

Biomass burning emission inventory with daily resolution: application to aircraft observations of Asian outflow

Colette L. Heald, Daniel J. Jacob, Paul I. Palmer, Mathew J. Evans, Glen W. Sachse, Hanwant B. Singh and Donald R. Blake

Journal of Geophys. Res. 108(D21), 8811, doi:10.1029/2002JD003082, 2003

Abstract

We develop a daily-resolved global emission inventory for biomass burning using AVHRR satellite observations of fire activity corrected for data gaps and scan angle biases. We implemented this inventory in a global three-dimensional model (GEOS-CHEM) to simulate aircraft CO observations during the TRACE-P mission over the NW Pacific in February–April 2001. Seasonal biomass burning in SE Asia was a major contributor to the outflow of Asian pollution observed in TRACE-P and shows large day-to-day fluctuations that vary depending on location. Three simulations were conducted with the same 3-month total (February–April) emissions but different temporal distributions: 2001 daily resolved, 2001 monthly resolved, and climatological monthly resolved. The effect of daily resolved versus monthly resolved 2001 emissions in the simulation of CO is less than 8 ppbv in Asian outflow over the NW Pacific but can exceed 100 ppbv over source regions. The relatively small effect in Asian outflow reflects spatial and temporal averaging of emissions during ageing in the continental boundary layer. Significant improvement in the simulation of TRACE-P observations (as diagnosed by the resolved variance) is found when using 2001 monthly versus climatological monthly emissions, but using 2001 daily emissions does not offer further improvement.

The full text of this paper is available here as a [pdf](#)