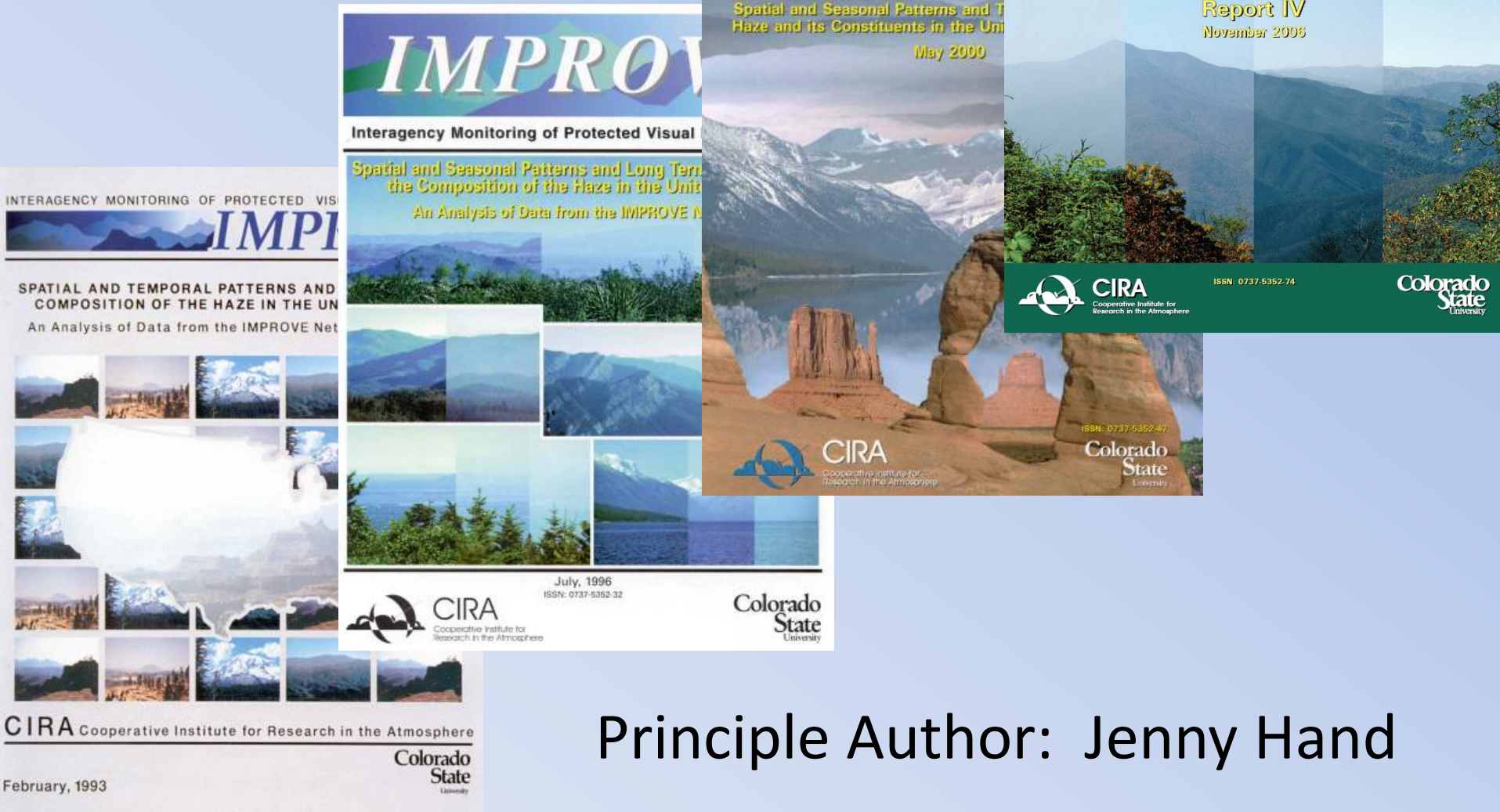


IMPROVE Report V

2010



Principle Author: Jenny Hand

Report Outline

- Overview and Summary
- Overview of IMPROVE network and its objectives
- Protocol, equipment or analytical changes
- IMPROVE vs CSN – Comparison and homogenization
 - Statistical comparison of composite aerosol components (UCD?)
 - Reconciling IMPROVE and CSN carbon (Schichtel)
- Spatial distributions of IMPROVE and CSN data
 - Mass concentrations and reconstructed mass
 - reconstructed aerosol extinction for major aerosol species
 - **Estimation of reconstructed b_{ext} using simple IMPROVE equation?**
 - Estimating CSN reconstructed extinction ($f(\text{RH})$, coarse mass)
- Spatial variability in monthly mean mass concentrations and b_{ext} (IMPROVE and CSN) for major aerosol species.

Report Outline

- RHR visibility metrics (Copeland)
- Rural vs urban aerosol signatures- temporal and spatial. Estimating the urban excess
- Aerosol and b_{ext} trends
 - Nitrate 2000 – 2009
 - PNO3, Satellite NO2 and NOx emissions
 - Total Carbon
 - **Babs??**
 - Sulfate
 - Soil
- Special studies:
 - RoMANS,
 - urban visibility,
 - mass scattering efficiency review,
 - smoke
 - Ground-based monitoring data comparisons with remote-sensing (both ground and satellite) data? (Duli Chand)

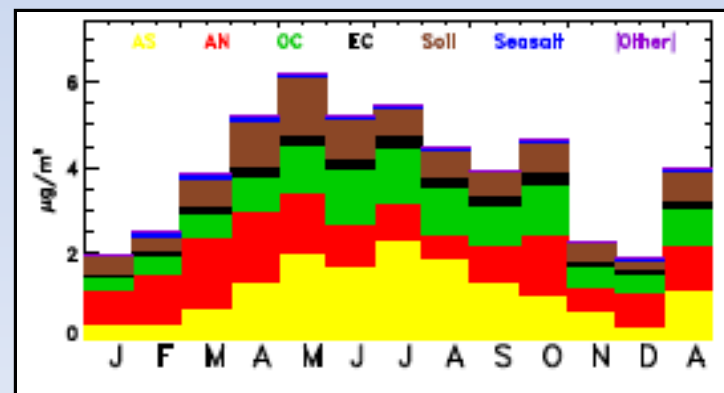
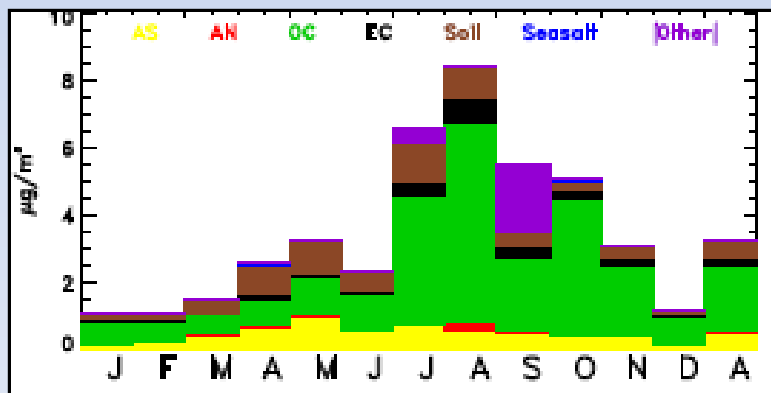
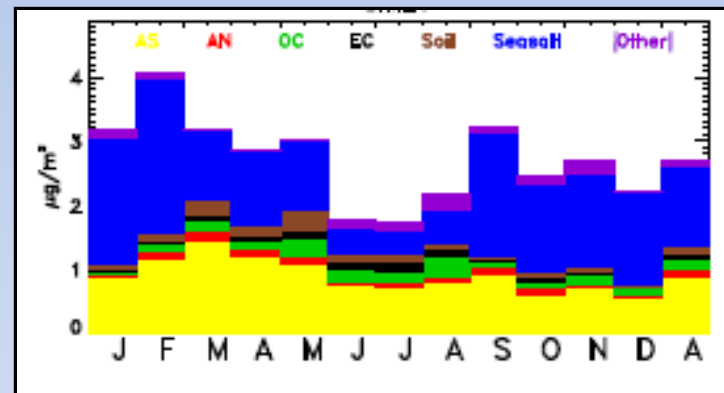
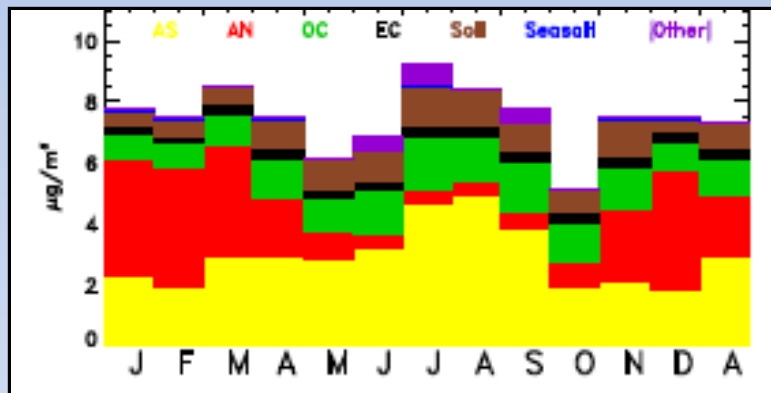
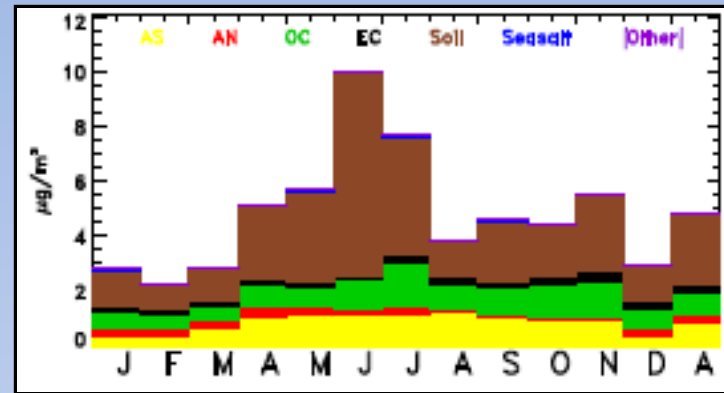
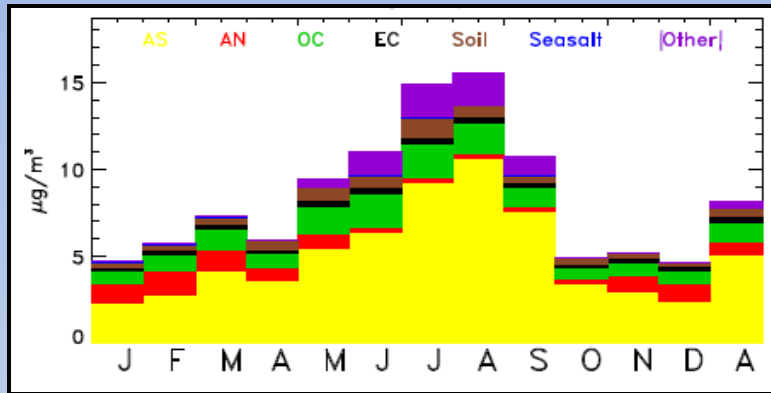
Report Outline

- What's missing?
- Interesting IMPROVE facts
 - Lowest concentrations/bext
 - Highest concentrations/bext
 - etc

Status

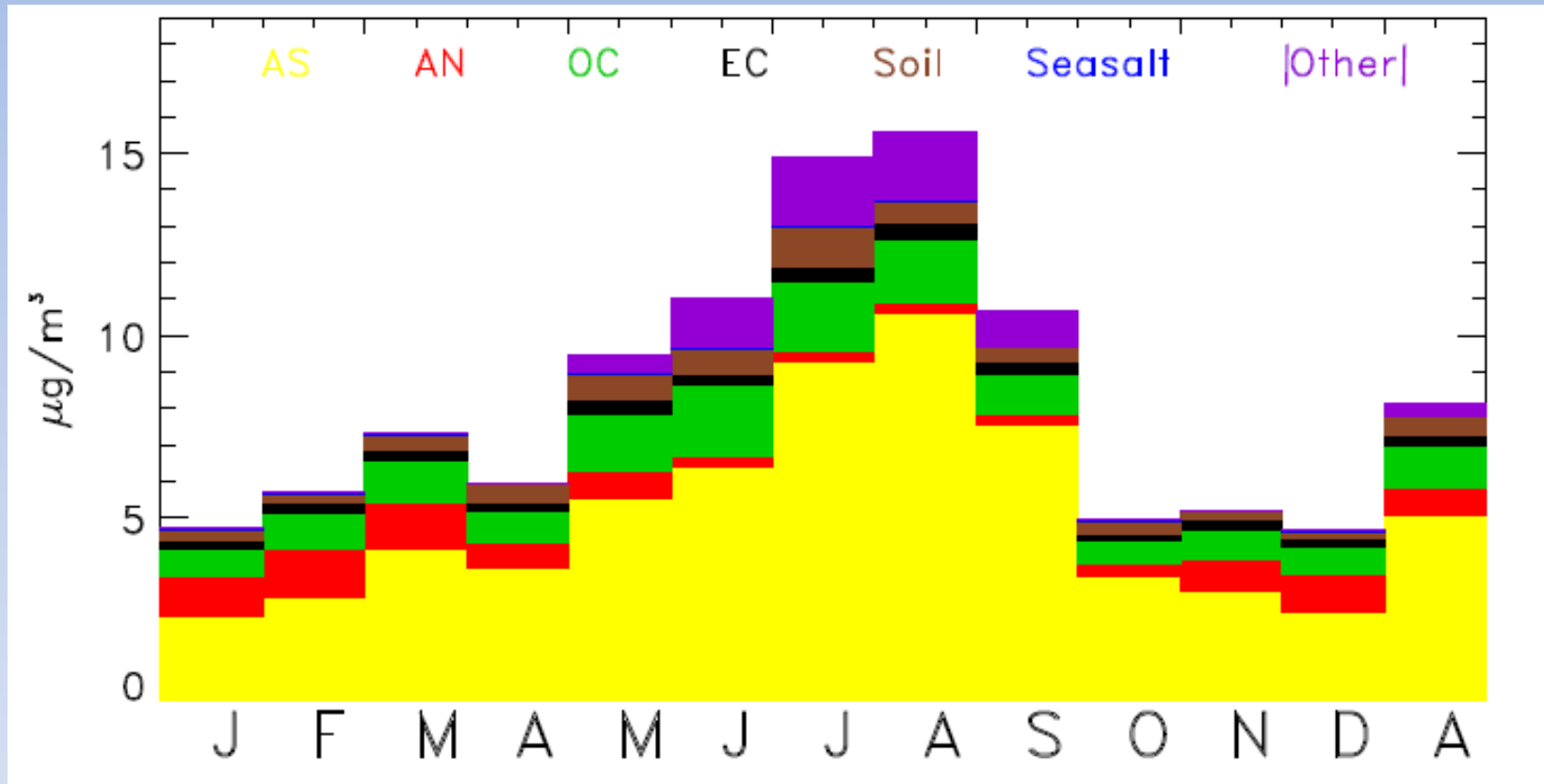
- Using June 2005 – June 2008 IMPROVE and CSN data
- Homogenized carbon measurements
 - Made the CSN look like the IMPROVE
- Spatial patterns
- Seasonal patterns

Name that Site



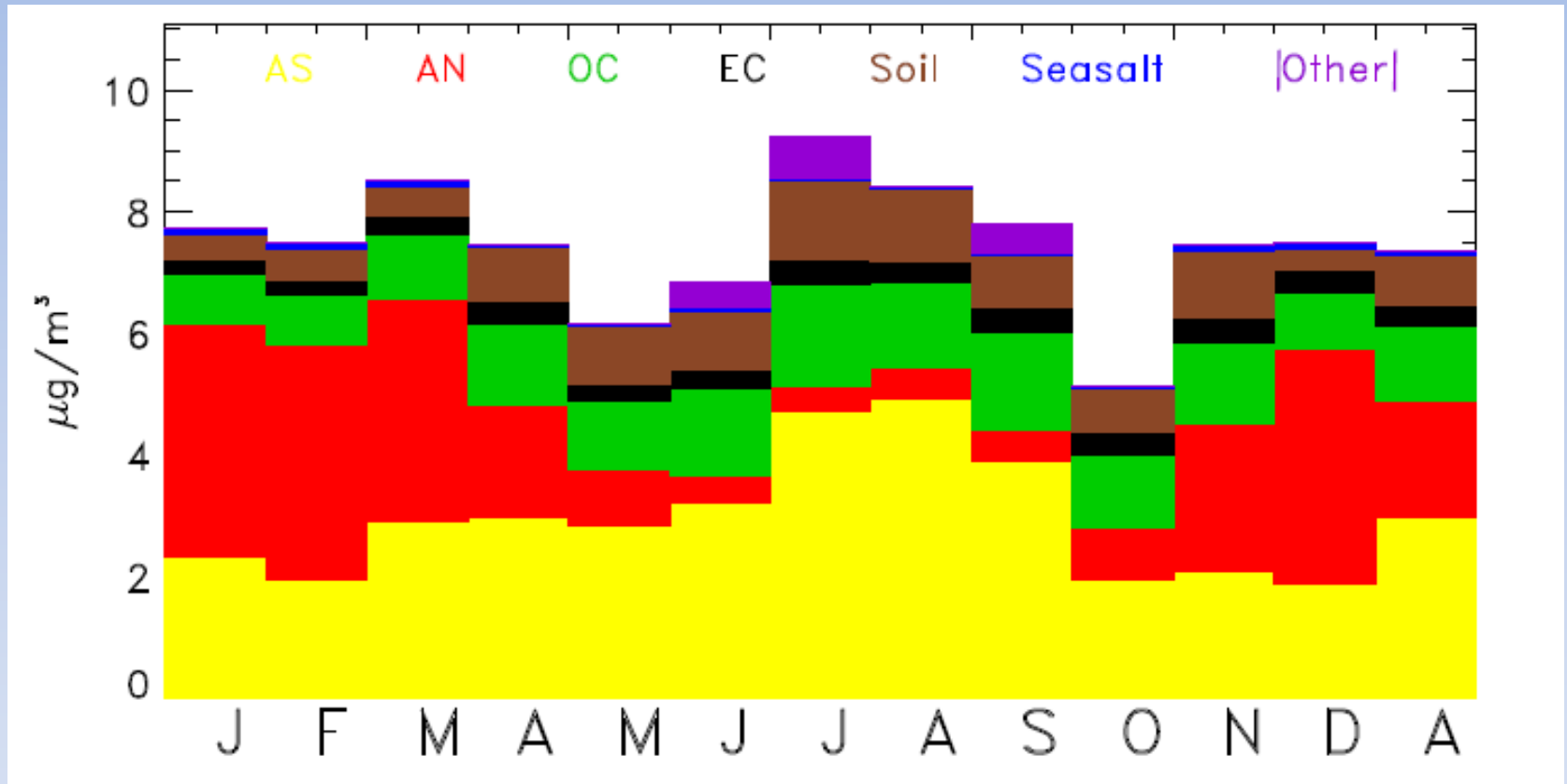
AS AN OC EC Soil Seasalt [Other]

Site?



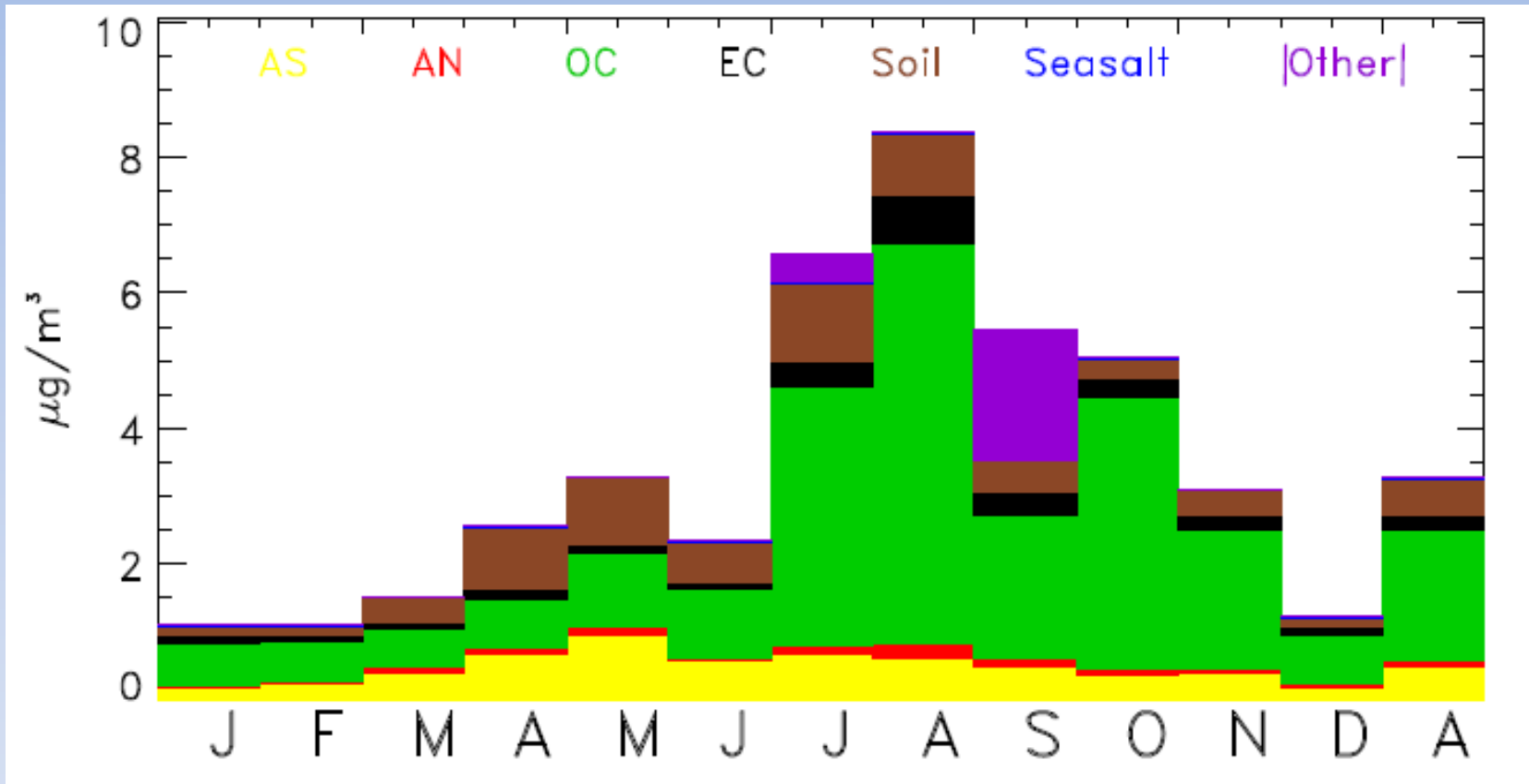
Shenandoah, VA

Site?



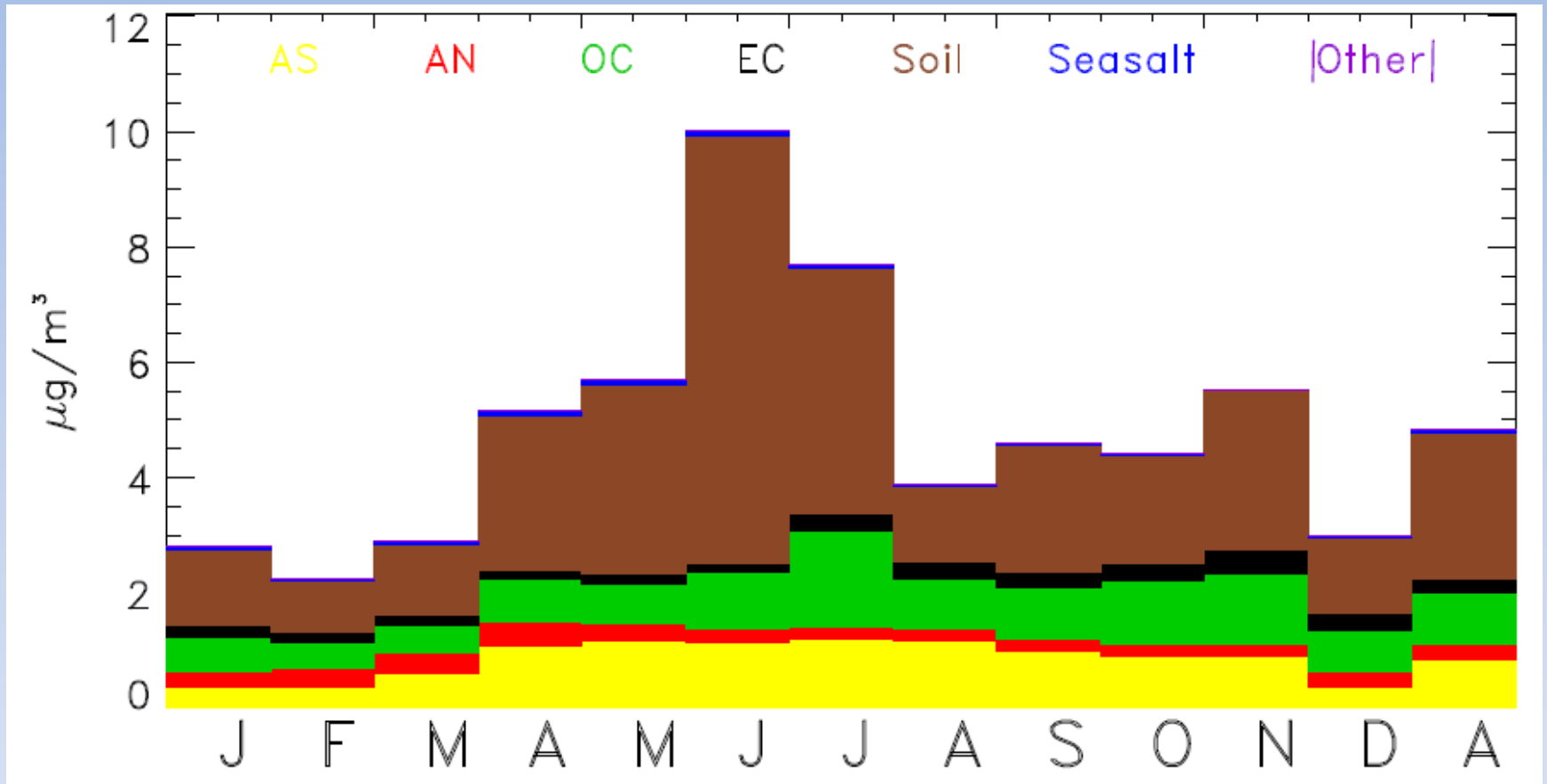
Sac and Fox, KS

Site?



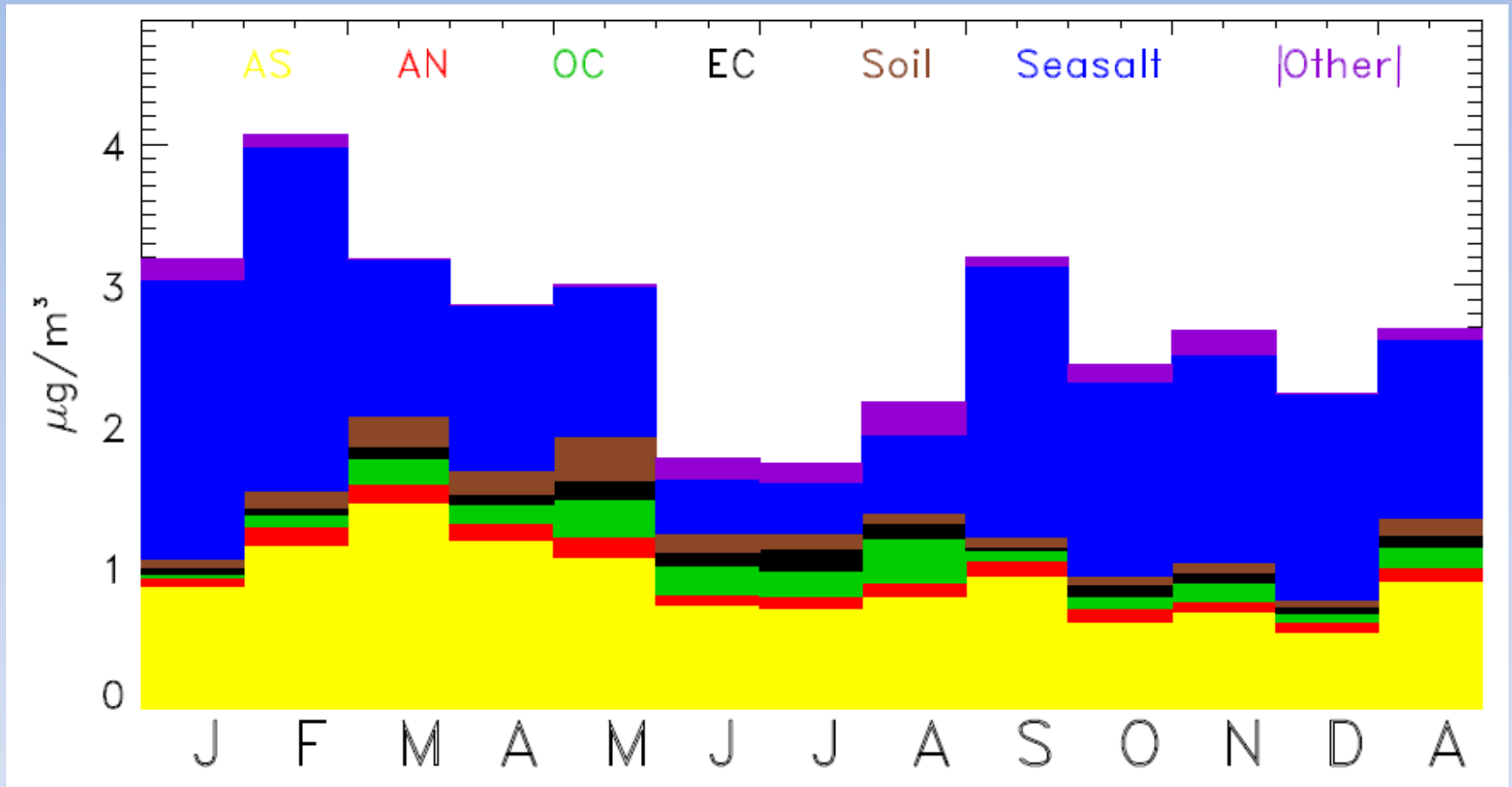
Sawtooth, ID

Site?



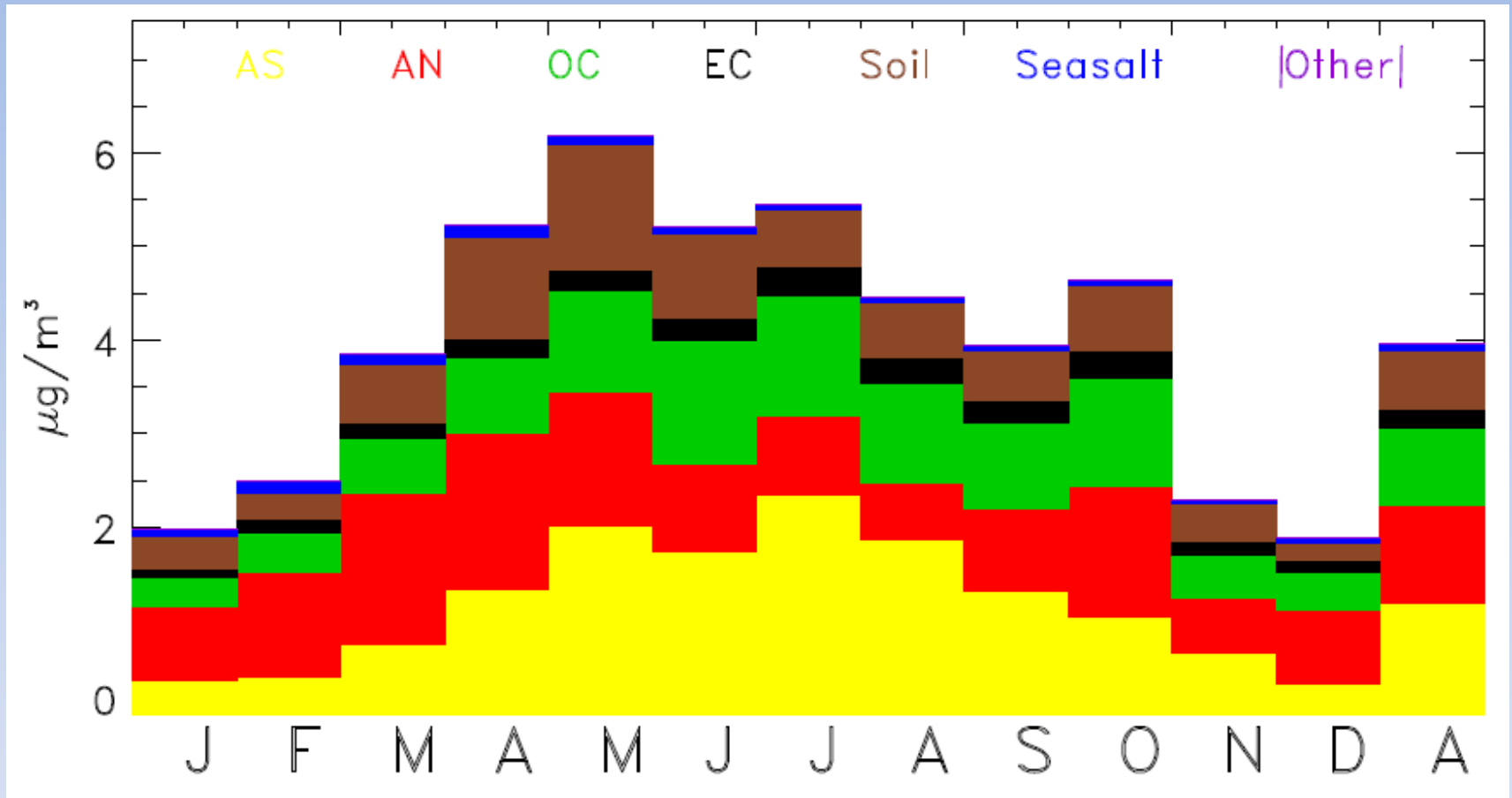
Sycamore Canyon, AZ

Site?



Simeonof , AK

Site?

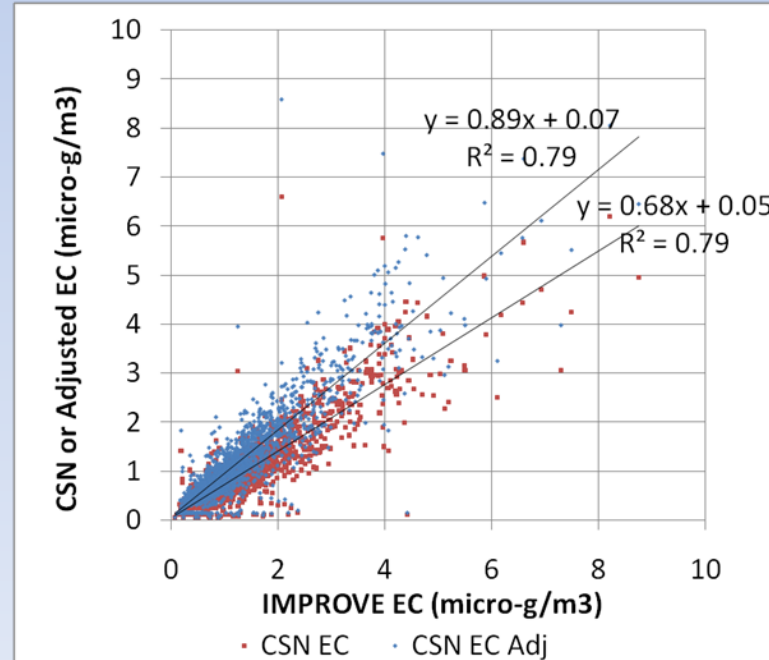
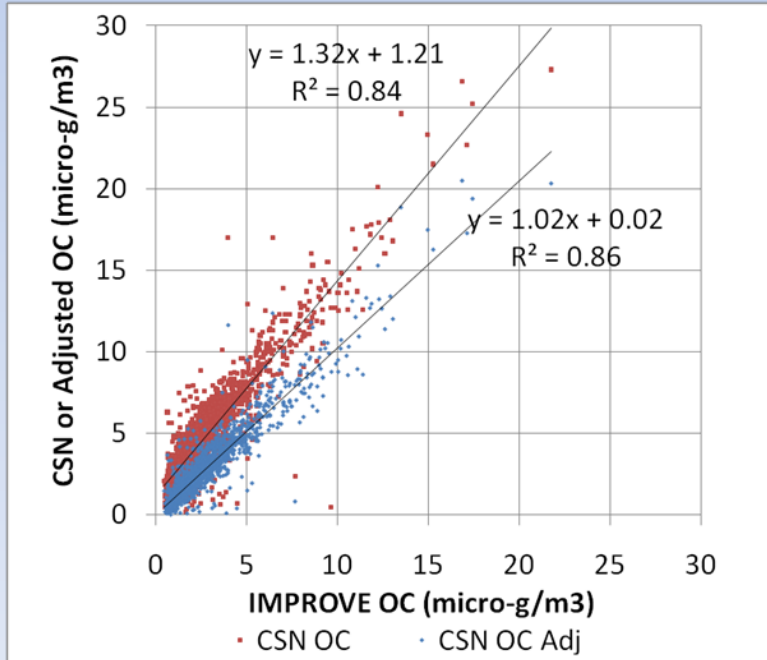
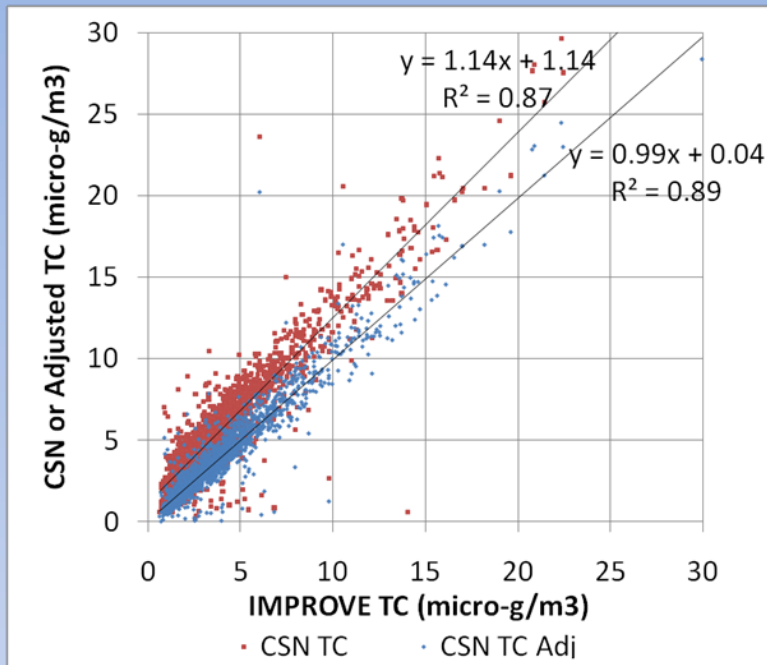


San Gabriel, CA

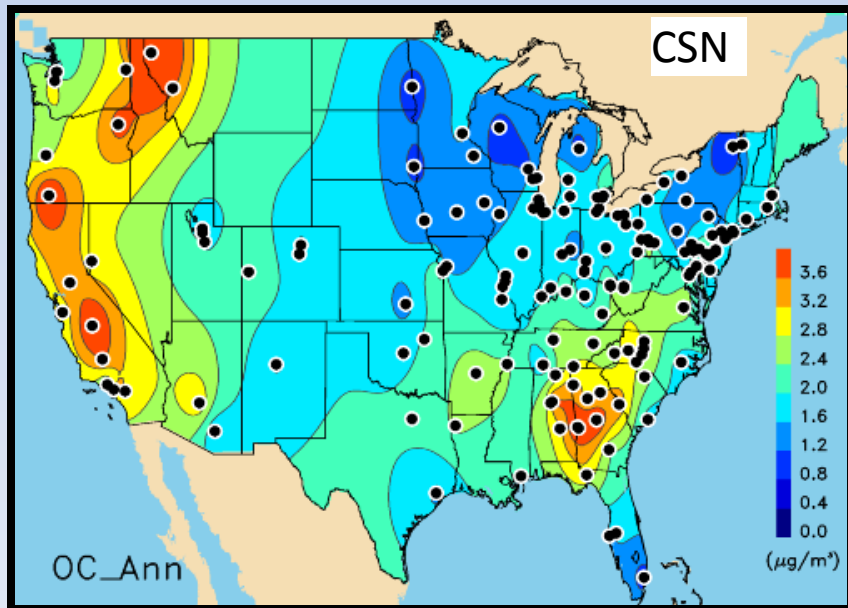
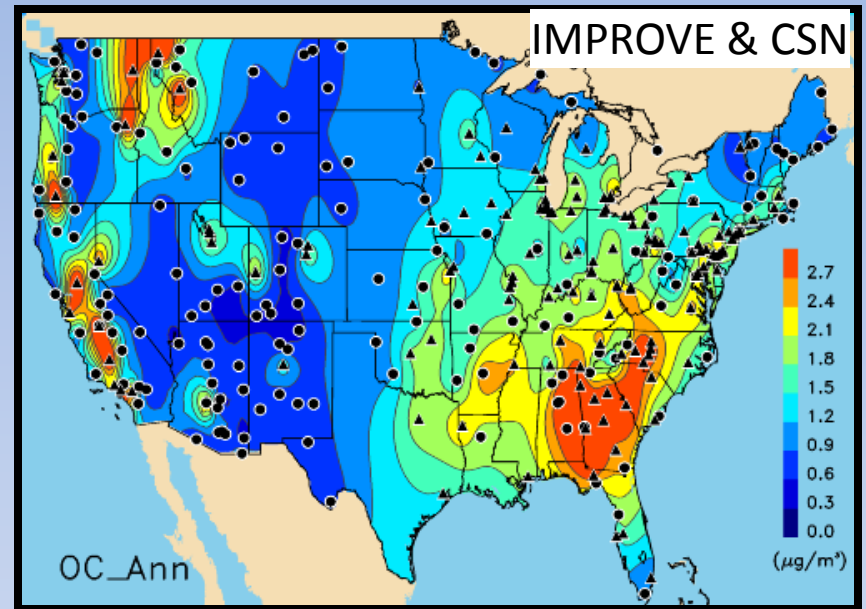
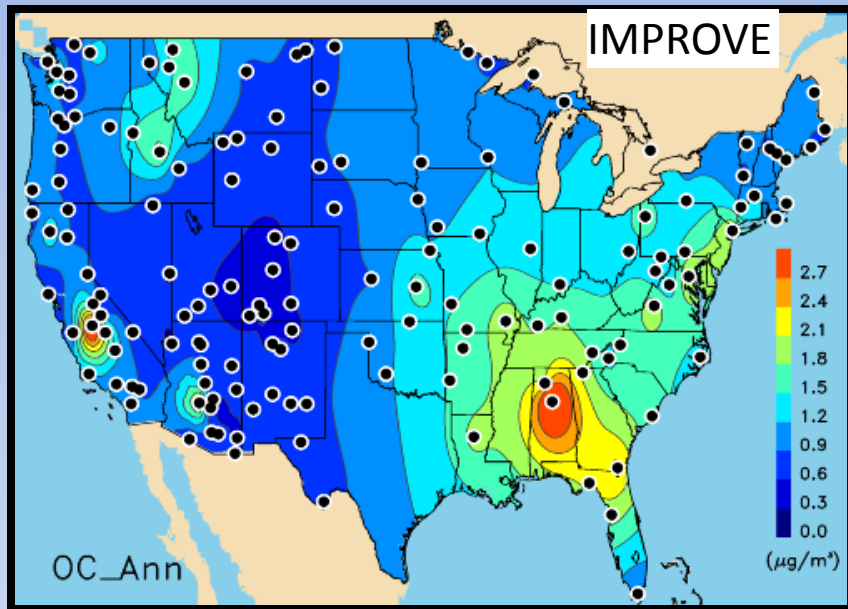
Combining IMPROVE and CSN data

- Homogenized carbon measurements
- Merging urban and rural measurements

Comparison of CSN and adjusted CSN to IMPROVE Carbon

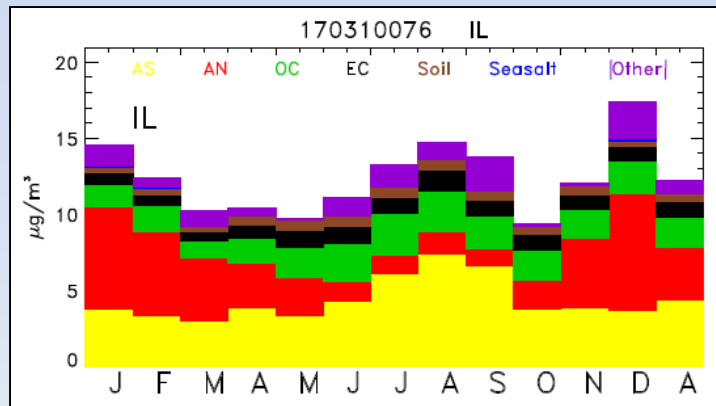
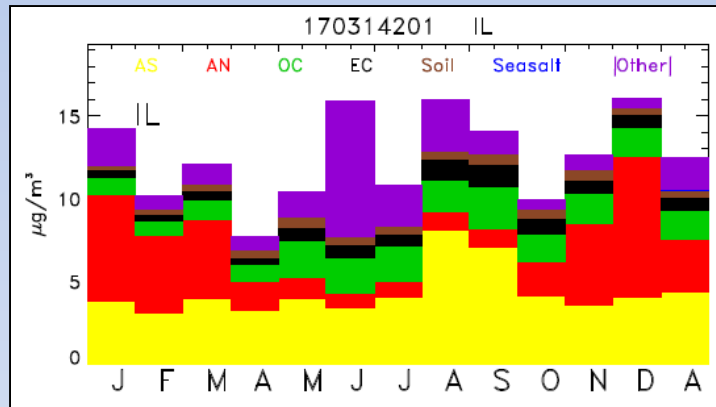
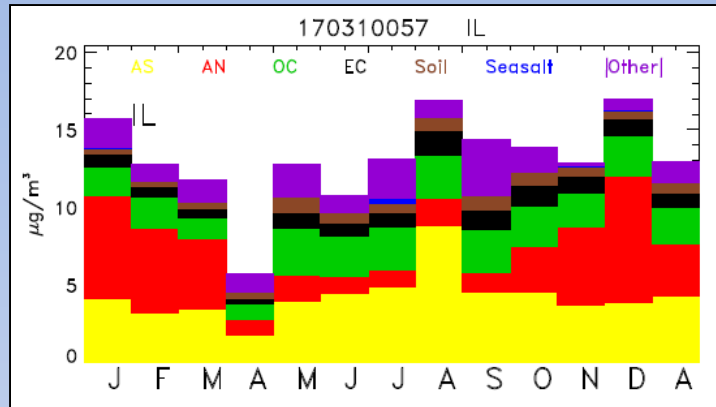


Spatial Patterns: Merging IMPROVE and CSN

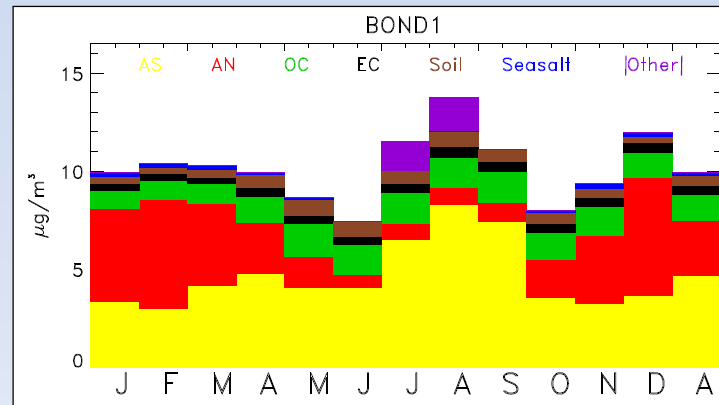


June 2005 – June 2008 Data
50% completeness criteria

Assessing Urban Excess

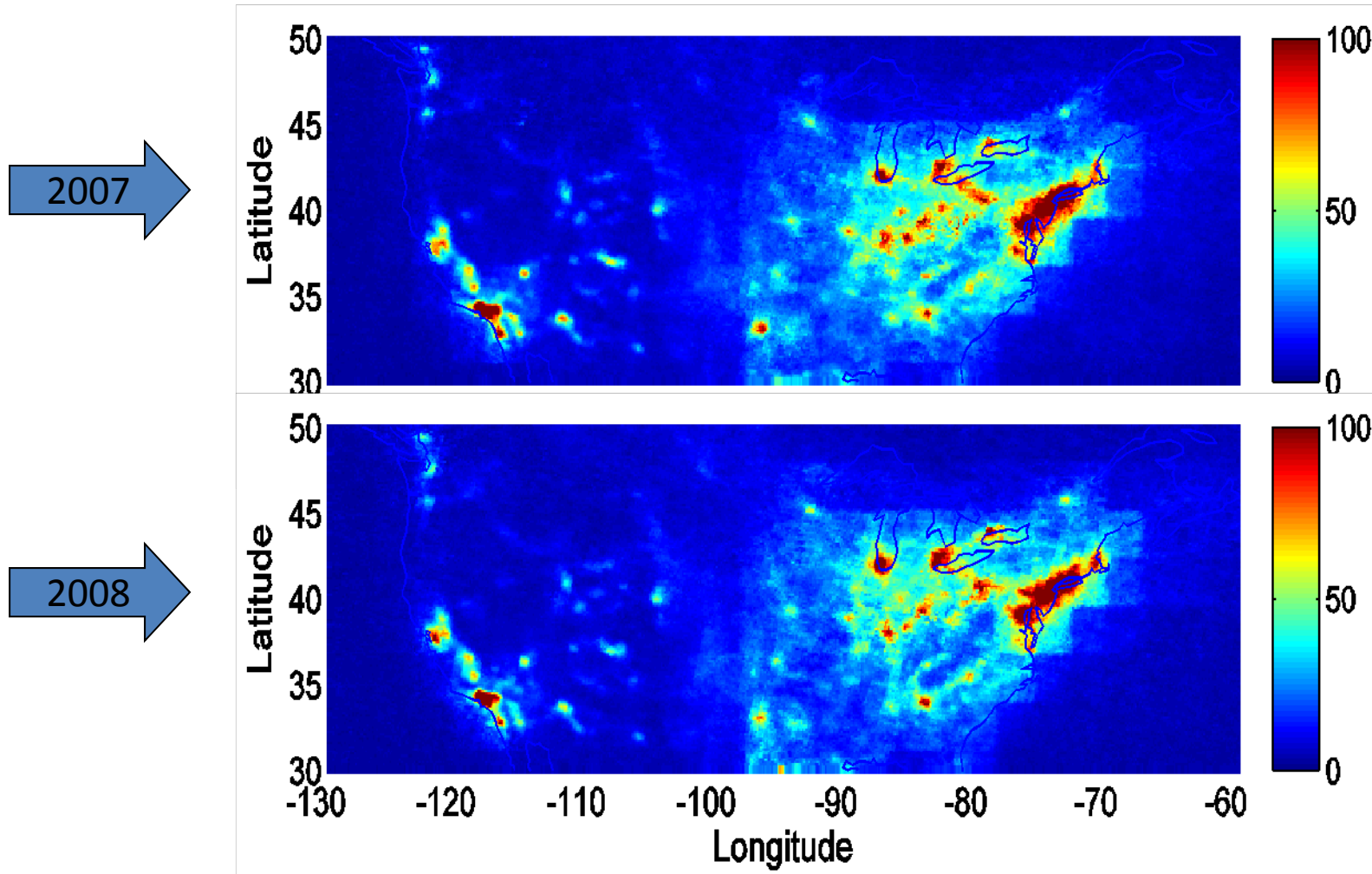


- Urban Heterogeneity
 - Chicago 8/2/2005 sulfate episode; AS $\sim 34 \mu\text{g}/\text{m}^3$ “biased” august concentrations
 - This episode had strong gradient in the city



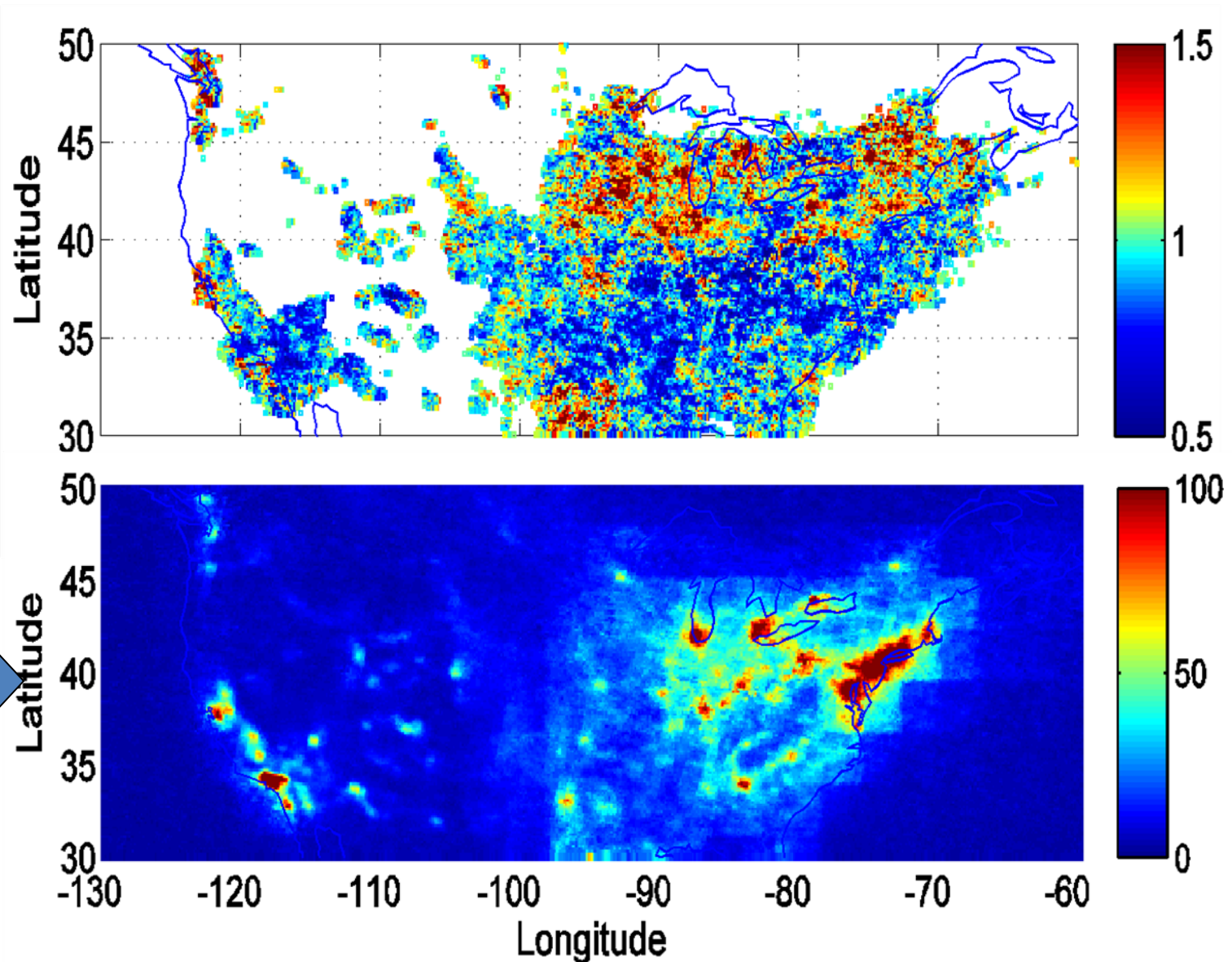
Satellite NO₂ Column Concentrations

SCIAMACHY Annual NO₂



- Satellites GOME: (1996 – 2002); SCIAMACHY (2002 – Present); OMI (2004 – present)

SCIAMACHY NO₂ 2008/2007 Ratio



Spatial Patterns: April Soil

