

Experimental Inter-comparisons of the Chemical Speciation Laboratories

Jewell Smiley
US EPA ORIA-Montgomery
Before the
IMPROVE Steering Committee
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US EPA / NAREL



Specific QA Activities at NAREL

- PT Samples
single-blind samples analyzed at different labs
- Laboratory TSA
on-site inspection and interviews with lab staff
- Special Studies
experimental investigations

Speciation Laboratories

California Air Resources Board (CARB) Sacramento, CA	Ions, Carbon, XRF
Desert Research Institute (DRI) Reno, NV	Mass, Ions, Carbon, XRF
Oregon Dept. of Environmental Quality (ODEQ) Portland, OR	Mass, Ions, XRF
Research Triangle Institute (RTI) Research Triangle Park, NC	Mass, Ions, Carbon, XRF
South Coast - Air Quality Management District (AQMD), Diamond Bar, CA	Mass, Ions, Carbon, XRF
Crocker Nuclear Lab, University of California Davis, CA (UCD)	Mass, XRF
EPA's National Exposure Research Lab (NERL) Research Triangle Park, NC	XRF
EPA's National Air and Radiation Environmental Lab (NAREL), Montgomery, AL	Mass, Ions, Carbon

Collocated Met One Samplers

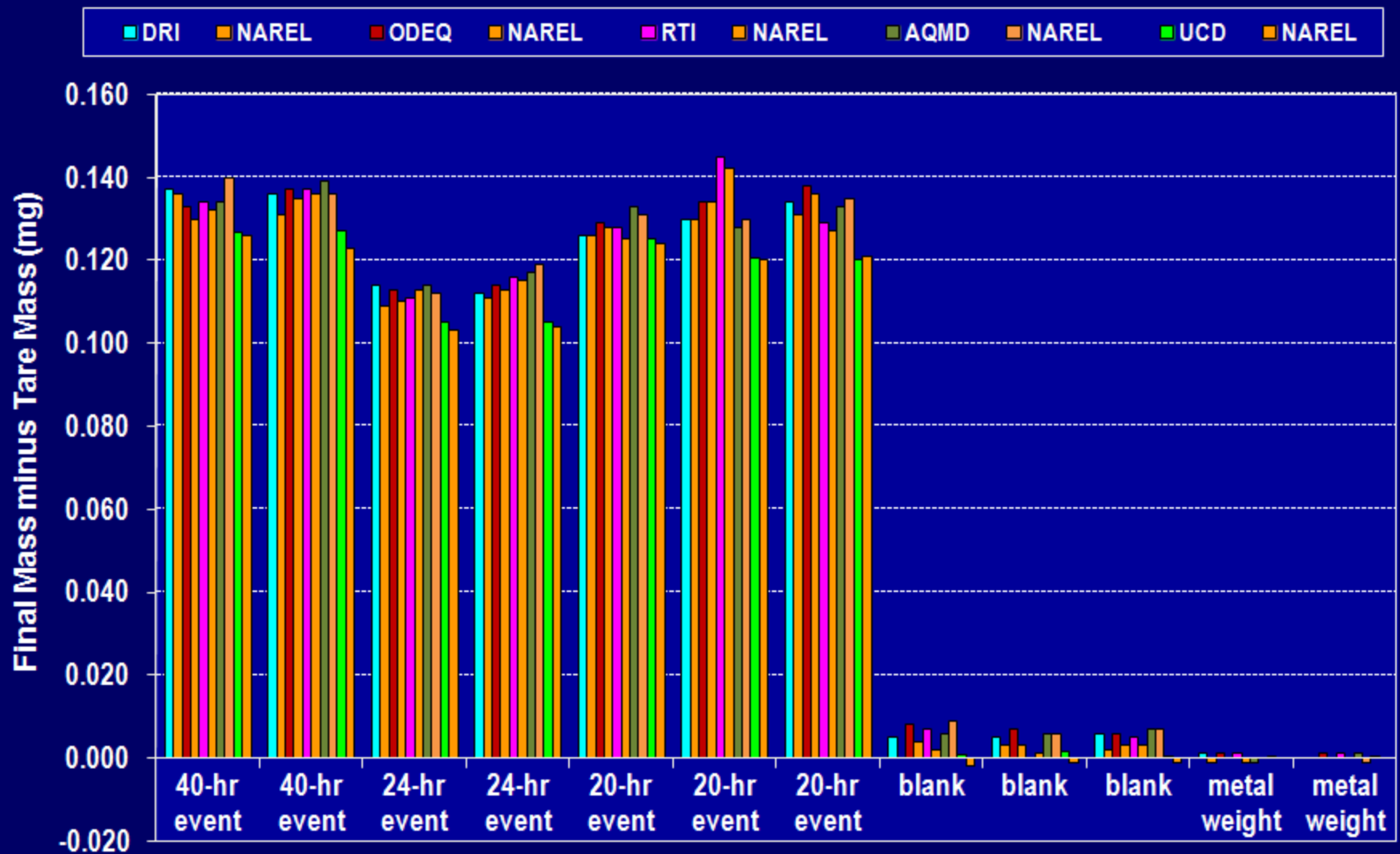


Gravimetric Mass Analysis

Ten teflon filters and two metallic weights were submitted to each lab for analysis.

NAREL served as reference lab

Captured PM2.5 Determined by Each Participating Lab and NAREL



PM2.5 Capture Comparisons - NAREL Value minus Participating Lab Value
(negative value indicates a smaller capture determined by NAREL)



Ion Chromatographic Analysis

Most Labs Received Six Filters for Analysis

2 replicates from March 1 sampling event

2 replicates from June 29 sampling event

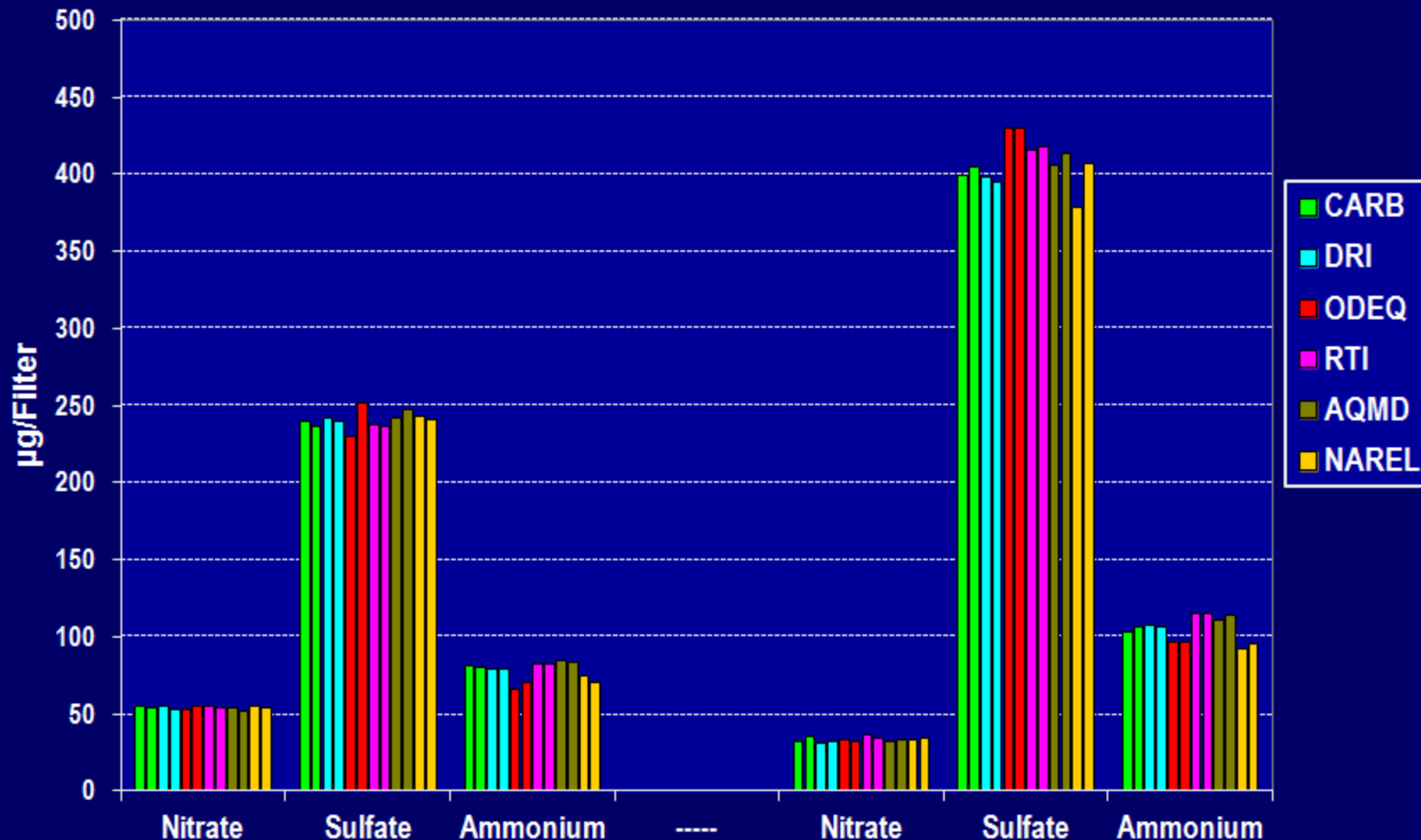
2 blank filters

DRI and RTI received extra filters to test more than one method.

Nylon Filter Analysis, CSN Method, Mid-level Components

March 1 Replicates

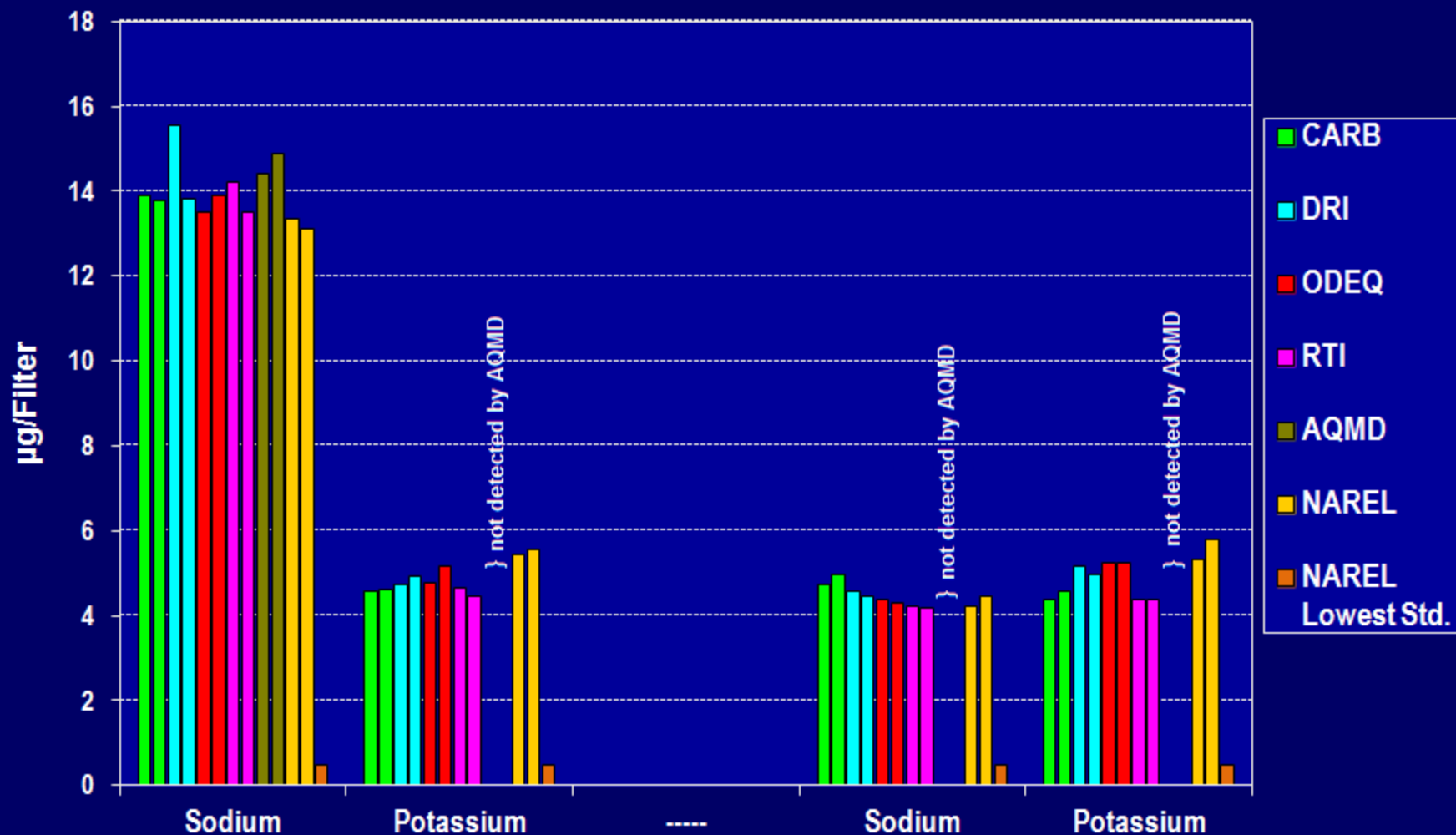
June 29 Replicates



Nylon Filter Analysis, CSN Method, Low-level Components

March 1 Replicates

June 29 Replicates



Ion Chromatographic Analysis

Extra Test Filters for RTI and DRI

2 replicates from March 10 sampling event

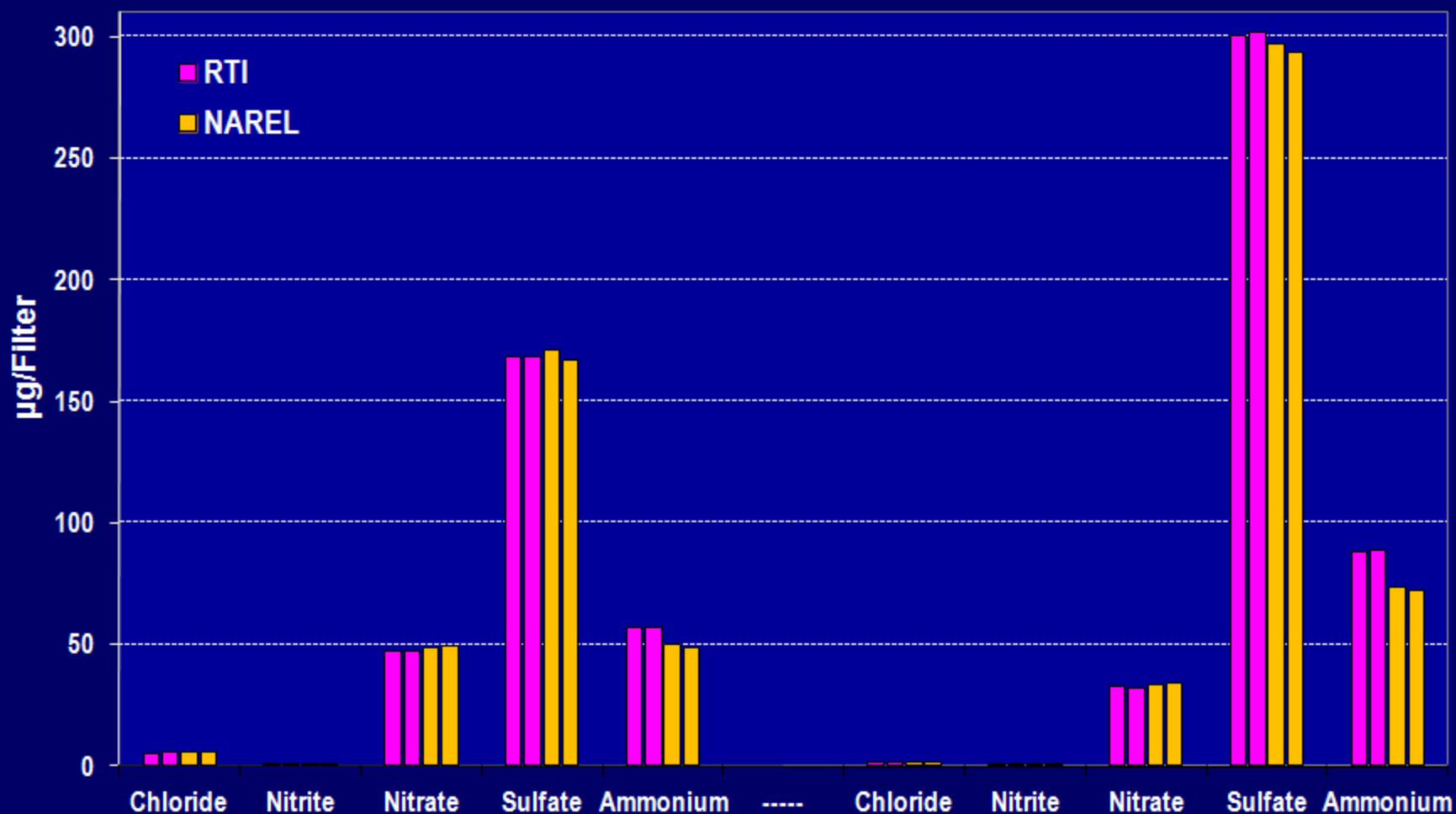
2 replicates from July 8 sampling event

2 blank filters

Nylon Filter Analysis, IMPROVE Method, Mid-level Components

March 10 Replicates

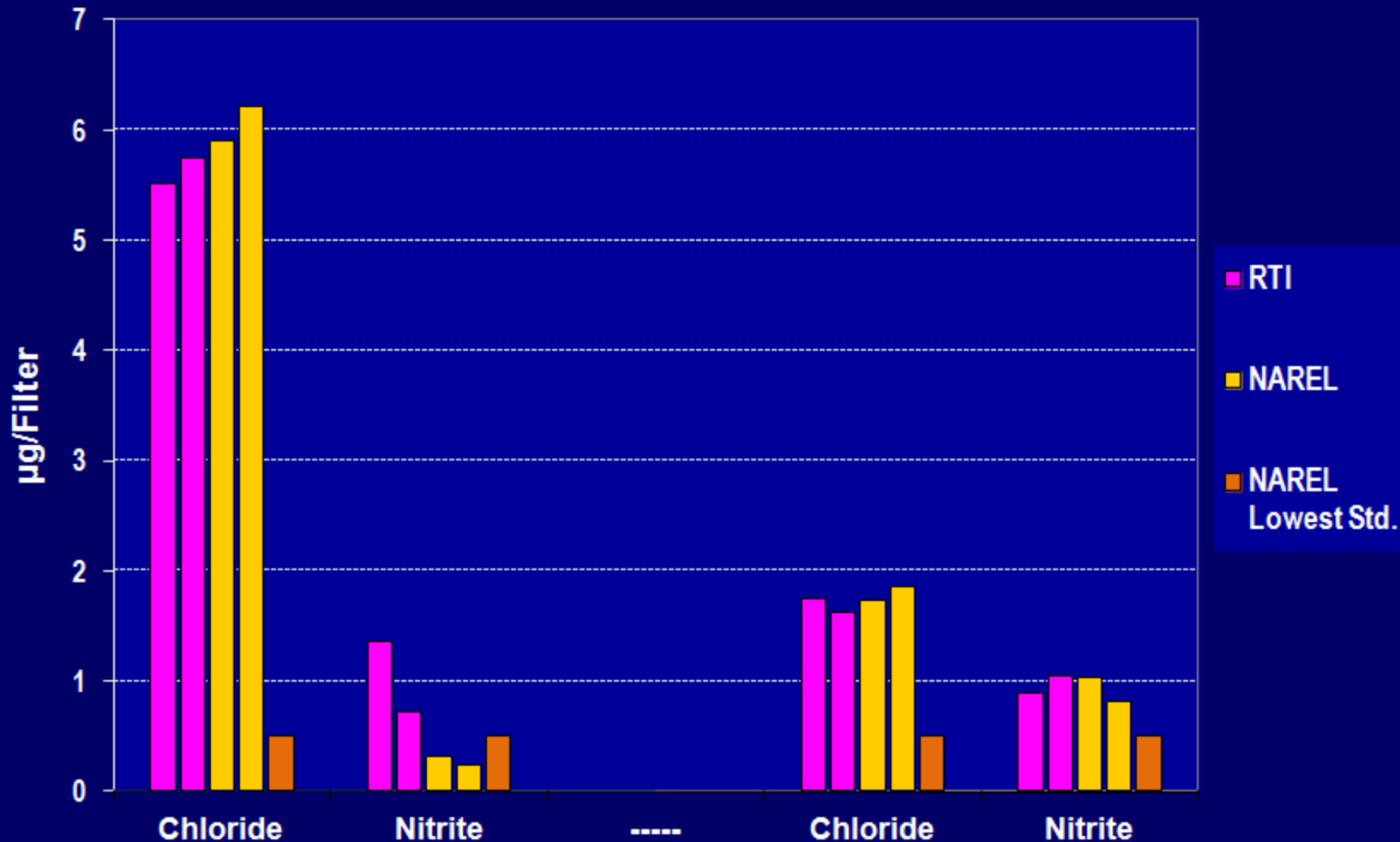
July 8 Replicates



Nylon Filter Analysis, IMPROVE Method, Low-level Components

March 10 Replicates

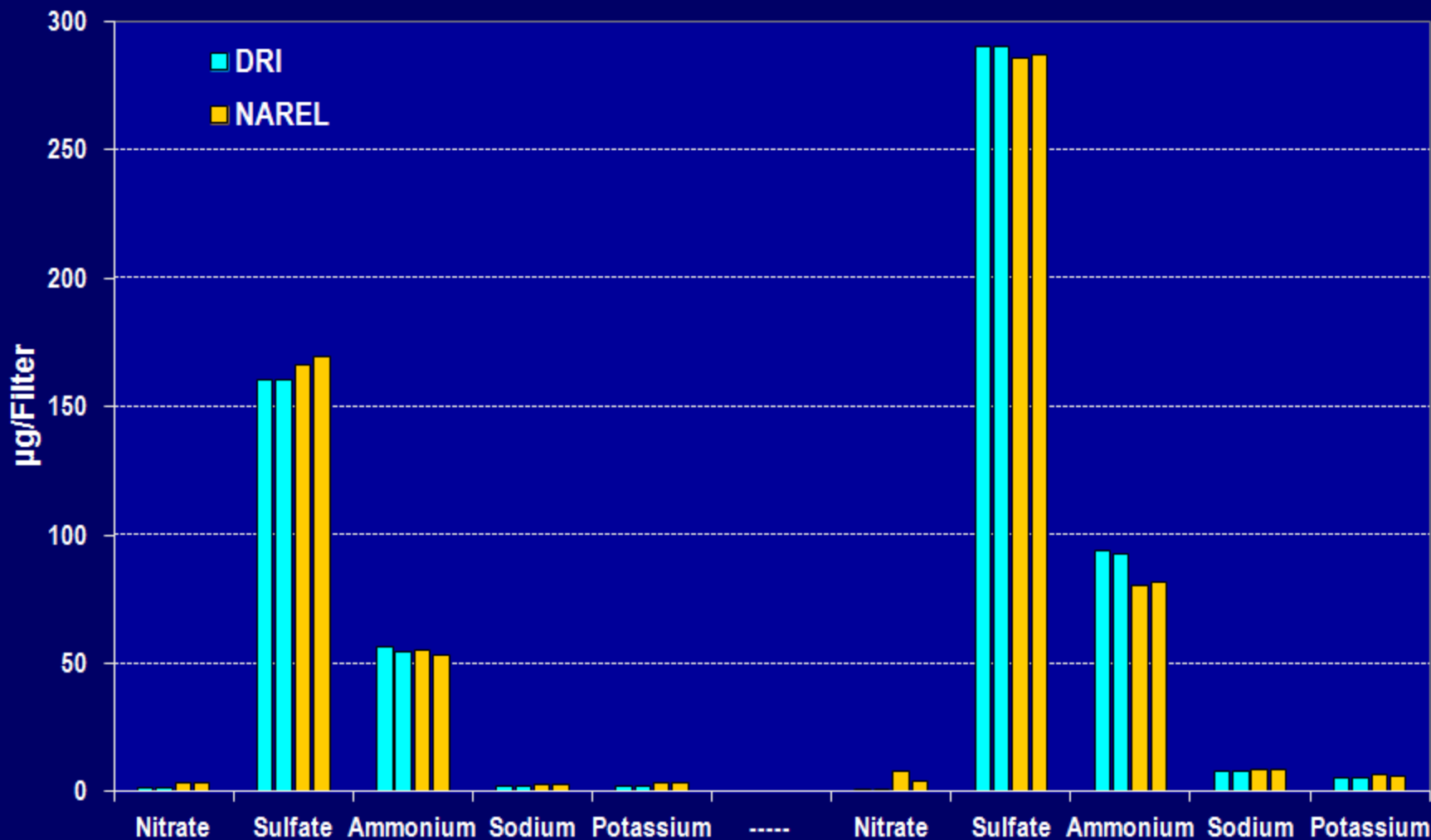
July 8 Replicates



Teflon Filter Analysis, CSN Method, Mid-level Components

March 10 Replicates

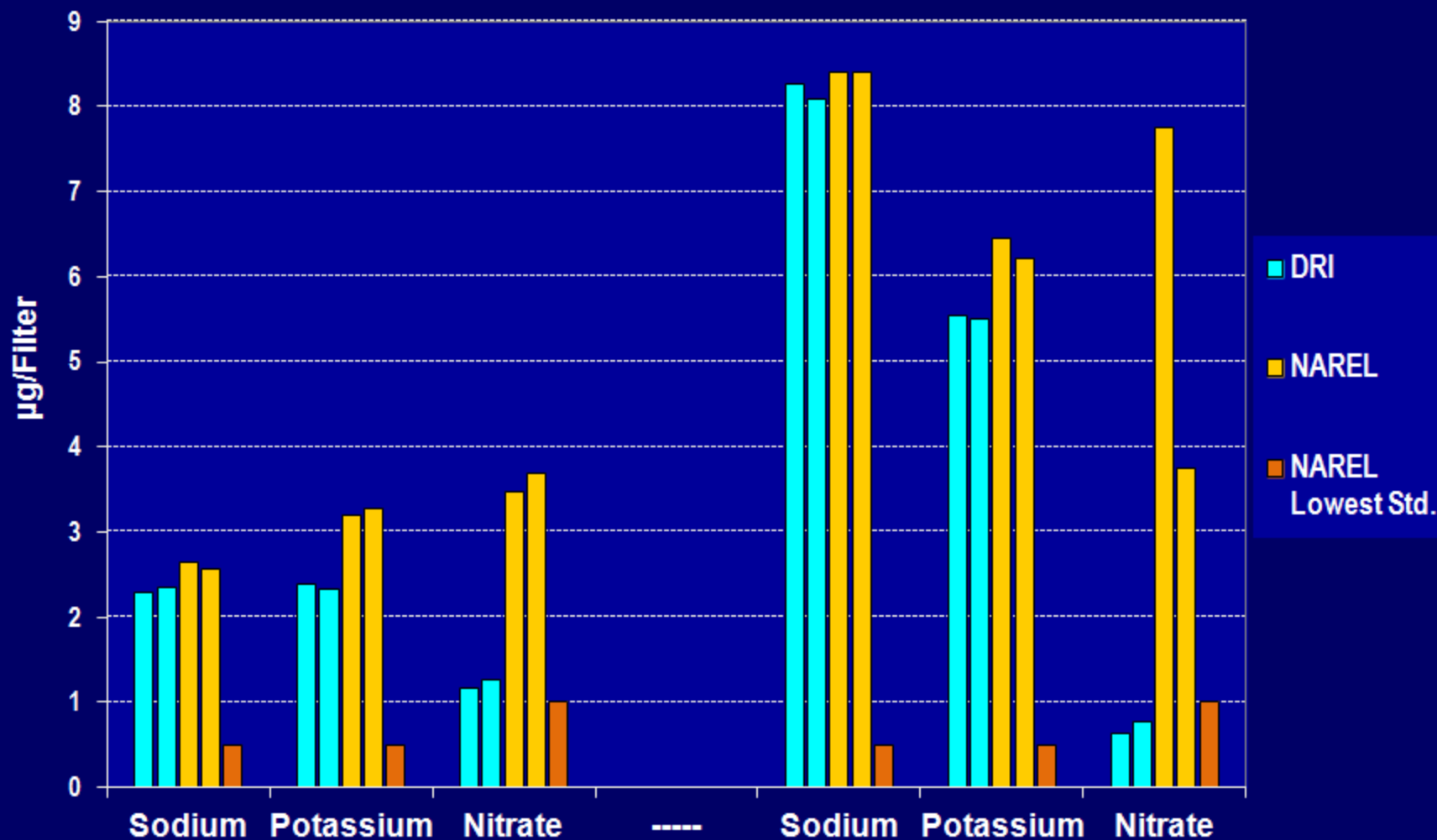
July 8 Replicates



Teflon Filter Analysis, CSN Method, Low-level Components

March 10 Replicates

July 8 Replicates



New MTL Teflon® Filters Wet with 100μL Ethanol



TOA Carbon Analysis

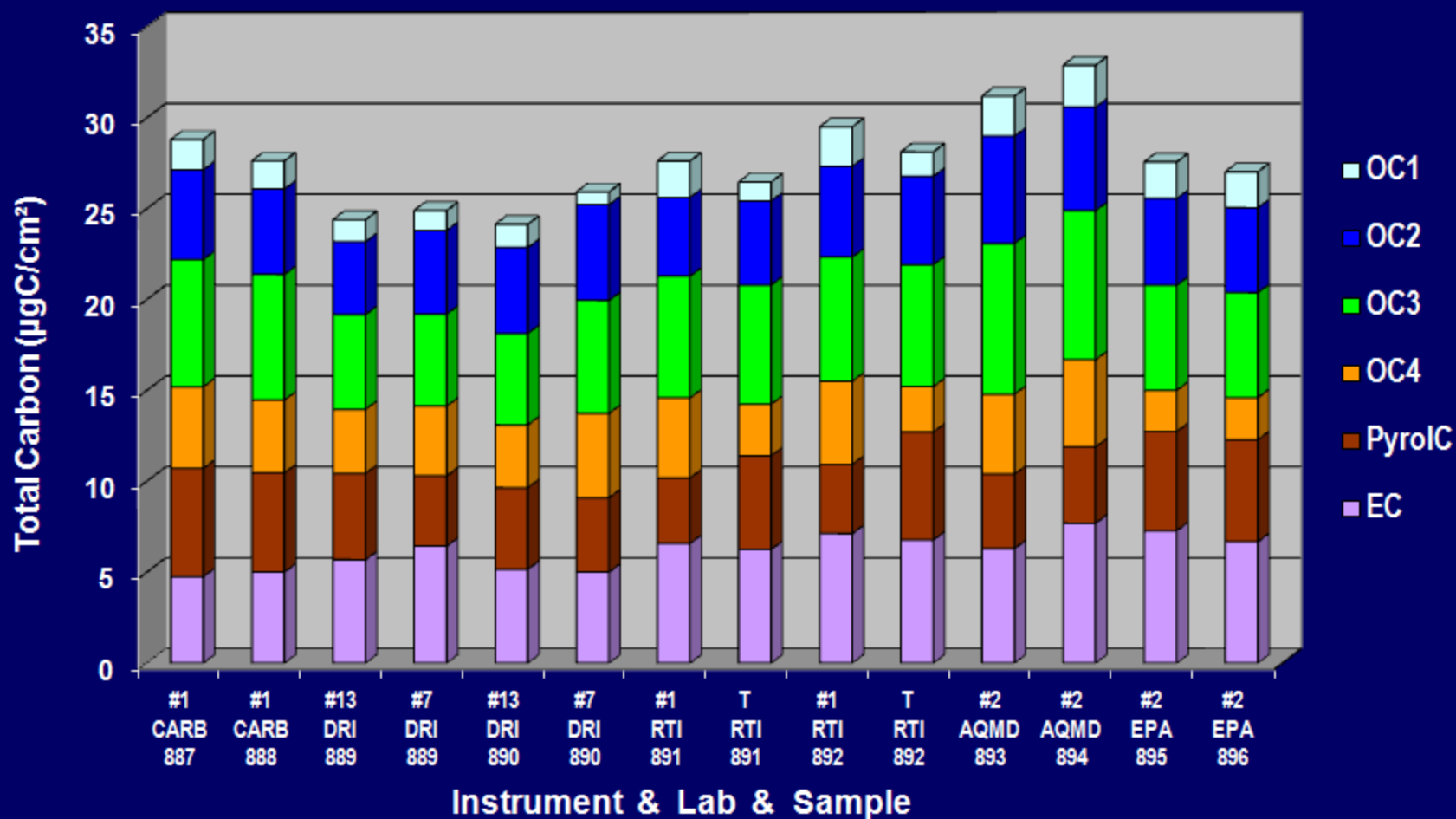
Each Lab Received Six Filters for Analysis

2 replicates from January 7 sampling event

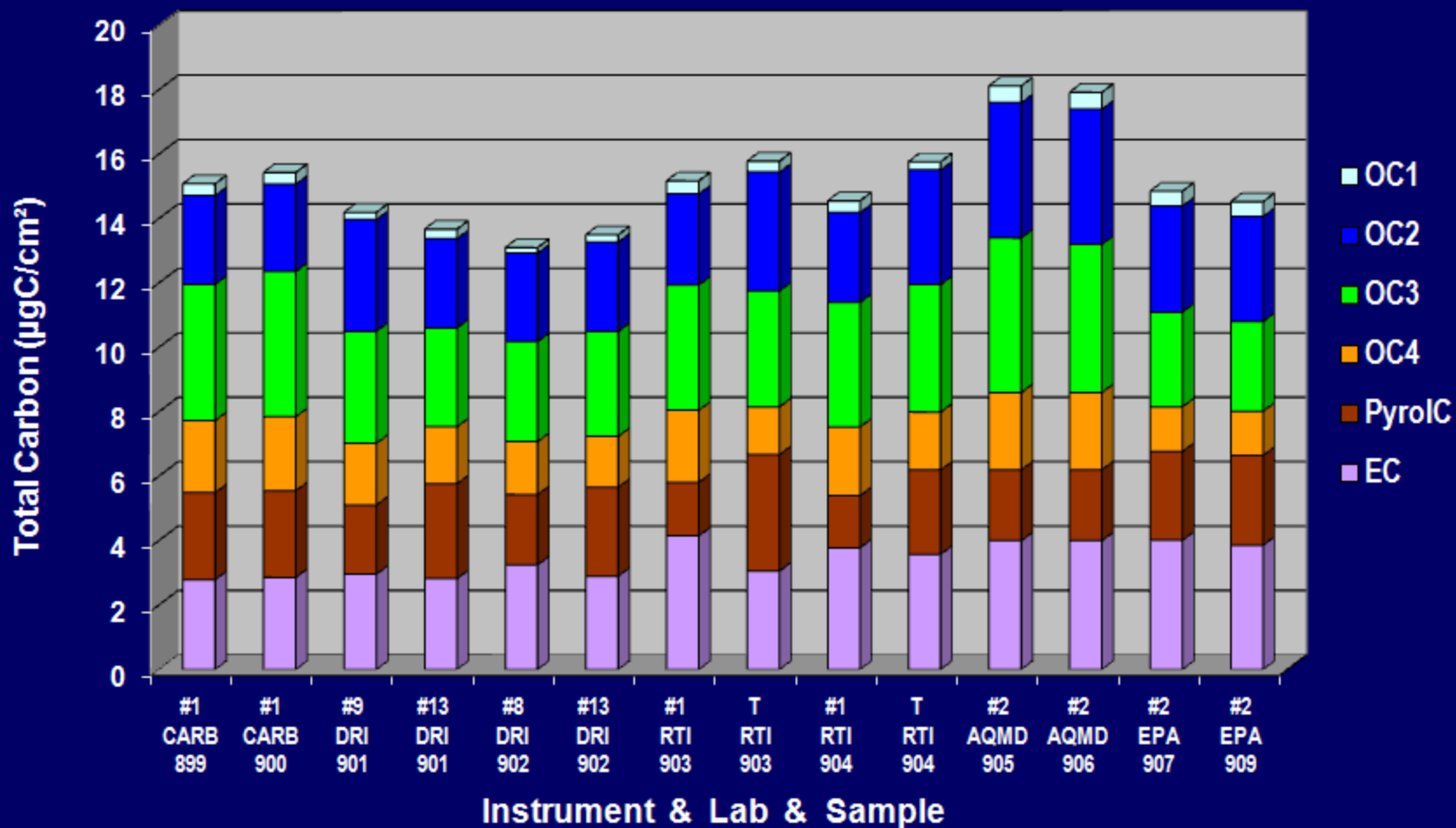
2 replicates from June 14 sampling event

2 blank filters

Analysis of Replicate Quartz Filters - January 7 Event **IMPROVE_A / TOR Method**



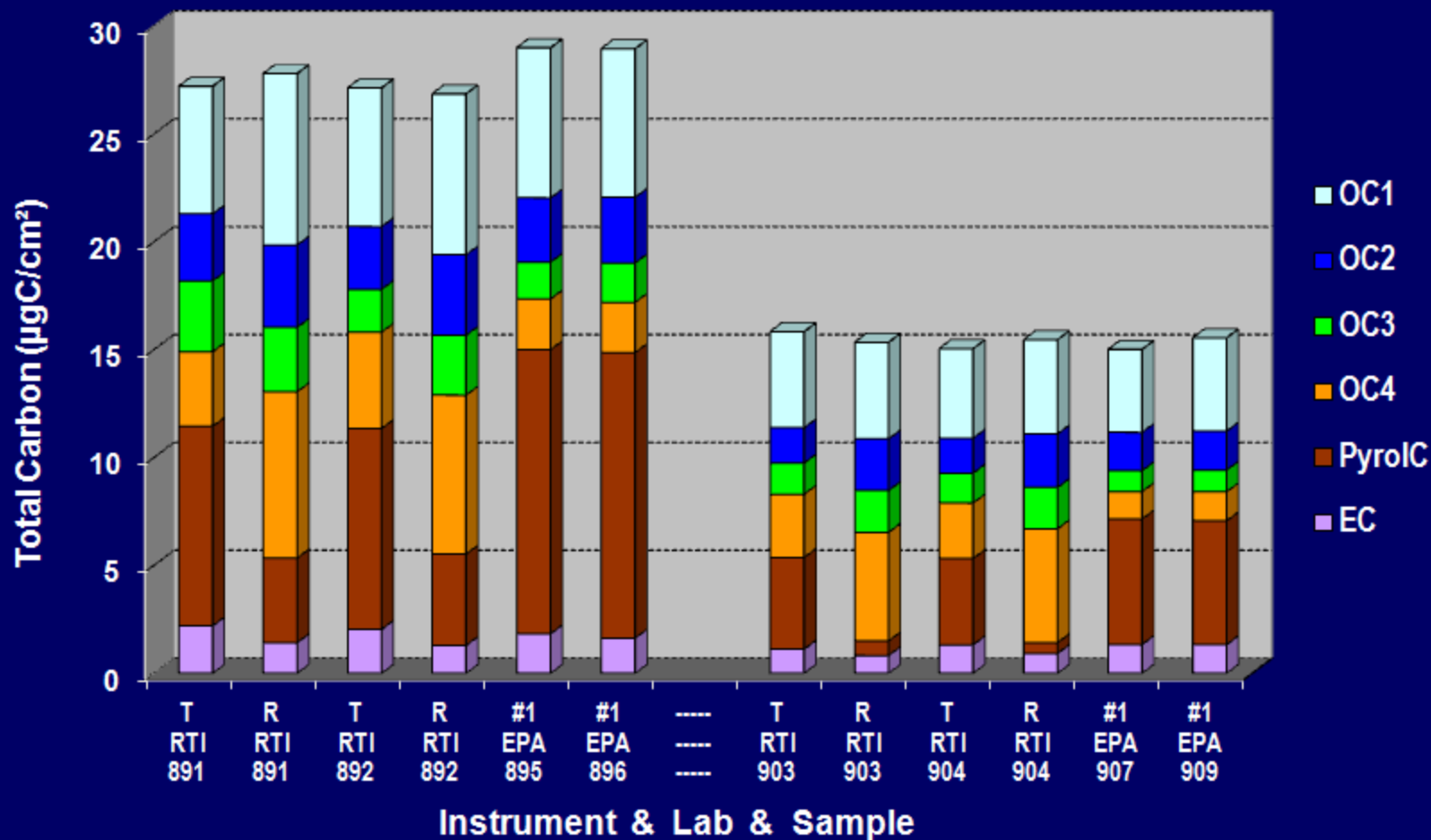
Analysis of Replicate Quartz Filters - June 14 Event IMPROVE_A / TOR Method



Analysis of Replicate Quartz Filters - CSN / TOT Method

January 7 Replicates

June 14 Replicates



XRF Analysis

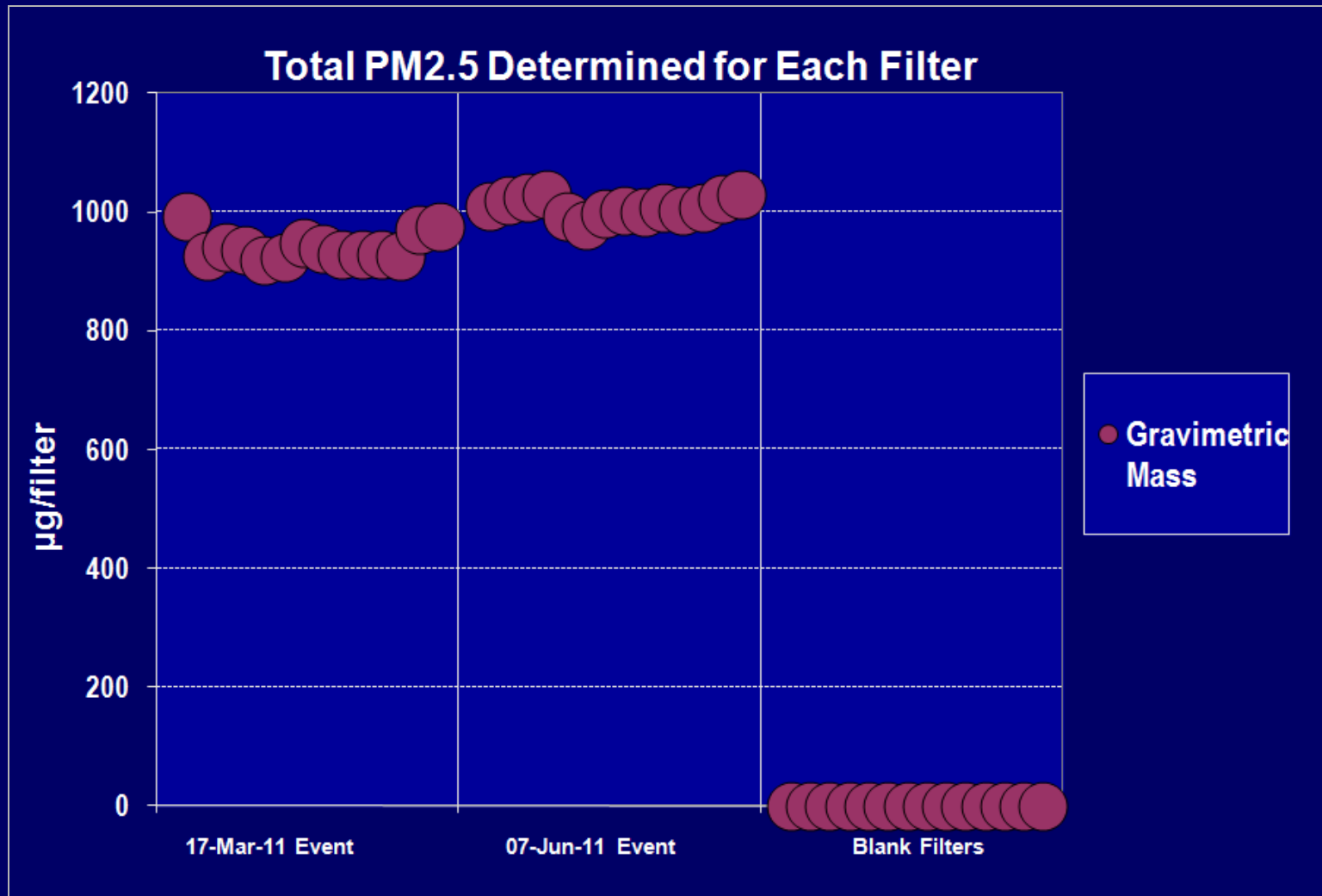
Thirty 47-mm filters analyzed at 6 Labs

RTI served as reference lab

Twelve 25-mm filters analyzed at 3 Labs

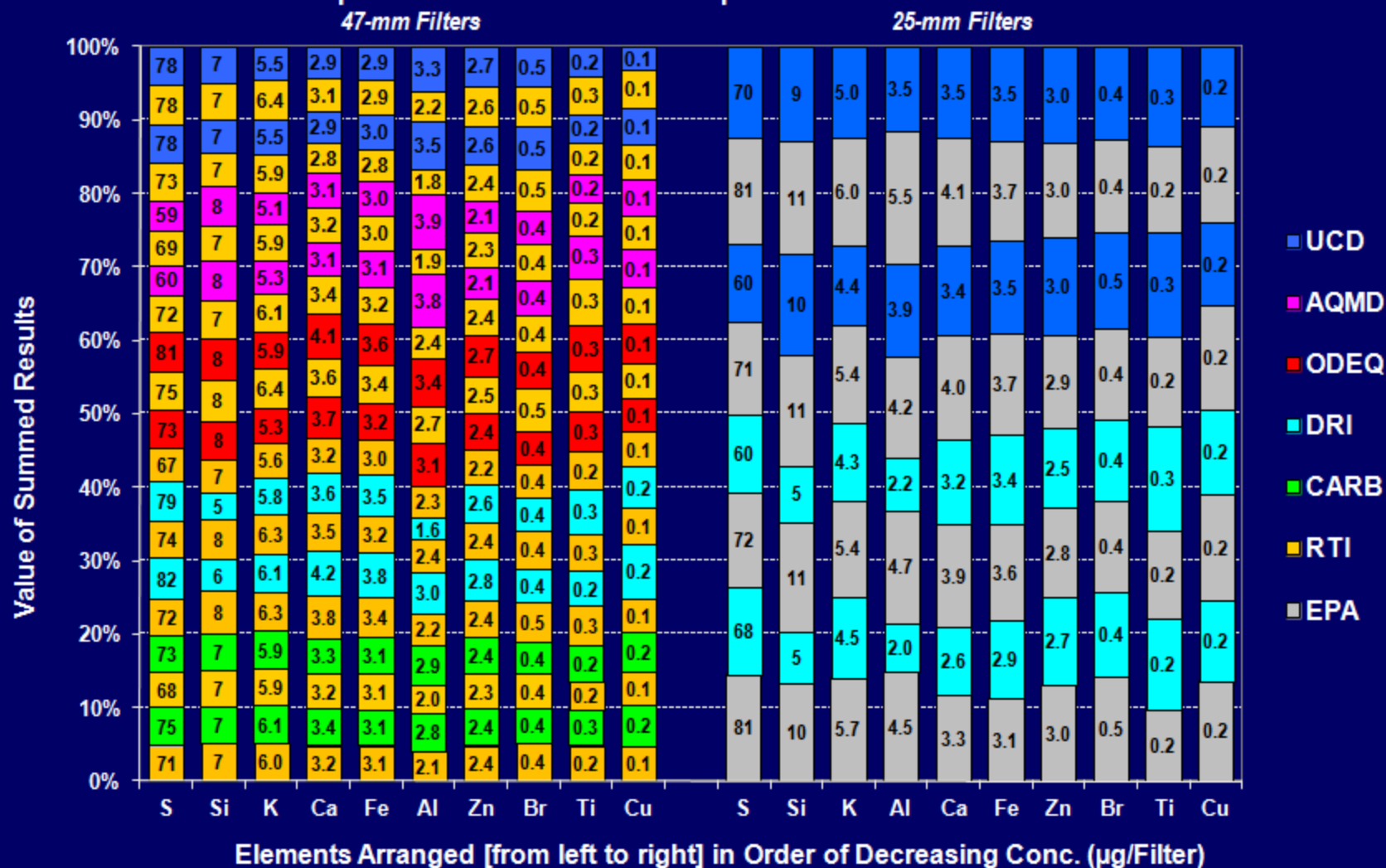
EPA / NERL served as reference lab

How good are the XRF replicates?



All of the replicates are weighed.

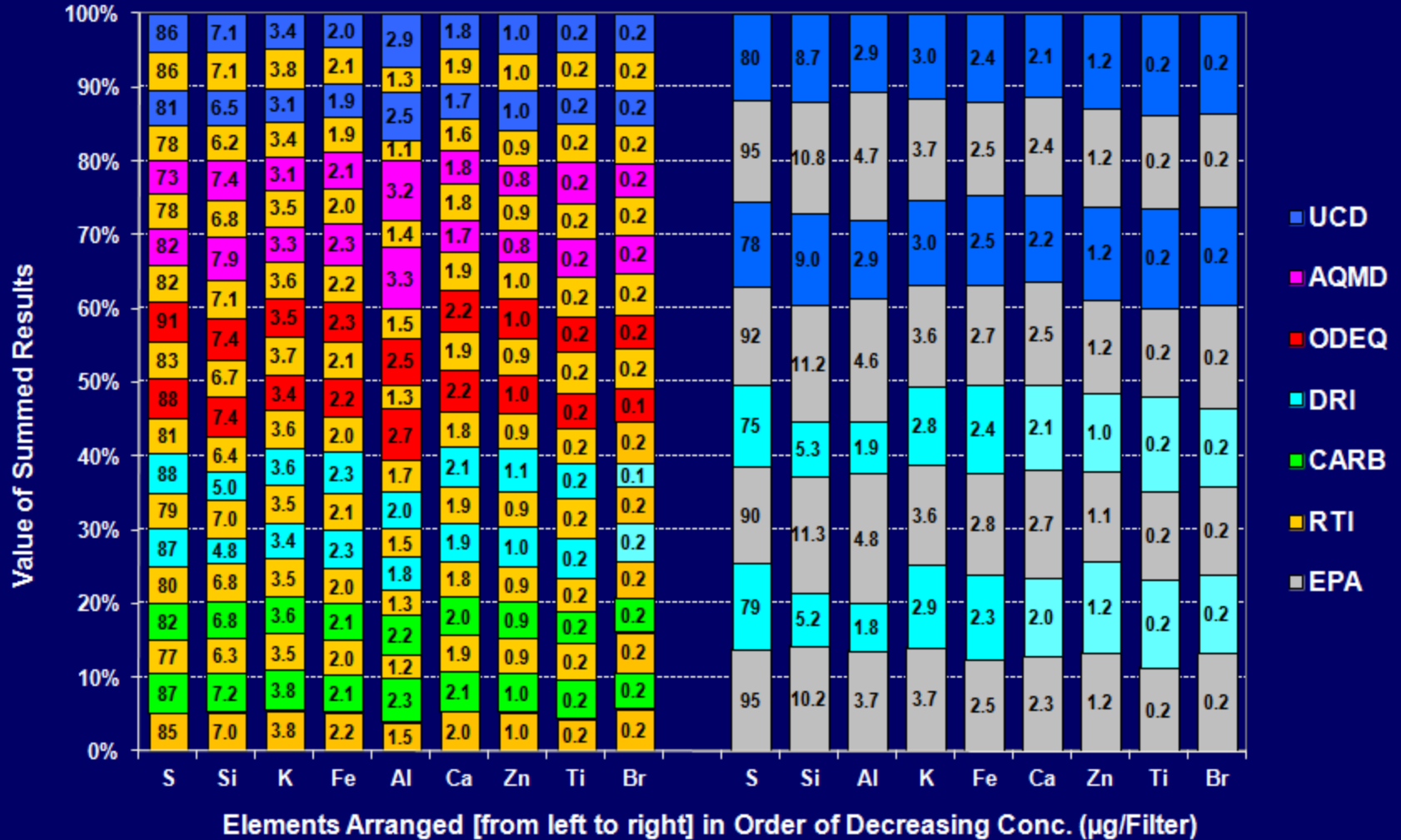
Comparison of XRF Results from Replicates Collected on March 17



Comparison of XRF Results from Replicates Collected on June 7

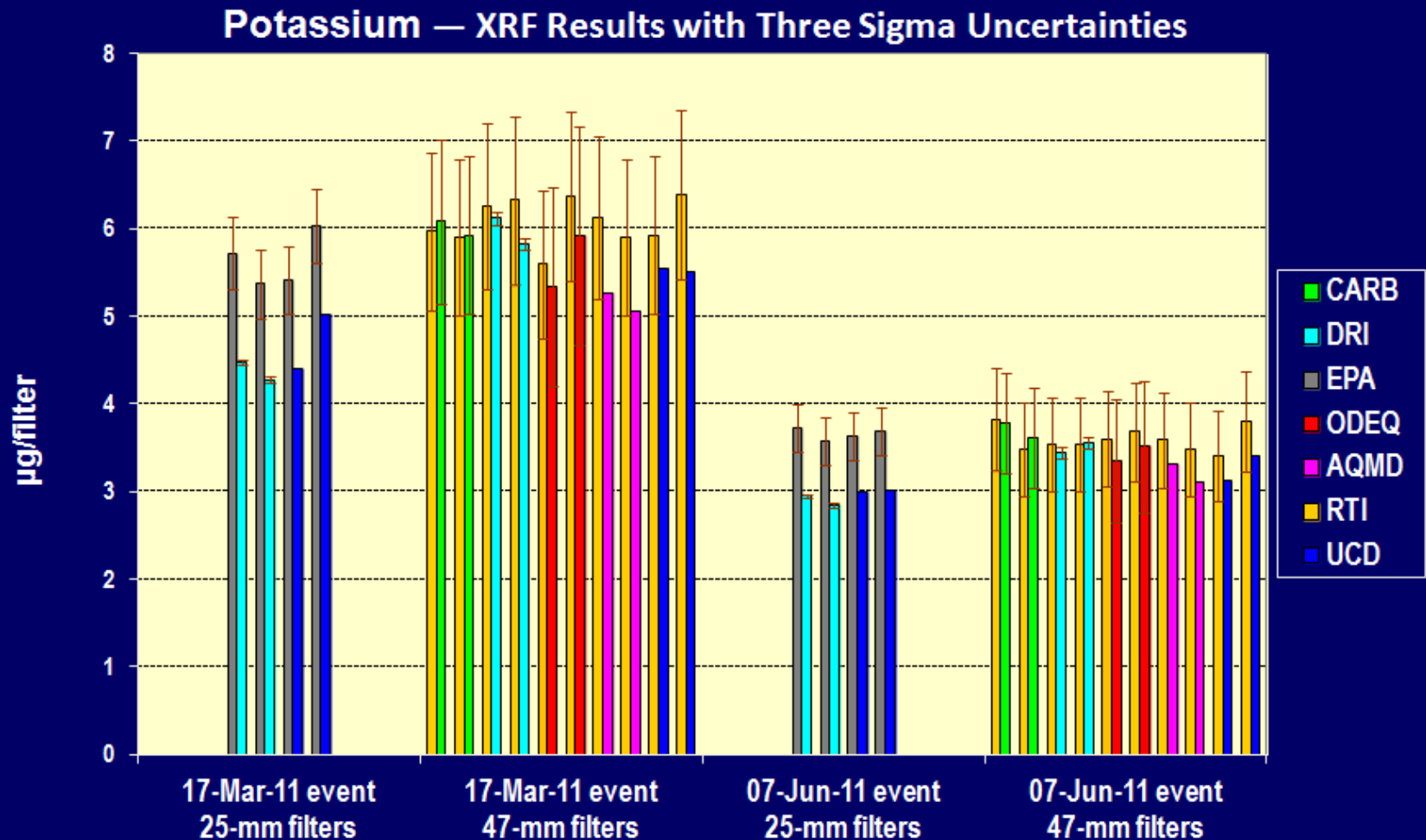
47-mm Filters

25-mm Filters



XRF Results for Replicates

Prepared During Two Different Sampling Events



Questions?

