Forecast of Rainfall Which Leads to Catastrophic Flood on the Amur Basin

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The report presents abilities of the WRF-ARW model to predict extreme precipitation on a basin of large rivers situated on south part of extratropical zone of Far East. These forecasts are used to predict riverine flooding and describe its formation process.

The most severe flood in at least the past 140 years is occurred on Amur River and its large tributaries (Sungari, Zeya, Bureya) during August and September 2013. The flood was a result of prolonged and intense rainfall on a vast territory of Far East for more than two months of 2013.

It was noted that predicted, on the data from the Amur River hydrological network, flow peaks are understated. In addition, a post factum analysis of observed hydrological data does not clarify rate of water level rising on such large river spreading on a vast territory.

Numerical calculation of continued and intense rainfall based on high resolution weather models leads to estimate probability of riverine flooding. The advantage is that water volume, accumulated on a basin area, measures more precisely in model grid points than on the data from relatively rare observed network.

Forecasts of rainfall intensity and placement by the WRF-ARW model with 15-km grid spacing are used to predict progress of the Amur River flood during Summer and Autumn 2013. The model runs in operational mode in Regional Center of World Weather Information Service (Khabarovsk, Russia).

Usage of simulated data (time, placement and amount of precipitation) for flood forecasting is discussed. Measures of rainfall prediction skill during the period of the flood are shown. Abilities of the WRF-ARW model to simulate prolonged and extreme rainfall on south part of extratropical zone of Far East are illustrated.