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# POTENTIAL RISKS OF CLIMATE CHANGE-CAUSED ESCALATING FIRE DANGER FOR SIBERIAN MAJOR CONIFEROUS TREES IN A WARMING CLIMATE BY THE MIDCENTURY

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Siberia (60–140° E and 48–70° N) is annually exposed to wildfires. In our study, a number of days with high wildfire danger conditioned by weather was calculated using the correlation model of Malevsky-Malevich et al. (2005) that relates the Nesterov index higher than 1000 (high wildfire danger) with a monthly hydrothermal coefficient (HTC) for the vegetation period. We calculated HTC based on data derived from weather stations in current climate and from the climate model INM-CM5-0 in warming climates by the mid-century. Potential areas of major Siberian trees: Siberian pine (*Pinus sibirica* Du Tour), Siberian fir (*Abies sibirica* Ledeb.), Siberian spruce (*Picea obovata* Ledeb.), Scots pine (*Pinus sylvestris* L.), Siberian larches (*Larix sibirica* Ledeb., *L. gmelinii* (Rupr.) Rupr. and *L. cajanderi* Mayr) were predicted in current and future climates based on our bioclimatic envelope models of their ranges that take into account permafrost thaw impacts. Potential areas of major Siberian trees were then paired with wildfire danger days to evaluate risks of disturbances caused by both permafrost and wildfire that are the most powerful environmental drivers over the Siberian boreal forest in a warming climate. The basic climate layers (1961–1990) were derived from climate data of 500 weather stations across Siberia using the spline interpolation procedure ANUSPLIN. The 2050s climate layers were derived from output data of the Russian climate model INM-CM5-0 for two IPCC climate change scenarios ssp126 и ssp585 (Parfenova et al., 2024). Coupling areas of major forest-forming trees with fire danger days, forest disturbance risks were mapped in space and time over Siberia in warming climate by the mid-century. The total number of days of high wildfire danger during the growing season in the forested area in Siberia increases by 5–10 days under the mild scenario and by 15–20 days under the severe scenario. The “hot spots” of wildfire-caused disturbances were found in Southern zonobiomes (forest-steppe, subtaiga, and Southern taiga); least disturbed – in Northern zonobiomes (Northern taiga and forest-tundra); and moderately disturbed – between them in middle taiga.

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**References:**

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