



Fire impact on ecosystem components and carbon budget of pine forests in the Zabaikalye Region, Siberia

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Boreal forests of Siberia contribute considerably to the global carbon budget. Fires cover annually millions hectares of boreal forests. Fire frequency has increased in the boreal forests of Siberia over the past several decades. Forest fire is the significant factor of profound ecological changes in ecosystems. Wildfires result in both direct and indirect postfire carbon emissions. Estimation of fire impact on phytomass and carbon balance components in the forest ecosystems is an urgent problem. This study focuses on collecting quantitative data and estimating impact of fires of varying severity on phytomass, carbon budget, and ecosystem processes in pine stands of the Selenga Middle Mountains in the Republic of Buryatia. Fire affects on all ecosystem components including the overstory, living ground vegetation, litter. Fires cause changes of phytomass structure with living and dead organic matter redistributed substantially depending on fire severity and time since last burning. The surface fires of varying severity decrease total aboveground phytomass by 11-24%. After fires of moderate- and low- severity living organic matter decreased by 40-60% and mortmass increased 2-3 times. Before fire ecosystem of pine forests acts as a sink of atmospheric carbon. Low- and moderate- severity fires do not change the status of ecosystems while after surface fires of high severity forest ecosystems become source of carbon over the first postfire years.