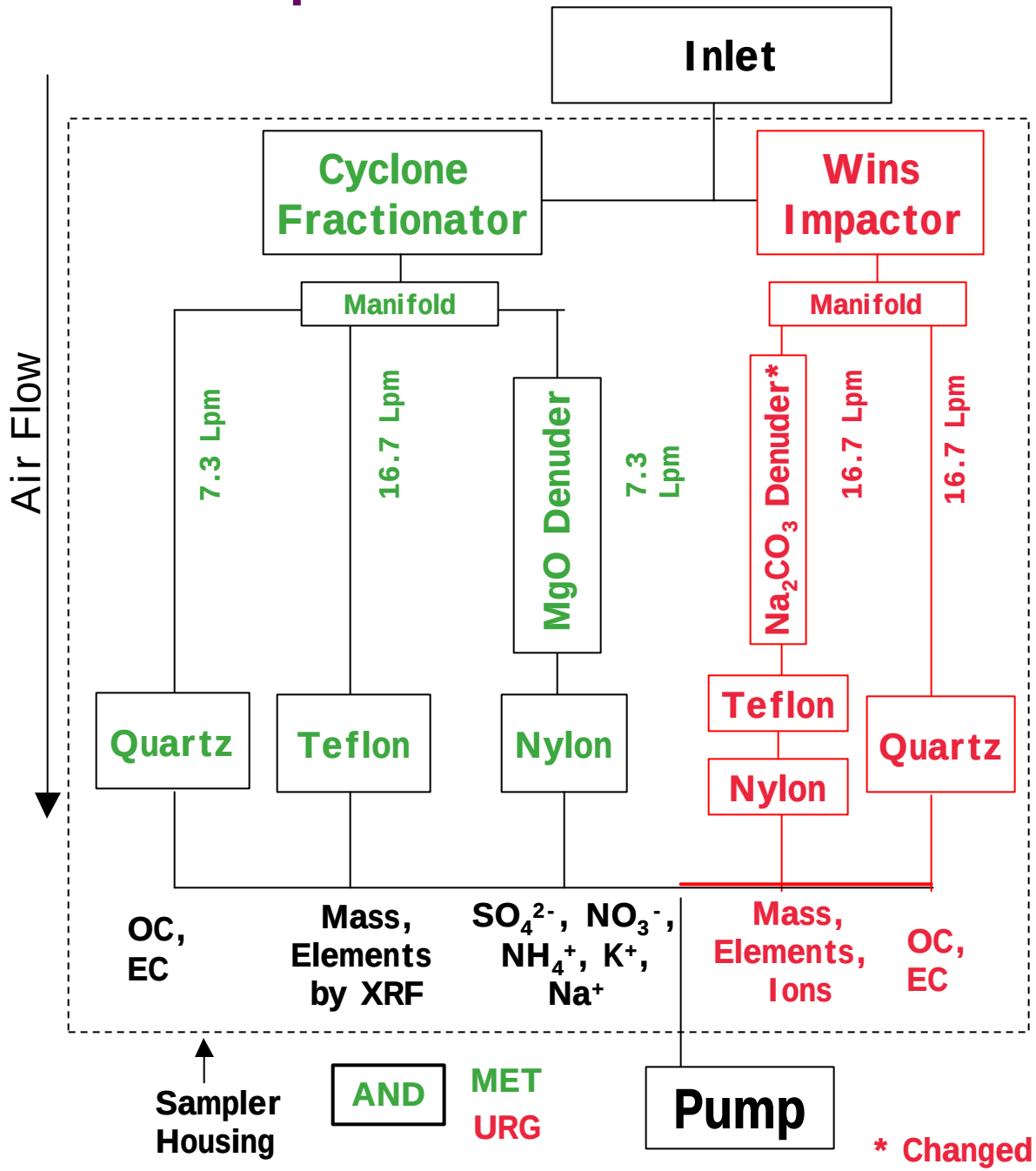
STN Sample Collection



Components - Affects

Inlet and Fractionators:
- Efficiency Curve (Slope & Cutpoint)
- Wall Losses

Manifold: Wall Losses

Transfer Lines:
- Wall Losses

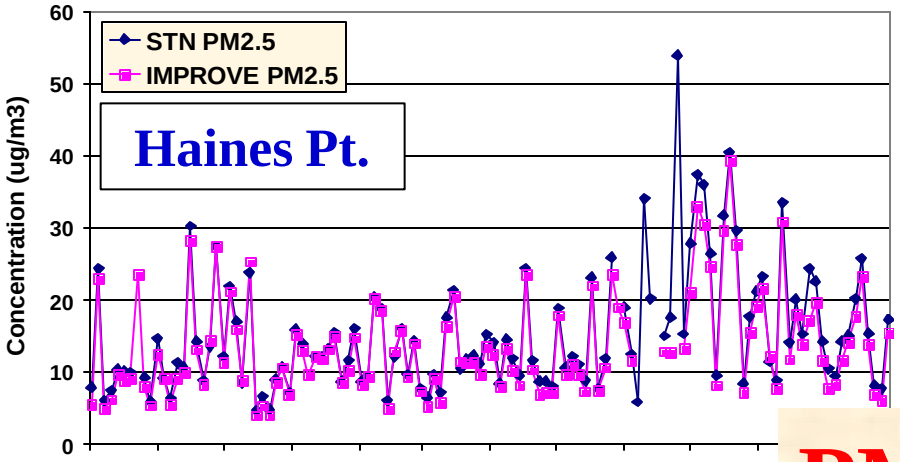
Denuders:
- Efficiency
- Capacity
- Selectivity

Filter – Inert
- Loss of Volatiles
- Blank Levels
- Flow Rate/Face Velocity

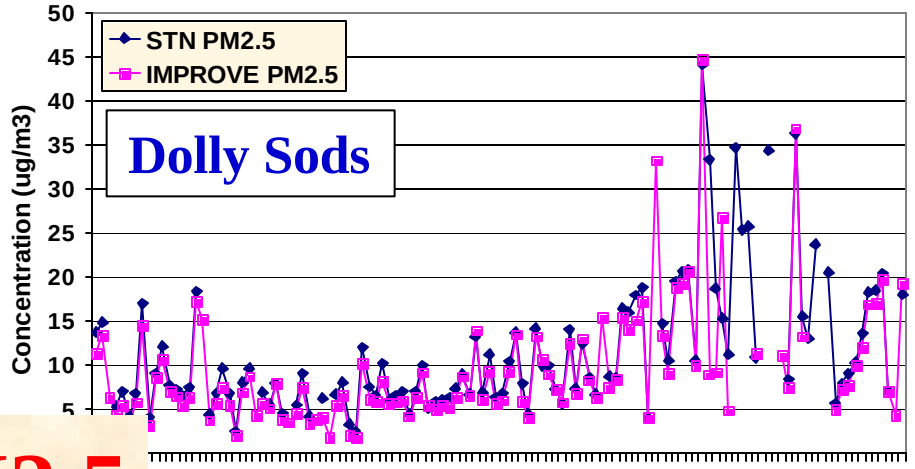
Filter – Reactive
- Efficiency
- Capacity
- Selectivity
- Stability
- Blank Levels

Daily Absolute Comparisons

Chemical Speciation for STN vs. IMPROVE for Particulate Matter 2.5 at Washington-Haine's Pt from 10-01 to 9-02

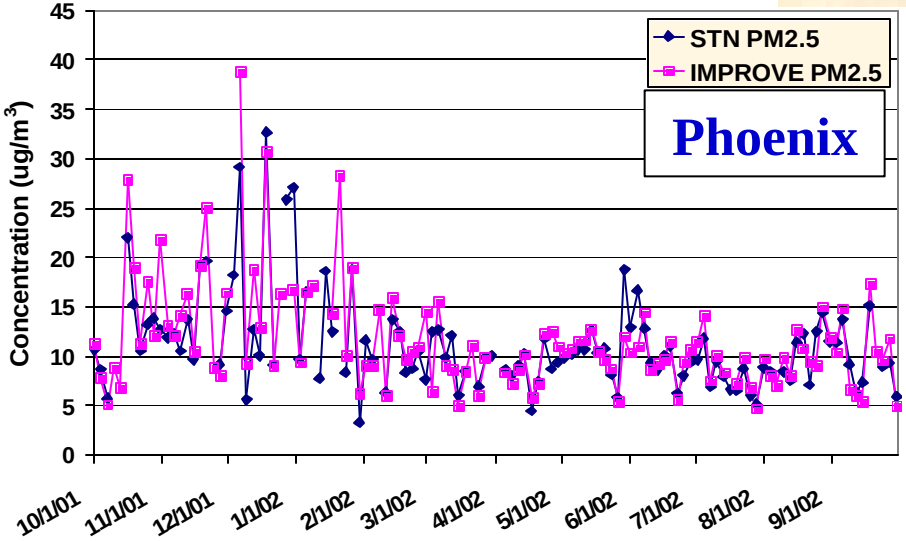


Chemical Speciation for STN vs. IMPROVE for PM2.5 at Dolly Sods from 10-01 to 9-02

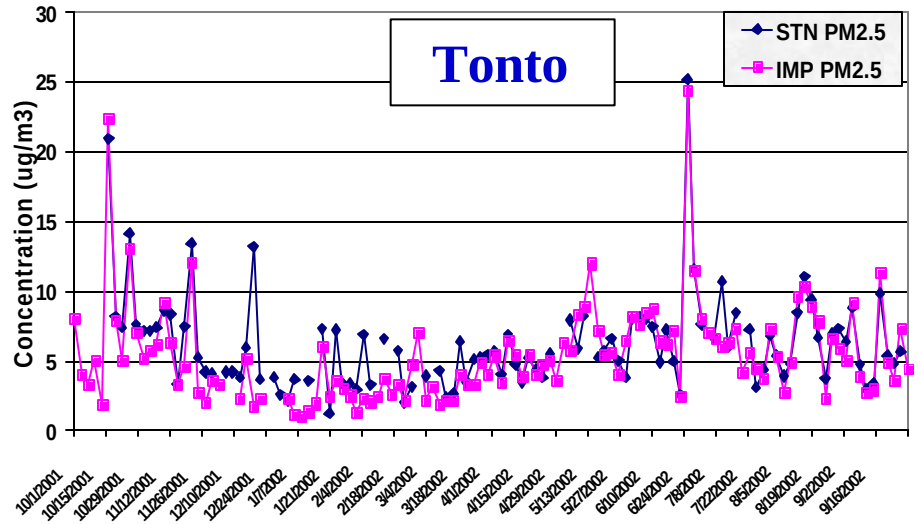


PM2.5

Chemical Speciation for STN vs. IMPROVE Particulate M 2.5 at Phoenix 10-01 to 9-02

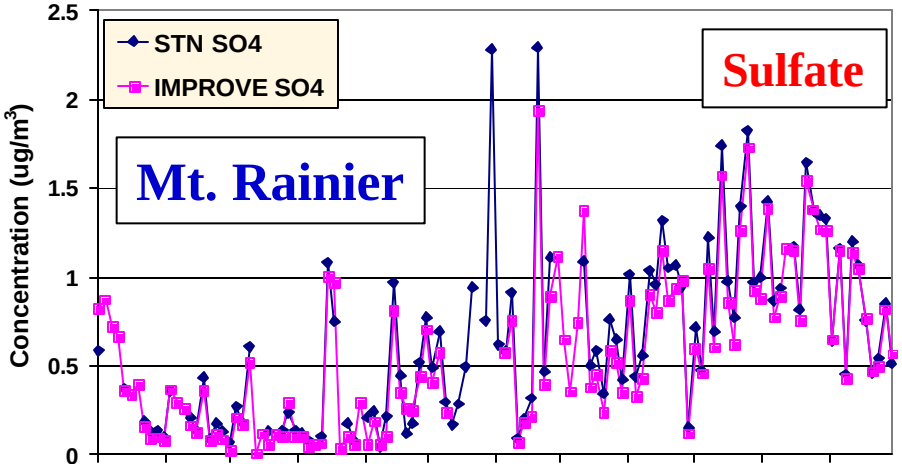


emical Speciation for STN vs. IMPROVE for Particulate Matter 2.5 at Tonto

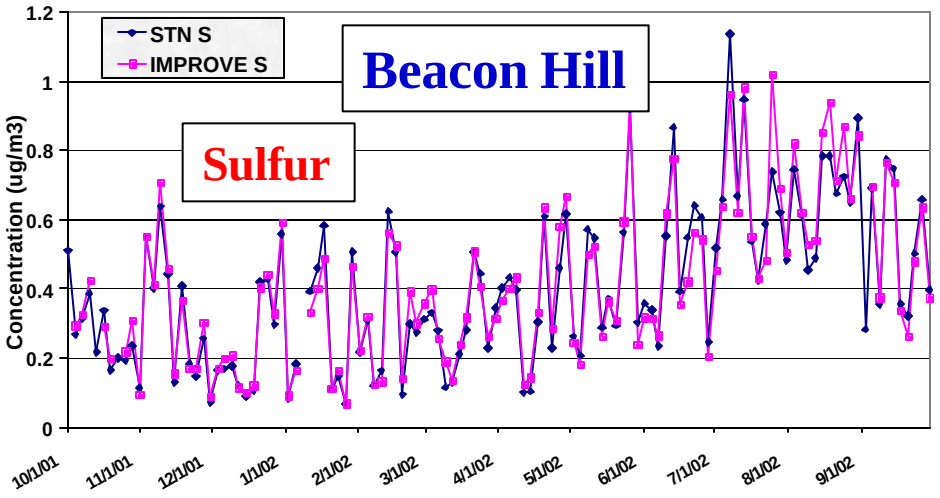


Daily Absolute Comparisons

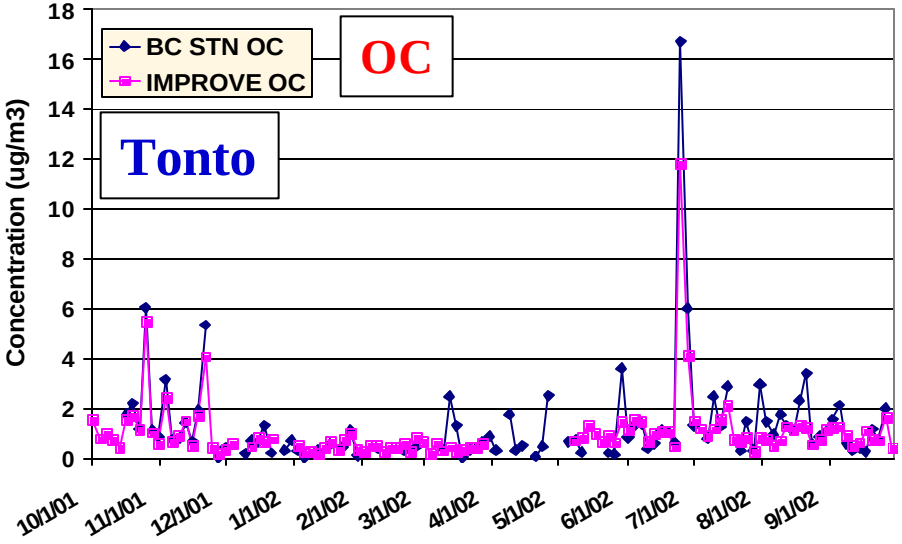
Chemical Speciation for STN vs. IMPROVE for Sulfate at Mt. Rainier from 10-01 to 9-02



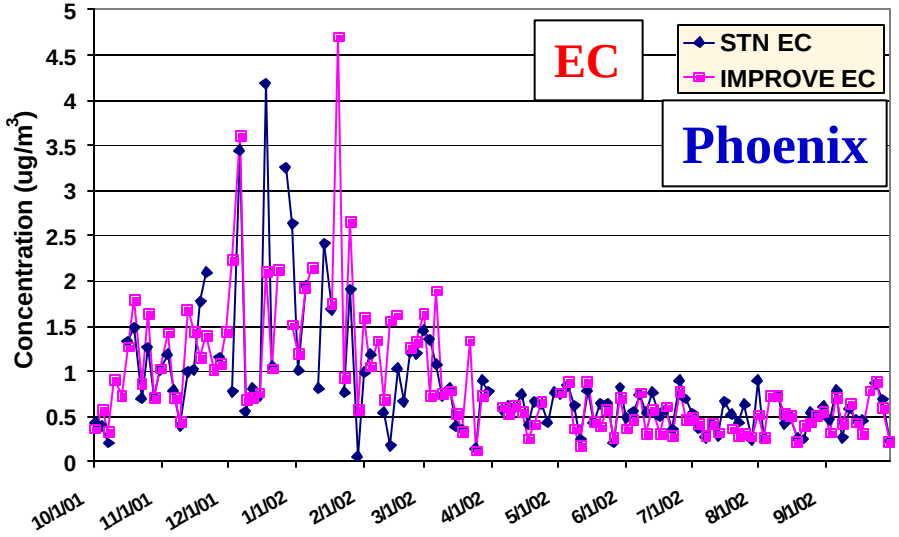
Chemical Speciation for STN vs. IMPROVE for Sulfur at Puget Sound-Beacon Hill from 10-01 to 9-02



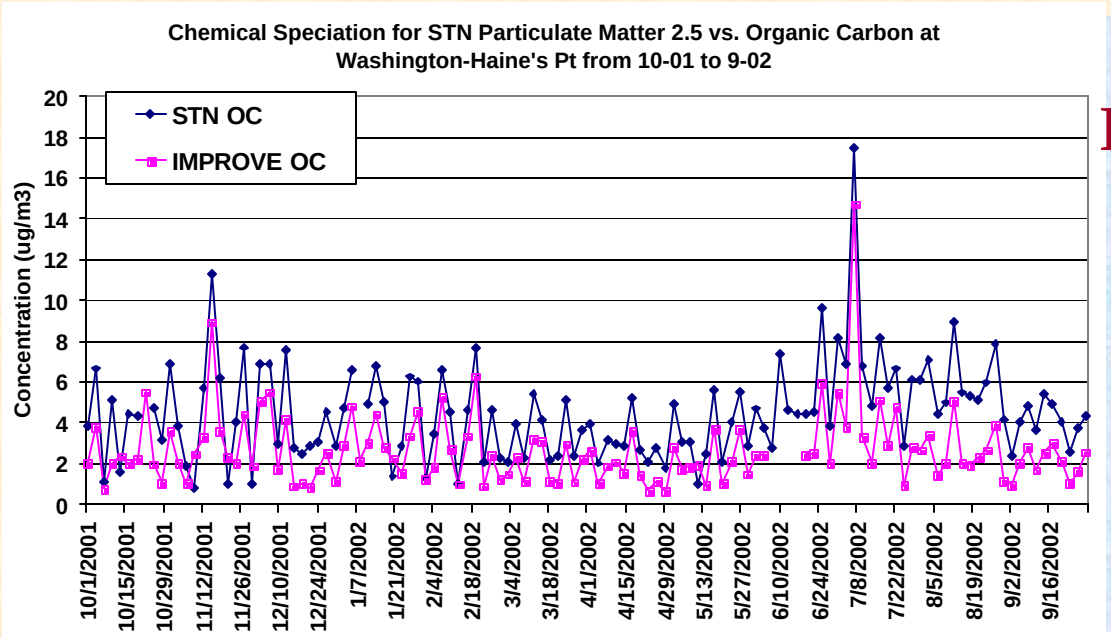
Chemical Speciation for STN vs. IMPROVE for Blank Corrected OC for STN vs OC for IMPROVE 9-01 to 10-02



Carbon at Phoenix from 10-01 to 9-02

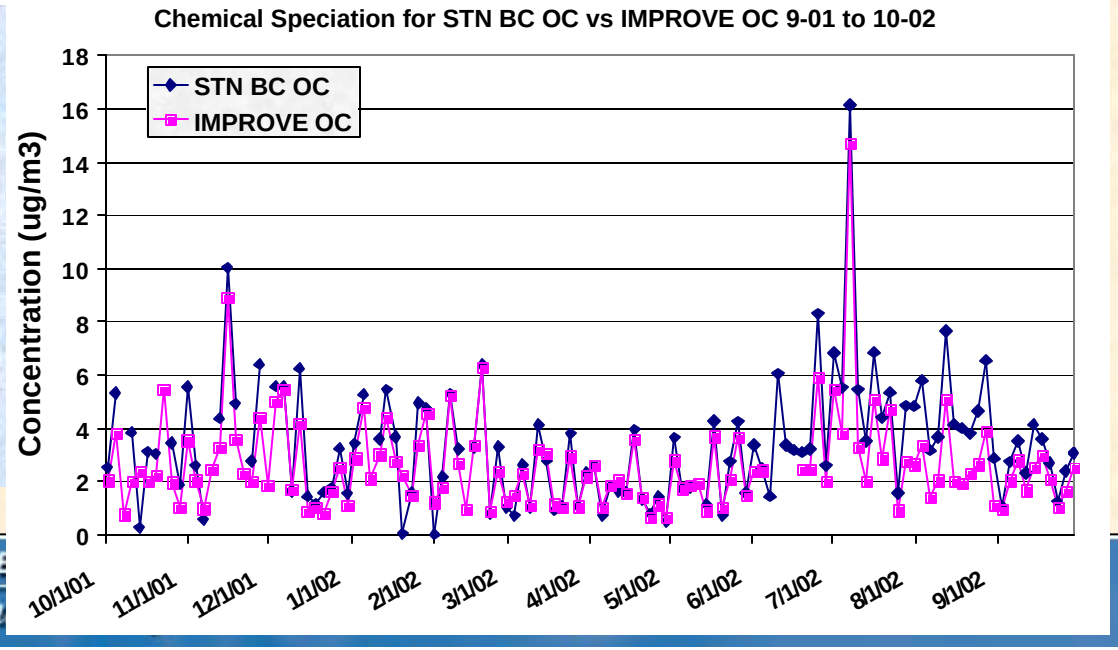


OC Artifacts: Results from STN-IMP Comparison Study



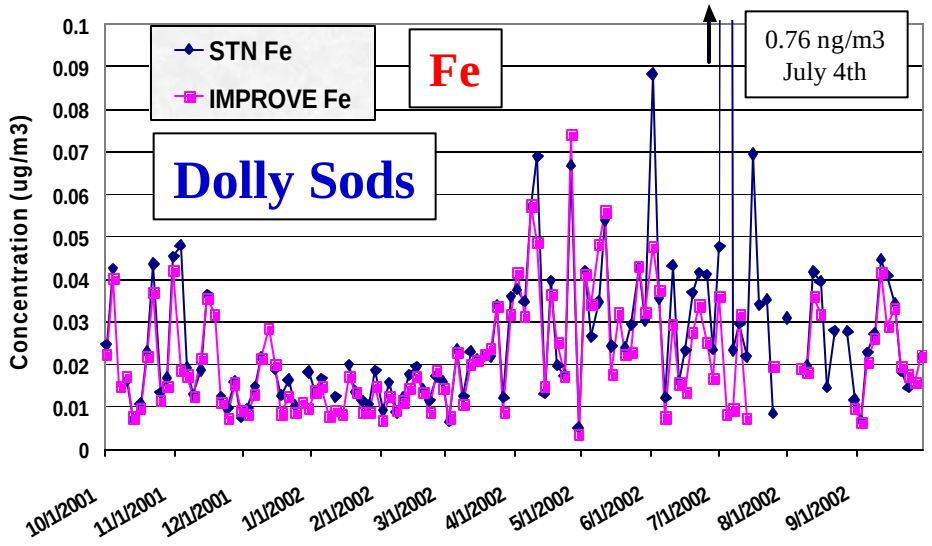
Before Blank Correction

After Blank Correction

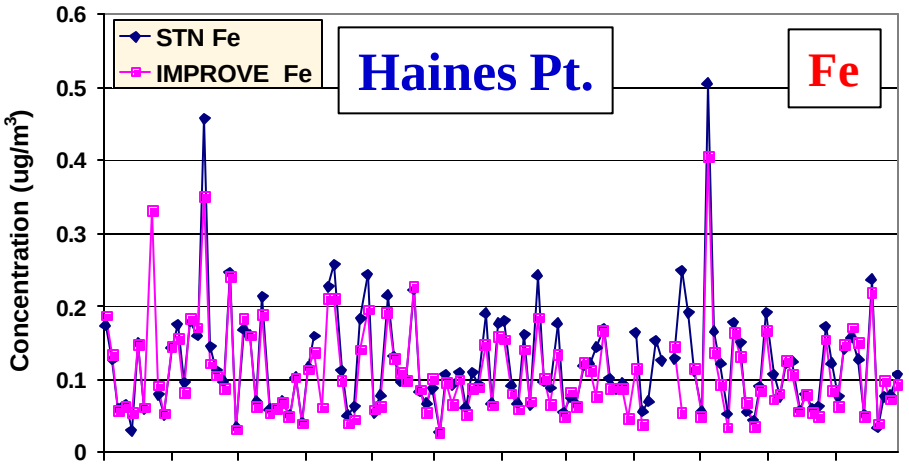


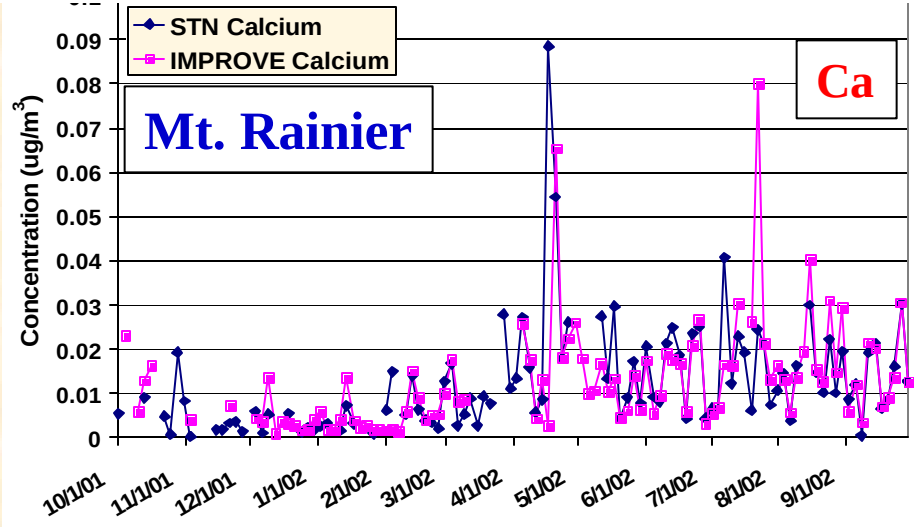
Daily Absolute Comparisons

STN vs. IMPROVE Chemical Speciation for Iron at Dolly Sods from 10-01 to 9-02

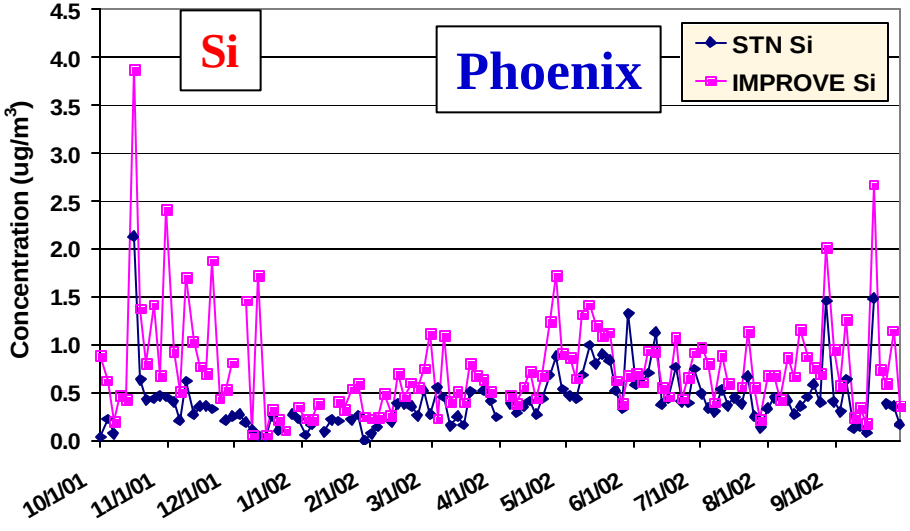


Chemical Speciation for STN vs. IMPROVE for Iron at Washington-Haine's Pt from 10-01 to 9-02



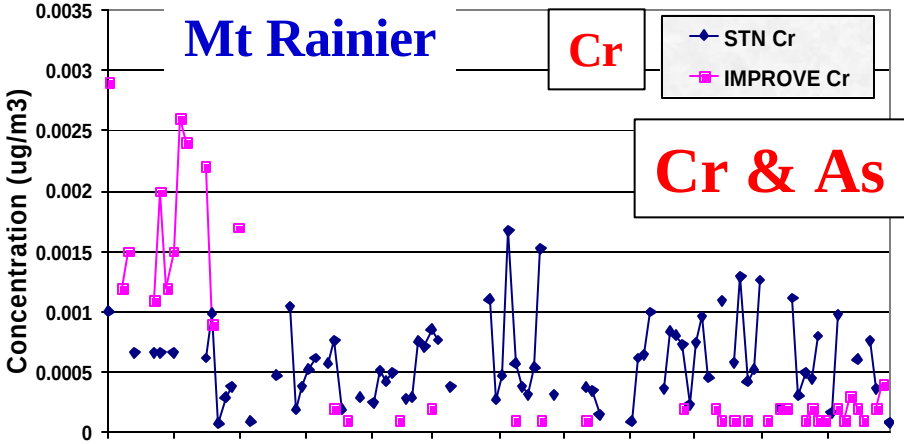


Chemical Speciation for STN vs. IMPROVE for Silicon at Phoenix from 10-01 to 9-02

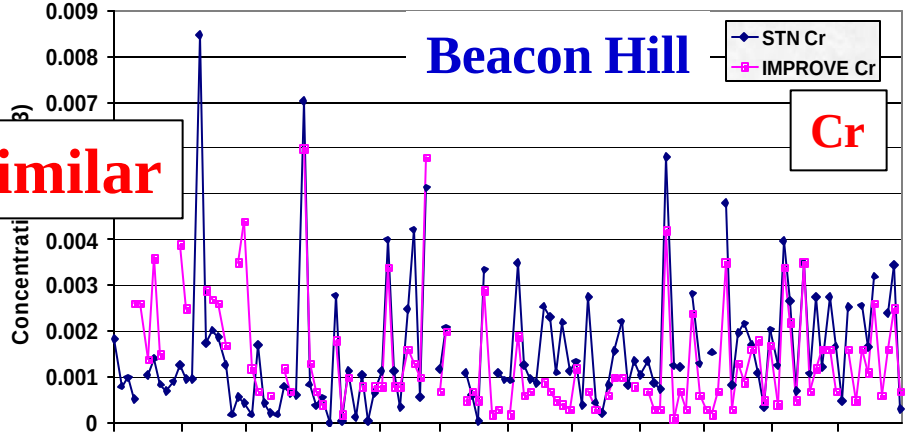


Daily Absolute Comparisons

Chemical Speciation for STN vs. IMPROVE for Chromium at Mt. Rainier from 10-01 to 9-02

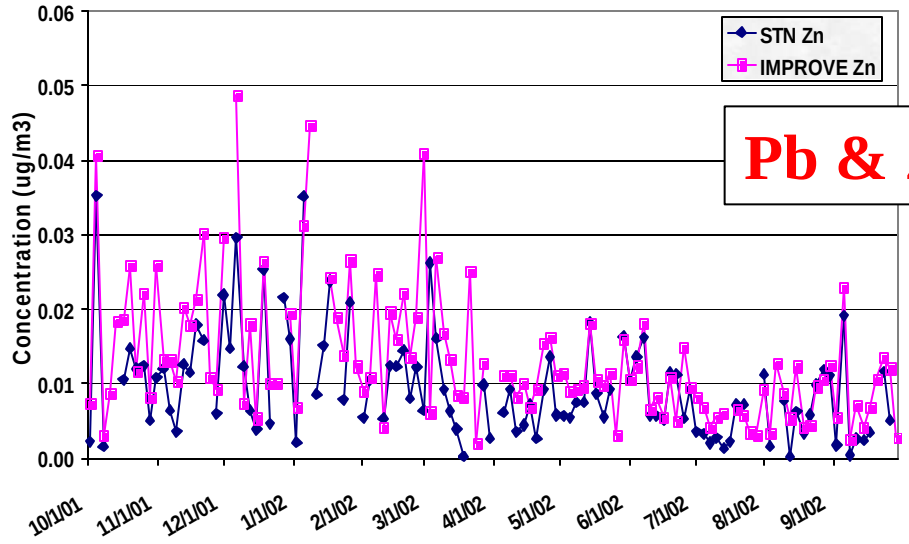


Chemical Speciation for Chromium at Puget Sound -Beacon Hill from 10-01 to 9-02

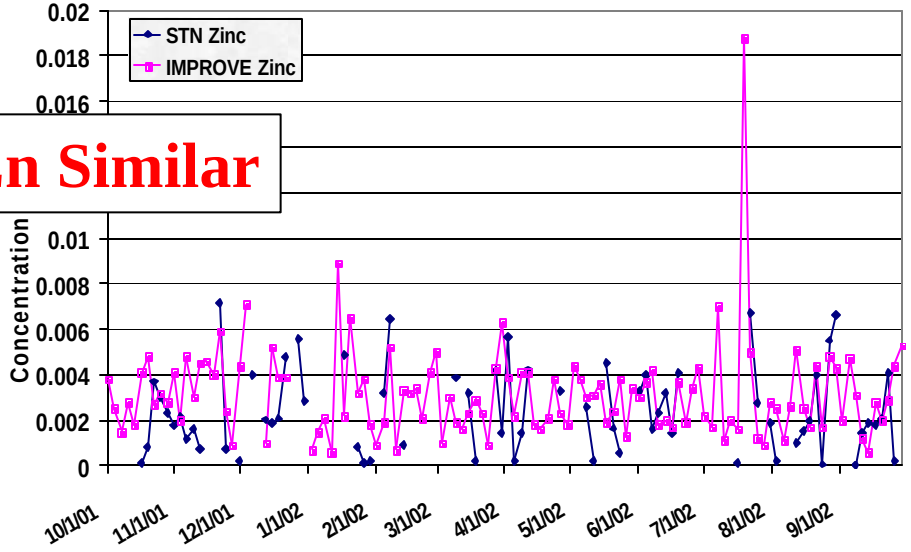


Cr & As Similar

Chemical Speciation for STN vs. IMPROVE for Zinc at Phoenix from 10-01 to 9-02

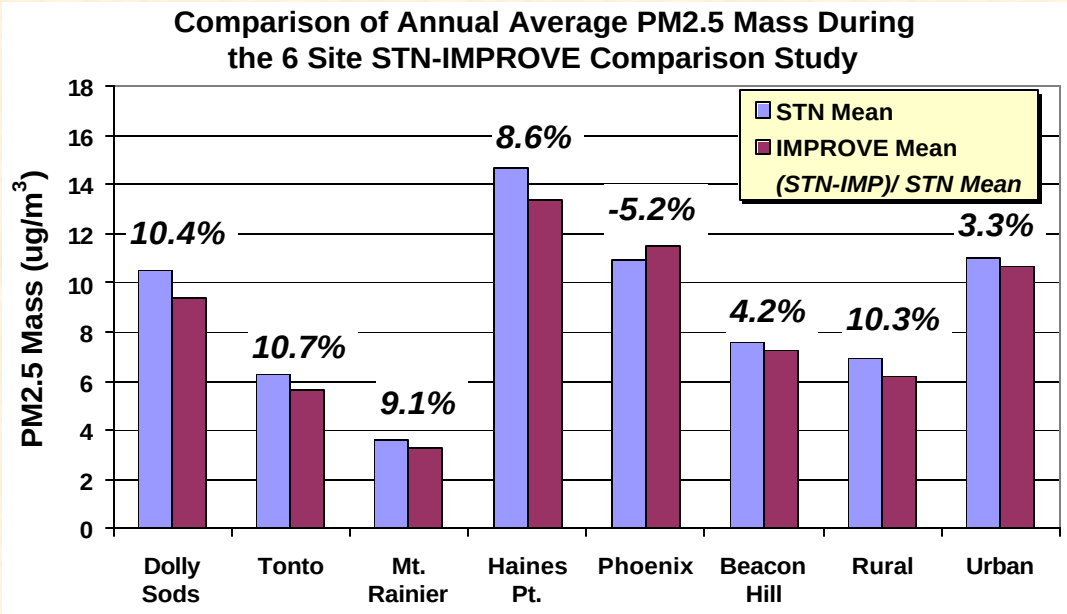


Chemical Speciation for STN vs. IMPROVE for Zinc at Tonto from 9-01 to 10-02



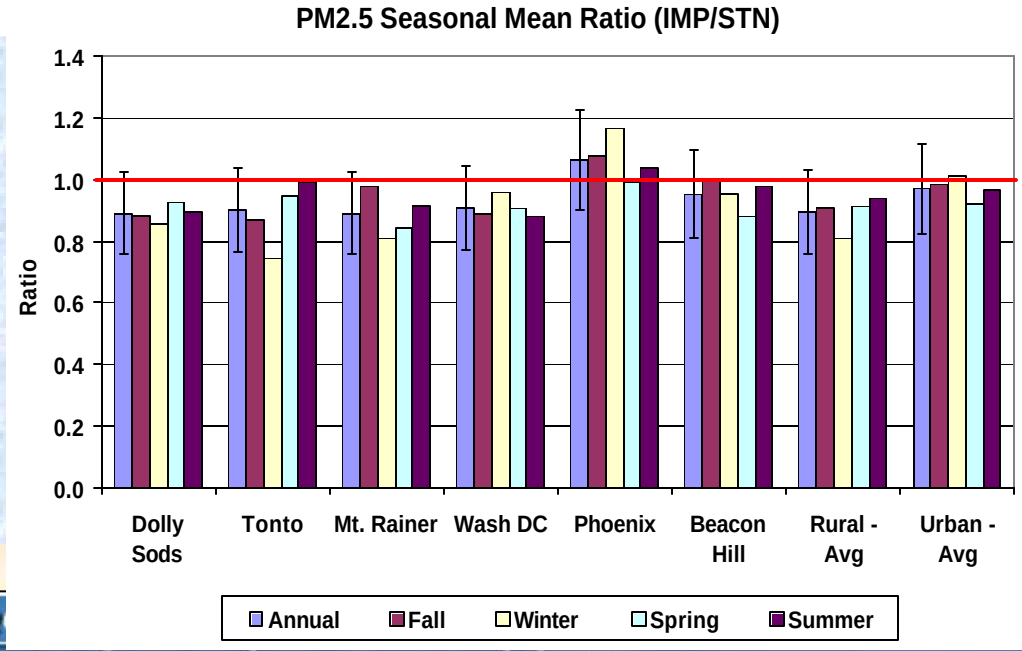
Pb & Zn Similar

Annual Average & Seasonal Comparisons

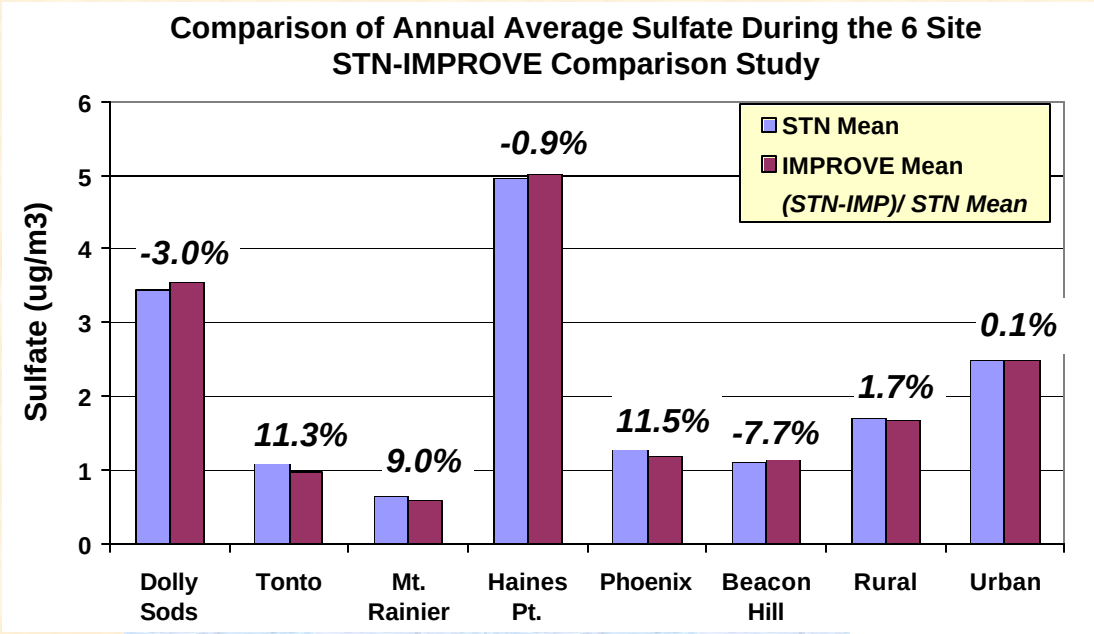


PM2.5

Previous Speciation Monitor Comparability Results = Ratio 10-20%; Error Bars = 15%

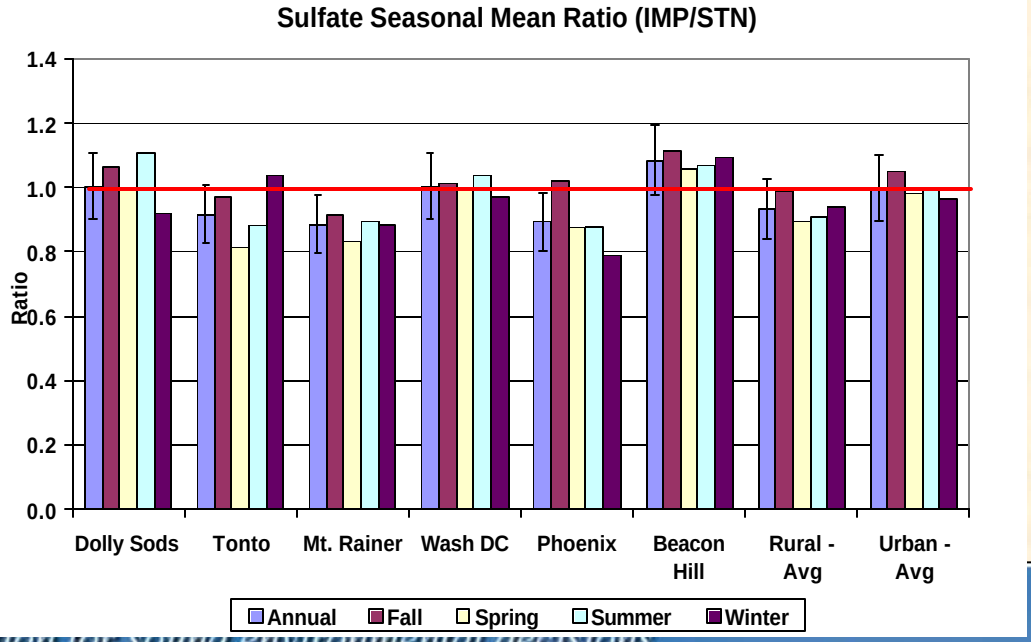


Annual Average & Seasonal Comparisons

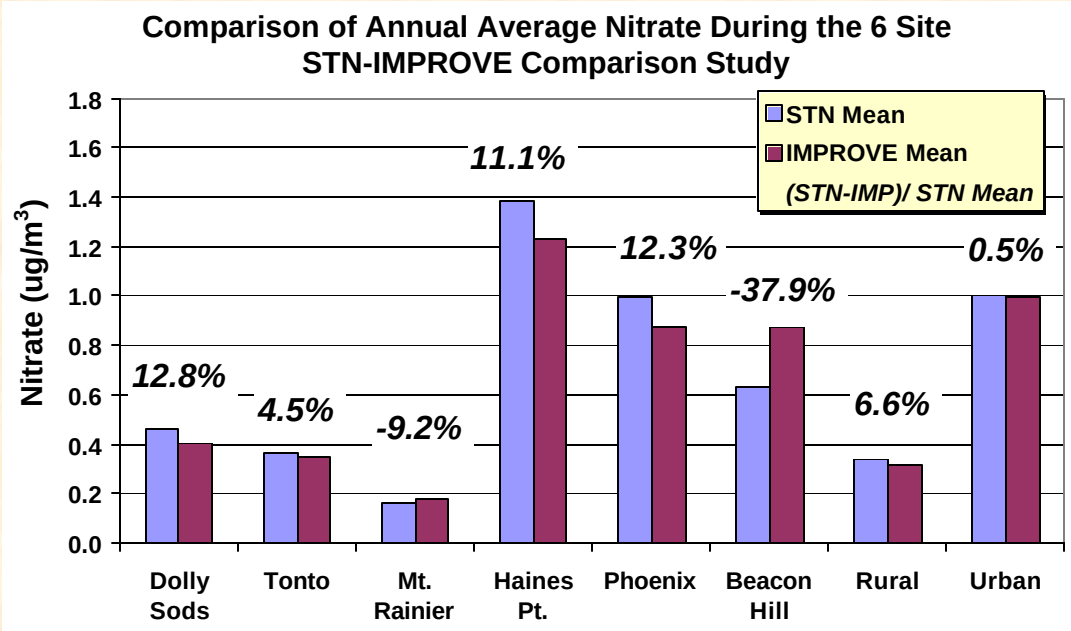


Sulfate

Previous Speciation Monitor Comparability Results = Ratio 10%; Error Bars = 10%



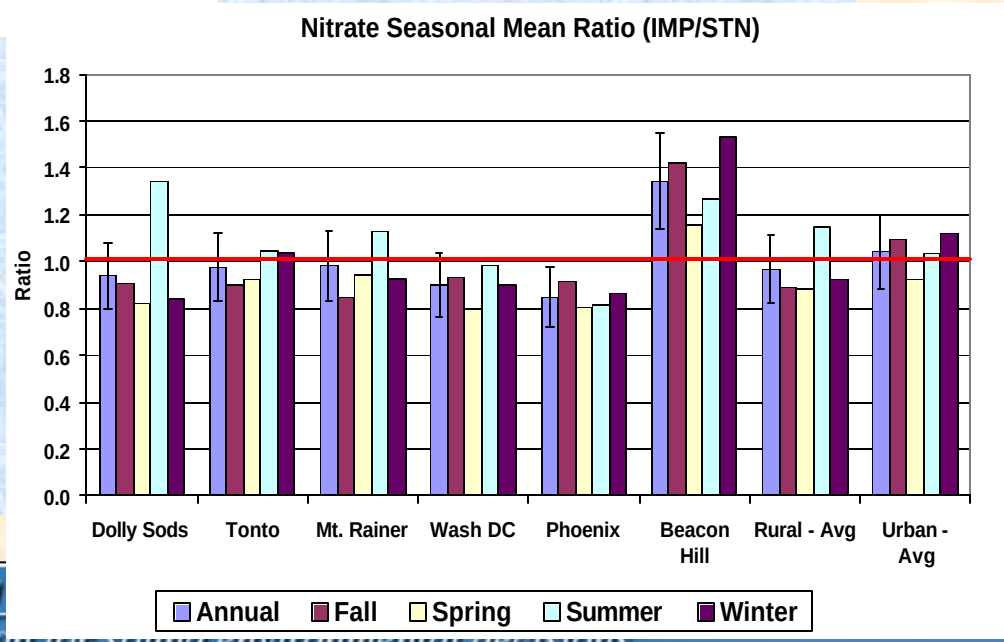
Annual Average & Seasonal Comparisons



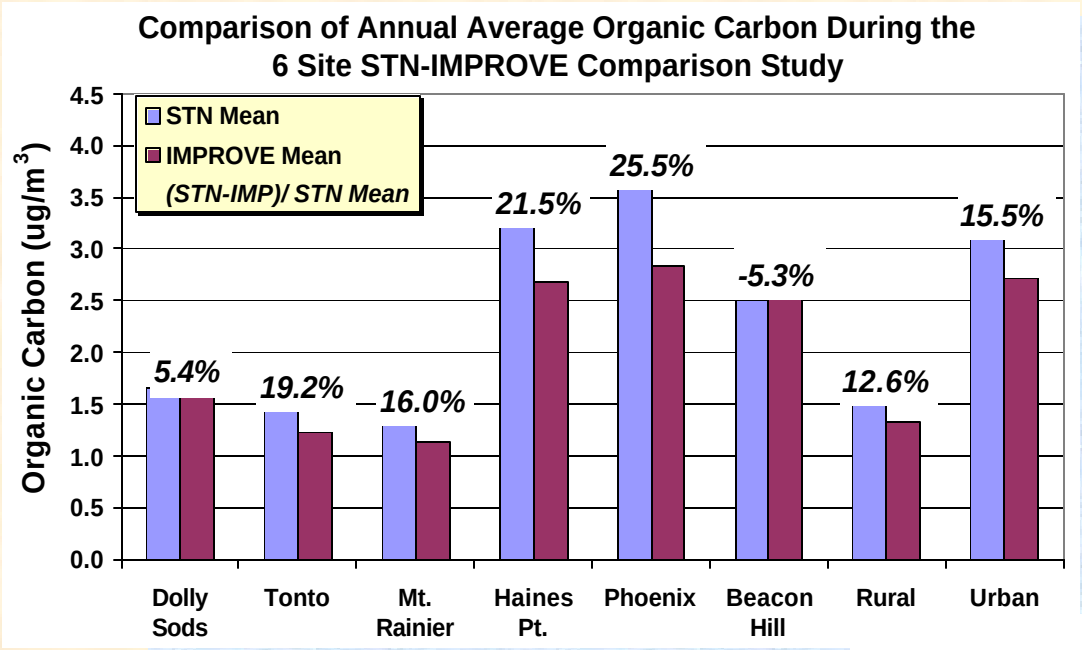
Nitrate

Previous Speciation Monitor Comparability Results = Ratio 15-35%*; Error Bars = 15%

***Range Function of Sampling Method**

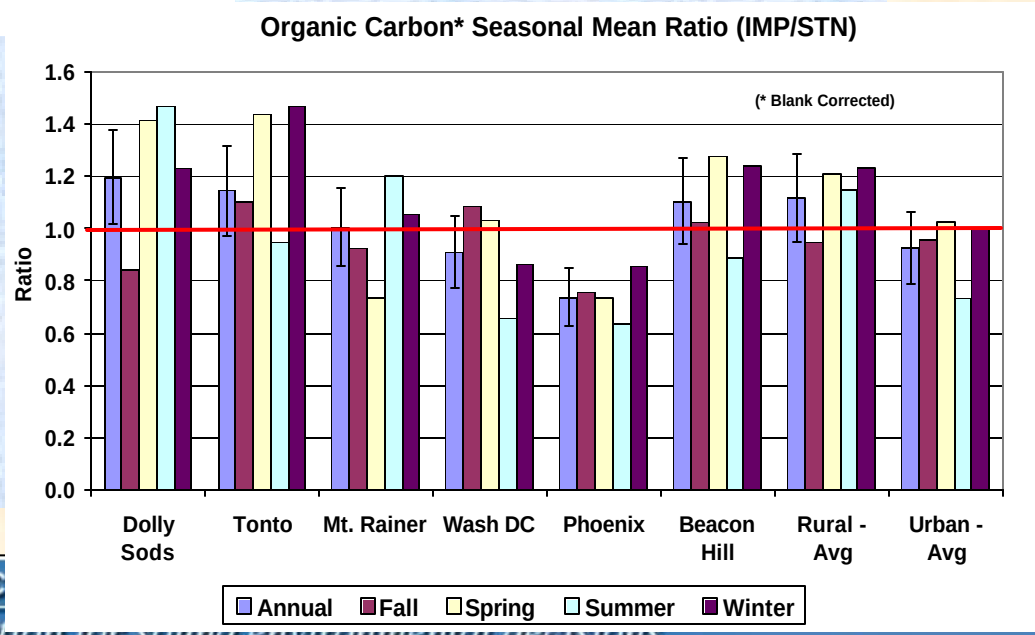


Annual Average & Seasonal Comparisons

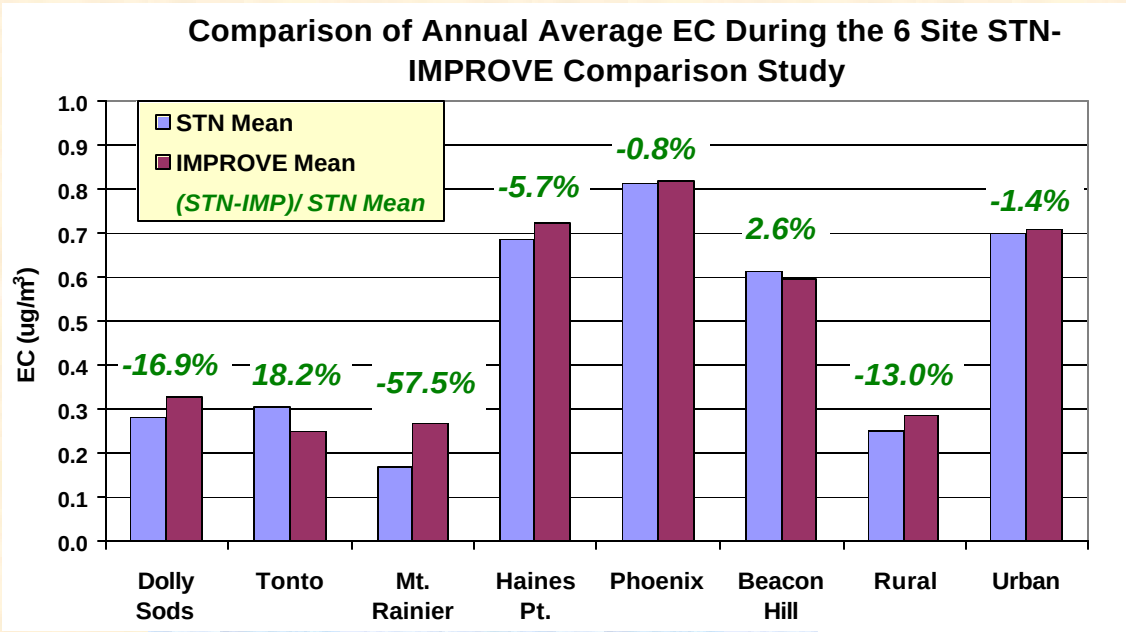


Organic Carbon

Previous Speciation Monitor Comparability Results = Ratio 15%; Error Bars = 15%



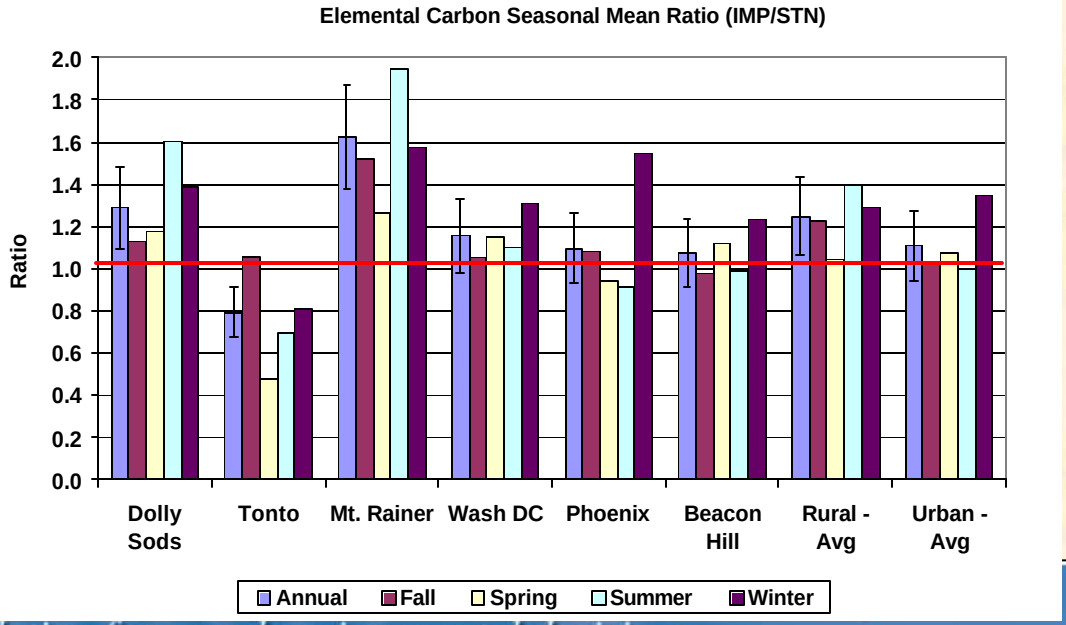
Annual Average & Seasonal Comparisons



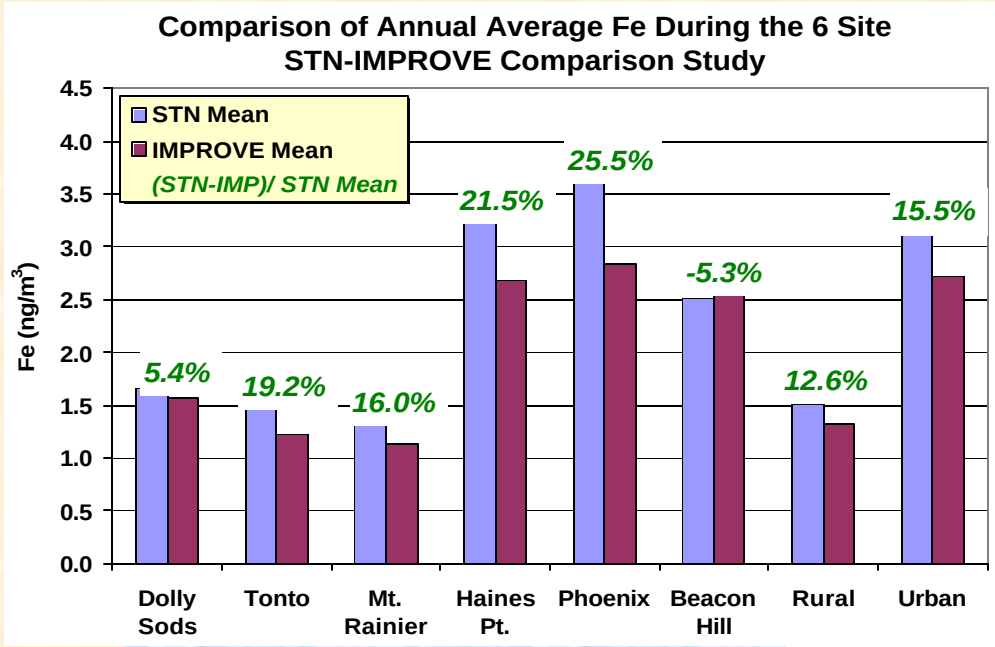
Elemental Carbon

Previous Speciation Monitor Comparability Results = Ratio 15%*; Error Bars = 15%

***Employing Same Analytical Method**

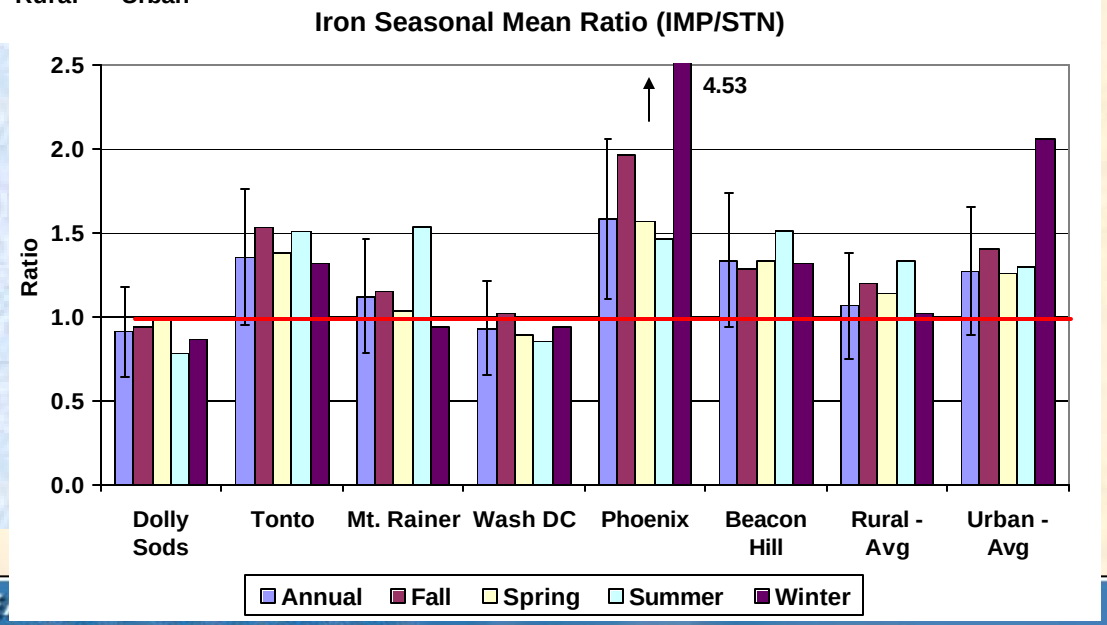


Annual Average & Seasonal Comparisons

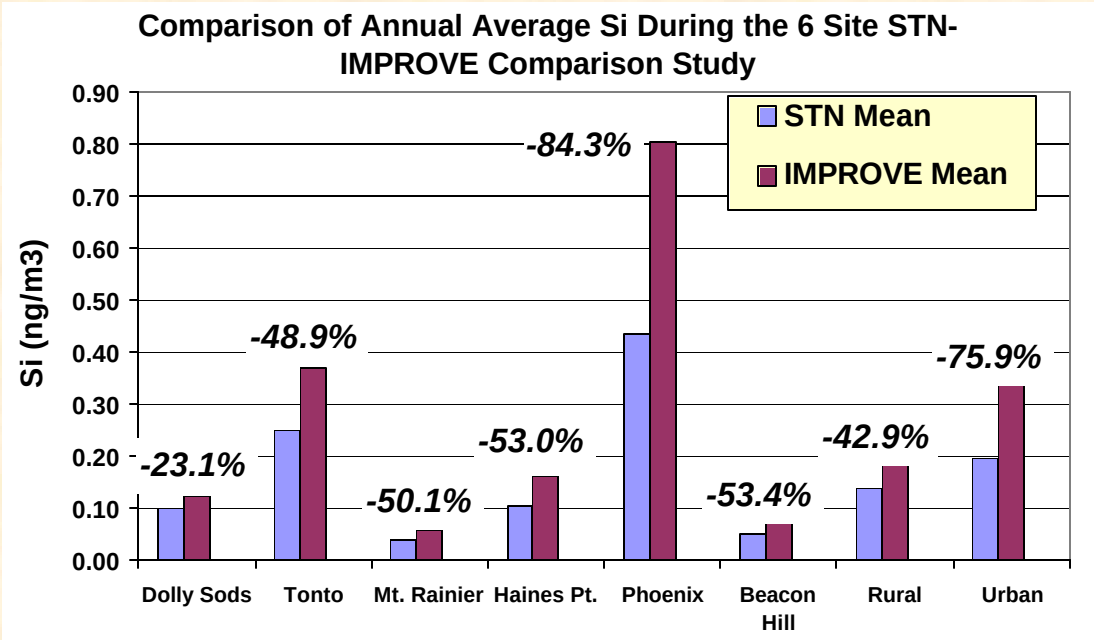


Iron*

Previous Speciation Monitor Comparability Results = Ratio 15-30%*; Error Bars = 30%



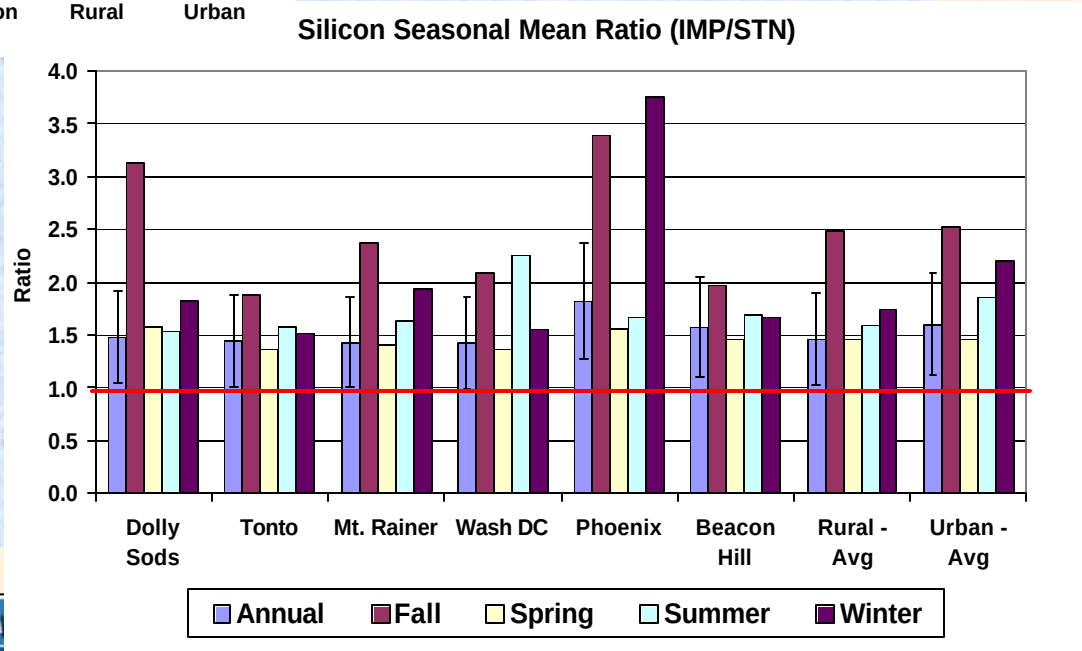
Annual Average & Seasonal Comparisons



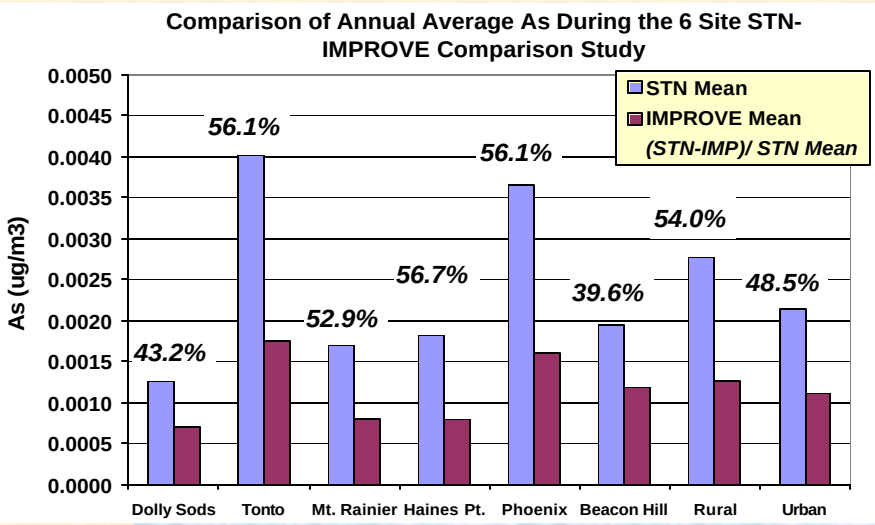
Silicon

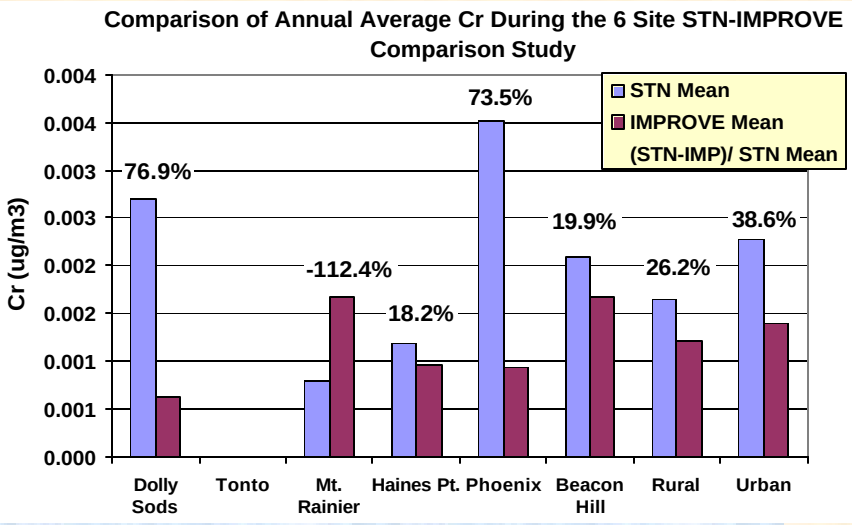
***Ca is Similar to Si**

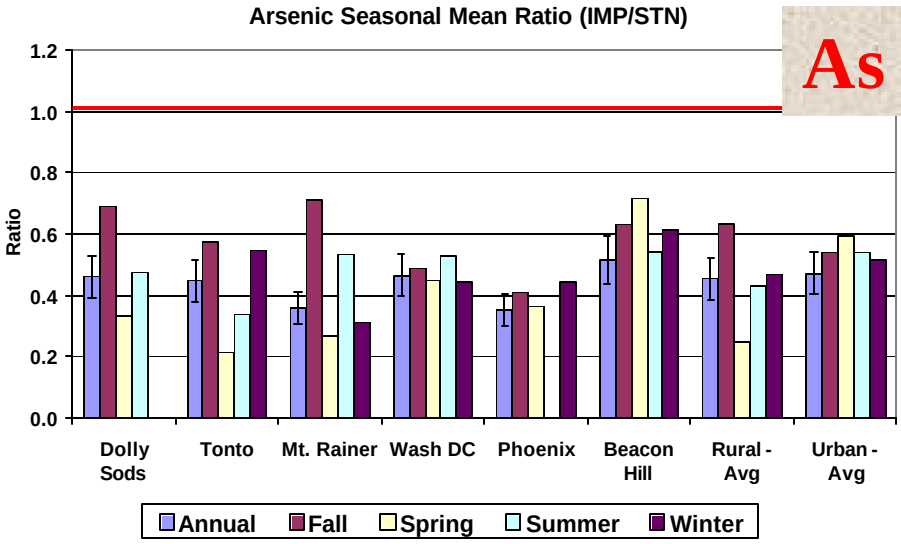
Previous Speciation Monitor Comparability Results = Ratio 15-30%*; Error Bars = 30%



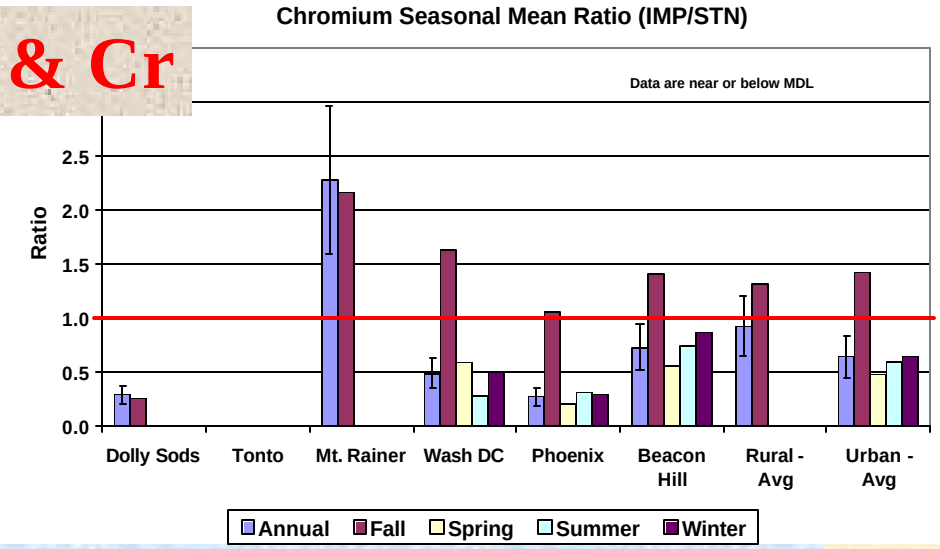
Annual Average & Seasonal Comparisons





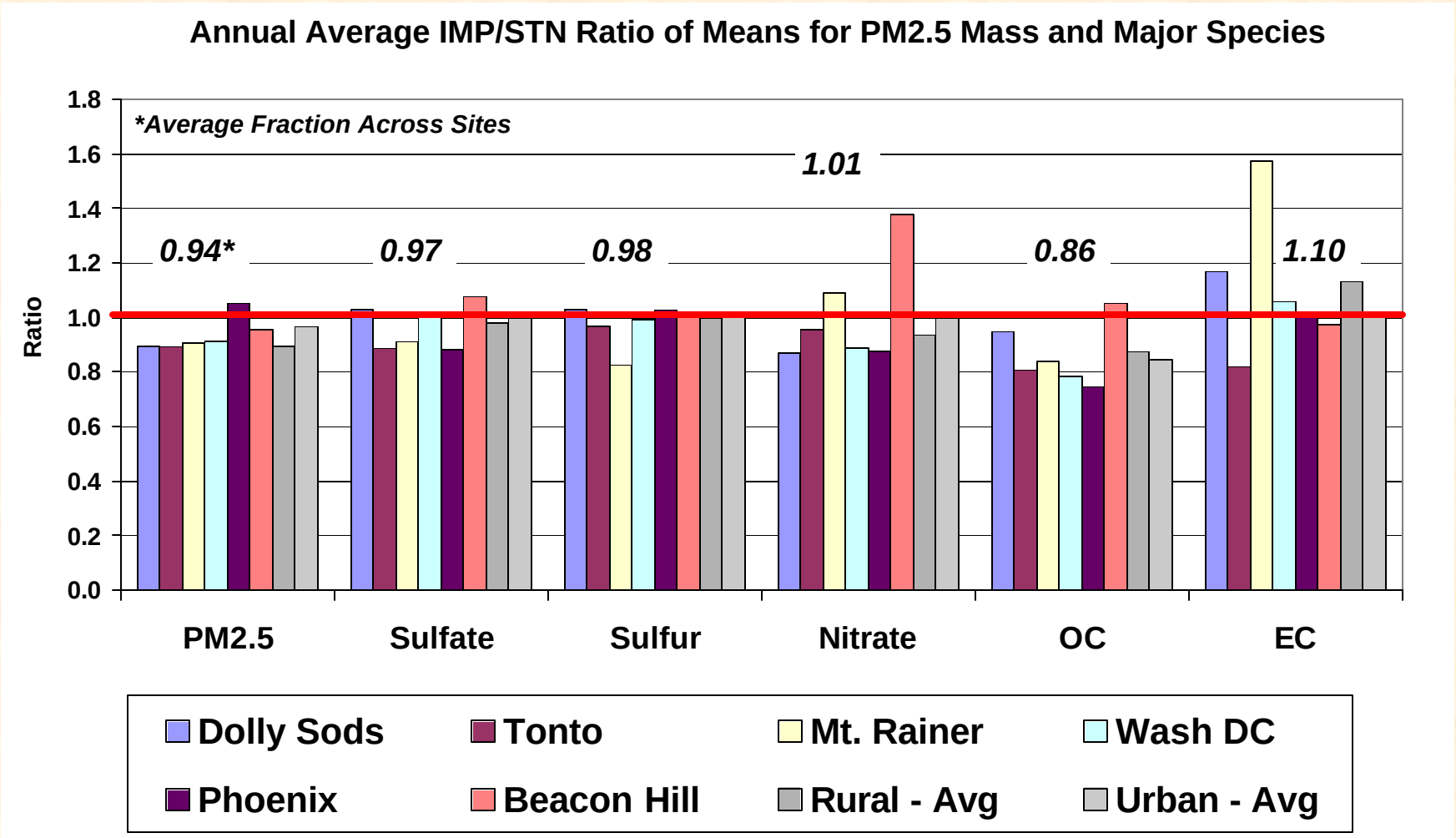


As & Cr



Previous Speciation Monitor Comparability Results = Ratio 15-30%*; Error Bars = 30%

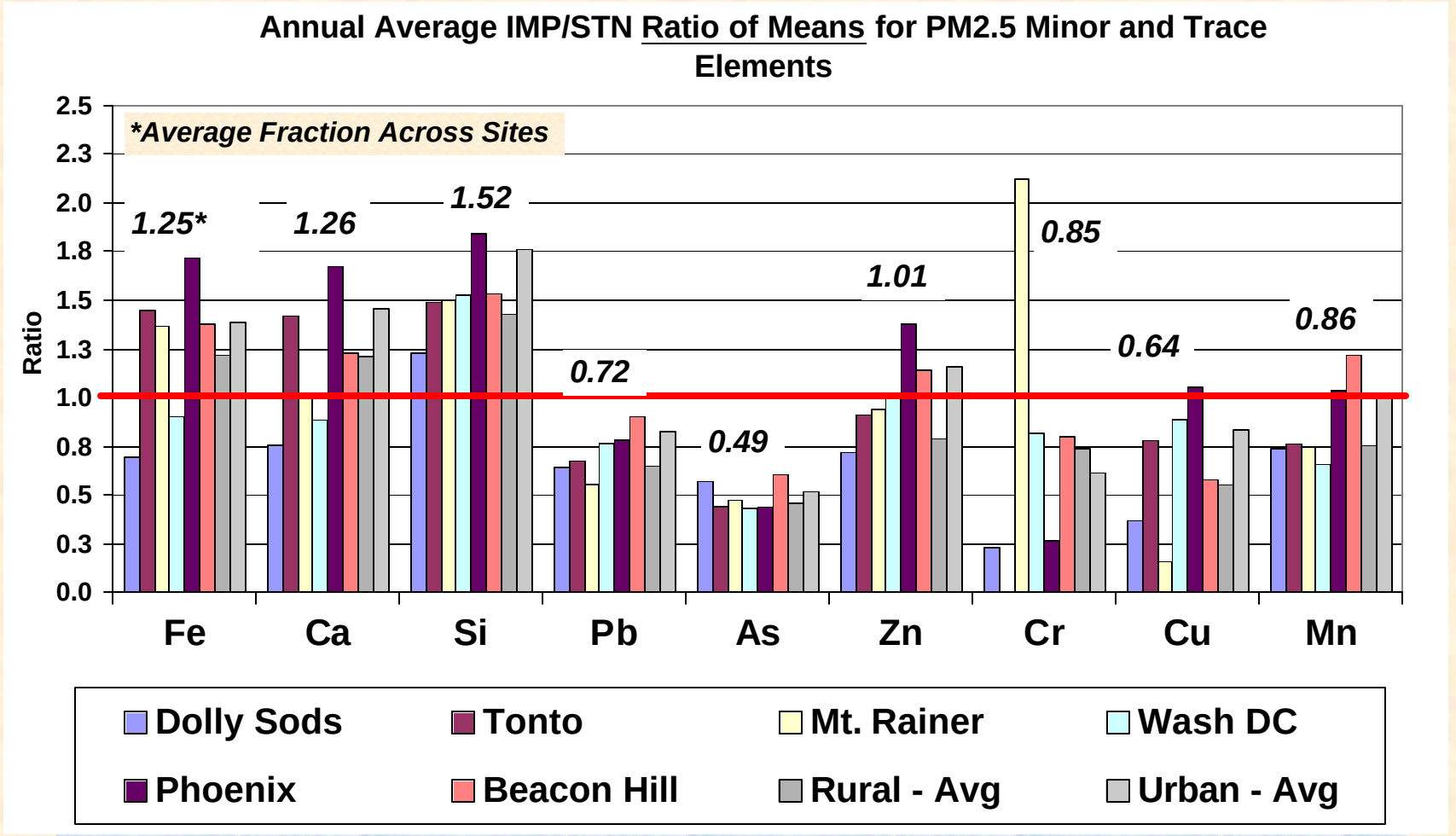
Relative Annual Average Comparability



Ratio of Means

Comparability ± 15%

Relative Annual Average Comparability



Ratio of Means

Comparability ± 30%
Most Species

Summary & Conclusions

- Concentrations at Rural Sites Were Lower Than Urban Sites for Most Species at Most Sites
- Less Consistency (Greater Scatter) Was Observed at Rural Sites Than Urban Sites Between Networks
- Higher Data Capture Was Observed at Urban Sites
- Mass and Sulfate Agreed Well (typically within 10%) at All Sites
- Nitrate Agreed Within Expectations (typically within 15%);
  - ✓ Better Agreement at Rural Sites Than Urban Sites, Which May Be Due to Differences in Denuder Protocols;
  - ✓ A Consistent Positive Bias (%) in Nitrate was Observed at Beacon Hill
- Organic Carbon Agreed Well (typically within 15% on Average)
  - ✓ Site-by-Site Comparability was Higher (typically within 25%);
  - ✓ (STN Data Were Blank Corrected)
- **Elemental Carbon Agreed Extremely Well.**
  - ✓ **Urban Sites Within About 5%; Rural Sites Between 20-50%**
  - ✓ **However, EC Conc. Were Low Overall, and Very Low At Rural Sites**

Summary & Conclusions

- Potentially Toxic Species (As, Cr, Pb, Zn) Showed Greater Scatter and Less Agreement Than Mass and Sulfate
- Higher Concentration Species Agreed Better than Species Observed at Lower Concentrations: MDL & Blanks are Likely an Issue Between Network Agreement
- Site-to-Site Variations Were Relatively Consistent, With Results From One Network Typically Being Higher than the Other
  - ✓ At Most Sites, Most Species Were Biased Slightly High for STN Relative to IMPROVE
  - ✓ Si and Ca Are the Major Exceptions, Where IMPROVE Is Slightly Higher Than STN.
- **In General, and on Average, Comparison Between Networks was Within Expectations for Most Species at Most Sites**
- Criteria Can Be Established Based On Past Multi-Sampler Comparisons for Chemical Components In Air
- Past Precision Results Need To Be Included in the Analysis