

## **Modeling variability in biomass consumption for estimating fire emissions**

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The study presented focuses on quantification of the variability in fuel consumption for the purpose of estimating carbon emissions during biomass burning. Landsat multi-spectral images are used to determine how much of the landscape is affected by fires of low, moderate, or severe consumption level within 13 forested ecoregions. Field-based measurements of fuel consumption are used to associate the remote sensing-based map of consumption level to the amount of fuel consumed (kg/m<sup>2</sup>). Fuel consumption in forested ecoregions of western and northern North America where forest fires are prevalent is the region of interest. In this presentation, the approach for mapping and measuring fuel consumption using a combination of remote sensing-based land classification and field measurements is described. Because data available for the boreal and temperate study regions are not the same, different approaches are used in Alaska, Canada, and the western lower-48 study regions. Preliminary results of mapping fuel consumption in Alaska shows a small percentage of the land burns in severe fires, but since this represents a substantial amount of the total carbon emissions, increases in severe fire will result in more extreme emissions events. Results of a model-based assessment of consumption in western lower-48 forested regions provides a quantitative review of the impact of fire on carbon emissions not previously available. Analysis of data provided by the Canadian Forest Service shows high levels of variability in fuel consumption in boreal North America and an uncertainty not yet quantified related to burning of boreal peatlands.