
**DONOR SITE RECOMMENDATIONS FOR
DATA SUBSTITUTION**

WESTERN REGIONAL AIR PARTNERSHIP

Submitted to:

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A decorative graphic in the bottom left corner consisting of three stylized mountain peaks in shades of green and blue.

INTRODUCTION

Air Resource Specialists (ARS), under contract to the Western Regional Air Partnership (WRAP), has reviewed western U.S. IMPROVE monitoring data for the period 2006 – 2017 to:

1. Determine which years are considered complete under EPA's Regional Haze Rule (RHR) guidance (specific years of interest only).
2. Recommend donor sites to use for data substitutions at sites with incomplete years.
3. Perform data substitutions with donor site data using period-specific regression statistics between donor and recipient sites.

The purpose of this memo is to present the results from ARS' work on bullets 1 and 2 above, so that states and tribes affected can comment on the donor site recommendation prior to ARS performing data substitutions.

ARS requests that states and tribes review this memo, particularly sites that fall under their respective jurisdictions, and either approve the recommended donor sites, suggest alternate donor sites they feel would be more appropriate, or provide other comments or questions no later than December 14, 2018.

Once donor site recommendations are approved, ARS will prepare data substitutions for the recipient sites based on quarterly Kendall-Theil regression statistics for each species between donor and recipient sites.

DONOR SITE SELECTION METHODOLOGY

RHR guidance outlines the following IMPROVE aerosol data completeness requirements:

- Individual samples must contain all seven species required for the calculation of light extinction (ammonium sulfate, ammonium nitrate, elemental carbon, organic carbon, soil, coarse mass, and sea salt).
- Individual seasons must contain at least 50% of all possible daily samples.
- Individual years must contain at least 75% of all possible daily samples.
- Individual years must not contain more than 10 consecutive missing daily samples.
- Five year reporting periods must contain at least three complete years of data.

ARS reviewed data completeness at WRAP IMPROVE sites for the years of interest: 2008, 2011, and 2013 – 2017. During these periods there were over 40 incomplete site-years. While some incomplete years were due to one or two species missing throughout the year, most were due to too many days missing all seven species. The first nine columns of Table 1 present the WRAP sites with incomplete years of interest. In the table, yellow squares indicate complete site-years, pink squares indicate incomplete site-years which can benefit from data substitutions, and red squares indicate incomplete site-years where data substitutions cannot be done with reasonable confidence.

The methodology used for donor site selection was essentially the same as the methodology used for the baseline period (2000-2004). Candidate donor sites were required to be within

approximately 200 kilometers of the recipient sites (the closer the better), and geographical and airshed differences were taken into consideration. Mass data correlations between recipient and candidate donor sites were calculated over five-year periods, including the year of interest, for the seven major IMPROVE species used in extinction calculation. The five-year periods used for comparisons were:

- 2006 – 2010 for incomplete site-years in 2008
- 2009 – 2013 for incomplete site-years in 2011
- 2013 – 2017 for incomplete site-years in 20013 – 2017

Correlations were calculated for all data and combined calendar quarters during the five-year periods.

Additionally, ARS looked at the data for several IMPROVE sites that moved in the past to determine if the second site could be considered as a continuation of the first site for Regional Haze tracking purposes. Those site pairs are:

- TUXE1/KPBO1 (AK)
- SYCA1/SYCA2 (AZ)
- HALE1/HACR1 (HI)
- ZION1/ZICA1 (UT)

DONOR SITE RECOMMENDATIONS

In most cases a single candidate donor site was easily identified as the best overall choice based on the data correlations discussed above. In a handful of cases the choices were more difficult and the recommendations may include a secondary donor site which could be used if the states and tribes feel it is more appropriate.

The final three columns in Table 1 present a summary of the candidate donor sites, ARS' recommendations, and an explanation of what type and how much data is missing for each incomplete site-year. In a few cases ARS's recommendations are that an incomplete site-year cannot be reasonably completed with data substitutions either because more than 50% of the daily samples for the year are missing or because there is no candidate donor site with sufficiently good correlations for major species. Appendices A through L provide graphical recipient-donor candidate site correlation comparisons, the Kendall-Theil regression statistics which will be used for data substitutions on the next phase of this work, and some notes as to how the donor sites were selected.

For the site pairs where an IMPROVE site moved location in the past ARS recommends that only the case of SYCA1/SYCA2 lends itself to considering the second site as a continuation of the first for Regional Haze tracking purposes. In the other cases there were poor correlations between site pairs and/or significantly different annual average and patterns in daily species mass prior to and after the site moved. Information used to examine all four cases is presented in the state-specific appendices.

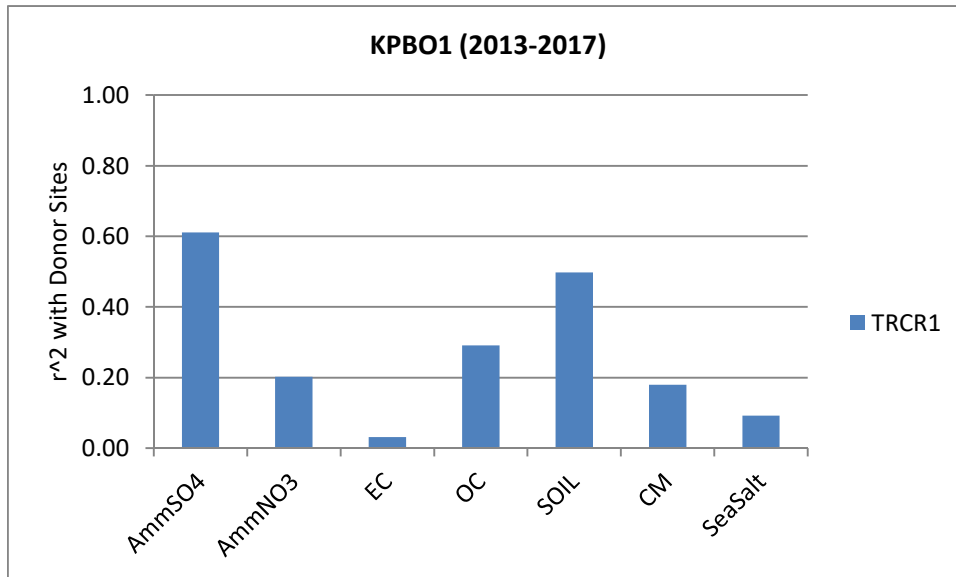
Table 1
Incomplete Site-Years by State and Site
Recommendations for Data Substitution Donor Sites

State	SiteCode	2008	2011	2013	2014	2015	2016	2017	Candidate Donor Sites	Recommended	Recipient Site Missing Data
AK	KPBO1	N/A	N/A	N/A	N/A	1	1		TRCR1	TRCR1	55 days missing CM & Soil
AK	TUXE1	1	1	1	1	N/A	N/A	N/A	N/A	N/A	
AZ	BALD1	1		1	1	1	1	1	TONT1, SIAN1	SIAN1	10 days (8%) missing all species
AZ	SAGU1	1		1	1	1	1	1	SAWE1, CHIR1	SAWE1	31 days (36%) missing all species
AZ	SIAN1	1		1					TONT1, BALD1, IKBA1, PEFO1	TONT1	34 days (28%) missing all species [2011]; 31 days (26%) missing all species, 1 day missing only OC & EC [2014]; 46 days (38%) missing all species [2015]; 69 days (58%) missing all species, 3 days missing only OC & EC [2016]; 74 days (62%) missing all species [2017]
AZ	SYCA1	1	1	1	1		N/A	N/A	SYCA1 moved < 3km to SYCA2, Oct 2015	Combine sites	
AZ	SYCA2	N/A	N/A	N/A	N/A		1	1			
CA	AGTI1	1	1	1	1	1	1		JOSH1, SAGO1, SAGA1	JOSH1	37 days (31%) missing all species
CA	KAIS1	1	1	1	1	1	1		YOSE1, SEQUI1, OWVL1, HOOV1, FRES1	YOSE1	34 days (28%) missing all species
CA	PORE1	1	1	1	1	1		1	PINN1, TRIN1, RAFA1	None	27 days (23%) missing all species, 2 days missing NO3, OC & EC
CA	SAGA1	1		1	1	1	1		SAGO1, AGTI1, RAFA1	SAGO1	90 days (75%) missing all species [2011]; 38 days (32%) missing all species [2017]
CA	TRIN1	1	1	1	1				LAVO1, LABE1, REDW1	LABE1	52 days (43%) missing all species [2015]; 122 days (100%) missing all species [2016]; 57 days (48%) missing all species [2017]
HI	HACR1	1	1		1	1	1	1	HAVO1	None	31 days (26%) missing all species
ID	SAWT1		1	1	1	1	1		CRMO1, HECA1, SULA1	CRMO1	12 days (10%) missing all species, 15 days missing only OC & EC [2008]; 11 days (9%) missing all species, 27 days missing OC & EC [2017]
Tribal (MT)	FOPE1	1		1	1	1	1		MELA1	MELA1	18 days (15%) missing all species [2011]; 28 days (23%) missing all species [2017]
MT	GAMO1	1		1	1	1	1	1	MONT1, SULA1, ULBE1	SULA1	30 days (25%) missing all species
MT	SULA1		1	1	1				MONT1, GAMO1, SAWT1	GAMO1 [2008]; MONT1 [2015,2017]	49 days (41%) missing all species [2008]; 28 days (23%) missing all species, 2 days missing NO3, OC & EC [2015]; 30 days (25%) missing all species [2017]
ND	LOST1	1			1	1	1	1	MELA1, THRO1	MELA1	15 days (13%) missing all species, 3 days missing only NO3 [2011] 30 days (25%) missing all species, 3 days missing only NO3, 2 days missing only OC & EC [2013]
NM	BOAP1	1	1	1		1	1	1	WHIT1, GICL1	WHIT1	25 days (21%) missing all species
NM	GICL1	1		1	1	1	1	1	BOAP1, BALD1, CHIR1	BALD1	28 days (23%) missing all species, 1 day missing only OC & EC
NM (TX)	GUMO1	1	1	1	1	1	1		WHIT1, SACR1	SACR1	7 days (6%) missing all species, 33 days missing CM
NM	SAPE1	1	1		1	1	1	1	BAND1, WHPE1	WHPE1	20 days (17%) missing all species
NM	WHPE1		1	1	1			1	BAND1, SAPE1	SAPE1	21 days (18%) missing all species, 6 days missing only OC & EC [2008]; 20 days (17%) missing all species, 9 days missing only EC [2015]; 9 days (8%) missing all species, 42 days missing only EC [2016]
OR	CRIA1	1	1		1	1	1	1	LABE1, THSI1, KALM1	LABE1	13 days (11%) missing all species
UT	BRCA1	1	1	1	1	1		1	ZICA1, CAPI1, GRBA1	CAPI1 (ZICA1)	12 days (10%) missing all species, 3 days missing only OC & EC
UT	ZICA1	1		1	1	1	1		BRCA1, MEAD1	BRCA1	30 days (25%) missing all species [2011]; 17 days missing only CM [2017]
WA	NOCA1	1	1	1	1	1	1		PASA1, SNPA1, PUSO1, OLYM1	OLYM1 (SNPA1)	23 days (19%) missing all species, 2 days missing NO3, OC & EC, 5 days missing Soil and CM
WA	SNPA1	1	1		1	1	1	1	MORA1, WHPA1, PUSO1, NOCA1, PASA1	MORA1	14 days (12%) missing all species
WY	NOAB1	1		1	1	1	1		YELL2, NOCH1, BRID1	YELL2	24 days (20%) missing all species [2011]; 26 days (22%) missing all species [2017]

APPENDIX A

ALASKA SITES

Kenai Peninsula Borough, AK



KPBO1vsTRCR1 2013-2017		All	Q1	Q2	Q3	Q4
AmmSO4	Slope=	0.98	0.97	0.88	1.14	0.71
	Intercept=	0.10	0.07	0.13	0.25	0.12
	r2=	0.61	0.68	0.28	0.72	0.34
AmmNO3	Slope=	0.75	0.81	0.51	0.87	0.40
	Intercept=	0.07	0.06	0.11	0.06	0.08
	r2=	0.20	0.25	0.14	0.26	0.17
EC	Slope=	0.27	0.55	0.29	0.24	0.05
	Intercept=	0.04	0.03	0.03	0.04	0.04
	r2=	0.03	0.16	0.13	0.01	0.01
OC	Slope=	0.36	0.02	0.44	0.42	0.14
	Intercept=	0.25	0.23	0.17	0.26	0.27
	r2=	0.29	0.02	0.37	0.40	0.02
SOIL	Slope=	1.32	1.59	0.46	2.56	1.34
	Intercept=	0.06	0.04	0.13	0.04	0.06
	r2=	0.50	0.46	0.04	0.48	0.78
CM	Slope=	1.51	3.22	4.44	0.21	1.52
	Intercept=	1.95	1.25	-4.25	4.30	2.11
	r2=	0.18	0.30	0.16	0.00	0.68
SeaSalt	Slope=	1.84	1.54	2.11	2.37	1.27
	Intercept=	0.28	0.21	0.41	0.31	0.22
	r2=	0.09	0.25	0.08	0.04	0.07

Missing data:

2017: 55 days (45%) missing Coarse Mass

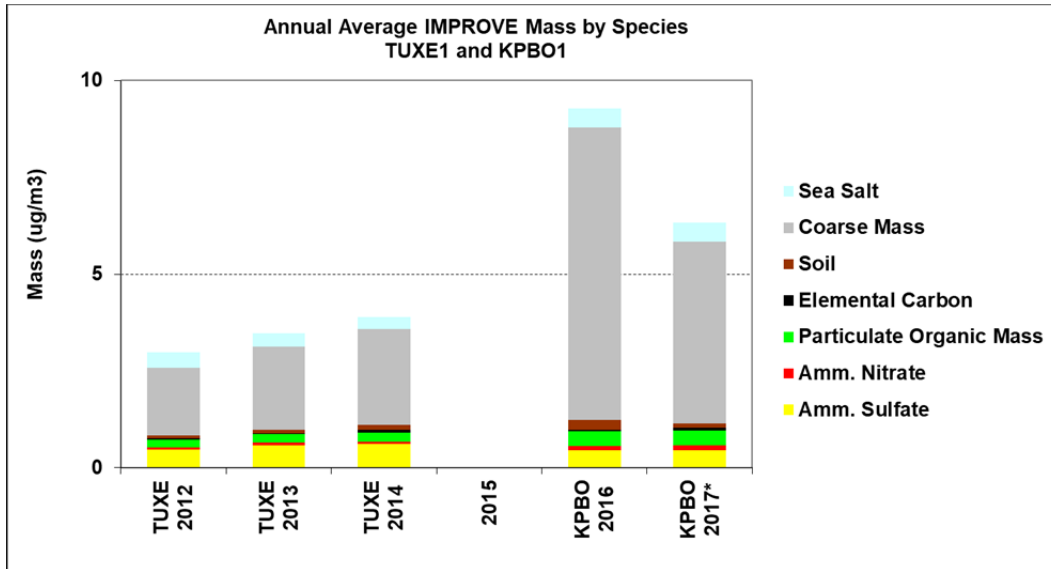
Recommended donor site:

TRCR1 Due to lack of other suitable donor sites.

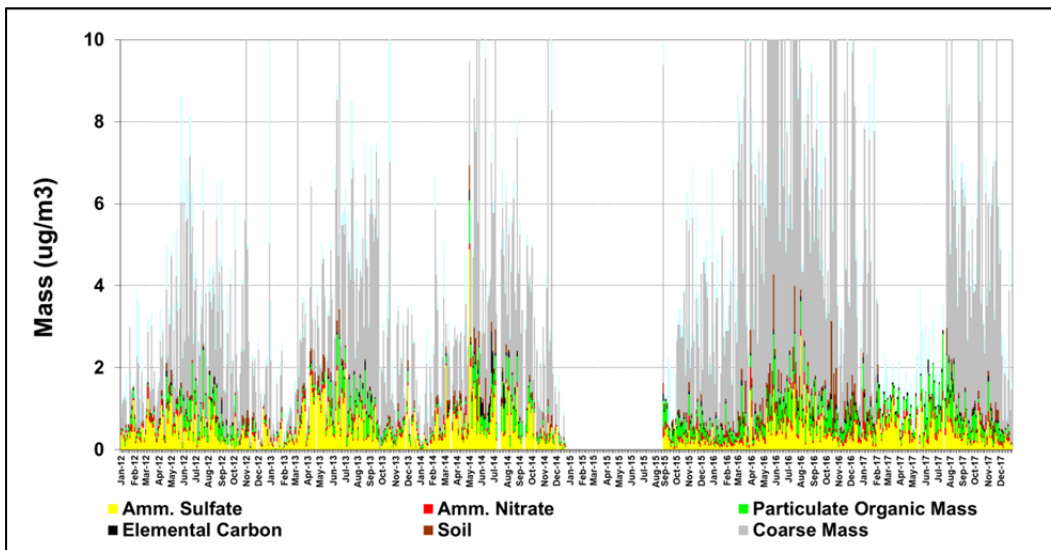
Additional comments:

While the Coarse Mass correlations with TRCI1 are not high, filling in missing Coarse Mass will allow the other species collected on those days to be used in visibility calculations. However, as described on the next page, it is not recommended that KPBO1 be used as a continuation of TUXE1 for Regional Haze tracking purposes.

Tuxedni, AK



* The annual 2017 KPBO1 data shown is missing 55 days of Soil and CM



Missing data:

Recommended donor site:

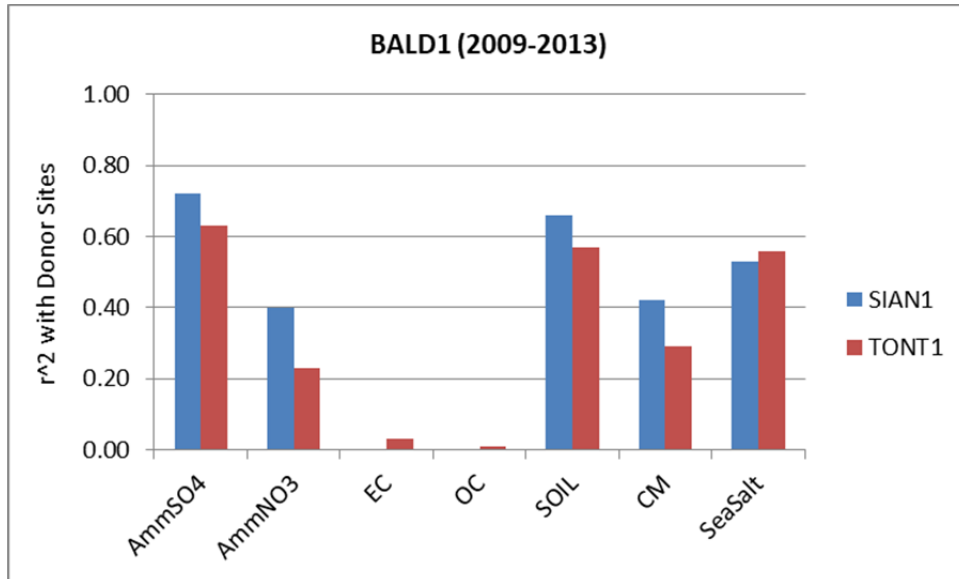
Additional comments:

The TUXE1 site ended monitoring in December 2014 and was moved to KPBO1 in late 2015. Annual average and patterns in daily species mass are shown to be significantly different prior to and after the move. Therefore it is not recommended the KPBO1 site be used as a continuation of TUXE1 for Regional Haze tracking purposes.

APPENDIX B

ARIZONA SITES

Mount Baldy, AZ



BALD1vsSIAN1 2009-2013		All	Q1	Q2	Q3	Q4
AmmSO4	Slope=	0.81	0.77	0.80	0.68	0.82
	Intercept=	0.05	0.00	0.15	0.19	-0.04
	r2=	0.72	0.77	0.65	0.49	0.75
AmmNO3	Slope=	0.55	0.48	0.59	0.40	0.33
	Intercept=	0.03	0.03	0.06	0.04	0.03
	r2=	0.40	0.34	0.43	0.47	0.20
EC	Slope=	0.24	0.25	0.13	0.35	0.21
	Intercept=	0.05	0.03	0.05	0.06	0.05
	r2=	0.00	0.07	0.00	0.03	0.03
OC	Slope=	0.38	0.18	0.22	0.32	0.26
	Intercept=	0.20	0.15	0.31	0.46	0.19
	r2=	0.00	0.01	0.00	0.11	0.07
SOIL	Slope=	0.72	0.76	0.74	0.64	0.44
	Intercept=	0.02	0.04	0.13	0.03	0.13
	r2=	0.66	0.88	0.58	0.44	0.05
CM	Slope=	0.62	0.58	0.63	0.44	0.42
	Intercept=	0.26	0.61	0.85	0.98	0.18
	r2=	0.42	0.50	0.48	0.14	0.05
SeaSalt	Slope=	0.39	0.20	0.47	0.31	0.06
	Intercept=	0.00	0.00	0.01	-0.01	0.00
	r2=	0.53	0.42	0.55	0.56	0.09

Missing data:

2011: 10 days (8%) missing all species

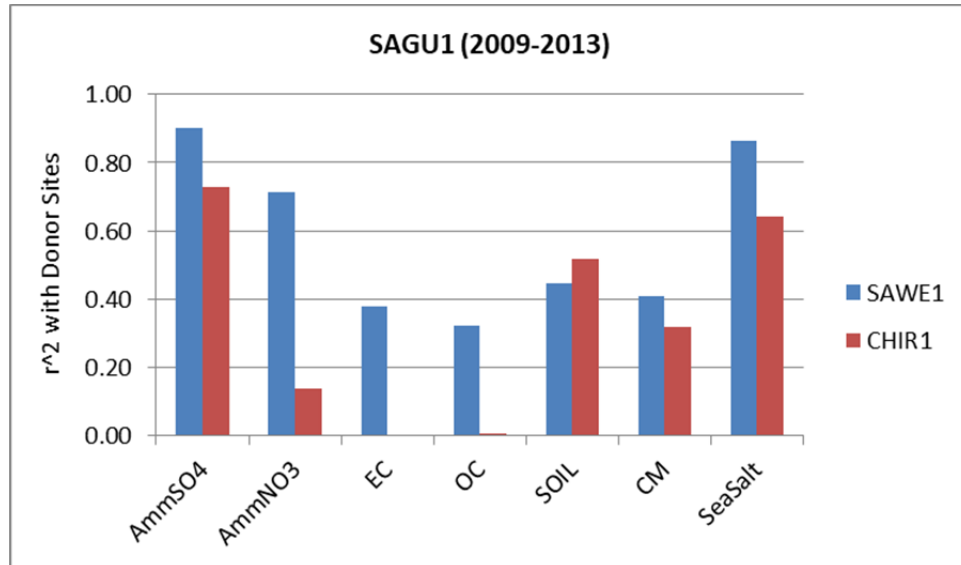
Recommended donor site:

SIAN1 due to reasonable AmmSO₄ and Soil correlations, and generally better correlations for other species than TONT1.

Additional comments:

Note that during the baseline period (2000 – 2004) TONT1 provided better correlations across species than SIAN1 and was used as the donor site for data substitution during that period.

Saguaro National Monument, AZ



SAGU1vsSAWE1 2009-2013		All	Q1	Q2	Q3	Q4
AmmSO4	Slope=	0.94	0.87	0.93	0.91	0.93
	Intercept=	-0.02	0.00	0.09	0.03	0.04
	r2=	0.90	0.80	0.84	0.86	0.94
AmmNO3	Slope=	0.76	0.56	0.84	0.82	0.73
	Intercept=	0.02	0.06	0.02	-0.02	0.00
	r2=	0.71	0.69	0.81	0.80	0.82
EC	Slope=	0.48	0.44	0.71	0.34	0.48
	Intercept=	0.06	0.05	0.03	0.08	0.05
	r2=	0.38	0.30	0.32	0.22	0.46
OC	Slope=	0.63	0.49	0.70	0.71	0.55
	Intercept=	0.15	0.20	0.13	0.17	0.17
	r2=	0.32	0.19	0.23	0.60	0.44
SOIL	Slope=	0.52	0.32	0.69	0.43	0.45
	Intercept=	0.12	0.24	0.30	0.33	0.13
	r2=	0.45	0.45	0.43	0.41	0.42
CM	Slope=	0.57	0.50	0.59	0.54	0.51
	Intercept=	1.65	1.63	2.85	1.22	2.25
	r2=	0.41	0.57	0.56	0.22	0.45
SeaSalt	Slope=	0.76	0.61	0.81	0.70	0.59
	Intercept=	-0.01	0.00	0.00	0.00	0.00
	r2=	0.87	0.75	0.90	0.84	0.53

Missing data:

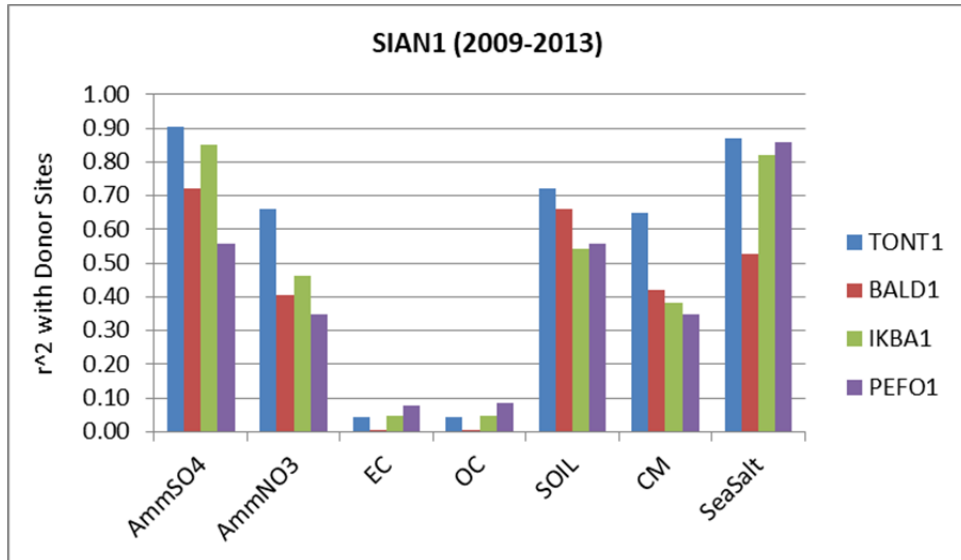
2011: 31 days (36%) missing all species

Recommended donor site:

SAWE1 due to strong AmmSO₄ and AmmNO₃ correlations, and better correlations for most other species than CHIR1.

Additional comments:

Sierra Ancha, AZ



SIAN1vsTONT1 2009-2013		All	Q1	Q2	Q3	Q4
AmmSO4	Slope=	0.83	0.77	0.82	0.78	0.81
	Intercept=	-0.01	0.02	-0.01	0.03	-0.06
	r2=	0.91	0.85	0.87	0.87	0.88
AmmNO3	Slope=	0.81	0.87	0.85	0.73	0.77
	Intercept=	-0.02	-0.01	0.01	0.00	0.01
	r2=	0.66	0.80	0.62	0.83	0.47
EC	Slope=	0.76	0.73	0.73	0.70	0.68
	Intercept=	0.03	0.04	0.02	0.04	0.06
	r2=	0.04	0.35	0.04	0.05	0.06
OC	Slope=	0.78	0.64	0.66	0.84	0.80
	Intercept=	0.15	0.19	0.17	0.14	0.18
	r2=	0.04	0.25	0.06	0.12	0.08
SOIL	Slope=	0.73	0.71	0.71	0.59	0.72
	Intercept=	-0.01	-0.04	0.01	0.05	-0.01
	r2=	0.72	0.74	0.67	0.55	0.83
CM	Slope=	0.61	0.56	0.58	0.45	0.60
	Intercept=	0.25	0.03	0.88	1.14	0.42
	r2=	0.65	0.52	0.67	0.60	0.85
SeaSalt	Slope=	0.65	0.59	0.71	0.55	0.47
	Intercept=	0.00	-0.01	0.00	0.01	-0.01
	r2=	0.87	0.92	0.87	0.90	0.11

Missing data:

2011: 34 days (28%) missing all species

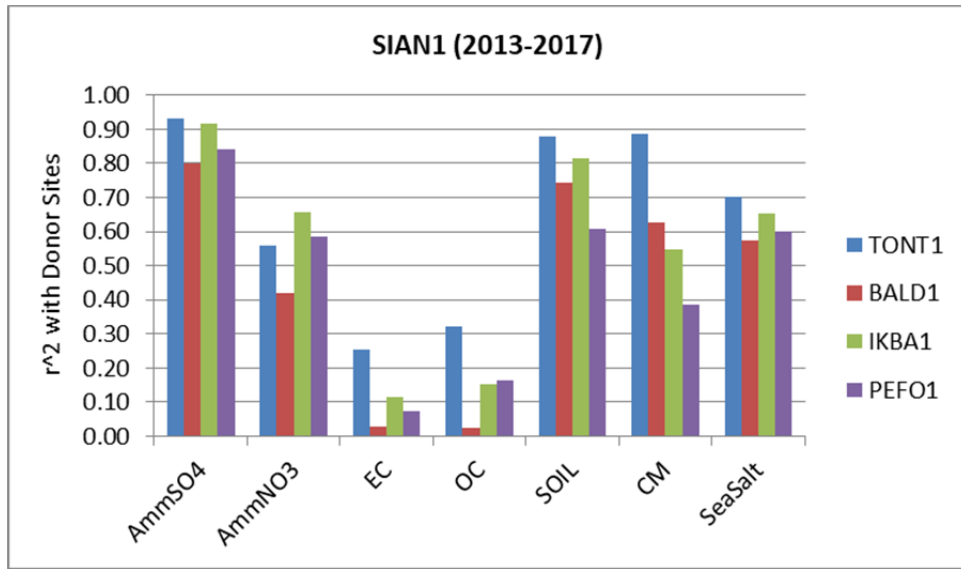
Recommended donor site:

TONT1 due to strong AmmSO₄ correlations, and generally equal or better correlations among other species than the other candidate sites.

Additional comments:

Note that SIAN1 was used as the donor site for TONT1 during the baseline period (2000 – 2004).

Sierra Ancha, AZ



SIAN1vsTONT1 2013-2017		All	Q1	Q2	Q3	Q4
AmmSO ₄	Slope=	0.83	0.75	0.84	0.78	0.80
	Intercept=	-0.03	-0.03	-0.02	0.04	-0.04
	r ² =	0.93	0.91	0.94	0.89	0.90
AmmNO ₃	Slope=	0.74	0.75	0.81	0.61	0.68
	Intercept=	-0.01	0.02	0.00	0.01	0.01
	r ² =	0.56	0.64	0.89	0.68	0.45
EC	Slope=	0.74	0.55	0.76	0.68	0.85
	Intercept=	0.03	0.05	0.02	0.03	0.03
	r ² =	0.25	0.15	0.34	0.29	0.32
OC	Slope=	0.82	0.66	0.77	0.98	0.85
	Intercept=	0.14	0.20	0.13	0.07	0.14
	r ² =	0.32	0.35	0.49	0.42	0.34
SOIL	Slope=	0.70	0.74	0.71	0.50	0.63
	Intercept=	-0.05	-0.04	-0.04	0.06	0.03
	r ² =	0.88	0.81	0.90	0.81	0.86
CM	Slope=	0.56	0.53	0.60	0.43	0.53
	Intercept=	0.47	0.34	0.41	1.24	0.41
	r ² =	0.89	0.88	0.94	0.83	0.77
SeaSalt	Slope=	0.57	0.48	0.68	0.51	0.55
	Intercept=	0.00	0.00	-0.01	0.00	0.00
	r ² =	0.70	0.34	0.92	0.54	0.62

Missing data:

2014: 31 days (26%) missing all species
 2015: 46 days (38%) missing all species
 2016: 69 days (58%) missing all species
 2017: 74 days (62%) missing all species

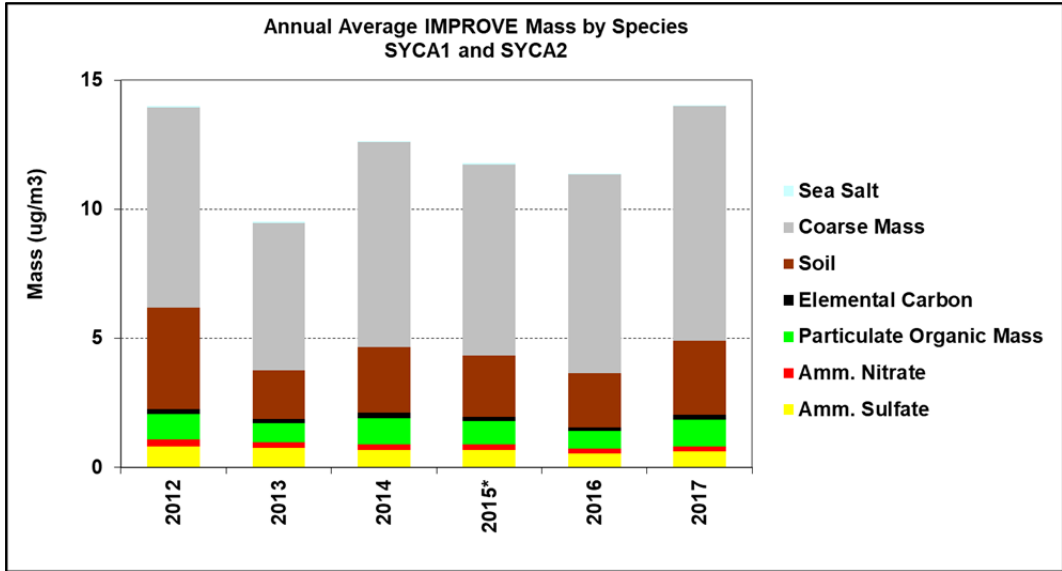
Recommended donor site:

2014, 2015: TONT1 due to strong AmmSO₄, Soil and CM correlations.
 2016, 2017: None

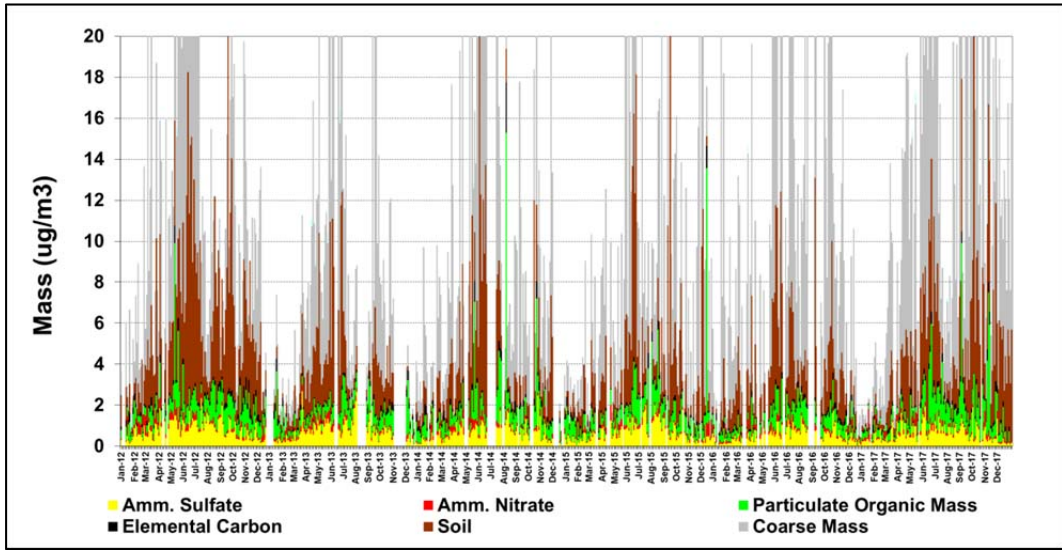
Additional comments:

There are too many samples missing in 2016 and 2017 to apply data substitutions at SIAN1. Note that SIAN1 was used as the donor site for TONT1 during the baseline period (2000 – 2004).

Sycamore Canyon, AZ



* The annual 2015 data for SYCA shown is bases on a combination of both sites for that year.



Missing data:

Recommended donor site:

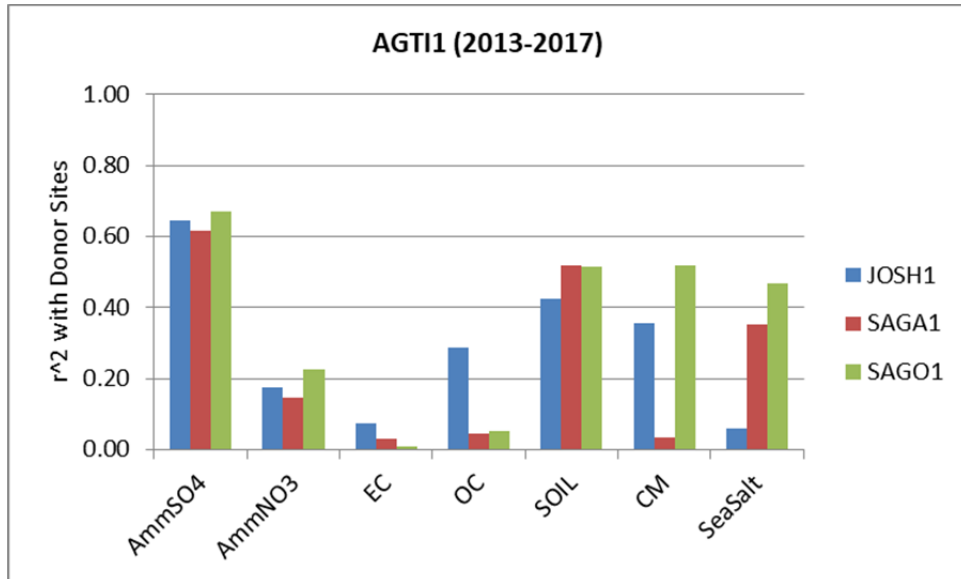
Additional comments:

The SYCA1 site moved less than 3 km to the SYCA2 site in 2015. Annual average and patterns in daily species mass are shown to be similar prior to and after the move. Therefore it is recommended the SYCA2 site be used as a continuation of SYCA1 for Regional Haze tracking purposes.

APPENDIX C

CALIFORNIA SITES

Agua Tibia, CA



AGT11vsJOSH1 2013-2017		All	Q1	Q2	Q3	Q4
AmmSO4	Slope=	1.20	1.34	0.97	0.66	1.18
	Intercept=	0.22	0.05	0.49	0.98	0.06
	r2=	0.64	0.74	0.41	0.34	0.69
AmmNO3	Slope=	1.01	0.60	0.69	1.12	0.85
	Intercept=	0.34	0.24	0.75	0.46	0.15
	r2=	0.18	0.12	0.15	0.20	0.25
EC	Slope=	0.68	0.86	0.62	0.47	0.88
	Intercept=	0.10	0.07	0.11	0.14	0.09
	r2=	0.07	0.08	0.03	0.07	0.13
OC	Slope=	0.67	0.72	0.48	0.42	0.81
	Intercept=	0.43	0.32	0.66	0.69	0.32
	r2=	0.29	0.15	0.11	0.26	0.40
SOIL	Slope=	0.52	0.74	0.46	0.31	0.73
	Intercept=	0.17	0.08	0.20	0.30	0.10
	r2=	0.42	0.65	0.63	0.25	0.49
CM	Slope=	0.79	0.79	0.70	0.41	0.81
	Intercept=	3.16	2.24	4.05	6.68	2.54
	r2=	0.36	0.53	0.23	0.31	0.47
SeaSalt	Slope=	1.89	1.73	2.66	0.75	1.33
	Intercept=	0.02	0.00	0.08	0.07	0.01
	r2=	0.06	0.03	0.23	0.06	0.33

Missing data:

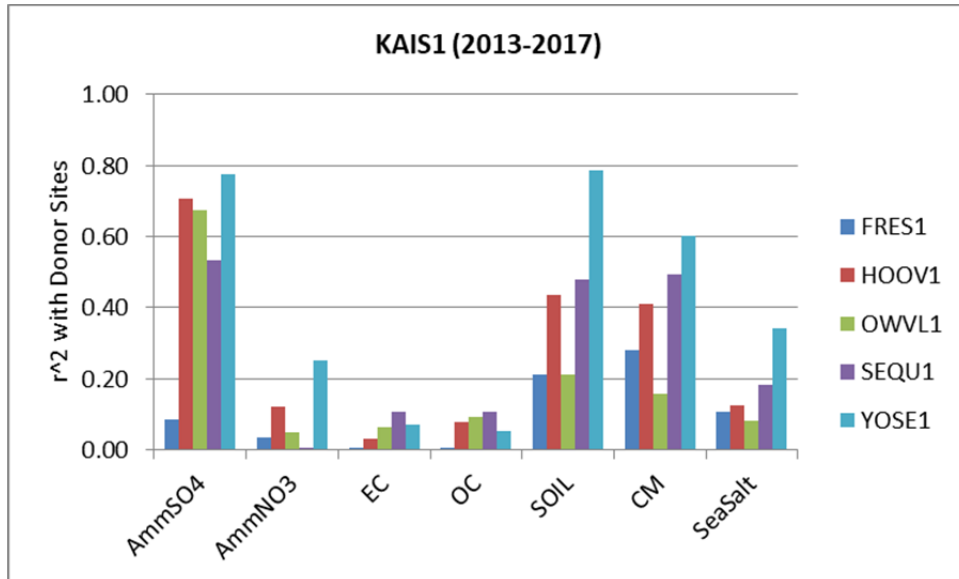
2017: 37 days (31%) missing all species

Recommended donor site:

JOSH1 due to reasonable AmmSO₄ and Soil correlations and somewhat better OC correlations than the other candidate sites.

Additional comments:

Kaiser, CA



KAIS1vsYOSE1 2013-2017		All	Q1	Q2	Q3	Q4
AmmSO4	Slope=	0.95	0.79	0.91	0.88	0.78
	Intercept=	-0.05	0.00	0.05	0.06	-0.03
	r2=	0.77	0.84	0.66	0.49	0.74
AmmNO3	Slope=	1.06	0.57	1.10	0.69	0.89
	Intercept=	0.01	0.01	0.11	0.23	-0.02
	r2=	0.25	0.32	0.57	0.03	0.59
EC	Slope=	0.46	0.37	0.64	0.20	0.45
	Intercept=	0.04	0.04	0.02	0.10	0.02
	r2=	0.07	0.06	0.23	0.03	0.11
OC	Slope=	0.72	0.59	0.87	0.33	0.49
	Intercept=	0.07	0.01	0.05	1.01	0.13
	r2=	0.05	0.47	0.40	0.02	0.06
SOIL	Slope=	1.04	1.02	0.98	0.90	0.77
	Intercept=	-0.01	-0.02	0.09	0.16	0.03
	r2=	0.79	0.88	0.78	0.46	0.77
CM	Slope=	0.85	0.55	0.89	0.63	0.45
	Intercept=	-0.41	0.32	0.36	2.83	0.30
	r2=	0.60	0.42	0.50	0.25	0.67
SeaSalt	Slope=	0.53	0.40	0.64	0.39	0.23
	Intercept=	0.00	0.00	0.00	0.01	0.00
	r2=	0.34	0.28	0.50	0.12	0.27

Missing data:

2017: 34 days (28%) missing all species

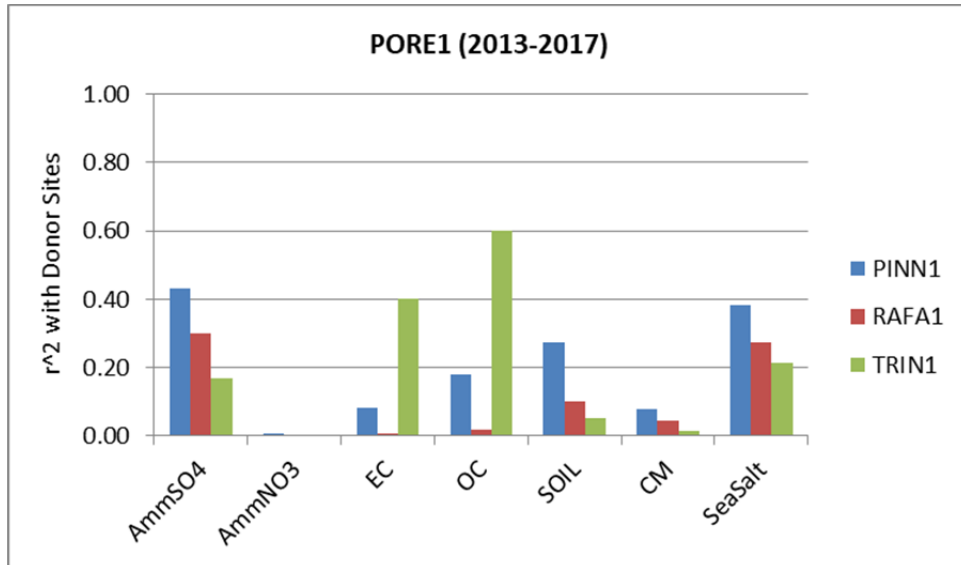
Recommended donor site:

YOSE1 due to strong AmmSO₄ and Soil correlations.

Additional comments:

Note that YOSE1 was used as the donor site for KAIS1 during the baseline period (2000 – 2004).

Point Reyes, CA



PORE1vsPINN1 2013-2017		All	Q1	Q2	Q3	Q4
AmmSO4	Slope=	0.71	0.57	0.69	0.60	0.72
	Intercept=	0.26	0.27	0.38	0.36	0.26
	r2=	0.43	0.31	0.38	0.28	0.29
AmmNO3	Slope=	0.17	0.09	0.28	0.26	0.08
	Intercept=	0.21	0.25	0.15	0.14	0.38
	r2=	0.01	0.00	0.10	0.16	0.04
EC	Slope=	0.13	0.09	0.08	0.14	0.21
	Intercept=	0.01	0.02	0.01	0.01	0.02
	r2=	0.08	0.02	0.19	0.17	0.09
OC	Slope=	0.29	0.25	0.22	0.28	0.38
	Intercept=	0.08	0.09	0.11	0.06	0.19
	r2=	0.18	0.09	0.24	0.25	0.05
SOIL	Slope=	0.24	0.38	0.34	0.13	0.30
	Intercept=	0.07	0.08	0.09	0.05	0.08
	r2=	0.27	0.51	0.38	0.22	0.22
CM	Slope=	0.33	0.63	0.73	0.48	0.49
	Intercept=	4.47	4.44	2.44	1.16	4.03
	r2=	0.08	0.16	0.15	0.13	0.12
SeaSalt	Slope=	3.24	3.22	3.02	2.66	3.45
	Intercept=	1.08	1.20	1.48	0.79	0.69
	r2=	0.38	0.31	0.34	0.27	0.42

Missing data:

2016: 27 days (23%) missing all species

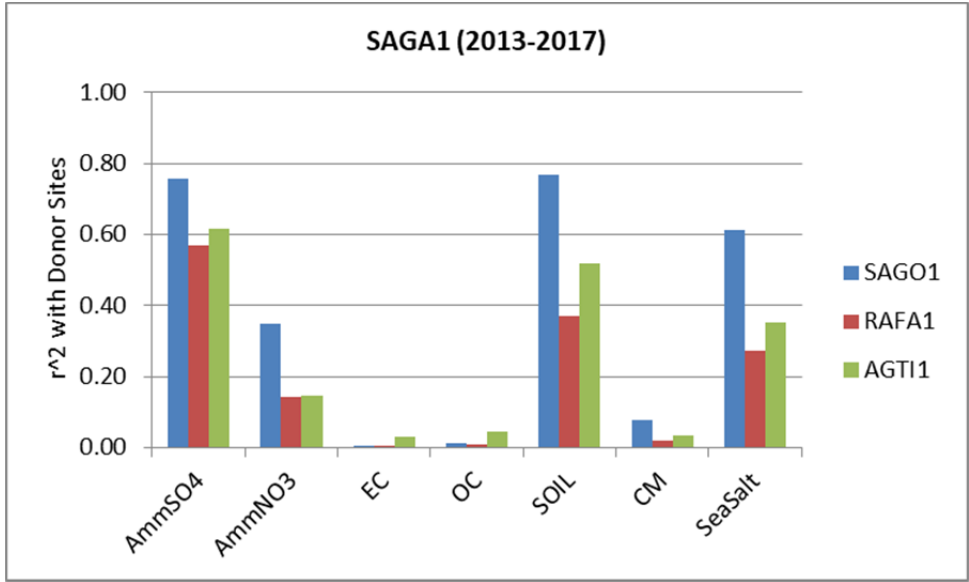
Recommended donor site:

None

Additional comments:

No inland candidate site shows strong correlations with PORE1, which is a coastal site. Consider leaving 2016 an incomplete year at PORE1.

San Gabriel, CA



SAGA1vsSAGO1 2013-2017		All	Q1	Q2	Q3	Q4
AmmSO4	Slope=	0.89	1.07	0.84	0.69	0.92
	Intercept=	0.05	0.00	0.19	0.29	0.03
	r2=	0.76	0.81	0.67	0.47	0.82
AmmNO3	Slope=	0.51	0.56	0.48	0.42	0.70
	Intercept=	0.20	0.26	0.15	0.20	0.12
	r2=	0.35	0.32	0.46	0.13	0.39
EC	Slope=	0.55	0.73	0.36	0.44	0.71
	Intercept=	0.02	0.01	0.06	0.04	0.01
	r2=	0.00	0.46	0.01	0.01	0.45
OC	Slope=	0.68	0.89	0.47	0.75	0.81
	Intercept=	0.09	0.03	0.37	-0.03	0.03
	r2=	0.01	0.51	0.03	0.04	0.54
SOIL	Slope=	0.85	0.94	0.93	0.71	0.90
	Intercept=	0.01	0.06	-0.05	0.03	0.01
	r2=	0.77	0.90	0.81	0.56	0.60
CM	Slope=	0.76	1.07	0.64	0.52	0.96
	Intercept=	1.11	0.52	2.11	2.03	0.87
	r2=	0.08	0.00	0.58	0.31	0.66
SeaSalt	Slope=	0.72	0.43	0.63	0.83	0.78
	Intercept=	0.01	0.01	0.02	0.00	0.01
	r2=	0.61	0.82	0.65	0.28	0.80

Missing data:

2011: 90 days (75%) missing all species
 2017: 38 days (32%) missing all species

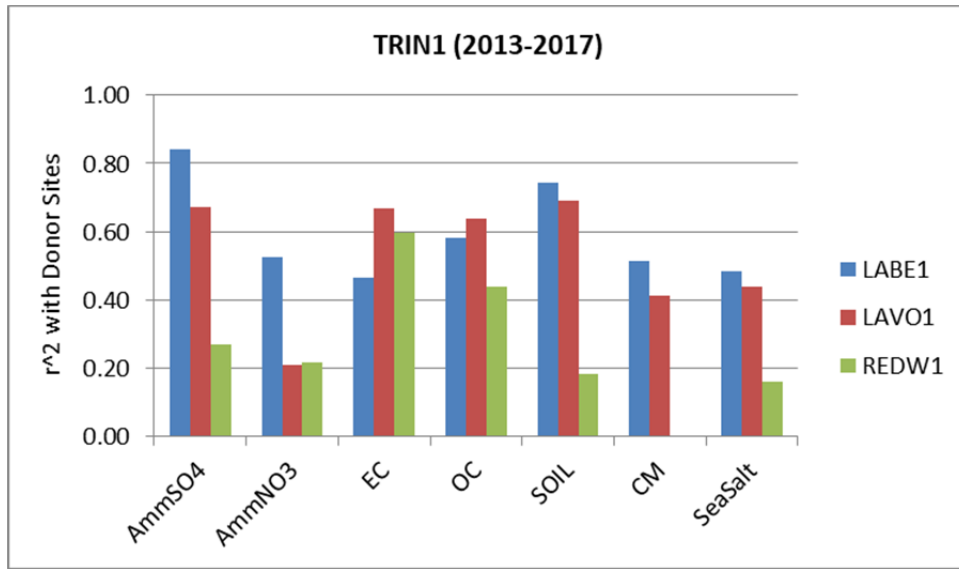
Recommended donor site:

2011: None
 2017: SAGO1 due to strong AmmSO₄ and Soil correlations.

Additional comments:

There are too many samples missing in 2011 to reasonably apply data substitutions at SAGA1.

Trinity, CA



TRIN1vsLAVE1 2013-2017		All	Q1	Q2	Q3	Q4
AmmSO4	Slope=	1.03	0.89	0.96	1.05	0.93
	Intercept=	0.03	0.01	0.10	0.07	0.05
	r2=	0.84	0.82	0.90	0.64	0.81
AmmNO3	Slope=	0.63	0.32	0.77	0.78	0.32
	Intercept=	0.01	0.01	0.02	0.02	0.03
	r2=	0.53	0.86	0.72	0.34	0.34
EC	Slope=	0.79	0.48	0.80	0.83	0.58
	Intercept=	0.02	0.02	0.01	0.03	0.05
	r2=	0.46	0.33	0.55	0.42	0.30
OC	Slope=	0.85	0.51	0.82	0.88	0.47
	Intercept=	0.14	0.17	0.08	0.24	0.45
	r2=	0.58	0.44	0.66	0.59	0.10
SOIL	Slope=	0.84	0.77	0.81	0.84	0.70
	Intercept=	-0.02	-0.01	-0.03	0.06	-0.01
	r2=	0.74	0.91	0.82	0.34	0.82
CM	Slope=	0.94	0.74	0.63	0.96	0.75
	Intercept=	0.34	0.25	0.65	1.14	0.68
	r2=	0.52	0.59	0.46	0.22	0.77
SeaSalt	Slope=	1.29	1.36	1.84	0.50	1.21
	Intercept=	0.01	0.01	0.02	0.02	0.00
	r2=	0.48	0.72	0.43	0.13	0.42

Missing data:

2015: 52 days (43%) missing all species
 2016: 122 days (100%) missing all species
 2017: 57 days (48%) missing all species

Recommended donor site:

2015, 2017: LAVE1 due to strong AmmSO₄ and Soil correlations, and reasonable AmmNO₃, EC, OC and CM correlations.
 2016: None

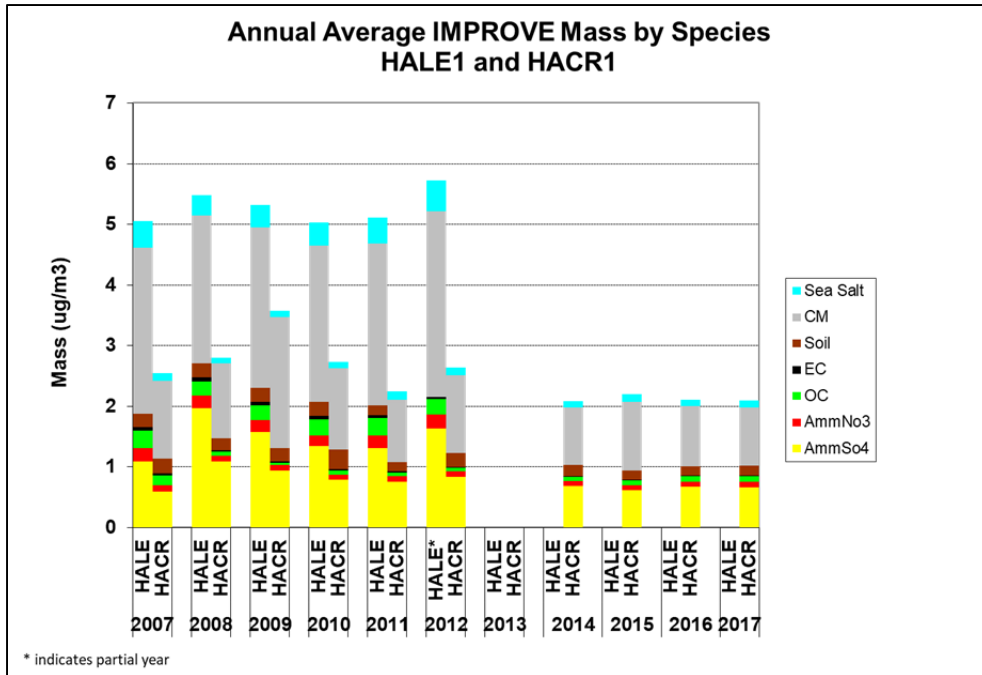
Additional comments:

There are too many samples missing in 2016 to reasonably apply data substitution to TRIN1. Note that LAVO1 was used as the donor site for TRIN1 during the baseline period of 2000 – 2004.

APPENDIX D

HAWAII SITES

Haleakala, HI



HALE1vsHACR1 2007-2012		All	Q1	Q2	Q3	Q4
AmmSO4	Slope=	1.15	1.51	1.04	0.77	1.24
	Intercept=	0.31	0.24	0.39	0.36	0.38
	r2=	0.77	0.75	0.88	0.55	0.75
AmmNO3	Slope=	0.92	1.16	0.75	0.56	1.10
	Intercept=	0.11	0.08	0.15	0.11	0.12
	r2=	0.15	0.11	0.22	0.10	0.20
EC	Slope=	0.96	0.69	0.91	1.01	1.45
	Intercept=	0.03	0.02	0.03	0.02	0.02
	r2=	0.09	0.22	0.27	0.02	0.32
OC	Slope=	0.57	0.33	0.67	0.62	0.60
	Intercept=	0.20	0.21	0.19	0.17	0.20
	r2=	0.04	0.15	0.26	0.02	0.22
SOIL	Slope=	0.66	0.61	0.60	0.44	0.90
	Intercept=	0.08	0.07	0.15	0.09	0.07
	r2=	0.51	0.62	0.43	0.14	0.17
CM	Slope=	0.39	0.38	0.33	0.29	0.49
	Intercept=	2.04	1.85	2.46	2.11	2.03
	r2=	0.13	0.18	0.09	0.08	0.15
SeaSalt	Slope=	1.88	1.81	1.90	1.63	2.06
	Intercept=	0.16	0.23	0.21	0.18	0.11
	r2=	0.30	0.16	0.37	0.32	0.56

HACR1vsHAVO1 2013-2017		All	Q1	Q2	Q3	Q4
AmmSO4	Slope=	0.17	0.08	0.28	0.28	0.12
	Intercept=	0.28	0.32	0.32	0.27	0.19
	r2=	0.19	0.07	0.34	0.29	0.26
AmmNO3	Slope=	0.44	0.26	0.79	0.47	0.08
	Intercept=	0.04	0.04	0.04	0.04	0.04
	r2=	0.23	0.10	0.28	0.21	0.04
EC	Slope=	0.06	0.01	0.17	0.12	0.06
	Intercept=	0.01	0.01	0.01	0.01	0.01
	r2=	0.00	0.00	0.04	0.00	0.00
OC	Slope=	0.10	0.06	0.25	0.20	0.05
	Intercept=	0.06	0.06	0.07	0.05	0.06
	r2=	0.01	0.01	0.05	0.07	0.01
SOIL	Slope=	0.72	0.51	0.74	0.63	0.34
	Intercept=	0.02	0.03	0.09	0.01	0.03
	r2=	0.34	0.24	0.33	0.04	0.03
CM	Slope=	0.23	0.19	0.31	0.33	0.11
	Intercept=	0.50	0.58	0.50	0.25	0.61
	r2=	0.21	0.09	0.36	0.36	0.06
SeaSalt	Slope=	0.18	0.10	0.33	0.22	0.08
	Intercept=	0.03	0.05	-0.02	0.03	0.05
	r2=	0.26	0.10	0.52	0.48	0.18

Missing data:

2013: 31 days (26%) missing all species.

Recommended donor site:

None.

Additional comments:

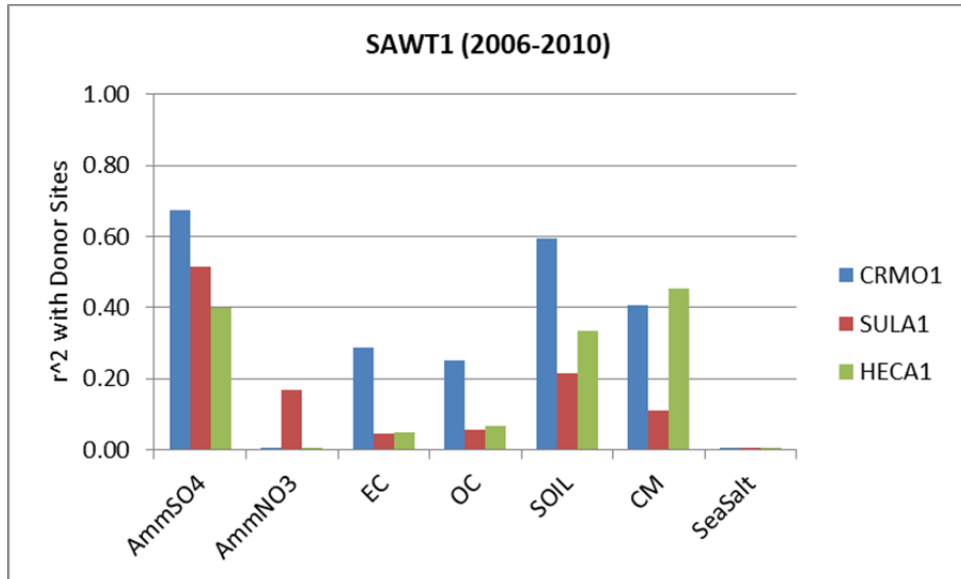
The only nearby candidate donor site is HAVO1 which is on a different Hawaiian island. Annual and quarterly correlations between the sites are poor. Consider leaving 2013 an incomplete year at HACR1.

The HALE1 site ended monitoring in 2012. The HACR1 site began monitoring in 2007. Annual average and patterns in daily species mass are shown to be significantly different during the period of concurrent sampling. Therefore it is not recommended the HACR1 site be used as a continuation of HALE1 for Regional Haze tracking purposes.

APPENDIX E

IDAHO SITES

Sawtooth, ID



SAWT1vsCRMO1 2006-2010	All	Q1	Q2	Q3	Q4	
AmmSO4	Slope=	0.82	0.50	0.90	0.85	0.58
	Intercept=	-0.04	0.01	-0.01	0.09	0.02
	r2=	0.68	0.53	0.85	0.58	0.47
AmmNO3	Slope=	0.02	0.01	0.37	0.41	0.00
	Intercept=	0.05	0.04	0.01	0.02	0.04
	r2=	0.00	0.01	0.38	0.25	0.00
EC	Slope=	0.79	0.51	0.80	1.03	0.57
	Intercept=	0.05	0.07	0.03	0.04	0.05
	r2=	0.29	0.00	0.01	0.48	0.04
OC	Slope=	1.03	0.70	0.95	1.23	0.69
	Intercept=	0.42	0.49	0.45	0.36	0.47
	r2=	0.25	0.00	0.31	0.53	0.00
SOIL	Slope=	0.63	0.67	0.70	0.27	0.36
	Intercept=	0.05	0.02	0.06	0.41	0.07
	r2=	0.59	0.56	0.73	0.11	0.94
CM	Slope=	0.41	0.32	0.44	0.27	0.23
	Intercept=	0.03	0.18	-0.14	1.63	0.22
	r2=	0.41	0.15	0.55	0.15	0.22
SeaSalt	Slope=	0.03	0.22	0.03	0.00	0.01
	Intercept=	0.00	0.00	0.00	0.00	0.00
	r2=	0.00	0.13	0.02	0.00	0.00

Missing data:

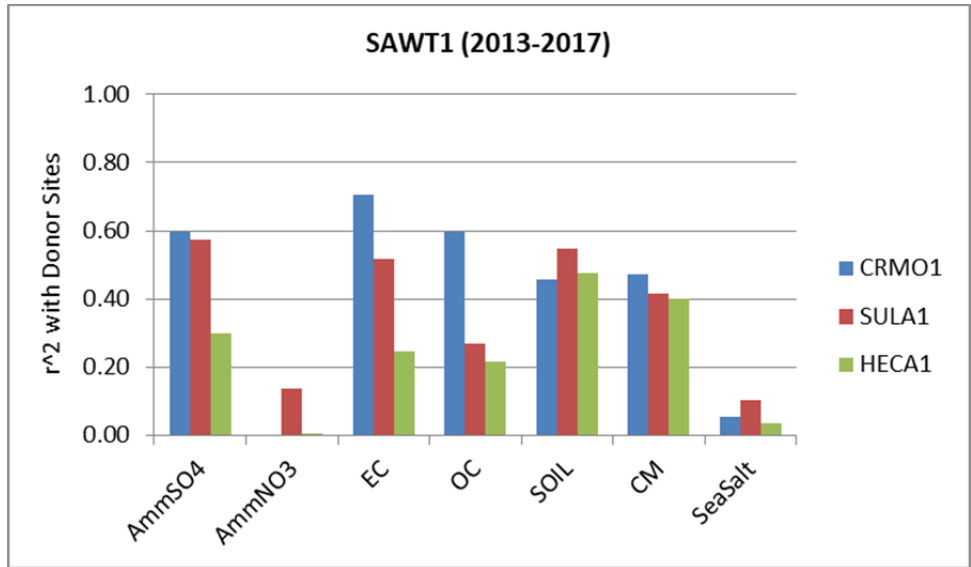
2008: 12 days (10%) missing all species. 15 days (12%) missing only OC/EC

Recommended donor site:

CRMO1 due to reasonable AmmSO₄ and Soil correlations.

Additional comments:

Sawtooth, ID



SAWT1vsCRMO1 2013-2017		All	Q1	Q2	Q3	Q4
AmmSO ₄	Slope=	0.88	0.56	0.91	0.85	0.62
	Intercept=	-0.04	-0.01	-0.03	0.07	0.02
	r ² =	0.60	0.67	0.84	0.30	0.57
AmmNO ₃	Slope=	0.02	0.00	0.30	0.55	0.01
	Intercept=	0.05	0.03	0.03	0.02	0.03
	r ² =	0.00	0.01	0.20	0.30	0.00
EC	Slope=	0.85	0.74	0.68	1.11	0.59
	Intercept=	0.02	0.02	0.03	0.00	0.03
	r ² =	0.71	0.27	0.28	0.67	0.25
OC	Slope=	1.08	0.75	1.04	1.13	0.74
	Intercept=	0.19	0.23	0.15	0.39	0.24
	r ² =	0.60	0.11	0.56	0.50	0.41
SOIL	Slope=	0.63	0.53	0.68	0.52	0.39
	Intercept=	0.02	0.02	0.03	0.13	0.03
	r ² =	0.46	0.66	0.66	0.11	0.33
CM	Slope=	0.44	0.17	0.44	0.53	0.17
	Intercept=	0.04	0.32	0.28	0.26	0.19
	r ² =	0.47	0.22	0.49	0.30	0.11
SeaSalt	Slope=	0.04	0.01	0.06	0.17	0.03
	Intercept=	0.00	0.00	0.00	0.00	0.00
	r ² =	0.06	0.07	0.10	0.13	0.02

Missing data:

2017: 11 days (9%) missing all species. 27 days (22%) missing only OC/EC

Recommended donor site:

CRMO1 due to reasonable AmmSO₄ and Soil correlations.

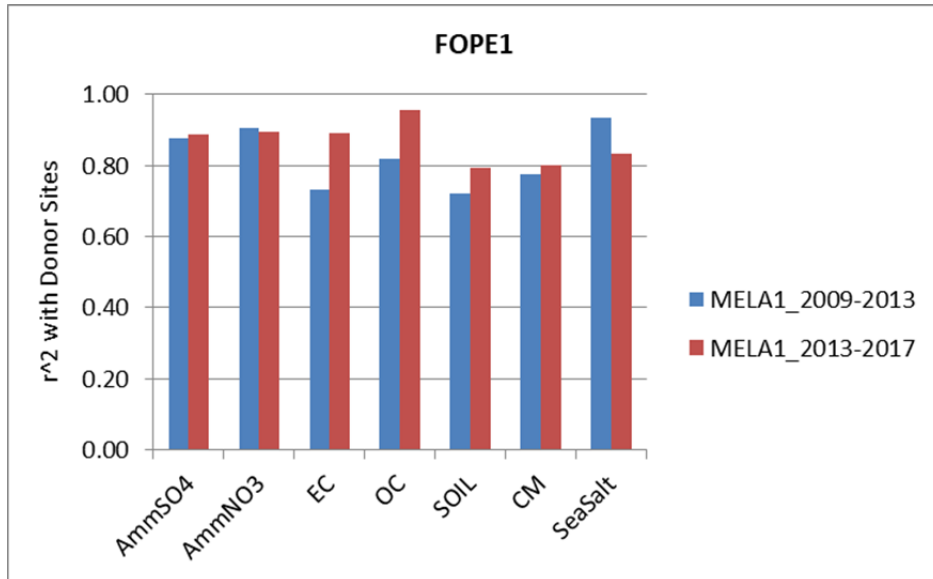
Additional comments:

EC and OC correlations between SAWT1 and CRMO1 are significantly better during 2013 – 2017 than during 2006 – 2010. This is likely due to several specific fire events in the region during the later time period. Correlations of other species between these sites are similar in both periods.

APPENDIX F

MONTANA SITES

Fort Peck, MT



FOPE1vsMELA1 2009-2013	All	Q1	Q2	Q3	Q4
AmmSO4					
Slope=	0.98	1.06	0.90	0.90	1.03
Intercept=	0.03	0.04	0.14	0.11	-0.03
r2=	0.88	0.93	0.77	0.79	0.84
AmmNO3					
Slope=	0.86	0.92	0.74	0.56	0.92
Intercept=	-0.03	-0.12	0.02	0.02	-0.04
r2=	0.91	0.88	0.80	0.63	0.88
EC					
Slope=	0.73	0.72	0.72	0.74	0.73
Intercept=	0.01	0.01	0.02	0.00	0.03
r2=	0.73	0.60	0.67	0.78	0.75
OC					
Slope=	0.91	0.79	0.84	0.97	0.87
Intercept=	0.11	0.12	0.10	0.08	0.15
r2=	0.82	0.67	0.80	0.79	0.70
SOIL					
Slope=	0.74	0.78	0.77	0.67	0.68
Intercept=	0.09	0.02	0.10	0.13	0.05
r2=	0.72	0.76	0.63	0.80	0.60
CM					
Slope=	0.67	0.55	0.64	0.65	0.65
Intercept=	0.37	0.26	0.23	0.36	0.32
r2=	0.78	0.55	0.75	0.69	0.80
SeaSalt					
Slope=	0.51	0.78	0.22	0.15	0.77
Intercept=	0.00	0.00	0.00	0.00	0.00
r2=	0.93	0.97	0.04	0.00	0.99

FOPE1vsMELA1 2013-2017	All	Q1	Q2	Q3	Q4
AmmSO4					
Slope=	0.92	0.93	0.92	0.87	0.93
Intercept=	0.01	-0.10	0.00	0.04	-0.01
r2=	0.89	0.93	0.83	0.80	0.93
AmmNO3					
Slope=	0.86	0.90	0.88	0.58	0.89
Intercept=	-0.03	-0.08	-0.05	0.01	0.03
r2=	0.89	0.90	0.90	0.83	0.83
EC					
Slope=	0.77	0.67	0.75	0.83	0.74
Intercept=	0.01	0.02	0.01	0.02	0.01
r2=	0.89	0.71	0.97	0.86	0.49
OC					
Slope=	0.89	0.57	0.81	0.95	0.93
Intercept=	0.06	0.16	0.08	0.01	0.06
r2=	0.96	0.41	0.99	0.94	0.81
SOIL					
Slope=	0.58	0.75	0.55	0.60	0.50
Intercept=	0.04	0.02	0.10	-0.02	0.07
r2=	0.79	0.60	0.77	0.76	0.62
CM					
Slope=	0.72	0.60	0.68	0.70	0.57
Intercept=	0.41	0.31	0.85	0.69	0.59
r2=	0.80	0.41	0.72	0.75	0.71
SeaSalt					
Slope=	0.50	0.56	0.32	0.26	0.58
Intercept=	0.00	0.01	0.00	0.00	0.00
r2=	0.83	0.91	0.16	0.05	0.56

Missing data:

2011: 18 days (15%) missing all species

2017: 28 days (23%) missing all species

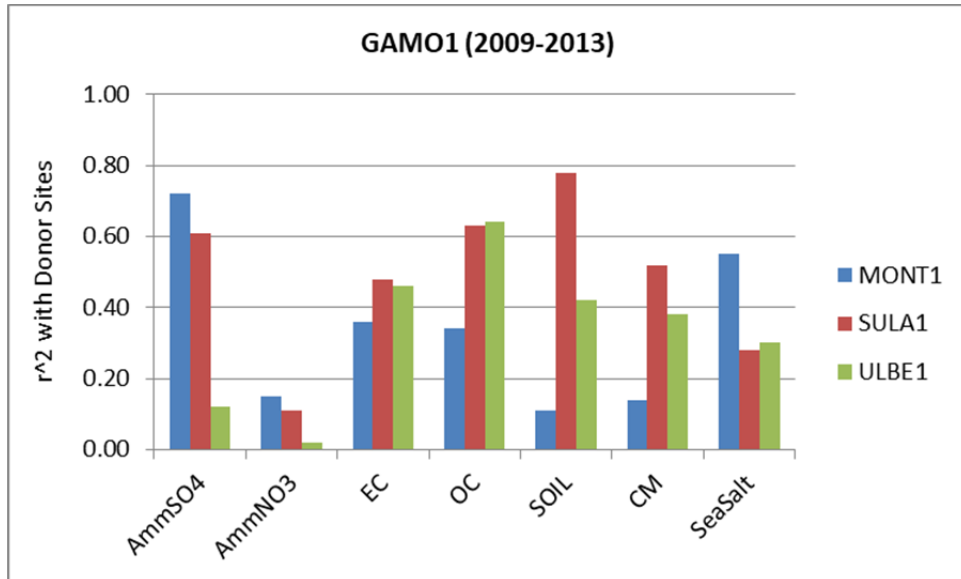
Recommended donor site:

MELA1 due to strong correlations for all species.

Additional comments:

There was only one nearby donor candidate site for FOPE1. Correlations for all species were similar during the periods of 2009 – 2013 and 2013 – 2017.

Gates of the Mountains, MT



GAMO1vsSULA1 2009-2013		All	Q1	Q2	Q3	Q4
AmmSO4	Slope=	0.87	0.87	0.89	0.60	0.84
	Intercept=	0.05	0.05	0.04	0.19	0.02
	r2=	0.61	0.51	0.60	0.28	0.70
AmmNO3	Slope=	0.66	0.80	1.02	0.31	0.51
	Intercept=	0.04	0.06	0.02	0.05	0.04
	r2=	0.11	0.25	0.39	0.22	0.07
EC	Slope=	0.52	0.36	0.55	0.34	0.51
	Intercept=	0.01	0.01	0.01	0.05	0.01
	r2=	0.48	0.28	0.33	0.46	0.29
OC	Slope=	0.58	0.44	0.65	0.34	0.51
	Intercept=	0.05	0.05	-0.01	0.59	0.06
	r2=	0.63	0.22	0.56	0.62	0.28
SOIL	Slope=	0.98	0.93	0.97	0.85	0.89
	Intercept=	0.01	0.02	0.03	0.16	0.01
	r2=	0.78	0.61	0.67	0.91	0.36
CM	Slope=	0.61	0.31	0.59	0.57	0.44
	Intercept=	0.12	0.33	0.22	1.10	0.23
	r2=	0.52	0.09	0.34	0.60	0.07
SeaSalt	Slope=	0.20	0.30	0.73	0.09	0.03
	Intercept=	0.00	0.00	0.00	0.00	0.00
	r2=	0.28	0.35	0.26	0.03	0.21

Missing data:

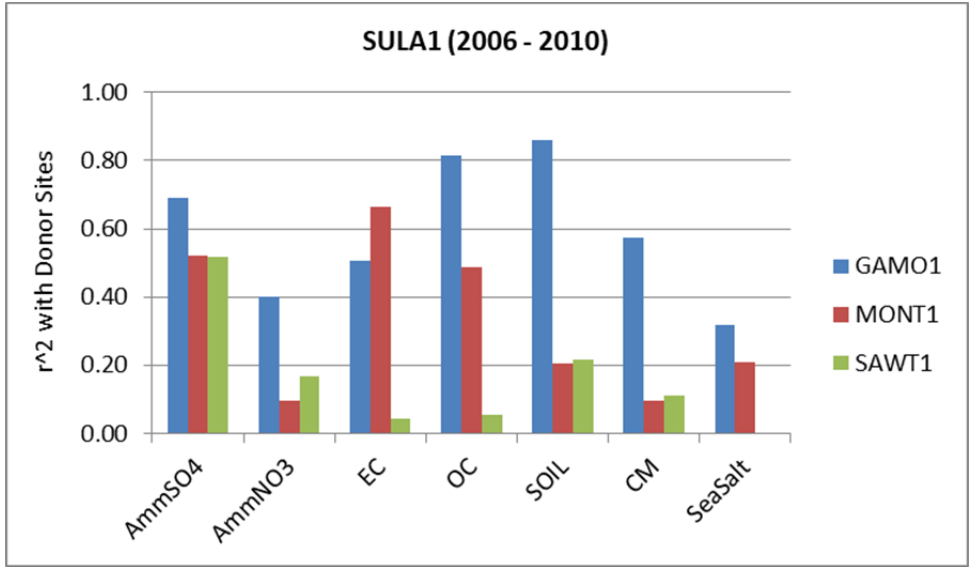
2011: 30 days (25%) missing all species

Recommended donor site:

SULA1 due to generally better correlations than other candidate sites.

Additional comments:

Sula Peak, MT



SULA1vsGAMO1 2006-2010		All	Q1	Q2	Q3	Q4
AmmSO4	Slope=	0.89	0.81	0.92	0.66	0.87
	Intercept=	0.03	0.00	0.11	0.20	0.03
	r2=	0.69	0.71	0.72	0.38	0.67
AmmNO3	Slope=	0.53	0.43	0.62	0.71	0.48
	Intercept=	0.02	0.02	0.00	0.01	0.01
	r2=	0.40	0.23	0.28	0.60	0.28
EC	Slope=	0.94	0.64	0.66	1.01	0.81
	Intercept=	0.02	0.01	0.03	0.04	0.02
	r2=	0.51	0.20	0.43	0.49	0.54
OC	Slope=	1.08	0.72	0.82	1.17	0.82
	Intercept=	0.10	0.07	0.29	0.40	0.10
	r2=	0.82	0.29	0.51	0.79	0.63
SOIL	Slope=	0.91	0.85	0.94	0.84	0.76
	Intercept=	0.01	0.01	0.08	0.09	0.00
	r2=	0.86	0.74	0.83	0.90	0.74
CM	Slope=	0.92	0.66	1.01	0.91	0.32
	Intercept=	0.42	0.29	0.37	0.71	0.51
	r2=	0.57	0.33	0.37	0.61	0.03
SeaSalt	Slope=	0.60	0.55	0.83	0.68	0.33
	Intercept=	0.00	0.00	0.00	0.00	0.00
	r2=	0.32	0.15	0.21	0.09	0.52

Missing data:

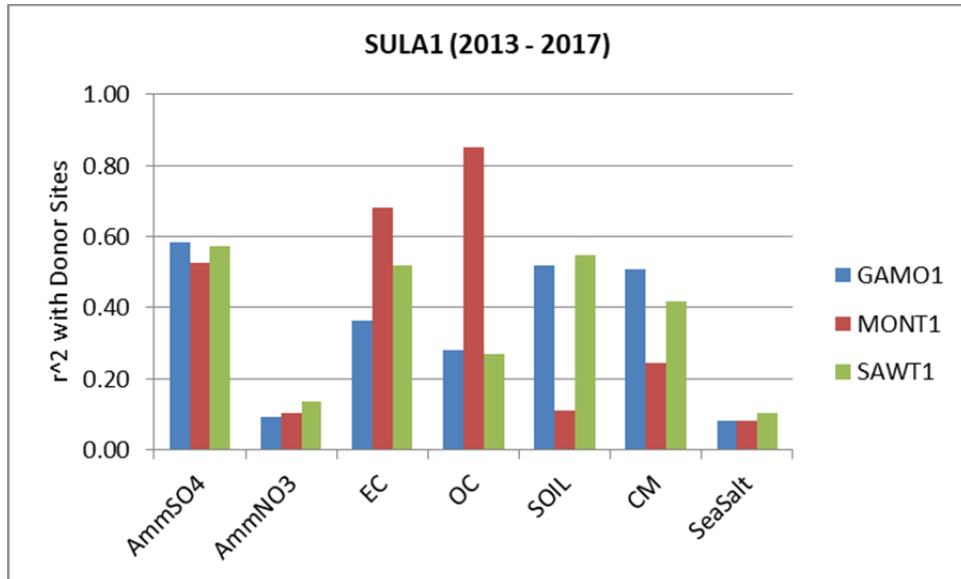
2008: 49 days (41%) missing all species

Recommended donor site:

GAMO1 due to strong AmmSO₄, OC, Soil and CM correlations.

Additional comments:

Sula Peak, MT



SULA1vsMONT1 2013-2017		All	Q1	Q2	Q3	Q4
AmmSO ₄	Slope=	0.79	0.52	0.87	0.81	0.71
	Intercept=	0.03	0.05	0.00	0.08	0.04
	r ² =	0.52	0.28	0.77	0.57	0.34
AmmNO ₃	Slope=	0.60	0.50	0.88	1.03	0.27
	Intercept=	0.03	0.02	0.02	0.02	0.03
	r ² =	0.10	0.02	0.44	0.43	0.10
EC	Slope=	0.33	0.09	0.54	0.84	0.12
	Intercept=	0.02	0.01	0.02	0.02	0.03
	r ² =	0.68	0.01	0.20	0.75	0.04
OC	Slope=	0.54	0.10	0.83	0.77	0.16
	Intercept=	0.05	0.08	0.02	0.26	0.17
	r ² =	0.85	0.00	0.54	0.89	0.05
SOIL	Slope=	0.70	1.03	0.99	0.16	0.87
	Intercept=	0.05	0.00	0.06	0.21	0.01
	r ² =	0.11	0.66	0.77	0.11	0.54
CM	Slope=	0.62	0.51	1.03	0.23	0.37
	Intercept=	0.39	0.36	0.26	2.43	0.43
	r ² =	0.24	0.01	0.43	0.12	0.15
SeaSalt	Slope=	0.36	0.20	0.63	0.75	0.21
	Intercept=	0.00	0.00	0.00	0.00	0.00
	r ² =	0.08	0.03	0.42	0.03	0.33

Missing data:

2015: 28 days (23%) missing all species

2017: 30 days (25%) missing all species

Recommended donor site:

MONT1 due to reasonable AmmSO₄ and strong EC and OC correlations.

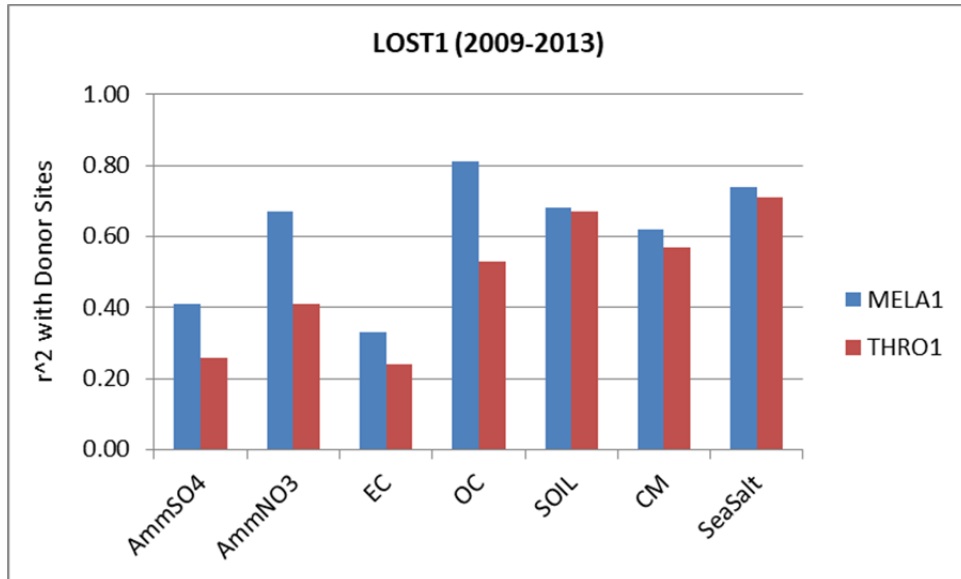
Additional comments:

Note that the recommended donor site for SULA1 in 2008 was GAMO1. That site could also be used as a donor site in 2015 and 2017, but common fire events with MONT1 would be missed.

APPENDIX G

NORTH DAKOTA SITES

Lostwood, ND



LOST1vsMELA1 2009-2013		All	Q1	Q2	Q3	Q4
AmmSO4	Slope=	0.88	0.86	0.80	0.88	0.91
	Intercept=	0.24	0.53	0.28	0.26	0.24
	r2=	0.41	0.39	0.44	0.29	0.50
AmmNO3	Slope=	1.08	1.00	1.09	0.68	1.02
	Intercept=	0.09	0.31	0.08	0.10	0.22
	r2=	0.67	0.59	0.48	0.13	0.63
EC	Slope=	0.87	0.72	0.88	0.73	1.12
	Intercept=	0.08	0.08	0.06	0.11	0.07
	r2=	0.33	0.28	0.40	0.24	0.38
OC	Slope=	0.89	0.68	0.94	0.91	0.92
	Intercept=	0.14	0.17	0.13	0.16	0.09
	r2=	0.81	0.46	0.79	0.82	0.67
SOIL	Slope=	0.88	0.89	0.75	0.86	1.03
	Intercept=	0.06	0.06	0.14	0.20	0.01
	r2=	0.68	0.69	0.58	0.67	0.72
CM	Slope=	1.03	0.78	0.94	1.01	1.10
	Intercept=	0.92	0.92	1.95	1.25	0.48
	r2=	0.62	0.36	0.50	0.62	0.60
SeaSalt	Slope=	0.87	0.96	0.67	0.45	1.28
	Intercept=	0.01	0.00	0.02	0.01	0.01
	r2=	0.74	0.89	0.04	0.01	0.81

Missing data:

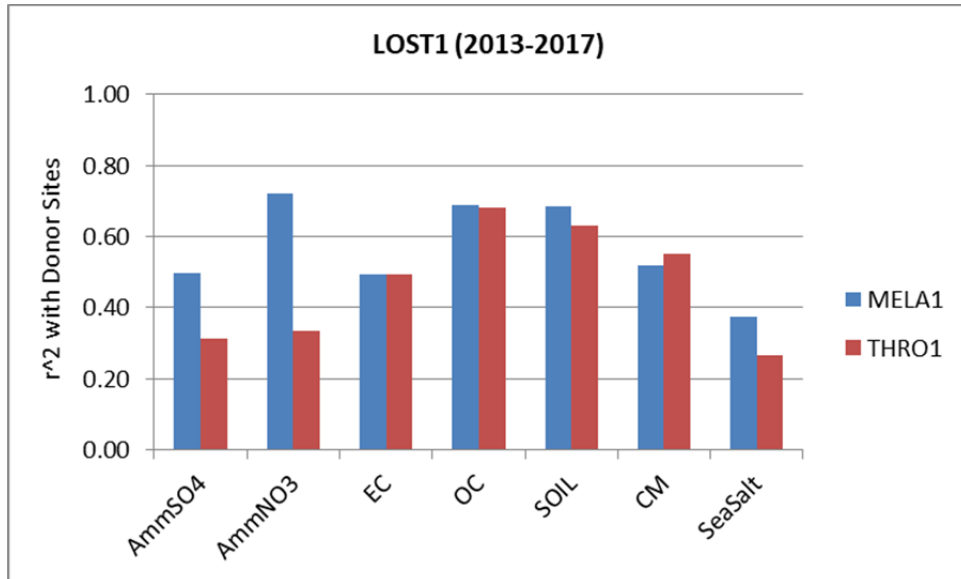
2011: 15 days (13%) missing all species

Recommended donor site:

MELA1 due to better correlations across all species than THRO1.

Additional comments:

Lostwood, ND



LOST1vsMELA1 2013-2017		All	Q1	Q2	Q3	Q4
AmmSO4	Slope=	0.83	0.89	0.67	0.85	0.87
	Intercept=	0.29	0.25	0.43	0.33	0.21
	r2=	0.50	0.64	0.38	0.42	0.54
AmmNO3	Slope=	1.05	0.90	1.05	0.74	0.98
	Intercept=	0.13	0.27	0.10	0.08	0.32
	r2=	0.72	0.64	0.60	0.57	0.71
EC	Slope=	0.76	0.59	0.65	0.76	1.06
	Intercept=	0.08	0.08	0.07	0.09	0.07
	r2=	0.49	0.17	0.61	0.56	0.38
OC	Slope=	0.87	0.58	0.88	0.89	0.94
	Intercept=	0.12	0.16	0.10	0.09	0.12
	r2=	0.69	0.21	0.75	0.69	0.52
SOIL	Slope=	0.64	0.55	0.66	0.60	0.81
	Intercept=	0.04	0.08	0.02	0.03	0.02
	r2=	0.68	0.27	0.67	0.62	0.67
CM	Slope=	0.85	0.53	0.90	0.76	0.99
	Intercept=	0.50	0.90	0.29	1.06	0.75
	r2=	0.52	0.19	0.58	0.31	0.60
SeaSalt	Slope=	0.66	1.04	0.27	0.34	0.88
	Intercept=	0.01	0.01	0.01	0.00	0.02
	r2=	0.37	0.38	0.01	0.08	0.34

Missing data:

2013: 30 days (25%) missing all species

Recommended donor site:

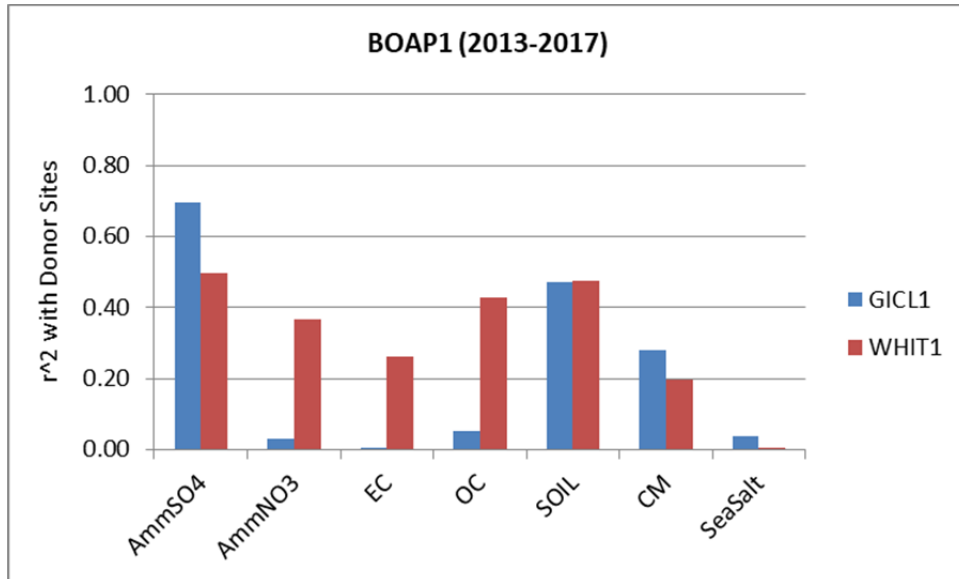
MELA1 due to better correlations across all species than THRO1.

Additional comments:

APPENDIX H

NEW MEXICO SITES

Bosque del Apache, NM



BOAP1vsGICL1 2013-2017		All	Q1	Q2	Q3	Q4
AmmSO4	Slope=	0.90	0.85	0.91	0.89	0.78
	Intercept=	0.08	0.09	0.08	0.23	0.15
	r2=	0.70	0.67	0.60	0.59	0.67
AmmNO3	Slope=	0.50	0.15	0.72	0.72	0.44
	Intercept=	0.09	0.20	0.05	0.02	0.11
	r2=	0.03	0.03	0.32	0.28	0.31
EC	Slope=	0.36	0.70	0.15	0.54	0.84
	Intercept=	0.07	0.09	0.06	0.04	0.10
	r2=	0.00	0.04	0.00	0.06	0.07
OC	Slope=	0.39	0.38	0.34	0.58	0.76
	Intercept=	0.34	0.34	0.30	0.17	0.32
	r2=	0.05	0.01	0.06	0.31	0.09
SOIL	Slope=	0.99	1.09	1.05	1.05	0.83
	Intercept=	0.24	0.23	0.06	0.29	0.12
	r2=	0.47	0.53	0.41	0.11	0.31
CM	Slope=	1.09	1.07	1.21	1.09	0.84
	Intercept=	1.73	2.23	2.45	1.72	2.09
	r2=	0.28	0.33	0.35	0.04	0.22
SeaSalt	Slope=	0.43	0.11	0.63	0.81	0.21
	Intercept=	0.03	0.03	0.02	0.03	0.03
	r2=	0.04	0.01	0.55	0.05	0.00

BOAP1vsWHIT1 2013-2017		All	Q1	Q2	Q3	Q4
AmmSO4	Slope=	0.67	0.69	0.54	0.62	0.77
	Intercept=	0.16	0.12	0.30	0.26	0.13
	r2=	0.50	0.25	0.40	0.61	0.31
AmmNO3	Slope=	0.48	0.49	0.62	0.33	0.56
	Intercept=	0.07	0.13	0.05	0.05	0.08
	r2=	0.37	0.41	0.33	0.09	0.41
EC	Slope=	0.59	0.86	0.73	0.62	0.74
	Intercept=	0.06	0.07	0.04	0.03	0.10
	r2=	0.26	0.07	0.66	0.32	0.04
OC	Slope=	0.57	0.52	0.90	0.60	0.69
	Intercept=	0.28	0.31	0.04	0.21	0.37
	r2=	0.43	0.01	0.71	0.79	0.10
SOIL	Slope=	0.80	0.80	0.85	0.56	0.79
	Intercept=	0.19	0.20	0.21	0.31	0.09
	r2=	0.47	0.56	0.49	0.09	0.15
CM	Slope=	0.71	0.55	0.71	0.73	0.53
	Intercept=	1.77	2.01	3.82	1.91	1.83
	r2=	0.20	0.39	0.31	0.11	0.06
SeaSalt	Slope=	0.48	0.07	0.58	1.40	0.07
	Intercept=	0.02	0.03	0.02	0.01	0.02
	r2=	0.00	0.00	0.29	0.01	0.00

Missing data:

2014: 25 days (21%) missing all species

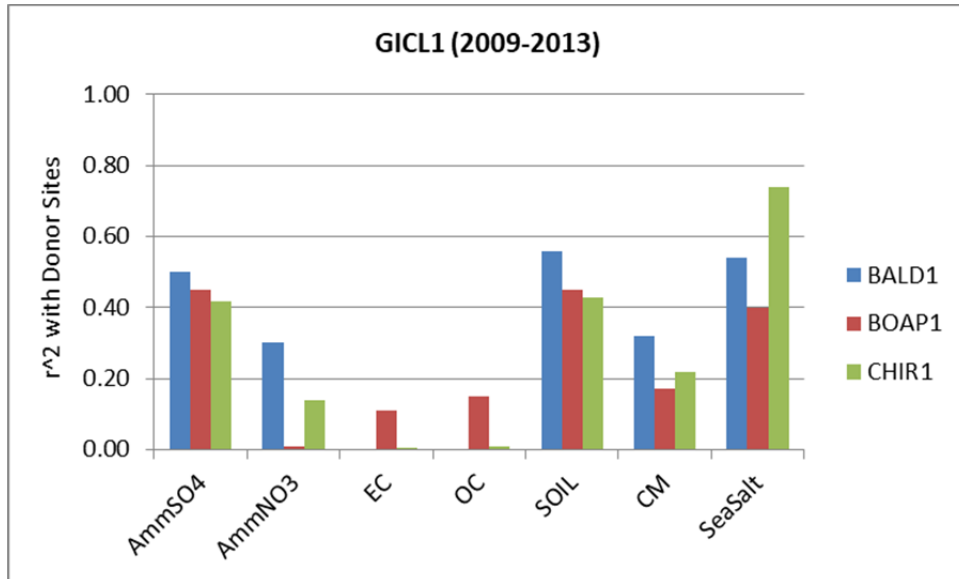
Recommended donor site:

WHIT1 due to higher correlations across most species than GICL1.

Additional comments:

It could be argued that most species correlations are poor for both candidate sites and that GICL1 should be chosen due to its stronger AmmSO₄ correlation.

Gila, NM



GICL1vsBALD1 2009-2013		All	Q1	Q2	Q3	Q4
AmmSO4	Slope=	0.90	0.94	0.84	0.79	0.84
	Intercept=	0.16	0.11	0.32	0.21	0.21
	r2=	0.50	0.73	0.57	0.23	0.71
AmmNO3	Slope=	0.66	0.50	0.67	0.52	0.41
	Intercept=	0.02	0.02	0.05	0.03	0.03
	r2=	0.30	0.54	0.13	0.43	0.33
EC	Slope=	0.45	0.27	0.89	0.52	0.29
	Intercept=	0.03	0.03	0.02	0.03	0.04
	r2=	0.00	0.07	0.00	0.23	0.05
OC	Slope=	0.75	0.21	1.06	0.71	0.28
	Intercept=	0.09	0.19	0.07	0.30	0.22
	r2=	0.00	0.01	0.00	0.20	0.01
SOIL	Slope=	0.93	1.14	0.85	0.61	0.63
	Intercept=	0.08	0.09	0.32	0.09	0.13
	r2=	0.56	0.64	0.52	0.30	0.13
CM	Slope=	0.72	0.64	0.77	0.26	0.69
	Intercept=	0.57	0.24	0.65	1.58	0.70
	r2=	0.32	0.38	0.60	0.00	0.48
SeaSalt	Slope=	0.67	0.61	0.86	0.37	0.33
	Intercept=	0.00	0.00	0.00	0.00	0.00
	r2=	0.54	0.51	0.58	0.07	0.24

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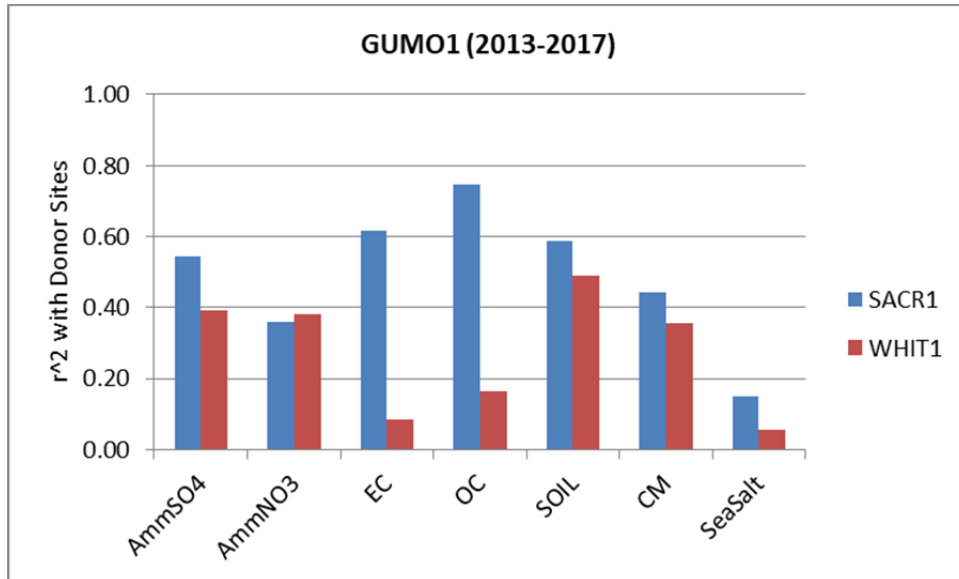
2011: 28 days (23%) missing all species

Recommended donor site:

BALD1 due to somewhat higher AmmSO₄ and Soil correlations than the other candidate sites.

Additional comments:

Guadalupe Mountains, NM/TX



GUMO1vsSACR1 2013-2017		All	Q1	Q2	Q3	Q4
AmmSO4	Slope=	0.72	0.62	0.62	0.66	0.64
	Intercept=	0.15	0.17	0.33	0.53	0.20
	r2=	0.54	0.54	0.49	0.36	0.48
AmmNO3	Slope=	0.17	0.20	0.36	0.15	0.10
	Intercept=	0.13	0.11	0.15	0.13	0.09
	r2=	0.36	0.44	0.21	0.07	0.27
EC	Slope=	0.41	0.35	0.46	0.50	0.37
	Intercept=	0.03	0.04	0.03	0.01	0.04
	r2=	0.62	0.85	0.18	0.38	0.27
OC	Slope=	0.61	0.40	0.62	0.71	0.55
	Intercept=	0.08	0.17	0.13	0.00	0.11
	r2=	0.74	0.95	0.44	0.42	0.54
SOIL	Slope=	1.00	1.23	0.86	0.82	0.96
	Intercept=	0.17	0.21	0.72	-0.06	0.11
	r2=	0.59	0.70	0.49	0.34	0.44
CM	Slope=	0.53	0.60	0.56	0.38	0.48
	Intercept=	1.42	1.32	3.56	1.76	1.24
	r2=	0.44	0.61	0.31	0.03	0.33
SeaSalt	Slope=	0.19	0.07	0.48	0.12	0.05
	Intercept=	0.01	0.01	0.01	0.00	0.01
	r2=	0.15	0.13	0.24	0.06	0.08

Missing data:

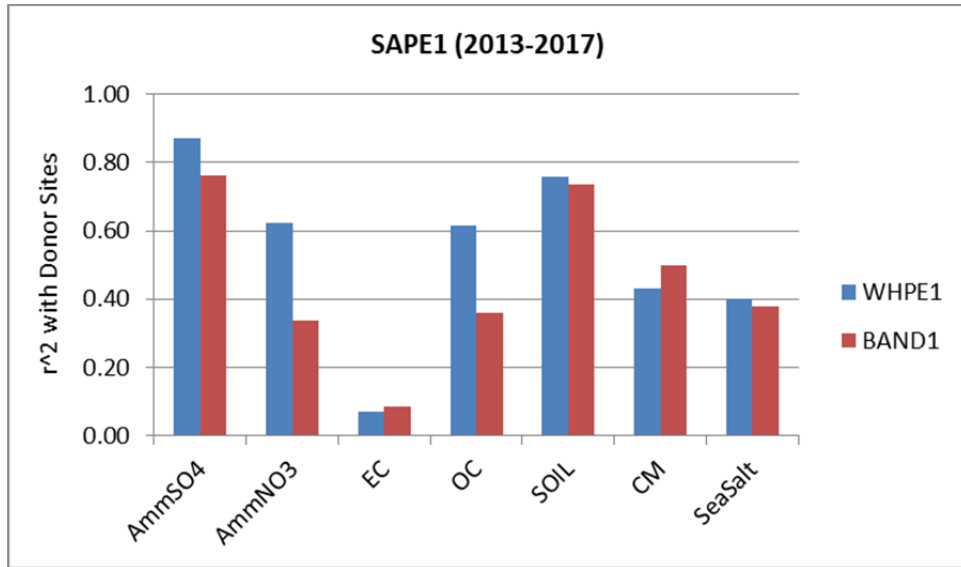
2017: 7 days (6%) missing all species. 33 days (27%) missing Coarse Mass

Recommended donor site:

SACR1 due to generally better correlations across all species.

Additional comments:

San Pedro, NM



SAPE1vsWHPE1 2013-2017	All	Q1	Q2	Q3	Q4	
AmmSO ₄	Slope=	1.02	0.93	0.98	1.07	1.02
	Intercept=	0.04	0.04	0.02	0.04	0.04
	r ² =	0.87	0.78	0.79	0.84	0.91
AmmNO ₃	Slope=	0.86	0.83	0.90	0.77	0.85
	Intercept=	0.02	0.04	0.03	0.02	0.02
	r ² =	0.62	0.61	0.61	0.47	0.65
EC	Slope=	0.56	0.38	0.66	0.50	0.40
	Intercept=	0.01	0.01	0.02	0.03	0.02
	r ² =	0.07	0.02	0.28	0.02	0.22
OC	Slope=	0.83	0.39	0.88	0.80	0.69
	Intercept=	0.05	0.09	0.05	0.11	0.08
	r ² =	0.62	0.16	0.70	0.48	0.31
SOIL	Slope=	0.93	1.01	0.96	0.78	0.59
	Intercept=	0.02	-0.01	0.06	0.08	0.06
	r ² =	0.76	0.93	0.70	0.34	0.37
CM	Slope=	0.88	0.69	0.94	0.75	0.76
	Intercept=	0.29	0.05	0.15	0.65	0.29
	r ² =	0.43	0.68	0.49	0.14	0.36
SeaSalt	Slope=	0.68	0.60	1.25	0.70	0.11
	Intercept=	0.00	0.00	0.00	0.00	0.00
	r ² =	0.40	0.16	0.47	0.14	0.04

Missing data:

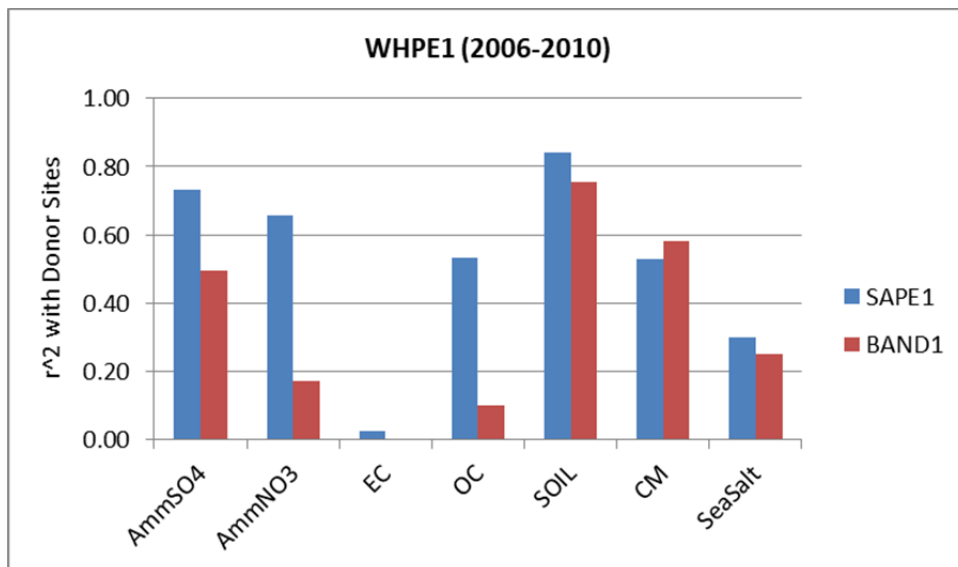
2013: 20 days (17%) missing all species

Recommended donor site:

WHPE1 due to strong AmmSO₄ and Soil correlations and generally higher correlations across other species than BAND1.

Additional comments:

Wheeler Peak, NM



WHPE1vsSAPE1 2006-2010		All	Q1	Q2	Q3	Q4
AmmSO4	Slope=	0.83	0.90	0.76	0.65	0.72
	Intercept=	0.06	0.01	0.21	0.23	0.07
	r2=	0.73	0.78	0.75	0.58	0.69
AmmNO3	Slope=	0.85	0.90	0.81	0.64	0.65
	Intercept=	0.01	-0.02	0.03	0.04	0.02
	r2=	0.66	0.73	0.72	0.32	0.48
EC	Slope=	0.56	0.73	0.48	0.47	0.51
	Intercept=	0.03	0.02	0.03	0.04	0.01
	r2=	0.02	0.00	0.14	0.33	0.37
OC	Slope=	0.77	0.66	0.70	0.73	0.61
	Intercept=	0.06	0.07	0.13	0.12	0.08
	r2=	0.53	0.43	0.29	0.50	0.59
SOIL	Slope=	0.80	0.89	0.76	0.61	0.71
	Intercept=	0.02	0.05	0.07	0.09	0.02
	r2=	0.84	0.78	0.82	0.54	0.58
CM	Slope=	0.74	0.71	0.72	0.52	0.66
	Intercept=	0.27	0.27	0.82	0.65	0.30
	r2=	0.53	0.37	0.77	0.11	0.46
SeaSalt	Slope=	0.56	0.24	0.64	0.03	0.45
	Intercept=	0.00	0.00	0.00	0.00	0.00
	r2=	0.30	0.47	0.55	0.17	0.07

Missing data:

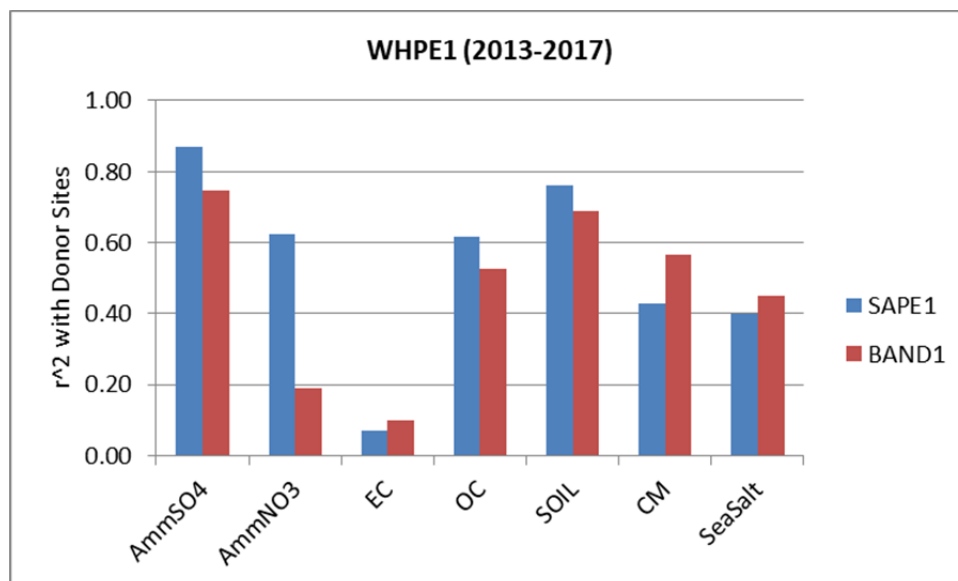
2008: 21 days (18%) missing all species

Recommended donor site:

SAPE1 due to strong AmmSO₄ and Soil correlations, and generally higher correlations across other species than BAND1.

Additional comments:

Wheeler Peak, NM



WHPE1vsSAPE1 2013-2017		All	Q1	Q2	Q3	Q4
AmmSO4	Slope=	0.86	0.87	0.86	0.71	0.82
	Intercept=	0.02	0.01	0.08	0.12	0.01
	r2=	0.87	0.78	0.79	0.84	0.91
AmmNO3	Slope=	0.80	0.82	0.81	0.70	0.64
	Intercept=	0.01	-0.01	0.02	0.03	0.02
	r2=	0.62	0.61	0.61	0.47	0.65
EC	Slope=	0.60	0.57	0.69	0.48	0.33
	Intercept=	0.02	0.01	0.01	0.03	0.02
	r2=	0.07	0.02	0.28	0.02	0.22
OC	Slope=	0.82	0.42	0.85	0.66	0.59
	Intercept=	0.05	0.06	0.04	0.18	0.08
	r2=	0.62	0.16	0.70	0.48	0.31
SOIL	Slope=	0.82	0.86	0.68	0.71	0.81
	Intercept=	0.07	0.03	0.31	0.08	0.07
	r2=	0.76	0.93	0.70	0.34	0.37
CM	Slope=	0.68	0.73	0.70	0.63	0.54
	Intercept=	0.37	0.50	0.88	0.35	0.47
	r2=	0.43	0.68	0.49	0.14	0.36
SeaSalt	Slope=	0.40	0.39	0.52	0.30	0.24
	Intercept=	0.00	0.00	0.00	0.00	0.00
	r2=	0.40	0.16	0.47	0.14	0.04

Missing data:

2015: 20 days (17%) missing all species

2016: 9 days (8%) missing all species. 42 days (34%) missing EC

Recommended donor site:

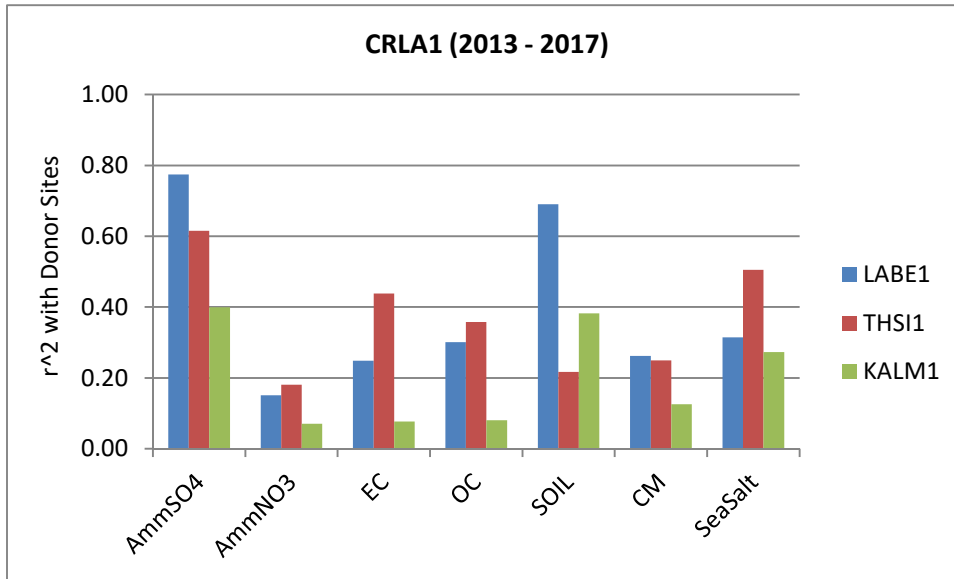
SAPE1 due to strong AmmSO₄ and Soil correlations, and generally higher correlations across other species than BAND1.

Additional comments:

APPENDIX I

OREGON SITES

Crater Lake, OR



CRLA1vsLABE1 2013-2017		All	Q1	Q2	Q3	Q4
AmmSO4	Slope=	0.82	0.74	0.85	0.74	0.67
	Intercept=	0.00	0.01	-0.05	0.09	0.01
	r2=	0.77	0.77	0.78	0.56	0.72
AmmNO3	Slope=	0.59	0.31	0.76	0.76	0.14
	Intercept=	0.00	0.01	0.00	0.00	0.02
	r2=	0.15	0.57	0.55	0.13	0.12
EC	Slope=	0.59	0.15	0.66	0.94	0.19
	Intercept=	0.02	0.02	0.02	0.03	0.04
	r2=	0.25	0.01	0.26	0.22	0.00
OC	Slope=	0.71	0.22	0.75	0.99	0.28
	Intercept=	-0.03	0.08	-0.04	-0.09	0.15
	r2=	0.30	0.26	0.60	0.22	0.10
SOIL	Slope=	0.65	0.94	0.80	0.67	0.47
	Intercept=	0.01	0.01	-0.02	0.02	0.05
	r2=	0.69	0.87	0.75	0.42	0.43
CM	Slope=	0.44	0.58	0.35	0.44	0.26
	Intercept=	0.29	0.12	0.45	0.36	0.23
	r2=	0.26	0.39	0.16	0.07	0.36
SeaSalt	Slope=	0.58	0.58	0.70	0.38	0.46
	Intercept=	0.00	0.00	0.01	0.00	0.00
	r2=	0.31	0.39	0.39	0.39	0.27

CRLA1vsTHS11 2013-2017		All	Q1	Q2	Q3	Q4
AmmSO4	Slope=	0.67	0.82	0.69	0.45	0.66
	Intercept=	0.05	0.03	0.04	0.17	0.05
	r2=	0.61	0.69	0.64	0.34	0.42
AmmNO3	Slope=	0.54	0.58	0.52	0.45	0.25
	Intercept=	0.02	0.02	0.03	0.04	0.03
	r2=	0.18	0.11	0.36	0.18	0.02
EC	Slope=	0.54	0.33	0.46	0.81	0.26
	Intercept=	0.02	0.02	0.02	0.04	0.04
	r2=	0.44	0.02	0.21	0.46	0.01
OC	Slope=	0.65	0.44	0.60	0.88	0.34
	Intercept=	0.03	0.08	0.02	0.18	0.16
	r2=	0.36	0.11	0.54	0.31	0.14
SOIL	Slope=	0.68	1.58	0.87	0.21	1.23
	Intercept=	0.11	0.04	0.14	0.23	0.05
	r2=	0.22	0.60	0.26	0.25	0.40
CM	Slope=	0.26	0.80	0.27	0.09	0.22
	Intercept=	0.62	0.14	0.79	1.51	0.26
	r2=	0.25	0.27	0.16	0.12	0.39
SeaSalt	Slope=	0.40	0.49	0.41	0.40	0.17
	Intercept=	0.00	0.00	0.01	0.00	0.01
	r2=	0.51	0.66	0.42	0.44	0.18

Missing data:

2013: 13 days (11%) missing all species

Recommended donor site:

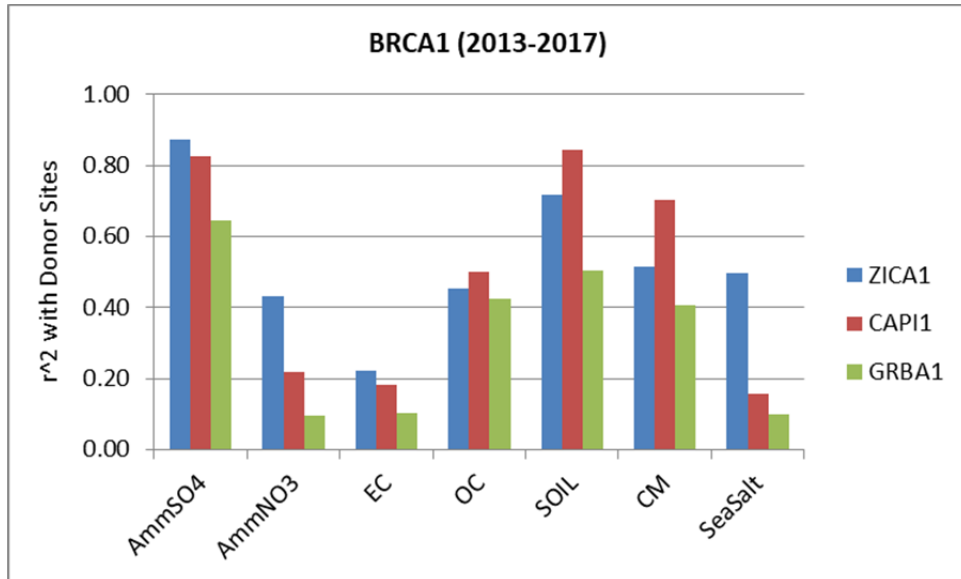
LABE1 due to strong AmmSO₄ and Soil correlations.

Additional comments:

APPENDIX J

UTAH SITES

Bryce Canyon, UT



BRCA1vsZICA1 2013-2017		All	Q1	Q2	Q3	Q4
AmmSO4	Slope=	0.86	0.81	0.86	0.80	0.88
	Intercept=	-0.02	0.01	0.01	0.04	0.00
	r2=	0.87	0.78	0.86	0.84	0.79
AmmNO3	Slope=	0.82	1.08	0.87	0.75	0.61
	Intercept=	0.02	0.01	0.02	0.01	0.03
	r2=	0.43	0.51	0.73	0.61	0.37
EC	Slope=	0.48	0.19	0.66	0.68	0.22
	Intercept=	0.01	0.01	0.02	0.02	0.02
	r2=	0.22	0.13	0.33	0.30	0.07
OC	Slope=	0.90	0.25	0.93	0.96	0.32
	Intercept=	-0.03	0.09	0.05	0.03	0.10
	r2=	0.45	0.11	0.34	0.59	0.17
SOIL	Slope=	0.65	0.60	0.75	0.55	0.32
	Intercept=	-0.07	-0.03	-0.03	0.03	0.03
	r2=	0.72	0.77	0.65	0.72	0.38
CM	Slope=	0.49	0.36	0.55	0.44	0.27
	Intercept=	-0.15	-0.16	0.38	0.50	0.14
	r2=	0.52	0.67	0.52	0.40	0.37
SeaSalt	Slope=	0.48	0.08	0.63	0.49	0.36
	Intercept=	0.00	0.00	0.00	0.00	0.00
	r2=	0.50	0.11	0.74	0.42	0.52

Missing data:

2016: 12 days (10%) missing all species

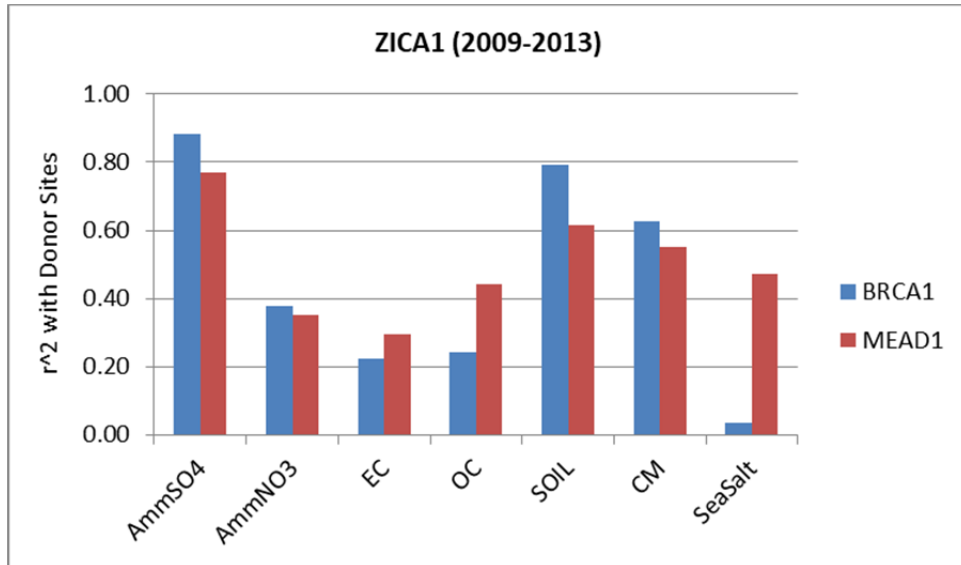
Recommended donor site:

CAPI1 due to strong AmmSO₄, Soil and CM correlations.

Additional comments:

ZICA1 would be a reasonable alternate choice because it has higher correlations for AmmSO₄ and AmmNO₃.

Zion Canyon, UT



ZICA1vsBRCA1 2009-2013	All	Q1	Q2	Q3	Q4	
AmmSO4	Slope=	1.05	0.92	1.09	1.01	0.96
	Intercept=	0.06	0.09	0.02	0.17	0.09
	r2=	0.88	0.93	0.90	0.78	0.78
AmmNO3	Slope=	0.60	0.37	0.85	0.73	0.43
	Intercept=	0.06	0.08	0.02	0.05	0.05
	r2=	0.38	0.37	0.69	0.38	0.29
EC	Slope=	0.40	0.64	0.53	0.23	0.43
	Intercept=	0.05	0.04	0.04	0.07	0.07
	r2=	0.22	0.23	0.12	0.31	0.09
OC	Slope=	0.52	0.47	0.65	0.44	0.38
	Intercept=	0.22	0.20	0.11	0.30	0.32
	r2=	0.24	0.19	0.27	0.21	0.21
SOIL	Slope=	1.15	0.99	1.08	1.22	1.38
	Intercept=	0.16	0.09	0.26	0.15	0.13
	r2=	0.79	0.93	0.81	0.49	0.62
CM	Slope=	1.25	1.16	1.16	0.91	1.77
	Intercept=	1.43	1.19	1.20	2.44	1.15
	r2=	0.63	0.81	0.65	0.34	0.55
SeaSalt	Slope=	0.84	0.15	1.00	1.06	0.78
	Intercept=	0.01	0.00	0.00	0.01	0.00
	r2=	0.04	0.00	0.80	0.30	0.26

Missing data:

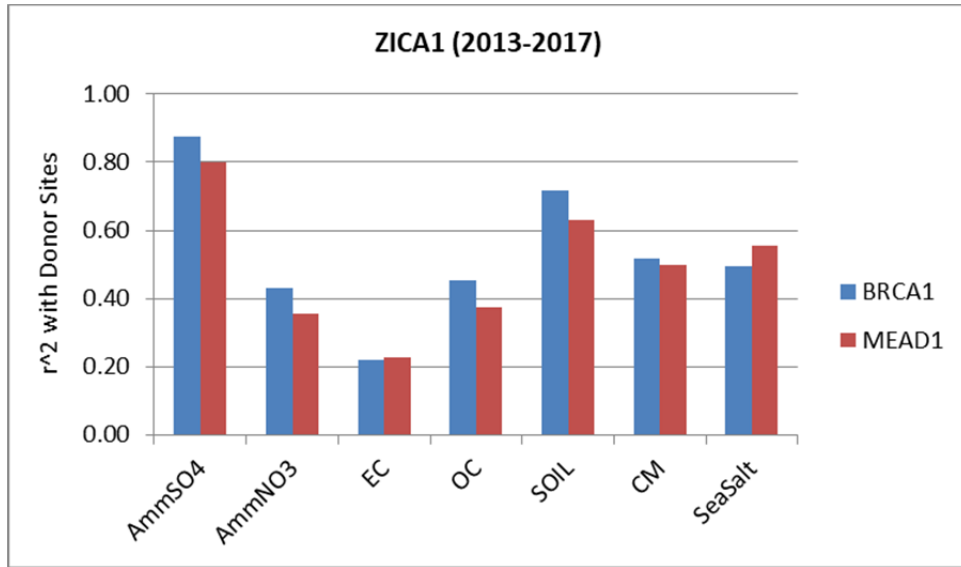
2011: 30 days (25%) missing all species.

Recommended donor site:

BRCA1 due to strong AmmSO₄ and Soil correlations, and generally higher correlations for other species than MEAD1.

Additional comments:

Zion Canyon, UT



ZICA1vsBRCA1 2013-2017		All	Q1	Q2	Q3	Q4
AmmSO4	Slope=	1.05	0.94	1.05	1.06	0.96
	Intercept=	0.08	0.07	0.07	0.09	0.06
	r2=	0.87	0.78	0.86	0.84	0.79
AmmNO3	Slope=	0.68	0.34	0.89	0.92	0.51
	Intercept=	0.03	0.05	0.02	0.02	0.05
	r2=	0.43	0.51	0.73	0.61	0.37
EC	Slope=	0.43	0.56	0.50	0.47	0.40
	Intercept=	0.04	0.04	0.03	0.04	0.06
	r2=	0.22	0.13	0.33	0.30	0.07
OC	Slope=	0.59	0.29	0.64	0.63	0.48
	Intercept=	0.20	0.21	0.13	0.22	0.29
	r2=	0.45	0.11	0.34	0.59	0.17
SOIL	Slope=	1.23	1.35	1.10	1.15	1.64
	Intercept=	0.21	0.10	0.24	0.19	0.16
	r2=	0.72	0.77	0.65	0.72	0.38
CM	Slope=	1.26	1.46	1.16	0.96	1.69
	Intercept=	1.90	1.33	1.69	2.64	1.90
	r2=	0.52	0.67	0.52	0.40	0.37
SeaSalt	Slope=	0.84	0.40	1.03	0.97	0.63
	Intercept=	0.01	0.01	0.01	0.00	0.01
	r2=	0.50	0.11	0.74	0.42	0.52

Missing data:

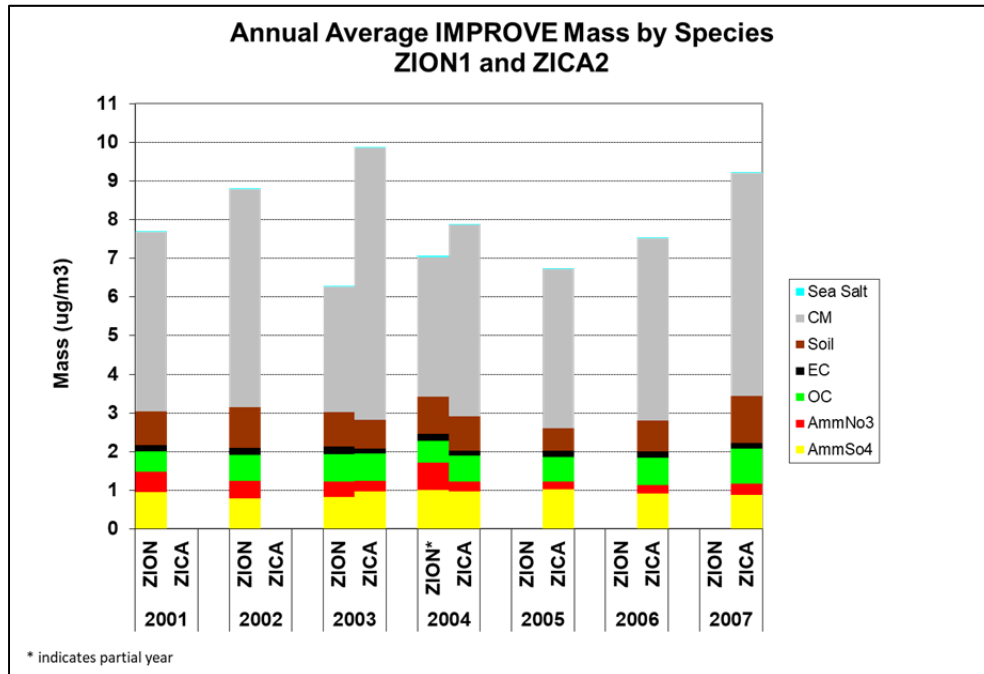
2017: 17 days (14%) missing Coarse Mass

Recommended donor site:

BRCA1 due to strong AmmSO₄ and Soil correlations, and generally higher correlations for other species than MEAD1.

Additional comments:

Zion Canyon, UT ZION1 and ZICA1 Comparisons



ZION1vsZICA1 2003-2004		All	Q1	Q2	Q3	Q4
AmmSO4	Slope=	0.86	1.00	0.81	0.82	0.89
	Intercept=	0.09	-0.02	0.04	0.15	0.05
	r2=	0.89	0.77	0.89	0.90	0.95
AmmNO3	Slope=	1.01	1.51	0.97	0.94	0.20
	Intercept=	0.04	0.13	0.03	0.04	0.13
	r2=	0.50	0.46	0.75	0.95	0.49
EC	Slope=	0.71	0.58	0.88	1.00	0.47
	Intercept=	0.08	0.07	0.08	0.10	0.08
	r2=	0.41	0.41	0.58	0.50	0.36
OC	Slope=	0.82	0.56	0.86	1.00	0.36
	Intercept=	0.02	0.12	0.05	0.06	0.19
	r2=	0.66	0.25	0.75	0.69	0.36
SOIL	Slope=	0.92	0.76	0.88	0.74	1.14
	Intercept=	0.06	0.04	-0.04	0.36	-0.10
	r2=	0.53	0.90	0.40	0.40	0.83
CM	Slope=	0.49	0.46	0.52	0.48	0.51
	Intercept=	0.12	0.49	0.33	-0.48	0.08
	r2=	0.57	0.61	0.59	0.33	0.79
SeaSalt	Slope=	0.53	0.19	0.76	0.00	-0.01
	Intercept=	0.00	0.00	0.00	0.00	0.00
	r2=	0.01	0.00	0.46	0.01	0.03

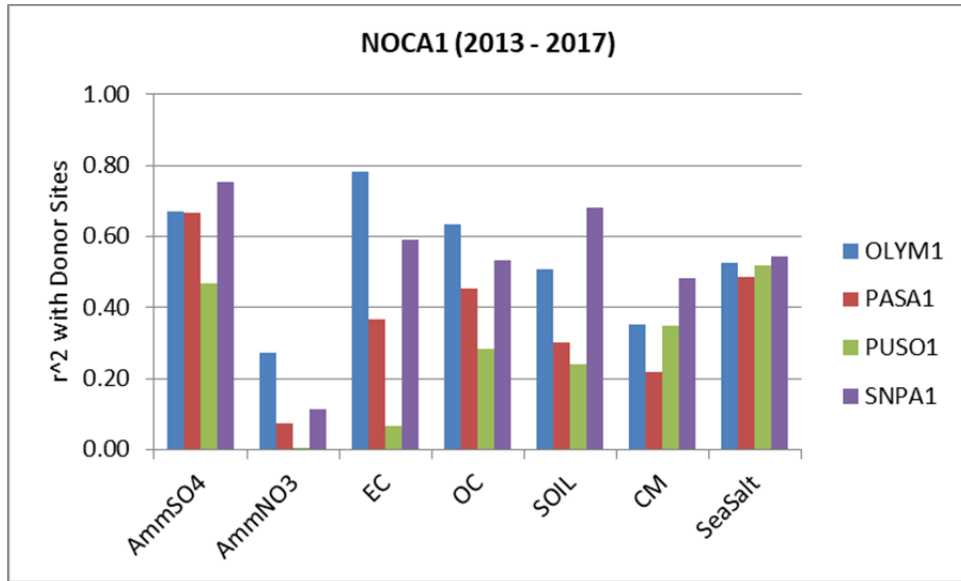
Additional comments:

The ZION1 site ended monitoring in 2004. In 2003 the ZICA1 site was installed and ran concurrently with ZION1 for approximately 18 months. The quarterly and overall data comparisons between these sites are variable and sometimes poor. Therefore it is not recommended that the ZICA1 site be used as a continuation of ZION1 for Regional Haze tracking purposes.

APPENDIX K

WASHINGTON SITES

North Cascades, WA



NOCA1vsOLYM1 2013-2017		All	Q1	Q2	Q3	Q4
AmmSO ₄	Slope=	0.71	0.47	0.73	0.67	0.55
	Intercept=	-0.01	0.04	0.04	0.09	0.04
	r ² =	0.67	0.45	0.50	0.52	0.72
AmmNO ₃	Slope=	0.25	0.11	0.29	0.39	0.10
	Intercept=	0.01	0.02	0.01	0.00	0.02
	r ² =	0.27	0.03	0.25	0.42	0.20
EC	Slope=	0.50	0.12	0.52	0.92	0.36
	Intercept=	0.01	0.00	0.02	0.03	0.01
	r ² =	0.78	0.12	0.26	0.80	0.27
OC	Slope=	0.83	0.25	0.86	1.24	0.49
	Intercept=	-0.01	0.06	0.02	0.06	0.05
	r ² =	0.64	0.24	0.54	0.63	0.47
SOIL	Slope=	0.91	0.54	1.04	1.34	0.45
	Intercept=	0.00	0.01	0.01	0.04	0.01
	r ² =	0.51	0.36	0.68	0.36	0.51
CM	Slope=	0.84	0.20	0.68	0.80	0.61
	Intercept=	-0.17	0.16	0.02	0.84	0.04
	r ² =	0.35	0.12	0.55	0.12	0.41
SeaSalt	Slope=	0.10	0.09	0.13	0.06	0.11
	Intercept=	0.00	0.00	0.00	0.00	0.00
	r ² =	0.52	0.46	0.65	0.14	0.74

NOCA1vsSNPA1 2013-2017		All	Q1	Q2	Q3	Q4
AmmSO ₄	Slope=	0.86	0.75	0.85	0.78	0.72
	Intercept=	0.02	0.02	0.10	0.09	0.03
	r ² =	0.75	0.51	0.68	0.67	0.62
AmmNO ₃	Slope=	0.25	0.04	0.43	0.36	0.00
	Intercept=	0.02	0.03	0.02	0.02	0.03
	r ² =	0.11	0.00	0.59	0.33	0.00
EC	Slope=	0.43	0.16	0.41	0.63	0.21
	Intercept=	0.00	0.00	0.02	-0.01	0.01
	r ² =	0.59	0.18	0.47	0.62	0.13
OC	Slope=	0.69	0.41	0.63	0.77	0.40
	Intercept=	0.06	0.05	0.14	0.10	0.12
	r ² =	0.53	0.32	0.75	0.51	0.23
SOIL	Slope=	0.78	0.65	0.90	0.79	0.41
	Intercept=	0.00	0.00	-0.01	0.00	0.01
	r ² =	0.68	0.76	0.69	0.58	0.51
CM	Slope=	0.74	0.25	0.60	0.54	0.54
	Intercept=	0.26	0.17	0.21	1.32	0.35
	r ² =	0.48	0.20	0.54	0.25	0.39
SeaSalt	Slope=	0.31	0.27	0.49	0.42	0.23
	Intercept=	0.00	-0.01	0.00	0.00	0.00
	r ² =	0.55	0.66	0.46	0.58	0.56

Missing data:

2017: 23 days (19%) missing all species

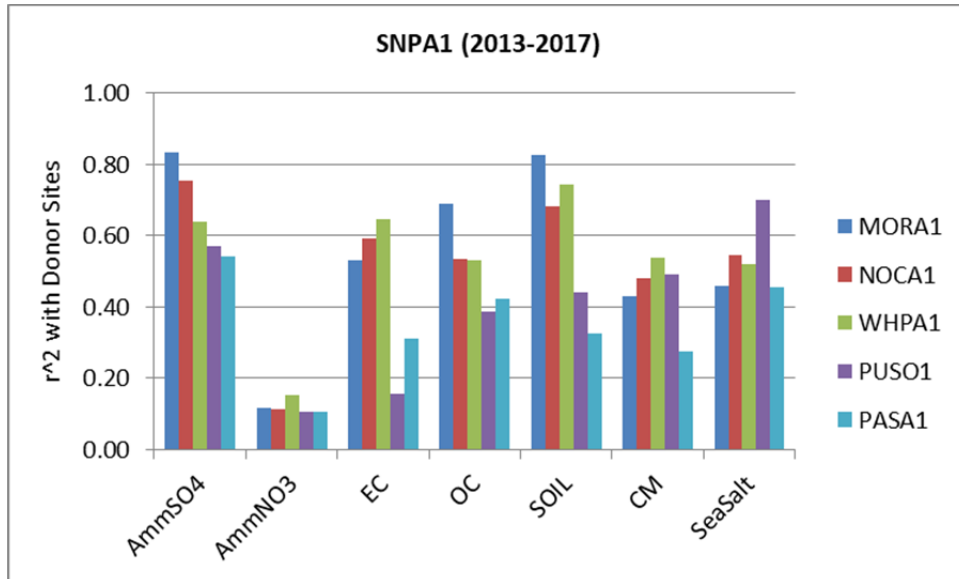
Recommended donor site:

OLYM1 due to reasonable AmmSO₄, EC and OC correlations.

Additional comments:

SNPA1 would be a reasonable alternative choice due to higher AmmSO₄ and Soil correlations. Note that SNPA1 was used as the donor site for NOCA1 during the baseline period (2000 – 2004).

Snoqualmie Pass, WA



SNPA1vsMORA1 2013-2017		All	Q1	Q2	Q3	Q4
AmmSO4	Slope=	0.85	0.73	0.92	0.86	0.82
	Intercept=	0.03	0.05	-0.04	0.01	0.04
	r2=	0.83	0.59	0.85	0.77	0.60
AmmNO3	Slope=	0.90	0.75	1.01	1.11	0.37
	Intercept=	0.09	0.07	0.05	0.06	0.10
	r2=	0.12	0.00	0.73	0.41	0.00
EC	Slope=	0.56	0.31	0.49	0.73	0.44
	Intercept=	0.03	0.03	0.04	0.03	0.04
	r2=	0.53	0.19	0.37	0.61	0.25
OC	Slope=	0.78	0.35	0.74	0.99	0.52
	Intercept=	-0.04	0.08	-0.02	-0.08	0.05
	r2=	0.69	0.33	0.68	0.69	0.37
SOIL	Slope=	0.99	0.85	1.04	0.95	0.91
	Intercept=	0.01	0.00	0.01	0.02	0.01
	r2=	0.82	0.78	0.86	0.75	0.59
CM	Slope=	0.54	0.34	0.80	0.57	0.19
	Intercept=	-0.16	0.15	-0.35	0.01	0.23
	r2=	0.43	0.26	0.64	0.17	0.28
SeaSalt	Slope=	0.60	0.65	0.41	0.60	0.99
	Intercept=	0.01	0.01	0.01	0.01	0.00
	r2=	0.46	0.52	0.42	0.60	0.56

Missing data:

2013: 14 days (12%) missing all species

Recommended donor site:

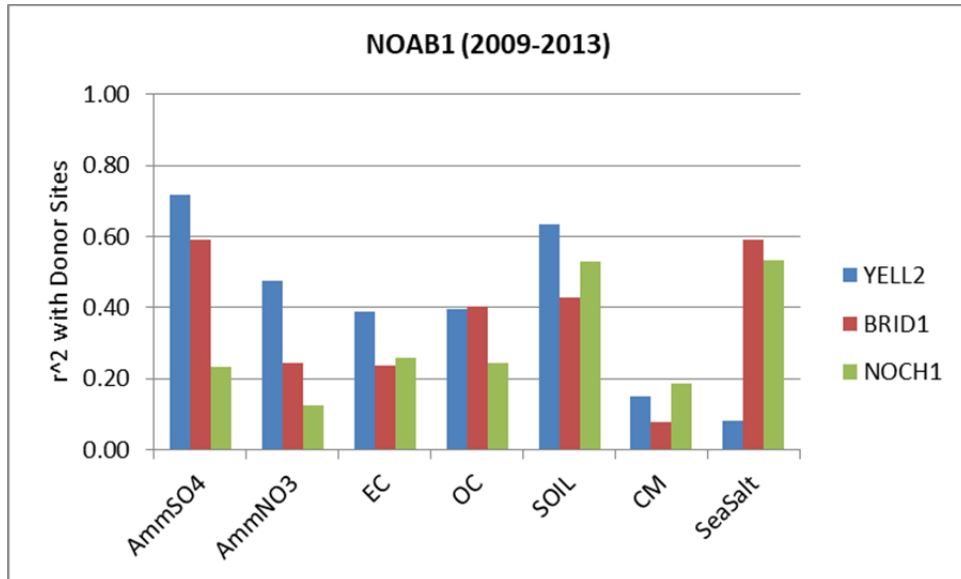
MORA1 due to strong AmmSO₄ and Soil correlations and generally reasonable EC, OC and CM correlations.

Additional comments:

APPENDIX L

WYOMING SITES

North Absaroka, WY



NOAB1vsYELL2 2009-2013		All	Q1	Q2	Q3	Q4
AmmSO4	Slope=	0.97	0.98	1.00	0.87	0.84
	Intercept=	-0.01	0.02	-0.01	0.11	0.02
	r2=	0.72	0.84	0.75	0.46	0.75
AmmNO3	Slope=	0.49	0.48	0.77	0.56	0.39
	Intercept=	0.03	0.02	0.01	0.04	0.01
	r2=	0.48	0.24	0.54	0.17	0.85
EC	Slope=	0.56	0.39	0.49	0.50	0.51
	Intercept=	0.01	0.01	0.01	0.05	0.01
	r2=	0.39	0.19	0.32	0.26	0.56
OC	Slope=	0.82	0.38	0.90	0.58	0.79
	Intercept=	0.02	0.08	0.03	0.45	0.01
	r2=	0.40	0.03	0.61	0.29	0.63
SOIL	Slope=	1.02	1.09	1.01	0.87	0.91
	Intercept=	0.03	0.06	0.00	0.25	0.03
	r2=	0.64	0.78	0.69	0.42	0.68
CM	Slope=	0.69	0.89	0.93	0.42	0.38
	Intercept=	0.81	0.72	0.06	1.82	0.79
	r2=	0.15	0.40	0.79	0.09	0.02
SeaSalt	Slope=	0.24	0.45	0.62	0.28	0.01
	Intercept=	0.00	0.00	0.00	0.00	0.00
	r2=	0.08	0.86	0.32	0.08	0.01

Missing data:

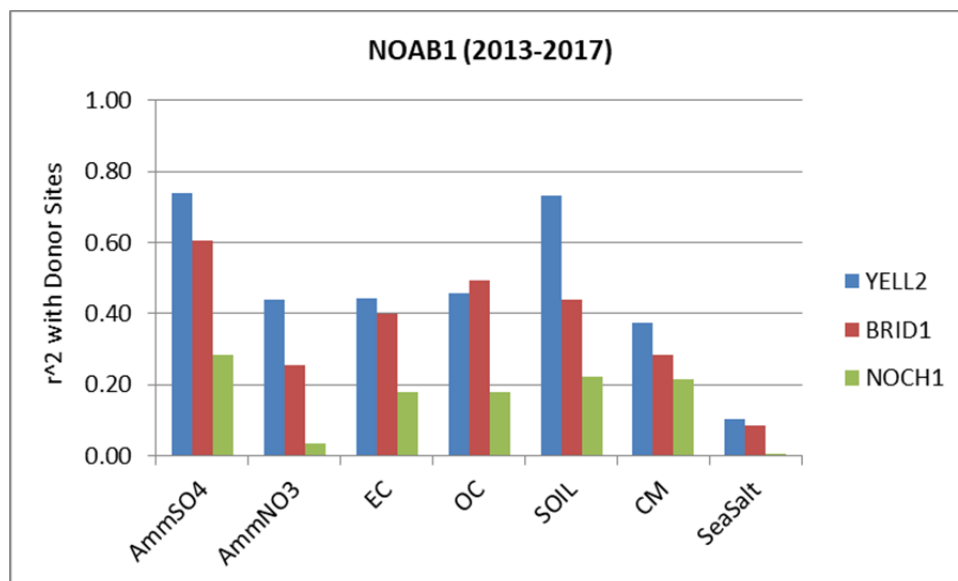
2011: 24 days (20%) missing all species

Recommended donor site:

YELL2 due to reasonable AmmSO₄ and Soil correlations and generally higher correlations with for other species than the other candidates.

Additional comments:

North Absaroka, WY



NOAB1vsYELL2 2013-2017		All	Q1	Q2	Q3	Q4
AmmSO4	Slope=	0.97	0.89	0.95	0.91	0.91
	Intercept=	0.01	0.01	0.01	0.06	0.01
	r2=	0.74	0.56	0.83	0.54	0.80
AmmNO3	Slope=	0.52	0.42	0.66	0.51	0.39
	Intercept=	0.03	0.02	0.04	0.04	0.02
	r2=	0.44	0.31	0.34	0.47	0.85
EC	Slope=	0.61	0.42	0.42	0.60	0.60
	Intercept=	0.00	0.00	0.01	0.02	0.00
	r2=	0.44	0.35	0.40	0.37	0.30
OC	Slope=	0.85	0.40	0.92	0.75	0.70
	Intercept=	-0.03	0.03	0.01	0.18	-0.02
	r2=	0.46	0.16	0.74	0.39	0.49
SOIL	Slope=	1.03	1.25	1.07	1.01	0.96
	Intercept=	0.03	0.05	-0.03	0.06	0.04
	r2=	0.73	0.82	0.83	0.37	0.74
CM	Slope=	0.78	0.90	0.92	0.84	0.45
	Intercept=	0.75	0.66	0.53	0.57	0.87
	r2=	0.37	0.82	0.67	0.09	0.16
SeaSalt	Slope=	0.20	0.10	0.37	0.33	0.07
	Intercept=	0.00	0.00	0.00	0.00	0.00
	r2=	0.10	0.15	0.03	0.07	0.32

Missing data:

2017: 26 days (22%) missing all species

Recommended donor site:

YELL2 due to reasonable AmmSO₄ and Soil correlations and generally higher correlations for other species than the other candidates.

Additional comments: