A semi-automated methodology for burned area mapping using HJ-CCD data in China

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Remote sensing is a useful tool to detect and map burned area, providing very elaborate information, even in remote regions. Various types of data have been explored for burned area mapping these years, consisting of sensors with different spatial and temporal resolution. This study focused on the development of a semi-automated methodology for burned area mapping using HJ-CCD image. HJ-CCD is carried on by HJ satellite which has been launched by China. The method we used in this study can be divided into two main phases. First, to minimize commission errors, a semi-adaptable threshold has been used to extract more severely burned pixels as core pixels based on the information of NIR (Near Infrared) channel, Red channel and NDVI (Normalized Difference Vegetation Index). Then, to minimize omission errors and to enlarge the severely burned patches previously, a logistic regression model has been made based on the information of multi-temporal vegetation indices and spectral channels, which showed a clear discrimination between burned and unburned areas. The core pixels extracted in the first phase have been processed to apply a region grow algorithm constrained by the result of sobel and canny edge detection algorithm, and the burned area can be shaped. Fixed probability thresholds were used in the second phase to perform the region grow algorithm due to the low computational cost. This method has been evaluated in three study areas in north and northeast of China. The results showed that the commission errors and omission errors of burned area mapping were lower than 10% by using the method. In conclusion, this semi-automated approach using HJ-CCD sensor produced promising results for study areas and could be suitable for burned area mapping. But further work has to be accomplished to assess its performance on national scale for burned area mapping.

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HJ-CCD

HJ-CCD

logistic   "   "

80%   5   85%
HJ-CCD

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