5B.8   Quantifying regional emissions using WRF-Chem tagged tracers: Implications for cross-state pollution transport and extreme air quality events

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Regional tracer simulations are implemented in WRF-Chem to understand the transport of air pollution across state-lines and analyze their impacts on air quality, especially during NAAQS exceedance. Previous studies have focused on sectoral tracers for CO in WRF-Chem. However, state-level emissions are critical to understand cross-state pollution transport. Here, we build on WRF-Chem CO tracers to identify contributions of dust and CO from individual sectors and geographical regimes. We will use WRF-Chem over megacities and semi-arid regions with initial and boundary conditions for meteorology from GFS and those for chemistry from MOZART. We also use anthropogenic and fire emissions from NEI 2005 and FINN from NCAR respectively. CO tracers will be implemented for all states in CONUS and dust tracers will be implemented for Arizona by tagging primary dust source regions in Yuma, Casa Grande, and Southern Arizona. Then, we update the state-level emissions of CO by developing an inversion approach using WRF-Chem in combination with observations from US Environmental Protection Agency (US-EPA) and Measurements of Pollution in the Troposphere (MOPITT). These optimized emissions of CO and dust will provide major insights about cross-state pollution transport patterns and improve the predictive capabilities of WRF-Chem especially during NAAQS exceedance in Arizona.