Exploration of a Multi-Sensor Approach for the Detection and Mapping of Coal Seam Fires in the United States [1]

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Coal fires, which are widespread and generally under-reported, pose a threat to both human and environmental health that can result in a further loss of resources and large economic cost. Traditional mapping and monitoring of coal fires within the US has primarily relied on field based or airborne data collection. Studies in other major coal producing nations (particularly China and India) have demonstrated the effectiveness of using remotely sensed satellite data to identify problematic coal fires. The Office of Surface Mining Reclamation and Enforcement (OSMRE) is currently investigating the use of such remote sensing techniques to enhance the mapping and monitoring of coal mine fires within the United States.

Here we present a multi-sensor approach to mapping surface thermal anomalies relating to coal mine fires. By employing multispectral imagery from ASTER, Landsat, and World View, we have attempted to detect the extent and surface expression of coal fires at the Wise Hill, South Canyon, and IHI #3 fire sites in Colorado. These spaceborne sensors observe wavelengths outside of the visible spectrum allowing for the detection of thermal anomalies. Preliminary results indicate a positive correlation between remotely sensed products and ground based survey data. The implementation of this remote sensing method could assist current monitoring efforts of fires throughout the nation, as well as provide updated information on historical fire data.

Additional Key Words: Remote Sensing, ASTER, Landsat, World View.

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