

Evaluation of Algorithms and Remote Sensing Datasets for Fire Mapping in China

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Abstract

Fire is a major disturbance of forest ecosystems that has tremendous impact on environment, humans and wildlife, ecosystem, weather, and climate. Detailed information about the spatial and temporal distribution of fires is important for evaluating these effects. Remote sensing (RS) provides us a practical and economic means to get this spatio-temporally fire information. There are many fire detect algorithms using different RS data for fire mapping around the world. This paper firstly reviewed some algorithms based on coarse resolution RS data with comparative longer observation history (Advanced Very High Resolution Radiometer (AVHRR), SPOT-Vegetation and Along Track Scanning Radiometer (ATSR)). Then, these algorithms and corresponding data applied in Northeast of China respectively. Through comparing detected result from coarse RS data with the one from Landsat ETM+ imagery and county level fire inventory data, we evaluated the applicability and limitation for each algorithms and RS data. It is found that all the algorithms usually miss the low severity fire with

short lasting due to the frequency of satellite overpass. Increasing the temporal resolution of satellite overpass through combining different RS data source with different overpass time will substantially improve the veracity of RS data-based fire information, even for small fire. Finally, Burnt area over the entire Chinese forest in 2000 are mapped through synthetically using AVHRR, SPOT-Vegetation and ATSR data in year of 2000, and combining with Land Use and Land Cover Change (LUCC) data of China.