



Ion Analysis

2015 IMPROVE Steering Committee Meeting Grand Canyon National Park, Arizona

Tracy Dombek, Doug Burnette, & Dorie Pickett

Adios Amigos!!



Ion Analysis for IMPROVE

- **2014 20,810 samples were received, analyzed and reviewed**
- **2015 14,544 samples received, and analyzed (data for samples through July have been reported to UCD)**

New Instruments

- Evaluated a capillary IC system
Results: Contaminated filter vials exceeded lower limits.
- Invited by Dionex to beta test the new IntegrION 2100 system evaluation beginning in November.

Sulfate PE Evaluation

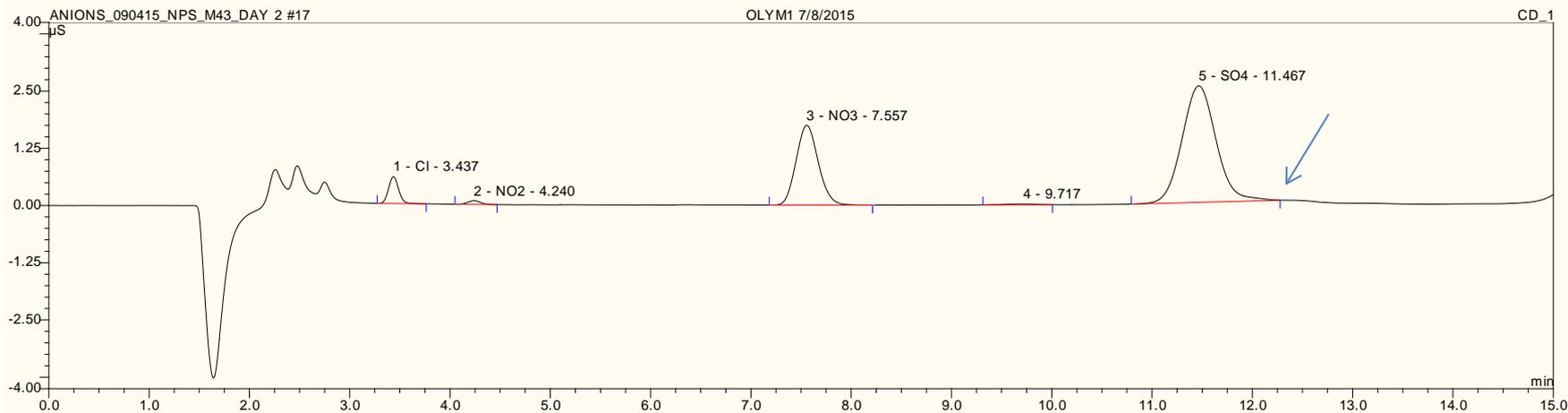
- Unfavorable Sulfate results produced during a PE evaluation by EPA.
- Extensive QC review of all data.
- Requested QA samples from another laboratory. Our results were in good agreement with published results for that particular study.

Sample	Target SO ₄ ⁼ value, mg/L	RTI SO ₄ ⁼ value, ppm
AES-07 (rain sample)	1.11 mg/L ± 0.090	1.10
MAURI-09 (soft river water)	3.78 mg/L ± 0.226	3.81
14005225	4.85 ± 0.312	4.90
14005226	0.360 ± 0.048	0.338
14005228	1.35 ± 0.108	1.34
14005229	6.92 ± 0.342	7.01
14005232	2.48 ± 0.168	2.50
14005233	3.11 ± 0.220	3.14

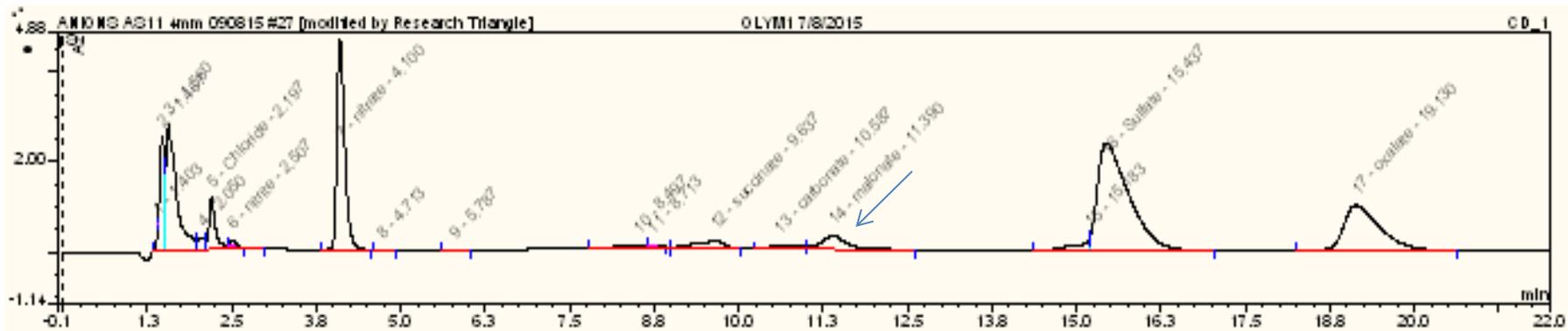
Evaluated Potential Interference

- ICP-OES and ICP-MS were used to look for any trace metal contamination and determine the total S, the ICP results were within 10- 15% of the reported values for the samples.
- Organic acids were detected using an alternate IC method, but levels were not significant.

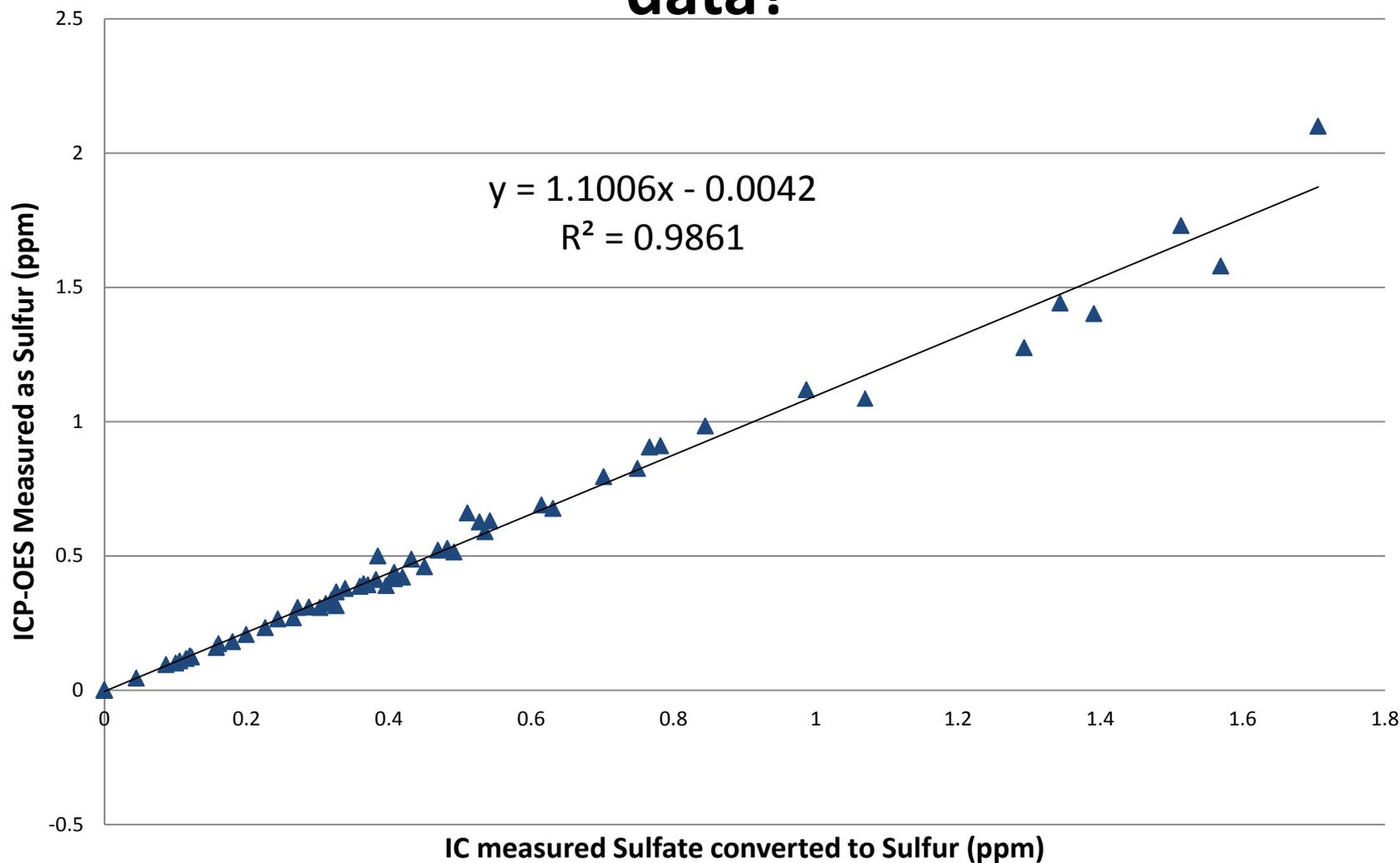
IMPROVE sample analyzed using IC with Sodium Carb/Bicarb Method



IMPROVE sample analyzed using IC with KOH Method



Does presence of organic acids bias sulfate data?



Changes



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- Adding documentation, documentation, documentation, documentation, documentation, documentation, documentation, documentation, documentation, documentation!!!

Chain of Custody

- Sample receipt
- Sample Condition
- Sample location and time in/out for location
- Sample location following extraction
- Sample location following analysis
- Sample comments

Extraction Record

- Water Quality
- Addition of laboratory control samples that are spiked with a known solution and diluted using the autodilution system
- Two person sign off of volume added
- Sonication Time documented
- Temperature monitored throughout sonication

Questions