Multimodel approach to forecast basic meteorological parameters over territory of Russia

V. Khan(1), V.Kryjov(1), V. Tischenko(1), R. Vilfand(1)

Hydrometeorological Center of Russia

The main objective of the present study is to develop the long-range forecasting approach to predict surface air temperature, precipitation, H-500 and T-850 over territory of Russia. The approach is based on using the outputs from GCMs of two Russian models (RHMC, MGO), Korean (GDAPS, GCPS, METRI), Japanese (JMA) and USA (NCEP). Model seasonal forecasts correspond to period from 1983 through 2003. Different statistical experiments were conducted including multiple regressions, stepwise multiple regression to find optimal linear combination between basic meteorological parameters of available models to improve the skill of the seasonal forecast. It was found that the optimal way to increase the performance of long-range predictions is using equal waiting averaging between available models. Following parameters such as correlation coefficients, absolute error, Brier score, and mean square skill score were used to assess the quality of elaborated multimodel approach. The statistical confidence level for correlation coefficients at each point was calculated. Special attention has been given to Russian territory, but at the same time estimates were done over the Globe, Northern Extratropics and Northern Eurasia. In general, the skill score of forecasts over Russia is not high, the useful prognostic information can be extracted only for some parts of Far Eastern and European regions of Russia. The results for H-500 and T-850 parameters are higher than for surface air temperature and precipitation. Averaged estimates are in agreement about higher performance of the models in tropics than in extratropics with results of other studies where model seasonal forecasts have been analyzed.