



Supplement of

Total organic carbon and the contribution from speciated organics in cloud water: airborne data analysis from the CAMP²Ex field campaign

Connor Stahl et al.

Correspondence to: Connor Stahl (cstahl1@email.arizona.edu)

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Table S1: Pearson's correlation matrix (r values) of water-soluble cloud water species for samples collected for the North case ($n = 20$). Blank boxes represent p-values exceeding 0.05 and therefore statistically insignificant. Gly – glycolate, Ace – acetate, For – formate, Pyr – pyruvate, Glu – glutarate, Adi – adipate, Suc – succinate, Mal – maleate, Ox – oxalate, MSA – methanesulfonate, DMA – dimethylamine.

	Gly	Ace	For	Pyr	Glu	Adi	Suc	Mal	Ox	MSA	DMA	TOC	Na	NH ₄	K	Mg	Ca	Cl	NO ₂	Br	NO ₃	SO ₄
Gly	1.00																					
Ace	0.54	1.00																				
For	0.83	0.74	1.00																			
Pyr	0.66	0.82	0.76	1.00																		
Glu	0.69	0.48	0.77	0.53	1.00																	
Adi		-0.56	-0.72	-0.64	-0.48	1.00																
Suc	0.74	0.73	0.91	0.88	0.81	-0.76	1.00															
Mal								1.00														
Ox	0.75	0.70	0.81	0.81	0.87	-0.51	0.91		1.00													
MSA	0.72		0.67	0.52	0.75		0.68		0.83	1.00												
DMA											1.00											
TOC	0.80	0.75	0.91	0.81	0.88	-0.61	0.93		0.96	0.81		1.00										
Na	0.64		0.69	0.47	0.94		0.76		0.84	0.70		0.84	1.00									
NH ₄	0.83	0.61	0.84	0.74	0.77		0.82		0.88	0.92		0.89	0.66	1.00								
K	0.64		0.70	0.47	0.95		0.76		0.84	0.70		0.84	1.00	0.67	1.00							
Mg	0.62		0.68	0.45	0.94		0.75		0.82	0.68		0.83	1.00	0.65	1.00	1.00						
Ca	0.61	0.44	0.66	0.45	0.91		0.73		0.79	0.62		0.82	0.98	0.59	0.98	0.99	1.00					
Cl	0.65	0.45	0.71	0.49	0.94	-0.45	0.77		0.85	0.72		0.86	1.00	0.69	1.00	1.00	0.98	1.00				
NO ₂																			1.00			
Br	0.79	0.60	0.72	0.83	0.58		0.79		0.83	0.81		0.79	0.49	0.92	0.49	0.47		0.52		1.00		
NO ₃	0.66	0.55	0.75	0.58	0.90	-0.53	0.82		0.85	0.65		0.89	0.97	0.65	0.96	0.96	0.98	0.96		0.50	1.00	
SO ₄	0.80	0.56	0.83	0.67	0.93	-0.49	0.88		0.94	0.89		0.94	0.89	0.93	0.89	0.88	0.83	0.90		0.80	0.86	1.00

Table S2: Same as Table S1 except for the East case (n = 11).

	Gly	Ace	For	Pyr	Glu	Adi	Suc	Mal	Ox	MSA	DMA	TOC	Na	NH ₄	K	Mg	Ca	Cl	NO ₂	Br	NO ₃	SO ₄	
Gly	1.00																						
Ace		1.00																					
For			1.00																				
Pyr				1.00																			
Glu	0.65				0.80	1.00																	
Adi							1.00																
Suc					0.80	0.78	0.82				1.00												
Mal								1.00															
Ox	0.65				0.87	0.97			0.84		1.00												
MSA		0.65				0.82	0.91		0.67		0.88	1.00											
DMA										1.00													
TOC	0.64	0.81			0.74	0.81				0.84	0.77		1.00										
Na		0.70				0.83	0.93		0.82		0.98	0.80		0.83	1.00								
NH ₄					0.91	0.93		0.85		0.92	0.95		0.71	0.85	1.00								
K		0.72			0.74	0.80		0.75		0.90	0.62		0.76	0.96	0.69	1.00							
Mg		0.68			0.84	0.95		0.82		0.99	0.84		0.84	1.00	0.87	0.94	1.00						
Ca		0.70			0.78	0.89		0.73		0.96	0.76		0.87	0.98	0.77	0.96	0.98	1.00					
Cl		0.69			0.84	0.94		0.82		0.99	0.83		0.83	1.00	0.87	0.95	1.00	0.98	1.00				
NO ₂																		1.00					
Br		0.80			0.75	0.75				0.73	0.85		0.89	0.67	0.75		0.70	0.68	0.69		1.00		
NO ₃		0.68			0.84	0.94		0.83		0.99	0.84		0.84	1.00	0.87	0.94	1.00	0.98	1.00		0.69	1.00	
SO ₄					0.90	0.98		0.83		0.98	0.95		0.80	0.93	0.98	0.80	0.95	0.88	0.95		0.78	0.95	1.00

Table S3: Same as Table S1 except for the Fire case ($n = 4$).

	Gly	Ace	For	Pyr	Glu	Adi	Suc	Mal	Ox	MSA	DMA	TOC	Na	NH ₄	K	Mg	Ca	Cl	NO ₂	Br	NO ₃	SO ₄	
Gly	1.00																						
Ace		1.00																					
For	-0.96	0.97	1.00																				
Pyr		0.99		1.00																			
Glu			0.99		1.00																		
Adi				0.99		1.00																	
Suc	0.96			0.99			1.00																
Mal					0.98			1.00															
Ox						0.98			1.00														
MSA							0.99			1.00													
DMA								0.99			1.00												
TOC									0.99			1.00											
Na										0.99			1.00										
NH ₄											0.99			1.00									
K												0.99			0.98	1.00							
Mg													1.00				1.00						
Ca														0.99			0.99	1.00					
Cl															0.98	0.97	0.96	1.00					
NO ₂	0.97		0.96														0.96				1.00		
Br																		0.97	1.00				
NO ₃																		0.99	0.98	1.00			
SO ₄																		0.97	1.00				

Table S4: Same as Table S1 except for the Clark case (n = 25).

	Gly	Ace	For	Pyr	Glu	Adi	Suc	Mal	Ox	MSA	DMA	TOC	Na	NH ₄	K	Mg	Ca	Cl	NO ₂	Br	NO ₃	SO ₄	
Gly	1.00																						
Ace	-0.66	1.00																					
For	-0.60	0.92	1.00																				
Pyr	-0.50	0.60	0.55	1.00																			
Glu	-0.44	0.66	0.81	0.68	1.00																		
Adi	0.45					1.00																	
Suc	-0.43	0.64	0.86	0.41	0.90		1.00																
Mal	-0.40						0.54		1.00														
Ox		0.58	0.78	0.48	0.92			0.93		1.00													
MSA						0.45		0.48		0.63	1.00												
DMA								0.67			1.00												
TOC	-0.49	0.83	0.89	0.70	0.87			0.76		0.83	0.40		1.00										
Na								0.51		0.58	0.73	0.70		0.46	1.00								
NH ₄	-0.57	0.71	0.76	0.78	0.78			0.64		0.71			0.89	0.49	1.00								
K						0.49		0.68		0.74	0.81	0.57		0.53	0.85	0.47	1.00						
Mg							0.50	0.56		0.72	0.70		0.46	1.00	0.48	0.84	1.00						
Ca							0.71						0.44			0.46	1.00						
Cl							0.49	0.56		0.71	0.69		0.45	1.00	0.50	0.84	1.00	0.43	1.00				
NO ₂	-0.44	0.66						0.63			0.62								1.00				
Br								0.42		0.47	0.62	0.70		0.93	0.43	0.74	0.92		0.94	1.00			
NO ₃								0.60	0.69	0.50	0.71	0.67		0.84	0.56		0.83	0.75	0.71	0.70	0.74	0.54	0.72
SO ₄								0.61	0.52	0.74	0.73	0.85	0.64		0.71	0.88	0.78	0.77	0.86	0.88	0.85	0.81	1.00

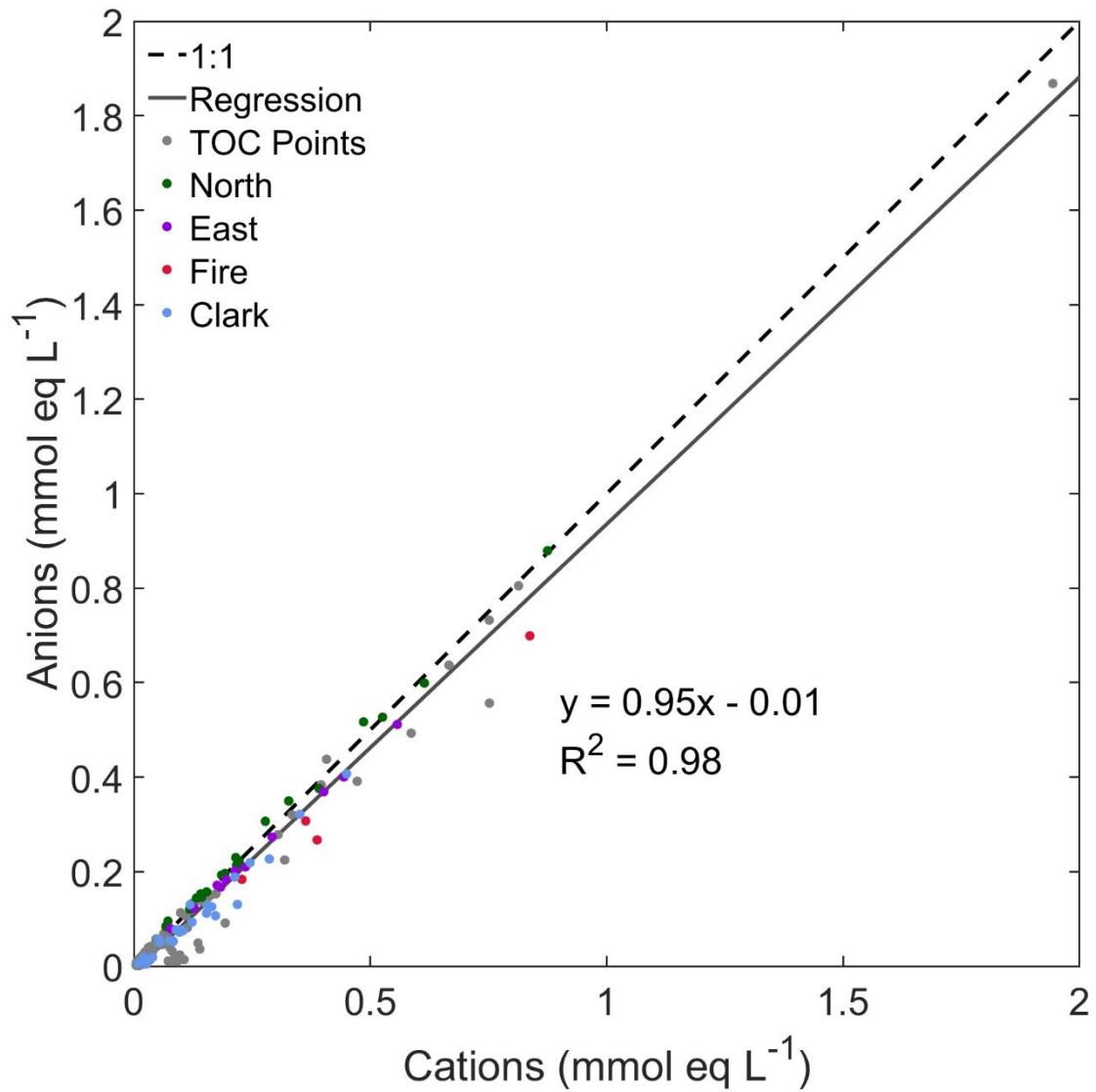


Figure S1: Charge balance summary of the 159 cloud water samples based on ion measurements of H^+ , Na^+ , NH_4^+ , DMA, K^+ , Mg^{2+} , Ca^{2+} , OH^- , glycolate, acetate, formate, MSA, pyruvate, Cl^- , NO_2^- , Br^- , NO_3^- , glutarate, adipate, succinate, maleate, SO_4^{2-} , and oxalate.