

# **RMC Activity Update**



**Emissions Forum**

**July 1, 2003**



# RMC Activity Update

- **Update on §309 modeling**
- **2 specific projects funded by EF:**
  - **Chemical Speciation and Temporal Allocation for Point and Area Sources**
  - **NH<sub>3</sub> Emissions Inventory Improvement**
- **General RMC work**



## **RMC Activity Update**

- **Some delay has been encountered in getting ENVIRON and CEP (formerly MCNC) their subcontracts.**
- **CEP has been unable to work without a subcontract.**
- **ENVIRON has continued working, primarily on the analysis of the §309 simulations and preparation of the TSD.**



# RMC Activity Update

## ■ *§309 Modeling*

- **Several of the §309 annual model simulations:**
  - were corrected and repeated, and
  - were corrected and repeated, and
  - were corrected and repeated, and
  - were corrected and repeated, and
  - were corrected and repeated (you get the idea).
- **Several new annual model simulations were performed with different permutations of the emissions inventories. These simulations were designed to correct errors in the emissions of major point sources that primarily affected Wyoming, and to diagnose and correct errors in the fire emissions.**



# RMC Activity Update

- **§309 annual modeling simulations which were repeated include the following cases:**
  - **2018**
    - **Base Case with no smoke management**
    - **Base Case with base smoke management**
    - **BART w/ Uncertainty**
    - **SO<sub>2</sub> Annex Milestones**
    - **NO<sub>x</sub> Sensitivity/PM Sensitivity/Combined 25% NO<sub>x</sub> & PM increase**
    - **All §309 control case with base smoke management**
    - **All §309 control case with optimal smoke management**
  - **1996**
    - **Base Case with base smoke management**



# RMC Activity Update

## ■ MCIP Error

- **As a result of an error in the MCIP preprocessor, they performed simulations for the month of January and July to determine the effects of the MCIP error in the WRAP simulations**
- **They found relatively small changes in the base case simulation with the corrected MCIP2.1 compared to the original MCIP 2.0**



# RMC Activity Update

## ■ Vertical Layer Averaging Comparison

- They have repeated the vertical layer averaging comparison using the corrected MCIP. Simulations were performed for January and July for models with 8, 12, 18 and 23 layers
- In the previous evaluation we focused primarily on O<sub>3</sub> and sulfate. In the new evaluation we have noted that even at 18 layers there are relatively large changes in PM<sub>2.5</sub> in the 18 layer model compared to the reference 23 layer model
- They plan to perform additional layer sensitivity experiments for VISTAS RPO to confirm this result. They also propose to perform a MM5 simulation with fewer vertical layers to determine whether MCIP layer averaging has a larger effect than simply using fewer MM5 layers.
- They should also perform a BART simulation with 23 layers to determine if the effect of the layer change is smaller for the “delta” in the sensitivity case compared to the error in the base case. (That is, if the error is consistent across all 18 layer simulations, there may not be much effect on the sensitivity results from using layer averaging.



# RMC Activity Update

- **NH<sub>3</sub> emissions inventory improvements:**
  - A literature review is near completion
  - (UCR/ENVIRON task) - they are preparing a detailed work plan and revised schedule which will be ready for review in mid-July.
  - They have begun to identify and collect data needed for NH<sub>3</sub> inventories





# RMC Activity Update

- **Temporal Allocation and Chemical Speciation Profile improvement for Point and Area Sources (CEP task)**
  - Not yet started
  - Planned schedule is to complete a draft of needed/proposed SMOKE improvements for EF and others' review by mid-August
  - Modeling Forum meeting in early October to discuss draft and comments



# RMC Activity Update

## ■ Source Apportionment

- They have developed new modules for CMAQ to use tagged species to track source apportionment
- This has been implemented for nitrogen gas phase species
- They still need to complete this for aerosols, and expect to complete this in December 2003, for review by the Modeling Forum and others at a January 2004 MF workshop.



# RMC Activity Update

## ■ CMAQ Development

- They have added an update to the CB4 mechanism (CB4-2002) to CMAQ
- It is currently implemented for the GEAR and QSSA solvers, and we are working on the Hertel/MEBI solver.

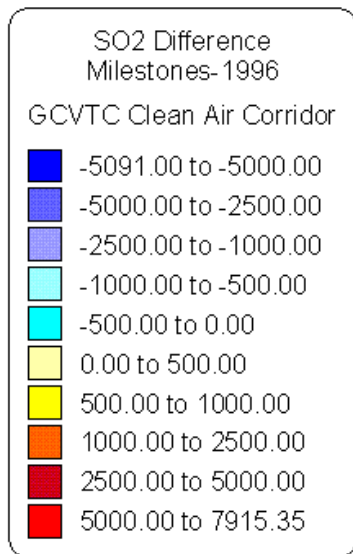


# RMC Activity Update

## ■ Emissions QA

- They have continued to do various QA analysis on emissions inventories for §309
- This includes preparing county totals of emissions for the §309 TSD
- Preparing an emissions QA checklist/protocol for use of the SMOKE emissions processor model is a high priority for the next 2 months, for review at the early October Modeling Forum meeting

# RMC Activity Update



SO2 Difference Milestone-1996

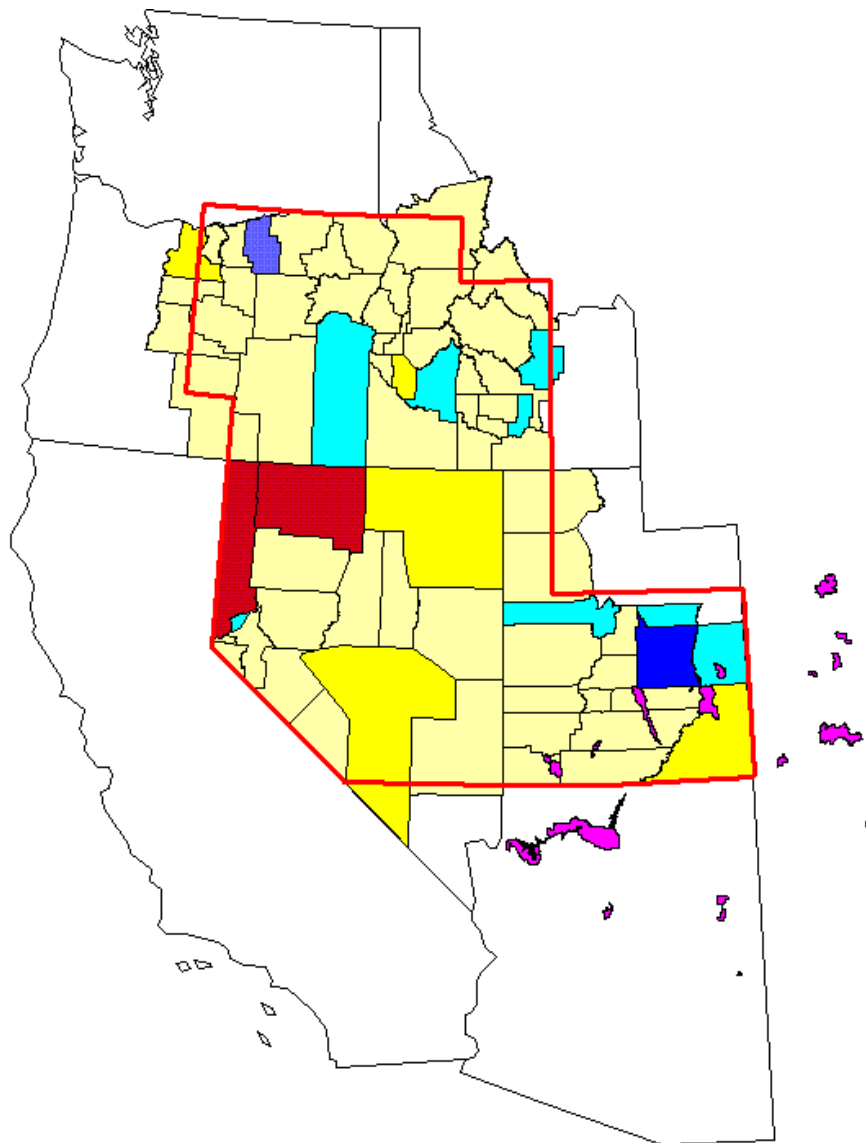
Number of values 71

Sum 4377.74684386377

Minimum -5090.61414923499

Maximum 2736.48093624772

Mean 61.6584062516024





# RMC Activity Update

## ■ Model Evaluation

- They have modified model performance software to include several new metrics that have been proposed by EPA, and by Christian Seigneur
- They plan to redo the 1996 model simulation with all available updates and bug fixes, and use this as a test case for the new performance criteria
- They have prepared emissions and MCIP files and plan to complete the revised CMAQ simulation and evaluation by end of July 2003.