# Isoprene emissions over Asia 1979-2012 : impact of climate and land use changes

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Due to the scarcity of observational contraints and the rapidly changing environment in East and Southeast Asia, isoprene emissions predicted by models are expected to bear substantial uncertainties. This study aims at improving upon current bottom-up estimates, and investigate the temporal evolution of isoprene fluxes in Asia over 1979-2012. For that, we use the MEGAN model and incorporate (i) changes in land use, including the rapid expansion of oil palms, (ii) meteorological variability, (iii) long-term changes in solar radiation constrained by surface network measurements, and (iv) recent experimental evidence that South Asian forests are much weaker isoprene emitters than previously assumed. These effects lead to a significant reduction of the total isoprene fluxes over the studied domain compared to the standard simulation. The bottom-up emissions are evaluated using satellite-based emission estimates derived from inverse modelling constrained by GOME-2/MetOp-A formaldehyde columns through 2007-2012. The top-down estimates support our assumptions and confirm the lower isoprene emission rate in tropical forests of Indonesia and Malaysia.