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Statistical Analysis of the Effect of Inspection and Maintenance on Carbon Monoxide Air Quality in Portland, Oregon

By

G.C. Tiao, J. Ledolter and G. Hudak

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Final Report

on

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G.C. Tiao

J. Ledolter

G. Hudak

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EPA Summary and Interpretation of Contract # 68-03-2931:

STATISTICAL ANALYSIS OF THE EFFECT OF INSPECTION AND MAINTENANCE ON CARBON MONOXIDE AIR QUALITY IN PORTLAND, OREGON

This study, conducted for EPA by Dr. George Tiao of the University of Wisconsin and his associates Johannes Ledolter and Gregory Hudak, compared CO air quality trends in Portland and Eugene, Oregon. Statistical models which accounted for local meteorological, traffic and air quality monitoring effects were constructed to determine if the biennial inspection and maintenance (I/M) program in Portland, which became mandatory in July of 1975, caused a significant improvement in CO air quality for the years 1975 through 1979. Because Eugene did not have an I/M program and because it was geographically close to Portland, it was used as a comparison site for studying the effect of the I/M program.

As explained below, and in detail in the report, the study found a CO air quality improvement attributable to the biennial I/M program in Portland. In the years when most Portland vehicles received their inspections, ambient CO concentrations were 8% to 15% less than they would have been without the I/M program. Based on this finding of the study, EPA calculates that the ambient CO improvement due to an annual I/M program that inspected every subject vehicle each year would have been 10% to 19%.

Three statistical approaches were used to analyze CO data for years 1970 through 1979 from four Portland monitoring sites and one Eugene site. The first approach related daily average ambient CO levels to wind speed and traffic counts in order to determine the true trend in CO concentrations over time. Wind speed and traffic counts were used because these variables resulted in the most successful fit to the CO data. The model shows an average annual reduction in CO concentrations of 3.4% to 7.3% per year for the Portland sites.[10]* A comparable number for Eugene could not be found because the CO monitor in Eugene was altered during 1975, making it undesirable to use the same type of analysis as used for the Portland sites. This first approach was a preliminary step and by itself does not tell anything about the effect of the Portland I/M program.

The second approach related monthly averages of CO concentrations to monthly averages of traffic volume and relative humidity, CO sampling probe changes at certain monitors, disruptions in traffic patterns, and a long term trend due to the Federal vehicle emission standards. The effect of I/M is represented

* Numbers in brackets refer to page numbers or tables in the report.

in the model by a variable which accounts for monthly inspection volumes in years 1975 through 1979. This is done by using the sum of the monthly inspection volumes for the current and preceding months, except that the volumes for preceding months are progressively discounted to account for emission deterioration after repair. This model shows that an average annual reduction in CO concentrations of 5% over the entire 1970 through 1979 period can be attributed to the Federal vehicle emission standards at one Portland site (CAMS) [29]. In addition, a sizable CO benefit can be attributed to the I/M program at that site. Because of the I/M program, the average CO concentration over the 1975 through 1979 period was 6% to 12% less than it would have been otherwise[30]. The I/M benefit was greater than this average in even-numbered years and lower in odd-numbered years, due to the biennial nature of the I/M program. For example, the estimate of the I/M benefit is 8% to 15% for both 1976 and 1978, which are the years in which inspection volumes were highest [Table 4.4]. None of the other Portland sites shows evidence of a CO reduction due to I/M. However, the report notes that the CAMS site had more complete CO data for 1970 through 1979 than any other Portland site and therefore the results from this site can be considered the most reliable. EPA notes that only one of the three other sites is in downtown Portland, and that the CAMS site generally has the highest CO readings of all four sites.

The analysis of the Eugene data showed no evidence of an I/M effect on CO levels in Eugene; this was expected since Eugene does not have an I/M program and supports the validity of the modeling approach used to determine the impact of I/M in Portland.

The third approach related averages of hourly CO observations over three-hour periods at the CAMS site for the peak weekday traffic hours in summer and winter (6-9 a.m. and 3-6 p.m., June-September and November-February) to traffic and meteorological observations. As in the second model, variables were included to account for probe changes and traffic disruptions. The I/M program was again represented by the discounted total of monthly inspection volumes. The third approach demonstrated that an average reduction in CO levels of 8% to 15% can be attributed to the Portland I/M program for years 1975 through 1979 [40]. The estimate of I/M benefit for 1976 is from 11% to 20% and for 1978 is from 12% to 21%, due to higher inspection volumes during these years as explained above.* These findings confirm the results of the second approach. Other Portland sites were not examined using the third approach because the necessary traffic observations were not available.

As mentioned previously, one setback for this study was the fact that no monitoring site had complete data for years 1970-1979, and that several sites had large gaps in the data. Another problem was that CO sampling probe changes occurred at several monitoring sites and a disruption in traffic occurred at one site (CAMS). The range of benefits listed above reflects the inclusion or exclusion of indicator variables for probe changes and traffic disruptions.

* The 1976 and 1978 benefit estimates were not listed in the report, but were calculated using the procedure described on page 40 of the report, as recommended by Dr. J. Ledolter, an associate author of the report.

In addition, it must be remembered that the estimates of I/M benefit listed in the study reflect CO air quality improvement from Portland's biennial I/M program. Other I/M programs will have annual inspections and therefore the air quality benefit from these programs will be greater than that of the Portland program. Based on the report's benefit estimates for 1976 and 1978, EPA has estimated what the air quality benefit would have been from an annual I/M program by accounting for increased inspection volume* in an annual program:

Year	Tiao Estimated CO Air Quality Benefit For Biennial I/M**	EPA Estimated CO Air Quality Benefit For Annual I/M**
1976	8%-15%	10%-19%
1978	8%-15%	10%-19%

This 10% to 19% estimate of the CO air quality benefit for an annual I/M program can be compared to the benefit predicted by MOBILE2, EPA's mobile source emission factor model. MOBILE2 predicts that an annual I/M program, similar to the Portland I/M program in other respects, would have produced a CO air quality benefit of 14% in 1976 and 28% in 1978.*** These MOBILE2 predictions compare favorably with the estimates based on actual CO air quality data.

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* Listed below in the first column are the actual Portland annual inspection volumes (including initial test and retest) from Table 1.2 of the report. The second column gives an estimate of the number of initial inspections if the program had been annual, as provided by Bill Jasper of Oregon DEQ. The third column adjusts the second column by multiplying by 1.4, to make the third column comparable with the first by accounting for the 40 percent failure rate on the initial test.

Year	Actual Number of Inspections and Reinspections	Number of Initial Inspections Assuming an Annual Program	Number of Inspections and Reinspections Assuming an Annual Program
1976	589,405	518,000	725,200
1978	577,022	527,000	737,800

** Second approach.

*** MOBILE2 input parameters: I/M started on July 1, 1975; 40% stringency factor; all model years subject to inspection; and no mechanic training program.

1. Introduction and Description of Data Base

1.1 Principal objectives and summary of findings

This report presents a statistical analysis of carbon monoxide concentrations over the period 1970 to 1979 at five air monitoring sites in the state of Oregon. Four of the sites (CAMS, Hollywood, Lloyd, and Alder) are located in Portland where the car inspection and maintenance (I/M) program has been in effect since 1975, and the remaining site is located in Eugene which is not covered by this program. The principal objectives of this study are to assess the trend in the CO concentrations which can be associated with the Federal emission standards and to determine whether or not the I/M program in the Portland area has any effect on the concentration level.

A description of the carbon monoxide, traffic and meteorological data used in the analysis is given in this section. Section 2 presents a preliminary exploratory analysis of the data including various summary statistics and graphical presentations of the main features of the variables. In Section 3 diurnal models relating CO to traffic and meteorological factors are constructed. Such models serve to identify the major exogenous variables affecting CO. In Section 4, intervention time series models for monthly means of CO readings are given. Traffic volume adjusted by relative humidity (a proxy for mixing height) is used as an exogenous variable, and appropriate nonlinear functional forms to model the effects of Federal emission standards and the I/M program are constructed. Finally in Section 5, a linear regression trend analysis of peak hour (6-9 am and 3-6 pm) CO concentrations with exogenous traffic and meteorological variables is given.

Our principal findings are as follows:

(i) At all Portland sites, one can observe a reduction in ambient CO concentrations over the 1970-79 period, with the average reduction ranging from 3.4% to 7.3% per year. The reduction in Eugene is much less, the average being 1.9% per year.

(ii) Based on the models for monthly means of CO at the CAMS site in Portland and the "control" site at Eugene, an estimated reduction in CO emissions (and, therefore, CO concentrations) of 5% per year can be attributed to the Federal emission standards. In addition, there is evidence to indicate that the I/M program has had an additional beneficial effect in reducing CO concentrations. During the period in which the I/M program was in effect, one can attribute to the program an average annual reduction of 6 to 12 percent of what the CO ambient levels would have been without the program. This period includes years in which few vehicles were inspected. In 1976 and 1978, years in which most vehicles in the biennial I/M program were inspected, the reduction attributable to the program is estimated to range from 8 to 15 percent.

(iii) The regression analysis of peak hour CO readings at CAMS and Eugene indicates a higher annual reduction associated with the Federal standards. The estimated average yearly benefit of the I/M program, ranging from 8% to 15%, is in good agreement with the findings based on models for the monthly means.

1.2 The Oregon car inspection and maintenance program

The United States Clean Air Act Amendments of 1977 require that certain states implement car inspection and maintenance programs (I/M programs) in certain of their major cities to reduce hydrocarbon (HC) and carbon monoxide (CO) emissions from light duty vehicles. The Oregon Department of Environmental Quality (DEQ) initiated in 1974 on a trial basis a motor vehicle inspection program within the boundaries of the Metropolitan Service District which includes the city of Portland. This I/M program became mandatory in July, 1975. By state law, vehicles registered within this area must comply with the state emissions control standards for HC and CO and obtain a certificate of compliance prior to registration renewal--see Rutherford and Waring (1980).

Since car registrations in Oregon are valid for a two year period (starting with January 1974), the CO and HC emissions inspection is required every two years. Data on the annual number of inspections, the number of rejections and failure rates obtained from the Oregon DEQ are given in Table 1.1 and plotted in Figure 1.1. Due to the biennial registration system, initially more cars are inspected in even years as compared with odd years. In 1976, for example, all cars which were licensed in 1974 for a two year period, had to be inspected. Testing volume will gradually stabilize as the vehicles involved in the initial testing become a smaller proportion of the fleet. It is expected that by 1983 approximately the same number of cars will be inspected in each year. Excluding the initial year of operation (1975) the failure rates among all inspections have been fairly constant between 21 and 23 percent. However, these failure rates included initial inspection <u>and</u> reinspection tests. Failure rates on the initial test were at a level of approximately 40 percent (James Rutherford, personal communication).

For more detailed information about the Portland I/M program, monthly inspection figures have also been obtained from the Oregon DEQ. These are given in Table 1.2 and are plotted in Figure 1.2.

1.3 Carbon monoxide data

The data consists of hourly CO concentrations recorded at 4 Portland sites and one Eugene site. The Portland CO measurement locations are: CAMS (at 718 West Burnside in downtown Portland), Alder (at the intersection of 4th and Alder), Hollywood (at the intersection of 41st and Sandy Blvd.), and Lloyd Center (at 1420 NE Halsey). The Eugene station is at 11th and Willamette in downtown Eugene. It was chosen as a control site since cars in Eugene are not subject to the Portland I/M program. The locations of the CO measurement sites are indicated on the maps of Portland (Figure 1.3) and Eugene (Figure 1.4).

The hourly data on CO concentrations at these 5 stations vary in length: CAMS (70/1-79/12), Hollywood (73/1-79/12); Alder (75/9-79/12), Lloyd (75/11-79/12) and Eugene (71/5-79/12). Missing data occur at all 5 sites, but the worst is at Eugene where several months of data are completely missing.

1.4 Traffic

Many studies have shown that ambient CO concentrations are approximately proportional to traffic, (Tiao, Box and Hamming (1975), Tiao and Hillmer (1978), Ledolter and Tiao (1979b)). It is therefore necessary to incorporate possible changes in traffic into the trend analysis. Ideally, one would want to use traffic data recorded at the CO measurement sites. Unfortunately, apart from a 14 month period (from 1978/2-1979/4) of hourly traffic counts at the Eugene station (11th and Willamette), such data are not available.

Thus, traffic data had to be obtained from other locations in the Portland and Eugene area which could be judged representative of the local traffic at the CO receptors. As traffic indicator for the Eugene station at 11th and Willamette, we used a monthly average of daily traffic counts recorded at the state operated Franklin station (at US 99 Pacific Highway West, approximately .02 miles NW of 11th Avenue). A previous analysis by the Oregon Department of Transportation of overlapping traffic counts at the 11th and Willamette, and the Franklin station has shown that they are highly correlated ($R^2 = .78$). For the Portland CO stations, we used the monthly average of daily traffic counts on I 80N, Columbia River Highway at NE 21st Avenue, which is a major tributary to the downtown Portland area. For the location of the traffic counters in relation to the CO receptors see Figures 1.3 and 1.4.

1.5 Meteorological data

Apart from traffic, variations in the CO concentrations are to a large extent affected by the meteorological conditions. Meteorological data were obtained from the National Climatic Center (NCC) for monitoring stations at the Portland and Eugene airports. Data on wind speed, wind direction, temperature, relative humidity and precipitation frequency were obtained for the time period 1970/1-1979/12. In addition to the NCC data which are recorded at three hour intervals (midnight, 3 am, 6 am, 9 am, noon, 3 pm, 6 pm, and 9 pm) we used hourly data on wind speed and wind direction supplied by the Oregon Department of Air Quality. In downtown Portland, wind speed and direction were measured at the Hughes Building (1970/12-1977/2) and at the Federal Building (1977/4-1979/12). These stations are in closer proximity to the downtown CO receptors (especially at CAMS and Alder) than the NCC station at the Portland airport. For Eugene the Oregon DEQ supplied wind speed and direction data for a station at Oakway Mall. However due to frequent gaps in the data, they are not used in our trend analysis.

Previous studies on CO have shown that the vertical diffusion of CO depends on the inversion (or mixing) height. Unfortunately mixing height data were only available at Salem, Oregon, which is approximately 45 miles from Portland and 60 miles from Eugene. There is some question whether the mixing height data for Salem are representative of the Portland and Eugene mixing heights. Nevertheless we obtained daily morning and afternoon mixing heights for the NCC station at Salem for the period 1970/1-1978/12.

1.6 Additional background

Several of the CO receptors were moved during the time span considered in our analysis. The receptor at CAMS, which originally was constructed at 18'6" height, was extended downward to 14'4" in 1972/9. In 1978/3 the probe was moved 20 ft. and extended to 12 ft. height. Beginning in 1976 the Burnside traffic pattern was changed, parking was removed and one lane was added to both east and westbound lanes. Construction disrupted traffic for most of a one year period.

The receptor at Hollywood, originally established at the intersection of 41st on Sandy Blvd. at 7 ft. height, was moved in 1975/10 to 12 ft. height and 33 ft. from the intersection.

In August 1975 the Eugene CO receptor was lowered 2 ft. and moved 18 ft. closer to the road. At Alder and Lloyd no changes in the CO measurement stations were made.

2. Summary Statistics and Graphical Descriptions of the Data

In this section we give summary statistics and various graphical representations of the CO concentrations, the traffic counts and the meteorological data on wind speed, wind direction, temperature, relative humidity, precipitation and mixing height. These preliminary summaries are a necessary first step in any statistical analysis. They serve to (i) bring out the main features of the data and (ii) provide the background for the various statistical models (diurnal models, time series intervention models, regression models) in Sections 3-5 where we relate the CO concentrations to traffic and meteorological variables.

2.1 Analysis of CO-data

The summary statistics and graphical representations of the CO data at the 4 Portland stations and one Eugene station include:

(a) Plots of monthly averages (Figures 2.1a-e): Due to meteorological factors the CO concentrations are seasonal, with high CO concentrations occurring in the winter and low concentrations in the summer. Looking at the concentrations over time we can notice reductions in CO at all 5 stations. These reductions will be quantified in Section 2.2. The monthly averages are also calculated separately for weekdays (Monday through Friday) and weekends (Saturday, Sunday). The weekend averages are considerably lower than the weekday averages (Figures 2.2a-e). This is due to the lower weekend traffic volume.

(b) Composite plots of monthly 25th, 50th, 75th, and 95th percentiles (Figures 2.3a-e): In addition to plots of the monthly means in (a) it is also informative to study the various percentiles of the empirical frequency distribution to see how the observations are distributed within each month. The 50th percentile (or median) is a robust measure of the center of the distribution; the distance between the 25th and 75th percentile is called the interquartile range and provides a measure of the variation in the data. The 95th percentile describes the upper tail of the distribution. Looking at the time series plots of the 95th percentiles one can clearly notice a reduction in the high CO concentrations at all 5 stations.

(c) Two way tables of monthly CO averages and of monthly 95th percentiles (Tables 2.1a-e): Each row consists of monthly means (monthly 95th percentiles) of a particular year; each column consists of means (95th percentiles) for a particular month over different years. The row (column) means and standard deviations are also given. Such representations are useful to discern seasonal and overall trend in the data.

(d) Diurnal diagrams of hourly CO averages, separated according to weekday/weekend and summer (June-September)/winter (November-February)--Figures 2.4a, b and 2.5a, b: The weekday diurnal diagrams (Figures 2.4a, b) are noticeably different from the weekend diurnal patterns (Figures 2.5a, b). This is due to different traffic patterns. The weekday diurnal CO pattern is characterized by two peaks, which correspond to the morning and afternoon rush hour traffic. The weekend CO diagrams typically have only one peak occurring in the afternoon.

The winter and summer CO patterns are similar in shape. However, the winter CO patterns are almost uniformly higher than the ones in the summer. This is readily explained by changes in the meteorology, as explained in Section 2.4.

Looking at the diurnal diagrams over time one can also assess the trend in the CO concentrations, keeping the season and the type of day (weekday/weekend) constant. Decreases at the 4 Portland and the one Eugene stations can be noticed.

(e) Two way tables of monthly averages of hourly CO (Tables 2.2a-e): Each row in such a table expresses the average diurnal CO pattern for a particular month; each column indicates the chronological variation of the pollutant concentration for a particular hour. The entries can also be classified according to the overall percentiles of the monthly hourly averages. The 50th, 75th and 95th percentiles are given at the bottom of the tables. To facilitate the trend analysis we can choose different colors for the 4 ranges (below 50th, between 50th and 75th, between 75th and 95th, above 95th percentile). In Tables 2.3a-e and 2.4a-e, similar monthly averages are given separately for the weekdays and the weekends.

2.2 A preliminary CO trend analysis

We now give a preliminary trend analysis of the CO concentrations based on the CO data alone. Such analysis does not account for possible changes in traffic and the meteorological variables.

At CAMS the CO average for 1970 and 1971 (4.85 $\mu g/m^3$) was reduced to 3.55 $\mu g/m^3$ in 1978-79. This corresponds to a reduction of 26.8 percent, or 3.4 percent a year.

At Hollywood the reduction from 5.7 $\mu g/m^3$ in 1973 to 3.2 $\mu g/m^3$ in 1979 amounted to 43.9 percent, or 7.3 percent a year.

At Lloyd the reduction from 3.0 $\mu g/m^3$ in 1976 to 2.5 $\mu g/m^3$ in 1979 amounted to 16.7 percent, or 5.6 percent a year.

At Alder the reduction from 3.7 $\mu g/m^3$ in 1976 to 2.9 $\mu g/m^3$ in 1979 was 21.6 percent, or 7.2 percent a year.

At Eugene the CO average for 1971-72 (3.14 $\mu g/m^3$) was reduced to 2.72 $\mu g/m^3$ in 1978-79. This is a reduction of 13.3 percent, or 1.9 percent a year. We notice that the reduction at Eugene, which is not affected by the I/M program, is much smaller than the reductions at the Portland stations. The CO receptor in Eugene however was moved in 1975/8. As indicated by Figure 2.1e this probe change led to an increase in the level of the CO concentrations. If the probe change is taken into account as done in Section 4.4, the trend reduction will be larger than the 1.9 percent given above.

2.3 Analysis of traffic data

It was pointed out earlier that hourly traffic counts were only available for the Eugene station at 11th and Willamette and furthermore only for the period 1978/2-1979/4. These traffic counts, which were obtained from the traffic engineer of the city of Eugene, are used in the diurnal models of Section 3. For the Portland CO monitoring stations we could only obtain hourly traffic counts for a few selected days during 1977 and 1979.

The hourly traffic count records, however, were not long enough to be of use in a CO trend assessment. In order to incorporate traffic into the CO trend analysis we used monthly averages of daily traffic counts at state operated traffic counters. While especially in Portland, these counters were not in close proximity to the CO receptors, as a first approximation we assume that these traffic counts are proportional to the traffic at the receptors in downtown Portland and Eugene. Monthly averages of traffic counts at the Franklin station at US 99 Pacific Highway West in Eugene, and at I 80N at 21st Avenue in Portland are listed in Tables 2.5 and 2.6. Time series plots are given in Figures 2.6 and 2.7. A seasonal pattern is apparent, with traffic volumes higher in the summer.

The traffic averages at Eugene and Portland both indicate a temporary reduction in traffic volume during the oil and energy crisis in the fall and winter of 1973. Apart from this temporary reduction the Portland traffic increased from an average of 98000 cars/day in 1970 to 111600 cars/day in 1979. This is an increase of 13 percent, or 1.44 percent a year. At the Eugene station traffic increased at a much slower pace; it grew from an average of 24800 cars/day in 1970 to 26200 cars/day in 1979. This represents an increase of 5.7 percent, or .63 percent a year.

2.4 Analysis of meteorological data

Meteorological variables are important factors affecting CO concentrations. In particular,

(a) wind speed and wind direction affect the transport and diffusion of CO emissions (with low wind speed resulting in high CO levels);

(b) inversion or mixing heights affect the volume of air available for dilution of CO emissions (with low mixing heights, or small volume, leading to high CO levels);

(c) temperature, solar intensity and relative humidity affect the formation of free radicals which in turn can deplete CO concentrations (high levels of these variables are associated with increased numbers of free radicals, and thus low CO);

(d) meteorological variables (such as temperature) influence the efficiency factors of car engines (cold starts leading to higher CO levels).

Thus, one should consider incorporating these variables as exogenous factors in a trend analysis of CO.

In the following discussion we give various graphical representations of wind speed, wind direction, relative humidity, temperature, and precipitation for the Eugene and Portland airport locations (NCC data). In addition we describe hourly wind speed and direction data recorded at the Hughes and at the Federal Building in downtown Portland, and morning and afternoon mixing height at the NCC station at Salem airport. Our analysis includes:

(a) plots of monthly averages;

(b) composite plots of 25th, 50th, 75th and 95th percentiles;

(c) two way tables of monthly averages;

(d) diurnal diagrams;

(e) two way tables of monthly averages of hourly observations;

(f) histograms of wind direction at selected hours during summer and winter periods of 1971;

(g) vector plots of resultant wind at selected hours during summer and winter periods of 1971 and 1976.

2.4.1 Wind speed

Monthly averages of wind speed at the Portland airport, the Eugene airport and the Hughes/Federal building (Portland) are given in Figures 2.8a-c. Comparing the wind speed data at the two Portland sites we find that the Hughes/Federal Building wind speed averages are more than twice as large as the wind speed averages at the airport. There is no good explanation for this difference, except that it could be due to some variable intrinsic to the method of data collection such as the location of the monitor in relation to the building. The wind speed at Eugene airport is slightly lower than the wind speed at the Portland airport.

Looking at the plots over time we notice that over the last 10 years (1970-79) the wind speed patterns at all three locations have stayed roughly constant, and that they exhibit only weak seasonality. A period of exceptionally low wind speed can be noticed in Eugene at the end of 1976. This is also reflected in the CO concentrations which are especially high during the same period (Figure 2.1e).

Apart from the monthly averages of wind speed, we also constructed the monthly 25th, 50th, 75th, and 95th percentiles (Figures 2.9a-c), and the diurnal diagrams of wind speed for the summer and the winter seasons (Figures 2.10a-c). Wind speeds are usually highest during the afternoon hours. Also, the speed in the winter is usually higher than in the summer, except during the late afternoon period where the summer wind speed is highest.

Two way tables of monthly means (Tables 2.7a-c) and two way tables of hourly monthly means (Tables 2.8a-c) are also given.

2.4.2 Wind direction

To represent the distribution of wind direction (WD) we divide the direction 0°-360° (0° is due north; clockwise) into 16 intervals of equal length and calculate the relative frequencies of winds coming from these intervals. The histogram is then plotted on a circle (similar to a wind rose). As illustrations we show such histograms for 1971. For these plots we use hourly wind speed data from the downtown Portland (Hughes building) and Eugene (Oakway Mall) meteorological stations. In order to assess differences according to season and hour of the day, we have given these histograms for summer/winter, and morning (7-9 am)/afternoon (4-6 pm) separately (Figure 2.11).

Wind direction and wind speed can also be represented jointly by plotting the resultant wind vector (WS·sinWD, WS·cosWD) in two dimensional space. The length of the vector represents the speed; the angle represents the direction. Such vector plots are made for the Hughes station in Portland and the Oakway Mall station in Eugene for 1971 and 1976, separated according to season and hour of the day (Figures 2.12a, b).

These plots indicate (i) generally higher wind speeds during the afternoon hours, (ii) large variability in the wind direction, and (iii) only moderate shifts in wind direction due to the hour of the day and the season.

2.4.3 Mixing heights

Monthly averages of morning and afternoon mixing heights at Salem are given in Tables 2.9a, b and are plotted in Figures 2.13a, b. Only data for the period 1970-78 are available.

The afternoon mixing height data show a strong seasonal pattern with high values occurring in the summer and low ones during the winter. No strong seasonal patterns are found in morning mixing height data. During the winter (November-February) the morning mixing heights are usually slightly higher than those in the afternoon. In all other months the afternoon values are much higher, and this is due to the fact that the inversion layer usually breaks in the afternoon.

2.4.4 Relative humidity

Monthly averages (Figures 2.14a, b), composite percentile plots (Figures 2.15a, b), two way tables of monthly averages (Tables 2.10a, b), two way tables of monthly averages of hourly readings (Tables 2.11a, b) and diurnal diagrams (Figures 2.16a, b) of relative humidity at the Portland and the Eugene airport are given. One can notice a strong seasonal pattern, with high relative humidity in winter and low values in the summer. The diurnal diagrams show that relative humidity is lowest during the afternoon; this is especially true for the summer months.

Relative humidity and mixing heights are inversely related. In fact, in a previous study (Ledolter and Tiao (1979a)) we have used relative humidity as a proxy for mixing height data which are difficult to obtain.

Comparing the Portland and Eugene monthly averages we find that, apart from 1979, relative humidity at Eugene is slightly higher than that at Portland.

2.4.5 Precipitation

Monthly frequencies of precipitation of any form (rain, snow, etc.) and intensity (light, moderate, heavy), are calculated for both Portland and Eugene (Tables 2.12a, b) and are plotted in Figures 2.17a, b. As expected, the frequency of precipitation is largest during the winter season. As with all other meteorological variables we notice only little change from one year to the next. The only exception is a very dry winter in 1976/77.

The diurnal patterns of precipitation frequency are given in Figures 2.18a, b. Two way tables of monthly precipitation frequencies according to the hour of day are given in Tables 2.13a, b. The precipitation frequencies exhibit little variability during the day; the winter frequencies are uniformly higher than those in the summer.

2.4.6 Temperature

Monthly temperature averages at Portland and Eugene are given in Tables 2.14a, b. The plots of monthly averages (Figures 2.19a, b), plots of monthly percentiles (Figures 2.20a, b), and the two way tables of monthly averages of hourly temperature (Tables 2.15a, b) illustrate the expected seasonal and diurnal patterns in temperature. We also notice little change in temperature from one year to the next.

3. Diurnal Models of CO

In this and the next two sections, we discuss various models relating CO to exogenous traffic and meteorological variables. The focus of this section is on modelling the diurnal behavior of CO which serves to identify the main factors affecting CO, and thus motivates the trend models discussed in Sections 4 and 5.

As mentioned in the previous section, detailed traffic information, such as hourly traffic counts, was available only for the Eugene station at 11th and Willamette, and only for the period 1978/2 to 1979/4. It is this period which we now use to identify the factors which affect the CO concentrations.

3.1 Formulation of the models

In Figure 3.1 we plot the average hourly weekday and weekend CO concentrations for summer 1978 (June-August). In Figure 3.2 we plot the corresponding hourly traffic averages for this period. We notice from these graphs that CO is essentially proportional to traffic counts, TR, implying a relationship of the form

$$CO_t = \alpha + kTR_t + \varepsilon_t \qquad (3.1)$$

where t stands for hour, ε_t is the error term and α and k are two constants. The CO concentrations, however, also depend on the meteorological variables. In particular CO will vary with wind speed (WS), mixing height (MH) and relative humidity (RH). This is illustrated in Figures 3.3a-c where we plot CO as a function of WS, MH and RH. To keep traffic and seasonal effects constant, we consider the (3-6 pm) weekday period of summer 1978. Notice that CO decreases (diffuses) with increasing wind speed, with increasing mixing height (volume) and with decreasing relative humidity. Relative humidity and mixing heights are in fact highly negatively correlated (see Figure 3.4 which presents a plot of RH against MH for the summer 1978 afternoon period at Eugene airport). The scatterplots in Figures 3.3 and 3.4 were constructed by first grouping the dependent variable y according to non-overlapping classes of the independent variable x, and then plotting the averages of y against the averages of x. The classes of the independent variable were chosen such that each group had the same number of observations. Such a representation is very useful since the large variability in our data would make it difficult to discern the relationship from a scatter plot of the raw data.

Figure 3.4 indicates that relative humidity can be considered a proxy for mixing height. As compared to mixing height, which is available only twice a day, relative humidity is recorded every 3 hours. Furthermore mixing height data are usually difficult to obtain. For these reasons we use relative humidity as an explanatory variable in our diurnal models. Diurnal diagrams for wind speed and relative humidity for summer 1978 are given in Figures 3.5a, b. These hourly averages were obtained by a linear interpolation of the averages which were available for every third hour. Furthermore since there was no reason to distinguish between weekday and weekend we calculated the combined average. Relative humidity decreases during the daytime hours, and is lowest during the early afternoon (3 pm). Wind speed follows an opposite pattern. Carbon monoxide (weekday/weekend), traffic (weekday/weekend), wind speed and relative humidity for the four seasons of the year are given in Figure 3.6. Here we consider spring

(March-May 1978), summer (June-August 1978), fall (September-October 1978) and winter (December-January 1979) separately. CO and the meteorological variables vary from season to season. During the afternoon hours, relative humidity is lowest in summer; wind speed is highest in summer afternoon. Both meteorological variables show little variation in the winter. Traffic counts are very similar for all seasons. The CO concentrations are high during the fall and winter, and low during spring and summer.

Figures 3.1-3.6 suggest the following models relating hourly CO to traffic and the meteorological variables:

$$
\begin{aligned}
&\text{M1:}\quad CO_t = \alpha + \varepsilon_t \\
&\text{M2:}\quad CO_t = \alpha + kTR_t + \varepsilon_t \\
&\text{M3:}\quad CO_t = \alpha + kTR_t/WS_t^{\delta} + \varepsilon_t \\
&\text{M4:}\quad CO_t = (\alpha + kTR_t)/WS_t^{\delta} + \varepsilon_t \\
&\text{M5:}\quad CO_t = \alpha + kTR_tRH_t + \varepsilon_t \\
&\text{M6:}\quad CO_t = (\alpha + kTR_t)RH_t + \varepsilon_t
\end{aligned}
\tag{3.2}
$$

where α, k and δ are constants. Model M1 is given here mainly for comparison to evaluate the model improvement after including traffic and meteorological variables. As mentioned earlier, model M2 expresses CO as a linear function of the traffic TR. Models M3 and M4 take into account the diffusion effect of the wind. In Model M4, the background CO level α is diffused by WS. Models M5 and M6 express the effect of relative humidity on the CO concentrations.

3.2 Fitting results

Each of these models is fitted by least squares to weekday and weekend hourly averages for spring, summer, fall, and winter separately. For models M3 and M4 we had to resort to a nonlinear least squares procedure--see Draper and Smith (1981). Nonlinear least squares routines are readily available in most statistical computer packages. We used the routine ZXSSQ in the IMSL program library; this program is based on the Marquardt-Levenberg algorithm for locating the minimum of a sum of squares corresponding to a model which is nonlinear in the parameters.

The results in Table 3.1 show the root mean square errors $\hat{\sigma}$ for the fitted models. The mean square error is given by $\hat{\sigma}^2 = \frac{1}{n-p} \sum_{t=1}^{n} (CO_t - \hat{CO}_t)^2$, where $\hat{CO}_t$ is the fitted value, p is the number of estimated parameters and n = 24 is the number of data points corresponding to the hours of the day. Table 3.1 shows that traffic is the most important variable in explaining CO, leading to a considerable reduction in the variation. In addition, the inclusion of wind speed (or relative humidity) leads in all cases except one (summer weekdays) to a further reduction in the variation. From the overall results of Table 3.1 we can conclude that models M3 and M4 yield the best fit.

Detailed results on parameter estimates and their standard errors for the summer 1978 period are given in Table 3.2 (weekdays) and Table 3.3 (weekends). The best model is M4

$$CO_t = (\alpha + kTR_t)/WS_t^{\delta} + \varepsilon_t. \qquad (3.3)$$

For weekdays this model leads to an 85.5 percent reduction in the standard deviation (root mean square error) as compared to model M1 (or R^2 = .98). For the weekend period the reduction in the root mean square error is 79.7 percent (or R^2 = .96). Note that the parameter estimates $\hat{\alpha}$, $\hat{k}$ and $\hat{\delta}$ are very similar for both weekday and weekend models.

In Figures 3.7a, b we compare the observed and the predicted hourly CO averages for the summer 1978 weekday and weekend. The model $CO_t = (\alpha + kTR_t)/WS_t^{\delta}$ leads to an excellent representation of the CO patterns. The model is capable of tracking both weekday and weekend CO patterns; also the CO peak hours are modelled extremely well.

Various other models have been tried, including ones which use discounted traffic (Tiao, Box and Hamming (1975)), and both wind speed and relative humidity. These models, however, did not lead to better fits.

Apart from learning which variables affect the CO concentrations, one can use these models for a trend analysis provided detailed information on traffic is available. If hourly traffic counts for the period prior to 1978/2 were available, one could calculate hourly weekday/weekend traffic averages for previous years, separated by season to adjust for seasonal differences. Then models of the form

$$CO_t^{(i,s)} = (\alpha + k_{(i,s)}TR_t^{(i,s)})/(WS_t^{(i,s)})^{\delta} + \varepsilon_t^{(i,s)}, \quad (3.4)$$

could be fitted to averages of CO, traffic, wind speed and relative humidity for season s of year i. The parameters $k_{(i,s)}$ express the CO emission factor of season s in year i, after having accounted for possible changes in traffic and meteorological variables. Such an approach was used by Tiao and Hillmer (1978), Ledolter et al. (1978) and Ledolter and Tiao (1979b).

In the present study, since traffic data for Eugene and Portland are available only at the monthly level prior to 1978, this approach cannot be used.

4. Time Series Intervention Models

In this section, we consider time series models relating monthly means of CO at the Portland and Eugene sites to traffic and meteorological variables. The objective is to assess the trends in CO and the effect of the I/M program.

4.1 Formulation of the trend models

The reduction in the CO concentrations which was reported in the preliminary trend analysis of Section 2 can be attributed to several factors: (1) Federal new car CO emission standards: Over the last 10 years the federal CO emission standards became increasingly more stringent. For example, they limit CO emissions to 34g/travelled mile for 1970/71 model year cars; to 28g/mile for 1972-74 model year cars, and to 15g/mile for 1975-77 model years cars (as based on the current procedure). The effect of these changes in the standards on the CO emissions in month t can be approximately modelled as

$$k_t = ke^{\beta t} \qquad (4.1)$$

where β is a parameter controlling the reduction in the CO emissions. We would expect β to be of the order -.005; such a value would translate into a monthly CO trend reduction of $100(1 - e^{\beta}) = .5$ percent. On an annual basis this would correspond to a yearly reduction of $100(1 - e^{12\beta})$ $= 5.8$ percent. A graph of k_t for $\beta = -.005$ and $t = 1, \ldots, 120$ (corresponding to the period 1970/1-1979/12 under study) is given in Figure 4.1. Since β is expected to be small, the term $ke^{\beta t}$ can also be approximated by a first order expansion[+]

[+]The linear expansion is presented as an alternative model for illustrative purposes here and in equation (4.11) and Table 4.5. However, the exponential form (4.1) is relied upon for the calculation of emission benefit.

$$k_t = k(1 + \beta t). \tag{4.2}$$

A plot of this function for $\beta = -.005$ is given in Figure 4.2. Over the range of t (1, ..., 120), the functions (4.1) and (4.2) differ only slightly.

(2) The Portland I/M program: The Portland car inspection and maintenance program is expected to have an additional impact on the CO emissions. Previous studies by Becker and Rutherford (1979) and Rutherford and Waring (1980) show that the effect of car maintenance on CO emissions lasts for approximately 9 to 12 months after maintenance, in spite of the fact that emissions from repaired vehicles deteriorate after corrective action has been taken. Thus instead of using the monthly inspection numbers I/M_t (which are given in Table 1.2), we use the discounted (total) number of car inspections

$$I/M_t^d = \sum_{j\geq 0} d^j I/M_{t-j} = I/M_t + dI/M_{t-1} + d^2 I/M_{t-2} + \ldots \tag{4.3}$$

in our analysis. The discounting factor d has to be between 0 and 1. A value $d = 0$ describes the situation where the effect of the I/M program is only immediate and loses its effect after the first month. A value $d = 1$ indicates that the effect of car maintenance is permanent, without ever deteriorating again. A value of d between 0 and 1 describes the immediate impact and the deterioration after corrective maintenance. A value $d = .7$ was chosen in our analysis. For this value the residual influence of inspections after 6 months amounts to 12 percent and the influence after 9 months is about 4 percent.

Combining the effect of the federal CO emission standards in (4.1) with the effect due to the I/M program in (4.3), we can model the CO emissions as

$$k_t = ke^{\beta t}(1 + \theta I/M_t^d). \tag{4.4}$$

The factor $100 \cdot \theta \cdot I/M_t^d$ measures the additional percent benefit due to the car inspection and maintenance program. Figure 4.3 shows a graph of k_t for $\beta = -.005$ and $\theta = -.001$. To be able to work with coefficients of comparable size we have defined I/M_t as the monthly number of car inspections (in units of 1000 cars). From Table 1.2 we find that the monthly average of the 1976-1979 car inspections is $\overline{I/M} = 34$. For d = .7, the average of the discounted number of inspections is $\overline{I/M}^d = \overline{I/M}/(1 - d) \simeq 113$. Thus for $\theta = -.001$ the average additional benefit due to I/M amounts to 11.3 percent.

The CO concentrations recorded at the CO receptors are functions of the CO emissions, which are modelled in equation (4.4). In modelling the CO concentrations however, one has to take account of additional factors such as traffic changes, changes in the meteorological variables, seasonality in the CO concentrations, and probe changes which affect the distance of the receptors from the source traffic. We emphasize the distinction between the reductions in CO concentrations (ambient CO levels) and the reductions in CO concentrations after adjusting for changes in traffic, meteorological variables and probe locations. The adjusted concentrations are then proportional to the CO emissions.

(3) Traffic: It was discussed in Section 3 that CO concentrations are essentially proportional to traffic:

$$CO_t \propto k_t TR_t. \tag{4.5}$$

The proportionality constant k_t is the emission constant which is modelled in (4.4).

(4) Meteorological variables: Several functional forms relating CO concentrations to meteorological variables were considered in Section 3. These models were of the form

$$CO_t \propto kTR_t f(WS_t, MH_t, RH_t). \tag{4.6}$$

Since mixing height data were not available for 1979, the last year of our study, we examined models which incorporate relative humidity and/or wind speed. Of these models we found that models of the form

$$CO_t = k_t TR_t RH_t = ke^{\beta t}(1 + \theta I/M_t^d) TR_t RH_t \qquad (4.7)$$

led to a good description of the data.

(5) Seasonality: We saw earlier in Figure 2.1 that CO concentrations exhibit a strong seasonal pattern, with high concentrations in the winter and low values in the summer. This seasonal variation can be partially explained to a large extent by changes in meteorological variables. To adjust for any residual seasonal pattern not explained by relative humidity in model (4.7), we introduce 12 monthly coefficients k_s ($s = 1, 2, \ldots, 12$) and consider a model of the form

$$CO_t = k_s e^{\beta t}(1 + \theta I/M_t^d) TR_t RH_t. \qquad (4.8)$$

(6) Noise term: The right hand side of model (4.8) specifies the predictable component of our model. Since the data on CO, TR and RH are observed in the form of time series, the noise or error component n_t (which is the part not explained by the model) is likely to be serially correlated. We characterize the serial correlation by a third order autoregressive model. This leads to the model

$$CO_t = k_s e^{\beta t}(1 + \theta I/M_t^d) TR_t RH_t + n_t, \qquad (4.9)$$

with $$n_t = \phi_1 n_{t-1} + \phi_2 n_{t-2} + \phi_3 n_{t-3} + \varepsilon_t$$

where ϕ_1, ϕ_2 and ϕ_3 are autoregressive parameters and the ε_t's are independent random variables with mean zero and constant variance σ^2. For further discussion of time series models, see Box and Jenkins (1970).

(7) Probe changes and other interventions: There have been several changes of the location of the CO receptors at some of the sites considered, thus affecting

the distance of the receptor from the traffic source. External interventions such as abrupt changes in local traffic patterns due to construction also occurred. To adjust for the effects of these changes we consider models of the form

$$CO_t = k_s e^{\beta t}(1 + \theta I/M_t^d)(1 + \sum_{i=1}^{p} \alpha_i IND_{ti})TR_t RH_t + n_t \qquad (4.10)$$

where the variables IND_{ti} are indicator variables taking a value of 0 or 1, and the α_i's are constants.

At CAMS, for example, the probe was moved in 1978/3; thus $IND_{t1} = 1$ for $t \geq 1978/3$ and 0 otherwise. Also, street construction disrupted traffic during most of 1976. Thus the indicator variable IND_{t2} was chosen such that $IND_{t2} = 1$ for all months in 1976 ($1976/1 \leq t \leq 1976/12$), and 0 otherwise. The effects of these two changes can be seen from the monthly CO averages at CAMS (Figure 2.1a) which show corresponding reductions in CO. Note that since these reductions occurred in even numbered years where most of the cars were inspected (1976, 1978), there is a partial confounding of the effects of the I/M program and those of the probe change and traffic disruption. Including the factor $(1 + \alpha_1 IND_{t1} + \alpha_2 IND_{t2})$ in the model will therefore lessen the significance of the I/M program.

At Eugene, the probe was moved in 1975/8. Prior to this move the probe was out of operation for a period of 6 months (1978/3-8). The plot of the CO averages in Figure 2.1e shows that the CO reduction at Eugene is rather small if the probe change is ignored (1.9 percent, as indicated in Section 2). However, by taking the effect of the probe change into account, one would expect to find a larger trend reduction.

We note that despite the increase in traffic at both Portland and Eugene, we have observed reductions in the CO concentrations at all 5 locations.

After adjusting for the traffic increase, the reductions in the CO emissions (expressed by the parameter β in models (4.9) and (4.10)) will be larger than the corresponding reductions in the CO concentrations.

An alternative model

By making a first order linear expansion of the first term on the right hand side of (4.10), we arrive at the alternative linear form

$$CO_t = k_s(1 + \beta t + \theta I/M_t^d + \sum_{i=1}^{p} \alpha_i IND_{ti})TR_t RH_t + n_t \qquad (4.11)$$

where $$n_t = \phi_1 n_{t-1} + \phi_2 n_{t-2} + \phi_3 n_{t-3} + \varepsilon_t.$$

Since the parameters β, θ and α are all rather small numbers the models in (4.10) and (4.11) are quite similar.

4.2 Model estimation

The parameters in models (4.10) and (4.11) are fitted to monthly averages of CO, TR and RH using a nonlinear least squares computer program (ZXSSQ of the IMSL library). Fitting the model to Eugene where several months of data were completely missing involved a two stage estimation approach. At the first stage the model was fitted with independent errors ($n_t = \varepsilon_t$) and the missing observations were replaced by their fitted values. At the second stage the complete model with the autoregressive error terms was fitted to the data.

The estimation results for the 5 stations and their interpretation follow. The locations with the longest data records--CAMS in Portland, and the 11th and Willamette station in Eugene, which serves as a control site--are discussed first.

4.3 Trend analysis for CAMS

The parameter estimates for models (4.9) and (4.10) are given at the bottom of Table 4.1 (models C7, C8), and in more detail in Table 4.2 (C7) and Table 4.3 (C8). For the model C7 the estimate for the trend parameter is $\hat{\beta} = -.00409$, which implies a trend reduction due to the more stringent federal CO new car emission standards of $100(1 - e^{12\hat{\beta}}) = 4.8$ percent per year. The estimate for θ is $\hat{\theta} = -.00106$; this indicates that on the average the I/M program has led to an additional annual percentage reduction of approximately 12 percent (i.e., $100 \cdot \hat{\theta} \cdot \overline{I/M}^d = 100 \times (-.00106) \times 113 = -12.$). The standard error in parentheses indicates that this I/M effect is statistically significant at the 5 percent level.

Analysis of the I/M benefits

Ignoring the seasonal effects, a plot of the trend in the CO emissions predicted by the estimated model is given in Figure 4.4. The area between the curves $e^{\hat{\beta}t}$ and $e^{\hat{\beta}t}(1 + \hat{\theta} I/M_t^d)$ represents the additional benefit due to the I/M program. The annual percentage benefits due to I/M are given in Table 4.4. Also given in the same table are corresponding estimates of the percentage mobile source emission benefit calculated by EPA using a Portland-specific version of its MOBILE 2 model (James A. Rutherford, personal communication).

In model C8 we have introduced parameters to account for the probe change in 1978/3 (IND_{t1}) and for the traffic disruption in 1976 (IND_{t2}). It was discussed earlier that the introduction of these interventions, which occurred precisely at times where the I/M program had its maximum impact (even numbered years), will lead to a partial confounding of the effects. This is reflected by the estimation results for model C8 in Tables 4.1, 4.3 and 4.4; the effect of the I/M program is approximately cut in half, leading to an average benefit of 6.1 percent (as compared to 12 percent before). The area between the curves $e^{\beta t}(1 + \alpha_1 IND_{t1} + \alpha_2 IND_{t2})$ and $e^{\beta t}(1 + \theta I/M_t^d) \times (1 + \alpha_1 IND_{t1} + \alpha_2 IND_{t2})$ in Figure 4.5 expresses the additional benefit due to I/M.

Summarizing the results of models C7 and C8, we can conclude that at CAMS there was evidence of additional benefits due to I/M. Our estimate at this point of our analysis is that the average percentage benefit is somewhere between 6 and 12 percent.

We also estimated the linearized model (4.11) in two versions corresponding to C7 and C8. The main results given in Table 4.5 show that, as expected, the linearized versions lead to essentially the same conclusions concerning the trend in the CO emissions and the benefit due to the I/M program.

<u>Additional models fitted</u>

Models C5 and C6 in Table 4.1 use only traffic as an explanatory variable. Comparing the standard deviations of the errors, $\hat{\sigma}$, we find that the failure to include meteorological variables (such as relative humidity) will increase $\hat{\sigma}$ by approximately 17 percent (from .504 in C7 to .585 in C5). This indicates that relative humidity is an important variable in our trend model.

Models C3 and C4 represent CO averages as functions of time only (thus omitting both traffic and relative humidity). We notice that in these models the estimates of β, which now represent the reduction <u>in the CO concentrations</u> (unadjusted for traffic and meteorological changes) and <u>not in the emissions</u> as in the other models, are smaller. For example $\hat{\beta} = -.0027$ corresponds to an annual trend reduction of 3.2 percent. This compares well with the 3.4 percent CO reduction estimate of Section 2.

Models C1 and C2 are models in which the CO averages are represented by 12 seasonal means and errors which follow a third order autoregressive model. Comparisons of their standard errors with those of C7 and C8 indicate that time, traffic and relative humidity are important variables affecting CO concentrations.

4.4 Trend analysis for Eugene

The model (4.10) is also fitted to the Eugene CO monthly averages. This station serves as a control site, since the I/M program does not extend beyond Portland. In estimating the model,

$$CO_t = k_s e^{\beta t}(1 + \theta I/M_t^d)(1 + \alpha IND_t) TR_t RH_t + n_t, \qquad (4.12)$$

we use the Portland I/M inspection volumes. Since the I/M program is restricted to the Portland area, we would expect that only a small fraction of the inspected cars would ever be in Eugene. Thus its impact should be negligible and the coefficient θ should be zero. The indicator IND_t, which takes on 1 for t > 1976/8 and 0 otherwise was introduced to model the effect of the probe change in 1976/8.

The main fitting results in Table 4.6 show that with or without the adjustment for the probe change, there is no evidence of an effect due to the I/M program. The parameter estimates of θ in models E3 and E4 are clearly insignificant.

Model E3 indicates that the probe change has had a positive effect on the CO concentrations. After adjusting for the effect of the probe change, we find that the estimate of β in model E3 is $\hat{\beta}$ = -.00465. This corresponds to an annual 5.4 percent (± 3.4) trend reduction in CO emissions. This estimate is comparable to the trend reduction at CAMS apart from the effect of the I/M program.

The standard error of the trend estimate $\hat{\beta}$ is quite large, and $\hat{\beta}$ is also correlated with $\hat{\alpha}$ (correlation of -.84). Ignoring the probe change would lead to a considerably lower trend reduction. The estimate $\hat{\beta}$ = -.00201 in E1 corresponds to an annual reduction of 2.4 percent and, after adjusting for the traffic increase, is consistent with the reduction of CO concentrations given in Section 2.

4.5 Trend analysis for Hollywood

The model $CO_t = k_s e^{\beta t}(1 + \theta I/M_t^d)(1 + \alpha IND_t)G_t + n_t$ for

(i) $G_t = 1$ (trend model)

(ii) $G_t = TR_t$ (model incorporating traffic)

(iii) $G_t = TR_t RH_t$ (model incorporating traffic and relative humidity)

was fitted to monthly CO averages at Hollywood (1973/1-1979/12). An indicator variable (IND_t = 1 for t ≥ 1975/10 and 0 otherwise) was included to account for the probe change in 1975/10. The results in Table 4.7 show that

(i) the annual trend reduction in the CO concentrations due to the federal standards is approximately 5.0 percent (average β for models H1-H3 is $\hat{\beta}$ = -.0043);

(ii) after incorporating traffic and relative humidity we find that the annual trend reduction in the CO emissions is approximately 7.5 percent (average β for models H4-H9 is $\hat{\beta}$ = -.0065);

(iii) looking at the estimate of θ we find no evidence that the I/M program has led to an additional improvement.

4.6 Trend analysis for Alder and Lloyd

CO records for Alder (1975/9-1979/12) and Lloyd (1975/11-1979/12) are relatively short, and only few observations are available for estimation (52 for Alder, 50 for Lloyd). Thus our models have to be simplified. Instead of fitting models with 12 seasonal (monthly) coefficients k_s, we fit models of the form

$$CO_t = k_s e^{\beta t}(1 + \theta I/M_t^d)TR_t RH_t + n_t$$

with 4 seasonal (quarterly) constants; k_1 for DJF, k_2 for MAM, k_3 for JJA, k_4 for SON.

The fitting results are given in Table 4.8. Due to the short data record, we find large correlations among the parameter estimates, especially among $\hat{k}_s$ and $\hat{\beta}$ (negatively correlated). Looking at the estimate $\hat{\theta}$, we find no evidence of a significant additional benefit due to the I/M program.

4.7 Summary of the trend analysis of monthly CO averages

At the locations with the longest data records (CAMS and the control site at Eugene) there is empirical evidence to indicate a real effect on CO emissions which can be associated with the I/M program. The estimated benefit of I/M lies between 6-12 percent.

At the other Portland stations we could not find a significant benefit. However, the results from our analysis have to be interpreted with caution, since at some of these stations we did not have long enough data records to establish a good estimate of the pre I/M trend.

5. Regression Trend Models for Hourly CO Concentrations During Peak Hours

The trend models in Section 4 were fitted to monthly averages of all hourly readings. In this section we analyze CO concentrations during peak hours, and consider the morning (6-9 am) and afternoon (3-6 pm) periods separately. The objective is to assess the trend in the CO concentrations during these peak periods.

In this trend analysis we consider daily weekday morning (afternoon) CO concentrations. Weekday (Monday-Friday) observations are chosen to keep traffic constant. Furthermore to block out seasonality we consider the summer (June-September) and winter (November-February) periods separately.

To calculate daily morning (afternoon) CO concentrations we average the hourly observations over the 6-9 am (3-6 pm) periods. To calculate morning (afternoon) wind speed, wind direction, temperature and relative humidity, we average the 6 and 9 am (3 and 6 pm) observations. Precipitation is in the form of an indicator variable (0 if no rain during the 3 hour period; 1 if rain). Since mixing height at Salem is only recorded twice a day (morning/afternoon), no averaging is necessary.

The model for the CO concentrations

$$CO_t = \text{trend}_t + g(\text{met. variables}) + \varepsilon_t, \qquad (5.1)$$

where t stands for day, consists of two parts: a trend component which models the reduction in CO through time and a component g(met. variables) which models the relationship between CO concentrations and the meteorologica variables (wind speed, wind direction, temperature, relative humidity, mixing height, and precipitation).

5.1 Meteorological variables

The scatter plots in Figures 5.1a-f illustrate the relationship between CO and the meteorological variables. To create these scatter plots we used the same procedure as that in the construction of Figures 3.3 and 3.4. The scatter plots show:

(i) CO decreases with increasing wind speed WS; as in Ledolter and Tiao (1979a), the relationship can be approximated by a model of the form

$$CO \propto \beta_1 WS^{-1} + \beta_2 WS^{-2},$$

(ii) CO changes with wind direction. One could represent this relationship with indicator variables representing the quadrants of wind direction. Instead, we model the relationship with a first order harmonics

$$CO \propto A \sin (WD - \phi) = \beta_3 \cos WD + \beta_4 \sin WD$$

where A is the amplitude and ϕ is the phase angle ($\beta_3 = -A \sin \phi$, $\beta_4 = A \cos \phi$). This representation is more parsimonious (uses fewer parameters) and models the relationship with a smooth function.

(iii) The relationships between CO and temperature, relative humidity and mixing height are approximately linear; $CO \propto \beta_5 Temp$; $CO \propto \beta_6 RH$; $CO \propto \beta_7 MH$. Since mixing height data was not available for the last year, 1979, of our study, we dropped MH from our analysis and used relative humidity as a proxy variable (Figure 5.1f indicates a strong inverse relationship between RH and MH).

Combining (i)-(iii) we model the relationship between the CO concentrations and the meteorological variables as

$$g(\text{met. variables}) \propto \beta_1 WS^{-1} + \beta_2 WS^{-2} + \beta_3 \cos WD + \beta_4 \sin WD + \beta_5 Temp + \beta_6 RH + \beta_7 Precip. \tag{5.2}$$

5.2 Trend component

Our first objective is to derive yearly trend estimates for the CO concentrations after allowing for the effects of the meteorological variables. We introduce dummy variables to estimate the yearly effects, as compared to a specified base period. To be able to compare CAMS and Eugene directly we chose the base period to be 1971 (summer 1971 for summer regressions; winter 1971/72 for winter regressions). The yearly trend model takes the form

$$\text{trend} = \alpha_0 + \sum_{i=1}^{p} \alpha_i X_i \tag{5.3}$$

where $X_i = 1$ for summer 1971 + i (winter 1971 + i/72 + i) and 0 otherwise. The parameter α_i expresses the change in the CO concentrations from 1971 to 1971 + i. For the summer regressions at CAMS and Eugene we use $p = 8$ indicator variables ($p = 7$ for winter). For the other stations the base periods in the trend comparison are: Hollywood (summer 1973; winter 1973/74); Alder (summer 1976; winter 1975/76); Lloyd (summer 1976; winter 1975/76).

5.3 Regression trend model

Combining (5.2) and (5.3) our model for daily morning (afternoon) CO concentrations can be written as

$$CO_t = \alpha_0 + \sum_{i=1}^{p} \alpha_i X_{it} + \beta_1 WS_t^{-1} + \beta_2 WS_t^{-2} + \beta_3 \cos WD_t + \beta_4 \sin WD_t$$
$$+ \beta_5 Temp_t + \beta_6 RH_t + \beta_7 Precip_t + \varepsilon_t \quad (5.4)$$

where t stands for day, and ε_t is the error term assumed independent across days with zero mean and variance σ^2. The model was fitted by least squares to morning (6-9 am)/afternoon (3-6 pm) and summer (June-September)/winter (November-February) data separately. Meteorological data from the NCC site at the Portland airport were used for the Portland locations, except that at CAMS and Alder (downtown locations) wind speed and wind direction data from the Hughes (Federal) Building were employed. For Eugene we used the meteorological data recorded at the Eugene airport.

The regression results for the 5 stations are given in Table 5.1a (summer) and Table 5.1b (winter). We also list the standard deviation of the data ($\hat{\sigma}_{obs}$) and the standard deviation of the errors after filtering the regression model ($\hat{\sigma}_{model}$). The reduction in the standard deviations expresses the explanatory power of the trend and meteorological variables. The results show that on the average reduction in the standard deviations is approximately 16 percent. This corresponds to $R^2 = .30$, which indicates that about 30 percent of the variation is explained by our regression model. Air pollutant concentrations are highly variable; thus realistically higher reduction could not be expected.

Our main interest is in the estimation of the parameters α_i, since they express the trend reductions in the CO concentrations. These trend reduction estimates are adjusted for possible changes in the meteorological variables. The trend estimates are plotted in Figure 5.2a (summer) and

Figure 5.2b (winter). We make the following observations.

(i) For both seasons and both day periods the CO concentrations at CAMS have clearly decreased.

(ii) The trend estimates at Eugene show considerably less evidence of a reduction. During the afternoon the CO concentrations have actually increased, as evidenced by positive α estimates for most of the years considered. During the morning period only small reductions can be noticed.

(iii) The CO concentrations at Hollywood, Alder and Lloyd have steadily decreased, especially during the summer periods.

5.4 A model for the trend

The trend indicators α_i are affected by changes in traffic volume, the progressively more stringent federal CO emission standards, the Portland I/M program, the various probe changes, and other interventions. A simple model which expresses the trend as function of these variables is given by

$$\text{trend}_t = \alpha_0 + \alpha_1 TR_t + \alpha_2 TR_t I_t + \alpha_3 TR_t I/M_t^d + \alpha_4 IND_t. \quad (5.5)$$

Combining this trend model with the meteorological component g(met. variables) in (5.2) leads to the model

$$\begin{aligned} CO_t = {} & \alpha_0 + \alpha_1 TR_t + \alpha_2 TR_t I_t + \alpha_3 TR_t I/M_t^d + \alpha_4 IND_t \\ & + \beta_1 WS_t^{-1} + \beta_2 WS_t^{-2} + \beta_3 \cos WD_t + \beta_4 \sin WD_t + \beta_5 Temp_t \\ & + \beta_6 RH_t + \beta_7 Precip_t + \varepsilon_t. \quad (5.6) \end{aligned}$$

Daily morning (afternoon) traffic counts were not available for our analysis.

Also monthly averages broken down by the hour of day were not available. The only observations available were monthly average daily traffic counts. From these averages we calculated traffic indicators for each season of each year considered. As an example, for Portland sites, the summer 1979 traffic indicator is given by (109.2 + 105.2 + 108.4 + 106.4)/4 = 107.3 (see Table 2.5) and is assumed the same for each weekday morning (afternoon) period in that season. Our analysis thus assumes that the actual morning/afternoon averages are proportional to the overall daily traffic averages.

The variable I_t models the linear time trend in the CO concentrations. It takes on a value of i for all days in season 1970 + i (It is 1 for days in 1971, 2 for days in 1972, etc.).

The variable I/M_t^d represents the discounted total of monthly car inspections. As in Section 4 we choose d = .7 as the discount coefficient. I/M_t^d stays constant for all observations during that month. For example for all observations in June 1979 I/M_t^d is given by $(20.57 + (.7)21.87 + (.7)^2 20.71 + \ldots)$--see Table 1.2.

The indicators IND_t are chosen to model the effect of probe changes and other interventions. At CAMS an indicator is introduced to model the traffic disruption in 1976; at Eugene the indicator adjusts for the probe change in 1975/8.

The model in (5.6) is fitted to CAMS and Eugene; the results are given in Tables 5.2a, b.

5.5 Analysis of the fitting results for the trend model (5.6)

From the estimates of α_2 and α_3 we calculate the average annual trend reductions and the additional percentage benefits due to the I/M program. These results are given in Table 5.3a (CAMS) and Table 5.3b (Eugene).

As an illustration of the calculation of Tables 5.3a, b, consider the CAMS summer am regression without the indicator for the traffic disruption in 1976. From the estimate $\hat{\alpha}_2 = -.035$, we calculate the average annual trend reduction $\hat{\alpha}_2 \cdot TR = -.035 \times 101 = -3.53$ where the TR = 101 is the summer traffic average obtained from Table 2.5. Compared with the CAMS summer am CO average of 40(in units of 10 $\mu g/m^3$), this corresponds to a $100 \times (-3.53)/40 = -8.8$ percent trend reduction per year. Similarly, the estimate $\hat{\alpha}_3 = -.0006$ is used to calculate the average additional I/M benefit. Specifically, $\hat{\alpha}_3 \times TR \times \overline{I/M}^d = -.0006 \times 101 \times 113 = -6.85$. Compared with the CO average of 40, this represents an estimated additional benefit of $100 \times (-6.85)/40 = -17.1$ percent.

The remaining entries in Tables 5.3a, b are obtained in a similar manner. We have used (i) the CAMS traffic averages of 101 for summer and 91.9 for winter, (ii) the Eugene traffic averages of 24.0 for summer and 22.7 for winter, and (iii) the CO averages for CAMS and Eugene given in Table 5.4. Standard errors of the estimated annual trend reductions and benefits due to I/M are given in the parentheses.

The results in Table 5.3a show that at CAMS, when averaged over the two seasons and the two periods of the day, the additional benefit of I/M is estimated at 15.1% without, and at 8.3% with indicator for the 1976 traffic disruption. These reductions are in good agreement with the results in Section 4.3 corresponding to the models C7 and C8 in Tables 4.2 and 4.3 using monthly CO averages (12% without and 6.1% with indicators for traffic disruption and a probe change). Table 5.3a also indicates that the I/M program's impact is especially felt during the summer periods.

With regard to the annual trend reductions, the average reduction of 3.9% per year at Eugene in Table 5.3b is fairly close to the estimated 5.4% per year obtained from modelling monthly CO averages as discussed in Section 4.4. At CAMS, Table 5.3a shows that the estimated annual trend reductions during the peak hours (8.1%-9.5%) are larger than the reductions (4.8%-5%) from monthly averages presented earlier in Section 4.3.

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Table 1.1

Yearly number of car inspections, number of rejections and failure rates--Portland I/M program (mandatory since July 1975)

	number of inspections	number of rejections	rejection rate
1974	23478	7909	33.7
1975	155475	46113	29.7
1976	589405	137419	23.3
1977	184524	41153	22.3
1978	577022	129302	22.4
1979	287518	59886	20.8

Table 1.2

Monthly car inspections--Portland I/M program
(mandatory since July 1975)

Month	Year				
	1975	1976	1977	1978	1979
January	7671	54566	24367	45170	29775
February	8788	45586	18057	47930	27457
March	17174	55211	17920	57796	32348
April	16365	47744	13383	48985	20711
May	14911	49116	11449	46310	21869
June	16728	49466	12074	51704	20570
July	6535	50046	11630	40266	19975
August	7672	48960	10578	58723	21966
September	6650	58233	10290	56221	19420
October	8078	55929	13740	54478	23214
November	15611	42152	17868	39681	20908
December	29792	32396	23168	29758	29305
Total	155475	589405	184524	577022	287518

Table 2.1(a)

Two way tables of monthly CO averages and of monthly 95th percentiles--CAMS

YR	1	2	3	4	5	6	7	8	9	10	11	12	AVE	SE
70	68	57	47	42	30	32	22	28	41	49	59	73	46	15.6
71	66	63	52	45	28	40	29	34	48	59	76	69	51	15.4
72	60	64	64	53	35	39	33	32	51	53	79	68	53	14.6
73	68	61	55	39	38	41	29	36	48	62	68	74	52	14.3
74	50	57	51	42	36	27	27	28	31	53	59	53	43	11.9
75	47	43	31	27	24	24	16	29	25	56	56	45	35	12.9
76	46	32	29	26	19	19	16	27	29	46	44	61	33	13.0
77	49	49	39	34	37	23	19	30	47	52	49	56	40	11.4
78	66	42	38	34	25	29	17	29	41	40	50	45	38	12.2
79	41	50	32	30	23	19	18	20	31	42	40	52	33	11.4
AVE	56	52	44	38	30	29	23	29	39	51	58	60		
SE	10.0	9.9	11.1	8.1	6.4	8.0	6.0	4.1	4.0	6.7	12.4	10.4		

(monthly averages)

YR	1	2	3	4	5	6	7	8	9	10	11	12	AVE	SE
70	172	138	126	92	60	92	69	92	115	126	161	184	121	35.9
71	161	161	126	126	92	115	92	103	126	161	184	172	135	30.5
72	138	138	150	115	92	104	104	92	138	150	165	184	133	30.7
73	173	150	138	92	92	104	81	115	127	138	161	184	130	32.2
74	127	127	115	115	92	81	81	92	92	150	150	127	112	23.6
75	127	115	92	80	69	92	58	103	69	149	161	103	102	30.7
76	115	92	69	69	58	69	58	80	69	115	115	149	88	27.7
77	126	115	80	80	80	69	58	80	115	138	126	126	99	26.2
78	126	92	103	92	69	69	46	30	92	103	115	103	91	21.1
79	103	103	80	69	63	50	46	57	80	98	94	138	82	25.7
AVE	137	123	108	93	79	85	69	89	102	133	145	147		
SE	22.8	27.6	25.9	18.8	12.5	19.3	18.6	15.4	23.9	20.4	19.5	10.9		

(95th percentiles)

Table 2.1(b)

Two way tables of monthly CO averages and of monthly 95th percentiles--Hollywood

YR	1	2	3	4	5	6	7	8	9	10	11	12	AVE	SE
70	...	...	...	...	...	...	...	...	...	...	...	...	...	.0
71	...	...	...	...	...	...	...	...	...	...	...	...	...	.0
72	...	...	...	...	...	...	...	...	...	...	...	...	...	.0
73	73	76	62	45	49	41	36	53	61	63	61	62	57	11.7
74	35	47	43	36	32	22	31	35	42	65	63	56	42	12.7
75	51	50	41	36	31	25	22	23	34	48	46	44	38	10.2
76	38	30	31	32	22	22	22	30	32	43	56	60	35	12.0
77	61	47	33	34	28	23	20	30	33	50	51	46	38	12.1
78	56	51	48	30	26	27	25	31	39	42	52	46	39	10.8
79	43	43	36	29	20	23	19	25	33	36	39	40	32	8.4
AVE	51	49	42	35	30	26	25	32	39	50	53	51		
SE	12.5	12.6	9.8	5.0	8.9	6.3	5.8	9.2	9.6	10.0	7.8	8.0		

(monthly averages)

YR	1	2	3	4	5	6	7	8	9	10	11	12	AVE	SE
70	...	...	...	...	...	...	...	...	...	...	...	...	...	.0
71	...	...	...	...	...	...	...	...	...	...	...	...	...	.0
72	...	...	...	...	...	...	...	...	...	...	...	...	...	.0
73	194	183	149	114	119	103	92	137	138	161	161	173	143	31.3
74	92	127	104	104	81	58	69	81	115	173	161	161	111	36.5
75	138	138	115	80	69	69	58	58	80	126	126	115	98	30.1
76	103	80	69	80	58	58	58	69	80	103	138	126	85	25.7
77	138	115	69	80	58	46	46	69	80	126	138	138	92	35.1
78	126	115	126	69	69	58	58	69	92	92	126	126	94	27.4
79	126	103	92	69	46	46	45	57	70	93	106	103	80	26.5
AVE	131	123	103	85	71	63	61	77	94	125	137	135		
SE	30.3	29.8	27.3	16.0	20.4	18.1	14.8	25.5	22.5	29.8	18.3	23.0		

(95th percentiles)

Table 2.1(c)

Two way tables of monthly CO averages and of monthly 95th percentiles--Alder

YR	1	2	3	4	5	6	7	8	9	10	11	12	AVE	SE
70	...	...	...	...	...	...	...	...	...	...	...	...	...	.0
71	...	...	...	...	...	...	...	...	...	...	...	...	...	.0
72	...	...	...	...	...	...	...	...	...	...	...	...	...	.0
73	...	...	...	...	...	...	...	...	...	...	...	...	...	.0
74	...	...	...	...	...	...	...	...	...	...	...	...	...	.0
75	...	...	...	...	...	...	...	...	45	35	33	41	39	4.8
76	28	25	33	29	30	34	31	38	47	48	49	54	37	9.4
77	52	35	34	40	30	31	28	37	32	36	38	34	36	6.0
78	36	29	30	30	28	31	29	27	29	38	37	36	32	3.7
79	41	31	31	27	20	22	27	25	29	31	28	30	29	5.1
AVE	39	30	32	32	27	30	29	32	36	38	37	39		
SE	8.7	3.6	1.6	5.0	4.1	4.5	1.5	5.8	7.9	5.7	7.0	8.3		

(monthly averages)

YR	1	2	3	4	5	6	7	8	9	10	11	12	AVE	SE
70	...	...	...	...	...	...	...	...	...	...	...	...	...	.0
71	...	...	...	...	...	...	...	...	...	...	...	...	...	.0
72	...	...	...	...	...	...	...	...	...	...	...	...	...	.0
73	...	...	...	...	...	...	...	...	...	...	...	...	...	.0
74	...	...	...	...	...	...	...	...	...	...	...	...	...	.0
75	...	...	...	...	...	...	...	...	126	92	103	115	109	12.7
76	69	69	92	80	80	80	80	92	103	115	138	126	94	21.5
77	126	92	92	92	69	69	69	80	69	80	80	80	83	15.6
78	92	69	69	69	58	69	58	58	69	92	92	103	75	15.0
79	103	69	80	69	58	58	69	66	74	79	75	84	74	11.7
AVE	98	75	83	78	66	69	69	74	88	92	98	102		
SE	20.5	10.0	9.6	9.5	9.1	7.8	7.8	13.0	22.7	13.0	22.4	17.6		

(95th percentiles)

Table 2.1(d)

Two way tables of monthly CO averages and of monthly 95th percentiles--Lloyd

YR	1	2	3	4	5	6	7	8	9	10	11	12	AVE	SE
70	...	...	...	...	...	...	...	...	...	...	...	...	...	.0
71	...	...	...	...	...	...	...	...	...	...	...	...	...	.0
72	...	...	...	...	...	...	...	...	...	...	...	...	...	.0
73	...	...	...	...	...	...	...	...	...	...	...	...	...	.0
74	...	...	...	...	...	...	...	...	...	...	...	...	...	.0
75	...	...	...	...	...	...	...	...	...	...	33	47	40	7.0
76	24	19	18	21	22	26	27	28	34	43	49	53	30	11.4
77	45	31	29	36	25	26	27	30	30	37	36	38	33	5.7
78	27	23	30	17	16	17	22	19	24	30	38	41	25	7.8
79	41	26	24	23	20	22	19	24	22	27	25	30	25	5.6
AVE	34	25	25	24	21	23	24	25	28	34	36	42		
SE	8.9	4.4	4.8	7.1	3.3	3.7	3.4	4.2	4.8	6.2	7.6	7.8		

(monthly averages)

YR	1	2	3	4	5	6	7	8	9	10	11	12	AVE	SE
70	...	...	...	...	...	...	...	...	...	...	...	...	...	.0
71	...	...	...	...	...	...	...	...	...	...	...	...	...	.0
72	...	...	...	...	...	...	...	...	...	...	...	...	...	.0
73	...	...	...	...	...	...	...	...	...	...	...	...	...	.0
74	...	...	...	...	...	...	...	...	...	...	...	...	...	.0
75	...	...	...	...	...	...	...	...	...	...	103	138	121	17.5
76	80	69	46	58	58	69	69	69	80	103	138	149	82	30.5
77	115	80	69	80	58	53	58	69	69	92	103	126	81	22.0
78	92	69	92	58	46	46	58	58	69	80	115	126	76	24.9
79	126	80	69	58	46	58	48	59	57	81	91	101	73	22.9
AVE	103	75	69	64	52	58	58	64	69	89	110	128		
SE	18.2	5.5	16.3	9.5	6.0	8.1	7.4	5.3	8.1	9.4	15.9	16.0		

(95th percentiles)

Table 2.1(e)

Two way tables of monthly CO averages and
of monthly 95th percentiles--Eugene

YR	1	2	3	4	5	6	7	8	9	10	11	12	AVE	SE
70	...	...	...	...	...	...	...	...	...	...	...	...	...	.0
71	...	...	...	...	20	16	20	25	26	34	35	29	26	6.4
72	26	32	30	27	35	26	33	41	48	50	43	42	36	8.1
73	32	46	...	...	29	27	27	28	34	41	35	31	33	6.4
74	27	...	...	...	...	...	29	18	20	33	34	36	28	6.4
75	14	...	...	...	...	...	...	...	38	33	33	34	30	8.4
76	38	29	27	30	24	21	21	23	25	38	45	57	32	10.6
77	53	37	27	32	23	25	26	26	33	42	30	31	32	8.2
78	39	31	26	21	15	25	21	20	25	33	37	38	28	7.6
79	36	28	31	27	22	21	19	21	24	30	34	29	27	5.2
AVE	33	34	28	27	24	23	25	25	30	37	36	36		
SE	10.7	6.8	1.9	3.7	6.0	3.6	4.7	6.7	8.3	5.9	4.5	8.4		

(monthly averages)

YR	1	2	3	4	5	6	7	8	9	10	11	12	AVE	SE
70	...	...	...	...	...	...	...	...	...	...	...	...	...	.0
71	...	...	...	...	40	29	35	40	46	63	81	63	50	16.5
72	63	75	58	46	63	52	58	75	72	109	72	115	75	21.5
73	69	81	0	0	52	46	46	41	69	87	81	87	55	29.2
74	58	0	0	0	0	0	50	35	40	75	75	80	34	31.8
75	30	0	0	0	0	0	0	0	75	75	80	80	28	35.7
76	90	70	55	60	40	40	40	45	55	81	100	130	67	27.1
77	112	85	60	56	47	47	48	47	66	94	79	60	68	19.7
78	93	68	50	49	34	47	42	44	53	69	85	84	60	18.6
79	81	62	64	52	44	41	39	43	51	63	75	65	57	13.2
AVE	75	55	36	33	36	34	40	41	61	78	83	87		
SE	23.6	32.5	28.0	26.0	23.5	18.9	15.5	18.1	15.3	13.5	7.7	30.7		

(95th percentiles)

Table 2.2(a)

Two way tables of monthly averages of hourly CO--CAMS

YR	MO	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE	DEV
70	1	51	37	27	19	18	16	45	67	83	65	72	77	84	85	85	97	130	140	87	75	89	85	58	55	66	33.4
70	2	40	34	46	48	16	15	32	74	74	56	51	54	57	55	81	78	115	116	79	64	63	63	60	53	57	25.7
70	3	49	34	44	18	18	12	22	31	5	51	47	56	33	48	52	55	90	122	57	54	44	46	46	39	47	23.6
70	4	36	44	44	18	17	15	45	51	52	40	44	30	56	49	53	55	75	79	42	46	36	35	41	43	42	16.2
70	5	26	24	18	13	14	12	22	43	45	33	34	41	42	37	37	44	53	41	42	19	25	30	26	30	30	11.1
70	6	27	21	16	13	14	14	40	29	41	23	30	30	26	37	36	65	61	54	28	26	29	35	36	36	32	11.7
70	7	17	17	13	11	11	10	13	21	44	42	45	46	48	30	29	35	40	46	21	19	15	17	16	16	22	8.9
70	8	43	13	14	13	14	12	17	26	44	34	34	20	26	33	33	34	41	50	24	21	22	24	24	24	27	14.3
70	9	25	24	18	18	13	16	46	44	54	43	42	42	45	47	56	56	74	67	37	45	49	49	50	44	41	15.6
70	10	24	24	26	18	18	16	21	26	74	49	52	57	53	80	59	70	93	111	84	55	49	51	44	45	49	23.4
70	11	28	20	44	17	17	19	27	61	74	58	64	80	64	71	77	83	123	132	78	56	57	56	55	45	59	32.3
70	12	45	31	27	18	24	14	26	63	94	70	76	80	91	97	101	111	157	142	87	84	81	89	87	66	73	39.9
71	1	65	52	27	41	24	17	27	64	81	29	65	72	74	83	84	94	130	194	83	71	69	63	50	56	86	34.4
71	2	54	44	48	42	44	46	34	73	72	56	57	82	85	72	70	87	117	128	81	73	64	80	80	59	82	40.3
71	3	44	40	24	14	14	16	22	82	75	50	55	59	61	81	82	72	93	117	56	56	50	50	48	50	52	23.5
71	4	31	22	16	13	12	18	46	26	53	42	47	55	54	54	57	71	101	98	40	44	38	41	41	40	45	22.6
71	5	26	19	19	11	14	14	19	30	32	33	39	34	33	31	35	45	51	37	20	22	27	29	27	28	26	13.1
71	6	27	44	19	15	14	12	22	53	55	45	31	35	34	35	52	55	75	41	27	47	31	34	34	32	46	14.4
71	7	26	14	15	14	11	12	14	28	37	34	35	37	34	40	38	41	43	44	20	19	23	27	33	28	29	11.1
71	8	22	22	42	17	15	14	44	43	49	32	34	44	44	47	44	54	58	57	29	28	31	31	30	31	34	14.1
71	9	35	43	44	18	14	17	21	44	74	54	54	80	54	55	59	44	51	45	40	44	47	48	43	44	49	26.7
71	10	52	34	34	40	17	18	47	59	74	61	55	80	62	87	77	84	113	149	70	84	73	67	80	51	59	26.8
71	11	53	37	32	41	21	17	34	63	84	72	79	79	81	88	98	114	173	145	97	77	71	70	71	89	76	40.3
71	12	41	29	41	16	17	15	31	75	94	75	76	67	76	91	97	111	162	134	80	84	56	56	56	50	65	36.9
72	1	45	33	46	16	14	17	31	70	84	64	80	73	89	73	75	89	139	148	72	54	56	56	50	49	60	30.1
72	2	44	34	22	19	15	15	32	64	74	84	80	77	81	81	84	143	130	149	80	61	59	66	57	30	60	33.2
72	3	47	33	46	44	16	17	34	64	84	62	80	80	61	60	33	94	119	126	72	75	67	67	70	61	64	26.4
72	4	67	33	24	45	24	26	25	67	74	59	54	62	62	60	61	70	98	143	56	53	47	50	51	49	56	26.2
72	5	48	41	41	17	18	17	26	43	43	34	36	41	42	45	46	34	43	42	34	24	25	30	33	31	35	13.4
72	6	25	42	45	46	14	14	34	32	24	44	49	50	45	51	52	53	71	62	28	26	25	34	33	36	40	14.2
72	7	27	44	19	13	14	14	23	23	41	26	25	40	44	49	43	40	60	55	26	22	24	26	27	29	33	13.5
72	8	62	41	41	17	14	14	46	42	44	36	35	40	37	40	36	46	56	42	26	21	25	30	28	27	32	11.2
72	9	22	24	44	44	17	18	31	63	74	59	61	84	63	63	65	78	102	90	45	44	43	43	38	36	50	22.6
72	10	43	33	43	44	14	18	33	65	72	56	56	62	63	55	54	61	43	48	72	59	54	56	58	54	53	19.0
72	11	45	47	35	44	41	14	35	42	47	72	75	42	43	45	91	141	133	143	97	82	63	61	87	77	79	44.3
72	12	47	34	44	44	17	17	34	43	74	71	77	89	84	94	75	112	140	141	66	72	68	62	57	55	66	33.9
73	1	46	38	44	43	44	14	49	53	64	68	73	79	80	82	87	162	139	146	99	81	81	87	64	60	64	32.4
73	2	44	37	44	41	14	14	14	25	34	44	43	72	73	74	74	43	114	123	49	71	41	47	44	40	61	27.2
73	3	47	34	47	16	14	13	24	33	44	44	54	56	54	64	67	79	135	115	74	64	54	53	39	51	55	24.6
73	4	26	31	49	16	14	14	26	34	44	29	24	42	44	44	44	44	62	42	43	35	35	40	39	39	39	9.4
73	5	39	42	24	19	16	14	22	34	54	42	44	47	44	47	53	65	67	50	43	40	35	35	30	30	38	13.7
73	6	32	24	14	15	15	15	24	34	54	42	50	55	54	55	60	44	41	44	37	30	31	31	34	35	40	17.4
73	7	24	24	19	10	14	16	21	25	21	41	44	46	40	41	43	31	31	34	21	16	17	18	20	21	29	11.0
73	8	26	14	14	17	17	17	21	25	34	43	44	52	54	50	46	51	39	35	31	24	26	25	24	26	30	15.2
73	9	30	27	21	43	44	43	36	44	84	71	34	56	53	62	61	67	42	63	47	31	40	42	43	38	48	14.0
73	10	44	32	34	41	42	41	35	78	87	71	73	75	72	82	72	43	115	112	70	41	40	43	40	36	62	24.9
73	11	47	31	44	14	14	17	32	40	71	74	76	82	61	67	67	110	144	139	85	77	63	61	63	63	60	33.3
73	12	32	41	32	44	17	41	37	67	74	75	83	80	91	91	103	117	156	156	96	62	68	67	63	56	76	36.1
74	1	34	43	14	16	13	13	14	44	67	64	63	62	42	65	69	74	96	110	89	50	43	44	41	40	50	25.1
74	2	44	34	34	45	21	19	33	72	71	70	70	49	44	45	44	79	101	101	49	57	54	51	55	31	56	22.1
74	3	43	34	24	14	14	17	23	34	74	34	43	45	44	43	41	70	44	46	45	47	49	47	44	40	51	18.6
74	4	30	43	16	15	16	15	32	52	34	41	42	54	54	54	43	41	43	64	34	45	47	34	32	32	42	10.4
74	5	27	24	19	16	16	15	25	27	34	25	26	44	44	47	43	44	44	34	33	24	29	31	34	33	36	13.2
74	6	19	14	13	14	14	15	17	22	34	32	33	35	37	35	35	36	34	51	43	22	23	22	21	23	27	10.4
74	7	40	14	16	12	13	13	13	22	34	32	33	42	39	37	36	36	43	40	22	21	20	21	22	23	27	10.5
74	8	17	16	16	13	13	14	22	41	44	35	36	32	31	35	34	41	44	37	30	21	20	20	20	19	28	14.3
74	9	46	44	16	15	13	14	24	43	44	35	36	32	31	35	35	44	44	44	30	34	34	30	23	30	31	13.2
74	10	43	33	44	42	19	14	45	43	71	32	50	47	43	45	47	56	29	45	40	44	73	70	44	57	53	20.4
74	11	47	21	41	15	13	13	21	40	48	55	64	44	44	45	76	92	131	144	90	49	56	57	57	55	59	32.8
74	12	29	24	17	12	14	12	22	40	64	65	72	72	73	73	76	83	115	119	75	55	44	42	42	40	53	29.1
75	1	49	19	15	12	12	12	43	47	54	44	46	56	54	54	72	83	115	103	56	46	47	37	37	37	44	27.3
75	2	44	13	14	9	2	4	14	31	35	46	49	32	39	41	41	72	44	78	42	40	40	40	41	38	43	21.3
75	3	41	12	9	3	4	7	17	41	43	34	37	39	33	34	41	43	55	43	35	26	30	31	30	31	37	16.0
75	4	16	16	4	3	3	5	14	34	31	34	33	33	35	37	41	44	48	47	26	26	21	19	21	23	27	14.5
75	5	12	4	4	5	4	6	12	27	31	28	32	39	34	40	45	40	44	33	17	17	22	26	22	23	24	11.9
75	6	12	4	4	2	3	4	12	27	31	28	32	39	34	40	45	40	57	46	20	22	19	17	13	13	24	15.4
75	7	16	9	5	2	3	4	7	20	24	16	18	44	43	29	30	33	25	15	11	11	11	13	12	12	16	9.6
75	8	17	9	9	4	4	5	12	47	34	38	35	44	45	47	45	44	79	57	23	22	23	22	24	23	29	19.3
75	9	15	9	7	4	4	7	19	34	35	25	43	34	33	41	44	44	52	43	22	22	19	21	24	23	25	13.4
75	10	32	22	14	12	11	10	21	44	44	58	66	47	64	72	74	90	137	131	87	63	60	53	51	49	56	32.3
75	11	37	22	16	14	14	13	24	62	57	51	53	54	56	65	75	94	141	129	77	70	55	56	54	43	56	32.3
75	12	31	24	23	17	15	15	22	44	57	49	50	58	41	41	61	69	79	61	53	47	43	38	36	37	45	19.0
76	1	36	23	21	14	13	17	23	34	64	46	51	34	35	41	62	47	44	67	57	52	43	41	40	35	46	20.4
76	2	23	17	15	11	11	12	15	34	44	35	37	37	32	35	38	47	44	44	41	35	31	28	33	32	32	14.0
76	3	26	13	9	5	3	7	14	23	34	29	34	34	36	39	38	42	36	50	38	35	27	27	28	24	29	14.1
76	4	19	13	9	4	4	6	16	32	32	47	47	35	37	37	41	37	55	46	27	26	22	23	21	23	26	12.8
76	5	12	4	4	4	4	6	12	23	24	25	26	24	24	24	24	28	32	24	15	14	16	19	20	16	19	6.2
76	6	10	4	4	4	3	3	15	43	31	44	44	27	24	29	29	34	34	32	16	13	14	13	18	16	16	6.7
76	7	13	10	4	4	4	4	13	24	22	23	22	26	24	24	26	24	24	22	10	9	15	12	13	12	16	7.6
76	8	41	14	15	14	4	5	17	26	24	32	37	37	30	34	38	34	36	40	20	22	24	23	24	23	27	11.0
76	9	42	16	16	13	14	15	21	34	35	35	35	35	34	34	38	33	44	34	20	26	33	25	24	24	26	9.7
76	10	44	36	24	24	17	19	24	52	44	47	45	44	45	50	52	54	69	76	58	54	50	48	52	55	44	14.6
76	11	32	25	24	21	17	14	24	42	46	42	39	39	46	55	54	64	99	103	58	47	44	44	44	41	44	25.1
76	12	47	36	26	44	44	41	37	59	75	63	44	73	84	77	74	94	121	121	73	67	59	59	60	57	61	26.2
77	1	32	22	16	14	11	11	21	47	44	45	42	54	54	56	54	74	94	99	67	55	47	43	43	38	46	21.1
77	2	44	21	24	21	19	44	45	42	54	45	47	55	44	66	64	69	69	142	64	54	47	44	47	47	49	19.7
77	3	31	24	44	14	13	10	25	42	52	45	43	45	44	50	51	56	73	74	60	34	35	36	37	35	40	15.5
77	4	36	25	25	40	17	16	13	37	34	32	33	35	36	40	41	48	58	54	39	40	35	31	36	34	36	10.3
77	5	32	24	21	15	14	14	19	34	42	43	47	50	45	49	50	54	61	58	37	31	31	34	35	33	37	13.9
77	6	22	11	12	10	9	6	14	21	23	20	27	31	31	31	33	37	39	40	22	15	19	24	20	23	23	9.2
77	7	16	13	11	12	9	11	16	40	34	27	20	27	30	27	27	27	29	24	13	12	13	14	17	16	20	7.5
77	8	43	10	10	14	13	14	40	33	34	21	31	42	43	38	42	47	55	44	24	24	25	24	27	27	33	11.5
77	9	37	44	47	14	14	15	46	52	34	47	44	54	54	57	42	71	49	53	50	47	44	40	41	43	47	10.4
77	10	41	34	34	44	44	41	32	57	84	61	41	42	40	61	44	44	27	29	41	52	56	52	48	44	52	14.3
77	11	42	44	44	13	11	11	19	37	54	53	64	53	44	41	45	70	98	110	84	55	53	51	50	44	50	24.0
77	12	44	34	31	44	44	46	49	35	87	39	61	65	74	73	77	84	112	113	87	57	49	49	51	44	57	24.4
78	1	22	44	34	24	44	26	43	62	81	62	80	80	71	73	77	91	123	144	81	72	61	63	62	58	65	24.5
78	2	27	40	21	13	14	16	23	47	57	46	53	51	44	47	52	50	72	74	47	43	34	43	41	42	42	15.9
78	3	27	17	15	11	14	11	40	43	41	26	39	37	41	44	47	50	44	44	49	52	42	43	40	35	36	15.3
78	4	40	41	40	15	14	16	27	45	4	26	41	47	56	53	55	37	71	71	36	34	34	37	40	35	39	15.4
78	5	19	11	12	4	4	11	19	33	44	27	31	49	32	34	30	29	43	42	23	21	23	23	26	21	25	10.1
78	6	46	16	15	12	11	12	26	40	44	25	34	33	35	43	39	49	44	40	23	26	21	30	29	26	29	11.4
78	7	12	11	14	9	9	7	11	22	44	19	43	40	46	26	22	26	27	20	15	14	14	10	16	16	17	6.1
78	8	42	16	10	12	11	16	17	22	34	29	36	40	37	41	40	41	50	49	29	28	28	25	30	25	29	11.2
78	9	55	47	44	17	16	14	42	35	44	41	63	49	46	67	51	59	72	67	44	45	45	44	44	41	41	14.9
78	10	26	44	24	44	14	17	42	44	44	36	41	41	44	45	40	55	71	67	47	45	43	44	47	42	40	15.3
78	11	34	34	44	40	42	44	42	40	51	43	45	40	51	51	58	70	99	111	65	59	48	53	52	47	50	20.8
78	12	37	49	43	41	14	26	40	26	24	36	34	45	51	31	36	54	93	92	63	51	47	53	40	45	45	16.5
79	1	37	43	44	46	17	16	43	27	41	28	38	45	44	40	50	56	76	83	49	45	42	44	45	45	41	16.0
79	2	27	22	26	17	14	13	22	32	42	49	44	56	61	60	65	61	105	164	64	46	47	32	31	42	50	23.9
79	3	26	19	19	14	13	14	40	39	34	29	36	34	37	33	40	44	56	61	40	36	33	30	35	35	32	11.9
79	4	24	14	17	13	12	11	22	36	34	45	26	37	27	39	37	44	53	30	31	31	29	30	31	29	30	10.8
79	5	15	12	12	11	4	16	19	34	47	40	44	40	33	33	32	32	41	34	42	19	19	20	21	13	23	8.7
79	6	15	13	13	9	14	14	10	22	44	18	40	24	23	27	29	27	33	32	18	15	14	16	19	17	20	6.7
79	7	15	14	14	10	8	6	13	17	14	17	23	45	44	41	21	40	30	27	17	14	13	16	20	19	18	5.7
79	8	17	13	14	9	7	7	14	21	14	40	44	27	26	48	26	40	31	34	20	20	22	22	22	20	20	6.9
79	9	45	41	24	15	14	16	20	34	33	29	30	35	32	30	38	41	31	34	31	32	32	29	27	29	31	10.1
79	10	23	44	41	16	12	15	20	44	30	40	41	48	44	31	56	42	76	72	53	30	44	45	44	40	43	10.7
79	11	47	19	19	13	12	14	24	41	40	27	45	51	51	45	44	45	79	84	54	44	42	40	33	30	40	18.7
79	12	30	23	21	13	14	12	44	52	44	54	58	44	45	49	40	44	118	112	44	45	42	44	45	39	55	28.4
AVE		32	24	20	16	14	16	26	47	54	44	44	51	51	53	55	62	82	82	64	62	40	40	40	38		

ST DEV 11.9 6.6 6.9 5.6 5.1 6.6 7.116.518.615.315.216.216.217.319.123.735.330.925.419.416.415.815.313.7

25TH, 50TH, 75TH, 95TH PERCENTILES, MAXIMUM AND MISSING

23 34 56 97 165 6

Table 2.2(b)

Two way tables of monthly averages of hourly CO--Hollywood

YR	MO	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE	DEV
73	1	37	20	23	14	14	14	37	63	82	72	82	102	144	148	110	118	142	147	95	82	69	72	56	43	72	37.4
73	2	35	28	26	16	14	15	35	47	74	72	86	143	116	113	110	127	140	146	116	101	83	79	58	44	76	42.1
73	3	34	24	17	12	4	14	41	99	82	59	67	83	85	88	89	87	163	162	82	89	65	68	64	54	63	29.3
73	4	29	20	24	12	17	19	42	71	84	61	48	53	62	33	55	58	82	82	53	58	53	52	42	35	45	16.1
73	5	23	25	12	13	12	18	35	65	58	49	58	25	72	71	69	79	78	74	58	52	52	58	38	36	49	21.1
73	6	21	14	13	11	11	14	31	55	48	42	52	52	88	85	70	60	71	59	39	42	36	39	28	25	41	20.9
73	7	14	10	13	11	11	12	22	41	34	24	42	53	63	65	64	61	60	52	40	37	34	30	22	18	36	16.4
73	8	24	14	14	11	11	43	43	49	34	43	80	100	85	68	88	40	67	92	75	76	74	40	49	56	53	20.3
73	9	20	17	17	26	43	41	65	54	57	69	87	82	86	93	144	92	74	87	75	64	50	47	36	25	60	40.8
73	10	45	38	23	14	10	17	37	80	77	66	73	78	85	76	73	82	93	100	83	86	79	79	61	56	63	24.5
73	11	27	23	16	17	14	15	33	74	58	58	88	81	82	81	81	127	131	125	91	75	59	60	42	36	61	33.7
73	12	22	40	17	14	14	15	42	67	64	58	64	72	81	77	79	166	134	123	95	80	67	69	56	45	62	32.7
74	1	18	14	12	13	14	13	27	54	44	45	38	44	46	43	47	41	69	57	42	41	36	29	26	23	35	14.8
74	2	33	47	22	17	15	15	20	72	84	56	53	55	58	80	56	48	87	89	56	53	50	54	61	41	47	17.3
74	3	27	46	17	14	13	14	49	68	84	52	56	32	55	42	44	51	61	59	46	48	49	44	43	38	43	16.4
74	4	22	15	12	12	11	11	26	59	37	35	40	44	47	45	30	63	84	52	36	32	37	35	31	26	35	16.1
74	5	23	14	14	13	13	13	26	47	34	30	12	27	46	45	38	44	53	48	37	33	33	34	29	27	32	12.3
74	6	16	14	4	8	4	14	14	27	24	24	28	47	36	33	36	36	39	31	24	22	21	26	18	16	22	9.0
74	7	22	17	16	11	11	12	24	41	34	23	25	28	46	47	43	45	42	29	30	25	21	15	27	27	31	11.7
74	8	24	17	17	14	14	15	23	55	44	27	40	40	53	53	45	45	54	48	35	37	38	41	30	26	35	13.4
74	9	25	17	18	14	13	15	32	74	54	39	42	43	48	47	43	56	84	61	52	55	53	53	37	31	42	17.8
74	10	44	40	34	49	24	42	53	105	44	63	52	53	51	53	54	63	79	79	93	117	96	93	82	79	63	24.9
74	11	42	27	40	15	12	14	51	76	82	50	59	69	69	75	79	66	130	136	99	65	78	69	52	44	63	33.3
74	12	26	44	20	10	13	15	31	77	74	58	57	73	72	74	83	95	114	69	75	71	55	47	41	46	56	24.2
75	1	23	10	14	5	14	16	42	73	82	50	56	83	72	79	83	92	106	57	83	56	58	41	37	32	51	28.3
75	2	29	14	14	12	11	14	33	69	61	55	57	83	87	76	87	74	79	60	62	60	59	53	46	36	50	22.4
75	3	27	14	12	10	4	8	23	55	34	43	46	51	52	80	82	65	84	82	51	82	42	51	34	34	41	19.3
75	4	24	10	10	12	13	13	31	69	54	36	34	43	42	48	44	55	54	44	39	40	23	45	27	26	36	14.6
75	5	21	17	14	16	4	16	22	42	37	32	30	35	38	37	43	49	48	44	34	37	38	44	33	26	31	12.3
75	6	10	4	5	4	4	4	17	38	34	29	30	30	35	44	40	40	45	35	23	27	21	26	16	14	25	14.0
75	7	9	6	4	1	1	2	12	34	22	22	31	37	37	42	44	32	45	34	25	21	21	24	13	12	22	14.1
75	8	12	7	6	3	2	3	14	34	27	27	34	34	33	37	37	20	39	34	23	23	22	23	19	16	23	12.1
75	9	14	15	11	4	8	16	47	67	44	28	42	42	42	47	47	46	54	50	34	30	36	30	32	28	34	15.8
75	10	25	17	12	9	7	16	44	77	85	40	34	81	81	58	86	77	86	76	58	67	56	51	43	39	48	23.8
75	11	24	14	14	9	7	16	21	60	54	44	44	46	48	39	80	74	94	57	70	65	55	56	39	27	46	25.3
75	12	21	13	11	5	4	5	45	83	58	48	45	53	58	87	61	68	63	86	87	57	46	42	29	27	43	23.4
76	1	19	9	7	5	4	4	41	31	47	41	41	49	58	81	54	71	79	76	52	47	34	31	25	24	36	22.8
76	2	18	13	16	5	3	4	15	26	34	20	21	35	35	38	42	32	53	60	40	36	29	34	27	23	30	15.4
76	3	17	14	12	16	9	5	44	40	31	29	30	33	35	35	36	44	51	57	47	43	34	33	28	27	31	15.4
76	4	19	13	12	8	8	5	21	63	31	21	28	41	37	42	45	30	56	55	43	39	34	34	26	27	32	14.4
76	5	12	9	7	6	4	6	18	26	24	23	26	34	31	33	20	33	39	34	28	21	25	27	13	19	22	10.4
76	6	11	4	7	5	4	6	16	32	24	25	33	32	32	32	33	35	41	36	22	22	21	27	17	15	22	11.3
76	7	10	4	4	5	3	5	14	30	24	23	31	32	34	34	31	30	38	33	26	22	23	27	16	16	22	11.3
76	8	15	16	11	3	7	5	41	29	34	33	37	37	43	43	39	43	46	47	32	32	36	31	25	26	30	12.2
76	9	22	17	18	10	16	13	22	45	43	27	35	37	43	42	41	43	63	42	34	41	40	35	25	26	32	11.7
76	10	29	34	25	15	10	14	28	44	51	40	42	43	43	42	46	51	56	63	59	69	61	55	50	45	43	15.3
76	11	41	28	27	19	16	26	34	59	82	55	52	53	58	57	83	82	115	114	89	89	55	60	60	57	56	25.9
76	12	37	31	25	21	24	19	35	88	84	82	85	72	78	80	88	90	165	164	78	70	65	66	55	47	60	25.3
77	1	39	23	26	25	24	21	37	76	78	74	86	87	74	73	82	66	162	147	82	70	57	64	55	50	61	24.2
77	2	37	40	22	14	10	20	33	69	54	49	44	54	55	53	53	63	72	78	67	58	50	53	50	44	47	16.5
77	3	25	19	17	16	15	17	30	52	47	40	25	43	36	37	39	43	43	48	37	35	30	33	27	24	33	10.7
77	4	23	22	24	18	15	16	27	44	32	26	32	38	26	36	39	46	46	48	41	45	45	41	36	29	34	10.2
77	5	21	14	16	15	16	14	19	35	34	23	31	32	31	36	32	41	45	45	36	32	31	33	27	24	28	9.7
77	6	17	14	12	10	9	9	16	20	23	26	22	26	30	31	31	35	35	39	31	28	26	26	23	18	23	8.5
77	7	12	10	9	7	6	6	15	42	41	21	27	31	32	29	32	30	32	27	22	20	21	22	19	15	20	8.4
77	8	21	14	16	10	4	11	22	37	38	31	35	41	42	43	42	43	50	44	29	25	29	30	25	22	30	11.8
77	9	26	20	15	11	4	9	22	47	42	25	35	35	37	35	35	41	52	53	43	44	45	38	32	26	33	12.4
77	10	37	34	25	19	15	15	30	69	88	59	50	55	51	64	47	57	70	75	69	73	61	56	52	47	56	17.5
77	11	33	25	21	16	15	15	32	61	83	51	51	54	56	61	57	67	90	94	74	64	58	61	55	45	51	22.3
77	12	23	10	16	6	4	9	22	53	54	53	61	80	72	75	69	80	94	93	61	56	64	42	32	29	47	20.4
78	1	26	22	17	12	11	10	32	84	83	82	68	75	76	73	79	92	107	117	78	67	60	55	46	39	57	29.0
78	2	33	26	17	10	4	3	24	56	53	57	62	65	65	62	67	61	95	97	74	65	61	57	48	44	52	23.4
78	3	41	29	21	19	14	17	23	64	53	45	47	47	51	50	53	64	79	73	63	68	65	57	56	51	46	16.7
78	4	23	12	12	9	7	10	21	38	34	29	34	34	35	35	30	43	43	50	42	41	33	30	31	26	30	12.1
78	5	19	11	11	9	4	4	17	27	30	27	29	33	35	35	35	30	47	47	33	25	27	25	22	19	26	11.4
78	6	19	15	13	9	9	11	21	35	34	30	32	30	38	35	34	30	39	41	29	22	25	29	25	23	27	9.7
78	7	16	13	12	9	4	8	15	26	44	29	33	41	34	37	34	35	38	36	28	26	25	24	22	17	25	10.4
78	8	21	17	14	11	4	10	40	44	36	23	41	44	42	42	38	38	47	44	34	32	32	30	26	26	31	12.1
78	9	32	23	14	13	11	14	29	34	38	43	35	40	41	41	42	31	58	58	52	52	48	54	43	41	39	14.1
78	10	38	48	28	18	14	16	38	87	87	48	45	45	45	48	46	48	51	61	52	51	45	48	42	42	43	14.3
78	11	48	34	34	40	21	43	29	81	81	55	43	34	33	34	36	83	62	94	74	83	57	59	53	49	52	17.4
78	12	42	27	25	26	12	17	28	45	46	38	43	45	56	43	56	65	84	65	70	82	56	51	51	44	48	18.4
79	1	25	13	16	14	13	14	24	46	44	81	43	54	66	57	81	63	79	88	84	52	45	43	35	33	43	19.3
79	2	21	14	15	16	8	14	25	52	53	53	44	58	58	51	56	60	75	45	64	54	50	46	35	31	43	21.4
79	3	22	17	15	11	11	14	38	57	47	41	39	48	44	41	41	48	55	53	47	65	61	34	31	28	36	13.9
79	4	25	14	14	11	14	16	22	37	31	45	47	33	34	33	33	42	49	41	35	41	36	38	29	27	29	10.4
79	5	11	9	9	7	7	14	24	33	44	43	46	26	23	25	25	36	36	29	22	21	17	19	17	13	20	6.4
79	6	14	14	11	10	4	13	43	34	[illegible]	27	30	32	36	31	32	33	34	32	21	21	19	22	20	18	23	8.8
79	7	12	4	4	8	8	5	19	25	24	23	28	30	22	23	27	29	27	25	17	16	16	19	14	15	19	7.9
79	8	15	11	14	7	6	9	23	31	24	27	30	33	38	32	32	36	42	39	26	31	29	29	24	20	25	10.2
79	9	27	23	22	17	15	18	32	51	44	28	27	38	37	36	33	43	41	40	31	36	35	36	31	29	33	9.0
79	10	18	13	11	7	7	19	27	52	54	42	39	35	42	39	41	51	57	64	53	53	44	50	35	27	37	16.8
79	11	12	15	4	8	8	9	25	43	44	62	43	43	52	49	50	66	73	84	82	55	44	40	36	23	39	21.2
79	12	23	17	12	9	7	10	25	67	44	44	46	56	55	54	53	63	75	79	51	51	39	39	31	26	40	19.9
AVE		25	14	18	12	11	13	27	53	47	42	44	43	52	52	53	59	68	67	52	46	44	43	35	31		
SD DEV		10.1	7.4	5.4	5.2	5.7	9.7	9.0	17.8	11.4	13.5	16.1	17.2	19.3	17.9	19.2	21.4	27.5	28.4	22.4	20.7	14.6	15.2	13.7	12.3		

25TH, 50TH, 75TH, 95TH PERCENTILES, MAXIMUM AND MISSING

22	37	54	84	164	0

Table 2.2(c)

Two way tables of monthly averages of hourly CO--Alder

YR	MO	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE	DEV
75	9	25	24	20	15	16	17	25	58	67	68	78	72	63	60	44	44	52	56	39	46	48	46	46	48	45	18.5
75	10	26	12	17	11	10	10	14	41	47	40	40	42	42	44	46	46	56	70	45	41	36	36	35	31	35	14.8
75	11	27	19	17	12	10	11	14	29	34	37	37	37	37	37	38	37	55	73	58	40	34	36	31	29	33	14.8
75	12	25	19	17	13	11	13	15	36	41	37	47	58	52	56	60	71	75	79	48	43	37	38	34	32	40	19.6
76	1	23	16	14	10	7	7	9	24	35	34	37	40	40	36	40	44	53	55	37	29	25	26	28	25	29	13.4
76	2	21	12	8	5	4	4	5	15	23	28	29	34	34	36	38	38	40	47	29	28	27	31	27	24	24	12.4
76	3	21	15	14	9	5	6	11	29	37	35	36	41	47	48	53	54	62	66	45	38	32	31	28	28	33	17.1
76	4	23	10	11	7	3	4	10	26	34	34	30	37	33	34	36	48	53	59	37	33	33	36	36	32	29	14.3
76	5	21	13	12	7	5	5	12	25	32	31	36	43	38	39	45	44	52	55	32	31	35	35	32	28	30	14.0
76	6	25	17	12	6	7	7	9	24	35	31	36	46	47	48	56	51	61	63	36	35	37	44	40	37	34	16.8
76	7	25	10	12	5	3	4	10	21	32	32	37	41	43	44	46	46	53	56	37	34	34	39	36	34	31	15.1
76	8	27	20	16	12	7	11	13	31	41	39	41	53	53	54	53	64	65	71	44	40	44	46	41	36	39	17.7
76	9	31	26	22	14	11	13	20	45	51	50	59	68	67	65	66	63	74	76	54	56	55	49	44	40	47	19.8
76	10	37	33	25	16	13	13	21	39	55	50	56	60	58	61	57	62	70	82	67	62	54	57	53	50	46	18.4
76	11	32	26	24	15	12	15	21	44	63	57	62	74	63	64	71	73	85	89	62	49	46	48	46	41	49	22.3
76	12	41	33	31	26	23	24	40	59	52	51	57	66	64	64	73	81	103	104	70	63	59	56	55	47	54	22.0
77	1	36	28	24	17	14	20	22	42	56	61	59	69	68	63	67	68	90	95	66	56	57	51	50	43	51	20.9
77	2	32	23	14	16	13	13	17	34	45	37	39	40	40	37	41	45	53	59	47	36	34	39	37	33	35	11.9
77	3	21	13	15	10	4	4	12	35	44	43	42	45	45	45	51	59	62	75	45	36	34	30	29	27	35	17.7
77	4	32	25	22	16	15	16	19	30	40	44	47	47	52	50	49	48	58	72	52	48	46	47	45	41	40	14.7
77	5	24	17	16	12	11	10	15	26	34	32	38	43	39	43	46	43	49	52	32	30	29	32	31	31	31	12.0
77	6	26	17	13	16	6	10	14	20	36	32	39	40	40	40	45	48	50	51	30	30	35	40	43	33	32	13.1
77	7	22	13	13	4	4	5	10	23	22	29	35	43	41	44	48	46	49	53	30	24	25	28	30	26	28	14.2
77	8	28	21	15	15	9	10	16	31	40	42	51	56	55	59	58	55	59	57	40	32	35	37	34	30	37	16.6
77	9	22	16	15	10	6	9	16	24	42	42	42	41	40	41	43	42	44	51	36	36	35	33	32	31	32	12.5
77	10	29	24	19	15	13	13	13	35	50	46	44	45	38	41	41	42	47	59	46	42	40	39	36	34	36	12.4
77	11	22	23	20	14	11	14	20	35	44	46	43	52	50	51	52	51	58	70	41	34	34	36	38	35	38	15.1
77	12	23	19	15	13	10	11	17	36	40	47	42	50	45	47	52	54	61	61	42	35	30	29	26	24	35	15.7
78	1	25	20	20	15	16	14	17	32	43	39	42	47	48	45	51	54	64	65	43	35	34	33	31	28	36	14.7
78	2	22	19	19	13	11	12	16	32	32	34	36	35	32	34	36	36	46	52	36	29	26	28	29	27	29	10.0
78	3	23	20	22	16	13	12	15	29	35	34	30	34	34	34	33	37	42	54	37	34	30	33	32	30	30	9.7
78	4	22	12	15	11	7	7	14	25	24	23	29	39	33	34	40	43	54	62	38	37	32	35	30	29	30	13.3
78	5	24	13	14	9	9	10	14	28	32	33	33	33	34	35	39	39	45	49	28	25	26	30	31	32	28	10.8
78	6	32	23	16	11	10	9	15	25	30	29	31	32	34	36	34	40	49	49	30	32	39	48	45	39	31	11.5
78	7	26	13	17	12	10	9	12	27	31	32	35	36	36	37	44	41	42	44	30	23	29	33	31	30	29	10.4
78	8	22	16	14	9	9	10	13	33	34	31	30	33	35	33	33	41	39	45	27	28	28	31	29	28	27	10.0
78	9	22	15	13	9	8	8	11	29	35	32	33	35	33	35	32	36	43	50	34	35	36	39	35	30	29	11.7
78	10	30	22	16	12	12	12	20	45	57	51	49	49	43	44	43	43	54	66	50	45	39	43	39	36	38	14.8
78	11	26	23	23	17	14	16	23	40	40	39	41	43	41	42	45	57	73	78	49	38	32	36	31	31	38	15.8
78	12	25	20	16	16	11	12	13	32	33	35	37	44	46	47	54	61	74	77	49	36	31	33	29	27	36	17.8
79	1	30	25	21	15	15	13	21	36	44	41	39	46	49	55	60	57	86	66	54	45	39	44	44	42	42	16.6
79	2	18	14	19	10	8	7	15	34	30	34	37	31	33	36	34	39	52	55	52	52	40	28	27	25	31	13.9
79	3	15	10	10	7	6	6	10	39	41	30	41	50	45	46	48	50	59	55	31	30	29	28	27	22	31	16.3
79	4	19	14	12	6	5	5	12	26	31	33	35	36	38	38	42	46	47	54	29	27	30	30	24	24	28	13.4
79	5	13	7	8	3	2	3	10	21	22	28	28	33	29	30	32	37	43	44	19	17	14	19	19	15	21	12.0
79	6	14	8	5	3	3	2	7	18	20	24	25	32	35	38	41	39	43	44	21	19	22	25	26	18	22	13.1
79	7	16	10	9	6	5	6	11	26	27	22	43	44	45	52	47	53	50	43	24	22	23	23	22	19	28	15.7
79	8	18	11	10	5	2	3	8	21	25	25	30	38	36	35	38	45	50	46	29	25	25	26	27	23	25	13.3
79	9	16	14	12	8	6	5	11	30	30	36	40	42	41	44	44	47	48	49	28	27	28	26	24	23	29	14.0
79	10	17	13	11	7	5	6	12	34	41	40	41	39	40	41	41	45	53	60	39	36	34	39	32	23	31	15.2
79	11	18	15	12	8	8	9	10	29	37	33	33	36	36	40	41	42	50	57	35	27	23	24	21	18	28	13.2
79	12	16	15	13	10	8	3	14	29	33	34	40	40	47	43	41	50	57	61	36	27	23	22	19	18	30	15.5
AVE		25	19	16	11	9	10	15	32	40	38	40	45	43	44	46	49	57	62	40	36	34	36	34	31		
ST DEV		6.2	5.5	4.9	4.2	4.4	4.4	4.8	7.9	9.4	5.9	9.8	10.6	9.6	9.3	9.7	10.2	15.5	13.8	11.6	10.0	8.8	8.6	8.3	7.8		

25TH, 50TH, 75TH, 95TH PERCENTILES, MAXIMUM AND MISSING

25TH	50TH	75TH	95TH	MAXIMUM	MISSING
21	36	44	62	104	0

Table 2.2(d)

Two way tables of monthly averages of hourly CO--Lloyd

YR	MO	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE	DEV
75	11	12	10	8	7	5	6	6	14	25	25	30	37	44	50	53	52	68	66	61	49	36	36	23	15	32	21.9
75	12	14	10	8	6	7	7	9	23	33	35	44	56	62	63	66	93	117	109	76	64	57	50	27	20	47	34.4
76	1	10	3	5	3	3	3	6	19	23	22	27	36	42	46	41	45	52	58	36	30	21	17	13	10	24	16.7
76	2	8	7	5	3	2	2	3	10	15	13	20	21	29	27	31	35	40	47	32	23	24	27	14	15	19	12.7
76	3	7	8	6	4	3	2	7	10	14	15	15	25	28	30	29	37	42	42	25	24	15	17	12	10	18	12.0
76	4	10	8	6	6	5	5	9	17	22	17	24	28	32	31	35	37	45	43	28	30	26	20	13	11	21	12.1
76	5	9	7	8	7	8	7	9	14	[illegible]	19	26	30	36	34	36	37	45	44	31	23	27	21	11	10	22	12.7
76	6	10	6	7	7	7	7	9	14	21	19	27	34	45	44	46	46	54	54	35	34	31	29	16	14	26	15.9
76	7	10	10	9	9	9	10	12	19	24	22	32	35	40	40	40	46	53	53	40	35	33	27	18	14	27	14.4
76	8	13	12	10	8	8	9	11	19	27	25	32	37	44	45	47	50	56	55	40	34	33	30	15	16	26	15.3
76	9	16	13	14	12	12	14	17	27	34	33	40	47	48	48	45	51	60	67	50	47	42	35	21	19	34	16.4
76	10	29	25	19	16	15	15	19	37	42	33	46	51	58	53	53	56	65	79	67	63	55	53	37	34	43	18.0
76	11	25	22	16	14	14	12	17	30	44	44	51	56	61	64	68	63	99	119	85	73	61	57	38	31	50	26.5
76	12	27	25	21	20	17	17	21	33	41	45	58	66	78	61	87	69	111	107	77	69	62	63	38	30	53	28.8
77	1	22	23	10	17	16	14	20	37	47	46	52	69	59	61	61	71	88	98	84	55	49	47	35	28	45	22.3
77	2	22	18	12	11	11	11	15	27	29	29	31	38	39	38	39	40	54	61	43	39	36	34	29	25	31	13.3
77	3	17	15	13	12	11	11	15	25	27	28	28	35	42	40	42	46	55	60	44	34	31	30	23	15	29	13.9
77	4	19	16	16	15	14	15	16	25	29	29	37	44	49	50	53	54	63	71	52	50	45	40	26	22	36	16.7
77	5	12	11	9	8	9	10	13	21	22	21	26	32	35	33	38	44	45	48	36	33	30	26	16	14	25	12.5
77	6	12	12	9	9	9	11	13	18	22	24	31	37	42	39	40	42	49	48	33	33	32	25	16	13	26	13.1
77	7	15	13	12	11	10	12	15	20	22	22	31	31	39	42	42	46	55	52	37	31	32	27	17	16	27	13.4
77	8	13	11	9	8	8	8	14	21	29	26	38	44	52	53	50	52	62	59	40	41	37	27	15	13	30	16.0
77	9	16	13	12	12	9	9	13	24	31	27	30	35	39	43	45	44	49	55	47	45	39	34	24	20	30	14.3
77	10	21	17	14	13	14	14	18	33	42	37	38	42	48	44	48	52	63	71	60	57	50	40	29	24	37	17.1
77	11	17	15	13	11	10	11	15	28	34	31	38	41	54	53	51	58	73	73	55	46	39	45	37	26	38	19.2
77	12	13	12	8	4	5	5	9	21	29	31	41	50	71	84	76	79	88	84	60	52	42	41	22	14	38	27.1
78	1	7	7	5	4	3	3	8	16	21	20	26	31	43	45	49	55	65	62	49	40	34	29	15	10	28	21.5
78	2	9	7	5	4	2	2	8	16	21	22	29	33	39	35	34	40	51	62	38	32	25	26	15	13	24	15.9
78	3	17	13	9	5	5	7	12	24	27	23	25	34	43	40	41	41	57	65	49	54	44	41	23	18	30	17.4
78	4	3	4	4	3	4	3	5	11	10	10	16	13	24	27	28	34	49	50	31	27	21	19	11	7	17	13.8
78	5	4	4	3	2	4	3	4	10	12	14	18	23	25	26	28	30	45	42	25	21	20	17	7	4	16	12.4
78	6	4	3	3	2	3	3	4	9	11	14	19	24	32	29	32	28	38	38	27	23	24	19	10	6	17	12.4
78	7	5	4	2	2	2	3	4	10	13	18	29	36	49	45	44	40	50	47	31	30	27	21	8	5	22	17.5
78	8	3	3	2	2	2	1	4	14	13	17	23	31	46	36	33	34	40	44	28	27	23	19	7	4	19	14.2
78	9	8	6	4	3	2	4	6	18	22	19	23	29	37	35	34	39	50	53	38	39	33	33	24	14	24	15.2
78	10	14	11	8	5	6	8	13	31	38	31	35	38	47	42	40	40	54	64	50	41	36	32	21	19	30	16.3
78	11	19	17	16	13	13	12	15	29	34	33	37	40	58	58	59	82	79	87	61	48	45	46	30	21	39	21.2
78	12	19	15	13	11	10	8	7	20	29	25	34	42	58	57	61	74	102	109	78	65	53	53	33	23	41	28.7
79	1	21	19	14	11	11	12	14	30	32	25	42	42	49	58	60	71	88	98	88	54	48	46	29	24	41	23.9
79	2	11	9	8	5	4	4	6	18	24	26	24	33	36	41	39	43	51	59	46	39	28	27	20	18	26	15.6
79	3	9	6	6	5	6	7	13	26	25	25	26	31	44	41	37	42	46	47	38	31	26	21	13	11	24	13.9
79	4	13	13	9	8	6	7	9	18	19	18	23	25	32	33	32	40	45	33	37	39	31	26	18	15	23	11.7
79	5	8	5	5	5	6	5	10	15	[illegible]	18	22	26	30	31	32	34	39	41	28	26	24	21	12	9	20	11.4
79	6	10	8	7	6	8	7	9	15	17	18	27	35	40	43	38	39	40	44	28	26	26	23	15	9	22	13.0
79	7	6	4	4	3	4	8	8	13	17	16	25	27	35	32	33	38	37	37	26	22	21	18	10	8	19	11.8
79	8	8	6	5	4	3	4	8	16	22	21	27	33	41	41	39	40	48	50	36	32	29	23	14	10	24	15.5
79	9	9	7	8	6	5	5	10	24	27	24	27	30	33	33	34	34	40	40	28	31	26	23	12	11	22	11.7
79	10	8	8	8	4	4	4	9	23	[illegible]	27	40	31	38	36	36	39	51	55	47	49	42	40	20	14	27	16.4
79	11	11	9	8	4	4	4	8	17	23	24	25	28	32	39	42	47	56	61	43	40	30	28	17	11	25	16.6
79	12	13	13	6	7	4	5	9	18	27	25	38	42	46	52	52	58	67	69	50	38	33	29	17	11	30	20.1
AVE		13	11	9	8	7	7	11	21	28	25	31	36	44	44	45	49	59	63	45	40	35	32	20	15		
ST DEV		6.2	5.7	4.7	4.4	4.1	4.1	4.6	7.1	8.7	8.2	9.2	9.5	11.9	12.3	13.4	14.7	19.0	20.8	15.7	12.8	11.1	11.4	8.5	7.1		

25TH, 50TH, 75TH, 95TH PERCENTILES, MAXIMUM AND MISSING

25TH	50TH	75TH	95TH	MAXIMUM	MISSING
13	26	44	84	118	0

Table 2.2(e)

Two way tables of monthly averages of hourly CO--Eugene

YR	MO	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE	DEV
71	5	17	16	16	16	16	15	20	41	10	17	20	41	23	22	23	26	47	27	21	21	21	23	21	18	20	3.7
71	6	12	12	16	9	9	16	15	13	17	16	16	19	18	23	21	22	22	16	15	16	16	16	16	14	16	3.4
71	7	16	12	16	15	13	16	17	23	10	23	21	21	22	22	22	23	22	20	20	24	25	22	21	26	20	2.4
71	8	22	21	19	16	17	26	27	26	28	26	20	27	27	27	28	27	28	28	25	27	27	28	23	26	25	3.2
71	9	29	19	17	16	15	16	30	39	42	29	25	28	27	28	26	32	45	27	29	31	29	30	27	27	26	3.7
71	10	48	24	19	19	16	16	31	40	32	27	35	37	35	35	33	35	35	37	41	44	43	35	35	35	34	8.0
71	11	22	17	15	15	14	18	29	39	25	38	36	34	42	43	40	55	66	46	46	41	37	36	29	26	35	13.1
71	12	20	19	17	16	16	19	27	35	24	49	30	36	34	34	34	35	42	53	36	34	32	31	26	25	29	8.2
72	1	17	13	13	12	12	15	24	34	28	42	40	34	26	31	35	42	47	36	34	27	26	23	22	19	26	9.9
72	2	43	42	14	17	18	15	29	28	32	32	36	36	32	32	35	37	47	45	42	40	38	34	31	29	32	8.2
72	3	41	16	16	16	17	41	31	32	31	33	32	32	30	32	33	36	36	36	36	38	38	35	31	28	30	7.6
72	4	42	41	19	16	17	26	28	24	27	26	40	32	26	29	33	35	36	30	29	31	31	30	23	23	27	6.9
72	5	33	30	20	20	22	29	46	27	35	35	37	39	41	39	39	42	46	35	26	37	38	36	33	32	35	4.7
72	6	21	19	17	15	15	17	21	23	23	25	29	31	31	34	37	40	39	26	26	28	28	26	25	22	26	6.9
72	7	30	29	26	25	22	47	33	30	30	30	32	35	36	34	40	42	43	51	42	43	44	45	35	32	33	5.1
72	8	36	34	25	20	36	31	41	36	32	33	38	44	45	44	53	52	53	42	43	46	48	45	44	40	41	7.0
72	9	46	43	38	33	33	38	32	53	46	41	40	43	47	52	54	55	61	51	54	52	61	57	60	54	48	8.0
72	10	40	35	47	43	28	40	40	52	51	42	36	41	43	45	36	66	71	45	70	74	71	67	63	53	54	10.0
72	11	45	44	44	46	41	48	36	48	34	46	40	41	43	46	32	72	74	40	58	53	44	45	39	36	43	14.0
72	12	26	44	42	43	41	42	34	42	42	44	47	51	53	50	50	61	70	58	58	49	51	41	38	34	42	13.4
73	1	42	22	17	15	15	14	26	35	31	25	32	33	35	39	43	31	37	46	38	35	36	34	33	26	32	10.7
73	2	41	33	32	26	26	27	32	42	32	53	26	46	44	52	54	59	64	71	61	62	56	52	50	49	46	12.3
73	3	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	-999	.0
73	4	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	-999	.0
73	5	29	25	22	21	16	17	19	29	22	31	28	30	32	31	33	36	37	36	30	30	33	36	35	33	29	5.6
73	6	42	41	26	18	16	17	21	31	31	27	24	28	29	30	30	32	34	33	27	27	27	29	30	28	27	5.1
73	7	26	26	25	22	21	22	23	20	21	26	27	28	28	28	30	31	34	33	27	27	28	30	29	29	27	3.2
73	8	26	24	23	22	21	21	23	26	31	25	29	26	26	30	32	36	36	35	31	30	32	31	28	29	28	4.2
73	9	36	31	28	25	22	22	25	38	40	40	35	32	32	33	35	36	35	37	37	36	39	45	41	40	34	6.4
73	10	46	35	36	46	44	41	46	44	56	45	36	39	36	36	39	42	49	51	46	53	53	54	52	46	41	10.6
73	11	26	22	26	17	17	17	23	25	46	29	43	36	36	38	44	47	55	50	40	46	45	34	30	43	35	11.9
73	12	42	21	17	13	14	15	17	26	34	33	37	36	36	38	42	46	50	51	40	34	34	29	28	23	31	11.1
74	1	24	16	22	19	14	19	22	25	24	29	26	29	25	27	29	35	39	37	37	23	25	31	33	28	26	6.3
74	2	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	-999	.0
74	3	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	-999	.0
74	4	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	-999	.0
74	5	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	-999	.0
74	6	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	-999	.0
74	7	26	23	24	20	16	15	22	24	23	31	32	33	34	36	36	32	33	31	27	27	31	35	36	36	29	5.1
74	8	15	16	16	13	12	12	16	19	21	20	20	21	21	20	21	20	21	21	17	17	17	19	18	16	18	3.3
74	9	19	15	16	11	14	16	12	22	24	24	22	21	22	22	23	22	24	24	19	21	24	26	26	26	20	5.2
74	10	49	40	19	17	14	16	22	33	42	42	35	33	31	32	40	33	36	40	45	40	42	43	41	37	33	9.6
74	11	42	46	43	46	16	17	20	21	35	35	36	37	37	40	41	42	44	46	53	43	44	42	36	38	34	9.4
74	12	25	46	40	41	21	41	24	34	41	40	46	40	41	43	43	45	45	53	45	44	42	41	36	32	36	9.2
75	1	6	5	5	5	5	8	9	11	13	14	15	16	16	14	26	19	21	20	14	15	16	16	16	15	14	4.4
75	2	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	-999	.0
75	3	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	-999	.0
75	4	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	-999	.0
75	5	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	-999	.0
75	6	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	-999	.0
75	7	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	-999	.0
75	8	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	-999	.0
75	9	32	26	26	20	17	15	41	45	52	32	46	30	44	41	40	38	42	46	35	40	46	46	45	44	38	11.4
75	10	25	26	17	16	14	14	16	20	22	36	36	41	41	42	38	41	42	50	51	40	36	40	36	36	33	11.4
75	11	26	17	16	16	9	11	16	20	34	29	31	36	34	35	36	42	56	49	41	45	40	41	38	35	32	15.0
75	12	18	16	16	13	16	16	15	27	36	29	42	44	45	47	46	46	59	45	43	41	43	35	27	26	34	15.9
76	1	29	16	16	13	11	13	13	33	44	44	43	43	45	46	47	54	56	47	53	51	43	44	47	41	38	15.4
76	2	22	17	16	12	[illegible]	9	15	29	37	36	33	32	32	32	35	33	40	45	39	34	36	33	34	30	29	10.4
76	3	21	16	13	10	[illegible]	9	15	31	35	29	28	29	31	27	29	32	36	40	29	34	36	33	36	30	26	9.3
76	4	25	16	16	16	13	14	19	28	30	30	34	37	37	38	38	42	44	44	28	32	32	34	32	32	30	9.4
76	5	24	21	19	17	14	14	18	27	24	23	27	24	28	28	26	24	26	27	20	22	22	26	28	26	24	4.3
76	6	19	17	15	15	14	13	17	25	24	25	25	27	26	28	24	27	27	26	17	16	17	20	20	22	21	5.3
76	7	18	16	16	16	11	11	15	22	24	24	35	28	36	24	20	27	27	28	18	17	16	17	18	20	21	6.6
76	8	18	15	14	12	11	11	15	24	21	24	33	36	31	30	30	34	32	31	23	23	25	24	24	22	23	7.6
76	9	20	16	17	14	15	16	19	29	34	24	34	32	32	29	28	27	29	28	22	22	22	24	26	25	25	6.2
76	10	35	47	42	16	16	15	19	36	51	40	43	45	43	40	40	41	45	50	45	46	48	44	48	47	38	11.6
76	11	27	21	21	16	13	13	17	31	51	40	56	52	53	49	50	57	70	41	46	44	58	55	51	44	45	19.9
76	12	45	33	23	21	24	19	26	42	42	44	45	70	74	74	70	74	89	105	76	70	65	64	59	31	37	22.9
77	1	47	42	34	40	24	41	28	44	77	62	59	52	55	51	54	56	69	42	60	70	65	64	61	60	34	14.3
77	2	20	24	14	14	12	14	17	31	44	29	39	43	41	40	43	43	57	65	40	50	44	45	47	42	37	13.6
77	3	19	16	14	13	11	13	17	29	36	31	31	33	32	32	36	30	41	45	49	27	29	28	28	28	27	6.9
77	4	29	24	24	17	15	10	22	33	36	26	34	37	45	35	34	30	44	47	30	34	32	34	37	35	32	8.4
77	5	18	14	14	11	[illegible]	16	16	23	24	45	27	49	31	31	29	32	35	37	42	20	19	22	25	22	23	7.8
77	6	19	16	16	15	14	15	16	22	44	29	32	37	34	35	33	33	37	38	43	22	21	23	26	24	25	7.4
77	7	24	16	14	16	16	17	20	25	40	33	34	34	37	34	34	34	37	36	23	23	21	23	20	21	26	7.3
77	8	17	16	16	12	14	13	19	28	34	31	34	33	37	35	34	35	39	37	23	23	27	24	26	23	26	8.9
77	9	23	17	13	16	[illegible]	9	16	34	34	29	35	44	46	45	43	47	54	57	41	34	35	37	32	31	33	14.2
77	10	23	24	21	16	13	13	19	32	31	47	44	44	51	51	51	55	59	61	54	54	53	35	50	43	42	15.3
77	11	16	13	11	3	7	7	4	19	24	27	26	37	40	41	41	46	55	65	46	60	37	33	30	26	30	15.9
77	12	17	13	11	[illegible]	6	8	17	21	34	32	30	34	42	43	47	52	57	65	50	43	35	27	21	19	31	16.4
78	1	24	16	14	14	13	14	19	22	41	42	45	35	35	34	55	62	66	69	54	44	36	35	31	27	34	17.9
78	2	18	13	12	13	11	10	13	23	34	40	44	33	33	53	32	44	48	45	38	34	26	23	25	25	31	15.3
78	3	14	17	17	13	14	13	17	41	47	28	33	34	35	38	25	42	39	35	20	27	18	21	21	21	26	8.5
78	4	10	12	11	10	[illegible]	6	11	19	44	42	23	25	43	46	40	24	32	30	43	27	25	27	24	20	21	7.4
78	5	12	10	14	8	6	7	10	14	22	17	19	19	41	40	18	43	23	23	15	14	16	17	16	15	15	6.6
78	6	19	17	16	15	14	14	18	25	40	47	30	34	35	34	33	36	36	35	24	22	22	25	25	22	25	7.4
78	7	10	12	12	8	[illegible]	8	11	19	20	26	28	30	32	31	31	30	32	31	40	19	18	26	21	17	21	8.3
78	8	13	14	6	7	7	7	16	23	44	45	47	27	36	49	27	47	30	34	40	15	21	21	19	18	20	6.4
78	9	15	13	14	7	7	6	11	27	34	27	30	32	33	33	35	30	41	39	47	20	25	26	24	23	25	10.3
78	10	27	24	15	12	14	10	14	34	31	47	43	40	36	35	34	38	42	46	39	40	38	44	40	35	33	12.5
78	11	26	43	17	12	14	11	16	32	44	42	41	41	42	43	44	47	53	79	58	50	45	44	39	35	37	15.4
78	12	28	44	19	15	14	12	17	27	34	37	40	44	50	48	44	33	63	72	59	51	41	42	37	31	36	16.2
79	1	26	26	17	14	14	13	16	29	44	24	37	42	42	44	44	50	69	72	53	42	41	37	32	49	36	15.3
79	2	17	16	14	9	9	8	14	44	34	29	32	35	38	38	38	40	46	51	37	32	30	28	26	22	28	11.8
79	3	41	14	15	12	11	13	26	36	34	35	34	35	34	37	41	47	40	56	38	37	35	36	31	47	31	11.7
79	4	16	13	13	16	6	11	14	45	27	27	20	36	35	36	38	34	42	46	31	31	30	31	26	26	27	10.1
79	5	13	11	16	6	7	9	16	23	47	26	28	29	36	50	31	31	33	33	22	20	22	23	23	19	22	8.3
79	6	13	11	[illegible]	8	3	9	16	21	45	23	27	49	31	33	33	31	36	33	21	20	19	22	21	17	21	8.3
79	7	12	[illegible]	6	7	7	[illegible]	14	23	24	24	25	27	28	47	27	49	29	28	19	18	17	20	18	15	19	7.5
79	8	12	11	8	7	7	8	16	25	46	47	47	48	36	29	26	22	35	32	24	23	21	21	20	18	22	6.3
79	9	15	14	19	8	[illegible]	[illegible]	15	29	34	31	30	31	36	49	49	32	35	35	28	25	26	26	26	42	26	6.6
79	10	41	13	12	[illegible]	[illegible]	11	17	26	42	37	36	32	34	32	33	36	41	31	40	46	35	40	36	30	33	11.9
79	11	22	17	13	10	[illegible]	11	19	20	5	26	39	39	36	37	39	47	58	44	44	41	42	44	36	32	34	16.6
79	12	8	16	11	9	[illegible]	9	14	25	31	32	25	36	26	36	38	42	53	42	44	38	33	29	20	22	29	15.9
AVE		26	24	17	15	14	15	20	24	31	33	34	35	36	36	37	40	44	45	36	35	36	34	32	29		
ST DEV		8.6	7.2	5.9	5.0	5.0	6.1	7.8	8.1	10.4	9.1	8.5	8.9	9.4	9.4	10.2	11.3	14.2	17.2	14.6	13.3	12.2	11.3	10.7	9.7		

25TH, 50TH, 75TH, 95TH PERCENTILES, MAXIMUM AND MISSING

24	[illegible]	34	54	105	336

Table 2.3(a)

Two way tables of monthly weekday averages of hourly CO--CAMS

YR	MO	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE	DEV
70	1	39	46	21	13	14	15	31	31	102	74	65	91	66	66	65	140	143	146	91	65	66	64	56	32	74	42.9
70	2	23	46	24	16	15	15	36	92	91	67	64	63	62	61	66	66	135	135	88	64	65	62	52	32	61	32.8
70	3	39	43	24	16	17	14	25	31	72	56	51	53	61	57	62	63	112	136	64	55	50	52	48	38	53	32.4
70	4	23	44	12	14	14	16	30	44	64	54	44	38	50	34	57	52	67	91	43	41	38	32	36	38	43	22.4
70	5	22	19	15	13	14	14	26	25	5	41	43	51	52	43	45	55	66	53	25	20	24	31	25	28	35	16.2
70	6	22	44	15	13	13	14	25	43	34	26	42	44	46	46	43	44	72	42	26	27	31	36	23	32	35	14.0
70	7	17	13	11	12	12	11	15	23	31	24	43	25	30	32	29	26	42	42	21	21	16	16	16	16	23	12.3
70	8	25	19	14	13	14	14	24	45	36	42	42	44	37	41	39	44	50	60	25	21	25	27	27	24	32	13.2
70	9	48	44	17	13	13	13	22	37	74	31	46	46	46	52	54	61	65	77	38	42	44	45	42	38	43	18.3
70	10	29	19	10	14	17	13	23	65	64	55	57	63	64	66	66	79	113	149	65	56	49	52	45	40	53	29.4
70	11	22	43	16	17	19	17	36	70	141	71	72	79	73	66	93	99	135	142	93	66	65	62	46	30	66	41.4
70	12	66	45	23	16	22	17	33	75	111	67	66	95	102	144	108	119	143	246	97	71	61	69	65	65	79	46.7
71	1	35	64	24	15	19	16	37	61	102	64	77	63	62	95	96	147	170	213	97	61	75	68	62	56	74	45.0
71	2	43	34	24	21	21	15	44	96	94	70	69	74	77	61	96	146	141	151	87	71	65	69	65	56	69	33.2
71	3	26	43	17	15	12	15	32	79	93	66	62	66	65	67	69	79	149	142	61	54	40	50	42	46	54	32.5
71	4	22	19	15	12	12	15	31	74	64	52	57	60	63	64	65	66	129	126	55	51	43	46	46	44	48	30.6
71	5	19	15	12	16	14	15	26	52	64	33	33	37	32	35	42	33	62	47	23	26	29	31	26	26	32	14.3
71	6	23	14	14	11	12	14	46	66	66	31	56	64	62	41	56	63	69	141	66	26	29	28	31	26	43	24.4
71	7	22	14	12	10	11	14	19	43	45	37	39	42	42	45	43	44	37	51	23	22	22	25	29	23	31	14.3
71	8	42	16	16	13	14	14	27	52	92	38	42	47	45	53	50	59	63	48	25	25	29	33	30	33	38	16.3
71	9	36	44	44	14	14	19	27	42	96	45	69	68	62	60	66	70	124	94	50	46	48	51	45	46	54	25.2
71	10	40	44	44	15	14	19	33	71	97	72	66	68	66	75	74	96	137	162	74	66	75	70	59	56	65	35.4
71	11	45	34	44	17	24	18	45	124	140	85	91	86	87	95	166	167	238	220	165	81	73	72	72	70	83	53.3
71	12	35	24	12	16	15	16	26	52	114	68	66	163	163	143	164	140	139	190	92	72	63	64	56	33	78	46.4
72	1	38	43	44	16	14	26	25	66	64	77	77	67	74	66	66	166	175	133	78	54	35	35	49	46	66	39.7
72	2	34	43	19	15	19	15	37	60	94	76	76	66	66	91	96	110	134	144	67	62	59	59	57	40	72	41.4
72	3	39	24	22	19	17	15	41	25	144	73	75	51	47	69	93	147	139	146	76	45	71	60	60	60	71	36.7
72	4	26	44	42	42	24	19	44	79	90	73	66	74	73	74	77	69	130	134	64	56	50	53	50	47	62	35.4
72	5	24	14	14	15	16	16	31	51	51	58	39	44	44	48	43	37	75	46	34	25	24	28	30	23	36	16.3
72	6	43	41	44	17	17	14	36	62	81	46	53	53	46	52	54	55	74	67	26	24	26	27	27	32	39	17.7
72	7	29	26	19	16	13	13	22	50	53	46	50	59	55	62	59	62	78	73	31	25	27	28	29	31	44	14.9
72	8	42	26	19	16	14	17	22	50	34	42	41	46	41	43	62	33	86	36	27	22	28	31	30	29	35	14.3
72	9	20	43	42	18	17	18	30	73	84	65	69	79	75	70	60	95	120	113	50	45	67	60	35	33	50	32.4
72	10	36	24	22	22	14	19	30	81	91	73	82	72	73	63	64	72	112	165	79	66	52	57	56	52	59	25.3
72	11	56	64	32	42	41	19	47	99	107	65	67	67	95	99	140	163	219	217	106	84	65	54	40	75	84	50.1
72	12	61	49	24	19	16	16	38	79	91	62	67	163	92	148	169	140	100	172	97	75	66	63	54	55	76	44.2
73	1	47	34	27	43	19	14	36	91	84	61	60	62	62	94	101	142	148	175	114	91	74	70	60	58	74	41.3
73	2	43	34	46	19	16	16	26	66	81	75	75	64	64	43	90	165	144	133	99	84	72	66	43	34	69	35.4
73	3	27	24	24	17	15	12	27	87	74	61	63	60	75	77	77	93	128	143	87	71	60	57	56	52	61	32.2
73	4	34	27	27	41	44	41	44	53	54	45	45	45	46	48	46	54	71	76	49	41	43	40	37	39	42	13.7
73	5	29	42	22	17	10	15	23	62	47	65	51	54	56	53	55	81	78	82	59	46	39	39	35	36	42	15.1
73	6	27	21	17	14	17	13	27	59	63	51	56	65	64	63	69	77	121	79	50	32	30	30	35	35	45	23.3
73	7	19	12	17	10	19	15	24	43	46	56	48	46	46	47	69	50	61	50	40	22	17	29	21	22	32	14.1
73	8	26	16	13	17	17	17	35	65	64	31	36	62	62	37	53	50	70	60	33	23	23	23	25	26	41	19.6
73	9	35	24	21	41	42	43	62	65	86	87	61	69	66	77	76	65	120	109	57	36	36	46	44	42	56	27.2
73	10	40	34	49	44	40	42	34	91	102	61	63	65	76	76	77	89	130	128	74	64	44	63	64	59	64	45.4
73	11	37	43	22	16	17	16	36	84	96	66	65	95	91	97	67	120	170	141	91	82	62	62	63	36	74	41.3
73	12	42	33	25	20	21	41	42	32	99	53	96	144	162	148	122	143	192	197	136	89	76	69	62	57	84	44.2
74	1	32	43	14	15	13	12	41	59	65	79	76	72	72	75	60	80	110	131	78	52	44	42	39	37	56	31.5
74	2	42	34	46	43	41	42	34	49	64	42	42	74	75	79	76	86	119	117	65	46	57	51	57	52	63	44.4
74	3	36	43	46	16	16	16	35	76	94	64	71	72	73	73	73	61	105	145	64	44	45	42	44	44	55	26.5
74	4	26	24	16	15	14	16	30	61	73	56	65	64	64	72	74	61	100	83	36	31	30	33	33	32	47	25.3
74	5	22	14	14	16	10	16	29	57	57	47	58	55	52	52	53	62	78	65	35	31	31	36	38	36	43	17.4
74	6	19	12	13	15	14	15	22	62	64	60	64	64	63	64	64	52	69	58	48	27	20	25	27	25	33	15.5
74	7	22	15	13	12	13	13	23	47	47	29	44	51	46	66	43	47	53	47	26	21	19	19	24	25	31	14.3
74	8	18	10	14	14	14	15	40	54	54	45	50	54	52	55	31	50	38	40	22	20	21	21	20	20	34	17.2
74	9	22	17	12	16	14	13	25	54	56	39	36	37	41	43	41	47	57	57	32	36	35	30	27	33	34	14.3
74	10	41	28	25	22	14	22	37	74	82	39	36	32	46	51	55	67	94	116	101	90	78	76	74	67	63	20.4
74	11	37	42	16	15	13	14	24	61	84	60	66	73	74	77	66	108	101	147	106	79	64	64	61	57	67	42.6
74	12	26	19	12	14	12	14	44	61	93	68	73	66	87	91	92	149	139	148	77	56	46	46	44	39	61	33.4
75	1	27	19	16	12	11	13	24	57	72	60	63	69	67	79	67	100	143	124	66	50	43	40	39	39	55	33.3
75	2	19	12	10	9	9	11	24	64	61	50	59	61	67	72	73	80	116	94	47	42	35	33	41	38	44	24.7
75	3	17	9	8	6	4	6	16	50	54	19	44	61	57	50	42	53	85	57	24	23	29	30	30	30	31	17.5
75	4	19	9	7	6	6	7	21	53	57	47	43	64	65	48	53	81	79	62	31	20	24	24	25	24	36	20.6
75	5	15	9	7	6	6	5	19	64	64	26	35	43	42	41	38	66	55	41	19	19	22	28	24	21	26	15.5
75	6	10	7	5	3	6	3	15	35	46	35	46	51	64	60	57	60	75	61	25	25	26	20	15	15	30	20.8
75	7	8	6	5	3	4	2	9	20	26	22	24	39	35	36	34	35	41	31	17	12	13	14	15	13	19	12.2
75	8	12	7	6	3	3	5	14	52	65	37	42	54	54	61	59	66	108	71	25	22	26	23	24	42	35	27.2
75	9	16	8	5	8	5	7	18	62	64	22	26	37	37	65	69	46	62	49	20	21	19	23	25	21	27	16.4
75	10	29	26	17	12	12	11	28	56	64	76	76	85	74	85	91	108	171	139	72	67	61	56	51	47	65	41.6
75	11	32	23	19	16	13	17	49	95	76	65	66	72	62	69	90	123	145	104	92	74	60	67	65	47	67	42.9
75	12	29	43	18	16	14	13	43	34	64	30	34	65	64	65	68	66	81	82	49	42	40	38	38	35	46	22.7
76	1	27	24	16	15	13	14	27	71	74	56	57	61	60	64	67	82	103	144	63	57	44	45	42	35	51	23.4
76	2	18	14	14	9	14	11	20	43	54	29	41	41	33	30	40	49	70	67	38	32	27	25	29	23	33	14.3
76	3	19	14	6	6	6	5	19	42	44	25	34	42	46	43	41	44	64	63	38	34	28	30	30	25	32	15.9
76	4	15	11	9	3	3	12	20	42	44	30	35	43	44	44	50	65	69	63	30	22	24	26	22	26	31	17.3
76	5	16	6	7	3	4	4	18	32	32	26	20	23	48	47	29	32	39	32	15	13	15	21	19	18	27	13.4
76	6	7	5	3	3	3	5	14	32	44	22	32	33	36	38	36	30	43	38	16	15	15	21	15	17	23	13.4
76	7	7	4	4	4	3	5	12	28	25	25	31	35	32	34	30	24	31	27	10	7	8	9	11	9	18	11.4
76	8	17	14	14	10	2	10	21	46	34	44	46	65	37	41	43	41	54	48	23	22	23	24	24	25	31	14.7
76	9	23	16	12	16	12	15	22	46	44	29	37	34	34	30	36	34	53	44	26	25	25	21	21	21	32	12.4
76	10	26	27	23	17	18	22	31	62	71	35	36	35	44	33	35	61	92	92	64	54	52	47	51	44	46	19.3
76	11	27	27	27	42	19	24	25	59	82	57	65	45	45	32	63	79	118	122	81	51	47	45	44	43	56	25.4
76	12	44	34	32	44	43	44	34	60	91	79	76	47	79	91	90	110	144	141	80	76	65	64	67	63	70	32.4
77	1	35	24	42	42	43	46	30	53	73	73	61	64	64	73	75	64	111	110	72	60	49	45	45	37	55	24.4
77	2	26	23	23	18	16	12	20	49	62	50	32	62	53	66	72	77	103	123	71	59	45	40	53	50	53	25.4
77	3	28	44	41	15	15	14	29	51	64	53	44	33	33	53	55	59	85	85	61	34	33	35	34	30	43	15.2
77	4	27	43	21	17	12	14	19	39	40	26	35	40	44	40	30	37	66	65	61	37	36	31	31	43	36	14.3
77	5	43	44	12	13	12	14	42	63	61	21	33	39	36	34	37	62	70	69	46	32	33	37	36	53	41	14.2
77	6	17	12	12	9	6	9	15	26	24	28	29	33	32	31	36	39	45	46	21	16	15	18	20	19	23	11.2
77	7	18	13	11	12	4	12	17	37	24	16	23	36	37	33	33	35	36	29	15	14	13	15	19	17	23	12.4
77	8	22	16	14	13	12	14	41	24	42	34	33	44	42	39	43	44	59	45	22	20	21	23	27	28	32	13.1
77	9	26	47	42	10	16	15	27	81	65	52	53	56	62	80	65	77	101	107	52	42	45	42	42	45	50	43.2
77	10	41	34	27	44	22	42	27	71	82	75	75	72	89	71	77	83	117	112	69	72	69	64	54	55	62	24.4
77	11	42	24	14	13	7	12	41	64	82	65	56	63	71	69	76	82	115	132	78	61	63	59	52	48	56	24.7
77	12	43	31	19	45	44	45	34	57	84	67	43	67	81	78	87	143	139	140	74	57	50	51	52	47	63	31.3
78	1	26	24	30	21	27	23	49	70	102	74	70	76	82	81	87	145	151	134	91	74	66	66	67	60	73	32.4
78	2	29	24	21	16	12	19	47	54	74	57	63	62	55	55	66	64	91	95	51	44	39	33	49	48	49	21.3
78	3	43	15	10	16	11	15	25	52	44	43	46	45	42	35	56	66	79	82	35	36	44	43	42	33	42	19.8
78	4	22	17	14	14	13	18	32	60	54	44	49	35	46	46	64	67	48	93	46	46	34	46	43	37	44	23.2
78	5	19	14	11	6	2	12	22	47	41	20	30	33	34	39	32	35	47	48	24	21	24	24	26	23	27	12.4
78	6	18	14	14	11	11	12	21	62	47	28	40	45	44	47	44	44	53	55	23	20	21	28	29	27	31	14.6
78	7	11	14	3	6	4	6	12	27	27	21	27	32	36	20	22	23	29	21	14	11	12	17	16	13	18	7.9
78	8	19	13	14	12	11	11	19	34	41	36	40	45	42	46	46	64	59	58	32	25	29	45	23	28	32	14.2
78	9	25	23	24	15	13	15	49	67	32	64	46	33	34	33	36	69	67	80	46	49	51	49	50	48	46	18.7
78	10	22	44	25	24	14	14	29	53	54	26	45	42	44	46	50	50	63	79	51	65	43	49	47	43	43	14.2
78	11	46	34	31	27	24	26	37	67	64	23	33	37	62	61	67	89	122	130	74	62	54	55	57	50	58	26.7
78	12	32	45	44	14	15	16	46	42	46	39	39	48	56	32	57	84	135	114	70	54	52	56	52	48	46	43.6
79	1	22	42	41	42	17	17	41	42	44	46	44	52	51	52	55	63	73	93	55	62	45	49	45	45	45	14.9
79	2	24	19	24	16	15	15	25	62	7	55	45	62	61	53	66	63	113	119	64	46	49	54	52	41	52	24.1
79	3	22	15	15	13	13	15	23	67	41	21	22	33	46	40	46	44	65	74	43	32	36	33	38	37	35	14.9
79	4	21	14	14	12	14	12	24	43	4	20	29	43	44	43	42	52	63	61	33	33	29	30	31	29	33	14.1
79	5	12	11	11	14	4	11	21	41	24	41	48	27	36	36	36	25	67	40	23	19	19	22	21	16	26	12.9
79	6	16	14	14	2	11	13	19	32	24	41	22	47	28	31	32	20	39	27	19	12	16	16	20	18	22	4.4
79	7	16	13	13	10	3	16	15	27	41	15	26	29	27	23	26	21	36	34	20	12	16	16	20	19	20	7.5
79	8	17	14	14	9	2	3	16	25	44	43	22	31	32	32	30	30	35	41	22	22	25	23	26	42	23	4.4
79	9	18	16	17	12	13	15	42	42	44	23	43	46	42	41	41	47	62	86	34	38	34	36	25	28	34	14.3
79	10	45	24	10	15	14	16	27	50	64	39	44	31	36	33	36	60	80	82	55	44	43	44	45	38	43	19.0
79	11	25	14	14	11	14	12	22	47	54	62	44	53	56	46	49	67	80	90	56	47	40	34	36	28	41	22.3
79	12	38	40	24	15	12	15	32	70	87	29	71	76	76	79	92	115	147	144	75	55	49	51	52	45	63	36.3
AVE		22	24	12	16	14	15	27	57	80	52	53	57	58	60	62	72	98	99	52	45	41	41	41	38		
ST DEV		10.3	7.5	6.6	5.3	5.4	4.9	[illegible]	17.8	22.9	18.4	17.8	19.0	19.6	20.1	22.0	27.8	43.3	40.5	27.4	21.4	18.3	17.1	16.3	14.1		

25TH, 50TH, 75TH, 95TH PERCENTILES, MAKEUP AND MISSING

Table 2.3(b)

Two way tables of monthly weekday averages of hourly CO--Hollywood

YR	MO	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE	DEV
73	1	25	40	22	16	14	19	66	123	111	83	90	127	110	112	111	125	152	133	98	86	67	60	50	41	77	41.2
73	2	26	40	13	8	8	15	39	109	92	78	85	112	141	112	114	136	160	154	114	98	82	60	57	40	78	46.4
73	3	31	21	10	12	16	14	52	134	90	61	69	86	87	92	98	99	116	118	90	90	72	76	68	54	69	35.1
73	4	49	44	16	15	15	15	56	69	50	45	50	56	58	54	60	62	72	65	50	57	55	50	43	33	47	16.9
73	5	35	40	13	11	11	10	29	26	64	51	50	60	74	75	72	69	67	62	62	54	59	56	34	32	52	20.9
73	6	21	18	13	11	12	15	39	72	67	60	58	65	71	76	75	90	79	64	37	61	34	36	28	25	45	23.9
73	7	17	15	16	11	11	13	26	64	30	36	42	50	69	79	71	68	95	56	38	32	30	24	19	16	37	20.4
73	8	29	17	17	12	14	46	75	63	60	52	66	158	126	80	81	140	155	138	92	109	103	58	69	46	73	42.1
73	9	15	15	15	41	24	141	79	59	61	65	67	74	83	95	108	94	74	90	77	84	52	48	39	27	64	29.4
73	10	34	40	42	19	18	17	64	111	96	71	73	78	91	79	75	91	163	117	86	82	73	77	69	64	69	26.7
73	11	26	16	12	13	13	15	38	92	60	62	72	80	92	80	82	110	141	133	101	73	65	68	64	61	64	37.5
73	12	24	10	15	10	13	15	34	35	77	68	72	81	85	82	83	117	159	136	90	56	68	71	56	46	67	38.5
74	1	12	12	10	12	12	12	43	60	57	46	39	43	46	42	49	65	76	64	39	34	27	24	20	19	35	19.6
74	2	27	22	21	17	18	18	37	95	77	62	57	59	81	87	59	73	78	76	58	53	52	59	42	44	51	21.7
74	3	25	21	10	14	11	13	36	61	75	81	57	56	52	57	52	55	73	88	50	46	46	48	45	35	45	20.4
74	4	43	15	12	14	11	11	36	73	44	46	44	51	46	59	56	75	61	61	40	33	37	35	29	27	39	19.9
74	5	15	15	10	14	10	14	26	22	40	26	30	43	43	48	40	36	46	59	41	37	35	36	30	27	35	15.2
74	6	12	11	9	4	5	11	19	39	32	48	35	35	28	40	42	41	49	40	28	26	24	30	22	18	27	12.1
74	7	20	10	13	14	14	14	23	50	41	29	41	42	56	51	45	40	52	43	31	31	32	36	25	40	33	13.4
74	8	19	15	13	12	14	15	30	71	40	42	44	40	36	36	52	53	62	51	35	37	39	42	29	22	38	16.9
74	9	21	10	10	12	11	13	37	104	73	44	40	49	50	51	55	94	73	89	50	40	52	48	34	27	44	22.4
74	10	32	30	20	40	20	24	57	128	104	64	54	55	52	54	81	89	91	92	103	134	109	108	97	46	71	32.3
74	11	45	19	15	10	14	10	30	103	82	63	65	70	74	83	86	113	153	108	109	97	89	80	82	53	70	40.5
74	12	44	20	17	15	13	15	37	58	51	67	64	77	72	79	88	147	149	147	78	71	58	48	37	39	61	33.4
75	1	27	15	12	13	10	12	30	92	70	67	64	73	64	90	90	105	123	111	67	55	53	42	37	33	56	34.7
75	2	26	13	12	9	9	13	40	58	70	61	61	88	65	66	72	63	49	69	68	71	59	58	65	40	54	27.4
75	3	17	10	9	16	7	12	35	75	60	52	40	51	47	24	59	64	65	63	63	54	40	47	35	37	42	22.7
75	4	19	10	12	16	4	12	34	45	61	61	42	45	44	33	50	64	61	55	62	63	40	51	29	27	39	19.4
75	5	21	16	14	16	9	11	47	27	42	39	34	42	42	44	50	36	36	30	35	34	25	48	36	27	35	15.0
75	6	5	3	3	3	4	6	20	21	22	21	37	43	37	36	52	36	56	42	25	27	21	26	16	14	28	17.5
75	7	4	3	3	1	1	3	10	40	31	25	36	42	44	49	51	40	54	43	27	24	23	27	15	14	20	17.0
75	8	9	4	6	1	1	3	18	46	24	33	41	41	28	43	44	45	44	41	26	24	25	25	20	16	24	15.7
75	9	11	3	6	4	7	10	35	42	55	39	43	43	44	50	51	57	83	55	33	37	35	41	35	32	36	17.4
75	10	42	16	12	9	9	12	30	94	75	59	60	73	71	80	76	49	97	84	75	71	56	52	40	38	54	28.4
75	11	74	15	13	8	4	13	29	83	80	52	55	52	51	97	84	90	140	117	81	71	80	78	44	33	54	31.8
75	12	18	11	5	4	3	9	24	79	84	44	40	53	54	65	80	69	79	82	58	50	39	37	22	24	42	24.4
76	1	14	4	3	3	3	4	23	69	61	51	44	54	86	65	61	81	92	90	59	49	37	34	27	25	43	27.3
76	2	15	9	7	2	2	4	41	53	[illegible]	34	34	39	34	33	44	36	59	60	50	42	32	39	30	23	32	17.9
76	3	17	13	14	9	4	16	30	50	44	20	32	35	34	34	28	40	57	85	49	41	35	33	27	26	33	15.3
76	4	15	12	12	4	7	11	20	24	64	35	40	45	37	44	43	57	83	84	45	42	35	35	26	23	35	17.3
76	5	4	7	4	4	4	4	40	45	33	25	31	35	32	32	32	33	45	39	26	21	25	28	17	16	24	12.7
76	6	10	7	3	4	4	6	19	42	33	28	37	36	35	27	37	42	50	40	26	22	22	25	16	13	25	13.9
76	7	8	7	4	3	4	5	17	39	40	20	35	35	34	39	35	41	45	37	27	22	23	27	18	13	24	13.4
76	8	21	10	9	7	4	12	45	50	40	59	44	45	44	42	61	40	52	51	34	34	34	32	20	29	33	14.3
76	9	29	16	16	9	3	13	27	55	53	42	39	41	47	47	40	40	47	44	37	38	33	30	21	21	33	14.3
76	10	20	23	10	12	9	10	26	84	85	51	67	60	64	64	69	57	85	76	83	74	62	56	40	43	40	16.9
76	11	40	32	40	42	17	42	69	71	75	46	58	53	81	81	73	89	129	127	88	84	48	57	61	62	60	24.0
76	12	24	29	20	42	21	42	40	80	74	71	73	81	85	80	93	97	115	117	84	78	73	70	60	52	60	24.7
77	1	28	24	24	42	19	44	40	71	54	90	70	78	61	83	88	95	118	124	69	77	60	64	55	51	67	30.2
77	2	32	43	17	15	10	19	30	75	64	57	53	81	58	56	55	70	84	89	70	57	52	56	50	47	51	20.7
77	3	17	13	14	11	12	10	31	61	53	83	35	41	38	39	40	43	47	51	38	32	30	31	27	26	33	13.4
77	4	22	21	13	10	13	13	36	54	44	40	37	40	41	43	44	49	53	52	44	44	45	41	36	28	36	12.8
77	5	21	17	15	12	7	10	22	45	45	25	30	37	34	39	37	48	53	56	40	35	33	36	29	25	32	12.8
77	6	18	10	13	16	9	14	16	25	24	27	26	29	32	31	36	37	37	61	32	27	23	23	21	16	26	9.4
77	7	12	4	3	4	4	5	16	28	27	30	32	38	28	32	36	35	37	33	24	21	20	20	18	15	23	10.7
77	8	19	13	12	10	3	11	47	65	54	26	35	45	44	65	45	40	55	49	29	24	27	28	25	22	31	13.6
77	9	24	20	15	11	3	16	40	81	51	20	33	35	38	34	32	40	57	59	41	43	45	38	30	25	34	14.5
77	10	39	32	24	18	16	46	44	38	48	80	50	61	50	49	40	89	86	91	78	81	88	80	58	55	56	22.1
77	11	32	43	10	14	16	14	28	77	72	58	53	55	86	63	62	76	99	103	60	72	61	65	61	49	55	25.5
77	12	29	15	16	4	7	10	25	89	85	59	60	72	75	75	76	89	107	163	65	60	50	40	35	28	51	29.7
78	1	46	12	16	11	4	10	40	82	42	71	76	83	82	79	87	163	125	129	64	72	83	59	49	40	63	36.0
78	2	22	41	17	9	7	4	29	76	84	39	85	87	86	87	73	49	165	165	79	85	81	80	50	48	55	27.4
78	3	35	47	40	16	15	17	45	76	65	53	52	52	56	53	56	60	79	79	82	87	63	52	50	45	50	16.9
78	4	17	12	4	3	5	5	27	68	34	37	35	39	35	29	40	49	59	59	46	38	34	35	32	30	33	15.9
78	5	13	4	2	7	3	5	19	44	43	47	49	32	30	35	38	39	53	50	32	24	20	25	22	20	27	14.1
78	6	15	10	12	6	9	12	29	44	44	25	38	42	43	39	59	45	44	44	30	27	20	31	20	21	30	12.8
78	7	14	11	11	5	4	4	19	33	30	36	37	44	61	29	35	37	42	39	30	20	25	24	23	18	27	12.0
78	8	10	13	10	9	4	11	31	42	47	39	40	47	46	47	41	44	53	53	34	29	28	28	23	26	33	15.7
78	9	36	40	22	13	11	15	35	94	46	40	39	41	42	44	40	56	63	64	54	51	57	81	50	46	44	16.7
78	10	35	26	24	17	11	17	44	44	7	53	40	67	40	45	45	51	57	89	53	44	43	44	40	37	44	17.5
78	11	40	34	24	43	42	23	81	74	73	82	51	63	66	56	80	70	98	104	79	80	58	81	56	50	57	21.3
78	12	32	42	40	17	14	10	31	80	84	67	50	53	54	55	59	75	144	104	80	71	62	81	58	47	52	24.1
79	1	24	19	16	10	16	19	25	62	34	45	47	85	64	84	84	87	36	90	83	44	41	40	32	28	44	21.4
79	2	18	10	11	4	7	9	44	69	30	55	43	53	33	54	50	48	40	93	85	55	52	40	38	33	44	23.2
79	3	40	10	14	12	10	13	42	23	34	44	41	44	44	42	40	44	83	54	54	47	41	40	31	30	36	16.4
79	4	26	13	12	13	10	11	44	69	30	47	33	38	29	37	39	50	55	48	39	43	36	36	29	44	32	13.4
79	5	9	4	4	7	6	11	29	45	26	40	40	29	28	48	44	33	40	36	24	22	19	20	18	14	23	10.7
79	6	19	9	12	9	14	14	49	42	34	21	34	35	37	37	38	38	40	37	43	21	18	22	14	16	25	11.2
79	7	11	6	7	5	4	6	42	31	44	33	43	33	35	31	49	32	30	25	18	14	15	19	14	13	20	9.7
79	8	16	4	4	4	4	4	47	37	31	30	33	38	46	36	35	38	47	83	48	31	29	29	24	41	27	14.1
79	9	44	41	10	16	14	16	40	67	32	46	30	44	30	37	36	61	69	65	33	35	37	39	34	32	35	12.7
79	10	15	11	9	7	7	12	32	63	62	43	39	38	40	36	41	55	85	72	55	55	47	34	37	28	38	19.5
79	11	14	15	4	3	5	10	30	54	50	44	44	53	56	44	54	70	83	95	70	53	44	42	34	24	42	24.7
79	12	43	15	13	16	4	12	33	62	50	32	55	50	58	55	54	87	65	93	54	53	42	43	34	32	45	22.4
AVE		22	17	14	11	14	14	33	68	50	47	48	54	55	56	57	66	78	75	55	51	45	45	37	32		
ST DEV		9.7	7.3	5.6	5.3	6.4	12.7	11.2	22.2	16.2	14.9	15.3	15.4	[illegible]	19.0	20.1	24.8	31.8	31.8	26.1	23.2	18.9	17.0	15.7	14.1		

25TH, 50TH, 75TH, 95TH PERCENTILES, AVERAGE AND MISSING

26	44	[illegible]	63	100	0

Table 2.3(c)

Two way tables of monthly weekday averages of hourly CO--Alder

YR	MO	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE	DEV
75	9	27	18	15	13	9	19	31	60	62	51	109	102	64	81	60	57	68	68	39	51	56	55	54	59	56	28.8
75	10	22	16	16	11	11	12	21	51	57	49	49	49	48	50	52	53	67	85	51	45	39	40	37	30	40	18.8
75	11	32	20	19	15	13	13	18	40	53	45	43	46	44	43	46	42	69	55	74	48	43	46	39	34	41	19.4
75	12	23	14	14	12	14	13	20	43	44	41	54	63	64	60	64	78	82	83	48	43	37	37	31	29	42	22.5
76	1	19	13	13	8	5	8	9	29	42	41	46	47	47	42	46	50	62	65	40	31	26	28	28	25	32	17.3
76	2	15	14	9	5	5	6	7	23	32	34	35	41	46	42	42	40	45	53	31	30	30	36	30	26	28	14.1
76	3	17	12	14	6	5	7	12	36	44	42	43	48	55	57	63	84	73	73	47	34	30	30	24	24	36	21.4
76	4	22	15	9	5	2	4	11	32	42	41	34	45	35	36	33	53	58	66	37	32	33	38	37	31	32	16.5
76	5	15	14	8	5	4	5	14	33	41	39	44	53	48	50	55	56	63	70	57	34	38	37	34	27	34	19.2
76	6	21	13	14	6	5	8	11	32	42	39	47	57	52	52	62	57	70	72	58	36	35	41	37	34	37	19.9
76	7	26	12	8	3	2	4	12	28	44	38	44	49	51	53	54	55	64	66	40	37	34	42	36	31	34	17.0
76	8	28	19	13	12	7	12	19	37	51	45	44	61	61	64	61	77	79	82	47	41	48	49	41	37	43	21.6
76	9	32	25	21	14	11	14	22	52	57	56	66	76	74	72	74	71	84	86	54	54	53	47	40	36	50	23.0
76	10	31	27	21	16	13	14	25	51	71	64	72	75	71	73	86	71	82	102	80	72	59	63	57	54	55	24.4
76	11	39	28	22	16	13	16	25	56	62	73	76	96	75	75	81	85	102	105	70	54	51	52	49	44	57	27.5
76	12	39	31	29	28	23	24	26	47	85	81	80	73	88	87	83	94	125	126	78-	73	69	64	62	54	62	27.7
77	1	33	25	22	18	18	22	33	57	64	71	68	73	72	71	78	81	107	116	77	61	56	56	52	44	58	26.7
77	2	29	24	17	13	11	13	22	42	56	46	49	49	42	44	47	53	64	71	53	40	33	43	41	36	39	16.0
77	3	20	14	14	9	4	8	12	40	51	44	47	51	47	50	55	66	69	85	49	37	36	33	29	26	38	20.6
77	4	29	23	20	14	13	14	22	38	54	55	58	53	53	52	53	58	69	88	59	51	49	50	46	41	44	18.3
77	5	20	13	13	10	9	9	17	32	41	33	44	47	45	50	55	51	59	62	34	32	30	32	28	27	33	15.9
77	6	24	18	14	10	8	11	18	38	44	40	50	50	49	49	53	58	60	61	33	33	34	35	36	30	35	16.2
77	7	13	14	13	7	4	7	13	32	34	29	44	54	45	54	59	52	57	61	30	24	26	27	28	25	32	18.0
77	8	24	13	12	12	6	10	17	37	50	51	62	70	68	70	69	83	70	83	44	33	37	38	34	31	41	21.6
77	9	21	12	15	14	9	10	13	42	54	52	50	49	47	49	52	51	51	80	40	40	36	34	30	29	36	15.8
77	10	23	24	15	13	14	13	21	44	82	61	56	55	45	50	49	52	55	72	55	49	44	42	38	35	41	17.4
77	11	27	22	19	14	14	15	24	45	64	53	53	82	58	58	56	55	66	80	44	35	38	40	43	40	43	18.1
77	12	21	17	13	12	14	10	20	44	54	56	46	56	47	50	55	57	86	69	45	36	31	32	27	23	37	18.2
78	1	22	20	19	15	13	18	20	41	54	50	54	59	58	54	59	85	79	80	49	40	37	35	32	29	42	19.6
78	2	18	15	17	11	9	11	19	39	43	38	39	36	33	34	36	34	48	56	36	28	24	27	25	23	29	12.0
78	3	21	14	22	15	12	13	17	37	48	40	39	41	38	38	43	42	48	86	42	36	29	31	26	28	33	12.9
78	4	21	13	13	8	8	9	17	34	44	50	44	54	44	43	49	49	69	79	44	39	32	36	29	30	36	18.6
78	5	19	13	12	8	8	10	14	33	42	39	38	36	38	40	45	45	51	57	30	26	27	31	31	31	30	13.7
78	6	28	18	14	11	10	9	15	31	39	30	38	37	27	42	39	46	58	56	31	34	39	49	44	39	33	13.4
78	7	23	18	14	11	12	10	13	35	44	40	44	44	44	44	53	49	52	54	34	30	30	36	33	29	33	14.1
78	8	19	13	12	8	8	10	15	37	42	27	36	41	40	38	40	50	45	53	29	28	27	30	29	27	30	13.3
78	9	18	13	10	8	6	6	15	27	45	42	45	43	39	40	38	42	49	57	35	35	39	42	36	32	32	14.4
78	10	29	22	18	14	13	14	28	59	72	68	64	65	53	55	52	54	66	82	56	47	41	47	41	37	46	19.9
78	11	28	24	23	17	14	17	22	49	54	44	48	47	45	44	48	63	86	91	53	40	34	37	33	30	41	19.1
78	12	22	17	15	10	10	13	16	43	55	48	47	55	58	60	87	75	95	97	60	43	36	41	33	30	44	24.5
79	1	21	18	17	14	14	12	21	39	42	42	38	49	49	55	83	58	89	88	54	44	38	41	38	38	41	20.6
79	2	15	13	13	8	8	6	16	39	43	37	41	32	31	40	35	37	55	60	57	57	41	26	25	23	32	16.4
79	3	15	9	9	6	8	7	19	50	54	44	50	82	54	53	56	56	70	65	35	32	31	29	26	21	36	20.5
79	4	14	10	9	5	3	6	14	34	41	40	43	48	47	47	51	57	65	69	34	32	33	32	26	24	33	18.9
79	5	9	5	6	3	2	4	12	29	34	34	38	43	34	38	41	46	54	54	22	19	16	21	19	14	25	16.0
79	6	2	3	1	2	2	2	8	24	34	31	33	40	42	45	49	46	53	52	22	20	23	24	23	15	25	16.8
79	7	13	2	7	5	4	5	13	32	36	38	53	56	58	86	80	86	62	52	28	25	25	24	22	19	32	21.2
79	8	15	8	8	5	4	2	10	29	32	33	37	40	43	43	46	56	63	58	36	29	27	27	29	24	30	17.6
79	9	14	12	10	7	6	6	14	40	52	48	52	54	52	56	54	57	59	81	30	30	30	29	24	23	34	19.2
79	10	15	11	9	6	4	6	14	42	51	48	48	45	48	48	45	50	63	71	44	38	37	40	34	23	35	18.7
79	11	14	11	10	6	7	9	13	37	44	41	40	44	41	46	46	48	56	66	38	29	24	25	22	19	31	16.6
79	12	17	13	12	10	9	9	17	37	43	42	49	56	54	49	45	56	66	72	43	31	25	24	20	20	34	18.9
AVE		21	18	14	10	9	10	17	40	50	47	49	54	50	52	54	57	67	73	45	39	36	38	34	31		
ST DEV		6.2	5.6	5.1	4.5	4.3	4.7	5.5	7.8	11.2	11.4	12.8	13.5	11.5	10.9	11.0	12.1	15.9	16.5	13.8	11.3	10.1	9.8	9.4	9.1		

25TH, 50TH, 75TH, 95TH PERCENTILES, MAXIMUM AND MISSING

25TH	50TH	75TH	95TH	MAXIMUM	MISSING
20	34	52	73	126	0

Table 2.3(d)

Two way tables of monthly weekday averages of hourly CO--Lloyd

YR	MO	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE	DEV
75	11	12	11	10	6	3	6	9	25	33	36	37	46	47	52	56	54	50	105	77	66	48	50	31	19	39	25.9
75	12	12	9	7	6	5	6	9	27	37	37	51	59	63	80	85	93	118	111	77	64	59	52	27	19	47	34.9
76	1	11	10	5	4	3	3	7	25	34	26	32	41	46	49	41	46	63	67	45	38	27	24	17	13	28	16.5
76	2	6	5	3	3	2	2	4	12	14	16	22	24	22	28	29	35	43	50	39	34	31	35	17	18	21	14.2
76	3	6	4	3	3	3	3	11	13	13	20	20	30	30	26	23	36	41	38	23	20	11	14	8	7	17	11.6
76	4	11	9	7	7	8	7	13	23	27	21	28	33	33	31	34	39	49	47	34	38	33	25	15	12	24	13.0
76	5	9	7	5	5	5	7	10	17	24	24	30	33	45	53	38	42	52	49	38	36	34	27	13	11	25	15.1
76	6	10	6	6	8	7	7	10	18	25	20	29	36	45	44	47	46	58	57	41	40	38	33	17	15	28	16.8
76	7	9	9	9	8	8	9	12	22	27	24	36	41	44	45	45	49	59	59	45	41	40	33	21	17	30	16.7
76	8	14	13	11	7	9	10	13	24	34	32	36	42	54	52	51	55	64	64	48	41	47	37	17	18	33	18.4
76	9	16	14	14	12	11	14	19	32	41	35	45	52	53	51	46	52	63	74	56	53	46	37	21	20	37	16.2
76	10	26	22	17	17	19	17	24	49	51	48	60	61	68	58	58	65	77	95	82	76	67	62	42	35	50	22.8
76	11	29	24	20	16	16	13	21	35	53	52	56	64	84	63	64	67	107	132	96	72	68	61	39	30	54	30.4
76	12	28	25	21	20	12	19	23	38	46	50	83	71	84	82	89	90	121	117	84	78	72	72	43	34	58	30.9
77	1	22	21	16	15	15	15	23	48	64	59	85	54	88	86	87	81	107	121	80	70	61	57	36	29	53	26.7
77	2	22	17	10	9	14	11	16	32	34	33	37	41	43	43	42	50	60	62	49	45	41	40	32	29	34	15.7
77	3	14	14	12	14	11	11	19	28	31	28	29	35	45	41	43	48	61	69	51	41	36	34	25	17	31	16.0
77	4	12	14	12	13	14	13	19	28	32	33	41	47	51	50	51	56	67	76	56	55	53	47	27	23	38	18.4
77	5	11	11	4	3	4	9	16	23	27	23	29	34	39	39	40	41	47	53	41	40	35	30	16	14	27	13.8
77	6	11	14	9	9	9	12	14	21	26	27	34	40	43	42	40	43	51	51	37	36	35	25	15	13	27	14.1
77	7	16	12	12	11	9	12	16	21	24	24	33	32	39	37	42	46	58	54	40	36	36	30	17	16	28	14.1
77	8	12	11	7	8	7	9	17	25	31	29	44	49	55	57	54	55	83	87	66	45	44	31	17	16	34	20.5
77	9	17	14	13	12	11	16	16	29	32	31	32	33	41	43	45	48	53	57	51	50	44	38	26	21	32	14.8
77	10	20	15	11	12	14	15	21	41	52	43	43	47	50	64	49	56	69	82	73	70	61	49	34	28	42	20.7
77	11	16	16	13	11	10	12	17	32	42	35	40	44	55	53	51	56	78	80	63	54	46	55	44	30	40	20.4
77	12	14	13	8	5	5	6	11	25	34	33	43	52	72	65	73	78	88	90	63	60	49	69	26	15	41	27.7
78	1	6	5	4	3	3	3	8	22	27	25	33	35	51	47	53	64	76	94	61	51	45	39	17	10	33	25.4
78	2	8	7	8	3	2	2	10	20	24	25	30	34	35	52	31	37	49	80	59	35	30	31	15	10	24	15.5
78	3	17	12	9	5	8	7	14	30	32	26	31	34	44	41	43	45	85	77	55	58	48	45	21	16	33	19.8
78	4	3	4	3	2	4	2	7	15	12	13	20	21	28	30	30	37	56	57	37	33	29	25	13	7	20	15.8
78	5	3	3	2	1	4	3	4	12	14	15	18	24	36	26	28	31	50	67	28	25	24	20	7	4	18	13.3
78	6	4	2	4	1	3	3	5	12	14	17	22	28	34	31	32	41	42	43	31	27	30	23	12	7	19	13.9
78	7	3	3	2	2	3	4	5	12	14	22	34	40	34	45	48	46	59	53	36	38	35	27	8	4	25	19.7
78	8	3	3	2	1	2	1	5	19	22	19	26	35	44	38	36	37	43	48	29	30	27	22	8	4	21	15.6
78	9	9	7	5	3	3	5	8	24	24	25	28	31	32	33	34	39	52	56	42	45	40	39	28	17	27	15.9
78	10	15	10	7	4	8	16	17	41	46	38	43	44	54	44	42	43	61	72	58	50	44	40	23	20	35	19.0
78	11	22	14	18	13	12	13	18	35	41	37	41	44	38	53	53	59	86	88	85	52	49	52	31	19	41	21.3
78	12	13	14	10	7	8	8	8	24	33	30	39	42	88	84	84	79	117	131	90	77	84	64	40	25	46	34.9
79	1	19	19	15	12	14	13	16	35	34	39	47	43	51	58	59	73	86	163	73	80	55	52	30	26	43	24.5
79	2	8	7	6	4	4	4	10	20	24	28	21	31	37	41	39	40	51	61	51	42	33	34	24	19	27	16.4
79	3	10	7	8	6	7	9	17	34	31	29	30	36	44	42	39	43	49	54	45	32	31	27	14	12	27	15.1
79	4	11	10	7	8	8	8	10	20	24	19	26	28	38	37	33	44	49	43	44	47	38	32	20	15	25	14.3
79	5	8	5	5	5	7	7	12	19	22	20	25	33	34	34	34	37	44	47	33	32	28	24	13	10	22	13.0
79	6	9	7	6	8	8	6	9	13	21	20	31	33	43	45	38	39	43	48	32	28	29	26	15	10	24	14.2
79	7	6	4	4	3	6	7	10	15	21	18	23	30	40	35	37	39	42	40	31	29	25	22	11	8	21	13.4
79	8	7	5	4	3	3	5	10	20	27	23	30	36	45	43	41	50	54	55	42	39	34	27	14	10	26	17.3
79	9	8	6	5	5	3	5	12	32	33	28	31	32	36	32	36	34	41	42	33	38	32	30	14	13	24	13.2
79	10	8	5	5	3	4	4	11	29	33	20	30	32	37	33	33	35	53	59	53	58	49	46	22	15	29	18.1
79	11	10	8	5	4	4	4	9	21	49	27	28	30	33	37	40	47	57	60	44	44	33	32	19	11	26	16.9
79	12	12	13	8	7	5	7	10	44	35	29	43	47	51	56	50	59	71	76	57	44	40	34	22	14	34	27.2
AVE		12	11	8	7	7	8	13	25	31	29	35	40	47	45	46	51	64	69	51	47	41	37	22	17		
ST DEV		4.3	5.6	4.6	4.5	4.2	4.3	5.1	6.9	11.4	9.6	10.8	10.5	12.7	12.5	13.5	15.2	20.7	24.1	17.4	14.4	12.7	12.9	9.6	7.8		

25TH, 50TH, 75TH, 95TH PERCENTILES, MAXIMUM AND MISSING

25TH	50TH	75TH	95TH	MAXIMUM	MISSING
13	32	45	71	132	0

Table 2.3(e)

Two way tables of monthly weekday averages of hourly CO--Eugene

YR	MO	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE	DEV
71	5	16	15	15	13	13	15	22	23	20	26	22	24	23	24	25	31	30	22	21	21	23	22	20	17	21	4.7
71	6	13	11	10	10	10	12	19	22	17	23	19	21	26	22	24	28	25	17	16	17	17	17	16	15	17	4.4
71	7	19	15	15	16	12	16	17	22	24	23	24	24	25	24	24	28	26	22	20	22	22	21	20	19	20	3.4
71	8	22	21	18	18	17	21	27	29	24	28	20	29	25	29	29	29	31	25	27	25	28	28	28	24	26	4.1
71	9	18	17	16	15	13	19	23	45	30	31	30	30	28	25	27	30	35	25	27	25	31	27	28	26	27	7.1
71	10	24	21	19	19	19	24	37	47	41	41	29	42	34	39	37	40	54	40	43	42	46	44	40	35	38	9.8
71	11	19	17	15	15	16	19	33	46	60	43	42	41	48	48	51	63	75	51	50	45	41	39	34	29	38	15.5
71	12	21	20	12	17	12	21	31	41	30	31	32	38	37	37	43	48	56	38	34	32	32	27	26	24	31	9.4
72	1	16	12	13	12	13	17	29	42	32	31	30	36	34	36	39	42	61	40	34	31	29	27	23	21	29	11.9
72	2	22	20	18	18	17	18	31	43	30	31	33	33	32	32	35	41	56	46	44	42	40	35	32	28	32	9.4
72	3	23	19	17	17	17	22	38	37	30	35	37	35	33	35	38	42	50	37	42	39	42	38	36	29	33	6.8
72	4	22	20	19	18	19	21	22	29	20	28	27	28	25	30	34	28	39	30	29	30	30	29	25	24	27	5.4
72	5	28	26	25	24	26	26	41	37	31	35	37	38	42	40	40	44	45	34	33	37	37	36	36	31	35	5.9
72	6	21	19	17	18	15	18	26	28	42	28	32	35	35	40	43	40	46	25	26	28	28	25	23	21	27	9.0
72	7	29	20	27	28	25	29	22	22	[illegible]	33	35	39	42	44	47	50	52	34	35	37	39	37	35	32	36	7.3
72	8	31	33	30	29	29	31	43	39	35	36	41	47	50	52	59	58	50	45	44	45	43	39	38	35	41	9.2
72	9	44	38	34	30	30	28	36	54	42	41	39	43	49	52	55	56	64	50	56	58	61	57	55	52	49	9.3
72	10	37	34	35	43	42	36	44	70	55	64	60	43	49	48	59	68	79	64	70	70	64	65	57	46	50	10.2
72	11	28	20	26	40	41	47	39	50	61	63	45	45	47	55	64	61	61	62	59	53	47	42	39	37	45	10.8
72	12	25	23	21	21	21	22	38	44	40	51	52	51	57	57	65	69	76	59	48	42	44	35	32	29	43	15.7
73	1	41	40	18	18	18	19	32	41	34	22	35	30	39	44	52	56	64	47	36	33	33	31	30	24	36	12.4
73	2	35	31	26	24	24	24	22	61	52	60	69	48	48	53	56	63	76	77	61	63	58	51	49	47	47	15.1
73	3	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	-499	.0
73	4	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	-499	.0
73	5	26	20	22	19	17	17	19	21	30	23	49	32	34	34	35	37	41	38	31	31	33	37	34	33	30	8.9
73	6	24	22	21	19	17	18	22	32	30	29	29	29	31	32	33	26	37	36	29	28	29	32	36	32	26	5.7
73	7	25	20	23	22	21	24	24	25	31	28	32	32	30	31	33	35	39	37	29	29	29	30	28	28	29	4.5
73	8	23	24	21	20	20	21	23	21	30	20	31	30	30	21	34	27	39	29	32	31	32	29	27	26	29	5.4
73	9	38	36	27	20	24	23	25	45	52	43	37	35	37	38	38	34	39	40	34	42	42	47	42	41	37	7.4
73	10	40	31	26	23	21	21	25	47	80	44	40	40	38	37	41	45	52	53	45	52	53	58	51	49	42	11.8
73	11	21	19	17	18	14	18	23	37	44	39	43	37	38	38	45	49	55	80	47	41	34	32	28	27	35	13.3
73	12	21	19	16	13	13	16	18	32	34	28	42	42	43	42	49	51	56	58	45	39	38	33	31	26	34	13.4
74	1	28	18	22	19	16	18	22	23	30	29	30	29	25	27	29	35	39	37	37	25	23	31	33	29	28	6.5
74	2	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	-499	.0
74	3	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	-499	.0
74	4	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	-499	.0
74	5	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	-499	.0
74	6	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	-499	.0
74	7	20	23	22	14	18	19	22	21	30	34	37	35	38	39	40	37	39	36	30	31	33	37	37	37	31	7.2
74	8	14	13	13	13	11	12	14	22	20	22	23	22	23	22	23	22	25	23	17	16	18	17	16	14	18	4.3
74	9	17	16	13	11	12	10	16	22	24	28	26	24	25	25	24	25	26	27	20	22	24	26	27	24	22	4.5
74	10	26	26	16	16	15	15	40	39	30	48	49	35	33	35	37	40	45	52	45	43	46	43	38	[illegible]	35	12.6
74	11	27	23	21	19	17	16	42	24	37	38	42	41	46	43	45	46	51	60	47	46	43	40	40	37	37	11.3
74	12	25	22	22	15	15	19	23	38	44	41	38	40	46	40	44	47	53	53	45	43	38	38	30	27	33	10.4
75	1	8	6	7	7	7	7	8	12	14	15	15	18	20	18	23	22	20	18	13	13	13	13	13	13	13	4.3
75	2	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	-499	.0
75	3	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	-499	.0
75	4	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	-499	.0
75	5	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	-499	.0
75	6	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	-499	.0
75	7	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	-499	.0
75	8	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	-499	.0
75	9	28	23	21	18	18	18	24	35	70	26	31	33	44	46	44	45	60	53	41	41	44	49	47	43	41	14.6
75	10	25	20	17	13	12	12	17	35	44	27	40	44	40	47	43	45	57	57	43	41	37	40	40	37	35	13.4
75	11	23	18	14	11	12	12	16	32	44	34	36	40	44	40	41	44	46	78	55	52	42	44	41	36	36	17.0
75	12	15	14	11	10	9	10	15	27	44	42	44	32	44	44	46	49	67	60	45	37	34	33	25	23	34	17.3
76	1	29	18	18	15	14	16	18	39	57	50	44	44	44	50	52	54	65	77	57	55	45	47	50	42	42	17.6
76	2	16	13	10	9	9	9	16	33	40	39	36	36	37	35	37	36	47	50	39	42	37	37	32	27	30	12.0
76	3	20	15	11	8	5	9	17	35	41	32	31	32	33	29	32	30	41	46	31	36	38	33	33	29	28	11.0
76	4	21	18	16	12	13	12	20	31	35	33	36	40	40	46	44	47	57	58	30	36	31	36	36	31	32	12.4
76	5	22	15	14	16	16	13	14	20	35	27	29	27	25	30	29	29	32	30	19	20	21	24	26	23	26	5.6
76	6	16	10	13	12	14	13	15	29	24	27	48	33	25	30	29	31	33	28	16	17	17	19	18	20	22	8.9
76	7	17	15	13	12	11	16	16	25	34	49	33	31	33	32	30	31	32	33	19	16	17	18	19	20	23	8.0
76	8	17	14	13	12	12	11	16	29	34	33	38	41	33	34	35	34	37	34	24	23	23	24	24	23	26	9.3
76	9	16	15	14	12	12	13	17	32	30	27	35	34	34	30	30	29	31	30	22	22	23	24	26	27	26	7.4
76	10	26	21	20	18	16	14	26	44	43	57	44	52	44	46	46	49	55	63	53	55	52	54	54	52	43	15.7
76	11	23	17	18	13	14	12	14	33	52	54	55	56	58	53	54	65	79	102	75	60	58	51	44	43	47	23.4
76	12	41	23	20	15	26	19	26	48	77	71	73	77	63	43	78	82	162	121	64	74	70	64	63	54	62	27.4
77	1	43	30	20	26	16	19	24	56	50	72	67	56	56	59	62	64	78	104	64	69	65	64	65	59	57	22.4
77	2	25	24	18	13	14	13	17	36	54	43	45	46	44	47	50	46	61	79	52	53	47	46	50	42	40	16.9
77	3	17	14	12	12	11	12	18	32	44	32	34	36	35	36	36	39	46	59	30	27	28	27	28	24	28	10.9
77	4	25	21	17	16	13	14	25	34	40	39	38	43	44	39	44	44	56	57	33	33	33	30	39	35	34	11.5
77	5	16	15	12	14	10	10	15	27	31	28	36	31	34	35	35	37	41	45	24	21	19	22	21	20	24	10.1
77	6	17	14	16	16	16	16	17	22	20	31	35	39	39	37	38	40	43	42	25	24	22	25	23	24	24	9.4
77	7	22	16	17	16	16	17	22	29	30	35	39	39	43	40	38	40	43	42	25	24	22	23	20	21	28	9.9
77	8	14	13	10	11	12	10	21	29	20	26	42	43	40	39	38	39	45	43	44	22	28	26	23	20	28	11.2
77	9	21	17	12	10	10	10	12	39	42	44	44	50	57	52	50	54	61	62	44	41	39	41	35	31	37	10.5
77	10	33	46	19	18	10	13	41	39	40	36	35	36	58	59	58	65	70	76	61	65	62	61	54	50	40	19.1
77	11	15	11	9	7	7	7	9	23	30	31	33	43	47	44	48	57	67	77	52	45	43	33	35	29	34	19.5
77	12	17	13	16	9	8	9	12	25	32	37	43	44	50	51	55	62	68	78	59	50	41	31	25	21	30	22.4
78	1	21	12	10	15	10	15	21	38	40	42	32	44	68	65	62	71	76	79	58	40	37	38	34	29	43	20.9
78	2	12	9	9	9	8	10	12	27	32	38	41	41	61	57	59	51	54	53	44	37	33	24	25	26	33	14.0
78	3	18	17	17	18	18	16	18	21	27	29	35	36	35	30	25	42	39	39	28	27	18	23	21	21	28	8.5
78	4	15	10	9	5	8	9	12	21	32	48	45	40	29	28	32	33	39	44	29	28	25	20	23	15	23	10.0
78	5	12	8	5	8	7	7	11	21	40	17	20	20	21	21	19	21	23	27	17	14	15	18	15	15	18	5.7
78	6	17	18	15	10	10	14	18	20	32	20	33	37	34	37	36	40	40	29	25	23	21	24	25	20	27	9.2
78	7	13	10	9	8	8	9	13	26	34	25	31	34	38	25	35	33	38	37	22	16	18	22	22	18	22	10.3
78	8	13	9	4	7	7	7	12	23	37	29	31	39	33	36	31	34	38	42	23	21	22	23	21	17	22	10.7
78	9	14	11	8	7	7	8	13	22	3	23	34	37	38	41	42	42	50	47	30	30	28	28	24	22	28	13.2
78	10	25	17	13	12	9	10	18	41	60	38	47	47	44	40	39	42	49	58	43	45	41	49	42	35	37	10.0
78	11	24	22	18	12	10	11	19	39	39	51	47	40	46	49	50	30	42	48	44	54	47	40	41	33	41	18.8
78	12	25	20	17	12	10	13	12	31	42	44	40	50	56	51	52	30	72	49	73	61	48	49	42	34	43	20.4
79	1	25	16	10	12	11	12	17	34	47	44	45	46	48	52	52	57	72	48	40	52	45	42	35	31	40	19.3
79	2	15	13	10	8	9	9	18	30	32	33	37	40	42	40	43	40	54	42	41	35	34	32	28	23	31	14.8
79	3	20	15	12	10	10	12	23	45	40	29	39	39	41	42	46	55	55	43	43	41	38	39	33	28	35	15.0
79	4	17	13	11	9	8	10	17	27	31	30	34	39	36	39	43	40	49	51	34	33	31	33	30	25	29	12.5
79	5	11	8	9	7	7	6	17	29	32	30	32	34	35	35	37	37	39	40	26	22	24	24	25	18	24	10.9
79	6	11	9	7	8	7	5	15	24	27	20	30	34	34	35	35	37	40	35	22	20	19	21	20	17	23	10.6
79	7	11	9	7	7	7	9	14	20	24	20	29	31	32	31	32	30	35	33	22	20	18	20	15	16	22	9.8
79	8	11	9	7	8	8	8	17	30	30	30	31	33	35	34	33	37	40	38	28	24	22	21	21	18	24	10.4
79	9	12	14	9	7	7	10	18	27	41	20	25	37	32	34	38	39	44	44	31	22	30	30	27	23	28	11.7
79	10	19	13	11	9	9	12	19	41	32	42	37	35	37	35	35	40	44	40	43	41	38	40	34	28	32	13.9
79	11	23	17	10	10	8	12	21	47	40	42	44	45	43	42	45	53	66	72	45	46	46	49	40	35	38	16.7
79	12	15	11	8	7	7	2	14	30	30	25	37	38	38	27	40	44	57	68	45	32	35	29	25	20	30	15.7
AVE		22	16	16	14	16	15	22	34	40	38	37	39	42	40	41	44	50	50	38	37	35	35	32	29		
ST DEV		7.4	5.2	5.7	5.4	5.3	6.4	8.5	9.5	13.2	10.5	9.3	10.3	10.5	12.5	11.1	12.8	15.7	20.2	15.7	16.1	12.8	12.1	11.2	10.0		

25TH, 50TH, 75TH, 95TH PERCENTILES, MAXIMUM AND MISSING

25TH	50TH	75TH	95TH	MAXIMUM	MISSING
26	31	42	60	121	330

Table 2.4(a)

Two way tables of monthly weekend averages of hourly CO-CAMS

YR	MO	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVG	DEV
70	1	22	61	46	45	43	19	28	38	41	39	34	41	53	37	62	70	79	76	78	71	76	66	66	65	54	19.1
70	2	79	80	61	40	17	15	43	23	20	27	31	44	64	63	69	50	65	61	57	57	57	65	63	55	65	17.5
70	3	46	42	23	19	16	16	15	26	20	35	37	41	35	46	29	30	33	41	39	52	42	33	36	39	31	13.7
70	4	32	41	36	21	16	13	11	16	20	19	22	27	36	34	41	46	46	46	36	37	37	44	33	36	34	12.8
70	5	27	26	16	12	11	16	15	15	10	17	16	22	43	42	40	47	18	16	16	17	28	27	28	16	20	6.2
70	6	41	26	14	19	16	16	10	12	11	16	23	21	18	21	40	30	31	31	21	22	26	34	43	40	24	9.5
70	7	10	27	19	16	9	4	11	15	15	15	14	20	24	26	33	32	31	28	21	14	16	19	15	19	19	6.6
70	8	26	16	15	13	14	11	12	15	16	16	16	16	19	21	40	26	29	23	22	17	16	18	42	[illegible]	16	4.5
70	9	32	30	23	23	17	13	16	23	17	23	26	31	30	33	40	43	45	39	36	36	30	59	49	67	36	16.2
70	10	44	27	36	41	26	16	16	27	33	26	41	43	45	45	42	46	46	47	42	51	50	46	43	56	40	13.3
70	11	33	38	23	17	12	15	16	26	21	43	34	36	37	42	39	43	57	47	39	34	34	34	31	33	32	11.7
70	12	63	40	29	29	20	16	41	43	30	44	63	56	50	70	40	46	72	72	57	50	60	47	73	69	55	21.6
71	1	57	40	32	27	42	19	19	40	47	30	46	56	48	38	48	49	72	61	53	51	57	53	53	53	46	16.1
71	2	52	34	26	40	44	19	19	43	40	34	40	36	40	46	46	57	47	48	45	40	41	57	49	47	46	17.6
71	3	37	40	39	27	44	17	17	14	40	38	34	34	50	43	46	32	46	46	61	51	54	52	44	42	46	14.6
71	4	25	32	22	15	16	11	17	13	13	17	15	41	19	24	25	26	27	26	27	25	26	27	31	27	23	6.6
71	5	25	27	16	12	14	14	12	13	11	23	26	25	23	22	21	21	16	13	15	23	24	26	27	[illegible]	20	6.9
71	6	39	33	21	27	16	16	17	18	17	27	27	47	33	37	39	37	31	37	28	26	31	38	42	43	31	6.9
71	7	22	44	16	10	11	16	11	17	11	23	26	20	26	27	25	20	27	26	16	17	23	32	40	38	23	7.6
71	8	26	34	27	20	16	14	16	23	22	26	49	26	32	32	32	29	33	37	31	32	37	27	32	33	30	7.5
71	9	45	26	43	14	13	13	16	13	26	34	36	37	40	43	44	47	53	49	46	44	43	39	40	40	34	12.6
71	10	77	38	46	31	23	19	21	35	42	39	35	44	52	52	56	61	60	59	62	71	70	62	62	46	48	15.6
71	11	75	57	56	31	41	15	23	26	36	46	47	56	63	65	72	80	79	80	76	65	65	65	70	67	55	20.6
71	12	62	43	26	26	15	17	19	36	32	40	41	36	60	42	57	50	46	41	37	43	40	41	[illegible]	[illegible]	39	14.9
72	1	26	31	36	17	11	12	14	26	21	34	44	43	51	43	54	60	64	64	59	52	53	54	50	[illegible]	43	16.1
72	2	40	46	27	23	16	15	13	23	27	23	37	49	44	55	40	46	60	50	50	61	54	58	46	[illegible]	46	16.7
72	3	47	49	27	22	13	12	13	16	22	22	41	51	55	56	55	56	61	59	61	54	55	42	75	66	46	19.3
72	4	42	32	44	22	26	16	22	48	46	26	36	35	41	46	40	32	36	42	39	42	41	42	52	32	37	11.1
72	5	42	31	36	22	16	15	13	26	26	42	29	33	34	36	40	46	46	42	35	32	31	33	41	35	32	10.8
72	6	42	46	27	26	25	19	25	26	34	33	38	42	42	49	46	46	40	49	33	32	32	36	46	45	40	11.4
72	7	26	21	17	11	14	16	12	16	15	15	15	42	41	41	26	23	25	21	17	17	17	20	23	45	16	4.7
72	8	33	26	26	40	12	16	16	16	16	19	19	23	26	32	28	33	38	24	21	16	18	45	22	43	23	5.4
72	9	41	30	22	47	16	17	17	36	42	43	36	35	45	43	28	39	29	31	31	42	49	42	44	41	36	9.2
72	10	22	46	22	43	24	17	19	27	27	21	34	30	40	36	47	22	37	29	57	56	60	54	64	58	39	14.3
72	11	46	46	46	42	41	16	16	29	30	25	42	42	48	48	51	62	67	68	71	75	75	76	79	62	55	23.6
72	12	60	40	31	44	46	16	19	22	30	45	55	56	62	62	64	76	79	70	62	58	74	62	56	56	51	16.7
73	1	33	43	31	43	26	16	19	28	30	32	36	43	46	40	45	51	56	58	55	52	51	59	61	65	43	13.6
73	2	36	46	36	46	23	14	19	25	40	33	43	42	45	40	49	52	40	51	51	40	52	58	41	59	43	13.3
73	3	85	53	22	23	16	13	10	16	40	40	32	39	42	46	40	46	40	47	42	40	39	44	50	50	38	13.7
73	4	46	46	25	21	46	43	29	30	32	26	20	34	32	33	35	36	33	30	30	31	33	40	43	43	33	6.9
73	5	38	36	40	43	19	18	16	19	43	23	20	49	31	31	29	22	29	43	43	21	23	23	23	26	25	6.9
73	6	36	30	21	16	16	13	17	19	20	22	30	31	35	35	30	40	36	31	32	34	31	32	39	35	29	8.5
73	7	23	40	46	17	16	16	14	17	17	19	21	20	24	47	27	43	20	23	21	17	17	15	18	18	21	6.7
73	8	23	17	10	10	10	16	14	16	10	40	20	23	26	31	28	21	26	23	26	22	26	29	26	25	23	6.9
73	9	39	36	26	19	19	10	29	26	20	26	41	23	29	31	30	23	35	33	48	37	36	36	32	28	26	6.1
73	10	34	31	21	40	46	10	22	26	30	40	43	45	46	45	38	41	59	59	54	55	48	49	46	50	43	13.3
73	11	76	40	28	28	43	15	22	29	22	39	45	40	50	58	61	68	75	81	66	69	65	59	69	68	51	19.3
73	12	72	55	45	31	40	42	27	37	46	43	46	50	63	60	67	76	66	79	64	67	55	61	65	61	56	17.3
74	1	41	22	25	16	15	12	12	14	21	22	31	36	45	36	36	41	48	49	42	42	41	40	46	46	36	12.0
74	2	46	45	30	43	26	16	22	31	30	36	41	45	51	45	45	58	56	61	52	46	48	40	49	48	43	12.3
74	3	36	43	26	42	17	15	26	21	32	46	47	50	44	46	46	47	46	54	44	52	59	58	56	58	43	12.8
74	4	41	31	45	19	16	12	23	20	26	25	29	29	36	32	32	38	33	29	23	26	32	38	32	30	28	6.6
74	5	42	31	22	10	10	13	19	19	21	42	22	40	44	31	25	40	23	23	45	22	25	33	31	32	25	6.6
74	6	16	15	13	16	13	13	16	16	10	16	10	17	15	15	16	17	13	12	12	12	15	16	13	19	15	2.2
74	7	19	16	16	13	12	12	12	12	13	15	16	10	15	19	18	16	18	19	16	15	22	26	18	16	17	3.6
74	8	16	12	14	19	11	13	13	13	10	16	16	17	26	26	18	17	19	15	16	17	20	18	23	17	16	2.8
74	9	26	26	23	16	15	16	19	25	20	19	16	16	21	23	20	25	26	20	25	36	33	29	32	31	26	5.7
74	10	42	45	36	20	24	22	20	32	20	35	36	36	35	27	26	23	35	42	36	43	48	39	35	29	35	7.2
74	11	89	31	22	26	16	12	14	42	47	36	46	40	41	50	35	54	62	58	50	46	37	40	40	50	43	15.3
74	12	44	30	27	20	10	12	16	21	40	20	32	35	37	30	37	40	51	48	56	51	40	36	38	46	34	11.9
75	1	33	18	10	11	12	10	11	13	12	21	26	20	35	33	30	35	44	43	38	36	31	28	31	31	27	10.3
75	2	42	40	27	17	14	13	16	20	22	26	25	35	46	30	33	39	40	39	32	34	41	43	40	39	31	10.3
75	3	39	42	26	7	6	1	6	10	13	43	31	36	36	46	47	59	57	40	26	36	37	32	33	38	30	16.2
75	4	27	44	17	6	5	5	6	9	4	4	4	6	16	6	12	9	8	7	2	4	10	6	10	22	10	6.2
75	5	19	13	16	7	3	3	4	9	11	13	10	13	16	19	22	24	16	14	12	15	21	21	18	27	14	6.6
75	6	15	9	10	7	6	4	7	9	11	10	13	16	16	19	19	17	13	10	9	9	7	9	9	9	11	4.2
75	7	13	4	4	1	1	1	1	1	4	5	6	12	13	12	15	16	10	9	10	5	5	6	7	6	7	4.6
75	8	24	10	13	6	5	6	7	13	12	16	42	40	47	40	41	40	17	30	20	21	20	19	25	27	18	7.3
75	9	28	16	13	7	7	7	9	17	19	16	27	40	32	32	30	31	27	27	27	27	17	17	20	27	21	8.2
75	10	32	47	20	13	7	7	9	17	20	16	23	20	34	30	36	40	42	50	53	56	56	46	49	53	32	15.6
75	11	46	49	40	13	7	7	12	16	10	26	50	30	38	48	31	55	57	59	49	55	45	40	47	41	35	16.6
75	12	36	32	27	41	10	15	19	26	26	28	43	43	31	32	43	71	75	78	60	66	50	46	43	42	43	16.7
76	1	30	34	24	45	40	19	21	27	31	29	30	36	45	40	46	53	48	45	41	39	33	33	37	36	35	9.0
76	2	25	29	42	30	10	14	10	41	20	23	43	25	36	32	32	41	40	51	48	43	46	30	46	41	32	11.5
76	3	42	17	12	3	1	1	3	6		9	17	45	41	47	49	30	47	29	38	30	23	19	19	17	18	11.0
76	4	22	13	19	7	4	4	4	6		9	16	16	22	14	17	17	17	15	20	26	16	16	19	21	14	5.6
76	5	17	12	13	6	2	2	2	4		33	17	20	21	43	20	19	19	21	15	16	16	16	23	17	13	6.5
76	6	10	10	12	4	4	4	4	4	4	6	9	9	7	5	7	5	5	5	7	7	11	29	20	13	9	6.2
76	7	10	9	15	10	16		11	7	7	8	9	12	12	13	12	12	4	9	10	13	15	16	18	19	12	3.6
76	8	49	12	14	12		5	7	12	13	15	23	29	48	31	26	26	21	18	18	22	25	21	24	20	19	6.2
76	9	10	13	16	23	10	14	10	21	21	23	29	27	36	49	29	33	30	24	31	43	42	34	33	29	25	8.6
76	10	26	40	23	43	20	15	15	20	43	29	30	34	42	42	45	43	41	40	47	52	43	50	55	64	38	13.6
76	11	21	19	15	17	11	11	11	13	10	16	21	21	27	23	27	32	32	42	40	36	34	38	46	40	20	11.6
76	12	30	40	22	41	10	14	23	27	40	27	33	30	30	40	34	57	57	65	53	46	46	46	42	42	39	12.3
77	1	20	30	33	46	41	17	40	40	20	46	27	32	36	28	43	45	54	53	42	43	40	40	39	42	35	11.1
77	2	66	47	40	47	48	40	43	27	40	23	30	39	44	49	44	36	55	53	46	43	43	37	40	40	42	10.1
77	3	46	30	42	19	16	11	16	17	21	40	47	34	33	40	37	37	37	42	37	36	40	38	46	46	31	10.3
77	4	37	29	22	47	40	16	19	10	20	43	40	44	43	25	21	49	34	49	36	46	37	31	47	47	29	9.0
77	5	24	49	20	21	10	16	11	11	10	22	43	28	34	34	36	34	37	32	29	28	27	28	29	33	27	7.5
77	6	26	12	16	14	14	12	12	12	1	41	41	20	25	41	30	30	26	40	23	21	27	39	44	31	23	8.6
77	7	16	10	11	6	7	7	7	9	11	11	11	15	15	15	16	12	15	13	13	4	12	11	12	14	12	2.6
77	8	29	43	43	17	17	12	15	17	17	19	25	29	33	34	37	40	37	35	34	39	41	27	27	25	26	10.6
77	9	34	33	21	17	17	15	17	15	20	30	30	40	44	40	50	52	49	46	44	44	35	32	24	36	35	11.2
77	10	42	34	32	40	10	10	12	29	30	28	33	40	44	41	46	40	37	37	42	33	29	24	44	20	31	9.6
77	11	32	43	23	41	10		12	12	10	20	27	33	27	30	37	43	50	57	43	37	36	33	42	30	33	13.7
77	12	67	25	23	21	13	26	16	20	30	41	55	40	41	55	57	51	55	56	52	56	47	43	48	46	43	14.3
78	1	61	40	46	22	27	40	47	29	23	30	42	39	31	54	52	59	56	54	59	62	49	53	49	53	45	11.6
78	2	42	49	19	23	11	11	11	19	20	22	32	32	36	36	19	20	35	37	40	40	26	23	26	31	27	9.6
78	3	30	40	42	16	17	18	15	21	21	12	41	43	40	43	29	33	33	36	36	42	39	43	57	40	26	10.6
78	4	22	30	22	17	17	16	17	17	1	42	40	33	32	32	33	37	30	31	29	36	36	30	34	30	23	7.6
78	5	23	13	16	5	7	12	13	12	12	15	12	16	25	45	25	21	33	40	42	22	18	23	25	17	18	6.2
78	6	27	44	12	13	13	10	10	23	2	25	10	14	25	27	21	25	25	46	46	22	21	40	29	20	22	6.6
78	7	15	14	16	14	9	7	7	11	11	15	16	12	16	19	22	22	23	40	16	17	17	15	16	17	15	4.5
78	8	22	44	44	16	13	16	11	16	16	10	16	46	20	27	26	47	26	23	20	26	27	26	34	19	22	6.6
78	9	28	40	27	46	16	13	13	19	46	47	32	38	36	34	30	25	39	34	40	34	32	31	21	45	29	8.1
78	10	23	30	27	41	10	10	13	16	42	32	34	40	41	49	40	46	43	30	39	46	48	32	43	39	36	11.6
78	11	35	24	32	43	46	46	16	16	40	46	40	40	36	47	33	42	37	42	40	36	22	34	36	37	30	7.4
78	12	47	24	37	47	22	42	43	44	44	46	30	39	42	44	34	50	56	46	49	45	39	42	44	39	38	10.1
79	1	52	21	40	41	12	16	19	40	40	24	43	40	21	27	33	27	36	34	32	34	34	39	46	46	30	9.6
79	2	53	46	42	40	10	15	10	43	30	27	47	49	46	55	65	72	73	65	62	47	65	47	69	43	45	16.6
79	3	40	40	40	19	16	14	16	15	40	46	43	27	36	34	38	45	33	29	33	32	30	23	27	29	27	7.6
79	4	26	44	43	12	16	16	16	12	10	15	19	43	49	26	27	47	28	25	25	25	25	26	31	29	23	6.9
79	5	48	10	17	12	8	8	16	11	12	15	10	22	43	23	22	43	25	18	16	16	17	17	24	17	16	5.2
79	6	12	10	14	11	8	8	7	16	11	13	15	17	22	20	21	42	21	21	16	13	12	14	16	14	15	4.3
79	7	16	15	12	12	9	7	8	9	10	14	17	18	16	16	16	15	15	11	10	11	10	16	21	19	14	3.8
79	8	17	10	15	16	8	6	5	7		7	11	14	13	18	17	15	15	14	10	18	21	17	13	13	13	4.7
79	9	45	20	20	10	10	12	16	10	17	42	43	45	48	45	31	30	29	29	26	24	27	28	32	30	25	6.3
79	10	37	41	40	19	13	16	10	24	4	26	35	43	44	47	46	52	50	46	48	52	52	69	54	44	36	13.0
79	11	40	31	40	19	10	16	17	22	40	31	43	47	32	41	47	52	50	50	53	45	46	49	30	36	37	12.6
79	12	38	25	19	16	4	8	7	15	21	49	32	40	43	46	56	63	57	44	40	36	28	31	31	45	31	15.7
AVG		44	34	40	16	15	13	15	19	22	25	28	31	33	35	37	40	41	39	37	37	36	36	38	37		
ST DEV		17.7	14.6	9.7	7.1	5.9	5.1	5.6	7.5	8.3	9.6	10.9	11.5	13.3	13.2	14.9	16.9	18.6	18.6	16.9	16.6	15.7	15.2	16.3	15.6		

25TH, 50TH, 75TH, 95TH PERCENTILES, MAXIMUM AND MISSING

16 28 41 61 96 0

Table 2.4(b)

Two way tables of monthly weekend averages of hourly CO--Hollywood

YR	MO	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE	DEV
73	1	42	36	20	21	14	8	11	10	21	30	42	43	99	97	109	99	115	110	77	94	76	81	66	50	61	35.0
73	2	56	47	21	22	14	18	27	34	42	48	83	93	104	105	102	104	112	125	149	109	85	79	80	80	72	35.5
73	3	51	36	19	12	2	11	19	21	21	44	81	71	60	72	73	65	61	60	65	72	52	58	56	53	49	23.7
73	4	27	29	28	28	21	18	41	27	40	33	47	57	72	32	42	40	55	56	59	80	49	57	61	43	42	14.8
73	5	40	35	20	19	13	17	40	23	32	44	57	56	65	59	59	51	53	52	40	43	57	83	47	42	43	15.8
73	6	22	10	10	10	10	16	15	14	23	29	37	37	82	55	58	39	54	50	62	44	42	46	29	26	34	17.2
73	7	40	12	11	11	8	9	16	20	20	22	41	43	53	53	44	40	46	39	46	50	40	37	27	25	32	14.8
73	8	23	11	11	11	11	17	23	17	20	25	40	63	54	52	52	40	43	44	58	40	44	40	29	23	34	10.2
73	9	29	21	16	16	22	27	25	44	30	29	87	90	80	79	92	79	71	79	72	51	40	44	28	21	33	25.8
73	10	35	25	22	18	16	15	20	21	32	52	65	79	82	81	76	56	55	55	76	75	81	53	62	56	47	21.2
73	11	46	26	24	24	10	16	26	26	20	40	49	89	77	62	78	89	107	105	84	83	69	60	36	23	51	28.9
73	12	45	30	20	14	12	13	15	22	30	42	47	53	83	66	70	60	63	95	86	88	66	65	50	46	50	26.8
74	1	23	16	12	15	12	15	15	20	20	23	34	40	49	40	42	40	45	45	51	62	52	44	35	36	35	14.4
74	2	40	22	26	10	14	12	13	19	24	29	33	46	44	43	43	40	45	52	51	54	46	41	39	35	36	12.7
74	3	21	31	23	21	12	17	26	25	30	31	46	46	51	39	39	39	30	36	46	49	35	46	43	43	37	10.7
74	4	26	10	12	12	11	11	10	14	19	22	28	29	41	32	33	32	33	29	28	29	38	35	35	26	25	9.3
74	5	24	17	13	11	11	11	11	11	16	20	23	23	32	35	33	30	23	23	27	22	27	27	27	27	22	7.7
74	6	12	10	9	7	7	7	6	10	10	10	10	16	26	20	18	16	15	12	12	12	12	14	8	10	13	4.3
74	7	21	20	10	12	10	10	13	13	10	18	23	25	33	33	36	36	34	29	26	24	28	33	34	30	26	8.9
74	8	22	23	21	18	16	16	16	19	20	26	31	40	43	42	39	35	26	35	33	37	36	37	31	28	29	8.4
74	9	25	26	24	14	15	13	21	41	30	27	33	32	37	34	36	39	44	44	54	69	70	66	45	40	37	15.4
74	10	122	63	40	21	29	26	40	45	30	49	66	69	60	36	35	44	45	42	65	63	59	55	35	36	46	14.6
74	11	49	25	21	16	12	6	13	21	22	42	40	55	60	38	47	29	61	25	78	82	54	44	32	31	40	22.2
74	12	40	26	27	16	16	16	17	25	31	37	43	36	82	86	73	65	61	76	87	69	49	46	30	84	40	20.5
75	1	22	10	12	2	4	6	11	18	20	23	22	36	44	46	39	40	55	58	51	52	76	39	35	30	33	17.4
75	2	32	33	23	22	16	17	17	21	32	29	48	52	62	53	55	52	53	54	47	52	36	40	48	29	41	14.3
75	3	44	28	21	10	5	3	6	12	10	24	49	50	80	65	69	69	71	59	80	70	47	62	32	27	40	23.5
75	4	27	22	22	22	22	19	22	26	20	23	49	33	34	32	30	31	29	26	29	33	32	30	26	21	26	5.4
75	5	21	16	12	10	5	5	9	11	17	19	20	43	48	29	29	32	30	30	30	37	35	36	28	23	22	9.5
75	6	15	13	17	10	2	6	9	10	10	22	25	27	32	31	33	29	25	23	19	25	22	22	17	14	20	8.1
75	7	12	8	8	1	1	1	2	2	0	13	18	23	22	24	23	17	18	16	13	14	16	16	7	8	12	7.4
75	8	10	10	10	9	4	2	5	5	10	13	22	19	28	25	26	22	21	18	20	21	16	18	19	15	15	6.9
75	9	43	36	22	15	13	12	19	27	22	36	40	24	40	37	37	29	32	37	36	42	30	22	23	16	29	9.5
75	10	23	16	16	16	4	6	8	10	20	14	17	29	37	37	39	40	43	45	40	37	30	47	42	40	30	15.9
75	11	20	24	15	8	5	5	6	12	20	20	33	36	44	43	45	44	49	59	51	52	36	29	27	15	30	16.1
75	12	31	21	20	7	21	16	14	19	20	40	46	52	55	71	66	87	104	92	94	61	82	56	48	39	48	27.8
76	1	19	13	12	10	7	5	4	9	10	27	31	22	47	48	40	30	31	43	38	43	27	24	20	22	27	15.1
76	2	23	10	17	9	6	2	4	8	10	19	27	28	35	37	40	43	41	47	36	36	22	24	21	23	24	13.0
76	3	24	12	15	13	10	4	4	12	20	26	24	23	34	32	31	29	31	35	40	49	42	34	31	33	26	10.8
76	4	21	15	11	9	4	4	11	7	11	21	23	31	34	45	28	27	27	23	34	33	32	30	25	30	23	10.2
76	5	20	10	10	4	3	5	6	10	12	18	23	31	36	25	23	22	25	25	25	23	26	25	18	24	19	8.3
76	6	13	11	11	8	8	8	8	8	10	17	20	19	21	17	23	17	17	19	10	20	20	30	21	20	16	6.2
76	7	15	10	11	9	5	6	7	8	11	19	22	25	20	21	20	26	21	24	23	24	31	29	18	15	17	7.4
76	8	17	10	13	11	11	7	12	13	13	18	20	23	36	34	36	36	31	36	27	27	36	26	23	19	23	9.1
76	9	23	20	19	13	14	12	10	14	17	24	27	33	33	30	30	31	33	37	34	52	57	47	36	37	29	11.4
76	10	41	32	30	22	12	10	9	15	10	26	33	26	35	33	42	37	33	39	50	57	57	55	52	48	37	15.4
76	11	26	10	22	14	11	11	11	14	17	29	32	40	42	43	49	50	80	80	98	40	30	72	55	38	42	20.4
76	12	40	39	40	41	17	10	19	24	25	29	42	49	55	62	72	70	76	76	60	53	49	53	39	32	45	18.3
77	1	44	37	40	21	20	17	20	27	30	45	41	40	55	53	70	80	89	73	89	56	51	70	56	40	46	16.9
77	2	49	41	30	27	23	22	20	25	22	22	36	43	42	43	48	50	44	53	82	59	47	40	40	37	40	11.7
77	3	40	31	20	23	26	26	27	27	27	33	36	37	36	39	37	36	33	40	33	43	31	37	29	32	33	6.8
77	4	27	23	23	25	19	17	21	19	17	23	19	27	25	27	27	29	29	40	34	44	44	42	37	34	28	8.5
77	5	23	20	12	10	12	16	12	10	12	17	40	21	22	43	22	41	23	43	18	23	27	26	23	20	19	6.6
77	6	21	14	16	10	8	6	6	5	2	15	17	21	25	29	25	29	27	32	27	25	27	32	29	25	20	8.7
77	7	13	13	9	4	3	7	7	9	8	10	15	17	21	43	25	41	22	21	17	18	25	25	23	17	16	8.4
77	8	28	26	20	12	9	9	9	16	10	26	26	30	31	37	31	33	33	34	30	30	34	33	27	23	25	8.8
77	9	25	26	10	11	9	8	9	15	20	21	42	36	35	39	43	44	43	42	44	44	44	42	34	36	30	13.5
77	10	36	30	25	23	17	17	17	25	22	43	37	43	35	42	43	40	39	37	52	50	44	40	37	29	35	10.1
77	11	36	25	27	26	11	13	16	19	22	32	43	49	53	36	45	52	65	63	57	45	49	47	39	36	39	15.3
77	12	20	17	13	9	3	5	3	14	21	30	47	50	62	57	59	55	82	87	52	47	36	32	26	30	35	20.2
78	1	22	20	20	10	15	16	11	16	22	30	36	40	56	59	52	50	59	73	58	32	48	42	38	37	36	16.9
78	2	28	23	16	15	10	2	10	19	29	53	57	59	55	44	61	49	75	73	75	67	60	50	40	32	44	22.2
78	3	56	30	24	20	10	14	24	44	22	31	34	38	23	37	40	40	63	44	83	72	70	70	72	57	42	18.7
78	4	22	22	15	17	11	16	12	12	11	15	42	20	40	40	30	32	30	33	40	47	33	37	29	18	25	10.0
78	5	20	10	20	13	9	3	12	13	11	25	31	36	30	34	29	25	30	38	36	38	29	27	23	17	24	9.5
78	6	27	20	20	13	8	9	3	11	12	17	21	21	24	24	22	20	23	24	20	21	20	21	21	29	20	5.8
78	7	26	19	13	16	2	6	8	8	10	17	20	33	33	31	32	20	26	22	25	29	20	25	18	15	23	8.3
78	8	31	27	24	16	9	5	15	14	10	40	40	30	30	29	27	23	33	27	34	46	42	33	26	20	26	8.4
78	9	40	10	16	14	13	13	16	23	20	23	36	40	40	33	27	31	43	33	40	45	23	31	24	25	28	10.3
78	10	40	32	28	23	16	13	10	21	22	39	30	41	46	44	41	37	33	38	47	59	49	48	48	54	37	12.3
78	11	42	37	36	25	20	24	22	22	2	29	42	33	41	43	34	40	45	85	59	55	52	35	47	47	41	11.4
78	12	30	24	20	23	28	21	10	17	10	43	31	37	28	38	43	45	45	51	52	45	45	33	38	38	35	11.4
79	1	26	10	16	13	3	8	8	12	10	22	40	40	55	57	54	63	56	87	85	59	48	53	44	42	36	19.3
79	2	49	21	20	17	11	13	12	21	30	20	60	60	58	43	57	60	73	65	80	52	44	40	27	26	41	19.1
79	3	32	20	17	9	3	5	10	10	21	26	36	41	41	35	43	40	43	42	42	41	43	28	29	23	30	12.6
79	4	30	30	21	14	4	6	11	10	17	21	20	21	21	21	20	23	29	25	20	37	30	30	30	29	23	4.3
79	5	17	13	11	9	7	8	9	11	10	16	14	17	18	17	17	13	17	14	14	17	13	17	13	11	14	3.6
79	6	14	14	10	12	4	10	12	10	15	19	20	28	27	24	22	23	20	20	15	20	21	23	23	23	18	5.2
79	7	10	13	14	7	2	10	12	11	10	13	20	22	24	21	21	23	21	20	17	17	19	20	16	18	17	4.6
79	8	10	10	13	11	7	2	10	19	10	14	23	22	22	22	22	22	24	29	21	33	28	31	23	17	19	7.3
79	9	22	22	27	22	19	10	17	23	21	33	36	33	36	31	30	37	36	31	26	31	30	29	20	23	26	5.7
79	10	26	20	17	13	2	10	11	19	20	29	39	37	48	48	43	42	41	43	47	49	43	40	31	25	32	13.1
79	11	32	29	12	8	4	6	11	15	10	21	41	37	43	35	33	40	46	42	42	47	37	33	27	21	31	14.3
79	12	40	21	9	8	2	5	2	12	10	26	35	47	50	50	51	50	53	56	59	47	36	28	19	15	30	17.6
AVE		32	26	20	15	12	11	14	17	20	30	35	43	44	42	43	43	45	47	44	44	42	40	33	30		

ST DEV 14.314.3 5.4 6.8 5.9 5.2 6.7 7.9 8.812.216.216.317.617.118.918.822.423.221.319.115.914.812.712.2

25TH, 50TH, 75TH, 95TH PERCENTILES, MAXIMUM AND MISSING

18 29 43 69 129 0

Table 2.4(c)

Two way tables of monthly weekend averages of hourly CO--Alder

YR	MO	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE	DEV
75	9	30	35	30	19	13	15	15	17	22	30	29	24	23	17	16	19	19	30	40	36	31	27	30	26	26	8.9
75	10	25	21	15	11	9	7	7	12	13	14	14	22	24	26	29	29	26	26	30	29	29	24	30	34	22	8.6
75	11	21	17	11	4	5	7	7	9	12	15	16	21	25	27	25	30	32	32	28	24	17	18	17	18	19	6.0
75	12	42	29	27	17	14	14	12	15	22	29	29	30	44	42	46	50	55	65	48	44	37	41	44	40	35	14.1
76	1	23	25	22	16	11	10	3	11	14	18	19	24	24	24	28	31	35	33	29	24	23	22	27	26	22	7.3
76	2	32	16	3	5	1	1	1	1	4	6	9	12	14	14	26	32	23	26	20	17	20	20	23	18	15	9.7
76	3	32	26	17	13	8	5	8	10	12	13	18	21	24	23	23	24	32	34	40	39	36	35	37	39	24	11.2
76	4	26	20	19	13	5	4	6	9	12	17	17	17	25	27	30	34	39	40	37	36	32	32	33	35	23	11.3
76	5	33	25	24	13	7	8	6	9	14	14	20	23	18	17	23	22	29	24	23	25	29	30	29	31	21	8.1
76	6	34	21	24	11	12	9	4	8	13	13	13	15	25	30	34	33	34	35	31	30	41	51	50	44	25	13.5
76	7	37	29	20	10	5	5	7	7	11	18	24	23	26	25	27	27	29	33	29	27	34	33	37	38	23	10.4
76	8	39	23	14	13	5	8	5	12	13	21	21	29	28	24	28	40	25	38	36	32	34	36	43	33	25	11.0
76	9	32	29	29	12	12	9	12	12	13	23	32	35	32	32	29	26	29	32	55	63	69	60	60	61	34	16.1
76	10	56	47	34	43	13	11	12	14	14	21	43	29	32	37	39	45	45	41	41	41	45	46	45	42	33	13.1
76	11	26	26	22	13	9	13	9	12	16	17	21	29	33	37	43	40	47	46	40	36	35	38	36	30	28	12.0
76	12	49	39	36	21	22	23	20	22	24	22	36	43	38	37	50	55	53	56	50	39	35	37	39	31	38	12.3
77	1	50	37	31	21	16	16	17	26	27	36	40	46	49	42	37	34	40	39	37	43	39	39	45	42	35	9.9
77	2	39	29	26	21	13	12	12	16	17	16	17	19	21	20	27	26	27	30	32	26	26	32	29	26	23	6.7
77	3	26	20	20	14	4	4	9	15	17	23	20	26	38	46	32	32	35	35	29	29	26	20	29	32	24	8.9
77	4	42	23	27	20	19	14	13	16	18	21	29	36	48	46	38	31	34	37	38	42	41	38	41	39	31	10.6
77	5	34	23	22	16	14	13	11	13	17	19	24	25	25	27	27	27	28	28	27	28	28	32	36	40	24	7.4
77	6	32	24	12	10	7	8	5	7	9	10	10	13	16	17	23	30	24	43	24	24	47	52	62	40	22	15.0
77	7	49	21	17	9	3	3	3	6	3	10	19	24	25	26	27	33	33	34	29	23	25	29	34	28	21	10.4
77	8	37	29	23	15	11	9	12	13	12	17	20	24	21	29	29	31	28	27	27	29	30	33	36	27	24	8.1
77	9	27	20	17	10	6	7	13	11	13	16	20	23	21	20	18	20	24	27	26	32	32	32	36	36	21	8.6
77	10	29	32	27	16	13	12	12	15	19	22	24	25	24	22	24	24	30	31	26	27	32	32	32	33	25	7.1
77	11	28	27	22	12	8	10	10	9	15	19	23	29	38	38	42	38	35	42	32	31	21	23	25	21	25	10.6
77	12	28	24	19	15	11	11	10	13	23	22	31	39	41	39	43	46	46	41	35	33	27	21	25	26	28	11.2
78	1	31	25	22	16	12	11	9	12	14	15	18	23	27	28	34	33	34	32	28	25	27	29	28	27	23	7.7
78	2	32	29	26	16	14	14	16	17	16	26	29	31	29	36	37	40	40	40	36	30	30	33	42	37	29	8.8
78	3	27	25	27	19	15	9	11	11	13	20	15	21	31	27	29	27	31	32	29	32	32	37	42	32	25	8.7
78	4	23	24	17	17	9	4	9	11	9	11	12	17	20	20	23	32	29	34	26	34	37	34	32	29	21	9.3
78	5	41	33	22	11	11	11	11	11	13	15	13	19	19	19	24	27	30	29	23	22	26	29	32	36	22	8.7
78	6	42	34	25	13	8	8	10	10	11	15	18	23	21	24	24	27	26	30	27	27	40	44	44	40	25	11.8
78	7	33	23	23	15	14	9	9	9	12	13	17	16	19	21	21	23	25	24	22	23	23	27	26	31	20	7.1
78	8	28	24	16	13	11	9	9	11	13	17	17	17	21	20	17	16	25	26	21	27	30	32	32	30	20	7.1
78	9	32	21	16	11	10	2	2	8	16	10	10	21	20	21	18	21	27	31	31	34	28	33	33	26	20	9.8
78	10	32	23	19	9	9	7	7	13	15	19	20	17	20	22	20	20	23	32	37	41	36	36	34	33	23	10.1
78	11	27	21	23	16	13	13	13	16	19	23	24	31	31	36	39	40	41	46	36	31	27	33	32	33	26	9.4
78	12	33	27	27	21	15	10	7	6	7	12	16	22	24	22	29	33	31	35	25	21	20	16	20	20	21	8.1
79	1	65	54	32	43	40	19	43	23	34	36	42	29	48	53	50	52	69	75	58	52	46	63	75	63	47	16.3
79	2	46	20	37	17	14	9	11	17	23	46	29	29	37	26	31	40	43	37	34	37	40	32	32	32	28	9.9
79	3	20	12	13	7	5	2	7	10	14	16	17	23	24	23	25	29	37	32	21	27	25	25	28	23	20	9.1
79	4	29	23	21	12	9	8	7	7	9	15	15	15	13	16	16	20	21	20	19	18	22	25	20	24	17	6.0
79	5	21	13	13	4	1	1	2	2	8	9	10	12	18	13	13	16	17	20	11	11	11	16	17	16	11	5.8
79	6	29	15	11	7	5	4	4	4	4	6	7	12	15	17	21	19	15	21	18	18	21	28	34	25	15	8.4
79	7	25	12	13	9	7	7	7	9	9	11	14	18	15	23	18	20	20	18	13	16	20	20	23	20	16	5.5
79	8	24	16	13	7	4	4	4	4	4	10	13	16	21	18	24	26	24	23	17	17	21	24	23	21	16	7.6
79	9	27	18	16	10	8	4	4	9	11	13	16	19	20	20	24	26	26	26	22	20	22	21	23	22	18	7.0
79	10	23	20	17	11	8	7	9	12	14	17	22	23	27	27	28	28	27	29	26	30	23	35	29	24	22	7.7
79	11	29	20	19	16	16	7	9	8	14	13	18	19	23	26	28	25	35	34	26	20	20	24	18	17	20	8.1
79	12	21	18	15	11	4	7	7	11	14	20	23	28	32	31	35	37	37	38	22	20	18	17	16	14	21	9.0
AVE		33	25	21	14	14	9	9	11	14	18	20	23	27	27	29	30	32	34	30	30	30	32	34	31		
ST DEV		9.1	7.4	6.4	4.4	6.5	4.4	4.3	4.6	5.2	6.9	7.5	7.4	9.3	5.3	8.6	8.8	9.9	10.3	9.5	9.6	9.5	10.1	11.4	9.7		

25TH, 50TH, 75TH, 95TH PERCENTILES, MAXIMUM AND MISSING

25TH	50TH	75TH	95TH	MAXIMUM	MISSING
15	22	31	44	75	0

Table 2.4(d)

Two way tables of monthly weekend averages of hourly CO--Lloyd

YR	MO	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE	DEV
75	11	11	10	5	4	3	3	3	7	13	18	22	25	37	47	49	67	46	52	35	22	16	12	10	9	21	16.5
75	12	18	15	15	15	12	2	10	11	21	29	40	50	79	92	68	92	115	103	81	62	50	46	29	25	46	33.8
76	1	6	3	4	2	2	1	1	4	4	10	16	25	32	39	42	42	39	33	12	9	6	2	6	3	14	14.1
76	2	12	12	12	5	3	1	1	5	3	7	14	14	20	25	34	34	32	39	14	10	5	7	5	4	13	11.2
76	3	9	9	7	7	4	1	1	6	12	9	9	20	26	34	34	37	43	49	29	31	23	23	17	17	19	13.5
76	4	9	8	1	3	1	1	1	1	3	8	15	17	25	31	37	33	35	33	12	10	8	6	6	10	13	12.1
76	5	9	9	5	9	7	7	7	8	10	12	18	24	21	28	30	27	33	33	18	14	13	9	9	9	16	8.8
76	6	9	6	5	5	6	6	6	5	13	16	21	27	42	43	43	42	42	46	21	17	13	17	13	10	20	14.8
76	7	13	12	10	10	10	12	13	12	12	16	23	24	26	28	28	36	31	36	24	14	13	10	9	4	18	8.9
76	8	9	9	8	9	7	7	8	9	14	13	23	27	30	30	38	35	40	36	23	18	19	14	11	11	19	11.2
76	9	14	13	13	12	14	14	12	15	14	26	29	33	37	39	43	46	52	49	34	32	33	27	20	17	26	12.9
76	10	33	33	23	15	10	10	10	11	17	19	19	29	35	42	42	38	38	42	31	29	29	33	27	25	27	10.5
76	11	14	12	12	10	10	10	10	10	13	27	34	40	54	69	75	75	80	82	71	59	42	48	37	33	39	25.7
76	12	24	24	22	17	12	13	16	19	21	32	45	53	60	77	83	63	80	79	54	42	34	39	21	18	40	24.3
77	1	27	25	22	21	17	13	13	15	14	23	26	39	45	50	50	53	48	52	32	26	25	26	32	25	30	12.7
77	2	23	21	18	15	13	10	13	17	17	19	17	26	32	29	33	36	40	43	29	26	23	20	21	15	23	8.7
77	3	23	14	14	11	11	10	11	16	15	20	18	33	34	37	39	40	39	37	24	23	16	16	16	14	22	10.2
77	4	20	18	13	20	13	18	18	19	24	23	27	36	45	49	56	50	55	59	41	33	28	25	21	22	31	14.0
77	5	14	10	9	9	9	10	9	14	15	13	21	25	37	36	34	35	41	37	24	12	18	18	16	15	20	10.4
77	6	14	11	13	9	9	7	7	10	14	16	21	29	34	32	39	42	43	39	23	23	23	23	17	13	21	11.5
77	7	15	13	12	13	11	11	13	15	13	17	27	29	40	46	42	44	50	48	29	19	23	19	17	17	25	13.1
77	8	16	13	14	13	8	8	6	9	13	18	26	30	33	42	40	43	46	37	21	17	16	14	10	9	21	12.6
77	9	13	11	9	10	4	5	6	9	12	17	23	27	33	43	44	49	39	49	36	30	24	23	20	18	23	14.0
77	10	23	21	14	16	14	13	14	17	23	24	27	33	42	40	45	42	49	47	33	31	27	19	20	15	27	11.3
77	11	19	18	12	12	9	9	9	11	14	21	28	34	50	52	53	58	63	70	33	25	19	19	17	15	28	18.3
77	12	10	10	6	3	3	3	6	11	13	25	38	45	68	63	75	60	82	87	53	32	23	23	15	14	32	26.7
78	1	8	9	5	5	3	2	1	4	4	10	14	23	28	39	42	33	43	56	24	13	11	8	10	8	17	15.3
78	2	10	6	5	5	1	1	4	5	15	17	26	30	39	40	42	49	55	85	35	22	15	13	15	12	22	17.9
78	3	18	13	10	8	5	6	7	5	12	13	20	34	35	37	37	32	37	42	32	44	35	30	29	22	24	12.9
78	4	4	5	5	4	3	1	3	3	2	4	9	13	17	21	25	28	34	37	19	15	7	7	6	5	12	10.1
78	5	8	5	5	5	4	4	4	4	2	10	20	23	27	26	27	29	31	30	17	9	8	8	8	4	13	9.9
78	6	7	5	4	2	2	2	1	1	4	6	12	13	24	23	31	25	26	27	17	13	9	7	7	5	11	9.4
78	7	8	6	3	2	2	1	2	4	3	10	20	27	37	38	37	43	30	34	16	13	8	8	8	6	15	13.7
78	8	6	4	4	8	4	2	2	2	7	12	16	21	28	37	23	23	31	32	16	13	10	8	4	4	13	10.0
78	9	6	4	2	4	1	1	1	4	4	7	13	24	24	26	36	40	46	46	28	25	18	20	15	5	17	14.7
78	10	12	13	11	8	4	4	4	8	13	18	19	26	33	37	34	31	39	45	33	21	19	14	16	15	20	11.7
78	11	14	16	15	13	13	9	8	13	17	22	29	42	58	69	72	69	68	85	52	38	34	32	28	26	35	23.1
78	12	35	22	24	20	24	13	10	9	3	10	19	27	35	40	53	60	85	56	49	36	27	28	16	19	29	18.8
79	1	25	12	12	9	9	7	9	16	17	25	35	40	43	60	66	65	94	84	51	38	29	29	25	21	35	23.7
79	2	18	12	13	9	4	6	5	13	14	24	30	36	32	42	39	49	50	53	33	33	16	11	13	16	24	14.8
79	3	7	4	4	4	3	3	4	5	14	14	18	26	30	36	33	41	39	34	20	15	14	9	9	9	16	12.8
79	4	19	19	14	13	11	9	8	7	12	15	17	19	23	21	29	32	34	30	21	22	15	14	14	14	18	7.3
79	5	12	8	4	4	4	2	5	6	4	12	14	17	20	24	27	24	26	21	15	10	12	12	10	5	12	7.7
79	6	12	3	7	7	7	7	8	8	14	15	20	25	34	33	38	38	36	36	21	21	18	16	15	8	19	11.4
79	7	7	4	4	3	4	4	6	6	4	12	16	20	24	27	26	29	25	28	14	9	9	8	8	9	13	8.4
79	8	4	8	5	6	3	1	3	4	4	15	18	24	30	37	33	35	32	33	18	11	13	13	12	11	16	11.6
79	9	10	8	9	4	8	5	5	9	13	16	20	20	27	36	32	35	37	35	19	16	12	9	8	6	17	10.3
79	10	8	7	6	5	5	4	5	7	14	18	22	26	34	42	45	39	44	45	31	21	23	22	15	8	21	14.2
79	11	14	13	10	7	3	5	5	6	4	15	18	23	30	44	46	49	53	64	40	29	24	18	12	10	23	17.2
79	12	13	12	7	8	4	3	3	5	4	17	27	33	37	45	56	57	57	54	36	25	19	17	6	4	23	18.8
AVE		14	12	10	9	7	6	7	9	13	16	22	28	34	40	43	44	46	47	30	24	19	18	15	13		
ST DEV		7.0	6.4	5.8	4.9	4.7	4.2	4.3	4.7	4.4	6.2	7.5	8.6	11.9	14.2	14.8	15.2	15.0	17.3	14.4	11.9	9.5	10.0	7.5	6.9		

25TH, 50TH, 75TH, 95TH PERCENTILES, MAXIMUM AND MISSING

25TH	50TH	75TH	95TH	MAXIMUM	MISSING
9	17	32	53	115	0

Table 2.4(e)

Two way tables of monthly weekend averages of hourly CO--Eugene

YR	MO	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE	DEV
71	5	22	19	16	15	16	16	16	16	16	20	20	21	21	21	22	23	20	20	21	21	24	25	23	21	20	2.7
71	6	16	13	10	8	7	7	3	10	11	13	13	13	13	13	13	13	14	15	12	12	15	13	14	12	12	2.3
71	7	22	21	15	16	14	15	15	16	14	14	15	15	15	16	17	17	16	16	18	21	25	26	24	26	18	3.7
71	8	22	24	24	22	17	16	17	20	21	22	21	20	26	21	22	22	20	21	23	25	27	26	29	27	22	3.4
71	9	25	27	24	19	16	16	21	23	24	23	23	24	23	19	22	23	23	24	24	30	32	36	36	32	25	5.4
71	10	30	25	14	14	13	17	20	25	27	29	27	27	27	25	25	24	27	28	30	32	38	39	33	30	24	6.9
71	11	26	15	15	15	15	16	19	22	27	25	28	31	25	27	34	33	42	34	37	29	28	22	18	17	25	7.3
71	12	16	17	13	13	13	14	15	18	16	22	21	26	25	25	25	27	31	31	30	32	28	23	21	18	22	6.0
72	1	19	16	16	11	14	14	13	16	1	21	18	22	22	19	26	26	35	25	24	12	18	15	19	15	19	3.6
72	2	23	24	21	14	24	20	26	27	24	28	41	43	44	38	29	29	32	38	37	35	32	33	30	31	31	7.3
72	3	15	13	15	13	14	15	17	18	22	22	23	23	21	22	24	25	27	24	28	28	25	28	25	24	22	4.4
72	4	28	23	14	16	17	16	20	21	23	27	24	20	27	27	29	31	31	29	30	33	32	33	29	30	26	4.3
72	5	47	44	38	31	27	28	30	27	34	37	39	33	35	37	39	37	39	37	41	35	40	39	39	37	37	3.7
72	6	23	24	17	15	14	12	14	15	14	19	20	19	14	19	20	22	22	21	23	27	27	30	30	24	20	4.9
72	7	22	22	24	23	23	24	28	25	24	26	28	27	25	26	26	26	25	25	26	31	35	34	34	32	27	3.7
72	8	51	42	34	23	34	24	34	35	34	39	30	35	31	35	35	35	37	35	37	48	40	44	40	32	40	10.2
72	9	53	44	39	35	34	37	43	45	32	42	42	44	43	35	52	47	55	52	35	34	40	56	45	40	44	9.0
72	10	61	64	54	43	34	42	26	28	21	21	31	37	37	40	50	37	56	67	71	64	61	72	79	63	47	20.2
72	11	35	31	22	21	24	22	27	31	34	36	32	34	34	36	39	42	36	35	34	55	52	44	41	35	38	10.9
72	12	42	34	44	22	21	42	23	27	24	30	32	30	36	34	36	44	42	57	54	57	63	54	46	43	40	13.4
73	1	23	24	15	12	12	14	15	15	21	23	24	25	23	23	25	26	35	33	39	41	46	43	42	33	27	10.1
73	2	35	43	44	43	36	38	41	45	50	62	65	62	62	69	69	51	55	58	61	63	53	55	52	52	50	6.3
73	3	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	-999	.0
73	4	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	-999	.0
73	5	28	32	32	23	26	18	21	22	22	27	25	28	23	24	23	25	28	25	26	27	33	32	37	35	27	5.2
73	6	22	24	17	15	16	15	16	17	20	22	23	23	26	24	23	26	27	24	21	25	21	14	16	16	21	4.1
73	7	27	27	24	24	22	24	21	22	21	21	22	22	22	22	22	22	22	22	22	22	22	27	31	32	26	3.6
73	8	36	26	23	24	23	21	25	25	22	22	23	26	23	25	25	25	28	27	27	28	32	34	33	26	27	4.3
73	9	27	33	24	24	24	19	20	23	31	34	30	24	24	26	29	32	27	30	26	28	32	41	39	39	29	5.8
73	10	44	37	33	29	24	23	20	28	31	35	31	33	31	33	37	26	41	45	46	55	53	59	52	51	36	10.3
73	11	22	26	24	24	21	21	32	30	34	41	43	46	38	38	39	29	44	50	43	35	39	40	34	32	36	8.1
73	12	20	24	19	13	12	12	16	20	24	23	24	27	25	23	22	26	34	34	26	22	29	19	19	18	23	6.6
74	1	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	-999	.0
74	2	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	-999	.0
74	3	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	-999	.0
74	4	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	-999	.0
74	5	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	-999	.0
74	6	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	-999	.0
74	7	29	21	23	23	22	19	19	20	20	21	20	23	21	20	19	19	18	18	19	21	25	30	26	23	22	3.9
74	8	17	16	16	13	12	12	12	13	14	16	15	17	16	16	16	16	17	17	16	17	17	19	19	18	16	1.6
74	9	26	24	16	14	11	14	11	11	14	16	16	16	14	14	15	15	16	15	15	18	23	24	23	24	16	4.3
74	10	34	29	22	21	14	16	19	22	23	28	23	20	24	23	23	25	24	26	28	29	39	37	34	37	27	5.8
74	11	37	34	22	21	16	16	16	22	26	24	25	27	31	31	31	32	36	37	35	38	40	35	31	34	29	6.6
74	12	38	37	34	22	27	26	26	26	31	39	45	42	42	50	41	39	41	52	45	42	52	49	44	44	34	6.2
75	1	10	14	14	10	14	16	10	10	11	15	15	15	15	15	10	10	25	25	25	20	25	30	25	23	16	6.5
75	2	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	-999	.0
75	3	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	-999	.0
75	4	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	-999	.0
75	5	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	-999	.0
75	6	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	-999	.0
75	7	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	-999	.0
75	8	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	-999	.0
75	9	42	30	31	23	18	15	15	23	26	32	39	42	35	31	29	45	26	22	21	33	42	38	39	41	30	6.6
75	10	26	24	16	14	12	12	13	14	14	22	22	24	27	23	25	22	29	27	35	37	34	40	32	31	26	6.2
75	11	20	24	15	9	7	9	9	13	14	10	14	21	23	21	18	20	35	44	46	41	36	34	29	24	23	11.0
75	12	27	21	21	14	13	11	14	15	24	31	38	39	33	40	44	51	55	56	51	44	39	38	31	35	36	14.5
76	1	31	14	17	12	13	11	13	17	26	28	23	34	37	34	34	39	38	40	41	35	36	35	41	38	29	10.2
76	2	36	40	23	19	14	10	13	29	24	26	29	20	23	47	31	27	27	35	36	36	37	32	30	31	26	7.6
76	3	26	17	21	13	6	6	12	18	16	19	19	19	25	22	21	20	19	20	26	28	29	31	36	31	21	6.2
76	4	27	26	27	16	14	16	17	19	14	22	25	26	24	26	23	27	23	23	26	29	34	36	25	33	25	6.0
76	5	27	25	22	16	15	16	16	21	21	23	26	24	25	26	21	22	20	22	20	20	25	30	31	32	23	4.4
76	6	24	21	15	13	13	12	12	14	15	17	17	19	15	19	16	15	16	15	15	14	18	25	28	28	16	4.4
76	7	14	13	14	12	11	6	13	16	14	21	22	21	22	19	19	18	17	16	16	16	16	14	17	19	16	3.4
76	8	16	12	11	9	9	6	12	13	13	16	21	20	21	21	18	18	19	22	19	21	21	23	24	21	17	4.6
76	9	33	27	22	18	16	17	19	21	22	20	30	27	28	25	24	43	24	23	22	21	21	19	19	21	23	4.0
76	10	44	35	25	22	26	17	16	40	44	20	35	32	34	48	40	40	23	23	48	37	39	34	35	35	29	6.9
76	11	44	34	34	22	14	10	16	46	34	32	30	35	41	38	39	41	47	58	54	54	56	58	58	46	39	13.6
76	12	56	42	23	40	41	19	46	24	34	43	44	52	42	40	40	53	53	59	53	58	51	57	60	44	43	12.7
77	1	30	32	43	44	47	44	43	24	33	41	42	61	62	36	37	39	51	66	73	71	83	58	54	61	46	14.5
77	2	41	33	22	15	14	12	15	22	31	49	23	30	48	23	23	32	25	49	30	41	45	37	40	43	29	9.5
77	3	27	42	17	16	12	13	15	17	22	27	42	43	24	43	22	20	26	23	25	27	33	26	28	33	23	5.7
77	4	34	24	20	15	15	17	18	20	41	43	25	40	48	40	45	23	27	25	23	29	29	48	32	35	25	5.2
77	5	23	14	44	12	11	11	11	19	14	19	22	43	44	41	21	19	20	19	17	12	10	22	26	27	19	4.3
77	6	24	40	21	13	14	12	16	18	1	43	24	30	45	43	45	42	21	23	16	15	13	18	20	44	21	4.4
77	7	40	40	14	17	18	17	15	14	22	23	23	44	44	44	44	23	22	41	18	20	20	24	21	23	21	2.5
77	8	23	19	44	12	14	12	15	17	2	42	40	27	21	45	26	43	23	42	22	26	25	36	26	49	22	5.1
77	9	19	14	13	12	6	6	4	13	1	22	14	16	17	19	23	19	27	35	48	29	19	18	22	31	19	7.0
77	10	43	23	20	10	12	11	14	19	24	31	32	33	24	33	32	31	32	33	36	33	33	41	33	29	26	8.4
77	11	19	12	13	3	6	8	7	4	1	15	14	20	23	41	21	24	28	33	31	25	21	14	16	17	18	7.3
77	12	15	13	14	2	7	7	6	11	1	15	17	20	24	19	40	41	43	25	45	23	16	17	12	15	16	5.5
78	1	18	14	15	12	14	11	14	10	40	40	26	31	42	49	35	38	39	41	42	46	35	26	23	21	27	10.7
78	2	22	24	18	44	13	14	13	10	14	43	32	30	41	44	37	31	33	30	40	28	22	22	26	48	27	11.1
78	3	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	-999	.0
78	4	16	17	10	11	11	2	4	11	13	14	15	17	12	16	15	17	15	18	14	24	26	26	27	42	17	5.3
78	5	18	16	13	14	4	7	8	10	12	18	17	17	14	17	16	16	12	12	12	14	14	18	16	16	14	3.3
78	6	23	20	18	10	14	15	14	10	14	21	23	25	24	25	25	20	24	24	42	22	23	27	23	27	22	4.0
78	7	21	14	14	4	4	0	4	11	11	10	41	42	43	43	22	43	40	20	17	18	19	27	19	14	17	5.4
78	8	13	14	2	2	7	7	7	6	14	16	10	10	12	15	15	15	14	14	13	13	17	18	16	18	13	3.7
78	9	27	20	13	6	7	7	7	14	17	18	20	19	24	22	19	21	20	19	19	22	23	20	22	23	16	3.5
78	10	32	46	44	11	14	10	10	16	1	44	24	23	22	40	16	19	19	41	24	24	29	34	35	34	22	7.4
78	11	22	24	19	10	4	6	14	15	21	42	47	47	45	49	33	49	33	33	41	40	41	38	36	43	47	16.2
78	12	44	23	44	13	13	12	13	17	20	45	24	33	40	42	40	42	45	34	32	30	18	28	28	23	28	9.5
79	1	32	22	44	14	15	13	14	17	24	45	46	47	44	30	31	32	31	37	37	38	31	31	40	45	26	6.9
79	2	43	42	12	12	4	8	9	12	14	40	41	44	47	24	20	24	29	40	44	45	26	21	23	23	21	6.4
79	3	28	21	20	14	14	14	15	19	22	40	23	43	43	43	44	40	25	31	27	28	28	27	27	45	23	4.7
79	4	20	41	17	12	14	12	12	16	17	40	21	25	44	43	44	43	25	48	43	27	29	25	26	23	21	5.3
79	5	15	15	14	14	2	4	11	12	1	12	17	15	18	17	16	16	15	15	14	14	15	16	10	10	15	3.0
79	6	19	17	13	21	12	16	12	15	15	16	14	16	21	19	13	19	21	21	19	15	23	26	43	17	17	3.7
79	7	13	4	4	7	2	7	16	12	11	16	15	16	18	15	16	14	15	15	13	13	16	14	16	18	13	3.2
79	8	19	18	14	10	0	7	12	15	12	10	15	16	17	14	17	17	19	19	17	16	16	19	19	19	16	3.6
79	9	21	12	10	11	4	2	10	15	14	41	42	13	17	15	16	10	18	18	15	17	20	19	13	21	17	3.7
79	10	44	22	20	6	7	8	10	15	14	43	40	45	43	44	25	40	49	48	32	37	39	40	41	37	26	10.1
79	11	23	17	11	4	7	6	12	18	24	19	43	40	48	41	23	47	30	42	31	30	33	28	23	19	22	7.9
79	12	40	41	14	12	11	14	15	15	44	40	21	21	35	35	35	37	45	52	42	34	29	29	27	40	26	10.7
AVE		29	24	21	17	15	14	16	19	24	25	26	27	27	27	26	27	29	30	30	31	32	32	30	29		
ST DEV		10.3	8.8	7.6	6.8	6.4	6.2	7.1	7.6	7.4	8.3	9.1	8.6	9.4	9.3	8.9	9.6	11.4	12.0	13.1	13.4	13.1	12.3	12.0	11.1		

25TH 50TH 75TH 90TH PERCENTILES, MAXIMUM AND MISSING

17 23 31 40 82 304

Table 2.5

Monthly average daily traffic counts (in 1000 cars/day), Portland I 80N, Columbia River Highway at NE 21st Ave.

YR	1	2	3	4	5	6	7	8	9	10	11	12	AVE	SE
70	80.5	86.7	90.2	89.9	93.9	100.8	97.1	100.4	96.7	93.0	89.0	90.0	92.3	5.6
71	82.3	89.8	91.9	94.4	92.9	98.9	96.3	99.1	97.8	95.2	90.0	91.6	93.3	4.6
72	84.8	87.4	93.2	93.5	92.8	97.1	95.2	96.7	94.8	94.2	95.6	91.5	93.1	3.5
73	85.2	96.1	98.9	98.8	97.1	101.2	95.9	100.7	96.2	94.0	90.3	87.1	95.1	4.9
74	79.3	79.6	87.1	91.9	93.4	99.2	96.0	99.4	93.8	94.8	92.8	92.9	91.7	6.3
75	88.9	89.1	95.3	95.8	96.1	101.9	98.0	98.9	94.2	94.8	92.5	91.7	94.8	3.7
76	88.9	92.1	96.1	98.8	96.9	104.4	100.2	103.7	98.2	99.5	98.4	99.5	98.1	4.1
77	89.3	98.3	102.6	103.9	101.2	107.1	105.4	106.7	101.8	102.2	96.7	101.9	101.4	4.7
78	93.0	101.1	105.6	104.8	103.8	111.5	108.4	110.5	105.3	105.6	97.4	101.8	104.1	5.0
79	86.1	101.7	107.7	105.8	103.7	109.2	105.2	108.4	106.4	104.1	101.5	102.0	103.5	5.8
AVE	85.8	92.2	96.9	97.8	97.2	103.1	99.8	102.5	98.5	97.7	94.4	95.0		
SE	4.1	6.7	6.4	5.3	4.1	4.5	4.6	4.4	4.3	4.5	3.9	5.4		

Table 2.6

Monthly average daily traffic counts (in 1000 cars/day), Eugene, US 99 Pacific Highway West (.02 miles NW of 11th Ave.)

YR	1	2	3	4	5	6	7	8	9	10	11	12	AVE	SE
70	20.9	21.8	22.0	23.4	25.6	24.3	22.8	23.3	23.6	24.0	23.1	22.4	23.1	1.2
71	22.5	24.1	24.2	25.2	25.3	25.7	24.2	25.0	24.6	25.0	24.5	23.0	24.4	.9
72	21.2	24.1	24.4	23.8	23.8	24.1	22.4	23.0	22.5	23.6	24.8	21.8	23.3	1.1
73	22.6	24.2	23.7	23.1	25.1	26.1	20.8	22.8	23.1	22.7	21.8	19.8	23.0	1.6
74	19.4	19.1	20.2	22.4	23.3	22.7	21.7	23.2	22.9	22.8	22.3	21.3	21.8	1.4
75	21.1	22.1	22.6	23.2	23.9	22.2	21.1	22.8	23.0	23.4	22.6	20.7	22.4	1.0
76	22.0	23.0	23.0	24.0	25.7	28.1	23.0	25.6	24.3	24.4	23.0	21.8	24.0	1.7
77	22.9	24.2	23.9	25.0	24.9	25.1	24.8	24.9	25.0	24.3	24.7	23.8	24.5	.6
78	23.9	24.6	24.8	25.5	25.8	27.2	24.3	25.3	24.9	26.0	24.6	22.8	25.0	1.1
79	23.3	24.6	24.4	26.0	25.4	25.2	24.0	24.4	25.0	24.7	23.7	21.6	24.4	1.1
AVE	22.0	23.2	23.3	24.2	24.9	25.1	22.9	24.0	23.9	24.1	23.5	21.9		
SE	1.3	1.7	1.3	1.1	.8	1.7	1.3	1.1	.9	1.0	1.0	1.1		

Table 2.7(a)

Two way tables of monthly wind speed averages
Portland-Airport

YR	1	2	3	4	5	6	7	8	9	10	11	12	AVE	SE
70	8	7	5	6	5	6	6	6	6	6	9	8	7	1.2
71	8	6	8	6	6	5	5	6	7	5	7	8	6	1.1
72	9	9	6	7	6	6	7	6	6	5	7	10	7	1.5
73	11	7	6	5	6	6	7	6	5	4	8	8	7	1.8
74	10	7	8	7	7	8	7	7	6	5	8	8	7	1.2
75	8	9	8	7	7	7	7	7	7	7	9	8	8	.8
76	7	9	6	7	6	7	7	6	6	6	6	5	7	1.0
77	7	8	8	5	7	7	7	7	6	7	9	11	7	1.4
78	9	8	7	7	7	7	7	7	6	5	8	6	7	1.0
79	10	9	7	6	7	8	7	6	7	7	10	10	8	1.5
AVE	9	8	7	6	6	7	7	6	6	6	8	8		
SE	1.3	1.0	1.0	.8	.7	.9	.6	.5	.6	1.0	1.1	1.7		

Table 2.7(b)

Two way tables of monthly wind speed averages
Eugene-Airport

YR	1	2	3	4	5	6	7	8	9	10	11	12	AVE	SE
70	...	...	...	...	...	...	...	...	...	...	...	...	...	.0
71	8	7	9	7	7	7	7	7	8	6	7	9	7	.9
72	9	8	8	8	8	8	8	7	8	7	7	8	8	.6
73	8	7	7	7	7	7	7	7	6	5	8	7	7	.8
74	6	7	7	6	6	6	6	6	6	5	6	6	6	.7
75	7	7	8	6	6	6	6	7	7	7	7	7	7	.6
76	7	8	8	6	6	6	6	6	6	5	4	3	6	1.4
77	5	6	8	5	6	6	7	7	6	6	7	8	6	1.0
78	6	6	6	7	7	6	6	7	6	6	6	6	6	.4
79	6	6	6	6	5	5	6	5	5	6	5	6	6	.8
AVE	7	7	7	6	6	6	7	7	6	6	6	7		
SE	1.2	.7	1.0	.8	.8	.8	.7	.7	1.0	.7	1.2	1.6		

Table 2.7(c)

Two way tables of monthly wind speed averages
Portland Hughes/Federal Building

YR	1	2	3	4	5	6	7	8	9	10	11	12	AVE	SE
70	...	...	...	...	...	...	...	...	...	...	...	29	29	.0
71	30	29	28	22	24	20	25	26	27	20	19	27	25	3.6
72	28	24	9	23	24	24	30	28	24	22	16	23	23	5.4
73	23	19	20	21	24	23	28	24	23	17	24	22	22	2.7
74	26	21	22	22	25	29	25	25	26	20	22	22	24	2.5
75	20	23	26	24	24	26	25	26	29	17	24	22	24	3.0
76	20	26	22	24	24	25	24	26	22	18	19	15	22	3.3
77	16	21	21	25	24	28	25	28	23	23	29	33	25	4.3
78	19	20	22	25	27	26	28	24	18	21	26	25	23	3.2
79	31	26	25	23	28	31	28	22	25	21	28	26	26	3.1
AVE	24	23	22	23	25	26	26	25	24	20	23	24		
SE	5.0	3.1	5.1	1.3	1.4	3.1	1.9	1.8	3.0	2.0	4.1	4.6		

Table 2.8(a)

Two way tables of monthly averages of hourly wind speed
Portland-Airport

YR	MO	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE	DEV
70	1	***	9	***	***	8	***	***	8	***	***	9	***	***	9	***	***	8	***	***	8	***	***	9	***	9	.6
70	2	***	5	***	***	5	***	***	3	***	***	8	***	***	9	***	***	9	***	***	8	***	***	7	***	7	1.4
70	3	***	5	***	***	5	***	***	3	***	***	8	***	***	5	***	***	4	***	***	8	***	***	5	***	6	1.3
70	4	***	4	***	***	4	***	***	4	***	***	5	***	***	7	***	***	8	***	***	7	***	***	6	***	6	1.3
70	5	***	4	***	***	3	***	***	3	***	***	4	***	***	6	***	***	8	***	***	8	***	***	5	***	5	1.0
70	6	***	4	***	***	4	***	***	5	***	***	4	***	***	7	***	***	9	***	***	9	***	***	6	***	6	1.9
70	7	***	4	***	***	4	***	***	4	***	***	5	***	***	7	***	***	9	***	***	10	***	***	7	***	6	2.2
70	8	***	4	***	***	3	***	***	8	***	***	4	***	***	6	***	***	8	***	***	10	***	***	7	***	6	2.9
70	9	***	4	***	***	4	***	***	4	***	***	5	***	***	8	***	***	8	***	***	9	***	***	6	***	6	1.8
70	10	***	4	***	***	3	***	***	4	***	***	7	***	***	8	***	***	9	***	***	6	***	***	5	***	6	2.0
70	11	***	8	***	***	8	***	***	4	***	***	9	***	***	11	***	***	10	***	***	9	***	***	8	***	9	1.1
70	12	***	8	***	***	7	***	***	8	***	***	8	***	***	9	***	***	8	***	***	8	***	***	7	***	8	.8
71	1	***	7	***	***	8	***	***	8	***	***	9	***	***	8	***	***	8	***	***	7	***	***	7	***	8	.8
71	2	***	6	***	***	6	***	***	6	***	***	7	***	***	8	***	***	7	***	***	5	***	***	5	***	6	1.3
71	3	***	7	***	***	7	***	***	7	***	***	9	***	***	10	***	***	10	***	***	8	***	***	8	***	8	1.2
71	4	***	5	***	***	4	***	***	4	***	***	7	***	***	9	***	***	8	***	***	7	***	***	5	***	6	1.0
71	5	***	5	***	***	4	***	***	5	***	***	5	***	***	7	***	***	8	***	***	9	***	***	5	***	6	1.8
71	6	***	3	***	***	3	***	***	3	***	***	4	***	***	6	***	***	7	***	***	7	***	***	5	***	5	1.6
71	7	***	4	***	***	4	***	***	4	***	***	6	***	***	6	***	***	7	***	***	7	***	***	5	***	5	1.2
71	8	***	5	***	***	4	***	***	4	***	***	6	***	***	7	***	***	8	***	***	9	***	***	6	***	6	1.7
71	9	***	5	***	***	6	***	***	4	***	***	7	***	***	8	***	***	10	***	***	8	***	***	6	***	7	1.6
71	10	***	4	***	***	3	***	***	4	***	***	6	***	***	7	***	***	6	***	***	5	***	***	4	***	5	1.3
71	11	***	7	***	***	7	***	***	6	***	***	7	***	***	7	***	***	7	***	***	7	***	***	6	***	7	.9
71	12	***	9	***	***	7	***	***	8	***	***	8	***	***	10	***	***	9	***	***	8	***	***	9	***	9	.9
72	1	***	8	***	***	9	***	***	8	***	***	9	***	***	11	***	***	10	***	***	9	***	***	8	***	9	.9
72	2	***	8	***	***	8	***	***	8	***	***	9	***	***	10	***	***	10	***	***	9	***	***	8	***	9	.8
72	3	***	5	***	***	6	***	***	6	***	***	6	***	***	7	***	***	5	***	***	6	***	***	6	***	6	.5
72	4	***	6	***	***	5	***	***	6	***	***	8	***	***	9	***	***	8	***	***	7	***	***	7	***	7	1.2
72	5	***	4	***	***	4	***	***	3	***	***	5	***	***	7	***	***	8	***	***	8	***	***	7	***	7	1.9
72	6	***	4	***	***	4	***	***	3	***	***	6	***	***	7	***	***	8	***	***	8	***	***	6	***	6	1.8
72	7	***	5	***	***	5	***	***	5	***	***	7	***	***	8	***	***	10	***	***	11	***	***	7	***	7	2.2
72	8	***	4	***	***	4	***	***	4	***	***	6	***	***	8	***	***	10	***	***	10	***	***	7	***	7	2.9
72	9	***	4	***	***	5	***	***	4	***	***	6	***	***	7	***	***	8	***	***	7	***	***	6	***	6	1.6
72	10	***	3	***	***	3	***	***	4	***	***	5	***	***	7	***	***	7	***	***	6	***	***	4	***	5	1.6
72	11	***	6	***	***	6	***	***	7	***	***	7	***	***	8	***	***	8	***	***	6	***	***	6	***	7	.8
72	12	***	11	***	***	10	***	***	9	***	***	10	***	***	11	***	***	10	***	***	10	***	***	11	***	10	.7
73	1	***	10	***	***	10	***	***	10	***	***	10	***	***	11	***	***	13	***	***	11	***	***	10	***	11	1.0
73	2	***	7	***	***	7	***	***	6	***	***	8	***	***	8	***	***	8	***	***	9	***	***	8	***	7	1.0
73	3	***	4	***	***	5	***	***	4	***	***	6	***	***	8	***	***	7	***	***	6	***	***	5	***	6	1.3
73	4	***	4	***	***	3	***	***	3	***	***	5	***	***	7	***	***	8	***	***	4	***	***	6	***	6	1.9
73	5	***	5	***	***	4	***	***	4	***	***	7	***	***	7	***	***	8	***	***	6	***	***	6	***	6	1.8
73	6	***	5	***	***	4	***	***	5	***	***	6	***	***	7	***	***	9	***	***	8	***	***	6	***	6	1.6
73	7	***	4	***	***	4	***	***	4	***	***	5	***	***	7	***	***	9	***	***	11	***	***	8	***	7	2.6
73	8	***	5	***	***	4	***	***	5	***	***	5	***	***	6	***	***	8	***	***	9	***	***	7	***	6	1.4
73	9	***	3	***	***	3	***	***	4	***	***	7	***	***	7	***	***	8	***	***	6	***	***	5	***	5	1.8
73	10	***	3	***	***	3	***	***	4	***	***	4	***	***	7	***	***	6	***	***	4	***	***	3	***	4	1.9
73	11	***	8	***	***	7	***	***	7	***	***	8	***	***	6	***	***	9	***	***	8	***	***	8	***	8	.7
73	12	***	7	***	***	7	***	***	8	***	***	8	***	***	10	***	***	10	***	***	8	***	***	8	***	8	1.1
74	1	***	9	***	***	9	***	***	9	***	***	11	***	***	13	***	***	12	***	***	10	***	***	10	***	10	1.9
74	2	***	6	***	***	8	***	***	6	***	***	8	***	***	9	***	***	9	***	***	6	***	***	6	***	7	1.3
74	3	***	7	***	***	7	***	***	7	***	***	9	***	***	10	***	***	9	***	***	8	***	***	7	***	8	1.1
74	4	***	5	***	***	5	***	***	6	***	***	9	***	***	8	***	***	8	***	***	6	***	***	7	***	7	1.9
74	5	***	6	***	***	6	***	***	7	***	***	7	***	***	9	***	***	10	***	***	9	***	***	7	***	8	1.4
74	6	***	7	***	***	5	***	***	5	***	***	7	***	***	9	***	***	12	***	***	11	***	***	9	***	8	2.2
74	7	***	5	***	***	5	***	***	4	***	***	7	***	***	8	***	***	9	***	***	4	***	***	7	***	7	1.7
74	8	***	5	***	***	5	***	***	4	***	***	5	***	***	7	***	***	9	***	***	10	***	***	7	***	7	2.0
74	9	***	4	***	***	3	***	***	3	***	***	6	***	***	9	***	***	10	***	***	8	***	***	6	***	6	2.6
74	10	***	7	***	***	4	***	***	3	***	***	5	***	***	8	***	***	7	***	***	6	***	***	4	***	5	1.3
74	11	***	7	***	***	6	***	***	6	***	***	8	***	***	10	***	***	9	***	***	8	***	***	8	***	8	1.3
74	12	***	8	***	***	7	***	***	7	***	***	8	***	***	9	***	***	8	***	***	9	***	***	8	***	8	.7
75	1	***	7	***	***	7	***	***	8	***	***	8	***	***	8	***	***	9	***	***	8	***	***	9	***	8	.7
75	2	***	8	***	***	8	***	***	9	***	***	10	***	***	12	***	***	10	***	***	9	***	***	9	***	9	1.2
75	3	***	7	***	***	7	***	***	7	***	***	9	***	***	11	***	***	10	***	***	9	***	***	8	***	9	1.4
75	4	***	4	***	***	5	***	***	5	***	***	7	***	***	9	***	***	9	***	***	8	***	***	7	***	7	1.6
75	5	***	6	***	***	5	***	***	5	***	***	7	***	***	9	***	***	10	***	***	9	***	***	7	***	7	1.8
75	6	***	6	***	***	5	***	***	5	***	***	7	***	***	8	***	***	10	***	***	10	***	***	8	***	7	1.9
75	7	***	6	***	***	6	***	***	5	***	***	6	***	***	6	***	***	8	***	***	9	***	***	8	***	7	1.3
75	8	***	6	***	***	6	***	***	6	***	***	7	***	***	8	***	***	8	***	***	10	***	***	7	***	7	1.3
75	9	***	5	***	***	5	***	***	4	***	***	6	***	***	9	***	***	10	***	***	8	***	***	6	***	7	2.8
75	10	***	7	***	***	7	***	***	6	***	***	6	***	***	9	***	***	9	***	***	6	***	***	6	***	7	1.2
75	11	***	10	***	***	9	***	***	9	***	***	9	***	***	10	***	***	9	***	***	9	***	***	8	***	9	.6
75	12	***	7	***	***	7	***	***	8	***	***	8	***	***	8	***	***	9	***	***	9	***	***	9	***	8	.8
76	1	***	7	***	***	6	***	***	7	***	***	8	***	***	8	***	***	7	***	***	8	***	***	7	***	7	.7
76	2	***	8	***	***	9	***	***	9	***	***	10	***	***	11	***	***	11	***	***	9	***	***	6	***	9	1.4
76	3	***	7	***	***	7	***	***	6	***	***	9	***	***	9	***	***	10	***	***	7	***	***	7	***	8	1.3
76	4	***	6	***	***	4	***	***	5	***	***	7	***	***	9	***	***	9	***	***	7	***	***	6	***	7	1.7
76	5	***	4	***	***	4	***	***	4	***	***	6	***	***	8	***	***	8	***	***	4	***	***	7	***	6	1.9
76	6	***	5	***	***	3	***	***	5	***	***	6	***	***	8	***	***	9	***	***	9	***	***	8	***	7	2.1
76	7	***	6	***	***	4	***	***	5	***	***	6	***	***	8	***	***	8	***	***	10	***	***	8	***	7	1.8
76	8	***	4	***	***	4	***	***	5	***	***	6	***	***	7	***	***	8	***	***	7	***	***	6	***	6	1.4
76	9	***	4	***	***	3	***	***	4	***	***	6	***	***	8	***	***	9	***	***	7	***	***	5	***	6	2.3
76	10	***	4	***	***	5	***	***	4	***	***	6	***	***	7	***	***	7	***	***	5	***	***	6	***	5	1.1
76	11	***	5	***	***	4	***	***	5	***	***	6	***	***	8	***	***	8	***	***	7	***	***	5	***	6	1.4
76	12	***	4	***	***	5	***	***	5	***	***	6	***	***	6	***	***	6	***	***	6	***	***	5	***	5	.7
77	1	***	6	***	***	6	***	***	6	***	***	6	***	***	8	***	***	8	***	***	7	***	***	7	***	7	.6
77	2	***	7	***	***	7	***	***	8	***	***	8	***	***	10	***	***	10	***	***	9	***	***	8	***	8	1.1
77	3	***	6	***	***	6	***	***	8	***	***	9	***	***	10	***	***	10	***	***	9	***	***	8	***	8	1.6
77	4	***	5	***	***	3	***	***	4	***	***	6	***	***	6	***	***	7	***	***	7	***	***	5	***	5	1.3
77	5	***	5	***	***	6	***	***	6	***	***	7	***	***	8	***	***	8	***	***	6	***	***	6	***	7	1.1
77	6	***	6	***	***	5	***	***	6	***	***	7	***	***	8	***	***	9	***	***	10	***	***	8	***	7	1.6
77	7	***	6	***	***	5	***	***	5	***	***	6	***	***	7	***	***	10	***	***	11	***	***	8	***	7	2.1
77	8	***	6	***	***	4	***	***	5	***	***	5	***	***	8	***	***	9	***	***	10	***	***	8	***	7	2.0
77	9	***	5	***	***	5	***	***	5	***	***	6	***	***	8	***	***	9	***	***	7	***	***	6	***	6	1.9
77	10	***	6	***	***	6	***	***	5	***	***	7	***	***	9	***	***	8	***	***	7	***	***	6	***	7	1.2
77	11	***	9	***	***	8	***	***	8	***	***	9	***	***	10	***	***	11	***	***	9	***	***	9	***	9	.8
77	12	***	11	***	***	10	***	***	11	***	***	12	***	***	12	***	***	11	***	***	11	***	***	12	***	11	.7
78	1	***	9	***	***	9	***	***	8	***	***	10	***	***	10	***	***	9	***	***	9	***	***	9	***	9	.6
78	2	***	7	***	***	8	***	***	7	***	***	9	***	***	10	***	***	10	***	***	9	***	***	8	***	9	1.1
78	3	***	5	***	***	6	***	***	5	***	***	7	***	***	8	***	***	9	***	***	7	***	***	7	***	7	1.3
78	4	***	6	***	***	6	***	***	6	***	***	8	***	***	8	***	***	9	***	***	8	***	***	7	***	7	1.1
78	5	***	5	***	***	5	***	***	5	***	***	7	***	***	9	***	***	12	***	***	9	***	***	7	***	7	1.2
78	6	***	5	***	***	4	***	***	5	***	***	8	***	***	7	***	***	9	***	***	9	***	***	8	***	7	1.9
78	7	***	6	***	***	5	***	***	6	***	***	5	***	***	7	***	***	9	***	***	9	***	***	7	***	7	1.6
78	8	***	5	***	***	5	***	***	6	***	***	6	***	***	9	***	***	9	***	***	9	***	***	7	***	7	1.7
78	9	***	4	***	***	5	***	***	5	***	***	7	***	***	3	***	***	7	***	***	9	***	***	5	***	6	1.3
78	10	***	4	***	***	4	***	***	3	***	***	6	***	***	6	***	***	7	***	***	6	***	***	5	***	5	1.3
78	11	***	7	***	***	6	***	***	7	***	***	7	***	***	9	***	***	9	***	***	9	***	***	8	***	8	1.1
78	12	***	6	***	***	5	***	***	6	***	***	7	***	***	7	***	***	7	***	***	7	***	***	6	***	6	.7
AVE		.***	6.	***	.***	5.	***	.***	6.	***	.***	7.	***	.***	8.	***	.***	9.	***	.***	8.	***	.***	7.	***		
ST DEV		.0	1.8	.3	.0	1.5	.0	.0	1.4	.3	.0	1.6	.0	.0	1.5	.0	.4	1.3	.0	.0	1.4	.0	.0	1.5	.0		

25TH, 50TH, 75TH, 95TH PERCENTILES, MAXIMUM AND MISSING

5 7 8 10 13 1728

Table 2.8(b)

Two way tables of monthly averages of hourly wind speed
Eugene-Airport

YR	MO	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE	DEV
71	1	***	7	***	***	7	***	***	6	***	***	8	***	***	9	***	***	9	***	***	7	***	***	6	***	8	1.0
71	2	***	7	***	***	7	***	***	7	***	***	7	***	***	8	***	***	8	***	***	6	***	***	6	***	7	.7
71	3	***	7	***	***	8	***	***	7	***	***	9	***	***	12	***	***	11	***	***	8	***	***	6	***	9	1.7
71	4	***	5	***	***	5	***	***	6	***	***	8	***	***	8	***	***	9	***	***	7	***	***	6	***	7	1.4
71	5	***	5	***	***	5	***	***	5	***	***	7	***	***	8	***	***	8	***	***	8	***	***	6	***	7	1.3
71	6	***	5	***	***	5	***	***	6	***	***	7	***	***	8	***	***	9	***	***	8	***	***	6	***	7	1.4
71	7	***	6	***	***	5	***	***	6	***	***	8	***	***	8	***	***	9	***	***	8	***	***	7	***	7	1.3
71	8	***	6	***	***	5	***	***	6	***	***	7	***	***	9	***	***	10	***	***	6	***	***	7	***	7	1.7
71	9	***	7	***	***	6	***	***	7	***	***	9	***	***	10	***	***	11	***	***	8	***	***	7	***	8	1.6
71	10	***	5	***	***	5	***	***	6	***	***	7	***	***	8	***	***	8	***	***	6	***	***	6	***	6	1.1
71	11	***	7	***	***	6	***	***	6	***	***	6	***	***	8	***	***	7	***	***	6	***	***	6	***	7	.7
71	12	***	6	***	***	8	***	***	6	***	***	10	***	***	11	***	***	9	***	***	8	***	***	6	***	9	1.1
72	1	***	6	***	***	9	***	***	9	***	***	9	***	***	9	***	***	8	***	***	9	***	***	9	***	9	.0
72	2	***	8	***	***	7	***	***	7	***	***	9	***	***	9	***	***	10	***	***	6	***	***	7	***	8	1.1
72	3	***	7	***	***	6	***	***	7	***	***	8	***	***	9	***	***	10	***	***	7	***	***	7	***	8	1.2
72	4	***	7	***	***	7	***	***	7	***	***	9	***	***	10	***	***	10	***	***	8	***	***	7	***	8	1.3
72	5	***	6	***	***	6	***	***	7	***	***	8	***	***	10	***	***	12	***	***	8	***	***	7	***	8	1.5
72	6	***	6	***	***	6	***	***	7	***	***	9	***	***	10	***	***	12	***	***	8	***	***	7	***	8	1.5
72	7	***	7	***	***	6	***	***	7	***	***	9	***	***	10	***	***	11	***	***	9	***	***	7	***	8	1.6
72	8	***	6	***	***	5	***	***	6	***	***	8	***	***	9	***	***	11	***	***	9	***	***	6	***	8	1.9
72	9	***	6	***	***	4	***	***	6	***	***	8	***	***	10	***	***	12	***	***	8	***	***	7	***	8	1.8
72	10	***	6	***	***	5	***	***	6	***	***	8	***	***	8	***	***	9	***	***	7	***	***	6	***	7	1.3
72	11	***	6	***	***	7	***	***	7	***	***	8	***	***	8	***	***	6	***	***	5	***	***	7	***	7	1.0
72	12	***	7	***	***	7	***	***	8	***	***	8	***	***	9	***	***	8	***	***	6	***	***	7	***	6	.7
73	1	***	7	***	***	7	***	***	7	***	***	6	***	***	10	***	***	8	***	***	7	***	***	7	***	8	1.0
73	2	***	6	***	***	6	***	***	6	***	***	7	***	***	8	***	***	8	***	***	6	***	***	6	***	7	.9
73	3	***	7	***	***	7	***	***	7	***	***	8	***	***	9	***	***	8	***	***	7	***	***	7	***	8	.7
73	4	***	6	***	***	6	***	***	6	***	***	7	***	***	9	***	***	9	***	***	8	***	***	6	***	7	1.3
73	5	***	6	***	***	5	***	***	6	***	***	8	***	***	9	***	***	9	***	***	8	***	***	6	***	7	1.5
73	6	***	6	***	***	5	***	***	6	***	***	7	***	***	9	***	***	9	***	***	8	***	***	6	***	7	1.4
73	7	***	5	***	***	5	***	***	6	***	***	8	***	***	8	***	***	9	***	***	8	***	***	6	***	7	1.4
73	8	***	5	***	***	4	***	***	6	***	***	7	***	***	9	***	***	9	***	***	8	***	***	6	***	7	1.7
73	9	***	5	***	***	4	***	***	4	***	***	8	***	***	9	***	***	10	***	***	6	***	***	6	***	7	2.1
73	10	***	5	***	***	4	***	***	5	***	***	6	***	***	7	***	***	7	***	***	4	***	***	4	***	5	1.2
73	11	***	9	***	***	8	***	***	7	***	***	8	***	***	9	***	***	8	***	***	8	***	***	8	***	8	.6
73	12	***	6	***	***	7	***	***	7	***	***	8	***	***	8	***	***	7	***	***	7	***	***	6	***	7	.7
74	1	***	7	***	***	6	***	***	7	***	***	9	***	***	10	***	***	10	***	***	8	***	***	8	***	8	1.1
74	2	***	6	***	***	6	***	***	6	***	***	8	***	***	9	***	***	8	***	***	6	***	***	6	***	7	1.2
74	3	***	6	***	***	7	***	***	6	***	***	8	***	***	9	***	***	9	***	***	6	***	***	6	***	7	1.3
74	4	***	5	***	***	5	***	***	5	***	***	7	***	***	8	***	***	8	***	***	7	***	***	5	***	6	1.3
74	5	***	4	***	***	4	***	***	6	***	***	7	***	***	7	***	***	8	***	***	6	***	***	5	***	6	1.4
74	6	***	4	***	***	3	***	***	5	***	***	7	***	***	8	***	***	9	***	***	7	***	***	5	***	6	1.5
74	7	***	3	***	***	3	***	***	5	***	***	7	***	***	8	***	***	9	***	***	7	***	***	5	***	6	2.1
74	8	***	4	***	***	4	***	***	3	***	***	6	***	***	8	***	***	10	***	***	8	***	***	5	***	6	2.3
74	9	***	4	***	***	3	***	***	3	***	***	6	***	***	9	***	***	10	***	***	7	***	***	5	***	6	2.4
74	10	***	3	***	***	3	***	***	3	***	***	5	***	***	8	***	***	8	***	***	5	***	***	4	***	5	2.0
74	11	***	5	***	***	5	***	***	3	***	***	7	***	***	7	***	***	6	***	***	6	***	***	4	***	6	1.0
74	12	***	6	***	***	7	***	***	6	***	***	7	***	***	7	***	***	7	***	***	6	***	***	6	***	7	.5
75	1	***	7	***	***	6	***	***	6	***	***	8	***	***	8	***	***	8	***	***	7	***	***	6	***	7	.9
75	2	***	7	***	***	5	***	***	7	***	***	7	***	***	8	***	***	9	***	***	7	***	***	7	***	7	.8
75	3	***	6	***	***	6	***	***	6	***	***	9	***	***	9	***	***	10	***	***	7	***	***	7	***	8	1.5
75	4	***	5	***	***	5	***	***	5	***	***	8	***	***	8	***	***	8	***	***	7	***	***	5	***	6	1.4
75	5	***	4	***	***	5	***	***	6	***	***	7	***	***	8	***	***	9	***	***	7	***	***	5	***	6	1.6
75	6	***	2	***	***	4	***	***	6	***	***	7	***	***	8	***	***	9	***	***	8	***	***	5	***	6	2.2
75	7	***	3	***	***	4	***	***	4	***	***	6	***	***	8	***	***	9	***	***	9	***	***	6	***	6	2.9
75	8	***	1	***	***	5	***	***	6	***	***	9	***	***	10	***	***	9	***	***	8	***	***	7	***	7	2.7
75	9	***	5	***	***	4	***	***	4	***	***	8	***	***	9	***	***	11	***	***	8	***	***	6	***	7	2.4
75	10	***	6	***	***	7	***	***	7	***	***	8	***	***	8	***	***	8	***	***	4	***	***	6	***	7	.9
75	11	***	8	***	***	8	***	***	7	***	***	8	***	***	7	***	***	8	***	***	6	***	***	7	***	7	.7
75	12	***	6	***	***	6	***	***	6	***	***	7	***	***	8	***	***	8	***	***	7	***	***	7	***	7	.6
76	1	***	7	***	***	7	***	***	7	***	***	8	***	***	8	***	***	7	***	***	7	***	***	6	***	7	.6
76	2	***	7	***	***	7	***	***	8	***	***	9	***	***	10	***	***	11	***	***	8	***	***	7	***	8	1.4
76	3	***	6	***	***	6	***	***	7	***	***	8	***	***	10	***	***	9	***	***	7	***	***	7	***	8	1.3
76	4	***	5	***	***	5	***	***	5	***	***	7	***	***	7	***	***	8	***	***	7	***	***	5	***	6	1.2
76	5	***	4	***	***	4	***	***	5	***	***	7	***	***	8	***	***	10	***	***	8	***	***	5	***	6	2.1
76	6	***	3	***	***	3	***	***	5	***	***	6	***	***	8	***	***	9	***	***	8	***	***	5	***	6	2.1
76	7	***	4	***	***	3	***	***	5	***	***	6	***	***	7	***	***	9	***	***	9	***	***	5	***	6	2.1
76	8	***	4	***	***	4	***	***	4	***	***	7	***	***	8	***	***	9	***	***	6	***	***	6	***	6	1.8
76	9	***	4	***	***	4	***	***	4	***	***	6	***	***	5	***	***	9	***	***	7	***	***	5	***	6	1.8
76	10	***	3	***	***	4	***	***	4	***	***	6	***	***	5	***	***	7	***	***	4	***	***	5	***	5	1.4
76	11	***	3	***	***	4	***	***	4	***	***	5	***	***	6	***	***	6	***	***	4	***	***	4	***	5	1.0
76	12	***	3	***	***	4	***	***	3	***	***	4	***	***	4	***	***	4	***	***	3	***	***	3	***	4	.5
77	1	***	4	***	***	5	***	***	4	***	***	4	***	***	7	***	***	6	***	***	5	***	***	5	***	5	1.0
77	2	***	5	***	***	4	***	***	6	***	***	8	***	***	8	***	***	8	***	***	6	***	***	5	***	6	1.5
77	3	***	6	***	***	6	***	***	6	***	***	9	***	***	10	***	***	10	***	***	8	***	***	4	***	8	1.7
77	4	***	4	***	***	4	***	***	5	***	***	6	***	***	7	***	***	7	***	***	6	***	***	4	***	5	1.2
77	5	***	4	***	***	4	***	***	5	***	***	6	***	***	8	***	***	9	***	***	7	***	***	5	***	6	1.7
77	6	***	4	***	***	4	***	***	5	***	***	7	***	***	8	***	***	9	***	***	7	***	***	5	***	6	1.8
77	7	***	4	***	***	4	***	***	5	***	***	7	***	***	8	***	***	10	***	***	9	***	***	5	***	7	2.2
77	8	***	6	***	***	5	***	***	5	***	***	6	***	***	8	***	***	10	***	***	9	***	***	6	***	7	1.4
77	9	***	4	***	***	5	***	***	5	***	***	8	***	***	8	***	***	8	***	***	5	***	***	5	***	6	1.6
77	10	***	4	***	***	4	***	***	5	***	***	8	***	***	8	***	***	8	***	***	5	***	***	5	***	6	1.7
77	11	***	7	***	***	6	***	***	6	***	***	7	***	***	8	***	***	7	***	***	6	***	***	7	***	7	.7
77	12	***	7	***	***	8	***	***	7	***	***	8	***	***	10	***	***	8	***	***	7	***	***	4	***	8	.9
78	1	***	5	***	***	6	***	***	6	***	***	6	***	***	7	***	***	7	***	***	6	***	***	6	***	6	.6
78	2	***	6	***	***	6	***	***	5	***	***	7	***	***	7	***	***	8	***	***	7	***	***	6	***	7	.9
78	3	***	5	***	***	5	***	***	4	***	***	6	***	***	7	***	***	9	***	***	6	***	***	6	***	6	1.6
78	4	***	5	***	***	5	***	***	6	***	***	8	***	***	9	***	***	8	***	***	7	***	***	6	***	7	1.6
78	5	***	6	***	***	4	***	***	6	***	***	7	***	***	7	***	***	10	***	***	7	***	***	6	***	7	2.0
78	6	***	4	***	***	5	***	***	5	***	***	7	***	***	8	***	***	9	***	***	8	***	***	6	***	7	1.7
78	7	***	4	***	***	4	***	***	5	***	***	7	***	***	9	***	***	9	***	***	8	***	***	6	***	7	1.9
78	8	***	5	***	***	5	***	***	5	***	***	8	***	***	9	***	***	10	***	***	8	***	***	5	***	7	2.0
78	9	***	5	***	***	5	***	***	5	***	***	7	***	***	8	***	***	7	***	***	5	***	***	5	***	6	1.2
78	10	***	6	***	***	4	***	***	6	***	***	6	***	***	9	***	***	9	***	***	5	***	***	5	***	6	2.0
AVE		-***	5-***	-***		5-***	-***		6-***	-***		7-***	-***		8-***	-***		9-***	-***		7-***	-***		6-***			
ST DEV		.0	1.6	.0	.0	1.4	.0	.0	1.2	.0	.0	1.1	.0	.0	1.1	.0	.0	1.3	.0	.0	1.3	.0	.0	1.1	.0		

25TH, 50TH, 75TH, 95TH PERCENTILES, MAXIMUM AND MISSING

6 7 8 10 12 1504

Table 2.8(c)

Two way tables of monthly averages of hourly wind speed
Portland Hughes/Federal Building

YR	MO	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVG	SDV
70	12	33	34	31	30	27	27	30	32	34	21	31	17	34	31	29	27	26	25	29	28	28	25	26	26	29	3.1
71	1	29	32	32	24	37	26	32	23	34	35	32	32	25	29	27	29	25	26	26	27	25	27	26	33	30	3.4
71	2	11	14	31	22	24	1	14	***	***	17	10	8	3	10	14	8	5	12	13	9	16	16	17	9	13	6.5
71	3	23	24	27	24	24	24	27	28	36	33	33	30	25	31	32	23	31	28	27	24	28	27	26	25	28	2.8
71	4	17	17	16	16	16	13	17	10	24	22	23	27	24	28	28	25	27	27	23	23	23	23	21	22	22	4.1
71	5	19	16	19	17	14	19	21	22	24	21	23	21	24	25	24	29	33	34	34	32	27	24	20	18	24	5.3
71	6	17	13	14	13	14	15	16	18	14	16	18	20	18	20	22	23	26	29	27	25	26	23	22	19	20	4.4
71	7	22	21	24	19	21	26	23	22	22	21	21	23	22	23	27	29	35	30	30	33	31	26	20	23	25	5.3
71	8	22	24	22	21	14	19	22	23	23	21	20	21	24	26	25	32	37	37	41	37	33	31	26	22	26	6.7
71	9	26	24	21	21	21	21	24	25	24	27	27	26	34	27	30	37	36	31	26	25	27	21	26	27	27	4.5
71	10	18	14	17	17	17	16	19	21	24	21	21	21	21	21	22	25	22	22	20	20	21	22	20	20	20	2.3
71	11	19	16	16	22	16	16	17	17	1?	19	22	22	19	20	22	23	21	20	20	19	21	20	18	18	19	1.4
71	12	24	24	24	24	24	24	23	24	24	23	33	31	33	29	29	27	25	27	27	28	27	26	27	26	27	2.8
72	1	23	24	24	28	34	26	26	27	24	29	31	31	30	30	25	24	26	28	20	24	27	28	27	27	28	1.7
72	2	26	24	21	21	24	21	23	27	22	27	27	29	28	31	30	27	25	22	21	21	19	20	20	20	24	3.9
72	3	8	6	2	***	6	6	***	***	.	***	5	12	15	12	17	17	16	14	6	10	12	16	23	26	10	7.3
72	4	22	17	16	19	16	16	19	20	22	24	26	25	24	28	28	23	26	24	23	24	25	24	21	22	23	3.2
72	5	26	14	14	10	14	22	21	23	24	22	22	22	23	23	25	27	29	33	34	31	26	25	23	22	24	4.3
72	6	16	16	18	18	14	16	21	21	24	23	23	22	23	26	29	29	31	33	33	30	27	27	24	22	24	5.3
72	7	23	23	27	20	23	20	27	29	24	26	26	27	27	30	32	30	39	41	41	37	33	30	26	26	30	5.2
72	8	22	24	24	24	21	21	22	24	24	24	24	26	24	29	32	35	34	46	38	35	35	33	28	25	28	6.3
72	9	23	24	24	20	21	26	23	23	23	23	24	25	24	22	26	28	28	27	24	25	26	25	23	21	24	2.2
72	10	10	19	17	10	19	21	23	21	24	21	23	22	23	23	27	29	23	23	22	20	20	19	18	19	22	3.2
72	11	13	13	14	15	16	15	16	16	16	19	20	24	22	21	22	20	19	15	16	15	12	12	10	13	16	3.5
72	12	23	21	24	24	24	19	21	20	21	23	20	26	26	25	27	25	25	23	24	22	22	21	21	22	23	2.6
73	1	22	21	24	24	24	26	16	19	23	22	21	23	27	30	31	29	27	23	24	23	22	21	21	22	23	3.3
73	2	14	16	17	17	15	12	14	17	17	15	21	21	24	23	23	24	21	25	24	19	19	19	19	19	19	2.4
73	3	16	17	19	17	15	13	17	17	14	21	21	21	24	23	24	23	24	25	21	20	19	20	17	19	20	2.9
73	4	17	16	15	15	15	16	13	16	19	22	23	23	25	25	25	28	30	31	29	25	25	22	20	16	21	3.4
73	5	19	17	14	19	14	19	16	21	21	23	24	23	23	24	28	31	33	34	31	28	26	27	23	23	24	4.3
73	6	21	16	16	18	16	16	20	21	21	19	19	22	24	22	24	33	32	32	33	32	33	29	24	22	23	5.3
73	7	22	24	23	19	19	19	21	24	24	22	24	21	23	27	30	33	37	42	44	41	38	34	30	25	27	7.9
73	8	21	24	23	27	24	23	22	22	24	17	17	16	14	21	25	27	31	34	38	34	32	29	25	23	24	6.2
73	9	19	21	24	26	24	21	23	23	24	23	24	24	23	25	27	27	28	24	23	22	22	23	23	20	23	2.3
73	10	16	13	14	14	14	15	17	17	1?	20	20	20	23	22	24	25	25	20	15	15	14	14	15	15	16	3.3
73	11	24	24	24	24	24	23	21	21	24	21	22	23	24	24	27	26	26	24	23	22	24	18	26	22	24	2.1
73	12	14	14	14	14	14	19	17	17	14	24	24	31	24	27	28	27	24	24	20	16	19	18	18	20	22	3.3
74	1	24	24	22	22	24	23	23	24	24	24	32	30	31	33	35	30	29	22	19	22	18	19	20	24	21	2.1
74	2	19	24	15	24	24	21	21	22	24	21	22	22	22	33	26	25	26	22	19	21	22	21	19	23	22	4.9
74	3	19	16	16	19	16	14	17	20	24	19	21	24	36	31	26	24	23	22	19	21	22	21	19	23	22	2.7
74	4	19	16	24	19	24	19	22	23	25	24	23	21	22	24	25	25	27	26	24	24	26	23	21	19	22	2.7
74	5	21	17	16	24	22	24	19	19	25	27	23	24	22	24	30	25	36	36	36	31	27	22	22	22	25	4.1
74	6	25	24	24	22	26	22	21	27	20	24	25	28	30	33	33	39	41	42	40	38	33	32	29	27	29	6.3
74	7	19	16	15	15	17	15	21	24	22	22	25	25	24	30	30	33	35	36	35	32	33	27	23	21	25	6.1
74	8	26	19	16	15	15	16	18	19	21	19	19	19	22	23	27	29	35	38	36	34	33	30	26	23	26	6.4
74	9	22	23	21	21	24	22	19	22	24	24	27	26	24	23	33	33	34	31	27	25	27	26	25	23	24	4.3
74	10	17	17	16	15	16	14	16	16	24	20	21	23	24	23	24	23	23	21	20	15	18	17	17	17	20	2.9
74	11	26	24	16	19	21	19	18	19	22	21	23	31	24	27	27	27	23	19	17	17	17	16	19	21	22	3.4
74	12	15	16	16	19	16	16	15	19	24	22	23	23	22	23	23	21	22	21	22	21	24	22	19	21	22	7.4
75	1	20	15	16	16	16	19	18	18	19	19	20	21	22	24	21	22	22	21	21	19	18	20	18	20	20	2.4
75	2	16	16	24	24	24	21	18	19	24	23	21	22	21	24	19	29	26	24	22	19	19	19	21	19	23	3.1
75	3	21	24	23	23	21	23	22	23	22	23	23	33	31	31	30	24	29	30	26	27	26	25	24	22	24	3.2
75	4	19	19	26	26	24	21	21	21	24	22	27	23	24	24	26	24	27	28	25	24	26	25	25	21	24	4.2
75	5	15	17	17	24	15	18	20	22	27	22	27	23	23	24	28	30	29	30	30	27	30	25	23	21	24	4.7
75	6	36	24	16	19	28	18	21	26	1?	19	21	21	22	25	24	31	34	19	34	33	32	34	27	25	26	4.4
75	7	23	21	19	21	24	21	22	27	24	23	17	18	19	21	23	22	31	33	34	34	33	34	30	25	25	4.1
75	8	24	24	23	23	27	26	22	22	21	23	24	23	22	24	28	29	33	34	35	32	31	28	24	23	26	4.3
75	9	26	24	23	24	28	24	22	24	3?	27	24	33	32	34	36	38	37	17	35	33	30	28	28	26	29	4.7
75	10	18	17	15	17	16	17	18	18	11	19	21	18	24	22	19	20	18	17	16	16	15	16	17	17	17	2.0
75	11	22	24	23	24	27	28	24	23	24	23	27	28	27	28	20	25	21	18	18	14	22	21	26	23	24	3.1
75	12	26	24	24	18	24	21	24	22	24	24	24	24	23	22	24	25	24	27	21	21	23	22	23	21	22	1.7
76	1	19	19	19	18	16	19	19	19	12	19	19	22	22	23	23	22	21	20	21	21	21	22	21	20	20	1.4
76	2	23	24	22	22	24	23	24	24	2?	20	31	31	31	31	32	31	30	27	23	25	26	25	23	22	26	3.5
76	3	21	24	21	20	22	21	22	21	23	23	20	25	25	27	24	24	28	22	21	19	17	18	23	20	22	2.4
76	4	18	16	17	14	17	17	16	19	2?	23	27	24	27	30	28	31	35	35	30	28	23	22	20	18	26	3.9
76	5	26	17	19	21	17	18	26	24	21	22	23	25	24	24	28	30	30	31	32	36	29	27	26	22	24	4.3
76	6	23	21	19	19	19	17	16	13	16	15	18	20	26	24	27	35	39	44	39	37	30	29	26	27	25	6.2
76	7	23	19	15	22	21	20	22	21	24	22	21	23	24	24	29	34	26	23	33	27	32	32	27	28	26	4.3
76	8	23	24	20	26	21	22	21	20	24	18	19	16	15	33	27	30	33	44	39	24	27	22	21	22	25	6.4
76	9	21	24	17	19	19	17	15	17	17	16	23	23	24	23	20	30	30	29	40	22	23	23	25	20	22	4.4
76	10	15	15	16	17	17	15	18	16	24	21	22	21	21	22	22	24	21	18	16	15	17	16	14	15	18	3.2
76	11	16	13	17	17	17	16	17	16	21	22	24	23	27	27	26	22	21	19	18	19	19	17	16	16	19	3.4
76	12	13	13	13	13	14	15	15	14	12	17	14	17	11	19	19	19	19	12	13	13	12	13	15	14	15	2.1
77	1	16	13	16	16	16	26	13	16	14	16	16	21	17	18	21	14	19	17	15	15	15	13	13	15	16	2.3
77	2	14	13	2	9	11	16	15	16	1.	27	20	31	24	24	28	22	19	15	13	16	16	14	15	11	17	6.7
AVG		26	19	19	26	19	19	20	21	24	23	23	24	23	24	27	27	28	27	26	25	26	23	22	21		
ST DEV		4.7	4.4	4.4	2.8	4.4	3.6	2.8	4.1	4.4	4.3	4.3	4.4	5.1	5.3	4.4	5.3	6.6	7.8	8.2	7.6	6.1	5.3	4.2	4.3		

25TH, 50TH, 75TH, 95TH PERCENTILES, MAXIMUM AND MISSING

19 24 28 36 52 0

Table 2.9

Monthly mixing height averages at Salem

(a) morning

YR	1	2	3	4	5	6	7	8	9	10	11	12	AVE	SE
70	745	490	779	810	490	674	373	364	520	620	557	742	597	148.0
71	852	646	773	637	702	821	471	494	506	542	709	994	679	155.1
72	979	854	818	864	544	446	271	269	361	334	713	716	597	245.6
73	758	460	864	590	548	731	440	469	513	556	989	757	640	169.2
74	724	674	616	738	752	484	626	371	199	182	549	520	536	188.3
75	903	771	930	771	630	736	484	674	260	723	715	620	685	172.2
76	633	764	831	732	560	567	481	551	420	284	344	348	543	168.4
77	333	510	996	509	943	523	551	472	695	487	817	797	636	199.8
78	531	781	455	830	873	873	584	726	791	361	467	563	653	172.2
79	****	****	****	****	****	****	****	****	****	****	****	****	****	.0
AVE	718	661	785	720	671	651	476	488	474	454	651	673		
SE	187.	136.	154.	112.	149.	144.	102.	139.	180.	165.	183.	175.		

(b) afternoon

YR	1	2	3	4	5	6	7	8	9	10	11	12	AVE	SE
70	445	676	1385	1742	1538	1512	1725	1567	1433	835	370	365	1133	525.5
71	314	535	921	1409	1399	1619	1471	1477	1311	929	456	454	1025	460.1
72	438	734	997	1507	1469	1359	1707	1542	1283	738	575	314	1055	460.9
73	504	708	1280	1422	1494	1531	1698	1366	1255	900	410	216	1065	476.2
74	622	629	1110	1437	1708	1371	1593	1532	1419	985	584	332	1110	447.8
75	363	725	1151	1503	1551	1496	1461	1405	1162	777	495	265	1030	460.4
76	314	743	1121	1509	1445	1441	1593	1300	1208	826	438	300	1020	458.2
77	386	669	1429	1446	1697	1379	1647	1585	1200	788	536	307	1089	495.4
78	256	631	887	1324	1822	1806	1641	1598	1277	854	454	331	1073	553.8
79	****	****	****	****	****	****	****	****	****	****	****	****	****	.0
AVE	405	672	1142	1478	1569	1502	1615	1486	1283	848	480	320		
SE	106.	63.	182.	109.	134.	135.	91.	100.	88.	74.	59.	62.		

Table 2.10

Two way tables of monthly averages of relative humidity

(a) Portland

YR	1	2	3	4	5	6	7	8	9	10	11	12	AVE	SE
70	82	73	72	69	63	59	59	64	62	70	75	84	69	8.0
71	85	79	73	67	65	65	60	61	64	78	83	78	72	8.5
72	76	76	74	70	65	64	55	58	69	76	83	77	70	8.0
73	75	74	75	66	62	62	55	63	66	79	84	83	70	8.9
74	73	79	74	72	68	61	62	61	58	72	80	84	70	8.1
75	83	78	68	68	64	63	61	66	62	80	79	86	72	8.6
76	83	74	72	67	65	63	61	71	72	76	81	88	73	7.9
77	80	78	75	68	75	65	61	63	74	79	82	81	73	7.0
78	85	81	74	77	71	66	65	69	80	77	82	86	76	6.8
79	74	86	73	78	67	62	61	70	72	79	80	85	74	7.8
AVE	80	78	73	70	67	63	60	65	68	77	81	83		
SE	4.4	3.7	1.9	4.0	3.7	2.0	2.9	4.1	6.9	3.1	2.5	3.4		

(b) Eugene

YR	1	2	3	4	5	6	7	8	9	10	11	12	AVE	SE
70	...	...	...	...	...	...	...	...	...	...	...	...	...	.0
71	87	86	80	75	74	74	65	68	69	83	89	87	78	8.0
72	84	86	82	78	72	70	59	63	71	82	91	87	77	9.6
73	87	85	83	77	74	68	59	67	75	93	89	88	78	9.2
74	71	84	80	78	74	71	68	65	61	72	90	93	76	9.3
75	66	91	85	83	78	69	59	64	68	84	83	88	78	10.2
76	86	77	77	75	70	67	61	70	69	77	87	93	76	8.9
77	84	85	78	73	77	71	62	64	74	83	86	87	77	8.1
78	89	87	79	79	75	70	64	68	80	79	79	79	77	6.9
79	80	82	74	75	47	43	41	49	52	78	89	88	67	17.7
AVE	84	85	80	77	71	67	60	64	69	80	87	88		
SE	5.2	3.6	3.1	7.8	8.6	8.7	7.3	5.8	7.7	3.7	3.6	3.9		

Table 2.11(a)

Two way tables of monthly averages of hourly relative humidity--Portland

YR	MO	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE	DEV
70	1	***	82	***	***	89	***	***	85	***	***	84	***	***	79	***	***	72	***	***	81	***	***	81	***	82	2.5
70	2	***	80	***	***	83	***	***	84	***	***	75	***	***	63	***	***	57	***	***	68	***	***	73	***	73	6.6
70	3	***	80	***	***	83	***	***	84	***	***	73	***	***	60	***	***	55	***	***	66	***	***	73	***	72	10.3
70	4	***	77	***	***	80	***	***	81	***	***	68	***	***	57	***	***	55	***	***	62	***	***	71	***	69	9.5
70	5	***	74	***	***	61	***	***	75	***	***	68	***	***	51	***	***	45	***	***	52	***	***	67	***	63	12.5
70	6	***	69	***	***	74	***	***	70	***	***	57	***	***	47	***	***	43	***	***	46	***	***	61	***	59	11.9
70	7	***	72	***	***	77	***	***	79	***	***	57	***	***	44	***	***	39	***	***	49	***	***	61	***	59	13.6
70	8	***	77	***	***	89	***	***	89	***	***	63	***	***	47	***	***	40	***	***	50	***	***	68	***	64	15.7
70	9	***	79	***	***	77	***	***	79	***	***	58	***	***	43	***	***	42	***	***	50	***	***	66	***	62	13.4
70	10	***	89	***	***	89	***	***	85	***	***	71	***	***	59	***	***	52	***	***	64	***	***	79	***	70	12.2
70	11	***	79	***	***	80	***	***	79	***	***	79	***	***	67	***	***	68	***	***	75	***	***	76	***	75	9.6
70	12	***	85	***	***	86	***	***	89	***	***	85	***	***	81	***	***	81	***	***	86	***	***	89	***	86	2.0
71	1	***	86	***	***	87	***	***	88	***	***	89	***	***	83	***	***	82	***	***	85	***	***	85	***	85	1.6
71	2	***	89	***	***	86	***	***	86	***	***	81	***	***	70	***	***	62	***	***	75	***	***	82	***	79	6.3
71	3	***	77	***	***	81	***	***	85	***	***	79	***	***	69	***	***	60	***	***	66	***	***	74	***	73	8.1
71	4	***	75	***	***	81	***	***	81	***	***	69	***	***	53	***	***	53	***	***	59	***	***	67	***	67	10.7
71	5	***	75	***	***	79	***	***	76	***	***	63	***	***	52	***	***	44	***	***	56	***	***	68	***	65	11.0
71	6	***	77	***	***	80	***	***	74	***	***	61	***	***	50	***	***	40	***	***	54	***	***	70	***	65	11.7
71	7	***	72	***	***	78	***	***	79	***	***	59	***	***	47	***	***	40	***	***	48	***	***	66	***	61	13.3
71	8	***	78	***	***	77	***	***	77	***	***	60	***	***	46	***	***	39	***	***	50	***	***	60	***	61	13.6
71	9	***	77	***	***	80	***	***	80	***	***	62	***	***	48	***	***	44	***	***	55	***	***	68	***	64	13.9
71	10	***	86	***	***	88	***	***	89	***	***	79	***	***	65	***	***	61	***	***	74	***	***	81	***	78	9.8
71	11	***	86	***	***	87	***	***	86	***	***	83	***	***	77	***	***	79	***	***	83	***	***	85	***	83	3.5
71	12	***	80	***	***	82	***	***	81	***	***	77	***	***	73	***	***	76	***	***	79	***	***	78	***	78	2.7
72	1	***	85	***	***	80	***	***	81	***	***	77	***	***	68	***	***	67	***	***	78	***	***	79	***	77	4.8
72	2	***	79	***	***	81	***	***	83	***	***	78	***	***	69	***	***	69	***	***	74	***	***	78	***	76	4.9
72	3	***	82	***	***	89	***	***	83	***	***	75	***	***	63	***	***	59	***	***	69	***	***	79	***	74	6.3
72	4	***	79	***	***	83	***	***	80	***	***	65	***	***	54	***	***	56	***	***	62	***	***	73	***	70	9.9
72	5	***	76	***	***	83	***	***	77	***	***	62	***	***	50	***	***	47	***	***	50	***	***	69	***	66	12.7
72	6	***	75	***	***	79	***	***	75	***	***	62	***	***	52	***	***	46	***	***	56	***	***	68	***	64	10.9
72	7	***	68	***	***	79	***	***	68	***	***	52	***	***	41	***	***	38	***	***	44	***	***	59	***	56	12.9
72	8	***	69	***	***	76	***	***	76	***	***	57	***	***	42	***	***	38	***	***	46	***	***	60	***	58	14.4
72	9	***	87	***	***	83	***	***	84	***	***	68	***	***	59	***	***	49	***	***	68	***	***	73	***	69	13.6
72	10	***	86	***	***	88	***	***	89	***	***	75	***	***	62	***	***	58	***	***	79	***	***	88	***	76	11.1
72	11	***	86	***	***	87	***	***	88	***	***	89	***	***	76	***	***	75	***	***	81	***	***	83	***	83	4.6
72	12	***	78	***	***	80	***	***	81	***	***	77	***	***	72	***	***	73	***	***	76	***	***	77	***	77	2.9
73	1	***	79	***	***	79	***	***	76	***	***	75	***	***	70	***	***	68	***	***	74	***	***	77	***	75	4.8
73	2	***	89	***	***	81	***	***	83	***	***	77	***	***	65	***	***	68	***	***	79	***	***	78	***	79	7.7
73	3	***	83	***	***	89	***	***	86	***	***	76	***	***	63	***	***	67	***	***	79	***	***	79	***	75	9.8
73	4	***	77	***	***	89	***	***	84	***	***	69	***	***	53	***	***	48	***	***	59	***	***	68	***	66	13.3
73	5	***	73	***	***	81	***	***	79	***	***	59	***	***	49	***	***	45	***	***	52	***	***	69	***	62	12.2
73	6	***	72	***	***	78	***	***	72	***	***	57	***	***	50	***	***	46	***	***	56	***	***	64	***	62	10.9
73	7	***	68	***	***	75	***	***	70	***	***	53	***	***	41	***	***	38	***	***	49	***	***	58	***	56	13.7
73	8	***	79	***	***	80	***	***	79	***	***	62	***	***	47	***	***	42	***	***	52	***	***	66	***	63	13.7
73	9	***	76	***	***	82	***	***	83	***	***	63	***	***	51	***	***	47	***	***	57	***	***	70	***	66	12.9
73	10	***	86	***	***	89	***	***	90	***	***	80	***	***	66	***	***	67	***	***	76	***	***	83	***	79	9.9
73	11	***	87	***	***	87	***	***	90	***	***	88	***	***	78	***	***	78	***	***	83	***	***	86	***	89	3.7
73	12	***	85	***	***	87	***	***	86	***	***	83	***	***	78	***	***	79	***	***	83	***	***	85	***	83	3.3
74	1	***	76	***	***	79	***	***	79	***	***	79	***	***	66	***	***	69	***	***	72	***	***	76	***	73	5.3
74	2	***	85	***	***	89	***	***	89	***	***	81	***	***	72	***	***	78	***	***	77	***	***	81	***	79	5.3
74	3	***	81	***	***	82	***	***	89	***	***	76	***	***	60	***	***	59	***	***	67	***	***	76	***	74	8.6
74	4	***	81	***	***	82	***	***	82	***	***	73	***	***	62	***	***	58	***	***	66	***	***	76	***	72	9.3
74	5	***	78	***	***	81	***	***	78	***	***	65	***	***	55	***	***	50	***	***	62	***	***	73	***	66	13.0
74	6	***	71	***	***	76	***	***	72	***	***	60	***	***	49	***	***	49	***	***	51	***	***	68	***	61	11.1
74	7	***	79	***	***	79	***	***	76	***	***	60	***	***	47	***	***	44	***	***	53	***	***	66	***	62	12.6
74	8	***	72	***	***	78	***	***	77	***	***	60	***	***	47	***	***	41	***	***	50	***	***	65	***	61	13.2
74	9	***	73	***	***	80	***	***	83	***	***	55	***	***	37	***	***	38	***	***	40	***	***	61	***	58	18.3
74	10	***	85	***	***	89	***	***	91	***	***	72	***	***	51	***	***	40	***	***	46	***	***	76	***	72	13.6
74	11	***	86	***	***	88	***	***	87	***	***	80	***	***	69	***	***	78	***	***	80	***	***	83	***	82	6.9
74	12	***	88	***	***	89	***	***	88	***	***	89	***	***	78	***	***	76	***	***	83	***	***	85	***	89	9.3
75	1	***	87	***	***	86	***	***	86	***	***	89	***	***	77	***	***	76	***	***	89	***	***	85	***	83	4.3
75	2	***	83	***	***	89	***	***	89	***	***	78	***	***	71	***	***	68	***	***	78	***	***	79	***	78	5.6
75	3	***	79	***	***	78	***	***	79	***	***	67	***	***	58	***	***	59	***	***	63	***	***	69	***	66	8.6
75	4	***	78	***	***	81	***	***	81	***	***	68	***	***	55	***	***	52	***	***	57	***	***	72	***	68	11.9
75	5	***	73	***	***	79	***	***	75	***	***	63	***	***	51	***	***	46	***	***	54	***	***	68	***	64	11.9
75	6	***	73	***	***	78	***	***	79	***	***	62	***	***	50	***	***	47	***	***	54	***	***	69	***	63	10.9
75	7	***	71	***	***	75	***	***	74	***	***	59	***	***	50	***	***	44	***	***	50	***	***	62	***	61	11.3
75	8	***	74	***	***	79	***	***	78	***	***	65	***	***	51	***	***	50	***	***	54	***	***	69	***	66	13.6
75	9	***	78	***	***	83	***	***	85	***	***	58	***	***	40	***	***	32	***	***	50	***	***	67	***	62	17.7
75	10	***	86	***	***	88	***	***	88	***	***	79	***	***	60	***	***	67	***	***	78	***	***	82	***	80	7.6
75	11	***	89	***	***	89	***	***	89	***	***	79	***	***	71	***	***	77	***	***	81	***	***	82	***	80	5.3
75	12	***	88	***	***	87	***	***	91	***	***	86	***	***	80	***	***	80	***	***	84	***	***	87	***	86	3.7
76	1	***	86	***	***	87	***	***	87	***	***	85	***	***	77	***	***	78	***	***	83	***	***	85	***	83	4.1
76	2	***	88	***	***	88	***	***	82	***	***	79	***	***	62	***	***	68	***	***	71	***	***	76	***	79	7.6
76	3	***	88	***	***	83	***	***	83	***	***	73	***	***	61	***	***	56	***	***	66	***	***	79	***	77	9.6
76	4	***	77	***	***	81	***	***	80	***	***	69	***	***	59	***	***	50	***	***	61	***	***	71	***	67	11.1
76	5	***	79	***	***	79	***	***	76	***	***	63	***	***	55	***	***	50	***	***	59	***	***	68	***	65	10.3
76	6	***	79	***	***	79	***	***	76	***	***	59	***	***	52	***	***	46	***	***	52	***	***	66	***	63	11.5
76	7	***	71	***	***	78	***	***	75	***	***	64	***	***	48	***	***	42	***	***	51	***	***	69	***	61	12.9
76	8	***	80	***	***	82	***	***	83	***	***	79	***	***	50	***	***	55	***	***	63	***	***	75	***	71	10.1
76	9	***	83	***	***	80	***	***	88	***	***	79	***	***	57	***	***	53	***	***	66	***	***	75	***	72	14.7
76	10	***	85	***	***	84	***	***	89	***	***	79	***	***	61	***	***	56	***	***	71	***	***	80	***	76	11.6
76	11	***	90	***	***	90	***	***	91	***	***	83	***	***	67	***	***	66	***	***	76	***	***	89	***	81	9.6
76	12	***	92	***	***	92	***	***	92	***	***	91	***	***	80	***	***	83	***	***	86	***	***	89	***	88	4.5
77	1	***	86	***	***	87	***	***	88	***	***	82	***	***	70	***	***	67	***	***	77	***	***	83	***	82	7.9
77	2	***	86	***	***	86	***	***	86	***	***	88	***	***	68	***	***	66	***	***	79	***	***	80	***	78	7.6
77	3	***	89	***	***	86	***	***	88	***	***	77	***	***	63	***	***	62	***	***	64	***	***	79	***	76	9.3
77	4	***	80	***	***	86	***	***	86	***	***	67	***	***	51	***	***	47	***	***	57	***	***	69	***	66	14.3
77	5	***	85	***	***	89	***	***	86	***	***	70	***	***	61	***	***	61	***	***	60	***	***	80	***	75	10.6
77	6	***	77	***	***	82	***	***	76	***	***	69	***	***	53	***	***	47	***	***	53	***	***	68	***	65	14.1
77	7	***	71	***	***	78	***	***	74	***	***	59	***	***	47	***	***	45	***	***	52	***	***	60	***	61	14.7
77	8	***	79	***	***	84	***	***	78	***	***	63	***	***	49	***	***	42	***	***	51	***	***	66	***	63	13.5
77	9	***	83	***	***	87	***	***	87	***	***	70	***	***	61	***	***	56	***	***	68	***	***	78	***	74	11.3
77	10	***	87	***	***	90	***	***	91	***	***	76	***	***	66	***	***	61	***	***	76	***	***	85	***	79	10.4
77	11	***	87	***	***	87	***	***	87	***	***	81	***	***	79	***	***	75	***	***	82	***	***	86	***	82	4.9
77	12	***	85	***	***	85	***	***	83	***	***	80	***	***	77	***	***	79	***	***	78	***	***	81	***	81	2.9
78	1	***	86	***	***	80	***	***	80	***	***	89	***	***	80	***	***	82	***	***	86	***	***	87	***	86	2.7
78	2	***	87	***	***	87	***	***	87	***	***	82	***	***	73	***	***	77	***	***	79	***	***	86	***	81	6.3
78	3	***	89	***	***	87	***	***	89	***	***	78	***	***	62	***	***	55	***	***	66	***	***	76	***	79	11.8
78	4	***	85	***	***	87	***	***	89	***	***	75	***	***	64	***	***	64	***	***	72	***	***	80	***	77	9.3
78	5	***	83	***	***	87	***	***	83	***	***	67	***	***	57	***	***	50	***	***	60	***	***	77	***	71	11.7
78	6	***	75	***	***	83	***	***	77	***	***	69	***	***	59	***	***	48	***	***	56	***	***	70	***	66	11.8
78	7	***	77	***	***	82	***	***	78	***	***	65	***	***	53	***	***	47	***	***	51	***	***	68	***	65	12.6
78	8	***	78	***	***	83	***	***	82	***	***	67	***	***	55	***	***	52	***	***	60	***	***	71	***	69	11.3
78	9	***	89	***	***	89	***	***	91	***	***	80	***	***	63	***	***	63	***	***	70	***	***	85	***	80	10.8
78	10	***	90	***	***	89	***	***	96	***	***	75	***	***	58	***	***	53	***	***	69	***	***	93	***	77	15.2
78	11	***	88	***	***	91	***	***	90	***	***	82	***	***	71	***	***	72	***	***	80	***	***	89	***	82	7.2
78	12	***	88	***	***	91	***	***	91	***	***	87	***	***	81	***	***	79	***	***	85	***	***	87	***	86	9.3
AVE		***	80	***	***	83	***	***	82	***	***	71	***	***	68	***	***	57	***	***	66	***	***	74	***		
ST DEV		.0	6.8	.0	.0	9.3	.0	.0	6.8	.3	.0	9.9	.0	.0	11.3	.0	.0	13.0	.0	.0	12.1	.0	.0	7.9	.0		

25TH, 50TH, 75TH, 95TH PERCENTILES, MAXIMUM AND MISSING

63 75 82 88 96 1728

Table 2.11(b)

Two way tables of monthly averages of hourly relative humidity--Eugene

YR	MO	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE	DEV
71	1	***	90	***	***	88	***	***	89	***	***	87	***	***	83	***	***	82	***	***	69	***	***	90	***	88	3.6
71	2	***	91	***	***	91	***	***	90	***	***	87	***	***	79	***	***	76	***	***	85	***	***	90	***	86	5.4
71	3	***	86	***	***	86	***	***	86	***	***	79	***	***	70	***	***	67	***	***	79	***	***	89	***	80	7.4
71	4	***	86	***	***	88	***	***	87	***	***	77	***	***	61	***	***	58	***	***	70	***	***	81	***	75	11.1
71	5	***	89	***	***	88	***	***	86	***	***	78	***	***	68	***	***	57	***	***	71	***	***	81	***	75	11.3
71	6	***	90	***	***	92	***	***	86	***	***	65	***	***	55	***	***	55	***	***	66	***	***	85	***	70	14.0
71	7	***	85	***	***	89	***	***	79	***	***	59	***	***	49	***	***	39	***	***	51	***	***	77	***	68	18.2
71	8	***	84	***	***	89	***	***	85	***	***	62	***	***	47	***	***	40	***	***	57	***	***	76	***	68	17.9
71	9	***	83	***	***	87	***	***	86	***	***	63	***	***	47	***	***	40	***	***	64	***	***	76	***	69	15.6
71	10	***	92	***	***	93	***	***	94	***	***	83	***	***	60	***	***	63	***	***	82	***	***	89	***	83	11.4
71	11	***	93	***	***	94	***	***	92	***	***	94	***	***	80	***	***	88	***	***	90	***	***	92	***	89	5.1
71	12	***	89	***	***	88	***	***	80	***	***	87	***	***	82	***	***	89	***	***	84	***	***	89	***	87	2.6
72	1	***	89	***	***	87	***	***	88	***	***	84	***	***	76	***	***	70	***	***	84	***	***	89	***	84	5.8
72	2	***	90	***	***	91	***	***	91	***	***	88	***	***	70	***	***	74	***	***	86	***	***	90	***	86	6.1
72	3	***	90	***	***	93	***	***	93	***	***	83	***	***	71	***	***	66	***	***	80	***	***	88	***	82	8.7
72	4	***	88	***	***	89	***	***	88	***	***	72	***	***	60	***	***	63	***	***	74	***	***	80	***	78	10.2
72	5	***	89	***	***	88	***	***	83	***	***	66	***	***	56	***	***	52	***	***	64	***	***	80	***	72	13.3
72	6	***	85	***	***	84	***	***	82	***	***	65	***	***	53	***	***	50	***	***	59	***	***	78	***	70	14.1
72	7	***	73	***	***	86	***	***	78	***	***	55	***	***	40	***	***	34	***	***	43	***	***	64	***	58	16.3
72	8	***	79	***	***	85	***	***	87	***	***	59	***	***	41	***	***	36	***	***	50	***	***	69	***	63	17.3
72	9	***	83	***	***	87	***	***	87	***	***	64	***	***	52	***	***	47	***	***	64	***	***	77	***	71	14.6
72	10	***	92	***	***	94	***	***	96	***	***	86	***	***	63	***	***	62	***	***	79	***	***	87	***	83	11.0
72	11	***	94	***	***	96	***	***	96	***	***	97	***	***	81	***	***	84	***	***	94	***	***	94	***	92	5.5
72	12	***	89	***	***	89	***	***	88	***	***	87	***	***	83	***	***	83	***	***	88	***	***	90	***	87	2.8
73	1	***	91	***	***	91	***	***	91	***	***	88	***	***	79	***	***	80	***	***	89	***	***	90	***	87	4.7
73	2	***	90	***	***	91	***	***	93	***	***	86	***	***	73	***	***	70	***	***	84	***	***	89	***	86	6.3
73	3	***	91	***	***	92	***	***	92	***	***	82	***	***	69	***	***	69	***	***	81	***	***	88	***	83	9.4
73	4	***	89	***	***	91	***	***	90	***	***	71	***	***	60	***	***	56	***	***	71	***	***	89	***	77	13.0
73	5	***	88	***	***	92	***	***	87	***	***	66	***	***	56	***	***	53	***	***	66	***	***	83	***	74	14.4
73	6	***	85	***	***	90	***	***	88	***	***	63	***	***	50	***	***	45	***	***	57	***	***	77	***	66	15.8
73	7	***	88	***	***	86	***	***	71	***	***	51	***	***	38	***	***	33	***	***	47	***	***	78	***	64	19.5
73	8	***	86	***	***	86	***	***	88	***	***	60	***	***	49	***	***	40	***	***	53	***	***	77	***	67	16.9
73	9	***	80	***	***	92	***	***	91	***	***	69	***	***	55	***	***	57	***	***	67	***	***	83	***	75	15.5
73	10	***	94	***	***	96	***	***	95	***	***	83	***	***	69	***	***	62	***	***	81	***	***	91	***	83	12.6
73	11	***	90	***	***	91	***	***	92	***	***	89	***	***	84	***	***	84	***	***	89	***	***	90	***	89	2.5
73	12	***	91	***	***	89	***	***	89	***	***	88	***	***	83	***	***	84	***	***	88	***	***	90	***	88	2.9
74	1	***	78	***	***	78	***	***	77	***	***	77	***	***	63	***	***	62	***	***	72	***	***	79	***	73	6.3
74	2	***	88	***	***	88	***	***	88	***	***	85	***	***	77	***	***	73	***	***	83	***	***	86	***	84	5.3
74	3	***	80	***	***	89	***	***	89	***	***	79	***	***	66	***	***	67	***	***	79	***	***	86	***	80	4.2
74	4	***	89	***	***	91	***	***	89	***	***	79	***	***	66	***	***	59	***	***	74	***	***	83	***	79	11.2
74	5	***	89	***	***	91	***	***	86	***	***	68	***	***	57	***	***	50	***	***	60	***	***	83	***	74	13.0
74	6	***	88	***	***	91	***	***	93	***	***	65	***	***	50	***	***	40	***	***	50	***	***	81	***	71	15.6
74	7	***	86	***	***	90	***	***	80	***	***	65	***	***	40	***	***	46	***	***	53	***	***	79	***	68	16.7
74	8	***	83	***	***	86	***	***	79	***	***	56	***	***	44	***	***	41	***	***	53	***	***	79	***	68	16.9
74	9	***	79	***	***	89	***	***	83	***	***	57	***	***	39	***	***	32	***	***	58	***	***	66	***	62	18.9
74	10	***	89	***	***	89	***	***	91	***	***	70	***	***	58	***	***	47	***	***	67	***	***	78	***	72	19.0
74	11	***	96	***	***	96	***	***	97	***	***	89	***	***	79	***	***	79	***	***	90	***	***	94	***	90	4.9
74	12	***	96	***	***	96	***	***	94	***	***	92	***	***	88	***	***	87	***	***	94	***	***	96	***	93	4.1
75	1	***	91	***	***	92	***	***	92	***	***	90	***	***	81	***	***	80	***	***	88	***	***	91	***	88	4.5
75	2	***	96	***	***	90	***	***	98	***	***	91	***	***	81	***	***	80	***	***	91	***	***	96	***	91	6.4
75	3	***	93	***	***	90	***	***	94	***	***	82	***	***	72	***	***	69	***	***	85	***	***	94	***	85	9.9
75	4	***	95	***	***	97	***	***	96	***	***	77	***	***	66	***	***	66	***	***	80	***	***	80	***	83	12.3
75	5	***	72	***	***	95	***	***	89	***	***	72	***	***	61	***	***	57	***	***	68	***	***	80	***	75	12.6
75	6	***	55	***	***	92	***	***	88	***	***	67	***	***	55	***	***	52	***	***	61	***	***	53	***	60	19.0
75	7	***	8	***	***	91	***	***	89	***	***	66	***	***	51	***	***	40	***	***	56	***	***	77	***	59	20.3
75	8	***	15	***	***	91	***	***	88	***	***	70	***	***	50	***	***	56	***	***	63	***	***	80	***	64	23.3
75	9	***	86	***	***	89	***	***	90	***	***	66	***	***	46	***	***	38	***	***	58	***	***	76	***	68	18.7
75	10	***	89	***	***	81	***	***	90	***	***	89	***	***	73	***	***	73	***	***	86	***	***	80	***	80	7.2
75	11	***	87	***	***	84	***	***	87	***	***	84	***	***	73	***	***	73	***	***	85	***	***	87	***	83	5.0
75	12	***	91	***	***	96	***	***	90	***	***	80	***	***	82	***	***	82	***	***	88	***	***	90	***	88	3.6
76	1	***	91	***	***	90	***	***	91	***	***	89	***	***	78	***	***	70	***	***	87	***	***	89	***	87	5.6
76	2	***	89	***	***	85	***	***	89	***	***	77	***	***	67	***	***	61	***	***	79	***	***	81	***	77	8.3
76	3	***	89	***	***	87	***	***	87	***	***	79	***	***	69	***	***	59	***	***	79	***	***	83	***	77	10.8
76	4	***	86	***	***	87	***	***	86	***	***	70	***	***	60	***	***	50	***	***	70	***	***	81	***	79	11.8
76	5	***	86	***	***	87	***	***	88	***	***	63	***	***	53	***	***	52	***	***	61	***	***	79	***	78	13.4
76	6	***	85	***	***	83	***	***	77	***	***	60	***	***	50	***	***	47	***	***	59	***	***	77	***	67	15.3
76	7	***	78	***	***	89	***	***	78	***	***	56	***	***	39	***	***	30	***	***	40	***	***	70	***	61	17.1
76	8	***	83	***	***	87	***	***	89	***	***	67	***	***	51	***	***	49	***	***	60	***	***	75	***	70	19.2
76	9	***	81	***	***	86	***	***	87	***	***	66	***	***	58	***	***	49	***	***	61	***	***	75	***	69	15.2
76	10	***	87	***	***	90	***	***	91	***	***	79	***	***	59	***	***	52	***	***	71	***	***	82	***	76	14.0
76	11	***	92	***	***	93	***	***	92	***	***	80	***	***	75	***	***	79	***	***	87	***	***	91	***	87	7.5
76	12	***	95	***	***	90	***	***	99	***	***	99	***	***	86	***	***	89	***	***	90	***	***	95	***	93	4.2
77	1	***	91	***	***	90	***	***	90	***	***	87	***	***	71	***	***	60	***	***	85	***	***	88	***	80	6.9
77	2	***	92	***	***	92	***	***	90	***	***	80	***	***	70	***	***	70	***	***	89	***	***	90	***	86	7.6
77	3	***	86	***	***	89	***	***	84	***	***	79	***	***	63	***	***	67	***	***	71	***	***	83	***	78	10.4
77	4	***	84	***	***	88	***	***	89	***	***	68	***	***	57	***	***	51	***	***	64	***	***	79	***	73	13.8
77	5	***	90	***	***	92	***	***	80	***	***	70	***	***	59	***	***	52	***	***	73	***	***	85	***	77	13.1
77	6	***	87	***	***	89	***	***	82	***	***	67	***	***	59	***	***	49	***	***	58	***	***	81	***	71	16.7
77	7	***	80	***	***	89	***	***	77	***	***	50	***	***	41	***	***	37	***	***	47	***	***	78	***	62	17.3
77	8	***	79	***	***	85	***	***	81	***	***	60	***	***	49	***	***	39	***	***	51	***	***	71	***	60	16.6
77	9	***	87	***	***	90	***	***	80	***	***	70	***	***	57	***	***	53	***	***	69	***	***	81	***	75	13.6
77	10	***	99	***	***	93	***	***	93	***	***	87	***	***	66	***	***	63	***	***	82	***	***	89	***	83	10.7
77	11	***	91	***	***	91	***	***	92	***	***	95	***	***	78	***	***	78	***	***	87	***	***	90	***	86	5.3
77	12	***	90	***	***	90	***	***	91	***	***	86	***	***	80	***	***	83	***	***	87	***	***	87	***	87	3.6
78	1	***	91	***	***	92	***	***	91	***	***	89	***	***	85	***	***	85	***	***	90	***	***	90	***	89	2.6
78	2	***	91	***	***	93	***	***	92	***	***	89	***	***	79	***	***	70	***	***	89	***	***	92	***	87	6.3
78	3	***	89	***	***	91	***	***	91	***	***	78	***	***	69	***	***	59	***	***	76	***	***	86	***	79	11.6
78	4	***	90	***	***	89	***	***	87	***	***	76	***	***	68	***	***	64	***	***	75	***	***	86	***	79	8.6
78	5	***	89	***	***	90	***	***	80	***	***	64	***	***	59	***	***	59	***	***	60	***	***	81	***	75	12.3
78	6	***	89	***	***	87	***	***	80	***	***	65	***	***	59	***	***	50	***	***	62	***	***	80	***	70	13.8
78	7	***	88	***	***	86	***	***	79	***	***	59	***	***	46	***	***	41	***	***	49	***	***	79	***	69	16.6
78	8	***	82	***	***	87	***	***	89	***	***	62	***	***	49	***	***	45	***	***	56	***	***	75	***	66	15.8
78	9	***	89	***	***	92	***	***	93	***	***	79	***	***	63	***	***	57	***	***	79	***	***	87	***	80	12.6
78	10	***	91	***	***	90	***	***	95	***	***	79	***	***	57	***	***	57	***	***	75	***	***	86	***	79	15.8

AVE .*** 85******.*** 90******** 86******.*** 75.*****.*** 63*****.*** 66*****.*** 72.*****.*** 83.***

ST DEV .012.9 .0 .0 3.6 .0 .0 4.9 .0 .011.1 .0 .013.9 .0 .015.1 .0 .013.8 .0 .0 7.8 .0

25TH, 50TH, 75TH, 95TH PERCENTILES, MAXIMUM AND MISSING

67 83 90 96 70 1509

Table 2.12

Monthly precipitation frequencies

(a) Portland

YR	1	2	3	4	5	6	7	8	9	10	11	12	AVE	SE
70	40	46	47	48	57	65	68	67	60	53	47	40	53	9.6
71	41	43	44	50	57	57	68	70	61	52	45	40	53	10.0
72	39	43	49	47	60	63	70	70	60	52	48	37	53	10.8
73	38	44	47	52	59	63	69	65	64	54	44	45	54	9.7
74	38	42	46	51	55	64	66	68	67	54	48	44	54	10.1
75	41	41	44	47	57	61	68	64	65	53	46	42	52	9.8
76	42	41	44	50	56	60	66	64	63	54	47	39	52	9.3
77	35	44	45	53	53	63	66	70	60	53	44	42	52	10.3
78	40	44	49	50	55	65	67	67	60	55	39	36	52	10.6
79	31	42	50	52	59	64	70	67	66	58	45	44	54	11.5
AVE	39	43	47	50	57	63	68	67	63	54	45	41		
SE	3.1	1.5	2.2	2.0	2.0	2.0	1.5	2.2	2.6	1.7	2.5	2.9		

(b) Eugene

YR	1	2	3	4	5	6	7	8	9	10	11	12	AVE	SE
70	***	***	***	***	***	***	***	***	***	***	***	***	***	.0
71	40	41	43	47	54	57	66	67	58	49	44	39	50	9.4
72	38	43	48	46	56	61	68	68	58	50	47	35	52	10.4
73	38	43	44	49	56	61	67	63	61	52	44	44	52	9.1
74	39	43	49	51	56	64	67	68	66	54	49	46	54	9.5
75	46	43	44	46	56	61	68	65	64	55	46	43	53	9.1
76	42	41	44	49	55	58	67	65	63	53	47	37	52	9.6
77	38	44	44	51	51	61	64	69	59	52	44	43	52	9.3
78	43	44	48	48	53	62	67	66	59	52	41	41	52	9.1
79	31	43	48	50	44	61	67	65	63	56	42	43	51	10.8
AVE	39	43	46	49	53	61	67	66	61	53	45	41		
SE	3.9	1.0	2.2	1.8	3.7	1.9	1.1	1.8	2.7	2.1	2.4	3.4		

Table 2.13(a)

Two way tables of monthly precipitation frequency according to hour of day--Portland

YR	MO	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVG	DEV
72	1	...	15	...	...	29	...	...	45	...	...	99	...	...	39	...	...	32	...	...	32	...	...	29	...	39	.1
72	2	...	15	...	...	15	...	...	11	...	...	10	...	...	17	...	...	15	...	...	14	...	...	15	...	16	.4
[illegible]																											
72	4	...	15	...	...	13	...	...	20	...	...	73	...	...	17	...	...	33	...	...	16	...	...	7	...	17	.1
72	5	...	17	...	...	6	...	...	10	...	...	11	...	...	6	...	...	3	...	...	10	...	...	10	...	8	.3
[illegible]																											
72	7	...	4	...	...	6	...	...	4	...	...	9	...	...	0	...	...	6	...	...	0	...	...	0	...	2	.1
72	8	...	5	...	...	3	...	...	3	...	...	9	...	...	3	...	...	3	...	...	0	...	...	0	...	4	.0
[illegible]																											
72	10	...	6	...	...	13	...	...	18	...	...	16	...	...	13	...	...	15	...	...	13	...	...	19	...	12	.1
72	11	...	17	...	...	19	...	...	50	...	...	29	...	...	33	...	...	24	...	...	23	...	...	33	...	29	.4
72	12	...	37	...	...	19	...	...	19	...	...	42	...	...	45	...	...	15	...	...	26	...	...	13	...	39	.1
71	1	...	20	...	...	72	...	...	45	...	...	30	...	...	29	...	...	13	...	...	43	...	...	29	...	35	.1
71	2	...	25	...	...	25	...	...	30	...	...	25	...	...	36	...	...	21	...	...	25	...	...	19	...	25	.1
[illegible]																											
71	4	...	5	...	...	13	...	...	28	...	...	13	...	...	23	...	...	17	...	...	10	...	...	7	...	12	.1
71	5	...	16	...	...	16	...	...	15	...	...	11	...	...	10	...	...	3	...	...	16	...	...	10	...	11	.0
[illegible]																											
71	7	...	5	...	...	3	...	...	3	...	...	7	...	...	4	...	...	8	...	...	1	...	...	4	...	2	.3
71	8	...	5	...	...	3	...	...	3	...	...	5	...	...	10	...	...	1	...	...	3	...	...	3	...	3	.4
[illegible]																											
71	10	...	13	...	...	16	...	...	27	...	...	17	...	...	16	...	...	16	...	...	16	...	...	17	...	17	.0
71	11	...	21	...	...	25	...	...	20	...	...	23	...	...	27	...	...	27	...	...	10	...	...	13	...	20	.0
[illegible]																											
72	1	...	76	...	...	34	...	...	21	...	...	79	...	...	29	...	...	23	...	...	29	...	...	15	...	31	.1
72	2	...	15	...	...	21	...	...	41	...	...	34	...	...	10	...	...	31	...	...	31	...	...	10	...	29	.1
[illegible]																											
72	4	...	17	...	...	14	...	...	17	...	...	29	...	...	17	...	...	20	...	...	17	...	...	27	...	22	.4
72	5	...	6	...	...	13	...	...	15	...	...	10	...	...	10	...	...	13	...	...	19	...	...	16	...	12	.3
[illegible]																											
72	7	...	5	...	...	5	...	...	3	...	...	6	...	...	3	...	...	3	...	...	3	...	...	3	...	3	.3
72	8	...	5	...	...	0	...	...	6	...	...	9	...	...	6	...	...	3	...	...	3	...	...	3	...	3	.3
[illegible]																											
72	10	...	7	...	...	6	...	...	11	...	...	16	...	...	6	...	...	6	...	...	6	...	...	3	...	7	.0
72	11	...	72	...	...	17	...	...	17	...	...	21	...	...	13	...	...	17	...	...	17	...	...	13	...	22	.1
[illegible]																											
73	1	...	16	...	...	13	...	...	19	...	...	16	...	...	23	...	...	27	...	...	23	...	...	19	...	21	.7
73	2	...	7	...	...	11	...	...	11	...	...	20	...	...	7	...	...	11	...	...	11	...	...	10	...	12	.4
[illegible]																											
73	4	...	3	...	...	7	...	...	7	...	...	7	...	...	7	...	...	10	...	...	3	...	...	3	...	6	.0
73	5	...	6	...	...	16	...	...	13	...	...	13	...	...	10	...	...	6	...	...	10	...	...	6	...	10	.3
[illegible]																											
73	7	...	7	...	...	3	...	...	6	...	...	7	...	...	0	...	...	0	...	...	9	...	...	3	...	1	.0
73	8	...	3	...	...	3	...	...	6	...	...	3	...	...	10	...	...	3	...	...	19	...	...	3	...	4	.3
[illegible]																											
73	10	...	10	...	...	20	...	...	19	...	...	16	...	...	10	...	...	13	...	...	23	...	...	6	...	17	.1
73	11	...	40	...	...	17	...	...	40	...	...	49	...	...	43	...	...	43	...	...	43	...	...	30	...	39	.0
[illegible]																											
74	1	...	15	...	...	41	...	...	19	...	...	29	...	...	14	...	...	23	...	...	23	...	...	15	...	30	.1
74	2	...	10	...	...	19	...	...	29	...	...	21	...	...	32	...	...	36	...	...	25	...	...	21	...	29	.1
[illegible]																											
74	4	...	26	...	...	17	...	...	33	...	...	23	...	...	17	...	...	23	...	...	17	...	...	7	...	20	.1
74	5	...	14	...	...	19	...	...	10	...	...	13	...	...	6	...	...	19	...	...	19	...	...	23	...	15	.1
[illegible]																											
74	7	...	17	...	...	13	...	...	16	...	...	3	...	...	6	...	...	13	...	...	10	...	...	16	...	11	.0
74	8	...	[illegible]	...	...	0	...	...	0	...	...	3	...	...	3	...	...	6	...	...	0	...	...	7	...	1	.0
[illegible]																											
74	10	...	16	...	...	6	...	...	17	...	...	6	...	...	6	...	...	10	...	...	16	...	...	3	...	8	.0
74	11	...	37	...	...	17	...	...	30	...	...	30	...	...	20	...	...	27	...	...	23	...	...	17	...	31	.3
74	12	...	35	...	...	19	...	...	33	...	...	26	...	...	20	...	...	23	...	...	35	...	...	19	...	30	.1
[illegible]																											
75	2	...	30	...	...	19	...	...	39	...	...	18	...	...	29	...	...	30	...	...	18	...	...	25	...	30	.1
75	3	...	19	...	...	16	...	...	16	...	...	32	...	...	19	...	...	10	...	...	23	...	...	16	...	20	.1
75	4	...	25	...	...	13	...	...	26	...	...	17	...	...	17	...	...	17	...	...	13	...	...	20	...	17	.4
75	5	...	6	...	...	11	...	...	23	...	...	10	...	...	6	...	...	18	...	...	10	...	...	6	...	11	.1
[illegible]																											
75	7	...	[illegible]	...	...	3	...	...	6	...	...	3	...	...	6	...	...	3	...	...	3	...	...	0	...	3	.0
75	8	...	6	...	...	6	...	...	7	...	...	16	...	...	10	...	...	13	...	...	6	...	...	10	...	10	.0
[illegible]																											
75	12	...	17	...	...	72	...	...	29	...	...	29	...	...	71	...	...	20	...	...	35	...	...	15	...	28	.1
75	11	...	27	...	...	13	...	...	27	...	...	77	...	...	78	...	...	17	...	...	19	...	...	17	...	23	.1
[illegible]																											
76	1	...	29	...	...	[illegible]	...	...	37	...	...	29	...	...	79	...	...	18	...	...	14	...	...	16	...	29	.1
76	2	...	37	...	...	29	...	...	71	...	...	79	...	...	17	...	...	7	...	...	39	...	...	20	...	29	.1
[illegible]																											
76	4	...	17	...	...	15	...	...	15	...	...	10	...	...	17	...	...	29	...	...	17	...	...	13	...	14	.3
76	5	...	4	...	...	10	...	...	17	...	...	11	...	...	22	...	...	17	...	...	6	...	...	3	...	13	.1
[illegible]																											
76	7	...	4	...	...	1	...	...	6	...	...	10	...	...	3	...	...	6	...	...	10	...	...	6	...	5	.0
76	8	...	7	...	...	13	...	...	15	...	...	16	...	...	6	...	...	19	...	...	16	...	...	10	...	13	.0
[illegible]																											
76	10	...	7	...	...	13	...	...	6	...	...	3	...	...	10	...	...	6	...	...	3	...	...	0	...	5	.6
76	11	...	3	...	...	3	...	...	7	...	...	1	...	...	7	...	...	3	...	...	10	...	...	10	...	6	.0
[illegible]																											
77	1	...	12	...	...	[illegible]	...	...	16	...	...	6	...	...	13	...	...	10	...	...	13	...	...	13	...	11	.0
77	2	...	15	...	...	21	...	...	20	...	...	11	...	...	19	...	...	10	...	...	31	...	...	15	...	17	.0
[illegible]																											
77	4	...	16	...	...	3	...	...	10	...	...	1	...	...	3	...	...	7	...	...	3	...	...	0	...	5	.0
77	5	...	20	...	...	43	...	...	19	...	...	29	...	...	23	...	...	19	...	...	32	...	...	15	...	26	.1
[illegible]																											
77	7	...	3	...	...	7	...	...	3	...	...	1	...	...	7	...	...	6	...	...	3	...	...	0	...	7	.3
77	8	...	10	...	...	[illegible]	...	...	1	...	...	17	...	...	6	...	...	18	...	...	13	...	...	6	...	8	.3
[illegible]																											
77	10	...	13	...	...	16	...	...	10	...	...	11	...	...	13	...	...	10	...	...	29	...	...	15	...	17	.1
77	11	...	23	...	...	17	...	...	40	...	...	17	...	...	37	...	...	27	...	...	30	...	...	13	...	30	.1
[illegible]																											
78	1	...	32	...	...	29	...	...	32	...	...	35	...	...	29	...	...	32	...	...	32	...	...	29	...	30	.1
78	2	...	10	...	...	29	...	...	15	...	...	24	...	...	21	...	...	25	...	...	32	...	...	21	...	23	.1
[illegible]																											
78	4	...	30	...	...	20	...	...	37	...	...	17	...	...	20	...	...	20	...	...	29	...	...	10	...	20	.1
78	5	...	20	...	...	10	...	...	16	...	...	16	...	...	10	...	...	23	...	...	19	...	...	13	...	16	.3
[illegible]																											
78	7	...	6	...	...	3	...	...	10	...	...	6	...	...	3	...	...	3	...	...	6	...	...	0	...	4	.4
78	8	...	13	...	...	26	...	...	20	...	...	10	...	...	10	...	...	13	...	...	16	...	...	10	...	15	.1
[illegible]																											
78	10	...	3	...	...	3	...	...	6	...	...	6	...	...	10	...	...	3	...	...	6	...	...	0	...	5	.3
78	11	...	10	...	...	20	...	...	17	...	...	17	...	...	17	...	...	23	...	...	23	...	...	27	...	20	.0
[illegible]																											
AVG	[illegible]																										
ST DEV		.0	.1	.1	.0	.1	.0	.0	.1	.3	.0	.1	.0	.0	.1	.3	.0	.1	.0	.0	.1	.0	.0	.1	.0		

Table 2.13(b)

Two way tables of monthly precipitation frequency according to hour of day--Eugene

YR	MO	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVG	DEV
71	1	...	38	...	...	14	...	...	47	...	...	30	...	...	37	...	...	35	...	...	52	...	...	40	...	40	.1
71	2	...	25	...	...	19	...	...	29	...	...	27	...	...	25	...	...	16	...	...	32	...	...	19	...	26	.1
71	3	...	[illegible]	...	...	27	...	...	39	...	...	46	...	...	37	...	...	29	...	...	23	...	...	23	...	27	.1
71	4	...	17	...	...	21	...	...	17	...	...	27	...	...	30	...	...	17	...	...	7	...	...	7	...	18	.1
71	5	...	4	...	...	13	...	...	6	...	...	11	...	...	19	...	...	13	...	...	10	...	...	13	...	13	.2
71	6	...	17	...	...	13	...	...	1	...	...	3	...	...	7	...	...	7	...	...	13	...	...	17	...	10	.1
71	7	...	9	...	...	1	...	...	2	...	...	2	...	...	0	...	...	3	...	...	6	...	...	0	...	3	.2
71	8	...	3	...	...	1	...	...	6	...	...	15	...	...	5	...	...	1	...	...	9	...	...	6	...	5	.0
71	9	...	[illegible]	...	...	17	...	...	15	...	...	10	...	...	7	...	...	13	...	...	12	...	...	10	...	14	.2
71	10	...	16	...	...	13	...	...	19	...	...	19	...	...	16	...	...	10	...	...	13	...	...	16	...	15	.0
71	11	...	27	...	...	27	...	...	25	...	...	19	...	...	23	...	...	37	...	...	29	...	...	33	...	26	.1
71	12	...	23	...	...	12	...	...	19	...	...	32	...	...	39	...	...	45	...	...	37	...	...	32	...	34	.1
72	1	...	19	...	...	20	...	...	29	...	...	23	...	...	19	...	...	39	...	...	35	...	...	34	...	33	.1
72	2	...	11	...	...	31	...	...	41	...	...	28	...	...	21	...	...	29	...	...	35	...	...	35	...	29	.1
72	3	...	17	...	...	31	...	...	26	...	...	26	...	...	26	...	...	17	...	...	19	...	...	13	...	22	.2
72	4	...	21	...	...	37	...	...	7	...	...	17	...	...	23	...	...	23	...	...	33	...	...	40	...	29	.1
72	5	...	10	...	...	19	...	...	13	...	...	10	...	...	13	...	...	6	...	...	10	...	...	5	...	11	.2
72	6	...	[illegible]	...	...	3	...	...	7	...	...	3	...	...	3	...	...	7	...	...	7	...	...	7	...	3	.3
72	7	...	4	...	...	3	...	...	5	...	...	3	...	...	3	...	...	0	...	...	0	...	...	3	...	1	.0
72	8	...	7	...	...	1	...	...	3	...	...	3	...	...	3	...	...	3	...	...	6	...	...	3	...	2	.3
72	9	...	7	...	...	1	...	...	7	...	...	3	...	...	3	...	...	7	...	...	7	...	...	3	...	5	.3
72	10	...	3	...	...	1	...	...	16	...	...	6	...	...	3	...	...	6	...	...	3	...	...	6	...	6	.0
72	11	...	37	...	...	23	...	...	49	...	...	29	...	...	37	...	...	10	...	...	17	...	...	10	...	24	.1
72	12	...	[illegible]	...	...	[illegible]	...	...	37	...	...	26	...	...	32	...	...	29	...	...	26	...	...	33	...	32	.0
73	1	...	30	...	...	25	...	...	23	...	...	13	...	...	32	...	...	35	...	...	23	...	...	23	...	25	.1
73	2	...	14	...	...	13	...	...	21	...	...	11	...	...	11	...	...	7	...	...	14	...	...	18	...	15	.3
73	3	...	7	...	...	32	...	...	75	...	...	29	...	...	13	...	...	35	...	...	26	...	...	26	...	26	.1
73	4	...	13	...	...	17	...	...	17	...	...	19	...	...	7	...	...	10	...	...	7	...	...	3	...	10	.3
73	5	...	6	...	...	13	...	...	13	...	...	19	...	...	13	...	...	13	...	...	3	...	...	3	...	13	.1
73	6	...	[illegible]	...	...	[illegible]	...	...	[illegible]	...	...	13	...	...	[illegible]	...	...	3	...	...	7	...	...	7	...	13	[illegible]
73	7	...	3	...	...	3	...	...	3	...	...	4	...	...	3	...	...	0	...	...	3	...	...	3	...	3	.3
73	8	...	1	...	...	1	...	...	1	...	...	3	...	...	0	...	...	1	...	...	1	...	...	1	...	1	.3
73	9	...	[illegible]	...	...	17	...	...	[illegible]	...	...	13	...	...	[illegible]	...	...	[illegible]	...	...	17	...	...	13	...	12	.2
73	10	...	9	...	...	14	...	...	10	...	...	13	...	...	13	...	...	10	...	...	10	...	...	6	...	12	.2
73	11	...	47	...	...	41	...	...	41	...	...	55	...	...	39	...	...	33	...	...	57	...	...	43	...	52	.1
73	12	...	[illegible]	...	...	37	...	...	37	...	...	37	...	...	29	...	...	26	...	...	28	...	...	[illegible]	...	38	.1
74	1	...	15	...	...	27	...	...	32	...	...	26	...	...	32	...	...	20	...	...	26	...	...	42	...	31	.1
74	2	...	31	...	...	21	...	...	25	...	...	27	...	...	29	...	...	25	...	...	37	...	...	21	...	27	.2
74	3	...	[illegible]	...	...	12	...	...	17	...	...	29	...	...	32	...	...	25	...	...	33	...	...	29	...	32	.2
74	4	...	12	...	...	13	...	...	19	...	...	17	...	...	23	...	...	10	...	...	7	...	...	29	...	15	.1
74	5	...	3	...	...	11	...	...	1	...	...	12	...	...	7	...	...	4	...	...	6	...	...	10	...	6	.3
74	6	...	[illegible]	...	...	[illegible]	...	...	[illegible]	...	...	[illegible]	...	...	[illegible]	...	...	[illegible]	...	...	[illegible]	...	...	[illegible]	...	[illegible]	[illegible]
74	7	...	9	...	...	13	...	...	7	...	...	3	...	...	9	...	...	10	...	...	4	...	...	3	...	6	.2
74	8	...	9	...	...	13	...	...	1	...	...	3	...	...	3	...	...	3	...	...	4	...	...	3	...	2	.0
74	9	...	[illegible]	...	...	[illegible]	...	...	[illegible]	...	...	[illegible]	...	...	[illegible]	...	...	[illegible]	...	...	[illegible]	...	...	[illegible]	...	[illegible]	[illegible]
74	10	...	16	...	...	11	...	...	6	...	...	3	...	...	10	...	...	10	...	...	10	...	...	0	...	7	.3
74	11	...	27	...	...	21	...	...	27	...	...	25	...	...	27	...	...	17	...	...	17	...	...	33	...	23	.2
74	12	...	[illegible]	...	...	[illegible]	...	...	33	...	...	37	...	...	26	...	...	19	...	...	37	...	...	19	...	25	[illegible]
75	1	...	17	...	...	17	...	...	19	...	...	26	...	...	26	...	...	37	...	...	32	...	...	16	...	25	.1
75	2	...	23	...	...	34	...	...	27	...	...	16	...	...	25	...	...	30	...	...	36	...	...	30	...	32	.1
75	3	...	[illegible]	...	...	[illegible]	...	...	33	...	...	35	...	...	23	...	...	13	...	...	23	...	...	16	...	23	[illegible]
75	4	...	49	...	...	14	...	...	19	...	...	13	...	...	13	...	...	13	...	...	20	...	...	23	...	15	.3
75	5	...	4	...	...	14	...	...	16	...	...	17	...	...	6	...	...	3	...	...	3	...	...	6	...	9	.3
75	6	...	[illegible]	...	...	[illegible]	...	...	[illegible]	...	...	[illegible]	...	...	[illegible]	...	...	[illegible]	...	...	[illegible]	...	...	[illegible]	...	[illegible]	[illegible]
75	7	...	0	...	...	3	...	...	4	...	...	3	...	...	0	...	...	3	...	...	3	...	...	3	...	2	.0
75	8	...	3	...	...	9	...	...	16	...	...	3	...	...	11	...	...	0	...	...	16	...	...	3	...	6	.3
75	9	...	[illegible]	...	...	[illegible]	...	...	[illegible]	...	...	[illegible]	...	...	[illegible]	...	...	[illegible]	...	...	[illegible]	...	...	[illegible]	...	2	[illegible]
75	10	...	20	...	...	21	...	...	25	...	...	13	...	...	16	...	...	10	...	...	35	...	...	23	...	22	.1
75	11	...	17	...	...	21	...	...	51	...	...	31	...	...	13	...	...	13	...	...	30	...	...	17	...	22	.1
75	12	...	15	...	...	11	...	...	21	...	...	15	...	...	7	...	...	29	...	...	23	...	...	29	...	25	.1
76	2	...	27	...	...	21	...	...	31	...	...	29	...	...	31	...	...	29	...	...	17	...	...	21	...	25	.0
76	3	...	30	...	...	13	...	...	21	...	...	17	...	...	16	...	...	13	...	...	19	...	...	23	...	19	.0
76	4	...	29	...	...	17	...	...	19	...	...	17	...	...	17	...	...	20	...	...	28	...	...	20	...	17	.3
76	5	...	3	...	...	16	...	...	13	...	...	7	...	...	16	...	...	13	...	...	4	...	...	3	...	8	.3
76	6	...	[illegible]	...	...	[illegible]	...	...	[illegible]	...	...	[illegible]	...	...	[illegible]	...	...	[illegible]	...	...	[illegible]	...	...	[illegible]	...	[illegible]	[illegible]
76	7	...	0	...	...	6	...	...	6	...	...	4	...	...	1	...	...	3	...	...	10	...	...	16	...	3	.3
76	8	...	3	...	...	3	...	...	3	...	...	1	...	...	1	...	...	1	...	...	3	...	...	3	...	3	.3
76	9	...	[illegible]	...	...	[illegible]	...	...	[illegible]	...	...	[illegible]	...	...	[illegible]	...	...	[illegible]	...	...	[illegible]	...	...	[illegible]	...	[illegible]	[illegible]
76	10	...	3	...	...	1	...	...	11	...	...	17	...	...	3	...	...	3	...	...	3	...	...	1	...	4	.3
76	11	...	7	...	...	13	...	...	25	...	...	19	...	...	13	...	...	10	...	...	13	...	...	13	...	12	.4
76	12	...	[illegible]	...	...	[illegible]	...	...	[illegible]	...	...	[illegible]	...	...	[illegible]	...	...	[illegible]	...	...	[illegible]	...	...	[illegible]	...	[illegible]	[illegible]
77	1	...	11	...	...	1	...	...	13	...	...	15	...	...	10	...	...	6	...	...	3	...	...	6	...	8	.3
77	2	...	4	...	...	11	...	...	11	...	...	25	...	...	32	...	...	14	...	...	11	...	...	15	...	16	.1
77	3	...	19	...	...	27	...	...	11	...	...	16	...	...	15	...	...	19	...	...	23	...	...	26	...	22	.1
77	4	...	3	...	...	21	...	...	7	...	...	3	...	...	7	...	...	3	...	...	3	...	...	7	...	5	.1
77	5	...	13	...	...	21	...	...	16	...	...	13	...	...	16	...	...	6	...	...	13	...	...	26	...	17	.1
77	6	...	[illegible]	...	...	[illegible]	...	...	7	...	...	3	...	...	3	...	...	3	...	...	3	...	...	3	...	3	.3
77	7	...	0	...	...	1	...	...	3	...	...	9	...	...	1	...	...	3	...	...	3	...	...	0	...	3	.3
77	8	...	6	...	...	13	...	...	6	...	...	1	...	...	3	...	...	3	...	...	3	...	...	6	...	5	.3
77	9	...	3	...	...	17	...	...	1	...	...	18	...	...	17	...	...	10	...	...	13	...	...	12	...	15	.1
77	10	...	3	...	...	23	...	...	13	...	...	13	...	...	13	...	...	6	...	...	10	...	...	13	...	11	.1
77	11	...	43	...	...	27	...	...	23	...	...	29	...	...	13	...	...	13	...	...	23	...	...	23	...	26	.1
77	12	...	[illegible]	...	...	[illegible]	...	...	29	...	...	32	...	...	32	...	...	32	...	...	32	...	...	42	...	37	.0
78	1	...	27	...	...	10	...	...	26	...	...	33	...	...	30	...	...	23	...	...	23	...	...	29	...	27	.1
78	2	...	10	...	...	21	...	...	29	...	...	29	...	...	13	...	...	29	...	...	25	...	...	11	...	21	.2
78	3	...	[illegible]	...	...	31	...	...	13	...	...	6	...	...	13	...	...	13	...	...	12	...	...	13	...	13	.3
78	4	...	30	...	...	23	...	...	27	...	...	30	...	...	20	...	...	47	...	...	27	...	...	23	...	25	.0
78	5	...	1	...	...	13	...	...	16	...	...	19	...	...	16	...	...	10	...	...	13	...	...	6	...	12	.1
78	6	...	[illegible]	...	...	[illegible]	...	...	3	...	...	19	...	...	3	...	...	7	...	...	7	...	...	7	...	6	.0
78	7	...	6	...	...	1	...	...	6	...	...	7	...	...	3	...	...	3	...	...	3	...	...	3	...	4	.3
78	8	...	6	...	...	11	...	...	29	...	...	13	...	...	13	...	...	3	...	...	3	...	...	6	...	12	.1
78	9	...	[illegible]	...	...	17	...	...	21	...	...	13	...	...	13	...	...	13	...	...	23	...	...	13	...	15	.3
78	10	...	4	...	...	4	...	...	1	...	...	1	...	...	1	...	...	8	...	...	9	...	...	0	...	2	.3

Table 2.14

Monthly temperature averages

(a) Portland

YR	1	2	3	4	5	6	7	8	9	10	11	12	AVE	SE
70	40	46	47	48	57	65	68	67	60	53	47	40	53	9.6
71	41	43	44	50	57	59	68	70	61	52	45	40	53	10.0
72	39	43	49	47	60	63	70	70	60	52	48	37	53	10.8
73	38	44	47	52	59	63	69	65	64	54	44	45	54	9.7
74	38	42	46	51	55	64	66	68	67	54	48	44	54	10.1
75	41	41	44	47	57	61	68	64	65	53	46	42	52	9.8
76	42	41	44	50	56	60	66	64	63	54	47	39	52	9.3
77	35	44	45	53	53	63	66	70	60	53	44	42	52	10.3
78	40	44	49	50	55	65	67	67	60	55	39	36	52	10.6
79	31	42	50	52	59	64	70	67	66	58	45	44	54	11.5
AVE	39	43	47	50	57	63	68	67	63	54	45	41		
SE	3.1	1.5	2.2	2.0	2.0	2.0	1.5	2.2	2.6	1.7	2.5	2.9		

(b) Eugene

YR	1	2	3	4	5	6	7	8	9	10	11	12	AVE	SE
70	***	***	***	***	***	***	***	***	***	***	***	***	***	.0
71	40	41	43	47	54	57	66	67	58	49	44	39	50	9.4
72	39	43	48	46	56	61	68	68	58	50	47	35	52	10.4
73	38	43	44	49	56	61	67	63	61	52	44	44	52	9.1
74	39	43	49	51	56	64	67	68	66	54	49	46	54	9.5
75	46	43	44	46	56	61	68	65	64	55	46	43	53	9.1
76	42	41	44	49	55	58	67	65	63	53	47	37	52	9.6
77	38	44	44	51	51	61	64	69	59	52	44	43	52	9.3
78	43	44	48	48	53	62	67	66	59	52	41	41	52	9.1
79	31	43	48	50	44	61	67	65	63	56	42	43	51	10.8
AVE	39	43	46	49	53	61	67	66	61	53	45	41		
SE	3.9	1.0	2.2	1.8	3.7	1.9	1.1	1.8	2.7	2.1	2.4	3.4		

Table 2.15(a)

Two way tables of monthly averages of hourly temperature readings--Portland

YR	MO	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE	SDV
70	1	***	36	***	***	39	***	***	38	***	***	39	***	***	42	***	***	43	***	***	48	***	***	41	***	40	1.6
70	2	***	43	***	***	42	***	***	40	***	***	46	***	***	51	***	***	53	***	***	44	***	***	46	***	46	4.2
70	3	***	43	***	***	41	***	***	40	***	***	47	***	***	53	***	***	55	***	***	50	***	***	46	***	47	5.1
70	4	***	44	***	***	43	***	***	43	***	***	49	***	***	56	***	***	55	***	***	50	***	***	46	***	48	4.5
70	5	***	50	***	***	47	***	***	51	***	***	58	***	***	66	***	***	67	***	***	62	***	***	55	***	57	6.7
70	6	***	54	***	***	56	***	***	59	***	***	66	***	***	73	***	***	76	***	***	71	***	***	63	***	65	6.9
70	7	***	61	***	***	56	***	***	60	***	***	68	***	***	77	***	***	81	***	***	75	***	***	66	***	68	8.0
70	8	***	61	***	***	57	***	***	59	***	***	66	***	***	76	***	***	80	***	***	74	***	***	65	***	67	7.9
70	9	***	55	***	***	53	***	***	53	***	***	61	***	***	69	***	***	70	***	***	66	***	***	58	***	60	6.4
70	10	***	49	***	***	47	***	***	46	***	***	53	***	***	61	***	***	61	***	***	55	***	***	51	***	53	5.4
70	11	***	45	***	***	46	***	***	45	***	***	48	***	***	51	***	***	50	***	***	47	***	***	46	***	47	2.3
70	12	***	39	***	***	35	***	***	38	***	***	43	***	***	43	***	***	43	***	***	40	***	***	40	***	40	1.7
71	1	***	40	***	***	39	***	***	39	***	***	40	***	***	42	***	***	43	***	***	41	***	***	41	***	41	1.3
71	2	***	41	***	***	40	***	***	40	***	***	42	***	***	46	***	***	47	***	***	46	***	***	41	***	43	2.5
71	3	***	43	***	***	39	***	***	38	***	***	44	***	***	49	***	***	49	***	***	46	***	***	43	***	44	3.9
71	4	***	45	***	***	42	***	***	44	***	***	51	***	***	57	***	***	58	***	***	53	***	***	46	***	50	5.6
71	5	***	51	***	***	46	***	***	51	***	***	57	***	***	63	***	***	66	***	***	61	***	***	55	***	57	5.8
71	6	***	54	***	***	56	***	***	54	***	***	61	***	***	66	***	***	67	***	***	63	***	***	56	***	59	5.6
71	7	***	61	***	***	56	***	***	60	***	***	67	***	***	76	***	***	80	***	***	75	***	***	66	***	66	7.7
71	8	***	64	***	***	61	***	***	62	***	***	70	***	***	78	***	***	82	***	***	76	***	***	64	***	70	7.3
71	9	***	55	***	***	53	***	***	54	***	***	62	***	***	69	***	***	70	***	***	66	***	***	58	***	61	6.2
71	10	***	48	***	***	47	***	***	46	***	***	52	***	***	58	***	***	59	***	***	53	***	***	50	***	52	4.6
71	11	***	44	***	***	43	***	***	43	***	***	45	***	***	49	***	***	48	***	***	46	***	***	45	***	45	2.1
71	12	***	40	***	***	36	***	***	38	***	***	40	***	***	42	***	***	41	***	***	40	***	***	39	***	40	1.2
72	1	***	38	***	***	37	***	***	37	***	***	39	***	***	42	***	***	42	***	***	39	***	***	38	***	39	1.9
72	2	***	41	***	***	41	***	***	40	***	***	44	***	***	47	***	***	47	***	***	43	***	***	42	***	43	2.5
72	3	***	46	***	***	45	***	***	45	***	***	49	***	***	55	***	***	55	***	***	50	***	***	46	***	49	3.6
72	4	***	46	***	***	42	***	***	43	***	***	49	***	***	53	***	***	56	***	***	50	***	***	46	***	48	4.3
72	5	***	53	***	***	56	***	***	53	***	***	60	***	***	67	***	***	69	***	***	65	***	***	57	***	59	6.7
72	6	***	57	***	***	55	***	***	57	***	***	66	***	***	70	***	***	72	***	***	66	***	***	61	***	63	6.1
72	7	***	63	***	***	60	***	***	63	***	***	71	***	***	79	***	***	81	***	***	77	***	***	66	***	70	7.5
72	8	***	66	***	***	66	***	***	61	***	***	70	***	***	79	***	***	83	***	***	77	***	***	66	***	70	8.1
72	9	***	53	***	***	52	***	***	53	***	***	60	***	***	67	***	***	70	***	***	66	***	***	58	***	60	6.2
72	10	***	46	***	***	46	***	***	46	***	***	53	***	***	60	***	***	62	***	***	55	***	***	50	***	52	5.7
72	11	***	46	***	***	46	***	***	45	***	***	46	***	***	52	***	***	52	***	***	49	***	***	47	***	46	2.5
72	12	***	37	***	***	36	***	***	35	***	***	37	***	***	39	***	***	39	***	***	38	***	***	36	***	37	1.6
73	1	***	37	***	***	37	***	***	36	***	***	38	***	***	42	***	***	42	***	***	39	***	***	37	***	39	2.2
73	2	***	41	***	***	46	***	***	39	***	***	43	***	***	48	***	***	51	***	***	45	***	***	43	***	44	4.0
73	3	***	46	***	***	43	***	***	42	***	***	47	***	***	52	***	***	53	***	***	48	***	***	46	***	47	3.8
73	4	***	46	***	***	46	***	***	45	***	***	52	***	***	58	***	***	61	***	***	56	***	***	51	***	52	5.9
73	5	***	53	***	***	56	***	***	53	***	***	61	***	***	67	***	***	69	***	***	66	***	***	57	***	59	6.6
73	6	***	57	***	***	55	***	***	58	***	***	66	***	***	69	***	***	71	***	***	67	***	***	61	***	63	5.5
73	7	***	62	***	***	56	***	***	61	***	***	69	***	***	78	***	***	81	***	***	76	***	***	67	***	69	7.8
73	8	***	59	***	***	56	***	***	57	***	***	66	***	***	72	***	***	76	***	***	71	***	***	63	***	65	7.0
73	9	***	50	***	***	56	***	***	56	***	***	66	***	***	72	***	***	75	***	***	66	***	***	62	***	66	6.7
73	10	***	50	***	***	46	***	***	48	***	***	54	***	***	60	***	***	61	***	***	55	***	***	52	***	54	4.4
73	11	***	42	***	***	42	***	***	42	***	***	44	***	***	47	***	***	46	***	***	44	***	***	43	***	44	1.8
73	12	***	44	***	***	44	***	***	44	***	***	45	***	***	47	***	***	47	***	***	44	***	***	43	***	45	1.4
74	1	***	36	***	***	35	***	***	35	***	***	38	***	***	42	***	***	42	***	***	38	***	***	37	***	38	2.6
74	2	***	41	***	***	40	***	***	40	***	***	42	***	***	45	***	***	46	***	***	44	***	***	42	***	43	2.1
74	3	***	43	***	***	42	***	***	41	***	***	46	***	***	52	***	***	53	***	***	49	***	***	45	***	46	4.2
74	4	***	47	***	***	46	***	***	46	***	***	52	***	***	56	***	***	57	***	***	53	***	***	49	***	51	4.1
74	5	***	50	***	***	49	***	***	50	***	***	56	***	***	61	***	***	62	***	***	58	***	***	53	***	55	4.4
74	6	***	56	***	***	55	***	***	58	***	***	66	***	***	71	***	***	74	***	***	69	***	***	62	***	66	6.6
74	7	***	66	***	***	58	***	***	68	***	***	67	***	***	73	***	***	76	***	***	72	***	***	65	***	66	6.3
74	8	***	62	***	***	59	***	***	60	***	***	67	***	***	75	***	***	79	***	***	74	***	***	66	***	68	7.0
74	9	***	66	***	***	56	***	***	56	***	***	66	***	***	78	***	***	81	***	***	73	***	***	65	***	67	9.0
74	10	***	48	***	***	46	***	***	46	***	***	55	***	***	66	***	***	66	***	***	57	***	***	52	***	56	7.2
74	11	***	45	***	***	45	***	***	45	***	***	46	***	***	53	***	***	52	***	***	48	***	***	47	***	48	2.3
74	12	***	43	***	***	42	***	***	42	***	***	46	***	***	46	***	***	46	***	***	46	***	***	43	***	46	1.5
75	1	***	46	***	***	46	***	***	40	***	***	41	***	***	46	***	***	46	***	***	42	***	***	41	***	42	1.6
75	2	***	38	***	***	38	***	***	38	***	***	41	***	***	45	***	***	46	***	***	42	***	***	40	***	41	3.0
75	3	***	42	***	***	46	***	***	46	***	***	45	***	***	50	***	***	50	***	***	46	***	***	43	***	46	3.6
75	4	***	43	***	***	41	***	***	41	***	***	47	***	***	53	***	***	55	***	***	51	***	***	45	***	47	5.1
75	5	***	51	***	***	48	***	***	51	***	***	58	***	***	66	***	***	66	***	***	62	***	***	55	***	57	6.1
75	6	***	55	***	***	53	***	***	55	***	***	63	***	***	67	***	***	69	***	***	65	***	***	59	***	61	5.6
75	7	***	62	***	***	59	***	***	60	***	***	67	***	***	76	***	***	78	***	***	76	***	***	66	***	68	6.7
75	8	***	59	***	***	57	***	***	58	***	***	66	***	***	71	***	***	73	***	***	68	***	***	62	***	64	5.7
75	9	***	57	***	***	56	***	***	56	***	***	66	***	***	76	***	***	78	***	***	79	***	***	62	***	65	8.9
75	10	***	56	***	***	56	***	***	58	***	***	56	***	***	58	***	***	57	***	***	53	***	***	52	***	53	3.0
75	11	***	44	***	***	43	***	***	43	***	***	46	***	***	49	***	***	48	***	***	45	***	***	45	***	46	2.2
75	12	***	42	***	***	43	***	***	46	***	***	43	***	***	46	***	***	45	***	***	42	***	***	41	***	43	1.9
76	1	***	43	***	***	46	***	***	39	***	***	41	***	***	45	***	***	45	***	***	43	***	***	42	***	42	2.1
76	2	***	39	***	***	38	***	***	38	***	***	42	***	***	47	***	***	47	***	***	42	***	***	40	***	42	3.6
76	3	***	41	***	***	39	***	***	39	***	***	46	***	***	49	***	***	50	***	***	46	***	***	43	***	46	4.0
76	4	***	46	***	***	46	***	***	45	***	***	51	***	***	56	***	***	58	***	***	53	***	***	49	***	50	4.6
76	5	***	51	***	***	48	***	***	51	***	***	57	***	***	62	***	***	66	***	***	61	***	***	56	***	56	5.3
76	6	***	56	***	***	52	***	***	56	***	***	61	***	***	66	***	***	68	***	***	65	***	***	58	***	60	5.6
76	7	***	60	***	***	57	***	***	59	***	***	66	***	***	73	***	***	77	***	***	72	***	***	65	***	66	6.4
76	8	***	60	***	***	59	***	***	58	***	***	66	***	***	70	***	***	72	***	***	66	***	***	63	***	66	4.9
76	9	***	56	***	***	56	***	***	56	***	***	66	***	***	70	***	***	73	***	***	67	***	***	62	***	63	6.0
76	10	***	49	***	***	49	***	***	48	***	***	56	***	***	61	***	***	63	***	***	56	***	***	52	***	56	5.3
76	11	***	43	***	***	42	***	***	42	***	***	47	***	***	53	***	***	53	***	***	48	***	***	45	***	47	4.2
76	12	***	38	***	***	37	***	***	36	***	***	38	***	***	43	***	***	43	***	***	40	***	***	39	***	39	2.4
77	1	***	33	***	***	33	***	***	33	***	***	35	***	***	41	***	***	41	***	***	36	***	***	36	***	35	3.7
77	2	***	41	***	***	40	***	***	40	***	***	46	***	***	50	***	***	51	***	***	46	***	***	43	***	46	4.3
77	3	***	42	***	***	43	***	***	40	***	***	46	***	***	50	***	***	51	***	***	47	***	***	46	***	45	4.3
77	4	***	47	***	***	46	***	***	45	***	***	53	***	***	61	***	***	63	***	***	56	***	***	51	***	53	6.4
77	5	***	46	***	***	47	***	***	48	***	***	55	***	***	59	***	***	59	***	***	56	***	***	51	***	55	4.6
77	6	***	57	***	***	56	***	***	57	***	***	63	***	***	70	***	***	74	***	***	70	***	***	61	***	63	6.9
77	7	***	66	***	***	57	***	***	56	***	***	60	***	***	73	***	***	75	***	***	71	***	***	66	***	66	6.6
77	8	***	66	***	***	61	***	***	63	***	***	70	***	***	78	***	***	81	***	***	76	***	***	69	***	70	7.3
77	9	***	56	***	***	56	***	***	55	***	***	60	***	***	66	***	***	66	***	***	62	***	***	58	***	60	4.6
77	10	***	49	***	***	46	***	***	47	***	***	55	***	***	61	***	***	61	***	***	55	***	***	51	***	53	5.2
77	11	***	41	***	***	41	***	***	42	***	***	46	***	***	47	***	***	46	***	***	44	***	***	42	***	43	2.1
77	12	***	43	***	***	42	***	***	41	***	***	43	***	***	45	***	***	46	***	***	42	***	***	41	***	42	1.6
78	1	***	39	***	***	37	***	***	39	***	***	40	***	***	43	***	***	43	***	***	40	***	***	39	***	40	1.6
78	2	***	42	***	***	42	***	***	42	***	***	44	***	***	46	***	***	46	***	***	46	***	***	43	***	45	2.6
78	3	***	46	***	***	43	***	***	43	***	***	46	***	***	50	***	***	50	***	***	46	***	***	45	***	46	3.7
78	4	***	44	***	***	43	***	***	45	***	***	51	***	***	56	***	***	56	***	***	52	***	***	48	***	50	4.3
78	5	***	49	***	***	47	***	***	50	***	***	57	***	***	62	***	***	63	***	***	59	***	***	53	***	55	5.7
78	6	***	59	***	***	56	***	***	59	***	***	63	***	***	71	***	***	74	***	***	70	***	***	63	***	65	6.1
78	7	***	61	***	***	55	***	***	66	***	***	67	***	***	74	***	***	78	***	***	74	***	***	66	***	67	6.8
78	8	***	61	***	***	56	***	***	66	***	***	67	***	***	74	***	***	76	***	***	71	***	***	65	***	67	6.1
78	9	***	56	***	***	55	***	***	56	***	***	60	***	***	66	***	***	67	***	***	61	***	***	56	***	60	4.3
78	10	***	45	***	***	46	***	***	47	***	***	56	***	***	61	***	***	56	***	***	58	***	***	53	***	55	6.2
78	11	***	37	***	***	36	***	***	35	***	***	36	***	***	45	***	***	41	***	***	40	***	***	39	***	40	3.5
78	12	***	35	***	***	34	***	***	33	***	***	36	***	***	39	***	***	38	***	***	36	***	***	35	***	36	1.9
AVE		***	46	***	***	47	***	***	48	***	***	53	***	***	59	***	***	60	***	***	56	***	***	51	***		
ST DEV		.3	8.1	.0	.3	7.3	.3	.3	8.6	.3	.3	10.1	.3	.3	11.7	.3	.3	12.9	.3	.3	12.0	.3	.3	9.6	.3		

25TH, 50TH, 75TH, 95TH PERCENTILES, MAXIMUM AND MISSING

43 51 61 74 83 1726

Table 2.15(b)

Two way tables of monthly averages of hourly temperature readings--Eugene

YR	MO	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVG	DEV
71	1	---	38	---	---	36	---	---	38	---	---	39	---	---	42	---	---	43	---	---	40	---	---	39	---	40	1.8
71	2	---	39	---	---	38	---	---	38	---	---	41	---	---	45	---	---	46	---	---	41	---	---	39	---	41	2.9
71	3	---	39	---	---	36	---	---	38	---	---	43	---	---	46	---	---	49	---	---	46	---	---	41	---	43	4.0
71	4	---	44	---	---	41	---	---	42	---	---	39	---	---	55	---	---	56	---	---	50	---	---	45	---	46	5.6
71	5	---	46	---	---	44	---	---	40	---	---	56	---	---	62	---	---	63	---	---	57	---	---	50	---	54	6.1
71	6	---	49	---	---	44	---	---	53	---	---	60	---	---	66	---	---	67	---	---	61	---	---	52	---	57	7.0
71	7	---	56	---	---	53	---	---	58	---	---	64	---	---	77	---	---	81	---	---	74	---	---	61	---	66	9.8
71	8	---	56	---	---	55	---	---	59	---	---	69	---	---	78	---	---	81	---	---	72	---	---	62	---	67	9.1
71	9	---	53	---	---	46	---	---	50	---	---	62	---	---	70	---	---	71	---	---	60	---	---	56	---	58	8.6
71	10	---	46	---	---	42	---	---	42	---	---	51	---	---	57	---	---	58	---	---	50	---	---	46	---	49	5.9
71	11	---	43	---	---	41	---	---	43	---	---	44	---	---	43	---	---	46	---	---	43	---	---	41	---	44	3.1
71	12	---	37	---	---	37	---	---	37	---	---	39	---	---	42	---	---	42	---	---	39	---	---	38	---	39	2.0
72	1	---	36	---	---	36	---	---	35	---	---	38	---	---	42	---	---	42	---	---	37	---	---	36	---	38	2.0
72	2	---	40	---	---	40	---	---	39	---	---	45	---	---	48	---	---	49	---	---	43	---	---	42	---	43	3.5
72	3	---	46	---	---	43	---	---	43	---	---	48	---	---	54	---	---	56	---	---	49	---	---	46	---	46	4.6
72	4	---	41	---	---	39	---	---	41	---	---	40	---	---	53	---	---	54	---	---	46	---	---	45	---	46	5.6
72	5	---	46	---	---	46	---	---	51	---	---	59	---	---	66	---	---	64	---	---	61	---	---	53	---	57	7.6
72	6	---	52	---	---	48	---	---	55	---	---	64	---	---	73	---	---	72	---	---	67	---	---	57	---	61	8.1
72	7	---	56	---	---	56	---	---	66	---	---	70	---	---	68	---	---	84	---	---	77	---	---	66	---	66	10.4
72	8	---	58	---	---	55	---	---	58	---	---	70	---	---	60	---	---	84	---	---	74	---	---	63	---	68	10.2
72	9	---	56	---	---	48	---	---	49	---	---	61	---	---	69	---	---	71	---	---	61	---	---	56	---	58	8.0
72	10	---	46	---	---	43	---	---	42	---	---	51	---	---	57	---	---	61	---	---	52	---	---	47	---	50	6.8
72	11	---	45	---	---	44	---	---	44	---	---	47	---	---	51	---	---	51	---	---	47	---	---	45	---	47	2.7
72	12	---	35	---	---	32	---	---	32	---	---	35	---	---	39	---	---	39	---	---	35	---	---	33	---	35	2.7
73	1	---	36	---	---	35	---	---	35	---	---	37	---	---	42	---	---	42	---	---	38	---	---	37	---	38	2.6
73	2	---	40	---	---	36	---	---	37	---	---	42	---	---	49	---	---	52	---	---	46	---	---	43	---	43	4.9
73	3	---	41	---	---	40	---	---	39	---	---	45	---	---	50	---	---	51	---	---	46	---	---	43	---	44	4.2
73	4	---	43	---	---	41	---	---	42	---	---	51	---	---	58	---	---	60	---	---	53	---	---	46	---	48	6.9
73	5	---	46	---	---	45	---	---	50	---	---	59	---	---	66	---	---	64	---	---	61	---	---	51	---	56	8.1
73	6	---	53	---	---	51	---	---	56	---	---	66	---	---	71	---	---	73	---	---	66	---	---	56	---	61	7.8
73	7	---	56	---	---	55	---	---	59	---	---	70	---	---	60	---	---	83	---	---	76	---	---	61	---	67	10.3
73	8	---	56	---	---	51	---	---	55	---	---	66	---	---	76	---	---	78	---	---	70	---	---	58	---	63	9.5
73	9	---	55	---	---	53	---	---	53	---	---	64	---	---	71	---	---	73	---	---	66	---	---	58	---	61	7.4
73	10	---	47	---	---	46	---	---	45	---	---	55	---	---	61	---	---	62	---	---	55	---	---	46	---	52	6.2
73	11	---	43	---	---	43	---	---	42	---	---	[illegible]	---	---	47	---	---	47	---	---	46	---	---	43	---	46	1.6
73	12	---	43	---	---	42	---	---	43	---	---	[illegible]	---	---	47	---	---	46	---	---	46	---	---	43	---	46	1.6
74	1	---	37	---	---	36	---	---	35	---	---	39	---	---	45	---	---	45	---	---	40	---	---	38	---	39	3.6
74	2	---	41	---	---	40	---	---	39	---	---	43	---	---	47	---	---	46	---	---	46	---	---	42	---	43	3.0
74	3	---	45	---	---	46	---	---	43	---	---	49	---	---	56	---	---	56	---	---	50	---	---	47	---	49	4.6
74	4	---	47	---	---	45	---	---	47	---	---	52	---	---	58	---	---	60	---	---	53	---	---	49	---	51	5.2
74	5	---	48	---	---	47	---	---	51	---	---	58	---	---	63	---	---	65	---	---	59	---	---	52	---	56	6.2
74	6	---	55	---	---	53	---	---	58	---	---	66	---	---	73	---	---	75	---	---	70	---	---	59	---	64	7.4
74	7	---	59	---	---	56	---	---	60	---	---	69	---	---	77	---	---	79	---	---	74	---	---	63	---	67	8.3
74	8	---	59	---	---	56	---	---	60	---	---	70	---	---	78	---	---	82	---	---	75	---	---	66	---	66	9.0
74	9	---	57	---	---	55	---	---	53	---	---	69	---	---	68	---	---	66	---	---	70	---	---	62	---	60	11.1
74	10	---	47	---	---	46	---	---	46	---	---	56	---	---	66	---	---	64	---	---	56	---	---	50	---	54	6.8
74	11	---	46	---	---	45	---	---	45	---	---	49	---	---	54	---	---	54	---	---	50	---	---	47	---	48	3.5
74	12	---	46	---	---	46	---	---	46	---	---	45	---	---	49	---	---	48	---	---	45	---	---	46	---	46	2.1
75	1	---	46	---	---	46	---	---	43	---	---	45	---	---	49	---	---	49	---	---	46	---	---	45	---	46	2.1
75	2	---	40	---	---	40	---	---	39	---	---	43	---	---	46	---	---	49	---	---	45	---	---	42	---	43	3.5
75	3	---	41	---	---	40	---	---	39	---	---	45	---	---	50	---	---	51	---	---	46	---	---	42	---	44	4.2
75	4	---	40	---	---	39	---	---	41	---	---	46	---	---	53	---	---	56	---	---	48	---	---	43	---	46	5.5
75	5	---	46	---	---	45	---	---	50	---	---	58	---	---	64	---	---	67	---	---	60	---	---	52	---	56	7.4
75	6	---	53	---	---	51	---	---	55	---	---	64	---	---	70	---	---	72	---	---	67	---	---	56	---	61	7.7
75	7	---	59	---	---	57	---	---	60	---	---	69	---	---	78	---	---	81	---	---	75	---	---	64	---	66	8.7
75	8	---	56	---	---	55	---	---	58	---	---	67	---	---	76	---	---	76	---	---	70	---	---	61	---	65	7.7
75	9	---	56	---	---	53	---	---	53	---	---	60	---	---	77	---	---	82	---	---	69	---	---	60	---	65	10.3
75	10	---	52	---	---	51	---	---	51	---	---	53	---	---	60	---	---	60	---	---	55	---	---	53	---	55	3.6
75	11	---	43	---	---	41	---	---	42	---	---	47	---	---	52	---	---	52	---	---	46	---	---	46	---	46	1.7
75	12	---	42	---	---	41	---	---	40	---	---	43	---	---	47	---	---	46	---	---	43	---	---	42	---	43	2.2
76	1	---	40	---	---	39	---	---	38	---	---	41	---	---	46	---	---	48	---	---	43	---	---	41	---	42	3.2
76	2	---	38	---	---	37	---	---	37	---	---	42	---	---	47	---	---	49	---	---	42	---	---	39	---	41	4.3
76	3	---	40	---	---	38	---	---	38	---	---	44	---	---	50	---	---	52	---	---	45	---	---	41	---	44	4.9
76	4	---	43	---	---	42	---	---	43	---	---	51	---	---	56	---	---	57	---	---	52	---	---	46	---	49	5.7
76	5	---	46	---	---	45	---	---	50	---	---	58	---	---	65	---	---	66	---	---	59	---	---	50	---	55	7.7
76	6	---	48	---	---	46	---	---	54	---	---	62	---	---	69	---	---	70	---	---	66	---	---	53	---	58	6.7
76	7	---	57	---	---	56	---	---	60	---	---	69	---	---	79	---	---	82	---	---	74	---	---	62	---	67	9.4
76	8	---	59	---	---	56	---	---	58	---	---	67	---	---	75	---	---	77	---	---	70	---	---	62	---	66	7.5
76	9	---	56	---	---	56	---	---	55	---	---	65	---	---	76	---	---	76	---	---	66	---	---	59	---	63	8.8
76	10	---	46	---	---	46	---	---	45	---	---	56	---	---	64	---	---	67	---	---	55	---	---	48	---	53	8.2
76	11	---	45	---	---	44	---	---	43	---	---	47	---	---	53	---	---	53	---	---	47	---	---	45	---	47	3.6
76	12	---	35	---	---	35	---	---	36	---	---	37	---	---	42	---	---	43	---	---	38	---	---	36	---	36	3.1
77	1	---	35	---	---	34	---	---	32	---	---	37	---	---	43	---	---	46	---	---	38	---	---	35	---	36	3.6
77	2	---	39	---	---	39	---	---	39	---	---	40	---	---	50	---	---	53	---	---	45	---	---	42	---	44	5.0
77	3	---	40	---	---	38	---	---	38	---	---	45	---	---	52	---	---	53	---	---	47	---	---	42	---	44	5.5
77	4	---	44	---	---	43	---	---	43	---	---	54	---	---	60	---	---	63	---	---	55	---	---	47	---	51	7.7
77	5	---	45	---	---	45	---	---	47	---	---	55	---	---	60	---	---	61	---	---	53	---	---	48	---	52	6.4
77	6	---	51	---	---	48	---	---	55	---	---	63	---	---	71	---	---	75	---	---	68	---	---	56	---	61	9.1
77	7	---	56	---	---	52	---	---	57	---	---	67	---	---	76	---	---	79	---	---	72	---	---	59	---	65	9.7
77	8	---	61	---	---	57	---	---	61	---	---	71	---	---	80	---	---	84	---	---	75	---	---	64	---	69	9.2
77	9	---	53	---	---	51	---	---	52	---	---	62	---	---	67	---	---	69	---	---	61	---	---	56	---	59	8.3
77	10	---	48	---	---	46	---	---	46	---	---	53	---	---	60	---	---	62	---	---	52	---	---	48	---	52	6.0
77	11	---	42	---	---	41	---	---	40	---	---	45	---	---	49	---	---	46	---	---	46	---	---	43	---	44	3.0
77	12	---	42	---	---	41	---	---	41	---	---	43	---	---	47	---	---	46	---	---	43	---	---	42	---	43	2.1
78	1	---	42	---	---	41	---	---	40	---	---	42	---	---	45	---	---	46	---	---	43	---	---	43	---	43	1.9
78	2	---	42	---	---	41	---	---	41	---	---	46	---	---	48	---	---	49	---	---	45	---	---	42	---	44	2.9
78	3	---	42	---	---	41	---	---	40	---	---	48	---	---	50	---	---	58	---	---	50	---	---	45	---	46	6.6
78	4	---	43	---	---	41	---	---	43	---	---	50	---	---	56	---	---	56	---	---	48	---	---	45	---	48	5.1
78	5	---	43	---	---	43	---	---	46	---	---	57	---	---	62	---	---	63	---	---	56	---	---	46	---	53	7.2
78	6	---	54	---	---	54	---	---	57	---	---	63	---	---	72	---	---	74	---	---	67	---	---	57	---	62	7.8
78	7	---	57	---	---	53	---	---	59	---	---	69	---	---	77	---	---	81	---	---	75	---	---	61	---	67	9.7
78	8	---	54	---	---	55	---	---	58	---	---	66	---	---	76	---	---	79	---	---	71	---	---	61	---	66	8.5
78	9	---	53	---	---	52	---	---	52	---	---	62	---	---	67	---	---	66	---	---	60	---	---	55	---	59	6.2
78	10	---	46	---	---	46	---	---	43	---	---	56	---	---	66	---	---	65	---	---	56	---	---	48	---	52	8.0
AVG		---	47	---	---	43	---	---	47	---	---	56	---	---	60	---	---	62	---	---	55	---	---	48	---		
ST DEV		.0	7.1	.0	.0	6.3	.0	.0	6.8	.0	.0	10.3	.0	.0	12.0	.0	.0	13.3	.0	.0	11.6	.0	.0	8.3	.0		

25TH, 50TH, 75TH, 95TH PERCENTILES, MAXIMUM AND MISSING

43 50 59 75 86 1506

Table 3.1

Root mean square errors $\hat{\sigma}$ for the diurnal models fitted to Eugene CO averages

		M1	M2	M3	M4	M5	M6
Spring	WD	.770	.287	.208	.199	.211	.185
	WE	.401	.360	.182	.185	.324	.268
Summer	WD	1.019	.219	.164	.148	.230	.257
	WE	.433	.204	.095	.088	.115	.154
Fall	WD	1.430	.663	.485	.514	.454	.420
	WE	.617	.519	.300	.331	.418	.350
Winter	WD	1.730	.697	.211	.234	.606	.574
	WE	.682	.400	.197	.218	.366	.366

Table 3.2

Diurnal model--Eugene, summer 1978 (weekdays)

	$\hat{\alpha}$	$\hat{k}$	$\hat{\delta}$	$\hat{\sigma}$
α	2.43 (.21)			1.019
$\alpha + kTR$	1.05 (.08)	1.93 (.09)		.219
$\alpha + kTR/WS^{\delta}$	.83 (.08)	6.62 (1.58)	.55 (.11)	.164
$(\alpha + kTR)/WS^{\delta}$	1.63 (.15)	6.45 (1.30)	.49 (.08)	.148
$\alpha + kTR \cdot RH$	.76 (.09)	.041 (.002)		.230
$(\alpha + kTR)RH$	.0081 (.0012)	.047 (.002)		.257

Table 3.3

Diurnal model--Eugene, summer 1978 (weekends)

	$\hat{\alpha}$	$\hat{k}$	$\hat{\delta}$	$\hat{\sigma}$
α	1.76 (.09)			.433
$\alpha + kTR$	1.08 (.09)	1.51 (.17)		.204
$\alpha + kTR/WS^{\delta}$	.80 (.05)	9.56 (1.36)	.79 (.06)	.095
$(\alpha + kTR)/WS^{\delta}$	1.73 (.10)	6.65 (.82)	.53 (.05)	.088
$\alpha + kTR \cdot RH$	.83 (.06)	.034 (.002)		.115
$(\alpha + kTR)RH$	.0086 (.0008)	.044 (.002)		.154

Table 4.1

CAMS: estimation results for the model

$$CO_t = k_s e^{\beta t}(1 + \theta I/M_t^d)(1 + \alpha_1 IND_{t1} + \alpha_2 IND_{t2})G_t + n_t$$

$$n_t = \phi_1 n_{t-1} + \phi_2 n_{t-2} + \phi_3 n_{t-3} + \varepsilon_t.$$

IND_{1t} = 1 for t ≥ 1978/3 and 0 otherwise;

IND_{2t} = 1 for 1976/1 ≤ t ≤ 1976/12 and 0 otherwise.

Model	G_t	β	θ	α_1	α_2	$\hat{\sigma}$
C1:	1					.629
C2:	1			-.256 (.101)	-.189 (.110)	.617
C3:	1	-.00271 (.00116)	-.00103 (.00052)			.588
C4:	1	-.00287 (.00123)	-.000505 (.000775)	-.060 (.092)	-.086 (.080)	.591
C5:	TR_t	-.00372 (.00115)	-.00116 (.00050)			.585
C6:	TR_t	-.00387 (.00126)	-.000655 (.000743)	-.055 (.090)	-.086 (.080)	.588
C7:	$TR_t RH_t$	-.00409 (.00105)	-.00106 (.00046)			.504
C8:	$TR_t RH_t$	-.00425 (.00115)	-.000540 (.000676)	-.060 (.079)	-.084 (.069)	.505

Table 4.2

CAMS: detailed estimation results for model C7

$$CO_t = k_s e^{\beta t}(1 + \theta I/M_t^d)TR_t RH_t + n_t;\ n_t = \phi_1 n_{t-1} + \phi_2 n_{t-2} + \phi_3 n_{t-3} + \varepsilon_t$$

$k_s \times 10^{-4}$		β	θ	ϕ	
1.06	(.07)	-.00409	-.00106	.19	(.10)
.96	(.07)	(.00105)	(.00046)	.25	(.10)
.84	(.06)			.29	(.10)
.74	(.06)	-4.8%	-12%		
.62	(.06)	(±1.2)	(±5.2)		
.62	(.06)				
.52	(.06)				
.60	(.06)				
.81	(.06)				
.93	(.06)				
1.04	(.07)				
1.04	(.07)				

Table 4.3

CAMS: detailed estimation results for model C8

$$CO_t = k_s e^{\beta t}(1 + \theta I/M_t^d)(1 + \alpha_1 IND_{t1} + \alpha_2 IND_{t2})TR_t RH_t + n_t;$$

$$n_t = \phi_1 n_{t-1} + \phi_2 n_{t-2} + \phi_3 n_{t-3} + \varepsilon_t.$$

$k_s \times 10^{-4}$		β	θ	α_1	α_1	ϕ	
1.07	(.07)	-.00425	-.000540	-.060	-.084	.15	(.10)
.96	(.07)	(.00115)	(.000677)	(.079)	(.069)	.26	(.10)
.84	(.06)					.31	(.10)
.74	(.06)	-5.0%	-6.1%				
.62	(.06)	(±1.4)	(±7.7)				
.62	(.06)						
.52	(.06)						
.61	(.06)						
.81	(.06)						
.93	(.06)						
1.05	(.07)						
1.05	(.07)						

Table 4.4

Additional percentage benefit for fleet attributable to the I/M program; comparison of EPA estimates and models C7 and C8

Year	$\overline{I/M}^d$ (1000)	Additional benefit attributable to I/M EPA	Model C7	Model C8
1975	32.5	0.4	3.5	1.8
1976	145.8	8.3	15.5	7.9
1977	68.8	14.4	7.3	3.7
1978	143.7	16.8	15.2	7.8
1979	91.9	19.6	9.7	5.0

Table 4.5

CAMS estimation results for model (4.11)

$$CO_t = k_s(1 + \beta t + \theta I/M_t^d + \alpha_1 IND_{t1} + \alpha_2 IND_{t2})TR_t RH_t + n_t;$$

$$n_t = \phi_1 n_{t-1} + \phi_2 n_{t-2} + \phi_3 n_{t-3} + \varepsilon_t$$

β	θ	α_1	α_2	$\hat{\sigma}$
-.00313 (.00065)	-.000749 (.000374)			.505
-4.6% (±1.0)	-10.4% (±5.2)			
-.00332 (.00070)	-.000361 (.000477)	-.026 (.053)	-.059 (.048)	.506
-5.0% (±1.0)	-5.1% (±6.7)			

Table 4.6

Eugene model fits

$CO_t = k_s e^{\beta t}(1 + \theta I/M_t^d)(1 + \alpha IND_t)TR_t RH_t + n_t$, where

$n_t = \phi_1 n_{t-1} + \phi_2 n_{t-2} + \phi_3 n_{t-3} + \varepsilon_t$;

$IND_t = 1$ for $t \geq 75/9$ and 0 otherwise.

Model	β	θ	α	$\hat{\sigma}$
E1	-.00201 (.00160)			.631
E2	-.00320 (.00255)	.000843 (.001327)		.633
E3	-.00465 (.00290)		.206 (.198)	.629
E4	-.00487 (.00334)	.000330 (.001385)	.194 (.220)	.634

Table 4.7

Hollywood model fits

$$CO_t = k_s e^{\beta t}(1 + \theta I/M_t^d)(1 + \alpha IND_t)G_t + n_t, \text{ where}$$

$$n_t = \phi_1 n_{t-1} + \phi_2 n_{t-2} + \phi_3 n_{t-3} + \varepsilon_t;$$

$$IND_t = 1 \text{ for } t \geq 75/10 \text{ and } 0 \text{ otherwise.}$$

Model	G_t	β	θ	α	$\hat{\sigma}$
H1	1	-.00422 (.00194)			.574
H2		-.00446 (.00236)	.000149 (.000801)		.578
H3		-.00423 (.00278)	.000288 (.000849)	-.028 (.117)	.582
H4	TR_t	-.00642 (.00174)			.571
H5		-.00653 (.00209)	.000013 (.000710)		.575
H6		-.00604 (.00255)	.000037 (.000731)	-.028 (.111)	.579
H7	$TR_t RH_t$	-.00716 (.00181)			.577
H8		-.00709 (.00221)	-.000100 (.000760)		.582
H9		-.00602 (.00258)	.000114 (.000810)	-.080 (.111)	.584

Table 4.8

CO model fits at Alder and Lloyd

$$CO_t = k_s e^{\beta t}(1 + \theta I/M_t^d)TR_t RH_t + n_t;$$

$$n_t = \phi_1 n_{t-1} + \phi_2 n_{t-2} + \phi_3 n_{t-3} + \varepsilon_t.$$

	β	θ	$\hat{\sigma}$
Alder:	-.0136 (.0051)		.538
	-.0122 (.0046)	.00055 (.00124)	.542
Lloyd:	-.0110 (.0059)		.633
	-.0110 (.0061)	-.00026 (.00178)	.641

Table 5.1(a)

Estimates in regression model (5.4)--summer

The CO observations are in 10 $\mu g/m^3$

		μ	72	73	74	75	76	77	78	79	WS^{-1}	WS^{-2}	cos	sin	T	RH	PR	standard errors obs	standard errors model
CAMS	am	74.5	4.4	6.3	-5.0	-17.9	-13.4	-14.7	-20.0	-17.4	172	-132	-1.3	-5.6	-.67	.02	19.0	24.6	18.9
		(15.5)	(3.1)	(3.1)	(3.1)	(3.1)	(4.1)	(3.4)	(3.2)	(3.1)	(18)	(20)	(1.1)	(1.1)	(1.7)	(.10)	(2.5)		
	pm	29.8	-5.2	2.4	-21.2	-20.7	-44.7	-28.4	-42.0	-31.8	823	-1852	-8.6	-4.9	-.34	.83	39.5	49.2	33.5
		(23.8)	(5.4)	(5.3)	(5.3)	(5.4)	(7.8)	(5.9)	(5.6)	(5.5)	(94)	(386)	(2.0)	(2.0)	(.24)	(.17)	(5.3)		
Eugene	am	12.2	7.3	4.1	-5.0	24.3	-1.2	0.9	-1.9	-3.2	33	-25	0.2	0.5	.22	-.07	0.6	11.4	10.5
		(8.8)	(1.6)	(1.7)	(1.9)	(3.7)	(1.6)	(1.9)	(1.6)	(1.7)	(9)	(7)	(0.6)	(0.6)	(.10)	(.05)	(1.7)		
	pm	5.4	21.0	11.1	0.2	21.6	5.3	16.9	11.0	9.9	21	-10	0.7	0.4	.18	.09	1.5	12.4	10.2
		(7.4)	(1.6)	(1.6)	(1.8)	(3.4)	(1.5)	(1.8)	(1.6)	(1.6)	(9)	(9)	(0.6)	(0.6)	(.08)	(.05)	(1.9)		
Hollywood	am	36.3			-2.7	-13.4	-16.9	-18.3	-11.5	-15.8	78	-62	0.9	1.0	-.45	.38	5.4	18.8	16.8
		(16.5)			(3.2)	(3.1)	(3.1)	(3.1)	(3.2)	(3.2)	(14)	(13)	(1.1)	(1.0)	(.18)	(.10)	(2.5)		
	pm	56.0			-17.6	-23.6	-29.3	-25.5	-28.0	-38.0	167	-133	1.5	0.1	-.20	.16	6.2	23.4	18.5
		(15.6)			(3.5)	(3.3)	(3.3)	(3.4)	(3.4)	(3.4)	(17)	(17)	(1.1)	(1.2)	(.16)	(.10)	(3.3)		
Alder	am	-27.0						1.2	-2.8	-7.5	-3	1	-1.2	1.1	.67	.28	-12.0	11.9	10.8
		(15.3)						(2.7)	(2.6)	(2.6)	(18)	(19)	(1.1)	(1.1)	(.17)	(.10)	(2.4)		
	pm	-38.6						-17.9	-26.2	-18.3	-193	594	-0.8	-1.7	1.19	.69	-12.2	17.4	14.3
		(18.0)						(3.5)	(3.4)	(3.4)	(79)	(365)	(1.4)	(1.4)	(.18)	(.13)	(3.8)		
Lloyd	am	-27.8						1.3	-8.3	-5.2	32	-24	-0.6	-0.2	.36	.31	-4.8	9.2	8.0
		(10.1)						(1.3)	(1.3)	(1.4)	(8)	(8)	(0.7)	(0.6)	(.11)	(.06)	(1.5)		
	pm	-21.0						-4.9	-14.5	-19.9	44	-31	0.5	0.0	.84	.26	0.7	18.9	17.3
		(18.2)						(2.8)	(2.7)	(2.9)	(19)	(18)	(1.4)	(1.4)	(.18)	(.12)	(3.9)		

Note: Wind speed and wind direction at CAMS and Alder from Hughes/Federal Buildings

Table 5.1(b)

Estimates in regression model (5.4)--winter

The CO observations are in 10 μg/m^3

		μ	72/3	73/4	74/5	75/6	76/7	77/8	78/9	WS^{-1}	WS^{-2}	cos	sin	T	RH	PR	standard errors obs	standard errors model
		22.3	-13.0	-11.7	-30.9	-31.1	-28.8	-24.2	-32.4	156	-126	1.7	1.8	.79	.16	1.5		
CAMS	am	(7.3)	(3.5)	(3.5)	(3.7)	(3.5)	(4.1)	(3.7)	(3.7)	(20)	(21)	(1.3)	(1.4)	(.13)	(.08)	(2.1)	27.2	22.3
		18.1	-5.5	-33.2	-44.3	-73.9	-58.3	-47.7	-55.9	193	-156	-0.7	-3.2	1.48	.84	15.8		
	pm	(15.5)	(7.6)	(7.6)	(7.8)	(7.6)	(8.7)	(7.9)	(7.7)	(50)	(56)	(2.9)	(2.9)	(.27)	(.17)	(4.7)	58.5	47.9
		21.1	0.5	-2.3	-5.8	-3.3	3.6	-9.5	-6.9	76	-59	-0.6	-2.7	-.21	-.15	-3.9		
Eugene	am	(7.4)	(2.4)	(2.8)	(2.8)	(2.3)	(2.4)	(2.5)	(3.1)	(13)	(12)	(0.9)	(0.9)	(.10)	(.09)	(1.5)	16.8	14.3
		1.2	10.1	2.9	-10.4	4.1	18.1	15.4	6.9	151	-118	-0.2	1.2	.28	.24	-9.1		
	pm	(10.1)	(3.6)	(4.1)	(4.2)	(3.5)	(3.6)	(3.6)	(4.6)	(16)	(15)	(1.4)	(1.4)	(.14)	(.11)	(2.4)	26.8	21.6
		11.1			1.3	-16.3	-9.4	-3.5	-15.6	107	-76	-5.2	-0.9	-.80	.51	-6.7		
Hollywood	am	(11.7)			(4.5)	(4.6)	(4.8)	(4.5)	(4.7)	(25)	(25)	(1.9)	(1.9)	(.20)	(.13)	(3.2)	31.0	27.6
		54.8			11.6	-19.5	-3.4	0.8	-23.4	161	-116	-10.0	-5.3	-.19	.42	1.1		
	pm	(16.5)			(6.6)	(6.7)	(7.1)	(6.6)	(6.9)	(33)	(33)	(2.9)	(2.7)	(.29)	(.17)	(5.0)	45.5	41.3
		-16.9					9.9	4.4	1.6	62	-63	-0.5	1.9	-.12	.62	-7.2		
Alder	am	(8.9)					(3.2)	(2.8)	(3.1)	(22)	(24)	(1.5)	(1.5)	(.15)	(.09)	(2.4)	19.4	16.3
		-25.3					23.2	-3.3	9.4	250	-277	-0.6	-6.2	-.01	1.09	-19.2		
	pm	(16.6)					(5.9)	(5.2)	(5.7)	(55)	(66)	(2.8)	(2.8)	(.28)	(.16)	(4.6)	38.8	30.9
		-1.6					8.4	2.1	-1.7	72	-51	-1.0	-0.3	-.37	.32	-2.5		
Lloyd	am	(6.6)					(2.3)	(2.2)	(2.3)	(14)	(14)	(1.1)	(1.1)	(.11)	(.07)	(1.9)	16.8	12.8
		48.1					16.3	4.7	-8.0	240	-188	-4.7	-2.5	-1.36	.68	-16.3		
	pm	(18.1)					(5.9)	(5.8)	(6.2)	(33)	(32)	(3.0)	(2.8)	(.30)	(.17)	(5.4)	44.1	34.8

Note: Wind speed and wind direction at CAMS and Alder from Hughes/Federal Buildings

Table 5.2(a)

Estimates in regression model (5.6)--summer

The CO observations are in 10 $\mu g/m^3$

	Const	TR	$I_t \cdot TR$	I/M·TR	IND	WS^{-1}	WS^{-2}	cos	sin	Temp	RH	Prec	Obs	Model
CAMS am	-97.7 (52.0)	1.74 (.53)	-.036 (.007)	-.0011 (.0003)	10.5 (5.1)	181 (18)	-141 (20)	-0.7 (1.1)	-5.4 (1.1)	-.55 (.17)	.06 (.10)	18.8 (2.5)	24.4	19.1
CAMS pm	-170.8 (92.5)	2.14 (.95)	-.055 (.012)	-.0016 (.0006)	-3.5 (9.4)	676 (73)	-1035 (219)	-8.3 (2.0)	-3.4 (1.9)	-.33 (.24)	.89 (.17)	35.1 (5.3)	49.3	34.1
CAMS am	-42.3 (44.8)	1.20 (.47)	-.035 (.007)	-.0006 (.0002)		181 (18)	-142 (21)	-0.7 (1.1)	-5.3 (1.1)	-.58 (.17)	.05 (.10)	18.3 (2.5)	24.4	19.1
CAMS pm	-187.7 (80.4)	2.35 (.83)	-.054 (.011)	-.0017 (.0004)		665 (73)	-1003 (217)	-8.3 (2.0)	-3.7 (1.9)	-.35 (.24)	.87 (.17)	35.7 (5.2)	49.0	33.8
Eugene am	80.7 (22.1)	-2.40 (.83)	-.064 (.021)		9.2 (3.9)	28 (8)	-21 (7)	0.3 (0.6)	0.5 (0.6)	.14 (.10)	-.08 (.05)	0.7 (1.7)	11.1	10.7
Eugene pm	169.2 (23.0)	-6.38 (.88)	-.055 (.022)		19.2 (4.0)	11 (11)	3 (12)	0.2 (0.6)	0.4 (0.7)	.15 (.08)	.11 (.05)	1.4 (2.2)	12.1	11.4

IND: CAMS 1 if 1976 Eugene 1 ≥ Aug. 1975

0 otherwise 0 otherwise

Table 5.2(b)

Estimates in regression model (5.6)--winter

The CO observations are in 10 $\mu g/m^3$

	Const	TR	$I_t \cdot TR$	I/M·TR	IND	WS^{-1}	WS^{-2}	cos	sin	Temp	RH	Prec	Obs	Model
CAMS am	14.2	0.18	-.059	.0010	-12.6	157	-129	1.9	1.2	.76	.14	2.8	27.2	23.0
	(32.5)	(.37)	(.010)	(.0004)	(4.0)	(20)	(22)	(1.4)	(1.4)	(.14)	(.08)	(2.1)		
CAMS pm	-101.4	1.70	-.142	.0013	-39.2	212	-170	2.5	-5.7	1.25	.84	15.4	64.3	54.1
	(73.4)	(.84)	(.022)	(.0010)	(8.9)	(54)	(62)	(3.1)	(3.1)	(.30)	(.18)	(5.1)		
CAMS am	2.0	0.29	-.045	.0001		157	-131	2.1	1.0	.66	.15	3.5	27.0	23.0
	(32.3)	(.37)	(.009)	(.0003)		(20)	(22)	(1.4)	(1.4)	(.14)	(.08)	(2.1)		
CAMS pm	-146.6	2.18	-.104	-.0015		182	-138	2.2	-5.6	.98	.88	14.8	64.3	54.9
	(73.8)	(.85)	(.021)	(.0007)		(55)	(63)	(3.2)	(3.2)	(.30)	(.18)	(5.2)		
Eugene am	20.1	0.06	-.090		6.7	92	-73	-0.5	-2.7	-0.23	.19	-3.5	16.8	14.5
	(16.1)	(.65)	(.026)		(2.8)	(13)	(12)	(0.9)	(0.9)	(.09)	(.10)	(1.5)		
Eugene pm	-70.5	2.86	-.019		10.4	165	-129	0.9	1.0	-0.24	.36	-9.7	27.0	22.1
	(23.5)	(.95)	(.039)		(4.3)	(17)	(16)	(1.4)	(1.4)	(.13)	(.12)	(2.4)		

IND: CAMS 1 if 1976; 0 otherwise. Eugene 1 ≥ Aug. 1975; 0 otherwise

Table 5.3(a)

Annual percentage trend reduction, and additional average benefit due to I/M at CAMS

(standard errors given in parentheses)

	without traffic disruption (1976)		with traffic disruption (1976)	
	trend	I/M	trend	I/M
summer am	-8.8 (1.8)	-17.1 (5.7)	-9.1 (1.8)	-31.4 (8.6)
summer pm	-9.0 (1.8)	-32.1 (7.6)	-9.2 (2.0)	-30.2 (11.3)
winter am	-6.9 (1.4)	1.7 (5.1)	-9.0 (1.5)	17.3 (6.9)
winter pm	-7.8 (1.6)	-12.8 (6.0)	-10.7 (1.7)	11.1 (8.5)
average	-8.1 (1.6)	-15.1 (6.2)	-9.5 (1.8)	-8.3 (9.0)

Table 5.3(b)

Annual trend reduction at Eugene
(Standard errors given in parentheses)

	trend
summer am	-5.4 (1.8)
summer pm	-3.6 (1.4)
winter am	-5.8 (1.7)
winter pm	-.7 (1.4)
average	-3.9 (1.6)

Table 5.4

CO summer/winter and morning/afternoon averages for CAMS and Eugene (in 10 $\mu g/m^3$)

	summer		winter	
	morning	afternoon	morning	afternoon
CAMS	40.0	60.5	60.0	122.0
Eugene	28.3	36.7	34.9	62.3

Figure 1.1

Annual vehicle inspection and failure rates

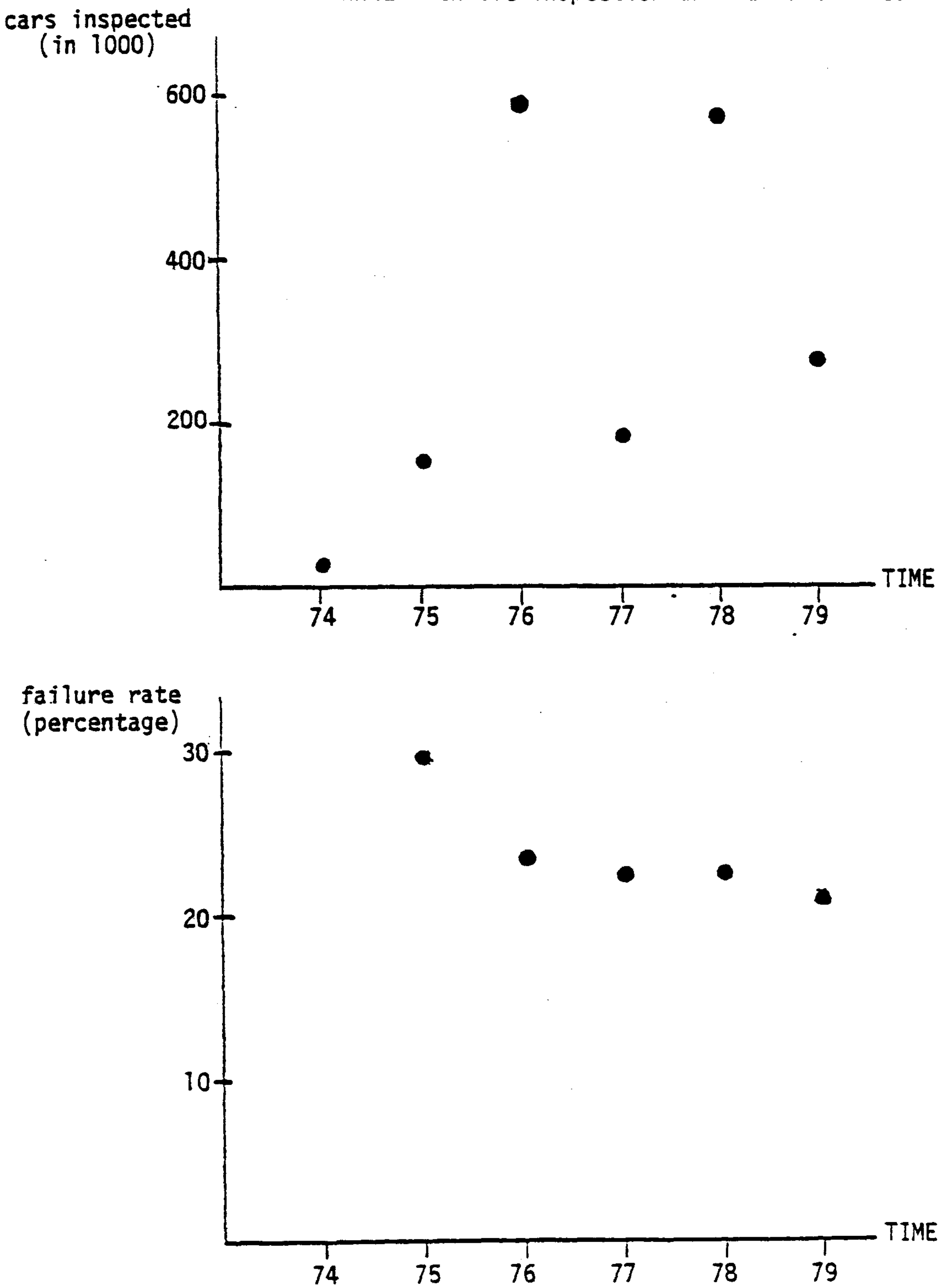


Figure 1.2

Monthly car inspections--Portland I/M program

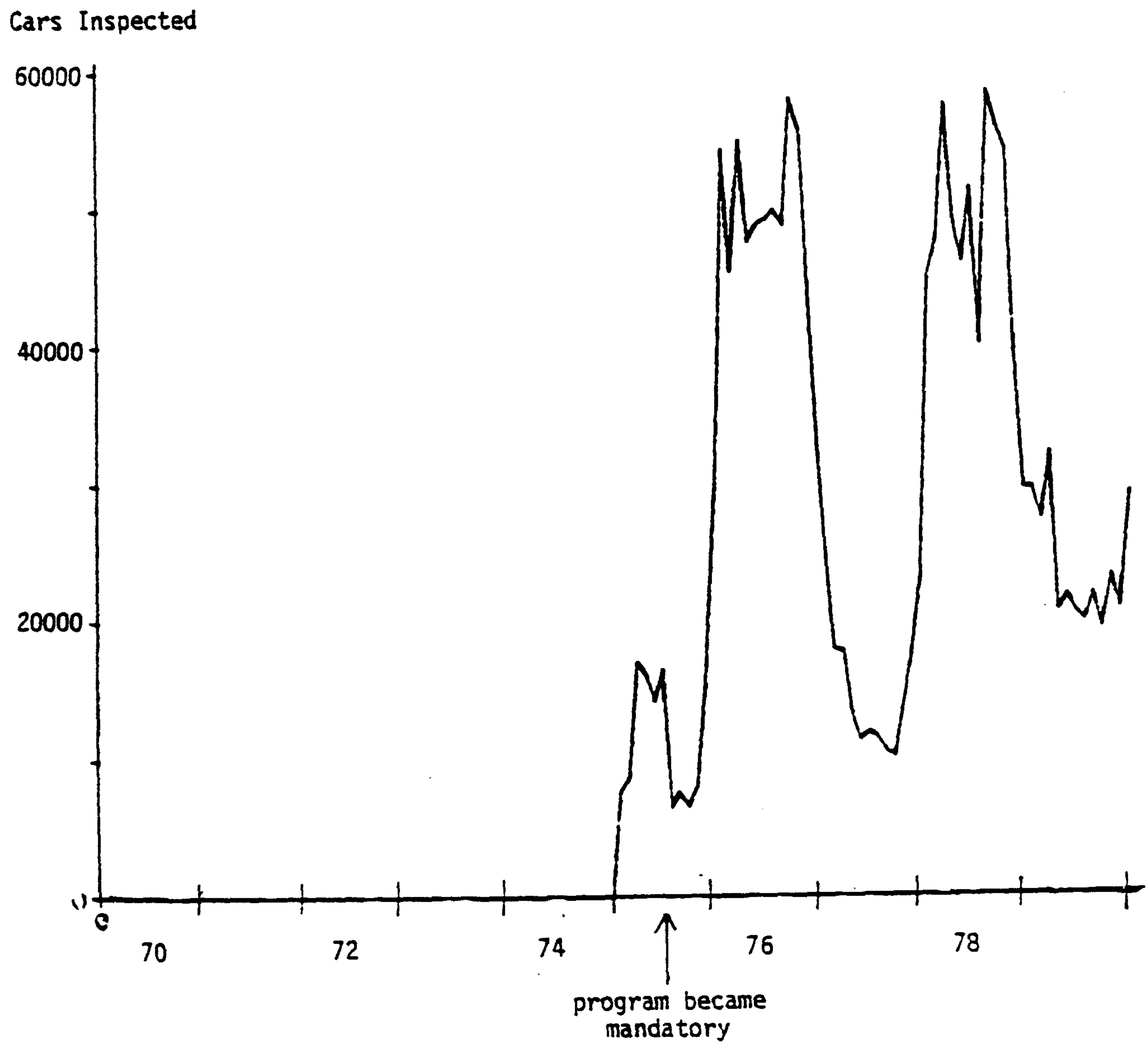


Figure 1.3

Map of Portland indicating locations of CO receptors, traffic counter and meteorological measurement sites

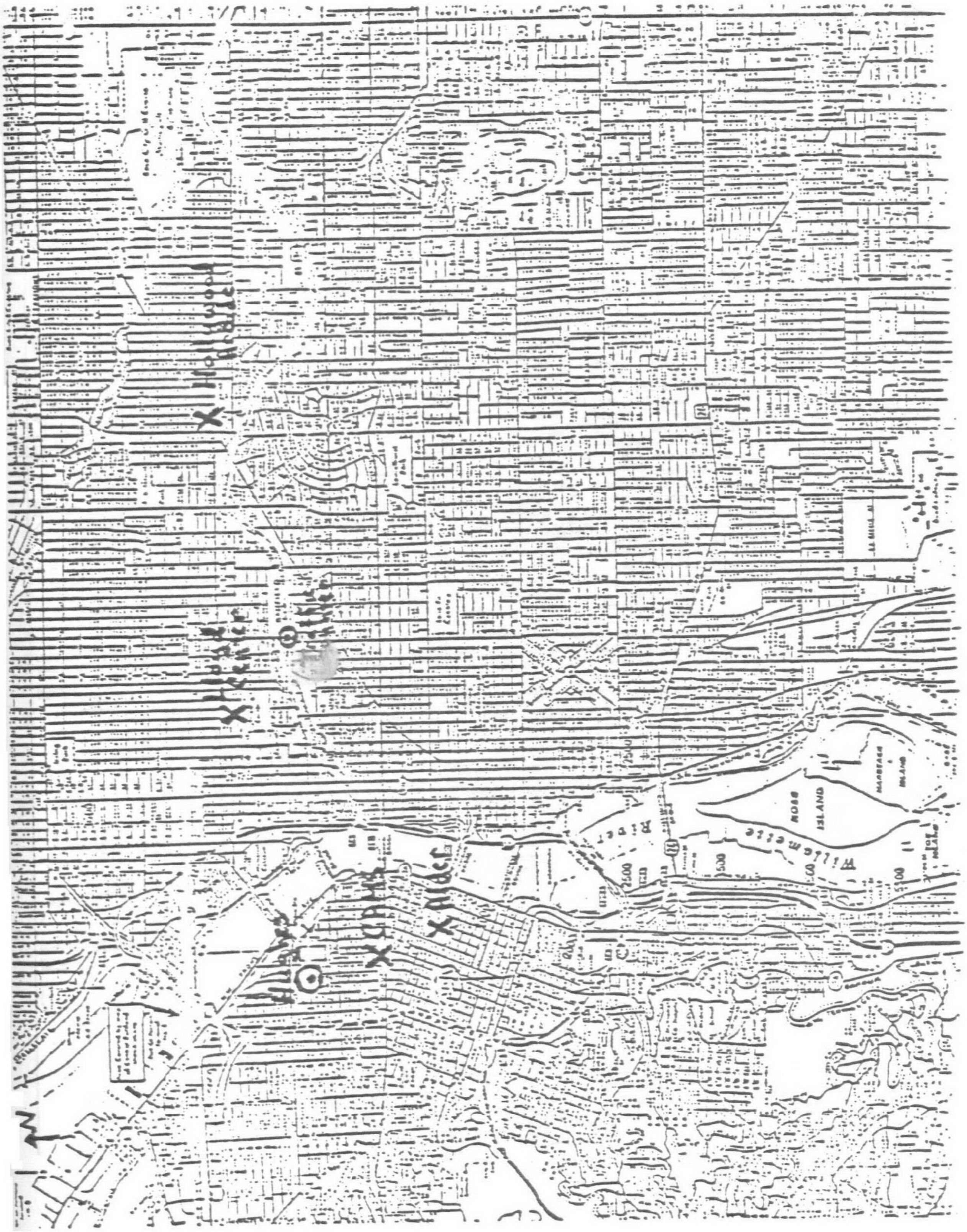


Figure 1.4

Map of Eugene indicating locations of CO receptor, traffic counter and meteorological measurement sites

Figure 2.1(a)

Plot of monthly CO averages--CAMS

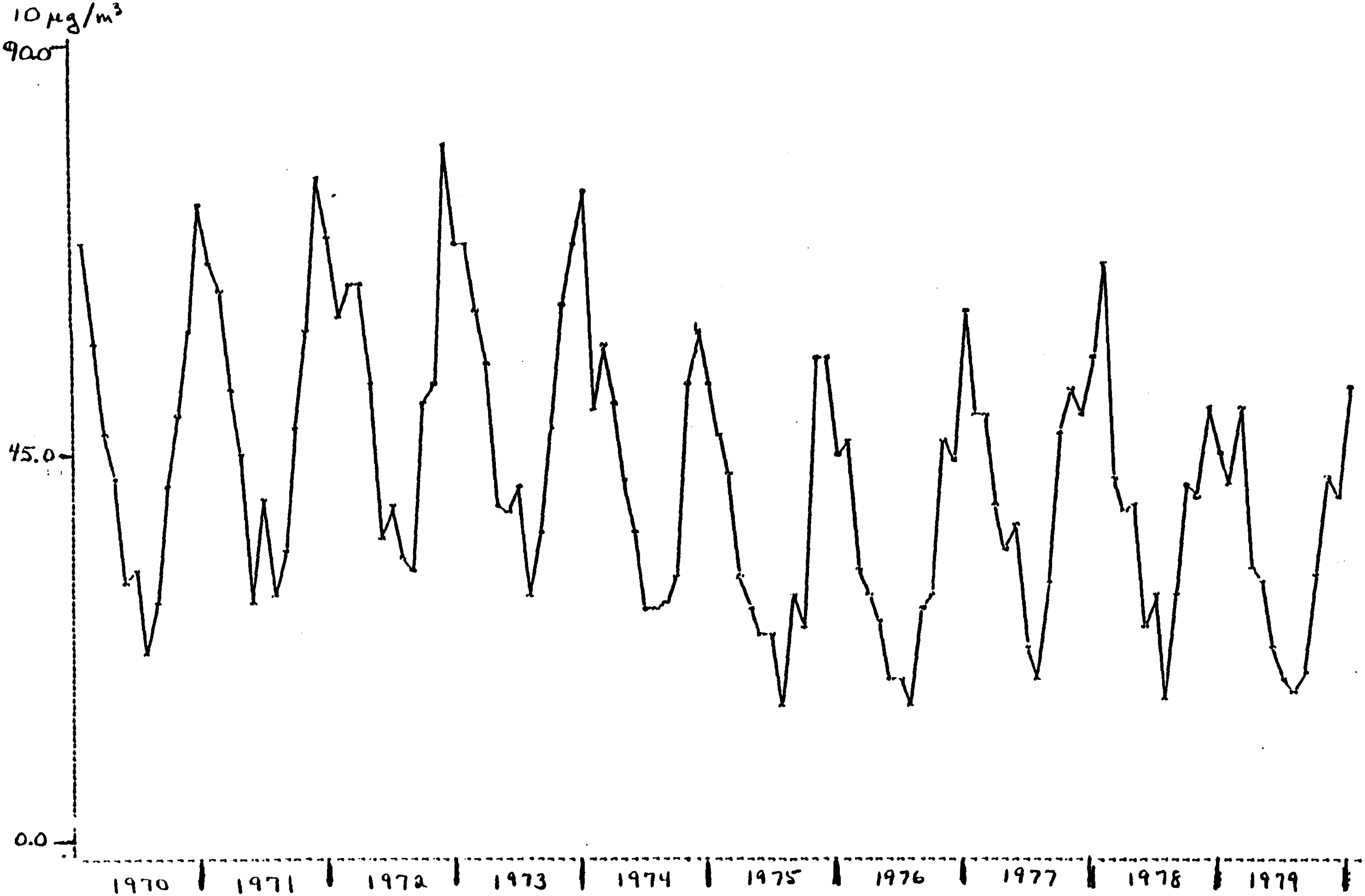


Figure 2.1(b)

Plot of monthly CO averages--Hollywood

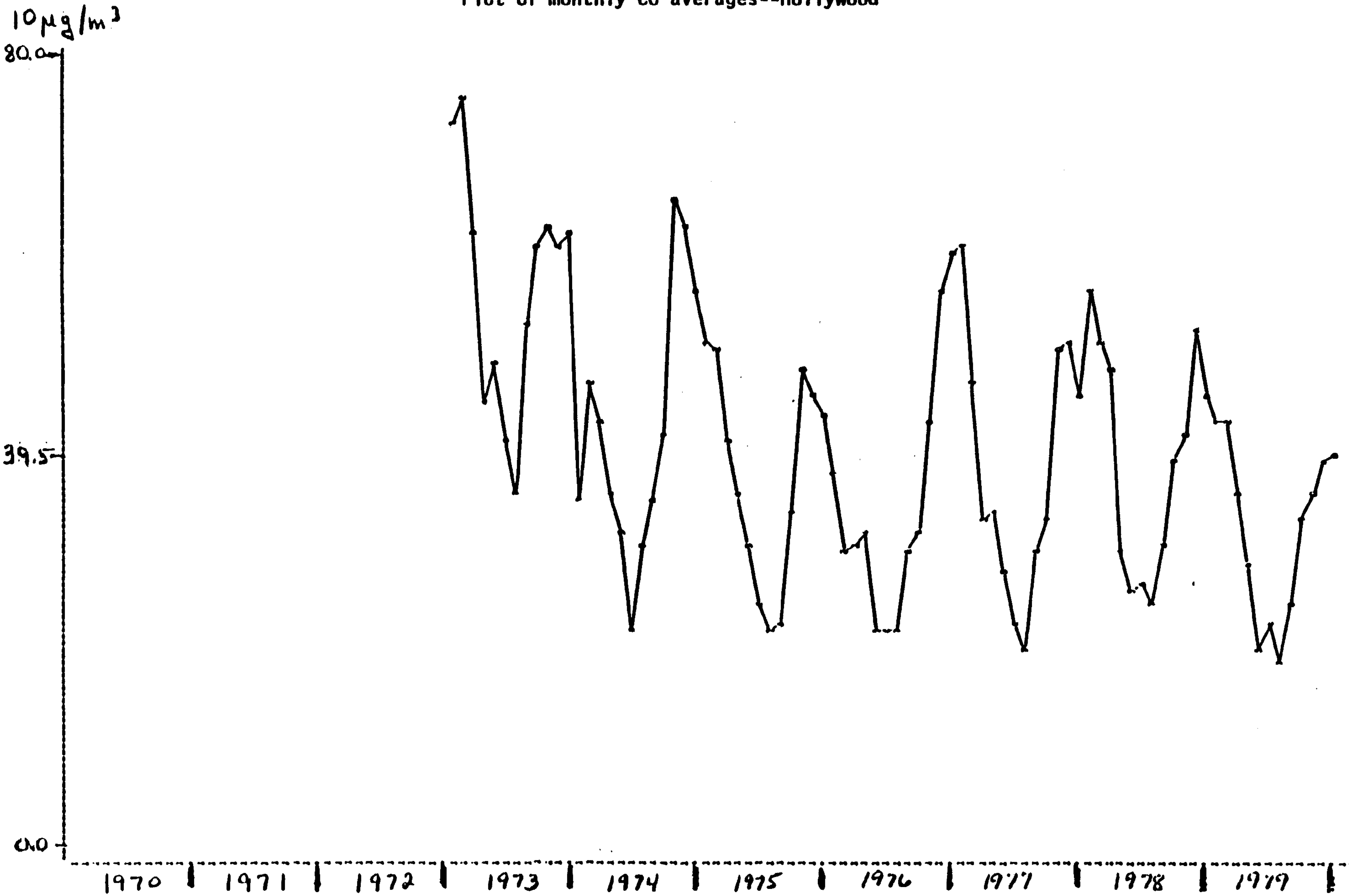


Figure 2.1(c)

Plot of monthly CO averages--Alder

Figure 2.1(d)

Plot of monthly CO averages--Lloyd

Figure 2.1(e)

Plot of monthly CO averages--Eugene

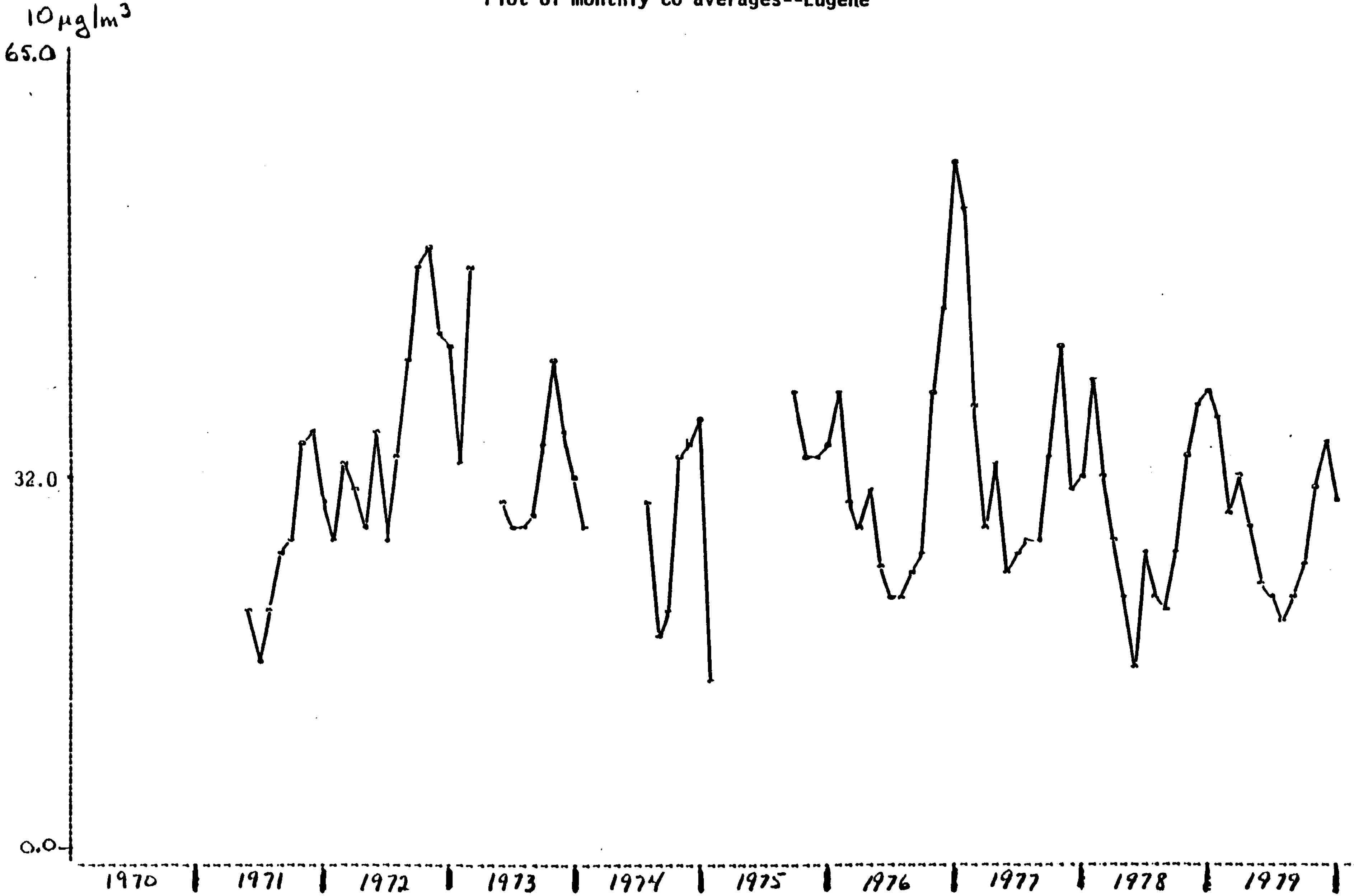


Figure 2.2(a)

Plot of monthly CO averages--weekday/weekend comparison--CAMS

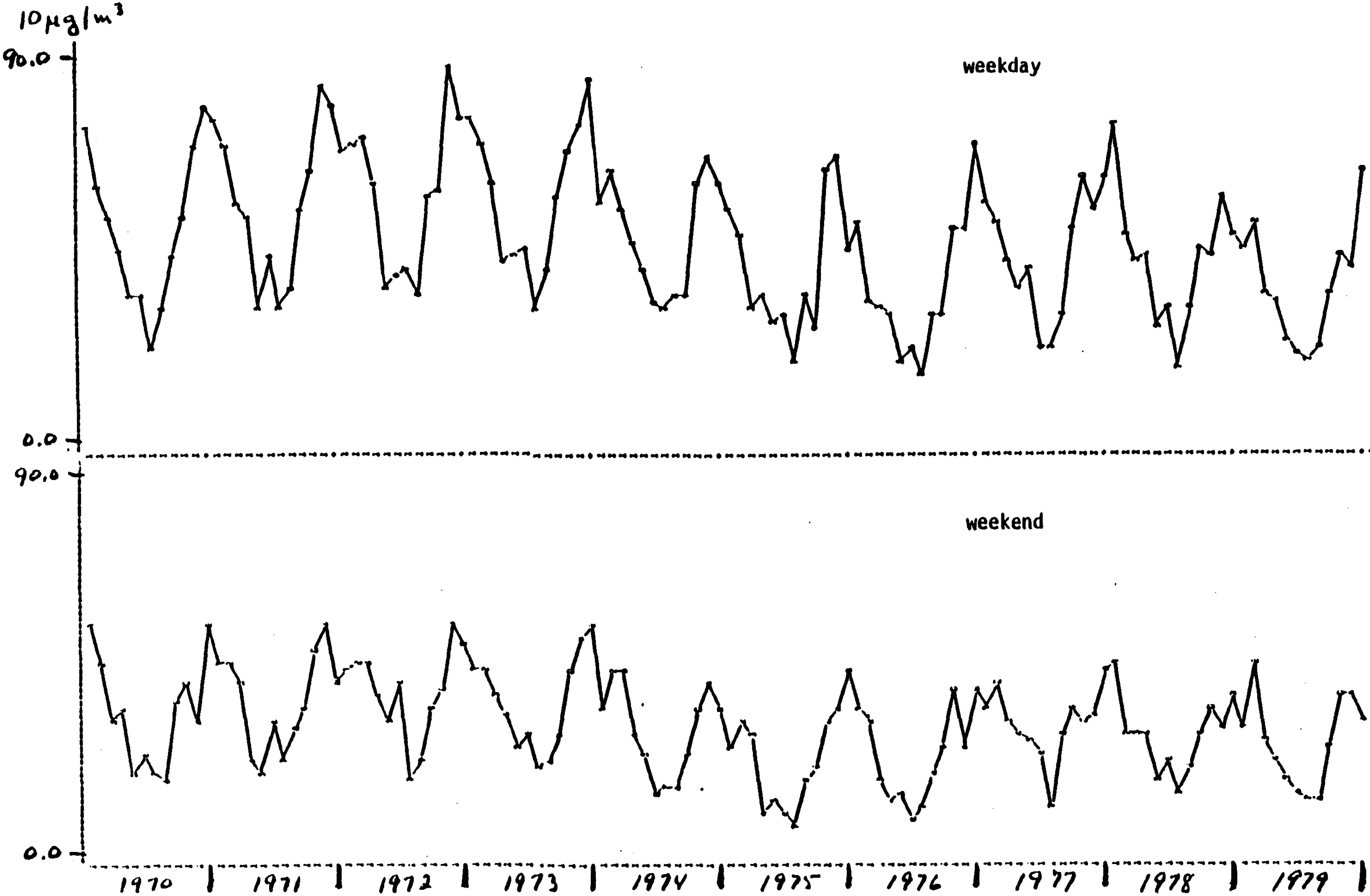


Figure 2.2(b)

Plot of monthly CO averages--weekday/weekend comparison--Hollywood

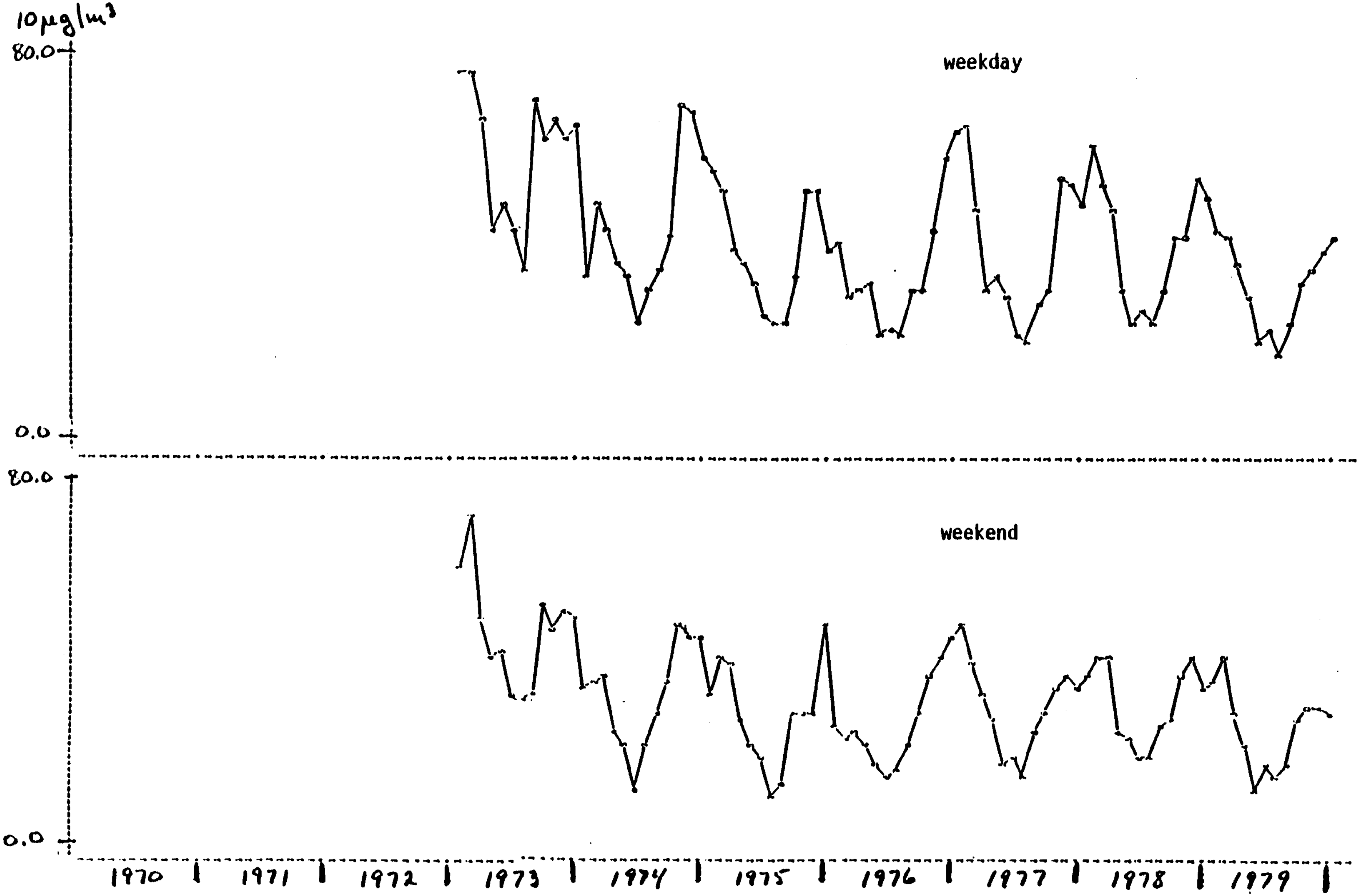


Figure 2.2(c)

Plot of monthly CO averages--weekday/weekend comparison--Alder

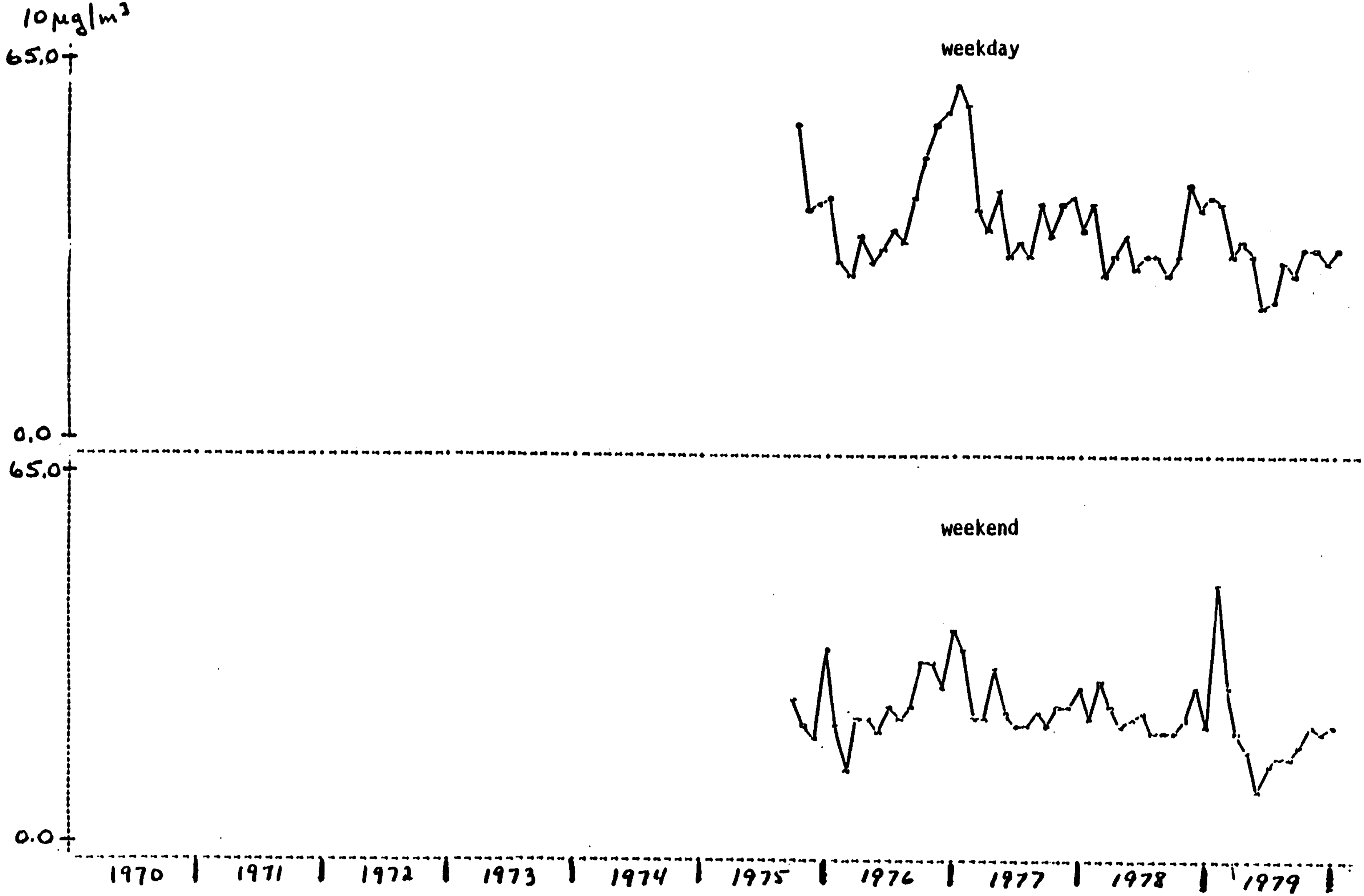


Figure 2.2(d)

Plot of monthly averages--weekday/weekend comparison--Lloyd

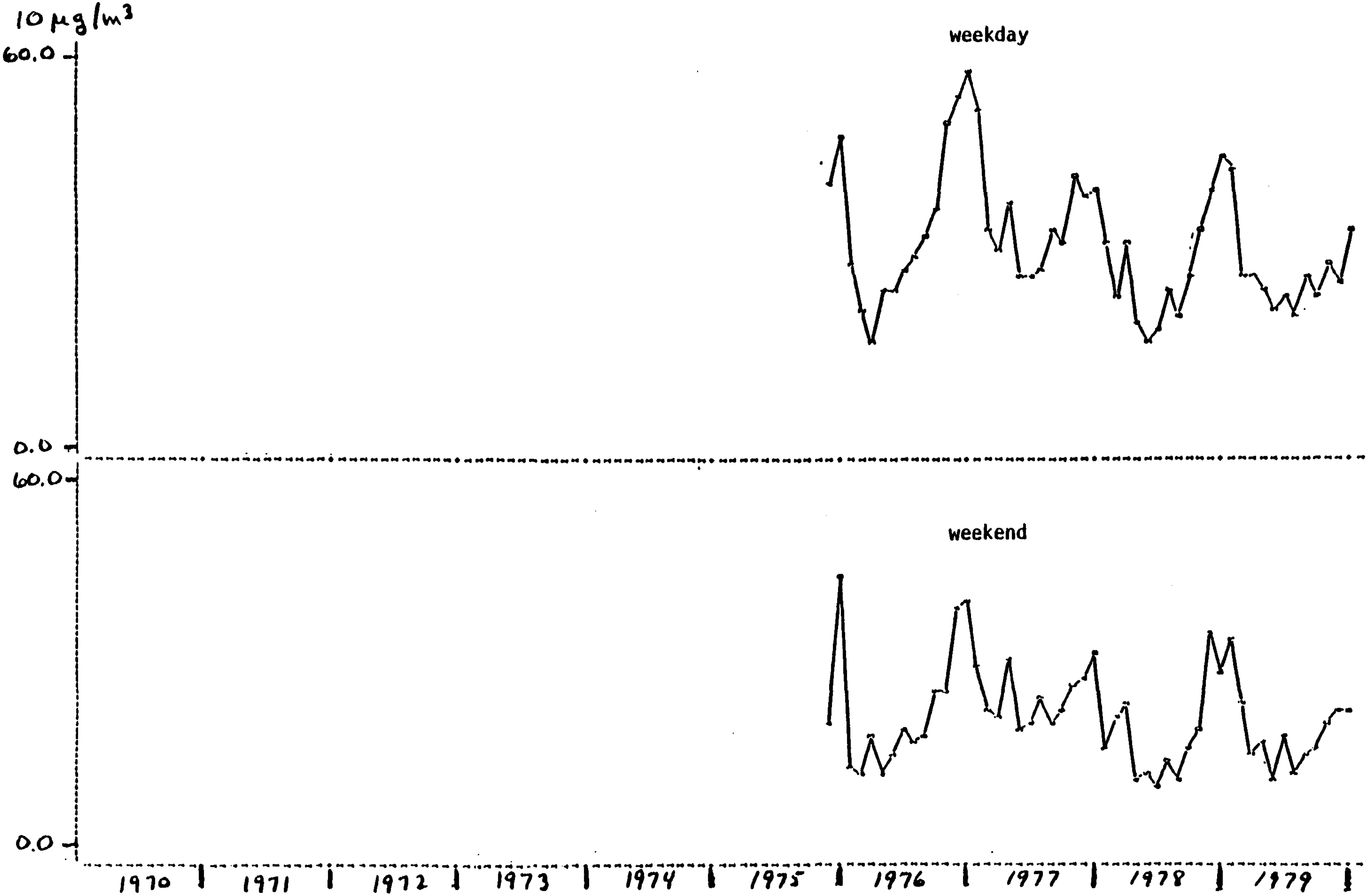


Figure 2.2(e)

Plot of monthly CO averages--weekday/weekend comparison--Eugene

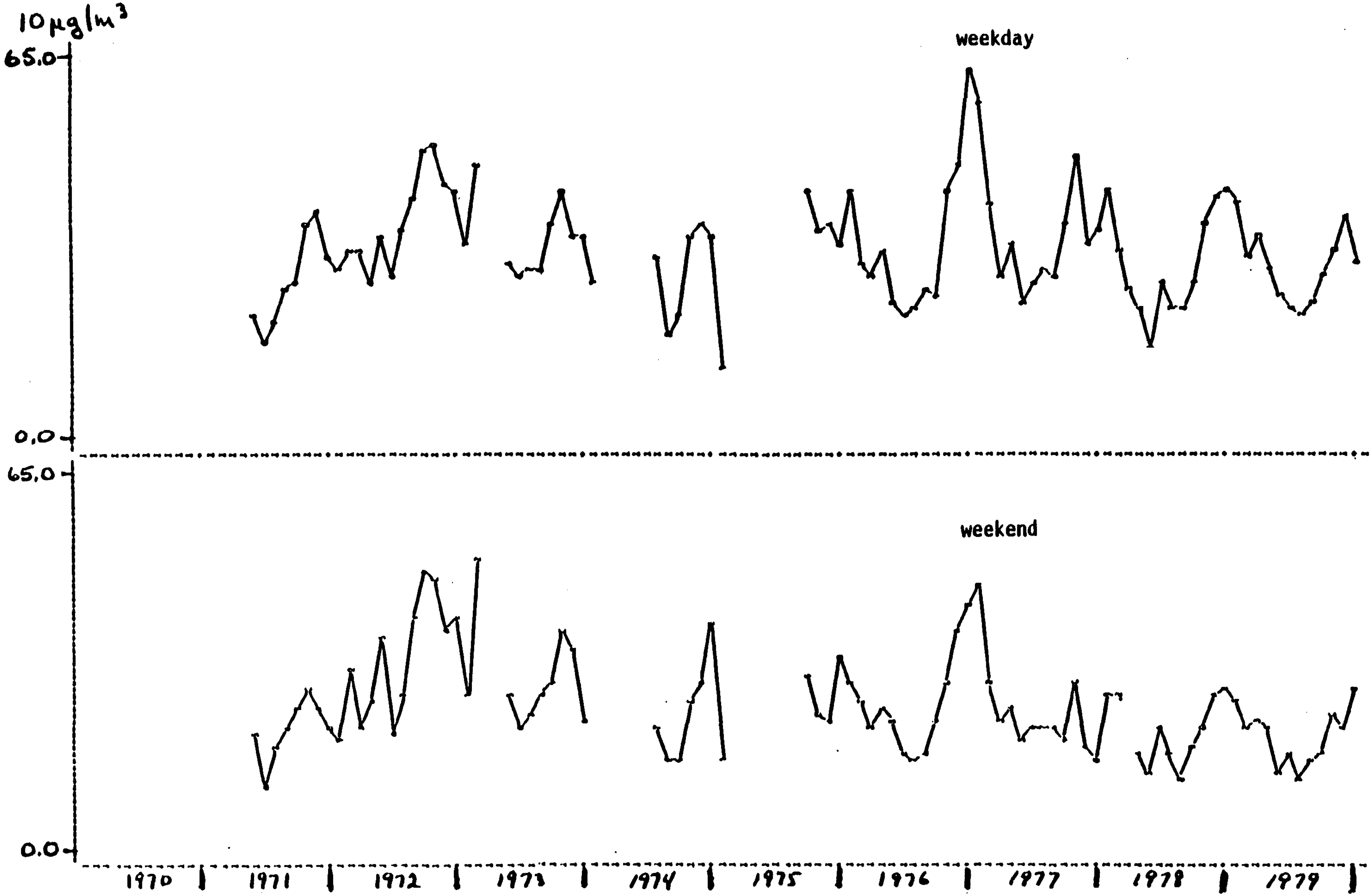


Figure 2.3(a)

Composite plots of monthly 25th, 50th, 75th, and 95th percentiles of CO--CAMS

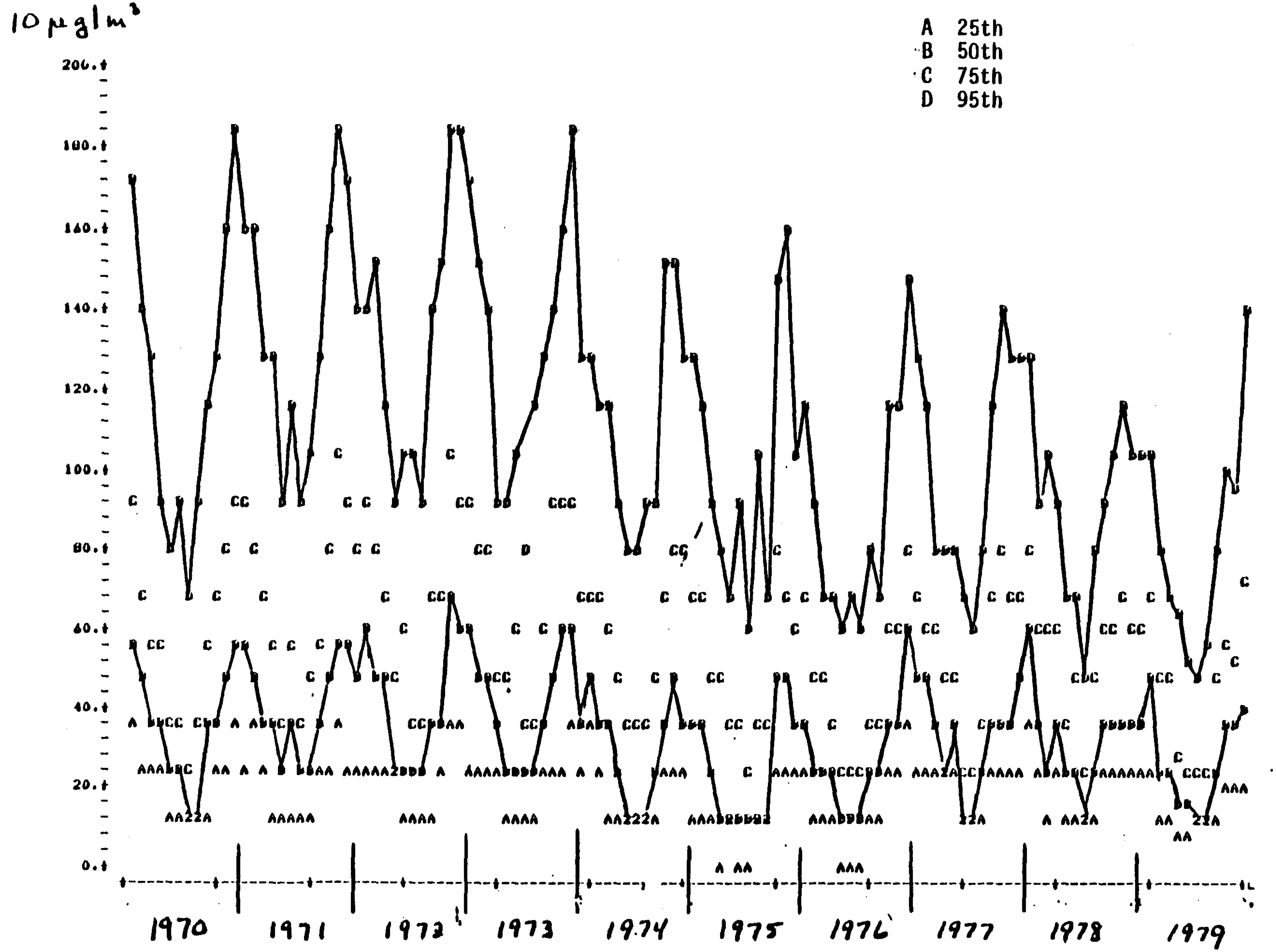


Figure 2.3(b)

Composite plots of monthly 25th, 50th, 75th, and 95th percentiles of CO--Hollywood

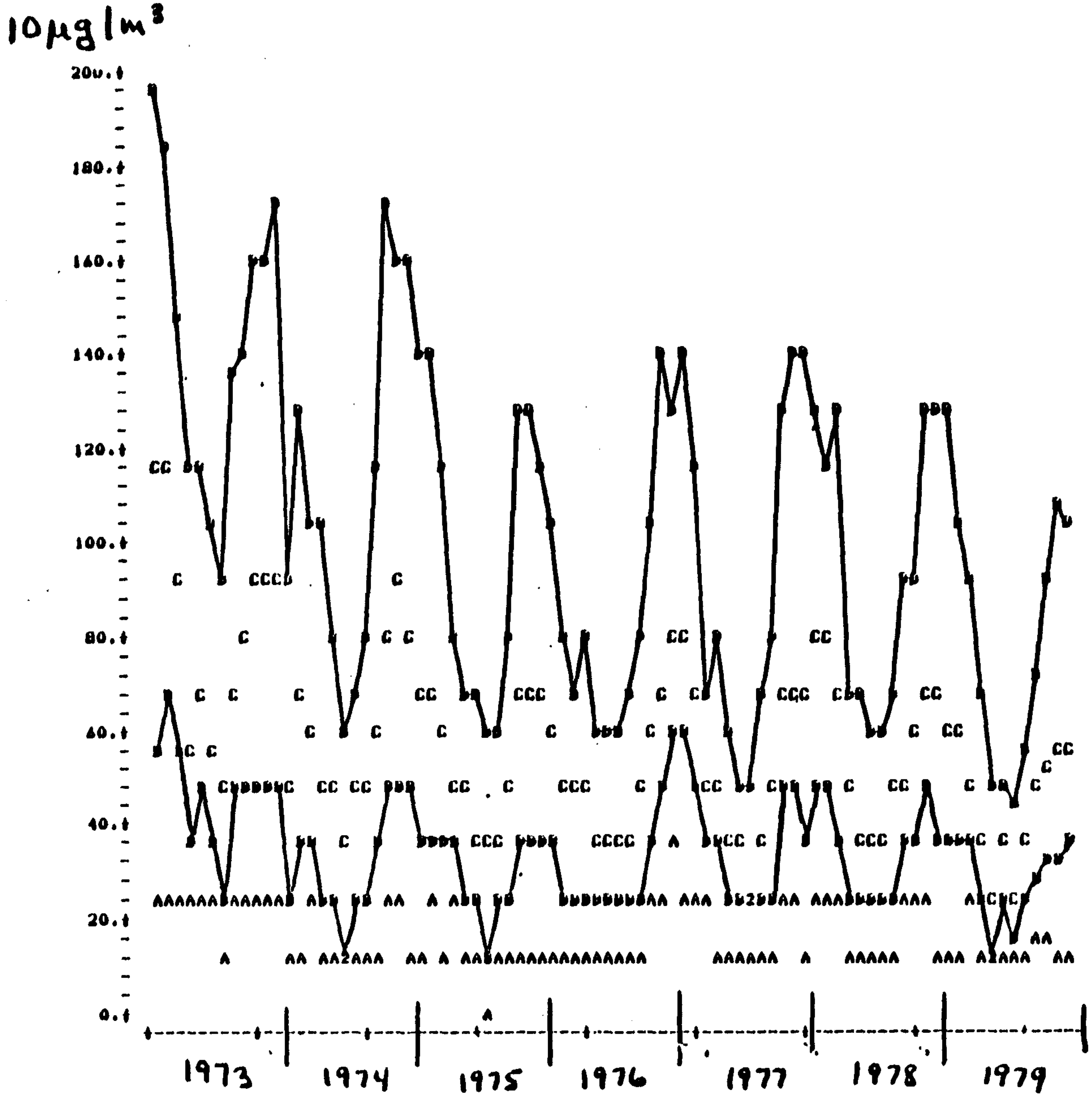


Figure 2.3(c)

Composite plots of monthly 25th, 50th, 75th, and 95th percentiles of CO--Alder

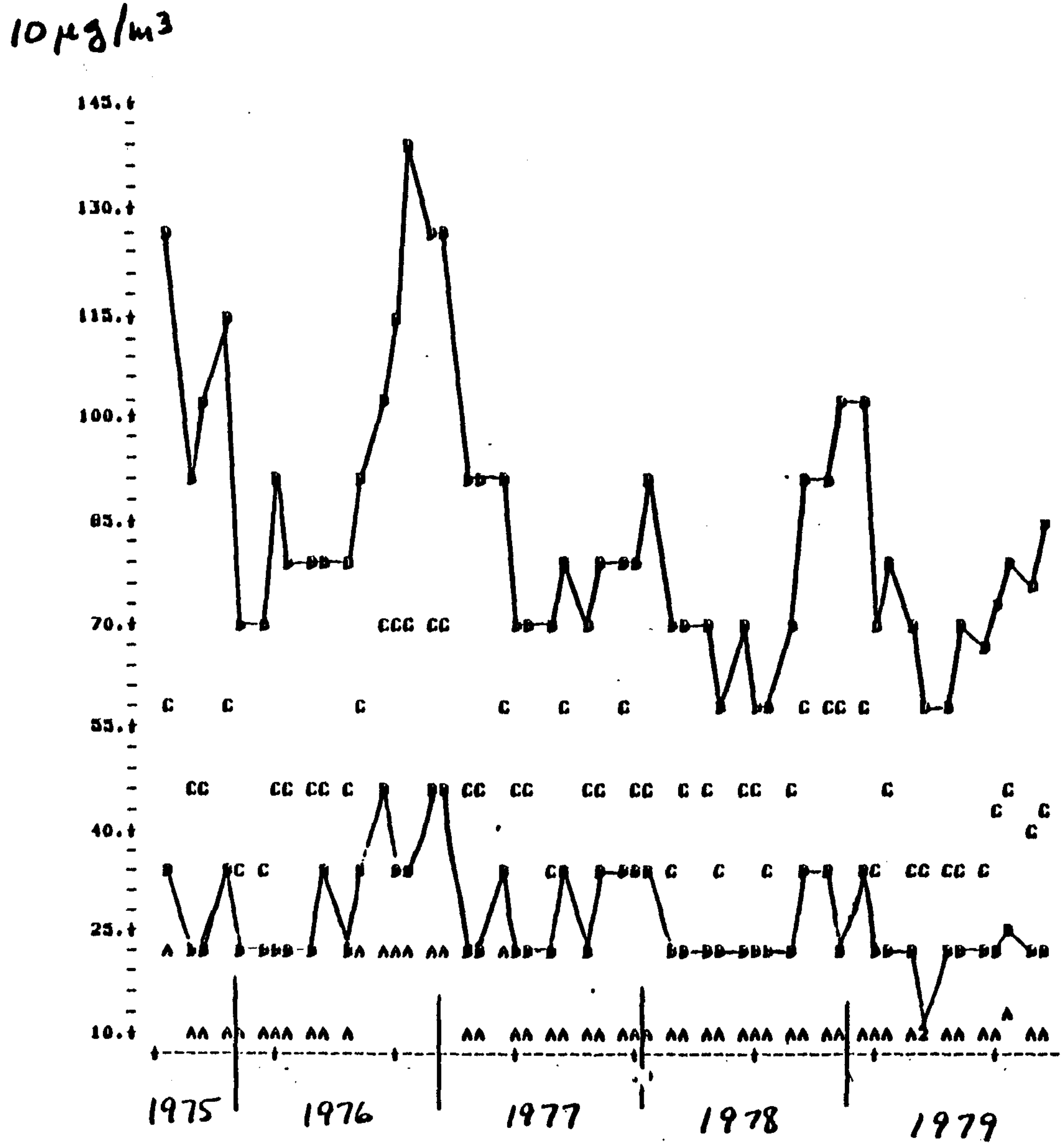


Figure 2.3(d)

Composite plots of monthly 25th, 50th, 75th, and 95th percentiles of CO--Lloyd

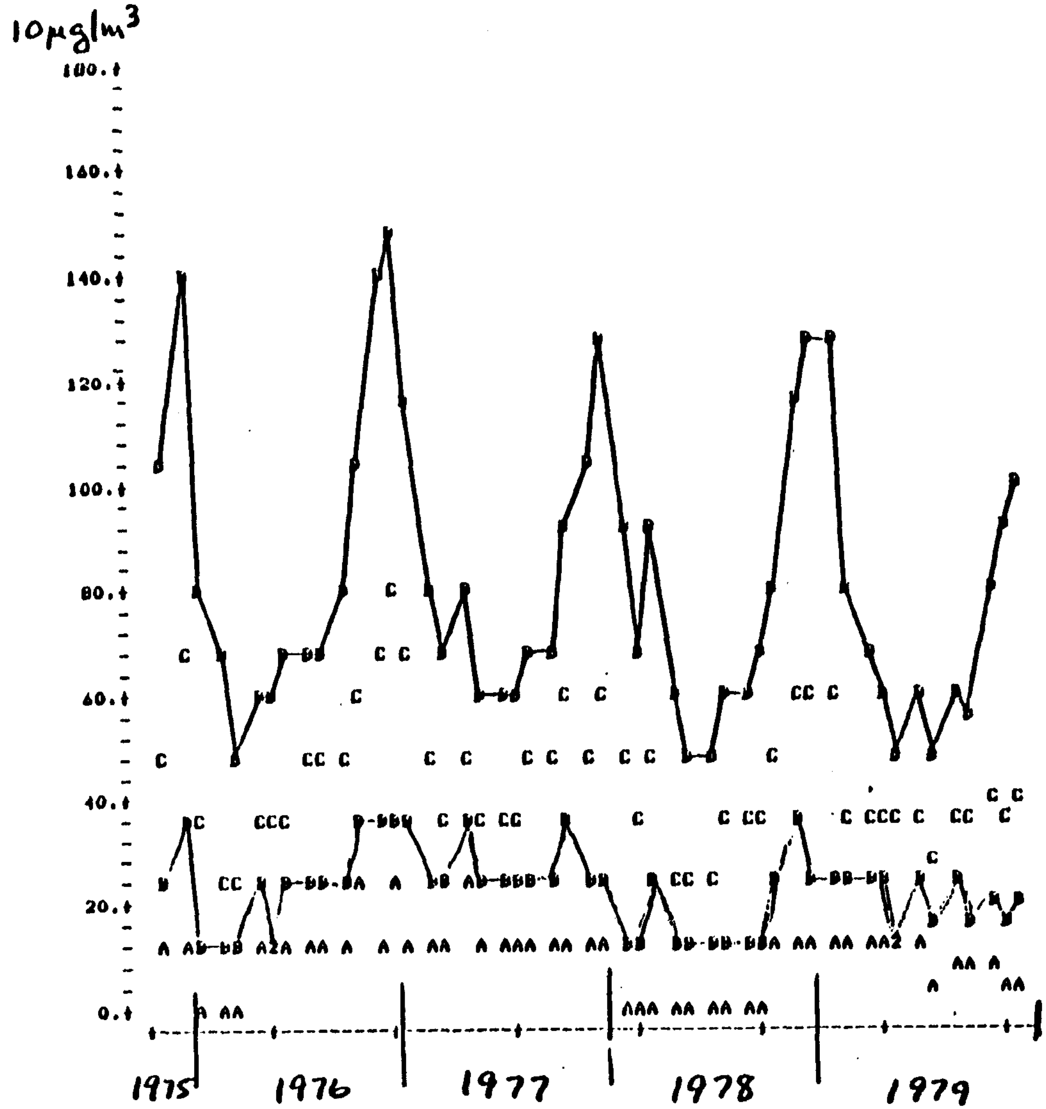


Figure 2.3(e)

Composite plots of monthly 25th, 50th, 75th, and 95th percentiles of CO--Eugene

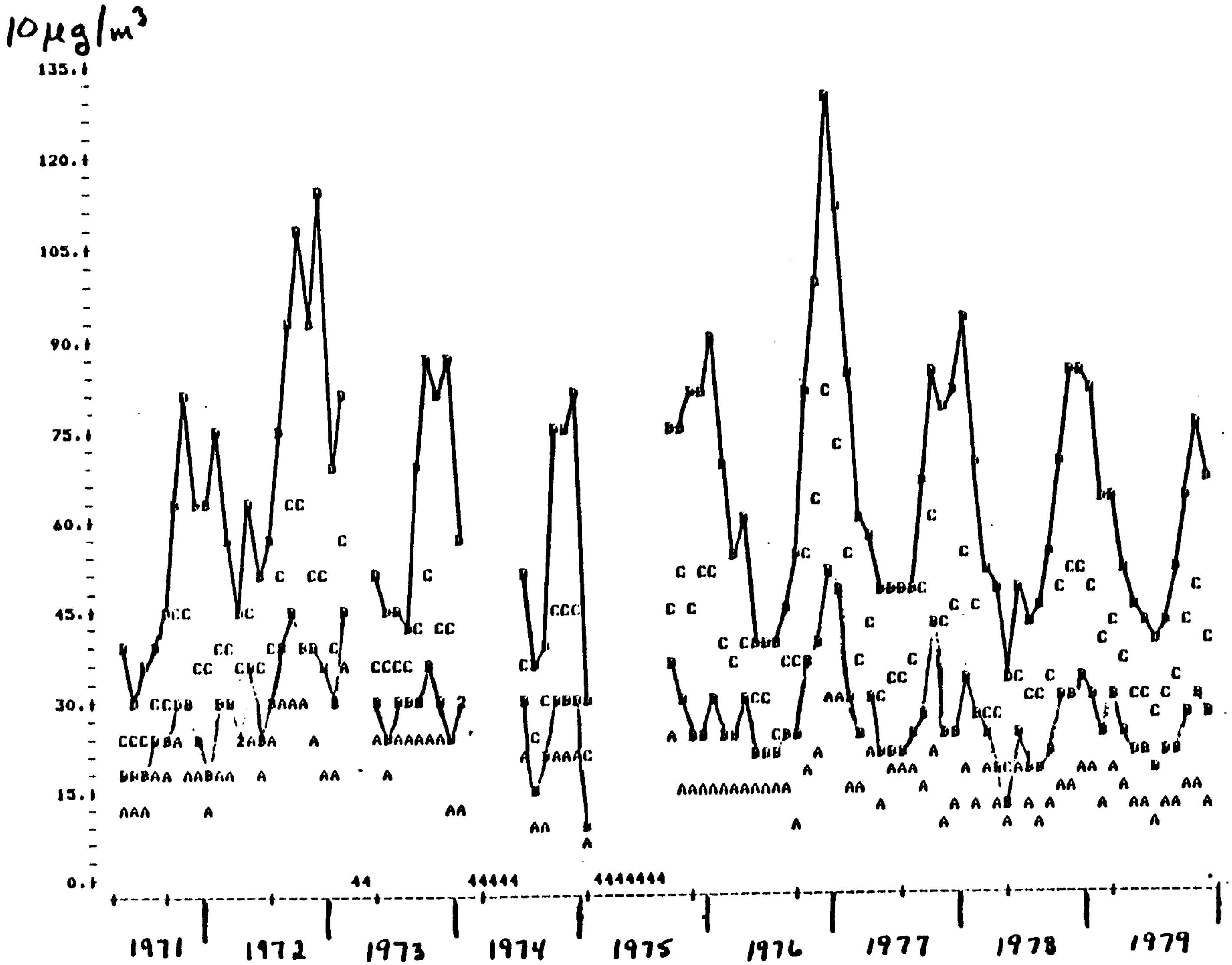


Figure 2.4(a)

Diurnal diagrams of hourly CO averages for weekdays, 1970-1974

(——— Summer, - - - - Winter)

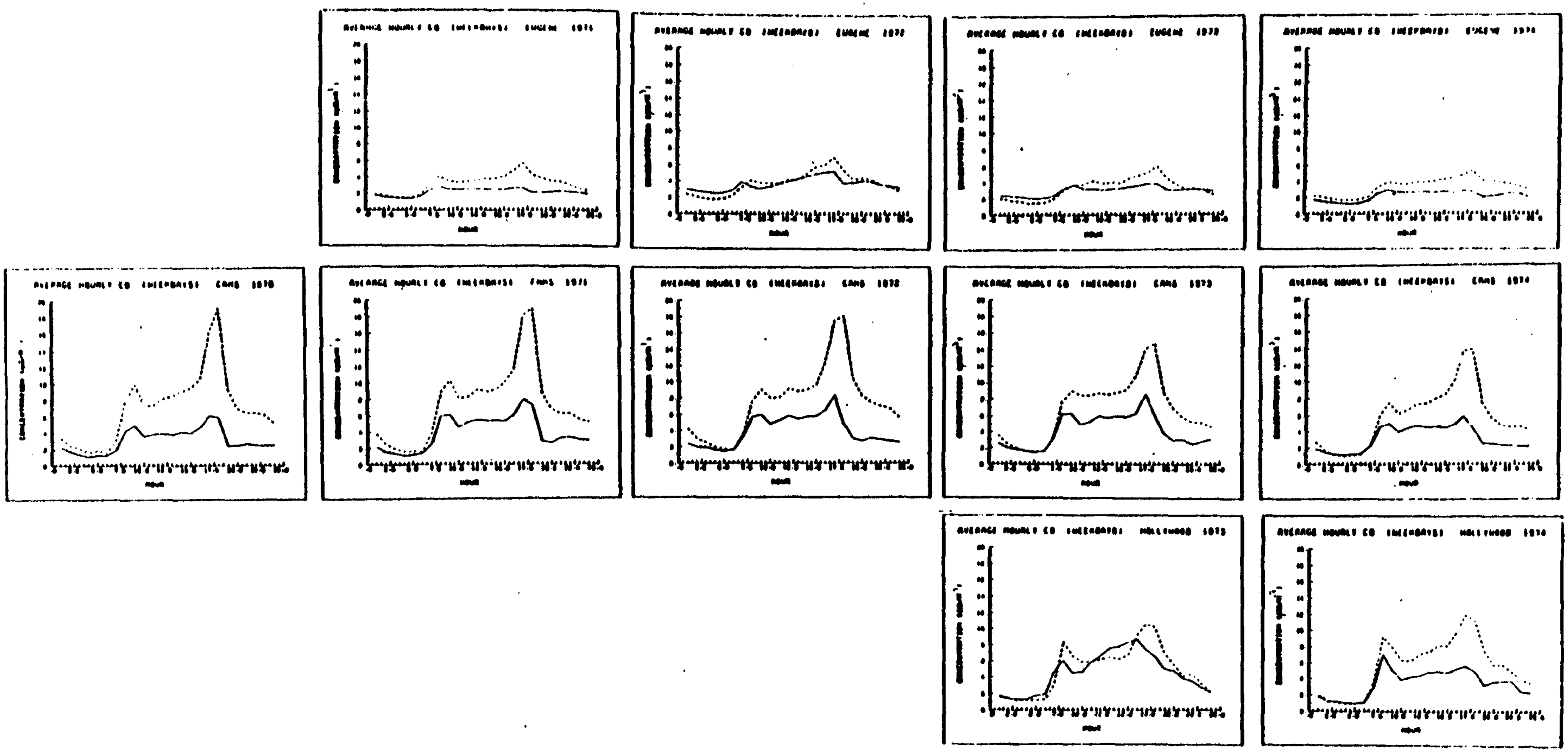


Figure 2.4(b)
Diurnal diagrams of hourly CO averages for weekdays, 1975-1979 (——— Summer, - - - - Winter)

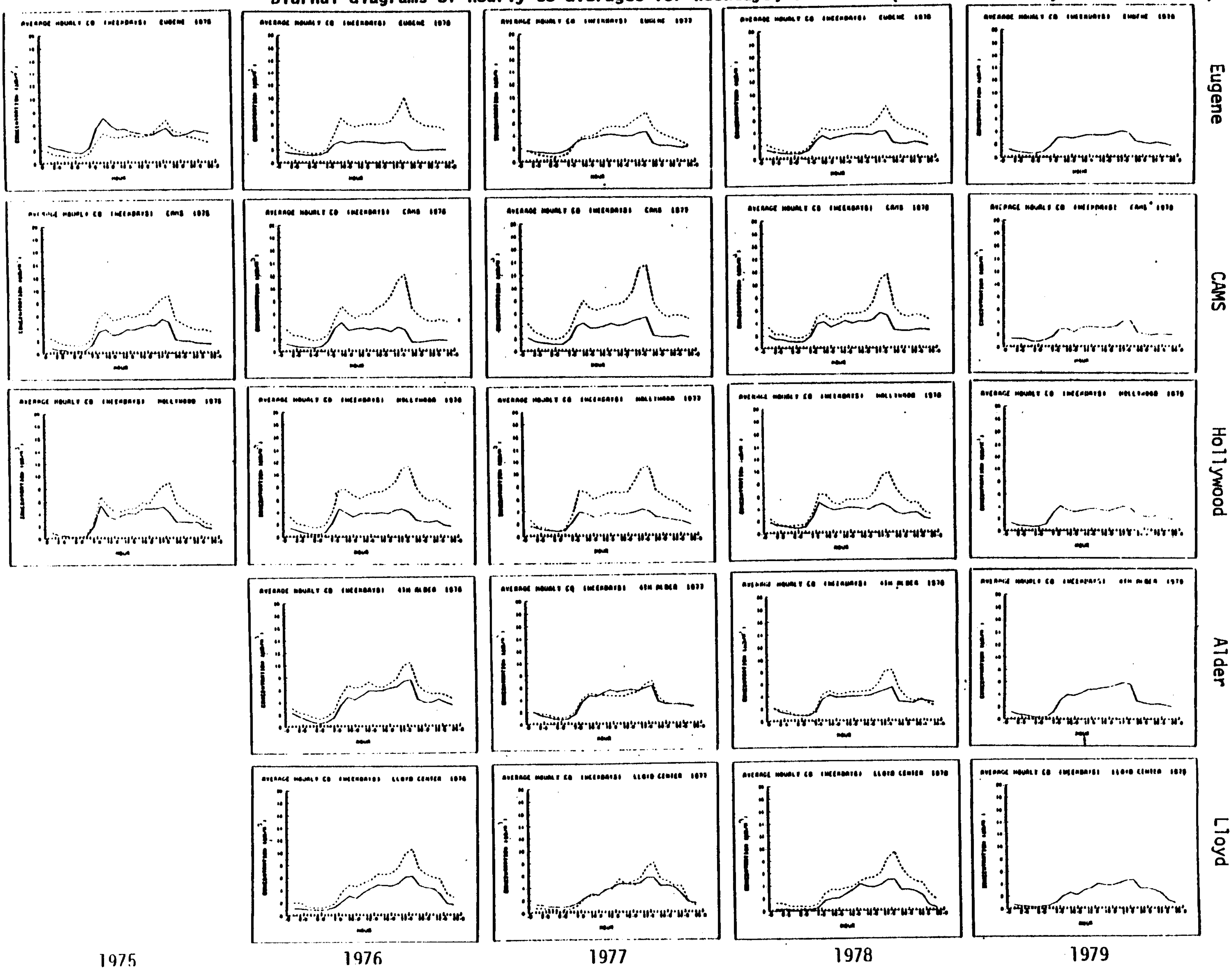


Figure 2.5(a)

Diurnal diagrams of hourly CO averages for weekends, 1970-1974

(——— Summer, - - - - Winter)

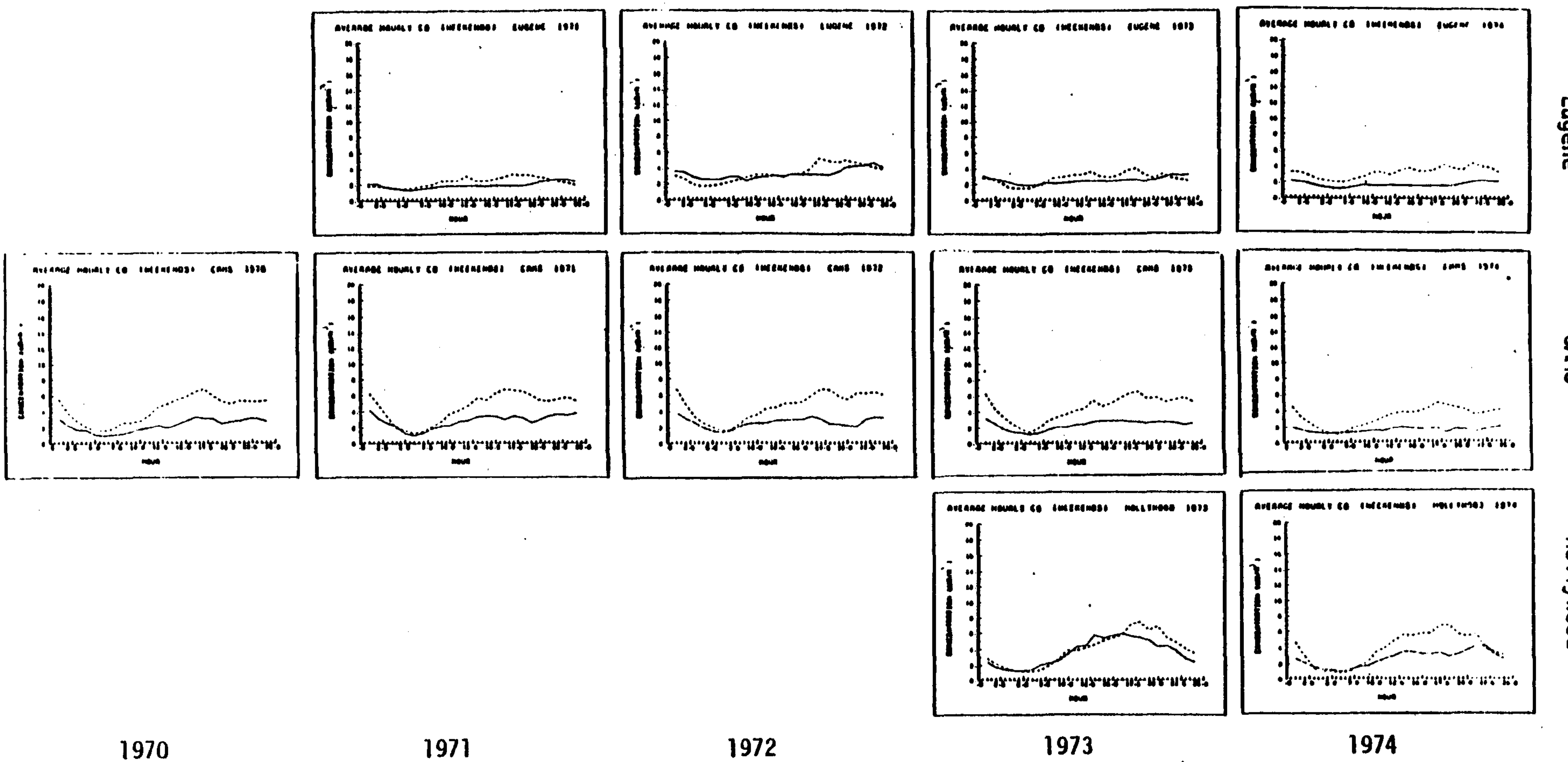


Figure 2.5(b)

Diurnal diagrams of hourly CO averages for weekends, 1975-1979 (——— Summer, - - - - Winter)

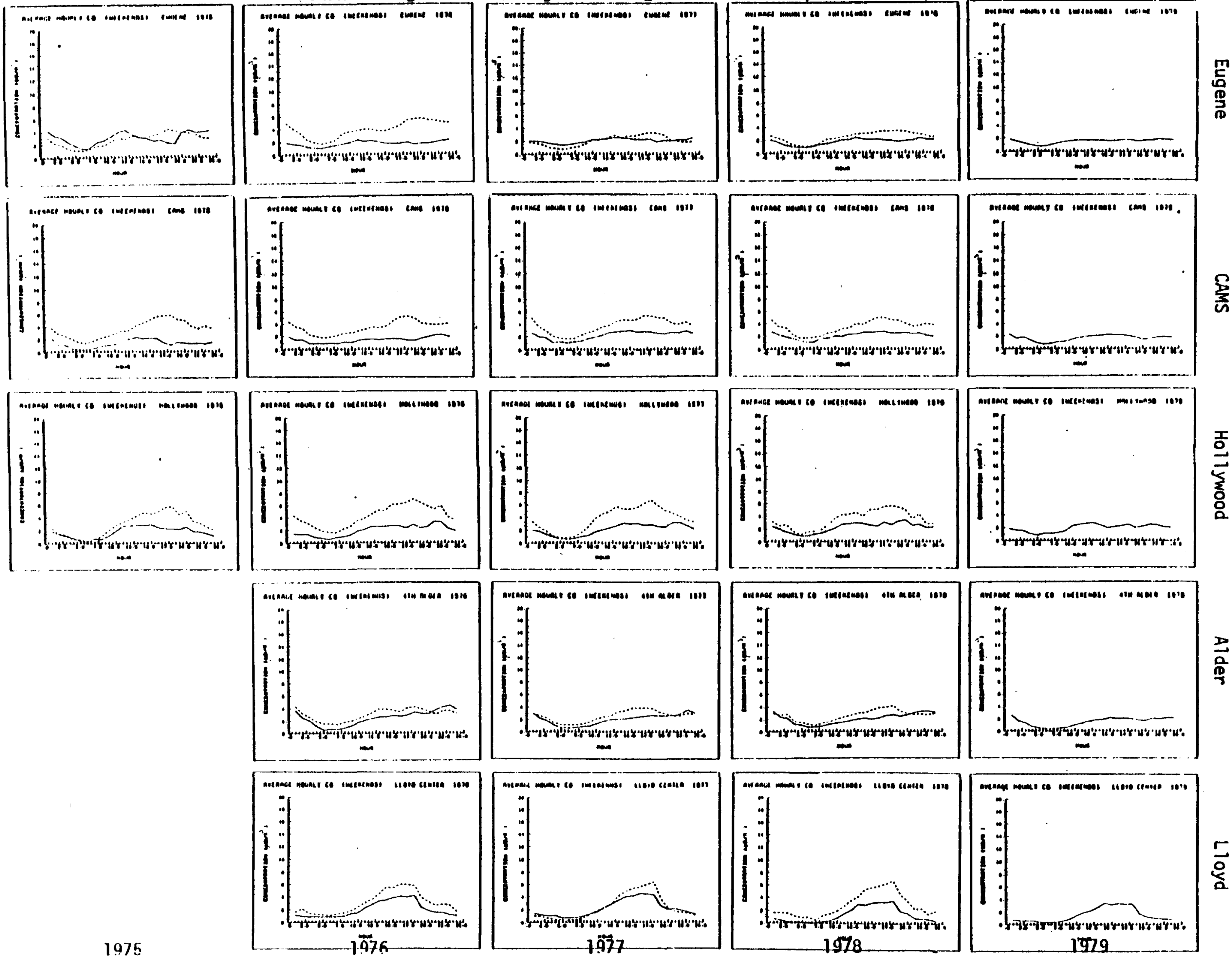


Figure 2.6

Plot of monthly average daily traffic counts (in 1000 cars/day),
Portland I 80N, Columbia River Highway at NE 21st Ave.

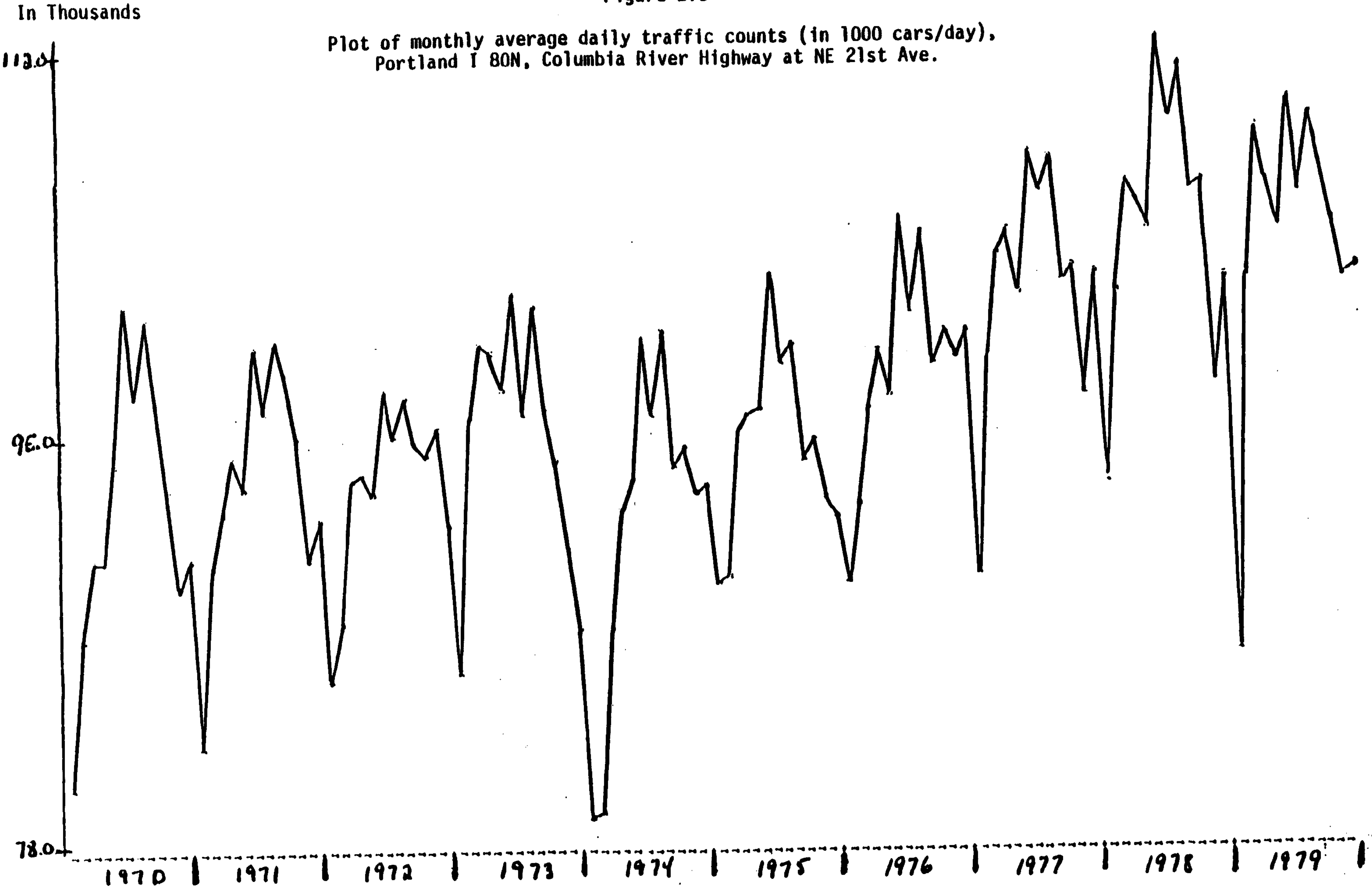


Figure 2.7

Plot of monthly average daily traffic counts (in 1000 cars/day), Eugene, US 99 Pacific Highway West (.02 miles NE of 11th Ave.)

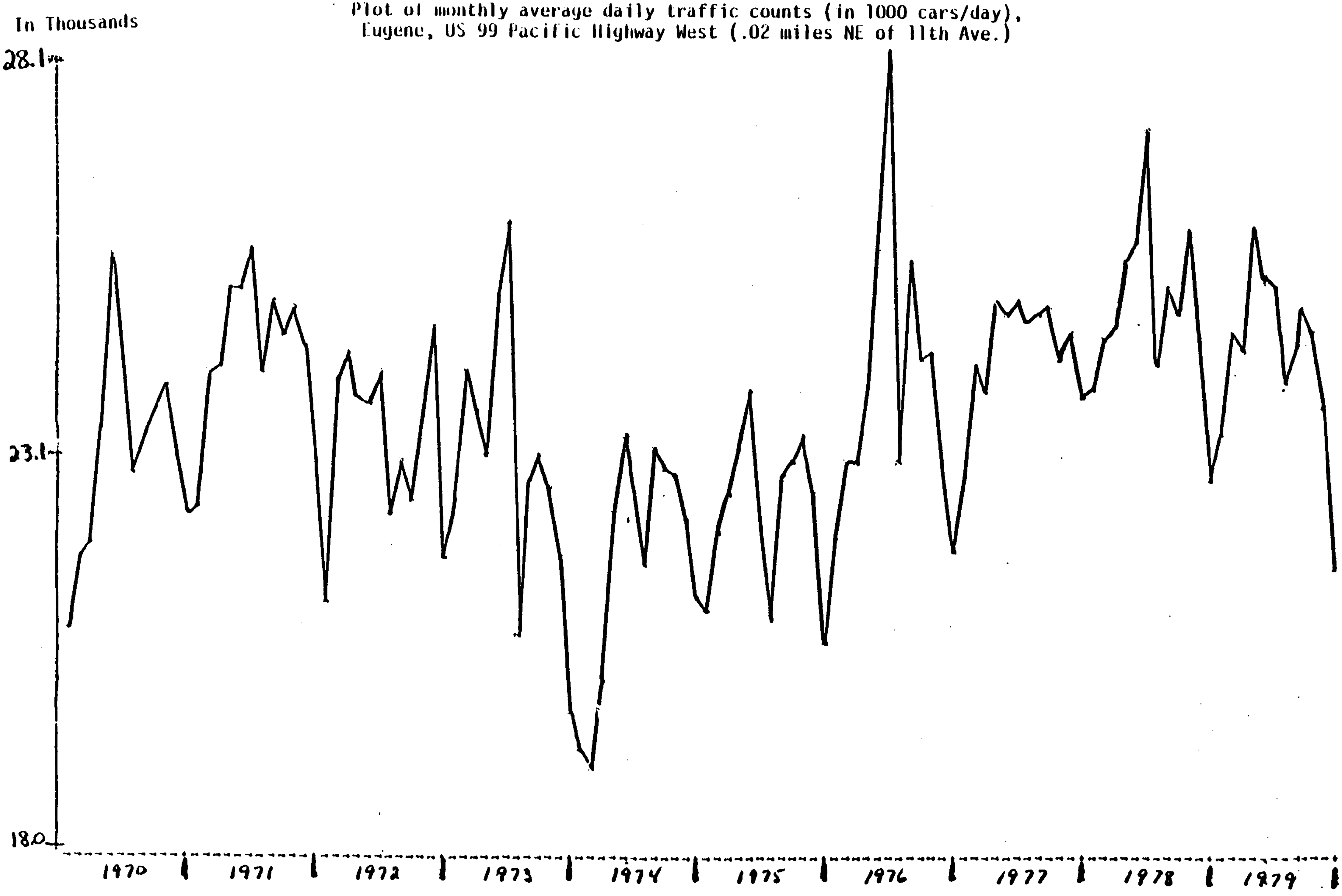


Figure 2.8(a)

Monthly wind speed averages
Portland Airport

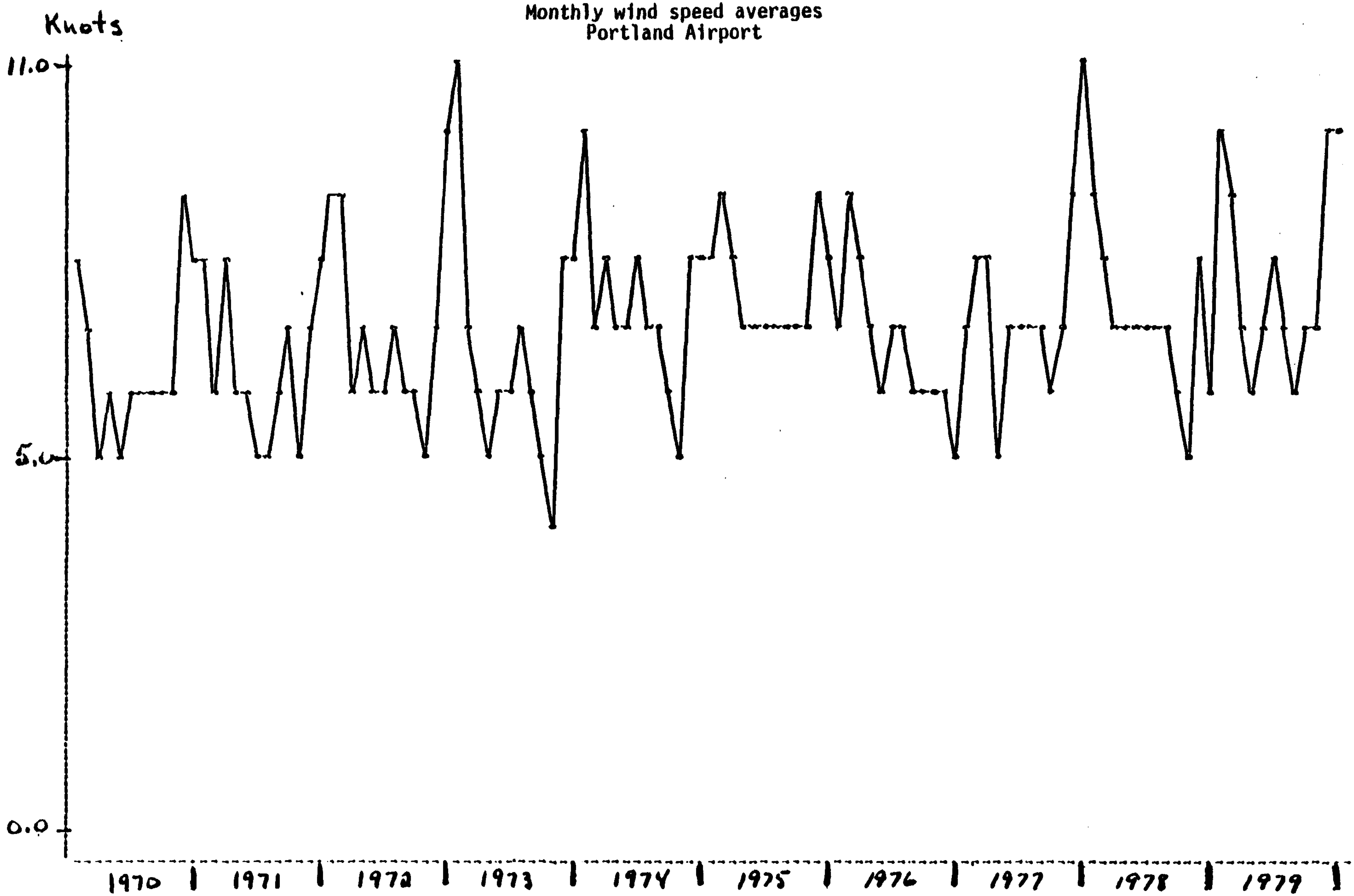


Figure 2.8(b)

Monthly wind speed averages
Eugene Airport

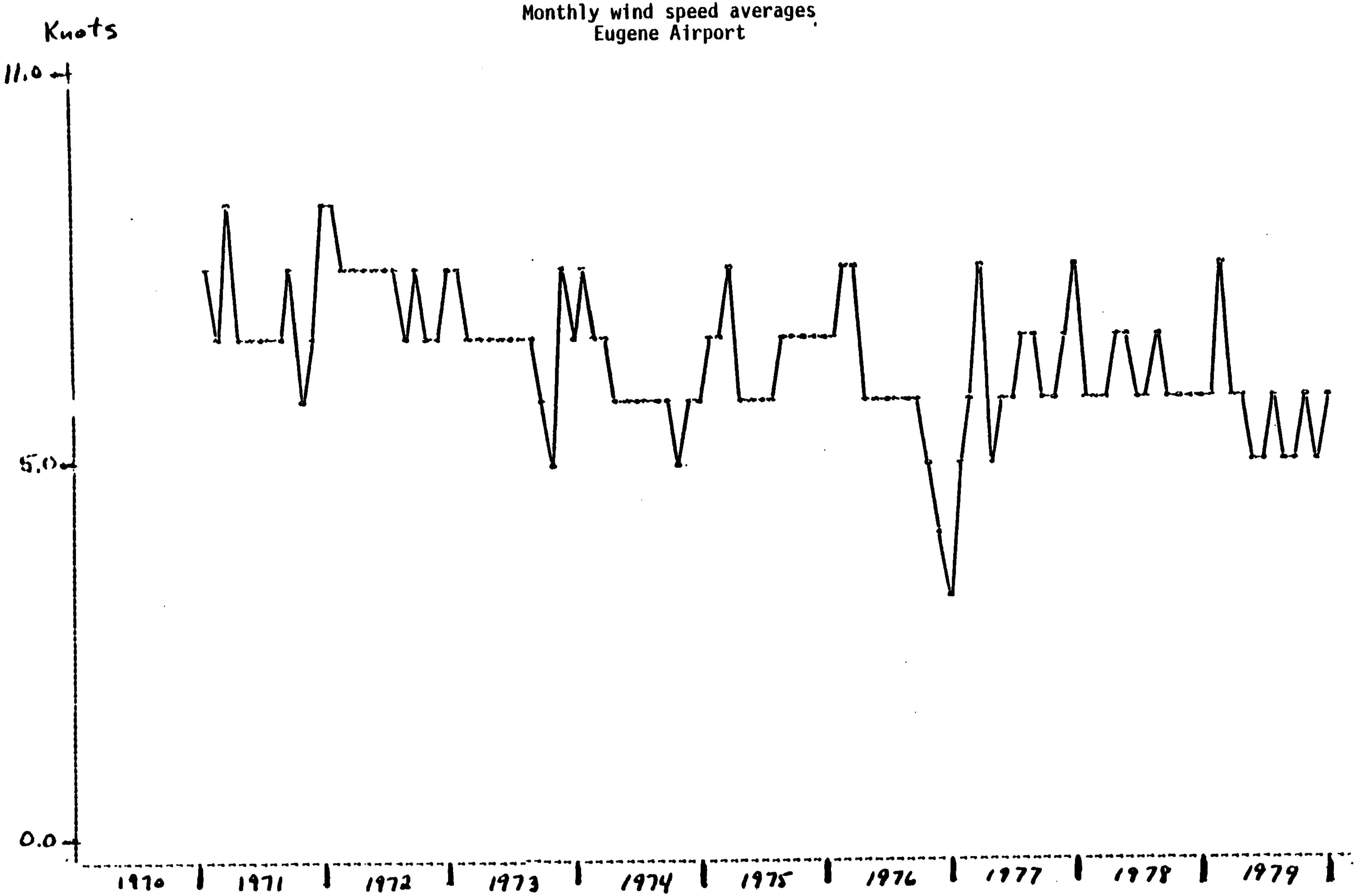


Figure 2.8(c)

Monthly wind speed averages
Portland Hughes/Federal Building

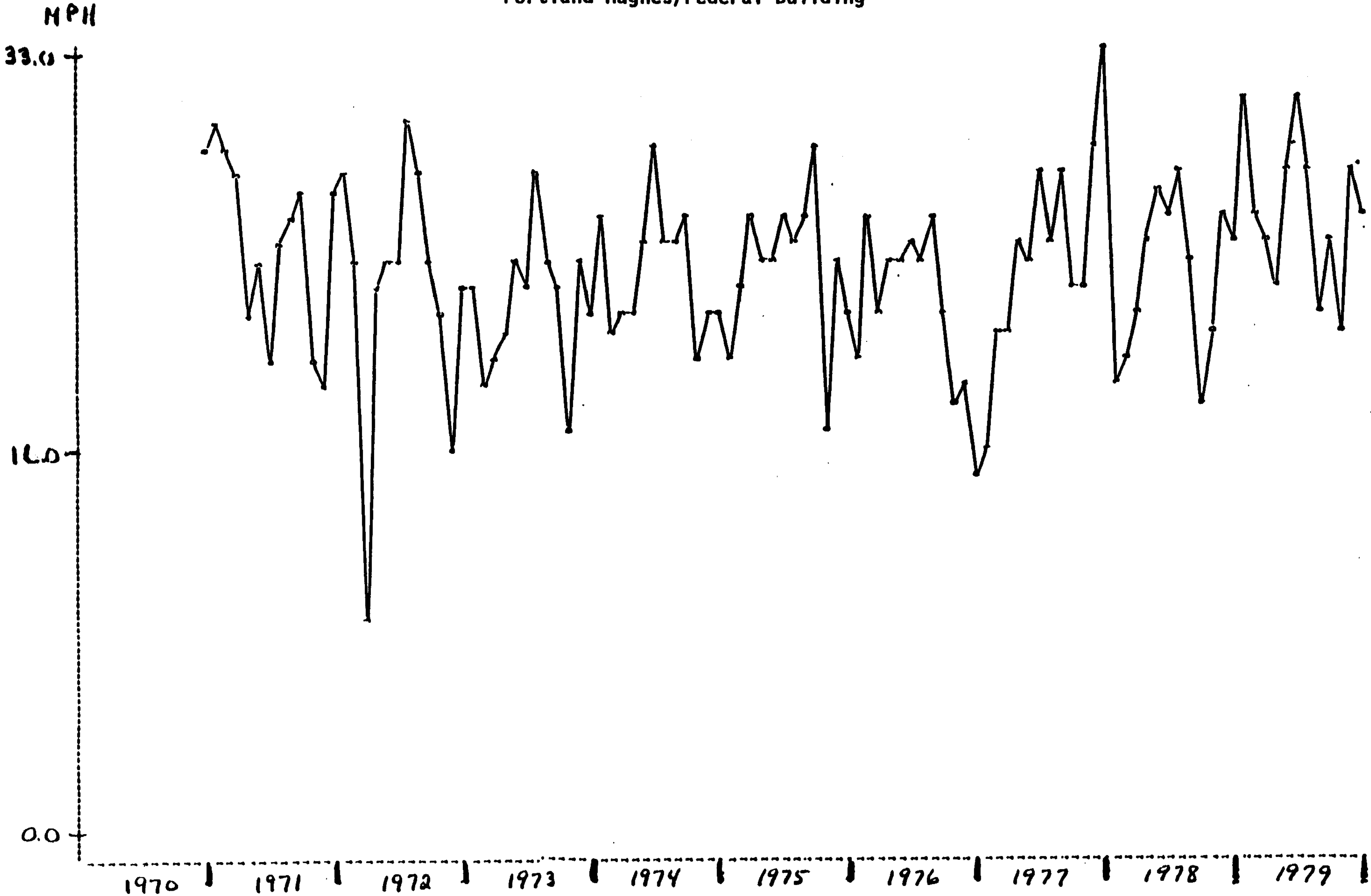
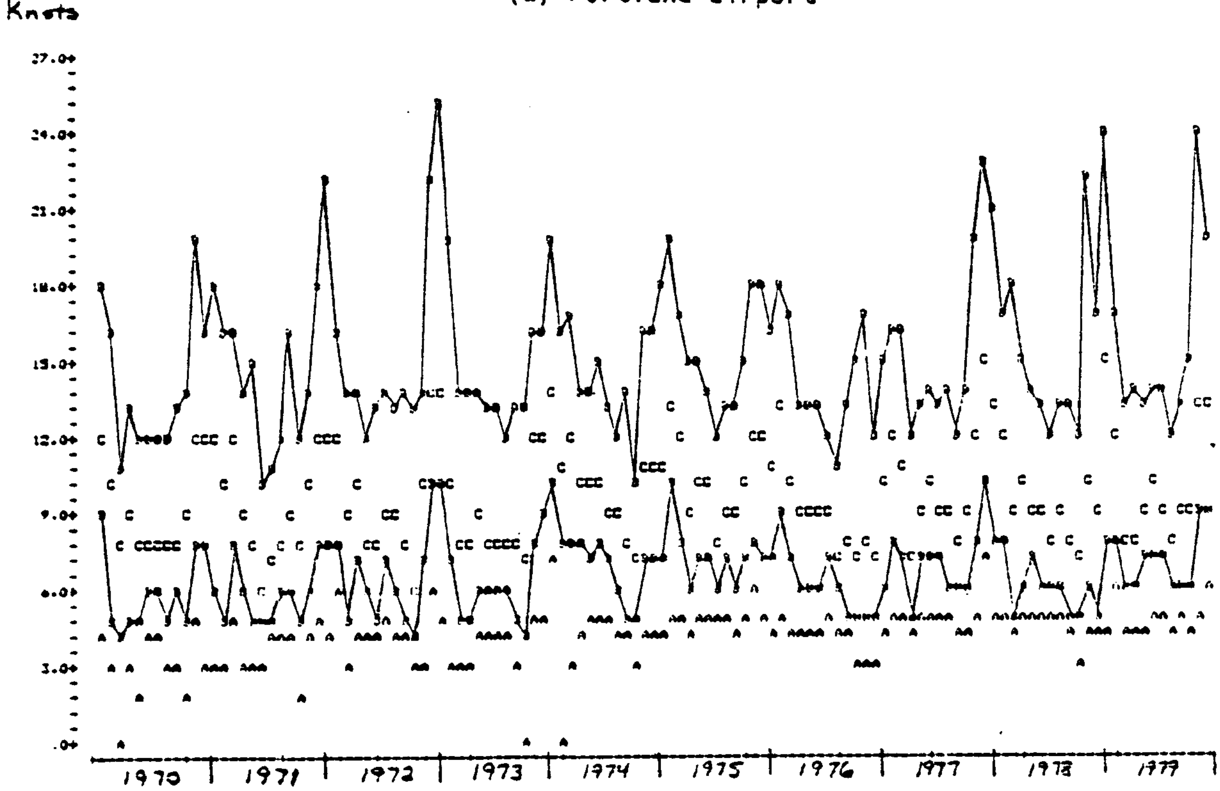


Figure 2.9

Composite plot of monthly 25th, 50th, 75th, and 95th percentiles of wind speed

(a) Portland airport



(b) Eugene airport

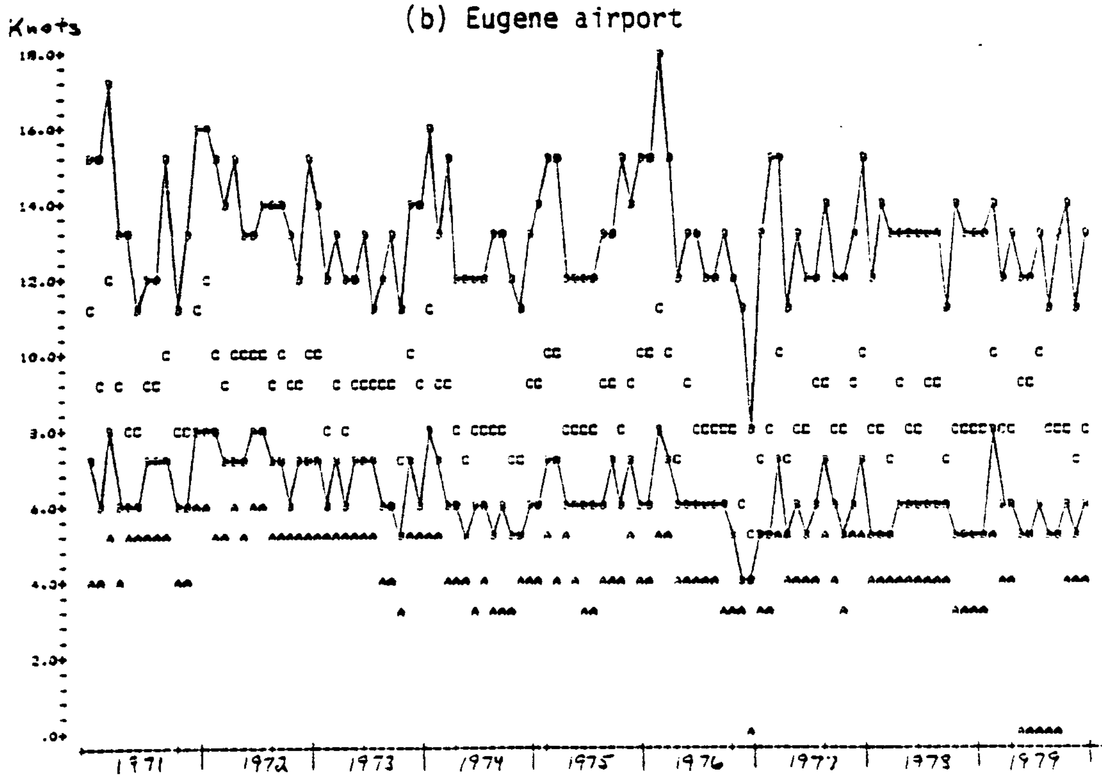


Figure 2.9

Composite plot of monthly 25th, 50th, 75th, 95th percentiles of wind speed

(c) Portland Hughes/Federal Building

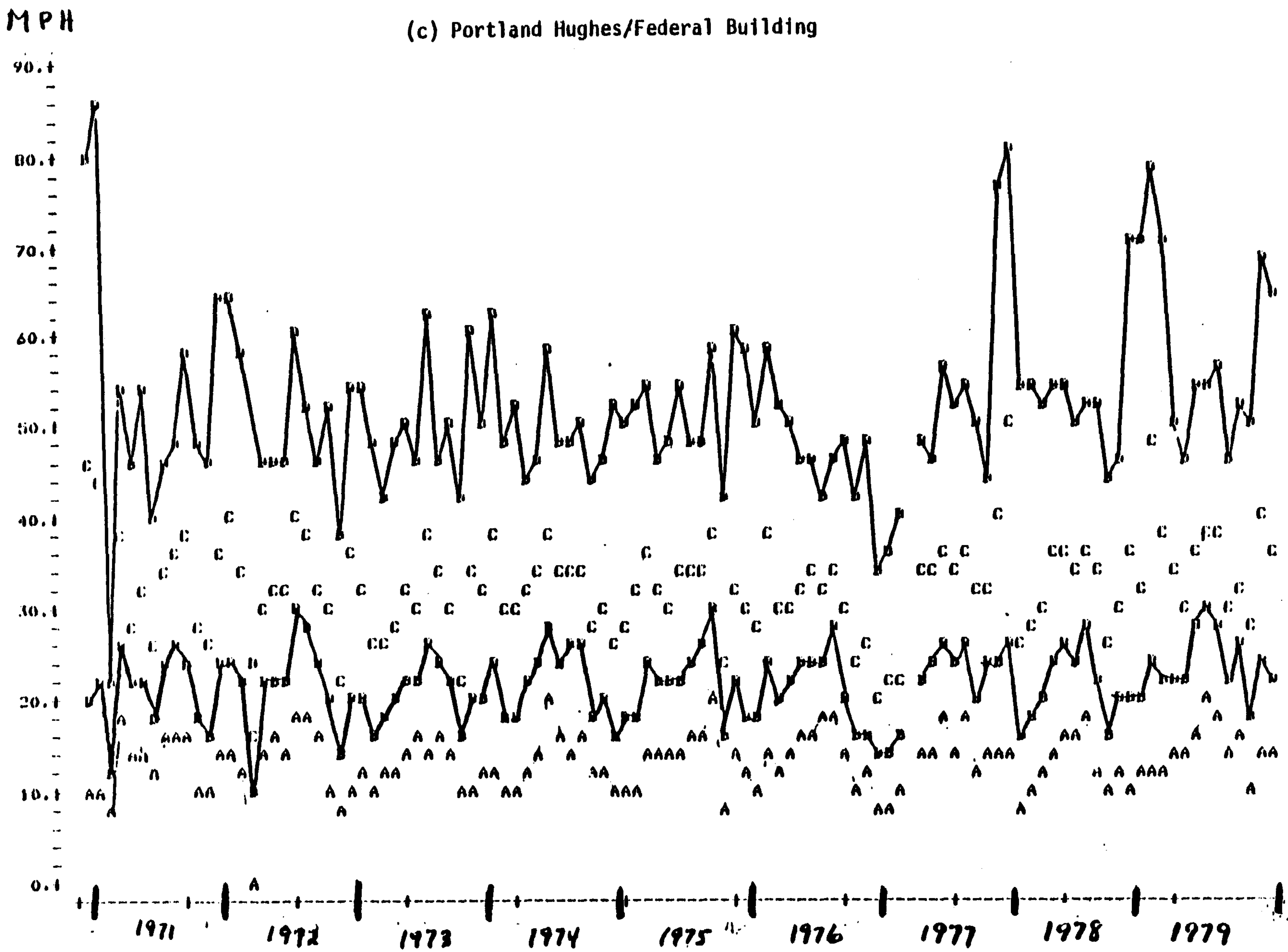
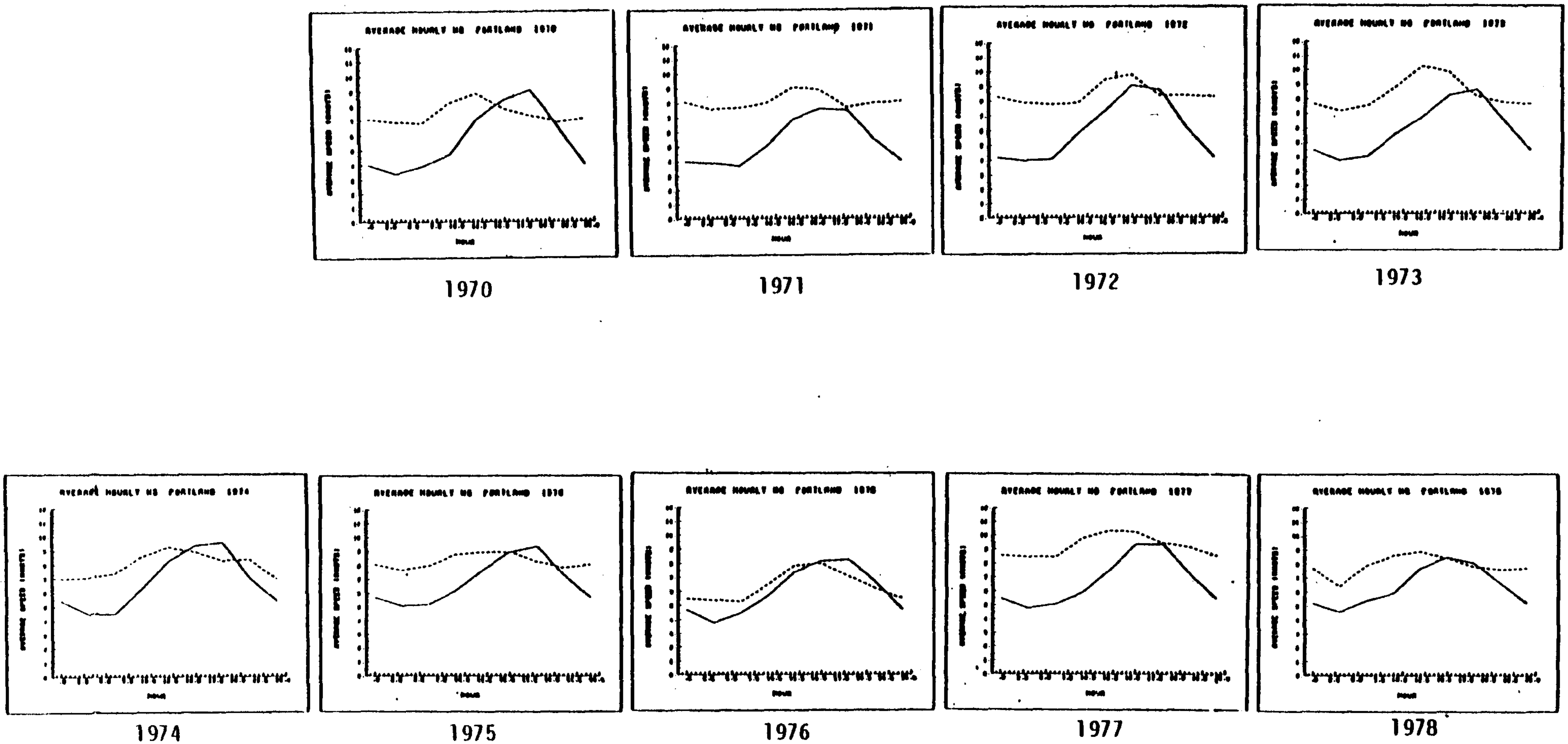


Figure 2.10(a)

Diurnal diagrams of hourly wind speed averages--Portland Airport



——————— Summer

- - - - - - - Winter

Figure 2.10(b)

Diurnal diagrams of hourly wind speed averages--Eugene Airport

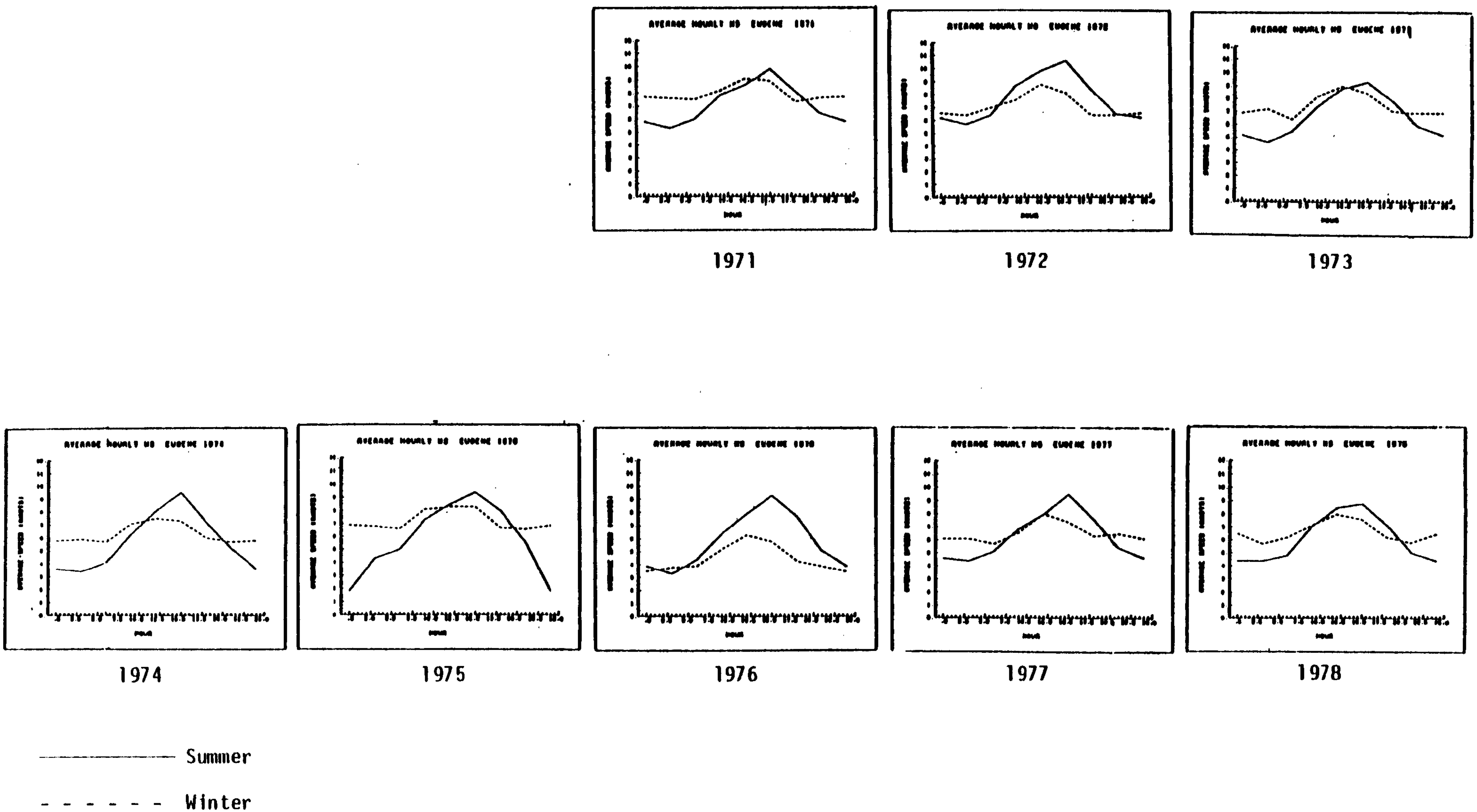
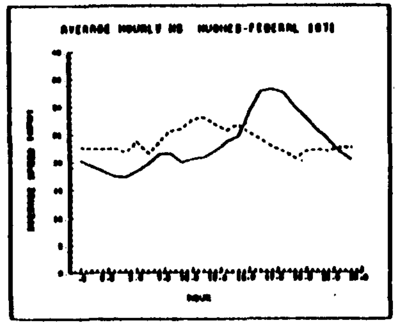
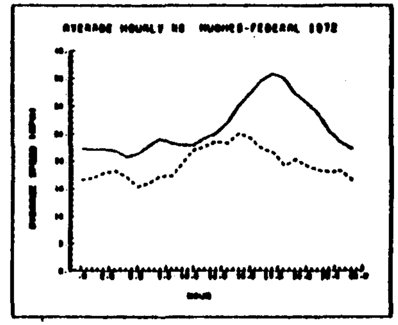
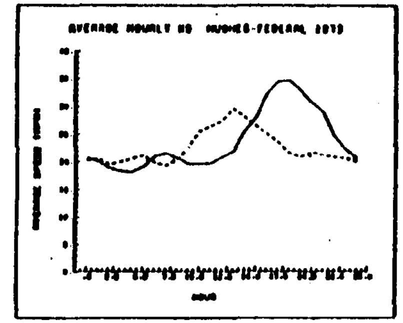


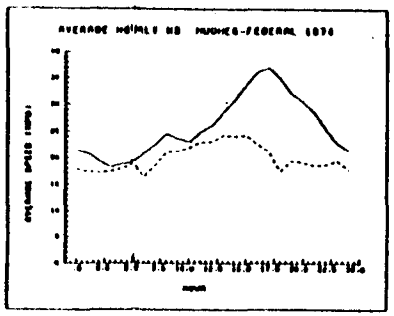
Figure 2.10(c)

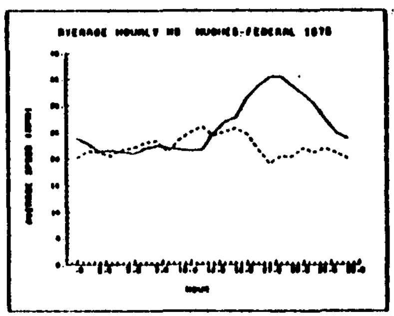
Diurnal diagrams of hourly wind speed averages--Portland Hughes/Federal Building

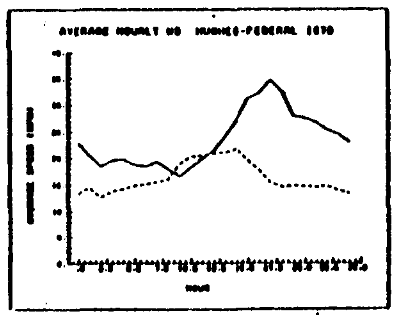

1971

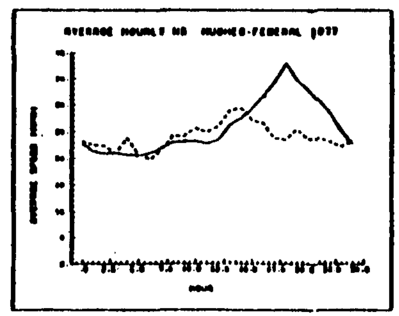

1972

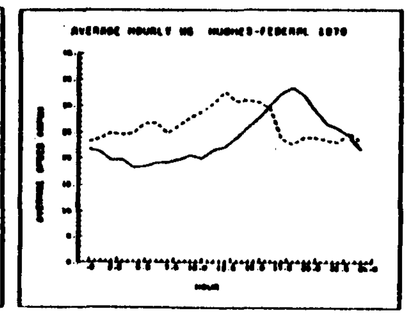

1973


1974


1975


1976


1977


1978

———————— Summer

- - - - - - Winter

Figure 2.11

Relative Frequency of wind direction

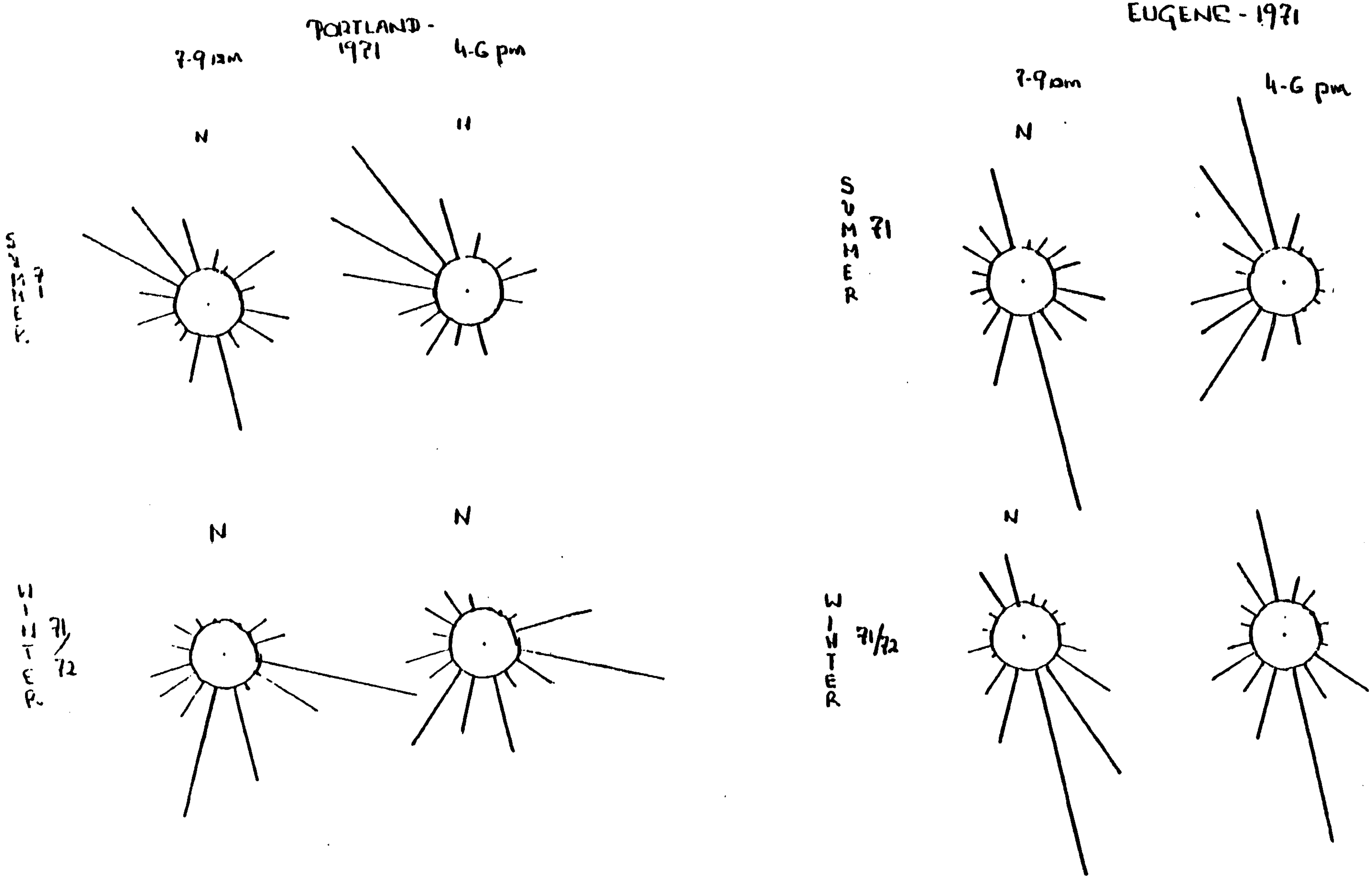


Figure 2.12(a)

Scatter diagrams of wind vectors--1971

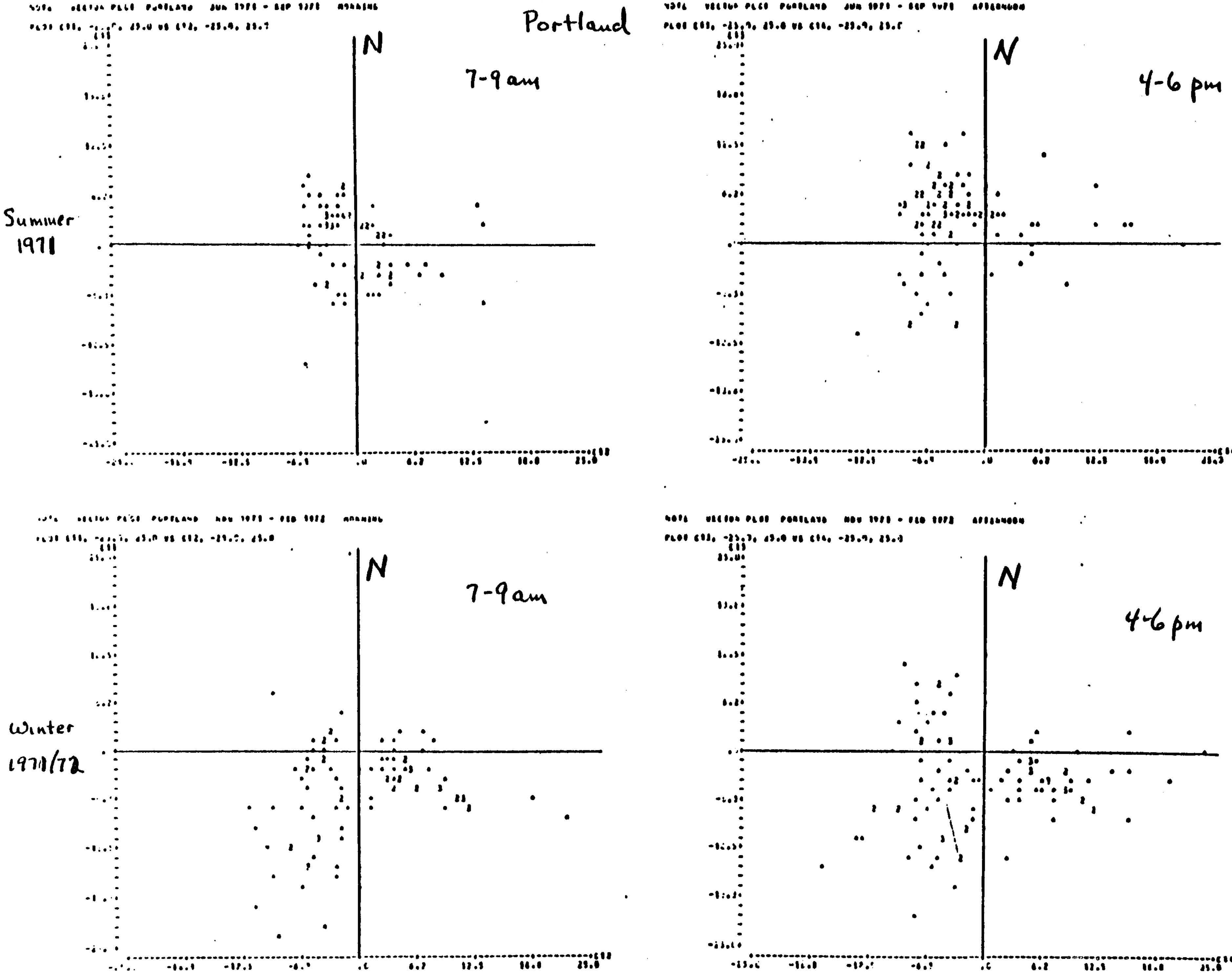
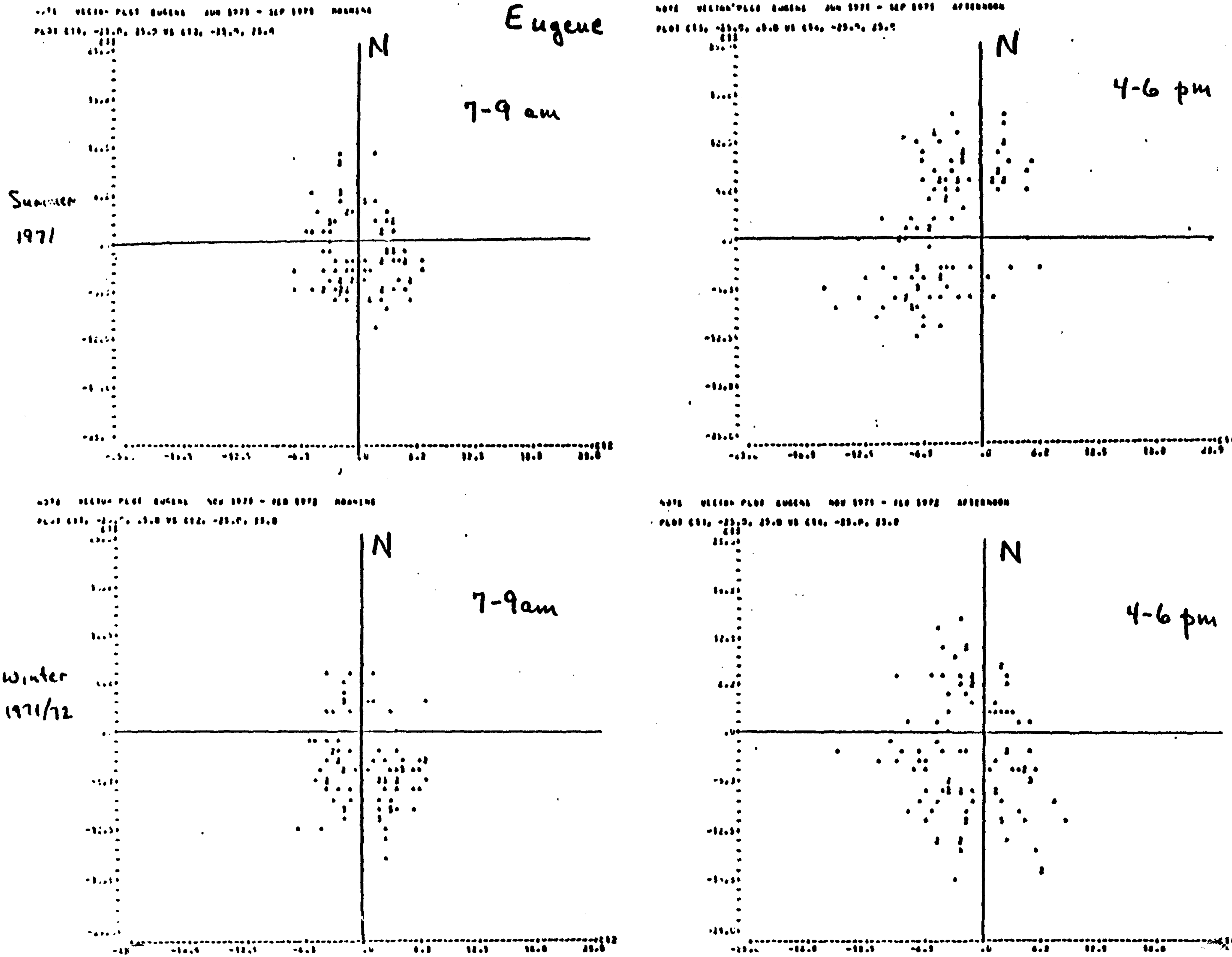


Figure 2.12(a) cont.
Scatter diagrams of wind vectors--1971



Scatter diagrams of wind vectors--1976

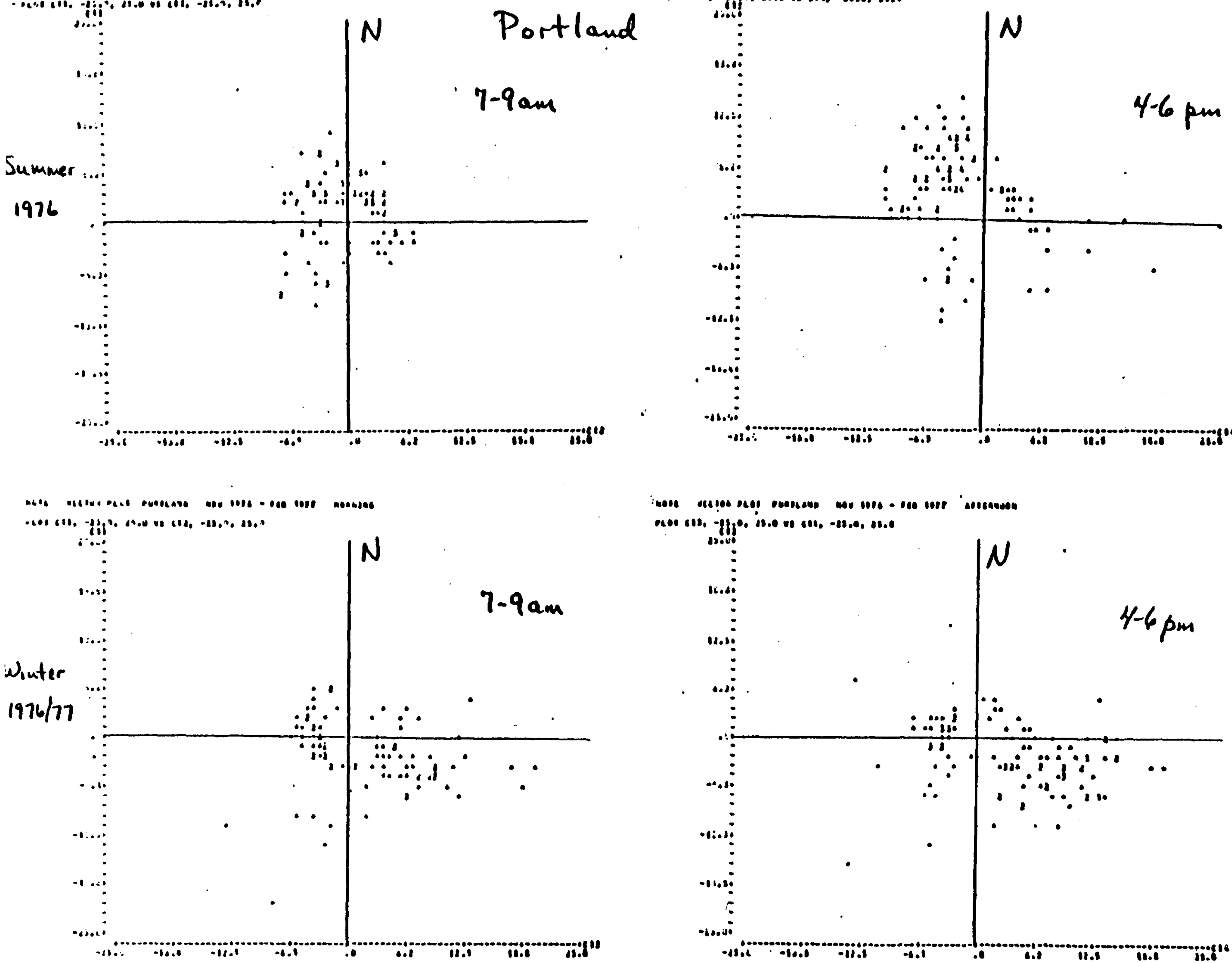


Figure 2.12(b) cont.
Scatter diagrams of wind vectors--1976

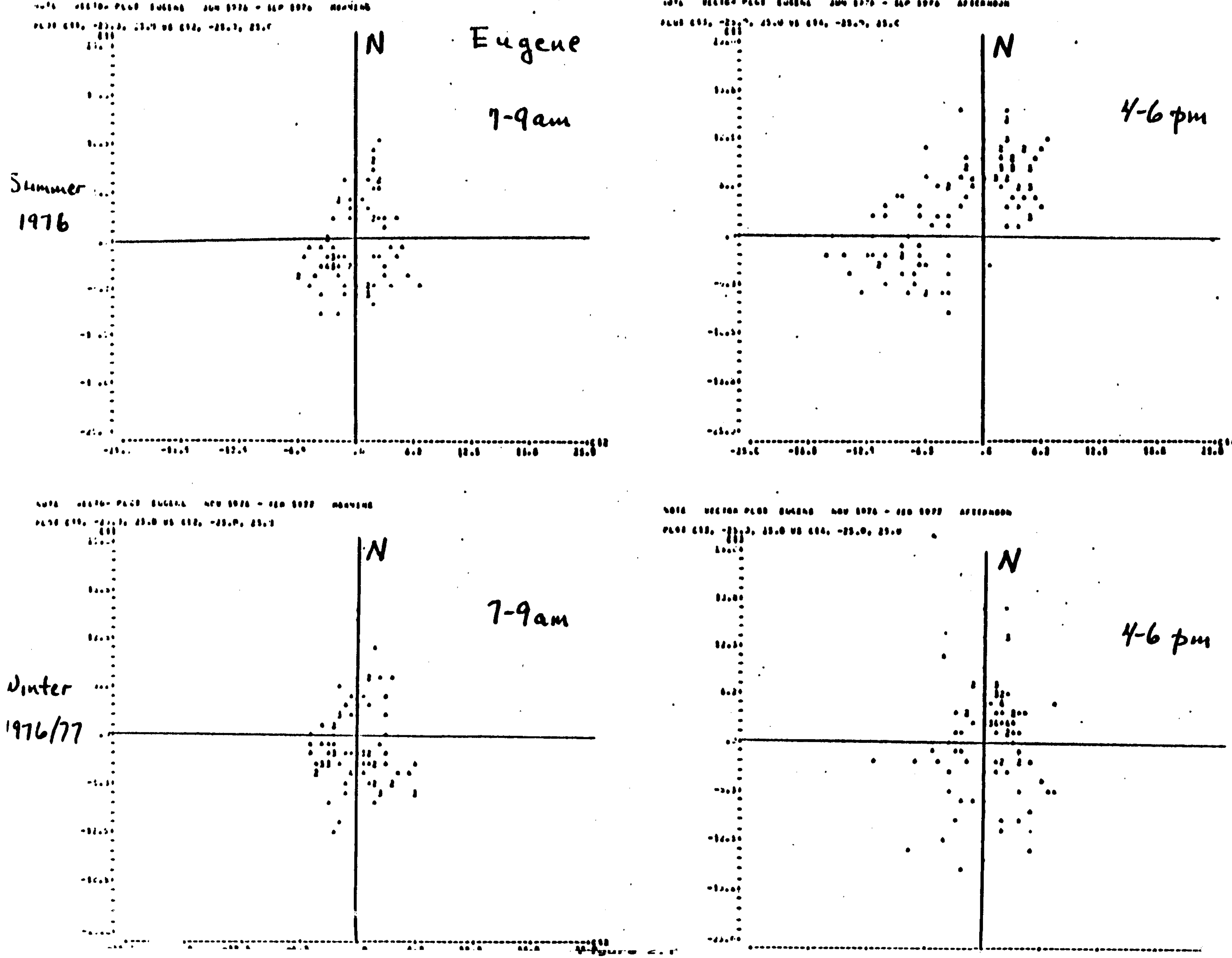


Figure 2.1

Plot of monthly mixing height averages at Salem

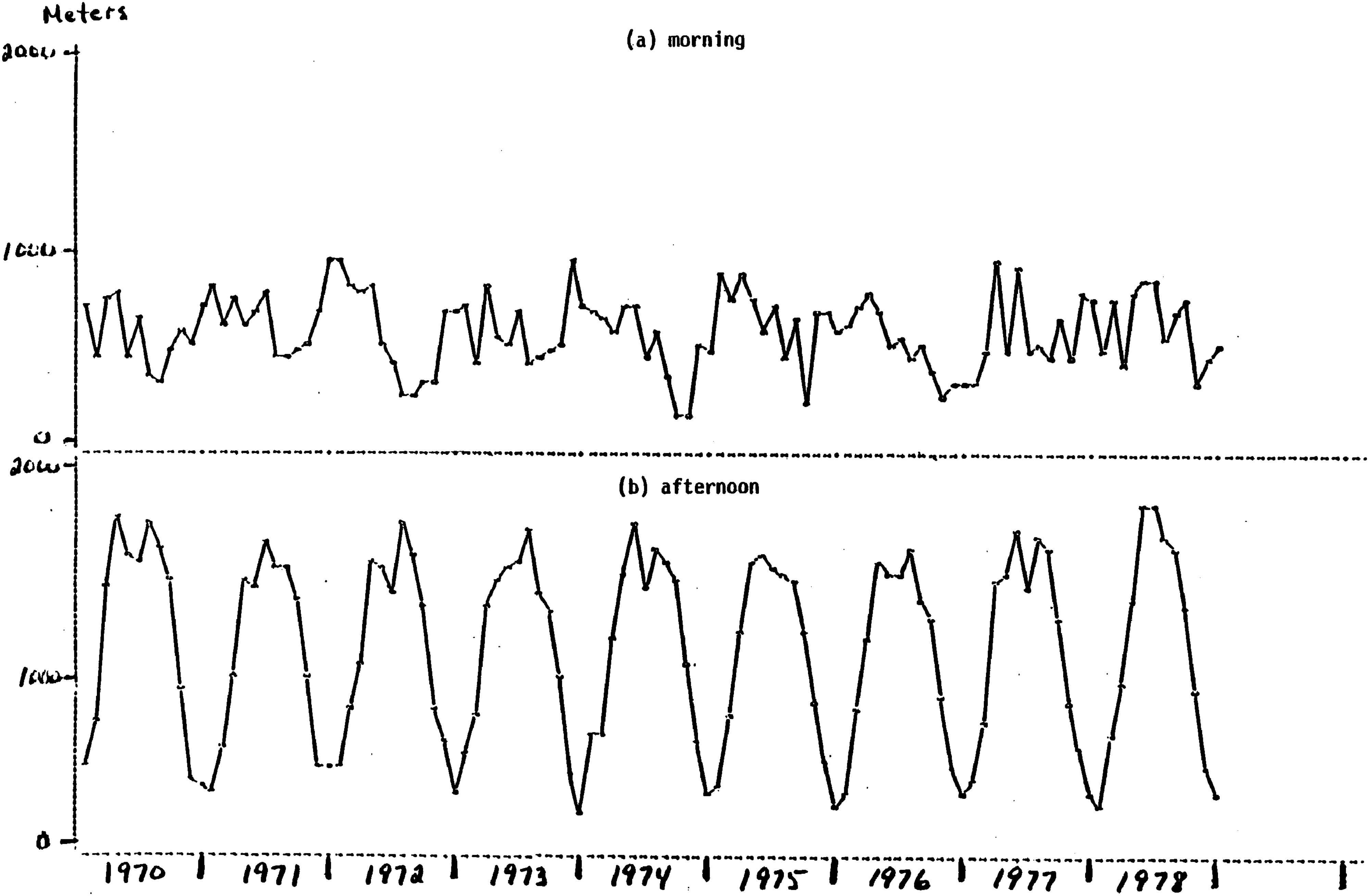


Figure 2.14(a)

Plot of monthly averages of relative humidity--Portland

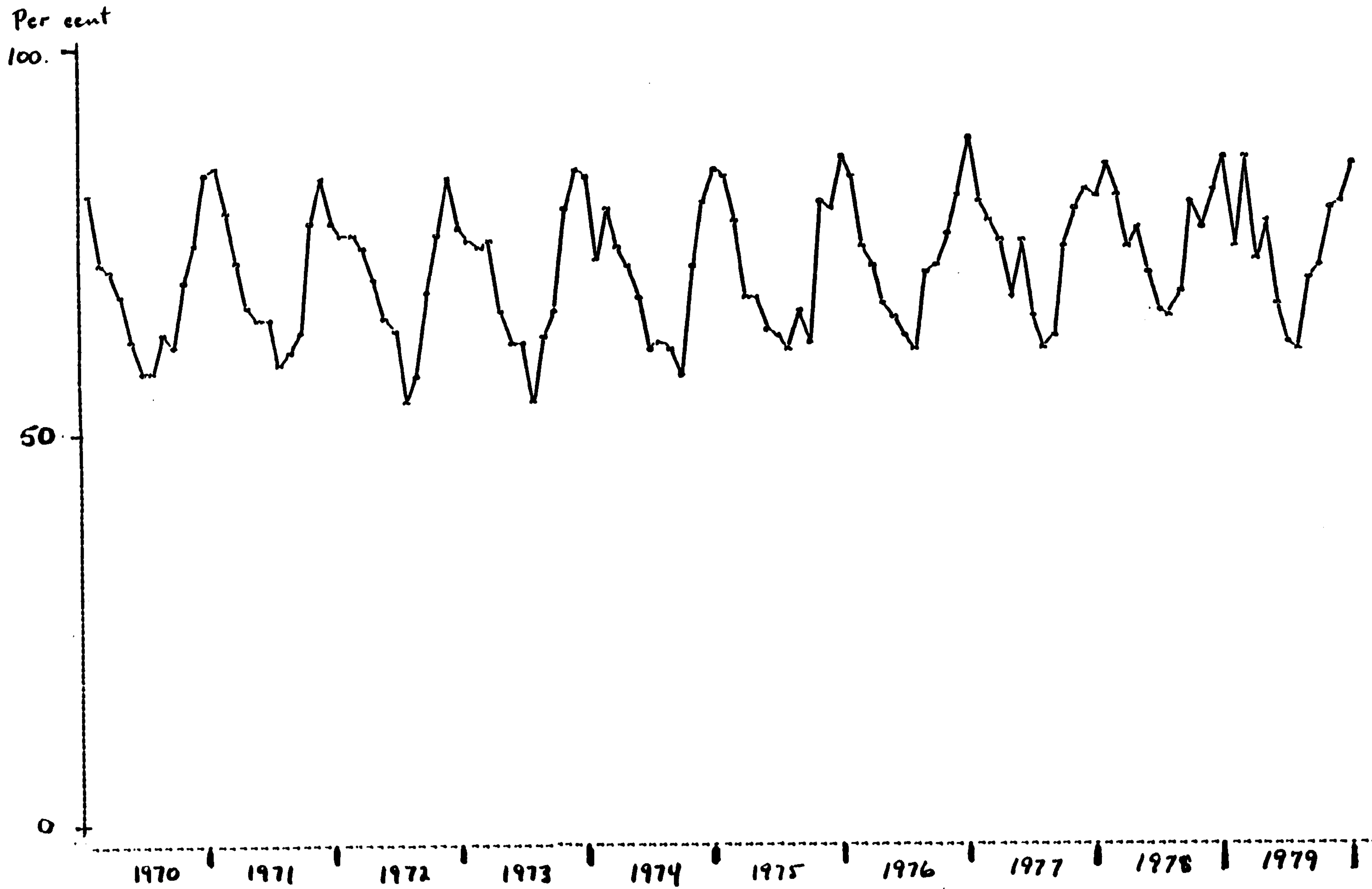


Figure 2.14(b)

Plot of monthly averages of relative humidity--Eugene

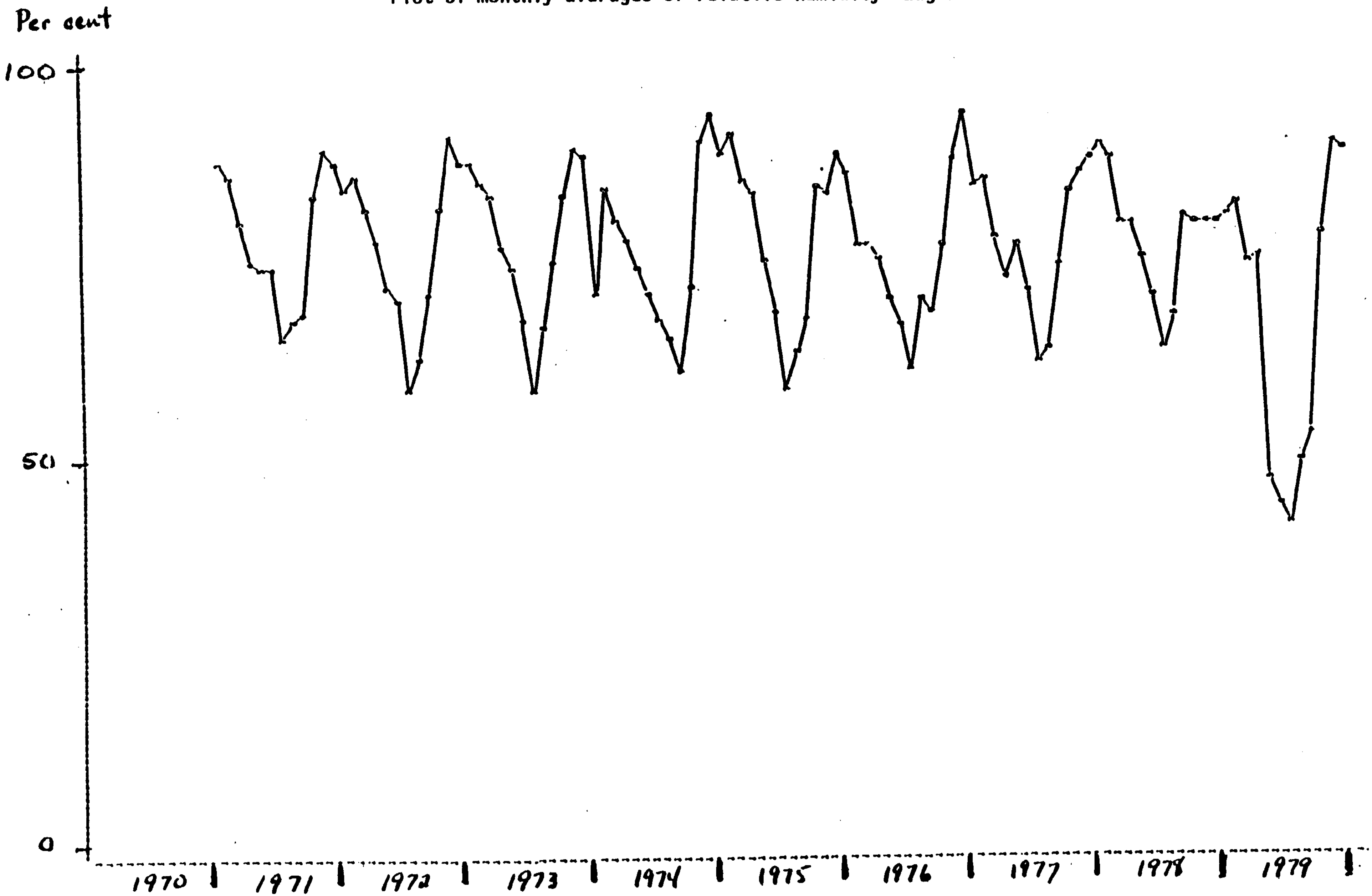
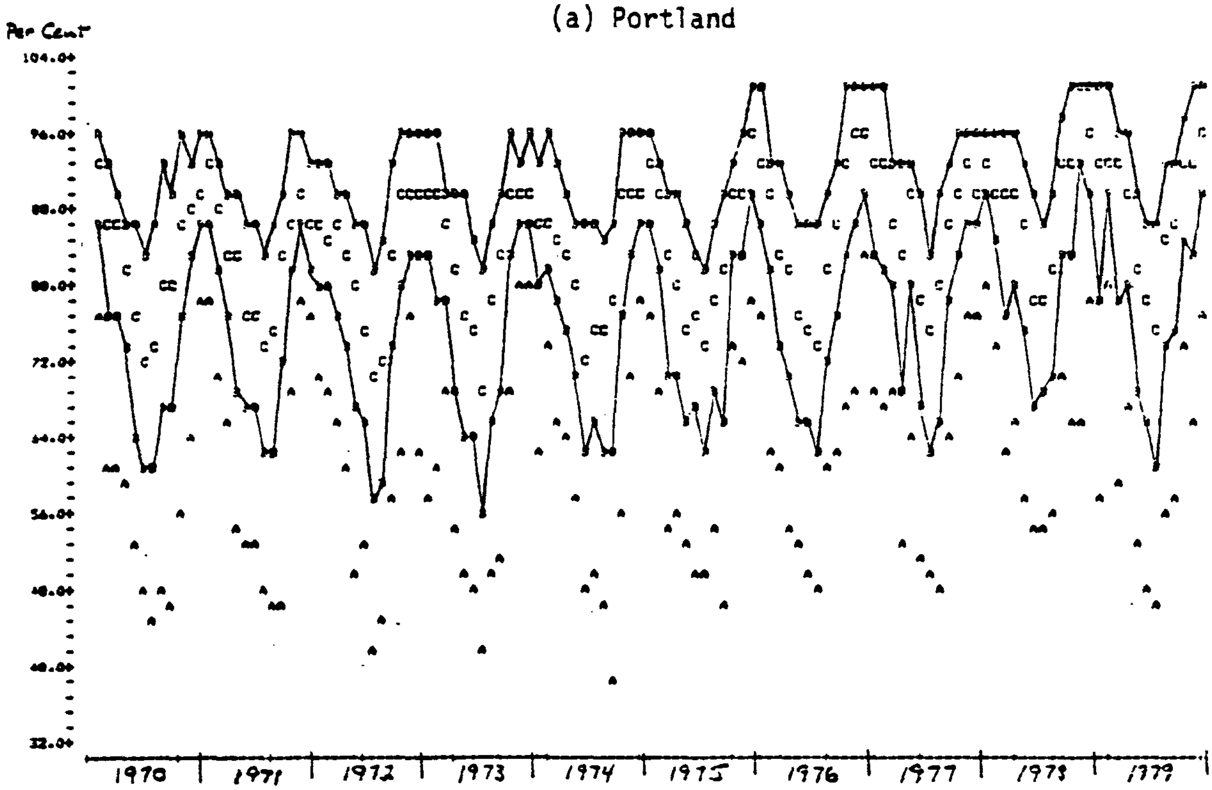


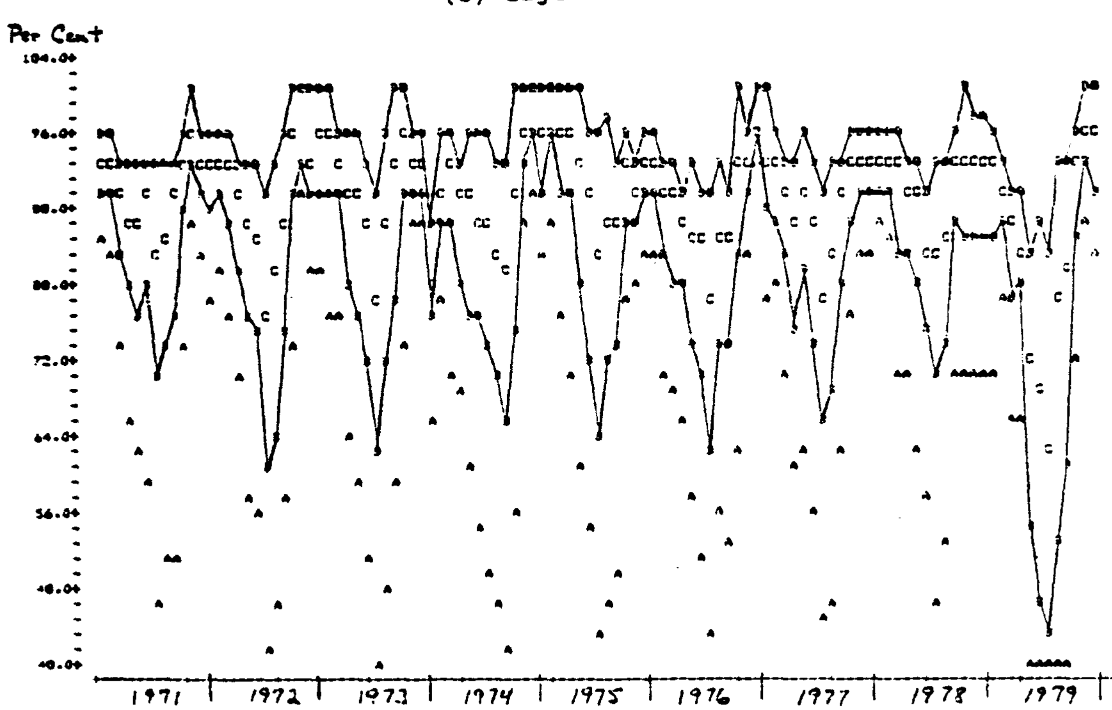
Figure 2.15

Composite percentile plots of monthly 25th, 50th, 75th, and 95th percentiles of relative humidity

(a) Portland



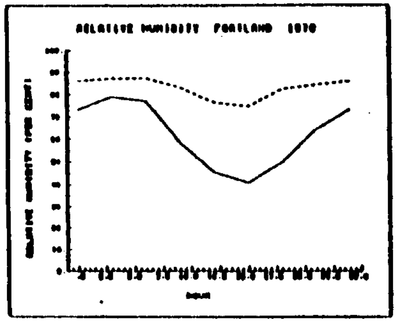
(b) Eugene



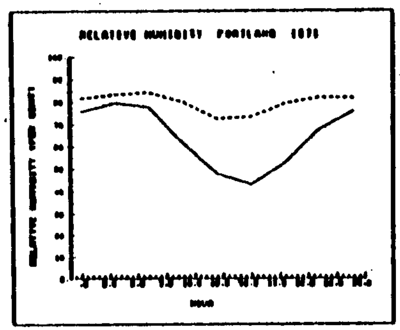
(A 25th, B 50th, C 75th, D 95th)

Figure 2.16(a)

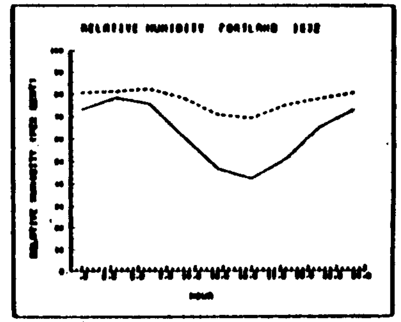
Diurnal diagrams of hourly averages of relative humidity--Portland



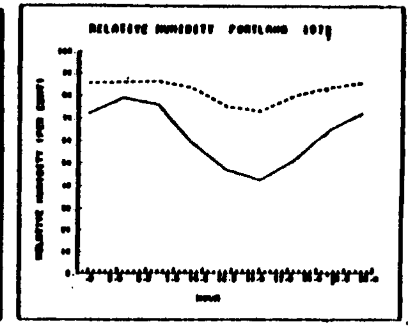
1970



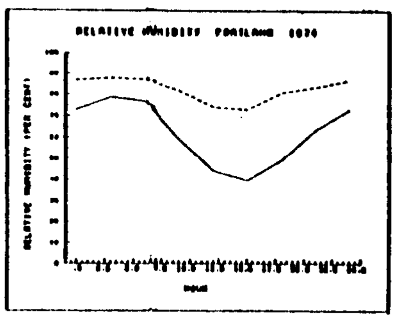
1971



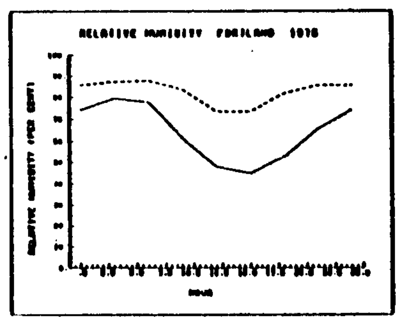
1972



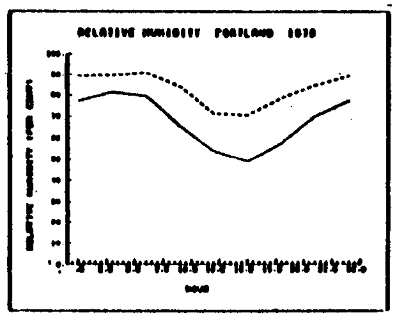
1973



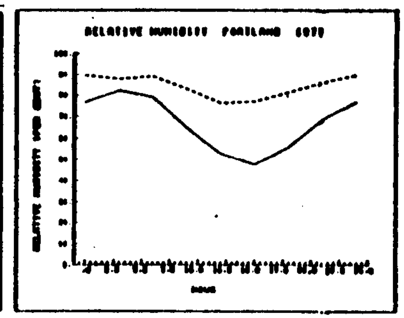
1974



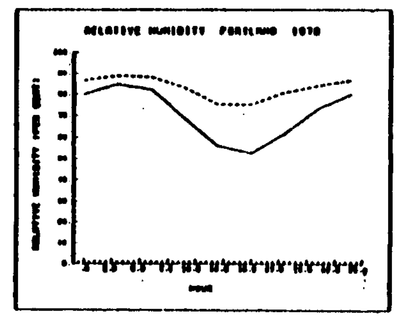
1975



1976



1977



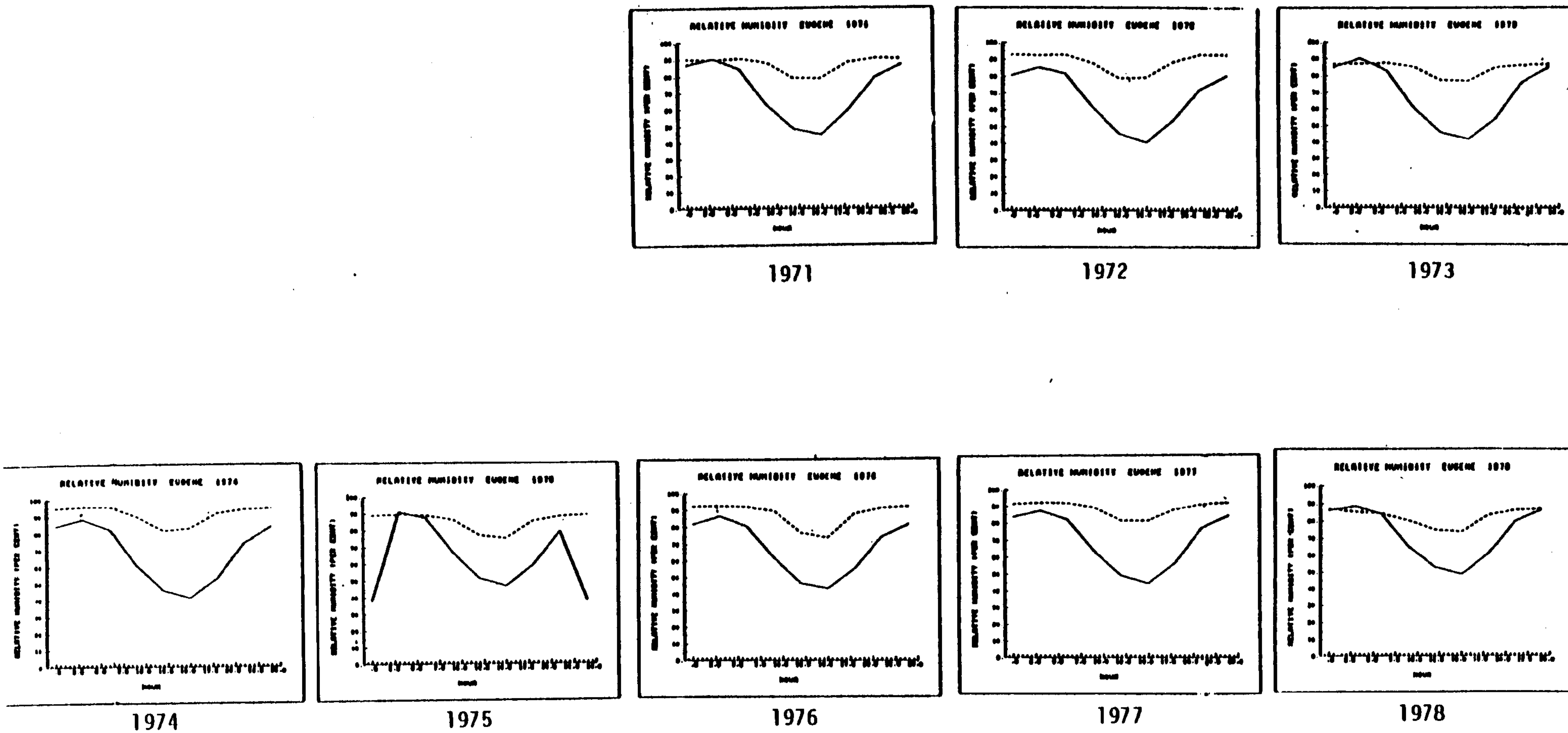
1978

——————— Summer

- - - - - - Winter

Figure 2.16(b)

Diurnal diagrams of hourly averages of relative humidity--Eugene



———————— Summer

- - - - - - Winter

Figure 2.17(a)

Plot of monthly frequencies of precipitation--Portland

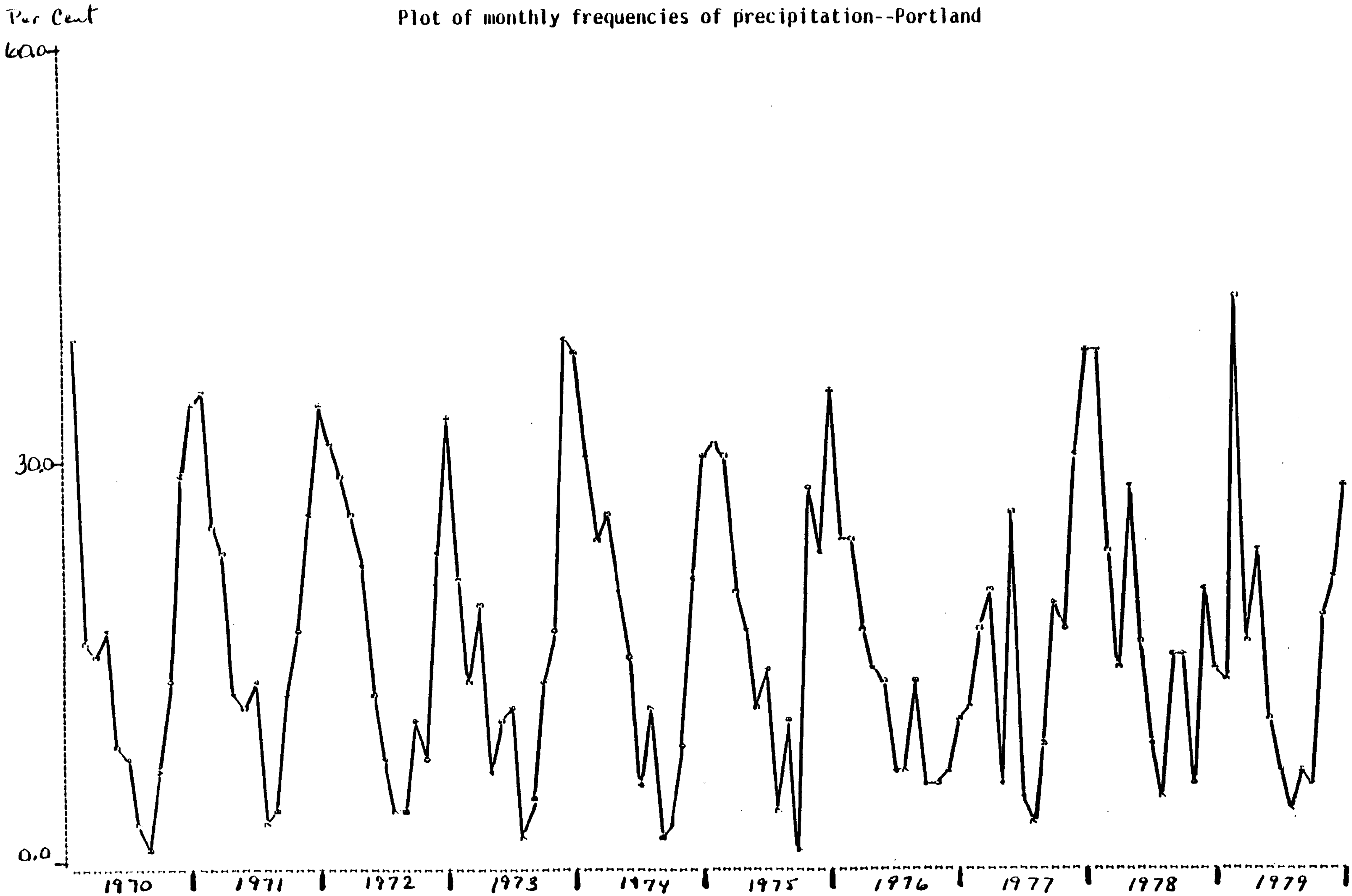


Figure 2.17(b)

Plot of monthly frequencies of precipitation--Eugene

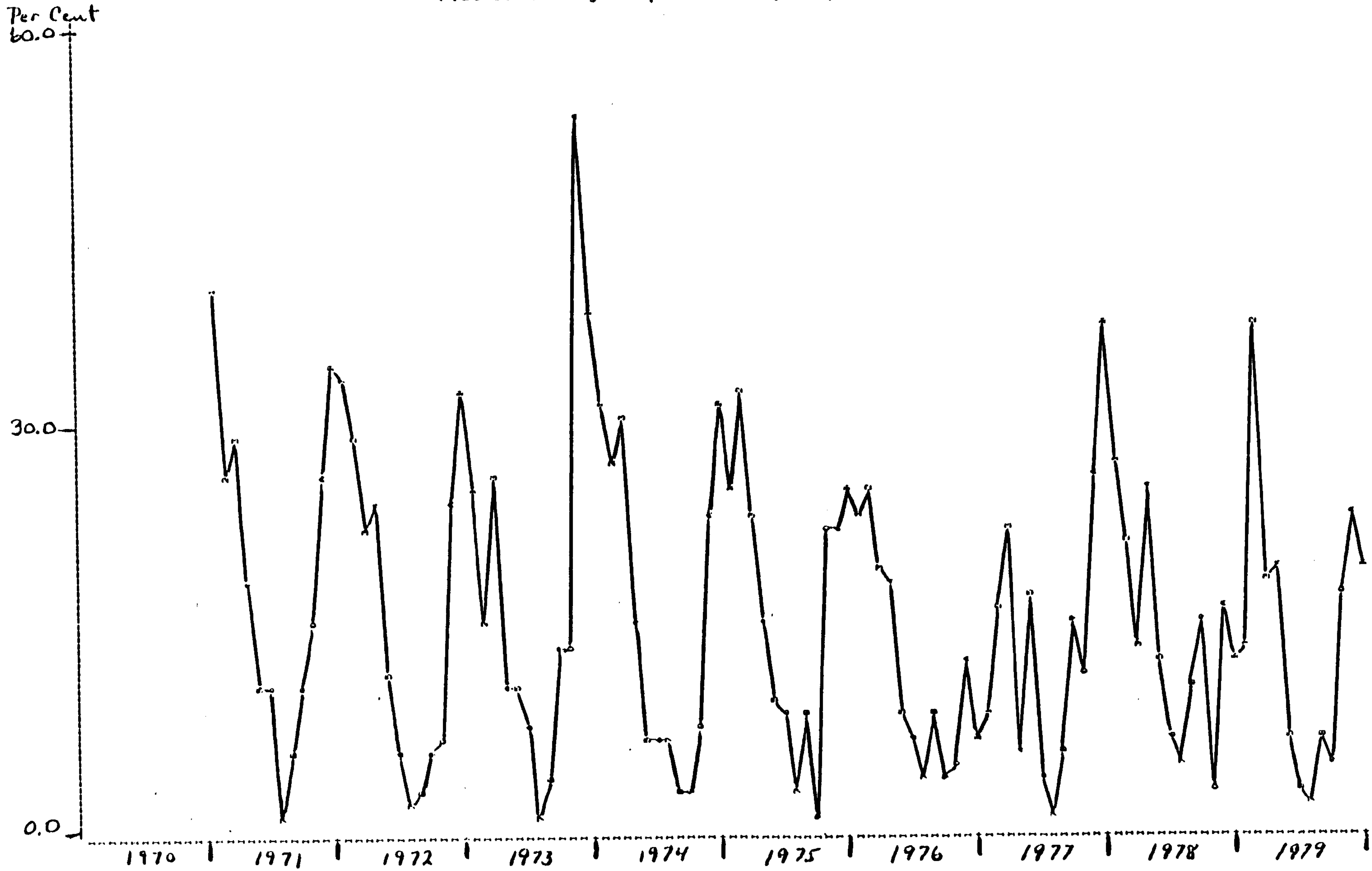
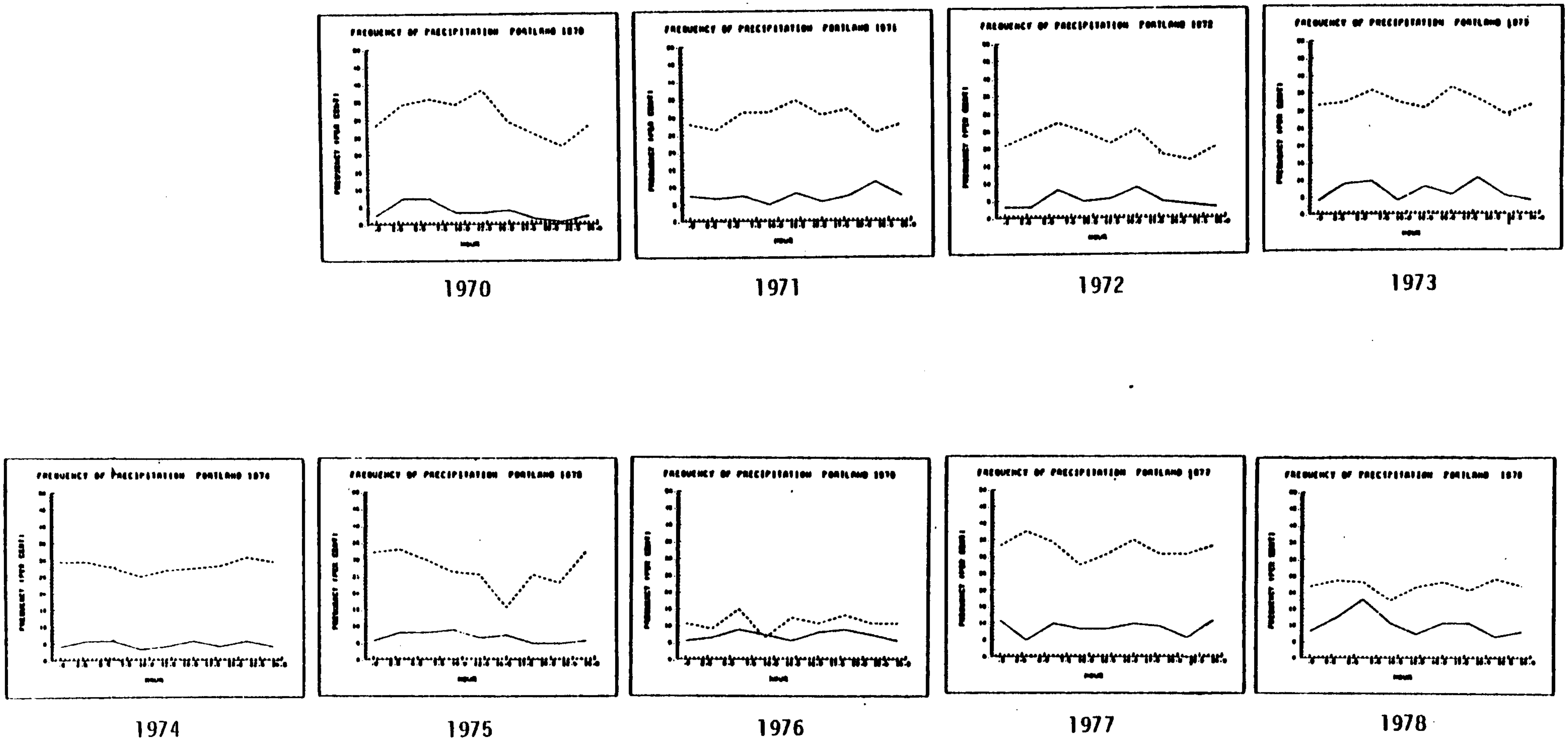


Figure 2.18(a)

Diurnal diagrams of hourly precipitation frequencies--Portland

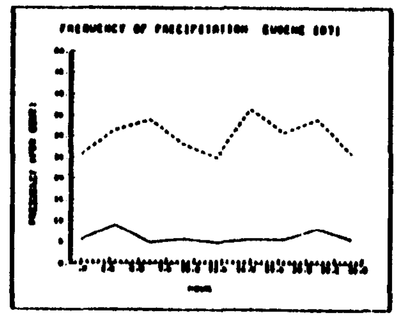


Summer

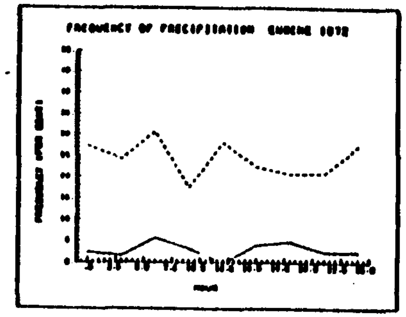
Winter

Figure 2.18(b)

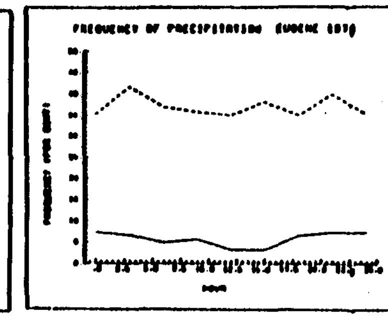
Diurnal diagrams of hourly precipitation frequencies--Eugene



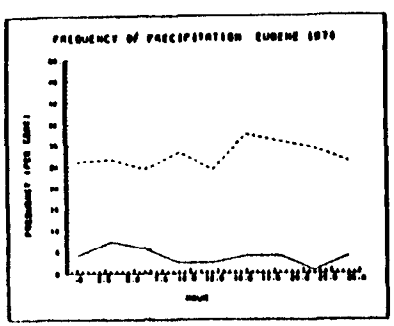
1971



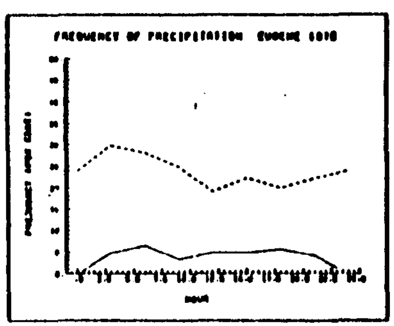
1972



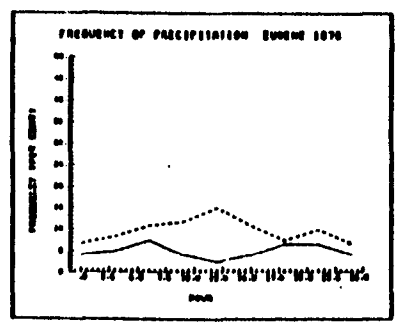
1973



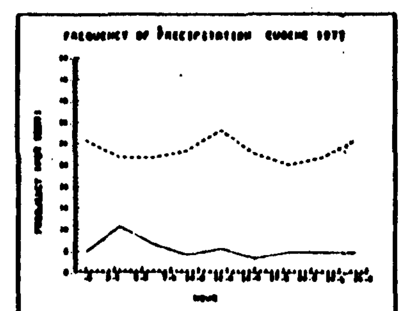
1974



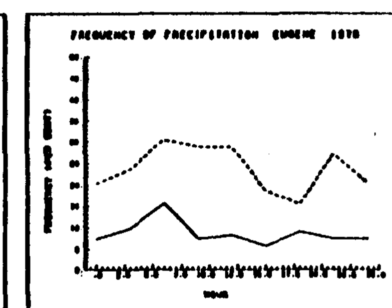
1975



1976



1977



1978

———————— Summer

- - - - - - Winter

Figure 2.19(a)

Plot of monthly temperature averages--Portland

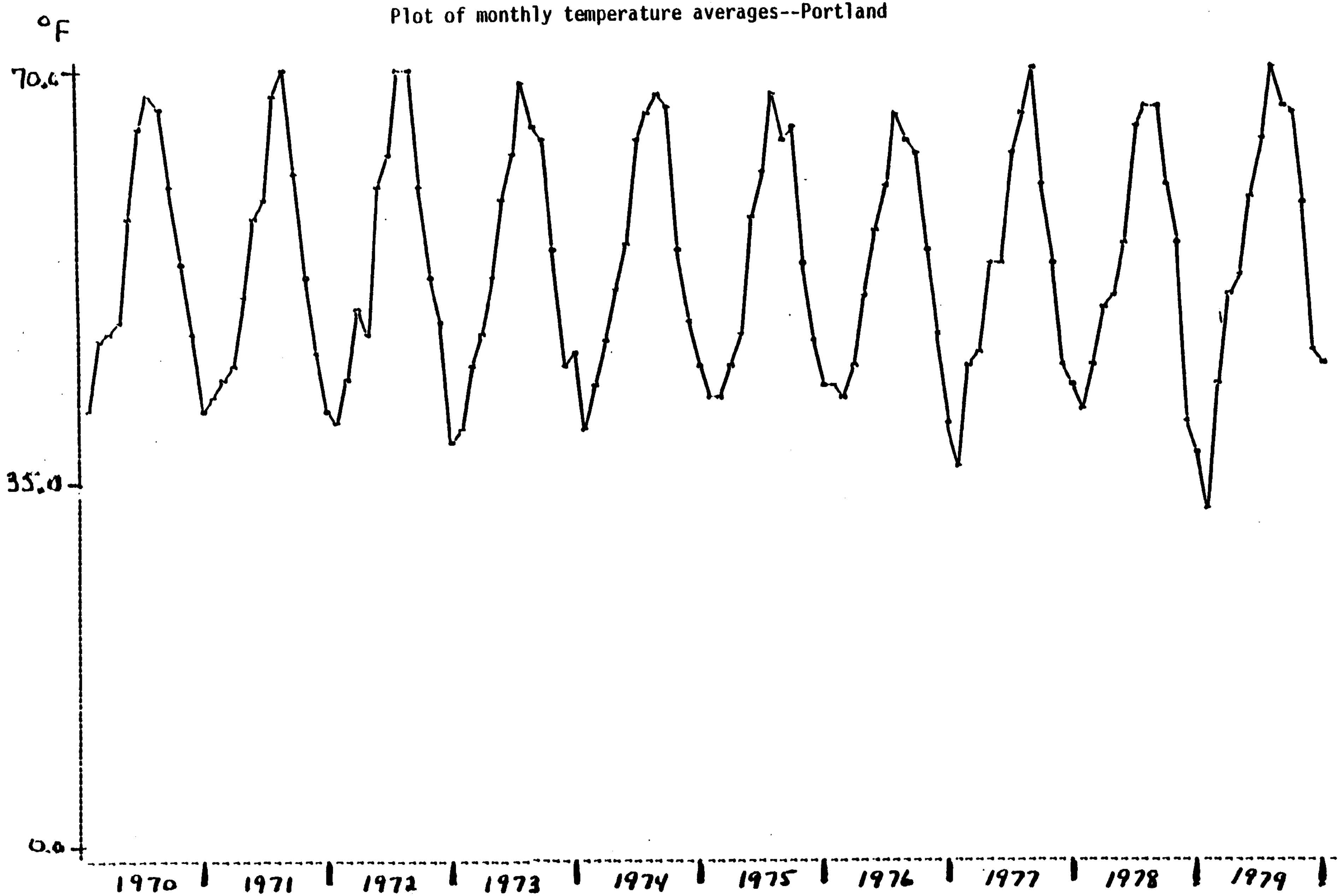


Figure 2.19(b)

Plot of monthly temperature averages--Eugene

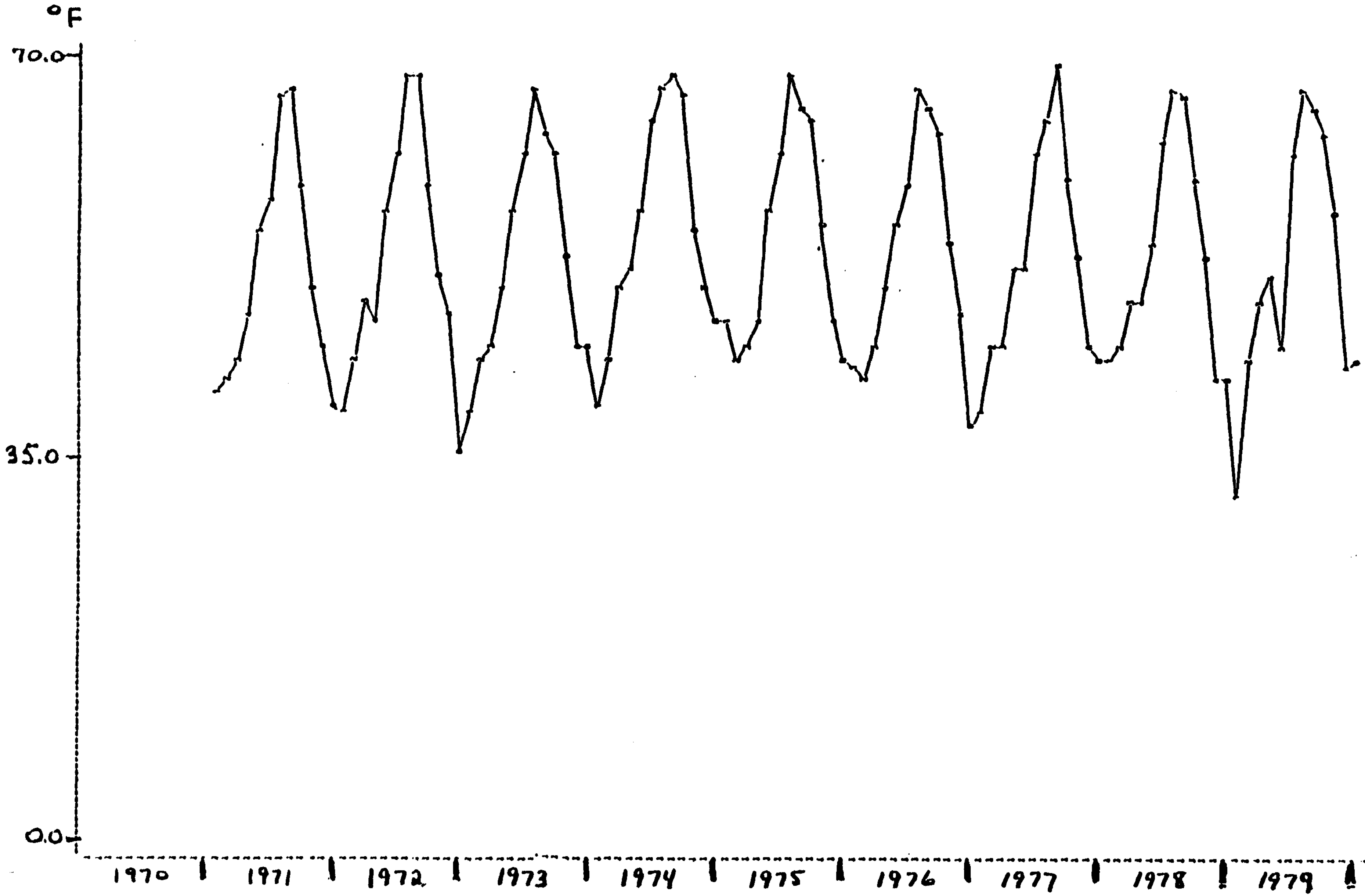
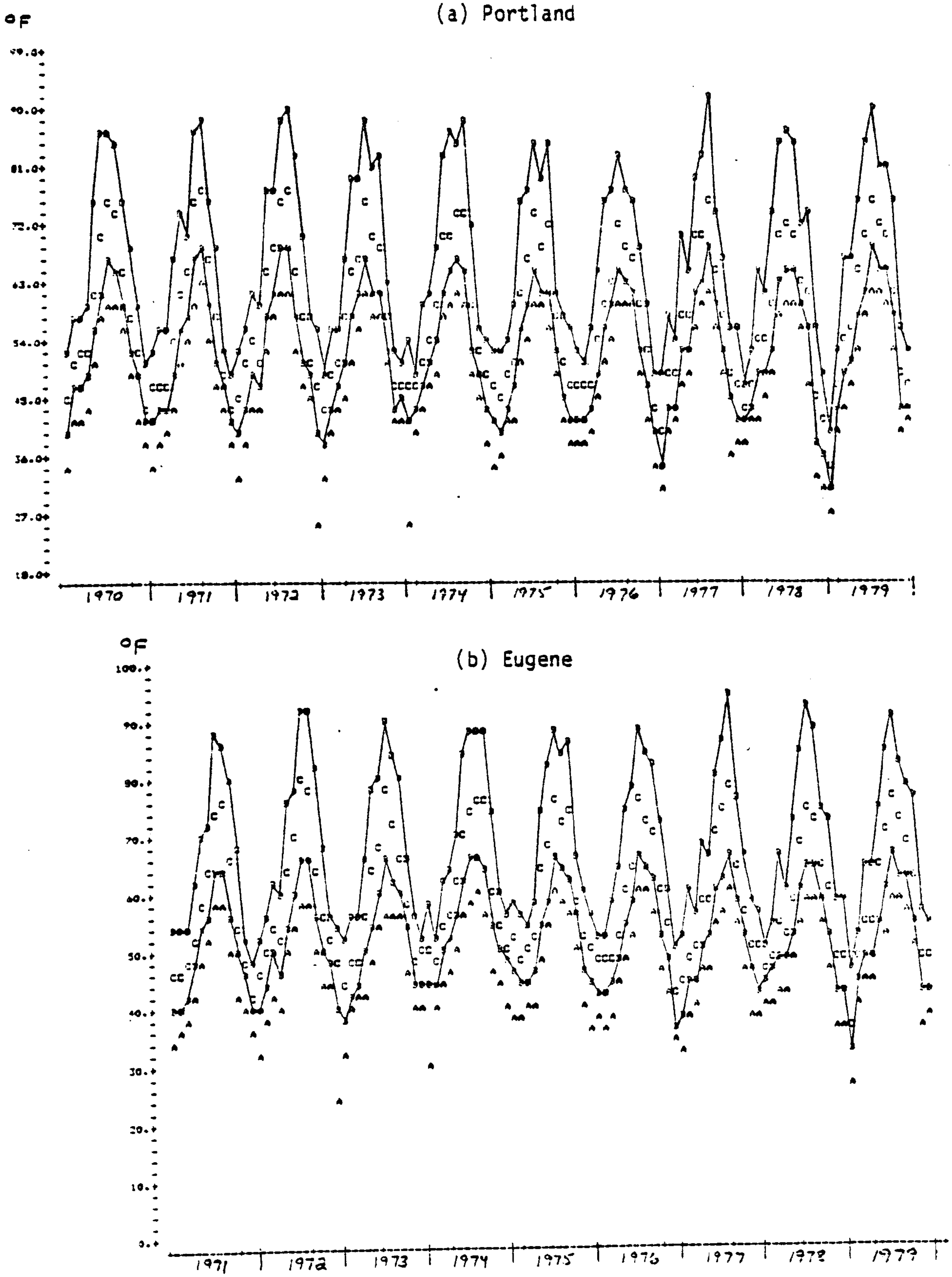


Figure 2.20

Composite percentile plots of monthly
25th, 50th, 75th, and 95th percentiles



(A 25th, B 50th, C 75th, D 95th)

Figure 3.1

Diurnal CO averages for Eugene, summer 1978

——— weekday - - - weekend

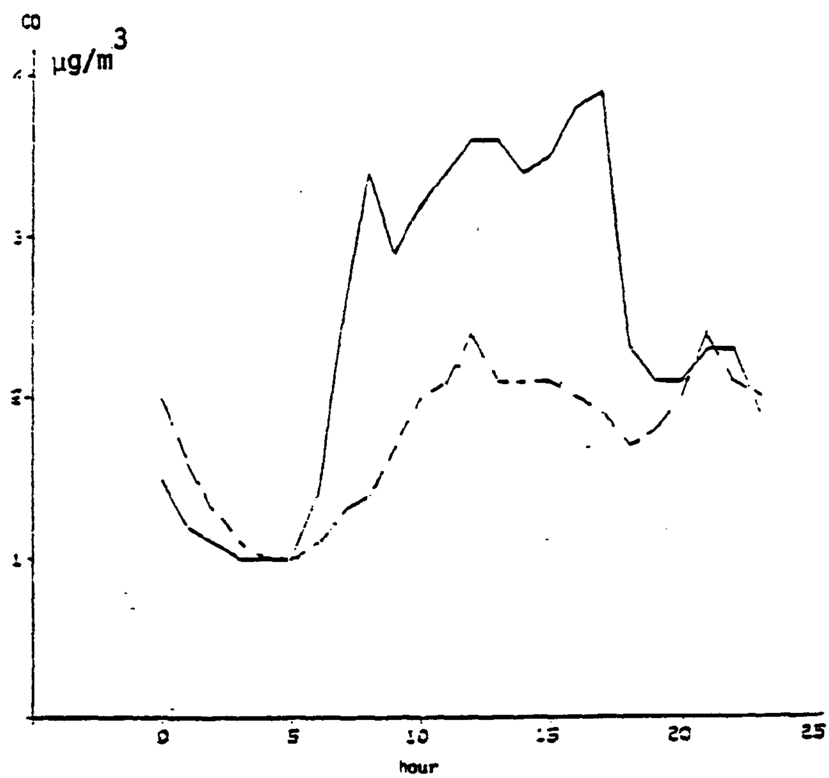


Figure 3.2

Diurnal traffic averages for Eugene, summer 1978 (in thousands of cars)

——— weekday - - - weekend

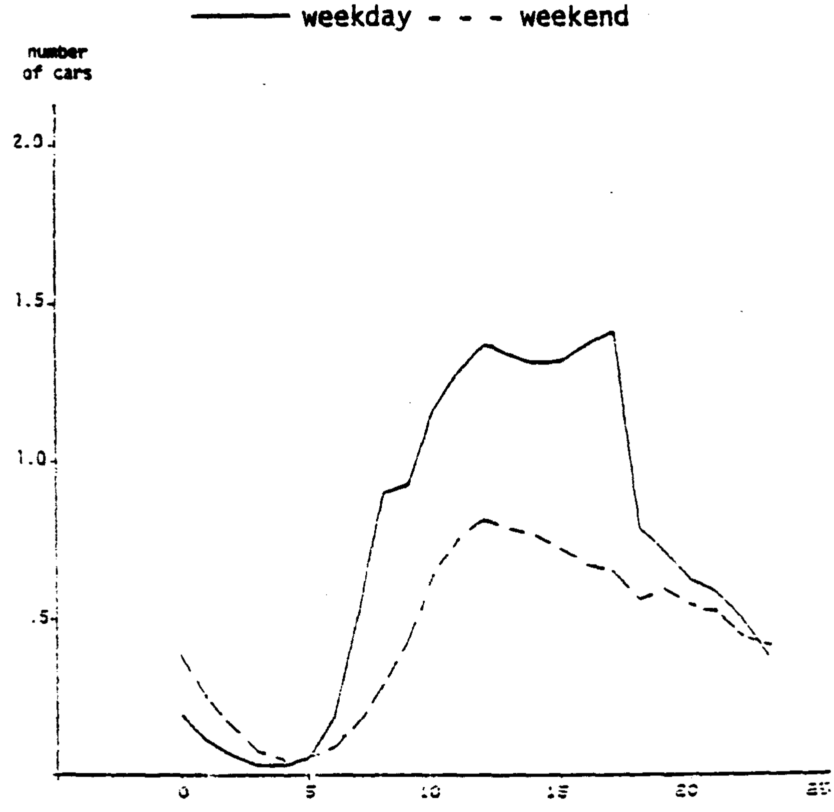


Figure 3.3

Plots of (a) CO vs WS, (b) CO vs MH, (c) CO vs RH
Eugene, summer 1978, weekday afternoon (3-6 pm)

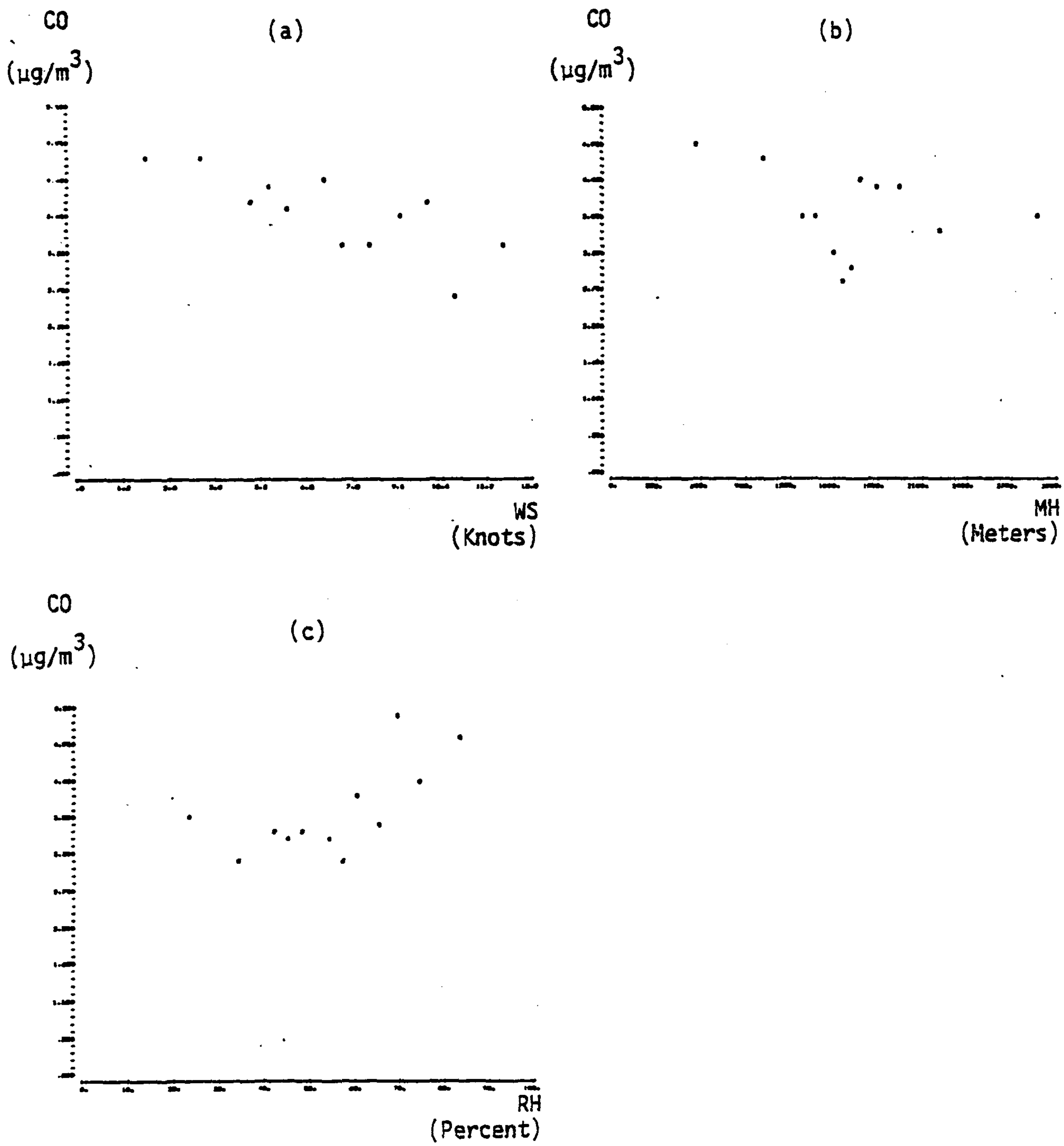


Figure 3.4

Plot of RH vs MH, Eugene, summer 1978, afternoon (3-6 pm)

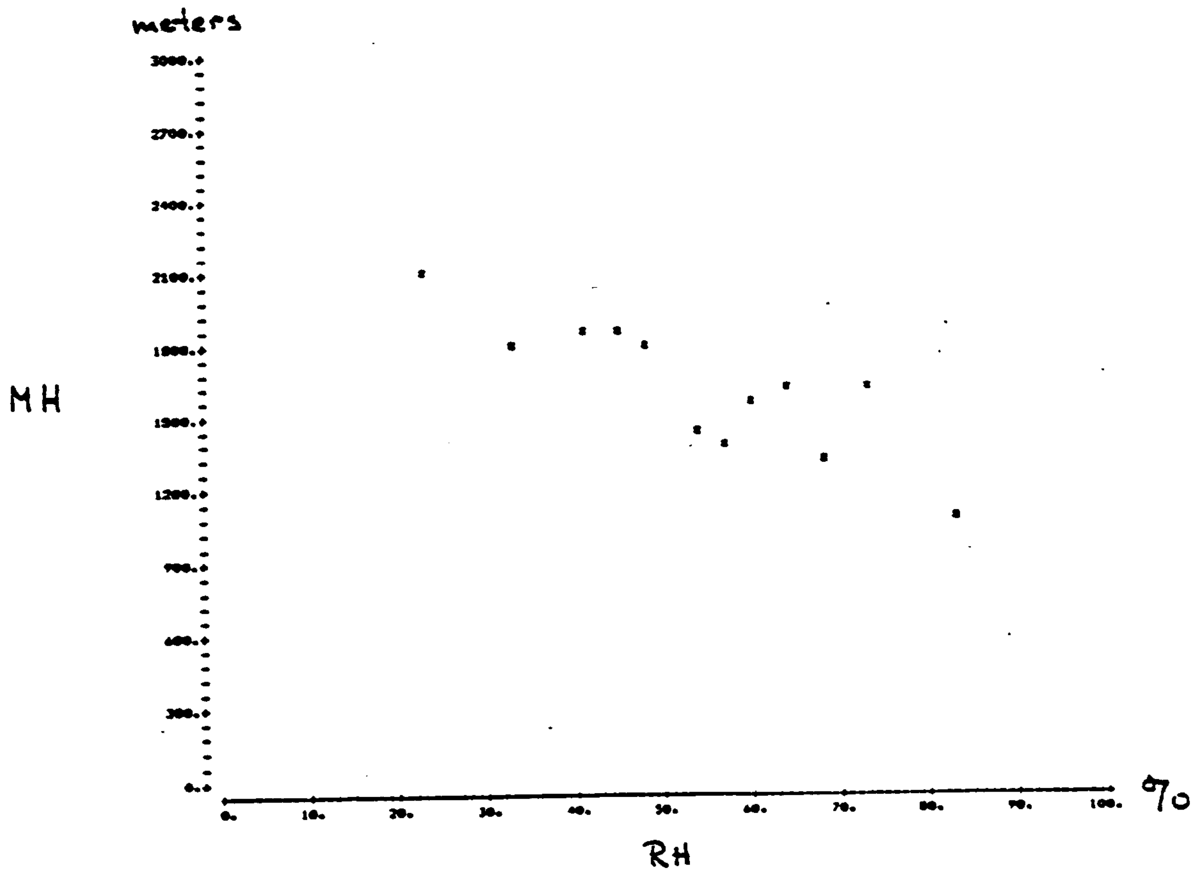


Figure 3.5(a)

Diurnal diagram of windspeed averages, Eugene summer 1978

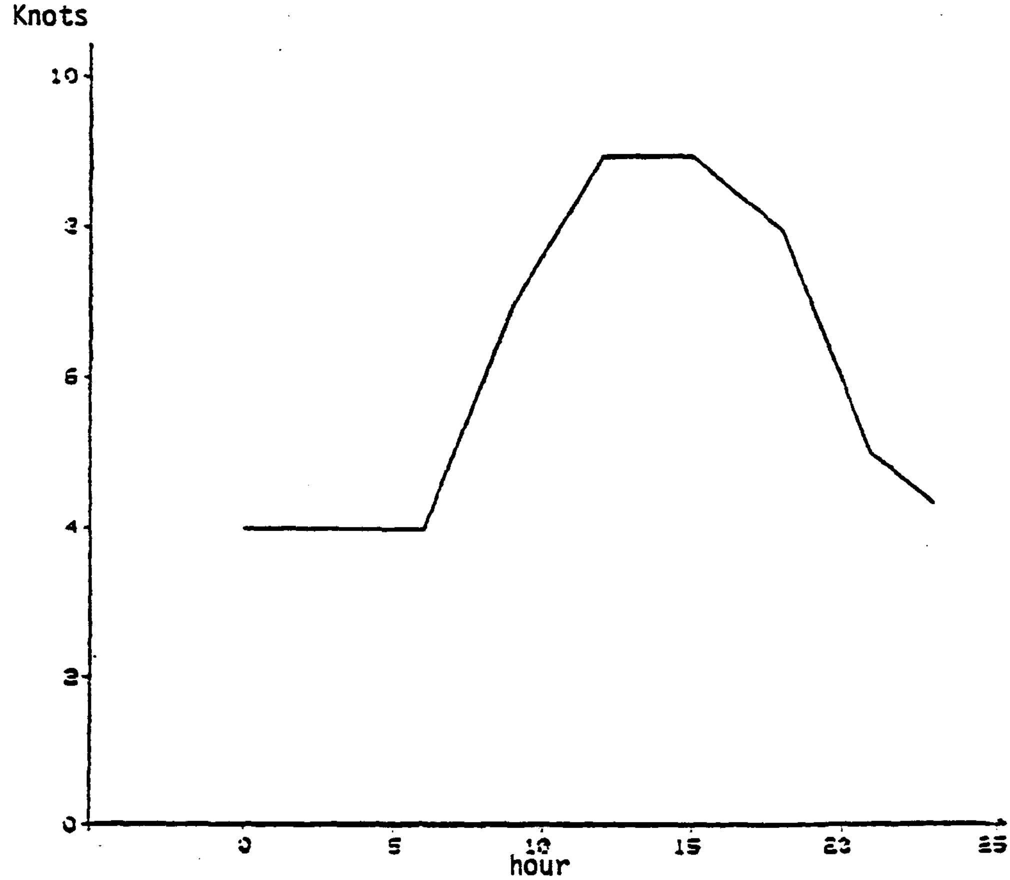


Figure 3.5(b)

Diurnal diagram of relative humidity averages, Eugene summer 1978

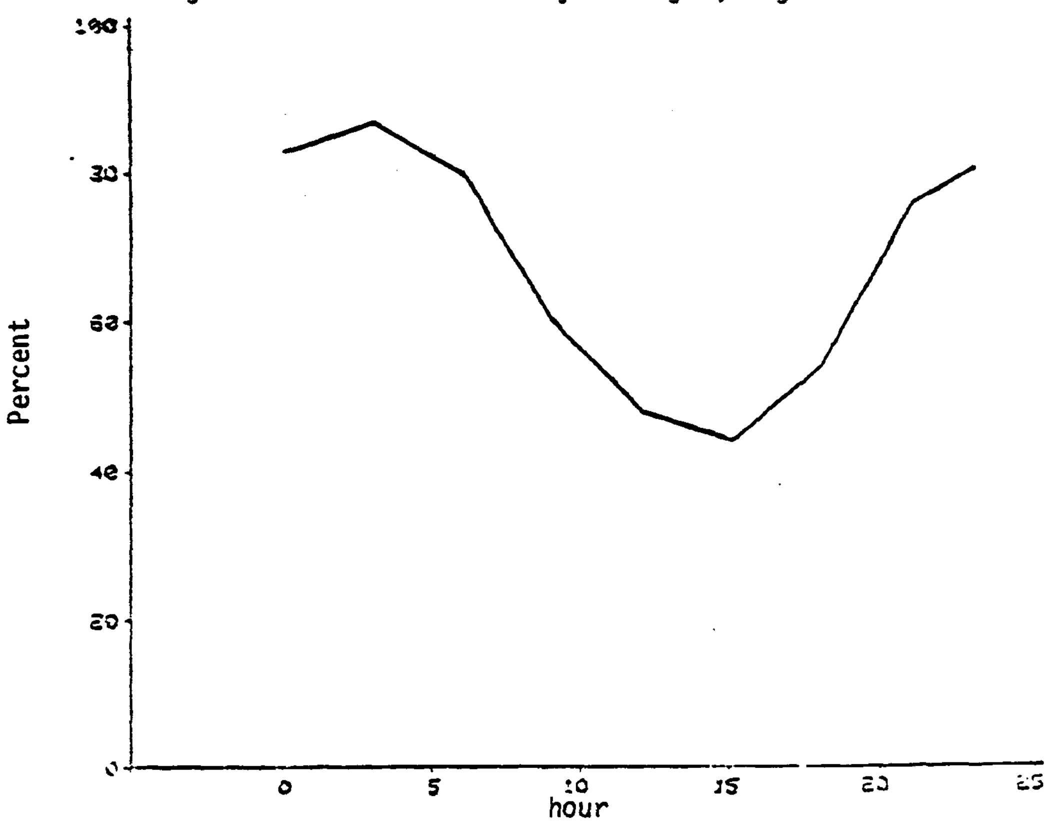


Figure 3.6
Diurnal diagrams of CO, traffic, wind speed, and relative humidity for four seasons at Eugene
——— weekday - - - - weekend

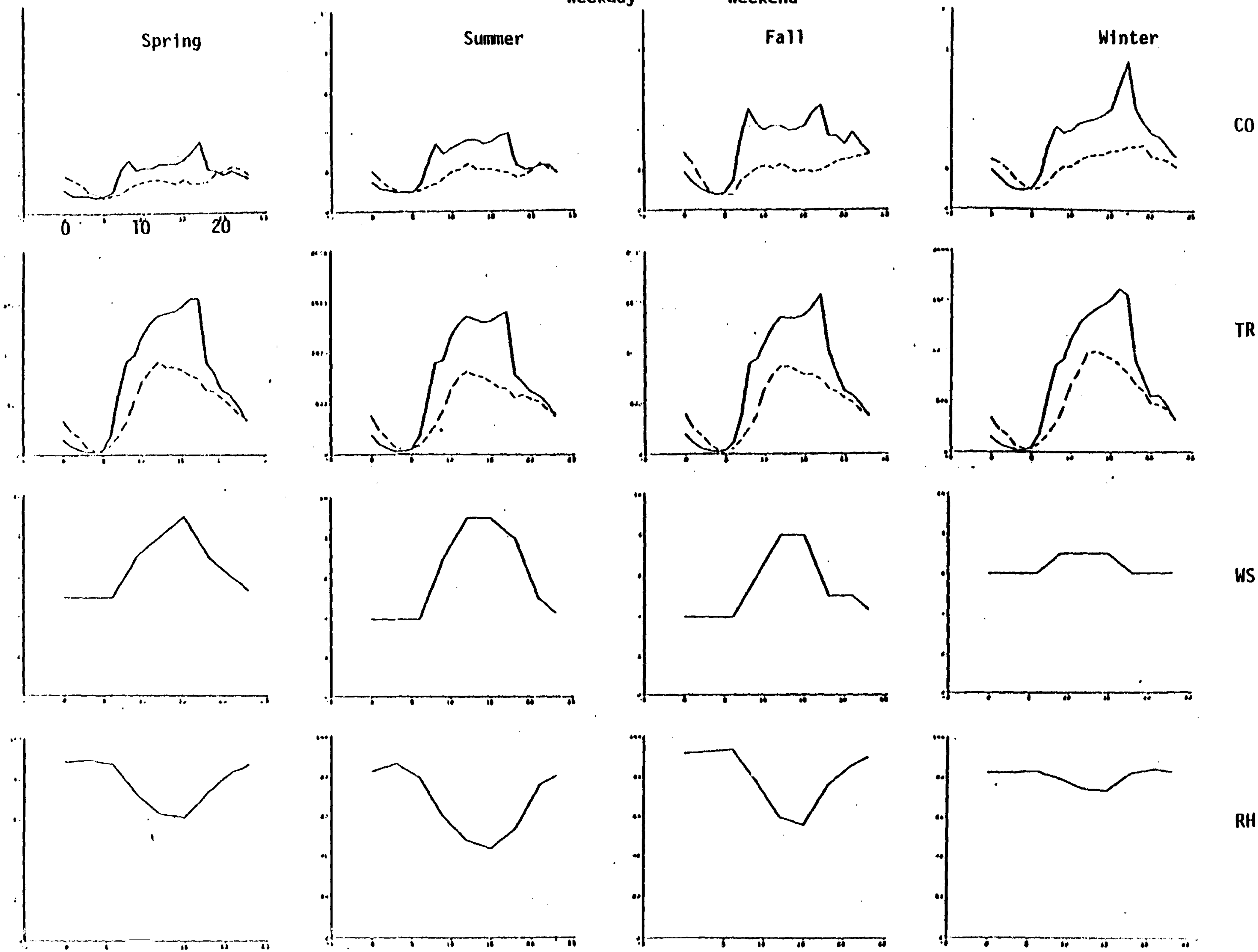
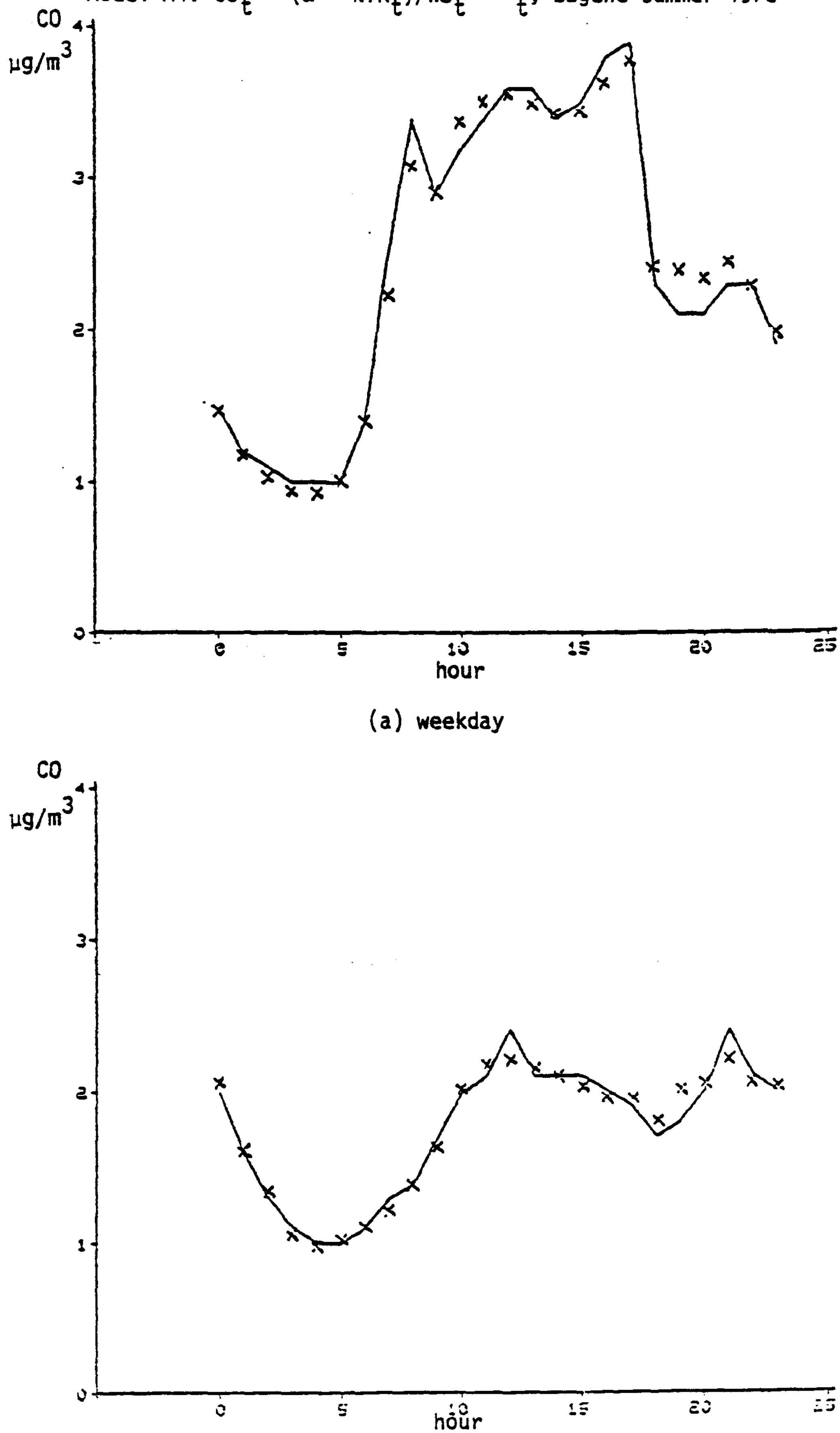


Figure 3.7
Observed (-) vs predicted (X) hourly CO averages
Model M4: $CO_t = (\alpha + kTR_t)/WS_t^{\delta} + \varepsilon_t$, Eugene summer 1978



(a) weekday

(b) weekend

Figure 4.1

Plot of $k_t = ke^{\beta t}$ for $\beta = -.005$; $k = 1$

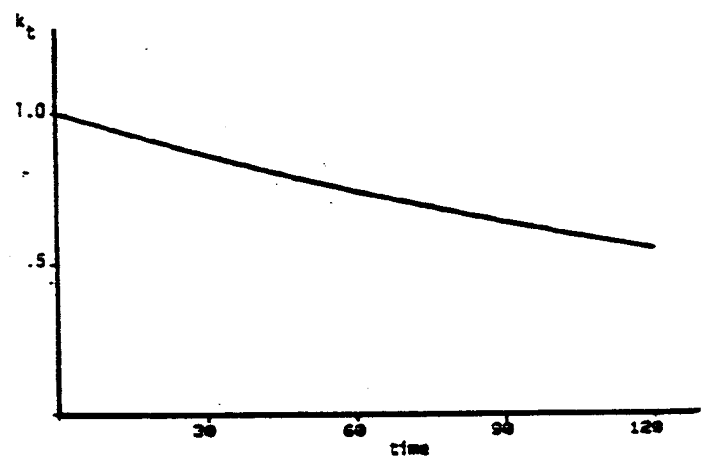


Figure 4.2

Plot of $k_t = k(1 + \beta t)$ for $\beta = -.005$; $k = 1$

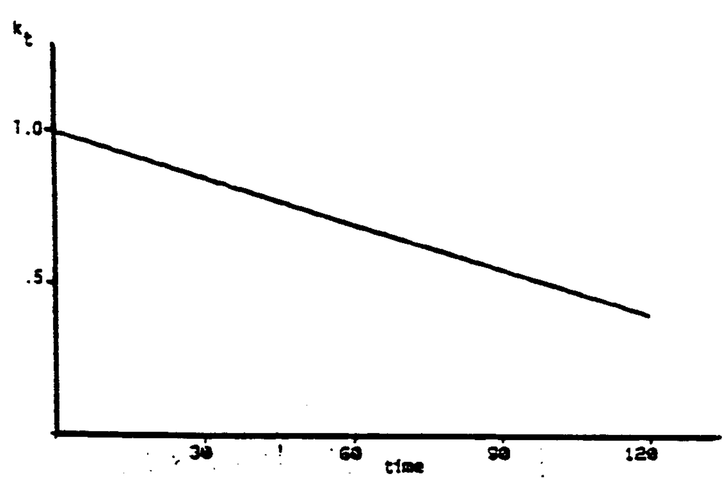


Figure 4.3

Plot of $k_t = ke^{\beta t}(1 + \theta I/M_t^d)$ for $k = 1$, $\beta = -.005$ and $\theta = -.001$

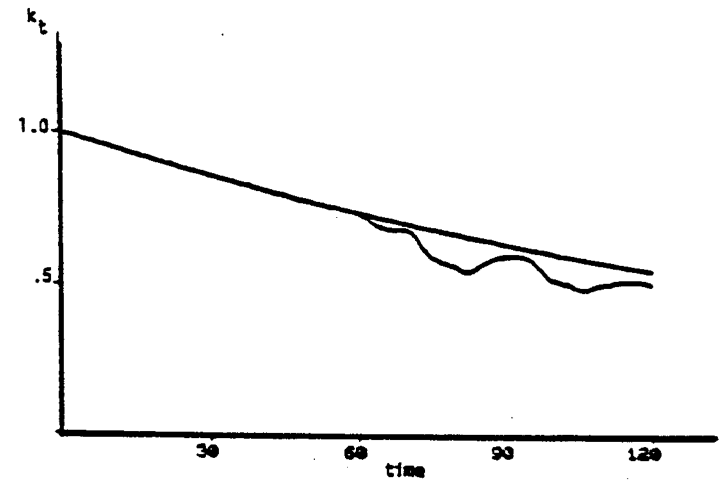


Figure 4.4

Plot of the estimated emission constants $e^{\beta t}(1 + \theta I/M_t^d)$; model C7; CAMS

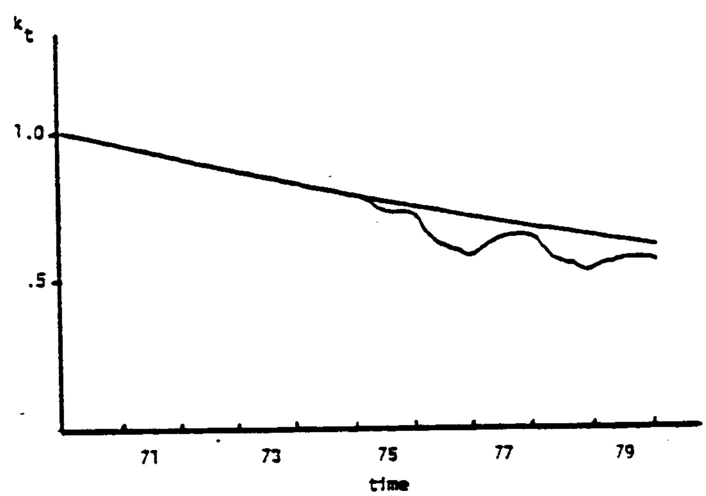


Figure 4.5

Plot of the estimated emission constants

$k_t = e^{\beta t}(1 + \theta I/M_t)(1 + \alpha_1 IND_{t1} + \alpha_2 IND_{t2})$; model C8; CAMS

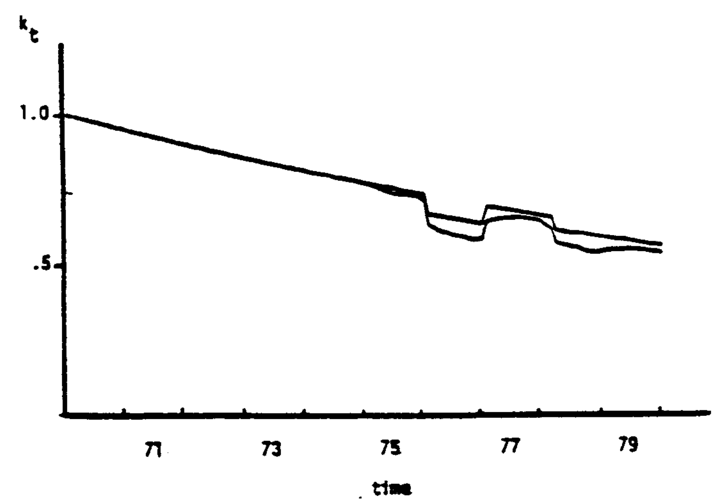
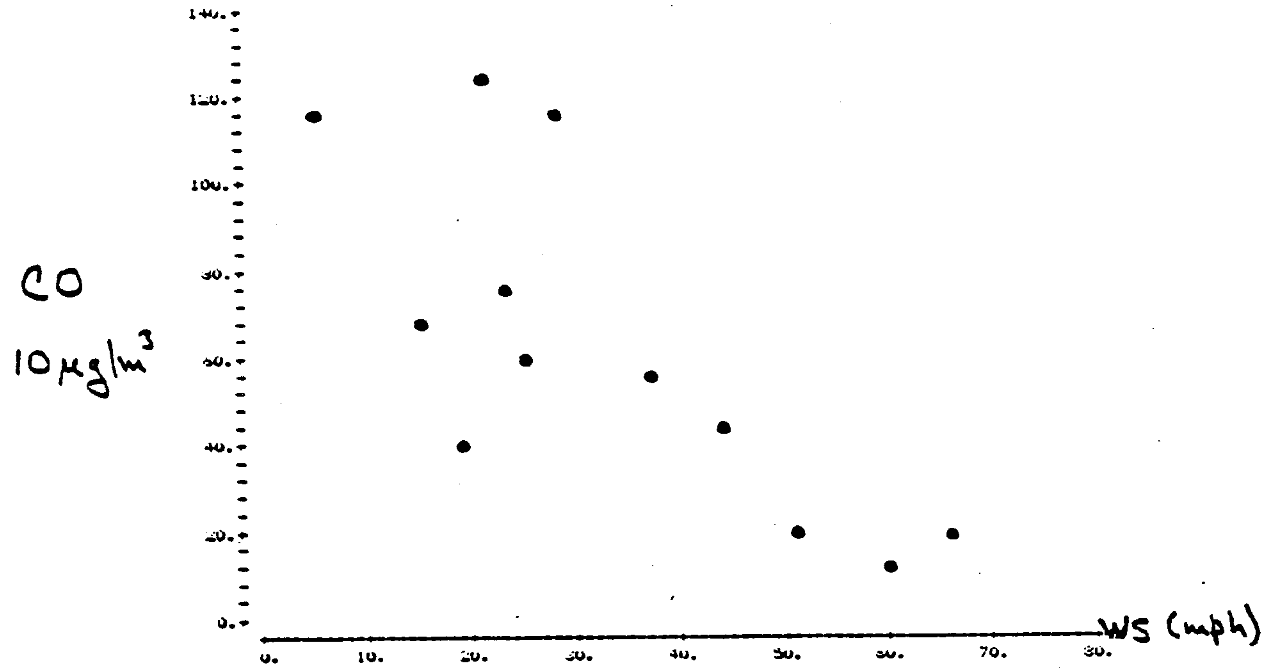


Figure 5.1

Scatterplots of CO against meteorological variables
Portland summer 1977, afternoon

(a) CO vs WS (at Hughes)



(b) CO vs WD (at Hughes)

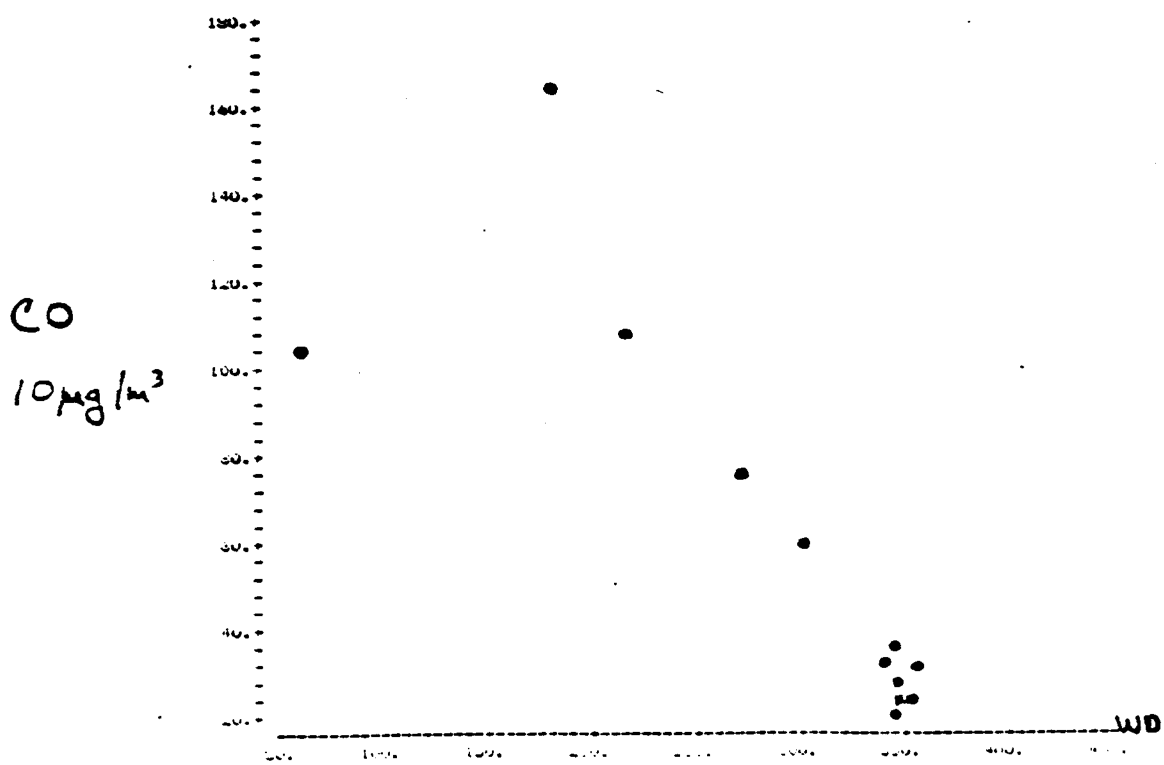
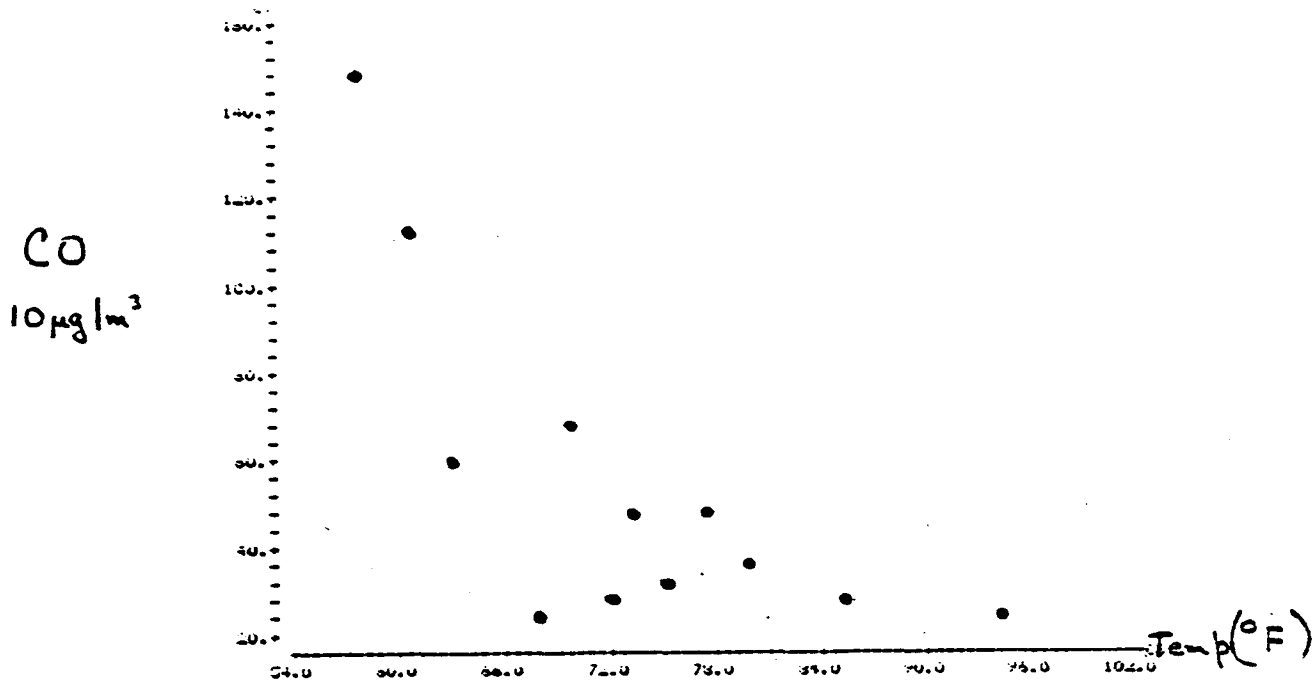


Figure 5.1

Scatterplots of CO against meteorological variables
Portland summer 1977, afternoon

(c) CO vs Temp (at NCC)



(d) CO vs RH (at NCC)

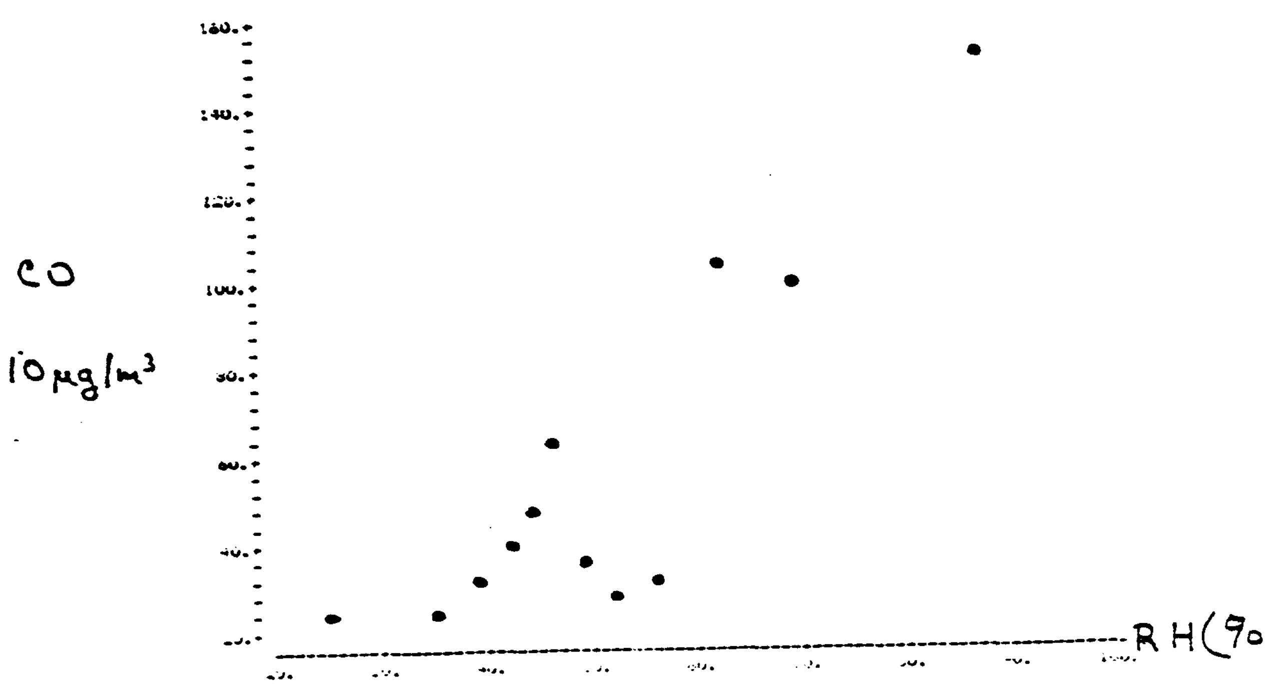
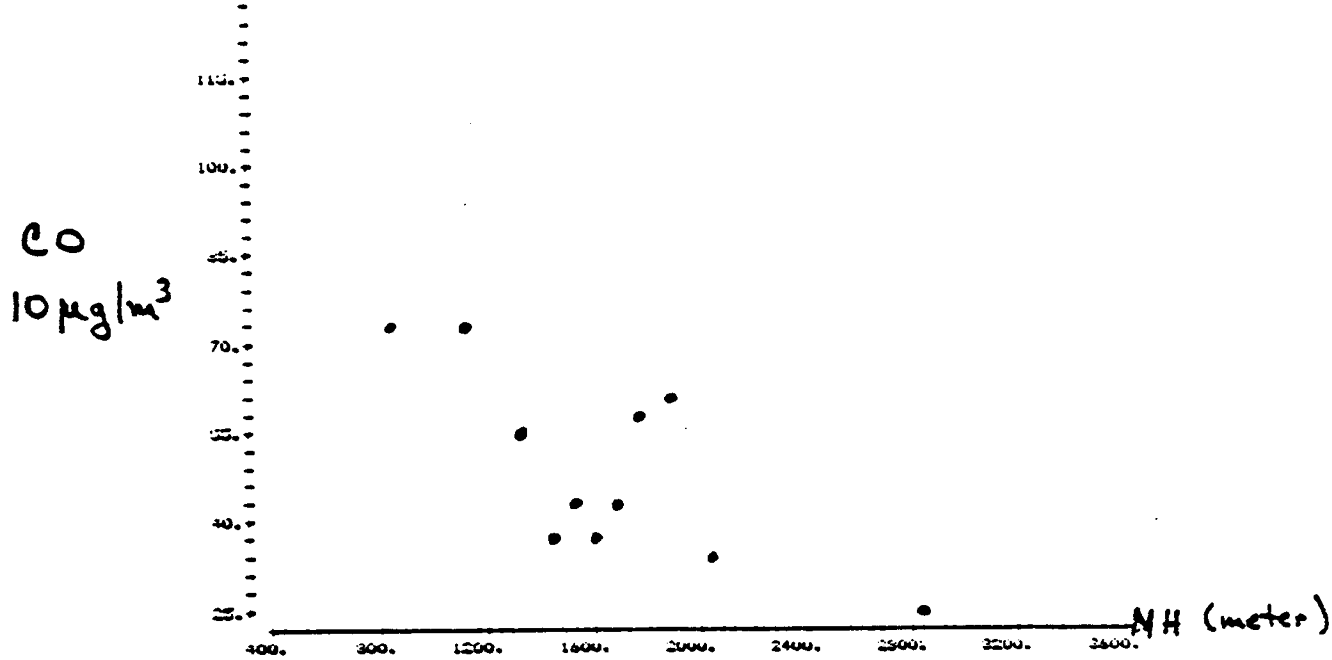


Figure 5.1

Scatterplots of CO against meteorological variables
Portland summer 1977, afternoon

(e) CO vs MH (at Salem)



~~(f)~~ MH ~~(at Salem) vs~~ RH (at NCC)

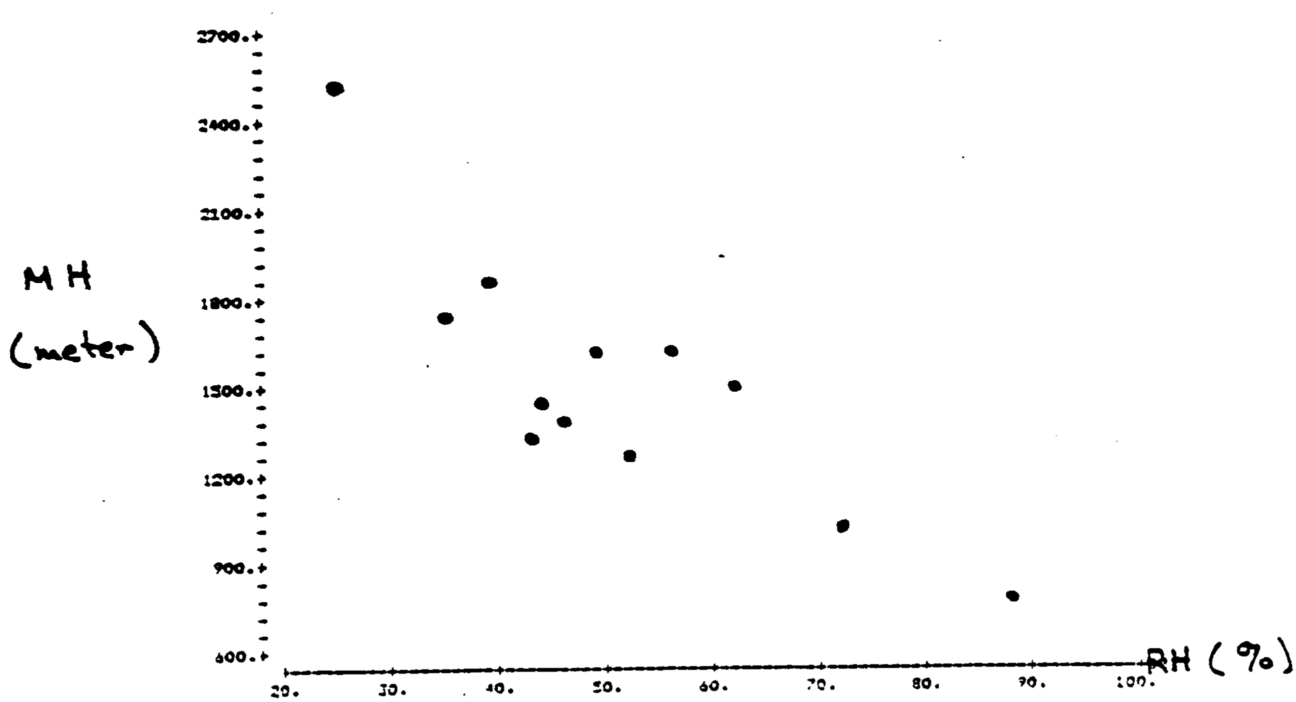


Figure 5.2(a)

Plot of the trend indicator estimates $\hat{\alpha}_i$ for regression model (5.4): Summer

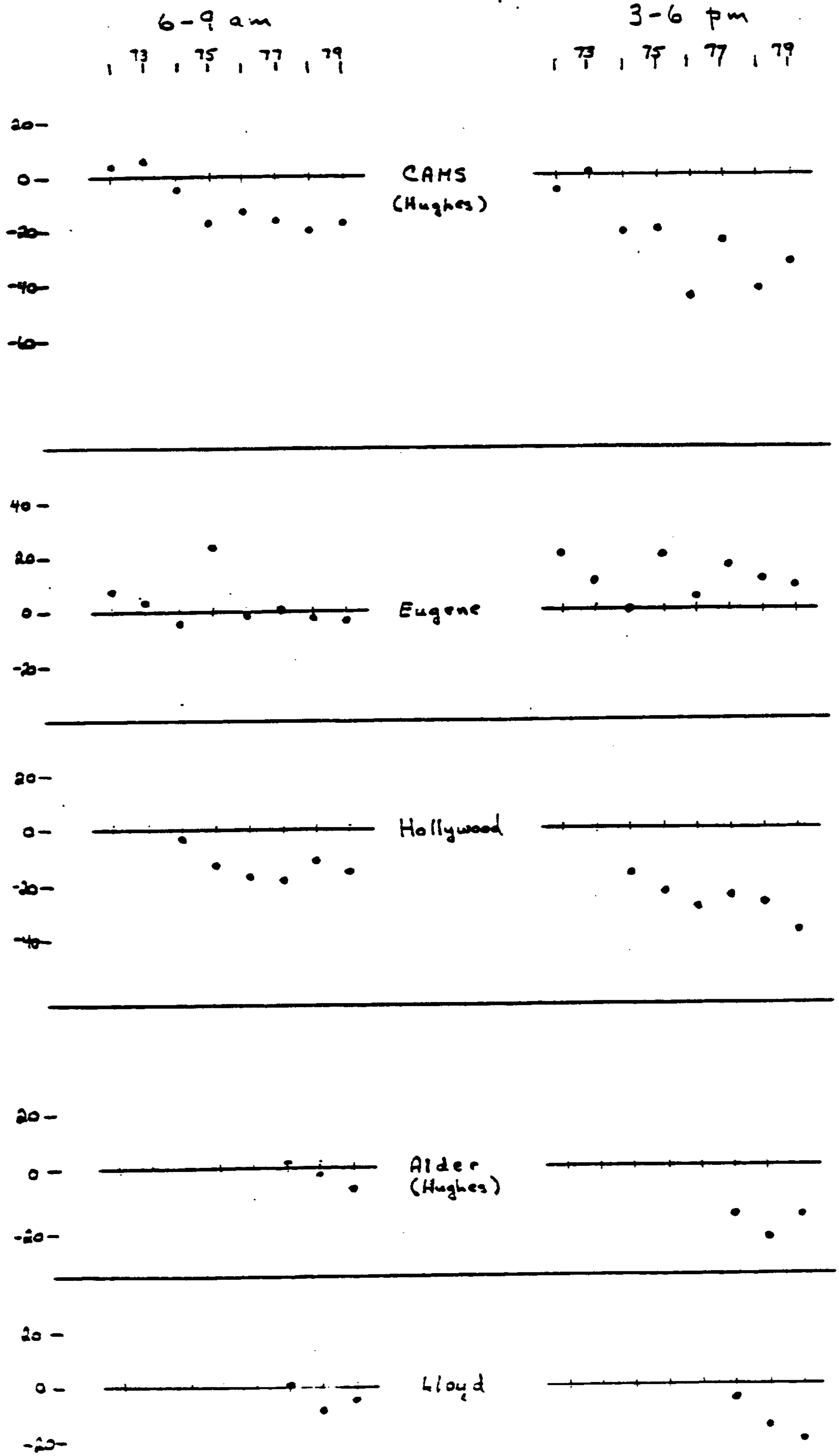


Figure 5.2(b)

Plot of the trend indicator estimates $\hat{\alpha}_i$ for regression model (5.4): Winter