

A semi-automated methodology for burned area mapping using HJ-CCD data in China*Zhu, Xi; Qin, Xianlin*

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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基于HJ-CCD数据的半自动过火区制图

朱曦，覃先林

遥感是进行过火区识别和制图的有效手段，能够为其提供非常详细的信息。近年来，人们利用不同空间和时间分辨率的传感器进行了过火区制图。本研究采用了一种基于HJ-CCD数据的半自动的方法对位于中国华北和东北的研究区进行了过火区制图，这种方法主要分为两个阶段：首先，利用波段反射率和光谱指数信息建立半动态的经验阈值对燃烧较为严重的像元进行提取，以减少误判率；然后建立一个多参数的二分类logistic模型，利用这个模型对第一阶段的"种子"像元进行区域生长降低漏判，同时将边缘检测的结果对区域生长进行限制，最后形成整个过火区。由于动态阈值的效率比较低，在二阶段的区域生长中采用固定阈值。我们将这种方法在中国的六个研究区进行了试验，结果显示除了一个云体覆盖较多的俄罗斯研究区精度低于80%，其他5个研究区的总体精度都高于85%。总体来说，这种半自动的过火区制图方法能够适用于HJ-CCD数据的过火区制图，但是阈值和模型的推广性仍然需要更多的试验。

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