

PMDETAIL – 2008 PSAT Simulation Specifications

Scenario Name: CAMx 2008 PSAT Simulation (Version D)

PMDETAIL Code: “PSAT08d”

Date Specifications Prepared: March 25, 2014

Time Window for Modeling/Analysis: CAMx modeling start date – April 2014.

Description: 36/12 km CAMx particulate source apportionment technology (PSAT) simulation of the fire episodes during April-October 2008 using the WestJumpAQMS 2008 Base C modeling database with revised 2008 fire emissions from Air Sciences that includes Levoglucosan emissions from fires.

Purpose/Objective: Obtain separate contributions of fine particulate matter (PM_{2.5}) concentrations due to emissions from wildfires (WF), prescribed burns (Rx) and agricultural burning (Ag) for the 2008 fire episodes.

Input Data:

Emissions – Emission data are based on the WestJumpAQMS Base08c modeling database; fire emissions replaced with revised 2008 fire emissions from Air Sciences that includes Levoglucosan. The four types of PSAT emission source groups are:

- Wildfires (WF)
- Prescribed burns (Rx)
- Agricultural burning (Ag)
- Everything else

Emissions Processing Approach

- Re-merge the WestJumpAQMS Base08c elevated source pre-merged emission files replacing the DEASCO3 fires with the revised fire emissions and Levoglucosan.
- Prepare the source apportionment emission inputs for three fire types (WF, Rx & Ag) using the CAMx compact point source feature.

Other Ancillary Inputs and Model Settings

- CAMx v6.1beta (unless CAMX v6.1 is released in time).
- The met and landuse inputs from the WestJumpAQMS modeling (prepared for CAMx v5.4) will be converted for CAMx v6.
- Ozone map inputs will be processed using the O3MAP pre-processor (modified for CAMx v6).
- Time period simulated: April-October 2008.
- Domains: Run with 36 km CONUS and 12 km WESTUS domains using two-way grid nesting (Figure 1)

- Source apportionment (PSAT):
 - 1 Source Region.
 - 4 Source Categories: (1) WF; (2) Rx; (3) Ag; and (4) Remainder.
 - Initial Concentration (IC) and Boundary Condition (BC)
 - PSAT tracers
 - 2 tracers for sulfur
 - 7 tracers for nitrogen
 - 20 tracers for SOA
 - 6 tracers for primary PM
 - Total 210 source group tracers.
- Spin-up:
 - Restart from the March 31 restart files from the WestJump Base08c simulation.
- Multi-Processing Strategy
 - Each run will use 24 CPUs using 12 CPUs with MPI (domain decomposition) and 2 CPUs with OpenMP (compiler directives) multiprocessing approaches.

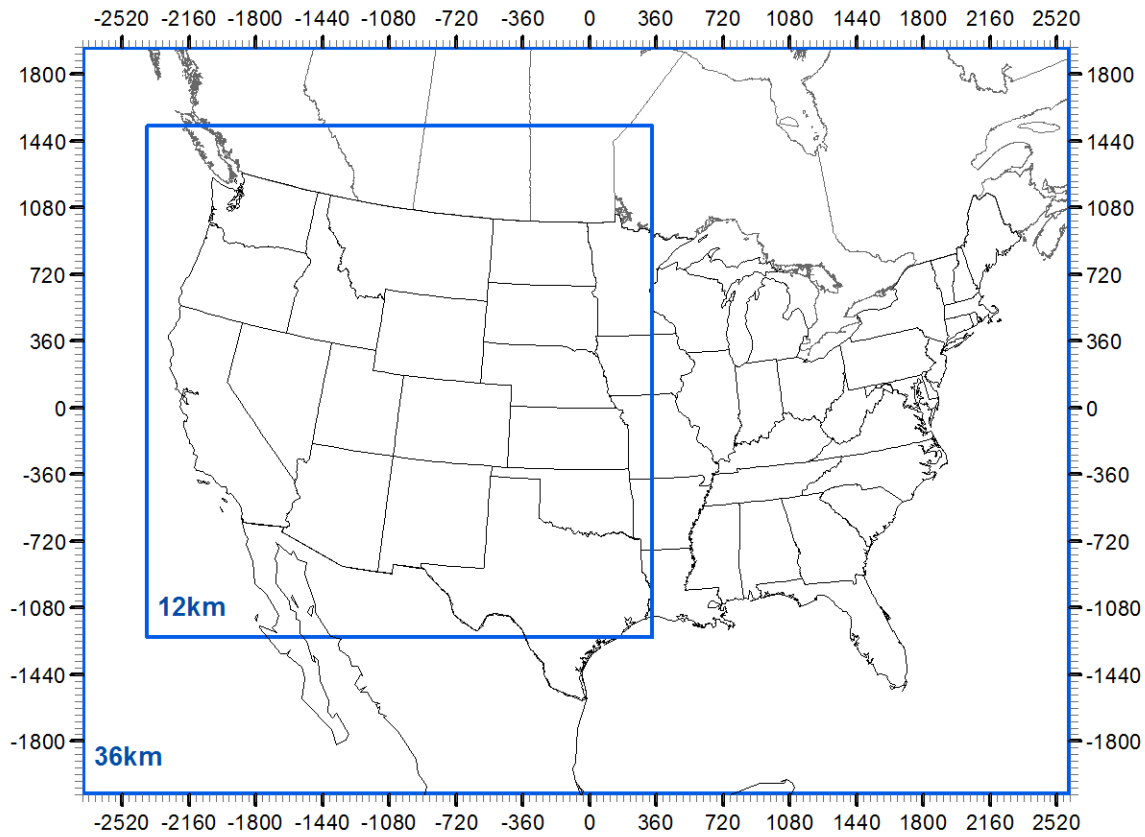
Results

Relevant Output Products

- Spatial plots and/or animations of modeled contributions of fire emissions to PM_{2.5} concentrations, overlaid with observed PM_{2.5} concentrations.
- Database of observed and modeled total and modeled fire contributions for SO₄, NO₃, EC, OC, and other PM_{2.5} at monitoring sites (IMPROVE, CSN and FRM): For use with the Empirical Assessment Tool.
- Other TBD.

Interpretation/Recommendations

Will obtain separate contribution of fire emissions to PM_{2.5} throughout the CONUS and WESTUS domains for use with the Empirical Assessment Tool. Generate spatial plots of modeled PM_{2.5}, fire contributions, fire emissions and observed PM_{2.5}. Additional displays will be generated as needed.



Modeling Domain

36km: 148 x 112 (-2736, -2088) to (2592, 1944)
 12km*: 227 x 230 (-2388, -1236) to (336, 1524)

* includes buffer cells

Figure 1. CAMx 36/12 km modeling grids.