North EurAsia Climate Centre

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SEASONAL OUTLOOK FOR WINTER

2025-2026

OVER NORTHERN EURASIA

Fourth Session of the Third Pole Climate Forum (TPCF-4)

online

1-2 December 2025

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https://seakc.meteoinfo.ru/en/

Sea surface temperature anomalies (SSTA) forecast

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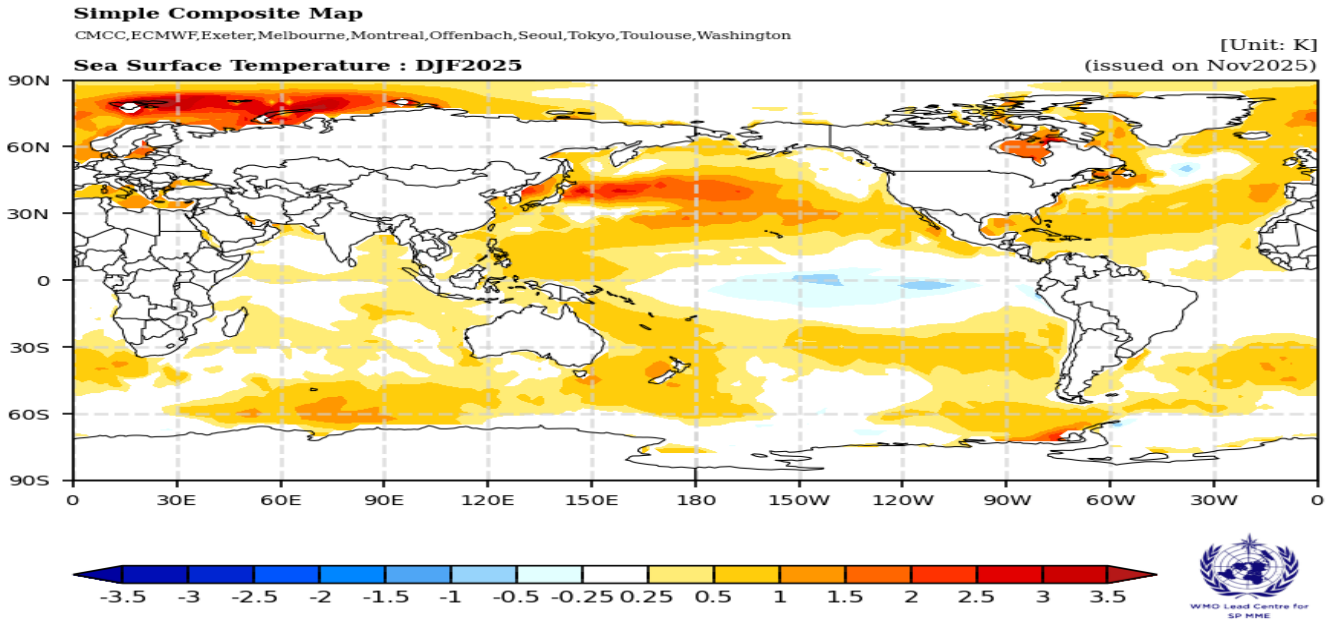
LC MMELRF-WMO Lead Centre for MME LRF



The forecasts of various centers are in good agreement with each other.

- **Indian ocean:** weak **positive sea surface temperature (SST)** anomalies are forecasted for the western half of the ocean. According to the Australian Bureau of Meteorology, a neutral Indian Ocean Dipole (IOD) phase is expected during the winter of 2025–2026.
- **Pacific ocean:** in the equatorial latitudes, **negative SST anomalies** are forecasted in the central part. **Positive SST** anomalies are expected across most of the northern half of the ocean, excluding the equatorial region.
- **North Atlantic:** most models predict **positive SST anomalies** across most of the ocean basin. The most significant **positive anomalies** are expected in the western and northern parts of the ocean, excluding the area south of Greenland, where SST is forecasted to be near or slightly below normal.

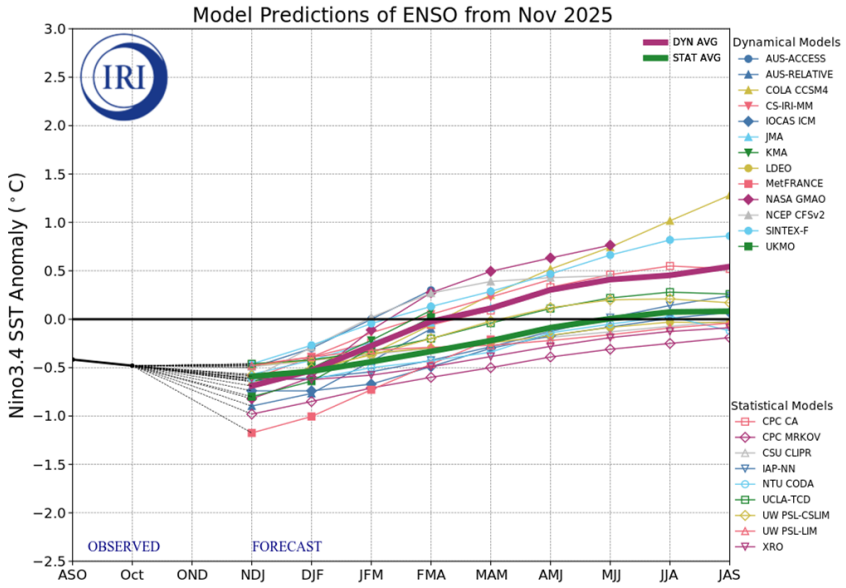
https://www.wmolc.org/

The forecast is issued in November 2025

El Nino / Southern Oscillation (SOI), IOD and PDO

The IRI/CPC probabilistic ENSO forecast.

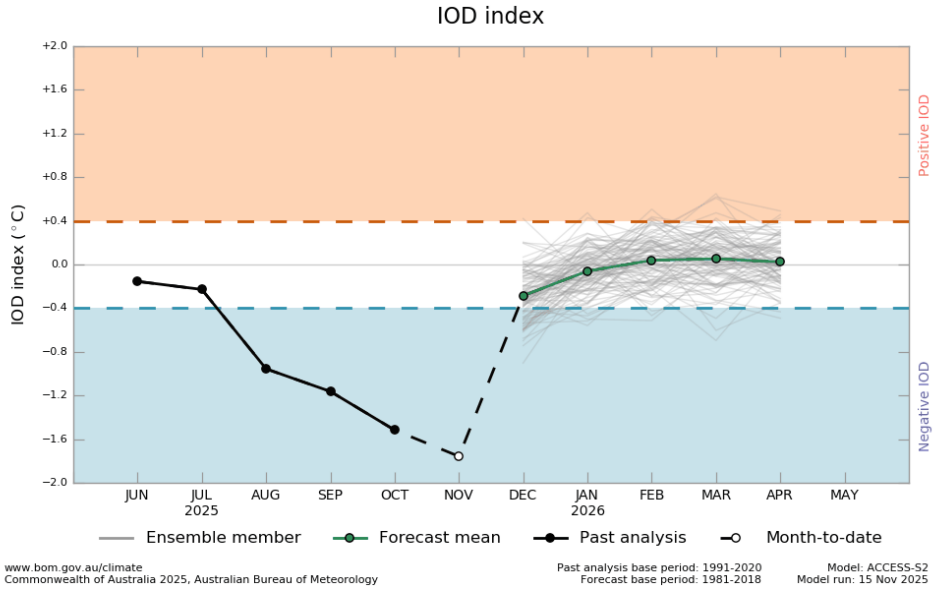
Nino 3.4 forecasts (120˚-170˚W, 5˚S-5˚N)



http://iri.columbia.edu/our-expertise/climate/forecasts/enso/current/

According to the most hydrodynamic and statistical models, conditions favorable for the onset of a La Niña event are predicted for the winter 2025-26 (December-February). According to the CPC/IRI Consensus Probabilistic Forecast the probabilities for La Nina, neutral and El Nino conditions (using -0.5C and 0.5C thresholds) over the coming winter season are: 56%, 43% and 1%.

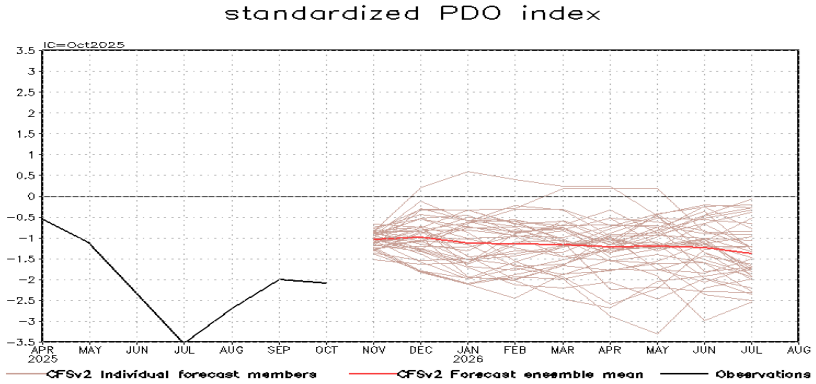
The Indian Ocean Dipole (IOD)



Australian Bureau predicts transition to neutral phase of IOD in the winter season.

Data by the Bureau of Meteorology of the Australian Government
http://www.bom.gov.au/?ref=hdr

The Pacific ocean (PDO)



According to the CFSv2 prediction, the negative phase of PDO will continue through July 2026.

https://www.cpc.ncep.noaa.gov/products/GODAS/ocean_briefing.shtml **The forecast is issued in November 2025**

Sea ice extent in the Arctic region

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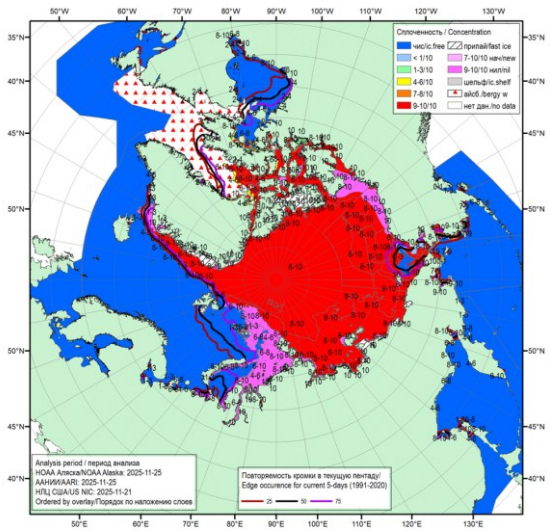
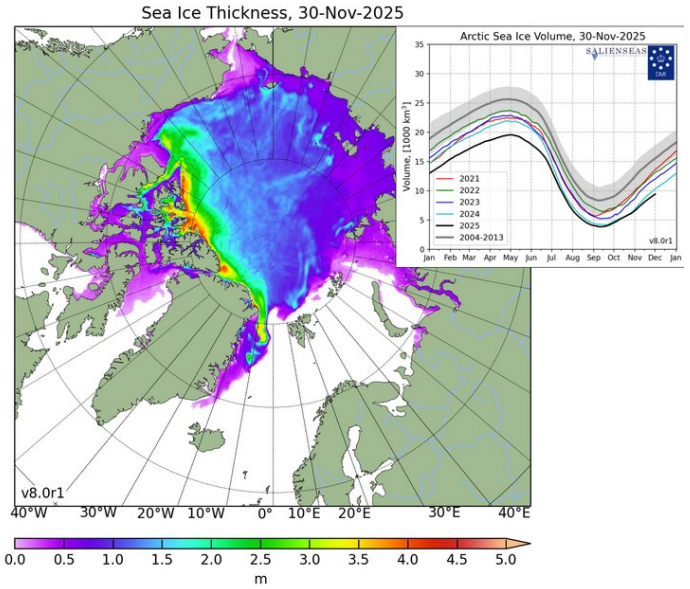
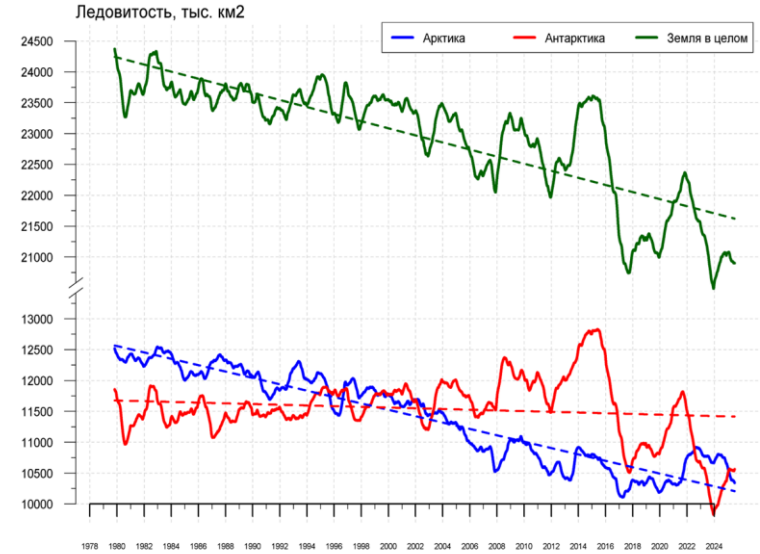


Overview ice map of the Arctic Region for 11/21/2025 – 11/25/2025 (color scheme for general cohesion) based on the ice analysis of NOVA Alaska (04/29/2025), AARI (04/29/2025), National Ice Center of the USA (04/25/2025) and the repeatability of the edge for the nearest pentad for the period 1991-2020. according to observations of SSMR-SSM/I-SMS (NASATEAM algorithm).



Sea ice thickness for 11/21/2025 and seasonal variation of sea ice volume in the Arctic based on calculations of the weighted average ice thickness of the joint sea ice-ocean model HYCOM/CICE of the Danish Meteorological Institute.



The 365 days daily window-smoothed values of the ice cover for the Arctic, Antarctic and the Earth from 10/26/1978 to 11/14/2020 based on SSMR-SSM / I-SSMIS Russian Arctic and Antarctic Research Institute (AARI)) http://www.aari.ru/

- The picture on the left side shows the position of sea ice edge in the Arctic region for 11/21/2025-11/25/2025. The deviations occurred in the Kara Sea;
- The figure and the graph in the center illustrate the low Arctic ice volume;
- The right-hand graph shows a decrease in sea ice extent;
- The melting sea ice enhances cloud development in the marginal ice zones and enhances downward longwave radiation at the surface toward the end of the season. It results in a positive cloud feedback and the region from the Mediterranean Sea to East Asia experiences significant surface warming, possibly linked to changes in the jet stream. (Knudsen E.M.; Orsolini, Y.J, Furevik T., Kevin E.H. Observed anomalous atmospheric patterns in summers of unusual Arctic sea ice melt, 2015. https://doi.org/10.1002/2014JD022608)

General circulation

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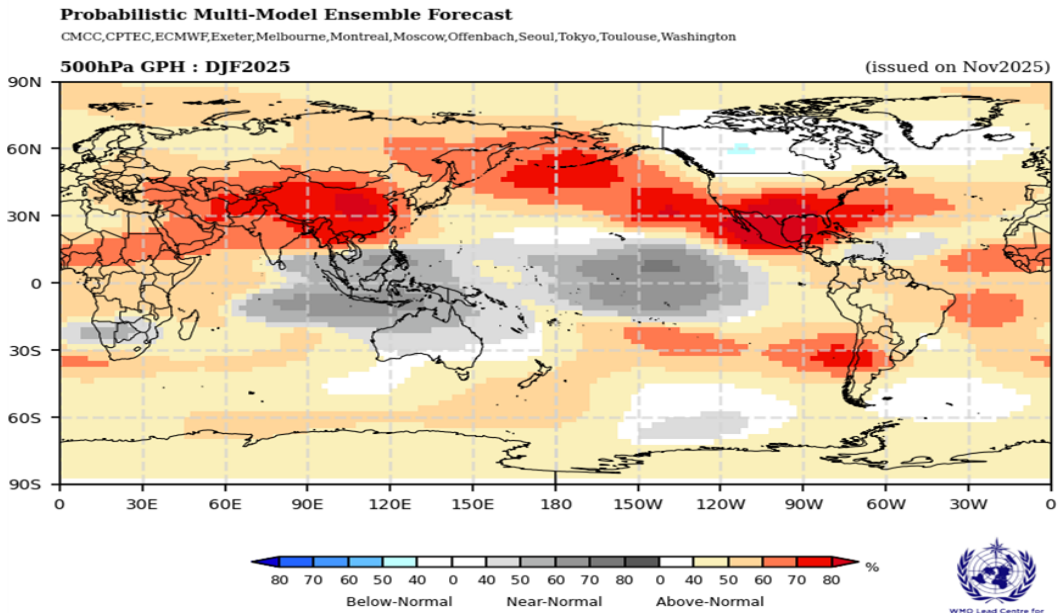
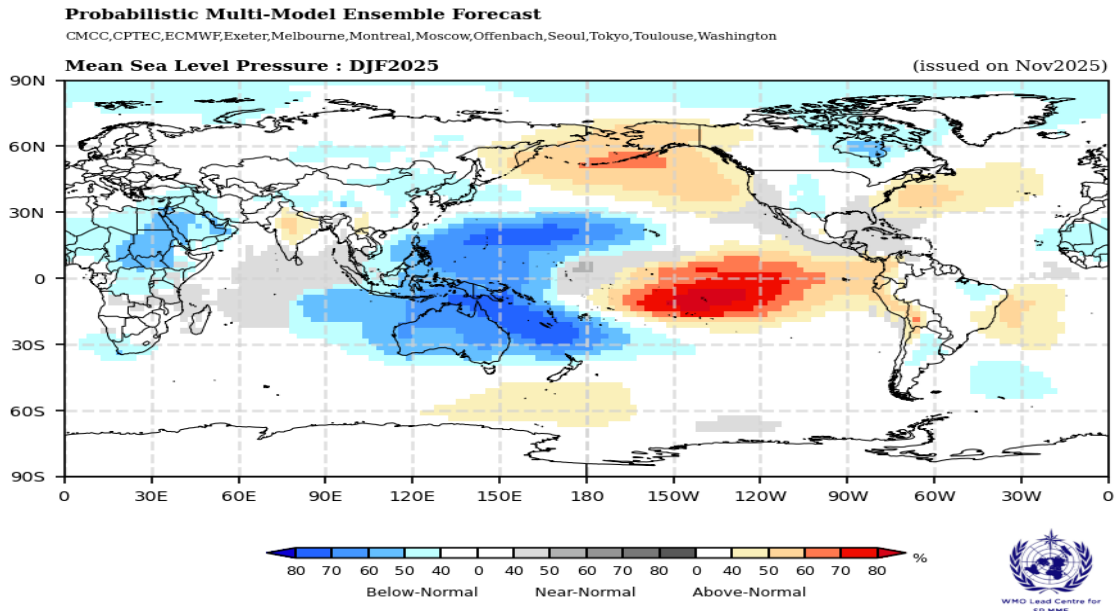
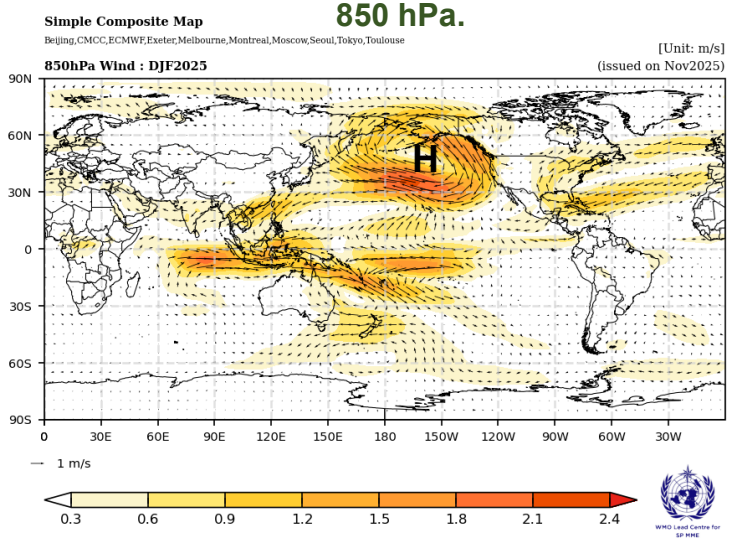
Probabilistic multi-model ensemble forecasts of H-500 and MSLP





Deterministic multi-model ensemble wind forecasts at the level 850 hPa.



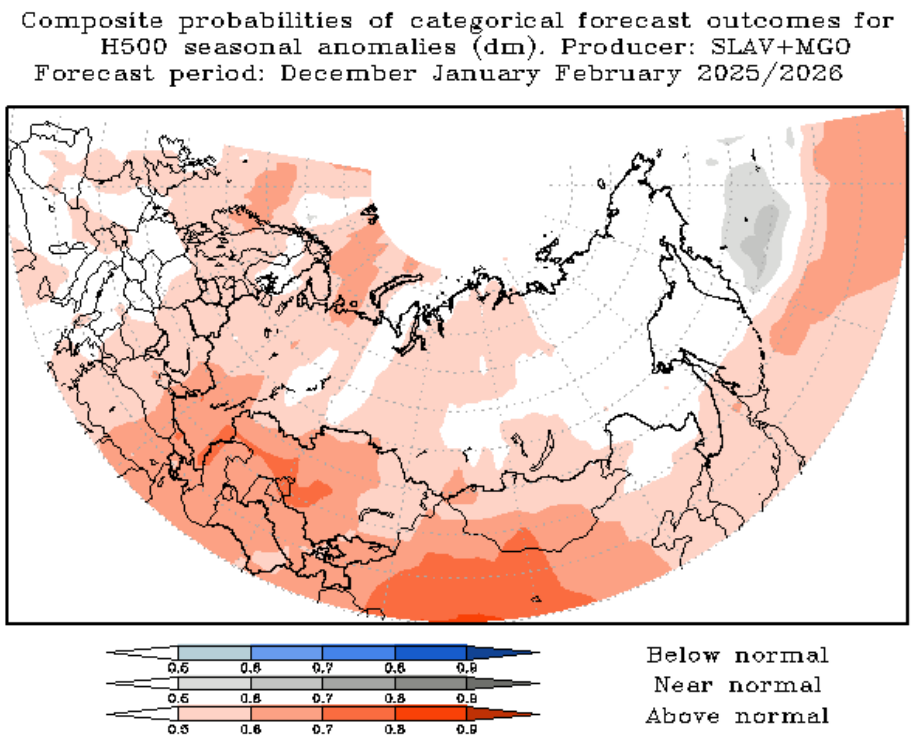
- The multi-model forecast indicates significant uncertainty for the northern part of European Russia. However, the highest confidence is for positive geopotential height anomalies in three key sectors:
  - Southeastern Europe, the southern ETR, and eastern Russia (50-60% probability).
  - Mongolia and the southern half of Central Asia, with a probability exceeding 70%, particularly over Kyrgyzstan, Tajikistan, and western Turkmenistan.
  - China, where the probability is the highest, forecast to be over 70-80%.
- According to the 850 hPa wind forecast, anticyclonic winds are expected to prevail the northern Pacific Ocean.
- The probabilistic forecast of surface pressure anomalies contains inherent uncertainty.

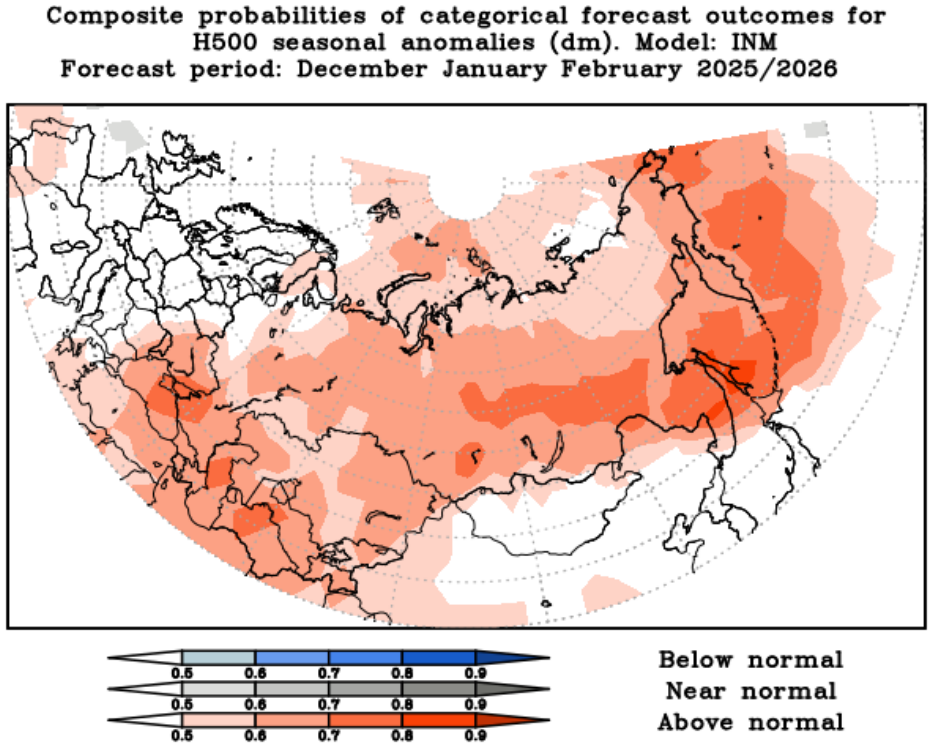
https://www.wmolc.org/

The forecast is issued in November 2025

General circulation

Composite probabilities of categorical forecast outcomes for H-500 seasonal anomalies.
Producer: HMC (SL-AV) and MGO model and INM





According to the SL-AV, MGO, and INM models, the mid-tropospheric geopotential height is predicted to be above normal over Central Asia. Additionally, the SL-AV and MGO models indicate the same signal specifically over northern China.

General circulation

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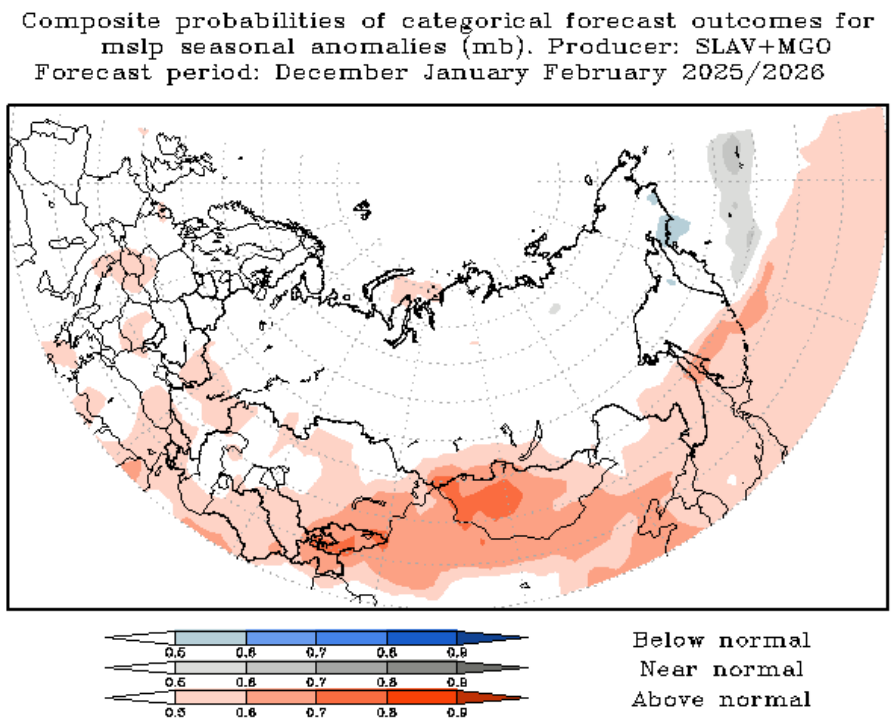
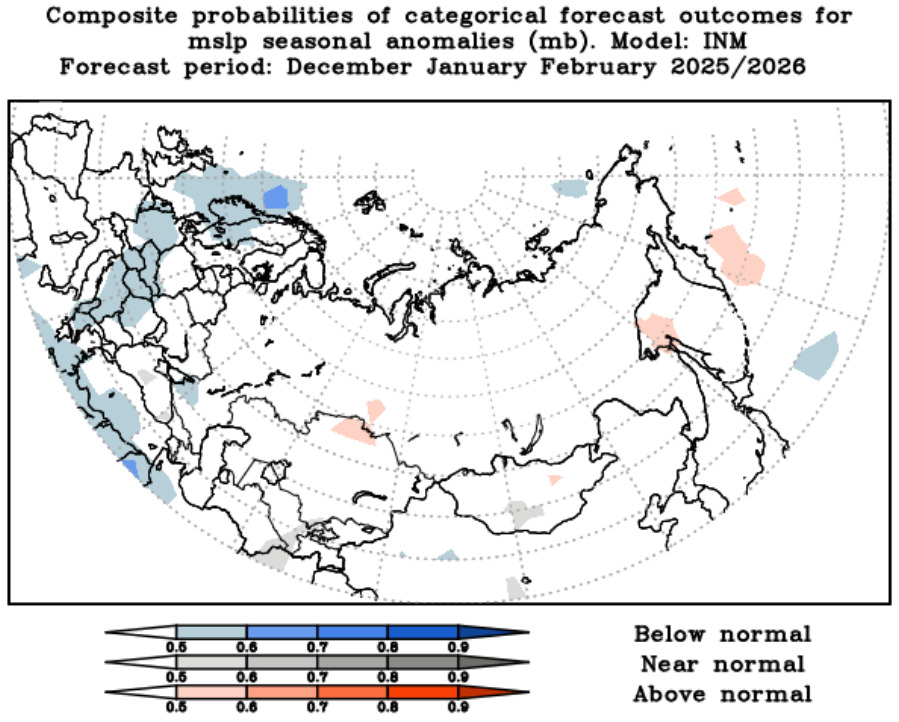
Composite probabilities of categorical forecast outcomes for MSLP seasonal anomalies.
Producer: HMC (SL-AV) and MGO model and INM





- There is considerable uncertainty in the surface pressure anomaly forecasts.
- According to the SL-AV and MGO models, there is a 50% probability of localized positive anomalies MSLP in Central Asia. In the southeastern part of the region, this probability exceeds 60%.

Teleconnection indices

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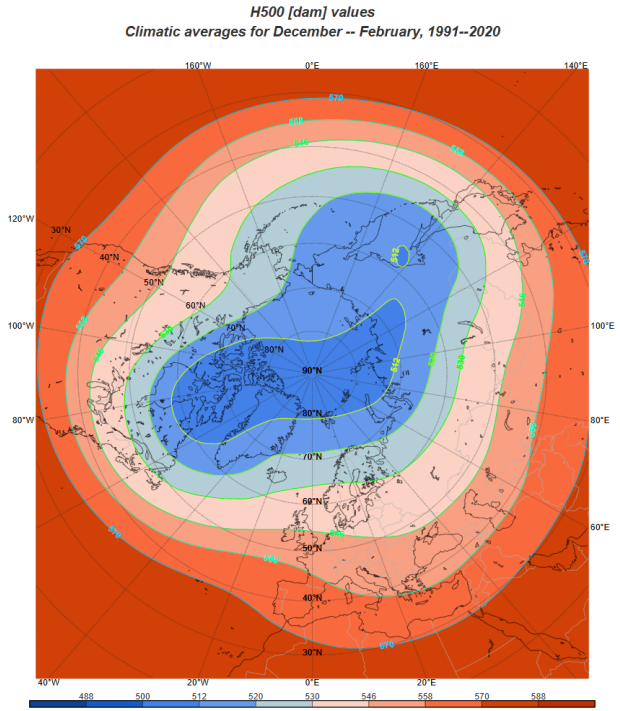
Table.1. Indices oscillation forecasts.
Data from Hydrometeorological centre of Russia (SL-AV).

INDEX	DECEMBER-FEBRUARY 2025-2026			
	DECEMBER	JANUARY	FEBRUARY	DECEMBER-FEBRUARY
EA	0,65	-0,04	0,12	0,34
WA	0,29	0,64	-0,33	0,21
EU	0,15	0,79	0,74	0,79
WP	0,89	1,66	0,91	1,34
PNA	-0,70	-0,29	-0,50	-0,56
NAO	-0,71	-0,24	0,11	-0,30
POL	0,72	-0,33	0,51	0,44
SHI	0,28	1,14	1,61	1,58
AOS	-0,35	0,69	-0,25	0,43

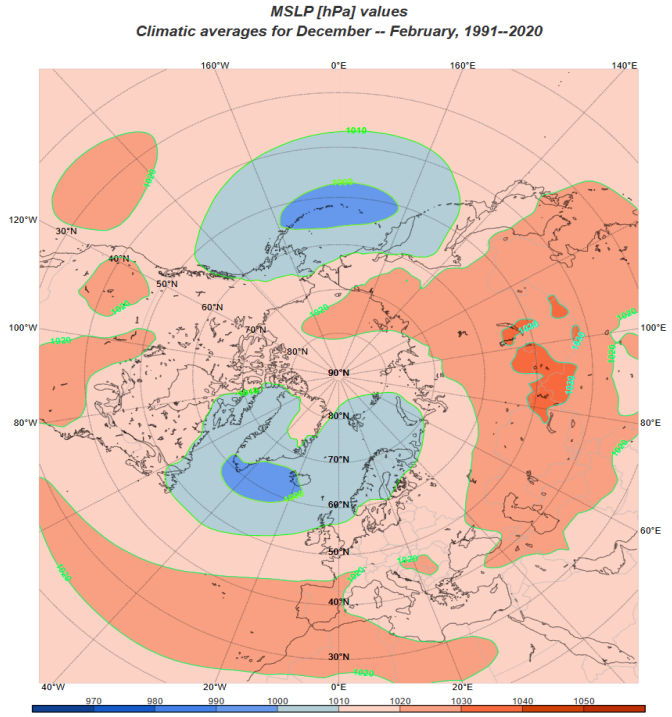
- West Atlantic **(WA),** Eurasian **(EU),** West Pacific **(WP),** Pacific-North American **(PNA)** oscillations (Wallace J. M., Gutzler D.S. Teleconnections in the geopotential height field during the Northern Hemisphere winter. – Mon. Wea. Rev., 1981, vol. 109, pp. 784-812).
- North Atlantic **(NAO),** Polar **(POL)** and Artic **(AO)** oscillations (Climate Prediction Centre of USA).

According to forecasts of the Hydrometcenter of Russia, the WP, EU and SHI indices in the upcoming winter season will be positive. Positive phases of these indices correspond to meridional atmospheric circulation patterns in Siberia and in the Far East, and to intensifying of the Siberian anticyclone, especially in the second half of the winter period. On the other hand, a change in sign of the NAO and POL indices suggests the increased variability of circulation processes in Europe and in northern Asia, and a positive phase of POL leads to the increased cyclonic activity, making advection of warm air masses to Northern Siberia and the Far East quite probable;

General circulation

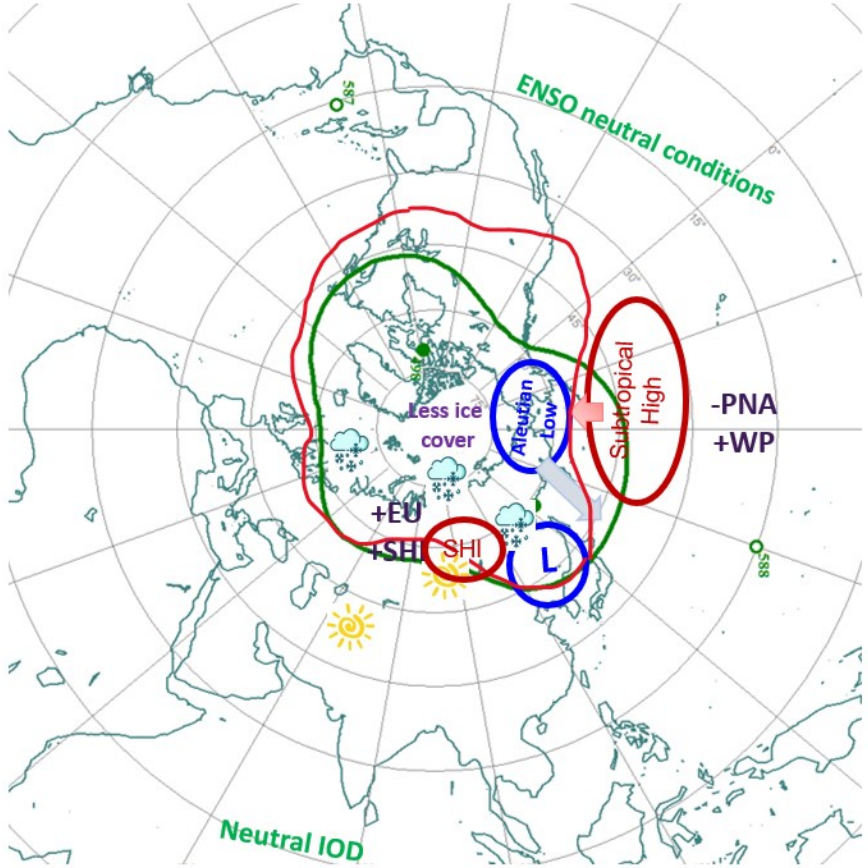


Mean H-500 for the winter season (norms 1991-2020), ERA5



Mean atmospheric pressure for the winter season (norms 1991-2020), ERA5

General circulation scheme for the winter season 2025-26 in The Northern Hemisphere



Planetary high-altitude frontal zonal (climate)

Planetary high-altitude frontal zonal (forecast)

The symbols/notations on the diagram are taken from open sources on the internet.

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Temperature anomalies forecast

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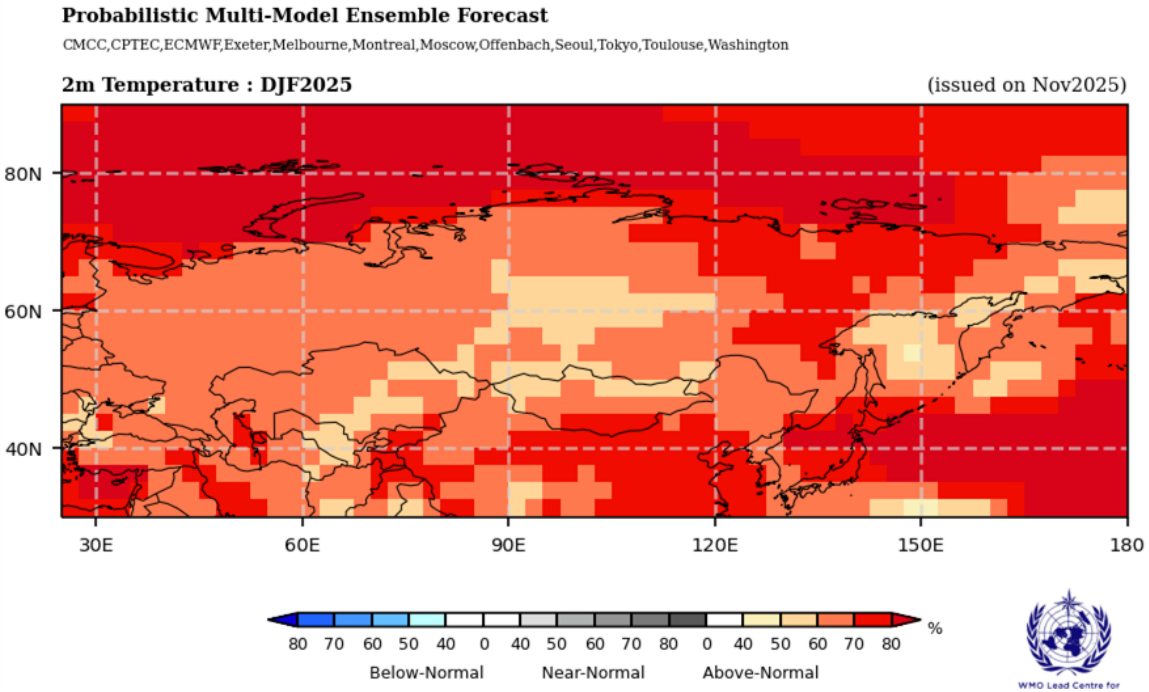
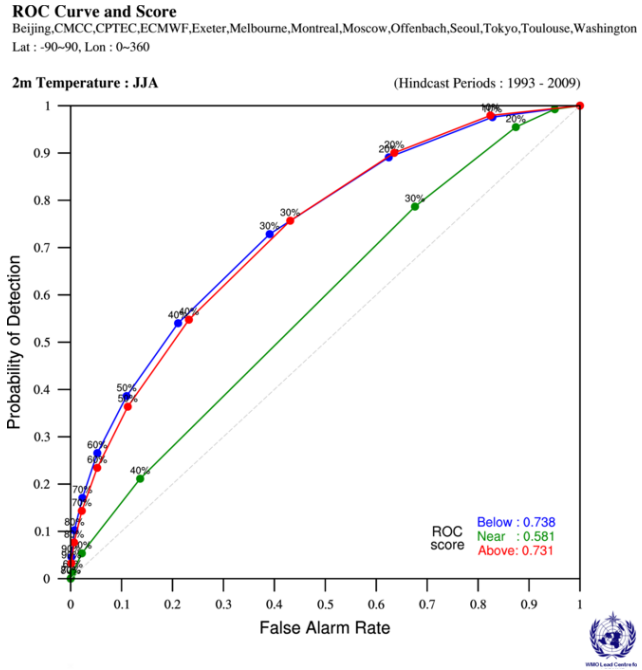
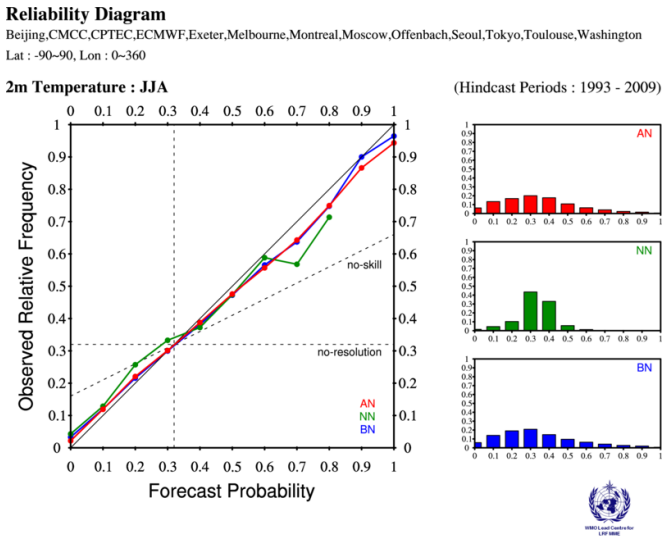
The estimation of tercile-based categorical probabilities (Global)







Forecast quality scores are slightly higher than climate

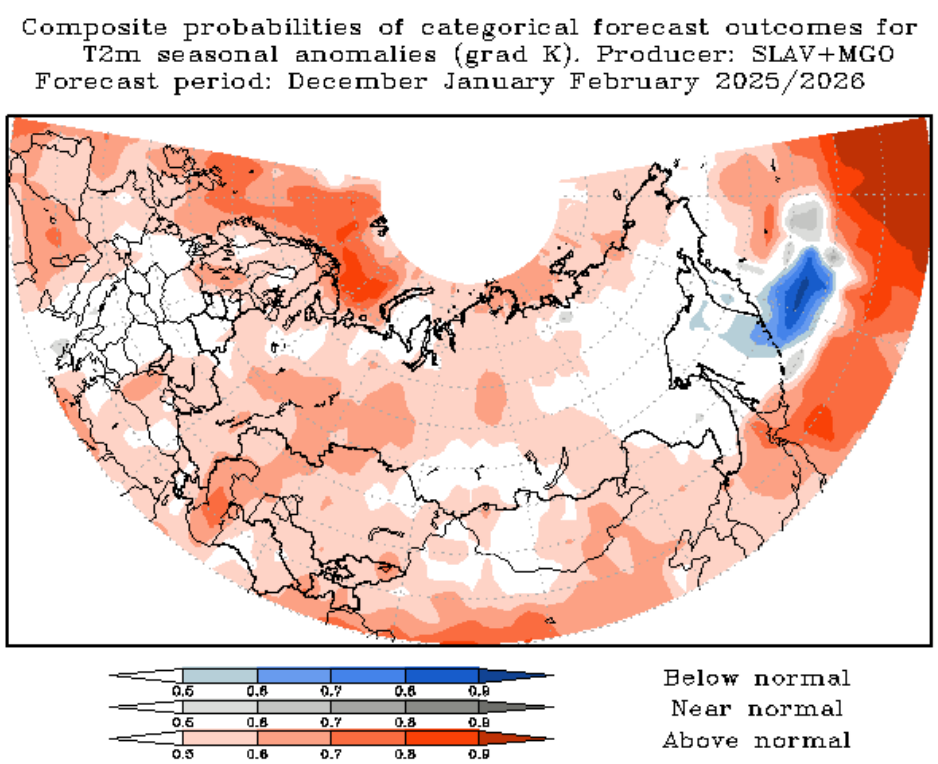
According to the probabilistic multi-ensemble forecast, positive temperature anomalies are expected across the entire European part of Russia and most of Central Asia, with a probability of 60-70%. In Central Asia, the highest likelihood of above-normal temperatures is forecasted for the eastern Caspian Sea coast, Kyrgyzstan, and Tajikistan. In the Asian part of Russia, the highest probability of positive anomalies is expected in Yakutia and the central part of Khabarovsk Krai. Positive anomalies with a probability exceeding 70% are forecast for southern Mongolia and parts of China.

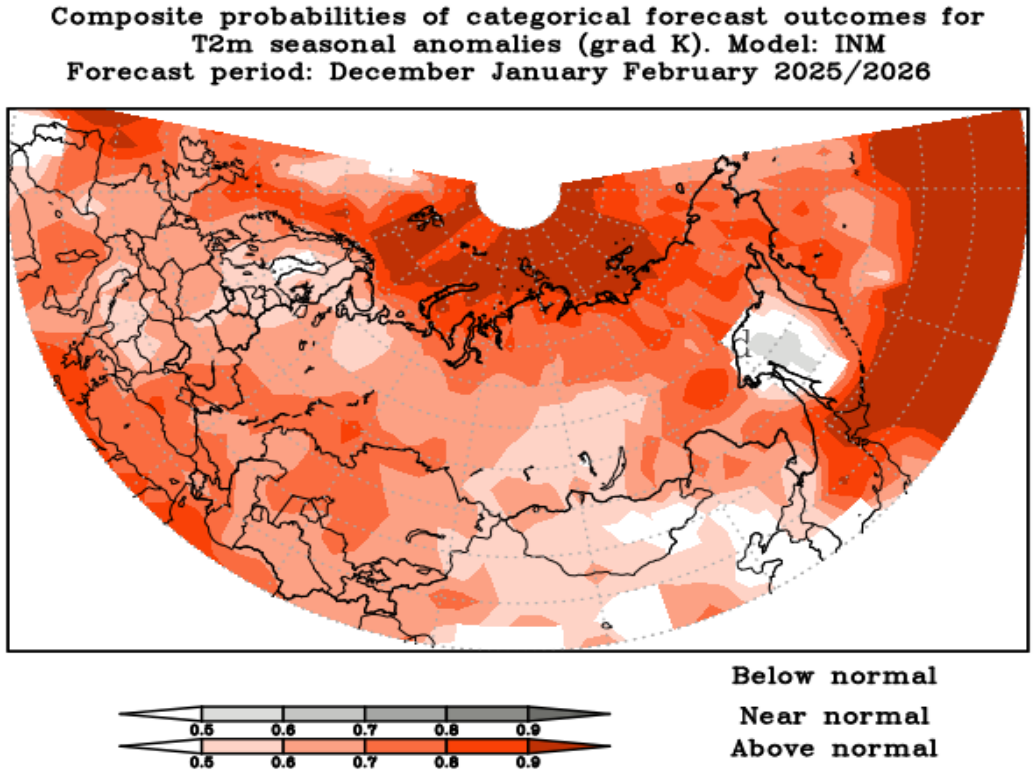
https://www.wmolc.org/

The forecast is issued in November 2025

Temperature forecast

Composite probabilities of categorical forecast outcomes for T2m seasonal anomalies.
Producer: HMC (SL-AV) and MGO model, and INM model





According to the SL-AV and MGO models, there is a high probability of positive anomalies across Central Asia, particularly in western Kazakhstan, northern Kyrgyzstan, and Tajikistan.

According to the INM model forecast, positive anomalies are expected across the entire territory of Northern Eurasia.

https://seakc.meteoinfo.ru/en/

The forecast is issued in November 2025

Precipitation forecast

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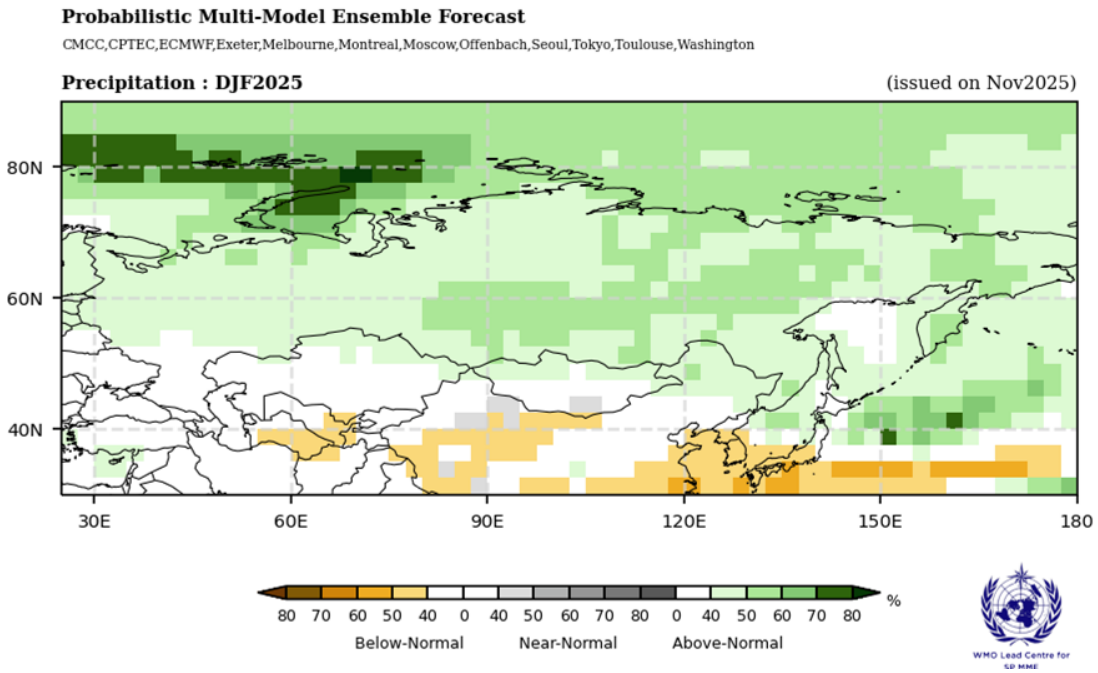
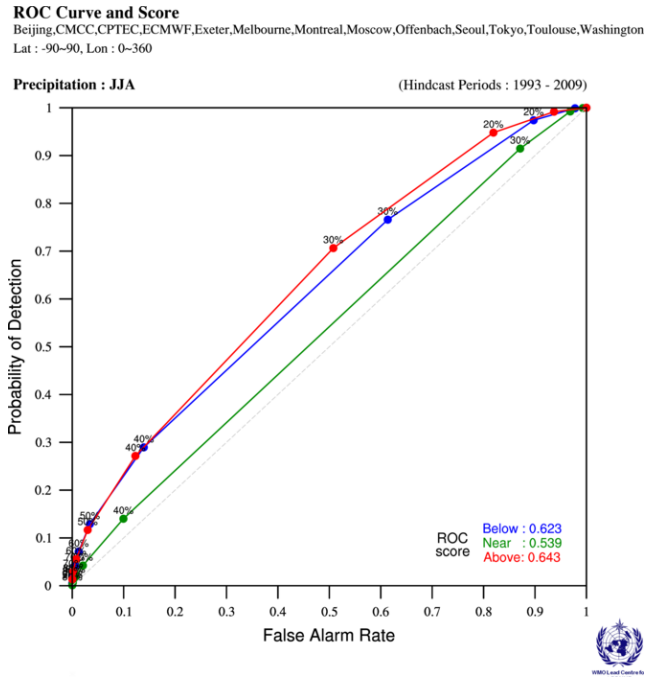
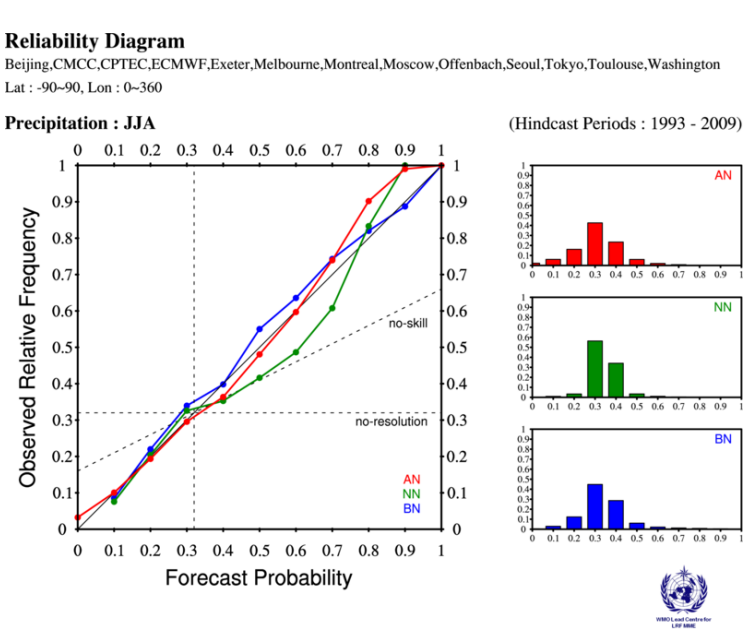
The estimation of tercile-based categorical probabilities (Global)







Forecast quality scores are approaching climate ones.

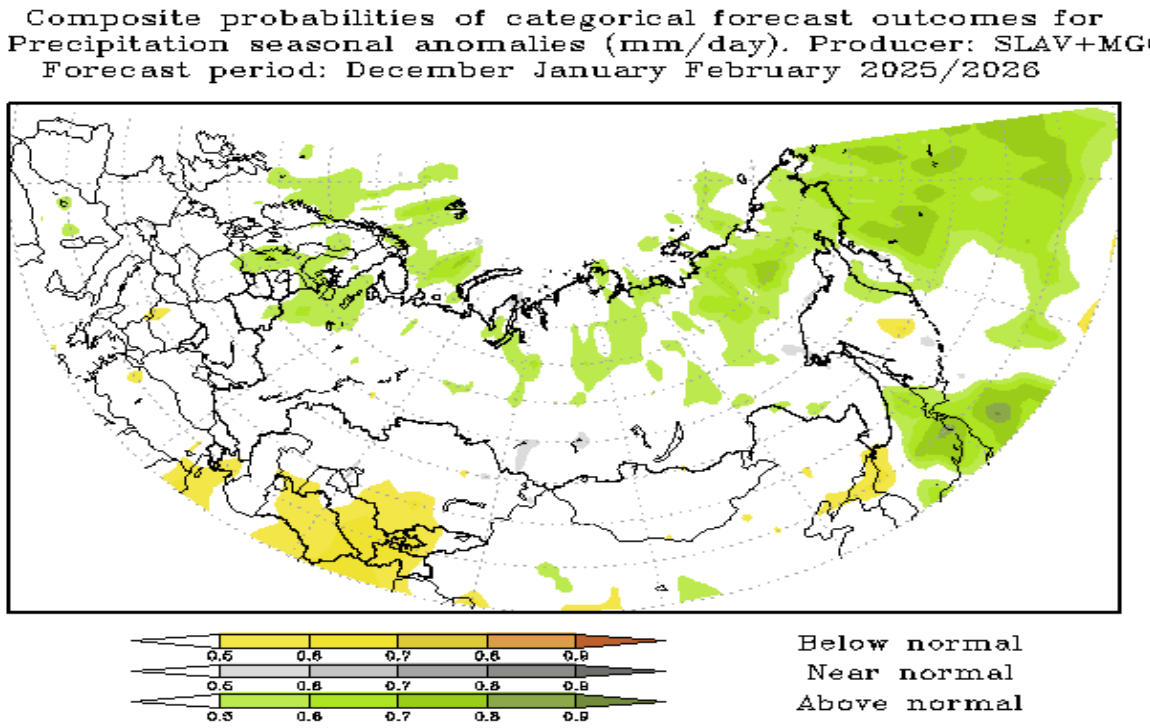
According to the probabilistic multi-model ensemble forecast, there is a 50-60% probability of above-average precipitation across most of the Russian Federation, with the exception of the southern regions of its European part. A probability of excessive precipitation exceeding 60% is forecast for some areas of Asian Russia. Below-normal precipitation with a probability of over 40% is expected in southern Central Asia and parts of northern China.

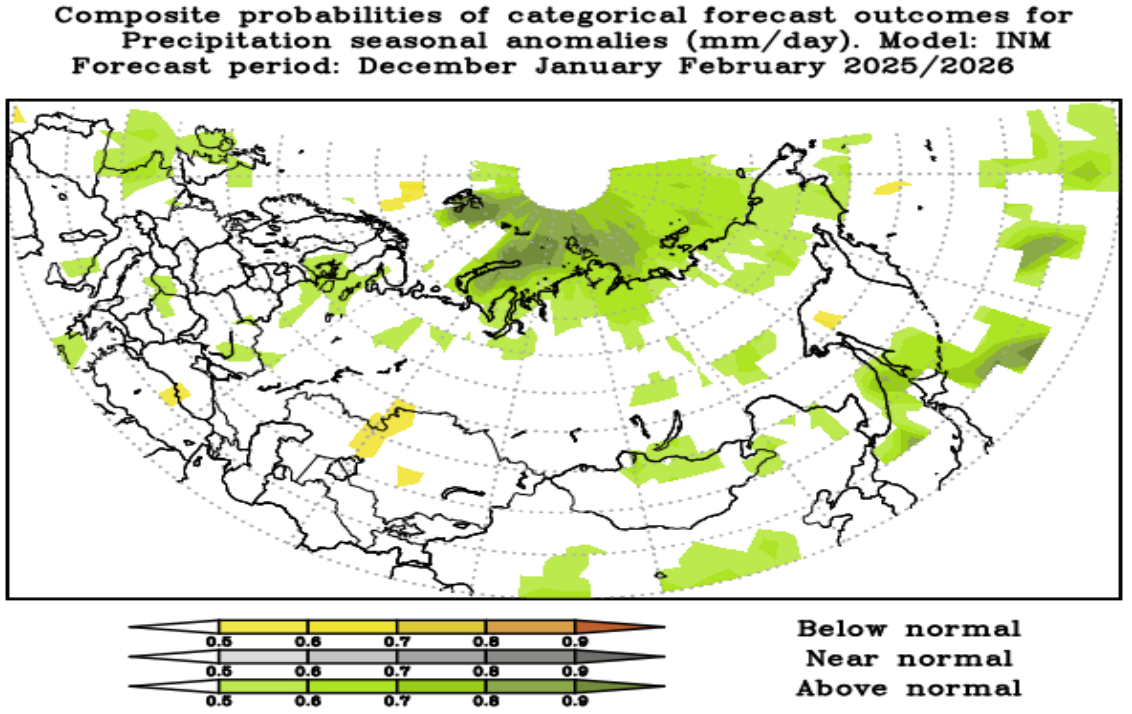
The forecast is issued in November 2025

https://www.wmolc.org/

Precipitation forecast

Composite probabilities of categorical forecast outcomes for precipitation seasonal anomalies. Producer: HMC (SL-AV) and MGO model, and INM model.





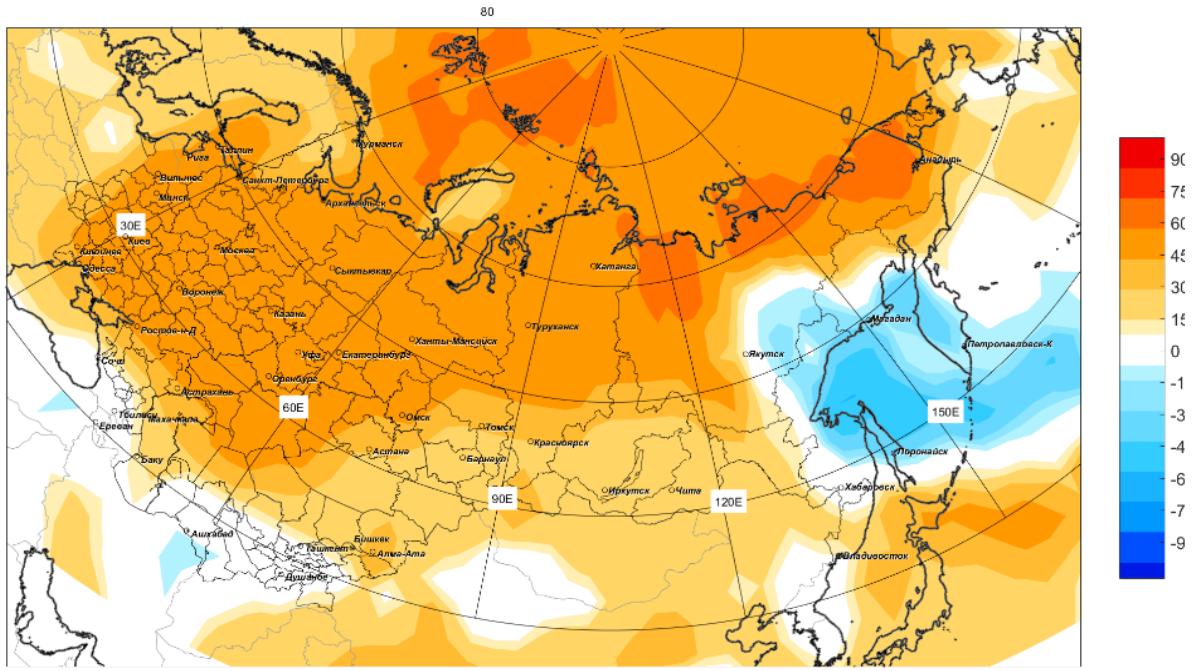
According to the SL-AV and MGO models, a precipitation deficit is expected over southern Central Asia.

From the INM model forecasts, there is some uncertainty in precipitation field.

https://seakc.meteoinfo.ru/en/

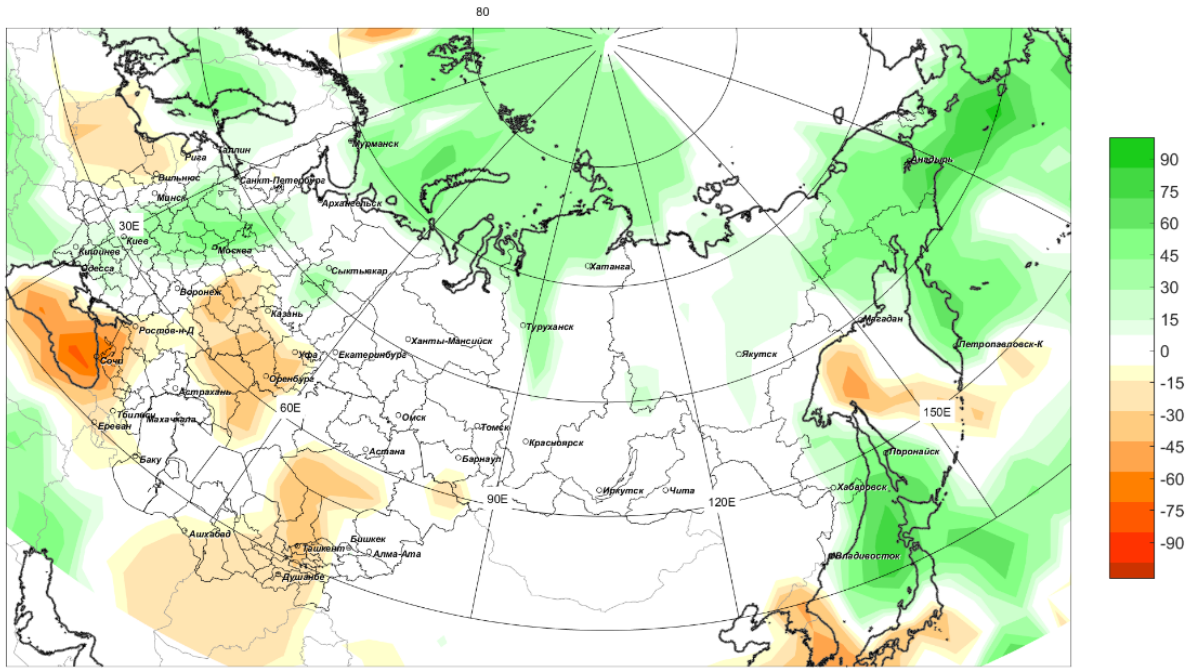
The forecast is issued in November 2025

Consensus forecast of near-surface air temperature anomalies and of precipitation anomalies for winter season of 2025/26



2M temperature forecast. DJF 2025 (Mgo Hmc Inm6 Composite Probabilities)

Consensus forecast of season-averaged air temperature anomaly for winter 2025/26 in probabilistic form, as calculated basing on interpreted data from three Russian models (PLAV, MGO and INM)
Positive anomalies are painted red and negative are painted blue, with saturation corresponding to probability of anomaly.



Precipitation forecast. DJF 2025 (Mgo Hmc Inm6 Composite Probabilities)

Consensus forecast of season-averaged precipitation anomaly for winter 2025/26 in probabilistic form, as calculated basing on interpreted data from three Russian models (PLAV, MGO and INM)
Positive anomalies are painted green and negative are painted red, with saturation corresponding to probability of anomaly.

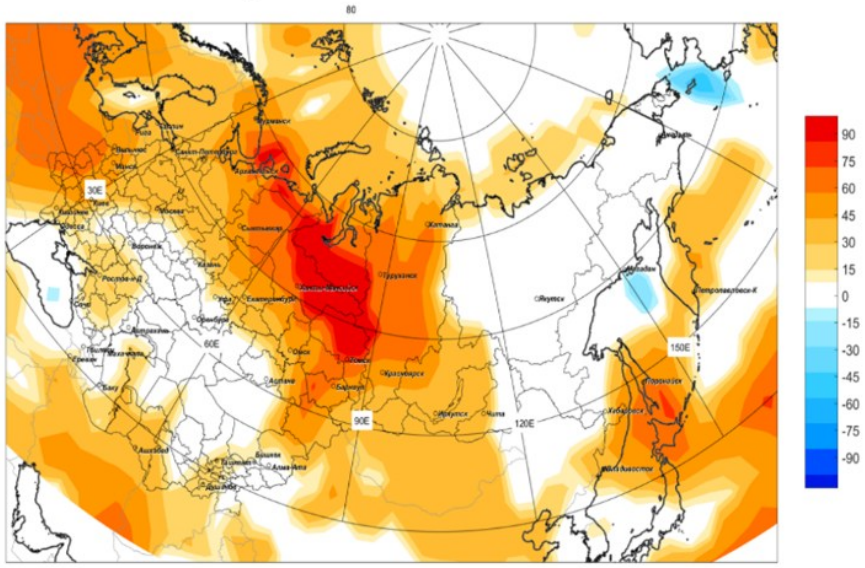
Summary

- According to the most hydrodynamic and statistical models, the conditions are predicted to be favorable for the onset of a **La Niña** event for the winter 2025-26 (December-February). According to the CPC/IRI Consensus Probabilistic Forecast the probabilities for La Nina, neutral and El Nino conditions (using -0.5C and 0.5C thresholds) over the coming winter season are: 56%, 43% and 1%;
- The reduction of ice cover in the Arctic seas, combined with positive temperature anomalies in the north Atlantic, can lead to a **weakening of zonal flow** and an **increase in the frequency of atmospheric blocking** patterns over Northern Eurasia;
- According to forecasts of the Hydrometcenter of Russia, the WP, EU and SHI indices in the upcoming winter season will be positive. Positive phases of these indices correspond to **meridional atmospheric circulation patterns** in Siberia and in the Far East, and to intensifying of the Siberian anticyclone, especially in the second half of the winter period. On the other hand, a change in sign of the NAO and POL indices suggests the increased variability of circulation processes in Europe and in northern Asia, and a positive phase of POL leads to the increased cyclonic activity, making advection of warm air masses to Northern Siberia and the Far East quite probable;
- Based on forecasts of the majority of models, the winter season 2025-26 is expected to be **warmer in most of North Eurasia**, with a lesser probability, in the north of the ETR and the south of Siberia, pointing at possible cold intrusions into the latter areas. Given the set of forecast data, negative temperature anomalies are likely in the Far East of Russia.
- Precipitation forecasts of most centers show humid conditions in the northern part of North Eurasia and **dry** ones in the south of Siberia and in Central Asia.

**The information in the bulletin is advisory in nature and should be applied to specific regions, taking into account the predictability of atmospheric processes, regional climatic features and the quality of modern hydrodynamic models.

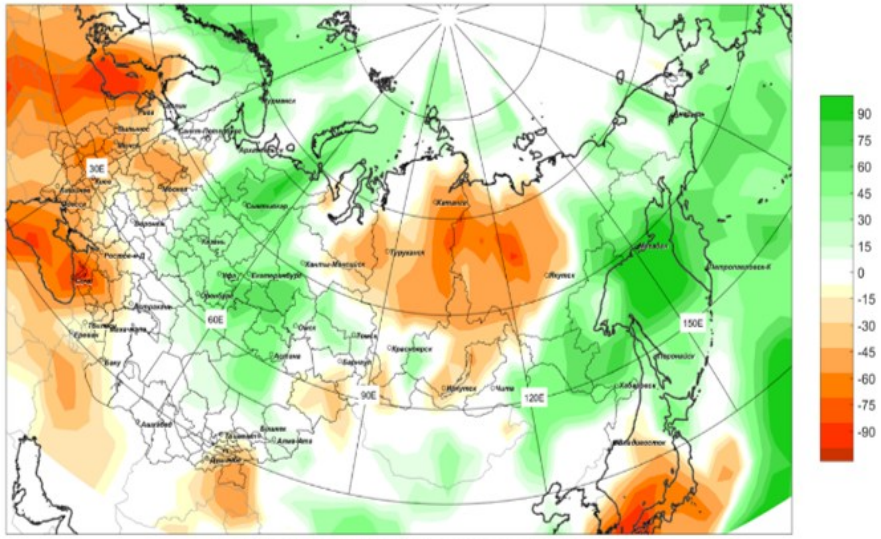
Success of the NEACOF Consensus Forecast for Air Temperature and Precipitation in Summer 2025

Consensus forecast of season-averaged air temperature anomaly for summer 2025 in probabilistic form, as calculated basing on interpreted data from three Russian models (PLAV, MGO and INM)



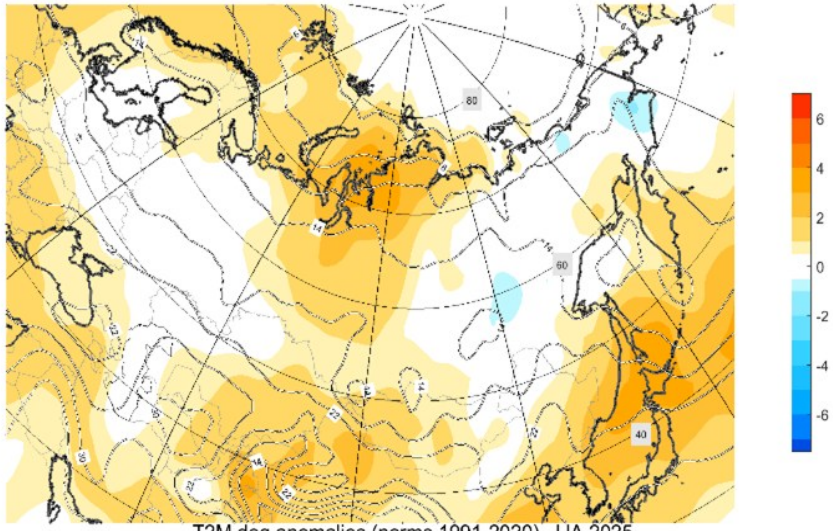
2M temperature forecast. JJA 2025 (Rus Composite Probabili

Consensus forecast of season-averaged precipitation anomaly for summer 2025 in probabilistic form, as calculated basing on interpreted data from three Russian models (PLAV, MGO and INM)



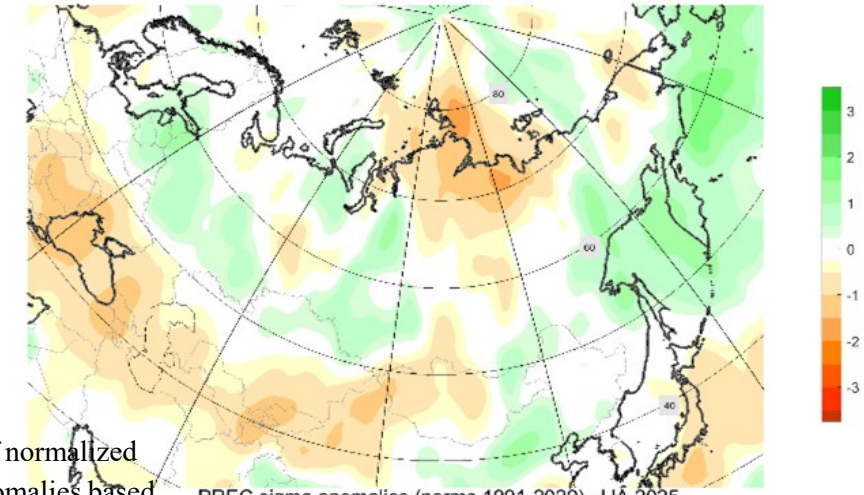
Precipitation forecast. JJA 2025 (Rus Composite Probabilities)

Distribution of normalized near-surface temperature anomalies based on ERA5 reanalysis data for summer 2025.



T2M deg anomalies (norms 1991-2020). JJA 2025.

Distribution of normalized precipitation anomalies based on ERA5 reanalysis data for summer 2025



PREC sigma anomalies (norms 1991-2020). JJA 2025.

	CIS	1 NSR*	2 NSR*	Central Asia and Kazakhstan
Skill score (%)				
Temperature, 2m	78	77	77	75
Precipitation	72	69	75	70
Anomaly correlation coefficient (ACC)				
Temperature, 2m	0.69	0.65	0.77	0.55
Precipitation	0.35	0.13	0.47	0.08

*NSR – natural synoptic region

The skill score of the forecast combined basing on the three Russian models (PLV, MGO and INM) for the summer season 2025 across the entire territory of North Eurasia was 78% for near-surface air temperature and 72 % for precipitation (see Table 2). In the first and second natural synoptic regions, the skill score for near-surface temperature was 77%. The skill score for precipitation (75 %) was high in the second natural synoptic region.

The correlation coefficient between the predicted and actual near-surface air temperature anomalies in North Eurasia was 0.69; the respective value for precipitation was quite low (0.35). For air temperature, the highest anomaly correlation coefficient was in the 2 NSR (0.77). For precipitation, the value sizeable for the analysis was also in the second synoptic region (0.47)

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Thank you !

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