# Utilizing Multi-Sensor Fire Detections to Map Fires in the United States

This Paper is intended for the NASA Wildfires Special Session

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A**bstract:**

In 2006, the Monitoring Trends in Burn Severity (MTBS) project began a cooperative effort between the US Forest Service (USFS) and the United States Geological Survey (USGS) to map and assess all the large fires that have occurred across the United States since 1984. Using Landsat imagery, MTBS is mandated to map any wildfire or prescribed fire that meets size criteria: greater than 1000 acres in the west and 500 acres in the east, regardless of ownership. Relying mostly on federal and state fire occurrence records, over 15,300 individual fires have been mapped. While mapping recorded fires, an additional 2,700 "unknown" fires were discovered and assessed. It has become apparent that there are perhaps thousands of undocumented fires in the US that are yet to be mapped. Fire occurrence records are inadequate if MTBS is to provide a comprehensive accounting of fire across the land, and the sheer number of fires to assess has overwhelmed current manual procedures.

To address this problem, the NASA Applied Sciences Program is helping to fund the USGS and several partners (USFS, National Park Service) to develop, and implement a system to automatically identify fires using satellite data. In near real time, USGS will combine active fire satellite detections from MODIS, AVHRR and GOES satellites with Landsat acquisitions. Newly acquired Landsat imagery will be routinely scanned to identify freshly burned pixels, derive an initial perimeter and tag the burned area with the satellite date and time of detection. Landsat imagery from the early archive will be scanned to identify undocumented fires. Additional automated fire assessment processes will developed.

The USGS will develop these processes using Open Source software packages in order to provide freely available tools to local land managers allowing them the capability to assess fires of local interest.

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