GLOBAL CLIMATE BULLETIN
n°174 - DECEMBER 2013

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I. DESCRIPTION OF THE CLIMATE SYSTEM (OCTOBER 2013)

I.1. OCEANIC ANALYSIS

I.1.a Global Analysis

At the Surface (fig. 1) :

Still little evolutions in the equatorial regions. In the tropics, cooling north to the Maritime Continent.

In the mid latitudes of the Northern hemisphere mostly cooling across the Pacific and warming across the Atlantic.

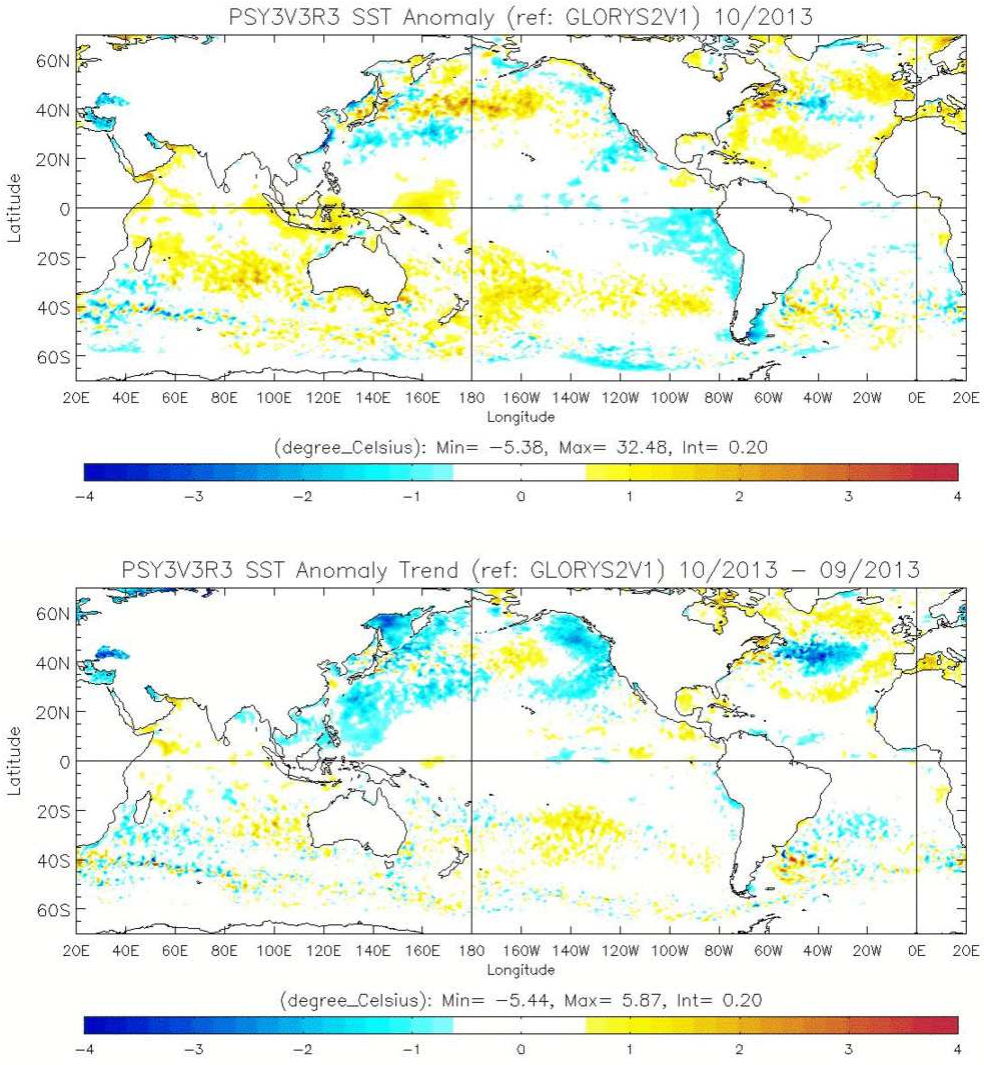


fig.1: top : SSTs Anomalies (°C) (reference Glorys 1993-2009); bottom : SST tendency (current – previous month) http://bcg.mercator-ocean.fr/

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 above the warm pool. 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 part (Northern and Southern tropics).
In the Indian Ocean : In the equatorial waveguide signal consistent with SSTs in the Southern Hemisphere West to Australia and in the vicinity of the maritime continent.

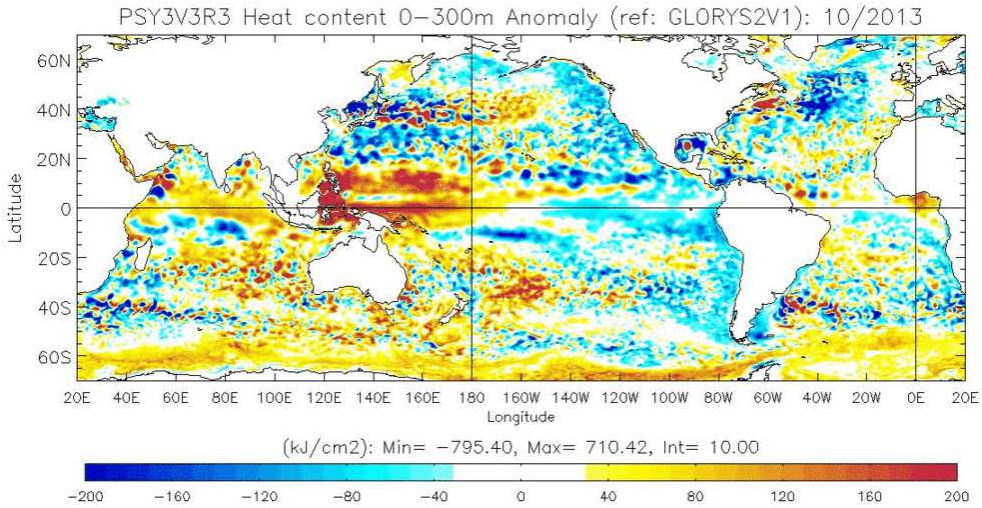


fig.2: map of Heat Content Anomalies (first 300m) (in kJ/cm²). (reference Glorys 1992-2009)
http://bcg.mercator-ocean.fr/

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

Still a dipole between the Western and Eastern part of the basin. Note the strengthening of the warm pool positive anomaly, and consequently the trade wind anomalies in the western part of the basin.

In the Niño boxes (4, 3.4, 3 et 1+2 ; see definition in Annex) the monthly averages are respectively -0.3°C, 0°C, -0.2°C to -0.6°C from West to East. In the Eastern equatorial Pacific, cool anomaly is likely due to cold advection from tropics.

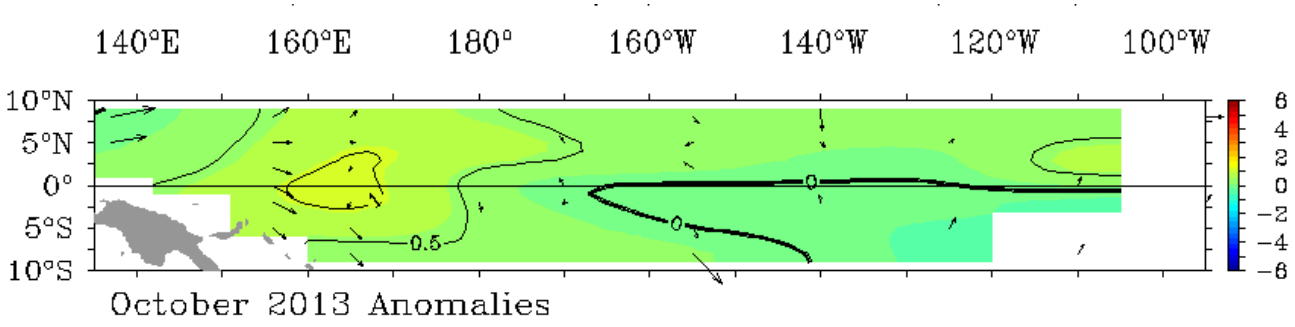


fig.3: SST and Wind anomalies over the Equatorial Pacific from TAO/TRITON. http://www.pmel.noaa.gov/tao/jsdisplay/monthly-summary/monthly-summary.html

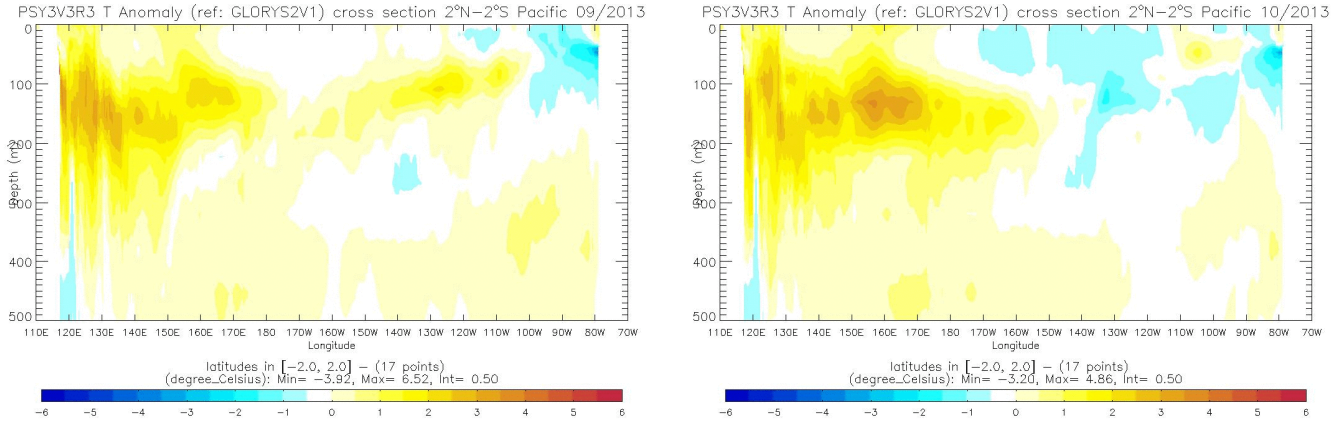


fig.4: Oceanic temperature anomaly in the first *500 metres* in the Equatorial Pacific, in previous month (left) and current month (right) http://bcg.mercator-ocean.fr/

In the equatorial waveguide (fig. 4 and 5) : still traces of propagation of Kelvin waves under the surface (fig..5). The warm reservoir is still strong in subsurface (Western part, around immersion 150m).

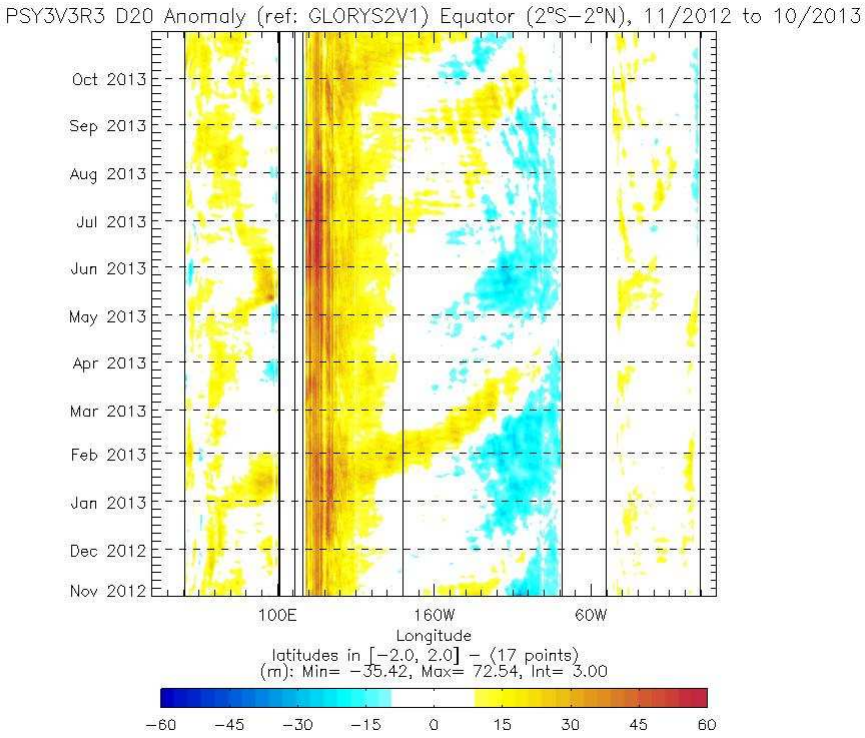


fig.5: Hovmüller diagram of Thermocline Depth Anomalies (m) (depth of the 20°C isotherm) along the equator for all oceanic basins over a 24 month period. http://bcg.mercator-ocean.fr/

I.1.c Atlantic Basin

Northern Tropical Atlantic : slightly warmer than normal and little evolutions.
Equatorial waveguide : weak signal, without wave propagation trace.
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, and between Australia and Madagascar. Close to normal elsewhere
Equatorial waveguide : weak dipole pattern, 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) : weak anomalies, monthly variability influenced by MJO activity.

2 distinct periods during this month :

- the first decade with active MJO over Western Pacific
- the 2 last decades with weak anomalies (MJO almost inactive)

Meaned over October, one can see the first decade structure in tropics.

On the Pacific : upward anomaly motion west to the Maritime Continent (related to the persistence of the SST forcing over warm pool).
On the Atlantic : Convergent circulation anomalies (downward anomaly motion) over the western equatorial Atlantic (close to Brazil). In the Northern hemisphere, to be quoted the positive anomaly extending over tropics.
On the Indian Ocean : Convergent circulation anomalies (downward anomaly motion) over most of the basin.

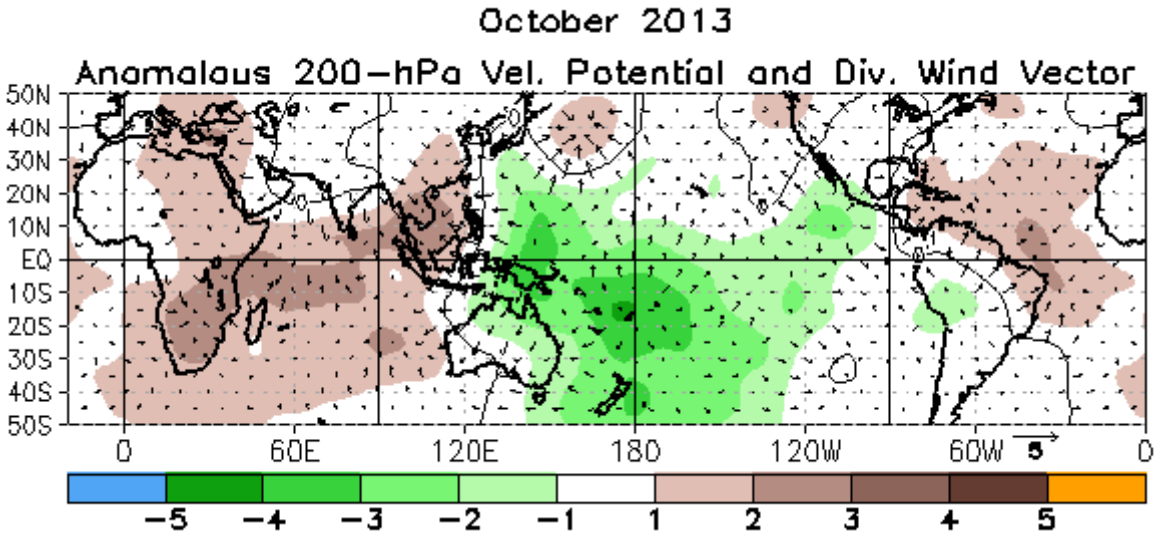


fig.6: Velocity Potential Anomalies at 200 hPa and associated divergent circulation. Green (brown) indicates a divergence-upward anomaly (convergence-downward anomaly).
http://www.cpc.ncep.noaa.gov/products/CDB/Tropics/figt24.shtml

Stream Function anomalies in the high troposphere (fig. 7 – insight into teleconnection patterns tropically forced) : on average weak signal in the intertropical band. Anomalies
likely related to Mid-Latitude activity and poorly influenced by the Tropics.

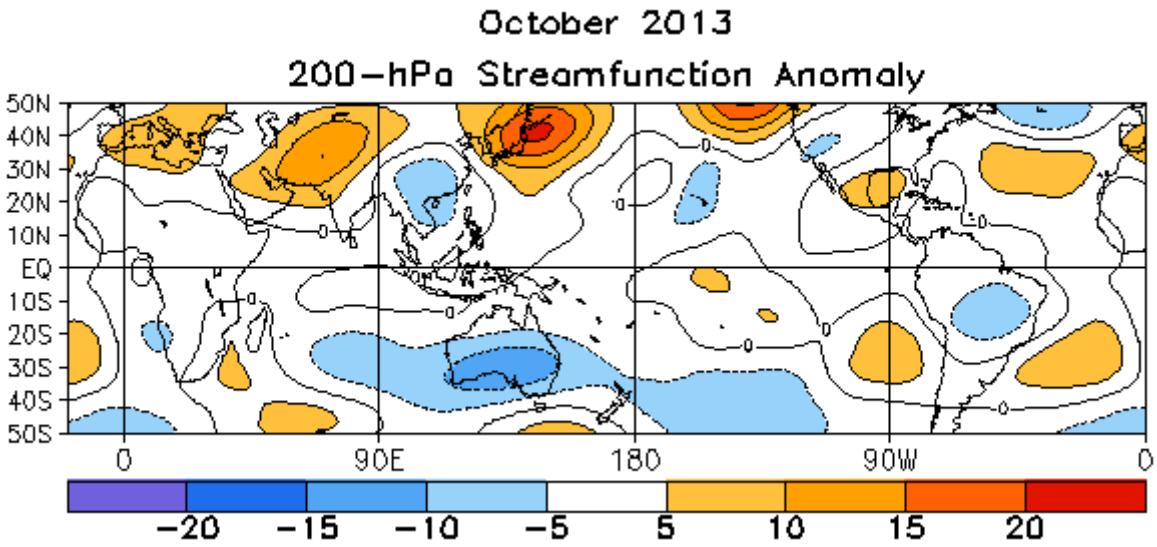


fig.7: Stream Function Anomalies at 200 hPa.
http://www.cpc.ncep.noaa.gov/products/CDB/Tropics/figt22.shtml

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 (East and West), across the Atlantic and Central Europe.
Only little activity in the atmospheric modes ; main active modes are found over the Pacific with East-North Pacific (1.0), and Atlantic with NAO (-0.9) and East Atlantic
(1.4).

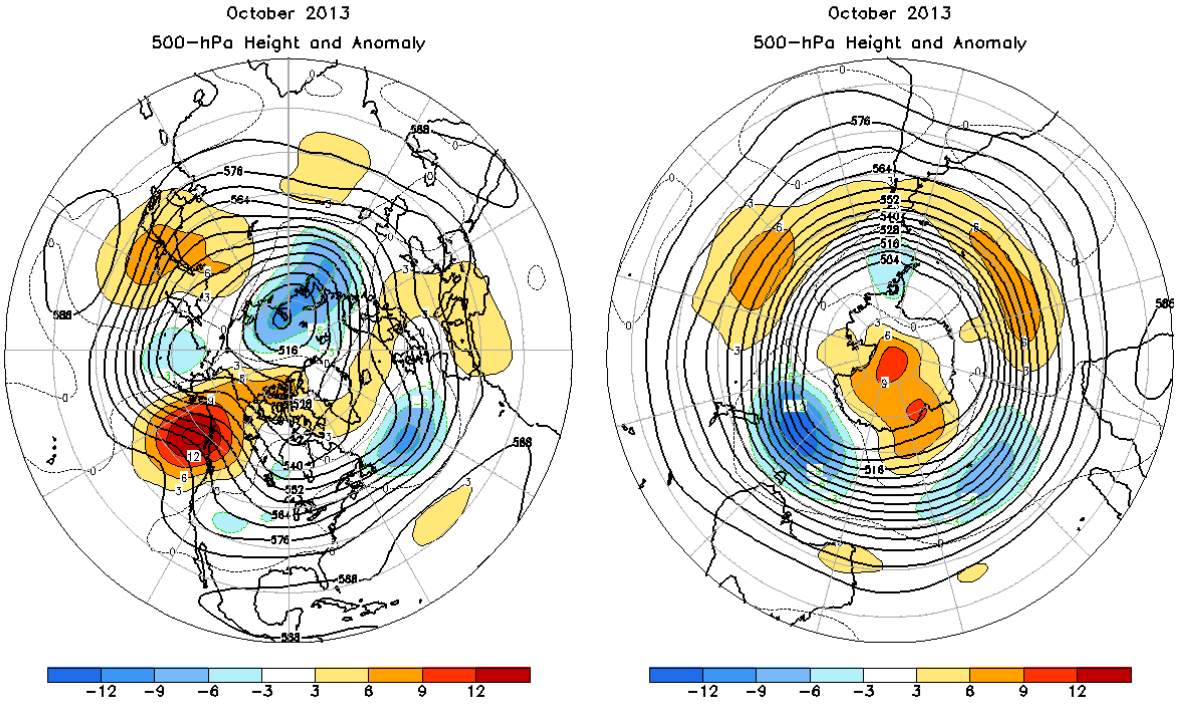


fig.8: Anomalies of Geopotential height at 500hPa (left North Hemisphere http://www.cpc.ncep.noaa.gov/products/CDB/Extratropics/fige9.shtml, and right South Hemisphere http://www.cpc.ncep.noaa.gov/products/CDB/Extratropics/fige15.shtml)

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
OCT 13	**-0.9**	**1.4**	**-0.1**	**1.0**	**-0.2**	---	**0.6**	**0.7**	**0.8**
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

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

I.2.b Precipitation

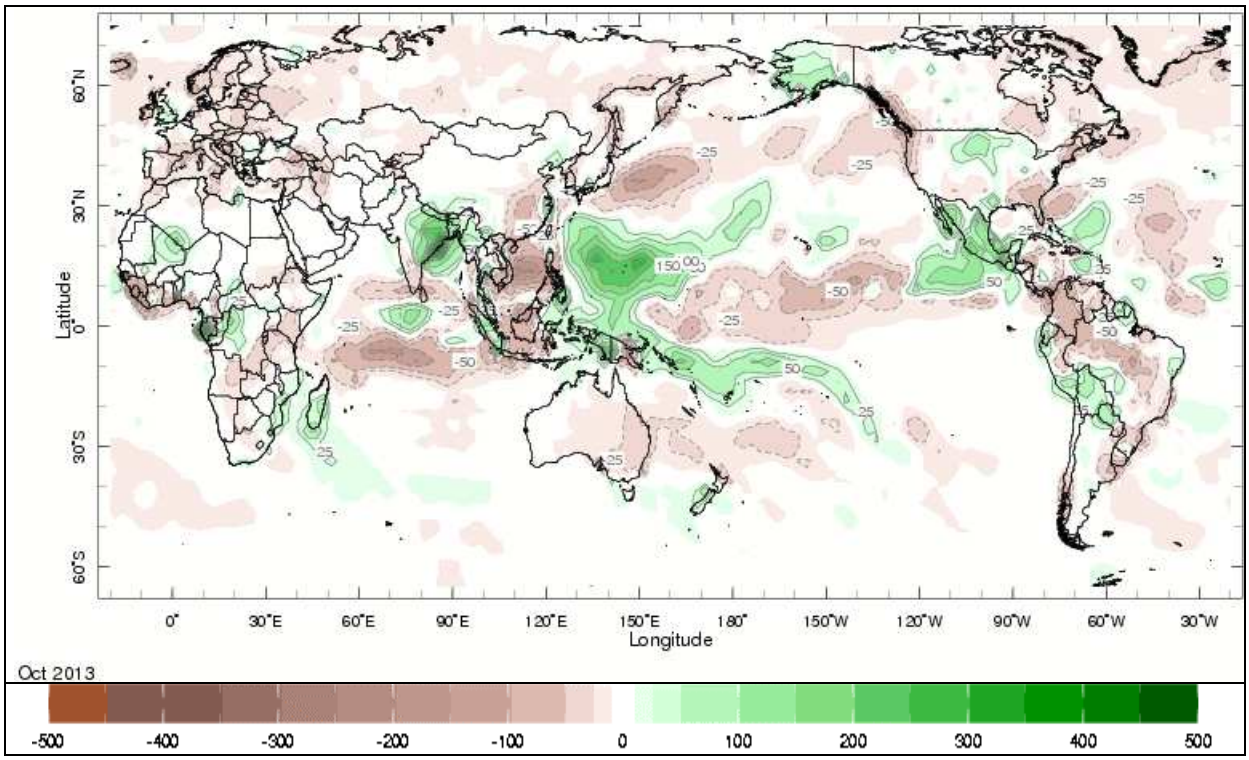


fig.9: Rainfall Anomalies (in mm) (departure to the 1979-2000 normal) – Green corresponds to above normal rainfall while brown indicates below normal rainfall.
http://iridl.ldeo.columbia.edu/maproom/.Global/.Precipitation/

Intertropical zones : good consistency with the Velocity Potential anomalies, especially over the Indian Ocean (globally -), western Pacific and SPCZ (+), Eastern Pacific (-). On the Eastern side of Pacific (close to Mexico), positive anomaly consistent with the small VP negative anomaly. Good consistency on northern South America, with the East-West contrast in precip and in velocity potential. (Between Brazil and Bolivia).

Mid-latitudes : mostly drier than normal over Europe and Eurasia.

I.2.cTemperature

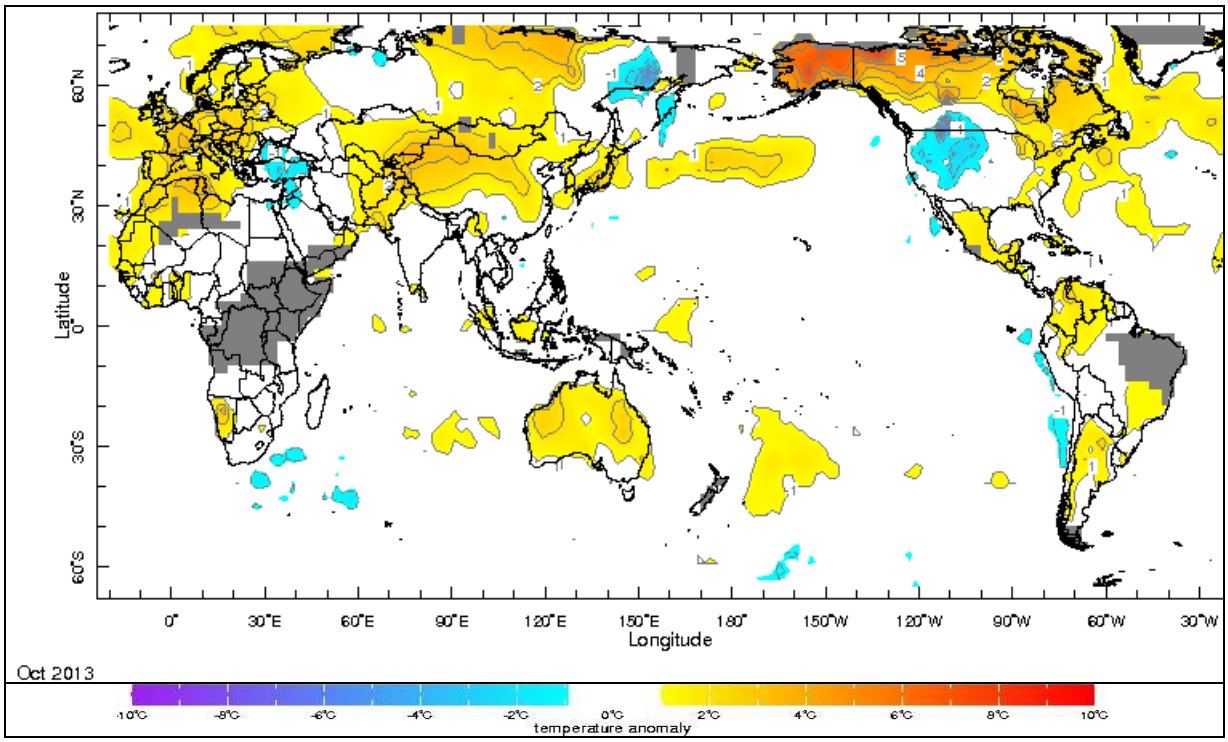


fig.10: Temperature Anomalies (in °C) (departure to the 1979-2000 normal)
http://iridl.ldeo.columbia.edu/maproom/.Global/.Atm_Temp/Anomaly.html

Strong warm anomalies over Alaska and East Canada : impact of Z500 anomaly described above.

Warmer than normal conditions overEurope (consistent with positive EA indice) and Eurasia. Weak negative anomaly over Middle-East countries.

Negative anomaly over North-Eastern US.

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.

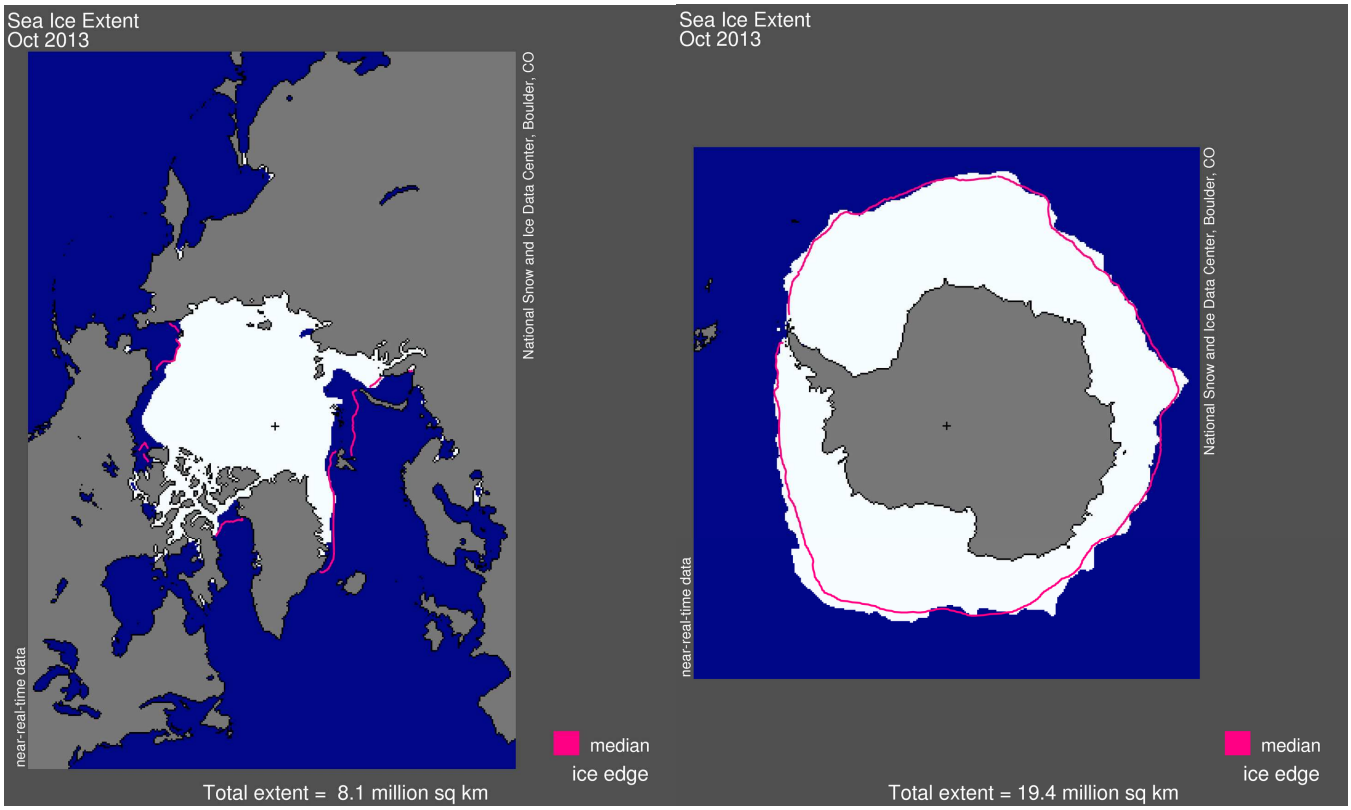


fig.11: Sea-Ice extension in Arctic (left), and in Antarctic (right). The pink line indicates the averaged extension (for the 1979-2000 period). http://nsidc.org/data/seaice_index/

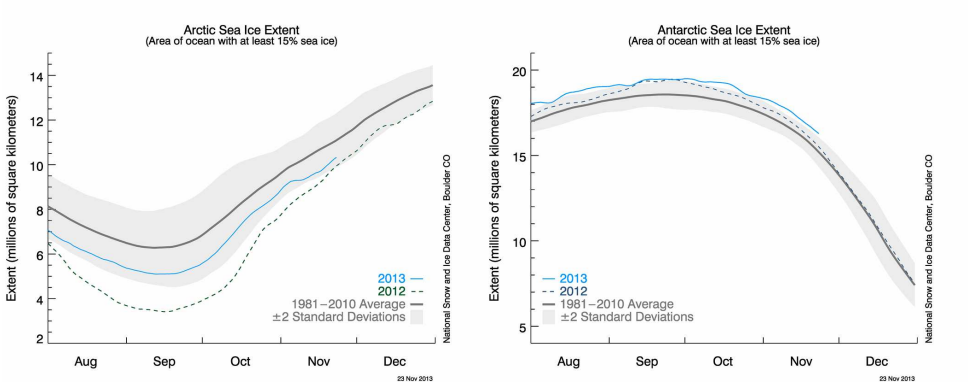


fig. 9bis : Sea-Ice extension evolution from NSIDC
http://nsidc.org/data/seaice_index/images/daily_images/N_stddev_timeseries.png

II.SEASONAL FORECASTS FOR DJF FROM DYNAMICAL MODELS

II.1. OCEANIC FORECASTS

II.1.a Sea Surface Température (SST)

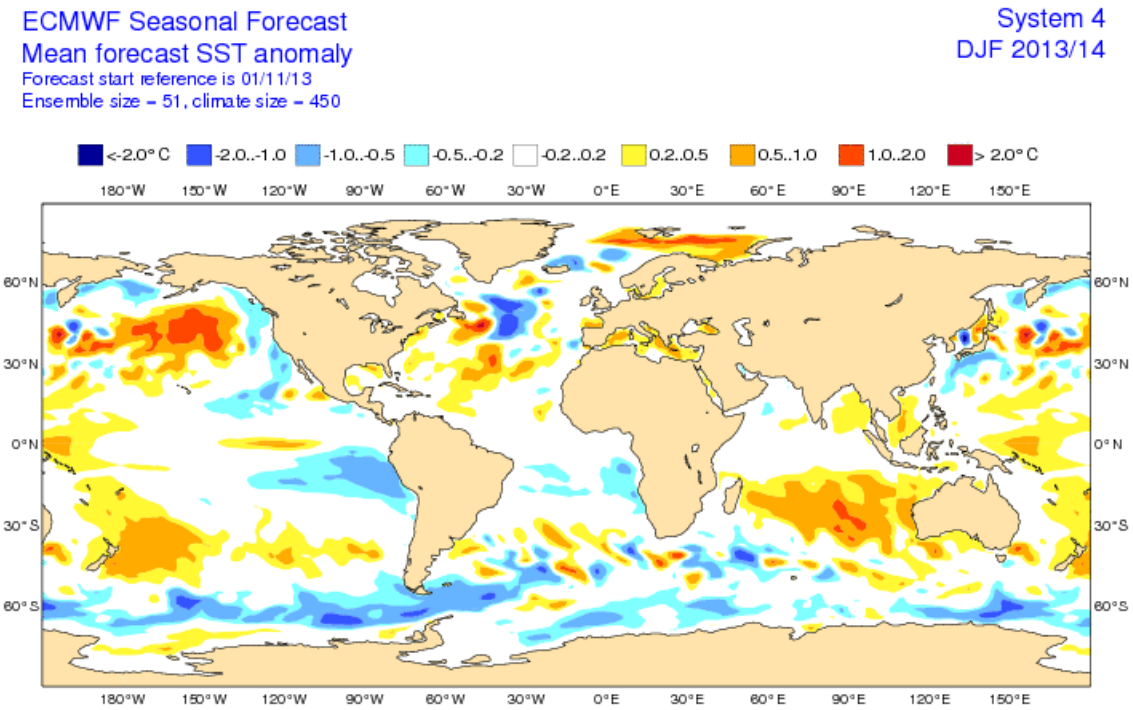


fig.12: SST anomaly forecast (in °C) from ECMWF.
http://www.ecmwf.int/products/forecasts/d/charts/seasonal/forecast/seasonal_range_forecast/group/

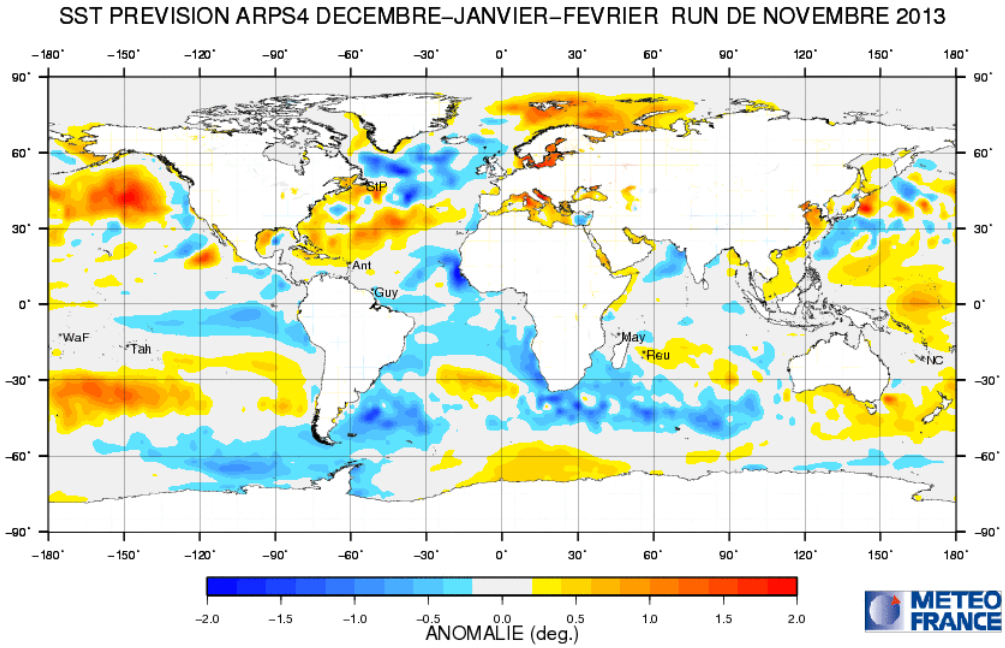


fig.13: SST Anomaly forecast (in°C - recalibrated with respect of observation) from Météo-France.
http://elaboration.seasonal.meteo.fr/

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 : Still positive anomaly over warm pool and SPCZ. Consistent signal in both models for continuing neutral anomalies over central equatorial waveguide. Still a negative anomaly in the most eastern part.
Atlantic : some differences in hte equatorial waveguide (MF colder than ECMWF). In both model great consistency for positive anomalies in the Northern hemisphere, from west (Carabean region) to East (west of Iberian peninsula).
Indian Ocean : consistent forecast in both models. IOD close to zero. Warmer than normal conditions in the Southern Sub-Tropics (persistent signal).

In Euro-SIP :
Some robust patterns appear in the tropics across the Pacific.
Pacific : The Western positive anomaly over equatorial waveguide region extends along the SPCZ. Quite consistent patterns in the subtropics and the mid-latitudes of both hemispheres.
Atlantic : Weak signal over the southern Tropics. 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 on the Southern Sub-Tropics.

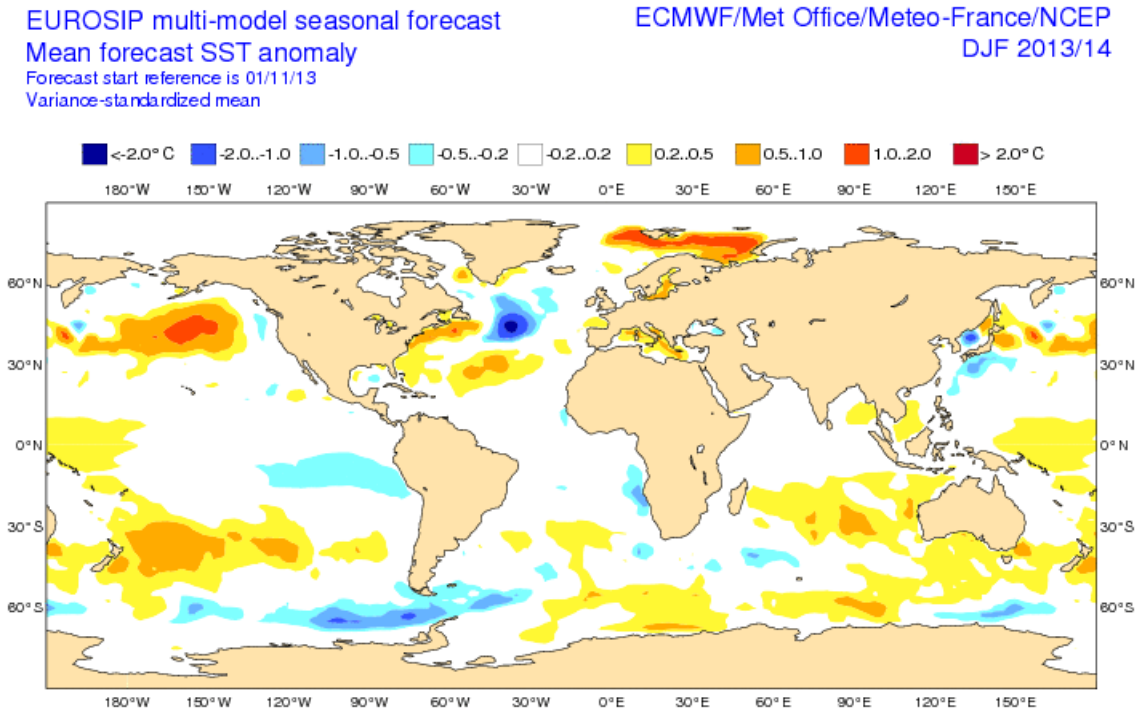


fig.14: Seasonal SST Forecasted anomaly (in °C) from Euro-SIP, issued in october.

II.1.b ENSO Forecast :

Forecasted Phase for DJF : neutral

For DJF : the majority of the dynamical models are in the range of neutral conditions for the targeted period (still quite large uncertainty).

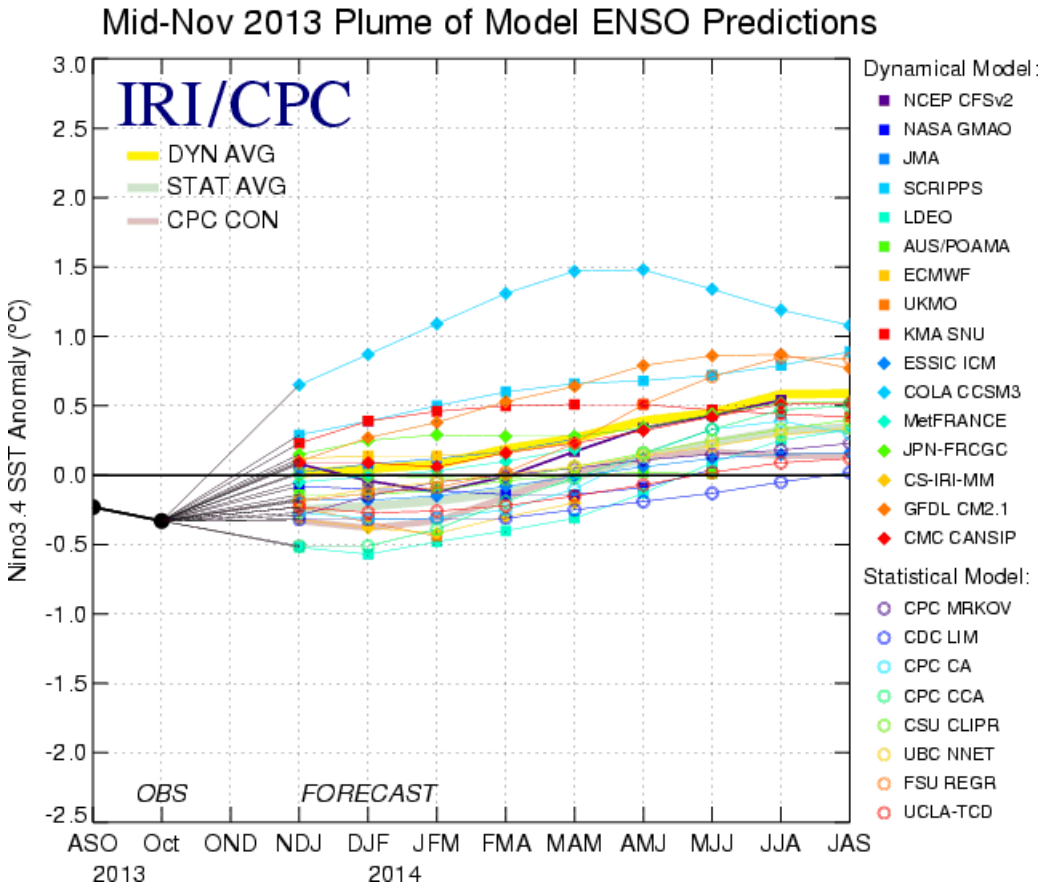


fig.15: Synthesis of Niño 3.4 forecasts (120° to 165°W) issued by IRI :
http://iri.columbia.edu/climate/ENSO/currentinfo/SST_table.html

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 DJF. In both models squite large uncertainty. In EuroSIP Plumes, close to normal conditions on average and quite large spread indicating a quite large uncertainty, but very few probabilities for non-neutral ENSO.

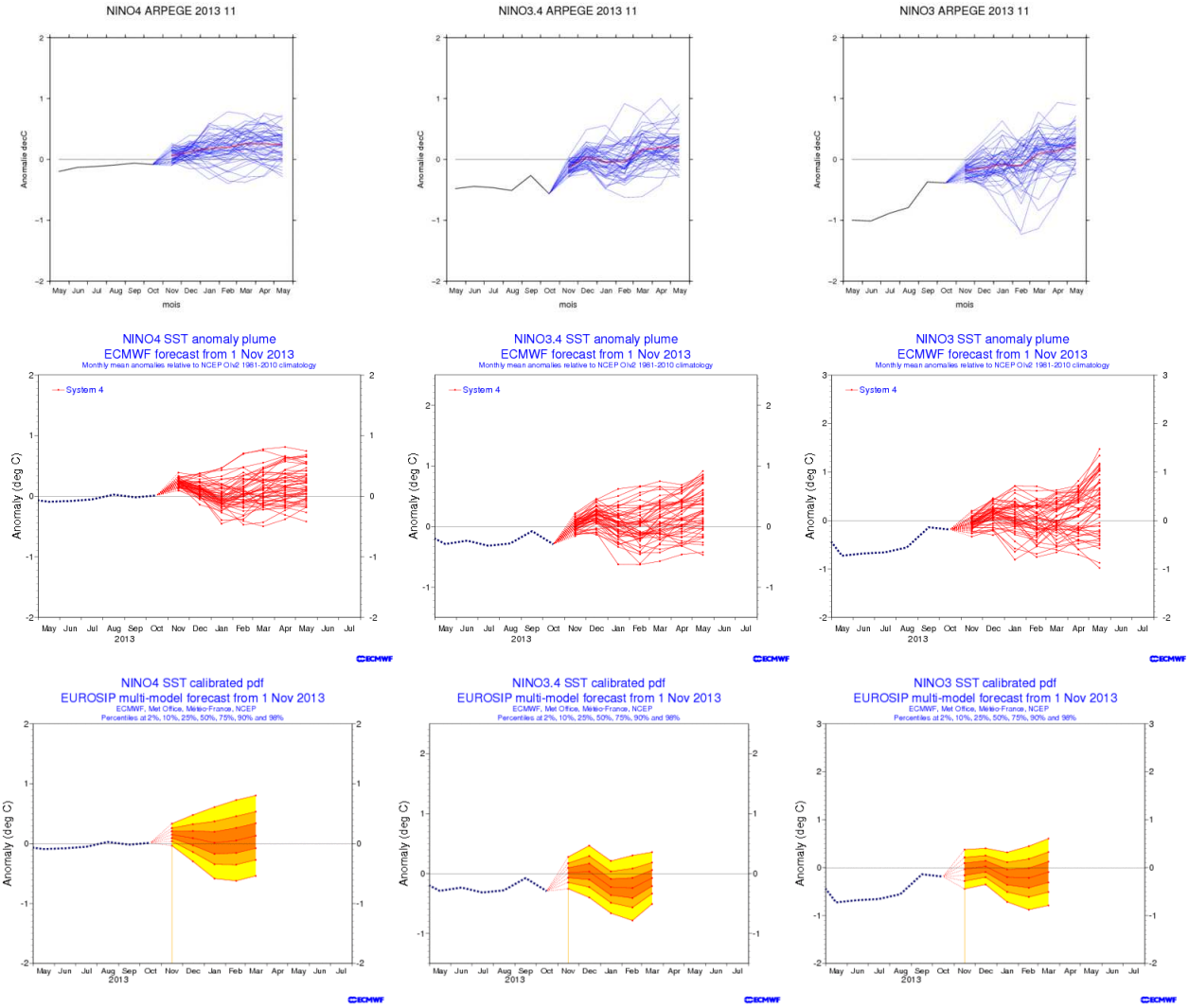


fig.16: SST anomaly forecasts in the Niño boxes from Météo-France (top) and ECMWF (middle) - monthly mean for individual members - and EuroSIP (bottom) – recalibrated distributions.
(http://www.ecmwf.int/)

II.1.c Atlantic Ocean forecasts :

Forecasted Phase: *Above Normal in the Northern Tropics*

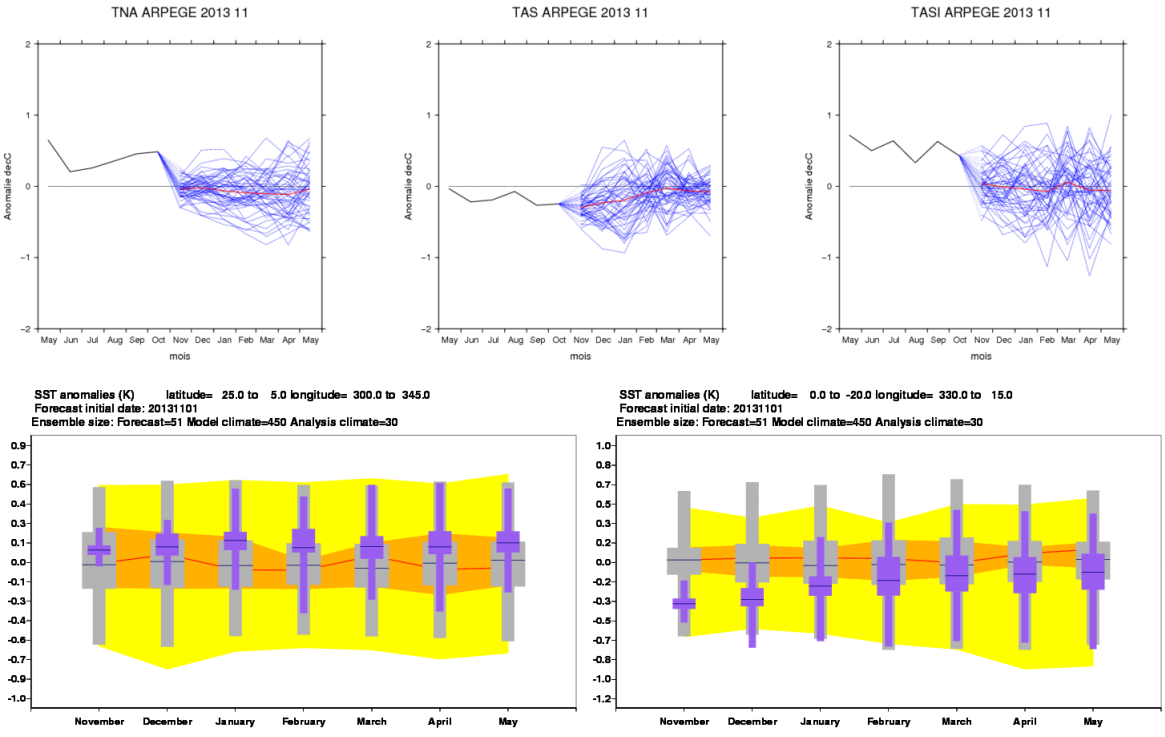


fig.17: SSTs anomaly forecasts in the Atlantic Ocean boxes from Météo-France (top) and ECMWF (bottom), plumes / climagrams correspond to 51 members and monthly means.

North Tropical Atlantic : warmer than normal conditions in ECMWF, close to normal in MF (but with a "warmer" hindcast).
South Tropical Atlantic : Colder than normal conditions in both models, with progressive warming.
TASI : the TASI index is close to neutral for DJF for MF. However the spread is large.

II.1.d Indian Ocean forecasts :

Forecasted Phase: *IOD progressively close to Normal*

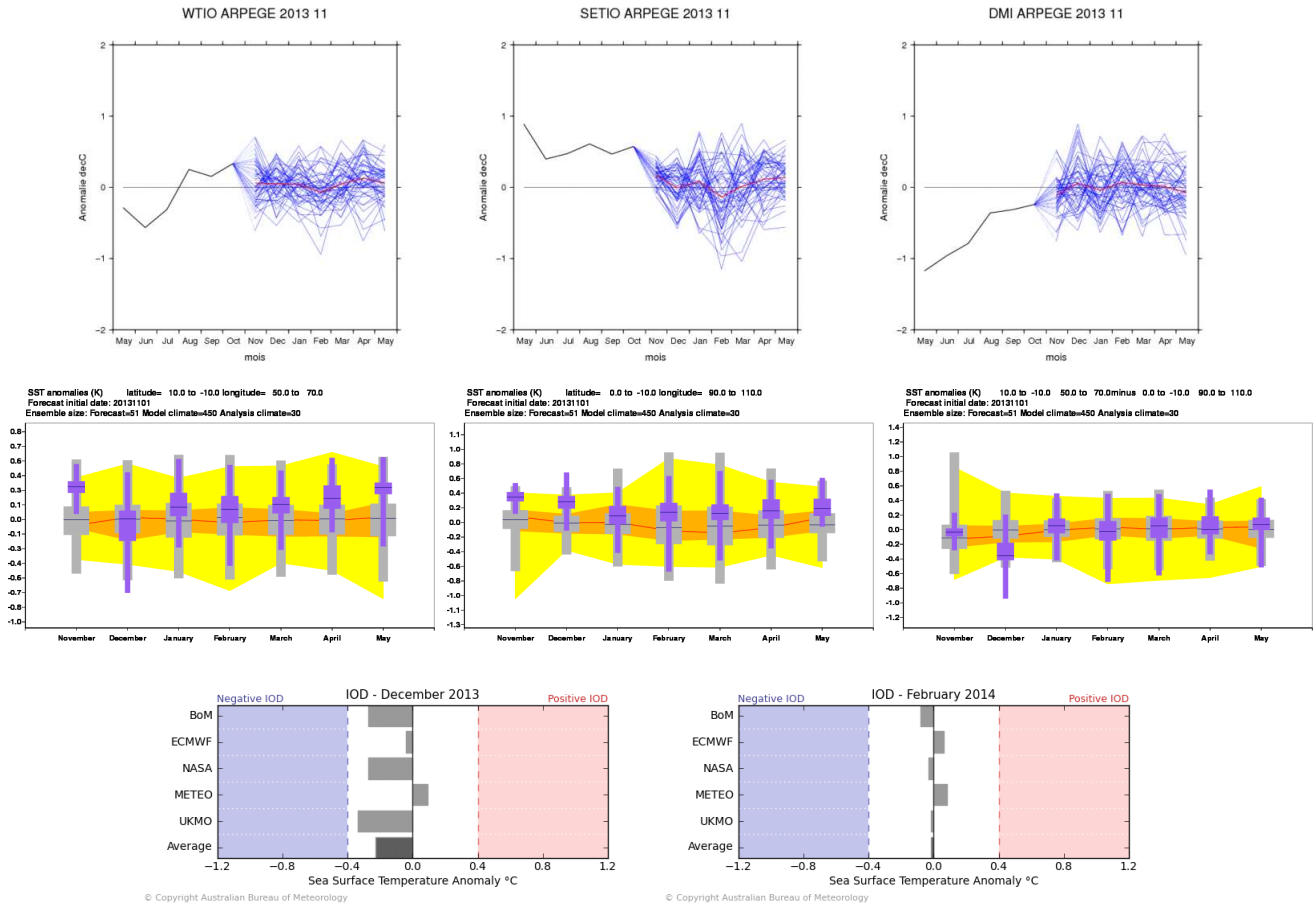


fig.18: SSTs anomaly forecasts in the Indian Ocean boxes from Météo-France (top), ECMWF (middle), plumes / climagrams correspond to 51 members and monthly means. Synthesis for IOD (bottom) for several GPCs from BoM

In WTIO : Some differences in the two models, with different intra-seasonal variability.
In SETIO : both models strating with Above normal conditions and then rapid decrease (close to normal) in MF while the "warm" scenario is maintened in ECMWF. Little spread in ECMWF and large spread in MF.
DMI (IOD) : moving to close to neutral with MF and ECMWF. Other models confirm this evolution.

II.2. GENERAL CIRCULATION FORECAST

II.2.a Global Forecast

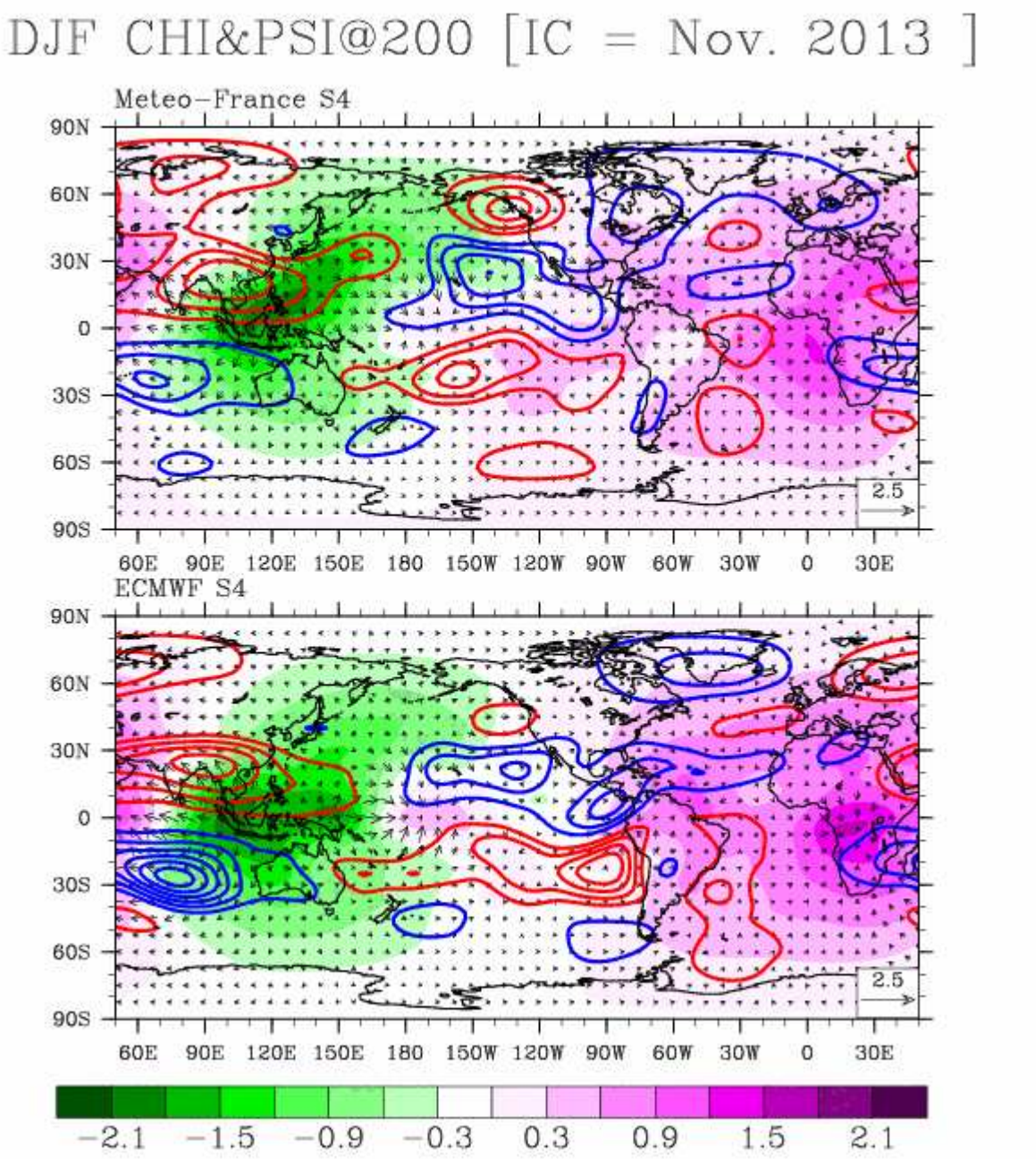


fig.19: Velocity Potential anomaly field χ (shaded area – green negative anomaly and pink positive anomaly), associated Divergent Circulation anomaly (arrows) and Stream Function anomaly ψ (isolines – red positive and blue negative) at 200 hPa by Météo-France (top) and ECMWF (bottom).

Velocity potential anomaly field (cf. fig. 19 – insight into Hadley-Walker circulation anomalies) :
in the Tropics, good consistency between the 2 models.
Over the Pacific, good consistency between the 2 models on warm pool, with negative anomaly extending westward over the maritime continent and east Indian Ocean (Divergent circulation anomaly - upward motion anomaly). This response is consistent with SST forecast for its Pacific part, not really for its Indian part.
Over Atlantic, still positive anomalies (downward motion), close to Brazil and close to Africa.

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

good consistency in tropics. The positive anomalies dipole in the tropical Eastern Indian is a typical response to an upward motion anomaly in the vicinity of Maritime Continent. However this signal seems to be trapped in the tropics.
Over the Atlantic, good consistency between the (weak) response of the 2 models, from the equator northward to Greenland. Unfortunately, fields are far fewer over Europe...

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 tropics.

II.2.b North hemisphere forecast and Europe

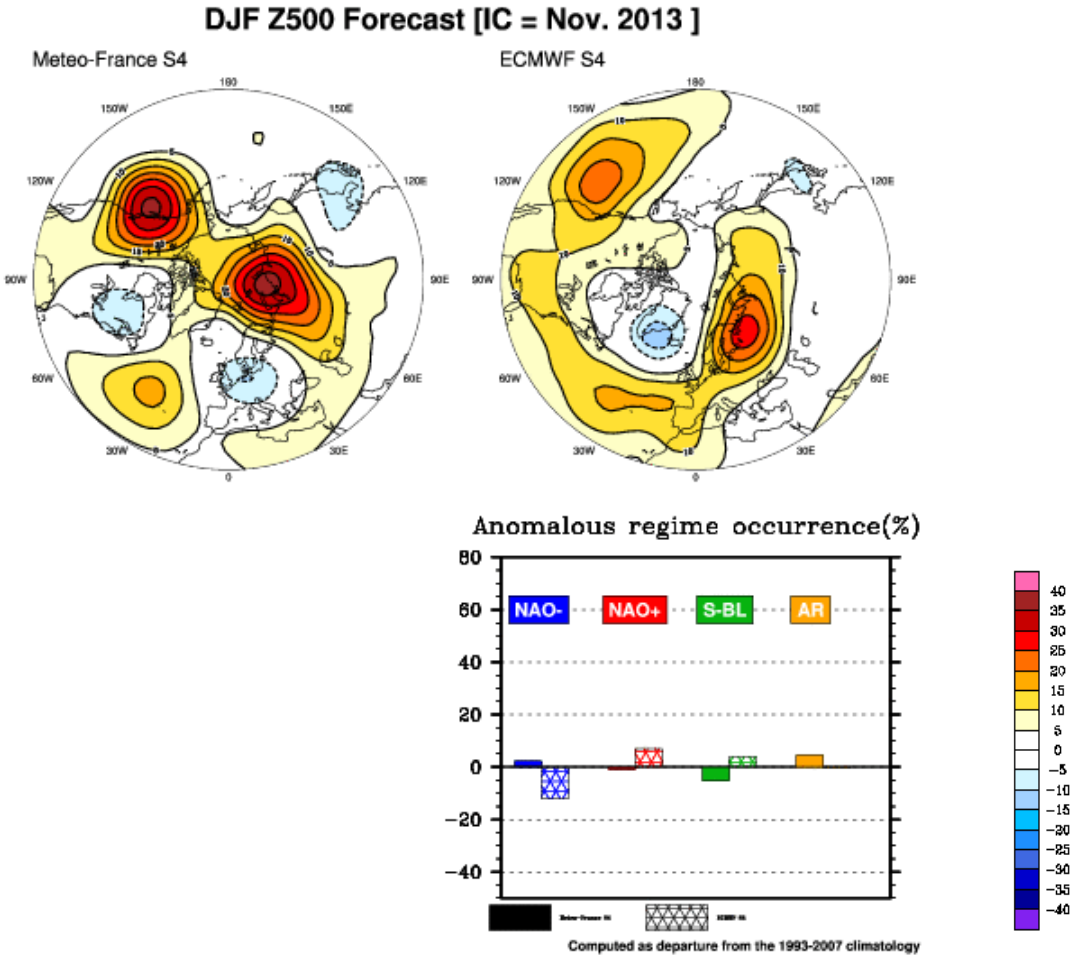


fig.20: Anomalies of Geopotential Height (top) at 500 hPa from Meteo-France (left) and ECMWF (right). http://www.ecmwf.int/products/forecasts/d/charts/seasonal/forecast/eurosip and North Atlantic Regime occurrence anomalies (bottom) from Météo-France and ECMWF : vertical bars represent the excitation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

Geopotential height anomalies (fig. 20 – insight into mid-latitude general circulation anomalies) :

Over Pacific, some consistency over north-eastern basin, close to US costs (like for streamfunction anomalies)

Over atlantic, the only consistency between the 2 models is in the central Atlantic. Over Europe, models are very different.

North Atlantic Circulation Regimes (fig. 21) :

As a consequence, no consistent signal in the regimes forecast, exept the fact that their regime occurrences are both close to normal.

II.3. IMPACT : TEMPERATURE FORECASTS

II.3.a ECMWF

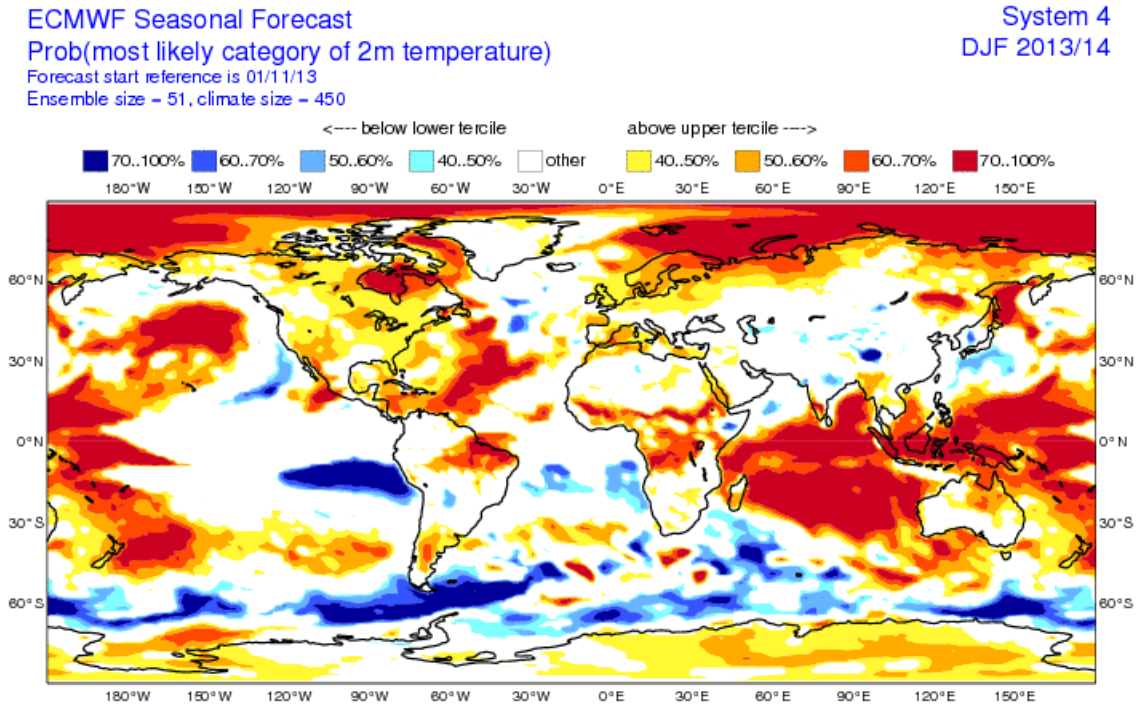


fig.21: Most likely category probability of T2m from ECMWF. Categories are Above Normal, Below Normal and « other » category (Normal and No Signal).
http://www.ecmwf.int/products/forecasts/d/charts/seasonal/forecast/seasonal_range_forecast/group/

II.3.b Météo-France

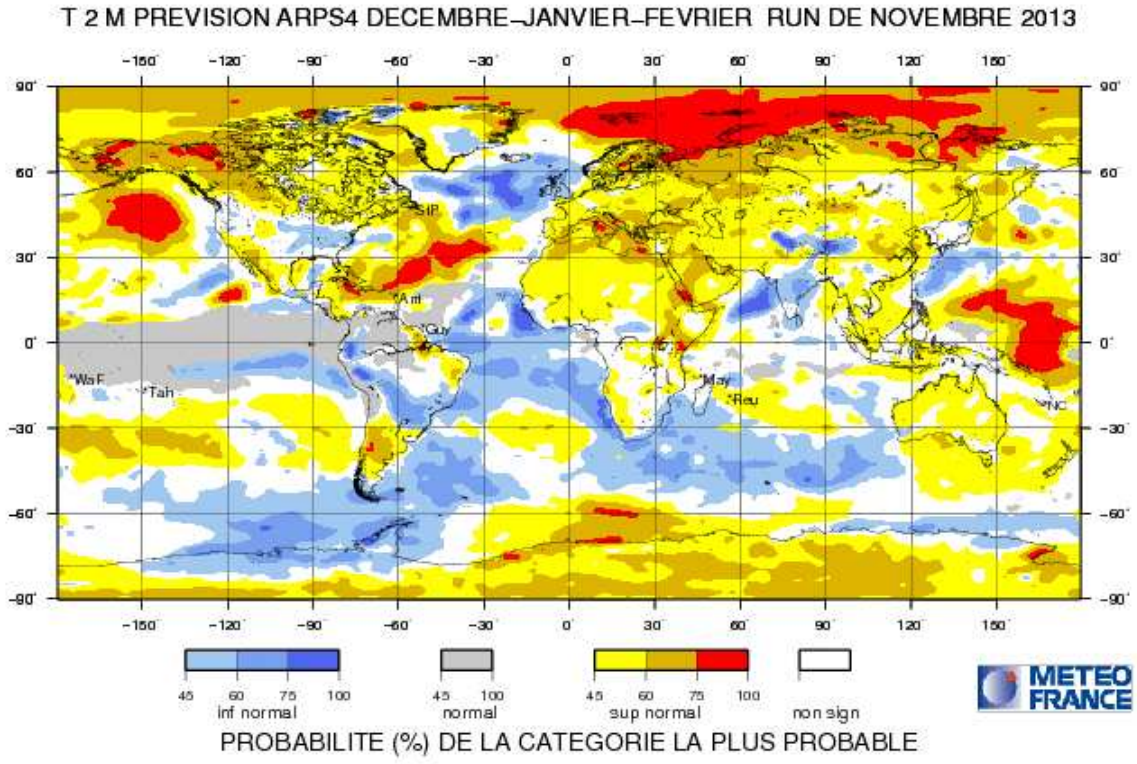


fig.22: Most likely category of T2m from Meteo-France. Categories are Above, Below and Close to Normal. White zones correspond to No Signal. http://elaboration.seasonal.meteo.fr/

II.3.c Met Office (UKMO)

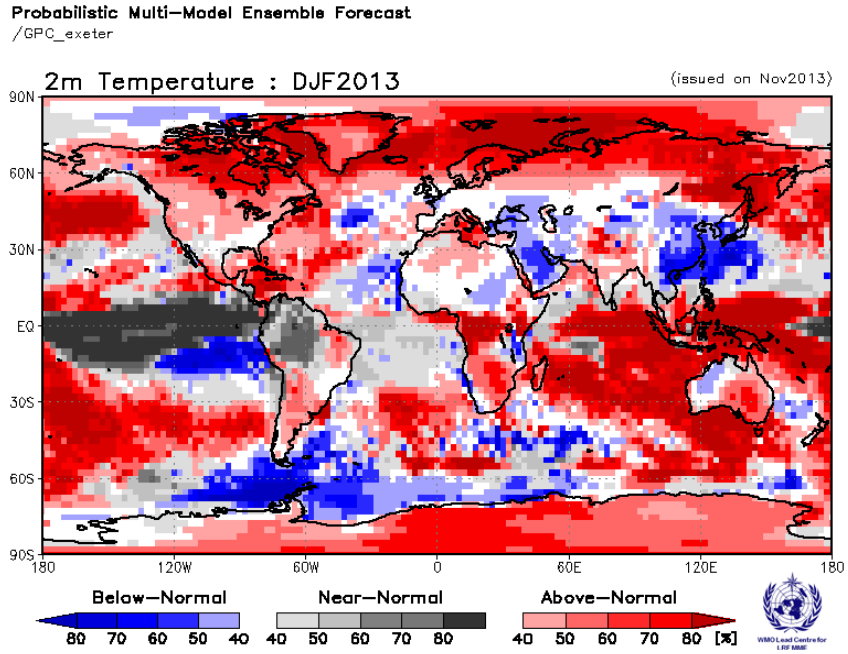


fig.23: **Most likely category of T2m Anomaly from UK Met Office.** https://www.wmolc.org/

II.3.d Climate Prediction Centre (CPC)

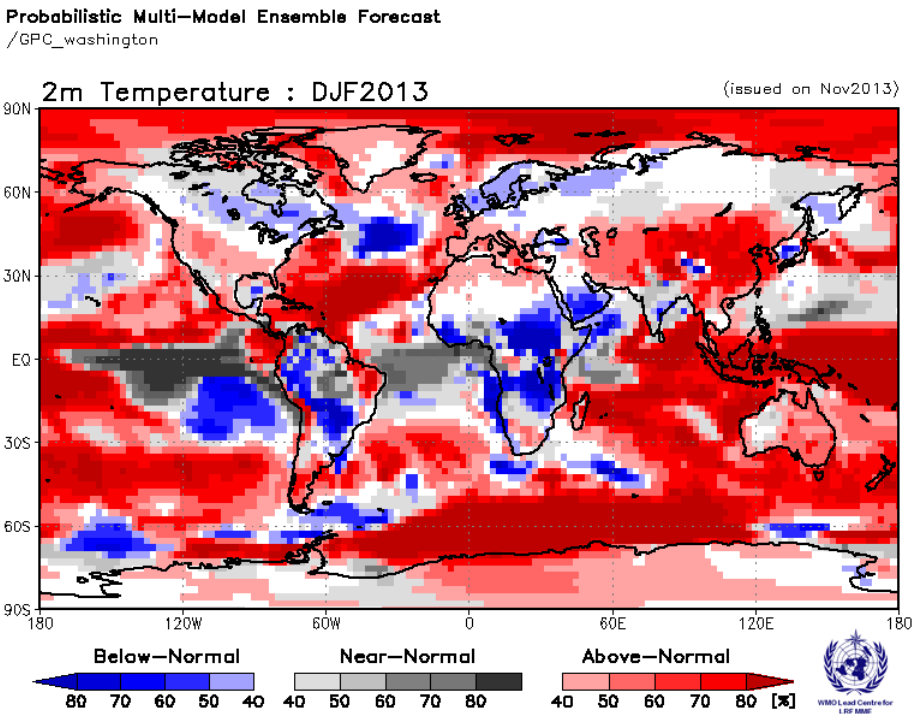


fig.24: **Most likely category of T2m Anomaly from CPC.** https://www.wmolc.org/

II.3.e Japan Meteorological Agency (JMA)

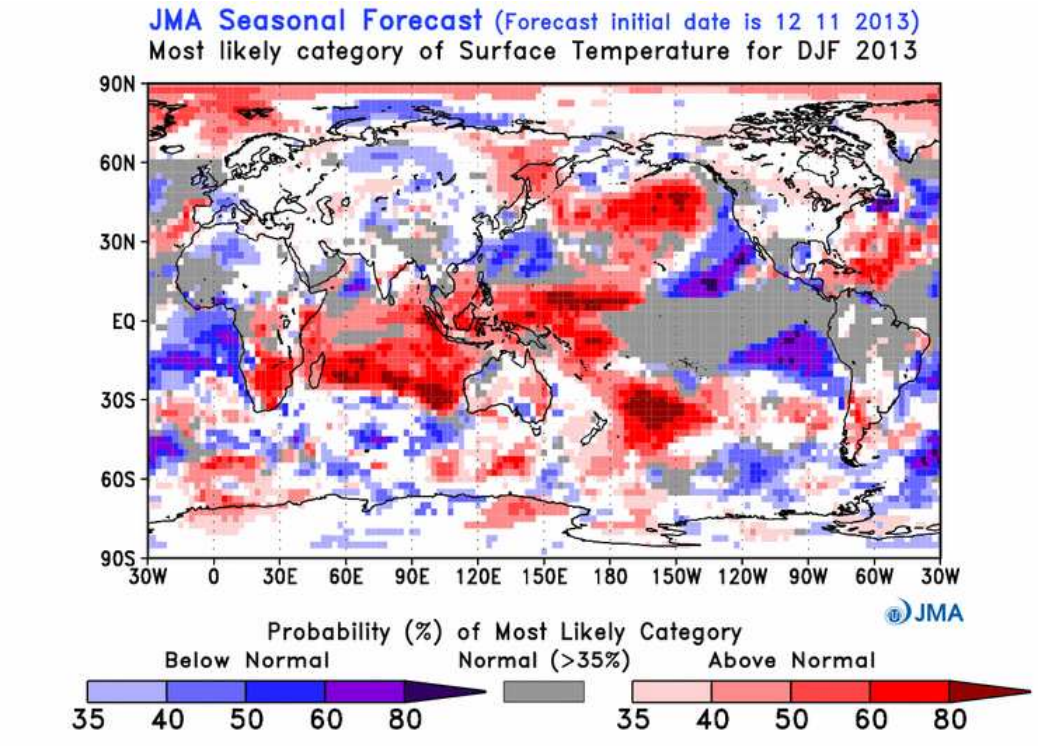


fig.25: Most likely category of T2m. Categories are Above, Below and Close to Normal. White zones correspond to No Signal. http://ds.data.jma.go.jp/tcc/tcc/products/model/

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

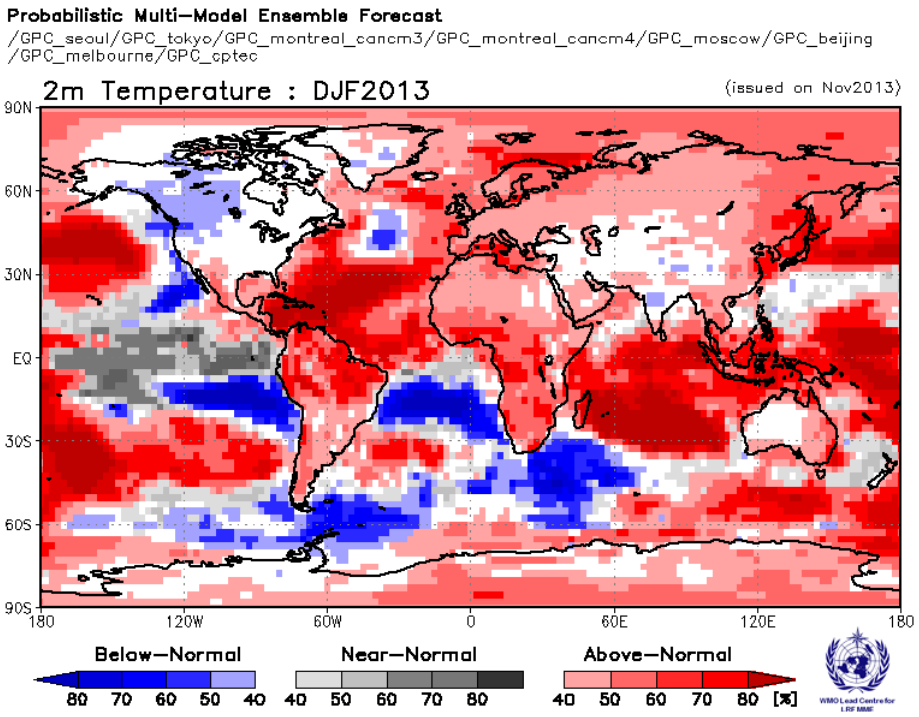


fig.26: MME most likely category of T2m from LC-MME. The MME composition corresponds to the GPCs not used in EuroSIP https://www.wmolc.org/

II.3.g Euro-SIP

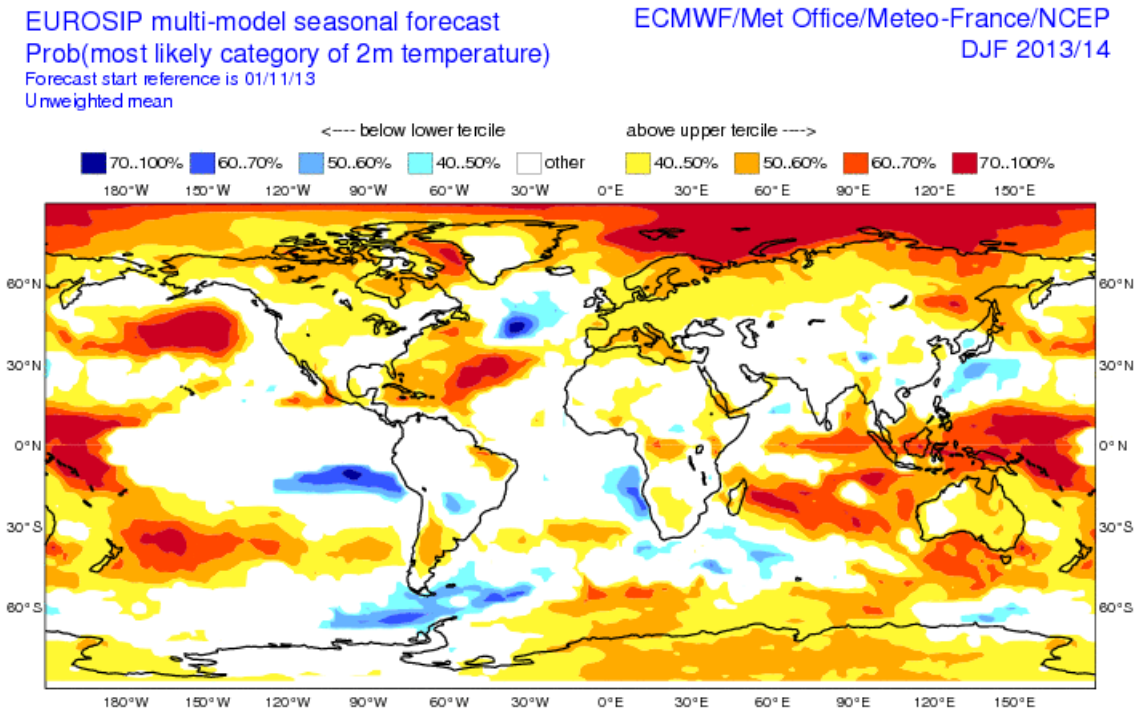


fig.27: Multi-Model Probabilistic forecasts for T2m from EuroSip.
(2 Categories, Below and Above normal – White zones correspond to No signal and Normal).

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

North-America : enhanced probabilities for cold anomalies over Western Canada and Nordth-Western part of USA (linked to the positive Z500 anomaly forecasted over North-Eastern Pacific).
Central-America : globally warmer than normal.

South-America : Some consistent signal over the southern part of the continent (warmer than normal).
Australia : traces of warmer than normal over the Eastern part and the Northern coastal part of the continent.
Asia : Mostly Warmer than normal conditions in the Eastern part, with a very strong probability in the vicinity of the maritime continent and Eastward.
Africa : no consistent signal.
Europe : Warmer than normal conditions over the Mediterranean basin. Over Europe, the dominant warmer signal is more uncertain.

II.4. IMPACT : PRECIPITATION FORECAST

II.4.a ECMWF

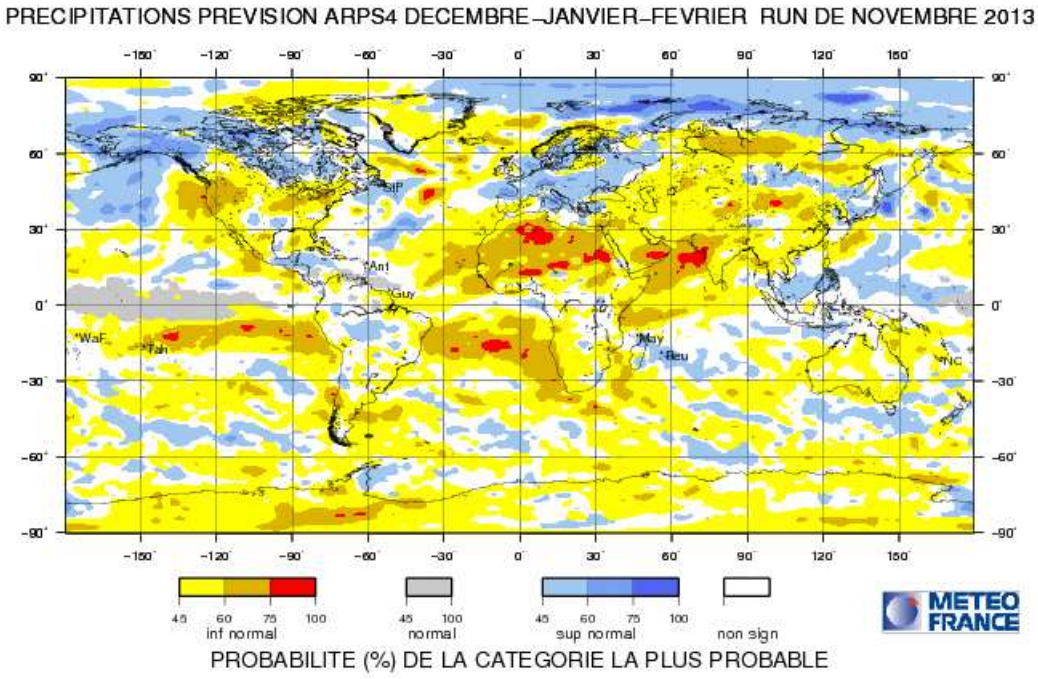


fig.28: Most likely category probability of rainfall from ECMWF. Categories are Above Normal, Below Normal and « other » category (Normal and No Signal).
http://www.ecmwf.int/products/forecasts/d/charts/seasonal/forecast/charts/seasonal_charts_s2/

II.4.b Météo-France

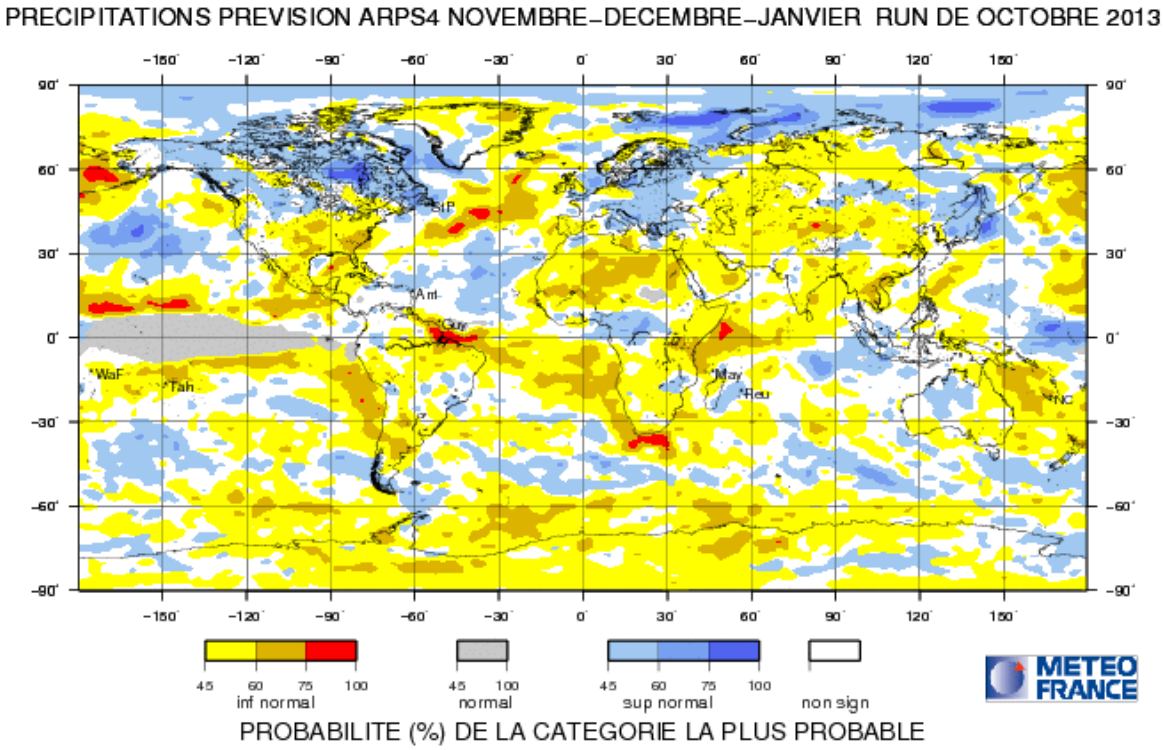


fig.29: Most likely category of Rainfall from Meteo-France. Categories are Above, Below and Close to Normal. White zones correspond to No Signal. http://elaboration.seasonal.meteo.fr/

II.4.c Met office (UKMO)

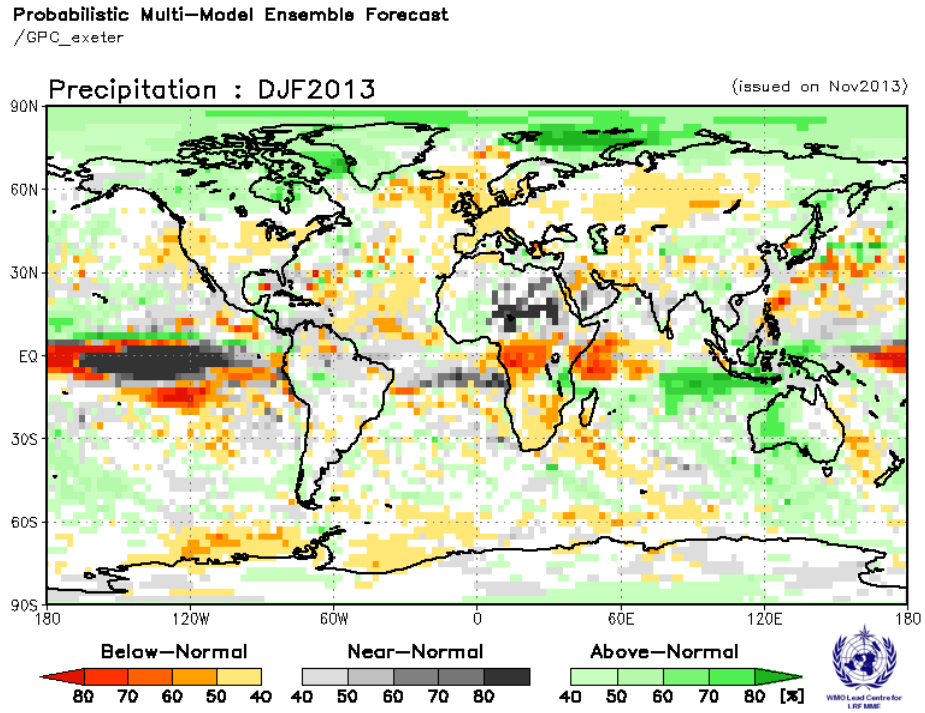


fig.30: **Most likely category of T2m Anomaly from UK Met Office.** **https://www.wmolc.org/**

II.4.dClimate Prediction Centre (CPC)

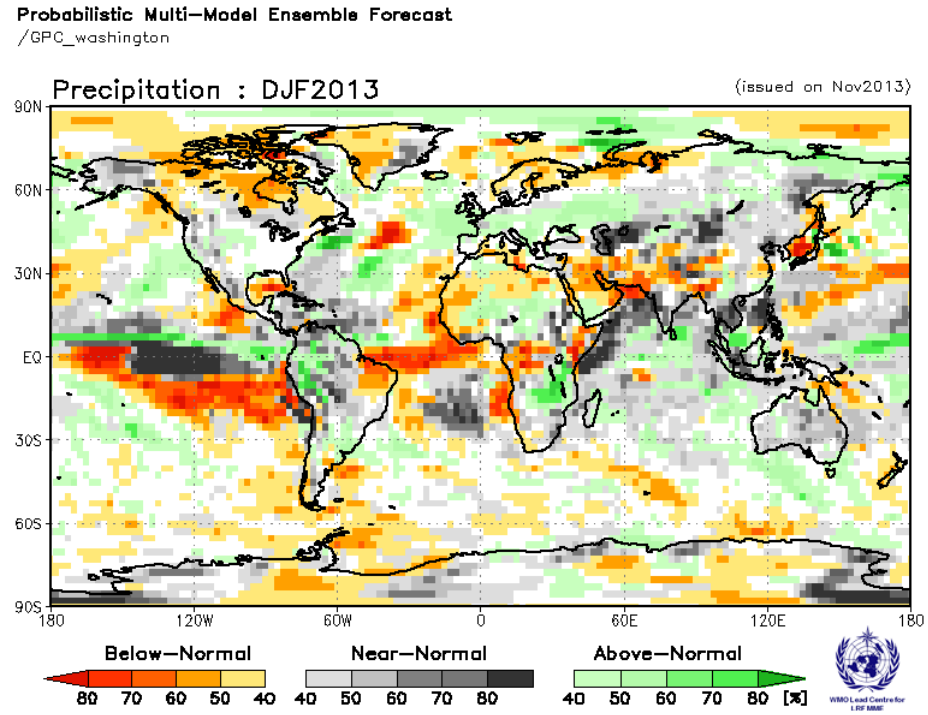


fig.31: **Most likely category of Rainfall from CPC.** **https://www.wmolc.org/**

II.4.e Japan Meteorological Agency (JMA)

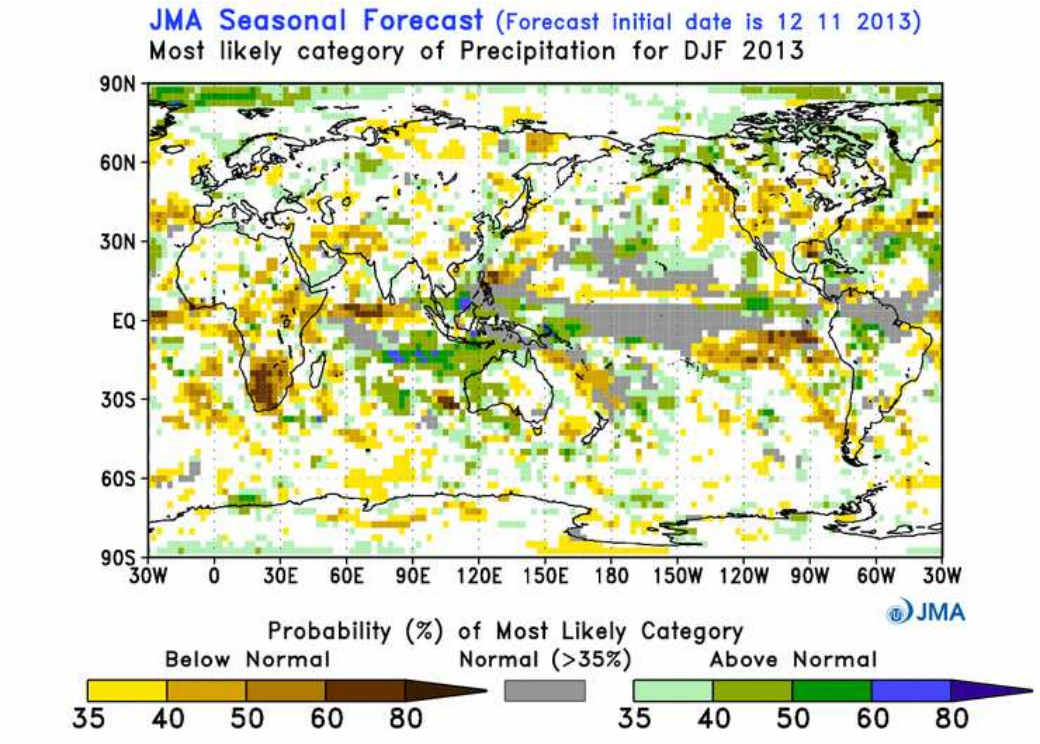


fig.32: Most likely category of Rainfall from JMA. Categories are Above, Below and Close to Normal. White zones correspond to No Signal. http://ds.data.jma.go.jp/tcc/tcc/products/model/

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

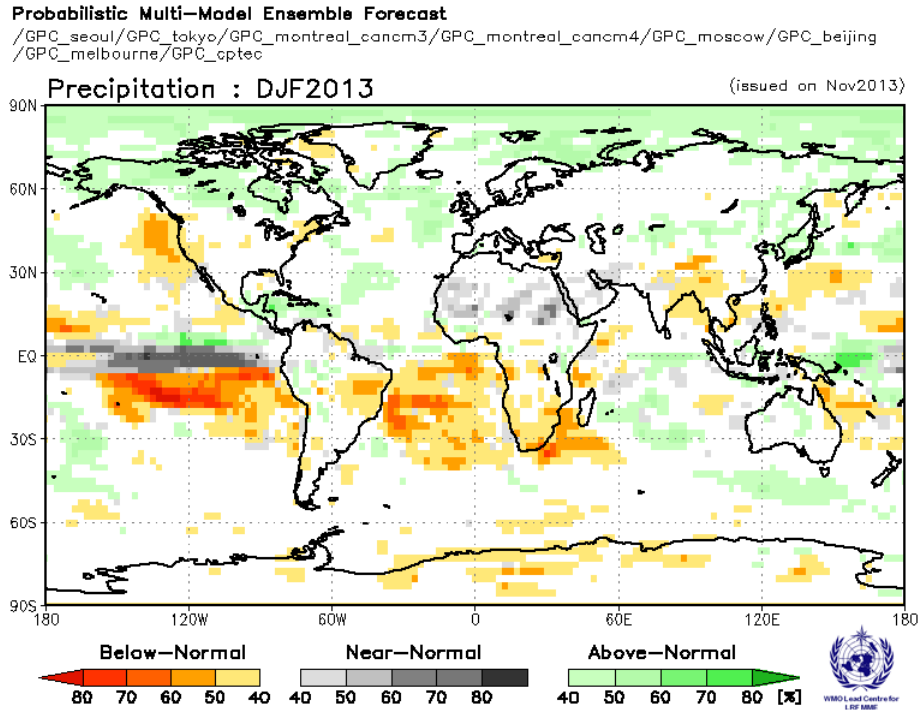


fig.33: MME most likely category of Rainfall from LC-MME. The MME composition corresponds to the GPCs not used in EuroSIP. https://www.wmolc.org/

II.4.g Euro-SIP

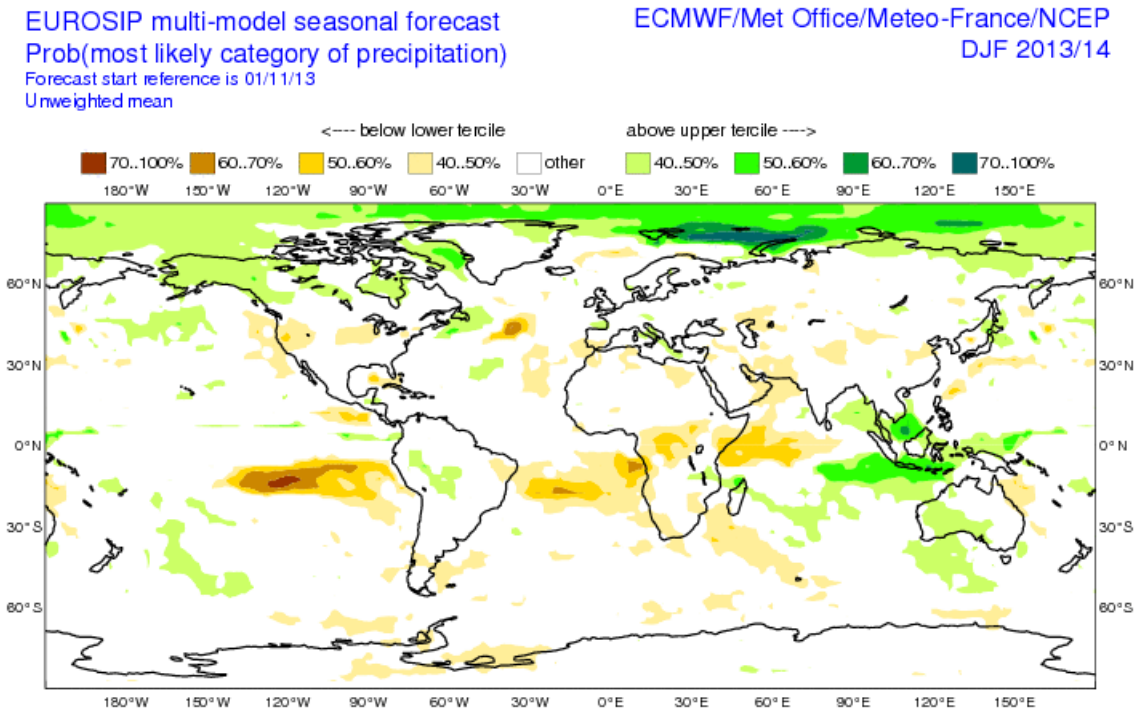


fig.34: Multi-Model Probabilistic forecasts for precipitation from EuroSip (2 Categories, Below and Above normal – White zones correspond to No signal).

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

In the Tropics : A few consistent signal. Enhanced probabilities for wet scenarios in the vicinity of the warm pool and the Maritime Continent. Enhanced probabilities of dry scenario over Eastern and central Africa.

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

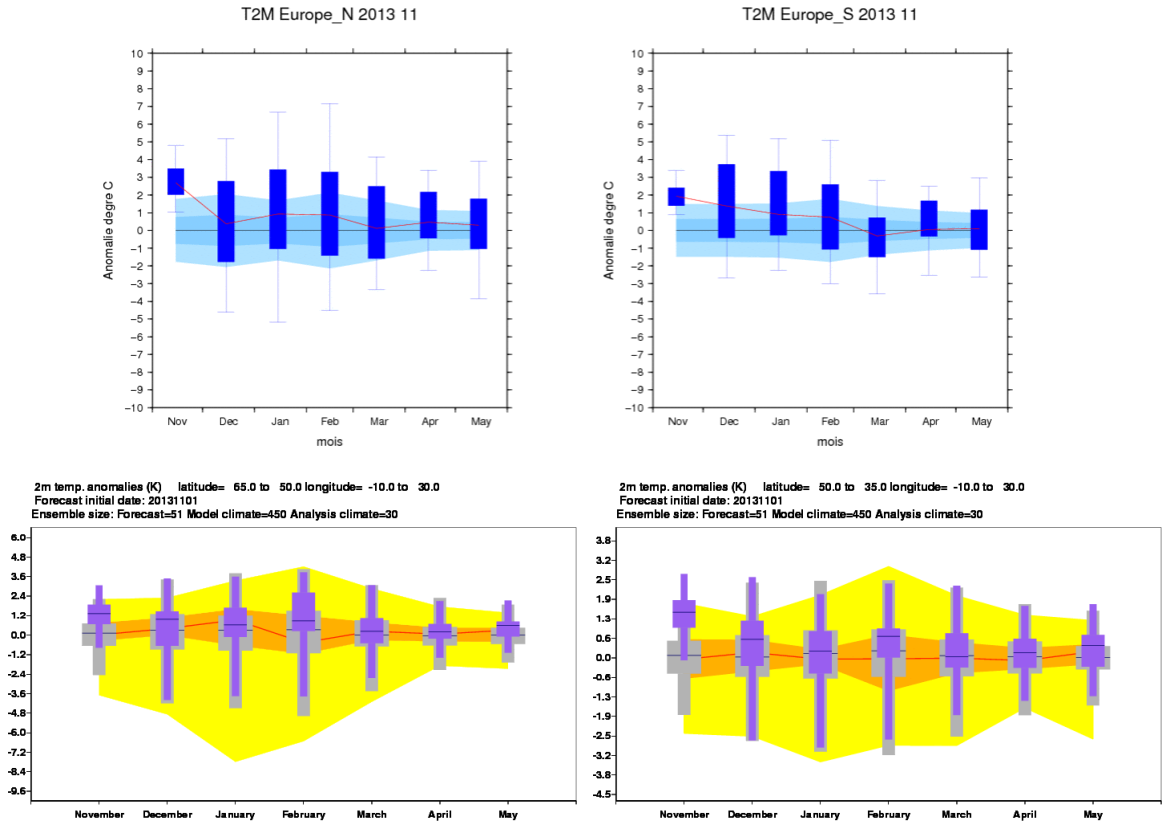


fig.35: Climagrams for T2m in Northern Europe (left) and in Southern Europe (right) from Météo-France (top) and ECMWF (bottom - idem).

For Northern Europe: large spread (with respect of the climate reference) in both models (especially MF which is very large), corresponding to a large uncertainty.

For Southern Europe: The spread is very large in both models, but the warm signal seems more robust. Any intra-seasonnal use is not recommended.

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

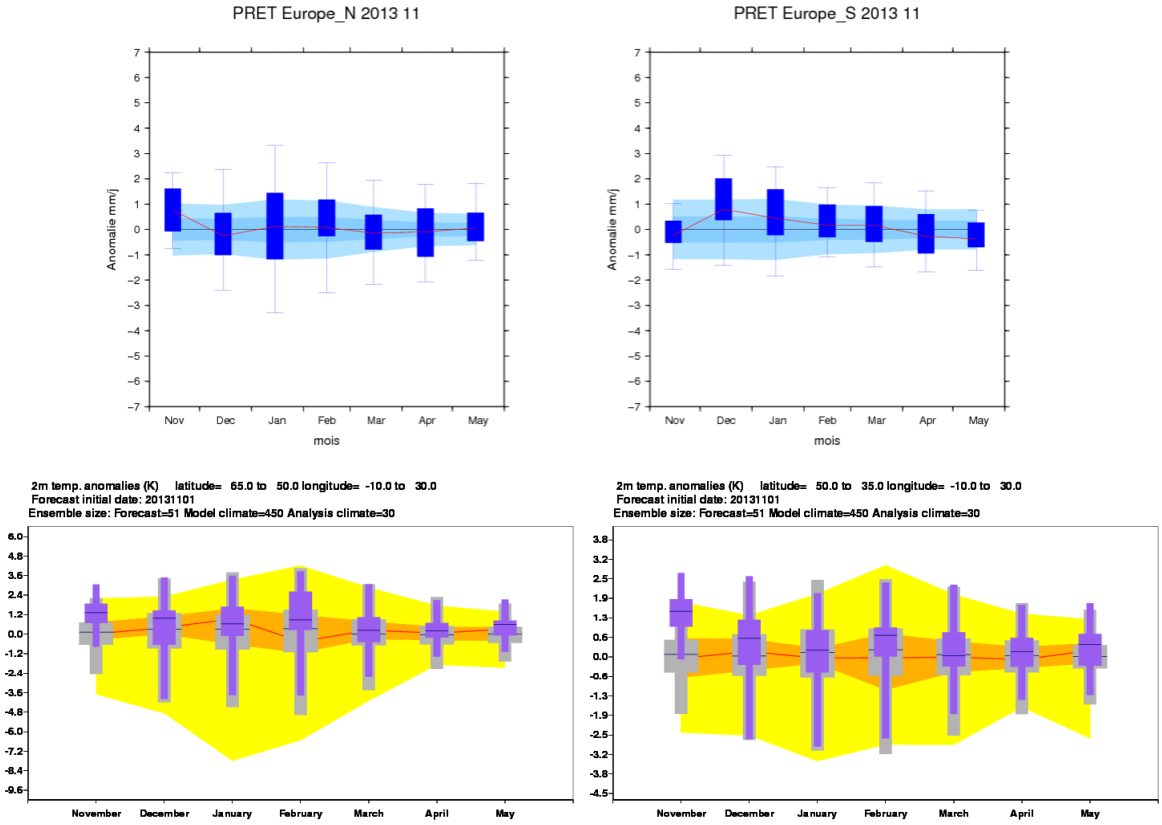


fig.36: Climagrams for Rainfall in Northern Europe (left) and in Southern Europe (right) from Météo-France (top) and ECMWF (bottom - idem).

Only little consistency between the 2 models.

For Northern Europe : the spread is very large, no usable signal.

For Southern Europe : Some consistency for Above normal conditions for the beginning of the season.

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

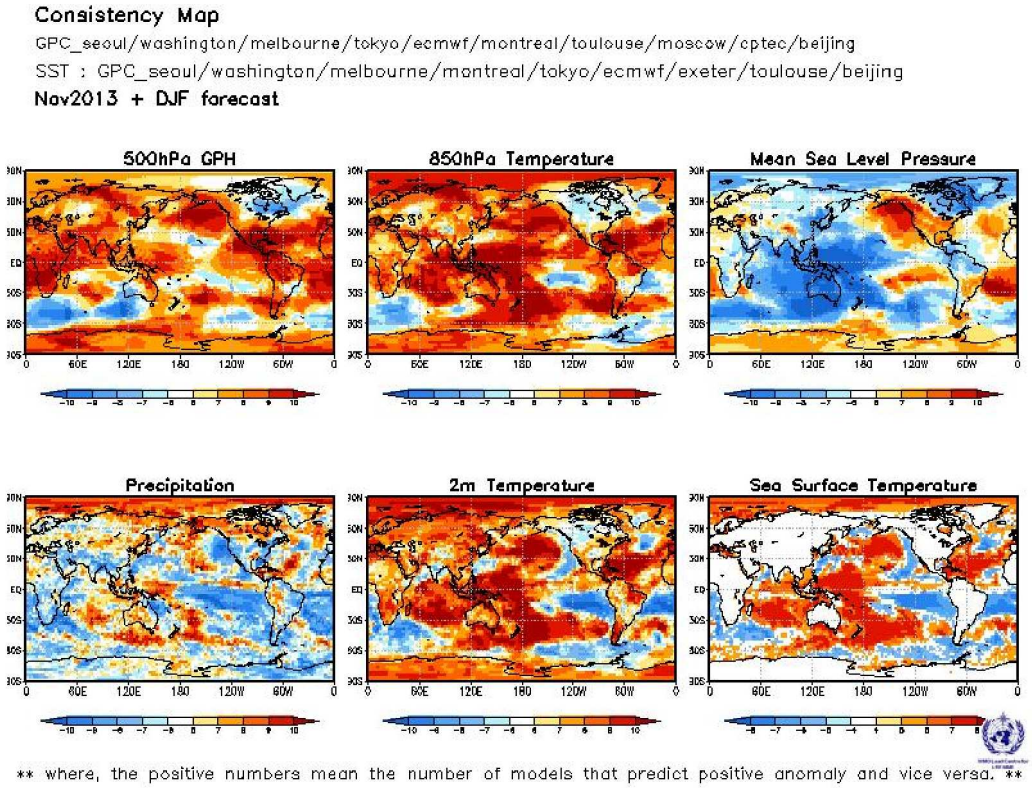


fig.37: GPCs Consistency maps from LC-MME http://www.wmolc.org/

For SST : Consistency over the Western Pacific (Warmer than normal). The slight warm conditions in the central equatorial wave guide is also present. In the Indian ocean, large convergence for Above normal conditions in the Eastern part and over the Southern sub-Tropics. The negative or neutral IOD is also conspicuous. For the Atlantic, consistency in the Northern Tropics and less consistency in the high latitudes of the Northern hemisphere.

For Z500 : Large consistency over Tropics and Sub-Tropics in both hemisphere to some exception like the regions in the vicinity of Australia and Japan (however consistent with the stream function analysis). In the Northern Atlantic, a pattern close to ECMWF Z500 forecast appears.

For T2m : Consistency for Above normal conditions more or less everywhere to the exception of North-Western part of North-America and large regions over South-America. To be quoted the lack of signal for Below normal conditions (probably climate change influence).

For precipitation : For Above normal conditions, some consistency in the vicinity of the warm pool and the SPCZ, over Canada. Note some signal for Above normal conditions over Sahelian regions. For the Below normal scenario, some consistency exists over part of South-Asia and India, East and South of the African continent, Middle-East, Brazil and US.

II.7. "EXTREME" SCENARIOS

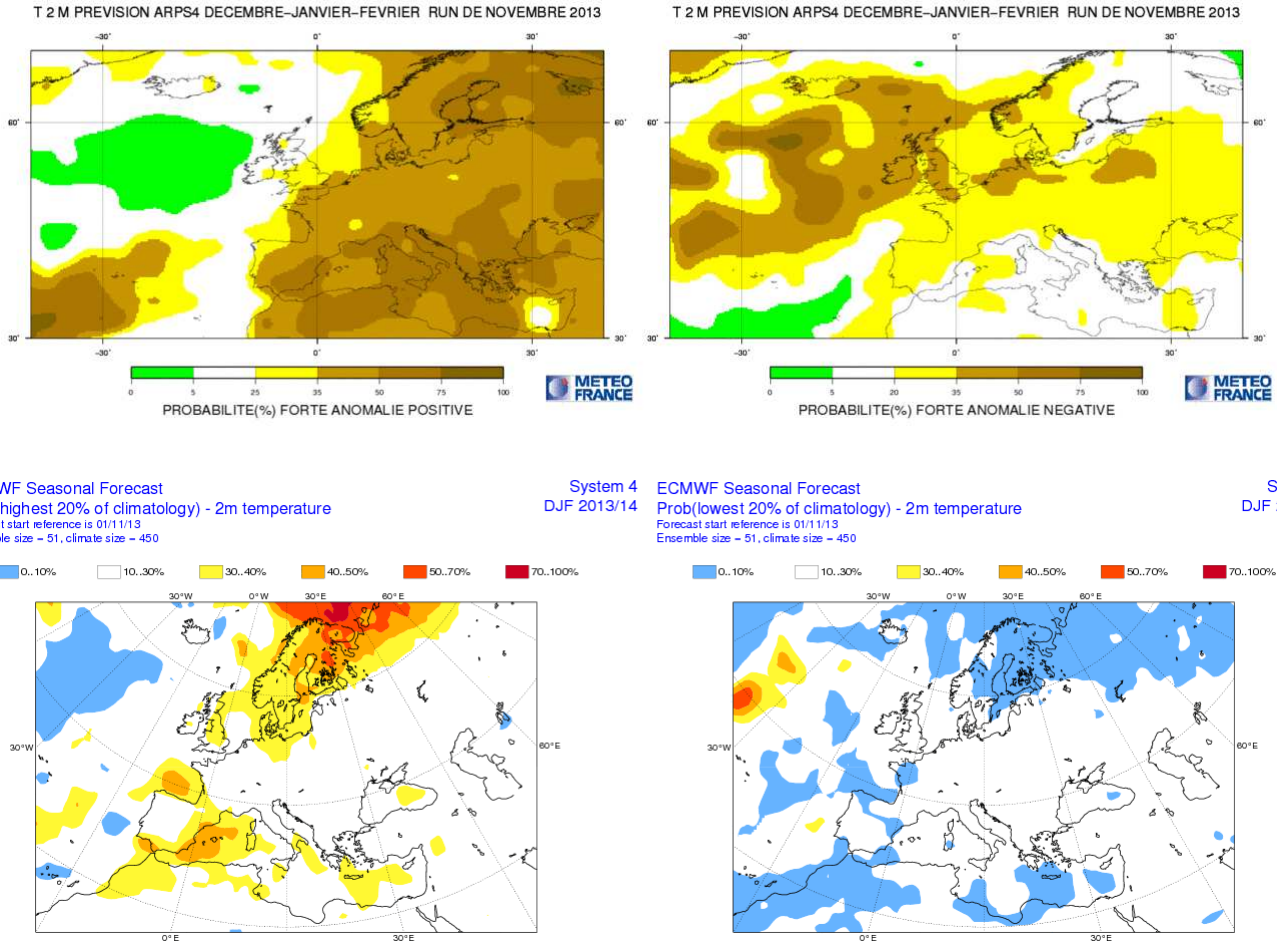


fig.38: Top : Probability of « extreme » above normal conditions from T2m for Meteo-France (left - highest ~15% of the distribution and right lowest ~15% of the distribution)
Bottom : idem from ECMWF (left - highest 20% of the distribution and right lowest 20% of the distribution).

To be noted the divergent scenarios proposed by MF (enhanced probabilities for both categories).

Some consistency between the 2 models for the Very Above scenario in the vicinity of the Mediterranean basin.
No consistency for very Below Normal scenario which is consistent with the differences in the geopotential height analysis. So in relationship with the current predictability and the model uncertainties, it seems difficult to use these forecast.

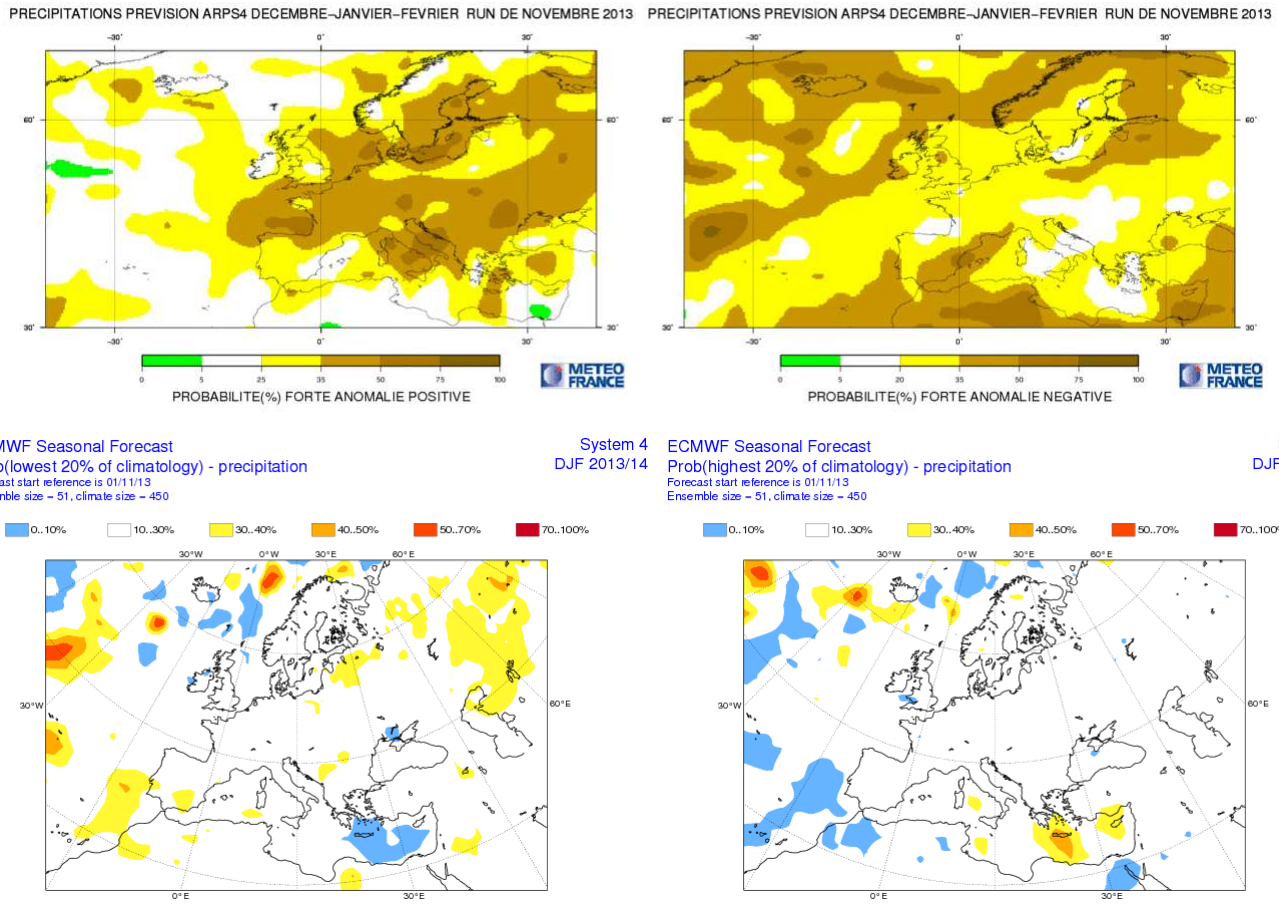


fig.39: Top : Probability of « extreme » above normal conditions for rainfall from Meteo-France (left - highest ~15% of the distribution and right lowest ~15% of the distribution)
Bottom : idem from ECMWF (left - highest 20% of the distribution and right lowest 20% of the distribution).).

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 forecast.

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 to tropical regions. 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, at the exception of the Mediterranean basin with a slight wet signal. For temperature: despite the weak predictability the Above normal scenario could be privileged for the most of Southern Europe 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

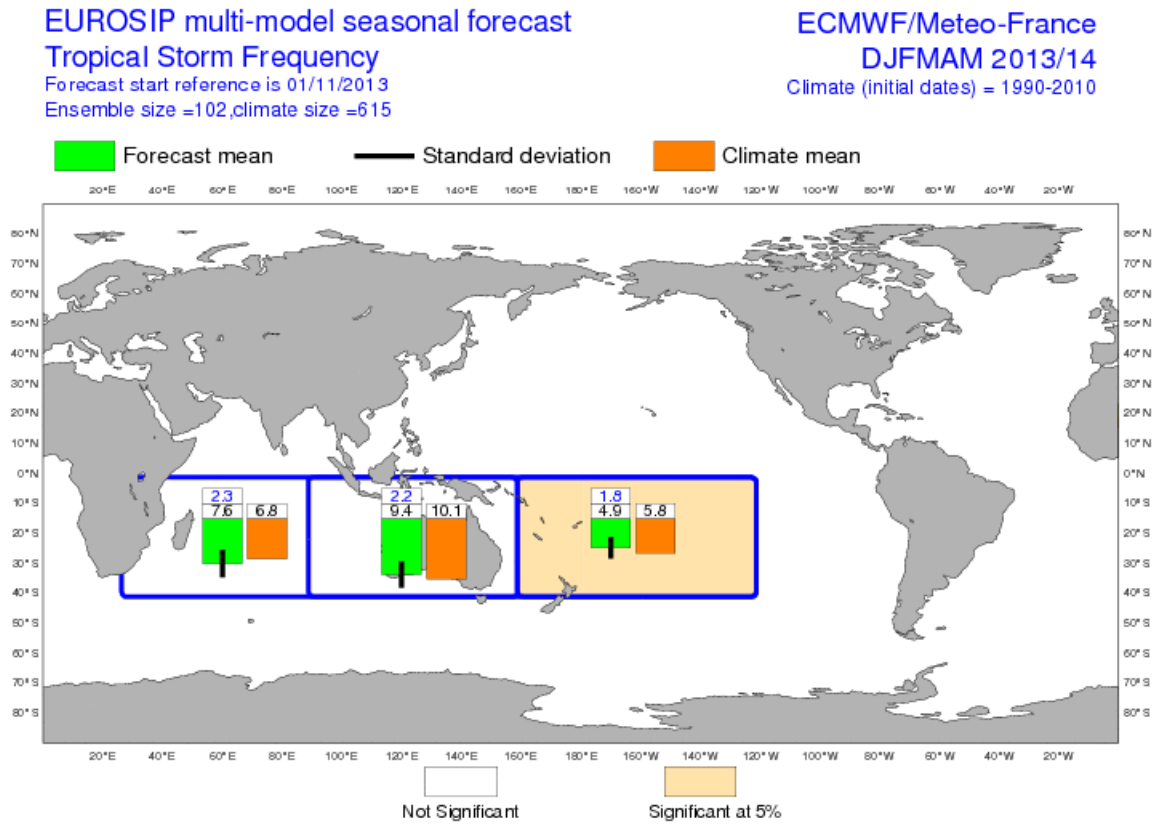


fig.40: Seasonal forecast of the frequency of Tropical Cyclones from EUROSIP (Météo-France & ECMWF).
http://www.ecmwf.int/products/forecasts/d/charts/seasonal/forecast/eurosip/mmtrop/trop_euro/eurosip_tropical_storm_frequency/

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 (Southern Hemisphere), and close to normal condition elsewhere.

Synthesis of Temperature forecasts for December-January-February 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*	*above normal*	*no privileged scenario*	*no privileged scenario*	*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 December-January-February 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

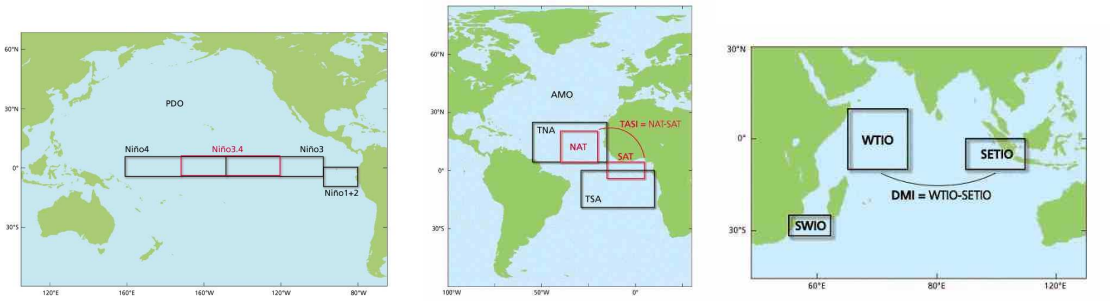
El Niño and La Niña events primarily affect tropical regions and are monitored by following the SST evolution in specific area of the equatorial Pacific.

- 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.