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Growth of precipitation over the territory of Ukraine in the beginning of 21 century

Shchehlov Olexander (1) and Martazinova Vazira (2)

(1) Taras Schevchenko National University, Kiev,Ukraine (aleshcheglov@gmail.com), (2) Ukrainian Hydrometeorological Institute, Kiev,Ukraine (vazira@gmail.com)

The climate change results in growing number of hazardous weather events. In this study we carried comparative analysis of current changes of precipitation on the territory of the Ukraine in order to identify vulnerabilities in the economy and the threat to the population from the global climate change. The classification of synoptic processes related with heavy rainfall was based on the method of “etalon field” (Martazinova, 2005).

Daily precipitation fields on a regular grid for the territory of Atlantic-European sector (30W – 70E, 40 – 70N) for the periods 1961-1990, 1991 2010, 1991-2000 and 2001-2010 were used to estimate changes in precipitation on the territory of Ukraine. The comparison of the curves of the monthly precipitation 1991-2010, 1961-1990 averaged over the territory of Ukraine shows that the sum of precipitations of all seasons coincides. However, the precipitation curves for 1961-1990, 1991-2000 and 2001-2010 are a significantly differ. The averaged over the territory precipitation for 1991-2000 in all seasons is significantly below norm (1961-1990), especially in the summer season. The precipitation 2001-2010 in all seasons is significantly above norm. The greatest increase of precipitation occurs in the western and south-western regions of Ukraine. The increase of extreme rainfalls (over 15 mm/day) is observed in the last decade for all regions of Ukraine. The increase was revealed also in the frequency of daily precipitation (less 15mm/day). Rise of monthly precipitation in last decade is observed in some month equally for daily extreme precipitation and for precipitation less of 15 mm/day. Noticeable changes in the atmospheric circulation due to climate change led to heavy rainfall over territory of the Ukraine in 2001-2010 in comparison with 1991-2000. The obtained by method of “etalon field” most probable class of synoptic situations of extreme rainfall in last decades in all months is very different from processes of extreme rainfall of the previous decades. These synoptic processes are new and its frequency is 5-10 cases/month.