Abstract Title: Wildfire & 4 km forecasting system to support AQ Campaigns: Emission, testing and evaluation

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A 12km and 4 km flight-measurement campaign-support forecast system was tested during an active wild fire season. In 2013 a field campaign were held over the Southern U.S. to study oxidation capability and aerosol formation potential. Vertical distribution of the pollutant poses a challenge. With the emergence of GOES-R satellite, and AQ dedicated instrumentation such as the Tropospheric Emissions Monitoring of Pollution (TEMPO) and Multi-Angle Imager for Aerosol (MAIA) one may distinguish air pollutants in the free troposphere from those near surface within the Planetary Boundary Layer. The Project is called Southeast Nexus Studying the Interaction Between Natural and Anthropogenic (SENEX) 2013. During the June 10 – July 19 2013 campaign a finer horizontal resolution AQ forecast in additional to the NOAA 12 km National Air Quality Forecasting Capability (NAQFC) was devised to capture the fine dynamic features of complex terrain orographic forcing and intermittent emissions. This study includes:

1. Configuration of a limited area fine resolution domain for AQ forecasting;
2. Inclusion of real time wild fire emissions;
3. Derivation of lateral boundary conditions for the domains;
4. Application of 4 km AQ system to Eastern Texas for June 10 July 19 2013;
5. Evaluate the 12 km and 4 km forecast by AIRNow & proxy aerosol fields.

The remaining challenge in the current system are:

a) The time latency of wild fire reporting;
b) The fire inflows from the outside the CONUS domain;
c) Future works include model simulated ΔAOD from fire versus VIIRS smoke AOD index.