



## Comparison of observed and different reanalysis climatic characteristics over Siberia

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Today numerous investigations have confirmed that warming over Siberian territory is significant and it inevitably would influence environment in the region. But it is impossible to obtain detailed pattern of climatic changes in the region using only in-situ measurements because there are gaps in observations and station network is sparse. Global climatic modeling archives (different reanalyses) would help solving this problem but they give scattered results leading to climate change assessment uncertainties. Thus, it is urgent to assess accuracy with which global climatic models reconstruct regional climate and to choose an archive which is closest to the observed meteorological parameters.

To achieve this goal, we developed a technique for comparison reanalyses and observational data at the weather stations locations. This technique provides: analysis of time series comprehension, selection of homogeneous observational series and removal of series having gaps; choice of a proper interpolation method (bilinear interpolation, third-order polynomial, inverse distance weighted, modified Shepard's interpolation, and basic geostatistical kriging); assessment of differences between reanalyses data reconstructed at weather station locations and data observed at these stations using a set of approved statistical methods (ME, RMSE, chi-square).

The technique developed has been applied to compare NCEP/NCAR, NCEP/DOE AMIP II, ECMWF ERA-40, ECMWF ERA Interim, and APHRODITE JMA datasets with the data observed at weather stations in Siberia ( $55^{\circ}$ – $130^{\circ}$ E,  $50^{\circ}$ – $75^{\circ}$ N) over period of 1979 – 2007. In particular, to describe air temperature and precipitation amount in Siberia, we selected 59 observational time series which meet the above requirements (less than 5 % gaps in the series). Reanalyses data have been reconstructed at these stations locations using modified Shepard's interpolation which gives the least deviation for different-size grids.

Air temperature difference between ECMWF (ERA-40, ERA INTERIM) and NCEP (NCEP/NCAR, NCEP/DOE AMIP II) reanalyses was in average  $0.3^{\circ}$ C with increase of data difference with latitude. Comparison of air temperature from the above reanalyses datasets and 59 observational series has shown that the ECMWF ERA INTERIM dataset is in a good agreement with the observations. Analysis of precipitation amount from ERA INTERIM and APHRODITE JMA archives has revealed that they are twice different. Comparison between reanalyses and observational data has shown that APHRODITE JMA dataset is closest to the observations (difference of 30-80 mm) [1].

Now we study dynamics of wind and pressure fields obtained with different reanalyses datasets using the comparison technique described above.

The results obtained would provide reliable information for assessment of climate dynamics in the region and basis for validation of existing and new regional climatic models.

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[1] Shulgina T.M., Genina E.Yu., Gordov E.P. Dynamics of climatic characteristics influencing vegetation in Siberia // Environmental Research Letters, 2011. – DOI: 10.1088/1748-9326/6/4/045210. – 7 p.