

Evaluation of Vegetation Fire Emissions Distribution by using Satellite Data and Bottom-Up Land Activity Data for 2015 in Peninsular Malaysia

Hwai Leng Teoh

Centre for Tropical Climate Change System, Institute of Climate Change, Universiti Kebangsaan Malaysia, 43600 UKM Bangi, Selangor, Malaysia, Malaysia

Author list (excluding presenting author)

Maggie Chel Gee Ooi, Mohd Talib Latif, Neng-Huei Lin, Mohd Shahrul Mohd Nadzir

Abstract

The El-Niño event of 2015 had profound effects on air quality in Malaysia. Malaysia experienced severe air quality deterioration and haze due to increased forest fires and agricultural burning, exacerbated by the dry and hot weather conditions associated with El Niño. Vegetation fires in Malaysia are often a result of agricultural practices and other human and natural factors. Studies have proved that vegetation fires especially forest fire significantly contribute to bad air quality through emissions of harmful pollutants and drastic temperature changes. Harmful pollutants as mentioned including fine particulate matter, (PM_{2.5}), total particulate matter (TPM), carbon dioxide (CO₂), carbon monoxide (CO), methane (CH₄) and Volatile Organic Compounds (VOC) could degrade air quality and subsequently human health. Various global biomass emissions inventories such as FINN, GFED, GFAS, and FEER have been developed globally. However, significant differences and uncertainties exist in the number of emission estimates due to differences in input factors and algorithms whether they are suitable for application in the case of Malaysia. This research aims to develop a vegetation fire emission inventory with 9km x 9km resolution using historical data burning cases in 2015 for Peninsular Malaysia. The work utilizes satellite data and accessible bottom-up localized data sets from related government sources to develop vegetation fire emission inventory. The findings highlight the spatial distribution and trend change of vegetation lands burning activities across different types of forested land and agriculture land. Emission estimates of PM_{2.5}, CO₂, CO, CH₄, VOCs, and other pollutants from vegetation land burning during 2015 in Peninsular Malaysia are calculated and compiled into a systematic inventory for the region.

Early Career Scientist

YES, I am an early career scientist.

IGAC Activities

AMIGO: Analysis of eMIssions using Observations, ACAM: Atmospheric Chemistry and the Asian Monsoon, CCMi: Chemistry Climate Model Initiative, GEIA: Global Emissions Initiative, BBURNED: Biomass Burning Uncertainty: ReactionS, Emissions and Dynamics, Allin-Wayra: Small Sensors for Atmospheric Science

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