Appendix 8E

MM5 Model Evaluation
Document #1
Meteorological Data Analysis

Urban, Regional Modeling and Analysis Section
Division of Air Resources
New York State Department of Environmental Conservation
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OTC Air Quality Modeling Domains

36km Domain (145x102x22)
12km Domain (172x172x22)
MM5 input and output files were received from UMD for entire 2002 in 128 3.5-day chunks with 12-hour overlapping period between adjacent pieces.

Evaluation was limited to 12km air quality modeling domain for 12km MM5 output files over the 5-month period of May to September 2002.

Surface observation datasets include NCAR ds472.0 (around 800 stations) and CASTNet data (around 50 stations).
METSTAT program from Environ was used to examine surface wind speed and direction, temperature and humidity

Correlation coefficients were calculated for surface wind speed, temperature and humidity

Wind speed correlation with TDL are ranging from 0.7 to 0.8
Temperature correlation with TDL are .96 and better
Humidity correlation with TDL are ranging from 0.8 to 0.9
Monthly total of MM5 predicted precipitation was compared with 1/8-degree CPC rain gauge analysis

For months of May and September 2002, MM5 is doing a fair job capturing the rainfall patterns

For months of June, July and August, the model is not doing well in terms of pattern and amount, probably is related to summertime convective activities
Obs  August 2002  MM5

Monthly Precip Accumulation August 2002 CPC RFC 1/8 Deg

UMD MM5 Monthly Precip Accumulation August 2002
MM5 cloud cover was compared qualitatively with UMD Surface Radiation Budget Groups’ products

The observed cloud interpolated from satellite base data of 0.5° by 0.5° resolution

Total cloud fraction estimated by MCIP from MM5 low, middle and high cloud fraction

MM5 is doing a fair job to simulate cloud patterns for the time periods we examined
Observed and Simulated Cloud field on August 13, 2002

Observed Cloud

MM5 Cloud
Observed and Simulated Cloud Field on August 14, 2002

**Observed Cloud**

**MM5 Cloud**

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**PANE by NCAR**

August 14, 2002 12:00:00

Min - 0.00 at (107.1), Max - 1.00 at (23.1)

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**PANE by NCAR**

August 14, 2002 12:00:00

Min - 0.00 at (163.1), Max - 1.00 at (12.28)
Observed and Simulated Cloud Field on August 15, 2002

Observed Cloud

MM5 Cloud

August 15, 2002 12:00:00

Min= 0.00 at (135.1). Max= 1.00 at (1.1)

August 15, 2002 12:00:00

Min= 0.00 at (154.6). Max= 1.00 at (96.1)
MM5 vertical wind speed profiles were compared qualitatively with wind profilers observations, using low level jets (LLJ) as an indicator

MM5 is doing a fair job capturing LLJ events