Evaluation of AVN NCAR model surface temperature data errors in cold Siberian region seasons

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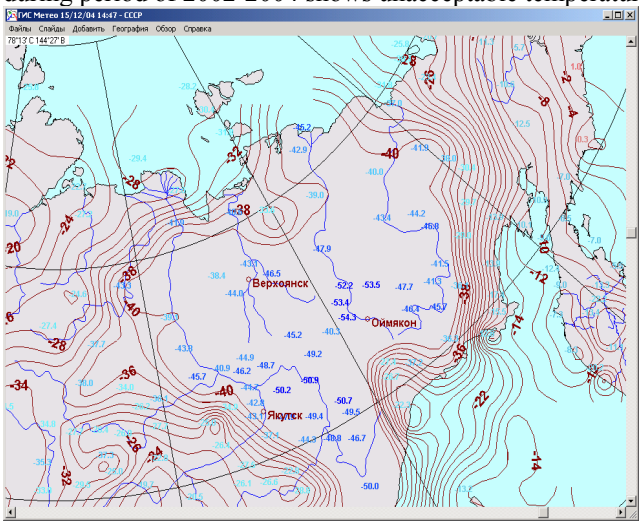
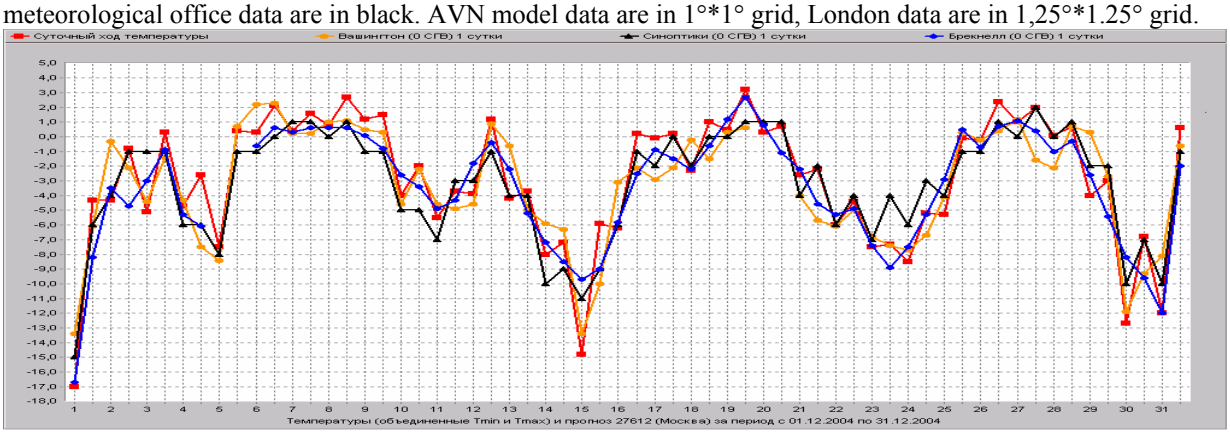
There is vast region in East Siberia where cold temperature –40°C and below lasts during several months. Evaluation of surface temperature fields received from INTERNET FTP server NCAR Washington (ftp://ftpprd.ncep.noaa.gov/pub/data/nccf/com/avn/prod/ and ftp://tgftp.nws.noaa.gov/SL.us008001/ST.opnl/) during period of 2002-2004 shows unacceptable temperatures in such regions.

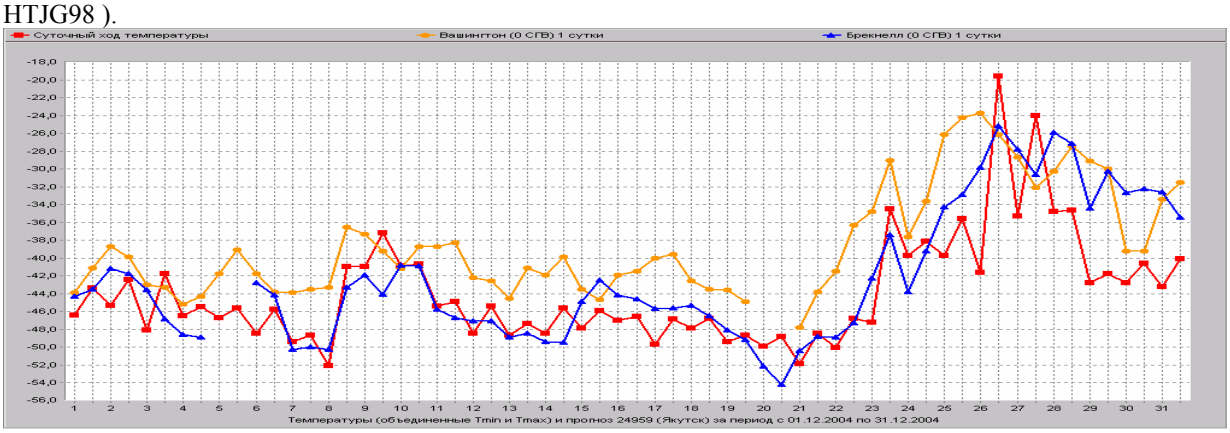


Vast area without isoterms on the surface temperature chart (Synop FM-12 data for 00 GMT 29 december 2004) shows such sample. Blue values are observed **T** data in °C. In this area differences between AVN data and observed T data are near 10-20°.
Cold weather periods in west Siberia in oil/gas fields region (from Yamal to Niznevartovsk) lasts so long too.
Numerical evaluation of surface temperature errors of AVN NCAR model data is shown below.

Graph below shows December 2004 day/night extreme temperature in Moscow (SYNOP FM-12 data from station 27612, red line) and corresponding 24/36 hours forecasts data. AVN NCAR data are in yellow color, London data (GTS WMO GRIB HTIE98 EGRR / HTIG98 EGRR from 00 GMT)are in blue, Moscow meteorological office data are in black. AVN model data are in 1°*1° grid, London data are in 1,25°*1.25° grid.

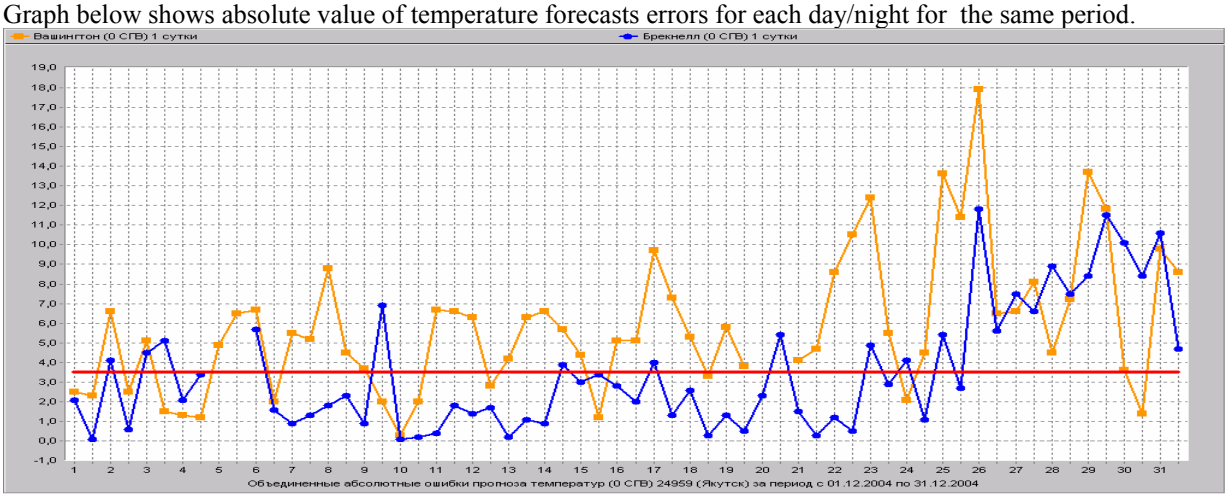


The same graph is done below for Yakutsk (meteostation Jakutsk 24959, GTS WMO GRIB EGRR HTJE98 и HTJG98).



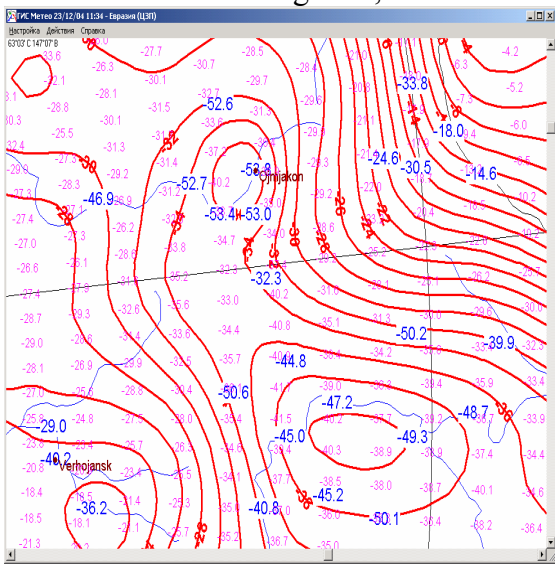
GRIB forecasts values for meteostations are prepared by interpolation. Its quality evaluates isoterms showed in maps below. Such interpolations are made automatically each day for more than 500 russian cities last 6 years. In this report we examine 24/36 forecast data from observing time 00 GMT only.
The graphs above demonstrates high quality AVN NCAR forecast for Moscow region and unacceptable one for Yakutsk.

Graph below shows absolute value of temperature forecasts errors for each day/night for the same period.

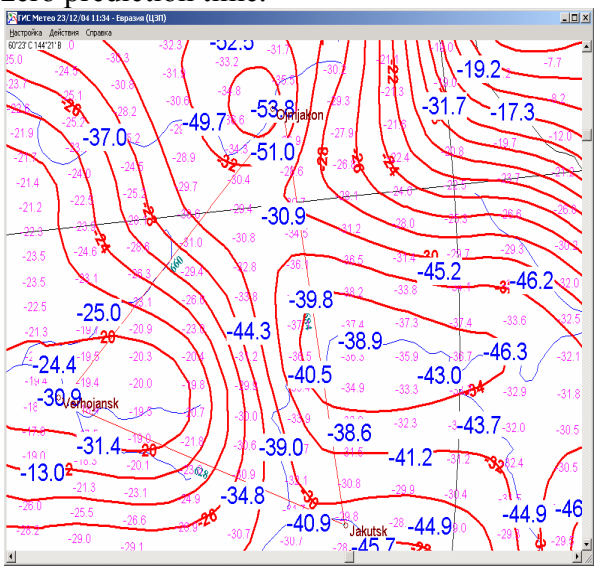


Red 3,5° line shows acceptable threshold for temperature forecast.

Some part of The cold region (Yakutsk – Verhoyansk - Ojmiakon) showed on surface T maps below. Magenta values and red isoterms are calculated for AVN NCAR data (see interpolation accuracy above), blue values are SYNOP air T data. Both kind of data relate toward same observing time, i.e. forecast with zero prediction time.



23 december 2004, obs. Time 00 GMT



23 december 2004, obs. Time 12 GMT

Triangle on the map to the right shows distances in km (pale blue). Meteostations are situated above sea level with the following heights: Yakutsk-110 m, Verhoyansk-138 m, Ojmiakon- 741 m.