

CAMx4 Full Science Plume-in-Grid Preliminary Results

May 2005

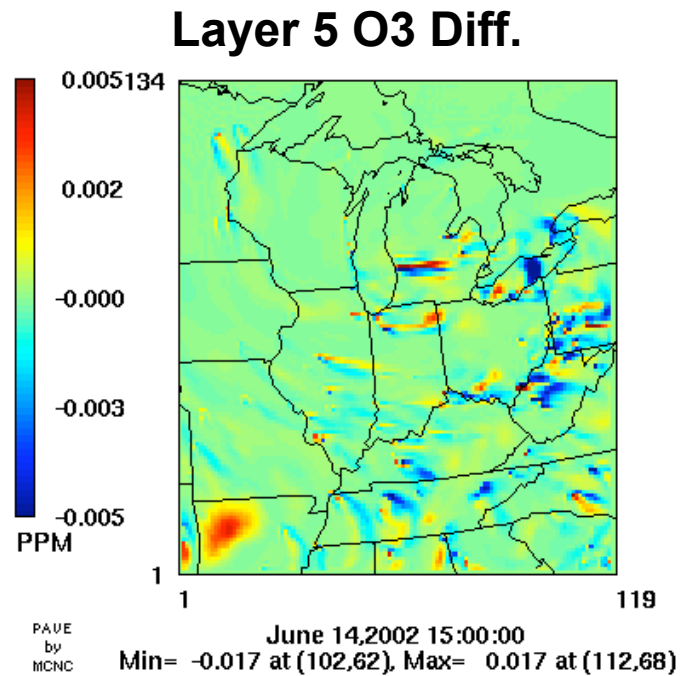
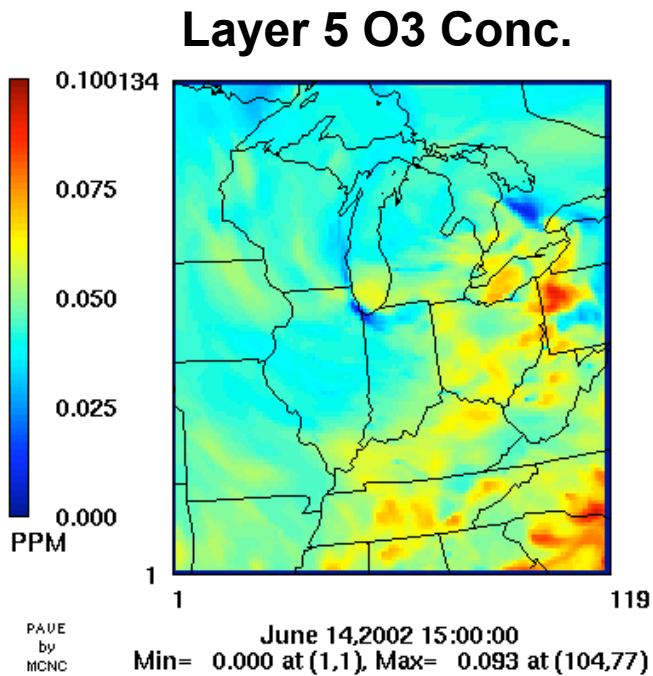
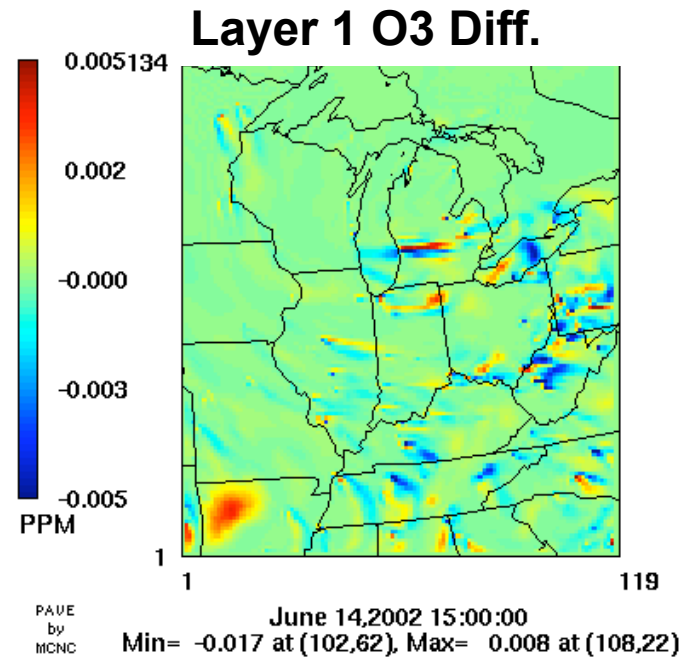
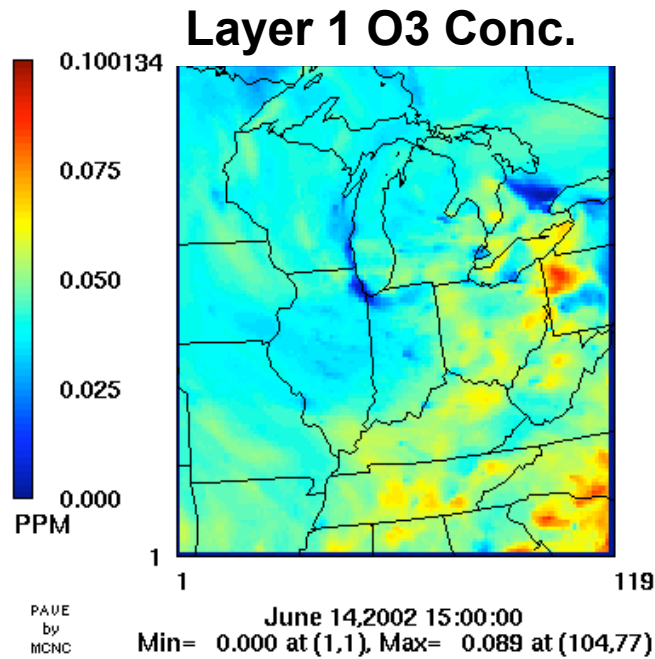
Kirk Baker (LADCO)
Chris Emery (ENVIRON)
Greg Yarwood (ENVIRON)

IRON PiG

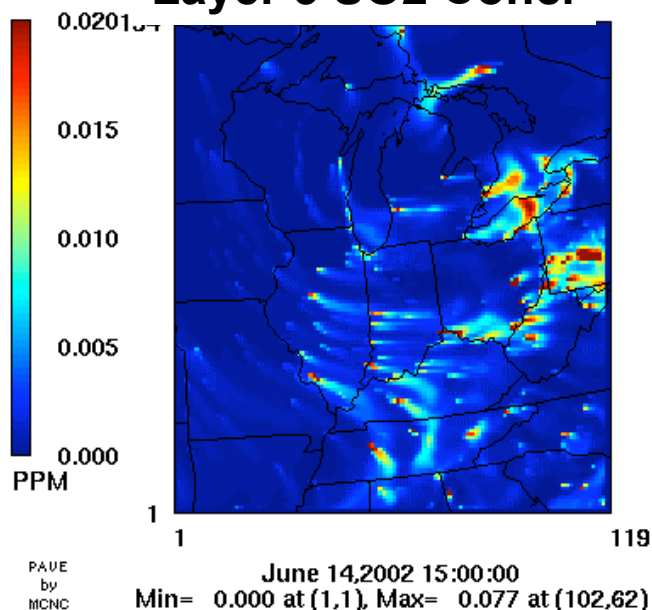
- IRON PiG (Incremental Reactions for Organics and NO_x)
- A similar chemistry approach is used in the SCICHEM Lagrangian model and in the Advanced Plume Treatment (APT) that joins SCICHEM to CMAQ
- Chemical processes are simulated within each plume segment using an “incremental chemistry” approach where puffs carry the incremental contributions of the puff relative to the grid concentrations
- Incremental puff concentrations can be positive or negative, depending upon the species and stage of plume evolution

IRON PiG

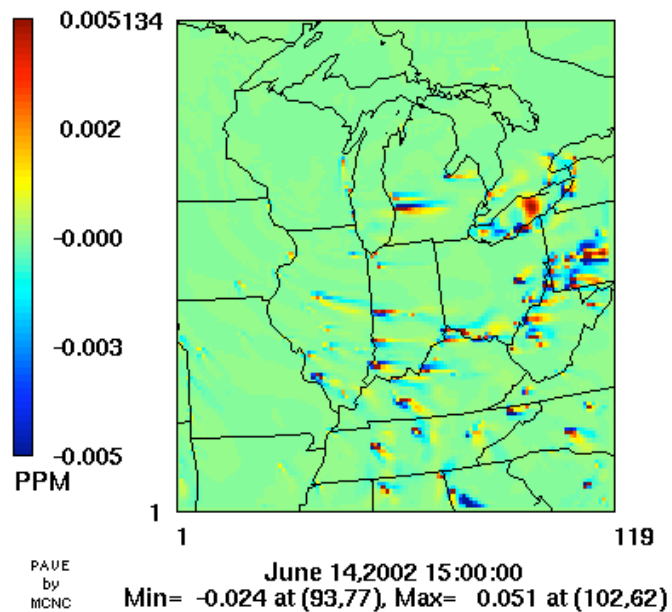
- 488 point sources emitting > 10 TPD NO_x
- plot show the results at 1500 EST on the second day (June 14, 2002)
- deposition loadings evaluated for SO₂ since removal is efficient for both dry and wet processes
- Puff leakage: off
- Puff rendering: on
- Puff overlap: off
- Max puff age: 18 hours



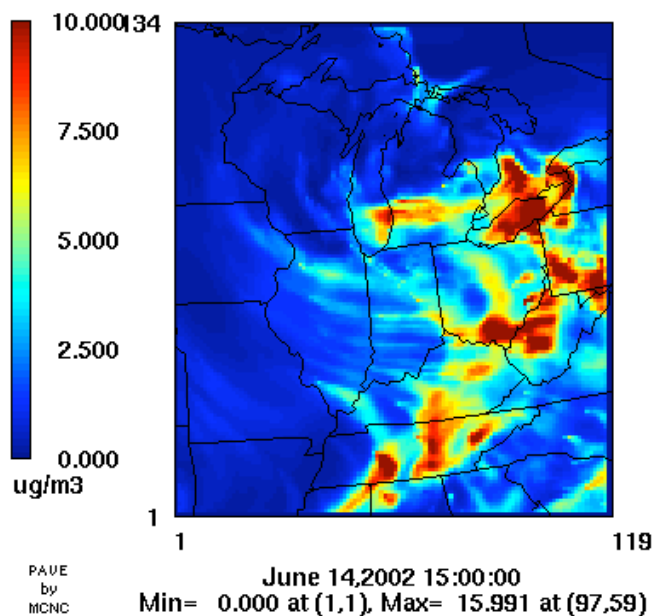
Layer 5 SO2 Conc.



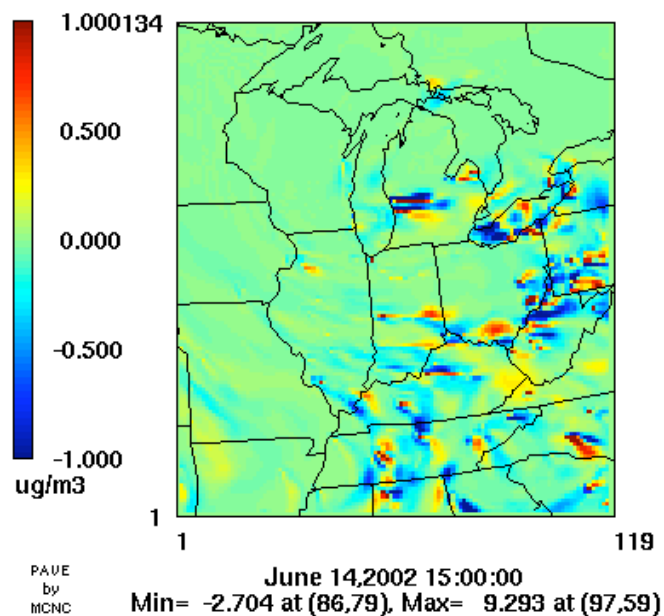
Layer 5 SO2 Diff.



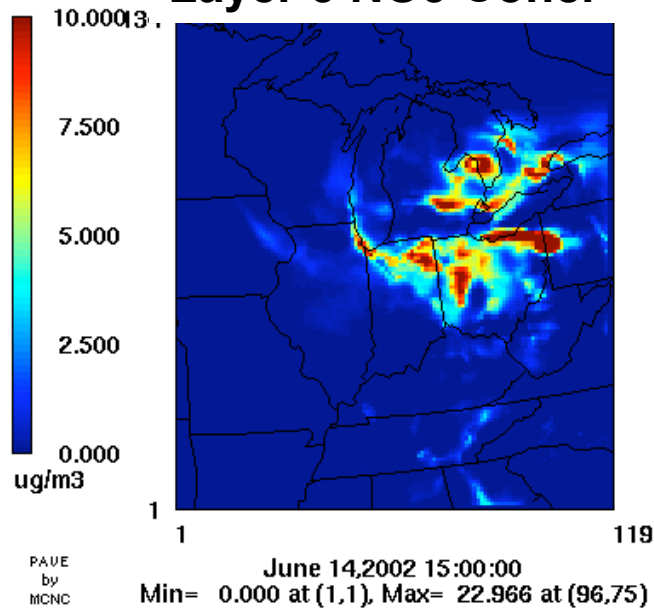
Layer 5 SO4 Conc.



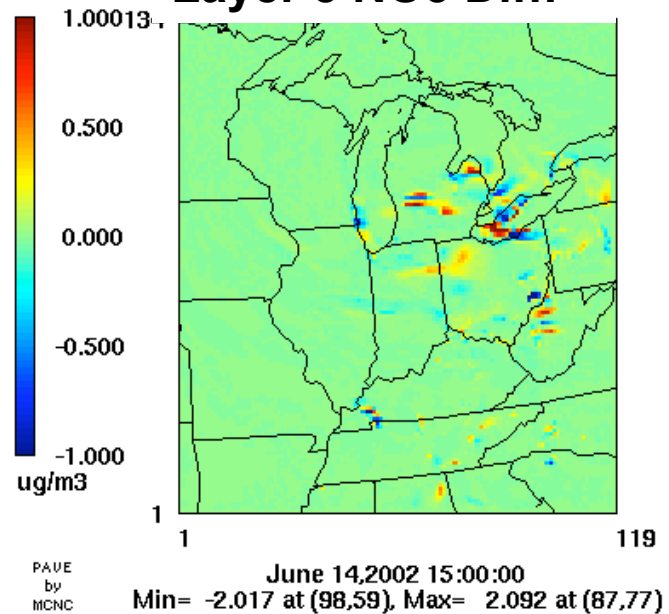
Layer 5 SO4 Diff.



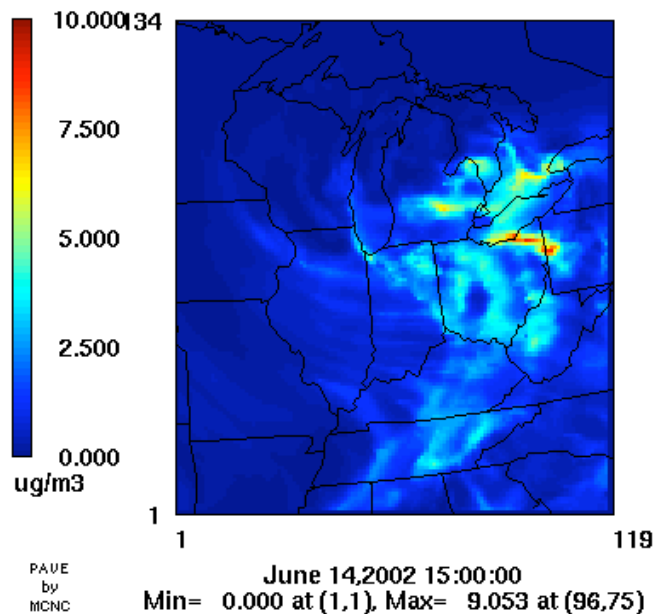
Layer 5 NO3 Conc.



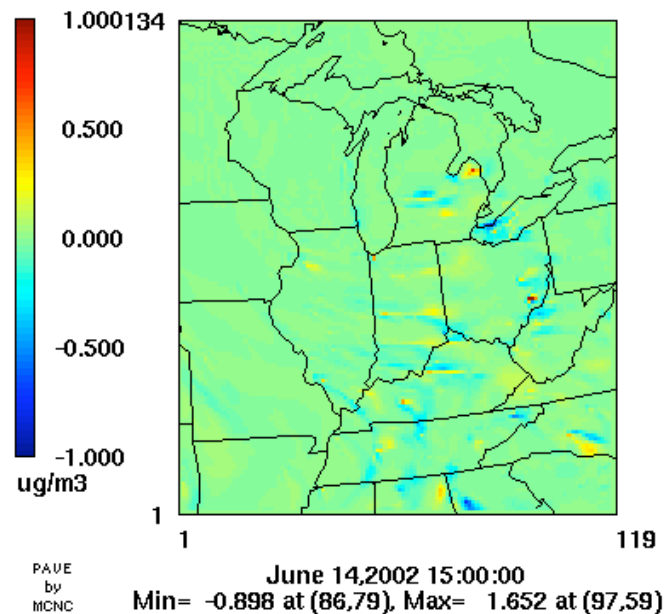
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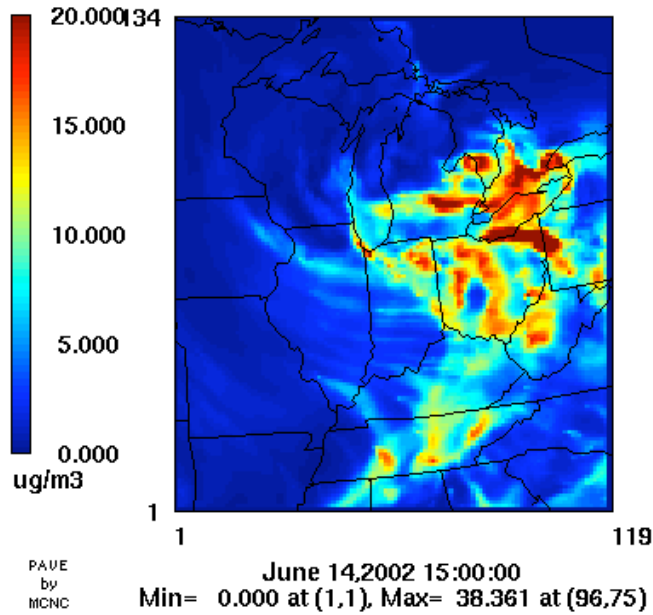
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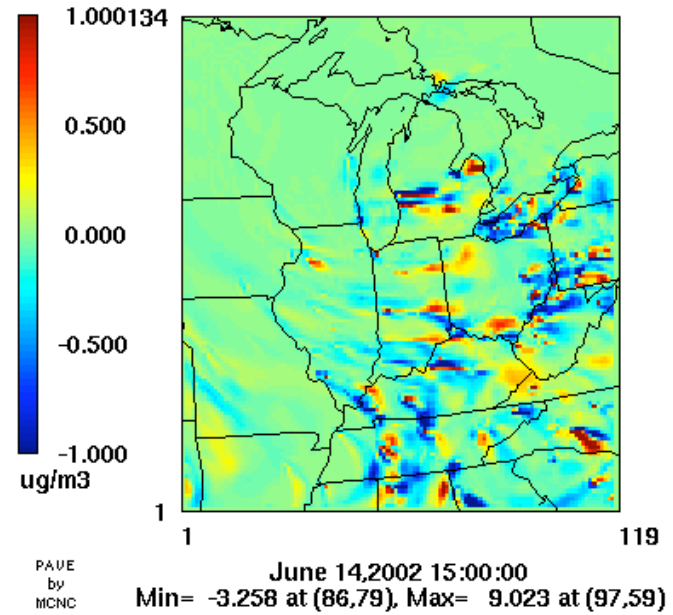
Layer 5 NH4 Diff.



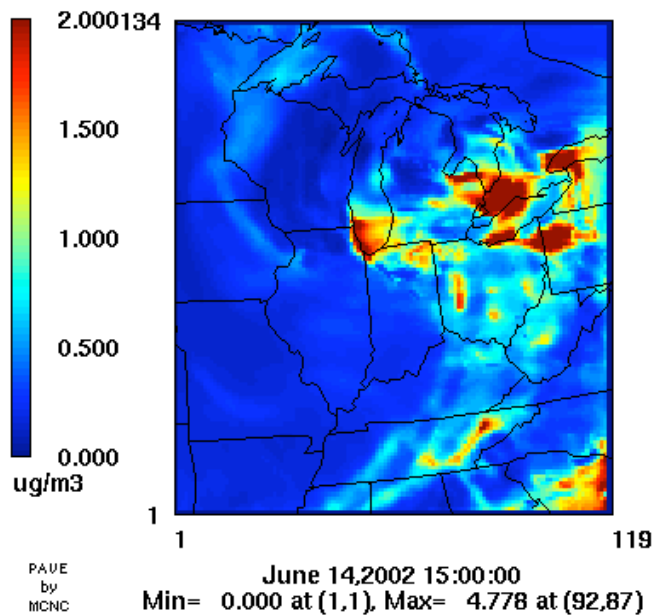
Layer 5 PM Conc.



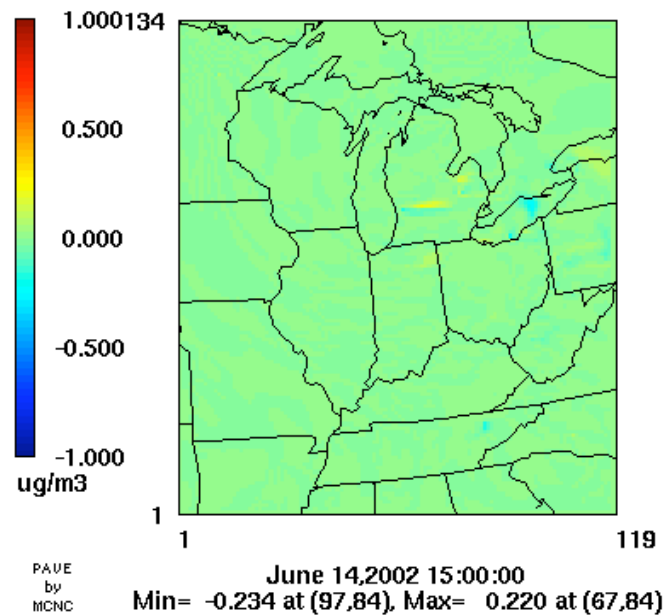
Layer 5 PM Diff.



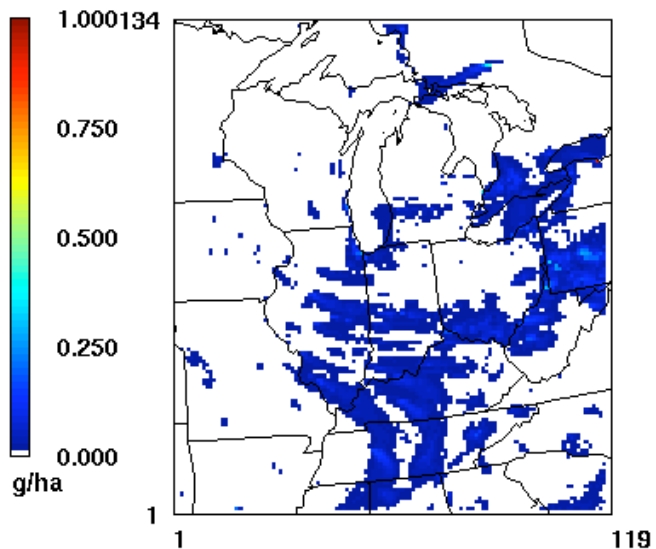
Layer 5 SOA Conc.



Layer 5 SOA Diff.

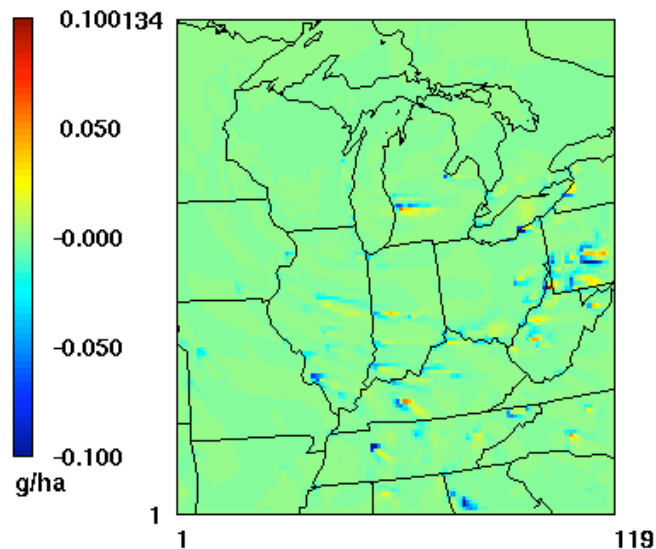


SO2 Dry Deposition



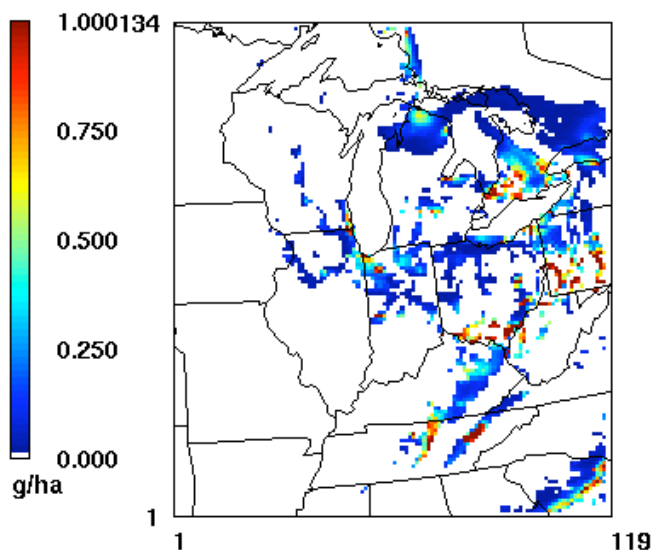
PAVE by MCNC
June 14,2002 15:00:00
Min= 0.000 at (1,1), Max= 0.934 at (116,96)

SO2 Dry Dep. Diff.



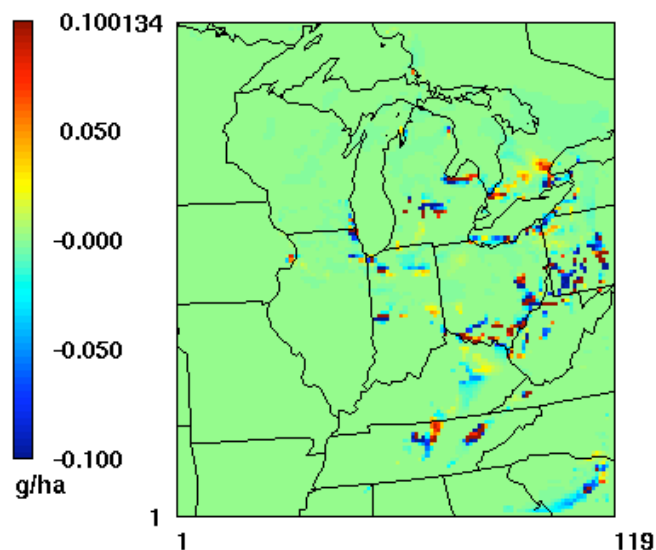
PAVE by MCNC
June 14,2002 15:00:00
Min= -0.213 at (54,19), Max= 0.113 at (102,62)

SO2 Wet Deposition



PAVE by MCNC
June 14,2002 15:00:00
Min= 0.000 at (1,1), Max= 5.728 at (96,48)

SO2 Wet Dep. Diff.



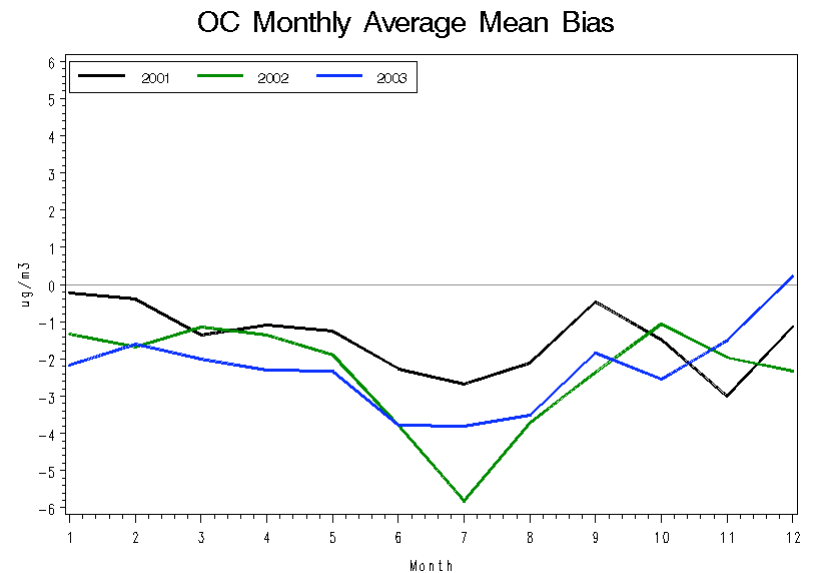
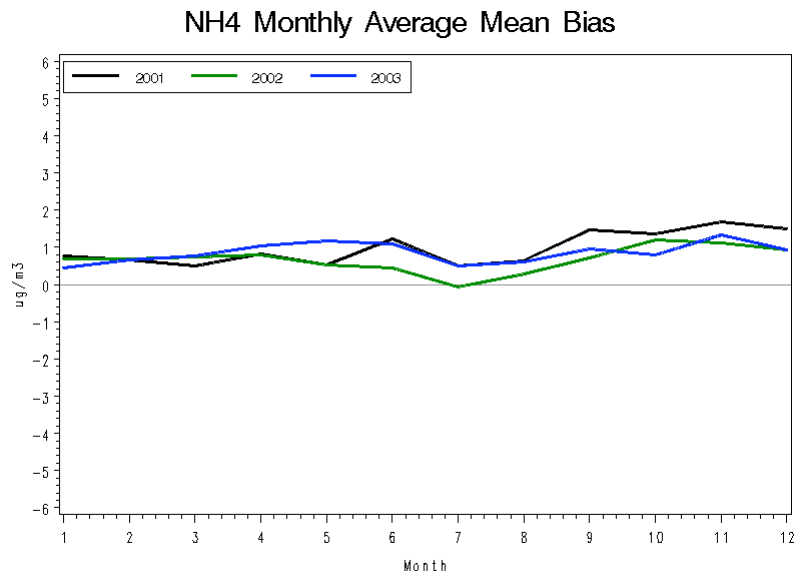
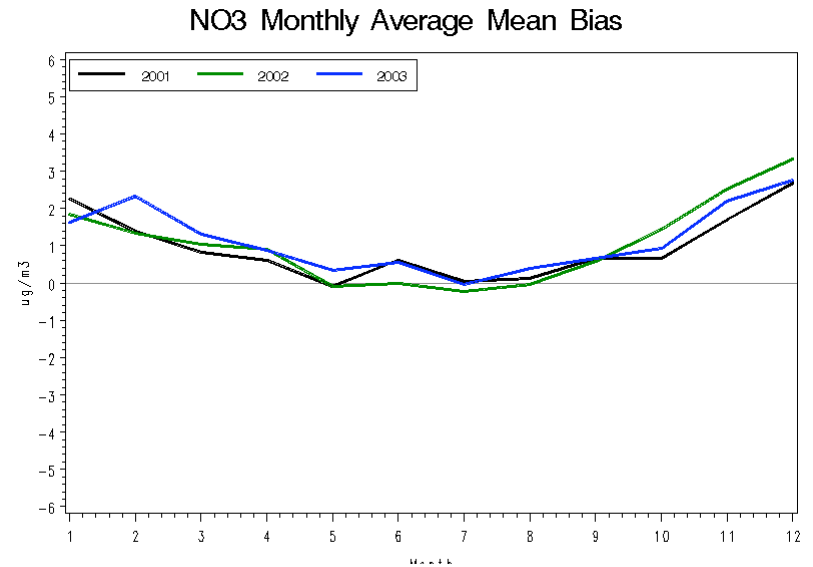
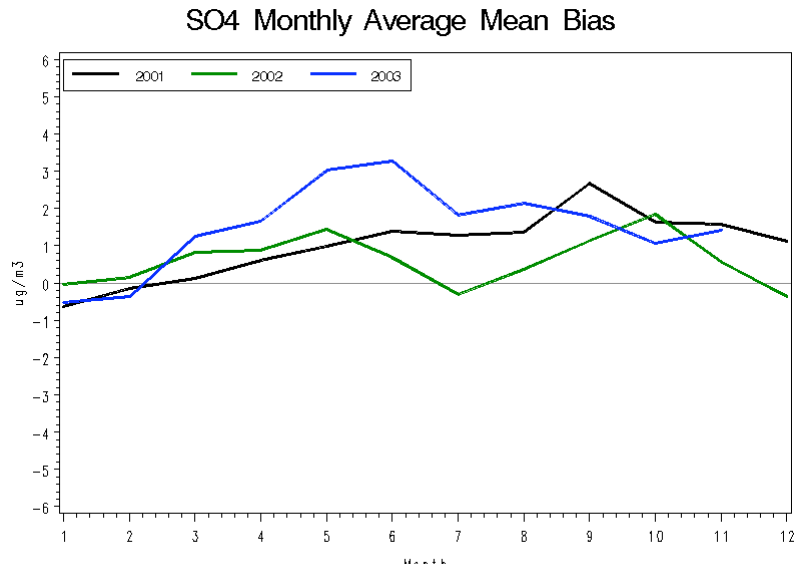
PAVE by MCNC
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Min= -1.900 at (111,69), Max= 4.473 at (96,48)

PM2.5 Performance Multiple Annual Simulations

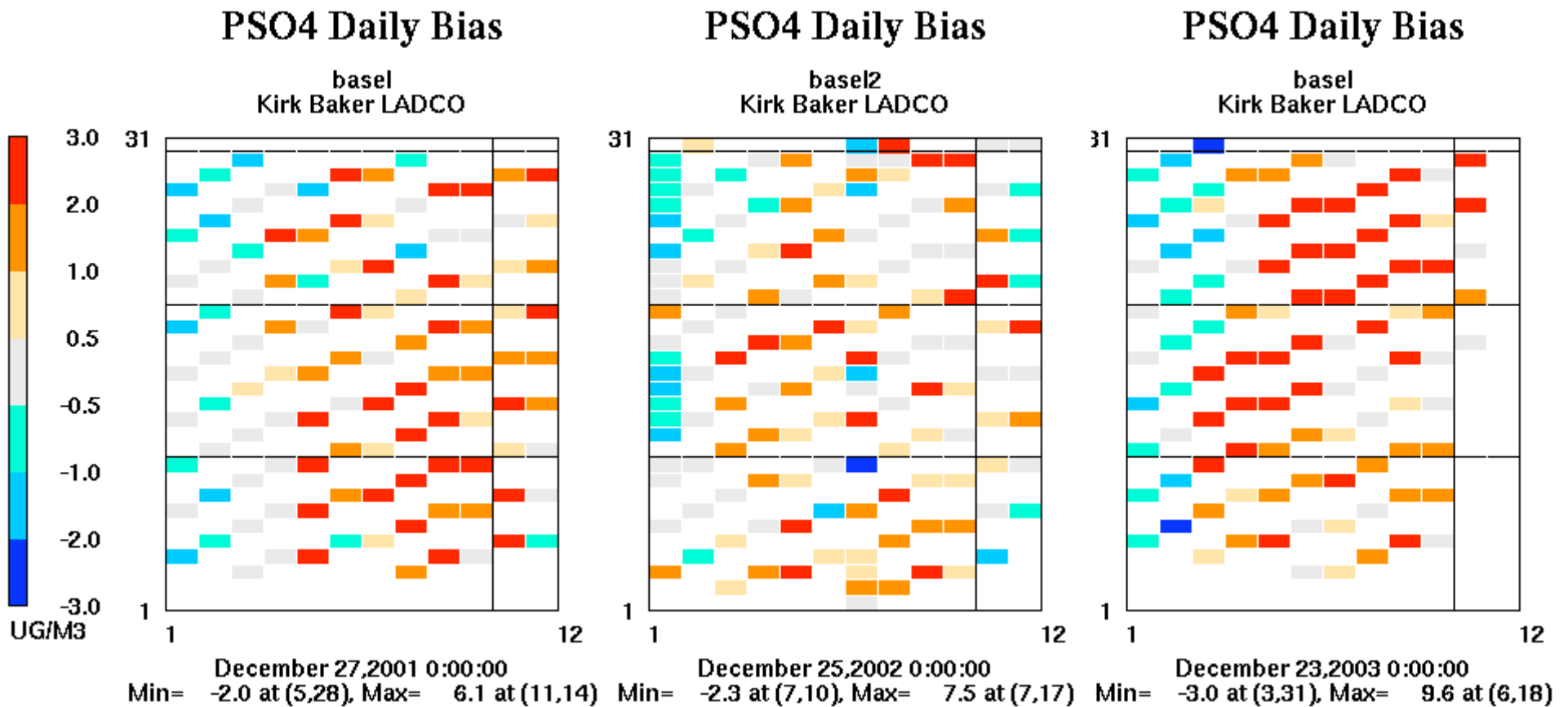
Kirk Baker

May 2005

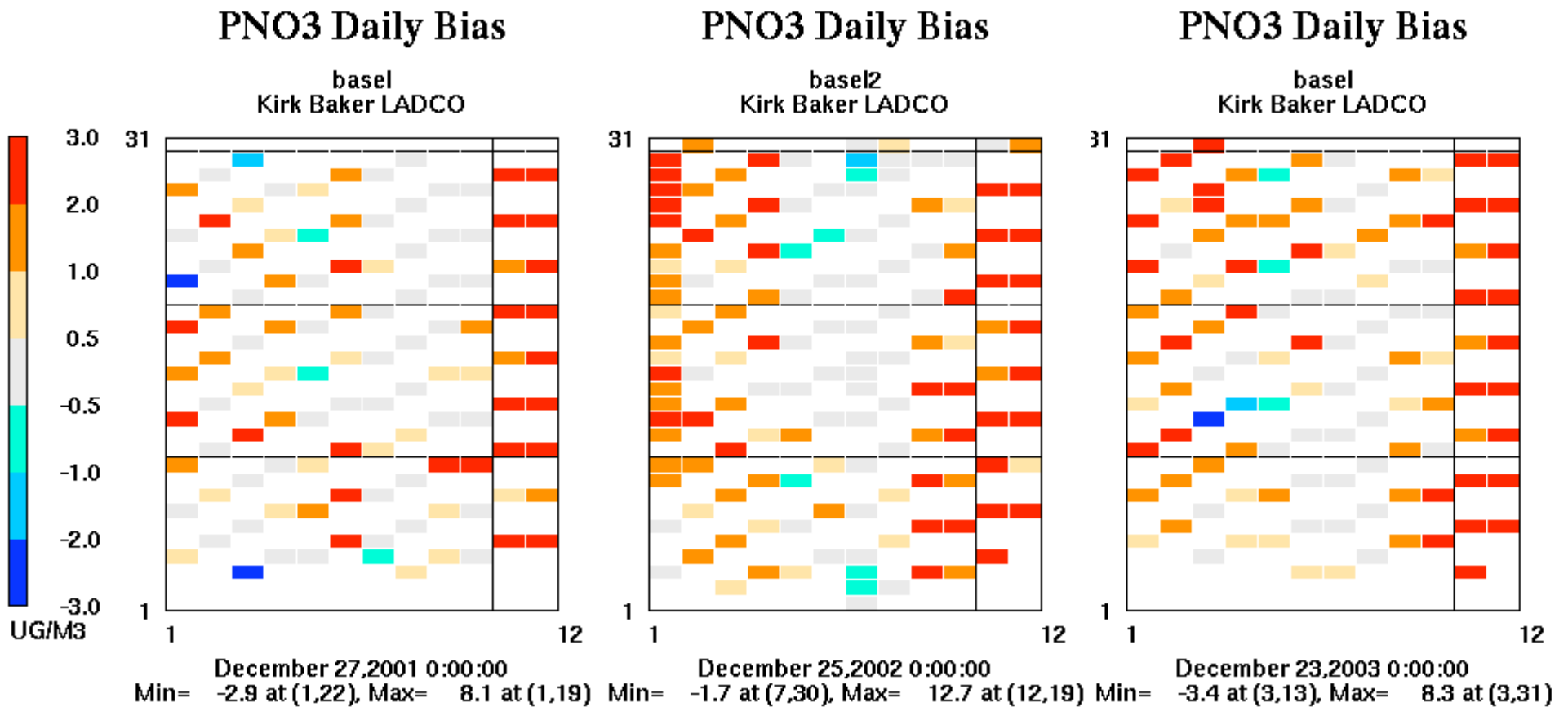
Monthly Bias for Each Annual Simulation by PM2.5 chemical specie (top left clockwise) sulfate, nitrate, ammonium, organics



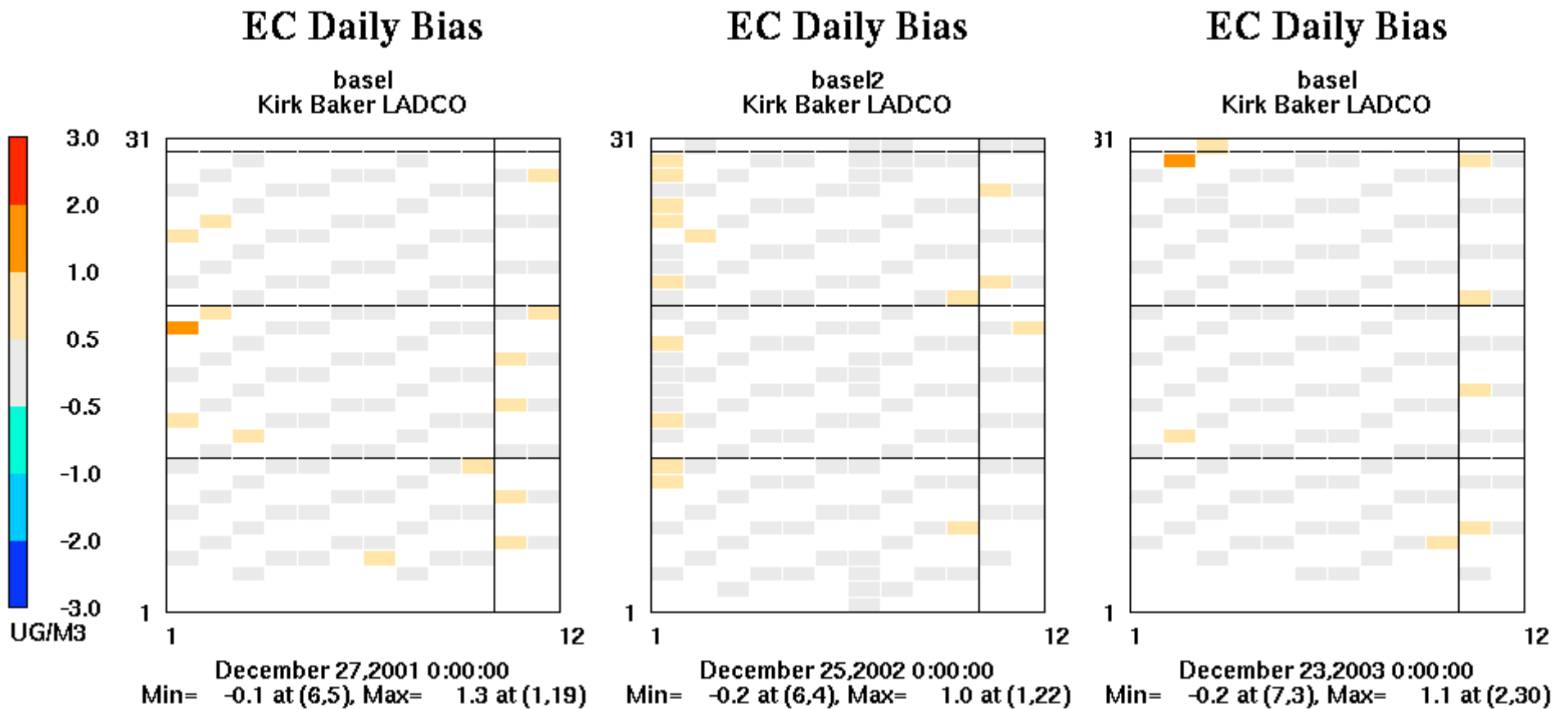
PSO4 Daily Bias: 2001-03



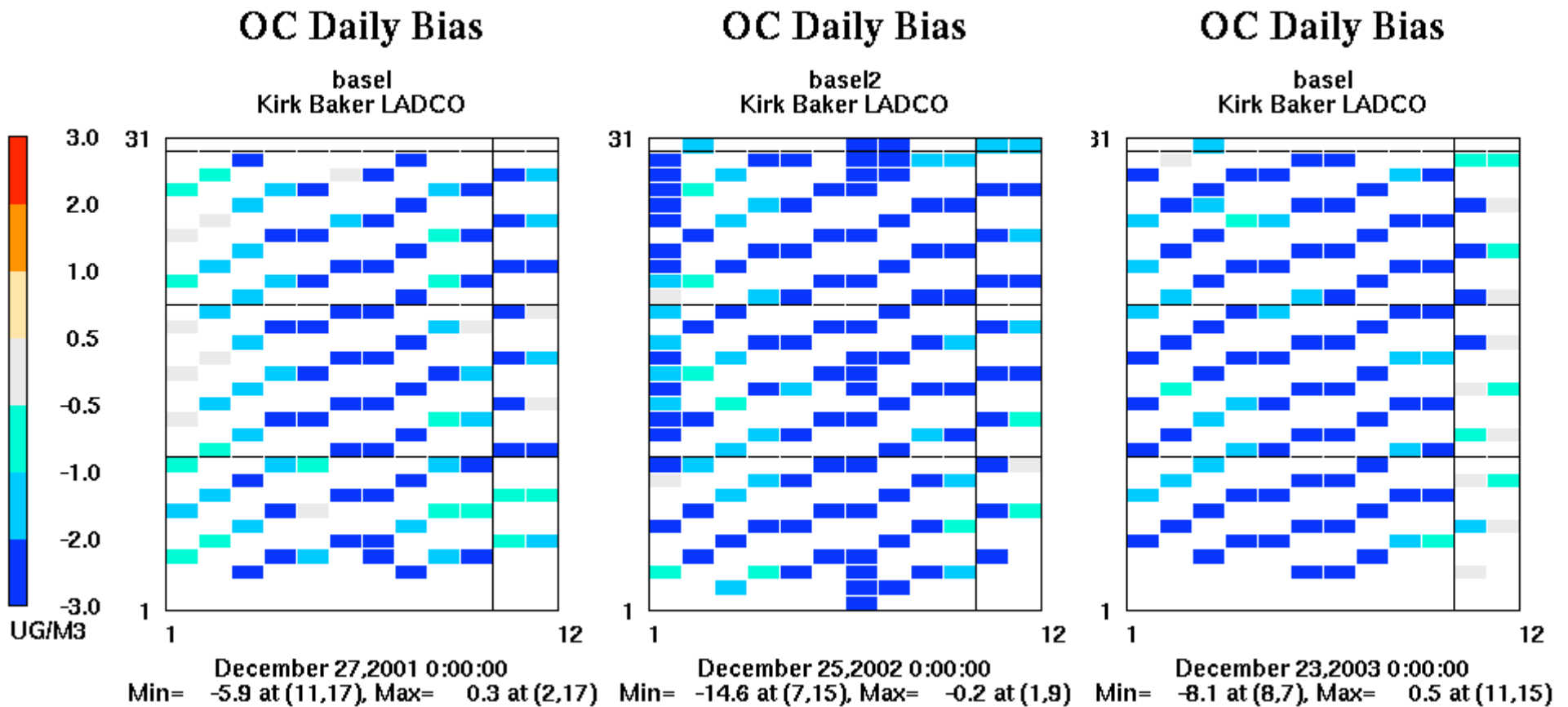
PNO3 Daily Bias: 2001-03



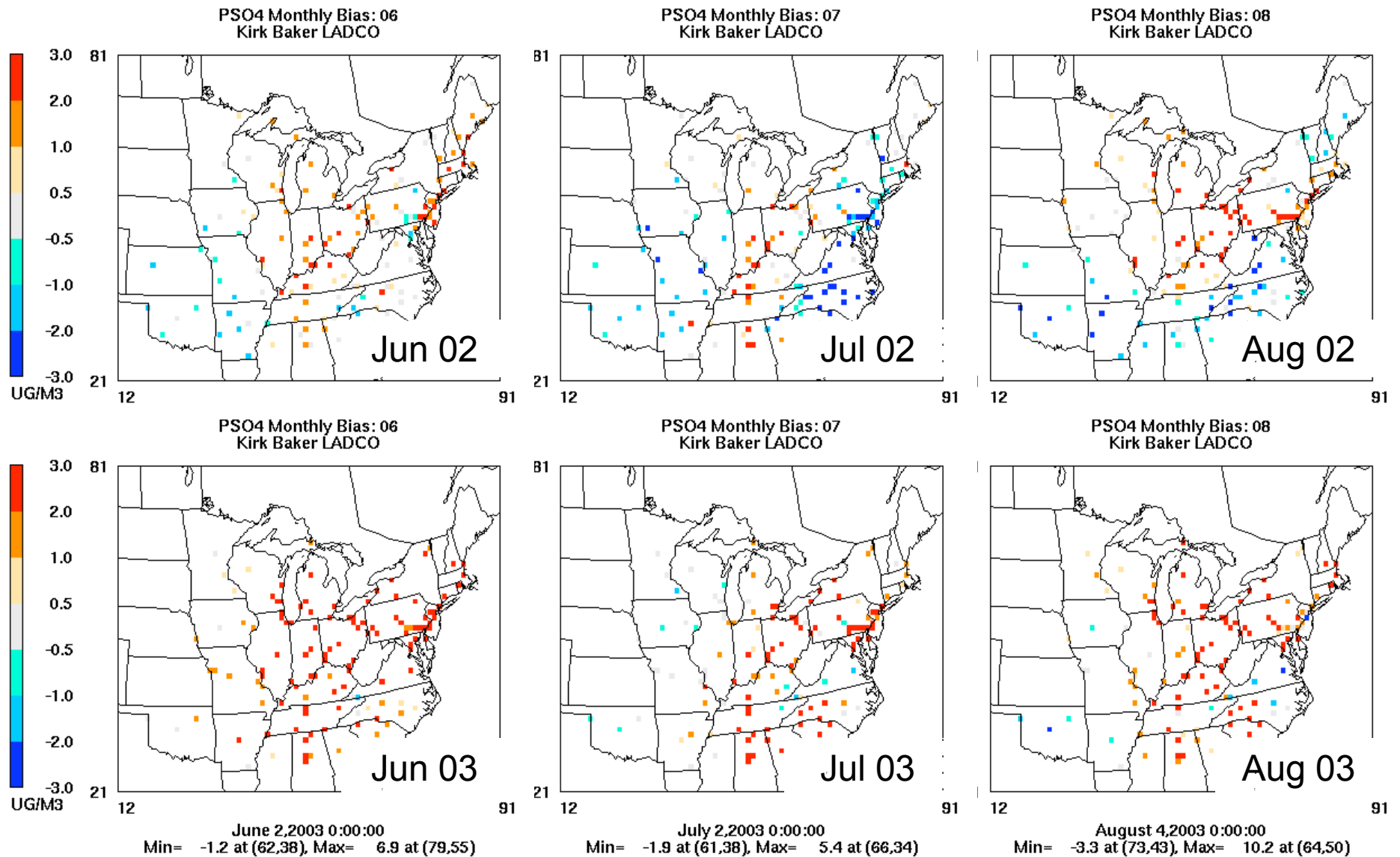
EC Daily Bias: 2001-03



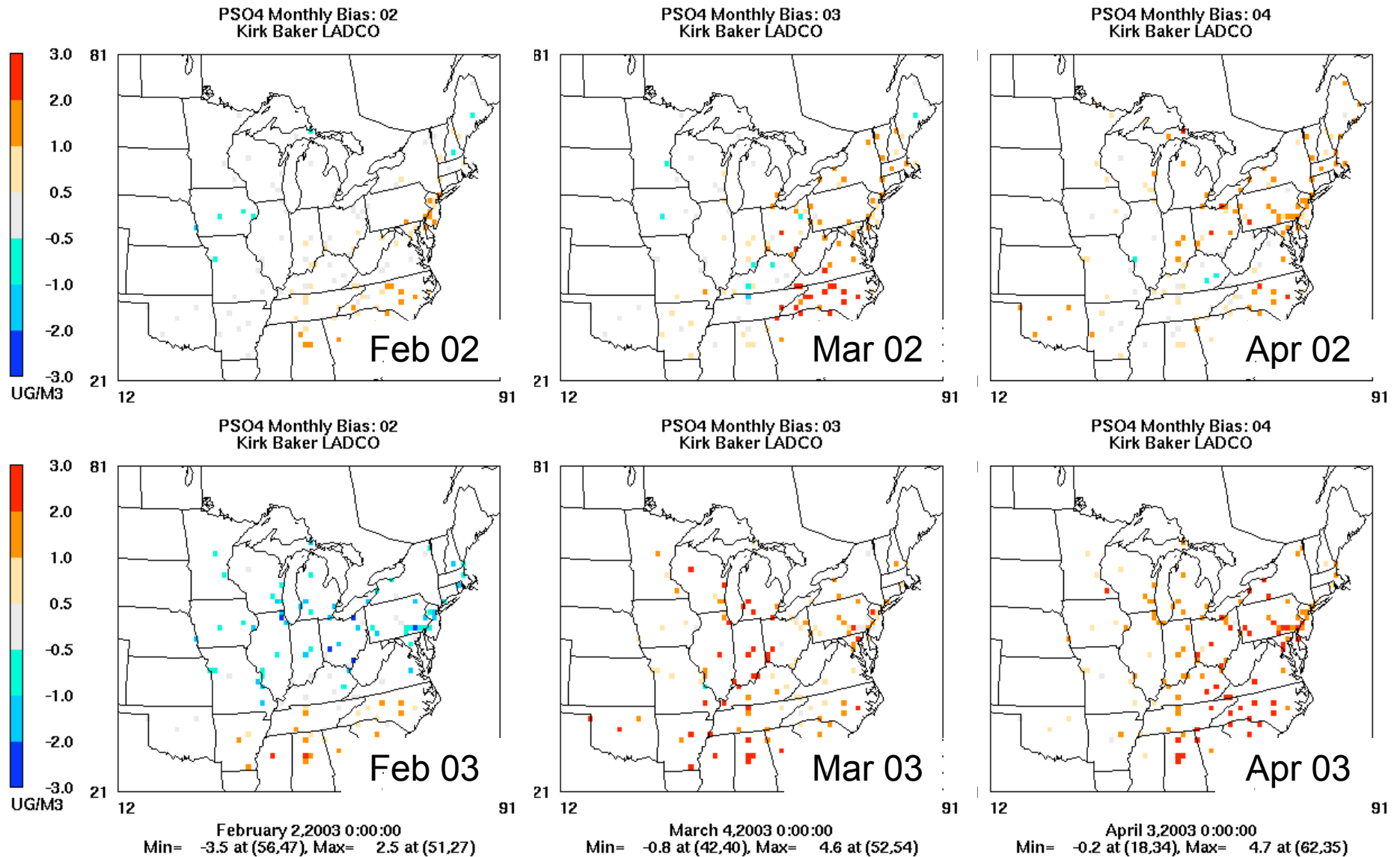
OC Daily Bias: 2001-03



PSO4 Monthly Spatial Bias



PSO4 Monthly Spatial Bias



PNO3 Monthly Spatial Bias

