



MATS

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MATS

- Software package that performs the modeled attainment tests for ozone and PM2.5
 - Developed at EPA under contract by Abt Associates
- Attainment tests in MATS are coded as recommended in the modeling guidance
- Current MATS version 2.3.1
 - http://www.epa.gov/scram001/modelingapps_mats.htm
 - 8-hr ozone
 - Annual PM2.5
 - 24-hr PM2.5
 - Regional haze

MATS- Ambient Datasets

- MATS is driven by both ambient data and model data
 - MATS contains default ambient datasets of design value and daily data
 - 8-hr ozone design values (1999-2008)
 - PM2.5 design values (1999-2008)
 - PM2.5 daily average FRM and speciation data
 - FRM (1999-2007)
 - Speciation- CSN and IMPROVE (2002-2006)
 - IMPROVE regional haze data (2000-2006)

Photochemical Model Data

- MATS uses post-processed photochemical model data (CMAQ or CAMx or any other model)
 - CSV files
 - MATS input format
- Ozone- 8-hr daily max
- Annual PM2.5- daily or quarterly average PM and species
- 24-hr PM2.5- daily average PM and species
- Regional haze- daily average PM species

MATS PM2.5 Attainment Test

- MATS interpolates PM2.5 species and FRM data to estimate species fractions at FRM sites
 - VNA interpolation scheme
- Species concentrations are calculated from species fractions
- Species concentrations adjusted to account for differences between STN and FRM measurements (SANDWICH)

Speciated PM_{2.5} Mass Components as defined in MATS

- **PM_{2.5}_{FRM}** = { [OCM_{mb}] + [EC] + [SO₄] + [NO₃_{FRM}] + [NH₄_{FRM}] + [water] + [crustal material] + [0.5] }
- OCM_{mb}- organic carbon mass by difference
- EC- measured elemental carbon
- SO₄- measured sulfate ion
- NO₃_{FRM}- nitrate retained on the FRM filter
- NH₄_{FRM}- ammonium retained on the FRM filter
- Water- particle bound water mass attached to sulfate, nitrate, and ammonium
- Crustal- soil and other inorganic mass
- Blank mass- a constant 0.5 ug/m³ blank mass

Species Components- More detail

- NO_3_{FRM} – Retained nitrate
 - Calculated using hourly temperature and relative humidity data
 - EPA has provided default pre-calculated retained nitrate concentrations
- NH_4_{FRM} - Retained ammonium
 - “Indirect” ammonium concentrations using retained nitrate, sulfate, and degree of neutralization of sulfate (DON)
- Particle bound water
 - EPA default water equation
 - Two 21 term equations (low acidity and high acidity cases)

Spatial Fields

- Spatial concentration fields
 - Ozone design values
 - Annual average PM2.5
- Fused spatial fields (gradient adjusted)
 - Interpolated ambient data is combined with gridded photochemical model data to adjust fields based on modeled gradients
- Spatial fields can be used for:
 - Unmonitored area analysis
 - Health benefits calculations (BenMAP)

Future MATS Updates

- 24-Hr. NAAQS
 - Add 24-hr spatial fields
- Updates for new ozone NAAQS
 - W126
 - Attainment test for new 8-hr primary
- Update ambient data
 - 2007 and 2008 PM speciation data
 - 2009 ozone design value data
 - 2009 FRM data
- Other requests?