3.032 Evaluating Global Biomass Burning Emission Inventories for CO in Australasia..

Early Career Scientist

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Abstract:

Knowledge about Australasian biomass burning emissions is under-represented in emission inventories. There was, therefore, a need to evaluate whether some of the mainstream global biomass burning emission inventories are suitable for the Australasian region. GEOS-Chem v10-01 was run, from 2008 to 2010, with three biomass burning emission inventories: FINN1.5, QFED2.4 and GFED4s; and an ACCESS-UKCA simulation with GFED4s was used as a comparison to also evaluate model variability. These four simulations were compared to a range of observations including surface mixing ratios, ground-based FTS total columns and satellite-based MOPITT total columns at five sites in Australasia: Cape Grim, Cape Ferguson, Lauder, Wollongong and Darwin. A previously documented high bias in CO levels was also found in both models, although it is slightly higher in GEOS-Chem. The three inventories were found to have up to an order of magnitude difference in their estimates of Australian biomass burning CO emissions, with FINN lowest and QFED highest. Bias aside, GEOS-Chem with GFED and QFED led to better correlation against measurements than either GEOS-Chem with FINN or ACCESS-UKCA with GFED. This poster demonstrates that GFED performs the best over the Australasian region and should, therefore, be used for this region. This study also highlighted that the FINN inventory requires improvements in its estimates of Australian savanna CO emissions.