



Change of frequency of weather conditions favorable for spring floods in North Eurasia

A. Shmakin

Institute of Geography, Laboratory of Climatology, Moscow, Russian Federation (andrey_shmakin@mail15.com, 007 495 9590033)

Statistical analysis is carried out on weather conditions in North Eurasia, which can result in spring floods in the region. Change of frequency and intensity of such situations since the middle of 20th century is studied. Specific weather conditions favorable for spring floods in North Eurasia and analyzed in the study include:

- extreme amount of snow accumulated before snowmelt;
- fast warming above 5-6°C within river basins;
- warming above 4-5°C in the upper parts of the river basins, with continuing frosty conditions downstream;
- heavy rains with air temperature above the melting point, combined with the presence of snow.

Detailed analysis of daily meteorological records over North Eurasia during 1950-2006 has been carried out for the study, with specific attention to the frequency and geographical distribution of the mentioned meteorological conditions. Two distinctive time spans were compared to each other: a base period from 1951 until 1980, and a period of contemporary climate warming from 1989 till 2006. Comparison of different characteristics during the climate warming time with those from the base period 1951-1980 can give an estimate of possible future scenarios of the climate change.

Among the weather conditions, favorable for the spring floods, snow accumulation is changing most intensively. Over most of Siberia and in the north-east of the East European Plain, it is increasing during the last decades as compared to the middle of 20th century. In some regions such as West Siberia, parts of South Central Siberia, the increase of snow amount is rather significant – up to 40% in some areas. This can result in larger frequency of spring discharge, and, under certain circumstances, spring floods. However, the frequency of other weather situations favorable for the spring floods didn't change so much: only fast warming has become more frequent in some limited areas (parts of Pechora, Volga and Amur basins), and this has reflected also in the velocity of snow melting.

All other variations can be regarded as occasional fluctuations, without significant trends. In general, potential threats from the viewpoint of spring floods increase only in few areas of North Siberia, while in other areas this danger has become less frequent.

Acknowledgement

The study has been supported by the Russian Foundation for Basic Research (grant 08-05-00475).