

October 9, 1997

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Memorandum

To: See Distribution List

From: David Joseph, Physical Scientist
Research and Monitoring Branch
Air Resources Division

Subject: Attainment of New Final Ozone National Ambient Air Quality Standards at
NPS Ozone Monitoring Sites

Introduction

On July 18, 1997, the U.S. Environmental Protection Agency (EPA) announced its decision to revise the National Ambient Air Quality Standards (NAAQS) for the air pollutant ozone. This memo discusses the changes to the standards and presents an analysis of which park units may exceed these standards based on the ozone monitoring data collected from the National Park Service (NPS) Gaseous Pollutant Monitoring Network. A March 17, 1997, memorandum from this office previously discussed the *proposed* changes to the ozone NAAQS that EPA published on December 13, 1996.

The results of this analysis indicate that more NPS units would not attain the new primary NAAQS than is presently the case with the existing ozone standard. Based on NPS monitoring network ozone data collected between 1994 and 1996, seven NPS areas were found to have ambient ozone levels that exceed the level of the new standard: Great Smoky Mountains, Joshua Tree, Sequoia, Kings Canyon, and Yosemite National Parks, Cape Cod National Seashore, and Pinnacles National Monument. In the future we will be looking at other sources of ozone data to estimate which other NPS units may be likely to exceed the new ozone NAAQS. Also, additional guidance on how the NPS can be involved in the implementation of the NAAQS is forthcoming.

Description of the New NAAQS

There are two established NAAQS for ozone. The “primary” NAAQS is designed to protect human health while the “secondary” NAAQS is designed to protect the public welfare from the adverse effects of the pollutant. The Clean Air Act defines public welfare effects to include, but are not limited to “effects on soils, water, crops, vegetation, manmade materials, animals, wildlife, weather, visibility and climate, damage to and deterioration of property, and hazards to transportation, as well as effects on economic values and on personal comfort and well-being.” (42 U.S.C. 7602(h))

The current primary and secondary ozone standards are identical and are each set at a 1-hour average ozone concentration level of 0.12 parts per million (ppm). These standards are attained when the maximum hourly average concentration is above 0.12 ppm on the average no more than once per year, averaged over three years. States are primarily responsible for ensuring the attainment and maintenance of ambient air quality standards once EPA has established them. Under section 110 of the Clean Air Act (42 U.S.C. 7410), States are required to submit, for EPA approval, State Implementation Plans (SIPs) that provide for the attainment and maintenance of such standards through control programs directed to the sources of the air pollutants involved.

The revised primary standard is based on 8-hour rather than 1-hour average ozone concentrations, and the level of the standard is lowered from 0.12 ppm to 0.08 ppm. The test for exceeding this new primary standard is based on a 3-year average of 8-hour ozone concentrations. For a monitoring site to be attaining the new primary standard, the annual *fourth* highest daily maximum 8-hour ozone concentration, averaged over three years, must not exceed 0.08 ppm. This represents a change from the December 1996 proposed ozone primary NAAQS of 0.08 ppm which was based on the annual *third* highest daily maximum 8-hour ozone concentration, averaged over three years. This test for attainment of the primary standard is discussed in more detail in Appendix 1.

The revised secondary standard replaces the current 1-hour secondary standard with an 8-hour secondary standard identical to the new 8-hour primary standard. The previously proposed secondary standard based on a SUM06 level of 25 ppm-hour (ppm-hr) was *not* adopted. (SUM06 is the sum of hourly ozone concentrations greater than or equal to 0.06 ppm, accumulated over 12 hours per day (8 am-8 pm) during a consecutive 3-month period.) In its final rule, the EPA Administrator stated that “this [secondary] standard will provide substantially improved protection for vegetation from O₃-related adverse effects as compared to that provided by the current 1-hour, 0.12 ppm secondary standard, while allowing time for additional research and the development of a more complete rural monitoring network and air quality database from which to evaluate the elements of an appropriate seasonal secondary standard.”

The EPA final rule promulgating these new primary and secondary ozone NAAQS became effective on September 16, 1997. However, the rule is subject to a 60 “legislative day” review by Congress. It is possible that Congress could develop a bill to repeal the standard, which the President would then decide to veto, or not. At this time, however, it appears that the new

Attainment of the New Primary Standard at NPS Monitoring Sites

A monitoring site attains the new primary NAAQS if the 3-year average of the annual fourth-highest daily maximum 8-hour average ozone concentration is less than 0.085 ppm or 85 ppb. EPA has indicated that 0.085 ppm is the lowest concentration that would exceed the 0.08 ppm standard. Appendix 1 explains the computation of these three-year average 8-hour concentrations. The results of these computations are tabulated in Appendix 2 by park and individual monitoring site. Figure 1 plots in ascending order the 1994-1996 3-year average of the annual fourth-highest 8-hour averages for the NPS monitoring sites that were operational during that three year period. The horizontal line in the figure is drawn at a concentration of 85 ppb. Sites with plotted 8-hour averages that equal or exceed this concentration of 85 ppb would violate the new primary ozone NAAQS. Nine monitoring sites in seven NPS units would have been in "non-attainment" of the primary standard in the three-year period ending with 1996. These seven units are displayed on a map in Figure 2 along with all of the other NPS areas with ozone monitors that attained the standard. The seven NPS areas not attaining the new primary standard in 1996 (based on 1994-1996 data) are Great Smoky Mountains, Joshua Tree, Sequoia, Kings Canyon, and Yosemite National Parks, Cape Cod National Seashore, and Pinnacles National Monument. (Brigantine Wilderness Area/Edwin B. Forsythe National Wildlife Refuge is managed by the U.S. Fish and Wildlife Service (FWS) and is also shown on this map as failing to meet the revised standard in 1996.) Of these areas, all but Cape Cod have the Class I area air quality designation. The highest computed 3-year average 8-hour concentrations were associated with NPS monitoring sites at Sequoia/Kings Canyon and Joshua Tree National Parks, with average values above 100 ppb. NPS sites in the east had average values lower than these western sites, with 3-year averages in the 80-100 ppb range. Sites with the lowest 3-year values in the NPS network included those in the northwest and north, with average 3-year 8-hour concentrations in the 45-65 ppb range.

In all likelihood, there will be more than seven NPS units that would be in non-attainment of the revised primary standard. Had we ozone monitors in all NPS units, we would have discovered other areas with 8-hour ozone concentrations for the 3-year period at 85 ppb or higher. Santa Monica Mountains National Recreation Area is an example of an NPS area that would undoubtedly exceed the revised standard. Ozone monitoring at this unit ended in 1992, but as Appendix 2 documents, three-year fourth-high maximum 8-hour concentrations for this site prior to 1993 exceeded 100 ppb. Other NPS units in California and the northeast United States--geographical regions with high ozone concentrations, might be expected to have ambient ozone

concentration levels above the revised primary standard.

Attainment of this standard, at any one monitoring site, can vary year by year. Pinnacles National Monument, for example, did not exceed the revised standard for any 3-year period between 1988 and 1995, but did in 1996 (based on 1994-1996 data). Figure 3 illustrates the variation in 3-year average 8-hour concentrations at Great Smoky Mountains National Park between 1990 and 1996. The 3-year average not only varies year by year but also between monitoring sites at this park. Great Smoky Mountain National Park Cades Cove site's 1996 3-year average was 14 and 17 ppb lower than those observed at the Cove Mountain and Look Rock sites, respectively. The year plotted on the horizontal axis of the graph in Figure 3 is associated with a particular 3-year average and represents the ending year of the 3-year period. For example, 1996 is associated with the 3-year period 1994-1996.

Attainment of the New Secondary Standard at NPS Monitoring Sites

The new secondary standard is identical to the new primary standard and the above discussion of attainment of the primary standard would apply to the secondary standard.

Implementation of the NAAQS

The results of this analysis suggest that more NPS units would be in non-attainment of the new primary NAAQS than is presently the case with the existing standards. The ultimate responsibility for the determination of a geographical area's attainment or non-attainment of the standards rests with the State.

The EPA will develop final guidance on how and by when States should implement the revised ozone NAAQS. In general, States are given time to revise their State Implementation Plan (SIP) to incorporate necessary air pollution control programs and regulations designed to lower ambient air pollution levels and make progress toward meeting the new NAAQS. If the NAAQS are already met, the State air pollution control programs must keep these ambient air pollution levels below the levels of the NAAQS. This SIP revision process generally takes years from the time the NAAQS are finalized.

President Clinton issued a memorandum on July 16, 1997, concerning the implementation of the revised air quality standards. (This was published in the Federal Register at 62FR38421 on July 18, 1997). This memorandum elaborated several principles that must be considered when the new standards are being implemented. These principles include the requirement that the implementation "be carried out to maximize common sense, flexibility and cost effectiveness" and that the "Nation continues its progress toward cleaner air by respecting the agreements already made by States, communities, and businesses to clean up the air, and by avoiding additional burdens with respect to the beneficial measures underway in many areas." The implementation must reward State and local governments that take early action to remedy air pollution problems and also acknowledge the fact that air pollution can be transported hundreds

of miles across many different States.

Several specific provisions of the ozone NAAQS implementation strategy were discussed in the President's memo. Some of these provisions included the following:

1. To ensure an effective transition to the new 8-hour NAAQS, the current 1-hour NAAQS *will* continue to apply to areas not attaining it. Once EPA determines that an area has attained the current 1-hour standard the standard will cease to apply. States will not have to prepare maintenance plans for those areas that attain the 1-hour standard.
2. Following the promulgation of a new NAAQS, the Clean Air Act allows up to three years for States to recommend and the EPA to designate non-attainment areas. States will then have up to three years to develop and submit a SIP to attain the new standard. In the case of the revised ozone NAAQS, non-attainment areas would be designated by 2000 and SIPs submitted by 2003. The Clean Air Act allows up to 10 years plus two one-year extensions from the date of non-attainment designation for areas to meet the revised NAAQS.
3. By September 1998, the EPA will issue a rule requiring those States in the eastern U.S. that significantly contribute to non-attainment, or interfere with maintenance of attainment in downwind States, to submit SIPs to reduce their interstate air pollution.
4. EPA will allow those States with areas that attain the 1-hour NAAQS but not the revised 8-hour standard a more flexible and less burdensome implementation approach if SIPs addressing the 8-hour standard are submitted early and the States participate in regional air pollution control strategies.

There are no specific dates by which the secondary NAAQS are to be met. Rather, under the Clean Air Act, states are required to meet the secondary standards in an "as expeditiously as practicable" timeframe.

If you have any questions or comments please contact me at (303) 969-2816, or via ccMail, or email at dbj@aqd.nps.gov.

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Air Quality Coordinators

M.Soukup, A.Miller, M.Ross

ARD Staff

1994-1996 Average of 4th Highest Daily Maximum 8-hour Ozone Concentration

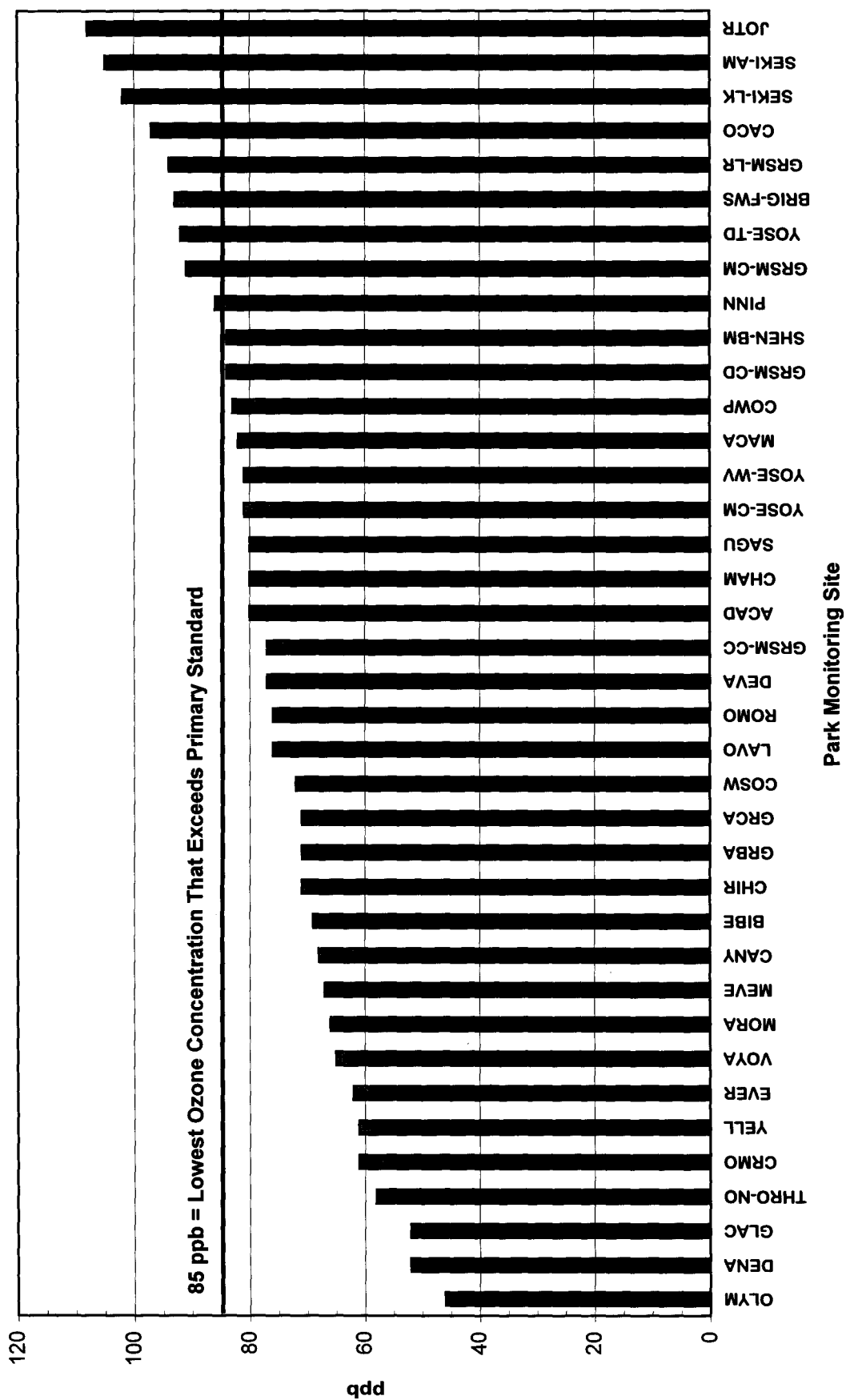


Figure 1

**1996 Attainment Status of NPS and FWS Monitoring Sites
With EPA's New Ozone Primary Ambient Standard
(8-hr, 3-yr average 4th daily maximum, 0.08 ppm)**

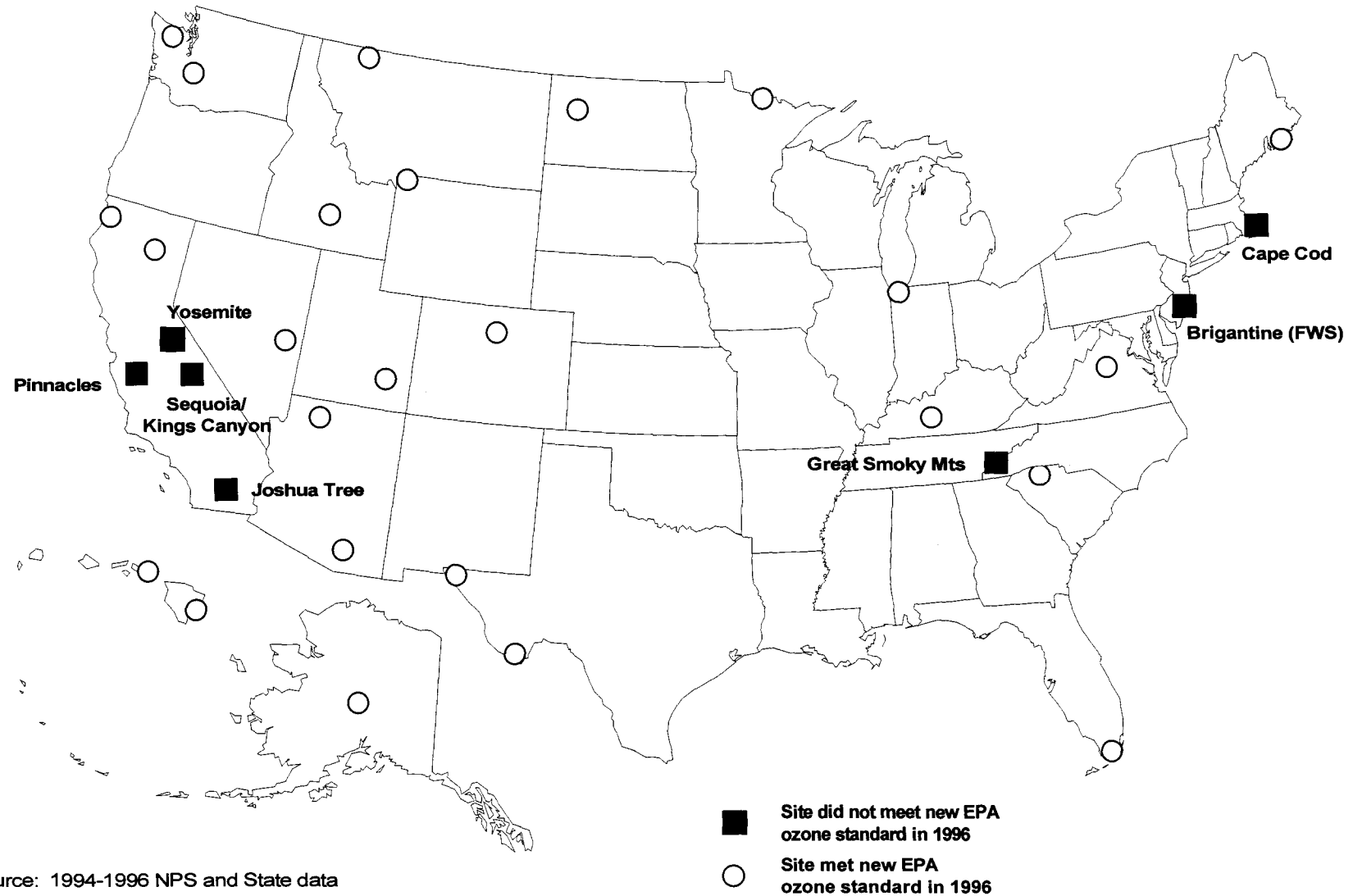
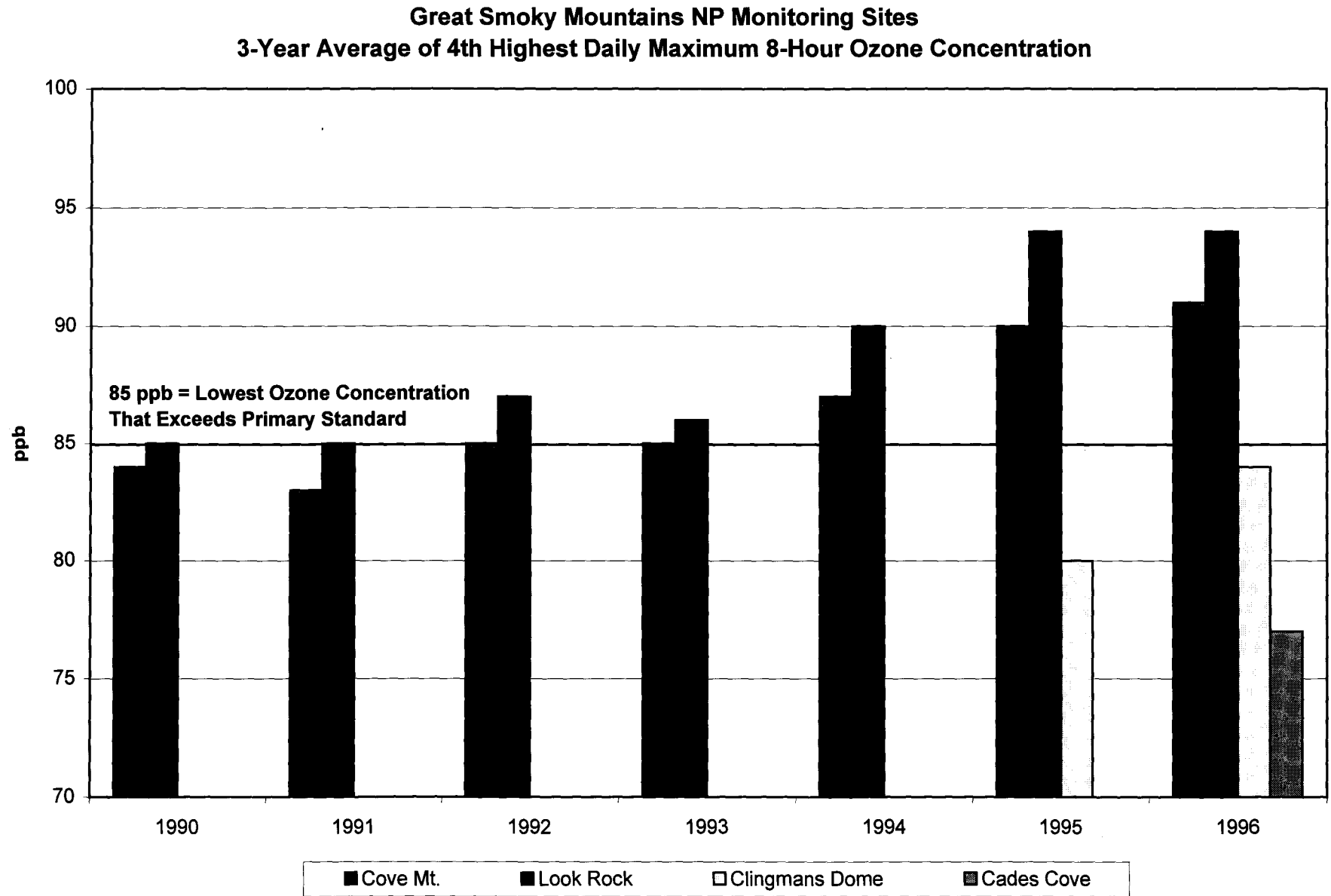


Figure 2

**Figure 3**

Appendix 1

How the NPS Ozone Monitoring Data Were Used to Determine Attainment Status With the U.S. Environmental Protection Agency (EPA) New Ozone National Ambient Air Quality Standards

The New Primary Ozone Standard

routine quality assurance checks, has 24 1-hour average ozone concentrations assigned to protect human health. The

The next step is to calculate running 8-hour average ozone concentrations for each hour of the year. Starting with the first hour of the day, the initial 8-hour average is the arithmetic average of that first hour's ozone concentration with those of the succeeding seven hours (hours 1-8). This 8-hour average is stored in the first, or start, hour of the 8-hour period. The next 8-hour average is computed from hours 2 through 9 and is associated with hour 2 of the day. The third running 8-hour average is calculated using hours 3 through 10 and is stored in hour 3 of the day. This continues for each hour of the day. These running 8-hour averages span the end of one day and the beginning of the next. Thus, the 11 pm 8-hour average is computed using the 11 pm 1-hour average of that day along with the midnight to 6 am 1-hour averages of the next day. An 8-hour average is considered valid if at least 75% of the hourly averages for the 8-hour period exist. Thus, six, seven, or eight 1-hour averages must be available for the 8-hour average to be valid. If only six (or seven) 1-hour averages are available, then the 8-hour average is computed by summing up the available 1-hour averages and using six (or seven) as the divisor.

Each day has 24 possible 8-hour average ozone concentrations. These 8-hour averages are computed for each day during the ozone monitoring season. The ozone monitoring season as defined by the EPA at 40CFR58 Appendix D varies by geographic location. For some states like California, the season is the entire year. For other states the season may be defined as a shorter period, for example, April through October.

The second step is to determine the daily maximum 8-hour concentration for each calendar day by selecting the highest of the 24 possible 8-hour averages for that day. A daily maximum 8-hour average is determined this way for each day of the ozone monitoring season. An ozone monitoring day is considered valid if at least 18 of its 24 possible 8-hour averages are valid. If less than 75% of the 8-hour averages are available, a monitoring day is counted as valid if its daily maximum 8-hour concentration is greater than the level of the ambient standard.

Once each calendar day's daily maximum 8-hour average is determined for the ozone monitoring season, the fourth highest daily maximum 8-hour average is chosen from all of the daily maxima in the ozone monitoring season for that year. The EPA standard-related summary statistic is the annual fourth-highest daily maximum 8-hour ozone concentration averaged over three years. The 3-year average is to be computed using the three most recent, consecutive calendar years of monitoring data meeting the EPA data completeness requirements. The primary ozone ambient standard is met at an ambient air quality monitoring site when the 3-year average of the annual fourth-highest daily maximum 8-hour average ozone concentration is less than or equal to 0.08 ppm (80 ppb). This standard is not met when this 3-year average is greater than 0.08 ppm (80 ppb). Using the EPA's rounding convention, a computed 3-year average ozone concentration of 0.085 ppm (85 ppb) is the smallest value that is greater than the level of the 0.08 ppm (80 ppb) standard.

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. Thus, a site could be found not to have met the standard with less than complete data. The percent data completeness is the percent of valid ozone monitoring days.

Determining a Monitoring Site's Attainment Status with the Primary Standard

The tables that follow in Appendix 2 list the results of the computations of the 3-year average fourth-highest daily maximum 8-hour ozone concentrations. These averages in ppb are found in the column with the heading "3-Yr Avg 4th High Daily Max 8-hr O3." The year associated with a particular 3-year average is the ending year of the 3-year period. (Thus, 1996 is associated with the 3-year period 1994-1996.) If the 3-year average is less than 85 ppb and the EPA data completeness requirements were met for the 3-year period, then the primary standard was met at the monitoring site for that time period. If the 3-year average is 85 ppb or greater than the primary standard was not met. The ultimate responsibility for the determination of a geographical area's attainment or non-attainment of the standard rests with the state. The summary pages also include each year's five highest daily maximum 8-hour ozone average concentrations, 3-year average data completeness, and a column indicating qualitatively whether the EPA data requirements were met for the 3-year period.

Appendix 2

Tables of Results for Individual Monitoring Sites

Acadia NP

Ozone Season Beginning Month = 4 and Ending Month = 10
 Three Year Averages of Annual 4th High Daily Max 8-hr Ozone Concentrations
 Caveat * Indicates EPA Data Completeness Requirement For 3-Yr Averages Not Met

Park	Year	Annual 4th High Daily Max 8-hr O3 ppb	3-Yr Avg 4th High Daily Max 8-hr O3 ppb	3-Yr Avg Data Complete %	CAVEAT	Annual 1st High Daily Max 8-hr O3 ppb	Annual 2nd High Daily Max 8-hr O3 ppb	Annual 3rd High Daily Max 8-hr O3 ppb	Annual 5th High Daily Max 8-hr O3 ppb
ACAD	1983	92	.	.	*	114	99	96	91
ACAD	1984	89	.	.	*	102	98	95	89
ACAD	1985	85	89	92		94	92	87	84
ACAD	1986	83	86	93		99	91	86	83
ACAD	1987	94	87	96		110	104	103	94
ACAD	1988	114	97	93		131	127	116	111
ACAD	1989	77	95	92		109	96	85	76
ACAD	1990	89	93	92		99	98	93	84
ACAD	1991	96	87	89	*	114	113	109	95
ACAD	1992	80	88	79	*	97	85	81	78
ACAD	1993	80	85	80	*	86	85	85	80
ACAD	1994	74	78	82	*	82	76	75	74
ACAD	1995	92	82	95		104	104	94	86
ACAD	1996	74	80	96		97	87	78	71

Arches NP

Ozone Season Beginning Month = 5 and Ending Month = 9
 Three Year Averages of Annual 4th High Daily Max 8-hr Ozone Concentrations
 Caveat * Indicates EPA Data Completeness Requirement For 3-Yr Averages Not Met

Park	Year	Annual 4th High Daily Max 8-hr O3 ppb	3-Yr Avg 4th High Daily Max 8-hr O3 ppb	3-Yr Avg Data Complete %	CAVEAT	Annual 1st High Daily Max 8-hr O3 ppb	Annual 2nd High Daily Max 8-hr O3 ppb	Annual 3rd High Daily Max 8-hr O3 ppb	Annual 5th High Daily Max 8-hr O3 ppb
ARCH	1988	63	.	.	*	68	67	65	62
ARCH	1989	62	.	.	*	67	65	63	62
ARCH	1990	44	56	83	*	49	48	47	43
ARCH	1991	56	54	62	*	63	62	57	52
ARCH	1992	61	54	45	*	64	61	61	61

Badlands NP

Ozone Season Beginning Month = 6 and Ending Month = 9
 Three Year Averages of Annual 4th High Daily Max 8-hr Ozone Concentrations
 Caveat * Indicates EPA Data Completeness Requirement For 3-Yr Averages Not Met

Park Year	Annual 4th High Daily Max 8-hr O3 ppb	3-Yr Avg 4th High Daily Max 8-hr O3 ppb	3-Yr Avg 3-Yr Avg Data Complete %	CAVEAT	Annual 1st High Daily Max 8-hr O3 ppb	Annual 2nd High Daily Max 8-hr O3 ppb	Annual 3rd High Daily Max 8-hr O3 ppb	Annual 5th High Daily Max 8-hr O3 ppb
BADL 1988	61	.	.	*	68	64	62	61
BADL 1989	63	.	.	*	69	66	64	60
BADL 1990	55	60	96		61	59	55	54
BADL 1991	56	58	94		58	58	56	55
BADL 1992	52	54	92		60	56	53	51

Bandalier NP

Ozone Season Beginning Month = 1 and Ending Month = 12
 Three Year Averages of Annual 4th High Daily Max 8-hr Ozone Concentrations
 Caveat * Indicates EPA Data Completeness Requirement For 3-Yr Averages Not Met

Park Year	Annual 4th High Daily Max 8-hr O3 ppb	3-Yr Avg 4th High Daily Max 8-hr O3 ppb	3-Yr Avg 3-Yr Avg Data Complete %	CAVEAT	Annual 1st High Daily Max 8-hr O3 ppb	Annual 2nd High Daily Max 8-hr O3 ppb	Annual 3rd High Daily Max 8-hr O3 ppb	Annual 5th High Daily Max 8-hr O3 ppb
BAND 1990	68	.	.	*	74	71	68	67
BAND 1991	75	.	.	*	77	76	76	74
BAND 1992	69	71	96		73	72	69	68
BAND 1993	64	69	96		67	66	65	63
BAND 1994	69	67	85	*	80	71	71	69

Big Bend NP

Ozone Season Beginning Month = 1 and Ending Month = 12
 Three Year Averages of Annual 4th High Daily Max 8-hr Ozone Concentrations
 Caveat * Indicates EPA Data Completeness Requirement For 3-Yr Averages Not Met

Park Year	Annual 4th High Daily Max 8-hr O3 ppb	3-Yr Avg 4th High Daily Max 8-hr O3 ppb	3-Yr Avg 3-Yr Avg Data Complete %	CAVEAT	Annual 1st High Daily Max 8-hr O3 ppb	Annual 2nd High Daily Max 8-hr O3 ppb	Annual 3rd High Daily Max 8-hr O3 ppb	Annual 5th High Daily Max 8-hr O3 ppb
BIBE 1991	57	.	.	*	60	59	58	56
BIBE 1992	61	.	.	*	63	63	62	60
BIBE 1993	63	60	75	*	69	65	64	61
BIBE 1994	69	64	90		77	76	74	69
BIBE 1995	65	66	84	*	71	67	66	65
BIBE 1996	73	69	86	*	81	80	73	73

Big Thicket NPRS

Ozone Season Beginning Month = 1 and Ending Month = 12
 Three Year Averages of Annual 4th High Daily Max 8-hr Ozone Concentrations
 Caveat * Indicates EPA Data Completeness Requirement For 3-Yr Averages Not Met

Park Year	Annual 4th High Daily Max 8-hr O3 ppb	3-Yr Avg 4th High Daily Max 8-hr O3 ppb	3-Yr Avg Data Complete %	CAVEAT	Annual 1st High Daily Max 8-hr O3 ppb	Annual 2nd High Daily Max 8-hr O3 ppb	Annual 3rd High Daily Max 8-hr O3 ppb	Annual 5th High Daily Max 8-hr O3 ppb
BITH 1987	88	.	.	*	101	98	96	86
BITH 1988	83	.	.	*	91	89	83	82
BITH 1989	78	83	65	*	100	83	79	72
BITH 1990	78	80	58	*	91	86	79	74
BITH 1991	73	76	49	*	83	76	75	67
BITH 1992	74	75	52	*	87	81	75	74

Canyonlands NP

Ozone Season Beginning Month = 5 and Ending Month = 9
 Three Year Averages of Annual 4th High Daily Max 8-hr Ozone Concentrations
 Caveat * Indicates EPA Data Completeness Requirement For 3-Yr Averages Not Met

Park Year	Annual 4th High Daily Max 8-hr O3 ppb	3-Yr Avg 4th High Daily Max 8-hr O3 ppb	3-Yr Avg Data Complete %	CAVEAT	Annual 1st High Daily Max 8-hr O3 ppb	Annual 2nd High Daily Max 8-hr O3 ppb	Annual 3rd High Daily Max 8-hr O3 ppb	Annual 5th High Daily Max 8-hr O3 ppb
CANY 1992	61	.	.	*	64	63	61	60
CANY 1993	64	.	.	*	67	67	65	64
CANY 1994	68	64	72	*	71	70	69	67
CANY 1995	63	65	92		81	72	65	63
CANY 1996	74	68	90		79	76	74	73

Cape Cod NS

Ozone Season Beginning Month = 4 and Ending Month = 10
 Three Year Averages of Annual 4th High Daily Max 8-hr Ozone Concentrations
 Caveat * Indicates EPA Data Completeness Requirement For 3-Yr Averages Not Met

Park Year	Annual 4th High Daily Max 8-hr O3 ppb	3-Yr Avg 4th High Daily Max 8-hr O3 ppb	3-Yr Avg Data Complete %	CAVEAT	Annual 1st High Daily Max 8-hr O3 ppb	Annual 2nd High Daily Max 8-hr O3 ppb	Annual 3rd High Daily Max 8-hr O3 ppb	Annual 5th High Daily Max 8-hr O3 ppb
CACO 1987	94	.	.	*	108	103	99	92
CACO 1988	131	.	.	*	155	146	136	127
CACO 1989	105	110	88	*	117	112	105	93
CACO 1990	97	111	93		116	102	102	96
CACO 1991	112	105	93		135	127	118	107
CACO 1992	97	102	96		111	109	105	91
CACO 1993	88	99	94		96	93	90	83
CACO 1994	89	91	96		97	92	90	85
CACO 1995	106	94	96		126	123	122	101
CACO 1996	97	97	99		111	107	100	95

Chamizal NMEM

Ozone Season Beginning Month = 1 and Ending Month = 12

Three Year Averages of Annual 4th High Daily Max 8-hr Ozone Concentrations

Caveat * Indicates EPA Data Completeness Requirement For 3-Yr Averages Not Met

Park Year	Annual 4th High Daily Max 8-hr O3 ppb	3-Yr Avg 4th High Daily Max 8-hr O3 ppb	3-Yr Avg 3-Yr Avg Data Complete %	CAVEAT	Annual 1st High Daily Max 8-hr O3 ppb	Annual 2nd High Daily Max 8-hr O3 ppb	Annual 3rd High Daily Max 8-hr O3 ppb	Annual 5th High Daily Max 8-hr O3 ppb
CHAM 1992	73	.	.	*	89	89	76	67
CHAM 1993	59	.	.	*	71	69	66	59
CHAM 1994	76	69	84	*	107	87	84	75
CHAM 1995	85	73	88	*	95	87	85	76
CHAM 1996	78	80	89	*	95	81	80	76

Channel Islands NP

Ozone Season Beginning Month = 1 and Ending Month = 12

Three Year Averages of Annual 4th High Daily Max 8-hr Ozone Concentrations

Caveat * Indicates EPA Data Completeness Requirement For 3-Yr Averages Not Met

Park Year	Annual 4th High Daily Max 8-hr O3 ppb	3-Yr Avg 4th High Daily Max 8-hr O3 ppb	3-Yr Avg 3-Yr Avg Data Complete %	CAVEAT	Annual 1st High Daily Max 8-hr O3 ppb	Annual 2nd High Daily Max 8-hr O3 ppb	Annual 3rd High Daily Max 8-hr O3 ppb	Annual 5th High Daily Max 8-hr O3 ppb
CHIS 1988	85	.	.	*	96	86	86	84
CHIS 1989	54	.	.	*	58	58	58	54
CHIS 1990	56	65	30	*	68	58	56	55
CHIS 1991	80	63	31	*	89	87	86	80
CHIS 1992	81	72	51	*	94	90	87	80

Chiricahua NM

Ozone Season Beginning Month = 1 and Ending Month = 12

Three Year Averages of Annual 4th High Daily Max 8-hr Ozone Concentrations

Caveat * Indicates EPA Data Completeness Requirement For 3-Yr Averages Not Met

Park Year	Annual 4th High Daily Max 8-hr O3 ppb	3-Yr Avg 4th High Daily Max 8-hr O3 ppb	3-Yr Avg 3-Yr Avg Data Complete %	CAVEAT	Annual 1st High Daily Max 8-hr O3 ppb	Annual 2nd High Daily Max 8-hr O3 ppb	Annual 3rd High Daily Max 8-hr O3 ppb	Annual 5th High Daily Max 8-hr O3 ppb
CHIR 1989	66	.	.	*	69	67	66	65
CHIR 1990	70	.	.	*	84	80	70	68
CHIR 1991	72	69	78	*	79	76	75	70
CHIR 1992	66	69	92		67	67	66	65
CHIR 1993	69	69	90		73	70	69	69
CHIR 1994	72	69	93		74	73	72	70
CHIR 1995	70	70	79	*	75	72	71	69
CHIR 1996	72	71	78	*	75	75	73	71

Colorado NM

Ozone Season Beginning Month = 3 and Ending Month = 9
 Three Year Averages of Annual 4th High Daily Max 8-hr Ozone Concentrations
 Caveat * Indicates EPA Data Completeness Requirement For 3-Yr Averages Not Met

Park	Year	Annual 4th High Daily Max 8-hr O3	3-Yr Avg 4th High Daily Max 8-hr O3	3-Yr Avg 3-Yr Avg Data Complete	CAVEAT	Annual 1st High Daily Max 8-hr O3	Annual 2nd High Daily Max 8-hr O3	Annual 3rd High Daily Max 8-hr O3	Annual 5th High Daily Max 8-hr O3
		ppb	ppb	%		ppb	ppb	ppb	ppb
COLM	1985	62	.	.	*	65	65	63	62
COLM	1986	68	.	.	*	72	71	71	67
COLM	1987	68	66	76	*	73	71	69	68
COLM	1988	61	66	65	*	64	64	64	60
COLM	1989	61	63	69	*	64	63	62	61
COLM	1990	59	60	72	*	63	60	60	59
COLM	1991	63	61	88	*	69	67	63	62
COLM	1992	65	62	74	*	68	66	66	64

Congaree Swamp NM

Ozone Season Beginning Month = 4 and Ending Month = 10
 Three Year Averages of Annual 4th High Daily Max 8-hr Ozone Concentrations
 Caveat * Indicates EPA Data Completeness Requirement For 3-Yr Averages Not Met

Park	Year	Annual 4th High Daily Max 8-hr O3	3-Yr Avg 4th High Daily Max 8-hr O3	3-Yr Avg 3-Yr Avg Data Complete	CAVEAT	Annual 1st High Daily Max 8-hr O3	Annual 2nd High Daily Max 8-hr O3	Annual 3rd High Daily Max 8-hr O3	Annual 5th High Daily Max 8-hr O3
		ppb	ppb	%		ppb	ppb	ppb	ppb
COSW	1981	60	.	.	*	71	67	63	58
COSW	1982	44	.	.	*	49	47	45	44
COSW	1983	75	60	49	*	101	96	88	69
COSW	1984	73	64	57	*	90	73	73	68
COSW	1985	64	71	46	*	70	70	67	61
COSW	1986	76	71	52	*	85	79	77	74
COSW	1987	68	69	51	*	72	70	68	68
COSW	1988	67	70	56	*	77	67	67	65
COSW	1989	74	70	54	*	99	93	91	74
COSW	1990	89	77	61	*	95	92	92	88
COSW	1991	59	74	56	*	64	61	60	59
COSW	1992	67	72	72	*	77	75	68	66
COSW	1993	63	63	79	*	67	66	66	62
COSW	1994	65	65	89	*	76	74	69	63
COSW	1995	77	68	84	*	87	79	77	71
COSW	1996	74	72	80	*	85	77	75	68

Cowpens NB

Ozone Season Beginning Month = 4 and Ending Month = 10
 Three Year Averages of Annual 4th High Daily Max 8-hr Ozone Concentrations
 Caveat * Indicates EPA Data Completeness Requirement For 3-Yr Averages Not Met

Park Year	Annual 4th High Daily Max 8-hr O3 ppb	3-Yr Avg 4th High Daily Max 8-hr O3 ppb	3-Yr Avg Data Complete %	CAVEAT	Annual 1st High Daily Max 8-hr O3 ppb	Annual 2nd High Daily Max 8-hr O3 ppb	Annual 3rd High Daily Max 8-hr O3 ppb	Annual 5th High Daily Max 8-hr O3 ppb
COWP 1988	111	.	.	*	136	112	112	105
COWP 1989	82	.	.	*	96	85	82	81
COWP 1990	75	89	88	*	80	80	76	74
COWP 1991	78	78	94		86	85	83	78
COWP 1992	86	80	95		106	90	90	85
COWP 1993	83	82	98		93	89	88	83
COWP 1994	83	84	97		94	92	84	79
COWP 1995	85	84	96		97	86	86	83
COWP 1996	81	83	96		94	90	85	80

Craters of the Moon NM

Ozone Season Beginning Month = 4 and Ending Month = 10
 Three Year Averages of Annual 4th High Daily Max 8-hr Ozone Concentrations
 Caveat * Indicates EPA Data Completeness Requirement For 3-Yr Averages Not Met

Park Year	Annual 4th High Daily Max 8-hr O3 ppb	3-Yr Avg 4th High Daily Max 8-hr O3 ppb	3-Yr Avg Data Complete %	CAVEAT	Annual 1st High Daily Max 8-hr O3 ppb	Annual 2nd High Daily Max 8-hr O3 ppb	Annual 3rd High Daily Max 8-hr O3 ppb	Annual 5th High Daily Max 8-hr O3 ppb
CRMO 1992	42	.	.	*	49	43	43	40
CRMO 1993	55	.	.	*	66	62	57	55
CRMO 1994	63	53	65	*	65	65	65	63
CRMO 1995	57	58	93		59	58	57	56
CRMO 1996	64	61	90		76	68	65	64

Cuyahoga Valley NRA

Ozone Season Beginning Month = 4 and Ending Month = 10
 Three Year Averages of Annual 4th High Daily Max 8-hr Ozone Concentrations
 Caveat * Indicates EPA Data Completeness Requirement For 3-Yr Averages Not Met

Park Year	Annual 4th High Daily Max 8-hr O3 ppb	3-Yr Avg 4th High Daily Max 8-hr O3 ppb	3-Yr Avg Data Complete %	CAVEAT	Annual 1st High Daily Max 8-hr O3 ppb	Annual 2nd High Daily Max 8-hr O3 ppb	Annual 3rd High Daily Max 8-hr O3 ppb	Annual 5th High Daily Max 8-hr O3 ppb
CUVA 1985	64	.	.	*	81	68	65	62
CUVA 1989	91	.	.	*	117	109	98	91
CUVA 1990	81	79	63	*	112	97	87	80
CUVA 1991	98	90	79	*	113	107	101	96

Death Valley NP

Ozone Season Beginning Month = 1 and Ending Month = 12
 Three Year Averages of Annual 4th High Daily Max 8-hr Ozone Concentrations
 Caveat * Indicates EPA Data Completeness Requirement For 3-Yr Averages Not Met

Park Year	Annual 4th High Daily Max 8-hr O3 ppb	3-Yr Avg 4th High Daily Max 8-hr O3 ppb	3-Yr Avg Data Complete %	CAVEAT	Annual 1st High Daily Max 8-hr O3 ppb	Annual 2nd High Daily Max 8-hr O3 ppb	Annual 3rd High Daily Max 8-hr O3 ppb	Annual 5th High Daily Max 8-hr O3 ppb
DEVA 1994	84	.	.	*	89	88	85	81
DEVA 1995	68	.	.	*	73	71	68	65
DEVA 1996	78	77	83	*	82	80	79	77

Denali NP

Ozone Season Beginning Month = 4 and Ending Month = 10
 Three Year Averages of Annual 4th High Daily Max 8-hr Ozone Concentrations
 Caveat * Indicates EPA Data Completeness Requirement For 3-Yr Averages Not Met

Park Year	Annual 4th High Daily Max 8-hr O3 ppb	3-Yr Avg 4th High Daily Max 8-hr O3 ppb	3-Yr Avg Data Complete %	CAVEAT	Annual 1st High Daily Max 8-hr O3 ppb	Annual 2nd High Daily Max 8-hr O3 ppb	Annual 3rd High Daily Max 8-hr O3 ppb	Annual 5th High Daily Max 8-hr O3 ppb
DENA 1987	42	.	.	*	44	44	44	42
DENA 1988	53	.	.	*	55	54	54	53
DENA 1989	47	47	68	*	48	48	47	47
DENA 1990	48	49	78	*	49	48	48	48
DENA 1991	50	48	78	*	54	54	50	47
DENA 1992	51	50	90		53	52	52	50
DENA 1993	48	50	96		53	53	51	48
DENA 1994	49	49	96		53	51	49	49
DENA 1995	54	50	97		58	56	56	51
DENA 1996	53	52	98		58	54	54	53

Everglades NP

Ozone Season Beginning Month = 1 and Ending Month = 12

Three Year Averages of Annual 4th High Daily Max 8-hr Ozone Concentrations

Caveat * Indicates EPA Data Completeness Requirement For 3-Yr Averages Not Met

Park Year	Annual 4th High Daily Max 8-hr O3 ppb	3-Yr Avg 4th High Daily Max 8-hr O3 ppb	3-Yr Avg 3-Yr Avg Data Complete %	CAVEAT	Annual 1st High Daily Max 8-hr O3 ppb	Annual 2nd High Daily Max 8-hr O3 ppb	Annual 3rd High Daily Max 8-hr O3 ppb	Annual 5th High Daily Max 8-hr O3 ppb
EVER 1986	54	.	.	*	59	58	55	51
EVER 1987	73	.	.	*	76	74	74	72
EVER 1988	69	65	51	*	88	83	81	69
EVER 1989	68	70	64	*	81	71	69	66
EVER 1990	61	66	69	*	70	65	62	60
EVER 1991	61	63	88	*	64	62	61	60
EVER 1992	62	61	81	*	73	68	66	61
EVER 1993	65	63	70	*	77	72	66	64
EVER 1994	64	64	51	*	73	71	67	58
EVER 1995	58	62	62	*	73	63	59	58
EVER 1996	63	62	70	*	77	64	63	59

Glacier NP

Ozone Season Beginning Month = 6 and Ending Month = 9

Three Year Averages of Annual 4th High Daily Max 8-hr Ozone Concentrations

Caveat * Indicates EPA Data Completeness Requirement For 3-Yr Averages Not Met

Park Year	Annual 4th High Daily Max 8-hr O3 ppb	3-Yr Avg 4th High Daily Max 8-hr O3 ppb	3-Yr Avg 3-Yr Avg Data Complete %	CAVEAT	Annual 1st High Daily Max 8-hr O3 ppb	Annual 2nd High Daily Max 8-hr O3 ppb	Annual 3rd High Daily Max 8-hr O3 ppb	Annual 5th High Daily Max 8-hr O3 ppb
GLAC 1989	56	.	.	*	60	58	57	56
GLAC 1990	50	.	.	*	52	52	51	50
GLAC 1991	52	53	100		56	55	53	51
GLAC 1992	51	51	100		56	54	53	51
GLAC 1993	45	49	100		49	47	45	44
GLAC 1994	55	50	99		57	57	56	53
GLAC 1995	44	48	93		50	47	45	44
GLAC 1996	57	52	90		60	59	58	57

Great Basin NP

Ozone Season Beginning Month = 1 and Ending Month = 12
 Three Year Averages of Annual 4th High Daily Max 8-hr Ozone Concentrations
 Caveat * Indicates EPA Data Completeness Requirement For 3-Yr Averages Not Met

Park Year	Annual 4th High Daily Max 8-hr O3 ppb	3-Yr Avg 4th High Daily Max 8-hr O3 ppb	3-Yr Avg Data Complete %	CAVEAT	Annual 1st High Daily Max 8-hr O3 ppb	Annual 2nd High Daily Max 8-hr O3 ppb	Annual 3rd High Daily Max 8-hr O3 ppb	Annual 5th High Daily Max 8-hr O3 ppb
GRBA 1993	52	.	.	*	60	58	54	51
GRBA 1994	70	.	.	*	72	72	70	68
GRBA 1995	68	63	74	*	73	69	68	67
GRBA 1996	74	71	96		79	78	75	73

Grand Canyon NP

Ozone Season Beginning Month = 1 and Ending Month = 12
 Three Year Averages of Annual 4th High Daily Max 8-hr Ozone Concentrations
 Caveat * Indicates EPA Data Completeness Requirement For 3-Yr Averages Not Met

Park Year	Annual 4th High Daily Max 8-hr O3 ppb	3-Yr Avg 4th High Daily Max 8-hr O3 ppb	3-Yr Avg Data Complete %	CAVEAT	Annual 1st High Daily Max 8-hr O3 ppb	Annual 2nd High Daily Max 8-hr O3 ppb	Annual 3rd High Daily Max 8-hr O3 ppb	Annual 5th High Daily Max 8-hr O3 ppb
GRCA 1983	42	.	.	*	53	49	43	41
GRCA 1989	57	.	.	*	62	59	58	56
GRCA 1990	66	55	57	*	67	66	66	64
GRCA 1991	72	65	71	*	75	73	72	72
GRCA 1992	68	69	90		76	75	71	67
GRCA 1993	64	68	96		65	64	64	64
GRCA 1994	70	67	97		75	71	70	69
GRCA 1995	69	68	96		71	70	70	69
GRCA 1996	73	71	94		80	79	76	73

Great Sand Dunes NM

Ozone Season Beginning Month = 3 and Ending Month = 9
 Three Year Averages of Annual 4th High Daily Max 8-hr Ozone Concentrations
 Caveat * Indicates EPA Data Completeness Requirement For 3-Yr Averages Not Met

Park Year	Annual 4th High Daily Max 8-hr O3 ppb	3-Yr Avg 4th High Daily Max 8-hr O3 ppb	3-Yr Avg Data Complete %	CAVEAT	Annual 1st High Daily Max 8-hr O3 ppb	Annual 2nd High Daily Max 8-hr O3 ppb	Annual 3rd High Daily Max 8-hr O3 ppb	Annual 5th High Daily Max 8-hr O3 ppb
GRSA 1988	60	.	.	*	66	60	60	58
GRSA 1989	57	.	.	*	61	59	59	57
GRSA 1990	61	59	90		65	63	62	61
GRSA 1991	63	60	94		72	71	67	63

Great Smoky Mountains NP - Cove Mountain

Ozone Season Beginning Month = 4 and Ending Month = 10
 Three Year Averages of Annual 4th High Daily Max 8-hr Ozone Concentrations
 Caveat * Indicates EPA Data Completeness Requirement For 3-Yr Averages Not Met

Park	Year	Annual 4th High Daily Max 8-hr O3	3-Yr Avg 4th High Daily Max 8-hr O3	3-Yr Avg 3-Yr Avg Data Complete	CAVEAT	Annual 1st High Daily Max 8-hr O3	Annual 2nd High Daily Max 8-hr O3	Annual 3rd High Daily Max 8-hr O3	Annual 5th High Daily Max 8-hr O3
		ppb	ppb	%		ppb	ppb	ppb	ppb
GSCM	1988	87	.	.	*	100	92	88	86
GSCM	1989	79	.	.	*	82	82	80	78
GSCM	1990	87	84	45	*	94	88	88	84
GSCM	1991	83	83	65	*	87	84	83	80
GSCM	1992	84	85	78	*	98	94	88	83
GSCM	1993	89	85	88	*	100	92	90	89
GSCM	1994	88	87	91		112	104	93	85
GSCM	1995	94	90	92		109	104	99	92
GSCM	1996	92	91	93		95	93	93	92

Great Smoky Mountains NP - Look Rock

Ozone Season Beginning Month = 4 and Ending Month = 10
 Three Year Averages of Annual 4th High Daily Max 8-hr Ozone Concentrations
 Caveat * Indicates EPA Data Completeness Requirement For 3-Yr Averages Not Met

Park	Year	Annual 4th High Daily Max 8-hr O3	3-Yr Avg 4th High Daily Max 8-hr O3	3-Yr Avg 3-Yr Avg Data Complete	CAVEAT	Annual 1st High Daily Max 8-hr O3	Annual 2nd High Daily Max 8-hr O3	Annual 3rd High Daily Max 8-hr O3	Annual 5th High Daily Max 8-hr O3
		ppb	ppb	%		ppb	ppb	ppb	ppb
GSLR	1988	79	.	.	*	107	90	79	79
GSLR	1989	83	.	.	*	88	87	84	83
GSLR	1990	92	85	68	*	96	94	92	86
GSLR	1991	80	85	86	*	86	86	81	79
GSLR	1992	88	87	86	*	95	92	89	86
GSLR	1993	89	86	88	*	100	94	92	80
GSLR	1994	94	90	89	*	109	97	97	91
GSLR	1995	99	94	80	*	110	106	103	94
GSLR	1996	89	94	83	*	91	90	89	89

Great Smoky Mountains NP - Clingmans Dome

Ozone Season Beginning Month = 4 and Ending Month = 10
 Three Year Averages of Annual 4th High Daily Max 8-hr Ozone Concentrations
 Caveat * Indicates EPA Data Completeness Requirement For 3-Yr Averages Not Met

Park Year	Annual 4th High Daily Max 8-hr O3 ppb	3-Yr Avg 4th High Daily Max 8-hr O3 ppb	3-Yr Avg Data Complete %	CAVEAT	Annual 1st High Daily Max 8-hr O3 ppb	Annual 2nd High Daily Max 8-hr O3 ppb	Annual 3rd High Daily Max 8-hr O3 ppb	Annual 5th High Daily Max 8-hr O3 ppb
GSCD 1993	74	.	.	*	75	74	74	74
GSCD 1994	76	.	.	*	97	91	87	76
GSCD 1995	89	80	83	*	98	89	89	89
GSCD 1996	87	84	83	*	94	89	89	87

Great Smoky Mountains NP - Cades Cove

Ozone Season Beginning Month = 4 and Ending Month = 10
 Three Year Averages of Annual 4th High Daily Max 8-hr Ozone Concentrations
 Caveat * Indicates EPA Data Completeness Requirement For 3-Yr Averages Not Met

Park Year	Annual 4th High Daily Max 8-hr O3 ppb	3-Yr Avg 4th High Daily Max 8-hr O3 ppb	3-Yr Avg Data Complete %	CAVEAT	Annual 1st High Daily Max 8-hr O3 ppb	Annual 2nd High Daily Max 8-hr O3 ppb	Annual 3rd High Daily Max 8-hr O3 ppb	Annual 5th High Daily Max 8-hr O3 ppb
GSCC 1994	76	.	.	*	99	87	79	74
GSCC 1995	78	.	.	*	84	83	82	77
GSCC 1996	76	77	91		84	82	79	76

Guadalupe Mountains NP

Ozone Season Beginning Month = 1 and Ending Month = 12
 Three Year Averages of Annual 4th High Daily Max 8-hr Ozone Concentrations
 Caveat * Indicates EPA Data Completeness Requirement For 3-Yr Averages Not Met

Park Year	Annual 4th High Daily Max 8-hr O3 ppb	3-Yr Avg 4th High Daily Max 8-hr O3 ppb	3-Yr Avg Data Complete %	CAVEAT	Annual 1st High Daily Max 8-hr O3 ppb	Annual 2nd High Daily Max 8-hr O3 ppb	Annual 3rd High Daily Max 8-hr O3 ppb	Annual 5th High Daily Max 8-hr O3 ppb
GUMO 1987	80	.	.	*	124	111	83	79
GUMO 1988	75	.	.	*	95	86	86	75
GUMO 1989	66	74	63	*	67	67	66	66
GUMO 1990	61	67	77	*	71	69	63	60
GUMO 1991	61	63	66	*	67	64	61	61
GUMO 1992	69	64	63	*	71	70	69	66

Haleakala NP

Ozone Season Beginning Month = 1 and Ending Month = 12
 Three Year Averages of Annual 4th High Daily Max 8-hr Ozone Concentrations
 Caveat * Indicates EPA Data Completeness Requirement For 3-Yr Averages Not Met

Park Year	Annual 4th High Daily Max 8-hr O3 ppb	3-Yr Avg 4th High Daily Max 8-hr O3 ppb	3-Yr Avg Data Complete %	CAVEAT	Annual 1st High Daily Max 8-hr O3 ppb	Annual 2nd High Daily Max 8-hr O3 ppb	Annual 3rd High Daily Max 8-hr O3 ppb	Annual 5th High Daily Max 8-hr O3 ppb
HALE 1991	39	.	.	*	42	41	39	39
HALE 1992	44	.	.	*	48	48	47	44
HALE 1993	46	43	78	*	47	46	46	46
HALE 1994	46	45	96		49	48	46	45
HALE 1995	48	47	79	*	51	48	48	48

Hawaii Volcanoes NP

Ozone Season Beginning Month = 1 and Ending Month = 12
 Three Year Averages of Annual 4th High Daily Max 8-hr Ozone Concentrations
 Caveat * Indicates EPA Data Completeness Requirement For 3-Yr Averages Not Met

Park Year	Annual 4th High Daily Max 8-hr O3 ppb	3-Yr Avg 4th High Daily Max 8-hr O3 ppb	3-Yr Avg Data Complete %	CAVEAT	Annual 1st High Daily Max 8-hr O3 ppb	Annual 2nd High Daily Max 8-hr O3 ppb	Annual 3rd High Daily Max 8-hr O3 ppb	Annual 5th High Daily Max 8-hr O3 ppb
HAVO 1987	54	.	.	*	56	55	55	53
HAVO 1988	56	.	.	*	59	58	56	53
HAVO 1989	46	52	87	*	49	49	48	46
HAVO 1990	42	48	80	*	48	46	42	41
HAVO 1991	34	41	78	*	35	35	35	33
HAVO 1992	45	40	81	*	50	49	46	44
HAVO 1993	41	40	93		46	41	41	40
HAVO 1994	51	46	94		53	52	51	46
HAVO 1995	48	47	76	*	50	48	48	46

Indiana Dunes NL

Ozone Season Beginning Month = 4 and Ending Month = 9
 Three Year Averages of Annual 4th High Daily Max 8-hr Ozone Concentrations
 Caveat * Indicates EPA Data Completeness Requirement For 3-Yr Averages Not Met

Park	Year	Annual 4th High Daily Max 8-hr O3 ppb	3-Yr Avg 4th High Daily Max 8-hr O3 ppb	3-Yr Avg 3-Yr Avg Data Complete %	CAVEAT	Annual 1st High Daily Max 8-hr O3 ppb	Annual 2nd High Daily Max 8-hr O3 ppb	Annual 3rd High Daily Max 8-hr O3 ppb	Annual 5th High Daily Max 8-hr O3 ppb
INDU	1984	100	.	.	*	116	109	103	96
INDU	1985	78	.	.	*	100	84	81	77
INDU	1986	81	86	90		84	84	82	76
INDU	1987	110	90	88	*	118	112	111	106
INDU	1988	121	104	84	*	135	126	123	118
INDU	1989	71	101	76	*	76	74	71	71
INDU	1990	100	97	70	*	123	110	101	97
INDU	1991	89	87	73	*	113	101	100	89
INDU	1992	87	92	79	*	109	98	96	85
INDU	1993	73	83	83	*	88	76	75	73
INDU	1994	81	80	87	*	110	91	83	80
INDU	1995	91	82	87	*	104	94	91	90

Isle Royale NP

Ozone Season Beginning Month = 4 and Ending Month = 9
 Three Year Averages of Annual 4th High Daily Max 8-hr Ozone Concentrations
 Caveat * Indicates EPA Data Completeness Requirement For 3-Yr Averages Not Met

Park	Year	Annual 4th High Daily Max 8-hr O3 ppb	3-Yr Avg 4th High Daily Max 8-hr O3 ppb	3-Yr Avg 3-Yr Avg Data Complete %	CAVEAT	Annual 1st High Daily Max 8-hr O3 ppb	Annual 2nd High Daily Max 8-hr O3 ppb	Annual 3rd High Daily Max 8-hr O3 ppb	Annual 5th High Daily Max 8-hr O3 ppb
ISRO	1987	52	.	.	*	54	54	53	51
ISRO	1988	79	.	.	*	87	80	80	79
ISRO	1989	54	62	46	*	83	76	58	54
ISRO	1990	45	59	37	*	64	53	47	44
ISRO	1991	64	54	37	*	76	67	65	63

Joshua Tree NP

Ozone Season Beginning Month = 1 and Ending Month = 12
 Three Year Averages of Annual 4th High Daily Max 8-hr Ozone Concentrations
 Caveat * Indicates EPA Data Completeness Requirement For 3-Yr Averages Not Met

Park Year	Annual 4th High Daily Max 8-hr O3 ppb	3-Yr Avg 4th High Daily Max 8-hr O3 ppb	3-Yr Avg 3-Yr Avg Data Complete %	CAVEAT	Annual 1st High Daily Max 8-hr O3 ppb	Annual 2nd High Daily Max 8-hr O3 ppb	Annual 3rd High Daily Max 8-hr O3 ppb	Annual 5th High Daily Max 8-hr O3 ppb
JOTR 1987	112	.	.	*	128	125	114	108
JOTR 1988	102	.	.	*	121	106	104	101
JOTR 1989	99	104	57	*	118	101	101	96
JOTR 1990	95	99	55	*	103	100	98	94
JOTR 1991	107	100	56	*	116	112	109	106
JOTR 1992	106	103	66	*	115	108	106	103
JTBR 1993	93	102	71	*	106	98	97	91
JOTR 1994	113	104	78	*	128	118	116	111
JOTR 1995	103	103	86	*	107	106	106	100
JOTR 1996	109	108	98		118	114	111	109

Kings Canyon NP - Grant Grove

Ozone Season Beginning Month = 1 and Ending Month = 12
 Three Year Averages of Annual 4th High Daily Max 8-hr Ozone Concentrations
 Caveat * Indicates EPA Data Completeness Requirement For 3-Yr Averages Not Met

Park Year	Annual 4th High Daily Max 8-hr O3 ppb	3-Yr Avg 4th High Daily Max 8-hr O3 ppb	3-Yr Avg 3-Yr Avg Data Complete %	CAVEAT	Annual 1st High Daily Max 8-hr O3 ppb	Annual 2nd High Daily Max 8-hr O3 ppb	Annual 3rd High Daily Max 8-hr O3 ppb	Annual 5th High Daily Max 8-hr O3 ppb
SEGG 1990	99	.	.	*	105	103	101	99
SEGG 1991	96	.	.	*	99	97	97	95
SEGG 1992	98	98	97		104	102	101	98
SEGG 1993	100	98	96		110	107	105	99
SEGG 1994	106	101	97		116	109	107	104
SEGG 1995	98	101	87	*	107	99	99	95

Lassen Volcanic NP

Ozone Season Beginning Month = 1 and Ending Month = 12

Three Year Averages of Annual 4th High Daily Max 8-hr Ozone Concentrations

Caveat * Indicates EPA Data Completeness Requirement For 3-Yr Averages Not Met

Park	Year	Annual 4th High Daily Max 8-hr O3	3-Yr Avg 4th High Daily Max 8-hr O3	3-Yr Avg 3-Yr Avg Data Complete	CAVEAT	Annual 1st High Daily Max 8-hr O3	Annual 2nd High Daily Max 8-hr O3	Annual 3rd High Daily Max 8-hr O3	Annual 5th High Daily Max 8-hr O3
		ppb	ppb	%		ppb	ppb	ppb	ppb
LAVO	1988	71	.	.	*	77	75	72	69
LAVO	1989	74	.	.	*	79	76	75	74
LAVO	1990	79	75	86	*	88	84	79	78
LAVO	1991	67	73	92		73	70	69	66
LAVO	1992	67	71	92		71	71	70	65
LAVO	1993	64	66	91		72	68	64	64
LAVO	1994	79	70	92		86	83	82	79
LAVO	1995	75	73	90		80	76	75	74
LAVO	1996	73	76	89	*	86	74	73	73

Mammoth Cave NP

Ozone Season Beginning Month = 4 and Ending Month = 10

Three Year Averages of Annual 4th High Daily Max 8-hr Ozone Concentrations

Caveat * Indicates EPA Data Completeness Requirement For 3-Yr Averages Not Met

Park	Year	Annual 4th High Daily Max 8-hr O3	3-Yr Avg 4th High Daily Max 8-hr O3	3-Yr Avg 3-Yr Avg Data Complete	CAVEAT	Annual 1st High Daily Max 8-hr O3	Annual 2nd High Daily Max 8-hr O3	Annual 3rd High Daily Max 8-hr O3	Annual 5th High Daily Max 8-hr O3
		ppb	ppb	%		ppb	ppb	ppb	ppb
MACA	1985	84	.	.	*	95	88	85	83
MACA	1986	85	.	.	*	97	93	85	83
MACA	1987	92	87	93		96	95	93	91
MACA	1988	110	96	92		114	112	110	108
MACA	1989	85	96	92		87	86	85	84
MACA	1990	84	93	93		88	87	84	83
MACA	1991	78	82	92		80	79	79	78
MACA	1992	73	78	94		78	77	75	73
MACA	1993	73	75	91		82	77	73	71
MACA	1994	76	74	86	*	88	79	77	76
MACA	1995	88	79	87	*	101	91	89	87
MACA	1996	82	82	91		95	89	82	81

Mesa Verde NP

Ozone Season Beginning Month = 3 and Ending Month = 9
 Three Year Averages of Annual 4th High Daily Max 8-hr Ozone Concentrations
 Caveat * Indicates EPA Data Completeness Requirement For 3-Yr Averages Not Met

Park Year	Annual	3-Yr Avg	3-Yr Avg Data Complete	CAVEAT	Annual	Annual	Annual	Annual
	4th High	4th High			1st High	2nd High	3rd High	5th High
	Daily Max 8-hr O3	Daily Max 8-hr O3			Daily Max 8-hr O3	Daily Max 8-hr O3	Daily Max 8-hr O3	Daily Max 8-hr O3
	ppb	ppb	%		ppb	ppb	ppb	ppb
MEVE 1993	59	.	.	*	64	62	61	57
MEVE 1994	63	.	.	*	64	64	63	63
MEVE 1995	64	62	80	*	68	64	64	63
MEVE 1996	73	67	98		75	73	73	71

Mount Rainier NP

Ozone Season Beginning Month = 4 and Ending Month = 10
 Three Year Averages of Annual 4th High Daily Max 8-hr Ozone Concentrations
 Caveat * Indicates EPA Data Completeness Requirement For 3-Yr Averages Not Met

Park Year	Annual	3-Yr Avg	3-Yr Avg Data Complete	CAVEAT	Annual	Annual	Annual	Annual
	4th High	4th High			1st High	2nd High	3rd High	5th High
	Daily Max 8-hr O3	Daily Max 8-hr O3			Daily Max 8-hr O3	Daily Max 8-hr O3	Daily Max 8-hr O3	Daily Max 8-hr O3
	ppb	ppb	%		ppb	ppb	ppb	ppb
MORA 1993	55	.	.	*	62	56	55	55
MORA 1994	67	.	.	*	86	86	71	67
MORA 1995	65	62	89	*	72	68	68	64
MORA 1996	66	66	90		75	68	67	66

Olympic NP

Ozone Season Beginning Month = 4 and Ending Month = 10
 Three Year Averages of Annual 4th High Daily Max 8-hr Ozone Concentrations
 Caveat * Indicates EPA Data Completeness Requirement For 3-Yr Averages Not Met

Park Year	Annual 4th High Daily Max 8-hr O3 ppb	3-Yr Avg 4th High Daily Max 8-hr O3 ppb	3-Yr Avg Data Complete %	CAVEAT	Annual 1st High Daily Max 8-hr O3 ppb	Annual 2nd High Daily Max 8-hr O3 ppb	Annual 3rd High Daily Max 8-hr O3 ppb	Annual 5th High Daily Max 8-hr O3 ppb
OLYM 1989	44	.	.	*	54	52	47	44
OLYM 1990	46	.	.	*	56	48	46	43
OLYM 1991	43	44	93		50	48	45	42
OLYM 1992	46	45	95		55	52	49	46
OLYM 1993	42	44	95		55	52	44	40
OLYM 1994	42	43	92		50	46	42	42
OLYM 1995	49	44	93		64	63	50	45
OLYM 1996	47	46	94		47	47	47	43

Petrified Forest NP

Ozone Season Beginning Month = 1 and Ending Month = 12
 Three Year Averages of Annual 4th High Daily Max 8-hr Ozone Concentrations
 Caveat * Indicates EPA Data Completeness Requirement For 3-Yr Averages Not Met

Park Year	Annual 4th High Daily Max 8-hr O3 ppb	3-Yr Avg 4th High Daily Max 8-hr O3 ppb	3-Yr Avg Data Complete %	CAVEAT	Annual 1st High Daily Max 8-hr O3 ppb	Annual 2nd High Daily Max 8-hr O3 ppb	Annual 3rd High Daily Max 8-hr O3 ppb	Annual 5th High Daily Max 8-hr O3 ppb
PEFO 1987	67	.	.	*	88	70	67	67
PEFO 1988	62	.	.	*	66	63	63	62
PEFO 1989	78	69	84	*	85	82	79	72
PEFO 1990	65	68	91		72	69	65	64
PEFO 1991	68	70	91		120	97	71	68
PEFO 1992	57	63	70	*	65	58	58	57

Pinnacles NM

Ozone Season Beginning Month = 1 and Ending Month = 12
 Three Year Averages of Annual 4th High Daily Max 8-hr Ozone Concentrations
 Caveat * Indicates EPA Data Completeness Requirement For 3-Yr Averages Not Met

Park Year	Annual 4th High Daily Max 8-hr O3 ppb	3-Yr Avg 4th High Daily Max 8-hr O3 ppb	3-Yr Avg 3-Yr Avg Data Complete %	CAVEAT	Annual 1st High Daily Max 8-hr O3 ppb	Annual 2nd High Daily Max 8-hr O3 ppb	Annual 3rd High Daily Max 8-hr O3 ppb	Annual 5th High Daily Max 8-hr O3 ppb
PINN 1987	104	.	.	*	113	108	105	102
PINN 1988	88	.	.	*	97	94	89	87
PINN 1989	81	91	84	*	101	82	81	80
PINN 1990	83	84	91		95	94	87	82
PINN 1991	85	83	88	*	108	94	88	85
PINN 1992	84	84	86	*	89	87	86	83
PINN 1993	82	84	85	*	88	88	83	80
PINN 1994	79	82	89	*	81	81	79	78
PINN 1995	83	81	94		102	88	85	83
PINN 1996	95	86	95		102	97	96	91

Point Reyes NS

Ozone Season Beginning Month = 1 and Ending Month = 12
 Three Year Averages of Annual 4th High Daily Max 8-hr Ozone Concentrations
 Caveat * Indicates EPA Data Completeness Requirement For 3-Yr Averages Not Met

Park Year	Annual 4th High Daily Max 8-hr O3 ppb	3-Yr Avg 4th High Daily Max 8-hr O3 ppb	3-Yr Avg 3-Yr Avg Data Complete %	CAVEAT	Annual 1st High Daily Max 8-hr O3 ppb	Annual 2nd High Daily Max 8-hr O3 ppb	Annual 3rd High Daily Max 8-hr O3 ppb	Annual 5th High Daily Max 8-hr O3 ppb
PORE 1989	60	.	.	*	69	67	61	59
PORE 1990	55	.	.	*	62	56	56	55
PORE 1991	52	56	89	*	68	54	52	52
PORE 1992	52	53	88	*	56	53	53	51

Redwood NP

Ozone Season Beginning Month = 1 and Ending Month = 12

Three Year Averages of Annual 4th High Daily Max 8-hr Ozone Concentrations

Caveat * Indicates EPA Data Completeness Requirement For 3-Yr Averages Not Met

Park Year	Annual 4th High Daily Max 8-hr O3	3-Yr Avg 4th High Daily Max 8-hr O3	3-Yr Avg 3-Yr Avg Data Complete	CAVEAT	Annual 1st High Daily Max 8-hr O3	Annual 2nd High Daily Max 8-hr O3	Annual 3rd High Daily Max 8-hr O3	Annual 5th High Daily Max 8-hr O3
	ppb	ppb	%		ppb	ppb	ppb	ppb
REDW 1988	52	.	.	*	61	58	53	49
REDW 1989	43	.	.	*	44	43	43	42
REDW 1990	46	47	84	*	51	47	47	44
REDW 1991	45	45	81	*	48	47	46	45
REDW 1992	45	45	83	*	60	53	45	45
REDW 1993	43	44	87	*	49	46	43	43
REDW 1994	46	45	92	*	48	48	46	45
REDW 1995	46	45	73	*	49	48	48	46

Rocky Mountain NP

Ozone Season Beginning Month = 3 and Ending Month = 9

Three Year Averages of Annual 4th High Daily Max 8-hr Ozone Concentrations

Caveat * Indicates EPA Data Completeness Requirement For 3-Yr Averages Not Met

Park Year	Annual 4th High Daily Max 8-hr O3	3-Yr Avg 4th High Daily Max 8-hr O3	3-Yr Avg 3-Yr Avg Data Complete	CAVEAT	Annual 1st High Daily Max 8-hr O3	Annual 2nd High Daily Max 8-hr O3	Annual 3rd High Daily Max 8-hr O3	Annual 5th High Daily Max 8-hr O3
	ppb	ppb	%		ppb	ppb	ppb	ppb
ROMO 1987	72	.	.	*	76	76	73	71
ROMO 1988	79	.	.	*	100	85	84	79
ROMO 1989	68	73	70	*	75	74	73	67
ROMO 1990	57	68	83	*	61	59	58	55
ROMO 1991	77	67	89	*	80	80	77	75
ROMO 1992	71	68	89	*	83	72	72	70
ROMO 1993	72	73	94		93	74	73	71
ROMO 1994	77	73	95		83	81	77	76
ROMO 1995	77	75	97		78	78	77	73
ROMO 1996	73	76	96		79	76	74	73

Saguaro NP

Ozone Season Beginning Month = 1 and Ending Month = 12
 Three Year Averages of Annual 4th High Daily Max 8-hr Ozone Concentrations
 Caveat * Indicates EPA Data Completeness Requirement For 3-Yr Averages Not Met

Park	Year	Annual 4th High Daily Max 8-hr O3 ppb	3-Yr Avg 4th High Daily Max 8-hr O3 ppb	3-Yr Avg Data Complete %	CAVEAT	Annual 1st High Daily Max 8-hr O3 ppb	Annual 2nd High Daily Max 8-hr O3 ppb	Annual 3rd High Daily Max 8-hr O3 ppb	Annual 5th High Daily Max 8-hr O3 ppb
SAGU	1982	66	.	.	*	70	66	66	66
SAGU	1983	79	.	.	*	86	80	80	77
SAGU	1984	73	73	73	*	76	73	73	72
SAGU	1985	80	77	84	*	94	82	81	79
SAGU	1986	75	76	88	*	81	78	76	74
SAGU	1987	64	73	78	*	69	67	66	64
SAGU	1988	76	72	81	*	82	78	77	75
SAGU	1989	72	71	82	*	74	74	73	72
SAGU	1990	76	75	90		77	77	76	75
SAGU	1991	74	74	86	*	84	80	77	73
SAGU	1992	75	75	84	*	90	77	75	73
SAGU	1993	82	77	87	*	89	83	83	79
SAGU	1994	81	79	94		84	83	82	80
SAGU	1995	84	82	97		93	87	84	83
SAGU	1996	76	80	96		81	79	77	76

Santa Monica Mountains NP

Ozone Season Beginning Month = 1 and Ending Month = 12
 Three Year Averages of Annual 4th High Daily Max 8-hr Ozone Concentrations
 Caveat * Indicates EPA Data Completeness Requirement For 3-Yr Averages Not Met

Park	Year	Annual 4th High Daily Max 8-hr O3 ppb	3-Yr Avg 4th High Daily Max 8-hr O3 ppb	3-Yr Avg Data Complete %	CAVEAT	Annual 1st High Daily Max 8-hr O3 ppb	Annual 2nd High Daily Max 8-hr O3 ppb	Annual 3rd High Daily Max 8-hr O3 ppb	Annual 5th High Daily Max 8-hr O3 ppb
SAMO	1984	146	.	.	*	174	155	150	144
SAMO	1985	169	.	.	*	203	195	181	166
SAMO	1986	63	126	34	*	110	110	76	55
SAMO	1987	130	121	46	*	152	137	132	124
SAMO	1988	135	109	52	*	146	145	141	131
SAMO	1989	139	135	82	*	174	171	143	131
SAMO	1990	135	136	87	*	139	138	136	131
SAMO	1991	125	133	90		155	146	140	119
SAMO	1992	78	113	68	*	92	86	83	77

Sequoia NP - Ash Mountain

Ozone Season Beginning Month = 1 and Ending Month = 12
 Three Year Averages of Annual 4th High Daily Max 8-hr Ozone Concentrations
 Caveat * Indicates EPA Data Completeness Requirement For 3-Yr Averages Not Met

Park Year	Annual 4th High Daily Max 8-hr O3 ppb	3-Yr Avg 4th High Daily Max 8-hr O3 ppb	3-Yr Avg Data Complete %	CAVEAT	Annual 1st High Daily Max 8-hr O3 ppb	Annual 2nd High Daily Max 8-hr O3 ppb	Annual 3rd High Daily Max 8-hr O3 ppb	Annual 5th High Daily Max 8-hr O3 ppb
SEAM 1982	121	.	.	*	129	129	124	120
SEAM 1983	104	.	.	*	113	110	106	103
SEAM 1984	103	109	24	*	118	108	103	103
SEAM 1985	113	107	26	*	114	114	113	111
SEAM 1986	113	110	30	*	120	115	115	113
SEAM 1987	112	113	58	*	123	119	116	112
SEAM 1988	108	111	76	*	111	110	109	105
SEAM 1989	100	107	95		104	103	102	97
SEAM 1990	101	103	94		106	105	102	100
SEAM 1991	103	101	96		105	105	104	101
SEAM 1992	102	102	96		106	106	104	102
SEAM 1993	105	103	97		117	112	107	105
SEAM 1994	114	107	97		117	116	116	113
SEAM 1995	101	107	96		110	105	101	100
SEAM 1996	101	105	78	*	108	107	104	101

Sequoia NP - Lower Kaweah

Ozone Season Beginning Month = 1 and Ending Month = 12
 Three Year Averages of Annual 4th High Daily Max 8-hr Ozone Concentrations
 Caveat * Indicates EPA Data Completeness Requirement For 3-Yr Averages Not Met

Park Year	Annual 4th High Daily Max 8-hr O3 ppb	3-Yr Avg 4th High Daily Max 8-hr O3 ppb	3-Yr Avg Data Complete %	CAVEAT	Annual 1st High Daily Max 8-hr O3 ppb	Annual 2nd High Daily Max 8-hr O3 ppb	Annual 3rd High Daily Max 8-hr O3 ppb	Annual 5th High Daily Max 8-hr O3 ppb
SELK 1984	101	.	.	*	103	103	103	100
SELK 1985	104	.	.	*	114	106	105	104
SELK 1986	103	103	27	*	110	108	103	101
SELK 1987	92	100	47	*	100	95	93	91
SELK 1988	98	98	73	*	107	103	98	97
SELK 1989	93	94	94		98	98	94	92
SELK 1990	96	96	95		99	98	98	96
SELK 1991	98	96	95		103	101	100	97
SELK 1992	103	99	96		105	104	103	102
SELK 1993	106	102	96		116	107	107	105
SELK 1994	107	105	94		116	115	109	106
SELK 1995	95	103	93		100	97	96	94
SELK 1996	105	102	94		108	108	106	103

Shenandoah NP - Big Meadows

Ozone Season Beginning Month = 4 and Ending Month = 10

Three Year Averages of Annual 4th High Daily Max 8-hr Ozone Concentrations

Caveat * Indicates EPA Data Completeness Requirement For 3-Yr Averages Not Met

Park	Year	Annual	3-Yr Avg	3-Yr Avg	CAVEAT	Annual	Annual	Annual	Annual
		4th High	4th High			1st High	2nd High	3rd High	5th High
		Daily Max	Daily Max	Data		Daily Max	Daily Max	Daily Max	Daily Max
		8-hr O3	8-hr O3	Complete		8-hr O3	8-hr O3	8-hr O3	8-hr O3
		ppb	ppb	%		ppb	ppb	ppb	ppb
SVBM	1983	89	.	.	*	101	97	90	86
SVBM	1984	91	.	.	*	111	105	98	89
SVBM	1985	63	81	64	*	73	69	67	62
SVBM	1986	78	77	67	*	88	80	78	78
SVBM	1987	88	76	67	*	107	91	88	87
SVBM	1988	101	89	75	*	125	113	102	100
SVBM	1989	73	87	81	*	78	78	77	73
SVBM	1990	86	87	88	*	93	92	89	84
SVBM	1991	85	81	86	*	91	90	88	84
SVBM	1992	78	83	89	*	96	79	78	77
SVBM	1993	83	82	89	*	93	92	83	83
SVBM	1994	83	81	95		91	86	84	80
SVBM	1995	87	84	91		94	89	88	86
SVBM	1996	82	84	91		87	82	82	81

Shenandoah NP - Dickey Ridge

Ozone Season Beginning Month = 4 and Ending Month = 10

Three Year Averages of Annual 4th High Daily Max 8-hr Ozone Concentrations

Caveat * Indicates EPA Data Completeness Requirement For 3-Yr Averages Not Met

Park	Year	Annual	3-Yr Avg	3-Yr Avg	CAVEAT	Annual	Annual	Annual	Annual
		4th High	4th High			1st High	2nd High	3rd High	5th High
		Daily Max	Daily Max	Data		Daily Max	Daily Max	Daily Max	Daily Max
		8-hr O3	8-hr O3	Complete		8-hr O3	8-hr O3	8-hr O3	8-hr O3
		ppb	ppb	%		ppb	ppb	ppb	ppb
SVDR	1983	89	.	.	*	101	97	92	89
SVDR	1984	95	.	.	*	101	100	96	91
SVDR	1985	49	78	64	*	88	59	57	48
SVDR	1986	74	73	74	*	95	80	79	74
SVDR	1987	95	73	71	*	101	100	97	95
SVDR	1988	114	94	77	*	140	134	115	106
SVDR	1989	83	97	75	*	94	87	85	81
SVDR	1990	82	93	81	*	90	84	84	80
SVDR	1991	86	84	83	*	96	91	89	86
SVDR	1992	74	81	84	*	89	77	76	74
SVDR	1993	78	79	89	*	87	83	79	77
SVDR	1994	81	78	90		87	85	85	79

Shenandoah NP - Sawmill Run

Ozone Season Beginning Month = 4 and Ending Month = 10
 Three Year Averages of Annual 4th High Daily Max 8-hr Ozone Concentrations
 Caveat * Indicates EPA Data Completeness Requirement For 3-Yr Averages Not Met

Park Year	Annual 4th High Daily Max 8-hr O3 ppb	3-Yr Avg 4th High Daily Max 8-hr O3 ppb	3-Yr Avg Data Complete %	CAVEAT	Annual 1st High Daily Max 8-hr O3 ppb	Annual 2nd High Daily Max 8-hr O3 ppb	Annual 3rd High Daily Max 8-hr O3 ppb	Annual 5th High Daily Max 8-hr O3 ppb
SVSR 1983	97	.	.	*	101	99	98	96
SVSR 1984	88	.	.	*	106	98	94	87
SVSR 1985	61	82	70	*	71	71	62	60
SVSR 1986	79	76	76	*	86	83	79	79
SVSR 1987	91	77	77	*	102	94	93	88
SVSR 1988	100	90	85	*	122	114	100	98
SVSR 1989	71	87	83	*	79	76	74	71
SVSR 1990	79	83	90		86	83	82	78
SVSR 1991	77	76	92		84	84	78	76
SVSR 1992	75	77	85	*	93	77	76	72
SVSR 1993	83	78	74	*	88	84	84	83
SVSR 1994	76	78	69	*	83	81	79	75

Theodore Roosevelt NP - North Unit

Ozone Season Beginning Month = 5 and Ending Month = 9
 Three Year Averages of Annual 4th High Daily Max 8-hr Ozone Concentrations
 Caveat * Indicates EPA Data Completeness Requirement For 3-Yr Averages Not Met

Park Year	Annual 4th High Daily Max 8-hr O3 ppb	3-Yr Avg 4th High Daily Max 8-hr O3 ppb	3-Yr Avg Data Complete %	CAVEAT	Annual 1st High Daily Max 8-hr O3 ppb	Annual 2nd High Daily Max 8-hr O3 ppb	Annual 3rd High Daily Max 8-hr O3 ppb	Annual 5th High Daily Max 8-hr O3 ppb
TRNO 1983	63	.	.	*	78	65	64	62
TRNO 1984	62	.	.	*	64	62	62	59
TRNO 1985	54	60	63	*	58	55	55	54
TRNO 1986	56	57	89	*	59	58	57	55
TRNO 1987	54	55	83	*	55	54	54	52
TRNO 1988	67	59	79	*	74	68	67	67
TRNO 1989	65	62	79	*	73	69	66	65
TRNO 1990	62	65	79	*	65	63	63	62
TRNO 1991	61	63	85	*	62	61	61	60
TRNO 1992	58	60	85	*	60	59	58	56
TRNO 1993	56	58	91		62	59	56	55
TRNO 1994	58	57	98		66	64	58	57
TRNO 1995	58	57	98		60	59	58	58
TRNO 1996	59	58	94		61	60	60	59

Ozone Season Beginning Month = 4 and Ending Month = 10
 Three Year Averages of Annual 4th High Daily Max 8-hr Ozone Concentrations
 Caveat * Indicates EPA Data Completeness Requirement For 3-Yr Averages Not Met

Park Year	Annual 4th High Daily Max 8-hr O3 ppb	3-Yr Avg 4th High Daily Max 8-hr O3 ppb	3-Yr Avg Data Complete %	CAVEAT	Annual 1st High Daily Max 8-hr O3 ppb	Annual 2nd High Daily Max 8-hr O3 ppb	Annual 3rd High Daily Max 8-hr O3 ppb	Annual 5th High Daily Max 8-hr O3 ppb
YELL 1987	61	.	.	*	72	63	61	57
YELL 1988	66	.	.	*	69	67	67	65
YELL 1989	63	63	72	*	67	66	65	63
YELL 1990	54	61	83	*	58	56	54	54
YELL 1991	57	58	84	*	59	59	58	57
YELL 1992	64	58	86	*	67	65	64	64
YELL 1993	54	58	84	*	55	55	54	53
YELL 1994	62	60	88	*	67	63	63	62
YELL 1995	60	59	93	*	65	62	61	60
YELL 1996	60	61	76	*	62	62	61	60

Yosemite NP - Wawona Valley

Ozone Season Beginning Month = 1 and Ending Month = 12

Three Year Averages of Annual 4th High Daily Max 8-hr Ozone Concentrations

Caveat * Indicates EPA Data Completeness Requirement For 3-Yr Averages Not Met

Park Year	Annual 4th High Daily Max 8-hr O3 ppb	3-Yr Avg 4th High Daily Max 8-hr O3 ppb	3-Yr Avg Data Complete %	CAVEAT	Annual 1st High Daily Max 8-hr O3 ppb	Annual 2nd High Daily Max 8-hr O3 ppb	Annual 3rd High Daily Max 8-hr O3 ppb	Annual 5th High Daily Max 8-hr O3 ppb
YOWV 1987	93	.	.	*	111	103	97	93
YOWV 1988	93	.	.	*	97	96	95	93
YOWV 1989	86	91	85	*	93	88	87	85
YOWV 1990	95	91	87	*	97	95	95	94
YOWV 1991	81	87	85	*	94	84	83	80
YOWV 1992	84	87	87	*	91	90	89	84
YOWV 1993	79	81	86	*	81	79	79	78
YOWV 1994	77	80	88	*	84	82	80	77
YOWV 1995	85	80	88	*	88	87	85	82
YOWV 1996	82	81	90		86	83	82	80

Yosemite NP - Yosemite Valley

Ozone Season Beginning Month = 1 and Ending Month = 12

Three Year Averages of Annual 4th High Daily Max 8-hr Ozone Concentrations

Caveat * Indicates EPA Data Completeness Requirement For 3-Yr Averages Not Met

Park Year	Annual 4th High Daily Max 8-hr O3 ppb	3-Yr Avg 4th High Daily Max 8-hr O3 ppb	3-Yr Avg Data Complete %	CAVEAT	Annual 1st High Daily Max 8-hr O3 ppb	Annual 2nd High Daily Max 8-hr O3 ppb	Annual 3rd High Daily Max 8-hr O3 ppb	Annual 5th High Daily Max 8-hr O3 ppb
YOYV 1990	79	.	.	*	81	81	80	79
YOYV 1991	66	.	.	*	72	68	67	65
YOYV 1992	74	73	89	*	84	78	75	73
YOYV 1993	77	72	91		79	77	77	76
YOYV 1994	78	76	93		89	84	81	78

BRIG 1987	110	109	94	---			
BRIG 1988	112	105	94	134	126	114	111
BRIG 1989	102	108	93	114	106	104	101
BRIG 1990	110	108	91	136	135	114	109
BRIG 1991	112	108	91	134	115	114	110
BRIG 1992	94	105	94	113	112	101	90
BRIG 1993	93	100	97	101	100	97	93
BRIG 1994	83	90	97	88	88	84	82
BRIG 1995	100	92	97	110	104	102	98
BRIG 1996	96	93	92	99	98	96	93