

## **SOUTHEAST TEXAS PHOTOCHEMICAL MODELING TECHNICAL COMMITTEE**

*Houston-Galveston Area Council Offices  
3555 Timmons Avenue  
Houston, Texas*

*April 13, 2015 10:00 a.m. – 3:30 p.m.*

### **ATTENDEES**

Rohit Sharma, Liz Hendler, Greg Stella, Ryan Perna, Bruce Davis, Jian Zhang, Ziyuan Wang, Sigie Ge, Shelley Whitworth, Dan Baker, Yunsoo Choi, Sherman Hampton, Zarena Post, Steve Davis, Marise Textor, Erik Snyder, Rebecca Rentz, Steve Smith, Lola Brown, Melanie Rousseau, Jim Smith, Kathy Wilson, John Jolly, Doug Boyer

### **MINUTES**

Doug Boyer with the Texas Commission on Environmental Quality (TCEQ) welcomed the group and started the meeting. A Microsoft Lync webinar was conducted for this meeting as well. All presentations are available on the [SET PMTC Web site](http://www.tceq.state.tx.us/implementation/air/airmod/committee/pmtc_set.html), [http://www.tceq.state.tx.us/implementation/air/airmod/committee/pmtc\\_set.html](http://www.tceq.state.tx.us/implementation/air/airmod/committee/pmtc_set.html).

#### SIP Planning and Implementation Update – Lola Brown (TCEQ)

Lola gave an update on the SIP and Rule actions that occurred since our last meeting, including the request for determination of attainment of the 1997 eight-hour ozone standard for the Houston-Galveston-Brazoria (HGB) and Dallas-Fort Worth (DFW) areas. Lola also discussed the Redesignation Substitute report for the Revoked One-Hour Ozone Standard and the Redesignation Substitute SIP Revision for the 1997 eight-hour ozone standard for the HGB nonattainment area.

#### EPA Update – Erik Snyder (EPA)

Erik discussed the main changes of the new draft modeling guidance. TCEQ and other states use this modeling guidance to develop their photochemical modeling for attainment demonstration. The main changes were to the relative response factor (RRF) calculation and the elimination of specific weight-of-evidence concentration goals.

Erik also touched on the SIP requirements for the PM NAAQS, SO<sub>2</sub> nonattainment SIPs, and the Texas regional haze SIP comment period.

#### H-GAC Update – Shelley Whitworth (H-GAC)

Shelley provided an update on recent conformity analyses, which were re-run to respond to TCEQ comments regarding sensitivity of motor vehicle speed bins. Their current work shows they are under the motor vehicle emission budgets using the latest MOVES work.

Shelley also discussed survey results regarding commuting alternatives.

Questions from the group were about TERP funding and natural gas vehicle usage.

Chemical condition and surface ozone in urban cities of Texas during the last decade: Observational evidence from OMI, CAMS, and model analysis – Yunsoo Choi, Ph.D. (University of Houston)

Dr. Choi showed trends in NO<sub>2</sub> and HCHO from the OMI satellite versus observed mixing ratios since 2005. For NO<sub>2</sub>, all urban areas of eastern Texas with OMI showed marked decreases in concentrations. The CAMS surface measurements exhibited larger decreases.

For HCHO, all urban areas of eastern Texas except Austin with OMI showed decreases in concentrations. The CAMS surface measurements showed larger decreases including Austin. The reason for Austin's increase in concentrations according to OMI wasn't quite clear.

Dr. Choi also showed a decreasing trend in maximum surface ozone for all urban areas in eastern Texas since 2005.

2014 HGB Ozone Season Review – John Jolly (TCEQ)

John showed the number of eight-hour periods in 2011, 2012, 2013, and 2014 with ozone greater or equal to 75 ppb by monitor. 2014 had far fewer periods above the 2008 eight-hour ozone standard. Comparing 2011 to 2014, John showed that 2014 had many days with low wind speeds that did not have high ozone. 2011 had many more high ozone days with low wind speeds.

In 2014, the daily temperatures were near the climatic normal while the precipitation was less than the long-term average. By comparison, 2011 was the driest year on record in the Houston area.

John also evaluated back trajectories on days with eight-hour maximum ozone concentrations above 75, 70, and 60 ppb. Many 2014 days had days with northerly winds while the comparable periods in 2011 had more southeasterly flow.

NO<sub>x</sub> and VOC trends at the HGB monitors showed decreasing or flat trends since 2010 (6 of 15 monitors' trends were statistically significant for NO<sub>x</sub>, 2 of 8 for VOC). Lynchburg Ferry had a slight positive trend in NO<sub>x</sub> however.

Reported NO<sub>x</sub> emission inventories for Harris County were very similar from 2010 to 2014.

CAMx to CMAQ Converter – Jim Smith, Ph.D. (TCEQ)

Jim updated the group on a new tool that TCEQ commissioned Environ to create. Because many other groups use CMAQ as their preferred photochemical model, they haven't been able to use our prepared modeling inventories. This new tool converts CAMx-formatted emission input files to CMAQ I-O/API format.

Comparing CAMx to the CMAQ run with the CAMx-converted emissions showed very similar spatial results, though CAMx produced more ozone. Both models overpredicted in the HGB area but performed well in DFW and San Antonio. Other areas had mixed performance.

TCEQ is continuing to investigate the differences between the two models' results.

### TCEQ 2012 Modeling Update – Doug Boyer (TCEQ)

Doug updated the group on the TCEQ's 2012 photochemical modeling efforts. The TCEQ decided to evaluate a new episode because the 2006 modeling episodes are now almost 9 years old. Significant changes to ozone precursor concentrations, population, emission sources, and ozone concentrations have occurred since 2006. Other groups including EPA have focused on 2011 as a base year to model, however the extreme drought that Texas observed does not make that an appropriate year to model.

The TCEQ is focusing on the June 2012 period to model first but would like to model the entire ozone season at some point. Most urban areas of eastern Texas observed ozone concentrations in excess of the 2008 eight-hour ozone standard during June 2012. The basis of the 2012 modeling platform is the 2015 DFW Attainment Demonstration SIP revision modeling. Most source categories have been updated, including on-road and oil and gas sources.

Initial model runs exhibited a high bias for maximum eight-hour ozone concentrations, especially along the Texas coast. Sensitivity runs to decrease concentrations over the Gulf of Mexico were made using updated sea salt chemistry and boundary condition reductions. Other tests involved reducing isoprene concentrations from biogenic sources. The best configuration at this time uses CAMx 6.10m3 with halogen chemistry and a 50% reduction in ozone along the Gulf/Atlantic boundary conditions. Compared to the first 2012 run, the model performance has markedly improved.

The 2012 modeling emission inventory and CAMx input files are now available at <https://www.tceq.texas.gov/airquality/airmod/data/tx2006>.

### Houston 8-hr Coalitioin Update: Review of EPA's 2025 Proposed Ozone NAAQS Control Cases – A Graphical Analysis – Greg Stella (Alpine Geophysics)

Greg updated the group on Alpine Geophysics's analysis of EPA's Ozone NAAQS control simulations for 2025. The evaluated the known and unknown NO<sub>x</sub> controls by county for the potential 70, 65, or 60 ppb ozone standard. They noted that 20 Texas counties (including current ozone nonattainment counties) did not have additional NO<sub>x</sub> reductions applied, unlike every other county in their scenarios. In each scenario, unknown controls were required for eastern Texas to reach attainment. Greg noted that EPA's control cases assumed that the unknown controls from anywhere in a region would achieve the same impact at all monitors within that region. Greg also noted that EPA's analysis did not take into account the non-linearity of emission controls and that the last ton of control may not yield the same ozone concentration reduction as the first ton of control.

### 2015 Air Quality Research Projects – Doug Boyer (TCEQ)

Doug updated the group on the TCEQ-sponsored air quality research projects and those under the Texas Air Quality Research Program administered by the University of Texas at Austin. Many of those projects will update emission inventories, improve air quality models, and analyze data from the 2013 DISCOVER-AQ study.

### Next Meeting

No suggestions for future meeting dates were given.