Meteorological Modeling Update
May/June ’05 Episode
Presented for Doug Boyer & Bright Dornblaser
by Dick Karp

Southeast Texas Photochemical Modeling
Technical Committee Meeting

June 20, 2007
Performance Evaluation

May 18 – June 3, 2005 (2005Ep0)

- Air Temperature Plots
- Wind “Whisker” Plots
- PBL & Kv Plots
- Plume Plots
May/June ‘05 Episode

hgb daily max 8-h ozone (ppb)

# of sites >= 85 ppb

<table>
<thead>
<tr>
<th>Date</th>
<th>Daily Max 8-h O3 (ppb)</th>
<th>Sites &gt;= 85 ppb</th>
</tr>
</thead>
<tbody>
<tr>
<td>20050519</td>
<td>73.1</td>
<td>1</td>
</tr>
<tr>
<td>20050520</td>
<td>84</td>
<td>1</td>
</tr>
<tr>
<td>20050521</td>
<td>92.6</td>
<td>2</td>
</tr>
<tr>
<td>20050522</td>
<td>84</td>
<td>1</td>
</tr>
<tr>
<td>20050523</td>
<td>70.4</td>
<td>1</td>
</tr>
<tr>
<td>20050524</td>
<td>92.2</td>
<td>1</td>
</tr>
<tr>
<td>20050525</td>
<td>88</td>
<td>1</td>
</tr>
<tr>
<td>20050526</td>
<td>116.8</td>
<td>2</td>
</tr>
<tr>
<td>20050527</td>
<td>57.4</td>
<td>1</td>
</tr>
<tr>
<td>20050528</td>
<td>10</td>
<td>1</td>
</tr>
<tr>
<td>20050529</td>
<td>54.7</td>
<td>1</td>
</tr>
<tr>
<td>20050530</td>
<td>64.3</td>
<td>1</td>
</tr>
<tr>
<td>20050531</td>
<td>98.5</td>
<td>1</td>
</tr>
<tr>
<td>20050532</td>
<td>92.2</td>
<td>1</td>
</tr>
<tr>
<td>20050533</td>
<td>20</td>
<td>2</td>
</tr>
<tr>
<td>20050534</td>
<td>76.6</td>
<td>1</td>
</tr>
<tr>
<td>20050535</td>
<td>125.8</td>
<td>2</td>
</tr>
</tbody>
</table>

Air Quality Division • Meteorological Modeling Update; Doug Boyer and Bright Dornblaser: June 20, 2007 • Page 4
Vertical Diffusivity $K_v$ (m$^2$/s) (05/19/2005-06/03/2005)

MM5 2005sep0_eta_fdda

GALC at (500.2, -1158.7) km (EPA481670014, C34/A109/X152, 1997/04/16-now, Galveston, Galveston Co., TX)
Temperature (°C) at Layer 1 (05/19/2005-06/03/2005)

MM5 2005ep0_ eta_fdda

C35C at (458.2, -1108.8) km (EPA482011035, C403/C304/A113, 1997/12/17-now, Clinton, Harris Co., TX)
Horizontal Wind (m/s) at Layer 1 (05/19/2005-06/03/2005)

MM5_2005sep0_eta_fdda

C35C at (458.2,-1108.8) km (EPA482011035, C403/C304/A113, 1997/12/17-now, Clinton, Harris Co., TX)
Horizontal Wind (m/s) at Layer 1 (05/19/2005-06/03/2005)

MM5 2005ep0_eta_fdda

HCQA at (437.9, -1122.2) km (EPA482010051, C409, 2000/02/08-now, Croquet, Houston, Harris Co., TX)
Vertical Diffusivity $K_v$ (m$^2$/s) (05/19/2005-06/03/2005)

HCQA at (437.9, -1122.2) km (EPA482010051, C409, 2000/02/08-now, Croquet, Houston, Harris Co., TX)
Horizontal Wind (m/s) at Layer 1 (05/19/2005-06/03/2005)

MM5 2005ep0_eta_fdda

CNR2 at (438.0,-1041.3) km (EPA483390078, C78, 2001/10/16-now, C65 Relocated, 9472A Highway 1484, Conroe, Montgomery Co., TX)
Vertical Diffusivity $K_v$ (m$^2$/s) (05/19/2005-06/03/2005)

MM5 2005ep0_eta_fdda

CNR2 at (438.0 -1041.3) km (EPA483390078, C78, 2001/10/16-now, C65 Relocated, 9472A Highway 1484, Conroe, Montgomery Co., TX)
Forward Plume trajectories from Monitored Winds for hours: 0000 to 1700 CST on May 27, 2005.
Red Plumes are predominantly VOC; Blue Plumes are predominantly NOx; and Numerical Values are 8-hour Ozone (ppb).
Forward Plume trajectories from Modeled Winds for hours: 0000 to 1700 CST on May 27, 2005.
Red Plumes are predominantly VOC; and Blue Plumes are predominantly NOx.
Forward Plume trajectories from Monitored Winds for hours: 0000 to 1700 CST on May 31, 2005.
Red Plumes are predominantly VOC; Blue Plumes are predominantly NOx; and Numerical Values are 8-hour Ozone (ppb).
Forward Plume trajectories from Modeled Winds for hours: 0000 to 1700 CST on May 31, 2005.
Red Plumes are predominantly VOC; and Blue Plumes are predominantly NOx.
Meteorological Modeling Episode Status

- May 18 – June 3, 2005 (2005Ep0)
  - MM5 FDDA modeling Complete
  - MM5 FDDA modeling Complete
  - MM5 Sensitivity Modeling (e.g., SST)
- July 25 – August 9, 2005
  - MM5 FDDA modeling Complete
  - MM5 Sensitivity Modeling (e.g., SST)
- May 29 – June 16, 2006 (2006Ep0)
  - MM5 Coarse Domains Modeled
  - Awaiting Data Validation
Future Work

- Run Alternative Met Configurations (e.g., PBL schemes, Cumulus Parameterization)

- Incorporate Updated Land-use Characterization (collaboration w/UH)

- Incorporate Hourly Sea Surface Temperatures (collaboration w/UH)

- Evaluate the Met Modeling (e.g., PBL Plots, Plume Plots, other evaluation tools/products)