WMO RA VI
WMO RA II
RCC-Network

SEASONAL FORECAST OUTLOOK

WINTER 2017-2018

Moskow, november 2017

TABLE OF CONTENTS

1. The general information
2. Some features of the regional climate
3. Consensus outlook DJF 2016-2017 and observations
4. Climate Diagnostics (Oct. 2017)
5. Three-month Predictions (Dec. 2017–Feb. 2018)
   Sea Surface Temperature (SST)
   Atmospheric circulation
   Temperature and precipitation
7. Verification
6. Summary and Discussion

1. THE GENERAL INFORMATION

• **Seasonal predictions** are based on a **NEACC's Seasonal Ensemble Prediction System (EPS)**, which is based on the atmosphere general circulation models (GCM) of Hydrometcenter of Russia (PL-AV) and of MGO.

• **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 three 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.

• **NEACC** provides month and three-month prediction products around the 30th of every month with warm-season (Jun. – Aug.) prediction products at the end of spring , and withcold-season (Dec. – Feb.) prediction products at the end of autumn. Main products and textual summary outlook regularly allocated on the web-site.

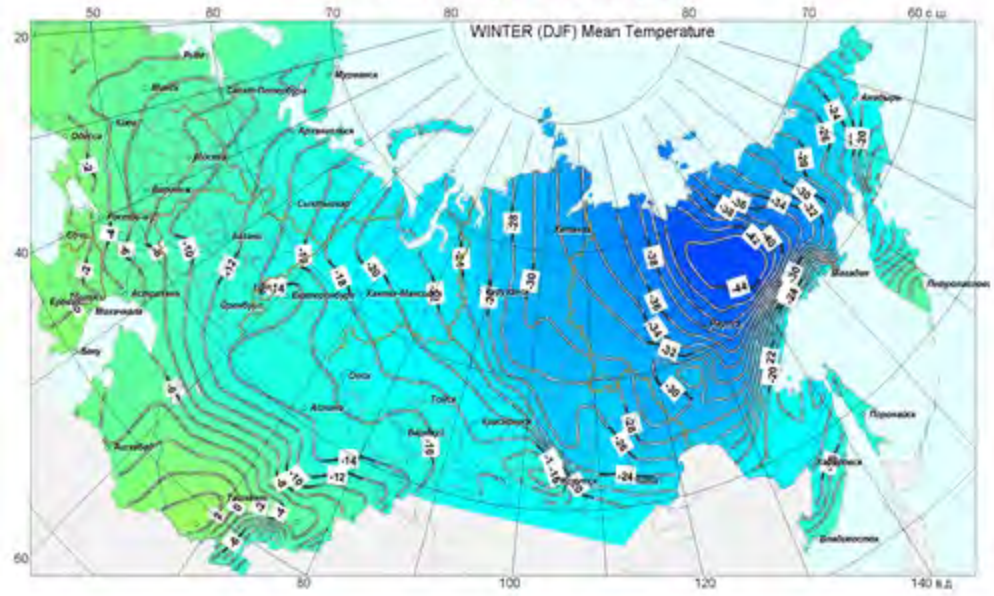
• **Prediction products** of Multi Model Forecasts Meteorological Services: **the APEC Climate Center – APCC**, the **EUROSIP** forecasting system, **the International Research Institute for Climate and Society (The IRI's), LC MMELRF (WMO Lead Centre for MME LRF) are used. The products of Tokyo Climate Center (TCC) and Climate Prediction Centre (CPC) are used too.**

http://neacc.meteoinfo.ru

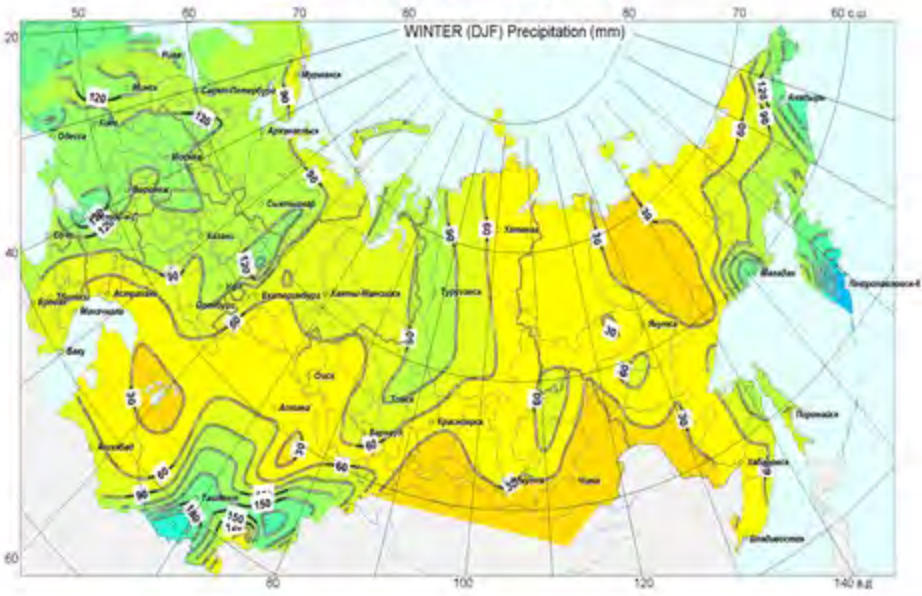
2. SOME FEATURES OF REGIONAL CLIMATE

December-February (1961-1990)

Mean temperature (°C)



Precipitation (mm)

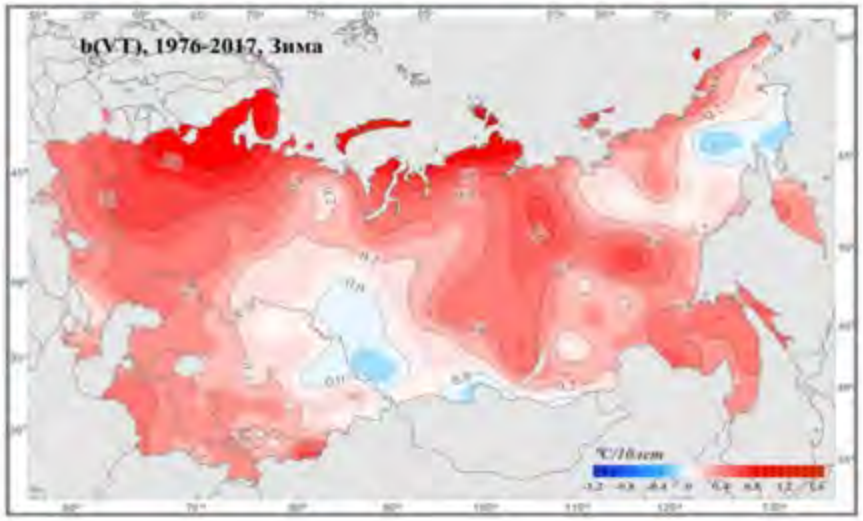


- **Some different climatic zones** and types of climate are distinguished over Northern Eurasia.
- **In winter** the characteristic conditions of the **continental zone and the eastern coasts** of the continents are associated with the cold anticyclones on the continents and the dry northwestern cold invasions on the coasts. Sometimes it is interrupted by the southern cyclones invasions, that produce large amounts of precipitation (the winter Far Eastern monsoon).
- Cyclonic activity and invasion of the Arctic anticyclones are observed in the **oceanic zone and the western shores** of the continents.

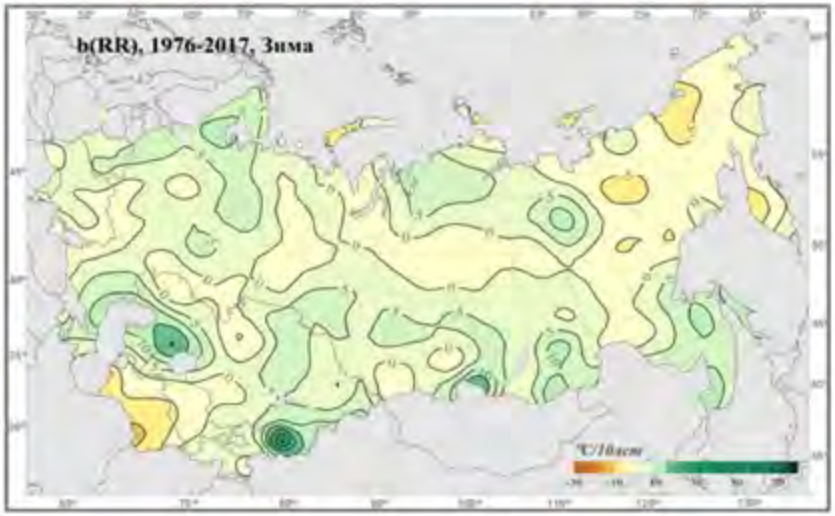
2. SOME FEATURES OF REGIONAL CLIMATE

Geographical distribution of linear trend coefficients (1976-2017)

Average winter temperature [° C / 10 years]



Average winter precipitation [% / 10 years]



- **Temperature:** there are positive temperature trends over most of Northern Eurasia.

There are negative trends only in the north-east of Russia, in the southeast of the West Siberia, in the south of Eastern Siberia and in the northeast of Kazakhstan - in region decreasing in area during the last 3 years.

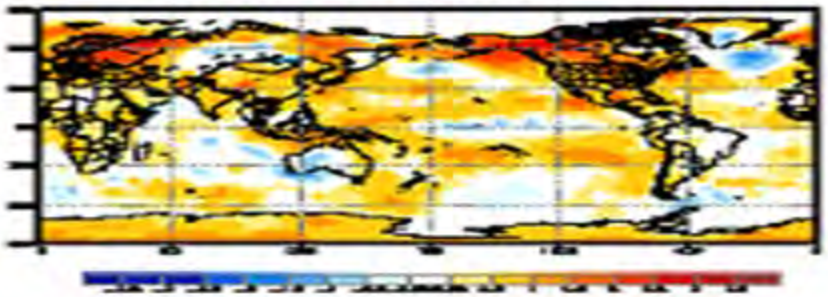
- **Precipitation:** over most of the territory is dominated by a tendency to increase precipitation. These trends are most clearly expressed in the north-west of European Russia, in the north and south of Siberia in the south of the Far East, in the south-west of Kazakhstan, in Kyrgyzstan. There are the precipitation negative trends during the winter season over most of the Far East and Turkmenistan.

3. FORECASTS AND OBSERVATIONS

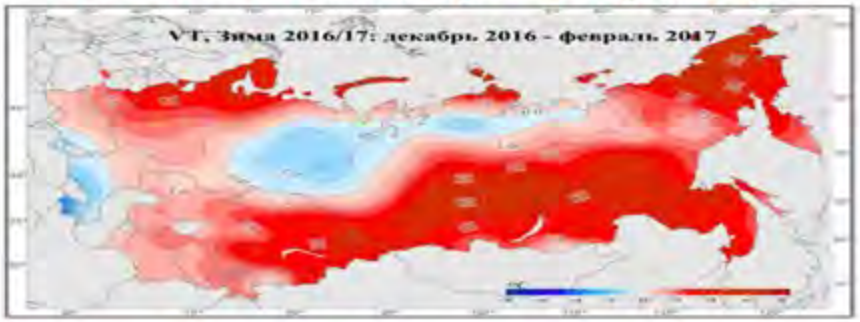
December 2016 -February 2017

Mean temperature

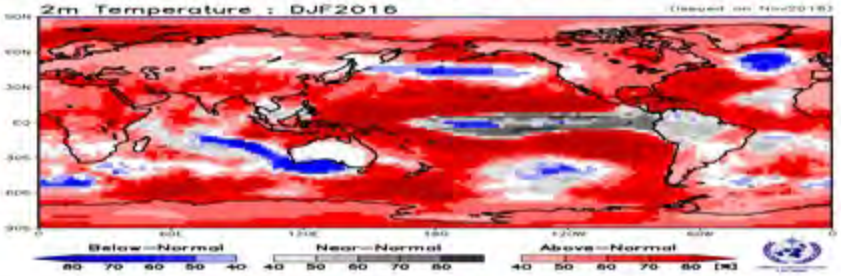
Forecast: GPC_Moscow



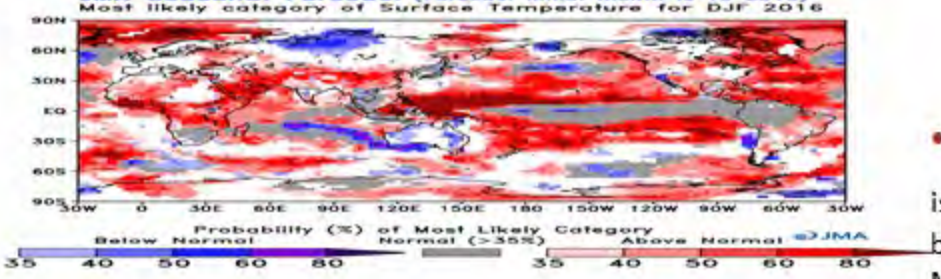
Fact: Temperatures above the 1961-1990 climatological average (IGCE)



Forecast: LC MMELRF-WMO Lead Centre for MME LRF



Forecast: TOKYO CLIMATE CENTRE



- **Temperature:** over most of Northern Eurasia winter 2016-2017 was anomalously warm. Only in Western Siberia, Urals with the adjacent areas of the European Russia the temperature was below the normal. The temperature was also below normal in southern Ukraine and Moldova, in the Caucasus region.

Forecast: Consensus outlook NEACC

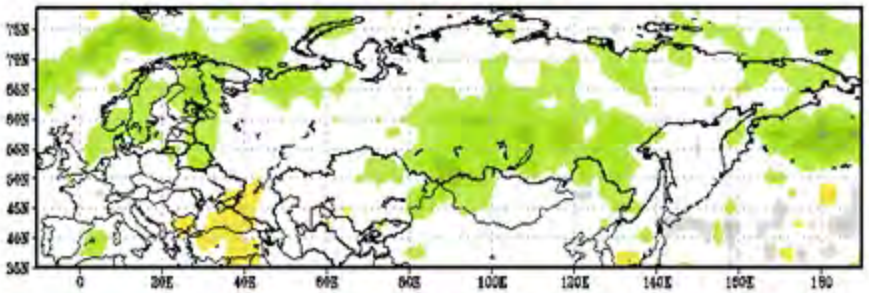
- **The comparison** of consensus seasonal forecasts with observations is made qualitatively. Positive temperature anomalies were predicted by the most of models. Negative anomalies were predicted by GPC Moscow and TCC, but with the shift to the east (flow zonalization) and to the north respectively.

3. FORECASTS AND OBSERVATIONS

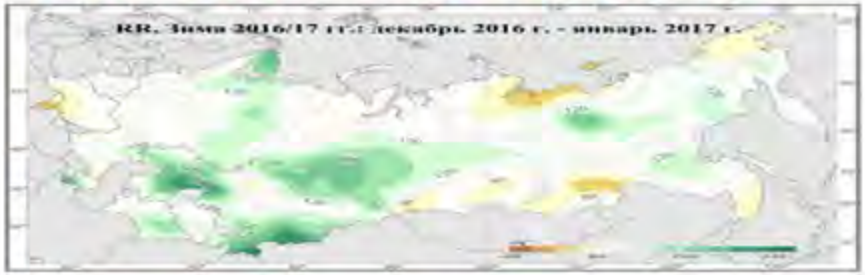
December 2016 -February 2017

Precipitation

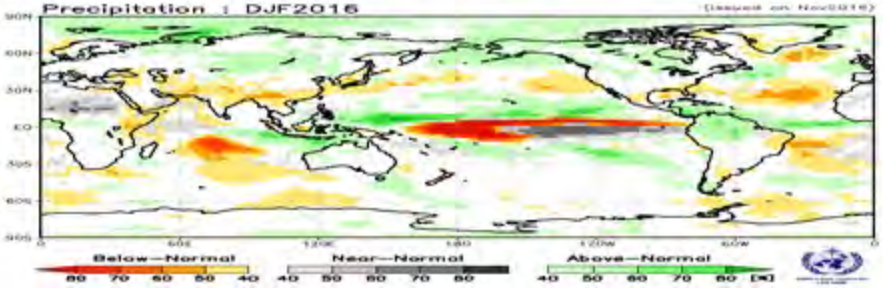
Forecast: GPC_Moscow



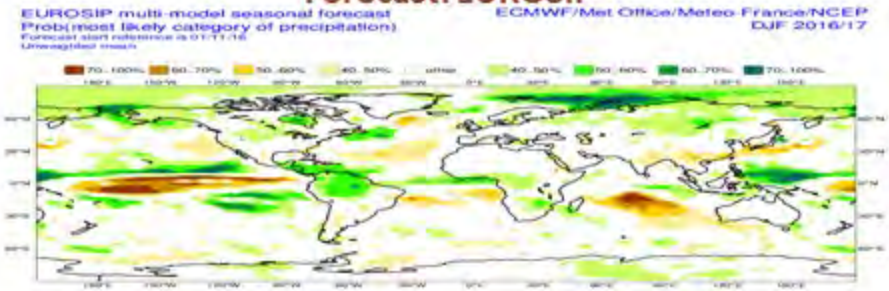
Fact: Precipitation above the 1961-1990 climatological average (IGCE)



Forecast: LC MMELRF-WMO Lead Centre for MME LRF



Forecast: EUROSIP



- **Precipitation** was above normal over most of Northern Eurasia winter. A significant excess of precipitation was observed in Kazakhstan (except for the central regions), in the southeastern part of Western Siberia, in eastern Kyrgyzstan and in Turkmenistan. Precipitation deficit was recorded in Moldova, in the south-west of Ukraine, in some in Russia (in the mountains of Southern Siberia and in Transbaikalia, in the north-west of Yakutia).

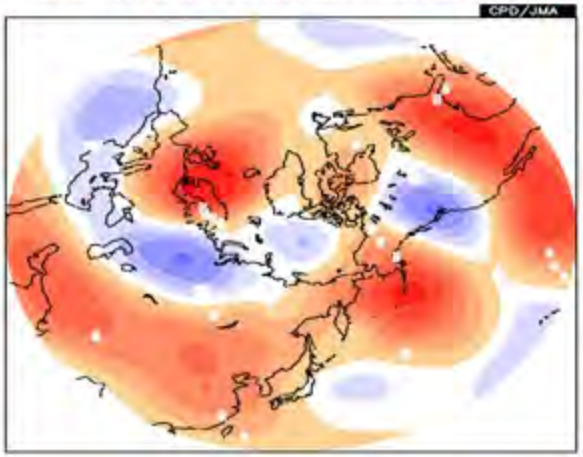
Forecast: Consensus outlook NEACC

Positive precipitation anomalies in Siberia and northern Kazakhstan were predicted by the most of hydrodynamic models, but with a shift to the east.

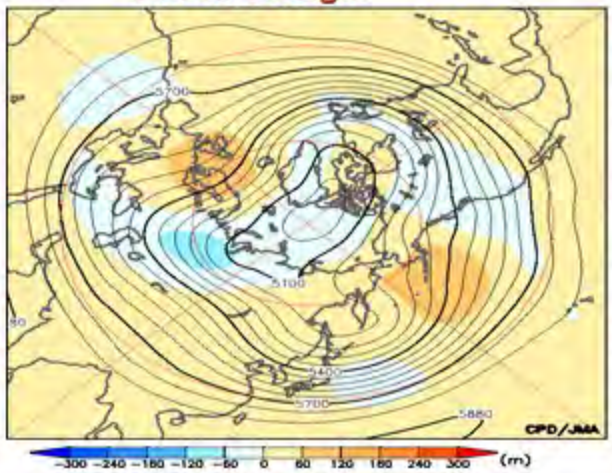
3. ATMOSPHERE CIRCULATION

December 2016- February 2017

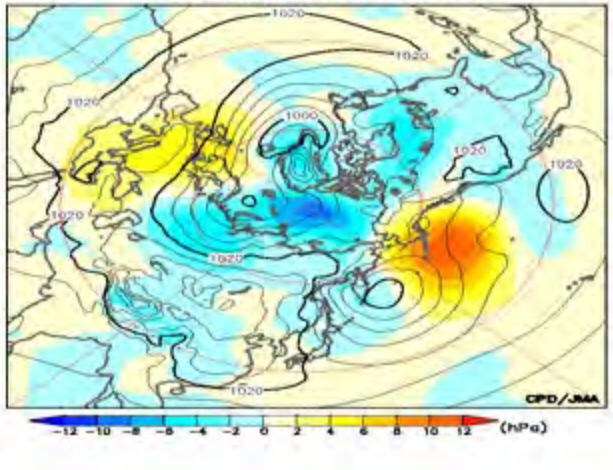
300 –hPa stream function anomaly



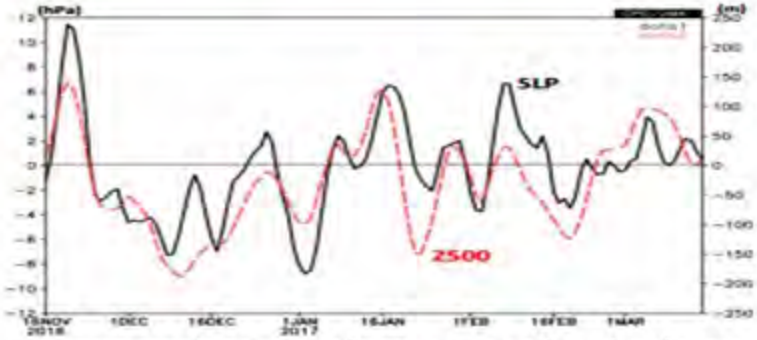
500-hPa Height



Sea Level Pressure



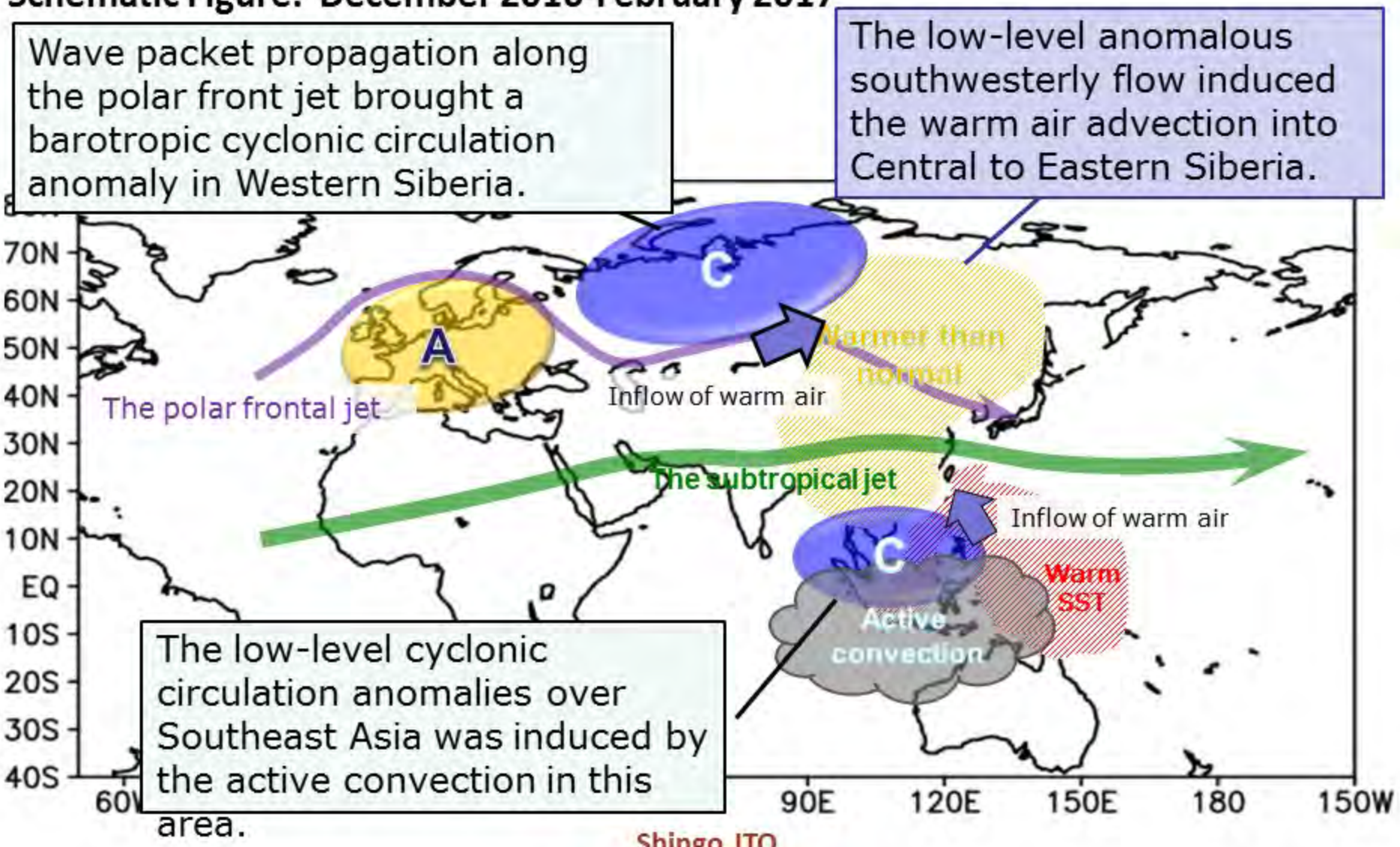
- There is a **planetary wave** of large amplitude with a zonal wave number 4.
- The **blocking European anticyclone** have played the leading role in the formation of circulation processes and weather in Europe and Western Asia. Another center with negative anomalies was located in the north of Western Siberia. It was connected with the deepest and vast **tropospheric trough**, extending far to the southwest up to the eastern Mediterranean. The weaker-than-normal **Siberian High** was another factor behind the warm conditions seen in East Asia.
- **Southern cyclones** combined with **northern cyclones** caused heavy precipitation in the Volga region, the southern Urals, northern Kazakhstan and the south of Western Siberia. These regions turned out to be simultaneously the regions of the maximum baroclinic instability of the mean flow. On the predictive maps of many centers, these regions turned out to be in the zone of forecast uncertainty.



Intraseasonal variation of area-averaged sea level pressure anomalies around the center of the Siberian High (40-60˚N, 80-120˚E; black; left axis) and 500-hPa height anomalies around Western Siberia (50-80˚N, 50-90˚E; red; right axis) from 16 November 2016 to 15 March 2017 (lines indicate five-day running means)

<Tokyo Climate Centre> *http://ds.data.jma.go.jp/tcc/tcc/products/climate/monthly.html*

Schematic Figure: December 2016-February 2017

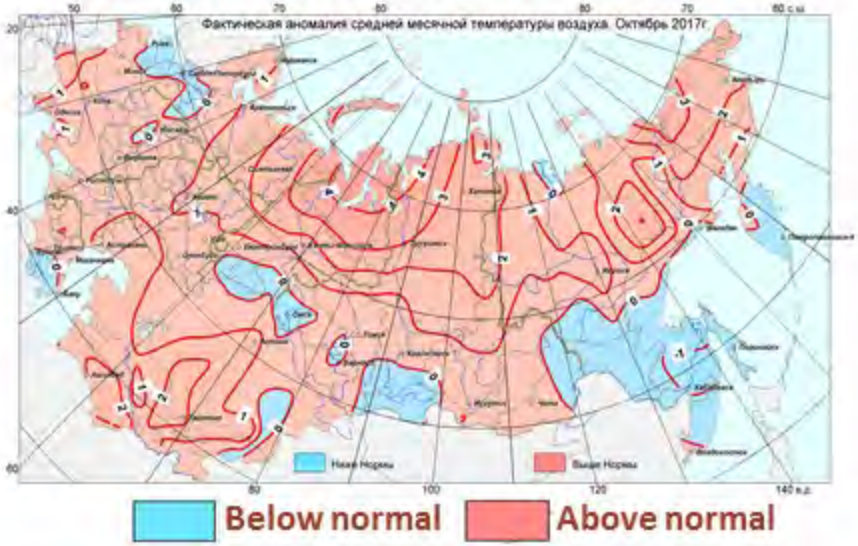


Shingo ITO
Tokyo Climate Center
Japan Meteorological Agency

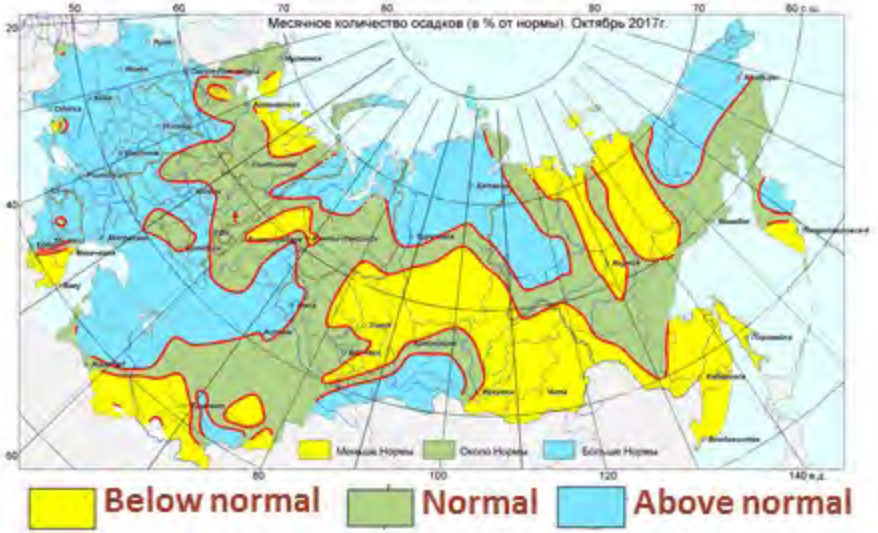
4. CLIMATE DIAGNOSTICS

October 2017

Monthly mean temperature anomalies (°C)



Precipitation(%)

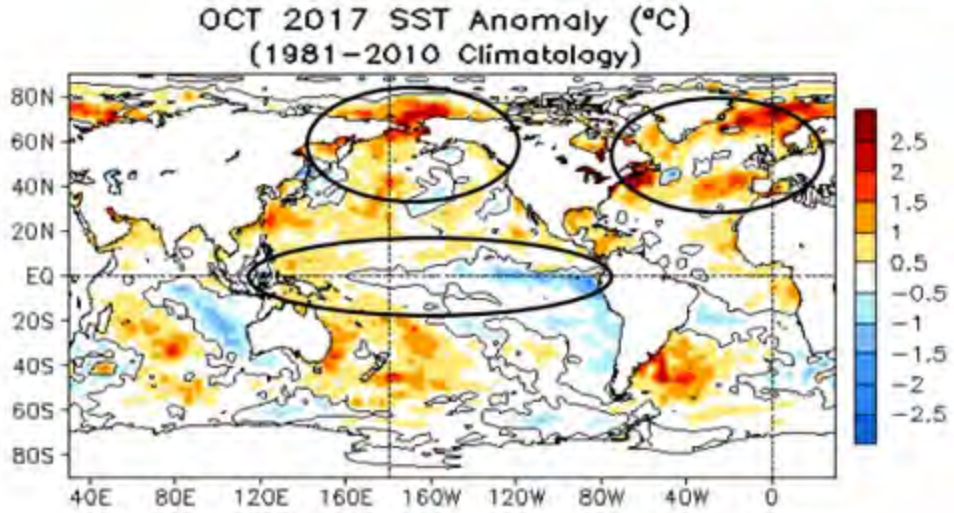


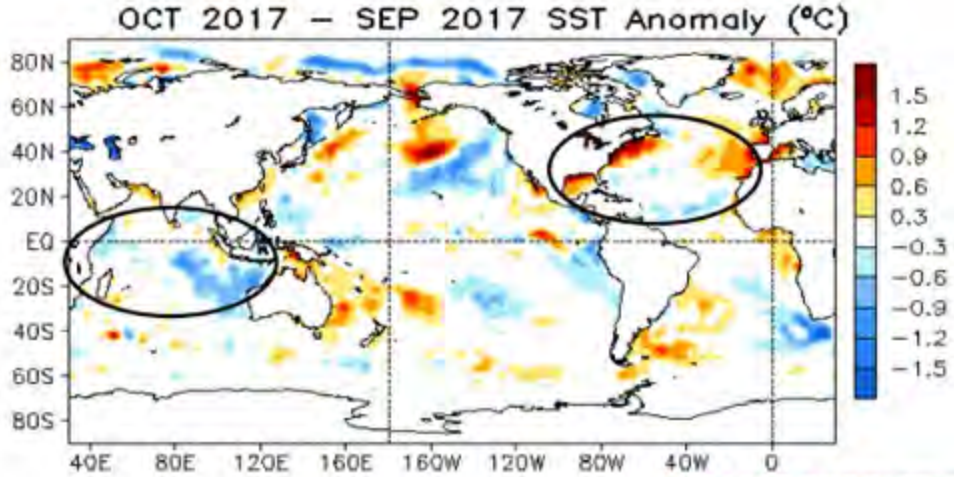
- **Temperature** was **above normal** over most of Northern Eurasia. The most significant anomalies (exceeded 4°C) were observed in the north of Western Siberia. The air temperature was slightly **below the normal** only in the south of Western Siberia, in the south-west of Eastern Siberia, in the south of the Far East and in Kamchatka.
- **Precipitation** was about the normal over most of Northern Eurasia. But the precipitation **exceeded the normal** in the European Russia (except for the northeast), in Transcaucasia (except for Azerbaijan). **The deficit** of precipitation was observed in the central regions of Eastern Siberia and in the south of the Far East, as well as in certain regions of Yakutia.

3. CLIMATE DIAGNOSTICS

October 2017

Sea Surface Temperature (SST)





- **SST** were below-normal (above normal) in the central-eastern (western) equatorial Pacific - Positive SSTA dominated in N. Pacific and N. Atlantic Oceans.

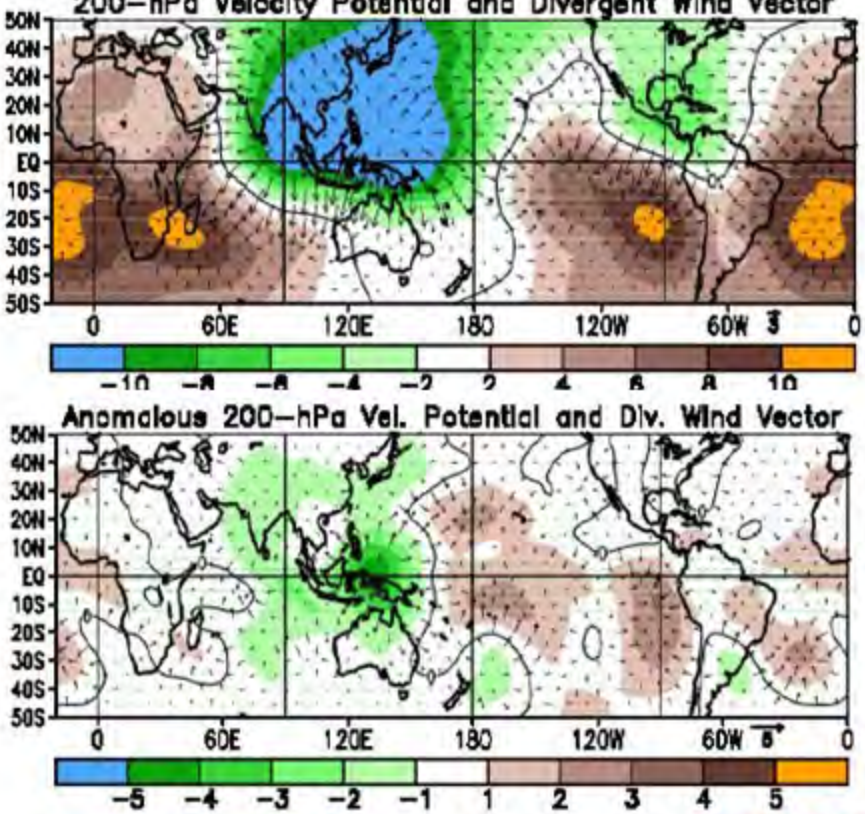
- **SSTA tendency** were mostly negative in the tropical **Indian Ocean**. Indian dipole index was near average in Oct 2017.
- **Strong SSTA tendencies** presented in the **N. Pacific Ocean**. ENSO cycle: developing from neutral into **cold** condition during Oct 2017. PDO switched to weakly **negative** phase with PDO = -0.2.
- **Positive SSTA** tendencies were observed in Gulf of Mexico and along the eastern coast of N. America.

CLIMATE PREDICTION CENTRE

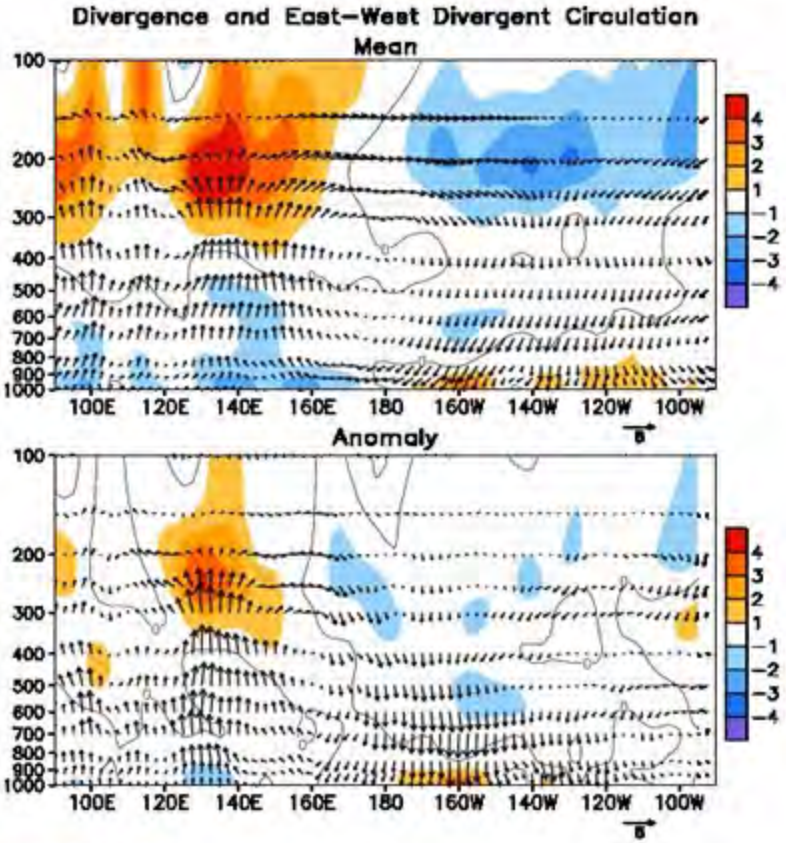
http://www.cpc.ncep.noaa.gov/products/GODAS/ocean_briefing_gif/global_ocean_monitoring_current.pdf

ATMOSPHERIC CIRCULATION < September 2017>

Mean (top) and anomalous (bottom) 200-hPa velocity potential ($10^6 m^2 s$) and divergent wind (CDAS/Reanalysis). Anomalies are departures from the 1981-2010 base period monthly means.



Pressure-longitude section (100E-80W) of the mean (top) and anomalous (bottom) divergence and divergent circulation averaged between 5N-5S.



CLIMATE PREDICTION CENTRE

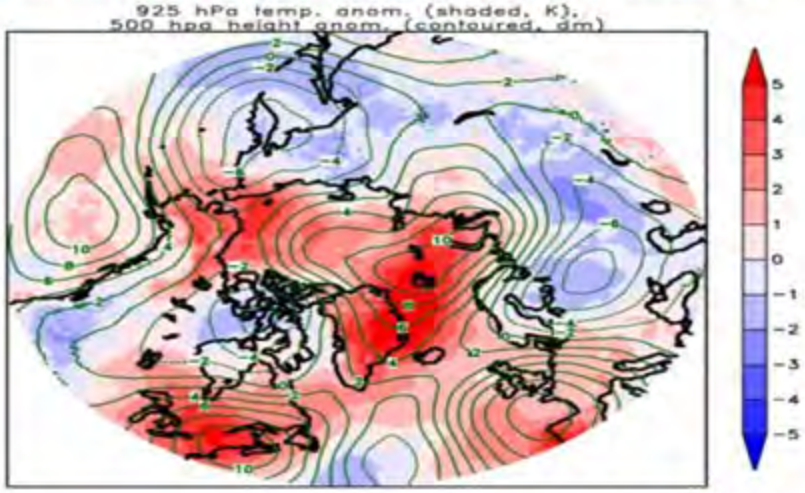
http://www.cpc.ncep.noaa.gov/products/CDB/CDB_Archive_pdf/pdf_CDB_archive.shtml

NORTH EURASIA CLIMATE CENTRE

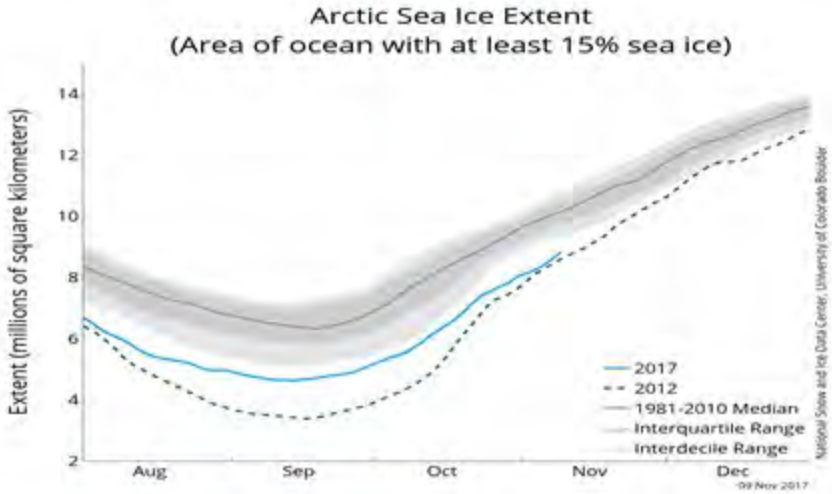
ARCTIC SEA ICE EXTENT

Sea-Ice extension in Arctic. October 2017. The pink line indicates the median ice edge 1981-2010 period.

October 2017 temperature and height anomalies



Arctic Sea Ice Extent (millions of square kilometers) 9 November



- **Arctic sea ice extent** for October was 6.71 million km² making it 5th lowest October in the satellite record extending back to 1979.
- **Currently** a slightly more expansive coverage exists compared to last year at this time. It is worth noting that the freeze-up rate has slowed in the last 2 weeks. The Arctic Ocean region generally had **above average** near surface temperatures in October 2017.

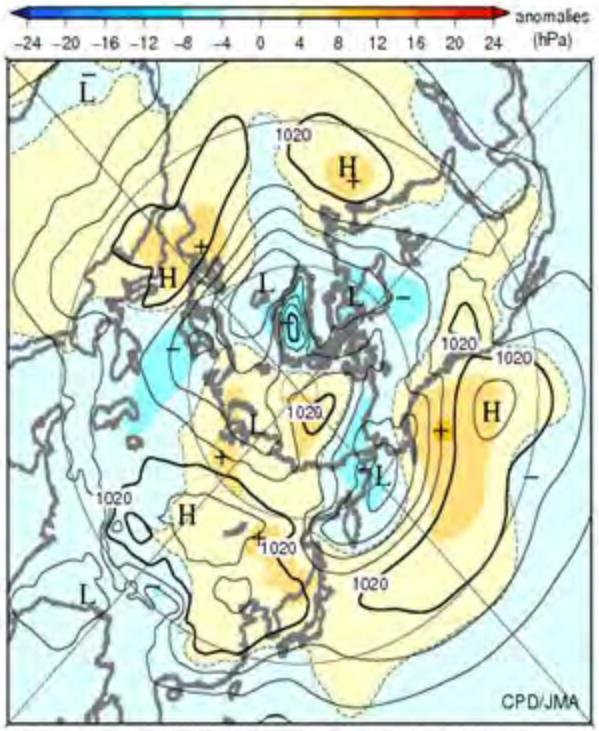
National Snow and Ice Data Centre, Boulder, CO

http://nsidc.org/data/seaice_index/

4. CLIMATE DIAGNOSTICS

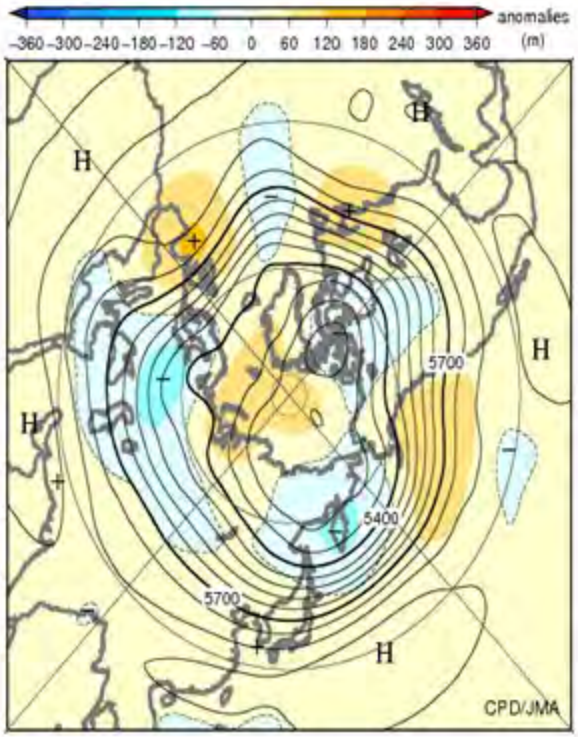
October 2017

Northern Hemisphere Circulation

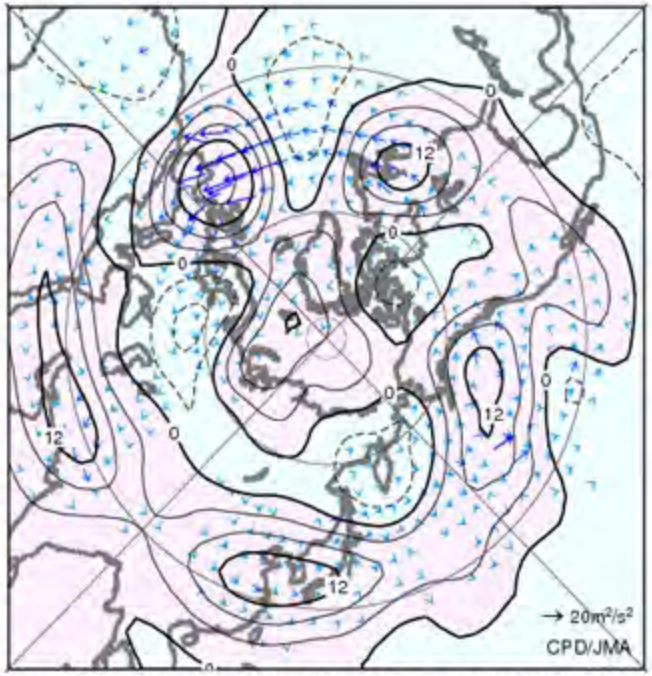


Monthly mean sea level pressure and anomaly in the Northern Hemisphere (Oct.2017)

Monthly mean sea level pressure and its anomalies. Contour: sea level pressure (hPa) Shading: sea level pressure anomalies (hPa)



Monthly geopotential height and its anomalies at 500-hPa. Contour: geopotential height (m) Shading: geopotential height anomalies (m)



Monthly mean 300 hPa function anomaly and wave activity flux. The contours indicate stream function anomalies of 4×10^5 m^2/s,and the vectors show wave activity flux (unit: m^2/s^2). The vectors are not shown where wave activity flux is less than 2 m^2/s^2

<Tokyo Climate Centre> http://ds.data.jma.go.jp/tcc/tcc/products/clisys/figures/db_hist_mon_tcc.html

5. THREE-MONTH PREDICTIONS
(Dec. 2017–Feb. 2018)

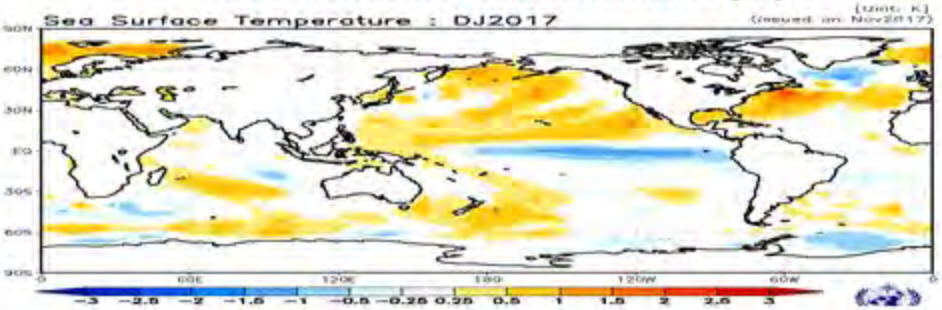
NORTH EURASIA CLIMATE CENTRE

SEA SURFACE TEMPERATURE (SST)

December 2017 – February 2018

Simple composite map

Three month mean SST anomalies (°K)



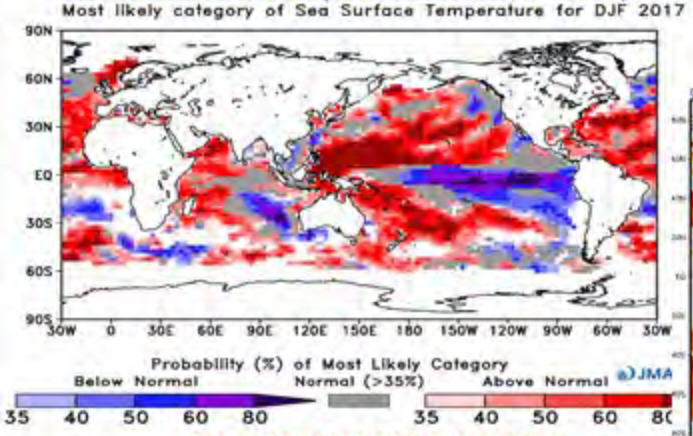
LC MMELRF-WMO Lead Centre for MME LRF

https://www.wmolc.org/

The different models are in good agreement this season.

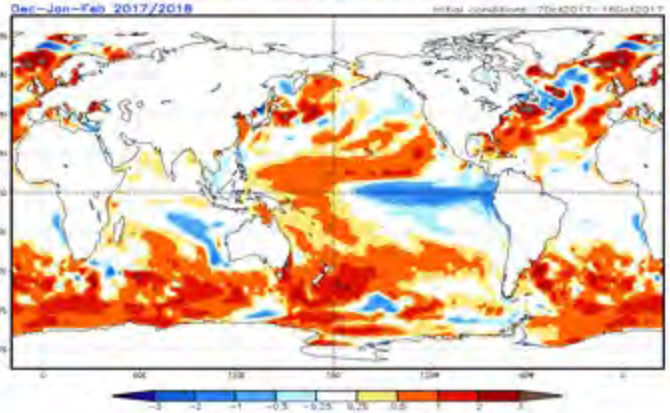
- **Indian Ocean:** the most significant SST anomalies are expected in the southern hemisphere (positive in the west and negative in the east). In the northern hemisphere, the IOD returned to neutral values.
- **Pacific Ocean:** Most models predict warmer (colder) than normal conditions in the west (centre and east) of the equatorial latitudes. It is likely that above normal SST in the latitudinal band 5-15N in the North Pacific Ocean will persist during the winter. Accoding to the IRI/CPC the probabilities for La Nina, neutral and El Nino conditions (using -0.5C and 0.5C thresholds) over the coming DJF season are: 67%, 33% и 0 %. Colder than normal conditions are expected near the north-west cost of Nothern America to north of 30°N. This can lead to a strengthening Pacific High and shift it to the north-west from the climate position.

Probability (%) of most likely category



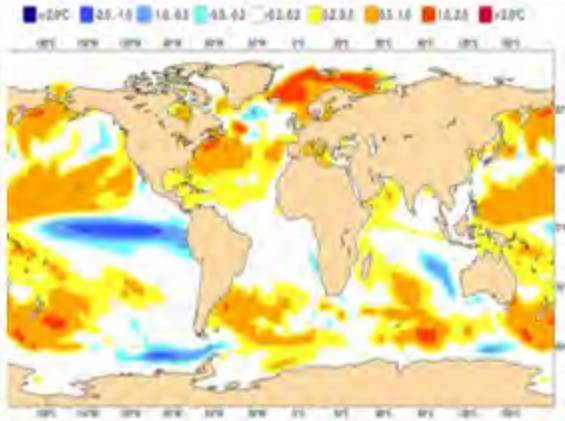
TOKYO CLIMATE CENTRE

Three month mean SST anomalies (°K)



CLIMATE PREDICTION CENTRE

November 2017 – January 2018

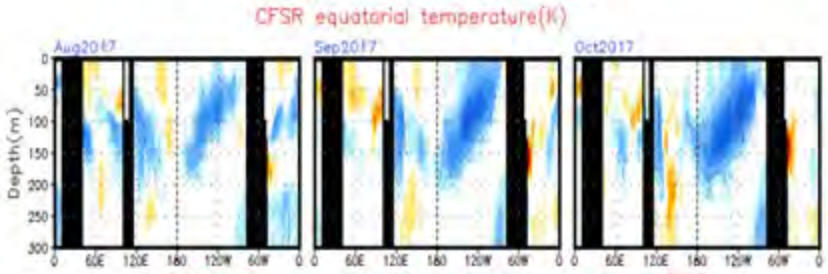


EUROSIP

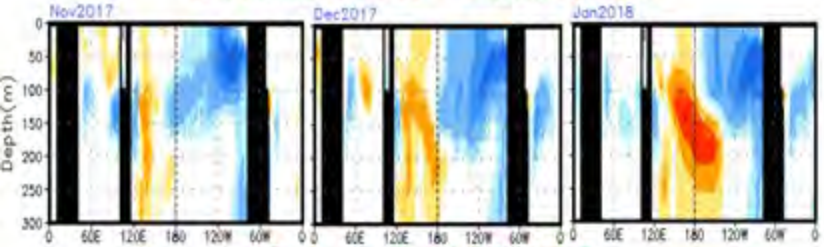
EQUATORIAL TEMPERATURE

Longitude cross section along the EQ

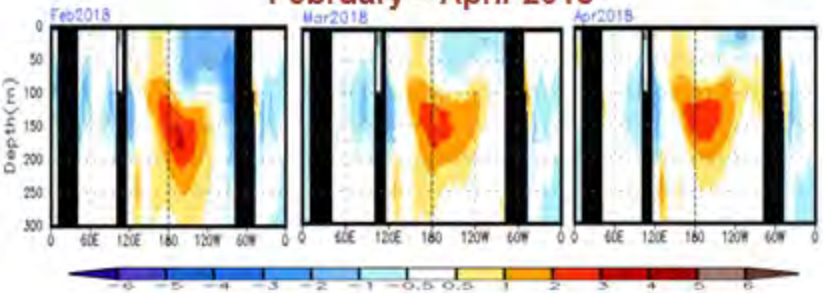
August – October 2017



November 2017 – January 2018

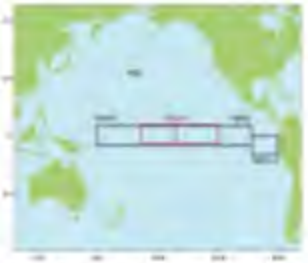


February – April 2018

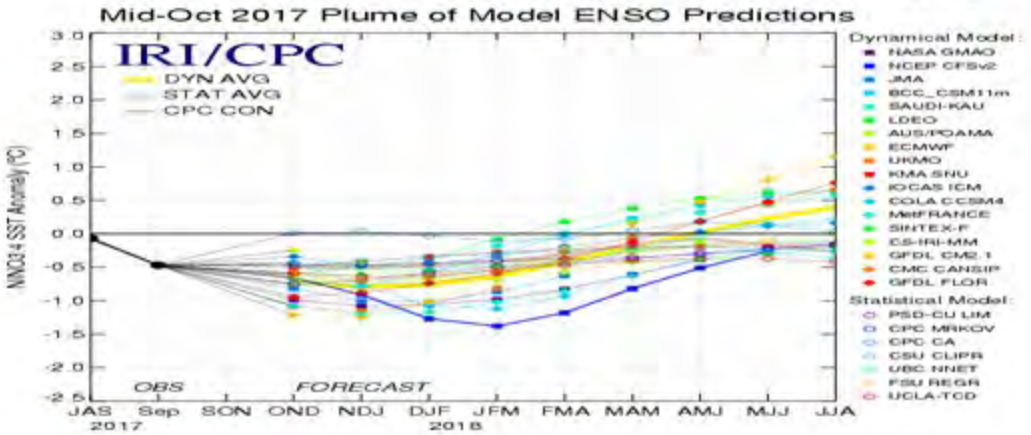


CLIMATE PREDICTION CENTRE

http://www.cpc.ncep.noaa.gov/products/CDB/CDB_Archive_pdf/pdf_CDB_archive.shtml



Nino 3.4 SST Anomaly (˚C)

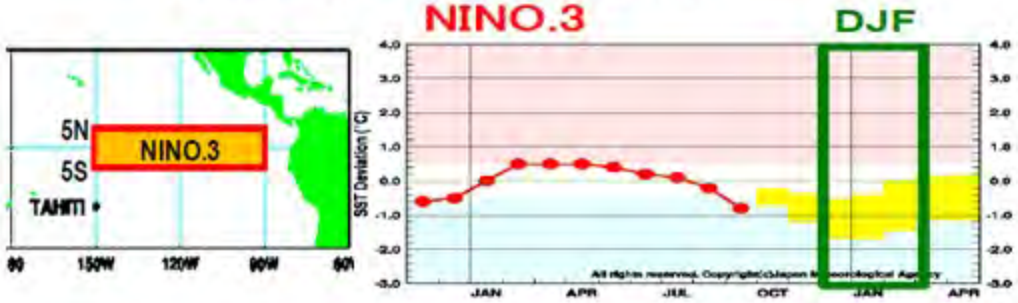


- **Most models** indicate that La Niña will continue through the Northern Hemisphere winter 2017-18, followed by weakening and a transition to ENSO-neutral during the late spring or early summer.
- **CPC/IRI Consensus ENSO Forecast** Probabilities winter 2017-2018 La Niña, Neutral and El Niño are 67%, 33% and 0 %. So the collection of latest ENSO prediction models indicates La Niña as a likely scenario during Northern Hemisphere fall and winter.

http://iri.columbia.edu/our-expertise/climate/forecasts/enso/current/?enso_tab=enso-sst_table

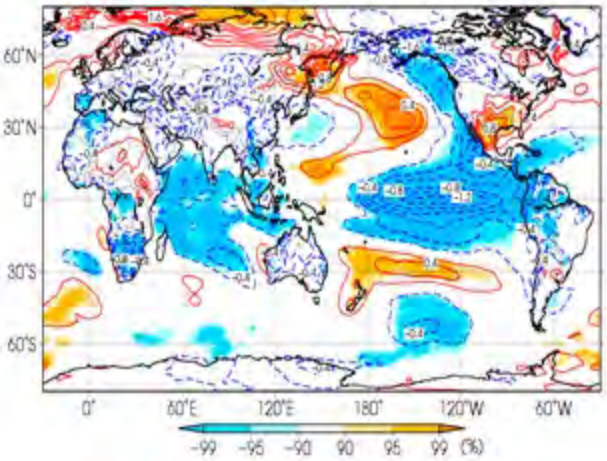
IMPACTS OF TROPICAL SST
December – February

Predicted SST indices DJF 2017/2018



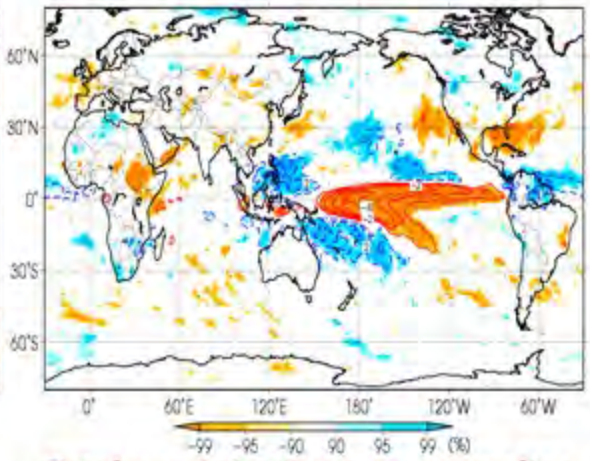
- **NINO.3 SST** is predicted to be **below normal**.
- The chance of **La Niña** based on JMA's definition is about 50% during the winter.
- **Prediction skill:** ACC=0,91.

Composite maps(1958-2012): The negative phase of NINO.3 (<-0.5)



2-m temperature anomalies

Contours show composite anomalies at intervals of 0.2°C. Shading indicates the confidence level.



Total precipitation rate anomalies

Contours show composite anomalies at intervals of 1 mm/day. Shading indicates the confidence level.

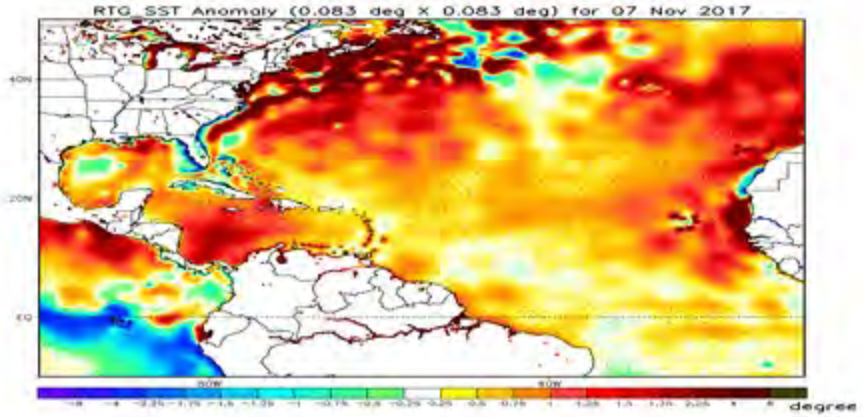
TOKYO CLIMATE CENTRE

- **Temperature anomalies (negative)** are seen in the central and the eastern equatorial Pacific, indicating well-developed **La Niña** . The **positive** anomalies are observed over most of the Far East. The weak **negative** signals are seen in the south-west of Western Europe and in Mongolia.
- **Precipitation anomalies** indicate that convective activity is suppressed over the western to central equatorial Pacific and enhanced over and around the Maritime Continent in response to the east-west contrast of SST anomalies in the equatorial Pacific. There is a weak **wet** signal in the Far East. It is likely a **dry** conditions in the south of Eastern Siberia and in the south of Central Asia.

http://ds.data.jma.go.jp/tcc/tcc/products/climate/ENSO/lanina.html

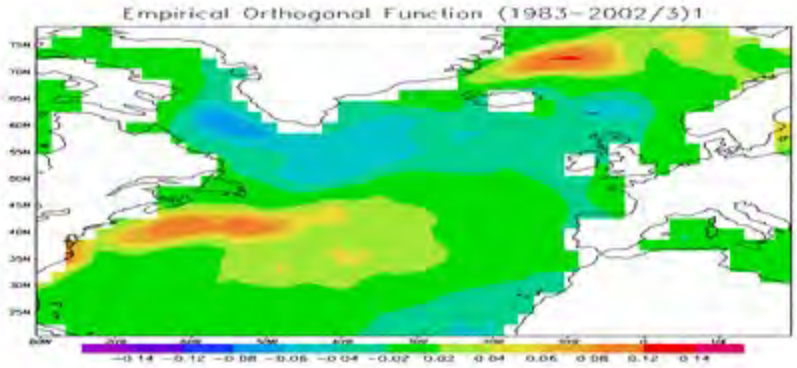
NORTH ATLANTIC

SST anomalies for 7 November 2017



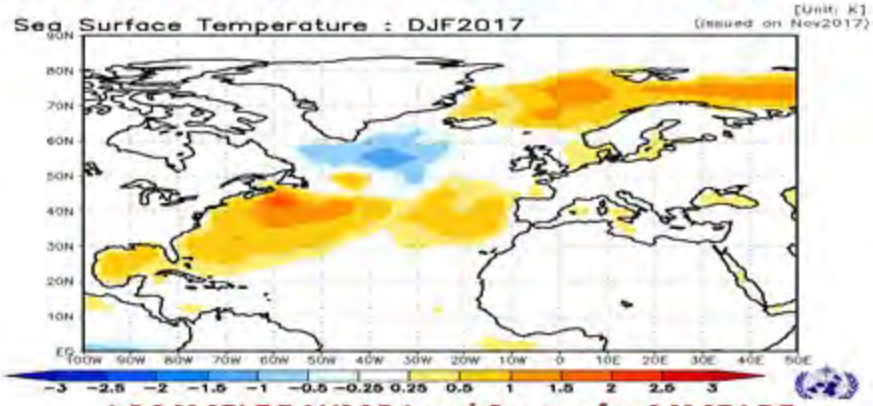
http://polar.ncep.noaa.gov/sst/rtg_high_res/

SST: First Empirical Orthogonal Function



December 2017 – February 2018

Simple composite map: SST anomalies (°K)



LC MMELRF-WMO Lead Centre for MME LRF

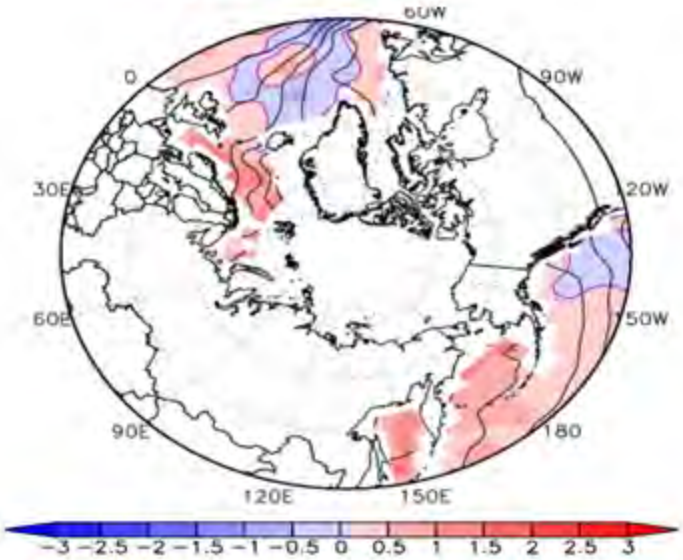
- **7 November**: positive SST anomalies were observed in most of Northern Atlantic. In the Gulf Stream, positive SST exceeded 3˚-4˚C.
- **The tripole** is the principal mode of SST variability in the North Atlantic (see picture). The distribution of predicted anomalies is consistent with the positive phase of tripole, associated with the positive phase of NAO.
- **The significant positive** SST anomalies are expected in the Gulf Stream and in Norwegian and Barents Seas at higher latitudes of the North Atlantic.

NORTH EURASIA CLIMATE CENTRE

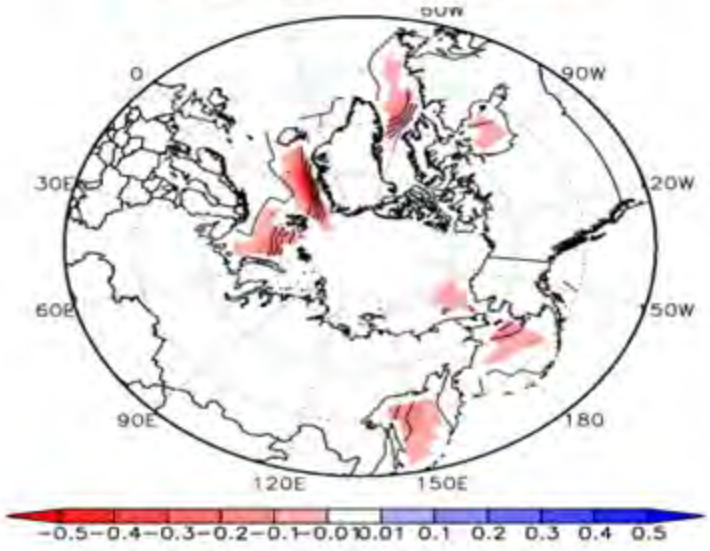
PREDICTED ARCTIC SEA ICE EXTENT

December 2017 – February 2018

SSTs anomalies



Sea ice Extent Anomalies



- **SSTs** are predicted to be above normal around the Arctic Sea
- **Sea Ice extents** are predicted to be below normal in the Sea of Okhotsk, the Barents Sea and the Bering Sea.
- **Experimental CFSv2 forecast** shows sea ice extent remaining below the 1981-2010 average but above last year's record lows (http://www.cpc.ncep.noaa.gov/products/GODAS/ocean_briefing_gif/global_ocean_monitoring_current.pdf.

TOKYO CLIMATE CENTRE

http://ds.data.jma.go.jp/tcc/tcc/library/temporary/JMA_Prediction_NEACOF-13.pdf

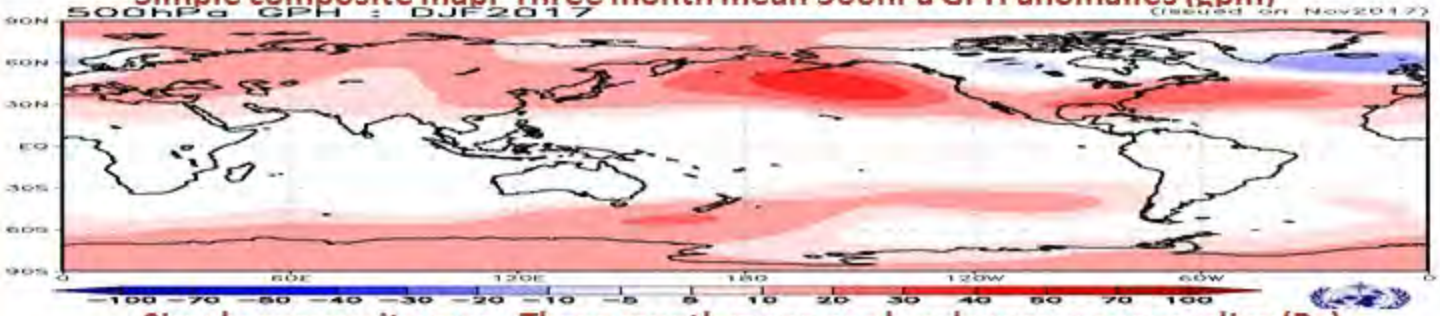
ATMOSPHERIC CIRCULATION

December 2017 - February 2018

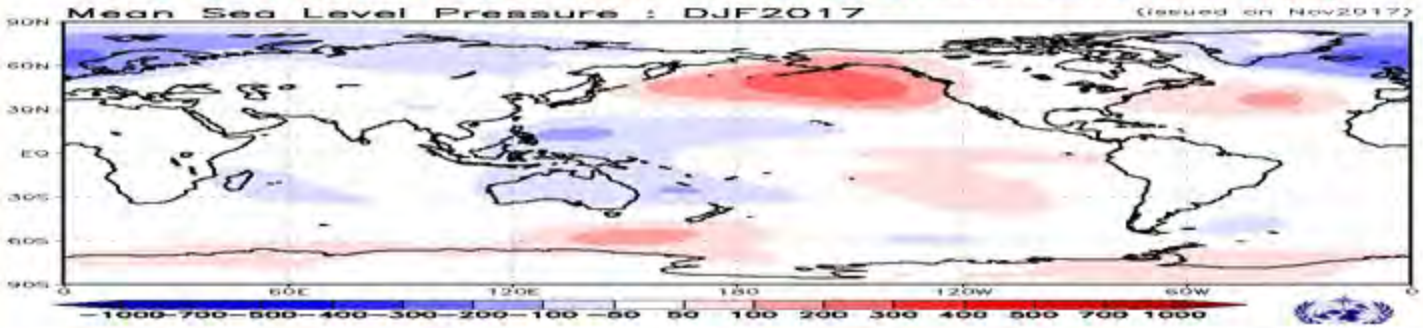
MODELS:

- Beijing
- Seul
- Washington
- Toulouse
- Exeter
- CPTEC
- ECMWF
- Melbourne
- Montreal
- Moscow
- Offenbax

Simple composite map. Three month mean 500hPa GPH anomalies (gpm)



Simple composite map. Three month mean sea level pressure anomalies (Pa)

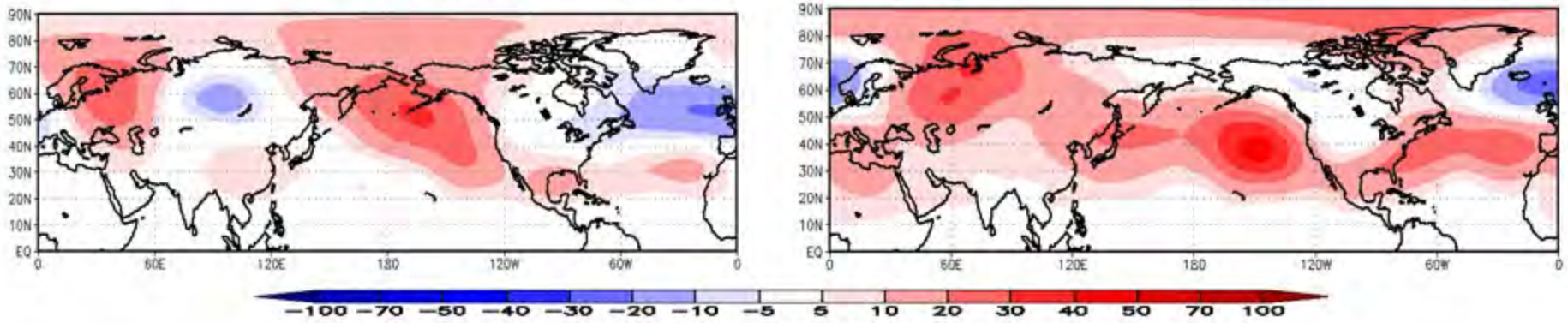


- **In the 500 hPa Height field** the most significant **positive anomalies** are predicted over European Russia and north-east of Northern Pacific. **Negative anomalies** are predicted around Iceland.
- **In the sea level pressure positive anomalies** are predicted in the north-east of Pacific Ocean. **Negative anomalies** are predicted in the south-west of North Pacific related to an active convection over warm SST conditions in the latitudinal band of about 5-15N (La Niña). **Negative anomalies** are predicted over north of Atlantic Ocean and north of Northern Eurasia too. **Positive anomalies** are predicted in the north-east of Pacific Ocean and over tropic in the N. Atlantic.

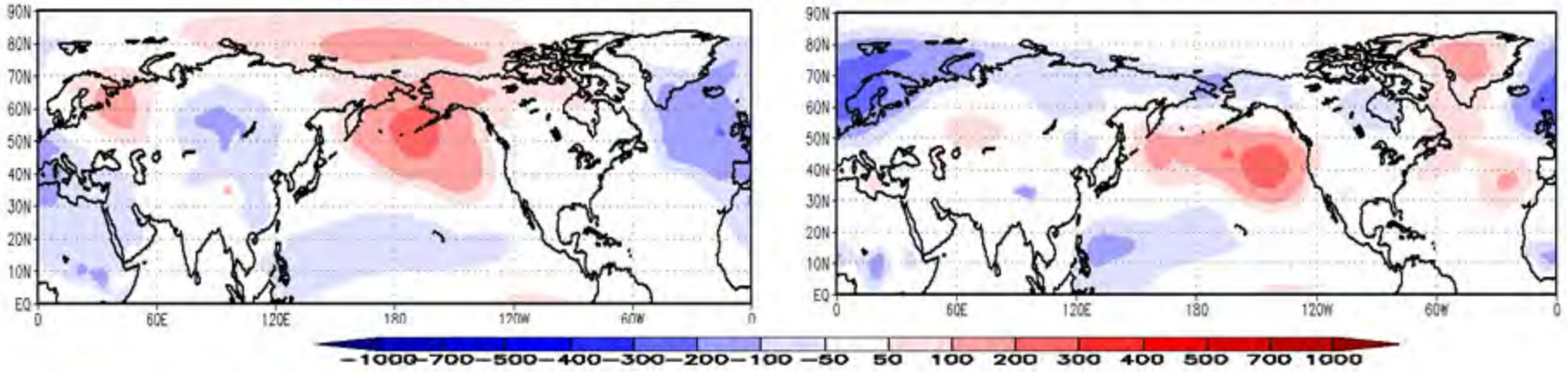
ATMOSPHERIC CIRCULATION

December 2017 - February 2018

Simple composite map. Three month mean 500hPa GPH anomalies (gpm).



Simple composite map. Three month mean sea level pressure anomalies (Pa).



GPC_ECMWF

GPC_OFFENBACH

LC MMELRF-WMO Lead Centre for MME LRF

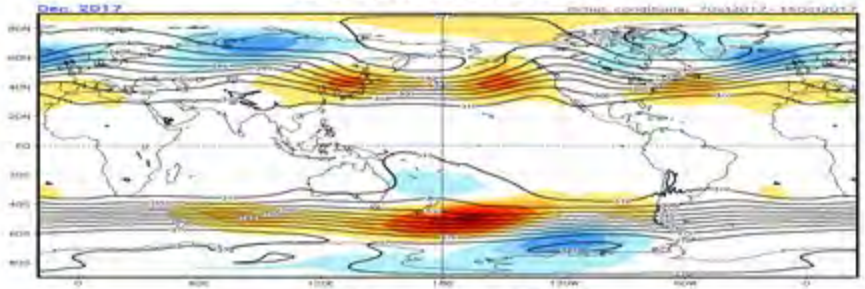
https://www.wmolc.org/

NORTH EURASIA CLIMATE CENTRE

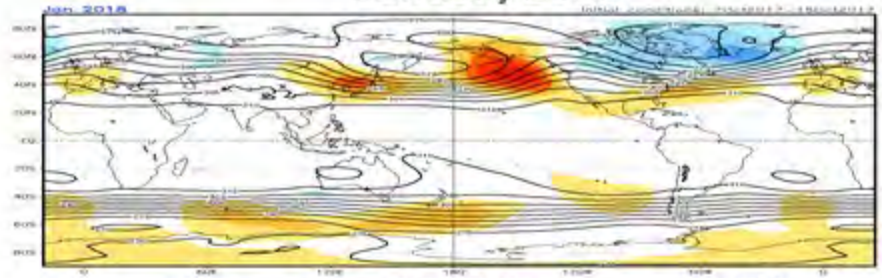
ATMOSPHERIC CIRCULATION

Monthly z700 anomalies (m: shaded) and total (dm:conrours)

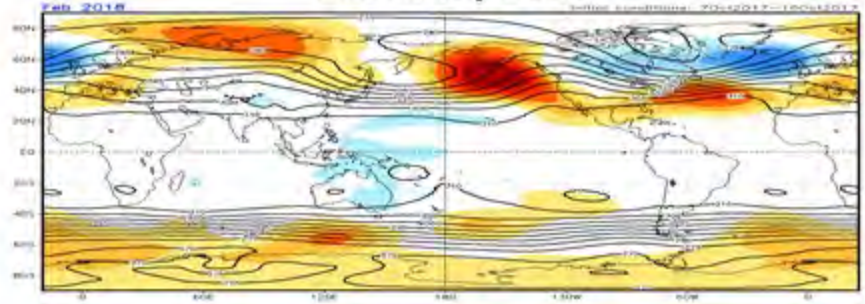
December 2017



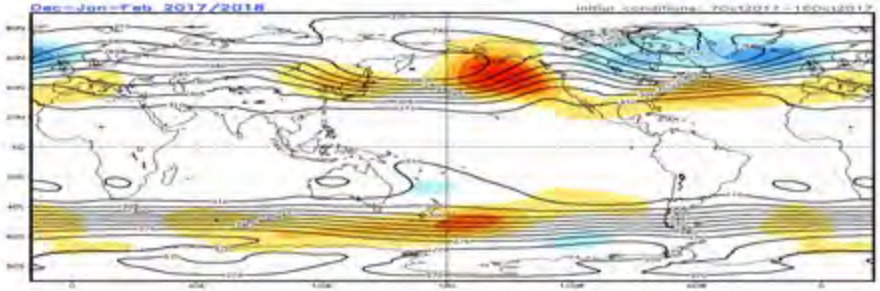
January 2018



February 2018



December 2017-February 2018



- **During the winter season** a stable **positive** (**negative**) anomalies are expected in the north-east of the Northern Pacific (north of Northern Atlantic).
- **It is likely** then the circulation will be diverse in character over most of Northern Eurasia. In December, the meridonal forms of circulation will be predominant, in January the flow will be more zonal.
- **For DJF** the predicted **positive** anomalies are expected in the south of Europe, in the south of the Far East, and the **negative** anomalies are in the north of Northern Atlantic.

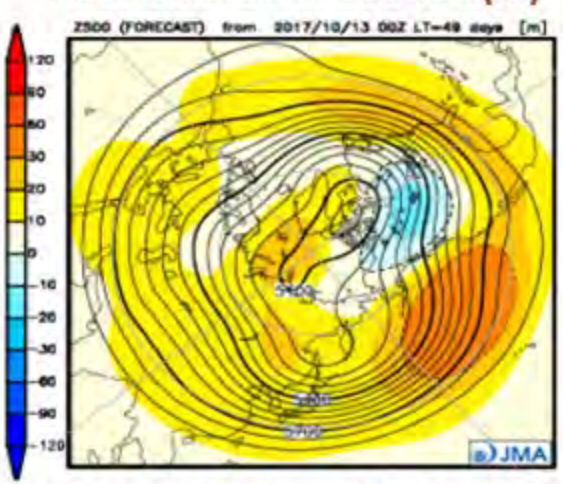
CLIMATE PREDICTION CENTRE

http://www.cpc.ncep.noaa.gov/products/CFSv2/CFSv2seasonal.shtml

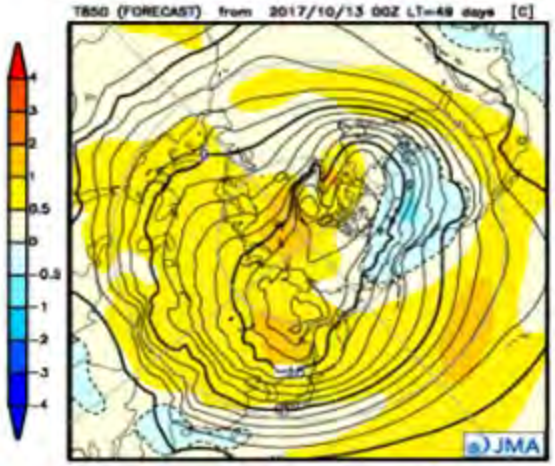
ATMOSPHERIC CIRCULATION

December 2017 - February 2018

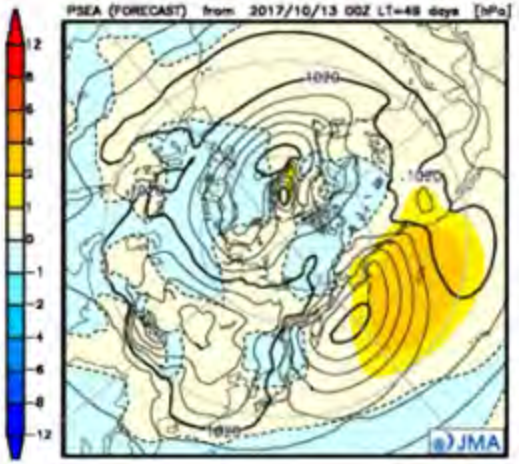
Three month mean geopotential height and its anomalies at 500-hPa(m)



Three month mean temperature and its anomalies at 850-hPa (° C)



Three month mean sea level pressure (SLP) and its anomalies (hPa)



- **In the 500-hPa height field, positive anomalies** are dominantly predicted over the Northern Hemisphere, with their centers over the eastern North Pacific, the western North Atlantic, the Barents Sea and south of Far East, while **negative anomalies** are predicted over the northern part of North America.
- **In the 850-hPa temperature field, positive anomalies** are also dominantly predicted over the Northern Hemisphere, while **negative anomalies** are predicted over the northwestern part of North America and over an area in the southeastern part of East Asia.
- **In the sea level pressure field, positive anomalies** are predicted over the eastern North Pacific, while **negative anomalies** are predicted from the Europe to Central Siberia, over the East Siberian Sea and the southeastern part of Eastern Siberia.

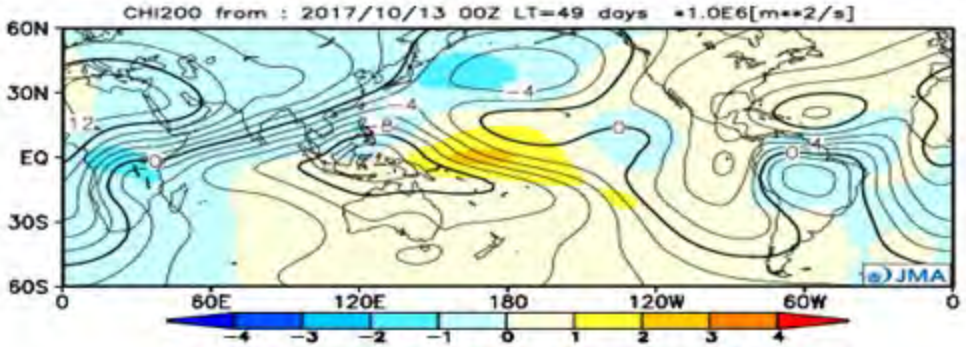
TOKYO CLIMATE CENTRE

http://ds.data.jma.go.jp/tcc/tcc/products/model/map/4mE/map1/pztmap.php

ATMOSPHERIC CIRCULATION

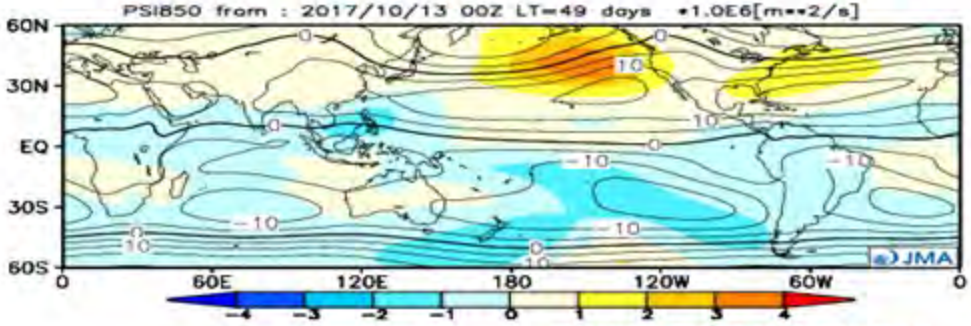
December 2017 - February 2018

Three month mean 200-hPa velocity potential
Contour: 200-hPa velocity potential (10^6 m^2/s)
Shading: 200-hPa velocity potential anomalies (10^6 m^2/s)



- **In the 200-hPa velocity potential field,** negative (large-scale divergence) anomalies are predicted from the northern Africa to the South China Sea, while positive (large-scale convergence) anomalies are predicted over the western equatorial Pacific.

Three month mean 850-hPa stream function
Contour: 850-hPa stream function (10^6 m^2/s)
Shading: 850-hPa stream function anomalies (10^6 m^2/s)



- **In the 850-hPa stream function field,** cyclonic circulation anomalies are predicted from the northern Indian Ocean to the seas south of Japan, and anti-cyclonic circulation anomalies are predicted over the north-east of the central Pacific.

TOKYO CLIMATE CENTRE

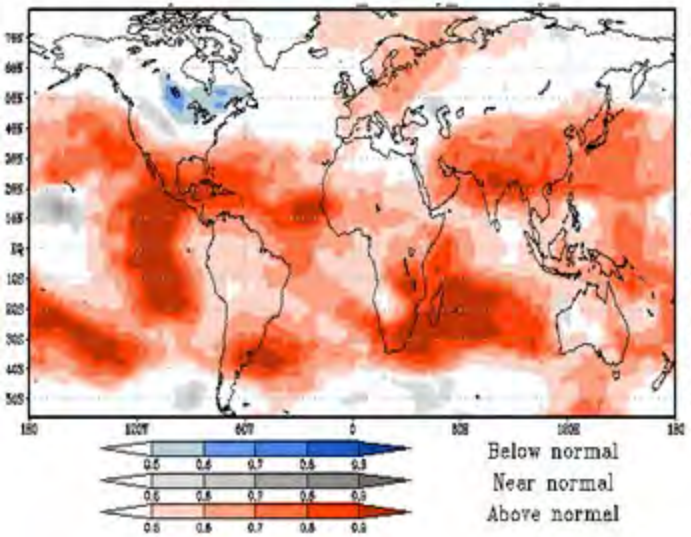
http://ds.data.jma.go.jp/tcc/tcc/products/model/map/4mE/map1/pztmap.php

ATMOSPHERIC CIRCULATION

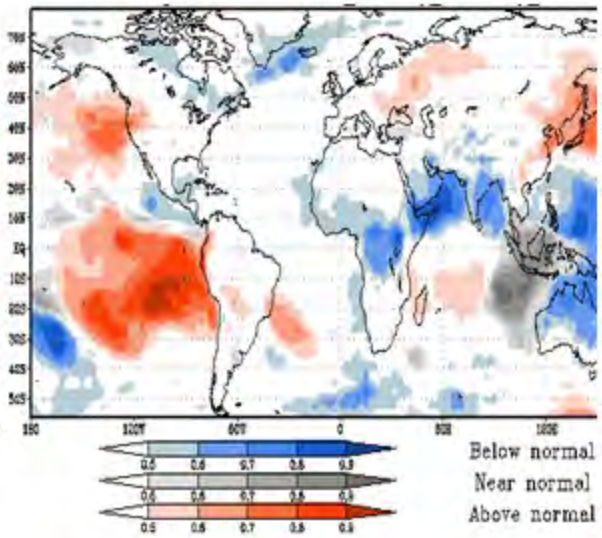
December 2017 - February 2018

Probability of most likely category

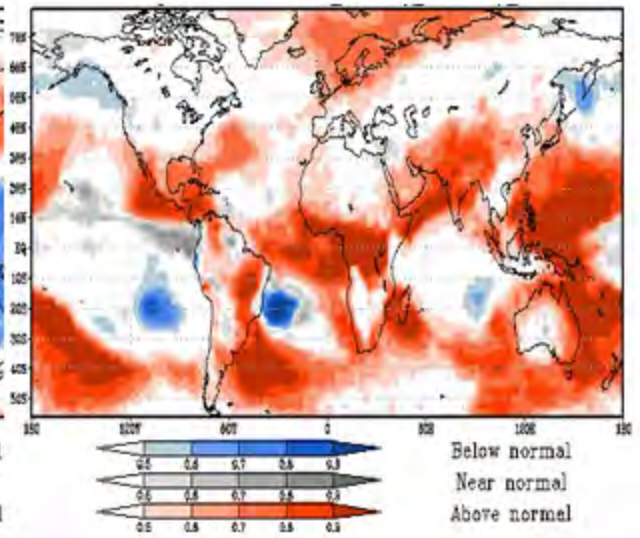
500-hPa Height



Sea level pressure



850 hPa Temperature



- **In the 500-hPa height field, positive** anomalies are predicted in the north east and in the south of Eurasia continent.
- **In the sea level pressure field, positive** anomalies are predicted from European Russia to the north of Western Siberia.
- **In the 850-hPa temperature field, positive** anomalies are predicted around Arctic seas and in the south of Northern Asia.

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

http://neacc.meteoinfo.ru

PREDICTED ATMOSPHERIC CIRCULATION INDICES

HIDROMETEOROLOGICAL CENTRE OF RUSSIA (SL-AV)

INDEX	DECEMBER 2017 – FEBRUARY 2018			
	DECEMBER	JANUARY	FEBRUARY	DECEMBER-FEBRUARY
EA	-0,6	-1,6	-1,26	-1,48
WA	-2,45	-1,35	-0,46	-1,66
EU	-1,34	-0,49	-1,3	-1,45
WP	-1,2	- 0,31	-0,83	-0,97
PNA	-0,39	-0,13	-0,67	-0,45
POL	0.26	0.02	-0.1	0.05
NAO	0,97	0,43	-0,13	0,44
AO	0,08	0,35	0,09	0,29

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).

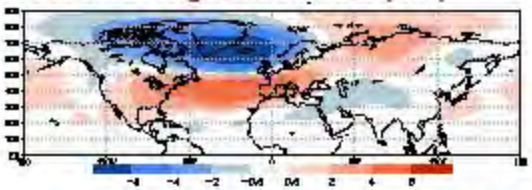
North Atlantic (**NAO**), Polar (POL), Arctic (**AO**) oscillations (Climate Prediction Centre of USA).

ATMOSPHERIC CIRCULATION INDICES

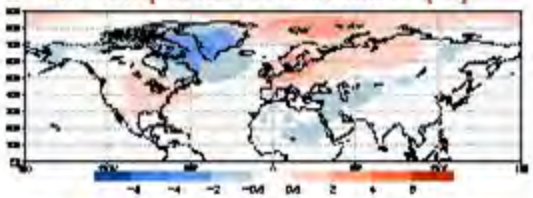
COMPOSITE MAPS

Positive phase of NAO

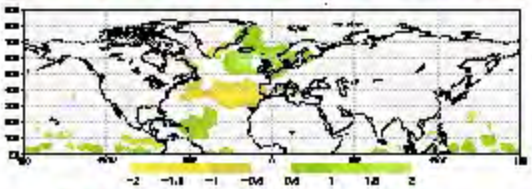
500 hPa Height anomalies (dm)



2m Temperature anomalies (°C)

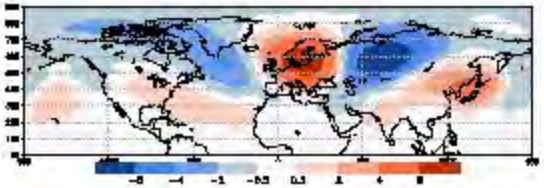


Precipitation anomalies (mm/day)

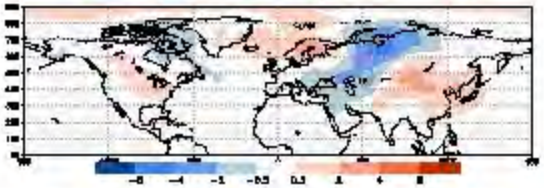


Negative phase of EU

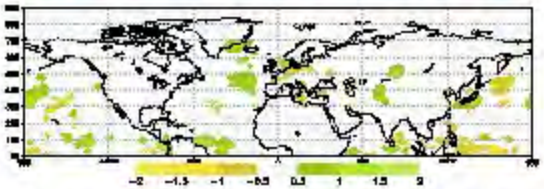
500 hPa Height anomalies (dm)



2m Temperature anomalies (°C)

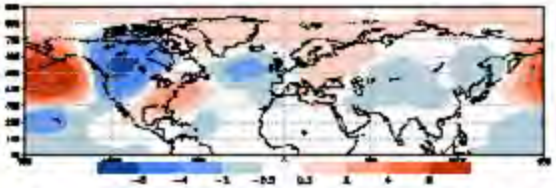


Precipitation anomalies (mm/day)

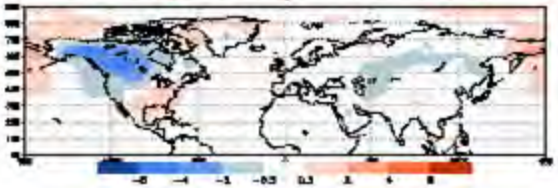


Negative phase of PNA

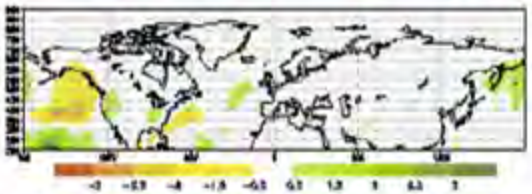
500 hPa Height anomalies (dm)



2m Temperature anomalies (°C)



Precipitation anomalies (mm/day)



- **The atmospheric circulation regimes** are the important factors decided the formation of the fields of temperature and precipitation on seasonal time intervals. Most of models predict the **negative** PNA pattern, which is consistent with a La Niña event. Besides that, la Niña events combined with a positive PDO is known to favor **positive** NAO circulations over Western Europe.

- **According to the forecasts of the Hydrometcenter of Russia**, the winter is expected with **positive** values of index NAO and **negative** values of index EU. **Positive** values of index NAO are indicative of an **above normal** temperature in the north of Europe and below normal temperature in the south of Europe. **Positive values** of the index are indicative of an **above** (**below**) normal precipitation in the north (south) of Europe too.

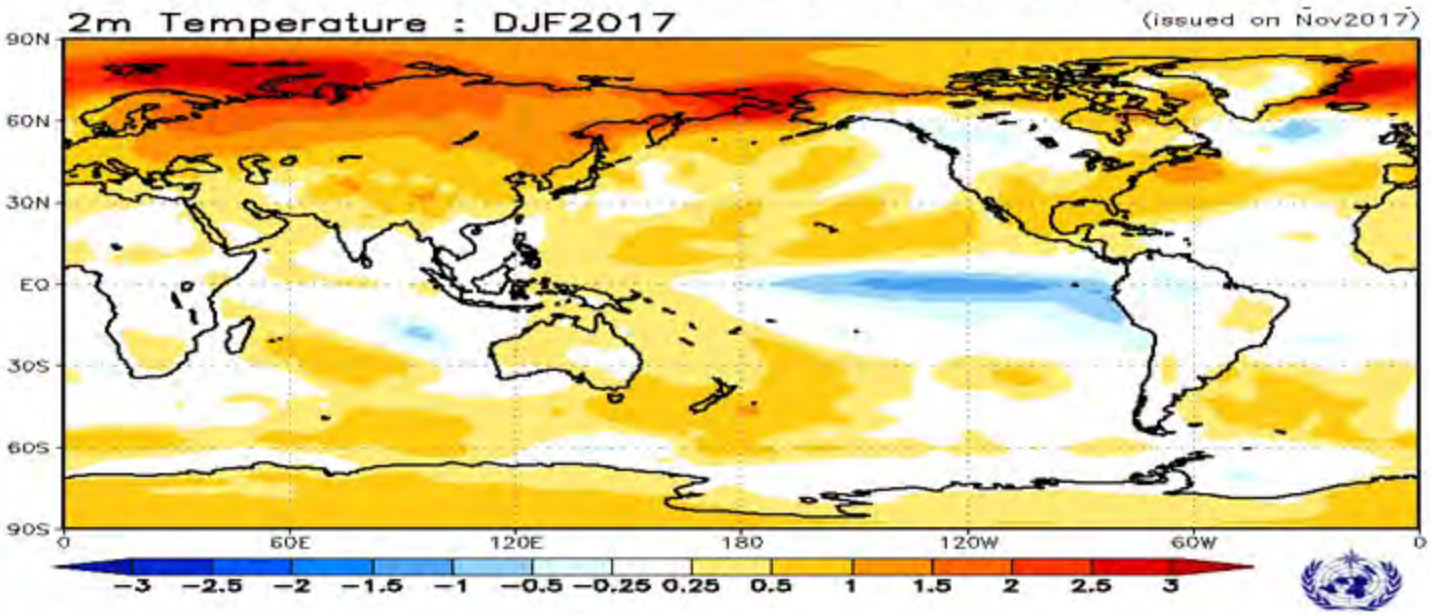
DETERMINISTIC FORECASTS OF AIR TEMPERATURE

December 2017 – February 2018

MODELS:

- Beijing
- Seul
- Washington
- Toulouse
- Exeter
- CPTEC
- ECMWF
- Melbourne
- Montreal
- Moscow
- Offenbax

Simple composite map: 2m Temperature anomalies (°K).



- **In the 2m temperature field** according to the forecasts of the most of centers positive anomalies are predicted over most of Northern Eurasia.
- **The most significant deviations** from climate are expected in the northeast of the Far East and around Arctic seas in the west.

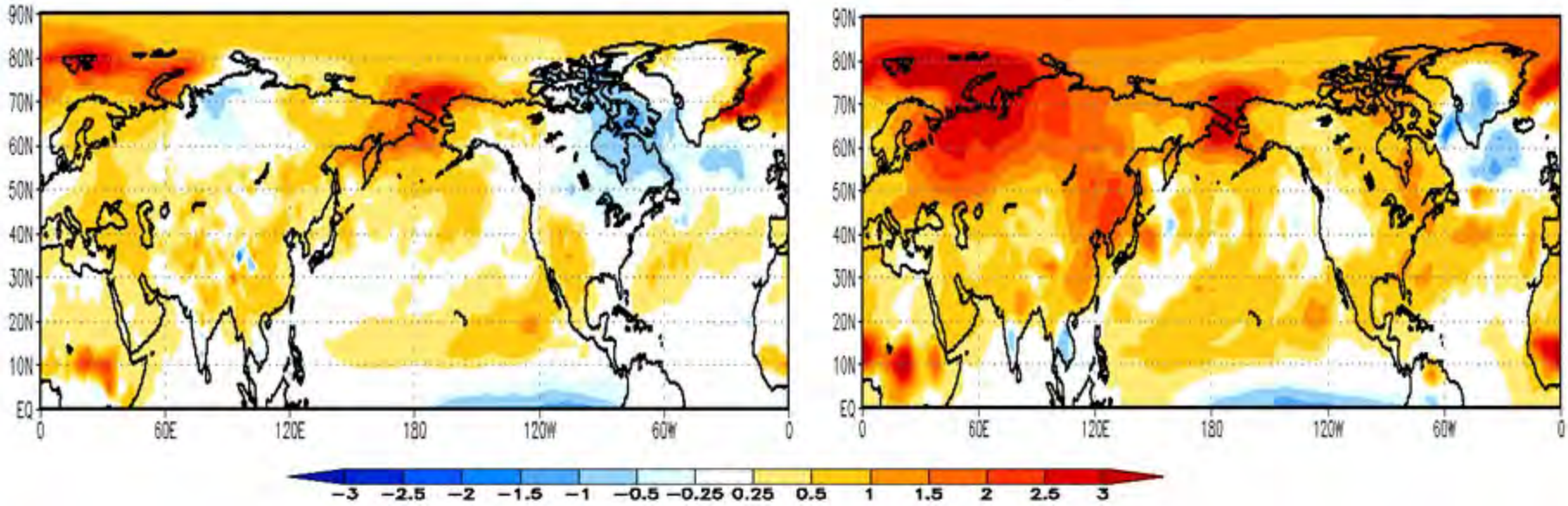
LC MMELRF-WMO Lead Centre for MME LRF

https://www.wmolc.org/

DETERMINISTIC FORECASTS OF AIR TEMPERATURE

December 2017 - February 2018

Temperature anomalies (°K)



GPC_ECMWF

GPC_OFFENBACH

- **According to the forecasts of the ECMWF, positive** temperature anomalies are most likely over most of Northern Eurasia, the **negative** anomalies are expecting over north of Siberia.

.

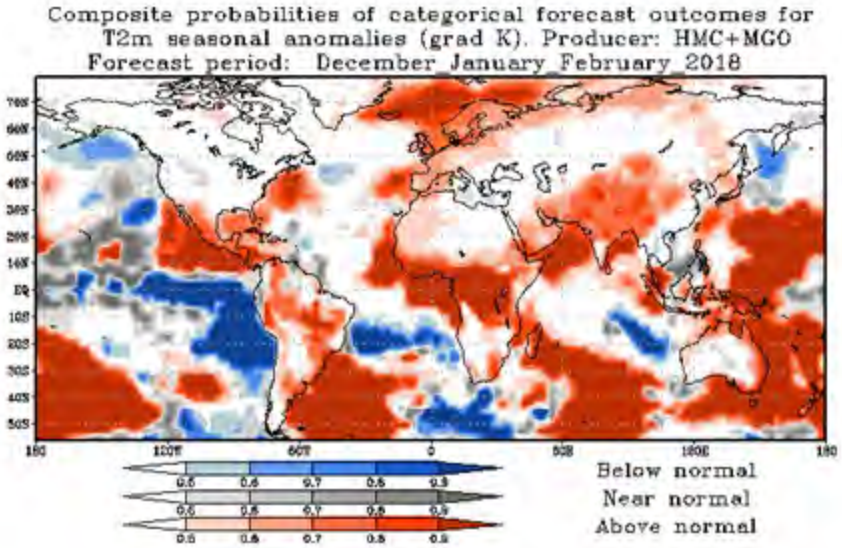
- **OFFENBACH** predicts **positive** temperature anomalies over most of Northern Eurasia.

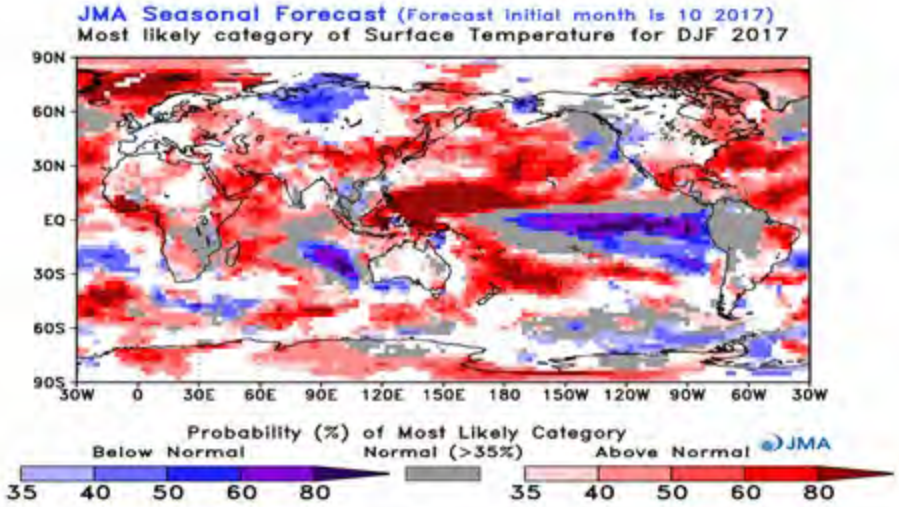
LC MMELRF-WMO Lead Centre for MME LRF

https://www.wmolc.org/

PROBABILISTIC FORECASTS OF AIR TEMPERATURE

December 2017 - February 2018





NEACC

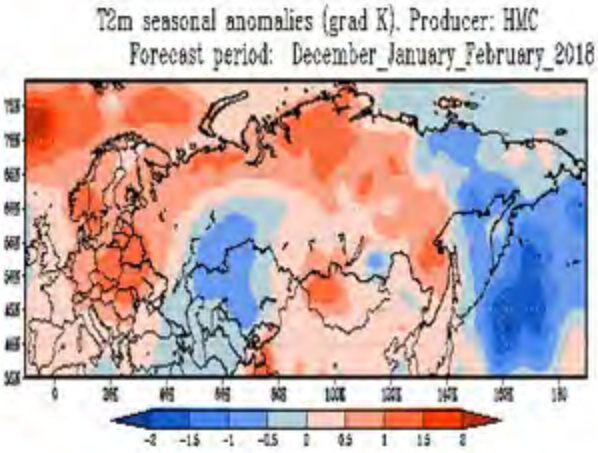
TOKYO CLIMATE CENTRE

- **According to the forecasts of the NEACC, positive** temperature anomalies are most likely over most of Europe, in northern Siberia, in the centre and south of the Far East, and over most of Central Asia (except for the north-west).
- **Tokyo Climate Centre** predicts **positive** anomalies in Eastern Europe, Central Asia, the south and east of the Far East, the **negative** anomalies are expecting over most of Siberia.

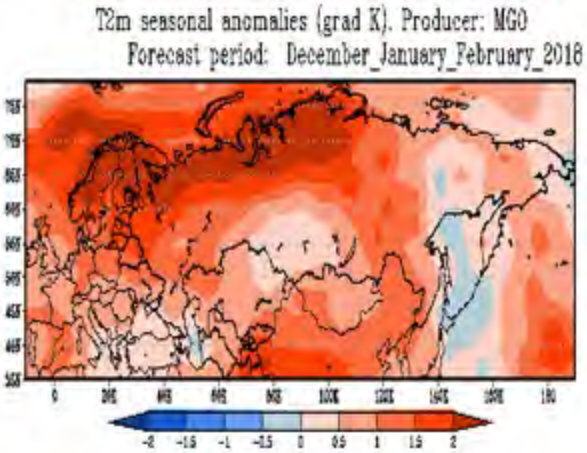
DETERMINISTIC FORECASTS OF AIR TEMPERATURE

December 2017 - February 2018

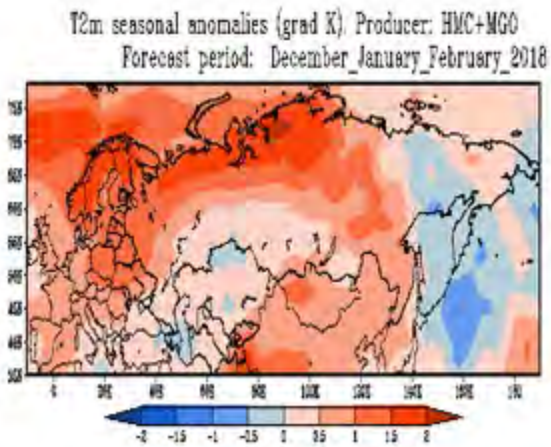
Seasonal T2m anomalies (°K)



HMC



MGO

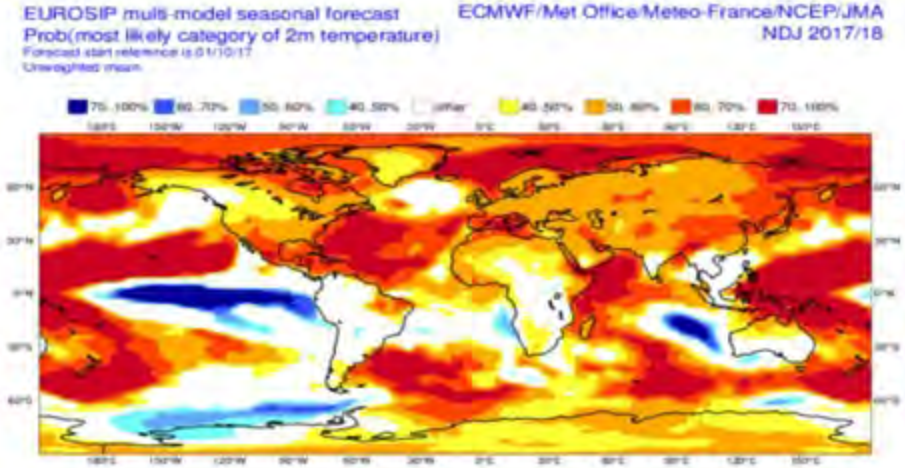


HMC and MGO

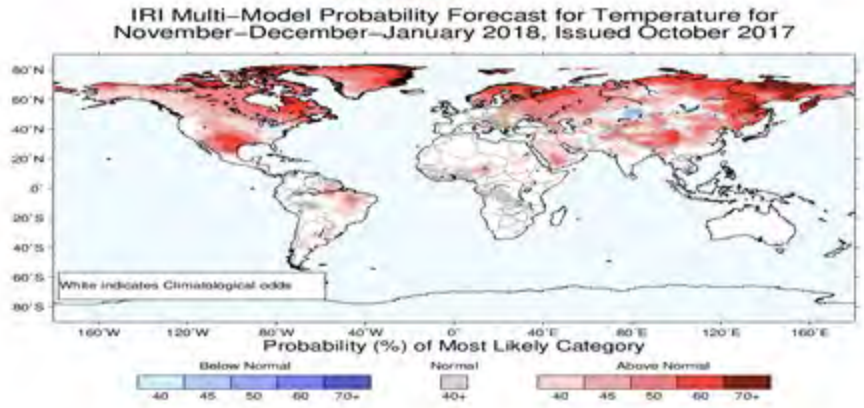
- **According to the forecasts of the HMC, positive** temperature anomalies are expected to be over most of Europe and Eastern Siberia. **Negative** anomalies are expecting to be in the south of Western Siberia, Central Asia and in the north-east of Far East.
- **MGO** predicts **positive** anomalies over most of Northern Eurasia.
- **HMC+MGO** predicts **positive** anomalies over most of Northern Eurasia, the **negative** anomalies are expecting in the north of Kazakhstan and in the north-east of Far East.

PROBABILISTIC FORECASTS OF AIR TEMPERATURE

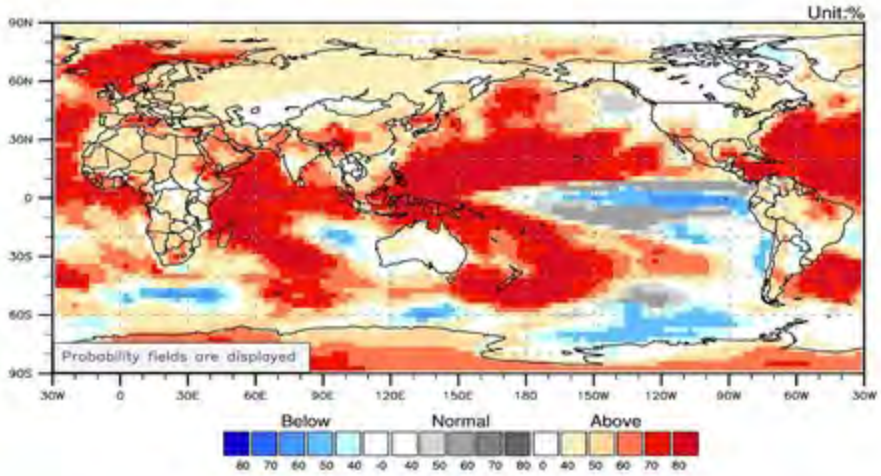
November 2017 - January 2018



EUROSIP



IRI



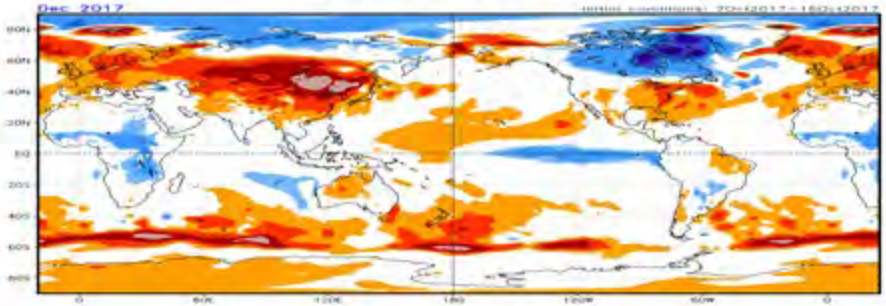
APCC

- **EUROSIP** predicts **positive** anomalies over most of Northern Eurasia.
- **IRI** predicts **positive** anomalies over most of Northern Eurasia (except for the west). **Negative** anomalies are expected only in the northeast of Kazakhstan and around Baikal.
- **APCC** predicts **positive** air temperature anomalies over most of Northern Eurasia with a 40% probability (except for Kazakhstan and Mongolia).

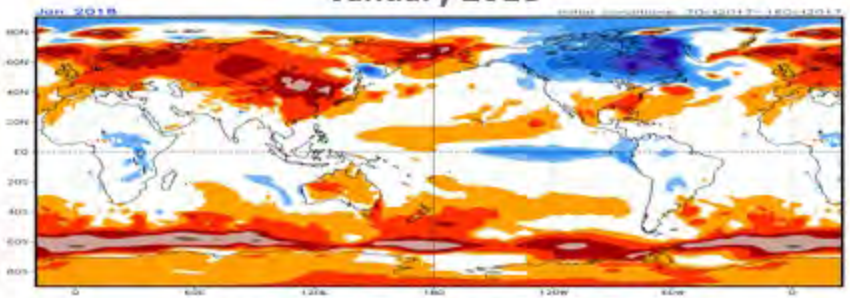
DETERMINISTIC FORECASTS OF AIR TEMPERATURE

Monthly and seasonal T2m anomalies (°K)

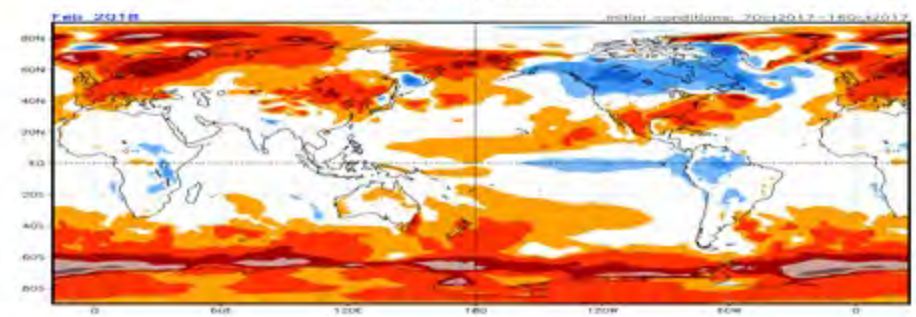
December 2017



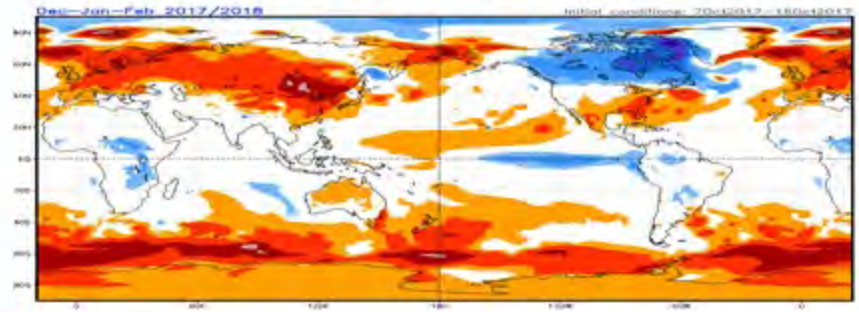
January 2018



February 2018



December 2017-February 2018



- **In the 2m temperature field positive** anomalies are predicted over most of the Northern Eurasia. **Negative** temperature anomalies are expected over Sea of Okhotsk.
- **According to the forecasts of CPC** January will be **the warmest** month for the central regions of the Northern Eurasia, December will be **the warmest** month for the south of Far East .

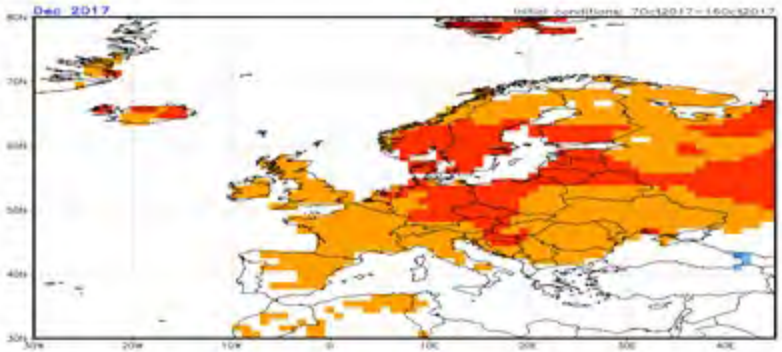
CLIMATE PREDICTION CENTRE

http://www.cpc.ncep.noaa.gov/products/CFSv2/CFSv2seasonal.shtml

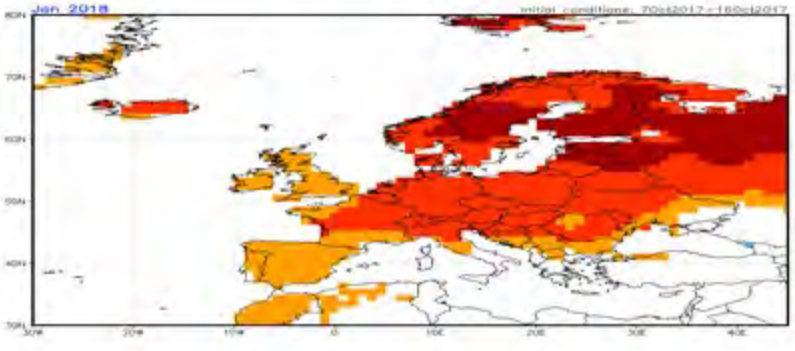
DETERMINISTIC FORECASTS OF AIR TEMPERATURE

Monthly and seasonal T2m anomalies (°K)

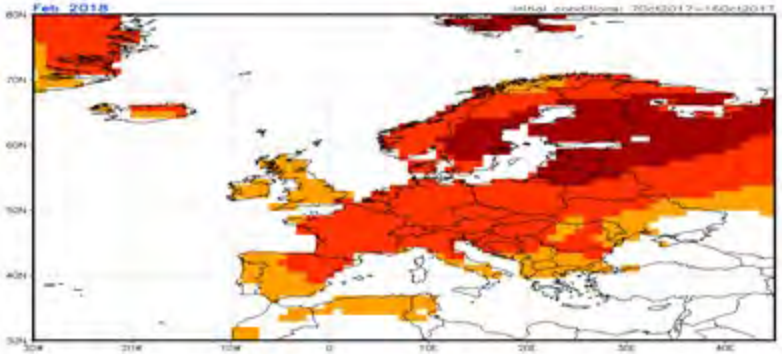
December 2017



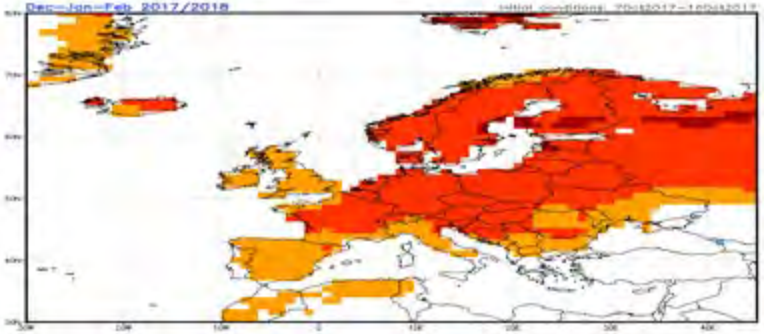
January 2018

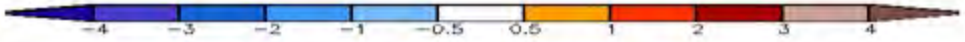


February 2018



December 2017-February 2018





CLIMATE PREDICTION CENTRE

http://www.cpc.ncep.noaa.gov/products/CFSv2/CFSv2seasonal.shtml

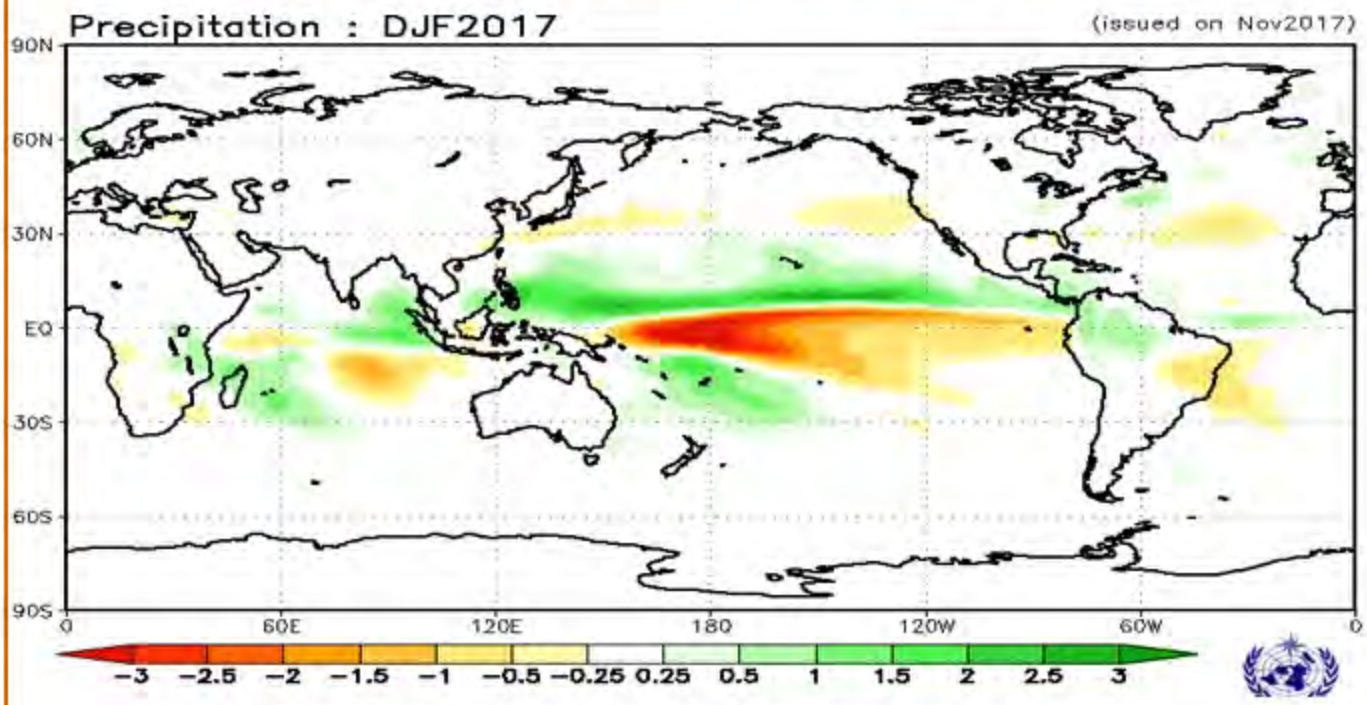
DETERMINISTIC FORECASTS OF PRECIPITATION

December 2017 – February 2018

MODELS:

- Beijing
- Seul
- Washington
- Toulouse
- Exeter
- CPTEC
- ECMWF
- Melbourne
- Montreal
- Moscow
- Offenbax

Simple composite map: Precipitation anomalies (mm/day)



- There no useful information for Northern Eurasia.
- It is likely the positive anomalies in the Western Europe.

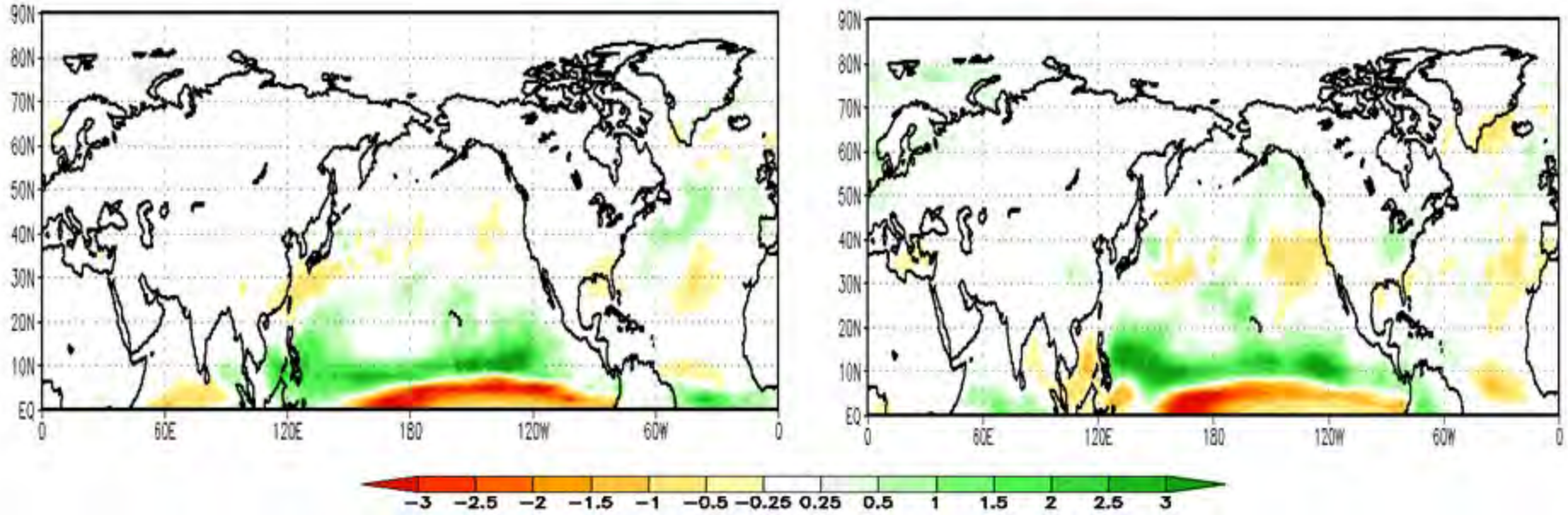
LC MMELRF-WMO Lead Centre for MME LRF

https://www.wmolc.org/

DETERMINISTIC FORECASTS OF PRECIPITATION

December 2017 - February 2018

Precipitation anomalies (mm/day)



GPC_ECMWF

GPC_OFFENBACH

- **ECMFW:** there no useful information for Northern Eurasia.
- **OFFENBACH** predicts **positive** precipitation anomalies over north of Europe.

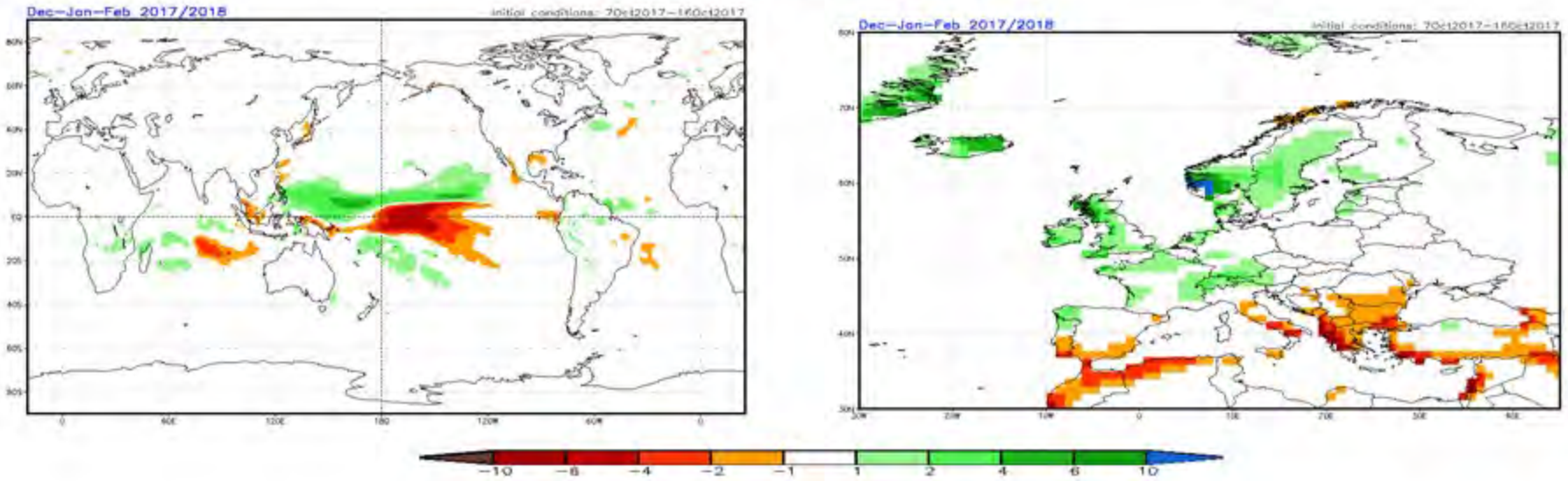
LC MMELRF-WMO Lead Centre for MME LRF

https://www.wmolc.org/

DETERMINISTIC FORECASTS OF PRECIPITATION

December 2017-February 2018

Seasonal precipitation anomalies (mm/day)



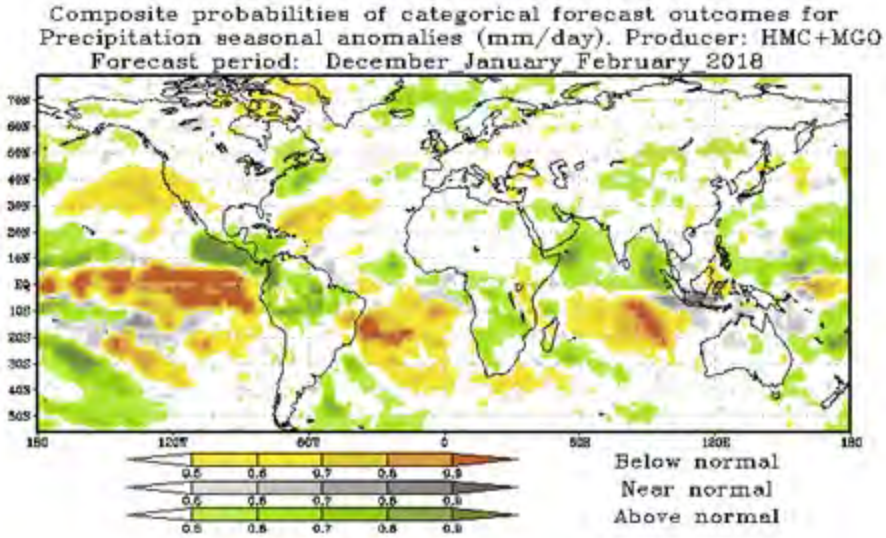
- **For Northern Asia** there no useful information.
- **For Europe**, **positive** anomalies are expected in the west and north-west, and **negative** anomalies are predicted in the south, which is in good agreement with the positive phase of the NAO index.

CLIMATE PREDICTION CENTRE

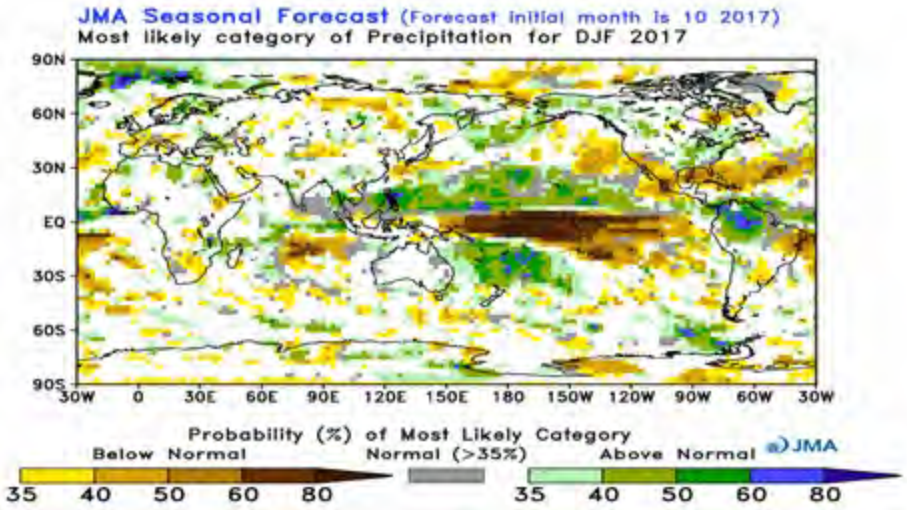
http://www.cpc.ncep.noaa.gov/products/CFSv2/CFSv2seasonal.shtml

PROBABILISTIC FORECASTS OF PRECIPITATION

December 2017 – February 2018



NEACC



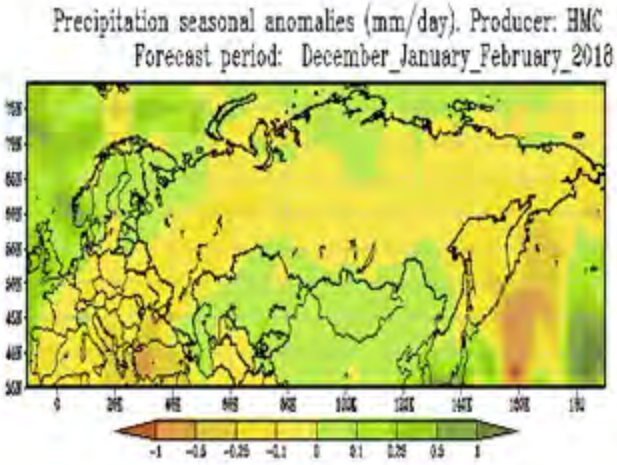
TOKYO CLIMATE CENTRE

- **NEACC** predicts **positive** (**negative**) anomalies in the north (south) of Europe. **Positive** anomalies are also expected in the east of Central Asia and in the south of the Far East.
- **Tokyo Climate Centre** predicts **positive** (**negative**) anomalies in the north (in the south-west) of Europe. Precipitation **deficit** is most likely in Siberia, in the northeast of Kazakhstan and in the west of the Far East. **Positive** anomalies are expected in the east of the Far East.

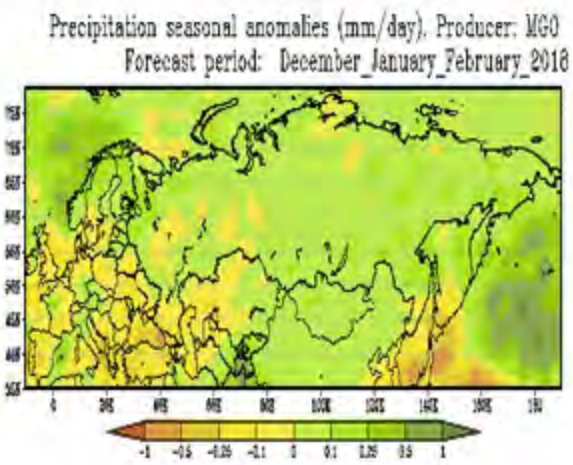
DETERMINISTIC FORECASTS OF PRECIPITATION

December 2017 - February 2018

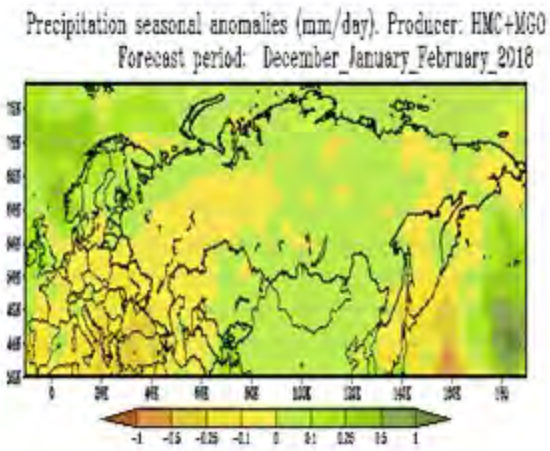
Seasonal anomalies (mm/day)



HMC



MGO

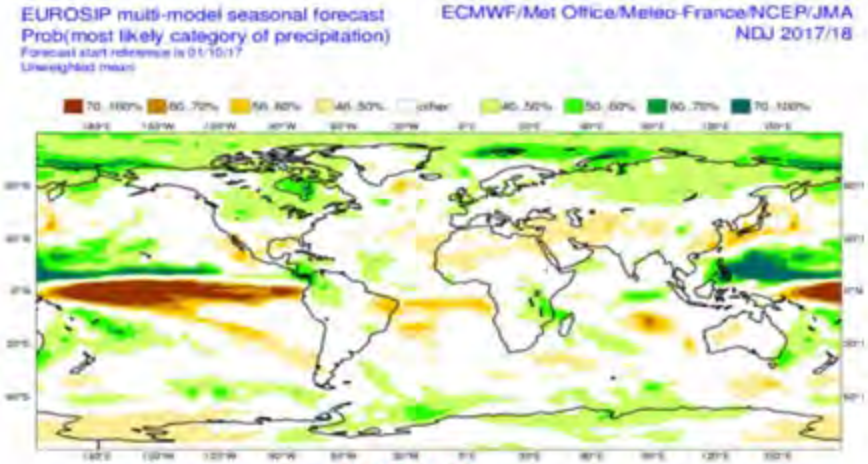


HMC and MGO

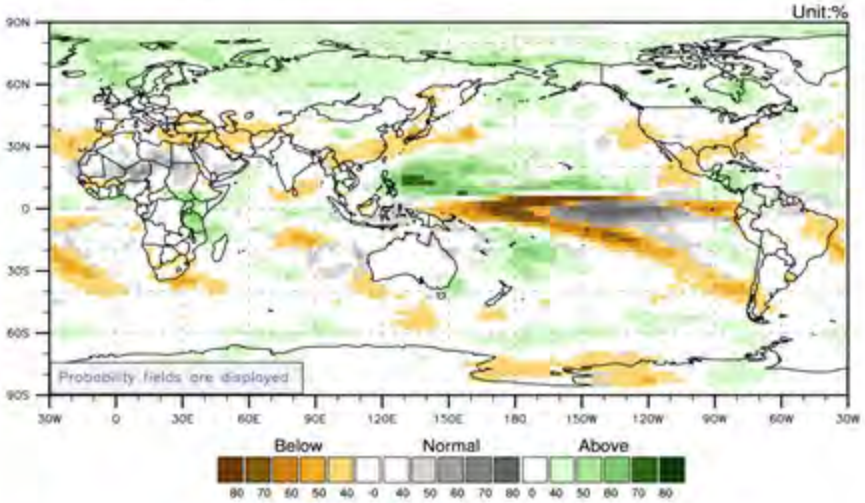
- **According to the forecasts of the HMC, negative** temperature anomalies are expected to be over most of Northern Eurasia. **Positive** anomalies are expecting to be in the north of Europe and of Eastern Siberia, Central Asia (expect for Uzbekistan and Turkmenistan.
- **MGO** predicts **positive** anomalies over most of Northern Eurasia (except for West Europe and west of Central Asia).
- **HMC and MGO** predict **positive** anomalies in the north Europe and Siberia, in the east of Central Asia and over most of Far East, the **negative** anomalies are expecting to be over moat of Europe, in the west of Central Asia and in the north-east of Far East.

PROBABILISTIC FORECASTS OF PRECIPITATION

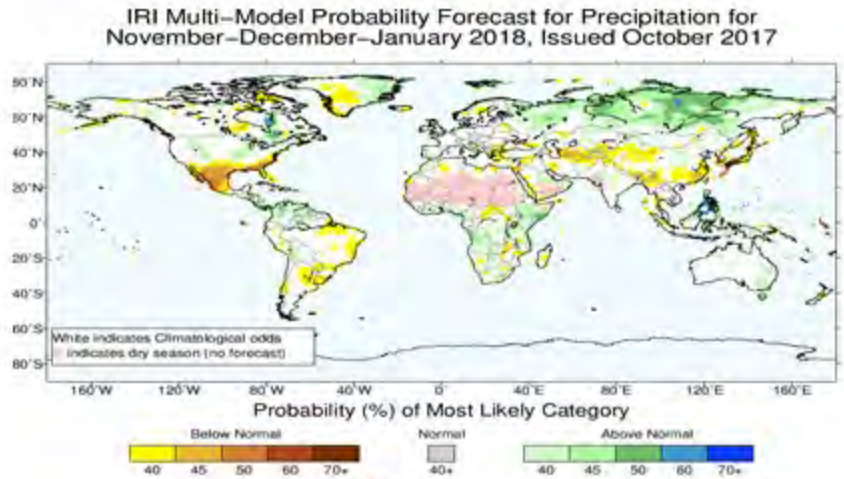
November 2017 – January 2018



EUROSIP



APCC



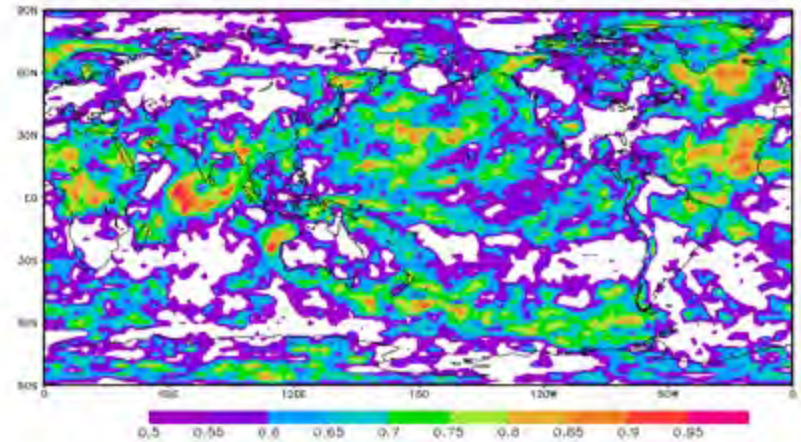
IRI

- **EUROSIP** predicts **positive** anomalies over most of Northern Eurasia. **Negative** anomalies are expected only in the south of Central Asia.
- **IRI** predicts **positive** anomalies over most of Northern Asia. **Negative** anomalies are expected only in the southeast of Europe and in the south of Central Asia.
- **APCC** predicts **positive** anomalies over most of Northern Eurasia with a 40-50% probability. The **negative** anomalies are likely in the south of Central Asia.

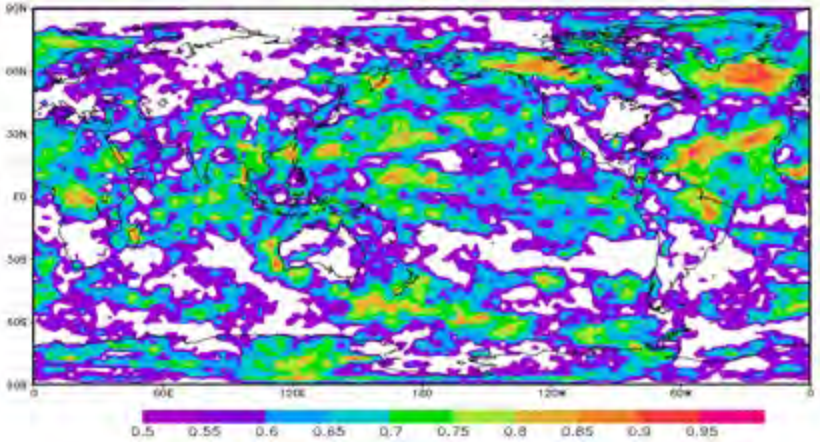
FORECAST VERIFICATION: TEMPERATURE

SL-AV, HMC

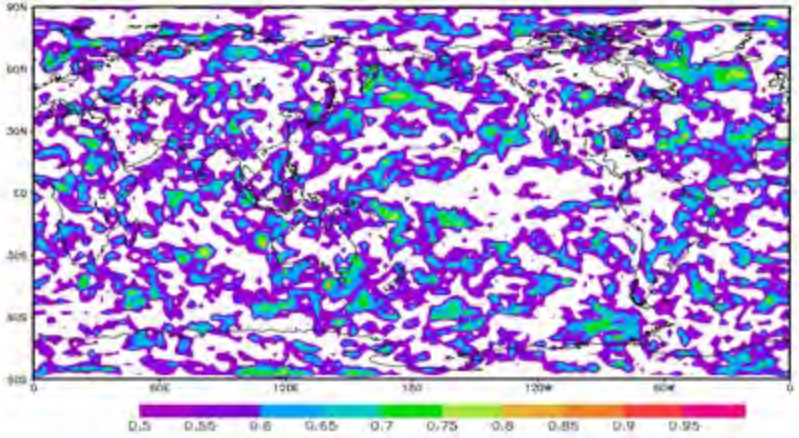
ROC_B



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.

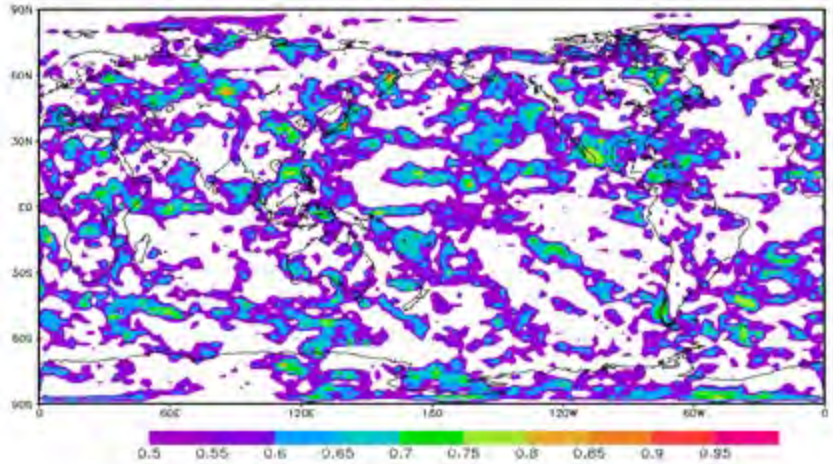
Guidance: Standardised Verification System for Long-Range Forecasts, SVSLRF, 2002. New Attachment II-8 to the *Manual on the GDPFS* (WMO-No. 485), Volume I.

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

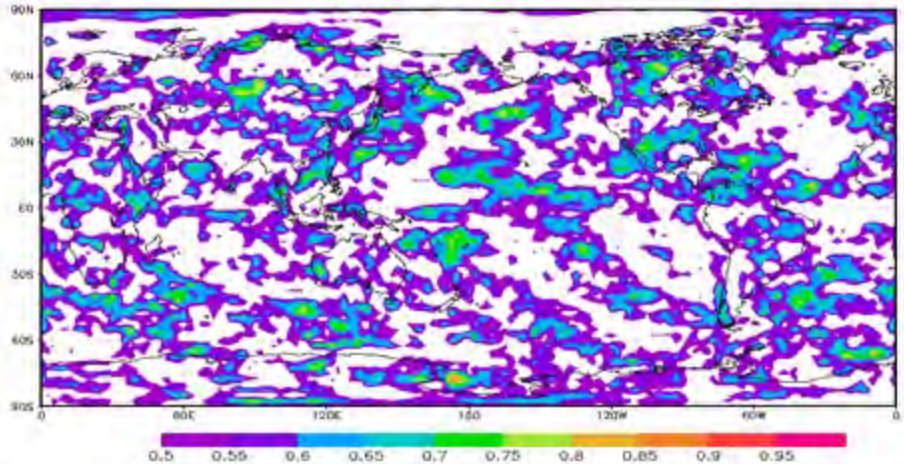
FORECAST VERIFICATION: PRECIPITATION

SL-AV, HMC

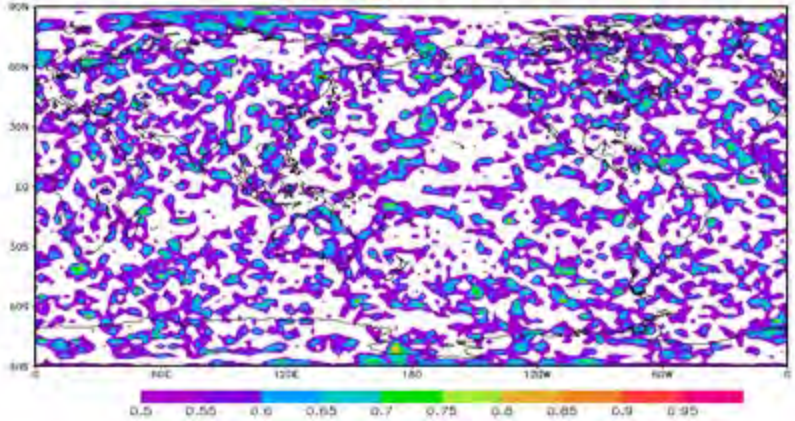
ROC_B



ROC_A



ROC_N



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.

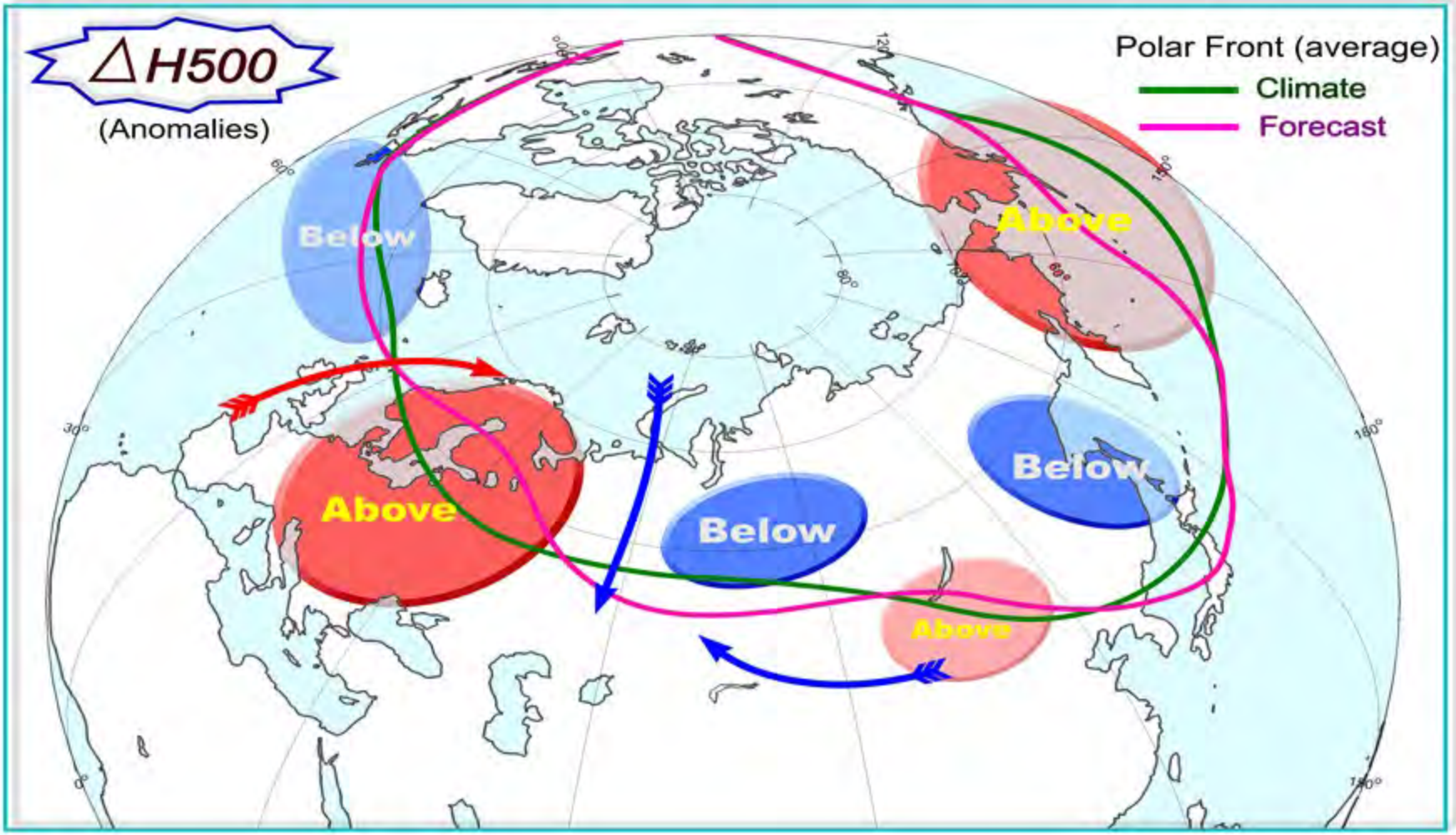
Verification characteristics are operationally presented on the NEACC web-site: http://seakc.meteoinfo.ru.

NORTH EURASIA CLIMATE CENTRE

OUTLOOK OF ATMOSPPHERIC CIRCULATION

December 2017 – February 2018

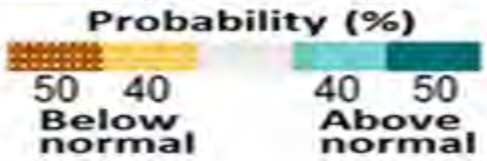
SCHEMATIC FIGURE



OUTLOOK

December 2017 – February 2018

Регион	Температура			Осадки		
	-	норма	+	-	норма	+
Европа (кроме юго-востока)	20	30	50	20	30	50
Европа (юго-восток)	50	30	20	50	30	20
Средняя Азия(запад)	50	30	20	50	30	20
Средняя Азия (восток)	30	50	20	30	50	20
Сибирь (кроме севера)	30	50	20	20	30	50
Сибирь (север)	50	30	20	20	50	30
Дальний Восток (кроме юга)	20	30	50	20	30	50
Дальний Восток (юг)	50	30	20	50	30	20



SUMMARY

- **Most of the centers** predict significant SST anomalies in the Northern Pacific. **Above-average** (**below-average**) temperatures are expected in the west (centre and east) of the equatorial latitudes. It is likely that **above-average** SST conditions in the latitudinal band 5-15˚N in the North Pacific Ocean will persist during the winter. According to the IRI/CPC the probabilities for La Nina, neutral and El Nino conditions (using -0.5C and 0.5C thresholds) over the coming DJF season are: 67%, 33% и 0 %. **Colder than normal** conditions are expected near the north-west cost of Northern America to north of 30˚N. It can lead to a strengthening Pacific High and shift it to the north-west from the climate position.
- **In the Northern Atlantic** the distribution of predicted anomalies is consistent with the **positive** phase of tripole, associated with the **positive** phase of NAO. 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.
- **According to the forecasts of the Hydrometcenter of Russia**, the winter is expected with **positive** values of index NAO and **negative** values of index EU. **Positive** values of index NAO are indicative of an **above normal** temperature in the north of Europe and **below normal** temperature in the south of Europe. **Positive values** of the index are indicative of an **above** (**below**) normal precipitation in the north (south) of Europe too.
- **The winter season of 2017-2018** is expected **warmer** than normal over most of Northern Eurasia according to the most of models. ECMWF predicts the **negative** anomalies in the Siberia, TCC predicts the **negative** anomalies in the north of Siberia, HMC predicts the **negative** anomalies in the south of Siberia, over most of Kazakhstan and in the north-east of Russia.
- **There are a lot of contradictions** and uncertainties in the forecasts of precipitation. The most of models predict the **positive** anomalies over north of Northern Eurasia. It is likely the **negative** anomalies in the south.
- *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.*

THANK YOU FOR ATTENTION!