of the equator. These anomalies spread Eastward over the Atlantic, up to Europe (with MF) and South Africa (stronger signal in Southern hemisphere). These patterns are very similar to the ones of last month.

Finally, over the Atlantic, downward anomalies. Those from MF are widely more intense : likely related to colder SSTs forecasts.

Consequently, predictability seems to be quite good ober tropical regions of Pacific and Indian Ocean, also over western tropical Atlantic (included Caribbean and South America). Over Europe, predictability is still weak because of the weak forcing coming from tropics.

II.2.b North hemisphere forecast and Europe

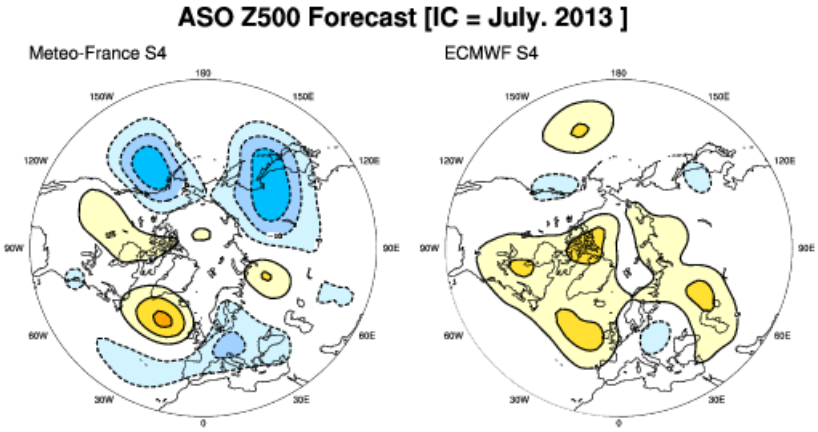


fig.20: Anomalies of Geopotential Height at 500 hPa for ASO, issued in July, from Euro-SIP. http://www.ecmwf.int/products/forecasts/d/charts/seasonal/forecast/eurosip

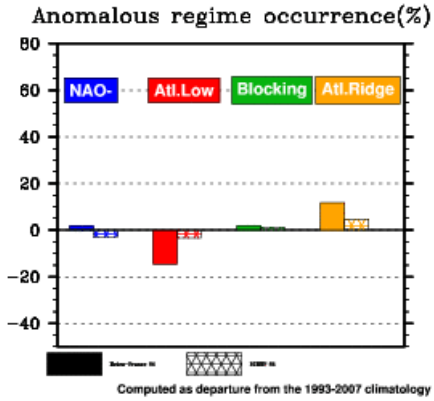


fig.21: North Atlantic Regime occurrence anomalies from Météo-France and ECMWF : vertical bars represent the excitation frequency anomaly (in %) for each of the 4 regimes.

Geopotential height anomalies (fig. 20 – insight into mid-latitude general circulation anomalies) :
MF and ECMWF anomalies are weak but consistent, and are consistent with Stream Function anomalies: high anomaly over Northern Atlantic, low anomaly over Europe, High anomaly over Eastern Europe.

North Atlantic Circulation Regimes (fig. 21) : ECMWF's regimes are wery close to climatology. MF's regimes diverge slightly from climatology, with less Southern circulation over Western Europe and more Northern circulations. As a consequence, there is only little signal in the mid-latitudes geopotential forecasts so no signal in the regimes forecast.

General atmospheric circulation in MF in the low troposphere (see fig. 22) : the zonal and meridionnal circulation over Europe don't show strong signal.

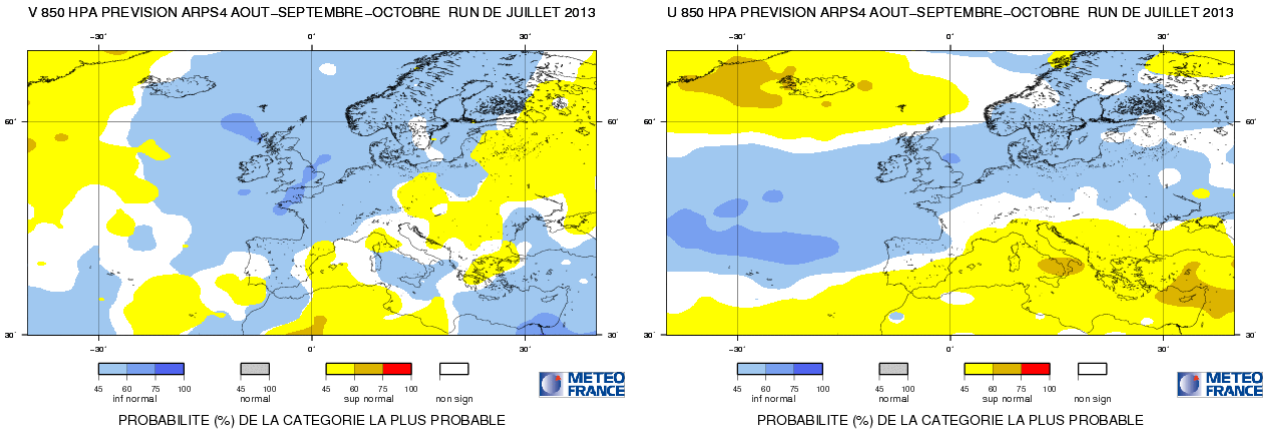


fig.22: Most likely category for the meridional (left) and zonal (right) wind at 850 hPa for ASO, issued in July from Météo-France.

II.3. IMPACT : TEMPERATURE FORECASTS

II.3.a ECMWF

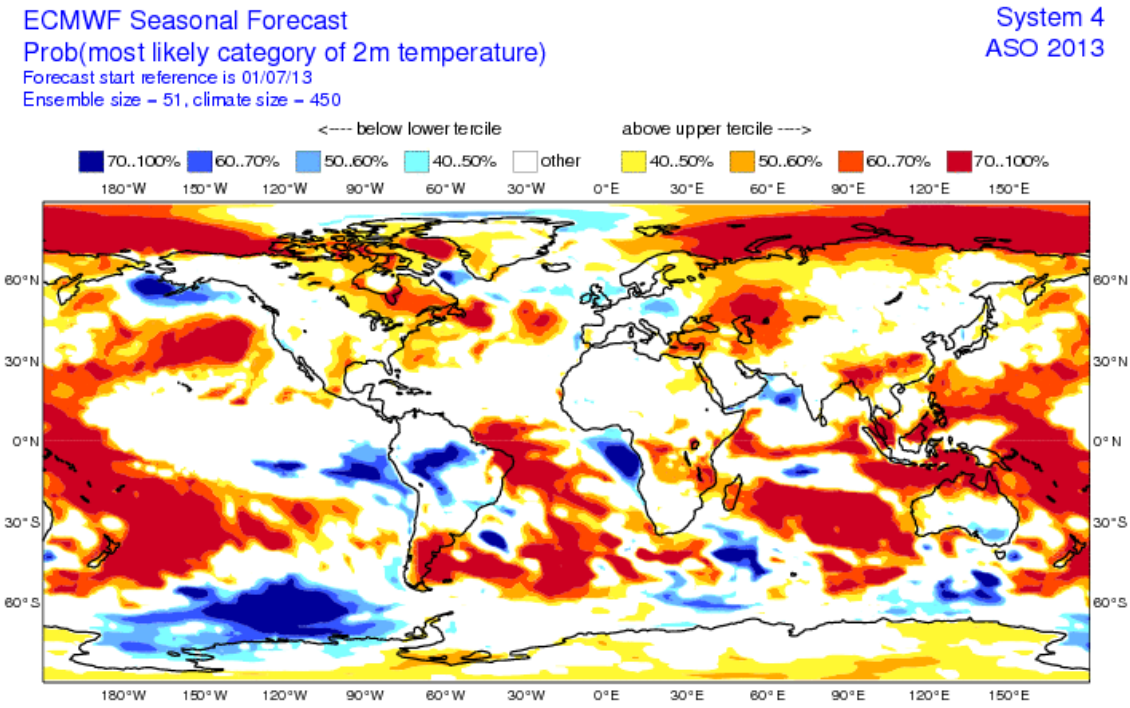


fig.23: Most likely category probability of T2m from ECMWF for ASO, issued in July. Categories are Above Normal, Below Normal and « other » category (Normal and No Signal).
http://www.ecmwf.int/products/forecasts/d/charts/seasonal/forecast/seasonal_range_forecast/group/

II.3.b Météo-France

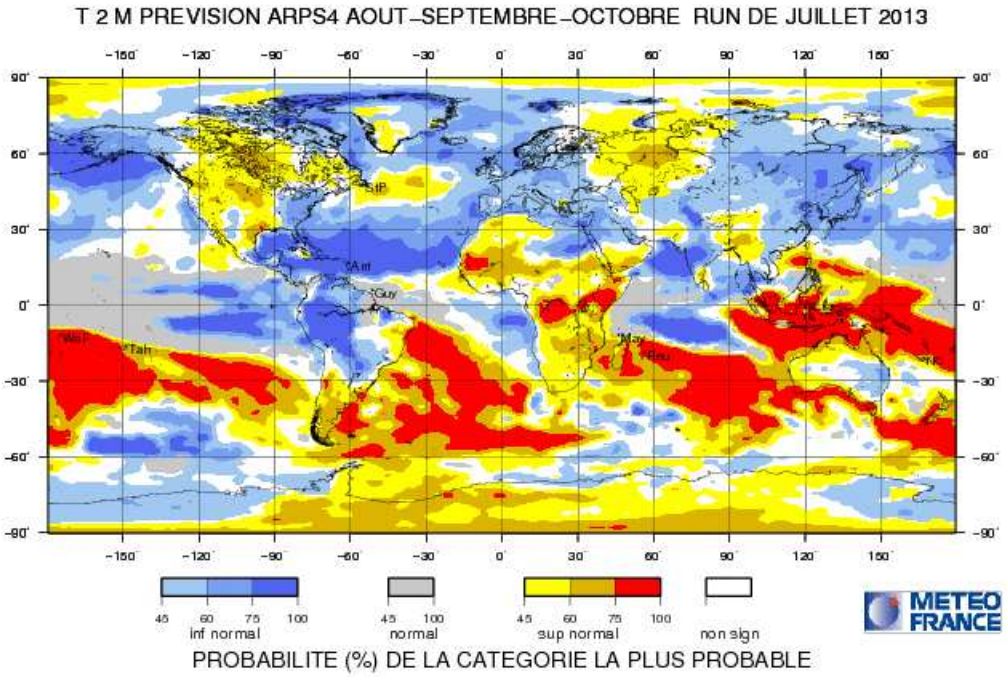


fig.24: **Most likely category of T2m for ASO, issued in July. Categories are Above, Below and Close to Normal. White zones correspond to No Signal.** http://elaboration.seasonal.meteo.fr/

II.3.c Met Office (UKMO)

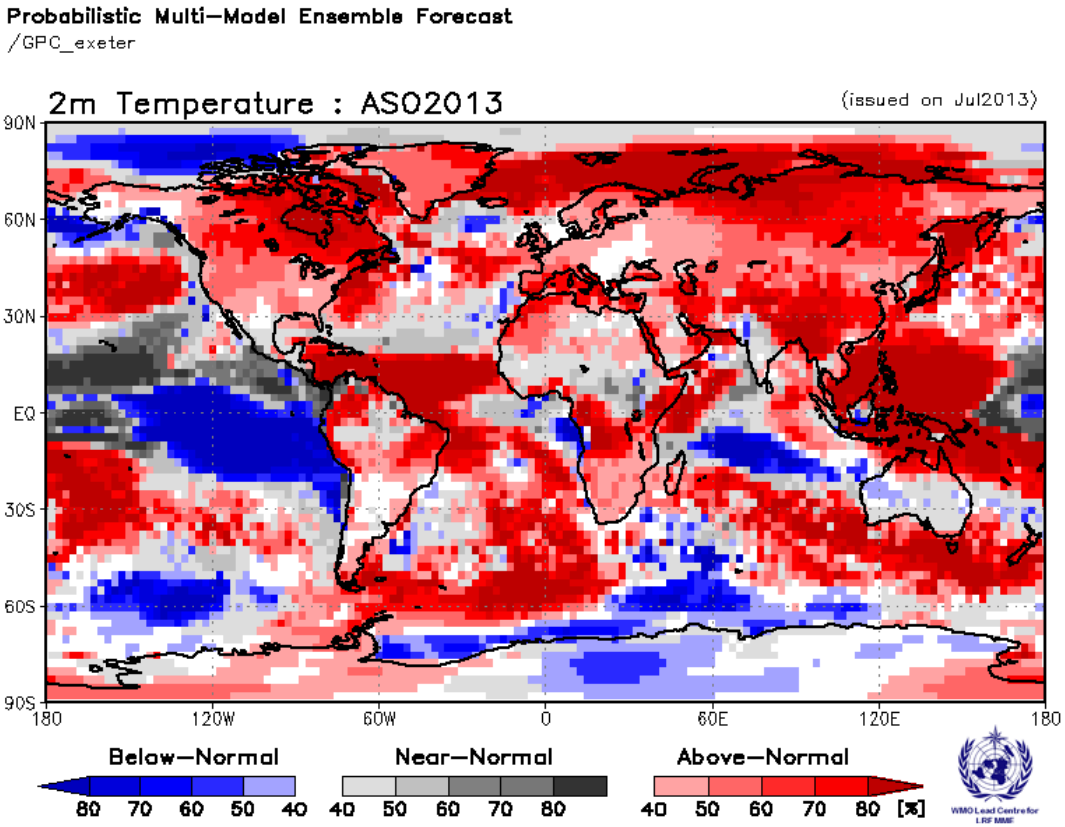


fig.25: **Most likely category of T2m Anomaly for ASO, issued in July from CPC.** https://www.wmolc.org/

II.3.d Climate Prediction Centre (CPC)

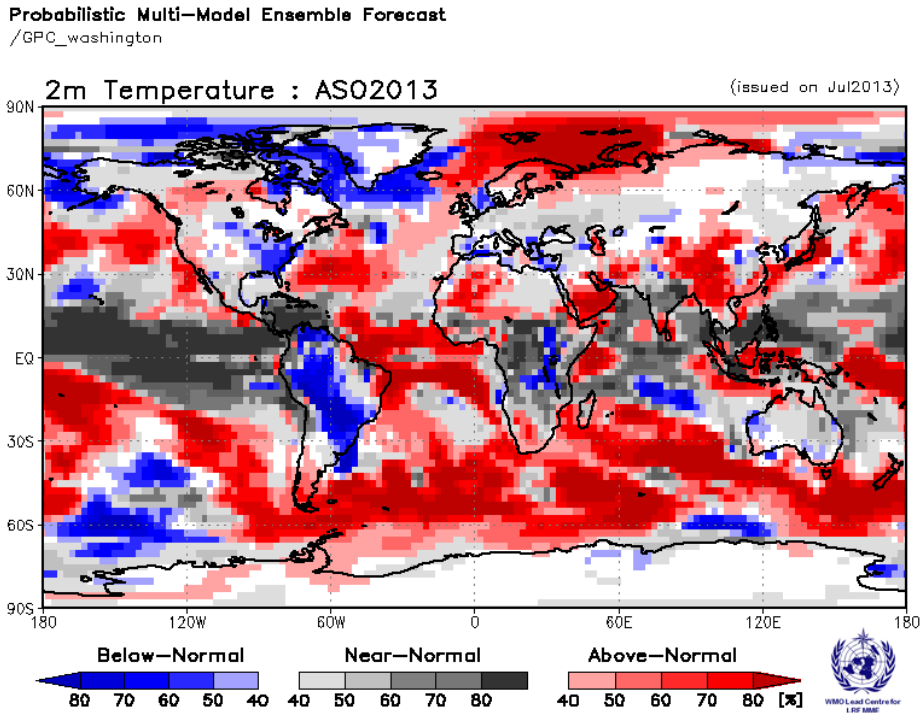


fig.26: Most likely category of T2m Anomaly for ASO, issued in July from CPC. https://www.wmolc.org/

II.3.e Japan Meteorological Agency (JMA)

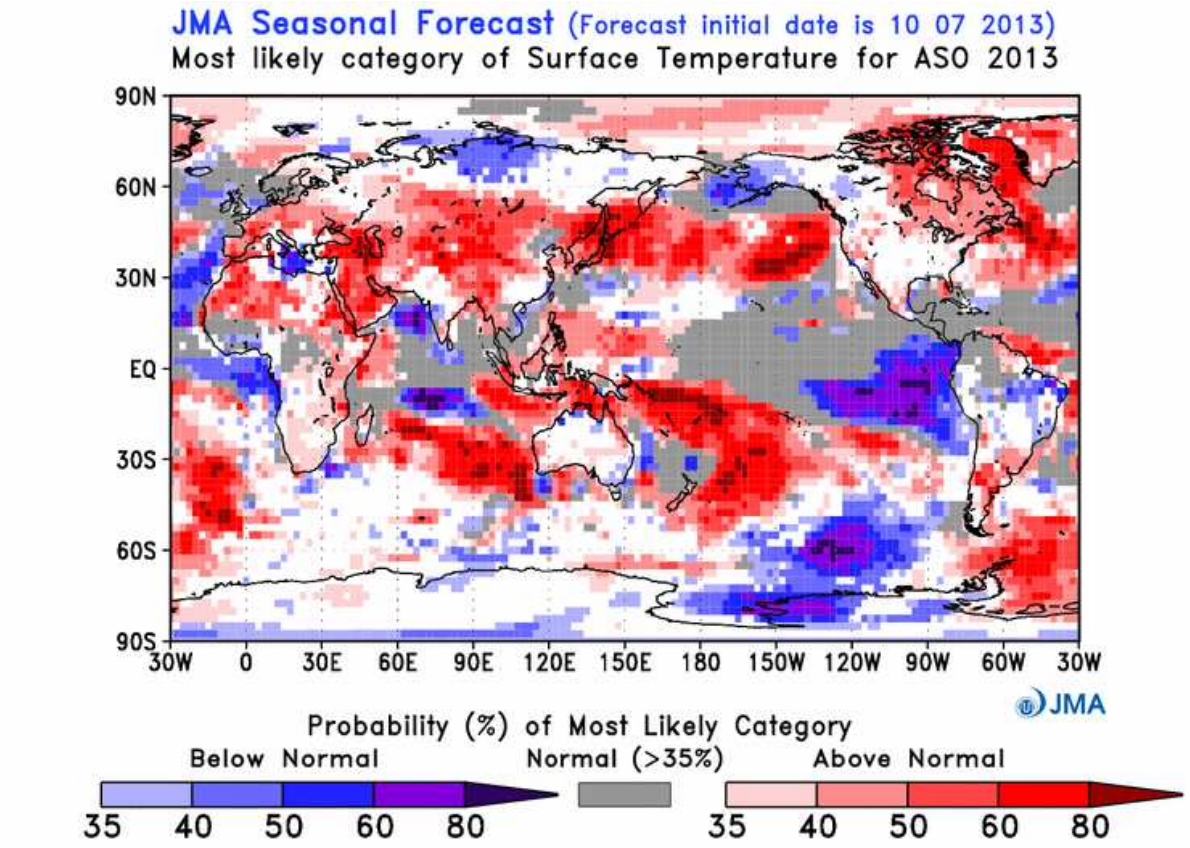


fig.27: Most likely category of T2m for ASO, issued in July. Categories are Above, Below and Close to Normal. White zones correspond to No Signal. http://ds.data.jma.go.jp/tcc/tcc/products/model/

II.3.f Lead Centre on Multi Model Ensemble (LCMME)

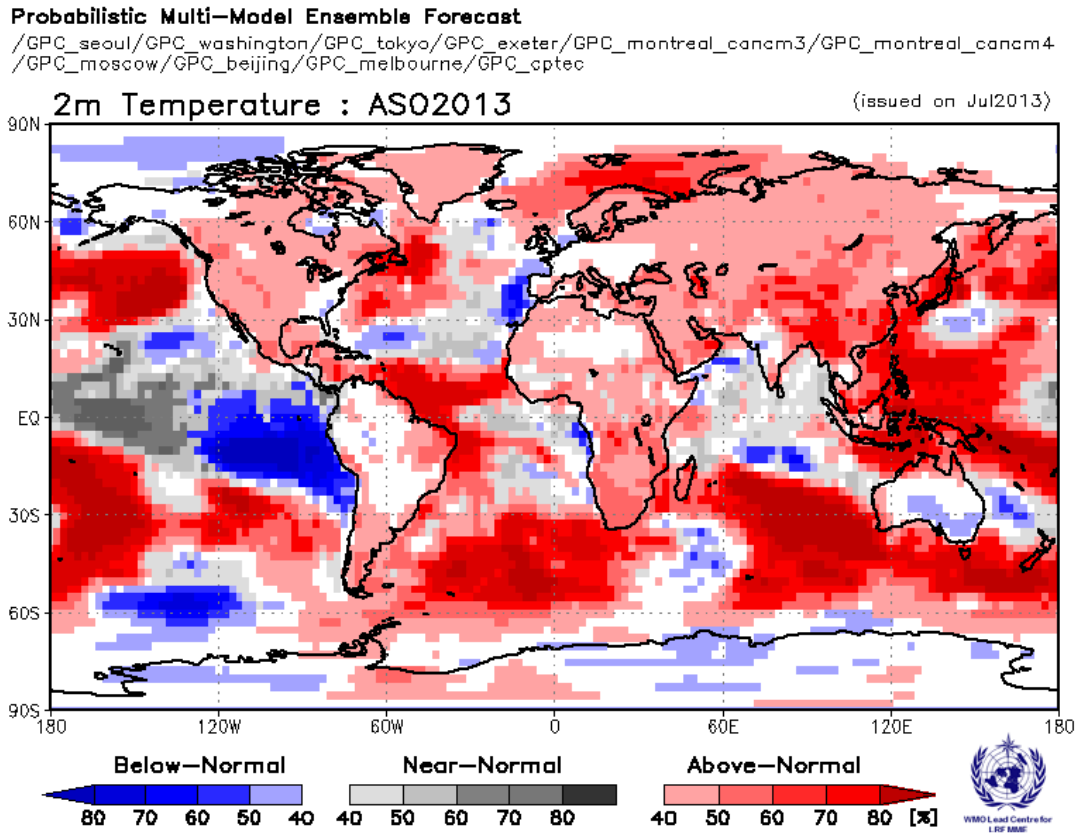


fig.28: T2m MME Anomaly for ASO, issued in July from LC-MME. The MME composition corresponds to the GPCs not used in EuroSIP https://www.wmolc.org/

II.3.g Euro-SIP

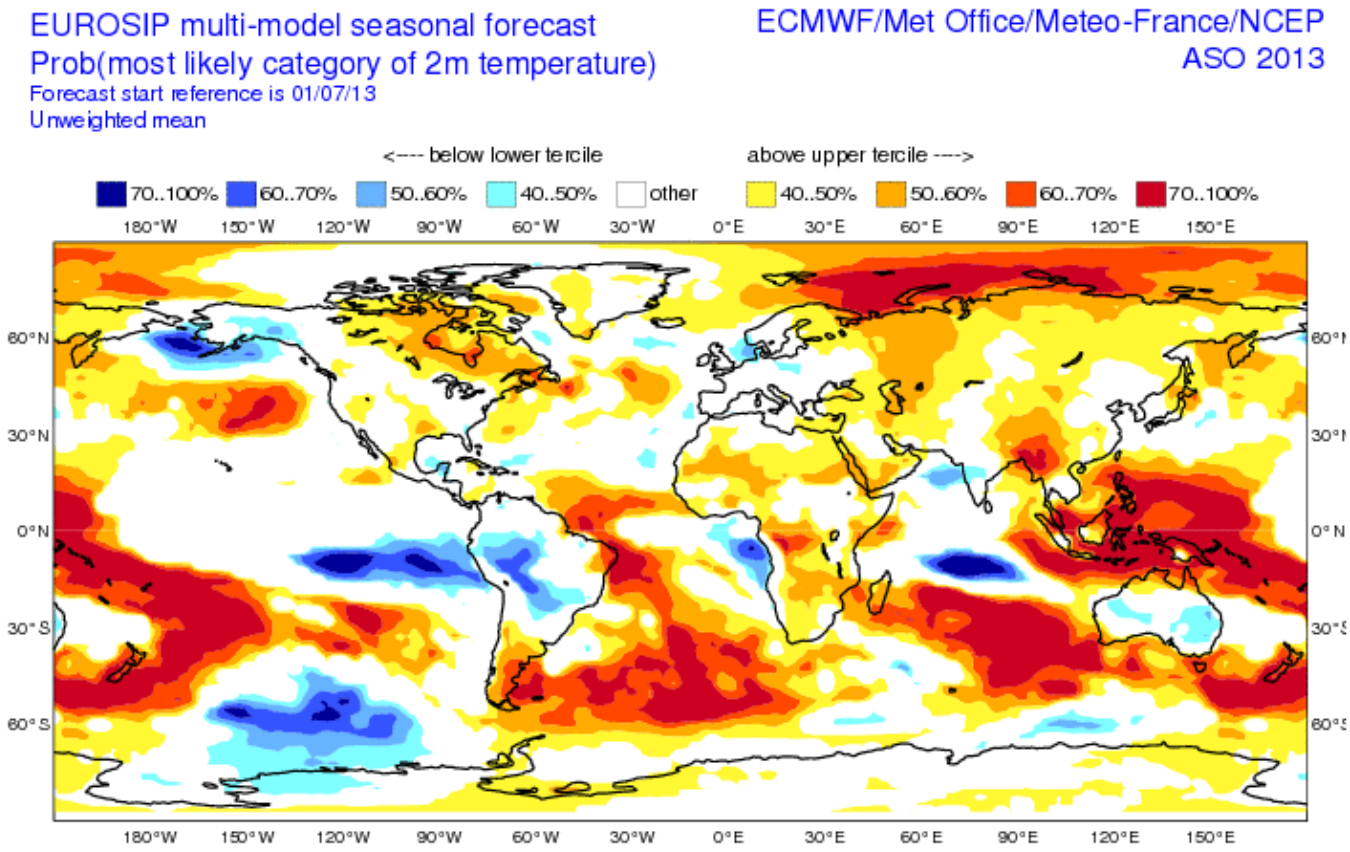


fig.29: Multi-Model Probabilistic forecasts for T2m from EuroSip for ASO, issued in July. (2 Categories, Below and Above normal – White zones correspond to No signal and Normal).

http://www.ecmwf.int/products/forecasts/d/charts/seasonal/forecast/eurosip/mmv2/param_euro/seasonal_charts_2tm/

Eurosip is a good summary of the most robust signals.

II.4. IMPACT : PRECIPITATION FORECAST

II.4.a ECMWF

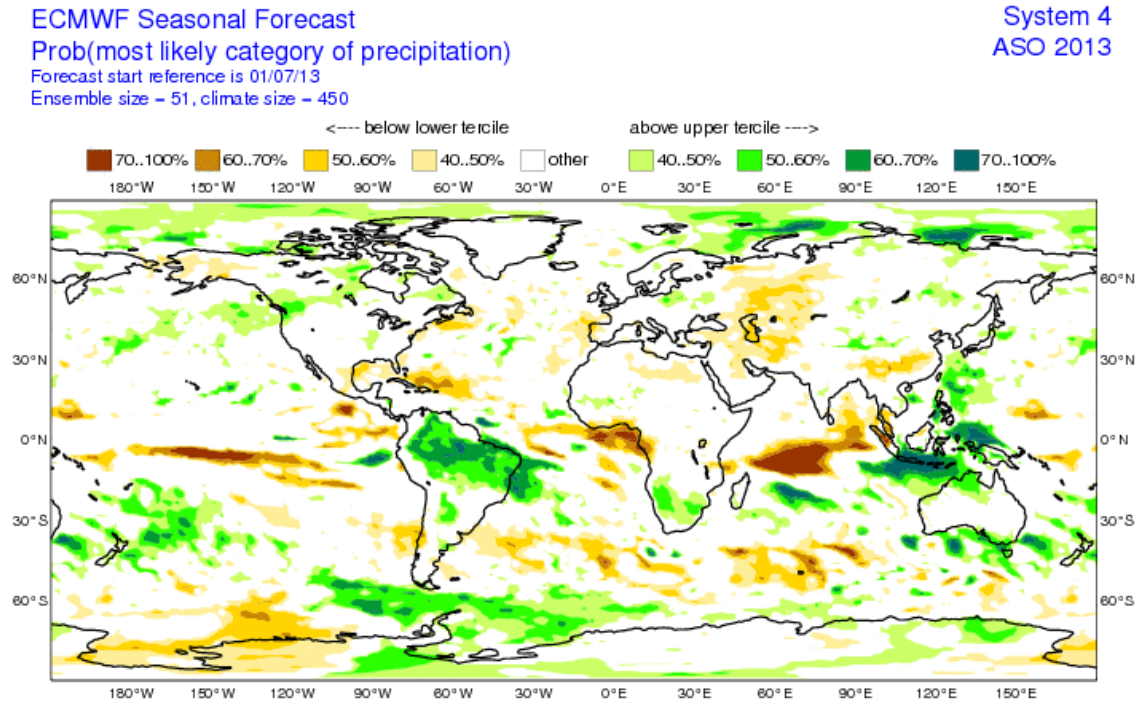


fig.30: Most likely category probability of rainfall from ECMWF for ASO, issued in July. Categories are Above Normal, Below Normal and « other » category (Normal and No Signal).
http://www.ecmwf.int/products/forecasts/d/charts/seasonal/forecast/charts/seasonal_charts_s2/

II.4.b Météo-France

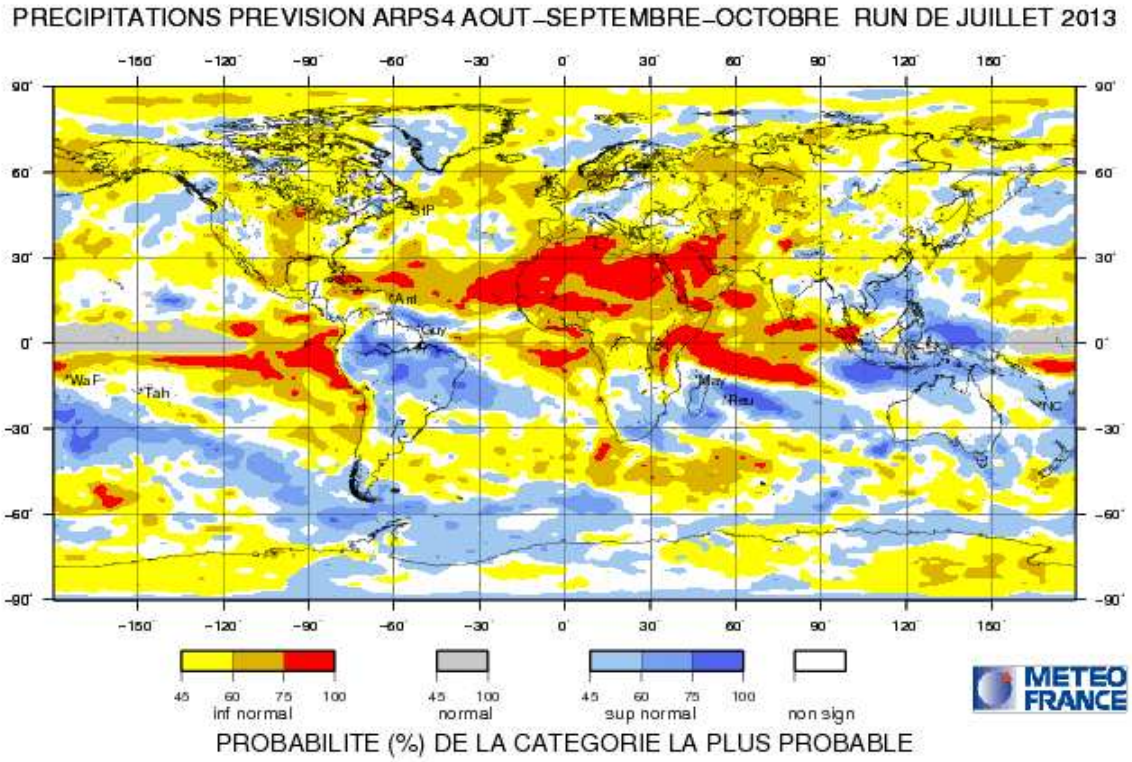


fig.31: Most likely category of Rainfall for ASO, issued in July. Categories are Above, Below and Close to Normal. White zones correspond to No Signal. http://elaboration.seasonal.meteo.fr/

II.4.c Met office (UKMO)

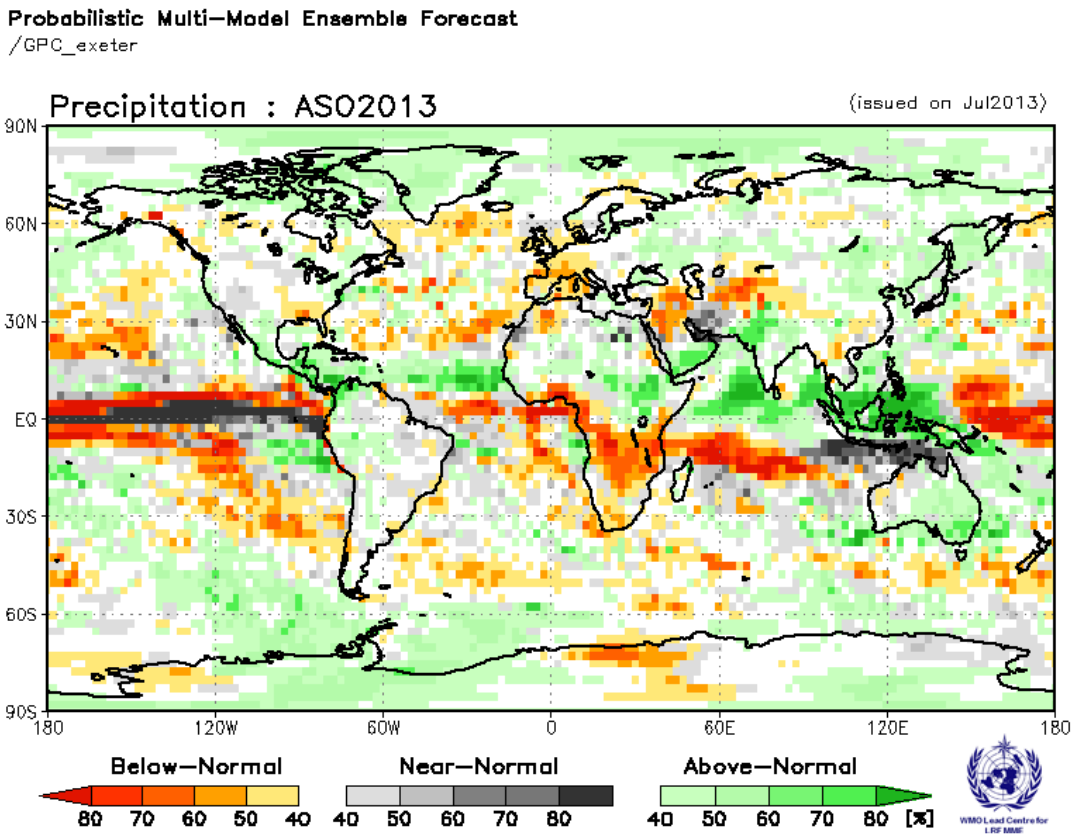


fig.32: Most likely category of Rainfall for ASO, issued in July from UKMO. https://www.wmolc.org/

II.4.dClimate Prediction Centre (CPC)

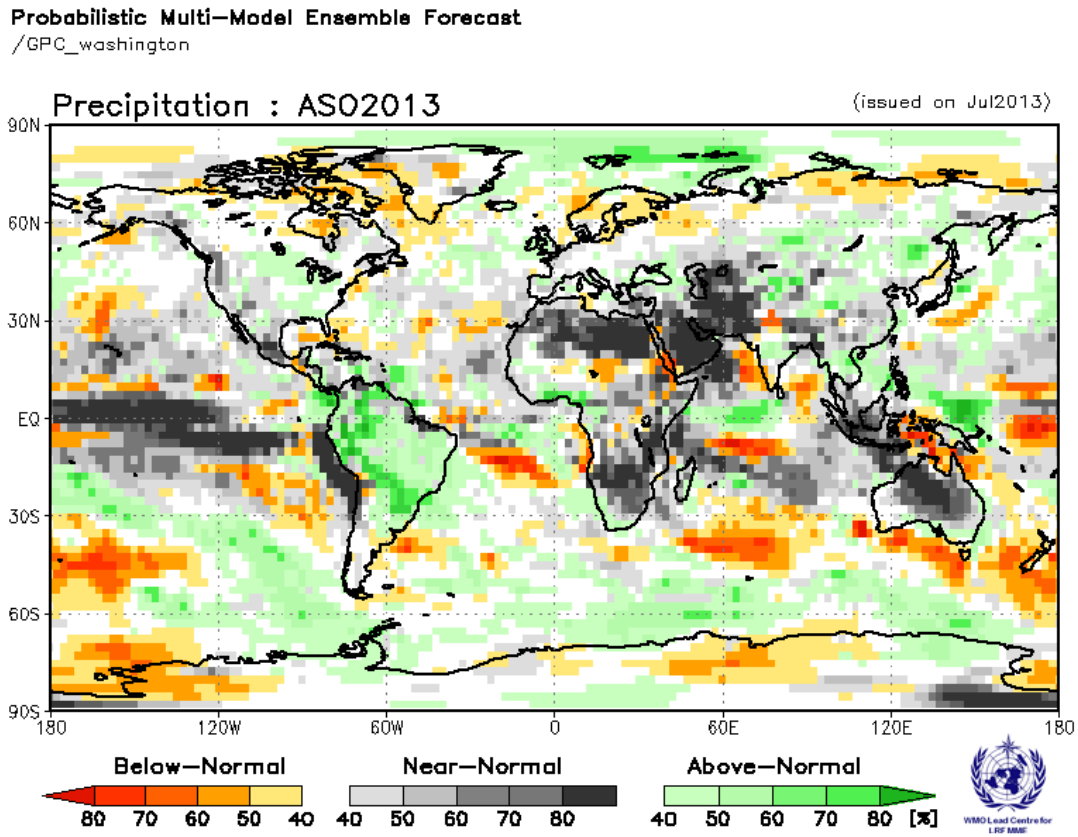


fig.33: Most likely category of Rainfall for ASO, issued in July from CPC. https://www.wmolc.org/

II.4.e Japan Meteorological Agency (JMA)

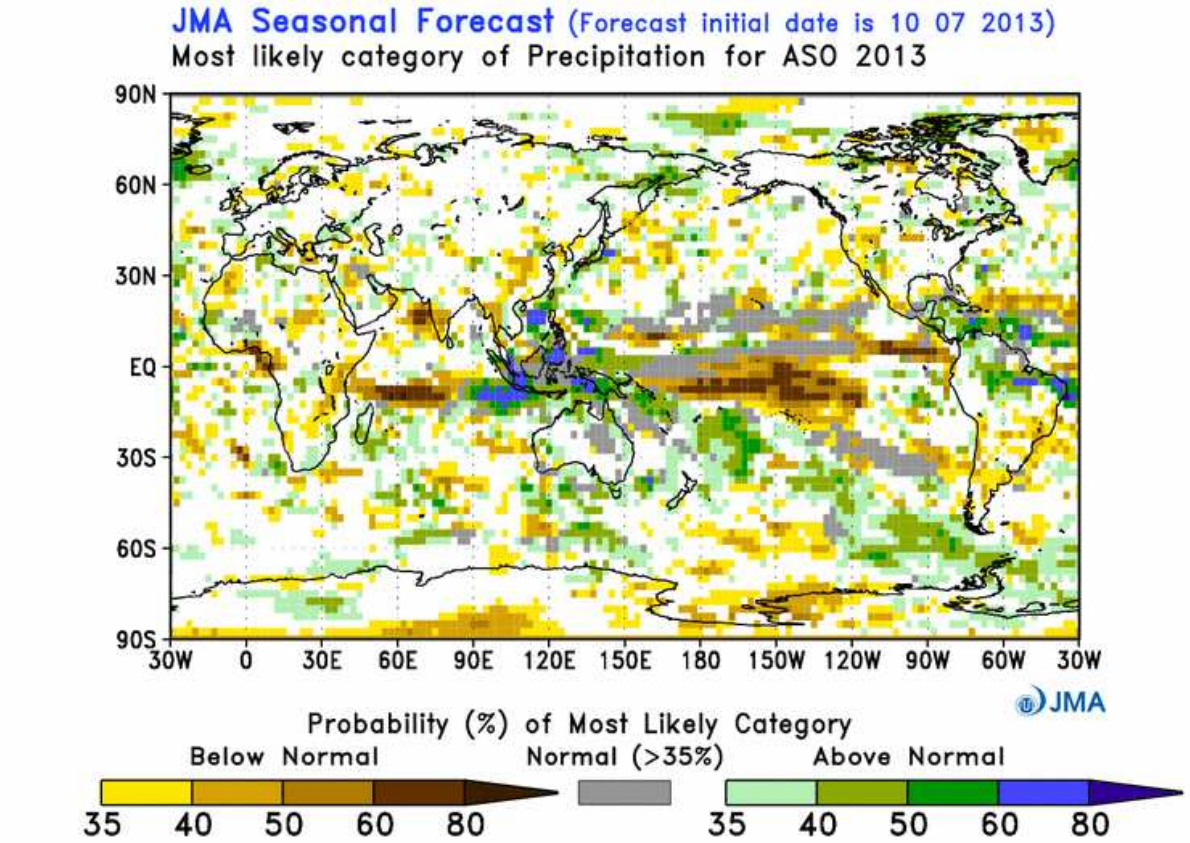


fig.34: Most likely category of Rainfall for ASO, issued in July from JMA. Categories are Above, Below and Close to Normal. White zones correspond to No Signal. http://ds.data.jma.go.jp/tcc/tcc/products/model/

II.4.f Lead Centre on Multi Model Ensemble (LCMME)

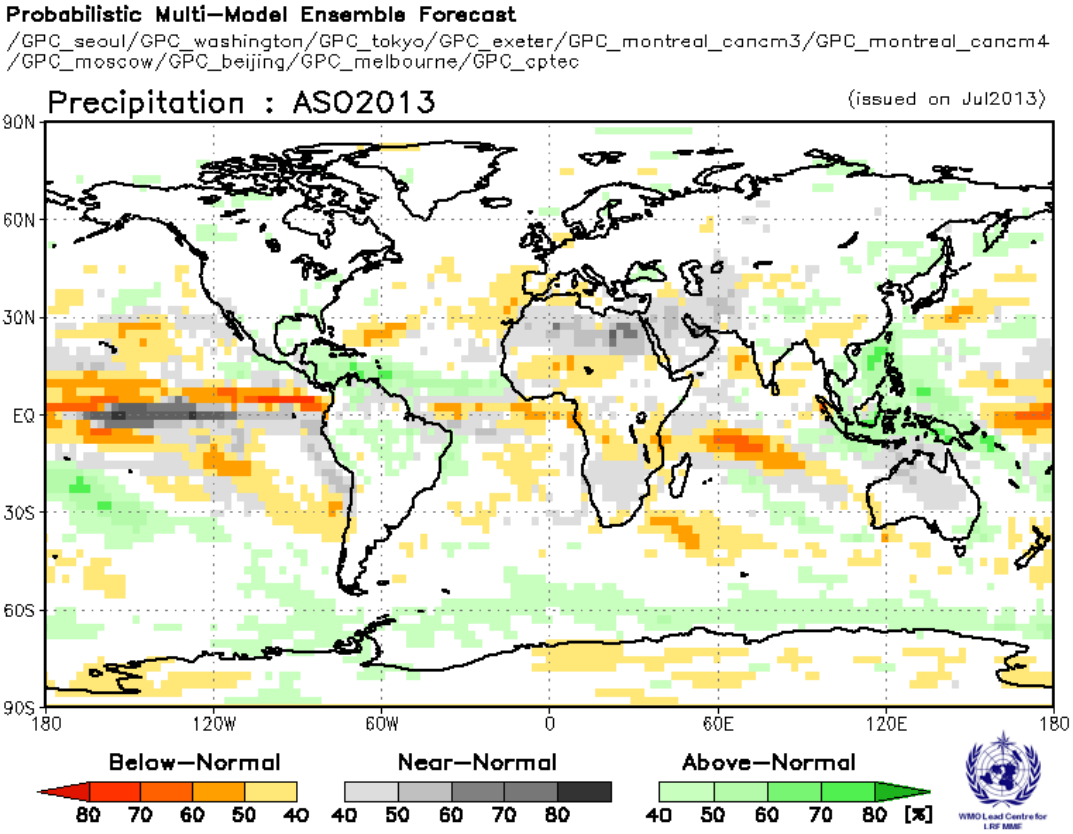


fig.35: **Rainfall MME anomaly for ASO, issued in July from LC-MME. The MME composition corresponds to the GPCs not used in EuroSIP.** **https://www.wmolc.org/**

II.4.g Euro-SIP

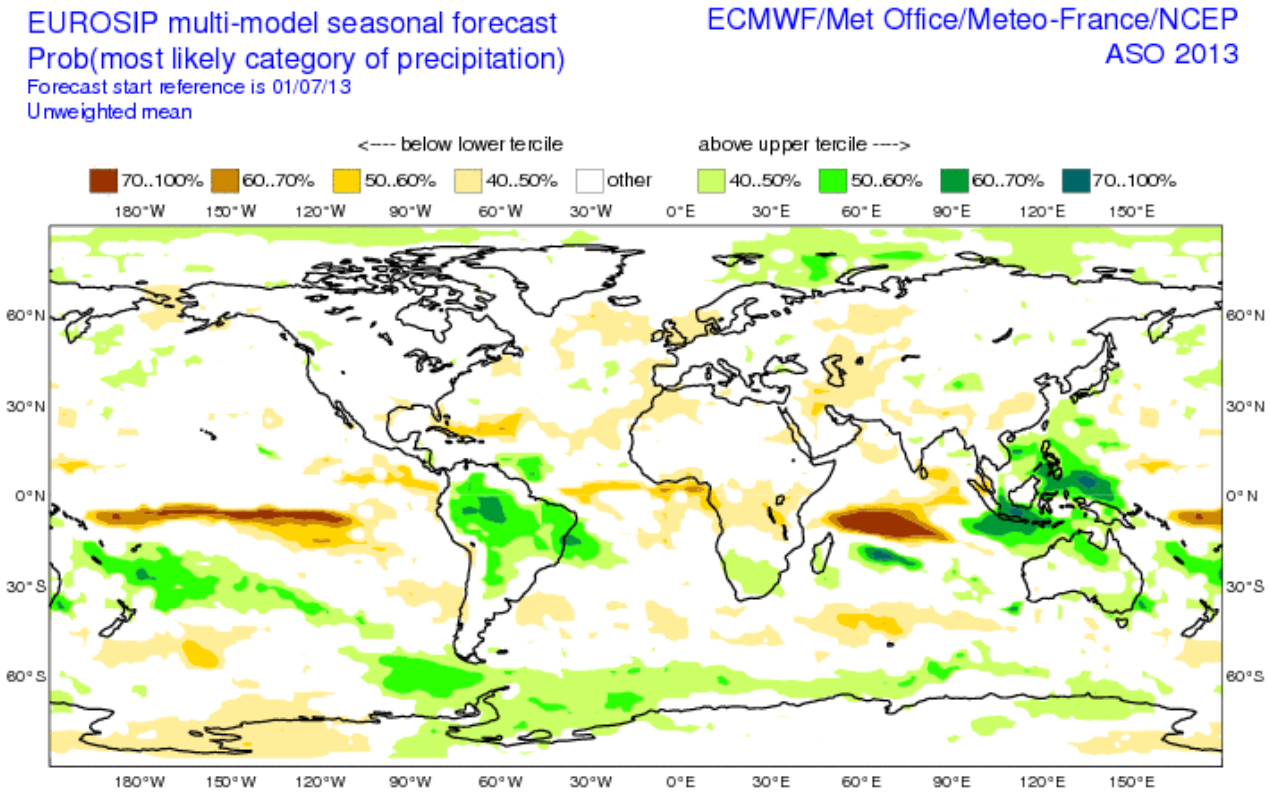


fig.36: Multi-Model Probabilistic forecasts for precipitation from EuroSip for ASO, issued in July. (2 Categories, Below and Above normal – White zones correspond to No signal).

http://www.ecmwf.int/products/forecasts/d/charts/seasonal/forecast/eurosip/mmv2/param_euro/seasonal_charts_2tm/

Some consistent signal in the Tropics ; enhanced probabilities for wet scenarios over the maritime continent, north of Australia, a large portion of South America covering especially Brazil and Amazonian regions. Enhanced probabilities for dry scenarios over East Africa.

For Europe and Eurasia: no signal quite everywhere and more generally for most of the mid latitude of Northern Hemisphere. To be quoted the weak signal for wet scenario over part of Central Europe and weak dry signal over Western Russia up to Caspian Sea : this is consistent with Z500 anomalies.

II.5. REGIONAL TEMPERATURES

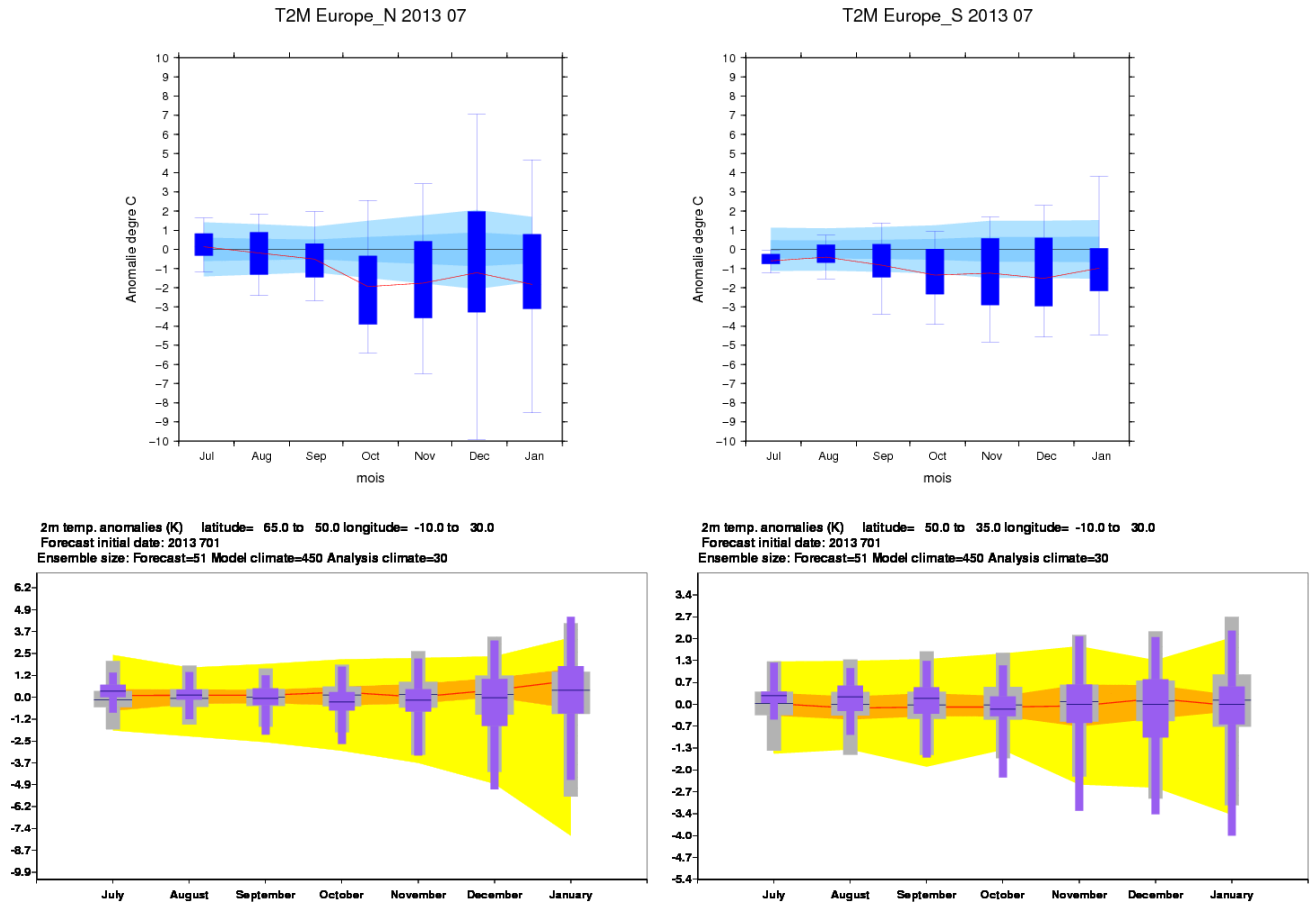


fig.37: Climagrams for T2m in Northern Europe (left) and in Southern Europe (right) from Météo-France (top) and ECMWF (bottom) issued in July.

For Northern: close to normal conditions, some consistency between the 2 models.
For Southern Europe: some differences between the 2 models (see general circulation).
Take care that due to the system change (from system 3 to system 4) the verification scores are not available yet.

In Météo-France climagrams, the distributions of area averages are displayed for the seasonal forecast (dark blue boxes and wiskers), and the climate reference on the 29-year hindcast period (blue and light blue bands). The limits of the boxes (ensemble forecast) and blue band (climate reference) correspond to the upper and lower terciles. The limits of the wiskers (ensemble forecast) and light blue band (climate reference) correspond to the mean + 1 standard deviation and the mean – 1 standard deviation. The red line corresponds to the ensemble mean.

REGIONAL PRECIPITATIONS

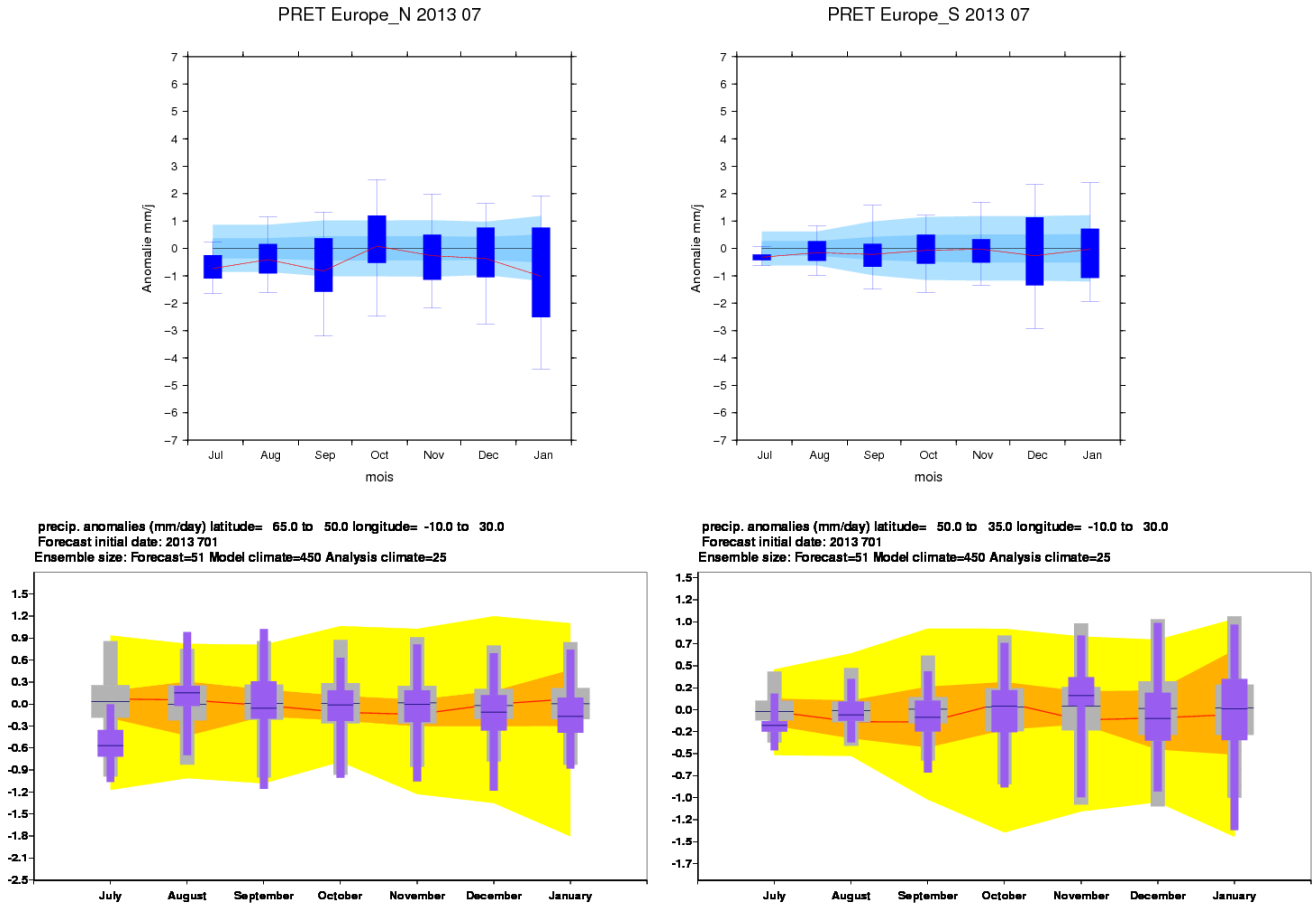


fig.38: Climagrams for Rainfall in Northern Europe (left) and in Southern Europe (right) from Météo-France (top) and ECMWF (bottom), issued in July.

Considering the low predictability and model uncertainties, no information to be exploited this month.
Take care that due to the system change (from system 3 to system 4) the verification scores are not available yet.

In Météo-France climagrams, the distributions of area averages are displayed for the seasonal forecast (dark blue boxes and wiskers), and the climate reference on the 29-year hindcast period (blue and light blue bands). The limits of the boxes (ensemble forecast) and blue band (climate reference) correspond to the upper and lower terciles. The limits of the wiskers (ensemble forecast) and light blue band (climate reference) correspond to the mean + 1 standard deviation and the mean – 1 standard deviation. The red line corresponds to the ensemble mean.

II.6. MODEL'S CONSISTENCY

II.6.a GPCs consistency maps

Not available this month

fig.39: ***GPCs Consistency maps from LC-MME*** *http://www.wmolc.org/*

For SST :
For Z500 :
For T2m :
For precipitation :

II.7. "EXTREME" SCENARIOS

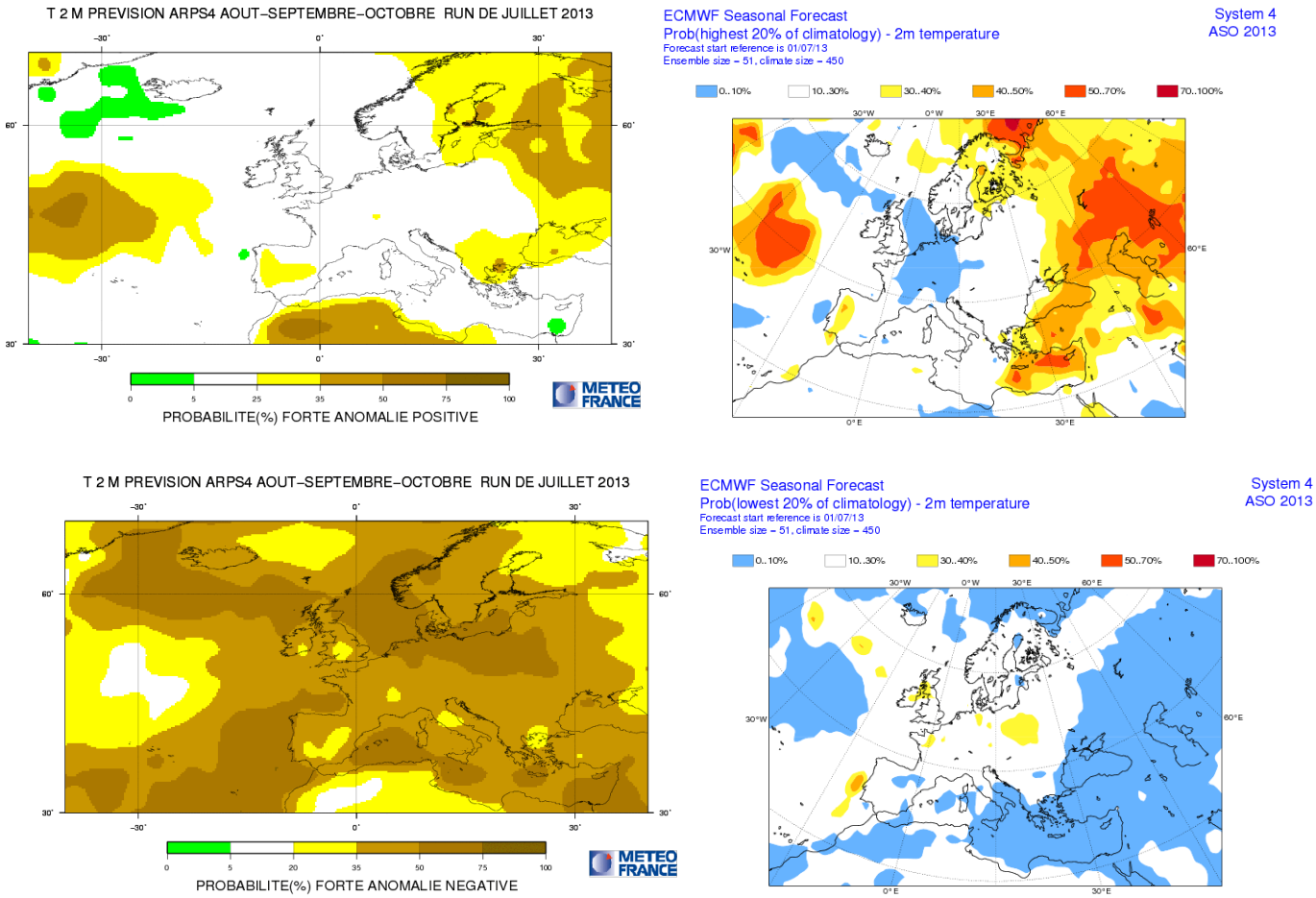


fig.40: Top : Probability of « extreme » above normal conditions for T2m for Meteo-France (left - highest ~15% of the distribution) and ECMWF (right - highest 20% of the distribution).
Bottom : Probability of « extreme » Below normal conditions for rainfall for Meteo-France (left - lowest ~15% of the distribution) and ECMWF (right – lowest 20% of the distribution).
For ASO, issued in July.

No consistency between the 2 models for the Very Below scenario to the exception of oceanic regions. No consistency for very Above Normal scenario. So in relationship with the current predictability and the model uncertainties, it seems difficult to use these forecast.
Take care that due to the system change (from system 3 to system 4) the verification scores are not available yet.

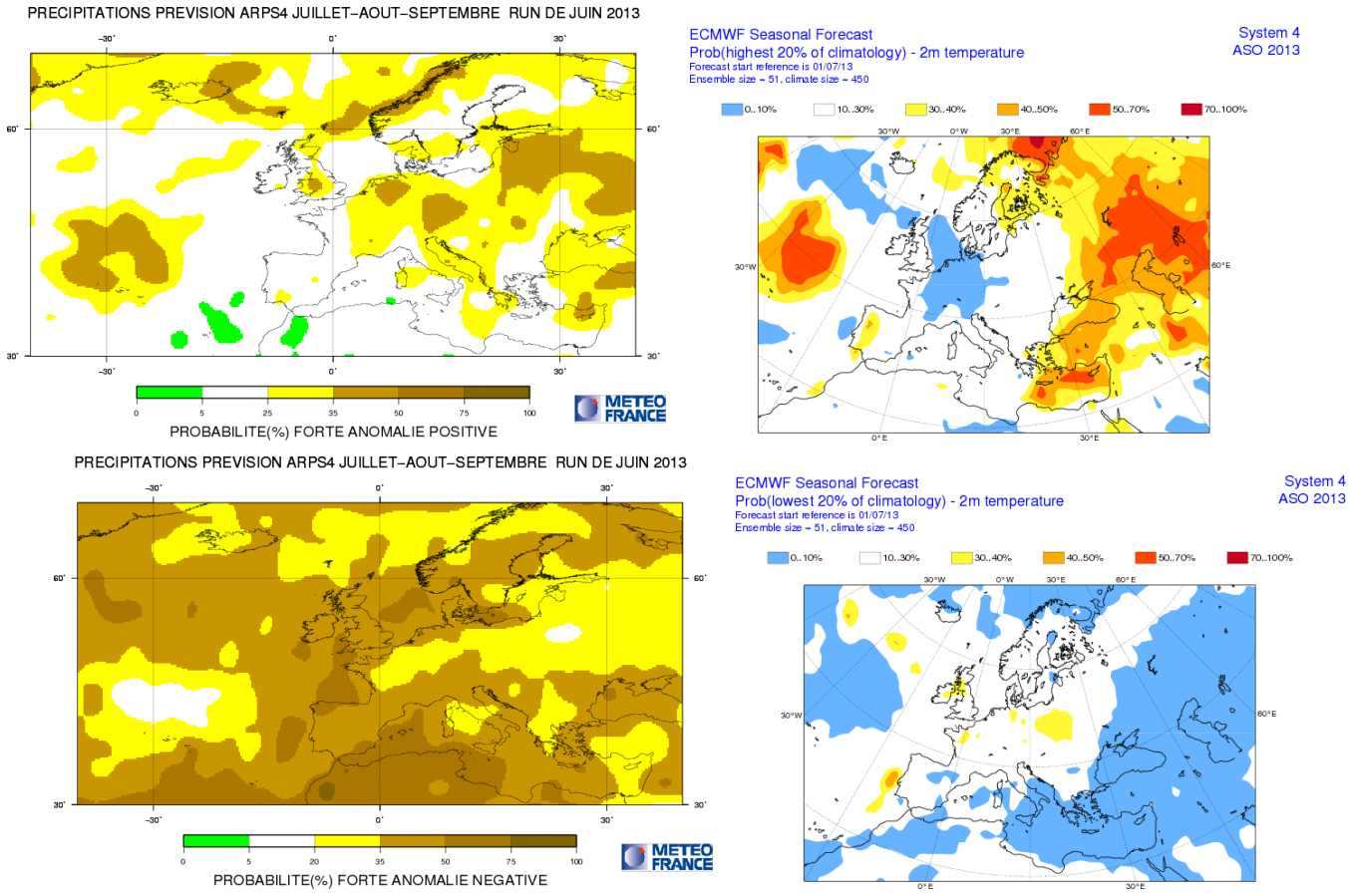


fig.41: Top : Probability of « extreme » Below normal conditions for rainfall for Meteo-France (left - lowest ~15% of the distribution) and ECMWF (right - lowest 20% of the distribution)
Bottom : Probability of « extreme » Above normal conditions for rainfall for Meteo-France (left - highest ~15% of the distribution) and ECMWF (right – highest 20% of the distribution).
For ASO, issued in July.

In relationship with the current predictability and the model uncertainties, it seems difficult to use these forecast.
Take care that due to the system change (from system 3 to system 4) the verification scores are not available yet.

II.8. DISCUSSION AND SUMMARY

Forecast over Europe

For this forecast the first comment is about the predictability in the climate system. The oceanic forcing is low more or less everywhere. A teleconnection pattern seem to be present in the forecasts, its origin is identifies in the Eastern Pacific (due to La Niña-like conditions). As a consequence, MF and ECMWF show a positive anomaly centered in the Northern Atlantic, a slightly negative one over Europe.
Because of the persistence of the tropical signal (the same as last month) and of the good consistency between MF and ECMWF for the large scale features, we choose to privilege a scenario for Northern and Southern Europe, and for Eastern regions of Europe

- For N and S Europe : the "warm" scenario is the less likely (less Southern circulations over Atlantic near Europe), related to the Z500 forecasts. The global context (weak predictability, strength of anomalies) is not sharp enough to choose the "cold" scenario. So we decided to privilege the "normal" scenario for temperature. No privileged scenario for rainfall.
- For Eastern Europe and SEE regions: related to the positive anomaly of Z500 and consistent with EUROSIP, we privilege a "warm" scenario. No privileged scenario for rainfall.

Obviously, some downscaled information could detail these scenarios for specific countries or sub-regions.

Tropical Cyclone activity

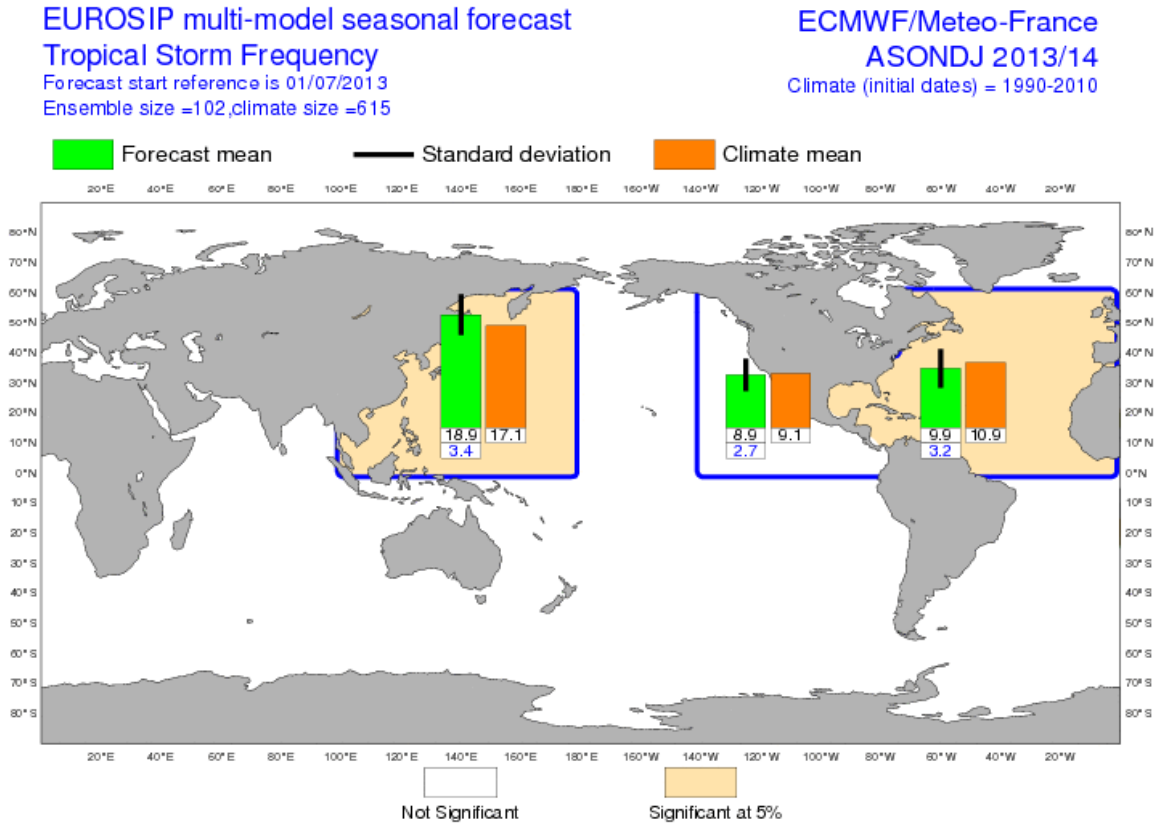


fig.42: Seasonal forecast of the frequency of Tropical Cyclones from EUROSIP (Météo-France & ECMWF) for the ASOOND period, issued in July.
http://www.ecmwf.int/products/forecasts/d/charts/seasonal/forecast/eurosip/mmtrop/trop_euro/eurosip_tropical_storm_frequency/

For the Tropical Cyclone season and in relationship with the SSTs scenarios, Euro-Sip forecasts indicate an enhanced Tropical Cyclone activity over the Western Pacific, close to normal condition over the Eastern Pacific and Below normal activity for the Tropical North Atlantic basin.

WMO RA VI
Pilot RCC-Network

Synthesis of Temperature forecasts for August-September-October 2013 for European regions

Results are expressed with respect of 3 possible scenarios : « Above normal », « close to normal » and « Below normal ». The limits between each category is given by the corresponding tercile such that each scenario have the same climatological probability of occurrence (33,3%). If the forecast shows no specific signal (because of low predictability and/or divergent scenarios between several models), the cell is filled in grey and "No privileged scenario" is indicated.

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	*normal*	*normal*	*no privileged scenario*	*above normal*	*above normal*

T Below normal (Cold) T close to normal T Above normal (Warm) No privileged scenario

WMO RA VI
Pilot RCC-Network

Synthesis of Rainfall forecasts for August-September-October 2013 for European regions

Results are expressed with respect of 3 possible scenarios : « Above normal », « close to normal » and « Below normal ». The limits between each category is given by the corresponding tercile such that each scenario have the same climatological probability of occurrence (33,3%). If the forecast shows no specific signal (because of low predictability and/or divergent scenarios between several models), the cell is filled in grey and “No privileged scenario” is indicated.

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*	*no privileged scenario*	*no privileged scenario*

RR Below normal (Dry) RR close to normal RR Above normal (Wet) No privileged scenario

III. ANNEX

III.1. SEASONAL FORECASTS

Presently several centres provide seasonal forecasts, especially those designated as Global Producing Centres by WMO (see http://www.wmo.int/pages/prog/wcp/wcasp/clips/producers_forecasts.html).
■ BoM, CMA, CPTEC, ECMWF, JMA, KMA, Météo-France, NCEP and UK Met Office have ocean/atmosphere coupled models. The other centres have atmospheric models which are forced by a SST evolution which is prescribed for the entire period of forecast.
■ LC-MME and Euro-SIP provide multi-model forecasts. Euro-Sip is presently composed using 4 models (ECMWF, Météo-France, NCEP and UK Met Office). LC-MME uses information coming from most of the GPCs ; providing deterministic and probabilistic combinations of several coupled and forced models.

Seasonal forecasts use the ensemble technique to sample uncertainty sources inherent to these forecasts. Several Atmospheric and/or oceanic initial states are used to perform several forecasts with slightly different initial state in order to sample the uncertainty related to imperfect knowledge of the initial state of the climate system. When possible, the model uncertainty is sampled using several models or several version of the same model. The horizontal resolution of the Global models is currently between 100 and 300km. This mean that only Large Scale feature make sense in the interpretation of the issued forecasts. Generally speaking, the temperature forecasts show better skills than rainfall forecasts. Then, it exists a natural weakness of the seasonal predictability in Spring (ref to North Hemisphere).

In order to better interpretate the results, it is recommended to look to verification maps and graphs which give some insight into the expected level of skill for a specific parameter, region and period. A set of scores is presented on the web-site of the Lead-Centre for Verification (see http://www.bom.gov.au/wmo/lrfvs/) ; scores are also available at the specific web site of each centres.

This bulletin collects all the information available the 21st of the current month preceding the forecasted 3-month period.

III.2. « NINO », SOI INDICES AND OCEANIC BOXES

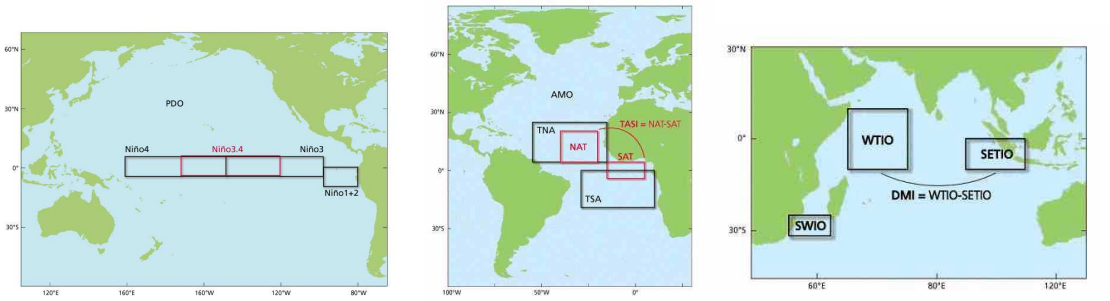
El Niño and La Niña events primarily affect tropical regions and are monitored by following the SST evolution in specific area of the equatorial Pacific.

- Niño 1+2 : 0°/10°S 80W-90W ; it is the region where the SST warming is developing first at the surface (especially for coastal events).
- Niño 3 : 5°S/5°N 90W-150W ; it is the region where the interanual variability of SST is the greatest.
- Niño 4 : 5°S/5°N 160E- 150 W ; it is the region where SST evolution have the strongest relationship with evolution of convection over the equatorial Pacific.
- Niño 3.4 : 5°S/5°N 120W-170W ; it is a compromise between Niño 3 and Niño 4 boxes (SST variability and Rainfall impact).

Associated to the oceanic « El Niño / La Niña » events, and taking into account the strong ocean/atmopshere coupling, the atmosphere shows also interanual variability associated to these events. It is monitored using the SOI (Southern Oscillation Index). This indice is calculated using standardized sea level pressure at Tahiti minus standardized sea level pressure at Darwin (see above

figure). It represents the Walker (zonal) circulation and its modifications. Its sign is opposite to the SST anomaly meaning that when the SST is warmer (respectively colder) than normal (Niño respectively Niña event), the zonal circulation is weakened (respectively strengthened).

Oceanic boxes used in this bulletin :



III.3.LAND BOXES

Some forecasts correspond to box averaged values for some specific area over continental regions. These boxes are described in the following map and are common to ECMWF and Météo-France.