Recap of Lessons Learned by Participants
MANE VU – Midwest RPO SCIENCE MEETING
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The following statements were gleaned from a discussion with participants at the end of the workshop. These represent information the participants learned from presentations at this meeting. This transcription was prepared and edited by Julie McDill with assistance from John Graham and Susan Wierman. It has not been reviewed by the participants or presenters.

What did we learn about the chemistry of carbonaceous aerosols?

1. Semi-volatile organics transition back and forth from gas to particle phases. Semi-volatile organics are important precursors of PM$_{2.5}$.

2. Scientists may want to rethink the concept of “primary” versus “secondary” OC.

3. Some studies suggest that there is a diurnal pattern of OC with lower concentrations observed at night.

What did we learn about the sources of carbonaceous aerosols?

4. Methods for analyzing sources of carbonaceous PM$_{2.5}$ are not perfect, but carbon is an important contributor to regional haze and PM$_{2.5}$ nonattainment, and sufficient certainty for action is available.

5. It is important to focus on emissions from diesels, fires, and oil burning to address PM health effects.

6. Secondary products of fires are important but not identified by the same markers as primary smoke, and we need more information on secondary products of fires.

7. Much of OC composition is unknown.

8. Carbon-14 analysis at Brigantine indicated that most of total carbon is modern carbon, but the proportion is less than at some other rural sites.

9. The sources of secondary Organic Carbon in the summer are uncertain, but biogenic sources are very important in the summer, especially in rural areas.

10. Biogenic OC is very important in the Southeast.

11. Modern carbon is not necessarily natural – the source can be wood burning etc.

12. Research oriented monitoring methods can give very highly time resolved and detailed data.

13. Highly time-resolved data is useful to pinpoint sources. However, highly time-resolved speciated data can be difficult to interpret.

14. Individual molecular markers and groups of compounds are important indicators and more data is needed.

15. Aethalometer delta C can be useful wood smoke indicator.

16. Motor vehicle contributions in the winter are most uncertain but appear to be larger than in summer. This result was found by Mei Zheng in Atlanta and USEPA in Kansas City.
17. Lube oil important source of ship emissions.
18. Substantial growth in freight transport emissions is expected (ships, highways, etc.)
19. BC data analysis is useful in finding local sources.
20. Meat cooking contributes to OM.
21. Combustion of wood, trash is important.
22. We can estimate in-use emissions from motor vehicles in the field.
23. Nanoparticles on and near roadways are of concern.
24. A small number of cars are responsible for a large fraction of emissions, and you can’t always see the smoke.
25. The dominance of fires and organics in the western US is very striking
26. New and simpler methods for levoglucosan analysis are under development and may be useful for retrospective analysis.

What did we learn about emissions that contribute to organic particles?
27. Direct mobile source PM emissions are higher in the winter – consistent with Atlanta monitoring.
28. The uncertainty in measuring PM emissions needs resolution
29. The ammonia inventory needs improvement
30. Inventories are important.
31. Slowing ships reduces emissions.
32. For the next round of SIP revisions, we need better mobile source emissions data.
33. What is the role of VOC emissions in PM and Haze formation? VISTAS results suggest it is less important.

What did we learn about monitoring organic particles?
34. For routine EC and OC monitoring the Sunset carbon instrument is the best bet, but OC blanks must be properly assessed and accounted for.
35. Black carbon data from Aelthalometers have artifacts.
36. People who do daily forecasts should use satellite tools.
37. Satellite data can help fill gaps between ground data stations and add vertical information to help assess model performance.
38. Someone should develop remote monitor for nanoparticles.

What did we learn about health effects of particles?
39. There is no known threshold for PM effects.
40. It is unlikely that EPA would adopt a NAAQS for PM components soon.
41. Women are a sensitive group for PM.
42. There are health effects below the PM standard.
43. There are in-city differences in PM effects.
44. Chronic effects are more clearly related to elevated PM concentrations than short-term effects.
45. Additional controls are reasonable to include in SIPs.
46. We are just beginning to look at whether certain fractions of the PM are more important than others in causing health effects.

**What did we learn about modeling of aerosols?**
47. Models don’t correctly represent SO₂ atmospheric chemistry.
48. Clouds are important in atmospheric chemistry and are also not accurately represented in most modeling.
49. Nitrogen chemistry is an issue with CMAQ.
50. Sensitivity analysis of CMAQ would be interesting.
51. Models are under-predicting concentrations of OC in the Summer.
52. Contributions to haze in MANE-VU come from within and outside MANE-VU.
53. Model (CMAQ) performance acceptable for visibility in MANE-VU.
54. Future concentrations are predicted to decline and to be consistent with the Uniform Rate of Progress line at all MANE-VU sites.
55. Using a new chemical mechanism improved CMAQ performance in VISTAS.
56. CMAQ seems to work OK and predict attainment of PM NAAQS, but more work is needed.
57. Given the new PM standard and NSR considerations, we need a method for modeling impacts of emissions soon.
58. An optimization model of freight transport is under development at the University of Delaware.
59. Communication between groups is needed to help identify data needs and possibilities.