

2.082 Accuracy evaluation of MODIS MCD64A1 burned area data product in boreal Eurasia .

Early Career Scientist

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Abstract:

Wildfires play an important role in affecting vegetation dynamics, biogeochemical cycles of carbon, nitrogen and other elements, atmospheric chemistry and the climate. Boreal Eurasia is one of the most important regions where large areas are burned every year. Numerous particles and greenhouse gases are emitted from these fires. These pollutants could be transported to the industrialized region in East Asia, the western North Pacific and the Arctic. Atmospheric transport of fire-emitted pollutants to the Arctic and the consequential deposition is believed to accelerate the arctic warming. To better understand the effect of fires in boreal Eurasia on the arctic, an accurate assessment of burned area from the boreal Eurasia is necessary.

The MCD64A1 burned area product is widely used for global burned area mapping. However, uncertainties in burned area estimations could be introduced due to the "moderate resolution" character of MCD64A1. Therefore, a comparison of MCD64A1 with higher resolution satellite products could provide basic and crucial information for its accuracy assessment and further applications. In this work, we used Landsat 7 surface reflectance, along with a few commercial satellite products as the reference scenes to derive the burned areas in a burning season in 2012. A wide range of ecotypes spanning from the western Russia/Kazakhstan to the eastern Siberia were covered. Each of these burned areas was compared with the corresponding region of MCD64A1 for the same periods. Our preliminary results indicated that MCD64A1 could well capture the large fires, while those less than 100 ha are prone to be undetected. We also found that MCD64A1 tends to underestimate the burned area in general. Based on the error statistics, we suggested the accuracy levels and precautions for applications in each ecotype.