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Interrelations of global change and Siberia regional climate

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Some results of analysis of recent observations and coupled climatic model projections of Siberia climate, surface hydrology and vegetation dynamics under global changes are reported. Special attention is paid to surface temperature behavior, circulation regime changes that play a significant role in Northern Eurasia/Arctic Climate System and to feedbacks between regional climate and the terrestrial surface hydrology and vegetation.

In particular, significant positive trends of growing season length accompanied by statistically significant increase of sum of the growing degree day temperatures and precipitation are occurring over the south of West Siberia. It might lead to an increase of vegetation productivity in this region. Results of a comparative analysis of observational and modeled time series for surface temperature in Siberia are presented as well. It reveals a number of stable periodicities in the observed changes of average annual temperature and statistically significant correlation of these periodicities with the planetary indices such as North Atlantic Oscillations and Southern Oscillations (in the Pacific Ocean).

Also a role of regional biosphere (including the surface air layer, the vegetation layer, soil, and hydrosphere) in 21st century regional and global climate formation is studied. In particular feedbacks generated by variations of some parameters of the atmosphere and surface hydrology are assessed and analyzed.

Still many important impacts of climate change on regional environment can not be quantified due to multiple environmental and human factors coming into play and additional study is required to better understand both the impacts and generated by those in Siberia feedbacks to the Earth system.