

The Rapid Synthesis of TexAQS II Results into the Texas State Implementation Plan (SIP)





Outline

- TexAQS II Purpose and Benefits
- Important SIP Dates
- The Rapid Synthesis Project
 - Approach
 - Time Line
 - Science Questions



TexAQS II Purpose and Benefits

- Better understanding of the importance of different emissions sources in the formation of ozone and particulate matter
- Document and understand transport of pollutants into and within Texas
- Acquire more accurate estimates of VOC and NO_x emissions
- Improve photochemical models through measurement of pollutants over East Texas
- Direct understanding of how and why pollution is forming without resorting to photochemical grid modeling
- Independent, objective verification of modeling results
- Acquire data to support a new photochemical modeling episode



TexAQS II Research Areas

- Emissions Verification and assessment
- Transport and Mixing
- Chemical Transformation
- Aerosol properties and radiative effects
- Forecast Models



Important SIP Dates

- Houston/Galveston/Brazoria and Dallas/Fort Worth SIP revisions must be submitted by June 15, 2007
- Houston SIP likely to be proposed December 13, 2006. Possible adoption in May 2007
- DFW SIP likely to be proposed in December 2006. Possible adoption in May 2007.
- For inclusion into SIPs technical results must be to TCEQ by late winter 2007 (February/early March 2007)
- TCEQ is funding a Rapid Synthesis Report to fast-track important study results into SIPs
- Additional results will become available as work is finished



Rapid Synthesis Project

- Grant to North Carolina State University
- Ellis Cowling (Southern Oxidants Study) is the Principal Investigator
- Cost is approximately \$136,000



Rapid Science Synthesis Approach

- TCEQ has identified SIP-relevant science questions/issues
- Principal Investigator will identify working groups composed of scientists from TexAQS II, Universities, Federal Labs, and Industry
- Working groups assess initial TexAQS findings and provide reports of findings with regard to SIP-relevant science questions and the certainty/uncertainty of results



Time Line for Rapid Science Synthesis of TexAQS Results

- Interim Progress Report (May 31, 2006)
- First Science Synthesis Report (July 15, 2006)
- Preliminary Rapid Synthesis Results (October 31, 2006)
- Final Rapid Science Synthesis of TexAQS II Results (August 31, 2007)



SIP-Relevant Science Questions

- Description of ozone and PM formation mechanisms, as observed and inferred independent of regulatory modeling.
 - Which local emissions are responsible for the production of high ozone in Houston, Dallas, and eastern Texas? Are different kinds of emissions responsible for transient high ozone and 8-hour average high ozone (i.e., ≥ 84 ppb)?
 - How do the structure and dynamics of the planetary boundary layer and lower troposphere affect ozone and aerosol concentrations in Houston, Dallas, and eastern Texas?



SIP-Relevant Science Questions

- Are highly-reactive VOC and NO_x concentrations still at the same levels in Houston as they were in 2000? How have they changed spatially and temporally? Are there specific locations where particularly large quantities of HRVOCs are still being emitted? Are those emissions continuous or episodic? How well do the reported emissions inventories explain the observed concentrations of VOCs and NO_x?
- What distribution of anthropogenic and biogenic emissions of ozone precursors can be inferred from observations?
- Are there sources of ozone and aerosol precursors that are not represented in the reported emissions inventories?



SIP-Relevant Science Questions

- Sensitivity to VOC and NOX emission reductions
 - How do the mesoscale chemical environments (NOX-sensitive ozone formation vs. radical-sensitive ozone formation) vary spatially and temporally in Houston, Dallas, and eastern Texas? Which mesoscale chemical environments are most closely associated with high ozone and aerosol?



SIP-Relevant Science Questions

- Background ozone and aerosol, and the role of regional transport
 - How do emissions from local and distant sources interact to determine the air quality in Texas? What meteorological and chemical conditions exist when elevated background ozone and aerosol from distant regions affect Texas?
 - Which areas within Texas adversely affect the air quality of other areas within Texas? Which areas outside of Texas adversely affect the air quality of areas within Texas?



SIP-Relevant Science Questions

- Other SIP-relevant science issues/questions
 - Why does the SAPRC chemical mechanism give different results than CB-IV? Which replicates the actual chemistry better?
 - How well do forecast air quality models predict the observed ozone and aerosol formation? What are the implications for improvement of ozone forecasts?
 - Who can observational approaches be used for determining NOX vs. VOC limitations for ozone production in different areas of the Houston-Galveston-Brazoria ozone nonattainment area?
 - What existing observational databases are suitable for evaluating and further developing meteorological models for application in the HGB area?