STUDY OF ACTIVE FIRE EVOLUTION IN NORTHERN THAILAND USING KERNEL DENSITY ESTIMATION (KDE)

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Abstract

Biomass burning is one of the major causes of air pollution in Northern part of Thailand releasing toxic compounds especially particulate matters causing adverse health effects, socio-economic impacts, and poor visibility. Patterns and causes of biomass burning remain unclear especially within the reserved forest areas, where thoroughly field survey is almost impossible. Currently, active fires can be near real-time monitored by satellites, mainly from Moderate Resolution Imaging Spectroradiometer (MODIS) and a newer system called Visible Infrared Imaging Radiometer Suite (VIIRS) which can provide better resolution on both time and space. In this paper, Space-Time Kernel Density Estimation (ST-KDE) was used to analyze historical active fire data from VIIRS during 1th December 2019 and 4th April 2020. The algorithm can reveal possible dense areas as well as frame periods and temporal dynamic of the fire. The 3D space-time visualization of the result allows users to compare between different time so it can reveal the spatial change of active fire areas especially how small areas built up larger areas. Possible ignition areas can also be identified. The comparison of the results with news and field surveys collected from the government was also reported. The information is useful for fire prevention and fire forecasting.

Keywords: *VIIRS, Kernel Density Estimation, Spatio-temporal, Active fire*