

CAMx Statistical Performance Evaluation

BAAQMD MAC Meeting

July 20, 2004

CAMx Performance

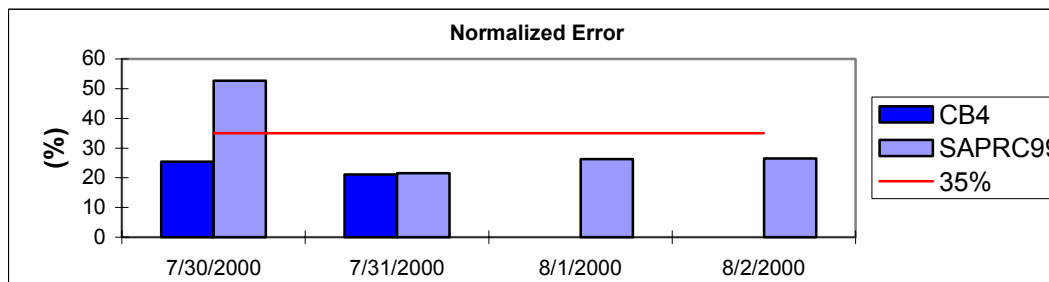
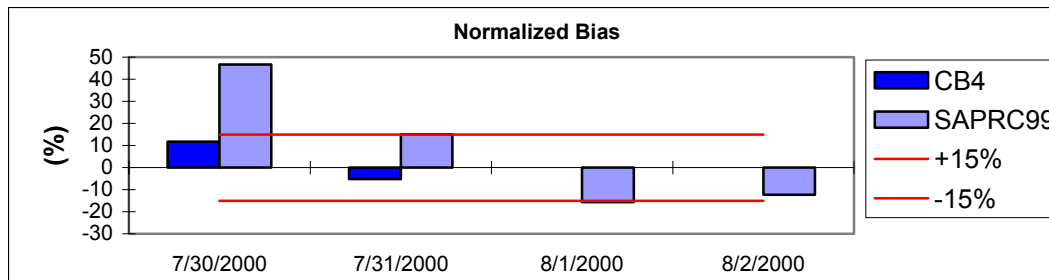
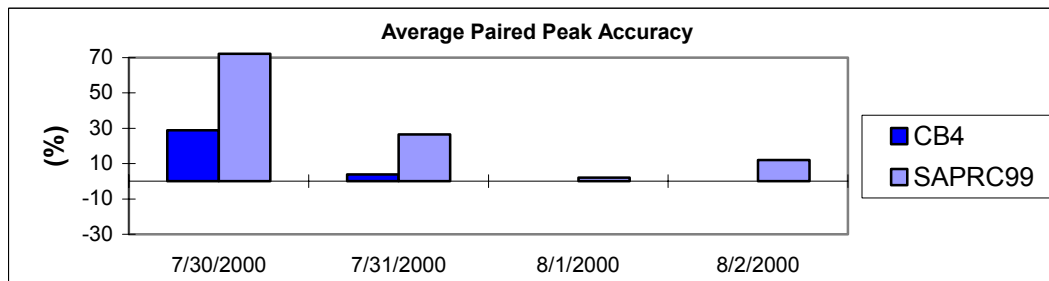
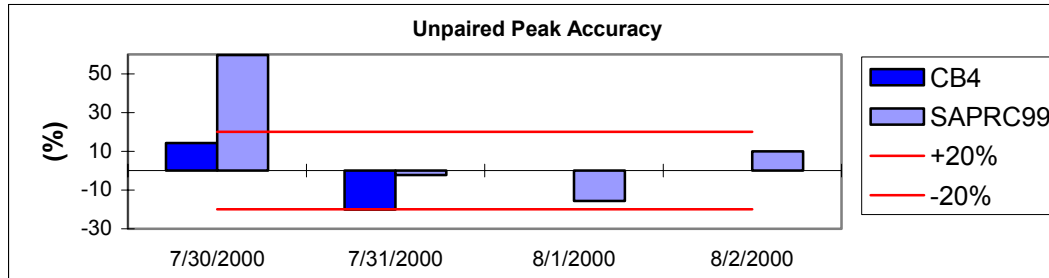
- **CAMx and statistical post-processing performed by District staff**
- **Daily ozone statistics relative to EPA performance goals**
 - Unpaired Peak Prediction Accuracy: single peak obs vs. single peak prediction (within 25 km, any time)
 - Average Paired Peak Accuracy: average peak obs over all sites vs. average peak predictions (paired in space, any time)
 - Normalized Bias: mean relative error over all sites and all hours (obs > 40 ppb)
 - Gross Error: mean absolute relative error over all sites and all hours (obs > 40 ppb)

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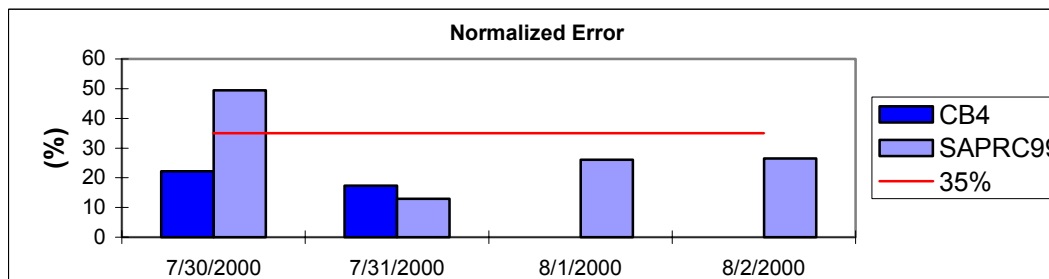
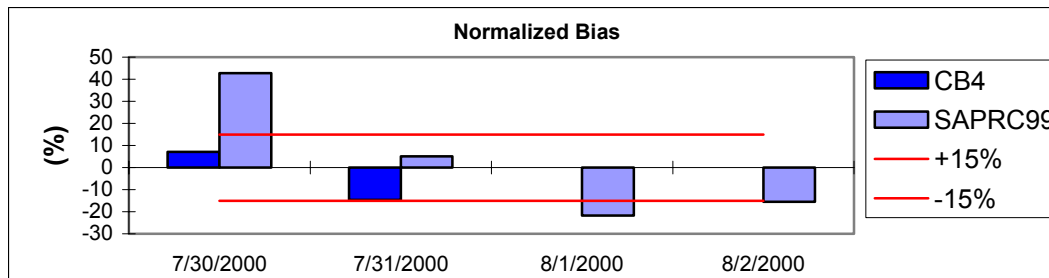
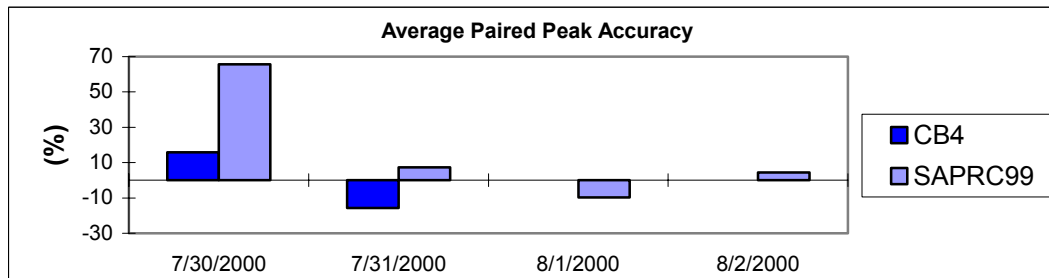
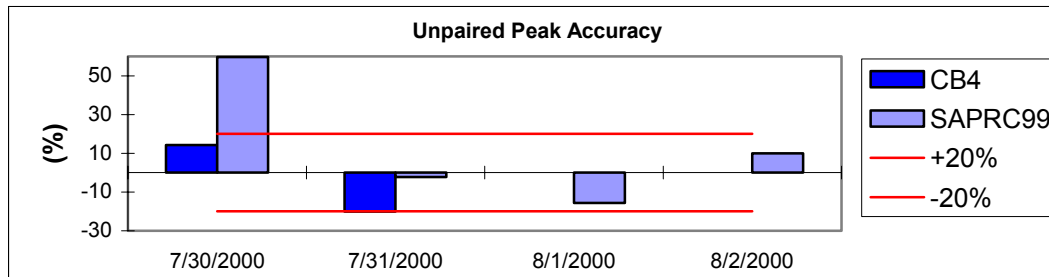
- **Sub-regional analysis:**
 - SF Bay Area (and SF East in some cases)
 - Sacramento
 - SJV

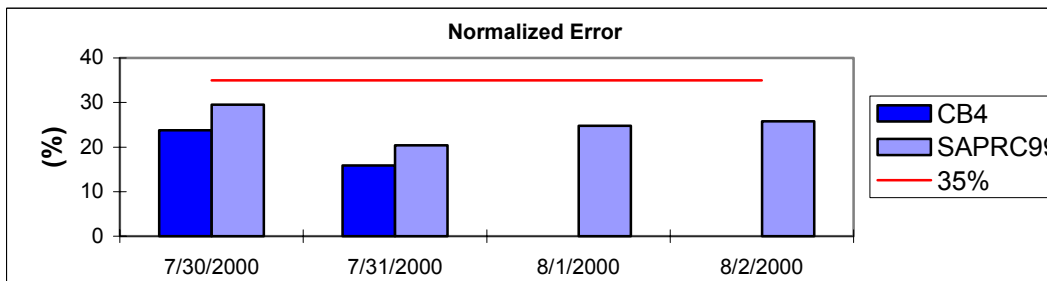
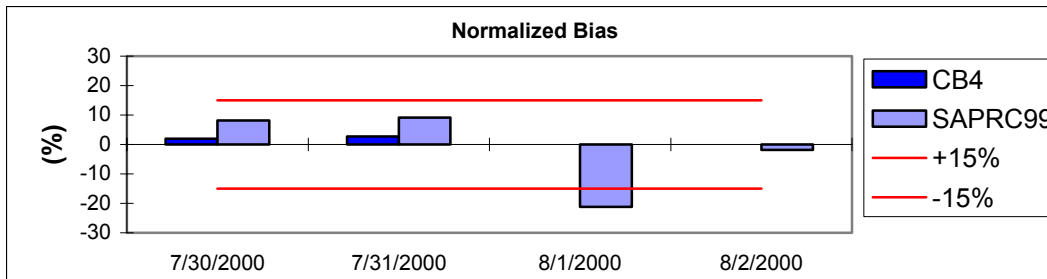
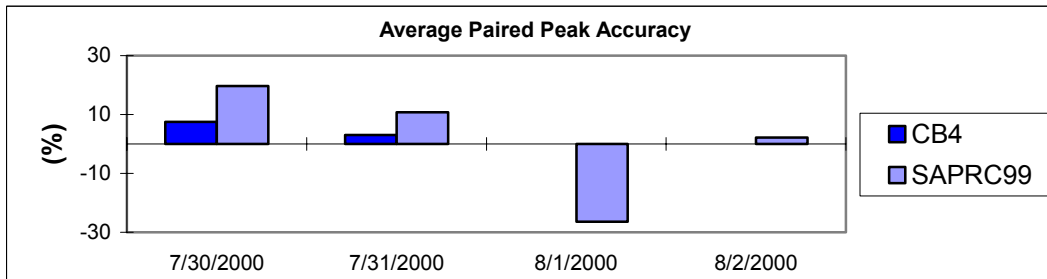
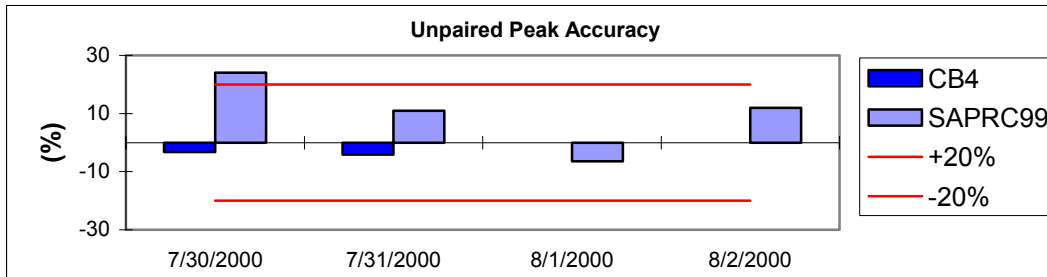
CAMx Performance

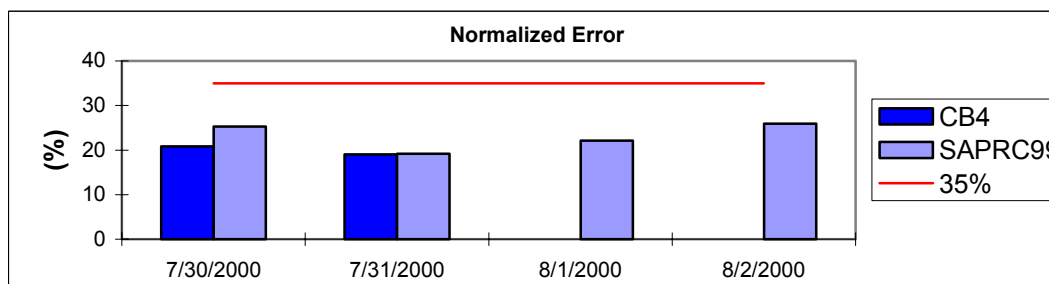
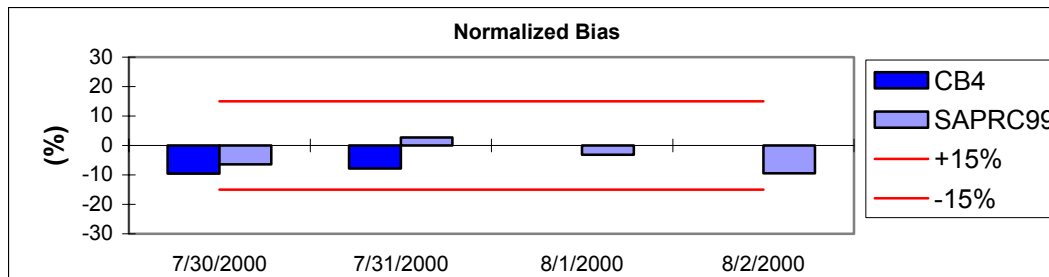
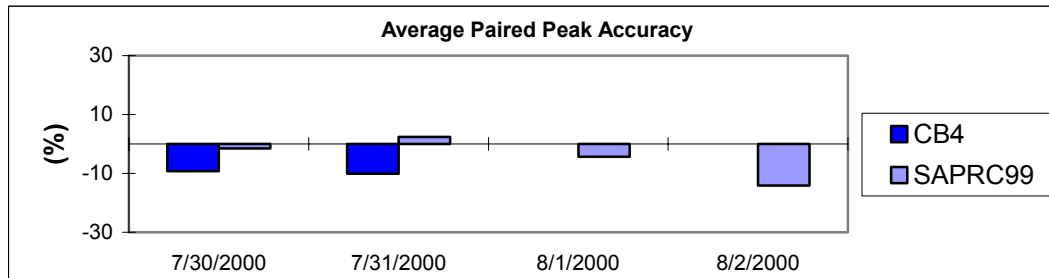
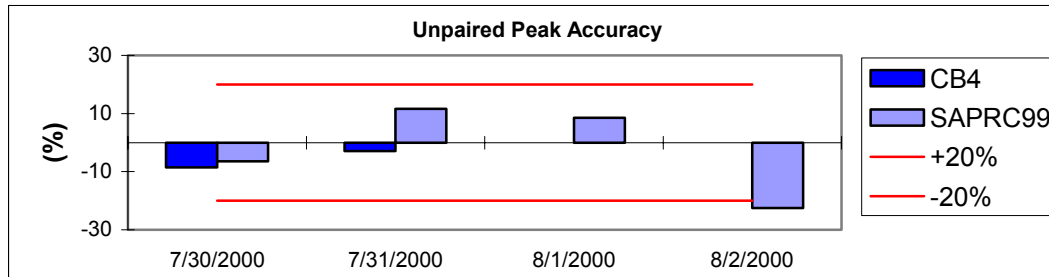
- **July/August 2000**
 - Met: MM5 using Eta PBL and 5-layer soil scheme
 - CB4: stats for July 30 and 31 only
 - SAPRC99: stats for July 30 – August 2
- **July 1999**
 - Met: ARB's MM5 run (MRF + 5-layer soil, less vertical layers)
 - CB4: stats for July 10 – 12
 - SAPRC99: stats for July 10 – 12 (no SF East)

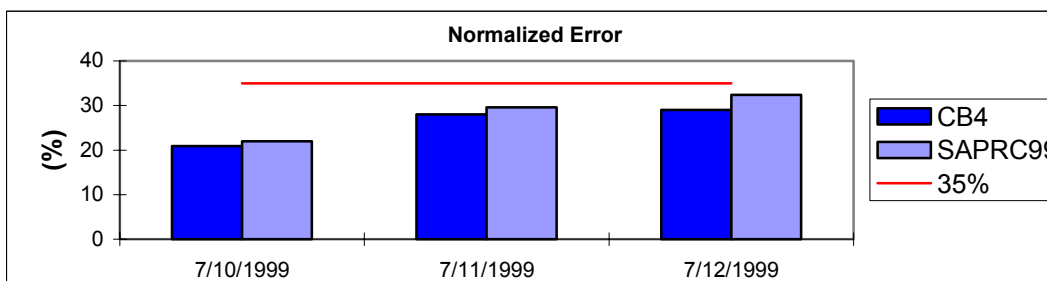
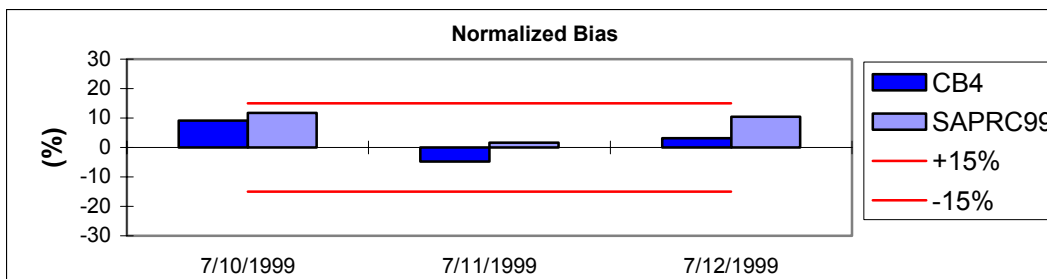
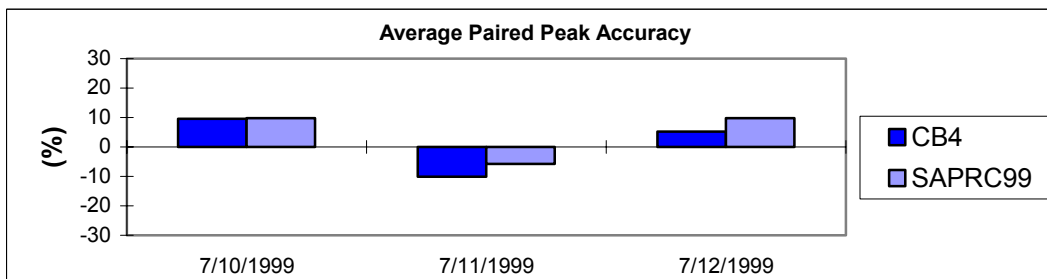
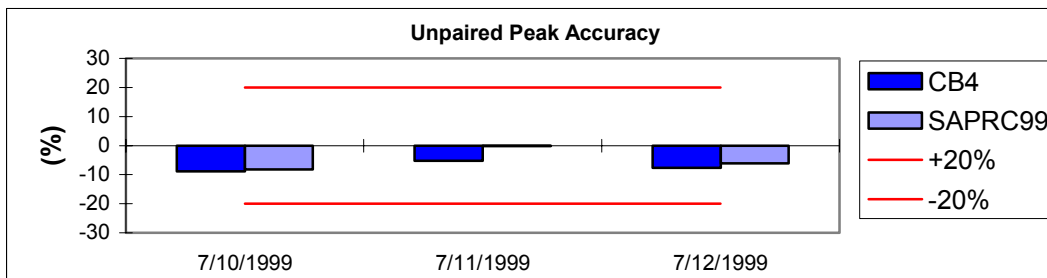


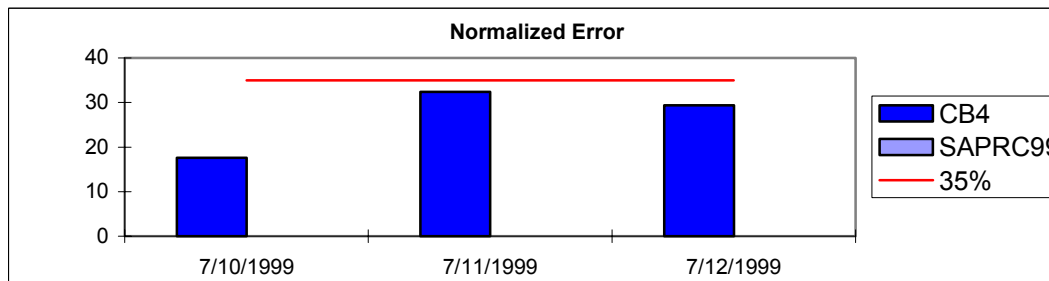
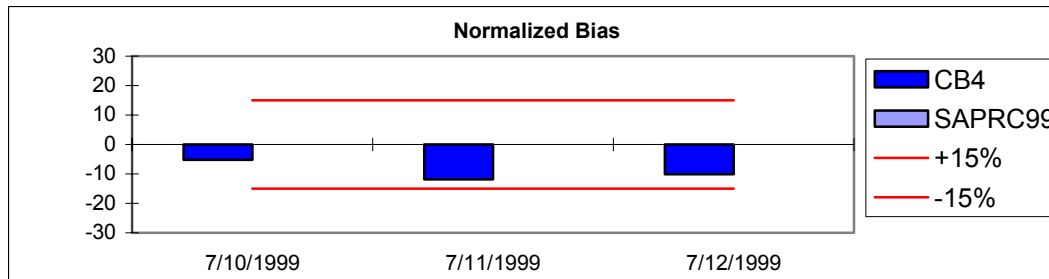
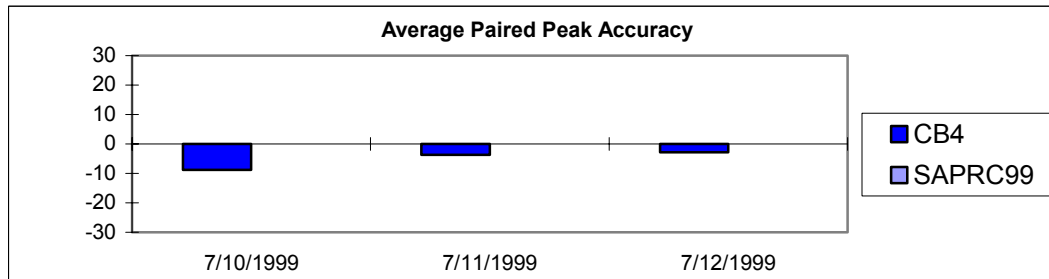
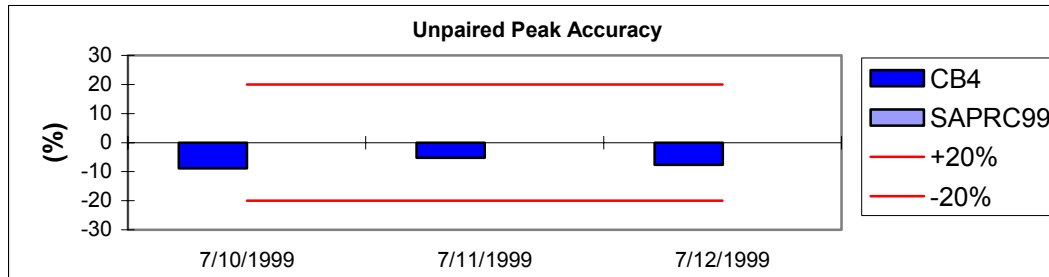
ENVIRON July/August 2000, SF East

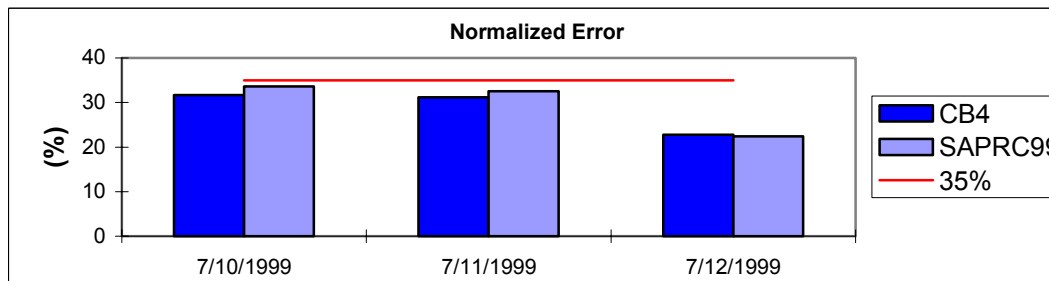
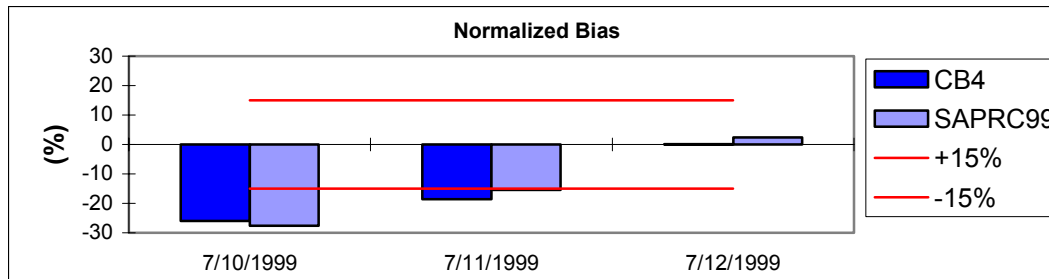
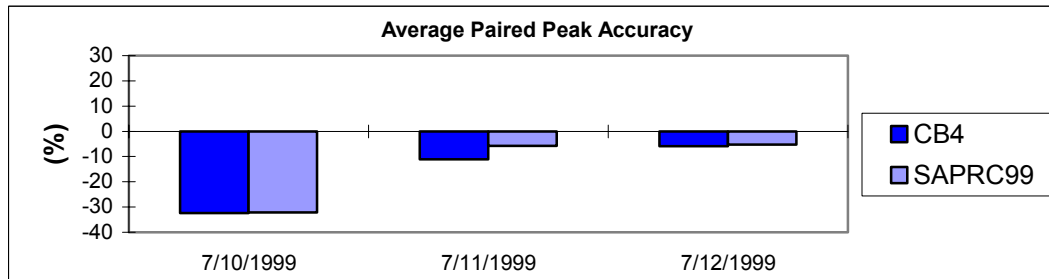
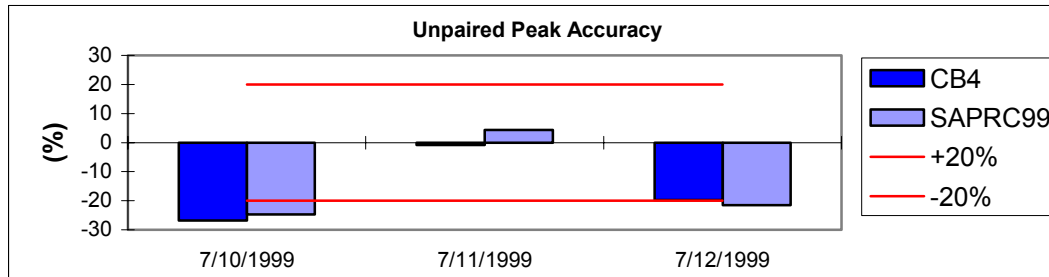


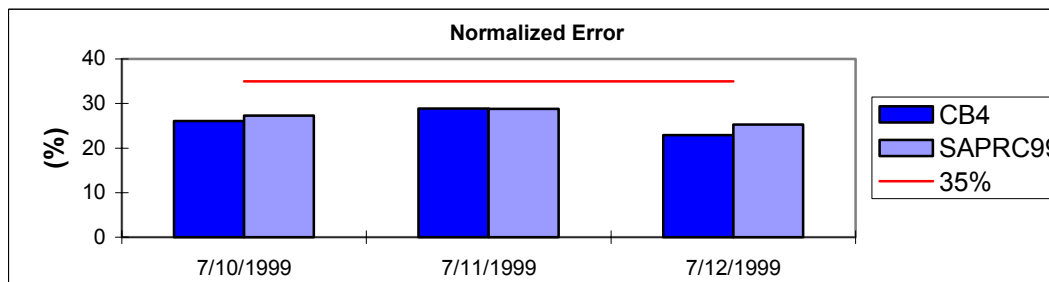
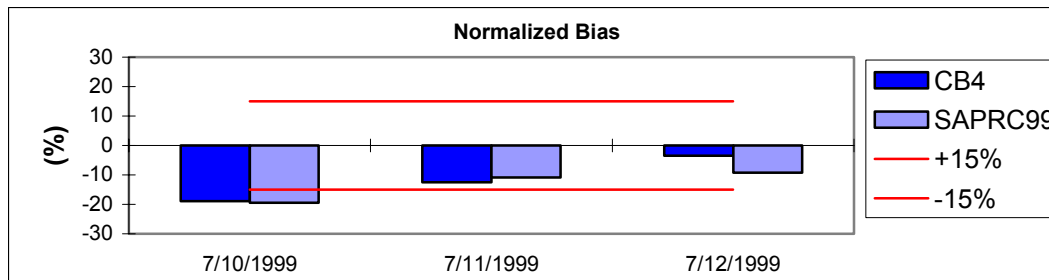
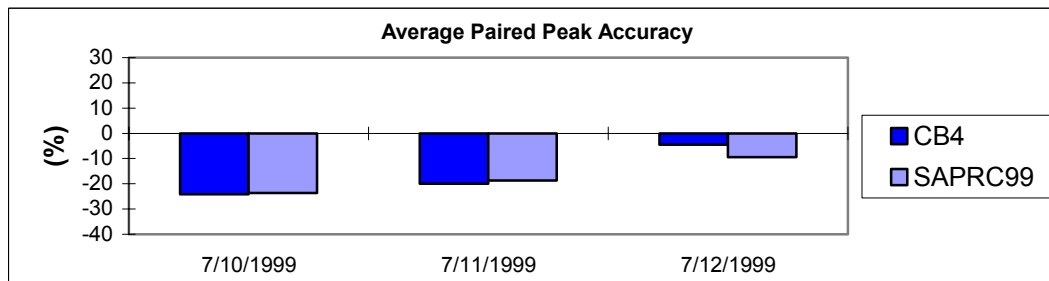
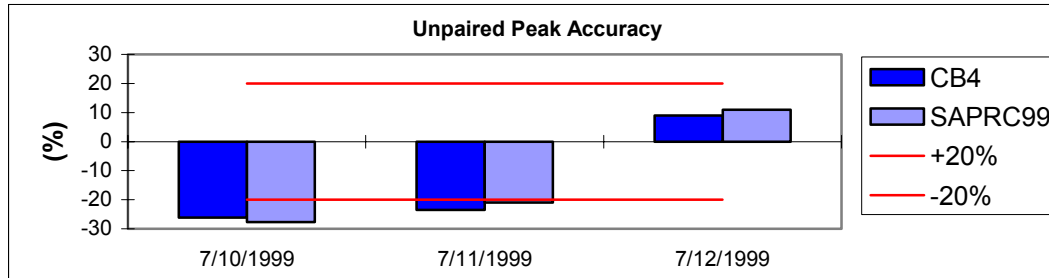












Reminder, July 1999 MM5 Performance

- **Original ARB run consistently performs better than any BAAQMD sensitivity test**
- **Analysis nudging run improves wind speed performance in BA, but is clearly worst run in all other respects**
- **MRF “phase-lag” problem clearly evident for some areas**
- **Wind direction performance especially unacceptable on July 11-12 in central valley**
- **BA is too warm, central valley is too cool in all runs**

New July 1999 MM5 Runs

- **Use Eta PBL instead of MRF**
 - To fix the time-lag in wind speeds
 - To reduce over estimates in mixing depth
- **Results**
 - Better wind speed RMSE
 - No significant impacts on wind direction or temperature
- **Newest run adds NOAH LSM**
 - To improve temperatures
 - Results?

Summary, July/Aug 2000 MM5

- **Addition of NOAH LSM improves:**
 - Humidity performance in BA, SAC, SSJV
 - Daytime temperature performance in central valley
- **Addition of FDDA improves wind performance in all 4 areas, and temperature in CSJV**
- **Overall, Eta+NOAH+FDDA is best simulation and performs acceptably well**

Remaining Met Issues

- **“Best” MM5 simulations are:**
 - Only moderately acceptable relative to performance benchmarks
 - But do not always lead to best CAMx performance
- **Issues:**
 - Proper temperature performance leads to high BA winds, and vice-versa
 - Need more terrain-induced drag?
 - MM5 roughness is too low
 - Terrain details (small canyons/arroyos) not captured even at 1-km resolution