

Emission Updates for 2012 Continental United States (CONUS) Operational and Experimental Domains

For the 2012 NAQFC experimental forecast over the Continental United States (U.S.), the major updates include 1) updates of on-road and off-road emissions based on the EPA projections; 2) incorporating new point source measurement data and energy projection for SO₂ and NO_x; and 3) updates of all Canadian emission sectors.

- **Point sources:** The 2005 National Emissions Inventory Version 1 (NEI05v1) is used as the base year for the Electric Generating Unit (EGU) and non-EGU point sources in the U.S. In Mexico, the 1999 Mexico National Emissions Inventory Version 2.2 used for six boarder states in Northern Mexico, and the Mexico NEI Version 1 was used for interior states. In Canada the 2006 Inventory compiled and provided by Environment Canada (EC) was used. NO_x and SO₂ emissions from US EGU sources were upgraded with the 2010 Continuous Emission Monitoring (CEM) data. Using the Annual Energy Outlook (AEO) from the Department of Energy released in January of 2012, we projected, on a regional basis, the EGU emissions to the year 2012 using the ratios of 2012 to 2010 emissions taken from the AEO. Another change in the point source emission processing is to expand the number of electricity marketing modules (EMMs) from 13 to 22, to be compliable with the recent changes of the DOE projection activities.
- **Area and non-road sources:** Area, except off-road, source emissions use the same emission inventories as in FY2011. The EPA 2005 NEIv1 is used for the U.S. sources, and the province-level 2006 Canadian Emissions Inventory from EC was used for Canada and the 1999 Mexico National Emissions Inventories used for Mexico. The US off-road emissions in the 2005 NEI are replaced with the 2012cs emission data prepared for the Cross-State Air Pollution Rule (CSAPR). These inventory data were processed using SMOKE to represent monthly, weekly, daily and holiday/non-holiday variations that are specific for each year. Emissions from wildfires, prescribed burning, and land clearing are removed from the area source emissions, based on observations of artificial biases introduced by this assumed recurring emissions, which is often not the case.
- **Mobile source emissions:** To reflect the recent change in mobile source emissions, the OTAQ 2005 on-road emission inventory is adjusted using the 2005 to 2012 projection from the CSAPR to generate on-road mobile emissions over the U.S. Again, the time-activity pattern counts for monthly, week/weekend, and diurnal variability of different vehicle types. The province-level 2006 Canadian Emissions Inventory from EC was used for Canada and the 1999 Mexico National Emissions Inventories used for Mexico.
- **For biogenic sources,** all inputs used in the forecast system were updated to the Biogenic Emission Inventory System (BEIS) version 3.13.
- **Chemistry.** All emission sectors are processed to meet the requirements of the CMAQ CB05 gas chemistry mechanism and AERO4 aerosol treatment.