

Table S1: Fixed Parameters applied in Land Use Change Scenarios of Figure 3. Radiative efficiencies are from Myhre et al.¹ SOA yields are approximate and based on the lower end of isoprene and monoterpene photo-oxidation experiments.^{2,3} Crop yields are estimated from USDA wheat and soybean yields for 2013 (http://www.nass.usda.gov/Statistics_by_Subject/index.php?sector=CROPS). The residue to crop ratios are based on wheat and soybean residue to product ratios from Koopmans and Koppejan.⁴ The fraction of emitted ammonia which is converted to ammonium is based on the NH_4/NH_x deposition estimates of Zhang et al.⁵

Parameter	Value
Aerosol Lifetime	5 days
SOA Radiative Efficiency	-122 Wg^{-1}
BC Radiative Efficiency	1438 Wg^{-1}
OC Radiative Efficiency	-113 Wg^{-1}
Ammonium Radiative Efficiency	-166 Wg^{-1}
Isoprene SOA Yield	1 %
Monoterpene SOA Yield	15 %
Crop Yield	400 gm^{-2}
Residue to crop ratio	1
Percentage of residues burned	50%
Emissions of ammonia from fertilizer applied to wheat crop	1 $\text{gm}^{-2}\text{yr}^{-1}$
Fraction of emitted ammonia converted to ammonium nitrate	0.64

Table S2: Vegetation-Specific Parameters applied in Land Use Change Scenarios of Figure 3. BVOC Emission Factors are from Guenther et al.⁶, with the exception of Asian tropical forest which is from Langford et al.⁷ and Palm oil which applies the Hewitt et al.⁸ scaling to the Langford et al. emissions. Consumption of above ground biomass in fires is from DeFries et al.⁹ for tropical forests, Turquety et al.¹⁰ for boreal forests and Sulaiman et al.¹¹ for palm oil. BC/OC emission factors from Akagi et al.¹²

	Broadleaf deciduous tropical forest	Crop (Soybean or Wheat)	Asian tropical forest	Palm Oil	Needleleaf evergreen boreal forest	Shrubs	Grasses	Broadleaf deciduous boreal forest
Isoprene Emission Factor ($\mu\text{g m}^{-2}\text{h}^{-1}$)	7000	1	930	4650	3000	4000	1600	11000
Monoterpene Emission Factor ($\mu\text{g m}^{-2}\text{h}^{-1}$)	1300	12.5	240	57.6	1450	670	12.5	990
Above Ground Biomass Burned (g m^{-2})	11600		11600	1000	5100			
BC Emission Factor (g/kg)	0.52	0.75	0.52	0.75	0.56			
OC Emission Factor (g/kg)	4.71	2.3	4.71	2.3	9			

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