Geophysical Research Abstracts
Vol. 13, EGU2011-13894, 2011
EGU General Assembly 2011

On the forecasting of the dangerous rainfalls and floods at the territory of Europe and the forecasting of the drought over the central part of Russia in the Summer of 2010

Elvira V. Perekhodtseva
Hydrometeorological Center of Russia, B. Predtechenskii 9-13, 123242, Moscow, Russia (e-mail: perekhod@mecom.ru)

The development of the successful methods of the forecast of the heavy and dangerous rainfalls could allow one to take proper measures against destruction of buildings and to protect people. Well-in-advance successful forecast (from 12 hours to 48 hour) of these phenomena makes possible to reduce the losses. The prediction of these phenomena is a very difficult problem for synoptic till recently. The existing graphic and calculation methods still depend on subjective decision of an operator. Nowadays in Russia there is no hydrodynamic model for forecast of the heavy and dangerous rainfalls, hence the main tools of the objective forecast are statistical methods using the dependence of the phenomena involved on a number of the atmospheric parameters (predictors).
The weather at the territory of Europe in the warm season of 2010 was no ordinary. There were very many days with the heavy and dangerous rainfalls. They have involved floods at the different regions of Europe. But in the center of European part of Russia the rainfalls were in absence during two summer months, the air temperature was so higher than climatic norm and the drought was observed over great region of the central part of Russia.
For the development of automated forecast of these phenomena the statistical decisive rule of the alternative and probability forecast of these events was obtained in accordance with the concept of “perfect prognosis” using the data of objective analysis of forty physically substantiated potential predictors for the samples of the presence and absence of heavy rainfalls. Then the informative vector-predictor was choosing by the empirical statistical method using the diagonalization of the mean correlation matrix R of the predictors.Thus for these phenomena the most informative predictors were selected without loosing information. The statistical decisive rule U(X) for diagnosis and prognosis of these phenomena was calculated for choosing informative vector-predictor in the nods of the grid 75x75km of the region hydrodynamic model of Russia. The values of probabilities P of dangerous rainfalls and heavy precipitation were calculated in the same nods of the grid 75X75km.
In order to change to the alternative forecast the author proposes the empirical threshold probability values P specified for these phenomena and advance periods 12-24-36 - 48 hours. In the accordance to the Pirsey-Obukhov criterion (T), the success of these automated statistical methods of forecast of heavy rainfalls to 36 –48 h ahead in the warm season of 2010 for the territory of Europe and European part of Russia was equal T = 1-a-b=0,48 - 0,65 after author experiments.
A lot of examples of the very successful forecasts of heavy and dangerous rainfalls and floods in the warm season of 2010 at the territories of Poland, Romania, Germany and other countries are submitted at this report. For the central region of Russia the absence of precipitation was forecasted successful. Really in the summer of 2010 there was the duration of long drought during two months in the Central part of Russia.