



Estimates of emissions from open biomass burning in Tropical Asia during 2000–2007

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Biomass burning in tropical Asia emits large amounts of trace gases and particulate matters to atmosphere, which have significant influence in climate change and atmospheric chemistry. Emissions from open biomass burning in tropical Asia are estimated during seven fire years 2000–2006 (i.e., April 1st 2000–March 31st 2007), using newly released L3JRC burned area product and MODIS burned area product (MCD45A1). Over seven fire years, both burned areas and fire emissions showed clearly spatial and inter-annual variations. The L3JRC burned areas ranged from $31.3 \times 10^3 \text{ km}^2$ for fire year 2005 to $57.5 \times 10^3 \text{ km}^2$ for 2000, while the MODIS burned areas ranged from $64.9 \times 10^3 \text{ km}^2$ for fire year 2002 to $127.0 \times 10^3 \text{ km}^2$ for 2004. We compared the total burned areas and forest burned areas derived from the two separate products with publication data for several typical countries and found that the L3JRC results were comparable to previous studies and the MODIS results showed significant overestimation. The annual average L3JRC-based emissions were 29915, 1948, 90, 30, 12, 105, and 871 Gg yr⁻¹ for CO₂, CO, CH₄, NO_x, BC, OC, and PM2.5 respectively, while MODIS-based emissions were 86740, 5222, 230, 83, 33, 296, and 2188 Gg yr⁻¹, 60.2%–65.5% higher than L3JRC. Forest fires were the largest contributor to fire emissions, though burned area within forest biomes only constituted a minority of total burned area. Fire emissions were mainly concentrated in Myanmar, Cambodia and India. Furthermore, the seasonal distribution of fire emissions was in good agreement with that of total burned areas.