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Fire Impact on Surface Fuels and Carbon Emissions in Scots pine Logged Sites of Siberia

G.A. Ivanova (1), E.A. Kukavskaya (1), A.V. Bogorodskaya (1), V.A. Ivanov (1), S.V. Zhila (1), and S.G. Conard (2)

(1) V.N. Sukachev Institute of Forest SB RAS, Krasnoyarsk, Russian Federation (gaivanova@ksc.krasn.ru), (2) USDA Forest Service, Rocky Mountain Research Station, Missoula, USA

Forest fire and large-scale forest harvesting are the two major disturbances in the Russian boreal forests. Non-recovered logged sites total about a million hectares. Logged sites are characterized by higher fire hazard than forest sites due great amounts of logging slash, which dries out much more rapidly compared to understory fuels. Moreover, most logging sites can be easily accessed by local population. Both legal and illegal logging are also increasing rapidly in many forest areas of Siberia. Fire effects on forest overstory, subcanopy woody layer, and ground vegetation biomass were estimated on logged vs. unlogged sites in the Central Siberia region in 2009-2012 as a part of the project “The Influence of Changing Forestry Practices on the Effects of Wildfire and on Interactions Between Fire and Changing Climate in Central Siberia” supported by NASA (NEESPI). Dead down woody fuels are significantly less at unburned/logged area of dry southern regions compared to more humid northern regions. Fuel consumption was typically less in spring fires than during summer fires. Fire-caused carbon emissions on logged sites appeared to be twice that on unlogged sites. Soil respiration is less at logged areas compared to undisturbed forest. After fire soil respiration decreases both at logged and unlogged areas. arbon emissions from fire and post-fire ecosystem damage on logged sites are expected to increase under changing climate conditions and as a result of anticipated increases in future forest harvesting in Siberia.