

THE VOLGA AND DON RIVER RUNOFF IN WARM CLIMATE EPOCHS

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The features of the Volga and the Don River runoff changes during the Holocene Climatic Optimum and scenario conditions of global climate warming in the current century have been revealed. Paleoclimatic reconstructions based on data of spore and pollen analysis of fossil plants and results of calculations carried out on the ensemble of global climate models of PMIP-II program, as well as scenarios of climate warming, performed on an ensemble of global climate models of CMIP3 and CMIP5 programs, have been used. Hydrological changes have been evaluated on the basis of the monthly water balance model [Georgiadi & Milyukova, 2002]. Scenario air temperature in the Volga and Don basins, typical for the first third of the current century, was close to the temperature of the Holocene optimum reconstructed on the basis of palynological data. At the same time, the simulated annual runoff of the Volga and Don rivers was lower than the modern one. This result is consistent with the estimates of the water runoff obtained earlier for the Volga River on the basis of relations of annual flow with climate zonality, and with the results of the reconstruction of water runoff based on paleomeander characteristics. At projected and the Holocene Optimum climatic conditions reconstructed by PMIP-II, annual runoff is above modern (in Volga) or almost does not differ from it (in Don). In the scenario projection for the first third and the middle of the current century, the annual runoff of Volga is likely to increase as the climate warms, while the runoff of Don is likely to remain unchanged. The most noticeable differences in the Volga and Don runoff in warm climate of the Holocene optimum, modern and scenario periods are manifested in changes in the intra-annual distribution of their water runoff.