GLOBAL CLIMATE BULLETIN
n°173 - NOVEMBER 2013

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I. DESCRIPTION OF THE CLIMATE SYSTEM (SEPTEMBER 2013)

I.1. OCEANIC ANALYSIS

I.1.a Global Analysis

At the Surface (fig. 1) :
Still little evolutions in the Tropics to the exception of the Pacific equatorial waveguide (warming on the Eastern part). Still a weak West/East dipole in the equatorial Pacific.
In the mid latitudes of the Northern hemisphere mostly cooling across the Pacific and warming East to Newfoundland across the Atlantic.

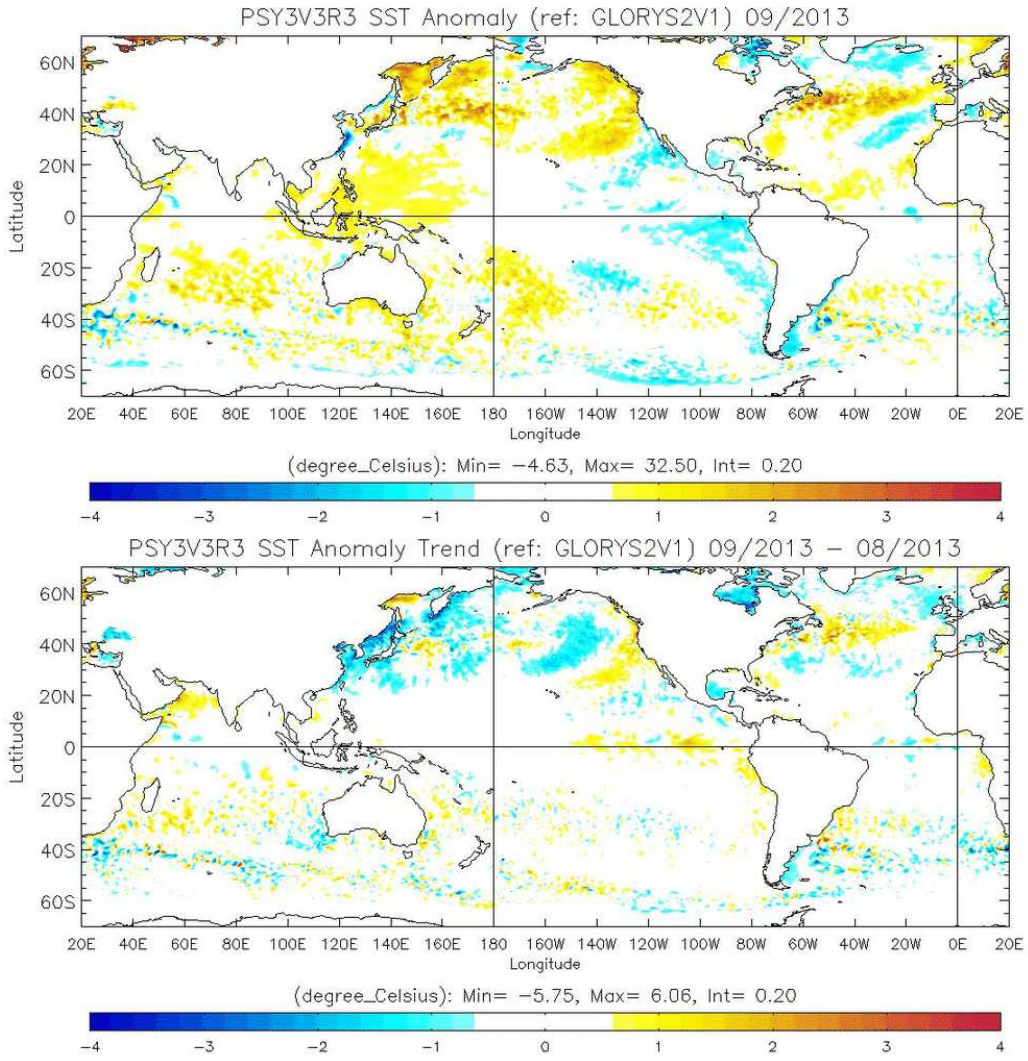


fig.1: top : SSTs Anomalies (°C) (reference Glorys 1993-2009); bottom : SST tendency (current – previous month) http://bcg.mercator-ocean.fr/

In subsurface (fig.2) :

In the Pacific : in the equatorial band (10°N-10°S), heat content anomalies mostly positive West to the dateline, East to this limit the landscape is less homogeneous. Strong positive anomalies in the Western part off equator (in the Northern hemisphere between 10°N and 20°N) consistently with the surface signal. In the SPCZ region positive anomaly extends South-East toward mid-latitudes.
In the Atlantic : in the equatorial waveguide little anomalies to the exception of positive anomalies in the Guinean Gulf. Persistence of slight positive anomaly in the tropical northern part and positive anomalies
in the Southern tropics (excepted close to the African continent – negative anomalies).
In the Indian Ocean : In the equatorial waveguide signal not fully consistent with the SST signal. Consistency with SSTs in the Southern Hemisphere West to Australia and in the vicinity of the maritime continent. the IOD is close to 0.

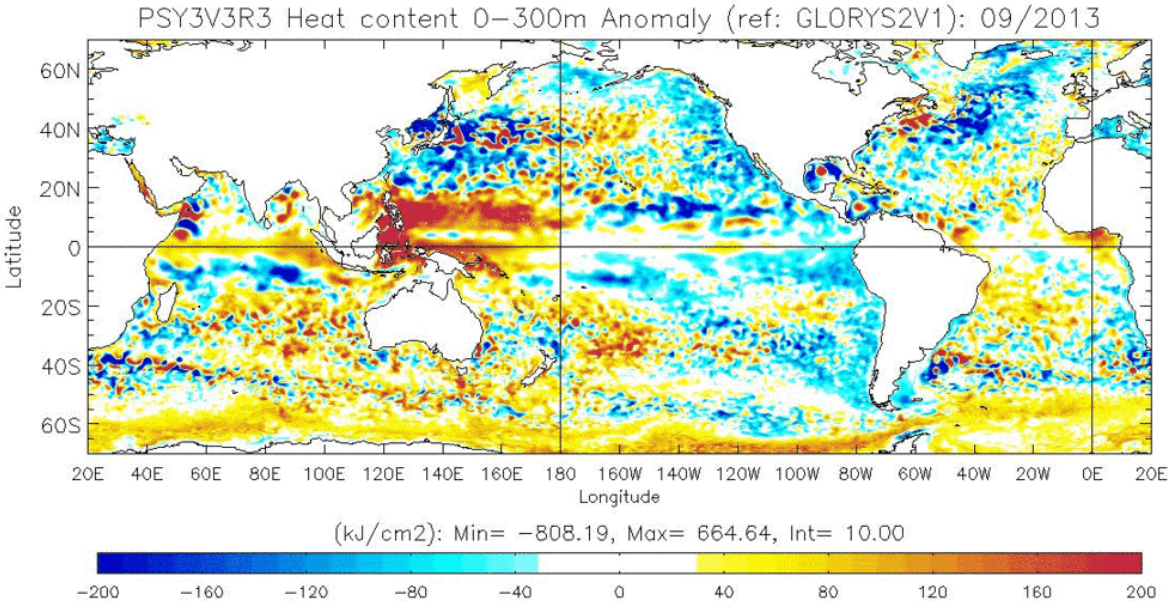


fig.2: map of Heat Content Anomalies (first 300m) (in kJ/cm²). (reference Glorys 1992-2009)
http://bcg.mercator-ocean.fr/

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

Still a weak dipole between the Western and most Eastern part of the basin. SOI slightly positive (+0.3) consistently with the weak dipole pattern and the little trade wind anomalies across the basin.
In the Niño boxes (4, 3.4, 3 et 1+2 ; see definition in Annex) the monthly averages are respectively 0°C, -0°C, -0.1°C to -0.6°C from West to East.

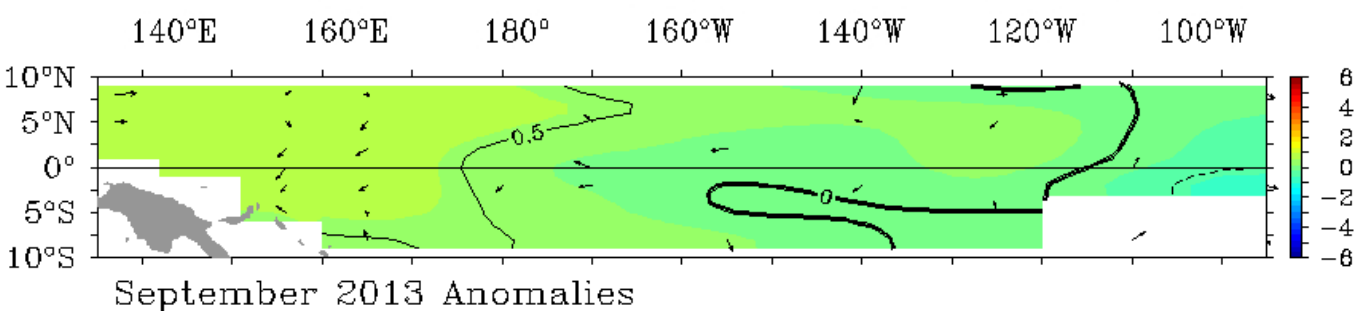


fig.3: SST and Wind anomalies over the Equatorial Pacific from TAO/TRITON.
http://www.pmel.noaa.gov/tao/jsdisplay/monthly-summary/monthly-summary.html

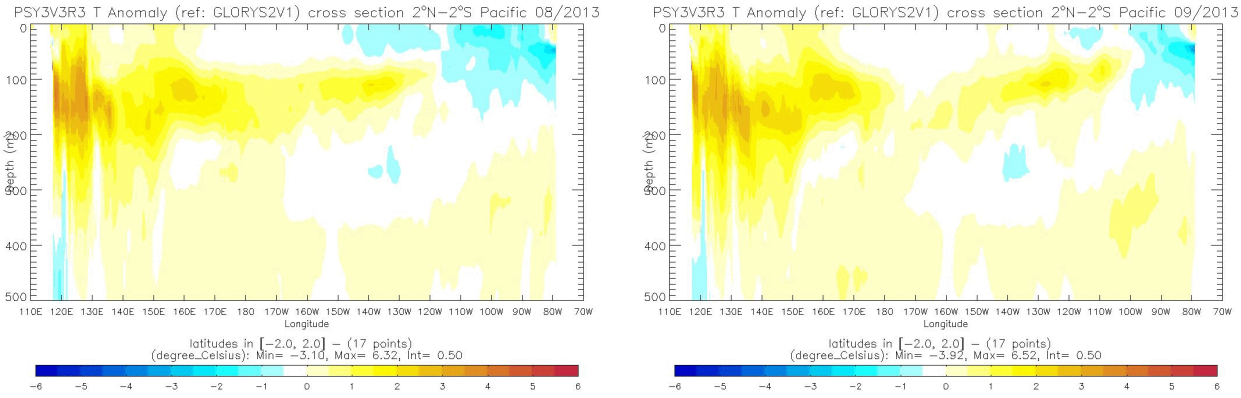


fig.4: Oceanic temperature anomaly in the first *500 metres* in the Equatorial Pacific, in previous month (left) and current month (right) http://bcg.mercator-ocean.fr/

In the equatorial waveguide (fig. 4) : still traces of propagation of Kelvin waves under the surface (warmer than normal around 150m) from the Western side and across the basin in the lower layers (around 150m). Consistently, decrease of the negative anomaly on the most Eastern side and relative discharge of the warm reservoir on the most western part.
The thermocline structure (fig. 5) : some traces of wave propagation of positive anomalies across the Pacific.

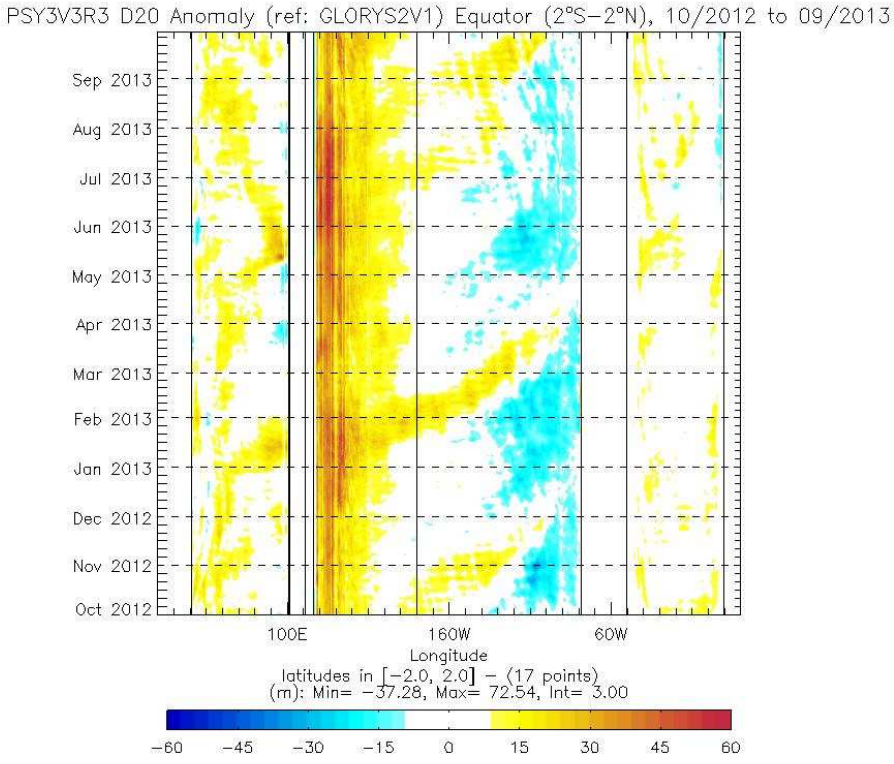


fig.5: Hovmüller diagram of Thermocline Depth Anomalies (m) (depth of the 20°C isotherm) along the equator for all oceanic basins over a 24 month period. http://bcg.mercator-ocean.fr/

I.1.c Atlantic Basin

Northern Tropical Atlantic : slightly warmer than normal and little evolutions.
Equatorial waveguide : weak signal, without wave propagation traces.
The Southern Tropical Atlantic : weak signal elsewhere.

I.1.d Indian Basin

Southern Tropical Indian Ocean : Still slightly warmer than normal between Australia and the maritime continent. Close to normal elsewhere. A positive anomaly conspicuous in the South Tropics/Sub-Tropics.
Equatorial waveguide : weak signal (weak positive anomaly), the DMI is close to 0.
Northern Tropical Indian Ocean : close to normal more or less everywhere.

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) : strong variability influenced by the MJO activity (mostly phase 5 - in the vicinity of the maritime continent) and only a little related to SST forcing. As a consequence, quite a lot of fragmented cells in the Sub-Tropics and Tropics.

On the Pacific : Mostly off equator, Divergent circulation anomalies (upward anomaly motion) in the vicinity of the Maritime
Continent (likely related to the persistence of the SST forcing) and convergent circulation anomaly (downward motion anomaly) on the Eastern Pacific in relationship with the Divergent circulation anomaly close to 130°W and North to the Equator. In addition, the Divergent circulation anomalies in the South-Eastern Sub-Tropics seems to be more related to mid-latitude activity.
On the Atlantic : Convergent circulation anomalies (downward anomaly motion) over the Southern Tropical Atlantic (especially close to the Greenwich meridian). This pattern is favouring a northward shift of the ITCZ. In the Northern hemisphere, to be quoted the positive anomaly extending over Central America and the Northern part of South America.
On the Indian Ocean : Convergent circulation anomalies (downward anomaly motion) over most of the basin, especially close to costal area of East Africa. Divergent circulation anomaly on the South-Eastern part of the basin and over South-East Asia and India.

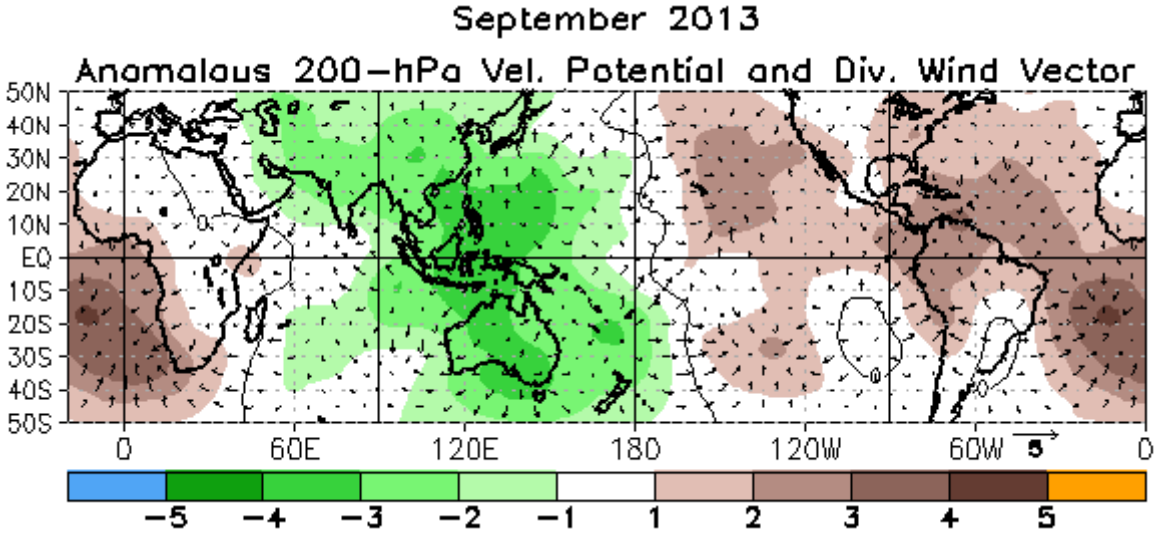


fig.6: Velocity Potential Anomalies at 200 hPa and associated divergent circulation. Green (brown) indicates a divergence-upward anomaly (convergence-downward anomaly).
http://www.cpc.ncep.noaa.gov/products/CDB/Tropics/figt24.shtml

Stream Function anomalies in the high troposphere (fig. 7 – insight into teleconnection patterns tropically forced) : on average weak signal in the intertropical band. The strongest related to the large scale convection (on North-Eastern tropical Pacific) could have some impact onto the stream function anomaly field with a possible wave train landing on the coastal area of Eastern North America. Elsewhere, anomalies likely related to Mid-Latitude activity and poorly influenced by the Tropics.

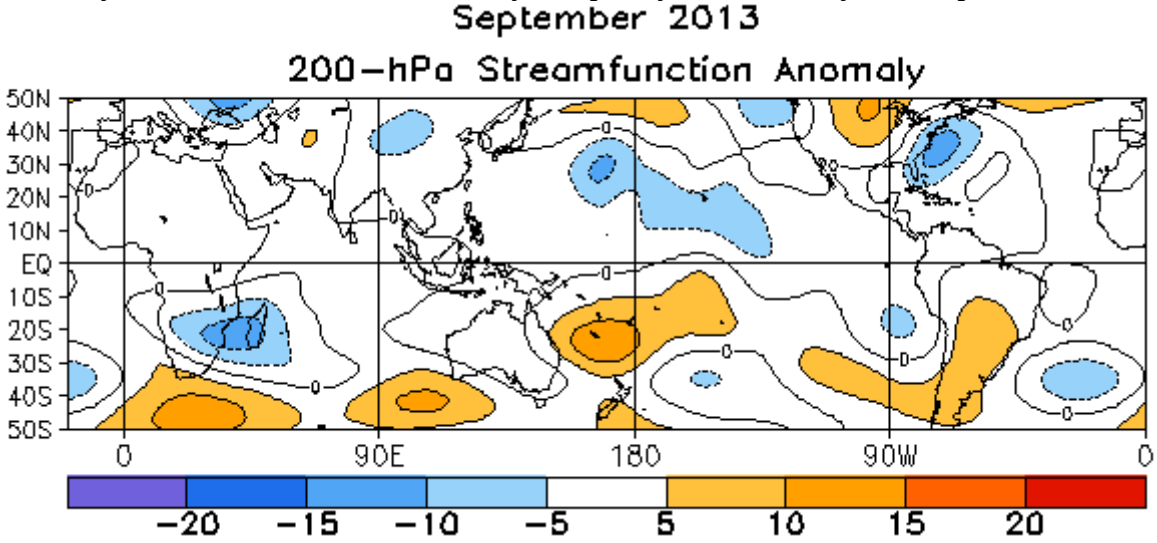


fig.7: Stream Function Anomalies at 200 hPa.
http://www.cpc.ncep.noaa.gov/products/CDB/Tropics/figt22.shtml

Geopotential height at 500 hPa (fig. 8 – insight into mid-latitude general circulation) : Consistently with the previous analysis, only little anomalies coming from the Tropics. Some anomalies observed in the mid/high latitudes of the North Pacific, across the Atlantic and over North-Eastern Europe and Siberia. Only little activity in the atmospheric modes ; main active modes are found over the Pacific : West Pacific (-0.9) and East-North Pacific (0.9) ; over Europe some positive NAO (0.7) and East Atlantic (0.6).

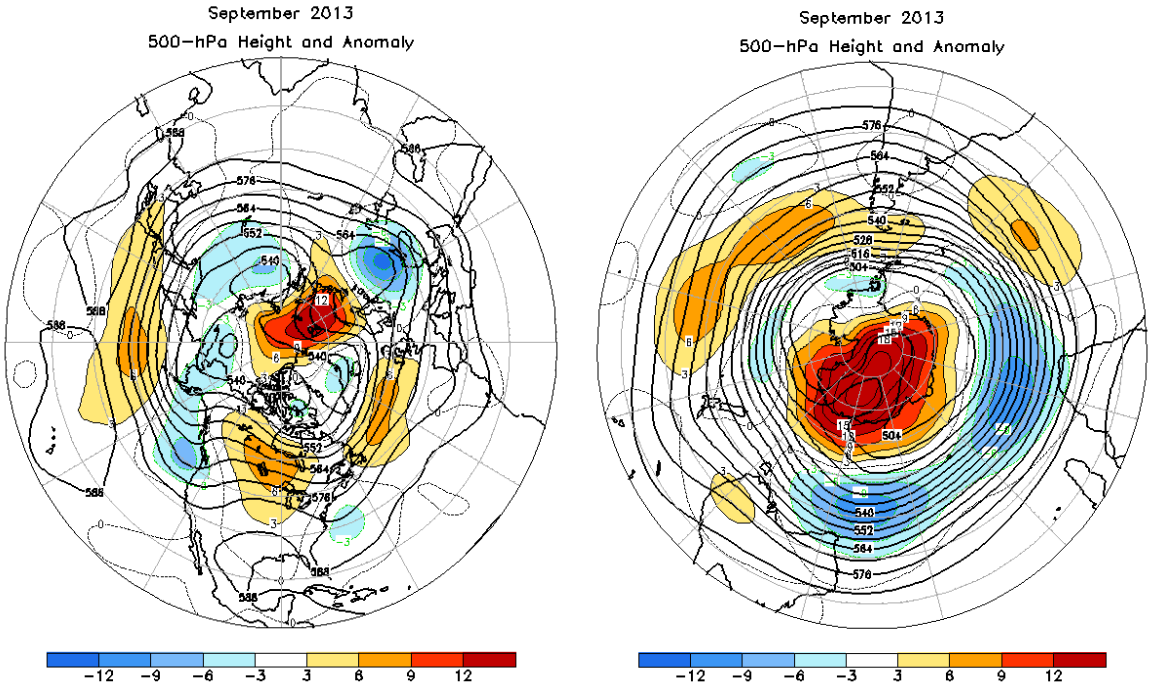


fig.8: Anomalies of Geopotential height at 500hPa (left North Hemisphere http://www.cpc.ncep.noaa.gov/products/CDB/Extratropics/fige9.shtml, and right South Hemisphere http://www.cpc.ncep.noaa.gov/products/CDB/Extratropics/fige15.shtml)

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
SEP 13	**0.4**	**-0.6**	**1.9**	**-1.4**	**0.4**	**---**	**-0.6**	**0.4**	**-1.6**
AUG 13	1.1	0.3	-0.2	-1.1	-0.1	---	-1.9	-0.8	0.0
JUL 13	0.7	0.6	-0.9	0.9	-0.7	---	-0.2	0.0	-0.3
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

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

I.2.b Precipitation

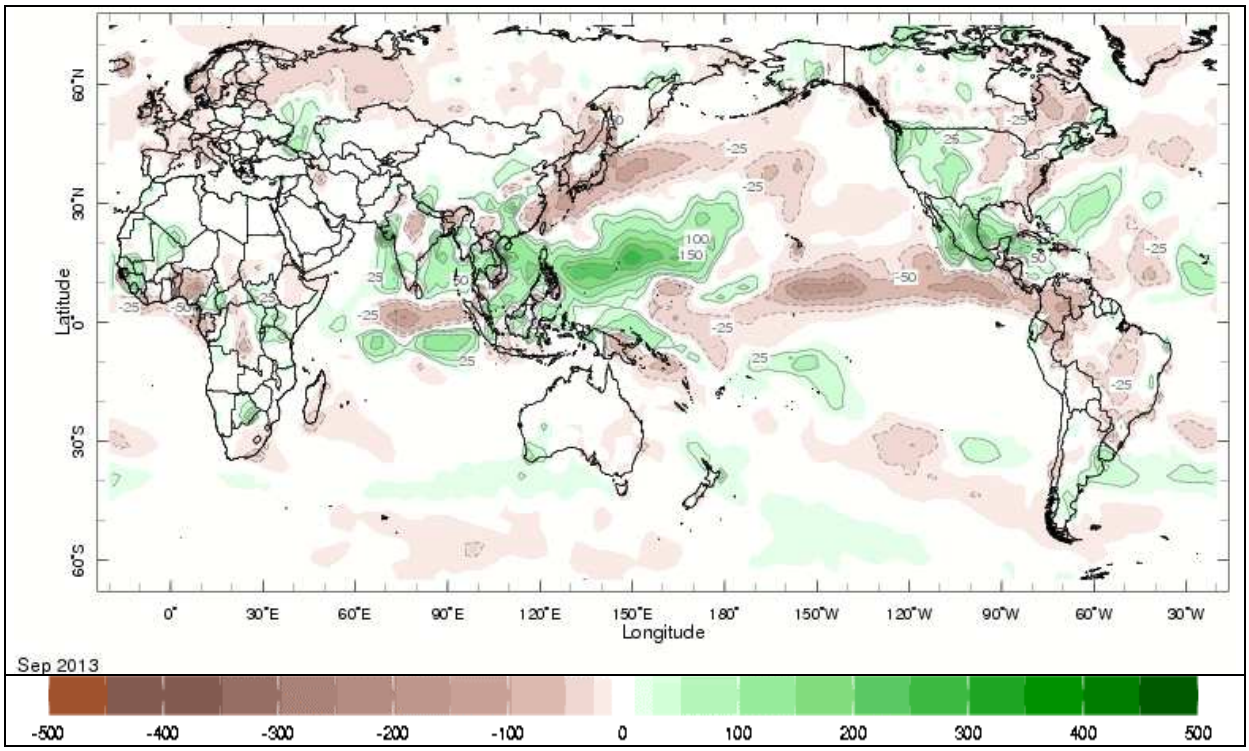


fig.9: Rainfall Anomalies (in mm) (departure to the 1979-2000 normal) – Green corresponds to above normal rainfall while brown indicates below normal rainfall.
http://iridl.ldeo.columbia.edu/maproom/.Global/.Precipitation/

Pacific : good consistency with the Velocity Potential anomalies. In the vicinity of the maritime continent and West to the date line (positive anomaly), on the Eastern side (North to the equator) extending up to the North of South America and Central America (negative anomalies).
Atlantic/Africa : negative anomaly over part of the Basil and the Southern Caribbean, Some drier than normal conditions close to the Guinean Gulf and wetter than normal conditions over the western part of West Africa. Quite consistent with the Velocity Potential field anomalies.
Indian Ocean : the relationship with the velocity potential field anomalies is unclear, especially over the Indian sub-continent, South-East Asia and East Africa.
Australia : Little anomalies.
North America : Dipole pattern (positive/negative anomalies) between the Western and Eastern part of US (extending on Eastern Canada).
Europe : mostly drier than normal over Europe, especially the Northern part from West to East; consistently with Geopotential height anomalies at 500hPa. Some positive anomalies on the most South-Eastern part of Europe.

I.2.cTemperature

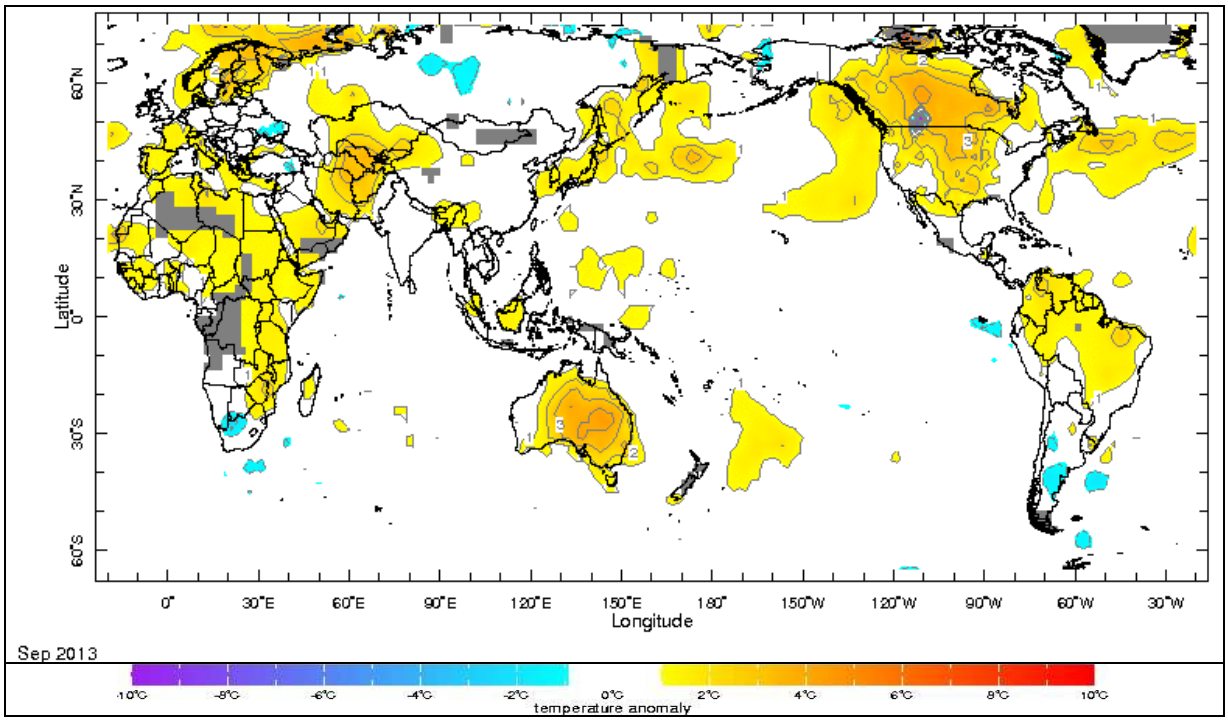


fig.10: Temperature Anomalies (in °C) (departure to the 1979-2000 normal)
http://iridl.ldeo.columbia.edu/maproom/.Global/.Atm_Temp/Anomaly.html

North-America : Positive anomalies over most of the continent.
South-America : warmer than normal conditions on most of the half Northern part of the continent.
Australia : Strong positive anomaly over a large portion of the continent.
Asia : little anomalies more or less everywhere to the exception of the most western part of the region.
Africa : Warmer than normal conditions more or less everywhere extending over toward the Arabic Peninsula.
Europe : Warmer than normal conditions over the western façade of European regions extending to Scandinavia and to the Mediterranean basin.

I.2.d Sea Ice

In Arctic (fig. 11 - left) : well below normal sea-ice extension (negative anomaly close to 2 standard deviation) but less than the previous year (which was in the record).
In Antarctic (fig. 11 - right) : well above normal sea-ice extension anomaly (on the record) with some large regional modulation.

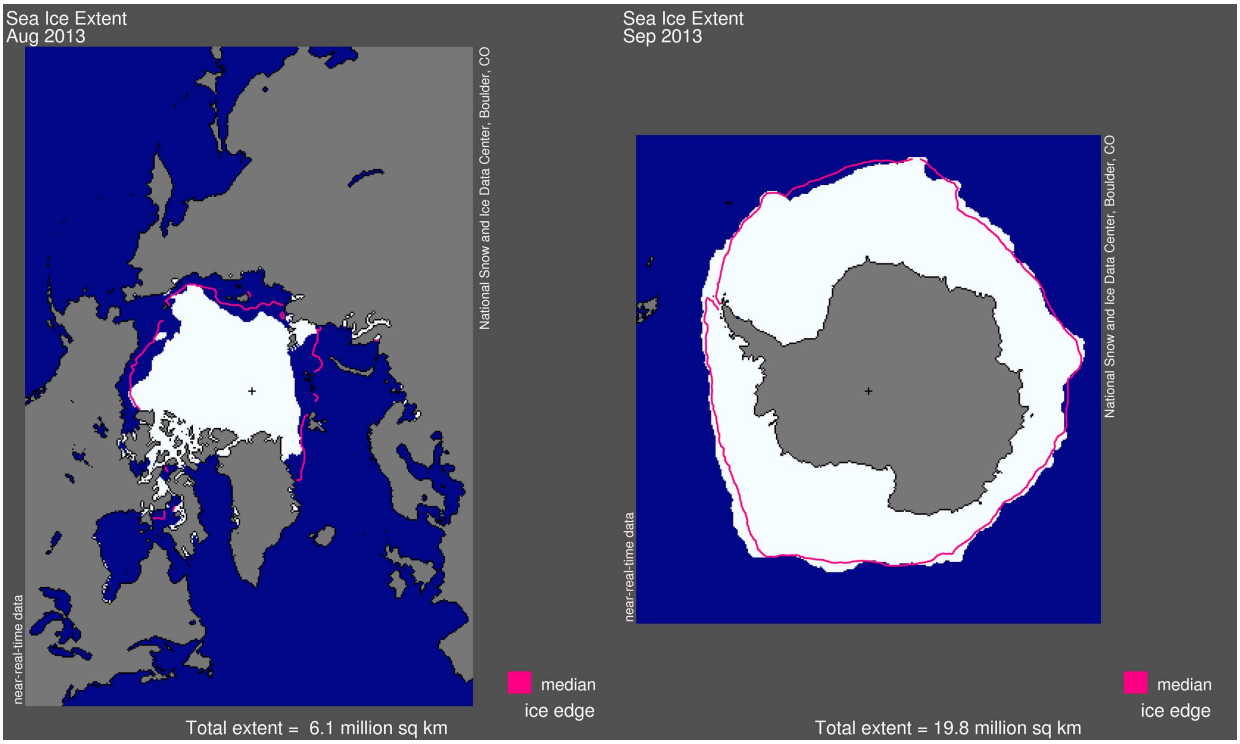


fig.11: Sea-Ice extension in Arctic (left), and in Antarctic (right). The pink line indicates the averaged extension (for the 1979-2000 period). http://nsidc.org/data/seaice_index/

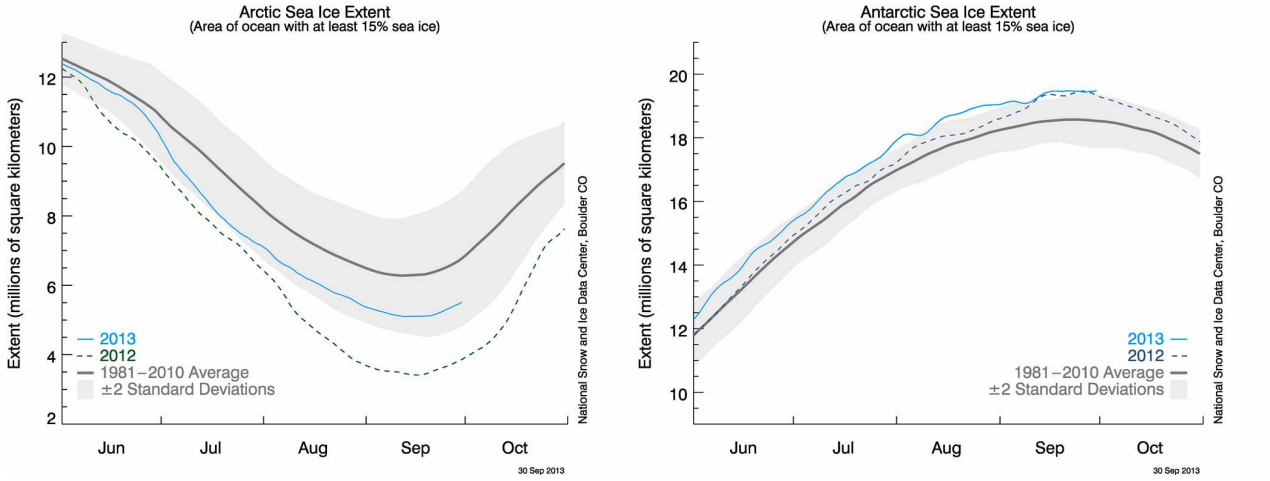


fig. 9bis : Sea-Ice extension evolution from NSIDC
http://nsidc.org/data/seaice_index/images/daily_images/N_stddev_timeseries.png

II.SEASONAL FORECASTS FOR NDJ FROM DYNAMICAL MODELS

II.1. OCEANIC FORECASTS

II.1.a Sea Surface Température (SST)

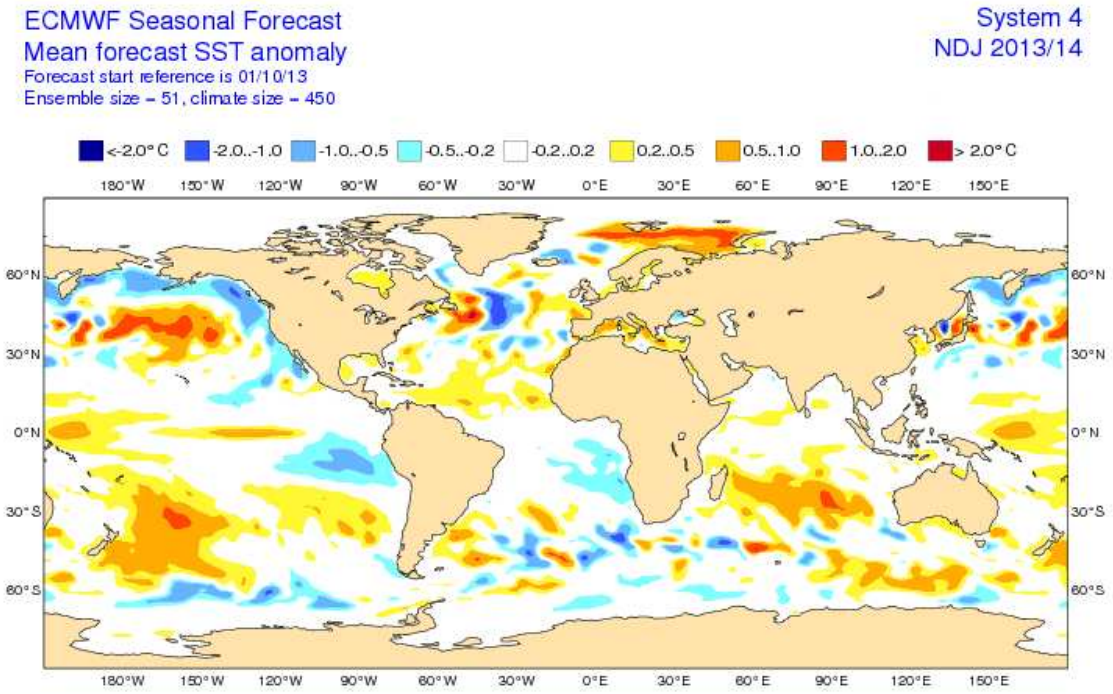


fig.12: SST anomaly forecast (in °C) from ECMWF.
http://www.ecmwf.int/products/forecasts/d/charts/seasonal/forecast/seasonal_range_forecast/group/

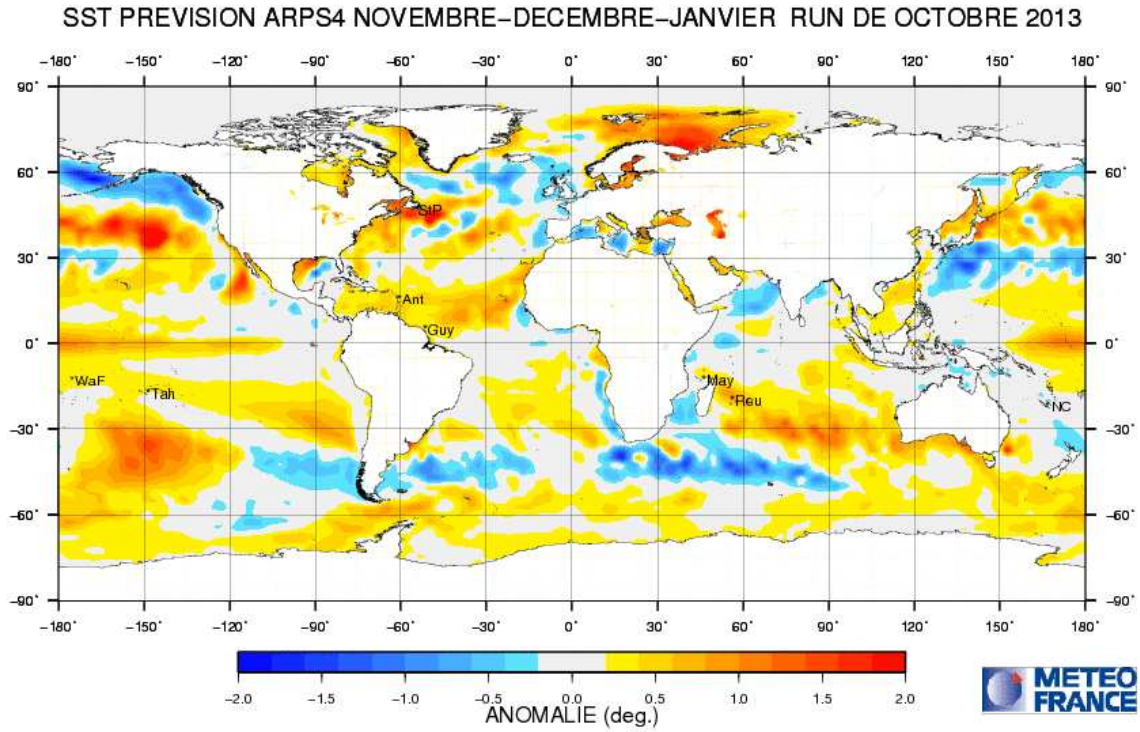


fig.13: SST Anomaly forecast (in°C - recalibrated with respect of observation) from Météo-France.
http://elaboration.seasonal.meteo.fr/

For the 2 individual models :
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), some consitent SST forecasts (taking into account the hindcast period differences).
Pacific : consistent signal in both models for a warming in the equatorial waveguide. Weakening of the negative anomaly in the most eastern part. However, some differences over the SPCZ regions (especially over New-Caledonia and French Polynesia).
Atlantic : in both model great consistency in the Northern Tropics and mid-latitudes. There are more differences in the Southern Tropics (mostly warmer than normal in MF – not explain by the hindcast issue).
Indian Ocean : consistent forecast in both models. Persistence of a weak West-East contrast which maintain the IOD on the negative side. Warmer than normal conditions in the Southern Sub-Tropics.

In Euro-SIP :
Some robust patterns appear in the tropics across the Pacific.
Pacific : Equatorial waveguide : very consistent with MF and ECMWF across the basin (positive anomaly in the Central part of the equatorial waveguide). The Western positive anomaly extends along the SPCZ regions. Quite consistent patterns in the subtropics
and the mid-latitudes of both hemispheres.
Atlantic : Weak signal over the southern Tropics. Slight warmer than normal conditions in the North Tropical Atlantic. Some consistency close to Newfoundland
Indian Ocean : weak signal over a large portion of the Tropical basin. Warmer than normal conditions in the Southern Tropics/Sub-Tropics.

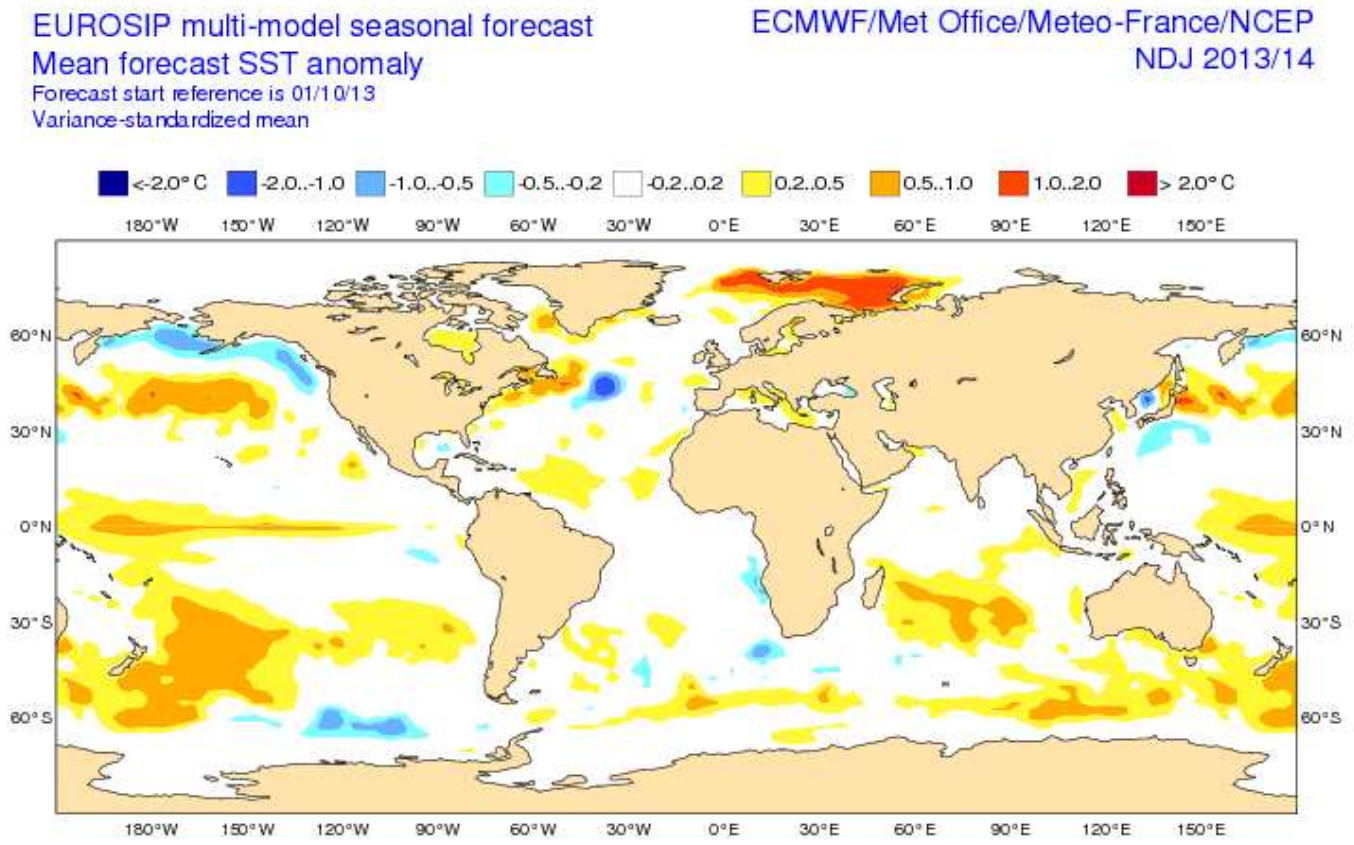


fig.14: SST Forecasted anomaly (in °C) from Euro-SIP for NDJ, issued in october.

II.1.b ENSO Forecast :

Forecasted Phase for NDJ : neutral

For NDJ : the majority of the models are in the range of neutral conditions for the targeted period despite some are close to Niño threshold (and one in Niña conditions – uncertainty less large than previously). Most of the dynamical models show a tendency to a slight warming on time (and warmer conditions with respect of statistical models).

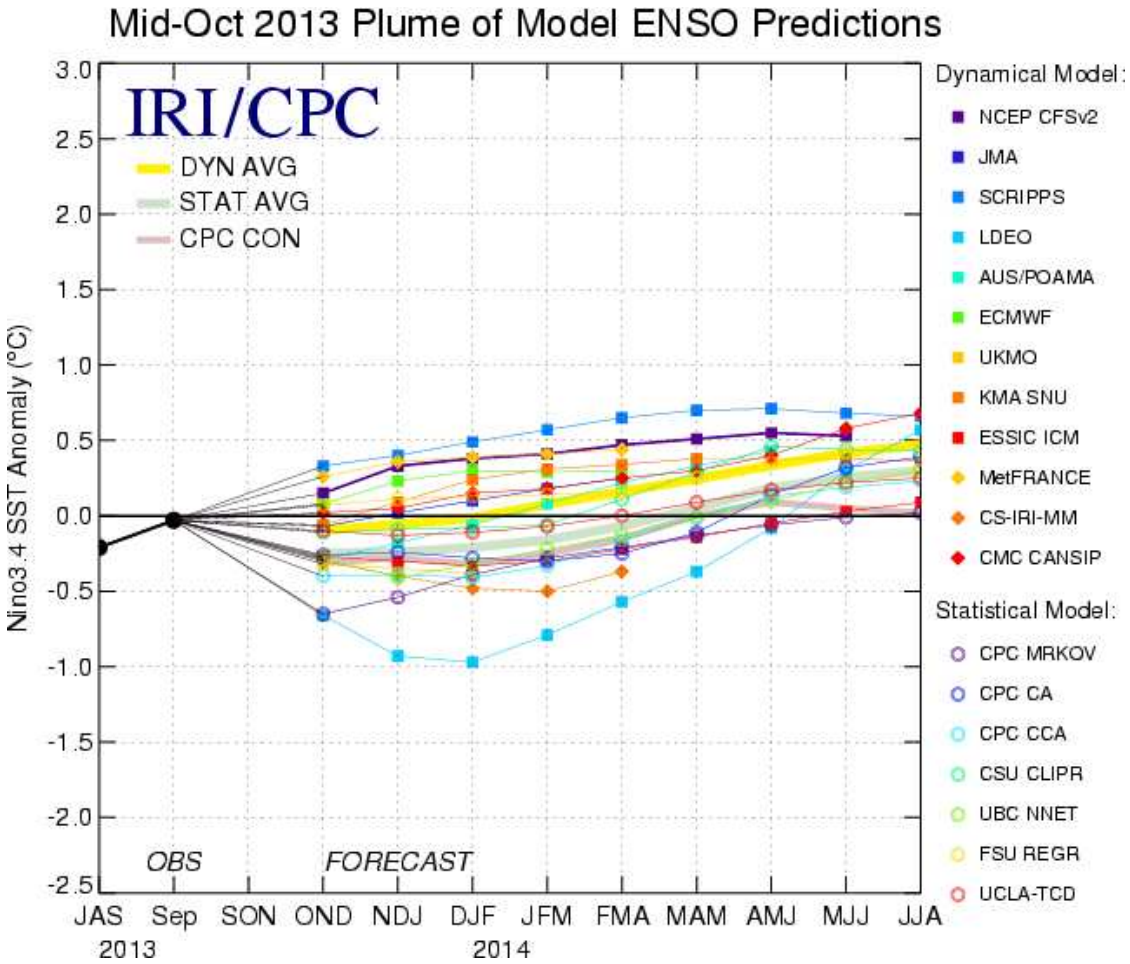


fig.15: Synthesis of Niño 3.4 forecasts (120° to 165°W) issued by IRI :
http://iri.columbia.edu/climate/ENSO/currentinfo/SST_table.html

Plumes from Météo-France and ECMWF for the 3 Niño boxes (see definition in Annex – fig. II.1.5) : In both models and on average, prevailing conditions in the normal range for NDJ. In both models progressive warming. In both models quite large uncertainty. In EuroSIP Plumes, close to normal conditions on average and quite large spread indicating a quite large uncertainty (but less than previously).

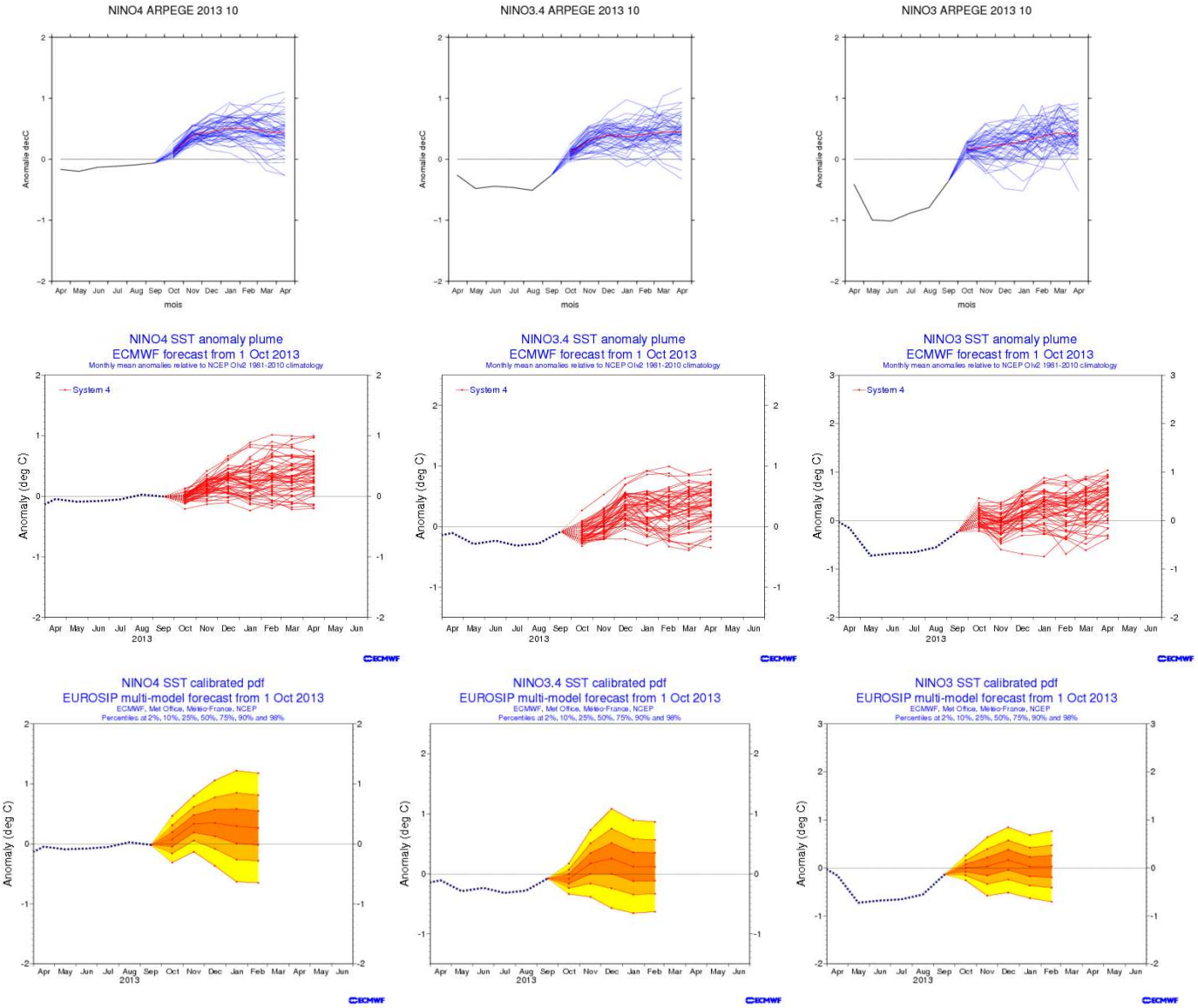


fig.16: SST anomaly forecasts in the Niño boxes from Météo-France (top) and ECMWF (middle) - monthly mean for individual members - and EuroSIP (bottom) – recalibrated distributions.
(http://www.ecmwf.int/)

II.1.c Atlantic Ocean forecasts :

Forecasted Phase: ***Above Normal in the Northern Tropics***
TASI on the positive side

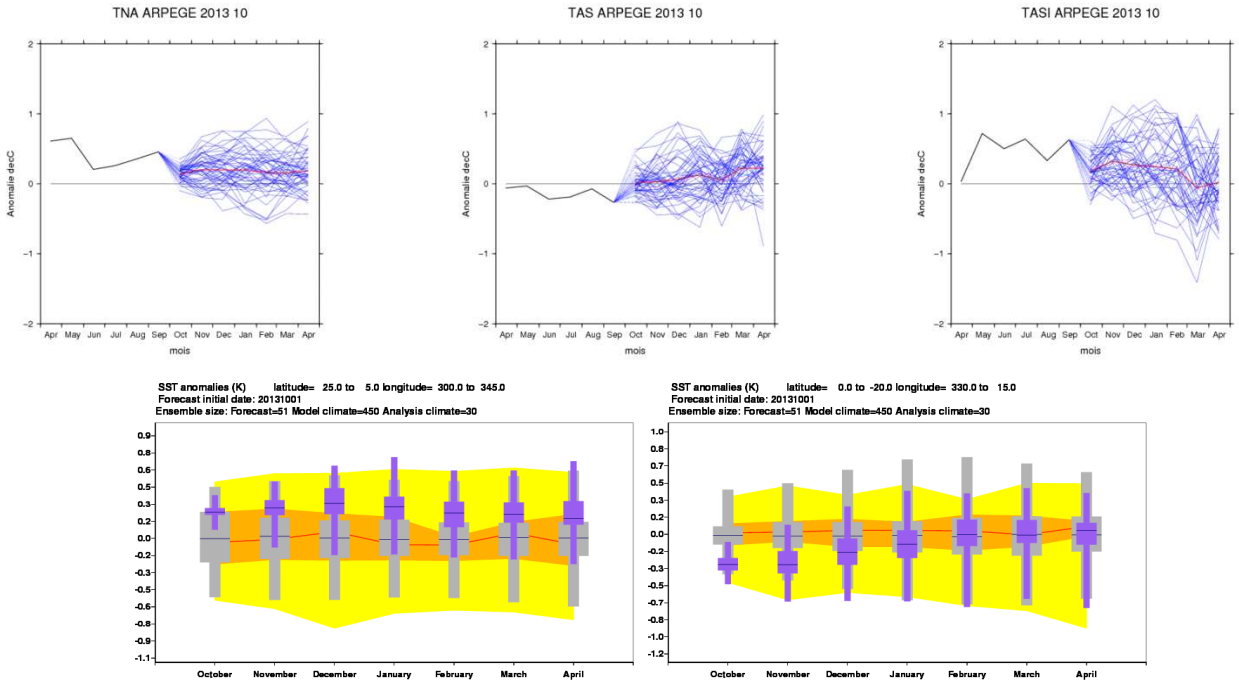


fig.17: SSTs anomaly forecasts in the Atlantic Ocean boxes from Météo-France (top) and ECMWF (bottom), plumes / climagrams correspond to 51 members and monthly means.

North Tropical Atlantic : warmer than normal conditions in both models. Evolution very similar. Larger spread in MF vs ECMWF.
South Tropical Atlantic : Colder than normal conditions in ECMWF and close to normal in MF. Progressive warming then in both models.
The inter-hemispheric SST gradient is consistent between the two models and positive.
TASI : the TASI index is slightly positive for NDJ for MF. However the spread is large.

II.1.d Indian Ocean forecasts :

Forecasted Phase: *IOD progressively close to Normal*

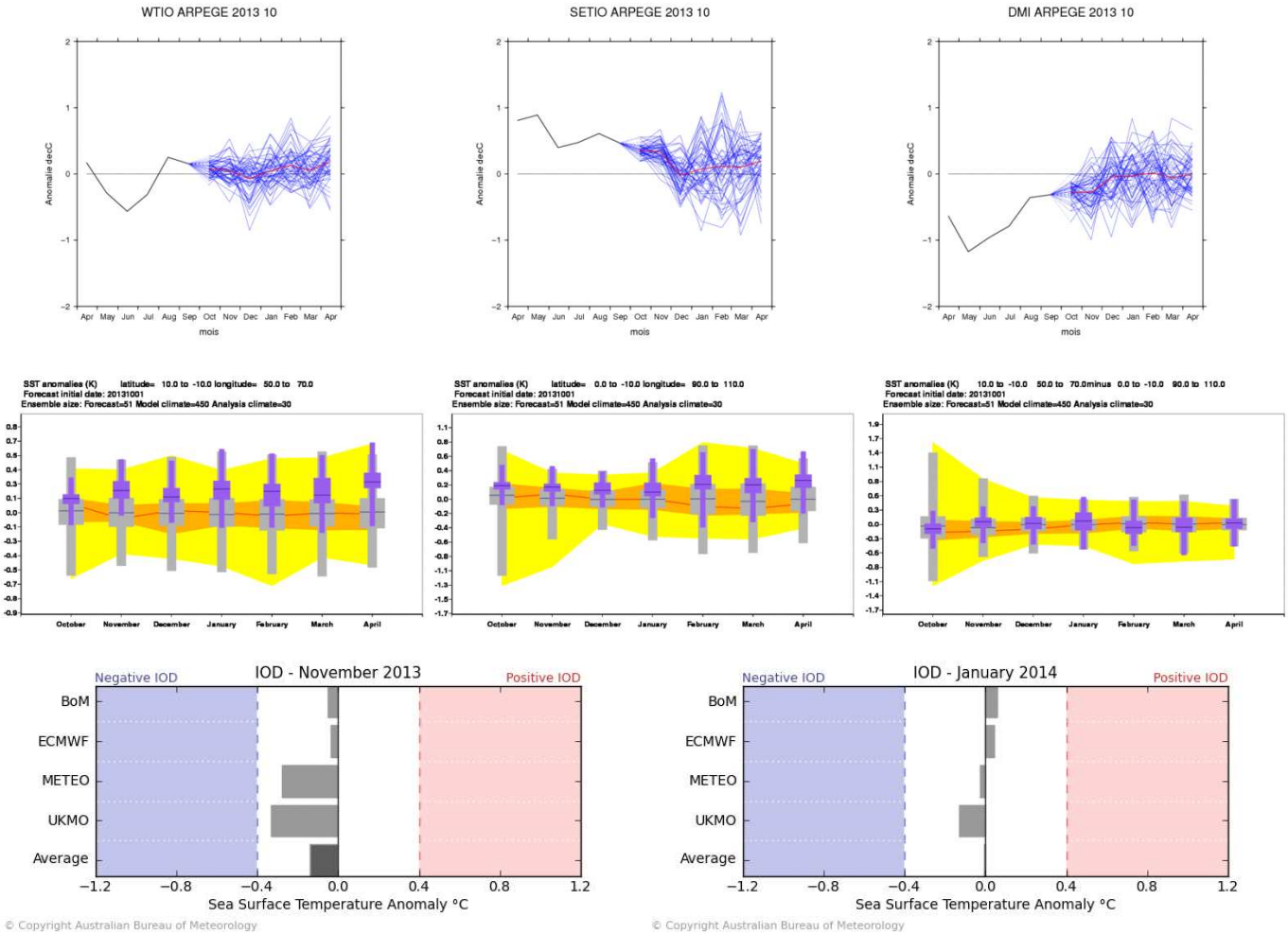


fig.18: SSTs anomaly forecasts in the Indian Ocean boxes from Météo-France (top), ECMWF (middle), plumes / climagrams correspond to 51 members and monthly means. Synthesis for IOD (bottom) for several GPCs from BoM

In WTIO : Some differences in the two models. Warmer than normal in ECMWF and rapidly close to normal in MF. More spread in MF.
In SETIO : both models starting with Above normal conditions and then rapid decrease (close to normal) in MF while the "warm" scenario is maintained in ECMWF. little spread in ECMWF and large spread in MF.
DMI (IOD) : Starting on the negative side in MF and then moving to close to neutral while neutral along the entire period for ECMWF. Still a large spread in MF. The evolution to the close to neutral value is confirmed by other models.

II.2. GENERAL CIRCULATION FORECAST

II.2.a Global Forecast

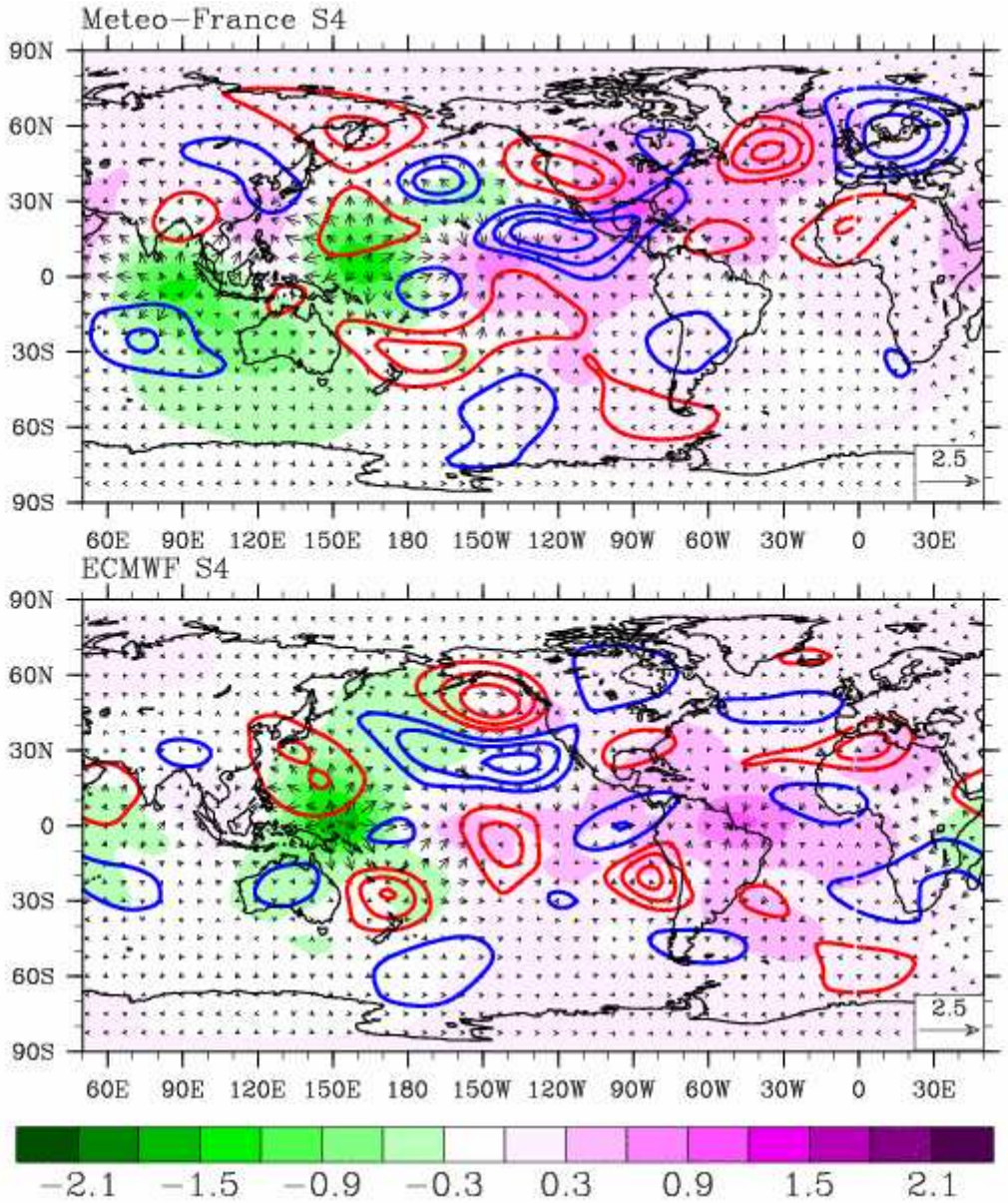


fig.19: Velocity Potential anomaly field χ (shaded area – green negative anomaly and pink positive anomaly), associated Divergent Circulation anomaly (arrows) and Stream Function anomaly ψ (isolines – red positive and blue negative) at 200 hPa by Météo-France (top) and ECMWF (bottom).

Velocity potential anomaly field (cf. fig. 19 – insight into Hadley-Walker circulation anomalies) : only little consistency between the 2 models and weak signal. Some large uncertainty in the location of similar cells in the Northern hemisphere.

Over the Pacific : Good consistency between the 2 models on warm pool; negative anomaly extending along the SCPZ region (Divergent circulation anomaly - upward motion anomaly) and some similarity East to the date line; positive anomaly (Convergent circulation anomaly - downward motion anomaly).

Over Indian Ocean : Unconsistent signal ; in MF Divergent circulation anomaly on the Eastern part of the basin followed by a Convergent circulation anomaly close to the Great Horn of Africa. Conversely in ECMWF, no signal in the Eastern part and Divergent circulation anomaly on the Western side and the costal area of East Africa.

Over Atlantic : Noticeable signal in ECMWF in term of Convergent circulation (downward motion)

anomalies in the equatorial region (and especially close to North-Eastern coast of South America) while only little signal over the Caribbean in MF. These differences could likely be related to the differences in SST scenarios.

Stream Function anomaly field (cf. fig. 19 – insight into teleconnection patterns tropically forced) :

Over the Pacific : In both models, the atmospheric response is quite consistent in both hemispheres to the exception of Western South-America. Over the Pacific there is some traces of signal propagation from the Western enhanced divergent circulation toward North Pacific. However, the patterns are not similar in terms of location leading to differences in terms of impact over the North American continent.
Over the Atlantic : No consistency between the response of the 2 models. In the Northern Hemisphere, ECMWF develops a response mostly in the Tropics while MF develops a response mostly in the mid-latitudes. So at the end, the rotational circulation anomaly is close to be opposite between the 2 models.

As a conclusion the predictability is very limited over Europe and more generally over mid-latitudes regions of the Northern Hemisphere. One can infer only some predictability in the vicinity of the warm pool and possibly on the North American continent.

II.2.b North hemisphere forecast and Europe

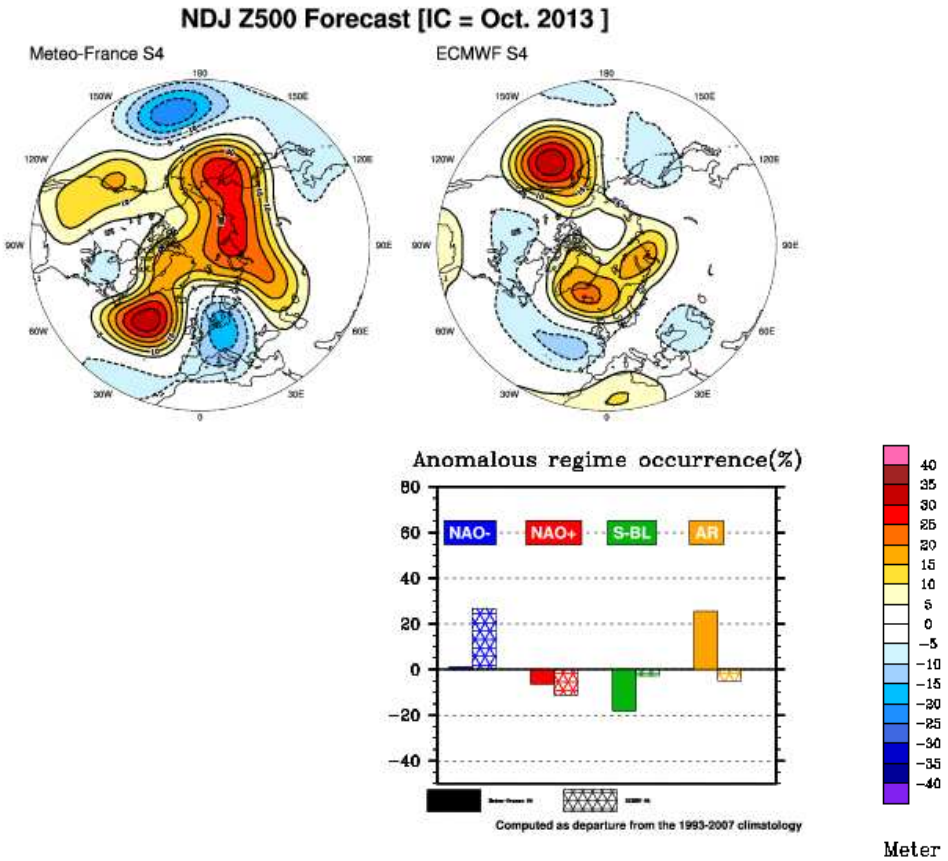


fig.20: Anomalies of Geopotential Height (top) at 500 hPa from Meteo-France (left) and ECMWF (right). http://www.ecmwf.int/products/forecasts/d/charts/seasonal/forecast/eurosip and North Atlantic Regime occurrence anomalies (bottom) from Météo-France and ECMWF : vertical bars represent the excitation frequency anomaly (in %) for each of the 4 regimes.

Geopotential height anomalies (fig. 20 – insight into mid-latitude general circulation anomalies) :
As seen on the Stream Function anomalies, very little consistency in the Stream Function Anomalies

over North Atlantic. Some signal in the Geopotential Heigh coming from the West Pacific but unfortunatelly with quite large positionning differences betwee,n the 2 models. So difficult to infer a reliable information from these anomalies. The differences between the two models can likely be related to the model uncertainty.

North Atlantic Circulation Regimes (fig. 20) : As a consequence, no consistent signal in the regimes forecast ; exceedance of NAO – circulations in ECMWF and Atlantic Ridge exceedance in MF (counterbalanced by a deficit of Blocking regimes). So difficult to infer any useful information from these forecasts.

II.3. IMPACT : TEMPERATURE FORECASTS

II.3.a ECMWF

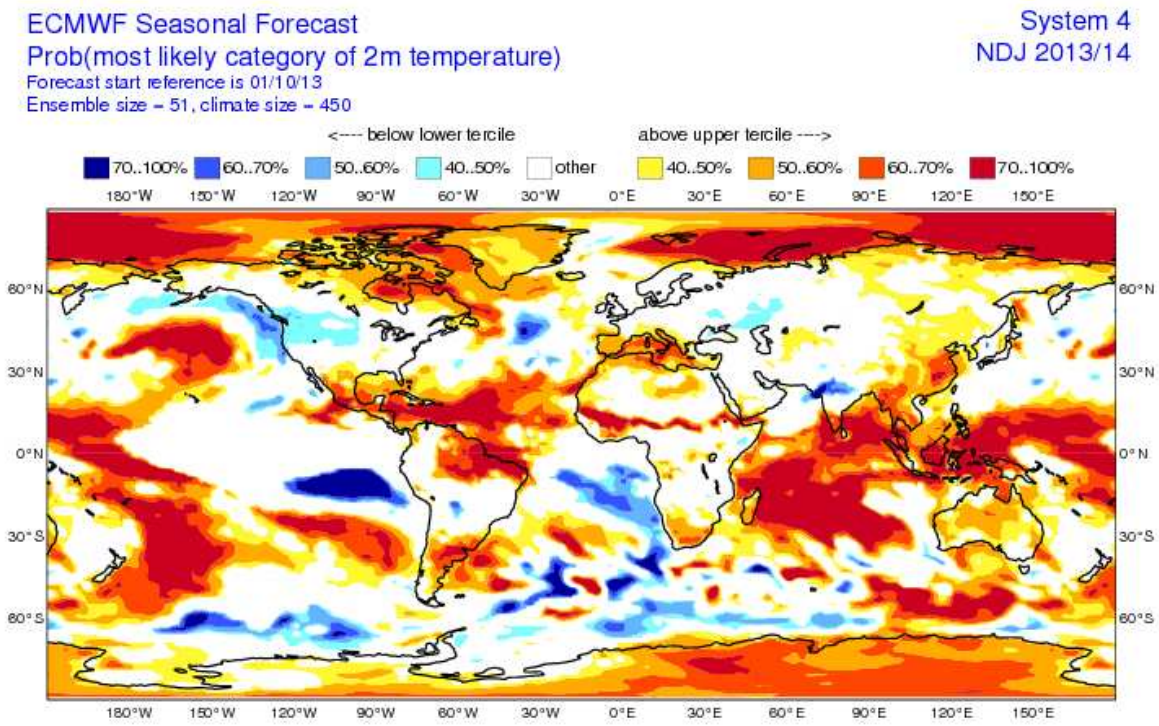


fig.21: Most likely category probability of T2m from ECMWF. Categories are Above Normal, Below Normal and « other » category (Normal and No Signal).
http://www.ecmwf.int/products/forecasts/d/charts/seasonal/forecast/seasonal_range_forecast/group/

II.3.b Météo-France

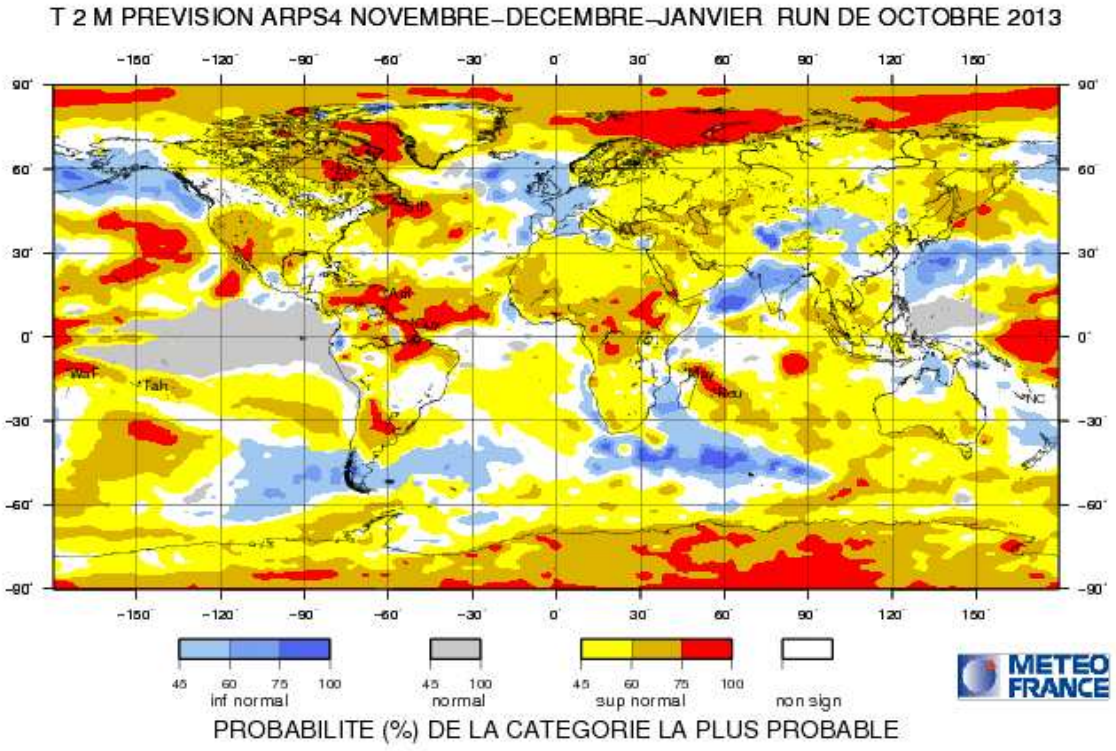


fig.22: Most likely category of T2m from Meteo-France. Categories are Above, Below and Close to Normal. White zones correspond to No Signal. http://elaboration.seasonal.meteo.fr/

II.3.c Met Office (UKMO)

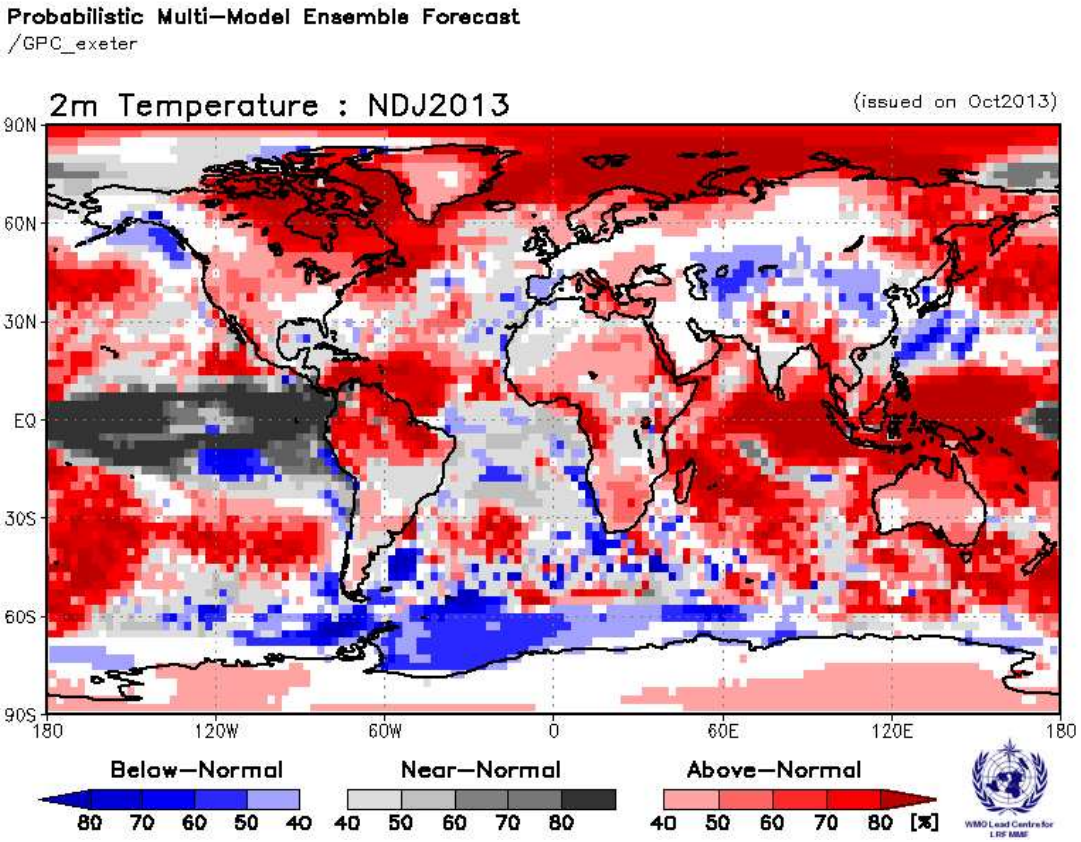


fig.23: **Most likely category of T2m Anomaly from UK Met Office.** **https://www.wmolc.org/**

II.3.d Climate Prediction Centre (CPC)

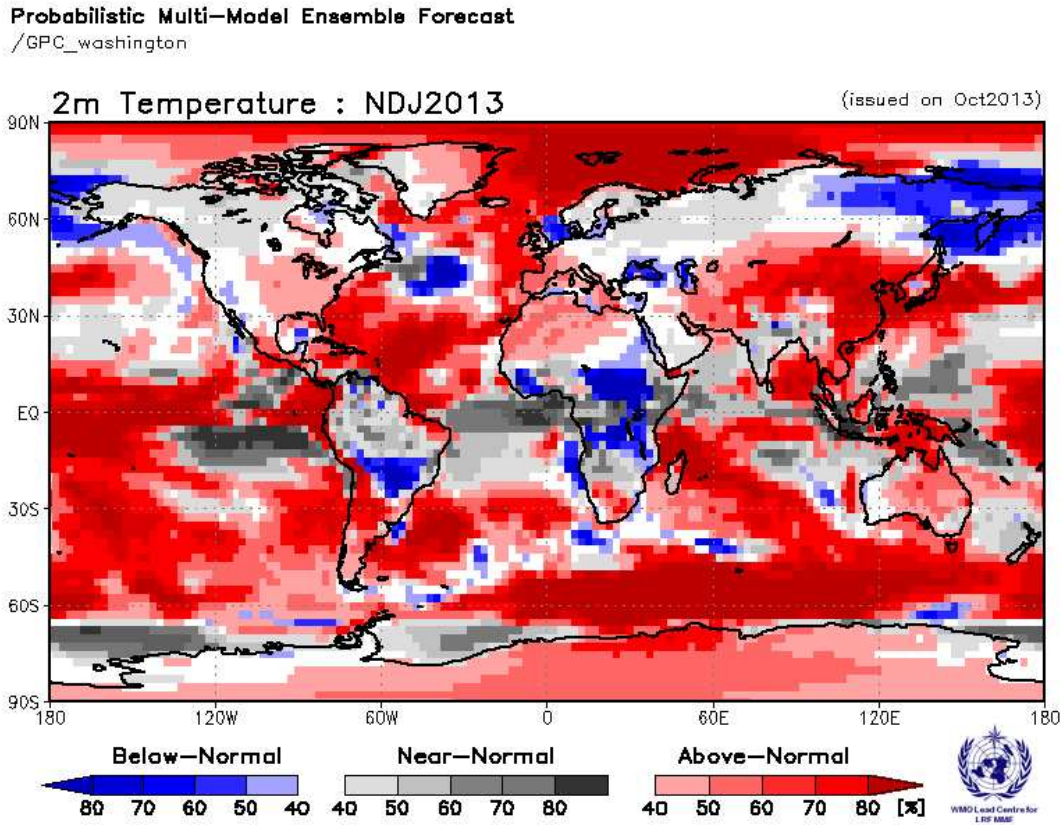


fig.24: **Most likely category of T2m Anomaly from CPC.** **https://www.wmolc.org/**

II.3.e Japan Meteorological Agency (JMA)

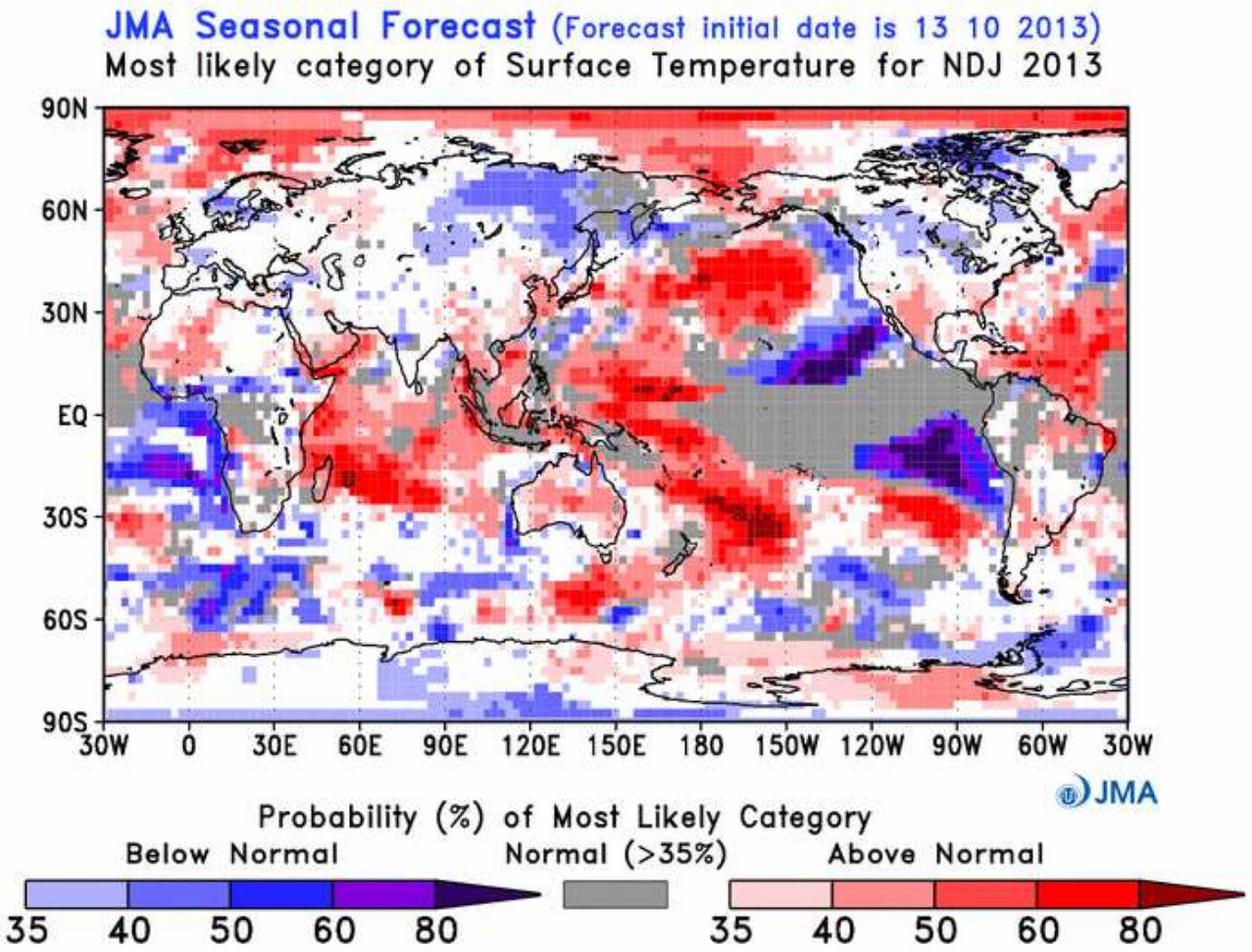


fig.25: Most likely category of T2m for OND, issued in September. Categories are Above, Below and Close to Normal. White zones correspond to No Signal. http://ds.data.jma.go.jp/tcc/tcc/products/model/

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

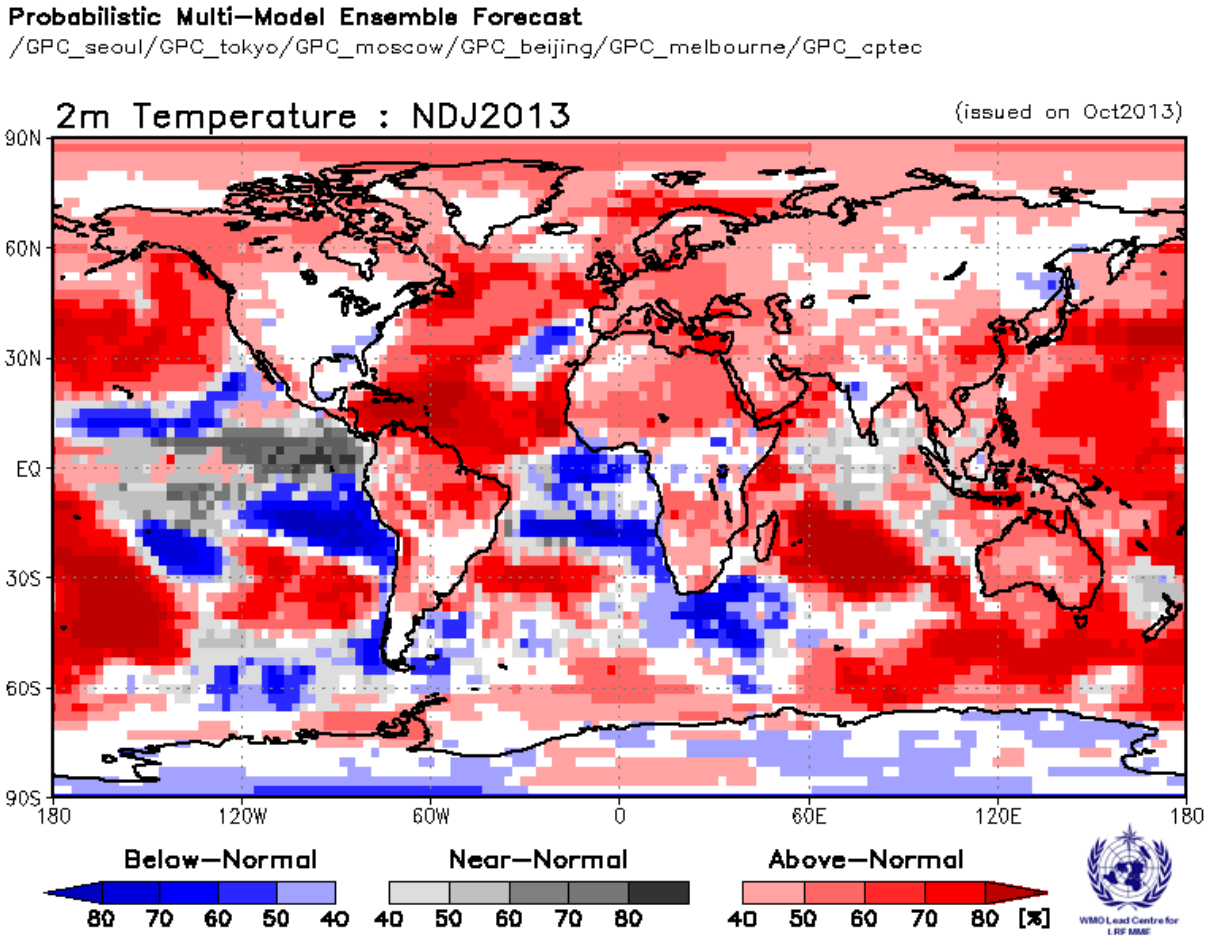


fig.26: MME most likely category of T2m from LC-MME. The MME composition corresponds to the GPCs not used in EuroSIP https://www.wmolc.org/

II.3.g Euro-SIP

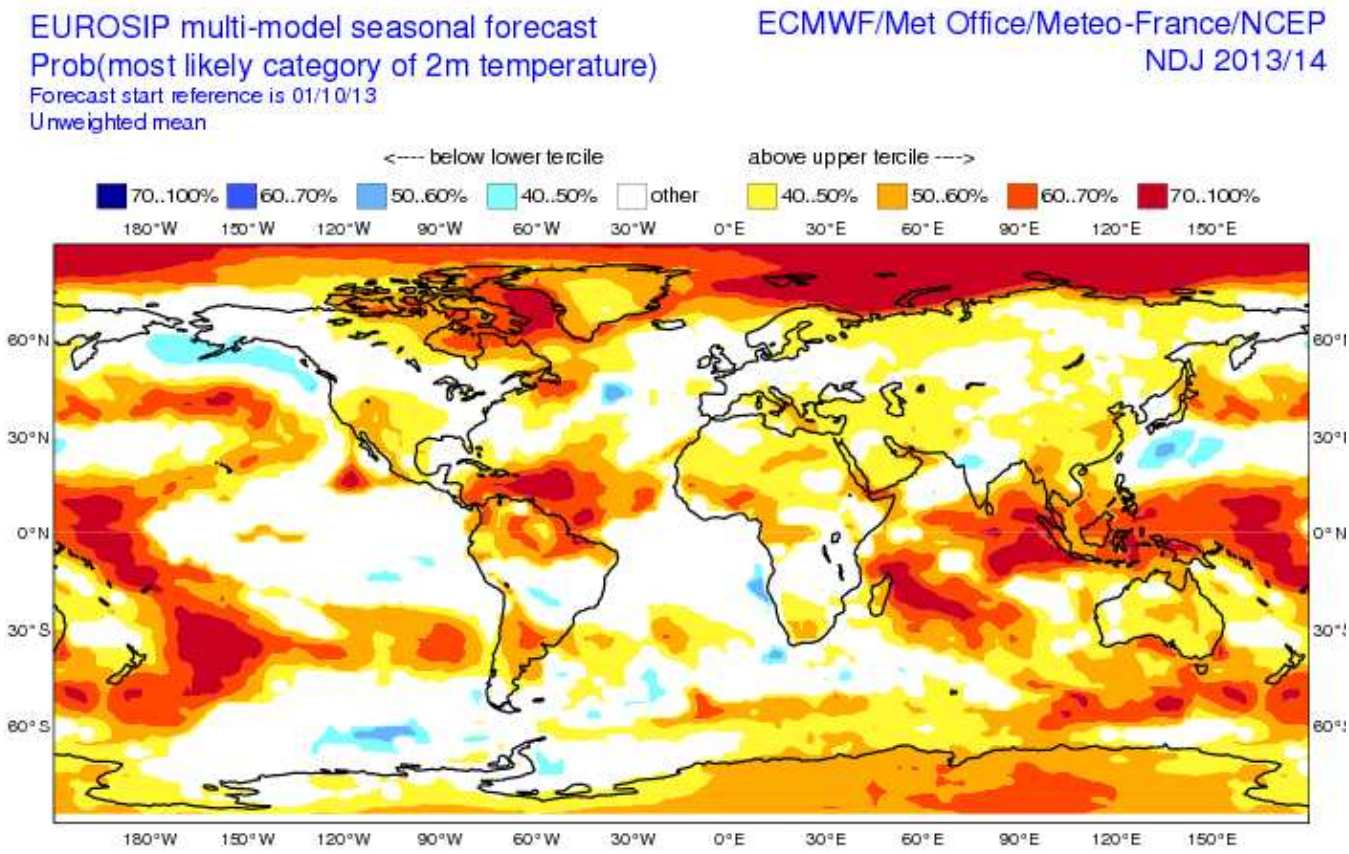


fig.27: Multi-Model Probabilistic forecasts for T2m from EuroSip.
(2 Categories, Below and Above normal – White zones correspond to No signal and Normal).

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

North-America : enhanced probabilities (Warmer than normal) North to the Great Lakes and over a large portion of US up to Mexico. Same signal over part of Central America and the Caribbean.
South-America : Some consistent signal over the Southern and Northern part of the continent (warmer than normal).
Australia : enhanced probabilities for warmer than normal conditions over most of the continent.
Asia : Mostly Warmer than normal conditions more or less everywhere (to the exception of India) with a strong probability in the vicinity of the maritime continent.
Africa : Mostly warmer than normal conditions North to the equator and in South Africa.
Europe : Slightly enhanced probabilities for Warmer than normal conditions over the most Eastern regions including the Eastern Mediterranean basin.

II.4. IMPACT : PRECIPITATION FORECAST

II.4.a ECMWF

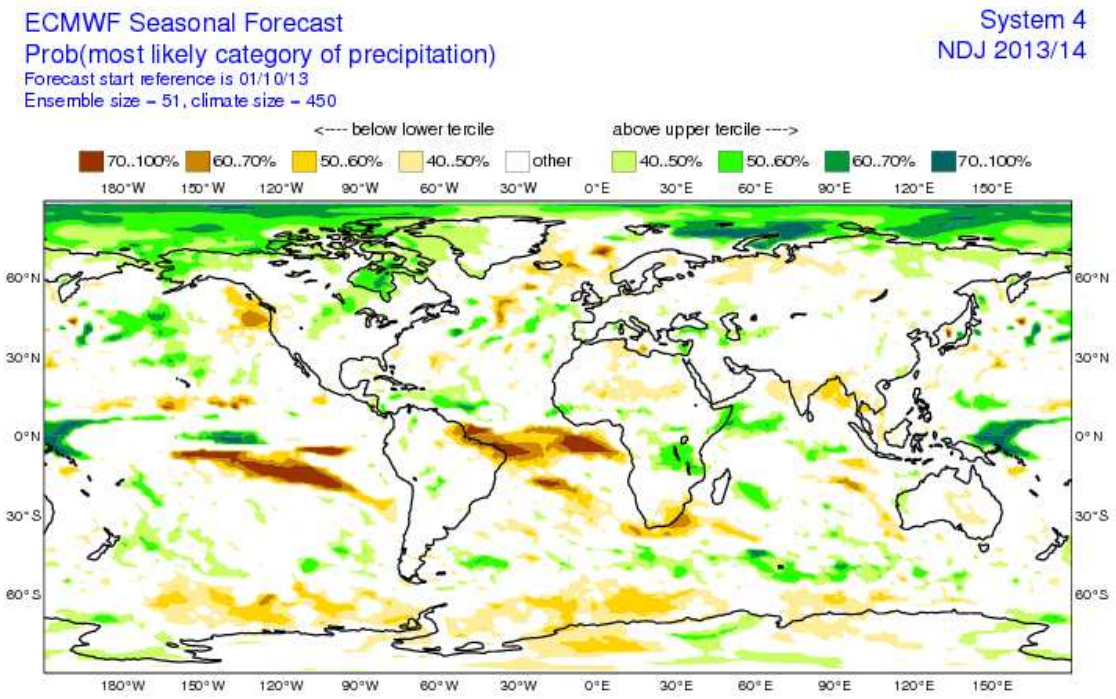


fig.28: Most likely category probability of rainfall from ECMWF for OND, issued in September. Categories are Above Normal, Below Normal and « other » category (Normal and No Signal).
http://www.ecmwf.int/products/forecasts/d/charts/seasonal/forecast/charts/seasonal_charts_s2/

II.4.b Météo-France

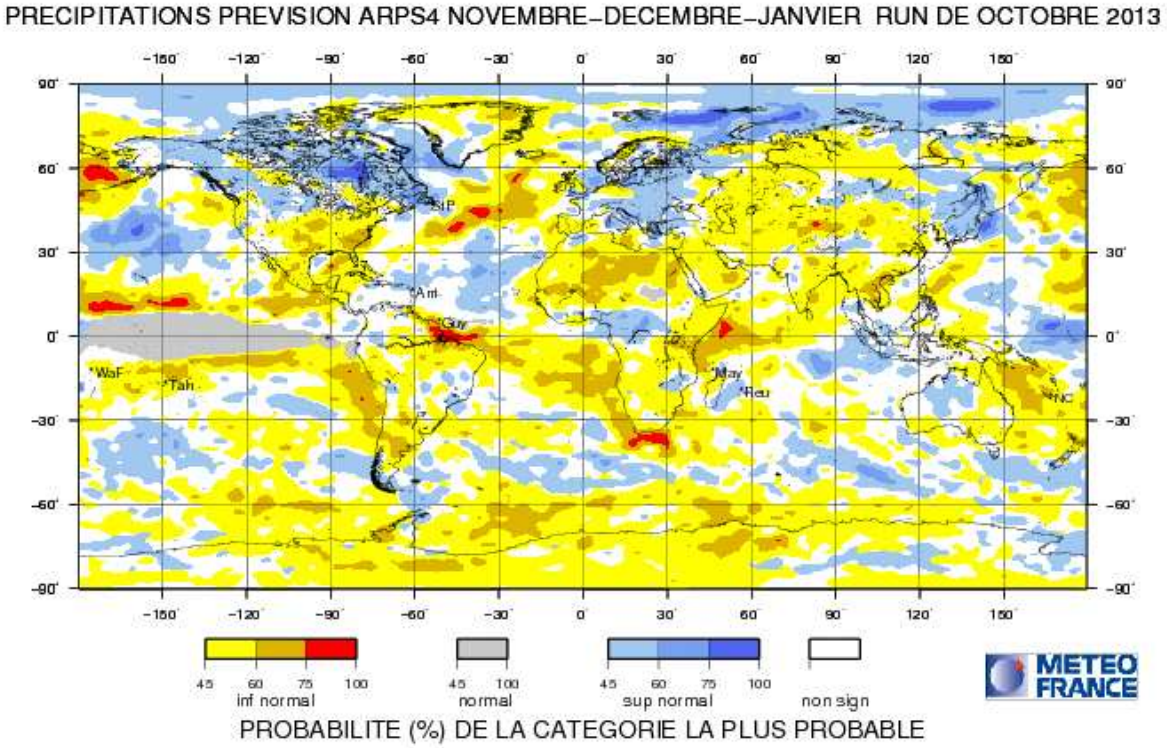


fig.29: Most likely category of Rainfall from Meteo-France. Categories are Above, Below and Close to Normal. White zones correspond to No Signal. http://elaboration.seasonal.meteo.fr/

II.4.c Met office (UKMO)

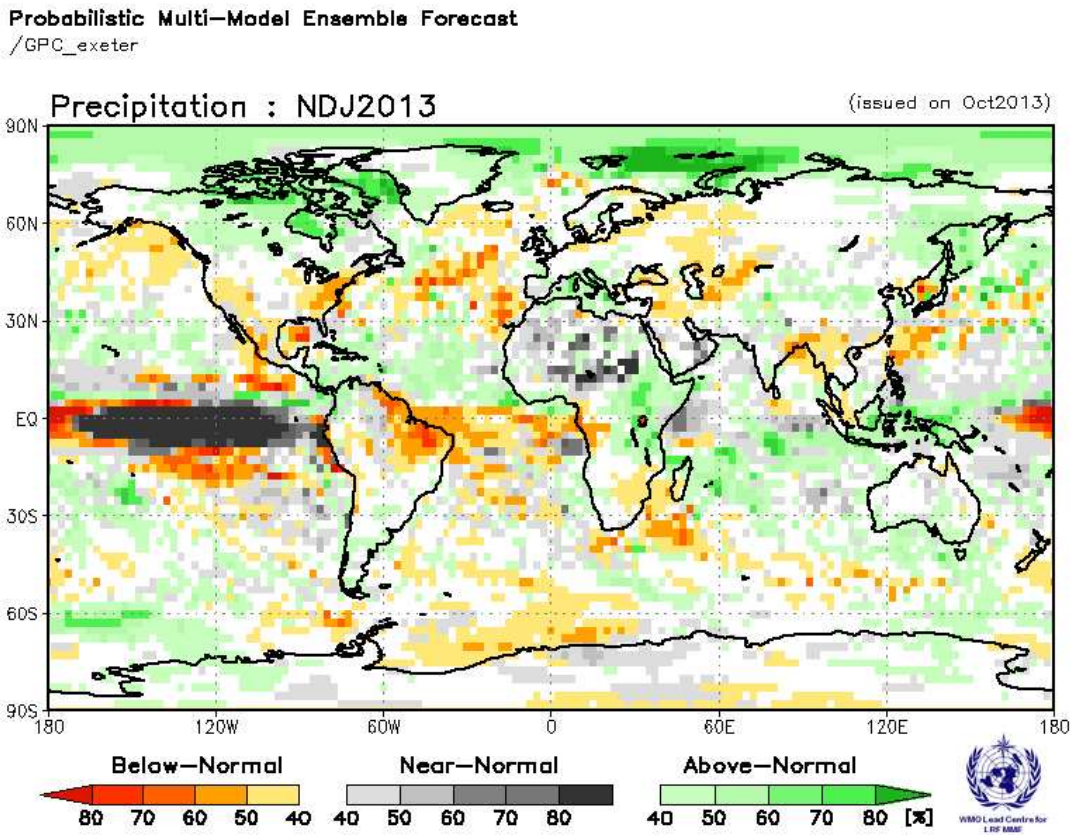


fig.30: Most likely category of T2m Anomaly from UK Met Office. https://www.wmolc.org/

II.4.dClimate Prediction Centre (CPC)

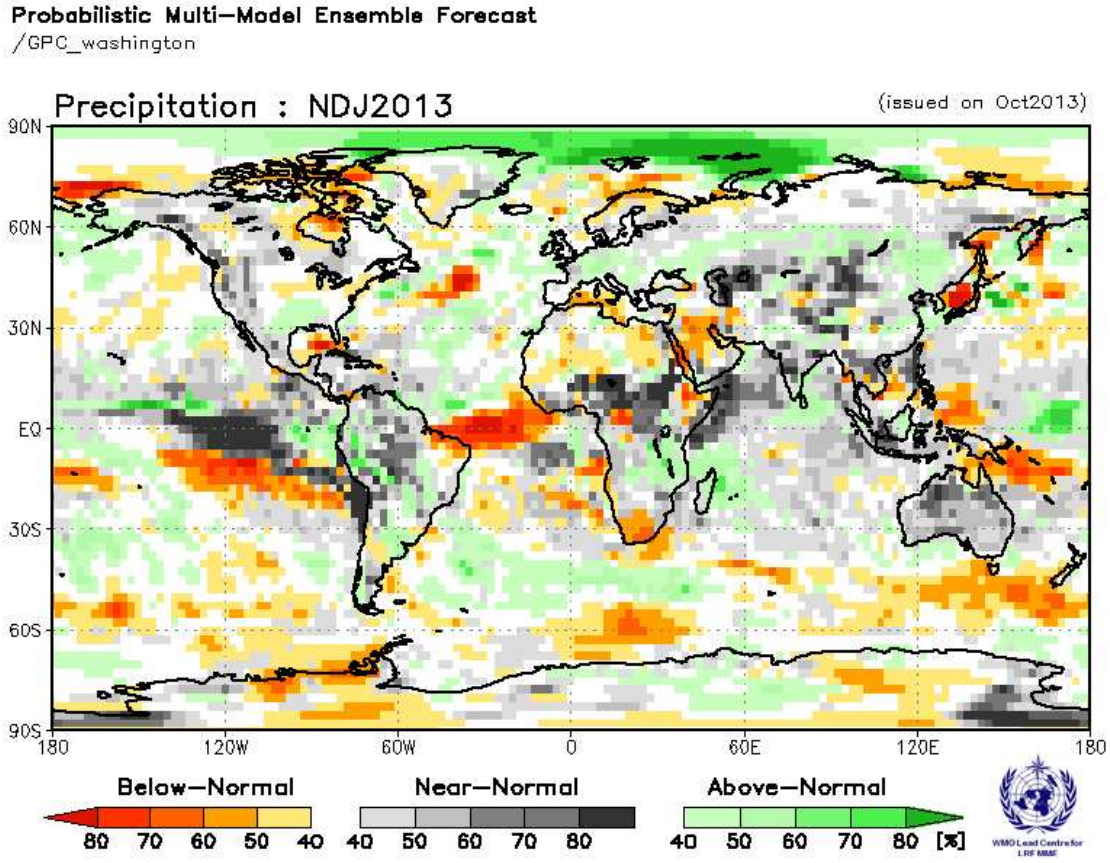


fig.31: Most likely category of Rainfall from CPC. https://www.wmolc.org/

II.4.e Japan Meteorological Agency (JMA)

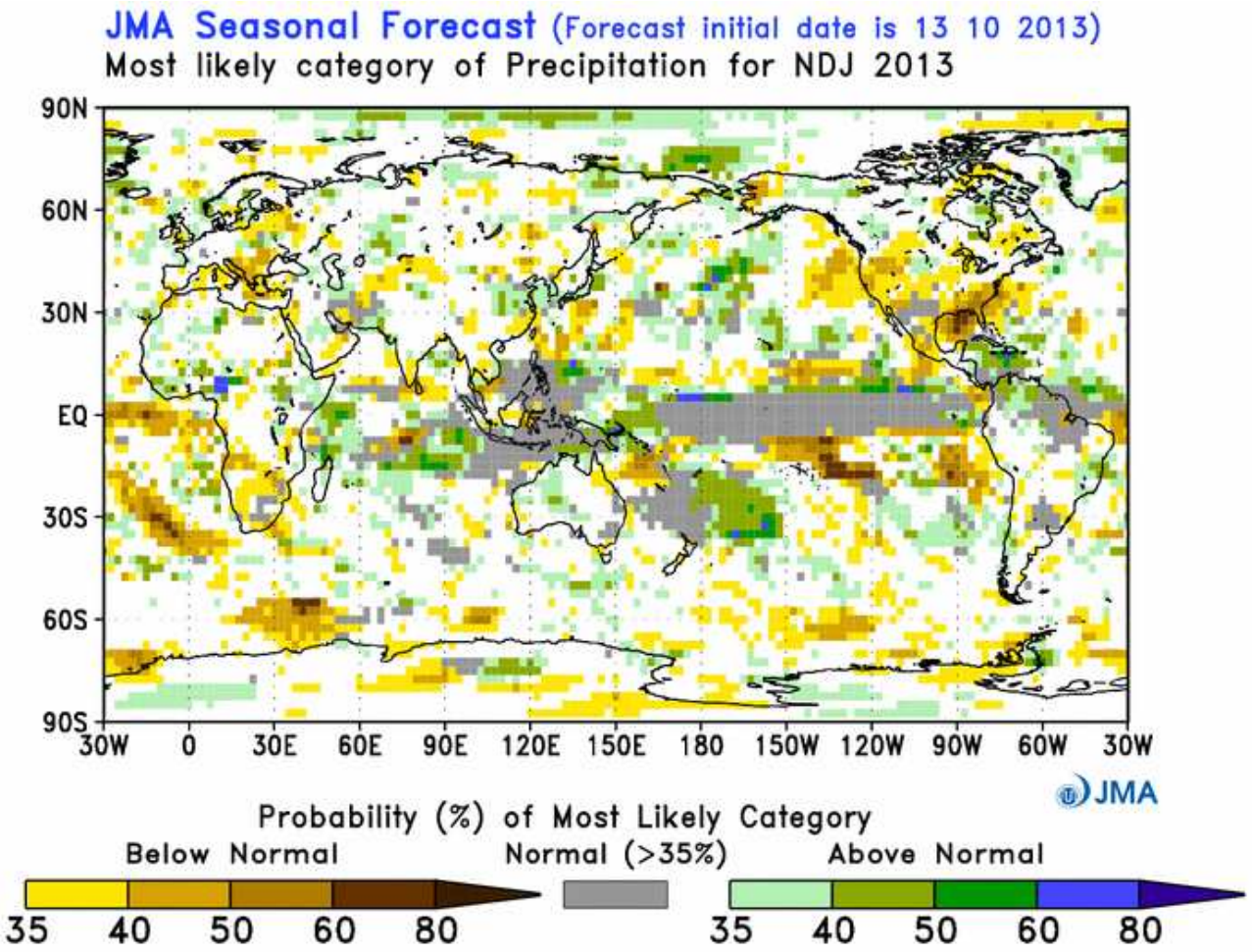


fig.32: Most likely category of Rainfall for OND, issued in September from JMA. Categories are Above, Below and Close to Normal. White zones correspond to No Signal. http://ds.data.jma.go.jp/tcc/tcc/products/model/

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

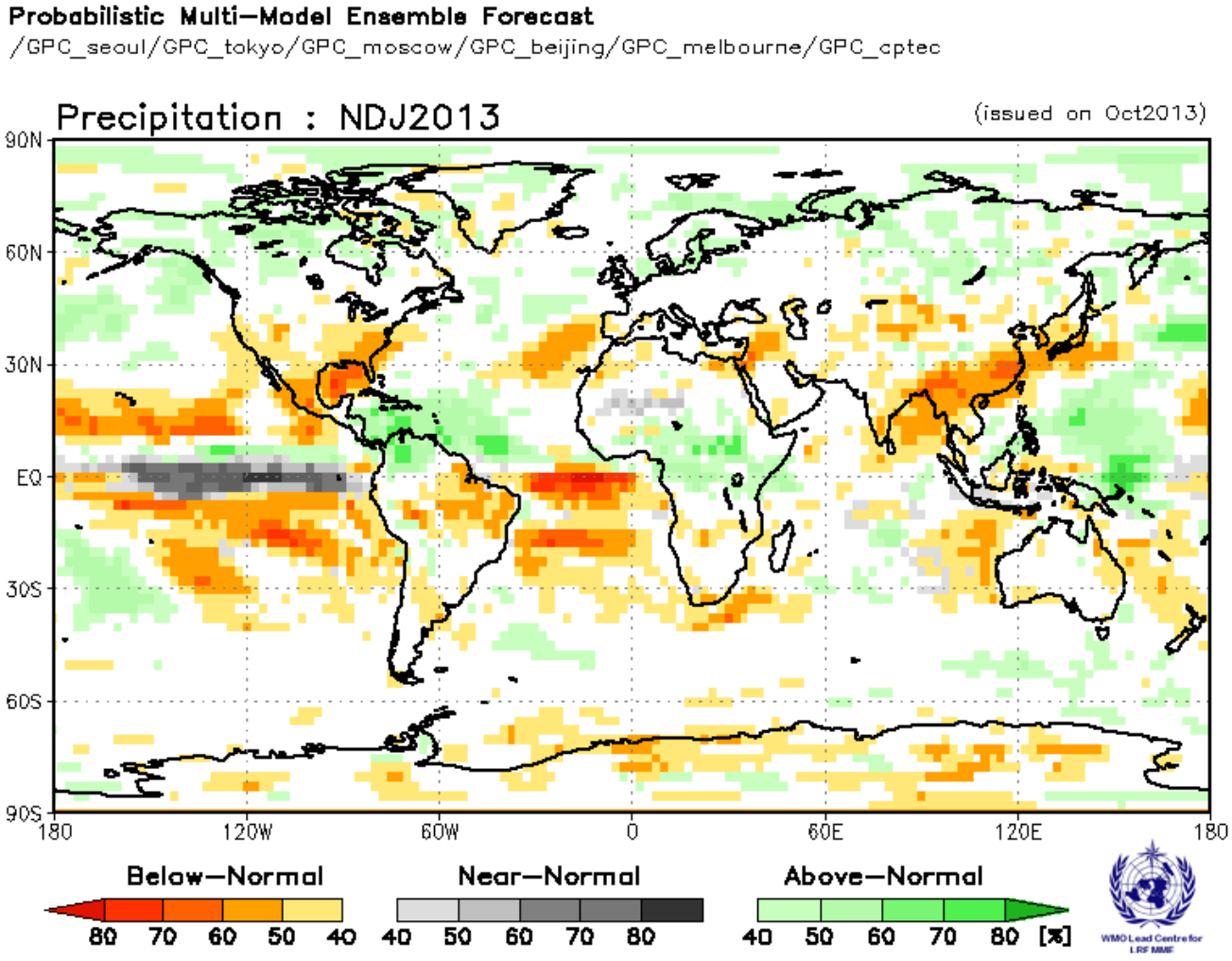


fig.33: **MME most likely category of Rainfall from LC-MME. The MME composition corresponds to the GPCs not used in EuroSIP. https://www.wmolc.org/**

II.4.g Euro-SIP

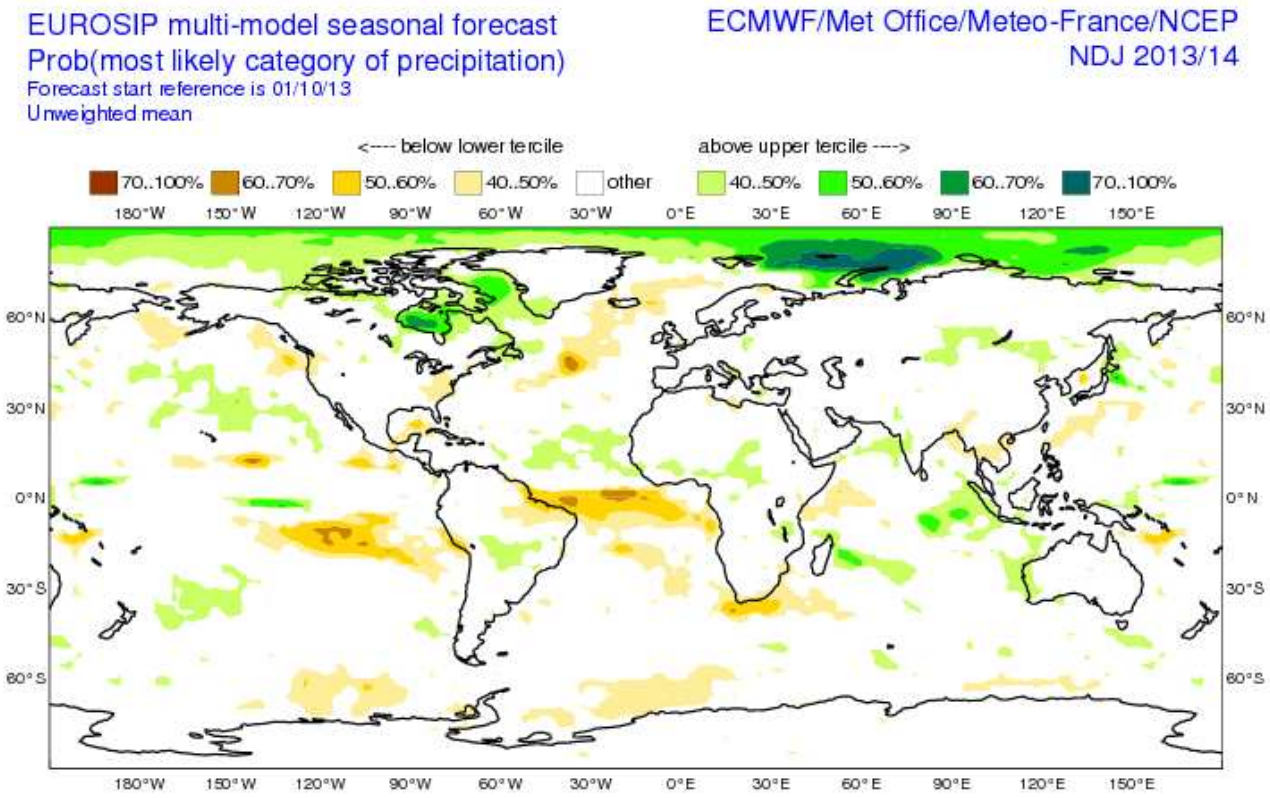


fig.34: Multi-Model Probabilistic forecasts for precipitation from EuroSip for OND, issued in September. (2 Categories, Below and Above normal – White zones correspond to No signal).

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

In the Tropics : A very few consistent signals ; slightly enhanced probabilities for wet scenarios across West Africa and close to Eastern Maritime continent. Slightly enhanced probabilities for dry scenarios over North-Eastern South America.

For Europe : No signal more or less everywhere (and more generally for most of the mid latitude of Northern Hemisphere, consistently with discussion on predictability and teleconnections).

II.5. REGIONAL TEMPERATURES

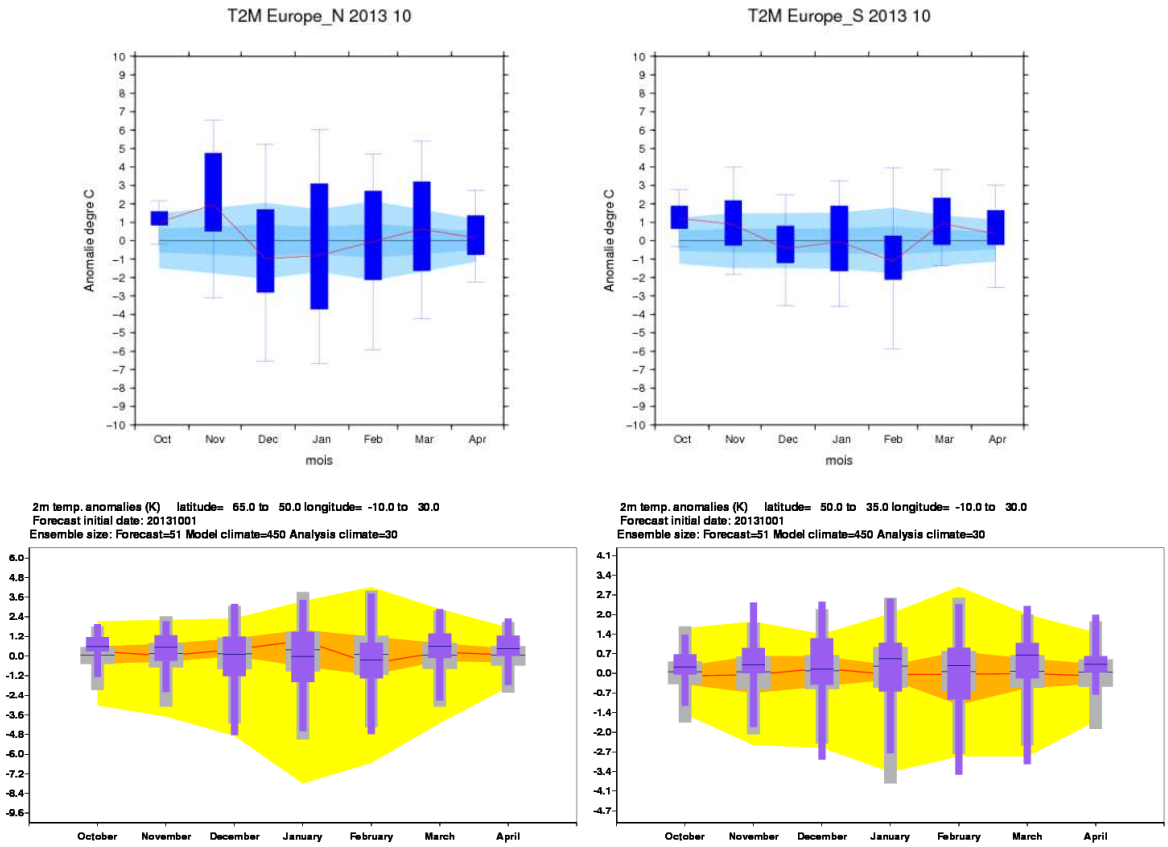


fig.35: Climagrams for T2m in Northern Europe (left) and in Southern Europe (right) from Météo-France (top) and ECMWF (bottom - idem).

For Northern Europe: Starting with Above normal conditions, ECMWF return close to normal in December and then Below Normal while MF evolve toward Below normal conditions since December. Note the large spread (with respect of the climate reference) in both models (especially MF which is very large).

For Southern Europe: starting with Above normal conditions, ECMWF remains in such a scenario in January while MF evolve toward close to normal conditions. The spread is very large in both models.

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

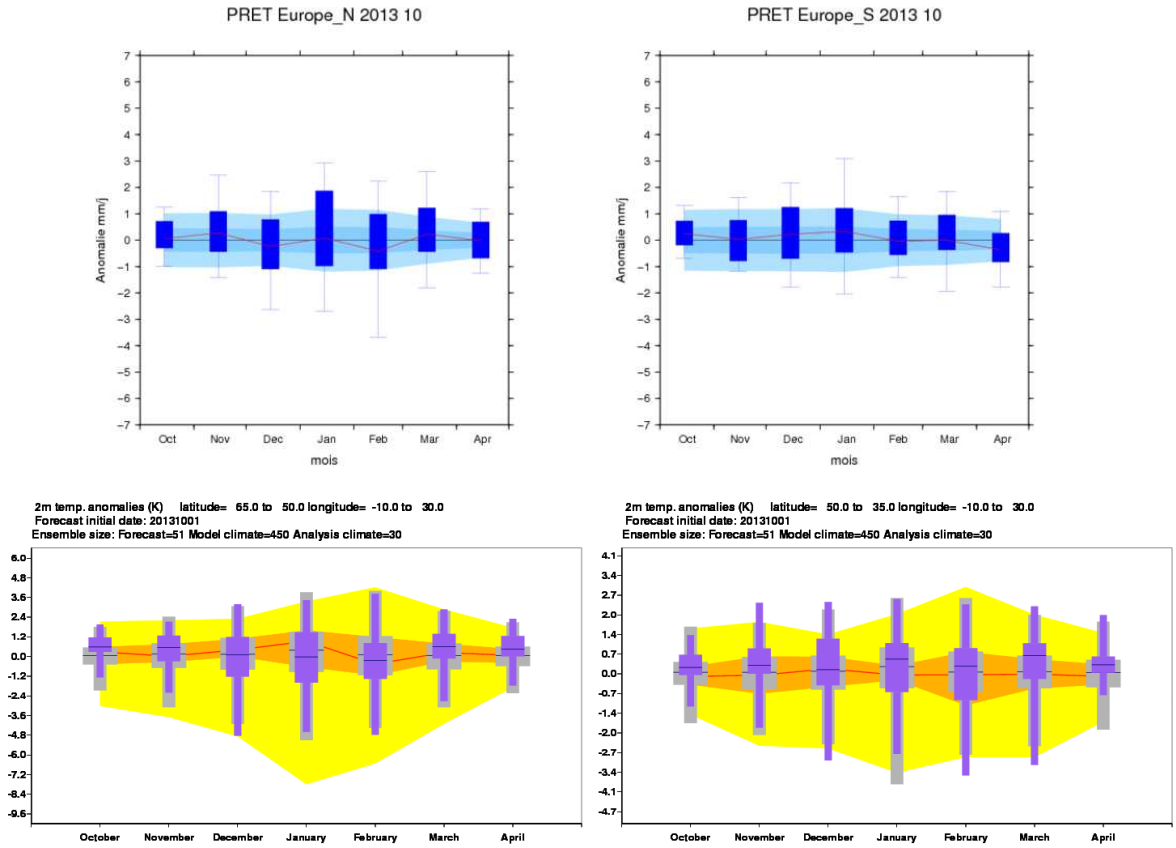


fig.36: Climagrams for Rainfall in Northern Europe (left) and in Southern Europe (right) from Météo-France (top) and ECMWF (bottom - idem).

Only little consistency between the 2 models.

For Northern Europe : Above than normal in November and then on average close to normal conditions in both models over NDJ. The spread is very large.

For Southern Europe : Some consistency for Above normal conditions (despite located at different months). The spread is very large.

Adding the low predictability and model uncertainties considerations, these intraseasonal evolutions should be considered with caution.

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

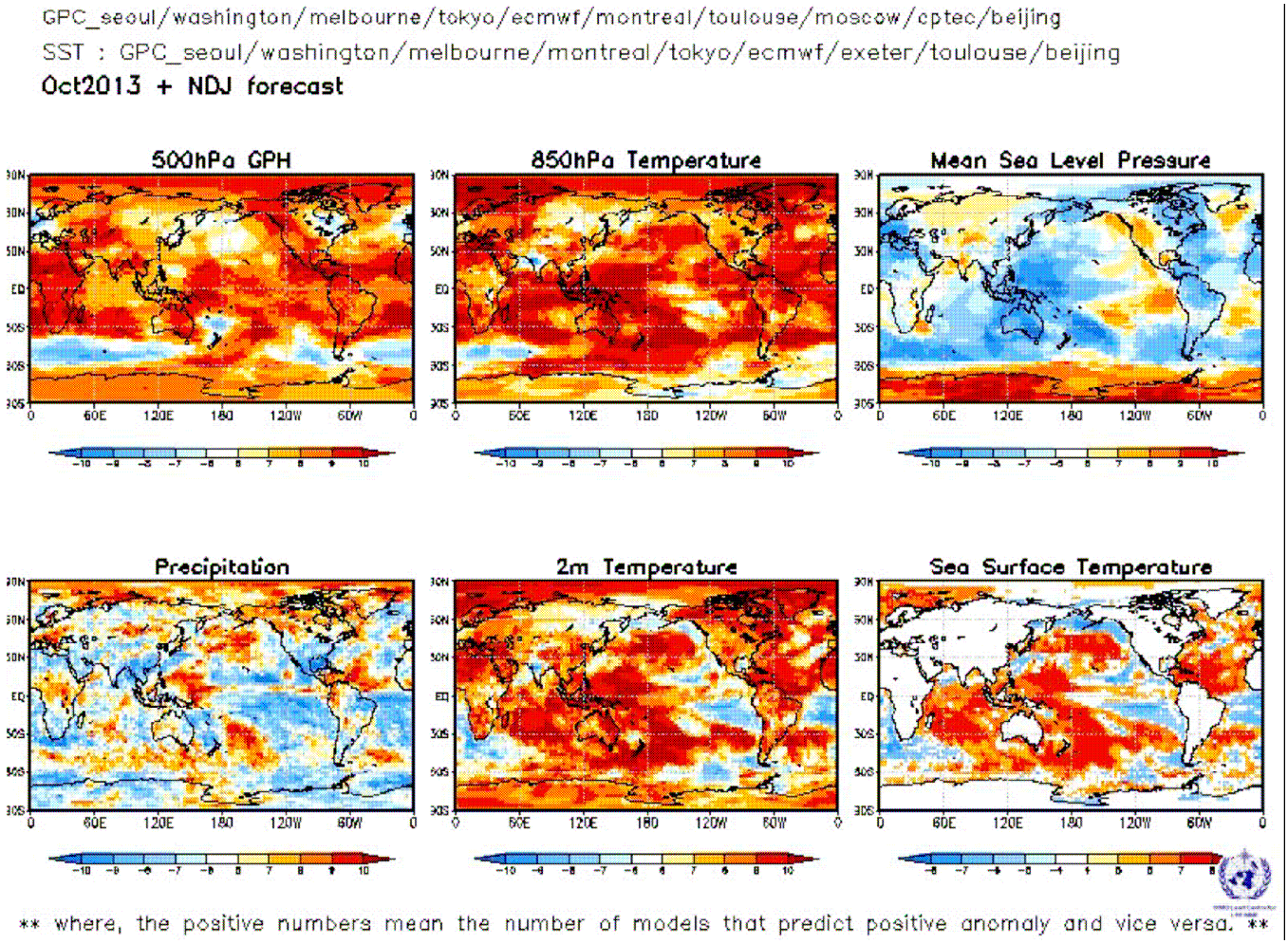


fig.37: ***GPCs Consistency maps from LC-MME*** *http://www.wmolc.org/*

For SST : Very consistent signal (warmer than normal) in the warm pool and along the SCPZ regions, in the Eastern part and South Sub-Tropics of the Indian Ocean and in the North Tropical Atlantic.

For Z500 : Mostly Above normal consistent signal in the Northern hemisphere and especially over Polar regions, over most of Africa, over part of Eastern European regions and over the North American continent. Also consistent signal over Australia (warmer than normal)

For T2m : Consistent signal (warmer than normal) over Africa North to the equator and in South Africa, Eastern European regions, the South Indian Ocean Sub-Tropics, part of South-East Asia, the maritime continent and Australia, a large portion of the North American continent, The Caribbean and North-East South America,

For precipitation : Some consistent signal : Wetter than normal over the warm pool, South-East European regions, East Africa, the Caribbean (Southern part) ; Drier than normal over South-East Asia, regions in the vicinity of Gulf of Mexico and North-East of South America.

II.7. "EXTREME" SCENARIOS

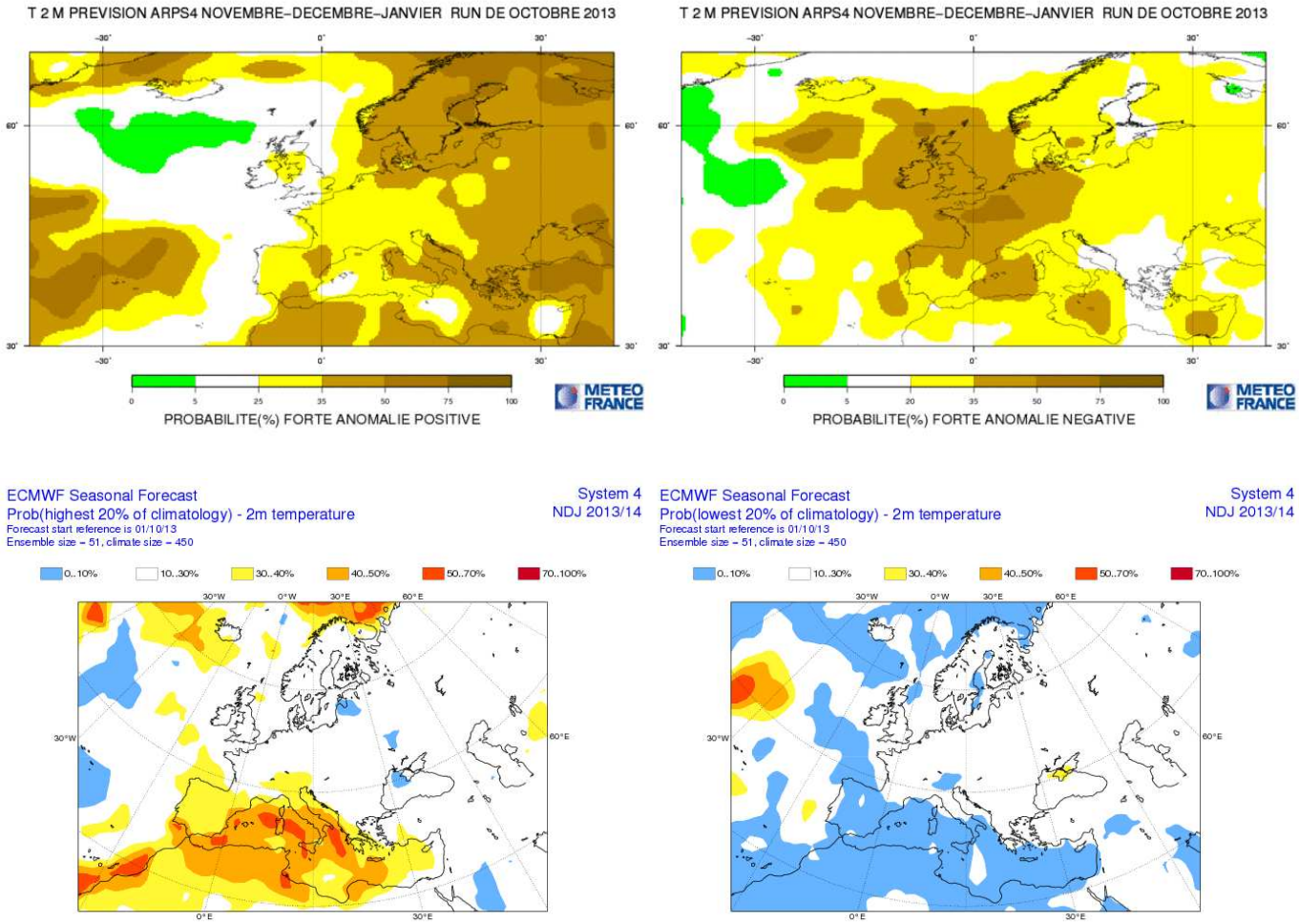


fig.38: Top : Probability of « extreme » above normal conditions from T2m for Meteo-France (left - highest ~15% of the distribution and right lowest ~15% of the distribution)
Bottom : idem from ECMWF (left - highest 20% of the distribution and right lowest 20% of the distribution).

To be noted the divergent scenarios proposed by MF (enhanced probabilities for both categories)
Some consistency between the 2 models for the Very Above normal scenario in the vicinity of the Mediterranean basin.
No consistency for Very Below Normal scenario which is consistent with the differences in the geopotential heigh analysis. 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.

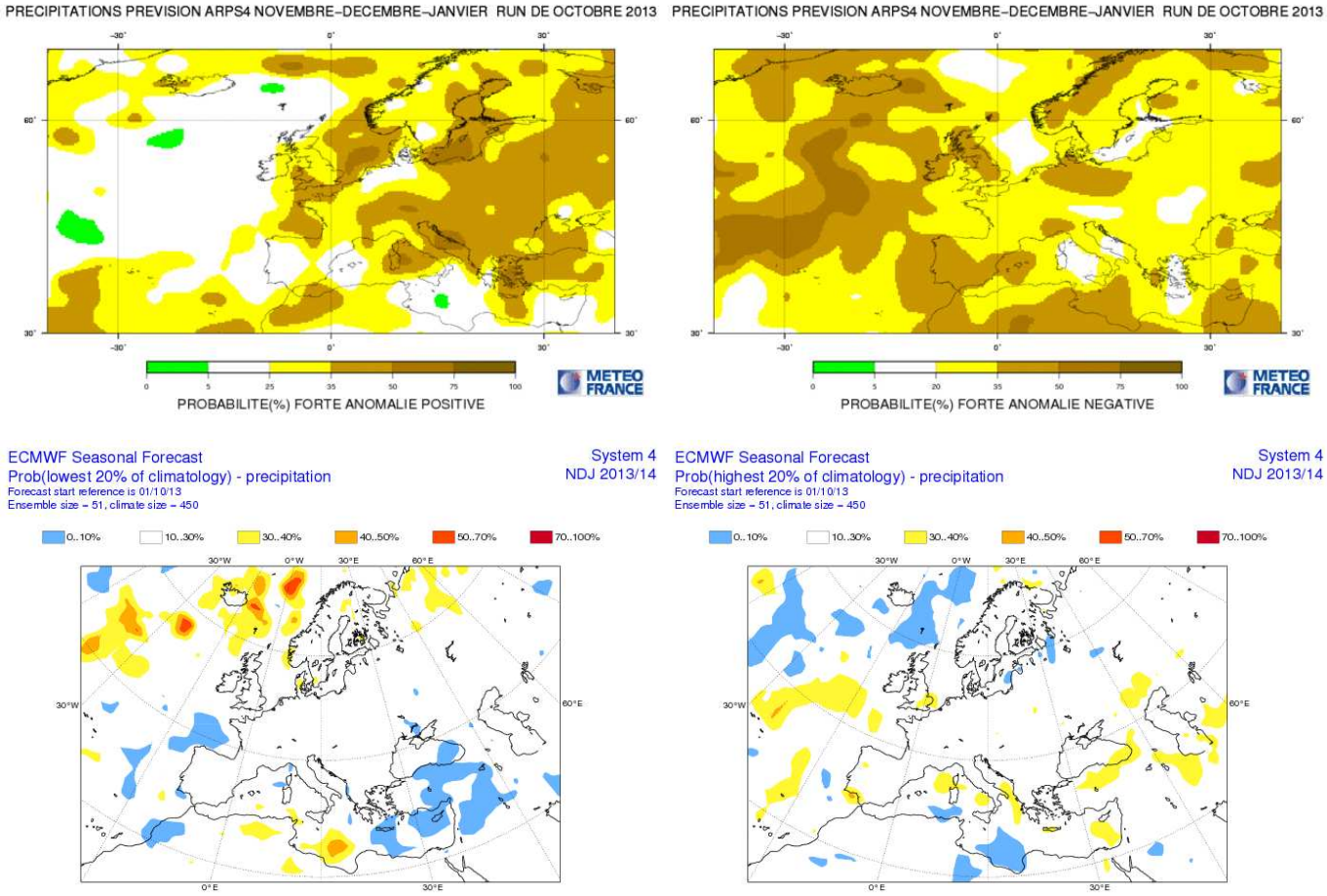


fig.39: Top : Probability of « extreme » above normal conditions for rainfall from Meteo-France (left - highest ~15% of the distribution and right lowest ~15% of the distribution)
Bottom : idem from ECMWF (left - highest 20% of the distribution and right lowest 20% of the distribution).).

Mostly No signal in ECMWF while there are traces of divergent scenarios in MF (strong enhanced probabilities for one category and some slight enhanced probabilities for the other extreme scenario).
So in relationship with the current predictability and the model uncertainties, it seems difficult to use these forecasts.
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 major comment is about the current predictability in the climate system. The oceanic forcing remains quite low to the exception of the vicinity of the warm pool. The current predictability seems to be limited even for tropical regions. No teleconnection patterns on the North Atlantic seem to be very active and the ECMWF and MF differences could likely be interpreted in terms of model uncertainty related to the current low predictability at seasonal scales. So in such a context, the EuroSIP forecasts are likely a good synthesis of possible scenarios across the planet and more specifically over European regions. **For rainfall, "No Privileged Scenario"** covers most of the European continent. **For temperature** : despite the weak predictability the **Above normal** scenario could be privileged for **the most Eastern Europe** (slightly enhanced probabilities) and especially **South-East Europe**. For the Western façade, there is No Privileged scenario.
Obviously, some downscaled information could detail these scenarios for specific countries or sub-regions.

Tropical Cyclone activity

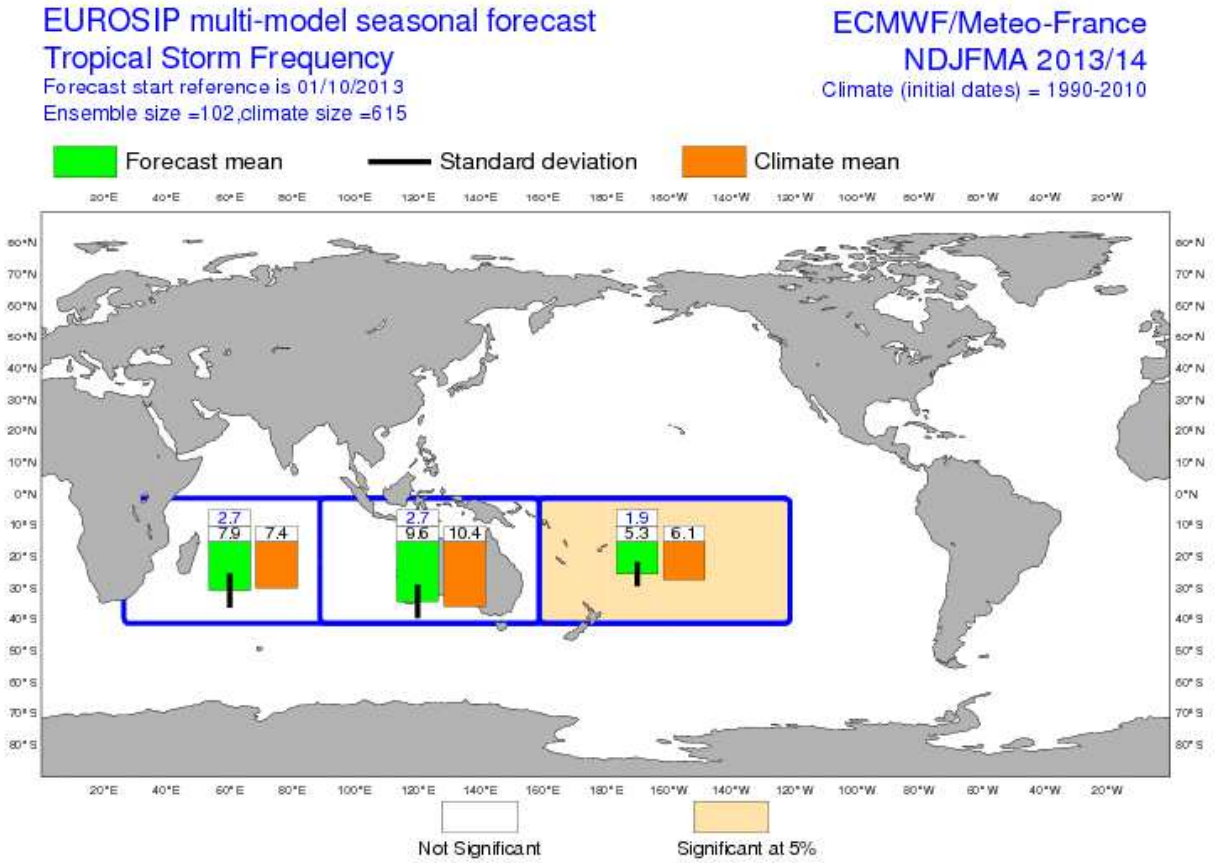


fig.40: Seasonal forecast of the frequency of Tropical Cyclones from EUROSIP (Météo-France & ECMWF).
http://www.ecmwf.int/products/forecasts/d/charts/seasonal/forecast/eurosip/mmtrop/trop_euro/eurosip_tropical_storm_frequency/

For the Tropical Cyclone season and in relationship with the SSTs scenarios, Euro-Sip forecasts indicate weakened Topical Cyclone activity over the South Western Pacific, and close to normal condition elsewhere.

WMO RA VI
Pilot RCC-Network

Synthesis of Temperature forecasts for November-December-January 2013-2014 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*	*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 November-December-January 2013-2014 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

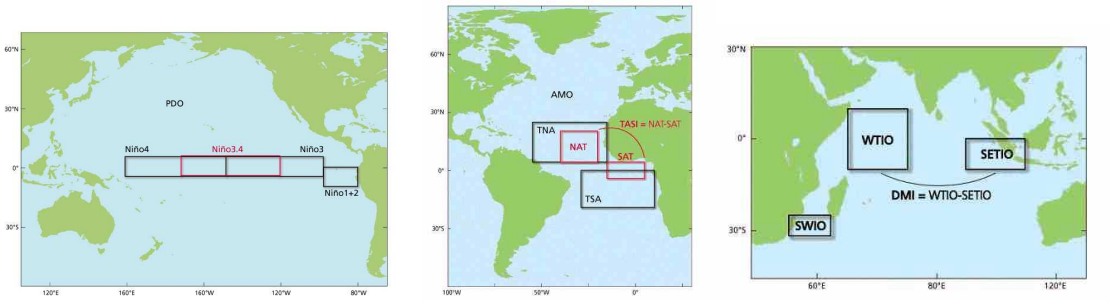
El Niño and La Niña events primarily affect tropical regions and are monitored by following the SST evolution in specific area of the equatorial Pacific.

- 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.