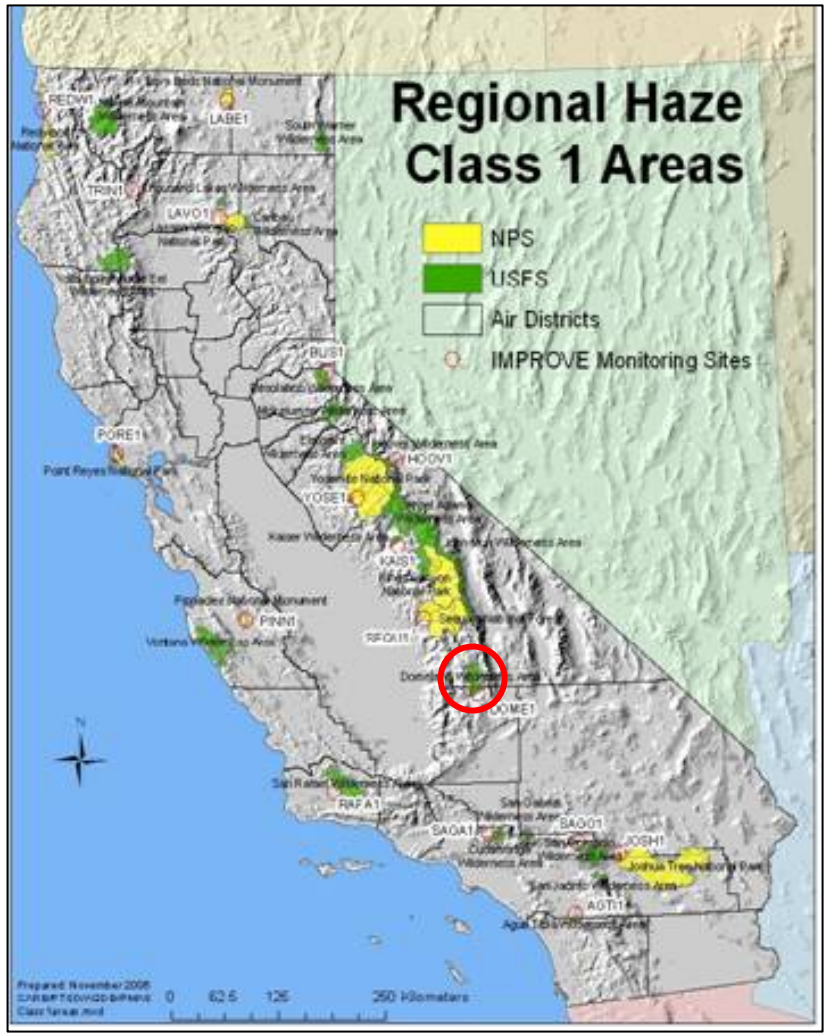
# Highlighting Monitor: DOME

# Dome Land Wilderness Area




Preliminary Draft
January 9, 2008

Feedback appreciated:
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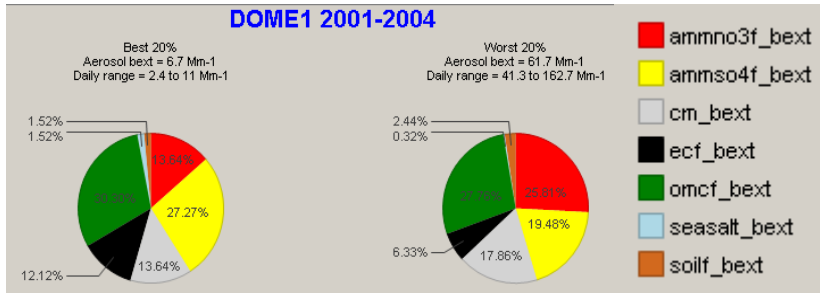
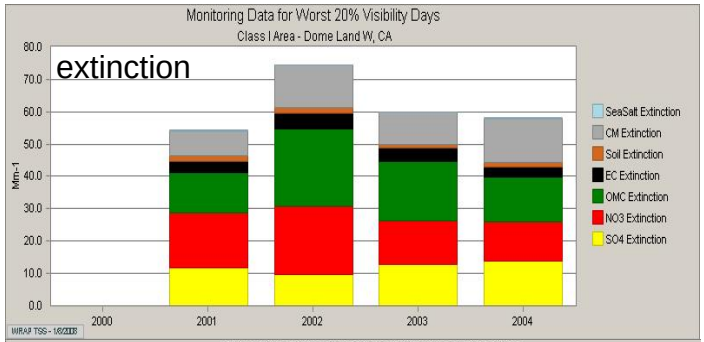
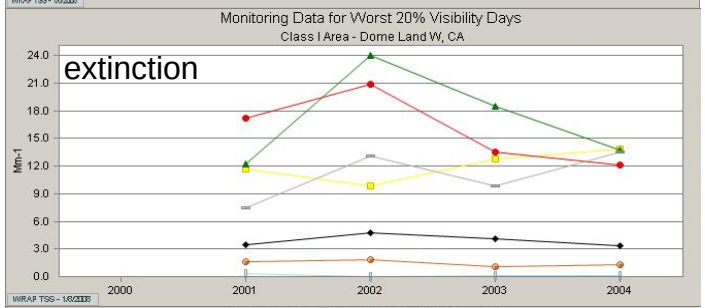
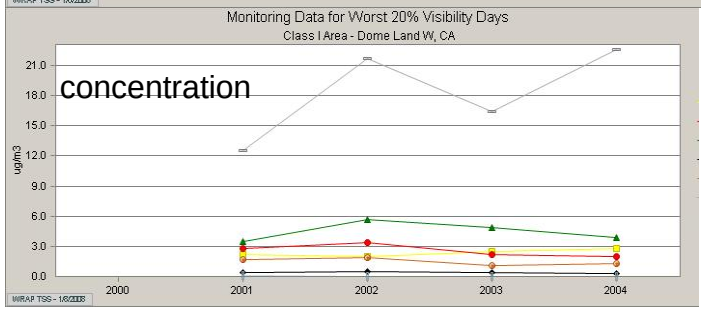
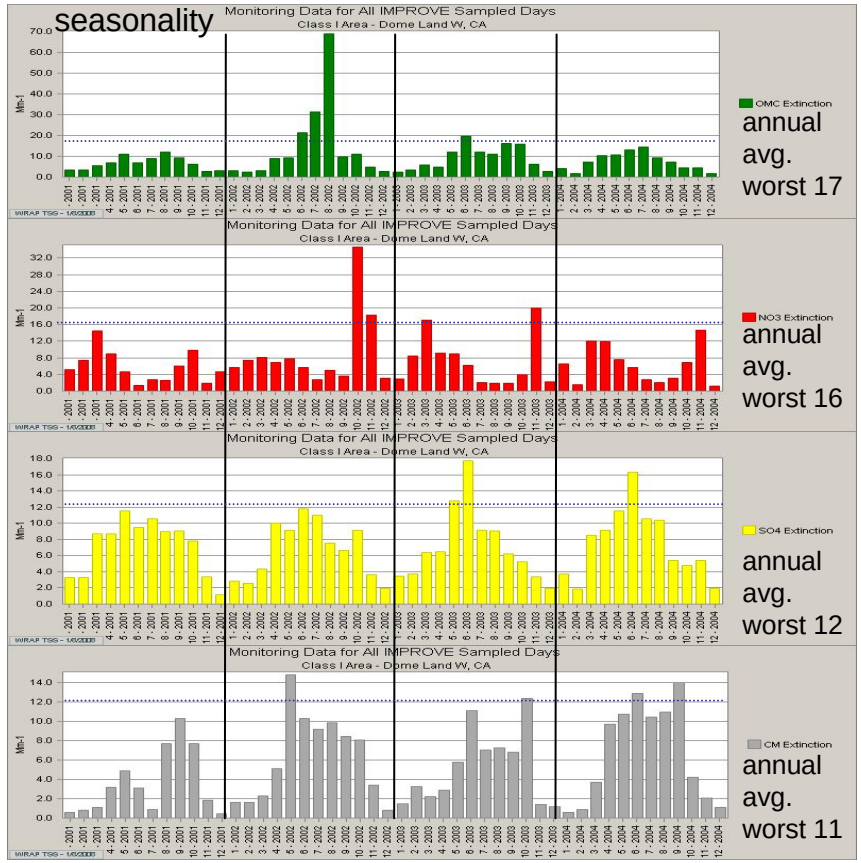
**DRAFT 1-9-08**




Seasonal pattern with worst days in dry season for OM and Sulfate

No worst days January nor December

Best Days always occur October through March

Nitrate drives worst days November through March

All major species drive worst days in early summer

CM and OM drive worst days in late summer

**<u>2002 Base Year contributions compared with other baseline years:</u>**

**Concentration:** Organic Matter, Nitrates, Fine Soil, Elemental Carbon, highest while Sulfates and Sea Salt lowest

**Extinction:** Organic Matter, Nitrates, Fine Soil, Elemental Carbon highest while Sulfate and Sea Salt lowest

**Patterns:** Coarse Mass irregular contributions annually, but seasonally high in dry season (May through October); despite high concentrations in atmosphere, coarse mass does not impair visibility (extinguish light) as strongly as other species

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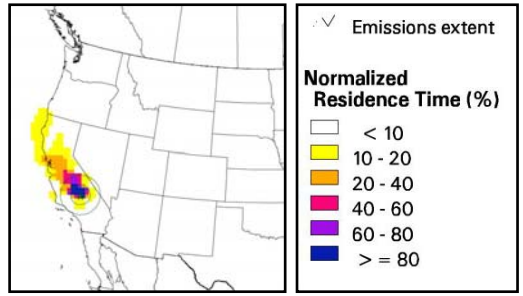
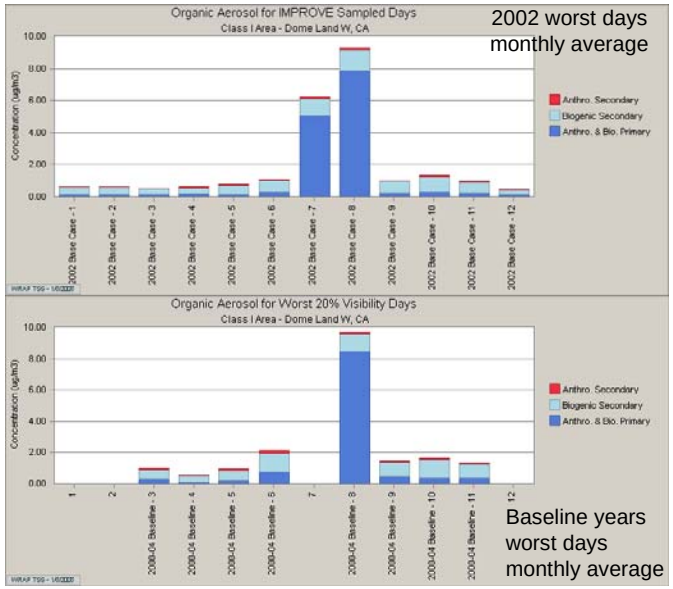
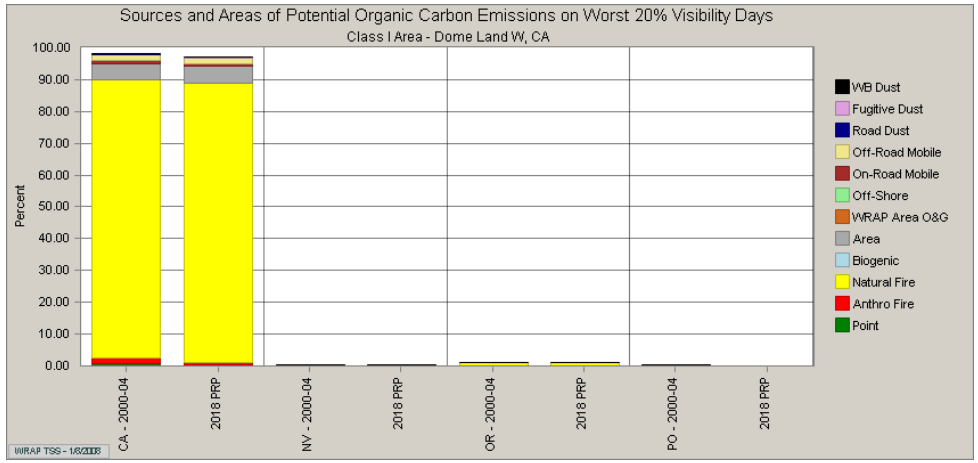
**ORGANIC MATTER**

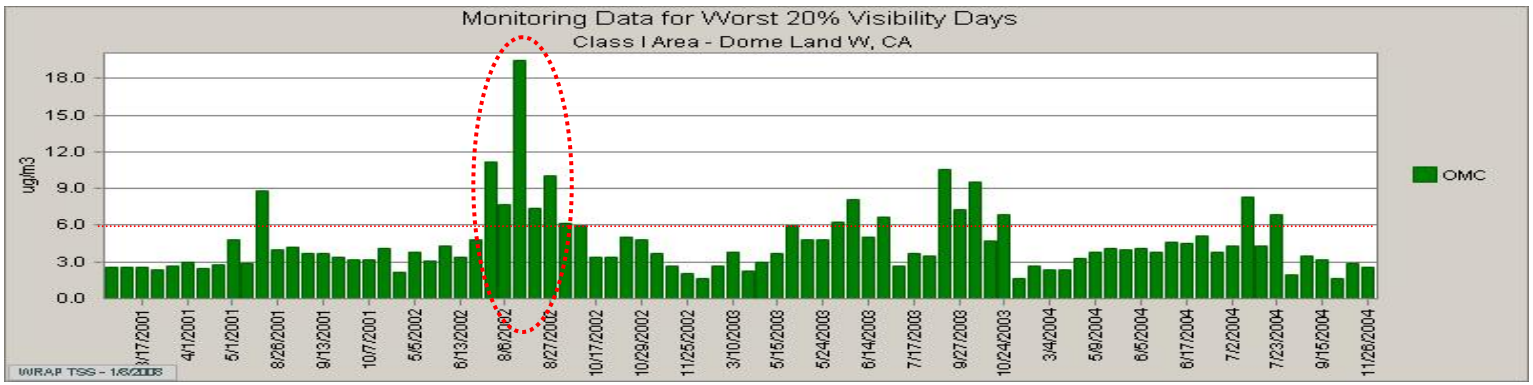



**Worst Day sources overwhelmingly Natural Fires in California**

Although Organic Aerosol concentrations are relatively high in July, there were no worst days during that month in 2001 and 2002




For all years, highest OMC concentrations hover around 10 ug/m3, but 2002 calculations are skewed by OMC spike at three times the worst day average of 6 ug/m3. Was this a wildfire event?

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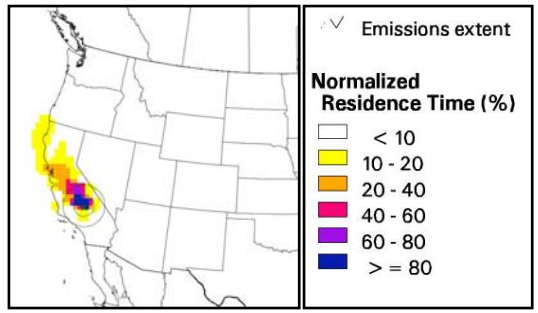
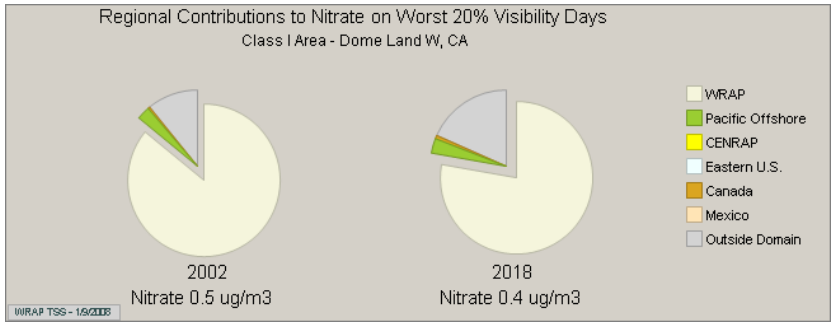
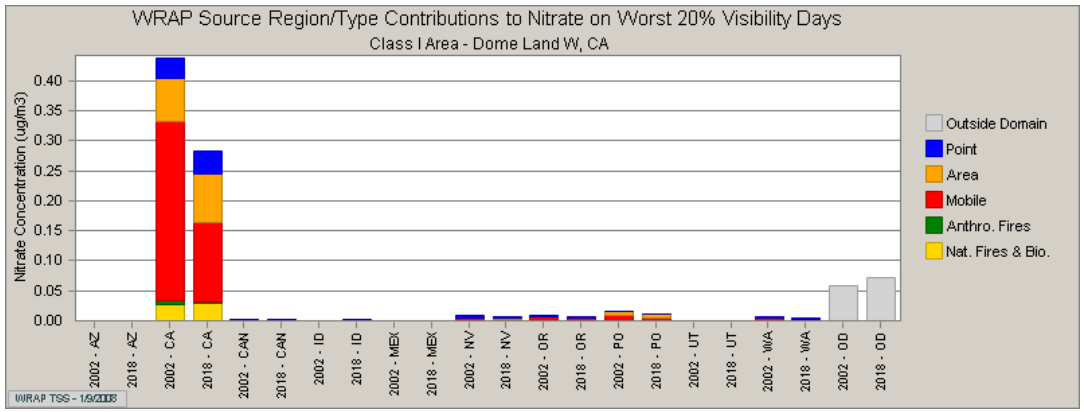
**NITRATES**



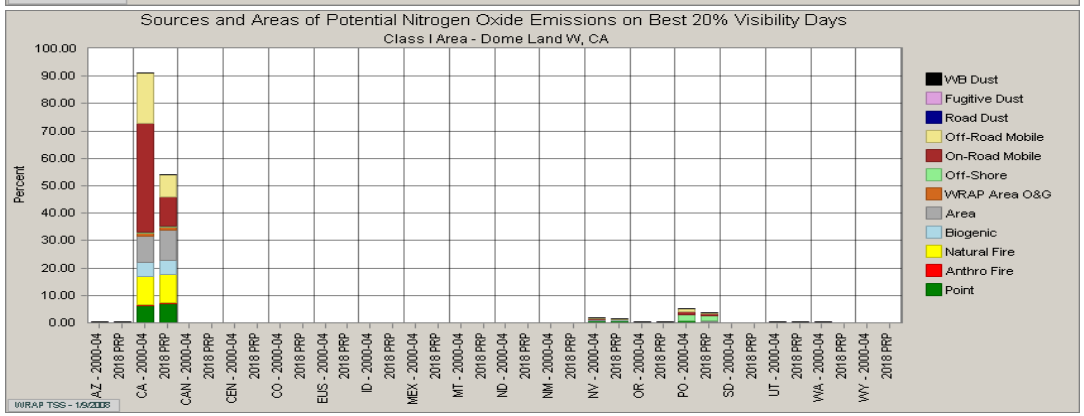




Nitrate concentrations could decrease 20% by 2018

California primary source area now but contributions from outside domain will increase in the future




Mobile Source NOx emission reductions from all contributing states are primary reason for nitrate reductions




Neighboring state contributions on worst days are relatively minor, despite the few individually large stationary sources

Meteorological patterns (residence times) on worst days transport very few haze species from other states

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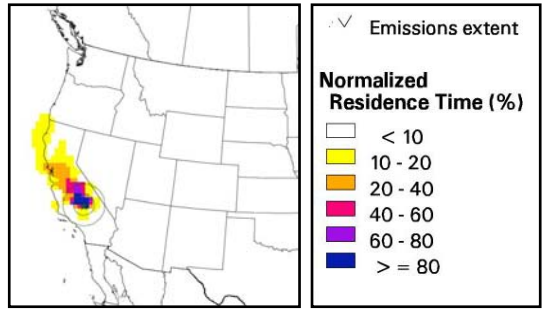
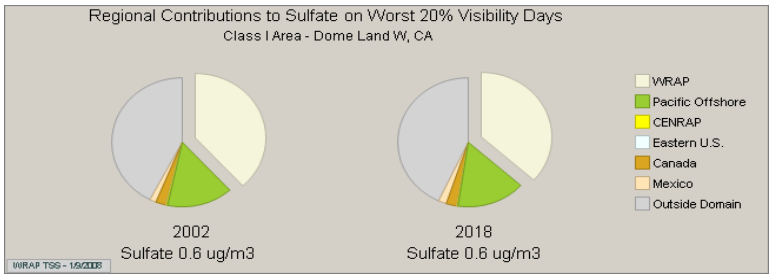
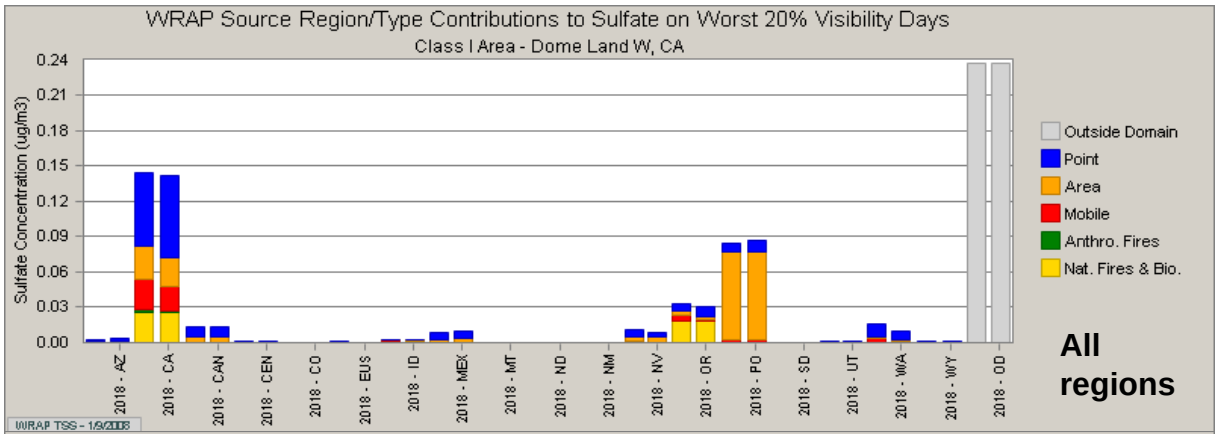
**SULFATES**

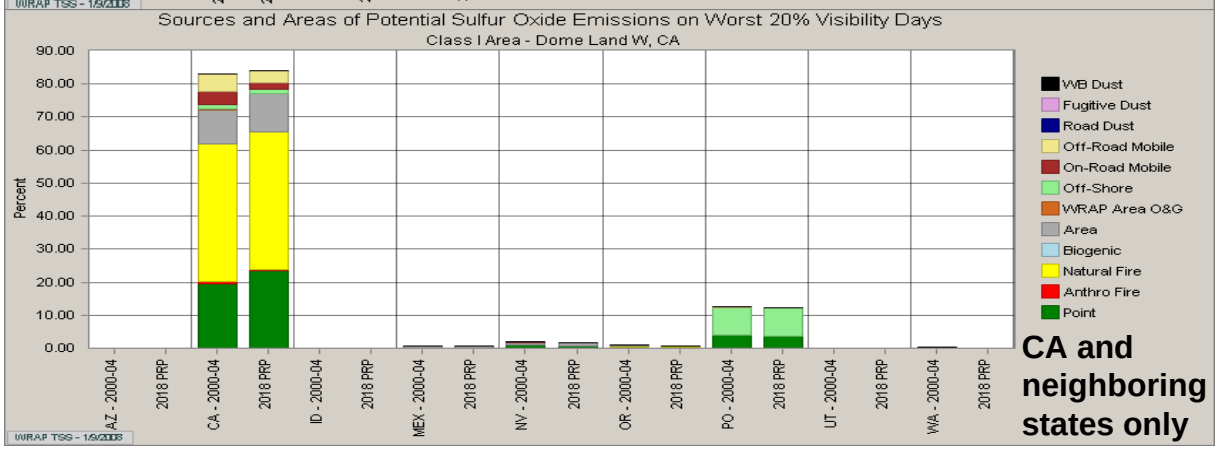



Very little change predicted in sulfates for 2018, using tracer analysis

Marine emissions will roughly double in Pacific Offshore by 2018 but currently NOT in the data for this modeling projection




The SOx/NOx Tracer analysis method (top graph) accounts for chemistry and removal processes. ***It shows sources from outside domain are biggest contributor of sulfates on worst visibility days.***

The Weighted Emissions Potential (WEP) analysis (bottom graph) is a screening tool that indicates which source regions have the potential to contribute to haze formation at specific Class I areas, based on both the baseline and 2018 emissions inventories. The WEP analysis relies on an integration of gridded emissions data, meteorological back trajectory residence time data, a one-over-distance factor to approximate deposition, and a normalization of the final results. Residence time over an area is indicative of general flow patterns, but does not necessarily imply the area contributed significantly to haze at a given receptor. ***It shows that California contributes the largest percentage of SOx emissions on worst visibility days.***

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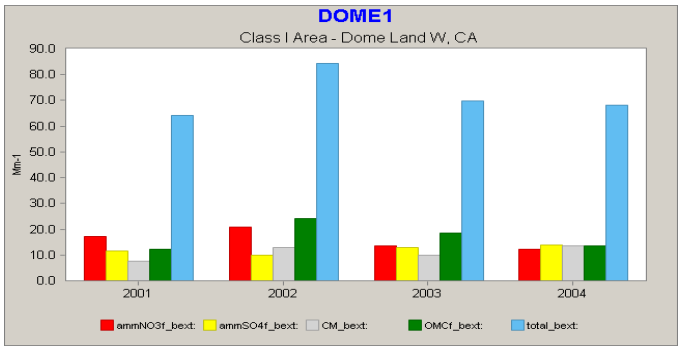
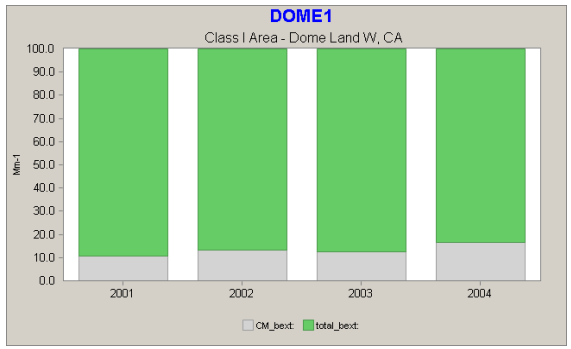
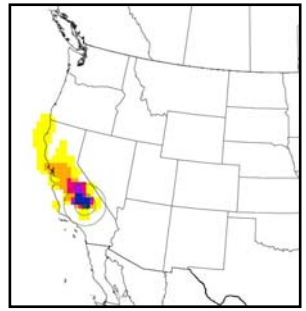
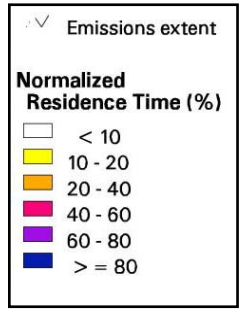
**COARSE MASS**

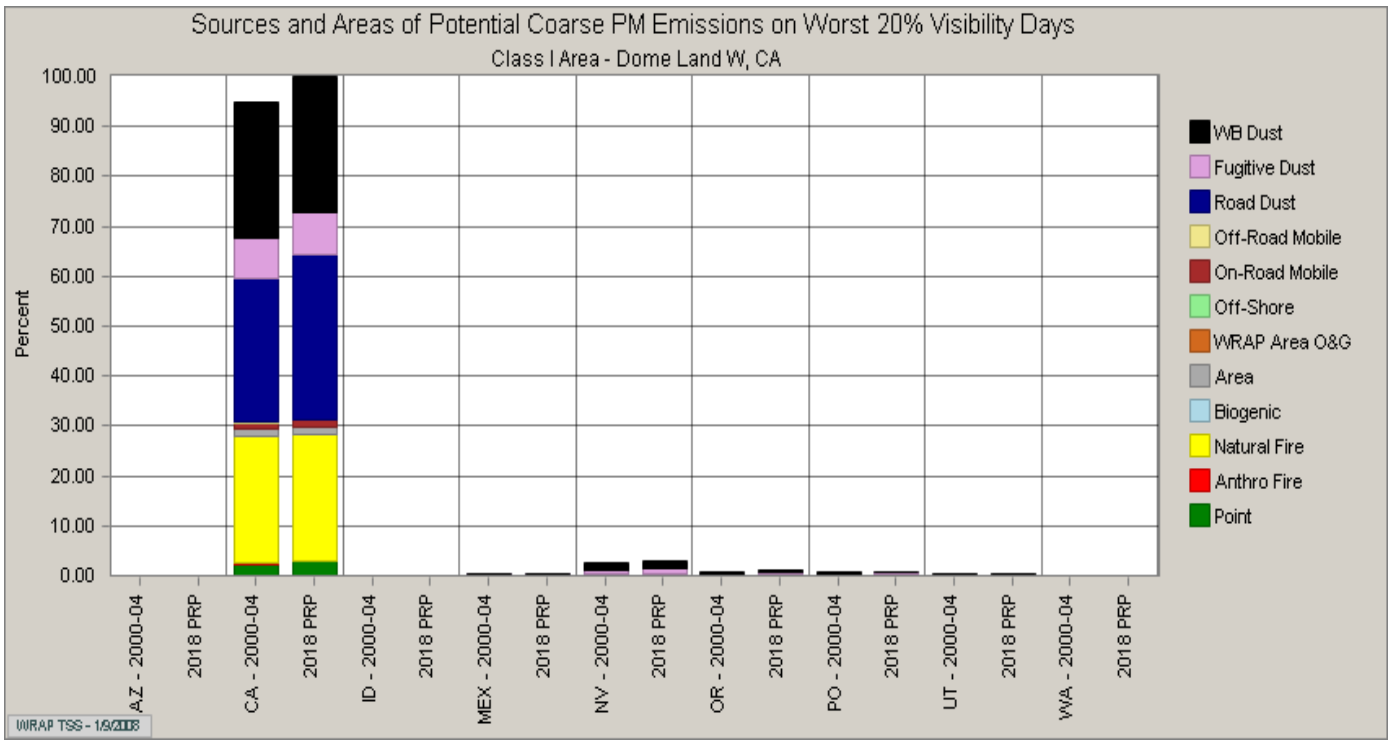


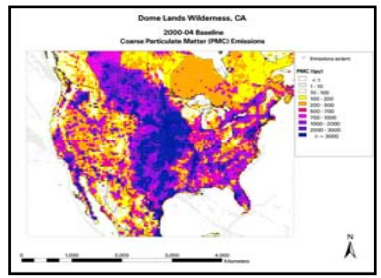






Annually, Coarse Mass is not a consistent portion of total extinction on worst days, but it is always less than a 20% contribution




Predominate sources are road dust, windblown dust, and natural fires from California

Looking towards DOME monitor and Dome Land Wilderness from south

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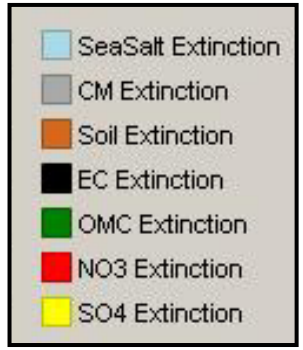
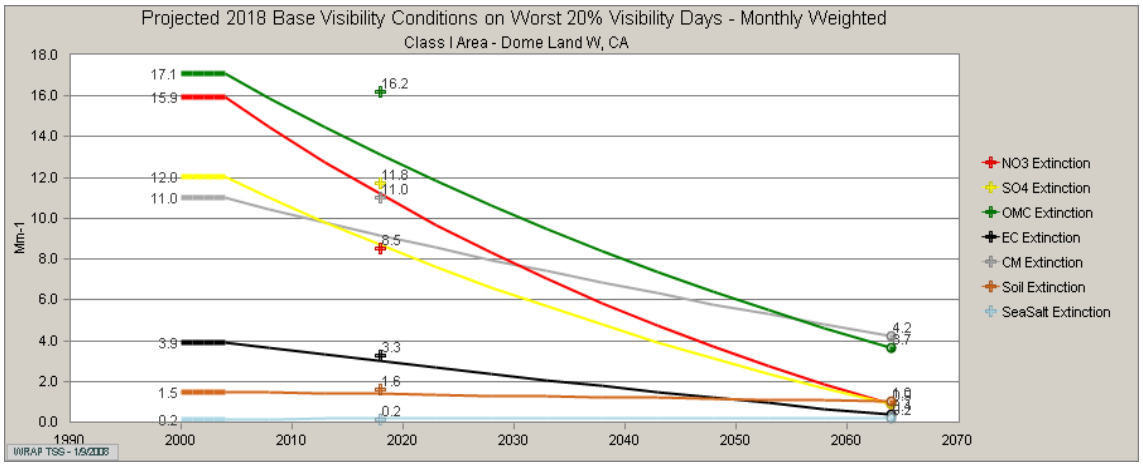
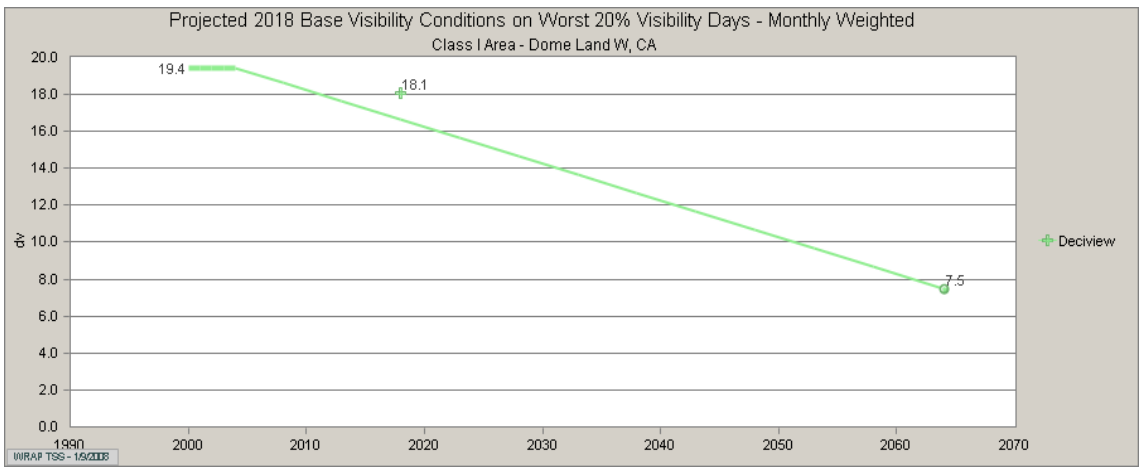
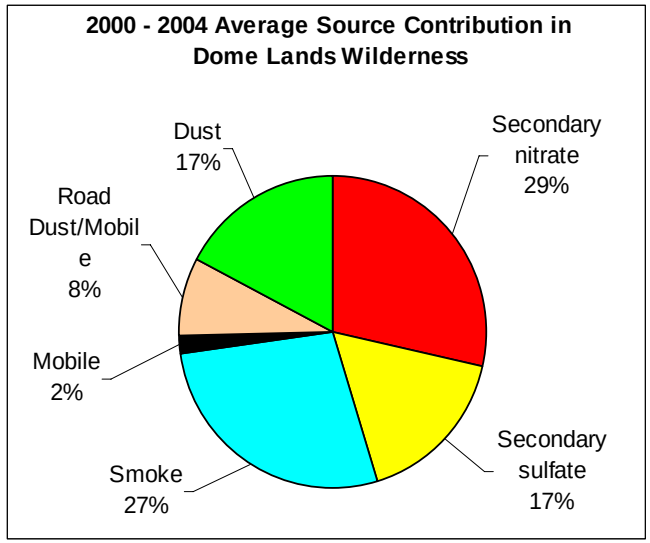



## 2000-2004 Baseline (plan02c) with 2018 Base Case Projection (base18b)




Preliminary draft Reasonable Progress Goal is 18.1 deciviews by 2018

Most of visibility benefit achieved by lowering NOX emissions from mobile sources

Positive Matrix Factorization (PMF, pie chart above) lists smoke as major contributor but does not specify species

Need inventory information to better understand potential precursors of secondary nitrates and sulfates