Geophysical Research Abstracts
Vol. 14, EGU2012-597, 2012
EGU General Assembly 2012

The Correlation Analysis of Fire Energy Release and Weather Conditions

E. Shvetsov
V.N. Sukachev Forest Institute, Russian Federation (e_shvetsov@hotmail.com)

Active fire remote sensing conducted using spaceborne systems, such as MODIS radiometer aboard the EOS Terra and Aqua satellites, allows estimation of wildfire thermal energy release. Such measures of fire radiative power (FRP) can provide information on fireline heat release intensity and on the amount and rate of biomass combustion in the large scale.
Biomass combustion rate is strongly related to fuel moisture and therefore to weather conditions. The correlation analysis of fire radiative power and weather fire danger was performed for the territory of Siberia. The measurements of FRP were performed using MODIS instrument and weather fire danger indices were calculated using weather stations data. The analysis was performed for several Siberian regions mostly liable to fires. Weather fire danger was characterized by Russian PV-1 and PV-2 fire danger indices and using Canadian Forest Fire Weather Index System. Only large fires having the final size of more than 500 ha were focused in this study.
In general it was rather good relationship between the fire danger indices and the measured fire radiative power for the most of the fires. For the weather stations considered the following weather indices had the highest correlation coefficients with measured FRP values: Russian PV-1 index and Canadian DMC, DC and BUI indices. Finally the ability of weather fire danger indices to predict the changes in fire radiative power was tested. A regression model was formulated to characterize the relationship between wildfire radiative power and fire danger indices. It was shown that the relationships have regional specificity and none of these indices can be considered as universal.