

Table 1. 2017 Site Specifications.

National Park Unit	Site Name	State	NPS Abbr.	CASTNET Abbr.	AQS ID Number	Latitude (degrees north)	Longitude (degrees west)	Elev. (m)	O ₃ Years ^a	SO ₂	CO	NO _x /NO _y	PM	WS/WD	TMP	RH	RNF	SOL	Filter Pack ^b
Sites operated by the National Park Service (Gaseous Pollutant Monitoring Program)																			
Big Bend	K-Bar Ranch Road	TX	BIBE-KB	BBE401	48-043-0101	29.3028	103.1778	1057	28	---	---	---	---	X	X	X	X	X	X
Canyonlands	Island in the Sky	UT	CANY-IS	CAN407	49-037-0101	38.4583	109.8214	1794	26	---	---	---	---	X	X	X	X	X	X
<u>Carlsbad Caverns</u>	Maintenance Area	NM	CAVE-MA	---	35-015-3001	32.1783	104.4406	1349	12	---	---	---	---	X	X	X	X	X	---
Chaco Culture	Radio Repeater	NM	CHCU-RR	CHC432	35-045-0020	36.0350	107.9042	1965	1	---	---	X	---	X	X	X	X	X	---
Chiricahua	Entrance Station	AZ	CHIR-ES	CHA467	04-003-8001	32.0094	109.3892	1569	27	---	---	---	---	X	X	X	X	X	X
Craters of the Moon	Visitor Center	ID	CRMO-VC	---	16-023-0101	43.4606	113.5622	1815	26	---	---	---	---	X	X	---	---	X	---
Death Valley	Park Village	CA	DEVA-PV	---	06-027-0101	36.5092	116.8481	125	25	---	---	---	---	X	X	---	---	---	---
Denali	Headquarters	AK	DENA-HQ	DEN417	02-068-0003	63.7233	148.9675	663	31	---	---	---	---	X	X	X	X	X	X
Dinosaur	West Entrance Housing	UT	DINO-WE	DIN431	49-047-1002	40.4372	109.3047	1463	17	---	---	---	---	X	X	---	X	X	X
Everglades	Beard Center	FL	EVER-BC	EVE419	12-086-0030	25.3911	80.6808	1	---	---	---	---	---	X	X	X	X	X	X
Glacier	West Glacier Horse Stables	MT	GLAC-WG	GLR468	30-029-8001	48.5103	113.9969	964	26	---	---	---	---	X	X	---	---	X	X
Grand Canyon	The Abyss	AZ	GRCA-AS	GRC474	04-005-8001	36.0586	112.1836	2073	25	---	---	---	---	X	X	X	X	X	X
Grand Teton	Science School	WY	GRTE-SS	---	56-039-0008	43.6708	110.5994	2105	7	---	---	---	---	X	X	X	X	X	---
Great Basin	Maintenance Yard	NV	GRBA-MY	GRB411	32-033-0101	39.0050	114.2158	2058	25	---	---	---	---	X	X	X	X	X	X
Great Smoky Mountains	Clingmans Dome	TN	GRSM-CD	---	47-155-0102	35.5619	83.4981	2021	25	---	---	---	---	X	---	X	X	X	---
Great Smoky Mountains	Cove Mountain	TN	GRSM-CM	---	47-155-0101	35.6967	83.6086	1243	30	---	---	---	---	X	X	X	X	---	---
Great Smoky Mountains	Look Rock NCore	TN	GRSM-LN	GRS420	47-009-0101	35.6336	83.9417	801	---	X	X	X	---	---	---	---	---	---	---
Great Smoky Mountains	Look Rock	TN	GRSM-LR	GRS420	47-009-0101	35.6336	83.9417	801	30	---	---	---	---	X	X	X	X	X	X
Hawaii Volcanoes	Observatory	HI	HAVO-OB	---	15-001-0007	19.4203	155.2881	1123	---	X	---	---	X	X	X	X	X	---	---
Hawaii Volcanoes	Visitor Center	HI	HAVO-VC	---	15-001-0005	19.4308	155.2578	1215	---	X	---	---	---	X	X	X	X	X	---
Joshua Tree	Black Rock	CA	JOTR-BR	JOT403	06-071-9002	34.0694	116.3889	1243	25	---	---	---	---	X	X	X	X	X	X
Joshua Tree	Cottonwood Canyon	CA	JOTR-CC	---	06-065-0008	33.7411	115.8206	984	13	---	---	---	X	X	X	X	X	X	---
<u>Joshua Tree</u>	Pinto Wells	CA	JOTR-PW	---	06-065-1004	33.9397	115.4108	326	12	---	---	---	---	X	X	X	---	X	---
Lassen Volcanic	Manzanita Lake Fire Station	CA	LAVO-ML	LAV410	06-089-3003	40.54	121.5764	1755	31	---	---	---	---	X	X	X	X	X	X
Mammoth Cave	Houchin Meadow	KY	MACA-HM	MAC426	21-061-0501	37.1317	86.1431	230	21	X	X	X	---	X	X	X	X	X	X
Mesa Verde	Resource Management Area	CO	MEVE-RM	MEV405	08-083-0101	37.1983	108.4906	2170	25	---	---	---	---	X	X	X	X	X	X
Minidoka	Maintenance Building	ID	MIIN-MB	---	16-053-0003	42.6800	114.2525	1223	---	---	---	---	X	X	X	X	---	---	---
<u>Mojave</u>	Kelso Mountains	CA	MOJA-KM	---	06-071-1001	35.1019	115.7767	1212	11	---	---	---	---	X	X	X	---	X	---
Petrified Forest	South Entrance	AZ	PEFO-SE	PET427	04-017-0119	34.8225	109.895	1712	16	---	---	---	---	X	X	---	---	X	X

Table 1. 2017 Site Specifications (continued).

National Park Unit	Site Name	State	NPS Abbr.	CASTNet Abbr.	AQS ID Number	Latitude (degrees north)	Longitude (degrees west)	Elev. (m)	O ₃ Years ^a	SO ₂	CO	NO _x /NO _y	PM	WS/WD	TMP	RH	RNF	SOL	Filter Pack ^b
Sites operated by the National Park Service (Gaseous Pollutant Monitoring Program)																			
Pinnacles	SW of East Entrance Station	CA	PINN-ES	PIN414	06-069-0003	36.4833	121.1569	317	31	---	---	---	---	X	X	X	X	X	X
Rocky Mountain	Long's Peak	CO	ROMO-LP	ROM406	08-069-0007	40.271	105.5456	2742	34	---	---	---	---	X	X	X	X	X	X
Sequoia and Kings Canyon	Ash Mountain	CA	SEKI-AS	SEK430	06-107-0009	36.4894	118.8292	510	19	---	---	---	X	X	X	X	X	X	X
Sequoia and Kings Canyon	Lower Kaweah	CA	SEKI-LK	---	06-107-0006	36.5658	118.7772	1890	34	---	---	---	---	X	X	X	X	X	---
Shenandoah	Big Meadows	VA	SHEN-BM	SHN418	51-113-0003	38.5231	78.4347	1068	35	---	---	---	---	X	X	X	X	X	X
Voyageurs	Sullivan Bay	MN	VOYA-SB	VOY413	27-137-0034	48.4128	92.8292	427	22	---	---	---	---	X	X	X	X	X	X
Yellowstone	Old Faithful Snow Lodge	WY	YELL-OS	---	56-039-1013	44.4582	110.8253	2230	---	---	X	---	X	X	X	X	---	---	---
Yellowstone	West Entrance	MT	YELL-WS	---	30-031-0017	44.6569	111.0894	2030	---	---	X	X	X	X	X	X	---	---	---
Yellowstone	Water Tank	WY	YELL-WT	YEL408	56-039-1011	44.5653	110.4003	2430	22	---	---	---	---	X	X	X	X	X	X
Yosemite	Turtleback Dome	CA	YOSE-TD	YOS404	06-043-0003	37.7133	119.7061	1599	25	---	---	---	---	X	X	X	X	X	X
Zion	Dalton's Wash	UT	ZION-DW	---	49-053-0130	37.1983	113.1506	1213	14	---	---	---	---	X	X	---	---	X	---
Sites operated by the NPS for the Bureau of Land Management																			
Meeker	Plant Science	CO	MEEK-PS	---	08-103-0005	40.0039	107.8475	1994	8	---	---	X	X	X	X	X	X	X	---
Rangely	Golf Course	CO	RANG-GC	---	08-103-0006	40.0869	108.7614	1655	8	---	---	X	X	X	---	X	X	X	---
Sites operated by cooperating state agencies																			
<i>Acadia</i>	Cadillac Mountain	ME	ACAD-CM	---	23-009-0102	44.3517	68.2269	466	23	---	---	---	---	X	X	X	---	---	---
<i>Acadia</i>	McFarland Hill	ME	ACAD-MH	ACA416	23-009-0103	44.3772	68.2608	153	20	X	X	X	X	X	X	X	X	X	X
<i>Badlands</i>	Visitor Center	SD	BADL-VC	---	46-071-1001	43.7436	101.9414	739	13	X	---	---	X	---	---	---	---	---	---
<i>Cape Cod</i>	Cape Cod	MA	CACO-XX	---	25-001-0002	41.9758	70.0247	41	31	---	---	---	---	X	X	X	---	X	---
<i>Chamizal</i>	Chamizal	TX	CHAM-XX	---	48-141-0044	31.7656	106.4550	1128	26	---	---	---	---	X	X	X	---	X	---

Table 1. 2017 Site specifications (continued).

National Park Unit	Site Name	State	NPS Abbr.	CASTNet Abbr.	AQS ID Number	Latitude (degrees north)	Longitude (degrees west)	Elev. (m)	O ₃ Years ^a	SO ₂	CO	NO _x	PM	WS/WD	TMP	RH	RNF	SOL	Filter Pack ^b
Sites operated by cooperating state agencies																			
<i>Congaree</i>	Congaree Bluff	SC	COSW-BL	---	45-079-0021	33.8147	80.7811	34	18	X	---	---	---	---	---	---	---	---	---
<i>Everglades</i>	Cutler Road	FL	EVER-CR	---	12-086-0029	25.5861	80.3269	4	33	---	---	---	---	---	---	---	---	---	---
<i>Great Smoky Mountains</i>	Cades Cove	TN	GRSM-CC	---	47-009-0102	35.6042	83.7831	564	25	---	---	---	---	X	X	X	X	X	---
<i>Great Smoky Mountains</i>	Purchase Knob	NC	GRSM-PK	---	37-087-0036	35.5900	83.0775	1550	23	---	---	---	---	---	---	---	---	---	---
<i>Indiana Dunes</i>	Ammunition Bunker	IN	INDU-AB	---	18-089-0022	41.6067	87.3047	183	25	X	---	---	X	X	X	X	---	X	---
<i>Mount Rainier</i>	Jackson Visitor's Center	WA	MORA-JV	---	53-053-0012	46.7853	121.7378	1615	20	---	---	---	---	---	---	---	---	---	---
<i>Saguaro</i>	East	AZ	SAGU-EA	---	04-019-0021	32.1744	110.7364	938	26	---	---	---	---	X	X	X	---	X	---
<i>Theodore Roosevelt</i>	Painted Canyon, VC	ND	THRO-VC	THR422	38-007-0002	46.8947	103.3778	840	20	X	---	---	X	X	X	X	X	X	X
<i>Wind Cave</i>	Visitor Center	SD	WICA-VC	WNC429	46-033-0132	43.5575	103.4839	1288	14	---	---	---	X	X	X	X	X	X	X
<i>Yosemite</i>	Village	CA	YOSE-VI	---	06-043-1001	37.7458	119.6028	1216	---	---	---	---	X	---	---	---	---	---	---

^a The values in this column represent the number of years an ozone analyzer has been operational at the site.

^b A filter pack is a part of the CASTNET network and is used to measure dry deposition using the "inferential method." This method combines air quality concentration data with meteorological measurements and land use functions to compute deposition velocities. Ambient air is drawn across the filter at either 3.0 or 1.5 liters per minute. The filter is then analyzed in a lab to yield weekly average concentrations of particulate sulfate (SO₄²⁻), particulate nitrate (NO₃⁻), particulate ammonium (NH₄⁺), sulfur dioxide (SO₂), and nitric acid (HNO₃). In some cases, the positive ions Na⁺, K⁺, Ca²⁺, and Mg²⁺ are also measured from the filter samples.

Operating agency key: plain text = site operated by the National Park Service, Bureau of Land Management, or U.S. Forest Service
italics = site operated by a state agency
underline = site operated by the National Park Service, but consisting of non-EPA certified portable instrumentation

Parameter key: O₃ = ozone (ppb)
SO₂ = sulfur dioxide (ppb)
CO = carbon monoxide (ppm)
NO_x = oxides of nitrogen (ppb)
PM = particulate matter (μg/m³)
WS = wind speed (m/s)
WD = wind direction (degrees)
TMP = ambient temperature (degrees C)
RH = relative humidity (%)
RNF = precipitation (mm/hr)
SOL = solar radiation (watts/m²)

Note: Dashed lines indicate parameter not measured at that site.

Table 2. 2017 Summary of 8-hour average ozone concentrations (ppb).

National Park Unit	Site Name	Valid Number of Days	1 st Highest	2 nd Highest	3 rd Highest	4 th Highest	# Days with 8-Hour Average O ₃ Values ≥70 ppb ^a
Sites operated by the National Park Service (Gaseous Pollutant Monitoring Program)							
Big Bend	K-Bar Ranch Road	356	66	65	64	63	0
Canyonlands	Island in the Sky	319	70	69	64	64	0
Chaco Culture	Radio Repeater	226	68	66	66	64	0
Chiricahua	Entrance Station	354	72	67	67	67	1
Craters of the Moon	Visitor Center	338	69	67	65	63	0
Death Valley	Park Village	316	72	70	70	70	2
Denali	Headquarters	354	53	52	52	50	0
Dinosaur	West Entrance Housing	356	77	75	75	74	6
Glacier	West Glacier Horse Stables	332	56	54	53	53	0
Grand Canyon	The Abyss	355	66	65	65	65	0
Grand Teton	Science School	355	61	60	59	59	0
Great Basin	Maintenance Yard	354	67	66	65	65	0
Great Smoky Mountains	Clingmans Dome	174	66	62	61	60	0
Great Smoky Mountains	Cove Mountain	358	67	67	66	65	0
Great Smoky Mountains	Look Rock	360	72	68	67	65	1
Joshua Tree	Black Rock	360	98	96	94	92	52
Joshua Tree	Cottonwood Canyon	241	87	79	79	78	21
Lassen Volcanic	Manzanita Lake Fire Station	353	71	66	66	64	1
Mammoth Cave	Houchin Meadow	360	66	64	64	64	0
Mesa Verde	Resource Management Area	359	72	67	66	66	1
Petrified Forest	South Entrance	348	71	67	67	65	1
Pinnacles	SW of East Entrance Station	360	69	68	66	66	0
Rocky Mountain	Long's Peak	346	74	68	67	67	1
Sequoia and Kings Canyon	Ash Mountain	345	92	89	89	89	80
Sequoia and Kings Canyon	Lower Kaweah	211	87	85	85	84	51
Shenandoah	Big Meadows	356	65	62	62	62	0
Voyageurs	Sullivan Bay	343	63	61	59	54	0
Yellowstone	Water Tank	330	65	64	64	63	0
Yosemite	Turtleback Dome	362	88	82	82	78	11
Zion	Dalton's Wash	352	69	67	67	67	0
Sites operated by the NPS for the Bureau of Land Management							
Meeker	Plant Science Center	356	63	61	60	59	0
Rangely	Golf Course	358	69	66	64	64	0
Sites operated by cooperating state agencies							
<i>Acadia</i>	Cadillac Mountain	195	98	85	82	80	6
<i>Acadia</i>	McFarland Hill	355	87	77	68	67	2
<i>Badlands</i>	Visitor Center	363	70	68	68	67	0
<i>Cape Cod</i>	Cape Cod	350	85	81	79	72	5
<i>Chamizal</i>	Chamizal	358	82	74	74	72	6
<i>Congaree</i>	Congaree Bluff	346	61	57	55	54	0

Table 2. 2017 Summary of 8-hour average ozone concentrations (ppb) (continued).

National Park Unit	Site Name	Valid Number of Days	1 st Highest	2 nd Highest	3 rd Highest	4 th Highest ^a	# Days with 8-Hour Average O ₃ Values ≥70 ppb ^a
Sites operated by cooperating state agencies							
<i>Everglades</i>	Cutler Road	307	71	69	66	62	1
<i>Great Smoky Mountains</i>	Cades Cove	238	63	63	61	61	0
<i>Great Smoky Mountains</i>	Purchase Knob	234	65	64	63	63	0
<i>Indiana Dunes</i>	Ammunition Bunker	353	79	77	75	70	3
<i>Mount Rainier</i>	Jackson Visitor's Center	329	78	74	70	69	2
<i>Saguaro</i>	East	364	77	74	73	73	5
<i>Theodore Roosevelt</i>	Painted Canyon, Visitor Cntr	359	62	62	61	61	0
<i>Wind Cave</i>	Visitor Center	358	68	66	66	65	0

Portable ozone monitoring systems (POMS)^b

<u>Carlsbad Caverns</u>	Maintenance Area	204	69	65	65	65	0
<u>Joshua Tree</u>	Pinto Wells	355	76	75	75	71	4
<u>Mojave</u>	Kelso Mountains	163	76	73	73	72	8

^a The primary and secondary National Ambient Air Quality Standard for ozone is 0.070 ppm over an 8-hour period. (An exceedance of the standard occurs when an 8-hour average ozone concentration is greater than or equal to 70 ppb. A violation of the standard occurs when the 3-year average of the fourth highest daily maximum 8-hour average ozone concentration equals or exceeds 70 ppb.) Exceedances of the standard are highlighted here in orange.

^b The Gaseous Pollutant Monitoring Program Portable Ozone Monitoring Systems (POMS) do not meet EPA standards for regulatory monitoring. However, ozone summary statistics from portable systems can be compared to EPA standards for reference purposes.

Operating agency key: plain text = site operated by the National Park Service, Bureau of Land Management, or U.S. Forest Service

italics = site operated by a state agency

underline = site operated by the National Park Service, but consisting of non-EPA certified portable instrumentation

Bold = Ozone summary statistics for POMS are highlighted bold where exceedances occurred. These sites should be compared to EPA standards for reference purposes only.

Color shading key: 4th highest 8-hour average **Red** >70 ppb ozone concentration # days with 8-hour average >70 ppb **Red** > 3 days

Table 3. 2017 Ozone violation summary - primary standard^{a,b}.

National Park Unit	Site Name	2015-2017	2014-2016	2013-2015	2012-2014	2011-2013	2010-2012	2009-2011
Sites operated by the National Park Service (Gaseous Pollutant Monitoring Program)								
Big Bend	K-Bar Ranch Road	62	62	64	65	71	70	69
Canyonlands	Island in the Sky	64	64	65	67	69	69	68
Chaco Culture	Radio Repeater							
Chiricahua	Entrance Station	65	65	68	71	73	73	70
Craters of the Moon	Visitor Center	60	60	61	62	63	63	61
Death Valley	Park Village	(70)	70	70	70	72	72	71
Denali	Headquarters	50	53	54	54	52	52	53
Dinosaur	West Entrance Housing	72	68	81	(84)	---	---	---
Glacier	West Glacier Horse Stables	53	53	(54)	54	55	55	55
Grand Canyon	The Abyss	66	67	69	70	72	72	69
Grand Teton	Science School	59	59	59	62	(60)	(60)	(54)
Great Basin	Maintenance Yard	64	64	68	71	74	72	70
Great Smoky Mountains	Clingmans Dome	(63)	(65)	(65)	(67)	(71)	(75)	(75)
Great Smoky Mountains	Cove Mountain	66	67	67	68	72	76	75
Great Smoky Mountains	Look Rock	67	67	65	67	74	79	77
Joshua Tree	Black Rock	87	86	86	90	90	94	93
Joshua Tree	Cottonwood Canyon	(74)	(79)	(80)	(81)	(76)	(76)	(78)
Lassen Volcanic	Manzanita Lake Fire Station	64	65	66	68	68	67	64
Mammoth Cave	Houchin Meadow	64	64	63	69	71	75	70
Mesa Verde	Resource Management Area	66	65	66	67	69	68	68
Petrified Forest	South Entrance	63	64	66	70	70	70	66
Pinnacles	SW of East Entrance Station	68	69	68	70	70	70	70
Rocky Mountain	Long's Peak	68	69	70	74	76	77	74
Sequoia and Kings Canyon	Ash Mountain	89	89	89	91	93	95	96
Sequoia and Kings Canyon	Lower Kaweah	84	(84)	(84)	(86)	85	81	79
Shenandoah	Big Meadows	63	63	62	65	69	72	71
Voyageurs	Sullivan Bay	54	55	57	59	59	63	62
Yellowstone	Water Tank	61	60	62	63	65	66	65
Yosemite	Turtleback Dome	75	74	74	77	77	78	77
Zion	Dalton's Wash	65	(65)	(67)	70	72	73	70
Sites operated by the NPS for the Bureau of Land Management								
Meeker	Plant Science Center	60	61	63	63	63	64	(64)
Rangely	Golf Course	63	63	73	74	77	66	(65)

Table 3. 2017 Ozone violation summary - primary standard^{a,b} (continued).

National Park Unit	Site Name	2015-2017	2014-2016	2013-2015	2012-2014	2011-2013	2010-2012	2009-2011
Sites operated by cooperating state agencies								
<i>Acadia</i>	Cadillac Mountain	71	66	67	66	69	72	74
<i>Acadia</i>	McFarland Hill	64	62	65	63	65	65	69
<i>Badlands</i>	Visitor Center	61	58	58	61	59	58	54
<i>Cape Cod</i>	Cape Cod	(69)	(65)	(67)	69	72	75	72
<i>Chamizal</i>	Chamizal	69	67	68	68	69	70	69
<i>Congaree</i>	Congaree Bluff	55	55	55	55	57	61	62
<i>Everglades</i>	Cutler Road	(61)	61	63	63	64	63	63
<i>Great Smoky Mountain</i>	Cades Cove	61	60	59	60	63	68	68
<i>Great Smoky Mountain</i>	Purchase Knob	64	65	65	66	67	69	67
<i>Indiana Dunes</i>	Ammunition Bunker	68	67	65	69	69	69	62
<i>Mount Rainer</i>	Jackson Visitor's Center	63	(59)	(60)	60	58	56	54
<i>Saguaro</i>	East	69	68	69	71	73	71	70
<i>Theodore Roosevelt</i>	Painted Canyon Visitor Cntr	60	58	58	56	57	58	58
<i>Wind Cave</i>	Visitor Center	61	58	59	62	63	62	60

^a The 2015 primary and secondary National Ambient Air Quality Standard for ozone is 0.070 ppm over an 8-hour period. This standard was used for the 2014-2016 period. (An exceedance of the standard occurs when an 8-hour average ozone concentration is greater than or equal to 71 ppb. A violation of the standard occurs when the 3-year average of the fourth highest daily maximum 8-hour average ozone concentration equals or exceeds 71 ppb.)

^b The 2008 primary and secondary National Ambient Air Quality Standard for ozone is 0.075 ppm over an 8-hour period. This standard was used for the 2013-2015 period through 2008-2010. (An exceedance of the standard occurs when an 8-hour average ozone concentration is greater than or equal to 76 ppb. A violation of the standard occurs when the 3-year average of the fourth highest daily maximum 8-hour average ozone concentration equals or exceeds 76 ppb.)

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italics = site operated by a state agency
underline = site operated by the National Park Service, but consisting of non-EPA certified portable instrumentation

Color shading key: 4th highest 8-hour average

Red = ozone violation based on the standard in place at that time

Note: A number in parenthesis () indicates that data completeness was not met. The primary standard requires 90 percent data completeness, on average, during the 3-year period, with no single year within the period having less than 75 percent data completeness. This data completeness requirement would have to be satisfied in order to determine that the standard has been met at a monitoring site. However, calendar years with less than 75 percent data completeness are included in the computation if the annual fourth-highest daily maximum 8-hour concentration is greater than the level of the standard. A site could be found not to have met the standard with less than complete data.

Table 4. 2017 Summary of indices for resource injury (SUM06 and W126).

National Park Unit	Site Name	O ₃ % Valid	SUM06 ^a (ppm-hr)	W126 ^b (ppm-hr)	Period	NPS W126 ^c (ppm-hr)	NPS W126 Period
Sites operated by the National Park Service (Gaseous Pollutant Monitoring Program)							
Big Bend	K-Bar Ranch Road	98.1	7.0	7.8	April-June	8.2	April-June
Canyonlands	Island in the Sky	89.5	6.8	8.5	June-August	11.1	April-June
Chaco Culture	Radio Repeater	81.6	18.4	13.5	April-June	14.0	April-June
Chiricahua	Entrance Station	98.4	23.3	15.3	April-June	15.7	April-June
Craters of the Moon	Visitor Center	92.3	2.8	6.4	June-August	6.9	June-August
Death Valley	Park Village	92.1	18.0	14.6	May-July	15.1	May-July
Denali	Headquarters	98.6	0.0	1.7	February-April	2.2	March-May
Dinosaur	West Entrance Housing	97.7	10.2	10.0	May-July	10.5	May-July
Glacier	West Glacier Horse Stables	90.4	0.5	1.9	July-September	2.4	July-September
Grand Canyon	The Abyss	97.9	11.5	11.4	April-June	11.9	April-June
Grand Teton	Science School	98.0	1.6	4.4	April-June	4.9	April-June
Great Basin	Maintenance Yard	97.6	7.8	9.3	May-July	9.7	May-July
Great Smoky Mountains	Clingmans Dome	52.4	1.4	3.4	May-July	3.9	May-July
Great Smoky Mountains	Cove Mountain	98.2	3.7	5.1	March-May	5.6	March-May
Great Smoky Mountains	Look Rock	98.9	4.8	5.1	March-May	5.6	March-May
Joshua Tree	Black Rock	98.6	48.9	34.2	May-July	34.7	May-July
Joshua Tree	Cottonwood Canyon	66.8	36.1	23.1	April-June	23.6	April-June
Lassen Volcanic	Manzanita Lake Fire Station	98.0	6.7	7.3	July-September	7.8	July-September
Mammoth Cave	Houchin Meadow	95.0	4.6	5.0	April-June	5.5	April-June
Mesa Verde	Resource Management Area	98.3	14.4	11.9	April-June	12.3	April-June
Petrified Forest	South Entrance	97.5	18.5	13.5	April-June	13.9	April-June
Pinnacles	SW of East Entrance Station	98.7	8.9	7.7	August-October	8.1	July-September
Rocky Mountain	Long's Peak	95.2	13.9	11.0	April-June	11.5	April-June
Sequoia and Kings Canyon	Ash Mountain	95.0	64.9	47.3	June-August	47.8	June-August
Sequoia and Kings Canyon	Lower Kaweah	98.8	53.9	36.5	June-August	37.0	June-August
Shenandoah	Big Meadows	98.2	2.6	4.8	April-June	5.3	April-June
Voyageurs	Sullivan Bay	95.0	0.8	1.8	April-June	2.3	April-June
Yellowstone	Water Tank	91.7	4.8	7.5	April-June	8.0	April-June
Yosemite	Turtleback Dome	99.2	23.5	16.7	July-September	17.2	July-September
Zion	Dalton's Wash	97.6	16.4	12.2	May-July	12.7	May-July
Sites operated by the NPS for the Bureau of Land Management							
Meeker	Plant Science Center	95.7	1.8	5.4	April-June	5.9	April-June
Rangely	Golf Course	97.4	7.7	9.4	June-August	9.9	June-August
Sites operated by cooperating state agencies							
<i>Acadia</i>	Cadillac Mountain	95.1	9.3	7.8	April-June	8.3	April-June
<i>Acadia</i>	McFarland Hill	97.4	3.0	2.9	April-June	3.3	April-June
<i>Badlands</i>	Visitor Center	98.5	7.0	8.3	May-July	8.8	May-July
<i>Cape Cod</i>	Cape Cod	97.9	7.9	6.2	May-July	6.6	May-July
<i>Chamizal</i>	Chamizal	98.3	15.9	13.4	May-July	13.4	May-July
<i>Congaree</i>	Congaree Bluff	95.3	1.0	2.5	February-April	2.9	March-May
<i>Everglades</i>	Cutler Road	92.2	4.2	4.2	March-May	4.6	March-May
<i>Great Smoky Mountains</i>	Cades Cove	97.0	3.2	4.3	March-May	4.8	March-May
<i>Great Smoky Mountains</i>	Purchase Knob	93.5	3.4	5.1	March-May	5.7	March-May
<i>Indiana Dunes</i>	Ammunition Bunker	97.6	8.6	7.5	May-July	7.9	May-July

Table 4. 2017 Summary of indices for resource injury (SUM06 and W126) (continued).

National Park Unit	Site Name	O ₃ % Valid	SUM06 ^a (ppm-hr)	W126 ^b (ppm-hr)	Period	NPS W126 ^c (ppm-hr)	NPS126 Period
Sites operated by cooperating state agencies							
<i>Mount Rainier</i>	Jackson Visitor's Center	95.2	5.4	4.7	July-September	5.1	July-September
<i>Saguaro</i>	East	99.6	28.8	18.6	April-June	19.0	April-June
<i>Theodore Roosevelt</i>	Painted Canyon Visitor Center	98.4	3.9	5.7	May-July	6.2	May-July
<i>Wind Cave</i>	Visitor Center	98.2	8.0	8.8	July-September	9.3	July-September
Portable ozone monitoring systems (POMS)							
<u>Carlsbad Caverns</u>	Maintenance Area	96.0	7.4	7.8	April-June	8.3	April-June
<u>Joshua Tree</u>	Pinto Wells	97.9	26.4	17.3	April-June	17.8	April-June
<u>Mojave</u>	Kelso Mountains	86.7	17.5	11.5	April-June	18.4	May-July

^a SUM06 exposure index represents the 0800-2000 hourly ozone concentrations equaling or exceeding 0.06 ppm. The value reported here represents a three-month maximum value during the ozone season. Units are ppm-hr.

^b W126 exposure index represents 0800-2000 hourly ozone concentrations where each concentration is weighted by a function that gives greater emphasis to the higher hourly concentrations while still including the lower ones. The value reported here represents a three-month maximum value during the ozone season. Units are ppm-hr. For more information on the W126 exposure index go to <http://www.nature.nps.gov/air/aqbasics/glossary.cfm>.

^c NPS W126 represents a three-month maximum value during the growing season (March to September) with a monthly completeness criteria of 50%, a three-month completeness criteria of 75%, and a seasonal completeness criteria of 60%.

Operating agency key: plain text = site operated by the National Park Service, Bureau of Land Management, or U.S. Forest Service
italics = site operated by a state agency
underline = site operated by the National Park Service, but consisting of non-EPA certified portable instrumentation

Table 6. 2017 Summary of carbon monoxide data.

		Highest Daily Maximum 1-Hour Average Concentration ^a (ppm)					Highest Daily Maximum 8-Hour Average Concentration ^b (ppm)				
		1 st Highest	2 nd Highest	3 rd Highest	4 th Highest	No. of Days with 1-Hr Average > 35 ppm	1 st Highest	2 nd Highest	3 rd Highest	4 th Highest	No. of Days with 8-Hr Average > 9 ppm
National Park Unit	Site Name										
Sites operated by the National Park Service (Gaseous Pollutant Monitoring Program)											
Great Smoky Mountains	Look Rock NCore	0.358	0.302	0.297	0.282	0	0.256	0.244	0.242	0.238	0
Mammoth Cave	Houchin Meadow	0.527	0.314	0.304	0.278	0	0.263	0.260	0.252	0.246	0
Yellowstone	Old Faithful Snow Lodge	0.781	0.584	0.498	0.478	0	0.676	0.529	0.459	0.441	0
Yellowstone	West Yellowstone	2.150	1.699	1.129	1.087	0	0.713	0.537	0.524	0.510	0
Sites operated by cooperating state agencies											
Acadia	McFarland Hill	0.256	0.250	0.245	0.244	0	0.248	0.229	0.222	0.219	0

^a The primary hourly National Ambient Air Quality Standard for carbon monoxide is a daily maximum 1-hour average of 35 ppm. (An exceedance of the Standard occurs when a daily maximum 1-hour average exceeds 35 ppm. A violation of the Standard occurs when a daily maximum 1-hour average exceeds 35 ppm more than once in a calendar year.)

^b The primary National Ambient Air Quality Standard for carbon monoxide is 9 ppm over an 8-hour period. (An exceedance of the Standard occurs when an 8-hour average exceeds 9 ppm. A violation of the Standard occurs when a daily maximum 8-hour average exceeds 9 ppm more than once in a calendar year.) (40 CFR 50.8.)

Operating agency key: plain text = site operated by the National Park Service, Bureau of Land Management, or U.S. Forest Service
italics = site operated by a state agency

Color shading key: **Red** >35 ppm 1-hour average or >9 ppm 8-hour average

Table 7. 2017 Summary of nitrogen dioxide data.

National Park Unit	Site Name	Highest Daily Maximum 1-Hour Average Concentrations ^{ab} (ppb)						
		1 st Highest	2 nd Highest	3 rd Highest	4 th Highest	98 th Percentile Value	No. of Days with 1-Hour Average >100 ppb	Annual Arithmetic Mean
Sites operated by the National Park Service (Gaseous Pollutant Monitoring Program)								
Chaco Culture	Radio Repeater	32.7	17.2	16.7	12.1	11	0	1
Great Smoky Mountains	Look Rock NCore	8.1	7.0	6.6	6.5	6	0	1
Mammoth Cave	Houchin Meadow	19.3	18.7	17.2	16.0	13	0	2
Yellowstone	West Yellowstone	55.2	40.6	39.3	36.1	33	0	2
Sites operated by the NPS for the Bureau of Land Management								
Meeker	Plant Science Center	8.0	6.7	6.6	6.1	4	0	0
Rangely	Golf Course	22.4	20.0	19.9	19.3	17	0	1

Table 8. 2017 Summary of oxides of nitrogen data.

		Highest Daily Maximum 1-Hour Average Concentrations (ppb)				
National Park Unit	Site Name	1 st Highest	2 nd Highest	3 rd Highest	4 th Highest	No. of Days with 1-Hour Average >100 ppb
Sites operated by the National Park Service (Gaseous Pollutant Monitoring Program)						
Chaco Culture	Radio Repeater	36.1	20.4	17.0	16.5	0
Great Smoky Mountains	Look Rock NCore (NO _y)	10.0	8.1	7.0	7.0	0
Mammoth Cave	Houchin Meadow	19.5	18.7	18.6	17.2	0
Yellowstone	West Yellowstone	172.5	155.6	119.6	111.2	5
Sites operated by the NPS for the Bureau of Land Management						
Meeker	Plant Science Center	24.0	12.3	11.1	10.8	0
Rangely	Golf Course	28.7	25.0	22.4	22.3	0
Sites operated by cooperating state agencies						
Acadia	McFarland Hill (NO _y)	19.8	15.3	11.7	11.6	0
Operating agency key:	plain text = site operated by the National Park Service, Bureau of Land Management, or U.S. Forest Service italics = site operated by a state agency					

Operating agency key: plain text = site operated by the National Park Service, Bureau of Land Management, or U.S. Forest Service
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Table 9. 2017 Summary of PM_{2.5} data from reference and equivalency methods.

					Highest Daily 24-Hour Average Concentrations ^c (µg/m ³)					
National Park Unit	Site Name	Sampler Type*	% Valid ^a	Annual Arithmetic Mean ^b (µg/m ³)	1 st Highest	2 nd Highest	3 rd Highest	4 th Highest	98 th Percentile Value	No. of Days with 24-Hour Average >35 µg/m ³
Sites operated by the National Park Service (Gaseous Pollutant Monitoring Program)										
Hawaii Volcanoes	Observatory	SHARP / BAM	72.7	7.2	28.1	23.6	21.5	20.2	19.7	0
Minidoka	Maintenance Building	BAM	75.2	6.7	60.2	53.9	47.5	44.7	37.2	6
Sequoia and Kings Canyon	Ash Mountain	BAM	60.3	13.0	42.3	41.8	40.4	33.1	33.1	3
Yellowstone	Old Faithful Snow Lodge	BAM	93.9	2.5	42.6	27.1	23.5	20.4	16.6	1
Yellowstone	West Entrance	BAM	96.5	3.0	37.8	33.9	33.0	27.7	23.2	1
Sites operated by the NPS for the Bureau of Land Management										
Meeker	Plant Science Center	TEOM	94.2	6.2	42.7	35.1	26.9	14.9	14.4	1
Rangely	Golf Course	BAM	94.3	7.2	28.7	16.7	15.9	14.9	14.7	0
Sites operated by cooperating state agencies										
Acadia	McFarland Hill	BAM	96.6	3.2	14.2	14.0	13.7	13.4	11.7	0
Badlands	Visitor Center	BAM	95.0	3.2	49.2	36.1	28.5	22.5	12.7	2
Indiana Dunes	Ammunition Bunker	BAM	90.2	8.0	65.4	30.2	25.6	24.8	19.9	1
Theodore Roosevelt	Painted Canyon Visitor Ctr	TEOM	97.8	3.7	62.0	41.5	30.5	27.9	16.6	2
Wind Cave	Visitor Center	BAM	98.1	4.7	71.4	47.1	36.3	32.4	17.6	3

^a At sites operated by an agency other than the National Park Service, the primary responsibility for the operation and data reporting of particulate matter belongs to the operating agency.

^b The primary annual National Ambient Air Quality Standard for PM_{2.5} is an annual arithmetic mean of 15.0 µg/m³. (An exceedance of the standard occurs when an annual arithmetic mean of PM_{2.5} concentrations is greater than 15.0 µg/m³. A violation of the standard occurs when the 3-year average of the weighted annual mean PM_{2.5} concentrations is greater than 15.0 µg/m³ (40 CFR 50.7).)

^c The primary daily National Ambient Air Quality Standard for PM_{2.5} is a 24-hour average concentration of 35 µg/m³. (An exceedance of the standard occurs when a 24-hour average PM_{2.5} concentration is greater than 35 µg/m³. A violation of the standard occurs when the 3-year average of the annual 98th percentile of 24-hour PM_{2.5} concentrations is greater than 35 µg/m³.) (40 CFR 50.7.)

* TEOM = tapered element oscillating microbalance

BAM = beta attenuation monitor

SHARP = synchronized hybrid ambient real-time particulate monitor

Operating agency key: plain text = site operated by the National Park Service, Bureau of Land Management, or U.S. Forest Service
 italics = site operated by a state agency

Color shading key: Annual arithmetic mean **Red** > 15 µg/m³

98th percentile value **Red** > 35 µg/m³

Table 10. 2017 Summary of PM₁₀ data from reference and equivalency methods.

National Park Unit	Site Name	Sampler Type*	% Valid ^a	Annual Arithmetic Mean ^b (µg/m ³)	Highest Daily 24-Hour Average Concentrations ^c (µg/m ³)				
					1 st Highest	2 nd Highest	3 rd Highest	4 th Highest	No. of Days with 24-Hour Average >150 µg/m ³
Sites operated by cooperating state agencies									
Badlands	Visitor Center	BAM	95.2	10	80	60	50	40	0
Wind Cave	Visitor Center	BAM	98.1	9	100	80	60	50	0
Yosemite	Village	BAM	93.4	24	140	120	120	110	0

^a At sites operated by an agency other than the National Park Service, the primary responsibility for the operation and data reporting of particulate matter belongs to the operating agency.

^b The primary annual National Ambient Air Quality Standard for PM₁₀ is an annual arithmetic mean of 50 µg/m³. (An exceedance of the standard occurs when an annual arithmetic mean of PM₁₀ concentrations is greater than 50 µg/m³. A violation of the standard occurs when the 3-year average of the weighted annual mean PM₁₀ concentrations is greater than 50 µg/m³ (40 CFR 50.6.)

^c The primary daily National Ambient Air Quality Standard for PM₁₀ is a 24-hour average concentration of 150 µg/m³. (An exceedance of the standard occurs when a 24-hour average PM₁₀ concentration is greater than 150 µg/m³. A violation of the standard occurs when a 24-hour average concentration greater than 150 µg/m³ occurs more than once in a calendar year.) (40 CFR 50.6.)

* TEOM = tapered element oscillating microbalance
BAM = beta attenuation monitor

Color shading key: **Red** >50 µg/m³ annual arithmetic mean, >150 µg/m³ 24-hour average

italics = site operated by a state agency

Table 11. 2017 PM₁₀ summary - maximum daily 24-hour average concentration in 2010-2012 (µg/m³)^a

National Park Unit	Site Name	Sampler Type*	2017	2016	2015
Sites operated by cooperating state agencies					
<i>Badlands</i>	Visitor Center	BAM	80	40	60
<i>Wind Cave</i>	Visitor Center	BAM	100	40	70
<i>Yosemite</i>	Village	BAM	140	---	---

^a The primary daily National Ambient Air Quality Standard for PM₁₀ is a 24-hour average concentration of 150 µg/m³. (An exceedance of the standard occurs when a 24-hour average PM₁₀ concentration is greater than 150 µg/m³. A violation of the standard occurs when a 24-hour average concentration greater than 150 µg/m³ occurs more than once in a calendar year.) (40 CFR 50.6.)

* TEOM = tapered element oscillating microbalance
BAM = beta attenuation monitor

Color shading key: **Red** more than one 24-hour average concentration >150 µg/m³

italics = site operated by a state agency

Table 12. 2017 Annual summary of selected meteorological data.

National Park Unit	Site Name	Wind Speed (m/s)	Ambient Temperature (degrees C)			Relative Humidity (%)			Precipitation (mm)
		Average	Average	Maximum	Minimum	Average	Maximum	Minimum	Annual Accumulation
Sites operated by the National Park Service (Gaseous Pollutant Monitoring Program)									
Big Bend	K-Bar Ranch Road	3.7	21.4	42.9	-5.6	42	99	3	315.0
Canyonlands	Island in the Sky	3.0	13.7	36.1	-14.4	37	98	4	149.4
Chaco Culture	Radio Repeater	3.9	13.1	31.1	-7.2	38	100	5	141.7
Chiricahua	Entrance Station	2.9	17.3	37.4	-7.4	41	98	5	291.5
Craters of the Moon	Visitor Center	3.4	7.5	34.7	-21.8	---	---	---	---
Death Valley	Park Village	3.8	28.7	48.1	8.4	---	---	---	---
Denali	Headquarters	1.4	-0.7	27.3	-34.7	71	100	22	298.0
Everglades	Beard Center	3.1	24.1	33.9	7.4	78	100	27	1548.9
Glacier	West Glacier Horse Stables	0.8	4.6	33.7	-28.1	---	---	---	---
Grand Canyon	The Abyss	2.9	12.2	33.2	-12.0	39	95	5	209.0
Grand Teton	Science School	2.6	3.1	29.3	-31.3	69	99	12	415.9
Great Basin	Maintenance Yard	2.8	10.0	35.4	-22.9	43	95	4	293.7
Great Smoky Mountains	Clingmans Dome	2.8	10.9	21.4	-10.3	87	100	7	1231.3
Great Smoky Mountains	Cove Mountain	4.5	12.0	27.2	-17.3	73	100	7	1135.9
Great Smoky Mountains	Look Rock	2.3	13.9	30.0	-15.0	71	100	15	1399.8
Hawaii Volcanoes	Observatory / Jaggar Museum	4.8	15.7	25.0	6.6	82	100	4	1362.1
Hawaii Volcanoes	Visitor Center	3.5	15.6	24.6	6.8	89	100	17	1520.4
Joshua Tree	Black Rock	3.8	17.0	39.0	-4.1	34	95	4	215.1
Joshua Tree	Cottonwood Canyon	3.5	20.4	41.2	1.3	29	98	4	135.5
Lassen Volcanic	Manzanita Lake Fire Station	1.6	7.4	33.0	-15.6	64	97	11	1440.5
Mammoth Cave	Houchin Meadow	1.8	14.8	34.2	-14.9	75	96	21	1276.0
Mesa Verde	Resource Management Area	3.1	11.3	33.6	-15.3	42	97	5	311.9
Minidoka	Maintenance Building	2.2	8.2	38.3	-29.3	67	100	8	---
Petrified Forest	South Entrance	4.1	14.3	37.1	-9.3	---	---	---	---
Pinnacles	SW of East Entrance Station	2.3	15.3	45.8	-7.4	60	100	6	396.4
Rocky Mountain	Long's Peak	2.6	5.2	26.0	-25.9	52	97	6	575.6
Sequoia and Kings Canyon	Ash Mountain	2.5	17.9	41.6	-1.0	52	100	6	812.4
Sequoia and Kings Canyon	Lower Kaweah	1.6	14.5	29.2	-5.6	55	100	8	181.0
Shenandoah	Big Meadows	1.8	9.1	27.8	-19.5	73	95	15	919.0
Voyageurs	Sullivan Bay	2.4	5.4	35.6	-35.4	75	98	15	395.9
Yellowstone	Old Faithful Snow Lodge	1.7	2.3	29.1	-34.0	69	99	10	---
Yellowstone	Water Tank	1.5	1.5	27.0	-29.4	70	95	13	696.4
Yellowstone	West Entrance	1.1	2.6	30.8	-37.2	70	100	10	---
Yosemite	Turtleback Dome	4.3	12.2	31.7	-7.7	51	100	7	1203.3
Zion	Dalton's Wash	4.1	17.8	43.5	-6.9	---	---	---	211.9
Sites operated by the NPS for the Bureau of Land Management									
Meeker	Plant Science Center	3.8	8.5	33.3	-29.0	54	100	10	351.0
Rangely	Golf Course	3.1	10.0	36.2	-27.3	50	100	7	230.0
Sites operated by cooperating state agencies									
Acadia	Cadillac Mountain	5.9	---	---	---	73	100	34	---
Acadia	McFarland Hill	2.7	7.6	31.0	-23.3	74	100	17	1115.8

Table 12. 2017 Annual summary of selected meteorological data (continued).

		Wind Speed (m/s)	Ambient Temperature (degrees C)			Relative Humidity (%)			Precipitation (mm)
		Average	Average	Maximum	Minimum	Average	Maximum	Minimum	Annual Accumulation
National Park Unit	Site Name								
Sites operated by cooperating state agencies									
Cape Cod	Cape Cod	2.4	10.9	34.9	-12.2	69	91	20	----
Chamizal	Chamizal	3.3	20.7	41.4	-3.7	32	95	2	----
Great Smoky Mountains	Cades Cove	1.2	14.7	33.3	-17.9	77	100	12	1459.9
Indiana Dunes	Ammunition Bunker	3.4	11.6	35.4	-18.8	70	100	16	----
Saguaro	East	----	22.8	44.6	0.4	30	99	2	----
Theodore Roosevelt	Painted Canyon Visitor Cntr	5.2	7.6	38.5	-42.2	61	98	11	234.3
Wind Cave	Visitor Center	2.8	9.5	36.0	-26.6	53	95	6	359.7
Portable ozone monitoring systems (POMS) (seasonal)									
Carlsbad Caverns	Maintenance Area	4.5	22.9	39.9	1.2	45	100	5	280.9
Joshua Tree	Pinto Wells	3.3	23.9	47.6	0.5	27	99	4	48.9
Mojave	Kelso Mountains	3.5	24.7	41.0	3.4	25	94	5	25.3

Note: Dashed lines represent no data available for that particular parameter at that site.

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