

THE IMPACT OF REGIONAL CLIMATE CHANGES ON THE EMERGENCE OF EXTREME HYDROLOGICAL SITUATIONS IN THE EUROPEAN TERRITORY OF RUSSIA IN THE 21ST CENTURY

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We estimate possible changes on the emergence of extreme hydrological situations in the European Russia (ER) in the 21st century. Large rivers catchments - Volga, Don, Terek, Severnaya Dvina, etc. are situated on the ER. We use data on precipitation and temperature from AOGCMs (atmospheric and ocean general circulation models) of the CMIP5 project, selected based on the best reproduction of the current climate.

We estimate possible changes in the average annual maximum snow reserves and flood runoff and the possible changes of the probability of occurrence of extremely shallow years in the 21st century in ER.

We show that multidirectional changes in the maximum snow reserves and flood runoff are expected in ER, although there is a tendency in the southern territories towards a decrease in these characteristics; this intensifies near the end of the 21st Century and when using data from the 'hard' scenario of greenhouse gas emissions.

Based on the estimates of possible changes in the variability index of precipitation and humidification conditions, according to the data of AOGCM, changes in the runoff variability index (Cvy) were calculate. Then we calculate the change in the runoff of extremely dry years (95% of supply) or the change in the probability of their occurrence by the probability distribution function (three-parameter gamma distribution), taking into account the predicted annual normal flow and variability index.

According of the calculations made by the AOGCM, an increase in the number of extreme shallow years will be characteristic of the southern and southeastern parts of the Russian Plain. The most unfavorable situation is predicted on the Lower Volga. North of 55 ° N, i.e. in the middle of the 21st century the runoff of dry years is practically unchanged, while by the end of the century the frequency of dry years can increase.

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