

# Regional Planning Organizations

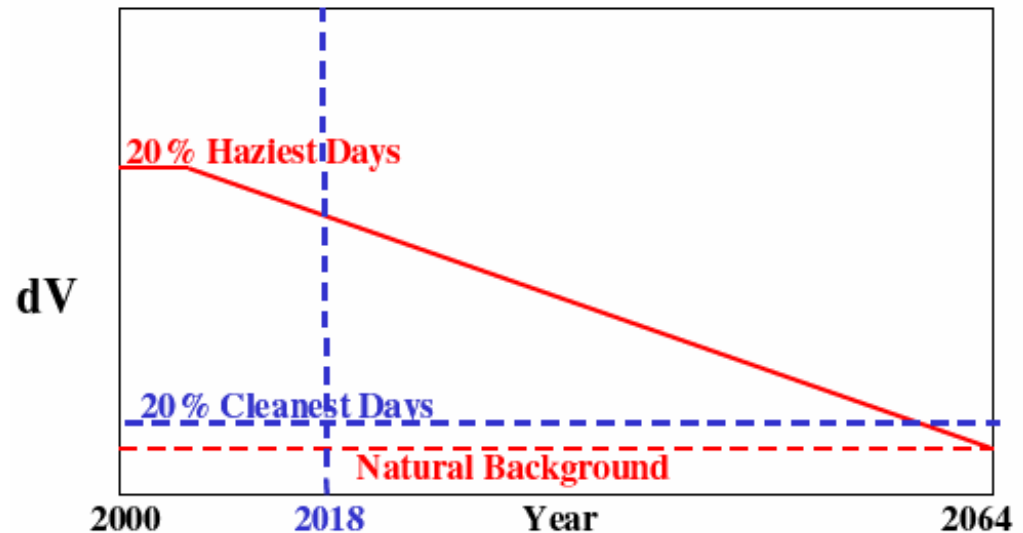
Technical Support to States for State Implementation Plans (SIPs) for 1999 EPA Regional Haze Rule

156 “Class 1 Federal Areas” (National Parks, Wilderness areas)

Haziest 20% days Must Improve to “Natural Background” by 2064

Based on Aerosol “Reconstructed Extinction” from IMPROVE data.

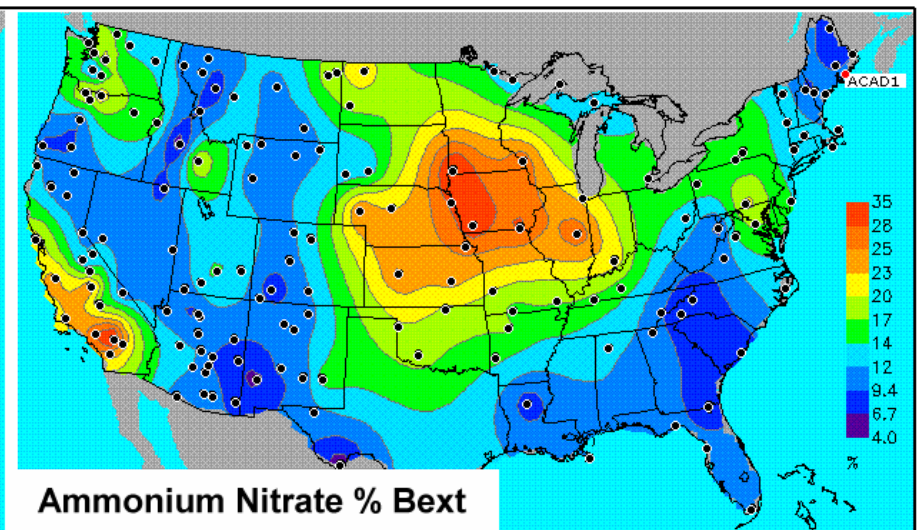
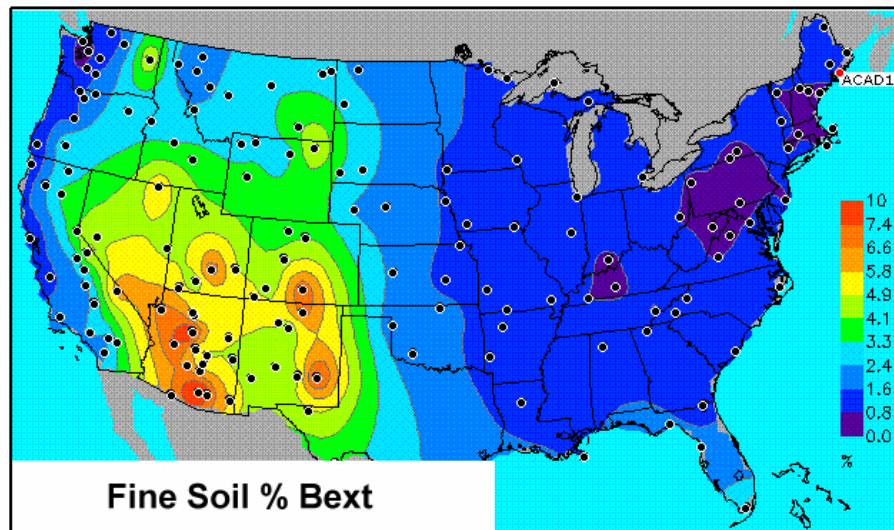
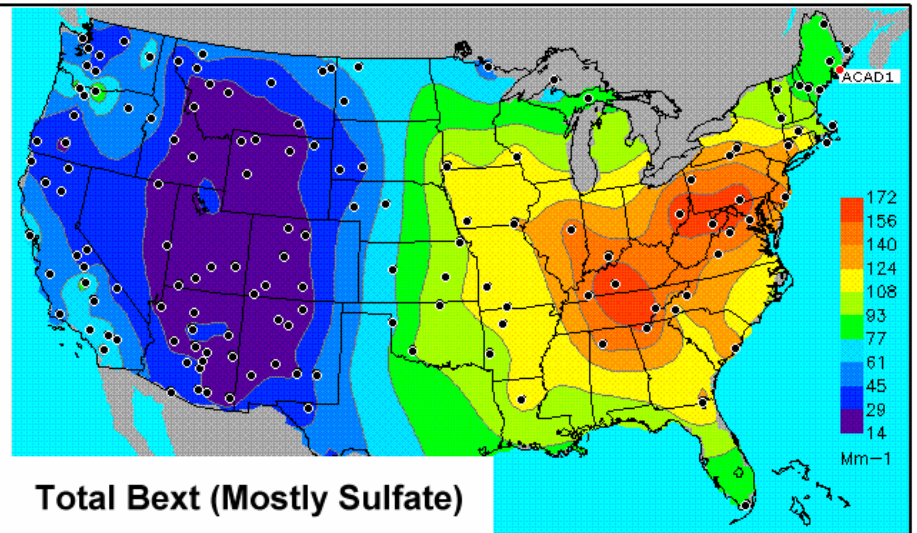
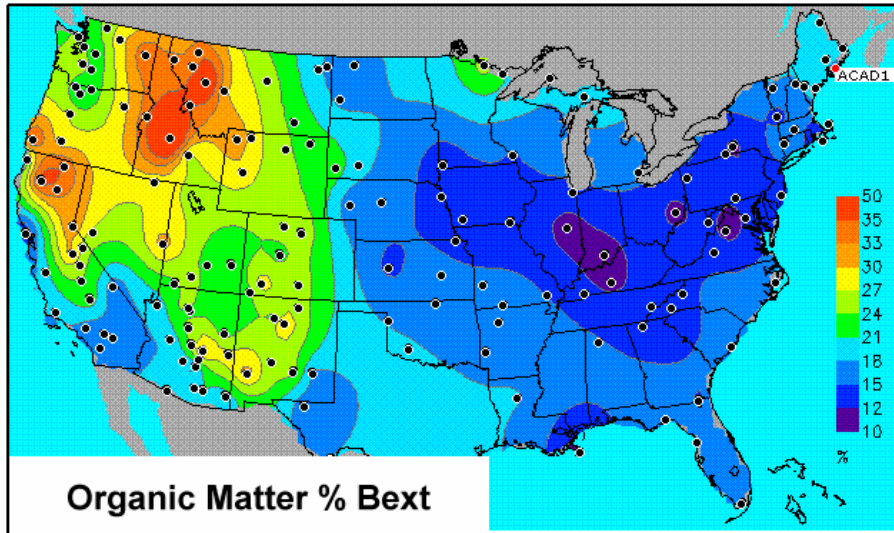
$$\begin{aligned}
 b_{ext} \approx & 3 \times f(RH) \times [Sulfate] \\
 & + 3 \times f(RH) \times [Nitrate] \\
 & + 4 \times [Organic Carbon] \\
 & + 10 \times [Elemental Carbon] \\
 & + 1 \times [Fine Soil] \\
 & + 0.6 \times [Coarse Mass] \\
 & + 10
 \end{aligned}$$

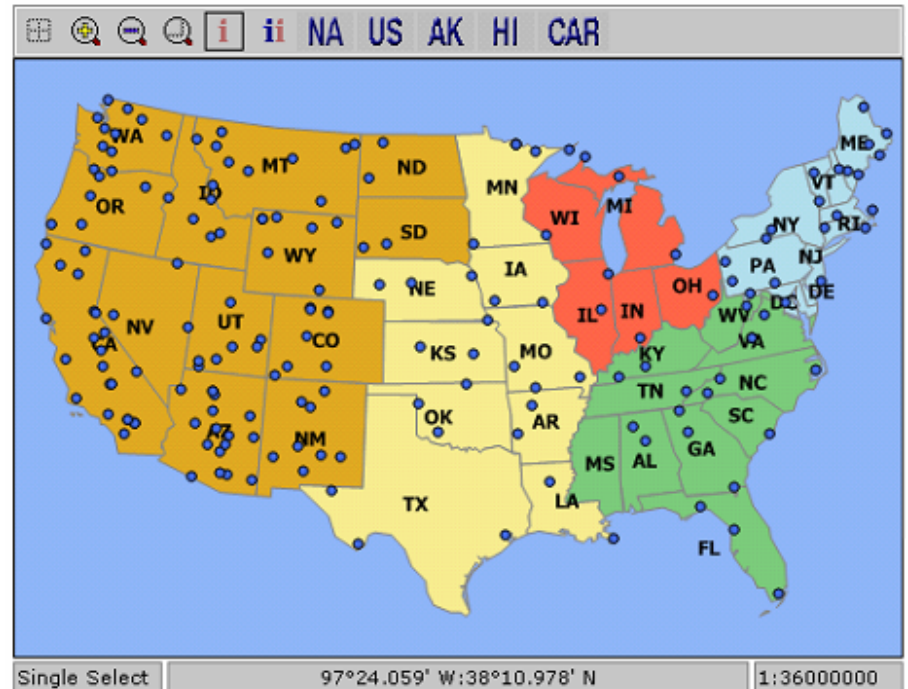


# Mandatory Class I Areas



# Aerosol Contributions to Regional Haze are Regionally & Temporally Variable





- Programs**
- AQS PM10 Mass (Hourly)
  - AQS PM2.5 Mass FRM (Daily)
  - AQS PM2.5 Mass FRM (Hourly)
  - AQS PM2.5 Speciation (Daily)
  - CASTNet Dry Chemistry
  - CASTNet Visibility Chemistry
  - GAViM
  - IMPROVE Aerosol (Preliminary)
  - IMPROVE Aerosol (Raw)**
  - IMPROVE Aerosol (RHR2, New Algo.)
  - IMPROVE Nephelometer (Raw)
  - IMPROVE Study - MOHAVE
  - IMPROVE Study - PREVENT
  - IMPROVE Study - SEAVS
  - IMPROVE Transmissometer (Raw)
  - Midwest RPO Ammonia
  - Model Base18a
  - Model Plan02a
  - NADP AIRMoN
  - NADP NTN
  - NPS SFU Aerosol

**IMPROVE** *Interagency Monitoring of Protected Visual Environments*

Overview Data Tools Publications Studies Education/Reg Forum Activities Links

## Interagency Monitoring of Protected Visual Environments

Our national Parks and Wilderness Areas possess many stunning vistas and scenery. Unfortunately, these scenes are diminished by uniform [haze](#) causing discoloration and loss of texture and visual range. [Layered hazes](#) and [plume blight](#) also detract from the scene. Recognizing the importance of visual air quality, congress included [legislation in the 1977 Clean Air Act](#) to prevent future and remedy existing visibility impairment in [Class I areas](#). To aid the implementation of this legislation, the [IMPROVE program](#) was initiated in 1985. This program implemented an extensive long term monitoring program to establish the current visibility conditions, track changes in visibility and determine causal mechanism for the visibility impairment in the National Parks and Wilderness Areas.

The [purpose](#) of this website is to provide access to the IMPROVE monitoring data resources and educational material on the science of visibility and regulations. First time visitors should visit the [Overview](#) section which summarizes the IMPROVE network and visibility science and regulations.

Diminishing View  
Diminishing View  
Diminishing View

West Elk Mountains, Colorado

B <sub>ext</sub> (Mm <sup>-1</sup> )	20	30	40	60	100	200	300	500
DeciViews	4	7	11	14	18	23	30	34
V.R. (km)	200	130	100	65	40	20	13	8

< Stop Loop >

# Combined Aerosol Trajectory Tool

[Resources/Discussion](#)

[Manual -pdf , ppt](#)

## Ensemble Trajectory Browsers

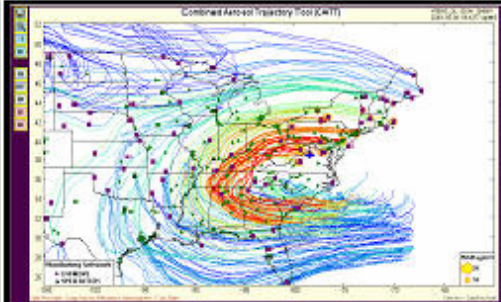
[Single Site , Single Day](#)



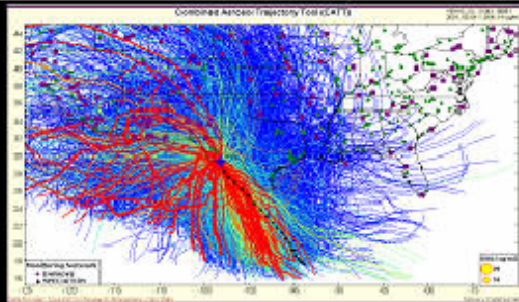
[Multi-Site, Single Day](#)



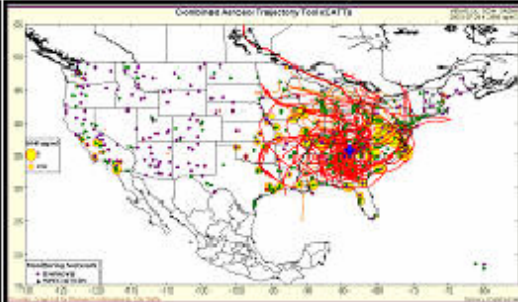
[All Sites, Single Day](#)



[Single Site, Time-Range](#)



[Concentr. Percentile](#)

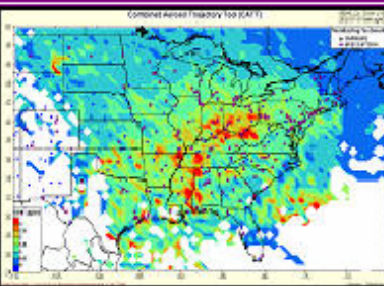


[User-Defined Filter](#)

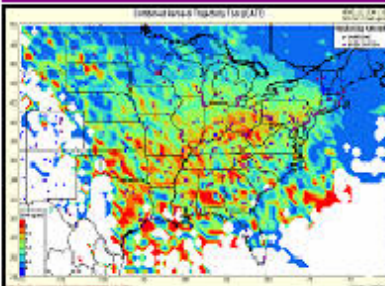


## Gridded Transport Metrics Browsers

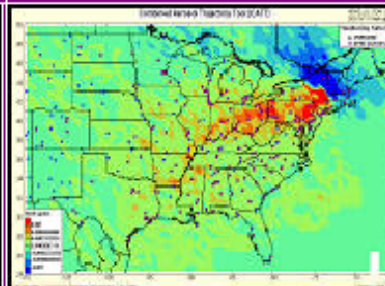
[Inc. Prob. 'Poirot'](#)



[Src. Contr. 'Hopke'](#)



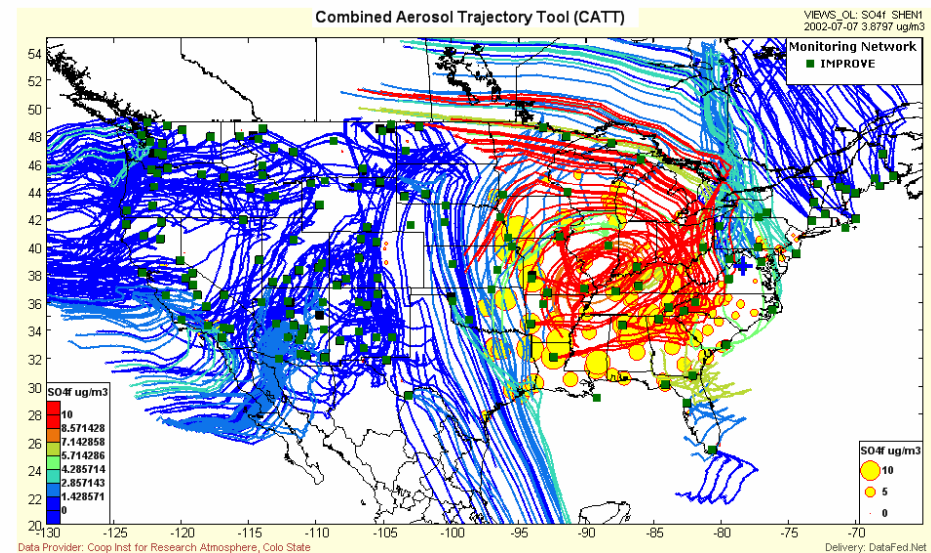
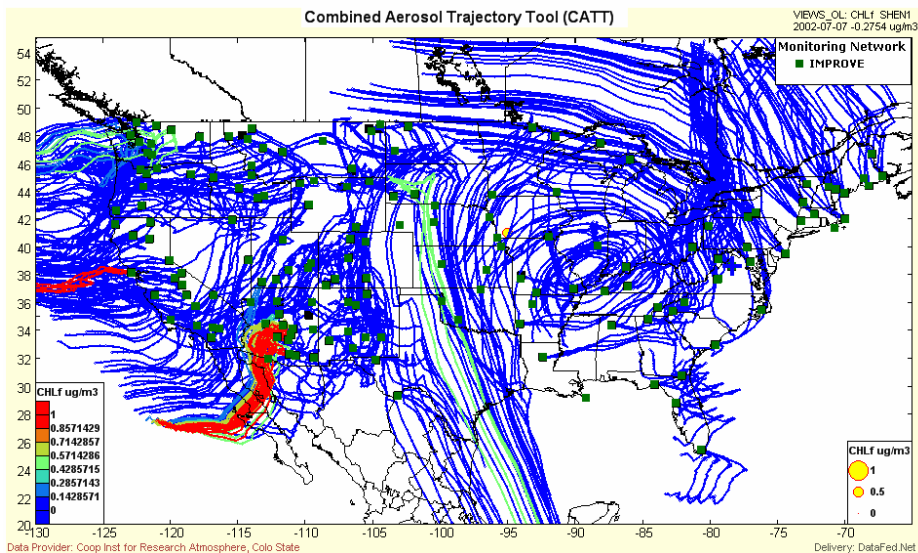
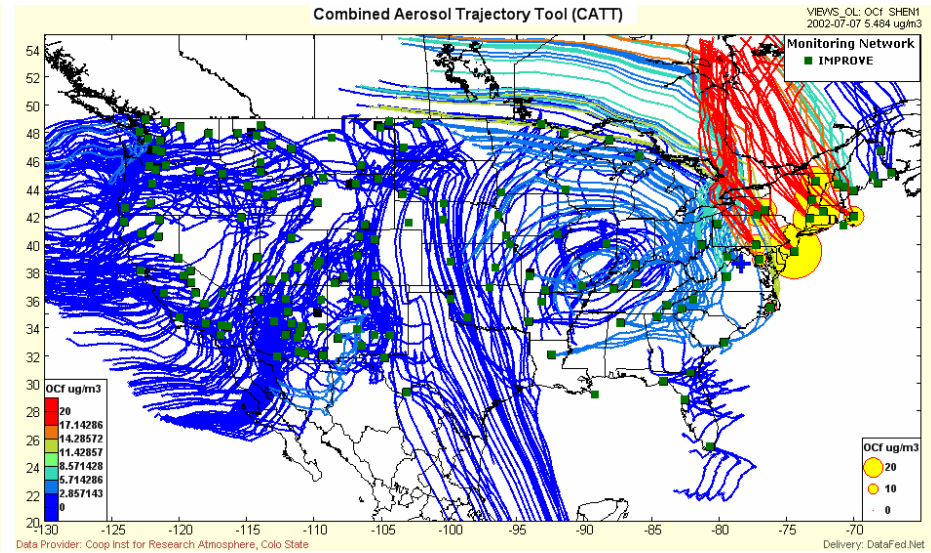
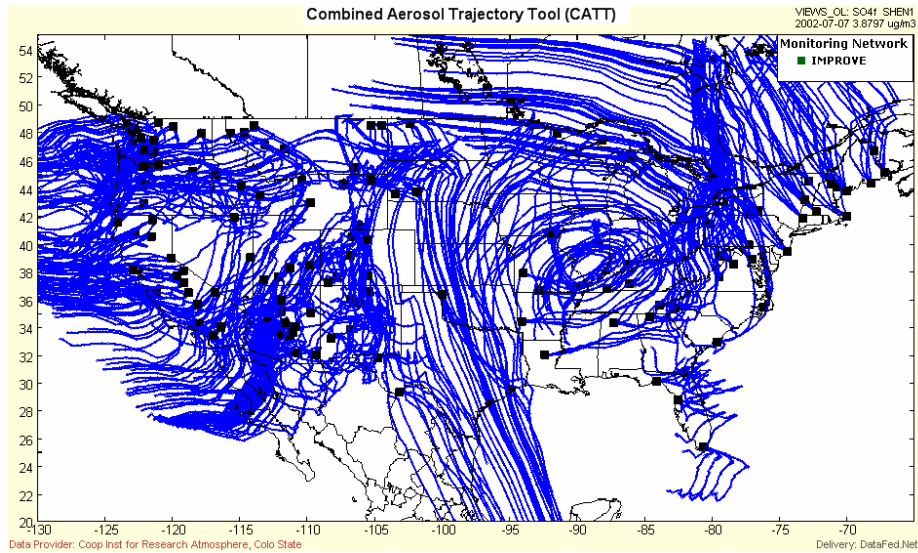
[Avg. Conc. 'Kenski'](#)



[Weighed Prob. 'Green'](#)

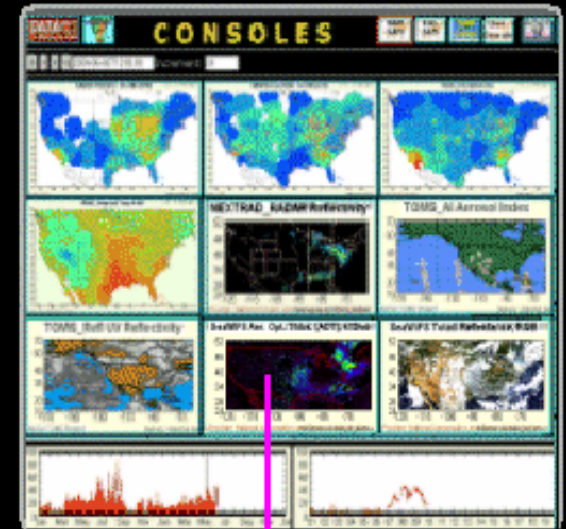
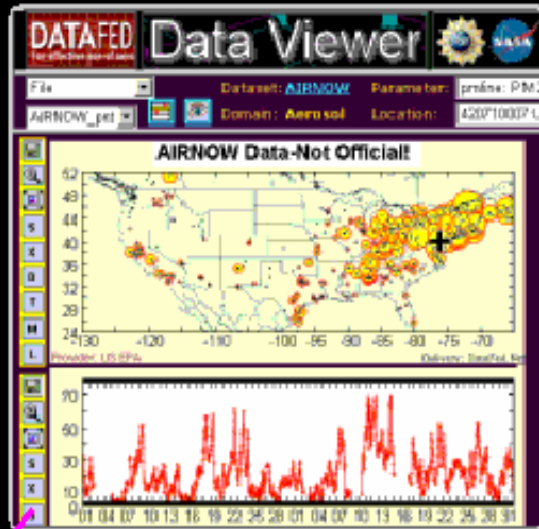
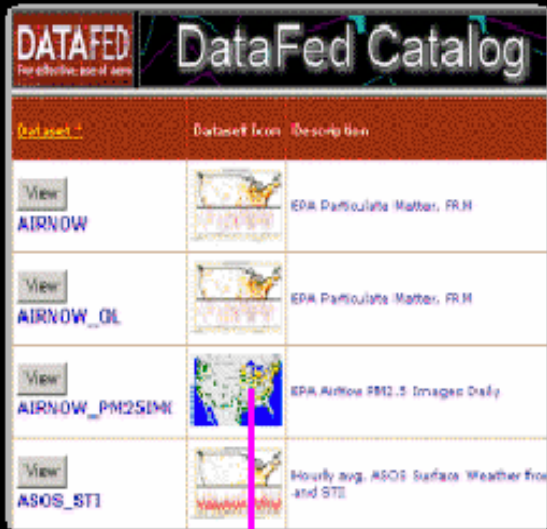


# Back Trajectories for All IMPROVE Sites on 7/7/02 Unweighted (top left), & color-weighted for OC (top right), SO4 lower right & Cl (lower left)



# Fast Aerosol Sensing and Tools for Natural Aerosol Tracking

Real-time and retrospective detection and analysis of smoke, dust and other aerosol events.



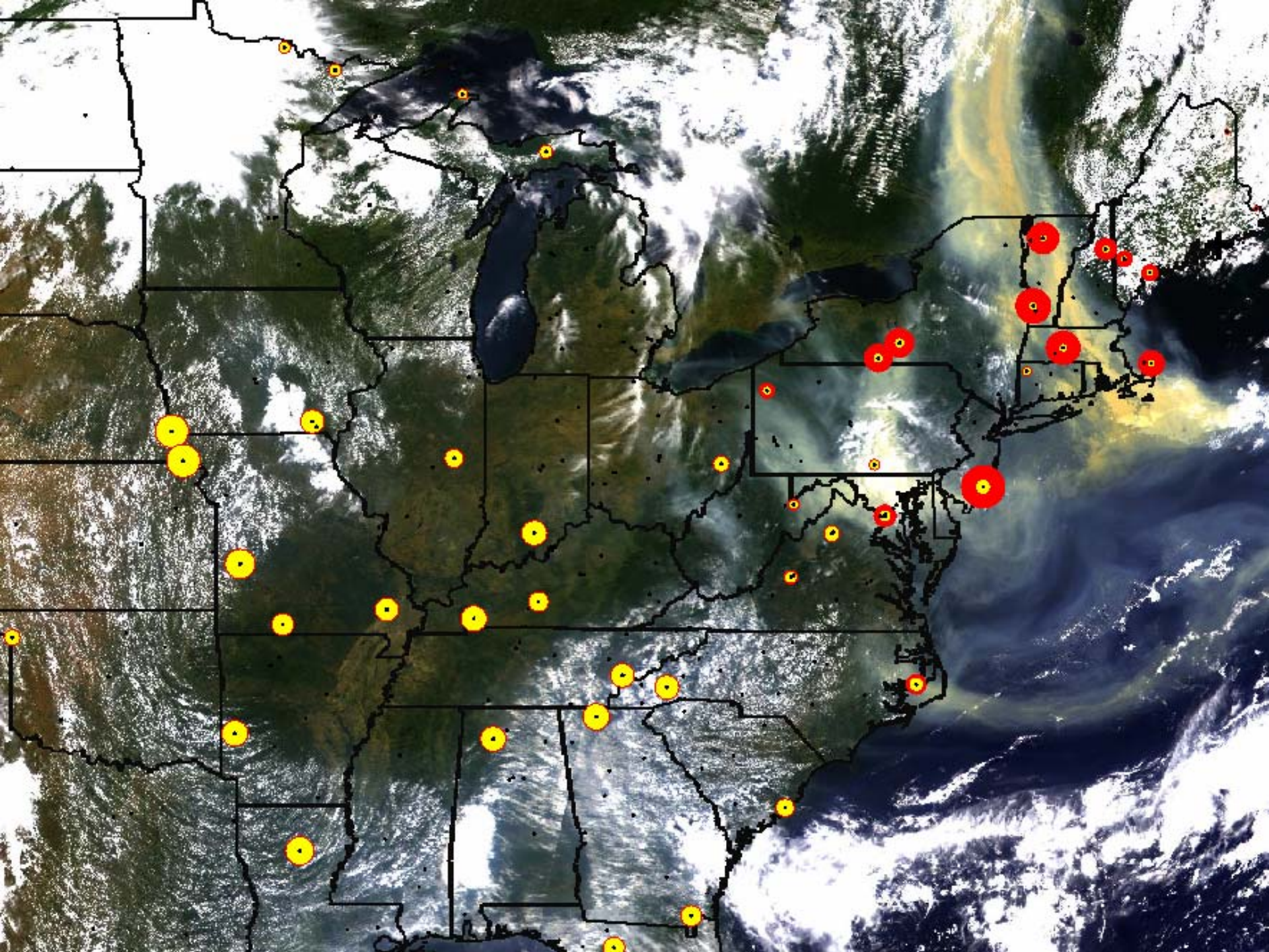
Find It, Add To It

See It, Get It  
Screen It,  
Aggregate It,  
Show It, Grow It

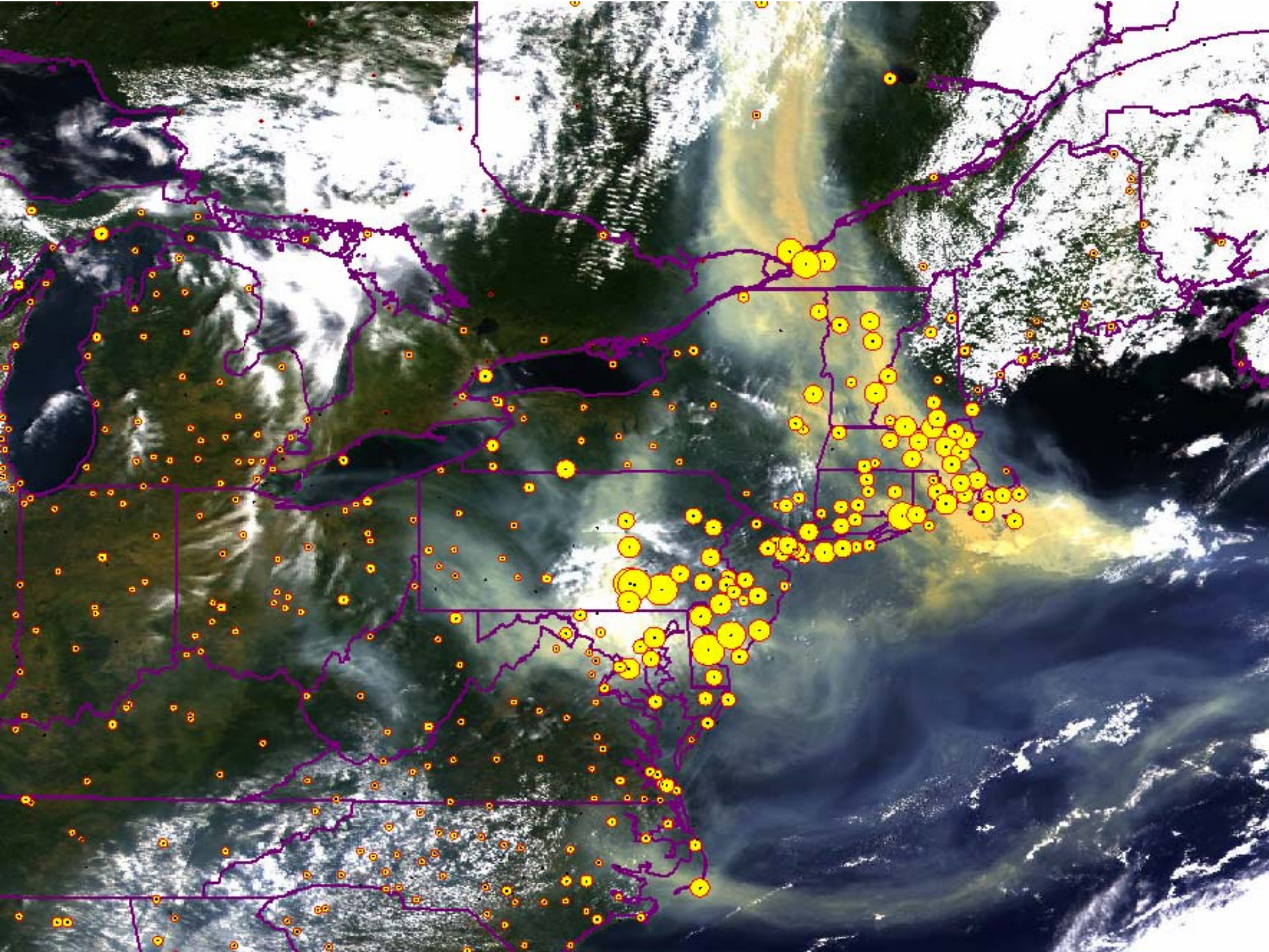


Layer It, Compare It,  
Merge It, Analyze It  
Interpret It.

Save It, Share It,  
Communicate It,  
Discuss It,  
Understand It



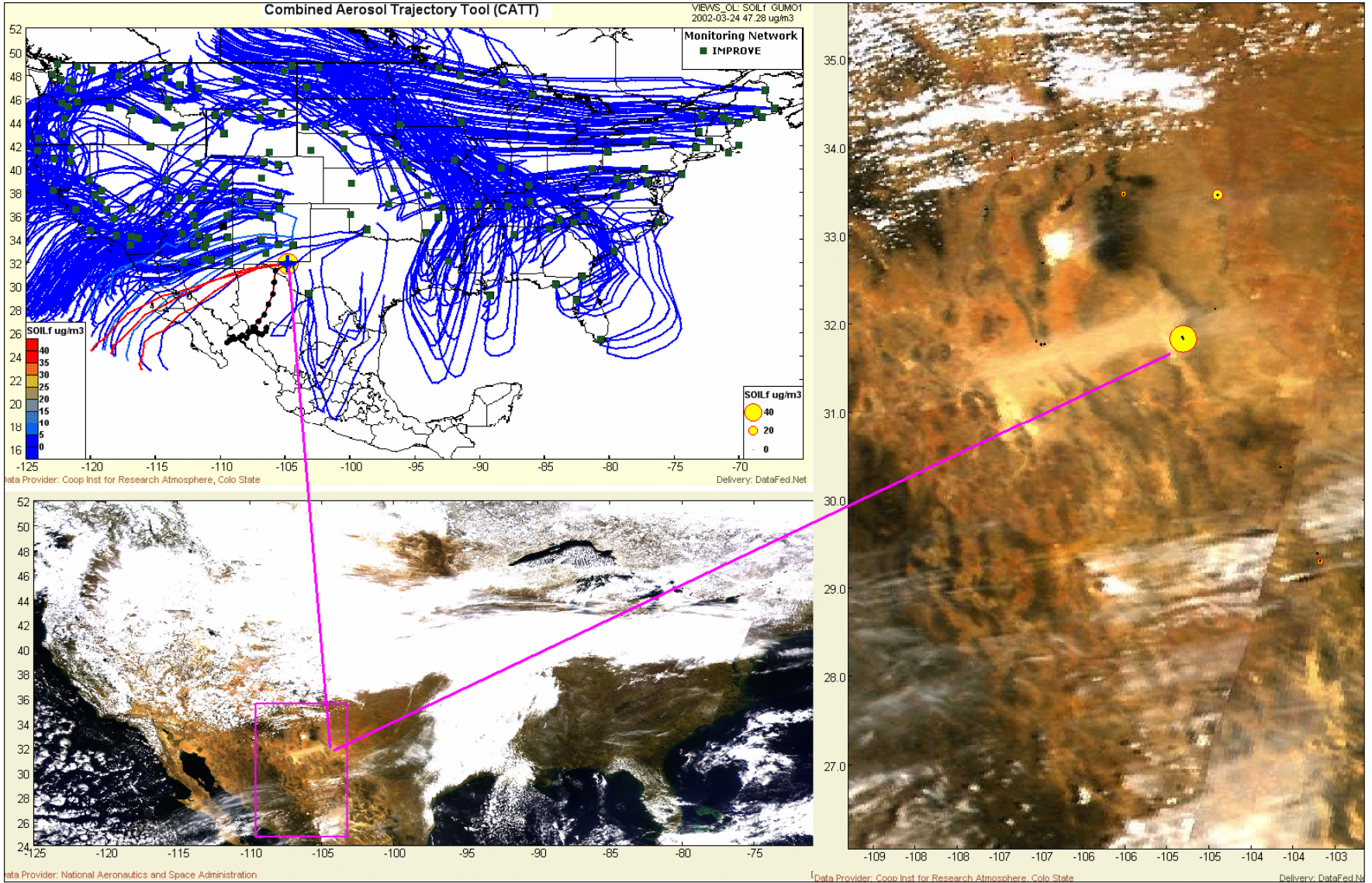




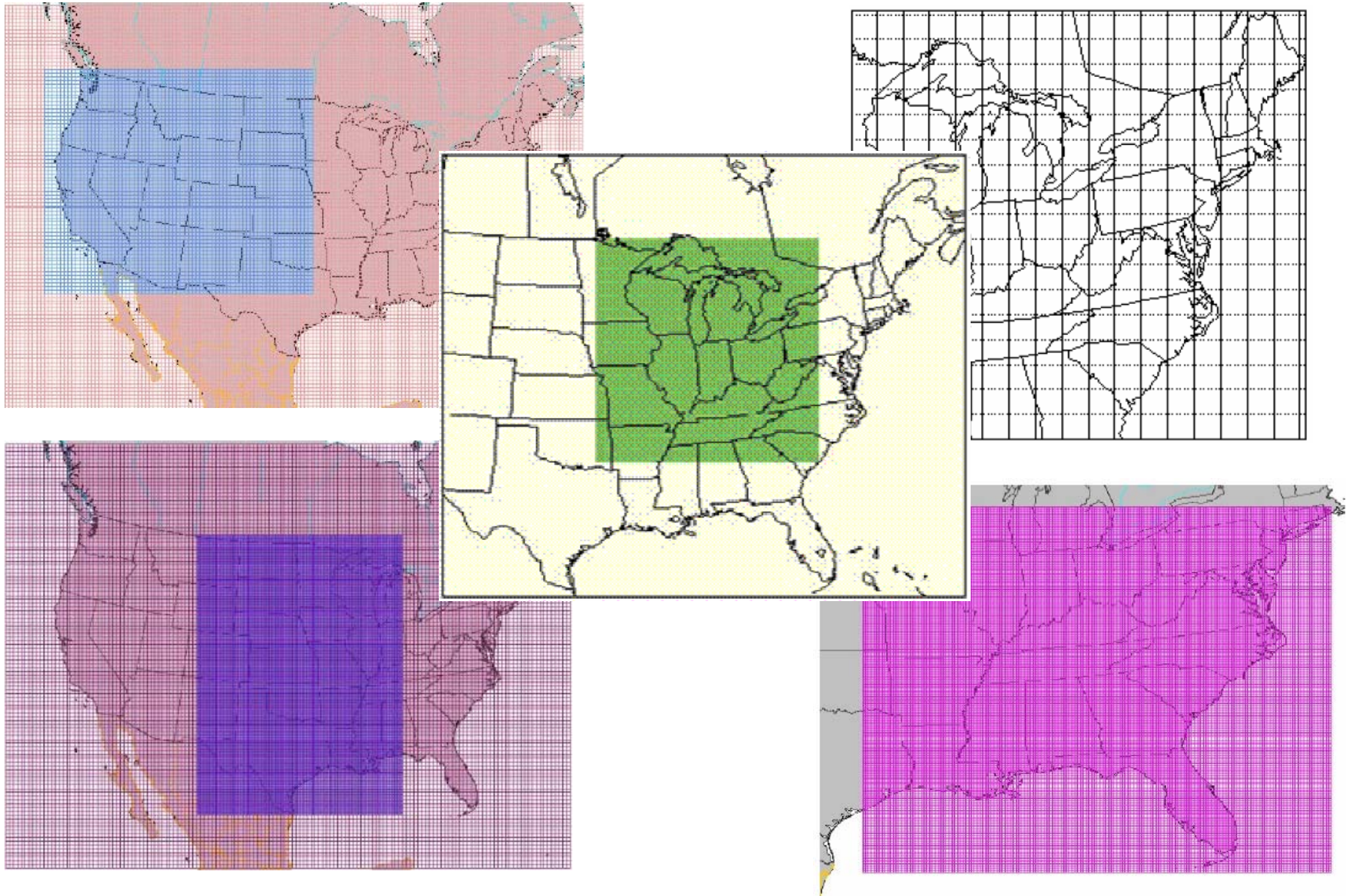
GUMO, TX on 3/24/02 is also  
 Clearly and Uniquely  
 Impacted by Windblown Dust

Site	Date	PM10	PM10-2.5	PM2.5	Fine Soil
GUMO1	03/24/02	85.9	28.6	57.3	47.3

IMPROVE Network Fine Soil, Color-weighted Trajectories (via CATT) & SEAWIFS Spectral Reflectance (via FASTNET) on 3/24/02

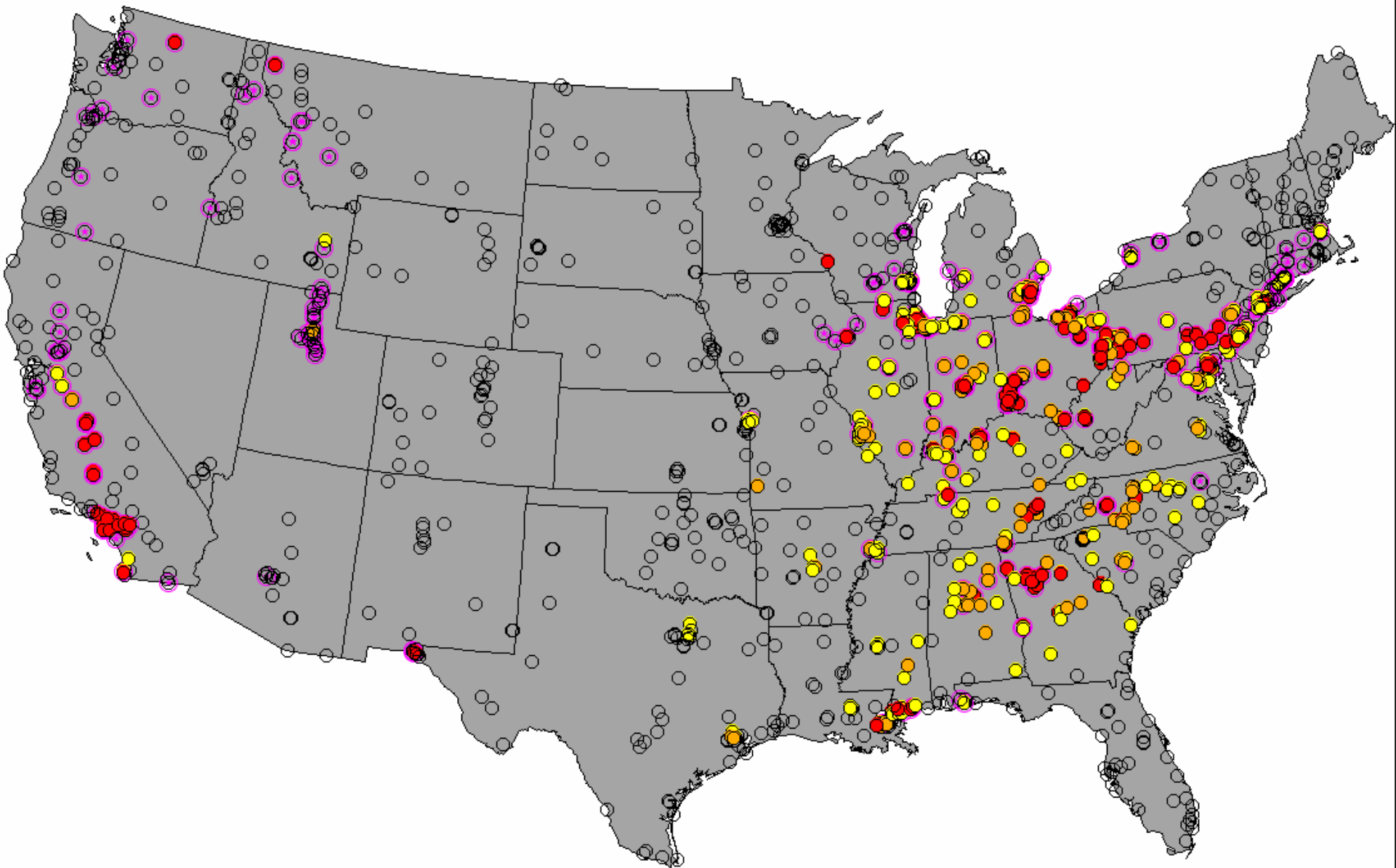


RPO Nested Modeling Domains for Haze (& in most cases also PM<sub>2.5</sub> & Ozone)  
Models include CMAQ, CAMx, REMSAD, CALPUFF – with MM5, SMOKE, etc.



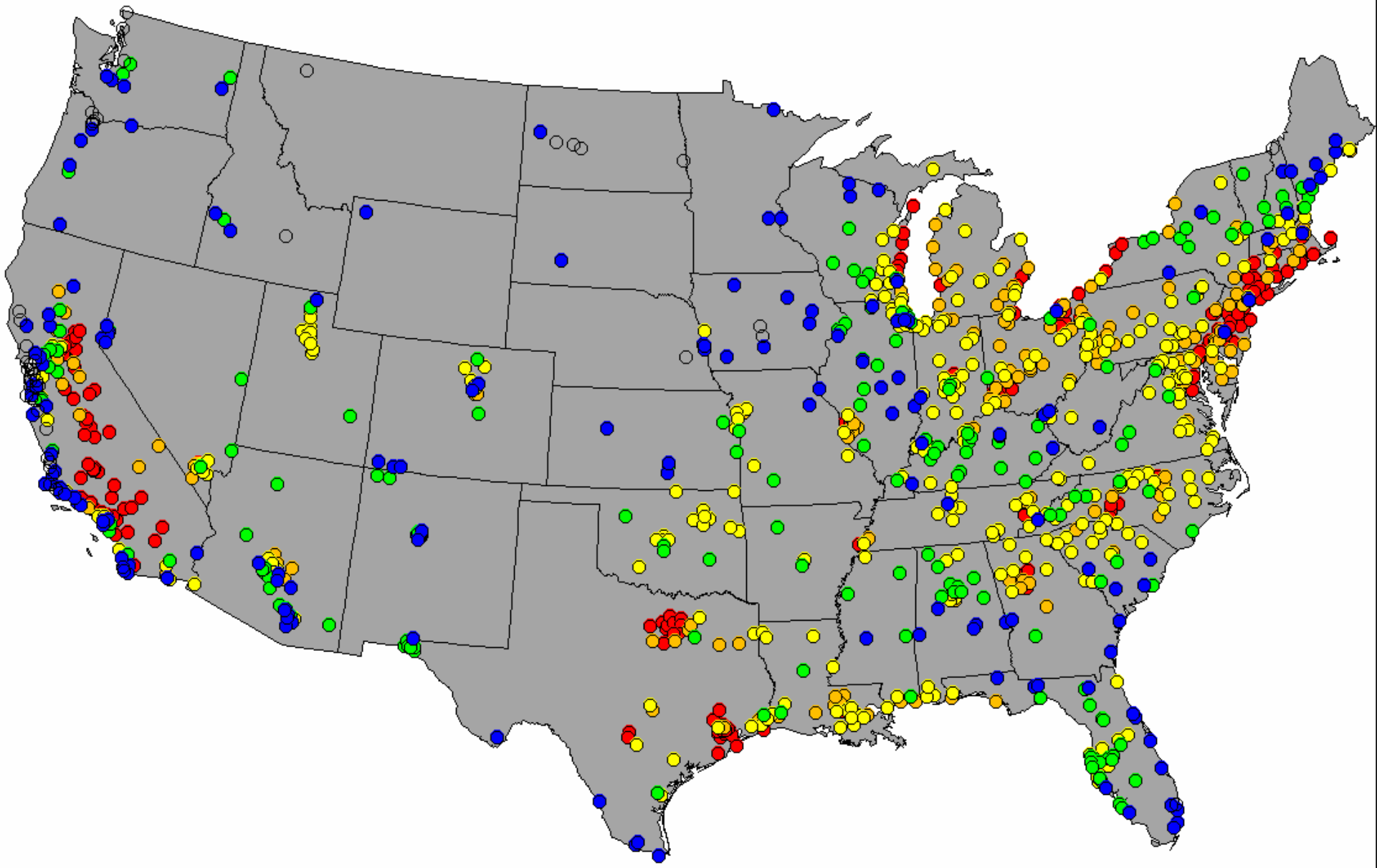
Sites with 2003-05 PM<sub>2.5</sub> Design Values:

> 15 ug/m<sup>3</sup>, 14-15, 13-14 ug/m<sup>3</sup> annual, > 35 ug/m<sup>3</sup> 24 hr 98%tile

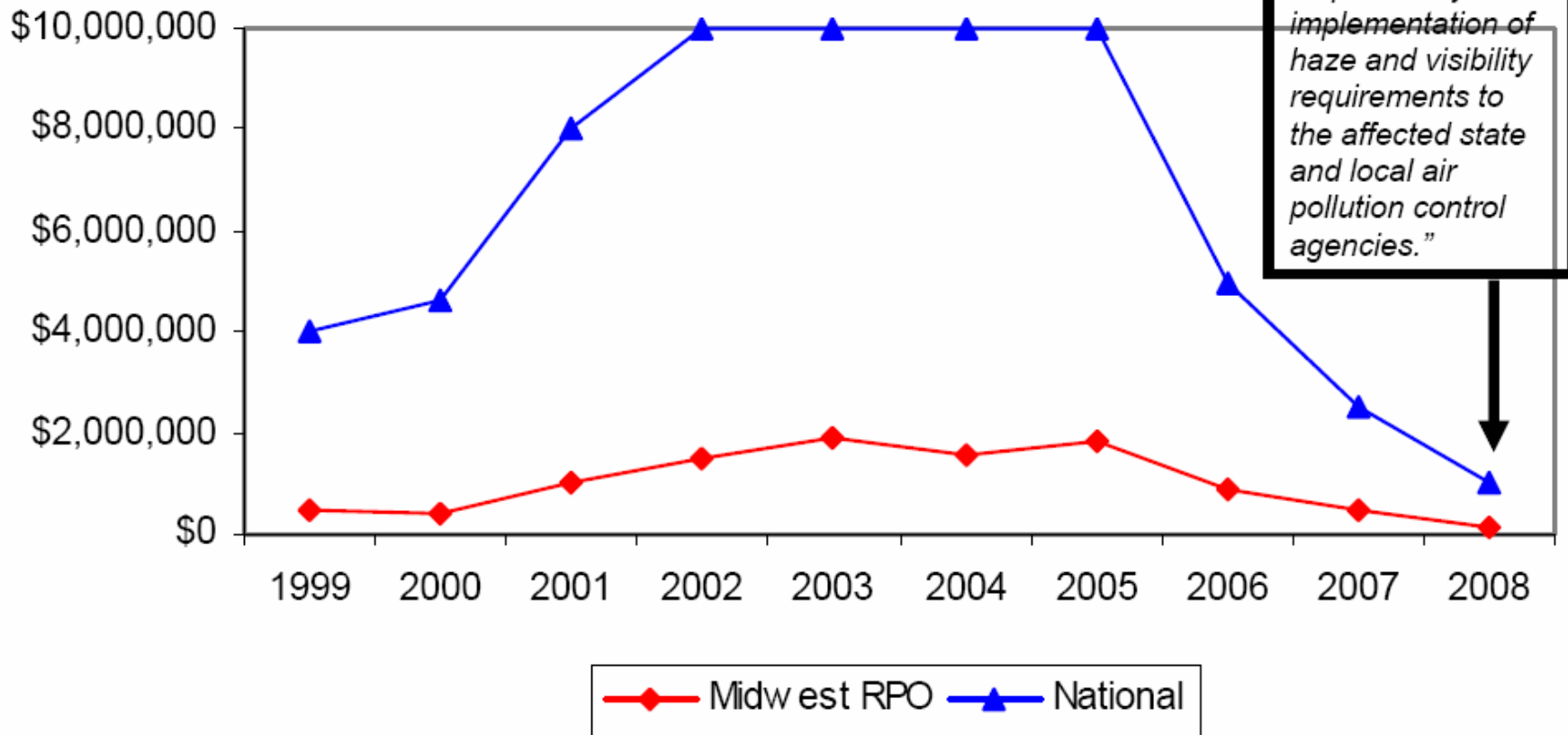


Sites with 2003-05 Ozone Design Values:

> 0.084 ppm, 0.081-0.084, 0.075-0.080, 0.071-0.074, 0.061-0.070 ppm



# RPO Funding



Although (2008 Budget not Final and) Various Regional Modeling, Monitoring, Data Analysis, Control Strategy, Forecasting & Public Outreach Activities will continue through the RPOs & other Pre-existing Regional Organizations (LADCO, WESTAR, CENSara, SESARM, MARAMA, NESCAUM, OTC, etc.

## **RPO/Regional Interests in NASA Air Quality-Related Information**

- **Graphic Documentation of Aerosol/Haze Events (both in near-real time and archived for retrospective historical analyses)**
- **Forecasting Ozone and PM – Air Quality Index & Health Advisories**
- **Improved Emission Inventories – especially for Wildfires, Prescribed Burns, Dust Storms and other “Natural Events”**
- **Improved Estimates of Natural and/or Policy Relevant Background**
- **Air Quality Model Development Evaluation and Validation**
- **Identifying & Discerning between Natural & Anthropogenic Sources**
- **Documenting “Exceptional Events for PM & Ozone**
- **Enhancing Spatial &/or Temporal Resolution of Air Monitoring**
- **Characterizing Vertical Distributions of Concentrations & Composition**
- **Documenting Inter: -State, -Regional, -National, -Continental Transport**
- **Evaluate Effectiveness of Control Strategies or Emissions Increases**