Table S1. Mass Selective Detector drift over seasonal focus periods July 29 - August 8 (summer) and November 4 - 14 (fall) 2005, as measured by daily-run tracking standard.

	SUMMER					FALL			
	slope	**intercept**	**r^2**	**start-finish (%)**		**slope**	**intercept**	**r^2**	**start-finish (%)**
Dodecane	4.3E-04	0.84	0.12	+13		-3.1E-04	1.12	0.04	-8
Phthalic acid	3.1E-04	0.98	0.02	+8		-8.7E-04	1.35	0.14	-21
Decanoic acid						-3.4E-04	1.14	0.03	-9
Acenaphthene	2.8E-04	0.90	0.11	+8		-8.1E-04	1.32	0.37	-20
Hexadecane	-5.1E-05	1.03	0.00	-1		-1.0E-03	1.41	0.68	-25
Eicosane	-2.3E-04	1.10	0.31	-6		-9.5E-04	1.37	0.87	-23
Heptadecanoic acid	-8.3E-03	6.13	0.38	-61		7.1E-04	0.66	0.06	26
Dimethoxybenzoph-enone	-2.0E-03	1.84	0.81	-44		-7.4E-04	1.29	0.29	-18
Chrysene	-1.7E-03	1.73	0.89	-40		-8.9E-04	1.35	0.53	-22
Octacosane	-6.8E-04	1.29	0.68	-18		-9.5E-04	1.37	0.77	-23
Cholestane	-9.6E-04	1.40	0.93	-24		-1.1E-03	1.44	0.88	-26
Cholesterol	-1.5E-03	1.65	0.76	-35		-1.3E-03	1.52	0.72	-30
Hexatriacontane	-8.6E-04	1.35	0.16	-22					
			Drift =	**-18%**				**Drift =**	**-17%**
			s.d. =	**23%**				**s.d. =**	**15%**

Table S2. (Part1) Compounds observed by TAG during SOAR.

Compound Name[A]	MW	Formula	CAS#	Major Ions[B]	Summer PMF	Fall PMF	PMF Factor[C] w/ Highest Correlation (r>0.4 only)			
							Summer		Fall	
							particle	gas+particle	particle	gas+particle
Alkanes										
tridecane	184	c13h28	629-50-5	**57**, 71, 184	-	-	-	SOA4+SV	-	LV
tetradecane	198	c14h30	629-59-4	**57**, 71, 198	-	-	-	SOA4+SV	-	LV
pentadecane	212	c15h32	629-62-9	**57**, 71, 212	-	-	-	SOA2	-	LV
hexadecane	226	c16h34	544-76-3	**57**, 71, 226	-	-	LV	LV	-	LV
heptadecane	240	c17h36	629-78-7	**57**, 71, 240	-	-	LV	SOA2	-	LV
octadecane	254	c18h38	593-45-3	**57**, 71, 254	-	-	LV	LV	LV	LV
nonadecane	268	c19h40	629-92-5	**57**, 71, 268	Y	Y	LV	LV	RPA	RPA
eicosane	282	c20h42	112-95-8	**57**, 71, 282	-	-	LV	SOA2	RPA	RPA
heneicosane	296	c21h44	629-94-7	**57**, 71, 296	Y	Y	SOA1	SOA1	RPA	RPA
docosane	310	c22h46	629-97-0	**57**, 71, 310	Y	Y	SOA1	SOA1	LV	LV
tricosane	324	c23h48	638-67-5	**57**, 71, 324	Y	Y	SOA1	SOA1	LV	LV
tetracosane	338	c24h50	646-31-1	**57**, 71, 338	Y	Y	LV	LV	LV	LV
pentacosane	352	c25h52	629-99-2	**57**, 71, 352	Y	Y	LV	LV	LV	LV
hexacosane	366	c26h54	630-01-3	**57**, 71, 366	Y	Y	LV	LV	LV	LV
heptacosane	380	c27h56	593-49-7	**57**, 71, 380	Y	Y	BB	BB	LV	LV
octacosane	394	c28h58	630-02-4	**57**, 71, 394	Y	Y	BB	BB	LV	LV
nonacosane	408	c29h60	630-03-5	**57**, 71, 408	Y	Y	BB	BB	LV	LV
triacontane	422	c30h62	638-68-6	**57**, 71, 422	Y	Y	BB	BB	LV	LV
hentriacontane	436	c31h64	630-04-6	**57**, 71, 436	Y	Y	BB	BB	SOA+FC1	SOA+FC1
Branched Alkanes										
3-methylpentadecane	226	c16h34	2882-96-4	57, 43, 71, 85, 99, 113, **197**	-	-	-	LV	-	LV
4-methylhexadecane	240	c17h36	25117-26-4	57, 43, 71, 85, 113, **197**	-	-	-	LV	-	LV
2-methylhexadecane	240	c17h36	1560-92-5	57, 43, 71, 85, 113, **197**	-	-	LV	LV	-	LV
3-methylhexadecane	240	c17h36	6418-43-5	57, 43, 71, 85, 113, **211**	-	-	LV	LV	-	LV
4-methylheptadecane	254	c18h38	26429-11-8	57, 43, 71, 85, 113, **211**	-	-	LV	LV	LV	LV
2-methylheptadecane	254	c18h38	1560-89-0	57, 43, 71, 85, 113, **211**	-	-	LV	LV	LV	LV
3-methylheptadecane	254	c18h38	6418-44-6	57, 71, 85, 113**, 225**	-	-	-	LV	LV	LV
4-methyloctadecane	268	c19h40	10544-95-3	57, 43, 71, 85, 113, **225**	Y	Y	LV	LV	RPA	RPA
2-methyloctadecane	268	c19h40	1560-88-9	57, 43, 71, 85, 113, **225**	Y	Y	LV	LV	RPA	RPA
3-methyloctadecane	268	c19h40	6561-44-0	57, 43, 71, 85, 113, **239**	Y	Y	LV	LV	LV	LV
pristane	268	c19h40	1921-70-6	**57**, 71, 43, 85, 113, 183, 268	-	-	LV	LV	LV	LV
phytane	282	c20h42	638-36-8	**57**,71,127,183,197	-	-	LV	LV	LV	LV
Alkenes (straight and branched)										
1-tetradecene	196	c14h28	1120-36-1	41, 55, 97, **83**, 111, 196	-	-	SOA4+SV	SOA4+SV	SOA+FC2	LV
1-pentadecene	210	c15h30	13360-61-7	43, 55, 97, **83**, 69, 111, 125, 210	Y	Y	SOA2	SOA2	SOA+FC2	SOA+FC2
1-hexadecene	224	c16h32	629-73-2	43, 55, 97, **83**, 69, 111, 125, 224	-	-	-	BB	SOA+FC2	LV
1-heptadecene	238	c17h34	6765-39-5	43, 55, 97, **83**, 69, 111, 125, 238	-	-	-	FC	SOA+FC2	SOA+FC2
3-heptene, 2,2,4,6,6-pentamethyl-	168	c12h24	123-48-8	**97**, 168, 57	-	-	-	-	-	-
Alkynes										
3-tetradecyne	194	c14h26	60212-32-0	**67**, 81, 95, 109, 55, 43	-	-	LV	LV	-	-
2-decyne	138	c10h18	2384-70-5	**95**, 109, 81, 67, 55, 43	-	-	SOA4+SV	SOA4+SV	SOA+FC1	SOA+SV

Table S2. (Continued) Compounds observed by TAG during SOAR.

Compound Name[A]	MW	Formula	CAS#	Major Ions[B]	Summer PMF	Fall PMF	PMF Factor[C] w/ Highest Correlation (r>0.4 only)			
							Summer		Fall	
Polycyclic Aromatic Hydrocarbons (PAH)							particle	gas+particle	particle	gas+particle
naphthalene	128	c10h8	91-20-3	**128**	-	-	-	SOA4+SV	LV	LV
fluorene	166	c13h10	86-73-7	**166,** 165	-	-	-	BB	BB	LV
phenanthrene	178	c14h10	85-01-8	**178,** 179, 89, 76, 152	-	-	-	BB	SOA+FC2	LV
anthracene	178	c14h10	120-12-7	**178,** 89, 76, 152	Y	Y	LV	LV	LV	LV
fluoranthene	202	c16h10	206-44-0	**202,** 101	Y	Y	LV	SOA1	LV	LV
acephenanthrylene	202	c16h10	201-06-9	**202,** 101	Y	Y	LV	LV	LV	LV
pyrene	202	c16h10	129-00-0	**202,** 101	Y	Y	LV	LV	LV	LV
11H-benzo[b]fluorene	216	c17h12	243-17-4	**216,** 215	Y	Y	SOA2	SOA2	LV	BB
7H-benz[de]anthracene	216	c17h12	199-94-0	**216,** 215	Y	Y	-	SOA1	LV	BB
benzo[a]anthracene	228	c18h12	56-55-3	**228**	Y	Y	LV	LV	LV	LV
cyclopenta(cd)pyrene	226	c18h10	27208-37-3	**226,** 113	Y	Y	LV	LV	LV	LV
chrysene	228	c18h12	218-01-9	**228,** 226	Y	Y	FC	FC	LV	LV
benzo(fluoranthenes + pyrenes)	252	c20h12	-	**252,** 126	-	-	-	-	LV	LV
Branched PAH's										
naphthalene, 1-methyl-	142	c11h10	90-12-0	**142,** 141, 115	-	-	SOA4+SV	BB	LV	LV
naphthalene, 2-methyl-	142	c11h10	91-57-6	**142,** 141, 115	-	-	-	SOA4+SV	-	LV
dimethyl(naphthalenes)	156	c12h12	581-40-8	**156,** 141, 115	-	-	-	BB	LV	LV
trimethyl(naphthalenes)	170	c13h14	2131-41-1	**170,** 155	-	-	SOA4+SV	BB	-	LV
naphthalene, 2-phenyl-	204	c16h12	612-94-2	**204,** 202, 101	-	Y	LV	LV	SOA+FC2	SOA+FC2
phenanthrene, 1-methyl	192	c15h12	832-69-9	**192,** 191	Y	Y	LV	LV	LV	LV
phenanthrene, 2-methyl	192	c15h12	2531-84-2	**192,** 191	-	Y	LV	LV	LV	LV
anthracene, 1-methyl	192	c15h12	610-48-0	**192,** 191	-	Y	LV	LV	LV	RPA
anthracene, 2-methyl	192	c15h12	613-12-7	**192,** 191	Y	-	LV	LV	BB	RPA
dimethyl(phenanthrenes+anthracenes)	206	c16h14	-	**206,** 191	Y	Y	LV	LV	LV	RPA
pyrene, 1-methyl-	216	c17h12	2381-21-7	**216,** 215	Y	Y	LV	SOA2	LV	LV
pyrene, 2-methyl-	216	c17h12	3442-78-2	**216,** 215	Y	Y	LV	-	BB	BB
retene	234	c18h18	483-65-8	**219,** 234, 204	Y	Y	BB	BB	BB	BB
simonellite	252	c19h24	27530-79-6	**237,** 252	Y	-	-	-	BB	BB
8-isopropyl-1,3-dimethylphenanthrene	248	c19h20	135886-06-5	233, **248,** 218	Y	Y		-	BB	BB
rimuene	272	c20h32	1686-67-5	**257,** 272	Y	Y	SOA3	SOA1	SOA+FC2	SOA+FC2
trans-4a,4b, 8,8,2-pentamethyl-1-butylperhydrophenanthrene	318	c23h42	91548-78-6	**191,** 137, 303, 318	-	-	SOA1	SOA1	RPA	RPA
Hopanes										
28-nor-17.beta.(H)-hopane	398	c29h50	36728-72-0	**191**, 177, 109, 123, 137, 217, 398	Y	Y	LV	LV	LV	LV
(17.alpha.H,21.beta.H)-hopane	412	c30h52	471-67-0	**191**, 412, 397, 206	Y	Y	LV	LV	LV	LV
Cyclohexanes										
nonylcyclohexane	210	c15h30	359071	83, **82**, 55, 41, 67, 210	-	-	SOA4+SV	BB	-	LV
decylcyclohexane	224	c16h32	1795-16-0	83, **82**, 55, 41, 224	-	-	FC	LV	-	LV
undecylcyclohexane	238	c17h34	54105-66-7	83, **82**, 55, 97, 238	-	-	-	LV	LV	LV
dodecylcyclohexane	252	c18h36	1795-17-1	83, **82**, 55, 97, 252	-	-	LV	LV	-	LV
tridecylcyclohexane	266	c19h38	6006-33-3	83, **82**, 55, 41, 266	-	-	LV	LV	LV	RPA

Table S2. (Continued) Compounds observed by TAG during SOAR.

Compound Name[A]	MW	Formula	CAS#	Major Ions[B]	Summer PMF	Fall PMF	PMF Factor[C] w/ Highest Correlation (r>0.4 only)			
							Summer		Fall	
							particle	gas+particle	particle	gas+particle
Cyclohexanes (Continued)										
tetradecylcyclohexane	280	c20h40	1795-18-2	83, **82**, 55, 41, 280	Y	Y	LV	LV	RPA	RPA
pentadecylcyclohexane	294	c21h42	6006-95-7	83, **82**, 55, 41, 294	Y	Y	SOA1	SOA1	RPA	RPA
hexadecylcyclohexane	308	c22h44	6812-38-0	83, **82**, 55, 41, 308	Y	Y	SOA2	SOA1	LV	LV
heptadecylcyclohexane	322	c23h46	19781-73-8	83, **82**, 55, 41, 322	Y	Y	SOA1	SOA1	LV	LV
octadecylcyclohexane	336	c24h48	4445-06-1	83, **82**, 55, 41, 336	Y	Y	LV	LV	LV	LV
nonadecylcyclohexane	350	c25h50	22349-03-7	83, **82**, 55, 41, 350	Y	Y	LV	LV	LV	LV
eicosylcyclohexane	364	c26h52	4443-55-4	83, **82**, 55, 41, 364	Y	Y	LV	LV	LV	LV
Acids										
heptanoic acid	130	c7h14o2	111-14-8	**60**, 73, 87, 43, 101, 130	-	-	FC	FC	SOA+FC2	SOA+FC2
octanoic acid	144	c8h16o2	124-07-2	**60**, 73, 43, 101, 115, 144	-	-	FC	FC	SOA+FC2	SOA+FC2
nonanoic acid	158	c9h18o2	112-05-0	**60**, 73, 115, 129, 158	-	-	Bio	FC	SOA+FC1	SOA+FC1
decanoic acid	172	c10h20o2	334-48-5	**60**, 73, 129, 41, 172	-	-	SOA1	FC	SOA+FC2	SOA+FC1
undecanoic acid	186	c11h22o2	112-37-8	**60**, 73, 43, 129, 143, 186	-	-	SOA3	SOA3	SOA+FC1	SOA+FC1
dodecanoic acid	200	c12h24o2	143-07-7	73, **60**, 43, 129, 200, 157	Y	Y	SOA1	SOA1	SOA+FC1	SOA+FC1
tetradecanoic acid	228	c14h28o2	544-63-8	73, **60**, 129, 185, 228	Y	Y	SOA1	SOA1	SOA+FC1	SOA+FC1
hexadecanoic acid	256	c16h32o2	57-10-3	43, 73, **60**, 129, 213, 256	Y	Y	FC	FC	SOA+FC1	SOA+FC1
octadecanoic acid	284	c18h36o2	57-11-4	73, 43, **60**, 129, 284, 241, 185	Y	Y	FC	FC	SOA+FC1	SOA+FC1
benzoic acid	122	c7h6o2	65-85-0	**105**, 77, 122, 51	-	Y	-	SOA2	SOA+FC2	SOA+FC2
phenylacetic acid	136	c8h8o2	103-82-2	91, **136**, 65	-	Y	SOA3	SOA2	SOA+FC1	SOA+FC1
propanoic acid, 2-methyl-, 3-hydroxy-2,4,4-trimethylpentyl ester	286	c16h30o4	74381-40-1	**71**, 43, 243, 159, 111, 56	-	-	LV	SOA4+SV	-	SOA+FC2
oleic acid	282	c18h34o2	112-80-1	55, 69, 41, 97, 111, **264**, 282	Y	Y	LV	LV	LV	LV
phthalic acid	166	c8h6o4	88-99-3	**104**, 148	Y	Y	SOA2	SOA3	SOA	SOA
3-methylphthalic acid	162	c9h6o3	4792-30-7	**90**, 89, 162, 118, 63, 134	Y	Y	SOA2	SOA2	SOA+FC2	SOA+FC2
4-methylphthalic acid	162	c9h6o3	19438-61-0	118, **90**, 89, 63, 162	Y	Y	SOA2	SOA2	SOA	SOA
Phthalates										
dimethyl phthalate	194	c10h10o4	131-11-3	**163**, 194	-	-	-	BB	SOA	SOA
diethyl phthalate	222	c12h14o4	84-66-2	**149**, 177, 105, 222	-	-	Bio	FC	SOA	SOA
diisobutyl phthalate	278	c16h22o4	84-69-5	**149**, 205, 278, 104	-	-	SOA1	SOA1	-	SOA+FC2
dibutyl phthalate	278	c16h22o4	84-74-2	**149**, 223, 205, 104, 278	-	-	SOA3	SOA1	SOA+FC2	SOA+FC2
1,8-naphthalic anhydride	198	c12h6o3	81-84-5	198, **154**, 126, 63	Y	Y	SOA2	SOA2	SOA+FC2	SOA+FC2
benzyl butyl phthalate	312	c19h20o4	85-68-7	**149**, 91, 206, 104, 123, 132	Y	Y	SOA1	SOA2	SOA+FC2	SOA+FC2
bis(2-ethylhexyl)phthalate	390	c24h38o4	117-81-7	**149**, 167, 57, 279, 113	Y	Y	-	-	LV	LV
dioctyl phthalate	390	c24h38o4	117-84-0	**149**, 167, 279, 57, 70	Y	Y	SOA2	SOA2	LV	LV
dinonyl phthalate	418	c26h42o4	84-76-4	**149**, 293	Y	Y	SOA1	SOA1	LV	LV
Furanones										
2(3H)-furanone,dihydro-5-ethyl-	114	c6h10o2	695-06-7	**85**	Y	Y	SOA3	SOA3	SOA+FC2	SOA+FC2
2(3H)-furanone,dihydro-5-propyl-	128	c7h12o2	105-21-5	**85**	-	-	SOA3	SOA3	SOA+FC2	SOA+FC2
2(3H)-furanone,dihydro-5-butyl-	142	c8h12o2	104-50-7	**85**	-	-	-	-	SOA+FC2	SOA+FC2
2(3H)-furanone,dihydro-5-pentyl-	156	c9h16o2	104-61-0	**85**	-	-	SOA3	FC	SOA+FC2	SOA+FC2
2(3H)-furanone,dihydro-5-hexyl-	170	c10h18o2	706-14-9	**85**	-	-	-	FC	SOA+FC2	SOA+FC2

Table S2. (Continued) Compounds observed by TAG during SOAR.

Compound Name[A]	MW	Formula	CAS#	Major Ions[B]	Summer PMF	Fall PMF	PMF Factor[C] w/ Highest Correlation (r>0.4 only)			
							Summer		Fall	
							particle	gas+particle	particle	gas+particle
Furanones (Continued)										
2(3H)-furanone,dihydro-5-heptyl-	184	c11h20o2	104-67-6	**85**	-	-	SOA3	SOA2	SOA+FC2	LV
2(3H)-furanone,dihydro-5-octyl-	198	c12h22o2	2305-05-7	**85**	-	-	SOA3	SOA1	SOA+FC2	SOA+FC2
2(3H)-furanone,dihydro-5-decyl-	226	c14h26o2	-	**85**	Y	Y	SOA1	SOA1	SOA+FC2	SOA+FC2
2(3H)-furanone,dihydro-5-undecyl-	240	c15h28o2	-	**85**	Y	Y	SOA3	SOA3	SOA+FC2	SOA+FC2
2(3H)-furanone, dihydro-5-dodecyl-	256	c16h30o2	730-46-1	**85**, 236	Y	Y	SOA1	SOA1	SOA+FC2	SOA+FC2
2(3H)-furanone,dihydro-5-tridecyl-	272	c17h32o2	-	**85**	Y	Y	SOA1	SOA1	LV	LV
2(3H)-furanone, dihydro-5,5-dimethyl-4-(3-oxobutyl)-	184	c10h16o3	004436-81-1	43, **166**, 98, 111, 151	-	Y	SOA3	SOA3	LV	LV
2(3H)-furanone, 5-methyl-	98	c5h602	591-12-8	**98**, 55, 43	Y	Y	SOA4+SV	SOA4+SV	SOA+FC2	SOA+FC2
Substituted Guaiacols and Syringols										
vanillin	152	c8h8o3	121-33-5	151, **152**	Y	Y	BB	BB	-	LV
syringaldehyde	182	c9h10o4	000134-96-3	182, **181**, 111, 93	-	-	-	BB	SOA+FC2	SOA+FC2
Other Oxygenated Compounds										
nonanal	142	c9h18o	124-19-6	**57**, 98	Y	Y	FC	FC	SOA+FC1	SOA+FC1
tetradecanal	212	c14h29o	124-25-4	57, **82**, 96	-	-	-	SOA1	-	RPA
cinnamaldehyde	132	c9h8o	104-55-2	132, **131**, 103	-	Y	-	SOA2	SOA+FC2	SOA+FC2
hexyl cinnamic aldehyde	216	c15h20o	101-86-0	117,**129**,91,216	-	-	Bio	BB	-	LV
levoglucosenone	126	c6h6o3	37112-31-5	**98**, 96, 39, 53, 68	Y	Y	-	-	BB	BB
2,5-cyclohexadiene-1,4-dione, 2,6-bis(1,1-dimethylethyl)-	220	c14h20o2	719-22-2	**177**, 135, 149, 220, 163	-	-	RPA	SOA4+SV	SOA+FC2	SOA+FC2
2-decanone	156	c10h20o	693-54-9	**58**, 156	-	-	-	FC	SOA+FC2	SOA+FC1
2-undecanone	170	c11h22o	112-12-9	**58**, 170	-	-	-	SOA4+SV	SOA+FC2	SOA+FC2
2-dodecanone	184	c12h24o	6175-49-1	**58**, 184	-	-	-	SOA4+SV	-	SOA+FC1
2-undecanone, 6,10-dimethyl-	198	c13h26o	1604-34-8	**58**, 43, 71, 85, 109, 180, 198	-	-	-	SOA4+SV	-	SOA+FC2
2-tridecanone	198	c13h26o	593-08-8	**58**, 198	-	-	-	SOA4+SV	-	SOA+FC2
2-tetradecanone	212	c14h28o	2345-27-9	**58,** 212	-	-	-	-	RPA	-
2-pentadecanone	226	c15h30o	2345-28-0	**58**, 226	-	-	BB	BB	-	LV
2-hexadecanone	240	c16h32o	18787-63-8	**58**, 240	-	Y	SOA1	SOA1	-	-
2-heptadecanone	254	c17h34o	2922-51-2	**58**, 254	Y	Y	SOA1	SOA1	SOA+FC2	SOA+FC2
2-octadecanone	268	c18h36o	7373-13-9	**58**, 268	Y	Y	SOA1	SOA1	LV	LV
2-Pentadecanone,6,10,14-trimethyl	268	c18h36o	502-69-2	**58**, 250	-	-	LV	SOA2	-	RPA
.delta.-octalactone	142	c8h14o2	698-76-0	**99**, 71, 42, 55, 114	-	Y	SOA3	SOA3	SOA+FC2	SOA+FC2
.delta.nonalactone	156	c9h16o2	3301-94-8	**99**, 71, 42, 55, 114	-	Y	SOA3	SOA3	SOA+FC2	SOA+FC2
.delta.decalactone	170	c10h18o2	705-86-2	**99**, 71, 43, 55, 149	-	Y	-	SOA4+SV	SOA+FC2	SOA+FC2
.delta.-dodecalactone	198	c12h22o2	713-95-1	**99**, 42, 55, 71, 114	Y	Y	-	SOA2	SOA+SV	SOA+SV
.delta.tetradecalactone	226	c14h26o2	2721-22-4	**99**, 114, 43, 41, 69, 70	Y	Y	SOA3	SOA3	SOA+FC2	SOA+FC2
2,5-undecanedione	184	c11h20o2	7018-92-0	114, **99**, 71, 43	Y	Y	SOA3	SOA3	SOA+FC2	SOA+FC2
6,7-dodecanedione	198	c12h22o2	13757-90-9	**99**, 71, 43, 55, 198	Y	Y	SOA3	SOA3	SOA+FC1	SOA+FC1
9H-fluoren-9-one	180	c13h8o	486-25-9	**180**, 152, 76	-	-	-	SOA2	SOA+FC2	SOA+FC2
9H-fluoren-9-ol	182	c13h10o	001689-64-1	**181**, 182, 152, 76	-	-	-	SOA4+SV	-	SOA+FC2
benzophenone	182	c13h10o	119-61-9	**105**, 77, 182, 51	-	Y	-	FC	SOA+FC2	SOA+FC2
anthraquinone	208	c14h8o2	84-65-1	208, 180, **152**, 76	Y	Y	SOA1	SOA1	SOA+FC2	SOA+FC2

Table S2. (Continued) Compounds observed by TAG during SOAR.

Compound Name[A]	MW	Formula	CAS#	Major Ions[B]	Summer PMF	Fall PMF	PMF Factor[C] w/ Highest Correlation (r>0.4 only)			
							Summer		Fall	
							particle	gas+particle	particle	gas+particle
Other Oxygenated Compounds (Continued)										
tetrahydroquinone	112	c6h8o2	637-88-7	**112**, 56, 42	-	-	-	BB	-	LV
benzaldehyde	106	c7h6o	100-52-7	**106**, 77	-	-	-	SOA4+SV	SOA+SV	SOA+SV
benzeneacetaldehyde	120	c8h8o	122-78-1	**91**, 120	-	-	-	-	SOA+SV	SOA+SV
acetophenone	120	c8h8o	98-86-2	**105**, 120	-	Y	SOA4+SV	SOA4+SV	SOA+FC2	SOA+FC2
p-methylacetophenone	134	c9h10o	122-00-9	**119**, 91, 134	-	Y	SOA4+SV	SOA4+SV	SOA+FC2	SOA+FC2
sabina ketone	138	c9h14o	513-20-2	81, 96, 95, 41, 67, 55, **123**, 138	Y	Y	-	SOA4+SV	SOA+FC2	SOA+FC2
2-pentylcyclohexanone	168	c11h20o	32362-97-3	**98**, 71, 43, 55, 83, 168	Y	Y	SOA4+SV	SOA4+SV	SOA+SV	SOA+SV
triacetin	218	c9h14o6	102-76-1	43, **103**, 145	-	-	SOA3	SOA3	-	-
1,6-dioxaspiro[4,4]nonane-2,7-dione	156	c7h8o4	3505-67-7	**112**, 56, 84	Y	Y	SOA3	SOA3	SOA+FC2	SOA+FC2
1,4-dioxaspiro[5,5]undecan-3-one	170	c9h14o3	-	**98**, 170, 69, 55, 41, 140, 127	Y	Y	SOA4+SV	SOA4+SV	SOA+FC1	SOA+FC1
2(4H)-benzofuranone, 5,6,7,7a-tetrahydro-4,4,7a-trimethyl-	180	c11h16o2	15356-74-8	**111**, 137, 67, 180	-	Y	-	SOA4+SV	SOA+FC2	SOA+FC2
naphtho[1,2-c]furan-1,3-dione	198	c12h6o3	005343-99-7	198, **154**, 126	Y	Y	SOA1	SOA1	SOA+FC2	SOA+FC2
1,3-isobenzofurandione, 4,7-dimethyl-	176	c10h8o3	005463-50-3	**176**, 104, 132, 148	Y	Y	SOA2	SOA2	SOA+FC2	SOA+FC2
3,5-di-tert-Butyl-4-hydroxybenzaldehyde	234	c15h22o2	1620-98-0	**219**, 191, 234, 57	-	-	Bio	BB	BB	RPA
7,9-di-tert-butyl-1-oxaspiro(4,5)deca-6,9-diene-2,8-dione	276	c17h24o3	82304-66-3	**205**, 217, 57, 175, 189, 261	-	Y	-	RPA	-	-
ethanedione, diphenyl-	210	c14h10o2	134-81-6	**105**, 77, 51, 210	Y	Y	LV	LV	SOA+FC2	SOA+FC2
1-penten-3-one, 1-phenyl-	160	c11h12o	3152-68-9	**131**, 103, 160, 77	-	Y	-	SOA2	SOA	SOA
ethanone, 2,2-dimethoxy-1,2-diphenyl-	256	c16h16o3	24650-42-8	**151**, 105, 77, 91, 225	Y	Y	-	SOA1	-	-
anthrone	194	c14h10o	90-44-8	**194**, 165	-	Y	Bio	LV	SOA+FC2	LV
xanthone	196	c13h8o2	90-47-1	**196**, 168, 139	Y	Y	SOA2	SOA3	SOA+FC2	SOA+FC2
cyclopenta(def)phenanthrenone	204	c15h8o	5737-13-3	**204**, 176	Y	Y	SOA2	SOA2	SOA+FC2	SOA+FC2
chrysanthenone	150	c10h14o	473-06-3	**107**, 91, 122, 105, 150, 79	-	Y	-	-	SOA+SV	SOA+SV
Other Esters										
ethylhexyl benzoate	234	c15h22o2	5444-75-7	**105**, 70, 112	-	-	-	FC	-	SOA+FC2
benzyl benzoate	212	c14h12o2	120-51-4	105, 91, **212**, 77, 194	-	Y	-	BB	SOA+FC2	SOA+FC2
2-ethylhexyl salicylate	250	c15h22o3	118-60-5	**120**, 138, 250	-	Y	Bio	FC	-	SOA+FC1
isopropyl myristate	270	c17h34o2	110-27-0	43, 60, 102, **228**, 211	-	-	LV	FC	-	-
homomenthyl salicylate	262	c16h22o3	000118-56-9	**138**, 109, 120, 69, 262	Y	Y	FC	FC	SOA+FC1	SOA+FC1
n-hexyl salicylate	222	c13h18o3	6259-76-3	120, **138**, 92, 43, 222	-	-	Bio	FC	SOA+FC1	SOA+FC1
hexadecanoic acid, methyl ester	270	c17h34o2	112-39-0	**74**, 87, 143, 270	Y	Y	SOA2	SOA2	SOA+FC2	SOA+FC2
isopropyl palmitate	298	c19h38o2	142-91-6	**256**, 102, 43, 60, 239	Y	Y	SOA1	SOA1	LV	LV
dehydroabietic acid, methyl ester	314	c21h30o2	1235-74-1	**239**, 314, 299	Y	Y	SOA1	SOA1	BB	BB
hexanedioic acid, bis(2-ethylhexyl)ester	370	c22h42o4	103-23-1	**129**, 112, 147, 57, 70, 241, 259	Y	Y	LV	LV	SOA+FC2	SOA+FC2
7-oxodehydroabietic acid, methyl ester	328	c21h28o3	110936-78-2	**253**, 328, 313, 269	Y	Y	-	-	BB	BB
methyldihydrojasmonate	226	c13h22o3	24851-98-7	83, **153**, 156	-	-	LV	FC	LV	LV
Other Phenyls										
biphenyl	154	c12h10	92-52-4	**154**, 153	-	-	-	FC	SOA+FC2	SOA+FC2
terphenyl	230	c18h14	26140-60-3	**230**, 115	Y	Y	SOA2	SOA2	SOA+FC2	SOA+FC2
p-methylbiphenyl	168	c13h12	644-08-6	**168**, 167, 152, 153	-	-	-	LV	LV	LV

Table S2. (Continued) Compounds observed by TAG during SOAR.

Compound Name[A]	MW	Formula	CAS#	Major Ions[B]	Summer PMF	Fall PMF	PMF Factor[C] w/ Highest Correlation (r>0.4 only)			
							Summer		Fall	
							particle	gas+particle	particle	gas+particle
Other Phenyls (Continued)										
3,3'-dimethylbiphenyl	182	c14h14	612-75-9	**182**, 167, 165, 89	-	-	LV	BB	LV	LV
2,2'-diethylbiphenyl	210	c16h18	013049-35-9	**181**, 210, 165	-	-	-	FC	-	LV
4,4'-diisopropylbiphenyl	238	c18h22	18970-30-4	**223**, 238, 43, 165, 178, 104	-	-	BB	BB	-	LV
3,4'-diisopropylbiphenyl	238	c18h22	61434-46-6	**223**, 238	-	-	LV	BB	-	RPA
1-pentylheptylbenzene (6-phenyldodecane)	246	c18h30	2719-62-2	**91**, 161, 175, 246	-	-	-	BB	-	SOA+FC2
1-methylundecylbenzene (2-phenyldodecane)	246	c18h30	2719-61-1	**105**, 246	-	-	-	FC	-	SOA+FC2
methylbis(phenylmethyl)benzene	272	c21h20	26898-17-9	**181**, 272, 91, 165	Y	Y	-	-	BB	BB
Terpenes and Terpenoids										
cumene	120	c9h12	98-82-8	**105**, 120	-	-	FC	SOA4+SV	-	SOA+FC1
p-cymene	134	c10h14	99-87-6	**119**, 134, 91	-	-	-	SOA4+SV	-	SOA+SV
limonene	136	c10h16	138-86-3	**68**, 67, 93, 79, 53, 121, 107	Y	-	-	BB	-	-
m-cymene	119	c10h14	535-77-3	**119**, 134, 91	-	-	-	SOA4+SV	SOA+FC2	SOA+FC2
p-cymenene	132	c10h12	1195-32-0	**132**, 117, 115, 91	Y	-	SOA4+SV	SOA4+SV	SOA+SV	SOA+SV
.alpha.-phellandrene	136	c10h16	99-83-2	**93**, 91, 77	Y	Y	SOA4+SV	SOA4+SV	SOA+SV	SOA+SV
.gamma.-terpinene	136	c10h16	99-85-4	**93**, 91, 77, 79, 136	-	Y	SOA4+SV	SOA4+SV	SOA+SV	SOA+SV
.delta.3-carene	136	c10h16	13466-78-9	**93**, 91, 79, 136	Y	Y	SOA4+SV	SOA4+SV	SOA+SV	SOA+SV
.alpha.-terpinene	136	c10h16	99-86-5	**121**, 136, 93, 106	-	-	SOA4+SV	SOA4+SV	SOA+FC1	SOA+FC1
.beta.-selinene	204	c15h24	17066-67-0	**93**,	-	Y	-	-	SOA+SV	SOA+SV
cis-.alpha.-bisabolene	204	c15h24	17627-44-0	**93**, 109	Y	Y	BB	BB	-	LV
.delta.-cadinene	204	c15h24	483-76-1	**161**, 204, 134, 119, 105	Y	Y	BB	BB	BB	LV
calamenene	202	c15h22	483-77-2	**159**, 160, 144, 202	-	-	-	BB	-	BB
cycloisolongifolene	204	c15h24	28380-07-6	**91**, 105, 133, 204, 161, 41	-	-	-	LV	SOA+FC2	LV
sesquiterpenes	204	c15h24	-	**204**	-	-	-	BB	-	LV
eudalene	184	c14h16	490-65-3	**169**, 184	-	-	-	BB	-	LV
cadalene	198	c15h18	483-78-3	**183**, 198, 168, 153	-	-	-	BB	-	SOA+SV
19-nor-abieta-3,8,11,13-tetraene	254	c19h26	-	**239**, 254, 240, 195, 178, 224	-	-	LV	LV	BB	BB
19-nor-abieta-4,8,11,13-tetraene + 18-nor-abieta-3,8,11,13-tetraene (mixture)	254	c19h26	23963-75-9	197, **239**, 254	Y	Y	BB	BB	BB	BB
19-nor-abieta-4,8,11,13-tetraene	254	c19h26	-	**239**, 254, 199, 159	Y	Y	Bio	Bio	BB	BB
18-norabieta-8,11,13-triene (dehydroabietin)	256	c19h28	-	159, **241**, 185, 256	-	-	-	BB	BB	BB
19-nor-abieta-8,11,13-triene	256	c19h28	19407-18-2	159, **241**, 185, 256	-	-	-	BB	BB	BB
abietatriene (dehydroabietane)	270	c20h30	019407-28-4	**255**, 270	-	-	Bio	BB	SOA+FC1	SOA+FC1
Oxygenated Terpenes										
.alpha.-campholenal	152	c10h16o	4501-58-0	**108**, 93, 95, 41, 67, 81, 55	-	-	SOA4+SV	SOA4+SV	-	BB
cuminic aldehyde	148	c10h12o	122-03-2	**133**, 148, 105	-	Y	SOA4+SV	SOA4+SV	SOA+FC2	SOA+FC2
limonene dioxide 4	168	c10h16o2	96-08-2	43, **107**, 67, 55, 79, 95	-	Y	-	Bio	SOA+SV	SOA+SV
lily aldehyde	204	c14h20o	80-54-6	**189**, 147, 131, 204	-	-	-	BB	BB	BB
nopinone	138	c9h14o	38651-65-9	**83**, 55, 109	-	Y	SOA4+SV	SOA4+SV	SOA+FC1	SOA+FC1
pinonaldehyde	168	c10h16o2	2704-78-1	43, **83**, 69, 98, 109	-	Y	SOA4+SV	SOA4+SV	BB	BB
methyl chavicol	148	c10h12o	140-67-0	**148**, 121, 133, 91, 105	-	Y	-	SOA4+SV	SOA+SV	SOA+SV

Table S2. (Continued) Compounds observed by TAG during SOAR.

Compound Name[A]	MW	Formula	CAS#	Major Ions[B]	Summer PMF	Fall PMF	PMF Factor[C] w/ Highest Correlation (r>0.4 only)			
							Summer		Fall	
							particle	gas+particle	particle	gas+particle
Chromenes										
galaxolide 1	258	c18h26o	-	**243**, 258, 213	-	-	BB	BB	BB	BB
galaxolide 2	258	c18h26o	-	**243**, 258, 213	-	-	LV	FC	-	-
precocene I	190	c12h14o2	17598-02-6	**175**, 190	-	-	-	SOA2	-	BB
precocene II	220	c13h16o3	644-06-4	**205**, 220, 191, 95, 123, 107, 177	-	-	SOA3	SOA1	-	BB
eupatoriochromene	218	c13h14o3	19013-03-7	**203**, 218, 185	Y	Y	BB	BB	LV	BB
encecalin	232	c14h16o3	20628-09-5	**217**, 232	Y	-	LV	LV	LV	LV
Nitrogen and Sulfur Containing Compounds										
hexadecanenitrile	237	c16h31n	629-79-8	41, 43, 57, **110**, 180, 222, 236	Y	Y	FC	FC	SOA+FC2	SOA+FC2
octadecanenitrile	265	c18h35n	638-65-3	41, 43, 97, 57, **110**, 222, 236	Y	Y	FC	FC	SOA+FC2	SOA+FC2
4-nitrophenol	139	c6h5no3	100-02-7	**139**, 65, 109, 39, 81, 93	Y	Y	SOA2	SOA2	SOA+FC1	SOA+FC1
5-methyl-2-nitrophenol	153	c7h7no3	700-38-9	**153**, 77, 123	Y	-	SOA3	SOA3	-	-
2,6-di-tert-butyl-4-nitrophenol	251	c14h21no3	728-40-5	**236**, 208, 251	Y	-	Bio	Bio	-	-
diethyltoluamide	191	c12h17no	134-62-3	**119**, 91, 190	-	-	-	RPA	-	-
p-aminobenzaldehyde	212	c13h12n2o	017625-83-1	**212**, 105, 77	-	Y	Bio	LV	LV	LV
phthalimide	147	c8h5no2	85-41-6	**147**, 76, 104, 50	Y	Y	SOA2	SOA2	SOA+FC2	SOA+FC2
diphenylamine	169	c12h11n	122-39-4	**169**, 168	Y	-	BB	BB	BB	LV
6-tert-butyl-2,3-naphthalenedicarbonitrile	234	c16h14n2	32703-82-5	**219**, 191, 234, 41	Y	-	-	SOA1	BB	BB
benzenamine, 2-nitro-N-phenyl-	214	c12h10n2o2	119-75-5	**214**, 167, 180, 77	Y	Y	SOA1	SOA1	SOA+FC1	SOA+FC1
penoxaline	281	c13h19n3o4	40487-42-1	**252**, 281, 191, 162	Y	Y	SOA1	SOA1	SOA+FC1	SOA+FC1
11H-indolo[3,2-c]quinoline	218	c15h10n2	239-09-8	**218**, 202	Y	Y	SOA2	SOA1	LV	LV
1,4-benzenediamine, N-(1,3-dimethylbutyl)-N'-phenyl-	268	c18h24n2	793-24-8	**211**, 268, 183, 253	Y	Y	BB	BB	BB	BB
benzenamine, N-[(2-methoxyphenyl)methylene]-	211	c14h13no	3369-37-7	**93**, 119, 91, 77, 211	Y	Y	SOA4+SV	SOA4+SV	SOA+SV	SOA+SV
4-methoxypyridine	109	c6h7no	620-08-6	**109**, 79, 52	Y	Y	SOA4+SV	SOA4+SV	SOA+SV	SOA+SV
pelletierine	141	c8h15no	4396-01-4	**84**, 43, 55, 141	Y	Y	SOA4+SV	SOA4+SV	SOA+FC1	SOA+FC1
benzenesulfonamide,N-butyl-	213	c10h15no2s	3622-84-2	**170**, 141, 77, 213	Y	-	SOA3	SOA1	-	-
benzothiazole	135	c7h5ns	95-16-9	**135**, 108	-	-	-	SOA4+SV	-	SOA+SV
dibenzothiophene	184	c12h8s	132-65-0	**184**	-	-	-	BB	SOA+FC2	SOA+FC2
Chlorine, Fluorine, and Phosphorus Containing Compounds										
trifluralin	335	c13h16f3n3o4	1582-09-8	**306**, 264, 335, 290	-	-	BB	BB	-	-
chlorothalonil	264	c8cl4n2	1897-45-6	**266**, 264, 268	Y	Y	-	SOA3	-	-
dcpa	330	c10h6cl4o4	1861-32-1	**301**, 332	-	-	SOA3	SOA3	-	RPA
2-propanol, 1-chloro-, phosphate (3:1)	326	c9h18cl3o4p	13674-84-5	125,99,**277**,201,157,117,175,279	Y	-	SOA3	SOA2	SOA+SV	SOA+SV
bis(1-chloro-2-propyl)(3-chloro-1-propyl)phosphate	326	c9h18cl3o4p	137909-40-1	99, 125, 157, 117, 175, **277**, 291	Y	-	SOA3	SOA2	-	-
tris(3-chloropropyl)phosphate	326	c9h18cl3o4p	1067-98-7	99, 43, 157, 175, 117, **277**, 291	-	-	-	SOA4+SV	-	-
Siloxanes										
cyclotetrasiloxane, octamethyl-	296	c8h24o4si4	556-67-2	**281**, 207	-	-	-	-	-	-
cyclopentasiloxane, decamethyl-	370	c10h30o5si5	541-02-6	**355**, 267, 73	-	-	SOA4+SV	SOA4+SV	-	-

Table S2. (Continued) Compounds observed by TAG during SOAR.

Compound Name[A]	MW	Formula	CAS#	Major Ions[B]	Summer PMF	Fall PMF	PMF Factor[C] w/ Highest Correlation (r>0.4 only)			
							Summer		Fall	
							particle	gas+particle	particle	gas+particle
Other Compounds										
allopregnane	288	c21h36	000641-85-0	**218**, 217, 109, 273, 288, 149	-	-	-	SOA1	-	RPA
1-methyl-2-oxaadamantane	152	c10h16o	6508-22-1	95, **94**, 152, 43, 109	Y	Y	SOA4+SV	SOA4+SV	SOA+SV	SOA+SV
1-methyldiamantane	202	c15h22	26460-76-4	**187**, 202	Y	Y	-	BB	LV	LV
furan, 2-ethyl-5-methyl-	110	c7h10o	1703-52-2	95, **110**, 43, 67	Y	Y	SOA4+SV	SOA4+SV	SOA+SV	SOA+SV
dibenzofuran	168	c12h8o	132-64-9	**168**, 139	-	-	SOA4+SV	SOA4+SV	-	SOA+FC2
monopalmitin	330	c19h38o4	542-44-9	112, 57, 71, **256**, 239, 257	Y	Y	LV	LV	-	-
monostearin	358	c21h42o4	123-94-4	112, 57, 71, **284**, 267, 285	Y	Y	-	-	SOA+FC2	SOA+FC2
Suspected Contaminant Compounds										
benzene, 1,3,-bis(1-methylethenyl)-	158	c12h14	003748-13-8	**158**, 128, 143, 115	-	-	-	-	-	RPA
benzene, 1,4,-bis(1-methylethenyl)-	158	c12h14	001605-18-1	**158**, 143, 128, 115	-	-	-	SOA3	-	RPA
1H-inden-1-one, 2,3-dihydro-3,3,-dimethyl	160	c11h12o	26465-81-6	**145**, 160, 115, 91	-	-	-	-	-	-
ethanone, 1-[4-(1-methylethenyl)phenyl]-	160	c11h12o	1263471	**145**, 160, 115, 91	-	-	-	-	-	-
benzene, p-diacetyl-	162	c10h10o2	1009-61-6	**147**, 91, 162, 43, 119	-	-	-	-	SOA+FC2	SOA+FC1
benzene, m-diisopropyl-	162	c12h18	99-62-7	**147**, 119, 162, 91	-	-	-	-	SOA+FC1	SOA+FC1
benzo[b]thiophene, 2-ethyl-7-methyl-	176	c11h12s	16587-43-2	**161**, 176, 43, 115, 145, 91	-	-	-	-	SOA+FC1	SOA+FC1
benzo[b]thiophene, 2-ethyl-5-methyl-	176	c11h12s	16587-51-2	**161**, 176	-	-	-	SOA1	SOA+FC1	SOA+FC1
4(1-hydroxy-1-methylethyl)acetophenone	178	c11h14o2	54549-72-3	**163**, 43, 121	-	-	-	-	SOA+FC1	SOA+FC1
unknown	-	-	-	**163**, 43, 121	-	-	-	-	SOA+FC1	SOA+FC1
Other Parameters[D]										
vol.57	Total high volatility m/z 57 (resolved+UCM)				-	-	LV	LV	-	LV
midvol.57	Total mid volatility m/z 57 (resolved+UCM)				-	-	LV	SOA2	LV	LV
nonvol.57	Total low volatility m/z 57 (resolved+UCM)				Y	Y	LV	LV	LV	LV
ox.vol.43	Total high volatility m/z 43 - primary fraction (resolved+UCM)				-	-	SOA2	SOA2	SOA+FC2	SOA+FC2
ox.midvol.43	Total mid volatility m/z 43 - primary fraction (resolved+UCM)				-	-	SOA2	SOA2	SOA+FC2	SOA+FC2
ox.nonvol.43	Total low volatility m/z 43 - primary fraction (resolved+UCM)				Y	Y	SOA2	SOA2	SOA+FC2	SOA+FC2
Cwax	Excess Odd Carbon from C25-C31 Alkanes				Y	-	BB	BB	-	SOA+FC1
PMF parameters										
				TAG features	3	2				
				TAG compounds	124	141				
				Total	**127**	**143**				

[A] Ambient compounds in bold print are present in chemical standards inventory.

[B] Major ions in bold have been used as MSD integration ion. Major ions with an underline have been used as additional identification during integrations.

[C] Abbreviated Source Names: (RPA) = Regional Primary Anthropogenic; (LV) = Local Vehicle; (FC) = Food Cooking; (Bio) = Primary Biogenic; (BB) = Biomass Burning; (SOA) = Secondary Organic Aerosol; (SOA+SV) = SOA + Semivolatiles; (SOA+FC1) = SOA + Food Cooking type 1; (SOA+FC2) = SOA + Food Cooking type 2.

[D] high volatility = 18-34 minutes retention time, mid volatility = 34-40 minutes retention time, low volatility = 40-59 minutes retention time

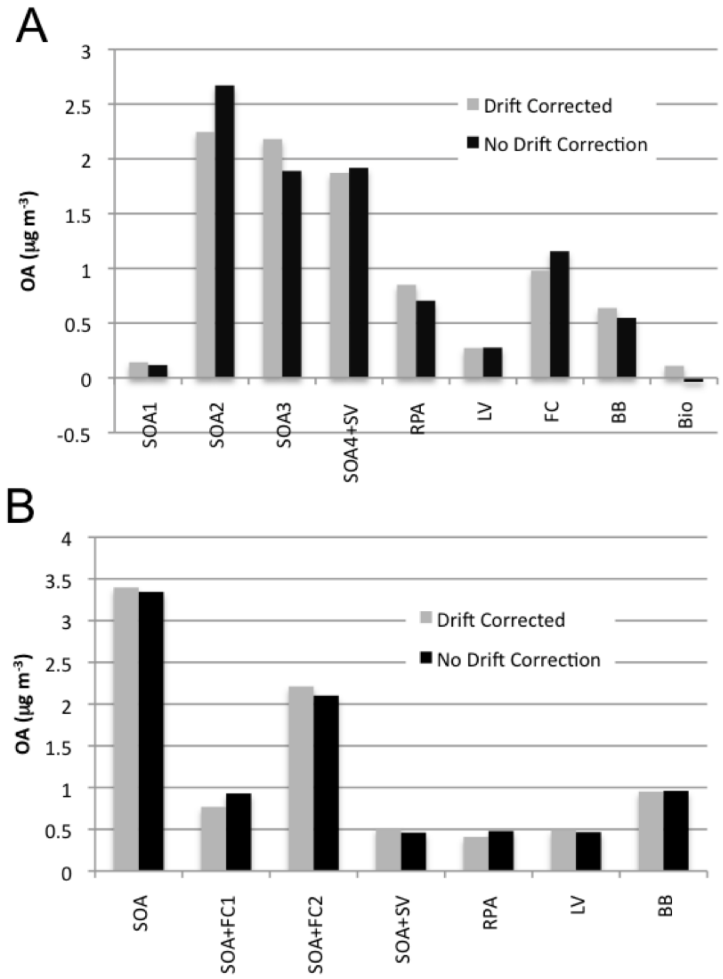

Fig. S1. SOAR PMF solutions. A) SOAR-1 (summer) PMF solutions for two different input matrices and error matrices, one where TAG compounds have been adjusted to account for a detector drift of -18% (in grey), and another where no detector drift is accounted for (in black). B) SOAR-2 (fall) PMF solutions for two different input matrices, one where TAG compounds have been adjusted to account for a detector drift of -17% (in grey), and another where no detector drift is accounted for (in black). Seasonal average detector drifts do not significantly impact the results of the PMF analysis in either season.

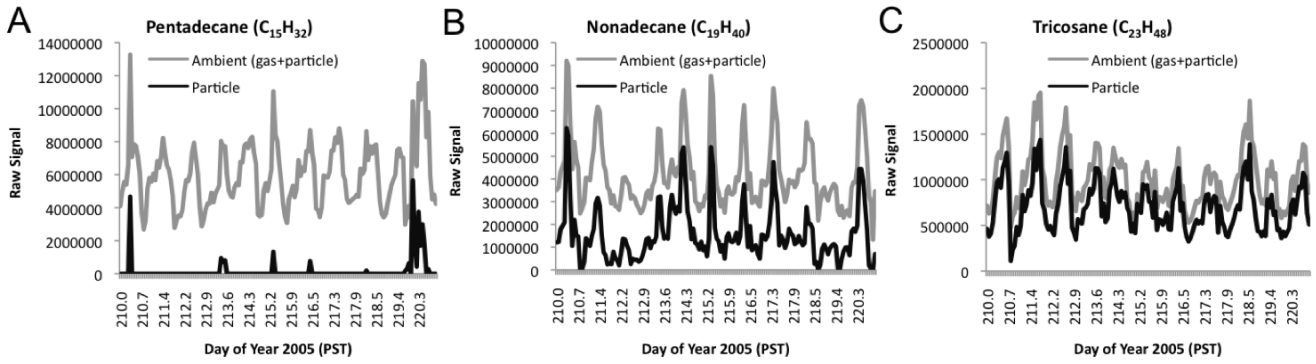

Fig. S2. Analysis of TAG compound signals to determine PMF input parameters. Particle-phase signal is determined by subtracting gas-phase only samples from total ambient samples (ambient = gas-phase + particle-phase). A) Pentadecane (a volatile compound) total ambient signal (grey) is compared to the particle-phase signal (black) over the 11-day summer focus period. B) Nonadecane (a semivolatile compound) total ambient signal (grey) is compared to the particle-phase signal (black) over the 11-day summer focus period. C) Tricosane (a relatively nonvolatile compound) total ambient signal (grey) is compared to the particle-phase signal (black) over the 11-day summer focus period. Here we observe that the large gas-phase subtractions from pentadecane results in an unreliable particle-phase timeline. Nonadecane is the smallest alkane to retain reliable particle-phase variability. Relatively little gas-phase signal is subtracted from the less volatile alkanes (e.g., tricosane).

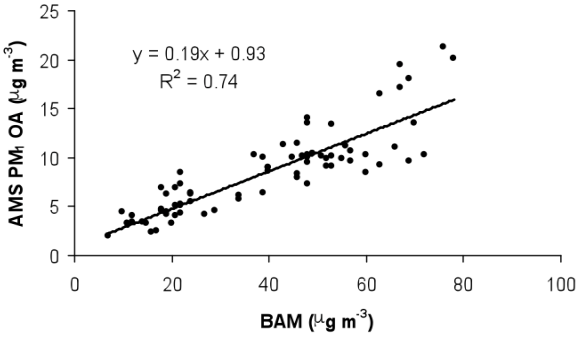

Fig. S3. Relationship between fall AMS PM_1 OA data (acquired in Riverside, CA), and BAM total $PM_{2.5}$ data (acquired in Rubidoux, CA, 10km from Riverside, CA) between Nov. 4-14, 2005. Data points that are greater than or less than one standard deviation from the mean of the ratio (BAM $PM_{2.5}$ / AMS PM_1 OA), have been excluded to filter out local events that do not impact the other site.

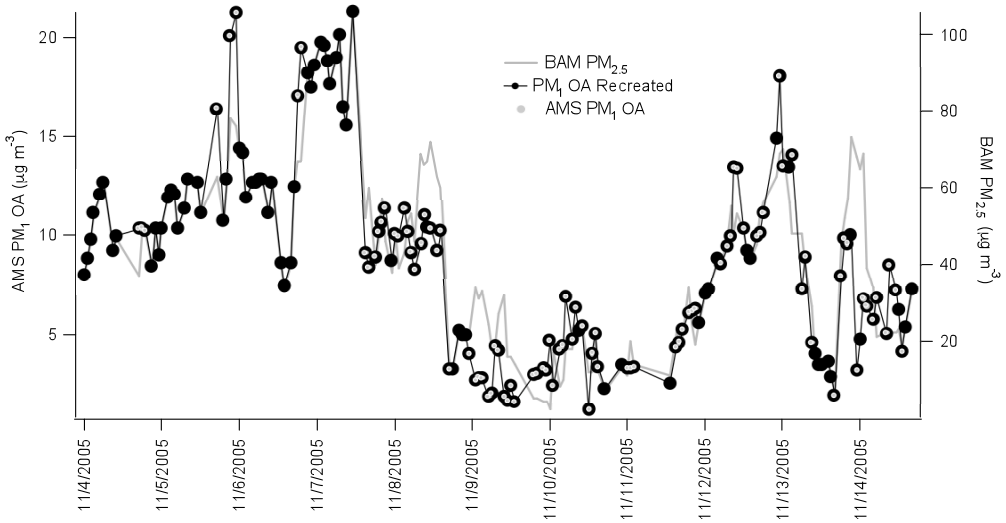

Fig. S4. Reconstruction of fall PM_1 OA at Riverside, CA. The light-shaded grey line is BAM $PM_{2.5}$ data collected in Rubidoux, CA (scale on secondary y-axis), the light-shaded circles are AMS PM_1 OA data collected in Riverside, CA (scale on primary y-axis). The black points are the reconstructed PM_1 OA, as described in the text.

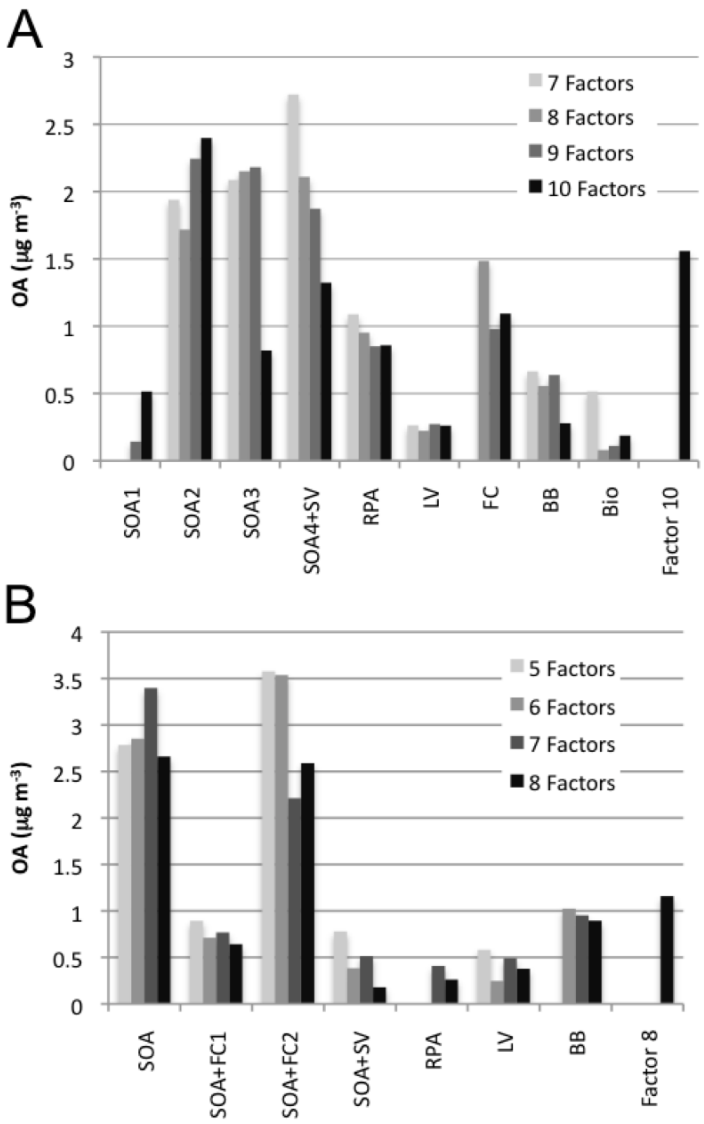

Fig. S5. Optional PMF solutions. A) Comparison amongst 7, 8, 9, and 10 factor PMF solutions for the summer focus period. The 7 factor solution does not resolve the SOA1 or FC components. The 8 factor solution does not resolve the SOA1 component. The 9 factor solution is discussed in great detail in the manuscript, and the 10 factor solution removes OA mass contributions from SOA3 and SOA4+SV while producing a 10th unknown component. B) Comparison amongst 5, 6, 7, and 8 factor PMF solutions for the fall focus period. The 5 factor solution does not resolve the RPA and BB component. The 6 factor solution does not resolve the RPA component, which matches the same component that was observed in the summer period. The 7 factor solution is discussed in great detail in the manuscript, and the 8 factor solution produces an 8th unknown component.

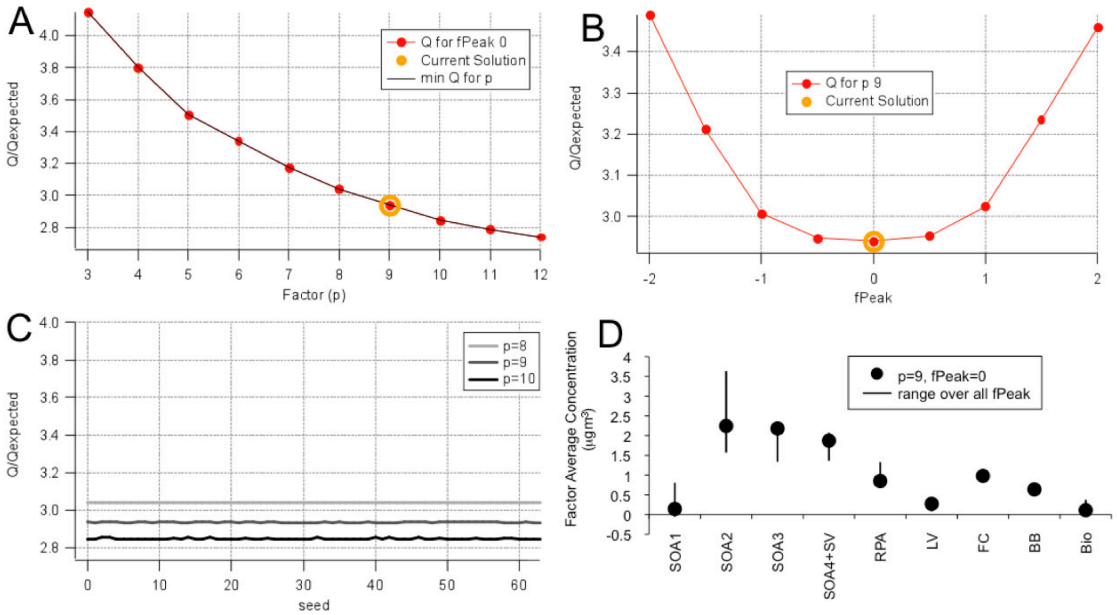

Fig. S6. Summer PMF results. A) Q/Q_{exp} values (y-axis) for 3 to 12 factors (x-axis). The chosen solution (9 factors) has a value of 2.9. B) Varying fpeak (x-axis) between ± 2 in increments of 0.5 displays a minimum Q/Q_{exp} at fpeak = 0. C) Using over 60 seeds (starting points) produces identical Q/Q_{exp} values for all solutions of the 9 factor case (p=9). Some fluctuation is observed when going to 10 factors. D) Solutions for 9-factor case, with various rotations (fPeak = -1, -0.5, 0, 0.5, 1). The same factors are found through all rotations, with some redistribution of mass amongst SOA factors.

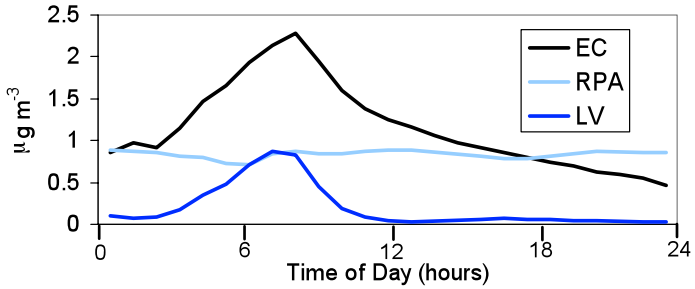

Fig. S7. Diurnal profiles of summer PMF components with vehicular influence (LV and RPA) as well as elemental carbon (EC). EC has an elevated nighttime baseline similar to RPA and a morning maximum like LV. It is suggested that EC is present in both particle types.

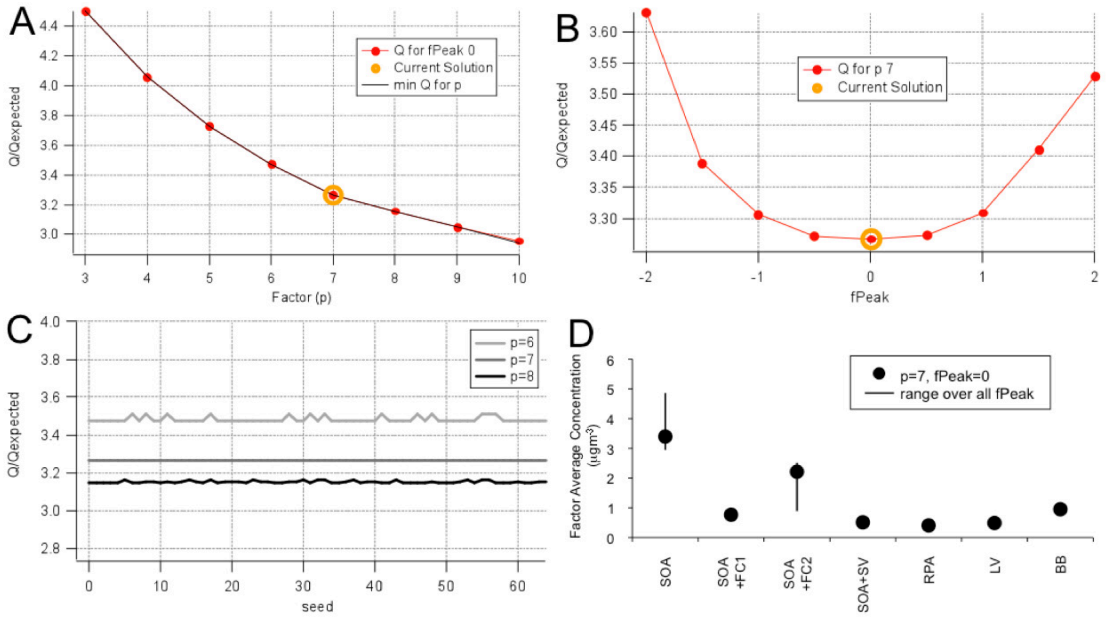

Fig. S8. Fall PMF results. A) Q/Q_{exp} values (y-axis) for 3 to 10 factors (x-axis). The chosen solution (7 factors) has a value of 3.3. B) Varying fpeak (x-axis) between ± 2 in increments of 0.5 displays a minimum Q/Q_{exp} at fpeak = 0. C) Using over 60 seeds (starting points) produces identical Q/Q_{exp} values for all solutions of the 7 factor case (p=7). Some fluctuation is observed when going to fewer factors (p=6). D) Solutions for 7-factor case, with various rotations (fPeak = -1, -0.5, 0, 0.5, 1). The same factors are found through all rotations, with some redistribution of mass between SOA and SOA+FC2.

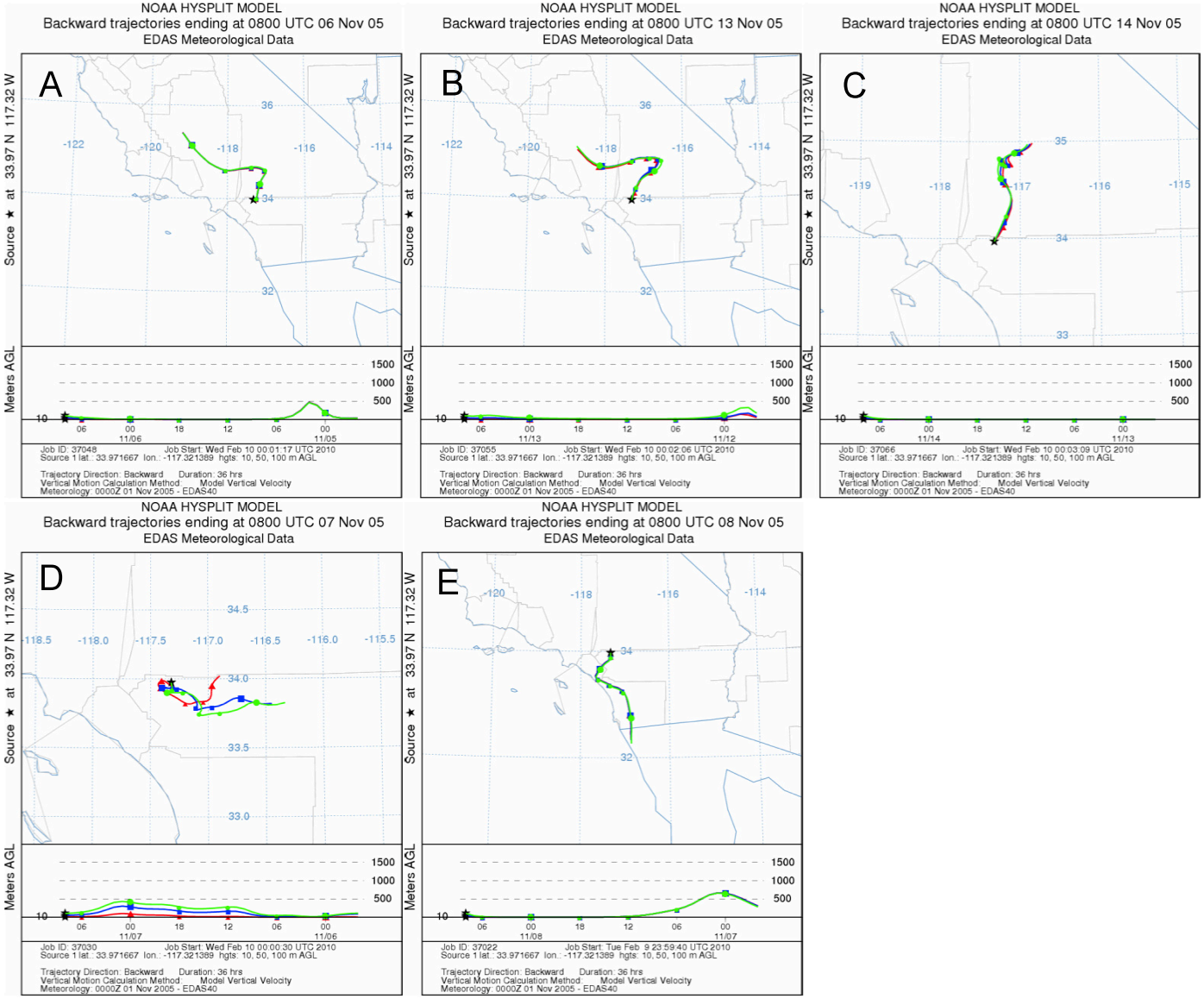

Fig. S9. 36-hour backward trajectories ending at Riverside, CA (black star). Air at 3 altitudes, 10m (red), 50m (blue), 100m (green), are arriving from the same locations. Figures A-C are times with large influence from SOA+FC1, and Fig. D, E are times with large influence from SOA+FC2. A) Backward trajectory of air arriving at 08:00 UTC (00:00 PST) November 6, 2005. B) Backward trajectory of air arriving at 08:00 UTC (00:00 PST) November 13, 2005. C) Backward trajectory of air arriving at 08:00 UTC (00:00 PST) November 14, 2005. D) Backward trajectory of air arriving at 08:00 UTC (00:00 PST) November 7, 2005. E) Backward trajectory of air arriving at 08:00 UTC (00:00 PST) November 8, 2005.

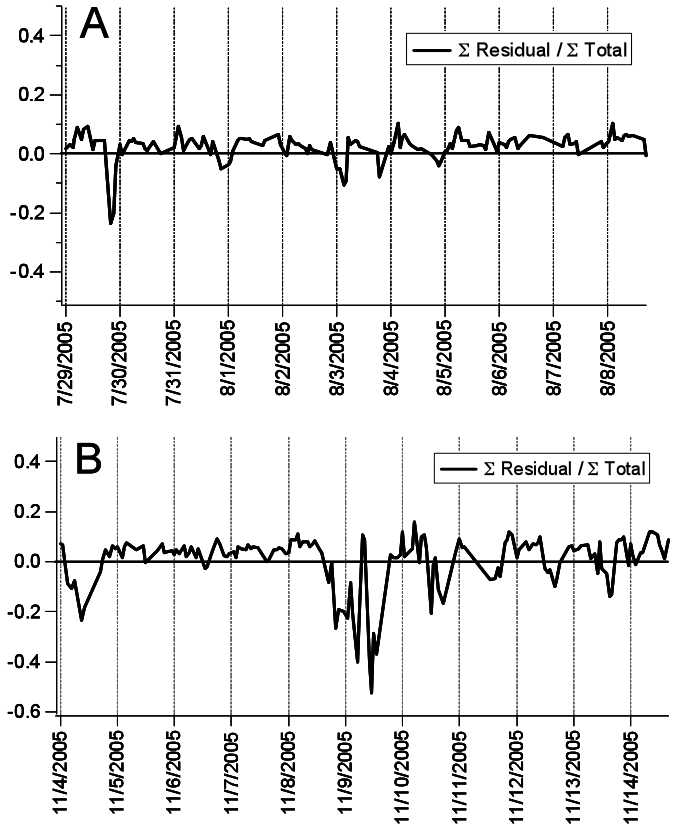

Fig. S10. PMF residuals as fraction of total, which represents the fraction of the summed signal from TAG compounds that was left under-explained (positive values) or was over-explained (negative values). A) Summer PMF residual timeseries. Average residual value is 3 ± 4 % of total signal. B) Fall PMF residual timeseries. Average residual value is 1 ± 11 % of the total signal.

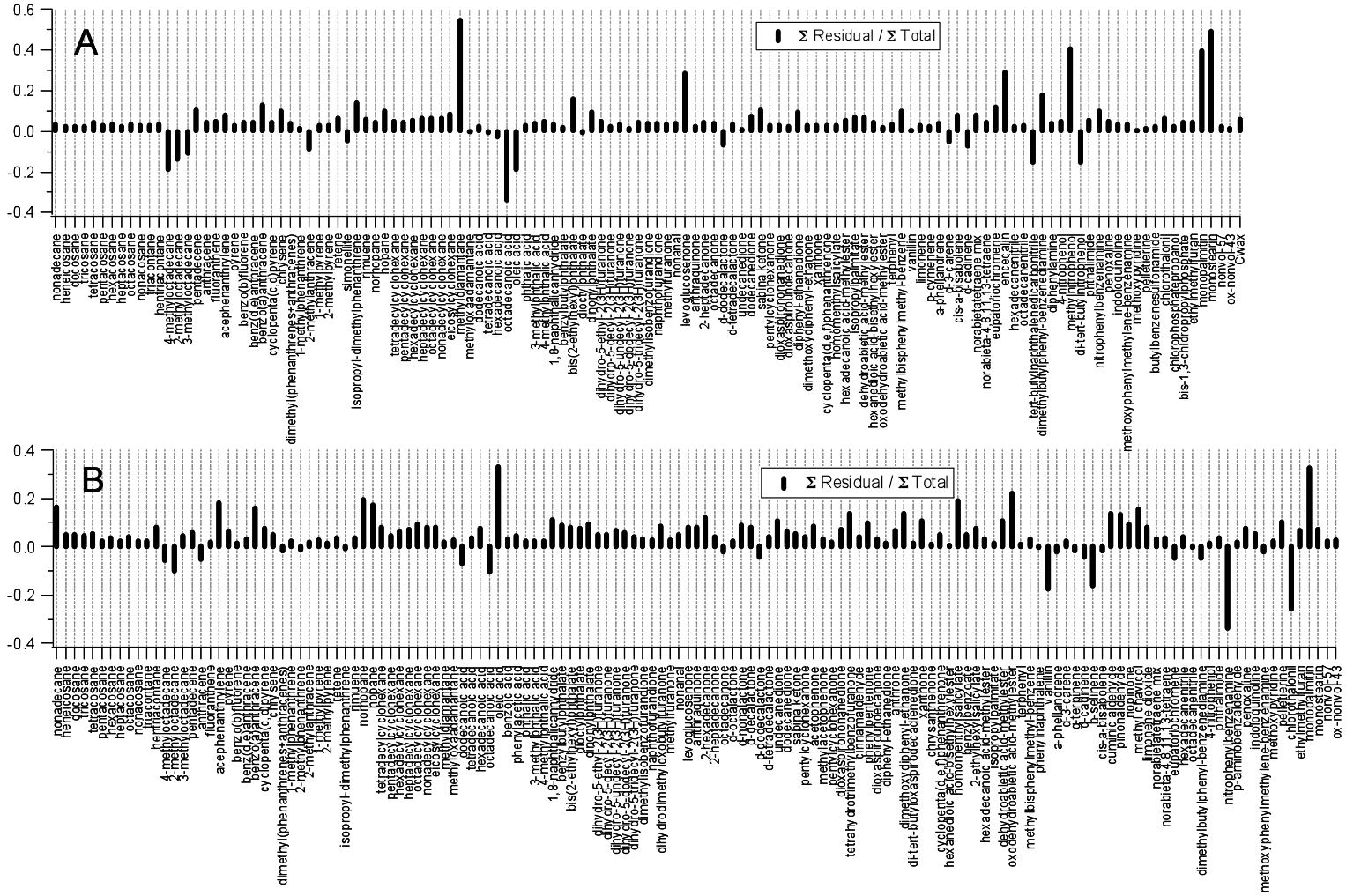

Fig. S11. PMF residual profiles, as fraction of total, which represents the fraction of the signal from TAG compounds that was left under-explained or was over-explained. A) Summer PMF residual profile. Most species are slightly under-explained. B) Fall PMF residual profile. Most species are slightly under-explained.