west virginia department of environmental protection

Appendix E-8

USEPA 2028 Model Projections of Visibility Impairing Species at VISTAS Class I Areas for 20% Most Impaired Days

West Virginia Division of Air Quality
601 57th Street, SE
Charleston, WV 25304

Promoting a healthy environment.

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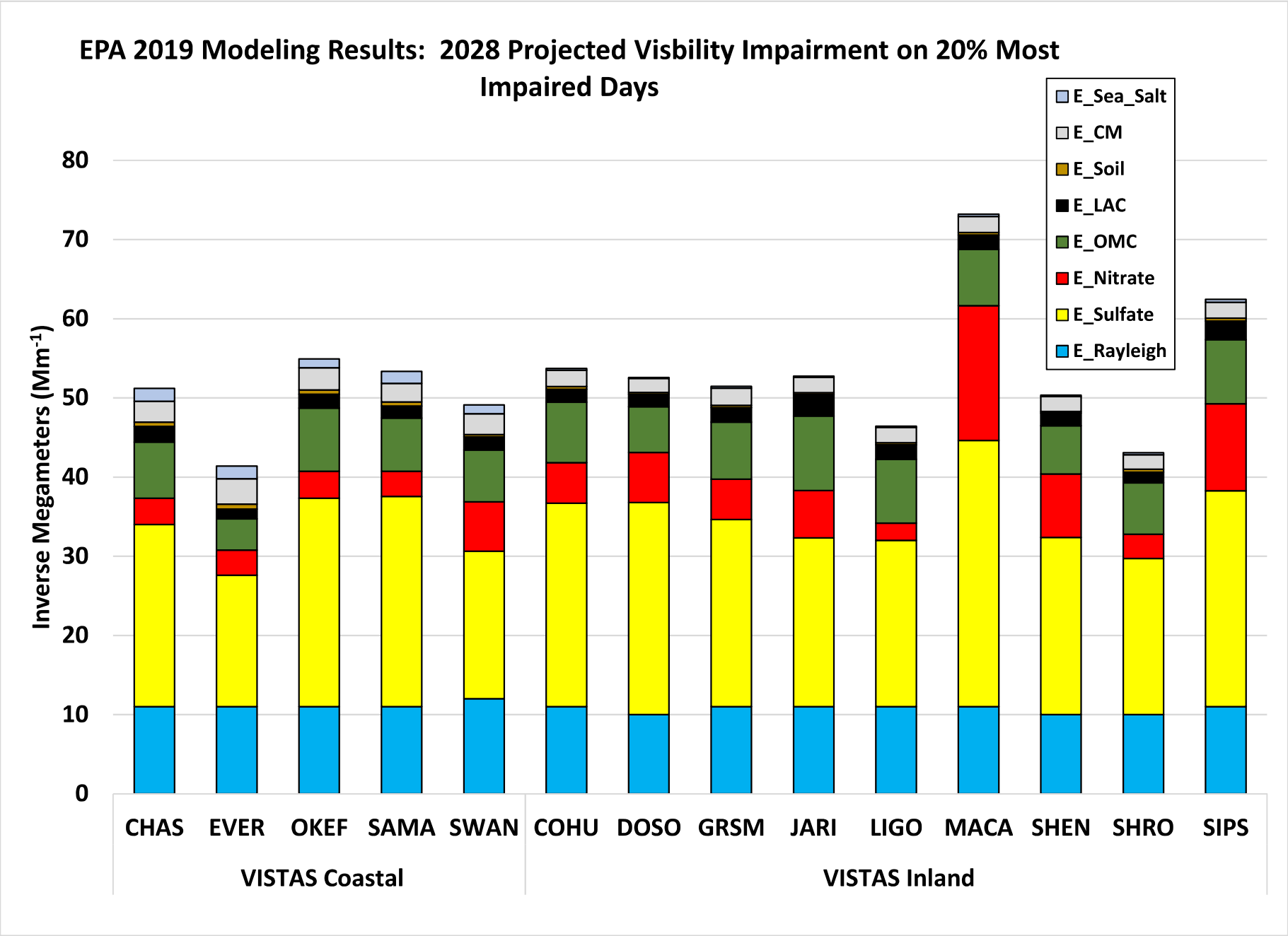
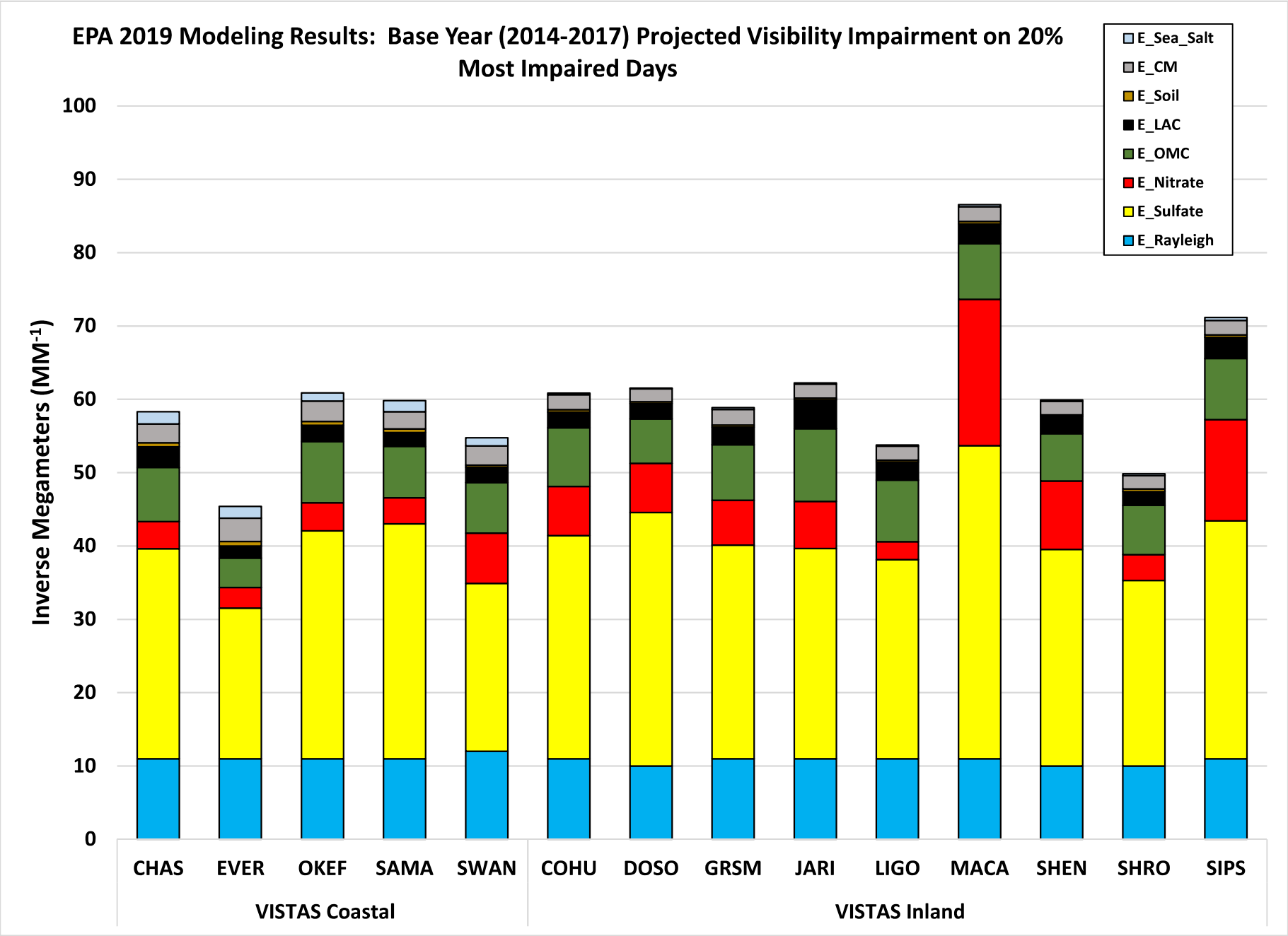


SMAT 2028 Bulk- EPA 2019 Modeling with graphics.xlsx-2028 20perMI

Row Labels	E_Rayleigh	E_Sulfate	E_Nitrate	E_OMC	E_LAC	E_Soil	E_CM	E_Sea_Salt
VISTAS Coastal								
CHAS	11	23.00	3.32	7.09	2.00	0.55	2.61	1.65
EVER	11	16.60	3.17	3.96	1.23	0.62	3.21	1.59
OKEF	11	26.34	3.40	7.99	1.75	0.53	2.81	1.12
SAMA	11	26.55	3.18	6.71	1.54	0.50	2.35	1.51
SWAN	12	18.64	6.24	6.55	1.65	0.29	2.65	1.12
VISTAS Inland								
COHU	11	25.69	5.13	7.64	1.62	0.35	2.07	0.21
DOSO	10	26.78	6.33	5.77	1.57	0.25	1.77	0.12
GRSM	11	23.64	5.08	7.22	1.81	0.29	2.18	0.23
JARI	11	21.33	5.98	9.40	2.71	0.25	1.94	0.14
LIGO	11	21.00	2.19	8.06	1.83	0.25	1.96	0.15
MACA	11	33.63	17.01	7.11	1.81	0.32	2.03	0.29
SHEN	10	22.38	8.00	6.10	1.59	0.22	1.87	0.19
SHRO	10	19.72	3.07	6.47	1.37	0.36	1.84	0.24
SIPS	11	27.26	10.99	8.11	2.34	0.36	2.01	0.37



SMAT 2028 Bulk- EPA 2019 Modeling with graphics.xlsx-2016 20per MI chart

Row Labels	E_Rayleigh	E_Sulfate	E_Nitrate	E_OMC	E_LAC	E_Soil	E_CM	E_Sea_Salt
VISTAS Coastal								
CHAS	11	28.63	3.69	7.39	2.83	0.54	2.59	1.65
EVER	11	20.54	2.80	4.01	1.66	0.59	3.20	1.59
OKEF	11	31.06	3.85	8.34	2.22	0.52	2.78	1.12
SAMA	11	32.04	3.54	7.00	1.91	0.49	2.33	1.51
SWAN	12	22.91	6.84	6.89	2.10	0.28	2.63	1.12
VISTAS Inland								
COHU	11	30.41	6.71	8.02	2.11	0.34	2.06	0.21
DOSO	10	34.58	6.70	6.04	2.12	0.25	1.73	0.12
GRSM	11	29.12	6.13	7.56	2.40	0.28	2.14	0.23
JARI	11	28.65	6.43	9.93	3.92	0.24	1.92	0.14
LIGO	11	27.15	2.43	8.40	2.46	0.24	1.93	0.15
MACA	11	42.69	19.94	7.59	2.70	0.33	2.01	0.29
SHEN	10	29.53	9.33	6.45	2.35	0.21	1.84	0.19
SHRO	10	25.31	3.52	6.74	1.85	0.36	1.82	0.24
SIPS	11	32.43	13.79	8.35	2.87	0.35	1.98	0.37

site_id	ss_Rayleigh	E_amm_so4_g90_b	E_amm_no3_g90_b	E_omc_g90_b	E_ec_g90_b	E_crustal_g90_b	E_cm_g90_b	E_sea_salt_g90_b	tbext_g90_b	E_amm_so4_g90_f	E_amm_no3_g90_f	E_omc_g90_f	E_ec_g90_f	E_crustal_g90_f	E_cm_g90_f	E_sea_salt_g90_f	tbext_g90_f
ACAD	12	16.72	5.13	6.45	1.81	0.18	1.99	1.42	45.69	13.57	5.22	5.97	1.34	0.18	2.03	1.42	41.73
AGTI	11	13.44	11.06	6.10	2.09	0.61	6.30	1.42	52.02	12.72	7.76	5.91	1.76	0.64	6.49	1.42	47.70
ALLA	11	9.12	7.45	6.06	1.75	0.19	1.09	0.38	37.05	8.87	5.94	5.87	1.37	0.20	1.11	0.38	34.75
ANAC	10	4.28	0.72	4.53	0.95	0.43	1.47	0.03	22.41	4.19	0.68	4.46	0.86	0.43	1.49	0.03	22.15
ANAD	9	6.81	4.17	5.98	1.20	0.79	3.04	0.21	31.20	6.68	3.23	5.85	1.10	0.79	3.06	0.21	29.93
ARCH	9	3.90	2.31	2.16	0.73	0.40	1.43	0.06	19.98	3.70	2.21	2.09	0.59	0.40	1.44	0.06	19.48
BADL	11	10.90	5.59	3.49	1.06	0.49	1.89	0.06	34.48	9.89	5.35	3.37	0.82	0.50	1.91	0.06	32.90
BALD	9	5.47	0.61	3.09	0.78	0.45	1.53	0.04	20.97	4.86	0.62	3.08	0.70	0.46	1.54	0.04	20.30
BAND	9	5.79	1.85	3.48	0.96	0.47	1.87	0.03	23.46	5.55	1.67	3.39	0.71	0.48	1.88	0.03	22.72
BIBE	10	20.57	1.10	4.63	1.46	0.90	3.68	0.10	42.45	19.58	1.14	4.71	1.42	0.93	3.74	0.10	41.63
BLCA	9	4.04	0.56	3.30	0.91	0.43	1.37	0.02	19.64	3.84	0.53	3.26	0.80	0.44	1.37	0.02	19.28
BOAP	10	5.90	2.45	4.74	1.53	0.63	3.19	0.14	28.57	5.82	2.09	4.70	1.36	0.64	3.20	0.14	27.95
BOMA	10	3.67	0.69	8.61	1.60	0.38	1.24	0.02	26.22	3.57	0.63	8.47	1.48	0.39	1.25	0.02	25.81
BOWA	11	12.72	13.16	4.07	1.36	0.20	1.54	0.16	44.21	11.59	10.67	3.83	1.13	0.20	1.55	0.16	40.13
BRET2	11	38.90	5.80	6.38	3.09	0.60	3.25	1.21	70.23	34.08	5.47	6.21	2.08	0.62	3.29	1.21	63.95
BRID	9	3.88	0.85	3.32	0.63	0.50	1.37	0.03	19.57	3.70	0.81	3.29	0.56	0.50	1.38	0.03	19.27
BRIG	12	26.00	20.73	9.76	3.95	0.29	5.18	1.17	79.08	19.79	18.42	9.13	2.61	0.30	5.26	1.17	68.67
CABI	10	4.44	1.13	8.20	1.50	0.43	1.37	0.06	27.12	4.33	1.05	8.09	1.43	0.44	1.38	0.06	26.78
CACR	11	31.23	8.94	8.36	2.23	0.55	2.88	0.47	65.66	23.53	7.56	8.10	1.80	0.59	2.92	0.47	55.96
CANY	9	3.90	2.31	2.16	0.73	0.40	1.43	0.06	19.98	3.70	2.21	2.09	0.59	0.40	1.44	0.06	19.48
CAPI	9	4.22	1.90	2.30	0.76	0.49	1.74	0.06	20.46	4.02	1.84	2.26	0.66	0.49	1.75	0.06	20.06
CARI	10	5.62	1.59	6.33	1.37	0.55	2.22	0.11	27.79	5.49	1.31	6.20	1.23	0.56	2.23	0.11	27.13
CAVE	9	14.87	1.59	3.57	1.01	1.53	4.38	0.09	36.03	14.33	1.56	3.58	0.91	1.56	4.42	0.09	35.46
CHAS	11	28.63	3.69	7.39	2.83	0.54	2.59	1.65	58.30	23.00	3.32	7.09	2.00	0.55	2.61	1.65	51.21
CHIR	10	7.69	0.81	2.59	0.81	0.65	3.26	0.05	25.86	6.55	0.80	2.60	0.73	0.67	3.29	0.05	24.69
CHIW	10	7.69	0.81	2.59	0.81	0.65	3.26	0.05	25.86	6.55	0.80	2.60	0.73	0.67	3.29	0.05	24.69
COHU	11	30.41	6.71	8.02	2.11	0.34	2.06	0.21	60.84	25.69	5.13	7.64	1.62	0.35	2.07	0.21	53.71
CRLA	9	6.40	1.18	4.01	1.23	0.48	1.00	0.16	23.47	6.31	1.09	3.94	1.13	0.48	1.01	0.16	23.12
CRMO	10	3.70	6.00	2.28	0.65	0.31	1.14	0.23	24.31	3.64	5.20	2.22	0.55	0.31	1.15	0.23	23.30
CUCA	9	7.85	11.50	4.72	1.38	0.58	3.77	0.61	39.41	7.74	8.09	4.66	1.10	0.58	3.81	0.61	35.59
DESO	9	4.86	1.14	6.78	1.36	0.57	2.02	0.07	25.80	4.76	0.97	6.61	1.26	0.57	2.03	0.07	25.28
DIPE	9	6.40	1.18	4.01	1.23	0.48	1.00	0.16	23.47	6.31	1.09	3.94	1.13	0.48	1.01	0.16	23.12
DOME	10	9.37	8.46	7.81	1.66	0.97	7.83	0.22	46.31	9.23	5.83	7.72	1.57	0.98	7.87	0.22	43.41

site_id	ss_Rayleigh	E_amm_so4_g90_b	E_amm_no3_g90_b	E_omc_g90_b	E_ec_g90_b	E_crustal_g90_b	E_cm_g90_b	E_sea_salt_g90_b	tbext_g90_b	E_amm_so4_g90_f	E_amm_no3_g90_f	E_omc_g90_f	E_ec_g90_f	E_crustal_g90_f	E_cm_g90_f	E_sea_salt_g90_f	tbext_g90_f
DOSO	10	34.58	6.70	6.04	2.12	0.25	1.73	0.12	61.54	26.78	6.33	5.77	1.57	0.25	1.77	0.12	52.59
EACA	10	6.35	8.66	4.73	1.28	0.30	1.17	0.15	32.64	6.20	7.47	4.61	1.12	0.30	1.18	0.15	31.03
EANE	8	3.54	0.87	1.88	0.63	0.59	1.00	0.05	16.57	3.35	0.86	1.86	0.55	0.60	1.01	0.05	16.27
EMIG	10	7.10	2.53	7.45	1.37	0.64	3.24	0.16	32.48	6.96	2.28	7.32	1.29	0.64	3.26	0.16	31.90
EVER	11	20.54	2.80	4.01	1.66	0.59	3.20	1.59	45.39	16.60	3.17	3.96	1.23	0.62	3.21	1.59	41.39
FITZ	9	3.88	0.85	3.32	0.63	0.50	1.37	0.03	19.57	3.70	0.81	3.29	0.56	0.50	1.38	0.03	19.27
FLTO	8	3.54	0.87	1.88	0.63	0.59	1.00	0.05	16.57	3.35	0.86	1.86	0.55	0.60	1.01	0.05	16.27
GALI	10	7.69	0.81	2.59	0.81	0.65	3.26	0.05	25.86	6.55	0.80	2.60	0.73	0.67	3.29	0.05	24.69
GAMO	9	3.93	1.07	4.65	0.87	0.43	1.18	0.03	21.15	3.83	1.14	4.59	0.78	0.44	1.19	0.03	20.99
GEMO	9	6.40	1.18	4.01	1.23	0.48	1.00	0.16	23.47	6.31	1.09	3.94	1.13	0.48	1.01	0.16	23.12
GICL	9	5.69	0.53	3.50	0.80	0.43	1.54	0.03	21.53	5.13	0.53	3.47	0.71	0.44	1.55	0.03	20.86
GLAC	11	5.62	6.17	12.29	3.21	0.31	1.59	0.14	40.32	5.39	5.96	12.03	2.87	0.31	1.60	0.14	39.30
GLPE	11	8.99	1.91	3.74	0.85	0.24	1.24	0.38	28.36	8.83	1.63	3.63	0.69	0.25	1.26	0.38	27.68
GORO	10	6.86	1.43	2.61	0.65	0.28	0.93	0.24	23.00	6.73	1.24	2.56	0.59	0.29	0.93	0.24	22.58
GRCA	9	4.71	0.97	2.42	0.69	0.73	1.39	0.07	19.98	4.28	0.94	2.40	0.65	0.72	1.39	0.07	19.45
GRGU	11	17.27	2.61	5.29	1.59	0.17	1.54	0.19	39.66	14.01	2.61	4.88	1.19	0.18	1.58	0.19	35.63
GRSA	9	4.27	1.14	4.62	1.22	0.54	1.56	0.02	22.37	4.04	1.12	4.56	1.06	0.55	1.57	0.02	21.91
GRSM	11	29.12	6.13	7.56	2.40	0.28	2.14	0.23	58.87	23.64	5.08	7.22	1.81	0.29	2.18	0.23	51.47
GRTE	9	3.51	0.98	5.18	0.99	0.42	1.37	0.07	21.52	3.41	0.92	5.12	0.91	0.43	1.38	0.07	21.24
GUMO	9	14.87	1.59	3.57	1.01	1.53	4.38	0.09	36.03	14.33	1.56	3.58	0.91	1.56	4.42	0.09	35.46
HECA	11	5.02	14.31	6.15	1.52	0.28	1.23	0.22	39.73	4.92	12.15	6.02	1.33	0.28	1.24	0.22	37.17
HEGL	11	26.50	16.05	8.07	2.60	0.38	2.84	0.30	67.75	21.37	13.36	7.73	2.17	0.38	2.86	0.30	59.18
HOOV	9	4.44	1.17	4.48	0.86	0.75	1.67	0.07	22.44	4.34	1.05	4.44	0.79	0.75	1.68	0.07	22.12
ISLE	12	16.49	16.50	4.54	1.67	0.18	1.84	0.21	53.43	14.73	13.99	4.27	1.33	0.19	1.85	0.21	48.56
JARB	10	3.98	0.67	3.56	0.69	1.02	2.51	0.03	22.47	3.91	0.64	3.53	0.62	1.02	2.52	0.03	22.27
JARI	11	28.65	6.43	9.93	3.92	0.24	1.92	0.14	62.22	21.33	5.98	9.40	2.71	0.25	1.94	0.14	52.75
JOMU	9	6.81	4.17	5.98	1.20	0.79	3.04	0.21	31.20	6.68	3.23	5.85	1.10	0.79	3.06	0.21	29.93
JOSH	10	7.65	7.24	4.37	1.34	0.90	5.21	0.41	37.14	7.43	5.92	4.32	1.18	0.93	5.32	0.41	35.50
JOYC	11	29.12	6.13	7.56	2.40	0.28	2.14	0.23	58.87	23.64	5.08	7.22	1.81	0.29	2.18	0.23	51.47
KAIS	9	6.81	4.17	5.98	1.20	0.79	3.04	0.21	31.20	6.68	3.23	5.85	1.10	0.79	3.06	0.21	29.93
KALM	12	7.12	1.86	7.58	1.39	0.25	1.54	1.71	33.46	6.91	1.75	7.41	1.26	0.25	1.54	1.71	32.83
KICA	11	12.91	21.27	13.51	2.53	0.69	5.30	0.39	67.59	12.74	12.39	13.21	2.21	0.69	5.34	0.39	57.97
LABE	10	5.60	1.73	6.41	1.19	0.52	1.76	0.09	27.30	5.47	1.50	6.30	1.10	0.52	1.76	0.09	26.75

site_id	ss_Rayleigh	E_amm_so4_g90_b	E_amm_no3_g90_b	E_omc_g90_b	E_ec_g90_b	E_crustal_g90_b	E_cm_g90_b	E_sea_salt_g90_b	tbext_g90_b	E_amm_so4_g90_f	E_amm_no3_g90_f	E_omc_g90_f	E_ec_g90_f	E_crustal_g90_f	E_cm_g90_f	E_sea_salt_g90_f	tbext_g90_f
LAGA	9	4.04	0.56	3.30	0.91	0.43	1.37	0.02	19.64	3.84	0.53	3.26	0.80	0.44	1.37	0.02	19.28
LAVO	10	5.62	1.59	6.33	1.37	0.55	2.22	0.11	27.79	5.49	1.31	6.20	1.23	0.56	2.23	0.11	27.13
LIGO	11	27.15	2.43	8.40	2.46	0.24	1.93	0.15	53.77	21.00	2.19	8.06	1.83	0.25	1.96	0.15	46.43
LOST	11	14.07	17.62	2.97	1.84	0.24	1.67	0.23	49.63	12.65	17.65	2.87	1.31	0.25	1.65	0.23	47.61
LYBR2	11	16.55	9.82	4.83	1.85	0.19	1.44	0.28	45.96	13.68	9.60	4.40	1.38	0.20	1.48	0.28	42.03
MABE	8	3.54	0.87	1.88	0.63	0.59	1.00	0.05	16.57	3.35	0.86	1.86	0.55	0.60	1.01	0.05	16.27
MACA	11	42.69	19.94	7.59	2.70	0.33	2.01	0.29	86.56	33.63	17.01	7.11	1.81	0.32	2.03	0.29	73.20
MAZA	10	5.65	1.94	3.29	1.05	0.73	2.94	0.15	25.75	5.06	1.90	3.24	0.86	0.74	2.97	0.15	24.91
MELA	11	13.29	14.93	2.62	1.33	0.29	2.00	0.11	45.57	13.24	13.87	2.57	1.01	0.30	2.01	0.11	44.12
MEVE	9	4.72	1.05	2.35	0.61	0.41	1.32	0.02	19.47	4.45	1.00	2.29	0.50	0.42	1.33	0.02	19.01
MIMO	10	3.67	0.69	8.61	1.60	0.38	1.24	0.02	26.22	3.57	0.63	8.47	1.48	0.39	1.25	0.02	25.81
MING	12	30.95	19.26	9.01	3.14	0.42	3.15	0.31	78.24	25.43	16.48	8.52	2.45	0.41	3.15	0.31	68.76
MOHO	10	7.05	2.54	3.34	0.86	0.33	1.27	0.44	25.84	6.81	2.11	3.29	0.80	0.33	1.28	0.44	25.05
MOJE	11	8.35	1.45	6.60	1.34	0.46	2.55	0.18	31.93	8.15	1.28	6.50	1.27	0.47	2.57	0.18	31.41
MOKE	9	4.86	1.14	6.78	1.36	0.57	2.02	0.07	25.80	4.76	0.97	6.61	1.26	0.57	2.03	0.07	25.28
MOLA	9	6.40	1.18	4.01	1.23	0.48	1.00	0.16	23.47	6.31	1.09	3.94	1.13	0.48	1.01	0.16	23.12
MOOS	12	15.10	3.38	4.97	1.46	0.16	1.33	0.95	39.34	13.31	3.48	4.55	1.12	0.16	1.38	0.95	36.95
MORA	11	10.65	2.34	7.43	2.16	0.23	1.81	0.28	35.91	10.18	1.95	7.19	1.71	0.23	1.85	0.28	34.40
MOWA	11	8.35	1.45	6.60	1.34	0.46	2.55	0.18	31.93	8.15	1.28	6.50	1.27	0.47	2.57	0.18	31.41
MOZI	8	4.01	1.14	2.15	0.55	0.47	1.04	0.02	17.37	3.82	1.09	2.11	0.46	0.49	1.04	0.02	17.04
NOAB	9	3.90	0.90	3.99	0.71	0.48	1.42	0.01	20.42	3.76	0.87	3.94	0.63	0.49	1.43	0.01	20.14
NOCA	11	8.99	1.91	3.74	0.85	0.24	1.24	0.38	28.36	8.83	1.63	3.63	0.69	0.25	1.26	0.38	27.68
OKEF	11	31.06	3.85	8.34	2.22	0.52	2.78	1.12	60.89	26.34	3.40	7.99	1.75	0.53	2.81	1.12	54.93
OLYM	11	10.48	4.29	4.34	1.08	0.17	1.27	0.81	33.44	10.38	3.59	4.30	0.91	0.17	1.31	0.81	32.48
OTCR	10	34.58	6.70	6.04	2.12	0.25	1.73	0.12	61.54	26.78	6.33	5.77	1.57	0.25	1.77	0.12	52.59
PASA	10	6.00	2.16	4.99	1.02	0.41	1.39	0.10	26.06	5.84	1.89	4.89	0.90	0.42	1.40	0.10	25.44
PEFO	9	5.03	1.07	3.19	1.41	0.69	2.65	0.05	23.10	4.67	1.00	3.13	1.18	0.70	2.68	0.05	22.41
PIMO	10	5.65	1.94	3.29	1.05	0.73	2.94	0.15	25.75	5.06	1.90	3.24	0.86	0.74	2.97	0.15	24.91
PINN	11	8.67	8.05	7.00	2.10	0.42	3.98	1.11	42.33	8.51	5.45	6.88	1.81	0.43	4.01	1.11	39.20
PRRA	11	17.27	2.61	5.29	1.59	0.17	1.54	0.19	39.66	14.01	2.61	4.88	1.19	0.18	1.58	0.19	35.63
RAFA	10	10.95	6.99	5.17	1.01	0.61	5.63	1.18	41.53	10.82	4.65	5.08	0.93	0.61	5.67	1.18	38.94
RAWA	8	4.01	1.14	2.15	0.55	0.47	1.04	0.02	17.37	3.82	1.09	2.11	0.46	0.49	1.04	0.02	17.04
REDR	9	3.51	0.98	5.18	0.99	0.42	1.37	0.07	21.52	3.41	0.92	5.12	0.91	0.43	1.38	0.07	21.24

site_id	ss_Rayleigh	E_amm_so4_g90_b	E_amm_no3_g90_b	E_omc_g90_b	E_ec_g90_b	E_crustal_g90_b	E_cm_g90_b	E_sea_salt_g90_b	tbext_g90_b	E_amm_so4_g90_f	E_amm_no3_g90_f	E_omc_g90_f	E_ec_g90_f	E_crustal_g90_f	E_cm_g90_f	E_sea_salt_g90_f	tbext_g90_f
REDW	11	11.14	2.63	2.83	0.43	0.11	2.23	6.65	37.02	10.88	2.26	2.80	0.38	0.12	2.24	6.65	36.32
ROCA	12	15.10	3.38	4.97	1.46	0.16	1.33	0.95	39.34	13.31	3.48	4.55	1.12	0.16	1.38	0.95	36.95
ROMA	12	29.33	3.87	8.56	2.34	0.50	3.44	1.28	61.33	24.38	3.69	8.30	1.75	0.52	3.50	1.28	55.42
ROMO	9	4.60	3.48	3.88	1.07	0.50	1.51	0.04	24.08	4.23	3.08	3.78	0.82	0.50	1.53	0.04	22.98
SACR	10	14.25	7.96	4.79	1.83	1.03	6.24	0.30	46.39	13.23	6.87	4.74	1.36	1.05	6.27	0.30	43.81
SAGA	9	7.85	11.50	4.72	1.38	0.58	3.77	0.61	39.41	7.74	8.09	4.66	1.10	0.58	3.81	0.61	35.59
SAGO	10	6.40	15.53	5.32	1.75	0.65	3.69	0.52	43.86	6.33	10.25	5.26	1.45	0.66	3.74	0.52	38.20
SAGU	10	6.93	1.97	3.47	1.41	1.25	4.68	0.18	29.90	5.98	1.82	3.38	1.06	1.26	4.70	0.18	28.38
SAJA	10	6.40	15.53	5.32	1.75	0.65	3.69	0.52	43.86	6.33	10.25	5.26	1.45	0.66	3.74	0.52	38.20
SAMA	11	32.04	3.54	7.00	1.91	0.49	2.33	1.51	59.82	26.55	3.18	6.71	1.54	0.50	2.35	1.51	53.35
SAPE	8	5.04	0.98	2.84	0.68	0.55	1.42	0.03	19.55	4.73	1.00	2.79	0.57	0.57	1.44	0.03	19.13
SAWT	10	3.01	0.44	7.32	1.24	0.49	1.10	0.02	23.61	2.93	0.41	7.22	1.10	0.49	1.11	0.02	23.29
SCAP	10	3.67	0.69	8.61	1.60	0.38	1.24	0.02	26.22	3.57	0.63	8.47	1.48	0.39	1.25	0.02	25.81
SELW	10	4.28	0.72	4.53	0.95	0.43	1.47	0.03	22.41	4.19	0.68	4.46	0.86	0.43	1.49	0.03	22.15
SENE	12	20.11	22.08	5.68	2.26	0.19	1.45	0.23	64.00	17.69	19.23	5.29	1.76	0.20	1.46	0.23	57.86
SEQU	11	12.91	21.27	13.51	2.53	0.69	5.30	0.39	67.59	12.74	12.39	13.21	2.21	0.69	5.34	0.39	57.97
SHEN	10	29.53	9.33	6.45	2.35	0.21	1.84	0.19	59.92	22.38	8.00	6.10	1.59	0.22	1.87	0.19	50.36
SHRO	10	25.31	3.52	6.74	1.85	0.36	1.82	0.24	49.84	19.72	3.07	6.47	1.37	0.36	1.84	0.24	43.07
SIPS	11	32.43	13.79	8.35	2.87	0.35	1.98	0.37	71.15	27.26	10.99	8.11	2.34	0.36	2.01	0.37	62.45
SOWA	10	5.60	1.73	6.41	1.19	0.52	1.76	0.09	27.30	5.47	1.50	6.30	1.10	0.52	1.76	0.09	26.75
STMO	10	6.35	8.66	4.73	1.28	0.30	1.17	0.15	32.64	6.20	7.47	4.61	1.12	0.30	1.18	0.15	31.03
SUPE	10	6.97	1.39	3.76	1.17	1.02	4.10	0.16	28.57	6.11	1.34	3.68	0.91	1.03	4.14	0.16	27.38
SWAN	12	22.91	6.84	6.89	2.10	0.28	2.63	1.12	54.77	18.64	6.24	6.55	1.65	0.29	2.65	1.12	49.13
SYCA2	9	4.32	0.91	6.17	2.40	3.49	7.13	0.11	33.52	4.04	0.89	6.08	2.16	3.51	7.17	0.11	32.96
TETO	9	3.51	0.98	5.18	0.99	0.42	1.37	0.07	21.52	3.41	0.92	5.12	0.91	0.43	1.38	0.07	21.24
THIS	11	8.35	1.45	6.60	1.34	0.46	2.55	0.18	31.93	8.15	1.28	6.50	1.27	0.47	2.57	0.18	31.41
THLA	10	5.62	1.59	6.33	1.37	0.55	2.22	0.11	27.79	5.49	1.31	6.20	1.23	0.56	2.23	0.11	27.13
THRO	11	11.91	9.88	2.47	1.13	0.28	2.24	0.14	39.04	11.29	8.75	2.38	0.83	0.28	2.26	0.14	36.93
ULBE	11	9.18	6.13	2.94	0.83	0.23	1.06	0.11	31.49	8.77	7.45	2.91	0.65	0.24	1.11	0.11	32.24
UPBU	11	27.14	11.95	8.08	2.22	0.53	2.36	0.39	63.68	21.61	10.32	7.83	1.89	0.55	2.38	0.39	55.97
VENT	11	8.67	8.05	7.00	2.10	0.42	3.98	1.11	42.33	8.51	5.45	6.88	1.81	0.43	4.01	1.11	39.20
VOYA	12	12.52	12.50	3.80	1.38	0.20	1.51	0.25	44.17	10.77	10.83	3.57	1.10	0.21	1.53	0.25	40.26
WASH	9	3.90	0.90	3.99	0.71	0.48	1.42	0.01	20.42	3.76	0.87	3.94	0.63	0.49	1.43	0.01	20.14

site_id	ss_Rayleigh	E_amm_so4_g90_b	E_amm_no3_g90_b	E_omc_g90_b	E_ec_g90_b	E_crustal_g90_b	E_cm_g90_b	E_sea_salt_g90_b	tbext_g90_b	E_amm_so4_g90_f	E_amm_no3_g90_f	E_omc_g90_f	E_ec_g90_f	E_crustal_g90_f	E_cm_g90_f	E_sea_salt_g90_f	tbext_g90_f
WEEL	8	3.54	0.87	1.88	0.63	0.59	1.00	0.05	16.57	3.35	0.86	1.86	0.55	0.60	1.01	0.05	16.27
WEMI	9	4.04	0.56	3.30	0.91	0.43	1.37	0.02	19.64	3.84	0.53	3.26	0.80	0.44	1.37	0.02	19.28
WHIT	9	8.44	2.07	3.70	0.98	0.76	3.03	0.14	28.12	8.14	1.95	3.68	0.81	0.78	3.05	0.14	27.56
WHPA	10	6.86	1.43	2.61	0.65	0.28	0.93	0.24	23.00	6.73	1.24	2.56	0.59	0.29	0.93	0.24	22.58
WICA	10	7.57	5.06	3.33	1.04	0.40	1.54	0.07	29.02	6.87	4.56	3.27	0.91	0.42	1.56	0.07	27.66
WIMO	11	22.85	14.95	6.93	2.40	0.58	4.21	0.33	63.26	18.41	12.88	6.79	1.81	0.60	4.24	0.33	56.07
WOLF	11	31.06	3.85	8.34	2.22	0.52	2.78	1.12	60.89	26.34	3.40	7.99	1.75	0.53	2.81	1.12	54.93
YELL	9	3.51	0.98	5.18	0.99	0.42	1.37	0.07	21.52	3.41	0.92	5.12	0.91	0.43	1.38	0.07	21.24
YOSE	10	7.10	2.53	7.45	1.37	0.64	3.24	0.16	32.48	6.96	2.28	7.32	1.29	0.64	3.26	0.16	31.90
ZION2	10	4.43	1.32	2.62	0.87	0.86	3.40	0.09	23.58	4.20	1.27	2.58	0.71	0.87	3.43	0.09	23.14

Column	Column Header	Column Description
A	site_id	Class I Area ID
B	type	unused
C	date	Base model year
D	monitor_gridcell	CAMx grid cell location of monitor
E	gridcell_lat	Latitude of grid cell centroid
F	gridcell_long	Longitude of grid cell centroid
G	monitor_lat	Latitude of IMPROVE monitor
H	monitor_long	Longitude of IMPROVE monitor
I	dv_best_b	2014-2017 IMPROVE deciviews 20% clearest days
J	dv_best_f	2028 projected deciviews 20% clearest days
K	dv_worst_b	2014-2017 IMPROVE deciviews 20% most impaired days
L	dv_worst_f	2028 projected deciviews 20% most impaired days
M	amm_so4_g10_b	2014-2017 observed total ammonium sulfate concentration- 20% clearest days (ug/m3)
N	s_amm_so4_g10_b	2014-2017 observed "small" ammonium sulfate concentration- 20% clearest days (ug/m3)
O	l_amm_so4_g10_b	2014-2017 observed "large" ammonium sulfate concentration- 20% clearest days (ug/m3)
P	amm_no3_g10_b	2014-2017 observed total ammonium nitrate concentration- 20% clearest days (ug/m3)
Q	s_amm_no3_g10_b	2014-2017 observed "small" ammonium nitrate concentration- 20% clearest days (ug/m3)
R	l_amm_no3_g10_b	2014-2017 observed "large" ammonium nitrate concentration- 20% clearest days (ug/m3)
S	omc_g10_b	2014-2017 observed total organic carbon mass concentration- 20% clearest days (ug/m3)
T	s_omc_g10_b	2014-2017 observed "small" organic carbon mass concentration- 20% clearest days (ug/m3)
U	l_omc_g10_b	2014-2017 observed "large" organic carbon mass concentration- 20% clearest days (ug/m3)
V	ec_g10_b	2014-2017 observed elemental carbon concentration- 20% clearest days (ug/m3)
W	crustal_g10_b	2014-2017 observed fine crustal mass concentration- 20% clearest days (ug/m3)
X	cm_g10_b	2014-2017 observed coarse mass concentration- 20% clearest days (ug/m3)
Y	sea_salt_g10_b	2014-2017 observed sea salt concentration- 20% clearest days (ug/m3)
Z	amm_so4_g90_b	2014-2017 observed total ammonium sulfate concentration- 20% most impaired days (ug/m3)
AA	s_amm_so4_g90_b	2014-2017 observed "small" ammonium sulfate concentration- 20% most impaired days (ug/m3)
AB	l_amm_so4_g90_b	2014-2017 observed "large" ammonium sulfate concentration- 20% most impaired days (ug/m3)
AC	amm_no3_g90_b	2014-2017 observed total ammonium nitrate concentration- 20% most impaired days (ug/m3)
AD	s_amm_no3_g90_b	2014-2017 observed "small" ammonium nitrate concentration- 20% most impaired days (ug/m3)
AE	l_amm_no3_g90_b	2014-2017 observed "large" ammonium nitrate concentration- 20% most impaired days (ug/m3)
AF	omc_g90_b	2014-2017 observed total organic carbon mass concentration- 20% most impaired days (ug/m3)
AG	s_omc_g90_b	2014-2017 observed "small" organic carbon mass concentration- 20% most impaired days (ug/m3)
AH	l_omc_g90_b	2014-2017 observed "large" organic carbon mass concentration- 20% most impaired days (ug/m3)
AI	ec_g90_b	2014-2017 observed elemental carbon concentration- 20% most impaired days (ug/m3)

Column	Column Header	Column Description
AJ	crustal_g90_b	2014-2017 observed fine crustal mass concentration- 20% most impaired days (ug/m3)
AK	cm_g90_b	2014-2017 observed coarse mass concentration- 20% most impaired days (ug/m3)
AL	sea_salt_g90_b	2014-2017 observed sea salt concentration- 20% most impaired days (ug/m3)
AM	ss_Rayleigh	Site specific Rayleigh scattering (Mm-1)
AN	E_amm_so4_g10_b	2014-2017 observed beta extinction (Mm-1) ammonium sulfate 20% clearest days
AO	E_amm_no3_g10_b	2014-2017 observed beta extinction (Mm-1) ammonium nitrate 20% clearest days
AP	E_omc_g10_b	2014-2017 observed beta extinction (Mm-1) organic carbon mass 20% clearest days
AQ	E_ec_g10_b	2014-2017 observed beta extinction (Mm-1) elemental carbon 20% clearest days
AR	E_crustal_g10_b	2014-2017 observed beta extinction (Mm-1) fine crustal 20% clearest days
AS	E_cm_g10_b	2014-2017 observed beta extinction (Mm-1) coarse mass 20% clearest days
AT	E_sea_salt_g10_b	2014-2017 observed beta extinction (Mm-1) sea salt 20% clearest days (observed IMPROVE data)
AU	tbext_g10_b	Total beta extinction (Mm-1) on the 20% clearest days (including Rayleigh)
AV	E_amm_so4_g90_b	2014-2017 observed beta extinction (Mm-1) ammonium sulfate 20% most impaired days
AW	E_amm_no3_g90_b	2014-2017 observed beta extinction (Mm-1) ammonium nitrate 20% most impaired days
AX	E_omc_g90_b	2014-2017 observed beta extinction (Mm-1) organic carbon mass 20% most impaired days
AY	E_ec_g90_b	2014-2017 observed beta extinction (Mm-1) elemental carbon 20% most impaired days
AZ	E_crustal_g90_b	2014-2017 observed beta extinction (Mm-1) fine crustal 20% most impaired days
BA	E_cm_g90_b	2014-2017 observed beta extinction (Mm-1) coarse mass 20% most impaired days
BB	E_sea_salt_g90_b	2014-2017 observed beta extinction (Mm-1) sea salt 20% most impaired days
BC	tbext_g90_b	2014-2017 observed total beta extinction (Mm-1) on the 20% most impaired days (including Rayleigh)
BC	amm_so4_g10_f	2028 total ammonium sulfate concentration- 20% clearest days (ug/m3)
BE	s_amm_so4_g10_f	2028 "small" ammonium sulfate concentration- 20% clearest days (ug/m3)
BF	l_amm_so4_g10_f	2028 "large" ammonium sulfate concentration- 20% clearest days (ug/m3)
BG	amm_no3_g10_f	2028 total ammonium nitrate concentration- 20% clearest days (ug/m3)
BH	s_amm_no3_g10_f	2028 "small" ammonium nitrate concentration- 20% clearest days (ug/m3)
BI	l_amm_no3_g10_f	2028 "large" ammonium nitrate concentration- 20% clearest days (ug/m3)
BJ	omc_g10_f	2028 total organic carbon mass concentration- 20% clearest days (ug/m3)
BK	s_omc_g10_f	2028 "small" organic carbon mass concentration- 20% clearest days (ug/m3)
BL	l_omc_g10_f	2028 "large" organic carbon mass concentration- 20% clearest days (ug/m3)
BM	ec_g10_f	2028 elemental carbon concentration- 20% clearest days (ug/m3)

Column	Column Header	Column Description
BN	crustal_g10_f	2028 fine crustal mass concentration- 20% clearest days (ug/m3)
BO	cm_g10_f	2028 coarse mass concentration- 20% clearest days (ug/m3)
BP	sea_salt_g10_f (from observed IMPROVE data)	2028 sea salt concentration- 20% clearest days (ug/m3) (from observed IMPROVE data)
BQ	amm_so4_g90_f	2028 total ammonium sulfate concentration- 20% most impaired days (ug/m3)
BR	s_amm_so4_g90_f	2028 "small" ammonium sulfate concentration- 20% most impaired days (ug/m3)
BS	l_amm_so4_g90_f	2028 "large" ammonium sulfate concentration- 20% most impaired days (ug/m3)
BT	amm_no3_g90_f	2028 total ammonium nitrate concentration- 20% most impaired days (ug/m3)
BU	s_amm_no3_g90_f	2028 "small" ammonium nitrate concentration- 20% most impaired days (ug/m3)
BV	l_amm_no3_g90_f	2028 "large" ammonium nitrate concentration- 20% most impaired days (ug/m3)
BW	omc_g90_f	2028 total organic carbon mass concentration- 20% most impaired days (ug/m3)
BX	s_omc_g90_f	2028 "small" organic carbon mass concentration- 20% most impaired days (ug/m3)
BY	l_omc_g90_f	2028 "large" organic carbon mass concentration- 20% most impaired days (ug/m3)
BZ	ec_g90_f	2028 elemental carbon concentration- 20% most impaired days (ug/m3)
CA	crustal_g90_f	2028 fine crustal mass concentration- 20% most impaired days (ug/m3)
CB	cm_g90_f	2028 coarse mass concentration- 20% most impaired days (ug/m3)
CC	sea_salt_g90_f	2028 sea salt concentration- 20% most impaired days (ug/m3) (from observed IMPROVE data)
CD	E_amm_so4_g10_f	2028 beta extinction (Mm-1) ammonium sulfate 20% clearest days
CE	E_amm_no3_g10_f	2028 beta extinction (Mm-1) ammonium nitrate 20% clearest days
CF	E_omc_g10_f	2028 beta extinction (Mm-1) organic carbon mass 20% clearest days
CG	E_ec_g10_f	2028 beta extinction (Mm-1) elemental carbon 20% clearest days
CH	E_crustal_g10_f	2028 beta extinction (Mm-1) fine crustal 20% clearest days
CI	E_cm_g10_f	2028 beta extinction (Mm-1) coarse mass 20% clearest days
CJ	E_sea_salt_g10_f	2028 beta extinction (Mm-1) sea salt 20% clearest days (observed IMPROVE data)
CK	tbext_g10_f	2028 Total beta extinction (Mm-1) on the 20% clearest days (including Rayleigh)
CL	E_amm_so4_g90_f	2028 beta extinction (Mm-1) ammonium sulfate 20% most impaired days
CM	E_amm_no3_g90_f	2028 beta extinction (Mm-1) ammonium nitrate 20% most impaired days
CN	E_omc_g90_f	2028 beta extinction (Mm-1) organic carbon mass 20% most impaired days
CO	E_ec_g90_f	2028 beta extinction (Mm-1) elemental carbon 20% most impaired days
CP	E_crustal_g90_f	2028 beta extinction (Mm-1) fine crustal 20% most impaired days
CQ	E_cm_g90_f	2028 beta extinction (Mm-1) coarse mass 20% most impaired days
CR	E_sea_salt_g90_f	2028 beta extinction (Mm-1) sea salt 20% most impaired days (from observed IMPROVE data)
CS	tbext_g90_f	2028 Total beta extinction (Mm-1) on the 20% most impaired days (including Rayleigh)
CT	rrf_g10_crustal	Modeled (2028/2016) fine crustal relative response factor (RRF) on 20% clearest days
CU	rrf_g10_no3	Modeled (2028/2016) nitrate relative response factor (RRF) on 20% clearest days

Column	Column Header	Column Description
CV	rrf_g10_oc	Modeled (2028/2016) organic carbon relative response factor (RRF) on 20% clearest days
CW	rrf_g10_ec	Modeled (2028/2016) elemental carbon relative response factor (RRF) on 20% clearest days
CX	rrf_g10_cm	Modeled (2028/2016) coarse mass relative response factor (RRF) on 20% clearest days
CY	rrf_g10_so4	Modeled (2028/2016) sulfate relative response factor (RRF) on 20% clearest days
CZ	rrf_g90_crustal	Modeled (2028/2016) fine crustal relative response factor (RRF) on 20% most impaired days
DA	rrf_g90_no3	Modeled (2028/2016) nitrate relative response factor (RRF) on 20% most impaired days
DB	rrf_g90_oc	Modeled (2028/2016) organic carbon relative response factor (RRF) on 20% most impaired days
DC	rrf_g90_ec	Modeled (2028/2016) elemental carbon relative response factor (RRF) on 20% most impaired days
DD	rrf_g90_cm	Modeled (2028/2016) coarse mass relative response factor (RRF) on 20% most impaired days
DE	rrf_g90_so4	Modeled (2028/2016) sulfate relative response factor (RRF) on 20% most impaired days