

Regional Haze

Arizona Department of Environmental Quality
October 19, 2010



Galiuro Wilderness, Arizona

What is Regional Haze?

Regional haze is visibility impairment produced by fine particles from a variety of sources that absorb or scatter light across a broad geographic area.

Class I Areas & Visibility Impairment

Washington State



21 dv, 50km (31 miles) visibility

Poor visibility



5 dv, 240km (150 mlie) visibility

Good visibility

Acadia National Park, Maine



Poor visibility



Good visibility

Visibility at the Grand Canyon

Good Visibility



Archived View From Yavapai Point,
Grand Canyon National Park
January 11, 2010 12:00 PM MST
Visual range is less than 234 miles

Poor Visibility



Archived View From Yavapai Point,
Grand Canyon National Park
February 4, 2010 12:00 PM MST
Visual range is less than 55 miles

Effects of Haze

- Aesthetic
- Cultural
- Economic
- Health

Causes of Visibility Impairment

- Natural Sources
- Anthropogenic Sources

Natural Sources



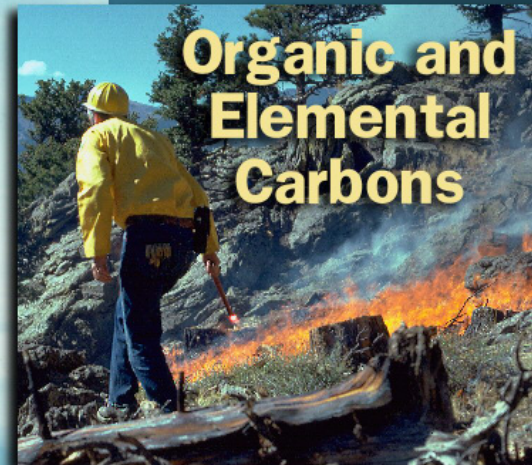
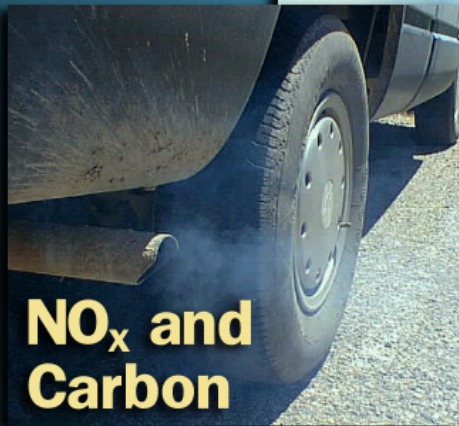
Wildfire



Dust Storms

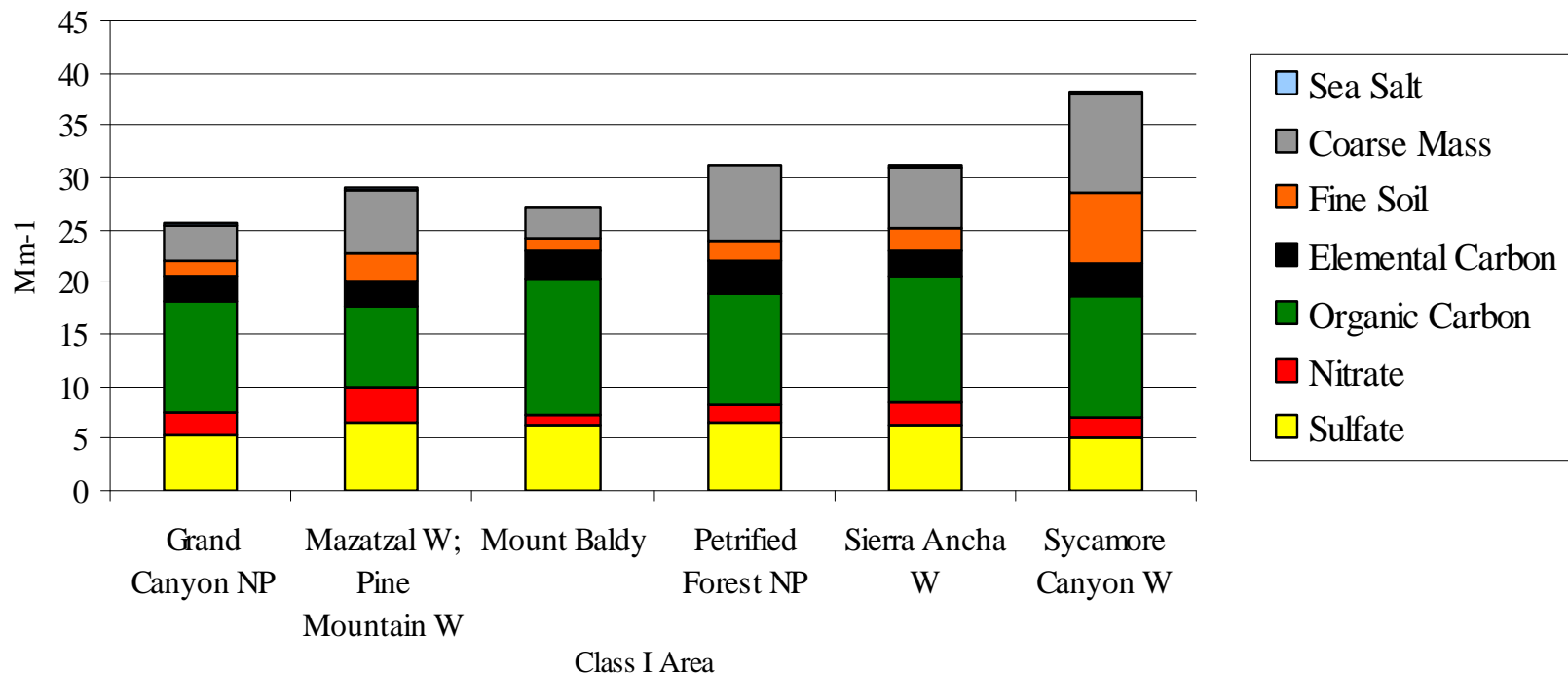
Anthropogenic Sources

Human Activities



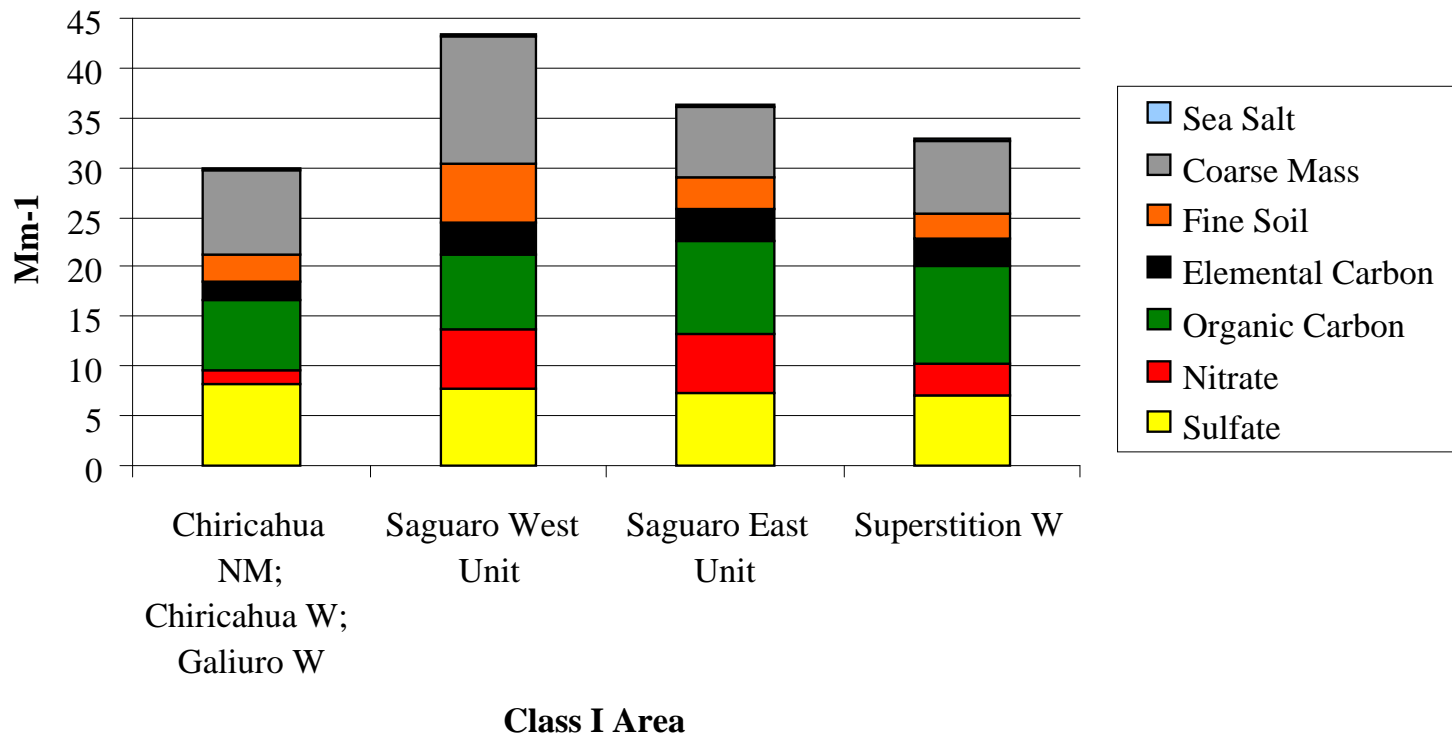
Light Extinction on Worst Days

Average Extinction for 20% Worst Days During Baseline Period (2000-2004)



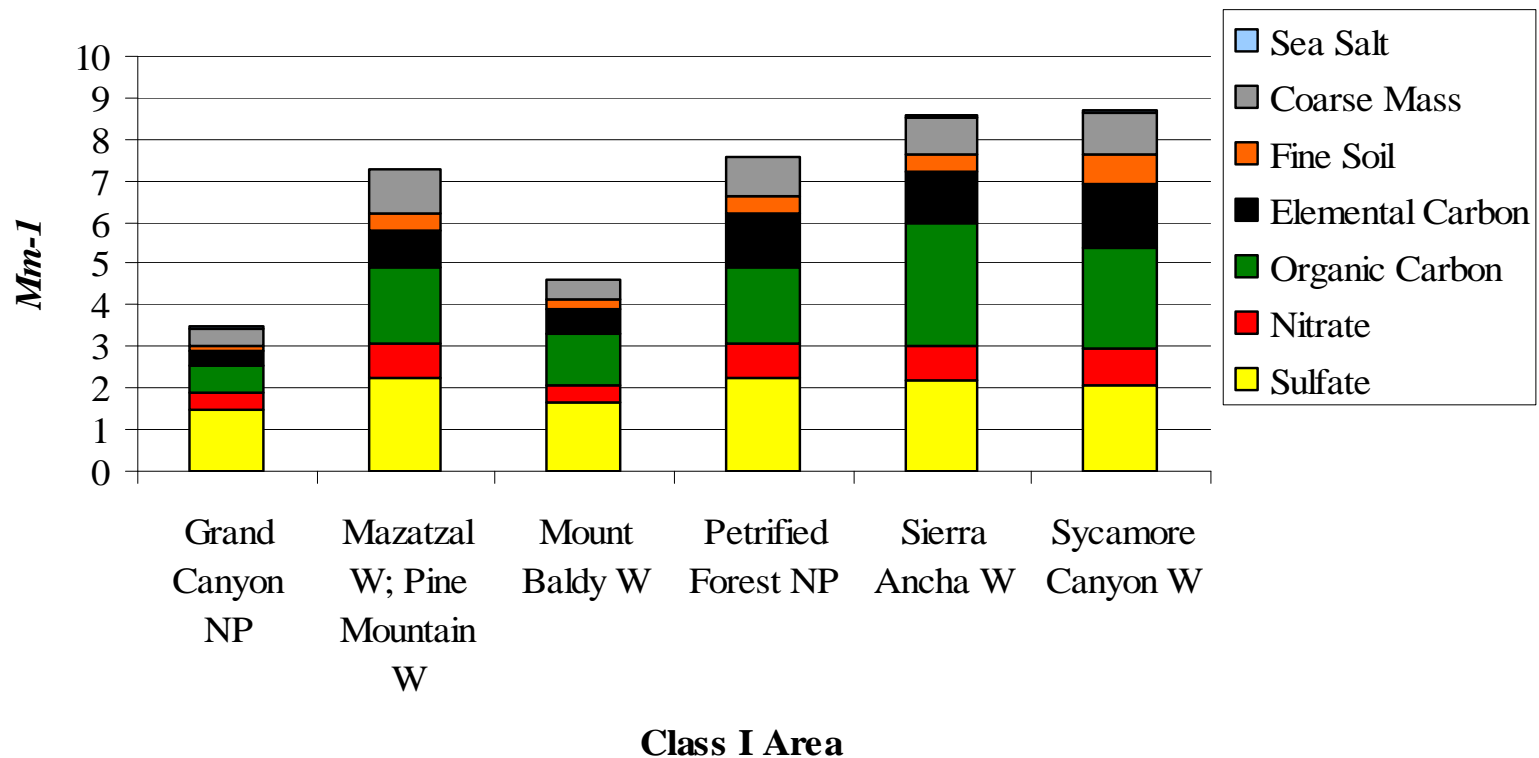
Light Extinction on Worst Days

**Figure 7.2 - Average Extinction for 20% Worst Days
During Baseline Period (2000-2004)**



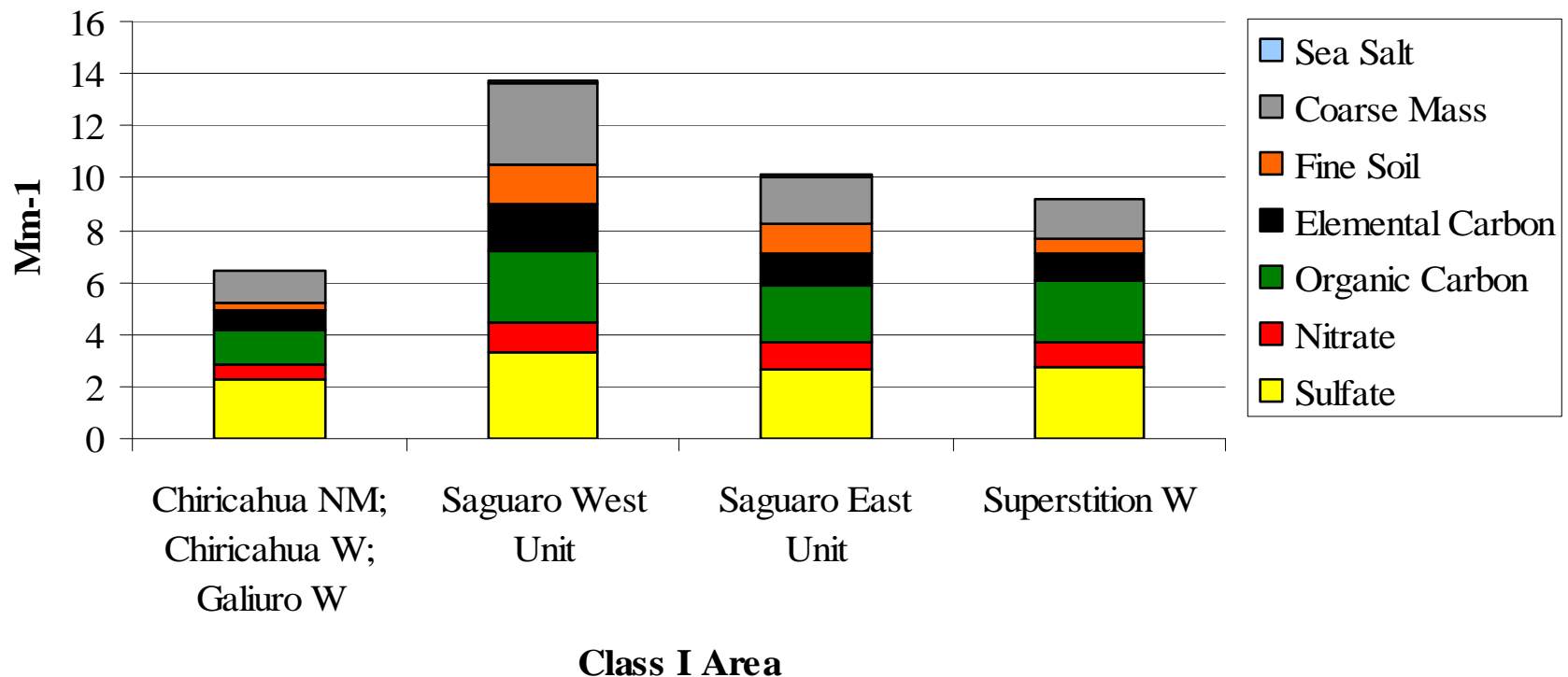
Light Extinction on Best Days

**Figure 7.3 - Average Extinction on 20% Best Days
During Baseline Period (2000-2004)**



Light Extinction on Best Days

**Figure 7.4 - Average Extinction on 20% Best Days
During Baseline Period (2000-2004)**



Clean Air Act - §169A

- “Congress hereby declares as a national goal the prevention of any future, and the remedying of any existing impairment of visibility in mandatory class I Federal areas which impairment results from man-made air pollution.” §169A(a)(1)

Clean Air Act - §169B

- National Visibility Program - Regional Haze
 - Studies on:
 - Current visibility conditions
 - Sources of haze-causing pollutants
 - Atmospheric chemistry & physics
 - Models for assessment of visibility
 - Regulations to achieve national goal

Clean Air Act - §169B

- Grand Canyon Visibility Transport Commission
- Ability to form other regional commissions
- **All regional commissions must consider:**
 - Clean air corridors
 - Application of "New Source Review"
 - Long-term strategies

State Visibility Program

- 12 Mandatory Federal Class I Areas
- Stationary Source Controls
 - Prevention of Significant Deterioration
 - Best Available Retrofit Technology (BART)
- Regional Haze
 - Grand Canyon Visibility Transport Commission
 - Western Regional Air Partnership (WRAP) - www.wrapair.org (archived); www.wrapair2.org

Grand Canyon Visibility Transport Commission

- Reduce emissions of sulfur dioxide from stationary sources by establishing emission reduction milestones and a backstop cap-and-trade program that would be implemented if emissions reductions milestones were exceeded
- Reduce emissions from mobile sources by implementing stringent federal engine and fuel standards
- The affect of road dust on visibility
- Manage visibility impacts resulting from increased emissions from prescribed fires

2003 Arizona Regional Haze Process

- Extensive stakeholder process for '03 submission to determine §308 or §309
- Chose §309 and submitted SIP by 12/31/03
- SIP revised in '04 for fire rules & final trading rule
- Milestone reports (SO₂) began with '03 emissions & continue as required by Article 16
- RAVI also submitted & still in place

Structure of 308 SIP

Elements from 309

- Recommendations from GCVTC
- Enhanced Smoke Management Program (ESMP)
- Long-term strategies for area, mobile, & other sources

Section 308

- Overview of Visibility & Regional Haze
- Summary of Section 308 & 309 of the Regional Haze Rule
- Monitoring Network
 - IMPROVE Monitoring Network
 - Az Regional Haze Monitoring Commitments
- Baseline, Current Conditions, Estimate of Natural Visibility Conditions & Uniform Rate of Progress for Az Class I Areas

Section 308

- Visibility Impairment at Arizona Class I Areas
- Emissions inventory
 - Arizona Emissions
 - Regional Emissions
- Source Apportionment & Regional Haze Modeling
 - CMAQ/PSAT/Weighted Emissions Potential
 - Major Source Categories Contributing to Regional Haze in Arizona
 - Visibility Projections for 2018

Section 308

- Best Available Retrofit Technology (BART) Evaluation
- Reasonable Progress Goal Demonstration
 - Steps in Determining Reasonable Progress
 - Four-Factor Analysis
 - Determination of Reasonable Progress Goals
 - Affirmative Demonstration of Reasonable Progress
 - 20% Reduction in Emissions from Anthropogenic Sources
 - Major Reductions in Mobile Source Emissions by 201
 - Additional Emission Reductions Expected by 2018 due to Long-Term Strategy

Section 308

- Long-Term Strategy (LTS)
 - Summary of Anthropogenic Sources of Visibility Impairment Considered in the LTS
 - Summary of Interstate Transport & Contribution
 - Other State Class I Areas Affected by Arizona Emissions
 - Arizona Class I Areas Affected by Other States
 - Estimated International Contribution to Arizona Class I Areas

Section 308

■ LTS - Continued

- Emission Reductions Due to Ongoing Air Pollution Programs
- Measures to Mitigate the Impacts of Construction Activities
- Emission Limitations and Schedules of Compliance
- Source Retirement and Replacement Schedules
- Enforceability of Arizona Measures

Section 308

- LTS - Continued
 - Additional Factors Considered in the LTS
 - Evaluation of Non-BART Sources and BART-eligible Sources
 - Evaluation of Prescribed Burning Contributions to Haze and Control Strategies
 - Evaluation of Agricultural and Open Burning
 - Projection of the Net Effect on Visibility from the LTS

Section 308

- Consultation
- Other SIP Requirements and Commitments
 - Enforceability of Emission Limitations and Control Measures
 - Commitment to Future Consultation
 - Commitment to Future 308 SIP Revisions
 - Commitment to Periodic Progress Reports
 - Determination of Plan Adequacy

Timeline for 308

- Public comment period: October 28th
– December 2nd
- Public hearing: December 2nd; at ADEQ at 3pm
- Submit to EPA by end of December

Questions?

Websites

- www.azdeq.gov/envIRON/air/haze
- www.wrapair2.org
- <http://vista.cira.colostate.edu/tss/>
- <http://views.cira.colostate.edu/web/>