

## **Forest fires in Southeast Asia: Spatial and temporal trends from 1997 to 2004**

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Biomass burning has been the traditional method of clearing land for shifting cultivation in Southeast Asia. However, the small scale clearing of land is increasingly being replaced by modern large-scale conversion of forests into plantations/agricultural land, usually by fires. In periods of extreme drought, especially during the El Nino periods, the fires get out of control resulting in severe transboundary air pollution in the form of smoke haze. In Southeast Asia, forest fire events occurred during the dry seasons in 1982-83, 1987, 1991, 1994 and 1997-98. The recent one in 1997 was especially severe, causing many countries in Southeast Asia to be affected by thick smoke haze. In response to this disaster, a regional forest fire monitoring operation is established at the Centre for Remote Imaging, Sensing and Processing (CRISP), in collaboration with the Environment Agency of Singapore, as part of the implementation of the ASEAN haze action plan. This operation makes use of the wide coverage AVHRR and MODIS sensors to detect hotspots and then use high resolution SPOT satellites to pin-point the locations of fires. This fire monitoring operation has been conducted daily since 1997, and we have collected a vast database of hotspots derived from MODIS and AVHRR, active fires verified by high resolution SPOT images, and burn areas compiled from SPOT quicklook images. In this paper, the methodology and results of our fire monitoring operation are reviewed. The spatial and temporal trends of the fires will be examined in relation to the land use and land cover change patterns.

We will focus on the particularly fire prone areas in the Riau and Jambi Provinces of Sumatra, and the peat swamp areas in Western and Central Kalimantan. In Sumatra and Western Kalimantan, the logged over forests are usually cleared by fires, and then replaced by plantations. In Central Kalimantan, recurrent fires occur primarily in and around the "Mega-Rice" area, a peat swamp area that was cleared by fires in 1997 causing haze pollution over the Southeast Asia region. After the 1997-98 fire episode, fire activities seem to have reduced in frequency and area coverage. However, there are signs that the fire activities are picking up again in recent years, especially towards the dry season of 2004.