

Regional Modeling Center Status Report

AoH Workgroup Meeting

Seattle, WA

April 25-26, 2006

Topics

- Emissions Modeling
- Source Apportionment (PSAT) modeling for 2002
- Simulation Specification Sheets
- Recent CMAQ results:
 - 2002 Base B Model Performance Evaluation
 - 2002 “Clean” Simulation
 - Wind Blown Dust zero-out sensitivity
- CALPUFF Modeling
- TSS Support

Emissions Modeling

- Completed the modeling and QA of Base02b
- Base02b updates relative Base02a
 - Corrections to temporal profiles for non-WRAP EGUs
 - New Gulf of Mexico area source inventories
 - Inventory updates to the WRAP stationary area, dust, on-road and non-road mobile, commercial marine, offshore point, oil and gas, and non-US sources
 - Readjusted PM_{2.5}/PM₁₀ ratio for dust sources
- Pending issues with Base02b
 - Some dust sources not extracted from the area inventory need to be included with in fugitive dust category to apply transport factors and PM_{2.5}/PM₁₀ ratios
- QA of Base18a ongoing

Emissions 2002 Base Case Version B

Changes from version A:

- Area:

- New inventories for WRAP, VISTAS, and Mexico
- New PM2.5/PM10 ratio for dust sources.
- Expanded the list of fugitive dust removed from the Canadian inventory.

- Road Dust:

- As Area sources

- Fugitive Dust:

- As Area sources
- Expanded the list of sources in the Canadian emissions

- Offshore:

- New inventories for the Pacific commercial Marine, and Gulf area inventories.

Emissions, cont'd

Changes from version A:

- Point Sources:

- New inventories for some WRAP, VISTAS and Mexico.
- New temporal profiles for WRAP EGU sources.

- On Road Mobile:

- New emissions for WRAP states and Mexico.

- Off Road Mobile:

- New inventories for WRAP, VISTAS, and Mexico.
- Temporal profiles update for CENRAP, VISTAS, and MANE-VU.

- Oil and Gas:

- New inventories for the WRAP states.

Emissions, cont'd

Changes from version A:

- Off Road Mobile:
 - New inventories for WRAP, VISTAS, and Mexico.
 - Temporal profiles update for CENRAP, VISTAS, and MANE-VU.
- Oil and Gas:
 - New inventories for the WRAP states.

Emissions, cont'd

QA Plots:

Base02b

http://www.cert.ucr.edu/aqm/308/qa_base02b36.shtml

Plan02a

http://www.cert.ucr.edu/aqm/308/qa_plan02a36.shtml

Base02a

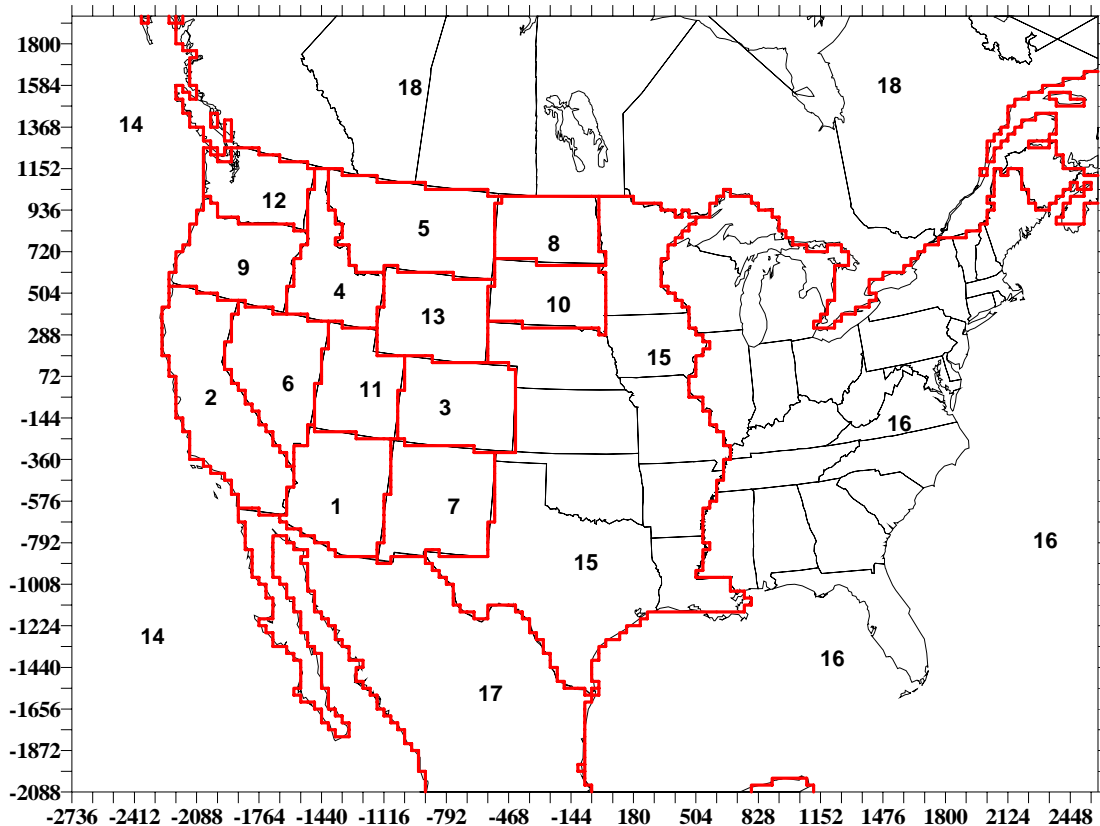
http://www.cert.ucr.edu/aqm/308/qa_base02a36.shtml

Source Apportionment Modeling

- Identify contributions of emissions by source category and visibility-impairing species to modeled air quality for:
 - 2000-04 “baseline planning period” emissions, fire normalized
 - 2018 “base case projection period” emissions
 - 2018 “control strategy scenarios” emissions
 - Difference plots and tables for the results of these runs
- Prepare results data for the Technical Support System “footprint” maps, charts, and tables.
- Execute and report on sensitivity modeling runs to complement the apportionment modeling.

Source Apportionment Modeling

- CAMx test case for 1 month now underway for QA to compare with PSAT setup:
 - modeling with the 2002 Typical and 2018 version B datasets.
- Source Categories are:
 - Point
 - Area
 - Mobile
 - Anthropogenic fire
 - Natural wildfire
 - Non-WRAP fires
 - everything else
- Source Regions
 - All WRAP States, Canada, Mexico, Offshore & other RPOs.



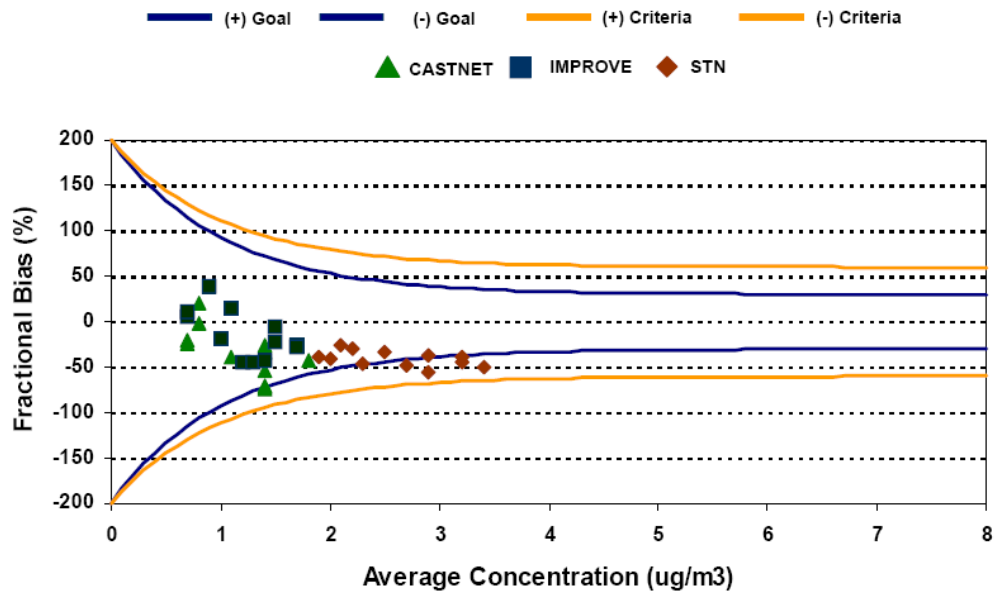
Source Region ID	Source Region Description	Source Region ID	Source Region Description
1	Arizona	10	South Dakota
2	California	11	Utah
3	Colorado	12	Washington
4	Idaho	13	Wyoming
5	Montana	14	Pacific Off-shore & Sea of Cortez
6	Nevada	15	CENRAP States
7	New Mexico	16	Eastern US, Gulf of Mexico & Atlantic Ocean
8	North Dakota	17	Mexico
9	Oregon	18	Canada

Recent CMAQ Simulations

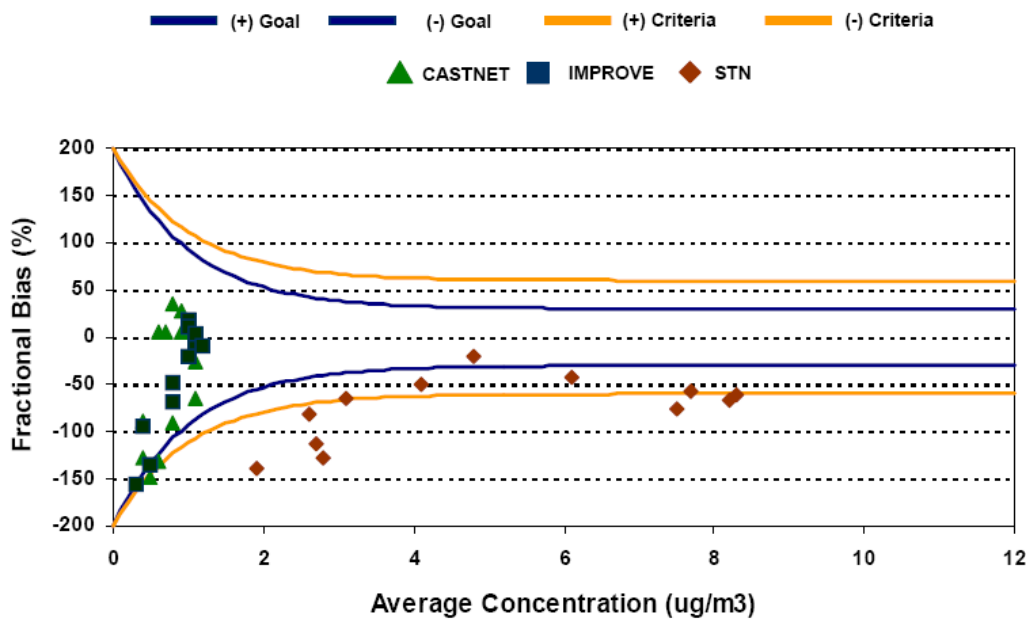
- 2002 Base B Model Performance Evaluation Wind
- 2002 “Clean” Simulation
- Windblown Dust Zero-out Sensitivity

2002 Base B MPE

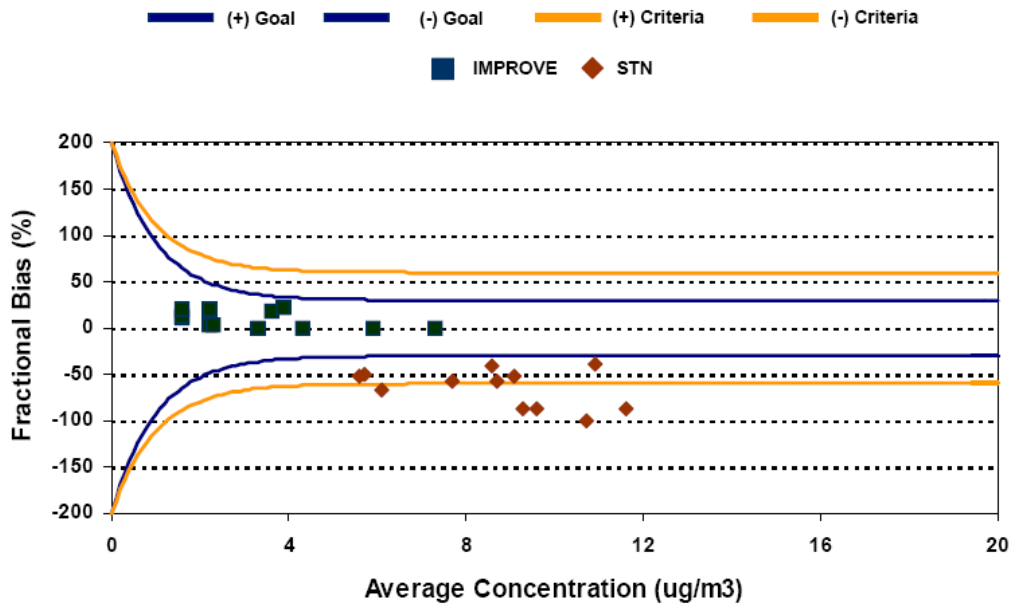
- Redo of the model performance evaluation using the updated version B emissions.
- Results on webpage:
<http://pah.cert.ucr.edu/aqm/308/cmaq.shtml#base02bvsbase02a36k>
- Small differences compared to version A. Slightly worse negative bias for summer sulfate
- Draft Spec Sheet completed



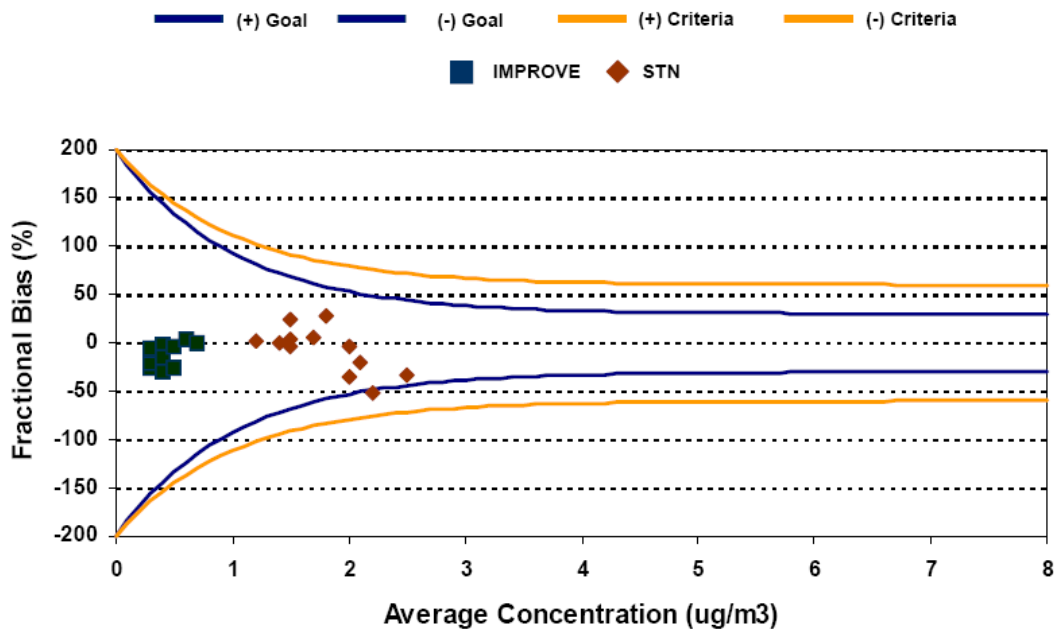
SO4



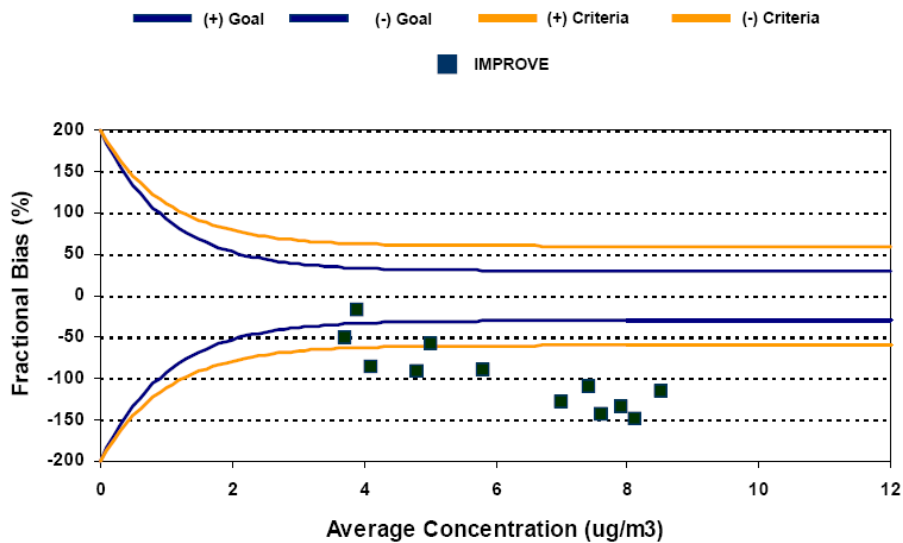
NO3



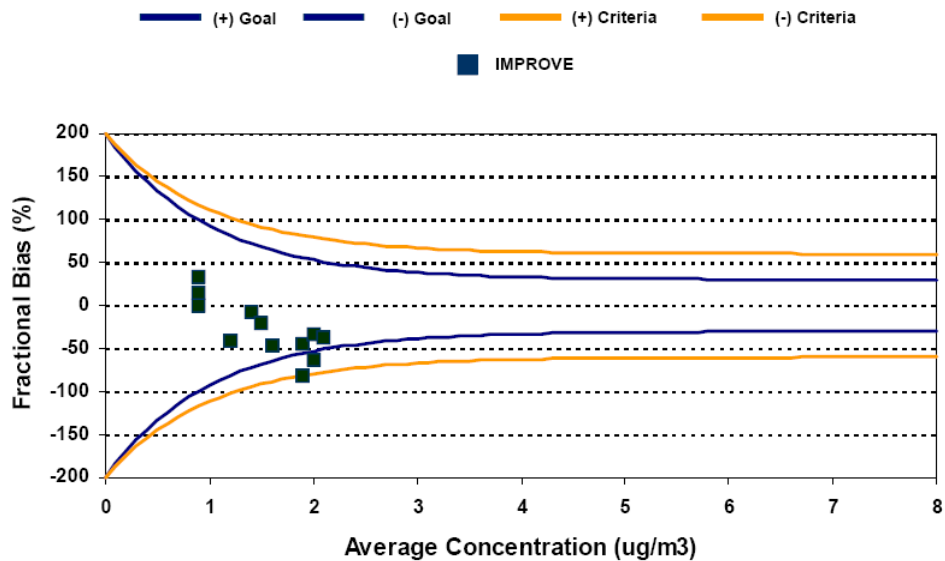
OC



EC



CM



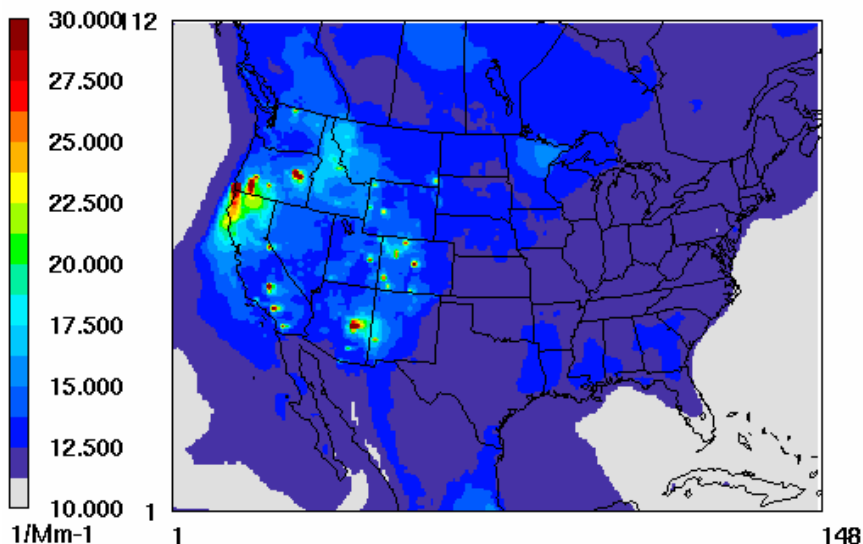
Soil

2002 “Clean” Simulation

- “Natural/Background” emissions sources only
- Evaluate impact of “natural” emissions background airquality conditions on visibility at Class I Areas
- Results on webpage, daily and monthly average:
<http://pah.cert.ucr.edu/aqm/308/cmaq.shtml#base02bvsnwbd>
- Draft Spec Sheet completed

EXT_Recon

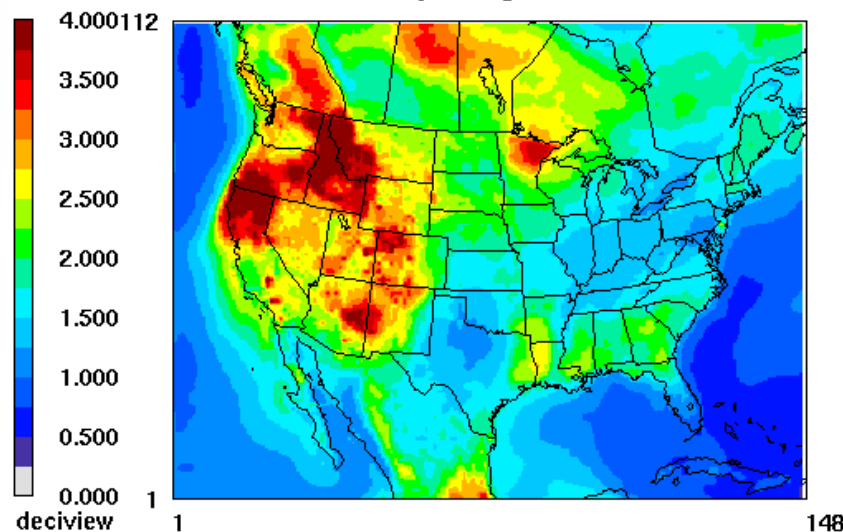
Natural Emissions
Yearly average aerovis



January 5, 2002 1:00:00
Min= 10.460 at (148,3), Max= 90.287 at (16,75)

DCV_Recon

Natural Emissions
Yearly average aerovis



January 5, 2002 1:00:00
Min= 0.441 at (148,3), Max= 6.641 at (16,75)

Wind Blown Dust Sensitivity

- Zero-out of wind blown dust emissions.
- Results on webpage, daily and monthly average:
<http://pah.cert.ucr.edu/aqm/308/cmaq.shtml#base02bvsnwbd>
- Small effects in western WRAP region:
 - Effects larger in eastern WRAP states on some days.
 - Largest effects are in CENRAP states
- Draft Spec Sheet completed

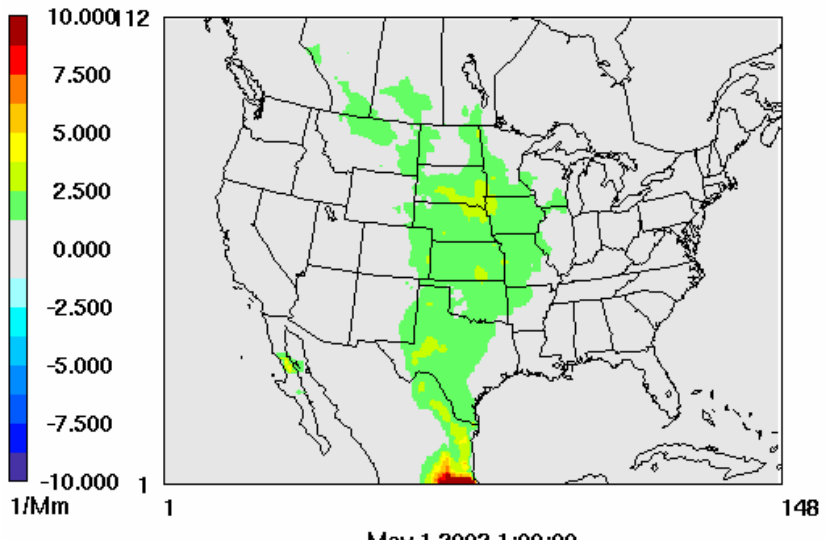
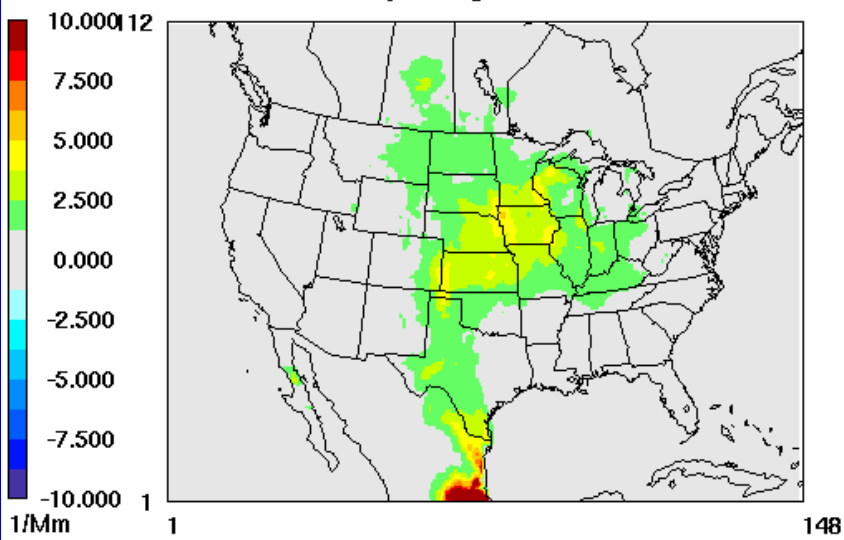
Delta EXT_Recon

ing

Delta EXT_Recon

Base02b - Base02b_NoWBD
Monthly average concentration

Base02b - Base02b_NoWBD
Monthly average concentration

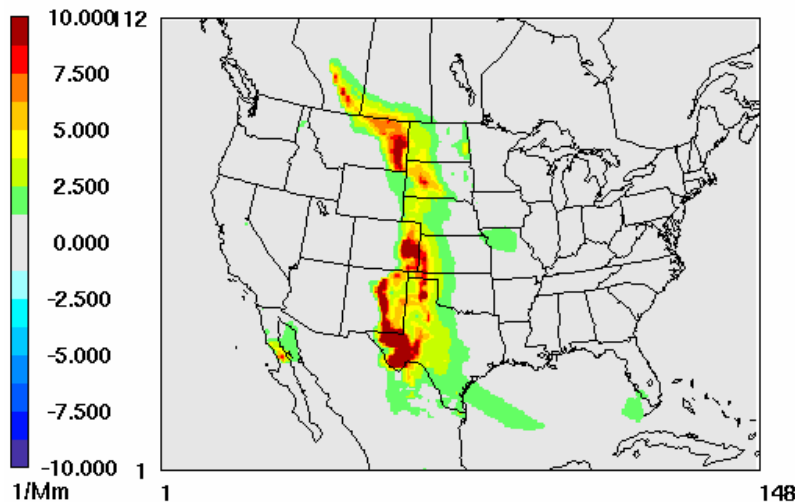


April 1, 2002 1:00:00
Min= -0.259 at (82,1), Max= 53.660 at (74,1)

May 1, 2002 1:00:00
Min= -0.038 at (27,33), Max= 32.704 at (73,1)

Delta EXT_Recon

Base02b - Base02b_NoWBD
Daily average concentration



April 6, 2002 1:00:00
Min= -0.879 at (44,83), Max= 33.240 at (60,30)

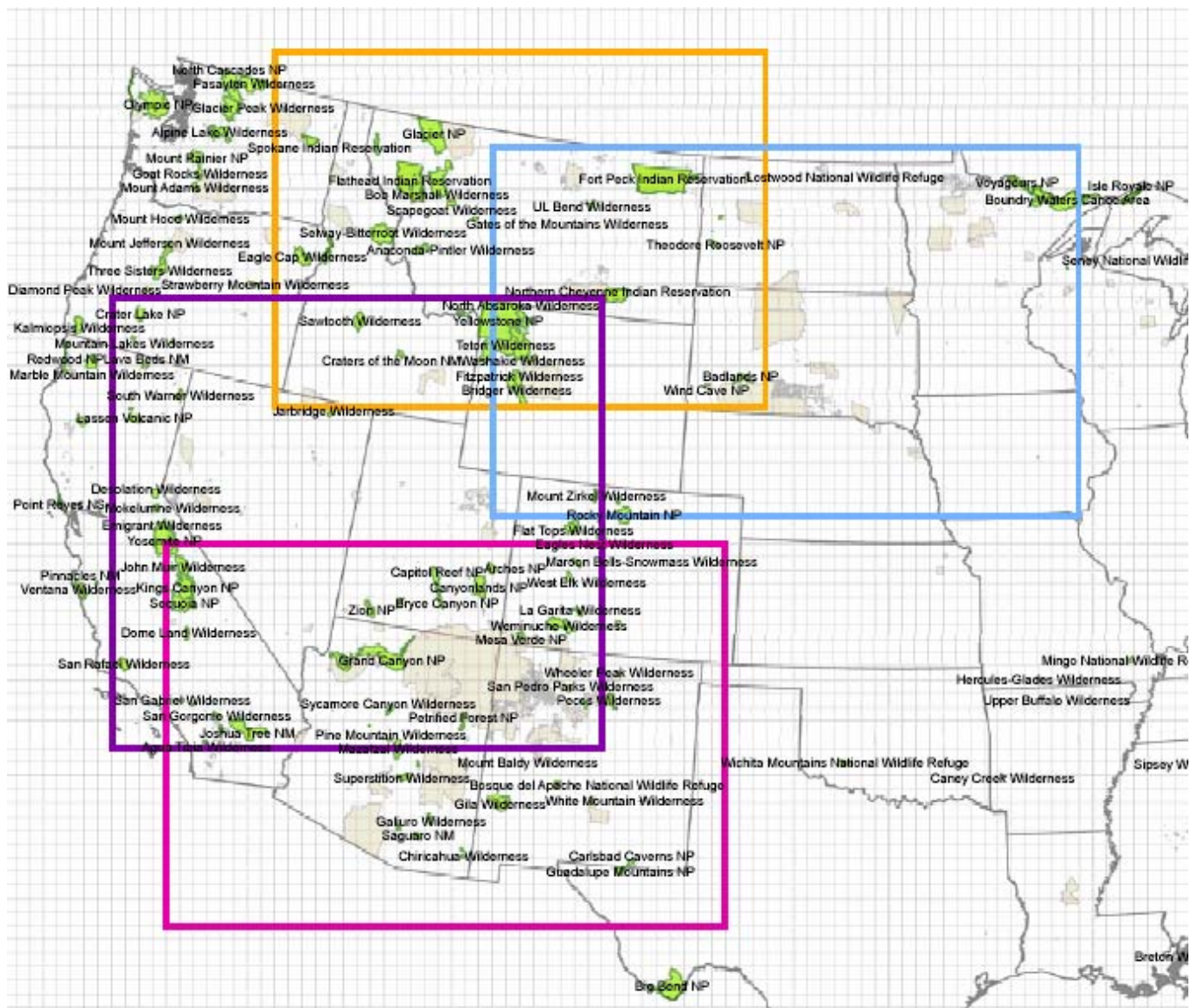
RMC BART CALPUFF Modeling

- Preliminary Draft CALPUFF BART Modeling Protocol dated April 14, 2006 being reviewed by Modeling Forum Co-Chairs
- 2001, 2002, 2003 36 km MM5 processing for CALMET for six States
 - AZ, MT, NM, NV, SD & UT
- BART screening CALMET/CALPUFF modeling for 5 States
 - NM, NV, SD & UT
 - AK special case – 2002 only

RMC BART CALPUFF Modeling

- 2001, 2002 & 2003 – NM, NV, SD & UT
- CALMET Modeling
 - 4 km Grid
 - Run in NOOBS mode
 - Use MM5 data and no observations
- CALPUFF Modeling
 - Follow EPA recommendations
 - EPA BART Modeling Guidelines (June 2005)
 - EPA March 16, 2006 Memo (Atkinson and Fox, 2006)
- Proposed CALMET/CALPUFF Modeling domains for NM, NV, SD and UT

CALPUFF modeling domains



RMC CALPUFF Modeling

- States to provide RMC with emissions and stacks parameters for sources for BART screening modeling
- RMC to provide visibility results to states for each Class I area in modeling domain
 - 24-hr change in deciview over Natural Conditions
 - Three Natural Conditions (B20%, W20%, annual)
- States to make BART determination
- Modeling databases provided to states as requested

Emissions Modeling for BART Modeling

- Developing BART selection worksheets
 - Cross-referencing modeling inventories with sources in ERG BART selection report
 - Preparing worksheets to distribute to WRAP states and tribes for review
 - Result will be a group of BART-eligible sources to target in zero-out and doubling sensitivity simulations

TSS Support

- Emissions data
- AQ Modeling data
- Web Site Design and Support