GLOBAL CLIMATE BULLETIN
n°184 - OCTOBER 2014

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I. DESCRIPTION OF THE CLIMATE SYSTEM (AUGUST 2014)

I.1.OCEANIC ANALYSIS

I.1.aGlobal analysis

At the surface (fig. 1) :

In the equatorial waveguide, slight warming in the Western Pacific. No clear evolution elsewhere, with some patches of both warming and cooling. Globally a slight warming in the Indian Ocean and in the Atlantic.

In the tropics, some warming west to Australia and west to South America.

In the sub-tropics and mid latitudes, we notice a reinforcement of the anomaly structures in the Northern Pacific .

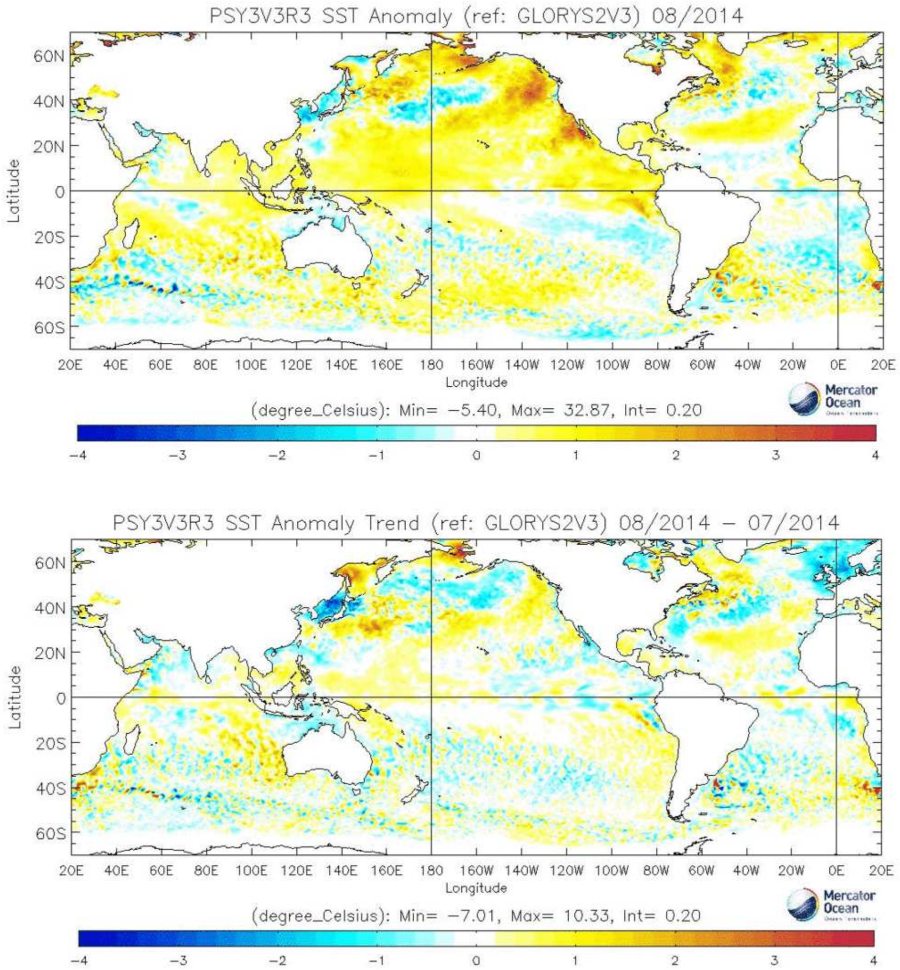


fig.I.1.1: top : SSTs Anomalies (°C) . Bottom : SST tendency (current – previous month), (reference Glorys 1992-2009). http://bcg.mercator-ocean.fr/

<u>In subsurface (fig. 2) :</u>
In the Pacific : in the equatorial band (10°N-10°S), strong positive heat content anomalies in the Central Pacific along the Equator and slight negative anomaly in the most eastern part. Persistent negative anomalies in the Northern hemisphere between 10°N and 20°N).
In the Atlantic : cool conditions in the equatorial waveguide, up to the Guinean Gulf. In the Topical North Atlantic, negative anomalies from West Africa to the Northern coast of South America (North Hemisphere). Positive anomalies in the Topical South Atlantic (globally, except close to the Angola's coast).
In the Indian Ocean : complex anomaly field, no clear signal.

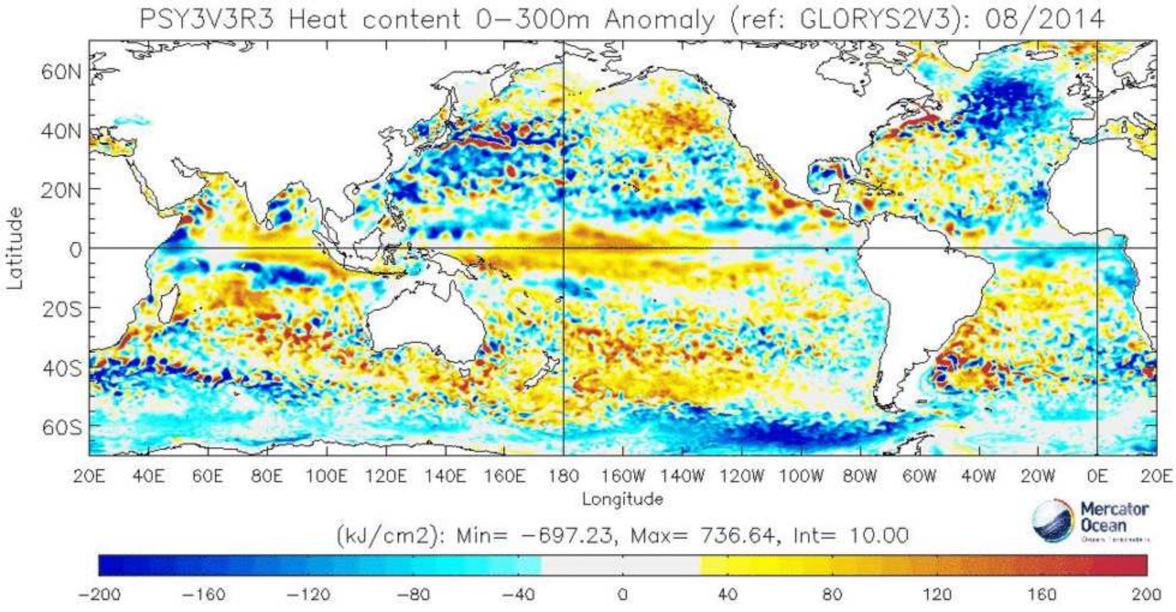


fig.I.1.2: map of Heat Content Anomalies (first 300m, kJ/cm2, reference Glorys 1992-2009)
http://bcg.mercator-ocean.fr/

I.1.b<u>Pacific Basin</u>

Most of the Northern Hemisphere shows a positive anomaly; a negative one is visible in the middle of the Northern basin.
SST anomaly field shows two maximum in the equatorial Pacific: the warmest in close Peru, the second close to the dateline.
We still have 2 maxima, the highest in the extreme Eastern part, and the other west to the date line.
SOI (-0.7) is consistent with the development of an El Niño and consistent with the trade wind anomalies.
In the Niño boxes (4, 3.4, 3 et 1+2 ; see definition in Annex) the monthly averages are respectively 0.5°C, 0.2°C, 0.5°C to 1.3°C from West to East

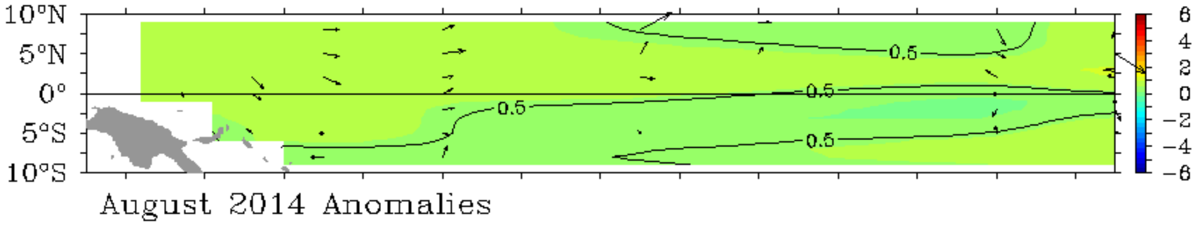


fig.I.1.3: SST Anomalies and Wind anomalies over the Equatorial Pacific from TAO/TRITON.
http://www.pmel.noaa.gov/tao/jsdisplay/monthly-summary/monthly-summary.html

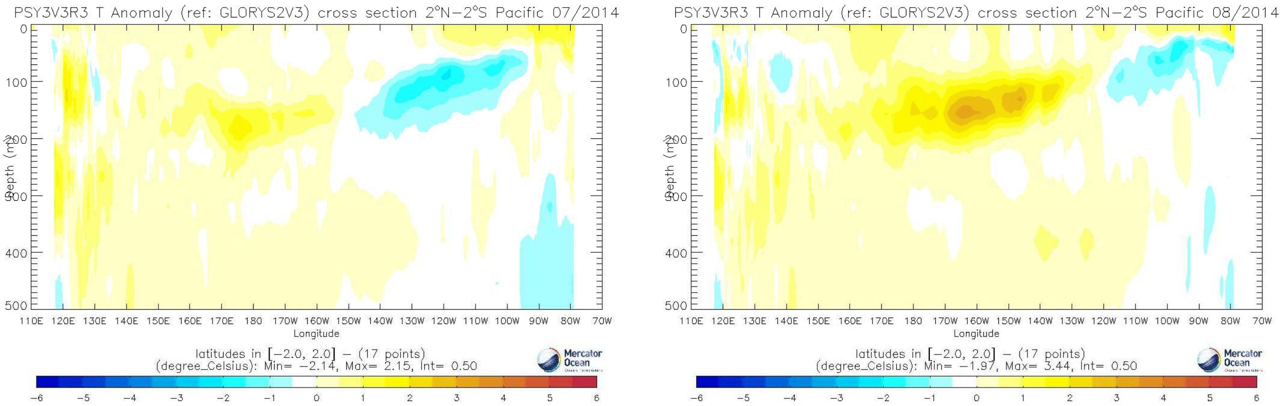


fig.I.1.4: Oceanic temperature anomaly in the first 500 meters in the Equatorial Pacific (previous and current month), http://bcg.mercator-ocean.fr

In the equatorial waveguide (fig. 4 and 5) : Kelvin wave clearly visible this month, consistent with a reactivation of El Nino in the next months.

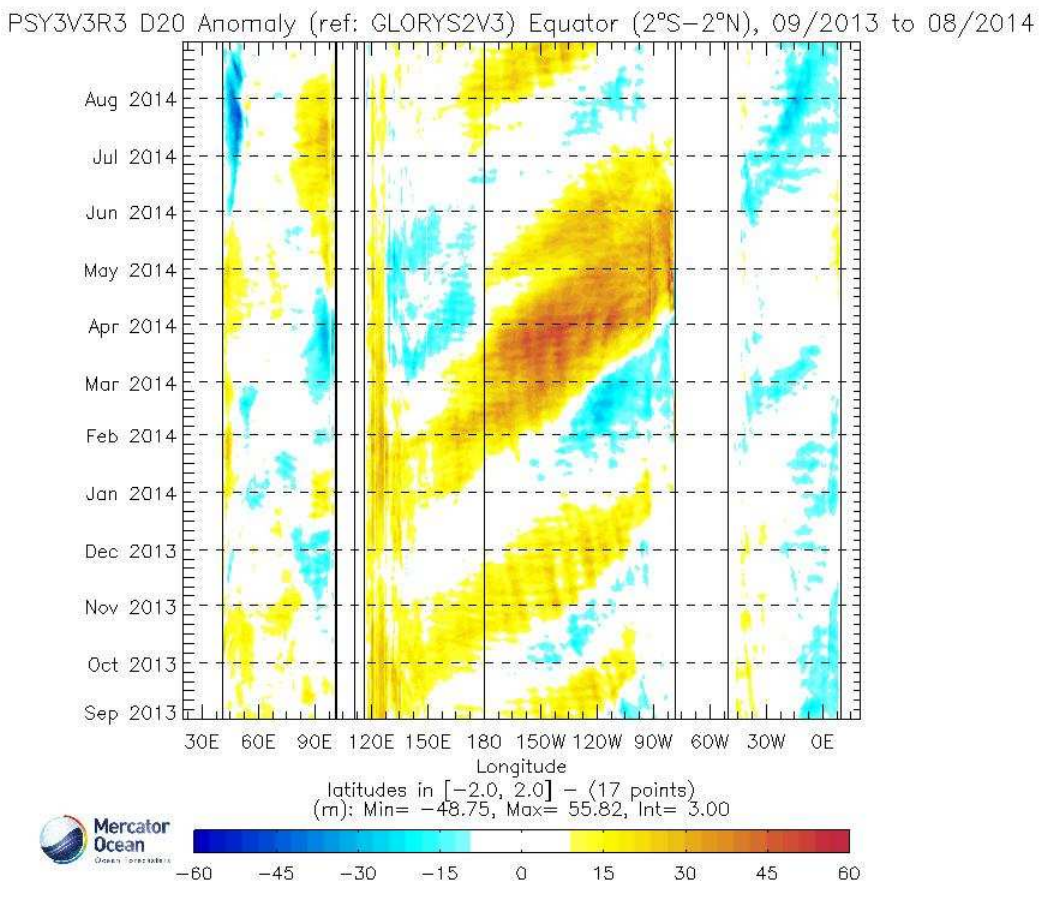


fig.I.1.5: Hovmüller diagram of Thermocline Depth Anomalies (m) (depth of the 20°C isotherm) along the equator for all oceanic basins over a 6 month period http://bcg.mercator-ocean.fr/

I.1.c Atlantic Basin

Northern Tropical Atlantic : South-North gradient. Globally warmer than normal (cf TNA box)
Equatorial waveguide : negative anomaly in the central part, neutral in the Guinean Gulf.

The Southern Tropical Atlantic : slight negative anomaly in the Eastern part, close to the African coast (Angola).
The TASI index is neutral.

Sea surface temperature near Europe :
Enhanced cooling of water surfaces near northern Europe causes reduced positive SST anomalies between Greenland and Norway, and also the Baltic Sea. In the North Sea and around UK / Ireland even negative anomalies. Still relatively strong SST gradient over the North Atlantic around 40° latitude.
Western Mediterranean still cooler than normal in contrast to Eastern Mediterranean and Black Sea, which were warmer. This shows that cooler air moved far to the south over western Europe, whereas subtropical warm air advection took place in southeastern parts.

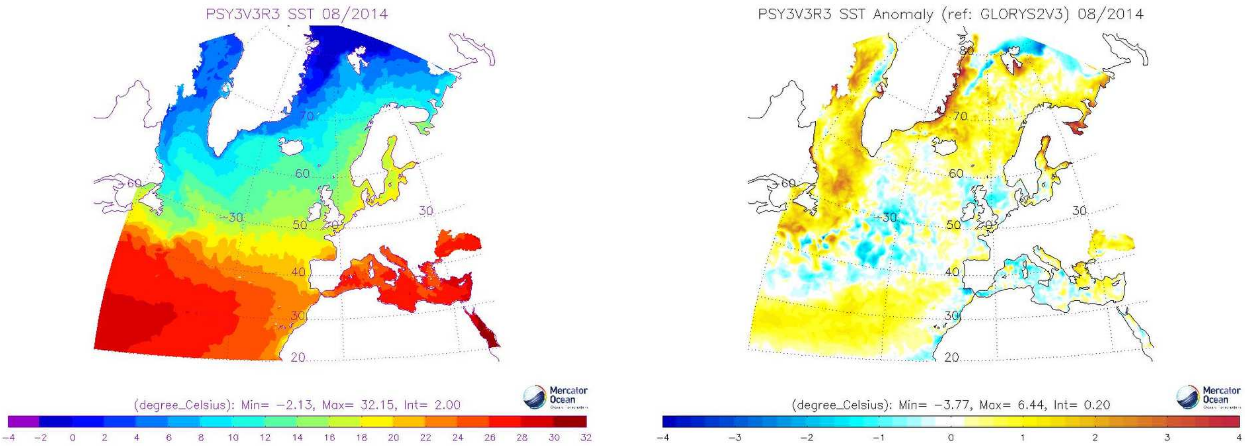


fig.I.1.6 : Mean sea surface temperature in the RA VI Region (Europe) and anomaly (reference Glorys 1992-2009). http://bcg.mercator-ocean.fr/

I.1.d Indian Basin

Southern Tropical Indian Ocean : warmer than normal conditions over most of the basin, with a significant warming trend near Australia.
Equatorial waveguide : a gradient from west (neutral) to East (warm anomaly). The DMI is still negative (-0.5°).
Northern Tropical Indian Ocean : a gradient from west (neutral) to East (warm anomaly)

I.2. ATMOSPHERE

I.2.a General Circulation

Velocity Potential Anomaly field in the high troposphere (fig. 1.2.1 – insight into Hadley-Walker circulation anomalies) :
In the tropics (~10°N), we can see a wavenumber-2 pattern. The MJO Index was significant during this month (mostly phase 1 and 2, during the 2nd half of the month), it could explain the main patterns of velocity potential anomaly field.
On the Pacific : strong convergent circulation anomaly in the Western part (~10°N) and strong divergent circulation anomaly (upward anomaly motion) in the Eastern part, around 10°N/120°W. These anomalies were quite persistent during the whole month, probably explained by the MJO activity (which favours upward motion East of this area in phase 1 and 2). Note that these anomalies are not correlated with SST anomalies.

On the Atlantic : Divergent circulation anomaly (upward anomaly motion) over Northern Africa. It is consistent with MJO activity. This anomaly extends to Middle East and Western Indian Ocean.
On the Indian Ocean : contrast between West (upward anomaly) and East (downward anomaly), consistent with MJO activity but not with SST (see DMI).
Globally, these inconsistencies between SST anomalies and velocity potential anomalies could be interpreted as a bad Ocean-Atmosphere coupling.

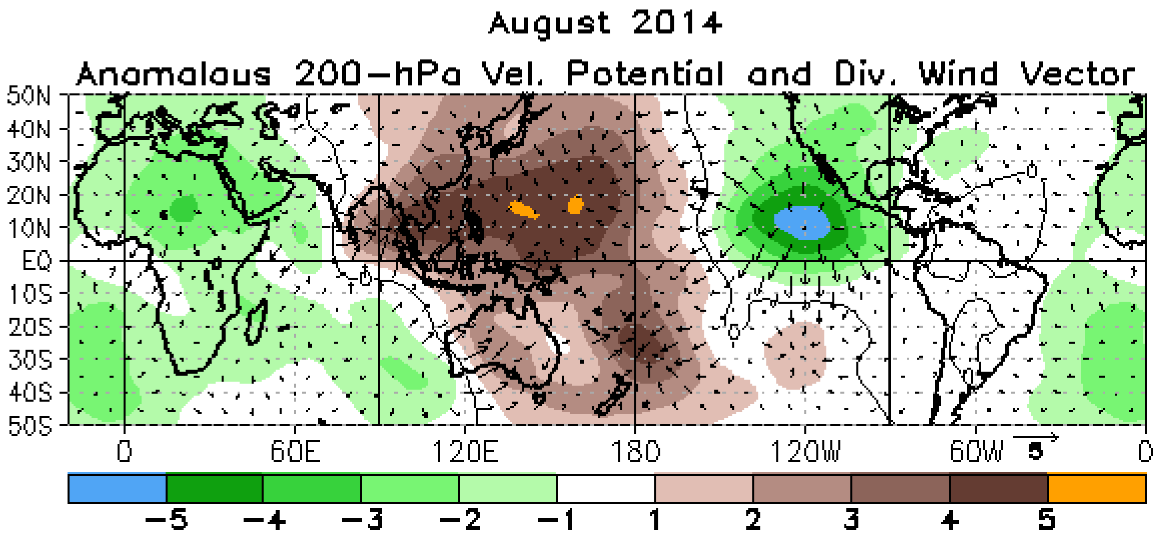


fig.I.2.1: Velocity Potential Anomalies at 200 hPa and associated divergent circulation anomaly. Green (brown) indicates a divergence-upward anomaly (convergence-downward anomaly).
http://www.cpc.ncep.noaa.gov/products/CDB/Tropics/figt24.shtml

Stream Function anomalies in the high troposphere (fig. 1.2.2 – insight into teleconnection patterns tropically forced) :

In the northern subtropics (~30°N), we can detect a wavenumber-2 pattern, shifted from velocity potential anomaly wave pattern. These high troposphere circulation anomalies could be linked to the persistent tropical forcings we have detected previously, especialy in Northern Pacific

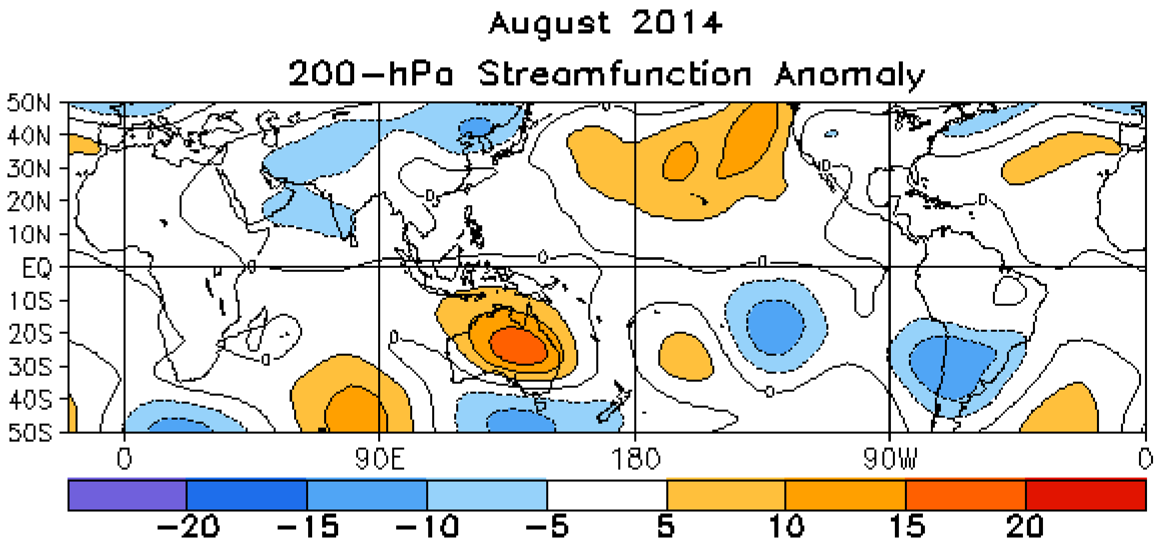


fig.I.2.2: Stream Function Anomalies at 200 hPa.
http://www.cpc.ncep.noaa.gov/products/CDB/Tropics/figt22.shtml

Geopotential height at 500 hPa (fig. 8 – insight into mid-latitude general circulation) :

Even if the tropics could have influenced subtropical circulations in Northern hemisphere, it seems that the main Z500 anomalies above 30°N are due to high latitude circulation. At the most, tropics could have favoured certain mid-latitude patterns (for example, positive anomalies along 30°N over Pacific Ocean, and negative anomalies over USA extending to Western Atlantic). This could be interpreted as a tropical contribution to negative NAO.

The main active modes (N. hemisphere) are NAO (strongly negative), PNA (positive), EATL/WRUS (neg.) and polar Eurasia (pos.). Note that only Pacific modes (PNA and WP) have been a little stable since last month.

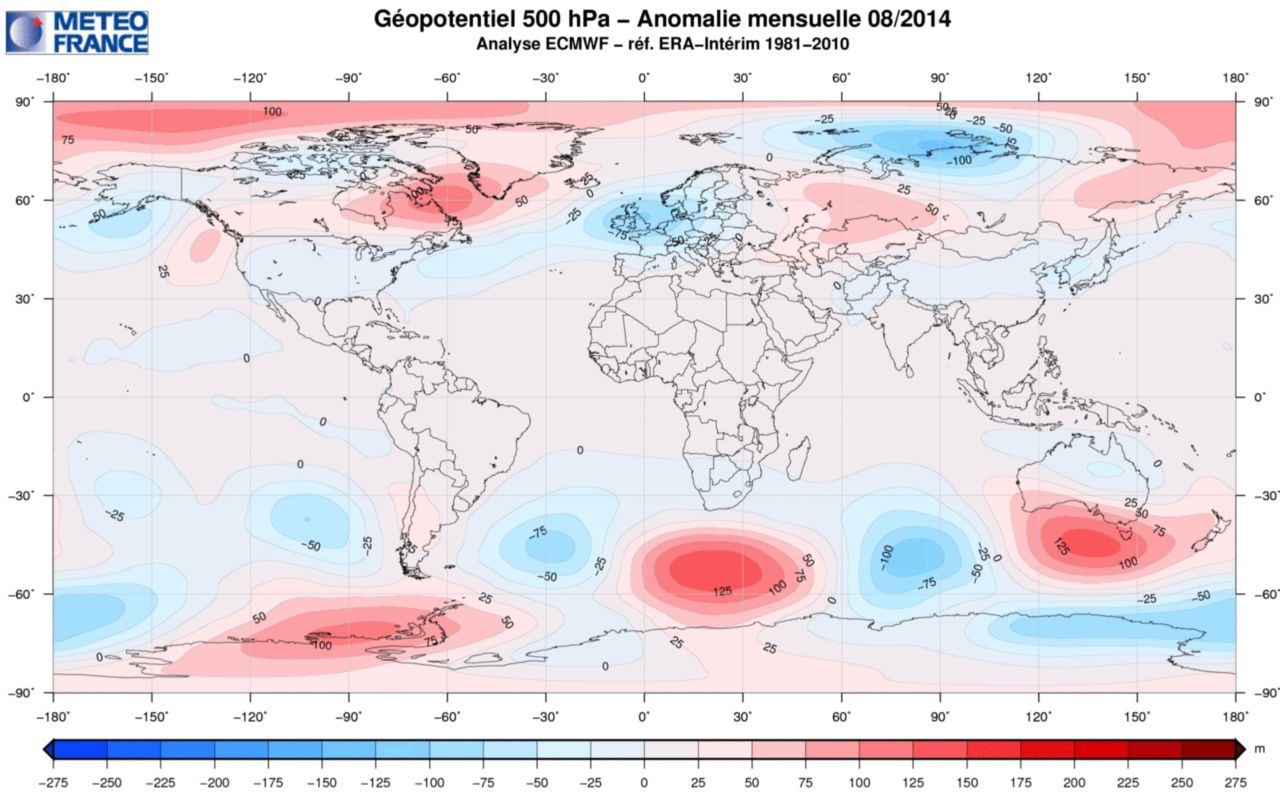


fig.I.2.3: Anomalies of Geopotential height at 500hPa (Meteo-France)

MONTH	NAO	EA	WP	EP-NP	PNA	TNH	EATL/WRUS	SCAND	POLEUR
AUG 14	**-2.3**	**0.8**	**-0.8**	**-1.0**	**1.3**	**---**	**-1.7**	**-0.6**	**1.6**
JUL 14	0.2	0.6	-1.6	0.3	0.5	---	-0.3	1.6	-0.9
JUN 14	-0.7	-1.0	-0.3	-0.7	-1.4	---	0.0	0.2	-0.0
MAY 14	-0.8	0.4	-0.9	0.8	-0.6	---	-1.4	-0.5	1.0
APR 14	0.2	0.5	-1.4	0.1	0.0	---	1.2	-0.7	1.0
MAR 14	0.4	0.9	-0.4	1.2	0.5	---	-0.1	-0.5	0.0

Evolution of the main atmospheric indices for the Northern Hemisphere for the last 6 months:
http://www.cpc.ncep.noaa.gov/products/CDB/Extratropics/table3.shtml

Sea level pressure and circulation types over Europe

The Icelandic low was shifted eastwards to a core position close to the Norwegian coast. This caused negative SLP anomalies over the North Sea, but positive anomalies around Iceland and Greenland. These anomalies, which were very different compared to July, were mainly caused by a strongly negative NAO pattern. The other patterns had a much weaker contribution in Europe.

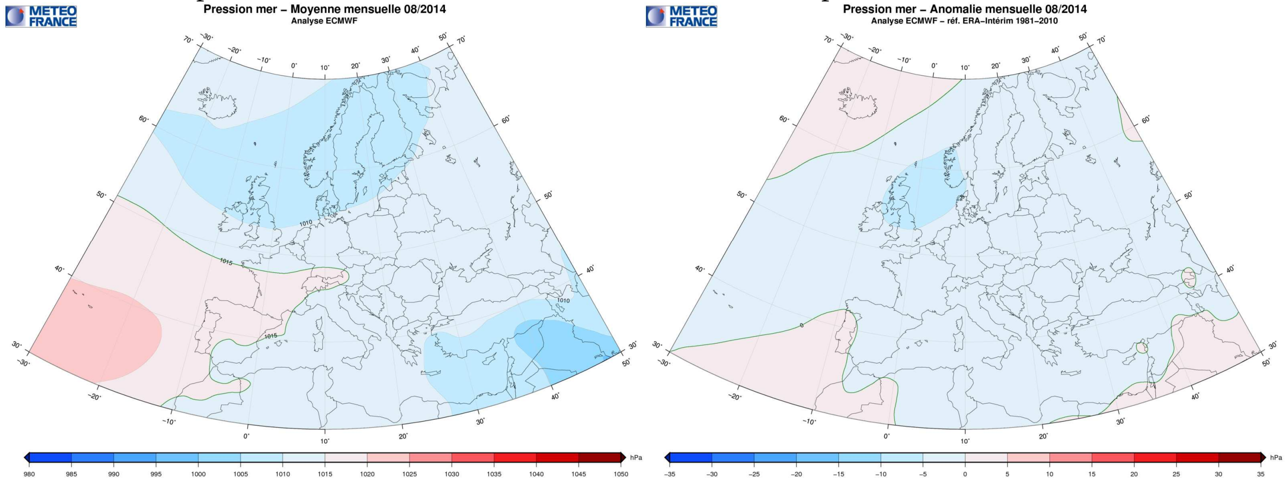


fig.I.2.4: Mean sea level pressure in the RA VI Region (Europe) (left) and 1981-2010 anomalies (right).

Circulation indices: NAO and AO

NAO was negative during the whole month with a peak in the middle of August. This means that the change of circulation from July to August started already at the beginning of August, developed further then and weakened at the end of the month. The AO did not follow this evolution and had a much weaker variability than NAO, supporting that these circulation anomalies were rather a regional than a global phenomenon.

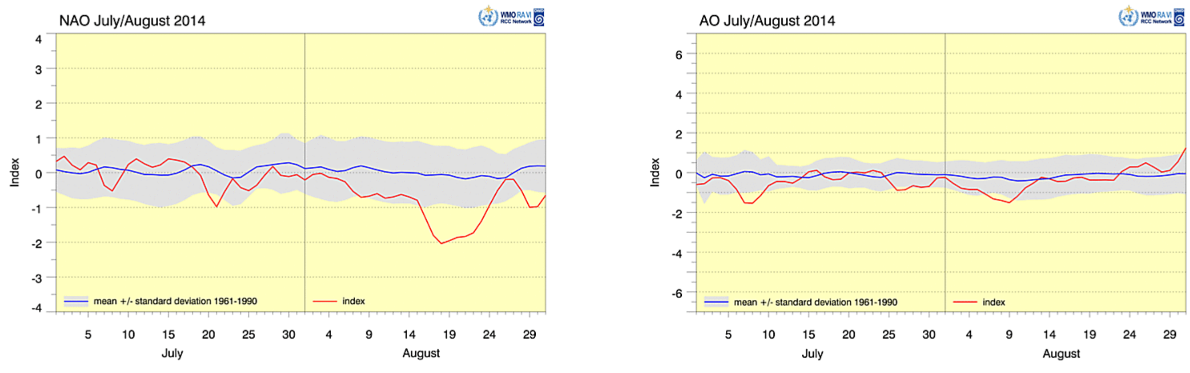


fig.I.2.5: North Atlantic Oscillation (NAO, upper graph) and Arctic Oscillation (AO, lower graph) indices with 1961-1990 mean standard deviation (shading). http://www.dwd.de/rcc-cm , data from NOAA CPC: http://www.cpc.ncep.noaa.gov/products/precip/CWlink/daily_ao_index/teleconnections.shtml

I.2.b Precipitation

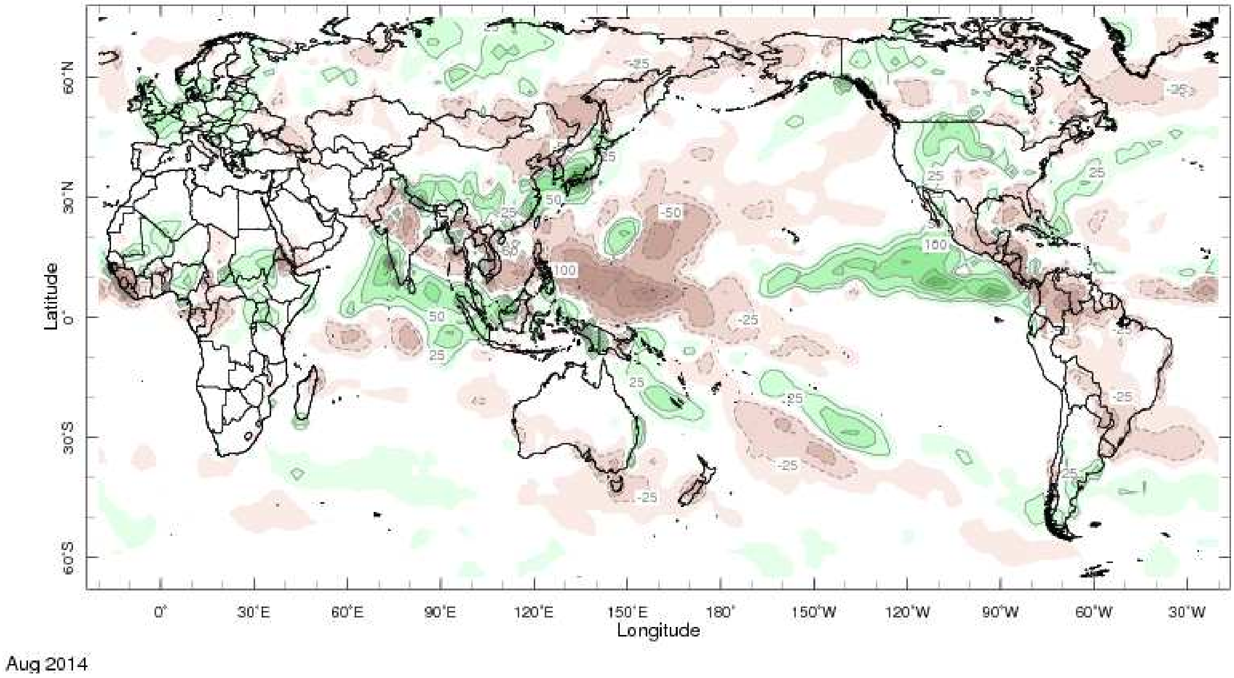


fig.I.2.4: Rainfall Anomalies (mm) (departure to the 1979-2000 normal) – Green corresponds to above normal rainfall while brown indicates below normal rainfall.
http://iridl.ldeo.columbia.edu/maproom/.Global/.Precipitation/Anomaly.html

Intertropical zones (including sub-tropics) : good consistency with the Velocity Potential anomalies : along the equatorial waveguide (+) in the Eastern Pacific, in contrast with Western Pacific (-) up to India.. Note the S/N contrast in Indian Ocean between North (-) and South (-). Northern South America an Carabean region were globally drier then normal (-). Contrast in West Africa between coastal (-) and inland (+) areas.
Mid-latitudes : mostly wetter than normal over Europe, South China and USA.

Precipitation anomalies in Europe:
The relocation of low pressure anomalies to the North Sea / Europe region favoured quite high precipitation anomalies in large parts of Europe. The 90th percentile was exceeded in some areas, especially northern France / Belgium and southern Sweden.

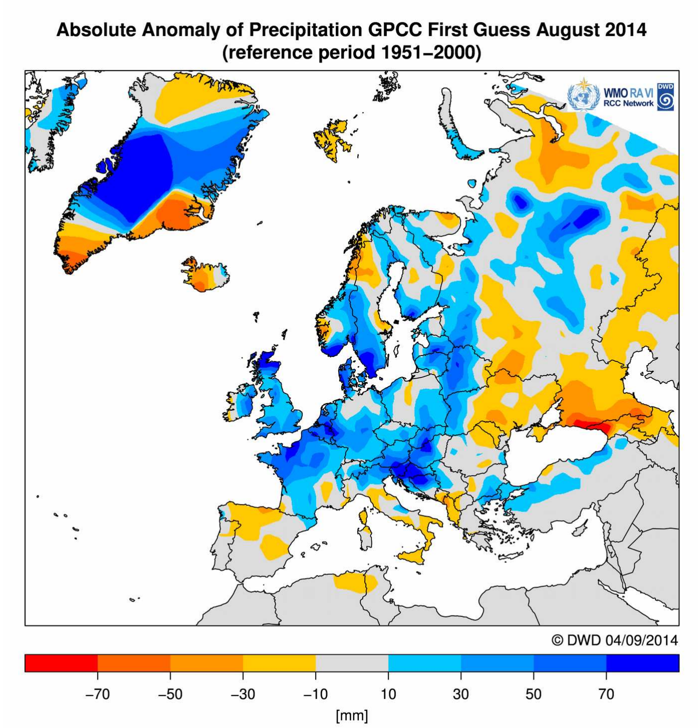


fig.I.2.5: Left: Absolute anomaly (1951-2000 reference) of precipitation in the RA VI Region (Europe), data from GPCC (Global Precipitation Climatology Centre), http://www.dwd.de/rcc-cm. Right: Percentiles of precipitation, 1981-2010 reference. Data from NOAA Climate Prediction Center, http://iridl.ldeo.columbia.edu/maproom/Global/Precipitation/Percentiles.html

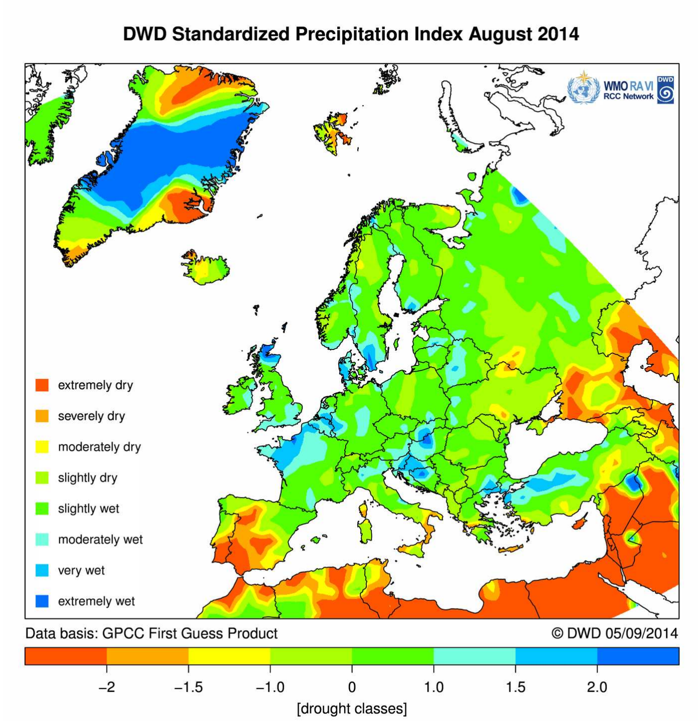


fig. I.2.5a: Standardized Precipitation Index with DWD modification (DWD-SPI), http://www.dwd.de/rcc-cm .

Subregion	Absolute anomaly	Relative of 1951-2000 normal	SPI DWD Drought Index
Northern Europe	+26.8 mm	135.9 %	+0.683
Southern Europe	+7.6 mm	95.1%	-0.094

Monthly mean precipitation anomalies in European subregions. Subregions refer to ECMWF land boxes defined in Annex III.3. Anomalies are based on gridded data from GPCC First Guess Product, ftp://ftp-anon.dwd.de/pub/data/gpcc/PDF/GPCC_intro_products_2008.pdf, 1951-2000 reference.

I.2.c Temperature

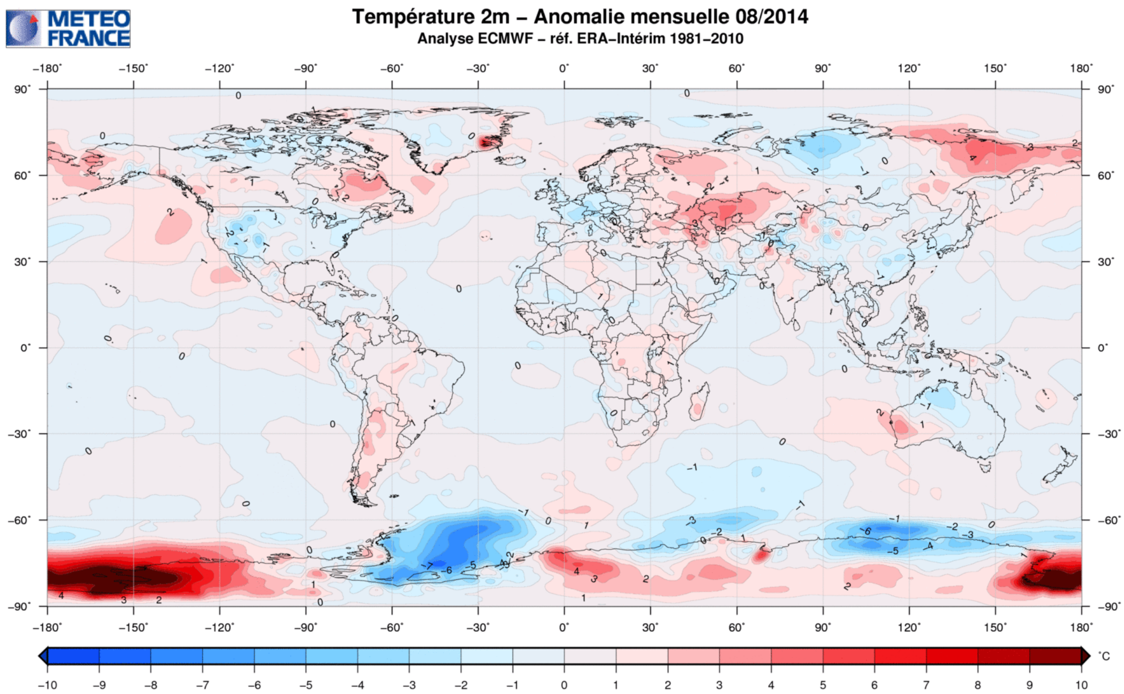


fig.I.2.6: Temperature Anomalies (°C) (Meteo-France)

Strong negative anomaly over Western Europe. Positive anomaly over Scandinavia., Eastern Europe, Russia, Middle East and Eastern Africa. Positive anomaly over Northern Pacific, Alaska and East Siberia. Warm anomaly over South America and NE Canada, Labrador and Greenland.

<u>Temperature anomalies in Europe:</u>

Low pressure anomalies also caused a cool month of August in most of Europe, except the east, where subtropical warm air masses reached even northern regions.

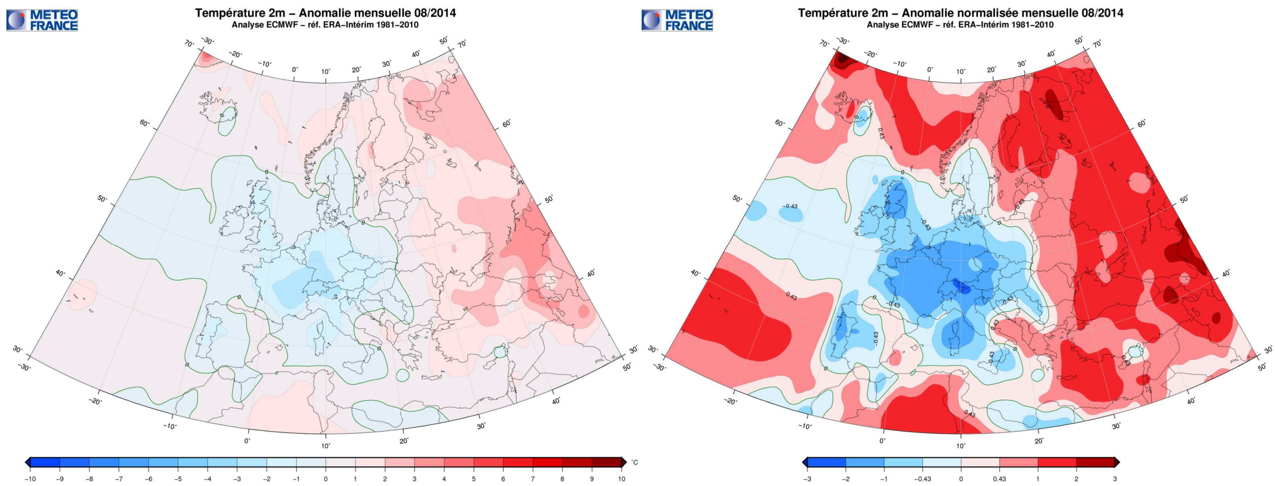


fig.I.2.7: Left graph: Absolute anomaly of temperature in the RA VI Region (Europe). Right graph: Standardized temperature anomalies

Subregion	**Anomaly**
Northern Europe	+0.9°C
Southern Europe	+0.8°C

Monthly mean temperature anomalies in European subregions: Subregions refer to ECMWF land boxes defined in Annex III.3. Anomalies are based on gridded CLIMAT data from DWD, http://www.dwd.de/rcc-cm, 1961-1990 reference.

I.2.dSea ice

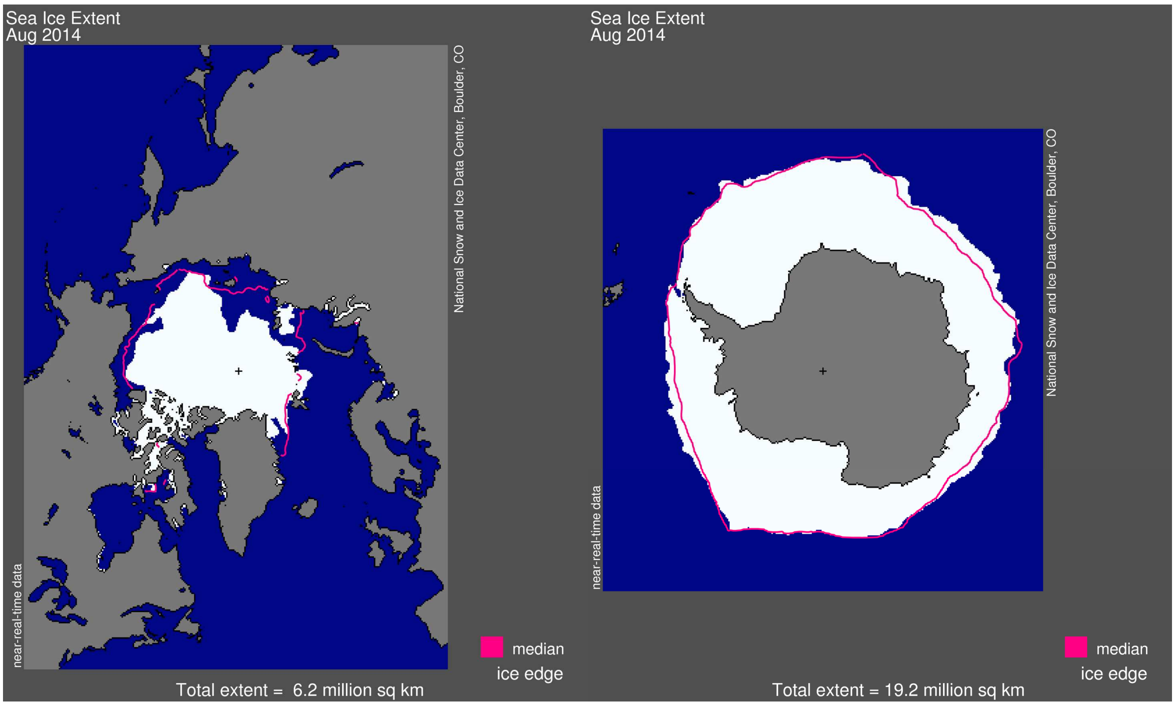


fig.I.2.6: Sea-Ice extension in Arctic (left), and in Antarctic (right). The pink line indicates the averaged extension (for the 1979-2000 period). http://nsidc.org/data/seaice_index/

In Arctic (fig. 1.2.6 and 1.2.7 - left) : well below normal sea-ice extension (negative anomaly close to 2 standard deviation).
In Antarctic (fig. 1.2.6 and 1.2.7 - right) : well above normal sea-ice extension anomaly with some large regional modulation.

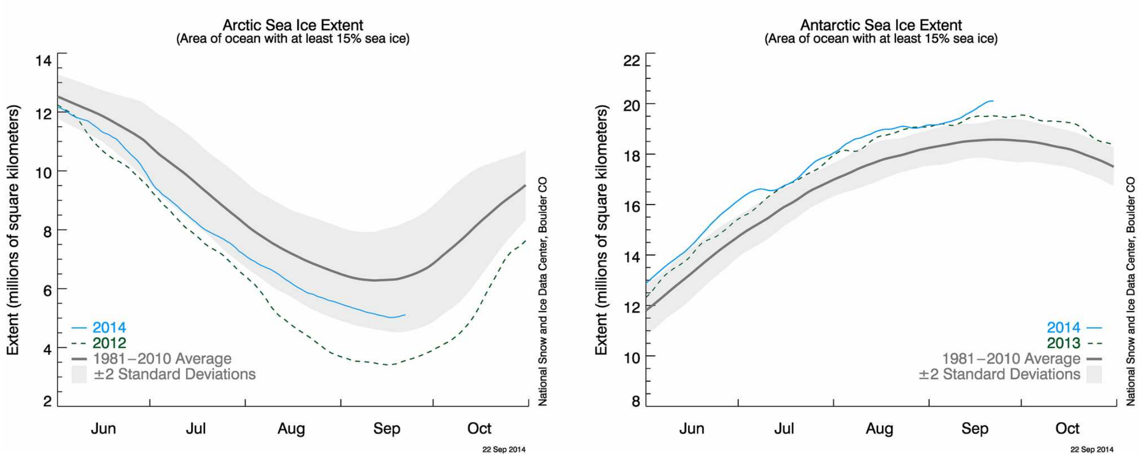


fig. I.2.7 : Sea-Ice extension evolution from NSIDC.
http://nsidc.org/data/seaice_index/images/daily_images/N_stddev_timeseries.png

II. SEASONAL FORECASTS FOR OND FROM DYNAMICAL MODELS

II.1.OCEANIC FORECASTS

II.1.a Sea surface temperature (SST)

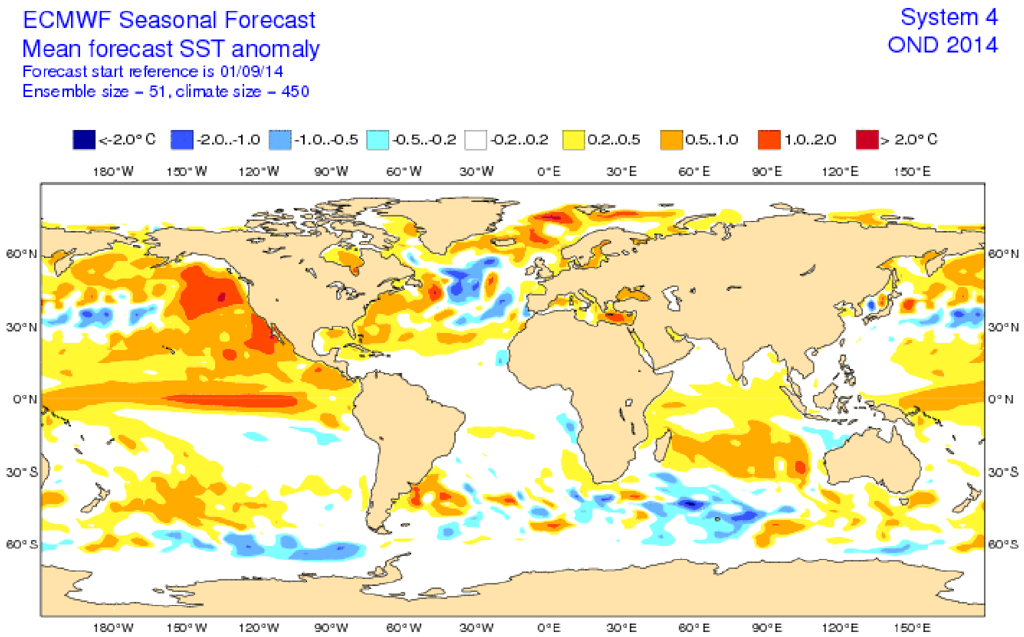


fig.II.1.1: SST anomaly forecast from ECMWF
http://www.ecmwf.int/products/forecasts/d/charts/seasonal/forecast/seasonal_range_forecast/group/

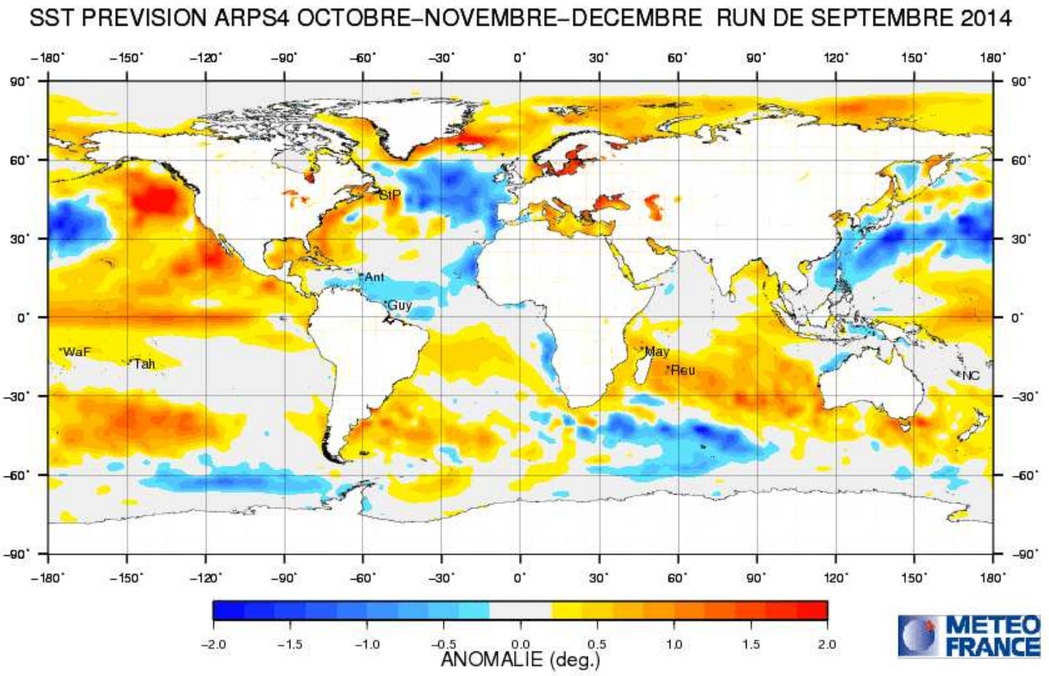


fig.II.1.2: SST Anomaly forecast from Meteo-France (recalibrated with respect of observation).
http://elaboration.seasonal.meteo.fr

<u>For the 2 individual models :</u>
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), fairly consistent SST forecasts (taking into account the hindcast period differences), over both Hemispheres.
Pacific : Clear warmer than normal conditions in the equatorial waveguide. The positive anomaly extends beyond the dateline in both models. Negative anomalies in the Western Tropics in MF. (probably linked to hindcast issues). Positive anomalies over the Half Eastern North Pacific and negative in the North Western Pacific in both models.
Atlantic : equatorial waveguide close to normal, even in the Guinean Gulf, in both models. Negative anomalies in the Northern tropics with MF (probably linked to hindcast issues) on the Western side. Colder than normal conditions in the Northern mid-latitudes.
Indian Ocean : Warmer than normal conditions in the equatorial waveguide and Southern hemisphere. IOD close to 0.

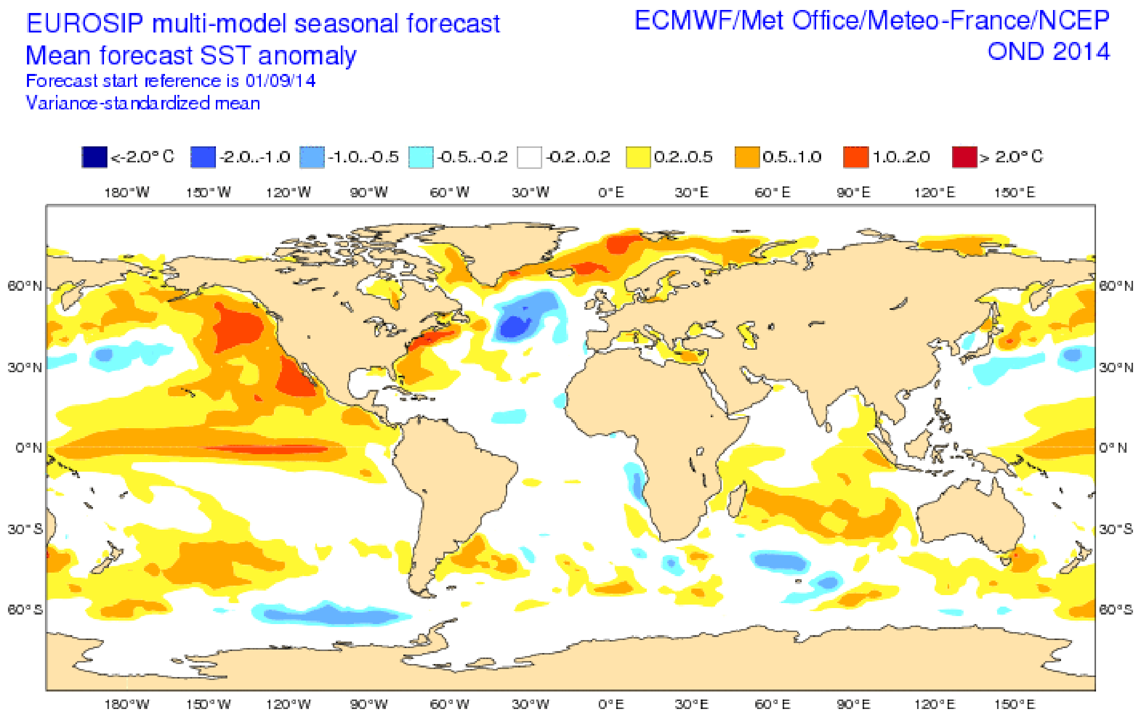


fig.II.1.3: SST Forecasted anomaly from Euro-SIP

In Euro-SIP :
Some robust patterns appear in the tropics everywhere to the exception of the Atlantic. The same comments than for the individual models, EUROSIP anomalies are very close to ECMWF anomalies.

II.1.b ENSO forecast :

Forecasted phase: weak to moderate positive phase for OND

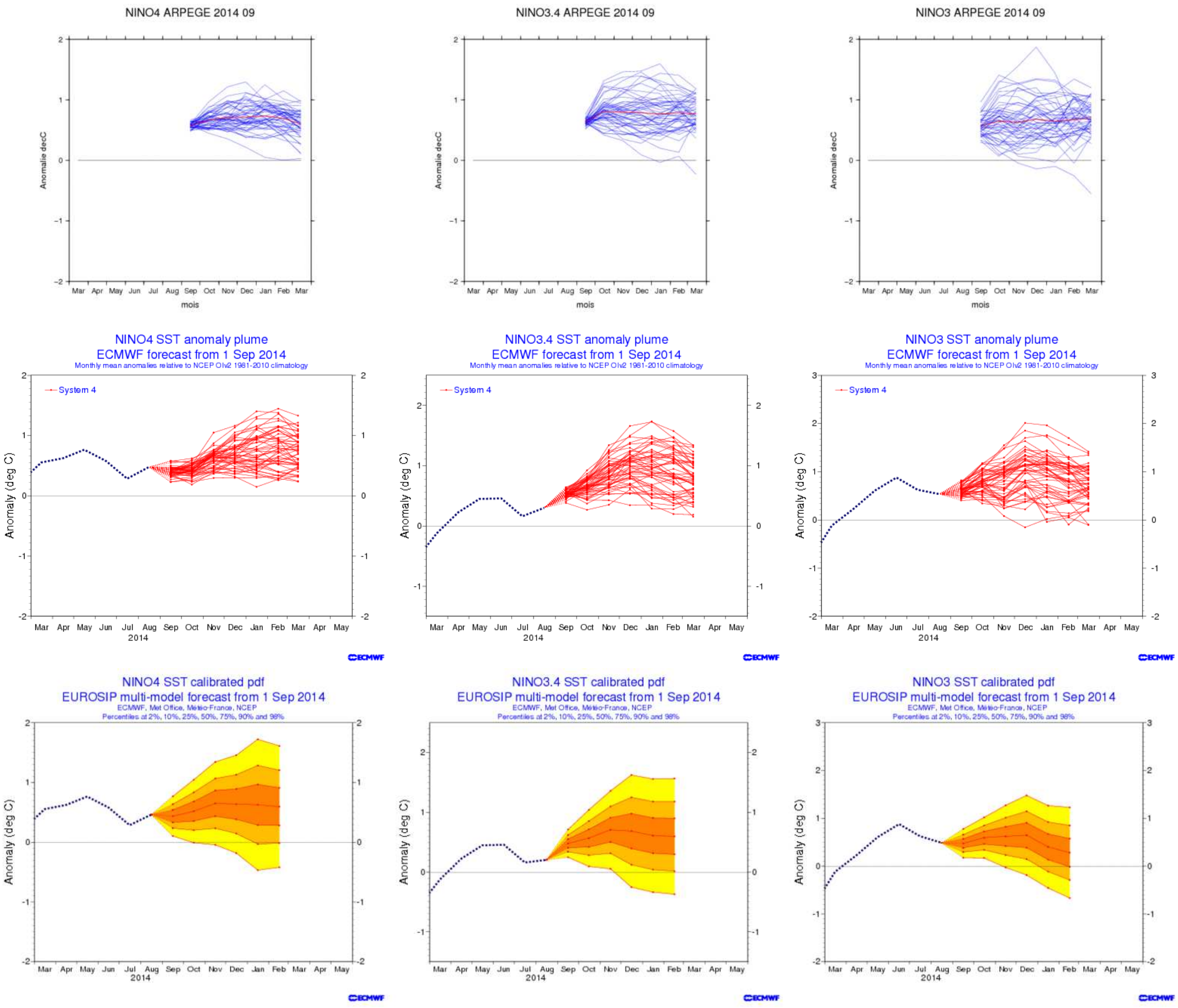


fig.II.1.5: SST anomaly forecasts in the Niño boxes from Météo-France (top) and ECMWF (middle) - monthly mean for individual members - and EuroSIP (bottom) – recalibrated distributions - (http://elaboration.seasonal.meteo.fr , http://www.ecmwf.int/)

Plumes from Météo-France and ECMWF for the 3 Niño boxes (see definition in Annex – fig. II.1.5) : ood consistency for the next 3 season, with increasing SST anomalies, rather in the Central Pacific. The maximum in Nino3.4 box is expected at the end of the year, with a weak probability to exeed +1°C.

II.1.c Atlantic ocean forecast

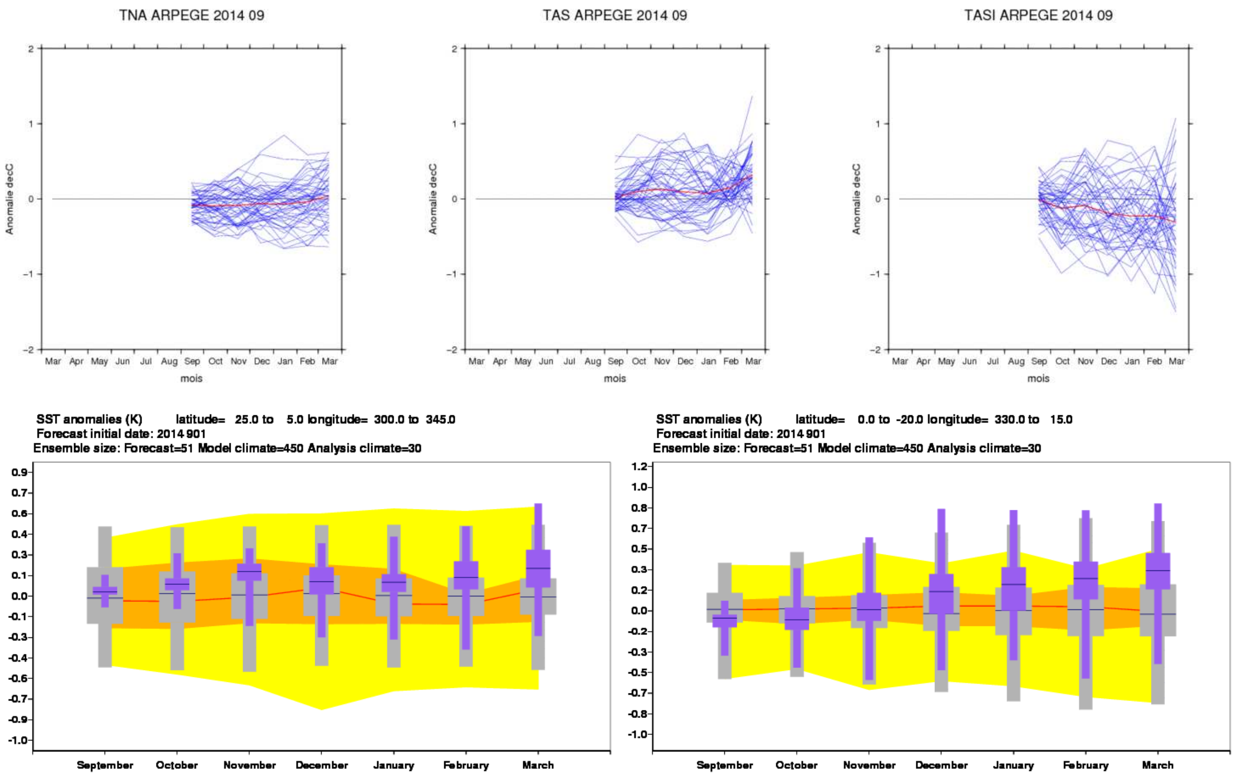


fig.II.1.6: SSTs anomaly forecasts in the Atlantic Ocean boxes from Météo-France and ECMWF, plumes / climagrams correspond to ensemble members and monthly means.

Poor consistency between the 2 models over the targeted period.
North Tropical Atlantic : close to normal conditions with MF, positive with ECMWF.
South Tropical Atlantic : close to normal
TASI : in MF, the TASI index is negative for OND.
Guinean Gulf : close to 0 in MF.

II.1.d Indian ocean forecasts

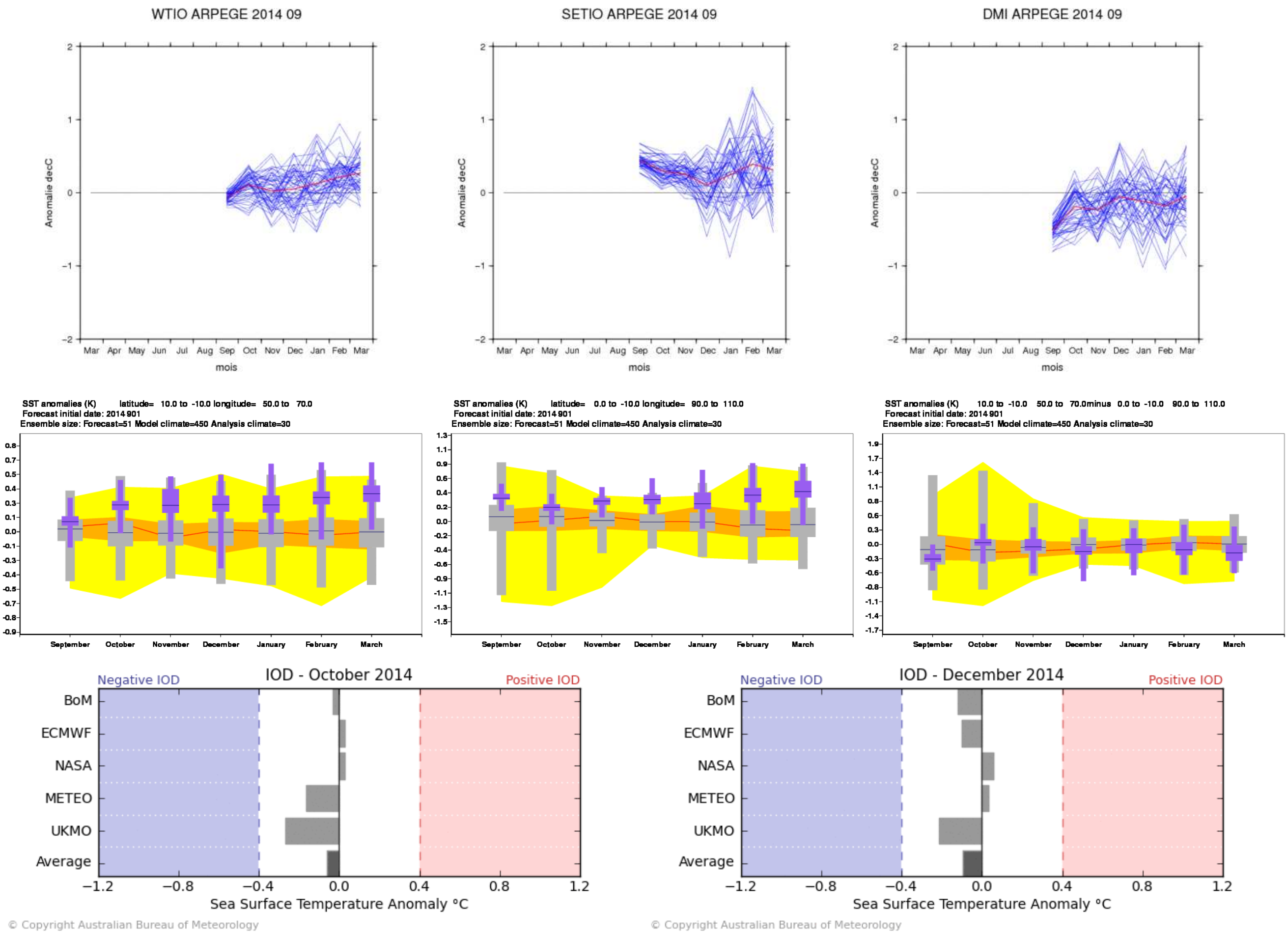


fig.II.1.7: SSTs anomaly forecasts in the Indian Ocean boxes from Météo-France and ECMWF, plumes / climagrams correspond to ensemble members and monthly means.

Quite consistent behaviour between the 2 models.
In WTIO : warmer than normal in ECMWF, normal in MF.
In SETIO : Above normal conditions.
DMI (IOD) : close to normal

II.2.GENERAL CIRCULATION FORECAST

II.2.a Global forecast

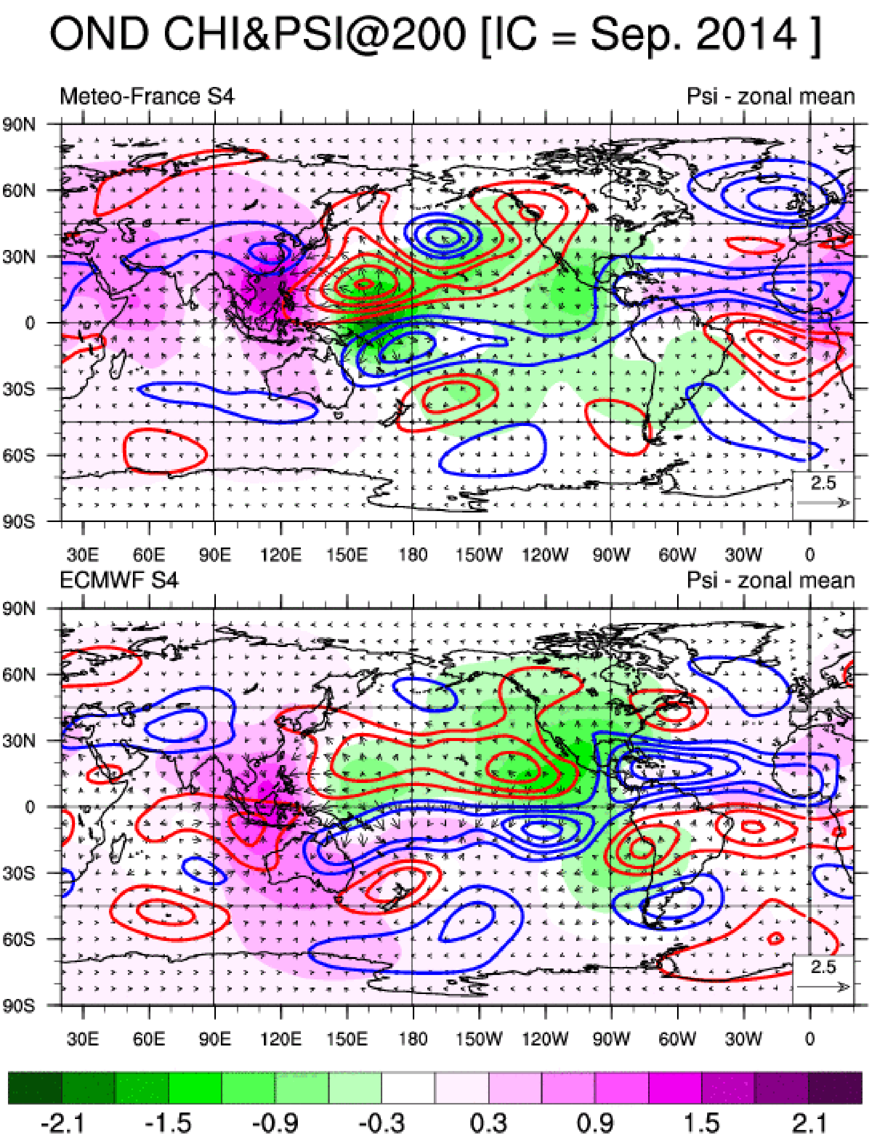


fig.II.2.1: Velocity Potential anomaly field χ (shaded area – green negative anomaly and pink positive anomaly), associated Divergent Circulation anomaly (arrows) and Stream Function anomaly ψ (isolines – red positive and blue negative) at 200 hPa by Météo-France (top) and ECMWF (bottom).

<u>Velocity potential anomaly field (cf. fig. II.2.1 – insight into Hadley-Walker circulation anomalies) :</u>
Globally a quite good consistency between the models in the Tropical Pacific patterns, but some differences of intensity.
Over the Pacific, 2 upward anomaly poles, on each side of the basin. In ECMWF (and JMA), the strongest one is the Western one, in MF it is the opposite.
Over the Atlantic, quite consistent response (Convergent circulation anomaly - downward anomaly motion) over the African continent North to the Equator with some extension over the Atlantic in the vicinity of the Equator.

Over the Indian Ocean : convergent circulation anomaly in both models over the Eastern Equatorial region, Southward up to Austalia, Northward up to India. Some differences over Western Indian Ocean (African coasts).
Stream Function anomaly field (cf. fig. 19 – insight into teleconnection patterns tropically forced) :
In MF, traces of teleconnexions from the Western Pacific up to Western Canada. This is also visible (but weaker) in ECMWF and JMA. Some similarities over Northern Atlantic and western Europe.
As a conclusion **the predictability** likely exists in the vicinity of the Pacific basin and in the tropics in the vicinity of the Atlantic sector and Eastern Indian basin. Over mid-latitudes regions of the Northern Hemisphere, some teleconnexions are visible from tropical Pacific, but we still have this difference between models concerning the dominant upward anomaly pole. Over Northern Atlantic and Europe, the dominant circulation anomaly patterns are resembling between models, but with shifted positions.

II.2.bNorth hemisphere forecast and Europe

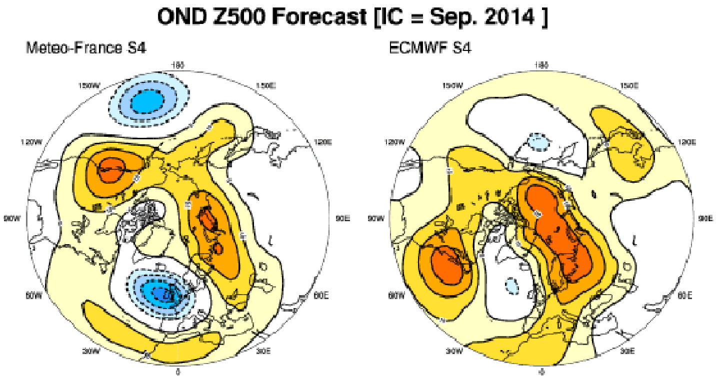


fig.II.2.2: Anomalies of Geopotential Height at 500 hPa from Météo-France (left) and ECMWF (right).
http://www.ecmwf.int/products/forecasts/d/charts/seasonal/forecast/eurosip

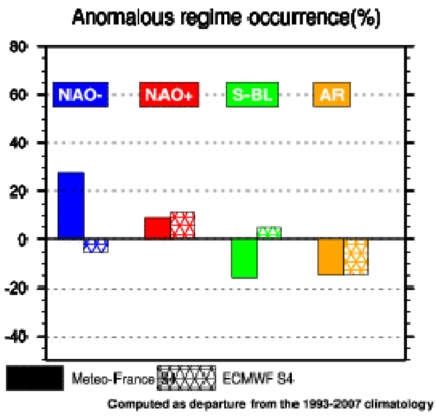


fig.II.2.3: North Atlantic Regime occurrence anomalies from Meteo-France and ECMWF : vertical bars represent the excitation frequency anomaly (in %) for each of the 4 regimes.

Geopotential height anomalies (fig. II.2.3 – insight into mid-latitude general circulation anomalies) :
Low anomaly over the western façade of Europe and a ridge anomaly over Central Europe.
North Atlantic Circulation Regimes (fig. 21) :
Low consistency in the regime forecasts. A deficit of Atlantic ridge and increased number of NAO+ regimes.

II.3. IMPACT : TEMPERATURE FORECASTS

II.3.a ECMWF

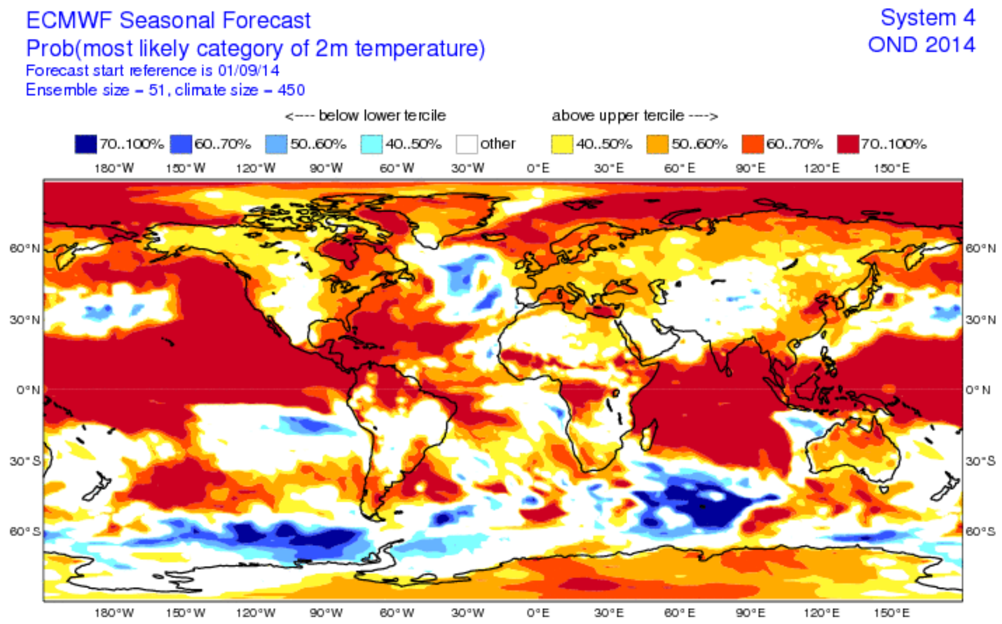


fig.II.3.1: Most likely category probability of T2m from ECMWF.

II.3.b Météo-France

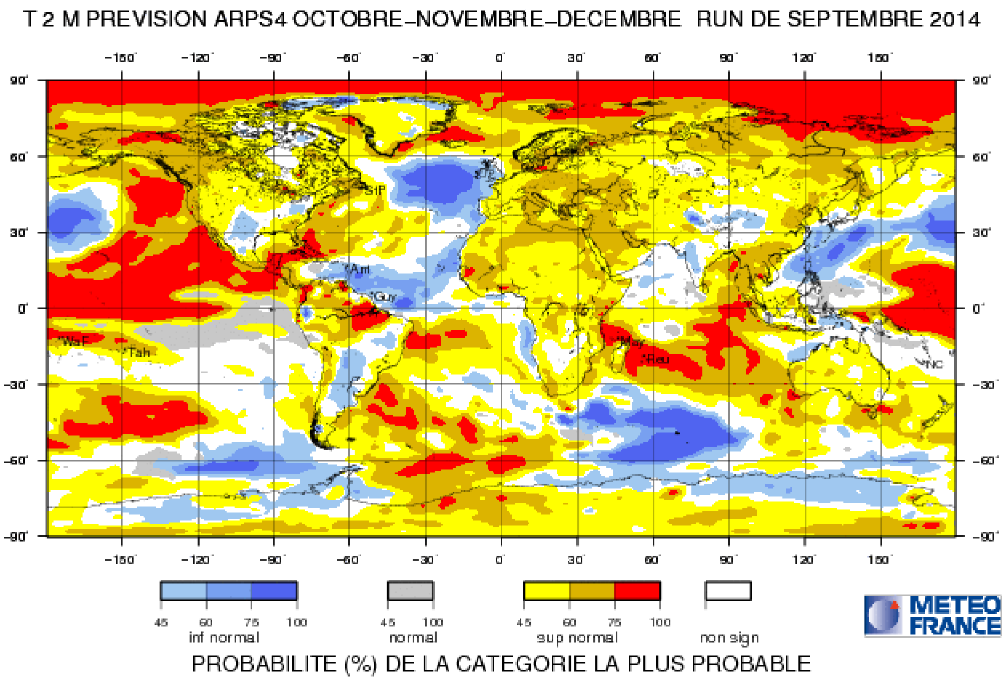


fig.II.3.2: Most likely category of T2m.

II.3.c Met Office (UKMO)

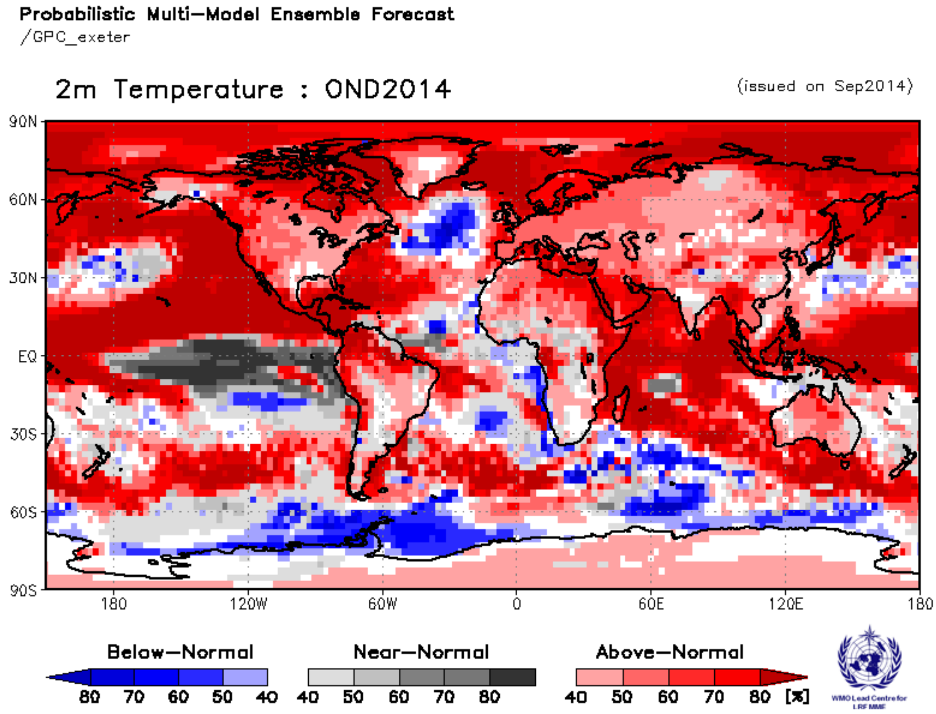


fig.II.3.3 : Most likely category of T2m from UK Met Office.

II.3.d Climate Prediction Centre (CPC)

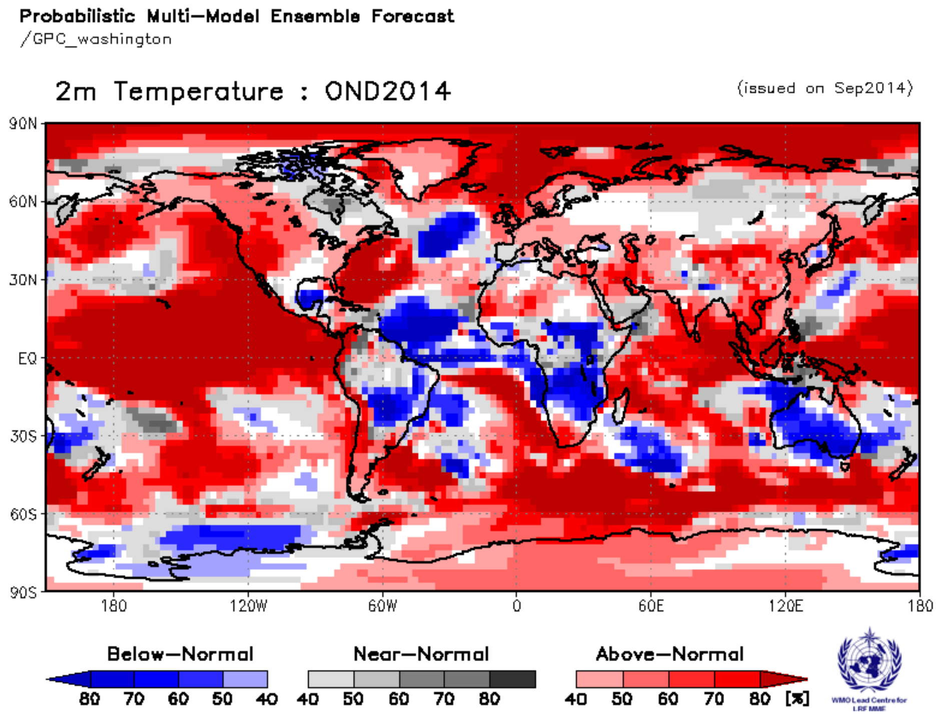


fig.II.3.4 : Most likely category of T2m from NCEP

II.3.e Japan Meteorological Agency (JMA)

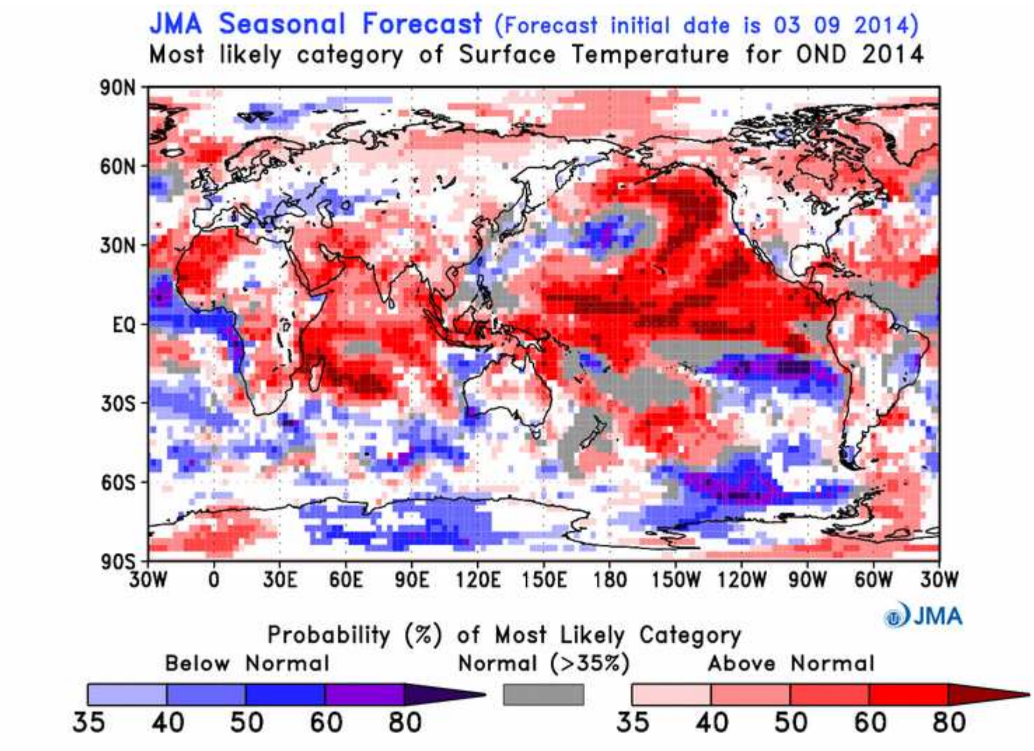


fig.II.3.5: Most likely category of T2m.

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

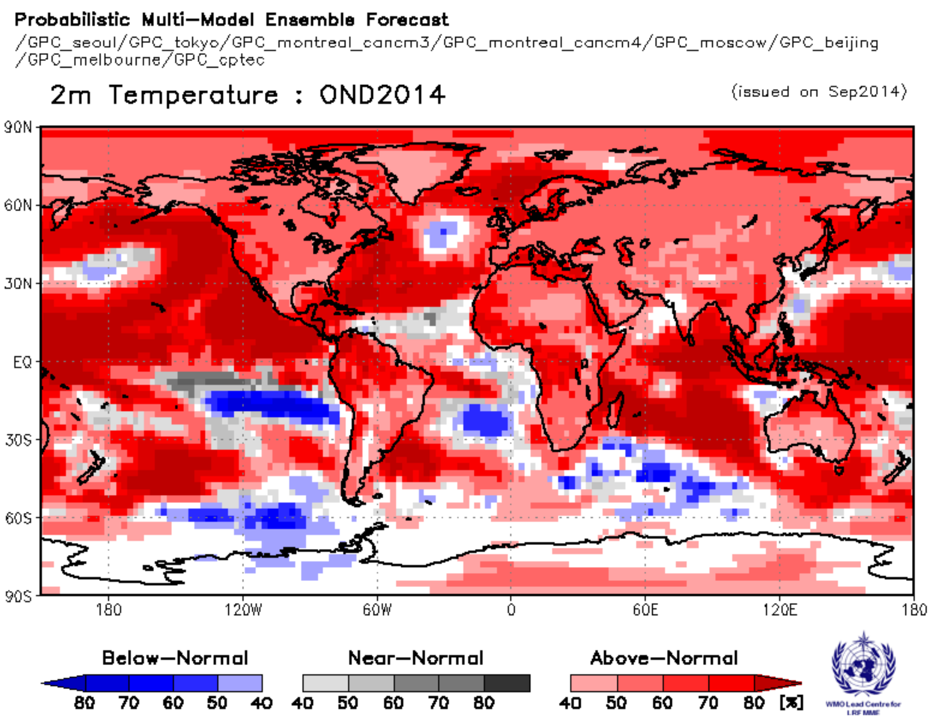


fig.II.3.6 : Most likely category of T2m from LC-MME.

II.3.g Euro-SIP

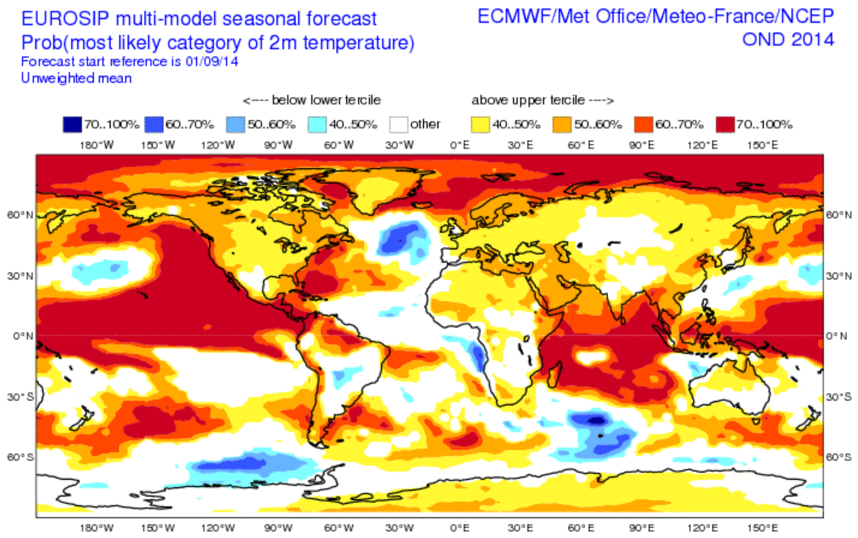


fig.II.3.7: Multi-Model Probabilistic forecasts for T2m from EuroSip

North-America : enhanced probabilities for warm anomalies, especially over the Western coast of USA.
Central-America : globally warmer than normal extending toward the North Caribbean.
South-America : Some consistent signal over the North part of the continent (warmer than normal).
Australia : warmer than normal
Asia : Mostly Warmer than normal conditions everywhere. Warmer than normal conditions over most of the Indian sub-continent (likely in relationship with a weak monsoon) and South-East Asia.
Africa : Mostly warmer than normal over most of the continent ; especially the North part.
Europe : warmer than normal signal over most of the continent.

II.4. IMPACT : PRECIPITATION FORECAST

II.4.a ECMWF

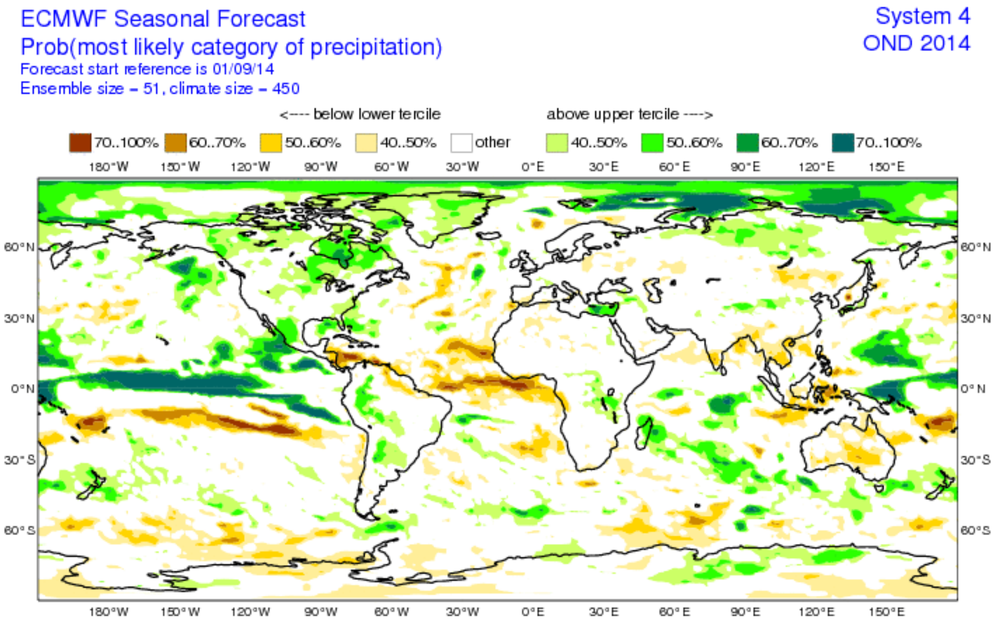


fig.II.4.1: Most likely category probability of rainfall from ECMWF.

II.4.b Météo-France

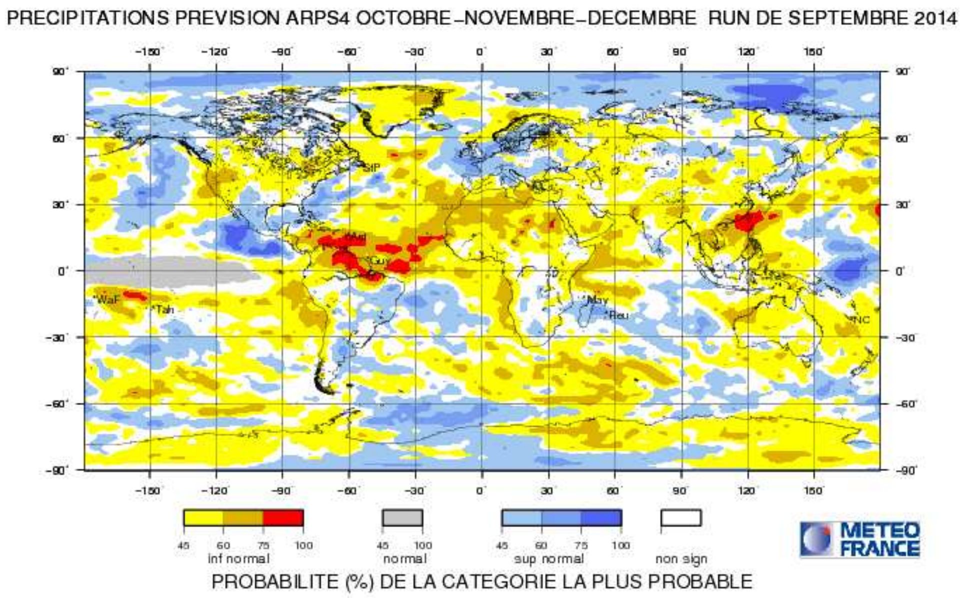


fig.II.4.2: Most likely category of Rainfall.

II.4.c Met office (UKMO)

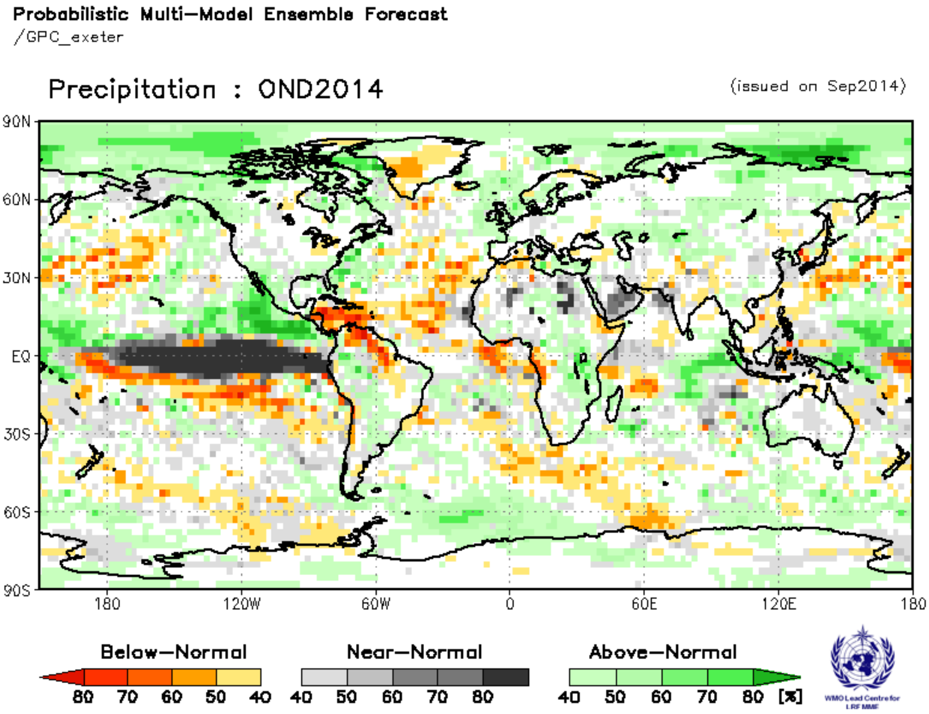


fig.II.4.3: Most likely category of Rainfall from UK Met Office.

II.4.d Climate Prediction Centre (CPC)

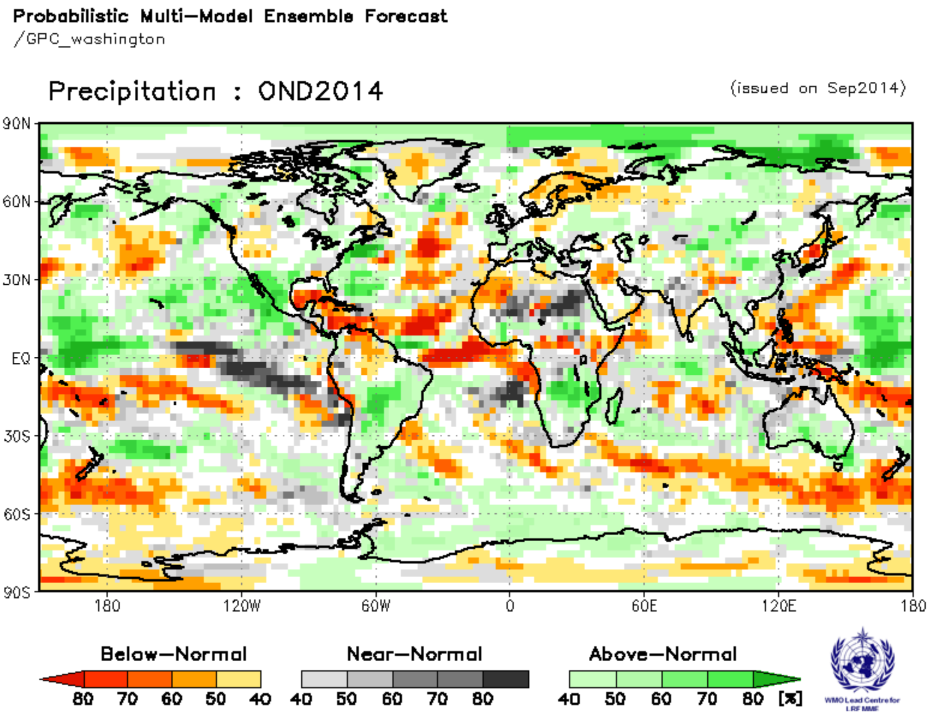


fig.II.4.4 : Most likely category of Rainfall from NCEP.

II.4.e Japan Meteorological Agency (JMA)

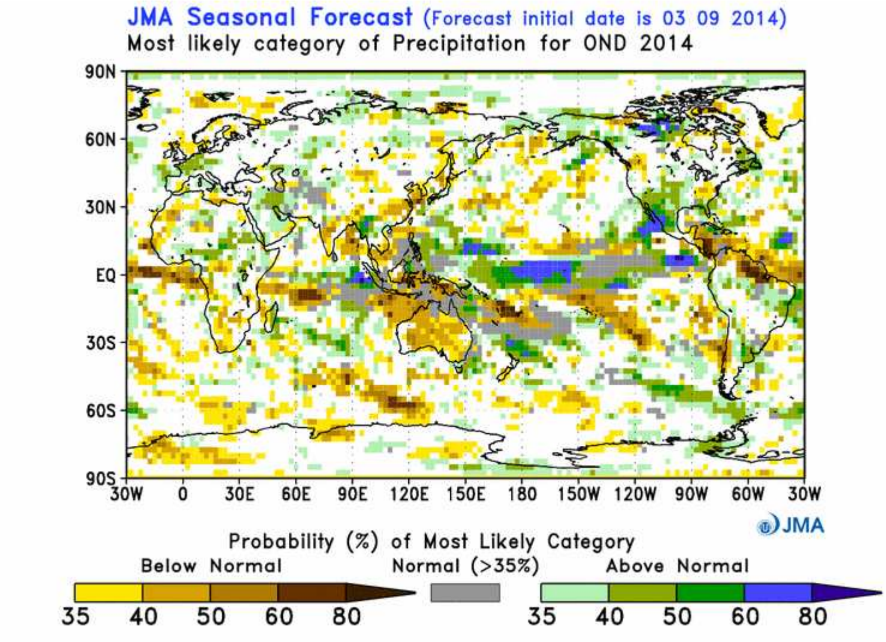


fig.II.4.5: Most likely category of Rainfall from JMA.

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

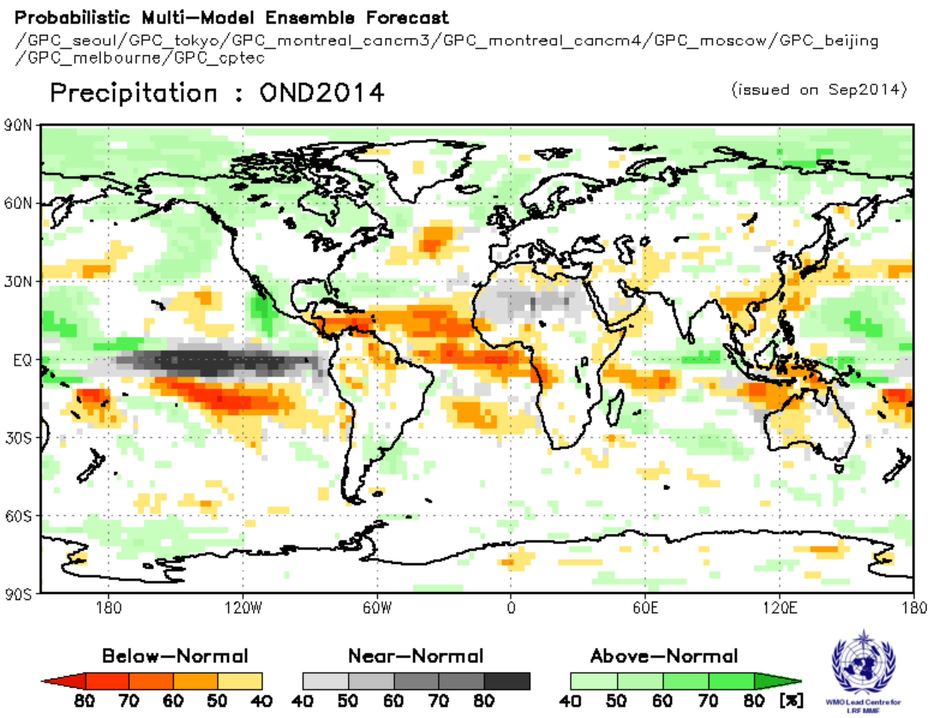


fig.II.4.6 : Most likely category of Rainfall from LC-MME.

II.4.g Euro-SIP

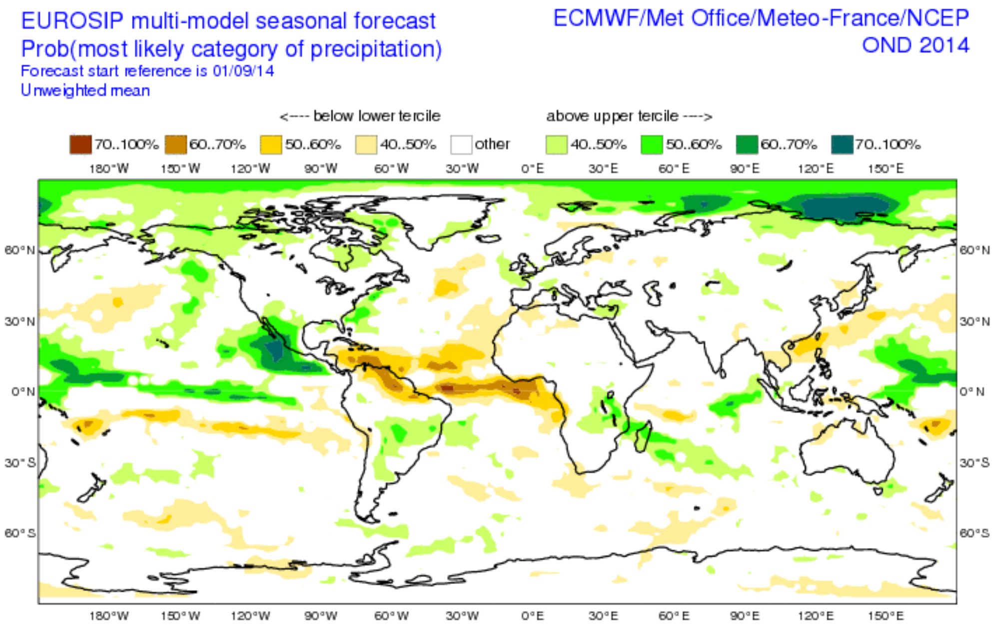


fig.II.4.7: Multi-Model Probabilistic forecasts for precipitation from EuroSip

In the Tropics : some consistent signal. Enhanced probabilities for wet scenarios across the Equatorial Pacific, over a large portion of South-America (Brazil, Argentina, Bolivia, …) and Central America (Western part). Enhanced probabilities for dry scenario over the Northern coastal areas of South America extending across the Caribbean. Uncertainty over the Maritime continent and Australia (likely dry).
For Europe : weak wet signal over western Europe.

II.5. REGIONAL TEMPERATURES

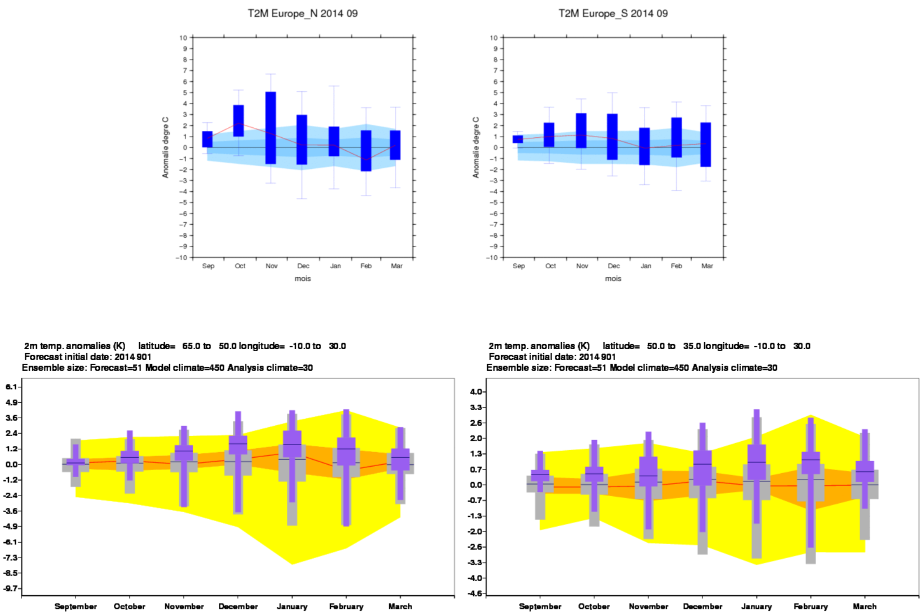


fig.II.5.1 : Climagrams for Temperaturel in Northern Europe (left) and in Southern Europe (right) from Météo-France (top) and ECMWF (bottom).

Good consistency between the two models (see discussion on Geopotential Height).
For Northern Europe : warm signal.
For Southern Europe : warm signal.

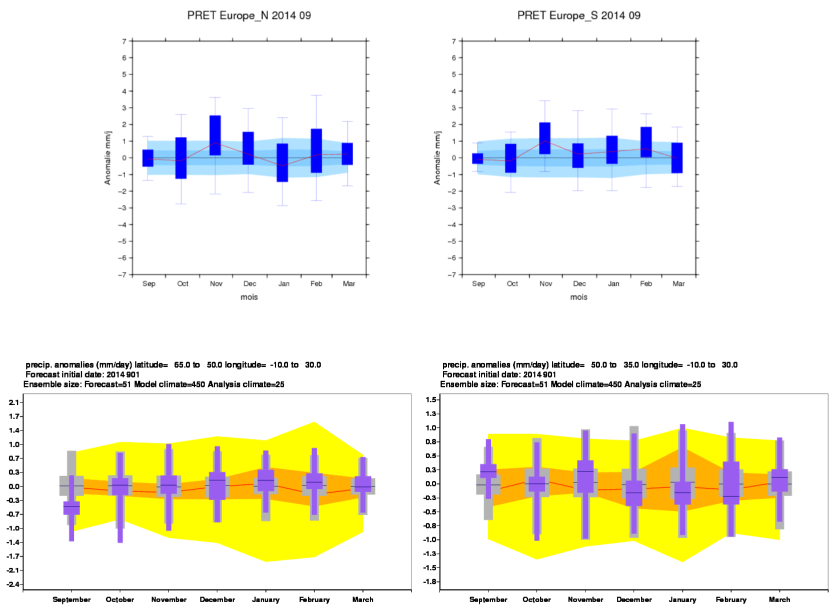


fig.II.5.2 : Climagrams for Rainfall in Northern Europe (left) and in Southern Europe (right) from Météo-France (top) and ECMWF (bottom).

No real signal in the models.

II.6. MODEL'S CONSISTENCY

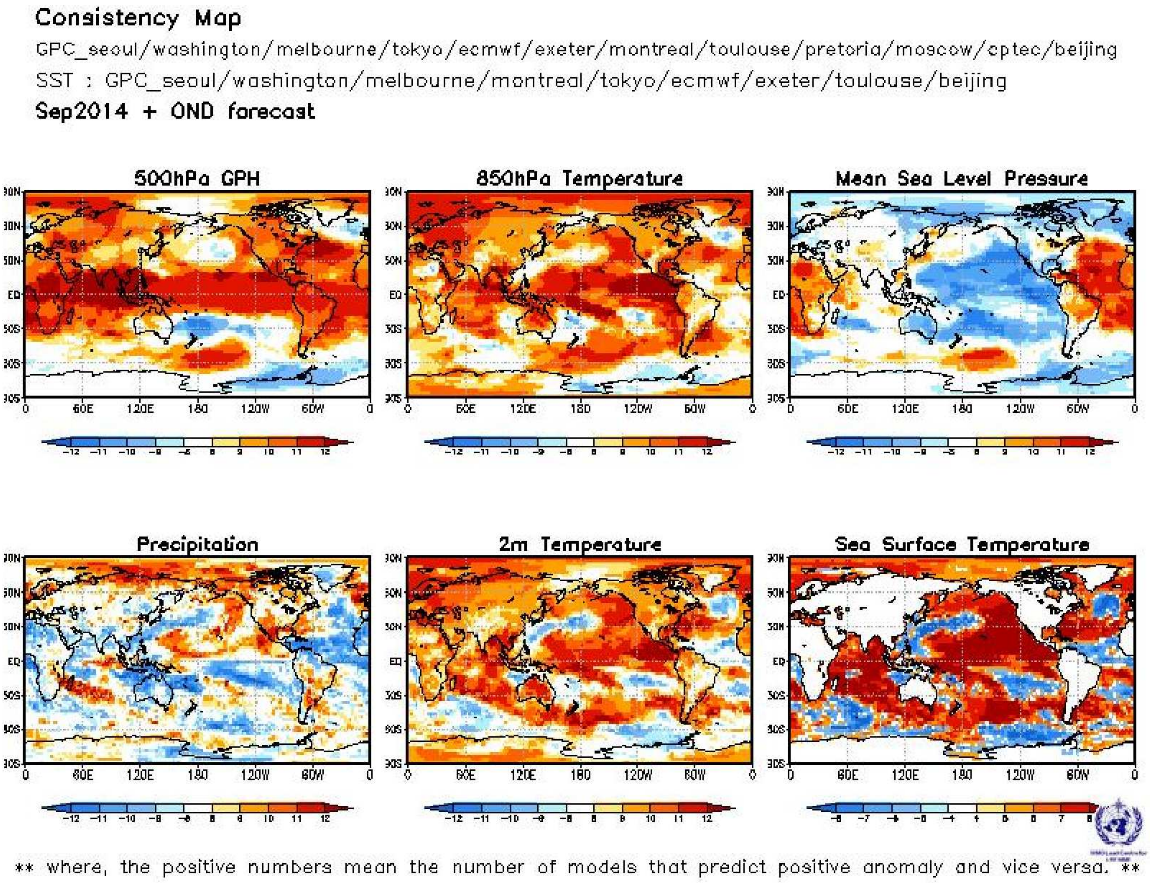


fig.II.6.1 : GPCs Consistency maps from LC-MME http://www.wmolc.org/

For SST : globally good consistency, even in mid-latitudes regions. Note the privileged cold signal in equatorial Atlantic, not obvious neither in MF and ECMWF neither in EUROSIP.
For Z500 : in the Northern Hemisphere, consistency for a EA mode pattern. Good consistency for positive anomaly over Central Europe and Eastern Pacific.
For T2m : more or less the same signal than EUROSIP.
For Precipitation : confirmation of the main EUROSIP signals. For Nortern Europe, enhanced probability of wet anomalies.

II.7. "EXTREME" SCENARIOS

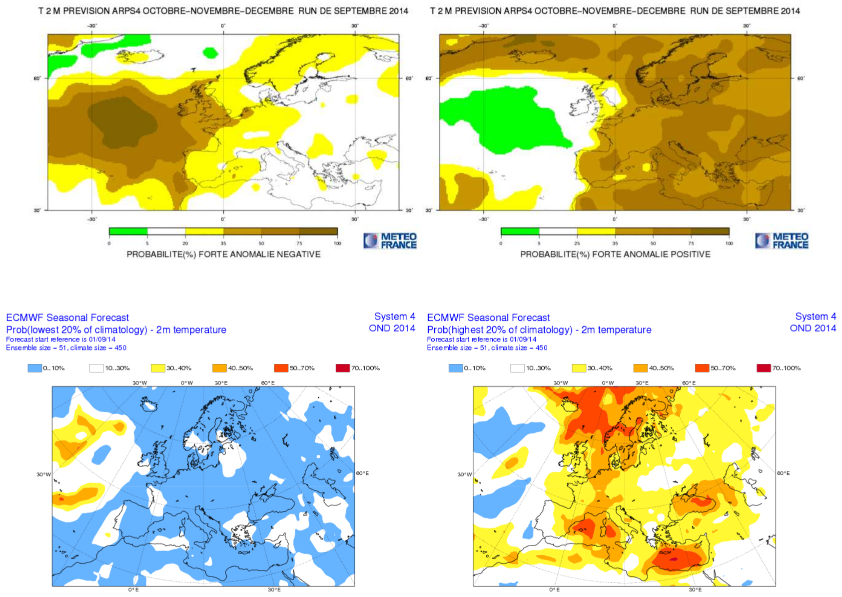


fig.II.7.1 : Top : Meteo-France T2m probability of « extreme » below normal conditions (left - lowest ~15% of the distribution) and "extreme" above normal conditions (right - highest ~15% of the distribution). Bottom : ECMWF T2m probability of « extreme » below normal conditions (left - lowest ~20% of the distribution) and "extreme" above normal conditions (right – highest ~20% of the distribution).

The 2 models agree to enhance probability of "extreme" above normal conditions over Europe.

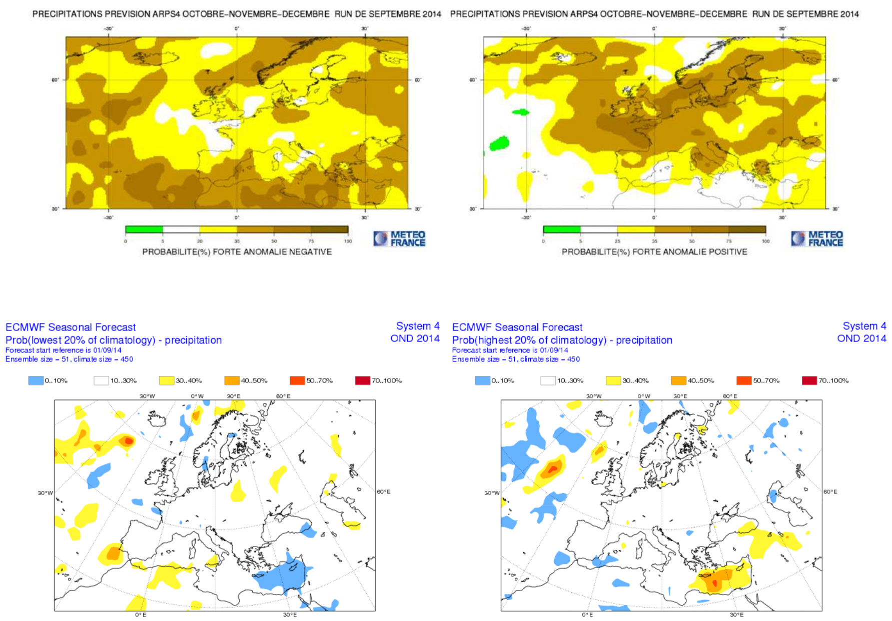


fig.II.7.2 : Top : Meteo-France rainfall probability of « extreme » below normal conditions (left - lowest ~15% of the distribution) and "extreme" above normal conditions (right - highest ~15% of the distribution).
Bottom : ECMWF rainfall probability of « extreme » below normal conditions (left - lowest ~20% of the distribution) and "extreme" above normal conditions (right – highest ~20% of the distribution).

No consistent signal.

II.8. DISCUSSION AND SUMMARY

II.8.a Forecast over Europe

Over the Northern hemisphere, models show possible teleconnections from Tropics to mid-latitude in Pacific basin, possibly in Atlantic too, but of weak intensity. The development of El Nino (weak to moderate) is confirmed and could explain it. Therefore, for this forecast we expect some predictability coming from tropical forcings.
Over Europe, a great majority of models shows a mean configuration that looks like East Atlantic mode. That is a low anomaly West of Europe and a high anomaly over Central Europe. The EuroSIP forecasts are likely a good synthesis of this scenario. MF and ECMWF Z500 fields are a good illustration of uncertainty around this mean scenario.
So globally the privileged scenario for temperature is "above normal" (better confidence for Eastern and Central Europe). No privileged scenario for precipitation.
Obviously, some downscaled information could detail these scenarios for specific countries or sub-regions.

II.8.b Tropical cyclone activity

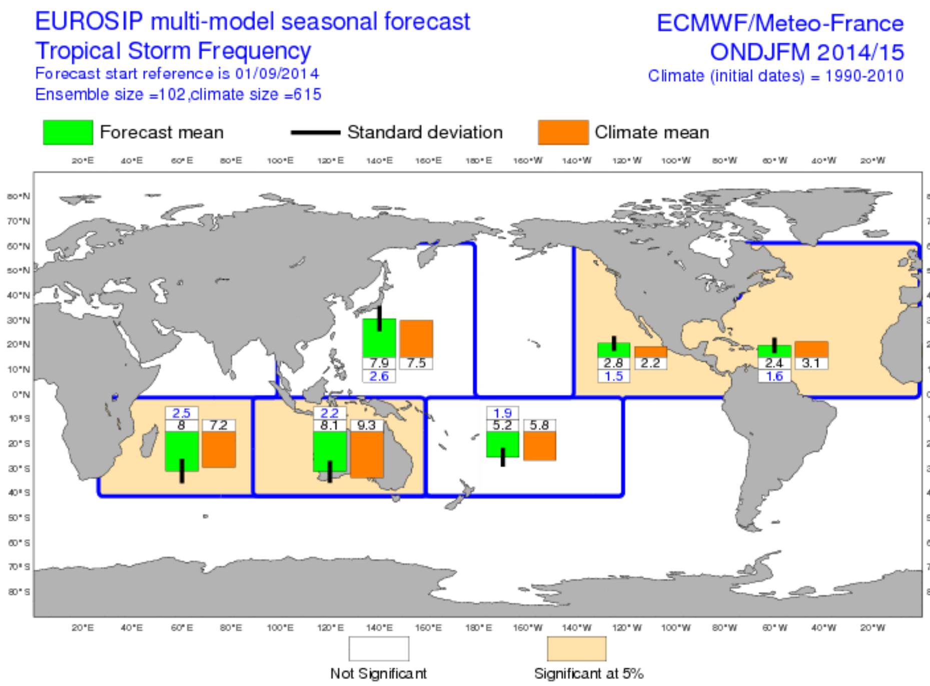


fig.II.8.1: Seasonal forecast of the frequency of Tropical Cyclones from EUROSIP (Météo-France & ECMWF).
For the Tropical Cyclone season and in relationship with the SSTs scenarios, Euro-Sip forecasts indicate

Below Normal Topical Cyclone activity over the Tropical North Atlantic (consistently with the development of the Pacific warm event) and above normal in the Eastern Pacific. Below normal activity in Eastern Indian Ocean, above normal in Western Indian Ocean.

Synthesis of Temperature forecasts for October-November-December 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	*above normal*	*above normal*	*above normal*	*above normal*	*above normal*

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

WMO RA VI
RCC Network

Synthesis of Rainfall forecasts for October-November-December 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.

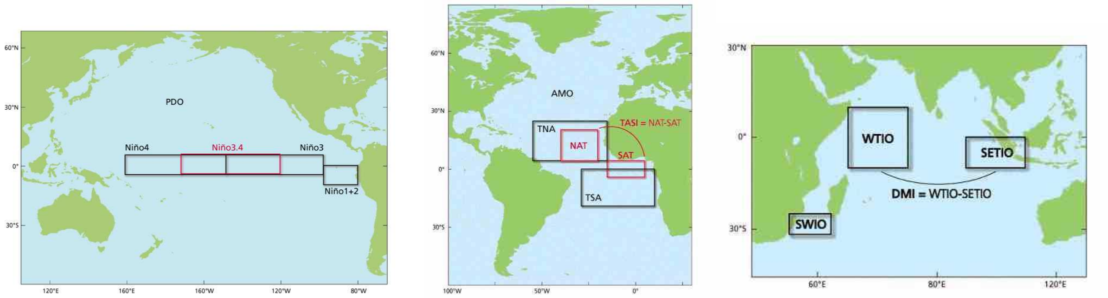
III.2. « NINO », SOI INDICES AND OCEANIC BOXES

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).

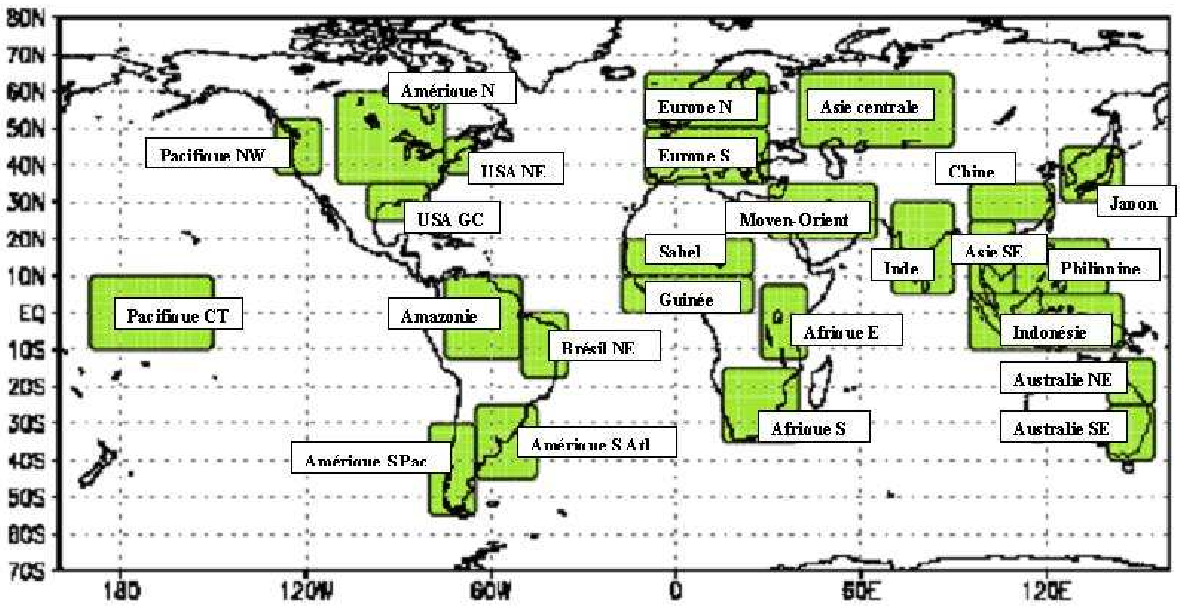
Associated to the oceanic « El Niño / La Niña » events, and taking into account the strong ocean/atmopshere coupling, the atmosphere shows also interanual variability associated to these events. It is monitored using the SOI (Southern Oscillation Index). This indice is calculated using standardized sea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



III.4. ACKNOWLEDGEMENT

This bulletin is edited by the RCC-LRF Node of the RCC Network in Toulouse for the RA VI. It is a joint effort of the RCC-Climate Monitoring Node (led by DWD) and the RCC-LRF Node (Co-Led by Météo-France).