Rapid Science Synthesis Update
1 June 2007 - Austin, Texas

Goal: Summary of RSS status after 7 months

12 RSS Questions, 10 most relevant addressed today:

- Emissions
- O_3 and Precursor Chemistry
- Background O_3 and Aerosols
- Meteorology and Transport
- Photochemical Mechanisms

Presentations:

Emissions - RSS Questions A, C, D, E

8:30-8:50 - Joost de Gouw - HVROC, biogenic VOC, formaldehyde emissions

8:50-9:10 - Tom Ryerson - Point source NOx and SO_2, shipping, ammonia, mercury emissions

9:10-9:30 - Greg Frost - On-road vehicle emissions

O_3 and Precursor Chemistry - RSS Questions A, F, K

9:30-9:50 - Michael Trainer - What is the best conceptualization of O_3 production in the Houston area?

9:50-10:10 - Basil Dimitriades - An Observational Investigation of Spatial and Temporal Variation Patterns in the Sensitivity of Ozone to VOC and NOx in the Houston-Galveston- Brazoria Ozone Non-Attainment Area

Background O_3 and Aerosols - RSS Questions G, H

10:30-10:50 - Christoph Senff - Characterization of background ozone and aerosols

10:50-11:10 - Chuck Brock - Aerosol formation and transport within east Texas

11:10-11:30 - Gregory Osterman - Interstate transport of ozone and aerosols: the view from satellites and models.

Meteorology and Transport - RSS Question B

11:30-11:50 - John Nielsen-Gammon - 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?

SAPRAC vs. CB-IV - RSS Question I

11:50-12:10 - Dave Allen - Why does the SAPRC chemical mechanism give different results than CB-IV? Which replicates the actual chemistry better?

Emissions - RSS Questions A, C, D, E

Question A:

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 ppbv)?

Question C:
Are highly reactive VOC and NO_x emissions and resulting ambient 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 HRVOC are still being emitted?

Are those emissions continuous or episodic?

How well do the reported emissions inventories explain the observed concentrations of VOC and NO_x?

Question D:

What distribution of anthropogenic and biogenic emissions of ozone and aerosol precursors can be inferred from observations?

Question E:

Are there sources of ozone and aerosol precursors that are not represented in the reported emissions inventories?

O_3 and Precursor Chemistry - RSS Questions A, F, K

Question A:

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 ppbv)?

Question F

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?

Question K

How can observation and modeling approaches be used for determining (i) the sensitivities of high ozone in the HGB non-attainment area to the precursor VOC and NOx emissions, and (ii) the spatial/temporal variation of these sensitivities?

Background O_3 and Aerosols - RSS Questions G, H

Question G

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?

How high are background concentrations of ozone and aerosol, and how do they vary spatially and temporally?

Question H

Which areas within Texas adversely affect the air quality of non-attainment areas in Texas?

Which areas outside of Texas adversely affect the air quality of non-attainment areas in Texas?

Meteorology and Transport - RSS Question B

Question B

How do the structure and dynamics of the planetary boundary layer and lower troposphere

SAPRAC vs. CB-IV - RSS Question I

Question I

Why does the SAPRC chemical mechanism give different results than the carbon bond (CB-IV) mechanism?

Which replicates the actual chemistry better?