



Abstract

# Integrating Field and Satellite Data for Improved Estimation of Fuel Consumption and Carbon Emissions in Siberia <sup>†</sup>

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**Abstract:** Wildfires are one of the most important disturbance factors in Siberia, covering up to 30 Mha annually. Carbon emissions vary greatly depending on the ecosystem type and fire severity. The fuel load and structure in different ecosystems are fundamental drivers of fire behavior and are of high importance to accurately estimate wildland fire emissions and their contribution to the regional and global carbon balance. We developed fuel load maps for the Krasnoyarsk region in central Siberia by integrating field and satellite data with respect to the forest-growing conditions and the disturbance of the territory via anthropogenic and natural factors (e.g., fires, logging, and insects). We found a drastic increase in fuel loads for some Siberian regions, with most disturbed by logging over the last two decades. This resulted in an increase in fire hazards and severity, as well as a higher amount of fuel consumed and of carbon emitted to the atmosphere.



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