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Contemporary climate changes in high latitudes of the Northern Hemisphere cause an increasing potential forest fire danger

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Significant climatic changes over the high latitudes in the 20th century have been reflected in many atmospheric, oceanic, and terrestrial variables. Changes in surface air temperature, precipitation, growing season duration, and snow cover cause changes in numerous derived variables of economic, social and ecological interest, including the natural frequency of forest fires. Using meteorological information for the past century, we found a significant (sometimes a twofold) increase in indices that characterize the weather conditions conducive to forest fires. The areas, where this increase was statistically significant, coincide with the areas of most significant warming during the past several decades in Central Alaska and in Siberia south of the Arctic Circle. Our analysis indicates that the frequency of unusually dry summer and spring conditions has increased in Siberia and Alaska during the past century (50 years in Alaska). These changes, when overlapping with anthropogenic factors, have already aggravated the negative consequences of forest fires and (if continued) may be devastating in the future.