

WRAP Technical Support System (TSS) Training

Source Apportionment/Emissions Analysis/Visibility Projections

June 19-20, 2007

1. Introduction

1.1 Opening Remarks

- a. This training will include a general overview of the WRAP Technical Support System and an in-depth review of the “Source Apportionment/Emissions Analysis/Visibility Projections” resources.
- b. The TSS resources, or tools, were developed with regional haze planners in mind. These tools directly support topics required to be addressed in all regional haze planning documents submitted to EPA.
- c. Feedback on the TSS in general or the specific resources reviewed today is welcome.

2. Overview of Home page

2.1 TSS Home page (<http://vista.cira.colostate.edu/tss/>)

- a. Left-hand navigation bar
- b. Help page
- c. Log-in
- d. Resources page
- e. Methods page
- f. Projects page
- g. Partners page



<p>3. Source Apportionment</p>	
<p>3.1 Site Selection</p> <p style="text-align: center;"><u>Example:</u> Select Mount Zirkel CIA (MOZI)</p>	
<p>3.2 Several Choices for Emissions and Source Apportionment data review. Review “Tracer” and “Weighted Emissions Potential” tool options. Review where emissions data currently housed and discuss future changes.</p> <p>Evaluate Sources and Regions</p> <p>Source Apportionment Results</p> <p>Sulfate/SOx Tracer - All Source Regions - Review sulfate/SOx contributions by all source regions.</p> <p>Nitrate/NOx Tracer - All Source Regions - Review nitrate/NOx contributions by all source regions.</p> <p>Weighted Emissions Potential - Organic Carbon - Review weighted emissions potential for organic carbon.</p> <p>Weighted Emissions Potential - Elemental Carbon - Review weighted emissions potential for elemental carbon.</p> <p>Weighted Emissions Potential - Fine PM - Review weighted emissions potential for fine particulates.</p> <p>Weighted Emissions Potential - Coarse PM - Review weighted emissions potential for coarse particulates.</p> <p>http://vista.cira.colostate.edu/tss/Results/Emissions.aspx - Review emissions data in greater detail.</p> <p>Use these tools to:</p>	

Review weighted emissions potential for elemental carbon.

[Weighted Emissions Potential - Fine PM](#) - Review weighted emissions potential for fine particulates.

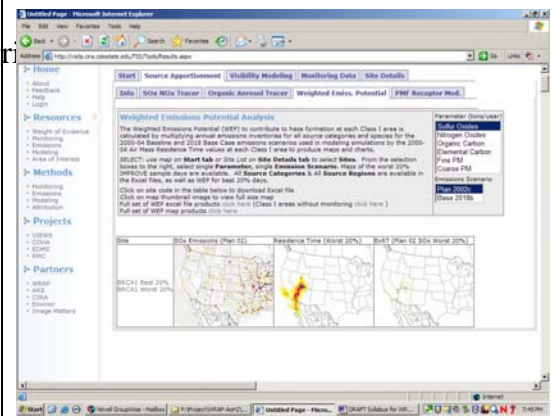
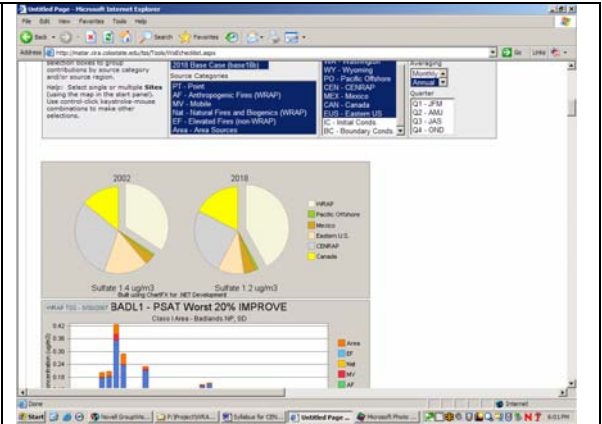
[Weighted Emissions Potential - Coarse PM](#) - Review weighted emissions potential for coarse particulates.

[Organic Aerosol Tracer](#) - Review organic aerosol contributions for selected Class I areas.

Emissions Data Review

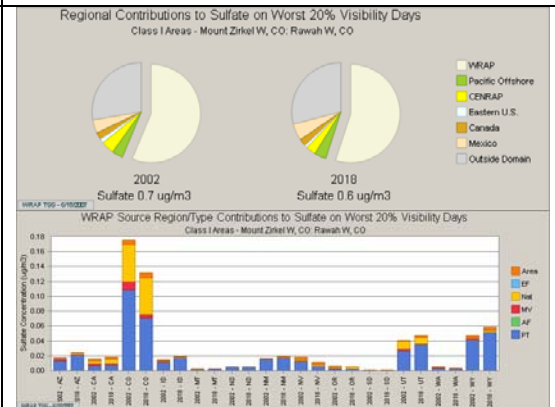
[Emissions Review Tool](#) - This tool will be used to review emissions and is under development.

[Emissions Viewer](#) - ArcIMS tool for reviewing gr emissions.

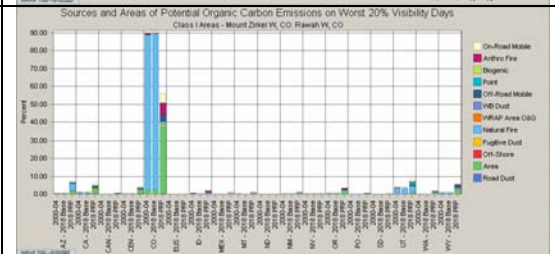


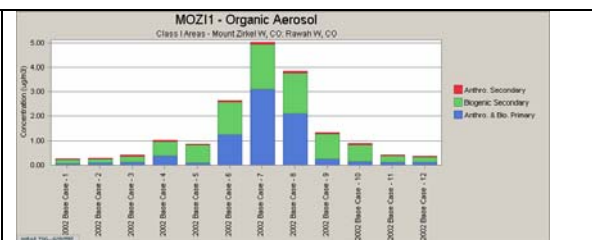
3.3 [Example: PSAT SO4 Tracers for MOZI](#)
 Area = Area Sources
 EF = Elevated Fires (non-WRAP)
 Nat = Biogenics and Natural Fires
 MV = On-Road and Non-Road Mobile Sources
 AF = Anthropogenic Fires
 PT = Point Sources

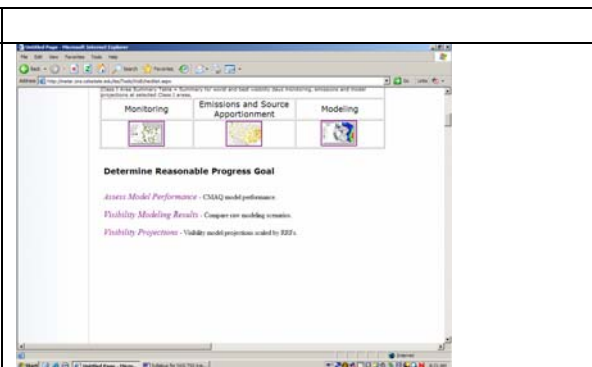
 W20% Days

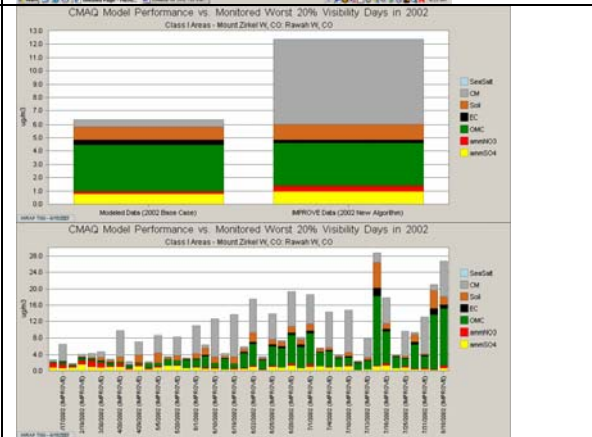


3.4 [Example: WEP Organic Carbon Analysis for MOZI](#)
 2000-2004 Baseline (plan02c)
 2018 Base188
 2018 Prp18a (still doing QA on Prp18a, preliminary and unverified results)

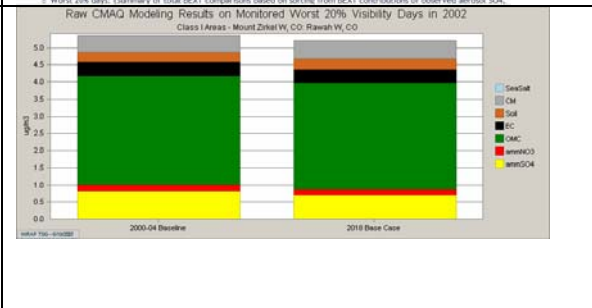


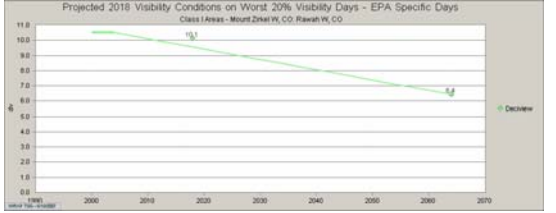
3.5	<p><u>Example</u>: Organic Aerosol Tracer Analysis for MOZI <u>Anthro Secondary</u> (SOA mainly from Aromatics) <u>Biogenic Secondary</u> (SOA from terpenes, does not include SOA from sesquiterpenes and isoprene) <u>Anthro and Bio Primary OC</u> (POA from mobile, area, etc Anthro plus fires)</p>	
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4.	<p>Modeling Output Review</p>		
4.1	<p>Several choices for Modeling output review. Review tool options.</p> <p>Assess Model Performance - CMAQ model performance. Visibility Modeling Results - Compare raw modeling scenarios. Visibility Projections - Visibility model projections.</p>		

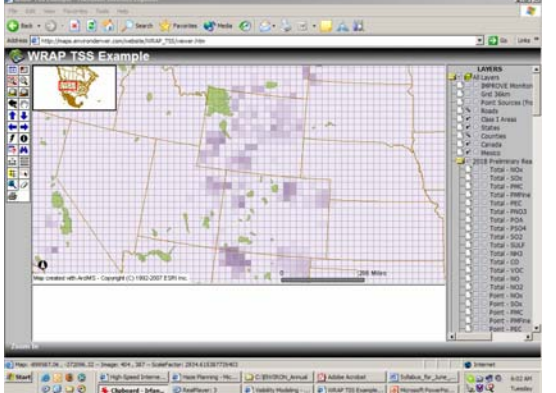
4.2	<p>Assess Model Performance #1</p> <p>Side-by-side modeled and observed stacked bar charts for PM mass and extinction for different days and averaging times:</p> <p>Average and Daily for W20% and B20% Days Valid IMPROVE Sampling Days All Days</p> <p><u>Example</u>: Average and Daily W20% days for MOZI</p>	
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4.3	<p>Assessing Model Performance #2 Access WRAP RMC Website http://pah.cert.ucr.edu/aqm/308/cmaq.shtml#base02bvsbase02a36k</p> <p>Scatter plots, time series plots bugle plots, spatial plots, MPE statistics, etc.</p>	<p>2002 CMAQ v4.5 base B and comparison with base A (base02b vs. base02a)</p> <p>Base02b results: Annual daily stacked bar plots, Bugle plots, Fractional Bias/Error, Unpaired in time/space analysis, Ambient visibility plots, Annual Aerosol spatial plots</p> <ul style="list-style-type: none"> • WRAP Run Specification Sheet (updated 4/12/06) • Daily stacked bar plots (dBF) for major extinction contribution species at IMPROVE sites in WRAP region, using IMPROVE dataset dated 09/09/05 • Bugle plots - Monthly Performance Goal (PG) and Performance Criteria (PC) based on: <ul style="list-style-type: none"> ◦ Individual Species: SO4, NO3, OC, EC, SO2, and CH ◦ Ambient Networks: IMPROVE, STN and CASTNet • Bar Plots - Fraction_Bias(k) (FB) and Fraction_Err(k) (FE) with results presented grouped in two different ways, by species and by monitoring network. <ul style="list-style-type: none"> ◦ Individual Species: SO4, NO3, OC, EC, SO2, and CH ◦ Ambient Networks: IMPROVE, STN and CASTNet • Unpaired in time and/or space analysis - comparisons of extinction contribution from major aerosol species are relaxed in time (for up to 2 weeks) and/or space (surrounding 9 grid cells) for each IMPROVE site (in WRAP region) on <ul style="list-style-type: none"> ◦ Best 20% days: unpaired_in_time and unpaired_in_time/space ◦ Worst 20% days: Summary of total BEXT comparison based on sorting from BEXT contributions of observed aerosol SO4
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4.4	<p>Visibility Modeling Results</p> <p>Side-by-side modeled and observed stacked bar charts for PM mass and extinction for different days and averaging times:</p> <p>Average and Daily for W20% and B20% Days Valid IMPROVE Sampling Days All Days</p> <p><u>Example</u>: Average W20% days for MOZI and 2000-2004 Baseline and 2018 base case</p>	
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4.5	<p>2018 Visibility Projections By total dv and extinction and species-specific 3 difference approaches for RRFs: EPA default – W20% Specific Days Quarterly W20% Days Monthly W20% Days <u>Example:</u> EPA default dv @ MOZI</p>	
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5. Emissions Inventory

5.1	<p>ArcIMS -- Spatial maps</p> <p>In Development</p> <p>http://maps.envirodenver.com/website/WRAP_TSS/viewer.htm</p> <p><u>Example:</u> WRAP Area O&G – NOx</p>	
5.2	<p>Emissions Summary Tables and Bar Charts</p> <p>In Development</p>	<p>SMOKE reports in process to being ported to TSS</p>