

Relationships between weather fire danger and biomass burning combustion efficiency from remote sensing data

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Fuel load and its moisture content are important factors that determine fire behavior in forest ecosystems. For instance, they determine combustion intensity and the amount of biomass burned during the fire. Lack of knowledge of the forest fuel loads and the combustion completeness depending on natural and weather factors leads to errors in fire emissions calculations. Remote sensing tools allow performing direct estimations of the amount of energy released during a fire, which is linearly related to the amount of biomass burned. Fire products generated by satellite systems such as MODIS or VIIRS contain such estimates of fire radiative power released during combustion process. At the same time, fire danger indices calculated using weather station data represent proxy to fuel moisture content. Together, these estimates make it possible to assess fuel loads and the combustion completeness and their relationships with the fuel moisture content. In this study we aim at estimation of dependencies between weather fire danger estimated using the Canadian Forest Fire Weather Index System that acts as a proxy to fuel moisture content and the amount of burned forest fuels estimated using MODIS active fire data in the Central Siberia (Angara region).

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