Regional Haze Reasonable Progress Modeling Test-Modeling Guidance Issues

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Modeled Attainment Tests

- All O3/PM2.5/RH modeled attainment tests use model estimates in a “relative” sense
  - Premise: models are better at predicting relative changes in concentrations than absolute concentrations
- Relative Reduction Factors (RRF) are calculated by taking the ratio of the model’s future to current predictions of PM2.5
- RRFs are calculated for ozone and for each component of PM2.5 and regional haze

Applying the Modeled Tests

- Future concentrations are estimated using (component specific) RRF's and ambient measurements
  - RRF X ambient concentration = Future concentration
- Ambient data
  - Ozone- ozone data from AIRS
  - PM2.5- FRM and PM2.5 speciation measurements
  - Regional haze- IMPROVE measurements

Application of Speciated Modeled Test for Regional Haze

- The ambient data is readily available for the regional haze reasonable progress test
  - IMPROVE data
  - SMAT interpolations and adjustments not necessary for regional haze
- Components for visibility calculation:
  - Ammonium sulfate, ammonium nitrate, organic carbon, elemental carbon, soil/crustal, coarse mass
  - IMPROVE visibility equation:

$$b_{ext} = 3((f(rh))[SO_4] + 3((f(rh))[NO_3] + 4(f'(rh))[OC] + 10[EC] + 1[IP] + 0.6[CM]$$

Regional Haze Reasonable Progress Test

- Estimate current b_{ext} from monitored data
  - Follow procedures in "Guidance for Tracking Progress Under the Regional Haze Rule"
    - Calculate extinction for 6 components
    - Calculate 20% worst days and 20% best days (5 years)
- Model "current" PM concentrations
- Model future PM concentrations
- Calculate RRF for each component (change in mass)
  - 20% best days and 20% worst days
- Estimate future b_{ext}
- Convert difference in future and current b_{ext} to deciviews
- Determine if reasonable progress goal is met

Regional Haze Test-Issues

- Test needs to be revised to account for differences in the draft modeling guidance and the final regional haze tracking guidance
  - Tracking guidance specifies calculation of **daily deciview values** which are averaged across the 20% best and 20% worst days
  - The modeling guidance specifies calculation of **daily beta extinction** values which are averaged across days, then converted to deciviews as the last step
    - Because deciviews is a log function, the values depend on the order of the calculation
  - The modeling guidance should be changed so that it is consistent with tracking guidance

Regional Haze Test-Issues

- Regional Haze test
  - There are many potential methods of calculating RRFs
    - Average RRF
    - Quarterly average RRF
    - Day specific RRF
    - etc.
  - VISTAS has identified and tested different options
    - White paper
  - We should attempt to identify the “best” methodology to include in the final PM2.5/RH modeling guidance