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ATLAS OF AIR QUALITY AND DEPOSITION IN OR NEAR FORESTS OF THE WESTERN UNITED STATES

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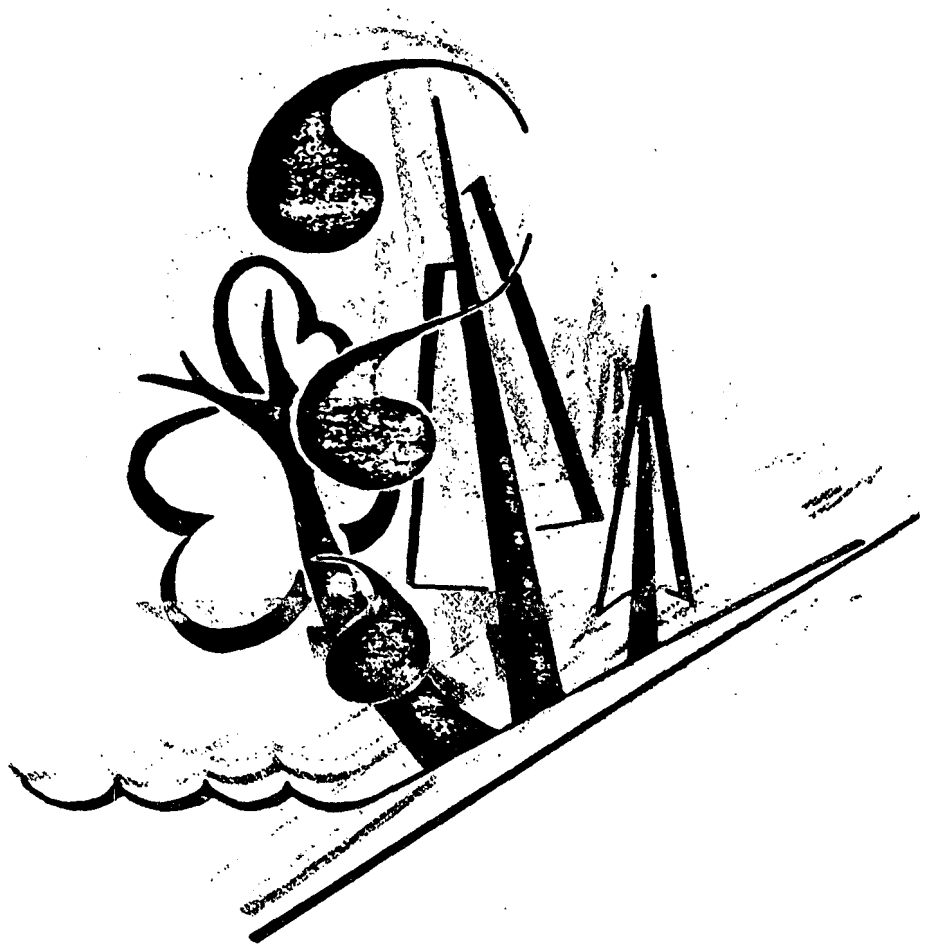

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ATLAS OF AIR QUALITY AND DEPOSITION IN OR NEAR FORESTS OF THE WESTERN UNITED STATES

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TABLE OF CONTENTS

Abstract iii

1. Introduction 1
   Objectives and Aims 2

2. Western Forests 2

3. Emissions 4
   Sources of Data 4
   Atlas Format 4
   Summary Statistics 4

4. Air Quality and Deposition 10
   Sources of Data 10
   Siting Criterion 10
   Data Quality 11
   Air Pollution Statistics and Biological Significance 11

4A. Sulphur Dioxide 13
   Sources of Data 13
   Atlas Format 13
   Summary Statistics 14

4B. Ozone 15
   Sources of Data 15
   Atlas Format 15
   Summary Statistics 16

4C. Wet Deposition from Rain and Snow 20
   Sources of Data 20
   Atlas Format 20
   Summary Statistics 21

5. Summary and Conclusions 24

6. Acknowledgements 24

7. Literature Cited 24

Appendix 1. Emissions Information by State 29
Appendix 2. Sulphur Dioxide Information by State 75
Appendix 3. Ozone Information by State 123
Appendix 4. Wet Deposition Information by State 405

LIST OF FIGURES

Figure 2.1 Major forest types across the western United States. 3

Figure 3.1 Locations of point sources emitting sulphur dioxide during 1985 across the western United States (NEDS 1985). 5

Figure 3.2 Point sources emitting nitrogen oxides during 1985 (NEDS 1985). 6

Figure 3.3 County estimates of total sulphur dioxide emissions (point and area sources) during 1985 (NEDS 1985). 8

Figure 3.4 County estimates of total nitrogen dioxide emissions (point and area sources) during 1985 (NEDS 1985). 9

Figure 4B.1 Seventeen calibration patterns of hourly ozone concentrations (ppb) for sites in or near western forests (after Böhm et al. 1990). The graphs are arranged by mean (smallest to left of plot, numbered 1 to 5) and coefficient of variation (lowest towards top of plot, lettered A to E). 19

Figure 4C.1 Mean annual estimates of precipitation amount, volume weighted pH averages, and deposition of hydrogen ion, sulphate, and nitrate in or near western forests during the period 1985 through 1988 (National Atmospheric Deposition Program (IR-7)/National Trends Network (1990)). 23

LIST OF TABLES

Table 3.1 State level estimates of annual average emissions from all anthropogenic sources during 1975, 1980, 1985, and 1987/88 (Tg/year). Estimates normalized by area of state are presented in brackets for 1985 (10^{-6} Tg year^{-1} km^{-2}). 1 Tg = 1 million metric tons. 7

ABSTRACT

An Atlas of air quality and deposition data has been compiled to make air pollution data and information more accessible to biologists and ecologists working in western forests. Data from the 1985 National Acid Precipitation Assessment Program Emission Inventory are used to characterize emissions of sulphur dioxide and nitrogen oxides across the West. Maps illustrating location, type, and magnitude of major point source emissions together with pie charts of the percent contribution by source category are presented alphabetically by state. Data from the Environmental Protection Agency databases AIRS and SAROAD are used to characterize ambient levels of sulphur dioxide and ozone for three averaging periods, viz., annual, May through October or growing season, and monthly. Data for 20 sulphur dioxide and 70 ozone sites in or near western forests are presented by state. Biographic information together with standard summary statistics are given for each site. Summary statistics for sulphur dioxide include frequency of occurrence of hourly sulphur dioxide concentrations between 9 intervals, viz., 0-10, 10-20, 20-30, 30-40, 40-50, 50-60, 60-70, 70-80, ≥ 80 ppb. Summary statistics for ozone include percentile distributions, mean and standard deviation, cumulative indices SUM06 and SUM08, and a description of the diurnal patterns experienced at each site. Data for 32 wet deposition sites in the National Atmospheric Deposition Program/National Trends Network (NADP/NTN) are presented by state for the three averaging periods. Biographic information together with several summary statistics are given for each site. Summary statistics include percentile distributions for weekly pH, and weekly concentrations (mg/L) for suiphate, nitrate, and ammonium. Annual and seasonal deposition estimates for volume weighted average concentrations and deposition (kg/ha) are also given.

1. INTRODUCTION

Subsequent to their discovery and documentation in Scandinavia and north-eastern America, acid deposition and gaseous pollution episodes have been reported in several locations in the western United States. Southern and central California have received particular attention especially with respect to episodes of ozone (O_3), sulphur dioxide (SO_2), and nitrogen oxides (NO_x) (Miller et al. 1986; Jacob et al. 1987; Bytnerowicz et al. 1987), deposition loadings of acidic ions (Leonard and Goldman 1981; Liljestrand and Morgan 1982; Stohlgren and Parsons 1987), and haze and cloud episodes (Macias and Zwicker 1981; Munger et al. 1990). Observations of acidic precipitation and of sensitive high elevation watersheds showing signs of acidification have been reported in Colorado (Nagamoto et al. 1983; Turk and Adams 1983; Harte et al. 1985; Reddy and Claassen 1985; Turk and Campbell 1987). Acid deposition and haze episodes in the Pacific Northwest (McBean and Nikleva 1986; Edmonds and Basabe 1989) and Central States (Dawson 1978; Flocchini et al. 1981a, 1981b; Macias and Zwicker 1981; Linak and Peterson 1983; Messer 1983; Thomas and Buseck 1983) are becoming more frequently documented.

There is little doubt that air pollution is capable of harming forests, either by direct effects, such as visible injury (e.g., Miller et al. 1963; Skelly et al. 1987), or by indirect effects, such as impacts of acid deposition on soils (e.g., Tabatabai 1985; Reuss and Johnson 1986), predisposing the ecosystem to attacks by pests (e.g., Cobb et al. 1968; Stark et al. 1968), or community changes (e.g., Miller 1973). Thresholds at which pollutants cause damage to vegetation are widely debated especially for natural, multi-species systems. Furthermore, regional assessments of forest condition are inhibited by complex interactions between species, pollutants, and environmental conditions.

The role played by air pollution on forest growth and vigor has been investigated in the United States by local studies as well as by national programs such as the National Acid Precipitation Assessment Program (NAPAP), Integrated Forest Studies (IFS), and Response of Plants to Integrated Stress (ROPIS). With the exception of southern California, the western United States is generally believed to be without an air pollution problem, especially in remote, forested areas. This conclusion is usually based on direct comparisons of ozone concentrations and annual wet depositions of sulphate in rain and snow between sites in the eastern and western United States. Little consideration is given to differences in pollutant sensitivity between eastern and western ecosystems nor to differences in the nature, magnitude, and seasonality of environmental stress experienced by eastern versus western forests. To further enhance the inapplicability of such direct comparisons, large areas of the West are without monitoring data, especially high elevation forests.

Population densities across the West are typically a fraction of those of the eastern United States. However, in areas with high population densities, such as southern California, ozone levels are comparable to or exceed those for similar areas in the east. Western forests surrounding densely populated valleys experience adverse effects such as foliar injury and reductions in growth (e.g., Miller et al. 1963; Miller et al. 1989; Pedersen 1989; Peterson et al. 1989). Southern and central California provide a window into the future of forests surrounding major western cites such as Seattle, Salt Lake City, Phoenix, Albuquerque, and Denver.

The western United States has a legacy of beautiful forests and mountains. Increasing reports of atmospheric fallout and pollution episodes in the West together with ecological damage to European and eastern American forests, provide sufficient reason for westerners to be concerned about the future of their heritage. The Western Conifers Research Cooperative was charged by NAPAP to investigate forest condition across the West. Part of the program involved accumulation of information on air quality and deposition in or near western forests. The data were obtained from a variety of sources such as the Environmental Protection Agency's (EPA) National Emissions Data System (NEDS) and Aerometric Information Retrieval System (AIRS), National Atmospheric Deposition Program and individual research projects. The results of the Western Conifers Atmospheric Project have been and are being published in the peer reviewed literature (Bohm 1989; Muir and Bohm 1989; Bohm et al. 1990; Warren et al. 1990; Bohm 1990b) and in peer reviewed government reports

(Bohm 1990a; Reams et al. 1990; Sisterton et al. 1990). These papers describe regional characteristics of ambient concentrations and deposition of air pollutants in or near western forests, together with detailed analyses of ozone and wet deposition under western conditions.

Objectives and Aims

General or regional descriptions rarely provide scientists with the kinds of air quality and deposition information needed to link air pollution exposure with vegetation effects and responses. The main objective of this Atlas is to summarize readily available air quality and deposition data for the western United States using a variety of summary parameters as surrogates for air pollution exposure. Specifically, the purposes of the Atlas are:

- provide a comprehensive description of emissions of sulphur and nitrogen oxides across the West; of ambient concentrations of sulphur dioxide and ozone in or near western forests; of the ionic chemistry of rain and snow in or near western forests; and of deposition loadings during rain and snow events to western forests.

- develop a convenient reference on air quality and deposition that can be used to guide western forest research scientists on the potential for their system being exposed to air pollutants.

- provide air quality and deposition data summaries in a flexible format that allows integration with biological effects information.

- present actual data used to create the published regional summaries.

The Atlas consists of (1) a brief description of the forests of the West; (2) a section on emissions of sulphur dioxide and nitrogen oxides across the West; (3) a section on ambient concentrations of sulphur dioxide and ozone, together with concentrations and depositions of ionic species in rain and snow. Methods used to generate the summaries are discussed in each subsection.

It is not the purpose of this Atlas to provide detailed spatial or within site analyses. These have been performed elsewhere and the interested user is referred to the general literature listed above.

2. WESTERN FORESTS

The eleven western states occupy about 40% of the land area of the conterminous United States. About one third of the West is forested (Figure 2.1). Coverage by state ranges from 11% in Nevada to 55% in Washington. Approximately 61% of western forests are federally owned.

The West is characterized by extreme relief with massive north-south mountain ranges separated by basins, valleys, and plateaus. The large area together with diversity of topography, climate, and soils lead to a corresponding diversity of species and forest types. With the exception of the Pacific Northwest, extensive forests only occur in the mountains. Natural disturbances are important determinants of forest structure and species composition in the West (Oliver 1981). At any given time, a large proportion of western forests are in a serial stage following fire, insect or disease outbreaks, or wind-throws. Fire is the most important natural disturbance over much of the West.

Conifers dominate western forests, presumably because of better adaption to the summer drought-winter precipitation climate that prevails over much of the West. Ponderosa pine (pinus ponderosa), lodgepole pine (Pinus contorta), and Douglas-fir (Pseudotsuga menziesii) are most common (Figure 2.1). Only 14% of forest land in the West is classified with a non-conifer type. Furthermore, hardwoods are usually only important in specialized situations such as riparian habitats, early successional stages, or certain xeric, low elevation habitats. The only major hardwood with distribution throughout the West is quaking aspen (Populus tremuloides). A detailed discussion of the distribution of forest species throughout the West is available in Whitney (1985) and Olson (1990).

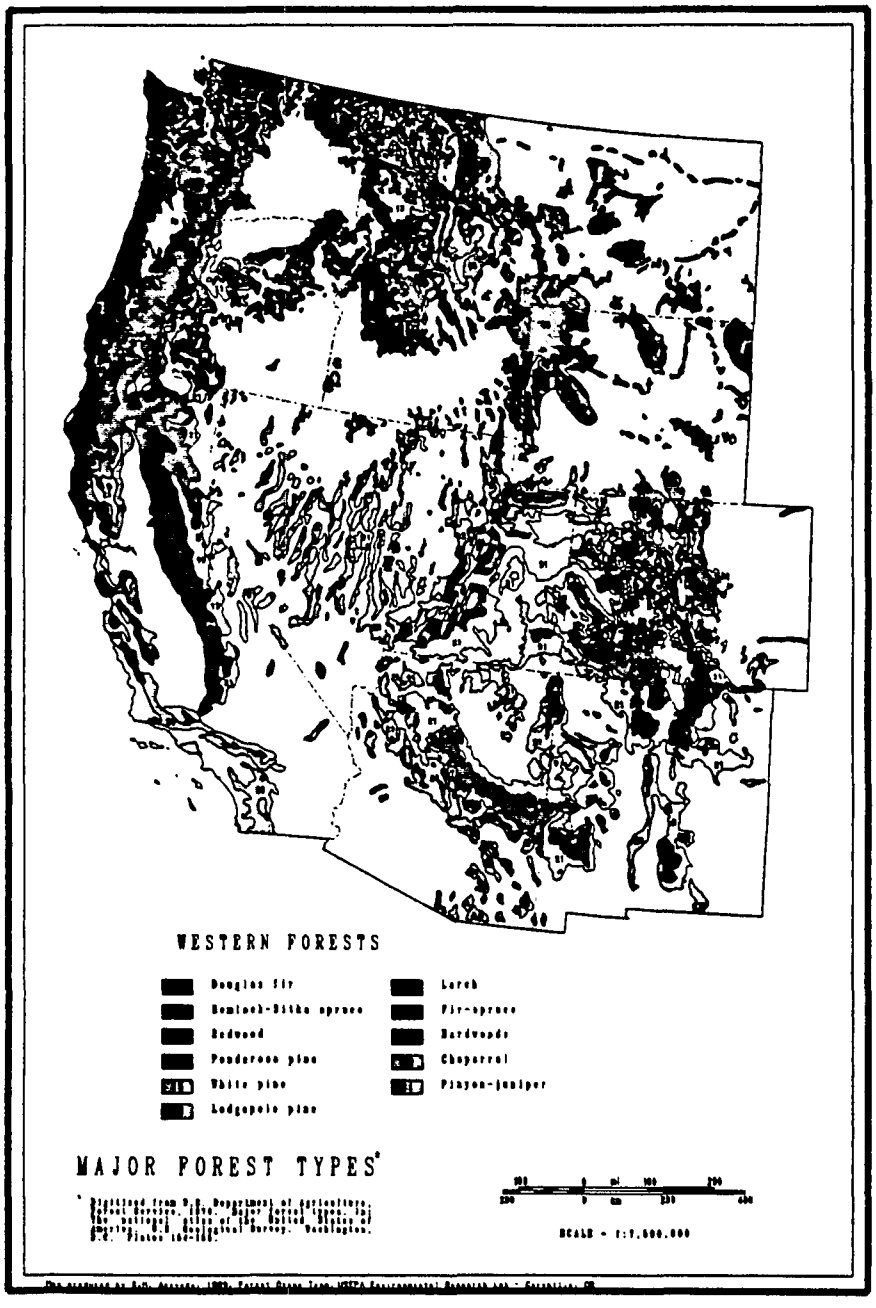

Figure 2.1 Major forest types across the western United States.

3. EMISSIONS

Point sources of sulphur and nitrogen dioxide are scattered across the eleven western states (Figures 3.1 and 3.2). In 1985, the estimated total sulphur dioxide emissions for the West was 2.15 Tg (1 Tg = 1 million metric tons), 10% of the national estimate, and 3.01 Tg for nitrogen oxides or 16% of the national estimate (Placet and Streets 1987). State totals for 1985 ranged between 0.04 and 0.59 Tg for sulphur dioxide and between 0.08 and 1.11 Tg for nitrogen oxides (Table 3.1). County estimates of total sulphur and total nitrogen dioxide emissions (point and area sources) are presented in Figures 3.3 and 3.4. The interested reader is referred to Placet and Streets (1987), Roth et al. (1985), Hidy and Young (1986), and Böhm (1990b) for more information on emissions of pollutants across the western United States.

Sources of Data

Data on the locations of point sources and on estimated annual emissions of sulphur and nitrogen dioxide were obtained from National Acid Precipitation Assessment Program's 1985 Emission Inventory; considered by many to be the most current, complete, and accurate large-scale inventory available for the West (NEDS 1985; Sellars and Norris 1989). Annual emission estimates for 1987/1988 were obtained from State Departments of Air and Environmental Quality.

Emissions data are not measured values. Instead, the emission factor is multiplied by the activity level of the source for a given time period to yield an estimate of emissions from that source. Consequently, emission inventories possess varying degrees of uncertainty. Langstaff and Wagner (1986) estimated the uncertainties associated with the 1980 NAPAP Emissions Inventory. Uncertainty values of 1% (based on a 90% confidence interval) were estimated for total national annual emissions of sulphur dioxide and nitrogen oxides. Uncertainty levels increased to 6% and 4%, respectively, for state-level total emissions of sulphur dioxide and nitrogen oxides. At the county level, uncertainty levels of annual emissions of sulphur dioxide and nitrogen oxides were estimated at 16%. The uncertainty estimates for national annual emissions may be lower than expected since errors associated with systematic bias and with the use of mean parameters for estimating emissions estimates were not included in the uncertainty analysis (Placet and Streets 1987).

A panel of 13 inventory experts reviewed the 1985 NAPAP Emissions Inventory (Sellars and Norris 1989). Although uncertainty estimates were not reported by Sellars and Norris, the panel concluded that the quality of the 1985 industrial process point source emission estimates was high; that the national emission estimates for specific categories appear to be more credible than estimates available in earlier inventories; and that area source emissions estimates were at best 'planning estimates' and for some categories, 'guesstimates'.

Atlas Format

Maps illustrating the location, type, and magnitude of major point sources (annual estimated emissions ≥ 100 Mg, where 1 Mg = 1 metric ton) of sulphur and nitrogen dioxide, together with pie charts illustrating the percent contribution by source category to annual emissions (point source only) are presented alphabetically by state for 1985 (Appendix 1). The maps and pie charts were generated directly from the emissions database (NEDS 1985).

Summary Statistics

Magnitude of annual estimated emissions from point sources during 1985 is represented as one of three categories, 10^2 - 10^3 Mg, 10^3 - 10^4 Mg, or 10^4 - 10^5 Mg. Industries are separated into seven categories, viz., metal industry, electric generation, petroleum industry, chemical processes, industrial fuel use, mineral products, and other. Activities such as wood products, food/agriculture, leather products, textile manufacturing, evaporation, and waste disposal were designated "other".

The percent contribution of specific source types to total point source emissions at state level during 1985 is presented as pie charts. Total emissions for the state during 1985 are available in Table 3.1.

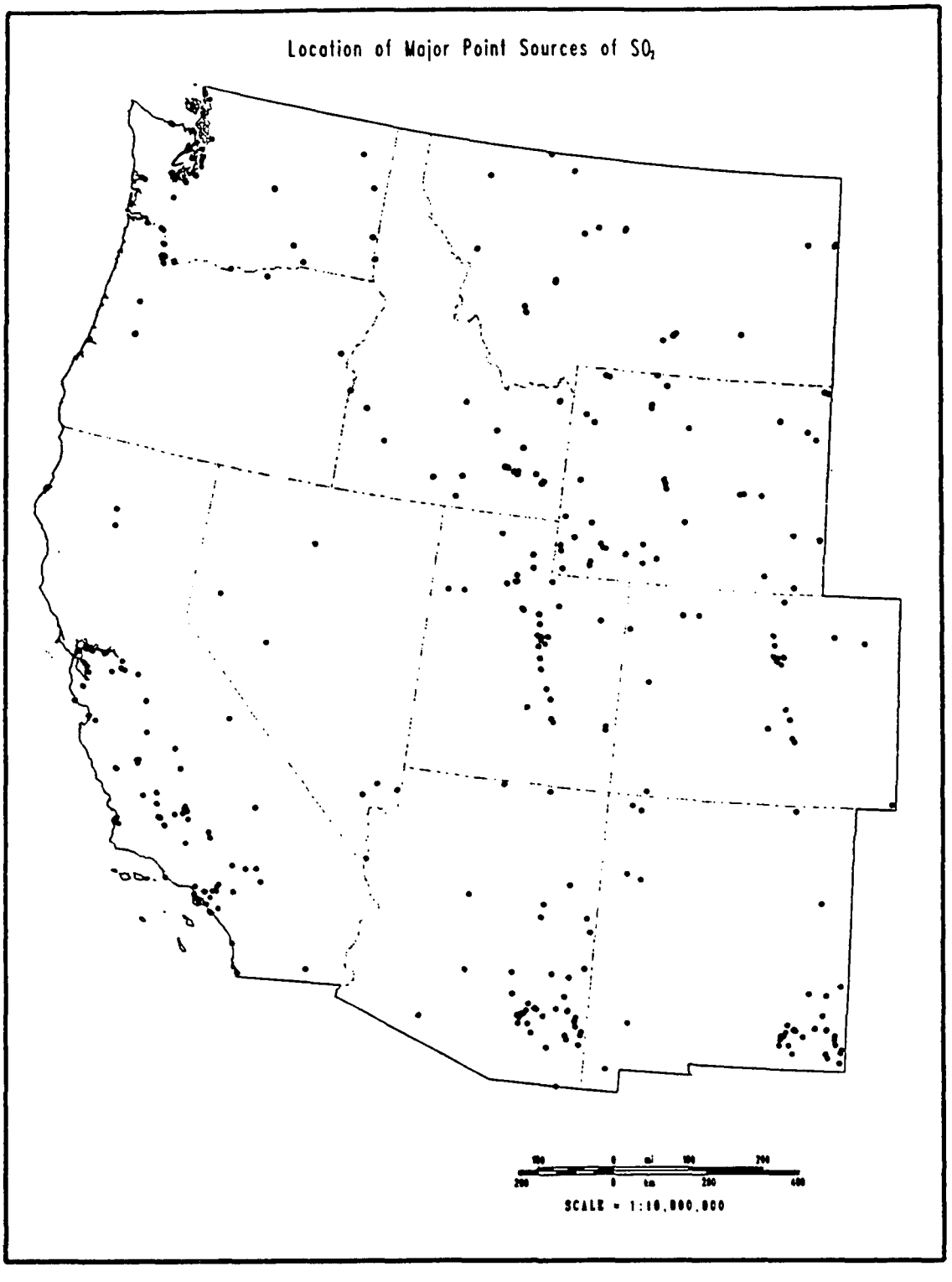

Figure 3.1 Locations of point sources emitting sulphur dioxide during 1985 across the western United States (NEDS 1985).

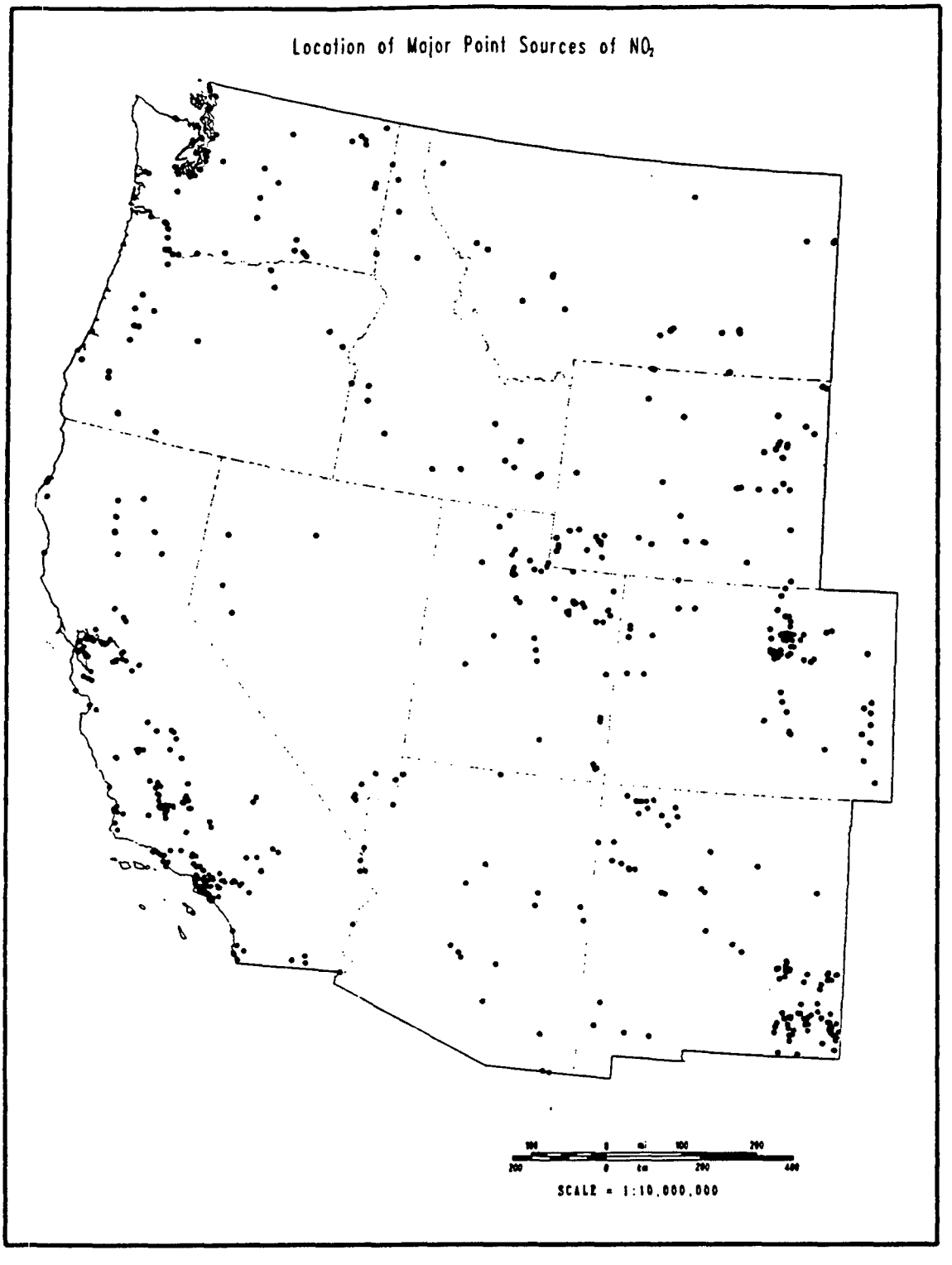

Figure 3.2 Point sources emitting nitrogen oxides during 1985 (NEDS 1985).

Table 3.1 State level estimates of annual average emissions from all anthropogenic sources in 1975, 1980, 1985, and 1987/1988 (Tg per year). Estimates normalized by area of state are presented in brackets for 1985 (10^{-6} Tg $year^{-1}$ km^{-2}). 1 Tg = 1 million metric tons.

A. SULPHUR DIOXIDE.

State	1975	1980[a]	1985[b]	1987/1988[c]
Arizona	1.37	0.71	0.59 (2.00)	na
California	0.47	0.43	0.30 (0.74)	na
Colorado	0.10	0.13	0.13 (0.48)	na
Idaho	0.05	0.04	0.05 (0.23)	na
Montana	0.20	0.14	0.12 (0.32)	na
Nevada	0.22	0.13	0.11 (0.39)	na
New Mexico	0.37	0.28	0.27 (0.86)	na
Oregon	0.04	0.04	0.04 (0.16)	0.04
Utah	0.09	0.09	0.08 (0.38)	0.06
Washington	0.35	0.28	0.25 (1.45)	0.12
Wyoming	0.14	0.19	0.21 (0.84)	na
Total U.S.	25.80	23.6	21.5 (15.7)	na

B. NITROGEN OXIDES.

State	1975	1980[a]	1985[b]	1987/1988[c]
Arizona	0.18	0.23	0.25	na
California	1.18	1.21	1.11	na
Colorado	0.24	0.26	0.28	na
Idaho	0.08	0.08	0.08	na
Montana	0.10	0.12	0.13	na
Nevada	0.08	0.09	0.10	na
New Mexico	0.20	0.22	0.22	na
Oregon	0.20	0.22	0.21	0.19
Utah	0.11	0.13	0.13	na
Washington	0.25	0.27	0.25	0.27
Wyoming	0.17	0.21	0.25	na
Total U.S.	18.5	19.4	19.1	na

[a] Total U.S. emissions for 1980 presented here are about 0.9 Tg lower than those in the NAPAP 1980 Emissions Inventory (Wagner et al., 1986) due to the possible omission of emissions from combustion of nonpurchased fuels in the industrial sector.

[b] Totals presented for 1985 are the sum of the 1985 power plant emissions (calculated using the same methodology as Knudson, 1986) and the 1984 values from Knudson (1986) for sulphur dioxide, and 1984 estimates for vehicular emissions for nitrogen oxides. The estimates do not reflect reductions from non utility sources during 1984-1985.

[c] Estimates obtained from state Departments of Air Quality. na - not available at time of printing.

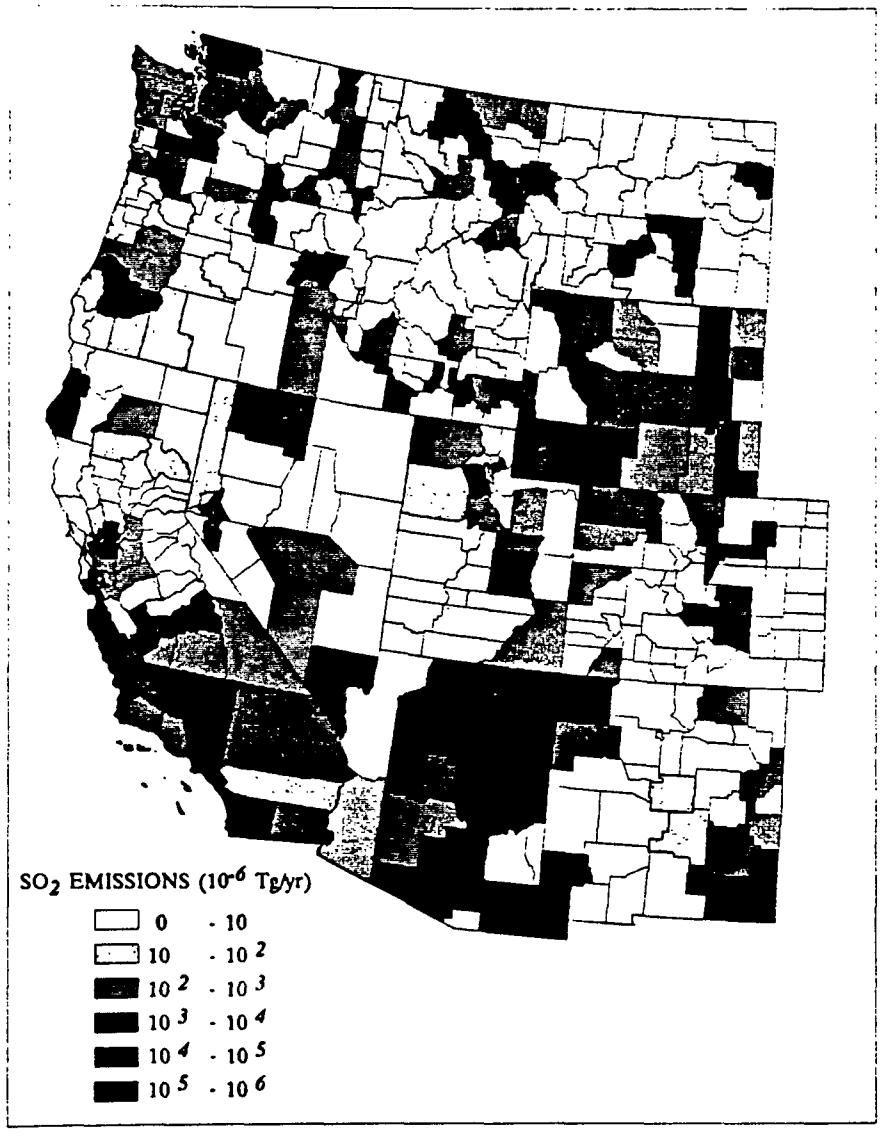

Figure 3.3 County estimates of total sulphur dioxide emissions (point and area sources) during 1985 (NEDS 1985).

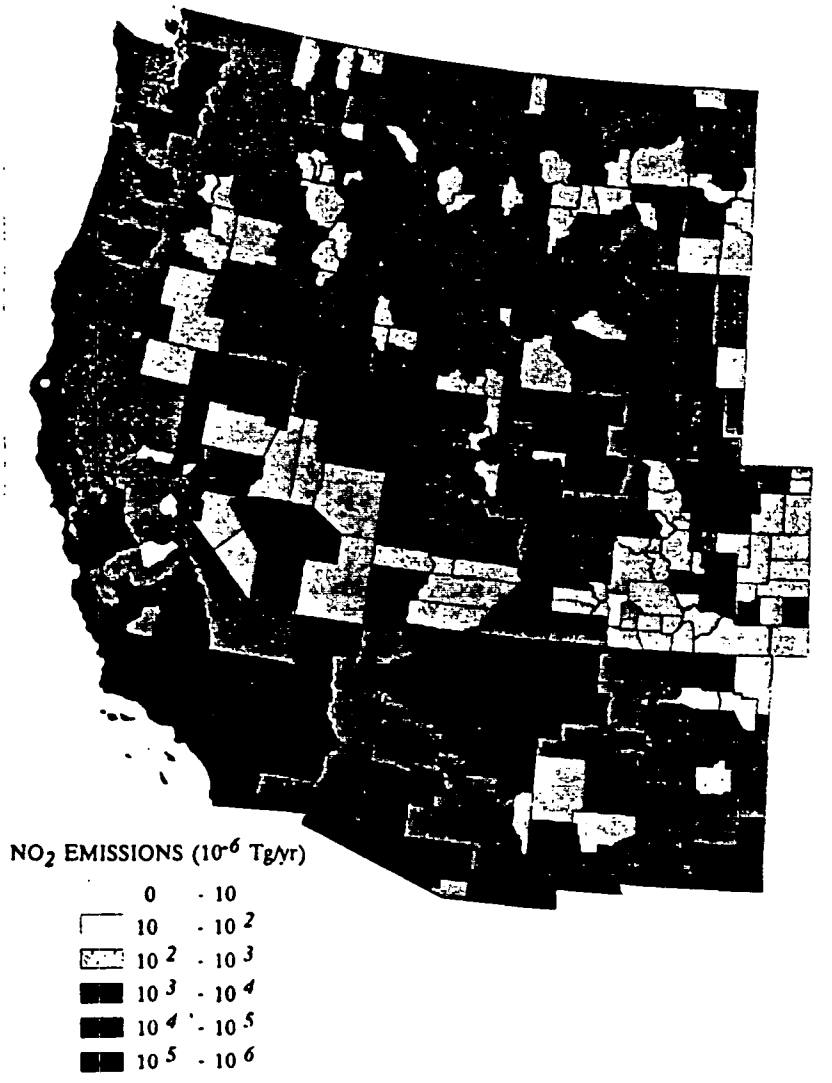

Figure 3.4 County estimates of total nitrogen dioxide emissions (point and area sources) during 1985 (NEDS 1985).

4. AIR QUALITY AND DEPOSITION

This section presents information on sulphur dioxide, ozone, and precipitation chemistry. Information on the deposition of ions during rain and snow events is also presented. Data summaries for nitrogen dioxide are not included since nitrogen oxides are readily oxidized and have short residence times in the atmosphere. The effects of nitrogen oxides on plants are not frequently studied and, for example, are not even considered by Skelly et al. (1987).

Sources of Data

Data describing ambient concentrations of sulphur dioxide, ozone, and the chemistry of precipitation across the West were assembled from public data bases and short-term monitoring projects, some of which were funded by Western Conifers Research Cooperative. The time period under consideration, January 1980 through December 1989, was chosen to limit uncertainties that may arise from non-standard calibration techniques used for ozone monitors prior to EPA standardization in 1979. A detailed description of monitoring techniques is available in Lefohn and Benkovitz (1990).

Hourly concentrations of ambient sulphur dioxide and ozone are monitored by the State Departments of Environmental Health or Air Quality. The data from these sites are fed into the EPA Aerometric Information Retrieval System (AIRS; previously SAROAD) as part of attainment analyses. In addition to compulsory monitoring sites, several states and research organizations also collect air pollution data as part of special projects funded at state level. These data are archived and are often available to the public. During the study period, 254 sulphur dioxide and 309 ozone monitoring sites were operational across the eleven western states, however, not all of these sites were active during the entire summary period.

Weekly composite precipitation samples are collected throughout the West as part of the National Atmospheric Deposition Program/National Trends Network (NADP/NTN). The weekly, seasonal or annual chemical data are available to the public through the NADP/NTN Coordination Office at Colorado State University. Monthly volume weighted averages can also be obtained from the NADP/NTN Coordination Office and from the Acid Deposition System Data Base (ADS) at Battelle Pacific Northwest Laboratories. Seventy-seven NADP/NTN wet deposition sites were operational in the eleven western states during the study period, however, not all of these sites were active during the entire summary period.

Siting Criterion

The sulphur dioxide, ozone, and wet deposition sites are usually not located within or near coniferous forests. A siting criterion of 20 km from the boundaries of coniferous forests was applied to select sites summarized in this Atlas. These sites were identified electronically in a Geographic Information System using latitude, longitude, and 1:2,500,000 ecoregion maps (Omerick and Gallant 1986; Omerick 1987). Although ecoregion maps are compiled using many different factors besides vegetation type, the ecoregions identified as typically covered with coniferous forests correlate well with those depicted on the 1:3,168,000 Natural Vegetation Map (Kuchler 1975) and 1:7,500,000 Major Forest Types Map (National Atlas of the United States Map 1970). Surprisingly no recent map showing the forests of the West could be found with a scale greater than 1:2,500,000. This is the smallest scale required to identify individual air quality monitoring sites, especially in southern California.

A total of 20 sulphur dioxide, 70 ozone, and 32 wet deposition sites were located within 20 km of forest ecoregion boundaries. Large areas are without air quality and deposition monitoring sites especially in Idaho, Montana, Wyoming, and Utah. Furthermore, air quality data from sites in complex terrain typical of the West are often not representative of regional pollution characteristics. This follows from the influences of topography and meteorology on the dilution and transport of air pollutants. For example, topography can restrict dispersion of pollutants from a basin and higher pollution levels may be measured at sites beneath inversion height than in forests at elevations above inversion height. Intrusions of polluted air up canyons and passes during valley and anabatic

winds cause spatial heterogeneity in air quality characteristics over short distances. A more detailed discussion of air pollution meteorology in complex terrain and western forests is offered by Oke (1987) and Bohm (1990b).

Data Quality

Data reported in the Sulphur Dioxide and Wet Deposition sections originated from the same data bases, viz., SAROAD and NADP/NTN respectively. The data within these sections are directly comparable since they were subjected to the same collection and measurement criteria, and data quality routines. The accuracy and precision of sulphur dioxide data are reported by AIRS (formally SAROAD), a detailed description of which is given in Lefohn and Benkovitz (1990). NADP/NTN operates using several Quality Assurance Programs that address site selection, sample collection techniques, field and laboratory measurements. Accuracy and precision of precipitation chemistry and wet deposition data are described by NADP/NTN in the Annual and Quality Assurance Reports available from the NADP/NTN Coordination Office at Colorado State University.

The data reported in the Ozone section originated from four sources, viz., AIRS, the National Park Service (NPS), Washington State Department of Ecology, and Washington University. Although a formal quality assurance plan is not available for NPS ozone data, the data from the NPS Network are included in the AIRS data base. Since NPS data have to conform with AIRS standards to be included in the data base, we consider NPS ozone data to be comparable with AIRS data in the context of this Atlas. The collection and measurement procedures used by Washington State Department of Ecology and Washington University follow Environmental Protection Agency guidelines (Washington State Department of Ecology Air Programs 1989; Edmonds et al. 1989). We consider the data from these two sources to be comparable with AIRS and NPS data in the context of this Atlas. The accuracy and precision of ozone data reported by AIRS and NPS is described in detail by Lefohn and Benkovitz (1990). The accuracy and precision of ozone data collected by Washington State Department of Ecology and Washington University is reported by Washington State Department of Ecology Air Programs (1989) and Edmonds et al. (1989) respectively.

Data of poor quality can be generated when an instrument does not operate correctly. Data on precipitation chemistry and wet deposition are carefully screened for data quality issues by NADP/NTN (National Atmospheric Deposition Program 1989). Ozone and sulphur dioxide data are screened by AIRS (formally SAROAD) as described in von Lehmden and Nelson (1977) and Puzak and McElroy (1987). Data presented in the Atlas were not screened further unless large deviations from expected values were found. In these cases, the data were set to missing.

Summary statistics presented in the Atlas usually do not estimate missing data, although it is recognized that missing data can lead to large underestimations of cumulative indices such as SUM06 or SUM08 for ozone and wet deposition of ions. Sulphur dioxide and ozone monitors usually undergo a span check once a day that results in a missing value every 24 hours. Span checks occur at the same time, frequently late at night. Ozone summary statistics reported in the Atlas for sites with low ozone values at night are rarely influenced by these missing data. Unfortunately, ozone statistics for rural and remote sites, especially those at high elevation, may be influenced by these missing data since ozone levels can range from 20 to above 60 ppb at night (e.g., Bohm et al. 1990). Sulphur dioxide summary statistics may also be influenced by missing data from span checks, especially if the monitor is close to a point source that emits effluent below the temperature inversion.

Missing data are also generated when an instrument fails to operate. In this case, blocks of missing data usually occur. The missing hours are often uniformly distributed, but data on air pollution episodes may not be collected if the instrument is non-operational. Consequently, estimates of data capture are included in the summary tables to guide the user as to the representativeness of the data summaries.

A detailed description of summary parameters is given for each pollutant in its relevant section.

Air Pollution Statistics and Biological Significance

A preliminary step in understanding ecological consequences of pollutant exposure is knowledge of plant physiological processes that influence pollutant uptake. These processes affect the sequence from external pollutant exposure to biologically significant pollutant dose, and control a multitude of temporary and permanent physiological responses. Intrinsic differences between species need to be understood to develop exposure-response functions for important species within western forest ecosystems. Variable environmental conditions for each individual and through the canopy of a single individual influence exposure-response functions within genetically determined boundaries. Long term consequences of pollutant exposure are difficult to understand because of scale problems related to the long life spans of trees.

Unfortunately, our present state of knowledge does not allow consistent quantification of links between air pollution exposure and plant or ecosystem response. Established relationships between various exposure characteristics and plant response gained from laboratory experiments usually on annual plants imply that both the magnitude of the pollutant concentration and the length of exposure are important. However, for all practical purposes, very little is known about the effect of both single and multiple pollutant exposures on natural and managed forest ecosystems under field conditions where additional environmental stresses influence the physiology of organisms exposed.

Over the years much effort has been placed in developing biologically meaningful indices for pollutant exposure (e.g., Lefohn and Benedict 1982; Heck et al. 1984; Lefohn et al. 1986; Lefohn and Runeckles 1987; Krupa and Kickert 1987; Hogsett et al. 1988; Lee et al. 1988; Tingey et al. 1989). A review of the literature implies that a single exposure index for a particular pollutant will probably not apply to all plant species, field conditions, and exposure levels. Our approach is to present several summary statistics, thereby allowing the user to decide which method yields an appropriate surrogate for pollutant uptake for the plant species of interest to that user. We wish to stress that summary statistics in this Atlas are not linked to biological effects until biologists apply the air quality data to their research or apply the information based on their research.

The choice of summary statistics used to characterize each pollutant was based on known or suspected mechanisms of damage to forest trees. For convenience, common summary statistics are also included. Descriptions and possible interpretations of the summary statistics are presented by pollutant in subsequent sections. Since ozone is the only regionally dispersed pollutant known to injure trees and because ozone damage to forests in southern and central California is well documented, more emphasis is placed on summarizing ozone concentrations than on summarizing sulphur dioxide and precipitation chemistry.

In the real world, plants are exposed to a melange of stresses all at once. Co-occurrence of exposure to several pollutants can, under laboratory conditions, lead to exacerbated effects in certain plant species (e.g., Olszyk et al. 1989). Many of these pollutants, such as sulphur dioxide and ozone, do not often co-occur under natural conditions (e.g., Lefohn et al. 1987). Thus we did not investigate hourly co-occurrence of pollutants, however, the summary tables for different pollutants are arranged so that some inference can be obtained on co-occurrence or sequential exposure of forests to different pollutants.

4A. SULPHUR DIOXIDE

Direct foliar injury to plants can occur after 1 hour exposures to sulphur dioxide concentrations of 500 ppb (e.g., Heck and Brandt 1977; McLaughlin 1981). Sulphur dioxide damage need not be visible. There is some evidence that annual average concentrations as low as 10 to 20 ppb, together with occasional peaks of between 40 and [illegible] ppb can reduce tree growth (Last and Rennie 1982).

Sulphur dioxide injury to forest trees is usually restricted to areas where undiluted plumes frequently come into contact with the ground. Forests located in areas with poor atmospheric ventilation are most susceptible to damage from sulphur dioxide. Thus, emissions of sulphur dioxide within valleys usually cause more injury to adjacent forests than do emissions from sources located in well-ventilated terrain (Skelly et al. 1987).

Regional levels of sulphur dioxide are low across the West, although pockets of high concentrations do occur. Sites recording high sulphur dioxide levels are usually located close to large point sources. Hourly concentrations in excess of 80 ppb occur relatively frequently at monitoring sites in southern Arizona, Idaho, and Montana (Bohm 1989). During periods of poor atmospheric ventilation, hourly sulphur dioxide levels in the San Joaquin Valley, California, averaged around 40 ppb with maximum values of up to 60 ppb (Jacob et al. 1987). Sulphur dioxide measurements at Tanque Verde near Tucson, Arizona, were typically below the detection limit of the instrument, although hourly concentrations as high as 30 ppb were recorded on occasion during both summer and winter months (Linak and Peterson 1983).

Sulphur dioxide abatement strategies have resulted in large reductions in emissions at many point sources across the West, especially in the smelter industry. Current levels of sulphur dioxide, where measured, are probably lower than those referred to above. However, there are very few sulphur dioxide monitors in or near forested areas in the West and additional pockets of high sulphur dioxide concentrations, thus far unmeasured, may occur near many point sources across the area.

Sources of Data

Hourly concentrations of ambient sulphur dioxide were obtained from the Environmental Protection Agency (SAROAD, currently AIRS) and were analyzed by Dr. Allen Lefohn of A.S. & L. Associates, Helena, Montana. The study period spans 01 January, 1980 through 31 December, 1988. All sites followed EPA calibration and monitoring guidelines, although not all sites operated for the entire study period.

Atlas Format

Data tables are presented alphabetically by site and state (Appendix 2). The first page for each site provides BIOGRAPHIC INFORMATION for that site that is available in SAROAD. The site name and state are clearly marked at the top of the page. A map displaying the location of the site together with locations of other sulphur dioxide sites within 20 km of forests in that state is presented. The site under discussion is demarcated with a star; remaining sites are represented by a small circle. Geographic data such as latitude, longitude, and elevation of the site in meters, are presented. Information on landuse around the site, on population of the nearest city and of the region as a whole (1980 Census), is given. The period for which data were available is indicated. The source of the data, together with SAROAD codes, is given. The purpose of this page is to provide the user with spatial data and useful information about the site.

The second page presents BASIC STATISTICS for the site. Again the site name is clearly marked at the top of the page. Tables of basic statistics are given for three averaging periods, viz., BY YEAR, BY GROWING SEASON, and BY MONTH. Derivations of statistics are explained below in the "Summary Statistics" section. "0" indicates no occurrence, "-" indicates missing data, and "0.1" refers to the range of percent occurrences from 0.01 to 0.09. The purpose of these tables is to provide the user with some standard summary statistics describing the frequency of occurrence of sulphur dioxide concentrations.

Summary Statistics

The sulphur dioxide data are summarized for three averaging periods, (1) January - December or BY YEAR; (2) May - October or BY GROWING SEASON; and (3) Months composited over years or BY MONTH. These averaging periods provide the user with a choice of resolution and allow integration of sulphur dioxide summary information with biological data at a variety of levels. Percent data capture is given for each summary period. Hourly data are considered valid if they are not missing. For the BY YEAR averaging period,

% data capture = (# valid hours / # hours in a year) * 100.

Usually a year has 8760 hours and 365 days, although leap years have 8784 hours and 366 days. For the BY GROWING SEASON averaging period,

% data capture = (# valid hours / 4416) * 100.

The period May through October has 4416 hours and 184 days. For the BY MONTH averaging period,

% data capture = (# valid hours / (# years with valid data for that month * # hours in that month)) * 100.

Months with 31 days have 744 hours, months with 30 days have 720 hours, and February has 28 days and 672 hours during normal years and 29 days and 696 hours during leap years.

Summary statistics are presented for all years, growing seasons, and months during which valid hours of data were recorded. The data are summarized following recommendations of Hogsett et al. (1987). The sulphur dioxide data are expressed as frequency of occurrence of hourly concentrations between 0.0 and 9.9 ppb, 10.0-19.9 ppb, 20.0-29.9 ppb, 30.0-39.9 ppb, 40.0-49.9 ppb, 50.0-59.9 ppb, 60.0-69.9 ppb, 70.0-79.9 ppb, and ≥ 80.0 ppb. The upper ranges in sulphur dioxide concentrations were chosen to represent those concentrations assumed detrimental to vegetation.

Percentage occurrence of hourly concentrations of sulphur dioxide provide an indication of the percent of hours during which the site was exposed to certain concentrations. These data do not provide any information on the amount of sulphur dioxide taken up by coniferous forests near the monitoring sites. Tables of percent occurrence of hourly sulphur dioxide concentrations for given intervals can be used in conjunction with results from dose-response studies to determine the probability for sulphur dioxide injury to vegetation near the monitoring site. Monthly tables of percent occurrence of hourly sulphur dioxide concentrations can be used to identify seasonal patterns in exposure and frequency of exposure of forests to sulphur dioxide.

Missing data were neither estimated nor included in the calculations, consequently data captures are presented for each summary period. A data capture of 50% indicates that half of the available data were valid and were used to generate the summary statistics. Summary statistics associated with low data captures are not as representative of the averaging period as are statistics associated with high data captures. The user of this Atlas is encouraged to compare BY YEAR, BY GROWING SEASON, and BY MONTH data captures to obtain a feel for the distribution of missing data for a particular site. The user has the option to regard or disregard summary information for a given summary period based on a level of uncertainty acceptable to that user. Data captures ≥ 75% are often considered representative of the population (e.g., California Air Resources Board 1987).

4B. OZONE

Ozone is formed by the photolysis of nitrogen oxides in the presence of non-methane hydrocarbons. Although nitrogen dioxide is the primary precursor of ozone, nitric oxide formed during the photolysis reaction reacts rapidly with ozone to form nitrogen dioxide and oxygen. Thus, nitric oxide and ozone do not co-exist in the atmosphere and the relationship between formation and scavenging processes determine ambient ozone concentrations (Finlayson-Pitts and Pitts 1986).

Ozone is the only regionally dispersed pollutant known to injure foliage and lead to tree mortality at ambient levels (Miller 1973; Woodman 1987). Ponderosa and Jeffreyi pine trees in the mixed conifer forests of southern Sierra Nevada and San Bernardino Mountains in California exhibit, in many cases, severe foliar injury. Changes in ecosystem composition and growth rates have occurred (e.g., Miller 1973; Peterson et al. 1989). Visible damage attributable to ozone has not been recorded in other forests of the West.

High ozone concentrations do occur downwind of most large urban complexes such as Seattle, WA; Salt Lake City, UT, Phoenix, AZ, and Denver, CO (Bohm 1989). The interested reader is referred to Lefohn and Pinkerton (1988); Fehsenfeld et al. (1983); Lefohn et al. (1990); Basabe et al. (1989); Edmonds and Basabe (1989); Bohm (1990b).

Sources of Data

Hourly concentrations of ambient ozone were obtained from the EPA AIRS data base, from the National Park Service (NPS), Washington Department of Ecology, and Washington University (through the Electric Power Research Institute and Edmonds et al. (1989)). To limit uncertainties associated with nonstandard calibration techniques prior to EPA standardization in 1979, the study period spans 01 January, 1980 through 31 December, 1989. All sites followed EPA calibration and monitoring guidelines, although not all sites operated for the entire study period.

Atlas Format

Data tables are presented alphabetically by site and state (Appendix 3). The first page for each site provides BIOGRAPHIC INFORMATION for that site that is available in AIRS. The site name and state are clearly marked at the top of the page. A map displaying the location of the site together with locations of other ozone sites within 20 km of forests in that state is presented. The site under discussion is demarcated with a star, remaining sites are represented by a small circle. Geographic data such as latitude, longitude, elevation of the site in meters, and elevation of the valley or basin floor in meters, are presented. Information on landuse around the site, on population of the nearest city and of the region as a whole (as defined in AIRS), is given. The period for which data were available is indicated. The source of the data, together with AIRS codes for AIRS sites, is given. The purpose of this page is to provide the user with spatial data and useful auxiliary information about the site.

The second page presents BASIC STATISTICS for the site. Again the site name is clearly marked at the top of the page. Tables of basic statistics are given for three averaging periods, viz., BY YEAR, BY GROWING SEASON, and BY MONTH. Derivations of statistics are explained below in "Summary Statistics" section. "0" indicates no occurrence and "-" indicates missing data. The purpose of these tables is to provide the user with some standard summary statistics describing the magnitude of ozone concentrations and frequency of occurrence of certain ozone concentrations.

The third page provides information on DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS, or on the dynamics of ozone exposure. The site name is clearly marked at the top of the page. Tables of percent occurrence of patterns (Bohm et al. 1990) are given for three averaging periods, viz., BY YEAR, BY GROWING SEASON, and BY MONTH. Derivations of the information are explained below in "Summary Statistics" section. "0" indicates no occurrence and "-" indicates missing data. The purpose of these tables is to provide detailed information on the diurnal and seasonal characteristics of the dynamics of ozone exposure at the site.

The fourth page displays the shape of DOMINANT DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS (MAY - OCT) experienced during the growing season. Again, the site name is clearly marked at the top of the page. Derivation of the information is explained below in "Summary Statistics" section. The purpose of these graphs is to provide a quick-look capability for both magnitude of ozone experienced at a site as well as dynamics of exposure.

Summary Statistics

Adverse ozone effects can occur at concentrations above 60 ppb (Pell 1974), however effects generally develop after short exposures to concentrations greater than 80 ppb (Taylor 1973). The response of vegetation to ozone is influenced by diurnal and seasonal patterns in exposure (Hogsett et al. 1985), as well as by the magnitude of ozone concentrations and length of exposure (e.g., Tingey and Taylor 1982; Guderian 1985). Summary statistics should be sensitive to these characteristics of ozone exposure.

The ozone data are summarized for three averaging periods, (1) January - December or BY YEAR; (2) May - October or BY GROWING SEASON; and (3) Months composited over years or BY MONTH. These averaging periods provide the user with a choice of resolution and allow integration of ozone summary information with biological data at a variety of levels. Some sites were not operational for the entire averaging period. Under these conditions, operational months are included in parentheses behind the summary period heading. Percent data capture and percent valid days are given for each summary period. Hourly data are considered valid if they are not missing. A day is considered valid if 75% of hours between 09:00 and 21:00 have valid ozone data (Federal Register 1979). For the BY YEAR averaging period,

% data capture = (# valid hours / # hours in a year) * 100.

% valid days = (# valid days / # days in a year) *100.

Usually a year has 8760 hours and 365 days, although leap years have 8784 hours and 366 days. For the BY GROWING SEASON averaging period,

% data capture = (# valid hours / 4416) * 100.

% valid days = (# valid days / 184) * 100.

The period May through October has 4416 hours and 184 days. If a site was not operational during the entire averaging period, data capture is still calculated as described above, but operational months are listed in parentheses behind the summary period heading. For the BY MONTH averaging period,

% data capture = (# valid hours / (# years with valid data for that month * # hours in that month)) * 100.

% valid days = (# valid days / (# years with valid data for that month * # days in that month)) * 100.

Months with 31 days have 744 hours, months with 30 days have 720 hours, and February has 28 days and 672 hours during normal years and 29 days and 696 hours during leap years.

BASIC STATISTICS are given for each averaging period, i.e., BY YEAR, BY GROWING SEASON, and BY MONTH. Missing data were usually neither estimated nor included in the calculations, consequently data captures are presented for each summary period. A data capture of 50% indicates that half of the available data were valid and were used to generate the summary statistics. Summary statistics associated with low data captures are not as representative of the averaging period as are statistics associated with high data captures. The user of this Atlas is encouraged to compare BY YEAR, BY GROWING SEASON, and BY MONTH data captures to obtain a feel for the distribution of missing data for a particular site. The user has the option to regard or disregard summary information for a given summary period based on a level of uncertainty acceptable to that user. Data captures ≥ 75% are often considered representative of the population (e.g., California Air Resources Board 1987). The following statistics are tabulated:

1. 5th, 10th, 25th, 50th, 75th, 90th, and 95th percentiles for the hourly data over the averaging period. If the desired percentile fell between two numbers, the arithmetic mean of the numbers was used as the percentile.

2. Arithmetic mean and standard deviation (ppb) for hourly data over the averaging period. The data for several sites are not continuous but are rather at discrete intervals of 5 or 10 ppb; for completeness, the mean and standard deviation are reported for these sites.

3. Cumulative indices S06 and S08 (ppm hr):

$$S06 = \Sigma [O_3] / 1000 \quad \text{where } [O_3] \geq 60 \text{ ppb.}$$

$$S08 = \Sigma [O_3] / 1000 \quad \text{where } [O_3] \geq 80 \text{ ppb.}$$

Cumulative indices are sensitive to missing data. If data captures are less than 100%, cumulative indices may under-estimate reality depending on the distribution of missing hours. For the averaging period MONTH, the cumulative indices are normalized as follows:

$$S06_n = S06 * (\text{\# hours in that month}) / (\text{\# valid hours}).$$

$$S08_n = S08 * (\text{\# hours in that month}) / (\text{\# valid hours}).$$

This approach assumes that the missing hours are uniformly distributed across the averaging period. In the event of no instrument failure, the missing hours are not uniformly distributed since span checks usually occur every 24 hours at the same time. Normalized cumulative indices for sites with data captures ≥ 96% (i.e., missing data are only due to span checks) are thus probably over-estimates of reality. In the event of instrument failure, frequencies of occurrence of missing hours are often uniformly distributed and the normalized cumulative indices are probably good surrogates of reality. However, there is no means of determining if an air pollution episode occurred during the period of instrument failure. If such an episode did occur, the normalized cumulative indices would under-estimate reality. If lower ozone levels occurred during the period of instrument failure than during the remainder of the averaging period, the converse is true.

Cumulative indices for GROWING SEASON were not normalized. We feel that a generic normalization routine applied to indices of long averaging periods for all sites in the analysis increases uncertainty to the point that the index is of little value. The data presented for S06 and S08 under BY GROWING SEASON provide the user with a lower bound. We consider the uncertainty associated with this estimate to be proportional to the data capture reported for the summary period. Users who wish to estimate total cumulative indices for a particular site or time period are encouraged to pursue the missing data issue from the original data.

4. Percent of valid hours during the averaging period with ozone concentrations greater than or equal to 60, 80, 100, and 120 ppb. In some cases the cumulative indices are greater than 0 although the percent valid hours for 60 and 80 ppb are reported as "0"; the percent valid hours were actually between 0.0 and 0.5% and were thus rounded to "0". Missing data were neither estimated nor included in the calculation of the percentages.

5. The number of days with ozone concentrations ≥ 120 ppb were determined from all the data in the averaging period, and not only from valid days.

Summary information presented in the BASIC STATISTICS section provides biologists with insights on the magnitude of ozone concentrations and frequencies of exposure to certain concentrations. However, the response of vegetation to ozone also appears to be influenced by diurnal and seasonal patterns in exposure (Hogsett et al. 1985, 1988). Thus, information on DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS is given for each averaging period, i.e., BY YEAR, BY GROWING SEASON, and BY MONTH. Seventeen diurnal patterns in hourly ozone concentrations can be identified using data from western sites (Figure 4B.1; Bohm et al. 1990). The patterns are labeled following a letter-number combination describing the shape of the curve (A - curve with very little diurnal variation in hourly ozone concentrations; E - curve with marked diurnal variations in hourly ozone concentrations) and the magnitude of the daily mean (1 - small daily mean; 5 - large daily mean). Each day with 23 or 24 valid hourly ozone concentrations can be classified against these 17 patterns using a discriminant analysis and a prior probability of 0.4. The interested reader

is referred to Böhm et al. (1990) for a detailed description of the analysis.

The percent occurrence of the 17 patterns is presented for averaging periods BY YEAR, BY GROWING SEASON, and BY MONTH. Percent unclassified days, or days with diurnal patterns in hourly ozone concentrations not closely associated with the 17 classification patterns (prior probability < 0.4 in discriminant analysis), is also given for each summary period. Detailed information on the characteristics of ozone exposure is available from these tables. Firstly, sites far removed from pollution source areas experience patterns with little fluctuation in hourly ozone concentrations whereas sites close to pollution source areas characteristically exhibit bell-shaped curves of ozone concentrations with maxima around the middle of the day. Thus, the frequency of occurrence tables can be used to identify subtle changes in ozone exposure at a site prior to there being noticeable changes in the basic statistics. Secondly, the tables can be used in a modelling framework. Detailed information on ozone exposure can be recreated in the modelling environment by simply using a 24 X 17 matrix describing the seventeen classification patterns and a frequency of occurrence matrix for the site and period of interest. Thirdly, responses of vegetation to ozone can be easily investigated at a monthly level, allowing integration of ozone exposure dynamics with phenological and other biological or environmental information.

A visual interpretation of the most common diurnal patterns in hourly ozone concentrations during the growing season is presented in the DOMINANT DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS (MAY - OCT) section. The graphs illustrate the average shape of the curve together with one standard deviation. Curves accounting for up to 75% of days during the growing season are shown with the most common curves at the base of the page. An idea of the dynamics of ozone exposure is obtained with one glance. Sites with very little fluctuation in ozone concentrations, such as Olympic National Park, require only two patterns to describe 75% of growing season days. Sites with widely fluctuating ozone exposures, such as San Bernardino, require five patterns to describe 75% of growing season days. Actual percent occurrences are available from B. BY GROWING SEASON (All Years) in the DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS section of the previous page.

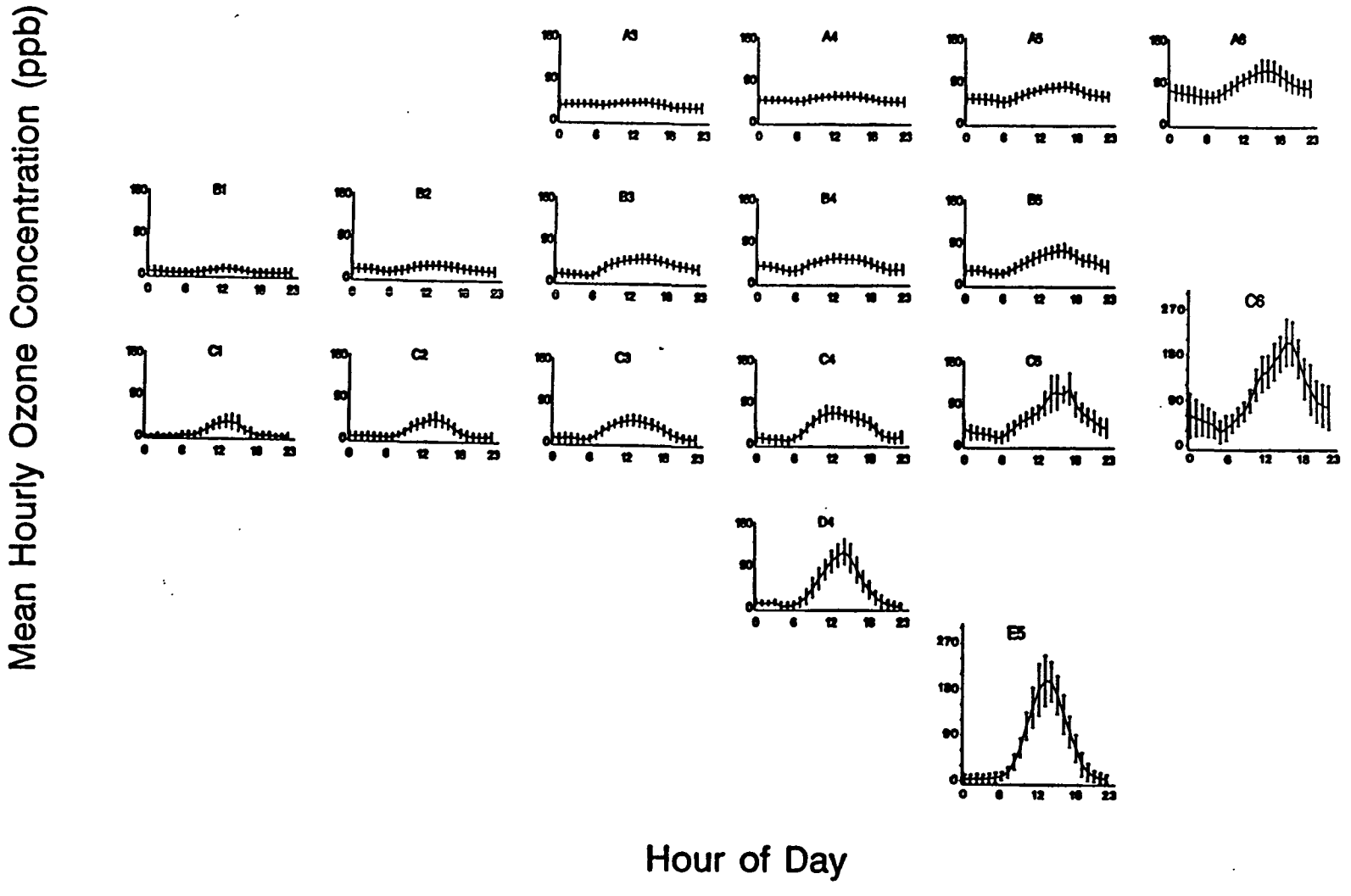

Figure 4B.1 Seventeen calibration patterns of hourly ozone concentrations (ppb) for sites in or near western forests (after Böhm et al. 1990). The graphs are arranged by mean (smallest to left of plot, numbered 1 to 5) and coefficient of variation (lowest towards top of plot, lettered A to E).

4C. WET DEPOSITION FROM RAIN AND SNOW

The chemistry of rain and snow and deposition of acidic ions are monitored near several forested areas across the West as part of the National Atmospheric Deposition Program/National Trends Network (NADP/NTN). Volume weighted average pH varies from 4.7 in southern Arizona and New Mexico, 5.0 in southern California, western Washington, and the Southwest including parts of Colorado, to 5.3 in eastern Oregon, Idaho, and Montana (Figure 4C.1b). Mean weekly pH values range from 4.6 to 5.4. Volume weighted sulphate concentrations (as SO_4^{2-}) are generally less than 1 mg/L although mean weekly concentrations range from 0.5 to 2.5 mg/L. Annual sulphate deposition ranges from 1 to 8 kg/ha (Figure 4C.1c). Volume weighted nitrate concentrations (as NO_3^-) are generally less than 1 mg/L although mean weekly concentrations range from 0.2 to 4.1 mg/L. Annual nitrate deposition ranges from 1 to 5 kg/ha (Figure 4C.1e). Higher concentrations of sulphate and nitrate occur at sites close to point sources or large urban settlements (Bohm 1989). Temporal patterns in deposition are related to seasonal patterns in precipitation. In general, most deposition to forested areas in the West occurs during the winter in the form of snow.

The ionic concentrations and depositions of precipitation in the West are 15-25% of eastern values. Depositions of sulphate and nitrate at high elevations in the West are largely unknown and may be larger than at low elevations where the sites are located, since high elevations usually receive more precipitation than low elevation sites.

The interested reader is referred to Dawson (1978), Leonard and Goldman (1981), Liljestrand and Morgan (1982), Nagamoto et al. (1983), Harte et al. (1985), Vong et al. (1985), Galbraith (1986), Hidy and Young (1986), Popp and Long (1986), Sharpless (1986), Stohlgren and Parsons (1987), Bohm (1989), Vong (1990) and to the Annual Reports of NADP/NTN for more detailed information on acid deposition in the United States (e.g., National Atmospheric Deposition Program 1989).

Sources of Data

Chemistry and deposition estimates were obtained from the NADP/NTN Coordination Office at Colorado State University (National Atmospheric Deposition Program (IR-7)/National Trends Network 1990). Deposition estimates do not carry the same level of confidence as do the chemical concentrations, since precipitation volume data are not subjected to the same rigorous quality assurance tests as precipitation chemistry data. Deposition values may also under-estimate actual loadings because they are not adjusted for the percentage of the summary period for which precipitation amounts were not available from the rain gauge or sampler. It should also be mentioned that there are various problems with sample integrity when using weekly sampling periods (e.g., Galloway and Likens 1976). Hydrogen ion and ammonium values may be underestimated due to changes in chemistry between the end of the event and analysis of the sample.

Atlas Format

Data tables are presented alphabetically by site and state (Appendix 4). The first page for each site provides BIOGRAPHIC INFORMATION for that site that is available in Robertson and Wojciechowski (1986) and National Atmospheric Deposition Program (1990). The site name and state are clearly marked at the top of the page. A map displaying the location of the site together with locations of other NADP/NTN sites within 20 km of forests in that state is presented. The site under discussion is demarcated with a star, remaining sites are represented by a small circle. Geographic data such as latitude, longitude, and elevation of the site in meters are presented. Information on landuse around the site and the period for which data were available is given. The source of the data, together with NADP/NTN identification code, is indicated. The purpose of this page is to provide the user with spatial data and useful auxiliary information about the site.

The second page presents BASIC STATISTICS for the site. Again the site name is clearly marked at the top of the page. The first table presents percentiles for weekly concentrations (mg/L) for each year together with

total precipitation measured during that year. The second table presents volume weighted averages (mg/L) and deposition estimates (kg/ha) for each year and for winter (December through February) and summer (June through August) summary periods within that year. Data for pH, sulphate, nitrate, and ammonium are given in both tables. Derivations of statistics are explained below in "Summary Statistics" section. "0" indicates no occurrence and "-" indicates missing data. The purpose of these tables is to provide the user with some standard summary statistics describing precipitation chemistry and deposition during summer, winter, and over the year as a whole. Similar information for chloride, calcium, potassium, magnesium, aluminium, and sodium is available from the NADP/NTN Coordination Office at Colorado State University. The NADP/NTN summaries present additional information that may be of use to the interested reader.

Summary Statistics

Samples are considered valid for precipitation chemistry if all of the following criteria are satisfied (National Atmospheric Deposition Program 1989):

1. NADP/NTN criteria for site location, sample collection and handling, and measurement protocols are satisfied.

2. The sampling interval is 6-8 days.

3. There is a rain gauge depth or sample volume reported for the sample.

4. The sample consists of "wet-only" deposition, i.e., it was not exposed to dry deposition during the sampling interval.

5. A complete set of chemical measurements is reported for the sample.

6. The sample is not contaminated.

Calculations of ion concentration and deposition statistics are limited to samples that meet the above criteria. Four completeness criteria form the basis for the decision to include the data from a site in the seasonal and annual summary tables (National Atmospheric Deposition Program 1989):

1. There must be valid samples for at least 75% of the summary period.

2. For at least 90% of the summary period, there must be precipitation amounts (including zero amounts) either from the rain gauge or from the sample volume.

3. There must be valid samples for at least 75% of the total precipitation amount reported for the summary period.

4. For the entire summary period, the total precipitation as measured from the sample volume must be at least 75% of the total precipitation measured by the rain gauge for all valid samples where both values are available.

It is important to recognize that if all the criteria were satisfied at the lower limit of acceptability, the summary could still account for less than 75% of the actual precipitation at a site. This could occur because the 90% precipitation coverage criterion is based on time and there may be no record of the amount of precipitation missed during the unsampled 10% of the period. Where the precipitation coverage is 100% however, these criteria ensure that at least 75% of the precipitation is represented by valid samples (National Atmospheric Deposition Program 1989). The interested reader is referred to the NADP/NTN Coordination Office at Colorado State University for more information on data analysis and interpretation.

Only data for sites and years included in NADP/NTN Annual Summaries are presented in this Atlas. The following BASIC STATISTICS are given for each averaging period:

1. 25th, 50th, 75th, and 90th percentiles together with the maximum value for weekly data over the averaging period. Missing data were neither estimated nor included in the calculation of the percentiles. If the desired percentile fell between two numbers, the arithmetic average was used as the percentile.

2. Volume weighted averages for the averaging period:

$$\bar{x} = (\Sigma\, c_i\, P_i) \,/\, (\Sigma\, P_i)$$

where c_i is the concentration (mg/L) for the ionic species of interest for the ith week and P_i is the precipitation amount for the ith week. The quantity of precipitation measured by the rain gauge is usually greater than that captured in the sampler bucket. NADP/NTN considers the rain gauge measurement to be the best estimate of precipitation amount, thus rain gauge rather than sample volume amounts are used when calculating volume weighted averages. It is assumed that the chemistry of the sample, determined from water collected in the sample bucket, represents the chemistry for the entire precipitation event.

3. Deposition is calculated from the product of the volume weighted mean concentration and the total measured precipitation for the averaging period. Deposition values were not adjusted for the percentage of the summary period for which precipitation amounts were not available from the rain gauge or the sampler. Measured deposition values may underestimate actual wet deposition.

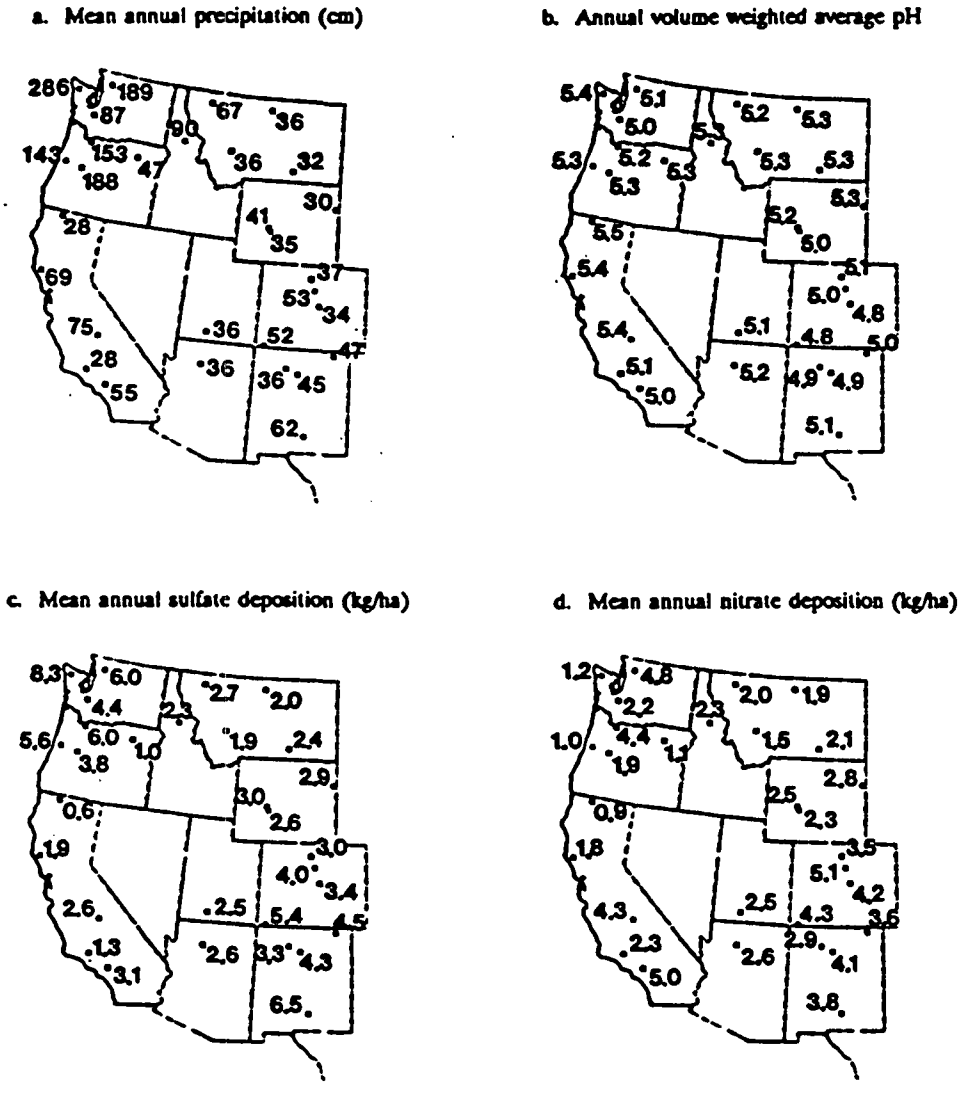

Figure 4C.1 Mean annual estimates of precipitation amount, volume weighted pH averages, and deposition of hydrogen ion, sulphate, and nitrate in or near western forests during the period 1985 through 1988 (National Atmospheric Deposition Program (IR-7)/National Trends Network (1990)).

5. SUMMARY AND CONCLUSIONS

An Atlas of air quality and deposition has been compiled to make air pollution data and information more accessible to biologists and ecologists working in western forests. The information is presented in an easy-to-comprehend format that gives both geographic and summary data on emissions of sulphur and nitrogen dioxides, on ambient concentrations of sulphur dioxide, ozone, and precipitation chemistry, and on wet deposition of acidic ions at sites located within 20 km of forest ecoregions within the West. The Atlas also directs users to the original sources of the data.

The Atlas should be used as a "quick look" reference. It is inevitable that as more atmospheric and biological data become available and as our knowledge of atmosphere-forest interactions increases, both the data bases and analytical approaches presented in this document will become outdated. A shortcoming of this Atlas and numeric analysis of large data sets in general, is treatment of missing values. Additional research is required to better characterize the distributions of missing data and their influence on the accuracy and precision of reported estimates.

Scientists addressing specific questions on the response of forests to air pollutants are encouraged to monitor air pollutants in the forests of interest. For example, most of the sulphur dioxide and ozone sites used in this Atlas were not located in forests. Very little is known about extrapolating air pollution information from valleys and non-forested areas to forests and within forests, especially when the forests occur in complex terrain.

It is important to note that the data presented in this Atlas merely characterize the chemical nature of air that may be in contact with forests close to the monitoring sites and not the uptake of pollutants by the forest ecosystem. We reiterate a statement made previously in the document, "We wish to stress that summary statistics in this Atlas are not linked to biological effects until biologists apply the air quality data to their research or apply the information based on their research."

6. ACKNOWLEDGEMENTS

This Atlas would never have materialized without support and contributions from many people and institutions, especially NADP/NTN. The original idea for a data Atlas, and the format of this document was derived after numerous interactions with NADP/NTN personnel in various Subcommittees. Special thanks to the personnel of AIRS, NEDS, University of Washington, EPRI, NPS, and State Departments of Air Quality for their time and effort in preparing the emissions and ozone data, and to Allen Lefohn for analyzing the sulphur dioxide data. We would also like to thank our reviewers for taking the time to carefully review such a cumbersome document. Their comments provided us with much food-for-thought and served to produce a more comprehensible document.

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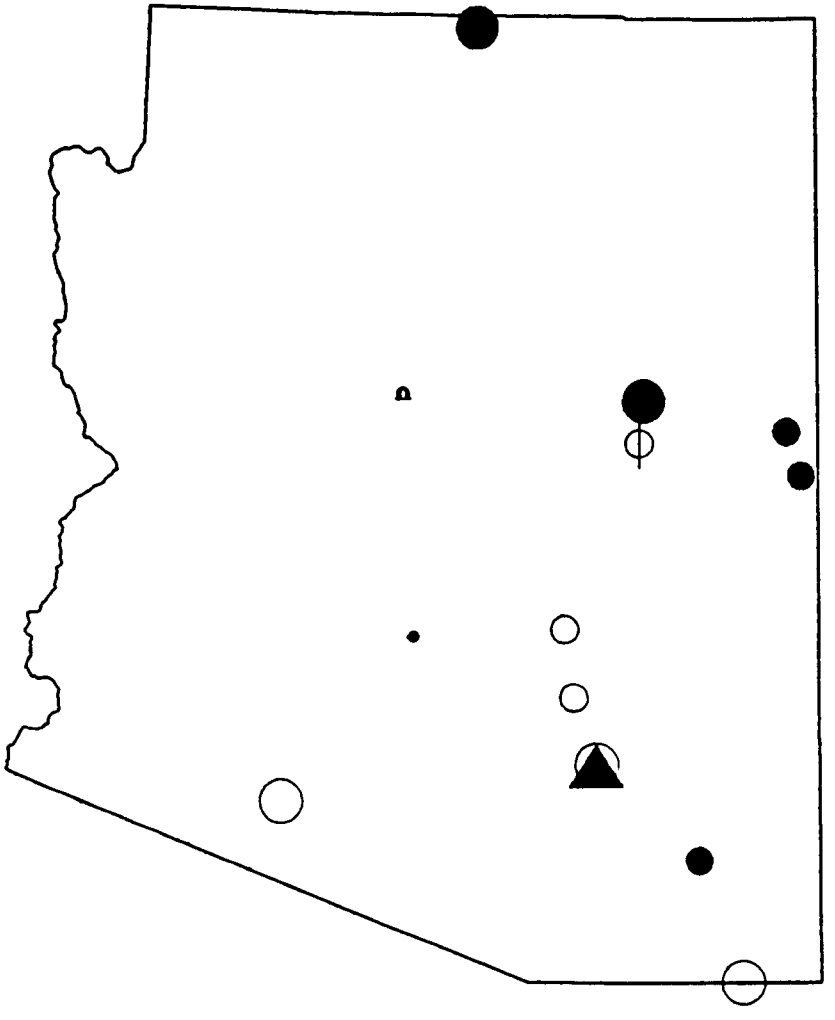
APPENDIX 1

EMISSIONS INFORMATION BY STATE

Location & Magnitude of Major SO2 Point Sources for Arizona



Metal Industry
Electric Generation
Petroleum Industry
Chemical Processes
Industrial Fuel Use
Mineral Products
Other

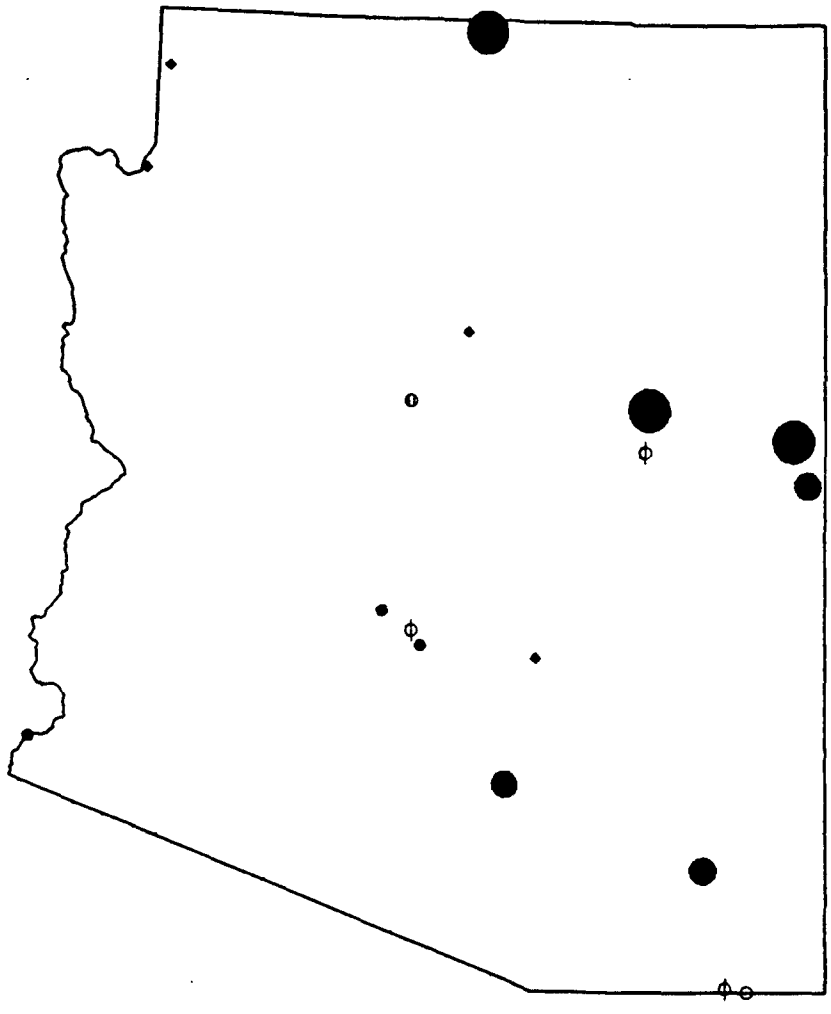
100 - 1000
1001 - 10000
10001 - 100000

Emissions (Mg/year)

50 0 50 100
km

SCALE = 1:3,750,000

Location & Magnitude of Major NO2 Point Sources for Arizona



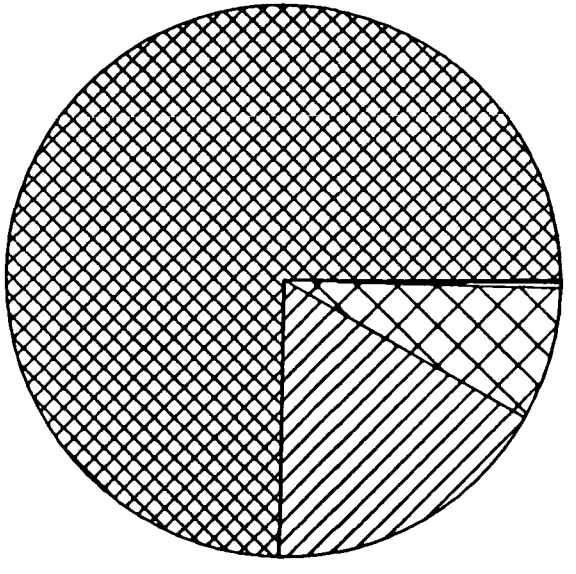
Metal Industry
Electric Generation
Petroleum Industry
Chemical Processes
Industrial Fuel Use
Mineral Products
Other

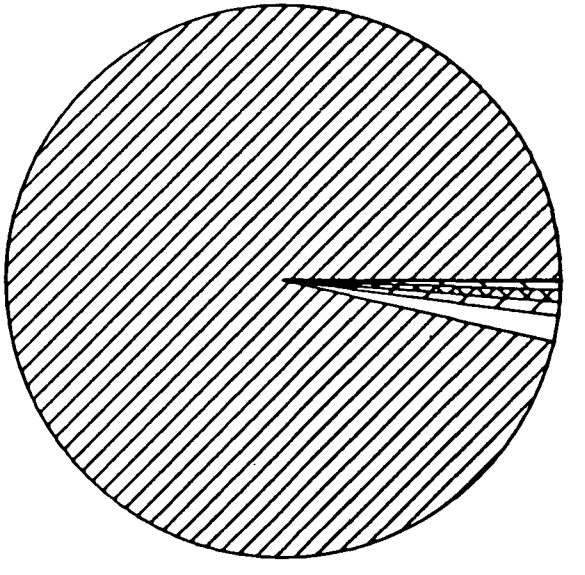
100 - 1000
1001 - 10000
10001 - 100000
Emissions (Mg/year)

50 0 50 100
km

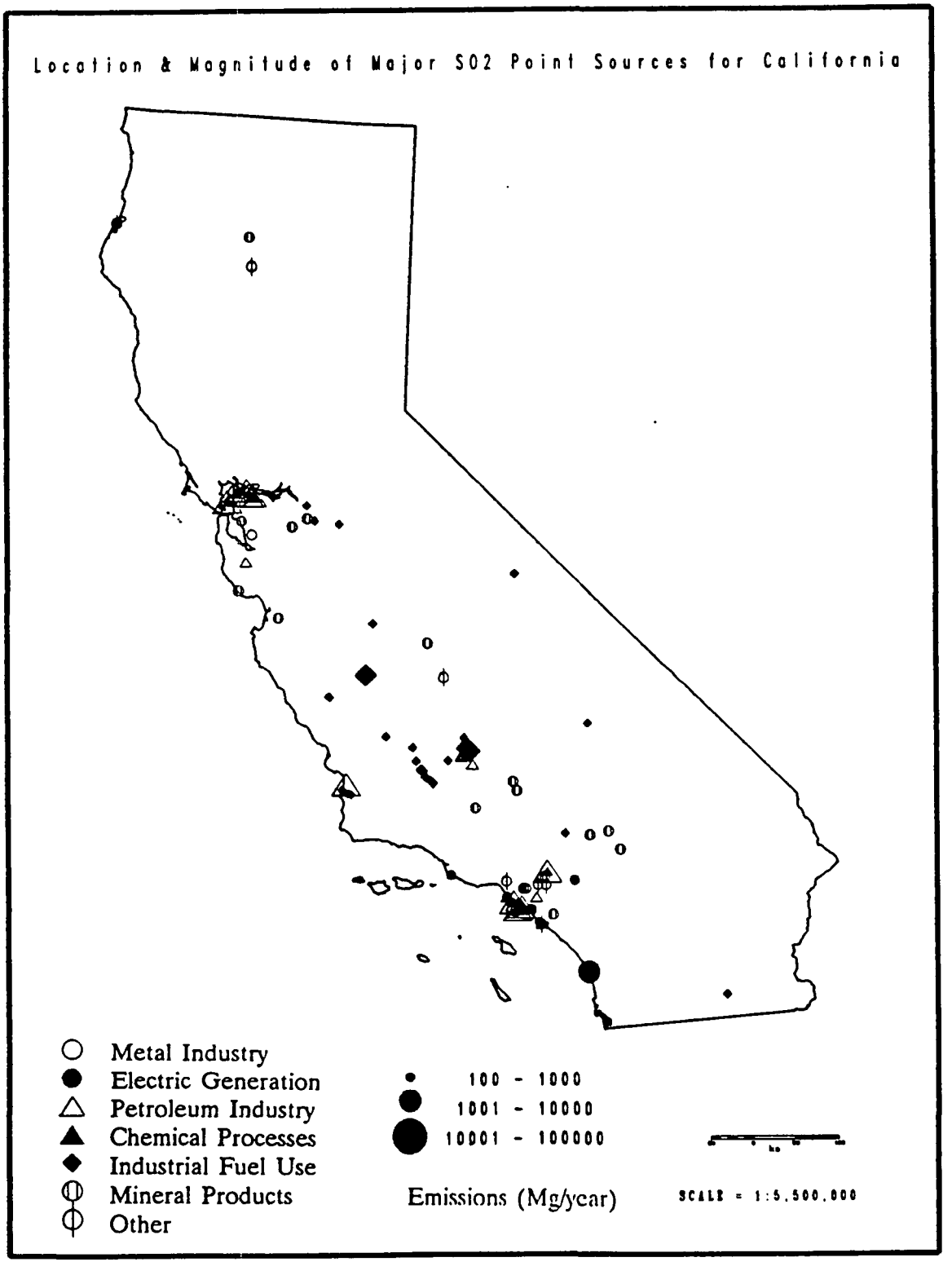
SCALE = 1:3,750,000

Percent Contribution by Industrial Activities to Total Point Source Emissions in Arizona for 1985

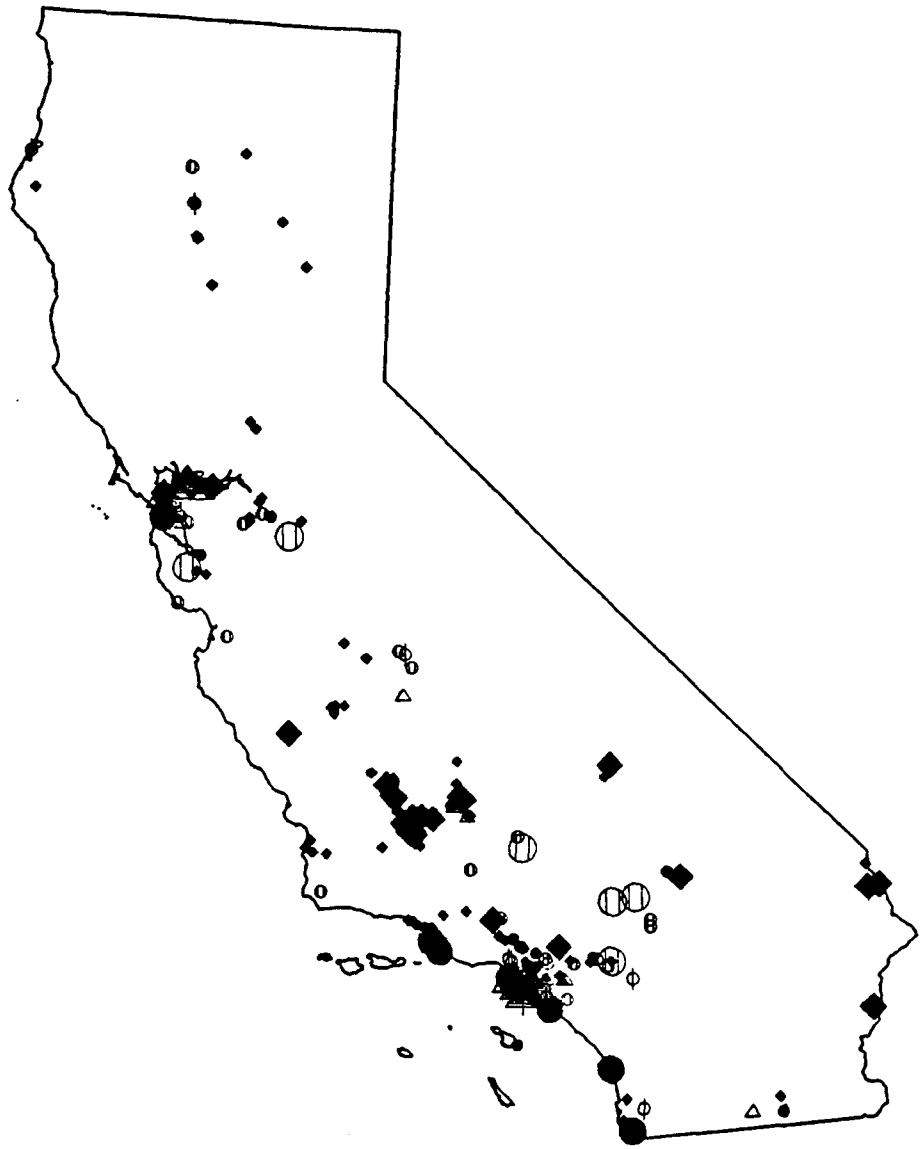




SO_2 (%)	Legend	NO_2 (%)
74.7	Metal Industry	0.7
17.0	Electric Generation	96.4
0.0	Petroleum Industry	0.1
7.8	Chemical Processes	0.0
0.0	Industrial Fuel Use	0.8
0.2	Mineral Products	0.5
0.3	Other	1.5


Location & Magnitude of Major SO2 Point Sources for California
Metal Industry
Electric Generation
Petroleum Industry
Chemical Processes
Industrial Fuel Use
Mineral Products
Other
100 - 1000
1001 - 10000
10001 - 100000
Emissions (Mg/year)
SCALE = 1:5,500,000

Location & Magnitude of Major NO2 Point Sources for California



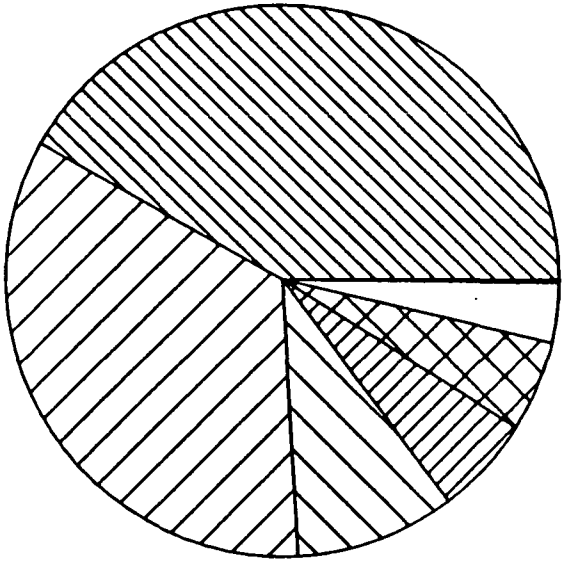
Metal Industry
Electric Generation
Petroleum Industry
Chemical Processes
Industrial Fuel Use
Mineral Products
Other

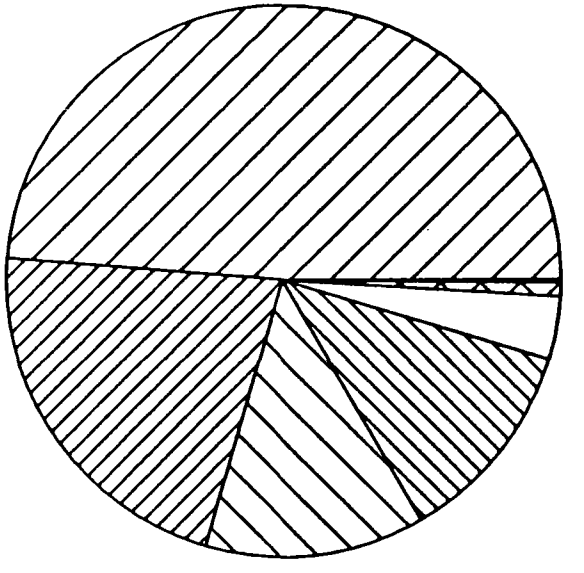
100 - 1000
1001 - 10000
10001 - 100000

Emissions (Mg/year)

SCALE = 1:5,500,000

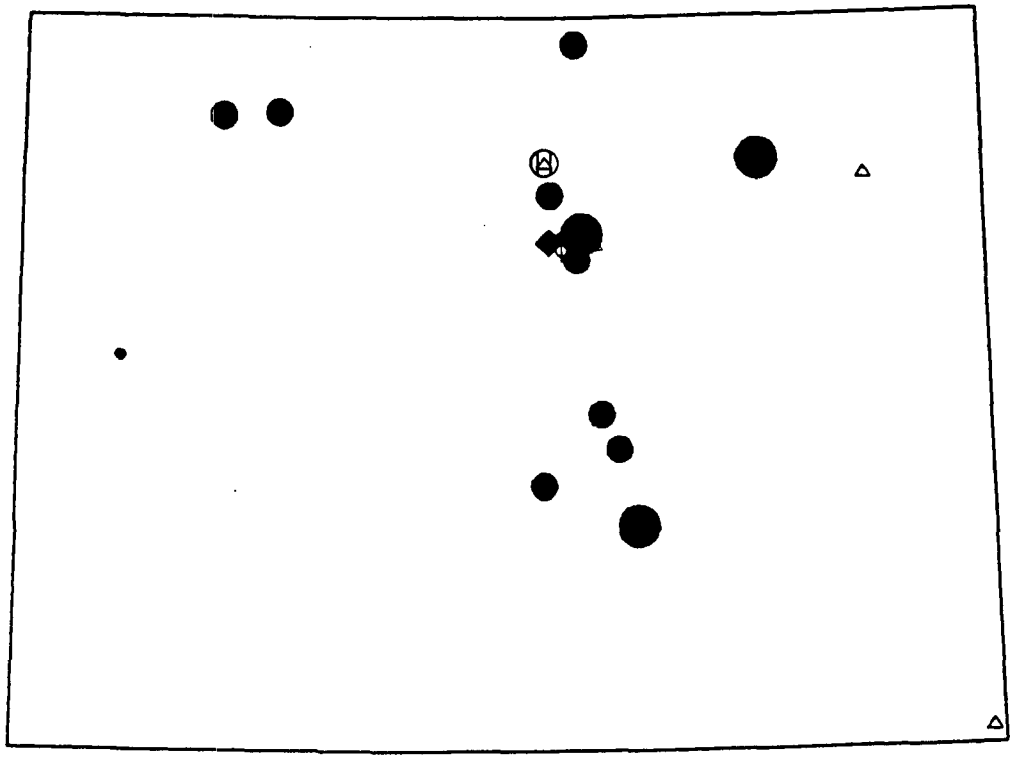
Percent Contribution by Industrial Activities to Total Point Source Emissions in California for 1985





SO_2 (%)	Legend	NO_2 (%)
0.2	Metal Industry	0.2
5.8	Electric Generation	21.8
41.8	Petroleum Industry	12.0
5.3	Chemical Processes	0.8
34.1	Industrial Fuel Use	48.7
9.3	Mineral Products	12.8
3.5	Other	3.7

Location & Magnitude of Major SO2 Point Sources for Colorado



○ Metal Industry
● Electric Generation
△ Petroleum Industry
▲ Chemical Processes
◆ Industrial Fuel Use
Mineral Products
Other

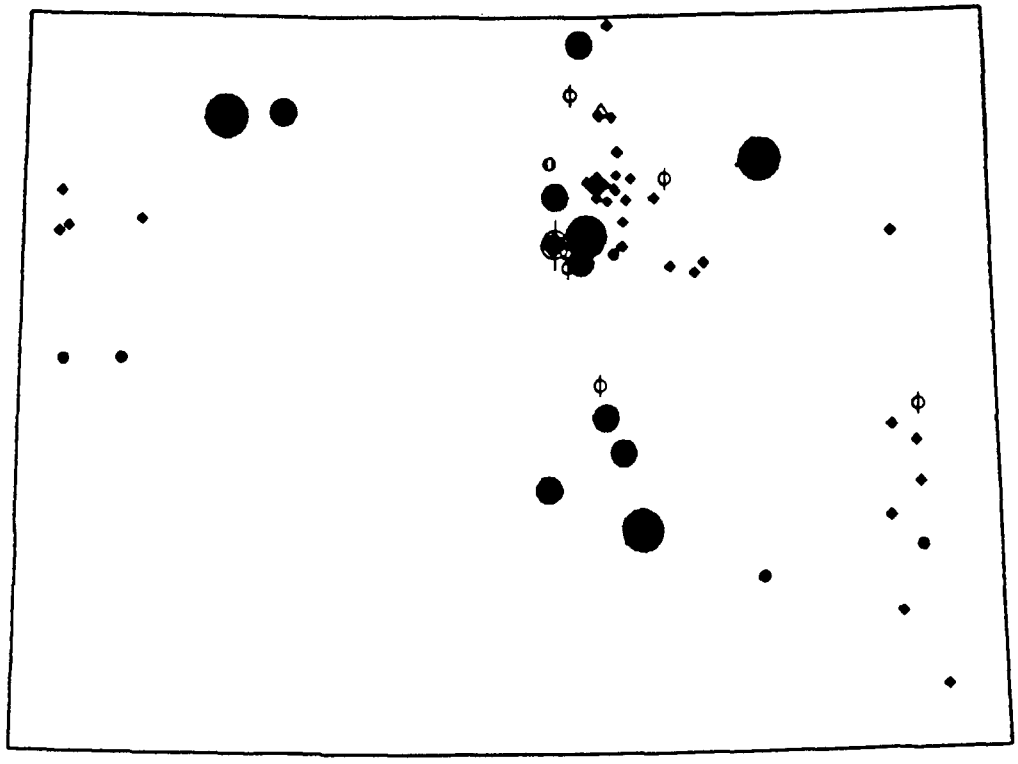
● 100 - 1000
● 1001 - 10000
● 10001 - 100000

Emissions (Mg/year)

50 0 50 100
km

SCALE = 1:3,500,000

Location & Magnitude of Major NO2 Point Sources for Colorado



○ Metal Industry
● Electric Generation
△ Petroleum Industry
▲ Chemical Processes
◆ Industrial Fuel Use
Φ Mineral Products
Φ Other

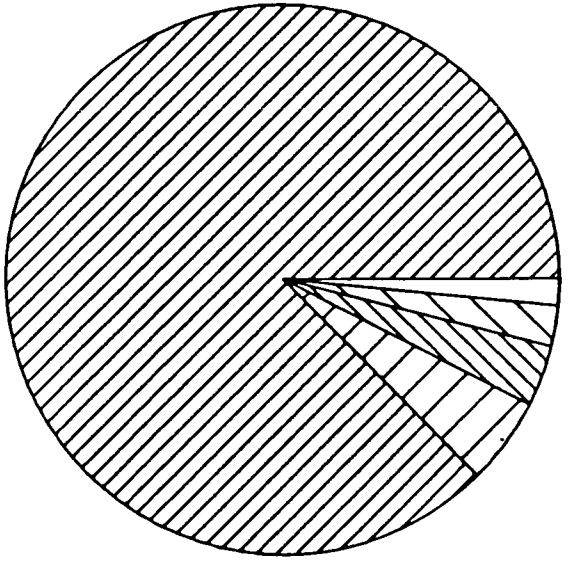
● 100 - 1000
● 1001 - 10000
● 10001 - 100000

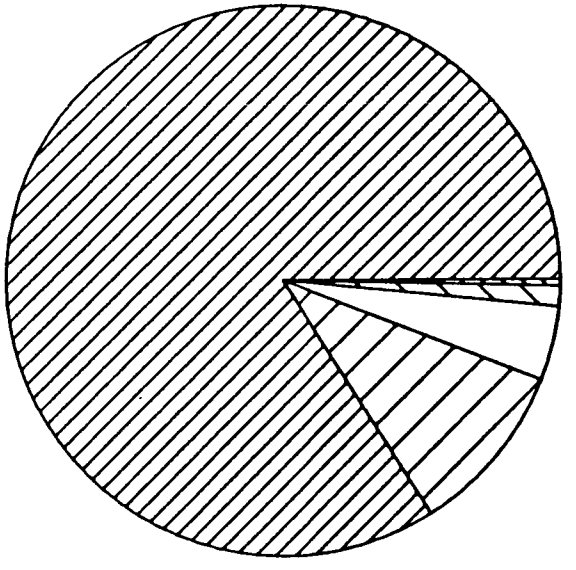
Emissions (Mg/year)

50 0 50 100
km

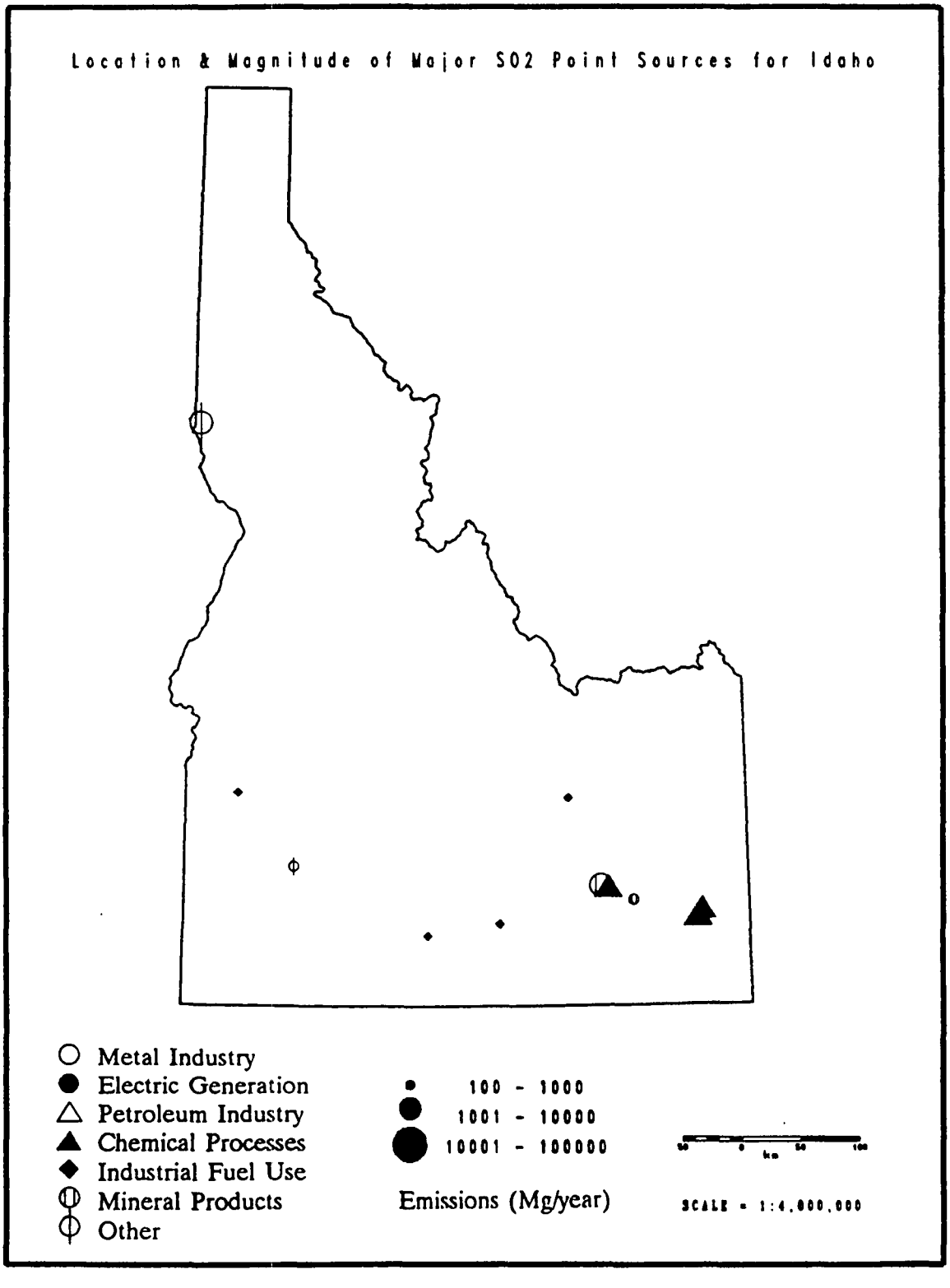
SCALE = 1:3,500,000

Percent Contribution by Industrial Activities to Total Point Source Emissions in Colorado for 1985





SO_2 (%)	Legend	NO_2 (%)
0.0	Metal Industry	0.0
87.3	Electric Generation	83.9
3.6	Petroleum Industry	0.4
0.0	Chemical Processes	0.0
5.1	Industrial Fuel Use	10.1
2.4	Mineral Products	1.2
1.6	Other	4.4


Location & Magnitude of Major SO2 Point Sources for Idaho
Metal Industry
Electric Generation
Petroleum Industry
Chemical Processes
Industrial Fuel Use
Mineral Products
Other
100 - 1000
1001 - 10000
10001 - 100000
Emissions (Mg/year)
SCALE = 1:4,000,000

Location & Magnitude of Major NO2 Point Sources for Idaho

Metal Industry
Electric Generation
Petroleum Industry
Chemical Processes
Industrial Fuel Use
Mineral Products
Other

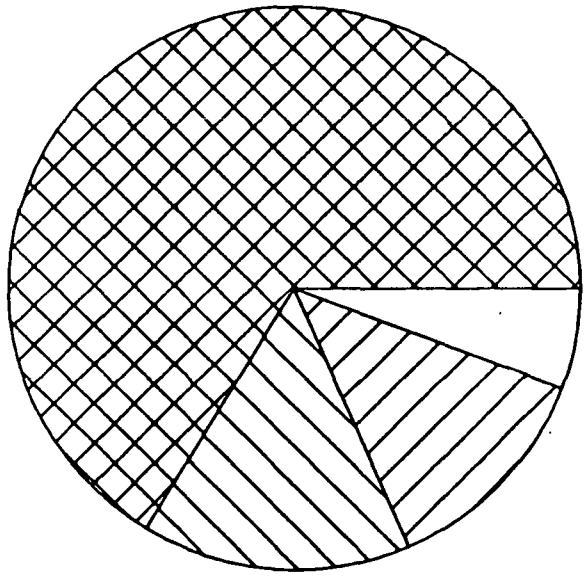
100 - 1000
1001 - 10000
10001 - 100000

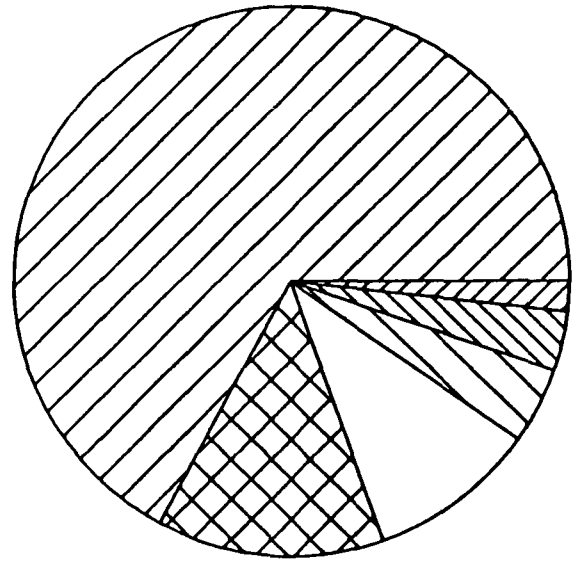
Emissions (Mg/year)

50 0 50 100
km

SCALE = 1:4,000,000

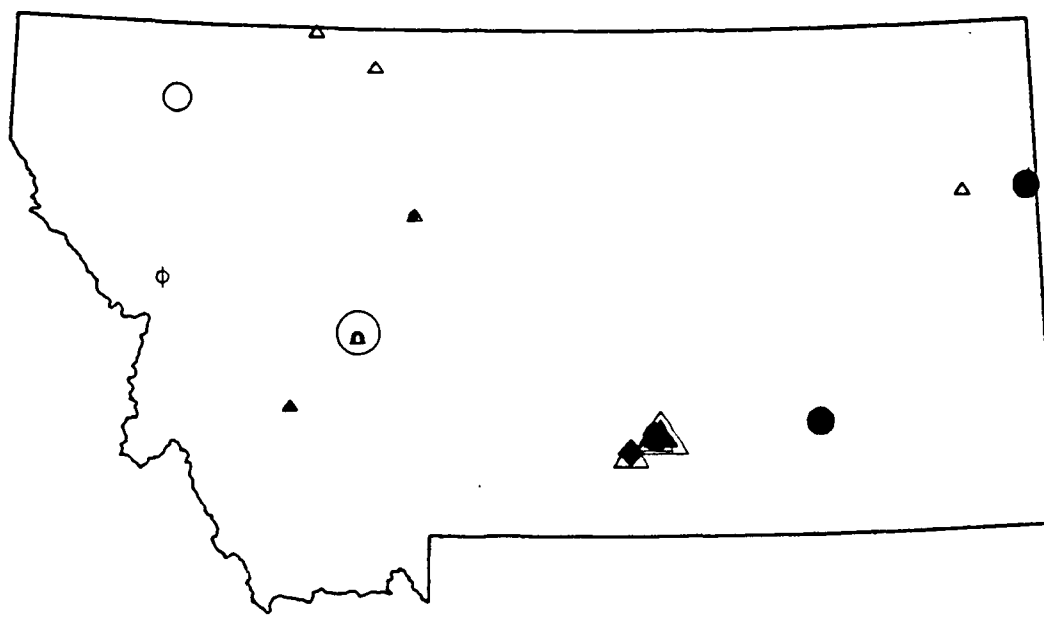
Percent Contribution by Industrial Activities to Total Point Source Emissions in Idaho for 1985





SO_2 (%)	Legend	NO_2 (%)
0.0	Metal Industry	0.0
0.0	Electric Generation	1.8
0.0	Petroleum Industry	3.5
66.3	Chemical Processes	13.3
12.7	Industrial Fuel Use	67.1
15.2	Mineral Products	4.5
5.8	Other	9.8

Location & Magnitude of Major SO2 Point Sources for Montana



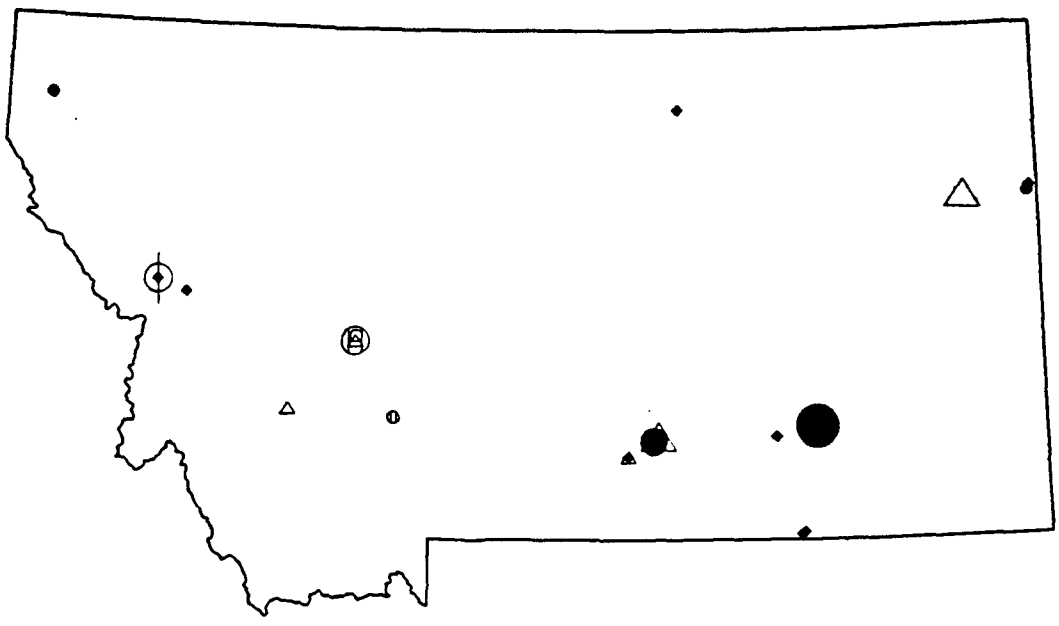
Metal Industry
Electric Generation
Petroleum Industry
Chemical Processes
Industrial Fuel Use
Mineral Products
Other

100 - 1000
1001 - 10000
10001 - 100000

Emissions (Mg/year)

SCALE = 1:5,000,000

Location & Magnitude of Major NO2 Point Sources for Montana



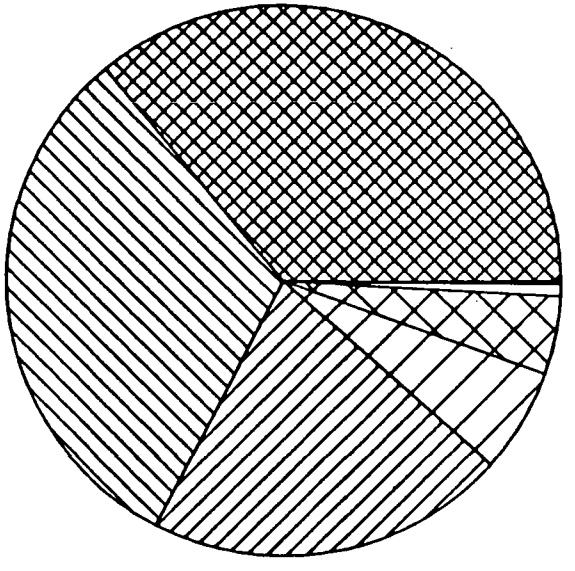
○ Metal Industry
● Electric Generation
△ Petroleum Industry
▲ Chemical Processes
◆ Industrial Fuel Use
Mineral Products
Other

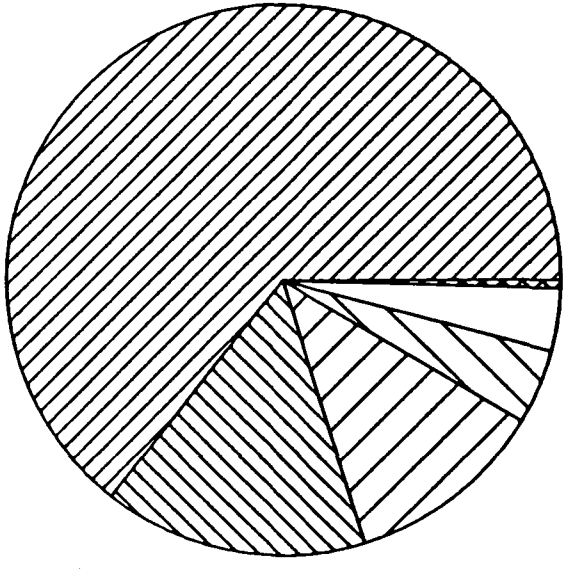
● 100 - 1000
● 1001 - 10000
● 10001 - 100000

Emissions (Mg/year)

SCALE = 1:5,000,000

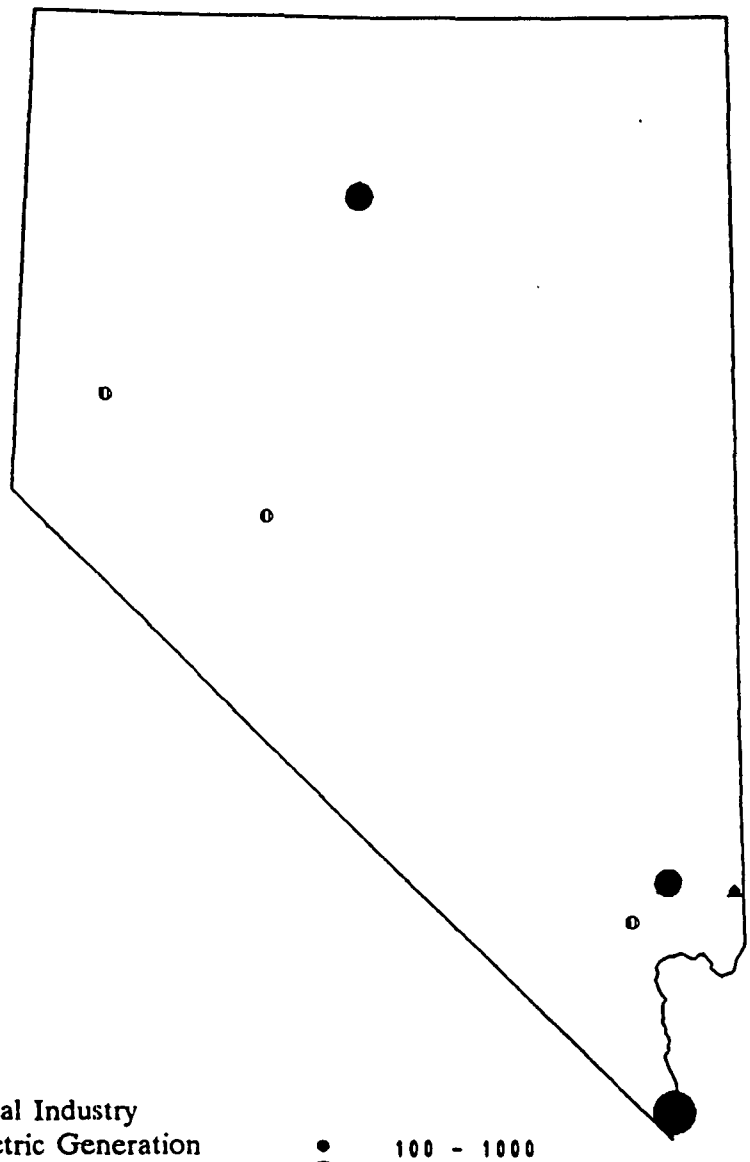
Percent Contribution by Industrial Activities to Total Point Source Emissions in Montana for 1985





SO_2(%)	Legend	NO_2(%)
36.0	Metal Industry	0.5
21.0	Electric Generation	64.3
31.4	Petroleum Industry	15.5
4.6	Chemical Processes	0.0
6.1	Industrial Fuel Use	11.6
0.2	Mineral Products	4.4
0.7	Other	3.7

Location & Magnitude of Major SO2 Point Sources for Nevada



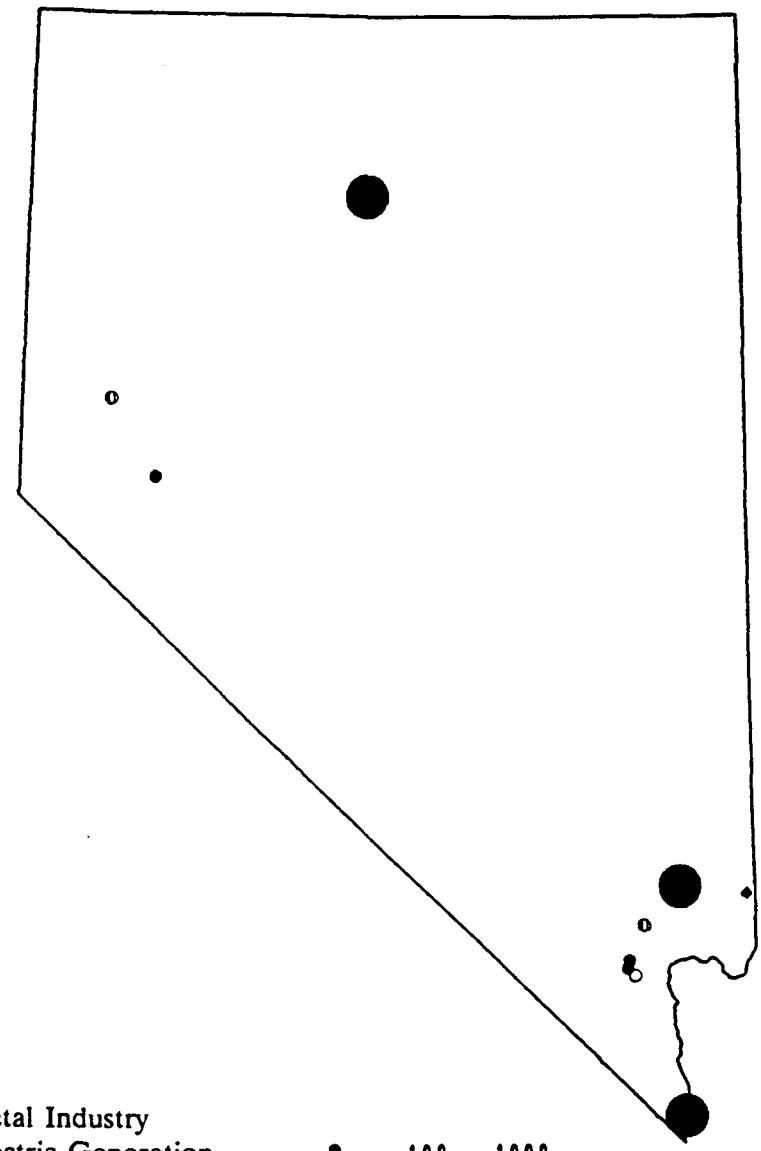
Metal Industry
Electric Generation
Petroleum Industry
Chemical Processes
Industrial Fuel Use
Mineral Products
Other

100 - 1000
1001 - 10000
10001 - 100000

Emissions (Mg/year)

SCALE = 1:4,000,000

Location & Magnitude of Major NO2 Point Sources for Nevada



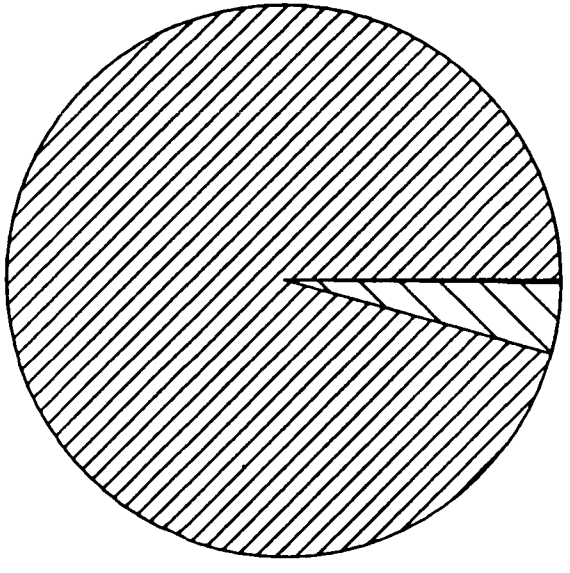
Metal Industry
Electric Generation
Petroleum Industry
Chemical Processes
Industrial Fuel Use
Mineral Products
Other

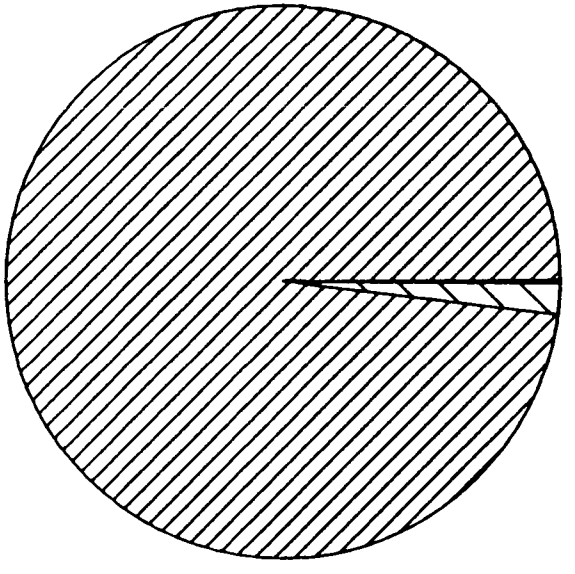
100 - 1000
1001 - 10000
10001 - 100000

Emissions (Mg/year)

SCALE = 1:4,000,000

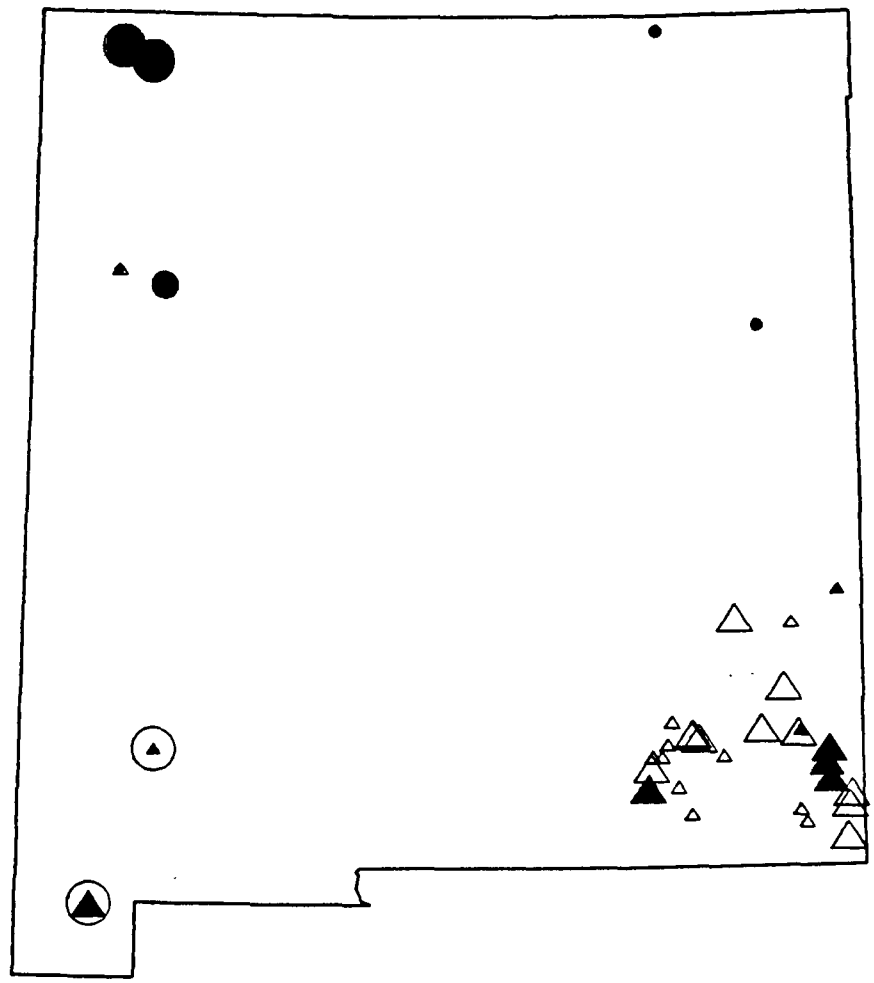
Percent Contribution by Industrial Activities to Total Point Source Emissions in Nevada for 1985





SO_2 (%)	Legend	NO_2 (%)
0.0	Metal Industry	0.2
95.7	Electric Generation	98.0
0.2	Petroleum Industry	0.0
0.0	Chemical Processes	0.0
0.0	Industrial Fuel Use	0.0
4.1	Mineral Products	1.8
0.0	Other	0.0

Location & Magnitude of Major SO2 Point Sources for New Mexico



Metal Industry
Electric Generation
Petroleum Industry
Chemical Processes
Industrial Fuel Use
Mineral Products
Other

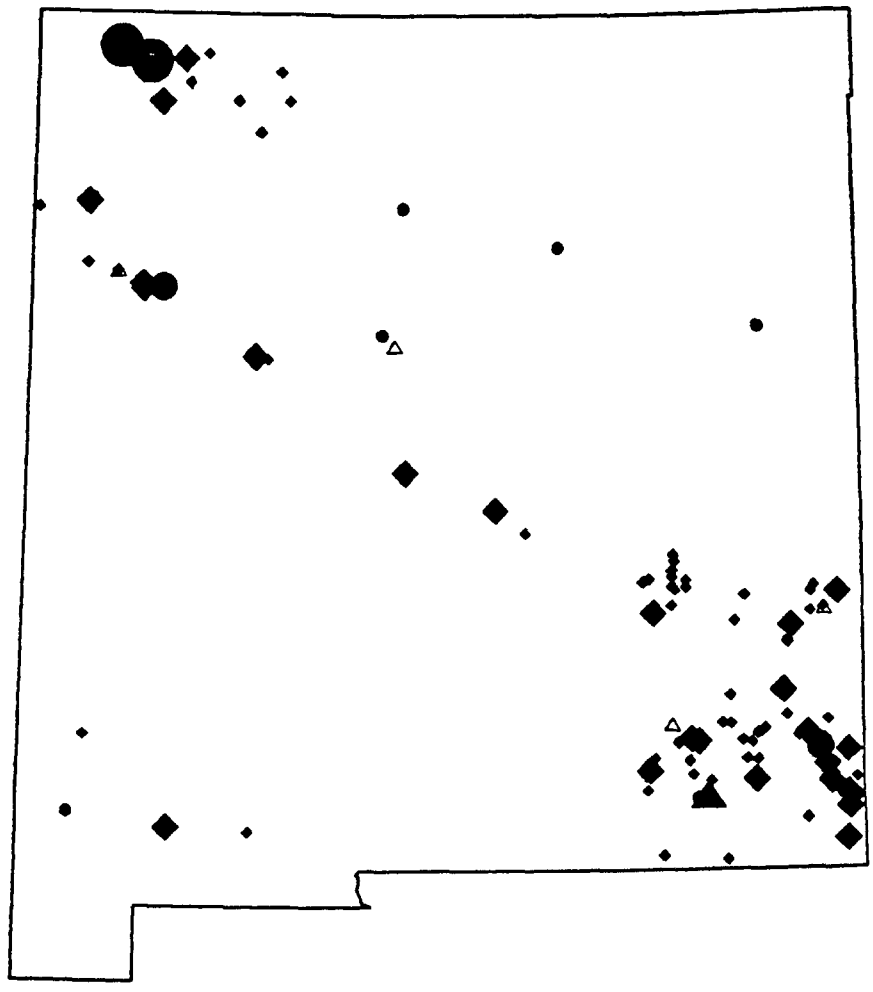
100 - 1000
1001 - 10000
10001 - 100000

Emissions (Mg/year)

km

SCALE = 1:3,750,000

Location & Magnitude of Major NO2 Point Sources for New Mexico



Metal Industry
Electric Generation
Petroleum Industry
Chemical Processes
Industrial Fuel Use
Mineral Products
Other

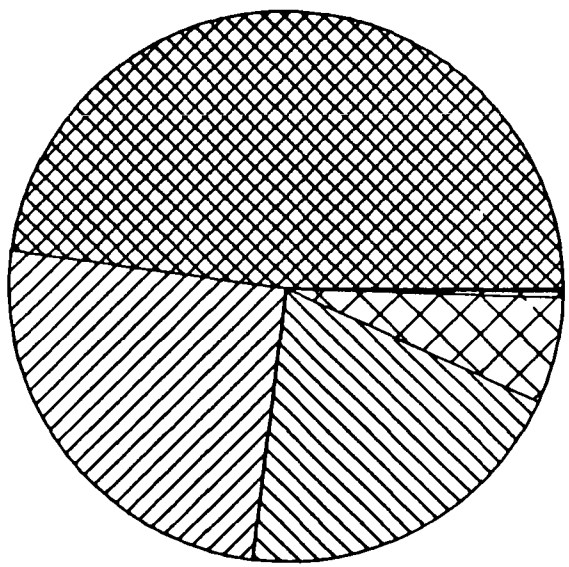
100 - 1000
1001 - 10000
10001 - 100000

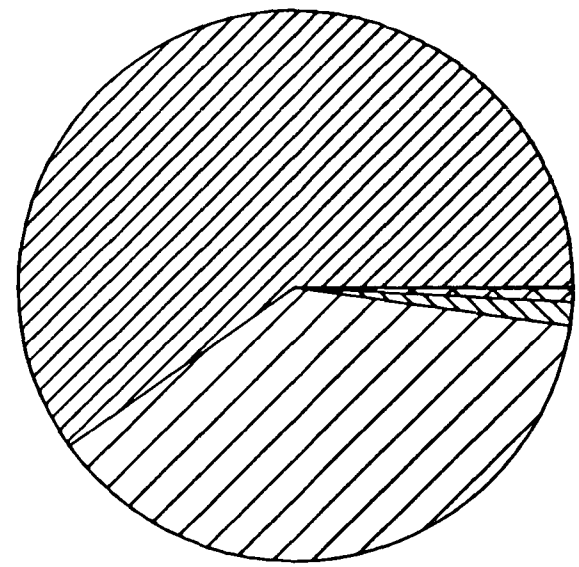
Emissions (Mg/year)

50 0 50 100
km

SCALE = 1:3,750,000

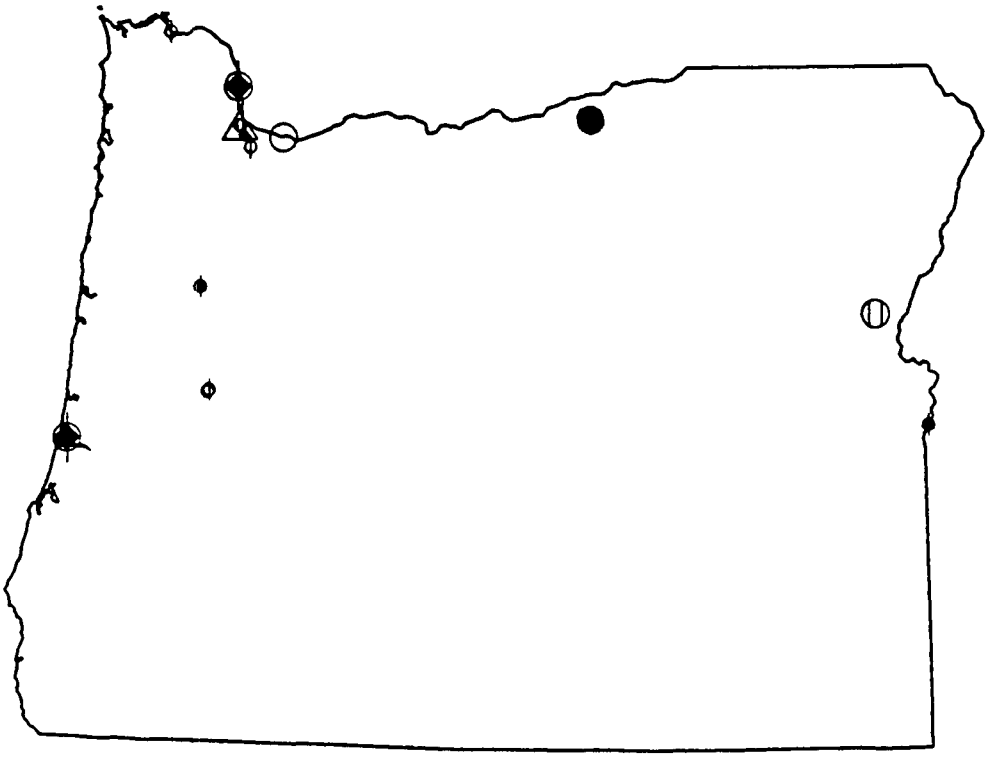
Percent Contribution by Industrial Activities to Total Point Source Emissions in New Mexico for 1985





SO_2 (%)	Legend	NO_2 (%)
43.5	Metal Industry	0.0
32.0	Electric Generation	59.8
18.3	Petroleum Industry	1.4
5.7	Chemical Processes	0.8
0.3	Industrial Fuel Use	37.9
0.1	Mineral Products	0.0
0.1	Other	0.1

Location & Magnitude of Major SO2 Point Sources for Oregon



Metal Industry
Electric Generation
Petroleum Industry
Chemical Processes
Industrial Fuel Use
Mineral Products
Other

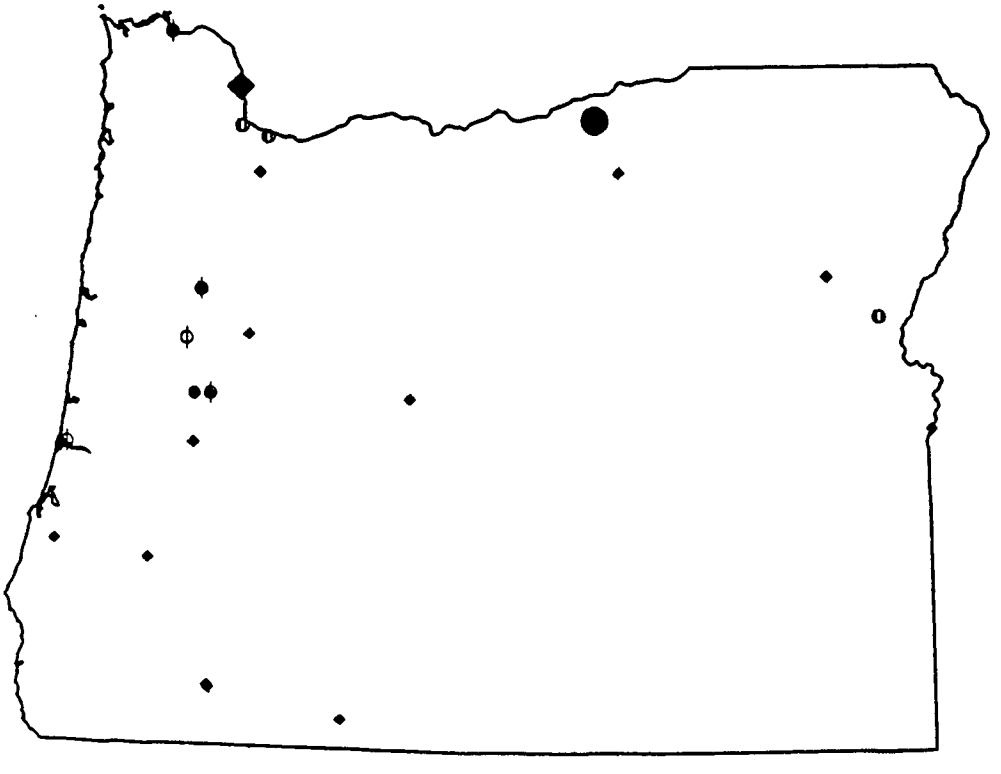
100 - 1000
1001 - 10000
10001 - 100000

Emissions (Mg/year)

50 0 50 100
km

SCALE = 1:3,750,000

Location & Magnitude of Major NO2 Point Sources for Oregon



○ Metal Industry
● Electric Generation
△ Petroleum Industry
▲ Chemical Processes
◆ Industrial Fuel Use
Mineral Products
Other

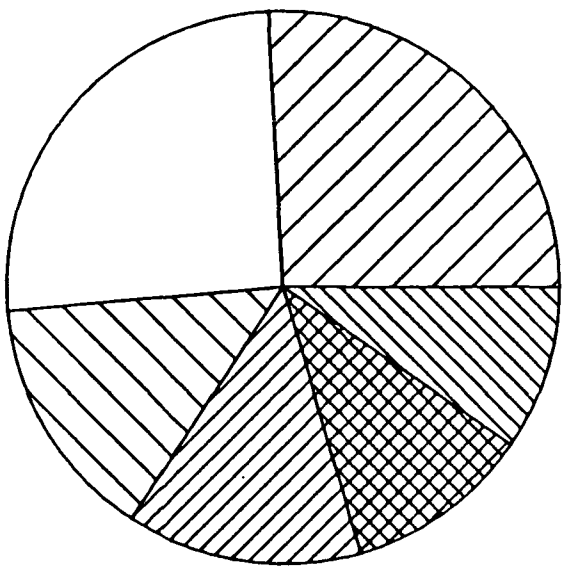
100 - 1000
1001 - 10000
10001 - 100000

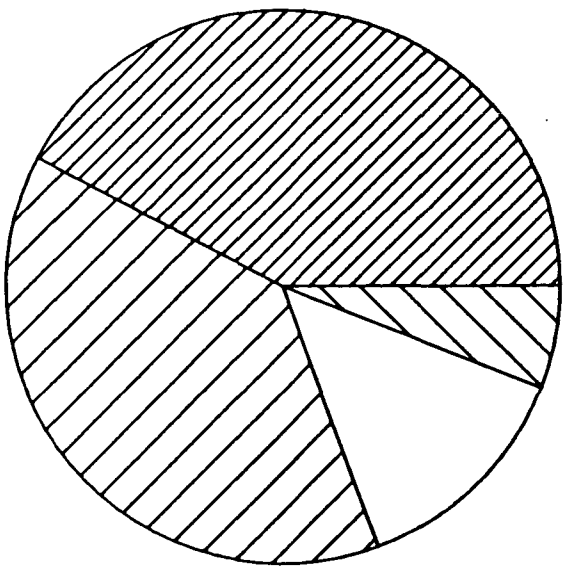
Emissions (Mg/year)

50 0 50 100
km

SCALE = 1:3,750,000

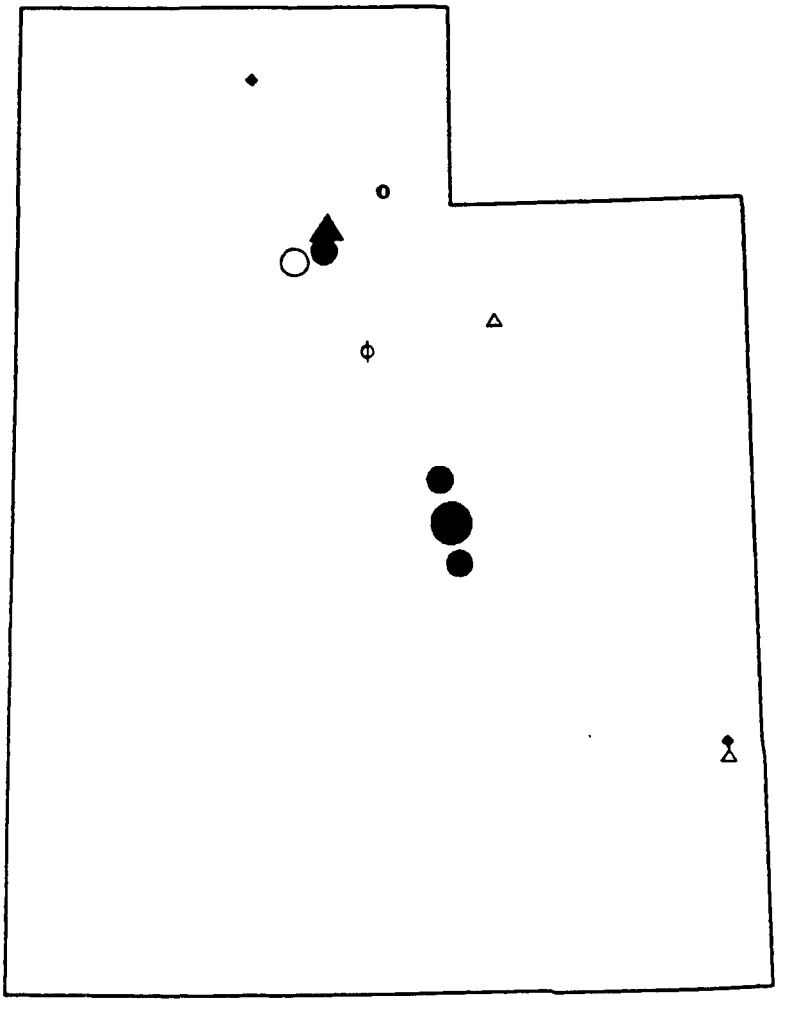
Percent Contribution by Industrial Activities to Total Point Source Emissions in Oregon for 1985





SO_2 (%)	Legend	NO_2 (%)
10.9	Metal Industry	0.0
13.7	Electric Generation	42.3
9.6	Petroleum Industry	0.0
0.0	Chemical Processes	0.0
25.8	Industrial Fuel Use	38.3
14.4	Mineral Products	6.0
25.6	Other	13.4

Location & Magnitude of Major SO2 Point Sources for Utah



○ Metal Industry
● Electric Generation
△ Petroleum Industry
▲ Chemical Processes
◆ Industrial Fuel Use
Mineral Products
Other

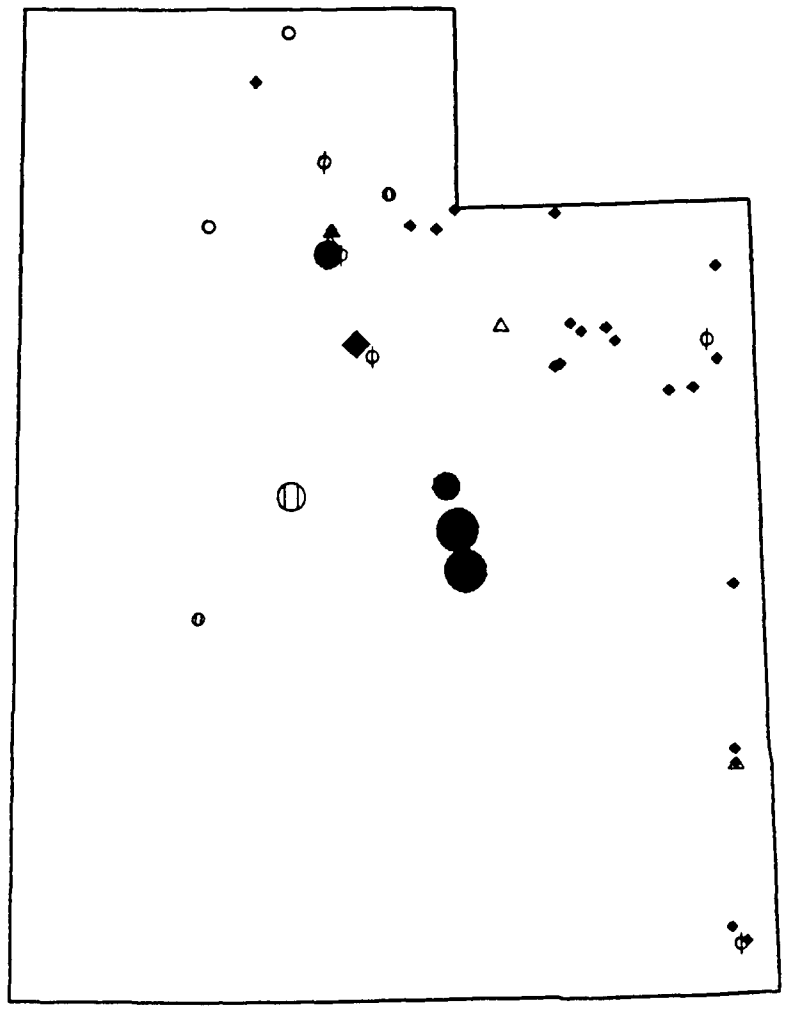
100 - 1000
1001 - 10000
10001 - 100000

Emissions (Mg/year)

50 0 50 100
km

SCALE = 1:3,250,000

Location & Magnitude of Major NO2 Point Sources for Utah



○ Metal Industry
● Electric Generation
△ Petroleum Industry
▲ Chemical Processes
◆ Industrial Fuel Use
Mineral Products
Other

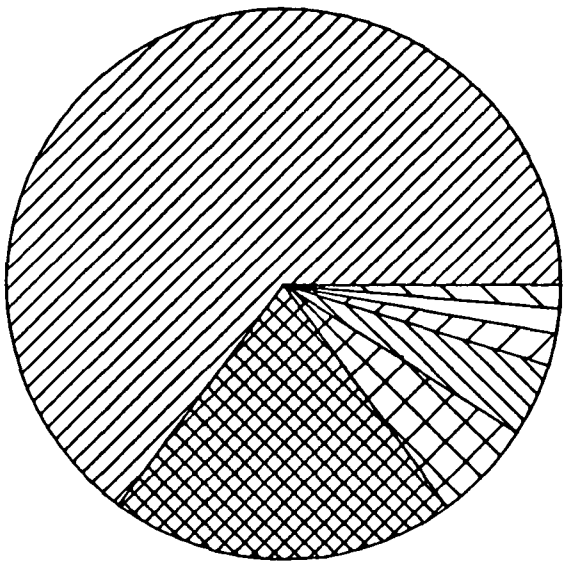
100 - 1000
1001 - 10000
10001 - 100000

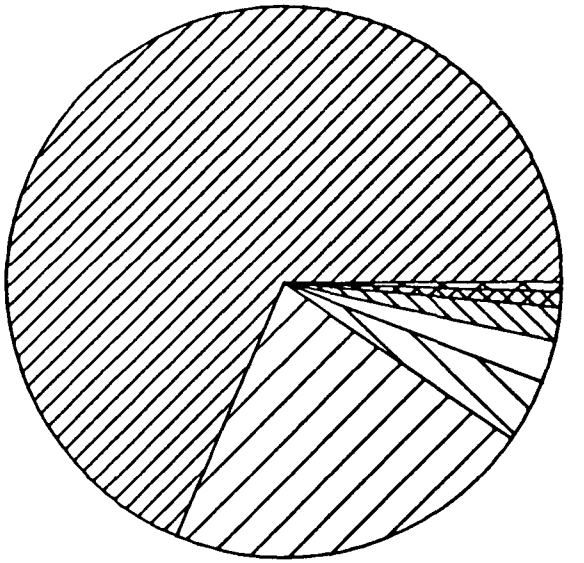
Emissions (Mg/year)

50 0 50 100
km

SCALE = 1:3,250,000

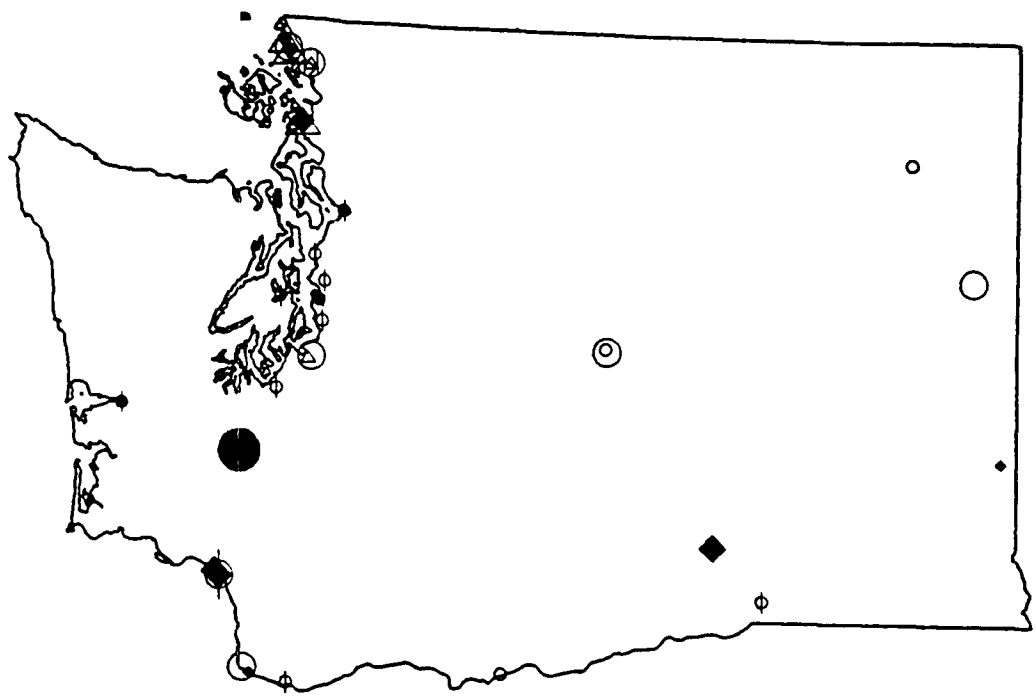
Percent Contribution by Industrial Activities to Total Point Source Emissions in Utah for 1985





SO_2 (%)	Legend	NO_2 (%)
20.2	Metal Industry	0.9
64.8	Electric Generation	68.6
4.3	Petroleum Industry	2.0
5.9	Chemical Processes	0.6
1.9	Industrial Fuel Use	21.7
1.4	Mineral Products	3.7
1.5	Other	2.5

Location & Magnitude of Major SO2 Point Sources for Washington



Metal Industry
Electric Generation
Petroleum Industry
Chemical Processes
Industrial Fuel Use
Mineral Products
Other

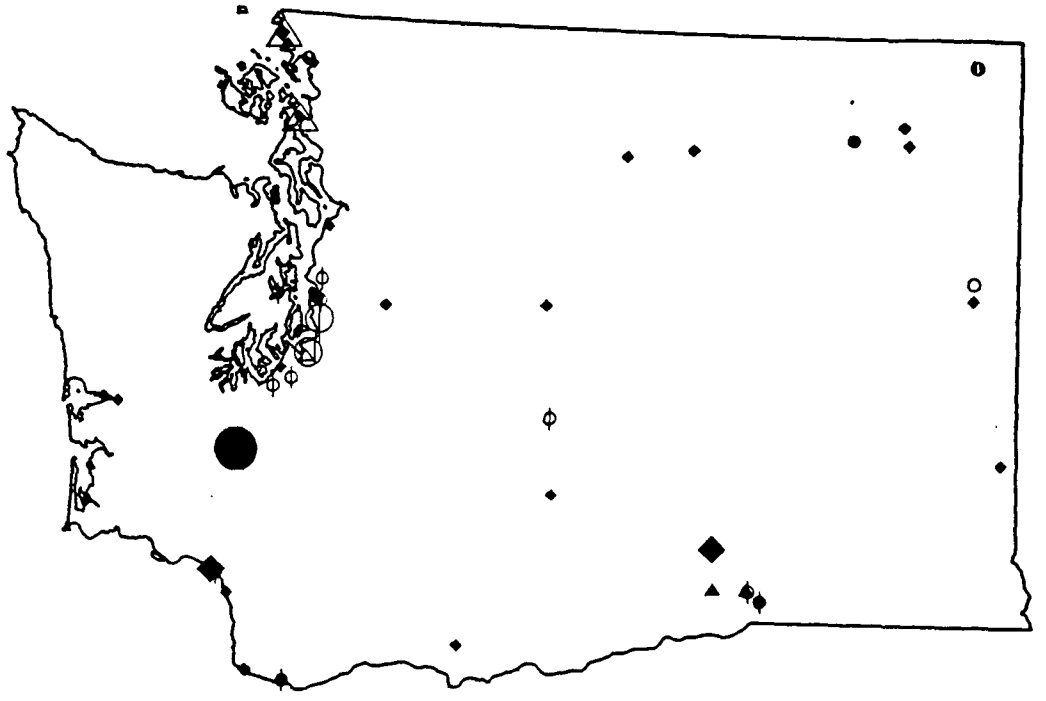
100 - 1000
1001 - 10000
10001 - 100000

Emissions (Mg/year)

50 0 50 100
km

SCALE = 1:3,250,000

Location & Magnitude of Major NO2 Point Sources for Washington



Metal Industry
Electric Generation
Petroleum Industry
Chemical Processes
Industrial Fuel Use
Mineral Products
Other

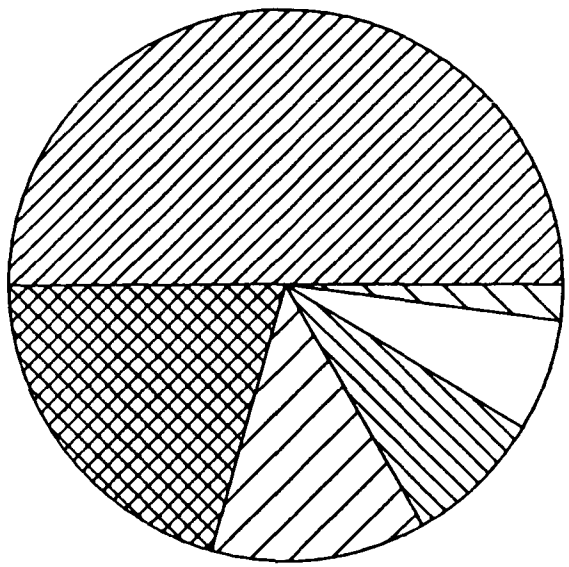
100 - 1000
1001 - 10000
10001 - 100000

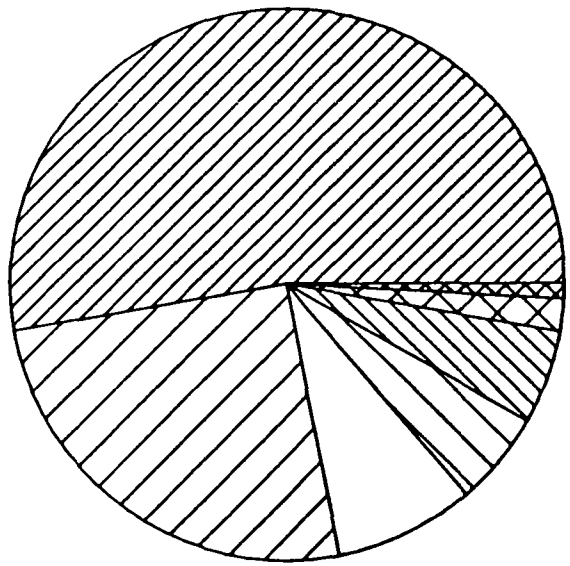
Emissions (Mg/year)

50 0 50 100
km

SCALE = 1:3,250,000

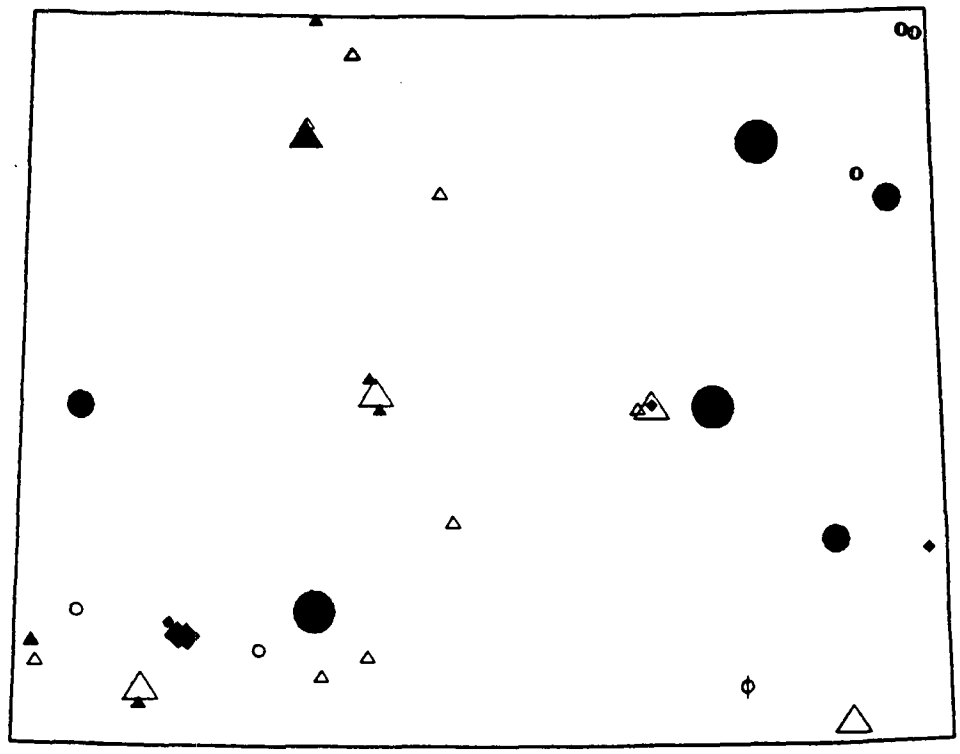
Percent Contribution by Industrial Activities to Total Point Source Emissions in Washington for 1985





SO_2 (%)	Legend	NO_2 (%)
20.6	Metal Industry	0.9
50.1	Electric Generation	52.7
8.1	Petroleum Industry	5.5
0.0	Chemical Processes	1.9
12.5	Industrial Fuel Use	25.4
2.1	Mineral Products	5.5
6.6	Other	8.1

Location & Magnitude of Major SO2 Point Sources for Wyoming



○ Metal Industry
● Electric Generation
△ Petroleum Industry
▲ Chemical Processes
◆ Industrial Fuel Use
Φ Mineral Products
Φ Other

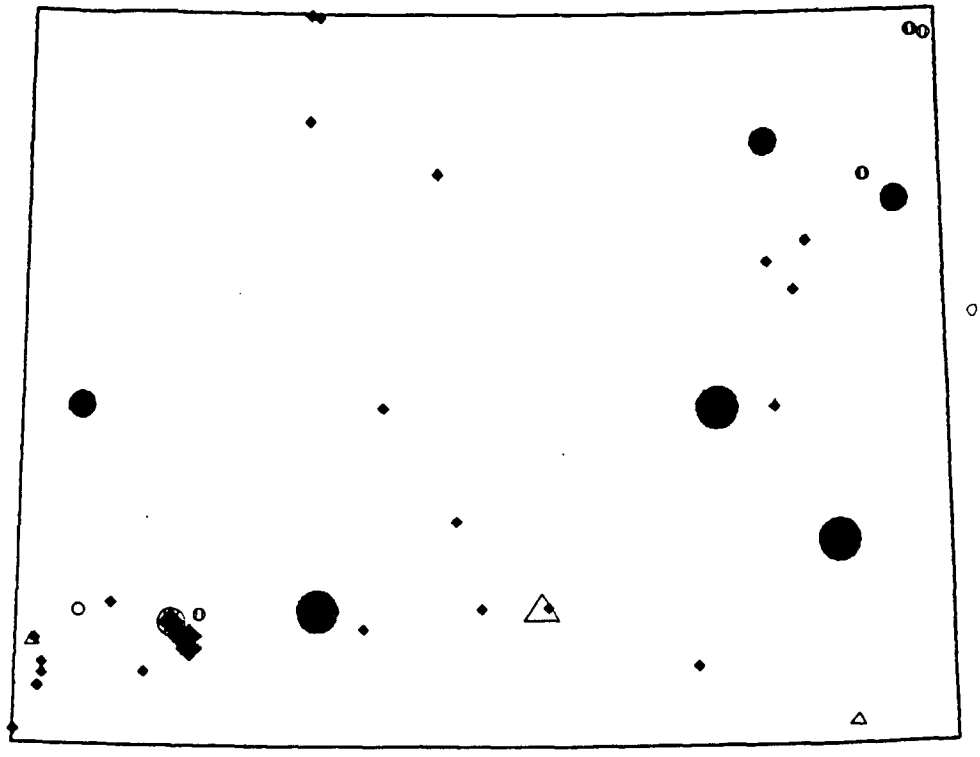
● 100 - 1000
● 1001 - 10000
● 10001 - 100000

Emissions (Mg/year)

50 0 50 100
km

SCALE = 1:3,500,000

Location & Magnitude of Major NO2 Point Sources for Wyoming



Metal Industry
Electric Generation
Petroleum Industry
Chemical Processes
Industrial Fuel Use
Mineral Products
Other

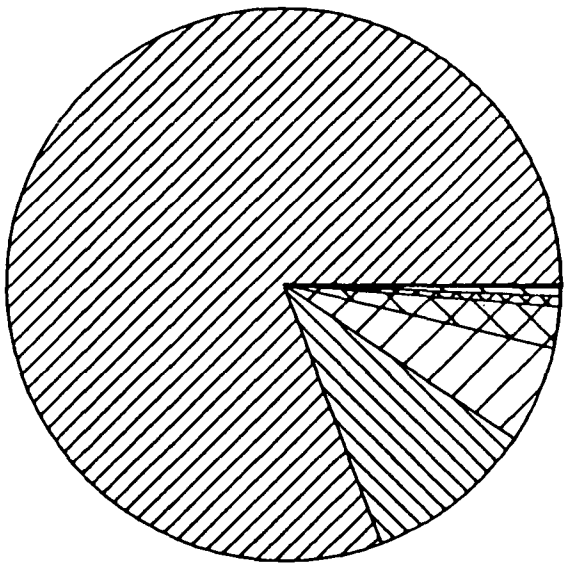
100 - 1000
1001 - 10000
10001 - 100000

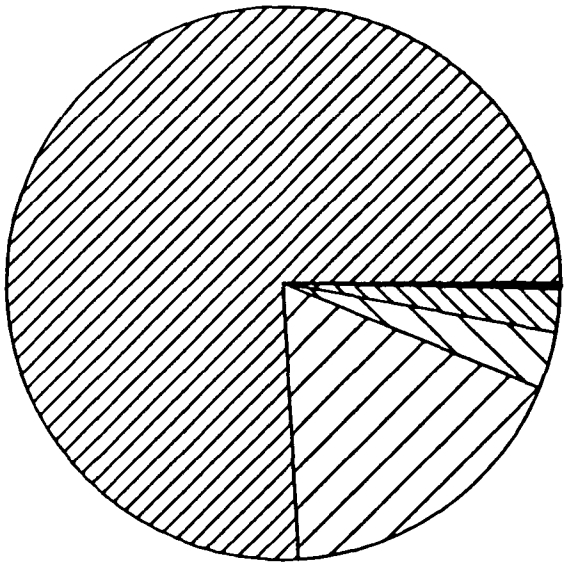
Emissions (Mg/year)

50 0 50 100
km

SCALE = 1:3,500,000

Percent Contribution by Industrial Activities to Total Point Source Emissions in Wyoming for 1985





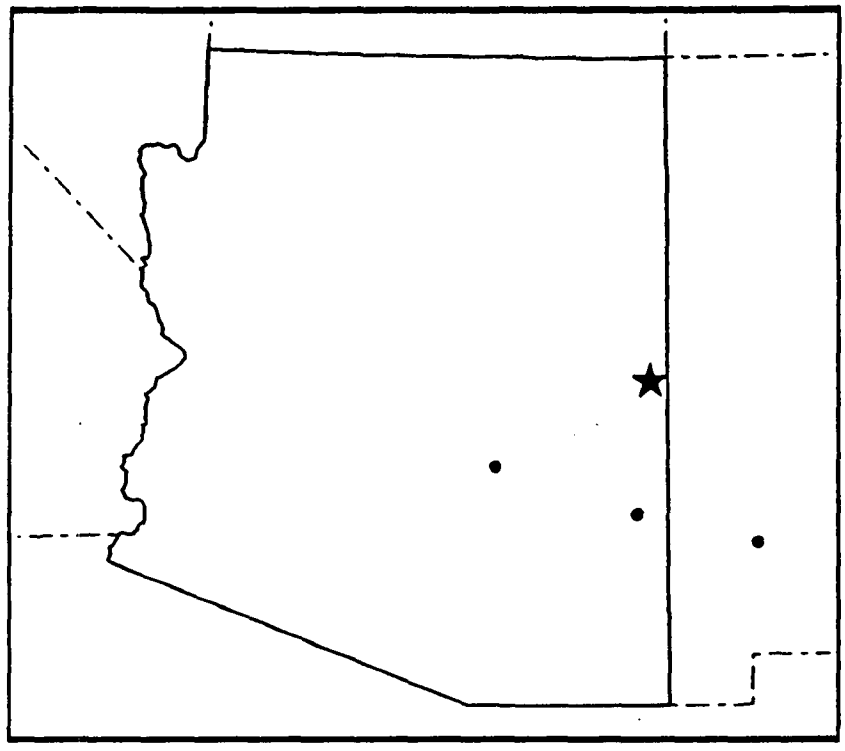
SO_2 (%)	Legend	NO_2 (%)
0.6	Metal Industry	0.2
80.7	Electric Generation	75.9
9.9	Petroleum Industry	2.5
2.4	Chemical Processes	0.0
5.7	Industrial Fuel Use	17.9
0.5	Mineral Products	3.3
0.2	Other	0.2

APPENDIX 2

SULPHUR DIOXIDE INFORMATION BY STATE

APACHE COUNTY ARIZONA

BIOGRAPHIC INFORMATION



Latitude	-	34.17° N
Longitude	-	109.23° W
Elevation (m)	-	2308
Landuse	-	Remote
City Population	-	Not in City
Basin Population	-	645,599
Start Summary	-	January, 1982
End Summary	-	March, 1986
Source of Data	-	SAROAD (030040008J02)

APACHE COUNTY

BASIC STATISTICS

A. BY YEAR.

Year	% Data Capt[1]	% Occurrence of hourly concentrations for given ranges (ppb)[2] <10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	≥80
1980	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-
1982	98	99.8	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1983	98	99.6	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0
1984	46	99.6	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0
1985	70	99.9	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1986	23	99.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.3
1987	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-
All Years	95	99.7	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.1

B. GROWING SEASON (May through October).

Year	% Data Capt[1]	% Occurrence of hourly concentrations for given ranges (ppb)[2] <10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	≥80
1980	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-
1982	98	99.8	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1983	98	99.8	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1984	26	99.9	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1985	78	99.9	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1986	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-
All Years	95	99.8	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0

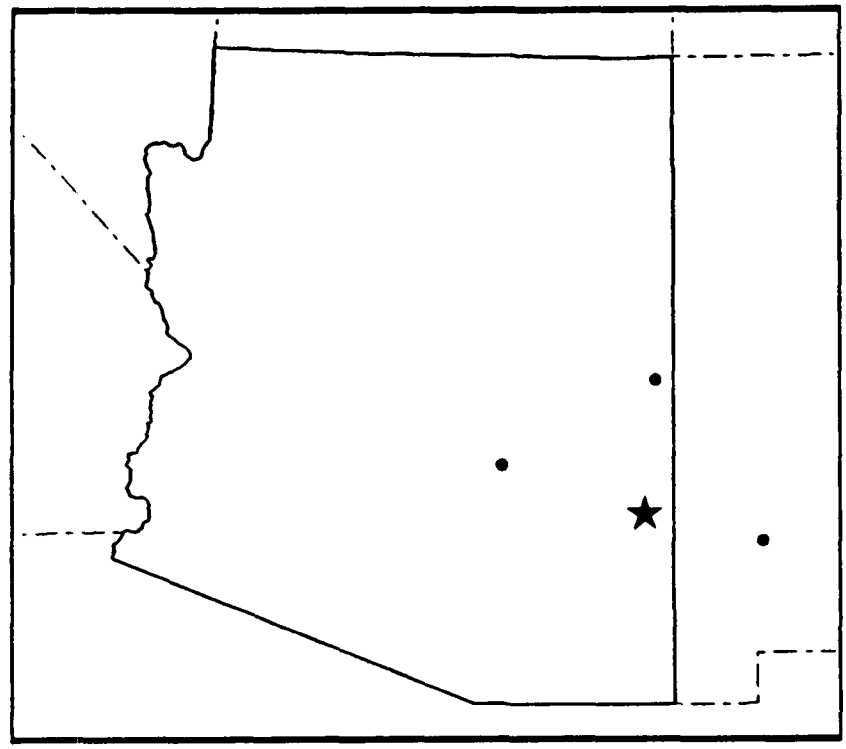
C. BY MONTH[3].

Month	% Data Capt[1]	% Occurrence of hourly concentrations for given ranges (ppb)[2] <10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	≥80
Jan	93	99.4	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Feb	96	99.8	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Mar	95	99.8	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Apr	98	99.6	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0
May	97	99.9	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Jun	88	99.9	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Jul	97	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Aug	95	99.9	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sep	98	99.9	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Oct	99	99.4	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nov	99	99.2	0.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Dec	99	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100.
2. % Occurrence = % of valid hours with SO_2 concentrations in a given range.
3. Statistics for monthly composites over the period of record.

GREENLEE COUNTY ARIZONA

BIOGRAPHIC INFORMATION



Latitude	-	33.01° N
Longitude	-	109.36° W
Elevation (m)	-	1488
Landuse	-	Rural/Industrial
City Population	-	Not in City
Basin Population	-	167,792
Start Summary	-	January, 1980
End Summary	-	December, 1984
Source of Data	-	SAROAD (030380001F02)

GREENLEE COUNTY

BASIC STATISTICS

A. BY YEAR.

Year	% Data Capt[1]	% Occurrence of hourly concentrations for given ranges (ppb)[2] <10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	≥80
1980	90	79.5	0.0	3.8	0.0	0.0	2.8	0.0	0.1	13.8
1981	99	62.3	3.4	9.8	1.2	0.8	3.7	0.7	0.5	17.6
1982	94	83.0	4.5	2.8	1.2	1.4	0.9	0.8	0.6	4.8
1983	96	63.6	7.3	3.5	1.4	2.3	4.5	1.1	1.8	14.5
1984	90	61.1	11.1	5.8	1.5	3.4	1.9	0.9	1.6	12.8
1985	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-
All Years	95	69.8	5.2	5.2	1.1	1.6	2.8	0.7	0.9	12.7

B. GROWING SEASON (May through October).

Year	% Data Capt[1]	% Occurrence of hourly concentrations for given ranges (ppb)[2] <10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	≥80
1980	87	87.8	0.0	3.0	0.0	0.0	2.3	0.0	0.0	7.0
1981	99	69.8	2.7	7.3	0.6	0.5	3.0	0.4	0.3	15.4
1982	98	97.8	0.5	0.3	0.1	0.3	0.3	0.1	0.1	0.6
1983	97	67.9	7.8	3.6	1.6	1.8	1.9	0.7	1.3	13.2
1984	98	64.6	8.6	6.7	1.2	3.7	1.3	0.7	1.7	11.5
1985	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-
All Years	96	77.4	4.0	4.2	0.7	1.3	1.7	0.4	0.7	9.6

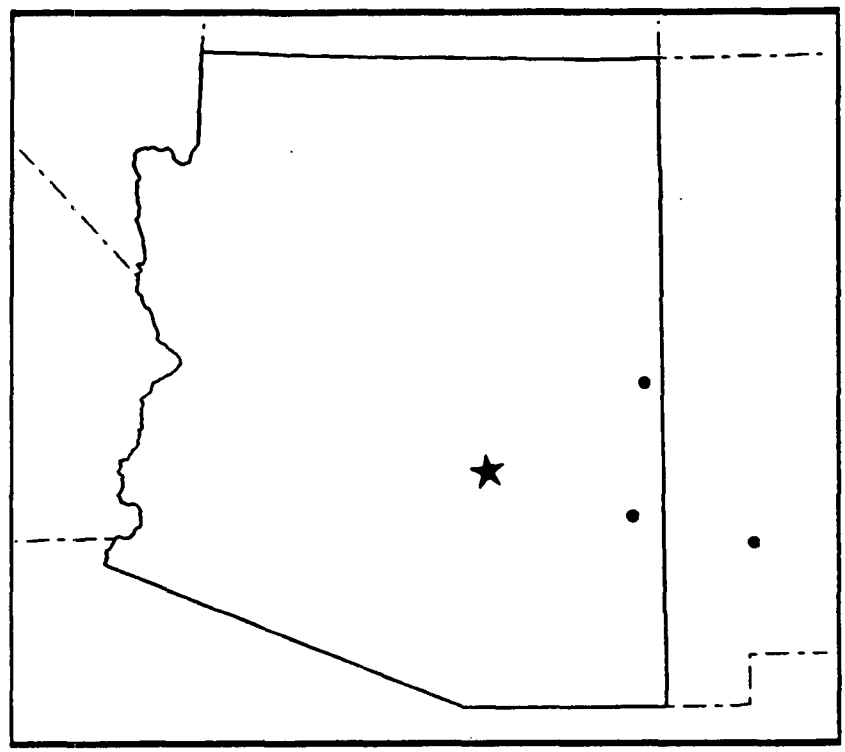
C. BY MONTH[3].

Month	% Data Capt[1]	% Occurrence of hourly concentrations for given ranges (ppb)[2] <10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	≥80
Jan	98	55.9	6.1	7.1	2.3	2.1	4.0	0.8	1.3	20.3
Feb	97	62.7	5.6	10.8	0.7	1.7	2.6	0.8	0.5	14.7
Mar	95	79.7	3.1	4.5	0.6	1.0	1.4	0.7	0.4	8.8
Apr	96	82.3	1.7	3.6	0.1	0.7	1.5	0.2	0.1	9.8
May	95	84.5	2.1	2.2	0.3	0.6	1.3	0.4	0.5	8.1
Jun	97	77.0	3.9	4.2	0.5	0.5	2.4	0.5	0.5	10.5
Jul	92	76.4	3.5	5.5	0.8	1.5	1.6	0.3	0.8	9.6
Aug	96	80.1	3.0	5.0	0.3	1.9	1.7	0.1	0.7	7.2
Sep	97	78.0	4.1	3.5	1.0	1.5	0.9	0.5	1.0	9.5
Oct	98	68.2	7.2	4.8	1.5	1.5	2.5	0.8	0.7	12.7
Nov	83	46.2	12.7	6.5	2.4	3.0	3.4	1.5	1.8	22.5
Dec	99	46.3	10.0	5.1	2.5	2.7	9.7	1.9	2.6	19.3

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100.
2. % Occurrence = % of valid hours with SO_2 concentrations in a given range.
3. Statistics for monthly composites over the period of record.

MIAMI ARIZONA

BIOGRAPHIC INFORMATION



Latitude	-	33.39° N
Longitude	-	110.87° W
Elevation (m)	-	1262
Landuse	-	Rural/Agriculture
City Population	-	2,716
Basin Population	-	2,189,162
Start Summary	-	January, 1980
End Summary	-	December, 1986
Source of Data	-	SAROAD (030480902F02)

MIAMI

BASIC STATISTICS

A. BY YEAR.

Year	% Data Capt[1]	% Occurrence of hourly concentrations for given ranges (ppb)[2] <10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	≥80
1980	98	91.8	0.0	2.2	0.0	0.0	1.4	0.0	0.4	4.2
1981	99	73.5	6.8	6.2	0.6	0.5	2.6	0.4	0.3	9.3
1982	93	70.0	14.5	8.5	0.9	0.6	0.7	0.4	0.4	4.0
1983	85	73.2	18.3	2.6	0.9	1.0	0.7	0.5	0.4	2.5
1984	85	74.8	10.1	4.2	0.9	1.5	1.1	0.7	0.9	5.9
1985	98	79.7	6.8	3.0	1.8	1.0	1.2	0.8	0.8	5.1
1986	91	82.9	7.5	3.8	2.1	0.7	0.8	0.5	0.4	1.3
1987	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-
All Years	94	78.1	8.9	4.4	1.0	0.7	1.2	0.5	0.5	4.7

B. GROWING SEASON (May through October).

Year	% Data Capt[1]	% Occurrence of hourly concentrations for given ranges (ppb)[2] <10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	≥80
1980	96	95.9	0.0	1.3	0.0	0.0	0.6	0.0	0.1	2.1
1981	99	77.3	6.4	5.4	0.7	0.5	2.0	0.3	0.2	7.0
1982	88	65.4	14.9	15.6	1.0	0.9	0.6	0.2	0.3	1.2
1983	99	80.8	13.6	1.7	0.5	0.7	0.5	0.2	0.3	1.7
1984	89	77.7	9.3	4.0	1.0	1.1	1.2	0.7	0.6	4.3
1985	99	81.4	6.0	2.6	1.6	1.0	1.3	0.7	0.7	4.7
1986	90	86.2	7.9	2.0	1.6	0.5	0.3	0.4	0.3	0.9
1987	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-
All Years	94	80.8	8.2	4.5	0.9	0.7	0.9	0.4	0.3	3.2

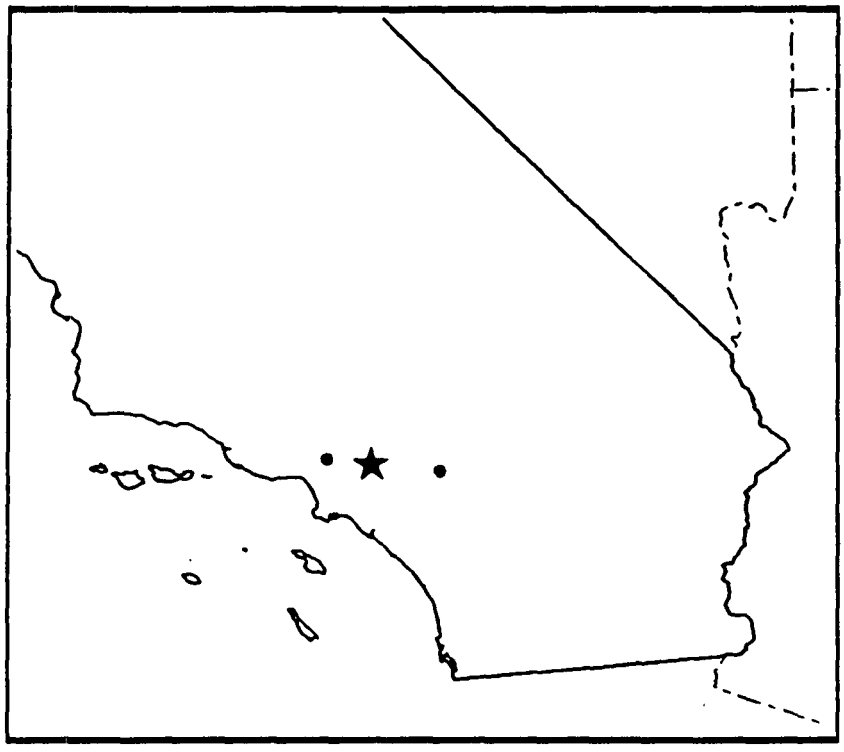
C. BY MONTH[3].

Month	% Data Capt[1]	% Occurrence of hourly concentrations for given ranges (ppb)[2] <10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	≥80
Jan	99	74.1	10.3	3.8	1.3	1.0	1.5	0.6	0.8	6.6
Feb	100	71.0	11.0	4.3	1.2	1.0	1.7	0.7	1.0	8.2
Mar	97	78.4	8.1	3.9	0.9	0.7	1.6	0.6	0.4	5.3
Apr	98	87.3	3.4	2.9	0.6	0.4	1.2	0.3	0.6	3.3
May	94	86.7	4.7	2.4	0.6	0.6	1.1	0.2	0.2	3.5
Jun	99	85.8	4.6	2.5	0.8	0.6	1.0	0.4	0.4	3.9
Jul	94	79.2	3.7	10.3	1.0	0.9	1.3	0.2	0.5	2.9
Aug	88	75.3	13.9	4.6	0.9	0.4	0.9	0.4	0.2	3.3
Sep	91	76.6	14.5	4.0	0.8	0.6	0.6	0.4	0.3	2.1
Oct	99	80.8	8.6	3.4	1.3	0.8	0.8	0.5	0.5	3.3
Nov	87	72.1	13.3	4.3	1.1	0.7	1.7	0.3	0.5	5.9
Dec	82	67.7	12.3	6.2	1.9	1.1	1.5	0.7	0.7	7.9

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100.
2. % Occurrence = % of valid hours with SO_2 concentrations in a given range.
3. Statistics for monthly composites over the period of record.

AZUSA CALIFORNIA

BIOGRAPHIC INFORMATION



Latitude	-	34.14° N
Longitude	-	117.92° W
Elevation (m)	-	185
Landuse	-	Suburban/Industrial
City Population	-	29,380
Basin Population	-	11,201,922
Start Summary	-	January, 1980
End Summary	-	December, 1986
Source of Data	-	SAROAD (050500002I01)

AZUSA

BASIC STATISTICS

A. BY YEAR.

Year	% Data Capt[1]	% Occurrence of hourly concentrations for given ranges (ppb)[2] <10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	≥80
1980	96	52.7	37.0	8.1	1.9	0.3	0.1	0.0	0.0	0.0
1981	95	70.4	27.0	2.4	0.1	0.1	0.0	0.0	0.0	0.0
1982	94	70.6	27.8	1.5	0.1	0.1	0.0	0.1	0.0	0.0
1983	96	79.4	20.0	0.5	0.1	0.0	0.0	0.0	0.0	0.0
1984	95	77.9	21.3	0.8	0.1	0.1	0.0	0.0	0.0	0.0
1985	95	71.1	28.4	0.5	0.0	0.0	0.0	0.0	0.0	0.0
1986	63	72.6	26.8	0.5	0.0	0.0	0.0	0.0	0.0	0.1
1987	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-
All Years	95	70.6	26.9	2.1	0.3	0.1	0.0	0.0	0.0	0.0

B. GROWING SEASON (May through October).

Year	% Data Capt[1]	% Occurrence of hourly concentrations for given ranges (ppb)[2] <10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	≥80
1980	99	43.1	41.7	11.5	3.1	0.6	0.0	0.0	0.0	0.0
1981	93	65.3	31.7	2.8	0.2	0.1	0.0	0.0	0.0	0.0
1982	94	64.3	34.1	1.5	0.1	0.1	0.0	0.1	0.0	0.0
1983	97	73.2	26.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0
1984	95	75.2	24.2	0.6	0.1	0.0	0.0	0.0	0.0	0.0
1985	95	73.2	26.5	0.3	0.0	0.0	0.0	0.0	0.0	0.0
1986	32	64.5	34.6	0.8	0.0	0.0	0.0	0.0	0.0	0.1
1987	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-
All Years	96	65.5	31.0	2.8	0.5	0.1	0.0	0.0	0.0	0.0

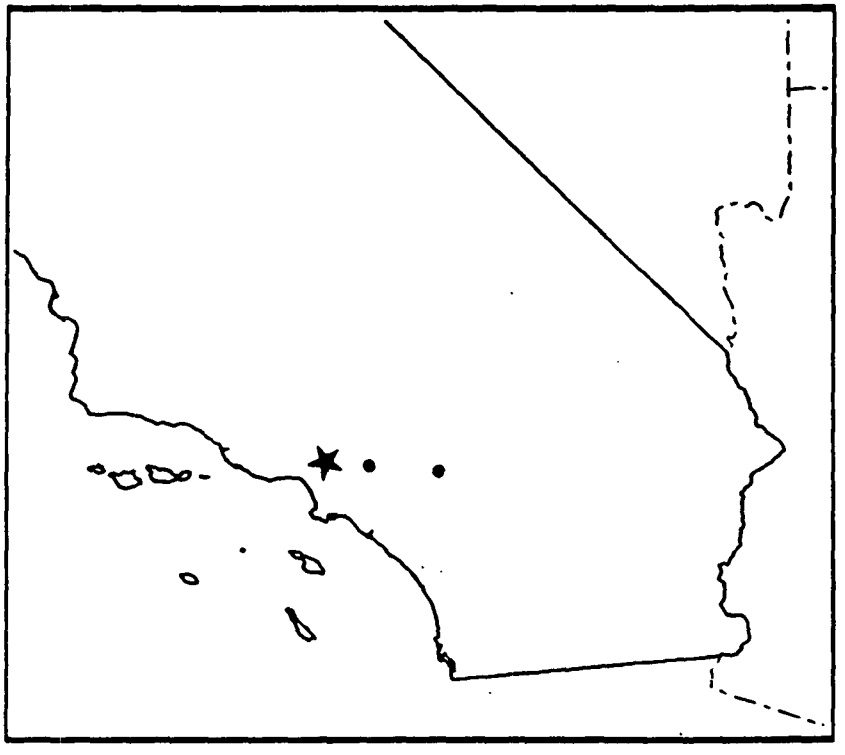
C. BY MONTH[3].

Month	% Data Capt[1]	% Occurrence of hourly concentrations for given ranges (ppb)[2] <10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	≥80
Jan	89	71.5	27.3	1.2	0.1	0.0	0.0	0.0	0.0	0.0
Feb	97	76.7	22.3	0.9	0.1	0.0	0.0	0.0	0.0	0.1
Mar	96	84.0	15.3	0.7	0.0	0.1	0.0	0.0	0.0	0.0
Apr	95	75.5	22.1	1.8	0.5	0.1	0.1	0.0	0.0	0.1
May	96	78.3	21.5	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Jun	96	65.7	26.7	5.6	1.7	0.3	0.0	0.0	0.0	0.0
Jul	96	64.7	30.4	4.1	0.6	0.1	0.0	0.1	0.0	0.0
Aug	95	63.3	34.5	2.0	0.2	0.1	0.0	0.0	0.0	0.0
Sep	96	55.9	40.3	3.1	0.6	0.1	0.0	0.0	0.0	0.0
Oct	96	63.2	34.0	2.3	0.4	0.1	0.0	0.0	0.0	0.1
Nov	95	72.1	25.7	2.1	0.1	0.0	0.0	0.0	0.0	0.0
Dec	96	71.8	25.9	2.1	0.1	0.1	0.0	0.0	0.0	0.0

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100.
2. % Occurrence = % of valid hours with SO_2 concentrations in a given range.
3. Statistics for monthly composites over the period of record.

BURBANK **CALIFORNIA**

BIOGRAPHIC INFORMATION



Latitude	-	34.18° N
Longitude	-	118.32° W
Elevation (m)	-	170
Landuse	-	Suburban/Industrial
City Population	-	84,625
Basin Population	-	11,201,922
Start Summary	-	January, 1980
End Summary	-	December, 1986
Source of Data	-	SAROAD (050900002I01)

BURBANK

BASIC STATISTICS

A. BY YEAR.

Year	% Data Capt[1]	% Occurrence of hourly concentrations for given ranges (ppb)[2] <10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	≥80
1980	98	48.5	41.5	8.4	1.4	0.2	0.0	0.0	0.0	0.0
1981	91	55.9	37.3	5.8	0.9	0.1	0.0	0.0	0.0	0.0
1982	94	48.1	46.5	4.4	0.8	0.1	0.0	0.1	0.1	0.1
1983	94	58.0	37.0	4.7	0.3	0.1	0.0	0.0	0.0	0.0
1984	91	53.1	42.0	4.5	0.4	0.1	0.1	0.0	0.0	0.0
1985	95	53.4	42.9	3.4	0.3	0.1	0.0	0.0	0.0	0.0
1986	63	66.2	32.6	1.1	0.0	0.0	0.0	0.0	0.0	0.1
1987	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-
All Years	94	54.1	40.4	4.8	0.6	0.1	0.0	0.0	0.0	0.1

B. GROWING SEASON (May through October).

Year	% Data Capt[1]	% Occurrence of hourly concentrations for given ranges (ppb)[2] <10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	≥80
1980	98	46.2	43.4	9.2	1.1	0.1	0.0	0.0	0.0	0.0
1981	86	49.7	44.9	5.0	0.3	0.0	0.0	0.0	0.0	0.0
1982	94	49.0	48.2	2.7	0.1	0.0	0.0	0.0	0.0	0.0
1983	94	63.1	34.2	2.4	0.2	0.1	0.0	0.0	0.0	0.0
1984	88	56.3	41.7	1.8	0.2	0.1	0.0	0.0	0.0	0.0
1985	95	57.0	41.9	1.1	0.0	0.0	0.0	0.0	0.0	0.0
1986	32	62.0	37.2	0.7	0.0	0.0	0.0	0.0	0.0	0.1
1987	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-
All Years	93	54.0	42.1	3.6	0.3	0.1	0.0	0.0	0.0	0.0

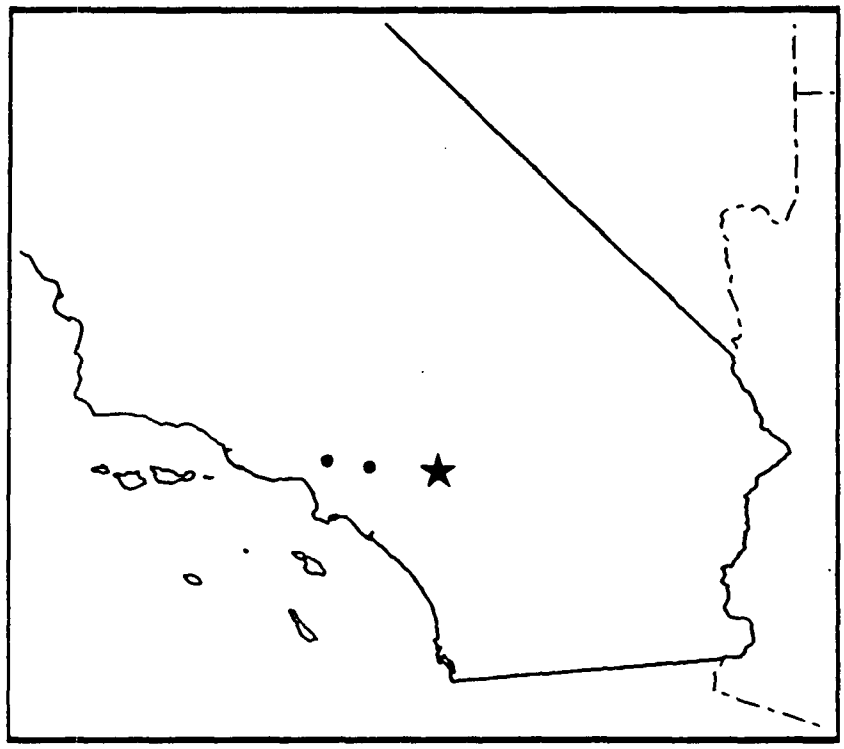
C. BY MONTH[3].

Month	% Data Capt[1]	% Occurrence of hourly concentrations for given ranges (ppb)[2] <10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	≥80
Jan	94	47.8	42.4	8.9	0.8	0.1	0.0	0.0	0.0	0.1
Feb	97	54.2	39.0	6.4	0.4	0.1	0.1	0.0	0.0	0.0
Mar	96	65.3	33.6	1.1	0.0	0.0	0.0	0.0	0.0	0.1
Apr	96	66.7	31.6	1.5	0.2	0.0	0.0	0.0	0.0	0.0
May	93	67.5	31.6	0.8	0.1	0.1	0.0	0.0	0.0	0.0
Jun	90	56.0	41.6	2.1	0.2	0.1	0.0	0.0	0.0	0.0
Jul	95	50.4	44.7	4.6	0.2	0.0	0.0	0.0	0.0	0.0
Aug	93	42.9	54.4	2.7	0.1	0.0	0.0	0.0	0.0	0.0
Sep	91	53.7	40.2	5.8	0.4	0.0	0.0	0.0	0.0	0.0
Oct	95	51.9	41.8	5.4	0.9	0.1	0.0	0.0	0.0	0.1
Nov	94	55.7	37.7	5.3	1.1	0.3	0.0	0.0	0.0	0.1
Dec	96	36.0	48.5	12.4	2.8	0.2	0.0	0.1	0.1	0.1

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100.
2. % Occurrence = % of valid hours with SO_2 concentrations in a given range.
3. Statistics for monthly composites over the period of record.

SAN BERNARDINO CALIFORNIA

BIOGRAPHIC INFORMATION



Latitude	-	34.10° N
Longitude	-	117.29° W
Elevation (m)	-	338
Landuse	-	City Center/Commercial
City Population	-	118,794
Basin Population	-	11,201,922
Start Summary	-	January, 1980
End Summary	-	December, 1980
Source of Data	-	SAROAD (056680001I01)

SAN BERNARDINO

BASIC STATISTICS

A. BY YEAR.

Year	% Data Capt[1]	% Occurrence of hourly concentrations for given ranges (ppb)[2] <10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	≥80
1980	99	85.1	14.3	0.5	0.1	0.0	0.0	0.0	0.0	0.0
1981	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-
All Years	99	85.1	14.3	0.5	0.1	0.0	0.0	0.0	0.0	0.0

B. GROWING SEASON (May through October).

Year	% Data Capt[1]	% Occurrence of hourly concentrations for given ranges (ppb)[2] <10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	≥80
1980	99	81.6	17.9	0.5	0.1	0.0	0.0	0.0	0.0	0.0
1981	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-
All Years	99	81.6	17.9	0.5	0.1	0.0	0.0	0.0	0.0	0.0

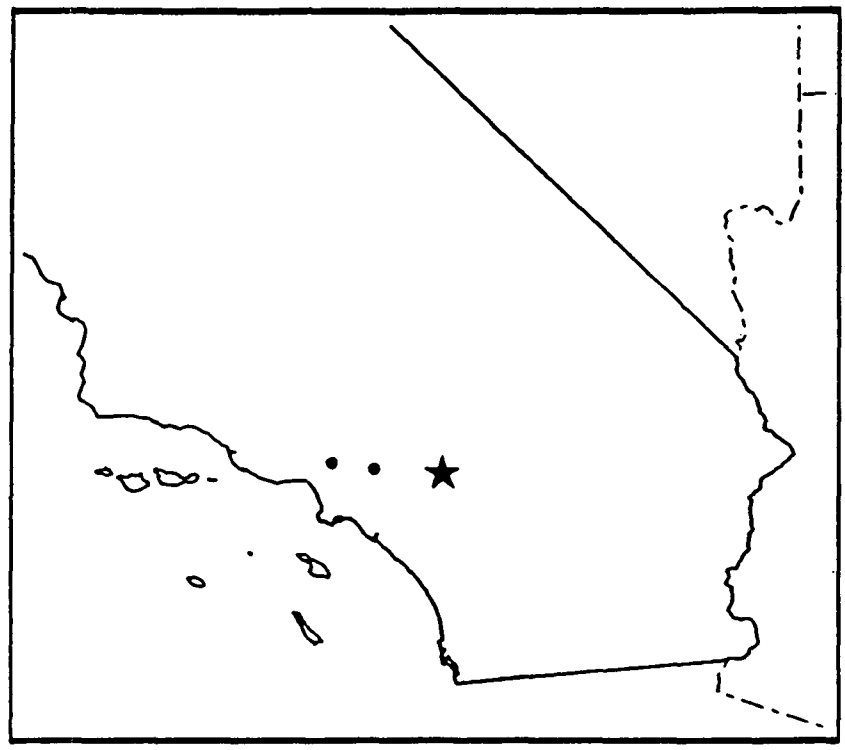
C. BY MONTH[3].

Month	% Data Capt[1]	% Occurrence of hourly concentrations for given ranges (ppb)[2] <10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	≥80
Jan	100	94.8	5.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Feb	100	93.1	6.5	0.4	0.0	0.0	0.0	0.0	0.0	0.0
Mar	100	85.7	14.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Apr	98	80.0	17.2	2.6	0.3	0.0	0.0	0.0	0.0	0.0
May	100	93.7	6.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Jun	100	78.3	21.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Jul	100	67.0	31.8	1.2	0.0	0.0	0.0	0.0	0.0	0.0
Aug	99	79.5	19.8	0.7	0.0	0.0	0.0	0.0	0.0	0.0
Sep	100	81.2	18.2	0.4	0.1	0.0	0.0	0.0	0.0	0.0
Oct	97	89.9	9.7	0.4	0.0	0.0	0.0	0.0	0.0	0.0
Nov	100	89.9	9.6	0.6	0.0	0.0	0.0	0.0	0.0	0.0
Dec	97	88.8	11.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100.
2. % Occurrence = % of valid hours with SO_2 concentrations in a given range.
3. Statistics for monthly composites over the period of record.

SAN BERNARDINO CALIFORNIA

BIOGRAPHIC INFORMATION



Latitude	-	34.11° N
Longitude	-	117.28° W
Elevation (m)	-	320
Landuse	-	City Center/Commercial
City Population	-	118,794
Basin Population	-	11,201,922
Start Summary	-	January, 1981
End Summary	-	December, 1984
Source of Data	-	SAROAD (056680003I01)

SAN BERNARDINO

BASIC STATISTICS

A. BY YEAR.

Year	% Data Capt[1]	% Occurrence of hourly concentrations for given ranges (ppb)[2] <10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	≥80
1980	-	-	-	-	-	-	-	-	-	-
1981	82	88.7	11.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0
1982	-	-	-	-	-	-	-	-	-	-
1983	95	90.4	9.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0
1984	95	79.5	20.3	0.3	0.1	0.0	0.0	0.0	0.0	0.0
1985	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-
All Years	91	86.2	13.6	0.2	0.1	0.0	0.0	0.0	0.0	0.0

B. GROWING SEASON (May through October).

Year	% Data Capt[1]	% Occurrence of hourly concentrations for given ranges (ppb)[2] <10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	≥80
1980	-	-	-	-	-	-	-	-	-	-
1981	71	83.0	16.6	0.4	0.0	0.0	0.0	0.0	0.0	0.0
1982	-	-	-	-	-	-	-	-	-	-
1983	94	86.9	13.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
1984	95	84.9	14.9	0.2	0.1	0.0	0.0	0.0	0.0	0.0
1985	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-
All Years	87	84.9	14.9	0.2	0.1	0.0	0.0	0.0	0.0	0.0

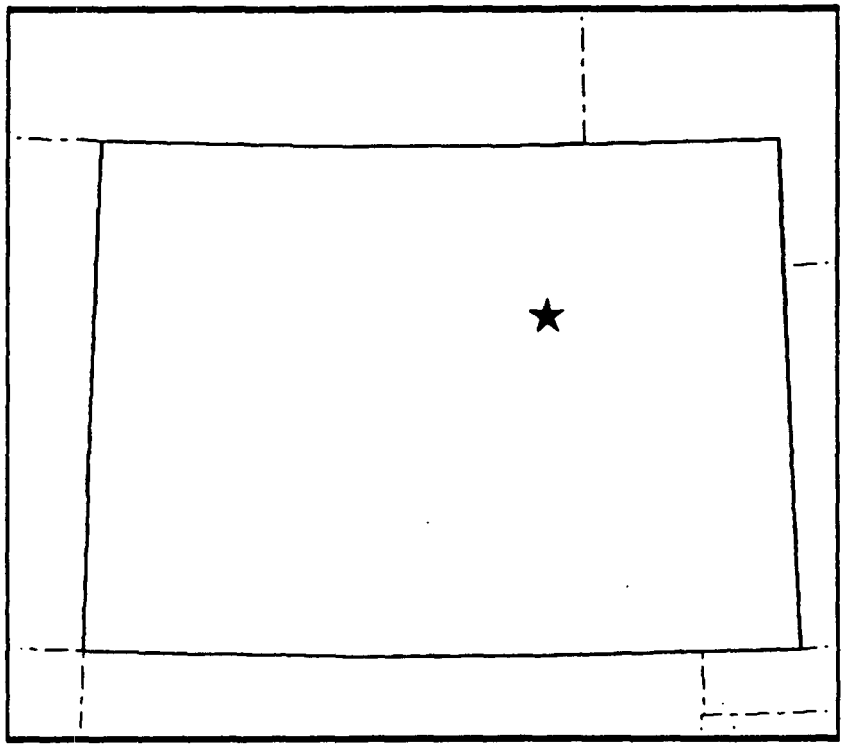
C. BY MONTH[3].

Month	% Data Capt[1]	% Occurrence of hourly concentrations for given ranges (ppb)[2] <10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	≥80
Jan	96	87.4	12.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Feb	98	91.8	7.7	0.5	0.0	0.0	0.0	0.0	0.0	0.0
Mar	96	89.0	11.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Apr	94	91.6	8.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0
May	65	90.2	9.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Jun	84	86.6	13.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Jul	93	89.3	10.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Aug	94	83.8	16.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Sep	95	74.7	24.8	0.4	0.1	0.0	0.0	0.0	0.0	0.0
Oct	91	87.6	12.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Nov	88	85.9	14.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Dec	92	76.2	23.7	0.1	0.0	0.0	0.0	0.0	0.0	0.0

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100.
2. % Occurrence = % of valid hours with SO_2 concentrations in a given range.
3. Statistics for monthly composites over the period of record.

DENVER COLORADO

BIOGRAPHIC INFORMATION



Latitude	-	39.75° N
Longitude	-	104.99° W
Elevation (m)	-	1606
Landuse	-	City Center/Commercial
City Population	-	492,365
Basin Population	-	1,628,210
Start Summary	-	January, 1980
End Summary	-	December, 1986
Source of Data	-	SAROAD (060580002F01)

DENVER

BASIC STATISTICS

A. BY YEAR.

Year	% Data Capt[1]	% Occurrence of hourly concentrations for given ranges (ppb)[2] <10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	≥80
1980	90	64.9	17.7	7.3	3.7	1.9	1.2	0.6	0.7	2.0
1981	89	58.2	21.8	9.5	4.6	2.2	1.3	0.9	0.6	0.9
1982	96	60.8	23.4	8.1	4.1	1.6	0.9	0.5	0.2	0.4
1983	96	53.0	25.8	11.2	5.1	2.3	1.3	0.7	0.3	0.3
1984	97	61.7	24.4	7.5	3.0	1.5	1.0	0.4	0.2	0.3
1985	93	69.8	21.7	5.8	1.7	0.5	0.2	0.1	0.1	0.1
1986	99	72.2	18.6	5.5	2.0	0.8	0.4	0.2	0.1	0.1
1987	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-
All Years	94	63.0	21.9	7.9	3.4	1.5	0.9	0.5	0.3	0.6

B. GROWING SEASON (May through October).

Year	% Data Capt[1]	% Occurrence of hourly concentrations for given ranges (ppb)[2] <10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	≥80
1980	90	68.9	16.6	6.5	2.8	1.7	1.0	0.5	0.6	1.5
1981	87	67.7	19.1	6.9	2.7	1.4	0.7	0.8	0.3	0.4
1982	96	66.1	21.5	6.9	3.2	1.0	0.6	0.4	0.1	0.2
1983	94	56.6	25.6	10.1	3.8	2.0	1.1	0.5	0.2	0.1
1984	97	71.0	21.0	4.9	1.6	0.6	0.5	0.3	0.1	0.1
1985	94	70.9	21.0	5.4	1.7	0.5	0.2	0.1	0.1	0.1
1986	99	74.8	16.7	5.1	1.6	1.0	0.4	0.2	0.1	0.2
1987	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-
All Years	94	68.1	20.3	6.5	2.5	1.2	0.6	0.4	0.2	0.4

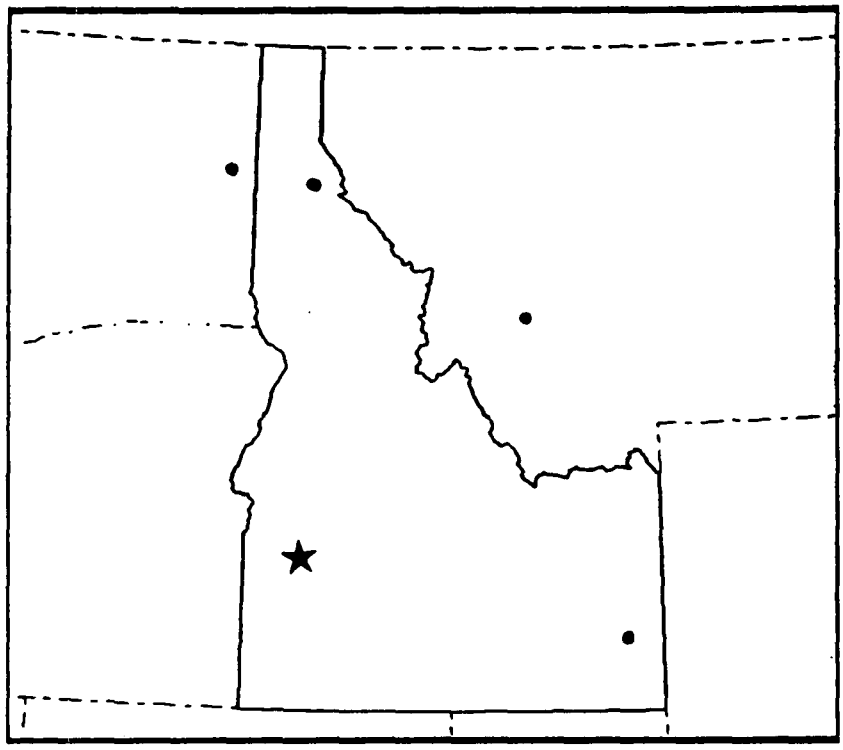
C. BY MONTH[3].

Month	% Data Capt[1]	% Occurrence of hourly concentrations for given ranges (ppb)[2] <10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	≥80
Jan	96	48.8	24.5	12.1	6.8	3.3	1.8	0.9	0.7	1.2
Feb	98	59.0	23.5	8.7	4.5	1.6	1.1	0.4	0.4	0.9
Mar	94	65.9	22.0	7.0	2.4	1.2	0.8	0.3	0.3	0.2
Apr	96	72.7	18.9	4.5	1.9	0.8	0.6	0.3	0.1	0.3
May	95	76.2	17.5	3.9	1.1	0.5	0.3	0.1	0.1	0.2
Jun	94	75.4	16.4	5.1	1.5	0.9	0.4	0.2	0.1	0.1
Jul	96	70.7	18.7	6.0	2.5	1.0	0.4	0.3	0.1	0.2
Aug	89	67.8	20.8	7.0	2.5	1.0	0.5	0.2	0.1	0.1
Sep	97	65.0	21.3	6.6	3.0	1.6	1.0	0.6	0.3	0.5
Oct	93	53.2	26.8	10.5	4.1	1.8	1.1	0.8	0.4	1.1
Nov	91	51.2	26.7	11.3	4.6	1.9	1.5	0.9	0.4	1.4
Dec	92	49.2	26.5	11.7	6.3	2.6	1.5	0.9	0.5	0.7

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100.
2. % Occurrence = % of valid hours with SO_2 concentrations in a given range.
3. Statistics for monthly composites over the period of record.

BOISE CITY IDAHO

BIOGRAPHIC INFORMATION



Latitude	-	43.61° N
Longitude	-	116.20° W
Elevation (m)	-	830
Landuse	-	City Center/Commercial
City Population	-	102,160
Basin Population	-	256,792
Start Summary	-	January, 1980
End Summary	-	December, 1980
Source of Data	-	SAROAD (130220007F01)

BOISE CITY

BASIC STATISTICS

A. BY YEAR.

Year	% Data Capt[1]	% Occurrence of hourly concentrations for given ranges (ppb)[2] <10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	≥80
1980	77	70.7	28.2	1.1	0.1	0.0	0.0	0.0	0.0	0.0
1981	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-
All Years	77	70.7	28.2	1.1	0.1	0.0	0.0	0.0	0.0	0.0

B. GROWING SEASON (May through October).

Year	% Data Capt[1]	% Occurrence of hourly concentrations for given ranges (ppb)[2] <10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	≥80
1980	74	76.9	22.5	0.6	0.1	0.0	0.0	0.0	0.0	0.0
1981	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-
All Years	74	76.9	22.5	0.6	0.1	0.0	0.0	0.0	0.0	0.0

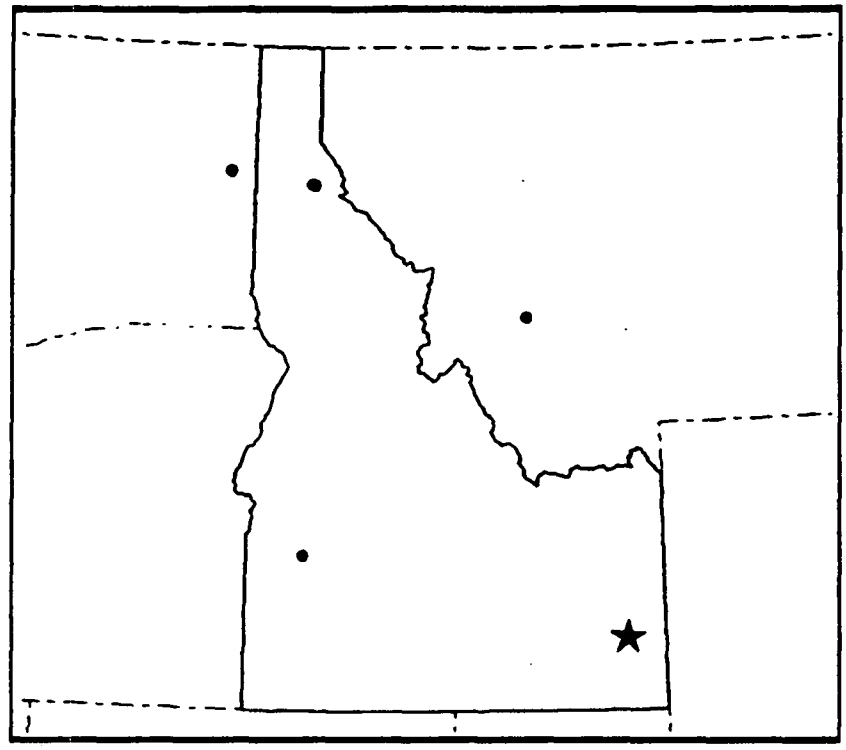
C. BY MONTH[3].

Month	% Data Capt[1]	% Occurrence of hourly concentrations for given ranges (ppb)[2] <10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	≥80
Jan	74	53.6	43.1	3.3	0.0	0.0	0.0	0.0	0.0	0.0
Feb	76	64.8	33.5	1.8	0.0	0.0	0.0	0.0	0.0	0.0
Mar	96	72.9	26.8	0.3	0.0	0.0	0.0	0.0	0.0	0.0
Apr	56	84.9	14.8	0.2	0.0	0.0	0.0	0.0	0.0	0.0
May	55	80.5	19.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Jun	93	77.0	22.4	0.6	0.0	0.0	0.0	0.0	0.0	0.0
Jul	95	82.2	17.7	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Aug	91	77.5	22.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sep	47	78.7	19.8	1.5	0.0	0.0	0.0	0.0	0.0	0.0
Oct	61	62.8	34.6	2.4	0.2	0.0	0.0	0.0	0.0	0.0
Nov	80	55.3	43.7	1.0	0.0	0.0	0.0	0.0	0.0	0.0
Dec	96	62.0	36.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100.
2. % Occurrence = % of valid hours with SO_2 concentrations in a given range.
3. Statistics for monthly composites over the period of record.

CARIBOU COUNTY IDAHO

BIOGRAPHIC INFORMATION



Latitude	-	42.76° N
Longitude	-	111.55° W
Elevation (m)	-	1846
Landuse	-	Rural/Industrial
City Population	-	Not in City
Basin Population	-	255,147
Start Summary	-	January, 1980
End Summary	-	December, 1983
Source of Data	-	SAROAD (130420014F02)

CARIBOU COUNTY

BASIC STATISTICS

A. BY YEAR.

Year	% Data Capt[1]	% Occurrence of hourly concentrations for given ranges (ppb)[2] <10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	≥80
1980	89	62.8	14.4	7.8	4.2	2.8	1.8	1.5	0.9	3.7
1981	80	61.0	14.5	10.0	4.2	2.5	2.1	1.3	0.7	3.6
1982	88	49.3	30.0	7.5	4.5	2.3	1.7	0.8	0.6	3.3
1983	87	72.4	12.3	4.7	2.8	2.2	1.4	1.0	0.5	2.6
1984	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-
All Years	86	61.4	17.8	7.5	3.9	2.5	1.8	1.2	0.7	3.3

B. GROWING SEASON (May through October).

Year	% Data Capt[1]	% Occurrence of hourly concentrations for given ranges (ppb)[2] <10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	≥80
1980	89	60.3	16.5	7.3	4.5	3.1	2.0	1.5	0.9	3.9
1981	92	63.0	11.4	11.6	3.8	1.9	2.4	1.6	0.6	3.7
1982	88	48.9	30.0	8.2	5.0	2.1	1.3	0.8	0.5	3.0
1983	86	71.8	12.7	5.1	2.8	2.0	1.3	1.2	0.6	2.5
1984	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-
All Years	89	61.0	17.7	8.1	4.0	2.3	1.8	1.3	0.7	3.3

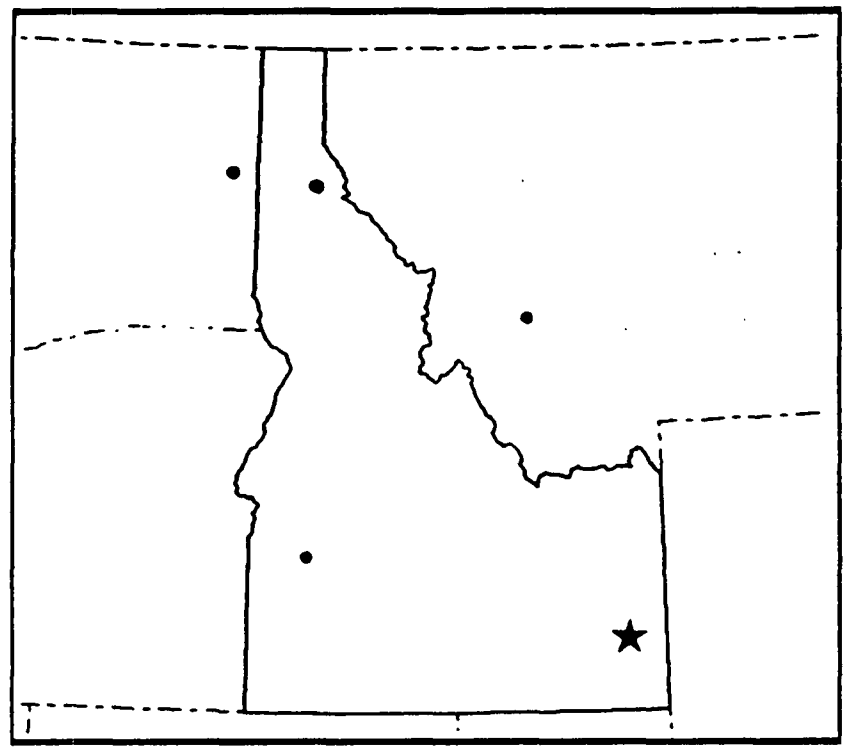
C. BY MONTH[3].

Month	% Data Capt[1]	% Occurrence of hourly concentrations for given ranges (ppb)[2] <10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	≥80
Jan	92	55.2	17.1	8.5	5.0	3.7	2.4	1.5	1.1	5.5
Feb	90	57.6	20.3	7.6	4.7	2.3	2.1	1.1	0.6	3.7
Mar	68	60.3	20.8	8.2	2.9	2.0	1.3	1.4	0.7	2.3
Apr	91	65.5	19.3	5.1	3.0	2.3	1.1	0.7	0.4	2.6
May	92	66.1	16.5	6.0	3.2	2.0	1.5	1.1	1.0	2.6
Jun	88	54.6	22.1	7.5	5.1	3.2	1.6	1.8	0.8	3.4
Jul	89	58.5	21.1	7.1	3.9	2.5	1.5	1.1	0.7	3.6
Aug	89	50.2	22.2	10.1	5.2	2.5	2.7	1.5	0.6	4.9
Sep	92	63.4	11.9	11.6	4.4	2.0	2.1	1.4	0.5	2.8
Oct	81	73.6	11.7	6.3	2.5	1.6	1.0	0.8	0.3	2.2
Nov	71	70.9	14.1	4.8	2.7	2.2	1.5	0.8	0.7	2.2
Dec	87	63.1	17.1	6.3	3.9	2.8	1.9	1.0	0.7	3.2

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100.
2. % Occurrence = % of valid hours with SO_2 concentrations in a given range.
3. Statistics for monthly composites over the period of record.

CARIBOU COUNTY IDAHO

BIOGRAPHIC INFORMATION



Latitude	-	42.73° N
Longitude	-	111.55° W
Elevation (m)	-	1892
Landuse	-	Rural/Industrial
City Population	-	Not in City
Basin Population	-	255,147
Start Summary	-	January, 1985
End Summary	-	December, 1986
Source of Data	-	SAROAD (130420027F02)

CARIBOU COUNTY

BASIC STATISTICS

A. BY YEAR.

Year	% Data Capt[1]	% Occurrence of hourly concentrations for given ranges (ppb)[2] <10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	≥80
1980	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-
1985	88	76.6	10.8	4.7	2.4	1.3	1.1	0.6	0.5	1.9
1986	88	82.9	10.1	2.9	1.5	0.9	0.5	0.2	0.3	0.7
1987	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-
All Years	88	79.7	10.4	3.8	2.0	1.1	0.8	0.4	0.4	1.3

B. GROWING SEASON (May through October).

Year	% Data Capt[1]	% Occurrence of hourly concentrations for given ranges (ppb)[2] <10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	≥80
1980	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-
1985	90	80.3	9.6	3.5	2.0	1.2	0.7	0.5	0.4	1.9
1986	90	89.3	8.4	1.2	0.4	0.2	0.1	0.1	0.1	0.4
1987	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-
All Years	90	84.8	9.0	2.3	1.2	0.7	0.4	0.3	0.3	1.2

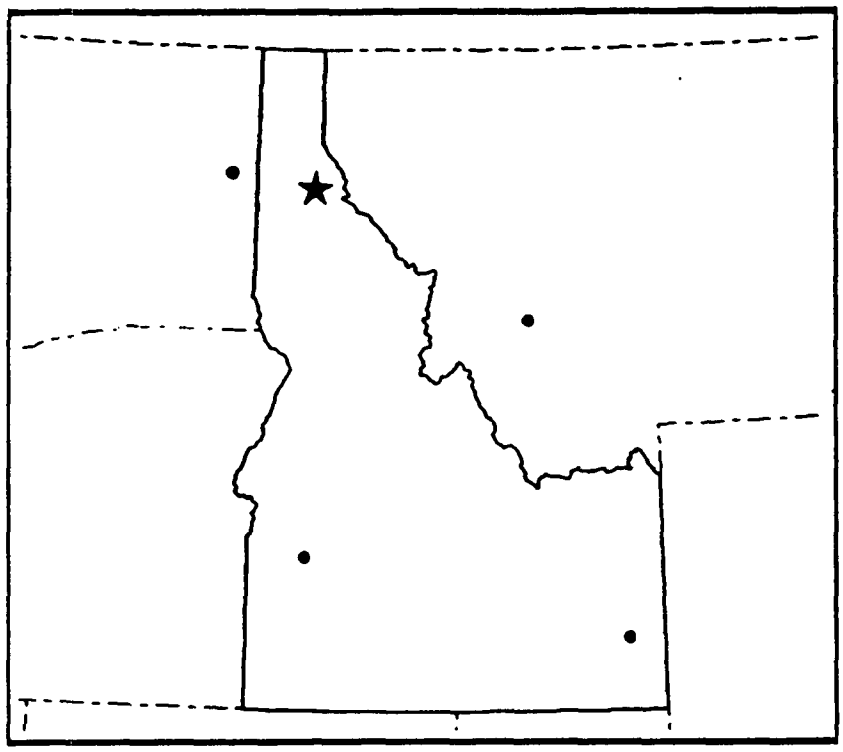
C. BY MONTH[3].

Month	% Data Capt[1]	% Occurrence of hourly concentrations for given ranges (ppb)[2] <10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	≥80
Jan	85	56.7	16.9	10.9	5.3	3.2	2.9	0.6	1.1	2.3
Feb	89	70.5	15.9	5.6	3.0	2.2	1.1	0.8	0.6	0.3
Mar	91	80.5	10.6	4.1	1.4	1.2	0.4	0.4	0.1	1.2
Apr	90	82.5	11.1	3.3	1.5	0.5	0.1	0.1	0.4	0.5
May	94	88.3	6.3	2.5	0.9	0.4	0.4	0.4	0.1	0.6
Jun	89	86.5	6.8	2.3	1.1	0.7	0.5	0.1	0.6	1.3
Jul	94	85.6	6.6	2.0	1.6	1.0	0.4	0.6	0.3	2.0
Aug	84	85.0	6.4	2.4	1.5	1.3	0.9	0.1	0.2	2.2
Sep	85	92.2	4.8	1.1	0.7	0.3	0.0	0.2	0.1	0.5
Oct	94	72.3	22.2	3.4	1.3	0.2	0.3	0.1	0.0	0.2
Nov	73	87.0	7.8	2.9	1.1	0.7	0.2	0.0	0.1	0.2
Dec	94	70.8	9.8	5.2	3.8	1.6	2.1	1.4	1.1	4.2

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100.
2. % Occurrence = % of valid hours with SO_2 concentrations in a given range.
3. Statistics for monthly composites over the period of record.

KELLOGG IDAHO

BIOGRAPHIC INFORMATION



Latitude	-	47.53° N
Longitude	-	116.13° W
Elevation (m)	-	754
Landuse	-	Suburban/Residential
City Population	-	3,417
Basin Population	-	625,936
Start Summary	-	January, 1980
End Summary	-	November, 1981
Source of Data	-	SAROAD (130840002F02)

KELLOGG

BASIC STATISTICS

A. BY YEAR.

Year	% Data Capt[1]	% Occurrence of hourly concentrations for given ranges (ppb)[2] <10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	≥80
1980	78	31.3	25.3	11.4	8.1	5.1	3.8	3.3	2.2	9.5
1981	74	29.0	23.6	12.2	8.8	3.8	4.9	3.0	2.4	12.3
1982	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-
All Years	79	30.2	24.4	11.8	8.4	4.5	4.4	3.2	2.3	10.9

B. GROWING SEASON (May through October).

Year	% Data Capt[1]	% Occurrence of hourly concentrations for given ranges (ppb)[2] <10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	≥80
1980	80	34.3	27.0	10.2	6.5	3.9	2.3	2.7	2.1	11.1
1981	84	32.4	18.7	12.3	7.5	2.9	5.2	3.2	1.9	16.1
1982	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-
All Years	82	33.3	22.7	11.2	7.0	3.4	3.8	2.9	2.0	13.7

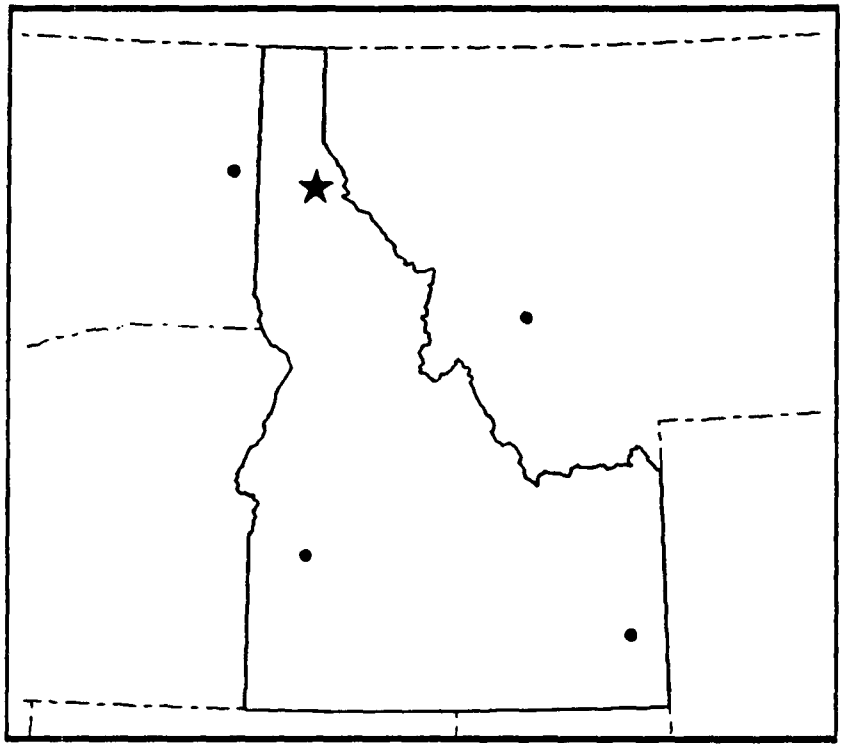
C. BY MONTH[3].

Month	% Data Capt[1]	% Occurrence of hourly concentrations for given ranges (ppb)[2] <10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	≥80
Jan	93	23.7	17.6	12.7	12.8	7.8	7.4	4.5	4.1	9.4
Feb	78	28.3	27.7	14.0	9.1	5.3	4.2	4.6	2.2	4.5
Mar	69	32.0	34.7	11.9	7.0	4.5	2.7	1.7	1.3	4.3
Apr	69	35.3	30.9	11.4	8.5	3.1	2.3	1.7	1.4	5.3
May	83	37.9	30.5	7.9	5.8	2.8	1.8	2.4	1.7	9.3
Jun	70	35.7	30.0	7.2	7.2	4.3	2.9	2.4	2.0	8.4
Jul	72	38.4	23.6	7.5	6.5	5.0	4.4	3.1	2.9	8.7
Aug	86	39.8	13.5	10.3	7.1	2.1	4.2	2.3	2.2	18.4
Sep	89	33.1	19.0	14.7	6.5	2.5	3.3	3.2	1.7	16.0
Oct	92	17.7	21.9	17.8	8.7	3.9	5.7	3.9	1.5	18.8
Nov	66	16.5	30.5	12.3	12.0	7.1	5.2	4.4	2.9	9.1
Dec	96	21.7	18.7	11.5	10.5	6.5	9.0	3.4	4.8	14.0

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100.
2. % Occurrence = % of valid hours with SO_2 concentrations in a given range.
3. Statistics for monthly composites over the period of record.

SHOSHONE COUNTY IDAHO

BIOGRAPHIC INFORMATION



Latitude	-	47.53° N
Longitude	-	116.17° W
Elevation (m)	-	708
Landuse	-	Suburban/Industrial
City Population	-	
Basin Population	-	625,936
Start Summary	-	January, 1980
End Summary	-	December, 1983
Source of Data	-	SAROAD (131420021F02)

SHOSHONE COUNTY

BASIC STATISTICS

A. BY YEAR.

Year	% Data Capt[1]	% Occurrence of hourly concentrations for given ranges (ppb)[2] <10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	≥80
1980	85	33.0	27.2	13.8	7.2	4.9	3.6	2.9	1.8	5.6
1981	82	36.3	22.3	14.2	7.1	3.1	4.0	2.9	1.5	8.6
1982	88	76.0	24.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0
1983	89	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1984	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-
All Years	86	62.2	18.1	6.8	3.5	1.9	1.8	1.4	0.8	3.4

B. GROWING SEASON (May through October).

Year	% Data Capt[1]	% Occurrence of hourly concentrations for given ranges (ppb)[2] <10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	≥80
1980	89	39.1	26.4	11.7	6.3	4.6	3.0	2.3	1.6	4.9
1981	86	33.6	16.0	16.0	8.6	2.6	5.3	3.1	1.7	13.2
1982	90	64.5	35.4	0.0	0.0	0.1	0.0	0.0	0.0	0.0
1983	89	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1984	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-
All Years	89	59.5	19.5	6.8	3.7	1.8	2.1	1.3	0.8	4.4

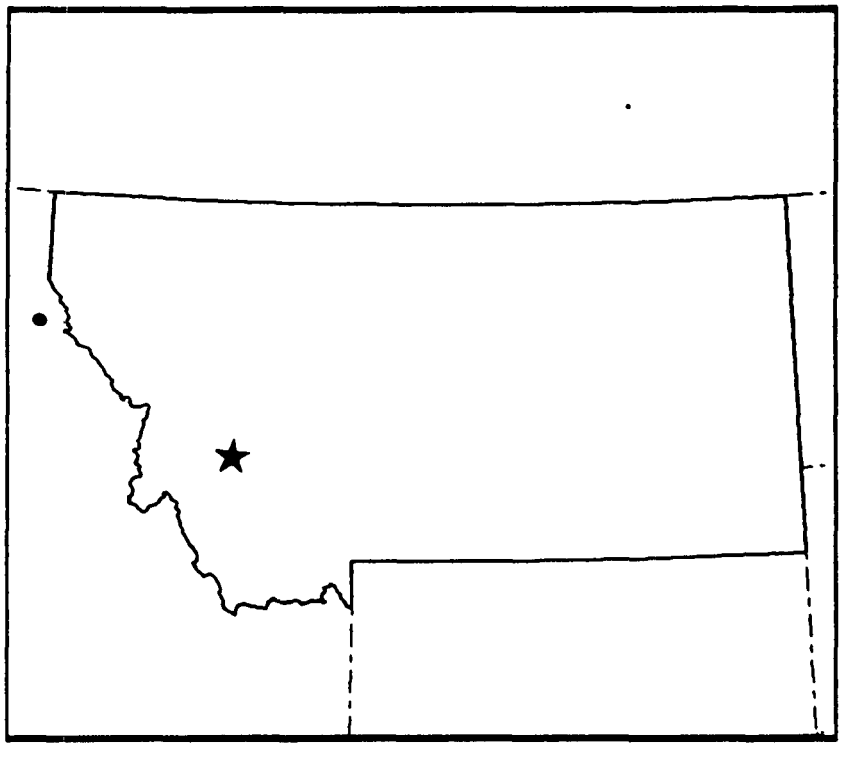
C. BY MONTH[3].

Month	% Data Capt[1]	% Occurrence of hourly concentrations for given ranges (ppb)[2] <10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	≥80
Jan	77	56.5	14.7	9.8	4.4	2.9	2.9	2.7	1.5	4.7
Feb	92	54.9	23.4	9.1	3.6	2.2	1.9	1.5	0.6	2.7
Mar	83	68.9	15.4	5.9	3.0	1.9	1.7	1.0	0.6	1.6
Apr	79	69.8	16.4	4.9	2.6	2.1	0.7	1.3	0.6	1.6
May	88	64.3	24.0	4.8	2.3	1.5	0.8	0.5	0.5	1.3
Jun	86	63.8	27.0	3.3	1.9	1.5	0.7	0.5	0.2	1.2
Jul	90	54.9	27.0	6.7	3.3	1.8	1.4	1.3	0.9	2.6
Aug	90	52.3	19.9	6.6	5.3	1.4	2.6	2.2	1.6	8.1
Sep	92	61.0	9.9	9.6	4.3	2.4	3.4	1.7	0.9	6.7
Oct	86	61.4	9.7	9.7	4.7	2.1	3.4	1.8	0.7	6.4
Nov	80	71.5	14.2	5.2	3.4	2.0	1.3	1.0	0.7	0.8
Dec	92	68.3	15.7	5.6	2.5	1.6	1.2	1.3	1.1	2.7

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100.
2. % Occurrence = % of valid hours with SO_2 concentrations in a given range.
3. Statistics for monthly composites over the period of record.

ANACONDA-DEER LODGE MONTANA

BIOGRAPHIC INFORMATION



Latitude	-	46.13° N
Longitude	-	112.94° W
Elevation (m)	-	1631
Landuse	-	Suburban/Residential
City Population	-	12,518
Basin Population	-	185,125
Start Summary	-	January, 1980
End Summary	-	December, 1980
Source of Data	-	SAROAD (270020007F01)

ANACONDA-DEER LODGE

BASIC STATISTICS

A. BY YEAR.

Year	% Data Capt[1]	% Occurrence of hourly concentrations for given ranges (ppb)[2] <10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	≥80
1980	90	65.5	14.8	7.6	2.1	1.4	1.0	0.7	0.6	6.2
1981	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-
All Years	90	65.5	14.8	7.6	2.1	1.4	1.0	0.7	0.6	6.2

B. GROWING SEASON (May through October).

Year	% Data Capt[1]	% Occurrence of hourly concentrations for given ranges (ppb)[2] <10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	≥80
1980	88	76.0	13.9	1.8	1.5	0.8	0.8	0.6	0.4	4.2
1981	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-
All Years	88	76.0	13.9	1.8	1.5	0.8	0.8	0.6	0.4	4.2

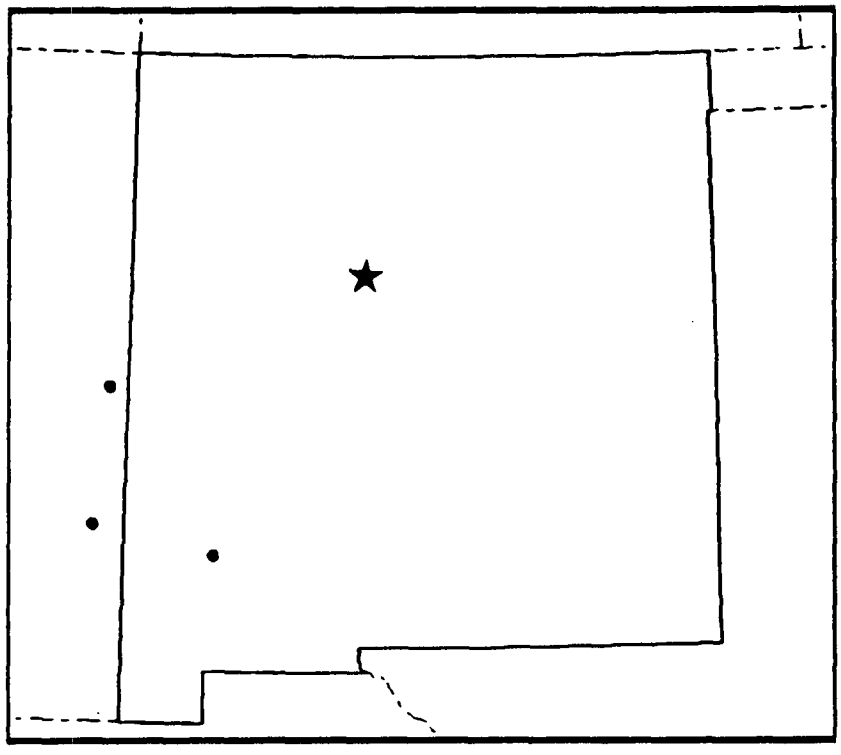
C. BY MONTH[3].

Month	% Data Capt[1]	% Occurrence of hourly concentrations for given ranges (ppb)[2] <10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	≥80
Jan	100	54.5	12.4	7.2	5.1	3.4	1.9	0.7	0.4	14.4
Feb	94	49.0	10.4	8.2	5.7	3.9	2.7	2.1	2.4	15.6
Mar	82	72.3	8.4	3.1	2.0	2.3	1.8	1.3	1.0	7.9
Apr	96	76.3	3.0	2.6	2.5	2.7	1.3	1.3	0.4	9.8
May	36	49.1	9.4	5.2	6.0	2.4	3.0	3.7	1.1	20.2
Jun	98	54.2	13.6	4.8	4.4	2.8	2.4	1.6	1.7	14.5
Jul	100	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Aug	96	87.2	5.2	2.9	1.7	0.6	0.7	0.1	0.3	1.3
Sep	100	76.2	23.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Oct	100	71.4	28.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nov	93	0.0	49.4	50.4	0.1	0.0	0.0	0.0	0.0	0.0
Dec	85	81.7	10.1	8.2	0.0	0.0	0.0	0.0	0.0	0.0

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100.
2. % Occurrence = % of valid hours with SO_2 concentrations in a given range.
3. Statistics for monthly composites over the period of record.

ALBUQUERQUE NEW MEXICO

BIOGRAPHIC INFORMATION



Latitude	-	35.14° N
Longitude	-	106.59° W
Elevation (m)	-	1600
Landuse	-	Suburban/Commercial
City Population	-	331,767
Basin Population	-	500,331
Start Summary	-	January, 1980
End Summary	-	June, 1986
Source of Data	-	SAROAD (320040015H02)

ALBUQUERQUE

BASIC STATISTICS

A. BY YEAR.

Year	% Data Capt[1]	% Occurrence of hourly concentrations for given ranges (ppb)[2] <10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	≥80
1980	94	97.5	2.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0
1981	96	96.1	3.7	0.2	0.0	0.0	0.0	0.0	0.0	0.0
1982	99	97.9	2.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
1983	96	98.6	1.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0
1984	96	98.6	1.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0
1985	66	97.5	2.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0
1986	44	78.5	21.3	0.1	0.0	0.0	0.0	0.0	0.0	0.1
1987	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-
All Years	96	96.3	3.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0

B. GROWING SEASON (May through October).

Year	% Data Capt[1]	% Occurrence of hourly concentrations for given ranges (ppb)[2] <10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	≥80
1980	97	99.3	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1981	98	98.9	1.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
1982	98	99.6	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1983	96	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1984	99	99.7	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1985	67	99.3	0.7	0.1	0.0	0.0	0.0	0.0	0.0	0.0
1986	29	89.5	10.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1987	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-
All Years	97	99.0	1.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0

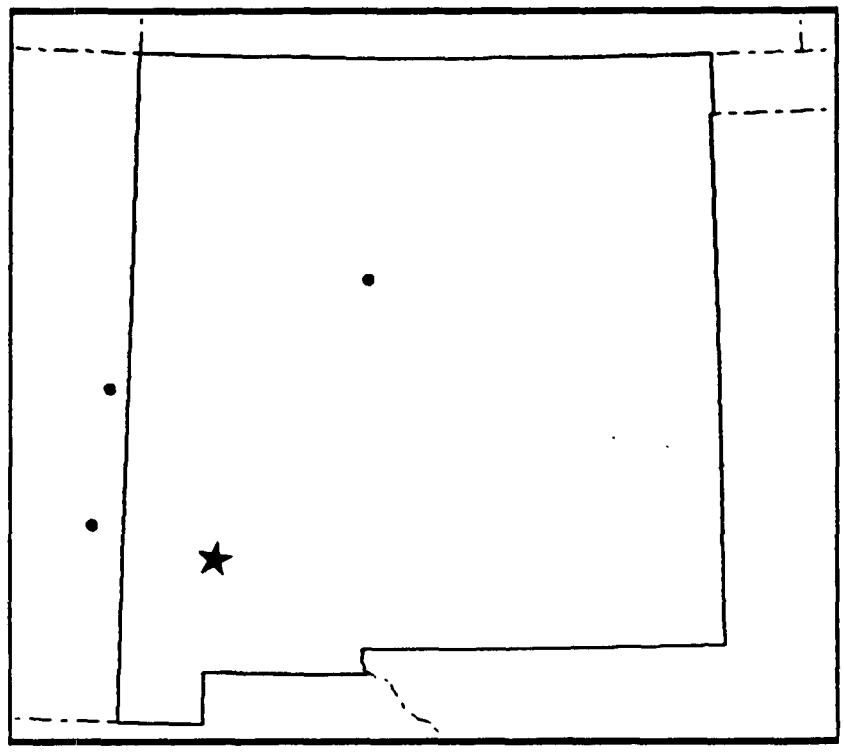
C. BY MONTH[3].

Month	% Data Capt[1]	% Occurrence of hourly concentrations for given ranges (ppb)[2] <10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	≥80
Jan	82	93.5	6.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Feb	100	94.2	5.8	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Mar	99	93.2	6.8	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Apr	93	95.7	4.3	0.0	0.0	0.0	0.0	0.0	0.0	0.1
May	99	98.5	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Jun	95	98.4	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Jul	97	99.9	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Aug	96	99.6	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Sep	99	99.6	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Oct	99	97.8	2.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Nov	96	93.1	6.6	0.3	0.0	0.0	0.0	0.0	0.0	0.0
Dec	99	91.4	8.2	0.4	0.0	0.0	0.0	0.0	0.0	0.0

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100.
2. % Occurrence = % of valid hours with SO_2 concentrations in a given range.
3. Statistics for monthly composites over the period of record.

BAYARD NEW MEXICO

BIOGRAPHIC INFORMATION



Latitude	-	32.76° N
Longitude	-	108.13° W
Elevation (m)	-	1785
Landuse	-	Suburban/Industrial
City Population	-	3,036
Basin Population	-	167,792
Start Summary	-	January, 1980
End Summary	-	December, 1986
Source of Data	-	SAROAD (320090001F01)

BAYARD

BASIC STATISTICS

A. BY YEAR.

Year	% Data Capt[1]	% Occurrence of hourly concentrations for given ranges (ppb)[2] <10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	≥80
1980	95	89.3	2.7	2.3	1.7	0.7	1.1	0.5	0.3	1.4
1981	87	87.3	3.4	3.2	1.4	0.9	1.1	0.6	0.2	1.9
1982	90	92.0	2.8	1.7	0.8	0.5	0.4	0.3	0.2	1.3
1983	94	82.3	7.7	2.8	1.4	1.1	1.0	0.7	0.5	2.6
1984	92	87.1	4.9	2.5	1.7	0.9	0.7	0.4	0.3	1.4
1985	92	90.0	4.8	2.1	1.0	0.7	0.3	0.3	0.2	0.6
1986	93	84.0	9.9	2.6	1.0	0.7	0.5	0.2	0.2	0.8
1987	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-
All Years	92	87.4	5.2	2.5	1.3	0.8	0.7	0.4	0.3	1.4

B. GROWING SEASON (May through October).

Year	% Data Capt[1]	% Occurrence of hourly concentrations for given ranges (ppb)[2] <10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	≥80
1980	95	93.8	1.7	1.2	1.2	0.4	0.9	0.2	0.2	0.5
1981	90	87.9	3.7	3.6	1.0	0.9	0.9	0.4	0.3	1.1
1982	93	97.4	1.1	0.5	0.2	0.1	0.2	0.1	0.1	0.3
1983	94	85.4	4.6	2.8	1.3	1.2	1.2	0.6	0.5	2.4
1984	90	90.0	3.4	2.3	1.4	1.0	0.5	0.4	0.1	0.9
1985	92	90.9	4.6	2.1	0.9	0.7	0.2	0.2	0.1	0.3
1986	93	88.7	6.6	2.1	0.8	0.7	0.4	0.2	0.1	0.3
1987	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-
All Years	93	90.6	3.7	2.1	1.0	0.7	0.6	0.3	0.2	0.8

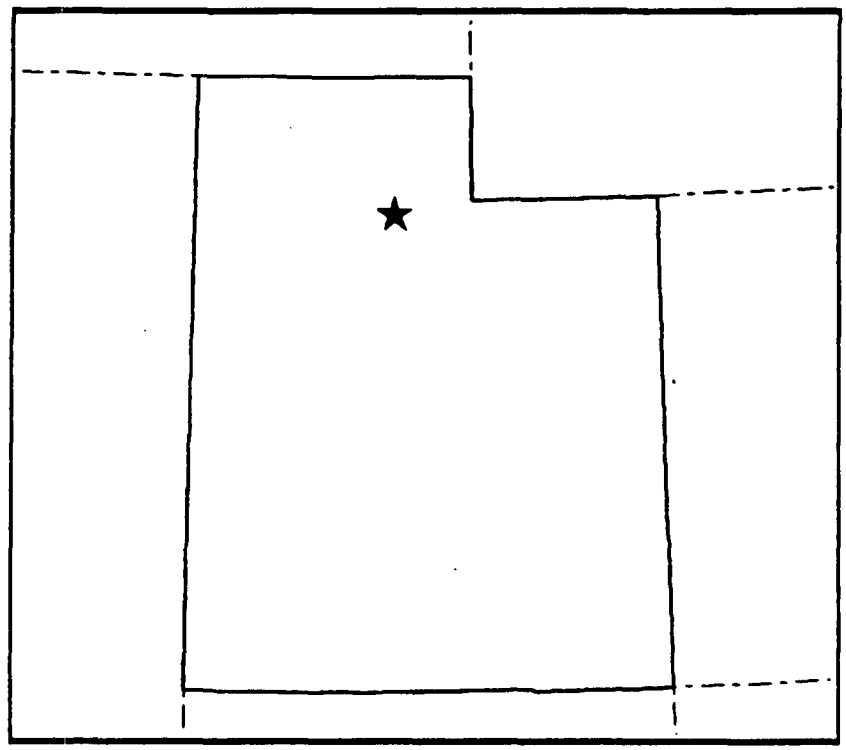
C. BY MONTH[3].

Month	% Data Capt[1]	% Occurrence of hourly concentrations for given ranges (ppb)[2] <10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	≥80
Jan	87	80.1	6.3	3.8	2.1	1.4	1.2	0.9	0.6	3.6
Feb	91	87.4	4.3	2.1	1.4	0.8	1.1	0.7	0.3	2.0
Mar	90	92.2	2.9	1.9	1.2	0.5	0.4	0.2	0.0	0.7
Apr	92	91.0	3.3	1.9	1.4	0.6	0.6	0.4	0.1	0.7
May	92	92.9	3.1	1.4	1.0	0.4	0.4	0.1	0.1	0.5
Jun	93	91.9	3.3	1.5	1.0	0.7	0.5	0.3	0.1	0.7
Jul	94	92.1	3.2	1.9	0.8	0.7	0.5	0.2	0.1	0.4
Aug	90	90.1	3.9	2.3	0.9	0.9	0.6	0.4	0.2	0.7
Sep	94	90.1	4.1	2.2	0.7	0.8	0.7	0.3	0.2	1.0
Oct	93	86.7	4.4	3.0	1.3	0.8	1.2	0.5	0.4	1.7
Nov	93	81.5	8.9	2.8	1.4	1.1	0.9	0.5	0.5	2.4
Dec	93	73.1	14.2	4.4	2.1	1.1	0.9	0.9	0.6	2.8

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100.
2. % Occurrence = % of valid hours with SO_2 concentrations in a given range.
3. Statistics for monthly composites over the period of record.

BOUNTIFUL **UTAH**

BIOGRAPHIC INFORMATION



Latitude	-	40.90° N
Longitude	-	111.88° W
Elevation (m)	-	1348
Landuse	-	City Center/Commercial
City Population	-	32,877
Basin Population	-	1,154,361
Start Summary	-	January, 1980
End Summary	-	December, 1986
Source of Data	-	SAROAD (460060001F01)

BOUNTIFUL

BASIC STATISTICS

A. BY YEAR.

Year	% Data Capt[1]	% Occurrence of hourly concentrations for given ranges (ppb)[2] <10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	≥80
1980	90	55.1	21.8	8.9	4.4	3.1	1.8	1.1	0.8	3.0
1981	88	62.5	20.3	7.2	4.2	1.9	1.4	0.9	0.7	0.9
1982	99	60.9	24.2	8.4	3.3	1.5	0.8	0.4	0.2	0.2
1983	83	66.7	21.7	6.7	2.8	1.2	0.6	0.2	0.1	0.2
1984	99	60.5	22.3	8.1	3.5	2.0	1.2	0.9	0.8	0.6
1985	93	64.1	20.1	7.3	4.1	1.9	1.1	0.5	0.2	0.7
1986	99	68.0	19.1	5.6	2.6	1.6	0.9	0.7	0.5	1.0
1987	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-
All Years	93	62.5	21.4	7.5	3.5	1.9	1.1	0.7	0.5	0.9

B. GROWING SEASON (May through October).

Year	% Data Capt[1]	% Occurrence of hourly concentrations for given ranges (ppb)[2] <10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	≥80
1980	81	65.2	21.4	6.9	2.6	1.6	0.9	0.6	0.3	0.5
1981	78	71.1	19.1	5.6	2.1	0.9	0.4	0.5	0.1	0.2
1982	99	66.9	23.1	6.1	2.4	0.8	0.5	0.1	0.1	0.1
1983	77	74.0	17.4	5.4	1.7	0.8	0.4	0.1	0.1	0.1
1984	99	73.5	19.0	5.0	1.5	0.5	0.2	0.1	0.1	0.1
1985	94	76.2	15.7	4.2	2.0	0.9	0.5	0.2	0.1	0.2
1986	99	77.8	16.2	3.6	1.5	0.5	0.2	0.1	0.1	0.1
1987	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-
All Years	90	72.2	18.8	5.2	1.9	0.8	0.4	0.2	0.1	0.2

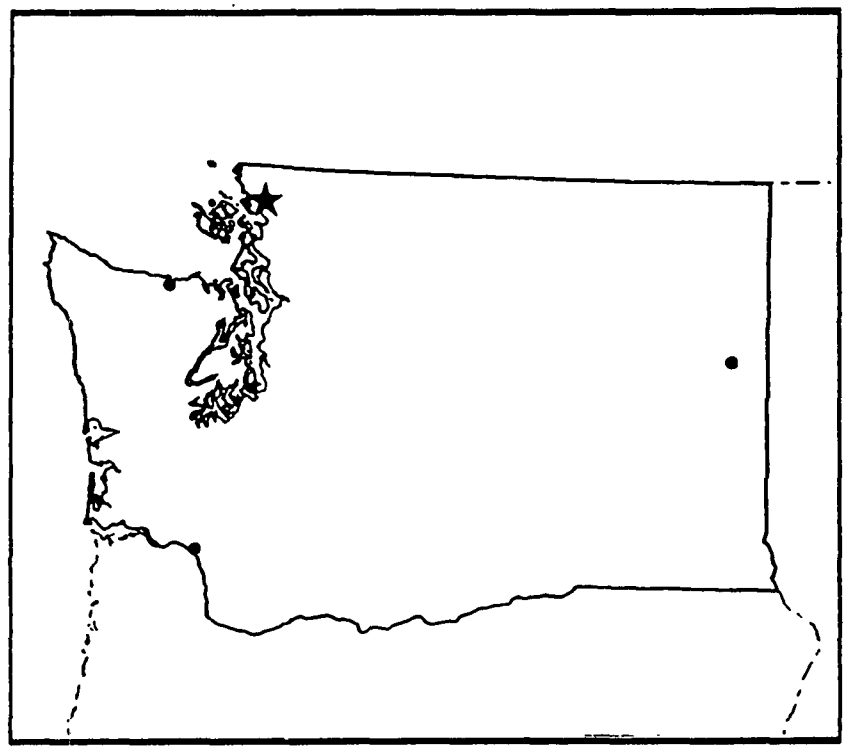
C. BY MONTH[3].

Month	% Data Capt[1]	% Occurrence of hourly concentrations for given ranges (ppb)[2] <10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	≥80
Jan	97	30.9	26.7	14.0	9.2	5.9	4.4	2.8	2.7	3.6
Feb	100	48.1	25.1	11.1	5.6	3.6	2.2	1.3	0.7	2.2
Mar	98	70.6	20.2	5.2	2.3	0.7	0.4	0.3	0.1	0.2
Apr	92	78.3	14.6	4.0	1.6	0.7	0.2	0.4	0.2	0.1
May	94	74.7	17.8	4.7	1.4	0.8	0.3	0.2	0.1	0.1
Jun	89	74.0	17.5	5.1	1.7	1.0	0.5	0.2	0.1	0.2
Jul	98	73.9	19.3	4.3	1.6	0.4	0.2	0.2	0.1	0.1
Aug	92	74.8	17.7	4.3	1.9	0.5	0.4	0.2	0.1	0.1
Sep	82	69.2	20.5	5.9	2.3	0.8	0.5	0.4	0.1	0.2
Oct	81	65.5	20.7	7.4	2.9	1.7	0.7	0.4	0.3	0.4
Nov	99	54.4	26.2	9.8	4.5	2.2	1.2	0.6	0.4	0.6
Dec	94	39.1	29.3	13.2	7.0	3.9	2.3	1.1	1.0	3.3

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100.
2. % Occurrence = % of valid hours with SO_2 concentrations in a given range.
3. Statistics for monthly composites over the period of record.

BELLINGHAM **WASHINGTON**

BIOGRAPHIC INFORMATION



Latitude	-	48.75° N
Longitude	-	122.48° W
Elevation (m)	-	17
Landuse	-	City Center/Industrial
City Population	-	45,794
Basin Population	-	529,337
Start Summary	-	January, 1983
End Summary	-	December, 1986
Source of Data	-	SAROAD (490140011I02)

BELLINGHAM

BASIC STATISTICS

A. BY YEAR.

Year	% Data Capt[1]	% Occurrence of hourly concentrations for given ranges (ppb)[2] <10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	≥80
1980	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-
1983	79	68.3	16.2	5.8	3.2	1.9	1.1	1.2	0.6	1.5
1984	95	83.3	10.2	3.9	1.8	0.5	0.2	0.1	0.1	0.1
1985	79	77.8	15.6	3.5	1.3	0.5	0.4	0.2	0.2	0.5
1986	86	58.2	29.1	7.4	2.7	1.4	0.6	0.2	0.2	0.3
1987	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-
All Years	85	72.1	17.6	5.1	2.2	1.1	0.6	0.4	0.2	0.6

B. GROWING SEASON (May through October).

Year	% Data Capt[1]	% Occurrence of hourly concentrations for given ranges (ppb)[2] <10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	≥80
1980	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-
1983	90	54.9	22.3	8.0	4.5	2.8	1.8	2.0	1.0	2.6
1984	95	88.2	7.9	2.6	1.1	0.2	0.1	0.0	0.1	0.0
1985	82	65.2	23.3	5.8	2.3	0.9	0.8	0.3	0.4	1.0
1986	84	50.0	33.6	9.7	3.5	1.8	0.6	0.2	0.2	0.4
1987	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-
All Years	88	65.1	21.3	6.4	2.9	1.4	0.8	0.6	0.4	1.0

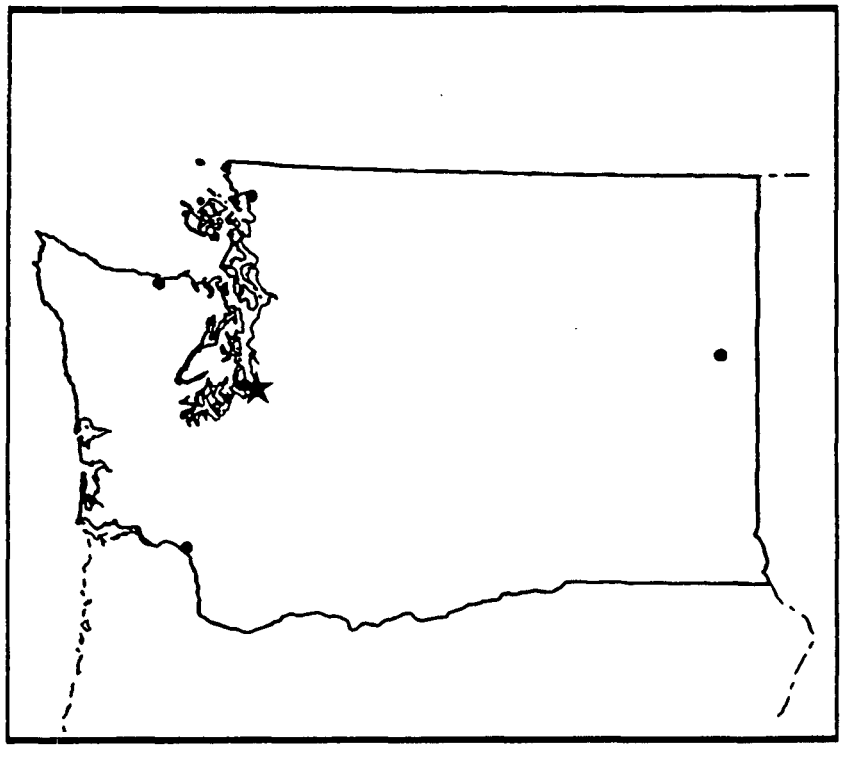
C. BY MONTH[3].

Month	% Data Capt[1]	% Occurrence of hourly concentrations for given ranges (ppb)[2] <10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	≥80
Jan	81	80.2	12.9	4.2	1.5	0.7	0.2	0.1	0.1	0.1
Feb	84	80.2	13.7	4.1	1.5	0.4	0.0	0.0	0.0	0.1
Mar	88	76.3	14.4	5.1	2.1	1.3	0.3	0.2	0.2	0.1
Apr	80	79.3	10.8	5.2	2.6	1.0	0.6	0.3	0.3	0.1
May	92	71.9	15.3	6.4	3.2	1.3	0.5	0.8	0.3	0.4
Jun	81	55.1	25.9	8.5	4.5	2.3	1.5	0.9	0.6	0.6
Jul	89	64.3	22.6	5.9	2.8	1.5	0.9	0.6	0.3	1.0
Aug	90	61.2	21.9	6.7	2.8	1.6	1.3	0.8	0.8	2.9
Sep	93	68.4	19.7	6.5	2.1	1.4	0.4	0.5	0.2	0.8
Oct	82	68.7	23.5	4.5	1.9	0.5	0.4	0.1	0.1	0.2
Nov	81	83.1	12.5	2.6	0.9	0.4	0.3	0.0	0.0	0.2
Dec	78	80.0	17.5	1.3	0.6	0.3	0.2	0.0	0.0	0.1

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100.
2. % Occurrence = % of valid hours with SO_2 concentrations in a given range.
3. Statistics for monthly composites over the period of record.

KING COUNTY WASHINGTON

BIOGRAPHIC INFORMATION



Latitude	-	47.35° N
Longitude	-	122.46° W
Elevation (m)	-	126
Landuse	-	Rural/Near Urban
City Population	-	Not in City
Basin Population	-	2,240,288
Start Summary	-	January, 1980
End Summary	-	April, 1986
Source of Data	-	SAROAD (490980014I02)

KING COUNTY

BASIC STATISTICS

A. BY YEAR.

Year	% Data Capt[1]	% Occurrence of hourly concentrations for given ranges (ppb)[2] <10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	≥80
1980	94	68.1	22.4	4.9	1.8	0.7	0.4	0.3	0.3	0.9
1981	98	64.0	22.4	6.1	2.4	1.3	1.0	0.6	0.4	1.8
1982	98	59.9	25.9	6.5	2.6	1.4	1.0	0.7	0.4	1.6
1983	93	65.4	23.9	5.6	2.1	0.8	0.6	0.5	0.2	0.8
1984	96	54.2	32.1	7.1	2.9	1.3	0.6	0.6	0.2	0.9
1985	91	52.9	37.2	6.1	2.2	0.8	0.2	0.2	0.1	0.3
1986	32	78.3	18.8	2.1	0.6	0.1	0.1	0.0	0.0	0.1
1987	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-
All Years	95	61.7	26.8	5.8	2.3	1.0	0.6	0.4	0.3	1.0

B. GROWING SEASON (May through October).

Year	% Data Capt[1]	% Occurrence of hourly concentrations for given ranges (ppb)[2] <10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	≥80
1980	96	79.6	15.5	2.7	1.0	0.4	0.2	0.1	0.1	0.5
1981	99	68.4	21.8	4.6	1.9	0.8	0.6	0.3	0.3	1.2
1982	98	72.1	19.1	4.5	1.5	0.9	0.5	0.4	0.2	0.7
1983	92	69.6	20.3	5.6	1.7	0.8	0.4	0.5	0.3	0.9
1984	92	51.3	36.4	5.8	2.9	1.2	0.6	0.6	0.2	0.9
1985	99	58.6	37.5	2.8	0.8	0.2	0.1	0.1	0.0	0.0
1986	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-
All Years	96	66.7	25.1	4.3	1.6	0.7	0.4	0.3	0.2	0.7

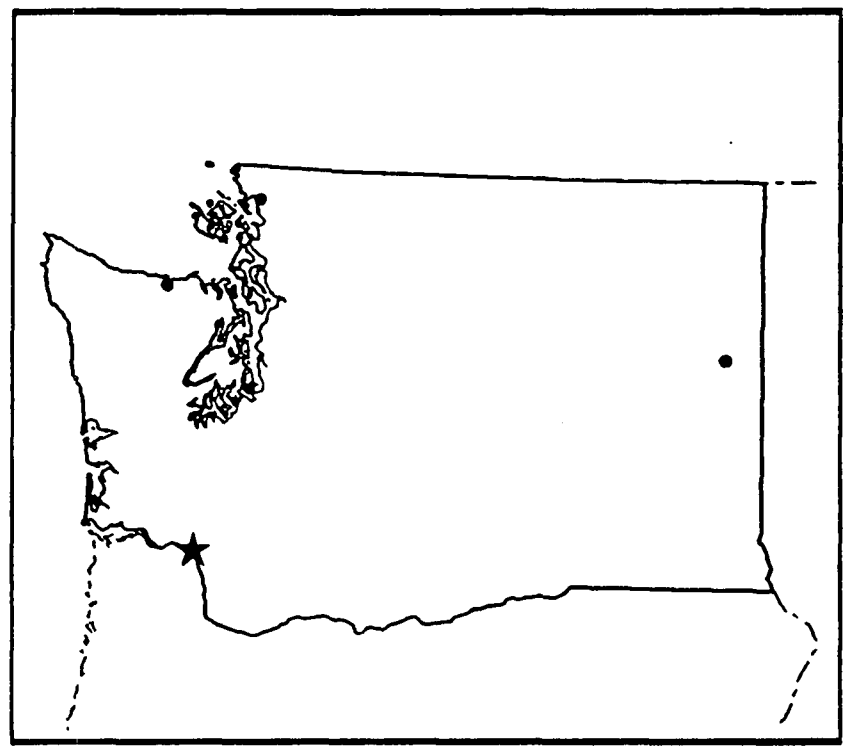
C. BY MONTH[3].

Month	% Data Capt[1]	% Occurrence of hourly concentrations for given ranges (ppb)[2] <10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	≥80
Jan	96	54.3	28.9	8.7	3.3	1.5	0.9	0.7	0.3	1.4
Feb	95	54.5	30.0	7.3	3.0	1.7	0.8	0.8	0.5	1.4
Mar	85	60.3	28.9	5.7	2.0	0.8	0.7	0.3	0.3	1.0
Apr	96	66.1	23.9	4.2	2.0	0.9	0.7	0.5	0.3	1.3
May	95	67.3	24.0	3.9	1.6	0.9	0.5	0.4	0.2	1.1
Jun	96	71.4	21.9	2.7	1.5	0.8	0.4	0.3	0.2	0.7
Jul	90	73.8	22.0	2.4	0.9	0.1	0.1	0.1	0.1	0.4
Aug	95	65.4	28.5	3.7	1.0	0.3	0.3	0.2	0.1	0.7
Sep	99	68.1	24.5	4.3	1.3	0.7	0.2	0.3	0.2	0.4
Oct	99	55.0	29.1	8.5	3.5	1.4	0.7	0.6	0.3	0.9
Nov	98	53.2	29.5	9.1	3.4	1.3	1.1	0.7	0.4	1.4
Dec	99	53.9	29.6	8.8	3.3	1.6	0.6	0.5	0.3	1.3

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100.
2. % Occurrence = % of valid hours with SO_2 concentrations in a given range.
3. Statistics for monthly composites over the period of record.

LONGVIEW WASHINGTON

BIOGRAPHIC INFORMATION



Latitude	-	46.14° N
Longitude	-	122.94° W
Elevation (m)	-	14
Landuse	-	City Center/Residential
City Population	-	31,052
Basin Population	-	2,163,762
Start Summary	-	January, 1980
End Summary	-	December, 1981
Source of Data	-	SAROAD (491140005F01)

LONGVIEW

BASIC STATISTICS

A. BY YEAR.

Year	% Data Capt[1]	% Occurrence of hourly concentrations for given ranges (ppb)[2] <10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	≥80
1980	91	66.1	31.4	1.9	0.4	0.2	0.1	0.1	0.0	0.0
1981	89	82.5	16.3	0.9	0.2	0.1	0.1	0.1	0.0	0.0
1982	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-
All Years	90	74.3	23.8	1.4	0.3	0.1	0.1	0.1	0.0	0.0

B. GROWING SEASON (May through October).

Year	% Data Capt[1]	% Occurrence of hourly concentrations for given ranges (ppb)[2] <10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	≥80
1980	98	63.8	34.0	1.6	0.5	0.2	0.1	0.0	0.0	0.0
1981	82	86.0	12.2	1.2	0.3	0.1	0.1	0.1	0.0	0.0
1982	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-
All Years	90	74.8	23.1	1.4	0.4	0.1	0.1	0.1	0.0	0.0

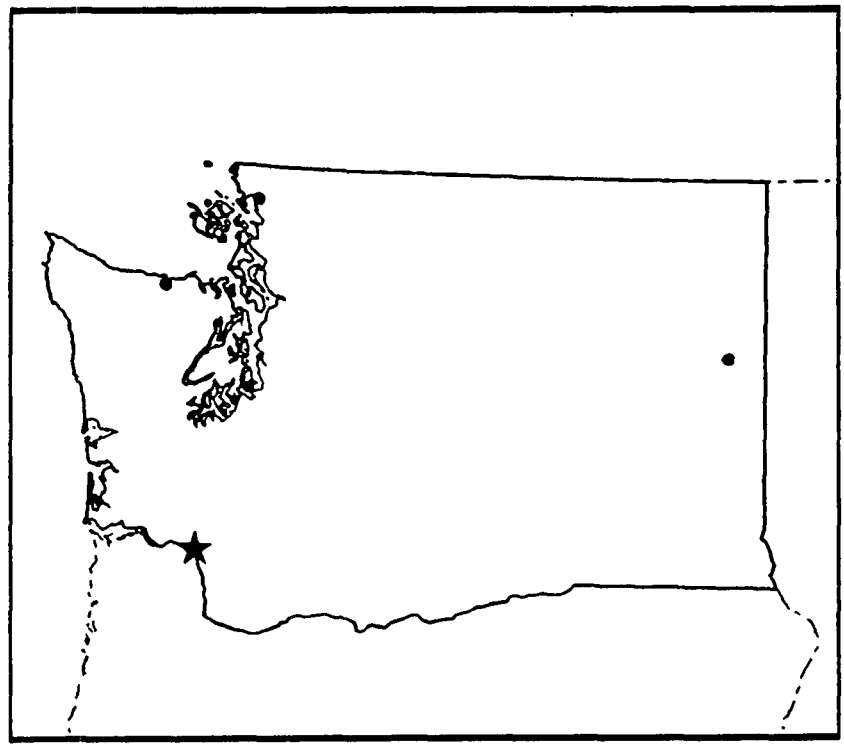
C. BY MONTH[3].

Month	% Data Capt[1]	% Occurrence of hourly concentrations for given ranges (ppb)[2] <10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	≥80
Jan	91	63.0	35.1	1.5	0.3	0.0	0.0	0.1	0.0	0.0
Feb	95	71.2	26.1	2.2	0.2	0.2	0.0	0.0	0.0	0.0
Mar	99	76.5	22.9	0.4	0.0	0.1	0.0	0.1	0.0	0.0
Apr	80	91.1	8.3	0.5	0.1	0.0	0.0	0.0	0.0	0.0
May	65	89.8	9.4	0.5	0.1	0.1	0.0	0.0	0.0	0.0
Jun	90	52.3	46.8	0.8	0.0	0.1	0.1	0.0	0.0	0.0
Jul	88	91.9	7.8	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Aug	99	76.7	21.7	1.1	0.3	0.1	0.0	0.1	0.0	0.0
Sep	97	64.8	31.7	2.4	0.9	0.2	0.0	0.0	0.0	0.0
Oct	99	72.0	23.1	3.1	1.2	0.3	0.2	0.1	0.0	0.0
Nov	94	79.8	18.9	1.2	0.1	0.0	0.0	0.0	0.0	0.0
Dec	83	67.6	29.6	2.3	0.4	0.1	0.0	0.0	0.0	0.0

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100.
2. % Occurrence = % of valid hours with SO_2 concentrations in a given range.
3. Statistics for monthly composites over the period of record.

LONGVIEW WASHINGTON

BIOGRAPHIC INFORMATION



Latitude	-	46.12° N
Longitude	-	122.95° W
Elevation (m)	-	3
Landuse	-	Suburban/Industrial
City Population	-	31,052
Basin Population	-	2,163,762
Start Summary	-	January, 1983
End Summary	-	December, 1986
Source of Data	-	SAROAD (491140007F01)

LONGVIEW

BASIC STATISTICS

A. BY YEAR.

Year	% Data Capt[1]	% Occurrence of hourly concentrations for given ranges (ppb)[2] <10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	≥80
1980	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-
1983	97	91.3	8.2	0.4	0.1	0.1	0.1	0.1	0.0	0.0
1984	98	89.2	9.4	1.0	0.2	0.1	0.1	0.1	0.1	0.1
1985	94	73.4	20.8	4.3	0.9	0.3	0.1	0.1	0.1	0.1
1986	85	77.6	19.0	2.3	0.6	0.2	0.1	0.1	0.1	0.2
1987	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-
All Years	94	82.9	14.4	2.0	0.5	0.2	0.1	0.1	0.1	0.1

B. GROWING SEASON (May through October).

Year	% Data Capt[1]	% Occurrence of hourly concentrations for given ranges (ppb)[2] <10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	≥80
1980	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-
1983	96	90.9	8.5	0.3	0.1	0.1	0.1	0.1	0.0	0.0
1984	98	89.2	10.0	0.8	0.1	0.0	0.0	0.0	0.0	0.0
1985	97	78.8	15.8	4.1	0.9	0.2	0.1	0.1	0.0	0.0
1986	74	85.2	12.2	1.6	0.5	0.2	0.2	0.1	0.0	0.1
1987	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-
All Years	91	86.0	11.6	1.7	0.4	0.1	0.1	0.1	0.0	0.1

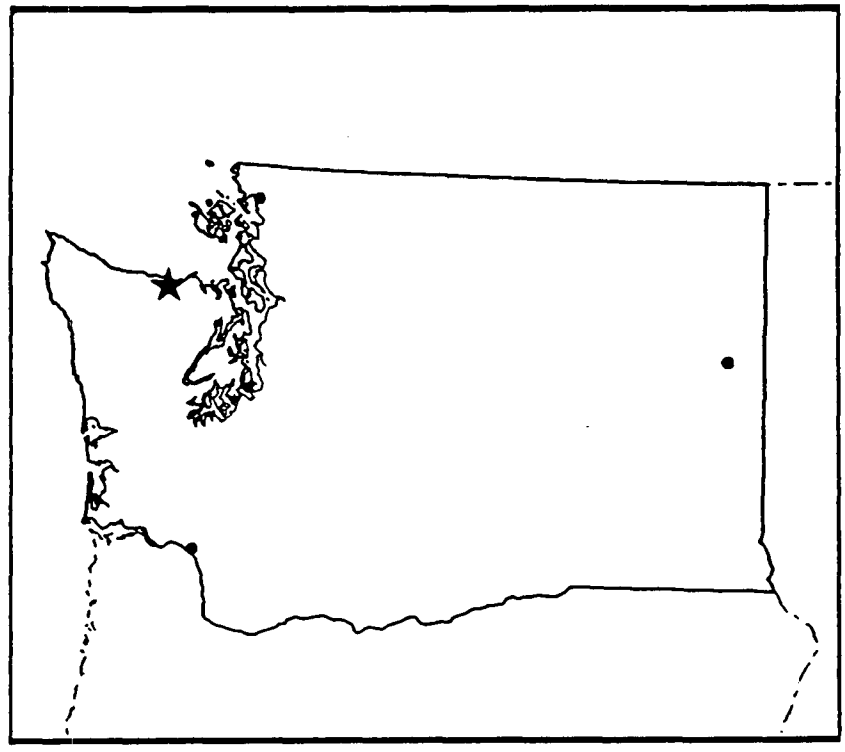
C. BY MONTH[3].

Month	% Data Capt[1]	% Occurrence of hourly concentrations for given ranges (ppb)[2] <10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	≥80
Jan	87	71.6	23.7	2.9	0.7	0.4	0.3	0.2	0.1	0.1
Feb	99	82.0	15.9	1.8	0.2	0.1	0.0	0.0	0.1	0.1
Mar	97	86.0	12.3	1.4	0.3	0.0	0.0	0.0	0.0	0.0
Apr	99	83.2	14.8	1.4	0.2	0.2	0.1	0.0	0.1	0.1
May	96	91.4	7.6	0.6	0.2	0.1	0.1	0.0	0.0	0.1
Jun	81	89.9	9.0	0.8	0.3	0.0	0.0	0.0	0.0	0.1
Jul	85	81.1	14.6	3.0	0.6	0.4	0.3	0.1	0.0	0.0
Aug	97	81.8	15.7	2.1	0.3	0.1	0.1	0.1	0.0	0.0
Sep	98	87.6	10.0	1.7	0.6	0.2	0.1	0.0	0.0	0.0
Oct	89	84.8	12.7	2.1	0.3	0.1	0.0	0.1	0.0	0.0
Nov	92	89.4	9.1	1.1	0.3	0.0	0.0	0.0	0.1	0.1
Dec	99	69.9	23.4	4.5	1.0	0.5	0.3	0.3	0.0	0.1

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100.
2. % Occurrence = % of valid hours with SO_2 concentrations in a given range.
3. Statistics for monthly composites over the period of record.

OLYMPIC PORT ANGELES WASHINGTON

BIOGRAPHIC INFORMATION



Latitude	-	48.07° N
Longitude	-	123.41° W
Elevation (m)	-	129
Landuse	-	Suburban/Residential
City Population	-	Not in City
Basin Population	-	529,337
Start Summary	-	January, 1982
End Summary	-	December, 1984
Source of Data	-	SAROAD (490566004A05)

OLYMPIC PORT ANGELES

BASIC STATISTICS

A. BY YEAR.

Year	% Data Capt[1]	% Occurrence of hourly concentrations for given ranges (ppb)[2] <10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	≥80
1980	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-
1982	97	96.7	1.4	0.0	0.7	0.5	0.3	0.1	0.0	0.3
1983	83	95.8	2.0	0.0	0.9	0.6	0.4	0.2	0.0	0.2
1984	92	99.6	0.3	0.1	0.0	0.1	0.0	0.0	0.0	0.0
1985	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-
All Years	93	97.4	1.2	0.0	0.5	0.3	0.2	0.1	0.0	0.2

B. GROWING SEASON (May through October).

Year	% Data Capt[1]	% Occurrence of hourly concentrations for given ranges (ppb)[2] <10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	≥80
1980	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-
1982	99	94.7	2.0	0.0	1.2	0.7	0.5	0.3	0.0	0.6
1983	81	93.8	2.5	0.0	1.3	1.0	0.8	0.3	0.0	0.3
1984	98	99.4	0.5	0.1	0.0	0.1	0.0	0.0	0.0	0.0
1985	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-
All Years	98	96.1	1.6	0.1	0.8	0.5	0.4	0.2	0.0	0.3

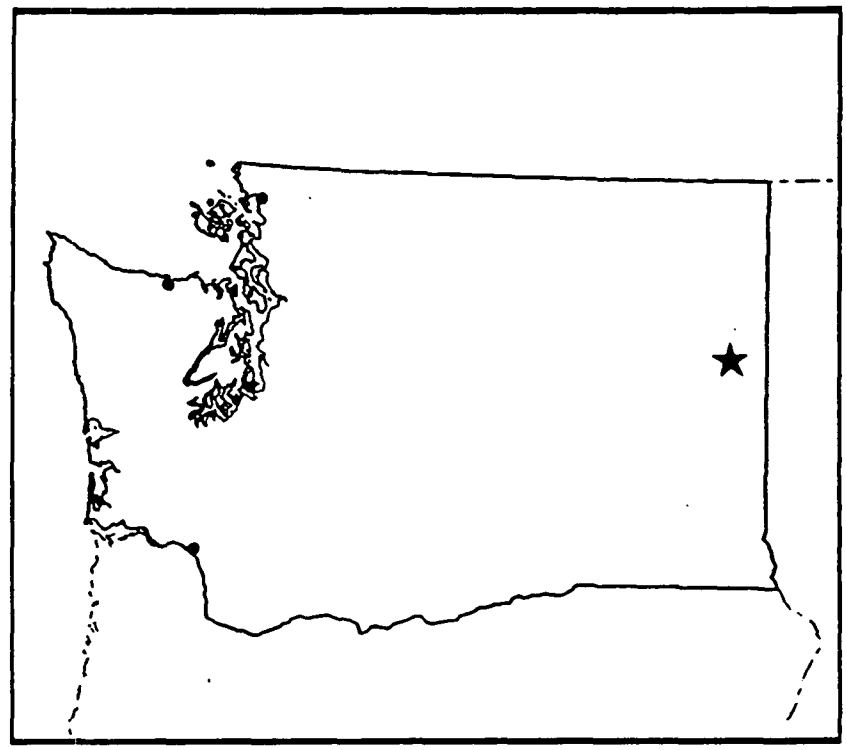
C. BY MONTH[3].

Month	% Data Capt[1]	% Occurrence of hourly concentrations for given ranges (ppb)[2] <10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	≥80
Jan	94	98.9	0.8	0.0	0.3	0.1	0.0	0.0	0.0	0.0
Feb	100	98.8	0.7	0.0	0.3	0.2	0.0	0.0	0.0	0.0
Mar	85	97.2	1.7	0.0	0.6	0.4	0.1	0.1	0.0	0.1
Apr	63	99.1	0.4	0.0	0.1	0.1	0.1	0.0	0.0	0.1
May	99	97.0	1.6	0.1	0.5	0.3	0.1	0.2	0.0	0.1
Jun	97	96.6	1.7	0.0	0.5	0.6	0.3	0.1	0.0	0.2
Jul	98	97.4	0.9	0.0	0.6	0.4	0.5	0.1	0.0	0.2
Aug	98	96.4	1.4	0.1	1.0	0.4	0.4	0.2	0.0	0.2
Sep	97	92.8	2.9	0.0	1.3	1.0	0.8	0.5	0.0	0.8
Oct	99	96.6	1.4	0.0	0.8	0.5	0.4	0.1	0.0	0.2
Nov	91	99.0	0.8	0.0	0.1	0.2	0.1	0.0	0.0	0.0
Dec	98	99.8	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100.
2. % Occurrence = % of valid hours with SO_2 concentrations in a given range.
3. Statistics for monthly composites over the period of record.

SPOKANE WASHINGTON

BIOGRAPHIC INFORMATION



Latitude	-	47.67° N
Longitude	-	117.42° W
Elevation (m)	-	589
Landuse	-	Suburban/Residential
City Population	-	171,300
Basin Population	-	625,936
Start Summary	-	January, 1980
End Summary	-	September, 1986
Source of Data	-	SAROAD (492040013F01)

SPOKANE

BASIC STATISTICS

A. BY YEAR.

Year	% Data Capt[1]	% Occurrence of hourly concentrations for given ranges (ppb)[2] <10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	≥80
1980	97	34.1	47.2	11.5	3.6	1.7	0.7	0.6	0.2	0.4
1981	92	62.0	25.6	7.0	2.7	1.3	0.7	0.3	0.1	0.3
1982	98	76.4	16.1	4.5	1.5	0.7	0.4	0.1	0.2	0.2
1983	96	77.9	15.5	4.4	1.3	0.6	0.2	0.1	0.1	0.1
1984	92	77.0	15.3	4.9	1.3	0.6	0.5	0.2	0.1	0.1
1985	81	77.0	15.9	4.8	1.4	0.4	0.3	0.2	0.1	0.1
1986	64	81.4	14.1	3.2	0.6	0.2	0.2	0.1	0.1	0.1
1987	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-
All Years	93	68.6	21.9	5.9	1.8	0.8	0.4	0.2	0.1	0.2

B. GROWING SEASON (May through October).

Year	% Data Capt[1]	% Occurrence of hourly concentrations for given ranges (ppb)[2] <10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	≥80
1980	95	25.6	57.3	11.3	3.1	1.6	0.6	0.2	0.1	0.2
1981	99	70.4	22.9	3.8	1.3	0.5	0.5	0.2	0.1	0.2
1982	98	83.7	13.0	2.5	0.5	0.2	0.1	0.0	0.1	0.1
1983	97	85.2	11.4	2.1	0.4	0.4	0.2	0.1	0.1	0.1
1984	97	85.4	10.0	2.7	0.9	0.4	0.4	0.1	0.1	0.1
1985	86	85.6	11.8	1.8	0.4	0.1	0.2	0.1	0.0	0.0
1986	64	88.5	10.4	0.9	0.1	0.1	0.0	0.0	0.0	0.1
1987	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-
All Years	93	74.1	20.0	3.8	1.0	0.5	0.3	0.1	0.1	0.1

C. BY MONTH[3].

Month	% Data Capt[1]	% Occurrence of hourly concentrations for given ranges (ppb)[2] <10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	≥80
Jan	97	52.3	28.1	12.0	4.1	1.5	0.8	0.5	0.2	0.6
Feb	99	59.7	26.0	8.6	3.0	1.2	0.6	0.4	0.1	0.5
Mar	83	78.2	17.4	3.2	0.6	0.3	0.2	0.1	0.1	0.1
Apr	86	74.4	21.5	2.7	0.7	0.3	0.2	0.1	0.1	0.1
May	95	83.6	13.9	1.6	0.4	0.1	0.1	0.1	0.1	0.1
Jun	98	85.8	12.7	1.0	0.3	0.1	0.1	0.0	0.1	0.1
Jul	88	75.0	21.4	2.2	0.7	0.3	0.2	0.1	0.1	0.1
Aug	96	70.7	24.5	3.3	0.7	0.4	0.2	0.1	0.1	0.1
Sep	85	66.3	22.7	7.3	2.0	0.8	0.4	0.2	0.1	0.2
Oct	98	61.2	26.1	8.0	2.1	1.4	0.8	0.2	0.1	0.1
Nov	99	61.9	22.5	9.5	3.4	1.5	0.6	0.3	0.1	0.1
Dec	93	49.9	27.5	12.9	4.6	2.3	1.0	1.0	0.3	0.5

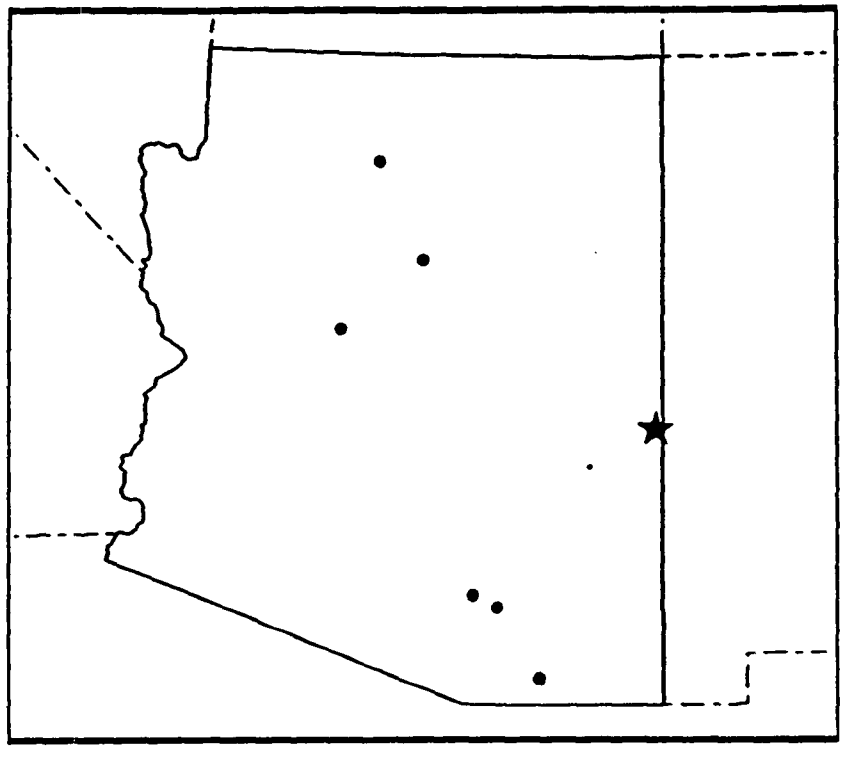
1. % Data Capture = # valid hours / (total # hours in averaging period) * 100.
2. % Occurrence = % of valid hours with SO_2 concentrations in a given range.
3. Statistics for monthly composites over the period of record.

APPENDIX 3

OZONE INFORMATION BY STATE

APACHE-SITGREAVES NATIONAL FOREST **ARIZONA**

BIOGRAPHIC INFORMATION



Latitude	-	33.75° N
Longitude	-	109.00° W
Elevation (m)	-	2462
Basin Height (m)	-	2307.7
Landuse	-	Forest
City Population	-	Not In A City
Basin Population	-	167,792
Start Summary	-	January, 1980
End Summary	-	January, 1984
Source of Data	-	AIRS (04-011-0110)

Apache-Sitgreaves National Forest

BASIC STATISTICS

A. BY YEAR.

Year	% Data Capt[1]	% Valid Days[2]	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	95	94	30	30	35	45	47.4±13	55	65	70	23	1	0	0	0
1981	95	95	25	25	30	35	35.3±07	40	45	50	0	0	0	0	0
1982	91	91	30	30	35	40	41.2±09	45	55	55	4	0	0	0	0
1983	90	89	25	25	35	35	37.9±09	40	50	55	3	0	0	0	0
1984	2	2	25	25	30	30	31.4±04	35	35	35	0	0	0	0	0
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	--	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	75	74	25	30	35	40	40.4±11	45	55	60	8	0	0	0	0

B. BY GROWING SEASON (May through October).

Year	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06[3] (ppm hr)	S08[4]	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	96	95	30	35	40	55	51.6±14	60	70	75	108	7	39	2	0	0	0
1981	93	93	25	25	30	35	35.8±08	40	45	50	2	0	1	0	0	0	0
1982	95	95	30	30	40	45	43.1±09	50	55	55	12	0	5	0	0	0	0
1983	92	91	20	25	30	40	38.6±11	45	55	55	12	0	5	0	0	0	0
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	94	93	25	30	35	40	42.3±12	50	60	65	-	-	12	1	0	0	0

C. BY MONTH [5].

Month	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06 (ppm hr)	S08[6]	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
Jan	78	77	25	30	30	35	35.0±07	40	45	45	1	0	0	0	0	0	0
Feb	79	75	25	30	35	35	38.2±07	40	50	50	1	0	0	0	0	0	0
Mar	91	93	35	35	40	45	44.3±08	50	55	55	2	0	4	0	0	0	0
Apr	91	91	35	35	40	45	46.9±09	55	60	60	7	0	14	0	0	0	0
May	86	83	35	35	45	50	51.8±12	60	70	70	15	2	29	2	0	0	0
Jun	97	98	35	35	40	50	49.5±10	55	60	65	11	1	22	1	0	0	0
Jul	95	94	25	30	35	40	43.3±12	50	60	65	8	1	15	1	0	0	0
Aug	97	97	25	30	35	40	41.2±11	50	55	60	5	1	9	0	0	0	0
Sep	94	93	20	25	30	35	33.9±07	40	45	45	0	0	0	0	0	0	0
Oct	97	96	20	25	30	35	35.0±08	40	45	45	0	0	0	0	0	0	0
Nov	98	98	25	25	30	35	33.9±06	35	40	45	0	0	0	0	0	0	0
Dec	95	95	25	30	30	35	33.3±05	35	40	40	0	0	0	0	0	0	0

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100. Av. period BY YEAR = 8760 hrs; BY G.S. = 4416 hrs.
2. % Valid Days = # days with 75 % of hours between 09:00 and 21:00 / (total # days) * 100 (Federal Register 1979).
3. Cumulative Index S06 = Σ $[O_3]$/1000, where $[O_3]$ is hourly ozone concentrations ≥ 60 ppb (Lee et al. 1988).
4. Cumulative Index S08 = Σ $[O_3]$/1000, where $[O_3]$ is hourly ozone concentrations ≥ 80 ppb (Lee et al. 1988).
5. Statistics for monthly composites over the period of record.
6. Monthly estimate of S06(08) = S06(08) * (# hours in that month) / (# valid hours).

Apache-Sitgreaves National Forest

DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS

A. BY YEAR.

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	0	30	51	11	0	0	5	1	1	0	0	0	0	0	0	0	0	0
1981	2	64	18	0	0	0	12	2	3	0	0	0	0	0	0	0	0	0
1982	2	45	44	1	0	0	6	2	3	0	0	0	0	0	0	0	0	0
1983	1	56	27	0	0	0	12	3	2	0	0	0	0	0	0	0	0	0
1984	0	75	0	0	0	0	25	0	0	0	0	0	0	0	0	0	0	0
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	1	49	35	3	0	0	9	2	2	0	0	0	0	0	0	0	0	0

B. BY GROWING SEASON (May through October).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	1	23	49	21	1	0	3	1	2	0	0	0	0	0	0	0	0	0
1981	2	54	22	0	0	0	15	3	6	0	0	0	0	0	0	0	0	0
1982	2	32	57	1	0	0	2	2	6	0	0	0	0	0	0	0	0	0
1983	2	41	36	0	0	0	15	5	3	0	0	1	0	0	0	0	0	0
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	2	37	41	6	0	0	9	3	4	0	0	0	0	0	0	0	0	0

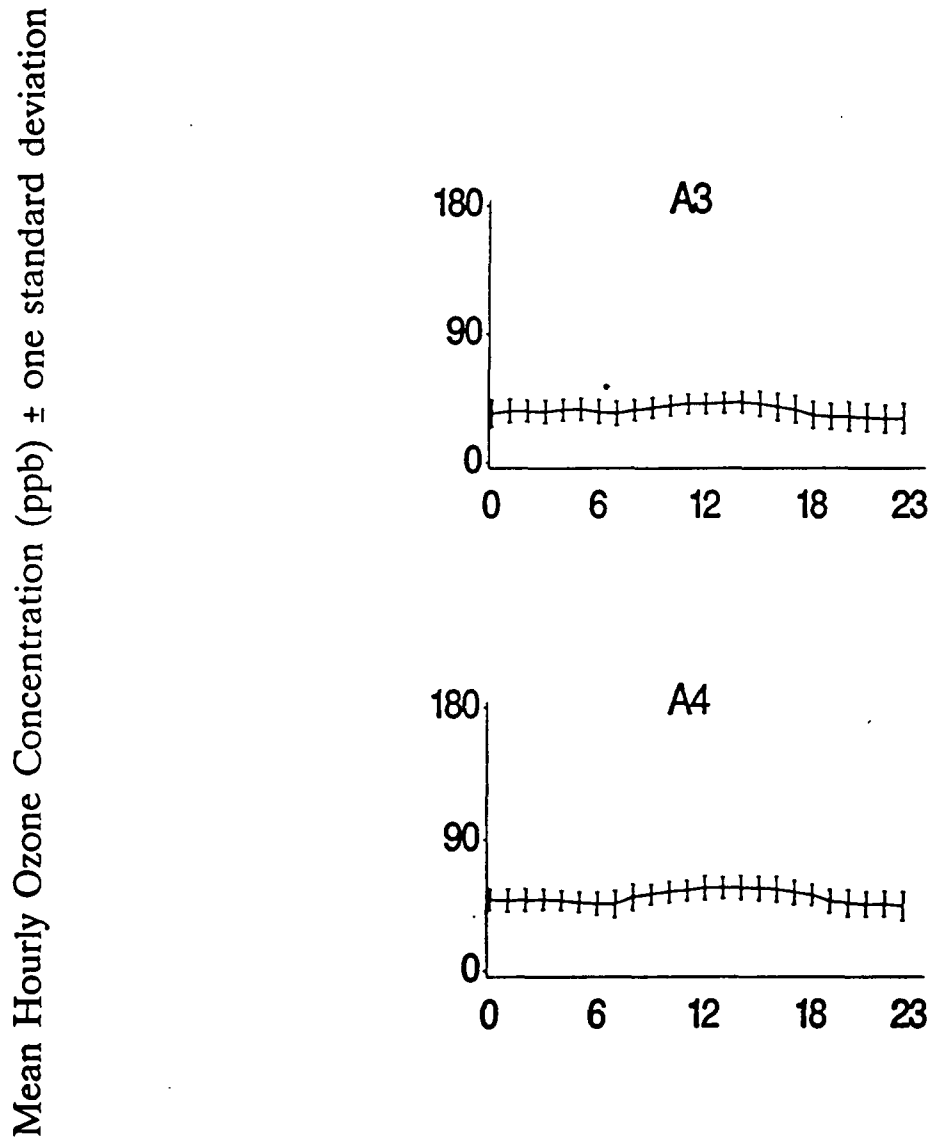
C. BY MONTH (composited over years).

Month	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
Jan	0	73	15	0	0	1	10	0	0	0	0	0	1	0	0	0	0	0
Feb	1	65	27	0	0	0	5	1	1	0	0	0	0	0	0	0	0	0
Mar	2	38	60	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
Apr	0	26	67	3	0	0	0	2	2	0	0	0	0	0	0	0	0	0
May	0	12	65	18	0	0	0	2	2	0	0	0	0	0	0	0	0	0
Jun	0	21	67	10	1	0	0	1	1	0	0	0	0	0	0	0	0	0
Jul	3	36	45	5	0	0	6	4	6	0	0	0	0	0	0	0	0	0
Aug	4	37	40	3	0	0	7	4	8	0	0	1	0	0	0	0	0	0
Sep	3	69	10	0	0	0	15	2	4	0	0	0	0	0	0	0	0	0
Oct	0	49	20	0	0	0	23	4	4	0	0	0	0	0	0	0	0	0
Nov	0	72	6	0	0	0	19	3	1	0	0	0	0	0	0	0	0	0
Dec	0	83	1	0	0	0	15	1	0	0	0	0	0	0	0	0	0	0

1. % days with unidentified diurnal patterns in hourly ozone concentration (see Böhm et al. 1990).
2. Pattern identifier relates to degree of diurnal variation in hourly ozone concentrations (A curves - least variation; E curves - greatest variation) and daily mean (1 curves - lowest mean; 6 curves highest mean) as described by Böhm et al (1990) and as illustrated in Figure 4C.1. Note that due to numeric rounding, the sums of percentages do not always equal 100.

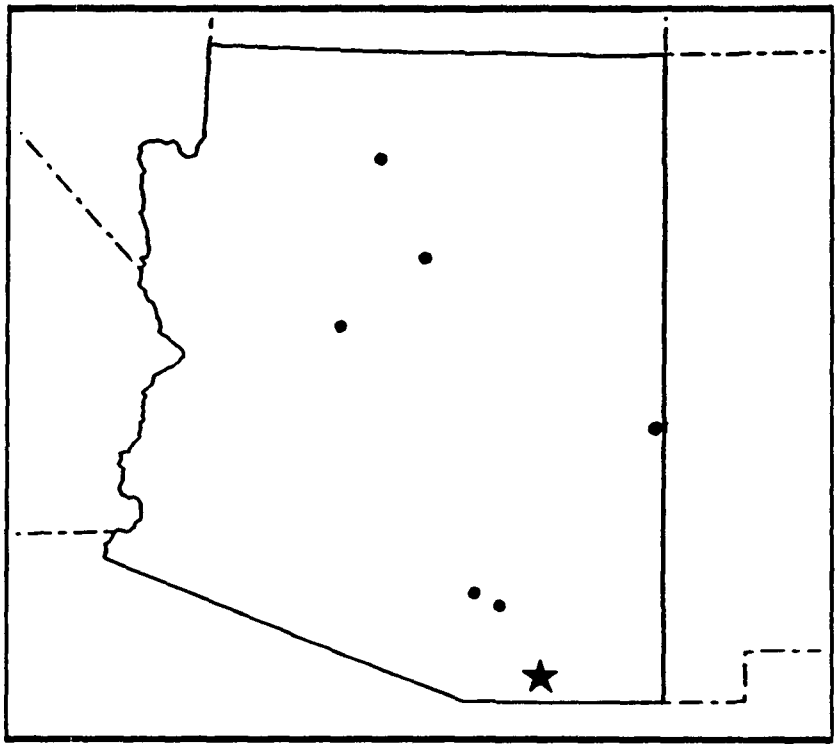
APACHE-SITGREAVES NATIONAL FOREST

DOMINANT DIURNAL PATTERNS IN HOURLY
OZONE CONCENTRATIONS (MAY - OCT)



COCHISE COUNTY ARIZONA

BIOGRAPHIC INFORMATION



Latitude	-	31.56° N
Longitude	-	110.29° W
Elevation (m)	-	1401
Basin Height (m)	-	1230.8
Landuse	-	Suburban - Residential
City Population	-	24,937
Basin Population	-	167,792
Start Summary	-	January, 1980
End Summary	-	August, 1985
Source of Data	-	AIRS (04-003-2003)

Cochise County

BASIC STATISTICS

A. BY YEAR (April through September).

Year	% Data Capt[1]	% Valid Days[2]	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	27	27	13	18	30	45	44.4±19	58	68	73	23	2	0	0	0
1981	40	40	17	22	31	40	39.4±12	49	55	58	4	0	0	0	0
1982	30	31	9	13	20	28	29.8±13	39	49	53	1	0	0	0	0
1983	28	27	14	17	26	36	35.8±14	48	54	57	2	0	0	0	0
1984	33	33	14	18	27	36	36.4±14	45	54	61	5	1	0	0	0
1985	39	39	9	15	26	34	34.1±13	44	51	55	2	0	0	0	0
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	33	33	13	17	26	37	36.5±15	47	55	60	6	0	0	0	0

B. BY GROWING SEASON (May through September).

Year	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06[3] (ppm hr)	S08[4] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	53	53	13	18	30	45	44.4±19	58	68	73	38	5	23	2	0	0	0
1981	78	79	17	22	31	40	39.4±12	49	55	58	8	0	4	0	0	0	0
1982	45	46	9	13	13	26	27.3±12	34	44	50	0	0	0	0	0	0	0
1983	51	50	13	17	26	36	34.9±13	45	53	56	2	0	1	0	0	0	0
1984	59	58	15	18	27	37	37.1±15	46	55	61	11	2	6	1	0	0	0
1985	62	61	8	14	24	34	33.0±14	42	51	55	4	0	2	0	0	0	0
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	58	58	13	17	25	36	36.4±15	47	55	60	-	-	6	0	0	0	0

C. BY MONTH [5].

Month	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06 (ppm hr)	S08[6] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
Jan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Feb	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mar	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Apr	65	64	16	21	30	37	37.3±12	46	54	58	2	0	4	0	0	0	0
May	76	77	13	16	25	36	35.3±14	45	53	57	2	1	3	0	0	0	0
Jun	54	53	20	25	31	40	40.2±13	49	57	60	4	1	7	0	0	0	0
Jul	78	78	13	17	26	39	38.4±17	49	59	71	6	1	10	1	0	0	0
Aug	77	77	13	17	26	37	37.2±15	49	56	63	4	1	7	0	0	0	0
Sep	71	71	8	13	21	32	32.0±15	42	52	58	2	0	3	0	0	0	0
Oct	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nov	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dec	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100. Av. period BY YEAR = 8760 hrs; BY G.S. = 4416 hrs.
2. % Valid Days = # days with 75 % of hours between 09:00 and 21:00 / (total # days) * 100 (Federal Register 1979).
3. Cumulative Index: S06 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 60 ppb (Lee et al. 1988).
4. Cumulative Index: S08 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 80 ppb (Lee et al. 1988).
5. Statistics for monthly composites over the period of record.
6. Monthly estimate of S06(08) = S06(08) * (# hours in that month) / (# valid hours).

Cochise County

DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS

A. BY YEAR (March through September).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	2	12	23	26	0	3	13	5	15	0	0	0	2	1	0	0	0	0
1981	6	14	12	0	0	0	5	21	37	4	0	0	6	1	0	0	0	0
1982	9	16	9	0	0	3	41	18	9	0	0	1	2	0	0	0	0	0
1983	2	9	18	0	0	1	13	21	19	8	0	3	9	0	0	0	0	0
1984	4	8	4	4	0	0	22	22	27	8	0	2	5	0	0	0	0	0
1985	12	11	5	0	0	3	19	19	30	3	0	1	9	1	0	0	0	0
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	6	12	11	4	0	2	18	18	24	4	0	1	6	0	0	0	0	0

B. BY GROWING SEASON (May through September).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	2	12	22	26	0	4	13	5	15	0	0	0	2	1	0	0	0	0
1981	6	14	12	0	0	0	5	22	37	4	0	0	6	1	0	0	0	0
1982	8	13	1	0	0	4	46	25	6	0	0	1	3	0	0	0	0	0
1983	2	10	18	0	0	1	14	21	18	6	0	2	10	0	0	0	0	0
1984	2	5	4	4	0	0	19	24	29	8	0	2	5	0	0	0	0	0
1985	8	10	4	0	0	3	21	21	26	2	0	1	10	1	0	0	0	0
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	5	11	10	5	0	2	18	20	23	4	0	1	6	1	0	0	0	0

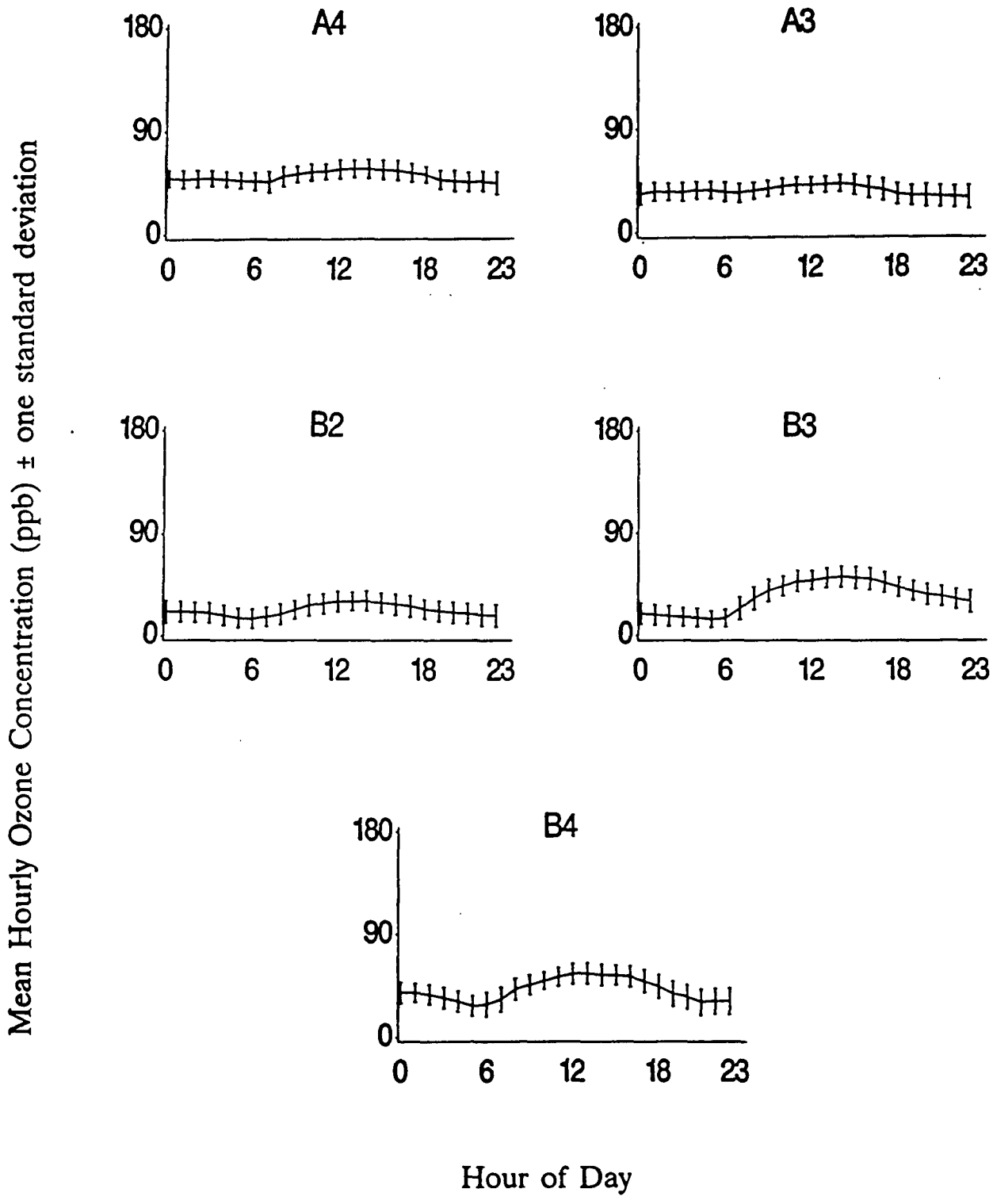
C. BY MONTH (composited over years).

Month	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
Jan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Feb	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mar	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Apr	18	20	18	0	0	0	20	7	29	5	0	0	2	0	0	0	0	0
May	4	17	15	2	0	4	23	10	24	3	0	0	0	1	0	0	0	0
Jun	8	16	13	1	0	0	1	15	36	10	0	0	4	1	0	0	0	0
Jul	7	6	7	9	0	1	15	28	21	3	0	0	10	0	0	0	0	0
Aug	2	5	7	8	0	1	15	30	22	3	0	2	7	1	0	0	0	0
Sep	5	12	11	1	0	3	31	11	19	1	0	3	10	0	0	0	0	0
Oct	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nov	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dec	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

1. % days with unidentified diurnal patterns in hourly ozone concentration (see Böhm et al. 1990).
2. Pattern identifier relates to degree of diurnal variation in hourly ozone concentrations (A curves - least variation; E curves - greatest variation) and daily mean (1 curves - lowest mean; 6 curves highest mean) as described by Böhm et al (1990) and as illustrated in Figure 4c.1. Note that due to numeric rounding, the sums of percentages do not always equal 100.

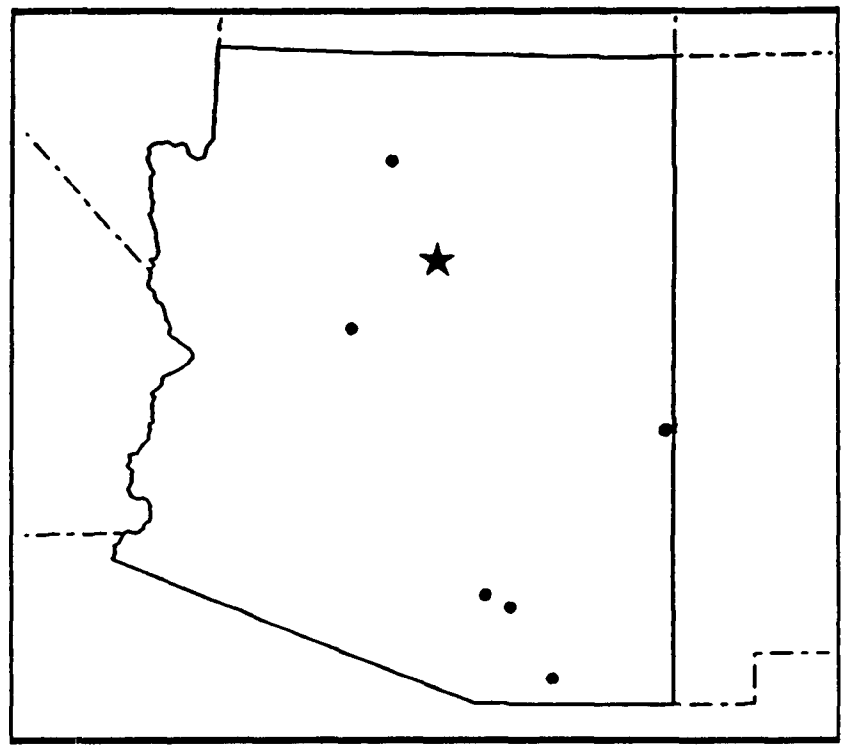
COCHISE COUNTY

DOMINANT DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS (MAY - OCT)



FLAGSTAFF **ARIZONA**

BIOGRAPHIC INFORMATION



Latitude	-	35.21° N
Longitude	-	111.61° W
Elevation (m)	-	2117
Basin Height (m)	-	1954.2
Landuse	-	Suburban - Commercial
City Population	-	34,743
Basin Population	-	645,599
Start Summary	-	May, 1980
End Summary	-	September, 1985
Source of Data	-	AIRS (04-005-1004)

Flagstaff

BASIC STATISTICS

A. BY YEAR (April through September).

Year	% Data Capt[1]	% Valid Days[2]	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	36	36	18	25	36	44	42.9±13	50	56	62	6	0	0	0	0
1981	45	45	15	23	33	43	41.4±14	50	56	63	9	0	0	0	0
1982	47	46	25	31	41	51	50.8±16	62	71	77	30	3	0	0	0
1983	50	50	19	26	36	46	44.9±15	56	63	67	17	0	0	0	0
1984	45	45	16	22	33	45	43.2±15	54	60	65	12	0	0	0	0
1985	49	49	15	23	33	43	41.1±13	49	56	59	5	0	0	0	0
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	45	45	17	25	35	45	44.1±15	53	62	67	13	1	0	0	0

B. BY GROWING SEASON (May through September).

Year	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06[3] (ppm hr)	S08[4] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	72	72	18	25	36	44	42.9±13	50	56	62	13	0	6	0	0	0	0
1981	73	73	15	22	31	43	41.3±14	53	60	63	22	0	10	0	0	0	0
1982	81	79	22	28	38	50	49.8±16	62	71	77	71	11	28	3	0	0	0
1983	83	83	19	23	33	46	44.5±15	56	63	67	43	2	18	0	0	0	0
1984	74	73	16	21	21	43	41.8±15	52	59	65	22	1	10	0	0	0	0
1985	80	80	17	24	33	43	41.5±13	49	56	61	12	0	5	0	0	0	0
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	77	77	17	24	34	44	43.7±15	53	62	67	-	-	13	1	0	0	0

C. BY MONTH [5].

Month	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06 (ppm hr)	S08[6] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
Jan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Feb	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mar	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Apr	94	93	18	27	40	49	46.5±14	55	62	67	7	1	14	1	0	0	0
May	96	97	23	30	41	51	49.3±14	59	67	70	13	1	25	0	0	0	0
Jun	91	91	26	33	43	53	51.8±15	62	71	77	15	2	28	3	0	0	0
Jul	88	86	20	24	33	43	41.1±12	50	56	59	3	0	4	0	0	0	0
Aug	93	92	17	23	33	42	40.6±13	49	56	60	3	1	6	0	0	0	0
Sep	96	96	12	17	28	37	35.9±13	45	51	55	1	0	2	0	0	0	0
Oct	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nov	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dec	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100. Av. period BY YEAR = 8760 hrs; BY G.S. = 4416 hrs.
2. % Valid Days = # days with 75 % of hours between 09:00 and 21:00 / (total # days) * 100 (Federal Register 1979).
3. Cumulative Index S06 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 60 ppb (Lee et al. 1988).
4. Cumulative Index S08 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 80 ppb (Lee et al. 1988).
5. Statistics for monthly composites over the period of record.
6. Monthly estimate of S06(08) = S06(08) * (# hours in that month) / (# valid hours).

Flagstaff

DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS

A. BY YEAR (March through September).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	7	19	36	4	0	0	3	13	20	2	0	0	4	1	0	0	0	0
1981	3	22	28	5	0	0	1	15	17	2	0	0	6	4	0	0	0	0
1982	1	10	35	25	1	0	3	10	9	6	0	0	1	1	0	0	0	0
1983	5	14	37	9	0	0	2	13	16	6	0	0	2	1	0	0	0	0
1984	7	14	25	10	0	1	5	13	23	4	0	0	5	0	0	0	0	0
1985	6	13	30	0	0	0	5	14	30	3	0	1	3	1	0	0	0	0
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	5	15	32	9	0	0	3	13	19	4	0	0	4	1	0	0	0	0

B. BY GROWING SEASON (May through September).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	7	19	36	4	0	0	3	13	20	2	0	0	4	1	0	0	0	0
1981	4	23	27	6	0	0	1	14	14	3	0	0	8	4	0	0	0	0
1982	1	11	32	23	1	0	3	11	10	7	0	0	1	1	0	0	0	0
1983	6	16	33	8	0	0	3	13	19	6	0	0	2	1	0	0	0	0
1984	8	14	20	10	0	1	6	14	25	2	0	0	7	0	0	0	0	0
1985	6	12	32	0	0	0	5	14	31	3	0	1	2	1	0	0	0	0
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	5	16	30	9	0	0	3	13	20	4	0	0	4	1	0	0	0	0

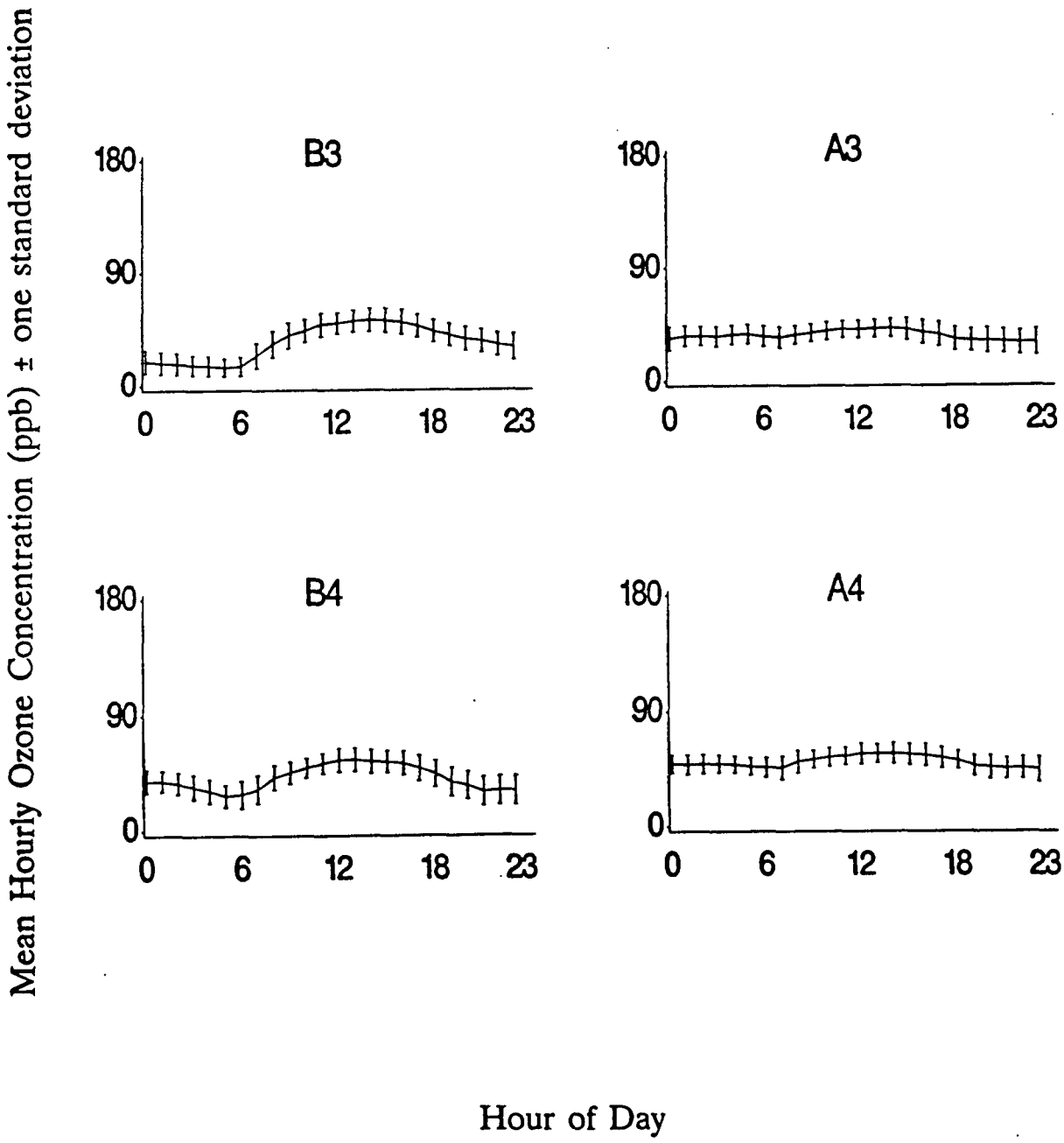
C. BY MONTH (composited over years).

Month	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
Jan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Feb	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mar	0	25	0	0	0	0	25	25	0	25	0	0	0	0	0	0	0	0
Apr	3	11	43	9	0	0	2	10	17	5	0	1	2	0	0	0	0	0
May	3	6	42	17	0	0	2	8	15	7	0	0	1	2	0	0	0	0
Jun	5	6	46	24	1	0	1	4	12	5	0	0	1	1	0	0	0	0
Jul	6	16	24	1	0	0	4	20	30	4	0	0	1	0	0	0	0	0
Aug	7	17	26	1	0	0	1	17	28	2	0	0	5	2	0	0	0	0
Sep	5	33	11	0	0	1	9	18	15	1	0	1	10	1	0	0	0	0
Oct	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nov	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dec	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

1. % days with unidentified diurnal patterns in hourly ozone concentration (see Böhm et al. 1990).
2. Pattern identifier relates to degree of diurnal variation in hourly ozone concentrations (A curves - least variation; E curves - greatest variation) and daily mean (1 curves - lowest mean; 6 curves highest mean) as described by Böhm et al (1990) and as illustrated in Figure 4C.1. Note that due to numeric rounding, the sums of percentages do not always equal 100.

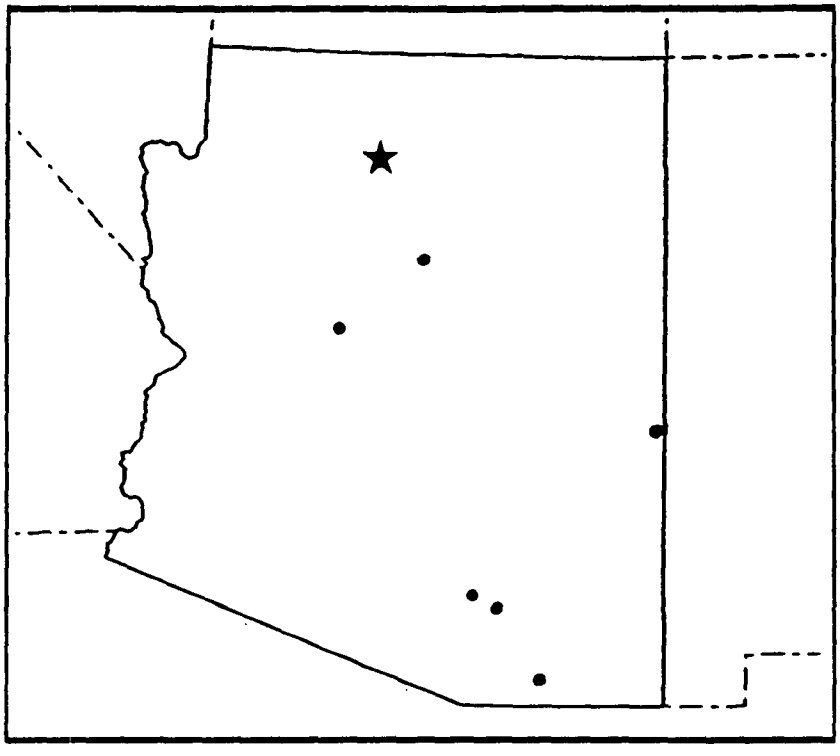
FLAGSTAFF

DOMINANT DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS (MAY - SEP)



GRAND CANYON NATIONAL PARK **ARIZONA**

BIOGRAPHIC INFORMATION



Latitude	-	36.06° N
Longitude	-	112.12° W
Elevation (m)	-	2073
Basin Height (m)	-	1846.2
Landuse	-	Rural - Desert
City Population	-	Not In A City
Basin Population	-	645,599
Start Summary	-	July, 1981
End Summary	-	November, 1983
Source of Data	-	National Park Service

Grand Canyon National Park

DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS

A. BY YEAR (April through November).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	5	52	40	0	0	0	0	2	5	0	0	0	0	0	0	0	0	0
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	0	35	0	0	0	1	65	0	0	0	0	0	0	0	0	0	0	0
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	1	38	7	0	0	0	53	0	1	0	0	0	0	0	0	0	0	0

B. BY GROWING SEASON (May through October).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	5	52	40	0	0	0	0	2	5	0	0	0	0	0	0	0	0	0
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	0	31	0	0	0	1	69	0	0	0	0	0	0	0	0	0	0	0
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	1	35	8	0	0	1	54	1	1	0	0	0	0	0	0	0	0	0

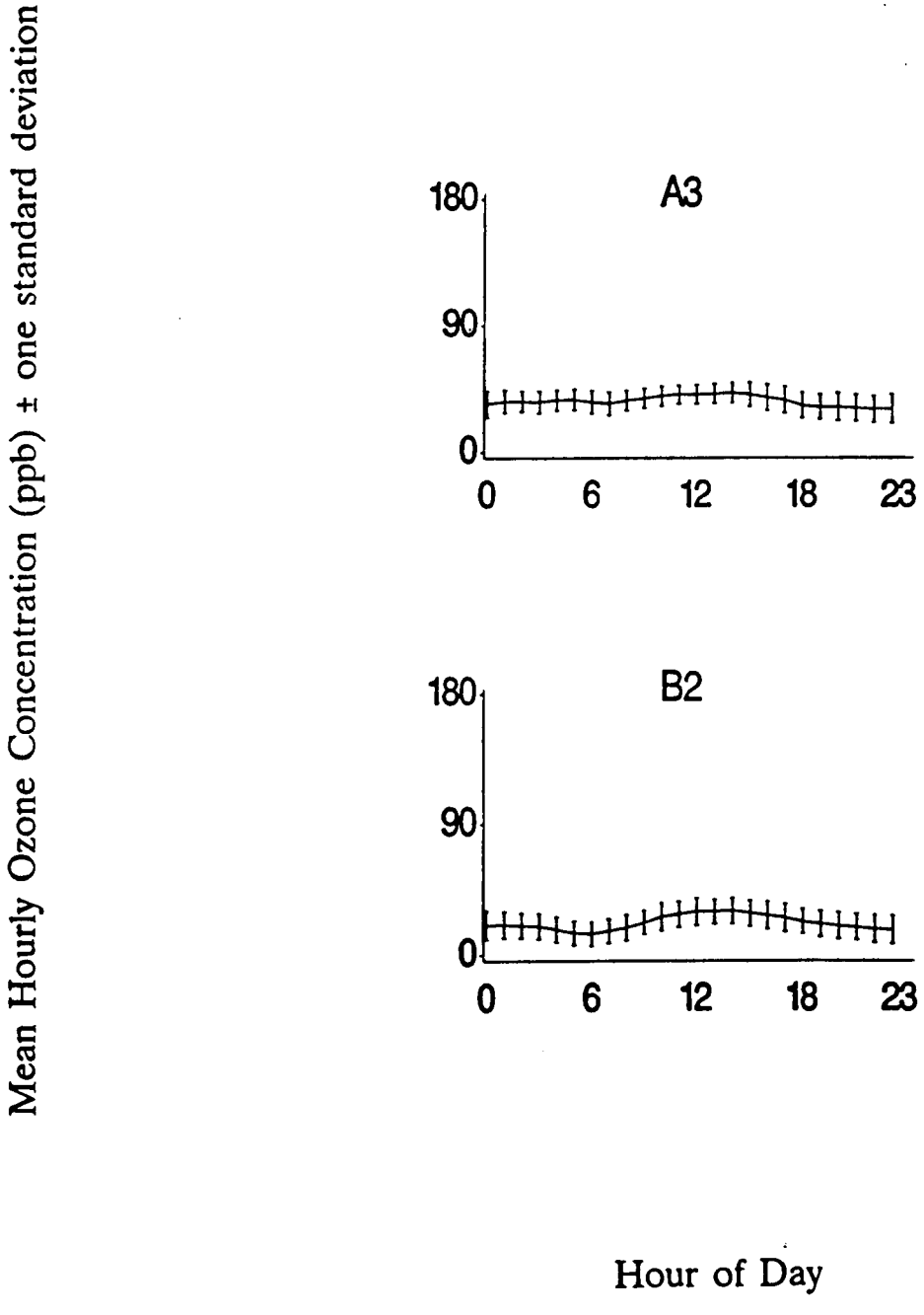
C. BY MONTH (composited over years).

Month	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
Jan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Feb	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mar	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Apr	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
May	0	33	0	0	0	0	67	0	0	0	0	0	0	0	0	0	0	0
Jun	0	74	0	0	0	0	26	0	0	0	0	0	0	0	0	0	0	0
Jul	0	47	5	0	0	0	45	0	3	0	0	0	0	0	0	0	0	0
Aug	2	27	25	0	0	2	43	2	2	0	0	0	0	0	0	0	0	0
Sep	3	33	0	0	0	0	67	0	0	0	0	0	0	0	0	0	0	0
Oct	0	3	0	0	0	0	97	0	0	0	0	0	0	0	0	0	0	0
Nov	0	6	0	0	0	0	94	0	0	0	0	0	0	0	0	0	0	0
Dec	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

1. % days with unidentified diurnal patterns in hourly ozone concentration (see Böhm et al. 1990).
2. Pattern identifier relates to degree of diurnal variation in hourly ozone concentrations (A curves - least variation; E curves - greatest variation) and daily mean (1 curves - lowest mean; 6 curves highest mean) as described by Böhm et al (1990) and as illustrated in Figure 4C.1. Note that due to numeric rounding, the sums of percentages do not always equal 100.

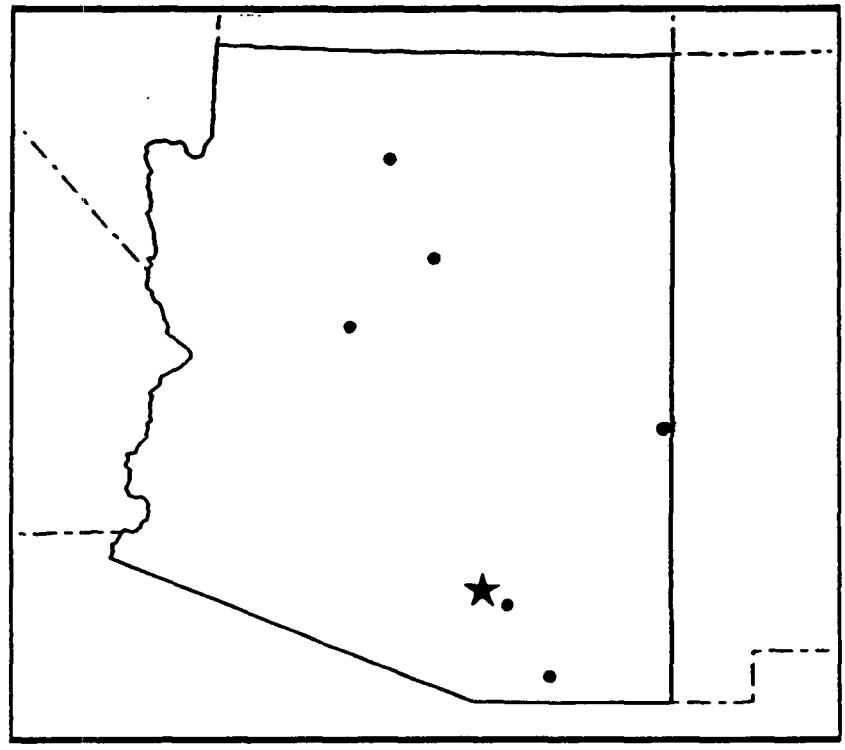
GRAND CANYON NATIONAL PARK

DOMINANT DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS (MAY - OCT)



PIMA COUNTY ARIZONA

BIOGRAPHIC INFORMATION



Latitude	-	32.29° N
Longitude	-	111.00° W
Elevation (m)	-	695
Basin Height (m)	-	632.6
Landuse	-	Suburban - Residential
City Population	-	Not In A City
Basin Population	-	2,189,162
Start Summary	-	January, 1980
End Summary	-	December, 1989
Source of Data	-	AIRS (04-019-0019)

Pima County

BASIC STATISTICS

A. BY YEAR.

Year	% Data Capt[1]	% Valid Days[2]	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	74	73	1	3	8	21	25.0±20	38	52	62	6	1	0	0	0
1981	89	90	3	5	9	25	27.9±21	45	58	65	10	1	0	0	0
1982	89	88	3	5	10	23	28.5±21	44	60	68	10	1	0	0	2
1983	80	80	1	3	8	24	26.9±21	42	57	66	8	1	0	0	1
1984	88	87	2	4	8	22	26.3±20	42	56	63	7	1	0	0	0
1985	92	92	1	3	6	20	25.5±21	40	57	65	9	1	0	0	0
1986	87	86	0	1	4	17	21.8±19	36	50	59	5	0	0	0	0
1987	79	81	0	0	4	21	22.9±19	38	49	55	3	0	0	0	0
1988	92	92	0	0	1	18	21.7±20	38	52	58	4	0	0	0	0
1989	75	74	0	1	7	23	25.8±21	42	56	62	7	0	0	0	0
All Years	85	84	0	2	7	21	25.2±21	40	55	62	7	1	0	0	3

B. BY GROWING SEASON (May through October).

Year	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06[3] (ppm hr)	S08[4] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	67	66	1	4	14	30	32.5±22	50	63	71	28	6	13	2	0	0	0
1981	96	96	3	5	13	30	32.9±22	50	62	70	41	7	14	2	0	0	0
1982	86	86	2	3	11	30	32.6±23	50	64	72	39	10	14	3	0	0	2
1983	85	86	0	2	9	27	30.0±23	47	63	72	36	8	13	2	0	0	1
1984	87	86	1	4	4	28	30.0±21	46	60	68	28	5	10	1	0	0	0
1985	91	91	2	3	10	27	30.0±23	48	63	70	38	7	14	2	0	0	0
1986	80	78	1	2	7	26	27.2±20	43	55	62	17	1	7	0	0	0	0
1987	95	98	0	1	7	25	25.9±20	42	52	58	12	1	4	0	0	0	0
1988	88	88	0	1	6	26	26.7±21	43	55	62	17	1	6	0	0	0	0
1989	81	80	1	4	12	30	30.5±20	47	58	64	21	1	9	0	0	0	0
All Years	86	85	1	2	10	28	29.8±22	46	60	68	-	-	10	1	0	0	3

C. BY MONTH [5].

Month	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06 (ppm hr)	S08[6] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
Jan	97	96	0	1	4	10	16.0±14	27	38	43	1	1	0	0	0	0	0
Feb	92	93	0	2	5	12	18.8±17	31	45	50	1	1	1	0	0	0	0
Mar	81	80	2	4	8	25	26.8±20	43	55	60	3	1	6	0	0	0	0
Apr	87	86	0	3	10	31	31.1±22	49	60	67	6	1	11	0	0	0	0
May	86	86	1	4	13	32	32.8±22	50	61	69	7	1	13	1	0	0	0
Jun	92	92	1	4	14	32	32.6±22	49	62	69	7	1	12	1	0	0	0
Jul	83	84	3	7	16	32	33.3±20	49	60	69	7	1	12	2	0	0	0
Aug	84	84	3	6	15	33	34.6±22	50	65	74	9	3	16	3	0	0	1
Sep	92	92	0	1	7	22	25.4±21	40	55	62	4	1	7	1	0	0	2
Oct	85	85	0	1	3	14	20.3±19	35	50	55	2	1	3	0	0	0	0
Nov	90	92	0	1	4	10	17.1±16	30	40	47	1	1	1	0	0	0	0
Dec	88	89	0	0	3	9	14.1±14	23	37	41	1	1	0	0	0	0	0

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100. Av. period BY YEAR = 8760 hrs; BY G.S. = 4416 hrs.
2. % Valid Days = # days with 75 % of hours between 09:00 and 21:00 / (total # days) * 100 (Federal Register 1979).
3. Cumulative Index S06 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 60 ppb (Lee et al. 1988).
4. Cumulative Index S08 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 80 ppb (Lee et al. 1988).
5. Statistics for monthly composites over the period of record.
6. Monthly estimate of S06(08) = S06(08) * (# hours in that month) / (# valid hours).

Pima County

DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS

A. BY YEAR.

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	6	6	0	0	0	3	11	8	2	2	12	25	18	12	0	0	0	0
1981	7	2	1	0	0	3	6	12	5	1	5	25	20	21	0	0	0	0
1982	2	2	1	0	0	4	9	8	3	3	1	25	20	24	0	0	1	0
1983	4	3	2	1	0	3	6	7	5	1	3	21	27	21	0	0	1	0
1984	5	3	3	0	0	5	3	10	5	2	5	26	23	15	0	0	0	0
1985	3	2	1	0	0	7	7	9	3	2	11	20	17	22	0	0	0	0
1986	3	3	0	0	0	12	5	9	4	1	13	23	20	9	0	0	0	0
1987	4	4	2	0	0	4	6	12	3	0	12	23	22	11	0	0	0	0
1988	2	2	0	0	0	5	4	11	4	0	20	23	20	11	0	0	0	0
1989	3	1	0	0	0	4	6	14	4	2	10	17	22	20	0	0	0	0
All Years	4	3	1	0	0	5	6	10	4	1	9	23	21	17	0	0	0	0

B. BY GROWING SEASON (May through October).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	3	6	0	0	0	0	4	18	5	4	0	11	24	27	0	0	1	0
1981	8	2	2	0	0	1	4	17	7	1	0	4	27	34	0	0	0	0
1982	1	1	1	0	0	1	3	11	7	3	1	12	24	36	0	0	1	0
1983	4	2	1	1	0	4	4	9	4	2	4	8	28	32	0	0	1	0
1984	5	3	4	1	0	1	3	14	7	1	0	16	28	23	0	0	1	0
1985	4	1	0	0	0	3	3	13	4	3	3	13	22	35	0	0	1	0
1986	3	3	1	0	0	0	7	14	6	1	3	18	32	15	0	0	0	0
1987	3	3	3	0	0	3	5	14	4	1	5	17	28	18	0	0	0	0
1988	1	3	1	0	0	1	2	17	6	0	3	21	29	17	0	0	0	0
1989	1	1	0	0	0	1	7	21	5	4	1	7	29	25	0	0	0	0
All Years	4	2	1	0	0	1	4	14	5	2	2	13	27	27	0	0	0	0

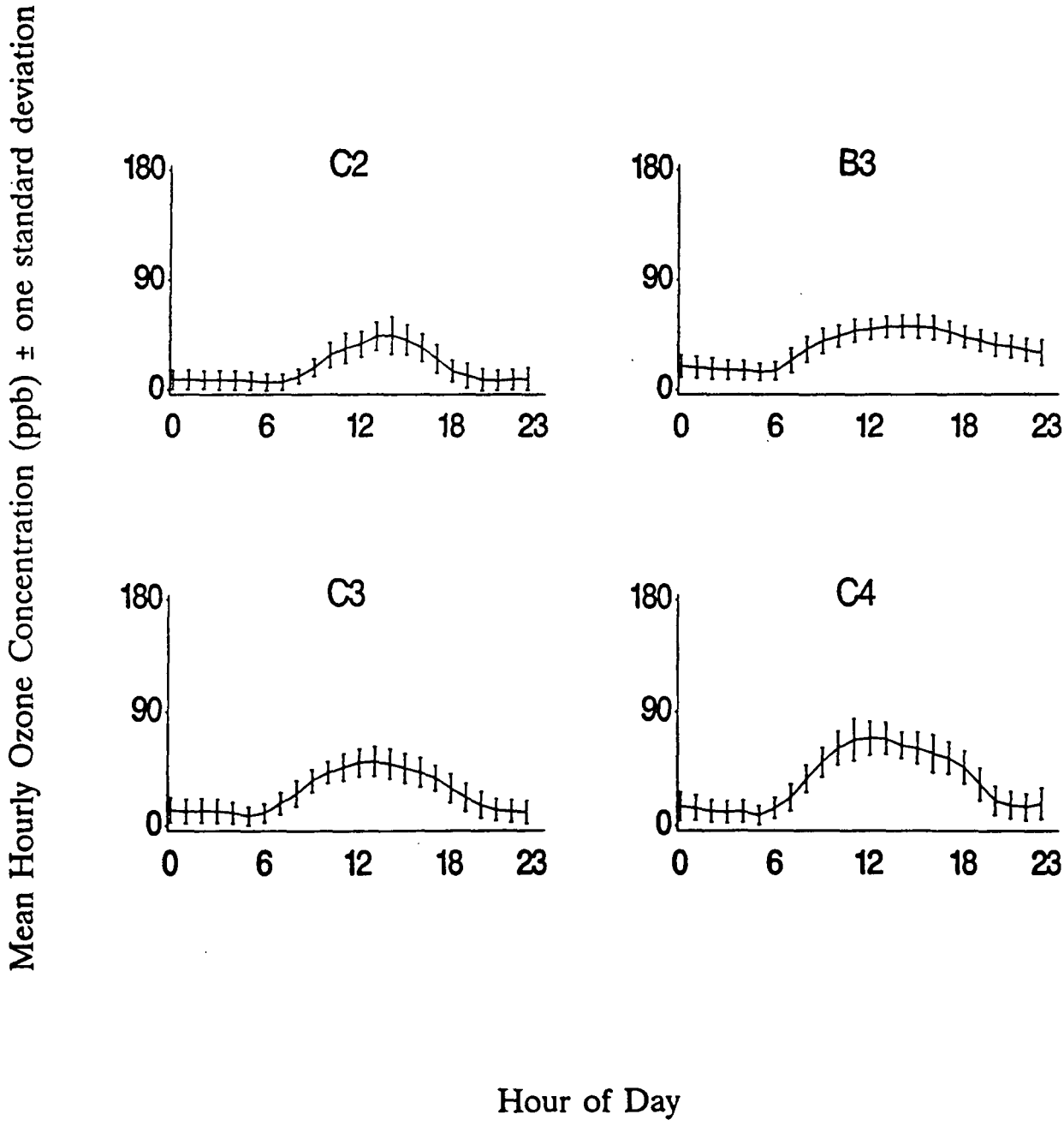
C. BY MONTH (composited over years).

Month	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
Jan	5	1	0	0	0	13	14	1	0	0	27	40	1	0	0	0	0	0
Feb	5	1	0	0	0	10	11	1	0	0	11	57	9	0	0	0	0	0
Mar	4	8	1	0	0	2	5	12	5	1	0	19	37	10	0	0	0	0
Apr	2	5	2	0	0	0	3	14	6	3	0	4	33	29	0	0	0	0
May	2	2	0	0	0	0	2	24	5	1	0	2	19	44	0	0	0	0
Jun	2	0	0	0	0	1	1	18	5	1	0	2	24	46	0	0	0	0
Jul	4	2	0	0	0	0	5	22	11	3	0	0	28	28	0	0	0	0
Aug	4	2	4	1	0	0	2	17	9	5	0	3	28	27	0	0	1	0
Sep	5	3	2	0	0	4	7	6	3	1	2	18	40	14	0	0	1	0
Oct	4	5	0	0	0	4	6	2	0	0	8	48	24	2	0	0	0	0
Nov	5	2	0	0	0	7	10	2	0	0	24	48	6	0	0	0	0	0
Dec	6	1	0	0	0	19	6	0	0	0	37	35	1	0	0	0	0	0

1. % days with unidentified diurnal patterns in hourly ozone concentration (see Böhm et al. 1990).
2. Pattern identifier relates to degree of diurnal variation in hourly ozone concentrations (A curves - least variation; E curves - greatest variation) and daily mean (1 curves - lowest mean; 6 curves highest mean) as described by Böhm et al (1990) and as illustrated in Figure 4C.1. Note that due to numeric rounding, the sums of percentages do not always equal 100.

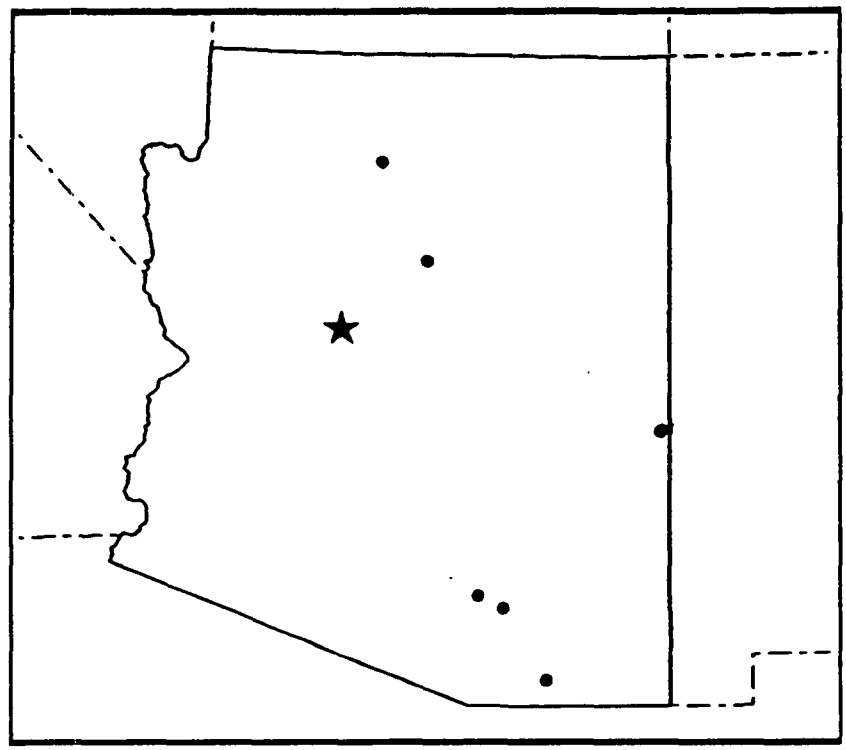
PIMA COUNTY

DOMINANT DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS (MAY - OCT)



PRESCOTT **ARIZONA**

BIOGRAPHIC INFORMATION



Latitude	-	34.55° N
Longitude	-	112.48° W
Elevation (m)	-	1673
Basin Height (m)	-	1384.6
Landuse	-	Suburban - Commercial
City Population	-	20,053
Basin Population	-	645,599
Start Summary	-	April, 1981
End Summary	-	September, 1984
Source of Data	-	AIRS (04-025-0002)

Prescott

DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS

A. BY YEAR (March through September).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	5	6	4	0	0	0	8	25	13	2	0	1	32	9	0	0	0	0
1982	8	9	3	1	0	1	3	15	16	1	0	4	31	14	0	0	0	0
1983	5	8	6	0	0	2	24	16	13	2	0	2	25	3	0	0	0	0
1984	4	7	2	1	0	9	8	19	14	1	2	2	24	11	0	0	0	0
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	6	7	4	0	0	4	11	19	14	1	1	2	27	9	0	0	0	0

B. BY GROWING SEASON (May through September).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	5	6	4	0	0	0	8	25	13	2	0	1	32	9	0	0	0	0
1982	9	10	3	1	0	1	3	13	18	1	0	3	32	14	0	0	0	0
1983	6	7	4	0	0	3	30	12	12	0	0	2	29	2	0	0	0	0
1984	4	4	1	0	0	10	9	18	13	1	2	2	27	12	0	0	0	0
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	6	7	3	0	0	4	12	17	14	1	1	2	30	9	0	0	0	0

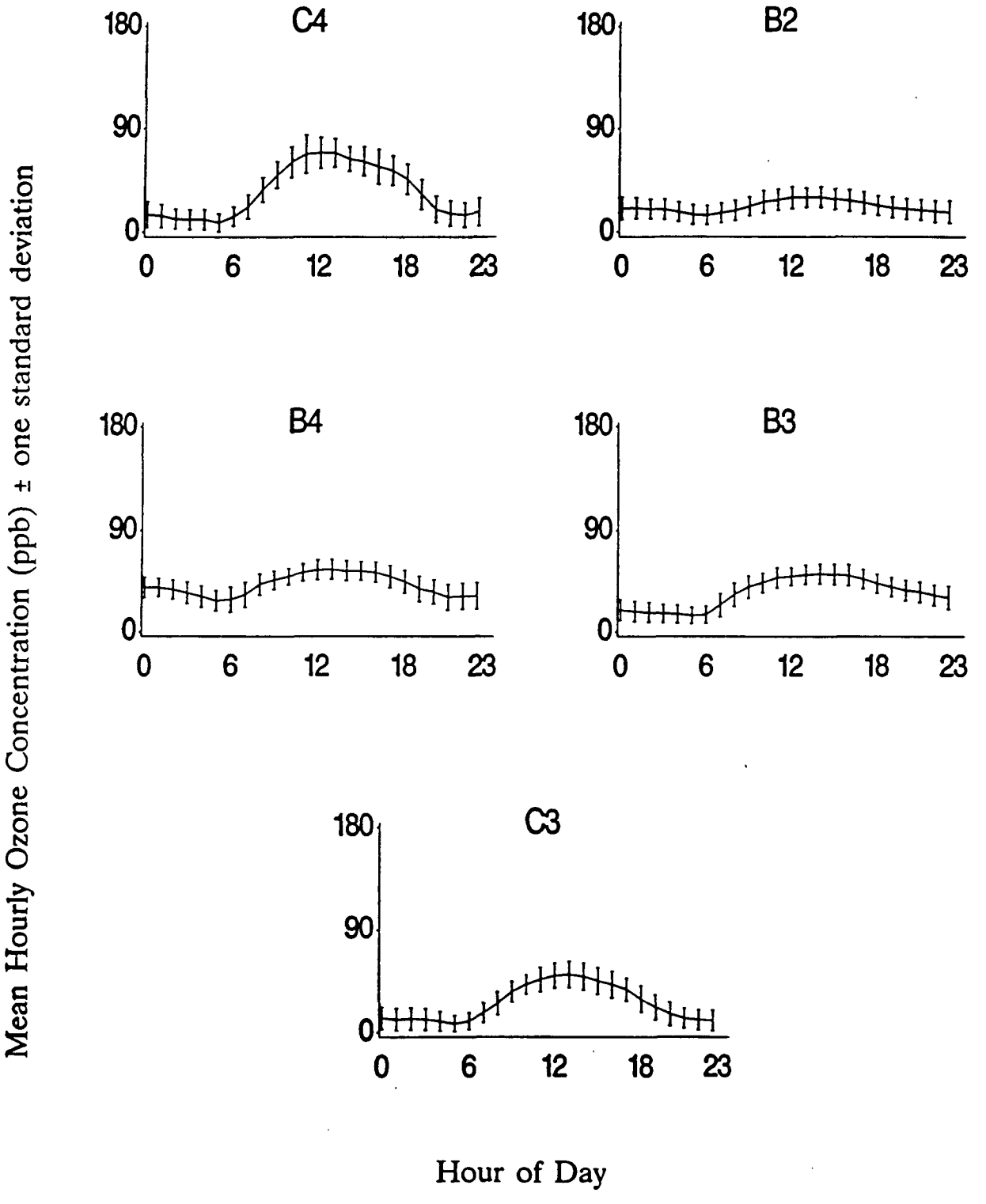
C. BY MONTH (composited over years).

Month	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
Jan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Feb	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mar	0	50	0	0	0	0	0	0	0	0	0	50	0	0	0	0	0	0
Apr	2	13	13	2	0	0	2	31	19	4	0	0	9	7	0	0	0	0
May	4	6	7	0	0	3	4	23	31	1	0	0	10	15	0	0	0	0
Jun	6	5	3	1	0	11	11	18	20	3	2	2	12	9	0	0	0	0
Jul	9	8	1	0	0	3	20	18	13	1	0	1	26	9	0	0	0	0
Aug	5	8	4	0	0	1	3	19	5	0	0	3	44	13	0	0	0	0
Sep	5	7	0	0	0	2	19	10	2	0	1	4	52	3	0	0	0	0
Oct	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nov	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dec	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

1. % days with unidentified diurnal patterns in hourly ozone concentration (see Böhm et al. 1990).
2. Pattern identifier relates to degree of diurnal variation in hourly ozone concentrations (A curves - least variation; E curves - greatest variation) and daily mean (1 curves - lowest mean; 6 curves highest mean) as described by Böhm et al (1990) and as illustrated in Figure 4C.1. Note that due to numeric rounding, the sums of percentages do not always equal 100.

PRESCOTT

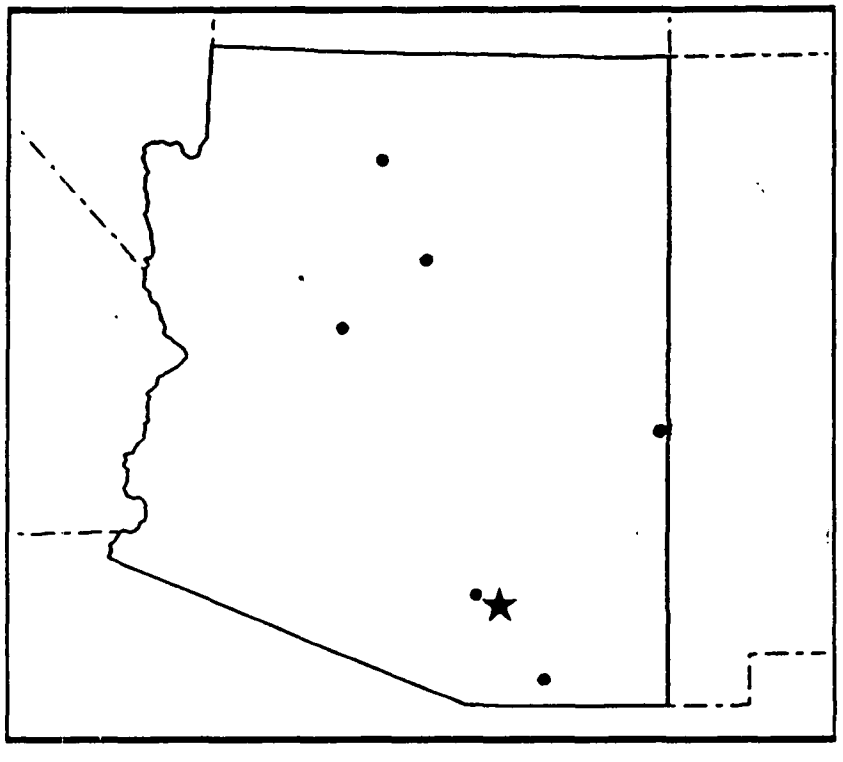
DOMINANT DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS (MAY - SEP)



SAGUARO NATIONAL MONUMENT

ARIZONA

BIOGRAPHIC INFORMATION



Latitude	-	32.18° N
Longitude	-	110.74° W
Elevation (m)	-	933
Basin Height (m)	-	734.2
Landuse	-	Rural - Desert
City Population	-	Not In A City
Basin Population	-	2,189,162
Start Summary	-	July, 1982
End Summary	-	July, 1989
Source of Data	-	National Park Service

Saguaro National Monument

BASIC STATISTICS

A. BY YEAR.

Year	% Data Capt[1]	% Valid Days[2]	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	54	54	15	19	25	30	32.3±12	39	48	54	3	0	0	0	0
1983	79	79	20	23	30	37	38.3±13	45	57	61	6	1	0	0	0
1984	92	91	19	22	30	38	38.2±13	46	54	60	5	0	0	0	0
1985	39	39	22	27	32	40	41.3±13	49	60	65	10	1	0	0	0
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	61	64	15	18	25	33	33.3±12	40	48	53	2	0	0	0	0
1988	92	96	19	23	29	37	38.0±13	46	54	60	5	0	0	0	0
1989	29	27	15	20	27	35	35.7±13	44	53	59	5	0	0	0	0
All Years	64	64	18	21	28	36	36.9±13	45	54	60	5	0	0	0	0

B. BY GROWING SEASON (May through October).

Year	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06[3] (ppm hr)	S08[4] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	74	74	15	20	25	32	34.1±13	40	50	57	9	1	4	0	0	0	0
1983	70	70	21	27	33	42	43.4±14	53	60	68	26	4	12	1	0	0	0
1984	91	90	20	23	23	38	38.5±13	46	55	61	18	2	7	1	0	0	0
1985	33	33	28	30	34	41	44.1±13	51	61	68	14	3	13	2	0	0	0
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	90	93	15	18	25	34	33.8±12	42	49	55	8	1	3	0	0	0	0
1988	93	97	21	25	32	40	41.1±13	49	59	66	26	3	9	1	0	0	0
1989	12	8	30	33	39	45	46.6±11	54	60	65	5	1	14	1	0	0	0
All Years	66	67	19	22	30	38	38.8±14	47	57	63	-	-	8	1	0	0	0

C. BY MONTH [5].

Month	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06 (ppm hr)	S08[6] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
Jan	92	94	12	18	24	30	29.5±09	36	40	42	1	0	0	0	0	0	0
Feb	88	88	20	24	29	35	35.0±09	40	47	50	1	0	1	0	0	0	0
Mar	67	68	27	30	36	42	42.4±10	49	55	60	3	1	5	0	0	0	0
Apr	78	79	32	34	40	46	47.0±11	53	60	66	6	1	11	1	0	0	0
May	86	84	27	30	36	43	44.4±12	52	60	65	6	1	11	1	0	0	0
Jun	82	82	20	24	30	38	39.5±13	47	58	64	5	1	8	1	0	0	0
Jul	80	80	15	20	28	38	38.9±15	49	59	65	5	1	10	1	0	0	0
Aug	86	87	20	24	30	38	39.5±13	48	57	63	4	1	8	1	0	0	0
Sep	94	96	18	21	28	35	36.2±13	44	52	58	3	1	4	1	0	0	0
Oct	81	83	15	19	25	32	32.1±11	39	45	50	1	0	1	0	0	0	0
Nov	95	97	17	20	25	31	31.4±09	38	42	48	1	0	0	0	0	0	0
Dec	92	94	12	17	22	29	27.9±09	33	38	41	1	0	0	0	0	0	0

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100. Av. period BY YEAR = 8760 hrs; BY G.S. = 4416 hrs.
2. % Valid Days = # days with 75 % of hours between 09:00 and 21:00 / (total # days) * 100 (Federal Register 1979).
3. Cumulative Index S06 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 60 ppb (Lee et al. 1988).
4. Cumulative Index S08 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 80 ppb (Lee et al. 1988).
5. Statistics for monthly composites over the period of record.
6. Monthly estimate of S06(08) = S06(08) * (# hours in that month) / (# valid hours).

Saguaro National Monument

DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS

A. BY YEAR.

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	7	34	6	0	0	1	41	3	10	3	0	0	2	0	0	0	0	0
1983	3	50	20	4	0	0	15	4	4	2	0	0	1	0	0	0	0	0
1984	3	46	22	1	0	0	11	7	7	4	1	1	1	0	0	0	0	0
1985	4	46	25	10	1	0	10	1	7	1	0	0	0	0	0	0	0	0
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	6	46	5	0	0	1	23	4	12	5	0	2	1	0	0	0	0	0
1988	5	39	20	3	0	0	20	6	9	2	0	0	0	0	0	0	0	0
1989	3	45	19	0	0	0	27	0	3	1	1	4	0	0	0	0	0	0
All Years	4	44	17	2	0	0	19	4	7	3	0	1	1	0	0	0	0	0

B. BY GROWING SEASON (May through October).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	10	32	10	0	0	0	32	5	15	4	0	0	3	0	0	0	0	0
1983	3	29	33	9	0	0	8	7	8	4	0	0	1	0	0	0	0	0
1984	4	44	14	1	0	0	7	13	12	8	0	1	1	0	0	0	0	0
1985	2	42	27	17	0	0	2	0	10	3	0	0	0	0	0	0	0	0
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	8	35	7	0	0	2	24	6	16	7	0	2	2	0	0	0	0	0
1988	7	28	23	5	0	0	12	12	14	5	0	0	1	0	0	0	0	0
1989	0	0	83	0	0	0	0	0	17	0	0	0	0	0	0	0	0	0
All Years	6	34	19	4	0	0	14	8	13	5	0	0	1	0	0	0	0	0

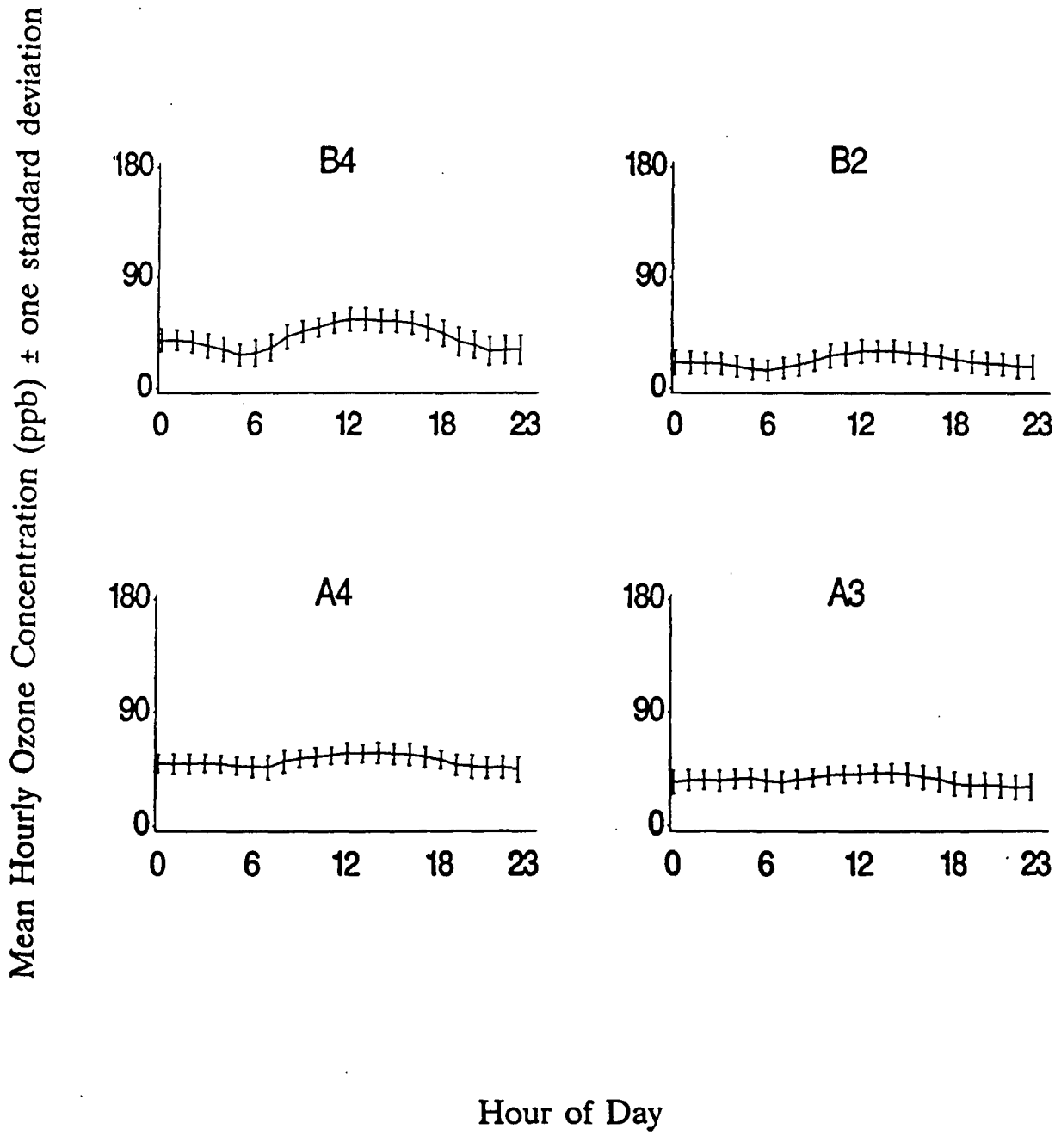
C. BY MONTH (composited over years).

Month	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
Jan	3	60	0	0	0	0	37	1	0	0	1	2	0	0	0	0	0	0
Feb	3	81	4	0	0	0	12	2	1	0	0	1	0	0	0	0	0	0
Mar	5	41	47	0	0	0	3	0	6	2	0	0	0	0	0	0	0	0
Apr	4	30	58	5	1	0	0	0	7	0	0	0	0	0	0	0	0	0
May	4	33	40	9	0	0	3	1	12	3	0	0	0	0	0	0	0	0
Jun	6	41	18	8	0	0	10	5	12	5	0	1	1	0	0	0	0	0
Jul	8	14	16	2	0	1	16	19	20	10	0	0	3	0	0	0	0	0
Aug	7	26	14	1	0	0	8	15	24	10	0	0	2	0	0	0	0	0
Sep	7	36	16	2	0	0	26	5	8	4	0	0	2	0	0	0	0	0
Oct	2	55	5	0	0	1	30	5	1	0	0	2	1	0	0	0	0	0
Nov	2	60	2	0	0	0	36	2	0	0	0	0	1	0	0	0	0	0
Dec	2	46	0	0	0	1	46	1	0	0	2	5	0	0	0	0	0	0

1. % days with unidentified diurnal patterns in hourly ozone concentration (see Böhm et al. 1990).
2. Pattern identifier relates to degree of diurnal variation in hourly ozone concentrations (A curves - least variation; E curves - greatest variation) and daily mean (1 curves - lowest mean; 6 curves highest mean) as described by Böhm et al (1990) and as illustrated in Figure 4C.1. Note that due to numeric rounding, the sums of percentages do not always equal 100.

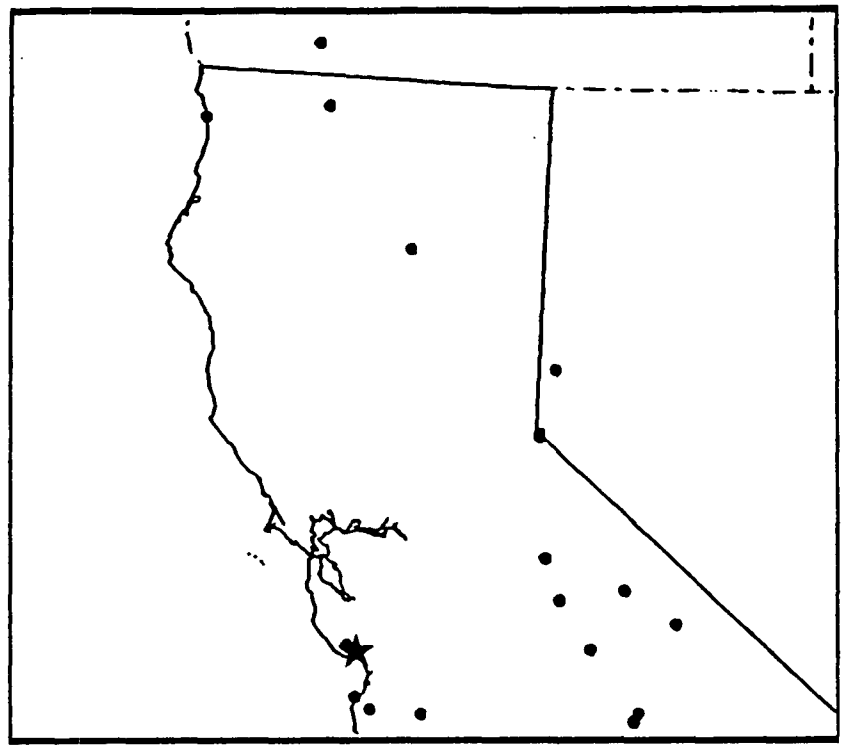
SAGUARO NATIONAL MONUMENT

DOMINANT DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS (MAY - OCT)



APTOS **CALIFORNIA**

BIOGRAPHIC INFORMATION



Latitude	-	36.99° N
Longitude	-	121.93° W
Elevation (m)	-	78
Basin Height (m)	-	0
Landuse	-	Suburban - Residential
City Population	-	7,039
Basin Population	-	503,590
Start Summary	-	January, 1980
End Summary	-	October, 1984
Source of Data	-	AIRS (06-087-0001)

Aptos

BASIC STATISTICS

A. BY YEAR.

Year	% Data Capt[1]	% Valid Days[2]	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	100	100	10	10	20	30	28.2±15	40	50	50	3	1	0	0	0
1981	99	99	0	10	10	20	24.0±15	30	40	50	3	0	0	0	0
1982	99	100	10	10	10	20	26.4±15	40	50	50	3	0	0	0	0
1983	100	100	10	10	10	20	23.3±13	30	40	40	1	0	0	0	0
1984	87	87	10	10	10	20	24.5±13	30	40	50	2	0	0	0	0
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	97	97	10	10	10	20	25.3±14	30	40	50	3	0	0	0	0

B. BY GROWING SEASON (May through October).

Year	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06[3] (ppm hr)	S08[4] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	100	100	10	10	20	30	28.4±16	40	50	50	14	4	4	1	0	0	0
1981	99	100	0	0	10	20	23.4±16	30	40	50	10	2	4	0	0	0	0
1982	99	100	10	10	10	20	25.7±15	40	50	50	10	1	3	0	0	0	0
1983	100	100	10	10	10	20	24.1±14	30	40	50	8	2	3	0	0	0	0
1984	100	99	10	10	10	20	24.0±14	30	40	50	9	2	3	0	0	0	0
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	100	100	0	10	10	20	25.1±15	30	40	50	-	-	3	0	0	0	0

C. BY MONTH [5].

Month	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06 (ppm hr)	S08[6] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
Jan	99	99	10	10	20	20	23.4±11	30	40	40	1	0	0	0	0	0	0
Feb	99	100	10	10	20	30	25.7±12	30	40	50	1	0	1	0	0	0	0
Mar	100	100	10	10	20	30	29.4±12	40	50	50	1	0	1	0	0	0	0
Apr	99	99	10	20	20	30	34.3±14	40	50	60	3	1	6	1	0	0	0
May	99	100	10	10	20	30	32.1±15	40	50	50	3	1	4	0	0	0	0
Jun	99	100	10	10	20	30	25.8±14	30	40	50	2	1	2	0	0	0	0
Jul	100	99	0	10	10	20	21.0±13	30	40	40	1	1	1	0	0	0	0
Aug	100	100	0	10	10	20	20.2±14	30	40	40	1	1	2	0	0	0	0
Sep	100	100	0	10	10	20	25.6±16	30	50	50	3	1	5	1	0	0	0
Oct	100	100	10	10	10	20	26.0±16	40	50	60	3	1	6	1	0	0	0
Nov	89	89	0	10	10	20	21.0±12	30	40	40	1	1	1	0	0	0	0
Dec	99	98	0	0	10	20	17.3±11	20	30	30	1	0	0	0	0	0	0

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100. Av. period BY YEAR = 8760 hrs; BY G.S. = 4416 hrs.
2. % Valid Days = # days with 75 % of hours between 09:00 and 21:00 / (total # days) * 100 (Federal Register 1979).
3. Cumulative Index S06 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 60 ppb (Lee et al. 1988).
4. Cumulative Index S08 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 80 ppb (Lee et al. 1988).
5. Statistics for monthly composites over the period of record.
6. Monthly estimate of S06(08) = S06(08) * (# hours in that month) / (# valid hours).

Aptos

DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS

A. BY YEAR.

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	4	24	3	0	0	5	36	9	4	1	2	7	9	0	0	0	0	0
1981	8	16	2	0	0	9	29	6	3	1	9	19	6	0	0	0	0	0
1982	8	19	4	0	0	7	37	8	2	1	3	13	5	0	0	0	0	0
1983	9	19	0	0	0	11	44	4	2	0	3	13	3	0	0	0	0	0
1984	10	16	1	0	0	5	43	7	2	0	4	14	9	0	0	0	0	0
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	8	19	2	0	0	7	38	7	3	1	4	13	7	0	0	0	0	0

B. BY GROWING SEASON (May through October).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	4	14	3	1	1	2	34	11	3	1	1	13	16	1	0	0	0	0
1981	9	11	2	0	0	4	25	6	2	1	10	28	11	1	0	0	0	0
1982	8	14	4	1	0	7	31	10	2	1	2	22	8	0	0	0	0	0
1983	15	15	1	0	0	3	37	6	3	1	3	23	7	0	0	0	0	0
1984	13	10	3	0	0	4	42	6	2	0	4	17	13	0	0	0	0	0
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	10	13	3	0	0	4	34	8	3	1	4	20	11	0	0	0	0	0

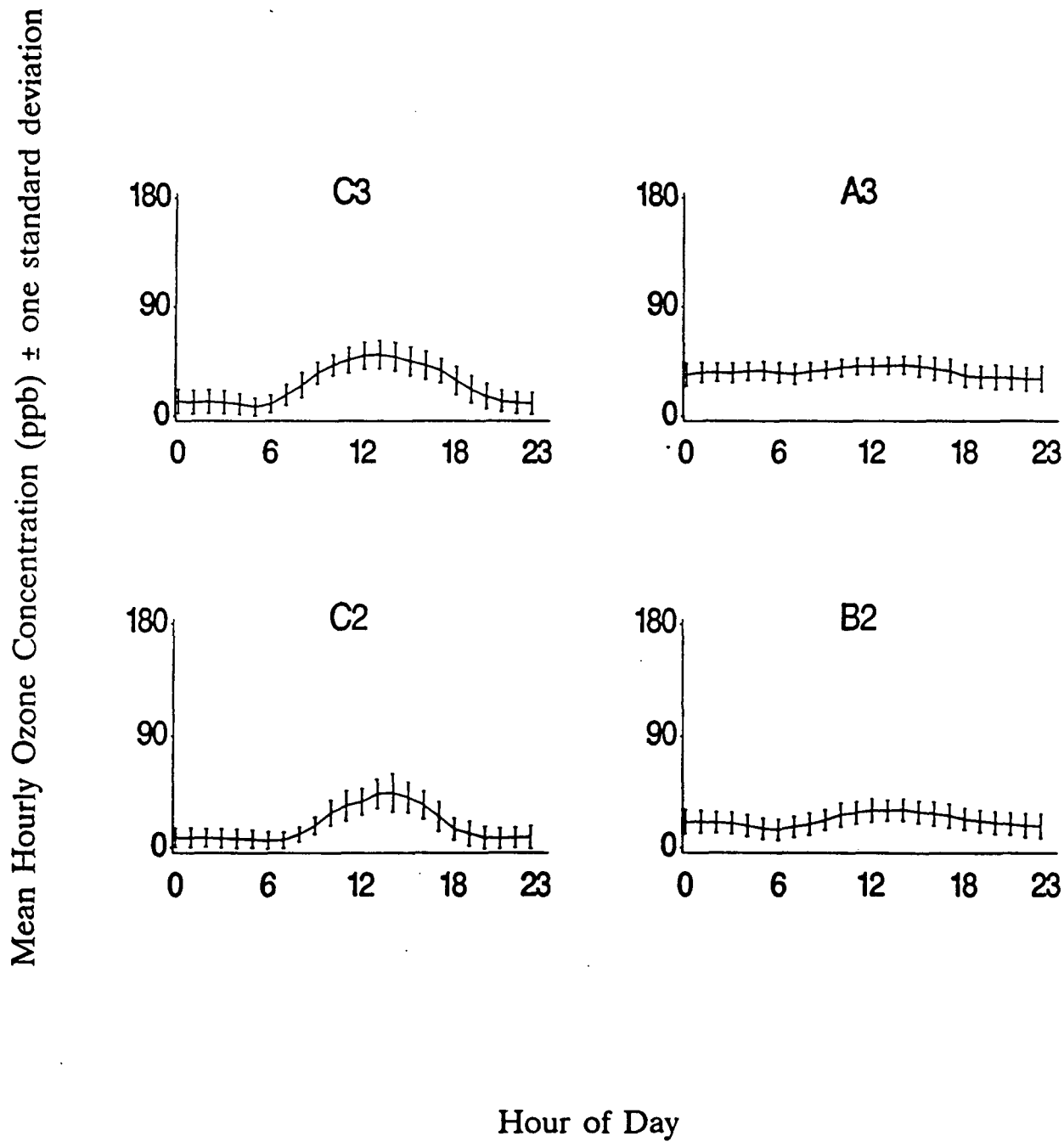
C. BY MONTH (composited over years).

Month	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
Jan	6	24	0	0	0	13	56	0	0	0	4	3	1	0	0	0	0	0
Feb	1	27	1	0	0	5	55	2	1	0	3	6	0	0	0	0	0	0
Mar	7	34	3	0	0	3	34	10	4	0	0	10	1	0	0	0	0	0
Apr	8	34	5	0	0	0	14	22	10	2	1	4	8	0	0	0	0	0
May	14	18	8	1	0	1	14	26	9	1	2	5	16	0	0	0	0	0
Jun	10	16	1	0	0	1	34	6	3	1	3	14	20	1	0	0	0	0
Jul	10	7	0	0	0	1	45	1	0	0	2	30	12	1	0	0	0	0
Aug	10	7	0	0	0	7	34	4	0	0	7	34	7	0	0	0	0	0
Sep	9	11	5	0	0	4	42	4	4	1	6	16	6	0	0	0	0	0
Oct	5	17	1	1	1	7	33	7	0	2	3	22	5	0	0	0	0	0
Nov	7	19	0	0	0	20	45	0	1	1	7	6	1	0	0	0	0	0
Dec	8	5	0	0	0	30	48	0	0	0	11	6	0	0	0	0	0	0

1. % days with unidentified diurnal patterns in hourly ozone concentration (see Böhm et al. 1990).
2. Pattern identifier relates to degree of diurnal variation in hourly ozone concentrations (A curves - least variation; E curves - greatest variation) and daily mean (1 curves - lowest mean; 6 curves highest mean) as described by Böhm et al (1990) and as illustrated in Figure 4C.1. Note that due to numeric rounding, the sums of percentages do not always equal 100.

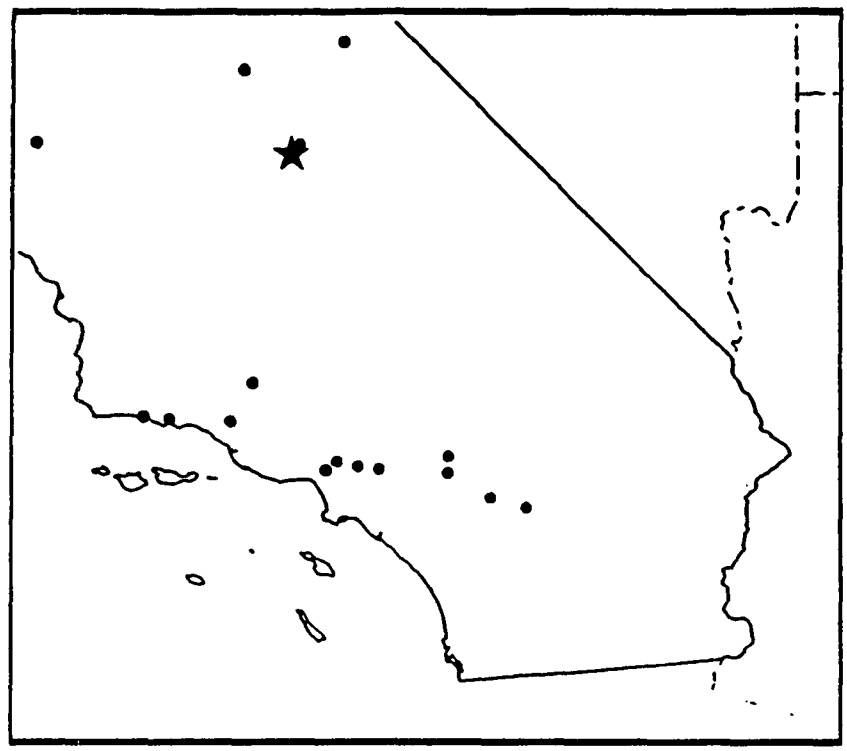
APTOS

DOMINANT DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS (MAY - OCT)



ASH MOUNTAIN, SEQUOIA NATIONAL PARK — CALIFORNIA

BIOGRAPHIC INFORMATION



Latitude	-	36.50° N
Longitude	-	118.83° W
Elevation (m)	-	526
Basin Height (m)	-	76.9
Landuse	-	Rural
City Population	-	Not In A City
Basin Population	-	2,082,850
Start Summary	-	June, 1982
End Summary	-	September, 1986
Source of Data	-	AIRS (06-107-1001)

Ash Mountain, Sequoia National Park (AIRS)

BASIC STATISTICS

A. BY YEAR (May through October).

Year	% Data Capt[1]	% Valid Days[2]	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	30	30	30	40	50	70	69.6±26	90	100	110	71	42	18	4	31
1983	30	30	10	20	30	50	50.9±25	70	80	90	43	18	4	0	3
1984	12	11	35	40	50	70	67.4±21	80	90	100	71	37	10	1	3
1985	37	37	20	30	50	70	64.1±25	80	90	100	66	36	10	1	14
1986	16	16	30	40	60	80	75.7±23	90	110	110	83	53	21	3	19
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	25	25	20	30	50	60	64.1±26	80	100	110	64	36	12	2	70

B. BY GROWING SEASON (May through October).

Year	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06[3] (ppm hr)	S08[4] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	60	60	30	40	50	70	69.6±26	90	100	110	153	104	71	42	18	4	31
1983	59	59	10	20	30	50	50.9±25	70	80	90	84	43	43	18	4	0	3
1984	24	23	35	40	40	70	67.4±21	80	90	100	59	36	71	37	10	1	3
1985	73	73	20	30	50	70	64.1±25	80	90	100	169	106	66	36	10	1	14
1986	32	31	30	40	60	80	75.7±23	90	110	110	97	70	83	53	21	3	19
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	50	49	20	30	50	60	64.1±26	80	100	110	-	-	64	36	12	2	70

C. BY MONTH [5].

Month	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06 (ppm hr)	S08[6] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
Jan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Feb	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mar	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Apr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
May	79	81	30	30	40	50	56.1±18	70	80	90	27	10	50	15	1	0	1
Jun	51	52	30	40	50	70	70.1±24	90	100	110	43	30	73	44	16	2	11
Jul	73	72	30	40	60	70	72.1±23	90	100	110	47	32	76	47	16	2	21
Aug	82	83	30	40	50	70	70.7±23	90	100	110	45	31	75	44	15	2	28
Sep	79	77	10	20	30	50	54.6±27	70	90	100	28	15	50	23	7	1	9
Oct	42	40	0	10	20	30	36.2±22	50	70	80	11	4	21	6	1	0	0
Nov	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dec	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100. Av. period BY YEAR = 8760 hrs; BY G.S. = 4416 hrs.
2. % Valid Days = # days with 75 % of hours between 09:00 and 21:00 / (total # days) * 100 (Federal Register 1979).
3. Cumulative Index S06 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 60 ppb (Lee et al. 1988).
4. Cumulative Index S08 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 80 ppb (Lee et al. 1988).
5. Statistics for monthly composites over the period of record.
6. Monthly estimate of S06(08) = S06(08) * (# hours in that month) / (# valid hours).

Ash Mountain, Sequoia National Park (AIRS)

DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS

A. BY YEAR (May through October).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	1	4	4	26	49	0	1	3	5	9	0	0	0	0	0	0	0	0
1983	6	3	3	25	11	1	3	9	5	33	1	2	2	1	0	0	0	0
1984	0	0	2	65	25	0	0	0	2	5	0	0	0	0	0	0	0	0
1985	0	1	3	34	36	2	2	4	2	13	1	1	2	1	0	0	0	0
1986	0	0	8	15	66	0	2	0	2	6	0	0	0	0	2	0	0	0
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	2	2	4	31	36	1	2	4	3	15	0	1	1	0	0	0	0	0

B. BY GROWING SEASON (May through October).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	1	4	4	26	49	0	1	3	5	9	0	0	0	0	0	0	0	0
1983	6	3	3	25	11	1	3	9	5	33	1	2	2	1	0	0	0	0
1984	0	0	2	65	25	0	0	0	2	5	0	0	0	0	0	0	0	0
1985	0	1	3	34	36	2	2	4	2	13	1	1	2	1	0	0	0	0
1986	0	0	8	15	66	0	2	0	2	6	0	0	0	0	2	0	0	0
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	2	2	4	31	36	1	2	4	3	15	0	1	1	0	0	0	0	0

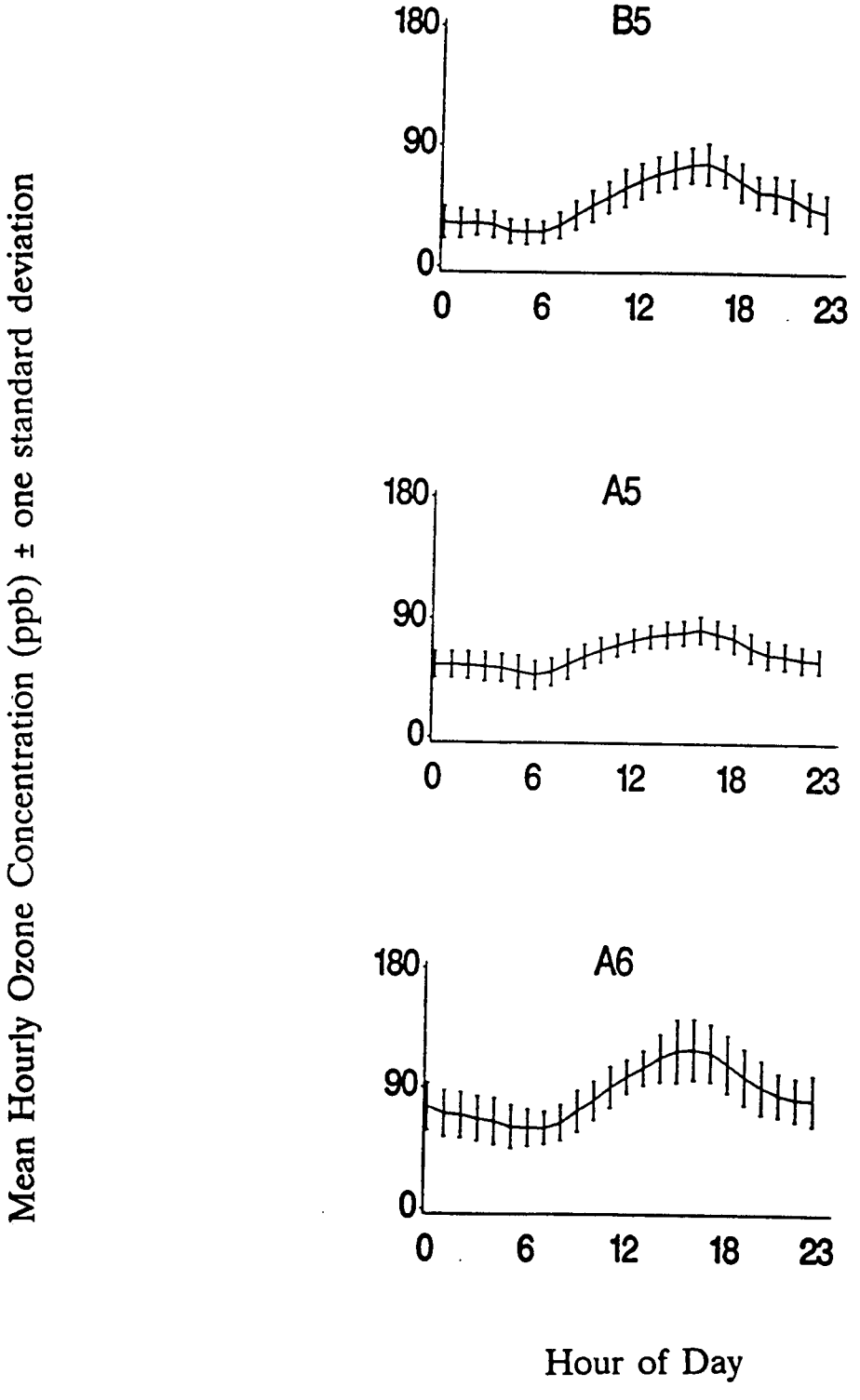
C. BY MONTH (composited over years).

Month	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
Jan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Feb	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mar	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Apr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
May	0	0	8	46	8	0	0	8	4	25	0	0	0	0	0	0	0	0
Jun	0	0	2	23	49	0	0	0	9	14	0	0	2	0	0	0	0	0
Jul	0	0	1	35	48	0	1	1	2	12	0	0	0	0	1	0	0	0
Aug	2	1	3	34	47	0	0	1	3	11	0	0	0	0	0	0	0	0
Sep	2	6	7	28	21	4	4	7	3	15	1	1	2	1	0	0	0	0
Oct	12	0	0	5	0	0	5	24	5	38	5	10	5	5	0	0	0	0
Nov	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dec	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

1. % days with unidentified diurnal patterns in hourly ozone concentration (see Böhm et al. 1990).
2. Pattern identifier relates to degree of diurnal variation in hourly ozone concentrations (A curves - least variation; E curves - greatest variation) and daily mean (1 curves - lowest mean; 6 curves highest mean) as described by Böhm et al (1990) and as illustrated in Figure 4C.1. Note that due to numeric rounding, the sums of percentages do not always equal 100.

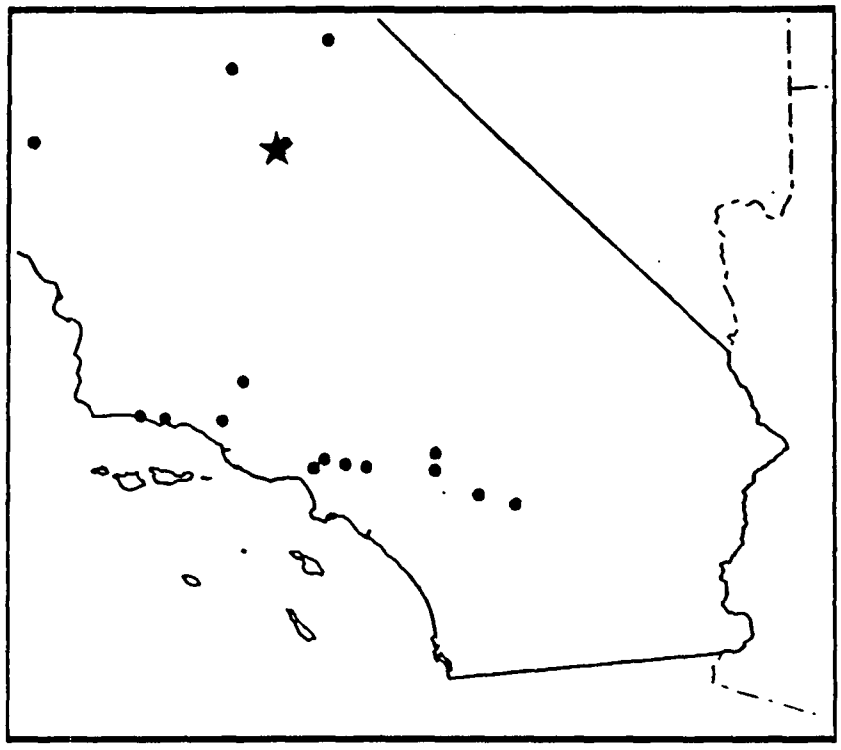
ASH MOUNTAIN, SEQUOIA NATIONAL PARK (AIRS)

DOMINANT DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS (MAY - OCT)



ASH MOUNTAIN, SEQUOIA NATIONAL PARK — CALIFORNIA

BIOGRAPHIC INFORMATION



Latitude	-	36.49° N
Longitude	-	118.83° W
Elevation (m)	-	610
Basin Height (m)	-	76.9
Landuse	-	Rural - Forest
City Population	-	Not In A City
Basin Population	-	2,082,850
Start Summary	-	July, 1982
End Summary	-	July, 1989
Source of Data	-	National Park Service

Ash Mountain, Sequoia National Park (NPS)

DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS

A. BY YEAR.

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	1	4	4	26	49	0	1	3	5	9	0	0	0	0	0	0	0	0
1983	6	3	3	25	11	1	3	9	5	33	1	2	2	1	0	0	0	0
1984	0	0	2	65	25	0	0	0	2	5	0	0	0	0	0	0	0	0
1985	0	1	3	34	36	2	2	4	2	13	1	1	2	1	0	0	0	0
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	5	5	9	30	21	4	16	4	2	7	1	3	0	0	0	0	0	0
1988	5	13	10	24	10	2	17	5	3	13	0	0	1	0	0	0	0	0
1989	8	28	0	0	0	3	57	2	0	0	0	8	2	0	0	0	0	0
All Years	4	8	6	27	21	2	13	4	3	12	0	2	1	0	0	0	0	0

B. BY GROWING SEASON (May through October).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	1	4	4	26	49	0	1	3	5	9	0	0	0	0	0	0	0	0
1983	6	3	3	25	11	1	3	9	5	33	1	2	2	1	0	0	0	0
1984	0	0	2	65	25	0	0	0	2	5	0	0	0	0	0	0	0	0
1985	0	1	3	34	36	2	2	4	2	13	1	1	2	1	0	0	0	0
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	5	3	11	40	29	0	1	2	1	8	0	3	0	0	0	0	0	0
1988	2	3	8	43	20	0	2	4	4	16	0	0	0	0	0	0	0	0
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	3	3	6	37	29	1	2	4	3	15	0	1	1	0	0	0	0	0

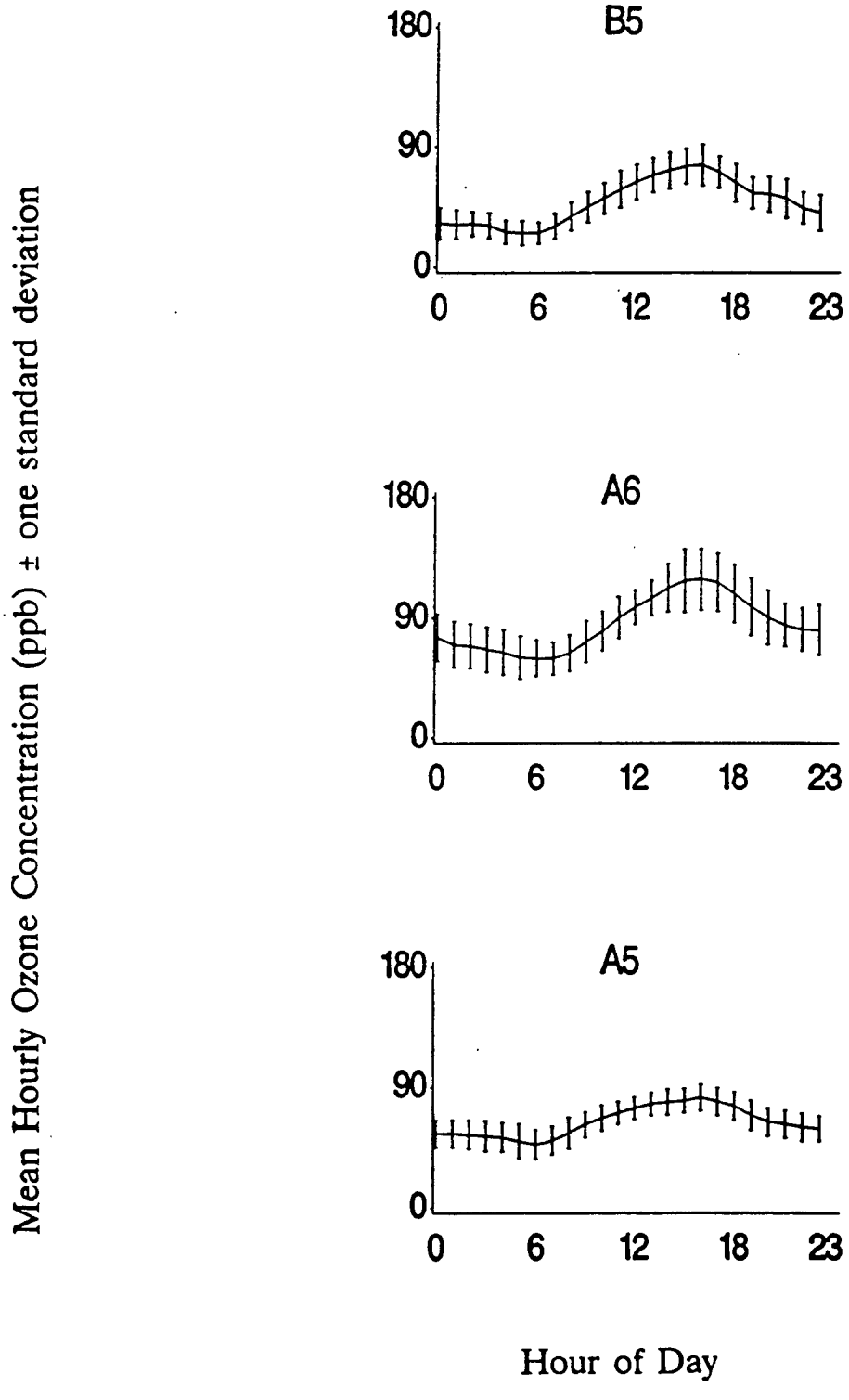
C. BY MONTH (composited over years).

Month	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
Jan	4	30	0	0	0	5	60	0	0	0	0	5	0	0	0	0	0	0
Feb	12	47	3	0	0	0	31	0	0	17	0	3	0	0	0	0	0	0
Mar	10	14	25	0	0	0	39	9	2	2	0	5	5	0	0	0	0	0
Apr	0	11	9	25	0	0	16	14	9	11	0	0	5	0	0	0	0	0
May	4	8	14	38	3	0	1	9	4	23	0	0	0	0	0	0	0	0
Jun	0	1	5	30	37	0	0	1	9	16	0	0	1	0	0	0	0	0
Jul	1	1	3	38	46	0	1	1	1	9	0	0	0	0	0	0	0	0
Aug	2	1	7	41	35	0	0	1	3	13	0	0	0	0	0	0	0	0
Sep	4	6	5	38	20	3	4	6	2	13	1	1	2	1	0	0	0	0
Oct	8	0	5	30	12	0	5	11	2	23	2	9	2	2	0	0	0	0
Nov	11	22	2	0	0	10	41	5	2	7	2	7	0	0	0	0	0	0
Dec	9	7	0	0	0	21	67	2	0	0	2	0	0	0	0	0	0	0

1. % days with unidentified diurnal patterns in hourly ozone concentration (see Böhm et al. 1990).
2. Pattern identifier relates to degree of diurnal variation in hourly ozone concentrations (A curves - least variation; E curves - greatest variation) and daily mean (1 curves - lowest mean; 6 curves highest mean) as described by Böhm et al (1990) and as illustrated in Figure 4C.1. Note that due to numeric rounding, the sums of percentages do not always equal 100.

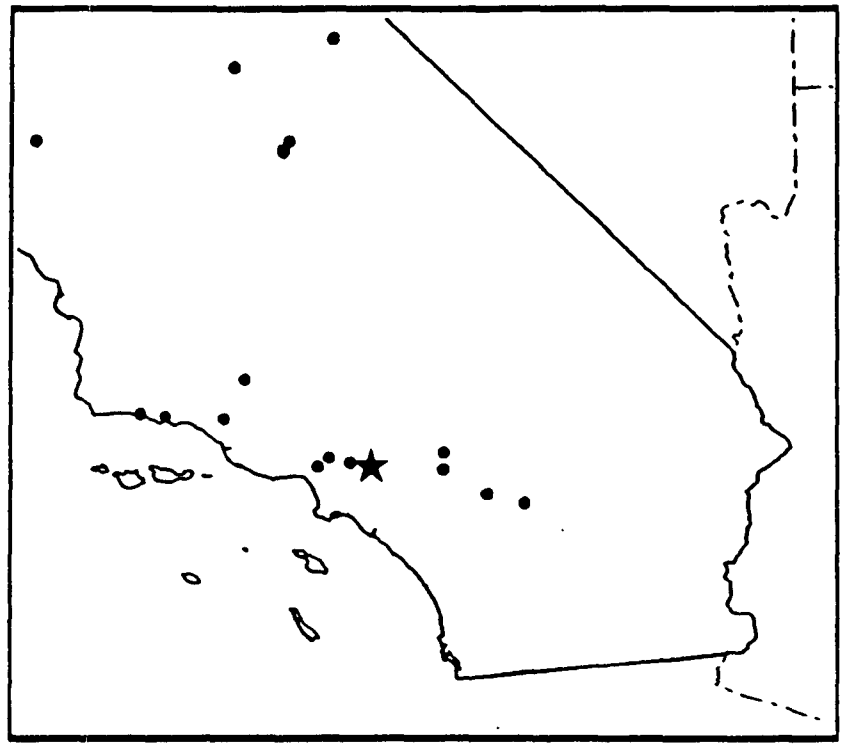
ASH MOUNTAIN, SEQUOIA NATIONAL PARK (NPS)

DOMINANT DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS (MAY - OCT)



AZUSA CALIFORNIA

BIOGRAPHIC INFORMATION



Latitude	-	34.14° N
Longitude	-	117.92° W
Elevation (m)	-	185
Basin Height (m)	-	123.1
Landuse	-	Suburban - Industrial
City Population	-	29,380
Basin Population	-	11,201,922
Start Summary	-	January, 1980
End Summary	-	September, 1989
Source of Data	-	AIRS (06-037-0002)

Azusa

BASIC STATISTICS

A. BY YEAR.

Year	% Data Capt[1]	% Valid Days[2]	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	99	99	0	0	0	20	34.1±50	40	90	150	18	13	10	7	140
1981	97	98	0	0	0	10	31.1±49	40	100	140	19	14	11	8	153
1982	94	98	0	0	0	20	31.0±43	40	80	130	17	12	8	6	116
1983	96	98	0	0	0	10	31.1±48	30	90	140	17	12	9	7	131
1984	95	100	0	0	0	20	32.8±45	40	90	135	19	14	10	7	139
1985	95	100	0	0	0	10	30.2±45	40	90	130	18	13	9	7	129
1986	95	99	0	0	0	20	33.5±44	40	90	130	20	14	10	7	139
1987	87	91	0	0	10	20	29.8±37	40	80	110	16	11	8	5	101
1988	94	99	0	0	10	20	35.1±41	40	90	130	19	14	9	6	138
1989	71	75	0	0	10	20	37.6±45	50	100	130	23	16	12	8	121
All Years	92	96	0	0	0	20	32.5±45	40	90	130	18	13	10	7	1307

B. BY GROWING SEASON (May through October).

Year	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06[3] (ppm hr)	S08[4] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	99	99	0	0	0	10	42.6±64	60	140	180	149	134	26	20	17	13	120
1981	97	99	0	0	0	20	45.5±61	70	140	180	159	142	30	23	19	15	130
1982	95	100	0	0	10	20	42.4±53	60	120	160	132	113	27	20	15	11	105
1983	98	98	0	0	0	20	45.1±61	70	130	180	154	138	28	23	17	14	125
1984	95	100	0	0	0	20	43.6±56	70	130	160	145	127	29	23	17	12	123
1985	96	100	0	0	0	20	41.1±55	60	120	160	136	118	28	21	16	11	110
1986	95	100	0	0	0	20	44.2±54	70	130	160	144	124	30	23	17	12	119
1987	80	83	0	0	10	20	40.6±47	60	110	140	103	87	27	20	15	10	89
1988	95	99	0	0	0	20	42.9±51	70	120	150	136	118	29	23	16	11	122
1989	79	83	0	0	0	20	45.0±53	70	120	150	120	103	31	23	17	12	99
All Years	93	96	0	0	0	20	43.3±56	70	130	160	-	-	28	22	17	12	1142

C. BY MONTH [5].

Month	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06 (ppm hr)	S08[6] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
Jan	96	99	0	0	0	10	14.2±14	20	30	40	1	1	1	0	0	0	0
Feb	95	98	0	0	0	20	20.7±23	30	50	60	4	3	7	3	1	1	18
Mar	95	99	0	0	0	20	24.8±27	40	60	80	8	5	12	6	3	1	31
Apr	96	98	0	0	10	20	34.4±37	50	80	110	14	10	20	12	7	4	90
May	96	100	0	0	10	30	41.0±46	60	110	140	21	17	26	18	12	9	142
Jun	96	100	0	0	0	20	46.7±57	70	130	170	27	24	31	24	18	13	203
Jul	96	100	0	0	0	20	50.7±64	90	150	180	33	30	35	28	22	17	265
Aug	95	99	0	0	0	20	49.0±64	80	150	180	32	29	33	28	22	17	264
Sep	96	100	0	0	0	10	40.0±57	60	120	160	23	20	26	20	15	11	168
Oct	95	99	0	0	0	20	31.1±42	40	90	120	15	12	18	12	8	5	100
Nov	94	98	0	0	0	10	19.8±23	30	40	60	4	3	6	3	2	1	23
Dec	95	98	0	0	0	10	14.0±14	20	30	40	1	1	1	0	0	0	3

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100. Av. period BY YEAR = 8760 hrs; BY G.S. = 4416 hrs.
2. % Valid Days = # days with 75 % of hours between 09:00 and 21:00 / (total # days) * 100 (Federal Register 1979).
3. Cumulative Index S06 = Σ [O_3], where [O_3] is hourly ozone concentrations ≥ 60 ppb (Lee et al. 1988).
4. Cumulative Index S08 = Σ [O_3]/1000, where [O_3] is hourly ozone concentrations ≥ 80 ppb (Lee et al. 1988).
5. Statistics for monthly composites over the period of record.
6. Monthly estimate of S06(08) = S06(08) * (# hours in that month) / (# valid hours).

Azusa

DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS

A. BY YEAR.

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	3	4	0	0	0	11	8	2	1	1	7	12	8	3	0	0	21	22
1981	1	0	0	0	0	12	2	0	0	0	17	16	5	2	1	0	21	24
1982	2	4	0	0	0	14	6	2	0	1	10	14	6	2	1	0	23	16
1983	3	0	0	0	0	16	7	1	1	1	12	11	7	3	1	0	17	23
1984	3	1	0	0	0	13	7	3	1	1	5	19	8	3	1	0	21	19
1985	5	1	0	0	0	15	6	1	0	1	13	15	3	2	0	0	26	17
1986	2	2	0	0	0	12	10	2	2	2	6	11	7	4	2	0	23	16
1987	5	3	1	0	0	15	12	1	0	2	8	12	3	3	0	0	29	10
1988	4	7	1	0	0	6	13	3	2	3	3	7	6	1	1	0	35	12
1989	4	4	0	0	0	5	7	2	3	2	4	10	6	6	0	0	32	18
All Years	3	2	0	0	0	12	8	2	1	1	9	13	6	3	1	0	25	18

B. BY GROWING SEASON (May through October).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	2	1	0	0	0	3	3	1	0	0	3	12	5	3	0	0	29	41
1981	0	0	0	0	0	3	1	0	0	0	1	12	6	2	2	0	28	45
1982	3	2	0	1	0	1	3	2	0	2	2	9	9	4	1	1	33	31
1983	2	0	0	0	0	4	2	1	1	1	2	8	7	5	2	0	27	42
1984	1	1	0	0	0	1	2	1	1	1	0	12	8	4	2	0	31	36
1985	2	1	0	0	0	5	1	1	0	0	3	11	5	3	0	0	41	30
1986	2	1	1	0	0	1	1	1	1	1	2	3	10	6	1	0	40	32
1987	4	1	0	0	0	4	3	1	0	3	4	6	5	4	0	0	50	21
1988	2	2	0	0	0	0	1	2	1	1	1	5	5	1	1	0	57	23
1989	3	2	0	0	0	1	1	1	2	1	0	4	6	4	0	0	47	30
All Years	2	1	0	0	0	2	2	1	1	1	2	8	7	4	1	0	38	33

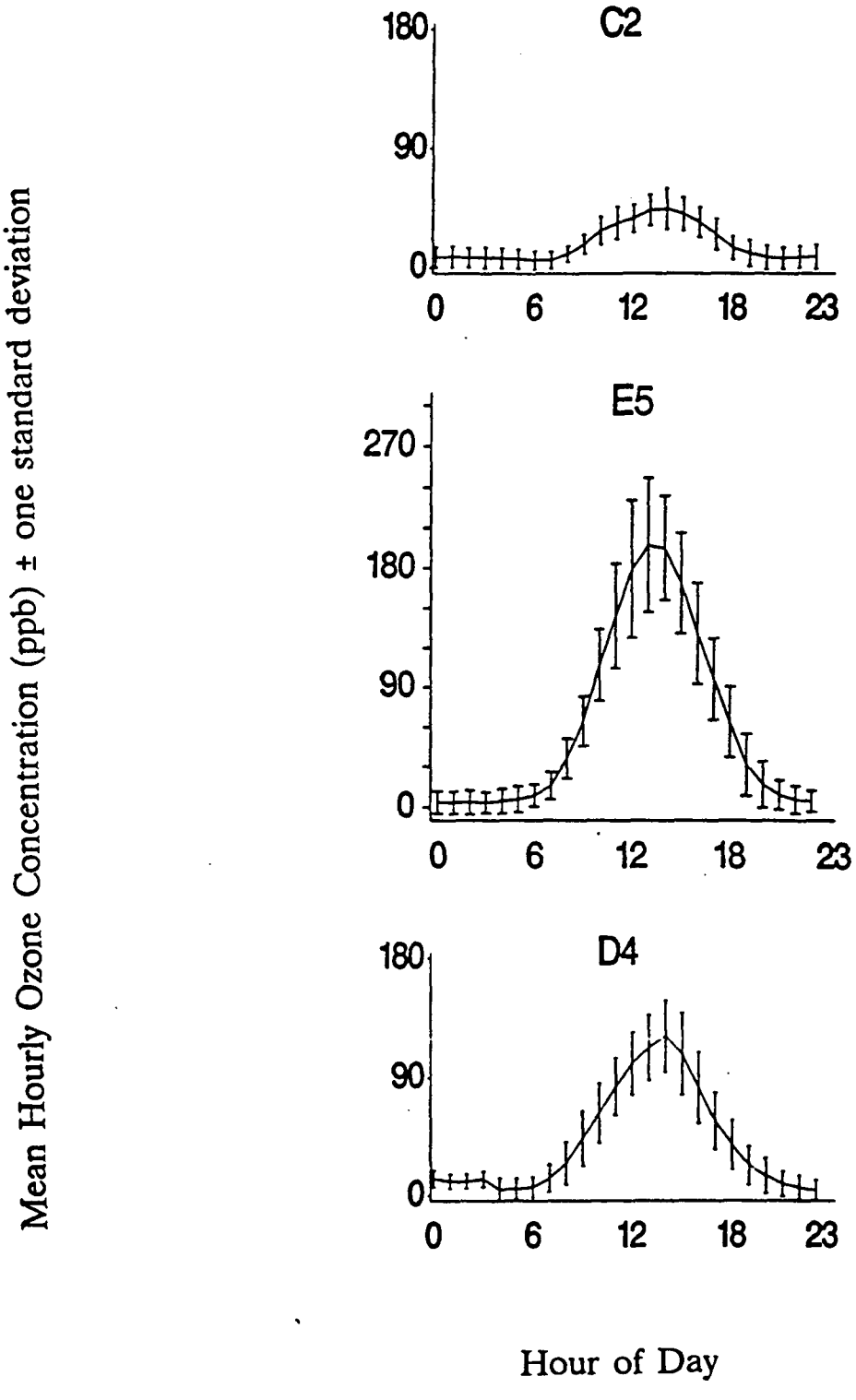
C. BY MONTH (composited over years).

Month	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
Jan	6	1	0	0	0	39	22	2	0	0	21	15	0	0	0	0	.0	0
Feb	6	7	0	0	0	23	13	3	3	3	13	23	3	1	0	0	6	0
Mar	4	5	0	0	0	11	8	4	2	3	14	24	9	3	2	0	14	0
Apr	4	2	1	0	0	2	11	4	2	5	2	13	15	7	2	0	29	6
May	5	3	0	0	0	2	5	3	1	2	1	5	14	8	1	0	31	23
Jun	2	0	0	0	0	2	1	0	1	1	1	5	7	3	1	0	38	39
Jul	1	0	0	0	0	0	1	0	0	0	0	2	2	3	0	0	40	51
Aug	1	0	0	0	0	1	0	0	0	0	0	2	2	3	1	0	44	47
Sep	0	0	0	0	0	3	2	1	0	1	2	12	7	2	1	0	40	28
Oct	4	2	0	0	0	7	3	1	1	1	6	26	7	3	1	0	33	8
Nov	4	6	0	0	0	18	16	0	1	1	22	21	3	0	0	0	10	0
Dec	4	3	0	0	0	42	17	2	0	0	27	8	0	0	0	0	1	0

1. % days with unidentified diurnal patterns in hourly ozone concentration (see Böhm et al. 1990).
2. Pattern identifier relates to degree of diurnal variation in hourly ozone concentrations (A curves - least variation; E curves - greatest variation) and daily mean (1 curves - lowest mean; 6 curves highest mean) as described by Böhm et al (1990) and as illustrated in Figure 4C.1. Note that due to numeric rounding, the sums of percentages do not always equal 100.

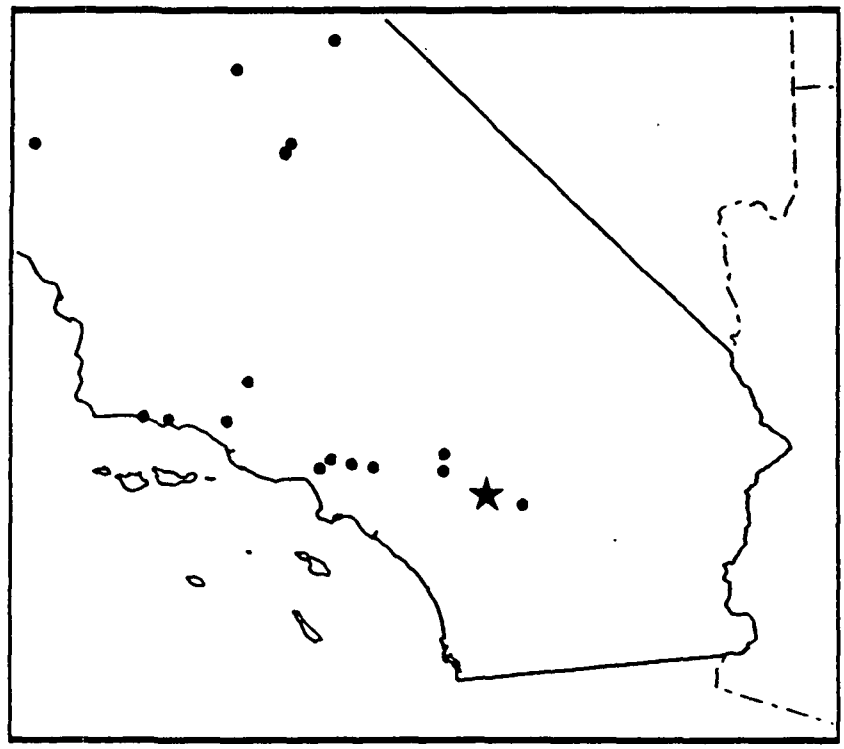
AZUSA

DOMINANT DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS (MAY - OCT)



BANNING **CALIFORNIA**

BIOGRAPHIC INFORMATION



Latitude	-	33.93° N
Longitude	-	116.88° W
Elevation (m)	-	722
Basin Height (m)	-	666.5
Landuse	-	City Center - Residential
City Population	-	14,020
Basin Population	-	611,117
Start Summary	-	January, 1980
End Summary	-	December, 1988
Source of Data	-	AIRS (06-065-0002)

Banning

BASIC STATISTICS

A. BY YEAR.

Year	% Data Capt[1]	% Valid Days[2]	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	98	98	10	10	20	30	42.9±34	50	90	110	25	14	9	5	87
1981	98	99	10	10	10	30	34.2±29	40	70	100	18	10	5	2	66
1982	99	99	0	10	10	30	34.2±31	50	70	100	19	10	5	3	71
1983	100	99	0	10	20	30	36.5±31	50	80	100	20	10	6	3	71
1984	100	99	0	10	10	30	34.4±30	40	70	90	18	10	5	3	66
1985	97	99	0	10	20	30	36.0±30	50	70	90	20	10	5	2	63
1986	97	99	10	10	20	30	35.3±28	40	70	90	17	9	4	2	53
1987	99	99	0	10	20	30	36.9±28	50	70	90	19	10	5	2	68
1988	94	99	10	10	20	30	42.0±30	60	80	100	25	12	6	3	77
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	98	99	0	10	20	30	36.9±30	50	80	100	20	10	6	3	622

B. BY GROWING SEASON (May through October).

Year	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06[3] (ppm hr)	S08[4] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	99	100	10	20	30	50	56.4±39	80	110	140	171	124	42	25	16	9	82
1981	99	100	10	10	20	30	43.5±35	60	90	110	114	77	30	17	9	4	59
1982	99	99	10	10	30	40	48.7±34	70	100	120	128	85	33	18	10	5	65
1983	100	100	10	10	30	40	51.6±36	70	100	130	144	96	37	20	12	6	71
1984	99	99	0	10	10	40	44.9±36	60	90	120	119	83	30	18	9	5	61
1985	96	99	10	20	30	40	49.4±33	60	90	110	122	78	34	17	9	5	56
1986	98	100	10	20	30	40	47.3±32	60	90	110	116	75	31	16	9	4	53
1987	98	99	10	20	30	40	49.9±32	70	90	110	126	81	34	18	9	5	63
1988	95	100	10	20	30	50	54.9±35	70	100	120	154	102	42	23	12	7	75
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	98	100	10	10	20	40	49.6±35	70	100	120	-	-	35	19	11	6	585

C. BY MONTH [5].

Month	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06 (ppm hr)	S08[6] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
Jan	99	99	0	10	10	20	18.4±11	30	30	40	1	0	0	0	0	0	0
Feb	98	98	0	10	10	20	20.9±13	30	40	40	1	1	2	0	0	0	0
Mar	97	98	10	10	20	30	27.4±17	30	50	60	4	2	7	2	1	0	3
Apr	98	98	10	20	20	30	38.4±23	50	70	80	10	5	17	7	3	1	33
May	99	100	10	20	30	40	50.1±30	70	90	110	22	14	35	17	9	4	82
Jun	98	100	10	20	30	50	60.8±36	80	110	130	32	23	50	29	17	9	134
Jul	98	99	10	20	30	50	59.3±39	80	110	140	31	22	45	26	16	10	141
Aug	99	100	10	10	30	50	53.8±37	70	100	130	27	19	40	23	12	7	126
Sep	98	100	10	10	20	30	41.7±32	50	80	110	16	10	25	13	7	4	73
Oct	98	100	10	10	20	30	32.1±24	40	60	80	9	5	14	6	3	1	29
Nov	98	99	0	10	10	20	21.6±15	30	40	50	2	1	3	1	0	0	1
Dec	97	97	0	0	10	20	17.4±11	20	30	30	1	0	0	0	0	0	0

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100. Av. period BY YEAR = 8760 hrs; BY G.S. = 4416 hrs.
2. % Valid Days = # days with 75 % of hours between 09:00 and 21:00 / (total # days) * 100 (Federal Register 1979).
3. Cumulative Index: S06 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 60 ppb (Lee et al. 1988).
4. Cumulative Index: S08 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 80 ppb (Lee et al. 1988).
5. Statistics for monthly composites over the period of record.
6. Monthly estimate of S06(08) = S06(08) * (# hours in that month) / (# valid hours).

Banning

* DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS

A. BY YEAR.

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	4	15	3	9	10	5	28	5	4	8	1	2	3	1	3	2	0	0
1981	2	9	4	6	5	17	27	6	3	5	1	3	2	3	7	1	1	0
1982	3	8	4	5	6	26	23	3	4	6	2	1	3	1	8	1	1	0
1983	4	8	5	4	6	16	25	6	4	6	3	4	1	1	6	3	0	0
1984	4	10	4	5	5	17	21	5	4	8	3	3	4	2	6	2	1	0
1985	4	9	5	7	5	16	25	5	5	5	3	3	3	1	5	1	1	0
1986	3	10	4	7	5	10	31	6	6	5	2	4	3	1	4	1	0	0
1987	5	8	5	5	5	9	27	4	6	10	4	2	3	2	8	1	1	0
1988	4	15	5	8	6	5	22	4	7	9	2	3	1	3	8	2	1	0
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	4	10	4	6	6	14	25	5	5	7	2	3	3	2	6	2	1	0

B. BY GROWING SEASON (May through October).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	5	9	3	15	20	1	12	5	5	11	1	1	2	2	5	5	1	0
1981	2	4	5	11	9	11	18	6	4	9	1	2	1	5	10	2	2	0
1982	3	9	6	10	11	3	15	5	6	11	1	0	4	2	14	2	2	0
1983	3	6	8	8	12	3	13	8	7	12	1	2	0	2	12	5	1	0
1984	5	3	5	9	9	5	16	6	5	12	2	2	4	4	11	4	2	0
1985	4	11	9	14	10	1	11	6	8	8	0	1	5	3	8	3	0	0
1986	2	7	6	12	10	1	19	7	10	9	0	2	4	3	8	2	1	0
1987	2	6	7	9	9	2	9	6	8	19	0	1	2	4	14	3	1	0
1988	4	6	6	14	12	0	6	5	10	14	1	1	0	4	16	3	2	0
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	3	7	6	11	11	3	13	6	7	12	1	1	3	3	11	3	1	0

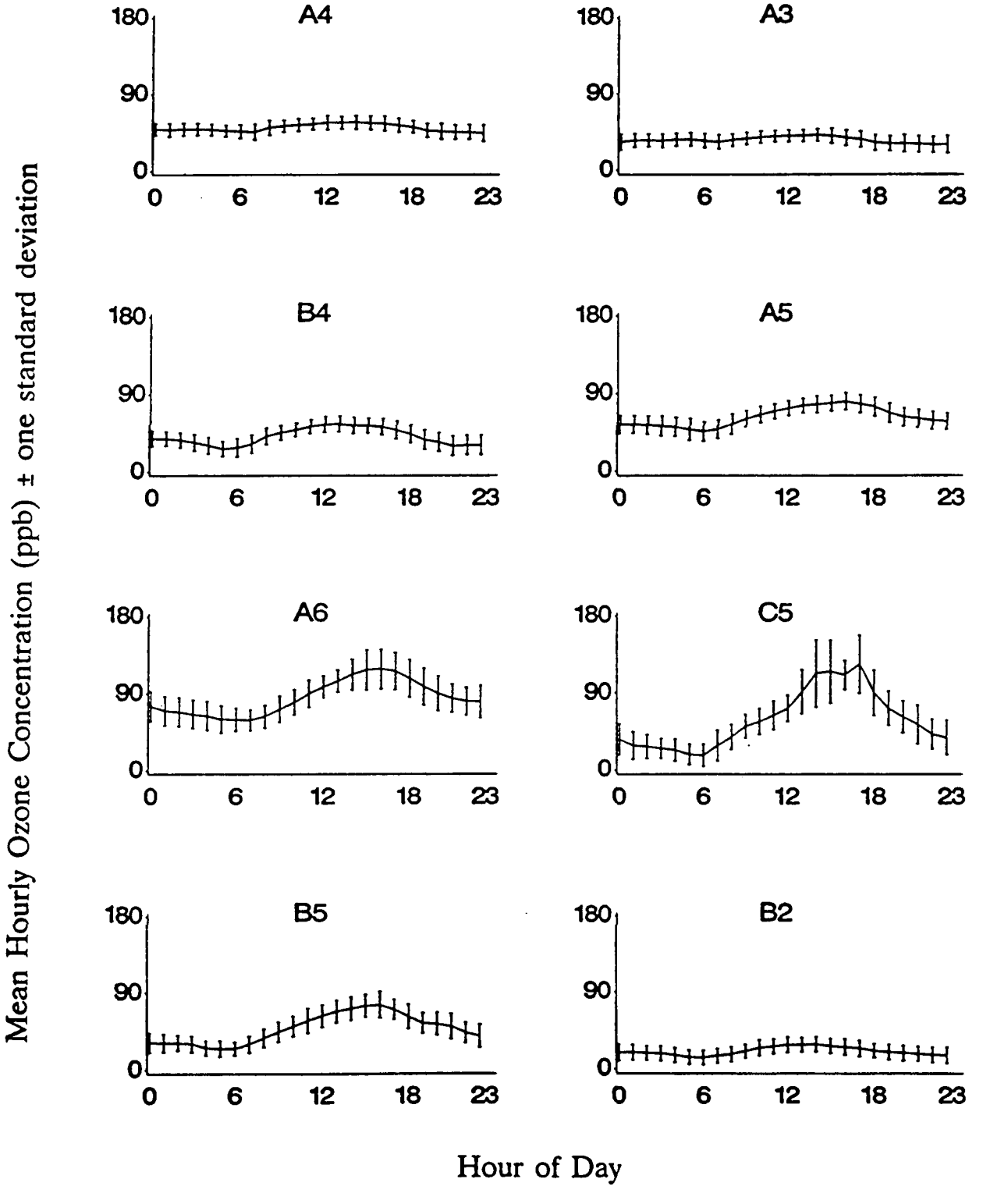
C. BY MONTH (composited over years).

Month	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
Jan	3	6	0	0	0	36	45	1	0	0	7	5	1	0	0	0	0	0
Feb	6	17	0	0	0	26	43	2	1	0	3	4	3	0	0	0	0	0
Mar	3	17	4	2	0	11	39	5	2	3	2	6	4	2	1	0	0	0
Apr	4	23	7	4	2	0	21	11	10	7	0	3	4	2	7	0	0	0
May	3	8	8	11	10	1	7	10	11	15	0	1	2	4	10	1	1	0
Jun	2	6	7	17	19	0	3	3	7	12	0	0	2	3	17	3	0	0
Jul	1	5	7	12	18	0	5	4	6	13	0	1	3	3	12	7	3	0
Aug	3	4	5	14	10	1	8	6	7	14	1	1	2	4	14	5	2	0
Sep	5	10	4	7	7	5	20	7	7	9	2	2	5	3	10	2	0	0
Oct	6	9	4	6	3	10	39	6	6	7	1	4	2	2	2	1	0	0
Nov	4	11	2	0	0	30	37	3	1	2	6	5	2	0	0	0	0	0
Dec	4	7	0	0	0	43	41	0	0	0	6	2	0	0	0	0	0	0

1. % days with unidentified diurnal patterns in hourly ozone concentration (see Böhm et al. 1990).
2. Pattern identifier relates to degree of diurnal variation in hourly ozone concentrations (A curves - least variation; E curves - greatest variation) and daily mean (1 curves - lowest mean; 6 curves highest mean) as described by Böhm et al (1990) and as illustrated in Figure 4C.1. Note that due to numeric rounding, the sums of percentages do not always equal 100.

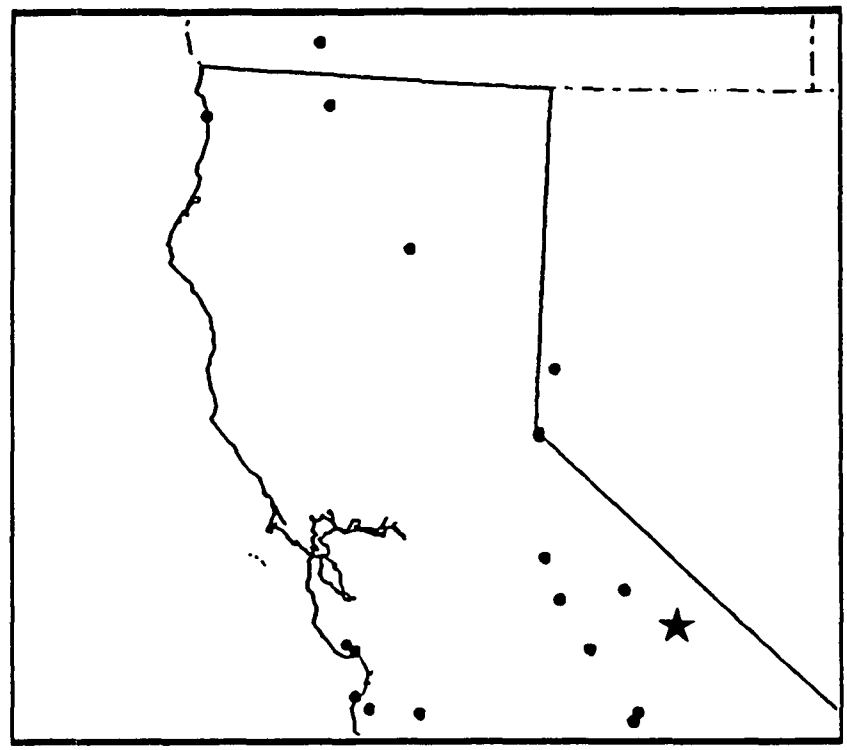
BANNING

DOMINANT DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS (MAY - OCT)



BISHOP **CALIFORNIA**

BIOGRAPHIC INFORMATION



Latitude	-	37.35° N
Longitude	-	118.40° W
Elevation (m)	-	1260
Basin Height (m)	-	1260
Landuse	-	City Center - Mobile
City Population	-	3,333
Basin Population	-	27,569
Start Summary	-	March, 1980
End Summary	-	October, 1981
Source of Data	-	AIRS (06-027-0001)

Bishop

BASIC STATISTICS

A. BY YEAR (March through November).

Year	% Data Capt[1]	% Valid Days[2]	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	48	48	0	10	20	30	29.7±17	40	50	55	5	0	0	0	0
1981	54	54	0	10	20	30	31.2±16	40	50	60	6	0	0	0	0
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	51	51	0	10	20	30	30.5±16	40	50	60	6	0	0	0	0

B. BY GROWING SEASON (May through October).

Year	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06[3] (ppm hr)	S08[4] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	70	70	0	10	20	30	31.2±17	40	50	60	13	1	7	0	0	0	0
1981	98	99	0	10	20	30	31.7±16	40	50	60	19	2	7	0	0	0	0
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	84	85	0	10	20	30	31.5±16	40	50	60	-	-	7	0	0	0	0

C. BY MONTH [5].

Month	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06 (ppm hr)	S08[6] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
Jan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Feb	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mar	100	100	0	0	20	40	29.6±17	40	50	50	1	1	1	0	0	0	0
Apr	54	53	0	10	20	30	26.2±14	30	40	50	1	0	2	0	0	0	0
May	100	100	10	10	20	30	31.3±13	40	50	50	1	0	1	0	0	0	0
Jun	87	87	10	20	30	40	37.4±16	50	60	60	6	1	13	0	0	0	0
Jul	97	97	10	20	30	40	37.9±15	50	60	60	5	1	10	0	0	0	0
Aug	88	89	10	15	20	40	35.3±16	50	60	60	5	1	10	1	0	0	0
Sep	99	98	0	0	10	20	23.0±14	30	40	50	1	0	1	0	0	0	0
Oct	87	87	0	0	10	30	24.1±15	30	40	50	1	0	2	0	0	0	0
Nov	54	53	0	0	10	20	18.3±13	30	30	40	0	0	0	0	0	0	0
Dec	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100. Av. period BY YEAR = 8760 hrs; BY G.S. = 4416 hrs.
2. % Valid Days = # days with 75 % of hours between 09:00 and 21:00 / (total # days) * 100 (Federal Register 1979).
3. Cumulative Index S06 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 60 ppb (Lee et al. 1988).
4. Cumulative Index S08 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 80 ppb (Lee et al. 1988).
5. Statistics for monthly composites over the period of record.
6. Monthly estimate of S06(08) = S06(08) * (# hours in that month) / (# valid hours).

Bishop

DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS

A. BY YEAR (March through November).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	3	13	8	1	0	6	20	23	7	3	2	10	7	1	0	0	0	0
1981	7	9	5	2	0	6	22	20	18	6	4	2	6	0	0	0	0	0
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	5	11	6	1	0	6	21	22	12	5	3	6	6	0	0	0	0	0

B. BY GROWING SEASON (May through October).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	2	13	10	2	0	3	19	21	9	4	2	9	7	0	0	0	0	0
1981	6	9	5	2	0	6	21	21	17	7	4	2	4	0	0	0	0	0
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	5	11	7	2	0	5	20	21	14	6	4	5	5	0	0	0	0	0

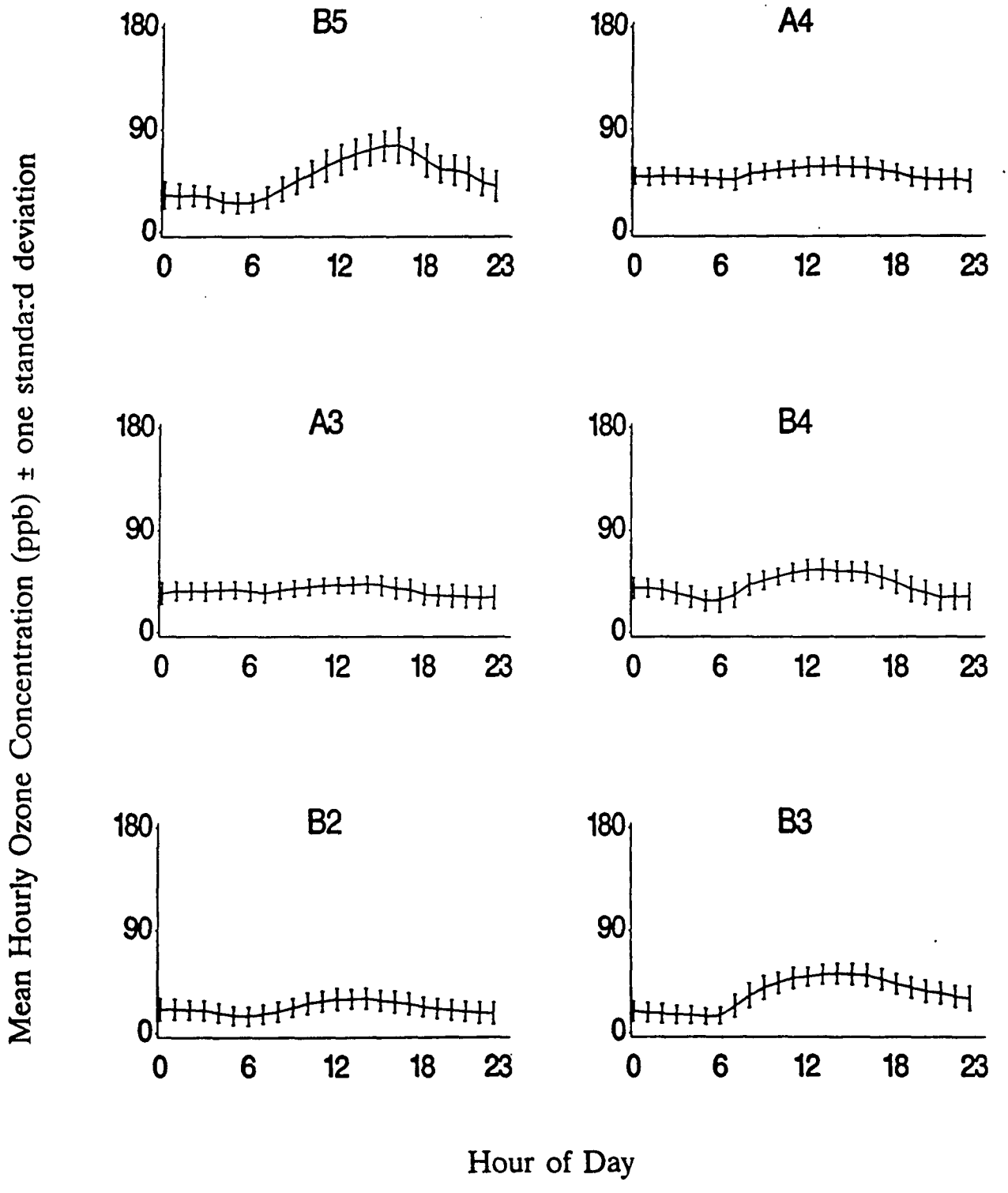
C. BY MONTH (composited over years).

Month	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
Jan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Feb	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mar	3	14	3	0	0	10	14	41	0	0	0	0	14	3	0	0	0	0
Apr	14	8	0	0	0	8	25	8	25	0	0	0	25	0	0	0	0	0
May	3	23	0	0	0	6	3	32	19	0	10	0	6	0	0	0	0	0
Jun	4	11	16	5	0	5	16	14	16	18	0	0	0	0	0	0	0	0
Jul	5	16	20	2	0	2	12	20	18	7	0	2	2	0	0	0	0	0
Aug	6	8	6	4	0	0	15	40	17	4	0	0	6	0	0	0	0	0
Sep	3	2	0	0	0	5	37	14	2	4	5	16	14	0	0	0	0	0
Oct	6	10	0	0	0	12	31	12	14	0	8	10	2	0	0	0	0	0
Nov	7	8	0	0	0	15	38	0	0	0	0	38	0	0	0	0	0	0
Dec	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

1. % days with unidentified diurnal patterns in hourly ozone concentration (see Böhm et al. 1990).
2. Pattern identifier relates to degree of diurnal variation in hourly ozone concentrations (A curves - least variation; E curves - greatest variation) and daily mean (1 curves - lowest mean; 6 curves highest mean) as described by Böhm et al (1990) and as illustrated in Figure 4C.1. Note that due to numeric rounding, the sums of percentages do not always equal 100.

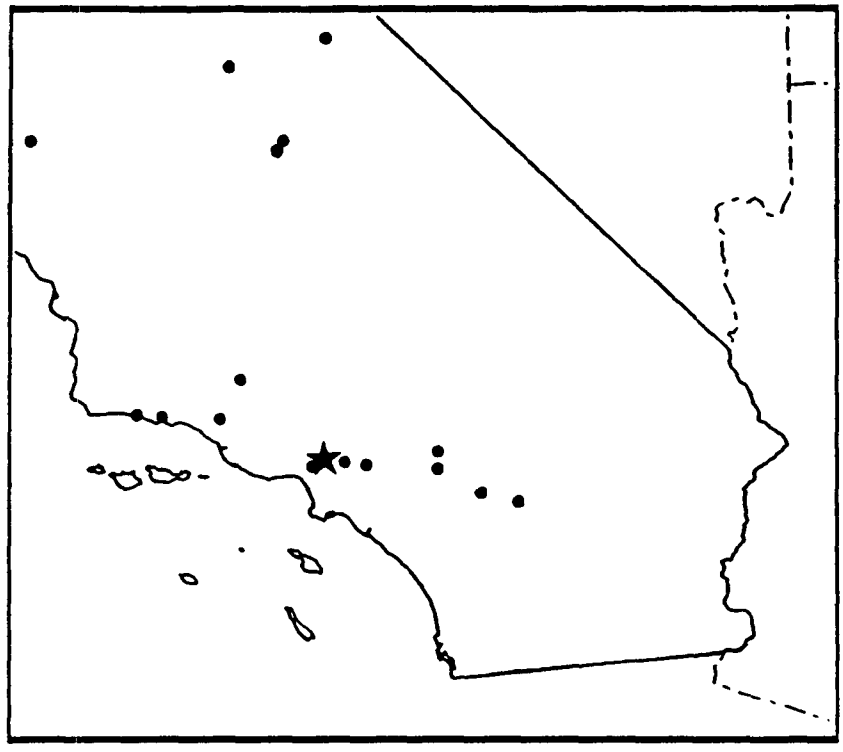
BISHOP

DOMINANT DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS (MAY - OCT)



BURBANK **CALIFORNIA**

BIOGRAPHIC INFORMATION



Latitude	-	34.18° N
Longitude	-	118.31° W
Elevation (m)	-	170
Basin Height (m)	-	123.1
Landuse	-	Suburban - Industrial
City Population	-	84,625
Basin Population	-	11,201,922
Start Summary	-	January, 1980
End Summary	-	December, 1988
Source of Data	-	AIRS (06-037-1002)

Burbank

DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS

A. BY YEAR.

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	3	1	0	0	0	11	8	1	1	0	12	16	10	6	0	0	21	14
1981	2	0	0	0	0	20	2	1	1	0	16	16	6	5	0	0	23	9
1982	5	2	0	0	0	23	4	1	0	2	14	13	6	5	0	1	20	6
1983	2	1	0	0	0	21	5	1	1	1	15	14	5	4	0	0	18	14
1984	2	1	0	0	0	14	4	0	0	0	17	22	9	5	0	0	23	4
1985	1	1	0	0	0	12	2	0	0	1	18	16	7	6	0	0	28	7
1986	2	1	0	0	0	15	4	0	0	0	12	17	10	5	0	0	29	7
1987	3	1	0	0	0	16	5	1	0	0	18	14	6	6	0	0	30	2
1988	2	1	0	0	0	12	6	1	1	0	14	15	8	6	0	0	31	4
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	2	1	0	0	0	16	5	1	0	1	15	16	7	5	0	0	25	8

B. BY GROWING SEASON (May through October).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	1	1	0	0	0	0	2	1	1	0	6	14	9	9	0	0	33	26
1981	2	0	0	1	0	2	2	1	1	1	5	10	10	10	0	0	40	17
1982	2	4	0	0	0	5	3	3	1	3	2	10	10	11	0	1	34	13
1983	1	1	0	0	0	4	3	2	2	3	2	10	6	8	0	0	33	27
1984	1	0	1	0	0	1	2	1	1	1	6	14	13	10	1	0	41	8
1985	2	1	0	0	0	2	1	0	0	1	3	13	11	11	0	0	45	11
1986	2	1	0	0	0	1	3	0	0	0	1	12	15	9	0	0	46	12
1987	3	1	1	0	0	3	3	2	0	0	3	11	7	9	1	0	54	5
1988	1	2	0	0	0	1	3	1	1	1	2	8	14	10	0	0	51	8
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	2	1	0	0	0	2	3	1	1	1	3	11	11	10	0	0	42	14

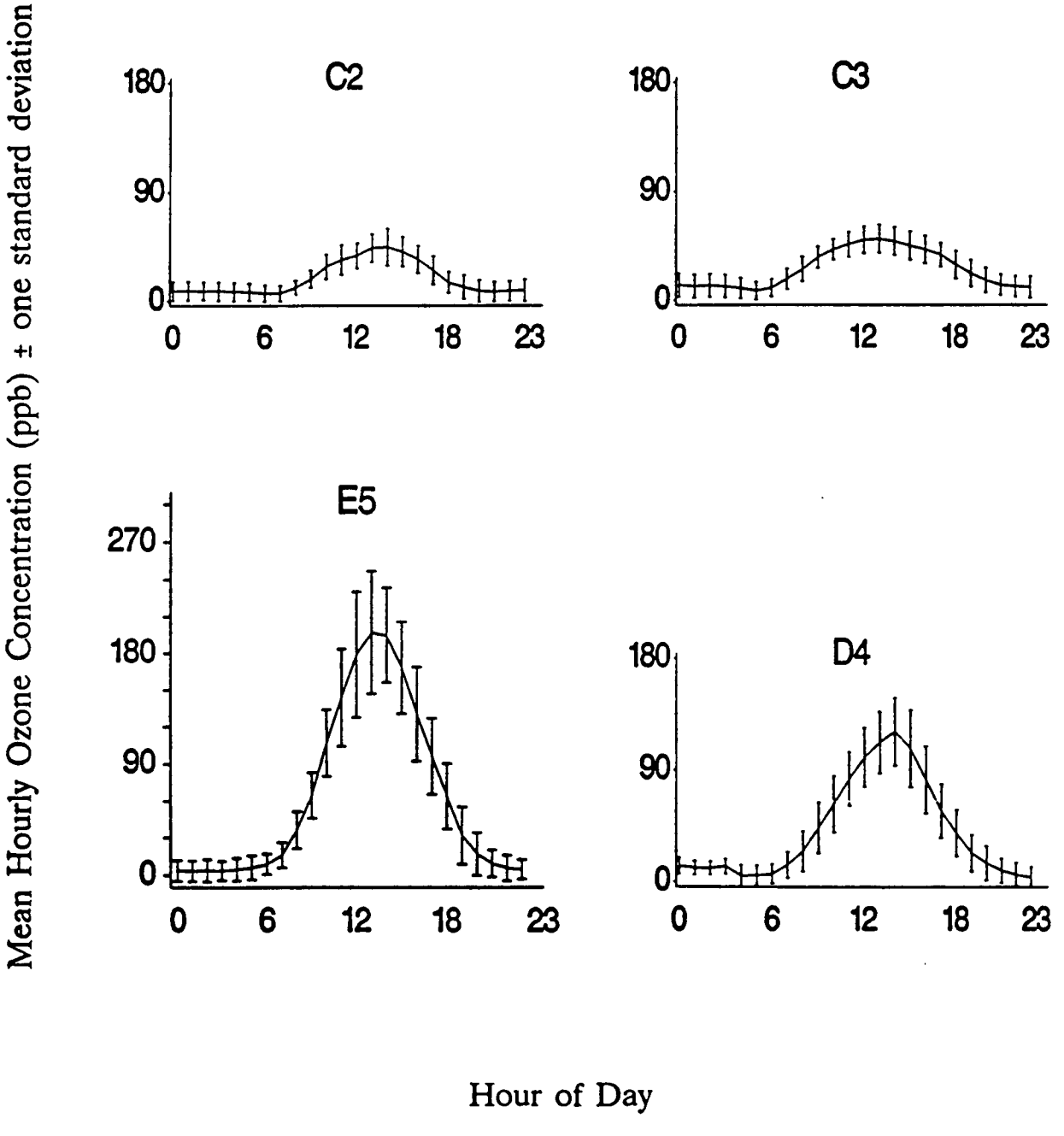
C. BY MONTH (composited over years).

Month	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
Jan	4	0	0	0	0	44	6	0	0	0	41	9	0	0	0	0	0	0
Feb	3	0	0	0	0	27	9	0	0	0	28	30	0	0	0	0	4	0
Mar	4	1	0	0	0	18	6	1	0	0	16	38	8	0	0	0	10	1
Apr	3	3	0	0	0	6	7	1	1	2	4	23	18	7	0	0	26	3
May	3	4	0	0	0	1	6	4	1	2	1	9	17	10	0	0	34	11
Jun	2	1	0	0	0	1	1	2	2	2	0	3	11	13	0	0	46	15
Jul	0	0	0	0	0	0	1	0	0	1	1	5	5	15	0	0	51	20
Aug	1	0	0	0	0	2	0	0	0	0	1	4	10	12	0	0	50	21
Sep	3	1	0	0	0	3	3	0	0	0	3	13	11	4	0	1	45	15
Oct	2	1	0	0	0	6	4	0	0	0	12	33	10	4	0	0	25	4
Nov	3	0	0	0	0	27	5	0	0	0	41	21	0	0	0	0	7	0
Dec	2	0	0	0	0	56	6	0	0	0	34	3	0	0	0	0	0	0

1. % days with unidentified diurnal patterns in hourly ozone concentration (see Böhm et al. 1990).
2. Pattern identifier relates to degree of diurnal variation in hourly ozone concentrations (A curves - least variation; E curves - greatest variation) and daily mean (1 curves - lowest mean; 6 curves highest mean) as described by Böhm et al (1990) and as illustrated in Figure 4C.1. Note that due to numeric rounding, the sums of percentages do not always equal 100.

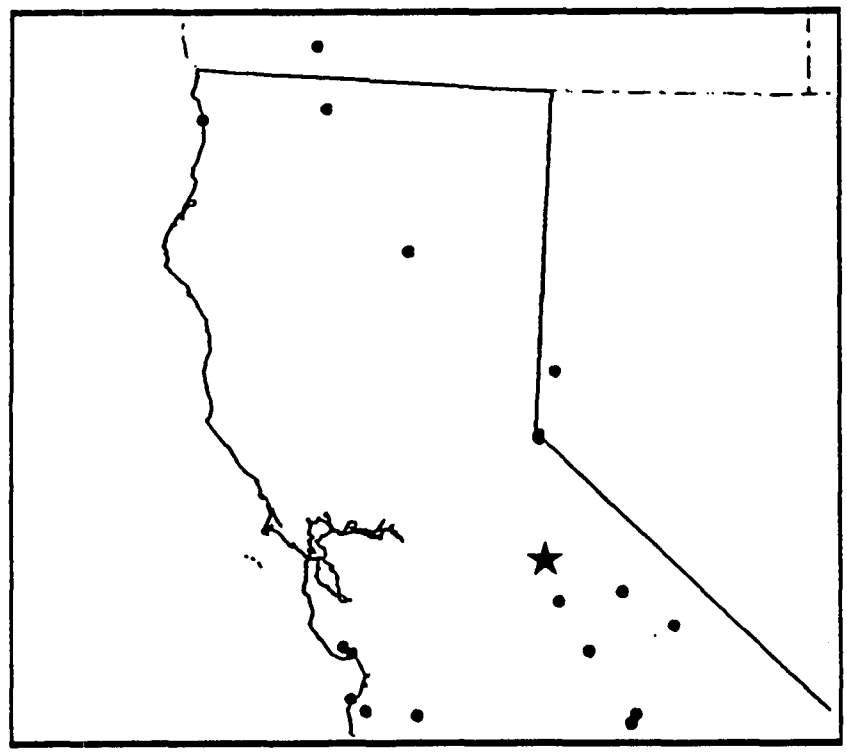
BURBANK

DOMINANT DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS (MAY - OCT)



CAMP MATHER, YOSEMITE NATIONAL PARK — CALIFORNIA

BIOGRAPHIC INFORMATION



Latitude	-	37.89° N
Longitude	-	119.84° W
Elevation (m)	-	1432
Basin Height (m)	-	27.1
Landuse	-	Rural - Forest
City Population	-	Not In A City
Basin Population	-	2,082,850
Start Summary	-	February, 1988
End Summary	-	June, 1989
Source of Data	-	National Park Service

Camp Mather, Yosemite National Park

BASIC STATISTICS

A. BY YEAR.

Year	% Data Capt[1]	% Valid Days[2]	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	67	69	13	17	25	35	37.7±17	49	63	71	13	1	0	0	0
1989	23	24	9	12	19	25	23.8±08	29	34	36	0	0	0	0	0
All Years	45	47	11	16	23	30	34.2±17	44	59	68	10	1	0	0	0

B. BY GROWING SEASON (May through October).

Year	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06[3] (ppm hr)	S08[4]	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	66	70	22	26	36	46	47.6±16	59	70	76	50	7	24	3	0	0	0
1989	0	0	24	24	30	40	37.8±09	44	49	53	0	0	0	0	0	0	0
All Years	33	35	22	26	36	46	47.5±16	59	70	76	-	-	24	3	0	0	0

C. BY MONTH [5].

Month	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06 (ppm hr)	S08[6]	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
Jan	95	100	18	19	23	26	25.6±05	28	31	34	0	0	0	0	0	0	0
Feb	64	67	10	12	18	25	24.8±09	31	36	38	1	0	0	0	0	0	0
Mar	91	92	7	10	17	26	25.2±12	33	41	45	0	0	0	0	0	0	0
Apr	95	100	13	18	26	35	35.7±14	45	54	60	3	0	6	0	0	0	0
May	48	50	17	21	28	38	38.6±14	47	58	67	5	0	9	0	0	0	0
Jun	48	50	19	22	29	41	42.0±16	54	65	71	9	1	18	1	0	0	0
Jul	10	10	32	36	41	49	52.3±15	64	75	81	17	4	31	6	0	0	0
Aug	20	23	36	42	48	61	60.8±15	73	80	87	30	8	55	11	0	0	0
Sep	95	100	34	38	46	56	56.7±14	67	77	81	22	4	41	7	0	0	0
Oct	74	77	32	34	40	49	49.6±13	58	69	72	11	1	21	1	0	0	0
Nov	90	90	8	10	15	23	23.8±12	30	41	46	1	0	1	0	0	0	0
Dec	91	97	14	16	20	24	23.7±06	28	31	33	0	0	0	0	0	0	

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100. Av. period BY YEAR = 8760 hrs; BY G.S. = 4416 hrs
2. % Valid Days = # days with 75 % of hours between 09:00 and 21:00 / (total # days) * 100 (Federal Register 1979).
3. Cumulative Index S06 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 60 ppb (Lee et al. 1988).
4. Cumulative Index S08 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 80 ppb (Lee et al. 1988).
5. Statistics for monthly composites over the period of record.
6. Monthly estimate of S06(08) = S06(08) * (# hours in that month) / (# valid hours).

Camp Mather, Yosemite National Park

DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS

A. BY YEAR.

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	7	20	14	13	0	3	24	9	4	9	0	4	3	0	0	0	0	0
1989	10	20	0	0	0	6	70	0	0	0	2	2	0	0	0	0	0	0
All Years	8	20	10	10	0	4	35	6	3	7	0	3	2	0	0	0	0	0

B. BY GROWING SEASON (May through October).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	11	12	24	26	0	0	2	11	5	16	0	0	3	0	0	0	0	0
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	11	12	24	26	0	0	2	11	5	16	0	0	3	0	0	0	0	0

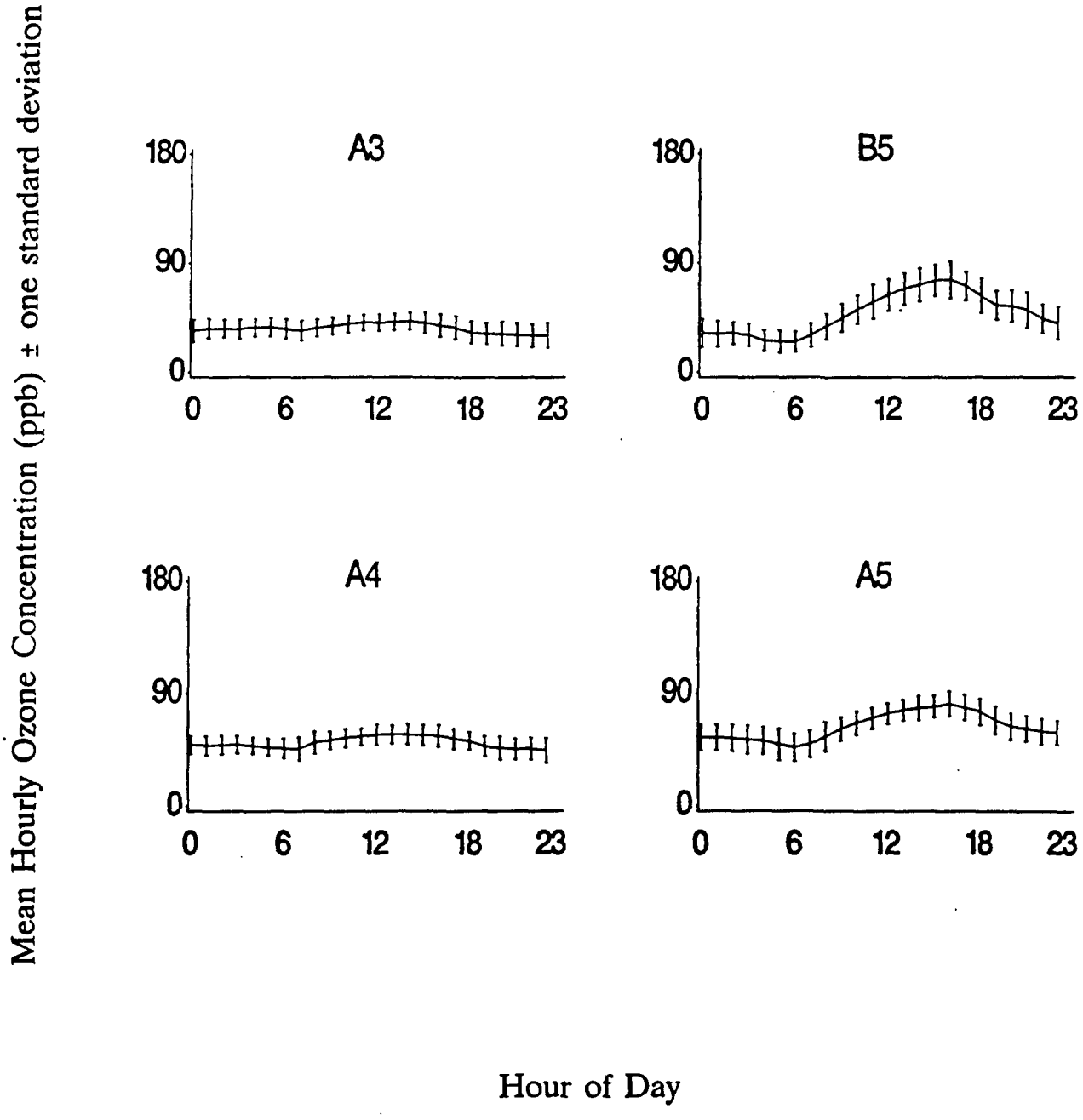
C. BY MONTH (composited over years).

Month	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
Jan	0	19	0	0	0	4	77	0	0	0	0	0	0	0	0	0	0	0
Feb	10	29	0	0	0	11	61	0	0	0	0	0	0	0	0	0	0	0
Mar	13	29	0	0	0	5	41	5	2	0	2	15	0	0	0	0	0	0
Apr	4	33	17	0	0	0	21	12	4	8	0	0	4	0	0	0	0	0
May	15	26	9	13	0	0	4	26	4	4	0	0	13	0	0	0	0	0
Jun	17	20	10	15	0	0	5	25	0	25	0	0	0	0	0	0	0	0
Jul	0	0	40	40	0	0	0	0	0	20	0	0	0	0	0	0	0	0
Aug	0	0	40	60	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sep	0	0	31	46	0	0	0	0	8	15	0	0	0	0	0	0	0	0
Oct	18	11	39	11	0	0	0	0	11	28	0	0	0	0	0	0	0	0
Nov	0	23	0	0	0	18	41	5	0	0	0	9	5	0	0	0	0	0
Dec	0	8	0	0	0	0	92	0	0	0	0	0	0	0	0	0	0	0

1. % days with unidentified diurnal patterns in hourly ozone concentration (see Böhm et al. 1990).
2. Pattern identifier relates to degree of diurnal variation in hourly ozone concentrations (A curves - least variation; E curves - greatest variation) and daily mean (1 curves - lowest mean; 6 curves highest mean) as described by Böhm et al (1990) and as illustrated in Figure 4C.1. Note that due to numeric rounding, the sums of percentages do not always equal 100.

CAMP MATHER, YOSEMITE NATIONAL PARK

DOMINANT DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS (MAY - OCT)



Carmel Valley

BASIC STATISTICS

A. BY YEAR.

Year	% Data Capt[1]	% Valid Days[2]	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	20	20	10	10	10	20	20.4±11	30	30	40	1	0	0	0	0
1983	98	98	10	10	10	20	24.1±14	30	40	50	2	0	0	0	0
1984	99	99	10	10	20	30	26.5±13	40	40	50	2	0	0	0	0
1985	98	98	10	20	20	30	31.0±13	40	50	50	4	1	0	0	0
1986	100	100	10	10	20	30	26.8±13	40	40	50	3	0	0	0	0
1987	98	98	10	10	20	30	28.2±14	40	50	50	4	0	0	0	0
1988	80	80	10	10	20	30	25.8±13	30	40	50	2	0	0	0	0
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	85	85	10	10	20	30	26.9±13	40	40	50	3	0	0	0	0

B. BY GROWING SEASON (May through October).

Year	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06[3] (ppm hr)	S08[4]	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	10	10	0	10	10	20	21.5±15	30	40	50	2	1	3	0	0	0	0
1983	100	100	10	10	20	30	27.2±15	30	50	50	13	3	4	1	0	0	0
1984	100	99	10	10	10	30	29.2±14	40	50	50	13	3	4	1	0	0	0
1985	100	100	10	20	20	30	31.8±14	40	50	60	18	4	6	1	0	0	0
1986	99	100	10	10	20	30	25.9±13	30	40	50	8	1	3	0	0	0	0
1987	99	99	10	10	20	30	30.0±14	40	50	50	13	2	5	1	0	0	0
1988	97	97	10	10	20	30	27.1±13	30	40	50	8	1	3	0	0	0	0
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	86	87	10	10	20	30	28.4±14	40	50	50	-	-	4	1	0	0	0

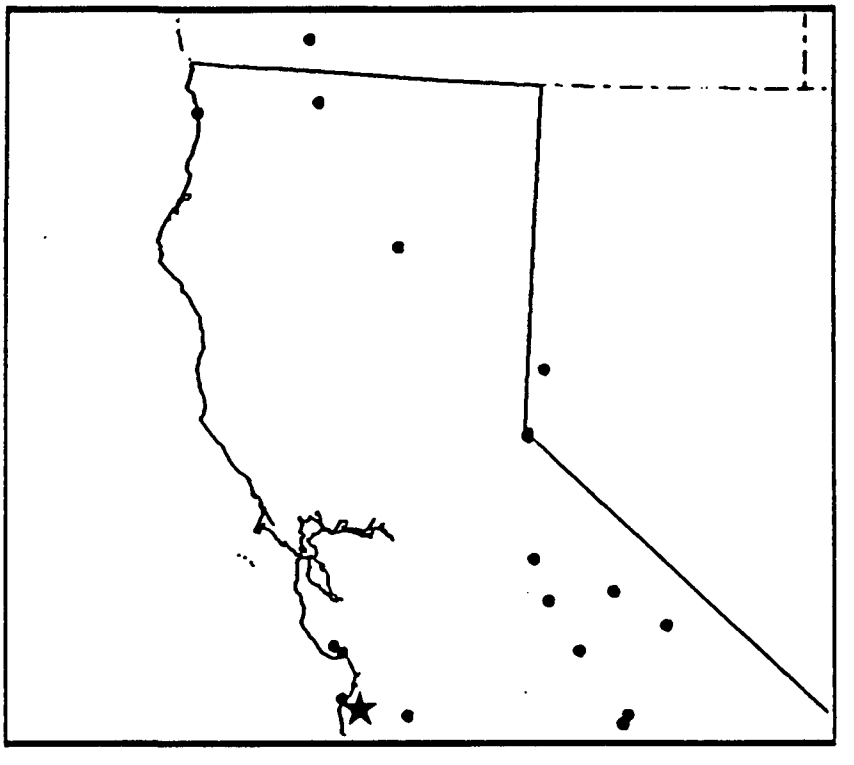
C. BY MONTH [5].

Month	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06 (ppm hr)	S08[6]	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
Jan	96	97	10	10	10	20	21.1±10	30	30	40	1	0	0	0	0	0	0
Feb	90	89	10	10	20	30	26.0±11	30	40	40	1	0	1	0	0	0	0
Mar	100	100	10	10	20	30	28.7±13	40	40	50	1	1	2	0	0	0	0
Apr	89	89	10	20	20	30	33.7±14	40	50	50	3	1	5	1	0	0	0
May	99	99	10	10	20	30	32.1±14	40	50	50	2	1	4	0	0	0	0
Jun	99	100	10	10	20	30	28.7±13	40	40	50	2	1	3	0	0	0	0
Jul	98	98	10	10	20	20	23.8±12	30	40	50	1	1	2	0	0	0	0
Aug	100	100	10	10	20	20	24.6±12	30	40	50	1	1	2	0	0	0	0
Sep	99	99	10	10	20	30	31.5±16	40	50	60	4	1	6	1	0	0	0
Oct	94	94	10	10	20	30	29.8±16	40	50	60	4	1	7	1	0	0	0
Nov	94	95	10	10	10	20	23.9±12	30	40	40	1	0	1	0	0	0	0
Dec	97	96	10	10	10	20	20.6±10	30	30	40	1	0	0	0	0	0	0

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100. Av. period BY YEAR = 8760 hrs; BY G.S. = 4416 hrs.
2. % Valid Days = # days with 75 % of hours between 09:00 and 21:00 / (total # days) * 100 (Federal Register 1979).
3. Cumulative Index S06 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 60 ppb (Lee et al. 1988).
4. Cumulative Index S08 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 80 ppb (Lee et al. 1988).
5. Statistics for monthly composites over the period of record.
6. Monthly estimate of S06(08) = S06(08) * (# hours in that month) / (# valid hours).

CARMEL VALLEY CALIFORNIA

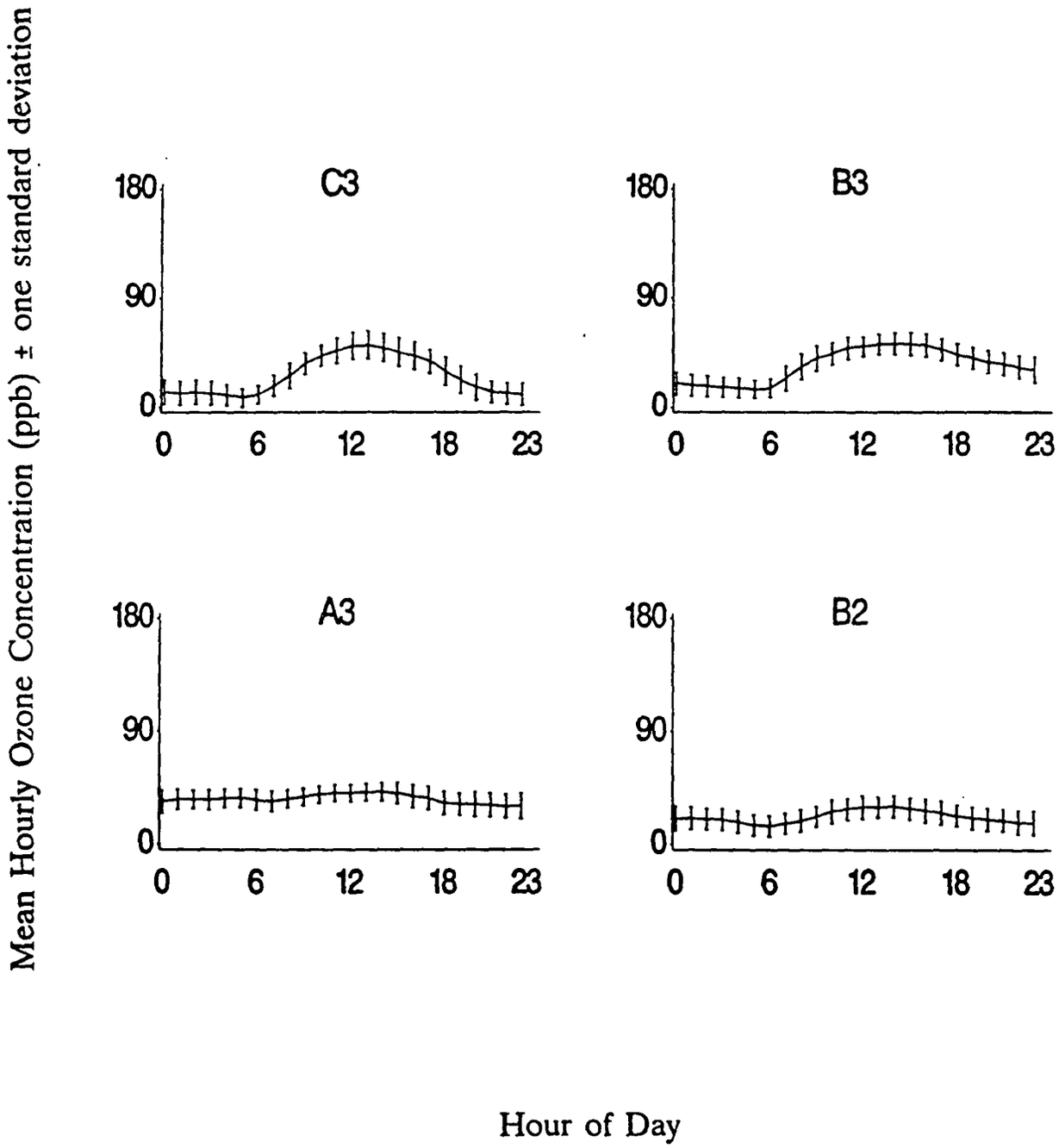
BIOGRAPHIC INFORMATION



Latitude	-	36.50° N
Longitude	-	121.73° W
Elevation (m)	-	131
Basin Height (m)	-	131
Landuse	-	Suburban - Residential
City Population	-	4,013
Basin Population	-	503,590
Start Summary	-	October, 1982
End Summary	-	December, 1988
Source of Data	-	AIRS (06-053-0002)

CARMEL VALLEY

DOMINANT DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS (MAY - OCT)



Carmel Valley

DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS

A. BY YEAR.

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	10	5	0	0	0	22	52	0	3	2	5	11	2	0	0	0	0	0
1983	11	13	1	0	0	8	40	9	3	2	5	9	10	0	0	0	0	0
1984	12	13	3	0	0	5	45	13	2	1	0	9	9	1	0	0	0	0
1985	7	23	3	1	0	1	36	19	7	2	0	3	5	0	0	0	0	0
1986	10	18	2	0	0	3	43	10	6	2	1	10	5	0	0	0	0	0
1987	8	16	6	1	0	4	44	11	5	1	1	7	6	0	0	0	0	0
1988	9	17	1	0	0	6	47	12	1	2	1	7	7	0	0	0	0	0
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	10	16	3	0	0	5	43	12	4	1	1	7	7	0	0	0	0	0

B. BY GROWING SEASON (May through October).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	5	0	0	0	0	33	39	0	6	6	0	11	6	0	0	0	0	0
1983	9	16	1	1	0	3	39	10	5	4	1	7	14	0	0	0	0	0
1984	10	15	5	1	0	2	37	15	3	1	0	5	14	1	0	0	0	0
1985	9	17	5	1	0	1	35	22	8	3	0	1	7	0	0	0	0	0
1986	14	10	3	0	0	1	50	11	6	1	1	10	6	0	0	0	0	0
1987	7	21	9	1	0	1	40	13	4	1	0	5	6	1	0	0	0	0
1988	10	16	2	1	0	4	44	15	1	3	1	4	10	1	0	0	0	0
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	10	15	4	1	0	3	41	14	5	2	0	5	9	0	0	0	0	0

C. BY MONTH (composited over years).

Month	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
Jan	12	10	0	0	0	15	58	3	0	0	3	11	1	0	0	0	0	0
Feb	7	24	0	0	0	2	51	8	1	0	1	12	0	0	0	0	0	0
Mar	13	18	1	0	0	1	36	13	10	2	0	10	7	0	0	0	0	0
Apr	8	19	5	1	0	0	12	35	9	3	0	1	15	0	0	0	0	0
May	7	21	3	1	0	2	19	31	11	2	1	2	6	1	0	0	0	0
Jun	10	24	4	1	0	0	45	10	3	1	0	4	8	0	0	0	0	0
Jul	9	5	1	0	0	2	65	6	2	1	1	4	12	1	0	0	0	0
Aug	9	11	1	0	0	1	51	10	1	0	0	9	14	1	0	0	0	0
Sep	11	15	9	1	0	2	35	14	7	5	0	3	9	0	0	0	0	0
Oct	12	16	6	1	0	7	30	12	4	4	2	10	7	1	0	0	0	0
Nov	10	20	1	0	0	6	49	2	1	0	2	17	1	0	0	0	0	0
Dec	7	13	0	0	0	15	57	2	0	0	7	6	1	0	0	0	0	0

1. % days with unidentified diurnal patterns in hourly ozone concentration (see Böhm et al. 1990).
2. Pattern identifier relates to degree of diurnal variation in hourly ozone concentrations (A curves - least variation; E curves - greatest variation) and daily mean (1 curves - lowest mean; 6 curves highest mean) as described by Böhm et al (1990) and as illustrated in Figure 4C.1. Note that due to numeric rounding, the sums of percentages do not always equal 100.

Fresno County

BASIC STATISTICS

A. BY YEAR.

Year	% Data Capt[1]	% Valid Days[2]	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	77	76	20	20	30	40	41.9±17	50	70	70	19	4	0	0	0
1981	80	79	10	20	20	30	37.5±19	50	70	70	19	4	0	0	2
1982	81	81	10	20	20	30	35.8±17	50	60	70	14	3	0	0	0
1983	68	68	20	30	30	40	38.9±11	40	50	60	8	1	0	0	0
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	77	76	20	20	30	40	38.4±17	50	60	70	15	3	0	0	2

B. BY GROWING SEASON (May through October).

Year	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06[3] (ppm hr)	S08[4] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	95	95	20	30	30	40	46.1±17	60	70	80	78	22	27	6	1	0	0
1981	78	77	20	30	40	50	49.8±18	60	70	80	92	25	39	8	1	0	2
1982	88	88	10	20	30	40	42.8±19	50	70	70	66	16	25	5	1	0	0
1983	77	78	20	20	30	40	41.0±13	50	60	60	30	4	14	1	0	0	0
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	85	84	20	20	30	40	44.9±17	60	70	80	-	-	26	5	0	0	2

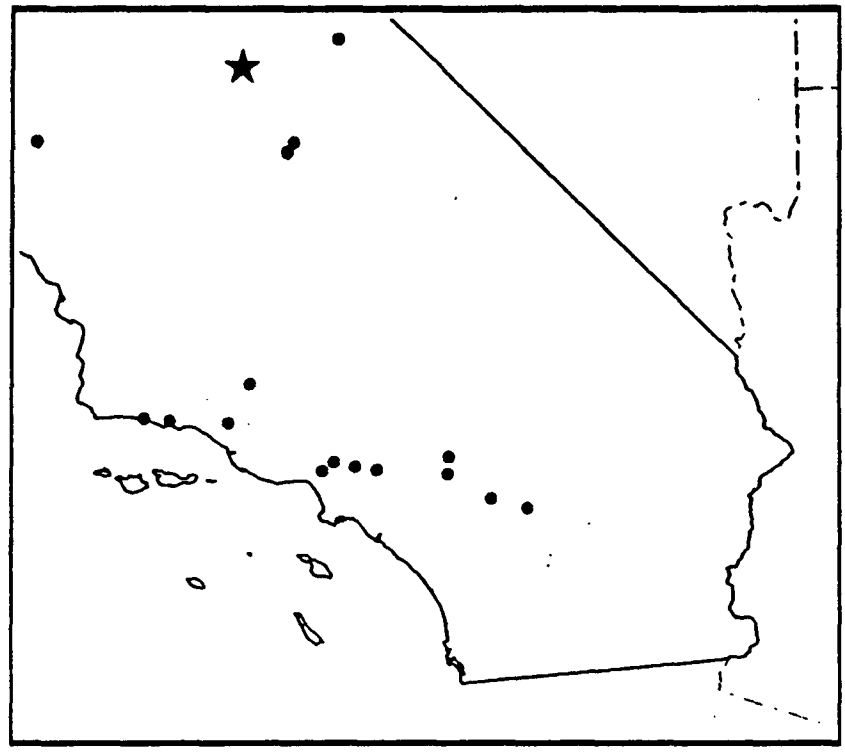
C. BY MONTH [5].

Month	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06 (ppm hr)	S08[6] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
Jan	83	82	10	20	20	30	26.0±09	30	40	40	0	0	0	0	0	0	0
Feb	88	88	10	20	20	30	30.8±10	40	40	50	1	0	1	0	0	0	0
Mar	85	84	20	20	30	30	32.3±11	40	40	50	2	1	4	0	0	0	0
Apr	85	85	20	30	30	40	37.0±10	40	50	50	2	1	3	0	0	0	0
May	70	70	10	20	30	40	39.4±16	50	60	70	8	1	16	2	0	0	0
Jun	96	96	20	30	40	50	47.5±16	60	70	70	15	3	30	5	0	0	0
Jul	89	89	30	30	40	50	52.7±17	60	80	80	22	7	41	10	1	0	0
Aug	89	89	20	20	40	50	48.4±19	60	70	80	19	6	36	9	1	0	2
Sep	96	96	20	30	30	40	44.4±16	50	70	70	12	3	23	3	0	0	0
Oct	91	90	20	20	30	30	36.6±14	40	60	60	6	1	11	1	0	0	0
Nov	70	68	10	10	10	20	22.4±12	30	40	40	1	0	1	0	0	0	0
Dec	72	71	10	20	20	30	27.0±09	30	40	40	0	0	0	0	0	0	0

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100. Av. period BY YEAR = 8760 hrs; BY G.S. = 4416 hrs.
2. % Valid Days = # days with 75 % of hours between 09:00 and 21:00 / (total # days) * 100 (Federal Register 1979).
3. Cumulative Index S06 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 60 ppb (Lee et al. 1988).
4. Cumulative Index S08 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 80 ppb (Lee et al. 1988).
5. Statistics for monthly composites over the period of record.
6. Monthly estimate of S06(08) = S06(08) * (# hours in that month) / (# valid hours).

FRESNO COUNTY **CALIFORNIA**

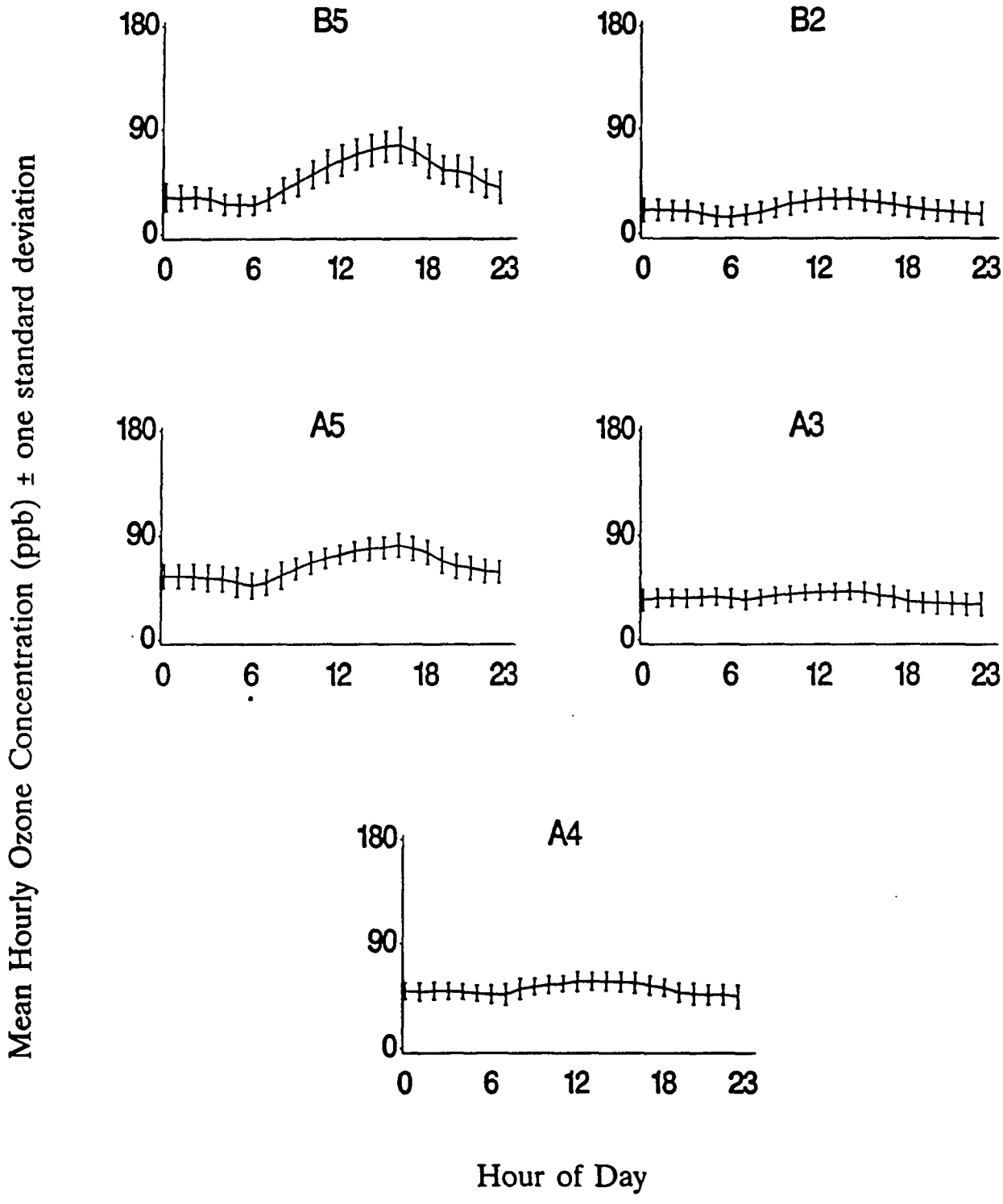
BIOGRAPHIC INFORMATION



Latitude	-	37.11° N
Longitude	-	119.31° W
Elevation (m)	-	1723
Basin Height (m)	-	30.8
Landuse	-	Remote
City Population	-	Not In A City
Basin Population	-	2,082,850
Start Summary	-	January, 1980
End Summary	-	December, 1983
Source of Data	-	AIRS (06-019-1003)

FRESNO COUNTY

DOMINANT DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS (MAY - OCT)



Fresno County

DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS

A. BY YEAR.

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	3	34	20	11	0	2	10	7	9	7	0	0	0	0	0	0	0	0
1981	1	26	10	18	1	4	33	2	3	4	0	0	0	0	0	0	0	0
1982	2	31	14	11	0	7	28	2	2	5	0	0	0	0	0	0	0	0
1983	4	55	18	2	0	0	6	7	8	5	0	0	0	0	0	0	0	0
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	2	35	15	11	0	3	20	5	5	5	0	0	0	0	0	0	0	0

B. BY GROWING SEASON (May through October).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	2	19	26	15	0	0	6	10	12	11	0	0	1	0	0	0	0	0
1981	1	19	19	36	1	0	11	3	4	7	0	0	0	0	0	0	0	0
1982	3	22	22	20	0	4	15	3	4	10	0	0	0	0	0	0	0	0
1983	6	31	25	3	0	0	7	10	13	9	0	0	0	0	0	0	0	0
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	3	23	23	18	0	1	10	7	8	9	0	0	0	0	0	0	0	0

C. BY MONTH (composited over years).

Month	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
Jan	0	47	0	0	0	9	44	0	0	0	0	0	0	0	0	0	0	0
Feb	1	57	7	0	0	5	31	0	0	0	0	0	0	0	0	0	0	0
Mar	1	52	4	3	0	1	36	3	1	0	0	0	0	0	0	0	0	0
Apr	1	61	16	1	0	0	10	7	5	0	0	0	0	0	0	0	0	0
May	2	33	19	8	0	8	7	10	11	4	0	0	0	0	0	0	0	0
Jun	2	25	25	25	0	0	6	1	10	8	0	0	0	0	0	0	0	0
Jul	5	12	30	37	0	0	0	4	6	11	0	0	1	0	0	0	0	0
Aug	2	6	28	22	2	0	12	6	7	17	0	0	0	0	0	0	0	0
Sep	1	24	25	14	0	0	9	8	9	12	0	0	0	0	0	0	0	0
Oct	5	38	12	4	0	0	25	10	8	3	0	0	0	0	0	0	0	0
Nov	5	18	0	0	0	34	45	0	3	0	0	0	0	0	0	0	0	0
Dec	2	56	0	0	0	5	40	0	0	0	0	0	0	0	0	0	0	0

1. % days with unidentified diurnal patterns in hourly ozone concentration (see Böhm et al. 1990).
2. Pattern identifier relates to degree of diurnal variation in hourly ozone concentrations (A curves - least variation; E curves - greatest variation) and daily mean (1 curves - lowest mean; 6 curves highest mean) as described by Böhm et al (1990) and as illustrated in Figure 4C.1. Note that due to numeric rounding, the sums of percentages do not always equal 100.

Lake Gregory

BASIC STATISTICS

A. BY YEAR.

Year	% Data Capt[1]	% Valid Days[2]	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	97	97	10	10	20	40	51.8±45	60	110	150	30	20	13	9	135
1981	98	99	10	10	20	40	52.0±47	70	120	150	33	22	15	11	145
1982	95	99	10	10	30	40	53.0±41	70	110	140	32	22	14	9	130
1983	95	99	10	10	30	40	54.3±43	70	110	150	33	20	14	10	122
1984	96	98	10	10	30	40	56.7±44	70	120	150	36	23	15	10	156
1985	99	99	10	10	30	40	52.8±42	70	110	150	34	21	13	9	131
1986	96	100	10	10	30	40	53.9±41	70	110	140	36	21	14	9	133
1987	79	81	10	10	30	40	45.1±35	50	90	120	24	15	10	6	84
1988	95	100	10	10	30	40	55.7±42	70	120	150	36	23	16	11	141
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	94	97	10	10	30	40	53.0±43	70	110	140	33	21	14	9	1177

B. BY GROWING SEASON (May through October).

Year	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06[3] (ppm hr)	S08[4] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	97	97	10	20	30	50	69.7±52	90	140	180	233	193	50	35	24	17	135
1981	98	98	20	20	40	60	75.5±52	100	150	180	261	216	55	39	28	20	145
1982	95	98	10	20	40	60	71.1±47	100	140	170	230	190	52	38	26	17	130
1983	94	98	10	20	40	60	74.6±50	100	150	180	252	203	57	39	27	19	122
1984	96	99	20	30	30	60	75.8±50	100	150	180	259	209	58	39	27	19	156
1985	99	100	10	20	30	60	69.8±49	90	140	170	241	191	53	36	24	16	131
1986	96	100	20	30	40	60	72.9±45	100	140	170	248	192	58	37	26	17	133
1987	63	66	10	20	30	50	63.4±42	90	130	150	132	100	49	31	21	13	84
1988	96	100	20	30	40	60	76.7±47	100	150	170	263	209	60	40	28	20	141
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	93	95	10	20	40	60	72.5±49	100	140	170	-	-	55	37	26	18	1177

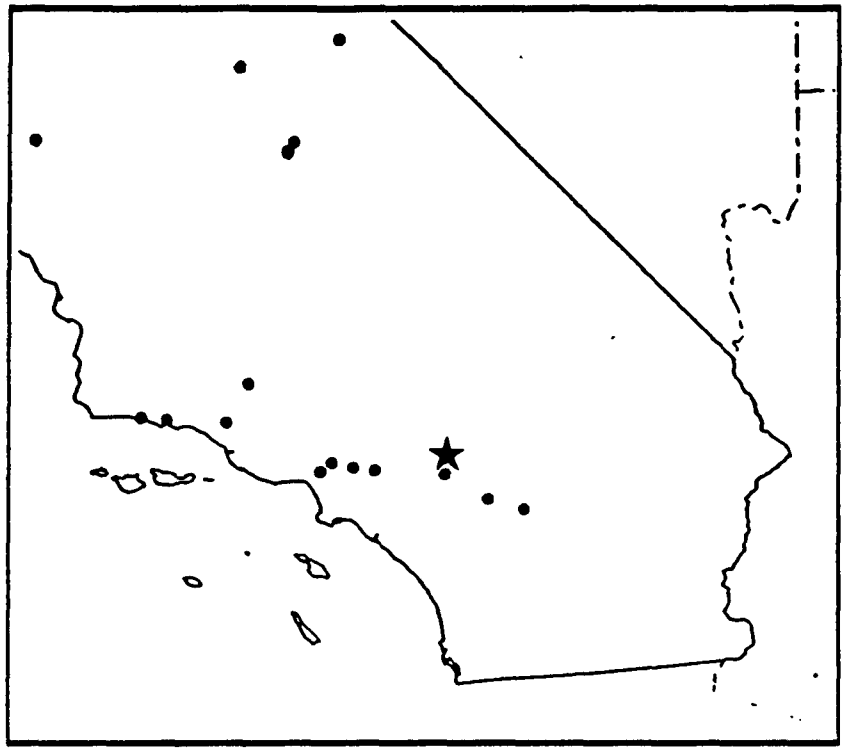
C. BY MONTH [5].

Month	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06 (ppm hr)	S08[6] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
Jan	95	98	0	10	10	30	26.5±15	40	40	50	1	1	2	0	0	0	0
Feb	96	98	0	10	20	30	30.4±18	40	50	60	3	2	6	2	0	0	2
Mar	98	100	10	10	30	40	38.2±21	50	60	80	8	4	14	6	2	1	22
Apr	97	99	20	20	40	50	54.3±30	60	90	110	22	14	36	18	10	5	83
May	96	98	20	30	40	60	68.7±41	90	130	150	39	29	53	33	21	14	158
Jun	96	100	30	40	50	80	88.3±50	120	160	190	56	46	70	50	37	26	226
Jul	97	100	20	30	50	80	92.1±54	130	170	195	61	52	71	53	40	30	234
Aug	96	99	20	30	50	70	85.1±52	120	160	180	55	47	67	50	36	25	253
Sep	95	99	10	20	30	50	61.6±42	80	120	150	33	24	46	29	18	11	144
Oct	96	97	10	10	20	40	40.0±28	50	80	90	14	8	22	10	5	2	50
Nov	97	99	0	10	20	30	30.2±19	40	50	60	5	2	8	3	1	0	4
Dec	94	98	0	0	10	30	23.5±14	30	40	40	1	1	1	0	0	0	1

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100. Av. period BY YEAR = 8760 hrs; BY G.S. = 4416 hrs.
2. % Valid Days = # days with 75 % of hours between 09:00 and 21:00 / (total # days) * 100 (Federal Register 1979).
3. Cumulative Index: S06 = Σ $[O_3]$/1000, where $[O_3]$ is hourly ozone concentrations ≥ 60 ppb (Lee et al. 1988).
4. Cumulative Index: S08 = Σ $[O_3]$/1000, where $[O_3]$ is hourly ozone concentrations ≥ 80 ppb (Lee et al. 1988).
5. Statistics for monthly composites over the period of record.
6. Monthly estimate of S06(08) = S06(08) * (# hours in that month) / (# valid hours).

LAKE GREGORY CALIFORNIA

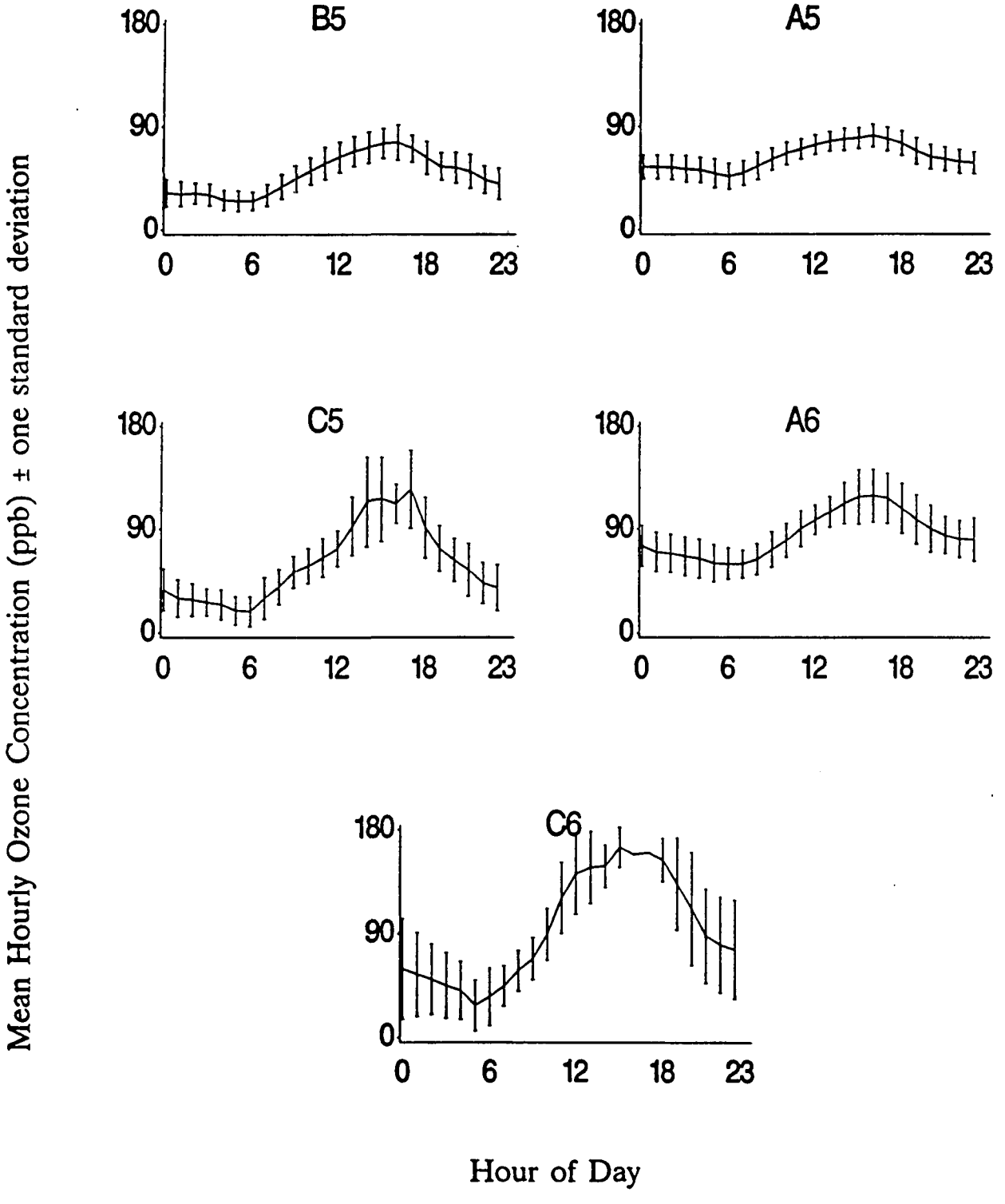
BIOGRAPHIC INFORMATION



Latitude	-	34.24° N
Longitude	-	117.28° W
Elevation (m)	-	1397
Basin Height (m)	-	123.1
Landuse	-	Rural - Urban
City Population	-	Not In A City
Basin Population	-	11,201,922
Start Summary	-	January, 1980
End Summary	-	December, 1988
Source of Data	-	AIRS (06-071-0005)

LAKE GREGORY

DOMINANT DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS (MAY - OCT)



Lake Gregory

DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS

A. BY YEAR.

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	4	13	6	5	8	6	13	5	3	6	1	2	4	2	9	15	1	1
1981	3	10	4	5	10	5	16	3	2	6	3	4	3	1	10	17	1	0
1982	2	20	6	6	15	2	9	5	4	3	3	4	4	1	7	11	0	0
1983	1	20	7	5	10	0	9	8	4	5	2	4	2	1	4	19	0	0
1984	3	17	7	5	12	0	6	4	4	7	1	5	4	2	8	16	0	1
1985	2	17	6	5	9	0	10	4	1	8	1	6	6	1	7	15	0	0
1986	3	18	4	6	13	0	6	5	5	7	2	6	5	1	8	14	1	0
1987	2	23	4	3	11	1	13	6	3	5	1	6	7	4	7	7	0	0
1988	3	18	5	5	15	1	9	4	6	4	3	2	4	2	5	15	1	0
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	3	17	6	5	11	2	10	5	3	6	2	4	4	1	7	15	1	0

B. BY GROWING SEASON (May through October).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	2	2	2	8	14	1	5	2	4	7	1	0	5	2	13	28	2	2
1981	1	7	4	7	17	0	2	1	2	7	0	1	2	2	16	32	2	0
1982	1	6	4	9	27	1	5	3	4	3	0	1	3	3	11	22	0	1
1983	1	3	3	6	20	0	3	4	5	8	0	1	2	1	8	37	1	0
1984	2	4	4	7	22	0	1	1	4	6	0	0	2	2	11	33	1	1
1985	1	5	4	9	16	0	5	2	2	8	0	3	3	1	12	29	1	0
1986	1	5	3	9	21	0	1	2	3	8	0	1	6	1	13	26	2	0
1987	1	4	5	5	24	2	5	4	5	6	0	0	5	4	15	17	0	0
1988	2	5	5	8	26	0	0	1	5	5	0	0	4	2	8	28	2	0
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	1	5	4	8	21	0	3	2	4	6	0	1	4	2	12	28	1	0

C. BY MONTH (composited over years).

Month	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
Jan	4	37	2	0	0	7	22	7	0	2	6	15	2	0	0	0	0	0
Feb	3	35	5	1	0	4	15	8	3	5	4	12	8	0	0	0	0	0
Mar	3	34	8	2	2	0	9	14	7	7	0	3	8	3	2	0	0	0
Apr	2	15	24	9	10	0	1	3	6	11	0	0	2	2	12	5	0	0
May	2	6	8	14	22	0	1	2	6	9	0	0	1	1	11	19	0	0
Jun	1	2	5	7	31	0	0	0	2	2	0	0	0	0	11	40	0	0
Jul	0	0	2	5	28	0	0	0	0	4	0	0	0	0	7	52	0	1
Aug	0	0	1	6	25	0	1	1	1	2	0	0	0	2	18	43	0	1
Sep	1	5	3	8	13	0	5	2	5	12	0	0	4	2	20	15	3	0
Oct	4	15	5	6	4	1	9	7	7	9	1	4	15	6	5	1	4	0
Nov	6	30	5	3	0	3	24	8	3	5	3	7	10	0	0	0	0	0
Dec	5	30	0	0	0	7	33	4	1	1	11	12	1	0	0	0	0	0

1. % days with unidentified diurnal patterns in hourly ozone concentration (see Böhm et al. 1990).
2. Pattern identifier relates to degree of diurnal variation in hourly ozone concentrations (A curves - least variation; E curves - greatest variation) and daily mean (1 curves - lowest mean; 6 curves highest mean) as described by Böhm et al (1990) and as illustrated in Figure 4C.1. Note that due to numeric rounding, the sums of percentages do not always equal 100.

Lassen Volcanic National Park

BASIC STATISTICS

A. BY YEAR.

Year	% Data Capt[1]	% Valid Days[2]	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	18	18	13	19	26	31	29.5±07	35	37	39	0	0	0	0	0
1988	74	77	17	21	28	34	35.0±12	41	51	59	5	0	0	0	0
1989	32	33	22	26	30	35	35.9±10	40	47	57	4	0	0	0	0
All Years	41	43	18	22	28	34	34.4±11	39	48	56	4	0	0	0	0

B. BY GROWING SEASON (May through October).

Year	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06[3] (ppm hr)	S08[4] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	4	5	10	11	18	25	24.4±09	31	36	38	0	0	0	0	0	0	0
1988	85	89	18	22	29	36	37.9±13	46	57	63	20	1	8	0	0	0	0
1989	18	17	18	21	29	40	41.0±15	52	63	67	8	1	14	1	0	0	0
All Years	36	37	17	21	28	36	37.8±14	46	58	64	-	-	9	0	0	0	0

C. BY MONTH [5].

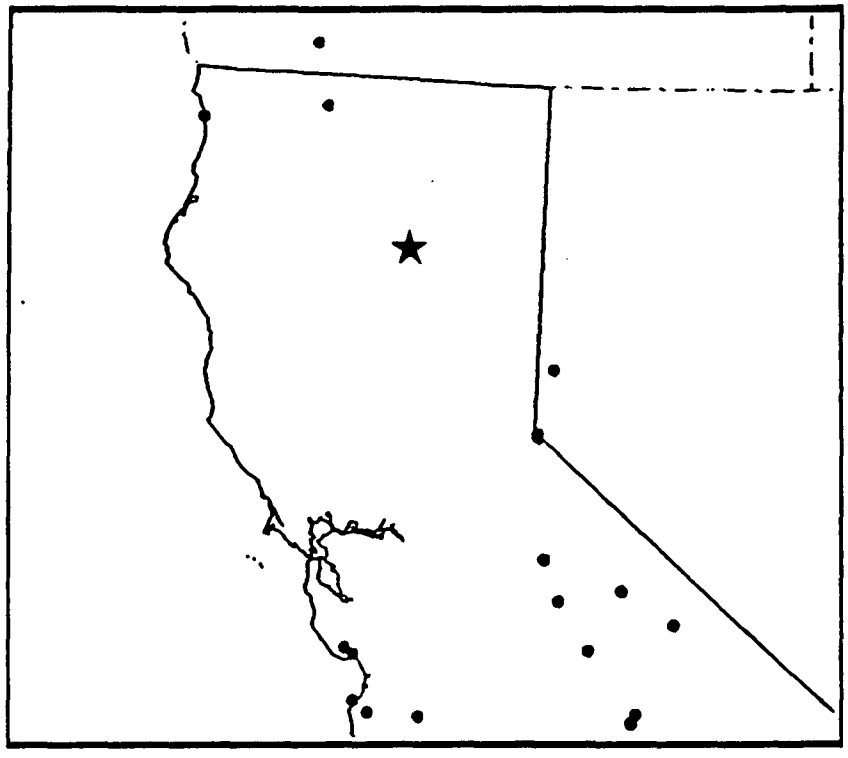
Month	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06 (ppm hr)	S08[6] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
Jan	95	100	24	27	30	33	33.4±05	37	40	42	0	0	0	0	0	0	0
Feb	70	74	27	30	33	37	36.4±05	40	42	44	0	0	0	0	0	0	0
Mar	71	74	19	22	28	33	32.1±07	37	40	41	0	0	0	0	0	0	0
Apr	27	30	19	25	29	36	37.2±11	43	52	59	2	0	4	0	0	0	0
May	23	23	20	23	29	37	39.2±14	49	58	64	5	1	8	1	0	0	0
Jun	58	60	15	18	24	32	33.0±13	40	52	57	2	0	3	0	0	0	0
Jul	89	92	18	21	28	37	38.8±15	48	61	67	6	1	12	0	0	0	0
Aug	95	100	24	27	33	41	41.9±12	50	59	63	5	0	10	0	0	0	0
Sep	95	100	27	31	36	41	43.8±12	51	63	67	7	0	13	0	0	0	0
Oct	58	58	13	17	24	31	32.5±13	39	50	58	3	0	5	0	0	0	0
Nov	87	87	11	15	23	28	26.8±08	33	36	37	0	0	0	0	0	0	0
Dec	83	84	18	23	28	31	30.4±06	34	36	37	0	0	0	0	0	0	0

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100. Av. period BY YEAR = 8760 hrs; BY G.S. = 4416 hrs.
2. % Valid Days = # days with 75 % of hours between 09:00 and 21:00 / (total # days) * 100 (Federal Register 1979).
3. Cumulative Index S06 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 60 ppb (Lee et al. 1988).
4. Cumulative Index S08 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 80 ppb (Lee et al. 1988).
5. Statistics for monthly composites over the period of record.
6. Monthly estimate of S06(08) = S06(08) * (# hours in that month) / (# valid hours).

LASSEN VOLCANIC NATIONAL PARK

CALIFORNIA

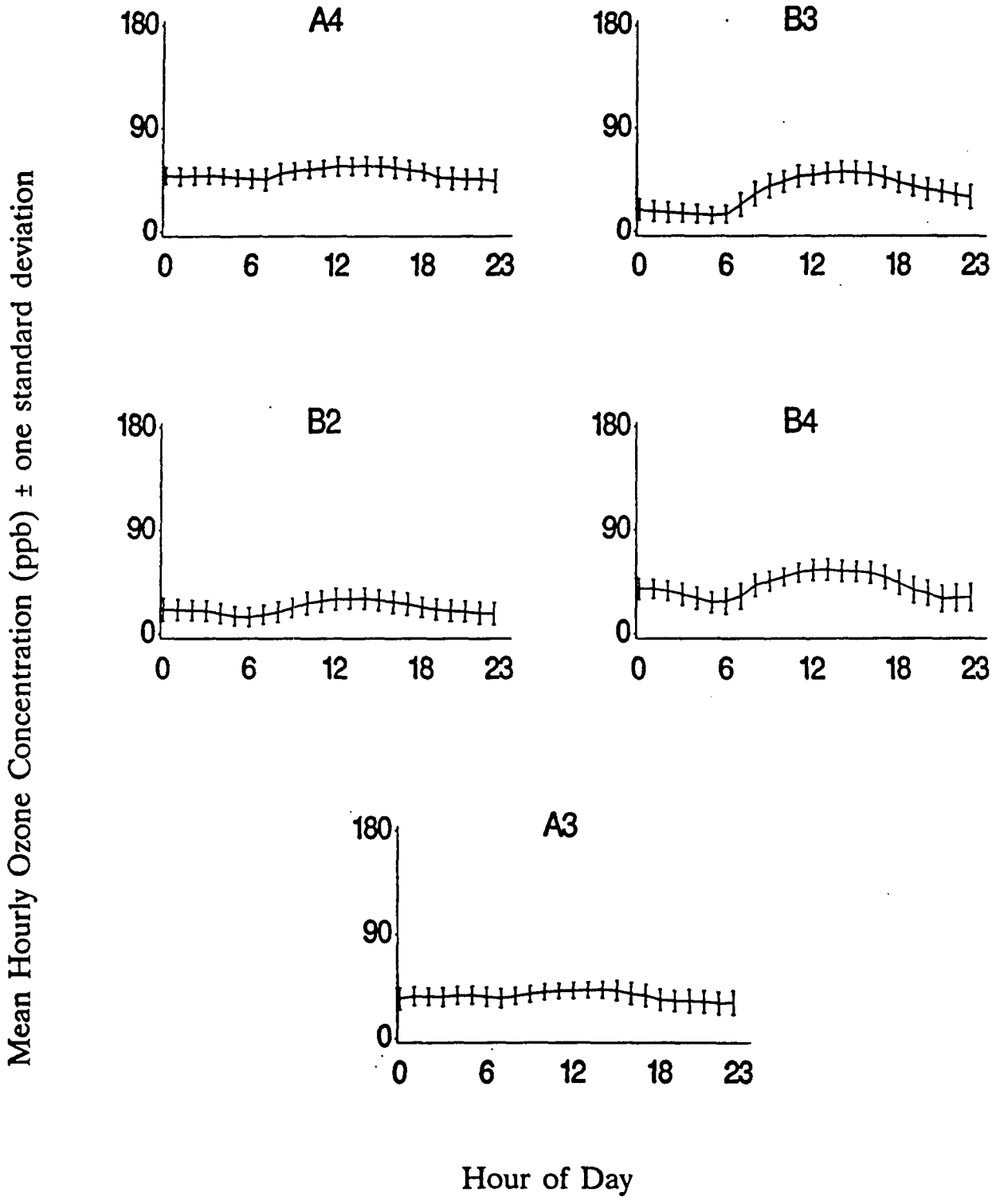
BIOGRAPHIC INFORMATION



Latitude	-	40.53° N
Longitude	-	121.57° W
Elevation (m)	-	1788
Basin Height (m)	-	95.4
Landuse	-	Rural - Forest
City Population	-	Not In A City
Basin Population	-	70,049
Start Summary	-	October, 1987
End Summary	-	July, 1989
Source of Data	-	National Park Service

LASSEN VOLCANIC NATIONAL PARK

DOMINANT DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS (MAY - OCT)



Lassen Volcanic National Park

DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS

A. BY YEAR.

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	4	57	0	0	0	2	39	0	0	0	0	0	2	0	0	0	0	0
1988	5	43	8	1	0	1	22	6	13	5	0	0	0	0	0	0	0	0
1989	1	73	3	4	0	0	5	9	3	2	0	0	0	0	0	0	0	0
All Years	4	53	6	2	0	1	20	6	9	4	0	0	0	0	0	0	0	0

B. BY GROWING SEASON (May through October).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	14	17	0	0	0	0	67	0	0	0	0	0	17	0	0	0	0	0
1988	7	28	12	2	0	1	18	9	22	9	0	0	0	0	0	0	0	0
1989	4	4	13	17	0	0	9	35	13	9	0	0	0	0	0	0	0	0
All Years	7	24	12	4	0	1	19	12	19	8	0	0	1	0	0	0	0	0

C. BY MONTH (composited over years).

Month	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
Jan	2	90	2	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0
Feb	0	94	3	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0
Mar	0	77	0	0	0	0	17	6	0	0	0	0	0	0	0	0	0	0
Apr	17	60	0	0	0	0	0	20	20	0	0	0	0	0	0	0	0	0
May	9	30	10	0	0	0	0	20	30	10	0	0	0	0	0	0	0	0
Jun	13	15	8	0	0	4	38	12	23	0	0	0	0	0	0	0	0	0
Jul	4	19	14	9	0	0	16	19	9	14	0	0	0	0	0	0	0	0
Aug	4	12	17	0	0	0	0	12	50	8	0	0	0	0	0	0	0	0
Sep	8	42	17	8	0	0	4	0	17	12	0	0	0	0	0	0	0	0
Oct	7	33	4	0	0	0	41	11	4	4	0	0	4	0	0	0	0	0
Nov	0	38	0	0	0	5	57	0	0	0	0	0	0	0	0	0	0	0
Dec	3	74	0	0	0	0	26	0	0	0	0	0	0	0	0	0	0	0

1. % days with unidentified diurnal patterns in hourly ozone concentration (see Böhm et al. 1990).
2. Pattern identifier relates to degree of diurnal variation in hourly ozone concentrations (A curves - least variation; E curves - greatest variation) and daily mean (1 curves - lowest mean; 6 curves highest mean) as described by Böhm et al (1990) and as illustrated in Figure 4C.1. Note that due to numeric rounding, the sums of percentages do not always equal 100.

Lower Kaweah, Sequoia National Park (AIRS)

BASIC STATISTICS

A. BY YEAR (June through October).

Year	% Data Capt[1]	% Valid Days[2]	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	20	19	20	30	40	60	62.0±26	80	90	100	61	34	9	1	7
1986	15	15	10	20	30	60	56.7±27	80	90	100	52	29	7	0	4
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	17	17	10	20	40	60	59.7±26	80	90	100	57	32	8	1	11

B. BY GROWING SEASON (June through October).

Year	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06[3] (ppm hr)	S08[4] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	39	39	20	30	40	60	62.0±26	80	90	100	84	53	61	34	9	1	7
1986	30	29	10	20	30	60	56.7±27	80	90	100	55	35	52	29	7	0	4
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	35	34	10	20	40	60	59.7±26	80	90	100	-	-	57	32	8	1	11

C. BY MONTH [5].

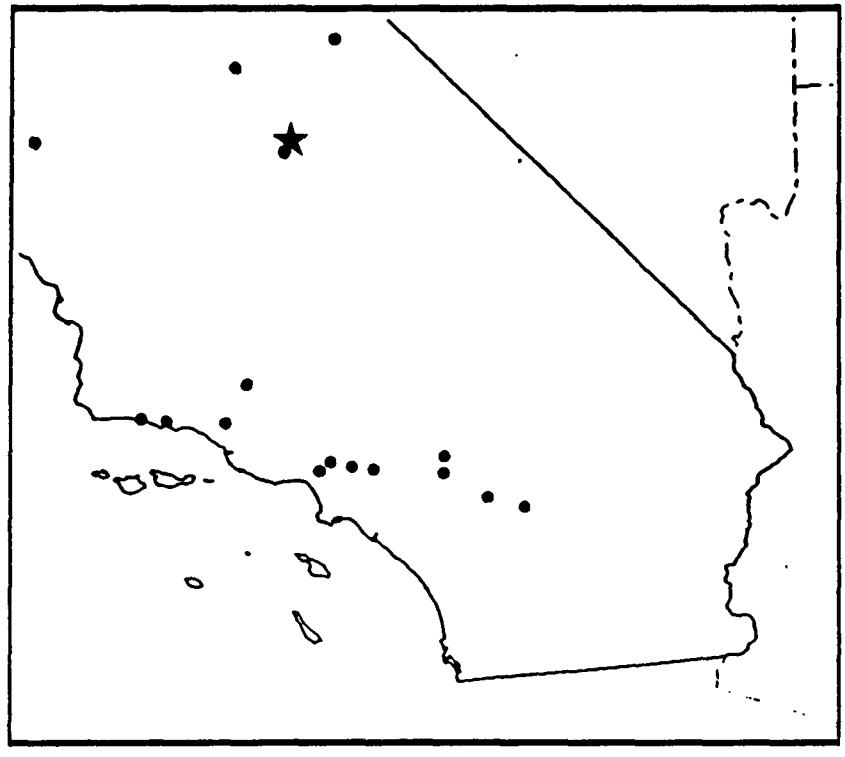
Month	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06 (ppm hr)	S08[6] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
Jan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Feb	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mar	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Apr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
May	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Jun	20	20	30	40	60	80	75.8±23	90	100	110	50	38	82	56	19	3	2
Jul	29	27	40	40	50	70	65.8±18	80	90	90	40	22	72	34	4	0	1
Aug	76	74	40	50	70	80	77.1±20	90	100	110	54	40	87	58	18	1	8
Sep	62	62	10	20	30	50	46.7±21	60	70	80	17	6	32	10	1	0	0
Oct	31	29	10	10	20	30	31.8±19	40	60	70	7	2	13	3	0	0	0
Nov	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dec	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100. Av. period BY YEAR = 8760 hrs; BY G.S. = 4416 hrs.
2. % Valid Days = # days with 75 % of hours between 09:00 and 21:00 / (total # days) * 100 (Federal Register 1979).
3. Cumulative Index: S06 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 60 ppb (Lee et al. 1988).
4. Cumulative Index: S08 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 80 ppb (Lee et al. 1988).
5. Statistics for monthly composites over the period of record.
6. Monthly estimate of S06(08) = S06(08) * (# hours in that month) / (# valid hours).

LOWER KAWEAH, SEQUOIA NATIONAL PARK

CALIFORNIA

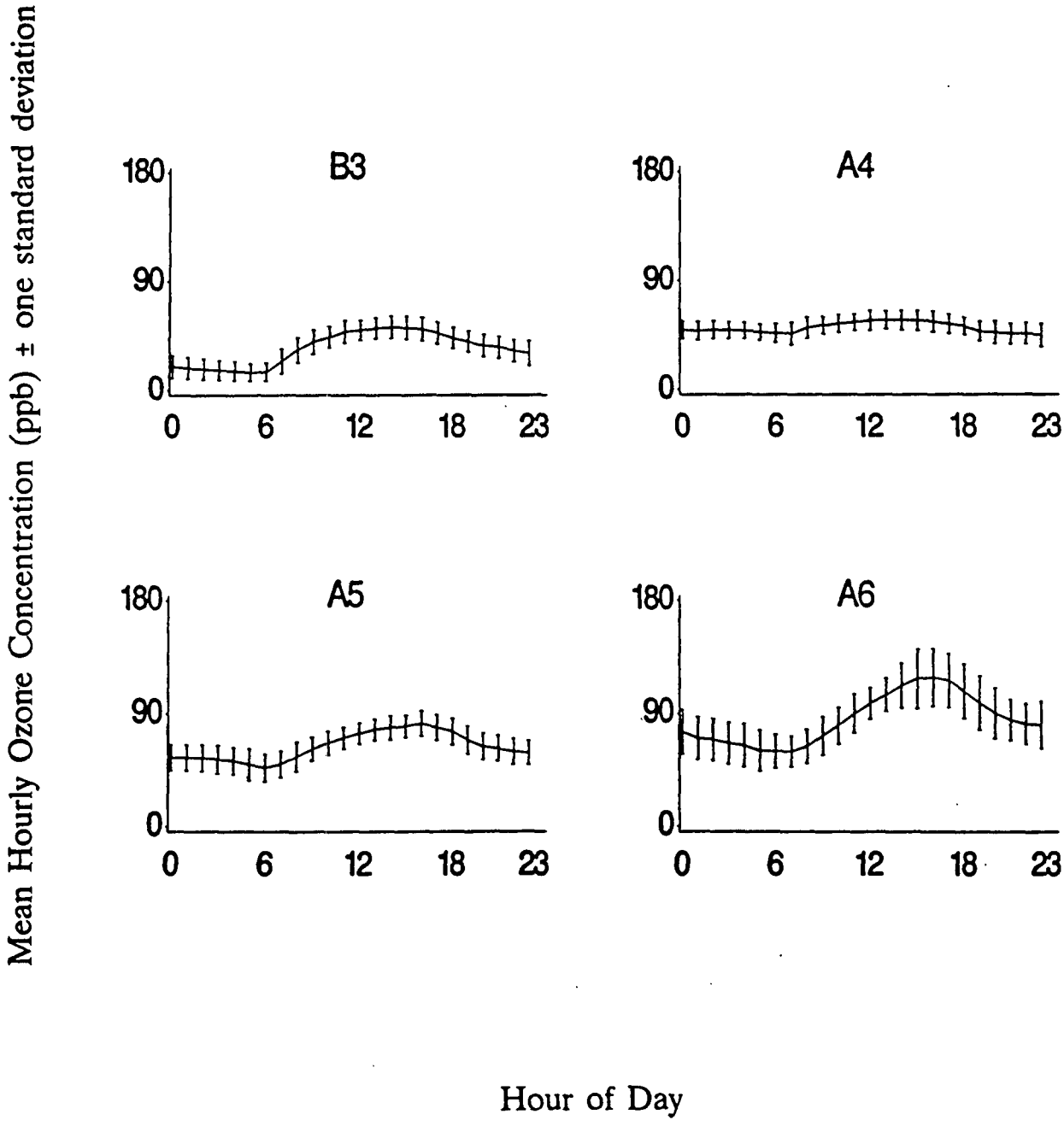
BIOGRAPHIC INFORMATION



Latitude	-	36.57° N
Longitude	-	118.78° W
Elevation (m)	-	1901
Basin Height (m)	-	76.9
Landuse	-	Rural
City Population	-	Not In A City
Basin Population	-	2,082,850
Start Summary	-	June, 1985
End Summary	-	September, 1986
Source of Data	-	AIRS (06-107-0002)

LOWER KAWEAH, SEQUOIA NATIONAL PARK (AIRS)

DOMINANT DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS (JUN - OCT)



Lower Kaweah, Sequoia National Park (AIRS)

DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS

A. BY YEAR (June through October).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	3	0	11	28	39	0	2	5	5	5	0	3	2	0	0	0	0	0
1986	4	6	8	29	29	2	4	6	6	2	2	0	6	0	0	0	0	0
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	4	3	9	28	34	1	3	6	6	4	1	2	4	0	0	0	0	0

B. BY GROWING SEASON (June through October).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	3	0	11	28	39	0	2	5	5	5	0	3	2	0	0	0	0	0
1986	4	6	8	29	29	2	4	6	6	2	2	0	6	0	0	0	0	0
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	4	3	9	28	34	1	3	6	6	4	1	2	4	0	0	0	0	0

C. BY MONTH (composited over years).

Month	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
Jan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Feb	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mar	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Apr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
May	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Jun	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0
Jul	0	0	15	77	8	0	0	0	0	0	0	0	0	0	0	0	0	0
Aug	0	2	0	23	72	0	0	0	0	2	0	0	0	0	0	0	0	0
Sep	6	3	17	33	0	0	0	13	17	7	0	3	7	0	0	0	0	0
Oct	11	6	19	0	0	6	19	12	6	6	6	6	12	0	0	0	0	0
Nov	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dec	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

1. % days with unidentified diurnal patterns in hourly ozone concentration (see Böhm et al. 1990).
2. Pattern identifier relates to degree of diurnal variation in hourly ozone concentrations (A curves - least variation; E curves - greatest variation) and daily mean (1 curves - lowest mean; 6 curves highest mean) as described by Böhm et al (1990) and as illustrated in Figure 4C.1. Note that due to numeric rounding, the sums of percentages do not always equal 100.

Lower Kaweah, Sequoia National Park (NPS)

BASIC STATISTICS

A. BY YEAR.

Year	% Data Capt[1]	% Valid Days[2]	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	20	19	20	30	40	60	62.0±26	80	90	100	61	34	9	1	7
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	68	70	17	22	31	42	45.2±19	59	73	80	24	5	0	0	0
1988	93	96	24	28	35	47	49.6±19	62	76	84	28	8	1	0	0
1989	25	25	5	9	15	22	23.5±15	28	36	55	4	1	0	0	0
All Years	51	53	15	20	30	43	46.2±22	61	77	85	27	9	1	0	7

B. BY GROWING SEASON (May through October).

Year	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06[3] (ppm hr)	S08[4] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	39	39	20	30	40	60	62.0±26	80	90	100	84	53	61	34	9	1	7
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	94	97	16	25	37	50	50.8±20	65	77	83	101	28	33	8	0	0	0
1988	95	99	30	36	46	59	59.3±18	73	83	90	152	55	48	15	1	0	0
1989	5	4	20	31	44	55	56.1±20	70	83	88	7	3	40	14	1	0	0
All Years	58	60	21	30	41	56	56.3±21	71	83	90	-	-	44	15	2	0	7

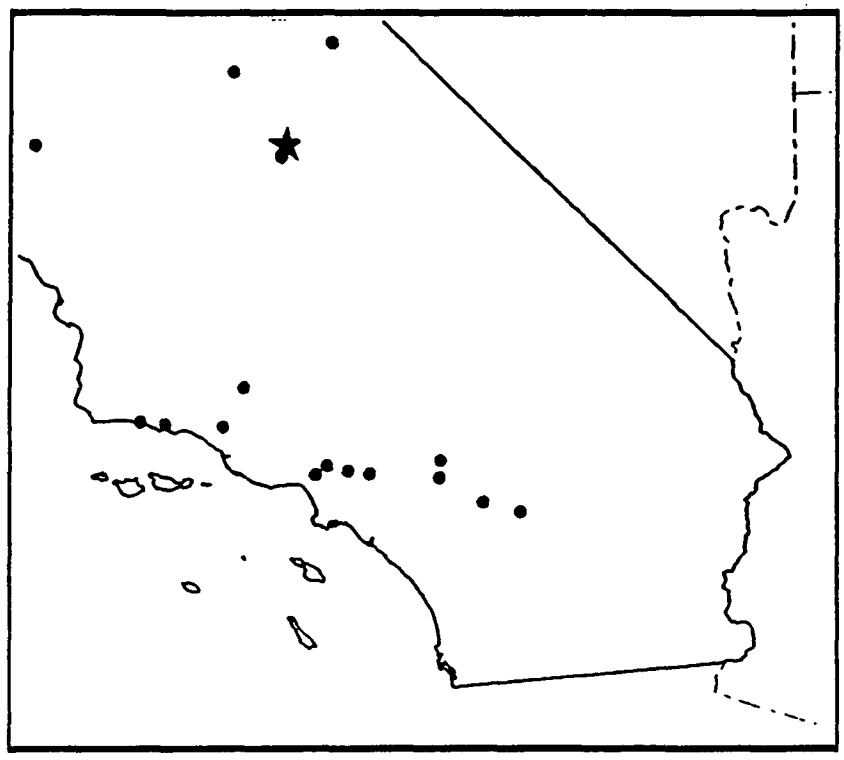
C. BY MONTH [5].

Month	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06 (ppm hr)	S08[6] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
Jan	91	95	17	19	23	28	27.7±07	32	37	39	0	0	0	0	0	0	0
Feb	92	93	9	12	21	33	32.2±14	44	49	52	1	0	1	0	0	0	0
Mar	95	100	4	8	17	29	31.5±19	48	57	63	4	1	8	0	0	0	0
Apr	77	80	21	26	35	46	45.9±15	56	66	72	10	1	19	2	0	0	0
May	64	65	25	31	40	48	50.0±16	59	73	78	14	3	24	4	0	0	0
Jun	54	54	18	25	38	52	53.7±22	70	83	90	22	10	38	15	2	0	2
Jul	62	64	31	38	48	61	62.0±19	76	88	94	32	15	56	22	3	0	1
Aug	93	97	32	38	50	66	65.1±20	80	90	100	37	18	64	27	6	0	4
Sep	79	82	18	30	40	53	53.3±20	69	80	86	21	7	39	11	0	0	0
Oct	73	76	12	20	34	50	49.6±21	67	76	83	19	5	34	7	0	0	0
Nov	94	97	16	19	24	31	30.7±10	36	42	47	1	0	1	0	0	0	0
Dec	82	85	19	22	28	32	30.9±06	35	38	39	0	0	0	0	0	0	0

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100. Av. period BY YEAR = 8760 hrs; BY G.S. = 4416 hrs.
2. % Valid Days = # days with 75 % of hours between 09:00 and 21:00 / (total # days) * 100 (Federal Register 1979).
3. Cumulative Index: S06 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 60 ppb (Lee et al. 1988).
4. Cumulative Index: S08 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 80 ppb (Lee et al. 1988).
5. Statistics for monthly composites over the period of record.
6. Monthly estimate of S06(08) = S06(08) * (# hours in that month) / (# valid hours).

LOWER KAWEAH, SEQUOIA NATIONAL PARK — CALIFORNIA

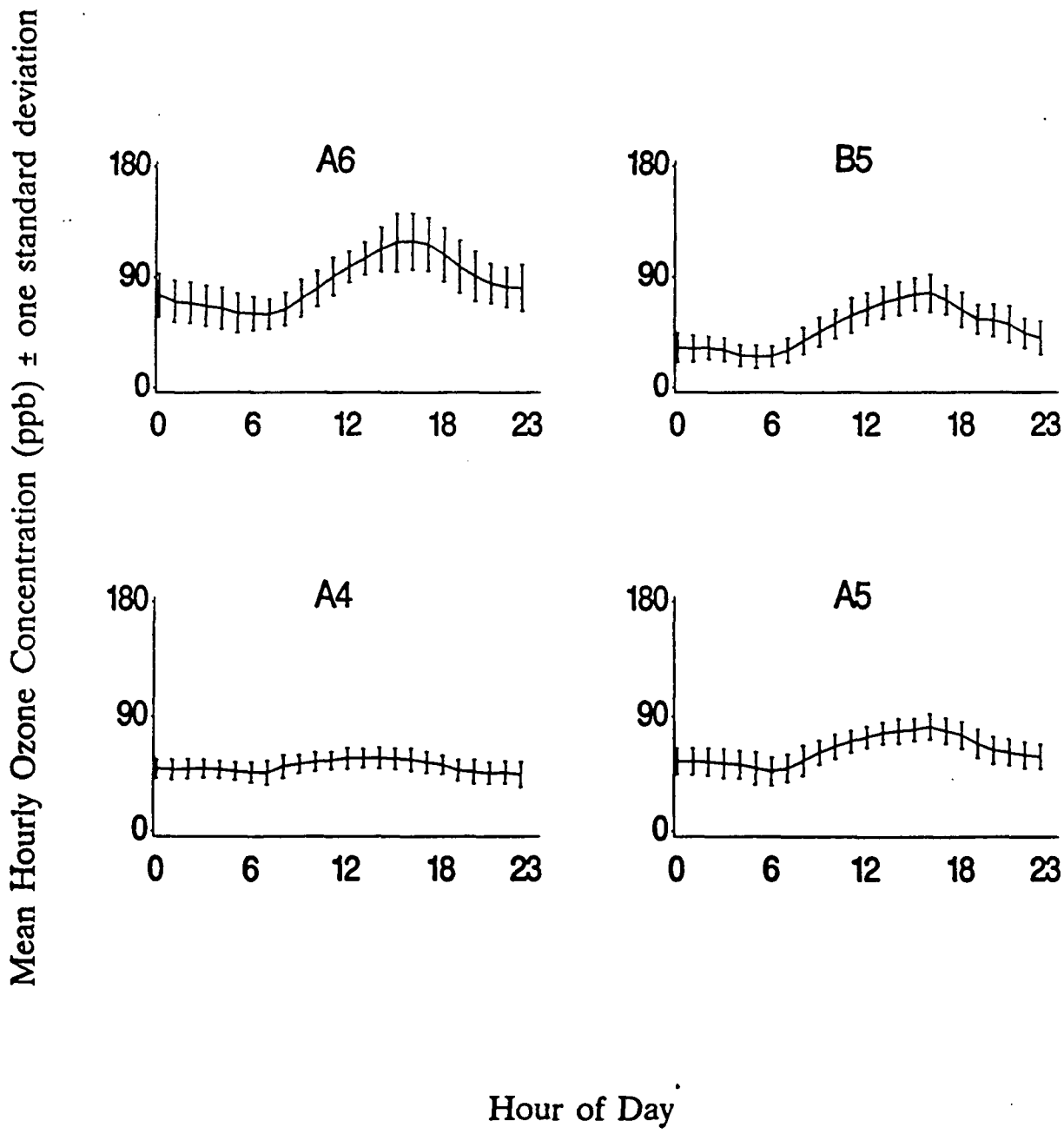
BIOGRAPHIC INFORMATION



Latitude	-	36.57° N
Longitude	-	118.78° W
Elevation (m)	-	1890
Basin Height (m)	-	76.9
Landuse	-	Rural - Forest
City Population	-	Not In A City
Basin Population	-	2,082,850
Start Summary	-	August, 1985
End Summary	-	July, 1989
Source of Data	-	National Park Service

LOWER KAWEAH, SEQUOIA NATIONAL PARK (NPS)

DOMINANT DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS (MAY - OCT)



Lower Kaweah, Sequoia National Park (NPS)

DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS

A. BY YEAR.

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	3	0	11	28	39	0	2	5	5	5	0	3	2	0	0	0	0	0
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	6	18	16	23	1	0	14	4	9	12	0	3	1	0	0	0	0	0
1988	1	28	20	28	5	0	6	3	5	4	0	0	0	0	0	0	0	0
1989	6	8	0	0	0	26	65	0	0	0	0	2	0	0	0	0	0	0
All Years	3	20	16	23	7	3	14	3	6	7	0	1	1	0	0	0	0	0

B. BY GROWING SEASON (May through October).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	3	0	11	28	39	0	2	5	5	5	0	3	2	0	0	0	0	0
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	4	4	19	32	2	0	6	6	10	16	0	4	1	0	0	0	0	0
1988	0	6	20	48	10	0	1	3	6	8	0	0	0	0	0	0	0	0
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	2	4	18	38	11	0	3	4	7	11	0	2	1	0	0	0	0	0

C. BY MONTH (composited over years).

Month	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
Jan	0	52	0	0	0	2	46	0	0	0	0	0	0	0	0	0	0	0
Feb	2	31	19	0	0	14	33	2	0	0	0	0	0	0	0	0	0	0
Mar	10	16	27	2	0	22	27	0	4	0	0	2	0	0	0	0	0	0
Apr	14	22	33	19	0	0	6	3	11	6	0	0	0	0	0	0	0	0
May	4	12	29	23	6	0	2	6	15	6	0	0	0	0	0	0	0	0
Jun	0	0	19	31	10	0	10	3	9	16	0	2	0	0	0	0	0	0
Jul	0	3	14	57	11	0	0	5	3	6	0	0	0	0	0	0	0	0
Aug	1	4	7	43	26	0	0	0	5	15	0	0	0	0	0	0	0	0
Sep	7	4	19	37	8	0	0	6	10	10	0	2	6	0	0	0	0	0
Oct	2	2	26	33	2	0	7	7	5	10	0	9	0	0	0	0	0	0
Nov	4	46	2	0	0	0	39	4	7	0	0	0	2	0	0	0	0	0
Dec	0	79	0	0	0	0	21	0	0	0	0	0	0	0	0	0	0	0

1. % days with unidentified diurnal patterns in hourly ozone concentration (see Böhm et al. 1990).
2. Pattern identifier relates to degree of diurnal variation in hourly ozone concentrations (A curves - least variation; E curves - greatest variation) and daily mean (1 curves - lowest mean; 6 curves highest mean) as described by Böhm et al (1990) and as illustrated in Figure 4C.1. Note that due to numeric rounding, the sums of percentages do not always equal 100.

Mammoth Lakes

BASIC STATISTICS

A. BY YEAR.

Year	% Data Capt[1]	% Valid Days[2]	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	62	61	10	20	30	40	37.7±16	50	60	70	15	1	0	0	0
1985	95	91	10	20	20	30	34.5±16	40	50	60	9	1	0	0	0
1986	96	93	20	30	40	40	45.8±15	50	70	70	23	4	0	0	0
1987	90	87	20	20	30	40	42.4±16	50	60	70	20	3	0	0	0
1988	98	98	20	20	30	40	42.2±15	50	60	70	19	3	0	0	0
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	88	86	20	20	30	40	40.8±16	50	60	70	17	3	0	0	0

B. BY GROWING SEASON (May through October).

Year	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06[3] (ppm hr)	S08[4] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	85	14	20	20	20	40	43.0±15	50	60	70	53	7	22	2	0	0	0
1985	92	14	10	20	30	40	40.3±17	50	60	70	49	6	18	2	0	0	0
1986	98	15	30	30	40	50	51.9±15	60	70	80	115	29	39	8	0	0	0
1987	85	16	20	30	40	50	48.5±16	60	70	80	86	17	35	5	0	0	0
1988	98	16	30	30	40	50	48.5±16	60	70	80	95	20	33	5	0	0	0
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	92	15	20	30	40	50	46.6±16	60	70	70	-	-	30	5	0	0	0

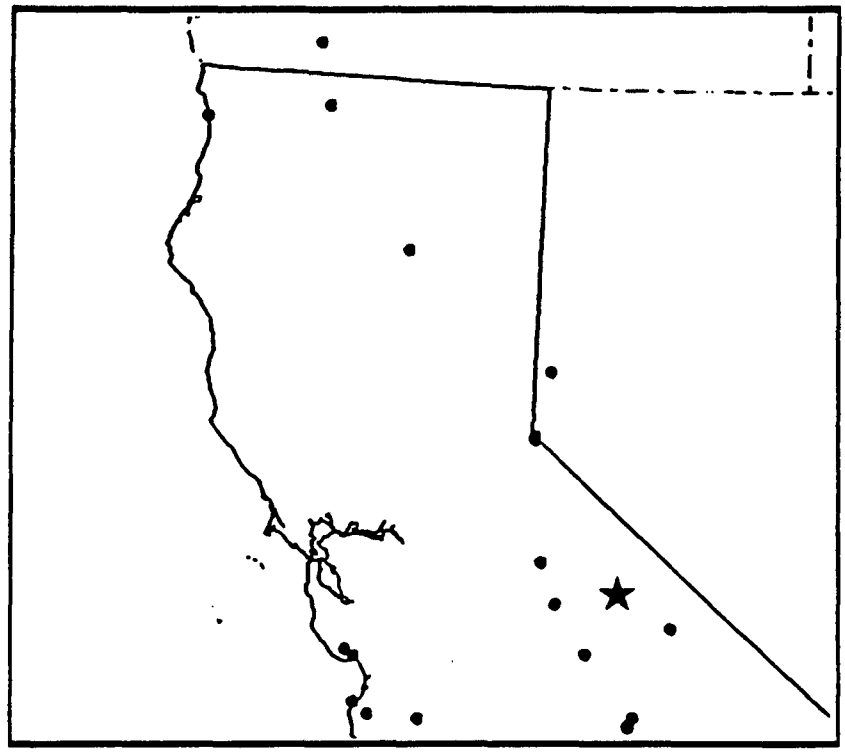
C. BY MONTH [5].

Month	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06 (ppm hr)	S08[6] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
Jan	97	92	10	20	20	30	31.8±13	40	50	50	1	0	2	0	0	0	0
Feb	97	96	10	20	30	30	32.9±12	40	50	50	2	1	3	0	0	0	0
Mar	94	90	20	20	30	30	34.9±11	40	50	50	1	0	1	0	0	0	0
Apr	86	84	20	20	30	40	41.4±14	50	60	60	8	1	15	1	0	0	0
May	97	96	20	20	30	50	44.1±16	60	60	70	13	1	26	2	0	0	0
Jun	97	97	20	20	30	50	45.4±17	60	70	70	14	3	29	4	0	0	0
Jul	95	94	30	30	40	50	49.5±15	60	70	70	18	3	36	5	0	0	0
Aug	96	97	30	30	40	50	54.0±16	60	80	80	24	7	47	10	0	0	0
Sep	83	84	30	30	40	50	49.0±16	60	70	80	15	4	31	6	0	0	0
Oct	82	79	20	20	30	40	36.3±12	40	50	60	4	1	6	1	0	0	0
Nov	95	90	20	20	30	40	35.6±11	40	50	50	2	0	3	0	0	0	0
Dec	97	89	10	10	20	30	30.1±11	40	40	50	1	0	0	0	0	0	0

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100. Av. period BY YEAR = 8760 hrs; BY G.S. = 4416 hrs.
2. % Valid Days = # days with 75 % of hours between 09:00 and 21:00 / (total # days) * 100 (Federal Register 1979).
3. Cumulative Index S06 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 60 ppb (Lee et al. 1988).
4. Cumulative Index S08 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 80 ppb (Lee et al. 1988).
5. Statistics for monthly composites over the period of record.
6. Monthly estimate of S06(08) = S06(08) * (# hours in that month) / (# valid hours).

MAMMOTH LAKES CALIFORNIA

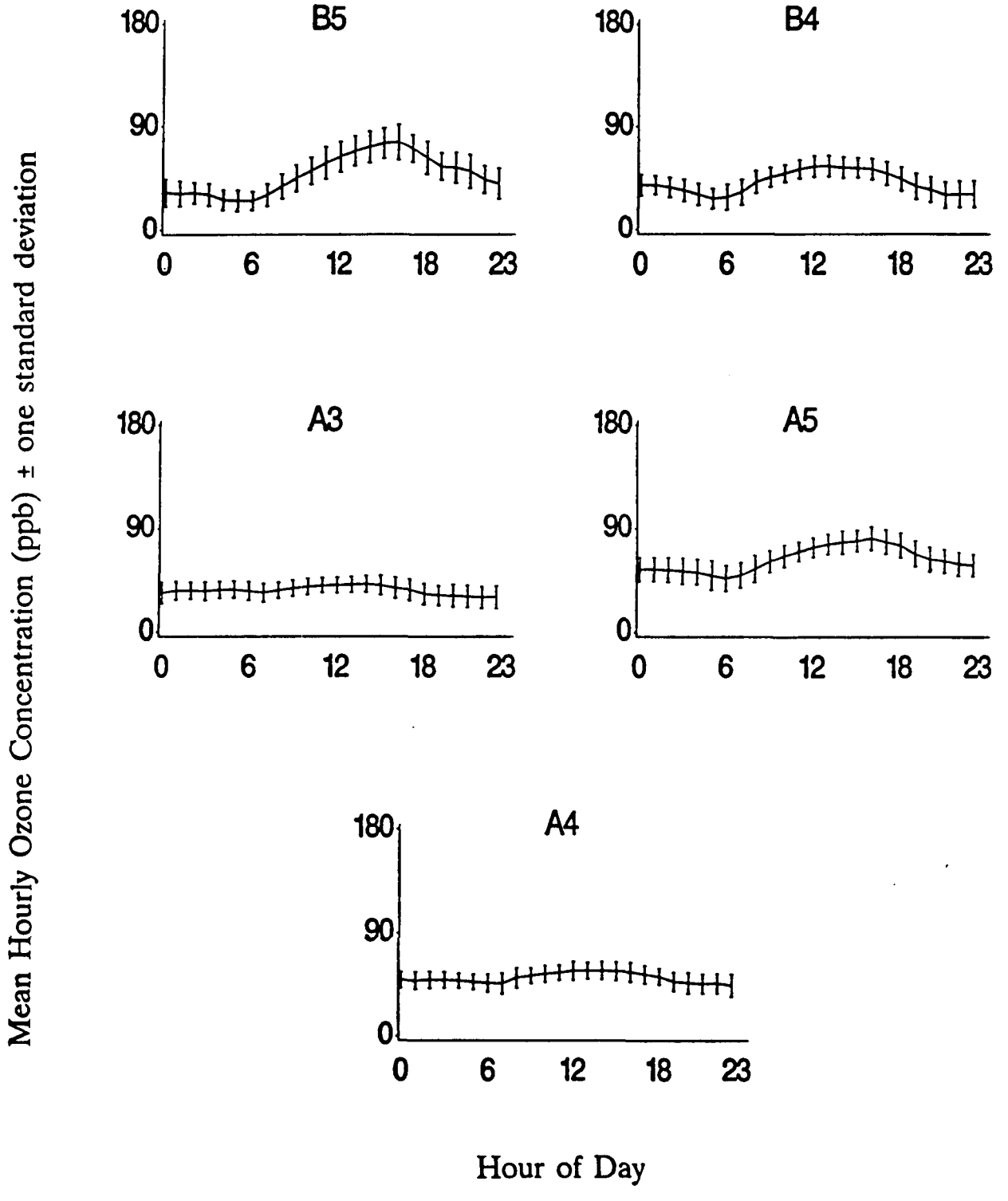
BIOGRAPHIC INFORMATION



Latitude	-	37.63° N
Longitude	-	118.97° W
Elevation (m)	-	2395
Basin Height (m)	-	2061.5
Landuse	-	City Center - Commercial
City Population	-	3,929
Basin Population	-	27,569
Start Summary	-	April, 1984
End Summary	-	December, 1988
Source of Data	-	AIRS (06-051-0001)

MAMMOTH LAKES

DOMINANT DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS (MAY - OCT)



Mammoth Lakes

DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS

A. BY YEAR.

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	7	27	15	9	0	3	17	11	7	8	1	0	1	0	0	0	0	0
1985	4	32	16	4	0	3	26	6	6	5	0	2	0	0	0	0	0	0
1986	2	28	31	15	1	0	3	6	10	5	0	0	0	0	0	0	0	0
1987	2	27	23	12	0	0	10	8	9	8	0	0	2	0	0	0	0	0
1988	5	37	18	14	0	0	10	7	8	5	0	0	0	0	0	0	0	0
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	4	31	21	11	0	1	13	7	8	6	0	1	1	0	0	0	0	0

B. BY GROWING SEASON (May through October).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	5	20	21	12	0	0	8	15	10	12	0	0	2	0	0	0	0	0
1985	4	23	22	8	0	1	17	9	9	10	0	0	0	0	0	0	0	0
1986	1	9	35	28	2	0	1	4	11	10	0	0	0	0	0	0	0	0
1987	2	4	29	23	0	0	3	9	13	15	0	0	2	1	0	0	0	0
1988	4	16	23	26	1	0	3	7	16	8	0	0	0	0	0	0	0	0
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	3	14	26	20	1	0	6	9	12	11	0	0	1	0	0	0	0	0

C. BY MONTH (composited over years).

Month	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
Jan	6	47	15	0	0	7	20	8	1	0	0	1	0	0	0	0	0	0
Feb	4	56	10	0	0	0	18	5	3	0	1	3	2	0	0	0	0	0
Mar	2	50	16	0	0	0	18	8	6	0	0	1	1	0	0	0	0	0
Apr	6	31	29	5	1	0	13	9	6	5	0	0	1	0	0	0	0	0
May	3	16	32	14	0	0	11	9	10	6	0	0	1	1	0	0	0	0
Jun	4	12	25	17	1	2	10	12	8	12	0	0	2	0	0	0	0	0
Jul	3	4	30	19	0	0	0	7	17	21	0	0	2	0	0	0	0	0
Aug	5	5	23	44	2	0	0	3	12	12	0	0	0	0	0	0	0	0
Sep	4	16	30	26	1	0	1	7	11	9	0	0	0	0	0	0	0	0
Oct	1	38	17	1	0	0	15	14	12	3	0	0	0	0	0	0	0	0
Nov	2	55	18	0	0	0	19	3	3	0	0	1	0	0	0	0	0	0
Dec	6	52	5	0	0	6	31	2	2	0	2	1	0	0	0	0	0	0

1. % days with unidentified diurnal patterns in hourly ozone concentration (see Böhm et al. 1990).
2. Pattern identifier relates to degree of diurnal variation in hourly ozone concentrations (A curves - least variation; E curves - greatest variation) and daily mean (1 curves - lowest mean; 6 curves highest mean) as described by Böhm et al (1990) and as illustrated in Figure 4C.1. Note that due to numeric rounding, the sums of percentages do not always equal 100.

Monterey

BASIC STATISTICS

A. BY YEAR.

Year	% Data Capt[1]	% Valid Days[2]	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	75	75	10	10	10	30	25.3±13	30	40	40	1	0	0	0	0
1981	99	100	0	10	10	20	23.6±13	30	40	40	0	0	0	0	0
1982	99	100	0	10	10	20	22.5±14	30	40	40	1	0	0	0	0
1983	98	98	0	10	10	30	24.1±14	30	40	40	1	0	0	0	0
1984	26	26	0	10	10	20	21.6±13	30	40	40	1	0	0	0	0
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	79	80	0	10	10	20	23.6±13	30	40	40	1	0	0	0	0

B. BY GROWING SEASON (May through October).

Year	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06[3] (ppm hr)	S08[4] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	50	50	10	20	30	30	32.2±12	40	40	50	5	2	3	1	0	0	0
1981	99	99	10	10	20	30	25.6±11	30	40	40	1	1	0	0	0	0	0
1982	99	99	10	10	20	30	25.4±12	30	40	40	5	1	2	0	0	0	0
1983	97	97	10	10	20	30	28.4±12	40	40	50	5	2	2	0	0	0	0
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	86	86	10	10	20	30	27.3±12	30	40	50	-	-	1	0	0	0	0

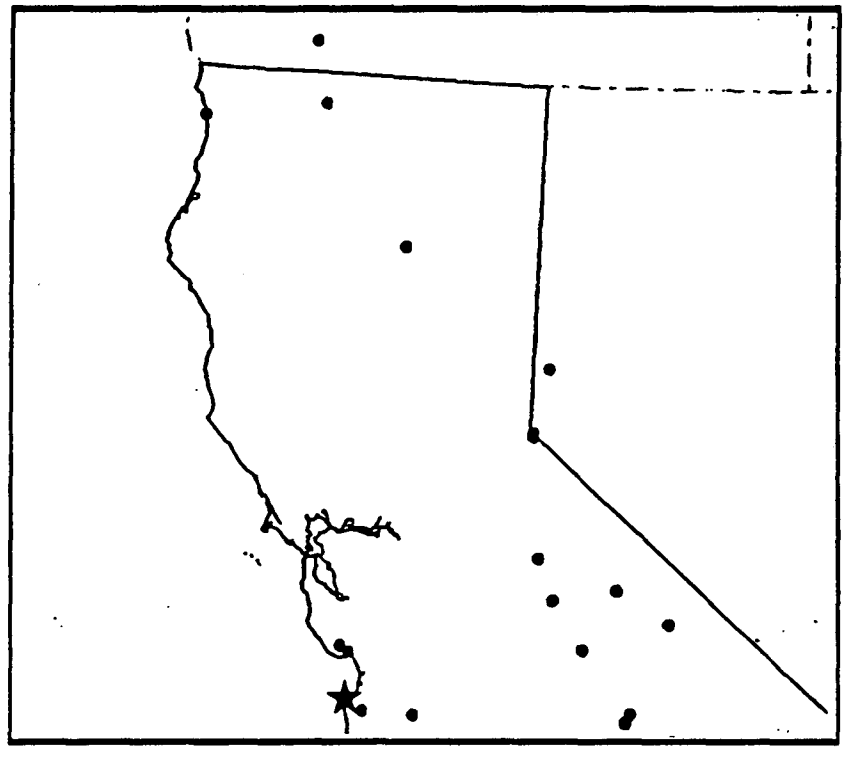
C. BY MONTH [5].

Month	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06 (ppm hr)	S08[6] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
Jan	99	100	0	0	10	10	14.9±11	20	30	30	1	0	0	0	0	0	0
Feb	99	100	0	0	10	20	19.7±13	30	40	40	1	1	1	0	0	0	0
Mar	100	100	10	10	10	30	24.8±13	40	40	40	1	0	0	0	0	0	0
Apr	83	83	10	10	20	40	31.9±13	40	50	50	2	1	3	0	0	0	0
May	98	99	10	20	30	40	35.5±10	40	50	50	1	1	1	0	0	0	0
Jun	99	99	10	20	20	30	28.2±09	30	40	40	1	1	0	0	0	0	0
Jul	81	80	10	10	20	20	24.2±08	30	30	40	1	1	0	0	0	0	0
Aug	99	100	10	10	20	20	21.4±09	30	30	30	1	1	0	0	0	0	0
Sep	99	100	10	10	20	30	26.1±13	30	40	40	2	1	2	1	0	0	0
Oct	90	90	0	10	10	30	25.8±16	30	40	50	3	1	4	1	0	0	0
Nov	100	100	0	0	10	20	18.4±12	30	30	40	1	0	0	0	0	0	0
Dec	100	100	0	0	10	10	15.5±12	20	30	30	1	0	0	0	0	0	0

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100. Av. period BY YEAR = 8760 hrs; BY G.S. = 4416 hrs.
2. % Valid Days = # days with 75 % of hours between 09:00 and 21:00 / (total # days) * 100 (Federal Register 1979).
3. Cumulative Index: S06 = Σ [O_3]/1000, where [O_3] is hourly ozone concentrations ≥ 60 ppb (Lee et al. 1988).
4. Cumulative Index: S08 = Σ [O_3]/1000, where [O_3] is hourly ozone concentrations ≥ 80 ppb (Lee et al. 1988).
5. Statistics for monthly composites over the period of record.
6. Monthly estimate of S06(08) = S06(08) * (# hours in that month) / (# valid hours).

MONTEREY **CALIFORNIA**

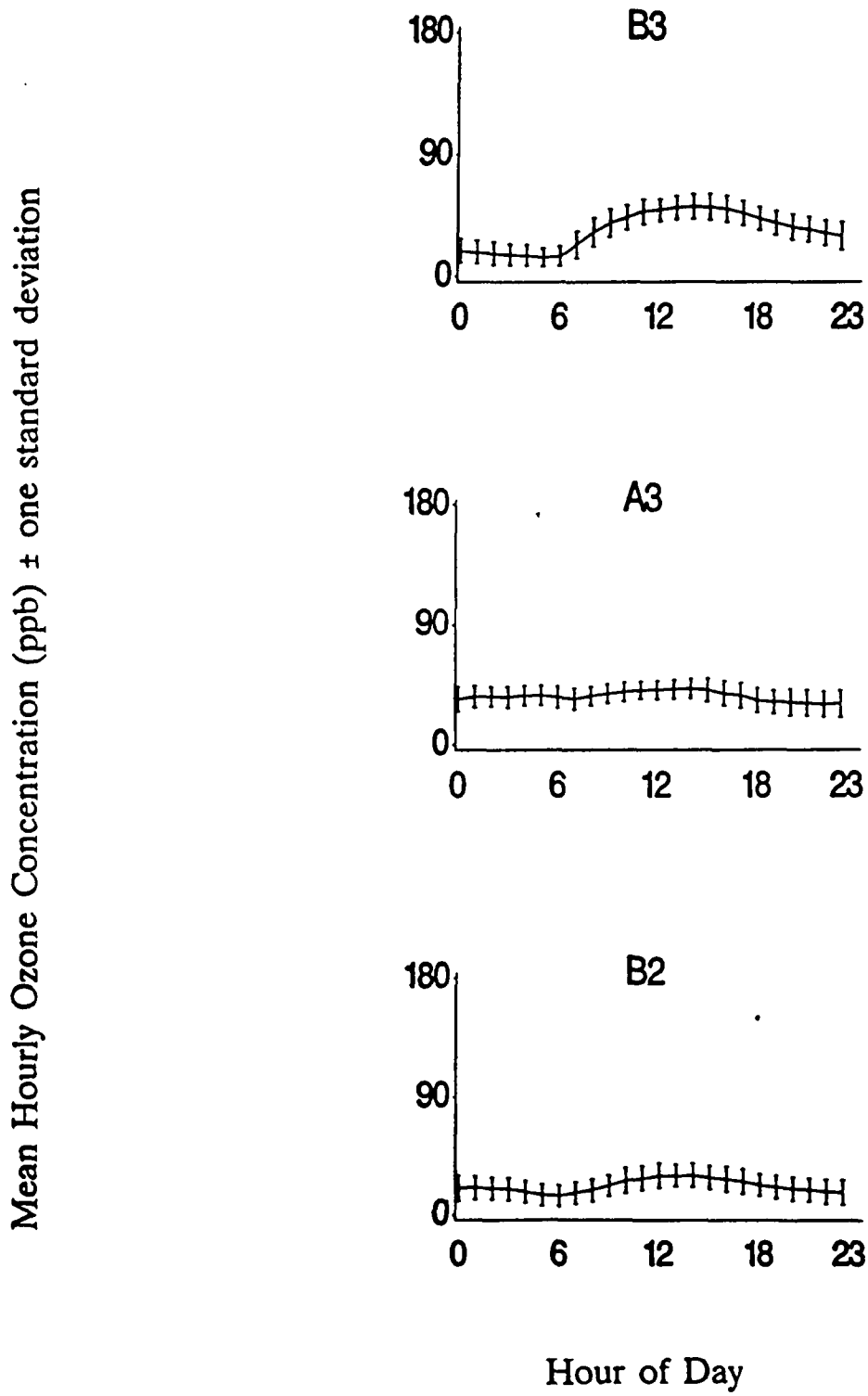
BIOGRAPHIC INFORMATION



Latitude	-	36.60° N
Longitude	-	121.90° W
Elevation (m)	-	23
Basin Height (m)	-	0
Landuse	-	City Center - Commercial
City Population	-	27,558
Basin Population	-	503,590
Start Summary	-	January, 1980
End Summary	-	April, 1984
Source of Data	-	AIRS (06-053-1001)

MONTEREY

DOMINANT DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS (MAY - OCT)



Monterey

DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS

A. BY YEAR.

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	7	27	0	0	0	10	37	4	4	0	4	9	4	0	0	0	0	0
1981	7	20	1	0	0	11	44	5	2	0	5	7	3	1	0	0	0	0
1982	5	20	1	0	0	15	33	4	2	1	9	10	5	0	0	0	0	0
1983	6	24	0	0	0	13	33	8	2	0	6	8	6	0	0	0	0	0
1984	9	6	0	0	0	14	40	6	3	1	6	19	6	0	0	0	0	0
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	6	21	1	0	0	12	37	5	2	1	6	9	5	0	0	0	0	0

B. BY GROWING SEASON (May through October).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	7	50	1	1	0	0	26	7	8	1	0	1	4	0	0	0	0	0
1981	6	23	2	0	0	2	51	7	3	0	2	6	4	1	0	0	0	0
1982	3	29	2	0	0	9	42	3	1	1	3	8	3	0	0	0	0	0
1983	6	33	0	0	0	1	36	10	4	1	1	6	7	1	0	0	0	0
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	5	31	1	0	0	3	41	7	4	1	2	6	4	0	0	0	0	0

C. BY MONTH (composited over years).

Month	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
Jan	7	4	0	0	0	41	29	0	0	0	15	10	1	0	0	0	0	0
Feb	7	9	0	0	0	15	41	1	1	1	11	21	1	0	0	0	0	0
Mar	7	17	0	0	0	6	42	6	4	0	2	13	11	0	0	0	0	0
Apr	5	35	2	0	0	1	19	18	4	3	2	3	13	1	0	0	0	0
May	2	62	4	0	0	0	8	10	9	0	0	0	6	1	0	0	0	0
Jun	5	47	0	0	0	3	37	3	4	0	0	3	4	1	0	0	0	0
Jul	7	23	0	0	0	2	67	2	0	0	0	1	4	0	0	0	0	0
Aug	3	6	0	0	0	9	72	2	0	0	2	7	1	0	0	0	0	0
Sep	8	24	0	0	0	3	47	8	3	1	3	6	5	0	0	0	0	0
Oct	5	15	2	1	0	5	30	14	4	2	5	18	5	0	0	0	0	0
Nov	12	7	0	0	0	18	36	1	0	0	14	21	3	0	0	0	0	0
Dec	4	9	0	0	0	34	37	0	0	0	16	3	0	0	0	0	0	0

1. % days with unidentified diurnal patterns in hourly ozone concentration (see Böhm et al. 1990).
2. Pattern identifier relates to degree of diurnal variation in hourly ozone concentrations (A curves - least variation; E curves - greatest variation) and daily mean (1 curves - lowest mean; 6 curves highest mean) as described by Böhm et al (1990) and as illustrated in Figure 4C.1. Note that due to numeric rounding, the sums of percentages do not always equal 100.

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BASIC STATISTICS

A. BY YEAR.

Year	% Data Capt[1]	% Valid Days[2]	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	85	89	10	10	20	30	34.8±22	50	70	80	17	6	1	0	7
1985	81	85	10	10	20	30	35.0±22	50	70	80	16	6	2	0	8
1986	94	99	10	10	20	30	36.6±24	50	70	80	20	8	3	0	13
1987	92	97	10	10	20	30	35.4±23	50	70	80	19	7	2	0	11
1988	78	82	10	10	20	30	37.9±24	50	70	80	23	9	2	0	13
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	86	90	10	10	20	30	35.9±23	50	70	80	19	7	2	0	52

B. BY GROWING SEASON (May through October).

Year	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06[3] (ppm hr)	S08[4] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	88	94	10	10	10	40	39.9±25	60	80	80	78	36	27	10	2	0	6
1985	67	71	10	10	20	40	41.3±25	60	80	90	61	31	27	11	3	1	6
1986	93	97	10	10	20	40	42.9±28	60	80	90	103	54	33	14	4	1	9
1987	94	99	10	10	20	40	42.0±25	60	80	90	92	41	30	11	3	1	9
1988	92	97	10	10	20	40	45.2±26	60	80	90	106	52	35	14	4	1	12
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	87	92	10	10	20	40	42.3±26	60	80	90	-	-	30	12	3	1	42

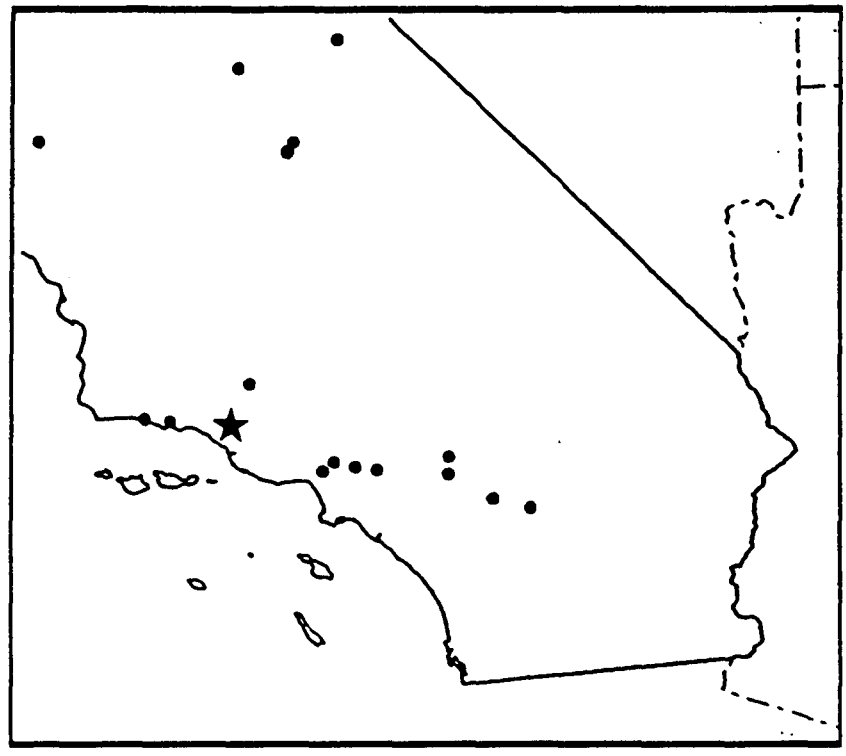
C. BY MONTH [5].

Month	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06 (ppm hr)	S08[6] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
Jan	93	97	10	10	10	20	22.3±14	30	40	50	1	1	2	0	0	0	0
Feb	85	86	10	10	20	30	29.4±15	40	50	50	3	1	4	1	0	0	1
Mar	83	87	10	10	20	40	35.5±18	50	60	70	6	2	11	2	1	0	1
Apr	95	99	10	20	20	40	41.3±22	50	70	80	12	5	22	7	2	1	7
May	92	99	10	20	30	40	45.1±24	60	80	90	18	8	32	12	3	0	4
Jun	91	95	10	10	20	40	44.2±25	60	80	90	19	8	35	13	3	0	4
Jul	94	99	10	10	20	40	42.4±27	60	80	90	19	9	32	13	4	1	5
Aug	80	86	10	10	20	40	44.5±30	70	90	100	22	13	36	18	6	1	13
Sep	93	97	10	10	20	30	39.7±27	60	80	90	15	8	27	10	4	1	12
Oct	90	94	10	10	20	30	38.2±23	50	70	80	12	6	22	8	2	0	4
Nov	95	100	10	10	10	30	27.0±16	40	50	50	3	1	4	1	0	0	1
Dec	94	99	10	10	10	20	22.2±12	30	40	40	1	1	1	0	0	0	0

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100. Av. period BY YEAR = 8760 hrs; BY G.S. = 4416 hrs.
2. % Valid Days = # days with 75 % of hours between 09:00 and 21:00 / (total # days) * 100 (Federal Register 1979).
3. Cumulative Index: S06 = Σ $[O_3]$/1000, where $[O_3]$ is hourly ozone concentrations ≥ 60 ppb (Lee et al. 1988).
4. Cumulative Index: S08 = Σ $[O_3]$/1000, where $[O_3]$ is hourly ozone concentrations ≥ 80 ppb (Lee et al. 1988).
5. Statistics for monthly composites over the period of record.
6. Monthly estimate of S06(08) = S06(08) * (# hours in that month) / (# valid hours).

OJAI **CALIFORNIA**

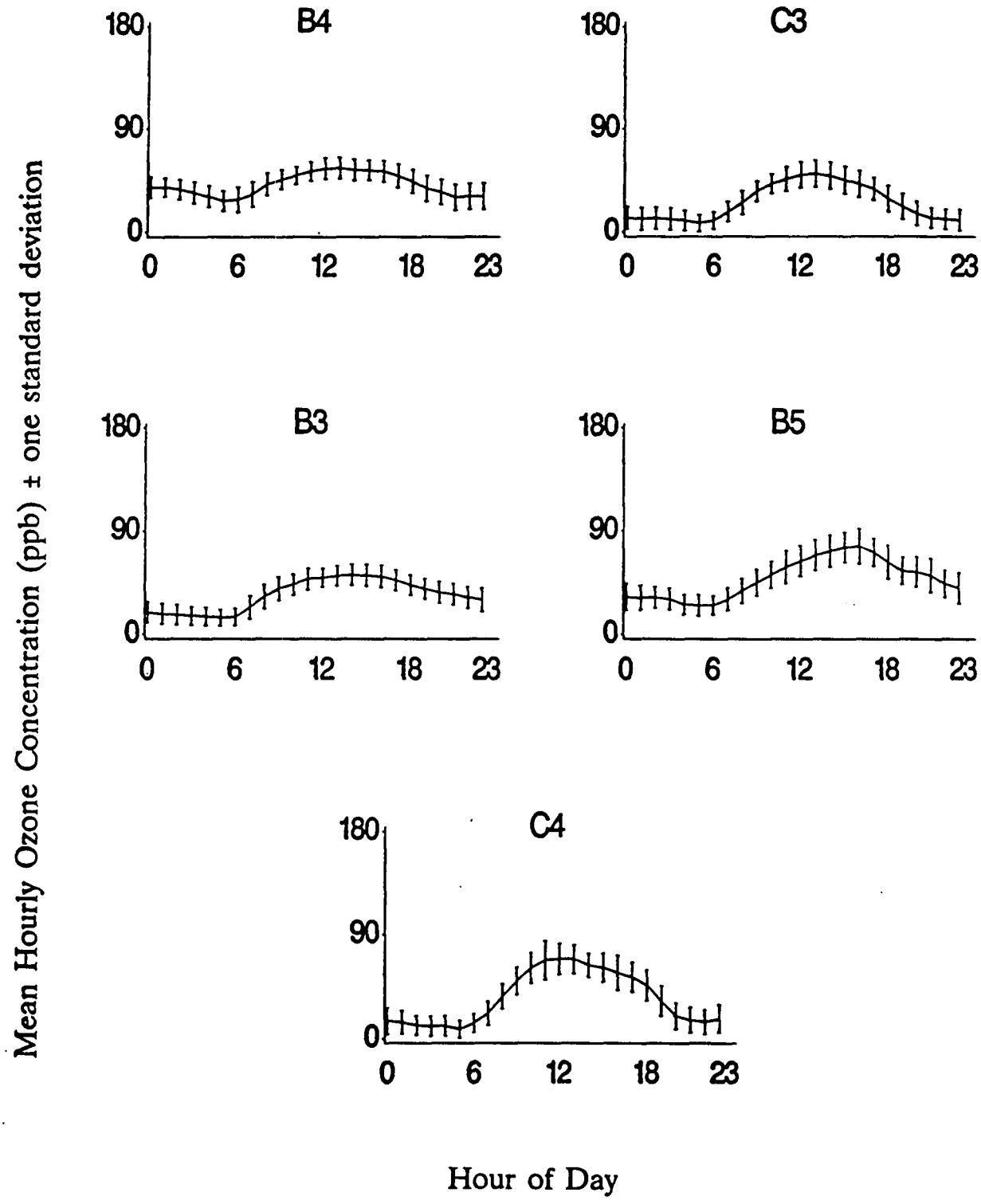
BIOGRAPHIC INFORMATION



Latitude	-	34.45° N
Longitude	-	119.27° W
Elevation (m)	-	233
Basin Height (m)	-	153.9
Landuse	-	Suburban - Mobile
City Population	-	6,816
Basin Population	-	11,201,922
Start Summary	-	January, 1984
End Summary	-	December, 1988
Source of Data	-	AIRS (06-111-1003)

OJAI

DOMINANT DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS (MAY - OCT)



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DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS

A. BY YEAR.

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	2	10	3	1	0	2	23	12	8	7	1	7	8	14	2	0	2	0
1985	9	6	3	2	0	2	18	10	7	10	1	10	12	15	3	0	0	0
1986	6	7	2	1	0	2	10	10	5	9	1	10	10	26	2	0	5	0
1987	4	6	2	2	0	3	14	9	8	11	1	11	7	21	2	0	4	0
1988	7	6	2	2	0	2	15	7	6	16	1	8	7	23	3	0	3	0
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	6	7	2	1	0	2	15	9	7	11	1	9	9	20	2	0	3	0

B. BY GROWING SEASON (May through October).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	1	3	4	0	0	1	6	11	7	15	0	3	11	31	4	0	4	0
1985	8	5	1	3	0	0	3	11	8	16	0	2	11	31	7	0	0	1
1986	4	1	1	1	0	1	0	8	4	15	0	1	10	47	3	0	9	1
1987	5	1	2	4	0	2	2	9	10	13	1	2	7	36	2	0	7	1
1988	6	3	2	3	0	0	1	8	8	23	0	1	4	36	5	0	4	0
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	5	2	2	2	0	1	2	9	7	16	0	2	8	37	4	0	5	0

C. BY MONTH (composited over years).

Month	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
Jan	4	6	2	0	0	8	39	3	0	2	7	30	3	0	0	0	0	0
Feb	4	20	1	0	0	3	30	10	3	3	0	14	12	3	0	0	0	0
Mar	7	16	5	1	0	0	7	16	21	6	0	4	16	5	1	0	1	0
Apr	4	11	9	2	0	0	3	17	14	19	0	0	10	12	3	0	1	0
May	4	2	8	2	0	0	3	13	10	23	0	1	5	29	4	0	0	1
Jun	4	1	1	3	0	0	0	7	8	21	0	0	5	47	4	0	3	0
Jul	5	1	0	1	0	0	1	7	3	15	0	1	6	52	5	0	7	0
Aug	1	0	1	1	0	0	1	6	2	13	0	1	4	51	8	0	12	0
Sep	6	2	0	3	0	2	3	13	8	13	0	3	15	28	3	0	6	2
Oct	10	8	3	4	0	3	5	8	12	14	2	3	14	18	0	0	5	0
Nov	11	11	0	0	0	2	26	12	3	3	0	25	16	2	0	0	2	0
Dec	6	8	0	0	0	5	57	1	0	0	3	24	2	0	0	0	0	0

1. % days with unidentified diurnal patterns in hourly ozone concentration (see Böhm et al. 1990).
2. Pattern identifier relates to degree of diurnal variation in hourly ozone concentrations (A curves - least variation; E curves - greatest variation) and daily mean (1 curves - lowest mean; 6 curves highest mean) as described by Böhm et al (1990) and as illustrated in Figure 4C.1. Note that due to numeric rounding, the sums of percentages do not always equal 100.

Palm Springs

BASIC STATISTICS

A. BY YEAR.

Year	% Data Capt[1]	% Valid Days[2]	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	97	97	10	10	20	40	46.7±31	60	90	100	32	15	7	3	67
1981	98	97	10	10	20	40	47.1±31	60	90	110	33	17	8	3	80
1982	98	98	0	10	20	40	42.3±29	60	80	100	28	13	5	2	55
1983	98	99	0	10	20	40	41.8±28	60	80	90	27	12	5	2	53
1984	94	99	0	0	20	40	40.6±30	60	80	100	26	12	5	2	50
1985	95	99	0	0	20	30	37.5±28	50	70	90	23	9	4	1	37
1986	94	98	0	0	20	40	39.0±29	60	80	90	27	11	4	2	41
1987	87	91	0	10	20	40	39.7±27	60	80	90	25	11	4	2	40
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	95	97	0	10	20	40	41.9±29	60	80	100	28	13	5	2	423

B. BY GROWING SEASON (May through October).

Year	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06[3] (ppm hr)	S08[4] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	95	95	20	30	40	60	62.6±31	80	100	120	190	120	54	28	14	7	63
1981	99	98	20	30	40	60	62.4±31	80	100	120	199	134	54	31	15	6	75
1982	99	99	10	20	40	50	56.9±29	70	100	110	169	103	47	24	10	4	53
1983	99	99	20	20	40	50	57.2±28	70	90	110	171	96	49	22	9	4	53
1984	94	98	20	20	20	50	56.7±29	70	100	110	154	95	45	23	10	4	48
1985	95	100	10	20	30	50	50.9±28	70	90	100	125	67	38	16	7	2	35
1986	92	97	10	20	40	50	55.7±28	70	90	110	153	83	48	21	9	3	41
1987	80	84	20	30	40	50	56.9±26	70	90	100	132	73	48	22	8	3	36
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	94	96	20	20	40	50	57.4±29	70	100	110	-	-	48	24	10	4	404

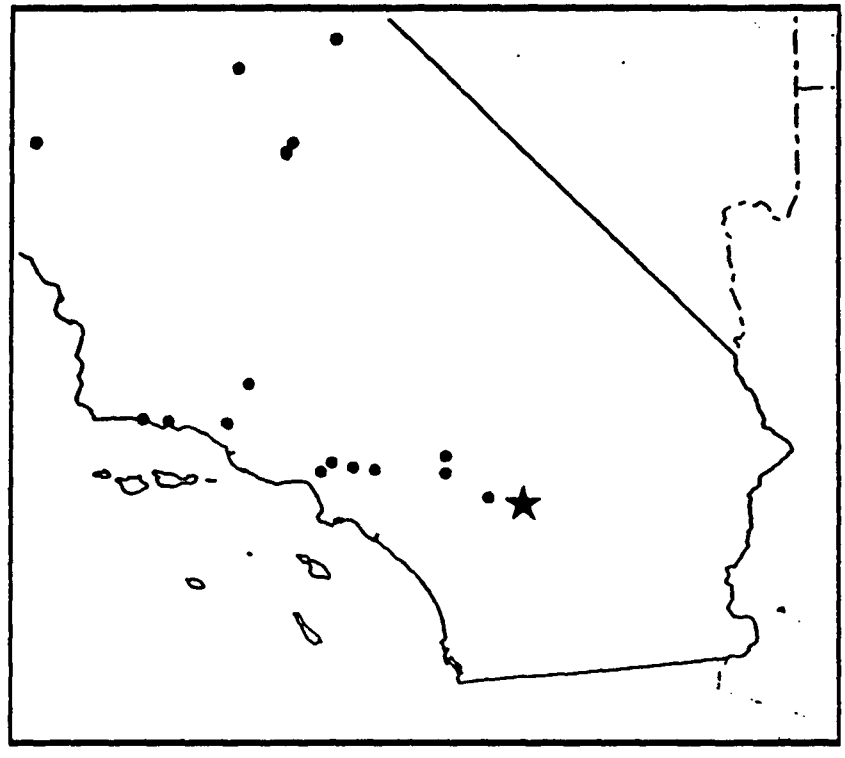
C. BY MONTH [5].

Month	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06 (ppm hr)	S08[6] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
Jan	96	98	0	0	10	20	17.9±14	30	40	40	1	1	1	0	0	0	0
Feb	97	99	0	0	10	20	21.9±16	30	40	50	1	1	2	0	0	0	0
Mar	97	99	10	10	20	30	34.0±18	40	60	60	6	2	11	2	0	0	1
Apr	95	98	20	20	40	50	47.8±21	60	70	90	16	7	29	9	3	1	18
May	96	98	30	40	50	60	62.7±25	80	100	110	34	19	56	26	10	4	67
Jun	96	99	30	40	50	70	70.9±28	90	110	120	42	29	69	40	18	7	95
Jul	97	99	20	30	40	60	65.0±31	80	100	120	37	24	59	31	15	7	106
Aug	95	97	20	30	40	60	61.2±29	80	100	120	33	20	54	27	11	5	97
Sep	95	98	10	20	30	40	47.3±26	60	80	90	18	9	31	12	5	2	34
Oct	97	99	10	10	20	40	36.3±20	50	60	70	9	3	16	4	1	0	5
Nov	96	98	0	0	10	20	21.9±17	30	40	50	2	1	4	1	0	0	0
Dec	96	98	0	0	0	10	15.6±14	30	40	40	1	1	1	0	0	0	0

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100. Av. period BY YEAR = 8760 hrs; BY G.S. = 4416 hrs.
2. % Valid Days = # days with 75 % of hours between 09:00 and 21:00 / (total # days) * 100 (Federal Register 1979).
3. Cumulative Index: S06 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 60 ppb (Lee et al. 1988).
4. Cumulative Index: S08 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 80 ppb (Lee et al. 1988).
5. Statistics for monthly composites over the period of record.
6. Monthly estimate of S06(08) = S06(08) * (# hours in that month) / (# valid hours).

PALM SPRINGS **CALIFORNIA**

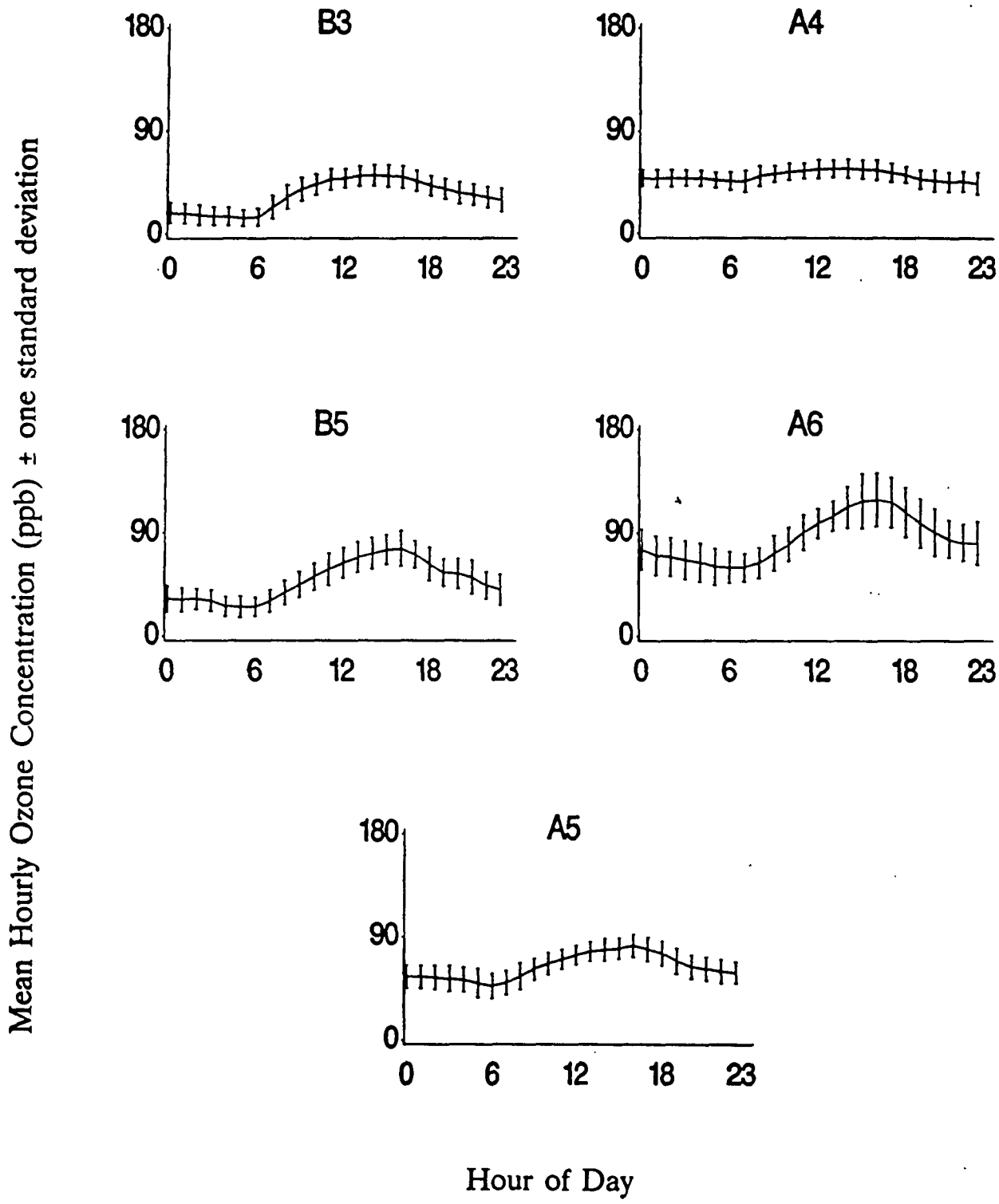
BIOGRAPHIC INFORMATION



Latitude	-	33.86° N
Longitude	-	116.54° W
Elevation (m)	-	171
Basin Height (m)	-	153.9
Landuse	-	Suburban - Residential
City Population	-	32,366
Basin Population	-	611,117
Start Summary	-	January, 1980
End Summary	-	December, 1987
Source of Data	-	AIRS (06-065-5001)

PALM SPRINGS

DOMINANT DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS (MAY - OCT)



Palm Springs

DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS

A. BY YEAR.

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	5	9	11	13	16	2	10	6	6	8	3	7	6	1	2	0	0	0
1981	4	7	5	16	15	1	9	10	6	8	6	8	5	1	2	1	1	0
1982	3	7	8	16	13	1	17	8	5	5	10	6	4	1	0	0	0	0
1983	4	9	4	14	12	3	11	10	6	9	8	10	4	0	1	0	0	0
1984	4	10	8	12	10	5	10	6	7	9	13	5	3	1	1	0	0	0
1985	4	6	6	15	5	6	10	13	4	10	13	6	4	0	1	0	0	0
1986	2	9	5	13	9	4	9	5	6	7	17	8	4	0	2	0	0	0
1987	3	9	9	18	7	3	12	4	6	8	11	10	2	0	1	0	0	0
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	4	8	7	15	11	3	11	8	6	8	10	8	4	0	1	0	0	0

B. BY GROWING SEASON (May through October).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	2	4	14	22	30	0	1	4	7	11	1	2	1	0	3	0	0	0
1981	3	3	9	24	28	0	2	9	5	10	0	1	2	1	3	1	1	0
1982	2	5	10	27	24	0	8	5	7	9	2	1	2	0	0	0	0	0
1983	2	7	6	26	23	1	6	9	5	12	0	1	1	0	1	0	0	0
1984	2	7	11	21	19	1	6	8	9	9	0	0	3	3	3	1	0	0
1985	2	3	8	26	10	1	7	14	8	16	1	1	4	0	1	1	0	0
1986	1	10	5	25	19	0	5	7	10	10	1	1	5	0	3	0	0	0
1987	2	4	14	36	15	0	6	4	7	11	0	2	0	0	2	0	0	0
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	2	5	10	26	21	0	5	7	7	11	0	1	2	0	2	0	0	0

C. BY MONTH (composited over years).

Month	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
Jan	9	7	0	0	0	12	26	2	0	0	35	15	2	0	0	0	0	0
Feb	6	12	0	0	0	6	20	6	0	1	13	30	10	0	0	0	0	0
Mar	5	16	5	4	0	1	16	21	9	10	1	7	10	1	0	0	0	0
Apr	2	12	19	15	5	0	1	10	14	16	0	1	4	1	1	0	0	0
May	1	2	20	37	22	0	0	2	7	8	0	0	0	0	0	0	0	0
Jun	0	2	5	32	41	0	0	1	5	12	0	0	0	0	2	0	0	0
Jul	1	2	8	30	31	0	3	5	6	11	0	0	0	0	2	1	0	0
Aug	2	3	7	33	23	0	4	8	6	11	0	0	0	0	4	0	0	0
Sep	1	10	10	13	8	2	7	14	13	15	1	2	4	1	1	0	0	0
Oct	7	15	8	7	1	0	17	16	7	10	2	4	9	0	1	0	0	0
Nov	5	11	0	0	0	5	21	8	1	2	25	20	4	0	0	0	0	0
Dec	3	7	0	0	0	13	17	1	0	0	45	13	3	0	0	0	0	0

1. % days with unidentified diurnal patterns in hourly ozone concentration (see Böhm et al. 1990).
2. Pattern identifier relates to degree of diurnal variation in hourly ozone concentrations (A curves - least variation; E curves - greatest variation) and daily mean (1 curves - lowest mean; 6 curves highest mean) as described by Böhm et al (1990) and as illustrated in Figure 4C.1. Note that due to numeric rounding, the sums of percentages do not always equal 100.

Pasadena

BASIC STATISTICS

A. BY YEAR.

Year	% Data Capt[1]	% Valid Days[2]	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	96	96	10	10	10	10	35.5±47	40	90	140	19	13	10	7	131
1981	94	97	0	10	10	10	32.8±44	40	90	130	19	14	10	7	134
1982	22	22	0	0	0	0	9.7±18	10	30	40	3	2	1	0	2
1983	70	73	0	0	0	20	35.2±52	50	110	150	21	16	12	9	114
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	71	72	0	0	10	10	32.5±46	40	90	130	18	13	10	7	381

B. BY GROWING SEASON (May through October).

Year	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06[3] (ppm hr)	S08[4] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	94	93	10	10	10	20	47.0±59	70	130	180	146	129	28	22	17	13	112
1981	93	98	10	10	10	20	47.8±55	70	130	170	149	131	30	24	18	14	122
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	79	82	0	0	0	20	48.6±62	80	140	180	140	125	32	26	20	15	108
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	89	91	0	0	10	20	47.8±58	70	130	170	-	-	30	24	18	14	342

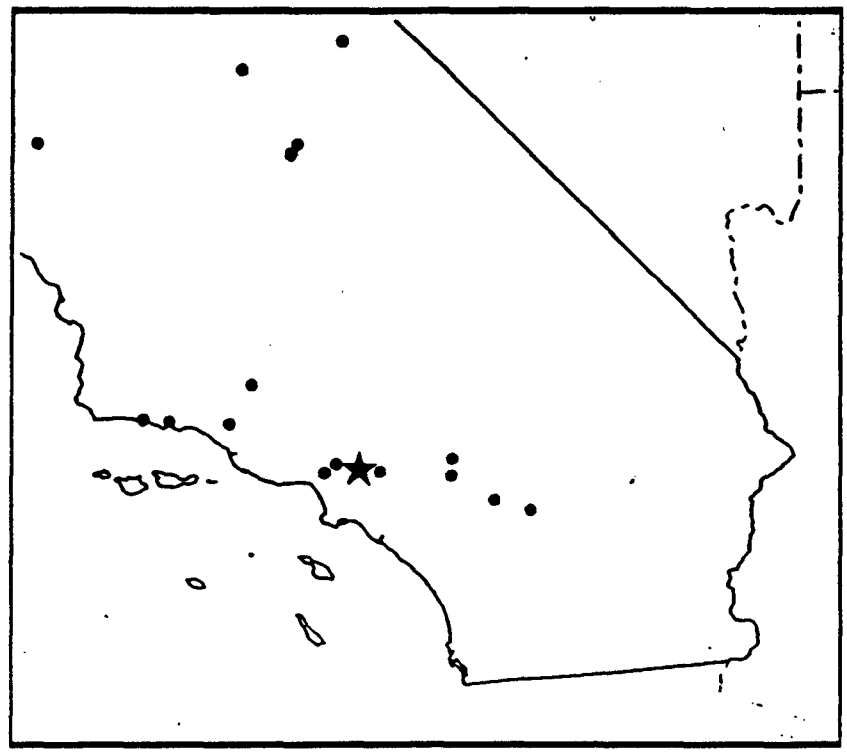
C. BY MONTH [5].

Month	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06 (ppm hr)	S08[6] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
Jan	96	98	0	0	0	10	12.3±14	20	30	40	1	1	2	0	0	0	0
Feb	95	96	0	0	0	10	17.9±22	20	50	70	4	3	7	3	2	1	7
Mar	93	94	0	0	10	10	20.5±23	30	50	70	6	3	9	4	1	0	3
Apr	95	97	0	0	10	20	31.4±35	40	80	100	12	9	18	10	6	3	22
May	88	88	0	0	10	20	36.3±42	50	90	130	17	13	21	14	10	6	31
Jun	93	97	0	10	10	30	54.2±58	90	140	170	32	28	36	29	22	17	68
Jul	95	98	0	0	10	30	60.3±66	100	160	200	38	35	39	33	27	21	85
Aug	97	100	0	0	10	20	51.9±64	80	140	190	33	29	34	27	22	17	76
Sep	97	99	0	0	10	10	46.2±60	70	140	180	27	24	30	24	19	14	65
Oct	95	98	10	10	10	10	31.8±47	30	70	120	14	11	15	10	7	6	17
Nov	96	98	10	10	10	10	19.5±23	20	40	70	5	4	8	4	2	1	7
Dec	96	97	0	0	0	10	11.1±13	10	30	40	1	1	1	0	0	0	0

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100. Av. period BY YEAR = 8760 hrs; BY G.S. = 4416 hrs.
2. % Valid Days = # days with 75 % of hours between 09:00 and 21:00 / (total # days) * 100 (Federal Register 1979).
3. Cumulative Index S06 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 60 ppb (Lee et al. 1988).
4. Cumulative Index S08 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 80 ppb (Lee et al. 1988).
5. Statistics for monthly composites over the period of record.
6. Monthly estimate of S06(08) = S06(08) * (# hours in that month) / (# valid hours).

PASADENA **CALIFORNIA**

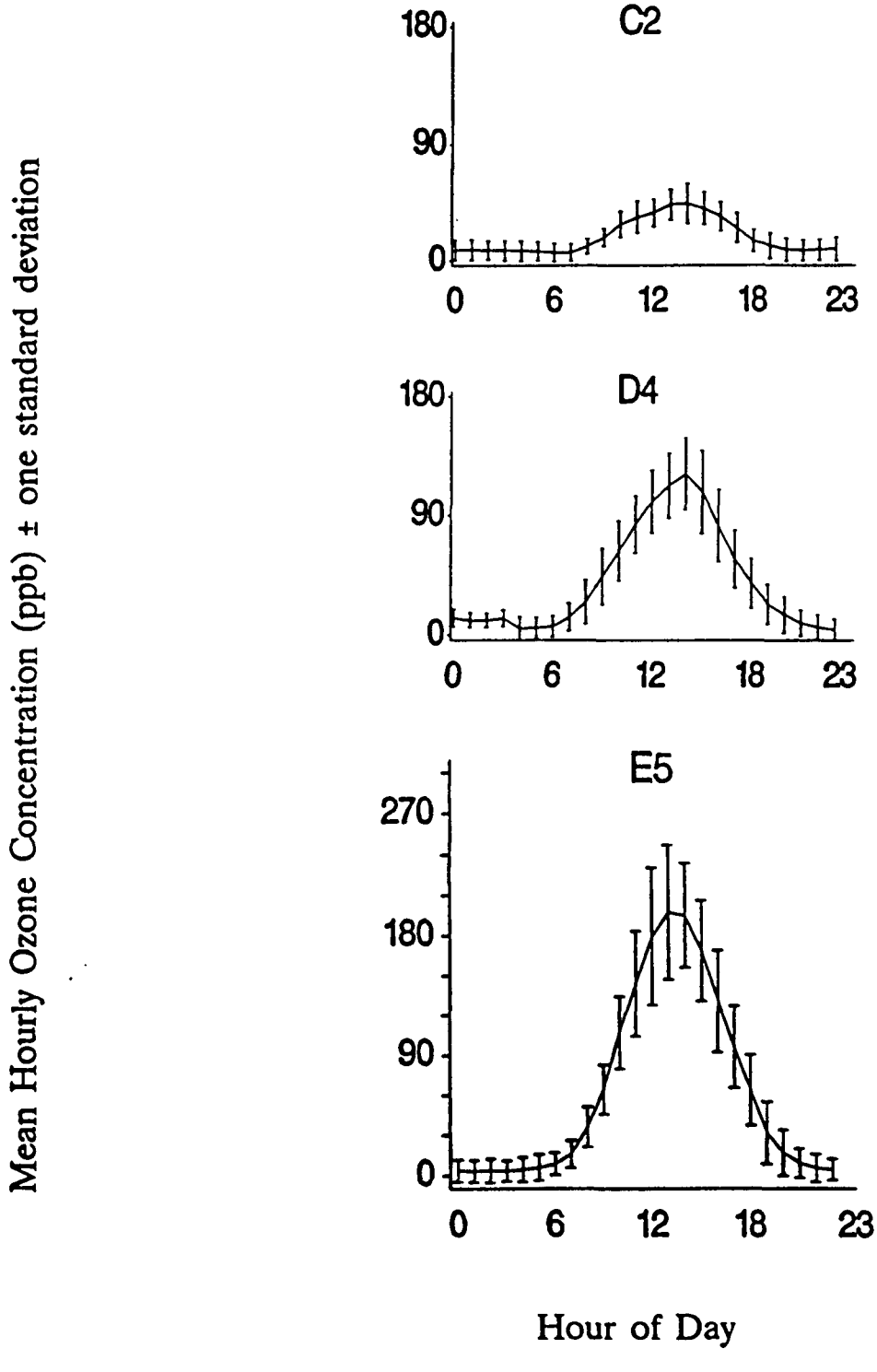
BIOGRAPHIC INFORMATION



Latitude	-	34.15° N
Longitude	-	118.12° W
Elevation (m)	-	255
Basin Height (m)	-	123.1
Landuse	-	City Center - Residential
City Population	-	118,072
Basin Population	-	11,201,922
Start Summary	-	January, 1980
End Summary	-	September, 1983
Source of Data	-	AIRS (06-037-1004)

PASADENA

DOMINANT DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS (MAY - OCT)



Pasadena

DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS

A. BY YEAR.

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	5	1	0	0	0	9	8	0	0	0	7	16	11	7	1	0	20	20
1981	4	0	0	0	0	16	3	0	0	0	9	20	7	3	0	0	21	20
1982	0	0	0	0	0	42	0	0	0	0	41	11	3	1	0	0	3	0
1983	3	0	0	0	0	5	5	0	0	1	11	15	10	4	0	0	20	29
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	4	0	0	0	0	13	5	0	0	0	11	17	9	5	0	0	19	21

B. BY GROWING SEASON (May through October).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	3	0	0	1	0	1	4	0	0	0	2	8	10	6	1	0	29	38
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	1	0	0	0	0	1	4	1	0	1	2	11	6	6	0	0	31	38
1983	2	0	0	0	0	2	2	0	0	2	1	4	6	4	0	0	29	51
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	2	0	0	0	0	1	3	0	0	1	2	8	7	6	0	0	30	42

C. BY MONTH (composited over years).

Month	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
Jan	11	0	0	0	0	41	4	0	0	0	33	22	0	0	0	0	0	0
Feb	3	1	0	0	0	22	8	0	0	0	17	37	4	0	0	0	10	0
Mar	3	1	0	0	0	12	6	0	0	0	15	31	21	5	0	0	10	0
Apr	5	1	0	0	0	3	13	0	0	0	1	7	27	17	0	0	24	7
May	4	0	0	0	0	2	12	0	0	2	2	9	21	9	0	0	24	20
Jun	4	0	0	0	0	0	1	0	0	3	0	1	6	4	3	0	31	51
Jul	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	30	66
Aug	0	0	0	0	0	2	0	0	0	0	2	3	2	9	0	0	34	46
Sep	0	0	0	0	0	1	4	0	0	0	0	8	6	8	0	0	33	39
Oct	5	0	0	2	0	4	4	2	0	0	8	33	13	0	0	0	19	15
Nov	8	0	0	0	0	27	2	0	0	0	19	35	4	0	0	0	12	0
Dec	4	0	0	0	0	44	6	0	0	0	42	8	0	0	0	0	0	0

1. % days with unidentified diurnal patterns in hourly ozone concentration (see Böhm et al. 1990).
2. Pattern identifier relates to degree of diurnal variation in hourly ozone concentrations (A curves - least variation; E curves - greatest variation) and daily mean (1 curves - lowest mean; 6 curves highest mean) as described by Böhm et al (1990) and as illustrated in Figure 4C.1. Note that due to numeric rounding, the sums of percentages do not always equal 100.

Pinnacles National Monument

BASIC STATISTICS

A. BY YEAR.

Year	% Data Capt[1]	% Valid Days[2]	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	70	73	5	10	23	38	40.7±24	56	74	82	21	6	1	0	8
1988	91	94	7	11	20	33	34.5±19	46	61	70	11	2	0	0	2
1989	30	31	6	9	16	27	29.5±17	41	53	61	6	1	0	0	1
All Years	64	66	6	10	20	34	36.0±21	49	65	75	14	3	1	0	11

B. BY GROWING SEASON (May through October).

Year	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06[3] (ppm hr)	S08[4] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	92	96	12	18	30	45	46.6±23	61	77	85	85	30	27	8	2	0	8
1988	89	91	10	14	24	37	39.9±20	54	69	76	52	12	18	3	0	0	2
1989	18	17	10	13	22	36	38.4±21	53	65	74	10	3	16	3	1	0	1
All Years	66	68	10	16	26	41	42.8±22	58	72	80	-	-	22	5	1	0	11

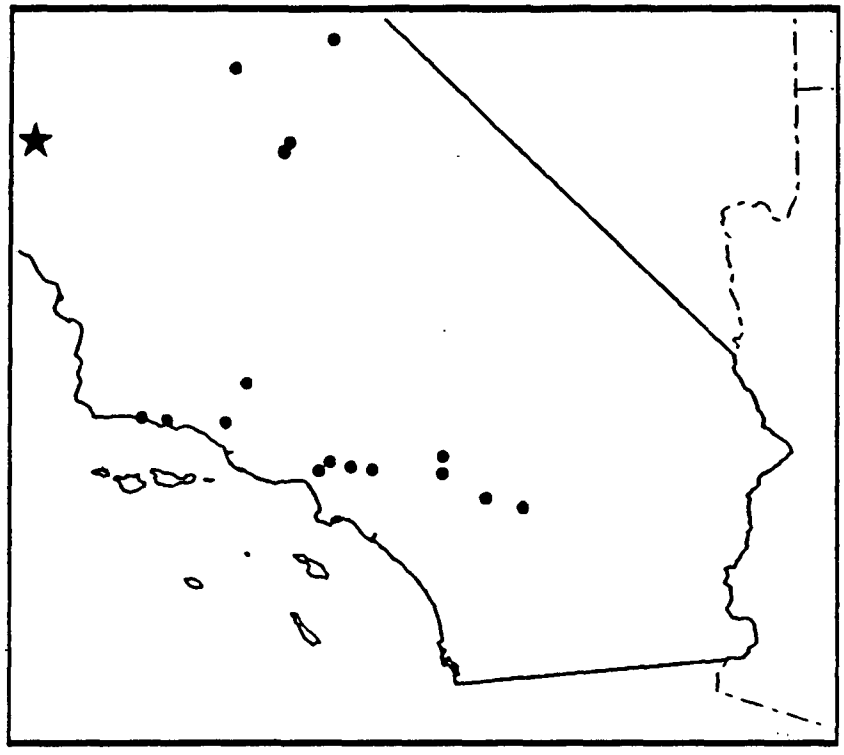
C. BY MONTH [5].

Month	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06 (ppm hr)	S08[6] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
Jan	94	98	3	6	12	21	22.5±14	33	42	46	1	0	0	0	0	0	0
Feb	94	98	7	10	15	26	28.5±17	40	51	57	2	1	4	1	0	0	0
Mar	82	85	7	11	18	28	29.4±15	40	49	56	2	1	3	0	0	0	0
Apr	93	97	14	19	30	42	43.7±19	56	70	79	11	4	20	5	1	0	0
May	73	73	13	19	29	41	42.3±18	55	68	73	10	2	18	2	0	0	0
Jun	71	74	12	18	28	40	43.3±21	56	73	81	12	4	21	6	1	0	2
Jul	75	77	13	18	26	41	43.9±22	60	73	81	14	4	25	6	1	0	4
Aug	83	84	10	15	24	38	41.1±22	56	71	79	12	3	21	4	1	0	2
Sep	91	95	14	19	31	48	48.8±23	64	80	89	17	7	31	10	3	0	3
Oct	93	95	4	8	19	36	37.7±24	54	71	79	11	4	19	5	1	0	0
Nov	95	100	3	4	10	23	23.6±15	36	43	47	1	0	0	0	0	0	0
Dec	93	97	2	5	12	24	23.3±14	33	40	46	1	0	1	0	0	0	0

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100. Av. period BY YEAR = 8760 hrs; BY G.S. = 4416 hrs.
2. % Valid Days = # days with 75 % of hours between 09:00 and 21:00 / (total # days) * 100 (Federal Register 1979).
3. Cumulative Index: S06 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 60 ppb (Lee et al. 1988).
4. Cumulative Index: S08 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 80 ppb (Lee et al. 1988).
5. Statistics for monthly composites over the period of record.
6. Monthly estimate of S06(08) = S06(08) * (# hours in that month) / (# valid hours).

PINNACLES NATIONAL MONUMENT **CALIFORNIA**

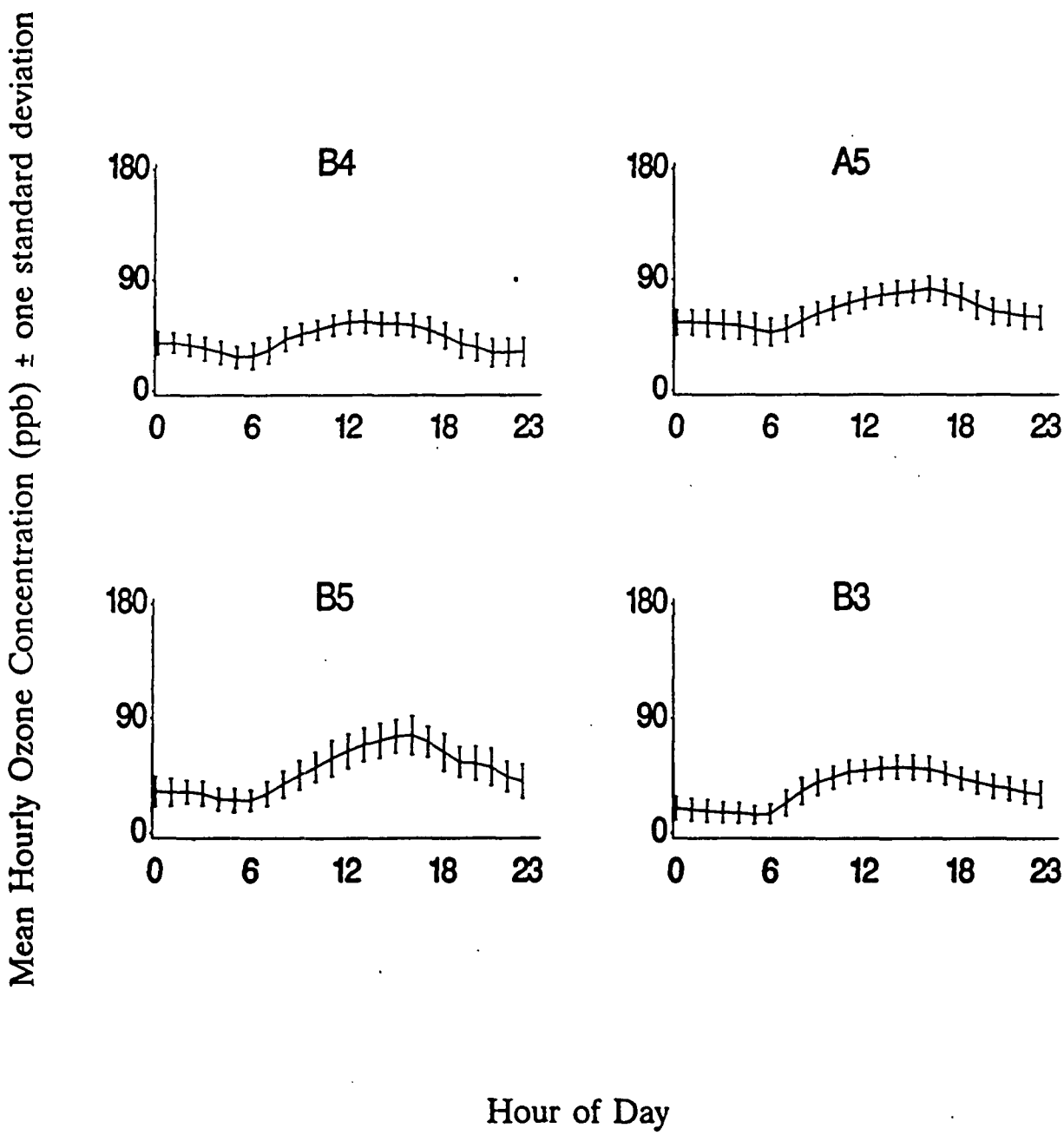
BIOGRAPHIC INFORMATION



Latitude	-	36.49° N
Longitude	-	121.16° W
Elevation (m)	-	335
Basin Height (m)	-	30.8
Landuse	-	Rural - Forest
City Population	-	Not In A City
Basin Population	-	503,590
Start Summary	-	May, 1987
End Summary	-	July, 1989
Source of Data	-	National Park Service

PINNACLES NATIONAL MONUMENT

DOMINANT DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS (MAY - OCT)



Pinnacles National Monument

DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS

A. BY YEAR.

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	5	2	6	12	1	2	7	23	5	26	1	9	5	3	1	0	0	0
1988	6	6	0	2	0	1	11	33	6	15	1	9	13	2	0	0	0	0
1989	9	7	0	0	0	1	23	27	0	8	0	17	16	1	0	0	0	0
All Years	6	5	2	6	1	2	11	28	4	18	1	10	10	2	1	0	0	0

B. BY GROWING SEASON (May through October).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	6	1	7	13	2	1	3	27	5	32	0	1	1	3	2	0	0	0
1988	4	4	0	5	0	0	3	41	8	25	0	0	9	3	1	0	0	0
1989	4	0	0	0	0	0	4	65	0	26	0	0	0	4	0	0	0	0
All Years	5	3	4	9	1	0	3	36	6	29	0	0	5	3	1	0	0	0

C. BY MONTH (composited over years).

Month	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
Jan	9	2	0	0	0	5	33	7	0	0	5	36	12	0	0	0	0	0
Feb	10	6	0	0	0	0	17	19	3	0	0	17	36	0	0	0	3	0
Mar	8	8	0	0	0	3	19	42	0	6	0	14	8	0	0	0	0	0
Apr	2	11	2	11	0	0	5	25	9	32	0	0	0	5	0	0	0	0
May	3	4	11	4	0	0	5	36	4	35	0	0	2	0	0	0	0	0
Jun	8	6	2	6	0	0	6	37	4	29	0	0	2	4	2	0	0	0
Jul	2	0	2	6	0	0	0	40	8	38	0	0	4	2	2	0	0	0
Aug	2	0	2	5	0	0	0	50	2	17	0	0	12	7	2	0	0	0
Sep	2	0	0	22	5	0	0	32	12	27	0	0	2	0	0	0	0	0
Oct	11	5	2	12	2	2	7	22	5	20	0	2	7	7	2	0	0	0
Nov	4	4	0	0	0	0	20	4	2	0	2	35	33	0	0	0	0	0
Dec	9	10	0	0	0	10	23	15	3	0	3	26	10	0	0	0	0	0

1. % days with unidentified diurnal patterns in hourly ozone concentration (see Böhm et al. 1990).
2. Pattern identifier relates to degree of diurnal variation in hourly ozone concentrations (A curves - least variation; E curves - greatest variation) and daily mean (1 curves - lowest mean; 6 curves highest mean) as described by Böhm et al (1990) and as illustrated in Figure 4C.1. Note that due to numeric rounding, the sums of percentages do not always equal 100.

Redwood National Park

BASIC STATISTICS

A. BY YEAR.

Year	% Data Capt[1]	% Valid Days[2]	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	10	10	13	15	20	26	24.8±07	30	33	36	0	0	0	0	0
1988	91	95	10	12	18	24	24.6±10	31	38	41	0	0	0	0	0
1989	20	21	11	14	18	24	23.4±07	29	32	34	0	0	0	0	0
All Years	40	42	10	13	18	24	24.4±09	30	36	40	0	0	0	0	0

B. BY GROWING SEASON (May through October).

Year	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06[3] (ppm hr)	S08[4]	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	94	97	8	10	15	22	22.2±09	28	35	39	0	0	0	0	0	0	0
1989	3	3	8	10	13	19	17.7±06	22	25	26	0	0	0	0	0	0	0
All Years	49	50	8	10	15	22	22.0±09	28	34	39	-	-	0	0	0	0	0

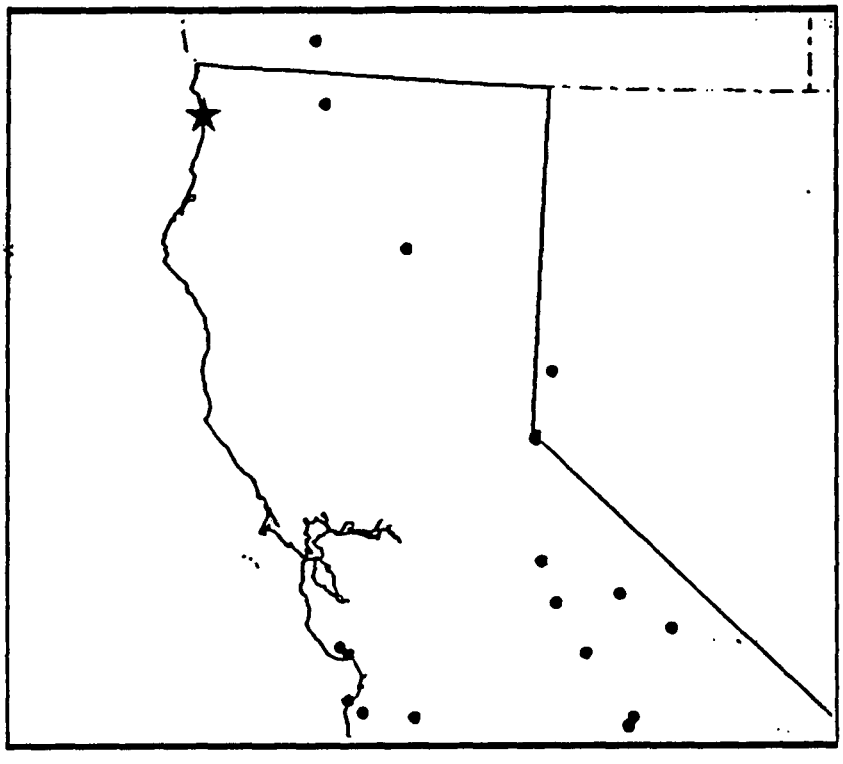
C. BY MONTH [5].

Month	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06 (ppm hr)	S08[6]	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
Jan	85	90	11	14	18	22	22.4±07	27	31	35	0	0	0	0	0	0	0
Feb	75	77	13	16	21	25	25.6±08	30	34	36	1	0	0	0	0	0	0
Mar	93	97	15	18	24	29	29.1±08	35	39	41	0	0	0	0	0	0	0
Apr	94	97	20	24	30	35	34.4±08	39	43	46	1	0	0	0	0	0	0
May	47	48	17	19	24	31	30.3±08	37	41	43	0	0	0	0	0	0	0
Jun	49	50	11	13	17	21	21.5±07	26	29	32	0	0	0	0	0	0	0
Jul	56	58	8	10	13	20	20.5±09	25	32	38	0	0	0	0	0	0	0
Aug	95	100	7	10	14	19	18.8±07	24	28	30	0	0	0	0	0	0	0
Sep	95	97	8	11	18	24	23.8±09	30	35	39	0	0	0	0	0	0	0
Oct	89	90	5	7	11	17	17.3±09	23	29	31	0	0	0	0	0	0	0
Nov	58	60	13	15	19	25	24.1±07	30	33	35	0	0	0	0	0	0	0
Dec	80	85	11	13	17	23	23.0±08	29	32	36	0	0	0	0	0	0	0

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100. Av. period BY YEAR = 8760 hrs; BY G.S. = 4416 hrs.
2. % Valid Days = # days with 75 % of hours between 09:00 and 21:00 / (total # days) * 100 (Federal Register 1979).
3. Cumulative Index: S06 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 60 ppb (Lee et al. 1988).
4. Cumulative Index: S08 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 80 ppb (Lee et al. 1988).
5. Statistics for monthly composites over the period of record.
6. Monthly estimate of S06(08) = S06(08) * (# hours in that month) / (# valid hours).

REDWOOD NATIONAL PARK CALIFORNIA

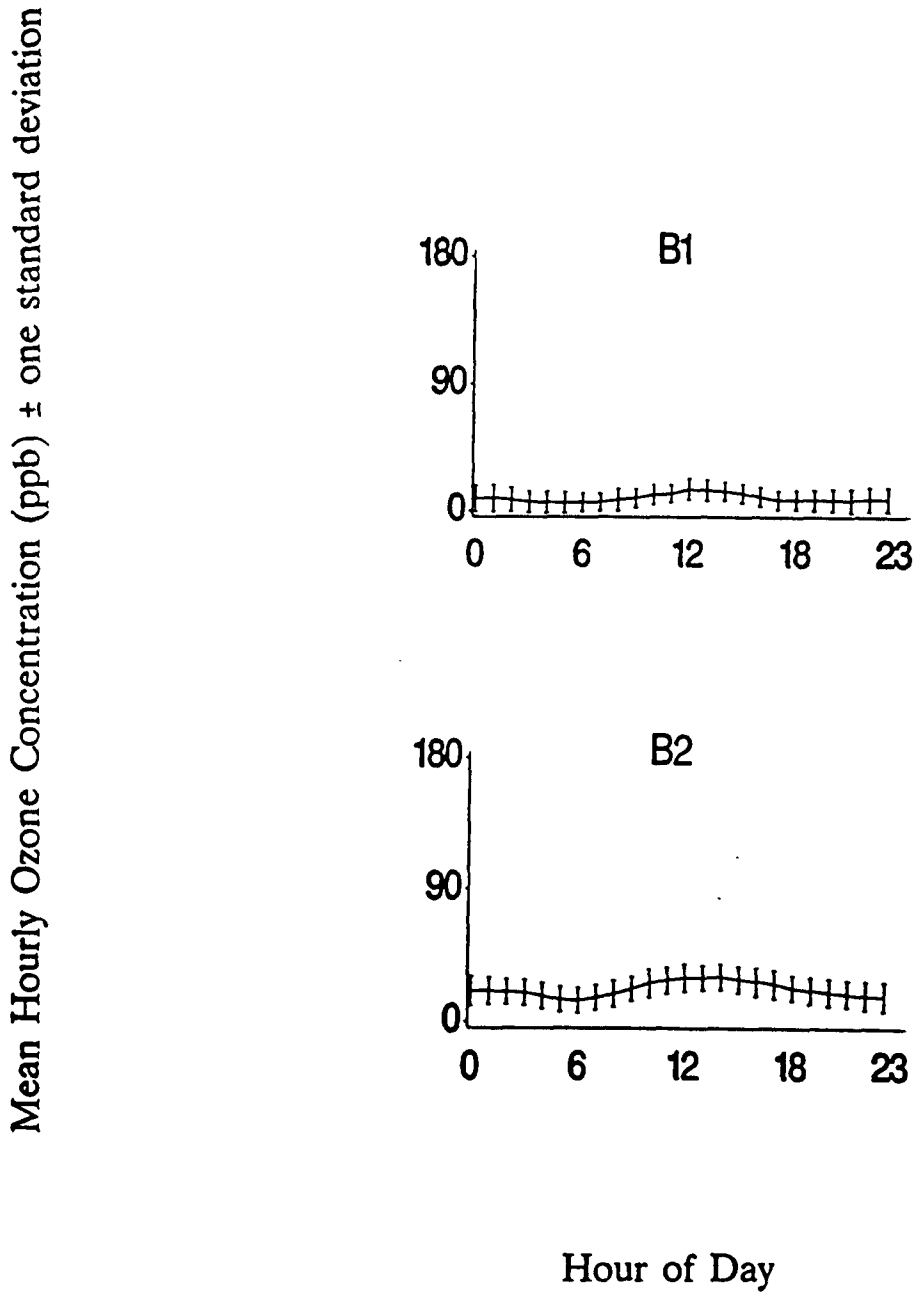
BIOGRAPHIC INFORMATION



Latitude	-	41.56° N
Longitude	-	124.08° W
Elevation (m)	-	233
Basin Height (m)	-	0
Landuse	-	Rural - Forest
City Population	-	Not In A City
Basin Population	-	249,510
Start Summary	-	December, 1987
End Summary	-	July, 1989
Source of Data	-	National Park Service

REDWOOD NATIONAL PARK

DOMINANT DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS (MAY - OCT)



Redwood National Park

DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS

A. BY YEAR.

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	0	24	0	0	0	7	66	0	0	0	0	0	3	0	0	0	0	0
1988	2	24	0	0	0	10	65	1	0	0	0	0	0	0	0	0	0	0
1989	0	27	0	0	0	9	64	0	0	0	0	0	0	0	0	0	0	0
All Years	2	24	0	0	0	9	65	1	0	0	0	0	0	0	0	0	0	0

B. BY GROWING SEASON (May through October).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	2	11	0	0	0	14	73	1	1	0	0	1	0	0	0	0	0	0
1989	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0
All Years	2	10	0	0	0	14	74	1	1	0	0	1	0	0	0	0	0	0

C. BY MONTH (composited over years).

Month	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
Jan	0	17	0	0	0	12	71	0	0	0	0	0	0	0	0	0	0	0
Feb	0	24	0	0	0	0	73	0	0	3	0	0	0	0	0	0	0	0
Mar	6	54	0	0	0	2	42	2	0	0	0	0	0	0	0	0	0	0
Apr	0	81	0	0	0	0	15	4	0	0	0	0	0	0	0	0	0	0
May	8	42	0	0	0	0	50	4	4	0	0	0	0	0	0	0	0	0
Jun	0	4	0	0	0	4	93	0	0	0	0	0	0	0	0	0	0	0
Jul	0	6	0	0	0	18	76	0	0	0	0	0	0	0	0	0	0	0
Aug	0	0	0	0	0	11	89	0	0	0	0	0	0	0	0	0	0	0
Sep	0	11	0	0	0	4	81	0	0	0	0	4	0	0	0	0	0	0
Oct	4	4	0	0	0	48	48	0	0	0	0	0	0	0	0	0	0	0
Nov	0	20	0	0	0	0	77	0	0	0	0	0	3	0	0	0	0	0
Dec	0	18	0	0	0	18	63	0	0	0	0	0	0	0	0	0	0	0

1. % days with unidentified diurnal patterns in hourly ozone concentration (see Böhm et al. 1990).
2. Pattern identifier relates to degree of diurnal variation in hourly ozone concentrations (A curves - least variation; E curves - greatest variation) and daily mean (1 curves - lowest mean; 6 curves highest mean) as described by Böhm et al (1990) and as illustrated in Figure 4C.1. Note that due to numeric rounding, the sums of percentages do not always equal 100.

San Bernardino

BASIC STATISTICS

A. BY YEAR.

Year	% Data Capt[1]	% Valid Days[2]	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	1	1	0	0	0	0	13.5±20	20	50	60	7	1	0	0	0
1981	90	92	0	0	0	20	38.0±52	50	120	160	24	18	13	11	144
1982	96	99	0	0	0	10	31.7±46	40	100	140	20	15	11	8	125
1983	95	99	0	0	0	10	33.0±48	40	100	140	20	15	11	8	126
1984	94	98	0	0	0	20	34.8±46	50	100	140	22	16	12	8	137
1985	93	96	0	0	0	20	34.0±44	50	100	130	22	16	11	7	118
1986	32	33	0	0	0	20	27.6±34	40	70	100	17	10	6	3	23
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	72	74	0	0	0	20	33.8±47	50	100	140	21	15	11	8	673

B. BY GROWING SEASON (May through October).

Year	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06[3] (ppm hr)	S08[4] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	87	90	0	0	10	30	57.7±63	90	160	180	185	166	39	31	24	20	121
1982	95	99	0	0	0	30	48.3±56	80	130	165	166	146	34	27	20	15	115
1983	95	99	0	0	0	30	50.8±60	80	140	170	178	157	36	28	22	16	121
1984	95	99	0	0	0	30	48.9±56	80	130	160	168	147	35	27	21	15	125
1985	93	98	0	0	0	30	47.1±52	80	130	150	154	132	35	26	18	12	102
1986	16	17	0	0	10	30	41.8±46	70	110	140	22	18	30	21	14	9	14
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	80	84	0	0	0	30	50.2±57	80	140	170	-	-	35	28	21	15	598

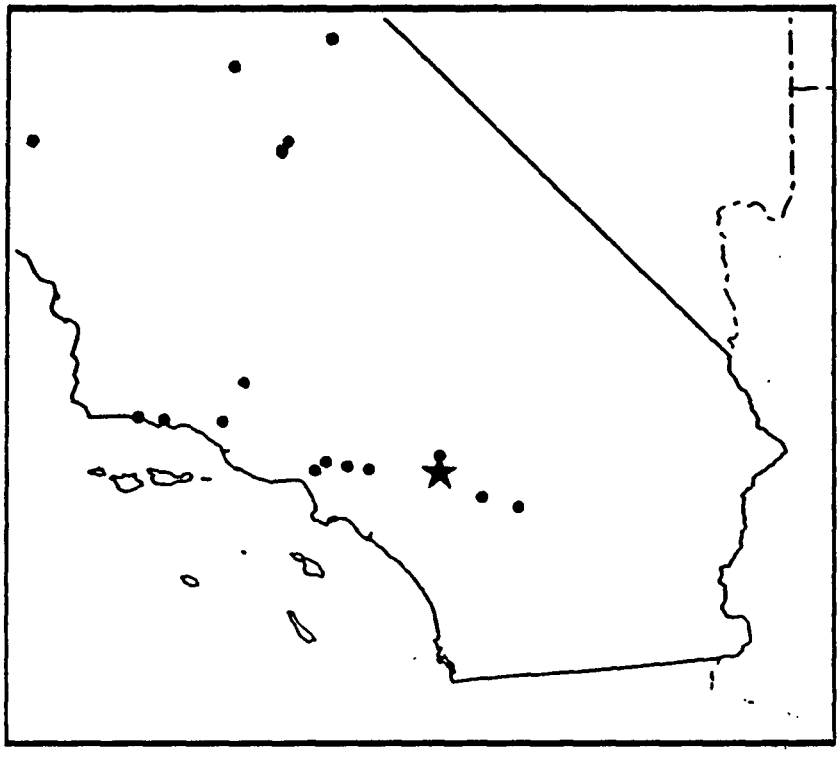
C. BY MONTH [5].

Month	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06 (ppm hr)	S08[6] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
Jan	93	96	0	0	0	0	11.6±15	20	30	40	1	1	1	0	0	0	0
Feb	90	93	0	0	0	10	14.9±20	30	40	50	3	2	5	2	1	0	4
Mar	85	88	0	0	0	15	22.8±27	30	60	80	7	5	11	6	2	1	15
Apr	95	97	0	0	10	30	35.2±38	50	80	110	15	11	22	13	8	5	48
May	95	99	0	0	10	30	49.5±51	80	130	150	29	24	36	26	19	13	108
Jun	94	99	0	0	10	40	59.1±61	100	150	180	36	33	41	33	27	20	117
Jul	92	97	0	0	0	40	64.3±67	110	160	190	44	40	47	39	31	23	135
Aug	92	95	0	0	0	30	59.3±66	110	160	180	40	37	43	36	28	22	132
Sep	92	96	0	0	0	20	42.2±53	70	120	150	24	20	30	22	15	11	78
Oct	93	96	0	0	0	10	26.8±33	40	70	100	11	8	17	9	6	3	28
Nov	94	95	0	0	0	0	14.4±21	30	40	50	3	2	5	3	1	0	7
Dec	81	82	0	0	0	0	9.9±14	20	30	40	1	1	1	0	0	0	1

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100. Av. period BY YEAR = 8760 hrs; BY G.S. = 4416 hrs.
2. % Valid Days = # days with 75 % of hours between 09:00 and 21:00 / (total # days) * 100 (Federal Register 1979).
3. Cumulative Index S06 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 60 ppb (Lee et al. 1988).
4. Cumulative Index S08 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 80 ppb (Lee et al. 1988).
5. Statistics for monthly composites over the period of record.
6. Monthly estimate of S06(08) = S06(08) * (# hours in that month) / (# valid hours).

SAN BERNARDINO **CALIFORNIA**

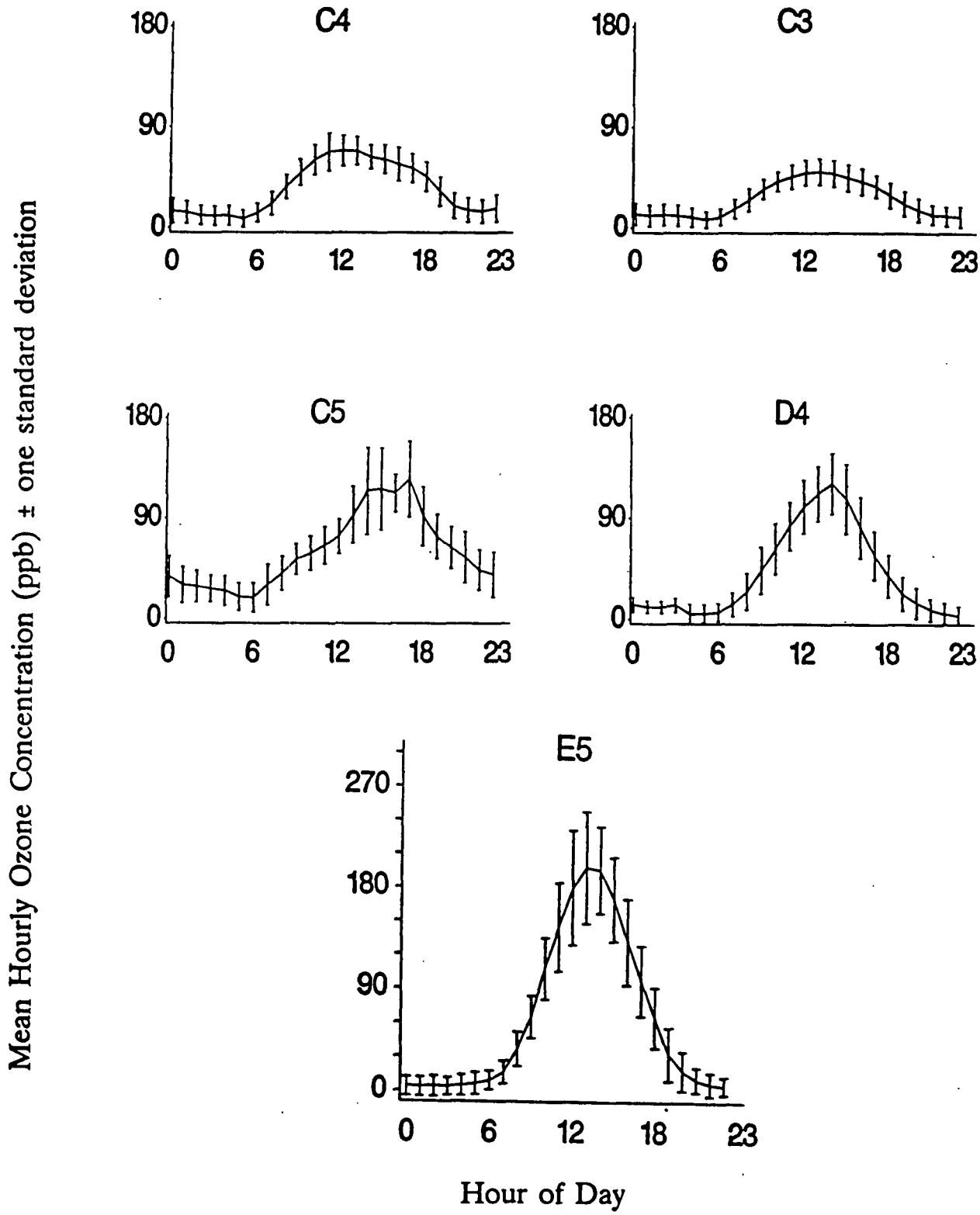
BIOGRAPHIC INFORMATION



Latitude	-	34.11° N
Longitude	-	117.28° W
Elevation (m)	-	320
Basin Height (m)	-	123.1
Landuse	-	City Center - Commercial
City Population	-	118,794
Basin Population	-	11,201,922
Start Summary	-	December, 1980
End Summary	-	May, 1986
Source of Data	-	AIRS (06-071-0003)

SAN BERNARDINO

DOMINANT DIURNAL PATTERNS IN HOURLY
OZONE CONCENTRATIONS (MAY - OCT)



San Bernardino

DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS

A. BY YEAR.

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	0	0	0	0	0	0	0	0	0	0	25	75	0	0	0	0	0	0
1981	1	0	0	0	0	4	3	1	1	0	19	15	6	4	2	6	16	22
1982	1	2	0	0	0	11	5	0	0	1	18	13	7	5	5	2	17	14
1983	2	1	0	0	0	13	5	0	0	0	19	10	10	5	8	4	14	12
1984	2	1	0	0	0	6	2	2	0	1	12	16	8	7	5	1	22	17
1985	1	2	0	0	0	4	5	2	0	1	14	14	9	9	4	3	19	14
1986	1	1	0	0	0	4	2	2	0	2	21	12	16	15	0	1	16	7
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	1	1	0	0	0	7	4	1	0	1	17	14	8	6	5	3	17	15

B. BY GROWING SEASON (May through October).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	0	0	1	0	0	0	1	2	1	1	1	8	3	5	3	12	21	42
1982	0	3	0	0	0	4	1	0	0	2	3	4	9	5	10	4	27	27
1983	1	0	0	1	0	2	2	1	0	1	1	5	8	7	16	9	23	24
1984	0	1	0	0	0	1	1	1	0	1	1	8	6	6	8	2	33	32
1985	1	1	0	0	0	1	3	1	1	1	1	4	9	14	5	5	30	25
1986	0	0	0	0	0	0	5	0	0	9	0	5	27	5	0	5	23	23
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	0	1	0	0	0	2	2	1	0	1	2	6	8	7	8	6	27	30

C. BY MONTH (composited over years).

Month	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
Jan	1	2	0	0	0	18	10	1	0	0	49	20	0	0	0	0	1	0
Feb	2	1	0	0	0	13	4	1	0	0	29	37	7	1	1	0	4	0
Mar	3	1	0	0	0	6	8	0	0	0	10	27	21	12	1	0	13	1
Apr	3	4	0	0	0	1	5	5	1	1	1	8	21	17	5	1	23	6
May	1	2	0	0	0	0	1	3	2	3	1	2	10	10	7	5	28	25
Jun	2	1	1	0	0	1	2	1	0	2	0	0	2	8	12	6	23	42
Jul	0	0	0	1	0	0	0	0	0	1	0	1	0	7	6	12	24	49
Aug	0	0	0	0	0	2	0	0	0	1	0	0	0	1	10	10	36	41
Sep	0	0	0	0	0	6	2	0	0	2	2	7	17	6	10	5	25	18
Oct	1	2	0	0	0	2	5	0	0	0	7	26	16	12	2	0	24	4
Nov	1	1	0	0	0	11	2	1	0	0	47	24	4	1	0	0	9	0
Dec	3	0	0	0	0	30	5	1	0	0	52	11	2	0	0	0	0	0

1. % days with unidentified diurnal patterns in hourly ozone concentration (see Böhm et al. 1990).
2. Pattern identifier relates to degree of diurnal variation in hourly ozone concentrations (A curves - least variation; E curves - greatest variation) and daily mean (1 curves - lowest mean; 6 curves highest mean) as described by Böhm et al (1990) and as illustrated in Figure 4C.1. Note that due to numeric rounding, the sums of percentages do not always equal 100.

Santa Barbara

BASIC STATISTICS

A. BY YEAR.

Year	% Data Capt[1]	% Valid Days[2]	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	93	93	0	10	20	40	36.1±20	50	60	70	16	3	1	0	2
1981	97	97	10	10	20	30	31.2±18	40	50	60	10	1	0	0	0
1982	99	99	0	10	20	30	29.6±17	40	50	60	8	1	0	0	1
1983	98	99	10	10	20	30	30.8±17	40	50	60	8	1	0	0	4
1984	98	98	10	10	20	30	31.6±17	40	50	60	8	2	0	0	3
1985	98	99	10	10	20	30	31.0±17	40	50	60	9	1	0	0	4
1986	95	96	10	10	20	30	29.7±17	40	50	60	6	1	0	0	0
1987	92	97	10	10	20	30	30.7±17	40	50	60	8	1	0	0	2
1988	94	99	10	10	20	30	31.0±17	40	50	60	9	1	0	0	0
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	96	97	10	10	20	30	31.3±18	40	50	60	9	1	0	0	16

B. BY GROWING SEASON (May through October).

Year	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06[3] (ppm hr)	S08[4] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	98	98	0	10	20	30	34.3±21	50	60	70	47	10	16	2	1	0	2
1981	99	99	10	10	20	30	32.8±19	50	60	60	33	6	12	1	0	0	0
1982	99	99	0	10	20	30	30.5±19	40	50	60	29	4	10	1	0	0	1
1983	98	99	10	10	20	30	33.3±20	50	60	60	38	10	13	2	1	0	4
1984	98	98	0	10	10	30	31.9±19	40	60	60	32	8	11	2	1	0	1
1985	98	99	0	10	20	30	31.5±18	40	60	60	30	6	10	1	0	0	3
1986	92	93	10	10	20	30	29.7±17	40	50	60	17	3	6	1	0	0	0
1987	90	94	0	10	20	30	32.7±19	50	60	60	31	5	12	1	0	0	2
1988	94	99	10	10	20	30	33.3±18	50	60	60	31	5	12	1	0	0	0
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	96	98	0	10	20	30	32.2±19	40	60	60	-	-	11	2	0	0	13

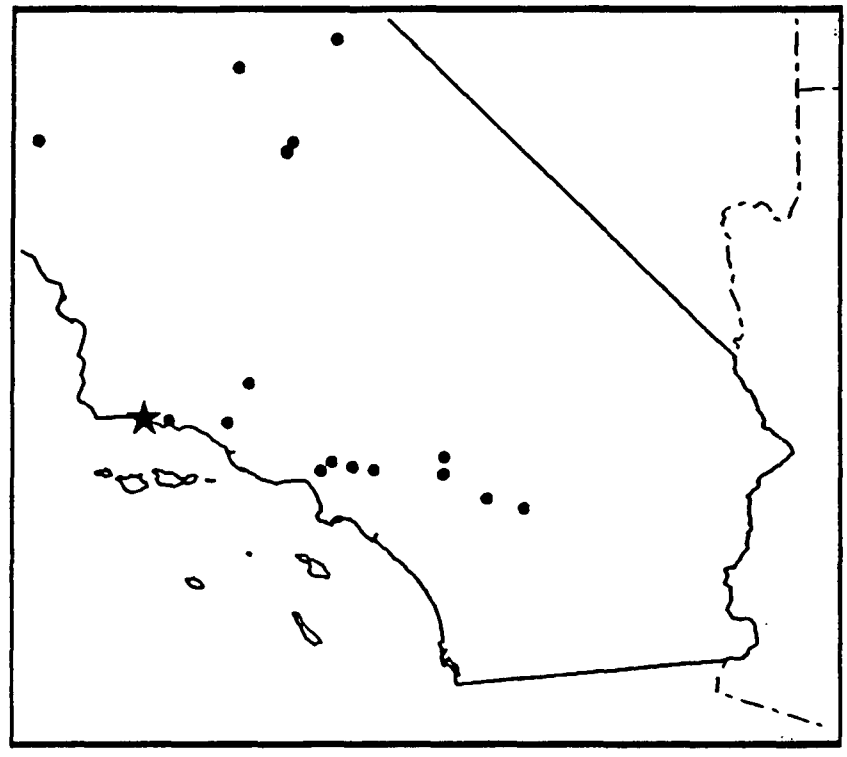
C. BY MONTH [5].

Month	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06 (ppm hr)	S08[6] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
Jan	97	97	10	10	20	20	25.3±13	30	40	50	2	1	2	0	0	0	0
Feb	95	96	10	10	20	30	30.9±16	40	50	60	4	1	7	1	0	0	0
Mar	98	99	10	20	20	30	34.2±15	40	50	60	4	1	7	2	0	0	1
Apr	98	99	10	20	30	40	39.0±17	50	60	70	8	2	15	2	0	0	1
May	97	99	10	10	20	40	37.6±18	50	60	70	8	1	16	1	0	0	0
Jun	95	97	10	10	20	30	33.5±18	50	50	60	5	1	10	1	0	0	1
Jul	97	99	0	10	10	30	28.9±18	40	50	60	4	1	8	1	0	0	1
Aug	97	99	0	0	10	30	26.8±17	40	50	50	3	1	5	0	0	0	0
Sep	95	96	0	10	20	30	31.6±20	40	60	60	6	2	12	2	1	0	4
Oct	96	96	10	10	20	30	35.0±20	50	60	70	9	2	17	3	1	0	7
Nov	92	93	10	10	20	30	28.6±16	40	50	60	3	1	6	1	0	0	1
Dec	96	98	10	10	10	20	23.9±13	30	40	40	1	1	2	0	0	0	0

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100. Av. period BY YEAR = 8760 hrs; BY G.S. = 4416 hrs.
2. % Valid Days = # days with 75 % of hours between 09:00 and 21:00 / (total # days) * 100 (Federal Register 1979).
3. Cumulative Index: S06 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 60 ppb (Lee et al. 1988).
4. Cumulative Index: S08 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 80 ppb (Lee et al. 1988).
5. Statistics for monthly composites over the period of record.
6. Monthly estimate of S06(08) = S06(08) * (# hours in that month) / (# valid hours).

SANTA BARBARA **CALIFORNIA**

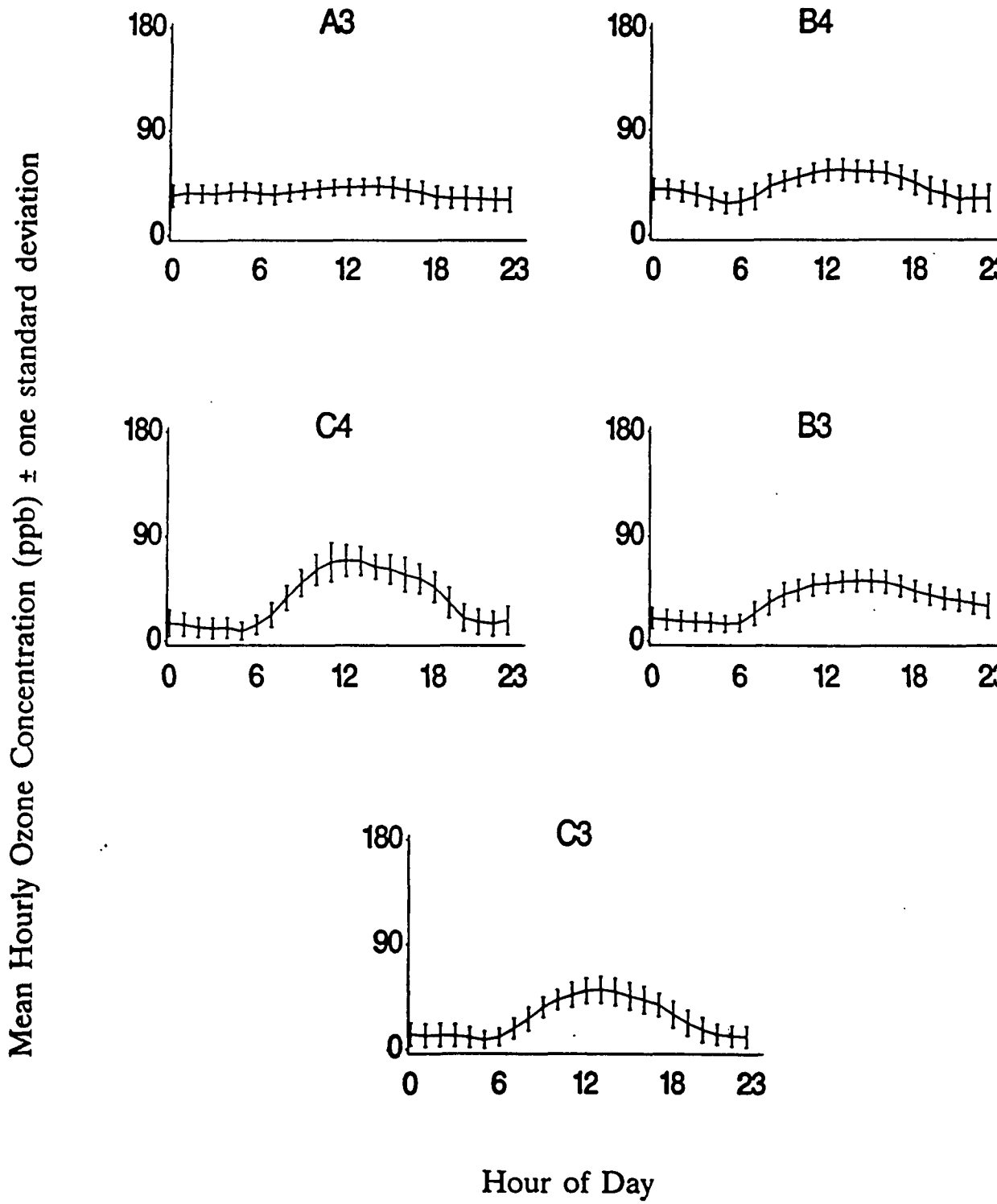
BIOGRAPHIC INFORMATION



Latitude	-	34.47° N
Longitude	-	120.03° W
Elevation (m)	-	25
Basin Height (m)	-	0
Landuse	-	Remote
City Population	-	74,414
Basin Population	-	11,201,922
Start Summary	-	January, 1980
End Summary	-	December, 1988
Source of Data	-	AIRS (06-083-0008)

SANTA BARBARA

DOMINANT DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS (MAY - OCT)



Santa Barbara

DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS

A. BY YEAR.

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	7	14	9	3	0	0	6	10	13	7	1	7	18	9	0	0	1	0
1981	6	14	1	0	0	2	11	12	11	4	1	10	24	9	0	0	1	0
1982	6	15	2	1	0	2	24	12	5	3	0	9	22	5	1	0	0	0
1983	5	21	2	0	0	1	21	12	7	2	2	6	18	7	1	0	0	0
1984	8	15	5	1	0	2	17	14	9	3	1	8	16	8	1	0	0	0
1985	5	14	4	1	0	0	20	12	9	4	1	10	18	6	0	0	0	0
1986	7	13	1	1	0	0	18	16	9	2	0	7	27	4	0	0	0	0
1987	8	15	6	1	0	0	24	9	10	4	0	7	20	4	0	0	0	0
1988	6	13	3	2	0	1	20	15	10	3	1	8	21	3	0	0	0	0
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	6	15	3	1	0	1	18	12	9	4	1	8	21	6	0	0	0	0

B. BY GROWING SEASON (May through October).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	7	7	4	2	1	1	4	13	10	7	0	5	32	13	1	0	1	0
1981	3	11	1	0	0	0	5	11	14	5	0	1	38	14	0	0	1	0
1982	5	9	3	1	0	2	8	17	8	3	0	5	36	8	1	0	0	0
1983	5	9	3	0	0	0	4	18	11	4	1	2	33	13	1	0	0	0
1984	4	8	5	1	0	3	5	16	9	5	0	5	28	14	1	0	0	0
1985	6	8	4	0	0	1	13	14	11	6	0	5	29	10	0	0	1	0
1986	3	5	1	0	0	0	8	19	9	1	0	1	48	7	0	0	0	0
1987	9	4	11	2	0	0	9	9	14	4	0	3	37	6	1	0	0	0
1988	4	9	5	4	0	0	9	19	8	5	0	1	34	6	0	0	0	0
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	5	8	4	1	0	1	7	15	10	5	0	3	35	10	0	0	0	0

C. BY MONTH (composited over years).

Month	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
Jan	7	18	1	0	0	4	44	4	2	0	2	21	4	0	0	0	0	0
Feb	7	29	3	2	0	0	28	5	7	3	1	15	7	0	0	0	0	0
Mar	8	34	5	0	0	0	15	16	13	3	0	6	4	2	1	0	0	0
Apr	8	21	9	1	0	0	2	20	20	7	0	0	11	8	1	0	0	0
May	4	9	8	3	0	0	4	19	17	6	0	0	16	17	0	0	0	0
Jun	4	8	5	0	0	0	5	20	12	6	0	3	29	11	0	0	1	0
Jul	6	4	2	0	0	0	9	10	7	4	0	4	47	11	0	0	0	0
Aug	5	5	0	0	0	2	4	10	5	3	0	3	60	8	0	0	0	0
Sep	5	7	3	0	0	1	10	15	8	5	0	4	36	8	1	0	0	0
Oct	6	13	5	2	0	1	10	18	13	4	0	5	19	8	1	0	0	0
Nov	8	21	1	2	0	1	35	8	5	1	1	17	6	1	0	0	0	0
Dec	7	14	0	0	0	3	51	2	1	2	4	22	1	0	0	0	0	0

1. % days with unidentified diurnal patterns in hourly ozone concentration (see Böhm et al. 1990).
2. Pattern identifier relates to degree of diurnal variation in hourly ozone concentrations (A curves - least variation; E curves - greatest variation) and daily mean (1 curves - lowest mean; 6 curves highest mean) as described by Böhm et al (1990) and as illustrated in Figure 4C.1. Note that due to numeric rounding, the sums of percentages do not always equal 100.

Santa Barbara County

BASIC STATISTICS

A. BY YEAR.

Year	% Data Capt[1]	% Valid Days[2]	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	99	100	0	10	10	30	28.9±21	40	60	70	11	3	1	0	4
1981	99	99	0	0	10	30	27.4±21	40	60	70	11	2	0	0	4
1982	92	93	0	0	10	30	27.1±20	40	50	60	9	1	0	0	3
1983	93	93	0	10	10	30	28.8±19	40	50	60	9	2	1	0	7
1984	98	99	0	10	10	30	27.1±19	40	50	60	7	1	0	0	6
1985	98	99	0	10	10	30	28.5±20	40	50	60	9	2	0	0	7
1986	99	100	0	10	10	30	27.5±19	40	50	60	8	2	0	0	1
1987	87	91	0	0	10	30	27.5±19	40	50	60	7	2	0	0	4
1988	95	99	0	0	10	30	27.6±19	40	50	60	9	1	0	0	2
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	96	97	0	0	10	30	27.8±20	40	50	60	9	2	0	0	38

B. BY GROWING SEASON (May through October).

Year	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06[3] (ppm hr)	S08[4] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	99	100	0	0	10	30	31.2±22	50	60	70	40	12	13	3	1	0	2
1981	99	99	0	10	20	30	32.5±22	50	60	70	46	13	15	3	1	0	3
1982	98	98	0	10	10	30	30.5±20	40	60	60	36	7	12	2	0	0	3
1983	99	99	0	10	20	30	32.8±21	50	60	70	47	13	16	3	1	0	6
1984	99	99	10	10	10	30	30.7±20	40	60	60	32	8	10	2	1	0	5
1985	99	99	0	10	20	30	31.3±21	40	60	70	37	10	12	2	1	0	3
1986	99	100	10	10	20	30	30.9±19	40	60	60	31	7	11	2	0	0	0
1987	81	84	0	10	10	30	31.4±20	50	60	70	28	7	11	2	0	0	1
1988	95	99	10	10	20	30	32.2±19	50	60	60	33	6	12	1	0	0	0
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	96	98	0	10	20	30	31.5±20	40	60	70	-	-	13	2	1	0	23

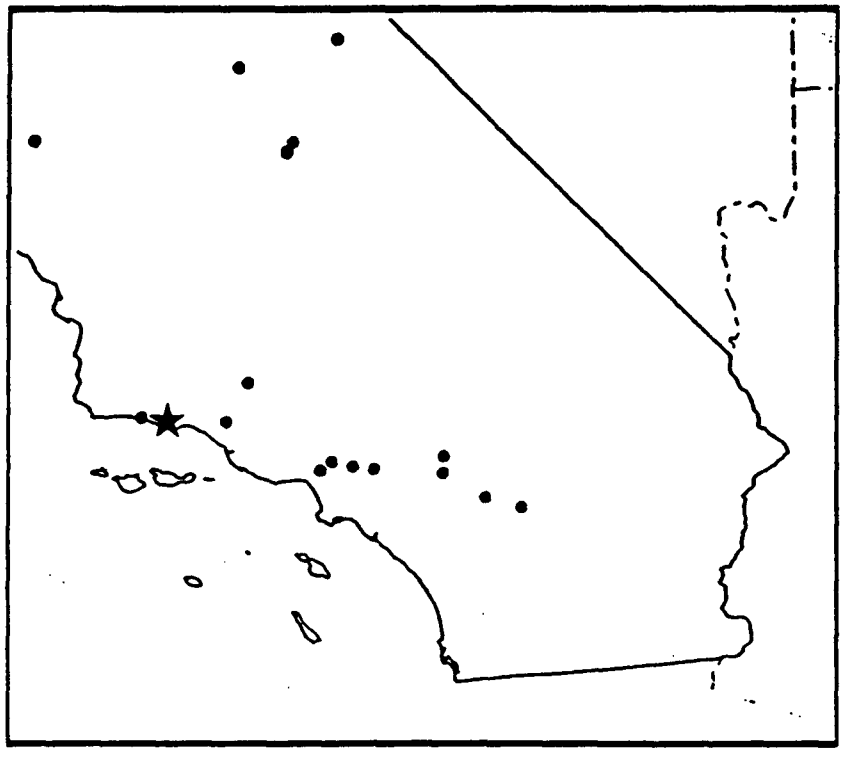
C. BY MONTH [5].

Month	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06 (ppm hr)	S08[6] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
Jan	92	93	0	0	10	10	17.3±15	30	40	40	1	1	2	0	0	0	0
Feb	97	98	0	0	10	20	23.1±17	30	40	50	2	1	4	1	0	0	0
Mar	97	99	10	10	20	30	29.6±17	40	50	60	4	1	6	1	0	0	1
Apr	97	99	10	10	20	40	35.7±19	50	60	70	7	2	13	3	1	0	10
May	98	100	10	10	20	40	37.2±18	50	60	70	8	2	15	2	0	0	1
Jun	98	100	10	10	20	30	32.7±19	50	60	60	6	2	12	2	0	0	2
Jul	98	100	0	10	10	30	29.5±20	40	60	70	6	2	11	2	0	0	2
Aug	89	90	0	10	10	30	28.7±20	40	60	60	6	2	10	2	0	0	1
Sep	98	100	0	10	10	30	30.8±22	40	60	70	7	3	12	3	1	0	12
Oct	97	97	0	0	10	30	30.0±22	50	60	70	7	2	14	3	1	0	5
Nov	95	97	0	0	10	20	21.7±19	30	40	50	3	1	5	1	0	0	4
Dec	91	92	0	0	0	10	16.3±15	30	40	40	1	1	1	0	0	0	0

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100. Av. period BY YEAR = 8760 hrs; BY G.S. = 4416 hrs.
2. % Valid Days = # days with 75 % of hours between 09:00 and 21:00 / (total # days) * 100 (Federal Register 1979).
3. Cumulative Index: S06 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 60 ppb (Lee et al. 1988).
4. Cumulative Index: S08 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 80 ppb (Lee et al. 1988).
5. Statistics for monthly composites over the period of record.
6. Monthly estimate of S06(08) = S06(08) * (# hours in that month) / (# valid hours).

SANTA BARBARA COUNTY CALIFORNIA

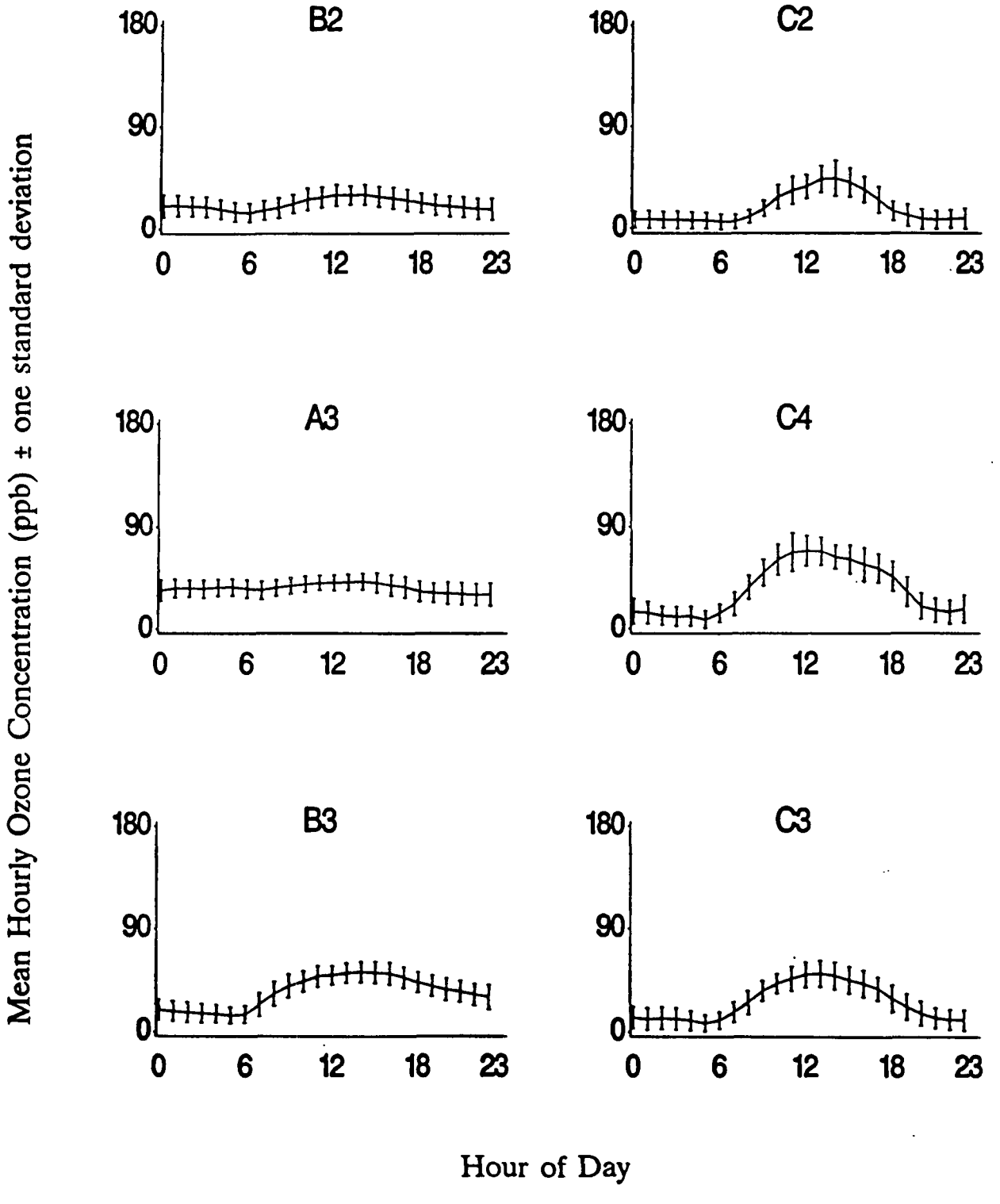
BIOGRAPHIC INFORMATION



Latitude	-	34.45° N
Longitude	-	119.79° W
Elevation (m)	-	12
Basin Height (m)	-	0
Landuse	-	Suburban - Residential
City Population	-	Not In A City
Basin Population	-	283,273
Start Summary	-	January, 1980
End Summary	-	December, 1988
Source of Data	-	AIRS (06-083-2002)

SANTA BARBARA COUNTY

DOMINANT DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS (MAY - OCT)



Santa Barbara County

DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS

A. BY YEAR.

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	7	10	5	1	0	3	11	8	6	0	9	18	20	7	0	0	3	0
1981	5	11	3	0	0	4	8	7	5	3	11	17	18	9	0	0	2	0
1982	5	10	1	0	0	4	11	13	3	2	4	18	26	6	0	0	1	0
1983	5	13	2	0	0	5	16	11	7	2	4	11	17	9	0	0	3	0
1984	5	10	1	0	0	5	15	8	6	1	5	19	21	7	0	0	2	0
1985	6	14	3	1	0	6	11	9	4	3	5	13	23	7	0	0	2	0
1986	5	13	3	0	0	3	12	10	4	1	6	17	20	8	0	0	1	0
1987	5	11	5	0	0	6	11	6	7	2	6	19	20	5	0	0	2	0
1988	5	10	3	1	0	4	14	11	6	3	8	15	20	3	0	0	1	0
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	5	11	3	1	0	4	12	9	5	2	7	16	21	7	0	0	2	0

B. BY GROWING SEASON (May through October).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	8	7	6	1	1	1	9	8	7	0	2	13	33	9	0	0	4	1
1981	6	13	4	1	0	1	4	11	9	5	1	8	28	13	0	0	2	1
1982	5	11	2	0	0	1	6	17	4	2	2	8	35	9	1	0	2	0
1983	4	9	2	0	0	0	7	16	9	4	1	6	24	16	0	0	5	0
1984	5	8	1	0	0	2	11	12	8	2	0	10	33	11	0	0	2	0
1985	7	10	4	1	0	1	10	12	5	4	1	4	35	12	1	0	1	1
1986	5	14	3	0	0	0	7	13	7	1	0	9	33	10	1	0	1	0
1987	4	7	10	1	0	3	6	6	10	4	2	10	35	4	1	0	1	0
1988	5	9	6	3	0	0	14	11	8	4	1	10	30	3	0	0	1	0
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	5	10	4	1	0	1	8	12	7	3	1	8	32	10	0	0	2	0

C. BY MONTH (composited over years).

Month	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
Jan	7	6	0	0	0	18	22	1	0	1	22	27	3	0	0	0	0	0
Feb	5	10	0	0	0	3	21	3	1	1	6	42	7	3	0	0	1	0
Mar	4	24	2	0	0	1	17	10	4	1	0	13	20	8	0	0	1	0
Apr	4	21	6	0	0	0	4	18	12	2	0	2	18	11	0	0	5	0
May	7	12	11	0	0	0	4	17	16	6	0	1	15	15	0	0	2	0
Jun	6	10	3	0	0	0	8	16	11	3	0	3	35	11	0	0	0	1
Jul	4	8	2	0	0	2	10	10	4	4	0	10	34	15	0	0	2	0
Aug	6	10	0	0	0	0	10	9	3	2	1	5	49	7	0	0	2	0
Sep	4	9	3	1	0	1	11	12	4	1	2	9	33	7	1	0	5	0
Oct	6	11	6	2	0	3	6	9	5	0	3	23	25	3	0	0	2	0
Nov	4	8	2	1	0	8	17	1	1	0	16	38	6	1	0	0	2	0
Dec	6	8	0	0	0	16	17	0	0	0	30	27	2	0	0	0	0	0

1. % days with unidentified diurnal patterns in hourly ozone concentration (see Böhm et al. 1990).
2. Pattern identifier relates to degree of diurnal variation in hourly ozone concentrations (A curves - least variation; E curves - greatest variation) and daily mean (1 curves - lowest mean; 6 curves highest mean) as described by Böhm et al (1990) and as illustrated in Figure 4C.1. Note that due to numeric rounding, the sums of percentages do not always equal 100.

Santa Monica Mtns Nat'l Recr. Area

BASIC STATISTICS

A. BY YEAR.

Year	% Data Capt[1]	% Valid Days[2]	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	30	30	0	0	10	20	29.1±32	40	60	90	14	7	4	3	19
1985	69	68	10	10	20	30	40.5±32	50	80	100	23	11	6	4	59
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	64	66	0	1	8	26	33.7±32	51	78	97	20	10	5	2	43
1988	83	87	0	0	6	23	29.8±30	43	70	89	15	7	3	2	44
1989	24	25	0	0	4	16	20.6±20	31	47	59	5	2	1	0	2
All Years	54	55	0	1	10	25	32.6±31	47	71	92	17	8	4	2	167

B. BY GROWING SEASON (May through October).

Year	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06[3] (ppm hr)	S08[4] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	34	34	0	10	10	30	36.3±37	50	80	120	29	20	21	11	7	5	17
1985	79	77	10	10	20	40	47.3±36	60	100	120	98	67	31	17	10	6	51
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	86	89	0	0	9	30	37.4±34	58	84	102	79	47	24	12	6	2	36
1988	76	78	0	0	7	28	35.6±34	54	82	102	63	39	21	11	5	2	31
1989	1	0	0	2	4	18	26.8±28	41	58	83	1	1	11	6	3	0	0
All Years	55	56	0	2	10	30	39.6±35	59	86	110	-	-	25	13	7	4	135

C. BY MONTH [5].

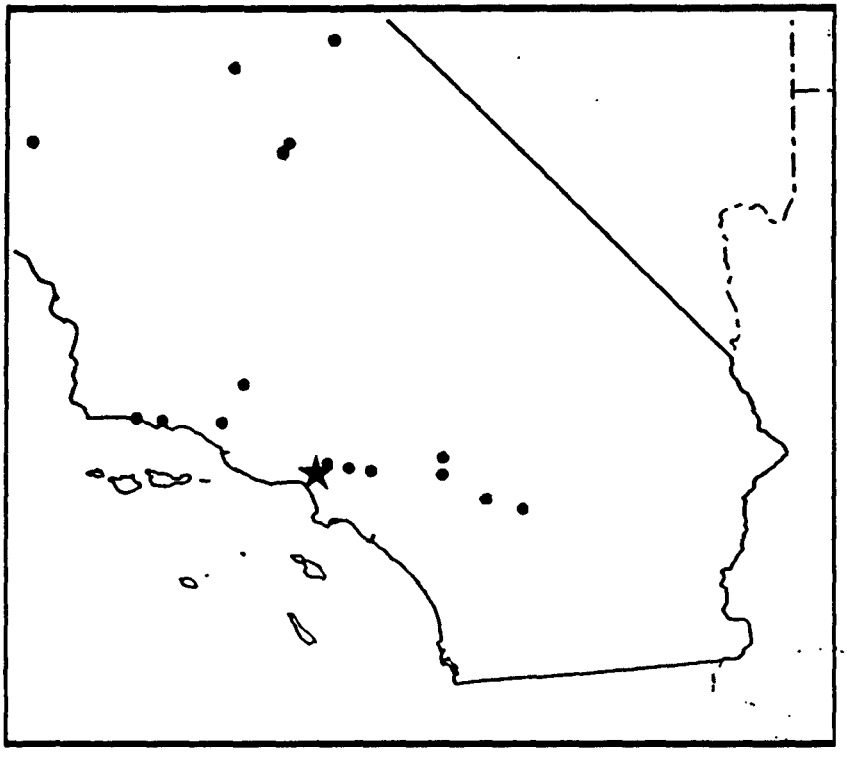
Month	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06 (ppm hr)	S08[6] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
Jan	81	85	0	0	3	14	16.3±15	26	36	40	1	1	1	0	0	0	0
Feb	95	99	0	1	10	20	25.8±22	38	54	70	5	2	9	3	1	0	4
Mar	71	74	0	0	10	28	30.3±25	44	64	76	8	4	13	4	2	1	4
Apr	87	91	1	4	16	35	40.4±33	59	82	103	16	9	25	11	6	3	22
May	64	65	1	5	20	40	41.6±31	60	81	104	16	9	26	11	6	3	18
Jun	66	66	0	4	19	37	42.1±33	60	83	101	17	10	27	13	6	3	17
Jul	54	55	0	0	10	29	35.9±32	56	82	98	15	9	23	11	5	1	7
Aug	64	65	0	3	10	30	42.1±40	65	98	120	21	15	29	18	10	5	32
Sep	93	94	0	2	10	30	40.4±40	57	98	130	18	13	24	15	10	7	46
Oct	74	73	0	0	10	30	35.2±31	50	74	93	13	8	20	9	5	2	15
Nov	73	74	0	1	8	20	22.9±20	32	50	60	4	1	6	1	1	0	2
Dec	74	76	0	0	4	16	17.4±14	29	37	40	1	1	1	0	0	0	0

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100. Av. period BY YEAR = 8760 hrs; BY G.S. = 4416 hrs.
2. % Valid Days = # days with 75 % of hours between 09:00 and 21:00 / (total # days) * 100 (Federal Register 1979).
3. Cumulative Index S06 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 60 ppb (Lee et al. 1988).
4. Cumulative Index S08 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 80 ppb (Lee et al. 1988).
5. Statistics for monthly composites over the period of record.
6. Monthly estimate of S06(08) = S06(08) * (# hours in that month) / (# valid hours).

SANTA MONICA MTNS
NAT'L RECREATIONAL AREA

CALIFORNIA

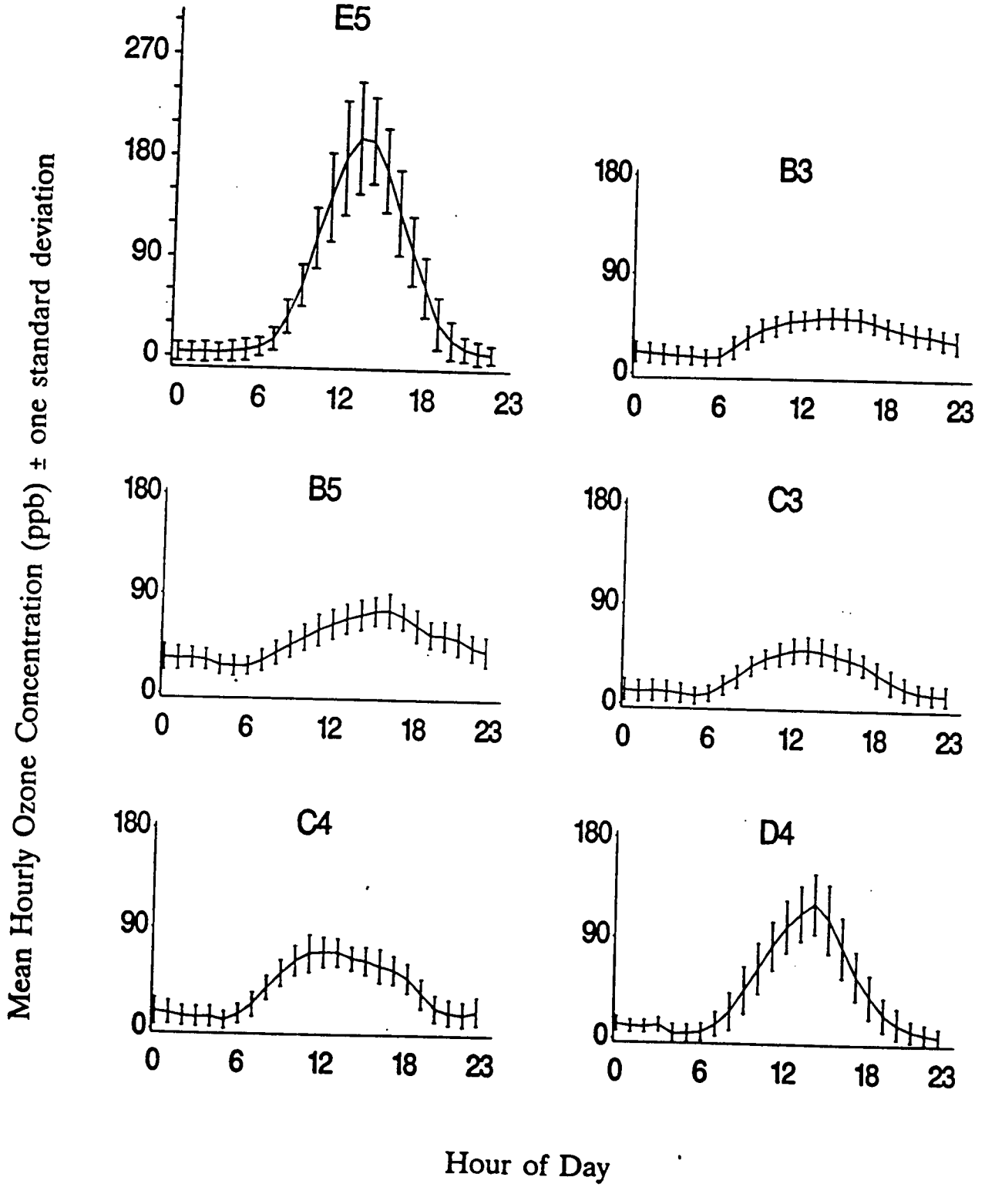
BIOGRAPHIC INFORMATION



Latitude	-	34.11° N
Longitude	-	118.41° W
Elevation (m)	-	191
Basin Height (m)	-	0
Landuse	-	Suburban - Residential
City Population	-	Not In A City
Basin Population	-	11,201,922
Start Summary	-	August, 1984
End Summary	-	July, 1989
Source of Data	-	National Park Service

SANTA MONICA MTNS NAT'L RECREATIONAL AREA

DOMINANT DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS (MAY - OCT)



Santa Monica Mtns Nat'l Recreational Area

DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS

A. BY YEAR.

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	4	6	0	0	0	7	7	8	0	1	12	16	16	11	1	0	9	8
1985	3	14	4	1	0	1	5	10	5	13	0	7	6	8	3	0	14	7
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	3	4	2	1	0	4	8	7	3	10	7	6	11	10	3	0	23	2
1988	2	5	1	0	0	6	9	6	2	5	6	12	17	11	1	0	17	3
1989	13	2	0	0	0	14	20	5	0	0	8	27	14	0	2	0	8	0
All Years	4	7	2	1	0	5	8	7	2	8	5	11	12	9	2	0	16	4

B. BY GROWING SEASON (May through October).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	2	5	0	0	0	2	2	12	0	2	0	12	22	19	0	0	12	14
1985	4	8	5	2	0	0	1	11	5	18	0	1	5	10	5	1	18	11
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	4	2	2	1	0	1	5	8	3	12	3	3	11	13	4	0	30	2
1988	2	3	1	0	0	0	3	5	3	5	0	7	23	18	0	0	26	5
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	3	5	2	1	0	0	3	9	3	11	1	5	14	14	3	0	23	7

C. BY MONTH (composited over years).

Month	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
Jan	6	3	0	0	0	19	29	0	0	0	14	30	5	0	0	0	0	0
Feb	10	14	0	0	0	9	7	7	0	5	2	28	14	2	2	0	9	2
Mar	6	11	0	2	0	0	4	17	2	4	4	13	19	6	0	0	17	0
Apr	1	2	6	0	0	0	3	12	8	15	0	0	9	12	8	0	23	3
May	6	3	8	2	0	0	2	8	7	20	0	0	8	12	5	0	22	2
Jun	3	4	4	1	0	0	4	12	6	16	0	4	9	7	6	0	19	6
Jul	0	2	0	0	0	0	2	13	4	9	0	5	20	22	0	0	20	4
Aug	3	0	2	2	0	0	3	3	3	11	0	2	12	20	3	2	30	9
Sep	4	3	0	1	0	1	3	7	0	4	0	6	15	16	2	0	25	15
Oct	1	14	1	0	0	1	1	10	2	9	5	9	16	9	0	0	19	4
Nov	4	14	1	0	0	7	19	3	0	0	11	25	14	1	1	0	3	0
Dec	3	14	0	0	0	22	19	1	0	0	27	14	3	0	0	0	0	0

1. % days with unidentified diurnal patterns in hourly ozone concentration (see Böhm et al. 1990).
2. Pattern identifier relates to degree of diurnal variation in hourly ozone concentrations (A curves - least variation; E curves - greatest variation) and daily mean (1 curves - lowest mean; 6 curves highest mean) as described by Böhm et al (1990) and as illustrated in Figure 4C.1. Note that due to numeric rounding, the sums of percentages do not always equal 100.

Scotts Valley

BASIC STATISTICS

A. BY YEAR.

Year	% Data Capt[1]	% Valid Days[2]	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	48	47	0	0	0	10	18.0±18	30	40	50	4	1	0	0	0
1981	88	88	0	0	10	20	20.9±17	30	40	50	3	1	0	0	0
1982	74	74	0	0	10	20	21.8±17	30	40	50	3	0	0	0	0
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	70	70	0	0	10	20	20.5±17	30	40	50	3	1	0	0	0

B. BY GROWING SEASON (May through October).

Year	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06[3] (ppm hr)	S08[4] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	62	61	0	0	10	20	22.3±18	30	50	60	12	4	6	2	0	0	0
1981	92	92	0	0	10	20	22.0±18	30	50	50	13	3	5	1	0	0	0
1982	83	83	0	0	10	20	22.9±17	30	40	50	9	3	4	1	0	0	0
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	79	78	0	0	10	20	22.4±18	30	50	50	-	-	5	1	0	0	0

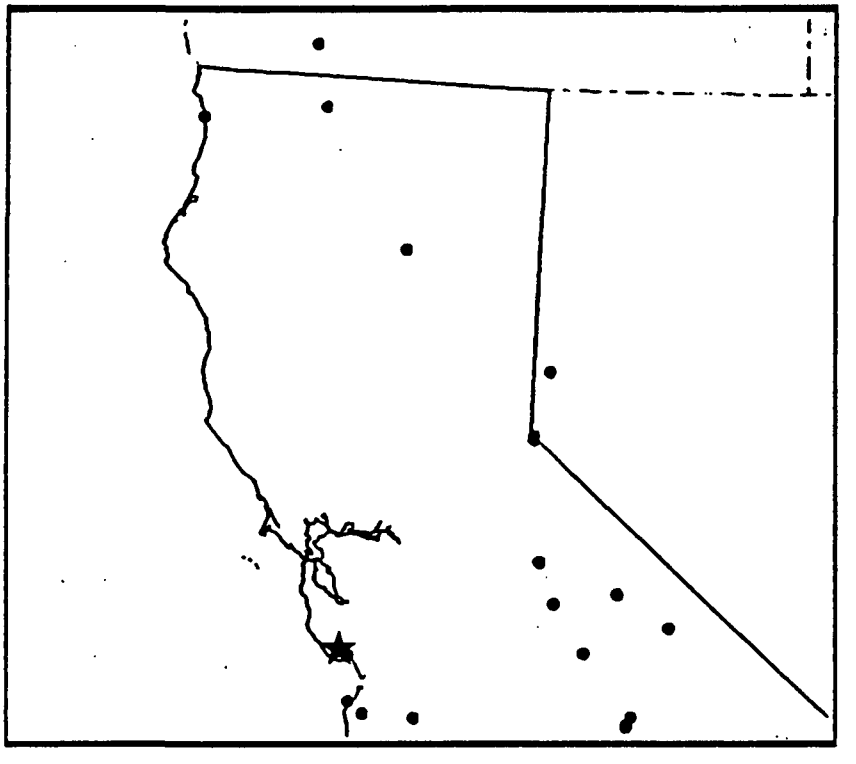
C. BY MONTH [5].

Month	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06 (ppm hr)	S08[6] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
Jan	65	65	0	0	0	10	12.5±12	20	30	30	0	0	0	0	0	0	0
Feb	84	84	0	0	10	10	17.1±14	30	40	40	1	0	0	0	0	0	0
Mar	100	100	0	10	10	20	24.0±14	40	40	40	1	0	1	0	0	0	0
Apr	100	100	0	10	10	30	29.4±18	40	50	60	4	1	7	1	0	0	0
May	100	100	0	10	20	30	29.4±16	40	50	50	2	0	2	0	0	0	0
Jun	100	100	0	10	10	30	26.5±17	40	40	60	3	2	5	2	0	0	0
Jul	84	82	0	0	10	20	20.5±17	30	40	50	3	1	4	1	0	0	0
Aug	97	96	0	0	10	20	20.1±18	30	40	55	3	1	5	1	0	0	0
Sep	95	94	0	0	10	20	19.9±17	30	40	50	2	1	4	0	0	0	0
Oct	97	98	0	0	0	10	20.4±20	30	50	60	4	2	7	2	0	0	0
Nov	100	100	0	0	0	10	13.3±13	20	30	40	1	0	1	0	0	0	0
Dec	100	100	0	0	0	10	10.4±11	20	30	30	0	0	0	0	0	0	0

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100. Av. period BY YEAR = 8760 hrs; BY G.S. = 4416 hrs.
2. % Valid Days = # days with 75 % of hours between 09:00 and 21:00 / (total # days) * 100 (Federal Register 1979).
3. Cumulative Index: S06 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 60 ppb (Lee et al. 1988).
4. Cumulative Index: S08 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 80 ppb (Lee et al. 1988).
5. Statistics for monthly composites over the period of record.
6. Monthly estimate of S06(08) = S06(08) * (# hours in that month) / (# valid hours).

SCOTTS VALLEY CALIFORNIA

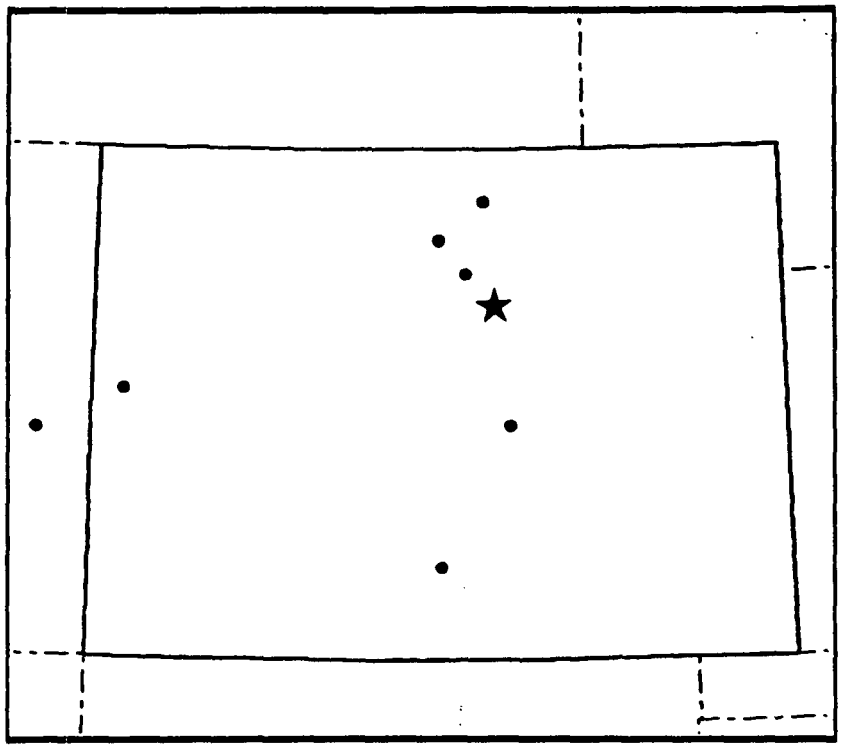
BIOGRAPHIC INFORMATION



Latitude	-	37.05° N
Longitude	-	122.03° W
Elevation (m)	-	171
Basin Height (m)	-	26.8
Landuse	-	Suburban - Mobile
City Population	-	6,891
Basin Population	-	503,590
Start Summary	-	July, 1980
End Summary	-	September, 1982
Source of Data	-	AIRS (06-087-1002)

DENVER **COLORADO**

BIOGRAPHIC INFORMATION



Latitude	-	39.75° N
Longitude	-	104.99° W
Elevation (m)	-	1591
Basin Height (m)	-	1591
Landuse	-	City Center - Commercial
City Population	-	492,365
Basin Population	-	1,628,210
Start Summary	-	January, 1980
End Summary	-	December, 1989
Source of Data	-	AIRS (08-031-0002)

Denver

BASIC STATISTICS

A. BY YEAR.

Year	% Data Capt[1]	% Valid Days[2]	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	90	93	0	0	2	11	16.8±18	27	42	51	2	0	0	0	1
1981	89	93	0	0	2	11	15.6±16	25	38	46	1	0	0	0	0
1982	96	96	0	0	3	13	17.0±16	26	40	49	2	0	0	0	0
1983	98	97	0	0	3	13	17.6±17	27	40	50	3	1	0	0	0
1984	96	96	0	1	3	13	16.6±16	26	39	47	2	0	0	0	0
1985	95	94	0	0	3	13	16.6±16	26	39	47	2	0	0	0	0
1986	99	98	0	1	4	13	17.1±16	27	40	48	1	0	0	0	2
1987	99	98	0	1	4	13	17.7±17	27	42	51	3	1	0	0	0
1988	92	90	0	1	3	13	17.3±16	27	40	47	1	0	0	0	0
1989	99	99	0	0	2	11	15.0±14	24	35	43	1	0	0	0	0
All Years	95	95	0	0	3	12	16.7±16	26	40	48	2	0	0	0	3

B. BY GROWING SEASON (May through October).

Year	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06[3] (ppm hr)	S08[4] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	92	96	0	1	6	19	23.0±20	36	50	58	13	4	4	1	0	0	1
1981	87	91	0	1	6	19	21.1±17	33	45	52	7	2	2	0	0	0	0
1982	96	96	0	2	6	18	21.7±18	32	48	57	13	3	4	1	0	0	0
1983	97	97	0	1	7	20	23.2±19	34	50	60	18	5	6	1	0	0	0
1984	97	97	1	2	2	18	21.2±17	32	45	54	10	2	3	0	0	0	0
1985	95	95	0	2	7	19	21.9±17	33	46	54	10	2	3	0	0	0	0
1986	99	97	1	2	7	19	21.4±17	32	46	53	8	1	2	0	0	0	1
1987	99	99	1	2	7	19	23.0±19	34	50	60	17	5	5	1	0	0	0
1988	97	96	0	1	6	19	21.4±17	33	46	53	8	1	3	0	0	0	0
1989	99	98	0	1	6	19	20.5±16	31	42	49	5	0	2	0	0	0	0
All Years	96	96	0	2	7	19	21.9±18	33	47	55	-	-	3	1	0	0	2

C. BY MONTH [5].

Month	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06 (ppm hr)	S08[6] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
Jan	94	94	0	0	1	4	7.5±09	12	21	25	0	0	0	0	0	0	0
Feb	92	93	0	0	1	7	10.2±10	17	26	30	0	0	0	0	0	0	0
Mar	94	95	0	1	4	13	15.1±13	24	34	38	1	0	0	0	0	0	0
Apr	97	98	1	2	9	21	21.6±15	32	41	46	1	1	1	0	0	0	1
May	96	97	1	4	11	23	24.1±16	35	45	51	1	1	2	0	0	0	0
Jun	96	95	2	4	12	24	26.0±18	37	50	57	3	1	4	1	0	0	0
Jul	96	97	2	4	12	26	28.4±20	42	56	64	4	1	8	1	0	0	1
Aug	94	95	1	3	10	22	25.2±19	37	51	60	3	1	6	1	0	0	1
Sep	96	95	0	1	4	13	17.0±15	26	39	47	1	1	2	0	0	0	0
Oct	96	97	0	0	1	6	10.5±11	17	27	33	1	0	0	0	0	0	0
Nov	96	96	0	0	1	4	7.6±09	12	21	26	0	0	0	0	0	0	0
Dec	95	94	0	0	1	3	6.7±08	10	19	23	1	0	0	0	0	0	0

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100. Av. period BY YEAR = 8760 hrs; BY G.S. = 4416 hrs.
2. % Valid Days = # days with 75 % of hours between 09:00 and 21:00 / (total # days) * 100 (Federal Register 1979).
3. Cumulative Index: S06 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 60 ppb (Lee et al. 1988).
4. Cumulative Index: S08 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 80 ppb (Lee et al. 1988).
5. Statistics for monthly composites over the period of record.
6. Monthly estimate of S06(08) = S06(08) * (# hours in that month) / (# valid hours).

Denver

DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS

A. BY YEAR.

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	4	1	0	0	0	34	10	4	2	0	16	11	17	5	0	0	0	0
1981	5	1	0	0	0	35	14	3	0	0	16	14	16	2	0	0	0	0
1982	3	2	0	0	0	36	14	4	2	0	11	11	16	4	0	0	0	0
1983	6	0	0	0	0	30	15	3	2	0	15	14	17	6	0	0	0	0
1984	7	1	0	0	0	38	15	2	3	0	13	10	15	4	0	0	0	0
1985	6	2	0	0	0	39	15	2	2	0	10	14	12	4	0	0	0	0
1986	7	2	0	0	0	33	14	4	2	0	12	13	16	3	0	0	0	0
1987	3	1	0	0	0	35	12	5	2	1	11	11	16	5	0	0	0	0
1988	4	1	1	0	0	34	23	4	4	0	9	8	13	2	0	0	0	0
1989	6	1	0	0	0	45	18	5	2	0	11	8	8	0	0	0	0	0
All Years	5	1	0	0	0	36	15	4	2	0	12	11	15	4	0	0	0	0

B. BY GROWING SEASON (May through October).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	5	2	0	0	0	11	11	9	4	1	14	12	26	10	1	0	0	0
1981	6	1	0	0	0	12	22	6	0	0	10	17	28	4	0	0	0	0
1982	4	1	0	0	0	15	19	5	3	0	9	11	27	9	0	0	1	0
1983	7	0	0	0	0	8	17	6	3	0	6	20	28	12	0	0	0	0
1984	9	0	0	0	0	21	18	2	4	0	7	12	27	8	0	0	0	0
1985	10	2	0	0	0	19	19	3	4	1	5	19	21	7	0	0	0	0
1986	9	2	1	0	0	12	14	7	3	0	10	16	27	7	0	0	0	0
1987	5	1	0	0	0	15	12	9	4	2	9	12	27	9	0	0	1	0
1988	4	1	1	0	0	19	23	8	7	0	6	9	21	4	0	0	1	0
1989	7	1	0	0	0	21	25	10	5	1	7	14	15	1	0	0	0	0
All Years	7	1	0	0	0	15	18	7	4	0	8	14	25	7	0	0	0	0

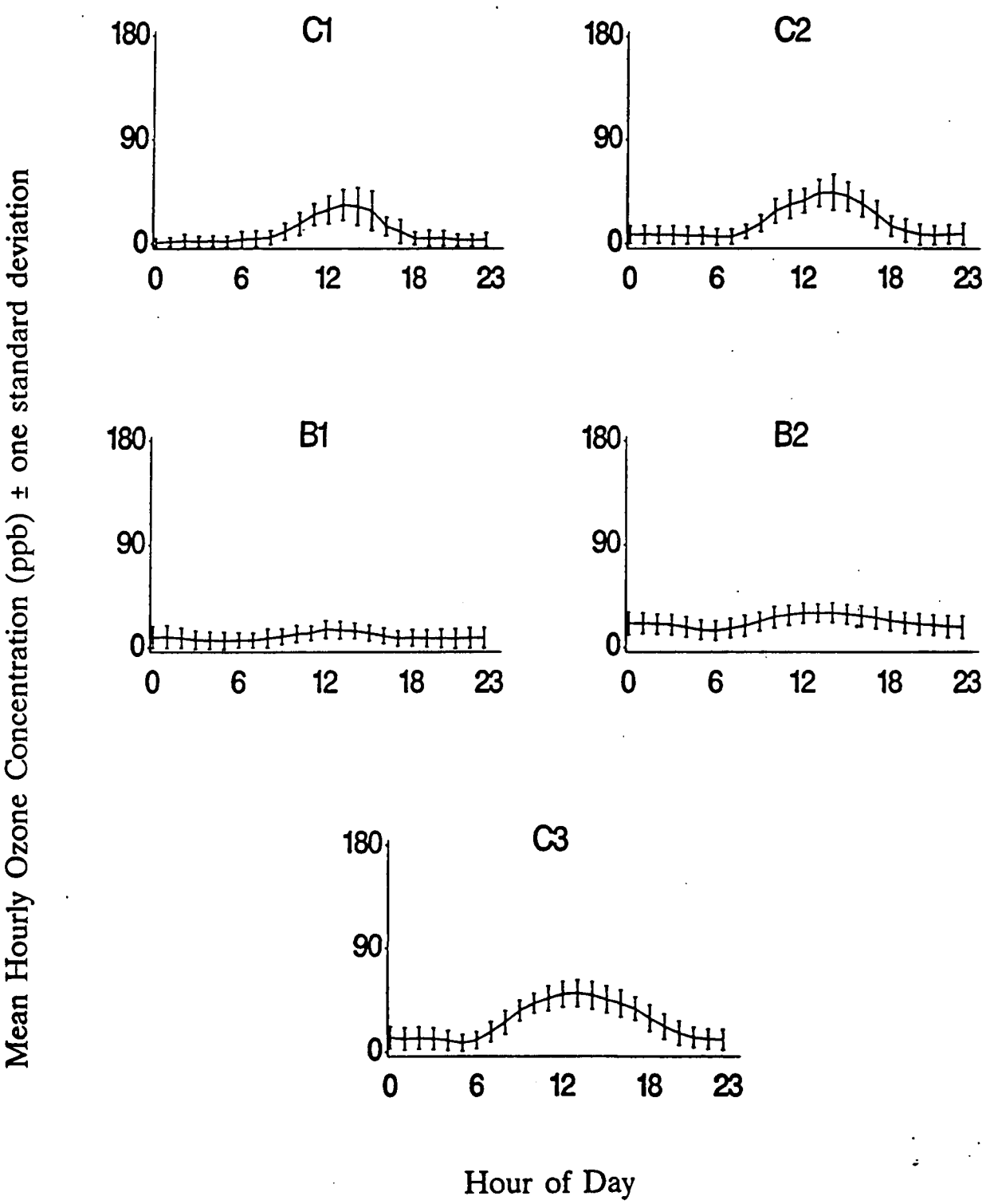
C. BY MONTH (composited over years).

Month	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
Jan	1	0	0	0	0	78	8	0	0	0	13	1	0	0	0	0	0	0
Feb	3	0	0	0	0	57	8	0	0	0	29	5	1	0	0	0	0	0
Mar	5	3	0	0	0	33	17	1	0	0	19	22	4	0	0	0	0	0
Apr	8	5	0	0	0	10	35	3	1	0	4	20	21	1	0	0	0	0
May	7	2	1	0	0	10	30	8	6	0	1	9	29	5	0	0	0	0
Jun	9	2	0	0	0	4	22	11	8	1	1	9	34	10	0	0	0	0
Jul	6	1	0	0	0	1	11	13	7	1	0	9	41	15	0	0	1	0
Aug	4	0	0	0	0	5	22	7	3	0	1	16	34	11	0	0	0	0
Sep	8	1	0	0	0	20	18	2	0	0	16	30	11	2	0	0	0	0
Oct	5	0	0	0	0	51	6	0	0	0	29	14	1	0	0	0	0	0
Nov	2	1	0	0	0	75	2	0	0	0	20	2	0	0	0	0	0	0
Dec	2	0	0	0	0	83	4	0	0	0	12	0	0	0	0	0	0	0

1. % days with unidentified diurnal patterns in hourly ozone concentration (see Böhm et al. 1990).
2. Pattern identifier relates to degree of diurnal variation in hourly ozone concentrations (A curves - least variation; E curves - greatest variation) and daily mean (1 curves - lowest mean; 6 curves highest mean) as described by Böhm et al (1990) and as illustrated in Figure 4C.1. Note that due to numeric rounding, the sums of percentages do not always equal 100.

DENVER

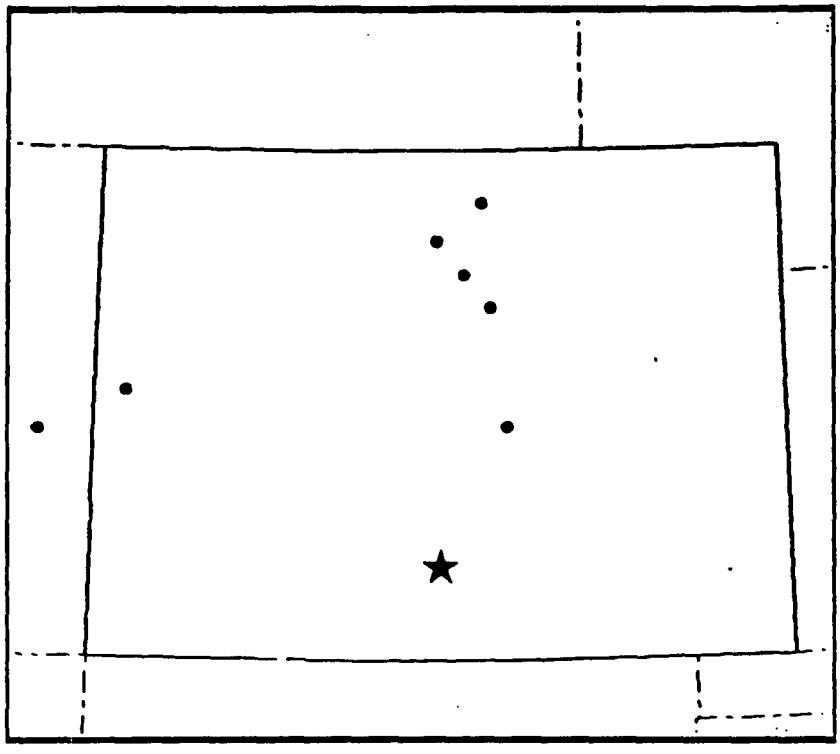
DOMINANT DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS (MAY - OCT)



GREAT SAND DUNES NATIONAL MONUMENT

COLORADO

BIOGRAPHIC INFORMATION



Latitude	-	37.71° N
Longitude	-	105.52° W
Elevation (m)	-	2487
Basin Height (m)	-	2307.7
Landuse	-	Rural - Desert
City Population	-	Not In A City
Basin Population	-	37,914
Start Summary	-	April, 1988
End Summary	-	July, 1989
Source of Data	-	National Park Service

Great Sand Dunes National Park

BASIC STATISTICS

A. BY YEAR.

Year	% Data Capt[1]	% Valid Days[2]	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	72	76	25	28	32	38	38.0±08	44	49	52	0	0	0	0	0
1989	30	32	28	30	34	38	37.5±06	42	45	47	0	0	0	0	0
All Years	51	54	26	29	33	38	37.9±08	43	48	51	0	0	0	0	0

B. BY GROWING SEASON (May through October).

Year	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06[3] (ppm hr)	S08[4] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	94	98	24	27	32	38	38.5±09	45	50	52	2	0	1	0	0	0	0
1989	15	15	24	29	34	39	37.8±07	43	46	47	1	0	0	0	0	0	0
All Years	54	56	24	27	33	39	38.4±09	44	49	52	-	-	1	0	0	0	0

C. BY MONTH [5].

Month	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06 (ppm hr)	S08[6] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
Jan	95	100	30	32	34	36	36.0±03	38	40	41	0	0	0	0	0	0	0
Feb	86	93	30	32	35	40	39.7±05	44	46	47	0	0	0	0	0	0	0
Mar	58	61	27	30	32	38	37.9±07	42	47	49	0	0	0	0	0	0	0
Apr	94	100	32	35	39	43	43.1±06	48	52	53	1	0	0	0	0	0	0
May	48	50	31	34	38	45	44.1±08	50	54	56	2	0	2	0	0	0	0
Jun	49	50	25	28	34	40	39.3±08	45	50	52	1	0	0	0	0	0	0
Jul	90	92	25	28	34	39	38.7±08	44	48	51	1	0	0	0	0	0	0
Aug	94	100	21	24	31	37	36.2±09	42	46	49	1	0	1	0	0	0	0
Sep	94	100	25	28	34	40	39.6±08	46	50	52	0	0	0	0	0	0	0
Oct	92	90	22	24	28	31	31.8±06	36	40	42	0	0	0	0	0	0	0
Nov	94	100	27	29	32	35	34.6±04	37	39	40	0	0	0	0	0	0	0
Dec	94	100	26	28	30	33	33.1±04	36	38	40	0	0	0	0	0	0	0

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100. Av. period BY YEAR = 8760 hrs; BY G.S. = 4416 hrs.
2. % Valid Days = # days with 75 % of hours between 09:00 and 21:00 / (total # days) * 100 (Federal Register 1979).
3. Cumulative Index: S06 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 60 ppb (Lee et al. 1988).
4. Cumulative Index: S08 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 80 ppb (Lee et al. 1988).
5. Statistics for monthly composites over the period of record.
6. Monthly estimate of S06(08) = S06(08) * (# hours in that month) / (# valid hours).

Great Sand Dunes National Park

DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS

A. BY YEAR.

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	4	64	16	0	0	0	4	7	7	1	0	0	0	0	0	0	0	0
1989	1	94	5	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0
All Years	4	71	13	0	0	0	3	6	6	1	0	0	0	0	0	0	0	0

B. BY GROWING SEASON (May through October).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	6	54	17	0	0	0	5	11	11	2	0	0	0	0	0	0	0	0
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	6	54	17	0	0	0	5	11	11	2	0	0	0	0	0	0	0	0

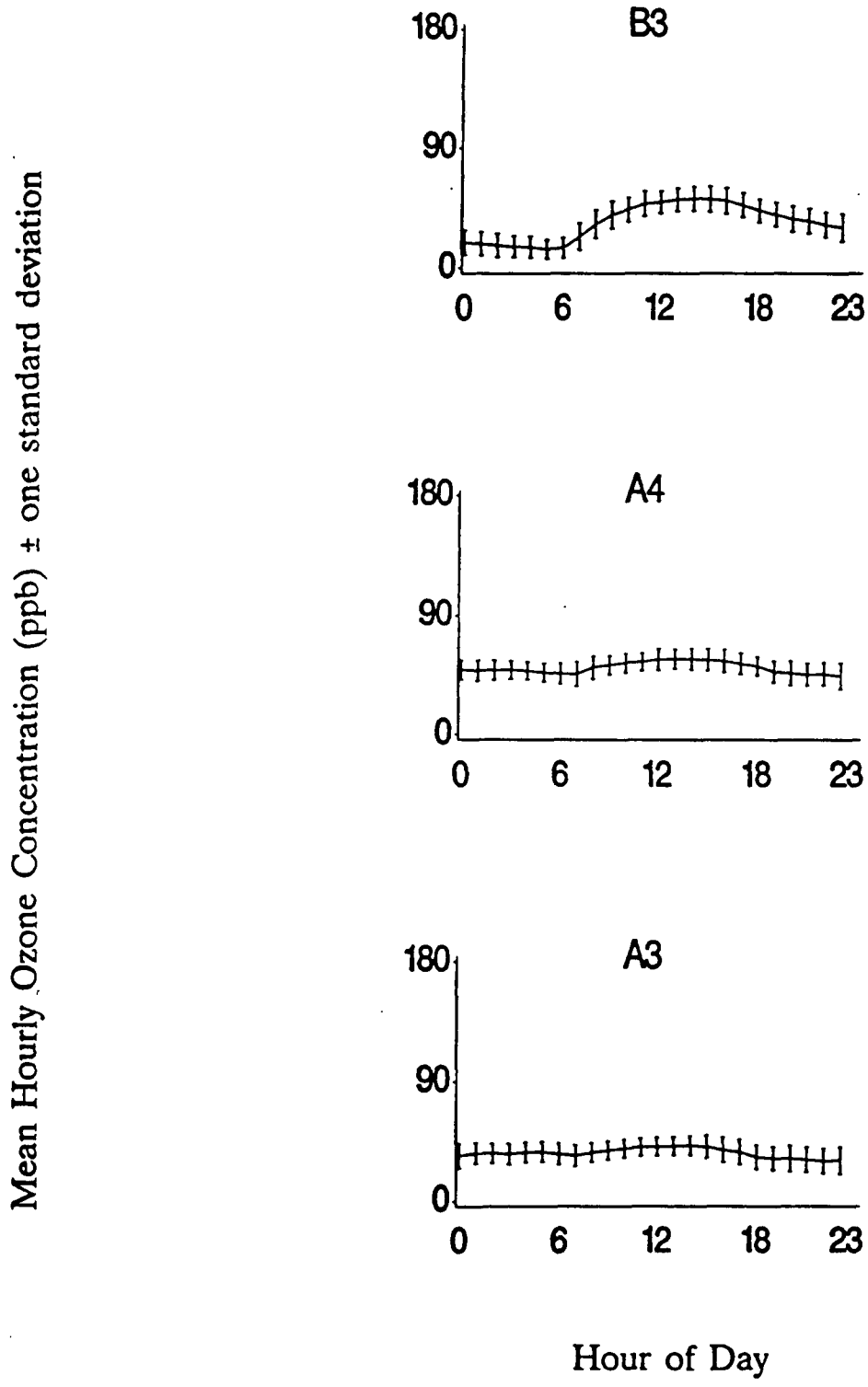
C. BY MONTH (composited over years).

Month	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
Jan	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Feb	0	87	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mar	3	87	10	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0
Apr	0	57	39	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0
May	9	33	48	0	0	0	0	0	14	5	0	0	0	0	0	0	0	0
Jun	0	59	9	0	0	0	0	14	18	0	0	0	0	0	0	0	0	0
Jul	11	54	8	0	0	0	0	12	25	0	0	0	0	0	0	0	0	0
Aug	18	61	0	0	0	0	6	22	0	11	0	0	0	0	0	0	0	0
Sep	0	42	33	0	0	0	4	17	4	0	0	0	0	0	0	0	0	0
Oct	0	74	0	0	0	0	22	4	0	0	0	0	0	0	0	0	0	0
Nov	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dec	0	96	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0

1. % days with unidentified diurnal patterns in hourly ozone concentration (see Böhm et al. 1990).
2. Pattern identifier relates to degree of diurnal variation in hourly ozone concentrations (A curves - least variation; E curves - greatest variation) and daily mean (1 curves - lowest mean; 6 curves highest mean) as described by Böhm et al (1990) and as illustrated in Figure 4C.1. Note that due to numeric rounding, the sums of percentages do not always equal 100.

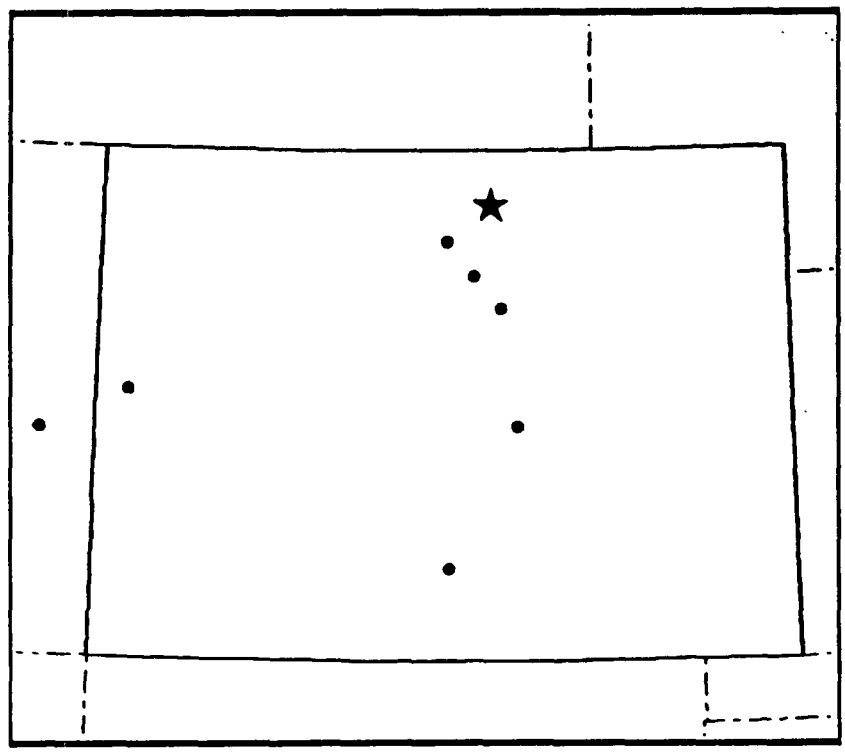
GREAT SAND DUNES NATIONAL MONUMENT

DOMINANT DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS (MAY - OCT)



LARIMER COUNTY COLORADO

BIOGRAPHIC INFORMATION



Latitude	-	40.58° N
Longitude	-	105.08° W
Elevation (m)	-	1522
Basin Height (m)	-	1522
Landuse	-	Suburban - Residential
City Population	-	Not In A City
Basin Population	-	337,729
Start Summary	-	December, 1980
End Summary	-	December, 1989
Source of Data	-	AIRS (08-069-1004)

Larimer County

BASIC STATISTICS

A. BY YEAR.

Year	% Data Capt[1]	% Valid Days[2]	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	8	8	10	10	15	20	21.7±09	25	35	40	0	0	0	0	0
1981	84	85	0	1	10	20	22.4±16	35	45	50	2	0	0	0	0
1982	86	89	1	2	8	20	22.0±16	34	44	49	1	0	0	0	0
1983	81	84	0	1	10	22	23.3±17	34	45	54	3	0	0	0	1
1984	95	98	1	2	10	21	23.0±16	34	45	53	2	0	0	0	0
1985	91	95	0	1	9	22	23.1±17	35	45	51	2	0	0	0	0
1986	89	92	0	0	7	22	22.4±17	34	46	52	2	0	0	0	2
1987	93	96	0	1	8	22	23.2±18	35	48	55	3	0	0	0	0
1988	95	98	0	1	8	24	24.4±18	36	49	56	4	0	0	0	0
1989	94	95	0	0	8	22	23.9±19	37	50	58	4	0	0	0	1
All Years	82	84	0	1	9	22	23.1±17	35	46	54	3	0	0	0	4

B. BY GROWING SEASON (May through October).

Year	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06[3] (ppm hr)	S08[4] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	73	75	5	6	12	25	27.2±17	40	50	55	9	2	4	0	0	0	0
1982	87	91	1	4	13	25	25.9±16	38	47	53	6	1	2	0	0	0	0
1983	86	88	2	6	15	28	29.1±18	40	53	61	16	2	6	0	0	0	1
1984	95	98	3	6	6	27	28.2±17	41	52	59	13	1	4	0	0	0	0
1985	93	97	0	3	12	25	26.3±18	40	50	56	10	1	3	0	0	0	0
1986	90	92	0	3	13	26	26.6±17	39	51	56	8	0	3	0	0	0	0
1987	95	100	0	2	12	26	27.4±19	41	54	60	15	1	5	0	0	0	0
1988	95	98	1	3	13	29	29.2±19	43	55	62	20	3	7	1	0	0	0
1989	99	99	1	4	16	29	30.5±19	44	57	64	23	3	8	1	0	0	1
All Years	90	93	1	4	14	27	27.9±18	40	52	59	-	-	5	0	0	0	2

C. BY MONTH [5].

Month	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06 (ppm hr)	S08[6] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
Jan	90	93	0	0	3	12	14.6±13	25	33	37	1	1	0	0	0	0	0
Feb	93	95	0	1	6	18	18.2±13	29	35	40	1	1	0	0	0	0	0
Mar	84	87	0	2	10	23	22.8±15	35	43	46	1	1	1	0	0	0	0
Apr	82	84	3	8	18	30	29.8±16	41	49	53	2	1	2	0	0	0	2
May	88	91	8	12	21	33	33.0±16	44	53	59	3	1	4	0	0	0	0
Jun	90	92	7	12	21	33	33.8±17	45	56	62	4	1	7	0	0	0	0
Jul	92	95	6	10	20	33	34.0±19	47	60	65	6	1	10	1	0	0	1
Aug	91	94	4	7	16	29	30.1±18	43	54	60	3	1	6	0	0	0	0
Sep	94	97	0	2	8	17	20.5±16	31	43	49	1	1	1	0	0	0	1
Oct	88	90	0	0	3	13	15.5±14	26	35	40	1	1	0	0	0	0	0
Nov	91	94	0	0	1	9	12.8±12	23	31	34	0	0	0	0	0	0	0
Dec	95	97	0	0	2	12	13.6±12	23	30	35	1	0	0	0	0	0	0

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100. Av. period BY YEAR = 8760 hrs; BY G.S. = 4416 hrs.
2. % Valid Days = # days with 75 % of hours between 09:00 and 21:00 / (total # days) * 100 (Federal Register 1979).
3. Cumulative Index: S06 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 60 ppb (Lee et al. 1988).
4. Cumulative Index: S08 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 80 ppb (Lee et al. 1988).
5. Statistics for monthly composites over the period of record.
6. Monthly estimate of S06(08) = S06(08) * (# hours in that month) / (# valid hours).

Larimer County

DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS

A. BY YEAR.

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	11	12	0	0	0	8	44	4	0	0	8	16	8	0	0	0	0	0
1981	6	8	1	0	0	20	13	7	6	0	7	14	19	5	0	0	0	0
1982	5	9	0	0	0	15	18	9	3	0	12	15	16	2	0	0	0	0
1983	6	5	1	0	0	18	13	9	8	1	12	11	14	8	0	0	0	0
1984	5	7	1	0	0	16	15	8	6	0	12	10	17	6	0	0	0	0
1985	5	8	0	0	0	9	14	8	7	0	11	19	17	5	0	0	0	0
1986	6	7	1	0	0	11	14	11	5	0	16	13	16	6	0	0	0	0
1987	6	5	1	0	0	15	19	10	5	2	9	16	12	6	0	0	0	0
1988	5	10	0	0	0	11	16	11	7	1	13	11	11	9	0	0	0	0
1989	4	5	2	0	0	17	15	10	8	2	13	9	13	5	0	0	0	0
All Years	5	7	1	0	0	15	15	9	6	1	12	13	15	6	0	0	0	0

B. BY GROWING SEASON (May through October).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	2	6	2	0	0	12	13	8	11	0	2	12	23	9	0	0	0	0
1982	4	7	0	0	0	5	16	16	4	1	5	13	28	5	0	0	0	0
1983	7	4	1	0	0	4	8	14	14	2	6	10	22	15	0	0	0	0
1984	6	6	1	0	0	9	10	14	10	1	2	8	28	11	0	0	0	0
1985	6	6	0	0	0	6	9	12	12	0	6	12	28	10	0	0	0	0
1986	4	7	1	0	0	6	8	18	8	0	10	10	21	11	0	0	0	0
1987	6	4	2	0	0	8	16	15	10	4	3	17	12	10	0	0	0	0
1988	3	9	1	0	0	6	9	15	12	2	6	11	12	17	0	0	0	0
1989	4	5	4	0	0	5	12	16	15	4	5	7	17	9	0	0	0	0
All Years	5	6	1	0	0	7	11	14	11	2	5	11	21	11	0	0	0	0

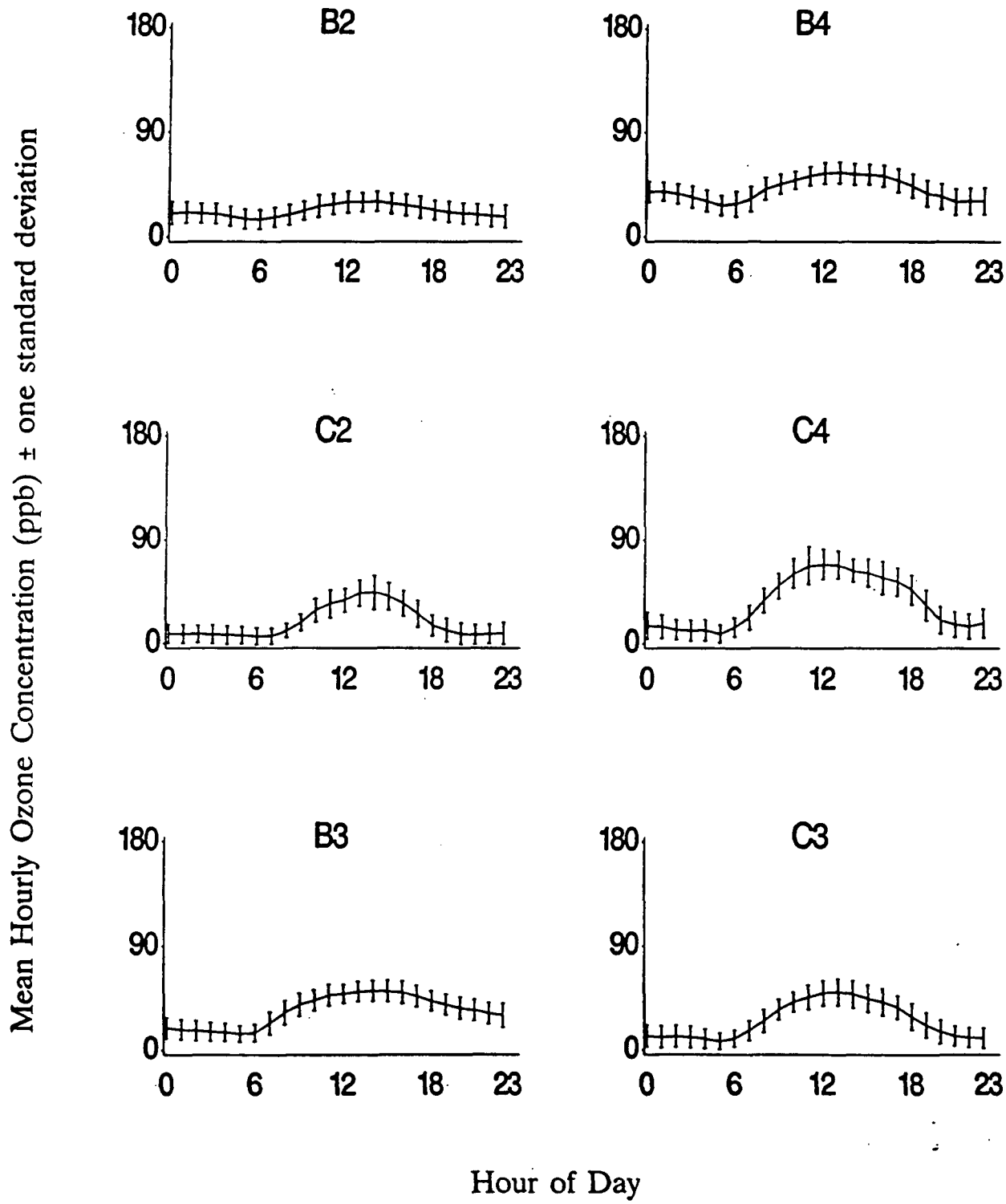
C. BY MONTH (composited over years).

Month	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
Jan	7	4	0	0	0	31	18	2	1	0	30	14	1	0	0	0	0	0
Feb	8	7	0	0	0	12	22	1	0	0	15	36	5	0	0	0	0	0
Mar	6	14	0	0	0	9	25	4	1	0	5	21	21	0	0	0	0	0
Apr	6	19	3	0	0	1	15	17	7	1	1	5	29	5	0	0	0	0
May	5	14	3	0	0	1	9	21	16	3	0	2	19	12	0	0	0	0
Jun	6	10	2	0	0	2	9	27	18	1	0	1	15	16	0	0	0	0
Jul	4	5	2	0	0	2	6	17	20	3	0	2	21	24	0	0	0	0
Aug	5	5	0	0	0	0	8	17	9	2	0	4	42	12	0	0	0	0
Sep	4	2	0	0	0	14	19	5	1	0	6	29	23	0	0	0	0	0
Oct	5	2	0	0	0	21	18	0	0	0	25	28	5	0	0	0	0	0
Nov	5	3	0	0	0	38	21	0	0	0	25	11	1	0	0	0	0	0
Dec	6	5	0	0	0	38	18	1	0	0	31	6	1	0	0	0	0	0

1. % days with unidentified diurnal patterns in hourly ozone concentration (see Böhm et al. 1990).
2. Pattern identifier relates to degree of diurnal variation in hourly ozone concentrations (A curves - least variation; E curves - greatest variation) and daily mean (1 curves - lowest mean; 6 curves highest mean) as described by Böhm et al (1990) and as illustrated in Figure 4C.1. Note that due to numeric rounding, the sums of percentages do not always equal 100.

LARIMER COUNTY

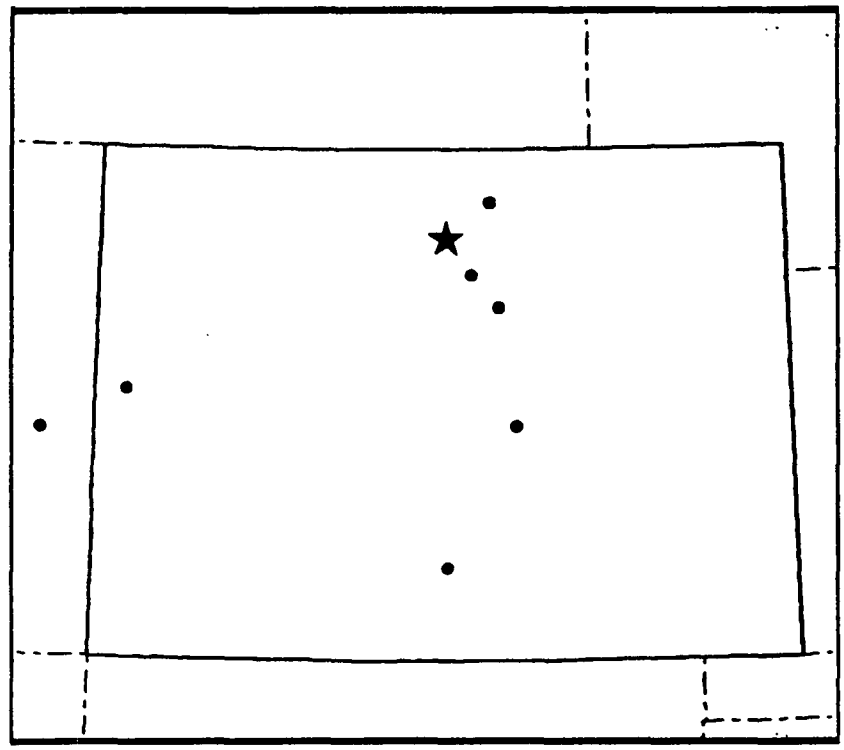
DOMINANT DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS (MAY - OCT)



ROCKY MOUNTAIN NATIONAL PARK

COLORADO

BIOGRAPHIC INFORMATION



Latitude	-	40.28° N
Longitude	-	105.55° W
Elevation (m)	-	2743
Basin Height (m)	-	1538.5
Landuse	-	Rural - Forest
City Population	-	Not In A City
Basin Population	-	337,729
Start Summary	-	August, 1987
End Summary	-	July, 1989
Source of Data	-	National Park Service

Rocky Mountain National Park

BASIC STATISTICS

A. BY YEAR.

Year	% Data Capt[1]	% Valid Days[2]	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	47	49	30	34	40	46	45.8±10	52	57	62	7	1	0	0	0
1988	77	80	25	31	39	46	45.2±11	51	58	62	7	1	0	0	0
1989	24	22	18	22	26	29	29.7±07	33	39	43	0	0	0	0	0
All Years	49	51	24	27	35	44	42.9±12	50	57	61	6	0	0	0	0

B. BY GROWING SEASON (May through October).

Year	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06[3] (ppm hr)	S08[4] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	62	65	29	33	40	48	47.4±11	54	60	64	20	2	11	1	0	0	0
1988	81	85	24	29	37	45	45.3±13	54	60	65	26	4	11	1	0	0	0
1989	4	0	18	22	29	40	38.1±12	45	51	56	1	0	5	0	0	0	0
All Years	49	50	25	31	38	46	46.0±12	54	60	65	-	-	10	1	0	0	0

C. BY MONTH [5].

Month	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06 (ppm hr)	S08[6] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
Jan	85	84	24	25	27	32	36.7±11	47	49	51	1	0	0	0	0	0	0
Feb	95	100	22	24	29	38	37.5±10	47	49	50	1	0	1	0	0	0	0
Mar	90	92	20	25	32	40	39.7±11	49	53	54	1	0	1	0	0	0	0
Apr	64	67	42	46	50	54	53.8±06	58	61	63	9	0	20	0	0	0	0
May	41	37	30	35	42	51	49.9±11	58	63	67	9	1	18	0	0	0	0
Jun	38	37	26	31	39	47	46.7±13	54	60	68	6	1	11	1	0	0	0
Jul	53	51	30	34	40	49	48.9±12	56	63	69	8	2	16	2	0	0	0
Aug	95	100	26	32	41	49	48.6±13	56	63	70	8	2	15	2	0	0	0
Sep	95	100	23	31	39	46	45.4±12	53	58	61	4	1	7	0	0	0	0
Oct	95	100	23	28	34	40	39.7±10	47	53	55	1	0	1	0	0	0	0
Nov	95	100	29	32	36	40	39.9±06	45	47	49	0	0	0	0	0	0	0
Dec	52	52	22	25	37	43	40.2±08	46	47	49	0	0	0	0	0	0	0

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100. Av. period BY YEAR = 8760 hrs; BY G.S. = 4416 hrs.
2. % Valid Days = # days with 75 % of hours between 09:00 and 21:00 / (total # days) * 100 (Federal Register 1979).
3. Cumulative Index: S06 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 60 ppb (Lee et al. 1988).
4. Cumulative Index: S08 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 80 ppb (Lee et al. 1988).
5. Statistics for monthly composites over the period of record.
6. Monthly estimate of S06(08) = S06(08) * (# hours in that month) / (# valid hours).

Rocky Mountain National Park

DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS

A. BY YEAR.

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	5	25	54	3	0	0	1	0	10	8	0	0	0	0	0	0	0	0
1988	2	25	53	3	0	0	4	2	6	4	0	0	0	0	0	0	0	0
1989	0	45	0	0	0	0	55	0	0	0	0	0	0	0	0	0	0	0
All Years	3	28	46	2	0	0	11	1	7	5	0	0	0	0	0	0	0	0

B. BY GROWING SEASON (May through October).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	7	14	54	4	0	0	2	0	14	12	0	0	0	0	0	0	0	0
1988	4	24	44	5	1	0	4	5	10	8	0	0	1	0	0	0	0	0
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	5	20	48	4	0	0	3	3	12	10	0	0	0	0	0	0	0	0

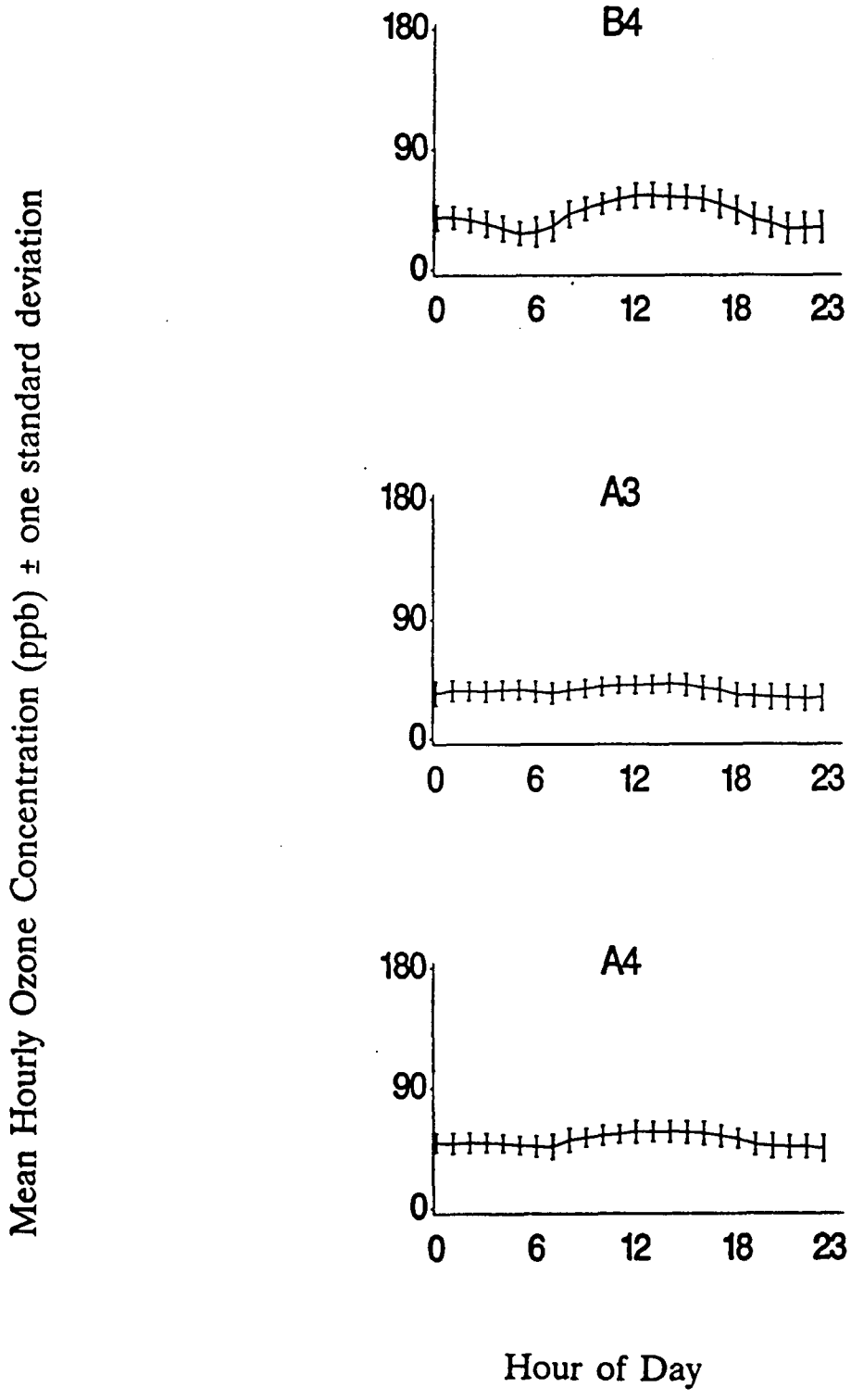
C. BY MONTH (composited over years).

Month	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
Jan	0	20	45	0	0	0	35	0	0	0	0	0	0	0	0	0	0	0
Feb	2	24	48	0	0	0	26	0	2	0	0	0	0	0	0	0	0	0
Mar	0	41	37	0	0	0	20	0	2	0	0	0	0	0	0	0	0	0
Apr	0	0	87	7	0	0	0	0	0	7	0	0	0	0	0	0	0	0
May	6	6	59	12	0	0	0	0	12	12	0	0	0	0	0	0	0	0
Jun	11	12	41	0	0	0	0	6	29	12	0	0	0	0	0	0	0	0
Jul	2	2	50	7	0	0	0	0	17	24	0	0	0	0	0	0	0	0
Aug	5	10	48	8	2	0	2	4	13	12	0	0	2	0	0	0	0	0
Sep	6	22	59	2	0	0	2	2	8	4	0	0	0	0	0	0	0	0
Oct	4	47	36	0	0	0	9	4	4	0	0	0	0	0	0	0	0	0
Nov	2	68	24	0	0	0	4	0	4	0	0	0	0	0	0	0	0	0
Dec	0	37	50	0	0	0	12	0	0	0	0	0	0	0	0	0	0	0

1. % days with unidentified diurnal patterns in hourly ozone concentration (see Böhm et al. 1990).
2. Pattern identifier relates to degree of diurnal variation in hourly ozone concentrations (A curves - least variation; E curves - greatest variation) and daily mean (1 curves - lowest mean; 6 curves highest mean) as described by Böhm et al (1990) and as illustrated in Figure 4C.1. Note that due to numeric rounding, the sums of percentages do not always equal 100.

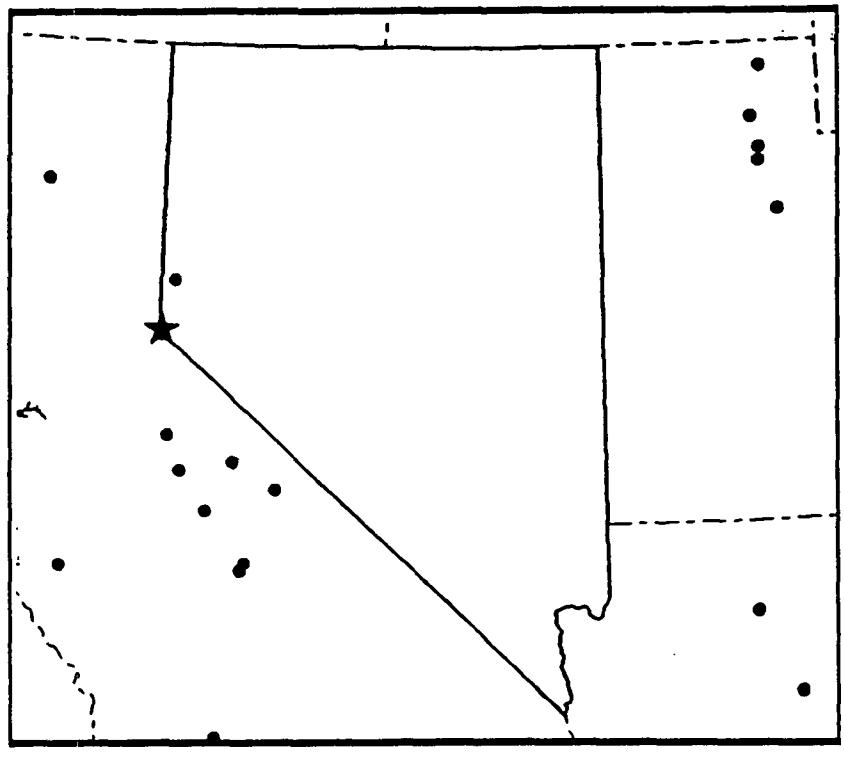
ROCKY MOUNTAIN NATIONAL PARK

DOMINANT DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS (MAY - OCT)



DOUGLAS COUNTY NEVADA

BIOGRAPHIC INFORMATION



Latitude	-	38.97° N
Longitude	-	119.96° W
Elevation (m)	-	1951
Basin Height (m)	-	1916.6
Landuse	-	Suburban - Commercial
City Population	-	Not In A City
Basin Population	-	260,163
Start Summary	-	October, 1982
End Summary	-	June, 1989
Source of Data	-	AIRS (32-005-0004)

Douglas County

BASIC STATISTICS

A. BY YEAR.

Year	% Data Capt[1]	% Valid Days[2]	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	23	23	0	1	7	13	17.1±13	28	35	40	0	0	0	0	0
1983	48	48	2	3	7	12	14.2±13	15	30	37	1	1	0	0	0
1984	57	57	0	4	12	29	27.1±17	40	48	53	2	0	0	0	0
1985	92	92	4	7	14	25	26.1±15	36	46	53	2	0	0	0	0
1986	94	95	7	10	19	30	31.7±17	43	53	63	7	1	0	0	0
1987	88	88	12	16	25	38	38.1±17	50	62	67	13	1	0	0	0
1988	95	95	11	15	25	37	37.9±18	48	62	71	12	2	0	0	0
1989	47	47	7	11	20	31	30.8±15	41	50	55	2	0	0	0	0
All Years	68	68	5	8	15	29	30.2±18	42	53	62	6	1	0	0	0

B. BY GROWING SEASON (May through October).

Year	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06[3] (ppm hr)	S08[4] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	17	17	0	0	8	19	20.3±14	32	38	42	1	0	0	0	0	0	0
1983	26	27	2	4	9	17	20.2±14	30	39	45	1	0	0	0	0	0	0
1984	49	49	0	0	0	27	26.9±19	44	52	56	4	1	3	0	0	0	0
1985	91	90	7	11	18	31	31.6±16	43	53	59	13	1	5	0	0	0	0
1986	94	95	10	14	23	37	37.2±18	49	63	71	36	6	12	2	0	0	0
1987	77	77	12	16	25	42	41.9±20	59	67	72	55	4	24	1	0	0	0
1988	92	92	15	18	28	43	43.9±19	58	71	77	67	13	23	4	0	0	0
1989	33	33	8	11	21	39	35.2±16	48	54	58	3	0	3	0	0	0	0
All Years	60	60	6	11	20	35	35.5±19	49	62	69	-	-	12	1	0	0	0

C. BY MONTH [5].

Month	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06 (ppm hr)	S08[6] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
Jan	99	99	2	4	9	19	21.0±14	33	40	44	1	0	0	0	0	0	0
Feb	95	95	4	7	11	23	23.3±14	33	42	46	1	1	1	0	0	0	0
Mar	92	92	6	9	14	28	26.8±14	38	44	48	1	1	0	0	0	0	0
Apr	96	96	8	11	16	33	32.0±16	44	53	59	3	0	5	0	0	0	0
May	80	81	12	15	25	39	37.9±16	49	58	64	5	1	8	1	0	0	0
Jun	70	69	0	0	17	34	31.9±19	45	56	63	4	1	7	1	0	0	0
Jul	79	79	6	10	18	31	34.2±20	50	61	69	7	1	12	1	0	0	0
Aug	93	93	9	14	23	37	40.1±21	59	69	73	13	2	24	2	0	0	0
Sep	78	79	9	12	23	38	39.3±21	53	70	78	9	3	17	4	0	0	0
Oct	82	82	4	8	16	29	30.2±18	42	56	62	4	1	7	0	0	0	0
Nov	95	94	9	12	21	31	30.1±13	40	47	50	1	0	1	0	0	0	0
Dec	88	88	2	5	11	23	23.1±15	33	40	46	1	1	2	1	0	0	0

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100. Av. period BY YEAR = 8760 hrs; BY G.S. = 4416 hrs.
2. % Valid Days = # days with 75 % of hours between 09:00 and 21:00 / (total # days) * 100 (Federal Register 1979).
3. Cumulative Index: S06 = Σ $[O_3]$/1000, where $[O_3]$ is hourly ozone concentrations ≥ 60 ppb (Lee et al. 1988).
4. Cumulative Index: S08 = Σ $[O_3]$/1000, where $[O_3]$ is hourly ozone concentrations ≥ 80 ppb (Lee et al. 1988).
5. Statistics for monthly composites over the period of record.
6. Monthly estimate of S06(08) = S06(08) * (# hours in that month) / (# valid hours).

Douglas County

DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS

A. BY YEAR.

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	2	11	0	0	0	48	26	1	0	0	1	11	1	0	0	0	0	0
1983	4	2	1	0	1	75	8	1	1	0	1	6	4	0	0	0	0	0
1984	6	23	3	0	0	11	14	15	4	1	2	9	16	3	0	0	0	0
1985	6	13	2	1	0	6	24	15	2	3	6	14	12	3	0	0	0	0
1986	8	20	6	2	0	3	18	13	6	4	4	11	7	5	0	0	0	0
1987	6	38	11	2	0	0	5	9	5	10	0	9	5	5	0	0	0	0
1988	5	28	7	5	0	0	7	11	12	6	2	6	7	9	0	0	0	0
1989	3	23	7	0	0	2	22	10	8	4	0	9	13	4	0	0	0	0
All Years	5	22	5	2	0	11	14	11	5	4	2	9	8	5	0	0	0	0

B. BY GROWING SEASON (May through October).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	3	17	0	0	0	24	34	3	0	0	0	21	0	0	0	0	0	0
1983	14	0	0	0	0	25	25	6	3	0	3	22	17	0	0	0	0	0
1984	9	12	4	0	0	19	4	23	4	3	0	1	24	6	0	0	0	0
1985	7	13	3	1	0	1	15	27	5	6	1	8	14	7	0	0	0	0
1986	10	16	10	3	0	2	5	20	10	8	1	3	10	11	1	0	0	0
1987	7	17	13	5	0	0	2	10	7	21	0	6	10	11	0	0	0	0
1988	6	8	9	11	1	0	1	13	21	11	0	0	7	17	0	0	0	0
1989	3	12	14	0	0	0	3	19	12	8	0	0	20	12	0	0	0	0
All Years	8	13	8	4	0	4	7	17	10	9	1	5	12	10	0	0	0	0

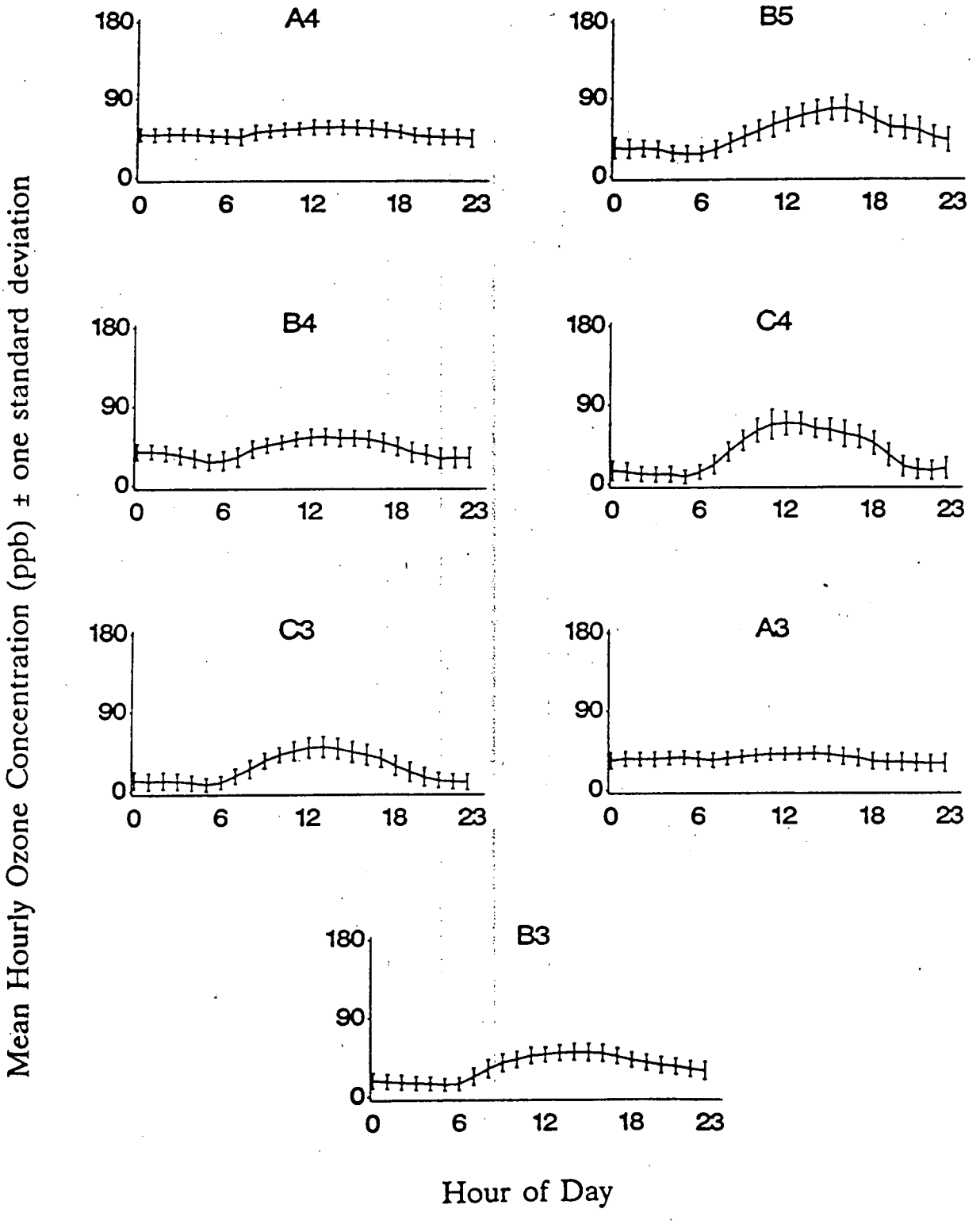
C. BY MONTH (composited over years).

Month	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
Jan	2	26	0	0	0	22	22	1	0	0	10	17	0	0	0	0	0	0
Feb	5	24	1	0	0	21	26	2	1	0	2	20	4	0	0	0	0	0
Mar	3	32	3	0	0	15	19	6	3	0	0	11	10	1	0	0	0	0
Apr	5	24	10	0	0	15	5	16	9	3	0	2	15	1	0	0	0	0
May	7	14	14	4	0	0	3	26	13	7	0	1	11	6	0	0	0	0
Jun	6	11	6	2	0	11	6	23	11	8	0	1	15	5	0	0	0	0
Jul	8	5	3	3	0	5	8	22	6	14	0	1	15	18	0	0	0	0
Aug	12	5	8	5	0	1	3	15	11	16	1	6	6	22	0	0	0	0
Sep	5	15	13	10	1	4	8	9	8	5	2	5	10	9	1	0	0	0
Oct	7	22	4	0	0	7	17	3	8	4	1	17	14	3	0	0	0	0
Nov	4	43	3	0	0	1	27	8	0	0	2	13	4	0	0	0	0	0
Dec	4	28	1	0	1	22	21	2	1	0	10	14	0	0	0	0	0	0

1. % days with unidentified diurnal patterns in hourly ozone concentration (see Böhm et al. 1990).
2. Pattern identifier relates to degree of diurnal variation in hourly ozone concentrations (A curves - least variation; E curves - greatest variation) and daily mean (1 curves - lowest mean; 6 curves highest mean) as described by Böhm et al (1990) and as illustrated in Figure 4C.1. Note that due to numeric rounding, the sums of percentages do not always equal 100.

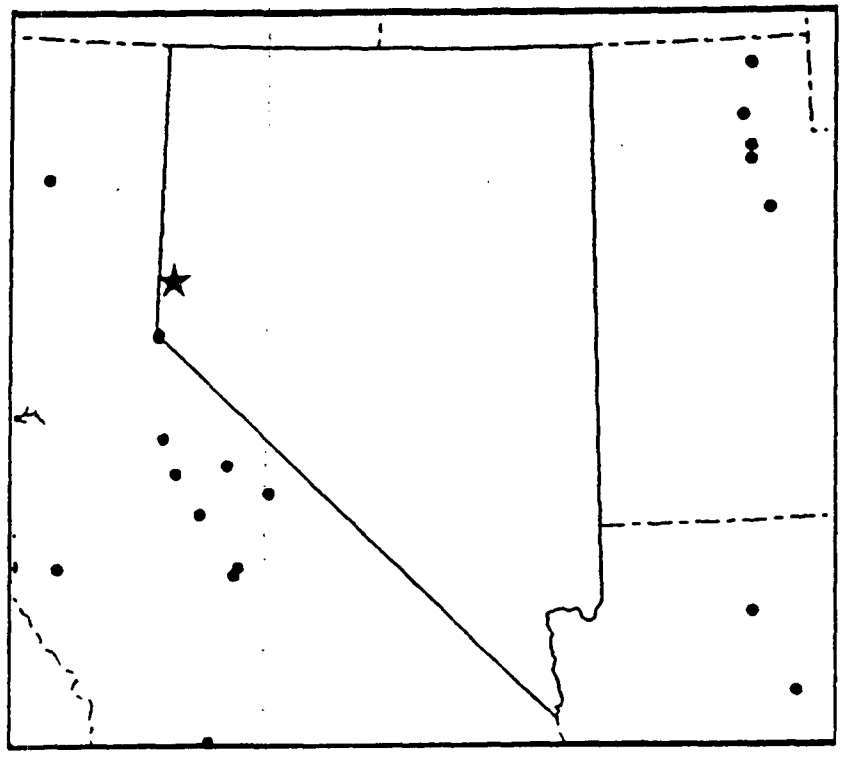
DOUGLAS COUNTY

DOMINANT DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS (MAY - OCT)



RENO NEVADA

BIOGRAPHIC INFORMATION



Latitude	-	39.53° N
Longitude	-	119.81° W
Elevation (m)	-	1280
Basin Height (m)	-	1280
Landuse	-	City Center - Residential
City Population	-	100,756
Basin Population	-	260,163
Start Summary	-	January, 1980
End Summary	-	November, 1981
Source of Data	-	AIRS (32-031-0005)

Reno

BASIC STATISTICS

A. BY YEAR.

Year	% Data Capt[1]	% Valid Days[2]	5	10	25	50	Mean±std	75	90	95	60	80	100	120	Days ≥ x 120 ppb
			Percentiles and Arithmetic Mean (ppb)								% hours ≥ x (ppb)				
1980	91	90	0	0	10	20	22.2±17	30	50	50	4	0	0	0	0
1981	86	85	0	0	0	20	22.3±20	40	50	60	7	1	0	0	0
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	88	88	0	0	10	20	22.3±19	30	50	60	5	1	0	0	0

B. BY GROWING SEASON (May through October).

Year	% Data Capt	% Valid Days	5	10	25	50	Mean±std	75	90	95	S06[3] (ppm hr)	S08[4]	60	80	100	120	Days ≥ x 120 ppb
			Percentiles and Arithmetic Mean (ppb)										% hours ≥ x (ppb)				
1980	91	90	0	0	10	30	27.8±19	40	50	60	20	2	7	0	0	0	0
1981	93	93	0	0	10	30	29.0±21	40	60	60	34	6	12	2	0	0	0
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	92	92	0	0	10	30	28.4±20	40	50	60	-	-	10	1	0	0	0

C. BY MONTH [5].

Month	% Data Capt	% Valid Days	5	10	25	50	Mean±std	75	90	95	S06 (ppm hr)	S08[6]	60	80	100	120	Days ≥ x 120 ppb
			Percentiles and Arithmetic Mean (ppb)										% hours ≥ x (ppb)				
Jan	100	100	0	0	0	10	11.3±10	20	30	30	0	0	0	0	0	0	0
Feb	92	93	0	0	0	10	15.9±13	30	30	40	1	0	0	0	0	0	0
Mar	95	94	0	0	10	20	19.4±13	30	30	40	1	0	0	0	0	0	0
Apr	82	80	0	0	10	30	24.0±15	40	40	50	1	1	1	0	0	0	0
May	89	87	0	10	20	30	29.1±15	40	50	50	2	0	3	0	0	0	0
Jun	86	83	0	10	20	30	32.6±18	50	50	60	5	1	9	0	0	0	0
Jul	95	98	0	10	20	40	37.7±21	50	60	70	11	3	21	3	0	0	0
Aug	96	92	0	0	10	40	32.3±22	50	60	70	9	2	17	2	0	0	0
Sep	88	88	0	0	10	20	25.0±20	40	50	60	4	1	8	0	0	0	0
Oct	100	100	0	0	0	10	14.7±15	30	40	40	1	0	1	0	0	0	0
Nov	90	88	0	0	0	10	11.2±12	20	30	30	0	0	0	0	0	0	0
Dec	97	100	0	0	0	10	9.3±10	20	20	30	0	0	0	0	0	0	0

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100. Av. period BY YEAR = 8760 hrs; BY G.S. = 4416 h
2. % Valid Days = # days with 75 % of hours between 09:00 and 21:00 / (total # days) * 100 (Federal Register 1979).
3. Cumulative Index S06 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 60 ppb (Lee et al. 1988).
4. Cumulative Index S08 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 80 ppb (Lee et al. 1988).
5. Statistics for monthly composites over the period of record.
6. Monthly estimate of S06(08) = S06(08) * (# hours in that month) / (# valid hours).

Reno

DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS

A. BY YEAR.

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	5	5	1	0	0	16	19	14	2	0	14	12	13	4	0	0	0	0
1981	4	4	1	0	0	12	13	17	3	2	18	13	12	6	0	0	0	0
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	5	4	1	0	0	14	16	16	2	1	16	12	12	5	0	0	0	0

B. BY GROWING SEASON (May through October).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	4	7	1	0	0	2	12	26	4	1	7	16	17	9	0	0	0	0
1981	4	5	1	0	0	2	9	29	5	4	10	10	14	10	0	0	0	0
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	4	6	1	0	0	2	10	27	4	2	8	13	15	10	0	0	0	0

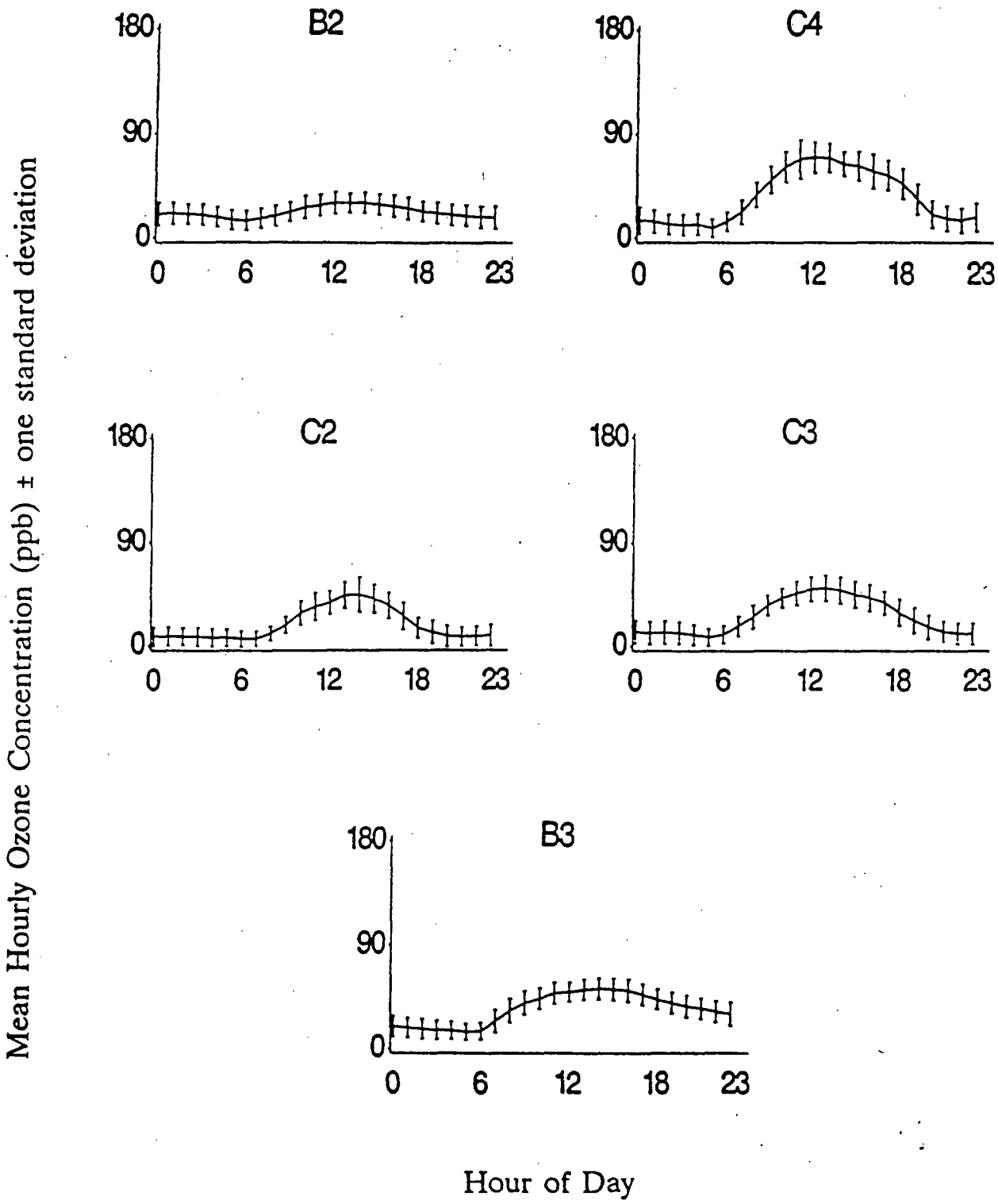
C. BY MONTH (composited over years).

Month	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
Jan	3	2	0	0	0	47	22	0	0	0	30	0	0	0	0	0	0	0
Feb	10	0	0	0	0	19	35	2	0	0	21	23	0	0	0	0	0	0
Mar	8	2	0	0	0	6	43	4	0	0	9	26	11	0	0	0	0	0
Apr	2	12	2	0	0	2	15	12	0	0	0	10	46	0	0	0	0	0
May	2	18	0	0	0	0	25	34	2	0	0	5	16	0	0	0	0	0
Jun	5	10	2	0	0	2	2	40	10	2	0	0	29	2	0	0	0	0
Jul	0	2	2	0	0	2	2	37	10	8	0	2	6	27	0	0	0	0
Aug	4	0	2	0	0	0	2	33	6	4	0	2	26	26	0	0	0	0
Sep	6	7	0	0	0	0	13	24	0	0	4	33	20	0	0	0	0	0
Oct	7	2	0	0	0	7	18	2	0	0	39	33	0	0	0	0	0	0
Nov	6	0	0	0	0	33	8	0	0	0	48	10	0	0	0	0	0	0
Dec	4	0	0	0	0	59	7	0	0	0	33	0	0	0	0	0	0	0

1. % days with unidentified diurnal patterns in hourly ozone concentration (see Böhm et al. 1990).
2. Pattern identifier relates to degree of diurnal variation in hourly ozone concentrations (A curves - least variation; E curves - greatest variation) and daily mean (1 curves - lowest mean; 6 curves highest mean) as described by Böhm et al (1990) and as illustrated in Figure 4C.1. Note that due to numeric rounding, the sums of percentages do not always equal 100.

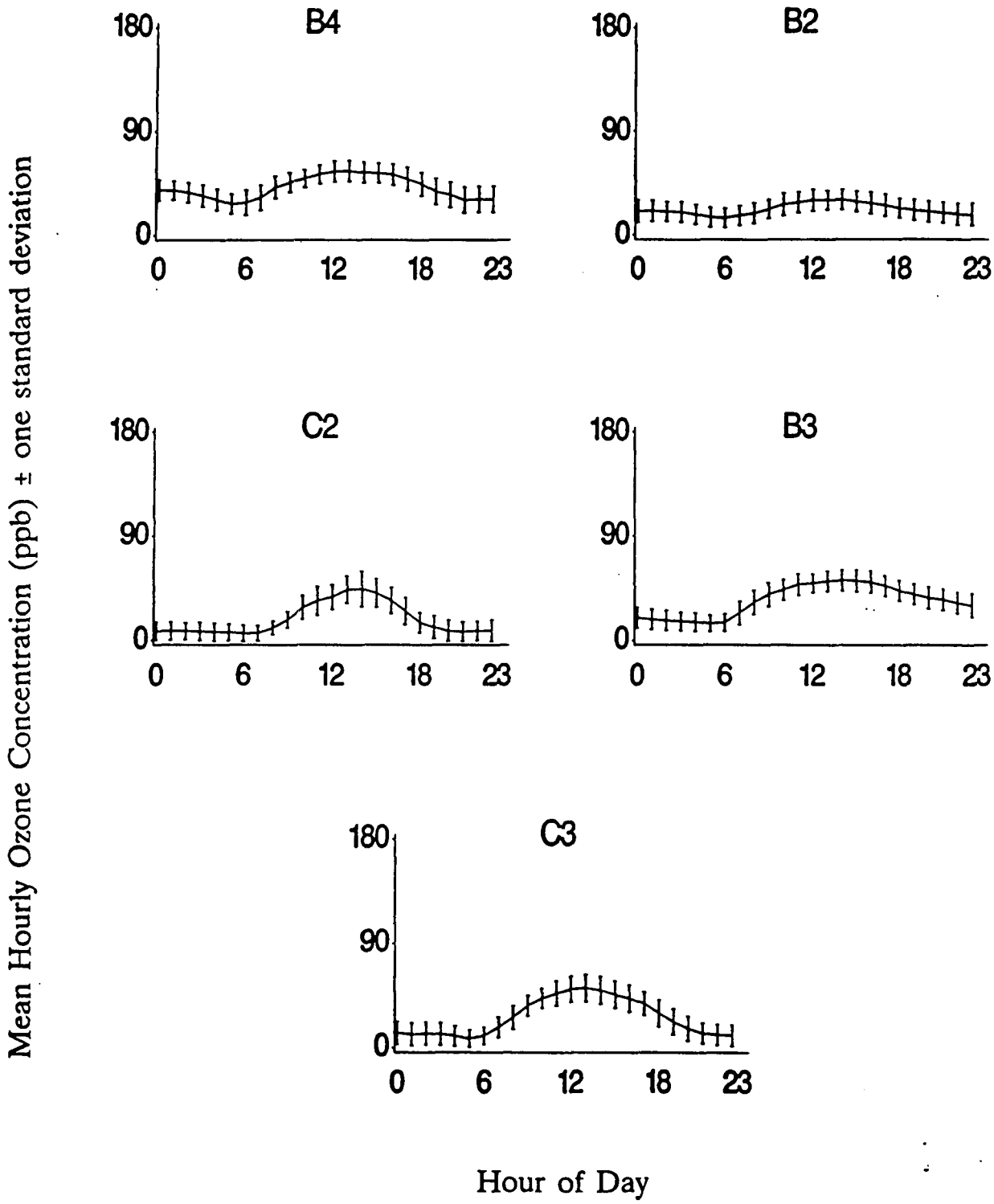
RENO

DOMINANT DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS (MAY - OCT)



ALBUQUERQUE

DOMINANT DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS (MAY - OCT)



Albuquerque

DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS

A. BY YEAR.

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	5	5	1	0	0	15	13	9	7	1	13	20	13	3	0	0	0	0
1981	8	8	3	0	0	8	13	10	8	4	14	17	11	5	0	0	0	0
1982	6	6	1	0	0	14	18	12	4	0	10	17	15	2	0	0	0	0
1983	5	5	0	0	0	14	14	9	7	1	12	20	14	4	0	0	0	0
1984	8	8	1	0	0	15	12	10	6	0	10	20	15	2	0	0	0	0
1985	8	7	1	0	0	8	16	11	6	3	8	19	17	4	0	0	0	0
1986	7	6	1	0	0	6	17	9	8	1	10	19	18	6	0	0	0	0
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	7	7	1	0	0	12	15	10	7	2	11	19	14	3	0	0	0	0

B. BY GROWING SEASON (May through October).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	8	4	1	0	0	1	19	16	14	3	1	19	15	6	0	0	1	0
1981	10	9	6	0	0	2	12	17	16	7	2	8	14	8	0	0	0	0
1982	7	6	2	0	0	2	14	22	7	1	2	19	19	5	0	0	1	0
1983	3	2	1	0	0	3	11	15	12	1	2	24	21	8	0	0	0	0
1984	10	8	1	0	0	4	14	17	10	1	1	16	26	3	0	0	0	0
1985	8	7	1	0	0	1	10	20	9	6	1	16	22	7	0	0	0	0
1986	9	8	1	0	0	1	20	11	11	3	0	10	22	13	0	0	0	0
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	8	6	2	0	0	2	14	17	11	3	2	16	20	7	0	0	0	0

C. BY MONTH (composited over years).

Month	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
Jan	7	1	0	0	0	42	11	0	0	0	34	11	0	0	0	0	0	0
Feb	3	3	0	0	0	10	22	1	0	0	14	48	2	0	0	0	0	0
Mar	8	14	0	0	0	4	23	3	1	0	5	29	19	1	0	0	0	0
Apr	8	20	2	0	0	0	10	16	10	1	0	5	34	2	0	0	0	0
May	9	10	2	0	0	0	10	25	16	1	0	2	25	10	0	0	0	0
Jun	7	7	4	0	0	0	10	25	11	4	0	3	24	13	0	0	0	0
Jul	10	5	3	0	0	1	9	25	14	9	0	6	21	7	0	0	1	0
Aug	9	5	2	0	0	0	9	19	24	3	0	7	22	8	0	0	1	0
Sep	7	7	0	0	0	3	20	8	4	1	0	37	19	1	0	0	0	0
Oct	5	3	0	0	0	11	23	1	0	0	10	45	7	0	0	0	0	0
Nov	6	2	0	0	0	22	19	0	0	0	32	23	1	0	0	0	0	0
Dec	4	0	0	0	0	45	7	0	0	0	37	10	1	0	0	0	0	0

1. % days with unidentified diurnal patterns in hourly ozone concentration (see Böhm et al. 1990).
2. Pattern identifier relates to degree of diurnal variation in hourly ozone concentrations (A curves - least variation; E curves - greatest variation) and daily mean (1 curves - lowest mean; 6 curves highest mean) as described by Böhm et al (1990) and as illustrated in Figure 4C.1. Note that due to numeric rounding, the sums of percentages do not always equal 100.

Albuquerque

BASIC STATISTICS

A. BY YEAR.

Year	% Data Capt[1]	% Valid Days[2]	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	85	85	0	1	7	20	23.1±18	35	48	55	3	0	0	0	0
1981	100	100	0	1	9	25	25.8±19	39	50	59	5	1	0	0	0
1982	99	99	0	1	9	22	23.0±17	35	45	51	2	0	0	0	0
1983	98	99	0	0	6	20	22.0±18	35	46	54	3	0	0	0	0
1984	96	95	0	0	8	23	23.3±17	36	47	54	2	0	0	0	0
1985	99	99	0	3	9	23	24.6±18	37	50	57	4	0	0	0	0
1986	57	57	0	3	10	25	25.8±18	39	50	56	3	0	0	0	0
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	91	91	0	1	8	23	23.9±18	36	49	55	3	0	0	0	0

B. BY GROWING SEASON (May through October).

Year	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06[3] (ppm hr)	S08[4] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	82	82	1	5	15	30	30.0±19	43	55	63	17	2	7	1	0	0	0
1981	100	99	4	8	19	33	33.4±19	47	58	65	27	4	9	1	0	0	0
1982	99	99	0	3	14	28	27.8±18	40	50	59	14	3	4	1	0	0	0
1983	98	98	0	2	12	26	27.9±19	42	53	61	18	3	6	1	0	0	0
1984	96	96	0	4	4	28	28.4±18	41	53	59	12	2	4	0	0	0	0
1985	99	99	4	6	14	29	30.6±19	45	56	63	23	4	8	1	0	0	0
1986	48	47	3	7	17	31	30.9±18	44	54	59	8	2	5	1	0	0	0
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	89	89	1	5	15	29	29.8±19	43	55	61	-	-	6	1	0	0	0

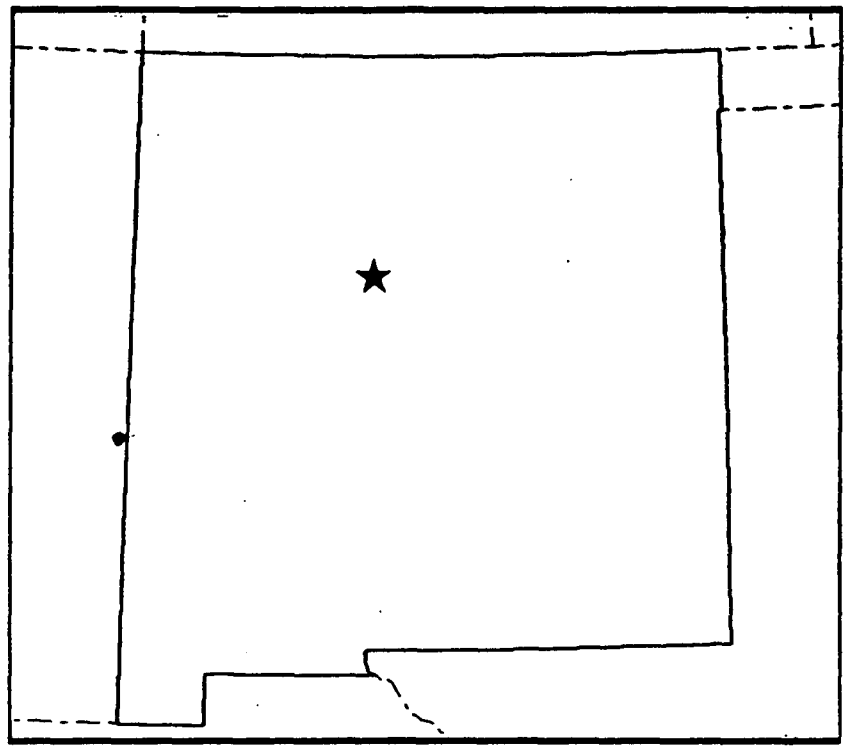
C. BY MONTH [5].

Month	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06 (ppm hr)	S08[6] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
Jan	100	100	0	0	1	10	12.1±11	21	30	33	0	0	0	0	0	0	0
Feb	99	99	0	0	4	16	17.3±14	29	36	40	1	0	0	0	0	0	0
Mar	91	91	0	1	10	25	23.5±15	35	42	46	1	1	0	0	0	0	0
Apr	97	97	2	6	18	33	30.2±16	42	49	54	1	1	1	0	0	0	0
May	86	86	3	8	19	35	32.5±17	45	53	58	2	1	4	0	0	0	0
Jun	95	95	3	7	19	34	33.4±18	46	57	63	4	1	8	1	0	0	0
Jul	99	99	4	9	19	34	34.0±19	47	60	67	6	1	10	1	0	0	0
Aug	99	99	4	9	18	32	33.3±19	46	59	67	6	2	10	2	0	0	0
Sep	99	99	1	3	10	23	25.0±18	37	49	55	2	1	3	0	0	0	0
Oct	97	97	0	0	5	16	19.0±15	30	41	47	1	1	1	0	0	0	0
Nov	97	96	0	0	2	11	14.5±13	25	33	38	1	0	0	0	0	0	0
Dec	99	99	0	0	1	6	10.3±11	18	27	30	1	0	0	0	0	0	0

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100. Av. period BY YEAR = 8760 hrs; BY G.S. = 4416 hrs.
2. % Valid Days = # days with 75 % of hours between 09:00 and 21:00 / (total # days) * 100 (Federal Register 1979).
3. Cumulative Index: S06 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 60 ppb (Lee et al. 1988).
4. Cumulative Index: S08 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 80 ppb (Lee et al. 1988).
5. Statistics for monthly composites over the period of record.
6. Monthly estimate of S06(08) = S06(08) * (# hours in that month) / (# valid hours).

ALBUQUERQUE **NEW MEXICO**

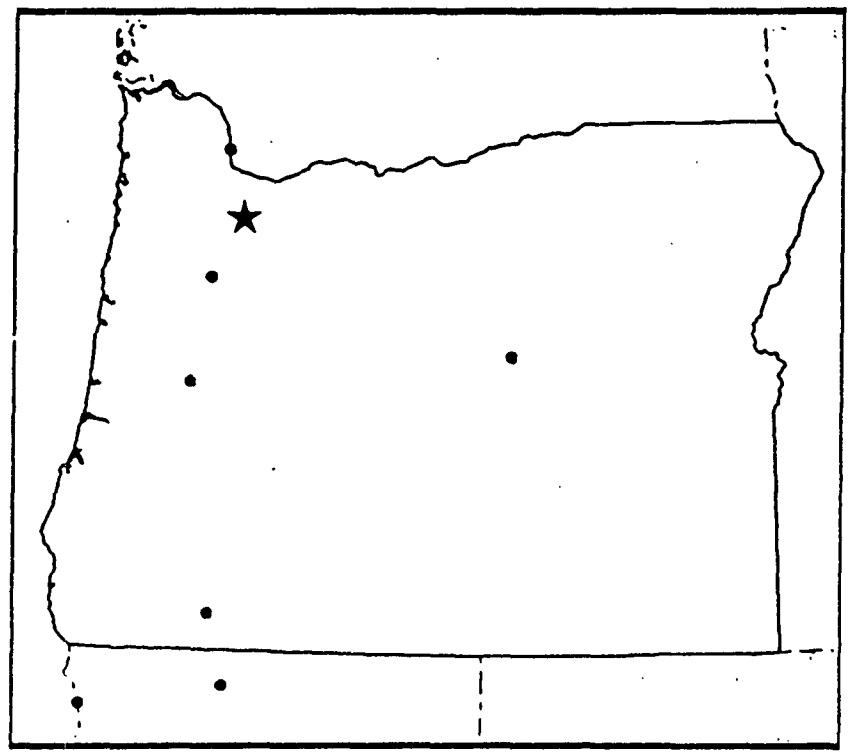
BIOGRAPHIC INFORMATION



Latitude	-	35.14° N
Longitude	-	106.59° W
Elevation (m)	-	1585
Basin Height (m)	-	1525.5
Landuse	-	City Center
City Population	-	331,767
Basin Population	-	500,331
Start Summary	-	January, 1980
End Summary	-	July, 1986
Source of Data	-	AIRS (35-001-0015)

CLACKAMAS COUNTY OREGON

BIOGRAPHIC INFORMATION



Latitude	-	45.26° N
Longitude	-	122.59° W
Elevation (m)	-	174
Basin Height (m)	-	50.8
Landuse	-	Rural - Agricultural
City Population	-	Not In A City
Basin Population	-	2,163,767
Start Summary	-	January, 1980
End Summary	-	October, 1989
Source of Data	-	AIRS (41-005-0004)

Clackamas County

DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS

A. BY YEAR.

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	7	14	0	0	0	28	43	7	1	2	1	4	0	0	0	0	0	0
1981	5	16	0	1	0	21	41	7	2	6	1	3	1	0	1	0	0	0
1982	4	22	0	0	0	25	36	7	1	4	2	2	2	0	0	0	0	0
1983	5	11	0	0	0	28	46	2	0	2	4	5	2	0	0	0	0	0
1984	7	17	0	0	0	21	46	7	1	2	1	3	3	0	1	0	0	0
1985	4	19	0	0	0	18	42	8	2	6	1	2	2	0	1	0	0	0
1986	7	19	0	1	0	14	41	12	1	6	0	3	1	0	1	0	0	0
1987	6	16	1	0	0	1	50	16	5	8	1	2	1	0	0	0	0	0
1988	7	6	1	0	0	9	54	12	5	10	1	2	1	0	1	0	0	0
1989	8	9	1	1	0	15	48	12	4	2	1	5	2	0	0	0	0	0
All Years	6	16	0	0	0	19	44	8	2	4	1	3	1	0	0	0	0	0

B. BY GROWING SEASON (May through October).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	9	3	0	0	0	22	53	11	1	3	1	6	1	0	0	0	0	0
1981	7	11	1	1	1	8	43	11	4	12	1	4	1	1	1	1	0	0
1982	5	6	0	0	0	26	39	11	2	8	3	3	2	0	0	0	0	0
1983	7	5	0	0	0	27	41	4	1	4	5	9	4	0	0	0	0	0
1984	11	12	0	0	0	11	51	11	1	3	1	5	3	0	1	0	0	0
1985	5	14	1	1	0	4	44	14	3	12	1	1	3	0	1	0	0	0
1986	7	11	0	1	0	12	44	13	2	10	1	3	1	1	1	0	0	0
1987	6	16	1	0	0	1	49	16	5	9	1	2	1	0	0	0	0	0
1988	7	7	1	0	0	9	52	12	5	11	1	2	1	0	1	0	0	0
1989	8	5	1	1	0	16	47	14	3	3	1	5	2	0	0	0	0	0
All Years	7	9	0	0	0	14	46	12	3	7	1	4	2	0	1	0	0	0

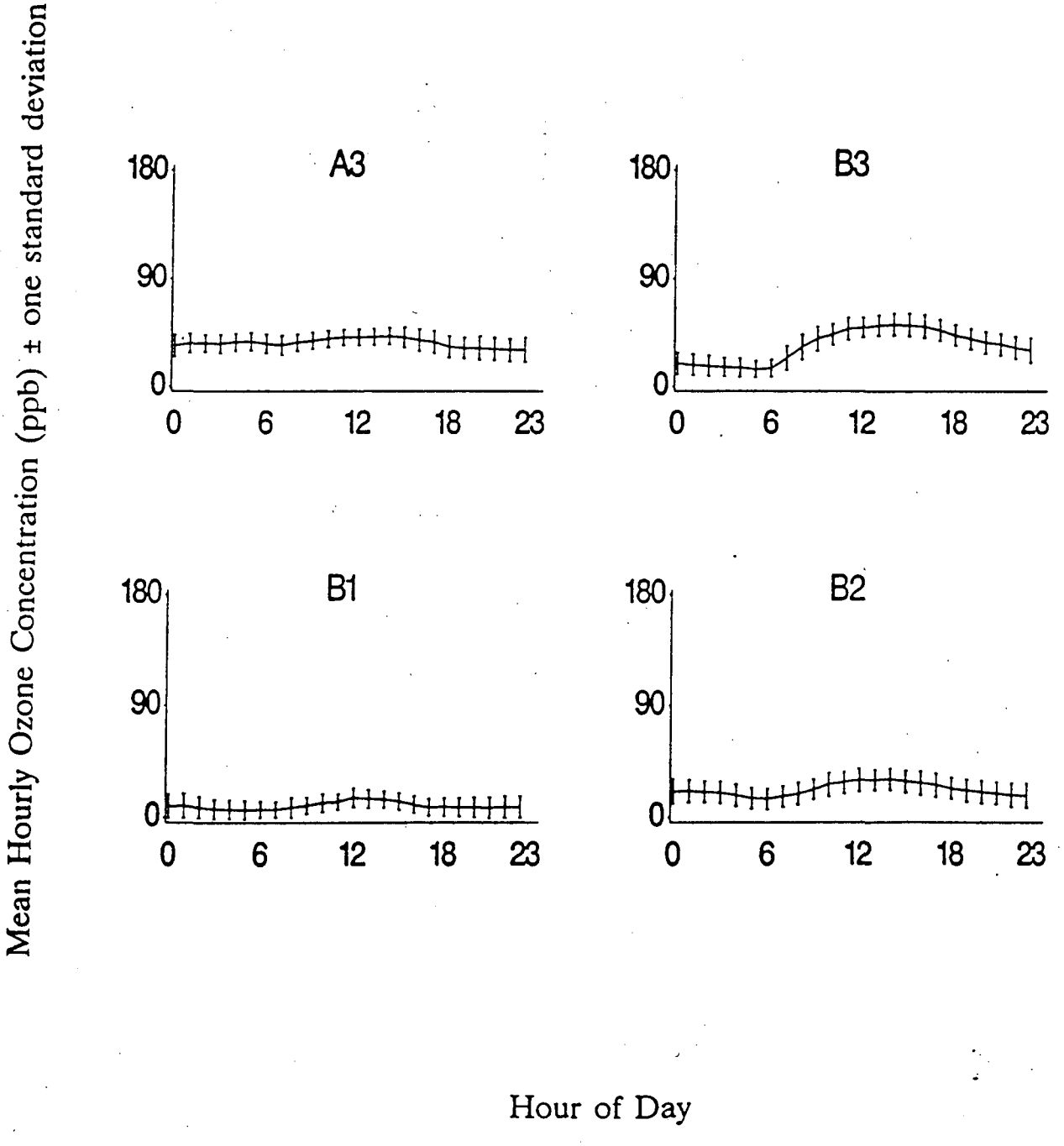
C. BY MONTH (composited over years).

Month	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
Jan	3	13	0	0	0	58	26	1	0	0	2	1	0	0	0	0	0	0
Feb	4	21	0	0	0	28	48	1	0	0	0	1	1	0	0	0	0	0
Mar	3	28	0	0	0	8	53	3	0	0	3	4	2	0	0	0	0	0
Apr	7	47	1	0	0	2	32	13	3	0	0	0	0	0	0	0	0	0
May	9	22	0	0	0	3	47	12	6	5	0	2	2	0	0	0	0	0
Jun	7	11	1	0	0	13	46	15	1	8	2	2	1	0	1	0	0	0
Jul	6	0	0	0	0	10	47	16	3	10	1	6	4	0	1	0	0	0
Aug	7	2	0	2	0	9	40	17	4	15	1	6	3	1	1	0	0	0
Sep	6	11	2	0	0	14	53	6	2	5	1	4	1	0	0	0	0	0
Oct	8	8	0	0	0	34	44	2	0	0	4	5	0	0	0	0	0	0
Nov	3	17	0	0	0	31	49	0	0	0	0	1	1	0	0	0	0	0
Dec	0	16	0	0	0	47	36	0	0	0	1	1	0	0	0	0	0	0

1. % days with unidentified diurnal patterns in hourly ozone concentration (see Böhm et al. 1990).
2. Pattern identifier relates to degree of diurnal variation in hourly ozone concentrations (A curves - least variation; E curves - greatest variation) and daily mean (1 curves - lowest mean; 6 curves highest mean) as described by Böhm et al (1990) and as illustrated in Figure 4C.1. Note that due to numeric rounding, the sums of percentages do not always equal 100.

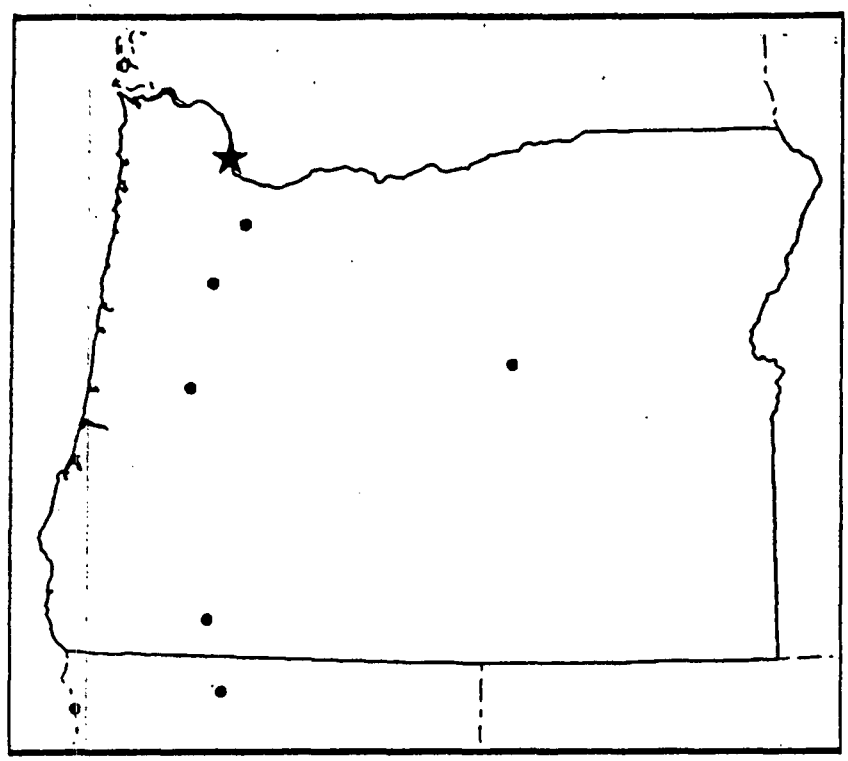
CLACKAMAS COUNTY

DOMINANT DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS (MAY - OCT)



COLUMBIA COUNTY OREGON

BIOGRAPHIC INFORMATION



Latitude	-	45.77° N
Longitude	-	122.77° W
Elevation (m)	-	6
Basin Height (m)	-	5.5
Landuse	-	Rural - Agricultural
City Population	-	Not In A City
Basin Population	-	2,163,767
Start Summary	-	July, 1980
End Summary	-	October, 1989
Source of Data	-	AIRS (41-009-0004)

Columbia County

BASIC STATISTICS

A. BY YEAR.

Year	% Data Capt[1]	% Valid Days[2]	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	32	32	1	2	10	17	18.5±12	25	35	41	1	0	0	0	0
1981	46	46	1	5	13	22	23.8±15	32	41	51	3	1	0	0	0
1982	48	47	2	5	13	23	23.9±15	33	43	50	2	0	0	0	2
1983	45	45	1	2	7	14	14.1±09	19	26	31	0	0	0	0	0
1984	32	32	1	4	13	21	22.5±14	31	39	46	2	0	0	0	0
1985	49	49	2	6	13	23	24.1±15	33	42	51	2	0	0	0	0
1986	42	42	1	3	10	18	20.1±14	28	38	43	2	0	0	0	0
1987	53	54	2	7	16	24	26.0±15	35	45	53	3	0	0	0	1
1988	52	52	1	1	7	14	16.3±13	23	33	39	1	0	0	0	0
1989	53	54	3	6	13	22	23.5±14	32	41	47	1	0	0	0	0
All Years	45	45	1	4	11	20	21.4±14	30	39	47	2	0	0	0	3

B. BY GROWING SEASON (May through October).

Year	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06[3] (ppm hr)	S08[4] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	62	63	1	2	10	17	18.6±12	26	35	41	2	1	1	0	0	0	0
1981	89	89	1	5	14	22	23.9±16	32	41	52	10	4	3	1	0	0	0
1982	93	92	2	5	13	22	23.7±15	32	42	50	7	2	2	0	0	0	2
1983	90	89	1	2	7	14	14.1±09	19	26	31	0	0	0	0	0	0	0
1984	64	64	1	4	4	21	22.5±14	31	39	46	4	1	2	0	0	0	0
1985	96	96	2	6	14	23	24.0±15	33	42	51	7	2	2	0	0	0	0
1986	84	83	1	3	10	18	20.1±14	28	38	43	4	1	2	0	0	0	0
1987	96	97	2	7	15	24	25.7±15	34	45	53	9	2	3	0	0	0	1
1988	96	97	1	1	7	14	16.0±13	22	32	39	4	1	1	0	0	0	0
1989	91	92	4	6	13	22	23.1±13	31	40	47	3	1	1	0	0	0	0
All Years	86	86	1	4	11	20	21.3±14	29	39	46	-	-	2	0	0	0	3

C. BY MONTH [5].

Month	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06 (ppm hr)	S08[6] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
Jan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Feb	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mar	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Apr	38	38	3	7	15	27	25.9±14	35	43	48	1	1	1	0	0	0	0
May	89	88	8	12	20	29	28.9±13	37	44	49	1	1	1	0	0	0	1
Jun	93	93	7	11	17	24	26.0±14	33	42	52	2	1	3	0	0	0	1
Jul	95	96	5	8	14	20	22.2±13	28	39	48	2	1	2	0	0	0	0
Aug	94	94	3	6	11	18	21.2±15	28	40	51	2	1	3	1	0	0	0
Sep	90	90	1	3	9	18	19.2±14	27	36	43	1	1	1	0	0	0	1
Oct	91	91	1	1	2	10	12.6±11	20	29	33	1	0	0	0	0	0	0
Nov	4	2	1	1	2	10	11.7±10	19	27	29	0	0	0	0	0	0	0
Dec	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100. Av. period BY YEAR = 8760 hrs; BY G.S. = 4416 hrs.
2. % Valid Days = # days with 75 % of hours between 09:00 and 21:00 / (total # days) * 100 (Federal Register 1979).
3. Cumulative Index S06 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 60 ppb (Lee et al. 1988).
4. Cumulative Index S08 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 80 ppb (Lee et al. 1988).
5. Statistics for monthly composites over the period of record.
6. Monthly estimate of S06(08) = S06(08) * (# hours in that month) / (# valid hours).

Columbia County

DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS

A. BY YEAR (March through November).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	7	0	0	0	0	24	56	8	0	0	4	8	1	0	0	0	0	0
1981	6	6	0	1	0	18	52	12	3	2	0	3	2	0	1	0	0	0
1982	8	14	1	0	0	18	36	10	6	4	3	6	2	0	0	0	0	0
1983	4	2	0	0	0	63	30	1	0	0	3	1	0	0	0	0	0	0
1984	10	5	0	0	0	19	52	7	2	2	5	8	0	0	0	0	0	0
1985	6	5	0	0	0	15	48	14	4	4	2	7	1	1	0	0	0	0
1986	6	7	0	1	0	34	38	9	1	2	1	7	1	0	0	0	0	0
1987	9	9	0	0	0	8	52	14	5	3	1	6	2	1	0	0	0	0
1988	7	1	0	0	0	44	35	2	1	1	2	8	5	0	0	0	0	0
1989	7	11	0	0	0	17	43	14	3	0	2	7	3	0	0	0	0	0
All Years	7	6	0	0	0	26	43	9	3	2	2	6	2	0	0	0	0	0

B. BY GROWING SEASON (May through October).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	7	0	0	0	0	23	57	7	0	0	4	8	1	0	0	0	0	0
1981	5	6	0	1	0	18	52	11	3	2	0	4	2	0	1	0	0	0
1982	8	15	0	0	0	19	36	9	6	4	3	6	2	0	0	0	0	0
1983	4	2	0	0	0	63	30	1	0	0	3	1	0	0	0	0	0	0
1984	10	5	0	0	0	19	52	7	2	2	5	8	0	0	0	0	0	0
1985	6	5	0	0	0	15	48	13	4	4	2	8	1	1	0	0	0	0
1986	6	7	0	1	0	34	38	9	1	2	1	7	1	0	0	0	0	0
1987	9	7	0	0	0	9	51	15	4	3	1	7	2	1	0	0	0	0
1988	7	1	0	0	0	46	33	3	1	1	3	8	5	0	0	0	0	0
1989	5	11	0	0	0	18	43	13	4	0	2	6	3	0	0	0	0	0
All Years	7	6	0	0	0	27	43	9	3	2	2	6	2	0	0	0	0	0

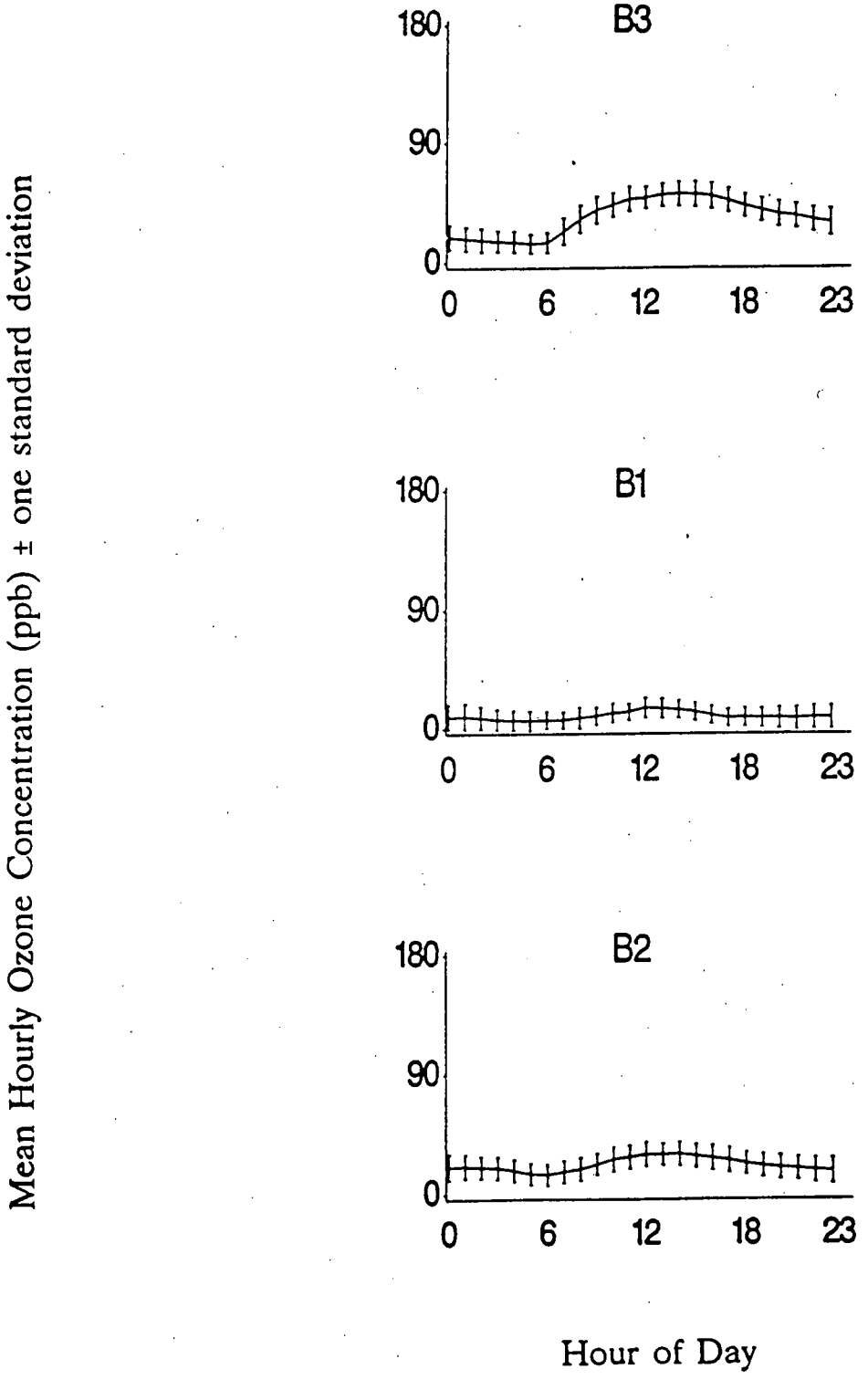
C. BY MONTH (composited over years).

Month	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
Jan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Feb	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mar	0	0	0	0	0	50	50	0	0	0	0	0	0	0	0	0	0	0
Apr	14	14	2	0	0	10	50	14	4	0	0	6	0	0	0	0	0	0
May	6	25	0	1	0	5	38	13	9	2	1	4	3	0	0	0	0	0
Jun	7	11	0	0	0	11	52	12	4	6	1	2	2	1	0	0	0	0
Jul	7	1	0	0	0	22	56	13	2	2	0	3	2	0	0	0	0	0
Aug	6	1	0	0	0	25	47	11	2	2	1	8	3	0	0	0	0	0
Sep	8	2	0	0	0	29	45	5	0	1	3	13	2	0	0	0	0	0
Oct	5	2	0	0	0	60	22	1	0	0	8	8	0	0	0	0	0	0
Nov	0	0	0	0	0	50	0	50	0	0	0	0	0	0	0	0	0	0
Dec	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

1. % days with unidentified diurnal patterns in hourly ozone concentration (see Böhm et al. 1990).
2. Pattern identifier relates to degree of diurnal variation in hourly ozone concentrations (A curves - least variation; E curves - greatest variation) and daily mean (1 curves - lowest mean; 6 curves highest mean) as described by Böhm et al (1990) and as illustrated in Figure 4C.1. Note that due to numeric rounding, the sums of percentages do not always equal 100.

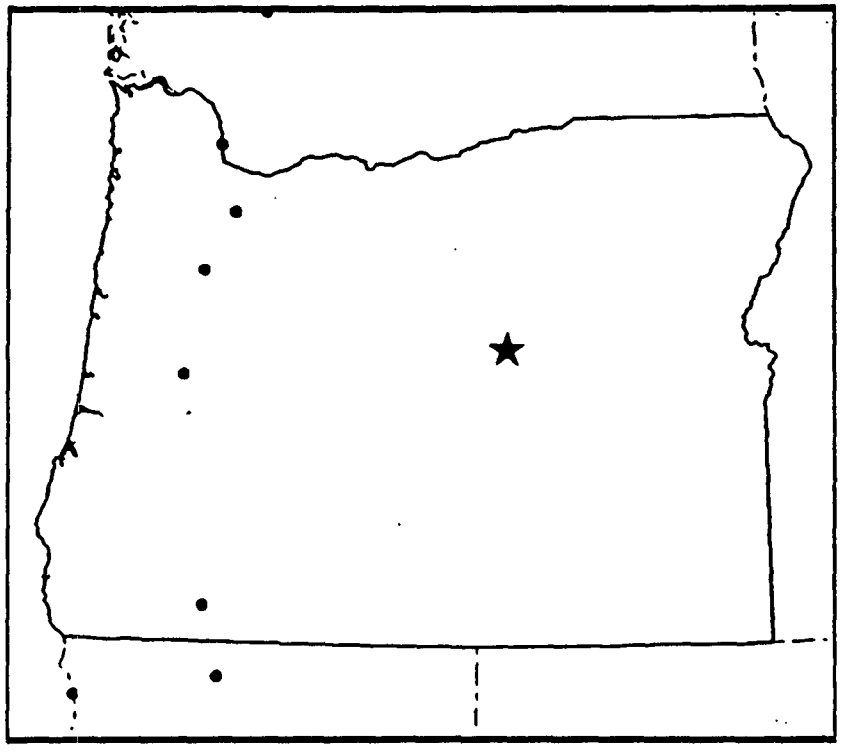
COLUMBIA COUNTY

DOMINANT DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS (MAY - OCT)



CROOK COUNTY OREGON

BIOGRAPHIC INFORMATION



Latitude	-	44.23° N
Longitude	-	119.71° W
Elevation (m)	-	1372
Basin Height (m)	-	1230.8
Landuse	-	Rural
City Population	-	Not In A City
Basin Population	-	193,220
Start Summary	-	January, 1980
End Summary	-	December, 1983
Source of Data	-	AIRS (41-013-0111)

Crook County

BASIC STATISTICS

A. BY YEAR.

Year	% Data Capt[1]	% Valid Days[2]	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	88	88	25	25	35	40	38.5±09	45	50	55	3	0	0	0	0
1981	89	87	20	20	25	30	31.2±08	35	40	45	0	0	0	0	0
1982	89	89	20	25	30	35	34.1±08	40	45	50	0	0	0	0	0
1983	83	84	25	25	30	35	34.4±08	40	45	50	0	0	0	0	0
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	87	87	20	25	30	35	34.5±09	40	45	50	1	0	0	0	0

B. BY GROWING SEASON (May through October).

Year	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06[3] (ppm hr)	S08[4]	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	93	92	25	30	35	40	40.6±10	45	55	55	13	1	5	0	0	0	0
1981	87	84	20	25	30	35	33.3±08	40	45	45	1	0	0	0	0	0	0
1982	92	92	20	25	30	35	35.4±09	40	50	50	3	0	1	0	0	0	0
1983	87	89	25	25	30	35	36.4±08	40	45	50	2	0	0	0	0	0	0
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	90	89	20	25	30	35	36.5±09	40	50	55	-	-	2	0	0	0	0

C. BY MONTH [5].

Month	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06 (ppm hr)	S08[6]	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
Jan	76	77	20	25	30	30	30.3±06	35	35	40	0	0	0	0	0	0	0
Feb	75	74	20	25	30	35	32.2±05	35	40	40	0	0	0	0	0	0	0
Mar	98	98	25	30	30	35	35.4±06	40	45	45	0	0	0	0	0	0	0
Apr	86	84	25	30	35	40	38.3±08	45	45	50	1	0	0	0	0	0	0
May	87	85	25	30	35	40	39.2±08	45	50	55	1	0	1	0	0	0	0
Jun	98	97	20	25	30	35	34.8±09	40	45	50	1	0	1	0	0	0	0
Jul	85	83	20	25	30	35	37.8±10	45	50	55	2	0	4	0	0	0	0
Aug	93	94	25	30	35	40	40.9±10	45	55	55	2	1	4	0	0	0	0
Sep	95	96	20	25	30	35	35.3±09	40	45	50	1	0	1	0	0	0	0
Oct	82	82	20	20	25	30	30.5±07	35	40	45	1	0	0	0	0	0	0
Nov	96	97	20	25	25	30	28.7±05	30	35	35	0	0	0	0	0	0	0
Dec	76	76	20	25	25	30	29.0±05	30	35	35	0	0	0	0	0	0	0

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100. Av. period BY YEAR = 8760 hrs; BY G.S. = 4416 hrs.
2. % Valid Days = # days with 75 % of hours between 09:00 and 21:00 / (total # days) * 100 (Federal Register 1979).
3. Cumulative Index: S06 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 60 ppb (Lee et al. 1988).
4. Cumulative Index: S08 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 80 ppb (Lee et al. 1988).
5. Statistics for monthly composites over the period of record.
6. Monthly estimate of S06(08) = S06(08) * (# hours in that month) / (# valid hours).

Crook County

DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS

A. BY YEAR.

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	4	47	32	0	0	0	10	6	4	0	0	0	0	0	0	0	0	0
1981	5	43	7	0	0	1	40	6	2	0	0	0	0	0	0	0	0	0
1982	4	51	14	0	0	0	27	3	4	0	0	0	0	0	0	0	0	0
1983	5	52	13	0	0	0	21	6	7	0	0	0	0	0	0	0	0	0
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	4	48	17	0	0	0	24	5	4	0	0	0	0	0	0	0	0	0

B. BY GROWING SEASON (May through October).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	5	40	38	1	0	0	7	8	6	0	0	0	0	0	0	0	0	0
1981	7	47	14	0	0	1	30	7	1	0	0	1	0	0	0	0	0	0
1982	7	37	23	0	0	0	29	6	5	0	0	0	0	0	0	0	0	0
1983	9	45	24	0	0	0	13	10	8	0	0	0	0	0	0	0	0	0
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	7	42	25	0	0	0	20	8	5	0	0	0	0	0	0	0	0	0

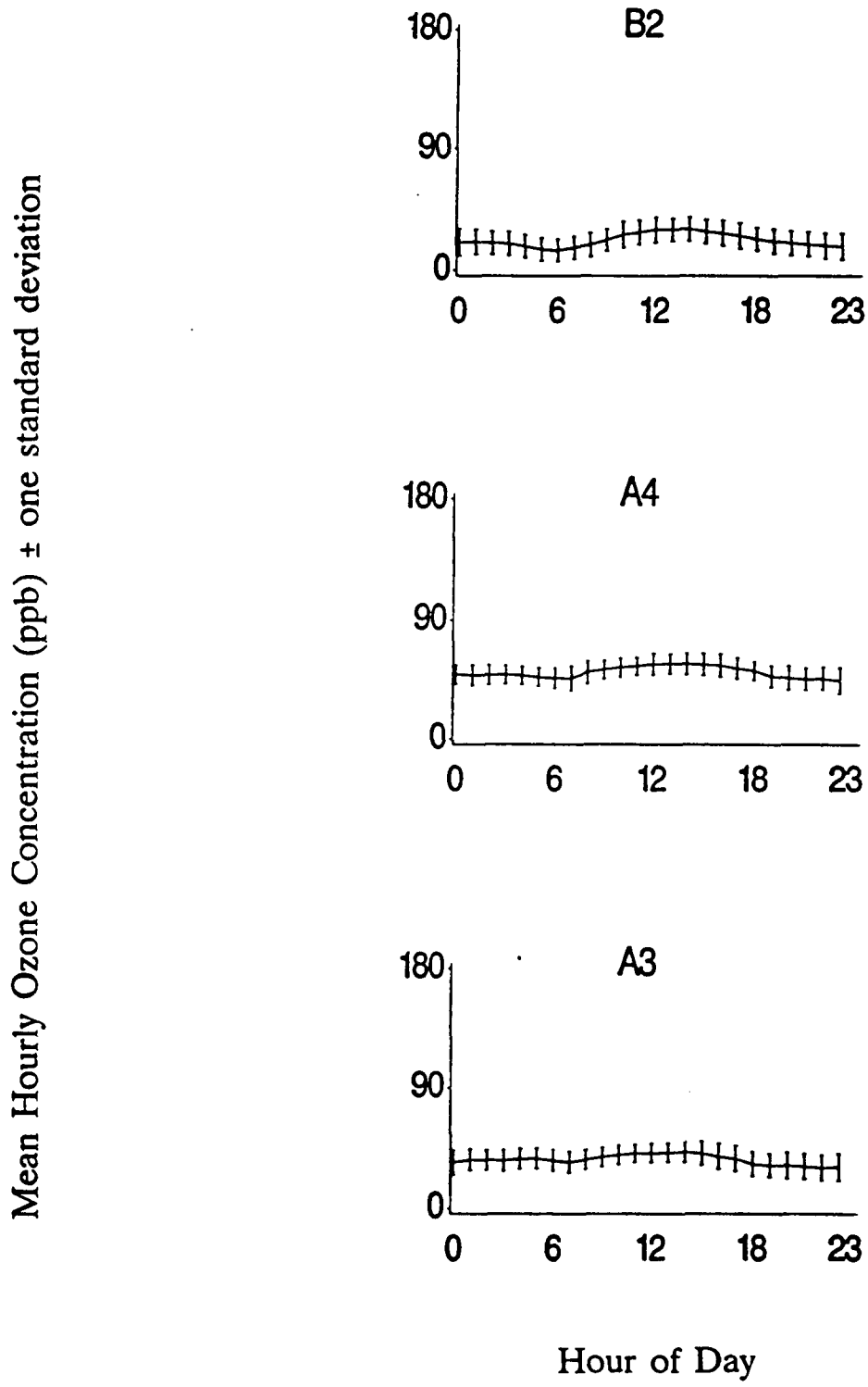
C. BY MONTH (composited over years).

Month	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
Jan	1	62	1	0	0	5	31	0	1	0	0	0	0	0	0	0	0	0
Feb	1	72	1	0	0	0	19	5	3	0	0	0	0	0	0	0	0	0
Mar	3	71	14	0	0	0	5	5	5	0	0	0	0	0	0	0	0	0
Apr	1	46	29	0	0	0	8	5	12	0	0	0	0	0	0	0	0	0
May	14	49	32	0	0	0	2	7	9	0	0	0	0	0	0	0	0	0
Jun	5	41	17	0	0	1	21	11	8	0	0	1	0	0	0	0	0	0
Jul	9	27	32	1	0	0	16	14	10	0	0	0	0	0	0	0	0	0
Aug	7	36	48	0	0	0	8	6	2	0	0	0	0	0	0	0	0	0
Sep	7	57	20	0	0	0	16	6	1	0	0	0	0	0	0	0	0	0
Oct	0	41	4	0	0	0	52	2	1	0	0	0	0	0	0	0	0	0
Nov	2	33	1	0	0	0	63	3	1	0	0	0	0	0	0	0	0	0
Dec	0	51	0	0	0	0	48	1	0	0	0	0	0	0	0	0	0	0

1. % days with unidentified diurnal patterns in hourly ozone concentration (see Böhm et al. 1990).
2. Pattern identifier relates to degree of diurnal variation in hourly ozone concentrations (A curves - least variation; E curves - greatest variation) and daily mean (1 curves - lowest mean; 6 curves highest mean) as described by Böhm et al (1990) and as illustrated in Figure 4C.1. Note that due to numeric rounding, the sums of percentages do not always equal 100.

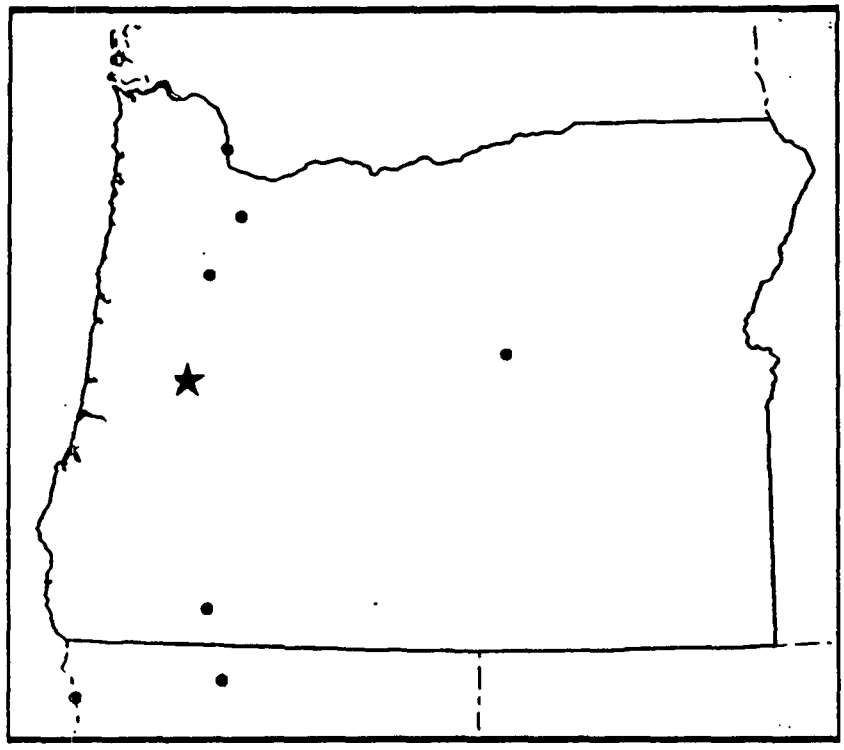
CROOK COUNTY

DOMINANT DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS (MAY - OCT)



EUGENE **OREGON**

BIOGRAPHIC INFORMATION



Latitude	-	44.01° N
Longitude	-	123.09° W
Elevation (m)	-	187
Basin Height (m)	-	144.6
Landuse	-	Suburban - Residential
City Population	-	105,264
Basin Population	-	2,163,767
Start Summary	-	January, 1980
End Summary	-	December, 1984
Source of Data	-	AIRS (41-039-0008)

Eugene

BASIC STATISTICS

A. BY YEAR.

Year	% Data Capt[1]	% Valid Days[2]	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	45	45	1	1	3	10	14.4±14	22	33	40	1	0	0	0	0
1981	93	93	1	1	6	18	21.1±18	32	42	51	3	1	0	0	3
1982	92	93	1	2	8	19	19.3±13	29	35	40	1	0	0	0	0
1983	31	31	1	1	6	16	16.9±12	27	33	35	0	0	0	0	0
1984	76	77	1	1	6	15	16.9±13	27	34	39	1	0	0	0	0
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	68	68	1	1	6	16	18.4±15	28	36	43	1	0	0	0	3

B. BY GROWING SEASON (May through October).

Year	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06[3] (ppm hr)	S08[4] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	49	49	1	2	6	13	17.6±15	26	39	48	3	0	2	0	0	0	0
1981	97	98	1	3	11	22	25.6±20	35	50	63	21	8	6	2	1	0	3
1982	94	95	1	4	10	19	20.8±14	29	38	47	6	1	2	0	0	0	0
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	69	70	1	3	3	16	19.1±15	28	38	46	4	1	1	0	0	0	0
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	77	78	1	3	9	18	21.4±17	30	42	52	-	-	3	1	0	0	3

C. BY MONTH [5].

Month	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06 (ppm hr)	S08[6] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
Jan	73	73	1	1	1	5	10.5±11	19	30	32	0	0	0	0	0	0	0
Feb	82	82	1	1	5	15	15.9±11	27	32	34	0	0	0	0	0	0	0
Mar	98	98	1	3	9	22	20.7±12	32	36	38	0	0	0	0	0	0	0
Apr	75	74	5	8	15	28	26.1±13	37	42	44	0	0	0	0	0	0	0
May	95	94	6	8	15	24	24.6±12	34	42	44	1	0	0	0	0	0	0
Jun	71	72	4	8	14	25	27.2±16	37	50	59	3	0	5	0	0	0	0
Jul	93	95	5	8	12	20	24.9±17	34	47	59	3	1	5	1	0	0	0
Aug	97	97	4	6	11	19	24.4±19	32	49	63	4	2	6	2	1	0	3
Sep	98	98	1	2	7	17	19.7±16	29	38	49	2	1	3	1	0	0	0
Oct	99	100	1	1	3	10	13.2±12	22	30	34	1	0	0	0	0	0	0
Nov	82	82	1	1	3	11	13.8±11	24	30	32	0	0	0	0	0	0	0
Dec	94	95	1	1	2	9	12.1±11	21	28	31	0	0	0	0	0	0	0

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100. Av. period BY YEAR = 8760 hrs; BY G.S. = 4416 hrs.
2. % Valid Days = # days with 75 % of hours between 09:00 and 21:00 / (total # days) * 100 (Federal Register 1979).
3. Cumulative Index: S06 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 60 ppb (Lee et al. 1988).
4. Cumulative Index: S08 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 80 ppb (Lee et al. 1988).
5. Statistics for monthly composites over the period of record.
6. Monthly estimate of S06(08) = S06(08) * (# hours in that month) / (# valid hours).

Eugene

DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS

A. BY YEAR.

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	6	5	0	0	0	41	21	3	1	0	12	15	2	0	0	0	0	0
1981	5	10	0	0	0	28	25	11	2	5	8	6	3	1	1	0	0	0
1982	6	11	0	0	0	27	37	7	0	1	5	9	2	0	0	0	0	0
1983	3	9	0	0	0	38	40	2	0	0	7	4	0	0	0	0	0	0
1984	7	5	0	0	0	36	37	1	0	1	8	9	2	0	0	0	0	0
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	6	8	0	0	0	32	32	6	1	2	8	9	2	0	0	0	0	0

B. BY GROWING SEASON (May through October).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	9	0	0	0	0	23	28	6	2	0	9	27	4	0	0	0	0	0
1981	5	7	0	0	1	14	28	18	3	9	9	6	4	1	1	0	0	0
1982	6	5	0	0	0	19	43	13	0	1	5	10	4	0	0	0	0	0
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	9	2	0	0	0	22	42	3	0	3	6	17	5	1	0	0	0	0
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	7	4	0	0	0	19	36	11	1	4	7	13	4	1	0	0	0	0

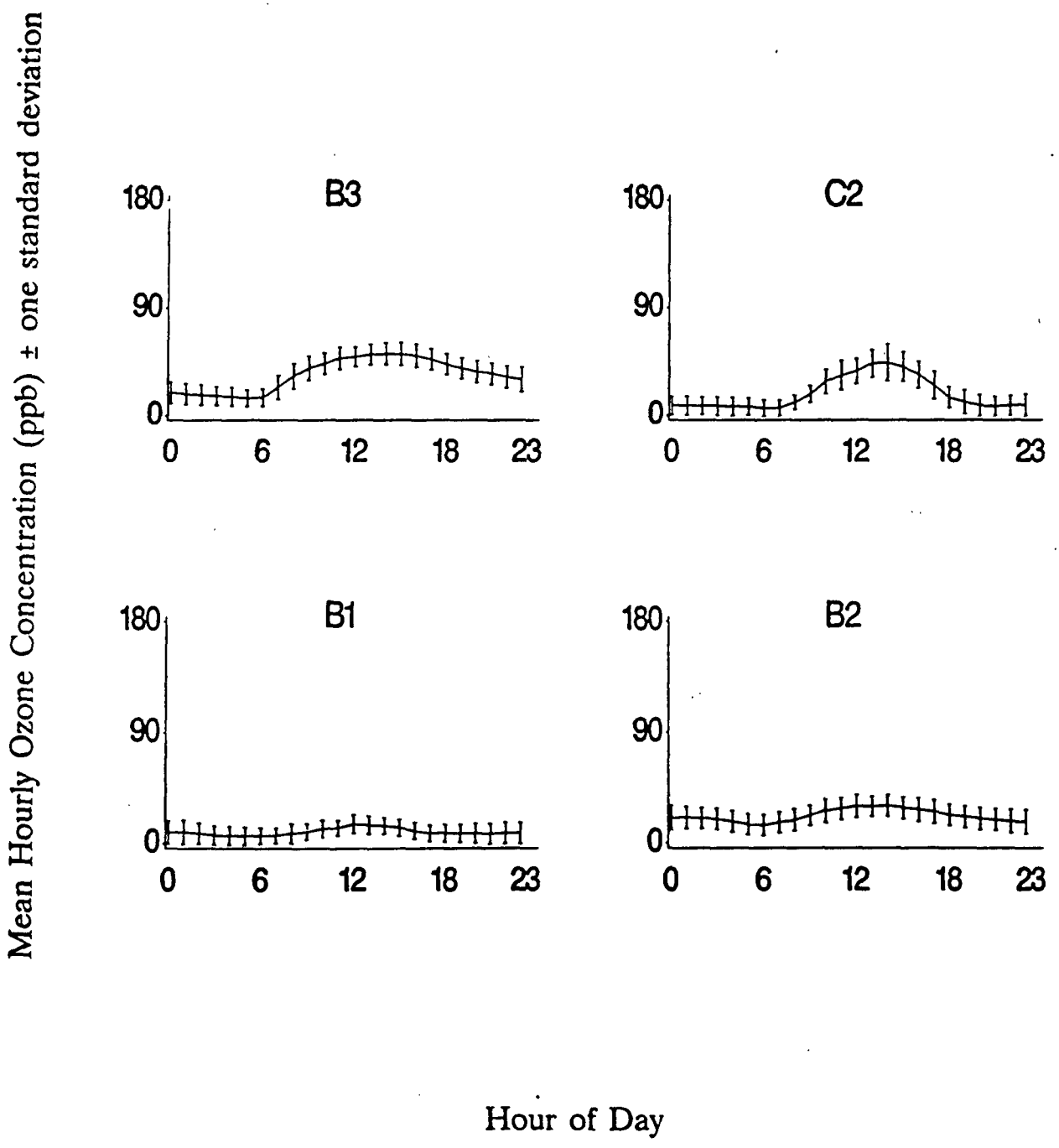
C. BY MONTH (composited over years).

Month	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
Jan	4	10	0	0	0	66	15	0	0	0	8	1	0	0	0	0	0	0
Feb	4	12	0	0	0	42	30	0	0	0	12	4	0	0	0	0	0	0
Mar	7	19	0	0	0	14	43	2	0	0	9	14	0	0	0	0	0	0
Apr	15	25	0	0	0	0	31	11	5	0	4	16	7	0	0	0	0	0
May	3	18	0	0	0	25	39	12	2	0	0	0	4	0	0	0	0	0
Jun	5	9	0	0	0	11	35	26	5	9	0	3	2	0	0	0	0	0
Jul	2	1	0	0	0	5	54	17	0	6	1	6	6	3	0	0	0	0
Aug	11	0	0	0	1	16	35	15	1	6	1	13	12	0	2	0	0	0
Sep	9	3	0	0	0	13	40	7	2	3	6	25	1	1	0	0	0	0
Oct	6	1	0	0	0	38	19	0	0	0	25	18	0	0	0	0	0	0
Nov	5	6	0	0	0	48	27	1	0	0	14	3	0	0	0	0	0	0
Dec	1	6	0	0	0	65	27	0	0	0	2	0	0	0	0	0	0	0

1. % days with unidentified diurnal patterns in hourly ozone concentration (see Böhm et al. 1990).
2. Pattern identifier relates to degree of diurnal variation in hourly ozone concentrations (A curves - least variation; E curves - greatest variation) and daily mean (1 curves - lowest mean; 6 curves highest mean) as described by Böhm et al (1990) and as illustrated in Figure 4C.1. Note that due to numeric rounding, the sums of percentages do not always equal 100.

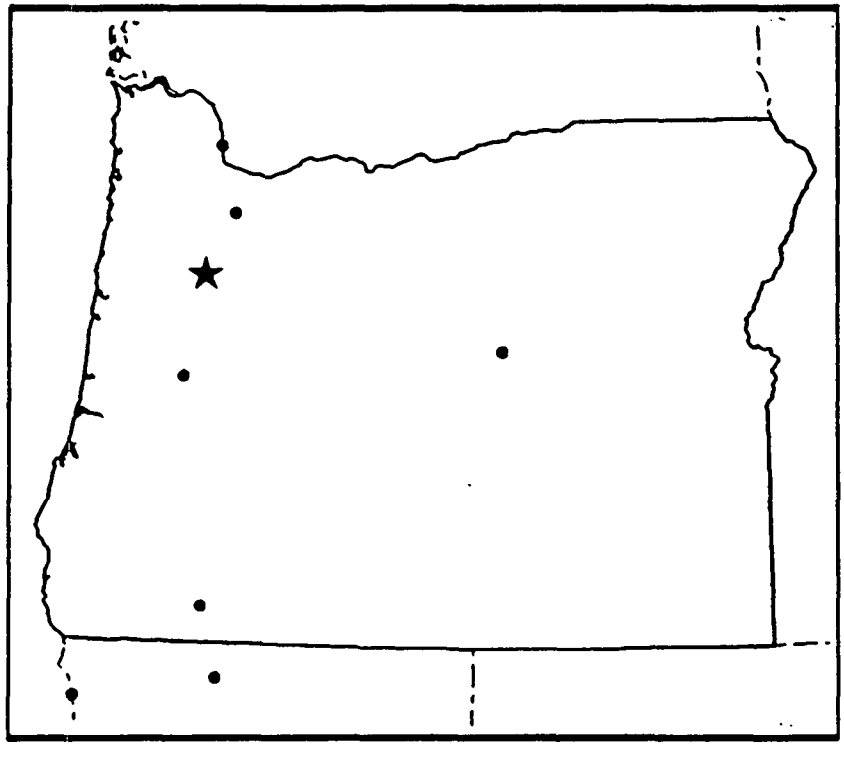
EUGENE

DOMINANT DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS (MAY - OCT)



MARION COUNTY OREGON

BIOGRAPHIC INFORMATION



Latitude	-	44.81° N
Longitude	-	122.91° W
Elevation (m)	-	102
Basin Height (m)	-	92.3
Landuse	-	Rural - Agricultural
City Population	-	Not In A City
Basin Population	-	2,163,767
Start Summary	-	July, 1982
End Summary	-	October, 1986
Source of Data	-	AIRS (41-047-0004)

Marion County

BASIC STATISTICS

A. BY YEAR (April through November).

Year	% Data Capt[1]	% Valid Days[2]	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	56	56	1	1	4	17	19.4±18	30	42	50	3	1	0	0	3
1982	45	45	1	1	8	18	19.4±14	28	38	46	2	0	0	0	0
1983	49	49	1	2	8	18	20.1±15	29	40	46	2	1	0	0	0
1984	49	49	1	2	10	21	22.5±16	32	43	49	2	1	0	0	0
1985	48	48	1	2	10	21	22.8±17	32	45	53	3	1	0	0	0
1986	47	47	1	1	4	15	18.6±17	28	41	52	3	1	0	0	0
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	49	49	1	1	7	18	20.5±16	30	42	49	2	1	0	0	3

B. BY GROWING SEASON (May through October).

Year	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06[3] (ppm hr)	S08[4] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	95	95	1	1	2	15	18.2±18	28	41	52	11	4	3	1	0	0	3
1982	88	89	1	1	8	17	19.2±14	28	37	46	5	1	2	0	0	0	0
1983	96	97	1	2	8	18	20.1±15	29	40	46	6	3	2	1	0	0	0
1984	97	98	1	2	2	21	22.5±16	32	43	49	7	2	2	1	0	0	0
1985	94	95	1	1	10	21	22.7±17	32	45	54	10	2	3	1	0	0	0
1986	94	93	1	1	4	15	18.6±17	28	41	52	10	3	3	1	0	0	0
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	94	94	1	1	7	18	20.3±16	30	41	50	-	-	3	1	0	0	3

C. BY MONTH [5].

Month	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06 (ppm hr)	S08[6] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
Jan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Feb	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mar	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Apr	39	39	2	6	16	29	26.9±14	38	45	47	1	0	0	0	0	0	0
May	93	92	5	9	18	28	27.8±15	37	45	50	2	1	2	1	0	0	0
Jun	94	94	1	4	12	21	22.5±15	31	41	49	2	1	2	0	0	0	0
Jul	96	96	1	1	8	16	20.5±18	29	45	56	3	1	4	1	0	0	0
Aug	90	90	1	1	6	17	21.9±20	33	49	60	3	1	5	1	0	0	3
Sep	98	99	1	1	4	15	16.9±14	26	35	42	1	1	1	0	0	0	0
Oct	94	94	1	1	1	10	12.2±11	21	28	32	0	0	0	0	0	0	0
Nov	5	3	1	1	15	18	17.5±07	23	25	28	0	0	0	0	0	0	0
Dec	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100. Av. period BY YEAR = 8760 hrs; BY G.S. = 4416 hrs.
2. % Valid Days = # days with 75 % of hours between 09:00 and 21:00 / (total # days) * 100 (Federal Register 1979).
3. Cumulative Index: S06 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 60 ppb (Lee et al. 1988).
4. Cumulative Index: S08 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 80 ppb (Lee et al. 1988).
5. Statistics for monthly composites over the period of record.
6. Monthly estimate of S06(08) = S06(08) * (# hours in that month) / (# valid hours).

Marion County

DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS

A. BY YEAR (March through November).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	3	6	1	0	0	20	21	7	1	0	9	18	13	2	1	0	1	0
1982	8	2	0	0	0	22	33	9	1	0	6	15	10	1	0	0	0	0
1983	13	3	0	0	0	20	33	7	0	2	3	19	12	1	0	0	1	0
1984	4	3	1	0	0	10	36	13	1	2	2	16	15	1	0	0	0	0
1985	8	3	0	0	0	10	27	20	1	1	4	21	11	3	0	0	1	0
1986	8	2	0	0	0	32	16	15	0	3	8	14	8	2	0	0	0	0
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	7	3	0	0	0	19	27	12	0	1	6	17	12	2	0	0	0	0

B. BY GROWING SEASON (May through October).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	3	3	0	0	0	23	20	6	1	0	11	20	12	2	1	0	1	0
1982	8	1	0	0	0	23	34	8	1	0	6	15	10	1	0	0	0	0
1983	13	3	0	0	0	20	33	7	0	2	3	19	12	1	0	0	1	0
1984	4	3	1	0	0	10	36	13	1	2	2	16	15	1	0	0	0	0
1985	7	3	0	0	0	10	27	19	1	1	4	21	11	3	0	0	1	0
1986	8	2	0	0	0	32	16	15	0	3	8	14	8	2	0	0	0	0
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	7	3	0	0	0	20	28	12	0	1	6	18	11	2	0	0	0	0

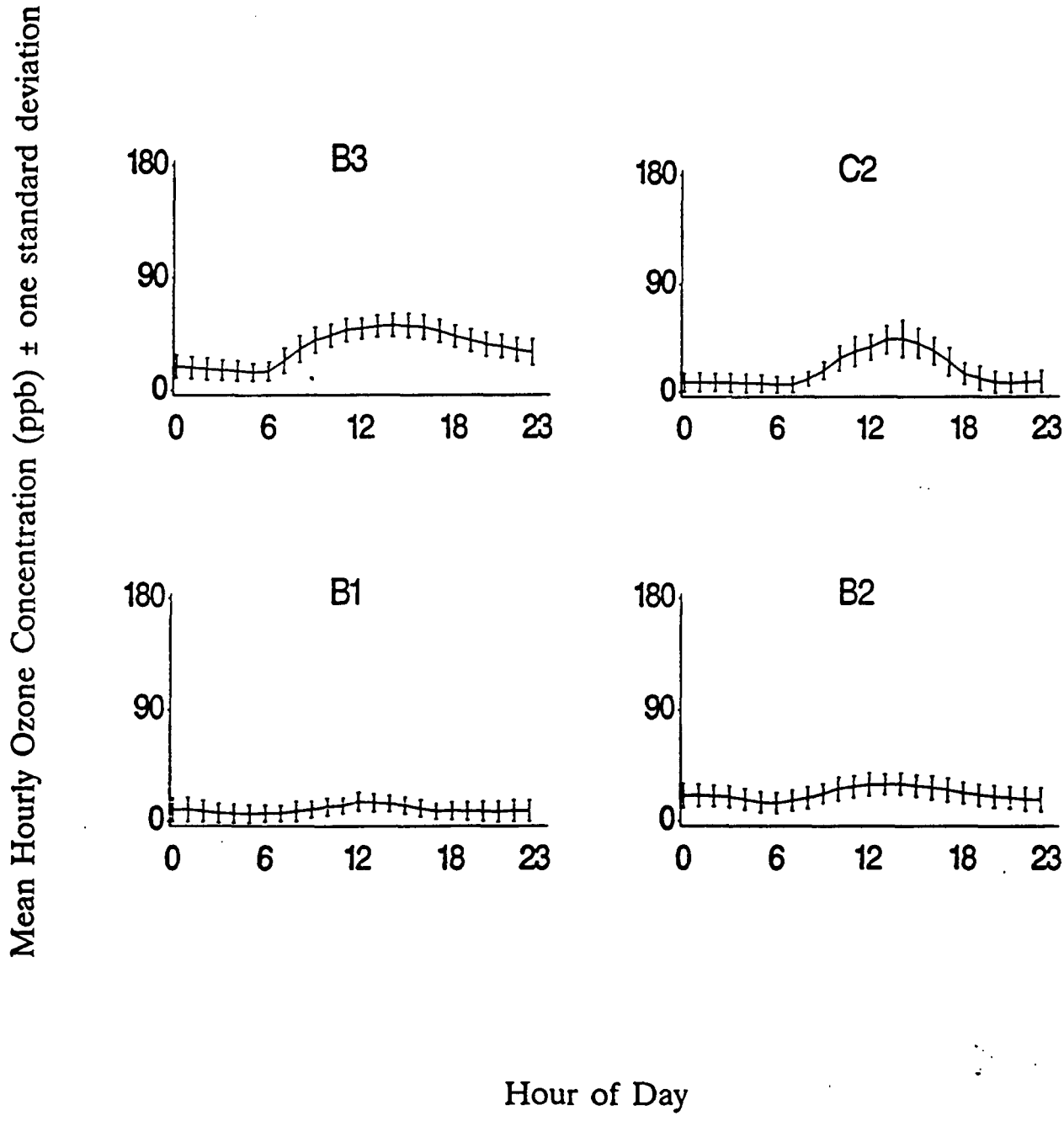
C. BY MONTH (composited over years).

Month	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
Jan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Feb	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mar	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0
Apr	3	23	3	0	0	9	23	17	0	0	0	9	17	0	0	0	0	0
May	7	11	1	0	0	0	34	27	2	2	1	3	17	1	0	0	1	0
Jun	10	3	0	0	0	10	38	13	0	1	3	12	18	1	0	0	0	0
Jul	9	0	0	0	0	21	25	13	0	4	3	21	9	3	0	0	1	0
Aug	7	1	0	0	0	12	20	16	1	1	2	28	16	3	1	0	1	0
Sep	6	1	0	0	0	21	32	2	0	0	8	26	9	1	0	0	0	0
Oct	4	0	0	0	0	50	17	0	0	0	16	16	1	0	0	0	0	0
Nov	0	0	0	0	0	0	50	0	0	0	50	0	0	0	0	0	0	0
Dec	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

1. % days with unidentified diurnal patterns in hourly ozone concentration (see Böhm et al. 1990).
2. Pattern identifier relates to degree of diurnal variation in hourly ozone concentrations (A curves - least variation; E curves - greatest variation) and daily mean (1 curves - lowest mean; 6 curves highest mean) as described by Böhm et al (1990) and as illustrated in Figure 4C.1. Note that due to numeric rounding, the sums of percentages do not always equal 100.

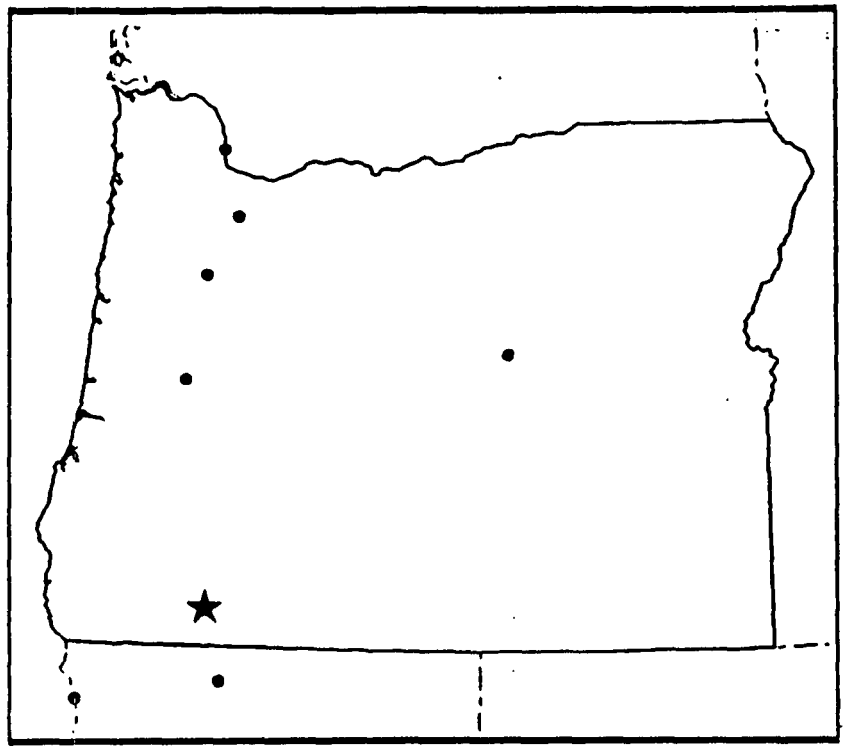
MARION COUNTY

DOMINANT DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS (MAY - OCT)



MEDFORD **OREGON**

BIOGRAPHIC INFORMATION



Latitude	-	42.27° N
Longitude	-	122.81° W
Elevation (m)	-	503
Basin Height (m)	-	425.5
Landuse	-	Suburban - Residential
City Population	-	39,603
Basin Population	-	366,098
Start Summary	-	July, 1982
End Summary	-	October, 1989
Source of Data	-	AIRS (41-029-0010)

Medford

BASIC STATISTICS

A. BY YEAR.

Year	% Data Capt[1]	% Valid Days[2]	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	49	49	1	2	7	20	22.6±19	32	50	60	6	2	0	0	0
1983	98	99	1	1	7	19	20.7±16	30	41	48	2	0	0	0	0
1984	97	97	1	1	5	17	20.0±16	32	42	49	2	0	0	0	0
1985	95	95	1	1	5	16	18.9±16	29	40	48	2	0	0	0	0
1986	78	78	1	2	8	20	22.2±17	33	43	53	3	0	0	0	0
1987	55	56	1	3	9	20	23.9±18	36	50	59	5	1	0	0	0
1988	54	54	1	4	11	24	26.3±19	38	52	61	6	1	0	0	1
1989	54	55	2	4	10	24	25.0±17	37	48	54	2	0	0	0	0
All Years	72	73	1	2	7	19	21.9±17	33	45	54	3	0	0	0	1

B. BY GROWING SEASON (May through October).

Year	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06[3] (ppm hr)	S08[4] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	64	64	1	4	10	24	27.3±21	40	55	69	19	7	9	3	0	0	0
1983	99	99	1	2	9	22	24.1±18	36	48	57	13	3	4	1	0	0	0
1984	96	96	2	3	3	23	25.2±18	37	49	57	11	2	4	0	0	0	0
1985	98	98	1	2	7	20	22.3±17	33	46	54	9	2	3	0	0	0	0
1986	91	90	1	3	10	23	25.3±18	37	50	60	15	3	5	1	0	0	0
1987	99	100	1	3	9	20	24.1±19	36	51	60	16	3	5	1	0	0	0
1988	99	99	1	4	11	24	26.6±19	39	53	62	19	4	6	1	0	0	1
1989	98	98	2	4	10	23	24.7±17	37	48	54	7	1	2	0	0	0	0
All Years	93	93	1	3	9	22	24.8±18	37	50	59	-	-	5	1	0	0	1

C. BY MONTH [5].

Month	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06 (ppm hr)	S08[6] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
Jan	97	98	1	1	1	7	10.4±10	18	27	30	0	0	0	0	0	0	0
Feb	98	99	1	1	5	14	15.0±11	24	30	33	0	0	0	0	0	0	0
Mar	99	100	1	3	8	22	20.6±13	31	37	40	0	0	0	0	0	0	0
Apr	82	82	2	5	13	26	24.7±14	35	42	46	1	0	0	0	0	0	0
May	98	98	3	6	15	27	26.5±15	37	46	50	2	1	2	0	0	0	0
Jun	99	100	3	5	12	24	25.9±17	37	48	56	2	1	3	0	0	0	0
Jul	98	98	2	5	13	27	28.6±19	41	56	64	4	1	7	1	0	0	0
Aug	96	97	2	5	12	26	29.4±21	44	59	66	5	2	9	2	0	0	0
Sep	96	97	1	2	7	18	22.3±18	33	48	57	3	1	4	1	0	0	1
Oct	94	93	1	1	3	11	16.2±15	26	39	46	1	0	1	0	0	0	0
Nov	85	86	1	1	3	10	13.2±11	22	30	34	0	0	0	0	0	0	0
Dec	99	100	1	1	2	9	11.3±10	19	27	30	0	0	0	0	0	0	0

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100. Av. period BY YEAR = 8760 hrs; BY G.S. = 4416 hrs.
2. % Valid Days = # days with 75 % of hours between 09:00 and 21:00 / (total # days) * 100 (Federal Register 1979).
3. Cumulative Index S06 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 60 ppb (Lee et al. 1988).
4. Cumulative Index S08 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 80 ppb (Lee et al. 1988).
5. Statistics for monthly composites over the period of record.
6. Monthly estimate of S06(08) = S06(08) * (# hours in that month) / (# valid hours).

Medford

DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS

A. BY YEAR.

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	7	2	0	0	0	18	22	14	0	10	10	14	9	1	1	0	0	0
1983	8	5	0	0	0	20	29	14	0	2	7	16	7	1	0	0	0	0
1984	9	5	0	0	0	22	21	16	0	1	12	10	10	1	0	0	0	0
1985	9	3	0	0	0	23	21	9	0	2	11	18	12	1	0	0	0	0
1986	10	4	0	0	0	17	26	19	1	3	6	12	10	2	0	0	0	0
1987	11	1	0	0	0	8	20	21	2	4	3	26	13	2	0	0	0	0
1988	10	5	0	0	0	4	23	28	0	8	6	17	6	1	0	0	2	0
1989	10	1	0	0	0	6	27	32	1	1	3	18	10	1	0	0	0	0
All Years	9	3	0	0	0	16	24	18	0	3	8	16	10	1	0	0	0	0

B. BY GROWING SEASON (May through October).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	8	2	0	0	0	5	20	22	0	16	2	17	14	2	1	0	0	0
1983	8	4	0	0	0	7	25	23	1	4	5	21	9	2	0	0	0	0
1984	8	4	0	0	0	6	21	32	1	3	6	13	14	2	0	0	0	0
1985	10	1	0	0	0	11	25	17	0	5	7	21	12	1	0	0	0	0
1986	13	4	0	0	0	7	22	32	0	5	6	12	9	3	0	0	1	0
1987	12	1	0	0	0	8	19	22	2	5	3	25	12	3	0	0	0	0
1988	10	4	0	0	0	3	21	31	0	8	6	17	7	1	0	0	2	0
1989	10	1	0	0	0	6	25	32	1	1	3	19	11	1	0	0	0	0
All Years	10	3	0	0	0	7	22	27	1	5	5	18	11	2	0	0	0	0

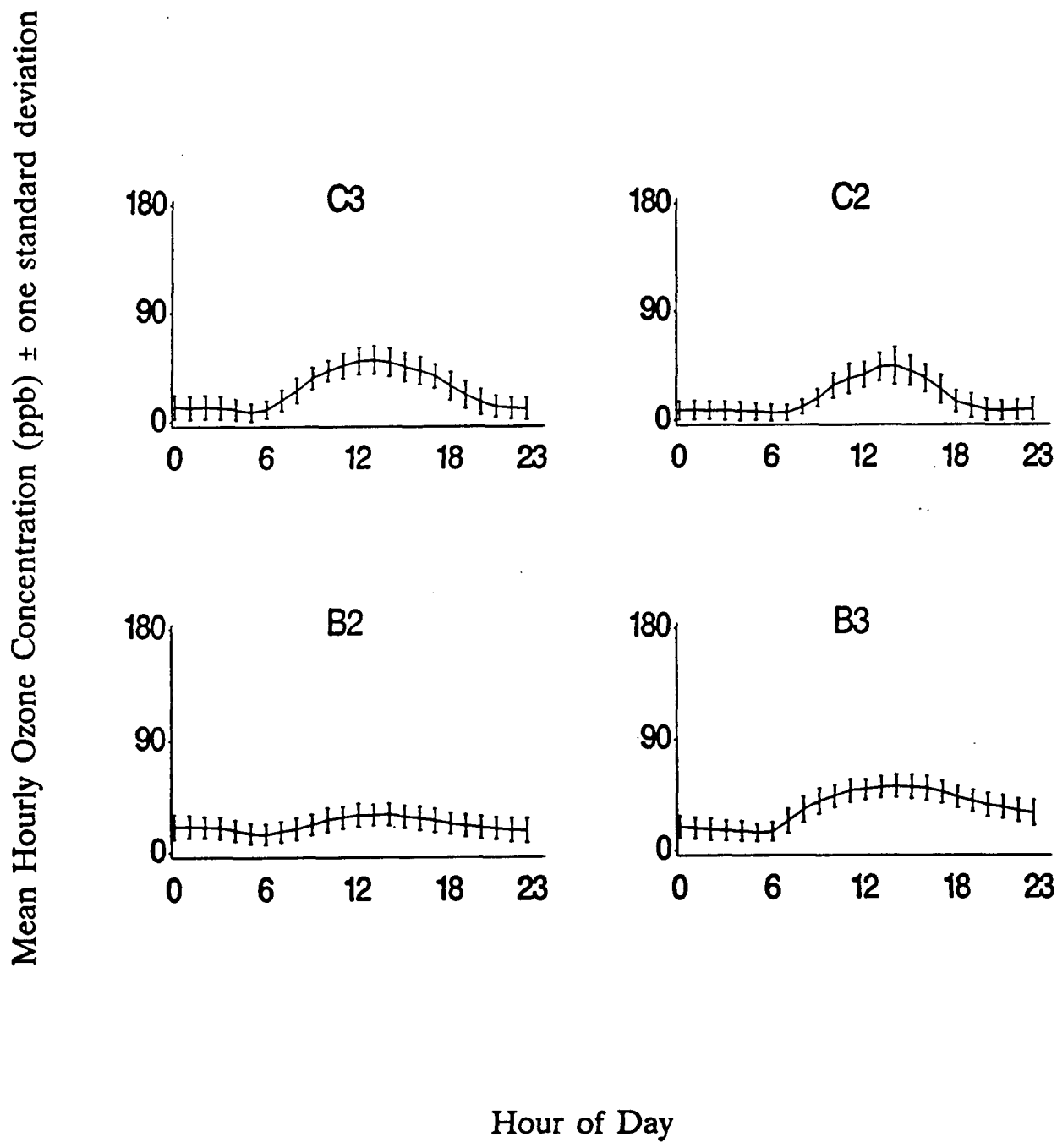
C. BY MONTH (composited over years).

Month	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
Jan	7	3	0	0	0	55	14	0	0	0	22	5	0	0	0	0	0	0
Feb	7	1	0	0	0	39	36	0	0	0	14	10	0	0	0	0	0	0
Mar	7	10	0	0	0	9	37	1	0	0	5	29	10	0	0	0	0	0
Apr	8	9	0	0	0	4	32	12	1	0	1	14	26	1	0	0	0	0
May	13	11	0	0	0	6	28	29	1	3	2	10	8	2	0	0	0	0
Jun	9	2	0	0	0	5	27	35	0	1	1	10	17	2	0	0	0	0
Jul	10	0	0	0	0	3	18	44	0	10	1	9	13	2	0	0	0	0
Aug	8	0	0	0	0	1	15	38	1	13	0	12	14	2	0	0	0	0
Sep	11	2	0	0	0	8	25	11	1	4	7	30	11	2	0	0	1	0
Oct	9	1	0	0	0	18	21	0	0	0	18	38	3	0	0	0	0	0
Nov	8	4	0	0	0	44	22	0	0	0	24	5	0	0	0	0	0	0
Dec	8	2	0	0	0	60	14	0	0	0	18	5	0	0	0	0	0	0

1. % days with unidentified diurnal patterns in hourly ozone concentration (see Böhm et al. 1990).
2. Pattern identifier relates to degree of diurnal variation in hourly ozone concentrations (A curves - least variation; E curves - greatest variation) and daily mean (1 curves - lowest mean; 6 curves highest mean) as described by Böhm et al (1990) and as illustrated in Figure 4C.1. Note that due to numeric rounding, the sums of percentages do not always equal 100.

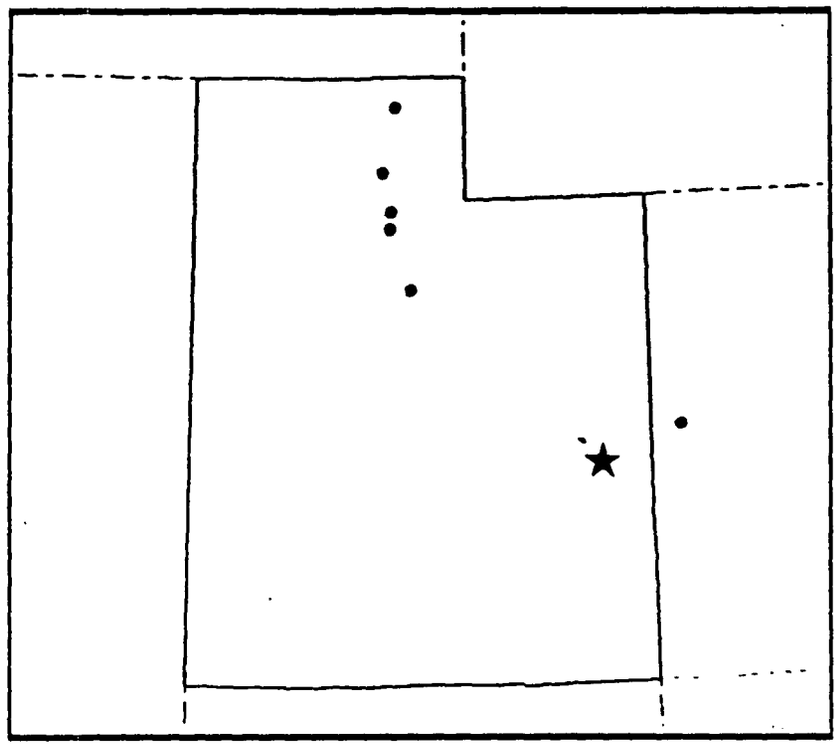
MEDFORD

DOMINANT DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS (MAY - OCT)



ARCHES NATIONAL PARK UTAH

BIOGRAPHIC INFORMATION



Latitude	-	38.78° N
Longitude	-	109.60° W
Elevation (m)	-	1567
Basin Height (m)	-	1323.1
Landuse	-	Rural - Desert
City Population	-	Not In A City
Basin Population	-	645,599
Start Summary	-	October, 1987
End Summary	-	June, 1989
Source of Data	-	National Park Service

Arches National Park

BASIC STATISTICS

A. BY YEAR (May through March).

Year	% Data Capt[1]	% Valid Days[2]	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	14	15	23	25	30	34	33.9±07	38	42	45	0	0	0	0	0
1988	56	58	28	30	35	41	41.6±09	48	53	57	3	0	0	0	0
1989	20	19	21	32	38	45	43.7±12	51	57	61	6	0	0	0	0
All Years	30	30	26	29	35	40	40.9±10	48	54	57	3	0	0	0	0

B. BY GROWING SEASON (May through October).

Year	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06[3] (ppm hr)	S08[4]	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	8	9	22	25	30	35	35.1±08	40	47	49	0	0	0	0	0	0	0
1988	81	84	29	31	37	43	43.1±09	49	55	58	9	0	4	0	0	0	0
1989	8	3	37	38	43	48	47.8±07	53	57	59	1	0	4	0	0	0	0
All Years	32	32	28	31	36	43	42.8±09	49	54	58	-	-	4	0	0	0	0

C. BY MONTH [5].

Month	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06 (ppm hr)	S08[6]	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
Jan	15	15	36	40	45	51	49.7±07	55	59	60	4	0	8	0	0	0	0
Feb	61	68	33	35	39	44	44.8±09	50	56	59	2	0	5	0	0	0	0
Mar	72	73	5	18	33	40	38.3±14	46	52	58	3	1	4	0	0	0	0
Apr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
May	23	18	37	39	44	48	47.9±06	52	57	59	2	0	3	0	0	0	0
Jun	50	47	29	33	37	44	43.7±09	49	56	60	3	0	6	0	0	0	0
Jul	54	52	34	37	42	47	47.3±08	54	58	61	4	0	8	0	0	0	0
Aug	96	100	31	34	39	45	45.0±08	51	56	60	3	0	5	0	0	0	0
Sep	89	93	28	30	34	41	40.8±08	47	51	54	1	0	0	0	0	0	0
Oct	70	74	25	27	31	37	36.5±07	41	46	48	0	0	0	0	0	0	0
Nov	85	88	24	27	30	34	33.8±05	38	40	42	1	0	0	0	0	0	0
Dec	16	18	22	24	29	33	32.5±06	37	40	41	0	0	0	0	0	0	0

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100. Av. period BY YEAR = 8760 hrs; BY G.S. = 4416 hrs.
2. % Valid Days = # days with 75 % of hours between 09:00 and 21:00 / (total # days) * 100 (Federal Register 1979).
3. Cumulative Index: S06 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 60 ppb (Lee et al. 1988).
4. Cumulative Index: S08 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 80 ppb (Lee et al. 1988).
5. Statistics for monthly composites over the period of record.
6. Monthly estimate of S06(08) = S06(08) * (# hours in that month) / (# valid hours).

Arches National Park

DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS

A. BY YEAR (January through March, May through November).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	10	53	35	0	0	0	5	1	5	2	0	0	0	0	0	0	0	0
1989	3	50	30	3	0	0	3	10	3	0	0	0	0	0	0	0	0	0
All Years	9	52	34	1	0	0	4	3	4	1	0	0	0	0	0	0	0	0

B. BY GROWING SEASON (May through October).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	13	47	42	0	0	0	1	1	7	2	0	0	0	0	0	0	0	0
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	13	47	42	0	0	0	1	1	7	2	0	0	0	0	0	0	0	0

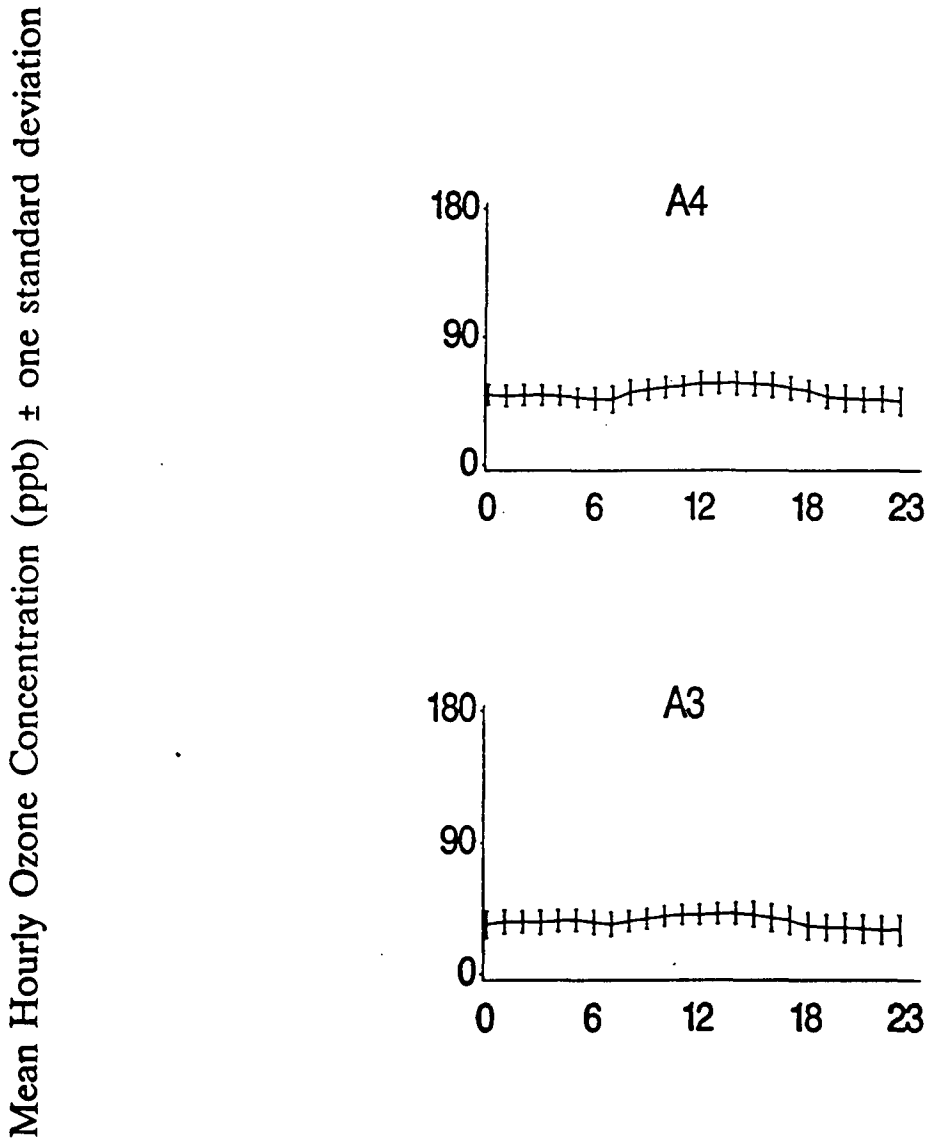
C. BY MONTH (composited over years).

Month	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
Jan	20	25	75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Feb	0	50	41	5	0	0	5	0	0	0	0	0	0	0	0	0	0	0
Mar	4	58	15	0	0	0	12	12	4	0	0	0	0	0	0	0	0	0
Apr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
May	12	0	86	0	0	0	0	0	14	0	0	0	0	0	0	0	0	0
Jun	11	35	47	0	0	0	0	6	6	6	0	0	0	0	0	0	0	0
Jul	0	18	76	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0
Aug	32	27	60	0	0	0	0	0	13	0	0	0	0	0	0	0	0	0
Sep	11	75	12	0	0	0	0	0	6	6	0	0	0	0	0	0	0	0
Oct	5	94	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0
Nov	0	87	0	0	0	0	13	0	0	0	0	0	0	0	0	0	0	0
Dec	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

1. % days with unidentified diurnal patterns in hourly ozone concentration (see Böhm et al. 1990).
2. Pattern identifier relates to degree of diurnal variation in hourly ozone concentrations (A curves - least variation; E curves - greatest variation) and daily mean (1 curves - lowest mean; 6 curves highest mean) as described by Böhm et al (1990) and as illustrated in Figure 4C.1. Note that due to numeric rounding, the sums of percentages do not always equal 100.

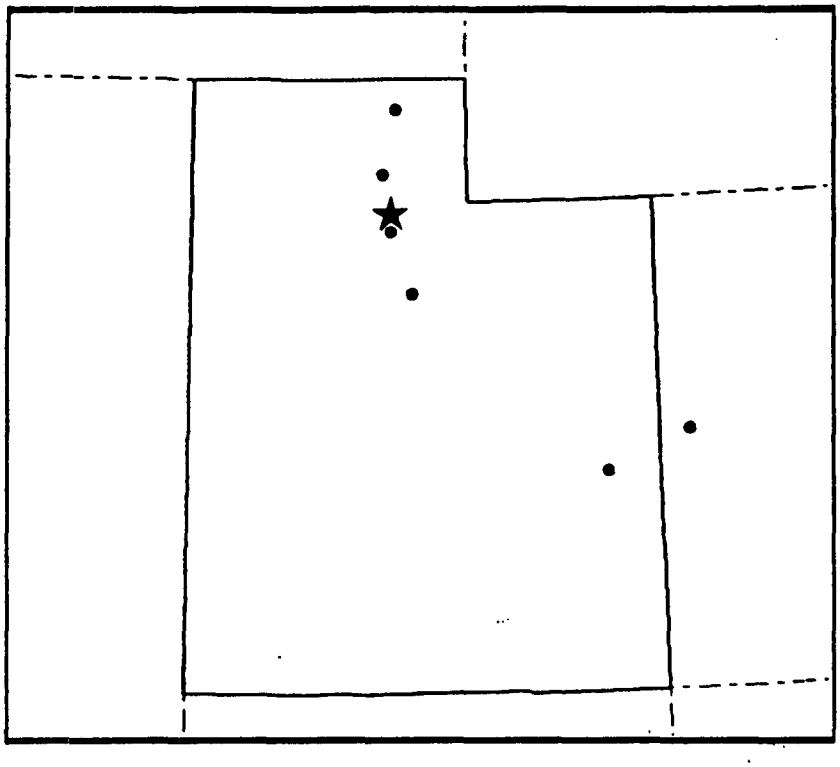
ARCHES NATIONAL PARK

DOMINANT DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS (MAY - OCT)



BOUNTIFUL **UTAH**

BIOGRAPHIC INFORMATION



Latitude	-	40.90° N
Longitude	-	111.88° W
Elevation (m)	-	1335
Basin Height (m)	-	1230.8
Landuse	-	Suburban - Commercial
City Population	-	32,877
Basin Population	-	1,154,361
Start Summary	-	January, 1980
End Summary	-	September, 1989
Source of Data	-	AIRS (49-011-0001)

Bountiful

BASIC STATISTICS

A. BY YEAR.

Year	% Data Capt[1]	% Valid Days[2]	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	67	67	0	0	5	21	23.1±20	36	48	57	4	1	0	0	3
1981	94	94	0	1	10	26	26.7±20	40	51	61	5	1	0	0	9
1982	94	93	0	2	14	29	29.5±20	43	54	63	6	2	0	0	4
1983	91	91	0	3	13	27	27.2±18	39	49	58	4	1	0	0	4
1984	93	94	4	6	18	31	31.6±19	42	54	65	7	2	1	0	8
1985	92	91	1	5	14	30	30.0±20	43	54	63	7	2	1	0	5
1986	94	94	1	2	15	30	30.0±20	42	55	64	7	2	0	0	6
1987	89	89	4	7	20	34	33.8±19	46	58	65	8	1	0	0	1
1988	96	96	4	6	17	31	31.6±19	43	55	64	7	2	0	0	3
1989	54	55	4	6	20	37	35.7±21	48	60	71	10	2	1	0	6
All Years	87	86	1	4	14	30	29.8±20	42	54	63	7	2	0	0	49

B. BY GROWING SEASON (May through October).

Year	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06[3] (ppm hr)	S08[4] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	53	53	3	8	19	32	33.6±21	45	58	71	17	8	9	3	1	0	3
1981	89	89	5	11	23	36	36.3±20	48	60	70	31	11	10	3	1	0	9
1982	99	99	5	11	23	37	37.2±20	49	61	72	37	13	11	3	1	0	4
1983	92	92	6	11	22	34	34.8±19	45	57	67	26	9	8	2	0	0	4
1984	99	99	11	17	17	36	37.3±18	46	58	70	31	13	9	3	1	0	7
1985	92	92	7	14	25	37	37.7±20	48	60	70	34	14	11	3	1	0	5
1986	99	98	9	16	26	38	39.2±20	50	62	74	43	14	13	3	1	0	6
1987	99	99	9	16	29	40	40.3±18	51	63	71	41	10	13	2	0	0	1
1988	94	94	12	19	29	40	41.1±19	51	63	74	42	14	14	3	1	0	3
1989	56	58	17	24	35	45	46.1±19	55	69	79	35	11	19	5	1	0	6
All Years	87	87	8	14	25	38	38.3±20	49	62	72	-	-	12	3	1	0	48

C. BY MONTH [5].

Month	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06 (ppm hr)	S08[6] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
Jan	90	89	0	0	2	8	13.5±13	23	33	38	1	0	0	0	0	0	0
Feb	97	97	0	2	7	19	21.4±17	32	42	50	2	1	3	1	0	0	0
Mar	90	89	4	8	18	30	28.7±14	39	45	49	1	1	1	0	0	0	1
Apr	88	88	11	17	27	37	36.0±14	45	52	58	3	1	4	0	0	0	0
May	98	98	13	19	30	40	39.8±16	49	58	64	5	1	9	1	0	0	3
Jun	85	85	20	24	34	44	44.9±18	54	66	76	9	3	16	4	1	0	8
Jul	87	87	15	21	32	43	45.6±21	55	72	85	12	5	20	7	2	1	22
Aug	97	98	14	20	31	41	43.0±19	53	67	78	9	4	16	4	1	0	11
Sep	95	95	7	12	21	32	33.4±17	43	54	65	4	1	7	1	0	0	4
Oct	99	99	2	4	12	23	24.1±16	34	45	53	2	1	3	0	0	0	0
Nov	91	91	0	1	5	15	16.3±13	26	33	37	1	1	0	0	0	0	0
Dec	85	84	0	0	1	7	11.1±11	19	29	33	0	0	0	0	0	0	0

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100. Av. period BY YEAR = 8760 hrs; BY G.S. = 4416 hrs.
2. % Valid Days = # days with 75 % of hours between 09:00 and 21:00 / (total # days) * 100 (Federal Register 1979).
3. Cumulative Index: S06 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 60 ppb (Lee et al. 1988).
4. Cumulative Index: S08 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 80 ppb (Lee et al. 1988).
5. Statistics for monthly composites over the period of record.
6. Monthly estimate of S06(08) = S06(08) * (# hours in that month) / (# valid hours).

Bountiful

DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS

A. BY YEAR.

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	5	11	2	0	0	23	14	8	4	2	12	15	5	1	0	0	1	0
1981	7	10	4	0	0	18	17	7	9	6	7	12	6	3	0	0	1	0
1982	5	10	5	2	0	12	17	10	10	8	6	14	4	1	0	0	1	0
1983	7	11	3	0	0	16	23	8	10	9	7	9	3	1	0	0	0	0
1984	7	13	3	1	0	9	21	12	16	8	3	5	6	2	0	0	1	0
1985	4	8	7	3	0	13	17	9	13	6	5	14	3	2	0	0	0	0
1986	5	14	5	3	0	16	18	6	12	8	4	8	3	2	0	0	0	0
1987	7	14	8	2	0	8	15	10	20	11	3	6	2	0	0	0	0	0
1988	5	14	7	2	0	9	20	8	11	10	5	9	3	1	0	0	0	0
1989	4	16	8	8	0	4	10	11	11	9	6	11	4	0	0	0	1	1
All Years	6	12	5	2	0	13	18	9	12	8	6	10	4	1	0	0	1	0

B. BY GROWING SEASON (May through October).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	7	10	4	1	0	3	14	18	9	6	2	12	12	3	1	0	2	1
1981	6	13	7	0	0	3	13	11	17	13	1	8	6	6	0	0	2	0
1982	3	8	10	3	0	5	12	15	16	13	1	8	8	1	1	0	1	0
1983	9	10	5	0	0	3	17	14	17	17	0	11	4	2	0	0	0	0
1984	3	10	4	2	0	2	19	17	23	11	1	0	7	3	0	0	2	0
1985	5	6	10	5	0	2	16	13	20	12	1	10	2	2	1	0	1	0
1986	4	11	9	5	0	1	14	8	17	16	1	9	4	3	1	0	1	1
1987	8	9	12	4	0	2	8	15	28	16	0	3	2	1	0	0	0	0
1988	6	11	15	5	0	1	13	13	16	19	1	3	3	1	0	0	0	0
1989	3	11	16	16	0	0	1	16	20	18	0	0	1	0	0	0	0	1
All Years	5	10	9	4	0	2	13	14	19	14	1	6	5	2	0	0	1	0

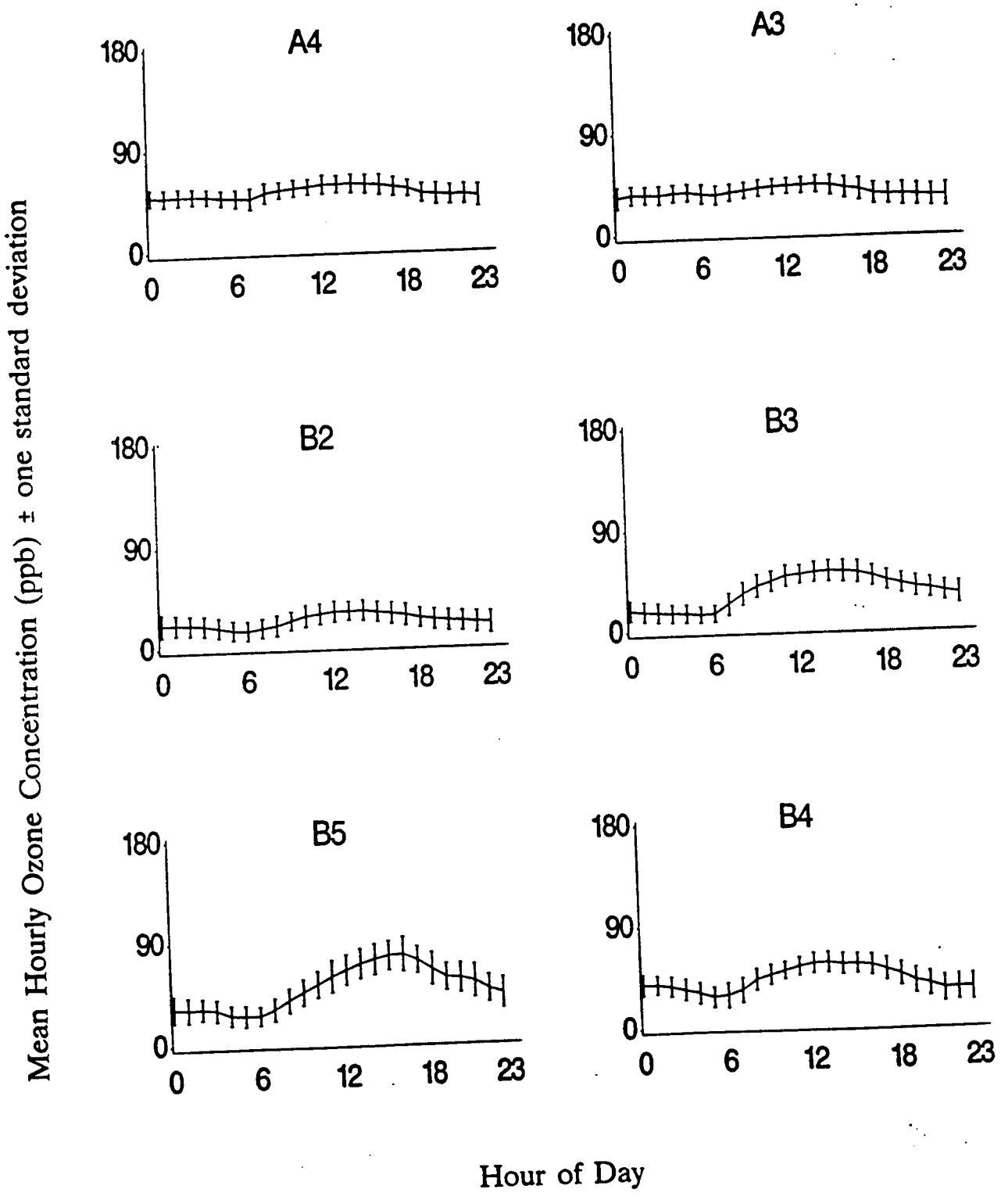
C. BY MONTH (composited over years).

Month	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
Jan	5	4	0	0	0	37	17	0	0	0	22	17	2	0	0	0	0	0
Feb	6	11	0	0	0	12	23	2	1	1	10	35	2	1	0	0	1	0
Mar	8	30	1	0	0	2	31	6	6	1	2	12	8	0	0	0	0	0
Apr	8	30	8	0	0	0	13	13	20	6	0	2	6	2	0	0	0	0
May	5	11	19	2	0	0	9	15	26	13	0	0	3	1	0	0	0	0
Jun	1	6	15	8	0	0	5	9	29	22	0	0	1	3	0	0	0	0
Jul	4	7	10	11	0	0	2	13	18	28	0	1	2	5	1	0	1	0
Aug	8	10	9	3	0	0	4	16	29	20	0	0	3	3	1	0	1	0
Sep	10	15	2	0	0	2	26	20	11	5	0	5	12	1	0	0	2	0
Oct	4	10	1	0	0	9	31	7	2	0	4	29	6	0	0	0	0	0
Nov	5	4	0	0	0	33	32	1	0	0	17	12	0	0	0	0	0	0
Dec	5	4	0	0	0	64	16	1	0	0	13	2	0	0	0	0	0	0

1. % days with unidentified diurnal patterns in hourly ozone concentration (see Böhm et al. 1990).
2. Pattern identifier relates to degree of diurnal variation in hourly ozone concentrations (A curves - least variation; E curves - greatest variation) and daily mean (1 curves - lowest mean; 6 curves highest mean) as described by Böhm et al (1990) and as illustrated in Figure 4C.1. Note that due to numeric rounding, the sums of percentages do not always equal 100.

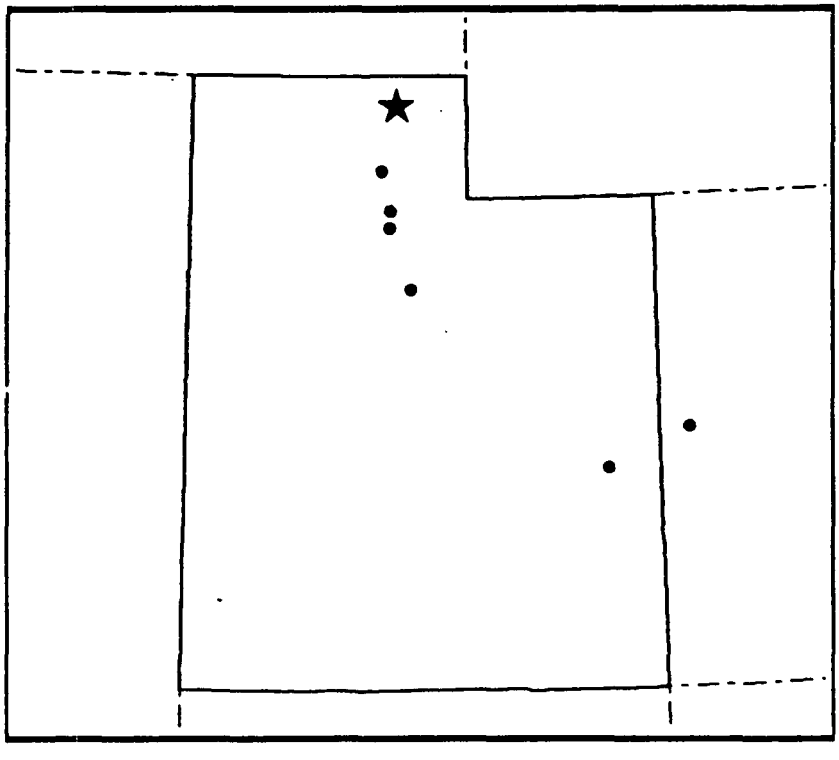
BOUNTIFUL

DOMINANT DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS (MAY - OCT)



LOGAN UTAH

BIOGRAPHIC INFORMATION



Latitude	-	41.75° N
Longitude	-	111.83° W
Elevation (m)	-	1382
Basin Height (m)	-	1382
Landuse	-	Suburban - Residential
City Population	-	26,844
Basin Population	-	221,709
Start Summary	-	May, 1982
End Summary	-	May, 1983
Source of Data	-	AIRS (49-005-0001)

Logan

BASIC STATISTICS

A. BY YEAR.

Year	% Data Capt[1]	% Valid Days[2]	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	58	59	3	7	18	28	28.8±16	40	50	55	3	0	0	0	0
1983	29	30	2	5	15	30	25.7±14	35	40	45	0	0	0	0	0
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	44	45	3	5	15	30	27.7±15	40	50	52	2	0	0	0	0

B. BY GROWING SEASON (May through October).

Year	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06[3] (ppm hr)	S08[4] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	88	90	8	12	20	32	32.5±15	45	52	58	11	0	4	0	0	0	0
1983	1	1	8	10	20	35	29.5±11	38	40	40	0	0	0	0	0	0	0
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	45	45	8	12	20	32	32.5±15	45	52	58	-	-	4	0	0	0	0

C. BY MONTH [5].

Month	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06 (ppm hr)	S08[6] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
Jan	97	97	0	0	3	10	14.0±12	25	33	35	0	0	0	0	0	0	0
Feb	77	79	3	5	13	27	23.7±12	33	40	40	0	0	0	0	0	0	0
Mar	78	81	10	15	25	30	29.4±10	38	40	40	0	0	0	0	0	0	0
Apr	97	100	15	20	30	40	36.0±10	45	45	50	0	0	0	0	0	0	0
May	32	32	18	20	30	35	37.2±13	48	55	57	2	0	3	0	0	0	0
Jun	93	97	20	25	31	40	39.9±12	50	55	58	2	0	4	0	0	0	0
Jul	96	100	15	20	25	35	37.1±14	48	55	60	4	0	7	0	0	0	0
Aug	95	94	15	20	30	40	38.8±14	50	58	60	5	0	9	0	0	0	0
Sep	96	97	5	10	18	25	25.0±12	32	40	48	1	0	1	0	0	0	0
Oct	93	94	2	4	10	18	18.3±12	25	35	40	1	0	0	0	0	0	0
Nov	97	97	0	2	5	13	15.4±11	25	30	35	0	0	0	0	0	0	0
Dec	67	71	0	3	8	20	18.0±11	28	32	35	0	0	0	0	0	0	0

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100. Av. period BY YEAR = 8760 hrs; BY G.S. = 4416 hrs.
2. % Valid Days = # days with 75 % of hours between 09:00 and 21:00 / (total # days) * 100 (Federal Register 1979).
3. Cumulative Index: S06 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 60 ppb (Lee et al. 1988).
4. Cumulative Index: S08 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 80 ppb (Lee et al. 1988).
5. Statistics for monthly composites over the period of record.
6. Monthly estimate of S06(08) = S06(08) * (# hours in that month) / (# valid hours).

Logan

DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS

A. BY YEAR.

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	7	8	2	0	0	10	22	14	20	2	7	10	3	1	0	0	0	0
1983	2	28	6	0	0	12	29	3	4	0	6	8	3	0	0	0	0	0
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	5	15	4	0	0	11	24	10	14	1	7	10	3	1	0	0	0	0

B. BY GROWING SEASON (May through October).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	7	9	3	0	0	5	17	19	26	3	2	10	4	1	0	0	0	0
1983	0	50	0	0	0	0	0	0	0	0	0	0	50	0	0	0	0	0
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	7	10	3	0	0	5	17	19	26	3	2	10	4	1	0	0	0	0

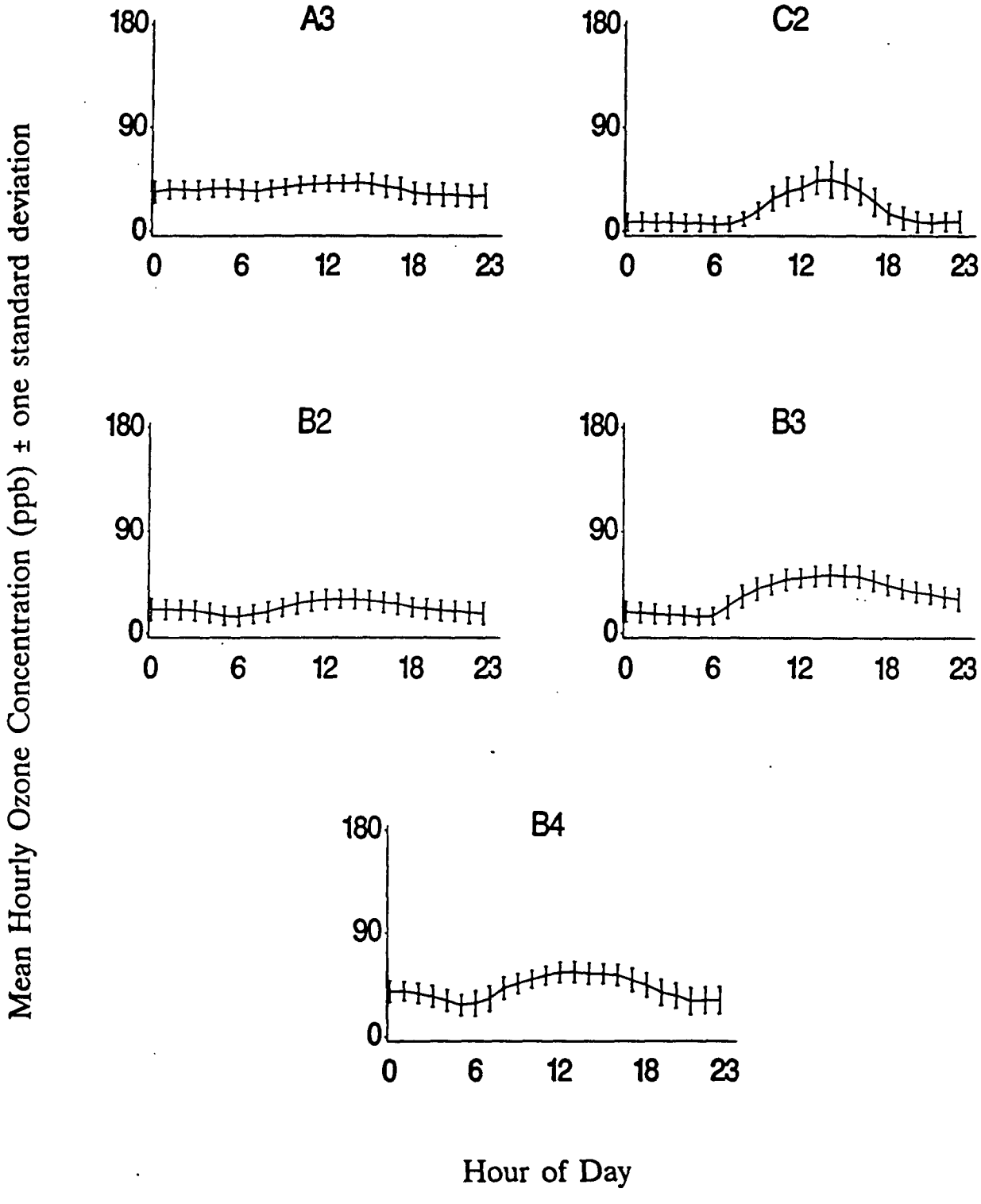
C. BY MONTH (composited over years).

Month	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
Jan	0	3	0	0	0	41	28	0	0	0	21	7	0	0	0	0	0	0
Feb	5	33	0	0	0	0	39	0	0	0	0	28	0	0	0	0	0	0
Mar	0	43	0	0	0	0	48	0	0	0	0	5	5	0	0	0	0	0
Apr	4	37	22	0	0	0	11	11	15	0	0	0	4	0	0	0	0	0
May	12	21	0	0	0	0	0	29	43	0	0	0	7	0	0	0	0	0
Jun	4	17	12	0	0	0	4	12	33	8	0	0	8	4	0	0	0	0
Jul	4	8	0	0	0	0	8	42	35	4	0	0	0	4	0	0	0	0
Aug	7	11	4	0	0	0	4	26	44	4	0	4	4	0	0	0	0	0
Sep	11	8	0	0	0	8	50	4	4	0	0	21	4	0	0	0	0	0
Oct	4	0	0	0	0	20	32	0	0	0	12	32	4	0	0	0	0	0
Nov	7	4	0	0	0	31	27	0	0	0	27	12	0	0	0	0	0	0
Dec	6	0	0	0	0	18	53	0	0	0	18	12	0	0	0	0	0	0

1. % days with unidentified diurnal patterns in hourly ozone concentration (see Böhm et al. 1990).
2. Pattern identifier relates to degree of diurnal variation in hourly ozone concentrations (A curves - least variation; E curves - greatest variation) and daily mean (1 curves - lowest mean; 6 curves highest mean) as described by Böhm et al (1990) and as illustrated in Figure 4C.1. Note that due to numeric rounding, the sums of percentages do not always equal 100.

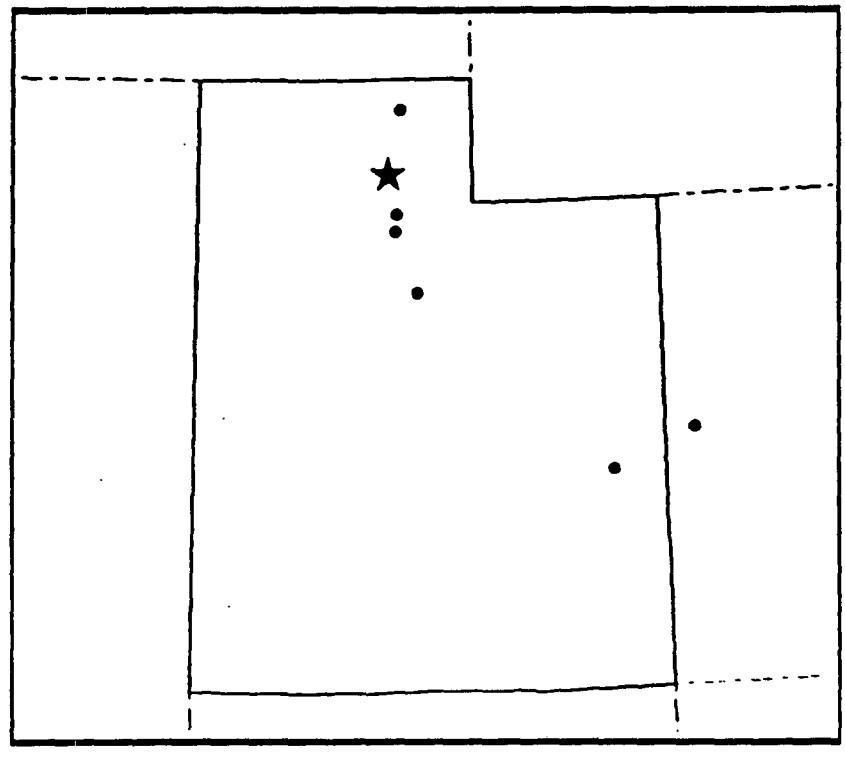
LOGAN

DOMINANT DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS (MAY - OCT)



OGDEN **UTAH**

BIOGRAPHIC INFORMATION



Latitude	-	41.22° N
Longitude	-	111.97° W
Elevation (m)	-	1314
Basin Height (m)	-	1230.8
Landuse	-	City Center - Commercial
City Population	-	64,407
Basin Population	-	1,154,361
Start Summary	-	January, 1980
End Summary	-	November, 1982
Source of Data	-	AIRS (49-057-0001)

Ogden

BASIC STATISTICS

A. BY YEAR.

Year	% Data Capt[1]	% Valid Days[2]	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	98	97	0	1	3	23	24.5±21	40	54	61	6	1	0	0	0
1981	97	96	0	0	3	19	21.9±20	36	49	58	4	0	0	0	0
1982	84	84	0	0	6	26	25.9±20	41	52	58	4	1	0	0	0
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	93	92	0	0	4	22	24.0±20	39	52	59	5	1	0	0	0

B. BY GROWING SEASON (May through October).

Year	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06[3] (ppm hr)	S08[4] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	97	96	1	1	8	31	30.7±23	49	60	68	31	6	10	2	0	0	0
1981	95	95	1	1	10	30	29.5±21	44	58	64	25	4	8	1	0	0	0
1982	98	97	0	1	10	30	29.3±21	45	56	63	21	4	7	1	0	0	0
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	97	96	0	1	9	30	29.8±22	46	58	65	-	-	8	1	0	0	0

C. BY MONTH [5].

Month	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06 (ppm hr)	S08[6] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
Jan	91	90	0	0	1	8	11.8±12	22	30	33	0	0	0	0	0	0	0
Feb	99	98	0	0	1	13	16.3±16	29	38	44	1	0	1	0	0	0	0
Mar	99	99	0	1	10	26	23.4±15	36	41	44	1	0	0	0	0	0	0
Apr	97	97	1	2	17	35	31.6±18	45	53	57	2	0	3	0	0	0	0
May	97	96	1	2	18	36	32.8±19	47	56	60	3	0	5	0	0	0	0
Jun	93	92	1	4	20	38	35.9±21	50	60	69	6	2	11	2	0	0	0
Jul	94	95	2	5	20	40	38.0±22	53	65	74	9	2	16	3	0	0	0
Aug	98	97	1	2	12	36	33.8±23	52	63	69	7	1	14	2	0	0	0
Sep	98	98	0	1	4	22	23.8±20	38	51	60	3	1	5	0	0	0	0
Oct	99	99	0	0	1	12	15.5±16	27	37	44	1	1	1	0	0	0	0
Nov	84	83	0	0	1	4	10.5±12	20	30	34	0	0	0	0	0	0	0
Dec	100	100	0	0	1	3	7.5±09	13	21	26	0	0	0	0	0	0	0

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100. Av. period BY YEAR = 8760 hrs; BY G.S. = 4416 hrs.
2. % Valid Days = # days with 75 % of hours between 09:00 and 21:00 / (total # days) * 100 (Federal Register 1979).
3. Cumulative Index: S06 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 60 ppb (Lee et al. 1988).
4. Cumulative Index: S08 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 80 ppb (Lee et al. 1988).
5. Statistics for monthly composites over the period of record.
6. Monthly estimate of S06(08) = S06(08) * (# hours in that month) / (# valid hours).

Ogden

DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS

A. BY YEAR.

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	4	8	2	0	0	16	9	6	8	1	9	15	9	16	0	0	1	0
1981	3	6	2	0	0	17	10	5	7	0	14	14	14	11	0	0	0	0
1982	3	9	3	0	0	6	13	9	7	2	10	17	10	13	0	0	1	0
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	3	8	2	0	0	13	11	7	7	1	11	15	11	13	0	0	1	0

B. BY GROWING SEASON (May through October).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	3	7	3	0	0	3	3	7	12	2	3	16	14	28	0	0	1	0
1981	3	8	3	0	0	2	8	8	13	0	5	11	19	21	0	0	1	0
1982	3	5	5	0	0	5	11	11	11	3	3	14	12	20	0	0	1	0
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	3	7	4	0	0	3	7	9	12	2	4	14	15	23	0	0	1	0

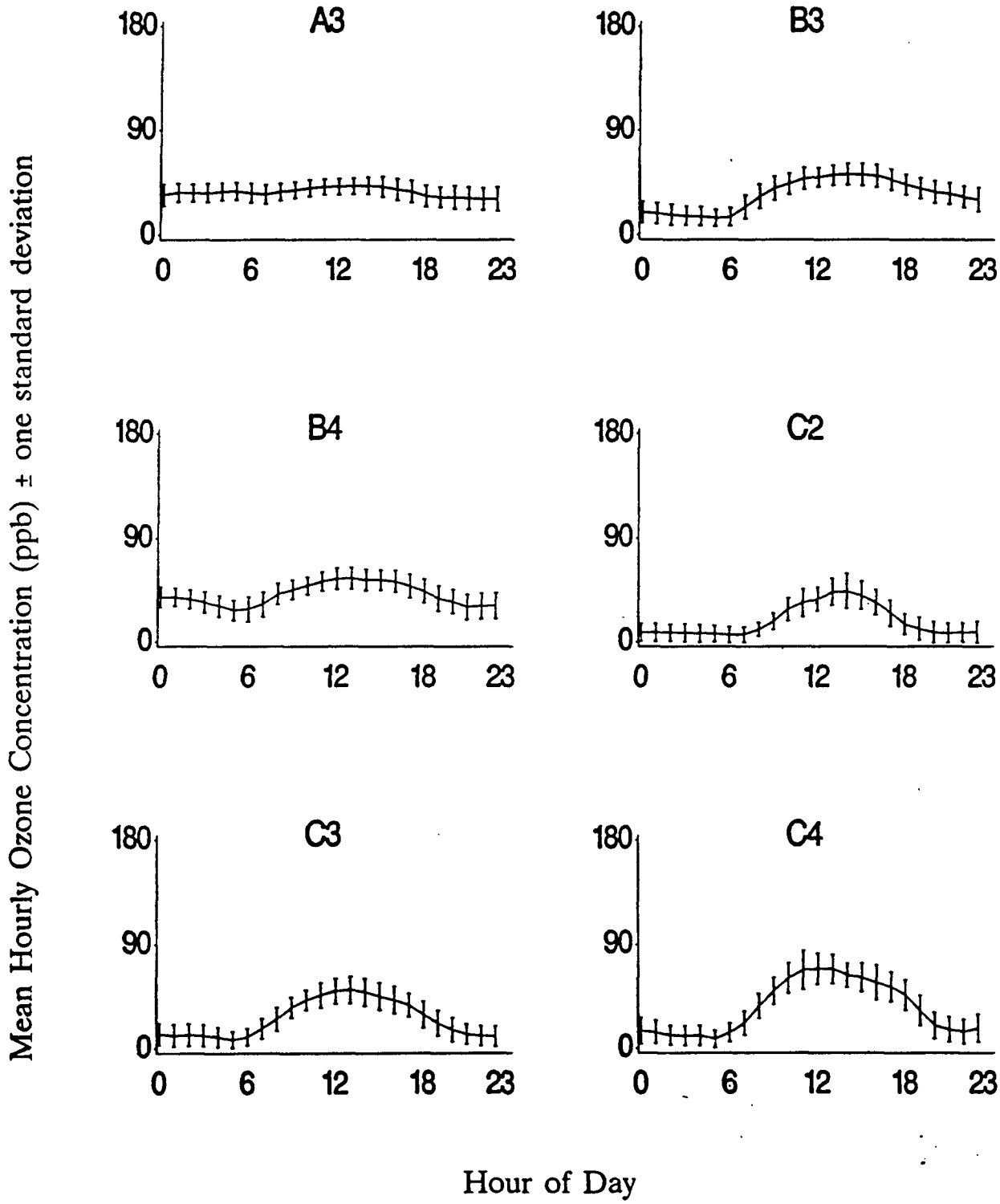
C. BY MONTH (composited over years).

Month	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
Jan	4	3	0	0	0	45	26	0	0	0	18	9	0	0	0	0	0	0
Feb	1	7	0	0	0	9	12	0	0	0	27	44	0	0	0	0	0	0
Mar	7	21	1	0	0	2	24	4	0	0	4	24	18	1	0	0	0	0
Apr	6	16	5	0	0	0	10	22	9	0	0	4	20	14	0	0	0	0
May	6	11	7	0	0	0	6	14	17	1	0	1	15	26	0	0	0	0
Jun	4	8	5	0	0	0	5	11	21	4	0	0	16	29	0	0	1	0
Jul	4	7	9	0	0	0	1	16	13	5	0	0	9	38	0	0	2	0
Aug	3	7	1	0	0	0	0	9	21	2	0	0	17	41	0	0	1	0
Sep	0	5	0	0	0	2	21	5	1	0	0	28	31	7	0	0	1	0
Oct	2	2	0	0	0	16	10	0	0	0	21	49	1	0	0	0	0	0
Nov	0	1	0	0	0	31	8	0	0	0	47	12	0	0	0	0	0	0
Dec	3	0	0	0	0	72	3	0	0	0	25	0	0	0	0	0	0	0

1. % days with unidentified diurnal patterns in hourly ozone concentration (see Böhm et al. 1990).
2. Pattern identifier relates to degree of diurnal variation in hourly ozone concentrations (A curves - least variation; E curves - greatest variation) and daily mean (1 curves - lowest mean; 6 curves highest mean) as described by Böhm et al (1990) and as illustrated in Figure 4C.1. Note that due to numeric rounding, the sums of percentages do not always equal 100.

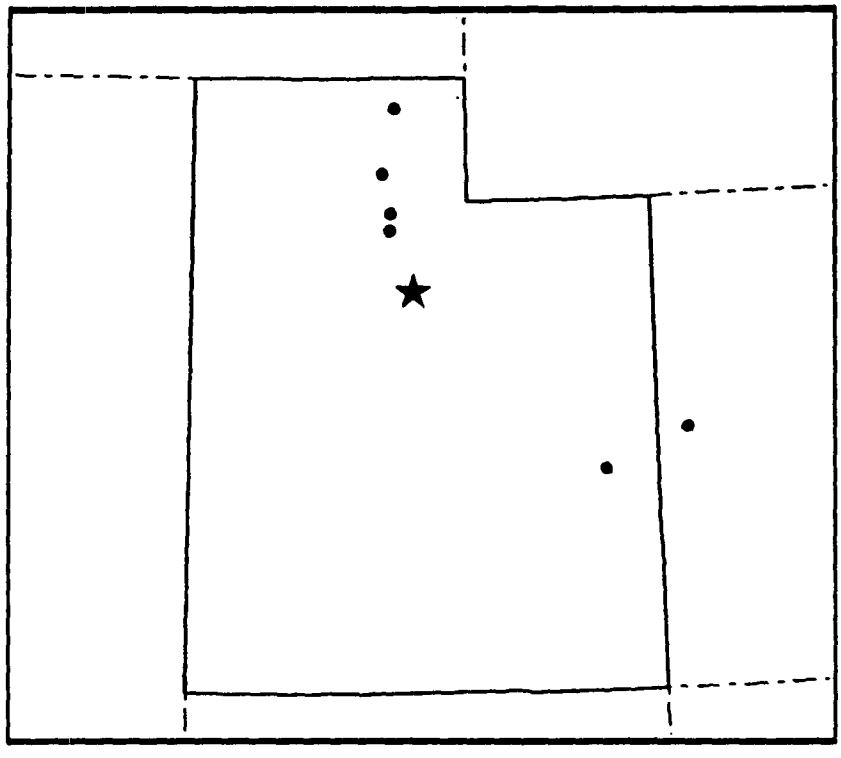
OGDEN

DOMINANT DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS (MAY - OCT)



PROVO **UTAH**

BIOGRAPHIC INFORMATION



Latitude	-	40.25° N
Longitude	-	111.66° W
Elevation (m)	-	1402
Basin Height (m)	-	1384.6
Landuse	-	City Center - Commercial
City Population	-	74,108
Basin Population	-	1,154,361
Start Summary	-	June, 1983
End Summary	-	September, 1989
Source of Data	-	AIRS (49-049-0002)

Provo

BASIC STATISTICS

A. BY YEAR (April through October).

Year	% Data Capt[1]	% Valid Days[2]	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	20	19	1	4	12	27	31.9±24	48	65	76	14	4	1	0	2
1984	28	28	3	6	13	27	31.2±22	48	61	69	12	2	0	0	0
1985	51	51	1	3	13	28	30.7±21	46	60	67	11	2	0	0	0
1986	47	47	5	7	16	30	33.2±21	49	63	70	13	2	0	0	0
1987	38	38	2	6	15	31	33.1±21	51	62	66	13	1	0	0	0
1988	44	44	2	4	12	29	31.7±22	49	62	69	13	2	0	0	0
1989	38	38	3	6	15	32	32.8±20	49	59	64	10	1	0	0	1
All Years	38	38	2	5	14	30	32.1±21	49	61	68	12	2	0	0	3

B. BY GROWING SEASON (May through October).

Year	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06[3] (ppm hr)	S08[4] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	39	39	1	4	12	27	31.9±24	48	65	76	18	6	14	4	1	0	2
1984	55	55	3	6	6	27	31.2±22	48	61	69	21	4	12	2	0	0	0
1985	93	93	1	3	12	27	30.6±22	47	60	67	32	7	11	2	0	0	0
1986	89	89	5	7	16	30	33.5±21	49	63	71	38	7	14	2	0	0	0
1987	74	74	2	6	15	31	33.0±21	51	62	66	28	2	13	1	0	0	0
1988	81	82	2	4	12	28	31.5±22	49	63	69	33	6	13	2	0	0	0
1989	74	74	3	6	15	32	32.8±20	49	60	64	23	3	10	1	0	0	1
All Years	72	72	2	5	14	29	32.1±22	49	62	68	-	-	12	2	0	0	3

C. BY MONTH [5].

Month	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06 (ppm hr)	S08[6] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
Jan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Feb	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mar	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Apr	24	24	2	6	18	34	31.9±17	45	53	59	3	1	5	0	0	0	0
May	90	90	5	9	19	37	35.4±19	51	60	64	6	1	11	1	0	0	0
Jun	86	87	6	10	19	35	36.2±21	52	64	71	8	2	16	2	0	0	0
Jul	86	85	6	9	17	32	35.6±22	52	65	73	9	3	17	3	1	0	1
Aug	99	100	3	5	13	29	32.5±22	50	63	71	8	2	14	2	0	0	1
Sep	78	79	1	2	8	21	25.3±20	40	54	60	3	1	5	1	0	0	1
Oct	55	55	0	1	3	10	17.9±18	31	45	52	1	1	2	0	0	0	0
Nov	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dec	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100. Av. period BY YEAR = 8760 hrs; BY G.S. = 4416 hrs.
2. % Valid Days = # days with 75 % of hours between 09:00 and 21:00 / (total # days) * 100 (Federal Register 1979).
3. Cumulative Index: S06 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 60 ppb (Lee et al. 1988).
4. Cumulative Index: S08 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 80 ppb (Lee et al. 1988).
5. Statistics for monthly composites over the period of record.
6. Monthly estimate of S06(08) = S06(08) * (# hours in that month) / (# valid hours).

Provo

DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS

A. BY YEAR (April through October).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	3	3	0	0	0	0	3	9	8	6	3	5	41	20	0	0	2	0
1984	3	4	0	0	0	0	5	13	5	2	0	8	29	33	0	0	0	0
1985	5	4	1	0	0	2	6	11	8	3	1	14	17	32	1	0	1	0
1986	4	6	1	0	0	1	8	10	13	4	1	6	21	30	0	0	0	0
1987	5	2	3	0	0	2	5	10	9	2	1	7	24	34	0	0	0	0
1988	5	3	0	0	0	0	3	8	10	2	1	16	23	32	0	0	1	0
1989	7	2	1	0	0	1	3	18	12	1	0	3	30	28	0	0	1	0
All Years	5	3	1	0	0	1	5	11	9	3	1	9	25	31	0	0	1	0

B. BY GROWING SEASON (May through October).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	3	3	0	0	0	0	3	9	8	6	3	5	41	20	0	0	2	0
1984	3	4	0	0	0	0	5	13	5	2	0	8	29	33	0	0	0	0
1985	4	2	1	0	0	2	6	12	6	3	1	15	17	32	1	0	1	0
1986	4	5	1	0	0	1	7	10	13	5	1	7	20	31	0	0	0	0
1987	5	2	3	0	0	2	5	10	9	2	1	7	24	34	0	0	0	0
1988	5	2	0	0	0	0	4	8	9	2	1	17	22	33	0	0	1	0
1989	7	2	1	0	0	1	3	18	12	1	0	3	30	28	0	0	1	0
All Years	5	3	1	0	0	1	5	12	9	3	1	9	24	31	0	0	1	0

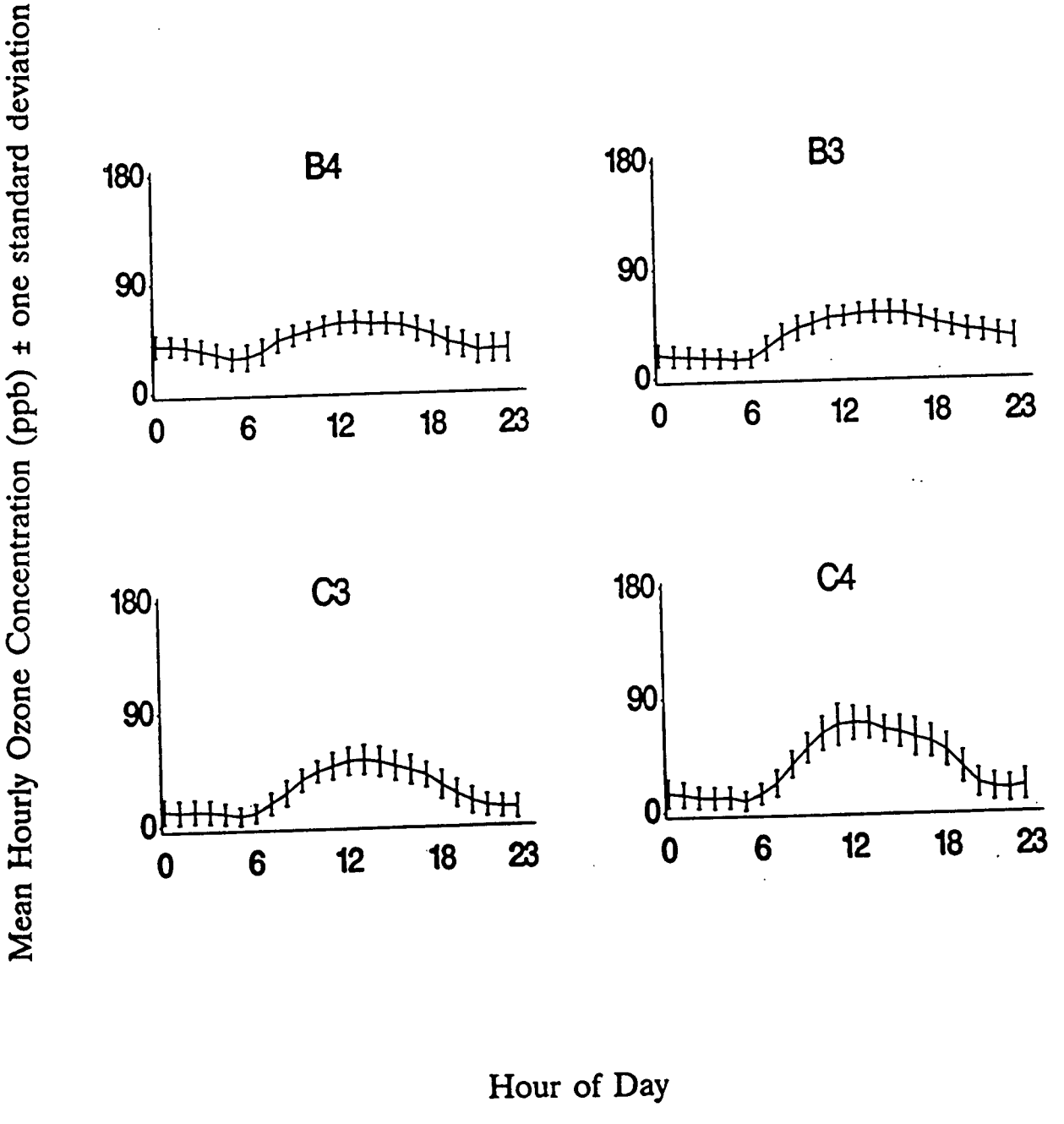
C. BY MONTH (composited over years).

Month	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
Jan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Feb	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mar	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Apr	10	26	0	0	0	0	4	4	15	0	0	0	30	22	0	0	0	0
May	5	2	3	0	0	0	4	17	15	2	0	0	22	34	0	0	0	0
Jun	4	4	2	0	0	0	3	14	11	4	0	0	15	45	0	0	1	0
Jul	6	3	0	0	0	0	6	16	8	5	0	1	17	43	1	0	1	0
Aug	4	1	0	0	0	0	4	10	12	4	1	2	32	34	0	0	0	0
Sep	5	5	0	0	0	2	8	5	2	1	1	24	44	7	0	0	2	0
Oct	3	0	0	0	0	6	9	3	0	0	8	69	5	0	0	0	0	0
Nov	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dec	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

1. % days with unidentified diurnal patterns in hourly ozone concentration (see Böhm et al. 1990).
2. Pattern identifier relates to degree of diurnal variation in hourly ozone concentrations (A curves - least variation; E curves - greatest variation) and daily mean (1 curves - lowest mean; 6 curves highest mean) as described by Böhm et al (1990) and as illustrated in Figure 4C.1. Note that due to numeric rounding, the sums of percentages do not always equal 100.

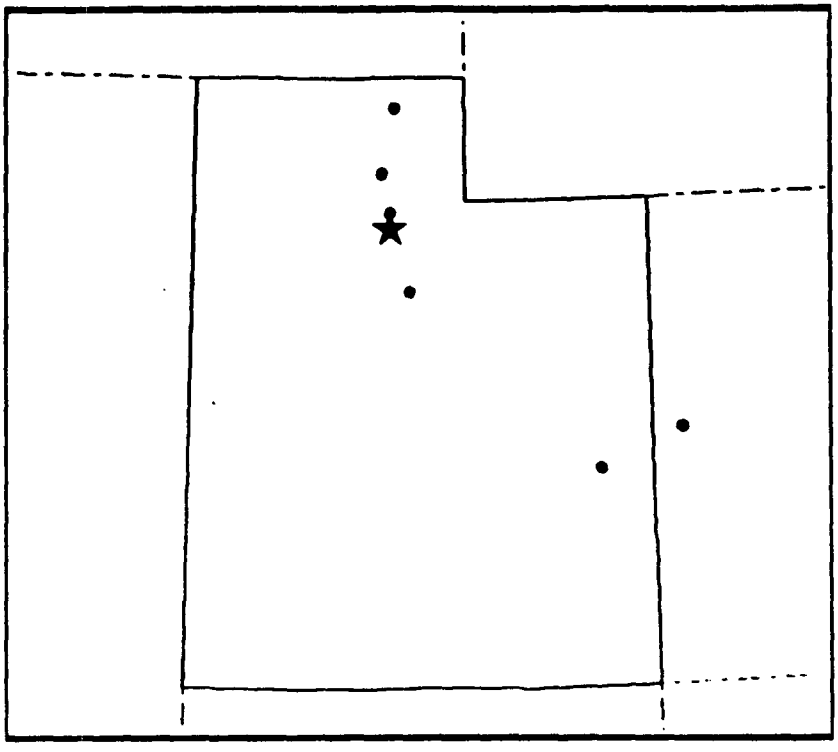
PROVO

DOMINANT DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS (MAY - OCT)



SALT LAKE CITY UTAH

BIOGRAPHIC INFORMATION



Latitude	-	40.76° N
Longitude	-	111.89° W
Elevation (m)	-	1305
Basin Height (m)	-	1230.8
Landuse	-	City Center - Commercial
City Population	-	163,697
Basin Population	-	1,154,361
Start Summary	-	January, 1980
End Summary	-	September, 1989
Source of Data	-	AIRS (49-035-3001)

Salt Lake City

BASIC STATISTICS

A. BY YEAR.

Year	% Data Capt[1]	% Valid Days[2]	5	10	25	50	Mean±std	75	90	95	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
			Percentiles and Arithmetic Mean (ppb)												
1980	98	97	0	2	5	24	29.1±25	48	64	73	13	3	1	0	15
1981	99	98	2	2	5	15	21.0±19	33	48	57	4	1	0	0	3
1982	75	75	1	2	8	23	25.5±20	39	52	61	6	1	0	0	4
1983	47	47	2	4	13	27	28.3±20	40	52	61	6	2	1	0	4
1984	45	46	2	3	12	26	28.6±21	42	55	66	7	2	1	0	3
1985	69	69	2	2	6	20	24.9±22	39	53	64	7	2	1	0	10
1986	95	95	1	1	4	16	21.0±20	33	48	58	5	1	0	0	4
1987	94	95	1	2	6	18	22.4±19	35	50	58	5	1	0	0	1
1988	65	66	2	2	4	16	21.2±20	32	50	62	6	1	0	0	2
1989	65	65	0	1	7	25	25.5±20	40	51	59	5	1	0	0	3
All Years	75	75	1	2	6	20	24.4±21	38	53	63	6	2	0	0	49

B. BY GROWING SEASON (May through October).

Year	% Data Capt	% Valid Days	5	10	25	50	Mean±std	75	90	95	S06[3] (ppm hr)	S08[4] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
			Percentiles and Arithmetic Mean (ppb)														
1980	98	97	1	3	12	35	37.0±27	56	72	82	71	25	21	6	2	1	15
1981	99	99	2	3	9	25	28.0±21	42	56	65	25	9	8	2	0	0	3
1982	91	91	2	4	12	28	29.9±22	45	57	67	27	9	9	2	1	0	4
1983	84	83	2	4	13	26	28.6±20	40	53	62	19	8	6	2	1	0	4
1984	85	86	1	3	3	26	28.8±21	42	56	68	22	9	8	2	1	0	3
1985	98	98	2	3	11	28	29.8±23	44	58	69	31	12	9	3	1	0	10
1986	91	92	3	4	11	27	29.5±21	43	58	68	28	10	9	2	1	0	4
1987	95	97	2	3	9	26	28.7±21	45	57	65	24	6	8	1	0	0	1
1988	56	58	3	4	12	30	32.5±23	48	63	72	24	8	13	3	1	0	2
1989	70	71	2	4	15	35	32.5±20	46	57	65	19	4	8	1	0	0	3
All Years	87	87	2	4	11	28	30.4±22	45	59	70	-	-	10	3	1	0	49

C. BY MONTH [5].

Month	% Data Capt	% Valid Days	5	10	25	50	Mean±std	75	90	95	S06 (ppm hr)	S08[6] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
			Percentiles and Arithmetic Mean (ppb)														
Jan	85	83	0	1	2	4	9.3±10	15	26	30	1	0	0	0	0	0	0
Feb	98	97	0	1	3	10	15.1±14	25	35	42	1	1	1	0	0	0	0
Mar	92	93	1	2	6	20	21.1±16	33	42	48	1	1	1	0	0	0	0
Apr	79	77	1	3	13	30	28.5±18	42	51	59	3	1	5	0	0	0	0
May	91	92	3	6	16	33	32.9±20	46	58	65	5	1	9	1	0	0	2
Jun	95	96	4	8	18	34	35.6±22	49	63	75	7	3	13	4	1	0	10
Jul	90	89	5	8	18	35	37.3±25	51	69	82	10	5	17	6	2	1	26
Aug	94	95	3	5	15	31	33.4±23	48	62	73	7	3	12	3	1	0	10
Sep	99	100	1	2	6	19	23.0±19	36	49	57	3	1	4	1	0	0	1
Oct	69	69	1	2	3	8	15.1±16	25	38	45	1	1	2	0	0	0	0
Nov	99	99	1	1	3	7	11.5±11	19	27	31	1	0	0	0	0	0	0
Dec	99	99	0	1	2	4	7.7±08	12	21	26	0	0	0	0	0	0	0

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100. Av. period BY YEAR = 8760 hrs; BY G.S. = 4416 hrs.
2. % Valid Days = # days with 75 % of hours between 09:00 and 21:00 / (total # days) * 100 (Federal Register 1979).
3. Cumulative Index S06 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 60 ppb (Lee et al. 1988).
4. Cumulative Index S08 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 80 ppb (Lee et al. 1988).
5. Statistics for monthly composites over the period of record.
6. Monthly estimate of S06(08) = S06(08) * (# hours in that month) / (# valid hours).

Salt Lake City

DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS

A. BY YEAR.

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	5	6	5	3	0	16	7	4	7	5	8	12	8	17	0	0	2	1
1981	5	3	1	0	0	21	11	6	3	1	10	16	17	10	0	0	1	0
1982	3	4	1	0	0	9	12	7	8	2	11	10	19	14	0	0	3	0
1983	5	5	0	0	0	2	15	11	5	1	1	9	31	17	0	0	4	0
1984	2	3	1	0	0	1	11	12	6	1	3	14	27	18	0	0	3	0
1985	4	3	0	0	0	20	8	8	10	3	9	8	16	10	0	0	4	0
1986	4	6	1	0	0	21	12	3	5	1	15	11	12	10	0	0	2	0
1987	4	6	1	0	0	20	12	8	5	3	10	11	14	9	0	0	1	0
1988	3	1	1	0	0	25	9	5	6	3	17	13	6	11	0	0	2	0
1989	5	10	1	0	0	11	7	12	10	1	8	12	17	8	0	0	2	0
All Years	4	5	1	0	0	16	10	7	6	2	10	12	15	12	0	0	2	0

B. BY GROWING SEASON (May through October).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	3	4	4	5	0	3	3	4	12	8	4	10	11	26	1	0	5	1
1981	5	3	1	0	0	3	10	11	5	2	5	14	23	19	0	0	3	0
1982	4	1	1	0	0	6	9	10	13	4	3	8	20	21	0	0	4	0
1983	5	5	0	0	0	2	13	11	6	1	1	8	30	19	0	0	4	0
1984	3	3	1	0	0	1	11	12	6	1	3	14	28	19	0	0	3	0
1985	4	2	1	0	0	4	9	12	12	4	6	12	18	14	0	0	6	0
1986	4	8	1	0	0	2	13	6	10	2	6	11	17	20	0	0	4	0
1987	2	6	2	0	0	5	7	12	8	4	4	12	23	15	0	0	2	0
1988	3	2	2	0	0	1	3	12	14	7	6	8	12	27	0	0	5	0
1989	6	12	3	0	0	2	4	17	13	3	0	6	23	13	0	0	4	0
All Years	4	5	2	1	0	3	9	10	10	3	4	11	21	19	0	0	4	0

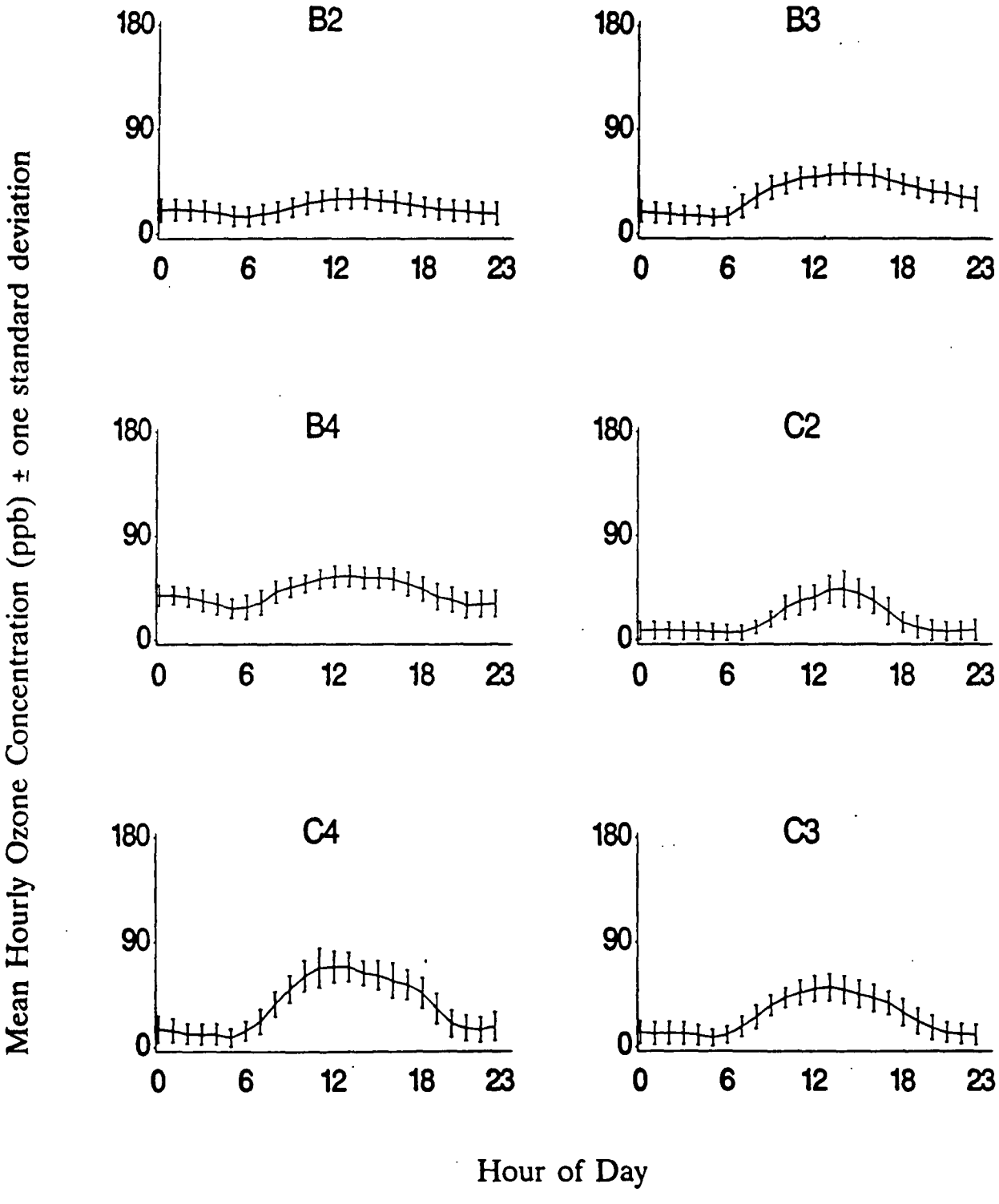
C. BY MONTH (composited over years).

Month	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
Jan	1	1	0	0	0	54	8	0	0	0	32	5	0	0	0	0	0	0
Feb	5	6	0	0	0	20	12	1	0	0	30	29	1	1	0	0	0	0
Mar	6	11	3	0	0	7	23	3	1	0	12	26	12	2	0	0	0	0
Apr	5	10	4	1	0	0	14	9	8	1	1	12	32	8	0	0	0	0
May	4	7	3	0	0	1	10	17	14	4	0	2	21	18	0	0	1	0
Jun	4	4	1	1	0	0	3	14	14	6	0	1	19	31	0	0	4	0
Jul	5	4	2	2	0	0	6	13	12	8	0	1	13	29	0	0	9	1
Aug	4	5	2	0	0	0	4	10	13	3	1	1	30	25	0	0	6	0
Sep	4	4	0	0	0	5	17	3	1	0	3	28	32	5	0	0	2	0
Oct	3	2	0	0	0	15	12	0	0	0	28	40	3	0	0	0	1	0
Nov	5	1	0	0	0	55	11	1	0	0	24	8	0	0	0	0	0	0
Dec	4	1	0	0	0	77	7	0	0	0	14	1	0	0	0	0	0	0

1. % days with unidentified diurnal patterns in hourly ozone concentration (see Böhm et al. 1990).
2. Pattern identifier relates to degree of diurnal variation in hourly ozone concentrations (A curves - least variation; E curves - greatest variation) and daily mean (1 curves - lowest mean; 6 curves highest mean) as described by Böhm et al (1990) and as illustrated in Figure 4C.1. Note that due to numeric rounding, the sums of percentages do not always equal 100.

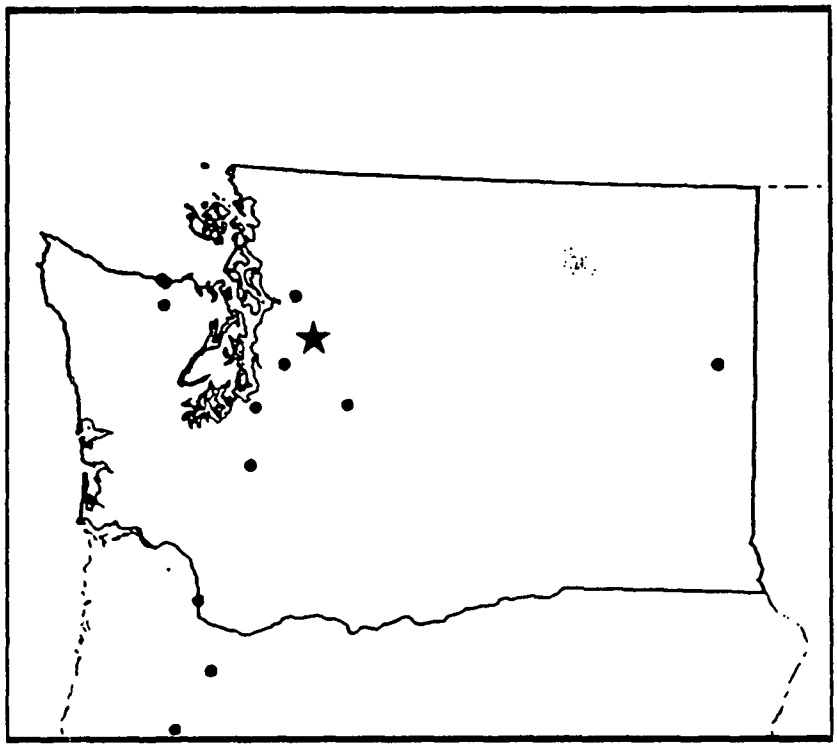
SALT LAKE CITY

DOMINANT DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS (MAY - OCT)



CEDAR RIVER **WASHINGTON**

BIOGRAPHIC INFORMATION



Latitude	-	46.39° N
Longitude	-	121.97° W
Elevation (m)	-	210
Basin Height (m)	-	5.5
Landuse	-	Rural
City Population	-	Not In A City
Basin Population	-	2,240,288
Start Summary	-	April, 1986
End Summary	-	September, 1988
Source of Data	-	EPRI

Cedar River

BASIC STATISTICS

A. BY YEAR.

Year	% Data Capt[1]	% Valid Days[2]	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	65	66	10	13	19	27	29.5±15	38	48	55	4	1	0	0	2
1987	83	83	10	13	20	27	28.9±14	35	46	57	4	1	0	0	1
1988	38	38	11	14	19	29	32.2±19	40	55	66	7	2	1	0	3
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	62	62	10	13	19	27	29.8±16	37	48	58	5	1	0	0	6

B. BY GROWING SEASON (May through October).

Year	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06[3] (ppm hr)	S08[4]	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	88	89	11	14	20	29	31.0±16	38	50	60	16	5	5	1	0	0	2
1987	90	90	11	13	19	28	31.2±17	39	53	64	20	6	7	1	0	0	1
1988	68	67	11	13	19	28	32.1±19	40	55	66	19	8	8	3	1	0	3
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	82	82	11	14	19	28	31.4±17	39	53	64	-	-	7	2	0	0	6

C. BY MONTH [5].

Month	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06 (ppm hr)	S08[6]	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
Jan	89	90	12	15	21	25	24.1±06	28	31	33	0	0	0	0	0	0	0
Feb	54	52	8	12	19	24	22.7±07	28	30	32	0	0	0	0	0	0	0
Mar	97	97	14	15	21	26	26.3±08	32	37	40	0	0	0	0	0	0	0
Apr	98	99	16	20	27	36	35.7±13	44	49	53	2	1	2	1	0	0	0
May	69	70	15	19	26	35	36.2±15	45	53	62	4	1	6	1	0	0	1
Jun	87	88	14	16	22	31	34.4±18	41	60	70	6	2	10	2	0	0	1
Jul	83	85	10	13	18	26	29.9±17	38	53	63	4	2	7	1	1	0	1
Aug	98	98	10	13	19	29	33.1±19	43	60	71	6	3	10	3	1	0	1
Sep	88	88	12	14	19	26	29.1±17	35	46	59	3	2	5	2	1	0	2
Oct	98	97	9	11	16	24	24.5±10	33	37	42	1	0	0	0	0	0	0
Nov	100	100	4	5	12	23	20.4±10	28	31	33	0	0	0	0	0	0	0
Dec	59	58	7	11	17	21	20.8±08	25	30	36	0	0	0	0	0	0	0

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100. Av. period BY YEAR = 8760 hrs; BY G.S. = 4416 hrs.
2. % Valid Days = # days with 75 % of hours between 09:00 and 21:00 / (total # days) * 100 (Federal Register 1979).
3. Cumulative Index: S06 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 60 ppb (Lee et al. 1988).
4. Cumulative Index: S08 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 80 ppb (Lee et al. 1988).
5. Statistics for monthly composites over the period of record.
6. Monthly estimate of S06(08) = S06(08) * (# hours in that month) / (# valid hours).

Cedar River

DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS

A. BY YEAR.

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	5	20	4	2	1	10	40	8	7	6	0	1	1	0	1	0	0	0
1987	5	22	0	0	0	7	41	13	4	10	0	0	1	0	0	0	0	0
1988	7	13	2	1	2	3	38	21	2	14	0	1	2	1	1	0	0	0
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	5	20	2	1	1	7	40	13	5	9	0	1	1	0	1	0	0	0

B. BY GROWING SEASON (May through October).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	6	20	3	3	2	7	39	8	7	8	0	1	2	0	1	0	0	0
1987	5	14	0	0	0	5	36	20	6	16	0	1	1	0	1	0	0	0
1988	7	9	1	1	2	4	38	23	3	15	0	1	2	1	1	0	0	0
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	6	15	1	1	1	5	37	17	6	13	0	1	2	0	1	0	0	0

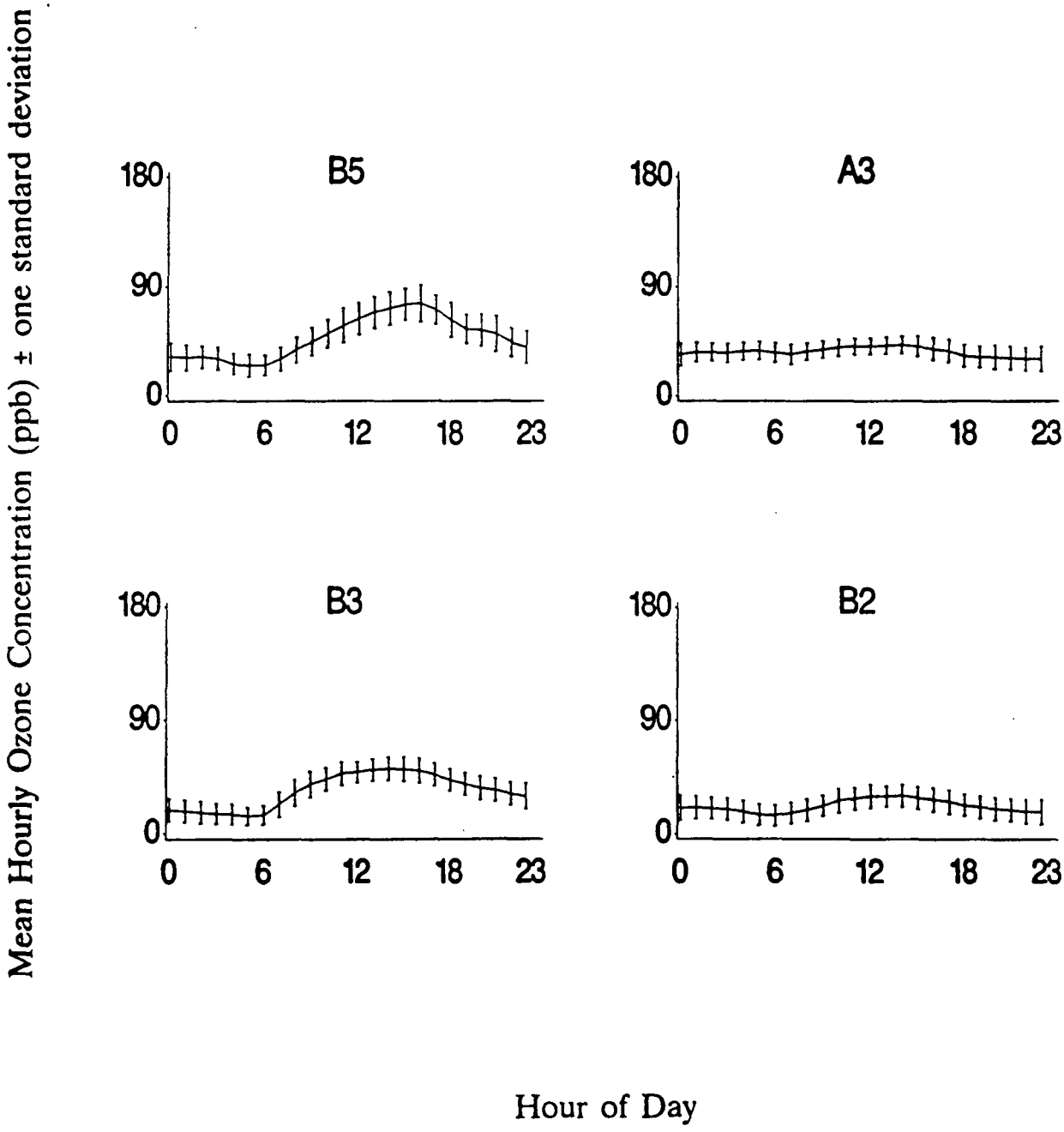
C. BY MONTH (composited over years).

Month	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
Jan	0	33	0	0	0	7	59	0	0	0	0	0	0	0	0	0	0	0
Feb	0	31	0	0	0	15	54	0	0	0	0	0	0	0	0	0	0	0
Mar	3	28	0	0	0	3	66	3	0	0	0	0	0	0	0	0	0	0
Apr	7	39	12	1	0	0	16	15	12	3	0	0	1	0	0	0	0	0
May	13	28	4	0	2	0	13	26	13	11	0	0	2	0	0	0	0	0
Jun	5	13	2	2	1	2	30	18	6	19	0	0	2	1	2	0	0	0
Jul	6	9	0	0	1	6	41	22	4	12	0	1	3	0	0	0	0	0
Aug	3	3	1	3	1	7	32	20	8	20	0	0	2	0	1	0	0	0
Sep	4	14	0	0	1	3	59	8	1	10	0	1	0	0	1	0	0	0
Oct	7	30	0	0	0	15	49	2	0	0	0	4	0	0	0	0	0	0
Nov	4	22	0	0	0	29	47	0	0	0	0	0	2	0	0	0	0	0
Dec	0	17	0	0	0	17	67	0	0	0	0	0	0	0	0	0	0	0

1. % days with unidentified diurnal patterns in hourly ozone concentration (see Böhm et al. 1990).
2. Pattern identifier relates to degree of diurnal variation in hourly ozone concentrations (A curves - least variation; E curves - greatest variation) and daily mean (1 curves - lowest mean; 6 curves highest mean) as described by Böhm et al (1990) and as illustrated in Figure 4C.1. Note that due to numeric rounding, the sums of percentages do not always equal 100.

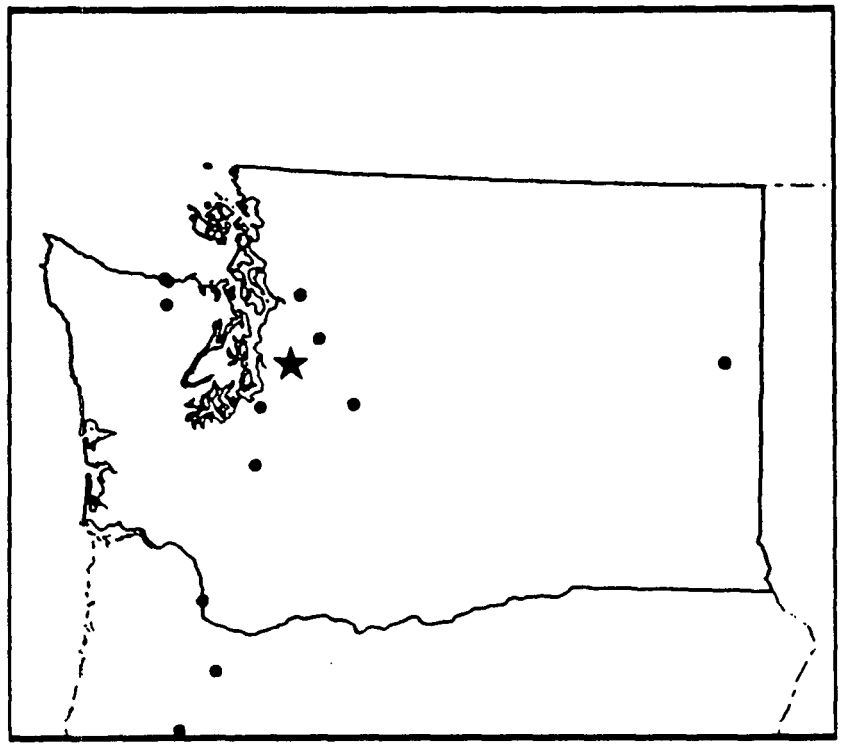
CEDAR RIVER

DOMINANT DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS (MAY - OCT)



KING COUNTY WASHINGTON

BIOGRAPHIC INFORMATION



Latitude	-	47.55° N
Longitude	-	122.05° W
Elevation (m)	-	22
Basin Height (m)	-	5.5
Landuse	-	Rural
City Population	-	Not In A City
Basin Population	-	2,240,288
Start Summary	-	January, 1980
End Summary	-	December, 1989
Source of Data	-	AIRS (53-033-0010)

King County

BASIC STATISTICS

A. BY YEAR.

Year	% Data Capt[1]	% Valid Days[2]	5	10	25	50	Mean±std	75	90	95	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
			Percentiles and Arithmetic Mean (ppb)												
1980	68	73	0	0	0	10	11.7±14	20	30	40	1	0	0	0	0
1981	63	67	0	0	0	10	11.7±16	20	30	40	2	1	0	0	2
1982	87	93	0	0	0	10	11.9±15	20	30	40	2	0	0	0	1
1983	88	91	0	0	0	10	12.4±15	20	30	40	1	0	0	0	0
1984	92	93	0	0	0	10	13.5±14	20	30	40	1	0	0	0	0
1985	94	95	0	0	0	10	14.4±16	20	40	40	2	1	0	0	1
1986	77	78	0	0	0	10	15.2±17	20	40	50	3	1	0	0	1
1987	50	50	0	0	0	10	16.5±18	30	40	50	3	1	0	0	0
1988	56	57	0	0	0	10	16.3±17	30	40	50	2	0	0	0	1
1989	63	66	0	0	1	9	13.4±15	20	38	43	1	0	0	0	0
All Years	74	76	0	0	0	10	13.5±16	20	30	40	2	0	0	0	6

B. BY GROWING SEASON (May through October).

Year	% Data Capt	% Valid Days	5	10	25	50	Mean±std	75	90	95	S06[3] (ppm hr)	S08[4] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
			Percentiles and Arithmetic Mean (ppb)														
1980	78	84	0	0	0	10	12.2±15	20	30	40	4	1	1	0	0	0	0
1981	95	99	0	0	0	10	13.8±17	20	40	50	11	5	3	1	0	0	2
1982	94	100	0	0	0	10	13.0±16	20	40	50	8	2	3	0	0	0	1
1983	87	91	0	0	0	10	14.1±17	20	40	50	7	3	2	1	0	0	0
1984	93	93	0	0	0	10	15.5±16	25	40	40	6	1	2	0	0	0	0
1985	90	91	0	0	0	20	18.4±19	30	40	50	13	4	4	1	0	0	1
1986	93	93	0	0	0	10	16.1±19	20	40	50	14	6	4	1	0	0	1
1987	83	83	0	0	0	10	16.1±18	30	40	50	10	2	4	1	0	0	0
1988	96	96	0	0	0	10	15.6±17	20	40	50	8	3	3	1	0	0	1
1989	89	94	0	0	1	10	14.3±15	21	39	44	4	1	1	0	0	0	0
All Years	90	93	0	0	0	10	14.9±17	20	40	50	-	-	3	1	0	0	6

C. BY MONTH [5].

Month	% Data Capt	% Valid Days	5	10	25	50	Mean±std	75	90	95	S06 (ppm hr)	S08[6] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
			Percentiles and Arithmetic Mean (ppb)														
Jan	83	86	0	0	0	0	7.1±10	10	20	30	0	0	0	0	0	0	0
Feb	86	89	0	0	0	10	9.9±11	20	30	30	0	0	0	0	0	0	0
Mar	93	97	0	0	0	10	13.1±13	20	30	30	0	0	0	0	0	0	0
Apr	89	92	0	0	0	20	18.9±16	30	40	40	1	1	1	0	0	0	0
May	88	91	0	0	10	20	20.4±17	30	40	50	2	1	3	1	0	0	0
Jun	94	97	0	0	0	20	18.0±17	30	40	50	2	1	4	1	0	0	1
Jul	96	100	0	0	0	10	16.7±18	22	40	50	3	1	4	1	0	0	2
Aug	90	93	0	0	0	10	15.8±20	20	50	60	3	2	6	2	0	0	2
Sep	90	93	0	0	0	4	10.6±14	20	30	40	1	1	1	0	0	0	1
Oct	82	83	0	0	0	0	7.2±10	10	20	30	0	0	0	0	0	0	0
Nov	88	91	0	0	0	10	9.3±10	20	28	30	0	0	0	0	0	0	0
Dec	94	97	0	0	0	0	6.3±09	10	20	30	0	0	0	0	0	0	0

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100. Av. period BY YEAR = 8760 hrs; BY G.S. = 4416 hrs.
2. % Valid Days = # days with 75 % of hours between 09:00 and 21:00 / (total # days) * 100 (Federal Register 1979).
3. Cumulative Index S06 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 60 ppb (Lee et al. 1988).
4. Cumulative Index S08 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 80 ppb (Lee et al. 1988).
5. Statistics for monthly composites over the period of record.
6. Monthly estimate of S06(08) = S06(08) * (# hours in that month) / (# valid hours).

King County

DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS

A. BY YEAR.

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	5	2	0	0	0	61	17	0	0	0	17	2	0	0	0	0	0	0
1981	3	0	0	0	0	49	11	0	0	0	13	15	8	1	0	0	2	0
1982	1	1	0	0	0	54	11	0	0	0	12	12	10	0	0	0	0	0
1983	2	1	0	0	0	45	12	0	0	0	15	15	9	1	0	0	1	0
1984	4	2	0	0	0	39	20	1	0	0	15	13	10	1	0	0	0	0
1985	3	2	0	0	0	33	22	1	0	0	15	11	13	2	0	0	2	0
1986	3	4	0	0	0	31	16	1	0	0	15	15	11	5	0	0	1	0
1987	5	0	0	0	0	24	14	2	1	0	14	19	20	5	0	0	1	0
1988	5	3	0	0	0	31	14	1	0	0	7	22	20	1	0	0	2	0
1989	2	0	0	0	0	42	11	1	0	0	13	19	12	1	0	0	1	0
All Years	3	2	0	0	0	39	15	1	0	0	14	15	12	2	0	0	1	0

B. BY GROWING SEASON (May through October).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	6	0	0	0	0	67	7	0	0	0	20	7	0	0	0	0	0	0
1981	4	1	0	0	0	40	11	1	0	0	15	19	10	2	0	0	2	0
1982	0	0	0	0	0	46	9	0	0	0	17	18	10	0	0	0	0	0
1983	3	1	0	0	0	31	10	1	0	0	17	21	14	3	0	0	1	0
1984	5	1	0	0	0	23	16	1	0	0	18	20	19	2	0	0	0	0
1985	4	1	0	0	0	14	20	2	0	0	13	15	26	5	0	0	3	0
1986	3	1	0	0	0	27	16	1	0	0	15	14	17	7	0	0	2	0
1987	5	0	0	0	0	26	9	2	1	0	15	16	23	6	0	0	1	0
1988	5	1	0	0	0	33	10	1	0	0	8	23	22	1	0	0	2	0
1989	1	0	0	0	0	29	12	1	0	0	17	24	15	1	0	0	1	0
All Years	4	1	0	0	0	30	13	1	0	0	15	19	17	3	0	0	2	0

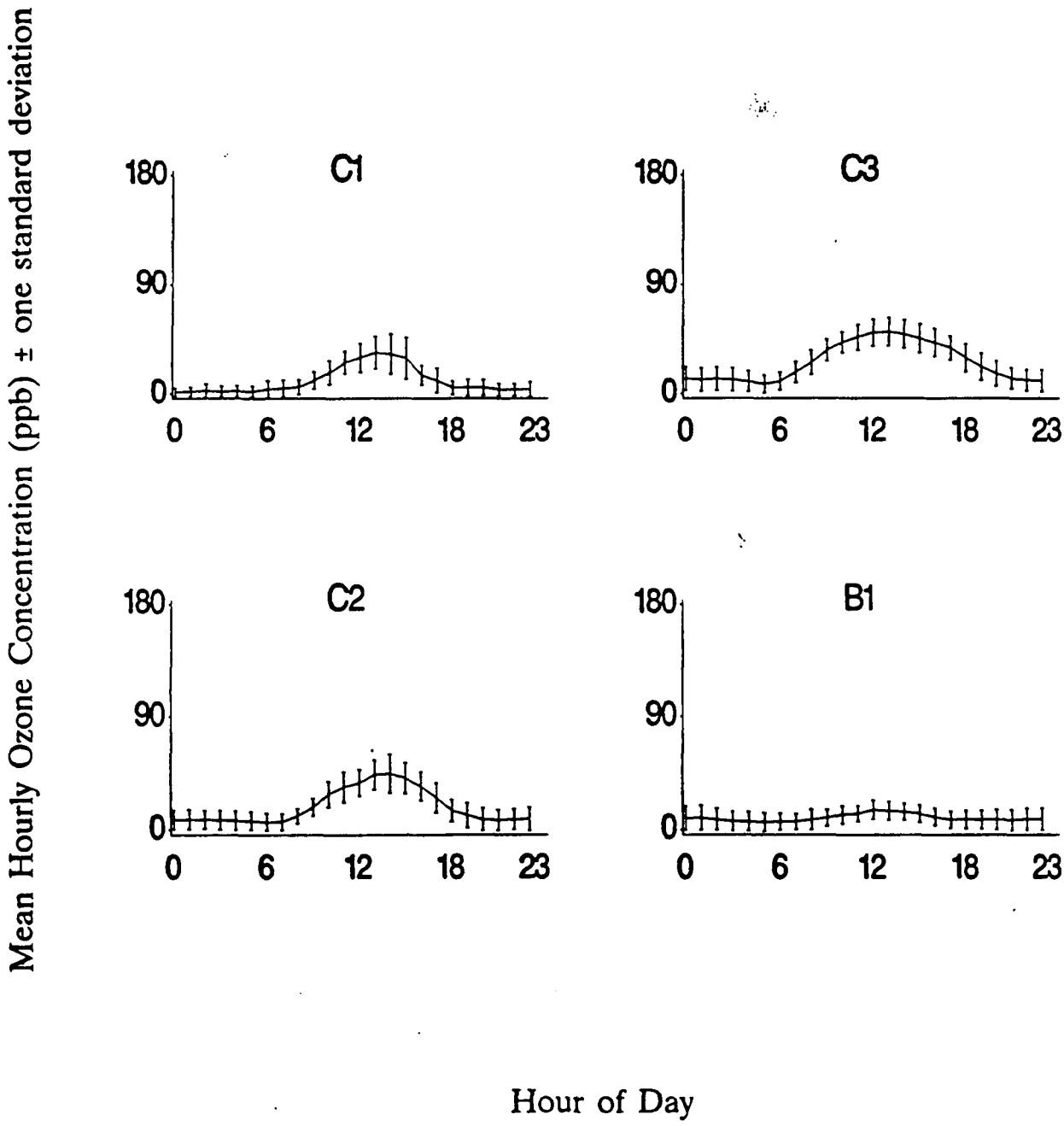
C. BY MONTH (composited over years).

Month	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
Jan	0	0	0	0	0	83	13	0	0	0	4	0	0	0	0	0	0	0
Feb	3	2	0	0	0	64	16	0	0	0	17	2	0	0	0	0	0	0
Mar	4	4	0	0	0	33	19	0	1	0	28	13	1	0	0	0	0	0
Apr	5	9	0	0	0	9	31	1	0	0	11	25	13	0	0	0	0	0
May	7	4	0	0	0	9	27	3	0	0	6	17	27	5	0	0	2	0
Jun	4	0	0	0	0	21	24	1	0	0	4	14	26	6	0	0	2	0
Jul	6	0	0	0	0	25	11	0	0	0	5	19	33	5	0	0	2	0
Aug	1	0	0	0	0	21	2	0	0	0	13	37	19	3	0	0	3	0
Sep	2	0	0	0	0	34	4	0	0	0	37	21	1	0	0	0	1	0
Oct	1	0	0	0	0	66	9	0	0	0	23	3	0	0	0	0	0	0
Nov	1	1	0	0	0	71	22	0	0	0	6	0	0	0	0	0	0	0
Dec	1	0	0	0	0	82	12	0	0	0	6	0	0	0	0	0	0	0

1. % days with unidentified diurnal patterns in hourly ozone concentration (see Böhm et al. 1990).
2. Pattern identifier relates to degree of diurnal variation in hourly ozone concentrations (A curves - least variation; E curves - greatest variation) and daily mean (1 curves - lowest mean; 6 curves highest mean) as described by Böhm et al (1990) and as illustrated in Figure 4C.1. Note that due to numeric rounding, the sums of percentages do not always equal 100.

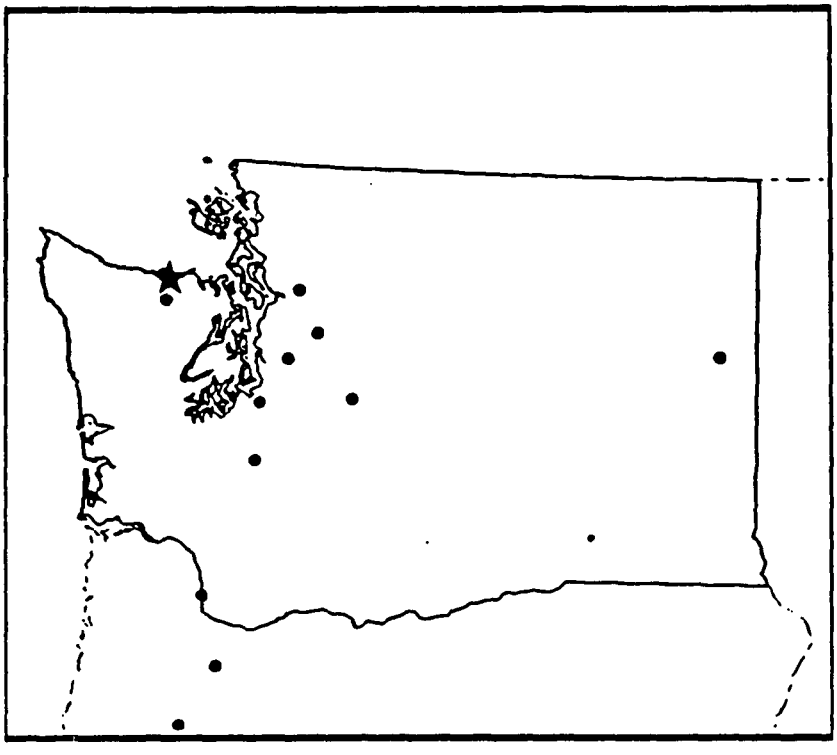
KING COUNTY

DOMINANT DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS (MAY - OCT)



OLYMPIC NATIONAL PARK WASHINGTON

BIOGRAPHIC INFORMATION



Latitude	-	48.10° N
Longitude	-	123.39° W
Elevation (m)	-	125
Basin Height (m)	-	0
Landuse	-	Suburban - Residential
City Population	-	Not In A City
Basin Population	-	529,337
Start Summary	-	August, 1985
End Summary	-	July, 1989
Source of Data	-	National Park Service

Olympic National Park (NPS)

BASIC STATISTICS

A. BY YEAR.

Year	% Data Capt[1]	% Valid Days[2]	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	38	38	0	0	1	2	1.7±01	2	3	3	0	0	0	0	0
1986	8	8	0	0	1	2	1.8±01	3	3	4	0	0	0	0	0
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	19	18	0	0	4	12	12.0±09	19	24	26	0	0	0	0	0
All Years	22	21	0	0	1	2	4.8±07	4	16	21	0	0	0	0	0

B. BY GROWING SEASON (May through October).

Year	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06[3] (ppm hr)	S08[4] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	42	42	0	1	1	2	1.9±01	3	3	4	0	0	0	0	0	0	0
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	11	7	3	4	9	17	16.4±08	23	27	30	0	0	0	0	0	0	0
All Years	26	25	0	1	1	2	4.8±07	3	17	23	-	-	0	0	0	0	0

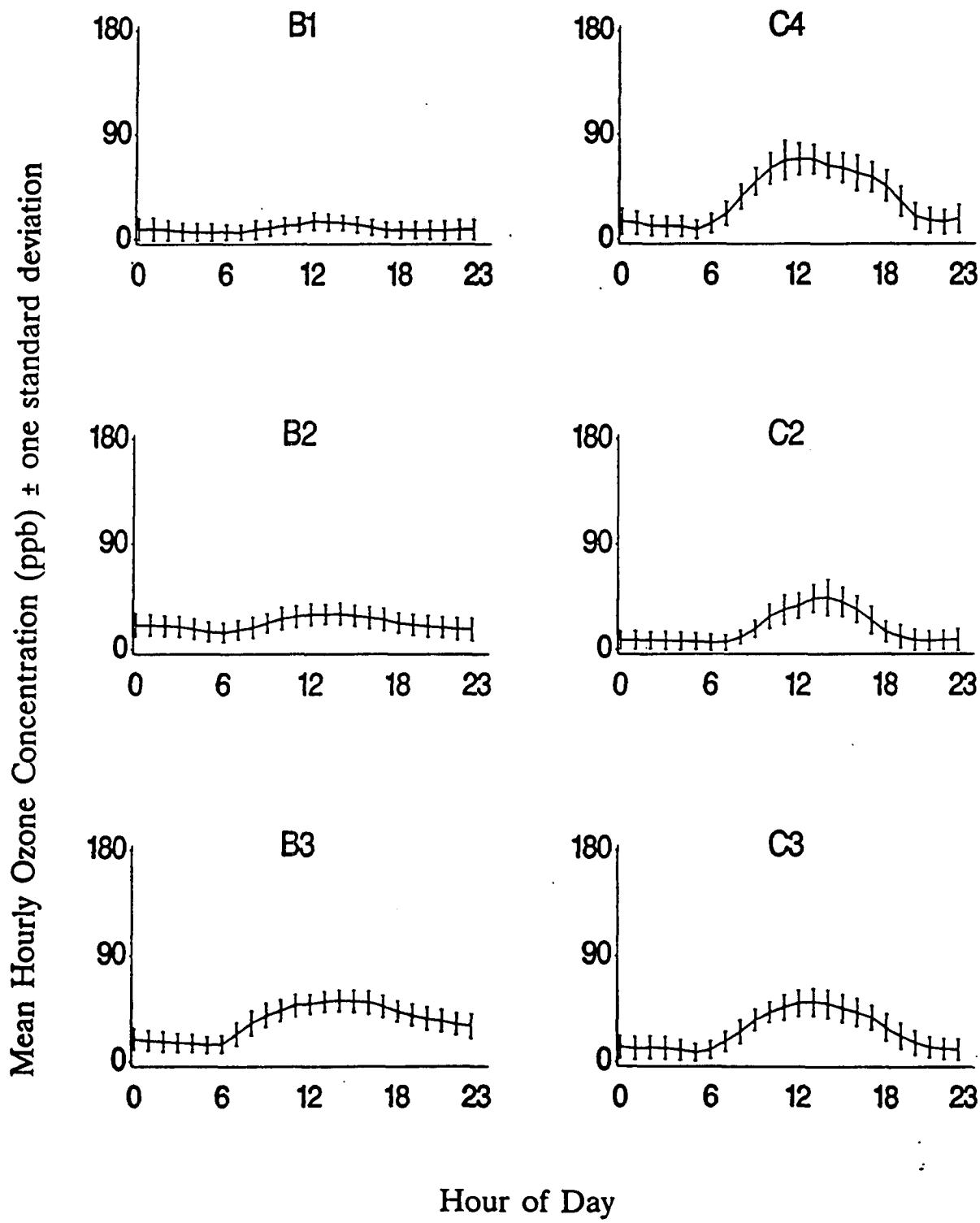
C. BY MONTH [5].

Month	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06 (ppm hr)	S08[6] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
Jan	98	100	0	0	1	2	5.1±06	7	16	20	0	0	0	0	0	0	0
Feb	74	75	0	1	8	13	13.5±08	20	24	26	0	0	0	0	0	0	0
Mar	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Apr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
May	14	3	4	6	12	23	20.6±10	29	33	34	0	0	0	0	0	0	0
Jun	35	30	4	6	12	19	17.1±07	23	26	28	0	0	0	0	0	0	0
Jul	16	10	0	2	5	12	11.1±07	16	19	20	0	0	0	0	0	0	0
Aug	56	58	1	1	2	3	2.7±01	3	4	4	0	0	0	0	0	0	0
Sep	99	100	0	1	1	2	1.7±01	2	3	3	0	0	0	0	0	0	0
Oct	99	97	0	0	1	2	1.6±01	2	3	3	0	0	0	0	0	0	0
Nov	99	100	1	1	2	2	1.9±01	2	3	3	0	0	0	0	0	0	0
Dec	99	100	0	0	0	1	1.0±01	1	2	2	0	0	0	0	0	0	0

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100. Av. period BY YEAR = 8760 hrs; BY G.S. = 4416 hrs.
2. % Valid Days = # days with 75 % of hours between 09:00 and 21:00 / (total # days) * 100 (Federal Register 1979).
3. Cumulative Index: S06 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 60 ppb (Lee et al. 1988).
4. Cumulative Index: S08 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 80 ppb (Lee et al. 1988).
5. Statistics for monthly composites over the period of record.
6. Monthly estimate of S06(08) = S06(08) * (# hours in that month) / (# valid hours).

COLORADO SPRINGS

DOMINANT DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS (MAY - OCT)



Colorado Springs

DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS

A. BY YEAR.

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	6	5	2	0	0	19	11	12	10	3	6	15	11	6	0	0	0	0
1981	5	5	0	0	0	21	17	5	2	0	12	15	21	2	0	0	0	0
1982	8	5	0	0	0	23	15	7	1	0	11	13	18	7	0	0	0	0
1983	8	8	0	0	0	12	13	8	6	0	15	12	17	8	0	0	0	0
1984	5	8	2	0	0	15	13	10	6	0	12	11	19	6	0	0	0	0
1985	5	4	0	0	0	22	15	4	1	0	19	12	19	3	0	0	0	0
1986	6	4	0	0	0	17	13	8	3	0	20	9	23	2	0	0	0	0
1987	5	6	0	0	0	10	14	6	6	2	12	15	22	6	0	0	0	0
1988	4	4	1	0	0	15	8	11	4	1	16	11	22	6	0	0	0	0
1989	4	5	2	0	0	16	16	8	7	1	14	10	15	6	0	0	0	0
All Years	5	5	1	0	0	17	14	8	5	1	14	12	19	5	0	0	0	0

B. BY GROWING SEASON (May through October).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	5	3	4	1	0	2	5	18	18	6	1	14	18	12	0	0	0	0
1981	4	5	0	0	0	9	17	8	4	0	6	13	35	4	0	0	0	0
1982	6	1	0	0	0	17	12	11	1	0	7	11	27	13	0	0	0	0
1983	8	6	0	0	0	5	8	11	8	1	7	11	28	14	0	0	0	0
1984	3	5	3	0	0	8	11	14	10	0	2	7	31	9	0	0	0	0
1985	6	3	0	0	0	15	11	7	1	0	17	14	27	5	0	0	0	0
1986	9	5	0	0	0	6	10	14	4	1	8	9	39	4	0	0	0	0
1987	5	3	0	0	0	2	12	11	8	2	4	12	34	10	0	0	0	0
1988	2	3	3	0	0	7	6	18	7	2	8	8	31	9	0	0	0	0
1989	3	5	3	0	0	5	13	12	11	3	2	9	26	11	0	0	0	0
All Years	5	4	1	0	0	7	10	12	7	2	6	11	30	9	0	0	0	0

C. BY MONTH (composited over years).

Month	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
Jan	4	3	0	0	0	43	16	0	0	0	29	8	0	0	0	0	0	0
Feb	6	4	0	0	0	21	20	1	0	0	22	31	1	0	0	0	0	0
Mar	6	12	0	0	0	10	24	5	1	0	8	24	15	0	0	0	0	0
Apr	3	16	2	0	0	0	14	17	10	0	0	4	29	6	0	0	0	0
May	5	11	3	0	0	1	12	19	12	3	0	3	28	7	0	0	0	0
Jun	5	4	2	0	0	0	8	24	12	4	2	1	30	13	0	0	0	0
Jul	5	1	1	0	0	0	5	15	12	3	1	5	32	24	0	0	0	0
Aug	5	3	1	0	0	1	10	14	6	1	1	5	48	9	0	0	0	0
Sep	6	3	0	0	0	14	12	5	2	0	9	18	35	1	0	0	0	0
Oct	5	0	0	0	0	25	15	1	0	0	22	28	8	0	0	0	0	0
Nov	9	2	0	0	0	33	15	0	0	0	35	14	0	0	0	0	0	0
Dec	6	4	0	0	0	45	13	0	0	0	32	6	1	0	0	0	0	0

1. % days with unidentified diurnal patterns in hourly ozone concentration (see Böhm et al. 1990).
2. Pattern identifier relates to degree of diurnal variation in hourly ozone concentrations (A curves - least variation; E curves - greatest variation) and daily mean (1 curves - lowest mean; 6 curves highest mean) as described by Böhm et al (1990) and as illustrated in Figure 4C.1. Note that due to numeric rounding, the sums of percentages do not always equal 100.

Colorado Springs

BASIC STATISTICS

A. BY YEAR.

Year	% Data Capt[1]	% Valid Days[2]	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	92	96	0	5	10	25	26.4±19	40	55	60	7	0	0	0	1
1981	87	90	0	0	5	20	19.4±15	30	40	45	1	0	0	0	0
1982	91	95	0	0	5	20	20.1±16	30	40	45	1	0	0	0	0
1983	76	78	2	3	7	21	22.4±17	34	45	51	2	0	0	0	0
1984	84	87	2	3	8	23	23.8±17	36	47	53	2	0	0	0	0
1985	83	86	0	0	3	16	17.8±15	29	40	45	0	0	0	0	0
1986	95	98	0	1	5	20	20.8±17	33	44	50	1	0	0	0	0
1987	95	99	1	1	6	22	23.3±18	36	48	54	2	0	0	0	0
1988	89	92	0	0	4	20	21.9±18	37	48	53	2	0	0	0	0
1989	99	99	0	1	6	21	22.6±18	36	49	55	2	0	0	0	0
All Years	89	92	0	1	5	20	21.9±17	35	45	52	2	0	0	0	1

B. BY GROWING SEASON (May through October).

Year	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06[3] (ppm hr)	S08[4]	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	91	96	5	10	20	35	34.9±19	50	60	65	34	3	13	1	0	0	1
1981	84	88	0	0	5	25	22.6±16	35	45	50	3	0	1	0	0	0	0
1982	91	97	0	0	5	20	22.0±17	35	45	55	6	0	2	0	0	0	0
1983	74	77	3	4	10	26	26.9±18	40	51	57	9	1	4	0	0	0	0
1984	77	81	3	5	5	28	28.5±18	43	52	57	8	1	4	0	0	0	0
1985	87	91	0	0	5	19	20.4±16	32	44	49	2	1	1	0	0	0	0
1986	95	98	0	2	9	25	24.9±17	38	48	53	5	0	2	0	0	0	0
1987	95	99	0	1	10	26	27.0±19	42	53	58	11	1	4	0	0	0	0
1988	90	93	0	1	7	26	26.3±19	43	52	57	8	1	3	0	0	0	0
1989	99	99	2	3	12	30	29.1±19	44	54	59	14	1	5	0	0	0	0
All Years	88	92	0	2	10	25	26.3±18	40	51	57	-	-	4	0	0	0	1

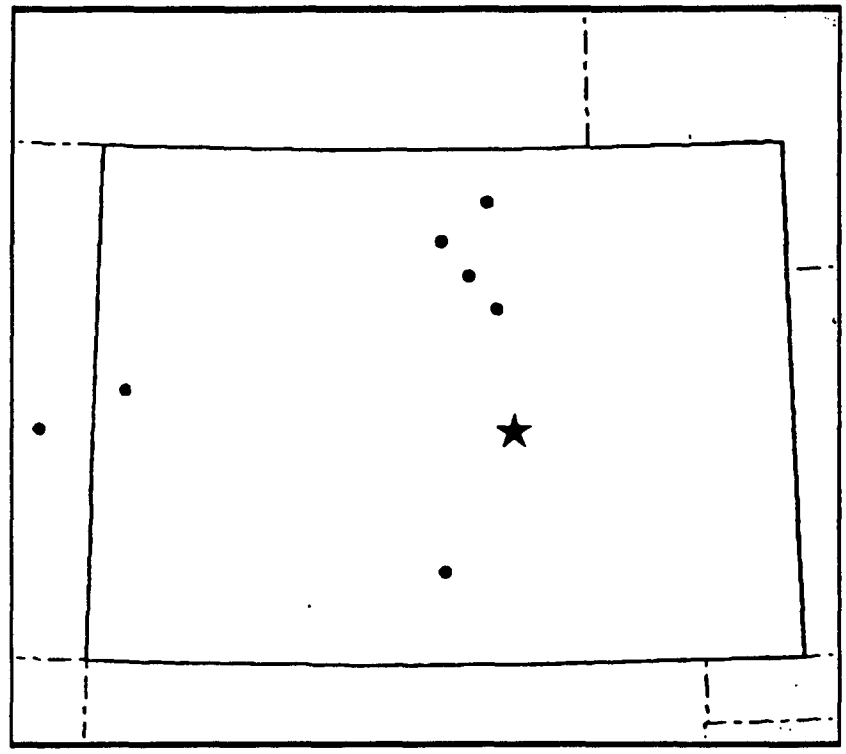
C. BY MONTH [5].

Month	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06 (ppm hr)	S08[6]	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
Jan	92	96	0	0	2	10	13.3±12	23	30	35	0	0	0	0	0	0	0
Feb	92	95	0	0	3	15	15.8±13	27	35	37	1	0	0	0	0	0	0
Mar	77	77	0	1	8	23	21.8±15	34	40	45	1	0	0	0	0	0	0
Apr	91	95	2	5	19	32	29.7±16	42	49	53	1	0	1	0	0	0	0
May	92	96	3	6	19	34	31.5±17	45	52	57	2	1	4	0	0	0	0
Jun	74	78	2	6	17	34	32.0±18	46	55	60	3	1	5	0	0	0	0
Jul	86	87	1	5	15	32	31.5±20	46	57	63	5	1	9	0	0	0	0
Aug	92	95	1	4	12	28	28.5±19	43	54	59	3	1	5	0	0	0	1
Sep	92	96	0	1	6	19	20.9±16	34	44	49	1	0	1	0	0	0	0
Oct	95	99	0	0	3	11	15.1±13	25	35	40	1	0	0	0	0	0	0
Nov	91	94	0	0	3	9	12.9±12	23	30	35	0	0	0	0	0	0	0
Dec	93	96	0	0	3	9	12.3±11	21	29	33	0	0	0	0	0	0	0

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100. Av. period BY YEAR = 8760 hrs; BY G.S. = 4416 hrs.
2. % Valid Days = # days with 75 % of hours between 09:00 and 21:00 / (total # days) * 100 (Federal Register 1979).
3. Cumulative Index: S06 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 60 ppb (Lee et al. 1988).
4. Cumulative Index: S08 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 80 ppb (Lee et al. 1988).
5. Statistics for monthly composites over the period of record.
6. Monthly estimate of S06(08) = S06(08) * (# hours in that month) / (# valid hours).

COLORADO SPRINGS COLORADO

BIOGRAPHIC INFORMATION

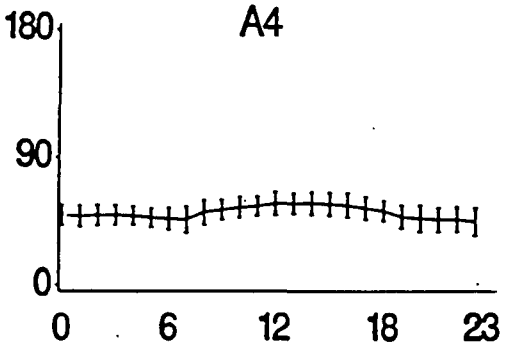


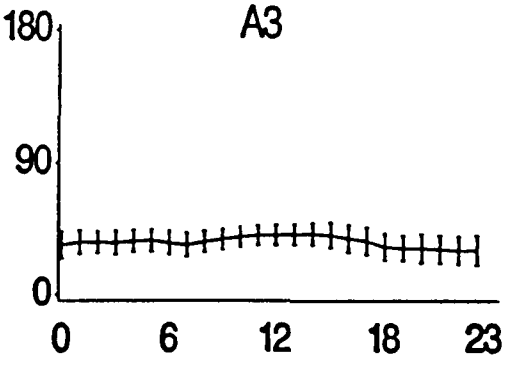
Latitude	-	38.82° N
Longitude	-	104.82° W
Elevation (m)	-	1842
Basin Height (m)	-	1842
Landuse	-	City Center - Commercial
City Population	-	214,821
Basin Population	-	522,361
Start Summary	-	January, 1980
End Summary	-	December, 1989
Source of Data	-	AIRS (08-041-0004)

COLORADO NATIONAL MONUMENT

DOMINANT DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS (MAY - OCT)

Mean Hourly Ozone Concentration (ppb) ± one standard deviation





Hour of Day

Colorado National Monument

DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS

A. BY YEAR.

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	4	68	14	0	0	0	18	0	0	0	0	0	0	0	0	0	0	0
1985	2	49	44	0	0	0	4	1	2	0	0	0	0	0	0	0	0	0
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	0	80	11	0	0	0	8	0	1	0	0	0	0	0	0	0	0	0
1989	0	80	18	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
All Years	1	61	32	0	0	0	5	0	1	0	0	0	0	0	0	0	0	0

B. BY GROWING SEASON (May through October).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	4	49	45	1	0	0	0	1	4	0	0	0	0	0	0	0	0	0
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	0	82	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1989	0	50	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
All Years	3	57	38	1	0	0	0	1	3	0	0	0	0	0	0	0	0	0

C. BY MONTH (composited over years).

Month	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
Jan	0	87	6	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0
Feb	0	49	51	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mar	0	41	56	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0
Apr	0	0	96	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0
May	0	15	80	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Jun	7	54	23	0	0	0	0	0	23	0	0	0	0	0	0	0	0	0
Jul	0	14	57	0	0	0	0	14	14	0	0	0	0	0	0	0	0	0
Aug	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sep	14	72	28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oct	0	88	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nov	2	83	4	0	0	0	11	0	2	0	0	0	0	0	0	0	0	0
Dec	1	80	4	0	0	0	15	0	0	0	0	0	0	0	0	0	0	0

1. % days with unidentified diurnal patterns in hourly ozone concentration (see Böhm et al. 1990).
2. Pattern identifier relates to degree of diurnal variation in hourly ozone concentrations (A curves - least variation; E curves - greatest variation) and daily mean (1 curves - lowest mean; 6 curves highest mean) as described by Böhm et al (1990) and as illustrated in Figure 4C.1. Note that due to numeric rounding, the sums of percentages do not always equal 100.

Colorado National Monument

BASIC STATISTICS

A. BY YEAR.

Year	% Data Capt[1]	% Valid Days[2]	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	6	7	22	24	30	35	34.7±08	41	44	46	0	0	0	0	0
1985	77	79	27	30	35	41	41.6±10	48	54	57	2	0	0	0	1
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	22	22	25	27	30	35	35.6±07	41	45	47	0	0	0	0	0
1989	26	25	30	32	35	39	40.0±07	44	49	52	1	0	0	0	0
All Years	33	33	26	29	34	39	39.9±09	46	52	55	2	0	0	0	1

B. BY GROWING SEASON (May through October).

Year	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06[3] (ppm hr)	S08[4] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	65	66	29	32	37	43	43.0±09	49	55	58	6	1	3	0	0	0	0
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	18	18	31	33	36	40	39.9±06	44	47	49	0	0	0	0	0	0	0
1989	8	4	35	37	39	44	44.1±06	49	52	54	1	0	0	0	0	0	0
All Years	30	29	30	32	37	42	42.5±08	48	54	57	-	-	2	0	0	0	0

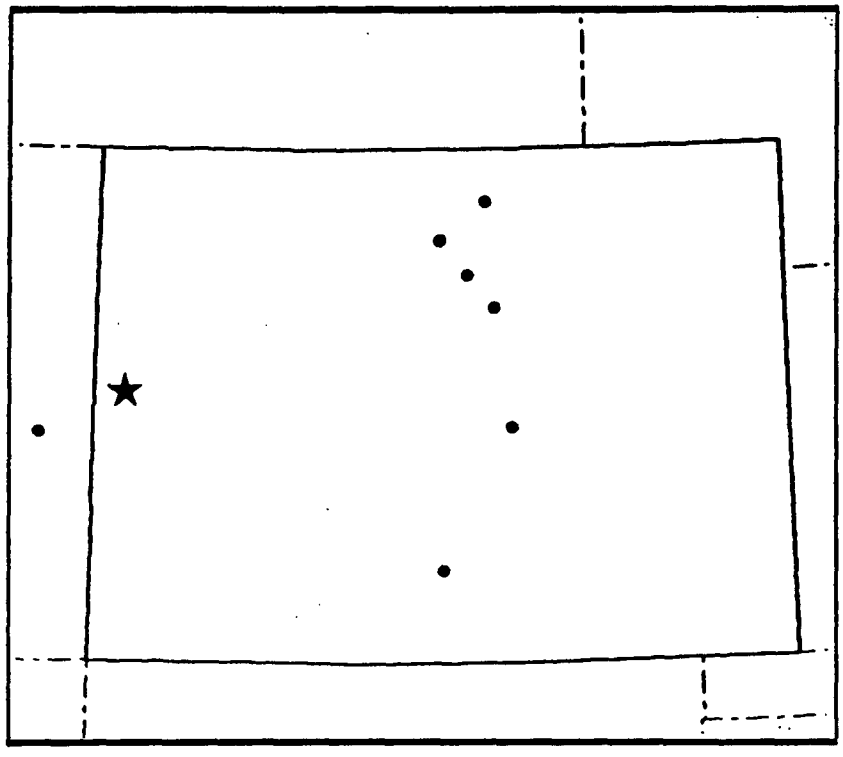
C. BY MONTH [5].

Month	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06 (ppm hr)	S08[6] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
Jan	82	84	24	28	32	36	35.8±11	39	43	46	1	1	1	0	0	0	1
Feb	84	88	32	34	38	43	42.8±07	47	51	54	1	0	1	0	0	0	0
Mar	94	97	29	32	38	44	44.1±09	50	55	58	2	0	3	0	0	0	0
Apr	87	90	31	40	45	49	47.6±11	54	57	59	2	0	4	0	0	0	0
May	43	40	36	38	43	48	48.2±08	54	58	60	4	0	7	0	0	0	0
Jun	35	30	30	33	37	42	41.9±07	47	51	54	1	0	1	0	0	0	0
Jul	20	18	30	34	40	46	45.1±08	50	55	58	1	0	2	0	0	0	0
Aug	66	65	39	40	45	50	49.6±07	55	59	60	4	0	7	0	0	0	0
Sep	44	43	28	31	35	40	39.8±07	45	48	51	0	0	0	0	0	0	0
Oct	95	100	28	30	34	38	38.3±06	43	46	48	1	1	0	0	0	0	0
Nov	87	88	25	27	31	35	34.8±06	39	42	44	1	0	0	0	0	0	0
Dec	83	86	23	25	29	33	33.0±06	37	41	43	1	0	0	0	0	0	0

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100. Av. period BY YEAR = 8760 hrs; BY G.S. = 4416 hrs.
2. % Valid Days = # days with 75 % of hours between 09:00 and 21:00 / (total # days) * 100 (Federal Register 1979).
3. Cumulative Index: S06 = Σ [O_3]/1000, where [O_3] is hourly ozone concentrations ≥ 60 ppb (Lee et al. 1988).
4. Cumulative Index: S08 = Σ [O_3]/1000, where [O_3] is hourly ozone concentrations ≥ 80 ppb (Lee et al. 1988).
5. Statistics for monthly composites over the period of record.
6. Monthly estimate of S06(08) = S06(08) * (# hours in that month) / (# valid hours).

COLORADO NATIONAL MONUMENT **COLORADO**

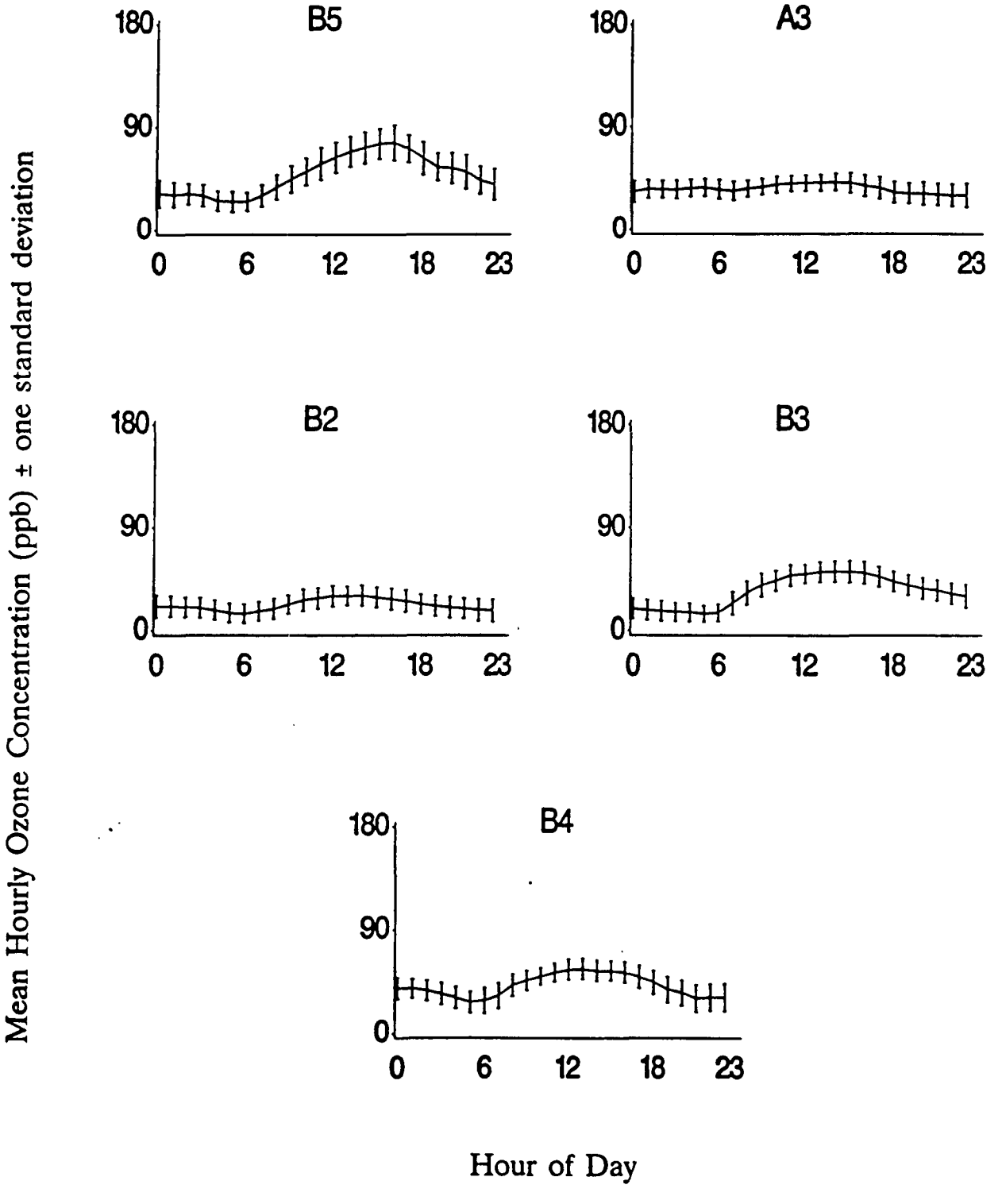
BIOGRAPHIC INFORMATION



Latitude	-	39.10° N
Longitude	-	108.74° W
Elevation (m)	-	1750
Basin Height (m)	-	1384.6
Landuse	-	Rural - Desert
City Population	-	Not In A City
Basin Population	-	198,341
Start Summary	-	January, 1985
End Summary	-	July, 1989
Source of Data	-	National Park Service

BOULDER COUNTY

DOMINANT DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS (MAY - OCT)



Boulder County

DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS

A. BY YEAR.

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	8	17	0	8	0	50	8	0	0	0	0	0	17	0	0	0	0	0
1981	6	15	1	0	0	10	24	14	11	4	5	6	7	2	0	0	0	0
1982	3	16	6	1	0	10	18	11	15	7	6	4	4	2	0	0	0	0
1983	6	13	2	1	0	7	26	13	11	7	5	8	6	1	0	0	0	0
1984	5	18	7	0	0	9	19	10	13	8	4	5	5	3	0	0	0	0
1985	6	19	5	0	0	10	18	12	13	7	4	7	4	1	0	0	0	0
1986	8	16	5	1	0	11	24	10	14	5	4	4	4	1	0	0	0	0
1987	6	13	8	2	0	20	19	8	11	8	4	3	3	1	0	0	0	0
1988	5	24	5	1	0	5	17	9	18	8	2	6	3	1	0	0	0	0
1989	5	17	4	1	0	16	16	15	10	6	4	6	3	2	0	0	0	0
All Years	6	17	5	1	0	11	20	11	13	7	4	5	4	1	0	0	0	0

B. BY GROWING SEASON (May through October).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	6	10	2	1	0	5	17	23	18	8	1	3	8	3	0	0	1	0
1982	3	14	5	1	0	4	14	15	21	11	2	3	6	4	0	0	0	0
1983	7	12	1	1	0	1	21	21	16	13	1	3	8	1	0	0	1	0
1984	6	12	7	0	0	7	12	14	19	13	0	3	7	4	1	0	0	0
1985	7	12	7	0	0	2	16	16	23	12	0	2	5	2	0	0	0	0
1986	9	11	7	1	0	4	18	15	23	10	0	4	5	1	0	0	0	0
1987	7	15	11	2	0	3	13	16	18	14	0	2	2	2	1	0	1	0
1988	4	14	8	2	0	3	10	13	27	15	1	2	3	1	1	0	0	0
1989	5	17	7	1	0	5	12	20	16	11	1	3	3	3	0	0	0	0
All Years	6	13	6	1	0	4	15	17	20	12	1	3	5	3	0	0	0	0

C. BY MONTH (composited over years).

Month	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
Jan	3	16	0	0	0	32	33	1	0	0	8	6	4	0	0	0	0	0
Feb	6	24	0	0	0	16	26	4	2	0	9	15	5	0	0	0	0	0
Mar	8	32	4	0	0	4	23	11	7	3	2	8	4	1	0	0	0	0
Apr	5	27	15	2	0	1	13	14	20	3	0	1	3	1	0	0	0	0
May	3	19	11	2	0	3	10	17	22	13	0	0	3	0	0	0	0	0
Jun	6	9	11	2	0	0	4	17	28	20	0	0	4	4	0	0	0	0
Jul	6	7	8	1	0	0	6	18	26	19	0	0	5	8	0	0	0	0
Aug	8	11	5	2	0	0	6	18	30	17	0	1	6	2	1	0	0	0
Sep	6	16	3	0	0	7	22	22	13	2	0	6	8	1	0	0	0	0
Oct	7	15	0	0	0	12	41	9	3	0	3	11	6	0	0	0	0	0
Nov	6	14	0	0	0	24	32	2	0	0	14	12	3	0	0	0	0	0
Dec	5	11	0	0	0	39	26	1	0	0	14	5	2	0	0	0	0	0

1. % days with unidentified diurnal patterns in hourly ozone concentration (see Böhm et al. 1990).
2. Pattern identifier relates to degree of diurnal variation in hourly ozone concentrations (A curves - least variation; E curves - greatest variation) and daily mean (1 curves - lowest mean; 6 curves highest mean) as described by Böhm et al (1990) and as illustrated in Figure 4C.1. Note that due to numeric rounding, the sums of percentages do not always equal 100.

Boulder County

BASIC STATISTICS

A. BY YEAR.

Year	% Data Capt[1]	% Valid Days[2]	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	5	6	1	3	9	17	20.5±17	30	36	45	4	2	0	0	0
1981	88	91	4	7	17	28	28.7±17	38	50	59	5	1	0	0	0
1982	86	85	3	7	18	31	31.3±18	42	54	62	6	1	0	0	0
1983	96	95	4	8	19	29	30.2±17	39	51	61	6	1	0	0	6
1984	92	93	3	8	19	31	31.5±18	42	54	62	6	1	0	0	1
1985	97	96	2	7	19	31	30.9±17	41	52	60	5	1	0	0	0
1986	99	99	3	8	18	29	30.1±17	40	52	61	5	1	0	0	2
1987	99	98	2	6	16	28	30.0±19	42	57	66	8	1	0	0	1
1988	86	86	4	10	22	34	33.7±18	43	56	64	7	1	0	0	2
1989	87	87	0	3	15	29	29.2±19	41	53	63	7	1	0	0	1
All Years	84	83	3	7	18	30	30.5±18	41	53	62	6	1	0	0	13

B. BY GROWING SEASON (May through October).

Year	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06[3] (ppm hr)	S08[4] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	92	97	6	11	21	32	33.4±18	44	56	66	24	6	8	2	0	0	0
1982	97	97	9	14	23	34	35.6±18	45	60	69	31	8	10	2	0	0	0
1983	96	96	10	15	24	33	35.3±18	44	58	68	30	11	9	2	1	0	6
1984	95	96	8	13	13	34	35.6±18	47	60	67	31	6	10	2	0	0	1
1985	97	96	11	16	25	35	36.5±17	46	59	68	29	6	10	2	0	0	0
1986	99	98	9	14	24	34	35.5±18	46	59	67	30	7	10	2	0	0	1
1987	98	98	11	16	25	37	38.5±19	50	64	72	44	11	14	3	1	0	1
1988	95	95	7	13	25	38	37.8±19	49	62	70	36	9	12	2	0	0	2
1989	86	85	4	11	23	35	35.8±19	47	61	70	32	7	12	2	0	0	1
All Years	95	95	8	14	24	35	36.0±18	47	60	69	-	-	11	2	0	0	12

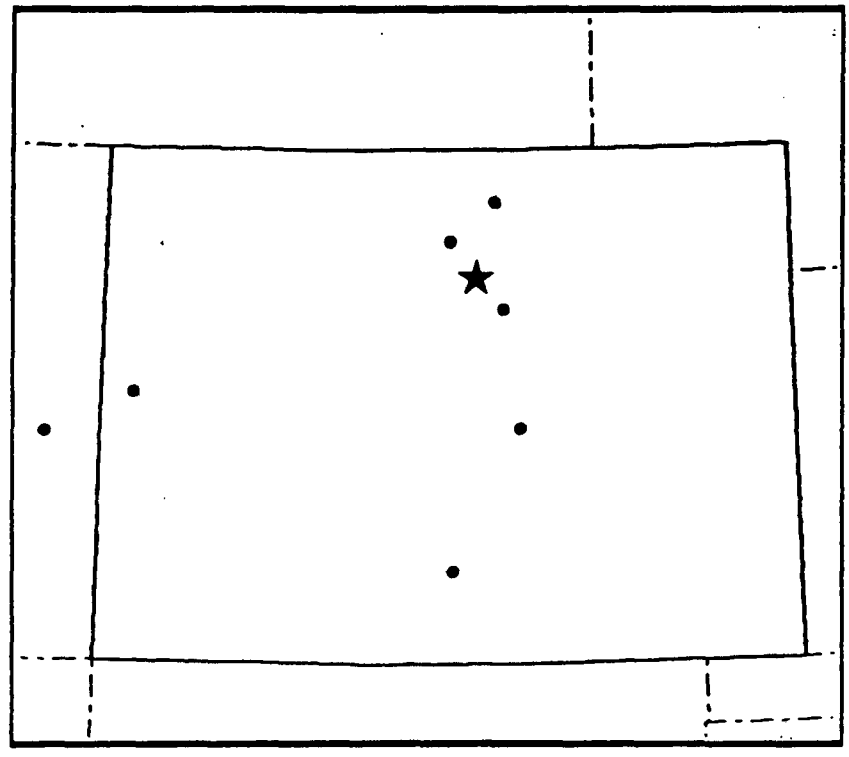
C. BY MONTH [5].

Month	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06 (ppm hr)	S08[6] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
Jan	80	78	1	2	8	19	19.7±13	31	37	40	1	1	1	0	0	0	0
Feb	87	86	0	2	10	23	22.7±15	34	41	44	1	1	1	0	0	0	0
Mar	94	93	5	10	20	31	30.3±15	40	48	52	1	1	2	0	0	0	0
Apr	96	96	13	18	28	38	37.3±15	47	55	60	3	1	6	1	0	0	1
May	97	98	12	18	27	38	38.5±17	49	60	68	6	1	11	1	0	0	0
Jun	97	98	18	21	30	39	41.6±18	51	65	75	9	3	16	3	1	0	1
Jul	96	96	14	19	28	38	40.7±18	51	65	74	9	3	15	3	1	0	5
Aug	93	92	13	18	27	38	40.1±19	51	65	75	8	3	15	3	1	0	6
Sep	93	93	6	10	19	30	31.4±17	42	53	61	3	1	6	1	0	0	0
Oct	95	95	3	6	13	23	23.8±14	33	41	46	1	1	1	0	0	0	0
Nov	95	95	1	2	8	18	19.0±13	29	36	39	1	0	0	0	0	0	0
Dec	91	91	1	2	6	17	17.7±13	27	35	37	1	1	1	0	0	0	0

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100. Av. period BY YEAR = 8760 hrs; BY G.S. = 4416 hrs.
2. % Valid Days = # days with 75 % of hours between 09:00 and 21:00 / (total # days) * 100 (Federal Register 1979).
3. Cumulative Index S06 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 60 ppb (Lee et al. 1988).
4. Cumulative Index S08 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 80 ppb (Lee et al. 1988).
5. Statistics for monthly composites over the period of record.
6. Monthly estimate of S06(08) = S06(08) * (# hours in that month) / (# valid hours).

BOULDER COUNTY COLORADO

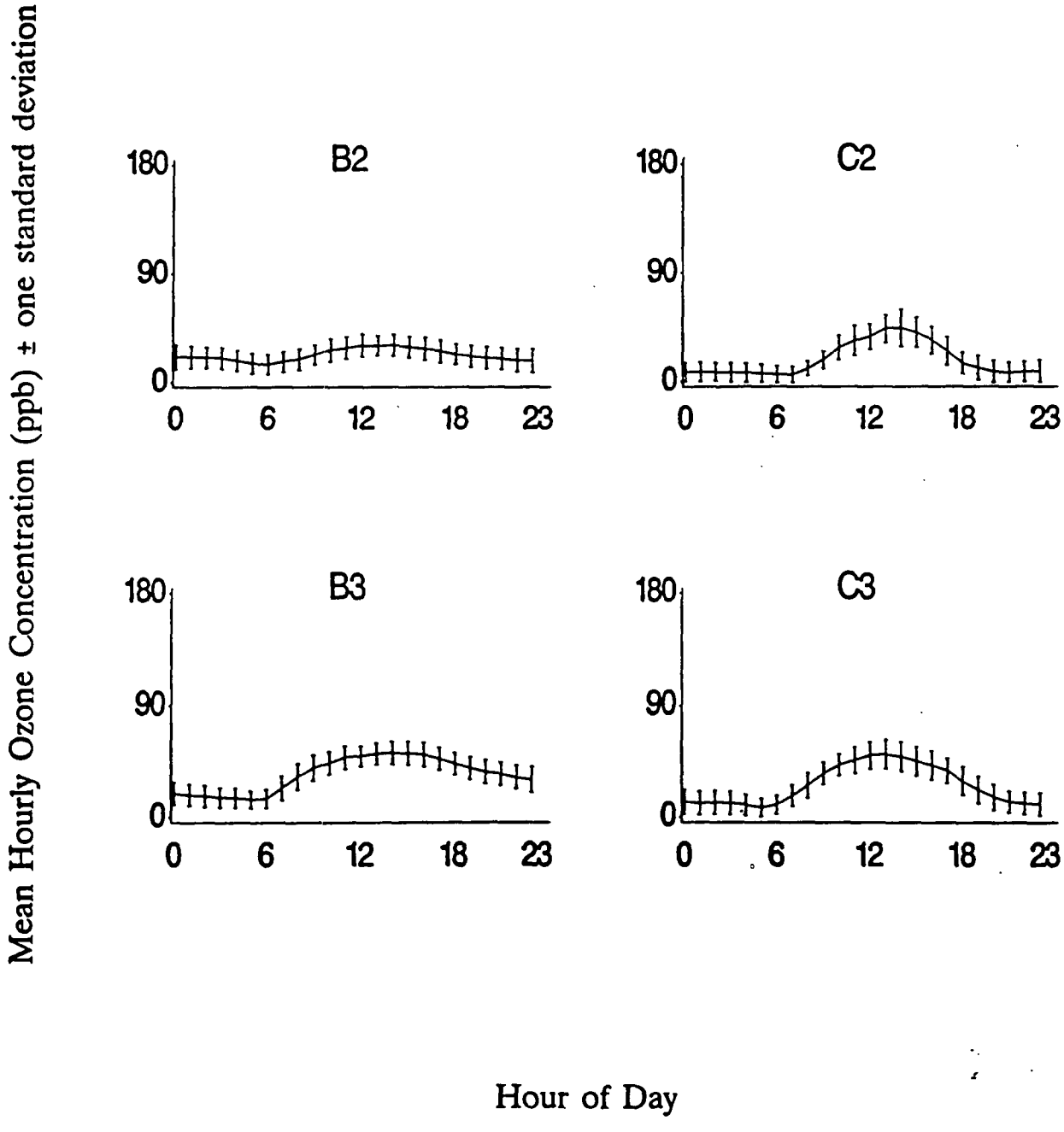
BIOGRAPHIC INFORMATION



Latitude	-	40.01° N
Longitude	-	105.27° W
Elevation (m)	-	1635
Basin Height (m)	-	1538.5
Landuse	-	City Center - Residential
City Population	-	Not In A City
Basin Population	-	1,628,210
Start Summary	-	January, 1981
End Summary	-	December, 1989
Source of Data	-	AIRS (08-013-1001)

YREKA

DOMINANT DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS (MAY - OCT)



Yreka

DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS

A. BY YEAR.

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	11	9	0	0	0	25	29	12	1	0	3	8	13	1	0	0	0	0
1982	8	4	0	0	0	11	22	14	1	0	5	13	26	5	0	0	0	0
1983	9	5	0	0	0	19	31	8	0	0	8	13	13	3	0	0	0	0
1984	8	3	0	0	0	16	13	13	3	0	13	12	24	2	0	0	0	0
1985	4	2	0	0	0	17	11	13	2	0	18	14	20	3	0	0	0	0
1986	4	3	1	0	0	7	15	16	4	3	7	16	20	8	0	0	0	0
1987	4	6	0	0	0	8	7	25	2	1	6	13	20	11	0	0	0	0
1988	6	5	0	0	0	13	10	14	1	0	9	12	28	8	0	0	0	0
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	7	4	0	0	0	14	17	14	2	1	9	13	21	5	0	0	0	0

B. BY GROWING SEASON (May through October).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	18	7	0	0	0	7	44	15	0	0	7	15	4	0	0	0	0	0
1982	5	1	0	0	0	5	13	20	1	0	4	11	38	8	0	0	0	0
1983	11	0	0	0	0	3	17	12	0	1	9	24	27	8	0	0	0	0
1984	7	2	0	0	0	5	7	21	3	1	8	15	33	4	0	0	0	0
1985	4	4	0	0	0	4	12	23	3	1	5	12	32	6	0	0	0	0
1986	4	3	1	0	0	1	9	24	6	4	0	11	26	15	0	0	0	0
1987	4	5	0	1	0	0	5	32	3	2	3	10	23	16	0	0	0	0
1988	5	3	0	0	0	4	11	22	2	1	2	4	35	16	0	0	0	0
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	6	3	0	0	0	3	11	22	3	1	4	12	30	10	0	0	0	0

C. BY MONTH (composited over years).

Month	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
Jan	8	3	0	0	0	43	25	0	0	0	21	6	2	0	0	0	0	0
Feb	9	2	0	0	0	27	26	0	0	0	23	21	2	0	0	0	0	0
Mar	7	9	0	0	0	4	24	7	1	0	4	27	24	0	0	0	0	0
Apr	5	12	1	0	0	1	10	26	3	1	1	7	36	2	0	0	0	0
May	5	8	1	0	0	0	4	50	4	1	0	0	27	4	0	0	0	0
Jun	4	4	0	0	0	2	14	28	4	2	0	0	32	13	0	0	0	0
Jul	6	2	0	0	0	1	12	35	4	2	0	0	33	11	0	0	0	0
Aug	4	1	0	0	0	0	6	19	2	2	0	3	46	22	0	0	0	0
Sep	7	2	0	1	0	3	15	4	1	1	4	30	34	6	0	0	0	0
Oct	10	1	0	0	0	14	16	2	0	1	21	39	6	0	0	0	0	0
Nov	9	3	0	0	0	36	27	0	0	0	16	18	1	0	0	0	0	0
Dec	6	4	0	0	0	41	25	1	0	0	23	7	0	0	0	0	0	0

1. % days with unidentified diurnal patterns in hourly ozone concentration (see Böhm et al. 1990).
2. Pattern identifier relates to degree of diurnal variation in hourly ozone concentrations (A curves - least variation; E curves - greatest variation) and daily mean (1 curves - lowest mean; 6 curves highest mean) as described by Böhm et al (1990) and as illustrated in Figure 4C.1. Note that due to numeric rounding, the sums of percentages do not always equal 100.

Yreka

BASIC STATISTICS

A. BY YEAR.

Year	% Data Capt[1]	% Valid Days[2]	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	40	39	0	10	10	20	21.1±13	30	40	40	1	0	0	0	0
1982	98	98	0	0	10	20	22.4±15	30	40	50	2	0	0	0	0
1983	79	78	0	0	10	20	19.6±14	30	40	40	1	0	0	0	0
1984	75	74	0	0	10	20	20.7±16	30	40	50	2	0	0	0	0
1985	94	93	0	0	0	20	18.5±17	30	40	50	2	0	0	0	0
1986	88	87	0	0	10	20	24.5±17	40	50	50	4	0	0	0	0
1987	71	68	0	0	10	20	26.2±19	40	50	60	8	0	0	0	1
1988	79	78	0	0	10	20	23.3±17	40	50	50	4	0	0	0	0
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	78	77	0	0	10	20	22.0±17	30	50	50	3	0	0	0	1

B. BY GROWING SEASON (May through October).

Year	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06[3] (ppm hr)	S08[4]	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	25	22	0	10	10	20	22.7±14	30	40	50	1	0	1	0	0	0	0
1982	99	99	0	0	10	20	24.6±17	40	50	50	10	0	4	0	0	0	0
1983	64	64	0	0	10	20	21.2±16	30	40	50	5	0	3	0	0	0	0
1984	82	82	0	0	0	20	23.4±18	40	50	50	9	1	4	0	0	0	0
1985	95	93	0	0	10	30	25.4±18	40	50	50	12	1	4	0	0	0	0
1986	94	93	10	10	10	30	29.0±18	40	50	60	20	1	8	0	0	0	0
1987	94	91	0	0	10	30	28.9±20	40	60	60	29	3	11	1	0	0	1
1988	86	84	0	10	10	30	28.0±18	40	50	60	18	1	7	0	0	0	0
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	80	79	0	0	10	20	25.9±18	40	50	60	-	-	6	0	0	0	1

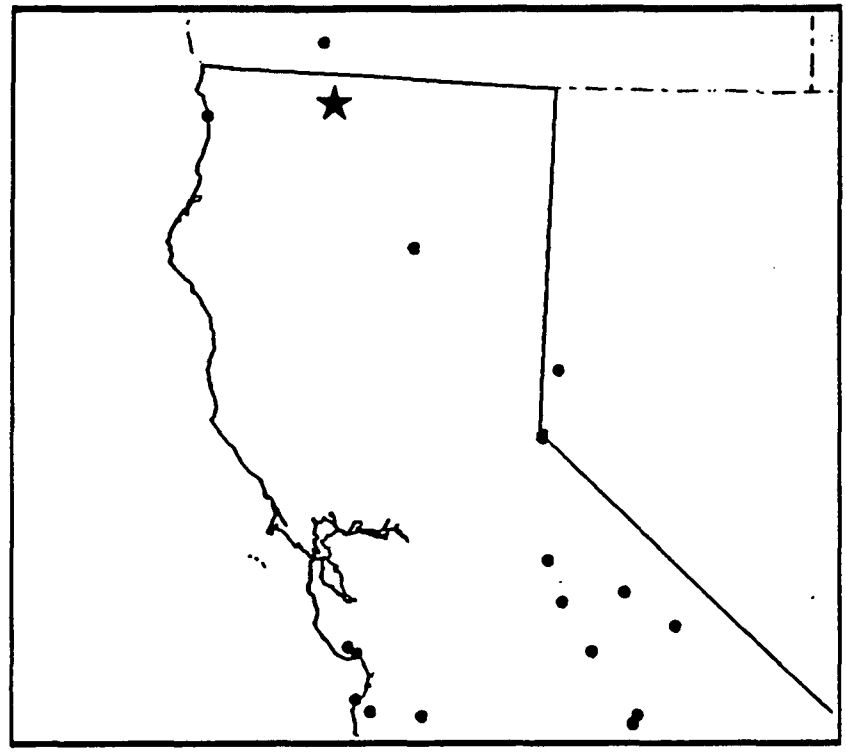
C. BY MONTH [5].

Month	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06 (ppm hr)	S08[6]	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
Jan	81	80	0	0	0	10	12.7±12	20	30	30	1	0	0	0	0	0	0
Feb	87	86	0	0	0	10	14.2±12	20	30	30	1	0	0	0	0	0	0
Mar	89	87	0	0	10	20	21.3±14	30	40	40	1	0	0	0	0	0	0
Apr	87	85	0	10	10	30	27.8±16	40	50	50	1	1	2	0	0	0	0
May	78	75	10	10	20	30	31.4±16	40	50	50	3	0	5	0	0	0	0
Jun	87	87	0	10	20	30	29.0±17	40	50	60	3	1	6	0	0	0	0
Jul	97	95	0	10	10	30	29.4±17	40	50	60	4	1	8	0	0	0	0
Aug	98	98	0	0	10	30	28.7±19	50	50	60	5	1	10	0	0	0	0
Sep	89	88	0	0	10	20	22.4±18	30	50	50	3	1	5	0	0	0	1
Oct	86	83	0	0	0	10	15.8±15	30	40	40	1	1	1	0	0	0	0
Nov	95	93	0	0	10	10	14.8±11	20	30	40	0	0	0	0	0	0	0
Dec	95	94	0	0	10	10	14.1±11	20	30	30	0	0	0	0	0	0	0

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100. Av. period BY YEAR = 8760 hrs; BY G.S. = 4416 hrs.
2. % Valid Days = # days with 75 % of hours between 09:00 and 21:00 / (total # days) * 100 (Federal Register 1979).
3. Cumulative Index S06 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 60 ppb (Lee et al. 1988).
4. Cumulative Index S08 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 80 ppb (Lee et al. 1988).
5. Statistics for monthly composites over the period of record.
6. Monthly estimate of S06(08) = S06(08) * (# hours in that month) / (# valid hours).

YREKA **CALIFORNIA**

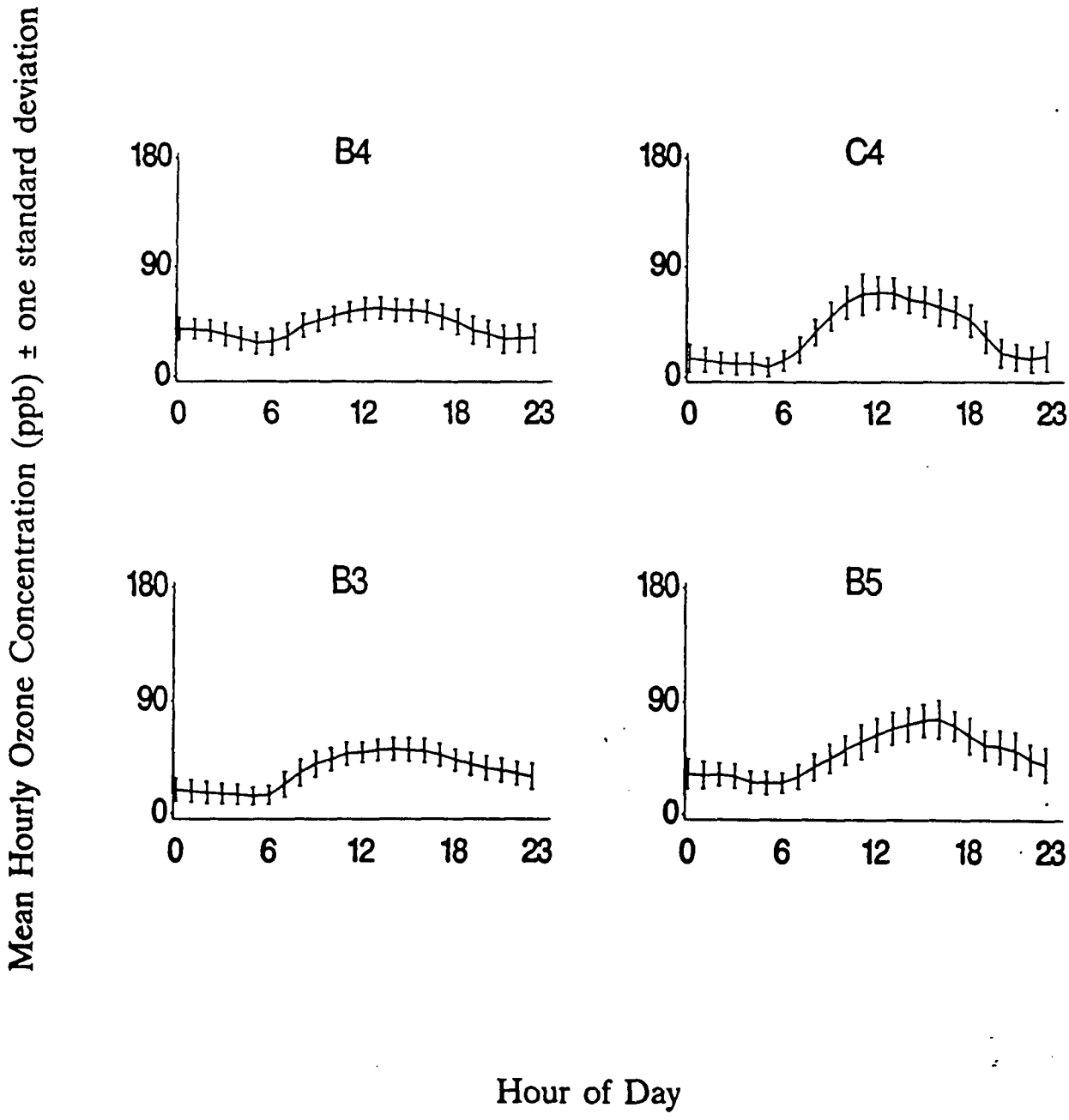
BIOGRAPHIC INFORMATION



Latitude	-	41.73° N
Longitude	-	122.64° W
Elevation (m)	-	809
Basin Height (m)	-	769.2
Landuse	-	Suburban - Residential
City Population	-	5,916
Basin Population	-	70,049
Start Summary	-	March, 1981
End Summary	-	December, 1988
Source of Data	-	AIRS (06-093-2001)

WAWONA VALLEY, YOSEMITE NATIONAL PARK

DOMINANT DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS (MAY - OCT)



Wawona Valley, Yosemite National Park

DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS

A. BY YEAR.

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	7	1	0	4	0	7	4	14	7	28	11	5	9	8	1	0	0	0
1988	8	3	0	3	0	12	10	23	3	24	3	8	7	5	0	0	1	0
1989	11	7	0	1	0	21	12	8	1	6	14	19	10	0	0	0	0	0
All Years	8	3	0	3	0	11	9	17	4	23	7	9	8	5	0	0	0	0

B. BY GROWING SEASON (May through October).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	4	0	0	6	0	2	1	15	10	41	2	3	9	9	2	0	0	0
1988	7	1	0	5	0	0	5	30	5	42	0	0	2	8	0	0	2	0
1989	0	0	0	8	0	0	0	42	8	33	0	0	8	0	0	0	0	0
All Years	5	0	0	6	0	1	3	24	7	41	1	1	6	8	1	0	1	0

C. BY MONTH (composited over years).

Month	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
Jan	23	3	0	0	0	50	15	0	0	0	21	9	3	0	0	0	0	0
Feb	5	3	0	0	0	19	28	3	0	0	14	28	6	0	0	0	0	0
Mar	8	7	0	0	0	7	9	14	0	0	2	34	25	2	0	0	0	0
Apr	10	11	0	0	0	0	5	39	0	5	0	5	21	13	0	0	0	0
May	2	2	0	0	0	0	0	30	0	14	0	0	27	27	0	0	0	0
Jun	10	0	0	3	0	0	14	30	8	35	0	0	0	8	3	0	0	0
Jul	4	0	0	6	0	0	0	15	12	60	0	0	0	4	2	0	0	0
Aug	6	0	0	17	0	0	2	2	11	61	0	0	0	4	0	0	2	0
Sep	4	0	0	6	0	0	0	26	9	49	0	4	2	2	0	0	2	0
Oct	6	0	0	0	0	7	4	42	4	24	7	4	4	2	0	0	0	0
Nov	11	3	0	0	0	23	13	3	0	0	38	18	3	0	0	0	0	0
Dec	11	6	0	0	0	50	24	0	0	0	15	3	3	0	0	0	0	0

1. % days with unidentified diurnal patterns in hourly ozone concentration (see Böhm et al. 1990).
2. Pattern identifier relates to degree of diurnal variation in hourly ozone concentrations (A curves - least variation; E curves - greatest variation) and daily mean (1 curves - lowest mean; 6 curves highest mean) as described by Böhm et al (1990) and as illustrated in Figure 4C.1. Note that due to numeric rounding, the sums of percentages do not always equal 100.

Wawona Valley, Yosemite National Park

BASIC STATISTICS

A. BY YEAR.

Year	% Data Capt[1]	% Valid Days[2]	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	70	74	3	5	16	34	36.9±25	55	71	80	20	5	1	0	3
1988	91	95	4	7	15	30	33.6±23	48	68	77	15	4	0	0	0
1989	28	28	3	4	7	17	21.3±17	33	44	52	3	1	0	0	0
All Years	63	65	3	6	13	29	33.0±23	48	67	77	15	4	0	0	3

B. BY GROWING SEASON (May through October).

Year	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06[3] (ppm hr)	S08[4] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	92	97	7	13	27	43	44.6±24	62	76	84	85	28	28	8	1	0	3
1988	94	99	11	16	27	41	44.1±23	60	76	83	81	28	26	7	1	0	0
1989	10	8	9	13	22	37	38.4±20	51	67	74	6	2	18	4	0	0	0
All Years	66	68	9	15	27	42	44.0±23	61	76	83	-	-	26	7	1	0	3

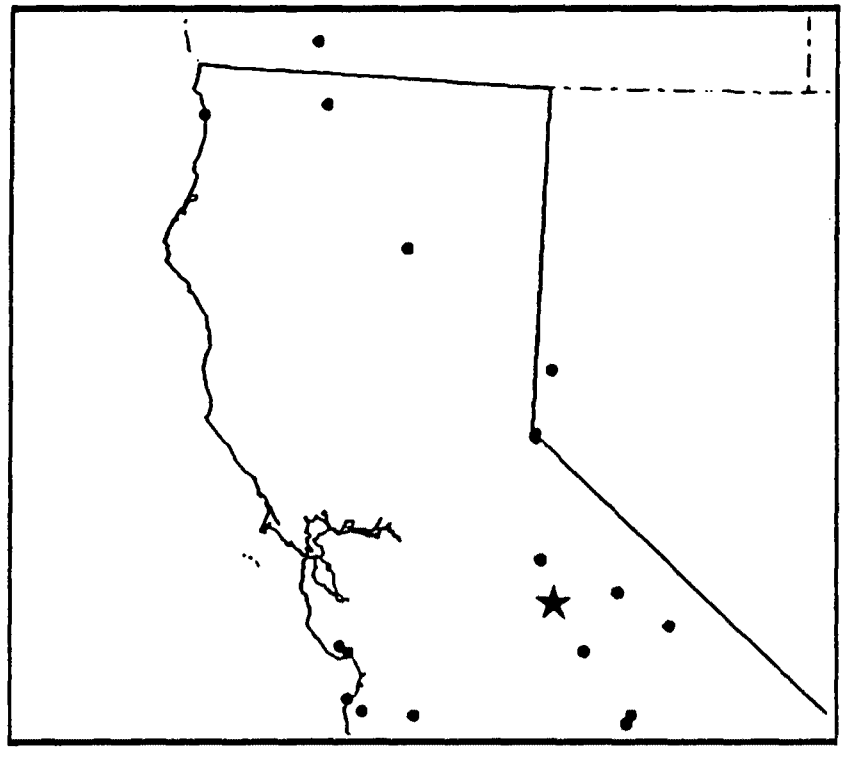
C. BY MONTH [5].

Month	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06 (ppm hr)	S08[6] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
Jan	87	89	3	3	6	10	13.3±10	18	30	35	0	0	0	0	0	0	0
Feb	91	95	1	3	8	16	19.6±15	29	42	47	1	0	1	0	0	0	0
Mar	95	100	3	5	9	22	23.5±16	35	46	51	1	0	1	0	0	0	0
Apr	95	100	10	12	19	33	35.7±19	51	63	70	7	1	14	1	0	0	0
May	66	67	6	9	17	34	35.5±21	52	65	71	8	2	15	2	0	0	0
Jun	65	69	9	13	24	40	42.6±24	60	74	83	14	5	26	6	2	0	2
Jul	73	74	16	21	31	47	48.4±22	65	80	87	18	7	31	10	1	0	1
Aug	95	100	21	26	35	51	52.3±21	69	81	88	22	8	38	11	1	0	0
Sep	95	100	11	19	29	45	47.5±23	65	81	87	17	7	31	11	1	0	0
Oct	95	100	4	10	24	34	37.6±21	51	69	77	10	3	18	4	0	0	0
Nov	93	97	2	3	5	12	15.9±13	25	35	43	1	0	0	0	0	0	0
Dec	83	84	2	2	6	12	15.6±12	24	34	38	0	0	0	0	0	0	0

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100. Av. period BY YEAR = 8760 hrs; BY G.S. = 4416 hrs.
2. % Valid Days = # days with 75 % of hours between 09:00 and 21:00 / (total # days) * 100 (Federal Register 1979).
3. Cumulative Index S06 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 60 ppb (Lee et al. 1988).
4. Cumulative Index S08 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 80 ppb (Lee et al. 1988).
5. Statistics for monthly composites over the period of record.
6. Monthly estimate of S06(08) = S06(08) * (# hours in that month) / (# valid hours).

WAWONA VALLEY, YOSEMITE NATIONAL PARK — CALIFORNIA

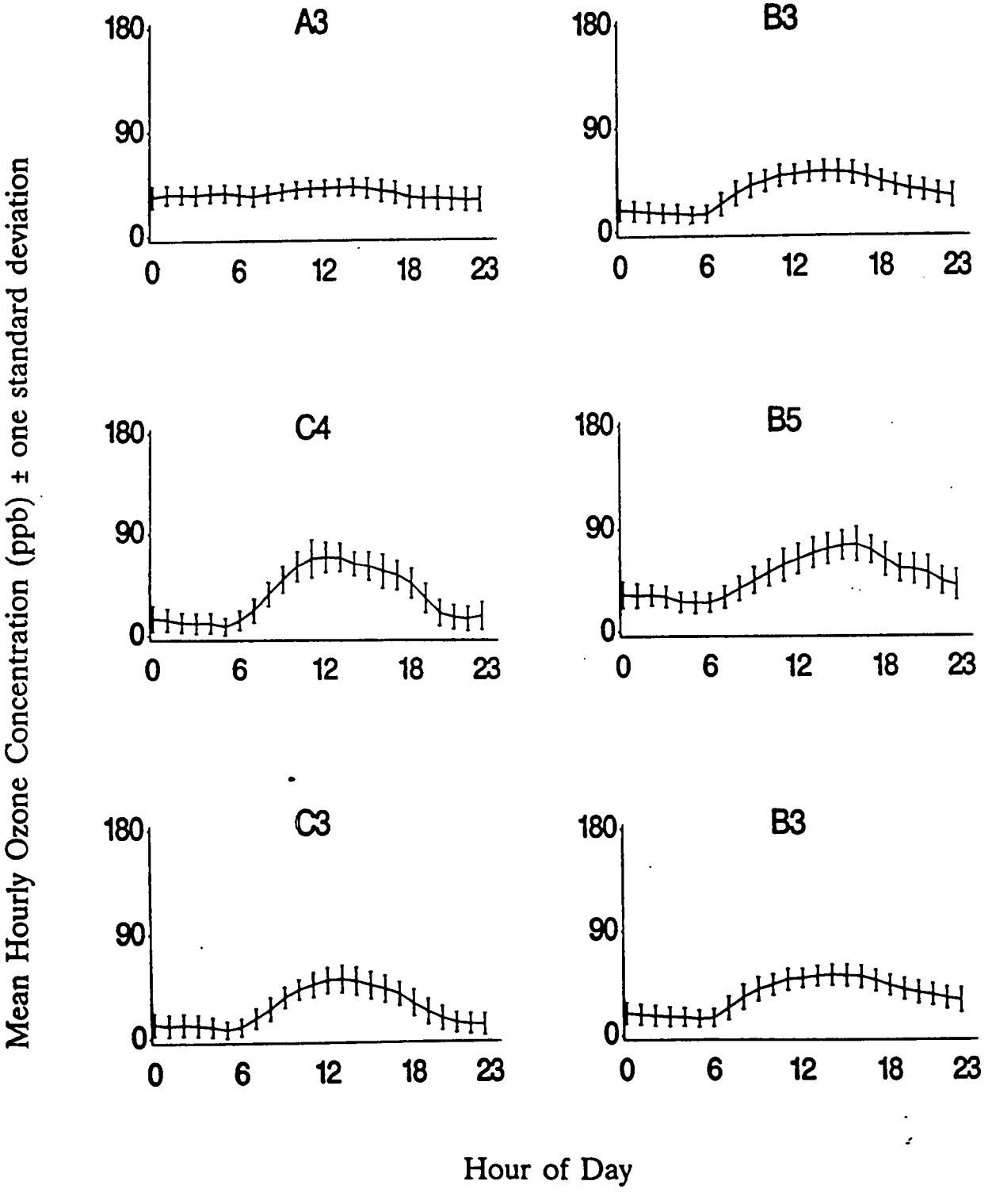
BIOGRAPHIC INFORMATION



Latitude	-	37.53° N
Longitude	-	119.66° W
Elevation (m)	-	1280
Basin Height (m)	-	27.1
Landuse	-	Rural - Forest
City Population	-	Not In A City
Basin Population	-	2,082,850
Start Summary	-	April, 1987
End Summary	-	July, 1989
Source of Data	-	National Park Service

VENTURA

DOMINANT DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS (MAY - OCT)



Ventura County

DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS

A. BY YEAR.

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	6	11	1	1	1	0	12	22	7	6	1	10	21	6	1	0	1	0
1981	5	5	3	1	0	4	5	19	5	7	8	17	18	6	0	0	1	0
1982	5	5	6	4	2	5	16	12	8	10	6	15	8	4	1	0	0	0
1983	7	14	1	3	1	2	21	13	8	8	0	11	10	8	0	0	1	0
1984	6	10	3	1	0	1	15	15	3	7	0	13	21	10	0	0	1	0
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	6	8	3	2	1	3	13	17	6	7	4	13	15	6	0	0	1	0

B. BY GROWING SEASON (May through October).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	7	8	2	1	2	0	10	34	7	9	1	4	19	5	0	0	0	0
1981	5	7	6	2	0	2	1	25	8	11	4	3	23	7	0	0	1	0
1982	5	4	8	6	2	4	15	16	6	12	1	6	12	6	0	0	1	0
1983	4	12	3	6	2	1	2	18	11	17	0	1	9	13	1	0	3	0
1984	5	6	7	2	0	0	4	30	7	15	0	4	11	15	0	0	0	0
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	5	7	5	3	1	2	7	24	8	12	1	4	16	8	0	0	1	0

C. BY MONTH (composited over years).

Month	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
Jan	3	10	0	0	0	9	27	3	2	1	11	32	4	1	0	0	0	0
Feb	5	15	0	0	0	8	21	5	3	1	9	27	10	1	0	0	0	0
Mar	11	10	2	0	0	1	10	15	11	1	0	12	27	9	0	0	1	0
Apr	5	6	2	3	1	0	9	20	6	8	0	4	29	6	2	0	3	0
May	6	8	12	8	3	0	1	20	6	18	1	2	12	8	0	0	1	0
Jun	2	4	12	5	2	0	6	32	10	12	0	0	10	5	0	0	2	0
Jul	5	7	3	0	0	0	12	41	11	8	1	1	6	7	0	0	1	0
Aug	6	11	1	1	0	2	11	27	10	5	1	3	23	5	0	0	0	0
Sep	6	7	1	2	0	2	6	18	3	18	1	4	19	15	1	0	1	0
Oct	7	4	0	0	3	8	8	4	5	10	5	15	26	9	0	0	1	0
Nov	2	8	0	1	0	2	23	6	1	3	5	35	3	8	2	0	1	0
Dec	15	11	0	0	0	2	26	2	2	0	13	39	3	0	0	0	2	0

1. % days with unidentified diurnal patterns in hourly ozone concentration (see Böhm et al. 1990).
2. Pattern identifier relates to degree of diurnal variation in hourly ozone concentrations (A curves - least variation; E curves - greatest variation) and daily mean (1 curves - lowest mean; 6 curves highest mean) as described by Böhm et al (1990) and as illustrated in Figure 4C.1. Note that due to numeric rounding, the sums of percentages do not always equal 100.

Ventura County

BASIC STATISTICS

A. BY YEAR.

Year	% Data Capt[1]	% Valid Days[2]	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	87	86	10	10	20	30	32.1±20	50	60	70	11	3	1	0	3
1981	92	92	0	0	10	30	28.8±22	40	60	60	11	2	1	0	4
1982	96	95	0	10	10	30	31.6±22	50	60	70	16	4	1	0	6
1983	87	90	10	10	20	30	34.1±21	50	60	70	14	4	1	0	12
1984	49	50	0	0	20	30	30.9±21	40	60	70	12	3	0	0	0
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	82	83	0	10	10	30	31.5±21	40	60	70	13	3	1	0	25

B. BY GROWING SEASON (May through October).

Year	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06[3] (ppm hr)	S08[4] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	94	93	10	10	20	30	33.5±20	50	60	70	32	11	11	3	1	0	1
1981	98	98	0	0	10	40	34.1±22	50	60	70	43	12	14	3	1	0	3
1982	97	97	10	10	20	30	35.7±22	50	70	70	61	19	20	5	1	0	3
1983	86	90	10	10	30	40	41.5±23	50	70	80	68	26	25	7	2	1	12
1984	37	37	0	10	10	40	37.8±22	50	70	80	25	8	22	5	1	0	0
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	83	83	0	10	20	40	36.2±22	50	60	70	-	-	18	5	1	0	19

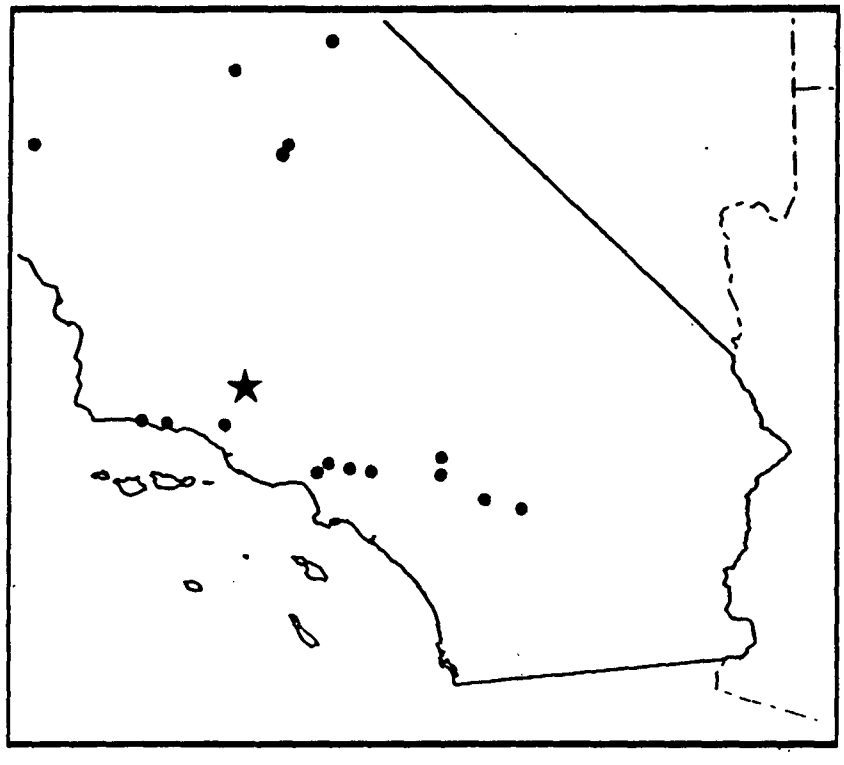
C. BY MONTH [5].

Month	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06 (ppm hr)	S08[6] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
Jan	86	86	0	0	10	20	21.7±16	30	40	50	2	1	3	0	0	0	0
Feb	91	94	0	0	10	20	22.8±17	30	50	50	3	1	5	1	0	0	0
Mar	92	94	0	10	10	30	29.5±19	40	50	60	5	1	10	1	0	0	0
Apr	95	94	0	10	20	30	33.7±22	50	60	70	8	3	15	4	1	0	4
May	96	95	0	10	30	40	41.5±22	60	70	80	14	5	27	7	1	0	1
Jun	91	92	10	10	30	40	40.9±21	50	70	80	12	4	23	5	1	0	4
Jul	82	84	10	10	20	30	35.4±19	50	60	70	7	2	12	3	1	0	4
Aug	97	97	10	10	20	30	32.5±18	40	50	60	5	1	9	1	0	0	1
Sep	92	93	0	10	10	30	34.0±23	50	60	80	9	4	16	5	2	0	4
Oct	94	94	0	0	10	30	30.6±25	50	60	80	10	4	17	5	2	1	5
Nov	90	90	10	10	10	20	27.5±20	40	50	70	5	3	9	3	1	0	1
Dec	91	92	0	0	10	20	23.1±17	30	40	50	3	1	5	1	0	0	1

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100. Av. period BY YEAR = 8760 hrs; BY G.S. = 4416 hrs.
2. % Valid Days = # days with 75 % of hours between 09:00 and 21:00 / (total # days) * 100 (Federal Register 1979).
3. Cumulative Index: S06 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 60 ppb (Lee et al. 1988).
4. Cumulative Index: S08 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 80 ppb (Lee et al. 1988).
5. Statistics for monthly composites over the period of record.
6. Monthly estimate of S06(08) = S06(08) * (# hours in that month) / (# valid hours).

VENTURA **CALIFORNIA**

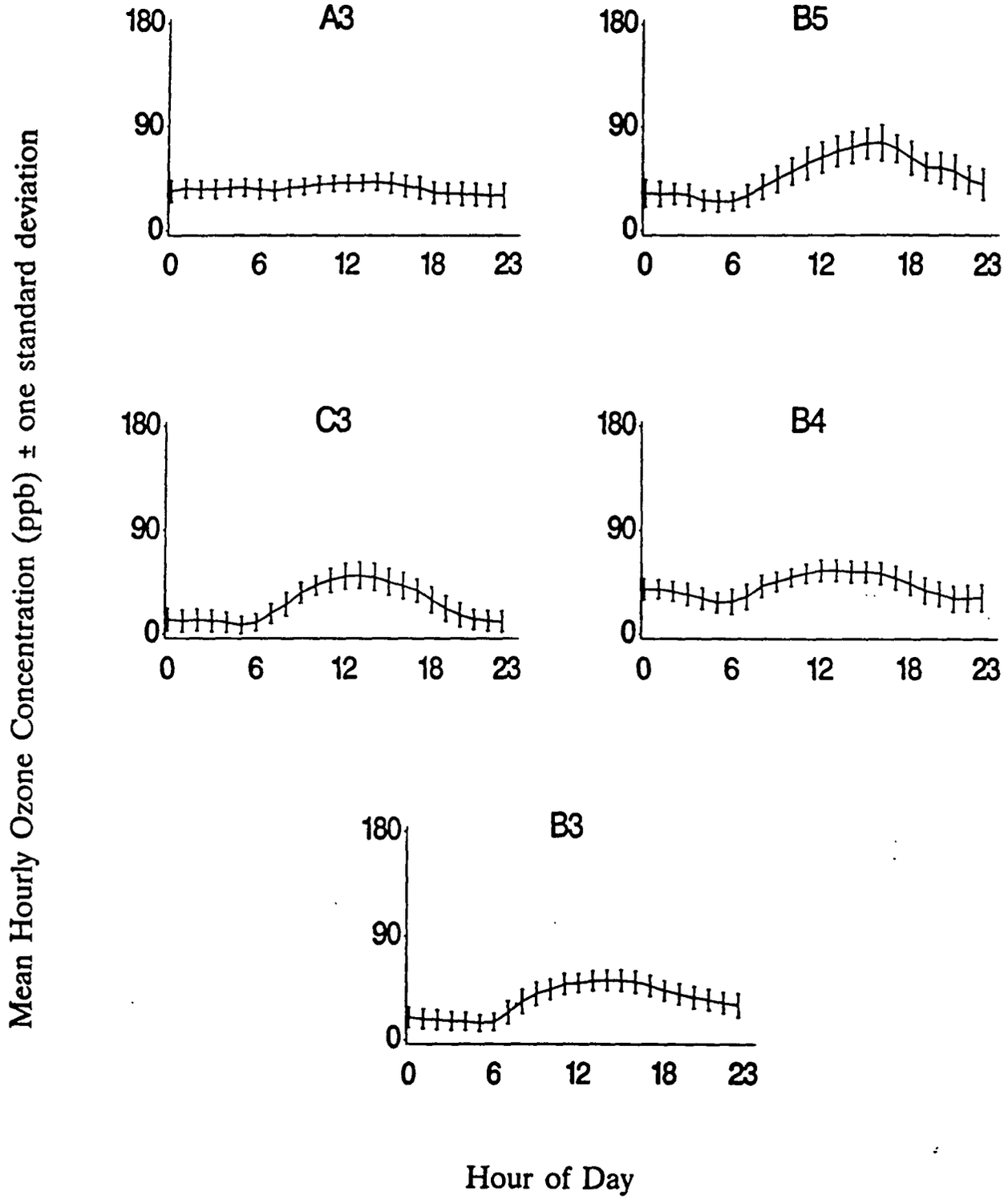
BIOGRAPHIC INFORMATION



Latitude	-	34.75° N
Longitude	-	119.09° W
Elevation (m)	-	1600
Basin Height (m)	-	123.1
Landuse	-	Remote
City Population	-	
Basin Population	-	11,201,922
Start Summary	-	January, 1980
End Summary	-	July, 1984
Source of Data	-	AIRS (06-111-3002)

SOUTH LAKE TAHOE

DOMINANT DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS (MAY - OCT)



South Lake Tahoe

DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS

A. BY YEAR.

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	5	16	8	1	0	0	13	21	5	6	1	2	19	8	0	0	0	0
1981	6	18	5	1	0	0	21	19	9	12	0	5	7	2	0	0	0	0
1982	5	24	4	1	0	0	18	22	8	3	0	5	9	5	0	0	0	0
1983	5	26	5	0	0	1	24	16	5	2	0	6	12	2	0	0	0	0
1984	6	21	4	0	0	0	23	22	8	4	0	6	10	2	0	0	0	0
1985	8	22	7	1	0	0	17	23	10	5	0	3	9	2	0	0	0	0
1986	6	20	7	0	0	0	16	20	12	6	0	6	9	1	0	0	0	0
1987	5	16	6	2	0	0	14	18	20	9	0	3	8	4	0	0	0	0
1988	7	16	9	4	0	0	9	24	13	7	2	3	10	4	0	0	0	0
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	6	20	6	1	0	0	18	20	10	6	0	5	10	3	0	0	0	0

B. BY GROWING SEASON (May through October).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	1	8	9	1	0	0	0	21	9	10	0	1	29	13	0	0	0	0
1981	6	7	9	2	0	0	10	25	12	22	0	2	8	3	0	0	0	0
1982	3	11	3	2	0	0	11	30	11	4	0	4	15	9	0	0	0	0
1983	3	7	8	0	0	0	7	25	10	4	0	7	27	5	0	0	0	0
1984	3	9	5	0	0	0	13	32	12	8	0	2	14	5	0	0	0	0
1985	9	11	7	2	0	0	6	26	18	11	0	0	14	4	0	0	0	0
1986	5	11	10	1	0	0	3	28	22	11	0	0	11	3	0	0	0	0
1987	3	3	9	4	0	0	2	21	30	15	0	1	10	5	0	0	0	0
1988	5	5	7	7	0	0	1	28	18	10	0	0	15	8	0	0	0	0
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	4	8	7	2	0	0	6	26	16	11	0	2	15	6	0	0	0	0

C. BY MONTH (composited over years).

Month	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
Jan	5	30	0	0	0	1	46	11	0	0	1	8	1	0	0	0	0	0
Feb	8	37	1	0	0	0	24	13	2	0	0	14	8	0	0	0	0	0
Mar	8	47	5	0	0	0	6	18	4	0	0	6	13	0	0	0	0	0
Apr	7	18	18	0	0	0	1	29	17	6	0	1	8	3	0	0	0	0
May	4	11	15	4	0	0	2	35	16	8	0	0	6	3	0	0	0	0
Jun	4	6	6	3	0	0	5	34	19	11	0	0	11	6	0	0	0	0
Jul	4	3	8	4	0	0	1	31	16	22	0	0	6	9	0	0	0	0
Aug	5	3	8	3	0	0	1	25	26	19	0	1	6	10	0	0	0	0
Sep	4	10	6	1	0	0	5	21	18	8	0	3	24	4	0	0	0	0
Oct	6	14	2	0	0	0	22	16	4	0	0	6	33	3	0	0	0	0
Nov	6	33	2	0	0	0	43	8	1	0	1	10	1	0	0	0	0	0
Dec	9	29	1	0	0	1	51	8	0	0	2	7	0	0	0	0	0	0

1. % days with unidentified diurnal patterns in hourly ozone concentration (see Böhm et al. 1990).
2. Pattern identifier relates to degree of diurnal variation in hourly ozone concentrations (A curves - least variation; E curves - greatest variation) and daily mean (1 curves - lowest mean; 6 curves highest mean) as described by Böhm et al (1990) and as illustrated in Figure 4C.1. Note that due to numeric rounding, the sums of percentages do not always equal 100.

South Lake Tahoe

BASIC STATISTICS

A. BY YEAR.

Year	% Data Capt[1]	% Valid Days[2]	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	42	43	10	10	20	30	34.5±17	50	60	60	13	1	0	0	0
1981	99	99	10	10	20	30	34.0±16	40	60	60	11	1	0	0	0
1982	96	98	10	10	20	30	32.8±15	40	50	60	7	0	0	0	0
1983	91	94	10	10	20	30	31.1±14	40	50	50	4	0	0	0	0
1984	93	92	10	10	20	30	32.4±15	40	50	60	7	0	0	0	0
1985	92	92	10	20	20	40	35.0±15	50	50	60	8	0	0	0	0
1986	93	96	10	20	20	40	35.0±15	50	60	60	10	0	0	0	0
1987	94	99	10	20	20	40	36.6±16	50	60	60	14	1	0	0	0
1988	91	94	10	20	20	40	38.2±17	50	60	70	16	1	0	0	0
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	88	90	10	10	20	30	34.4±15	40	50	60	10	0	0	0	0

B. BY GROWING SEASON (May through October).

Year	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06[3] (ppm hr)	S08[4] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	51	52	10	10	20	40	36.5±19	50	60	70	28	2	20	1	0	0	0
1981	99	99	10	20	30	40	39.0±18	50	60	70	59	5	21	1	0	0	0
1982	96	98	10	10	20	30	33.9±17	50	60	60	33	1	13	0	0	0	0
1983	86	89	10	10	20	30	33.4±17	50	50	60	21	1	9	0	0	0	0
1984	87	86	10	10	10	40	35.2±17	50	60	60	32	1	13	0	0	0	0
1985	88	89	10	20	20	40	38.2±16	50	60	60	38	2	15	1	0	0	0
1986	94	99	20	20	30	40	39.7±16	50	60	60	48	2	18	1	0	0	0
1987	95	99	10	20	30	40	41.8±17	50	60	70	66	5	25	1	0	0	0
1988	95	99	10	20	30	40	41.7±18	60	60	70	69	9	25	3	0	0	0
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	88	90	10	20	20	40	37.8±17	50	60	60	-	-	18	1	0	0	0

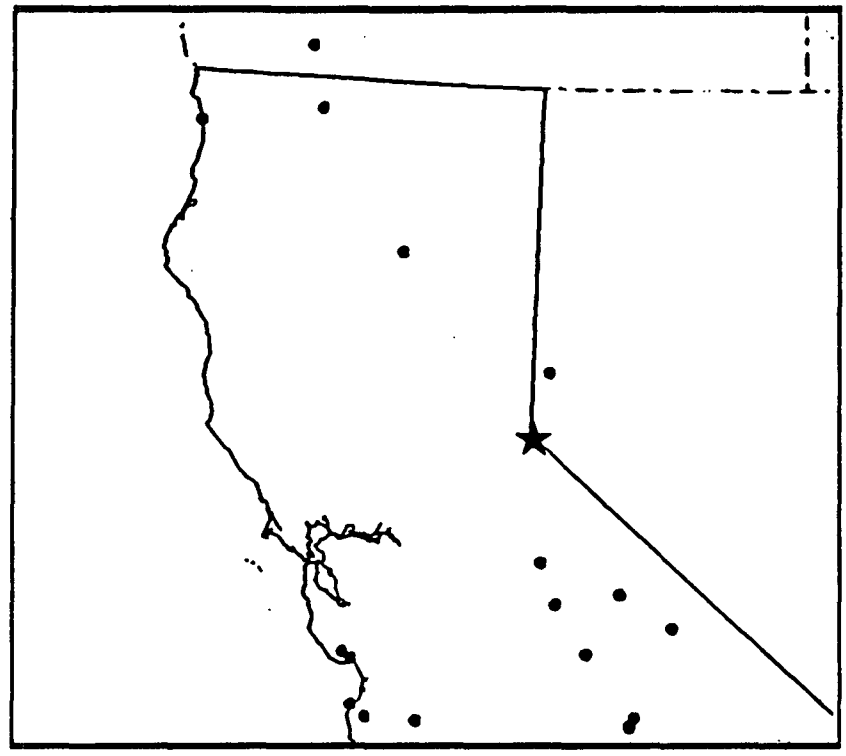
C. BY MONTH [5].

Month	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06 (ppm hr)	S08[6] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
Jan	96	98	10	10	20	30	28.0±11	40	40	50	1	0	1	0	0	0	0
Feb	89	90	10	10	20	30	30.5±12	40	40	50	1	1	1	0	0	0	0
Mar	96	98	10	20	20	40	33.5±12	40	50	50	1	1	1	0	0	0	0
Apr	95	96	10	20	30	40	38.1±14	50	50	60	4	1	8	0	0	0	0
May	92	96	10	20	30	40	41.2±16	50	60	60	9	1	19	1	0	0	0
Jun	90	93	10	20	20	40	39.0±17	50	60	60	8	1	17	1	0	0	0
Jul	84	86	10	20	30	40	41.6±18	60	60	70	13	1	26	1	0	0	0
Aug	96	97	10	20	30	40	41.2±18	60	60	70	13	1	27	1	0	0	0
Sep	93	94	10	10	20	40	35.3±17	50	60	60	6	1	13	1	0	0	0
Oct	93	95	10	10	20	30	29.6±14	40	50	60	3	1	5	0	0	0	0
Nov	96	99	10	10	20	30	28.7±11	40	40	50	1	0	1	0	0	0	0
Dec	96	97	10	10	20	30	27.4±11	40	40	40	1	0	1	0	0	0	0

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100. Av. period BY YEAR = 8760 hrs; BY G.S. = 4416 hrs.
2. % Valid Days = # days with 75 % of hours between 09:00 and 21:00 / (total # days) * 100 (Federal Register 1979).
3. Cumulative Index: S06 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 60 ppb (Lee et al. 1988).
4. Cumulative Index: S08 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 80 ppb (Lee et al. 1988).
5. Statistics for monthly composites over the period of record.
6. Monthly estimate of S06(08) = S06(08) * (# hours in that month) / (# valid hours).

SOUTH LAKE TAHOE CALIFORNIA

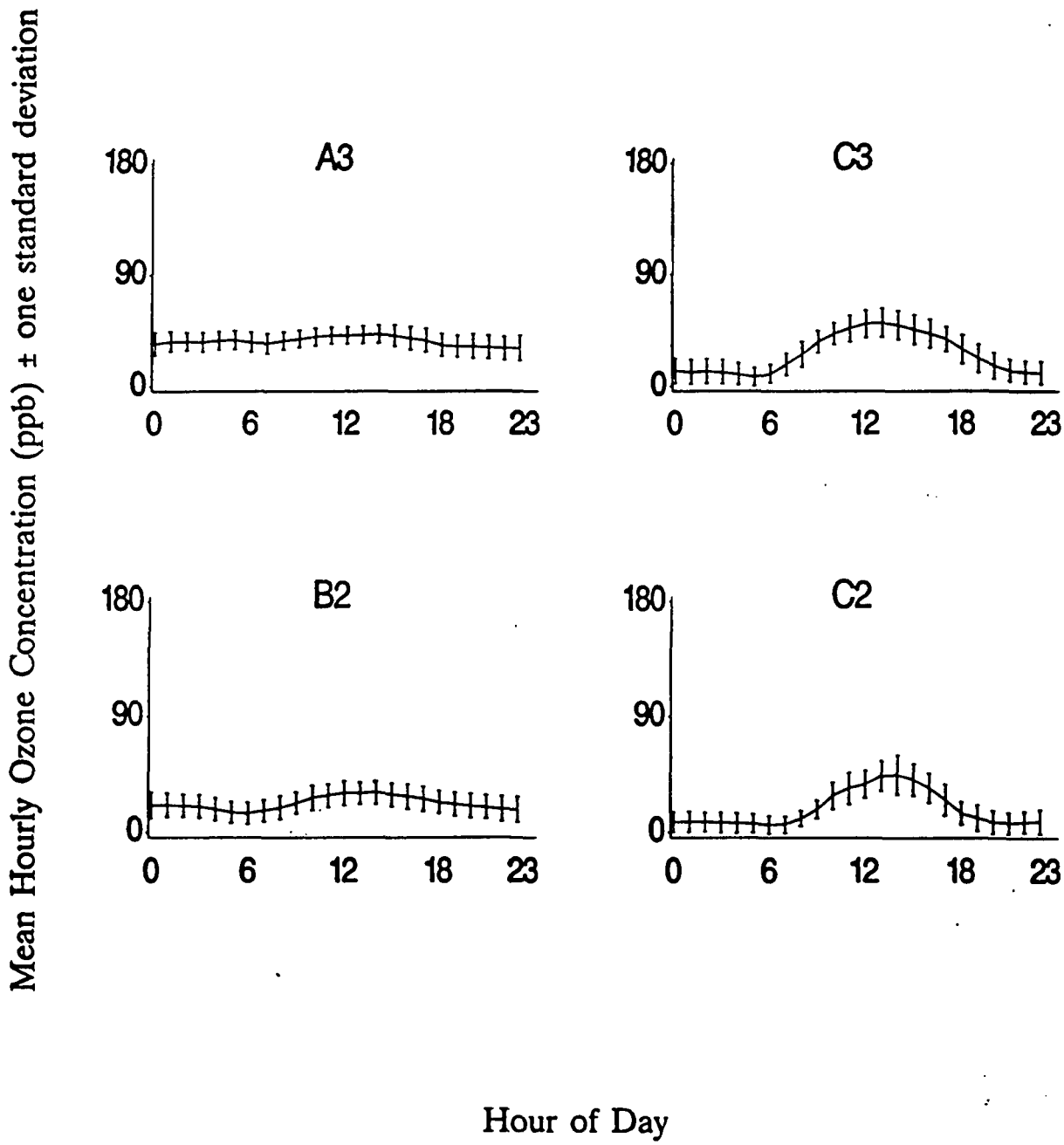
BIOGRAPHIC INFORMATION



Latitude	-	38.94° N
Longitude	-	119.96° W
Elevation (m)	-	1907
Basin Height (m)	-	1907
Landuse	-	Suburban - Residential
City Population	-	20,681
Basin Population	-	1,598,583
Start Summary	-	July, 1980
End Summary	-	December, 1988
Source of Data	-	AIRS (06-017-0006)

SCOTTS VALLEY

DOMINANT DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS (MAY - OCT)



Scotts Valley

DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS

A. BY YEAR.

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	6	2	0	0	0	14	18	3	0	0	18	30	12	1	0	0	2	0
1981	8	7	1	0	0	14	19	7	2	1	10	21	16	2	0	0	1	0
1982	6	9	1	0	0	6	24	7	1	0	8	25	14	4	0	0	0	0
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	7	6	1	0	0	11	21	6	1	0	11	24	14	2	0	0	1	0

B. BY GROWING SEASON (May through October).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	9	3	0	0	0	2	25	5	0	0	3	39	17	2	0	0	3	0
1981	7	5	1	0	0	8	20	6	3	2	9	23	19	2	0	0	1	0
1982	7	12	1	0	0	2	25	5	1	0	4	30	16	3	0	0	1	0
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	7	7	1	0	0	4	23	6	2	1	6	30	18	2	0	0	2	0

C. BY MONTH (composited over years).

Month	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
Jan	8	0	0	0	0	31	25	0	0	0	36	8	0	0	0	0	0	0
Feb	4	2	0	0	0	18	18	7	0	0	18	33	4	0	0	0	0	0
Mar	6	14	0	0	0	0	36	7	2	0	0	26	16	0	0	0	0	0
Apr	3	14	2	0	0	0	3	26	3	0	0	9	29	14	0	0	0	0
May	8	18	7	0	0	0	21	12	7	0	3	2	26	3	0	0	0	0
Jun	5	19	0	0	0	2	33	9	3	5	0	5	16	3	0	0	3	0
Jul	9	1	0	0	0	9	26	3	0	0	3	35	22	0	0	0	0	0
Aug	6	4	0	0	0	5	26	0	0	0	6	40	14	4	0	0	1	0
Sep	11	3	0	0	0	7	20	8	0	0	9	35	15	1	0	0	1	0
Oct	5	0	0	0	0	2	11	4	0	0	12	52	14	2	0	0	4	0
Nov	9	0	0	0	0	26	15	0	0	0	30	25	4	0	0	0	0	0
Dec	7	2	0	0	0	51	9	0	0	0	32	5	2	0	0	0	0	0

1. % days with unidentified diurnal patterns in hourly ozone concentration (see Böhm et al. 1990).
2. Pattern identifier relates to degree of diurnal variation in hourly ozone concentrations (A curves - least variation; E curves - greatest variation) and daily mean (1 curves - lowest mean; 6 curves highest mean) as described by Böhm et al (1990) and as illustrated in Figure 4C.1. Note that due to numeric rounding, the sums of percentages do not always equal 100.

Olympic National Park (NPS)

DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS

A. BY YEAR (August through February).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0
1986	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	7	0	0	0	0	77	21	0	0	0	2	0	0	0	0	0	0	0
All Years	1	0	0	0	0	95	5	0	0	0	0	0	0	0	0	0	0	0

B. BY GROWING SEASON (August through October).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0

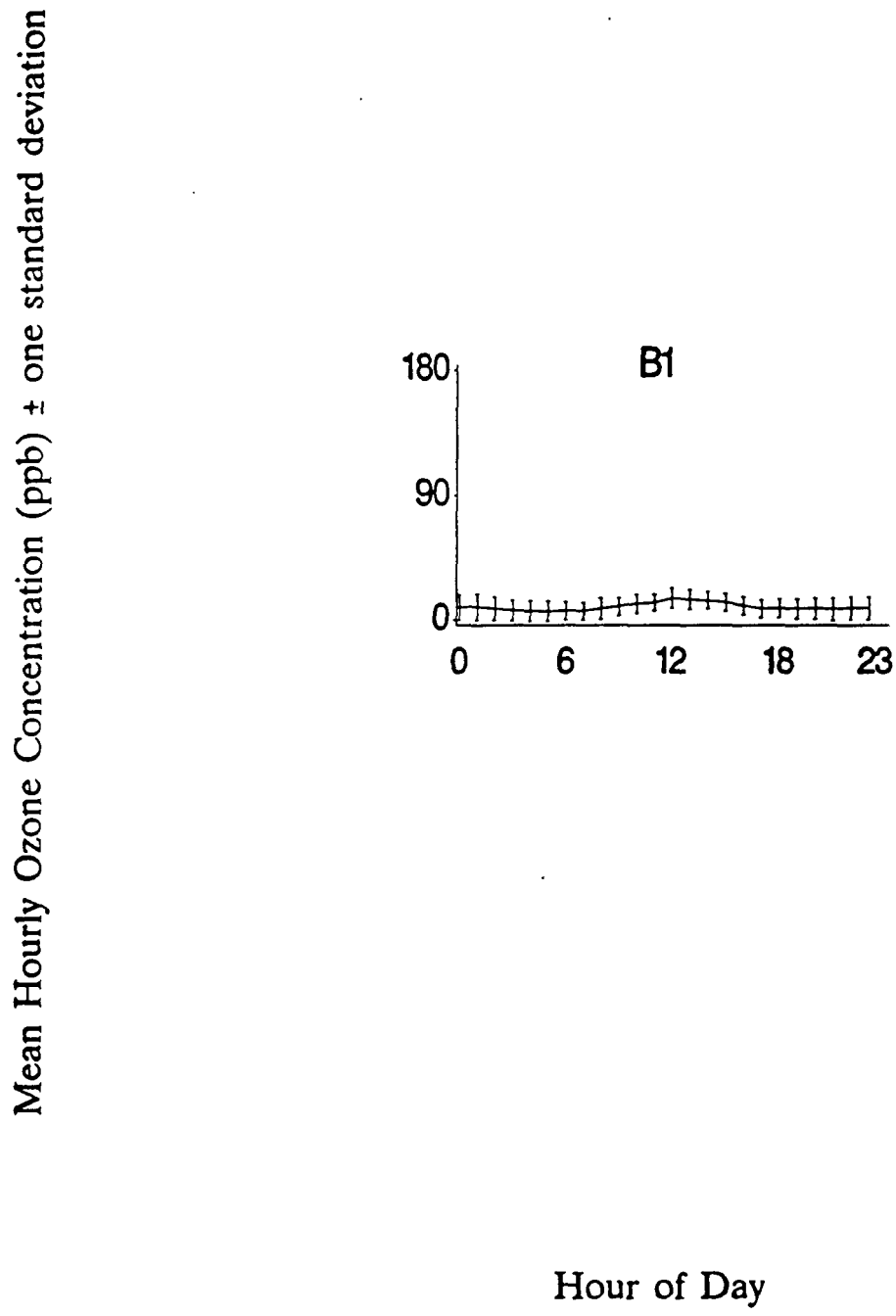
C. BY MONTH (composited over years).

Month	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
Jan	2	0	0	0	0	94	6	0	0	0	0	0	0	0	0	0	0	0
Feb	11	0	0	0	0	59	35	0	0	0	6	0	0	0	0	0	0	0
Mar	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Apr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
May	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Jun	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Jul	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aug	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0
Sep	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0
Oct	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0
Nov	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0
Dec	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0

1. % days with unidentified diurnal patterns in hourly ozone concentration (see Böhm et al. 1990).
2. Pattern identifier relates to degree of diurnal variation in hourly ozone concentrations (A curves - least variation; E curves - greatest variation) and daily mean (1 curves - lowest mean; 6 curves highest mean) as described by Böhm et al (1990) and as illustrated in Figure 4C.1. Note that due to numeric rounding, the sums of percentages do not always equal 100.

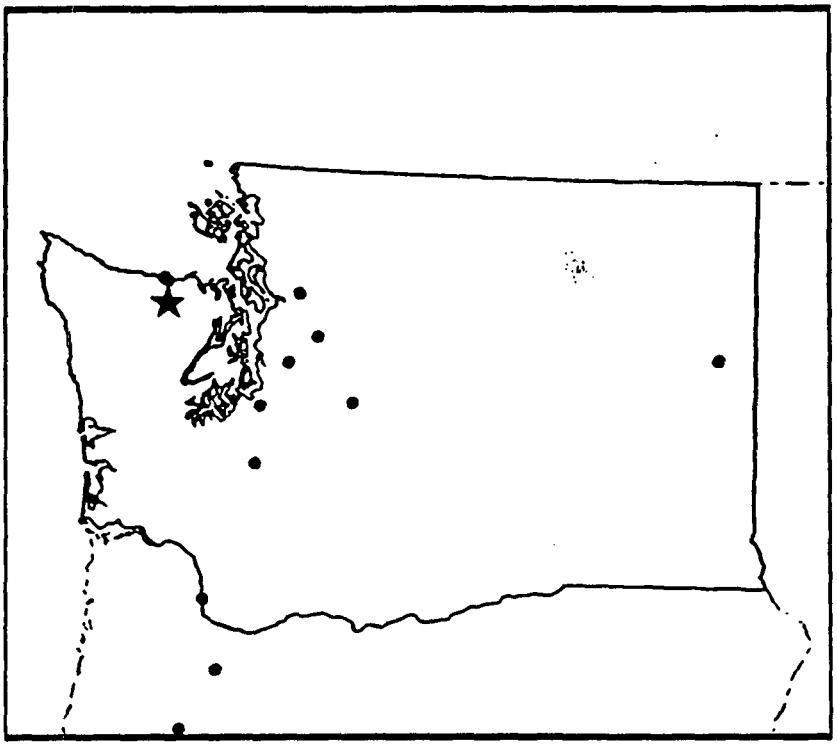
OLYMPIC NATIONAL PARK (NPS)

DOMINANT DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS (AUG - OCT)



OLYMPIC NATIONAL PARK WASHINGTON

BIOGRAPHIC INFORMATION



Latitude	-	47.93° N
Longitude	-	123.37° W
Elevation (m)	-	100
Basin Height (m)	-	0
Landuse	-	Rural
City Population	-	Not In A City
Basin Population	-	529,337
Start Summary	-	June, 1982
End Summary	-	September, 1984
Source of Data	-	WADOE

Olympic National Park (WADOE)

BASIC STATISTICS

A. BY YEAR.

Year	% Data Capt[1]	% Valid Days[2]	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	13	13	0	0	10	10	11.8±08	20	20	30	0	0	0	0	0
1982	90	91	0	0	0	10	12.2±11	20	30	30	0	0	0	0	0
1983	56	56	0	0	10	10	12.6±08	20	20	30	0	0	0	0	0
1984	77	78	0	0	0	10	10.2±08	20	20	20	0	0	0	0	0
1985	80	79	0	0	10	20	18.1±10	20	30	40	0	0	0	0	0
1986	78	79	0	0	10	20	17.4±12	20	30	40	0	0	0	0	0
1987	58	58	0	10	10	20	20.8±12	30	40	40	1	0	0	0	0
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	65	65	0	0	10	10	14.9±11	20	30	30	0	0	0	0	0

B. BY GROWING SEASON (May through October).

Year	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06[3] (ppm hr)	S08[4]	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	88	89	0	0	0	10	13.3±11	20	30	30	1	0	0	0	0	0	0
1983	77	77	0	0	10	10	13.7±09	20	20	30	0	0	0	0	0	0	0
1984	92	93	0	0	0	10	10.1±08	20	20	20	0	0	0	0	0	0	0
1985	69	68	0	10	10	20	20.4±11	30	30	40	1	0	0	0	0	0	0
1986	98	99	0	0	10	20	18.3±12	30	30	40	1	0	0	0	0	0	0
1987	84	83	10	10	20	20	23.1±12	30	40	40	2	1	1	0	0	0	0
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	85	85	0	0	10	20	16.3±11	20	30	40	-	-	0	0	0	0	0

C. BY MONTH [5].

Month	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06 (ppm hr)	S08[6]	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
Jan	95	98	0	0	0	10	11.6±10	20	20	30	1	0	0	0	0	0	0
Feb	97	97	0	0	10	10	13.2±08	20	20	30	0	0	0	0	0	0	0
Mar	99	100	0	10	10	20	15.8±09	20	30	30	1	0	0	0	0	0	0
Apr	97	96	10	10	10	20	21.1±10	30	40	40	0	0	0	0	0	0	0
May	98	97	10	10	10	20	23.7±12	30	40	40	1	0	0	0	0	0	0
Jun	98	98	0	10	10	20	19.7±11	30	30	40	1	1	0	0	0	0	0
Jul	97	98	0	0	10	10	13.8±08	20	20	30	0	0	0	0	0	0	0
Aug	97	98	0	0	10	20	16.2±11	20	30	40	1	0	0	0	0	0	0
Sep	98	99	0	0	10	10	13.6±10	20	30	30	0	0	0	0	0	0	0
Oct	98	98	0	0	0	10	11.1±10	20	20	30	1	0	0	0	0	0	0
Nov	98	98	0	0	0	10	11.5±10	20	20	30	0	0	0	0	0	0	0
Dec	97	99	0	0	0	10	9.0±08	10	20	20	0	0	0	0	0	0	0

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100. Av. period BY YEAR = 8760 hrs; BY G.S. = 4416 hrs.
2. % Valid Days = # days with 75 % of hours between 09:00 and 21:00 / (total # days) * 100 (Federal Register 1979).
3. Cumulative Index S06 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 60 ppb (Lee et al. 1988).
4. Cumulative Index S08 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 80 ppb (Lee et al. 1988).
5. Statistics for monthly composites over the period of record.
6. Monthly estimate of S06(08) = S06(08) * (# hours in that month) / (# valid hours).

Olympic National Park (WADOE)

DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS

A. BY YEAR.

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	5	4	0	0	0	59	25	0	0	0	4	5	2	0	0	0	0	0
1983	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0
1984	6	0	0	0	0	78	15	0	0	0	6	1	0	0	0	0	0	0
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	6	2	0	0	0	68	20	0	0	0	5	3	1	0	0	0	0	0

B. BY GROWING SEASON (May through October).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	4	4	0	0	0	53	27	1	1	0	6	7	3	0	0	0	0	0
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	7	0	0	0	0	76	17	0	0	0	6	1	0	0	0	0	0	0
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	5	2	0	0	0	64	22	0	0	0	6	4	1	0	0	0	0	0

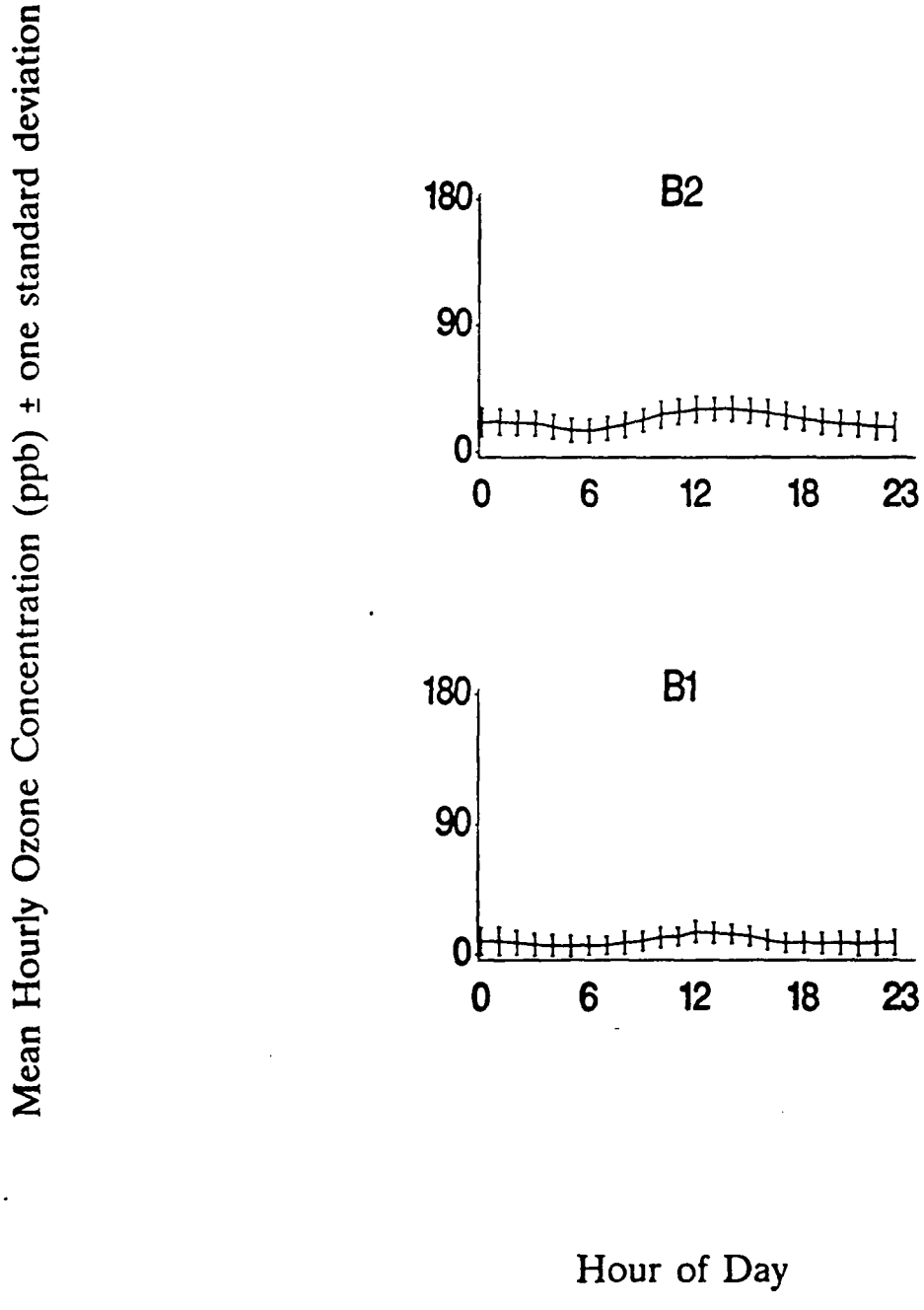
C. BY MONTH (composited over years).

Month	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
Jan	3	0	0	0	0	81	19	0	0	0	0	0	0	0	0	0	0	0
Feb	5	0	0	0	0	85	7	0	0	0	5	2	0	0	0	0	0	0
Mar	15	0	0	0	0	67	19	0	0	0	12	2	0	0	0	0	0	0
Apr	7	12	0	0	0	43	41	0	0	0	0	2	2	0	0	0	0	0
May	12	10	0	0	0	25	43	2	0	0	8	6	6	0	0	0	0	0
Jun	4	2	0	0	0	44	38	0	2	0	6	6	2	0	0	0	0	0
Jul	5	0	0	0	0	62	33	0	0	0	4	2	0	0	0	0	0	0
Aug	7	0	0	0	0	75	10	0	0	0	10	6	0	0	0	0	0	0
Sep	0	0	0	0	0	89	0	0	0	0	7	4	0	0	0	0	0	0
Oct	0	0	0	0	0	98	0	0	0	0	2	0	0	0	0	0	0	0
Nov	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0
Dec	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0

1. % days with unidentified diurnal patterns in hourly ozone concentration (see Böhm et al. 1990).
2. Pattern identifier relates to degree of diurnal variation in hourly ozone concentrations (A curves - least variation; E curves - greatest variation) and daily mean (1 curves - lowest mean; 6 curves highest mean) as described by Böhm et al (1990) and as illustrated in Figure 4C.1. Note that due to numeric rounding, the sums of percentages do not always equal 100.

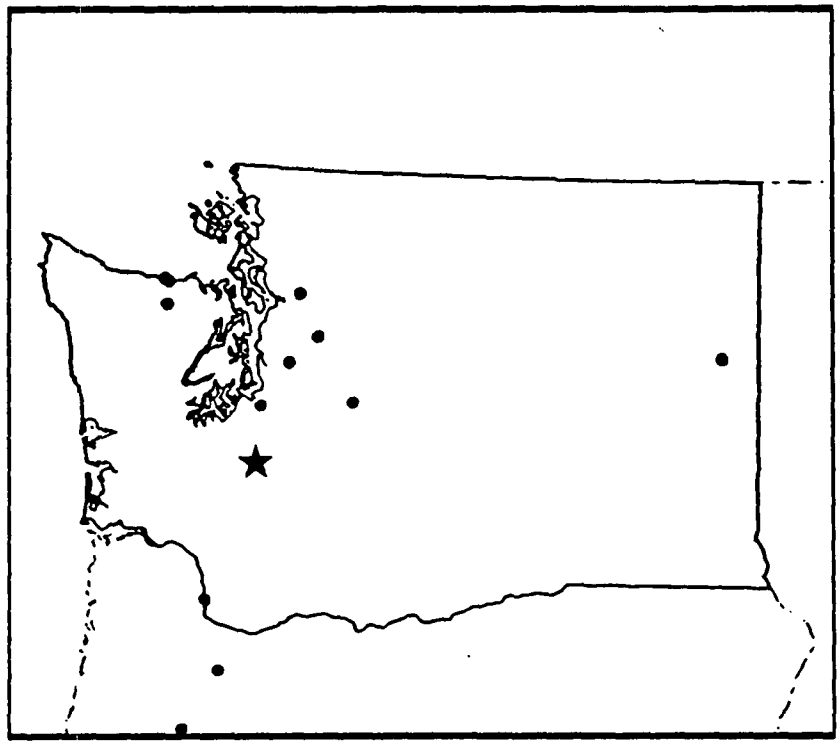
OLYMPIC NATIONAL PARK (WADOE)

DOMINANT DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS (MAY - OCT)



PACK FOREST **WASHINGTON**

BIOGRAPHIC INFORMATION



Latitude	-	46.79° N
Longitude	-	122.33° W
Elevation (m)	-	24
Basin Height (m)	-	5.5
Landuse	-	Rural - Forest
City Population	-	Not In A City
Basin Population	-	2,240,288
Start Summary	-	June, 1985
End Summary	-	October, 1987
Source of Data	-	WADOE

Pack Forest

BASIC STATISTICS

A. BY YEAR (April through October).

Year	% Data Capt[1]	% Valid Days[2]	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	40	42	10	10	20	30	30.3±18	40	50	70	8	3	1	0	3
1986	38	41	10	10	20	30	31.9±18	40	50	70	10	4	1	0	1
1987	48	51	10	10	20	30	28.2±16	40	50	60	7	2	0	0	0
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	42	45	10	10	20	30	30.0±18	40	50	60	8	3	1	0	4

B. BY GROWING SEASON (May through October).

Year	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06[3] (ppm hr)	S08[4] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	79	84	10	10	20	30	30.3±18	40	50	70	22	10	8	3	1	0	3
1986	76	80	10	10	20	30	31.9±18	40	50	70	25	12	10	4	1	0	1
1987	85	89	10	10	20	20	28.0±17	40	50	60	19	6	7	2	0	0	0
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	80	84	10	10	20	30	30.0±18	40	50	70	-	-	8	3	1	0	4

C. BY MONTH [5].

Month	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06 (ppm hr)	S08[6] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
Jan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Feb	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mar	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Apr	91	100	10	10	20	30	30.4±14	40	50	50	3	1	5	1	0	0	0
May	89	96	10	20	20	30	34.0±16	40	50	70	5	3	8	3	1	0	0
Jun	92	98	10	20	20	30	35.2±19	40	60	70	7	3	13	4	1	0	1
Jul	92	99	10	10	20	20	29.0±19	40	60	70	6	3	11	3	1	0	2
Aug	94	98	10	10	20	30	32.1±21	40	60	70	8	4	13	5	1	0	1
Sep	95	98	10	10	20	20	26.4±13	30	40	50	2	1	3	0	0	0	0
Oct	90	93	10	10	20	20	23.4±11	30	40	40	1	0	0	0	0	0	0
Nov	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dec	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100. Av. period BY YEAR = 8760 hrs; BY G.S. = 4416 hrs.
2. % Valid Days = # days with 75 % of hours between 09:00 and 21:00 / (total # days) * 100 (Federal Register 1979).
3. Cumulative Index: S06 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 60 ppb (Lee et al. 1988).
4. Cumulative Index: S08 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 80 ppb (Lee et al. 1988).
5. Statistics for monthly composites over the period of record.
6. Monthly estimate of S06(08) = S06(08) * (# hours in that month) / (# valid hours).

Pack Forest

DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS

A. BY YEAR (April through October).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	9	12	0	0	0	6	45	15	3	10	0	3	3	0	2	0	0	0
1986	18	12	0	5	0	2	47	15	2	2	2	5	5	0	0	0	0	0
1987	6	10	1	0	0	7	31	20	6	6	1	11	6	1	1	0	0	0
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	9	11	0	1	0	6	39	17	4	7	1	7	5	1	1	0	0	0

B. BY GROWING SEASON (May through October).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	9	12	0	0	0	6	45	15	3	10	0	3	3	0	2	0	0	0
1986	18	12	0	5	0	2	47	15	2	2	2	5	5	0	0	0	0	0
1987	6	11	1	0	0	7	29	20	6	5	1	12	5	2	1	0	0	0
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	9	11	0	1	0	6	38	17	5	7	1	8	4	1	1	0	0	0

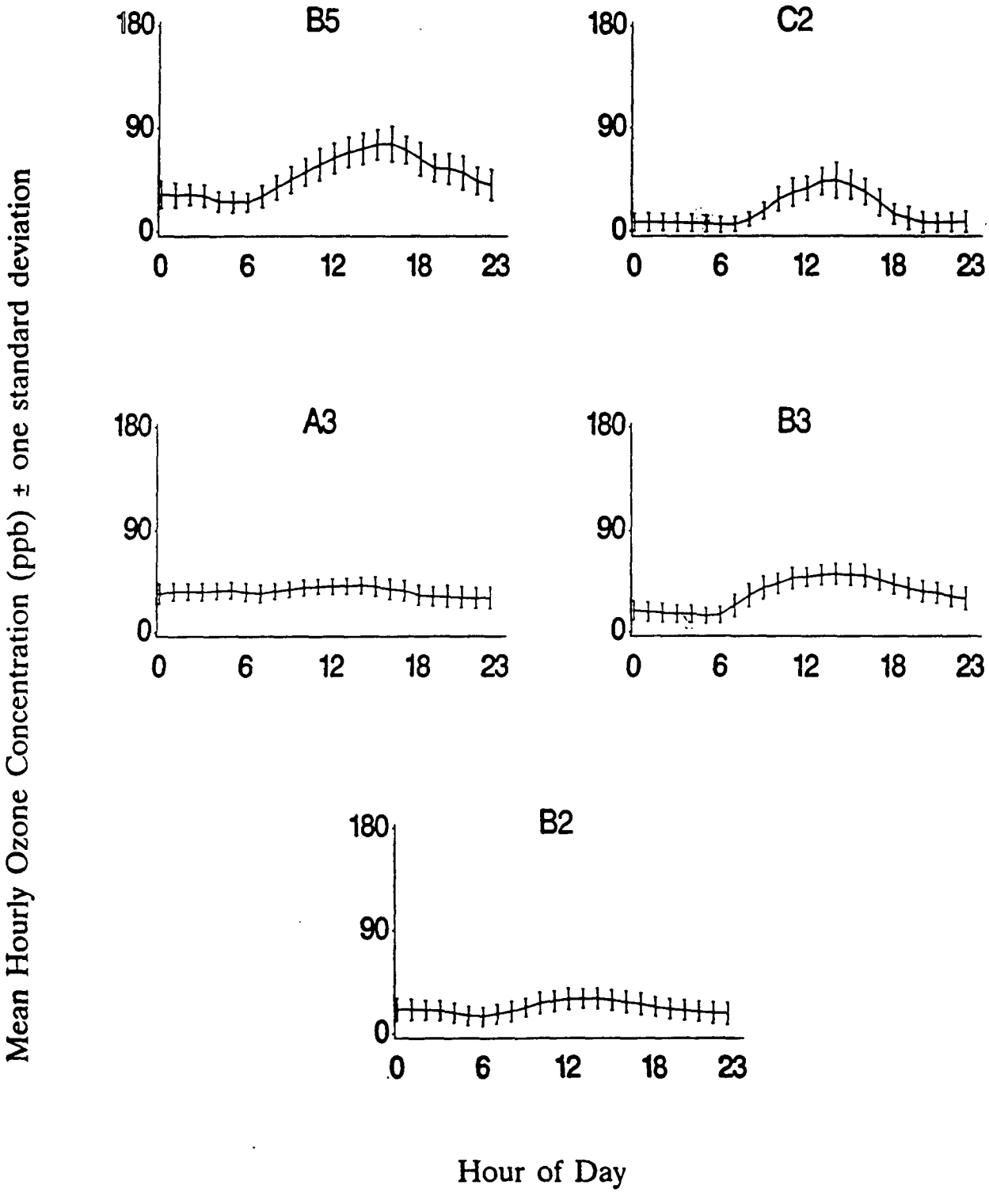
C. BY MONTH (composited over years).

Month	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
Jan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Feb	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mar	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Apr	0	0	0	0	0	0	50	10	0	20	0	0	20	0	0	0	0	0
May	7	32	4	0	0	0	16	32	8	4	0	0	0	0	4	0	0	0
Jun	11	7	0	0	0	7	32	27	7	12	0	0	2	2	2	0	0	0
Jul	6	0	0	0	0	12	41	16	3	9	0	9	6	3	0	0	0	0
Aug	7	2	0	3	0	9	31	20	6	16	2	5	5	0	2	0	0	0
Sep	10	11	0	0	0	1	52	15	4	0	0	10	7	0	0	0	0	0
Oct	14	27	0	0	0	7	43	0	0	0	2	18	2	0	0	0	0	0
Nov	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dec	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

1. % days with unidentified diurnal patterns in hourly ozone concentration (see Böhm et al. 1990).
2. Pattern identifier relates to degree of diurnal variation in hourly ozone concentrations (A curves - least variation; E curves - greatest variation) and daily mean (1 curves - lowest mean; 6 curves highest mean) as described by Böhm et al (1990) and as illustrated in Figure 4C.1. Note that due to numeric rounding, the sums of percentages do not always equal 100.

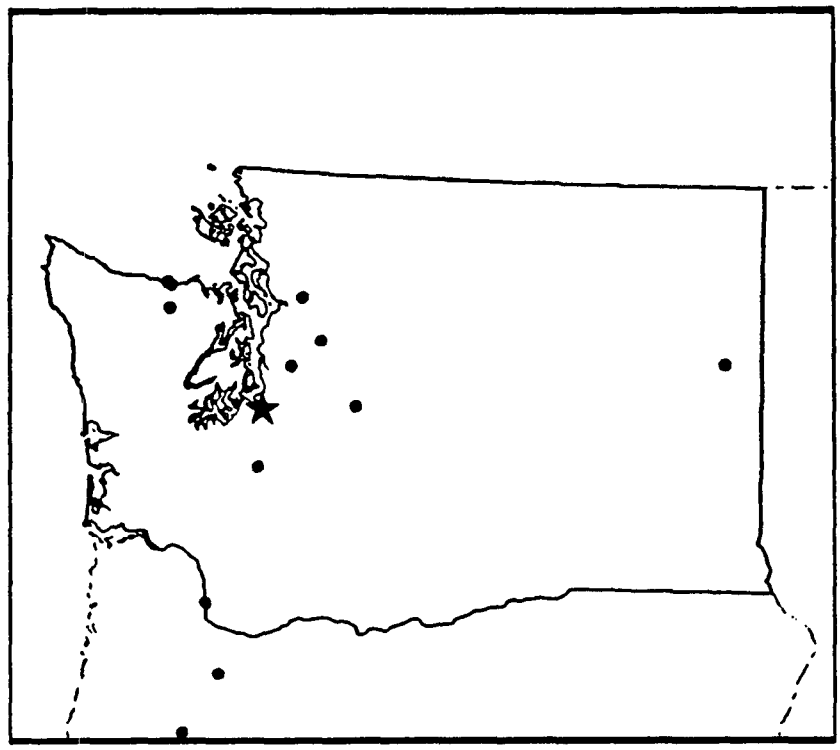
PACK FOREST

DOMINANT DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS (MAY - OCT)



PIERCE COUNTY **WASHINGTON**

BIOGRAPHIC INFORMATION



Latitude	-	47.22° N
Longitude	-	122.32° W
Elevation (m)	-	14
Basin Height (m)	-	5.5
Landuse	-	Suburban - Residential
City Population	-	Not In A City
Basin Population	-	2,240,288
Start Summary	-	April, 1980
End Summary	-	October, 1986
Source of Data	-	AIRS (53-053-0004)

Pierce County

BASIC STATISTICS

A. BY YEAR.

Year	% Data Capt[1]	% Valid Days[2]	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	42	45	0	0	0	10	14.9±15	20	40	40	1	0	0	0	0
1981	62	65	0	0	0	10	11.4±15	20	30	40	2	1	0	0	1
1982	89	93	0	0	0	10	12.3±15	20	30	40	1	0	0	0	0
1983	70	70	0	0	0	10	12.4±14	20	30	40	0	0	0	0	0
1984	96	97	0	0	0	10	13.5±14	20	30	40	0	0	0	0	0
1985	95	96	0	0	0	10	14.5±16	30	40	40	1	0	0	0	0
1986	81	81	0	0	0	10	13.6±15	20	30	40	1	0	0	0	0
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	77	78	0	0	0	10	13.2±15	20	30	40	1	0	0	0	1

B. BY GROWING SEASON (May through October).

Year	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06[3] (ppm hr)	S08[4]	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	78	83	0	0	0	10	14.4±14	20	30	40	3	1	1	0	0	0	0
1981	92	97	0	0	0	10	13.6±17	20	30	40	8	3	2	1	0	0	1
1982	85	92	0	0	0	10	13.5±16	20	30	40	7	2	3	0	0	0	0
1983	50	50	0	0	0	20	16.8±15	30	40	40	2	1	1	0	0	0	0
1984	94	95	0	0	0	20	16.4±15	30	40	40	2	0	1	0	0	0	0
1985	98	99	0	0	0	20	17.5±17	30	40	50	8	2	2	0	0	0	0
1986	95	96	0	0	0	10	14.0±15	20	40	40	5	1	1	0	0	0	0
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	85	87	0	0	0	10	15.1±16	20	40	40	-	-	2	0	0	0	1

C. BY MONTH [5].

Month	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06 (ppm hr)	S08[6]	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
Jan	93	94	0	0	0	0	5.3±09	10	20	20	0	0	0	0	0	0	0
Feb	98	99	0	0	0	0	9.7±11	20	30	30	0	0	0	0	0	0	0
Mar	97	98	0	0	0	10	13.3±13	20	30	30	0	0	0	0	0	0	0
Apr	88	91	0	0	10	20	21.3±16	30	40	40	1	0	1	0	0	0	0
May	92	95	0	0	10	20	20.8±15	30	40	40	1	1	1	0	0	0	0
Jun	94	97	0	0	0	20	17.5±15	30	40	40	1	1	2	0	0	0	0
Jul	88	91	0	0	0	10	15.4±16	20	40	50	2	1	2	0	0	0	0
Aug	85	87	0	0	0	10	16.0±19	30	40	50	3	1	4	1	0	0	1
Sep	95	98	0	0	0	10	10.7±13	20	30	40	1	1	1	0	0	0	0
Oct	96	98	0	0	0	0	7.9±10	20	20	30	0	0	0	0	0	0	0
Nov	89	89	0	0	0	0	8.3±11	20	20	30	0	0	0	0	0	0	0
Dec	92	93	0	0	0	0	5.5±09	10	20	20	0	0	0	0	0	0	0

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100. Av. period BY YEAR = 8760 hrs; BY G.S. = 4416 hrs.
2. % Valid Days = # days with 75 % of hours between 09:00 and 21:00 / (total # days) * 100 (Federal Register 1979).
3. Cumulative Index: S06 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 60 ppb (Lee et al. 1988).
4. Cumulative Index: S08 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 80 ppb (Lee et al. 1988).
5. Statistics for monthly composites over the period of record.
6. Monthly estimate of S06(08) = S06(08) * (# hours in that month) / (# valid hours).

Pierce County

DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS

A. BY YEAR.

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	8	1	0	0	0	33	10	1	0	0	14	33	8	1	0	0	0	0
1981	3	1	0	0	0	49	9	1	0	0	11	17	9	2	0	0	2	0
1982	3	4	0	0	0	55	10	1	0	0	7	9	11	2	0	0	0	0
1983	5	3	0	0	0	45	15	1	0	0	9	19	7	0	0	0	0	0
1984	6	4	0	0	0	41	19	1	0	0	12	13	9	0	0	0	0	0
1985	4	3	0	0	0	31	17	2	1	0	16	14	14	2	0	0	0	0
1986	5	5	0	0	0	36	12	1	0	0	15	19	11	0	0	0	0	0
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	5	3	0	0	0	41	14	1	0	0	12	16	10	1	0	0	0	0

B. BY GROWING SEASON (May through October).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	7	1	0	0	0	35	8	0	0	0	16	36	2	1	0	0	0	0
1981	4	1	0	0	0	30	12	1	0	0	13	24	13	2	0	0	3	0
1982	4	0	0	0	0	41	6	2	0	0	11	15	20	6	0	0	0	0
1983	8	3	0	0	0	21	19	3	0	0	12	27	17	0	0	0	0	0
1984	11	6	0	0	0	23	19	2	0	0	13	19	17	1	0	0	0	0
1985	3	2	0	0	0	16	16	2	1	0	16	21	24	4	0	0	0	0
1986	6	2	0	0	0	29	11	1	0	0	18	21	16	1	0	0	1	0
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	6	2	0	0	0	26	14	1	0	0	15	23	16	2	0	0	1	0

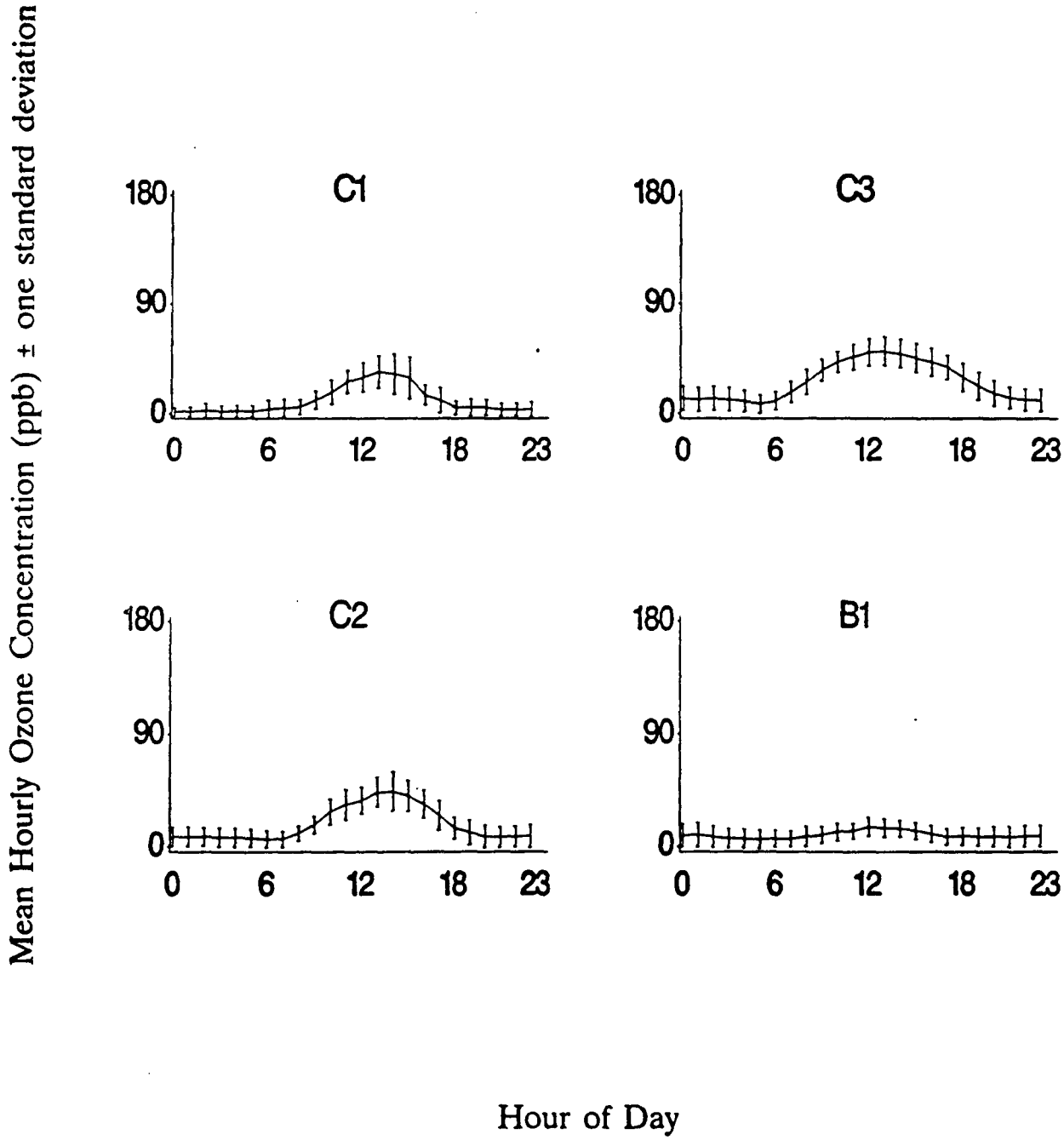
C. BY MONTH (composited over years).

Month	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
Jan	0	1	0	0	0	86	8	0	0	0	4	0	1	0	0	0	0	0
Feb	2	2	0	0	0	63	16	0	0	0	12	6	0	0	0	0	0	0
Mar	7	4	0	0	0	27	20	1	0	0	28	19	2	0	0	0	0	0
Apr	7	16	0	0	0	7	19	3	2	0	4	29	19	1	0	0	0	0
May	7	11	0	0	0	8	27	4	1	0	5	14	28	1	0	0	0	0
Jun	10	1	0	0	0	27	19	3	0	0	6	20	22	1	0	0	1	0
Jul	7	0	0	0	0	27	6	0	0	0	6	34	23	3	0	0	0	0
Aug	4	1	0	0	0	18	6	2	0	0	13	37	17	4	0	0	3	0
Sep	4	0	0	0	0	28	10	0	0	0	40	21	1	0	0	0	0	0
Oct	4	2	0	0	0	55	16	0	0	0	24	3	0	0	0	0	0	0
Nov	1	1	0	0	0	73	19	0	0	0	6	1	0	0	0	0	0	0
Dec	1	1	0	0	0	87	7	1	0	0	4	1	0	0	0	0	0	0

1. % days with unidentified diurnal patterns in hourly ozone concentration (see Böhm et al. 1990).
2. Pattern identifier relates to degree of diurnal variation in hourly ozone concentrations (A curves - least variation; E curves - greatest variation) and daily mean (1 curves - lowest mean; 6 curves highest mean) as described by Böhm et al (1990) and as illustrated in Figure 4C.1. Note that due to numeric rounding, the sums of percentages do not always equal 100.

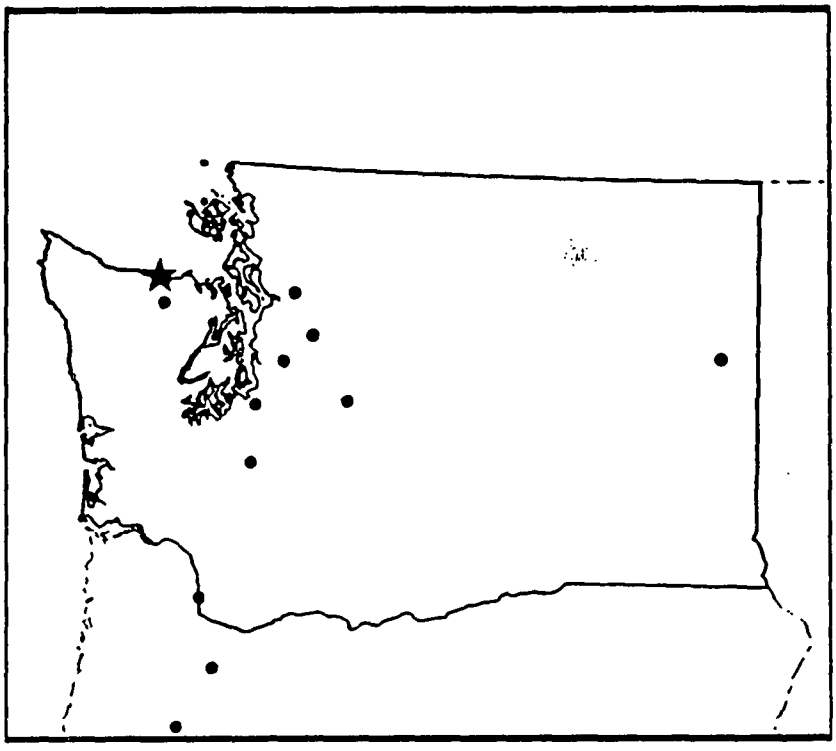
PIERCE COUNTY

DOMINANT DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS (MAY - OCT)



PORT ANGELES **WASHINGTON**

BIOGRAPHIC INFORMATION



Latitude	-	48.12° N
Longitude	-	123.43° W
Elevation (m)	-	30
Basin Height (m)	-	0
Landuse	-	City Center - Commercial
City Population	-	17,331
Basin Population	-	529,337
Start Summary	-	November, 1981
End Summary	-	June, 1985
Source of Data	-	WADOE

Port Angeles

BASIC STATISTICS

A. BY YEAR.

Year	% Data Capt[1]	% Valid Days[2]	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	13	13	0	0	10	10	12.0±08	20	20	30	0	0	0	0	0
1982	89	91	0	0	0	10	12.2±11	20	30	30	0	0	0	0	0
1983	55	56	0	0	10	10	12.6±08	20	20	30	0	0	0	0	0
1984	77	78	0	0	0	1	1.0±01	2	2	2	0	0	0	0	0
1985	42	41	0	1	1	2	1.9±01	3	3	4	0	0	0	0	0
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	55	56	0	0	1	2	7.6±09	10	20	30	0	0	0	0	0

B. BY GROWING SEASON (May through October).

Year	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06[3] (ppm hr)	S08[4] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	88	89	0	0	0	10	13.3±11	20	30	30	1	0	0	0	0	0	0
1983	77	77	0	0	10	10	13.7±09	20	20	30	0	0	0	0	0	0	0
1984	92	93	0	0	0	1	1.0±01	2	2	2	0	0	0	0	0	0	0
1985	27	26	1	1	2	2	2.3±01	3	4	4	0	0	0	0	0	0	0
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	71	71	0	0	1	2	8.4±10	10	20	30	-	-	0	0	0	0	0

C. BY MONTH [5].

Month	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06 (ppm hr)	S08[6] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
Jan	63	65	0	0	0	1	4.8±07	10	20	20	0	0	0	0	0	0	0
Feb	91	92	0	0	1	2	4.8±07	10	20	20	0	0	0	0	0	0	0
Mar	99	100	0	1	1	2	6.3±08	10	20	30	0	0	0	0	0	0	0
Apr	95	94	1	1	2	2	9.2±12	20	30	30	0	0	0	0	0	0	0
May	93	94	0	1	1	2	9.6±12	20	30	30	0	0	0	0	0	0	0
Jun	87	87	0	0	1	3	8.9±10	20	20	30	1	0	0	0	0	0	0
Jul	97	98	0	0	1	10	9.5±09	20	20	20	0	0	0	0	0	0	0
Aug	98	99	0	0	1	10	9.2±09	20	20	30	0	0	0	0	0	0	0
Sep	86	86	0	0	0	10	7.8±09	10	20	30	0	0	0	0	0	0	0
Oct	79	80	0	0	0	0	4.3±07	10	15	20	0	0	0	0	0	0	0
Nov	75	76	0	0	0	10	7.1±08	10	20	20	0	0	0	0	0	0	0
Dec	95	96	0	0	0	10	8.2±08	10	20	20	0	0	0	0	0	0	0

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100. Av. period BY YEAR = 8760 hrs; BY G.S. = 4416 hrs.
2. % Valid Days = # days with 75 % of hours between 09:00 and 21:00 / (total # days) * 100 (Federal Register 1979).
3. Cumulative Index S06 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 60 ppb (Lee et al. 1988).
4. Cumulative Index S08 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 80 ppb (Lee et al. 1988).
5. Statistics for monthly composites over the period of record.
6. Monthly estimate of S06(08) = S06(08) * (# hours in that month) / (# valid hours).

Port Angeles

DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS

A. BY YEAR.

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	0	0	0	0	0	78	19	0	0	0	3	0	0	0	0	0	0	0
1982	5	4	0	0	0	59	25	0	0	0	4	5	2	0	0	0	0	0
1983	7	1	0	0	0	66	23	0	0	0	6	2	1	0	0	0	0	0
1984	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	3	2	0	0	0	80	13	0	0	0	3	2	1	0	0	0	0	0

B. BY GROWING SEASON (May through October).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	4	4	0	0	0	53	27	1	1	0	6	7	3	0	0	0	0	0
1983	9	2	0	0	0	59	26	0	0	0	9	3	1	0	0	0	0	0
1984	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	4	2	0	0	0	74	15	0	0	0	4	3	1	0	0	0	0	0

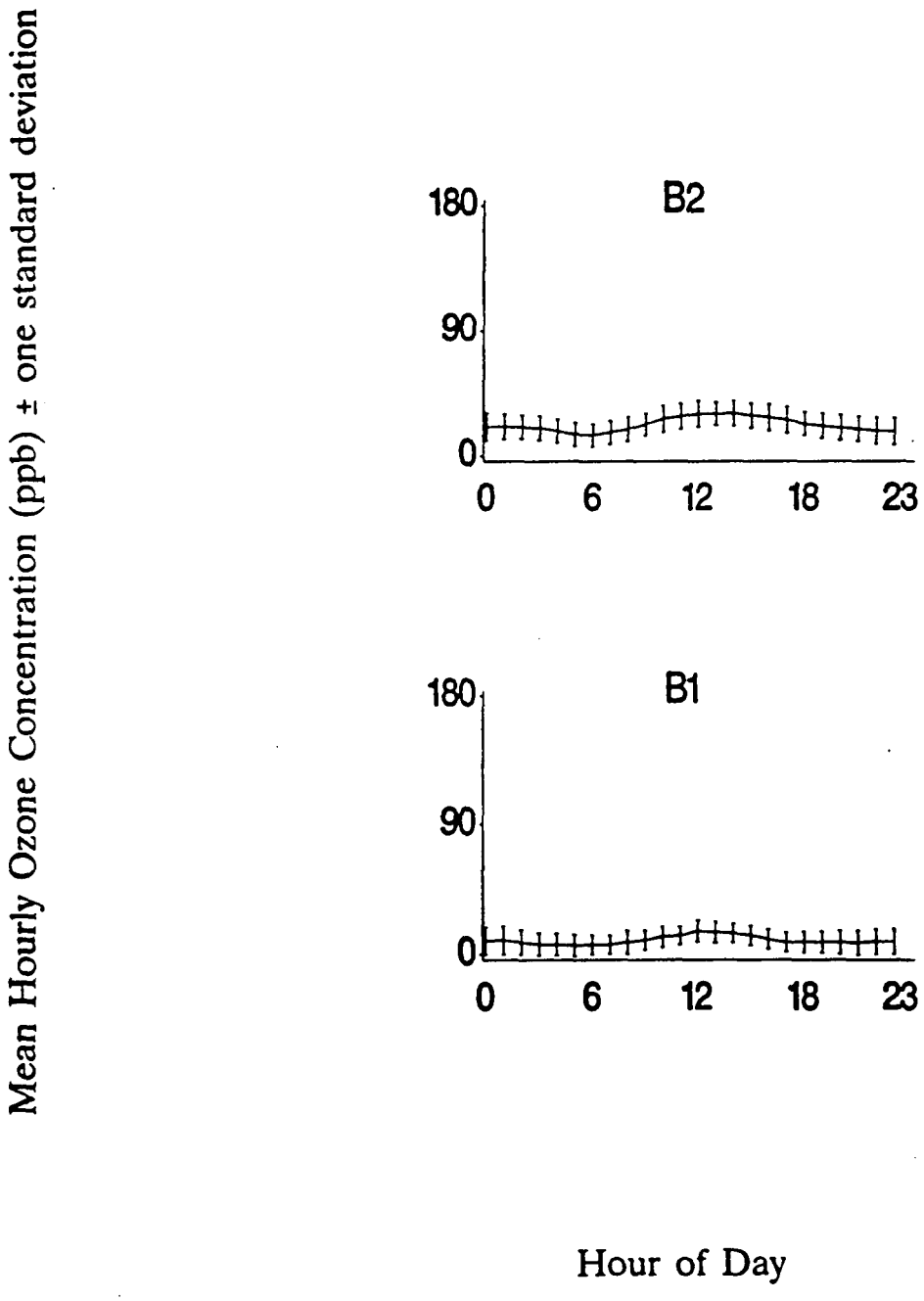
C. BY MONTH (composited over years).

Month	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
Jan	0	0	0	0	0	94	6	0	0	0	0	0	0	0	0	0	0	0
Feb	3	0	0	0	0	94	5	0	0	0	0	2	0	0	0	0	0	0
Mar	6	0	0	0	0	85	12	0	0	0	2	1	0	0	0	0	0	0
Apr	4	8	0	0	0	72	18	0	0	0	0	1	1	0	0	0	0	0
May	2	6	0	0	0	64	19	1	0	0	1	4	4	0	0	0	0	0
Jun	4	1	0	0	0	74	18	0	1	0	3	2	1	0	0	0	0	0
Jul	6	1	0	0	0	70	21	0	0	0	7	0	1	0	0	0	0	0
Aug	5	1	0	0	0	70	16	0	0	0	5	7	0	0	0	0	0	0
Sep	0	0	0	0	0	74	16	0	0	0	5	4	0	0	0	0	0	0
Oct	4	0	0	0	0	96	0	0	0	0	4	0	0	0	0	0	0	0
Nov	2	0	0	0	0	87	11	0	0	0	2	0	0	0	0	0	0	0
Dec	0	0	0	0	0	87	13	0	0	0	0	0	0	0	0	0	0	0

1. % days with unidentified diurnal patterns in hourly ozone concentration (see Böhm et al. 1990).
2. Pattern identifier relates to degree of diurnal variation in hourly ozone concentrations (A curves - least variation; E curves - greatest variation) and daily mean (1 curves - lowest mean; 6 curves highest mean) as described by Böhm et al (1990) and as illustrated in Figure 4C.1. Note that due to numeric rounding, the sums of percentages do not always equal 100.

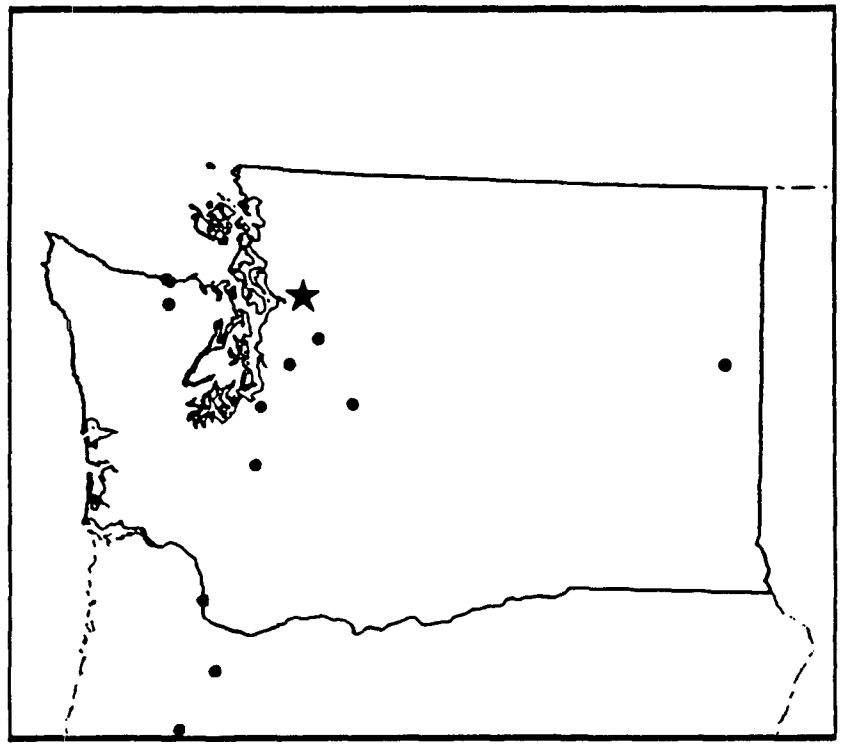
PORT ANGELES

DOMINANT DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS (MAY - OCT)



SNOHOMISH COUNTY WASHINGTON

BIOGRAPHIC INFORMATION



Latitude	-	48.07° N
Longitude	-	121.98° W
Elevation (m)	-	120
Basin Height (m)	-	5.5
Landuse	-	Rural - Agricultural
City Population	-	Not In A City
Basin Population	-	2,240,288
Start Summary	-	May, 1980
End Summary	-	October, 1986
Source of Data	-	AIRS (53-061-2001)

Snohomish

BASIC STATISTICS

A. BY YEAR (April through November).

Year	% Data Capt[1]	% Valid Days[2]	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	33	34	0	0	10	10	16.3±13	20	30	40	0	0	0	0	0
1981	44	46	0	0	0	10	16.6±15	30	40	40	2	0	0	0	0
1982	54	56	0	0	0	20	18.6±17	30	40	50	3	1	0	0	0
1983	41	41	0	0	0	10	13.1±12	20	30	40	0	0	0	0	0
1984	51	51	0	0	10	20	17.7±14	30	40	40	1	0	0	0	0
1985	45	45	0	0	10	20	20.8±17	30	40	50	4	0	0	0	0
1986	41	41	0	0	0	10	16.9±16	30	40	50	2	0	0	0	0
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	44	45	0	0	0	20	17.3±15	30	40	40	2	0	0	0	0

B. BY GROWING SEASON (May through October).

Year	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06[3] (ppm hr)	S08[4] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	65	68	0	0	10	10	16.3±13	20	30	40	1	0	0	0	0	0	0
1981	88	91	0	0	0	10	16.6±15	30	40	40	5	1	2	0	0	0	0
1982	91	95	0	0	0	10	17.3±17	30	40	50	8	3	3	1	0	0	0
1983	81	82	0	0	0	10	13.1±12	20	30	40	1	1	0	0	0	0	0
1984	93	94	0	0	0	20	18.0±14	30	40	40	3	0	1	0	0	0	0
1985	89	90	0	0	10	20	20.8±17	30	40	50	10	2	4	0	0	0	0
1986	76	76	0	0	0	10	16.5±17	30	40	50	6	1	3	0	0	0	0
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	83	85	0	0	0	10	17.0±15	30	40	40	-	-	2	0	0	0	0

C. BY MONTH [5].

Month	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06 (ppm hr)	S08[6] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
Jan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Feb	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mar	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Apr	60	63	0	10	20	30	26.2±13	30	40	50	1	0	1	0	0	0	0
May	89	92	0	0	10	20	23.5±15	30	40	50	1	1	2	0	0	0	0
Jun	84	86	0	0	10	20	20.1±15	30	40	50	2	1	2	1	0	0	0
Jul	89	91	0	0	10	10	16.9±16	30	40	50	2	1	2	0	0	0	0
Aug	93	95	0	0	0	10	17.0±17	30	40	50	2	1	4	0	0	0	0
Sep	81	82	0	0	0	10	12.0±13	20	30	40	1	1	0	0	0	0	0
Oct	64	65	0	0	0	10	10.6±11	20	30	30	1	0	0	0	0	0	0
Nov	48	47	0	0	10	20	14.2±10	20	20	30	0	0	0	0	0	0	0
Dec	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100. Av. period BY YEAR = 8760 hrs; BY G.S. = 4416 hrs.
2. % Valid Days = # days with 75 % of hours between 09:00 and 21:00 / (total # days) * 100 (Federal Register 1979).
3. Cumulative Index: S06 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 60 ppb (Lee et al. 1988).
4. Cumulative Index: S08 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 80 ppb (Lee et al. 1988).
5. Statistics for monthly composites over the period of record.
6. Monthly estimate of S06(08) = S06(08) * (# hours in that month) / (# valid hours).

Snohomish County

DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS

A. BY YEAR (April through November).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	12	0	0	0	0	28	9	2	0	0	15	28	18	0	0	0	0	0
1981	13	2	0	0	0	26	23	2	0	0	7	20	19	2	0	0	0	0
1982	7	5	0	0	0	27	14	6	1	1	12	9	22	3	0	0	1	0
1983	11	1	0	0	0	34	16	0	0	0	23	17	8	1	0	0	0	0
1984	11	3	0	0	0	24	27	1	1	0	16	10	18	0	0	0	0	0
1985	9	2	0	0	0	11	19	10	1	1	10	15	24	4	0	0	2	0
1986	8	1	0	0	0	29	18	4	1	0	8	12	26	2	0	0	0	0
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	10	2	0	0	0	25	19	4	1	0	13	14	20	2	0	0	0	0

B. BY GROWING SEASON (May through October).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	12	0	0	0	0	28	9	2	0	0	15	28	18	0	0	0	0	0
1981	13	2	0	0	0	26	23	2	0	0	7	20	19	2	0	0	0	0
1982	8	3	0	0	0	31	13	4	1	1	13	9	21	4	0	0	1	0
1983	11	1	0	0	0	34	16	0	0	0	23	17	8	1	0	0	0	0
1984	12	4	0	0	0	20	27	1	1	0	17	11	20	0	0	0	0	0
1985	9	2	0	0	0	11	19	10	1	1	10	15	24	4	0	0	2	0
1986	7	1	0	0	0	30	16	4	1	0	8	12	26	2	0	0	0	0
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	10	2	0	0	0	25	18	4	1	0	13	15	20	2	0	0	0	0

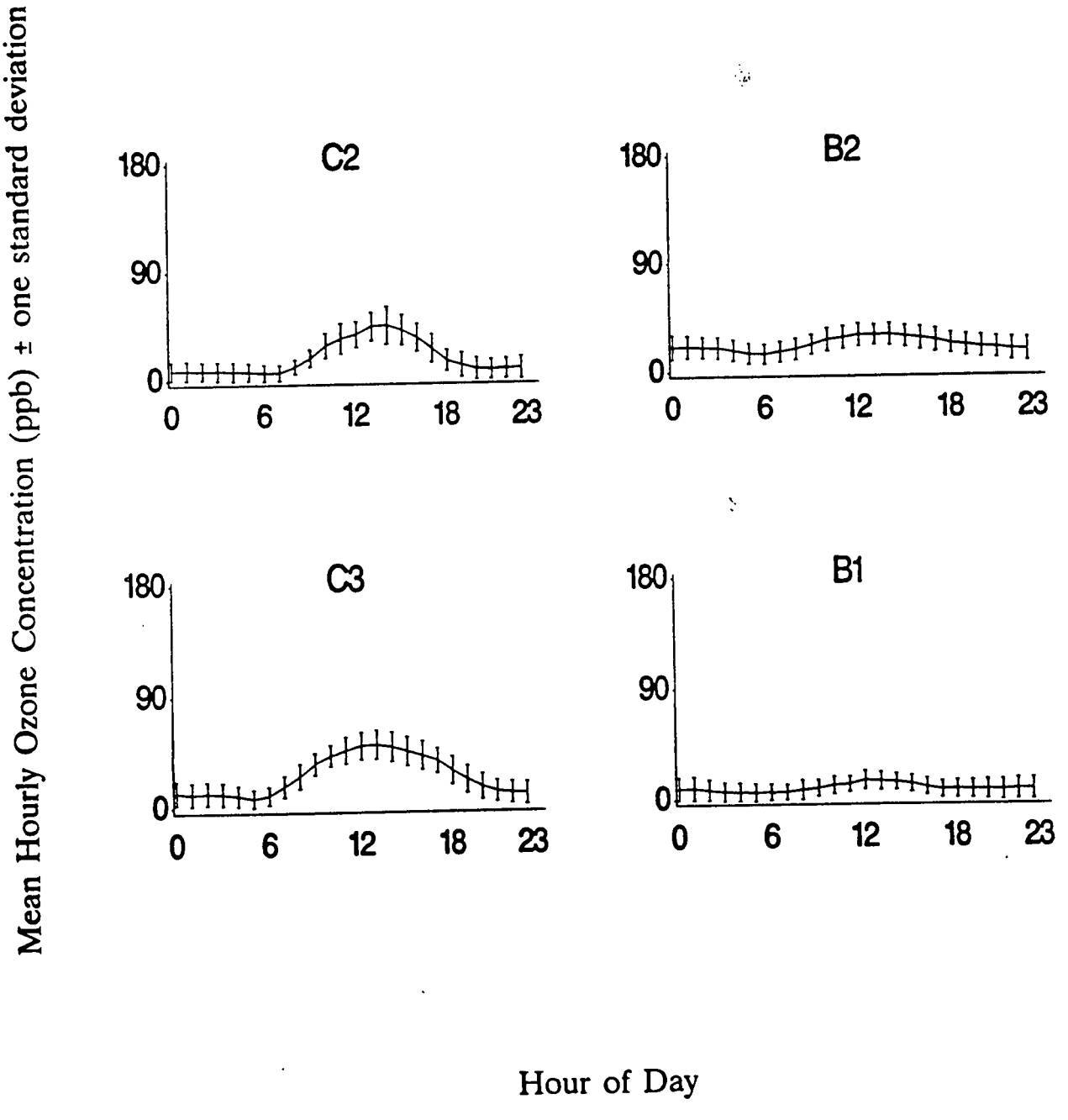
C. BY MONTH (composited over years).

Month	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
Jan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Feb	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mar	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Apr	10	12	0	0	0	4	35	15	0	0	0	4	31	0	0	0	0	0
May	9	9	0	0	0	7	32	5	4	1	2	5	33	1	0	0	0	0
Jun	14	2	0	0	0	18	35	5	0	1	5	8	22	4	0	0	2	0
Jul	13	0	0	0	0	35	12	5	0	0	7	16	22	2	0	0	1	0
Aug	9	0	0	0	0	20	7	5	0	0	10	24	29	4	0	0	0	0
Sep	10	0	0	0	0	27	9	0	0	0	36	26	2	0	0	0	0	0
Oct	4	0	0	0	0	48	17	0	0	0	25	8	2	0	0	0	0	0
Nov	0	0	0	0	0	57	36	0	0	0	7	0	0	0	0	0	0	0
Dec	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

1. % days with unidentified diurnal patterns in hourly ozone concentration (see Böhm et al. 1990).
2. Pattern identifier relates to degree of diurnal variation in hourly ozone concentrations (A curves - least variation; E curves - greatest variation) and daily mean (1 curves - lowest mean; 6 curves highest mean) as described by Böhm et al (1990) and as illustrated in Figure 4C.1. Note that due to numeric rounding, the sums of percentages do not always equal 100.

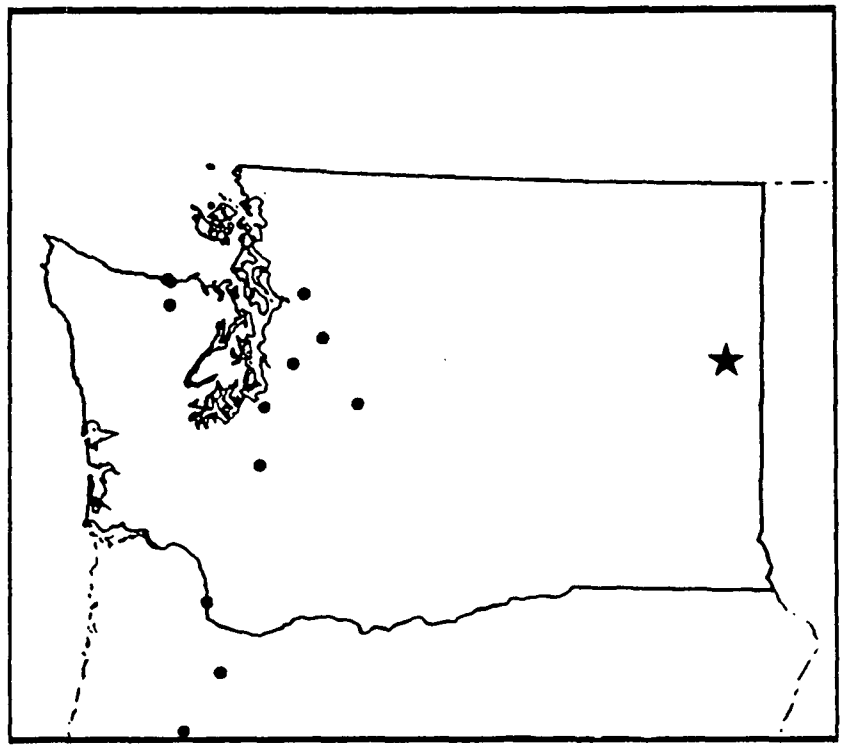
SNOHOMISH COUNTY

DOMINANT DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS (MAY - OCT)



SPOKANE WASHINGTON

BIOGRAPHIC INFORMATION



Latitude	-	47.67° N
Longitude	-	117.42° W
Elevation (m)	-	584
Basin Height (m)	-	461.5
Landuse	-	Suburban - Residential
City Population	-	171,300
Basin Population	-	625,936
Start Summary	-	April, 1980
End Summary	-	September, 1986
Source of Data	-	AIRS (53-063-0013)

Spokane

BASIC STATISTICS

A. BY YEAR (March through October).

Year	% Data Capt[1]	% Valid Days[2]	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	47	49	0	0	0	10	15.1±13	20	30	40	0	0	0	0	0
1981	53	54	0	0	10	20	24.0±15	30	40	50	2	0	0	0	0
1982	45	48	0	0	10	20	22.5±15	30	40	50	2	0	0	0	0
1983	43	44	0	0	0	20	17.7±14	30	40	40	0	0	0	0	0
1984	47	47	0	0	0	20	18.3±15	30	40	40	1	0	0	0	0
1985	40	41	0	0	10	30	26.8±18	40	50	60	5	0	0	0	0
1986	20	19	0	0	10	30	29.0±19	40	50	60	8	1	0	0	0
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	42	43	0	0	10	20	21.3±16	30	40	50	2	0	0	0	0

B. BY GROWING SEASON (May through October).

Year	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06[3] (ppm hr)	S08[4] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	86	91	0	0	0	10	15.3±13	20	30	40	1	0	0	0	0	0	0
1981	81	84	0	0	10	20	23.5±17	40	40	50	8	1	3	0	0	0	0
1982	70	74	0	0	10	20	22.4±16	30	40	50	5	0	2	0	0	0	0
1983	85	87	0	0	0	20	17.7±14	30	40	40	1	0	0	0	0	0	0
1984	87	88	0	0	0	20	17.7±15	30	40	40	3	0	1	0	0	0	0
1985	70	71	0	0	10	30	26.6±18	40	50	60	12	1	6	0	0	0	0
1986	39	39	0	0	10	30	29.0±19	40	50	60	10	2	8	1	0	0	0
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	74	76	0	0	10	20	20.9±16	30	40	50	-	-	2	0	0	0	0

C. BY MONTH [5].

Month	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06 (ppm hr)	S08[6] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
Jan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Feb	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mar	37	37	10	10	10	20	21.5±09	30	30	40	0	0	0	0	0	0	0
Apr	64	67	0	0	10	30	24.8±14	30	40	40	1	0	0	0	0	0	0
May	91	95	0	0	10	30	25.0±16	40	40	50	2	1	2	0	0	0	0
Jun	82	85	0	0	10	20	23.3±15	30	40	50	1	1	2	0	0	0	0
Jul	78	79	0	0	10	20	22.9±16	30	40	50	2	1	2	0	0	0	0
Aug	94	95	0	0	10	20	23.6±19	40	50	60	3	1	6	1	0	0	0
Sep	79	81	0	0	0	10	14.6±13	20	30	40	1	0	0	0	0	0	0
Oct	62	62	0	0	0	0	8.6±11	20	20	30	1	0	0	0	0	0	0
Nov	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dec	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100. Av. period BY YEAR = 8760 hrs; BY G.S. = 4416 hrs.
2. % Valid Days = # days with 75 % of hours between 09:00 and 21:00 / (total # days) * 100 (Federal Register 1979).
3. Cumulative Index S06 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 60 ppb (Lee et al. 1988).
4. Cumulative Index S08 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 80 ppb (Lee et al. 1988).
5. Statistics for monthly composites over the period of record.
6. Monthly estimate of S06(08) = S06(08) * (# hours in that month) / (# valid hours).

Spokane

DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS

A. BY YEAR (March through October).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	4	0	0	0	0	26	12	0	0	0	34	18	9	0	0	0	0	0
1981	4	12	0	0	0	11	23	8	2	0	3	2	30	9	0	0	0	0
1982	4	4	0	0	0	6	26	6	0	0	3	12	36	6	0	0	0	0
1983	5	0	0	0	0	18	25	1	0	0	19	19	18	0	0	0	0	0
1984	7	7	0	0	0	18	17	2	1	0	13	14	27	1	0	0	0	0
1985	3	13	1	0	0	2	17	13	7	0	3	9	25	11	0	0	0	0
1986	11	5	0	0	0	0	11	23	11	0	2	2	27	18	0	0	2	0
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	5	7	0	0	0	11	20	7	2	0	10	11	26	6	0	0	0	0

B. BY GROWING SEASON (May through October).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	4	0	0	0	0	26	12	0	0	0	34	18	9	0	0	0	0	0
1981	3	6	0	0	0	13	21	7	2	0	4	3	32	11	0	0	0	0
1982	4	3	0	0	0	6	22	6	0	0	4	11	42	7	0	0	0	0
1983	5	0	0	0	0	18	25	1	0	0	19	19	18	0	0	0	0	0
1984	6	5	0	0	0	19	18	2	1	0	14	15	27	1	0	0	0	0
1985	3	9	1	0	0	2	18	14	6	0	4	6	27	13	0	0	0	0
1986	11	5	0	0	0	0	11	23	11	0	2	2	27	18	0	0	2	0
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	5	4	0	0	0	13	19	6	2	0	11	11	27	6	0	0	0	0

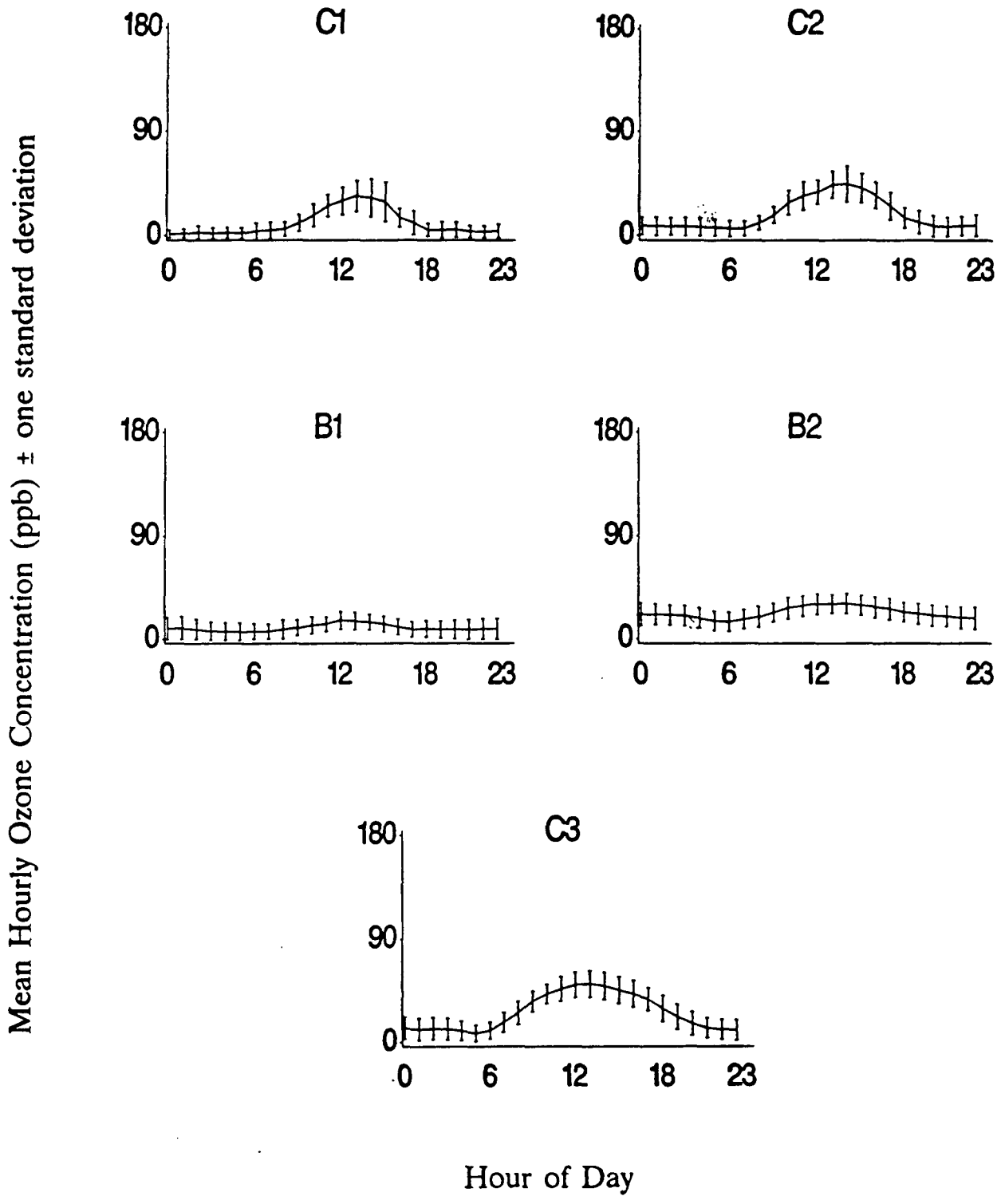
C. BY MONTH (composited over years).

Month	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
Jan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Feb	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mar	18	14	0	0	0	7	64	0	0	0	0	14	0	0	0	0	0	0
Apr	5	28	0	0	0	3	22	10	4	0	0	10	23	1	0	0	0	0
May	7	16	1	0	0	4	24	10	3	0	0	4	30	9	0	0	0	0
Jun	7	4	0	0	0	4	30	12	6	0	1	8	29	6	0	0	0	0
Jul	4	2	0	0	0	6	22	10	2	0	1	10	38	10	0	0	0	0
Aug	4	4	0	0	0	5	14	6	3	0	3	14	40	11	0	0	1	0
Sep	3	1	0	0	0	24	17	1	0	0	31	19	7	0	0	0	0	0
Oct	3	0	0	0	0	47	3	0	0	0	44	6	0	0	0	0	0	0
Nov	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dec	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

1. % days with unidentified diurnal patterns in hourly ozone concentration (see Böhm et al. 1990).
2. Pattern identifier relates to degree of diurnal variation in hourly ozone concentrations (A curves - least variation; E curves - greatest variation) and daily mean (1 curves - lowest mean; 6 curves highest mean) as described by Böhm et al (1990) and as illustrated in Figure 4C.1. Note that due to numeric rounding, the sums of percentages do not always equal 100.

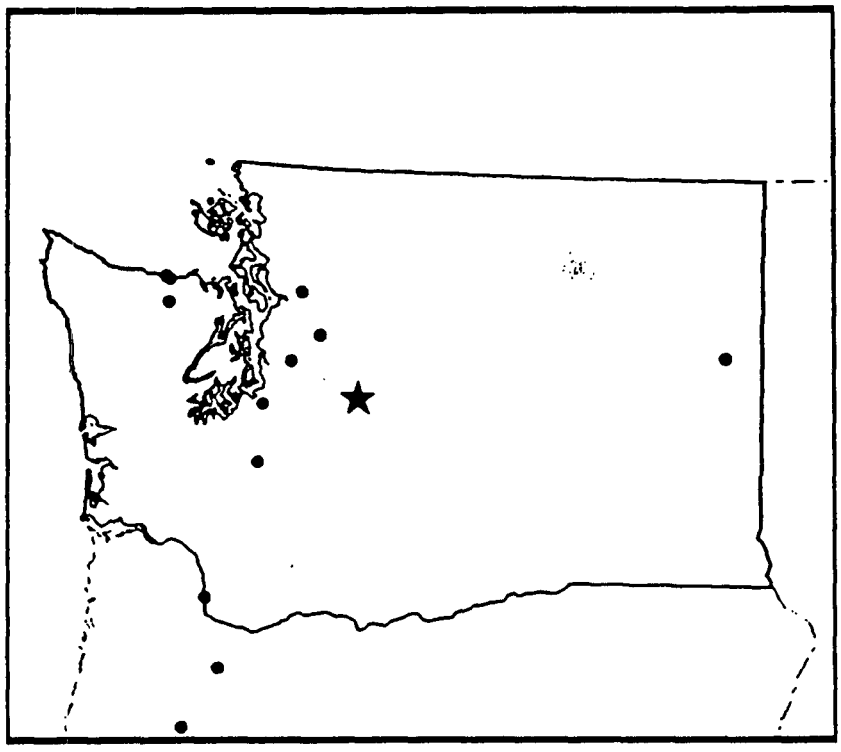
SPOKANE

DOMINANT DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS (MAY - OCT)



STAMPEDE PASS **WASHINGTON**

BIOGRAPHIC INFORMATION



Latitude	-	47.28° N
Longitude	-	121.34° W
Elevation (m)	-	1217
Basin Height (m)	-	5.5
Landuse	-	Remote
City Population	-	Not In A City
Basin Population	-	2,240,288
Start Summary	-	June, 1988
End Summary	-	October, 1988
Source of Data	-	EPA (U. OF WA.)

Stampede Pass

BASIC STATISTICS

A. BY YEAR (June through October).

Year	% Data Capt[1]	% Valid Days[2]	5	10	25	50	Mean±std	75	90	95	60	80	100	120	Days ≥ x 120 ppb
			Percentiles and Arithmetic Mean (ppb)								% hours ≥ x (ppb)				
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	32	31	20	20	30	30	35.2±14	40	50	60	7	0	0	0	1
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	32	31	20	20	30	30	35.2±14	40	50	60	7	0	0	0	1

B. BY GROWING SEASON (June through October).

Year	% Data Capt	% Valid Days	5	10	25	50	Mean±std	75	90	95	S06[3] (ppm hr)	S08[4] (ppm hr)	60	80	100	120	Days ≥ x 120 ppb
			Percentiles and Arithmetic Mean (ppb)										% hours ≥ x (ppb)				
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	63	63	20	20	30	30	35.2±14	40	50	60	13	2	7	0	0	0	1
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	63	63	20	20	30	30	35.2±14	40	50	60	-	-	7	0	0	0	1

C. BY MONTH [5].

Month	% Data Capt	% Valid Days	5	10	25	50	Mean±std	75	90	95	S06 (ppm hr)	S08[6] (ppm hr)	60	80	100	120	Days ≥ x 120 ppb
			Percentiles and Arithmetic Mean (ppb)										% hours ≥ x (ppb)				
Jan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Feb	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mar	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Apr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
May	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Jun	38	37	10	20	20	30	30.3±12	40	50	50	1	0	1	0	0	0	0
Jul	99	97	0	20	20	40	34.2±18	50	50	60	4	2	6	1	1	0	1
Aug	97	97	20	20	30	30	35.9±13	40	50	60	4	1	7	0	0	0	0
Sep	99	100	20	25	30	30	37.0±12	40	60	60	6	0	12	0	0	0	0
Oct	75	78	20	20	30	40	36.1±10	40	50	50	1	0	1	0	0	0	0
Nov	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dec	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100. Av. period BY YEAR = 8760 hrs; BY G.S. = 4416 hrs.
2. % Valid Days = # days with 75 % of hours between 09:00 and 21:00 / (total # days) * 100 (Federal Register 1979).
3. Cumulative Index S06 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 60 ppb (Lee et al. 1988).
4. Cumulative Index S08 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 80 ppb (Lee et al. 1988).
5. Statistics for monthly composites over the period of record.
6. Monthly estimate of S06(08) = S06(08) * (# hours in that month) / (# valid hours).

Stampede Pass

DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS

A. BY YEAR (June through October).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	2	41	15	0	0	3	33	3	4	1	0	0	0	0	0	0	0	0
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	2	41	15	0	0	3	33	3	4	1	0	0	0	0	0	0	0	0

B. BY GROWING SEASON (June through October).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	2	41	15	0	0	3	33	3	4	1	0	0	0	0	0	0	0	0
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Years	2	41	15	0	0	3	33	3	4	1	0	0	0	0	0	0	0	0

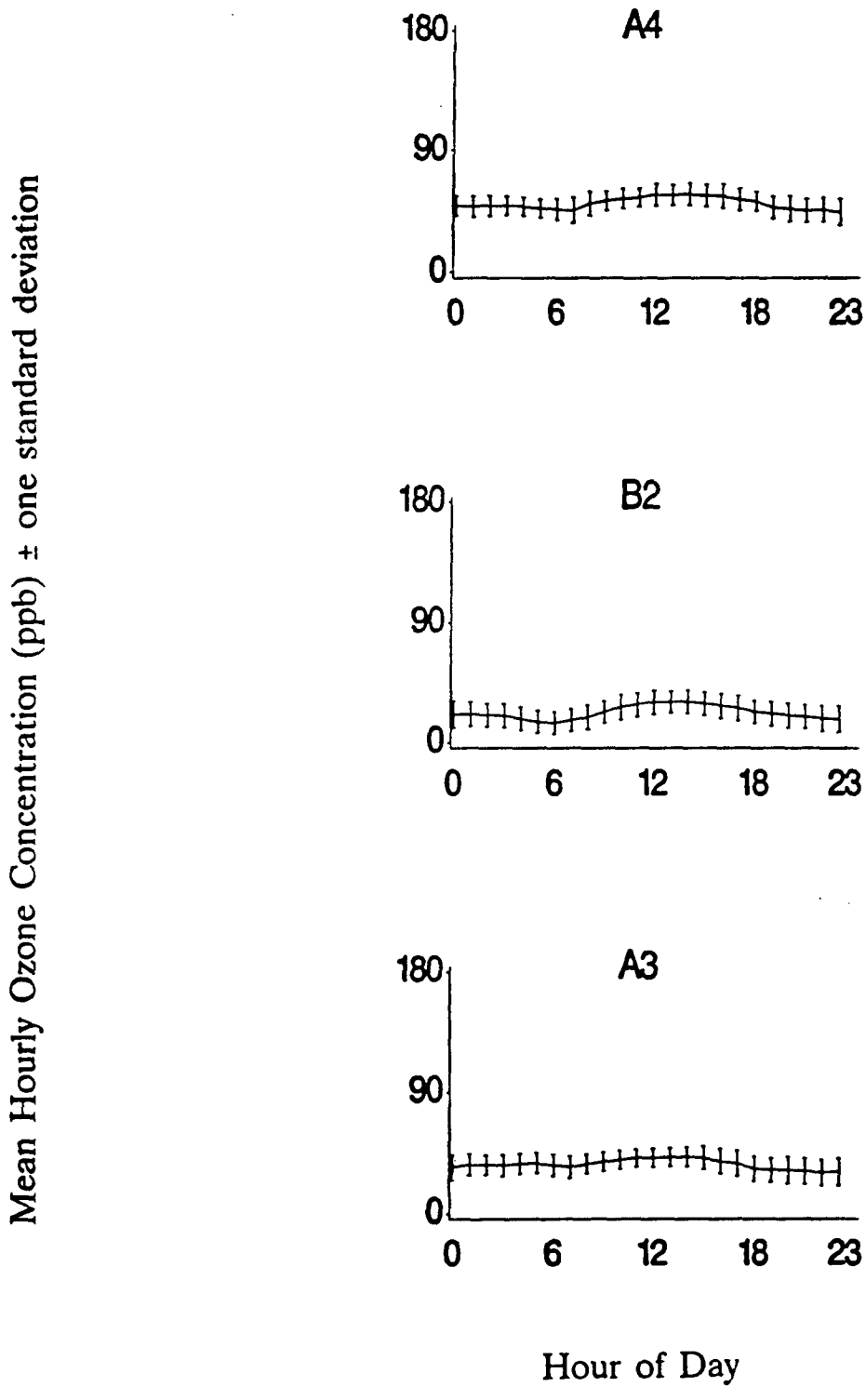
C. BY MONTH (composited over years).

Month	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
Jan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Feb	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mar	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Apr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
May	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Jun	10	22	11	0	0	0	56	11	0	0	0	0	0	0	0	0	0	0
Jul	4	32	12	0	0	4	36	4	8	4	0	0	0	0	0	0	0	0
Aug	0	45	17	0	0	3	31	0	3	0	0	0	0	0	0	0	0	0
Sep	0	41	17	0	0	0	38	0	3	0	0	0	0	0	0	0	0	0
Oct	0	70	10	0	0	10	0	10	0	0	0	0	0	0	0	0	0	0
Nov	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dec	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

1. % days with unidentified diurnal patterns in hourly ozone concentration (see Böhm et al. 1990).
2. Pattern identifier relates to degree of diurnal variation in hourly ozone concentrations (A curves - least variation; E curves - greatest variation) and daily mean (1 curves - lowest mean; 6 curves highest mean) as described by Böhm et al (1990) and as illustrated in Figure 4C.1. Note that due to numeric rounding, the sums of percentages do not always equal 100.

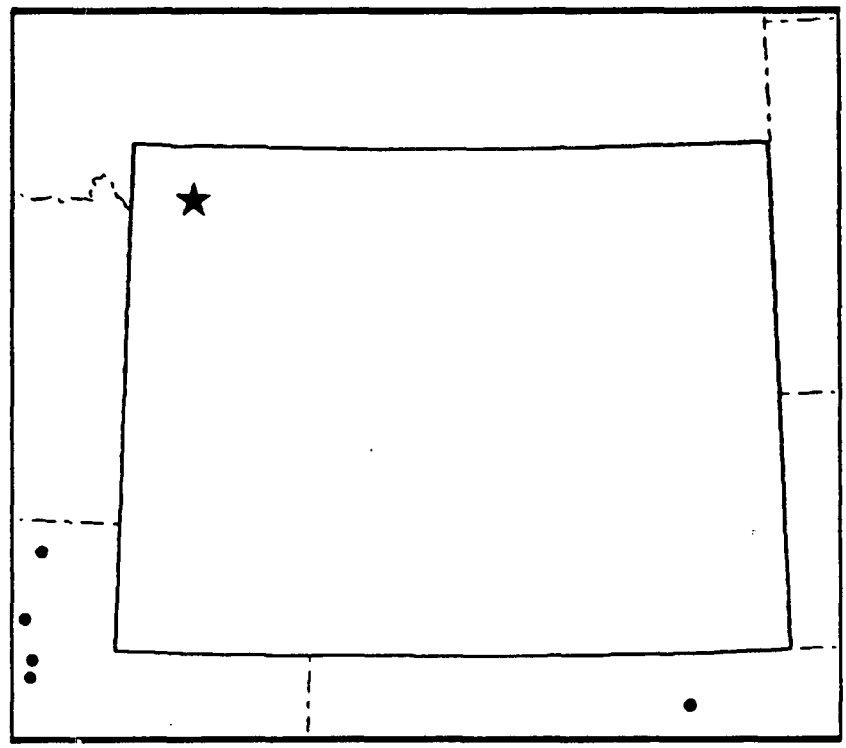
STAMPEDE PASS

DOMINANT DIURNAL PATTERNS IN HOURLY
OZONE CONCENTRATIONS (JUN - OCT)



YELLOWSTONE NATIONAL PARK **WYOMING**

BIOGRAPHIC INFORMATION



Latitude	-	44.56° N
Longitude	-	110.39° W
Elevation (m)	-	2484
Basin Height (m)	-	2461.5
Landuse	-	Rural - Forest
City Population	-	Not In A City
Basin Population	-	222,914
Start Summary	-	June, 1987
End Summary	-	July, 1989
Source of Data	-	National Park Service

Yellowstone National Park

BASIC STATISTICS

A. BY YEAR.

Year	% Data Capt[1]	% Valid Days[2]	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	48	51	15	20	27	35	34.0±11	41	47	51	1	0	0	0	0
1988	79	80	17	22	30	37	37.3±12	45	52	56	2	0	0	0	0
1989	25	25	11	13	15	30	28.9±14	39	48	54	1	0	0	0	0
All Years	51	52	14	17	27	35	34.8±12	43	50	54	2	0	0	0	0

B. BY GROWING SEASON (May through October).

Year	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06[3] (ppm hr)	S08[4] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	68	71	15	20	27	35	34.9±12	43	49	52	3	1	1	0	0	0	0
1988	82	84	15	18	26	35	35.0±13	44	52	56	5	1	2	0	0	0	0
1989	23	22	16	21	29	40	38.3±12	47	54	57	2	0	2	0	0	0	0
All Years	58	59	15	19	27	36	35.4±12	44	51	55	-	-	2	0	0	0	0

C. BY MONTH [5].

Month	% Data Capt	% Valid Days	Percentiles and Arithmetic Mean (ppb) 5	10	25	50	Mean±std	75	90	95	S06 (ppm hr)	S08[6] (ppm hr)	% hours ≥ x (ppb) 60	80	100	120	Days ≥ x 120 ppb
Jan	64	63	28	30	33	36	36.1±05	39	42	43	0	0	0	0	0	0	0
Feb	16	14	12	13	15	35	28.0±12	39	42	42	0	0	0	0	0	0	0
Mar	96	97	10	12	15	28	30.5±17	47	51	54	2	0	3	0	0	0	0
Apr	44	47	33	37	41	47	47.6±10	53	59	65	5	1	9	1	0	0	0
May	54	50	24	28	35	44	43.2±11	52	57	58	2	0	3	0	0	0	0
Jun	57	59	14	18	25	35	35.1±13	44	52	56	2	1	3	0	0	0	0
Jul	87	91	13	17	25	36	34.9±13	45	51	55	2	0	2	0	0	0	0
Aug	93	95	15	19	28	37	36.7±13	46	52	55	1	1	2	0	0	0	0
Sep	59	60	15	19	25	32	33.4±12	41	48	52	1	1	1	0	0	0	0
Oct	94	100	16	20	26	32	31.9±09	38	43	45	0	0	0	0	0	0	0
Nov	93	95	17	23	28	33	31.8±08	37	39	42	0	0	0	0	0	0	0
Dec	81	82	20	25	31	34	33.2±07	37	40	41	0	0	0	0	0	0	0

1. % Data Capture = # valid hours / (total # hours in averaging period) * 100. Av. period BY YEAR = 8760 hrs; BY G.S. = 4416 hrs.
2. % Valid Days = # days with 75 % of hours between 09:00 and 21:00 / (total # days) * 100 (Federal Register 1979).
3. Cumulative Index S06 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 60 ppb (Lee et al. 1988).
4. Cumulative Index S08 = Σ $[O_3]/1000$, where $[O_3]$ is hourly ozone concentrations ≥ 80 ppb (Lee et al. 1988).
5. Statistics for monthly composites over the period of record.
6. Monthly estimate of S06(08) = S06(08) * (# hours in that month) / (# valid hours).

Yellowstone National Park

DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS

A. BY YEAR.

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	8	44	3	0	0	1	21	17	10	1	0	1	2	0	0	0	0	0
1988	8	36	20	0	0	0	11	16	12	2	0	0	2	0	0	0	0	0
1989	1	26	0	0	0	29	16	19	10	1	0	0	0	0	0	0	0	0
All Years	7	37	11	0	0	5	15	16	11	2	0	0	2	0	0	0	0	0

B. BY GROWING SEASON (May through October).

Year	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	11	33	4	0	0	0	18	25	14	2	0	1	3	0	0	0	0	0
1988	14	11	9	0	0	1	17	32	22	4	0	0	4	0	0	0	0	0
1989	4	16	0	0	0	0	4	48	28	4	0	0	0	0	0	0	0	0
All Years	12	21	6	0	0	0	16	30	19	3	0	0	3	0	0	0	0	0

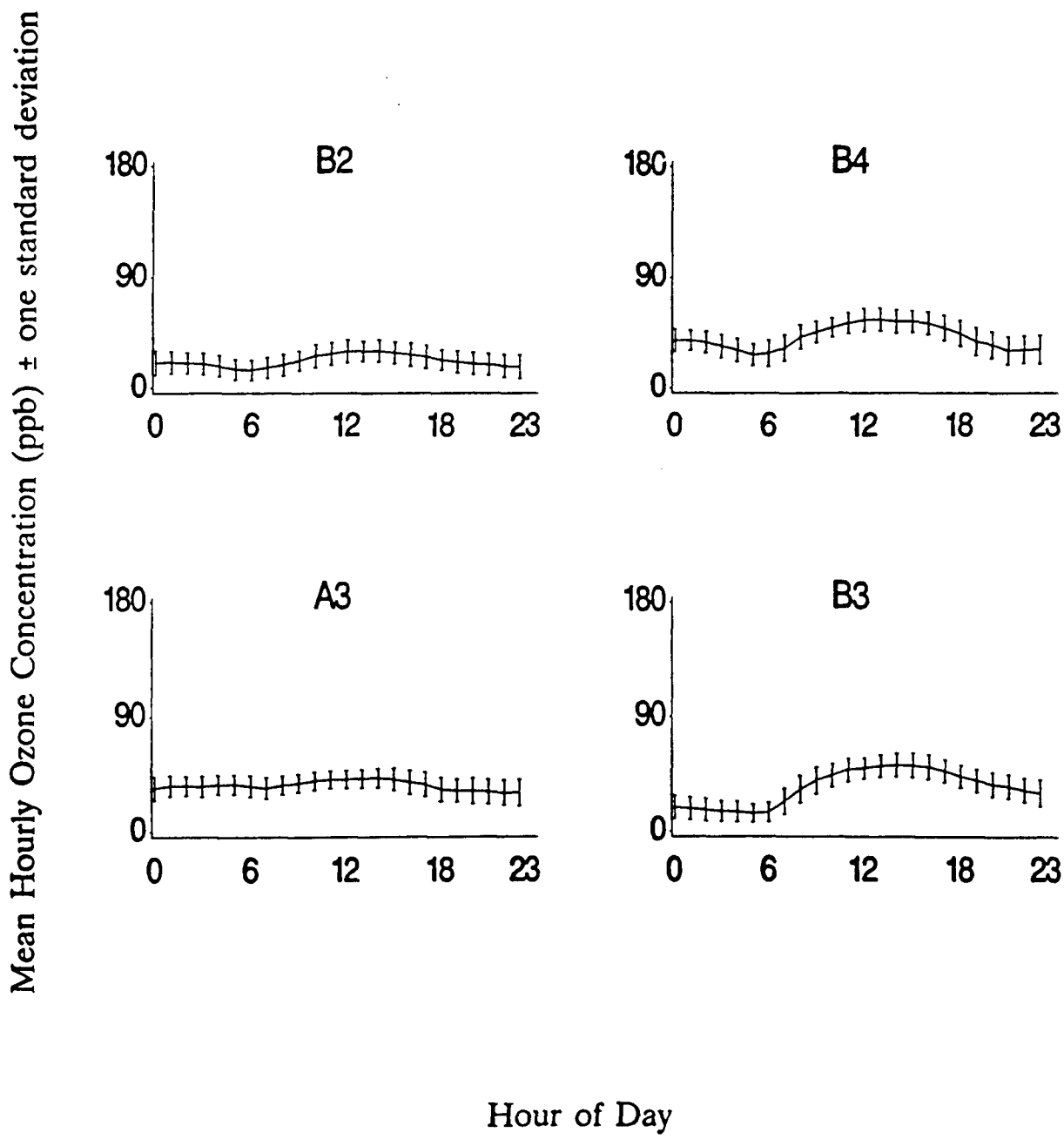
C. BY MONTH (composited over years).

Month	% Days Unclassified[1]	Percent occurrence of diurnal ozone patterns as defined by Böhm et al (1990) (Figure 4C.1)[2]																
		A3	A4	A5	A6	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	D4	E5
Jan	0	91	0	0	0	0	6	3	0	0	0	0	0	0	0	0	0	0
Feb	0	50	0	0	0	37	12	0	0	0	0	0	0	0	0	0	0	0
Mar	0	8	41	0	0	35	14	0	2	0	0	0	0	0	0	0	0	0
Apr	4	23	68	5	0	0	0	0	5	0	0	0	0	0	0	0	0	0
May	8	9	32	0	0	0	0	18	32	9	0	0	0	0	0	0	0	0
Jun	11	12	0	0	0	2	5	41	24	2	0	0	12	0	0	0	0	0
Jul	18	8	2	0	0	0	12	49	20	5	0	2	2	0	0	0	0	0
Aug	11	12	12	0	0	0	10	29	27	4	0	0	4	0	0	0	0	0
Sep	11	25	0	0	0	0	33	29	12	0	0	0	0	0	0	0	0	0
Oct	7	60	0	0	0	0	36	2	2	0	0	0	0	0	0	0	0	0
Nov	0	70	2	0	0	2	24	0	2	0	0	0	0	0	0	0	0	0
Dec	0	82	0	0	0	0	16	0	0	0	0	2	0	0	0	0	0	0

1. % days with unidentified diurnal patterns in hourly ozone concentration (see Böhm et al. 1990).
2. Pattern identifier relates to degree of diurnal variation in hourly ozone concentrations (A curves - least variation; E curves - greatest variation) and daily mean (1 curves - lowest mean; 6 curves highest mean) as described by Böhm et al (1990) and as illustrated in Figure 4C.1. Note that due to numeric rounding, the sums of percentages do not always equal 100.

YELLOWSTONE NATIONAL PARK

DOMINANT DIURNAL PATTERNS IN HOURLY OZONE CONCENTRATIONS (MAY - OCT)

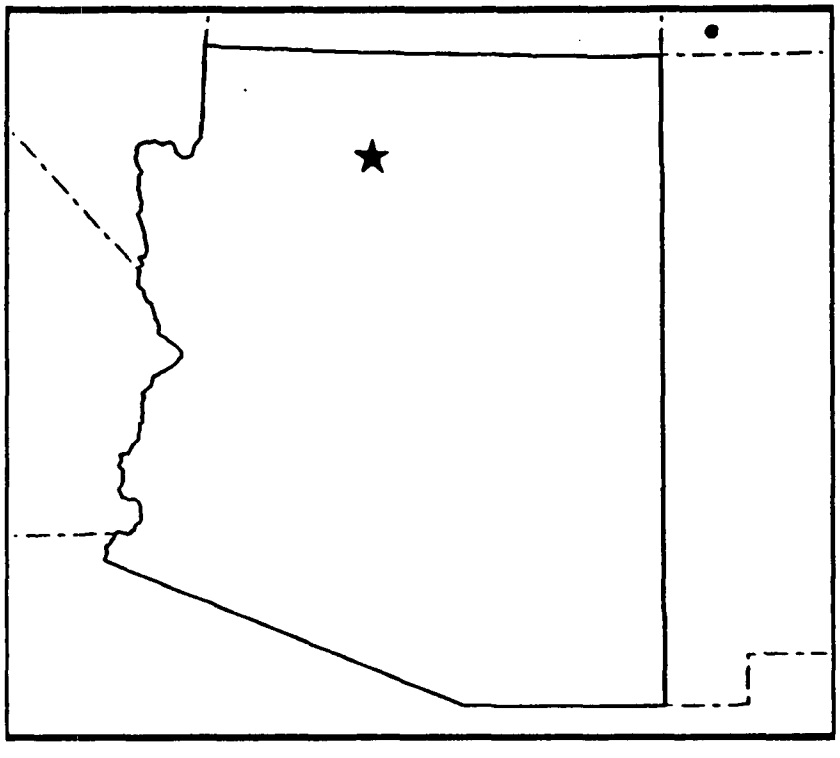


APPENDIX 4

WET DEPOSITION INFORMATION BY STATE

GRAND CANYON NATIONAL PARK **ARIZONA**

BIOGRAPHIC INFORMATION



Latitude	-	36.07 ° N
Longitude	-	112.15 ° W
Elevation (m)	-	2152
Landuse	-	Rural
Start Summary	-	August 1981
End Summary	-	December 1988
Source of Data	-	NADP/NTN (AZ03)

Grand Canyon National Park

BASIC STATISTICS

A. PERCENTILES IN WEEKLY CONCENTRATIONS BY YEAR

Year	ppt vol[1]	pH 25	pH 50	pH 75	pH 90	pH max	Sulphate (mg/L) 25	Sulphate 50	Sulphate 75	Sulphate 90	Sulphate max	Nitrate (mg/L) 25	Nitrate 50	Nitrate 75	Nitrate 90	Nitrate max	Ammonium (mg/L) 25	Ammonium 50	Ammonium 75	Ammonium 90	Ammonium max
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	6.28	5.54	4.58	4.09	4.09	1.06	3.86	4.87	8.98	8.98	0.15	1.13	2.27	3.45	3.45	0.02	0.02	0.39	0.66	0.66
1982	63.5	5.78	5.44	4.98	4.61	4.15	0.52	0.92	1.41	3.05	4.42	0.38	0.89	1.25	2.14	2.85	0.04	0.11	0.19	0.29	0.41
1983	51.8	5.77	5.36	5.12	4.84	4.24	0.50	0.74	1.58	2.32	4.75	0.37	0.71	1.30	3.12	4.89	0.04	0.08	0.18	0.31	0.98
1984	36.6	6.51	6.08	5.26	5.11	4.71	0.69	1.01	1.94	3.52	4.14	0.62	0.94	1.70	2.28	2.78	0.02	0.06	0.15	0.26	0.73
1985	36.7	5.91	5.46	5.04	4.67	4.45	0.52	0.72	1.85	2.64	10.82	0.18	0.91	1.68	3.40	11.91	0.02	0.06	0.21	0.36	1.42
1986	37.2	5.91	5.46	4.83	4.57	4.49	0.37	1.17	1.79	2.60	3.35	0.20	0.71	1.63	2.56	4.00	0.02	0.07	0.15	0.24	0.29
1987	-	6.02	5.71	5.29	5.01	4.82	0.24	0.36	0.65	0.94	1.70	0.24	0.47	0.82	1.05	1.89	0.02	0.05	0.07	0.15	0.25
1988	33.6	5.99	5.46	5.13	4.71	4.60	0.33	0.79	2.27	3.48	6.34	0.41	0.92	2.09	3.27	3.53	0.02	0.03	0.13	0.40	0.44

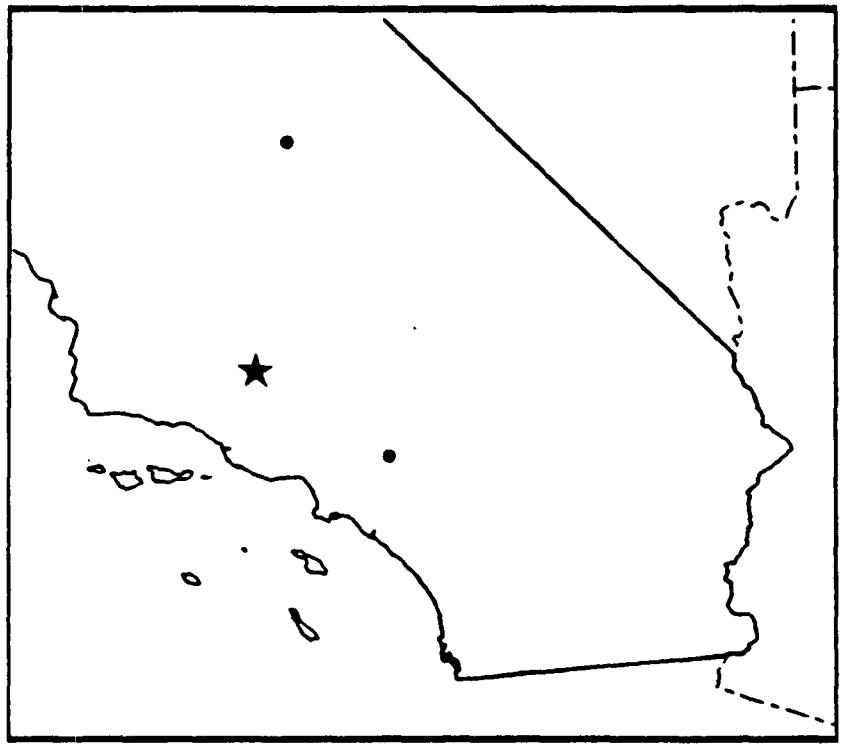
B. VOLUME WEIGHTED AVERAGES AND DEPOSITION BY YEAR AND SEASON

Year	Annual pH x̄[2]	Annual pH dep[3]	Annual Sulphate x̄	Annual Sulphate dep	Annual Nitrate x̄	Annual Nitrate dep	Annual Ammonium x̄	Annual Ammonium dep	Winter (Dec-Feb) pH x̄	Winter pH dep	Winter Sulphate x̄	Winter Sulphate dep	Winter Nitrate x̄	Winter Nitrate dep	Winter Ammonium x̄	Winter Ammonium dep	Summer (Jun-Aug) pH x̄	Summer pH dep	Summer Sulphate x̄	Summer Sulphate dep	Summer Nitrate x̄	Summer Nitrate dep	Summer Ammonium x̄	Summer Ammonium dep
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.88	0.01	1.28	1.40	1.22	1.33	0.14	0.16
1983	5.25	0.03	0.70	3.60	0.68	3.52	0.09	0.47	5.33	0.01	0.39	0.60	0.35	0.54	0.06	0.09	5.01	0.01	1.15	1.39	1.16	1.41	0.14	0.17
1984	5.30	0.02	0.94	3.45	0.79	2.89	0.06	0.22	-	-	-	-	-	-	-	-	5.14	0.01	0.95	1.68	0.97	1.71	0.05	0.08
1985	5.14	0.03	0.65	2.40	0.58	2.15	0.08	0.28	5.13	0.01	0.58	0.90	0.42	0.64	0.07	0.10	-	-	-	-	-	-	-	-
1986	5.23	0.02	0.71	2.64	0.70	2.64	0.07	0.26	5.35	0.00	0.34	0.16	0.43	0.21	0.04	0.02	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	5.44	0.00	0.57	0.56	0.38	0.37	0.03	0.03	-	-	-	-	-	-	-	-
1988	5.21	0.02	0.86	2.88	0.93	3.14	0.04	0.14	5.18	0.01	0.34	0.35	0.54	0.56	0.05	0.05	5.09	0.01	1.47	1.65	1.46	1.64	0.05	0.06

1. Estimated annual precipitation amount in cm.
2. Volume weighted averages (in pH units for pH and in mg/L for sulphate, nitrate, and ammonium).
3. Estimated deposition in kg/ha.

CHUCHUPATE RANGER STATION **CALIFORNIA**

BIOGRAPHIC INFORMATION



Latitude	-	34.81 ° N
Longitude	-	119.01 ° W
Elevation (m)	-	1614
Landuse	-	Rural
Start Summary	-	August 1983
End Summary	-	December 1988
Source of Data	-	NADP/NTN (CA98)

Chuchupate Ranger Station

BASIC STATISTICS

A. PERCENTILES IN WEEKLY CONCENTRATIONS BY YEAR

Year	ppt vol[1]	pH 25	pH 50	pH 75	pH 90	pH max	Sulphate (mg/L) 25	Sulphate (mg/L) 50	Sulphate (mg/L) 75	Sulphate (mg/L) 90	Sulphate (mg/L) max	Nitrate (mg/L) 25	Nitrate (mg/L) 50	Nitrate (mg/L) 75	Nitrate (mg/L) 90	Nitrate (mg/L) max	Ammonium (mg/L) 25	Ammonium (mg/L) 50	Ammonium (mg/L) 75	Ammonium (mg/L) 90	Ammonium (mg/L) max
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	5.50	5.50	5.33	5.01	5.01	0.10	0.42	0.69	0.78	0.78	0.08	0.16	0.28	0.93	0.93	0.02	0.02	0.03	0.04	0.04
1984	26.8	6.24	5.54	5.03	4.55	4.26	0.39	0.78	1.77	2.85	9.36	0.23	0.58	2.41	4.93	8.42	0.05	0.08	0.54	1.55	2.13
1985	19.3	5.55	5.41	4.94	4.66	4.43	0.15	0.58	1.08	2.38	4.28	0.23	0.71	2.14	5.13	7.38	0.02	0.14	0.32	0.75	2.88
1986	33.5	5.92	5.50	5.30	4.47	4.16	0.13	0.32	0.96	2.44	3.85	0.09	0.31	1.76	7.72	10.71	0.02	0.02	0.27	1.21	2.36
1987	42.2	5.64	5.43	5.11	4.70	4.56	0.22	0.42	0.81	2.85	4.77	0.26	0.60	2.05	5.68	10.89	0.02	0.16	0.39	0.84	1.11
1988	21.5	6.09	5.48	5.17	4.82	4.66	0.19	0.27	1.05	2.79	5.30	0.14	0.28	1.01	2.77	3.49	0.02	0.02	0.20	0.44	0.47

B. VOLUME WEIGHTED AVERAGES AND DEPOSITION BY YEAR AND SEASON

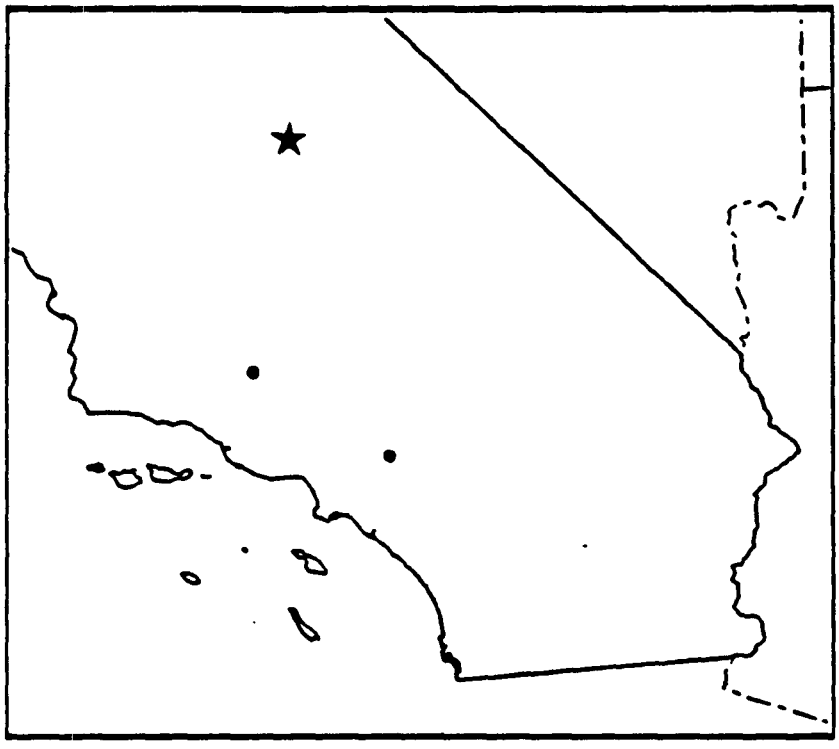
Year	Annual pH x̄[2]	Annual pH dep[3]	Annual Sulphate x̄	Annual Sulphate dep	Annual Nitrate x̄	Annual Nitrate dep	Annual Ammonium x̄	Annual Ammonium dep	Winter (Dec-Feb) pH x̄	Winter pH dep	Winter Sulphate x̄	Winter Sulphate dep	Winter Nitrate x̄	Winter Nitrate dep	Winter Ammonium x̄	Winter Ammonium dep	Summer (Jun-Aug) pH x̄	Summer pH dep	Summer Sulphate x̄	Summer Sulphate dep	Summer Nitrate x̄	Summer Nitrate dep	Summer Ammonium x̄	Summer Ammonium dep
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	4.97	0.03	0.89	2.39	1.16	3.11	0.22	0.60	5.77	0.00	0.20	0.13	0.24	0.15	0.06	0.04	-	-	-	-	-	-	-	-
1985	5.07	0.02	0.47	0.90	0.98	1.89	0.16	0.30	4.96	0.01	0.35	0.41	0.81	0.94	0.05	0.06	5.15	0.00	3.84	0.11	6.80	0.19	2.42	0.07
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	5.08	0.04	0.53	2.24	0.92	3.89	0.18	0.75	5.23	0.00	0.30	0.20	0.45	0.30	0.09	0.06	-	-	-	-	-	-	-	-
1988	5.16	0.01	0.37	0.79	0.53	1.15	0.07	0.15	-	-	-	-	-	-	-	-	4.66	0.01	1.12	0.30	2.58	0.68	0.43	0.11

1. Estimated annual precipitation amount in cm.
2. Volume weighted averages (in pH units for pH and in mg/L for sulphate, nitrate, and ammonium).
3. Estimated deposition in kg/ha.

GIANT FOREST, SEQUOIA NATIONAL PARK

CALIFORNIA

BIOGRAPHIC INFORMATION



Latitude	-	36.57 ° N
Longitude	-	118.78 ° W
Elevation (m)	-	1902
Landuse	-	Rural
Start Summary	-	July 1980
End Summary	-	December 1988
Source of Data	-	NADP/NTN (CA75)

Giant Forest, Sequoia National Park

BASIC STATISTICS

A. PERCENTILES IN WEEKLY CONCENTRATIONS BY YEAR

Year	ppt vol[1]	pH 25	pH 50	pH 75	pH 90	pH max	Sulphate (mg/L) 25	Sulphate 50	Sulphate 75	Sulphate 90	Sulphate max	Nitrate (mg/L) 25	Nitrate 50	Nitrate 75	Nitrate 90	Nitrate max	Ammonium (mg/L) 25	Ammonium 50	Ammonium 75	Ammonium 90	Ammonium max
1980	-	5.53	5.06	4.88	4.60	4.60	1.20	1.40	3.36	3.53	3.53	1.62	2.45	4.36	5.72	5.72	0.11	0.50	0.85	1.61	1.61
1981	64.0	5.74	5.53	5.07	4.79	4.61	0.42	0.63	1.77	3.22	9.67	0.27	0.70	1.61	3.52	4.40	0.07	0.15	0.39	0.94	1.58
1982	203.1	5.60	5.33	5.11	4.92	4.19	0.27	0.35	1.30	2.15	3.84	0.14	0.29	2.16	3.98	5.53	0.02	0.09	0.71	1.28	2.18
1983	148.6	5.81	5.50	5.30	4.71	4.44	0.21	0.55	1.02	2.02	3.44	0.19	0.48	1.54	4.09	6.95	0.05	0.12	0.44	1.07	1.68
1984	69.0	5.79	5.56	5.40	4.84	4.55	0.37	0.54	0.84	1.40	3.89	0.29	0.49	1.51	2.59	6.09	0.04	0.15	0.30	0.44	1.55
1985	71.9	5.82	5.55	5.17	5.00	4.99	0.32	0.48	0.86	1.62	2.77	0.21	0.97	1.84	3.35	7.81	0.02	0.33	0.47	0.99	2.00
1986	79.1	6.01	5.63	5.40	4.89	4.54	0.21	0.77	1.07	2.47	2.47	0.17	1.40	3.29	4.30	5.03	0.02	0.40	0.85	1.89	1.99
1987	-	5.86	5.55	5.28	5.18	4.96	0.16	0.21	0.44	0.77	0.91	0.32	0.75	1.16	1.40	1.75	0.02	0.13	0.31	0.48	0.50
1988	83.6	5.77	5.60	5.40	5.15	5.01	0.13	0.36	1.01	1.48	1.84	0.15	0.56	1.52	2.18	2.53	0.02	0.10	0.39	0.58	0.67

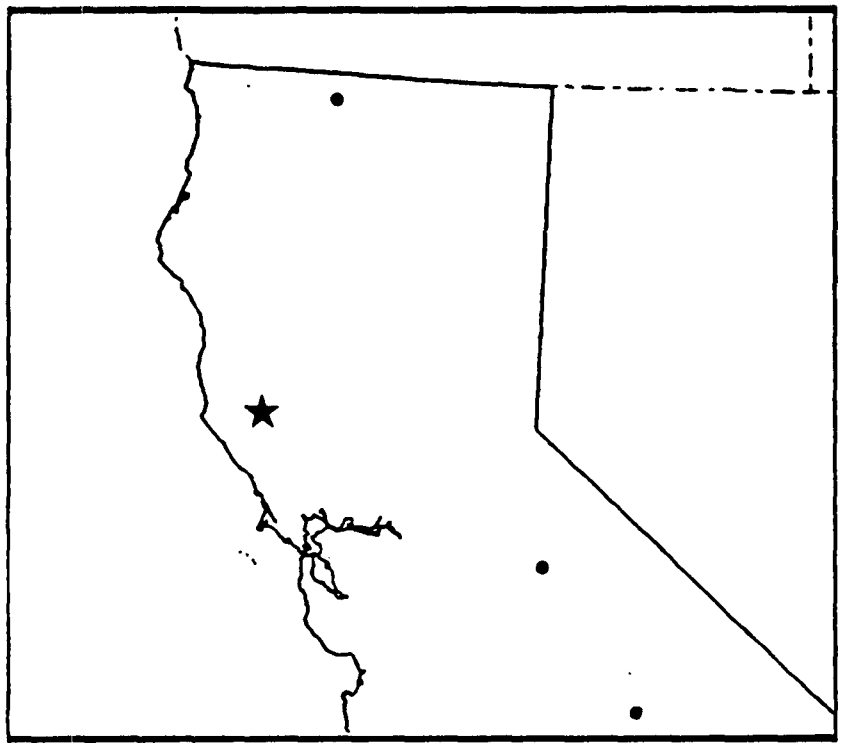
B. VOLUME WEIGHTED AVERAGES AND DEPOSITION BY YEAR AND SEASON

Year	Annual pH x̄[2]	Annual pH dep[3]	Annual Sulphate x̄	Annual Sulphate dep	Annual Nitrate x̄	Annual Nitrate dep	Annual Ammonium x̄	Annual Ammonium dep	Winter (Dec-Feb) pH x̄	Winter pH dep	Winter Sulphate x̄	Winter Sulphate dep	Winter Nitrate x̄	Winter Nitrate dep	Winter Ammonium x̄	Winter Ammonium dep	Summer (Jun-Aug) pH x̄	Summer pH dep	Summer Sulphate x̄	Summer Sulphate dep	Summer Nitrate x̄	Summer Nitrate dep	Summer Ammonium x̄	Summer Ammonium dep
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	5.32	0.03	0.58	3.75	0.55	3.50	0.19	1.18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	5.30	0.10	0.29	5.91	0.22	4.37	0.07	1.32	5.46	0.02	0.23	1.28	0.09	0.48	0.01	0.06	-	-	-	-	-	-	-	-
1983	5.44	0.05	0.34	5.04	0.38	5.62	0.13	1.92	5.43	0.03	0.12	1.09	0.16	1.46	0.05	0.44	5.29	0.00	1.83	0.78	3.67	1.56	1.33	0.56
1984	5.44	0.03	0.42	2.87	0.44	3.04	0.10	0.72	5.69	0.01	0.40	1.16	0.35	1.03	0.11	0.33	4.82	0.01	0.89	0.35	1.62	0.63	0.23	0.09
1985	5.35	0.03	0.33	2.37	0.48	3.48	0.15	1.09	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	5.55	0.02	0.35	2.81	0.66	5.20	0.26	2.04	5.35	0.02	0.18	0.61	0.24	0.81	0.05	0.17	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	5.35	0.01	0.20	0.54	0.42	1.09	0.10	0.26	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	5.41	0.02	0.12	0.50	0.25	1.02	0.03	0.12	5.40	0.00	1.29	0.45	1.54	0.54	0.28	0.10

1. Estimated annual precipitation amount in cm.
2. Volume weighted averages (in pH units for pH and in mg/L for sulphate, nitrate, and ammonium).
3. Estimated deposition in kg/ha.

HOPLAND **CALIFORNIA**

BIOGRAPHIC INFORMATION



Latitude	-	39.00 ° N
Longitude	-	123.08 ° W
Elevation (m)	-	253
Landuse	-	Rural
Start Summary	-	January 1980
End Summary	-	December 1988
Source of Data	-	NADP/NTN (CA45)

Hopland

BASIC STATISTICS

A. PERCENTILES IN WEEKLY CONCENTRATIONS BY YEAR

Year	ppt vol[1]	pH 25	pH 50	pH 75	pH 90	pH max	Sulphate (mg/L) 25	Sulphate 50	Sulphate 75	Sulphate 90	Sulphate max	Nitrate (mg/L) 25	Nitrate 50	Nitrate 75	Nitrate 90	Nitrate max	Ammonium (mg/L) 25	Ammonium 50	Ammonium 75	Ammonium 90	Ammonium max
1980	82.1	6.07	5.72	5.46	5.05	4.96	0.34	0.50	1.05	3.40	11.26	0.18	0.42	0.85	1.53	4.07	0.02	0.04	0.13	0.32	1.05
1981	110.8	5.89	5.49	5.24	5.05	5.01	0.31	0.42	0.58	0.81	6.91	0.18	0.32	0.57	1.04	1.46	0.04	0.07	0.12	0.44	1.32
1982	118.2	5.78	5.45	5.35	5.10	4.67	0.29	0.36	0.79	1.01	2.39	0.15	0.25	0.76	1.62	1.97	0.03	0.08	0.22	0.40	0.68
1983	182.2	5.57	5.45	5.27	5.13	4.88	0.26	0.39	0.61	0.90	2.09	0.13	0.25	0.60	1.38	1.81	0.02	0.05	0.12	0.18	0.29
1984	69.3	6.20	5.64	5.41	5.19	4.26	0.40	0.51	0.73	1.77	5.40	0.18	0.29	0.56	0.71	6.20	0.02	0.03	0.11	0.33	1.57
1985	51.2	5.77	5.48	5.32	4.93	4.53	0.20	0.28	0.47	1.19	3.51	0.03	0.08	0.44	1.92	10.89	0.02	0.02	0.12	0.61	1.38
1986	93.2	5.81	5.48	5.39	5.23	4.89	0.22	0.35	0.49	0.76	0.82	0.14	0.29	0.39	0.86	1.17	0.02	0.05	0.08	0.18	0.31
1987	80.6	5.68	5.42	5.23	5.06	5.02	0.18	0.25	0.62	0.90	2.78	0.28	0.39	0.77	1.91	3.50	0.02	0.06	0.18	0.60	1.04
1988	52.9	5.87	5.47	5.32	5.09	4.97	0.18	0.29	0.42	0.71	0.86	0.10	0.25	0.35	0.63	1.19	0.02	0.02	0.06	0.11	0.33

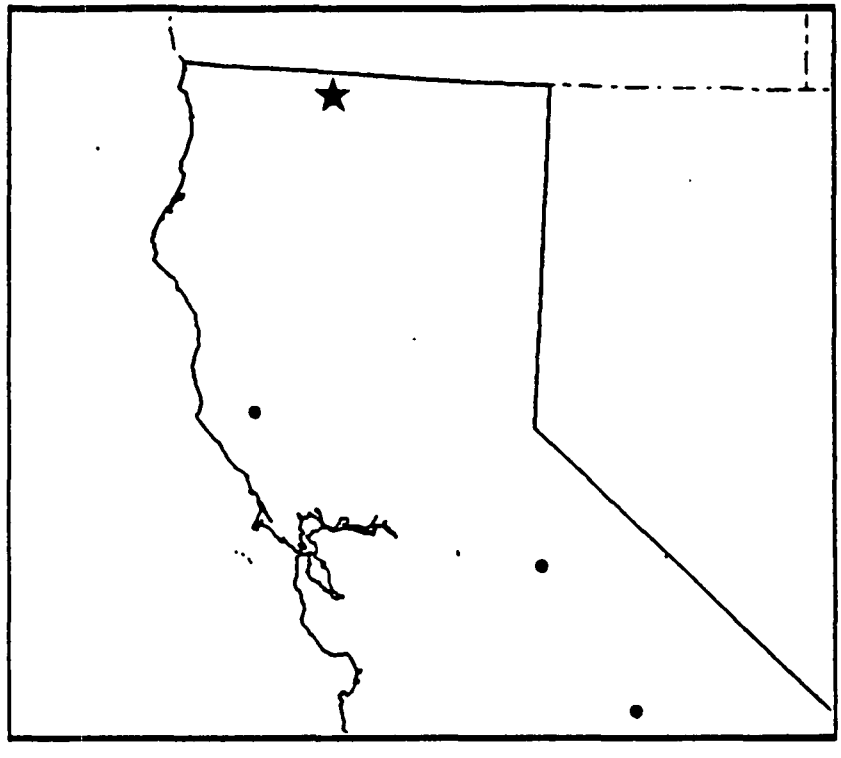
B. VOLUME WEIGHTED AVERAGES AND DEPOSITION BY YEAR AND SEASON

Year	Annual pH x̄[2]	Annual pH dep[3]	Annual Sulphate x̄	Annual Sulphate dep	Annual Nitrate x̄	Annual Nitrate dep	Annual Ammonium x̄	Annual Ammonium dep	Winter (Dec-Feb) pH x̄	Winter pH dep	Winter Sulphate x̄	Winter Sulphate dep	Winter Nitrate x̄	Winter Nitrate dep	Winter Ammonium x̄	Winter Ammonium dep	Summer (Jun-Aug) pH x̄	Summer pH dep	Summer Sulphate x̄	Summer Sulphate dep	Summer Nitrate x̄	Summer Nitrate dep	Summer Ammonium x̄	Summer Ammonium dep
1980	5.54	0.02	0.49	4.04	0.21	1.76	0.04	0.36	5.45	0.02	0.45	3.01	0.21	1.40	0.04	0.25	5.50	0.00	0.70	0.06	0.43	0.04	0.07	0.01
1981	5.38	0.05	0.31	3.43	0.28	3.11	0.07	0.78	5.51	0.01	0.15	0.67	0.25	1.12	0.08	0.36	-	-	-	-	-	-	-	-
1982	5.39	0.05	0.33	3.91	0.24	2.87	0.06	0.70	5.30	0.03	0.37	2.10	0.29	1.67	0.05	0.28	5.37	0.00	0.64	0.01	1.01	0.01	0.20	0.00
1983	5.45	0.06	0.32	5.92	0.26	4.73	0.05	0.90	5.36	0.04	0.34	2.81	0.25	2.09	0.05	0.41	4.97	0.00	0.60	0.06	0.83	0.08	0.14	0.01
1984	5.38	0.03	0.43	2.95	0.30	2.06	0.06	0.39	5.60	0.01	0.26	1.19	0.20	0.89	0.03	0.13	5.33	0.00	0.56	0.07	0.38	0.05	0.03	0.00
1985	5.45	0.02	0.24	1.24	0.09	0.45	0.02	0.11	5.61	0.00	0.44	0.48	0.37	0.40	0.09	0.10	4.53	0.00	3.51	0.01	10.9	0.03	1.38	0.00
1986	5.40	0.04	0.29	2.73	0.21	1.92	0.03	0.27	5.41	0.02	0.26	1.70	0.15	0.98	0.02	0.14	-	-	-	-	-	-	-	-
1987	5.36	0.03	0.26	2.09	0.42	3.40	0.07	0.58	5.26	0.02	0.30	1.00	0.46	1.53	0.06	0.21	-	-	-	-	-	-	-	-
1988	5.36	0.02	0.28	1.49	0.29	1.51	0.05	0.25	5.41	0.02	0.23	0.96	0.35	1.47	0.05	0.23	5.59	0.00	0.34	0.03	0.02	0.00	0.01	0.00

1. Estimated annual precipitation amount in cm.
2. Volume weighted averages (in pH units for pH and in mg/L for sulphate, nitrate, and ammonium).
3. Estimated deposition in kg/ha.

MONTAGUE **CALIFORNIA**

BIOGRAPHIC INFORMATION



Latitude	-	41.77 ° N
Longitude	-	122.48 ° W
Elevation (m)	-	797
Landuse	-	Rural
Start Summary	-	June 1985
End Summary	-	December 1988
Source of Data	-	NADP/NTN (CA76)

Montague

BASIC STATISTICS

A. PERCENTILES IN WEEKLY CONCENTRATIONS BY YEAR

Year	ppt vol[1]	pH 25	pH 50	pH 75	pH 90	pH max	Sulphate (mg/L) 25	Sulphate 50	Sulphate 75	Sulphate 90	Sulphate max	Nitrate (mg/L) 25	Nitrate 50	Nitrate 75	Nitrate 90	Nitrate max	Ammonium (mg/L) 25	Ammonium 50	Ammonium 75	Ammonium 90	Ammonium max
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	5.91	5.51	5.24	4.78	4.68	0.15	0.21	0.32	1.26	1.72	0.06	0.26	0.57	2.43	3.48	0.02	0.02	0.15	0.30	0.36
1986	32.9	6.07	5.74	5.59	5.36	4.82	0.14	0.30	0.60	0.84	0.91	0.16	0.38	0.83	1.31	1.72	0.04	0.12	0.20	0.29	0.48
1987	25.2	6.07	5.82	5.49	4.81	4.68	0.14	0.20	0.51	1.11	2.62	0.23	0.31	0.57	2.29	4.08	0.06	0.11	0.19	0.50	1.10
1988	27.3	5.94	5.63	5.48	5.32	5.18	0.13	0.25	0.42	0.73	2.56	0.26	0.48	0.83	0.97	1.91	0.03	0.07	0.21	0.27	0.38

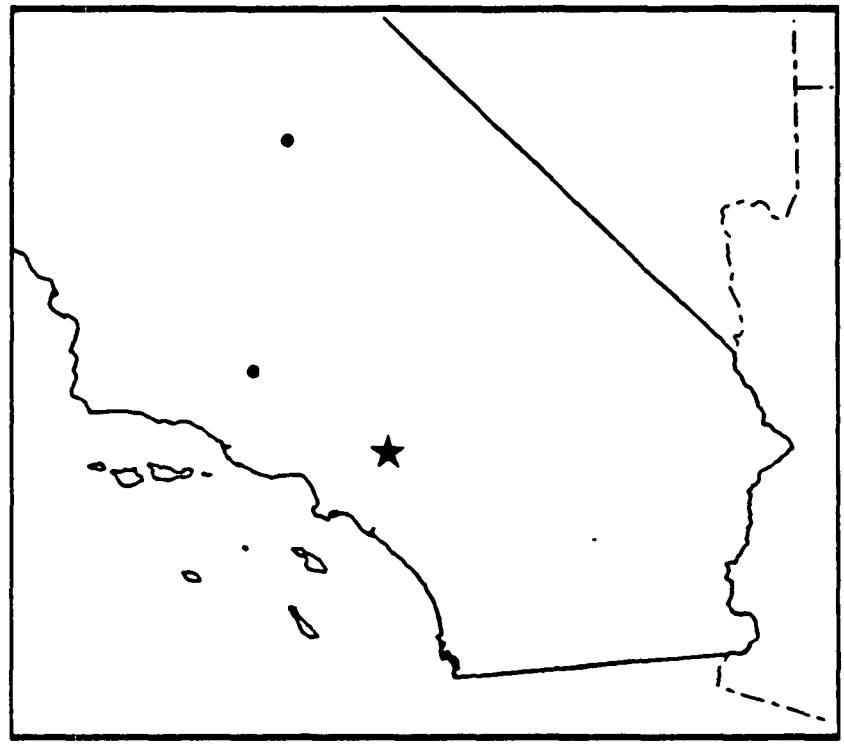
B. VOLUME WEIGHTED AVERAGES AND DEPOSITION BY YEAR AND SEASON

	Annual										Winter (Dec-Feb)								Summer (Jun-Aug)					
	pH		Sulphate		Nitrate		Ammonium		pH		Sulphate		Nitrate		Ammonium		pH		Sulphate		Nitrate		Ammonium	
Year	x̄[2]	dep[3]	x̄	dep	x̄	dep	x̄	dep	x̄	dep	x̄	dep	x̄	dep	x̄	dep	x̄	dep	x̄	dep	x̄	dep	x̄	dep
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	5.61	0.01	0.20	0.66	0.28	0.93	0.09	0.29	5.61	0.00	0.11	0.18	0.12	0.19	0.03	0.05	5.78	0.00	0.73	0.06	1.18	0.10	0.33	0.03
1987	5.43	0.01	0.25	0.63	0.41	1.03	0.09	0.23	5.60	0.00	0.15	0.14	0.26	0.23	0.07	0.06	4.96	0.00	0.76	0.33	1.16	0.50	0.20	0.09
1988	5.55	0.01	0.19	0.51	0.34	0.94	0.07	0.20	5.54	0.00	0.13	0.16	0.27	0.33	0.04	0.05	-	-	-	-	-	-	-	-

1. Estimated annual precipitation amount in cm.
2. Volume weighted averages (in pH units for pH and in mg/L for sulphate, nitrate, and ammonium).
3. Estimated deposition in kg/ha.

TANBARK FLAT **CALIFORNIA**

BIOGRAPHIC INFORMATION



Latitude	-	34.21 ° N
Longitude	-	117.76 ° W
Elevation (m)	-	853
Landuse	-	Rural
Start Summary	-	January 1982
End Summary	-	December 1988
Source of Data	-	NADP/NTN (CA42)

Tanbark Flat

BASIC STATISTICS

A. PERCENTILES IN WEEKLY CONCENTRATIONS BY YEAR

	ppt	pH					Sulphate (mg/L)					Nitrate (mg/L)					Ammonium (mg/L)				
Year	vol[1]	25	50	75	90	max	25	50	75	90	max	25	50	75	90	max	25	50	75	90	max
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	95.6	5.47	5.05	4.29	3.64	3.19	0.78	1.87	5.68	15.51	34.50	0.94	1.86	8.52	36.19	56.88	0.14	0.57	1.38	3.58	6.76
1983	131.2	5.18	4.84	4.47	4.14	3.57	0.46	0.74	1.66	4.87	8.36	0.49	1.19	4.50	9.53	20.30	0.11	0.16	0.79	1.28	2.44
1984	48.1	5.47	4.90	4.56	3.84	3.54	0.49	0.68	1.96	9.98	14.88	0.59	1.63	2.58	15.45	27.35	0.07	0.16	0.35	2.09	3.42
1985	39.5	5.35	4.77	4.36	4.17	4.16	0.52	1.01	2.74	4.17	4.57	0.74	1.85	3.66	5.33	7.75	0.09	0.24	0.48	0.70	0.92
1986	63.8	5.95	5.37	4.89	4.49	4.19	0.29	0.39	1.31	4.26	5.66	0.41	0.82	2.87	4.72	5.36	0.03	0.07	0.36	0.99	1.79
1987	49.1	5.57	5.19	4.87	4.68	3.91	0.31	0.75	1.33	4.20	10.52	0.44	1.12	2.60	8.88	13.13	0.04	0.23	0.66	1.85	2.12
1988	66.9	5.37	4.98	4.46	4.14	3.92	0.26	0.82	1.95	4.04	5.81	0.29	1.50	5.12	6.77	7.98	0.02	0.18	0.91	1.20	1.40

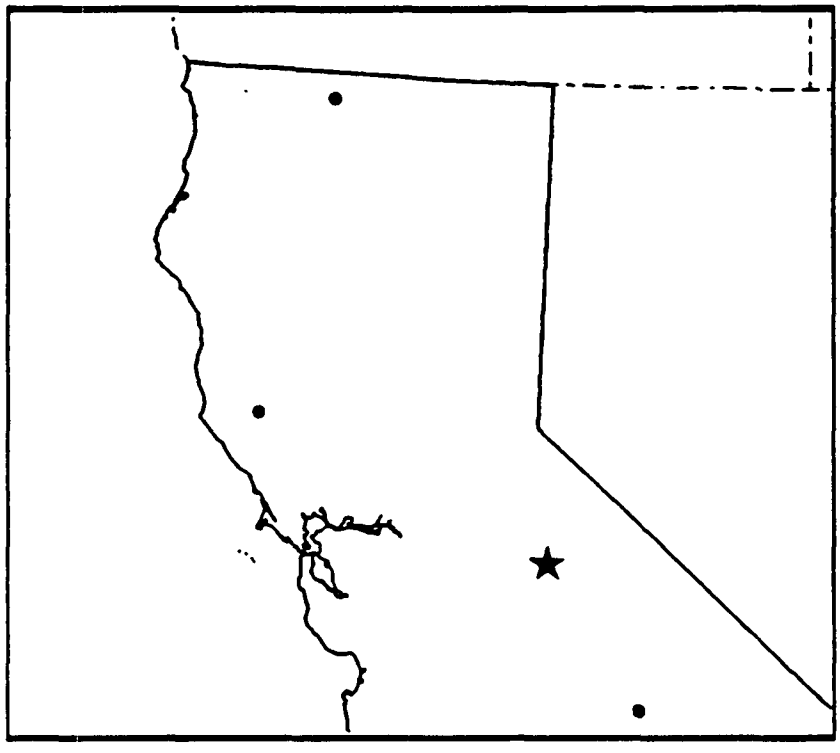
B. VOLUME WEIGHTED AVERAGES AND DEPOSITION BY YEAR AND SEASON

	Annual								Winter (Dec-Feb)								Summer (Jun-Aug)							
	pH		Sulphate		Nitrate		Ammonium		pH		Sulphate		Nitrate		Ammonium		pH		Sulphate		Nitrate		Ammonium	
Year	x̄[2]	dep[3]	x̄	dep	x̄	dep	x̄	dep	x̄	dep	x̄	dep	x̄	dep	x̄	dep	x̄	dep	x̄	dep	x̄	dep	x̄	dep
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	4.82	0.14	0.98	9.36	1.19	11.4	0.25	2.35	-	-	-	-	-	-	-	-	4.06	0.01	4.89	0.75	9.29	1.43	1.45	0.22
1983	5.03	0.12	0.56	7.33	0.82	10.8	0.17	2.20	5.28	0.04	0.35	2.42	0.41	2.84	0.10	0.69	4.20	0.02	3.07	1.10	6.58	2.36	1.26	0.45
1984	5.03	0.04	0.72	3.48	1.15	5.53	0.27	1.28	5.14	0.01	0.52	0.74	0.52	0.75	0.12	0.17	4.45	0.01	2.10	0.82	3.61	1.42	0.58	0.23
1985	4.83	0.06	0.76	3.00	1.23	4.87	0.14	0.56	5.44	0.01	0.38	1.23	0.48	1.53	0.12	0.37	-	-	-	-	-	-	-	-
1986	5.09	0.05	0.46	2.94	0.63	4.03	0.06	0.40	5.05	0.03	0.52	1.53	0.45	1.31	0.05	0.16	5.08	0.00	3.66	0.01	2.91	0.01	0.04	0.00
1987	5.08	0.04	0.49	2.38	0.96	4.72	0.23	1.13	5.09	0.01	0.23	0.33	0.58	0.82	0.08	0.11	-	-	-	-	-	-	-	-
1988	4.93	0.08	0.64	4.30	0.98	6.58	0.19	1.28	-	-	-	-	-	-	-	-	4.55	0.00	1.42	0.11	4.09	0.31	0.55	0.04

1. Estimated annual precipitation amount in cm.
2. Volume weighted averages (in pH units for pH and in mg/L for sulphate, nitrate, and ammonium).
3. Estimated deposition in kg/ha.

YOSEMITE NATIONAL PARK CALIFORNIA

BIOGRAPHIC INFORMATION



Latitude	-	37.80 ° N
Longitude	-	119.86 ° W
Elevation (m)	-	1408
Landuse	-	Rural
Start Summary	-	December 1981
End Summary	-	December 1988
Source of Data	-	NADP/NTN (CA99)

Yosemite National Park

BASIC STATISTICS

A. PERCENTILES IN WEEKLY CONCENTRATIONS BY YEAR

Year	ppt vol[1]	pH 25	pH 50	pH 75	pH 90	pH max	Sulphate (mg/L) 25	Sulphate (mg/L) 50	Sulphate (mg/L) 75	Sulphate (mg/L) 90	Sulphate (mg/L) max	Nitrate (mg/L) 25	Nitrate (mg/L) 50	Nitrate (mg/L) 75	Nitrate (mg/L) 90	Nitrate (mg/L) max	Ammonium (mg/L) 25	Ammonium (mg/L) 50	Ammonium (mg/L) 75	Ammonium (mg/L) 90	Ammonium (mg/L) max
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	212.4	5.74	5.44	5.28	4.98	4.71	0.13	0.29	0.79	1.71	2.89	0.14	0.26	1.06	2.14	2.72	0.02	0.06	0.21	0.40	0.61
1983	232.2	5.64	5.43	5.24	4.73	4.55	0.24	0.36	1.00	1.33	1.52	0.20	0.37	1.50	2.22	3.04	0.04	0.09	0.31	0.69	0.77
1984	82.7	5.84	5.70	5.49	5.27	5.18	0.37	0.43	1.01	1.27	1.41	0.28	0.64	1.60	2.11	2.41	0.05	0.12	0.35	0.53	0.68
1985	90.6	5.60	5.39	5.06	4.74	4.66	0.21	0.52	1.03	1.69	2.08	0.26	1.07	2.14	3.64	3.85	0.02	0.19	0.47	0.90	1.12
1986	113.0	5.99	5.37	5.28	4.53	4.53	0.46	0.89	1.41	4.95	4.95	0.78	1.40	2.41	12.46	12.46	0.17	0.25	0.54	3.37	3.37
1987	-	5.69	5.55	5.35	5.05	5.03	0.12	0.21	0.36	1.01	1.43	0.16	0.48	0.81	2.17	3.39	0.02	0.08	0.18	0.79	1.24
1988	66.9	5.93	5.57	5.20	4.88	4.86	0.21	0.36	0.81	1.76	1.97	0.30	0.54	1.35	1.90	2.07	0.02	0.05	0.25	0.28	0.29

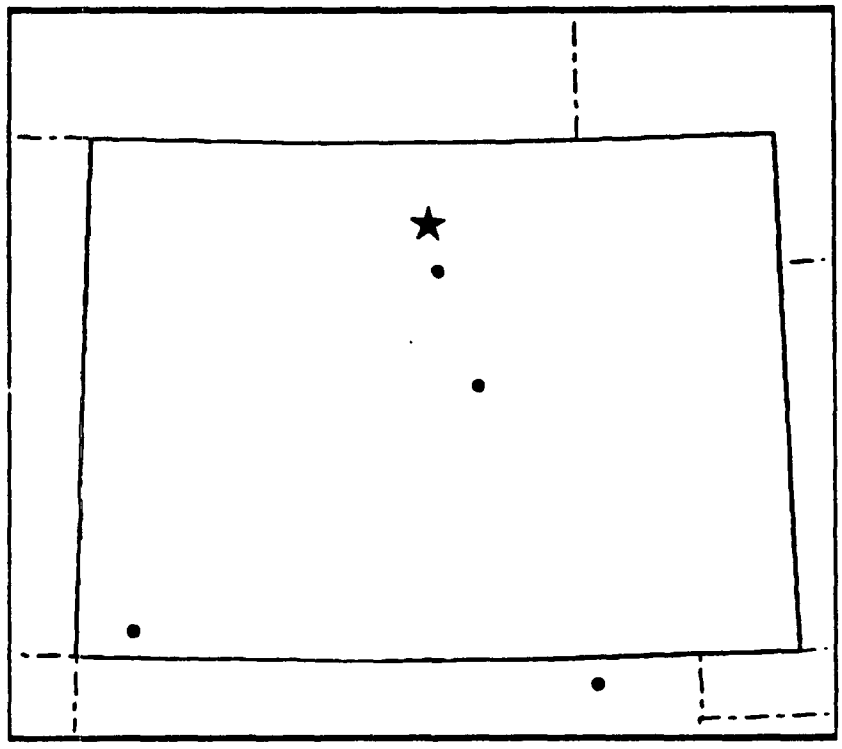
B. VOLUME WEIGHTED AVERAGES AND DEPOSITION BY YEAR AND SEASON

Year	Annual pH x̄[2]	Annual pH dep[3]	Annual Sulphate x̄	Annual Sulphate dep	Annual Nitrate x̄	Annual Nitrate dep	Annual Ammonium x̄	Annual Ammonium dep	Winter (Dec-Feb) pH x̄	Winter pH dep	Winter Sulphate x̄	Winter Sulphate dep	Winter Nitrate x̄	Winter Nitrate dep	Winter Ammonium x̄	Winter Ammonium dep	Summer (Jun-Aug) pH x̄	Summer pH dep	Summer Sulphate x̄	Summer Sulphate dep	Summer Nitrate x̄	Summer Nitrate dep	Summer Ammonium x̄	Summer Ammonium dep
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	5.47	0.08	0.27	6.29	0.31	7.15	0.09	2.02	5.39	0.04	0.10	1.01	0.17	1.70	0.02	0.24	4.99	0.00	0.77	0.05	1.53	0.10	0.18	0.01
1984	5.47	0.03	0.43	3.58	0.46	3.78	0.11	0.90	-	-	-	-	-	-	-	-	5.70	0.00	0.73	0.19	0.91	0.23	0.20	0.05
1985	-	-	-	-	-	-	-	-	5.32	0.01	0.20	0.37	0.39	0.73	0.05	0.10	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.14	0.00	1.69	0.14	1.83	0.15	0.03	0.00

1. Estimated annual precipitation amount in cm.
2. Volume weighted averages (in pH units for pH and in mg/L for sulphate, nitrate, and ammonium).
3. Estimated deposition in kg/ha.

BEAVER MEADOWS, ROCKY MTN NAT'L PARK **COLORADO**

BIOGRAPHIC INFORMATION



Latitude	-	40.36 ° N
Longitude	-	105.58 ° W.
Elevation (m)	-	2490
Landuse	-	Rural
Start Summary	-	May 1980
End Summary	-	December 1988
Source of Data	-	NADP/NTN (CO19)

Beaver Meadows, Rocky Mountain National Park

BASIC STATISTICS

A. PERCENTILES IN WEEKLY CONCENTRATIONS BY YEAR

	ppt	pH					Sulphate (mg/L)					Nitrate (mg/L)					Ammonium (mg/L)				
Year	vol[1]	25	50	75	90	max	25	50	75	90	max	25	50	75	90	max	25	50	75	90	max
1980	-	6.04	4.90	4.82	4.48	4.46	0.71	1.46	2.09	4.91	8.68	1.06	1.46	2.22	5.74	9.76	0.14	0.22	0.60	1.22	1.28
1981	33.4	5.92	5.22	4.87	4.63	4.27	0.78	1.97	2.70	3.55	4.69	0.62	1.31	2.11	3.57	6.42	0.13	0.21	0.52	0.74	1.84
1982	36.8	5.45	5.08	4.73	4.54	4.16	0.69	0.98	1.37	2.36	6.71	0.62	1.09	1.55	1.97	3.79	0.06	0.13	0.23	0.32	1.02
1983	45.4	5.69	5.32	4.72	4.34	4.04	0.55	0.88	1.74	2.98	5.81	0.45	0.87	1.53	3.13	5.78	0.06	0.11	0.33	0.45	1.53
1984	43.1	6.12	5.56	5.16	4.77	4.58	0.70	0.91	1.38	1.90	4.49	0.72	1.09	1.56	2.10	4.81	0.08	0.18	0.36	0.61	1.69
1985	41.8	5.65	5.10	4.87	4.71	4.47	0.58	0.98	1.77	2.49	6.91	0.59	1.05	1.99	2.27	6.67	0.02	0.15	0.39	0.61	2.19
1986	44.0	5.90	5.19	4.77	4.67	4.37	0.45	0.79	1.32	2.12	2.97	0.54	0.99	1.66	2.53	3.85	0.08	0.22	0.34	0.53	1.00
1987	-	5.76	5.51	5.08	4.87	4.65	0.21	0.48	0.76	1.23	1.48	0.47	0.70	0.98	1.28	1.60	0.06	0.10	0.21	0.28	0.30
1988	25.4	6.16	5.37	5.06	4.82	4.15	0.37	0.84	1.63	2.24	3.22	0.47	0.98	2.11	2.69	3.88	0.02	0.07	0.29	0.57	0.79

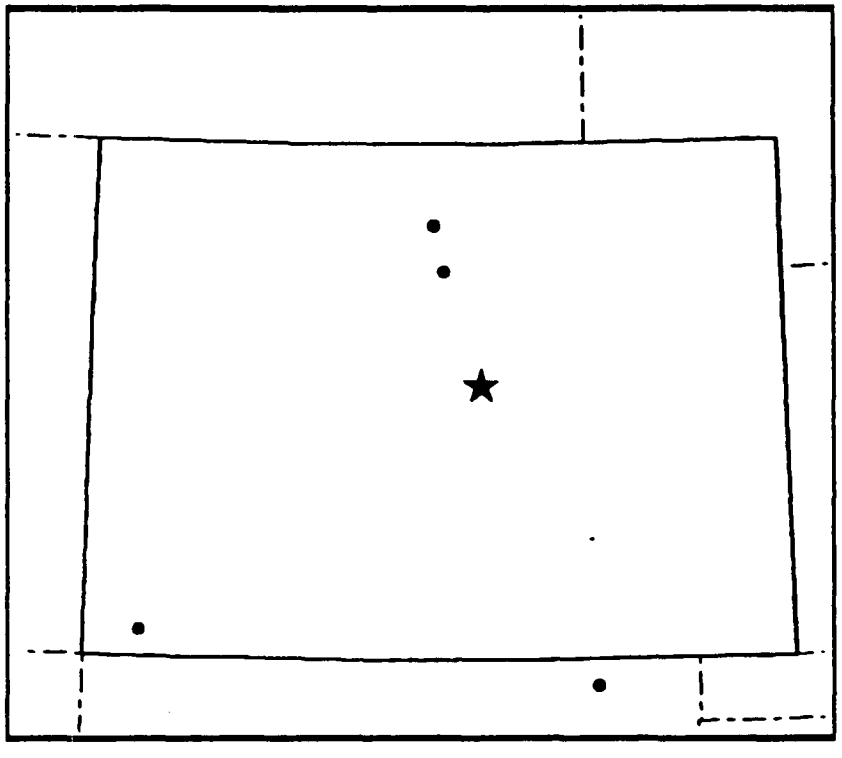
B. VOLUME WEIGHTED AVERAGES AND DEPOSITION BY YEAR AND SEASON

	Annual								Winter (Dec-Feb)								Summer (Jun-Aug)							
	pH		Sulphate		Nitrate		Ammonium		pH		Sulphate		Nitrate		Ammonium		pH		Sulphate		Nitrate		Ammonium	
Year	x̄[2]	dep[3]	x̄	dep	x̄	dep	x̄	dep	x̄	dep	x̄	dep	x̄	dep	x̄	dep	x̄	dep	x̄	dep	x̄	dep	x̄	dep
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	5.00	0.03	1.58	5.29	1.46	4.87	0.34	1.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	4.97	0.04	0.91	3.36	0.93	3.41	0.14	0.50	-	-	-	-	-	-	-	-	4.78	0.02	1.21	1.37	1.22	1.39	0.24	0.27
1983	5.09	0.04	0.80	3.65	0.85	3.87	0.15	0.70	5.44	0.00	0.63	0.14	0.63	0.14	0.08	0.02	4.80	0.02	1.24	1.54	1.48	1.84	0.26	0.32
1984	5.14	0.03	0.98	4.21	1.13	4.87	0.25	1.07	-	-	-	-	-	-	-	-	4.93	0.02	1.29	1.95	1.36	2.04	0.30	0.45
1985	4.99	0.04	0.91	3.80	0.95	3.95	0.17	0.73	-	-	-	-	-	-	-	-	4.89	0.01	1.21	1.32	1.36	1.49	0.27	0.29
1986	5.07	0.04	0.77	3.40	0.94	4.11	0.23	1.03	5.24	0.00	0.23	0.18	0.27	0.21	0.01	0.01	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	5.19	0.02	0.76	1.94	0.94	2.39	0.11	0.27	-	-	-	-	-	-	-	-	4.91	0.01	1.59	0.93	1.79	1.05	0.16	0.09

1. Estimated annual precipitation amount in cm.
2. Volume weighted averages (in pH units for pH and in mg/L for sulphate, nitrate, and ammonium).
3. Estimated deposition in kg/ha.

MANITOU COLORADO

BIOGRAPHIC INFORMATION



Latitude	-	39.10 ° N
Longitude	-	105.09 ° W
Elevation (m)	-	2362
Landuse	-	Rural
Start Summary	-	January 1980
End Summary	-	December 1988
Source of Data	-	NADP/NTN (CO21)

Manitou

BASIC STATISTICS

A. PERCENTILES IN WEEKLY CONCENTRATIONS BY YEAR

Year	ppt vol[1]	pH 25	pH 50	pH 75	pH 90	pH max	Sulphate (mg/L) 25	Sulphate 50	Sulphate 75	Sulphate 90	Sulphate max	Nitrate (mg/L) 25	Nitrate 50	Nitrate 75	Nitrate 90	Nitrate max	Ammonium (mg/L) 25	Ammonium 50	Ammonium 75	Ammonium 90	Ammonium max
1980	41.5	5.83	5.24	4.78	4.49	4.37	0.96	1.73	2.40	3.66	3.68	1.13	1.92	2.20	3.33	3.50	0.18	0.31	0.43	0.51	0.56
1981	40.0	6.19	5.25	4.83	4.64	4.37	0.95	1.47	1.43	4.62	18.47	0.69	1.35	2.34	3.84	7.29	0.10	0.21	0.33	0.54	0.81
1982	45.6	5.61	5.07	4.81	4.63	4.41	0.63	1.16	1.47	2.61	3.52	0.76	1.14	1.95	3.00	4.31	0.07	0.16	0.31	0.54	0.67
1983	48.8	5.50	5.19	4.80	4.51	4.18	0.59	0.94	1.57	2.18	3.91	0.75	1.06	2.06	2.63	4.45	0.07	0.18	0.27	0.48	1.91
1984	41.5	6.11	5.30	4.79	4.62	4.36	0.71	1.26	2.14	3.05	3.24	0.92	1.25	2.11	3.69	5.15	0.09	0.17	0.29	0.50	1.18
1985	39.6	5.21	4.98	4.76	4.58	4.43	0.41	0.61	1.89	2.85	5.15	0.56	1.08	2.07	3.00	6.13	0.02	0.06	0.41	0.56	1.32
1986	31.7	5.54	5.05	4.66	4.49	4.24	0.57	0.85	1.74	2.23	12.68	0.85	1.21	2.21	3.36	16.79	0.04	0.11	0.26	0.41	2.84
1987	-	5.47	4.93	4.72	4.58	4.31	0.37	0.85	1.23	1.94	4.42	0.75	1.17	2.04	3.63	9.36	0.06	0.11	0.29	0.42	1.49
1988	30.2	5.87	5.05	4.78	4.48	3.84	0.47	0.97	1.64	2.55	2.99	0.68	1.07	2.34	2.82	4.01	0.02	0.05	0.18	0.37	1.02

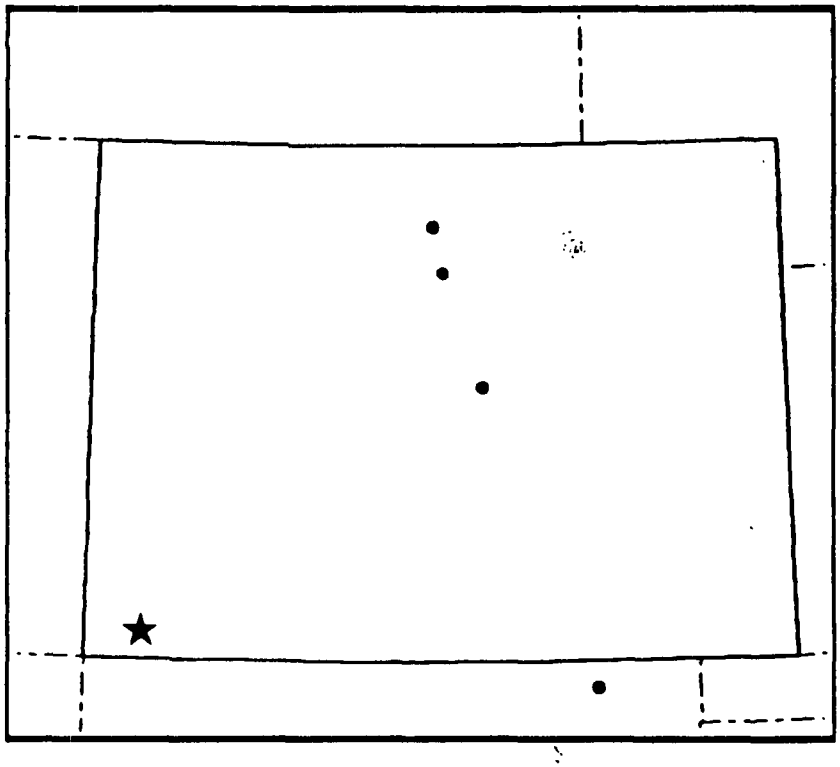
B. VOLUME WEIGHTED AVERAGES AND DEPOSITION BY YEAR AND SEASON

Year	Annual pH x̄[2]	Annual pH dep[3]	Annual Sulphate x̄	Annual Sulphate dep	Annual Nitrate x̄	Annual Nitrate dep	Annual Ammonium x̄	Annual Ammonium dep	Winter (Dec-Feb) pH x̄	Winter pH dep	Winter Sulphate x̄	Winter Sulphate dep	Winter Nitrate x̄	Winter Nitrate dep	Winter Ammonium x̄	Winter Ammonium dep	Summer (Jun-Aug) pH x̄	Summer pH dep	Summer Sulphate x̄	Summer Sulphate dep	Summer Nitrate x̄	Summer Nitrate dep	Summer Ammonium x̄	Summer Ammonium dep
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	4.81	0.06	1.50	6.01	1.45	5.78	0.23	0.92	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	4.91	0.06	1.02	4.64	1.13	5.17	0.17	0.77	5.27	0.00	1.14	0.22	0.76	0.15	0.09	0.02	-	-	-	-	-	-	-	-
1983	4.97	0.05	0.91	4.45	1.07	5.23	0.18	0.87	-	-	-	-	-	-	-	-	4.86	0.03	1.04	2.50	1.11	2.64	0.19	0.44
1984	4.90	0.05	1.12	4.66	1.25	5.20	0.22	0.91	-	-	-	-	-	-	-	-	4.77	0.04	1.12	2.58	1.27	2.92	0.22	0.51
1985	4.86	0.05	0.87	3.45	1.04	4.12	0.15	0.60	5.13	0.00	0.36	0.07	1.01	0.18	0.02	0.00	4.78	0.03	1.03	2.10	1.35	2.32	0.19	0.38
1986	4.82	0.05	1.03	3.28	1.32	4.19	0.15	0.49	4.84	0.00	0.41	0.08	1.58	0.29	0.09	0.02	4.70	0.03	1.15	1.98	1.15	2.32	0.13	0.22
1987	-	-	-	-	-	-	-	-	4.92	0.01	0.28	0.10	1.14	0.43	0.08	0.03	4.77	0.03	0.93	1.46	1.23	1.92	0.12	0.18
1988	4.85	0.04	1.15	3.46	1.45	4.37	0.10	0.30	-	-	-	-	-	-	-	-	4.80	0.03	1.38	2.75	1.69	3.38	0.09	0.18

1. Estimated annual precipitation amount in cm.
2. Volume weighted averages (in pH units for pH and in mg/L for sulphate, nitrate, and ammonium).
3. Estimated deposition in kg/ha.

MESA VERDE NATIONAL PARK **COLORADO**

BIOGRAPHIC INFORMATION



Latitude	-	37.20 ° N
Longitude	-	108.49 ° W
Elevation (m)	-	2172
Landuse	-	Rural
Start Summary	-	April 1981
End Summary	-	December 1988
Source of Data	-	NADP/NTN (CO99)

Mesa Verde National Park

BASIC STATISTICS

A. PERCENTILES IN WEEKLY CONCENTRATIONS BY YEAR

	ppt	pH					Sulphate (mg/L)					Nitrate (mg/L)					Ammonium (mg/L)				
Year	vol[1]	25	50	75	90	max	25	50	75	90	max	25	50	75	90	max	25	50	75	90	max
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	6.28	4.95	4.43	4.26	4.07	1.38	2.83	4.02	6.01	6.30	0.98	1.33	2.17	2.62	3.82	0.04	0.13	0.27	0.38	0.53
1982	64.9	5.66	4.92	4.61	4.25	4.02	0.84	1.53	2.74	6.06	9.62	0.51	0.97	1.50	3.88	7.09	0.06	0.12	0.21	0.28	0.49
1983	57.3	5.96	5.23	4.76	4.33	3.84	0.64	0.87	2.05	3.87	12.34	0.43	0.68	1.70	2.34	5.22	0.05	0.09	0.17	0.28	0.67
1984	40.9	6.61	5.11	4.66	4.30	4.10	0.97	1.46	2.78	4.40	5.26	0.73	1.32	2.06	2.90	5.18	0.06	0.12	0.29	0.41	0.61
1985	53.5	5.66	5.04	4.81	4.45	4.16	0.64	0.98	1.65	4.06	12.20	0.32	0.82	1.56	3.22	5.70	0.02	0.03	0.22	0.50	1.23
1986	64.0	5.89	5.02	4.76	4.46	4.23	0.59	1.10	1.83	2.96	4.33	0.46	0.91	1.52	2.60	4.05	0.02	0.09	0.23	0.39	0.69
1987	48.6	5.82	4.89	4.67	4.40	4.30	0.70	1.44	2.26	2.92	3.43	0.68	1.12	2.04	3.14	5.29	0.04	0.13	0.25	0.44	0.81
1988	41.0	5.80	4.83	4.60	4.49	4.01	0.43	1.00	2.09	2.76	8.76	0.69	1.09	2.32	3.13	6.78	0.02	0.02	0.11	0.29	0.59

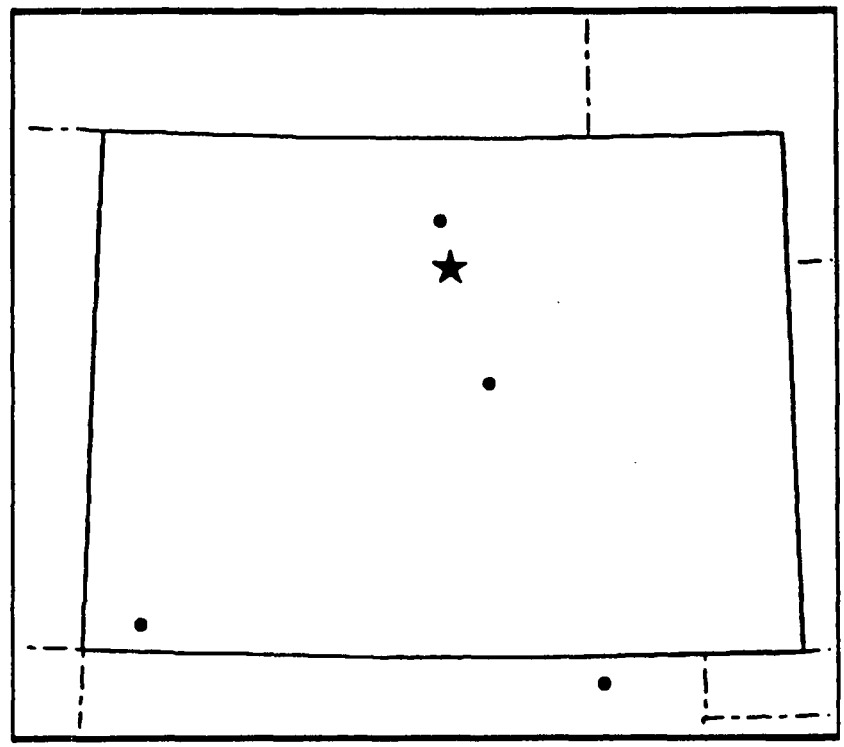
B. VOLUME WEIGHTED AVERAGES AND DEPOSITION BY YEAR AND SEASON

	Annual								Winter (Dec-Feb)								Summer (Jun-Aug)							
	pH		Sulphate		Nitrate		Ammonium		pH		Sulphate		Nitrate		Ammonium		pH		Sulphate		Nitrate		Ammonium	
Year	x̄[2]	dep[3]	x̄	dep	x̄	dep	x̄	dep	x̄	dep	x̄	dep	x̄	dep	x̄	dep	x̄	dep	x̄	dep	x̄	dep	x̄	dep
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.64	0.04	2.26	3.54	1.67	2.61	0.17	0.27
1982	4.69	0.13	1.43	9.30	0.89	5.79	0.13	0.87	-	-	-	-	-	-	-	-	4.41	0.07	1.99	3.55	1.42	2.54	0.14	0.25
1983	4.88	0.08	0.96	5.53	0.70	4.02	0.09	0.50	5.05	0.02	0.64	1.16	0.51	0.92	0.07	0.12	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	4.91	0.07	1.07	5.72	0.72	3.85	0.07	0.40	4.93	0.01	0.73	0.86	0.56	0.66	0.09	0.10	-	-	-	-	-	-	-	-
1986	4.89	0.08	0.95	6.09	0.72	4.59	0.09	0.54	5.11	0.01	0.56	0.37	0.52	0.34	0.03	0.02	-	-	-	-	-	-	-	-
1987	4.80	0.08	1.08	5.26	0.94	4.59	0.13	0.64	4.88	0.01	0.62	0.62	0.59	0.60	0.05	0.01	4.68	0.03	1.25	1.73	1.09	1.50	0.17	0.23
1988	4.82	0.06	1.14	4.65	1.04	4.26	0.07	0.30	-	-	-	-	-	-	-	-	4.70	0.02	1.23	1.44	1.27	1.49	0.03	0.03

1. Estimated annual precipitation amount in cm.
2. Volume weighted averages (in pH units for pH and in mg/L for sulphate, nitrate, and ammonium).
3. Estimated deposition in kg/ha.

SUGARLOAF **COLORADO**

BIOGRAPHIC INFORMATION



Latitude	-	39.99 ° N
Longitude	-	105.48 ° W
Elevation (m)	-	2524
Landuse	-	Rural
Start Summary	-	November 1986
End Summary	-	December 1988
Source of Data	-	NADP/NTN (CO94)

Sugarloaf

BASIC STATISTICS

A. PERCENTILES IN WEEKLY CONCENTRATIONS BY YEAR

Year	ppt vol[1]	pH 25	pH 50	pH 75	pH 90	pH max	Sulphate (mg/L) 25	Sulphate (mg/L) 50	Sulphate (mg/L) 75	Sulphate (mg/L) 90	Sulphate (mg/L) max	Nitrate (mg/L) 25	Nitrate (mg/L) 50	Nitrate (mg/L) 75	Nitrate (mg/L) 90	Nitrate (mg/L) max	Ammonium (mg/L) 25	Ammonium (mg/L) 50	Ammonium (mg/L) 75	Ammonium (mg/L) 90	Ammonium (mg/L) max
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	6.24	5.50	5.25	5.20	5.20	0.46	0.85	1.32	1.41	1.41	0.82	1.13	1.65	1.76	1.76	0.10	0.51	0.79	0.83	0.83
1987	56.7	5.51	5.15	4.84	4.58	4.47	0.43	0.67	1.17	1.63	3.23	0.64	1.00	1.46	2.63	3.26	0.08	0.19	0.38	0.62	0.72
1988	49.0	5.70	5.09	4.73	4.50	4.15	0.34	0.92	1.77	2.98	6.15	0.48	1.00	1.87	3.26	7.27	0.02	0.08	0.19	0.45	1.63

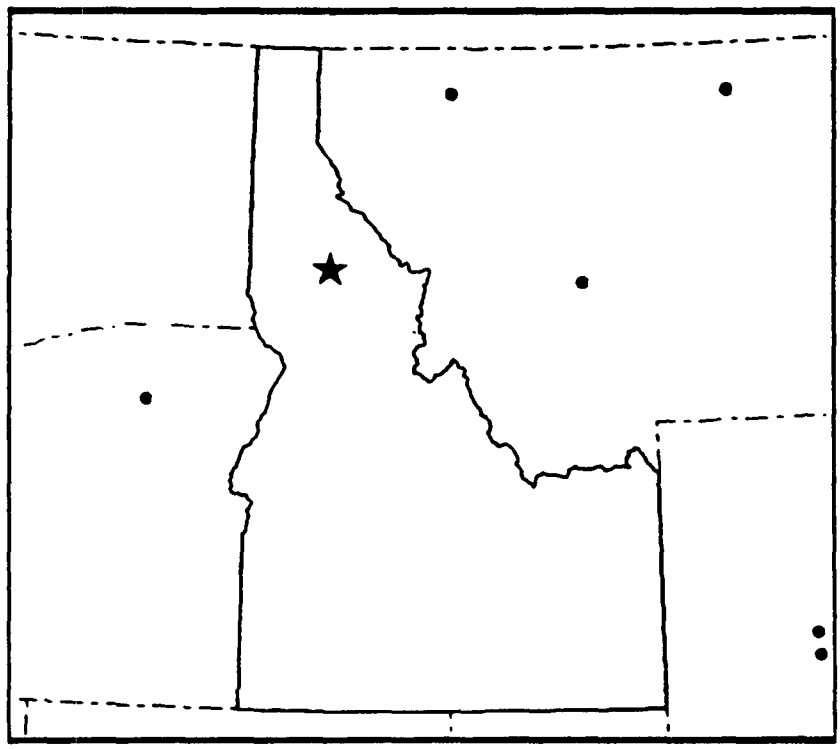
B. VOLUME WEIGHTED AVERAGES AND DEPOSITION BY YEAR AND SEASON

Year	Annual pH x̄[2]	Annual pH dep[3]	Annual Sulphate x̄	Annual Sulphate dep	Annual Nitrate x̄	Annual Nitrate dep	Annual Ammonium x̄	Annual Ammonium dep	Winter (Dec-Feb) pH x̄	Winter pH dep	Winter Sulphate x̄	Winter Sulphate dep	Winter Nitrate x̄	Winter Nitrate dep	Winter Ammonium x̄	Winter Ammonium dep	Summer (Jun-Aug) pH x̄	Summer pH dep	Summer Sulphate x̄	Summer Sulphate dep	Summer Nitrate x̄	Summer Nitrate dep	Summer Ammonium x̄	Summer Ammonium dep
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	4.97	0.06	0.71	4.01	0.99	5.59	0.21	1.21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	5.00	0.05	0.80	3.92	0.96	4.71	0.14	0.69	-	-	-	-	-	-	-	-	4.73	0.02	1.64	1.59	1.93	1.88	0.13	0.13

1. Estimated annual precipitation amount in cm.
2. Volume weighted averages (in pH units for pH and in mg/L for sulphate, nitrate, and ammonium).
3. Estimated deposition in kg/ha.

HEADQUARTERS **IDAHO**

BIOGRAPHIC INFORMATION



Latitude	-	46.63 ° N
Longitude	-	115.82 ° W
Elevation (m)	-	969
Landuse	-	Rural
Start Summary	-	July 1982
End Summary	-	December 1988
Source of Data	-	NADP/NTN (ID04)

Headquarters

BASIC STATISTICS

A. PERCENTILES IN WEEKLY CONCENTRATIONS BY YEAR

Year	ppt vol[1]	pH 25	pH 50	pH 75	pH 90	pH max	Sulphate (mg/L) 25	Sulphate 50	Sulphate 75	Sulphate 90	Sulphate max	Nitrate (mg/L) 25	Nitrate 50	Nitrate 75	Nitrate 90	Nitrate max	Ammonium (mg/L) 25	Ammonium 50	Ammonium 75	Ammonium 90	Ammonium max
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	5.64	5.53	5.23	5.03	4.95	0.31	0.44	0.92	2.44	2.81	0.30	0.56	1.81	3.21	3.60	0.02	0.09	0.26	0.68	0.80
1983	113.2	5.60	5.42	5.04	4.93	4.57	0.31	0.43	0.62	1.41	2.59	0.21	0.38	0.60	1.25	1.74	0.02	0.06	0.14	0.17	0.54
1984	106.1	5.67	5.48	5.32	5.18	5.11	0.29	0.42	0.69	0.94	3.38	0.27	0.36	0.64	1.08	3.04	0.03	0.07	0.17	0.37	0.54
1985	85.4	5.55	5.33	5.11	4.96	4.89	0.21	0.33	0.46	0.61	0.84	0.10	0.29	0.63	0.83	1.06	0.02	0.03	0.09	0.16	0.35
1986	85.5	5.63	5.46	5.32	5.12	4.92	0.18	0.29	0.44	0.53	1.30	0.21	0.34	0.53	0.87	2.34	0.02	0.04	0.09	0.16	0.77
1987	68.2	5.64	5.45	5.24	4.90	3.95	0.19	0.32	0.61	0.93	2.29	0.20	0.37	0.76	1.38	3.77	0.02	0.05	0.12	0.35	0.41
1988	98.5	5.57	5.34	5.20	5.00	4.81	0.19	0.23	0.36	0.90	1.79	0.17	0.27	0.44	0.64	3.56	0.02	0.02	0.02	0.10	0.48

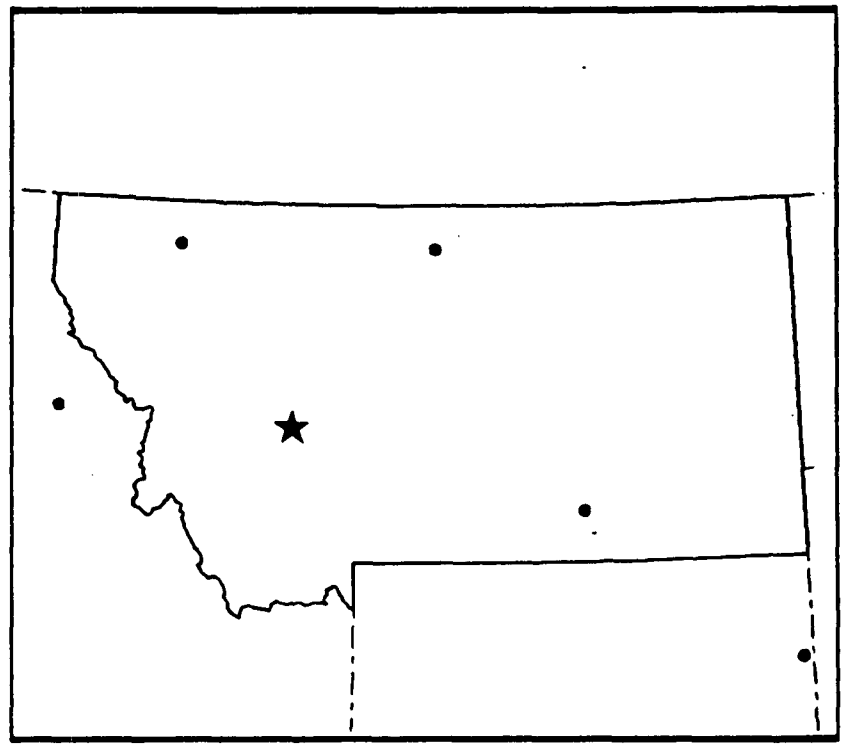
B. VOLUME WEIGHTED AVERAGES AND DEPOSITION BY YEAR AND SEASON

Year	Annual pH x̄[2]	Annual pH dep[3]	Annual Sulphate x̄	Annual Sulphate dep	Annual Nitrate x̄	Annual Nitrate dep	Annual Ammonium x̄	Annual Ammonium dep	Winter (Dec-Feb) pH x̄	Winter pH dep	Winter Sulphate x̄	Winter Sulphate dep	Winter Nitrate x̄	Winter Nitrate dep	Winter Ammonium x̄	Winter Ammonium dep	Summer (Jun-Aug) pH x̄	Summer pH dep	Summer Sulphate x̄	Summer Sulphate dep	Summer Nitrate x̄	Summer Nitrate dep	Summer Ammonium x̄	Summer Ammonium dep
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	5.42	0.04	0.38	3.98	0.38	4.00	0.08	0.83	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	5.26	0.05	0.28	2.35	0.23	1.96	0.03	0.26	5.27	0.01	0.32	0.83	0.43	1.12	0.04	0.10	5.15	0.01	0.28	0.44	0.13	0.20	0.01	0.02
1986	5.38	0.04	0.23	1.96	0.29	2.46	0.06	0.47	5.35	0.02	0.12	0.42	0.15	0.52	0.04	0.13	5.15	0.00	0.37	0.20	0.40	0.22	0.01	0.01
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.14	0.01	0.42	0.43	0.56	0.58	0.07	0.07
1988	5.36	0.04	0.24	2.39	0.25	2.49	0.02	0.21	-	-	-	-	-	-	-	-	5.21	0.01	0.40	0.38	0.16	0.15	0.02	0.02

1. Estimated annual precipitation amount in cm.
2. Volume weighted averages (in pH units for pH and in mg/L for sulphate, nitrate, and ammonium).
3. Estimated deposition in kg/ha.

CLANCY **MONTANA**

BIOGRAPHIC INFORMATION



Latitude	-	46.49 ° N
Longitude	-	112.07 ° W
Elevation (m)	-	1489
Landuse	-	Rural
Start Summary	-	January 1984
End Summary	-	December 1988
Source of Data	-	NADP/NTN (MT07)

Clancy

BASIC STATISTICS

A. PERCENTILES IN WEEKLY CONCENTRATIONS BY YEAR

Year	ppt vol[1]	pH 25	pH 50	pH 75	pH 90	pH max	Sulphate (mg/L) 25	Sulphate 50	Sulphate 75	Sulphate 90	Sulphate max	Nitrate (mg/L) 25	Nitrate 50	Nitrate 75	Nitrate 90	Nitrate max	Ammonium (mg/L) 25	Ammonium 50	Ammonium 75	Ammonium 90	Ammonium max
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	30.3	6.27	5.75	5.45	4.84	4.71	0.43	0.68	1.41	2.91	3.50	0.32	0.51	1.24	2.48	3.58	0.05	0.09	0.20	0.27	1.18
1985	33.1	5.96	5.62	5.15	4.98	4.78	0.33	0.56	0.88	1.47	5.95	0.12	0.43	0.78	1.58	6.26	0.02	0.08	0.16	0.42	1.36
1986	39.2	5.78	5.37	5.14	4.89	4.77	0.29	0.45	0.69	1.12	1.51	0.25	0.40	0.80	1.10	1.55	0.02	0.05	0.13	0.34	0.59
1987	35.0	5.66	5.39	5.17	4.91	3.98	0.46	0.67	1.10	1.94	3.54	0.36	0.57	0.83	2.56	3.82	0.05	0.13	0.22	0.49	0.72
1988	36.1	5.72	5.41	5.19	5.01	4.89	0.21	0.38	0.69	1.00	3.37	0.06	0.27	0.58	0.87	4.35	0.02	0.02	0.07	0.15	0.47

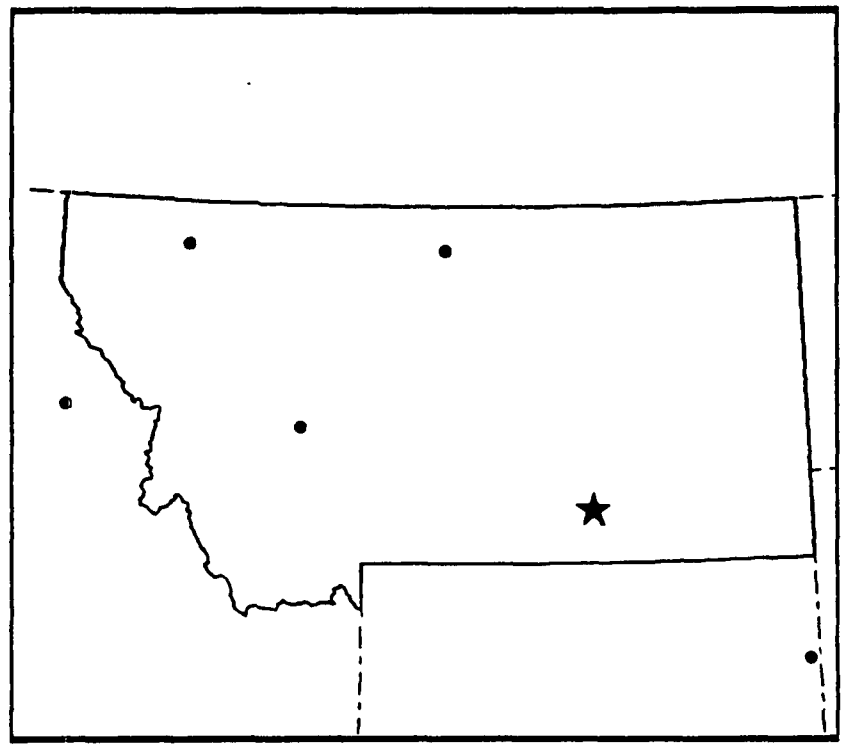
B. VOLUME WEIGHTED AVERAGES AND DEPOSITION BY YEAR AND SEASON

Year	Annual pH x̄[2]	Annual pH dep[3]	Annual Sulphate x̄	Annual Sulphate dep	Annual Nitrate x̄	Annual Nitrate dep	Annual Ammonium x̄	Annual Ammonium dep	Winter (Dec-Feb) pH x̄	Winter pH dep	Winter Sulphate x̄	Winter Sulphate dep	Winter Nitrate x̄	Winter Nitrate dep	Winter Ammonium x̄	Winter Ammonium dep	Summer (Jun-Aug) pH x̄	Summer pH dep	Summer Sulphate x̄	Summer Sulphate dep	Summer Nitrate x̄	Summer Nitrate dep	Summer Ammonium x̄	Summer Ammonium dep
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.12	0.01	0.79	1.01	0.62	0.79	0.12	0.16
1985	5.28	0.02	0.51	1.67	0.39	1.29	0.08	0.27	5.52	0.00	0.41	0.18	0.29	0.13	0.04	0.02	5.17	0.01	0.50	0.46	0.56	0.52	0.10	0.09
1986	5.19	0.03	0.48	1.87	0.42	1.65	0.08	0.33	5.09	0.00	0.31	0.19	0.27	0.16	0.02	0.01	5.15	0.01	0.66	0.79	0.56	0.67	0.14	0.17
1987	5.24	0.02	0.62	2.17	0.53	1.85	0.11	0.38	-	-	-	-	-	-	-	-	5.16	0.01	0.61	0.87	0.55	0.79	0.10	0.14
1988	5.35	0.02	0.47	1.70	0.34	1.24	0.06	0.21	5.42	0.00	0.23	0.13	0.30	0.17	0.02	0.01	-	-	-	-	-	-	-	-

1. Estimated annual precipitation amount in cm.
2. Volume weighted averages (in pH units for pH and in mg/L for sulphate, nitrate, and ammonium).
3. Estimated deposition in kg/ha.

CUSTER BATTLEFIELD NATIONAL MONUMENT **MONTANA**

BIOGRAPHIC INFORMATION



Latitude	-	45.57 ° N
Longitude	-	107.44 ° W
Elevation (m)	-	957
Landuse	-	Rural
Start Summary	-	July 1984
End Summary	-	December 1988
Source of Data	-	NADP/NTN (MT00)

Custer Battlefield National Monument

BASIC STATISTICS

A. PERCENTILES IN WEEKLY CONCENTRATIONS BY YEAR

Year	ppt vol[1]	pH 25	pH 50	pH 75	pH 90	pH max	Sulphate (mg/L) 25	Sulphate (mg/L) 50	Sulphate (mg/L) 75	Sulphate (mg/L) 90	Sulphate (mg/L) max	Nitrate (mg/L) 25	Nitrate (mg/L) 50	Nitrate (mg/L) 75	Nitrate (mg/L) 90	Nitrate (mg/L) max	Ammonium (mg/L) 25	Ammonium (mg/L) 50	Ammonium (mg/L) 75	Ammonium (mg/L) 90	Ammonium (mg/L) max
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	6.44	5.92	5.36	5.05	4.98	0.51	0.81	2.72	5.20	6.93	0.34	0.65	2.09	3.92	4.84	0.02	0.09	0.32	0.59	0.74
1985	32.3	5.85	5.44	5.12	4.85	4.45	0.47	0.78	1.36	2.10	3.36	0.47	0.67	1.22	2.65	3.22	0.02	0.18	0.34	0.60	0.65
1986	37.8	6.06	5.47	5.12	4.80	4.46	0.36	0.83	1.36	2.72	4.08	0.35	0.73	1.29	1.76	1.98	0.02	0.11	0.25	0.33	0.82
1987	32.9	5.79	5.31	5.06	4.89	4.70	0.51	0.84	1.43	1.87	3.81	0.57	0.81	1.58	1.93	3.30	0.08	0.16	0.28	0.41	0.84
1988	25.5	6.18	5.88	5.52	5.13	4.98	0.50	0.67	1.00	3.09	26.72	0.27	0.69	1.03	1.63	3.16	0.02	0.07	0.14	0.36	0.75

B. VOLUME WEIGHTED AVERAGES AND DEPOSITION BY YEAR AND SEASON

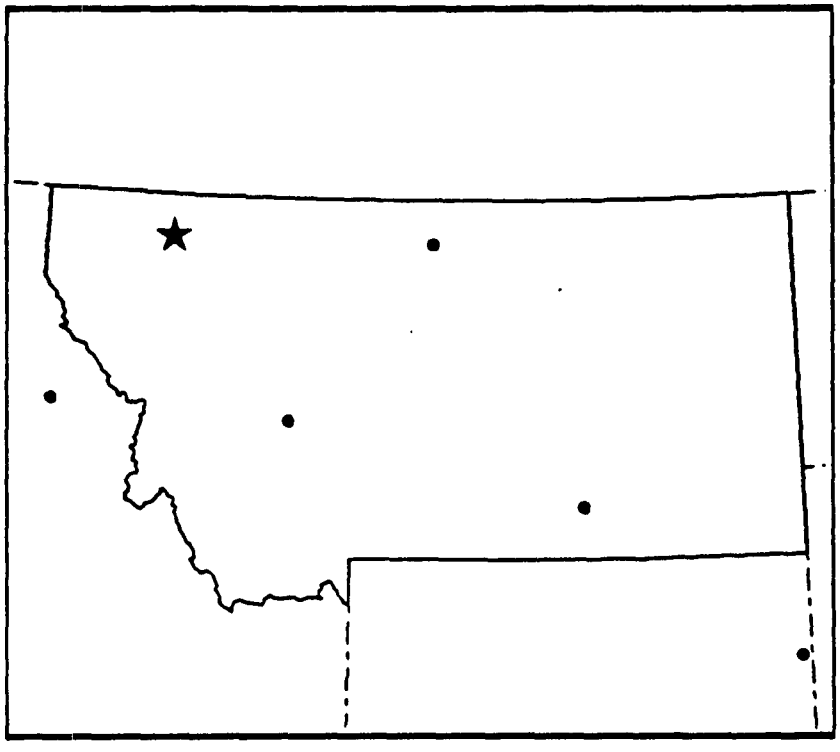
Year	Annual pH x̄[2]	Annual pH dep[3]	Annual Sulphate x̄	Annual Sulphate dep	Annual Nitrate x̄	Annual Nitrate dep	Annual Ammonium x̄	Annual Ammonium dep	Winter (Dec-Feb) pH x̄	Winter pH dep	Winter Sulphate x̄	Winter Sulphate dep	Winter Nitrate x̄	Winter Nitrate dep	Winter Ammonium x̄	Winter Ammonium dep	Summer (Jun-Aug) pH x̄	Summer pH dep	Summer Sulphate x̄	Summer Sulphate dep	Summer Nitrate x̄	Summer Nitrate dep	Summer Ammonium x̄	Summer Ammonium dep
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	5.29	0.02	0.76	2.46	0.67	2.16	0.16	0.51	5.31	0.00	0.77	0.21	0.64	0.18	0.07	0.02	-	-	-	-	-	-	-	-
1986	5.17	0.03	0.73	2.74	0.64	2.43	0.12	0.43	5.31	0.00	0.31	0.14	0.37	0.17	0.04	0.02	-	-	-	-	-	-	-	-
1987	5.19	0.02	0.75	2.48	0.71	2.32	0.15	0.51	5.35	0.00	0.64	0.10	0.98	0.15	0.16	0.03	5.13	0.01	0.86	1.15	0.75	1.00	0.15	0.20
1988	5.57	0.01	0.79	2.01	0.57	1.46	0.10	0.26	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

1. Estimated annual precipitation amount in cm.
2. Volume weighted averages (in pH units for pH and in mg/L for sulphate, nitrate, and ammonium).
3. Estimated deposition in kg/ha.

FIRE WEATHER STATION, GLACIER NATIONAL PARK

MONTANA

BIOGRAPHIC INFORMATION



Latitude	-	48.51 ° N
Longitude	-	114.00 ° W
Elevation (m)	-	968
Landuse	-	Rural
Start Summary	-	June 1980
End Summary	-	December 1988
Source of Data	-	NADP/NTN (MT05)

Fire Weather Station, Glacier National Park

BASIC STATISTICS

A. PERCENTILES IN WEEKLY CONCENTRATIONS BY YEAR

	ppt	pH					Sulphate (mg/L)					Nitrate (mg/L)					Ammonium (mg/L)				
Year	vol[1]	25	50	75	90	max	25	50	75	90	max	25	50	75	90	max	25	50	75	90	max
1980	-	5.29	4.84	4.68	4.53	4.44	0.65	1.10	1.83	2.70	5.91	0.28	0.37	0.94	1.78	2.04	0.03	0.11	0.22	0.52	0.66
1981	78.2	5.50	5.17	4.98	4.82	4.78	0.65	1.10	1.26	1.48	1.68	0.36	0.60	0.72	1.02	1.06	0.02	0.09	0.12	0.23	0.26
1982	91.9	5.73	5.32	5.08	4.94	4.92	0.33	0.57	1.00	1.61	2.98	0.27	0.50	0.86	1.03	2.33	0.04	0.07	0.14	0.23	0.54
1983	83.2	5.77	5.44	5.14	4.88	4.42	0.47	0.59	0.81	1.10	3.34	0.27	0.43	0.62	0.88	1.63	0.04	0.08	0.17	0.32	0.41
1984	80.0	5.63	5.33	5.16	5.06	4.63	0.38	0.47	0.86	1.00	2.30	0.31	0.41	0.63	1.40	3.02	0.05	0.08	0.15	0.26	0.69
1985	64.4	5.44	5.28	5.08	4.92	4.77	0.30	0.46	0.70	1.43	2.01	0.22	0.50	1.03	1.37	2.51	0.02	0.03	0.16	0.25	0.30
1986	75.7	5.45	5.30	5.10	4.97	4.87	0.32	0.42	0.62	0.95	1.14	0.23	0.46	0.57	0.80	1.30	0.02	0.04	0.13	0.24	0.36
1987	-	5.44	5.32	5.19	5.05	4.97	0.22	0.37	0.62	0.95	1.37	0.27	0.51	0.70	1.36	1.37	0.05	0.08	0.13	0.18	0.34
1988	72.9	5.48	5.31	5.16	5.04	4.81	0.24	0.43	0.69	1.08	3.40	0.20	0.40	0.66	1.11	1.67	0.02	0.02	0.11	0.22	1.01

B. VOLUME WEIGHTED AVERAGES AND DEPOSITION BY YEAR AND SEASON

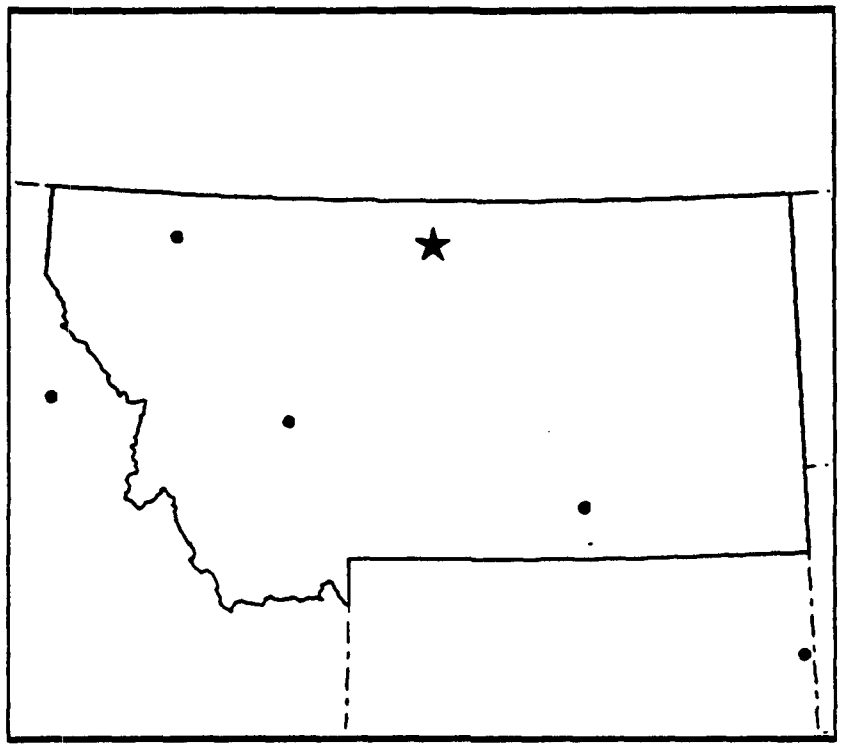
	Annual								Winter (Dec-Feb)								Summer (Jun-Aug)							
	pH		Sulphate		Nitrate		Ammonium		pH		Sulphate		Nitrate		Ammonium		pH		Sulphate		Nitrate		Ammonium	
Year	x̄[2]	dep[3]	x̄	dep	x̄	dep	x̄	dep	x̄	dep	x̄	dep	x̄	dep	x̄	dep	x̄	dep	x̄	dep	x̄	dep	x̄	dep
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.79	0.03	1.01	1.96	0.51	1.00	0.08	0.15
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	5.25	0.05	0.43	3.98	0.38	3.45	0.07	0.66	-	-	-	-	-	-	-	-	5.09	0.01	0.50	0.71	0.49	0.70	0.07	0.09
1983	5.25	0.05	0.49	4.10	0.33	2.76	0.07	0.58	5.42	0.01	0.18	0.51	0.23	0.65	0.04	0.12	-	-	-	-	-	-	-	-
1984	5.25	0.05	0.50	4.00	0.42	3.34	0.07	0.58	5.36	0.01	0.50	0.98	0.39	0.77	0.05	0.10	-	-	-	-	-	-	-	-
1985	5.22	0.04	0.38	2.47	0.26	1.70	0.04	0.26	-	-	-	-	-	-	-	-	5.14	0.01	0.48	0.46	0.45	0.43	0.06	0.06
1986	5.15	0.05	0.37	2.81	0.34	2.54	0.05	0.39	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	5.26	0.04	0.38	2.76	0.33	2.43	0.06	0.41	5.21	0.01	0.24	0.42	0.35	0.61	0.04	0.06	5.14	0.01	0.50	0.43	0.41	0.35	0.01	0.01

1. Estimated annual precipitation amount in cm.
2. Volume weighted averages (in pH units for pH and in mg/L for sulphate, nitrate, and ammonium).
3. Estimated deposition in kg/ha.

HAVRE EXPERIMENTAL STATION

MONTANA

BIOGRAPHIC INFORMATION



Latitude	-	48.50 ° N
Longitude	-	109.80 ° W
Elevation (m)	-	815
Landuse	-	Rural
Start Summary	-	July 1985
End Summary	-	December 1988
Source of Data	-	NADP/NTN (MT98)

Havre Experimental Station

BASIC STATISTICS

A. PERCENTILES IN WEEKLY CONCENTRATIONS BY YEAR

Year	ppt vol[1]	pH 25	pH 50	pH 75	pH 90	pH max	Sulphate (mg/L) 25	Sulphate (mg/L) 50	Sulphate (mg/L) 75	Sulphate (mg/L) 90	Sulphate (mg/L) max	Nitrate (mg/L) 25	Nitrate (mg/L) 50	Nitrate (mg/L) 75	Nitrate (mg/L) 90	Nitrate (mg/L) max	Ammonium (mg/L) 25	Ammonium (mg/L) 50	Ammonium (mg/L) 75	Ammonium (mg/L) 90	Ammonium (mg/L) max
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	5.67	5.34	5.16	4.80	4.68	0.44	0.60	0.82	2.35	2.90	0.07	0.22	0.63	3.35	4.43	0.02	0.13	0.16	0.29	0.31
1986	50.3	6.51	5.67	5.45	5.23	5.07	0.35	0.58	0.97	1.34	3.21	0.26	0.56	0.91	1.35	4.60	0.02	0.10	0.26	0.77	0.85
1987	22.6	5.92	5.53	5.10	4.87	4.84	0.45	0.78	1.53	2.00	2.17	0.48	0.81	1.20	1.54	1.88	0.09	0.17	0.24	0.47	0.52
1988	19.2	6.45	5.83	5.43	5.25	5.03	0.26	0.47	0.86	1.25	2.55	0.37	0.59	0.71	1.73	3.04	0.05	0.11	0.17	0.44	0.92

B. VOLUME WEIGHTED AVERAGES AND DEPOSITION BY YEAR AND SEASON

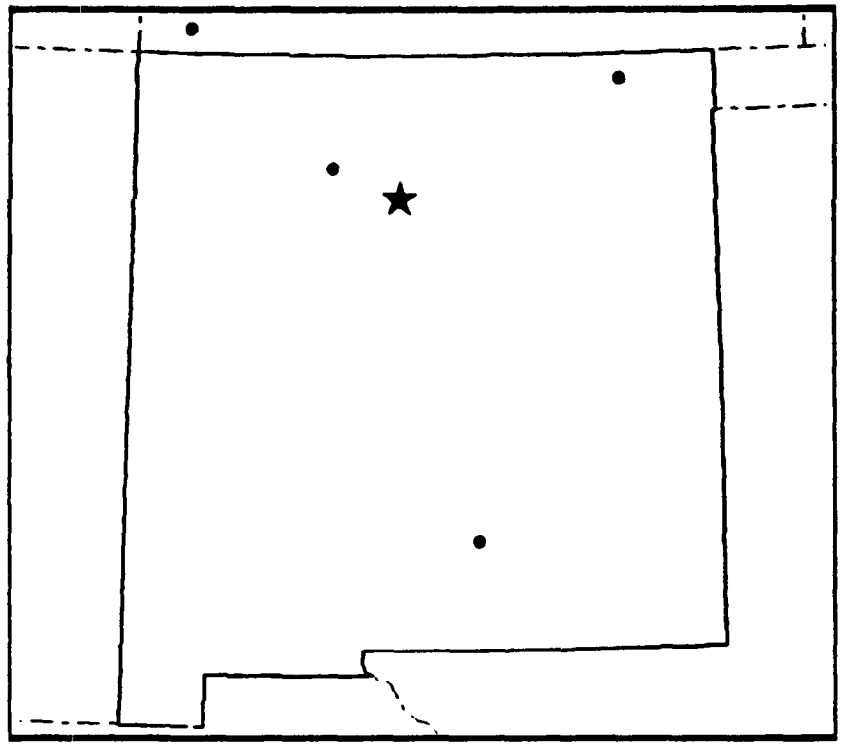
Year	Annual pH x̄[2]	Annual pH dep[3]	Annual Sulphate x̄	Annual Sulphate dep	Annual Nitrate x̄	Annual Nitrate dep	Annual Ammonium x̄	Annual Ammonium dep	Winter (Dec-Feb) pH x̄	Winter pH dep	Winter Sulphate x̄	Winter Sulphate dep	Winter Nitrate x̄	Winter Nitrate dep	Winter Ammonium x̄	Winter Ammonium dep	Summer (Jun-Aug) pH x̄	Summer pH dep	Summer Sulphate x̄	Summer Sulphate dep	Summer Nitrate x̄	Summer Nitrate dep	Summer Ammonium x̄	Summer Ammonium dep
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	5.45	0.02	0.49	2.47	0.43	2.14	0.11	0.57	-	-	-	-	-	-	-	-	5.40	0.01	0.62	0.80	0.58	0.75	0.09	0.12
1987	5.20	0.01	0.66	1.49	0.75	1.70	0.18	0.41	-	-	-	-	-	-	-	-	5.24	0.01	0.60	0.68	0.75	0.84	0.15	0.17
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

1. Estimated annual precipitation amount in cm.
2. Volume weighted averages (in pH units for pH and in mg/L for sulphate, nitrate, and ammonium).
3. Estimated deposition in kg/ha.

BANDELIER NATIONAL MONUMENT

NEW MEXICO

BIOGRAPHIC INFORMATION



Latitude	-	35.78 ° N
Longitude	-	106.27 ° W
Elevation (m)	-	1998
Landuse	-	Rural
Start Summary	-	June 1982
End Summary	-	December 1988
Source of Data	-	NADP/NTN (NM07)

Bandelier National Monument

BASIC STATISTICS

A. PERCENTILES IN WEEKLY CONCENTRATIONS BY YEAR

Year	ppt vol[1]	pH 25	pH 50	pH 75	pH 90	pH max	Sulphate (mg/L) 25	Sulphate 50	Sulphate 75	Sulphate 90	Sulphate max	Nitrate (mg/L) 25	Nitrate 50	Nitrate 75	Nitrate 90	Nitrate max	Ammonium (mg/L) 25	Ammonium 50	Ammonium 75	Ammonium 90	Ammonium max
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	5.82	5.17	5.05	4.95	4.93	0.80	1.14	1.62	1.91	1.91	0.44	0.58	1.32	2.50	2.78	0.14	0.20	0.29	0.49	0.63
1983	37.0	5.92	5.36	4.95	4.83	4.74	0.53	0.84	1.58	4.12	7.75	0.43	0.80	1.33	3.68	7.51	0.05	0.09	0.24	0.51	1.30
1984	37.3	6.14	5.44	4.92	4.73	4.38	0.80	1.26	2.15	2.58	3.11	0.66	1.13	1.66	2.24	3.08	0.08	0.16	0.27	0.38	0.69
1985	55.6	5.34	5.07	4.86	4.60	4.35	0.63	1.15	1.68	2.59	5.55	0.41	0.68	1.49	1.99	3.09	0.02	0.10	0.25	0.36	1.02
1986	56.9	5.33	5.13	4.94	4.63	4.10	0.54	1.02	1.56	2.19	8.80	0.47	0.66	1.27	2.26	9.84	0.05	0.08	0.20	0.41	1.76
1987	38.2	5.32	5.02	4.74	4.64	4.29	0.69	1.04	1.42	3.28	5.34	0.75	1.05	1.96	3.63	5.47	0.06	0.16	0.23	0.45	1.22
1988	52.6	5.15	4.87	4.70	4.59	4.46	0.66	1.09	1.25	1.65	1.94	0.47	1.02	1.44	2.03	3.07	0.02	0.02	0.07	0.15	0.23

B. VOLUME WEIGHTED AVERAGES AND DEPOSITION BY YEAR AND SEASON

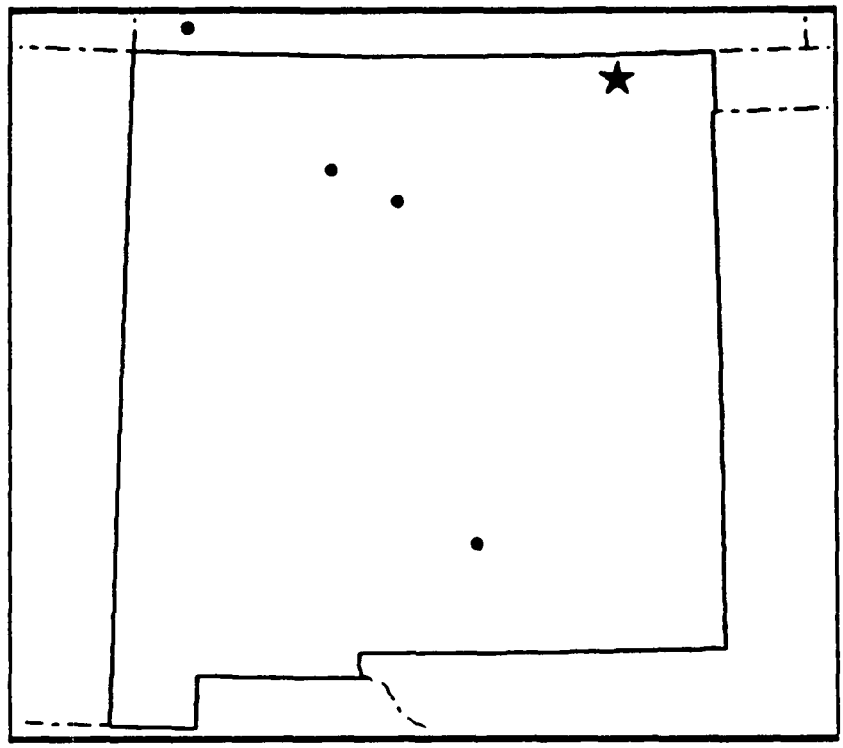
Year	Annual pH $\bar{x}$[2]	Annual pH dep[3]	Annual Sulphate $\bar{x}$	Annual Sulphate dep	Annual Nitrate $\bar{x}$	Annual Nitrate dep	Annual Ammonium $\bar{x}$	Annual Ammonium dep	Winter (Dec-Feb) pH $\bar{x}$	Winter pH dep	Winter Sulphate $\bar{x}$	Winter Sulphate dep	Winter Nitrate $\bar{x}$	Winter Nitrate dep	Winter Ammonium $\bar{x}$	Winter Ammonium dep	Summer (Jun-Aug) pH $\bar{x}$	Summer pH dep	Summer Sulphate $\bar{x}$	Summer Sulphate dep	Summer Nitrate $\bar{x}$	Summer Nitrate dep	Summer Ammonium $\bar{x}$	Summer Ammonium dep
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	5.06	0.03	1.01	3.73	0.86	3.17	0.16	0.57	5.11	0.01	0.89	0.94	0.51	0.54	0.15	0.16	4.96	0.02	1.19	1.94	1.10	1.80	0.23	0.37
1984	5.03	0.04	1.03	3.84	0.90	3.36	0.17	0.63	-	-	-	-	-	-	-	-	4.75	0.02	1.44	1.94	1.35	1.82	0.26	0.36
1985	5.04	0.05	0.90	5.00	0.71	3.94	0.12	0.66	-	-	-	-	-	-	-	-	4.97	0.02	1.15	1.63	1.14	1.61	0.19	0.27
1986	5.01	0.06	0.90	5.13	0.71	4.02	0.11	0.65	-	-	-	-	-	-	-	-	5.02	0.02	0.85	1.79	0.82	1.72	0.12	0.24
1987	4.91	0.05	1.00	3.82	1.07	4.10	0.16	0.59	4.84	0.02	1.00	1.06	0.85	0.90	0.14	0.14	4.84	0.02	1.01	1.28	1.25	1.58	0.14	0.18
1988	4.89	0.07	0.89	4.70	0.78	4.08	0.05	0.24	-	-	-	-	-	-	-	-	4.85	0.03	0.90	1.94	0.85	1.83	0.03	0.07

1. Estimated annual precipitation amount in cm.
2. Volume weighted averages (in pH units for pH and in mg/L for sulphate, nitrate, and ammonium).
3. Estimated deposition in kg/ha.

CAPULIN MOUNTAIN NATIONAL MONUMENT

NEW MEXICO

BIOGRAPHIC INFORMATION



Latitude	-	36.78 ° N
Longitude	-	103.98 ° W
Elevation (m)	-	2205
Landuse	-	Rural
Start Summary	-	November 1984
End Summary	-	December 1988
Source of Data	-	NADP/NTN (NM12)

Capulin Mountain National Monument

BASIC STATISTICS

A. PERCENTILES IN WEEKLY CONCENTRATIONS BY YEAR

Year	ppt vol[1]	pH 25	pH 50	pH 75	pH 90	pH max	Sulphate (mg/L) 25	Sulphate 50	Sulphate 75	Sulphate 90	Sulphate max	Nitrate (mg/L) 25	Nitrate 50	Nitrate 75	Nitrate 90	Nitrate max	Ammonium (mg/L) 25	Ammonium 50	Ammonium 75	Ammonium 90	Ammonium max
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	5.80	5.80	5.80	5.80	5.80	0.61	0.61	0.61	0.61	0.61	0.26	0.26	0.26	0.26	0.26	0.03	0.03	0.03	0.03	0.03
1985	46.9	6.07	5.27	4.92	4.34	4.28	0.75	1.18	1.68	2.86	5.47	0.52	0.90	1.83	2.10	4.31	0.09	0.15	0.30	0.58	0.92
1986	-	6.23	5.81	5.42	5.04	5.02	0.39	0.64	2.05	3.64	4.16	0.42	0.76	2.50	4.34	4.89	0.02	0.11	0.23	1.21	1.60
1987	47.1	6.44	5.65	5.05	4.89	4.69	0.42	0.79	1.69	2.74	3.03	0.50	1.29	1.95	2.47	3.03	0.12	0.34	0.49	1.20	2.02
1988	46.9	5.88	5.33	4.85	4.67	4.63	0.63	0.87	1.36	1.99	2.18	0.29	0.68	1.42	2.14	2.45	0.02	0.07	0.19	0.31	0.44

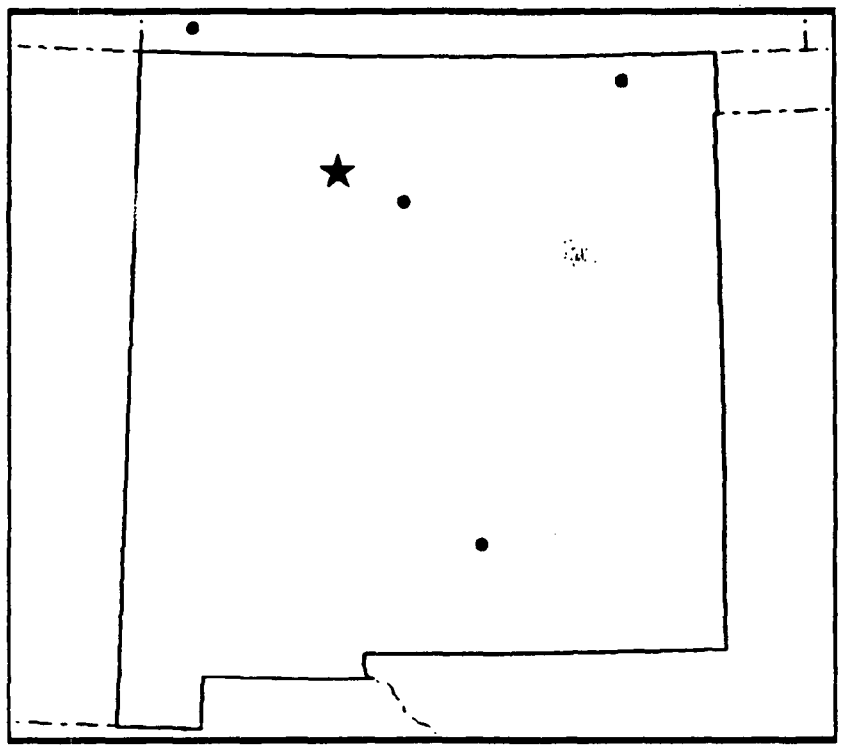
B. VOLUME WEIGHTED AVERAGES AND DEPOSITION BY YEAR AND SEASON

Year	Annual pH x̄[2]	Annual pH dep[3]	Annual Sulphate x̄	Annual Sulphate dep	Annual Nitrate x̄	Annual Nitrate dep	Annual Ammonium x̄	Annual Ammonium dep	Winter (Dec-Feb) pH x̄	Winter pH dep	Winter Sulphate x̄	Winter Sulphate dep	Winter Nitrate x̄	Winter Nitrate dep	Winter Ammonium x̄	Winter Ammonium dep	Summer (Jun-Aug) pH x̄	Summer pH dep	Summer Sulphate x̄	Summer Sulphate dep	Summer Nitrate x̄	Summer Nitrate dep	Summer Ammonium x̄	Summer Ammonium dep
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	5.02	0.05	0.96	4.49	0.84	3.96	0.16	0.76	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	5.07	0.04	0.95	4.46	0.68	3.19	0.08	0.39	-	-	-	-	-	-	-	-	4.99	0.02	0.99	2.08	0.65	1.36	0.05	0.11

1. Estimated annual precipitation amount in cm.
2. Volume weighted averages (in pH units for pH and in mg/L for sulphate, nitrate, and ammonium).
3. Estimated deposition in kg/ha.

CUBA **NEW MEXICO**

BIOGRAPHIC INFORMATION



Latitude	-	36.04 ° N
Longitude	-	106.97 ° W
Elevation (m)	-	2124
Landuse	-	Rural
Start Summary	-	February 1982
End Summary	-	December 1988
Source of Data	-	NADP/NTN (NM09)

Cuba

BASIC STATISTICS

A. PERCENTILES IN WEEKLY CONCENTRATIONS BY YEAR

Year	ppt vol[1]	pH 25	pH 50	pH 75	pH 90	pH max	Sulphate (mg/L) 25	Sulphate 50	Sulphate 75	Sulphate 90	Sulphate max	Nitrate (mg/L) 25	Nitrate 50	Nitrate 75	Nitrate 90	Nitrate max	Ammonium (mg/L) 25	Ammonium 50	Ammonium 75	Ammonium 90	Ammonium max
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	6.14	5.54	5.08	4.75	4.45	0.95	1.45	2.21	4.13	7.37	0.55	1.18	1.66	3.31	4.45	0.09	0.21	0.29	0.43	0.52
1983	34.7	5.78	5.25	4.78	4.65	4.54	0.55	0.97	1.93	3.48	4.54	0.47	0.94	1.56	2.27	4.01	0.07	0.12	0.22	0.53	0.78
1984	29.4	6.29	5.49	4.88	4.43	3.92	0.97	1.27	2.14	4.46	9.94	0.59	1.09	1.66	3.43	9.94	0.07	0.17	0.32	0.49	0.73
1985	37.3	5.53	4.99	4.72	4.50	4.27	0.65	0.94	1.73	4.22	9.02	0.42	0.77	1.49	3.15	11.28	0.02	0.04	0.18	0.53	2.60
1986	44.9	5.43	4.94	4.80	4.45	4.21	0.67	0.97	1.71	2.59	5.74	0.50	0.80	1.23	2.58	4.09	0.02	0.08	0.30	0.43	0.62
1987	24.9	5.43	5.10	4.78	4.49	4.31	0.53	0.99	1.40	2.76	5.03	0.40	1.02	1.60	2.72	5.68	0.07	0.12	0.24	0.34	0.85
1988	37.8	5.30	4.91	4.68	4.53	4.19	0.59	0.96	1.33	2.13	3.73	0.42	0.78	1.67	2.07	3.91	0.02	0.02	0.09	0.16	0.50

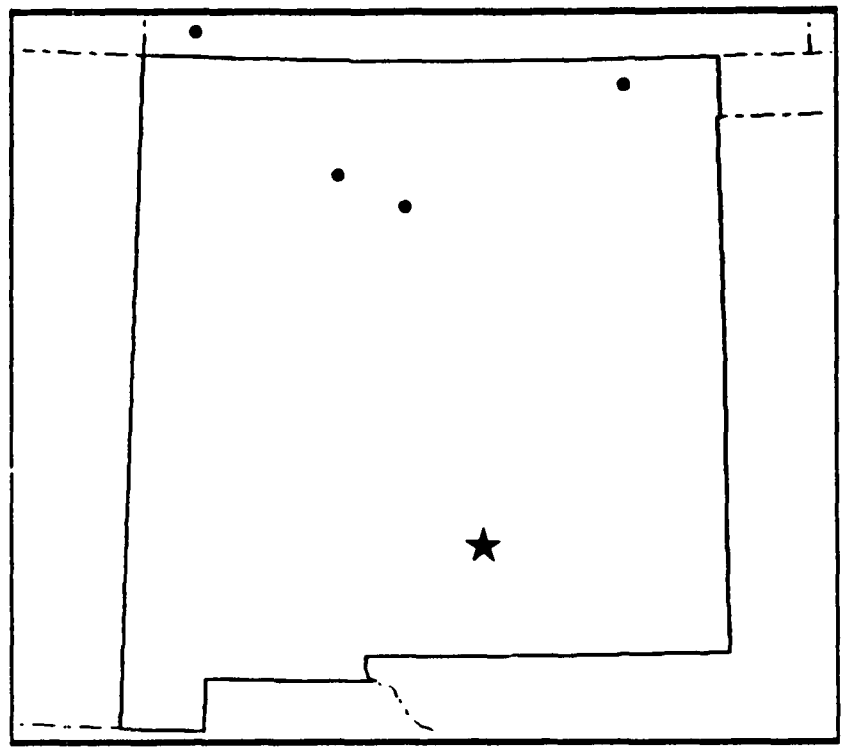
B. VOLUME WEIGHTED AVERAGES AND DEPOSITION BY YEAR AND SEASON

Year	Annual pH x̄[2]	Annual pH dep[3]	Annual Sulphate x̄	Annual Sulphate dep	Annual Nitrate x̄	Annual Nitrate dep	Annual Ammonium x̄	Annual Ammonium dep	Winter (Dec-Feb) pH x̄	Winter pH dep	Winter Sulphate x̄	Winter Sulphate dep	Winter Nitrate x̄	Winter Nitrate dep	Winter Ammonium x̄	Winter Ammonium dep	Summer (Jun-Aug) pH x̄	Summer pH dep	Summer Sulphate x̄	Summer Sulphate dep	Summer Nitrate x̄	Summer Nitrate dep	Summer Ammonium x̄	Summer Ammonium dep
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.69	0.02	1.71	1.47	1.45	1.25	0.21	0.18
1983	4.99	0.04	1.08	3.74	0.89	3.08	0.17	0.58	-	-	-	-	-	-	-	-	4.78	0.02	1.42	1.32	1.42	1.33	0.29	0.27
1984	4.88	0.04	1.38	4.04	1.04	3.04	0.18	0.54	-	-	-	-	-	-	-	-	4.64	0.02	1.97	1.98	1.59	1.60	0.28	0.28
1985	4.97	0.04	0.88	3.26	0.68	2.55	0.07	0.26	5.09	0.01	0.75	0.57	0.52	0.40	0.06	0.05	4.79	0.01	1.24	0.95	1.40	1.07	0.17	0.13
1986	4.91	0.05	0.93	4.15	0.79	3.54	0.11	0.51	-	-	-	-	-	-	-	-	4.76	0.03	1.09	1.59	1.28	1.88	0.17	0.24
1987	4.92	0.03	0.94	2.34	0.87	2.17	0.14	0.36	-	-	-	-	-	-	-	-	4.77	0.01	1.24	0.80	1.39	0.90	0.21	0.13
1988	4.79	0.06	0.95	3.61	0.93	3.53	0.07	0.26	4.95	0.01	0.60	0.34	0.46	0.26	0.02	0.01	4.74	0.04	0.95	1.89	1.15	2.28	0.09	0.17

1. Estimated annual precipitation amount in cm.
2. Volume weighted averages (in pH units for pH and in mg/L for sulphate, nitrate, and ammonium).
3. Estimated deposition in kg/ha.

MAYHILL NEW MEXICO

BIOGRAPHIC INFORMATION



Latitude	-	32.91 ° N
Longitude	-	105.47 ° W
Elevation (m)	-	2009
Landuse	-	Rural
Start Summary	-	January 1984
End Summary	-	December 1988
Source of Data	-	NADP/NTN (NM08)

Mayhill

BASIC STATISTICS

A. PERCENTILES IN WEEKLY CONCENTRATIONS BY YEAR

Year	ppt vol[1]	pH 25	pH 50	pH 75	pH 90	pH max	Sulphate (mg/L) 25	Sulphate 50	Sulphate 75	Sulphate 90	Sulphate max	Nitrate (mg/L) 25	Nitrate 50	Nitrate 75	Nitrate 90	Nitrate max	Ammonium (mg/L) 25	Ammonium 50	Ammonium 75	Ammonium 90	Ammonium max
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	83.9	6.09	5.51	5.04	4.76	4.69	0.60	1.02	2.16	12.70	363.8	0.49	0.80	1.04	2.27	2.45	0.09	0.12	0.22	0.51	0.61
1985	53.8	5.62	5.38	4.95	4.79	4.65	0.64	1.12	1.43	5.25	12.87	0.29	0.66	1.18	1.31	2.66	0.02	0.06	0.17	0.34	0.55
1986	81.2	5.73	5.22	5.01	4.64	4.35	0.56	1.08	1.95	4.62	5.78	0.38	0.61	1.07	1.63	3.99	0.02	0.08	0.18	0.34	0.58
1987	51.8	6.15	5.43	5.09	4.95	4.87	0.73	1.05	2.41	4.06	4.11	0.53	0.83	1.27	2.49	4.06	0.10	0.13	0.21	0.50	0.58
1988	52.1	5.82	5.29	4.99	4.75	4.38	0.60	0.98	2.00	3.59	5.01	0.22	0.71	1.13	1.63	2.98	0.02	0.02	0.20	0.56	1.26

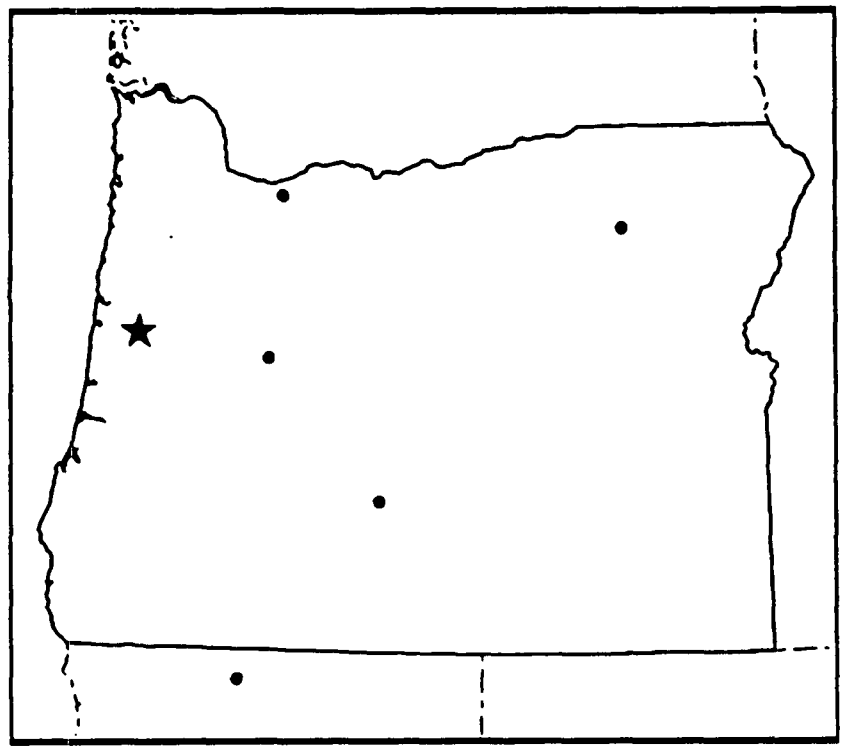
B. VOLUME WEIGHTED AVERAGES AND DEPOSITION BY YEAR AND SEASON

Year	Annual pH x̄[2]	Annual pH dep[3]	Annual Sulphate x̄	Annual Sulphate dep	Annual Nitrate x̄	Annual Nitrate dep	Annual Ammonium x̄	Annual Ammonium dep	Winter (Dec-Feb) pH x̄	Winter pH dep	Winter Sulphate x̄	Winter Sulphate dep	Winter Nitrate x̄	Winter Nitrate dep	Winter Ammonium x̄	Winter Ammonium dep	Summer (Jun-Aug) pH x̄	Summer pH dep	Summer Sulphate x̄	Summer Sulphate dep	Summer Nitrate x̄	Summer Nitrate dep	Summer Ammonium x̄	Summer Ammonium dep
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.05	0.05	0.96	5.59	0.60	3.46	0.14	0.82
1985	5.07	0.05	1.13	6.05	0.55	2.95	0.09	0.49	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	5.18	0.05	0.98	7.94	0.57	4.66	0.12	0.95	-	-	-	-	-	-	-	-	5.24	0.03	0.74	3.57	0.56	2.68	0.09	0.43
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.10	0.02	0.80	2.15	0.66	1.76	0.09	0.24
1988	4.92	0.06	1.04	5.42	0.74	3.85	0.08	0.40	-	-	-	-	-	-	-	-	4.88	0.05	1.06	3.73	0.78	2.74	0.05	0.18

1. Estimated annual precipitation amount in cm.
2. Volume weighted averages (in pH units for pH and in mg/L for sulphate, nitrate, and ammonium).
3. Estimated deposition in kg/ha.

ALSEA GUARD RANGER STATION **OREGON**

BIOGRAPHIC INFORMATION



Latitude	-	44.39 ° N
Longitude	-	123.62 ° W
Elevation (m)	-	84
Landuse	-	Rural
Start Summary	-	January 1980
End Summary	-	December 1988
Source of Data	-	NADP/NTN (OR02)

Alsea Guard Ranger Station

BASIC STATISTICS

A. PERCENTILES IN WEEKLY CONCENTRATIONS BY YEAR

	ppt	pH					Sulphate (mg/L)					Nitrate (mg/L)					Ammonium (mg/L)				
Year	vol[1]	25	50	75	90	max	25	50	75	90	max	25	50	75	90	max	25	50	75	90	max
1980	139.7	6.07	5.64	5.43	5.32	4.51	0.39	0.66	0.99	1.47	2.45	0.08	0.13	0.18	0.29	0.65	0.02	0.02	0.02	0.02	0.08
1981	179.7	5.77	5.55	5.37	5.19	5.04	0.37	0.62	1.11	3.91	17.25	0.05	0.14	0.28	0.83	2.28	0.02	0.02	0.05	0.14	0.64
1982	183.8	5.58	5.42	5.30	5.16	4.78	0.31	0.72	1.02	2.80	6.91	0.08	0.16	0.43	0.98	1.12	0.02	0.02	0.07	0.19	0.29
1983	204.1	5.67	5.50	5.32	5.11	4.83	0.41	0.52	0.79	0.97	1.21	0.09	0.16	0.35	0.59	1.19	0.02	0.02	0.07	0.11	0.21
1984	191.5	5.64	5.55	5.45	5.28	4.92	0.39	0.51	0.70	0.87	1.22	0.06	0.10	0.19	0.34	0.86	0.02	0.02	0.06	0.07	0.14
1985	104.9	5.51	5.33	5.14	5.02	4.54	0.33	0.50	0.83	1.23	1.39	0.03	0.10	0.18	0.41	1.17	0.02	0.02	0.02	0.03	0.28
1986	166.9	5.54	5.38	5.30	5.23	4.96	0.31	0.46	0.67	0.95	1.52	0.03	0.09	0.17	0.36	2.28	0.02	0.02	0.02	0.11	0.32
1987	142.4	5.68	5.50	5.36	5.22	5.17	0.27	0.44	0.60	0.96	3.75	0.08	0.13	0.35	0.97	5.31	0.02	0.02	0.03	0.29	0.78
1988	156.4	5.75	5.45	5.32	5.17	4.93	0.23	0.40	0.55	0.81	0.98	0.03	0.07	0.12	0.23	0.58	0.02	0.02	0.02	0.04	0.31

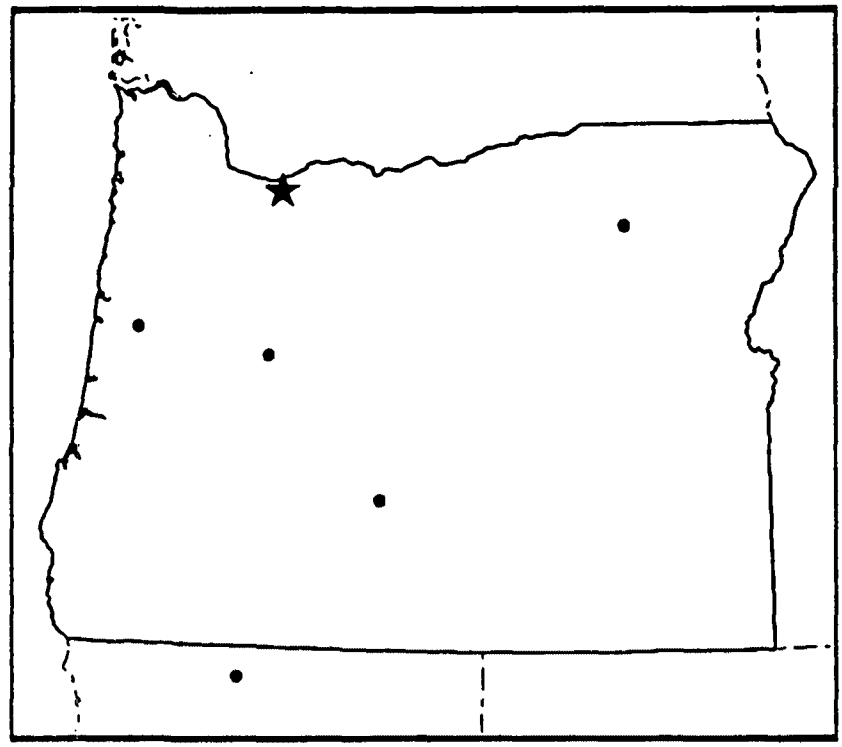
B. VOLUME WEIGHTED AVERAGES AND DEPOSITION BY YEAR AND SEASON

	Annual								Winter (Dec-Feb)								Summer (Jun-Aug)							
	pH		Sulphate		Nitrate		Ammonium		pH		Sulphate		Nitrate		Ammonium		pH		Sulphate		Nitrate		Ammonium	
Year	x̄[2]	dep[3]	x̄	dep	x̄	dep	x̄	dep	x̄	dep	x̄	dep	x̄	dep	x̄	dep	x̄	dep	x̄	dep	x̄	dep	x̄	dep
1980	5.47	0.05	0.57	7.91	0.12	1.62	0.01	0.15	-	-	-	-	-	-	-	-	4.91	0.01	1.26	0.76	0.08	0.05	0.02	0.01
1981	5.48	0.06	0.53	9.56	0.12	2.17	0.02	0.29	5.47	0.02	0.34	2.03	0.14	0.85	0.01	0.07	5.42	0.00	1.32	1.51	0.19	0.22	0.02	0.02
1982	-	-	-	-	-	-	-	-	5.38	0.05	0.39	4.65	0.10	1.19	0.01	0.13	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.31	0.01	0.33	0.52	0.13	0.20	0.02	0.03
1984	5.47	0.06	0.54	10.4	0.10	1.88	0.03	0.52	5.48	0.02	0.46	3.20	0.07	0.52	0.02	0.11	5.74	0.00	0.47	0.51	0.14	0.15	0.05	0.06
1985	5.34	0.05	0.43	4.53	0.07	0.69	0.01	0.12	5.25	0.02	0.58	1.98	0.17	0.63	0.02	0.08	5.29	0.01	0.27	0.36	0.05	0.07	0.01	0.02
1986	5.38	0.07	0.35	5.86	0.07	1.24	0.01	0.18	5.34	0.03	0.24	1.70	0.06	0.39	0.01	0.07	5.39	0.00	0.29	0.09	0.09	0.03	0.01	0.00
1987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.40	0.00	0.27	0.20	0.15	0.11	0.01	0.01
1988	5.32	0.08	0.41	6.49	0.07	1.14	0.02	0.25	5.45	0.03	0.31	2.33	0.06	0.47	0.01	0.08	5.23	0.00	0.41	0.27	0.02	0.01	0.01	0.01

1. Estimated annual precipitation amount in cm.
2. Volume weighted averages (in pH units for pH and in mg/L for sulphate, nitrate, and ammonium).
3. Estimated deposition in kg/ha.

BULL RUN **OREGON**

BIOGRAPHIC INFORMATION



Latitude	-	45.45 ° N
Longitude	-	122.15 ° W
Elevation (m)	-	267
Landuse	-	Rural
Start Summary	-	July 1982
End Summary	-	December 1988
Source of Data	-	NADP/NTN (OR98)

Bull Run

BASIC STATISTICS

A. PERCENTILES IN WEEKLY CONCENTRATIONS BY YEAR

Year	ppt vol[1]	pH 25	pH 50	pH 75	pH 90	pH max	Sulphate (mg/L) 25	Sulphate (mg/L) 50	Sulphate (mg/L) 75	Sulphate (mg/L) 90	Sulphate (mg/L) max	Nitrate (mg/L) 25	Nitrate (mg/L) 50	Nitrate (mg/L) 75	Nitrate (mg/L) 90	Nitrate (mg/L) max	Ammonium (mg/L) 25	Ammonium (mg/L) 50	Ammonium (mg/L) 75	Ammonium (mg/L) 90	Ammonium (mg/L) max
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	5.21	5.11	4.82	4.42	4.22	0.44	0.97	1.31	3.94	5.98	0.29	0.54	1.27	5.92	6.24	0.06	0.17	0.22	0.70	1.04
1983	197.6	5.36	5.25	5.00	4.75	4.44	0.30	0.49	0.85	1.73	2.42	0.19	0.34	0.83	1.11	2.83	0.02	0.06	0.15	0.30	0.33
1984	200.0	5.64	5.33	5.21	5.08	4.90	0.37	0.52	0.64	1.05	3.77	0.21	0.34	0.53	0.88	2.98	0.04	0.08	0.14	0.26	0.47
1985	136.2	5.29	5.17	4.86	4.62	4.29	0.33	0.51	1.03	2.09	3.72	0.17	0.41	1.11	2.10	6.71	0.02	0.02	0.19	0.44	0.68
1986	156.5	5.38	5.25	4.89	4.59	4.26	0.33	0.55	1.05	2.11	5.04	0.15	0.34	0.92	2.07	5.06	0.02	0.07	0.16	0.34	1.65
1987	137.3	5.44	5.31	5.04	4.67	4.06	0.26	0.40	0.85	1.39	4.21	0.20	0.51	0.89	1.83	4.45	0.02	0.07	0.23	0.37	0.53
1988	185.7	5.41	5.22	5.06	4.82	4.29	0.31	0.46	0.70	0.98	2.72	0.17	0.33	0.76	0.98	3.97	0.02	0.02	0.11	0.17	0.80

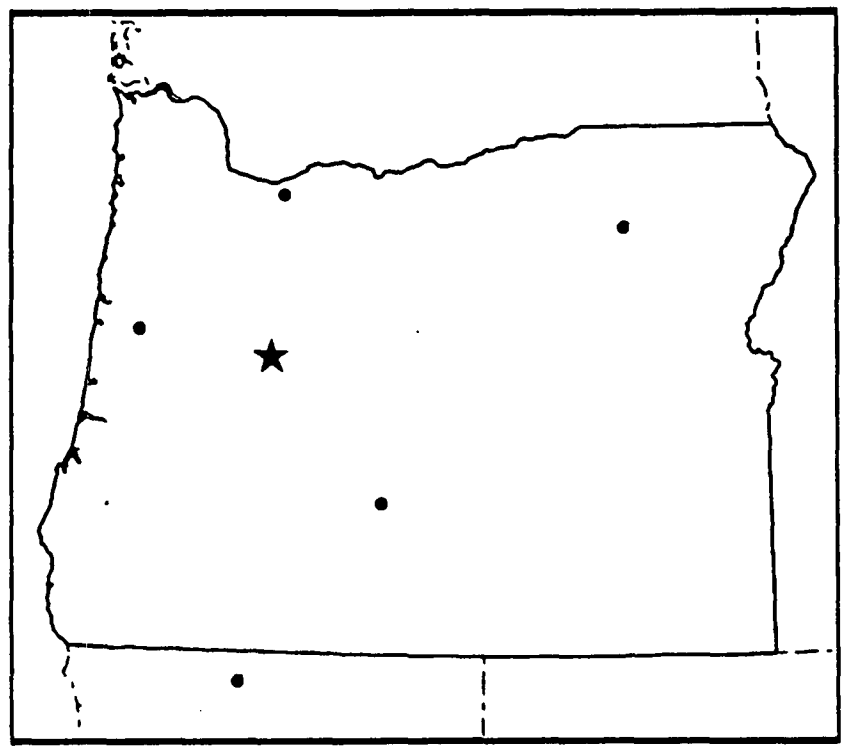
B. VOLUME WEIGHTED AVERAGES AND DEPOSITION BY YEAR AND SEASON

Year	Annual pH $\bar{x}$[2]	Annual pH dep[3]	Annual Sulphate $\bar{x}$	Annual Sulphate dep	Annual Nitrate $\bar{x}$	Annual Nitrate dep	Annual Ammonium $\bar{x}$	Annual Ammonium dep	Winter (Dec-Feb) pH $\bar{x}$	Winter pH dep	Winter Sulphate $\bar{x}$	Winter Sulphate dep	Winter Nitrate $\bar{x}$	Winter Nitrate dep	Winter Ammonium $\bar{x}$	Winter Ammonium dep	Summer (Jun-Aug) pH $\bar{x}$	Summer pH dep	Summer Sulphate $\bar{x}$	Summer Sulphate dep	Summer Nitrate $\bar{x}$	Summer Nitrate dep	Summer Ammonium $\bar{x}$	Summer Ammonium dep
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.01	0.04	0.64	2.32	0.43	1.56	0.08	0.28
1984	5.30	0.10	0.46	9.18	0.28	5.66	0.07	1.30	-	-	-	-	-	-	-	-	5.21	0.01	0.43	1.00	0.30	0.71	0.09	0.22
1985	5.16	0.10	0.43	5.79	0.27	3.66	0.04	0.53	5.26	0.02	0.44	1.77	0.38	1.52	0.05	0.18	5.07	0.02	0.40	0.71	0.21	0.38	0.03	0.06
1986	-	-	-	-	-	-	-	-	5.33	0.02	0.21	1.09	0.12	0.63	0.01	0.07	4.90	0.02	0.93	1.16	0.76	0.94	0.15	0.18
1987	5.26	0.07	0.36	4.92	0.32	4.45	0.06	0.84	-	-	-	-	-	-	-	-	4.86	0.01	0.82	0.61	0.90	0.67	0.21	0.15
1988	5.20	0.12	0.40	7.37	0.27	5.05	0.04	0.76	5.36	0.03	0.25	1.76	0.20	1.41	0.02	0.15	5.16	0.01	0.46	0.65	0.28	0.40	0.01	0.01

1. Estimated annual precipitation amount in cm.
2. Volume weighted averages (in pH units for pH and in mg/L for sulphate, nitrate, and ammonium).
3. Estimated deposition in kg/ha.

H.J. ANDREWS EXPERIMENTAL FOREST **OREGON**

BIOGRAPHIC INFORMATION



Latitude	-	44.21 ° N
Longitude	-	122.25 ° W
Elevation (m)	-	436
Landuse	-	Rural
Start Summary	-	May 1980
End Summary	-	December 1988
Source of Data	-	NADP/NTN (OR10)

H.J. Andrews Experimental Forest

BASIC STATISTICS

A. PERCENTILES IN WEEKLY CONCENTRATIONS BY YEAR

Year	ppt vol[1]	pH 25	pH 50	pH 75	pH 90	pH max	Sulphate (mg/L) 25	Sulphate 50	Sulphate 75	Sulphate 90	Sulphate max	Nitrate (mg/L) 25	Nitrate 50	Nitrate 75	Nitrate 90	Nitrate max	Ammonium (mg/L) 25	Ammonium 50	Ammonium 75	Ammonium 90	Ammonium max
1980	-	5.83	5.55	5.41	5.09	4.81	0.12	0.50	1.56	2.98	5.00	0.06	0.15	0.42	1.63	4.03	0.02	0.02	0.03	0.66	0.98
1981	245.2	5.68	5.45	5.35	5.13	5.02	0.24	0.37	0.54	0.77	4.29	0.11	0.19	0.29	0.56	1.70	0.02	0.02	0.02	0.06	0.36
1982	245.6	5.60	5.41	5.22	5.09	4.68	0.24	0.38	0.71	1.40	5.04	0.09	0.23	0.51	1.38	2.90	0.02	0.02	0.06	0.25	0.65
1983	247.8	5.56	5.37	5.18	4.99	4.64	0.23	0.42	0.65	1.23	2.53	0.09	0.17	0.44	1.19	4.45	0.02	0.02	0.07	0.25	1.92
1984	274.3	5.64	5.45	5.36	5.11	4.88	0.25	0.40	0.50	0.79	7.00	0.09	0.15	0.24	0.61	7.48	0.02	0.03	0.06	0.10	2.57
1985	148.1	5.48	5.37	5.09	4.93	4.77	0.22	0.38	0.55	0.98	2.19	0.09	0.19	0.41	0.98	1.45	0.02	0.02	0.03	0.11	0.23
1986	230.9	5.52	5.40	5.27	5.20	5.06	0.19	0.27	0.39	0.68	1.80	0.10	0.13	0.22	0.41	1.21	0.02	0.02	0.03	0.12	0.28
1987	148.5	5.57	5.39	5.30	5.08	4.45	0.14	0.22	0.53	1.22	4.01	0.11	0.16	0.37	1.38	5.67	0.02	0.02	0.04	0.27	0.53
1988	225.7	5.52	5.41	5.30	5.25	5.08	0.14	0.21	0.34	0.42	1.34	0.03	0.08	0.18	0.29	2.13	0.02	0.02	0.02	0.02	0.36

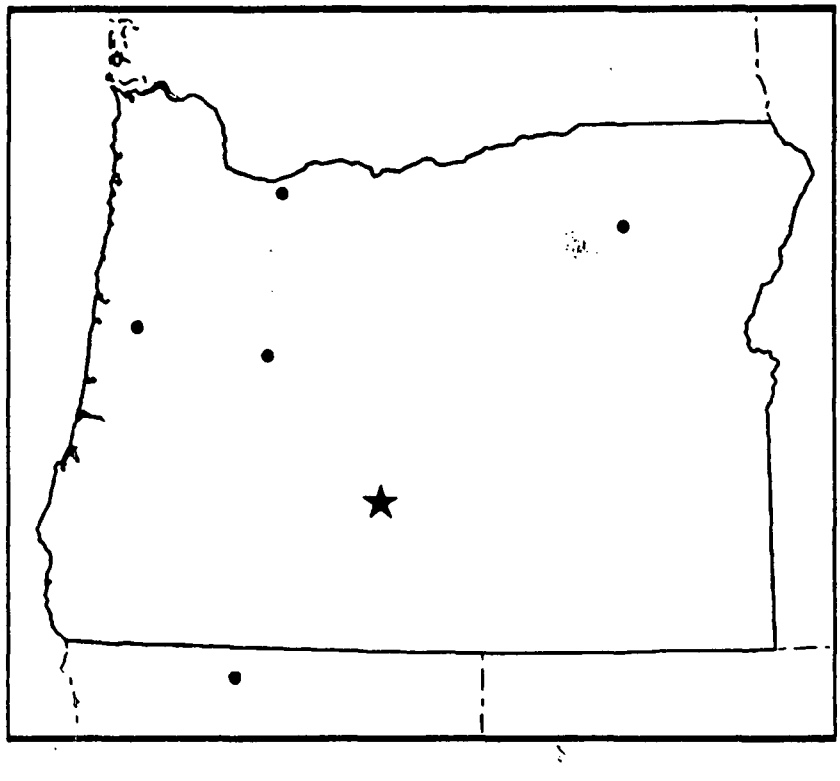
B. VOLUME WEIGHTED AVERAGES AND DEPOSITION BY YEAR AND SEASON

Year	Annual pH x̄[2]	Annual pH dep[3]	Annual Sulphate x̄	Annual Sulphate dep	Annual Nitrate x̄	Annual Nitrate dep	Annual Ammonium x̄	Annual Ammonium dep	Winter (Dec-Feb) pH x̄	Winter pH dep	Winter Sulphate x̄	Winter Sulphate dep	Winter Nitrate x̄	Winter Nitrate dep	Winter Ammonium x̄	Winter Ammonium dep	Summer (Jun-Aug) pH x̄	Summer pH dep	Summer Sulphate x̄	Summer Sulphate dep	Summer Nitrate x̄	Summer Nitrate dep	Summer Ammonium x̄	Summer Ammonium dep
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.38	0.00	0.60	0.59	0.22	0.21	0.08	0.08
1981	5.43	0.09	0.31	7.72	0.13	3.06	0.01	0.27	5.45	0.03	0.16	1.31	0.10	0.87	0.01	0.08	5.55	0.01	0.57	1.11	0.26	0.50	0.01	0.02
1982	5.39	0.10	0.29	7.17	0.14	3.49	0.02	0.44	5.38	0.06	0.30	4.62	0.09	1.29	0.01	0.17	5.15	0.01	0.36	0.50	0.49	0.68	0.05	0.06
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.25	0.01	0.32	0.65	0.17	0.33	0.07	0.15
1984	5.43	0.10	0.31	8.39	0.13	3.51	0.03	0.82	-	-	-	-	-	-	-	-	5.46	0.01	0.32	0.62	0.22	0.41	0.05	0.10
1985	5.31	0.07	0.24	3.51	0.12	1.84	0.01	0.19	-	-	-	-	-	-	-	-	5.17	0.01	0.28	0.31	0.24	0.26	0.03	0.03
1986	5.38	0.10	0.18	4.25	0.08	1.94	0.02	0.44	5.44	0.04	0.10	1.01	0.02	0.21	0.01	0.10	5.38	0.00	0.33	0.15	0.18	0.08	0.01	0.01
1987	5.35	0.07	0.21	3.06	0.15	2.23	0.02	0.31	5.38	0.03	0.16	1.03	0.07	0.44	0.01	0.07	4.98	0.01	0.44	0.34	0.49	0.38	0.05	0.04
1988	5.36	0.10	0.19	4.22	0.08	1.81	0.02	0.34	5.41	0.03	0.15	1.28	0.09	0.73	0.01	0.09	5.33	0.01	0.18	0.21	0.02	0.02	0.01	0.01

1. Estimated annual precipitation amount in cm.
2. Volume weighted averages (in pH units for pH and in mg/L for sulphate, nitrate, and ammonium).
3. Estimated deposition in kg/ha.

SILVER LAKE RANGER STATION **OREGON**

BIOGRAPHIC INFORMATION



Latitude	-	43.12 ° N
Longitude	-	121.06 ° W
Elevation (m)	-	1336
Landuse	-	Rural
Start Summary	-	August 1983
End Summary	-	December 1988
Source of Data	-	NADP/NTN (OR09)

Silver Lake

BASIC STATISTICS

A. PERCENTILES IN WEEKLY CONCENTRATIONS BY YEAR

Year	ppt vol[1]	pH 25	pH 50	pH 75	pH 90	pH max	Sulphate (mg/L) 25	Sulphate (mg/L) 50	Sulphate (mg/L) 75	Sulphate (mg/L) 90	Sulphate (mg/L) max	Nitrate (mg/L) 25	Nitrate (mg/L) 50	Nitrate (mg/L) 75	Nitrate (mg/L) 90	Nitrate (mg/L) max	Ammonium (mg/L) 25	Ammonium (mg/L) 50	Ammonium (mg/L) 75	Ammonium (mg/L) 90	Ammonium (mg/L) max
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	6.18	5.75	5.42	5.08	5.08	0.34	0.47	1.00	1.21	1.22	0.11	0.19	0.75	1.37	1.40	0.02	0.03	0.14	0.30	0.31
1984	26.4	6.21	5.90	5.52	5.21	4.98	0.32	0.40	1.70	3.70	4.31	0.16	0.31	0.80	2.24	6.58	0.02	0.08	0.15	0.38	1.01
1985	18.8	5.99	5.75	5.25	5.03	4.98	0.17	0.31	0.54	1.51	1.94	0.12	0.30	0.57	1.31	2.33	0.02	0.03	0.12	0.29	0.72
1986	26.2	5.96	5.64	5.35	5.14	4.98	0.15	0.25	0.49	0.75	0.98	0.15	0.31	0.67	1.24	4.65	0.02	0.03	0.12	0.32	0.54
1987	26.1	5.75	5.43	5.18	4.95	4.48	0.10	0.21	0.38	1.30	2.76	0.16	0.34	0.61	1.45	3.50	0.02	0.06	0.09	0.21	0.25
1988	21.9	5.96	5.50	5.29	4.75	3.99	0.13	0.24	0.38	0.77	1.16	0.07	0.16	0.36	0.87	1.18	0.02	0.02	0.04	0.20	0.52

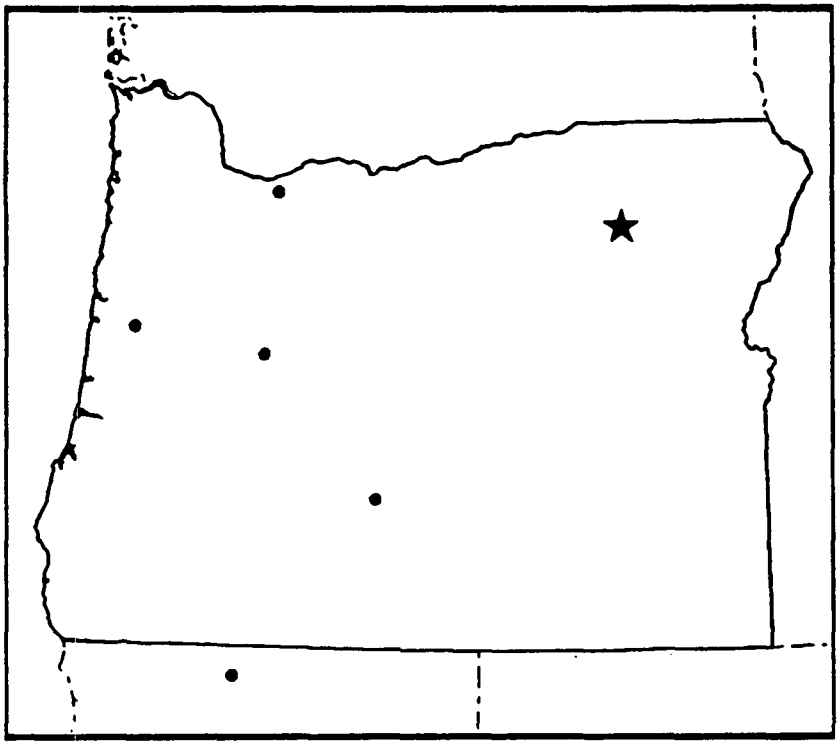
B. VOLUME WEIGHTED AVERAGES AND DEPOSITION BY YEAR AND SEASON

Year	Annual pH x̄[2]	Annual pH dep[3]	Annual Sulphate x̄	Annual Sulphate dep	Annual Nitrate x̄	Annual Nitrate dep	Annual Ammonium x̄	Annual Ammonium dep	Winter (Dec-Feb) pH x̄	Winter pH dep	Winter Sulphate x̄	Winter Sulphate dep	Winter Nitrate x̄	Winter Nitrate dep	Winter Ammonium x̄	Winter Ammonium dep	Summer (Jun-Aug) pH x̄	Summer pH dep	Summer Sulphate x̄	Summer Sulphate dep	Summer Nitrate x̄	Summer Nitrate dep	Summer Ammonium x̄	Summer Ammonium dep
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	5.31	0.01	0.31	0.58	0.37	0.69	0.07	0.14	5.57	0.00	0.38	0.09	0.25	0.06	0.06	0.01	5.10	0.00	0.53	0.26	0.81	0.38	0.17	0.08
1986	5.44	0.01	0.22	0.58	0.29	0.77	0.04	0.10	5.51	0.00	0.06	0.07	0.05	0.05	0.02	0.02	-	-	-	-	-	-	-	-
1987	5.29	0.01	0.27	0.70	0.41	1.06	0.06	0.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	5.30	0.01	0.27	0.60	0.22	0.48	0.03	0.06	5.43	0.00	0.13	0.10	0.15	0.11	0.02	0.01	5.02	0.00	0.48	0.19	0.14	0.06	0.01	0.01

1. Estimated annual precipitation amount in cm.
2. Volume weighted averages (in pH units for pH and in mg/L for sulphate, nitrate, and ammonium).
3. Estimated deposition in kg/ha.

STARKEY EXPERIMENTAL FOREST **OREGON**

BIOGRAPHIC INFORMATION



Latitude	-	45.22 ° N
Longitude	-	118.51 ° W
Elevation (m)	-	1253
Landuse	-	Rural
Start Summary	-	March 1984
End Summary	-	December 1988
Source of Data	-	NADP/NTN (OR18)

Starkey Experimental Forest

BASIC STATISTICS

A. PERCENTILES IN WEEKLY CONCENTRATIONS BY YEAR

Year	ppt vol[1]	pH 25	pH 50	pH 75	pH 90	pH max	Sulphate (mg/L) 25	Sulphate (mg/L) 50	Sulphate (mg/L) 75	Sulphate (mg/L) 90	Sulphate (mg/L) max	Nitrate (mg/L) 25	Nitrate (mg/L) 50	Nitrate (mg/L) 75	Nitrate (mg/L) 90	Nitrate (mg/L) max	Ammonium (mg/L) 25	Ammonium (mg/L) 50	Ammonium (mg/L) 75	Ammonium (mg/L) 90	Ammonium (mg/L) max
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	5.79	5.50	5.30	5.02	4.84	0.33	0.44	0.73	1.56	3.55	0.20	0.33	0.73	1.36	2.84	0.02	0.07	0.11	0.25	0.35
1985	43.3	5.46	5.31	5.17	4.85	4.72	0.17	0.27	0.52	1.23	8.67	0.13	0.31	0.65	2.01	11.58	0.02	0.02	0.02	0.35	3.92
1986	53.9	5.53	5.38	5.12	5.03	4.78	0.10	0.18	0.40	0.75	1.82	0.11	0.24	0.50	0.92	2.49	0.02	0.02	0.05	0.16	0.39
1987	36.3	5.58	5.46	5.14	4.96	4.77	0.10	0.19	0.39	0.53	1.42	0.15	0.28	0.69	0.84	2.59	0.02	0.02	0.11	0.30	0.35
1988	55.6	5.58	5.44	5.22	4.86	3.74	0.10	0.20	0.32	0.60	0.95	0.03	0.12	0.24	0.64	1.03	0.02	0.02	0.02	0.11	0.32

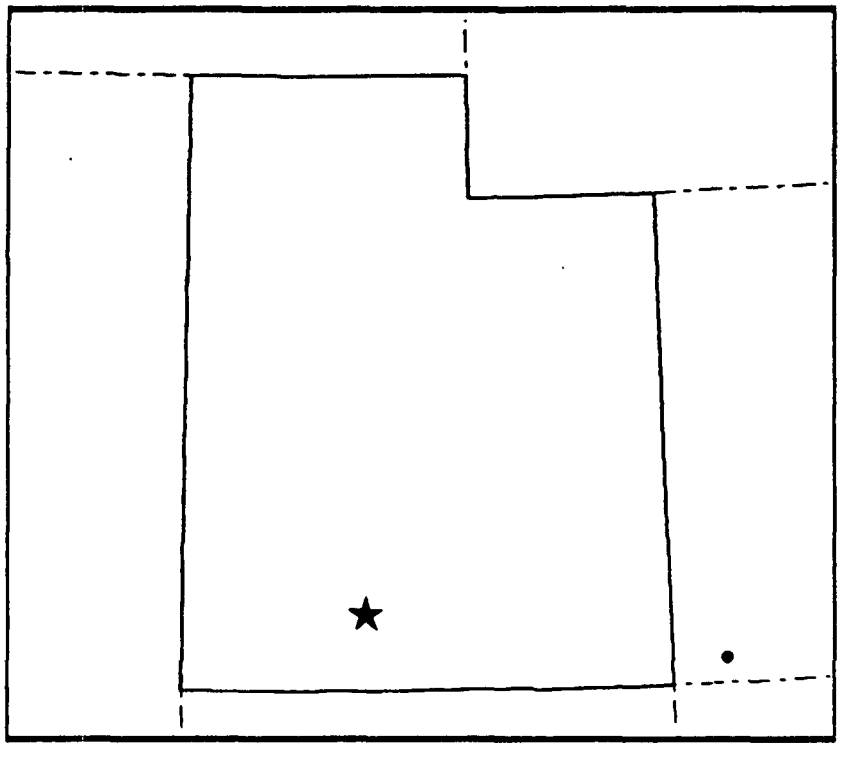
B. VOLUME WEIGHTED AVERAGES AND DEPOSITION BY YEAR AND SEASON

Year	Annual pH x[2]	Annual pH dep[3]	Annual Sulphate x	Annual Sulphate dep	Annual Nitrate x	Annual Nitrate dep	Annual Ammonium x	Annual Ammonium dep	Winter (Dec-Feb) pH x	Winter pH dep	Winter Sulphate x	Winter Sulphate dep	Winter Nitrate x	Winter Nitrate dep	Winter Ammonium x	Winter Ammonium dep	Summer (Jun-Aug) pH x	Summer pH dep	Summer Sulphate x	Summer Sulphate dep	Summer Nitrate x	Summer Nitrate dep	Summer Ammonium x	Summer Ammonium dep
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	5.26	0.02	0.27	1.15	0.25	1.09	0.03	0.13	-	-	-	-	-	-	-	-	4.95	0.00	0.51	0.17	0.44	0.15	0.05	0.02
1986	5.35	0.02	0.14	0.77	0.18	0.95	0.02	0.11	5.46	0.01	0.06	0.11	0.07	0.13	0.01	0.02	5.05	0.00	0.44	0.21	0.48	0.22	0.06	0.03
1987	5.31	0.02	0.23	0.82	0.35	1.29	0.06	0.22	5.59	0.00	0.14	0.15	0.17	0.19	0.01	0.01	-	-	-	-	-	-	-	-
1988	5.34	0.03	0.20	1.09	0.18	1.00	0.02	0.09	-	-	-	-	-	-	-	-	5.07	0.01	0.35	0.23	0.26	0.17	0.01	0.01

1. Estimated annual precipitation amount in cm.
2. Volume weighted averages (in pH units for pH and in mg/L for sulphate, nitrate, and ammonium).
3. Estimated deposition in kg/ha.

BRYCE CANYON NATIONAL PARK **UTAH**

BIOGRAPHIC INFORMATION



Latitude	-	37.62 ° N
Longitude	-	112.17 ° W
Elevation (m)	-	2477
Landuse	-	Rural
Start Summary	-	January 1985
End Summary	-	December 1988
Source of Data	-	NADP/NTN (UT99)

Bryce Canyon

BASIC STATISTICS

A. PERCENTILES IN WEEKLY CONCENTRATIONS BY YEAR

Year	ppt vol[1]	pH 25	pH 50	pH 75	pH 90	pH max	Sulphate (mg/L) 25	Sulphate (mg/L) 50	Sulphate (mg/L) 75	Sulphate (mg/L) 90	Sulphate (mg/L) max	Nitrate (mg/L) 25	Nitrate (mg/L) 50	Nitrate (mg/L) 75	Nitrate (mg/L) 90	Nitrate (mg/L) max	Ammonium (mg/L) 25	Ammonium (mg/L) 50	Ammonium (mg/L) 75	Ammonium (mg/L) 90	Ammonium (mg/L) max
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	38.4	6.31	5.68	5.20	4.82	4.65	0.38	0.71	1.23	2.94	3.42	0.22	0.71	1.87	3.25	5.79	0.02	0.06	0.23	0.34	0.52
1986	34.0	6.04	5.51	5.08	4.72	4.21	0.32	0.52	1.21	2.85	4.27	0.24	0.67	1.22	1.96	2.52	0.02	0.06	0.16	0.19	1.13
1987	43.8	6.03	5.34	4.98	4.83	4.60	0.37	0.66	1.14	1.94	3.24	0.38	0.64	1.37	1.84	4.92	0.04	0.06	0.12	0.23	0.46
1988	31.4	6.04	5.46	4.85	4.58	4.40	0.26	0.62	1.67	2.92	4.57	0.21	0.87	1.53	2.54	2.96	0.02	0.03	0.18	0.40	0.72

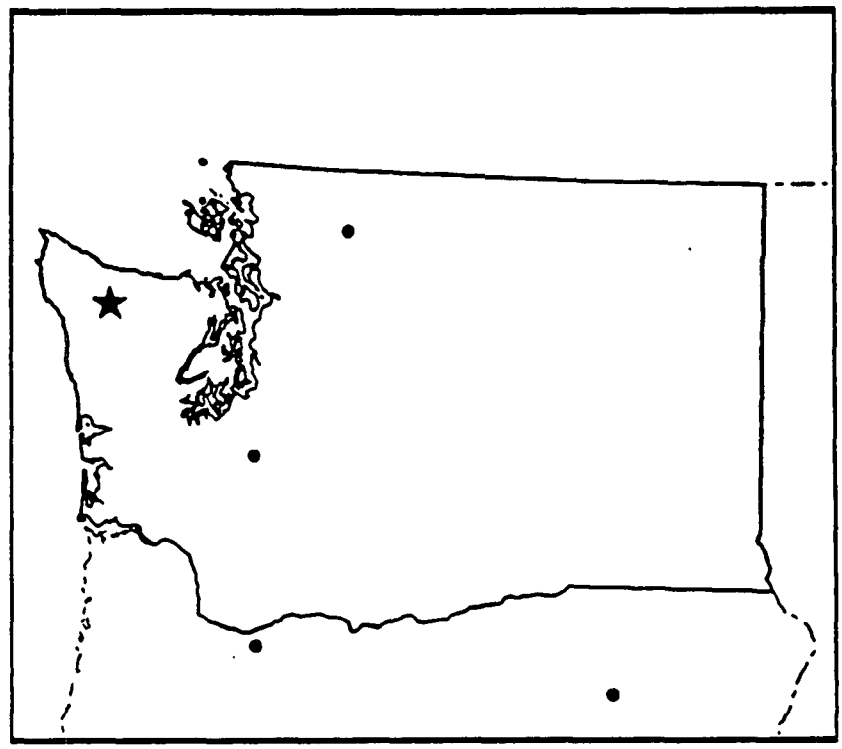
B. VOLUME WEIGHTED AVERAGES AND DEPOSITION BY YEAR AND SEASON

Year	Annual pH x̄[2]	Annual pH dep[3]	Annual Sulphate x̄	Annual Sulphate dep	Annual Nitrate x̄	Annual Nitrate dep	Annual Ammonium x̄	Annual Ammonium dep	Winter (Dec-Feb) pH x̄	Winter pH dep	Winter Sulphate x̄	Winter Sulphate dep	Winter Nitrate x̄	Winter Nitrate dep	Winter Ammonium x̄	Winter Ammonium dep	Summer (Jun-Aug) pH x̄	Summer pH dep	Summer Sulphate x̄	Summer Sulphate dep	Summer Nitrate x̄	Summer Nitrate dep	Summer Ammonium x̄	Summer Ammonium dep
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	5.12	0.03	0.58	1.97	0.54	1.83	0.05	0.18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	5.07	0.04	0.70	3.08	0.67	2.95	0.09	0.38	5.00	0.01	0.76	0.68	0.57	0.50	0.07	0.06	4.94	0.01	0.92	0.98	1.17	1.25	0.14	0.15
1988	5.17	0.02	0.78	2.44	0.88	2.76	0.07	0.22	-	-	-	-	-	-	-	-	5.11	0.01	1.07	1.19	1.33	1.49	0.05	0.06

1. Estimated annual precipitation amount in cm.
2. Volume weighted averages (in pH units for pH and in mg/L for sulphate, nitrate, and ammonium).
3. Estimated deposition in kg/ha.

HOH RANGER STATION, OLYMPIC NATIONAL PARK — WASHINGTON

BIOGRAPHIC INFORMATION



Latitude	-	47.86 ° N
Longitude	-	123.93 ° W
Elevation (m)	-	176
Landuse	-	Rural
Start Summary	-	May 1980
End Summary	-	December 1988
Source of Data	-	NADP/NTN (WA14)

Hoh Ranger Station, Olympic National Park

BASIC STATISTICS

A. PERCENTILES IN WEEKLY CONCENTRATIONS BY YEAR

	ppt	pH					Sulphate (mg/L)					Nitrate (mg/L)					Ammonium (mg/L)				
Year	vol[1]	25	50	75	90	max	25	50	75	90	max	25	50	75	90	max	25	50	75	90	max
1980	-	5.75	5.47	5.35	4.88	4.71	0.29	0.42	0.96	0.93	4.04	0.05	0.11	0.23	0.31	0.40	0.02	0.02	0.02	0.02	0.07
1981	368.5	5.62	5.40	5.24	5.03	4.57	0.30	0.50	0.71	1.22	1.85	0.07	0.13	0.19	0.35	1.61	0.02	0.02	0.02	0.03	0.14
1982	366.5	5.73	5.50	5.36	5.22	4.83	0.27	0.46	0.75	1.91	2.38	0.06	0.09	0.19	0.56	1.75	0.02	0.02	0.03	0.07	0.19
1983	398.4	5.62	5.51	5.36	5.20	5.08	0.10	0.35	0.58	0.99	5.77	0.04	0.09	0.14	0.28	5.20	0.02	0.02	0.02	0.04	0.67
1984	347.8	5.69	5.46	5.37	5.24	4.95	0.30	0.45	0.58	0.79	6.38	0.04	0.11	0.15	0.21	0.91	0.02	0.02	0.04	0.06	1.46
1985	221.1	5.59	5.43	5.26	5.09	4.95	0.22	0.32	0.53	0.75	1.01	0.03	0.03	0.11	0.25	1.27	0.02	0.02	0.02	0.02	0.15
1986	350.6	5.56	5.44	5.34	5.21	4.83	0.16	0.25	0.38	0.72	0.93	0.03	0.03	0.08	0.38	0.71	0.02	0.02	0.02	0.02	0.47
1987	-	5.47	5.39	5.31	5.18	5.00	0.19	0.30	0.39	0.52	0.58	0.06	0.09	0.13	0.25	0.29	0.02	0.02	0.02	0.05	0.08
1988	345.0	5.56	5.42	5.28	5.12	4.42	0.19	0.27	0.46	0.66	2.30	0.03	0.04	0.12	0.18	4.48	0.02	0.02	0.02	0.02	0.30

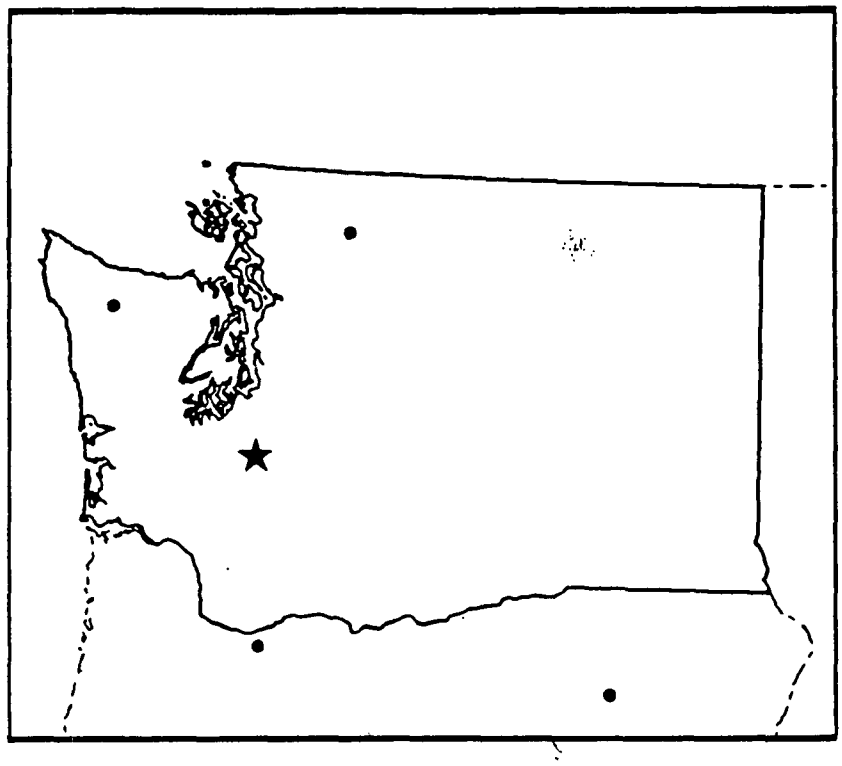
B. VOLUME WEIGHTED AVERAGES AND DEPOSITION BY YEAR AND SEASON

	Annual								Winter (Dec-Feb)								Summer (Jun-Aug)							
	pH		Sulphate		Nitrate		Ammonium		pH		Sulphate		Nitrate		Ammonium		pH		Sulphate		Nitrate		Ammonium	
Year	x̄[2]	dep[3]	x̄	dep	x̄	dep	x̄	dep	x̄	dep	x̄	dep	x̄	dep	x̄	dep	x̄	dep	x̄	dep	x̄	dep	x̄	dep
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.18	0.02	0.73	1.67	0.13	0.28	0.01	0.02
1981	5.39	0.15	0.39	14.3	0.10	3.50	0.01	0.48	-	-	-	-	-	-	-	-	5.34	0.02	0.57	2.17	0.15	0.56	0.01	0.05
1982	5.41	0.14	0.36	13.2	0.07	2.46	0.02	0.59	-	-	-	-	-	-	-	-	5.40	0.01	0.25	0.50	0.08	0.15	0.01	0.02
1983	5.45	0.14	0.29	11.5	0.07	2.95	0.02	0.60	5.45	0.07	0.18	3.41	0.06	1.20	0.02	0.40	5.24	0.02	0.46	1.97	0.12	0.50	0.01	0.04
1984	5.47	0.12	0.35	12.3	0.08	2.89	0.02	0.83	5.65	0.03	0.45	5.54	0.07	0.86	0.03	0.34	5.36	0.01	0.51	1.09	0.11	0.23	0.02	0.04
1985	5.37	0.10	0.32	7.03	0.04	0.91	0.01	0.22	5.44	0.02	0.29	1.72	0.08	0.45	0.01	0.06	-	-	-	-	-	-	-	-
1986	5.39	0.14	0.27	9.50	0.04	1.51	0.01	0.39	5.43	0.05	0.23	2.82	0.03	0.42	0.01	0.12	5.30	0.01	0.35	0.57	0.05	0.08	0.01	0.02
1987	-	-	-	-	-	-	-	-	5.34	0.06	0.29	3.62	0.07	0.83	0.01	0.16	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.29	0.01	0.35	0.63	0.05	0.09	0.01	0.02

1. Estimated annual precipitation amount in cm.
2. Volume weighted averages (in pH units for pH and in mg/L for sulphate, nitrate, and ammonium).
3. Estimated deposition in kg/ha.

LA GRANDE **WASHINGTON**

BIOGRAPHIC INFORMATION



Latitude	-	46.84 ° N
Longitude	-	122.29 ° W
Elevation (m)	-	617
Landuse	-	Rural
Start Summary	-	April 1984
End Summary	-	December 1988
Source of Data	-	NADP/NTN (WA21)

La Grande

BASIC STATISTICS

A. PERCENTILES IN WEEKLY CONCENTRATIONS BY YEAR

Year	ppt vol[1]	pH 25	pH 50	pH 75	pH 90	pH max	Sulphate (mg/L) 25	Sulphate (mg/L) 50	Sulphate (mg/L) 75	Sulphate (mg/L) 90	Sulphate (mg/L) max	Nitrate (mg/L) 25	Nitrate (mg/L) 50	Nitrate (mg/L) 75	Nitrate (mg/L) 90	Nitrate (mg/L) max	Ammonium (mg/L) 25	Ammonium (mg/L) 50	Ammonium (mg/L) 75	Ammonium (mg/L) 90	Ammonium (mg/L) max
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	5.52	5.24	5.00	4.62	4.28	0.47	0.67	1.10	2.96	11.14	0.13	0.25	0.66	3.40	9.37	0.02	0.05	0.10	0.29	3.55
1985	66.6	5.34	4.94	4.65	4.44	4.35	0.53	0.83	1.18	2.71	3.29	0.16	0.32	0.53	1.18	1.83	0.02	0.02	0.02	0.12	0.15
1986	97.8	5.34	5.23	4.91	4.63	4.25	0.23	0.47	0.78	1.34	3.28	0.07	0.18	0.42	1.64	1.90	0.02	0.02	0.07	0.27	0.48
1987	73.0	5.37	5.14	4.63	4.38	4.30	0.34	0.77	1.66	3.71	6.65	0.15	0.49	1.09	1.57	6.24	0.02	0.06	0.15	0.46	1.29
1988	90.6	5.32	5.09	4.88	4.63	4.44	0.38	0.54	0.90	1.48	3.67	0.10	0.23	0.40	0.72	1.55	0.02	0.02	0.03	0.10	0.35

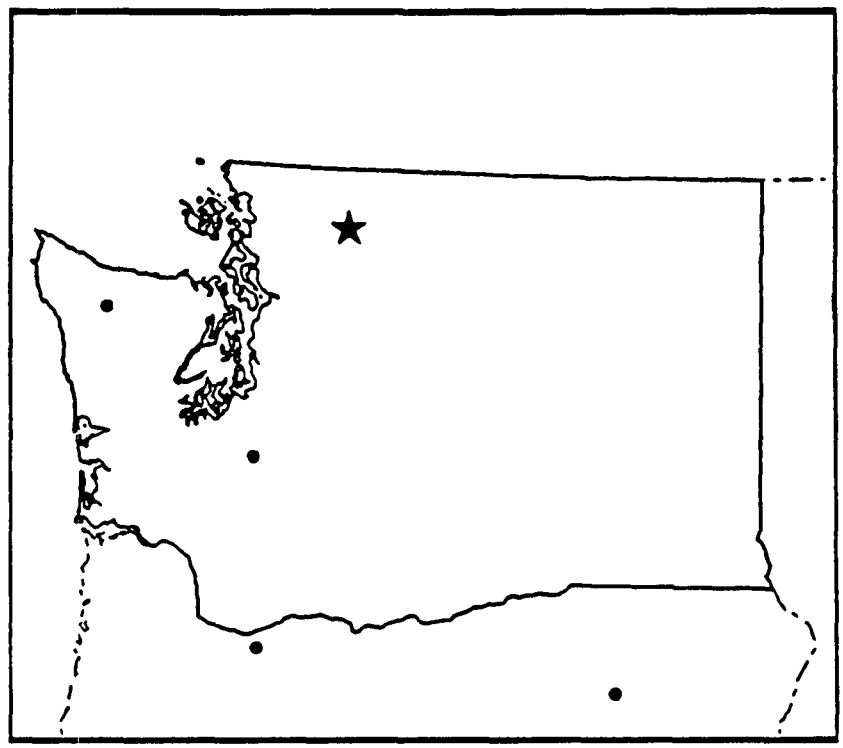
B. VOLUME WEIGHTED AVERAGES AND DEPOSITION BY YEAR AND SEASON

Year	Annual pH $\bar{x}$[2]	Annual pH dep[3]	Annual Sulphate $\bar{x}$	Annual Sulphate dep	Annual Nitrate $\bar{x}$	Annual Nitrate dep	Annual Ammonium $\bar{x}$	Annual Ammonium dep	Winter (Dec-Feb) pH $\bar{x}$	Winter pH dep	Winter Sulphate $\bar{x}$	Winter Sulphate dep	Winter Nitrate $\bar{x}$	Winter Nitrate dep	Winter Ammonium $\bar{x}$	Winter Ammonium dep	Summer (Jun-Aug) pH $\bar{x}$	Summer pH dep	Summer Sulphate $\bar{x}$	Summer Sulphate dep	Summer Nitrate $\bar{x}$	Summer Nitrate dep	Summer Ammonium $\bar{x}$	Summer Ammonium dep
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.88	0.02	0.78	0.98	0.49	0.62	0.07	0.09
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	5.15	0.07	0.41	3.96	0.20	1.94	0.03	0.28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	5.00	0.07	0.62	4.54	0.32	2.31	0.05	0.37	5.08	0.03	0.34	1.03	0.20	0.62	0.03	0.08	4.75	0.01	1.15	0.74	0.44	0.28	0.06	0.04
1988	5.01	0.09	0.51	4.65	0.25	2.30	0.02	0.22	-	-	-	-	-	-	-	-	4.92	0.01	0.71	0.44	0.20	0.12	0.01	0.01

1. Estimated annual precipitation amount in cm.
2. Volume weighted averages (in pH units for pH and in mg/L for sulphate, nitrate, and ammonium).
3. Estimated deposition in kg/ha.

MARBLEMOUNT, CASCADES NATIONAL PARK WASHINGTON

BIOGRAPHIC INFORMATION



Latitude	-	48.54 ° N
Longitude	-	121.45 ° W
Elevation (m)	-	120
Landuse	-	Rural
Start Summary	-	February 1984
End Summary	-	December 1988
Source of Data	-	NADP/NTN (WA19)

Marblemount, Cascades National Park

BASIC STATISTICS

A. PERCENTILES IN WEEKLY CONCENTRATIONS BY YEAR

Year	ppt vol[1]	pH 25	pH 50	pH 75	pH 90	pH max	Sulphate (mg/L) 25	Sulphate 50	Sulphate 75	Sulphate 90	Sulphate max	Nitrate (mg/L) 25	Nitrate 50	Nitrate 75	Nitrate 90	Nitrate max	Ammonium (mg/L) 25	Ammonium 50	Ammonium 75	Ammonium 90	Ammonium max
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	180.1	5.11	4.96	4.78	4.65	4.39	0.50	0.73	0.96	2.20	3.56	0.26	0.45	0.74	1.83	3.54	0.02	0.05	0.07	0.24	0.83
1985	165.8	5.12	4.95	4.76	4.68	4.68	0.31	0.51	0.72	0.93	0.94	0.14	0.38	0.73	1.11	1.32	0.02	0.02	0.02	0.12	0.21
1986	191.3	5.36	5.14	4.92	4.61	4.04	0.16	0.31	0.54	0.97	2.25	0.14	0.33	0.71	1.25	7.92	0.02	0.02	0.07	0.20	0.33
1987	148.5	5.25	5.05	4.78	4.72	4.52	0.28	0.36	0.80	0.92	1.41	0.22	0.34	0.80	1.25	1.46	0.02	0.02	0.04	0.10	0.18
1988	226.6	5.20	5.06	4.96	4.67	4.56	0.27	0.38	0.52	1.15	2.20	0.12	0.30	0.49	1.02	1.91	0.02	0.02	0.02	0.02	0.06

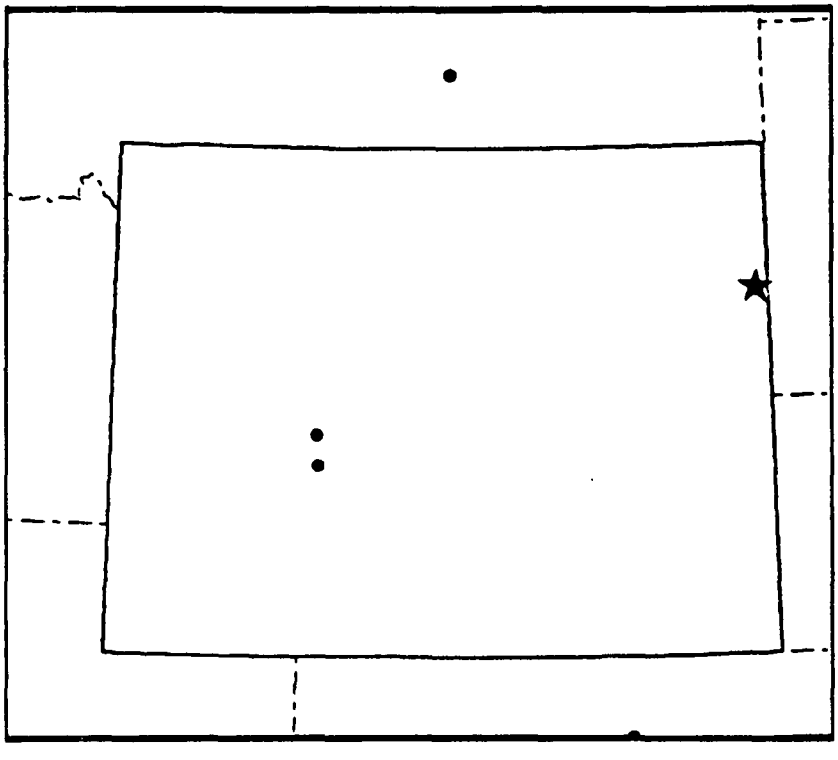
B. VOLUME WEIGHTED AVERAGES AND DEPOSITION BY YEAR AND SEASON

Year	Annual pH x̄[2]	Annual pH dep[3]	Annual Sulphate x̄	Annual Sulphate dep	Annual Nitrate x̄	Annual Nitrate dep	Annual Ammonium x̄	Annual Ammonium dep	Winter (Dec-Feb) pH x̄	Winter pH dep	Winter Sulphate x̄	Winter Sulphate dep	Winter Nitrate x̄	Winter Nitrate dep	Winter Ammonium x̄	Winter Ammonium dep	Summer (Jun-Aug) pH x̄	Summer pH dep	Summer Sulphate x̄	Summer Sulphate dep	Summer Nitrate x̄	Summer Nitrate dep	Summer Ammonium x̄	Summer Ammonium dep
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.71	0.03	1.15	1.66	0.62	0.89	0.07	0.09
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	5.15	0.14	0.27	5.20	0.25	4.71	0.02	0.46	-	-	-	-	-	-	-	-	4.86	0.01	0.44	0.47	0.59	0.62	0.05	0.05
1987	5.04	0.14	0.38	5.70	0.33	4.84	0.02	0.33	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	5.09	0.18	0.32	7.25	0.22	5.01	0.01	0.25	5.14	0.05	0.32	2.25	0.22	1.51	0.01	0.07	-	-	-	-	-	-	-	-

1. Estimated annual precipitation amount in cm.
2. Volume weighted averages (in pH units for pH and in mg/L for sulphate, nitrate, and ammonium).
3. Estimated deposition in kg/ha.

NEWCASTLE WYOMING

BIOGRAPHIC INFORMATION



Latitude	-	43.87 ° N
Longitude	-	104.19 ° W
Elevation (m)	-	1466
Landuse	-	Rural
Start Summary	-	August 1981
End Summary	-	December 1988
Source of Data	-	NADP/NTN (WY99)

Newcastle

BASIC STATISTICS

A. PERCENTILES IN WEEKLY CONCENTRATIONS BY YEAR

Year	ppt vol[1]	pH 25	pH 50	pH 75	pH 90	pH max	Sulphate (mg/L) 25	Sulphate 50	Sulphate 75	Sulphate 90	Sulphate max	Nitrate (mg/L) 25	Nitrate 50	Nitrate 75	Nitrate 90	Nitrate max	Ammonium (mg/L) 25	Ammonium 50	Ammonium 75	Ammonium 90	Ammonium max
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	6.28	5.75	5.45	4.85	4.82	1.32	1.87	3.55	22.39	23.10	0.68	1.20	1.97	7.59	8.52	0.09	0.19	0.40	1.59	1.84
1982	46.6	5.96	5.43	5.07	4.92	4.79	0.64	1.05	1.65	2.73	4.55	0.66	0.86	1.25	2.40	3.89	0.08	0.21	0.33	0.66	1.04
1983	34.3	6.05	5.81	5.19	4.93	4.85	0.72	1.16	1.62	3.09	7.82	0.54	0.94	1.42	3.12	4.06	0.07	0.23	0.54	0.82	2.43
1984	33.3	6.21	5.61	5.15	4.92	4.84	0.69	1.12	1.63	2.38	16.42	0.71	0.99	1.45	2.26	4.63	0.10	0.20	0.29	0.57	1.03
1985	25.8	6.12	5.50	5.17	4.90	4.43	0.66	1.01	1.60	2.51	6.64	0.40	1.03	1.70	3.39	8.97	0.02	0.22	0.34	0.69	2.08
1986	55.8	6.16	5.61	5.26	5.03	4.86	0.54	0.74	1.12	2.06	2.43	0.41	0.80	1.50	2.26	3.33	0.02	0.11	0.24	0.48	1.30
1987	29.7	6.15	5.66	5.20	5.02	4.67	0.42	0.92	1.49	2.21	4.66	0.55	0.85	1.69	1.94	5.99	0.08	0.13	0.21	0.49	0.71
1988	34.8	6.13	5.80	5.46	5.00	4.75	0.53	0.90	1.32	2.03	2.70	0.47	0.95	1.56	2.68	3.82	0.02	0.07	0.14	0.59	0.74

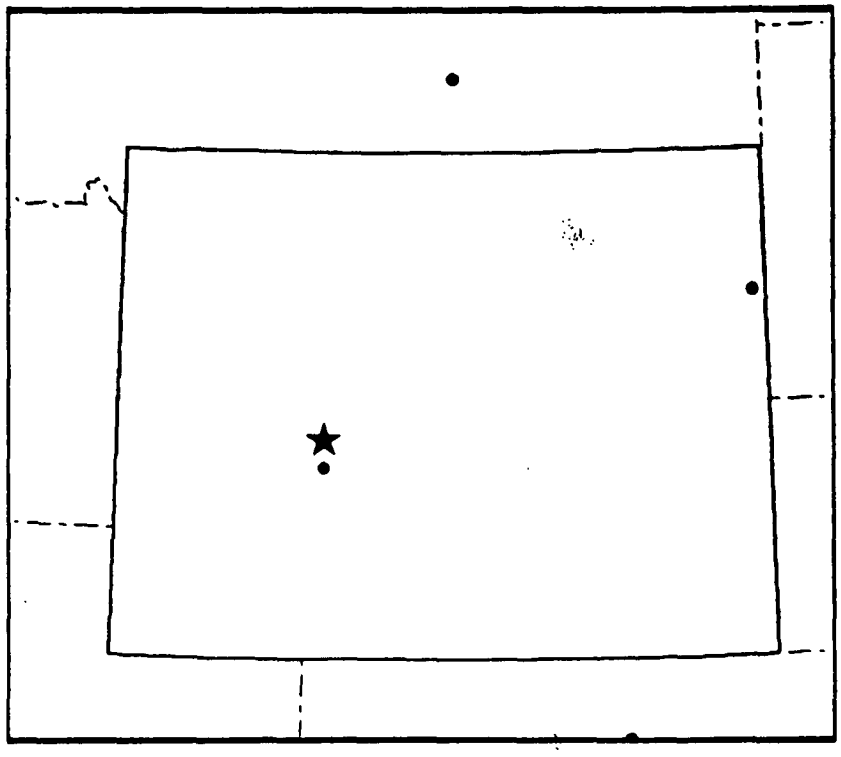
B. VOLUME WEIGHTED AVERAGES AND DEPOSITION BY YEAR AND SEASON

Year	Annual pH x̄[2]	Annual pH dep[3]	Annual Sulphate x̄	Annual Sulphate dep	Annual Nitrate x̄	Annual Nitrate dep	Annual Ammonium x̄	Annual Ammonium dep	Winter (Dec-Feb) pH x̄	Winter pH dep	Winter Sulphate x̄	Winter Sulphate dep	Winter Nitrate x̄	Winter Nitrate dep	Winter Ammonium x̄	Winter Ammonium dep	Summer (Jun-Aug) pH x̄	Summer pH dep	Summer Sulphate x̄	Summer Sulphate dep	Summer Nitrate x̄	Summer Nitrate dep	Summer Ammonium x̄	Summer Ammonium dep
1980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	5.14	0.03	0.90	4.20	0.88	4.10	0.20	0.96	5.32	0.00	0.72	0.35	0.74	0.36	0.19	0.09	5.02	0.02	0.99	1.96	1.04	2.06	0.22	0.43
1983	5.20	0.02	1.11	3.80	1.01	3.48	0.36	1.23	-	-	-	-	-	-	-	-	5.12	0.01	1.27	1.60	1.36	1.72	0.36	0.45
1984	5.18	0.02	1.05	3.50	0.88	2.94	0.20	0.65	5.38	0.00	1.34	0.37	0.81	0.22	0.08	0.02	5.09	0.01	1.01	1.79	0.93	1.64	0.20	0.35
1985	5.24	0.01	0.95	2.44	0.97	2.50	0.21	0.54	-	-	-	-	-	-	-	-	5.31	0.00	1.13	0.94	1.26	1.04	0.30	0.25
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	5.23	0.02	0.77	2.29	0.80	2.39	0.14	0.42	-	-	-	-	-	-	-	-	5.28	0.00	1.27	0.55	1.48	0.63	0.23	0.10
1988	5.37	0.01	1.13	3.94	1.01	3.53	0.11	0.37	-	-	-	-	-	-	-	-	5.32	0.01	1.12	1.77	1.27	2.01	0.07	0.10

1. Estimated annual precipitation amount in cm.
2. Volume weighted averages (in pH units for pH and in mg/L for sulphate, nitrate, and ammonium).
3. Estimated deposition in kg/ha.

SINKS CANYON WYOMING

BIOGRAPHIC INFORMATION



Latitude	-	42.73 ° N
Longitude	-	108.85 ° W
Elevation (m)	-	2164
Landuse	-	Rural
Start Summary	-	August 1984
End Summary	-	December 1988
Source of Data	-	NADP/NTN (WY02)