NORTH EURASIA CLIMATE CENTRE

WMO RA VI
WMO RA II
RCC-Network

SEASONAL FORECAST FROM

ROSHYDROMET

http://neacc.meteoinfo.ru

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NEACC: ESTABLISHMENT AND DESIGNATION

The North EurAsia Climate Centre (NEACC) was established by the Intergovernmental Council for Hydrometeorology of the Common wealth of Independent States (CIS – Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Moldova, the Russian Federation, Tajikistan, Turkmenistan, Uzbekistan and Ukraine) at its 18th Session held in Dushanbe, Tajikistan, 4-5 April 2007.

For RA-VI Region NEACC works as one of Long-Range Forecast nodes of the RA-VI Regional Climate Network.

For RA-II Region NEACC works as a Multifunctional Regional Climate Center.

Area of responsibility

http://neacc.meteoinfo.ru (English)
http://seakc.meteoinfo.ru (Russian)

NEACC: THE FORECAST MODELS DISCRIPTION

The Semi-Lagrangian 28-level atmospheric prognostic global model **(SL-AV)** developed at the Hydrometeorological centre of Russia and the Institute of Numerical Mathematics of the Russian Academy of Sciences is in active operational use. The model has a spatial resolution of 0.9°x0.72°, L28. Source of atmospheric initial conditions are NCEP Reanalysis 2 (hindcast) / HMC data assimilation system (forecast). Ensemble size for the hindcasts is 10. Ensemble size for the forecast is 20.
The forecast ensemble is configured by the original and perturbed (breeding of fast growing modes) analysis fields from the date 2 days prior to current month. Source of ocean initial conditions is Reynolds-Smith OI. SSTs are taken 3 days before the forecast period.

The model of Voeikov Main Geophysical Observatory (MGO) - T 63 (1.9°×1.9°, L25).
Ensemble size for the forecast is 10. The forecast ensemble is configured by the original and perturbed analysis fields of the Hydrometeorological centre of Russia. SSTs are taken from the inertial forecasts.

The maps of temperature and precipitation forecasts from individual Atmospheric General Circulation Models of Hydrometeorological centre of Russia and MGO are placed at the site of NEACC. The multi-model seasonal forecasts are presented too.

Experiments on the basis of coupled model of an atmosphere and ocean of the Hydrometeorological centre of Russia and the Institute of Numerical Mathematics of the Russian Academy of Sciences are carried out.

NEACC: THE FORECAST OUTPUT

At present HMC and NEACC produce:

-Probabilistic forecasts of three equiprobable categories for surface air temperature, precipitation rate, 500 hPa height, air temperature at 850 hPa level, and mean sea level pressure with zero and 1 month lead time;

- Deterministic forecasts of the seasonal and monthly mean values of meteorological variables (ensemble averages and anomalies) with zero and 1 month lead time;

- Forecasts of indices of the atmospheric circulation;

- **Outlook of forecasts** of NEACC and forecasts maps of Multi Model Forecasts Meteorological Services: **the APEC Climate Center – APCC,** the **EUROSIP** forecasting system, **the International Research Institute for Climate and Society (The IRI's), LC MMELRF (WMO Lead Centre for MME LRF).**

- Seasonal forecast Bulletin is proposed to be regularly (twice a year) issued a few weeks ahead of each of the standard seasons (winter and summer). All information is synthesized in the form of text and map summaries based on expert consensus. This bulletin and seasonal forecast statement are edited and approved by the Climate Outlook Forums for North Eurasian region (NEACOF).

NORTH EURASIA CLIMATE CENTRE

Main products and textual summary outlook regularly are located on the web-site

Long-Range Forecasts - Windows Internet Explorer

http://neacc.meteoinfo.ru/forecast

Live Search

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Long-Range Forecasts

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North Eurasia Climate Centre

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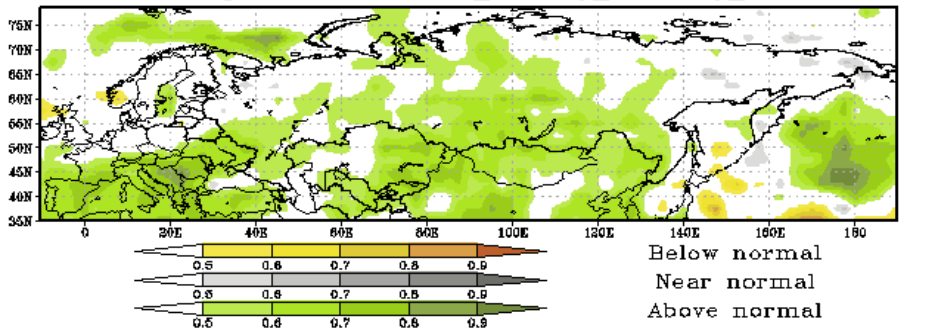
Hi ravi,

LOG OUT

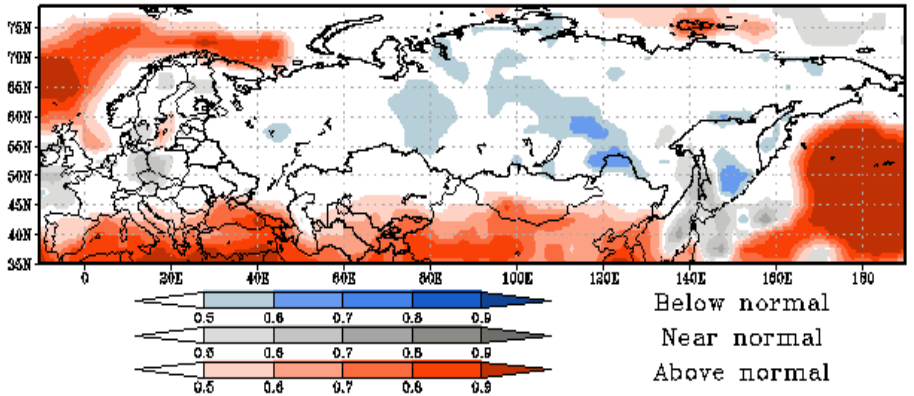
- SEASONAL OUTLOOK (in pdf-format)

Long-Range Forecasts

Composite probabilities of categorical forecast outcomes for Precipitation seasonal anomalies (mm/day). Producer: HMC+MGO
Forecast period: December_January_February_2015



Composite probabilities of categorical forecast outcomes for T2m seasonal anomalies (grad K). Producer: HMC+MGO
Forecast period: December_January_February_2015



http://neacc.meteoinfo.ru

FORECAST VERIFICATION

- Guidance: Standardized Verification System for Long-Range Forecasts, SVSLRF, 2002. New Attachment II-8 to the *Manual on the GDPFS* (WMO-No. 485), Volume I.

- Verified regions: the Globe, Northern and Southern Extratropics, Tropics, Russia, Eurasia.

- Scores:

ROC_A - ROC Score Above Normal
ROC_N - ROC Score Near Normal
ROCS_B - ROC Score Below Normal
RO - sign consistency coefficient
ACC - anomaly correlation coefficient
RMSE - root mean square skill score

relative operating characteristics

Verification characteristics are operationally presented on the NEACC web-site: http://seakc.meteoinfo.ru.

OUTLOOK of EXPECTED CONDITIONS

- The outlook includes the results of long-term forecasts of the Hydrometcenter of Russia and Voeikov Main Geophysical Observatory (in the framework of NEACC project) and of other foreign centers. They are:
  - ***APCC*** *– APEC Climate Center, http://www.apcc21.net.*
  - ***EuroSIP*** *multi-model seasonal forecasting system (ECMWF, UK MetOffice, MeteoFrance), https://www.ecmwf.int/.*
  - ***IRI*** *– International Research Institute for climate and society, http://iri.columbia.edu.*
  - ***LC MMELRF –*** *WMO Lead Centre for MME LRF, http://www.wmolc.org*
- The comparison is carried out only for some North Eurasia regions where the APCC, EuroSIP, IRI forecasts, and consistency maps of the WMO Lead Centre for MME LRF are informative.

NORTH EURASIA CLIMATE CENTRE

INDICES

North Eurasia Climate Centre

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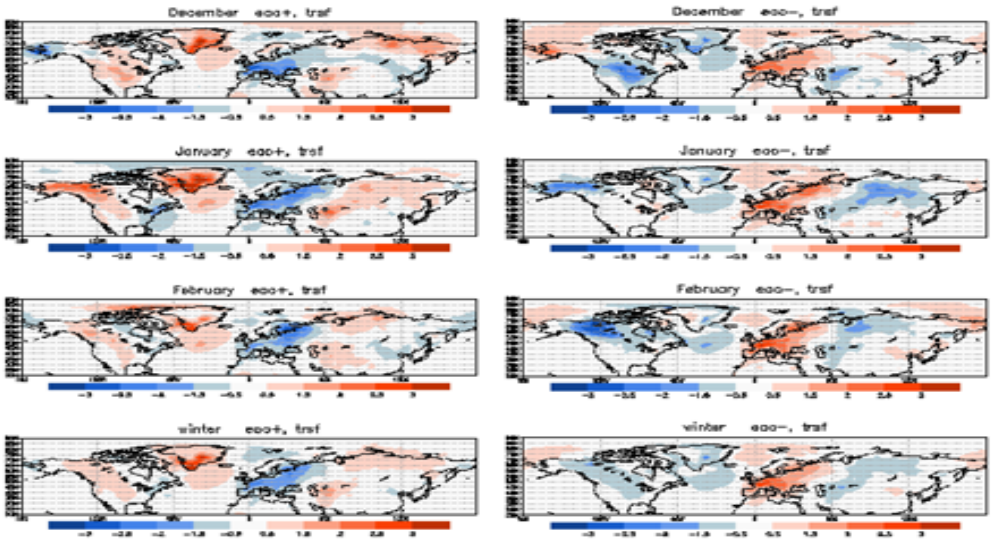
Indices of Circulation

Composite anomaly charts (NCEP/NCAR, Reanalysis -2, means: 1981-2010)

Indices: EA | Season: Winter | Parameter: T at a height of 2 m



Figs. (left) and figs. (right) are the composites of the meteorological fields for the positive and negative phase of index respectively

White areas are not significant at 99% level of confidence.

The Model of Hydrometeorological centre of Russia Forecast

index	NOVEMBER, DECEMBER 2015, JANUARY, FEBRUARY 2016					
	1 month	2 month	3 month	4 month	1 сезон	2 season
EA	-0,4	-1,05	-0,58	0,09	-0,88	-0,66
WA	1,45	1,12	0,09	0,57	0,88	0,37
EU	1,51	0,98	1,4	1,76	1,32	1,35
WP	-0,96	0,25	-0,76	-0,91	-0,27	-0,23
PNA	0,24	0,62	0,36	0,16	0,61	0,54
NAO	-0,27	0,16	0,15	0,31	-0,04	0,25
POL	-1,18	-1,04	-0,12	-0,83	-0,81	-0,54
AOS	-0,24	0,09	-0,91	-0,6	-0,35	-0,47

Red (blue) represents the positive (negative) phase of index

Designation

1. EA - East Atlantic Oscillation
2. WA - West Atlantic Oscillation
3. EU - Eurasia Pattern
4. WP - West Pacific Oscillation
5. PNA - Pacific – North American Patte
6. NAO - North Atlantic Oscillation
7. POL - Polar Oscillation
8. AOS - Arctic Oscillation

Quartile Analysis of Indices

Index	Q1 (25%)	Q3 (75%)
EA	-0.493	0.485
WA	-0.559	0.494
EU	-0.452	0.458
WP	-0.544	0.501
PNA	-0.386	0.404
NAO	-0.487	0.632
POL	-0.487	0.632
AOS	-0.884	0.87

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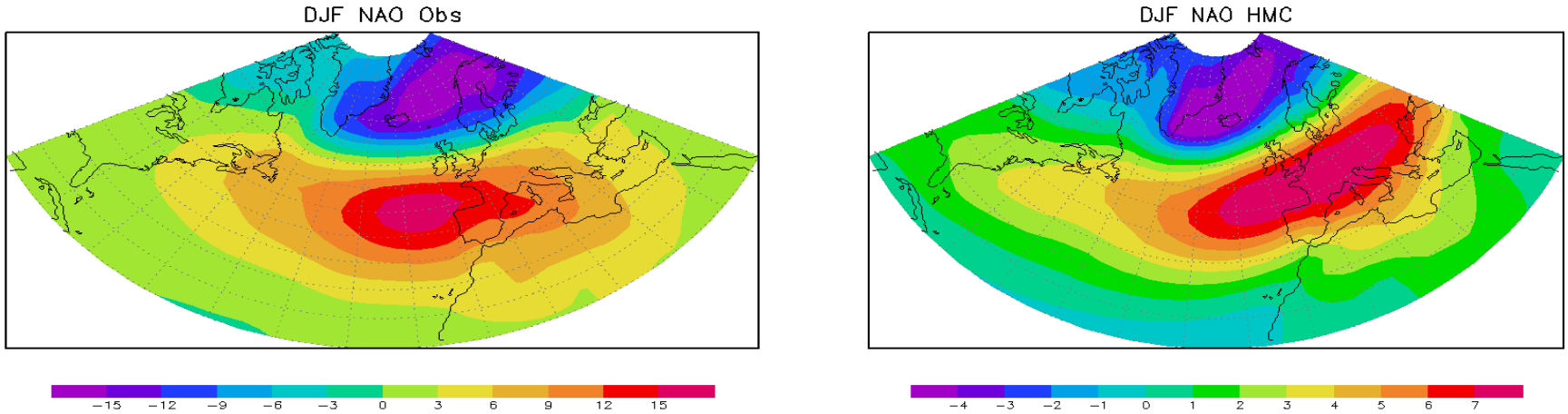
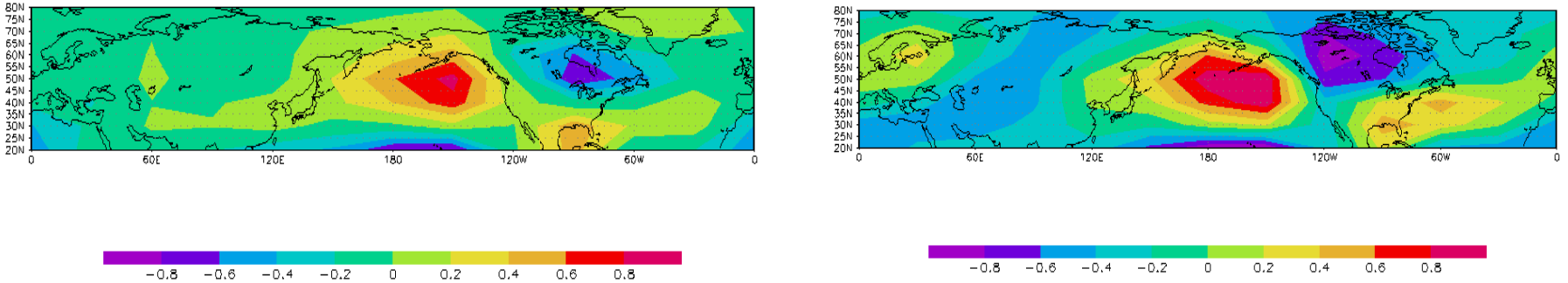
LOW-FREQUENCY MODES AND ATMOSPHERIC VARIABILITY



EOF1 wintertime (DJF) SLP over the North Atlantic in observations (left) and model predictions (right) with the seasonal version of SLAV model (by V.N. Kryjov)

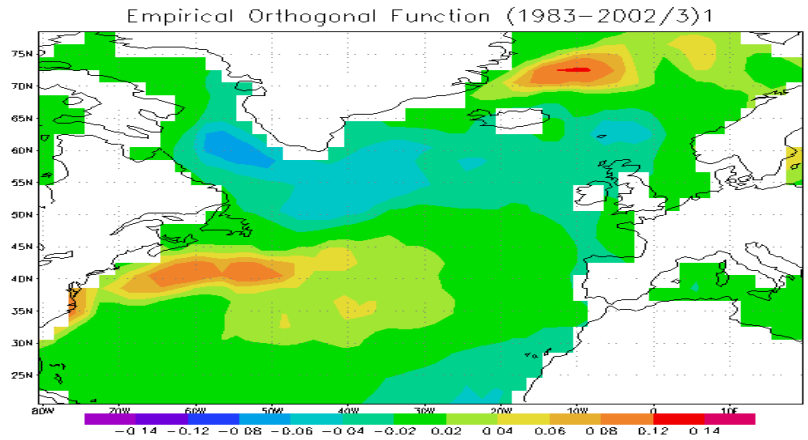


Loading patterns wintertime (DJF) from Rotated Principle Component analysis (with varimax rotation) of monthly mean height anomalies of 500 hPa (NH) in observations (left) and model predictions (right) with the seasonal version of SLAV model(by D.B. Kiktev, E.N. Kruglova, I.A. Kulikova)

PART II
SESONAL FORECASTS

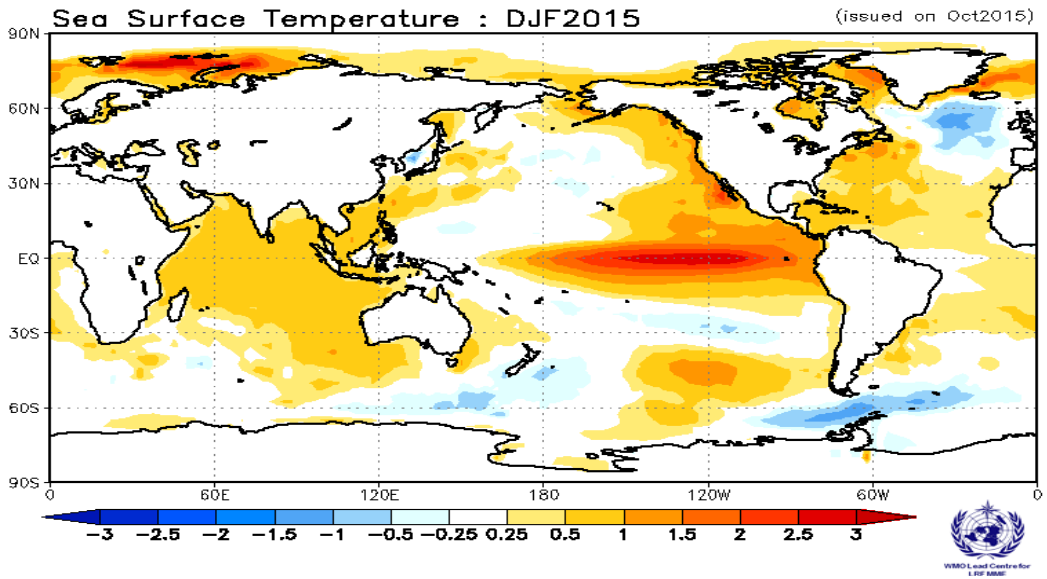
OCEANIC FORECASTS
SEA SURFACE TEMPERATURE (SST)

North Atlantic: The tripole is the principal mode of SST variability in the North Atlantic (see picture). According to the most models, it is characterized by negative anomalies from Labrador to Europe. There are significant positive SST anomalies in the Gulf Stream and the NEO. Increasing temperature contrasts can lead to an exacerbation of atmospheric fronts and increased cyclonic activity . This means that the zonal transport of air mass is more intensive than it is necessary under the climate.



SST: First Empirical Orthogonal Function.

LC MMELRF-WMO Lead Centre for MME LRF



According to the forecasts of most centers the significant positive SST anomalies are expected in the Norwegian and Barents Seas at higher latitudes of the North Atlantic. These anomalies are characterized by high stability. Significant positive SST anomalies that persist for a long time may result in a further reduction in the area of ice cover in the Arctic.

INDICES OCSILLATION FORECASTS

HIDROMETEOROLOGICAL CENTRE OF RUSSIA (SL-AV)

INDEX	DECEMBER 2015 – FEBRUARY 2016			
	DECEMBER	JANUARY	FEBRUARY	DECEMBER-FEBRUARY
EA	-1,05	-0,58	0,09	-0,89
WA	1,12	0,09	0,57	0,88
EU	0,98	1,40	1,76	1,32
WP	0,25	- 0,76	-0,91	-0,27
PNA	0,62	0,36	0,16	0,61
POL	-1.04	-0.12	-0.83	-0.81
NAO	0,16	0,15	0,31	-0,04
AO	0,09	-0,91	-0,60	-0,35

East Atlantic (**EA**), West Atlantic (**WA**), Eurasian (**EU**), west Pacific (**WP**), Pacific-North American (**PNA)** oscillations (Wallace J. M., Gutzler D.S. Teleconnections in the geopotential height field during the Northern Hemisphere winter. – Mon. Wea. Rev., 1981, vol. 109, pp. 784-812).

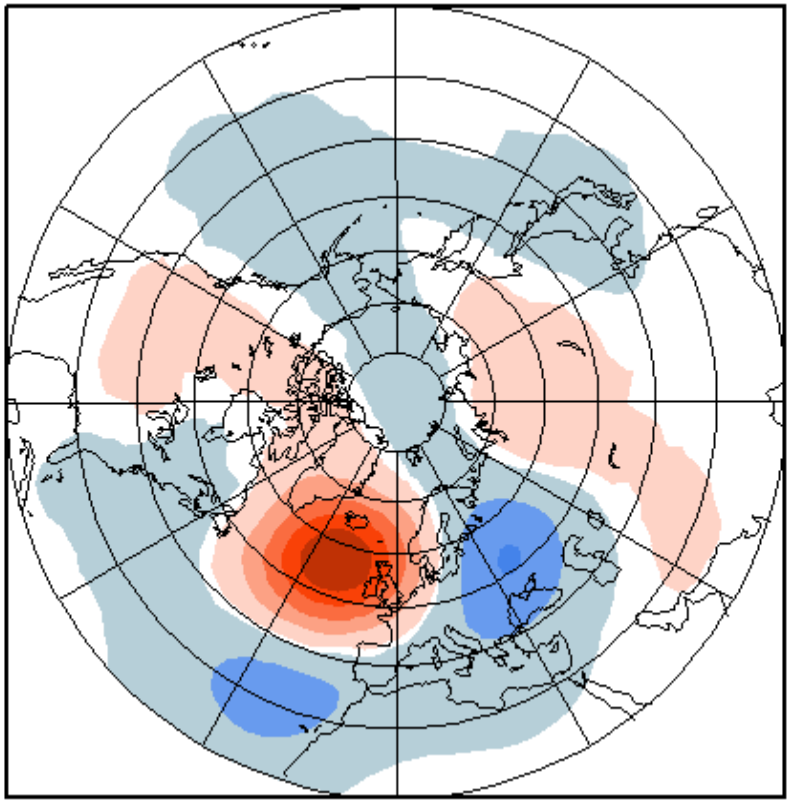
North Atlantic (**NAO**), Polar (POL), Arctic (**AO**) oscillations (Climate Prediction Centre of USA).

EAST ATLANTIC OSCILLATION

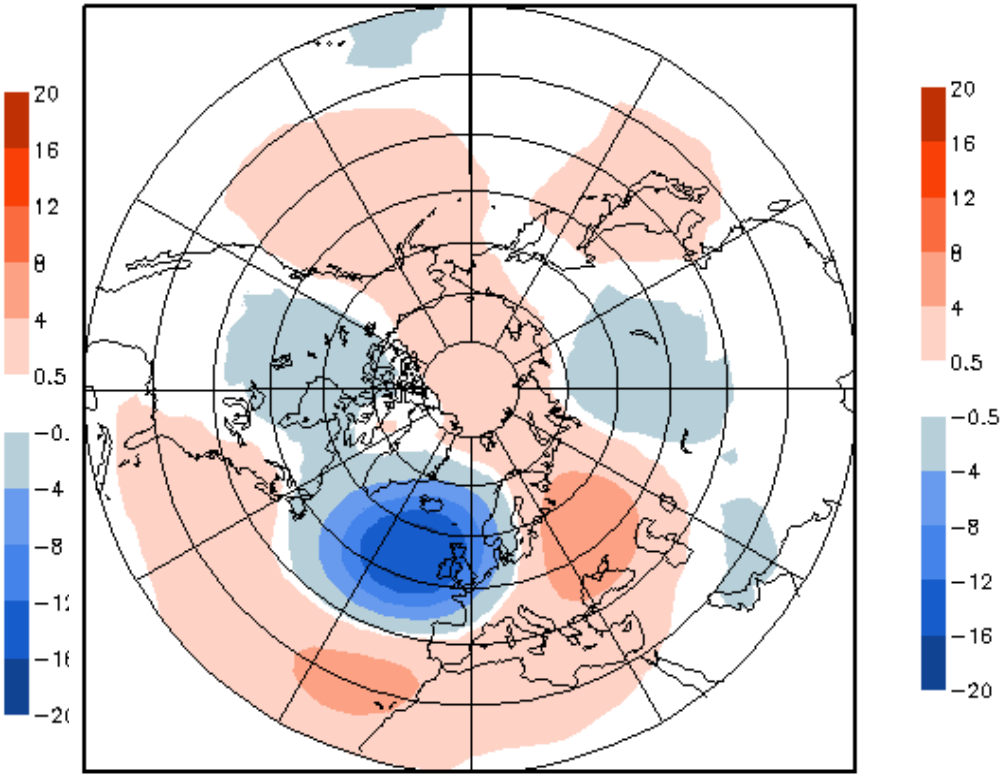
COMPOSITE MAPS

ANOMALY OF H-500 (dm)

Positive phase
(EA>0.49)



Negative phase
(EA < -0.48)

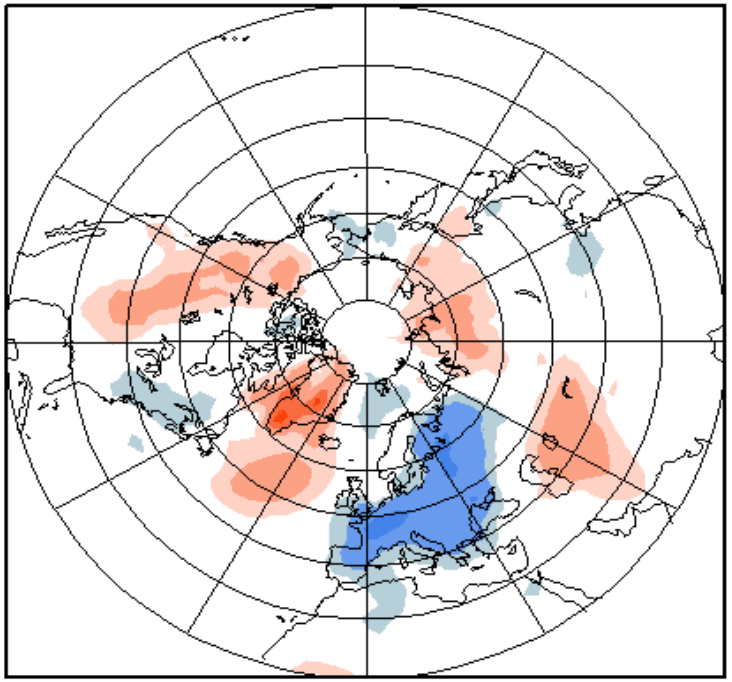


EAST ATLANTIC OSCILLATION

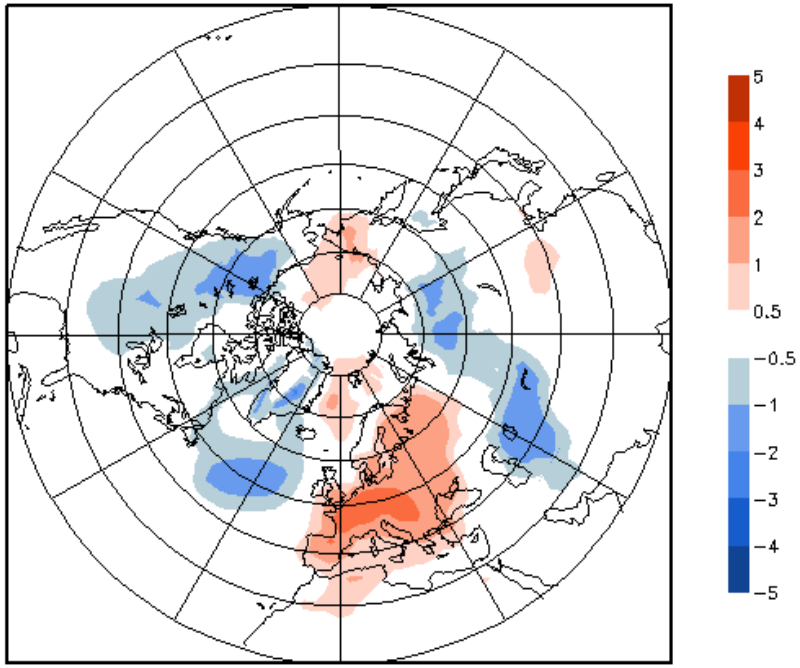
COMPOSITE MAPS

ANOMALY OF AIR TEMPERATURE (°C)

Positive phase
(EA>0.49)



Negative phase
(EA< -0.48)

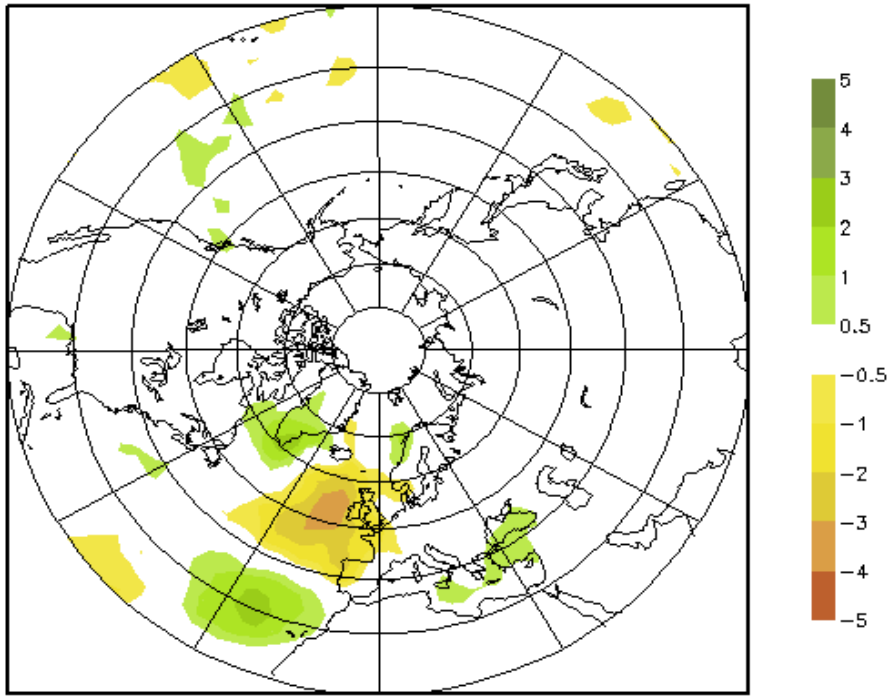


EAST ATLANTIC OSCILLATION

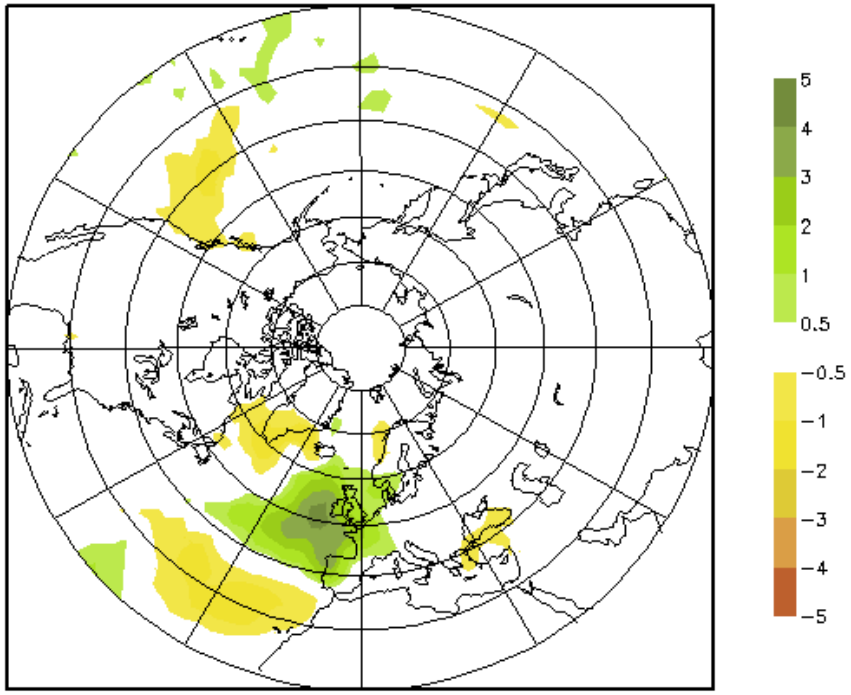
COMPOSITE MAPS

ANOMALY OF PRECIPITATION (mm/day)

Positive phase
(EA>0.49)



Negative phase
(EA< -0.48)

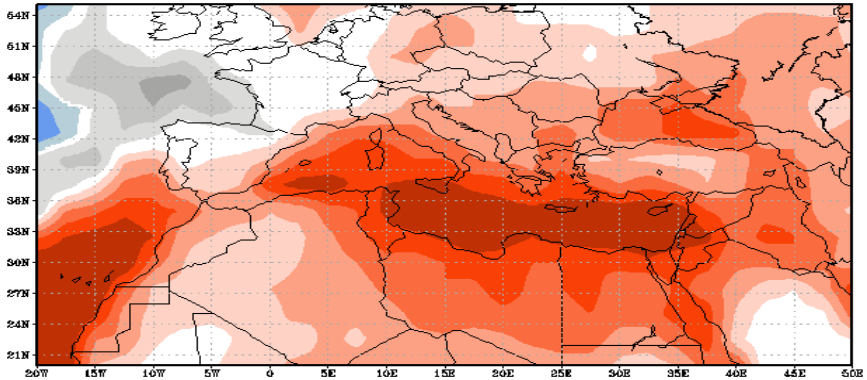


FORECASTS OF AIR TEMPERATURE

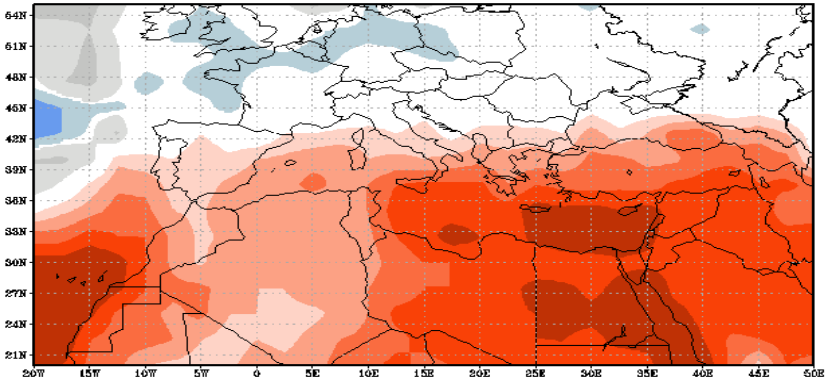
THE PROBABILISTIC FORECASTS

MODELS: HMC(SL-AV) and MGO

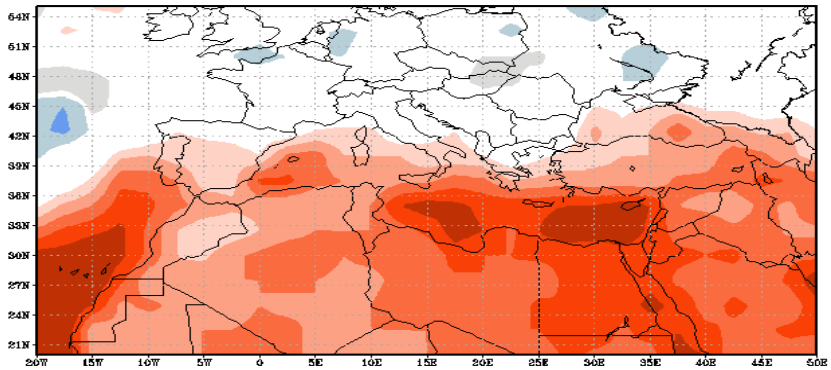
December 2015



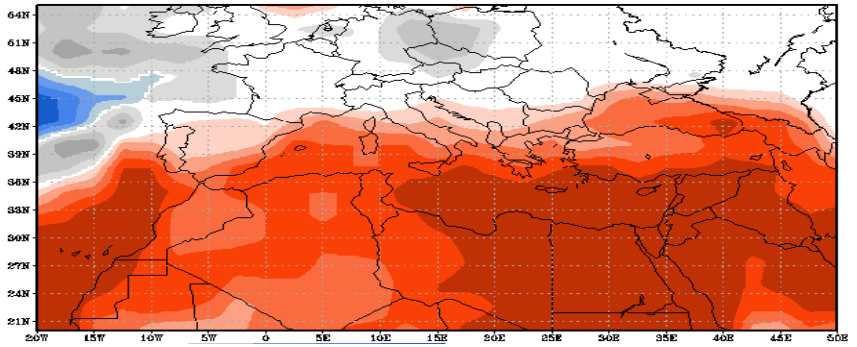
January 2016

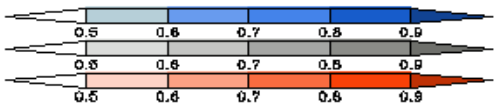


February 2016



December 2015 - January 2016





Below normal
Near normal
Above normal

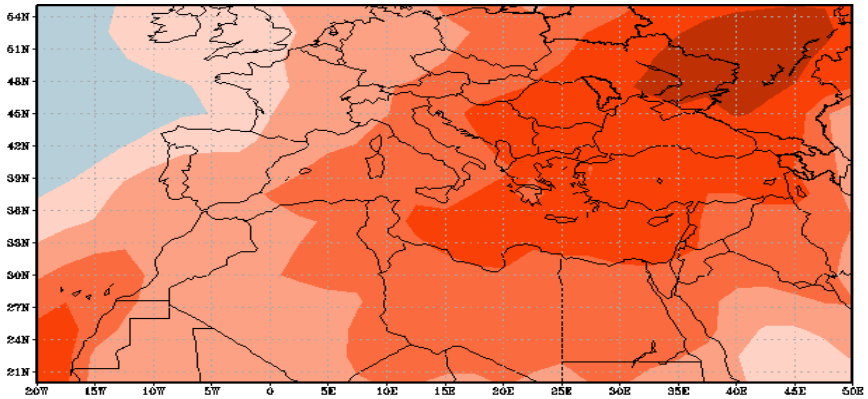
issued October 2015

FORECASTS OF AIR TEMPERATURE

THE ENSEMBLE AVERAGE ANOMALIES

MODELS: HMC(SL-AV) and MGO

December 2015



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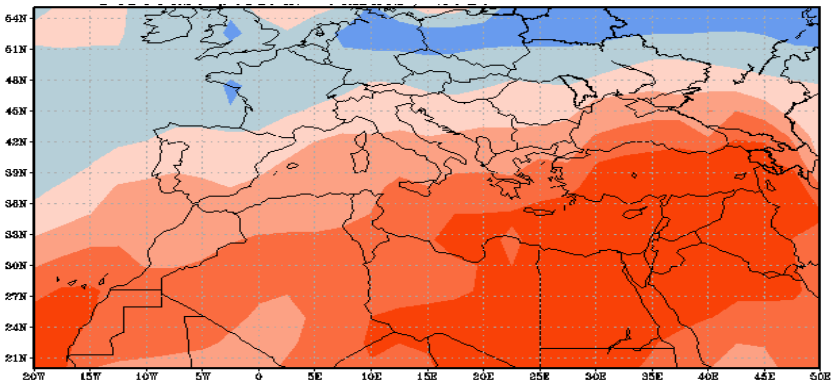
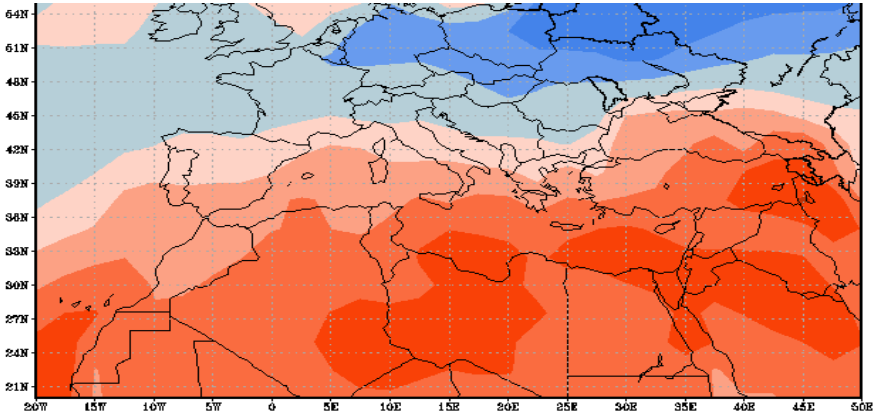
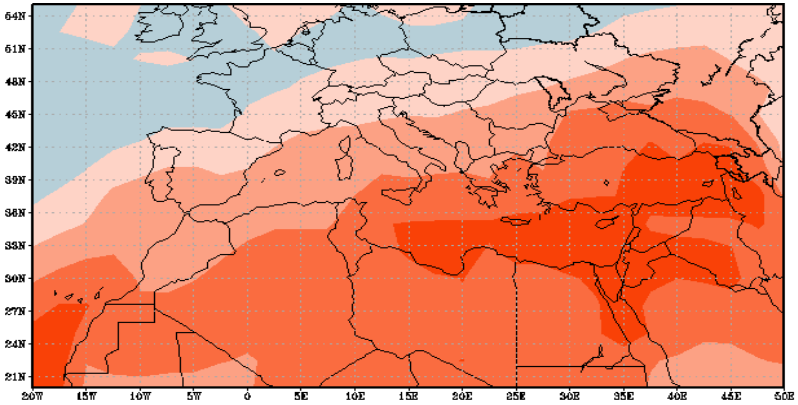
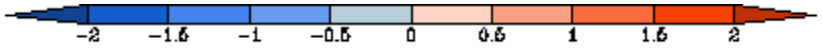


February 2016



December 2015 - January 2016





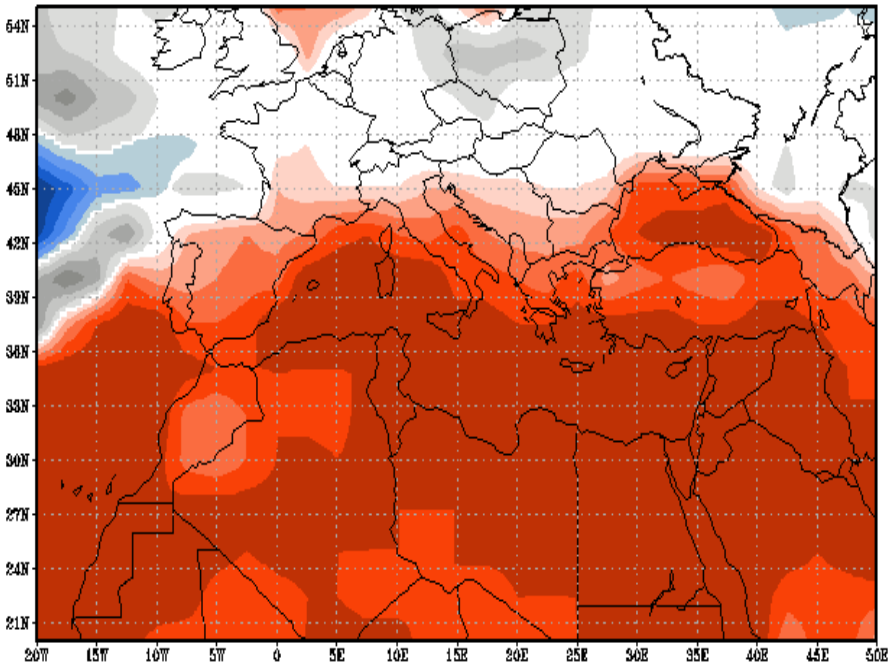
issued October 2015

FORECASTS OF AIR TEMPERATURE

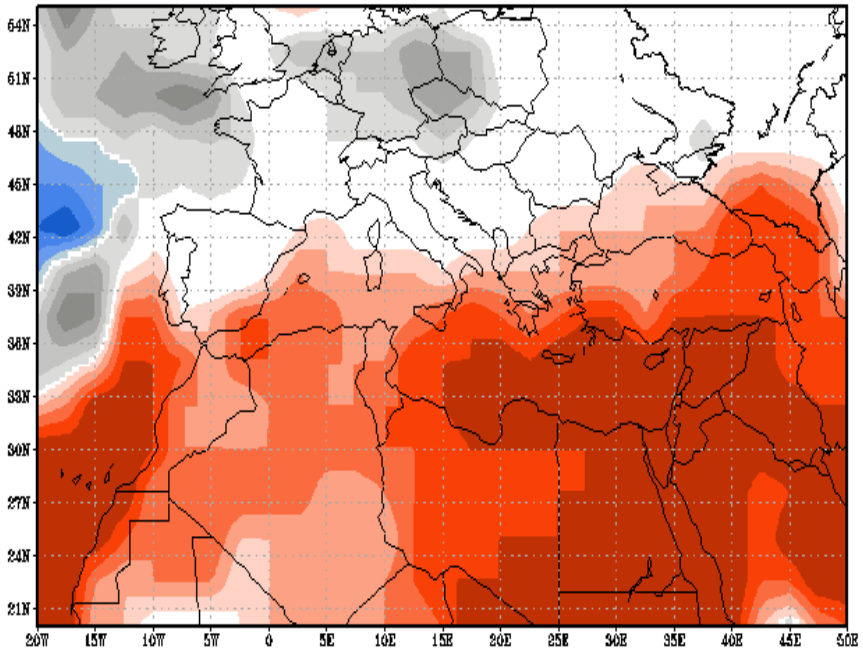
THE PROBABILISTIC FORECASTS

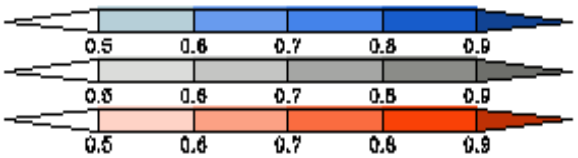
December 2015 - January 2016

MODEL: HMC(SL-AV)



MODEL: MGO





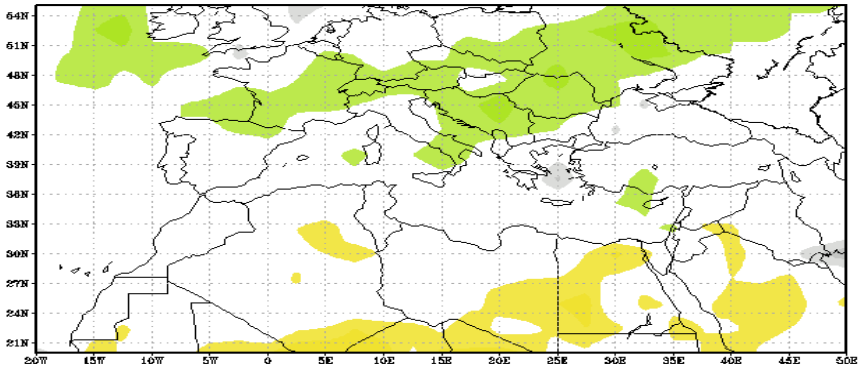
Below normal
Near normal
Above normal

issued October 2015

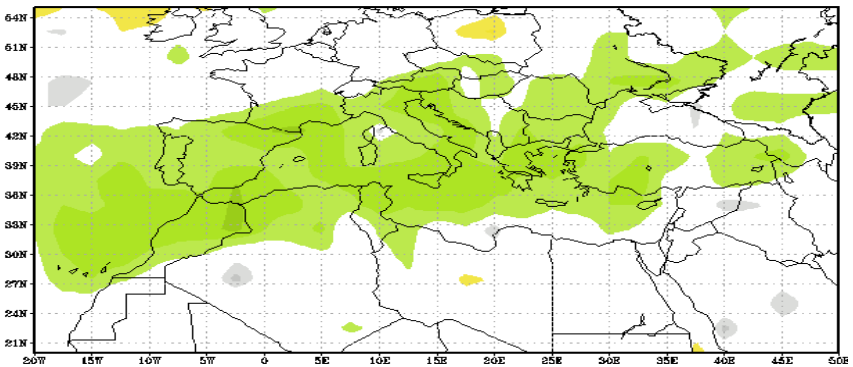
THE PROBABILISTIC FORECASTS OF PRECIPITATION

HIDROMETEOROLOGICAL CENTRE OF RUSSIA (SL-AV) and MGO MODEL

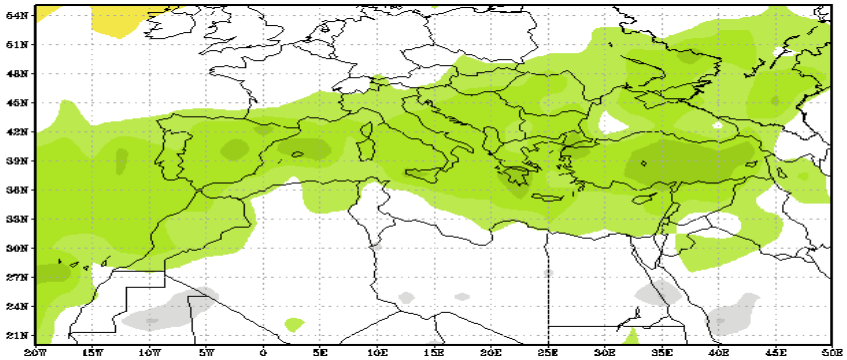
December 2015



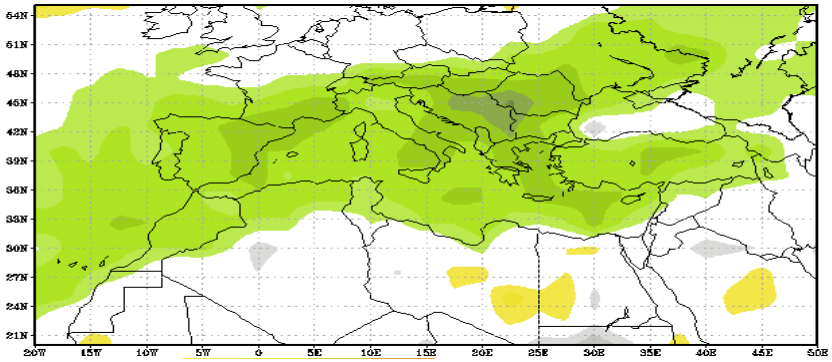
January 2016

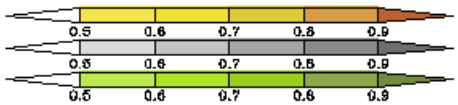


February 2016



December 2015 - January 2016





Below normal
Near normal
Above normal

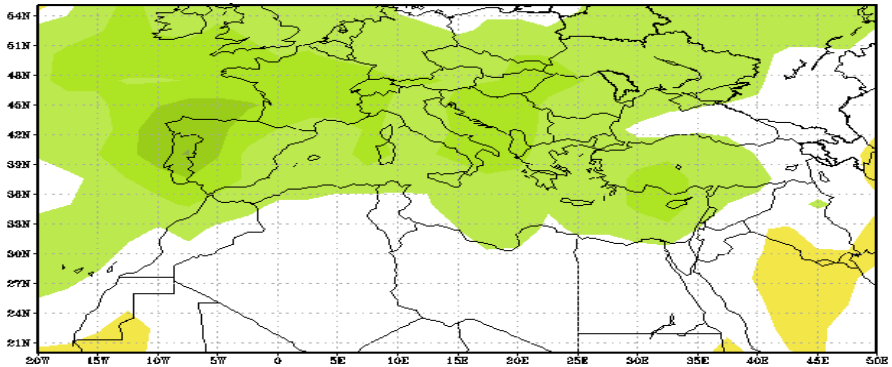
Issued October 2015

FORECASTS OF PRECIPITATION

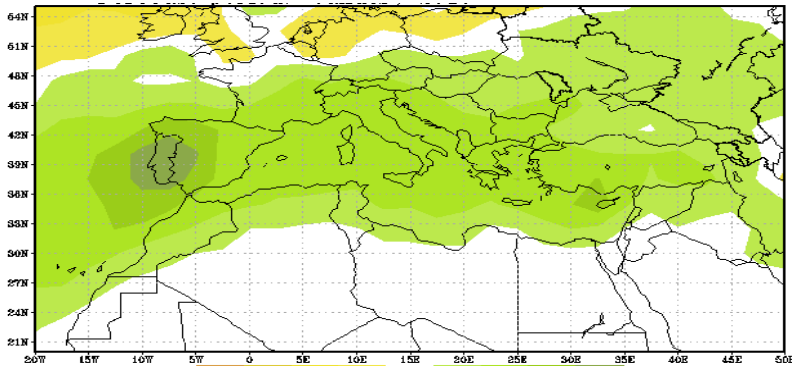
ENSEMBLE AVERAGE ANOMALIES

MODELS: HMC(SL-AV) and MGO

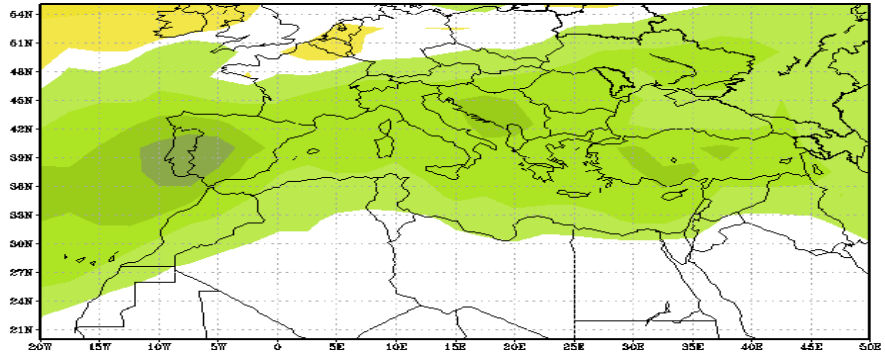
December 2015



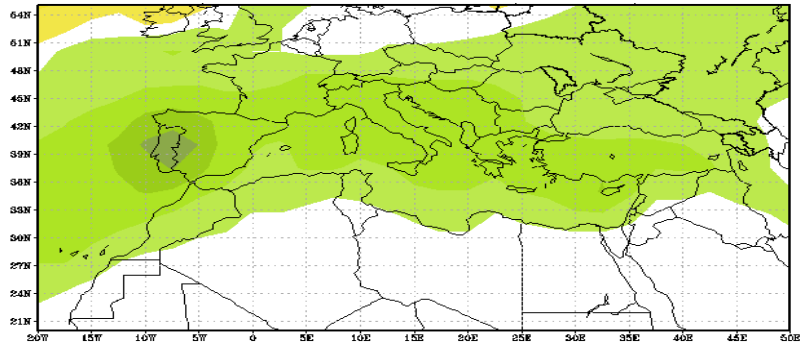
January 2016

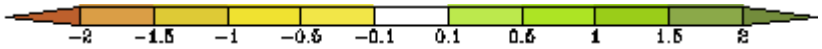


February 2016



December 2015 - January 2016





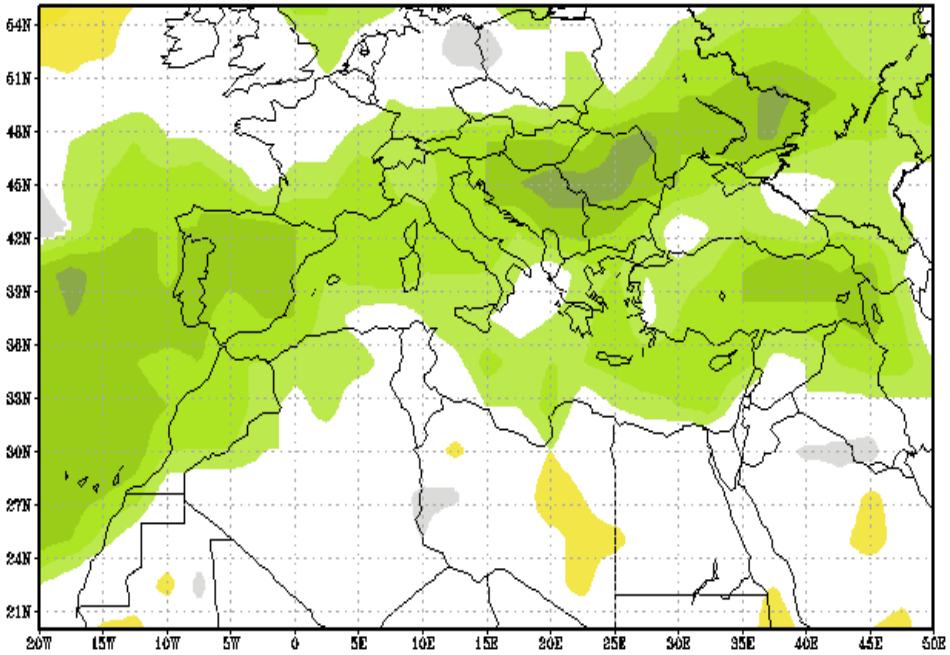
issued October 2015

FORECASTS PRECIPITATION

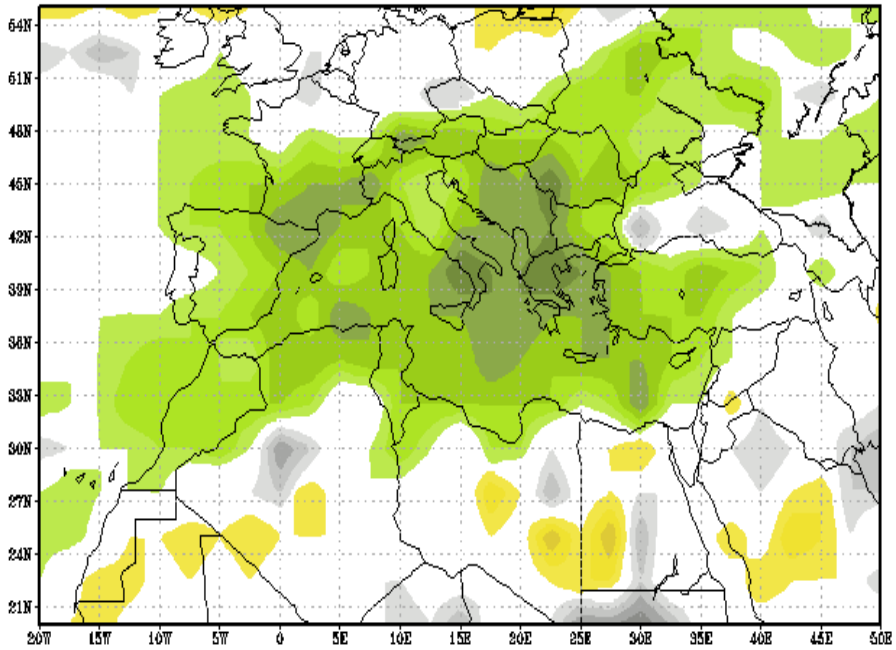
THE PROBABILISTIC FORECASTS

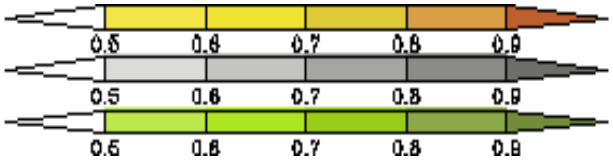
December 2015 - January 2016

MODEL: HMC(SL-AV)



MODEL: MGO





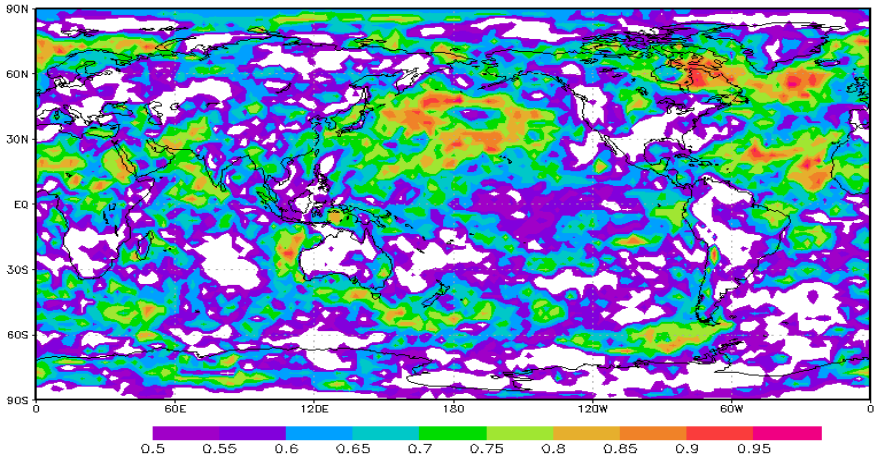
Below normal
Near normal
Above normal

issued October 2015

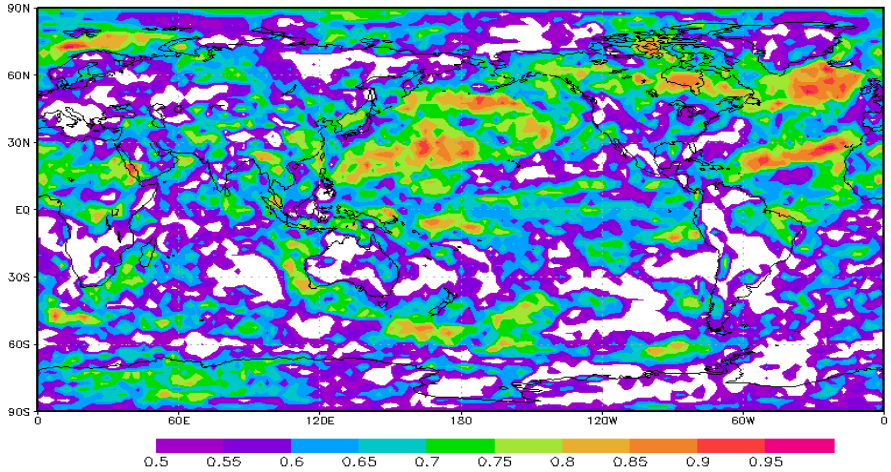
FORECAST VERIFICATION: TEMPERATURE

SL-AV, HMC

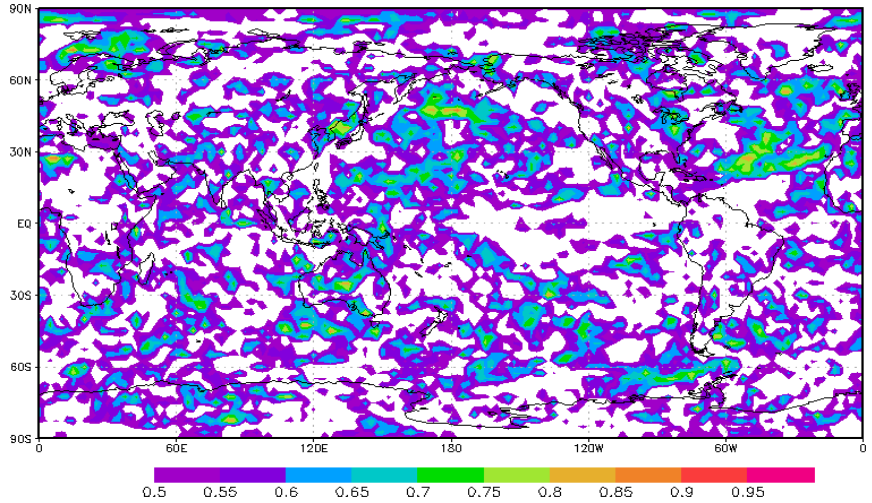
ROC_B



ROC_A



ROC_N



Scores:

ROC_A - ROC Score Above Normal

ROC_N - ROC Score Near Normal

ROC_B - ROC Score Below Normal

Verification scores are made on a historical material (1981-2010) for winter season.

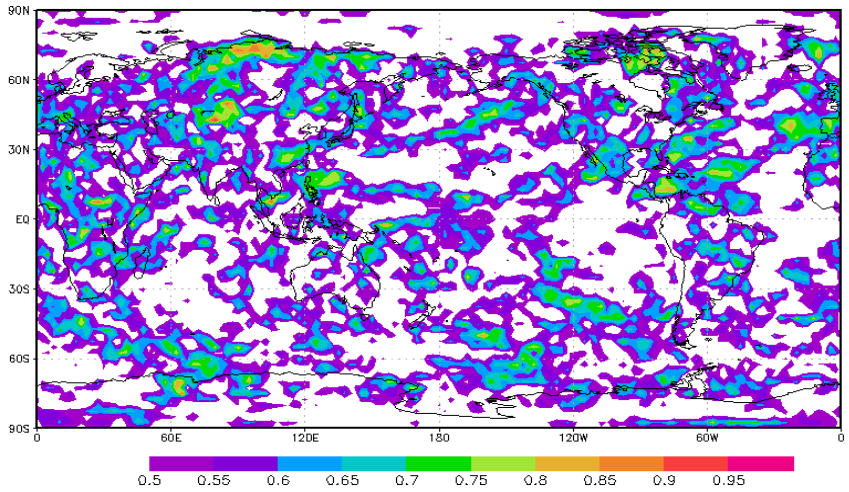
Guidance: Standardised Verification System for Long-Range Forecasts, SVSLRF, 2002. New Attachment II-8 to the *Manual on the GDPFS* (WMO-No. 485), Volume I.

Verification characteristics are operationally presented on the NEACC web-site: http://seakc.meteoinfo.ru.

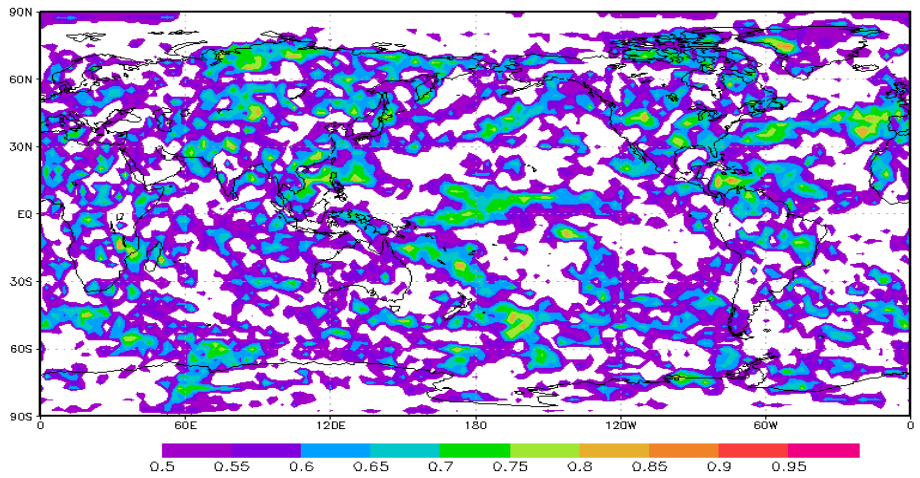
FORECAST VERIFICATION: PRECIPITATION

SL-AV, HMC

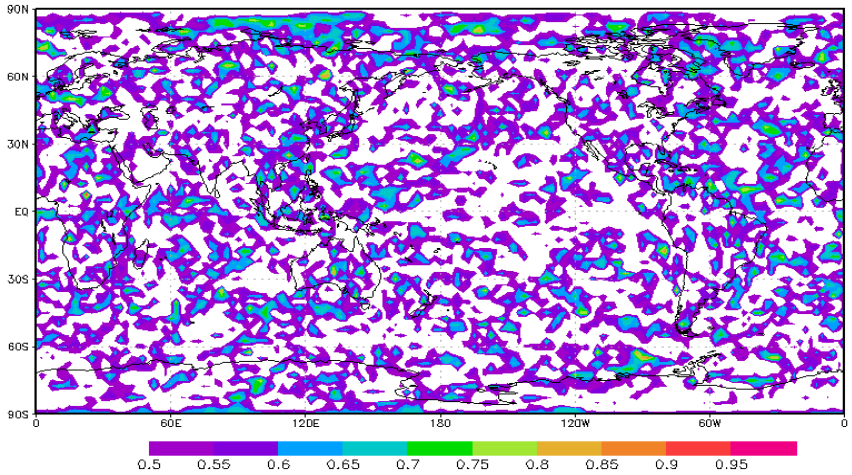
ROC_B



ROC_A



ROC_N



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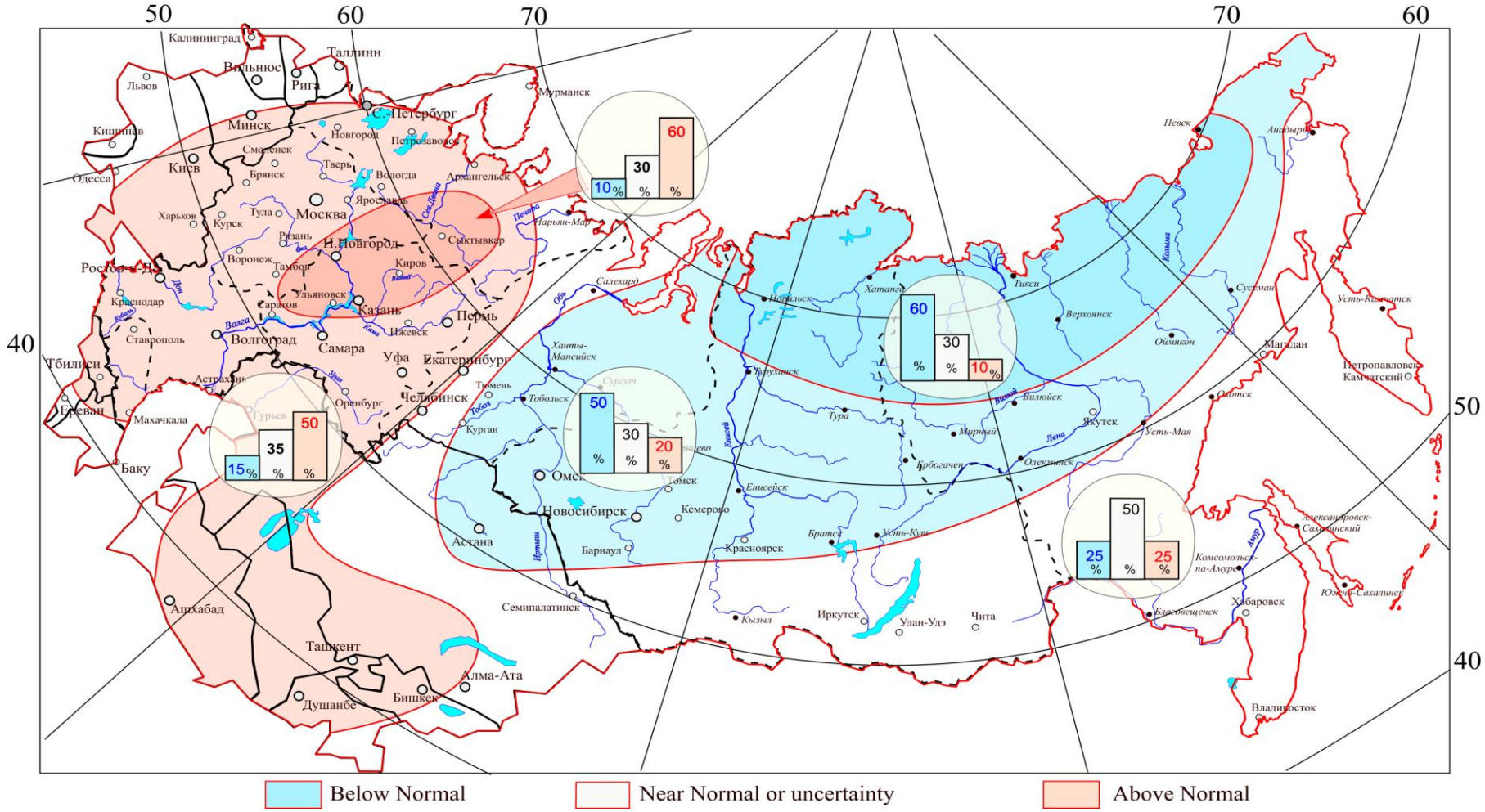
THE NORTH EUROSIAN CLIMATE OUTLOOK FORUM (NEACC-9)

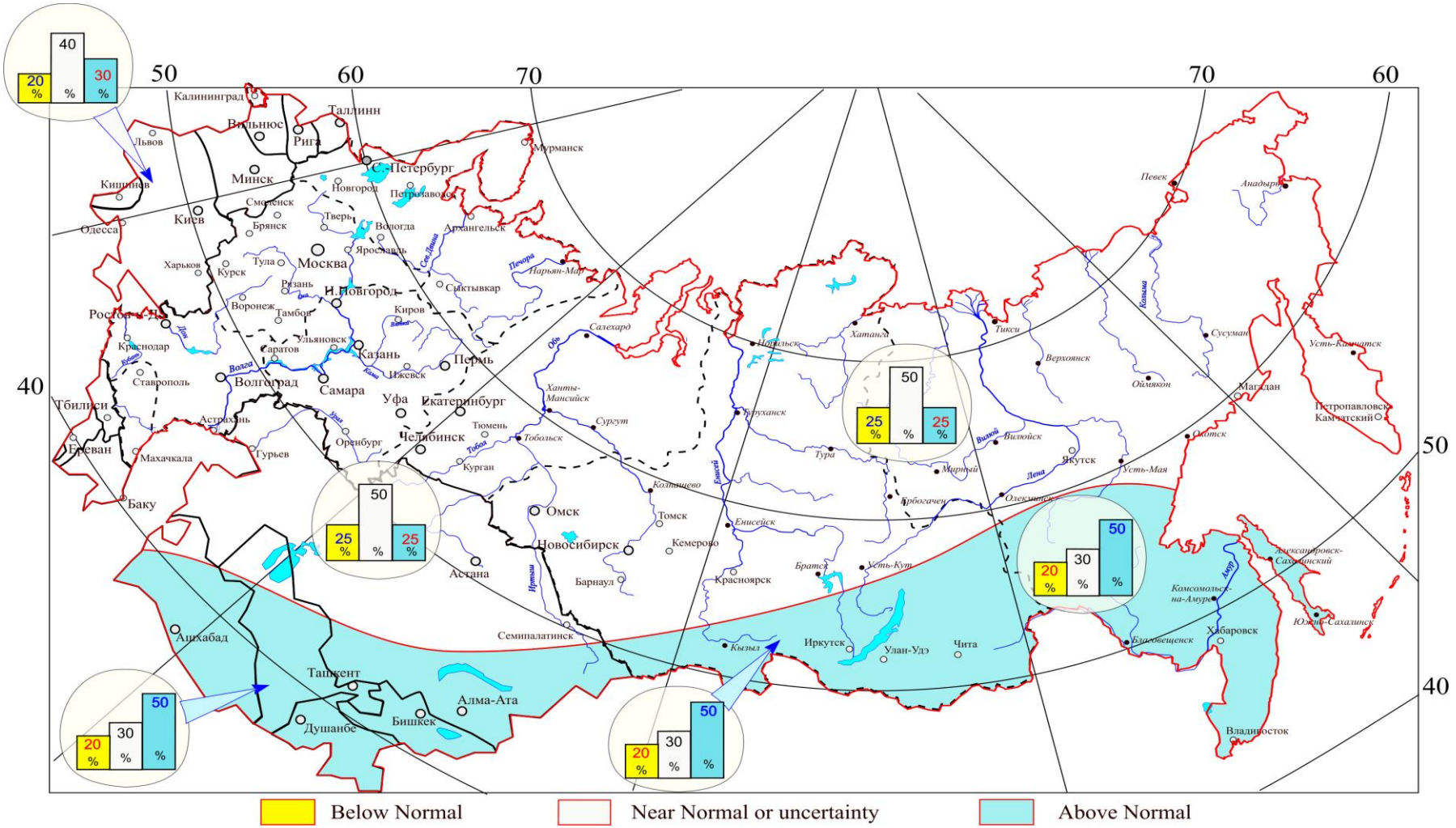
- Most of the ENSO prediction models indicate a continuation of ENSO through the winter 2015-2016. The probabilities for La Nina, neutral and El Nino conditions (using -0.5C and 0.5C thresholds) over the coming DJF season are: 0%, 1% и 99 %.
- Most of the centers predict significant SST anomalies in the North Pacific Ocean connected with the positive phase of PDO. It can drive the variations of the geographical position and intensity of the Pacific maximum and the Aleutian minimum. The significant temperature and precipitation anomalies are possible in the Far East as a result.
- In the North Atlantic significant positive SST anomalies are expected near the Gulf Stream and NEZ. The negative anomalies are expected from Labrador to Europe. The forecasts of most centers indicate the signal associated with the appearance of positive SST anomalies in the Norwegian and Barents Seas.
- NEACC predict the negative phases of EA in winter 2015-2016. The negative phases of EA is associated with the positive temperature anomalies in Europe and the negative temperature anomalies over most of Siberia and Kazakhstan. The positive anomalies of precipitation are possible in the west of Europe.
- The winter season of 2015-2016 is expected warmer than normal over most of Northern Eurasia according to the most of models. The negative temperature anomalies are expected in the north-east of Far East. The cold scenario prevails in the forecasts of the NEACC.
- There are a lot of contradictions and uncertainties in the forecasts of precipitation. The precise signal is marked only in the south where exceeding precipitation is expected.
- *The Bulletin information is of advisory character and must be applied to particular regions taking into account the predictability of meteorological processes, regional climate, and quality of state-of-the-art atmosphere and ocean general circulation models.*

GRAFICAL PRESENTATION OF THE WINTER 2015-2016 TEMPERATURE OUTLOOK



http://neacc.meteoinfo.ru

GRAFICAL PRESENTATION OF THE WINTER 2015-2016 PRECIPITATION OUTLOOK



http://neacc.meteoinfo.ru

THANK YOU FOR ATTENTION!