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New global fire emission estimates and evaluation of volatile organic compounds

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A daily, high-resolution, global fire emissions model has been built to estimate emissions from open burning for air quality modeling applications: The Fire INventory from NCAR (FINN version 1). The model framework uses daily fire detections from the MODIS instruments and updated emission factors, specifically for speciated non-methane organic compounds (NMOC). Global daily fire emissions have been produced for 2005-August 2010. The improvements to the emission factors has led to an increase in simulated NMOC emissions when compared to other global emission estimates, including the Global Fire Emissions Database (GFED). Speciation profiles of the NMOC, based on the ecosystem in which the fire burns, have been developed for multiple chemical mechanisms including SAPRC99 and the MOZART-4 mechanisms. Two different fire emissions inventories (GFED and FINN) for 2008 have been used as inputs to various simulations of the MOZART-4 chemical transport model. The results have been compared to detailed airborne NMOC measurements made during the ARCTAS campaign. Using these model-observation comparisons, an initial assessment of the global fire emission inventories will be provided.

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