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TITLE: Ongoing climatic extreme dynamics in Siberia

ABSTRACT BODY: Ongoing global climate changes accompanied by the restructuring of global processes in the atmosphere and biosphere are strongly pronounced in the Northern Eurasia regions, especially in Siberia. Recent investigations indicate not only large changes in averaged climatic characteristics (Kabanov and Lykosov, 2006, IPCC, 2007; Groisman and Gutman, 2012), but more frequent occurrence and stronger impacts of climatic extremes are reported as well (Bulygina et al., 2007; IPCC, 2012: Climate Extremes, 2012; Oldenborh et al., 2013).

This paper provides the results of daily temperature and precipitation extreme dynamics in Siberia for the last three decades (1979 – 2012). Their seasonal dynamics is assessed using 10th and 90th percentile-based threshold indices that characterize frequency, intensity and duration of climatic extremes. To obtain the geographical pattern of these variations with high spatial resolution, the sub-daily temperature data from ECMWF ERA-Interim reanalysis and daily precipitation amounts from APHRODITE JMA dataset were used. All extreme indices and linear trend coefficients have been calculated using web-GIS information-computational platform Climate (<http://climate.scert.ru/>) developed to support collaborative multidisciplinary investigations of regional climatic changes and their impacts (Gordov et al., 2012).

Obtained results show that seasonal dynamics of daily temperature extremes is asymmetric for tails of cold and warm temperature extreme distributions. Namely, the intensity of warming during cold nights is higher than during warm nights, especially at high latitudes of Siberia. The similar dynamics is observed for cold and warm day-time temperatures. Slight summer cooling was observed in the central part of Siberia. It is associated with decrease in warm temperature extremes. In the southern Siberia in winter, we also observe some cooling mostly due to strengthening of the cold temperature extremes. Changes in daily precipitation extremes are spatially inhomogeneous. The largest increase in frequency and intensity of heavy precipitation is observed in the north of East Siberia. Negative trends related to precipitation amount decrease are found in the central West Siberia and in the south of East Siberia.

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