Title : **Land Surface Change Monitoring System (LSCMS)**

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ABSTRACT

Wildfires in northern Thailand are a recurring environmental challenge, particularly in Chiang Mai Province, where seasonal burning and complex terrain contribute to frequent fire events and prolonged smoke accumulation. Effective monitoring of affected areas is essential for environmental management and decision-making. This research develops a spatial analysis model for monitoring land surface changes associated with wildfire events in Chiang Mai Province using satellite-derived data integrated with hotspot information. The model applies the differenced Normalized Burn Ratio (dNBR) derived from pre- and post-event satellite imagery to detect changes in vegetation and surface conditions within designated monitoring areas. These spectral change results are integrated with thermal hotspot data to identify zones potentially related to wildfire activity.The study covers a three-year retrospective period from 2023 to 2025 in Chiang Mai Province, with satellite imagery and hotspot data collected and analyzed the data on a monthly basis to enable consistent temporal monitoring and comparative assessment across districts. Areas with dNBR values greater than 0.44 are classified as high-severity change zones and spatially compared with hotspot locations to evaluate the consistency between detected surface changes and recorded thermal anomalies.To enhance accessibility and reduce technical barriers associated with conventional geographic

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information system (GIS) tools, the developed model is implemented through a web-based platform. The system presents monthly spatial maps, district-level change area statistics, and hotspot summaries in an intuitive format to support situational awareness and data-driven decision-making for relevant agencies. Future improvement is required because the approach detects land surface changes and vegetation disturbances that are not uniquely attributable to wildfires; the detected signals may also result from crop harvesting, seasonal leaf shedding, and temporary flash floods of flooding.

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