CSN Data Validation Quick Reference Guide

Items to Check

- ☐ Consistency with Field Logs
- ☐ Comments from Labs and UCD
- ☐ Invalid Samples
- ☐ Sampling Anomalies
- ☐ Operational Parameter Values
- ☐ Null, Qualifier, A1, B1, and C1 Flags
- ☐ Recurring Issues
- ☐ Field Blanks
- ☐ Consistency with Other Measurements
- ☐ Historical Measurements

When to Invalidate

Only invalidate data when measurements are not acquired correctly.

Examples include: ◊ No sample air flow ◊ Filter Damage ◊ Contamination

Please Do

- Respond to questions in the comments section
- Write clear and detailed comments
- Check all invalid filters
- Change the "AM" null flag to a more detailed flag
- Add qualifier flags (there is space for 10)
- Invalidate samples with a serious sampling problem
- Check flow rates and operational parameters carefully
- Be careful when applying flags to multiple parameters
- Review data flagged with the "A1", "B1", and/or "C1" flags
- Get in touch using the contacts below

Please Don't

- Invalidate samples with the "FX" or "MX" qualifier flags unless data results support invalidation
- Remove the "TT" and "MD" flags

List of Calculated Parameters Available in DART

Parameter		Calculation	Notes
Code	Name		
00001	Elements	Na + Mg + Al + Si + P + S + Cl + K + Ca + Ti + V + Cr + Mn + Fe + Co + Ni + Cu + Zn + As + Se + Br + Rb + Sr + Zr + Ag + Cd + In + Sn + Sb + Cs + Ba + Ce + Pb	Sum of elements measured by XRF. Calculated in DART.
00002	Ions	chloride + ammonium + sodium ion + potassium ion + nitrate + sulfate	Sum of ions measured by IC. Calculated in DART.
00010	$PM_{2.5}$ Mass Difference	$PM_{2.5}$ Raw Data—Reconstructed Mass	Difference between measured and calculated mass.
88339	Ammonium sulfate	4.125 * sulfur	This is a historical estimation of ammonium sulfate using XRF sulfur rather than measured sulfate.
88344	Ammonium nitrate	1.29 * nitrate	-
88348	Soil	2.2*aluminum + 2.49*silicon + 1.63*calcium + 2.42*iron + 1.94*titanium	These are estimated from stoichiometric relationships of crustal soil oxides.
88350	Organic Carbon Mass (OMC)	1.4 * organic carbon	Organic carbon by TOA.
88401	Reconstructed Mass	ammonium sulfate + ammonium nitrate + soil + 1.8*chloride + elemental carbon + OMC	Elemental carbon by TOA.

:: Resources and Contacts ::

DART Training

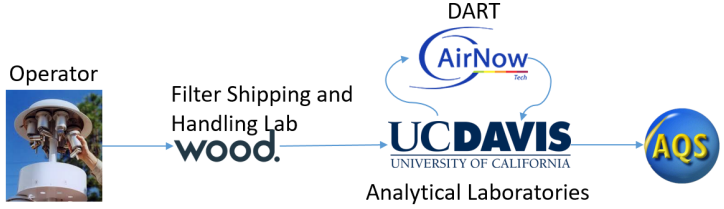
- https://youtu.be/bNSjMgVSdj0
- https://www.airnowtech.org -> Resources Page
- https://projects.erg.com/conferences/ambientair/conf18/Young_Chemical%20Speciation%20Network.pdf

EPA Resources

- AQS Codes List — https://www.epa.gov/aqs/aqs-code-list
- Ambient Monitoring Technology Information Center — https://www.epa.gov/amtic

Email Support

- CSN Email Support— CSNsupport@sonomatech.com

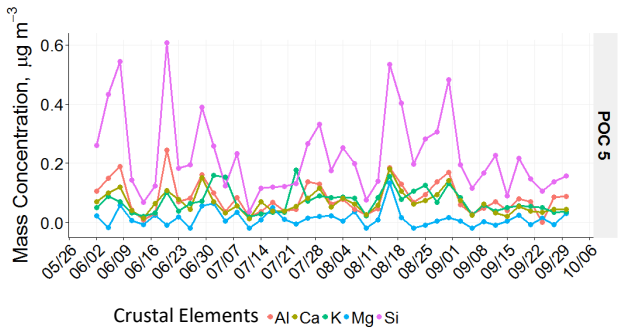


Possible Analysis Techniques*

Time Series

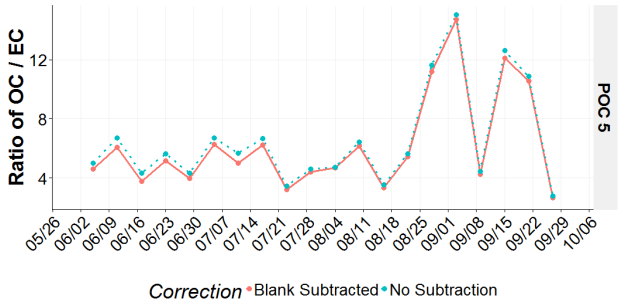
Related Parameters

Use to find potential contamination



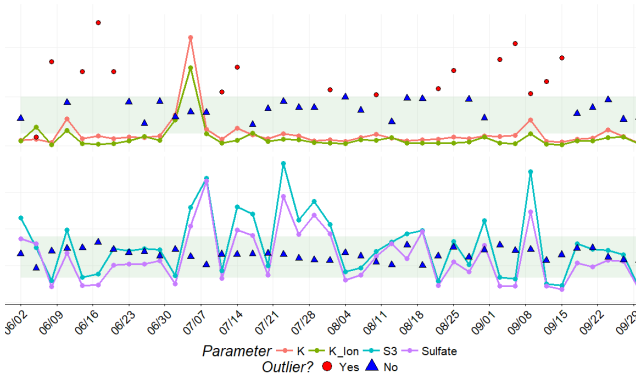
Ratios

Use to find abnormal events or potential swaps



Comparison Between Elements and Ions

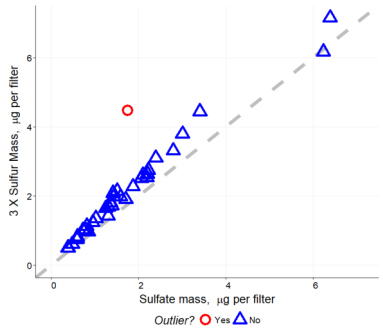
Use to find potential swaps and sampling issues



Regression

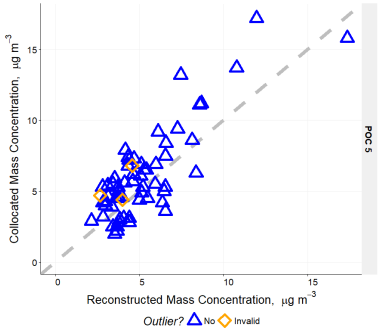
Related Parameters

Comparing 3*Sulfur to Sulfate can help identify outliers



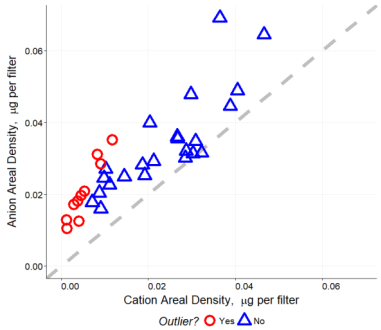
Mass Balance Comparison

Calculated mass versus reconstructed mass



Ion Balance Comparison

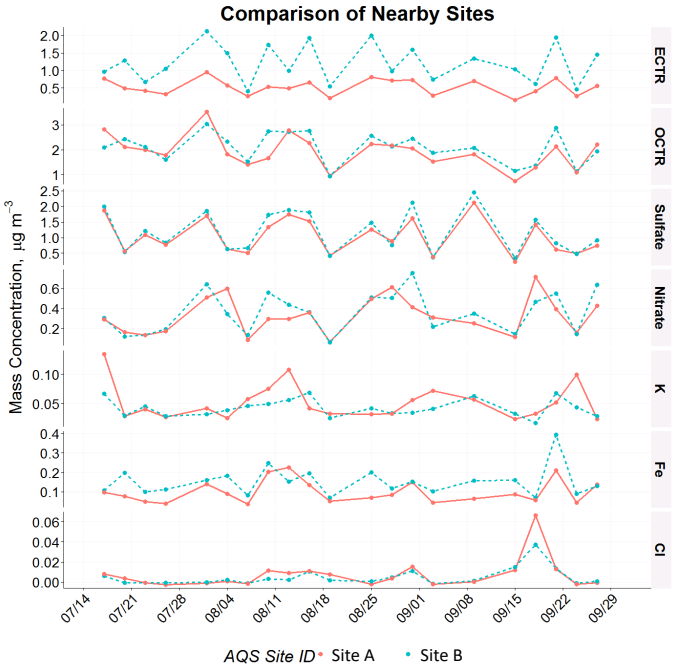
Use to find inconsistencies between ion species



Geospatial

Buddy Sites

Use to compare pollutants between two nearby sites



***Note for SLT Data Validators**

Not all of these examples can be performed within the DART interface. However, DART enables exporting the data for offline analysis using your own software.

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For more information about the examples shown here, please see the CSN Data Validation Guide. UC Davis validation protocols are available in the documents section on the UCD AQRC website:

https://airquality.ucdavis.edu/documentation