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LUCAS HEIGHTS RESEARCH LABORATORIES

SOME METEOROLOGICAL PARAMETERS FOR ATMOSPHERIC DISPERSION MODELLING AT LUCAS HEIGHTS, NSW, AUSTRALIA 1975 TO 1983

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ABSTRACT

Meteorological data collected in the years 1975 to 1983 at the AAEC's Research Establishment at Lucas Heights, New South Wales, Australia have been summarised. Wind speed, direction and turbulence trace types from 7 and 49 m, temperature difference between 9 and 49 m, ambient temperature and precipitation rates have been extracted as 30 minute averages. Seasonal wind speed and direction roses are summarised for 7 and 49 m together with wind direction persistence statistics which are relevant to short-term (accident) releases of atmospheric pollutants. A 'split-sigma' approach has been adopted for definition of the atmospheric stability categories: a 'turbulence' method using the wind direction turbulence trace types for the horizontal diffusion category; and the US Nuclear Regulatory Commission temperature gradient criteria are combined with Smith's 1972 scheme for the vertical diffusion estimates. Statistics on 10, 50 and 90 per cent probability and average wind speeds and atmospheric stabilities are also analysed. An extensive data summary is included.

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AAEC; NEW SOUTH WALES; REACTOR SITES; METEOROLOGY; ATMOSPHERIC PRECIPITATIONS; WIND; TURBULENCE; TEMPERATURE DISTRIBUTION; SEASONS

CONTENTS

1. INTRODUCTION

In common with many other nuclear facilities the AAEC has, at its Lucas Heights Research Establishment, an active program of meteorological measurements. The prime reason for such a program is to allow estimates to be made of the downwind concentration of any airborne pollutants, particularly radionuclides, released from the site.

The emissions into the lower atmospheric boundary layer (typically below 400 m) can be from high chimneys or low-level building vents. Subsequent dispersion of the radionuclides will be influenced by the degree of atmospheric turbulence and transport by the mean wind. In the boundary layer, atmospheric turbulence has two components, mechanical and convective or thermal turbulence, each of which has a different origin and degree of importance. Mechanical turbulence is generated by the interaction of winds with features such as the terrain (*e.g.* hills, valleys, coastlines), vegetation and buildings or other structures. During strong winds, mechanical turbulence is of increased importance to atmospheric dispersion of pollutants released near ground level. Convective turbulence has its origins in the solar radiation heating of the underlying surface (earth or water). Both mechanical and convective turbulence have significant diurnal and seasonal variations. With vigorous convection, such as can occur during the day, the boundary layer can extend beyond 1 km. At night, the depth of the atmospheric boundary layer is usually more shallow and, together with the degree of atmospheric turbulence, is influenced both by radiation heat losses and lower frequency wind shear or mechanical turbulence.

Meteorological data that reflect these different mechanisms can be processed in various ways to produce parameters that can be used in atmospheric dispersion models to estimate pollutant concentrations downwind of a release. The consequences of two different types of release need to be considered. In the first, the release follows from routine operations on site and the release rate is known as a function of time over a given period. In this case, the data can be used in a relatively straightforward fashion to predict downwind concentrations. In the second, the release is consequent on a hypothetical accident which takes place over a short period and is less well known as a function of time. In this case, the available data can be processed to provide statistical information that can be used to estimate the consequences of the hypothetical release.

This report presents data collected at Lucas Heights between July 1975 and May 1983 and is a considerable extension of earlier studies made at this site [Charash and Bendun 1968]. Parameters from the present study can be compared with those from the somewhat more restricted study at Jervis Bay [Clark and Bendun 1974; Clark 1985]. Rather than presenting the methodologies for evaluation of the parameters and the reasons for choosing these methodologies in one section, the report deals separately with wind speed and direction, stability parameters, temperature and precipitation, each section covering the methodology used and the reasons for its choice.

Lucas Heights is situated 29 km south-west of Sydney, 18 km west-south-west of Botany Bay and 16 km directly inland from the Pacific Ocean (figure 1). It is located on the undulating Woronora plateau (140 m above mean sea level (MSL)), a physiographic region, effectively drained by numerous creeks and rivers, which extends south from Sydney in a ramp-like structure. The Woronora River flows to the north-east, adjacent to the site, and joins the Georges River which then flows east into Botany Bay.

It is important to consider the applicability of meteorological statistics from a single station to atmospheric dispersion modelling in complex terrain. Start and Wendell [1974] found that horizontal wind field variations due to complex terrain influences can cause plume trajectories and predicted pollutant concentrations which deviate from those derived from single station wind data. Other research on complex terrain influences has concentrated on flow near individual terrain features such as hills or ridges [Hunt *et al.* 1978; Lavery *et al.* 1983] and pollutant dispersion within valleys [see Egan 1975]. A frequent conclusion to emerge from these studies is that pollutant dispersion is better in complex terrain than over level terrain under similar meteorological conditions [Egan 1975]. It is only recently that detailed study of the interaction between synoptic and local air flows has commenced [*e.g.* Dickerson 1980]. The influence of these studies and the effect of local terrain features on the meteorological statistics and atmospheric dispersion around Lucas Heights is the focus of a developing research program.

2. METEOROLOGICAL INSTRUMENTATION AT LUCAS HEIGHTS

Details of the meteorological instrumentation type, location, performance and calibration procedures are shown in table 1. Wind statistics for near ground level releases were obtained with a Dines anemograph located at 7 m above ground level. Although this instrument is sited on a reasonably well exposed area of low grass, the 7 m measurements are influenced by the local terrain (hills and valleys) and, to a lesser extent, by the vegetation (trees) and nearby buildings. The Dines wind speed transducer is not sensitive to light winds, having a quoted starting speed of 1.6 m s^{-1}; in fact, ***in situ*** comparisons with a secondary standard indicated a wind speed threshold of 0.9 m s^{-1} for the Dines wind speed transducer [Clark and Bendun 1981]. The Dines wind vane is more sensitive than the speed transducer with a threshold of 0.5 m s^{-1} [Mazzarella 1972] and a distance constant* of 13.8 m.

To take wind measurements near the same altitude as pollutant releases from the site chimney stacks, a sensitive Climatronics Mark III anemometer is located on a meteorological tower, 49 m above local ground level. This instrument has a threshold of 0.34 m s^{-1} for the wind speed and direction sensors and a maximum distance constant of 2.4 m. Therefore, it has better light wind performance and turbulence response characteristics than the Dines anemometer.

One measure of the prevailing atmospheric stability is the vertical temperature gradient. On the meteorological tower at Lucas Heights, aspirated resistance bulbs are used to measure the temperature gradient between 9 and 49 m. This system is calibrated annually using a method of known temperature variations of ***in situ*** water baths; the ambient temperatures are calibrated by regular comparison with an Assman psychrometer.

Net all-wave solar radiation is measured over short grass at 0.5 m above the ground using a Funk radiometer which is calibrated by the CSIRO's National Measurement Laboratory every 18 to 24 months. Two radiometers have been operated simultaneously to ensure high quality data by means of data redundancy and to enable periodic calibration without loss of continuity in the data time series. Recordings from one radiometer are input to an integrator with a one hour time constant. These data are then transferred from a printed tape into a computer data file. The back-up radiometer is output to an analogue recorder for visual examination and comparison with the digital data from the other instrument.

A CSIRO-designed RIMCO digital event recorder with a six-minute resolution was connected to a tipping bucket rain gauge which measures rainfall in increments of 0.254 mm (0.01 in.) between contact closures (digital event). For the present study, these precipitation rates were integrated into 30-minute totals to enable direct comparison with the other meteorological data.

3. WIND SPEED AND DIRECTION STATISTICS

3.1 Introduction

Surface winds are influenced by large, synoptic-scale (horizontal dimensions of the order of 1000 km) pressure gradients and mesoscale processes (scales of the order of 100 km) associated with differential heating of land and water surfaces or local topography. Synoptic (or geostrophic) winds exert an overall influence. Mesoscale winds often develop only under weak geostrophic winds or in highly stable atmospheric conditions. For example:

. differential cooling of the land and sea at night can cause a land breeze to develop;

. in a sloping terrain drainage of the cooler air can also lead to local katabatic winds;

. during the morning, when the convection or mixing layer reaches altitudes of the order of 1 km, the gradient or geostrophic wind may mix downward to influence the surface winds; and finally,

. differential heating of the land and sea surfaces during the day can cause local sea breeze development under favourable synoptic conditions.

Wind speed and direction data can be presented in a form that shows the relative importance of these effects at a particular location. Alternatively, the data can be presented in a form which is more directly applicable to the problem of pollutant transport and dispersion. Wind speed and direction data have been analysed for presentation in both ways.

* The distance constant is an indication of the turbulence response characteristics of the instrument. This is related to the time constant of the instrument but is independent of wind speed.

3.2 Data Analysis

The raw wind speed and direction data were in the form of traces from the Dines and Climatronics Mark III anemometers. An 'eye-ball' estimate was made of the average wind speed and direction during each 30-minute interval from these traces and the data points manually digitised using a magnetic coordinate digitiser. The digitised information was fed directly on to computer files, calibrated and stored as 30-minute averages. Wind direction turbulence trace types were also interpreted (figure 2) and stored as 30-minute averages.

The wind speed and direction data were analysed to produce Bailley-type wind roses which are useful for illustrating diurnal and seasonal trends; seasons were defined as summer (December to February), autumn (March to May), winter (June to August), and spring (September to November). Figures 3 to 10 show 30-minute averaged wind roses for the 7 m location plotted at three-hourly intervals, and figures 11 to 18 show similar data for the 49 m location. Although wind roses present a clear picture of the relative frequencies of different wind directions and wind speeds, it is less easy to extract from them a quantitative estimate of, for example, the average wind speed associated with a particular wind direction, time of year and time of day. Such information is essential for estimating likely pollutant concentrations downwind of the site following the release from a hypothetical accident. Hence the data have also been analysed to produce average wind speeds corresponding to particular directions, seasons and times of day.

The data have also been processed to yield the cumulative probability distribution, since this allows ready graphical representation of the spread in wind speed frequency distribution and hence an idea of how representative the average wind speed might be. The average wind speeds are presented in figures 19 to 22 for the 7 m location and figures 23 to 26 for the 49 m location. Also shown on these figures are the wind speeds corresponding to the 10 and 90 per cent levels of the cumulative probability distribution, where, for example, the 10 per cent level indicates that the events have wind speeds less than or equal to this value.

Blank spaces appearing in the time series indicate that there were no observations at those points. Any marked variability in the averages or in the cumulative probability values is also indicative that only a few observations were available to form these statistics in spite of the long duration of data collection. For example, figures 7, 8, 15 and 16 show that winds in the north-north-east to east sectors were quite rare in winter and only about ten or so observations of winds in each of these sectors were noted throughout the period of data collection.

Although the wind speed is crucial in determining the downwind concentration of a pollutant, the exposure at a receptor site downwind depends on how long the wind persists in the direction that carries the pollutant from the release point to the receptor. Hence an estimate has been made from the data of the wind persistence associated with a particular wind direction and time of day at different times of the year. The persistence at a particular time of day was, in essence, the number of 30-minute periods the wind continued in a particular direction from that specific time.

Table 2 indicates how the persistence over a period of 12 hours was evaluated. Average wind directions for each 30-minute period were sorted into 16 sectors with north = 1, north-north-east = 2, north-east = 3, etc. For this example, only three wind directions (12,13,14) were considered. From this schematic block of data it follows that, at 0500-0530 EST direction 14 has a persistence of six half-hours, at 0630-0700 EST it has a persistence of three half-hours, and at 0200-0230 EST direction 13 has a persistence of three half-hours. When the wind stays in one sector for only one half-hour period before turning to another sector, then the persistence is 30 minutes.

Together with the persistence statistics, inverse persistence is important when considering the percentage of time a plume is over a receptor during the finite release time associated with a hypothetical accident. Inverse persistence was defined as the time the wind remained in any sector other than that prevailing in a given period. For example, in table 2, after the time that the wind persists from sector 14 between 0000 and 0200 EST, six half-hour periods have elapsed before it again reverts to sector 14. In this case, the inverse persistence for the period 0130-0200 EST would be classified as six half-hours from sector 14. These data were further analysed to produce cumulative persistence and inverse persistence probabilities, which are defined in a manner similar to the cumulative wind direction probabilities.

3.3 Results and Discussion

The Bailley wind roses in figures 3 to 10 show that in summer, south-south-east to south winds predominate at night. The 0900 EST wind rose is typical of the transition from nocturnal winds to daytime conditions. By 1200 EST, the sea breeze influence has commenced with winds from the north-east, east-north-east and south-east to south-south-east sectors (see Clark [1982] for more details of the sea breezes over Lucas Heights and McGrath [1972] for a discussion of sea breezes in the general Sydney region). These persist until 2100 EST when there is a change to the north and south. Although the sea breezes are present in summer, there is an almost total lack of winds from the north through the west to south-south-west sectors.

Both the autumn and spring wind roses represent the transition months between summer and winter influences. The nocturnal winds begin to indicate the influence of cool air drainage from the west-south-west to south-west sectors. Winds from the south and south-south-east are still an important influence. Sea breezes are observed less frequently and not clearly until the 1500 EST wind rose data are reached. In winter there is a strong west to south-south-west influence in the 7 m nocturnal winds with virtually no winds from the south-south-east to north sectors.

The wind roses from 49 m (figures 11 to 18) indicate that, over all the seasons, there is an increase in the wind speeds at 49 m when compared to those at 7 m. During summer, the predominant direction of the sea breeze measured at 49 m is east-north-east rather than north-east through to south-south-east at 7 m whereas the 2100 EST wind rose, which represents the transition to nocturnal flow, shows that the probability of south and north-east winds is greater at 49 m than at 7 m. From 0000 to 0900 EST, the wind direction distributions are similar at both heights.

In autumn, the strong southerly influence noted in the night winds at 7 m is less in the winds measured at 49 m. West-south-west and south-west winds predominate between 0000 and 0600 EST. During the day, the winds also turn clockwise with height and there is a predominance of east-north-east and south winds. In common with the summer, remnants of the autumn sea breeze are observed in the 2100 EST wind roses. During spring, there is a stronger daytime sea breeze and a diminished southerly influence at 49 m. At night, the winds are more uniform in the south to west sector. This feature is also observed in the 7 m spring winds between 0000 and 0600 EST.

In winter, the 49 m winds indicate a strong west to west-south-west influence throughout the day. At night, between 10 and 25 per cent of 49 m winds occur in the west-south-west sector, but the west to north-west winds are also important. The more westerly wind could indicate a regional drainage of cool air across Lucas Heights [Hyde *et al.* 1982]. There is only a small (less than five per cent) presence of sea breezes evident in the 1500 and 1800 EST wind roses during winter (see Clark [1982] for a discussion of sea breeze statistics in winter).

Figures 19 to 22 show that in summer, the nocturnal south to south-south-east winds average 2 m s^{-1} at 7 m whereas winds from other directions are generally lighter. The sea breezes have wind speeds between 3 and 4 m s^{-1}, the 90 per cent value being higher by 1 to 2 m s^{-1}. At night, autumn winds from the south-south-east to south-west sectors have speeds slightly below 2 m s^{-1}. During the day, the south-south-east winds rise to 4 m s^{-1} but winds from the south-east and east-south-east show little diurnal variation at 2.5 m s^{-1}. During autumn, sea breezes are less intense at 2 to 2.5 m s^{-1}. West-south-west winds predominate in winter with relatively high speeds above 4 m s^{-1} during the day; the 90 per cent probability values are near 7 m s^{-1}. Winds from the south and south-south-west are less intense. The low frequency of winds from the south-east to north sectors again accounts for the variability and small diurnal change in the associated wind speed graphs. Sea breezes are more predominant in spring than in autumn; these are similar to the summer sea breezes with a peak average speed of 4 m s^{-1} near 1500 EST. At night, winds from the south to west-south-west sectors again decrease to near 2 m s^{-1}.

Similar probability and average wind speed statistics have been analysed from the 49 m data (figures 23 to 26). Again, these need to be interpreted in terms of the prevailing wind direction distributions (figures 11 to 18). In summer, even at the 10 per cent probability level, there is still a speed of 2 m s^{-1} at 49 m during the night; the average speed is 5 m s^{-1}. With the daytime east-north-east sea breeze, this average increases to above 6 m s^{-1} at 49 m compared to 3 to 4 m s^{-1} at 7 m. The nocturnal winds in autumn show a similar trend. There is little diurnal variation (average 5 to 6 m s^{-1}) in winds from the south which have greater than 10 per cent probability of occurrence at all times. The east-north-east sea breezes diminish in intensity to below 6 m s^{-1} at 49 m in autumn, as is also the case in spring, when day and night wind speeds average 5 to 6 m s^{-1}.

Winter is usually considered to be the season with the minimum (worst) atmospheric dispersion conditions. Figure 21 shows that at night near ground level, the 10 per cent probability wind speeds diminish below the instrument threshold (less than 0.9 m s^{-1}). At 49 m and clear of any surface frictional drag effects or the air flow, this value increases to between 2 and 3 m s^{-1}, with an average speed in excess of 6.5 m s^{-1} from the prevailing west to west-south-west sector. During the day, winter westerly winds average about 7.5 m s^{-1}.

Examples of persistence and inverse persistence curves are shown in figures 27 and 28, respectively, where the time periods have been expanded to three hours to reduce the number of curves. However, half-hour averaging periods are available for future analysis.

In the illustration (figure 27), wind direction persistence from the west-south-west sector generally increases between the summer and winter seasons. The morning transition from stable/nocturnal to unstable/day conditions is also accompanied by wind direction changes and minimum persistences. This is further emphasised by the inverse persistence curves which indicate a maximum for the 0600-0900 EST period (figure 28). However, these curves need to be interpreted in terms of the frequency of a particular wind direction. When all wind directions were combined, there was reasonable agreement with Shirvaikar [1972] who found that the cumulative probability of persistence followed a log-normal distribution at two sites; at a third site no such analytic function could be fitted.

4. SEASONAL ATMOSPHERIC STABILITY STATISTICS

4.1 Introduction

Another aspect of the meteorological data required for atmospheric dispersion modelling concerns the definition of atmospheric stability categories. Originally, Pasquill [1961] and Gifford [1961] related six atmospheric diffusion categories to general weather observations of wind speed and cloud cover. In the Pasquill scheme, category A is the least stable, most diffusive condition and is generally associated with light winds and strong radiation heating during the day. The most stable, least diffusive condition was defined as category F; subsequently a category G was added by Beattie [1963]. Categories F and G usually occur with light winds, under clear night skies. Subsequently, the United States Nuclear Regulatory Commission [USNRC 1974] related the prevailing Pasquill stability categories to classes of vertical temperature gradient and the standard deviation of horizontal wind direction σ_θ.

It is usual for one set of criteria to define conditions for both the horizontal and vertical dispersion. The USNRC criteria have been criticised because the temperature gradients are not appropriate to horizontal diffusion (σ_y) estimates or even to vertical dispersion (σ_z) in unstable conditions [Weber *et al.* 1977; Hanna *et al.* 1977]. In addition, the USNRC classes of σ_θ values in very stable conditions do not account for the frequently observed low-frequency meandering component [Sedefian and Bennett 1980; Hanna 1983]; Mitchell and Timbre [1979] have allowed for the meander in an improvement to the σ_θ method. Weber *et al.* [1977], and Irwin [1979, 1983] have also suggested other measurements of turbulence and atmospheric stability which correlate better with the diffusion experiment results.

A 'split-sigma' method has been developed in which different criteria are used for σ_y and σ_z estimates [Sagendorf and Dickson 1974]. A modified form of the split-sigma method, in which the USNRC vertical temperature gradient classes were used to define (σ_z), has also been suggested for use at Lucas Heights. The split-sigma method usually has σ_θ classes to define (σ_y). Because there are no σ_θ parameter measurements available, Clark [1982] suggested a relationship between the turbulent nature of wind direction traces and the Pasquill stability categories which he described as the 'turbulence' method. This involved subjective interpretation of anemometer traces over 30 minute periods (figure 2) and is consistent with a similar study [Lalas *et al.* 1979] which used the more restricted number of traces from the Brookhaven National Laboratories [Singer and Smith 1953]. When the horizontal atmospheric dispersion parameters are assessed, using the turbulence method to categorise atmospheric stability, one modification has been made to the method of Clark [1982] to allow for wind meander. In the analyses described below, the light wind meandering trace 10 has been assigned to the slightly more dispersive Pasquill category F and the near straight line trace 5 is designated as the most stable category G.

Another method for estimating the vertical dispersion stability category, suggested by Smith [1972], was developed from a limited number of numerical solutions to the two-dimensional diffusion equation. Instead of the discrete Pasquill stability categories (A to G), Smith defined a continuum of stability parameters (p) such that A is equivalent to $0<p<1$..... G = $6<p<7$. The 'p' parameter is determined from the prevailing sensible heat flux into the lower atmosphere (or the incoming solar radiation) and wind speed at 10 m. The Smith nomogram relating 'p' to the meteorological variables is shown in figure 29.

4.2 Data Analysis

To apply the Smith [1972] scheme to Lucas Heights data, several modifications were necessary. Smith suggested that the sensible heat flux (H) was related to the incoming solar radiation (R) by

$$H = 0.4(R - 10) \ mW \ cm^{-2}$$

The value of (R-10) allows for net black body radiation away from the surface, which is equivalent to net radiation measurements at Lucas Heights. An adjustment was also required for the 7 to 10 m wind speeds. In the absence of more detailed wind profile measurements, a power law profile was used as a function of atmospheric stability and surface roughness [Hanna *et al.* 1982]. For the current analysis, the following ratios of the 10 to 7 m wind speeds were derived from the urban profiles considered to be more typical of the Lucas Heights terrain than the rural profiles from undulating land presented in Hanna *et al.* [1982]:

Turbulence Trace Types	1 to 4	6 to 9	5,10
u_{10}/u_7	1.06	1.15	1.24

In a similar manner to the wind speeds, average stabilities and the 90 per cent values for the cumulative probability distribution of stabilities have been plotted as a function of time of day, wind direction and season. To calculate the average stability, categories A to G were assigned values of 1 to 7 and averaged arithmetically. To estimate downwind air concentrations, the average stabilities were used to determine weighted arithmetic averages of the discrete Pasquill curves for σ_y and σ_z (*e.g.* an average stability of 3.6 would be averaged arithmetically between categories C and D). Another approach is to apply the average stability to the Smith [1972] nomograms for a direct determination of σ_z. The cumulative probability distributions are such that 100 per cent of the cases occurred in the most stable category G.

At Lucas Heights, the USNRC [1974] temperature gradient criteria have been applied to the temperature difference data collected between 9 and 49 m on the meteorological tower. The turbulence method was applied to the wind direction traces from the anemometers at 7 and 49 m. These stability prediction categories are grouped by season in figures 30 to 45, together with the Smith scheme. Again, these should be interpreted in terms of the frequency of occurrence of various wind directions at 7 m (figures 4 to 11); the highly variabl^ traces usually indicate few observations.

4.3 Results and Discussion

In summer, both the USNRC criteria (figure 30) and turbulence method (figure 31) indicate slightly stable Pasquill categories (D to E) during the presence of south-south-east to south-south-west winds at night. The Smith scheme (figure 32) indicates an average stability slightly above category E. Later in the day, after the onset of the north-east to east-north-east sea breeze, both the turbulence and Smith methods predict categories B to C whereas the USNRC temperature gradient criteria lead to less stable categories A to B. As the sea breeze weakens in the evening, there is a more rapid stabilisation of the lower atmosphere; this is indicated by the Smith scheme rather than the other two schemes.

It is interesting to note that the difference between the average and 90 per cent probability atmospheric stabilities is greatest during the day and decreases during the morning and afternoon transition periods, as atmospheric conditions change from stable to unstable or *vice versa*. When the average and 90 per cent values are close together, a very narrow, peaked distribution of stabilities is indicated. Both the Smith and turbulence schemes produce this type of distribution during the day (*e.g.* figures 31 and 32 for east to east-north-east winds); there is a much wider spread of USNRC stabilities (figure 30). This trend is evident over all seasons and is most marked in the Smith stabilities after sunrise and near sunset. In several cases (USNRC with north-north-east and north-east winds), the 90 per cent probability values are slightly less than the average stabilities, particularly category A. This is due to the occurrence of more than 90 per cent category A and to the use of the interpolation scheme to calculate the 90 per cent values. The averages must always be greater than or equal to (*i.e.* 100 per cent of cases) the least stable (A) category.

During autumn, the nocturnal/early morning stabilities indicated by the Smith (figure 35) and the USNRC (figure 33) schemes are very similar (average E to F). The turbulence method (figure 34) gives results which are slightly less stable than those of the temperature gradient criteria. This implies relatively greater estimates of horizontal diffusion than would be the case if the temperature criteria alone were used in these conditions. Compared to the summer sea breezes, those in autumn have higher atmospheric stabilities (USNRC gives B and turbulence B to C). The Smith scheme predicts similar stabilities in the early part of the day, but once again there is a rapid transition to more stable conditions after sunset as the sea breeze diminishes. The USNRC and turbulence stabilities follow a similar trend during this period.

The results for spring are discussed before those for winter as this could again be considered a transition season between the more stable dispersion conditions in winter and less stable conditions in summer. In the early morning, the USNRC (figure 39) and Smith schemes (figure 41) indicate higher stabilities (E to F) than those using the turbulence method (figure 40: D to E). When the north-east to east-north-east winds prevail during the afternoon, both the Smith and turbulence stabilities (C) are more stable than those of the USNRC, until 1700 EST. At this time, results from the Smith scheme again diverge to more stable categories which last until 2300 EST, when results from the Smith and USNRC schemes agree (E to F), although stabilities using the turbulence method remain less stable (D to E) thoughout the night. Winds from the south to west sector prevail throughout the day in winter. There is only a small diurnal variation (C to D) found in stabilities using the turbulence method (figure 37), which indicates moderate horizontal turbulence and diffusion conditions through the day. By contrast, the Smith (figure 38) and USNRC criteria (figure 36) indicate similar stabilities with significant diurnal variations. At night and in the early morning the average stability, using both of these methods, is E to F. During the day, the USNRC scheme predicts slightly lower stabilities (B to C) than the Smith scheme (a little above C).

It is interesting to contrast the stability categories determined by applying the turbulence method to data obtained at 49 m (figures 42 to 45) with those from 7 m; this can only be done in general terms because of the different wind direction distributions at the two altitudes. In summer, the stability category for horizontal diffusion is type C during the sea breeze and category E at night; this is slightly more stable than at 7 m. During autumn, the nocturnal stabilities are similar at both altitudes (average E). Stabilities at 49 m are more stable than those nearer the ground only during a sea breeze. This probably reflects the surface roughness influences on atmospheric turbulence closer to the ground. At 49 m, the daytime horizontal stability varies between B and C for south to south-east winds in autumn.

At night during spring, winds from the south to west sector generally have stabilities more stable by one stability category at 49 m (*e.g.* category E) when compared to the 7 m data (*e.g.* category D). With the onset of sea breezes from the north-east to east-north-east sector, the stability category is type C at both altitudes, but this becomes more stable during the afternoon. It is most interesting to contrast the near ground and elevated turbulence levels during winter. At night, although stronger winds are observed at 49 m (average 6.5 m s^{-1}) there is less horizontal turbulence (figure 25); this causes more stable (E to F) categories to be predicted by the turbulence method at 49 m than with the light winds near ground. It also suggests that the 49 m level is frequently above the nocturnal boundary layer in a region of near laminar flow.

4.4 Summary

At night there is good agreement between the Smith and USNRC criteria whereas the turbulence method (applied at 7 m), which defines the horizontal diffusion conditions, indicates less stability (*i.e.* greater diffusion). During the day, the USNRC scheme indicates a large range of stabilities but on average these are less than the Smith estimates. The turbulence method and Smith scheme show good agreement in daytime stabilities. However, after sunset the Smith stabilities diverge to more stable categories. Further away from the ground and surface roughness effects, stabilities are higher when the turbulence method is applied to the 49 m data. This is particularly evident during winter and in stable conditions and could be due to the 49 m level being in smooth flow above the shallow nocturnal boundary layer.

5. TEMPERATURE STATISTICS

5.1 Introduction

Another aspect of the dispersion of gases and aerosols from building vents or chimney stacks is their rise due to momentum and buoyancy forces. Briggs [1969] concluded that buoyant plumes rise according to the following general formula:

$$\Delta h = 1.6 F^{1/3} u^{-1} x^{2/3}$$

where Δh is the plume rise; u is the average wind speed; x is the downwind distance; F $(1-T_a/T_o) g w_o r_o^2$; T_a is the ambient temperature; T_o is the temperature of stack/vent gases; g is the gravitational acceleration; w_o is the speed of gases from vent/stack; and r_o is the internal stack radius. This formula has several caveats which depend on the thermal stratification and downwind distance. However, the important point to note is the influence of ambient temperature on the F parameter, and subsequently on the calculated plume rise.

5.2 Data Analysis and Results

The ambient (dry bulb) temperature was measured at 49 m, a level which is near the height of several chimney stacks at Lucas Heights. These temperatures are summarised in table 3. The 9 m temperatures were calculated using the simultaneous temperature difference data between 9 and 49 m together with the 49 m temperatures. Average temperatures show the predictable diurnal and seasonal variations with daytime maxima at 49 m, ranging from 15.3°C in winter to 25.2°C in summer. A seasonal range of nearly 10°C between summer and winter is also evident in the minima temperatures.

6. PRECIPITATION STATISTICS

6.1 Introduction

The US Department of Energy [USDOE 1984] has summarised some of the theoretical models which describe the wet deposition or precipitation scavenging of atmospheric aerosols and gases. For releases below cloud level, the current models are usually simple variations of

$$\chi = \chi_o \, e^{-\lambda(a)t}$$

where χ is the pollutant air concentration; χ_o is the initial pollutant air concentration; $\lambda(a)$ is the washout coefficient; a is the aerosol radius; and t is the downwind diffusion time. The washout coefficient can be approximated by

$$\lambda(a) = C_1 \, \varepsilon \, J_o \, E(a, R_m)/R_m$$

where C_1 is the constant (1/2); ε is the retention efficiency for atmospheric aerosol particles (1); J_o is the precipitation rate; $E(a, R_m)$ is the collection efficiency; and R_m is the average raindrop radius (0.35 mm $(J_o/1 \text{ mm h}^{-1})^{1/4}$ [Mason 1971 for steady rain].

6.2 Data Analysis and Results

The measurement of local precipitation rates is an important requirement for the prediction of pollutant washout. The influence of wind direction on precipitation rates is seen in table 4. Winds from the south-east to south sector account for 49 per cent of all rainfall observations. These have a predominantly low intensity of 0-1 mm/30 minutes. The heaviest rains occur with south-south-east winds. There is also a small peak in the distribution of large precipitation rates (> 7 mm/30 minutes) with winds from the north-east direction.

The precipitation rates have been analysed for all wind directions as a function of time of day and season (table 5). Most observations are made in autumn and summer, and the least in spring. The autumn and summer rainfall rates are slightly more intense than in the other seasons. In summer and spring the rainfall occurs more often in late afternoon and early evening. The winter rains are more evenly distributed during the day whereas those in autumn have a maximum occurrence between 2100 and 0300 EST. The probability of rain during any three-hour period is given as a function of season in table 6.

7. SUMMARY OF METEOROLOGICAL STATISTICS

All of the statistics presented so far have been based on 30-minute average data. In the analyses given in Appendix A, these data have been integrated into three-hour time intervals and tabulated for ease of reference. Two types of statistics are presented. The first is the common average statistic and the second is based on analysis of the probability distributions with values for 50 per cent probability being extracted.

In the case of the wind speed distributions, the probability of calms can be determined by extrapolating the distribution to 0 m s^{-1}. If there is greater than 50 per cent of calms then the 50 per cent probability wind speed will be 0 m s^{-1}. However, as was discussed in Section 2, the anemometers have a threshold greater than 0 m s^{-1}. Therefore the average statistics will reflect this threshold speed, particularly during light wind conditions (*e.g.* at night). In these cases, the probability values are likely to be more representative of the actual winds. The data are tabulated by height of observation (for the wind statistics), time of day and season. Several tables in Appendix A then separately combine all seasons and all times.

Detailed interpretation of these tables is not required as they only reflect trends already discussed in the 30-minute data. The tables are presented as a data set in Appendix A. The last point to note from these tables is the relationship between the statistics based on the temperature gradient criteria which should be independent of the observation level (*i.e.* 7 or 49 m). Differences between these data are due to the different seasonal wind direction distributions at the two altitudes. For this reason it is not reasonable to compare the σ_z stability categories between 7 and 49 m.

8. ACKNOWLEDGEMENTS

Dr M. Petersen provided inspiration and there were many useful discussions with Dr A.I.M. Ritchie during the preparation of this report. Mr K. Bendun kept the instrumentation functional. and with Mr J. Kristo completed much of the computer digitisation of the meteorological data. I gratefully acknowledge this assistance and the patience of staff of the AAEC's Applied Mathematics and Computing Division.

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TABLE 1
INSTRUMENTATION AT LUCAS HEIGHTS

Measurement	Instrument/sensor	Height (m)	Data analysis period	Data recovery (%)	Calibration type and frequency
Dry bulb temperature (unaspirated)	Resistance bulb	49	30.7.1975 to 1.5.1983	94	*In situ* Assmann psychrometer; one reading per month
Wet bulb temperature (unaspirated)	Resistance bulb	49	12.8.1976 to 1.5.1983	88	"
Differential temperature (aspirated)	Resistance bulb	9 to 49	30.7.1975 to 1.5.1983	97	*In situ* variable temperature water baths; annual
Wind	Dines anemograph	7	30.7.1975 to 1.5.1983	Dirn.97 Speed 99 Turb.99	*In situ* comparison with secondary standard; 12-18 months
Wind	Climatronics Mark III	49	8.11.1977 to 1.5.1983+	Dirn.99 Speed 98 Turb.98	CSIRO wind tunnel; 12-18 months
Net radiation	Funk net all-wave radiometer	0.5	18.2.1976 to 1.5.1983	99	CSIRO; 12-18 months
Precipitation rate	CSIRO RIMCO digital event recorder	Ground	30.7.1975 to 1.5.1983	81*	Known rainfall equivalent added; occasional
Acoustic sounder	Monostatic, designed by Shaw (1971)	Ground	22.9.1975 to 5.9.1981	83†	Tethered balloon profiles; occasional special studies

\+ The Climatronics wind recorder was not operated between 13.9.1979 and 12.3.1981.

* The RIMCO recorder was not operated from 12.12.1978 to 5.12.1979. If this period is ignored the data recovery rises to 90%.

† There is no differentiation made between no/bad echoes due to wind/rain noise and instrument malfunction.

Dirn. = direction.

Turb. = turbulence.

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TABLE 2
AN EXAMPLE OF WIND DIRECTION PERSISTENCE AND 'INVERSE' PERSISTENCE CALCULATIONS

Time (EST)	Wind direction	0000-0030	0030-0100	0100-0130	0130-0200	0200-0230	0230-0300
Wind Direction		14	14	14	14	13	13
	14	1	2	3	4		
Persistence	13					1	2
(½ hours)	12						
	14					1	2
Inverse Persistence	13						
(½ hours)	12						

Time (EST)		0300-0330	0330-0400	0400-0430	0430-0500	0500-0530	0530-0600
Wind Direction		13	12	12	12	14	14
	14					1	2
Persistence	13	3					
(½ hours)	12		1	2	3		
	14	3	4	5	6		
Inverse Persistence	13		1	2	3	4	5
(½ hours)	12					1	2

Time (EST)		0600-0630	0630-0700	0700-0730	0730-0800	0800-0830	0830-0900
Wind Direction		14	14	14	14	12	12
	14	3	4	5	6		
Persistence	13						
(½ hours)	12					1	2
	14					1	2
Inverse Persistence	13	6	7	8	9	10	11
(½ hours)	12	3	4	5	6		

Time (EST)		0900-0930	0930-1000	1000-1030	1030-1100	1100-1130	1130-1200
Wind Direction		12	12	12	13	13	13
	14						
Persistence	13				1	2	3
(½ hours)	12	3	4	5			
	14	3	4	5	6	7	8
Inverse Persistence	13	12	13	14			
(½ hours)	12				1	2	3

TABLE 3
DIURNAL AND SEASONAL VARIATIONS OF DRY BULB TEMPERATURES AT 9 and 49 m

DRY BULB TEMPERATURE (DEG.C)

TIME (EST.)

SEASON	HEIGHT (M)	0000-0300	0300-0600	0600-0900	0900-1200	1200-1500	1500-1800	1800-2100	2100-2400	MINIMUM	MAXIMUM
SUMMER	9	19.1	18.7	20.9	24.0	24.9	23.5	21.2	20.0	17.7	26.2
	49	19.3	18.9	20.2	23.0	23.9	22.6	20.9	20.0	18.0	25.2
AUTUMN	9	15.1	14.6	15.7	19.2	20.7	19.3	17.1	16.0	13.5	21.6
	49	15.8	15.4	15.7	18.5	20.0	18.9	17.2	16.5	14.4	20.9
WINTER	9	9.5	9.0	9.6	13.3	15.3	14.0	11.6	10.3	7.7	16.0
	49	10.4	9.9	9.9	12.6	14.5	13.8	12.1	11.2	8.8	15.3
SPRING	9	13.8	13.3	15.7	19.2	20.2	18.7	16.2	15.0	12.2	21.5
	49	14.5	13.9	15.0	18.1	19.2	18.0	16.1	15.3	12.8	20.4

BEGINNING DATE : 300775 END DATE : 10583

TABLE 4
30 MINUTE PRECIPITATION RATES *v.* WIND DIRECTIONS
FOR LUCAS HEIGHTS

PRECIPITATION RATES (MM.)

DIRECTION	0- 1	1- 2	2- 3	3- 4	4- 5	5- 6	6- 7	> 7	TOTAL
N	1.90	0.39	0.06	0.08	0.03	0.0	0.0	0.06	2.51
NNE	2.43	0.47	0.14	0.06	0.03	0.03	0.0	0.03	3.17
NE	2.79	0.75	0.52	0.36	0.17	0.0	0.0	0.22	4.80
ENE	2.57	0.77	0.44	0.30	0.14	0.03	0.0	0.06	4.31
E	2.98	0.69	0.39	0.14	0.08	0.03	0.0	0.14	4.44
ESE	3.84	1.35	0.55	0.08	0.06	0.03	0.08	0.17	6.16
SE	7.67	2.90	1.13	0.36	0.30	0.14	0.17	0.19	12.86
SSE	13.22	4.11	1.16	0.66	0.39	0.22	0.14	0.33	20.23
S	11.26	2.82	0.99	0.19	0.17	0.11	0.06	0.11	15.71
SSW	4.39	1.13	0.72	0.41	0.06	0.0	0.06	0.08	6.85
SW	3.34	0.94	0.30	0.33	0.25	0.06	0.06	0.06	5.33
WSW	2.13	0.69	0.28	0.11	0.08	0.0	0.03	0.11	3.42
W	1.32	0.39	0.17	0.03	0.03	0.0	0.03	0.06	2.01
WNW	1.52	0.41	0.03	0.03	0.0	0.0	0.0	0.06	2.04
NW	2.01	0.36	0.14	0.08	0.0	0.0	0.03	0.0	2.62
NNW	2.70	0.58	0.14	0.03	0.06	0.0	0.0	0.03	3.53
TOTAL	66.08	18.74	7.15	3.26	1.82	0.63	0.63	1.68	3623.

BEGINNING DATE 310775 END DATE 10583

NOTE: TABLE FREQUENCIES ARE IN % WITH THE TOTAL NUMBER OF 30 MIN. OBS.
IN THE LOWER RIGHT HAND CORNER

TABLE 5
DIURNAL AND SEASONAL FREQUENCIES OF PRECIPITATION RATES

PRECIPITATION RATES (M.M.)

SEASON	TIME (EST)	0.0-0.5	0.5-1.0	1.0-1.5	1.5-2.0	2.0-2.5	2.5-3.0	3.0-3.5	>3.5	TOTAL
SUMMER	0000-0300	5.32	3.45	1.40	0.19	0.47	0.19	0.37	1.03	12.41
	0300-0600	6.53	2.89	2.05	0.56	0.65	0.19	0.0	0.84	13.71
	0600-0900	4.76	3.17	1.21	0.75	0.28	0.56	0.28	0.37	11.38
	0900-1200	4.01	1.77	0.84	0.75	0.75	0.09	0.0	0.75	8.96
	1200-1500	3.82	2.61	0.93	0.65	0.56	0.19	0.28	0.93	9.98
	1500-1800	4.38	3.54	2.15	1.40	1.21	0.56	0.37	1.87	15.49
	1800-2100	5.50	4.48	2.71	1.03	0.93	0.19	0.09	0.37	15.30
	2100-2400	4.38	4.10	2.05	0.65	0.37	0.37	0.09	0.75	12.78
	TOTAL	38.71	26.03	13.34	5.97	5.22	2.33	1.49	6.90	1072.
AUTUMN	0000-0300	5.75	3.54	2.04	1.42	0.88	0.35	0.09	1.06	15.13
	0300-0600	5.22	3.36	1.24	0.71	0.18	0.09	0.35	0.71	11.86
	0600-0900	4.60	2.30	1.15	0.35	0.18	0.18	0.18	0.97	9.91
	0900-1200	4.42	3.27	1.50	0.80	0.62	0.44	0.18	0.88	12.12
	1200-1500	1.86	3.01	1.59	0.62	0.71	0.27	0.0	0.62	8.67
	1500-1800	2.83	3.27	1.86	1.24	0.35	0.53	0.27	1.06	11.42
	1800-2100	3.10	4.78	1.77	0.97	1.33	0.27	0.18	0.88	13.27
	2100-2400	5.58	5.58	2.30	0.97	0.80	0.62	0.62	1.15	17.61
	TOTAL	33.36	29.12	13.45	7.08	5.04	2.74	1.86	7.35	1130.
WINTER	0000-0300	6.09	2.74	1.07	0.36	0.24	0.24	0.24	0.48	11.46
	0300-0600	6.21	4.18	1.79	0.48	0.48	0.24	0.24	0.84	14.44
	0600-0900	6.80	3.46	1.31	0.60	0.36	0.48	0.24	0.24	13.48
	0900-1200	4.53	2.86	2.27	1.55	0.24	0.12	0.36	1.43	13.37
	1200-1500	4.30	3.82	1.43	0.84	0.24	0.24	0.24	0.48	11.58
	1500-1800	5.37	3.34	1.79	0.60	0.36	0.12	0.24	0.12	11.93
	1800-2100	5.61	3.10	1.43	0.48	0.72	0.60	0.24	0.84	13.01
	2100-2400	4.65	2.51	1.43	1.19	0.60	0.0	0.24	0.12	10.74
	TOTAL	43.56	26.01	12.53	6.09	3.22	2.03	2.03	4.53	838.
SPRING	0000-0300	4.23	1.13	0.42	0.71	0.71	0.71	0.56	0.42	8.89
	0300-0600	4.80	2.82	0.71	0.42	0.56	0.14	0.0	0.28	9.73
	0600-0900	4.37	2.68	1.27	0.85	0.14	0.14	0.0	0.71	10.16
	0900-1200	4.51	2.82	1.13	1.27	0.28	0.56	0.28	0.42	11.28
	1200-1500	6.35	3.95	1.69	1.27	0.42	0.85	0.42	1.27	16.22
	1500-1800	7.19	4.37	2.12	1.13	0.71	0.71	0.71	1.13	18.05
	1800-2100	4.37	3.39	1.69	0.28	0.71	0.42	0.14	0.56	11.57
	2100-2400	6.91	3.67	1.13	0.28	0.42	0.42	0.28	0.99	14.10
	TOTAL	42.74	24.82	10.16	6.21	3.95	3.95	2.40	5.78	709.

BEGINNING DATE : 310775 END DATE : 10583

NOTE: THE FREQUENCIES ARE IN %. THE TOTAL NUMBER OF 30 MINUTE PRECIPITATION RATES FOR EACH SEASON APPEAR IN THE LOWER RIGHT HAND CORNER OF THE TABLE.

DUE TO INSTRUMENT MALFUNCTION THE DATA ARE NOT CONTINUOUS BETWEEN THE BEGINNING AND END DATES. PLEASE REFER TO THE TEXT FOR MORE DETAILS.

TABLE 6
DIURNAL AND SEASONAL PROBABILITIES OF RAINFALL

PROBABILITY (%) OF RAINFALL

TIME (EST.)

SEASON	0000-0300	0300-0600	0600-0900	0900-1200	1200-1500	1500-1800	1800-2100	2100-2400
SUMMER	3.69	4.09	3.40	2.67	2.97	4.60	4.55	3.80
AUTUMN	4.66	3.81	3.18	3.88	2.78	3.66	4.26	5.66
WINTER	2.77	3.50	3.27	3.23	2.80	2.89	3.15	2.60
SPRING	1.97	2.16	2.25	2.50	3.60	4.00	2.56	3.13

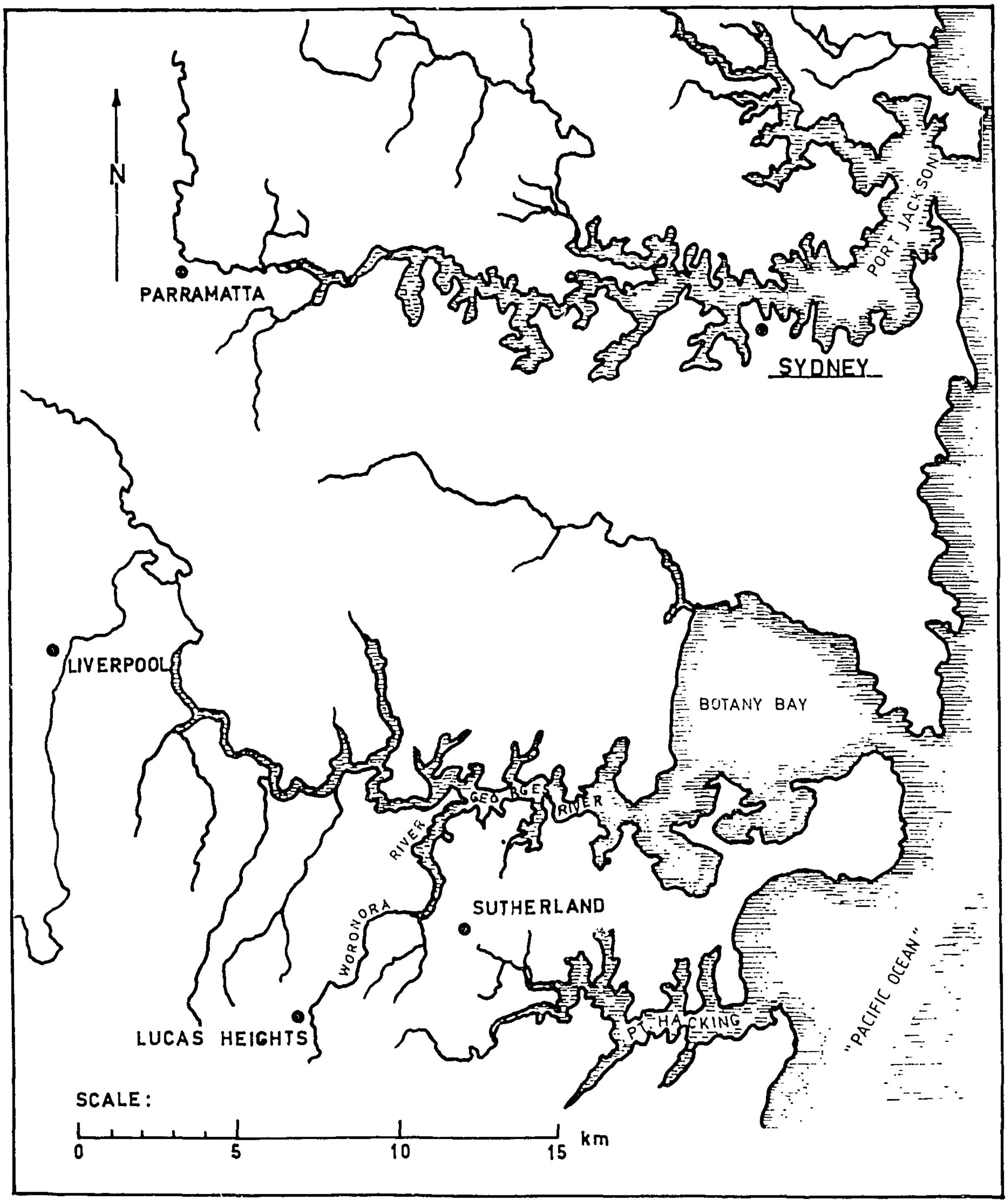

Figure 1 Geographical region surrounding Lucas Heights

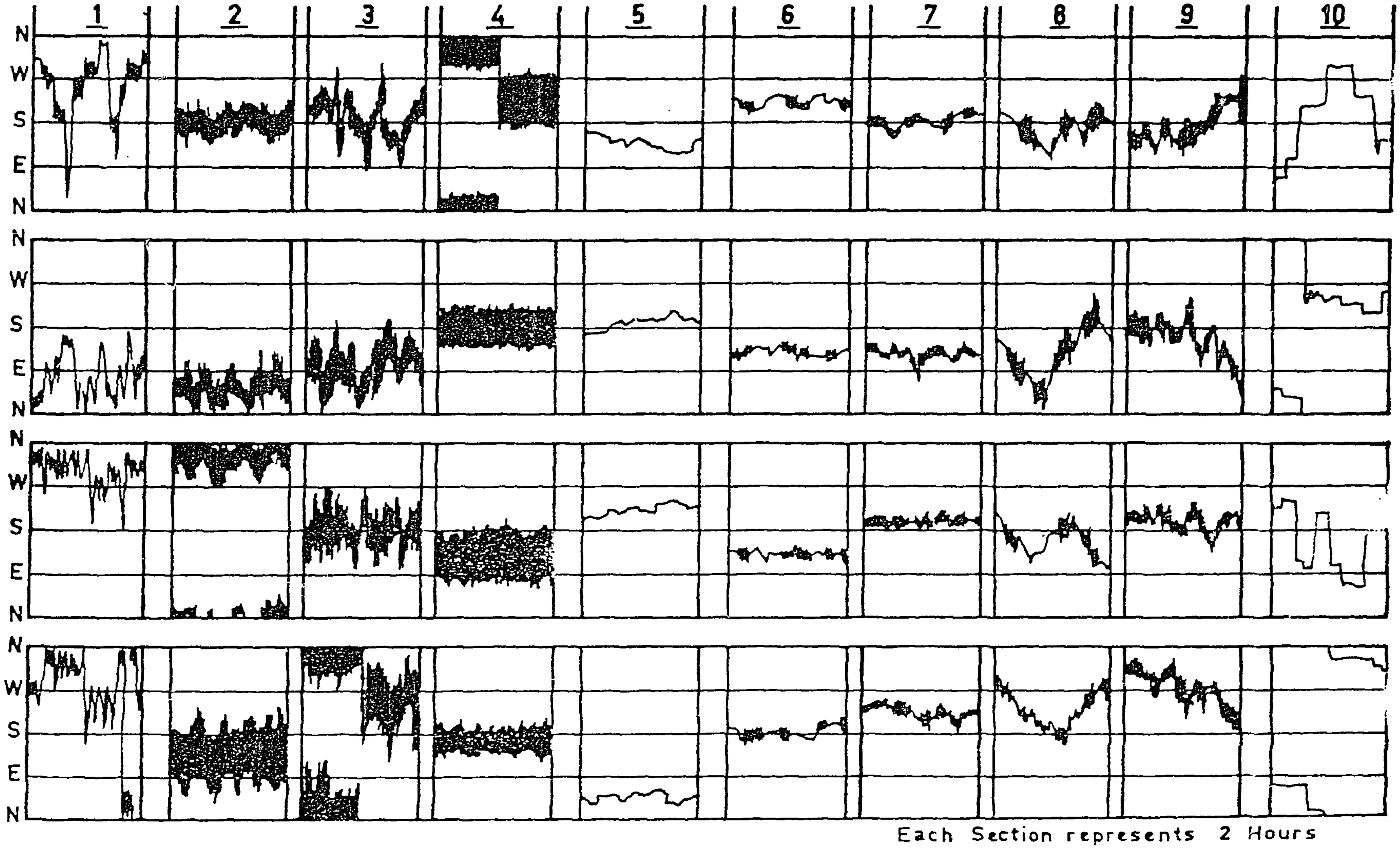

Figure 2 Wind direction turbulence trace types [after Clark and Bendun 1974]

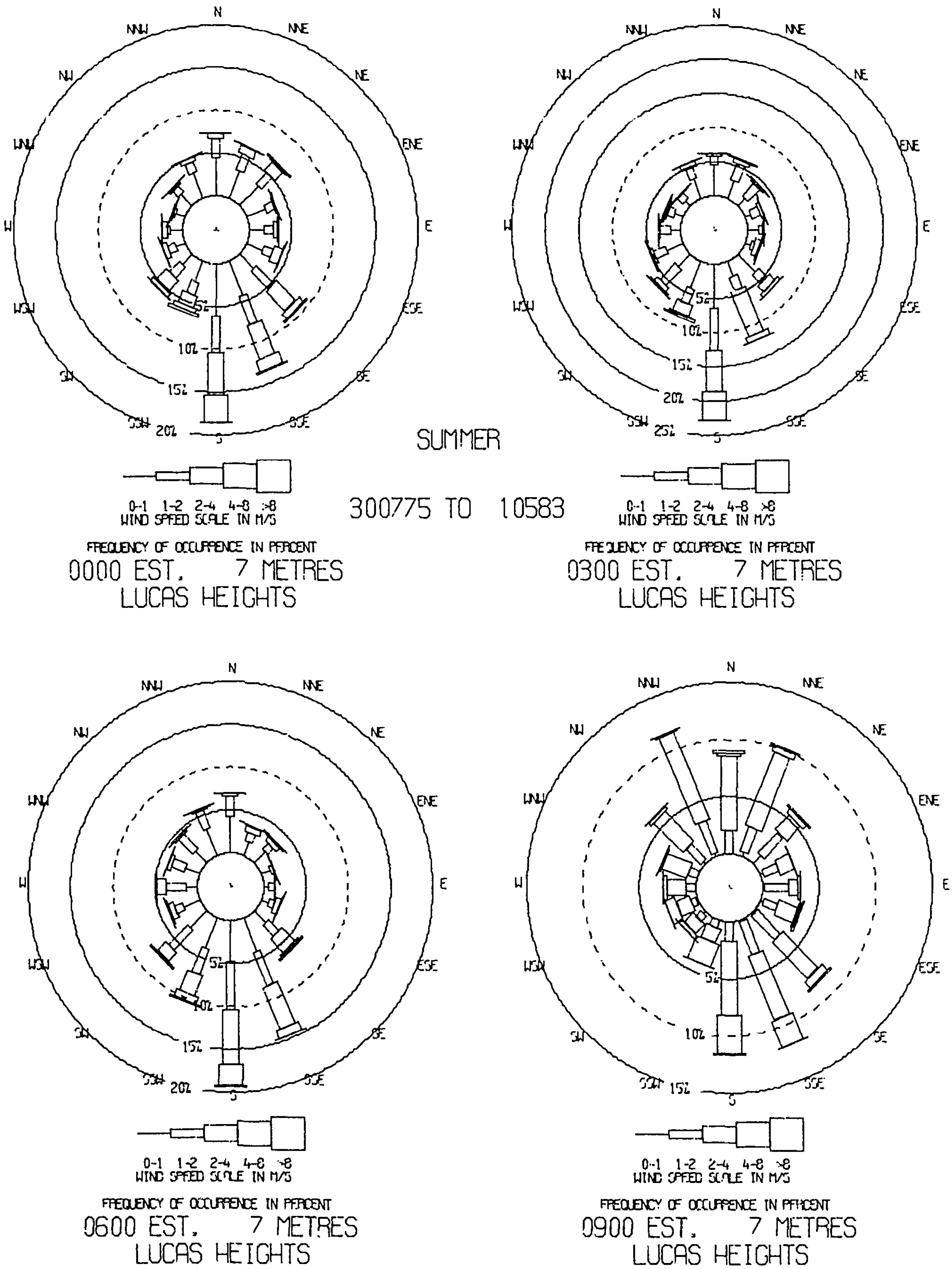

Figure 3 Summer Bailley-type wind roses, 7 m; 0000, 0300, 0600 and 0900 EST

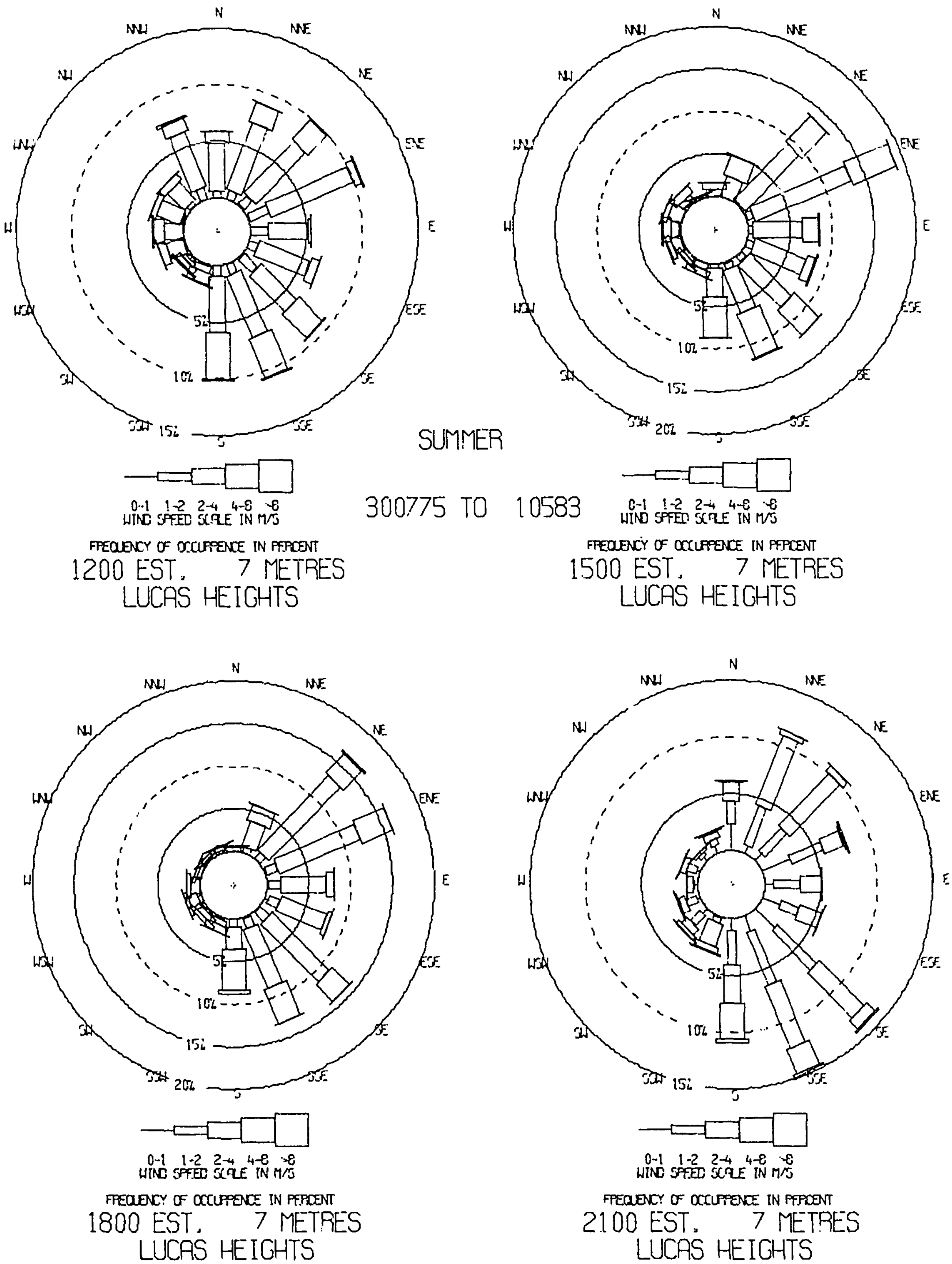

Figure 4 Summer Bailley-type wind roses, 7 m; 1200, 1500, 1800 and 2100 EST

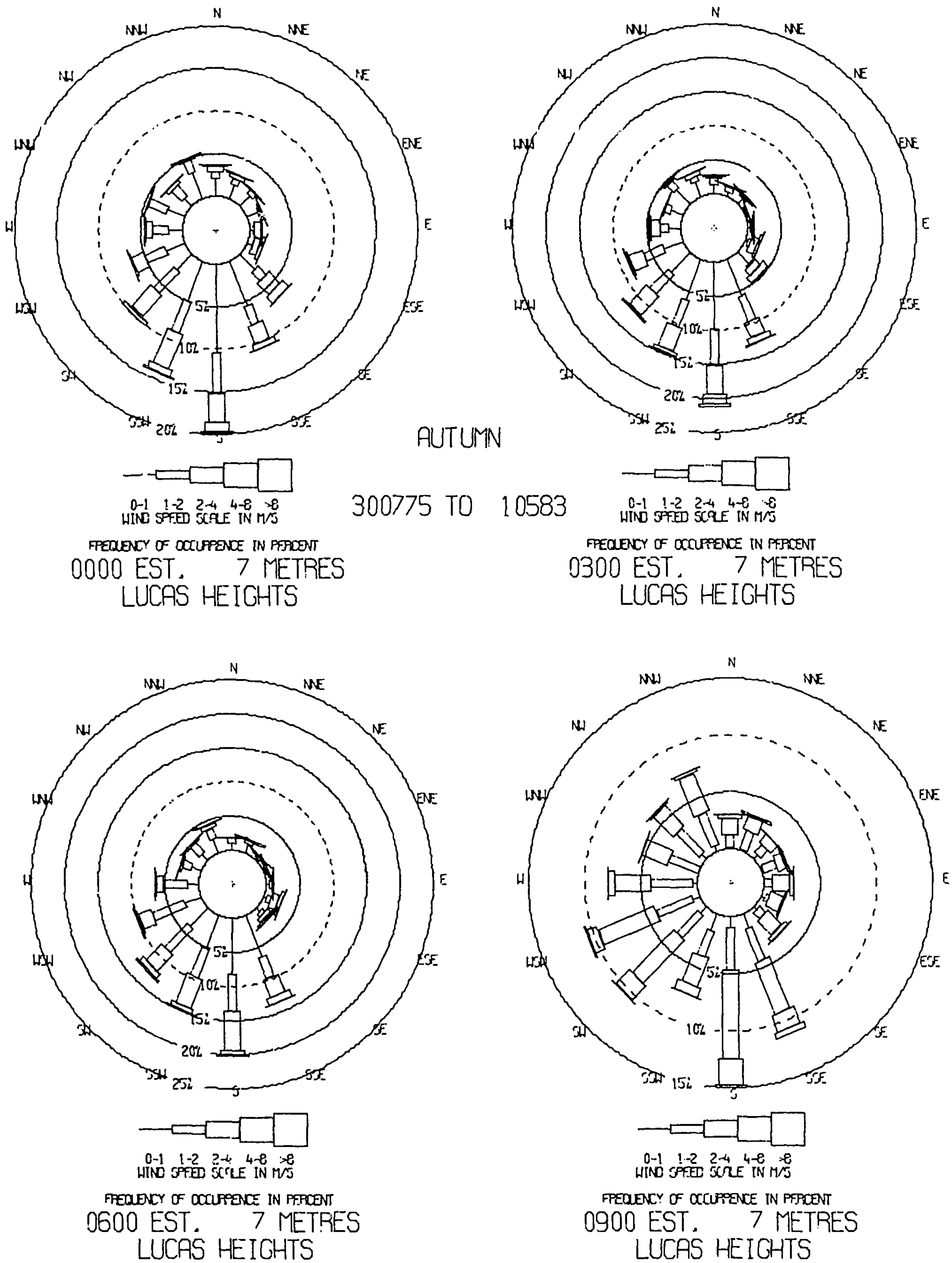

Figure 5 Autumn Bailley-type wind roses, 7 m; 0000, 0300, 0600 and 0900 EST

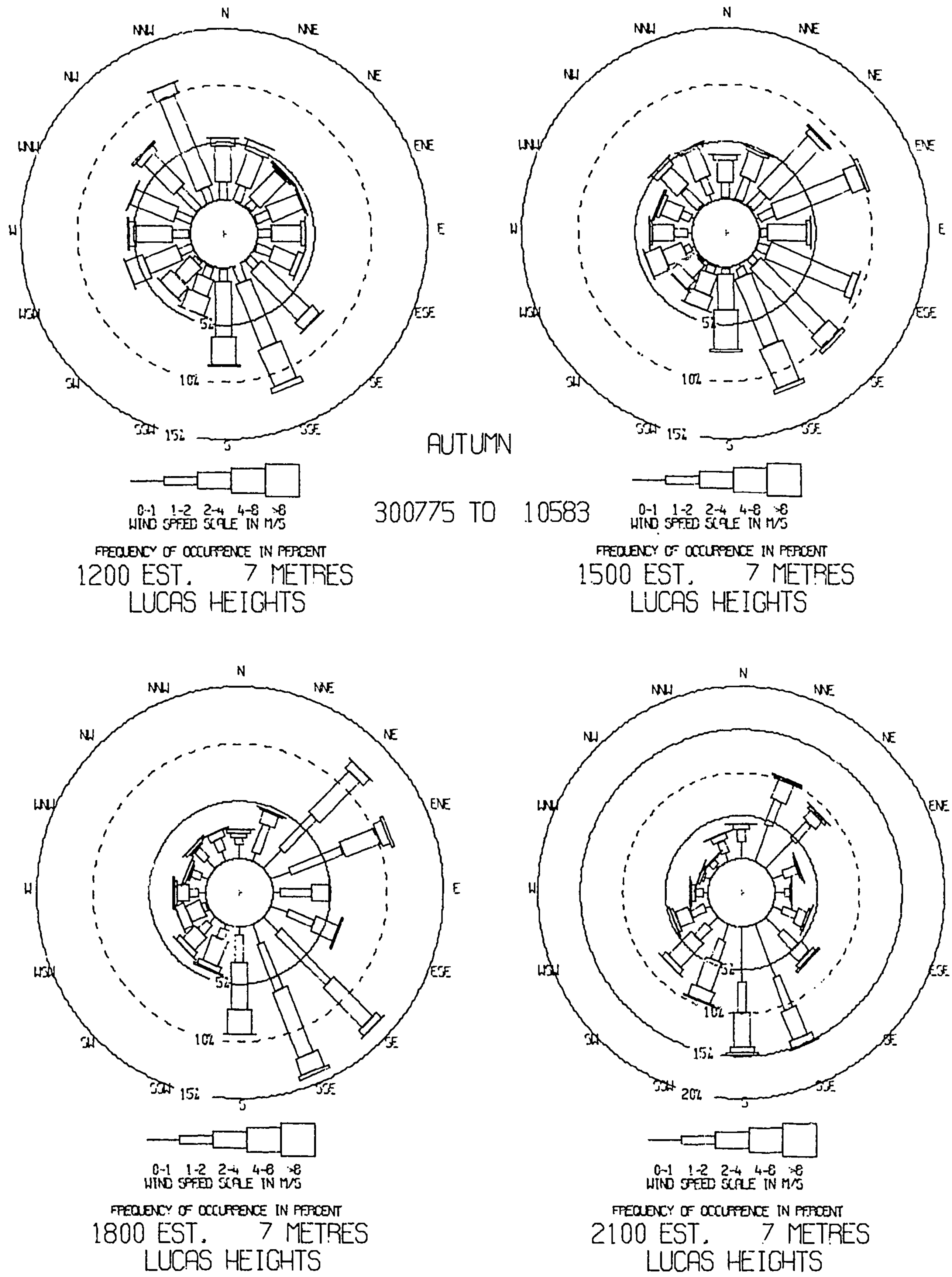

Figure 6 Autumn Bailley-type wind roses, 7 m; 1200, 1500, 1800 and 2100 EST

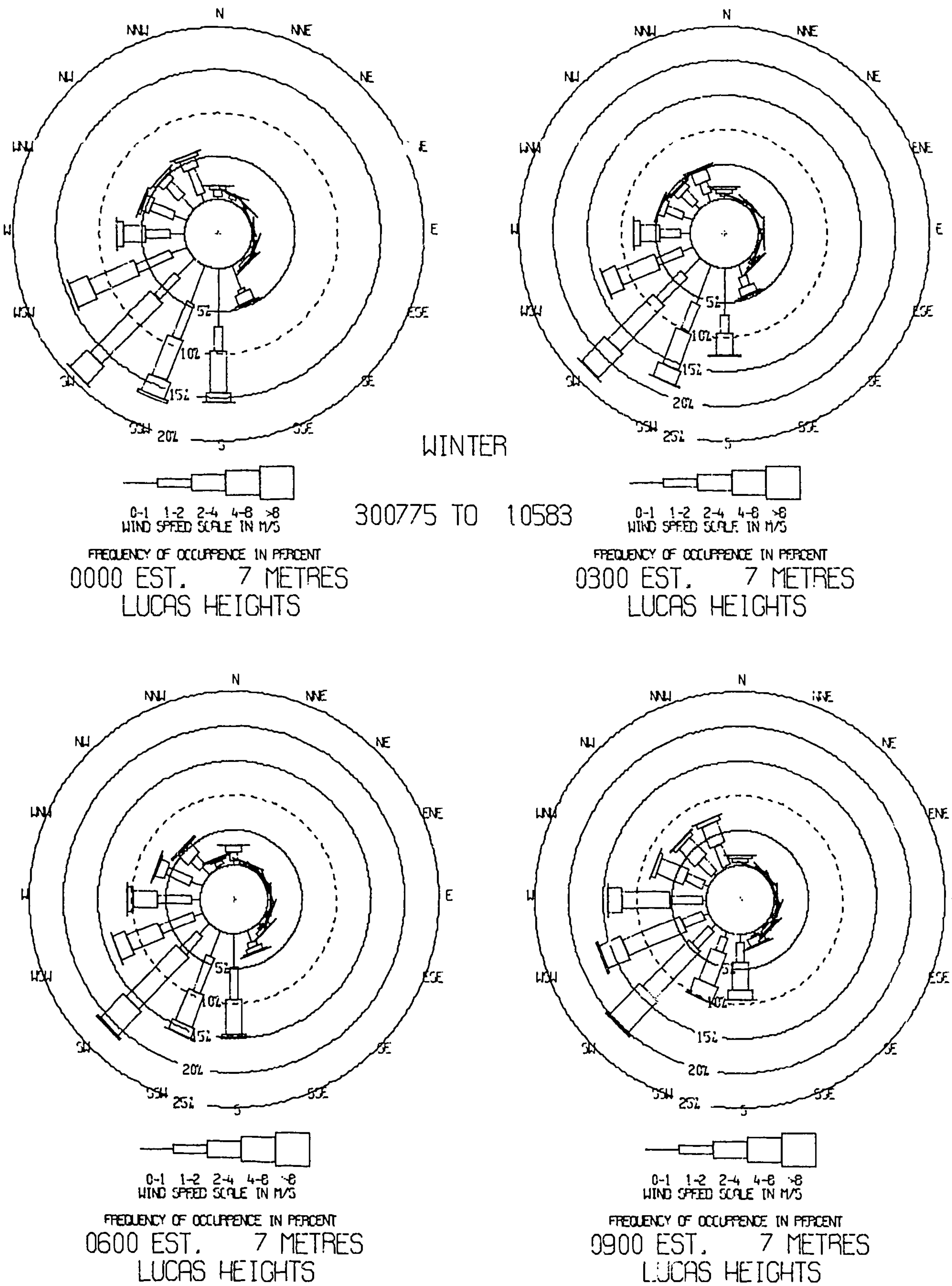

Figure 7 Winter Bailley-type wind roses, 7 m; 0000, 0300, 0600 and 0900 EST

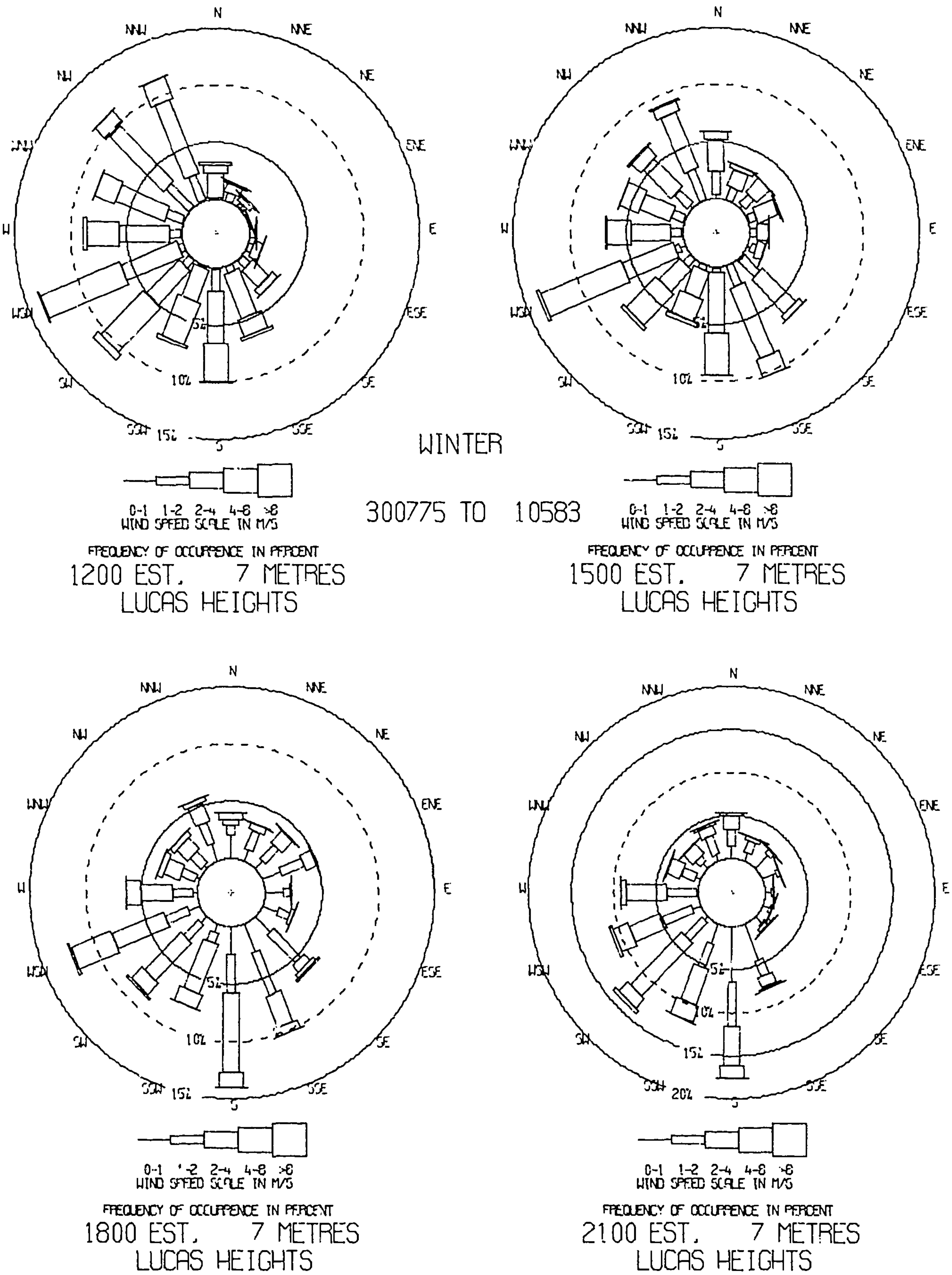

Figure 8 Winter Bailley-type wind roses, 7 m; 1200, 1500, 1800 and 2100 EST

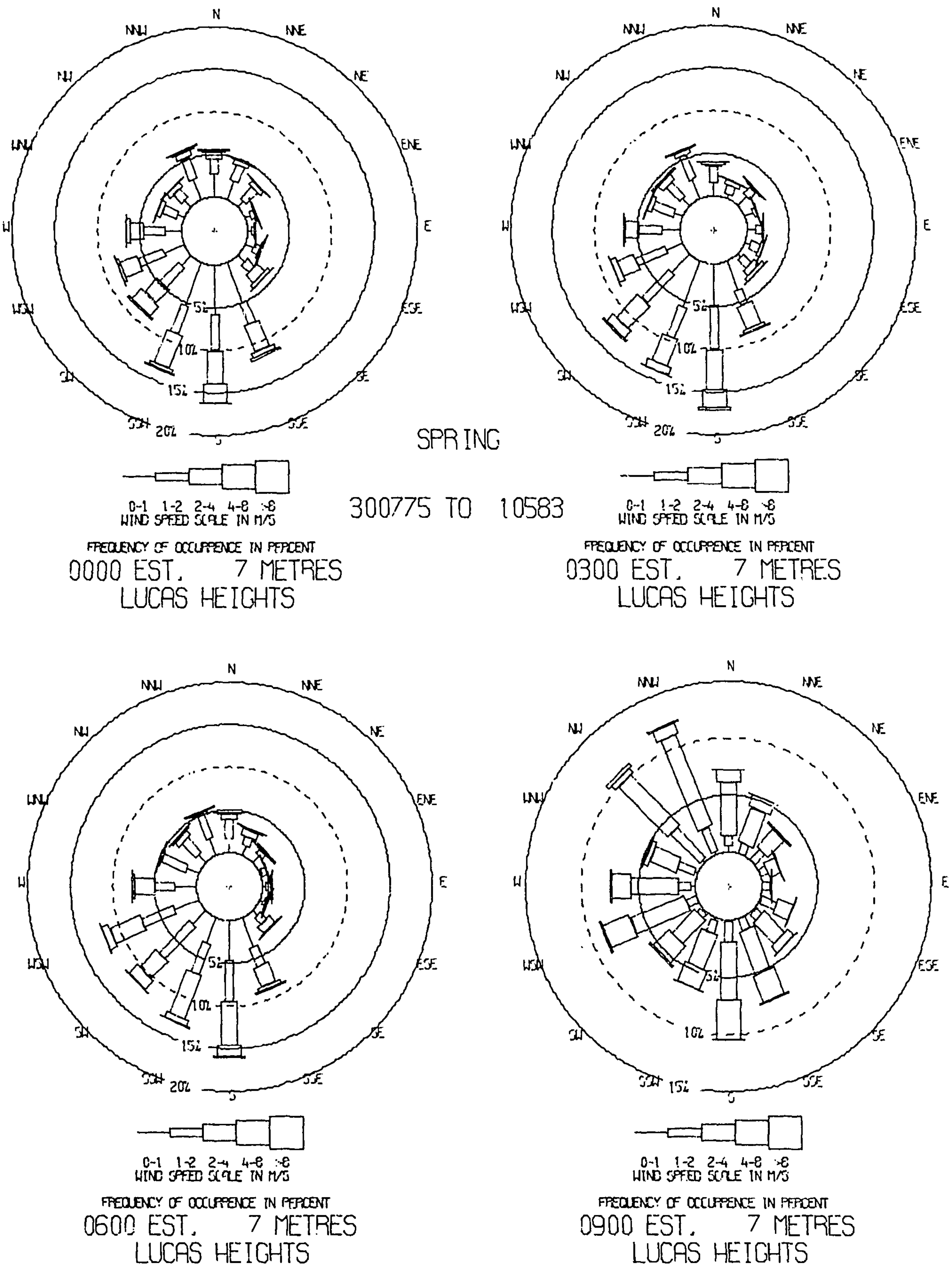

Figure 9 Spring Bailley-type wind roses, 7 m; 0000, 0300, 0600 and 0900 EST

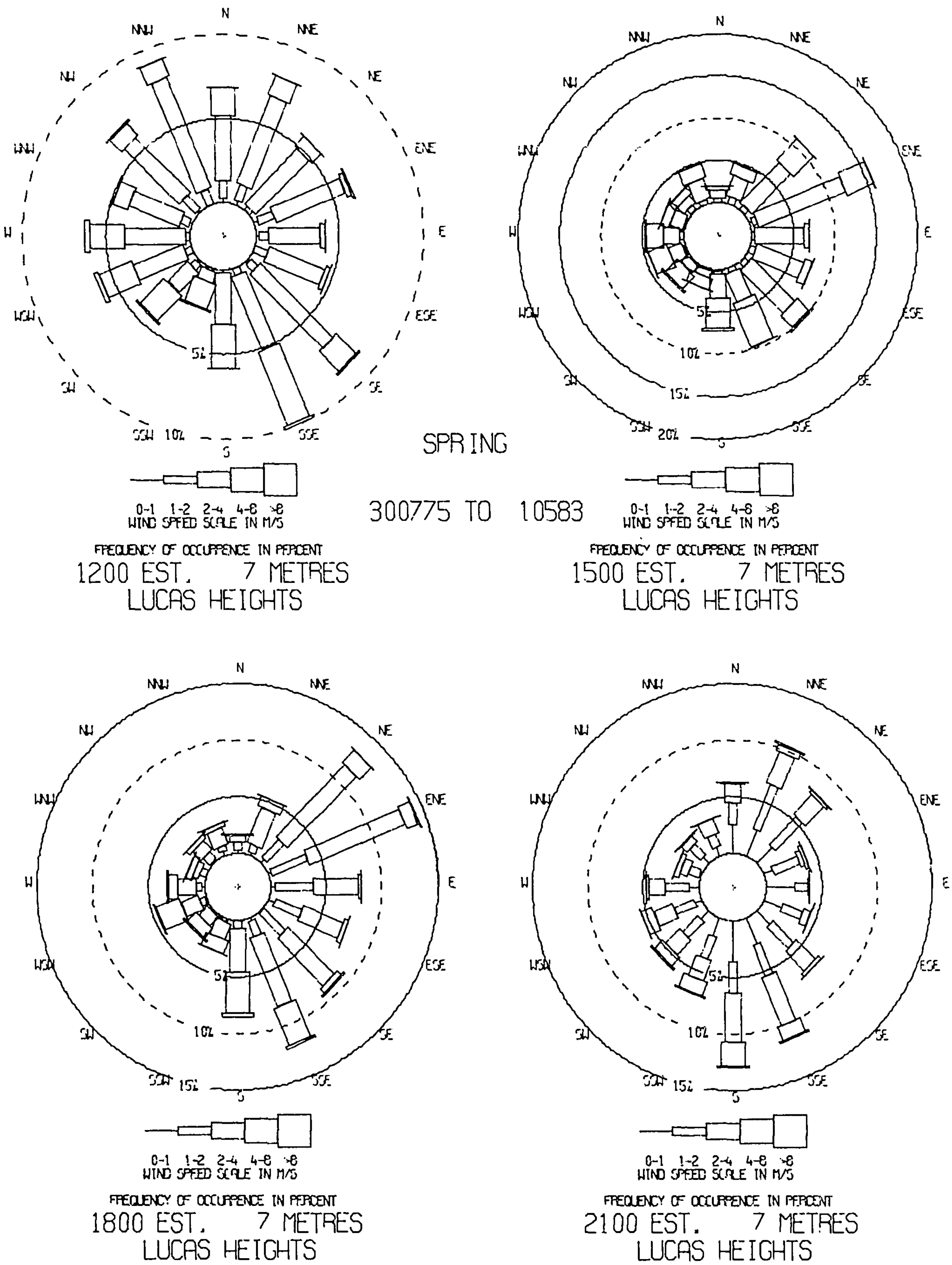

Figure 10 Spring Bailley-type wind roses, 7 m; 1200, 1500, 1800 and 2100 EST

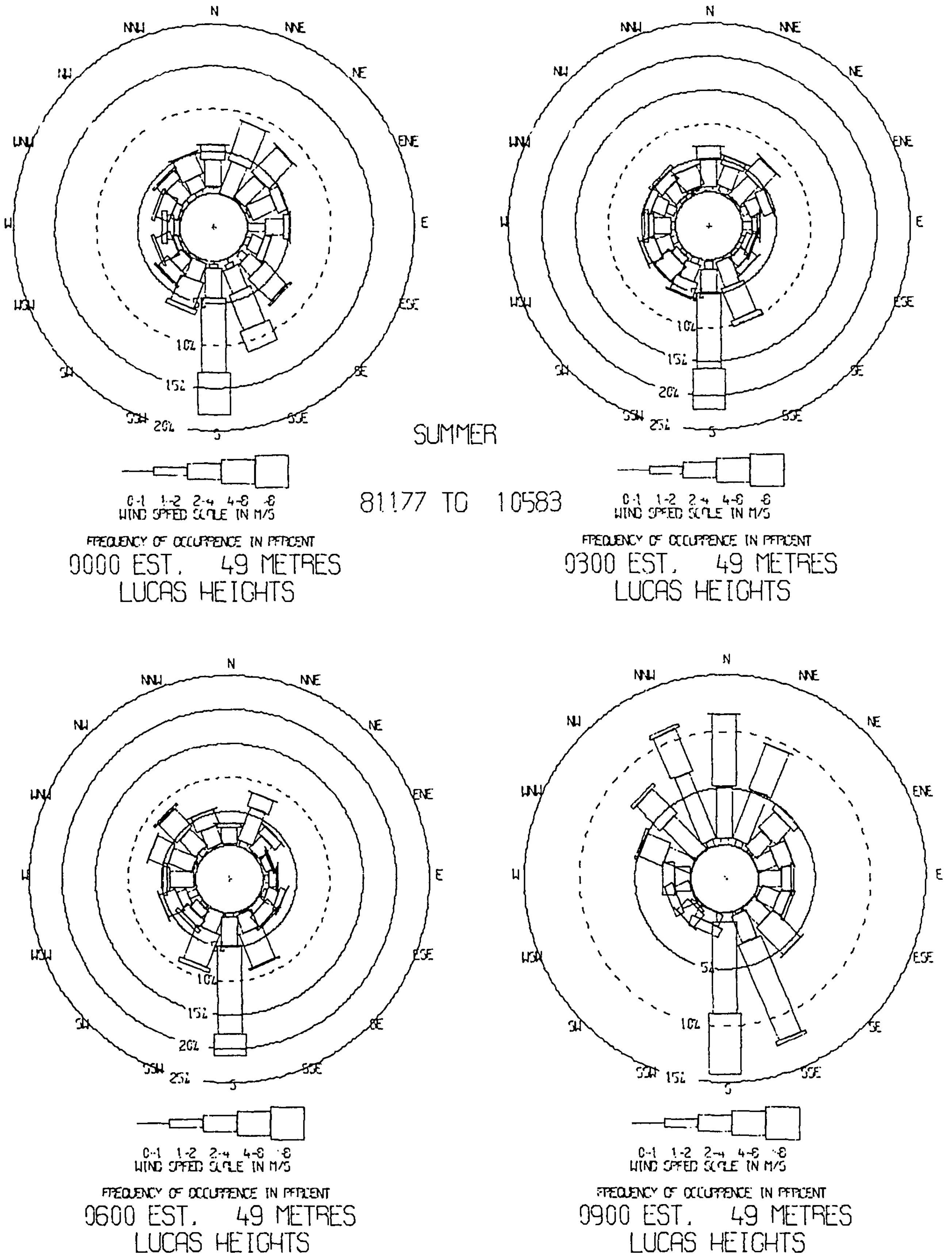

Figure 11 Summer Bailley-type wind roses, 49 m, 0000, 0300, 0600 and 0900 EST

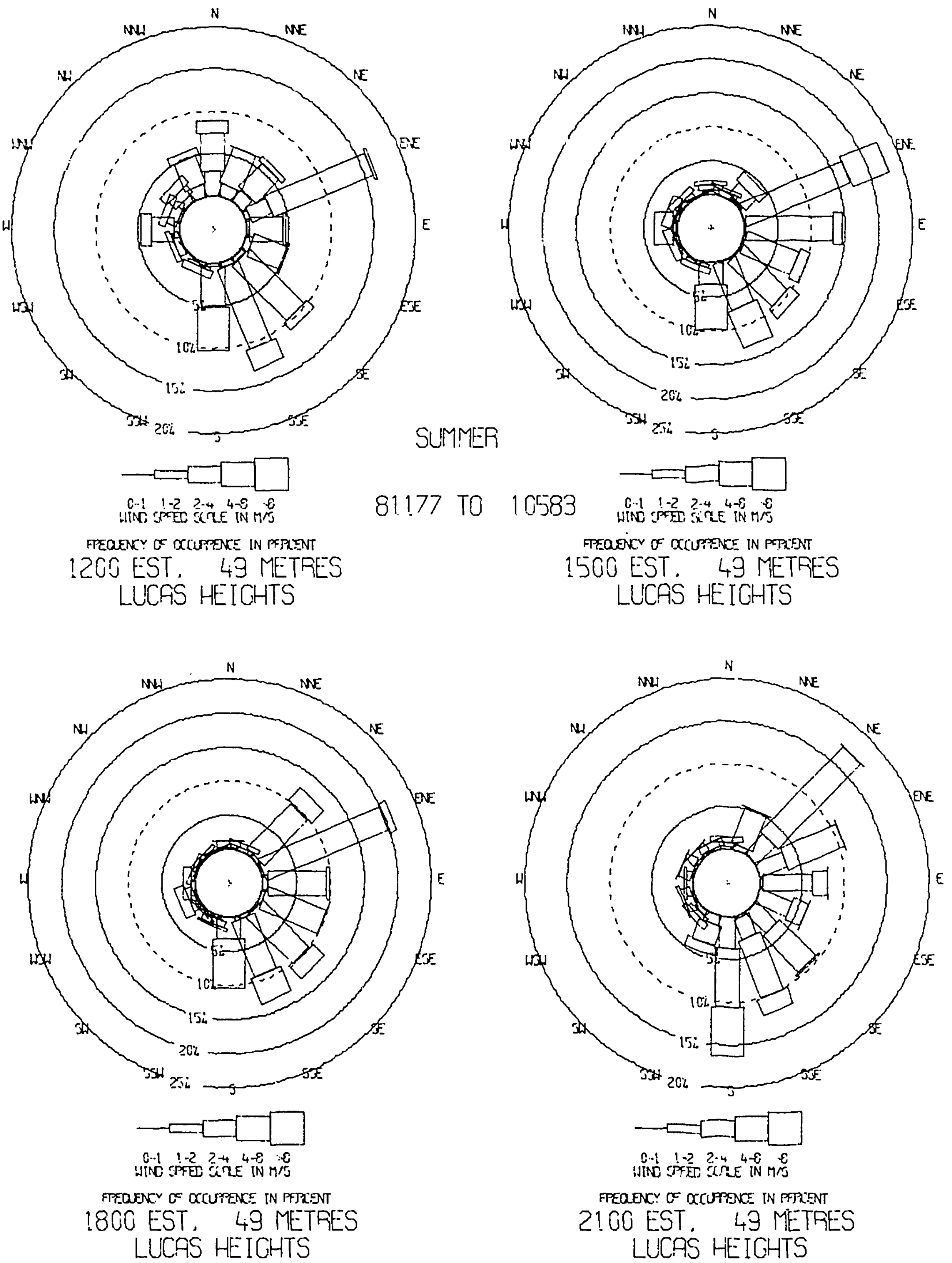

Figure 12 Summer Bailley-type wind roses, 49 m, 1200, 1500, 1800 and 2100 EST

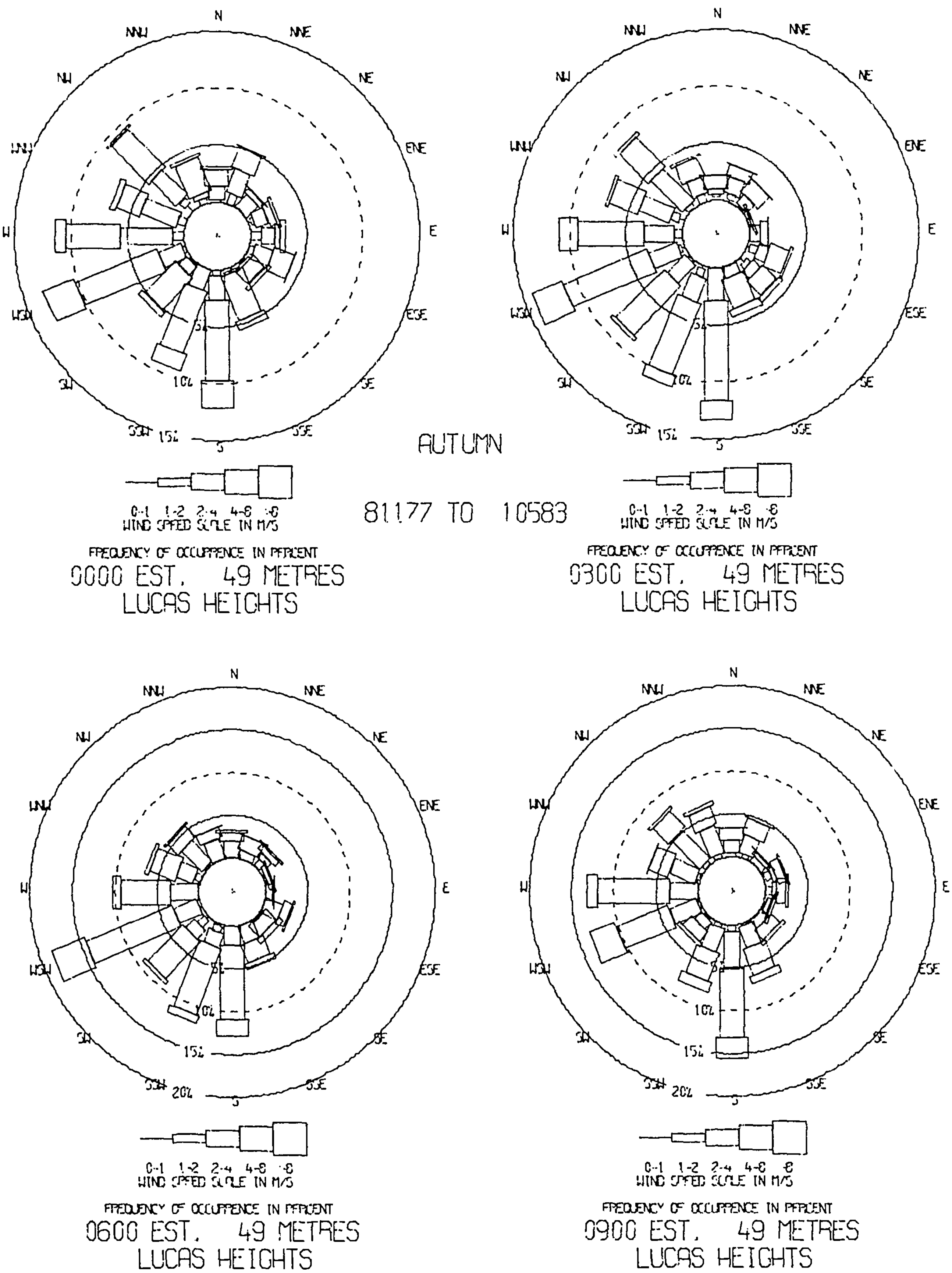

Figure 13 Autumn Bailley-type wind roses, 49 m, 0000, 0300, 0600 and 0900 EST

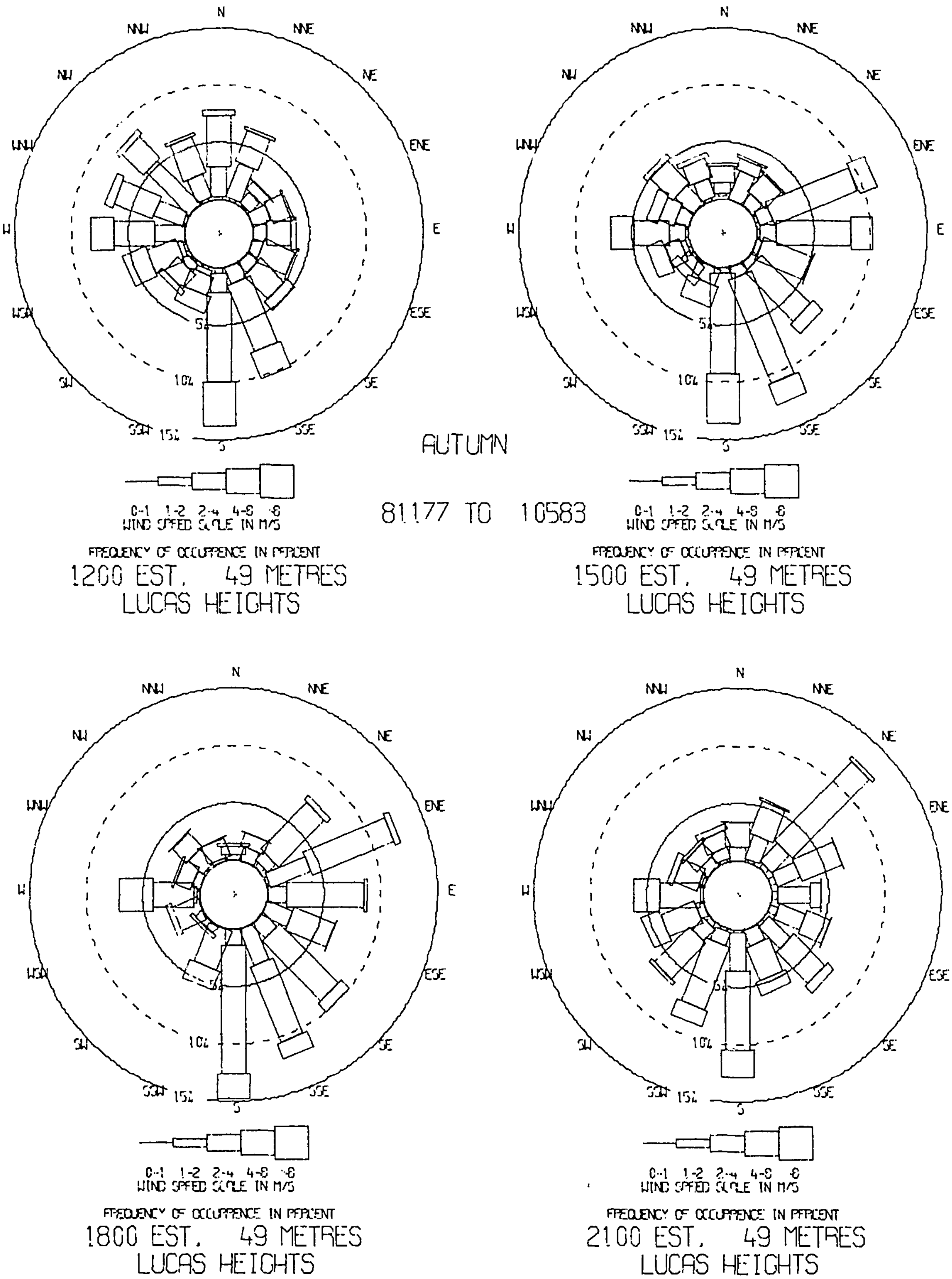

Figure 14 Autumn Bailley-type wind roses, 49 m, 1200, 1500, 1800 and 2100 EST

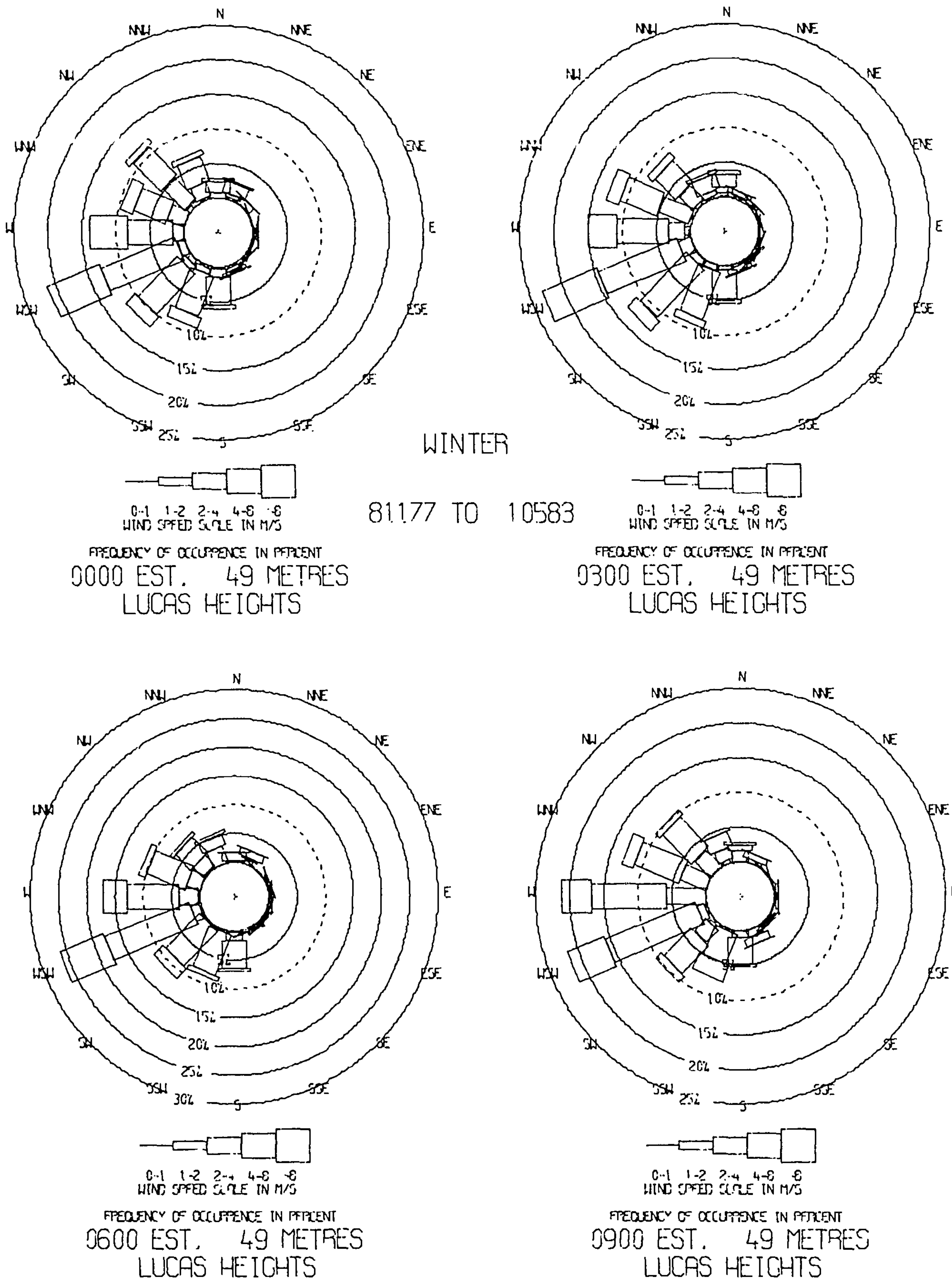

Figure 15 Winter Bailley-type wind roses, 49 m; 0000, 0300, 0600 and 0900 EST

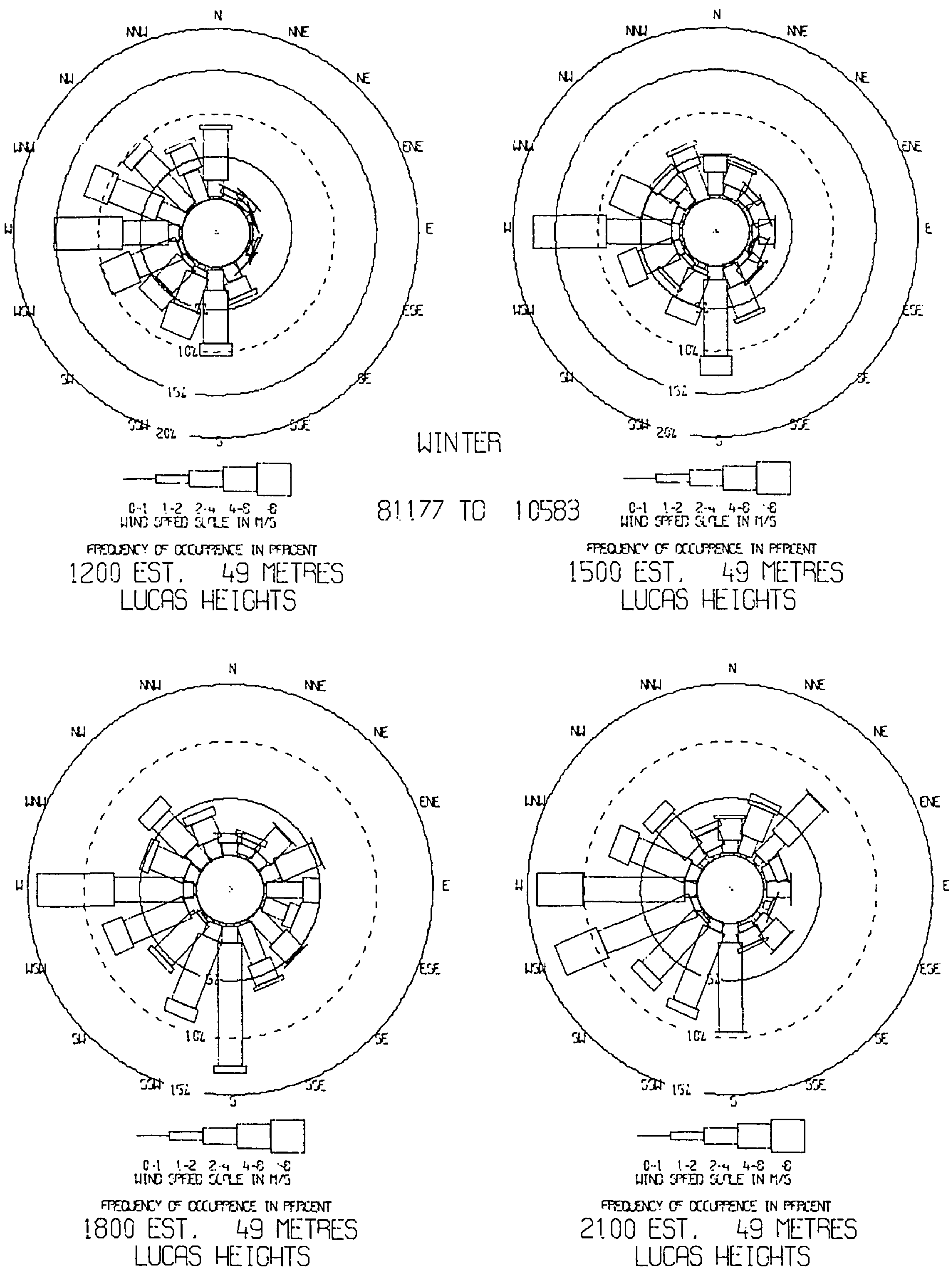

Figure 16 Winter Bailley-type wind roses, 49 m; 1200, 1500, 1800 and 2100 EST

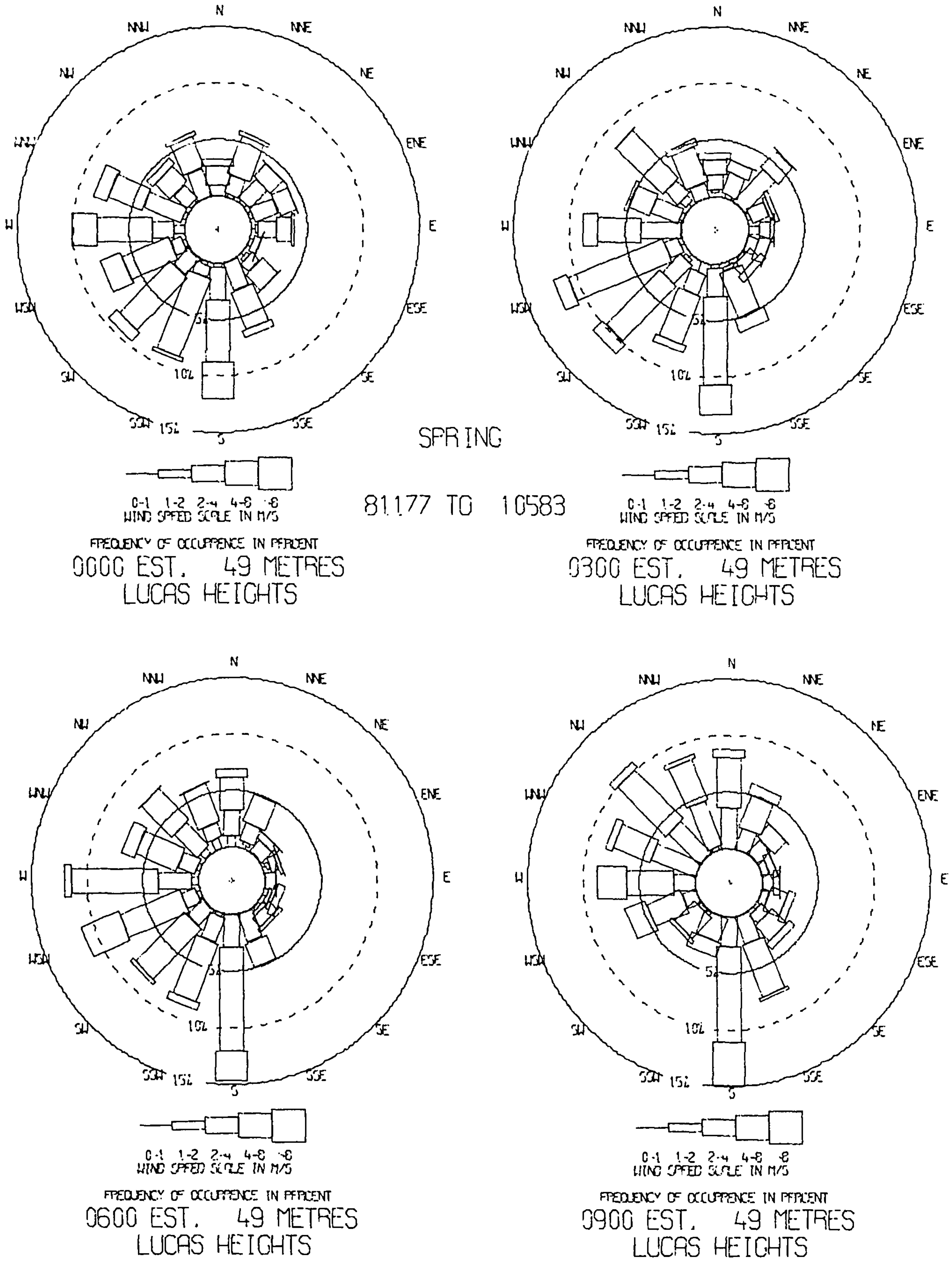

Figure 17 Spring Bailley-type wind roses, 49 m; 0000, 0300, 0600 and 0900 EST

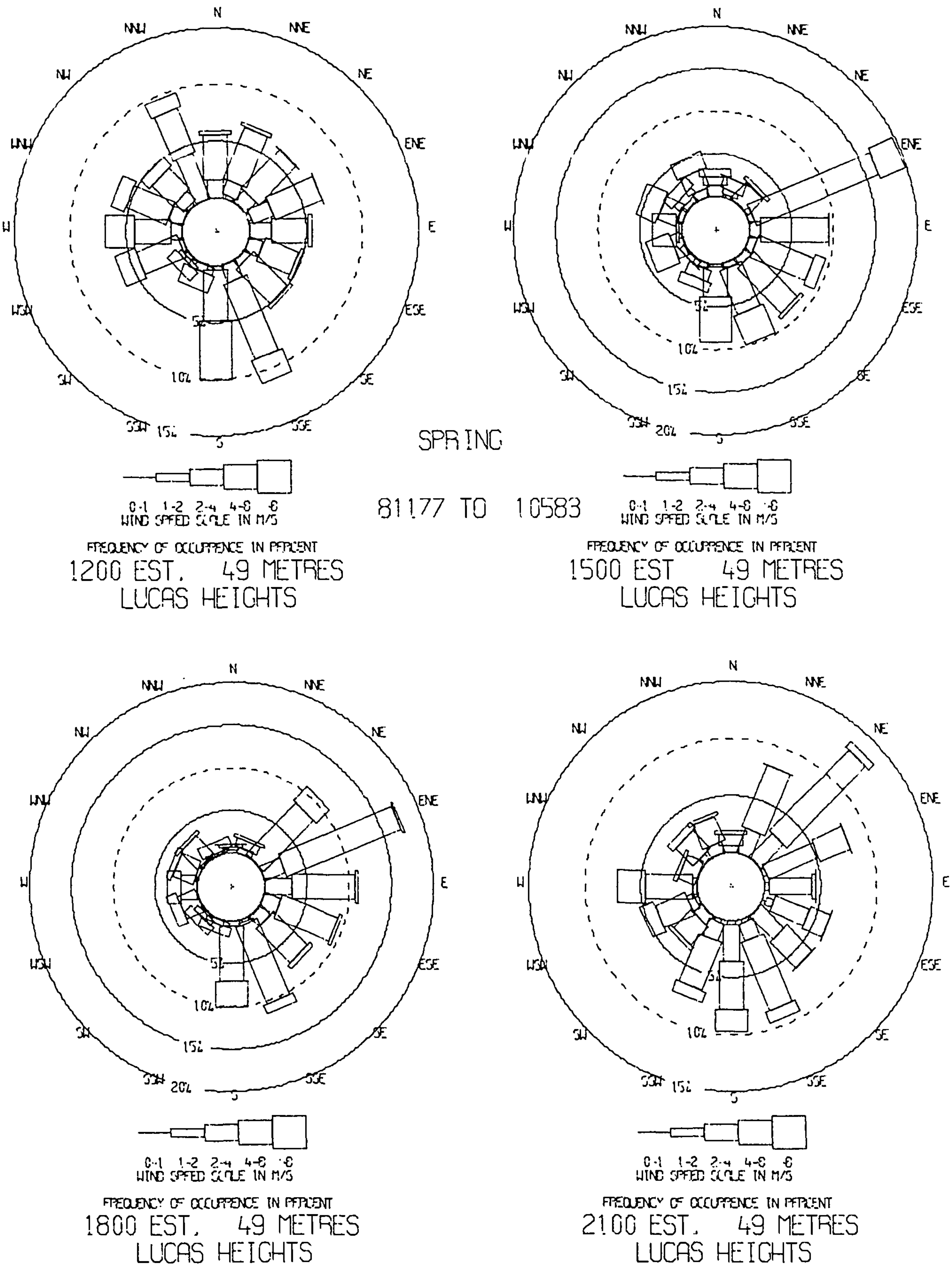

Figure 18 Spring Bailley-type wind roses, 49 m; 1200, 1500, 1800 and 2100 EST

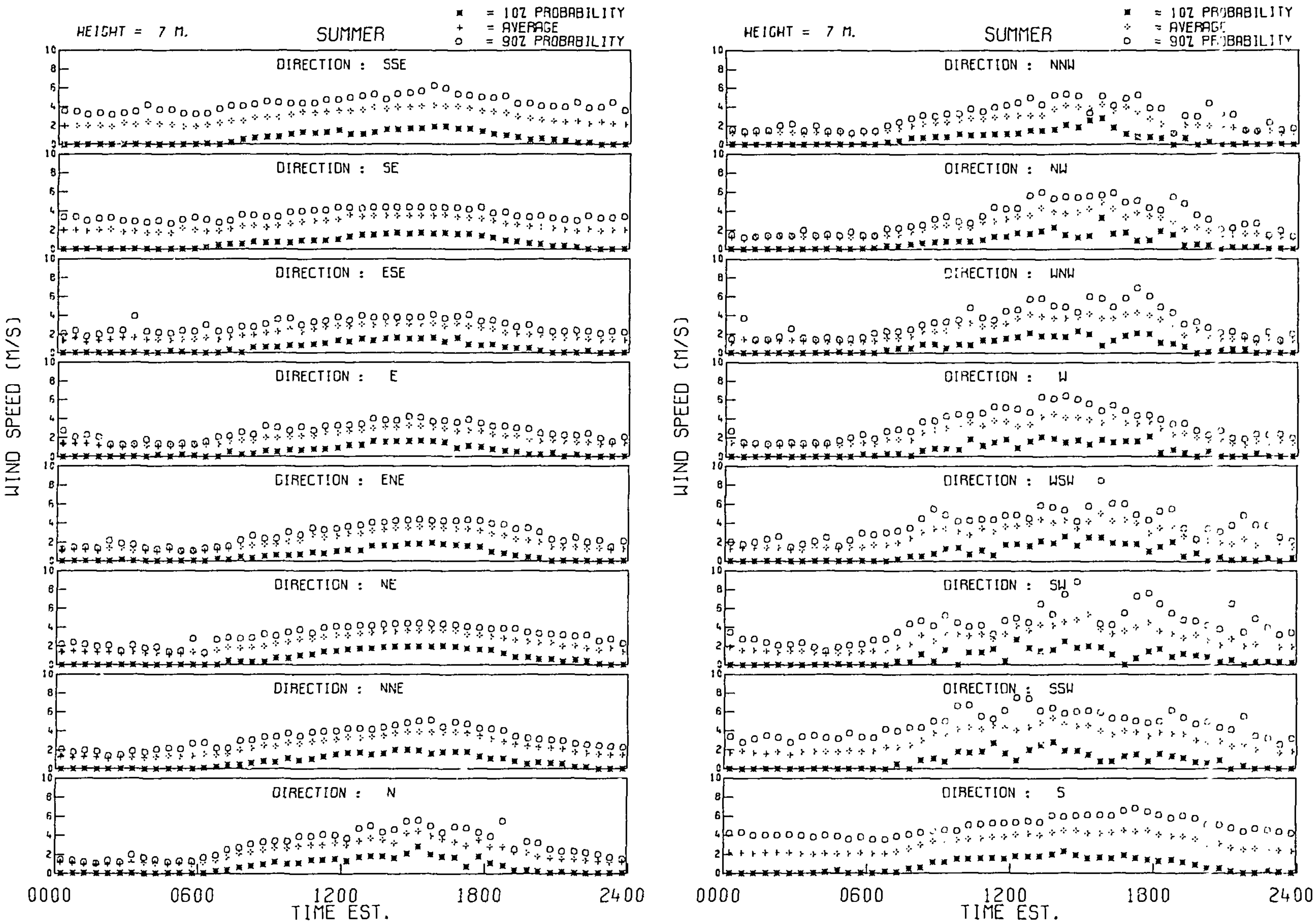

Figure 19 Summer, diurnal variation of average, 10 and 90% of 7 m wind speeds as a function of wind direction

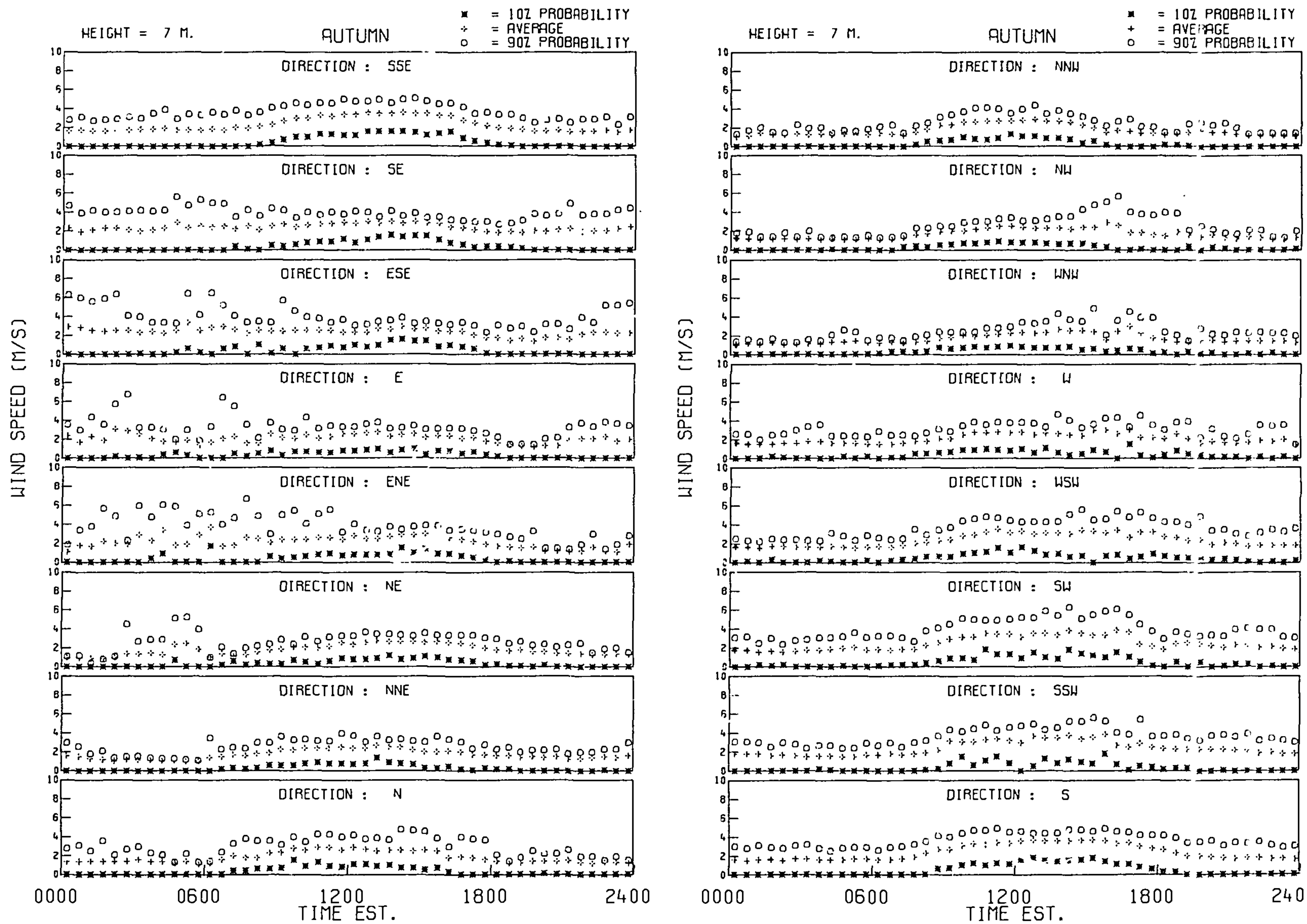

Figure 20 Autumn, diurnal variation of average, 10 and 90% of 7 m wind speeds as a function of wind direction

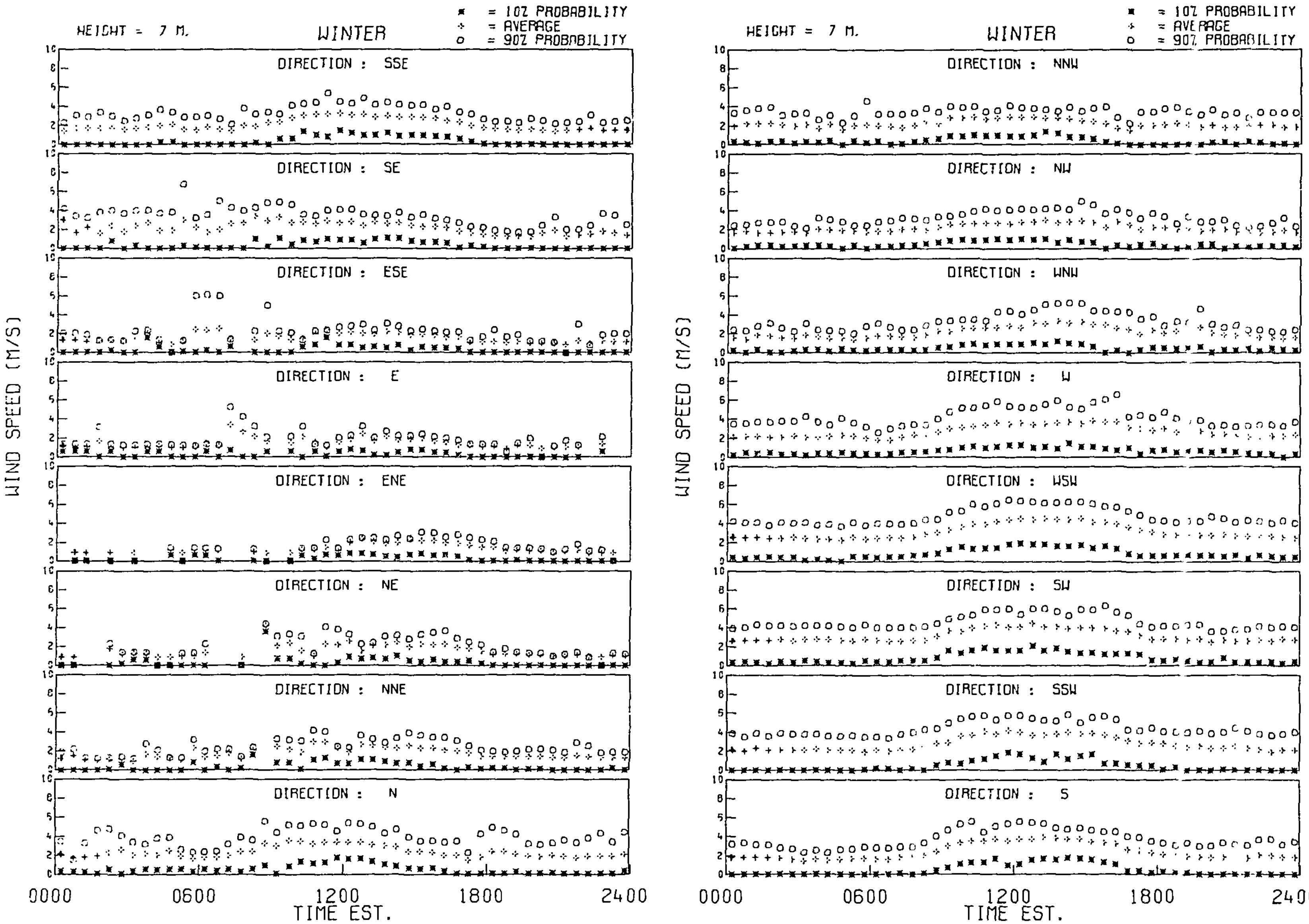

Figure 21 Winter, diurnal variation of average, 10 and 90% of 7 m wind speeds as a function of wind direction

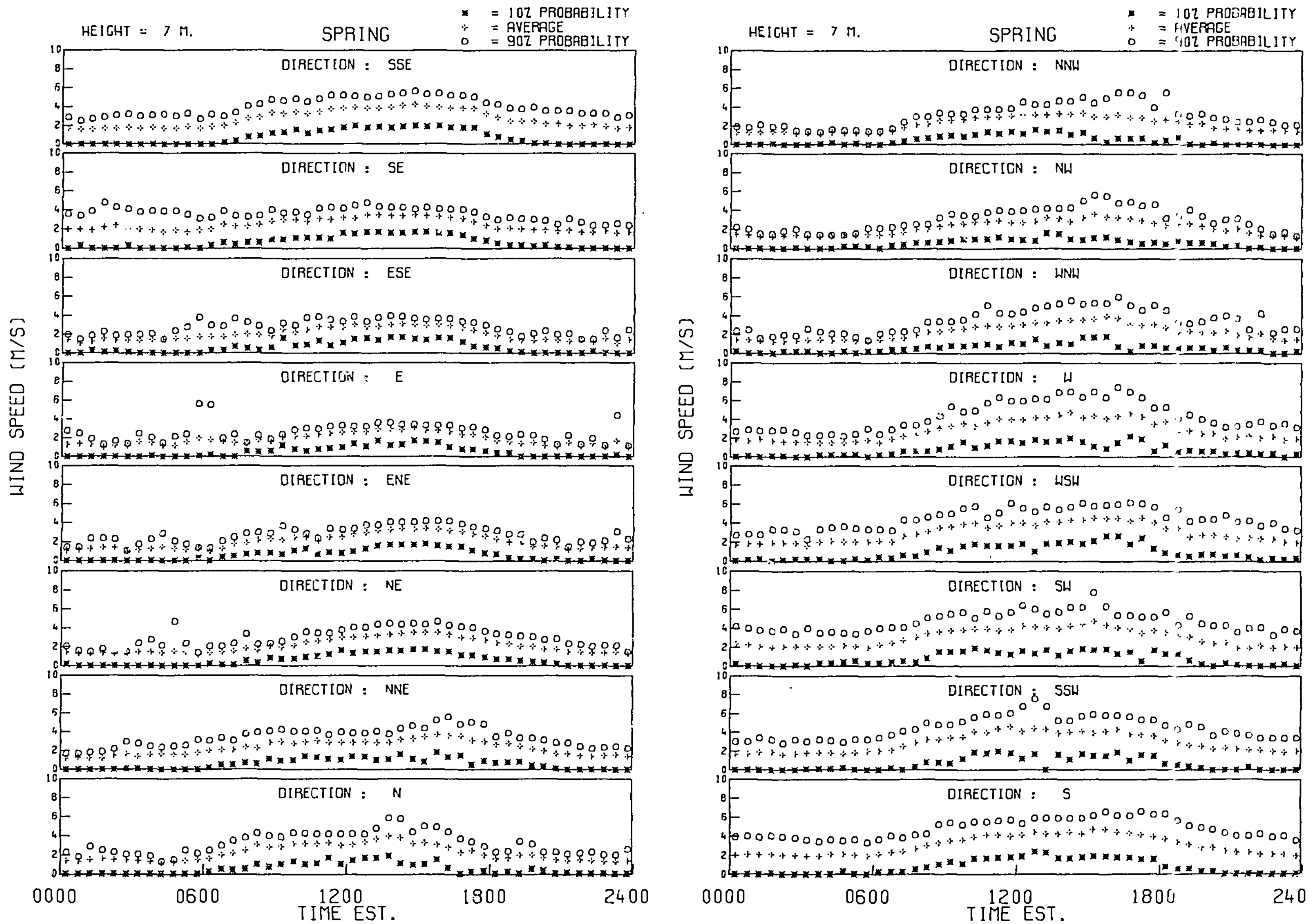

Figure 22 Spring, diurnal variation of average, 10 and 90% of 7 m wind speeds as a function of wind direction

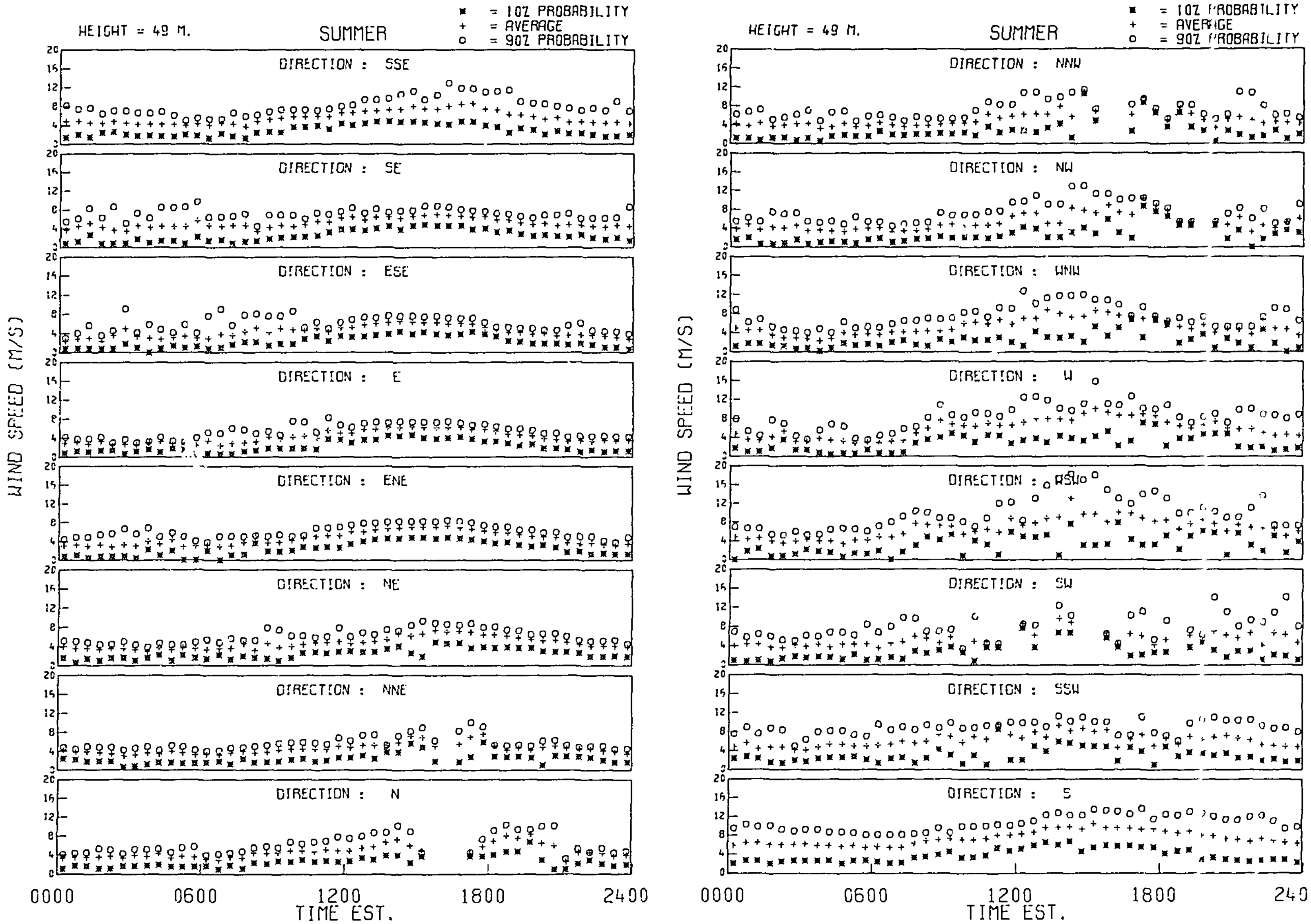

Figure 23 Summer, diurnal variation of average, 10 and 90% of 49 m wind speeds as a function of wind direction

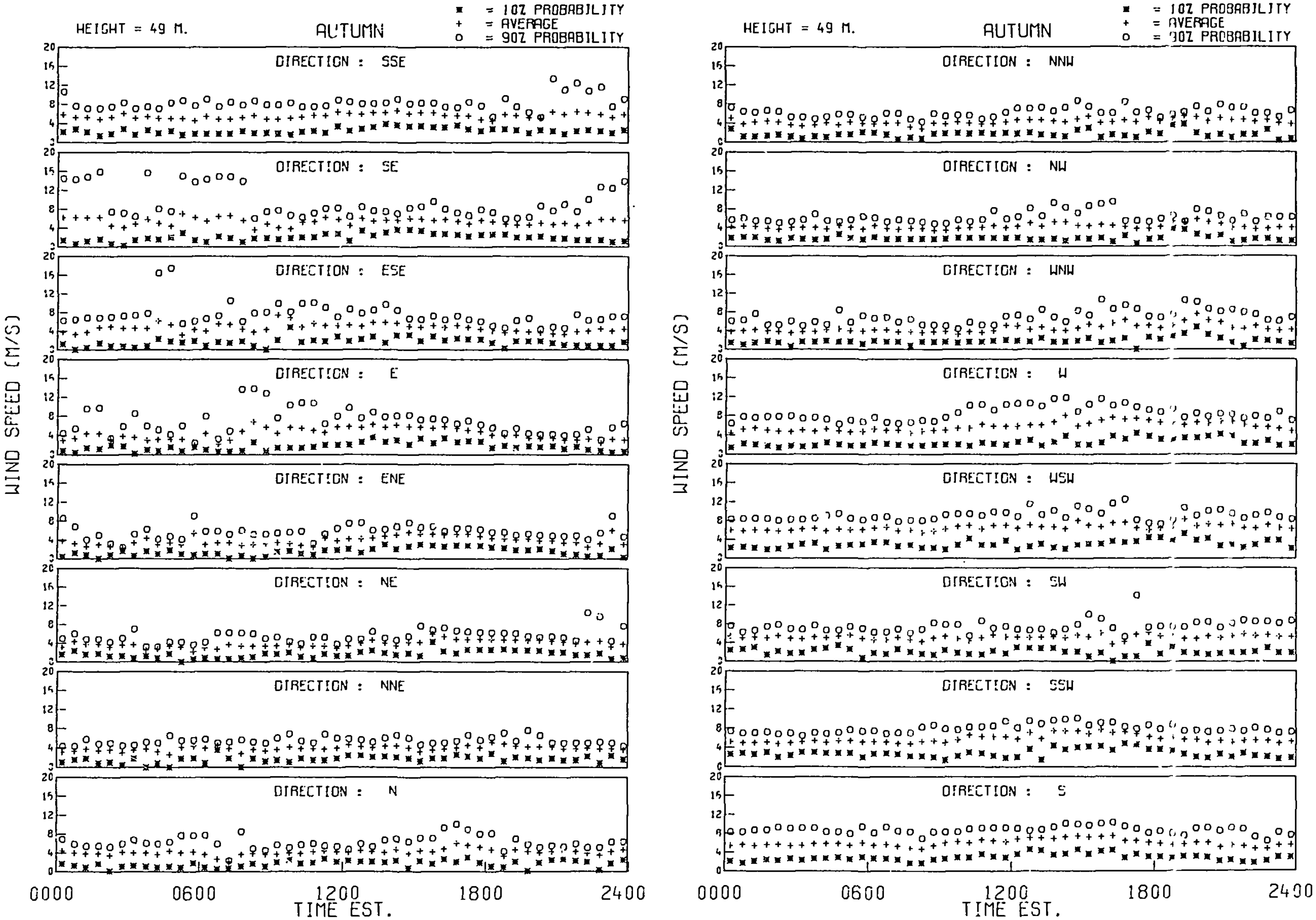

Figure 24 Autumn, diurnal variation of average, 10 and 90% of 49 m wind speeds as a function of wind direction

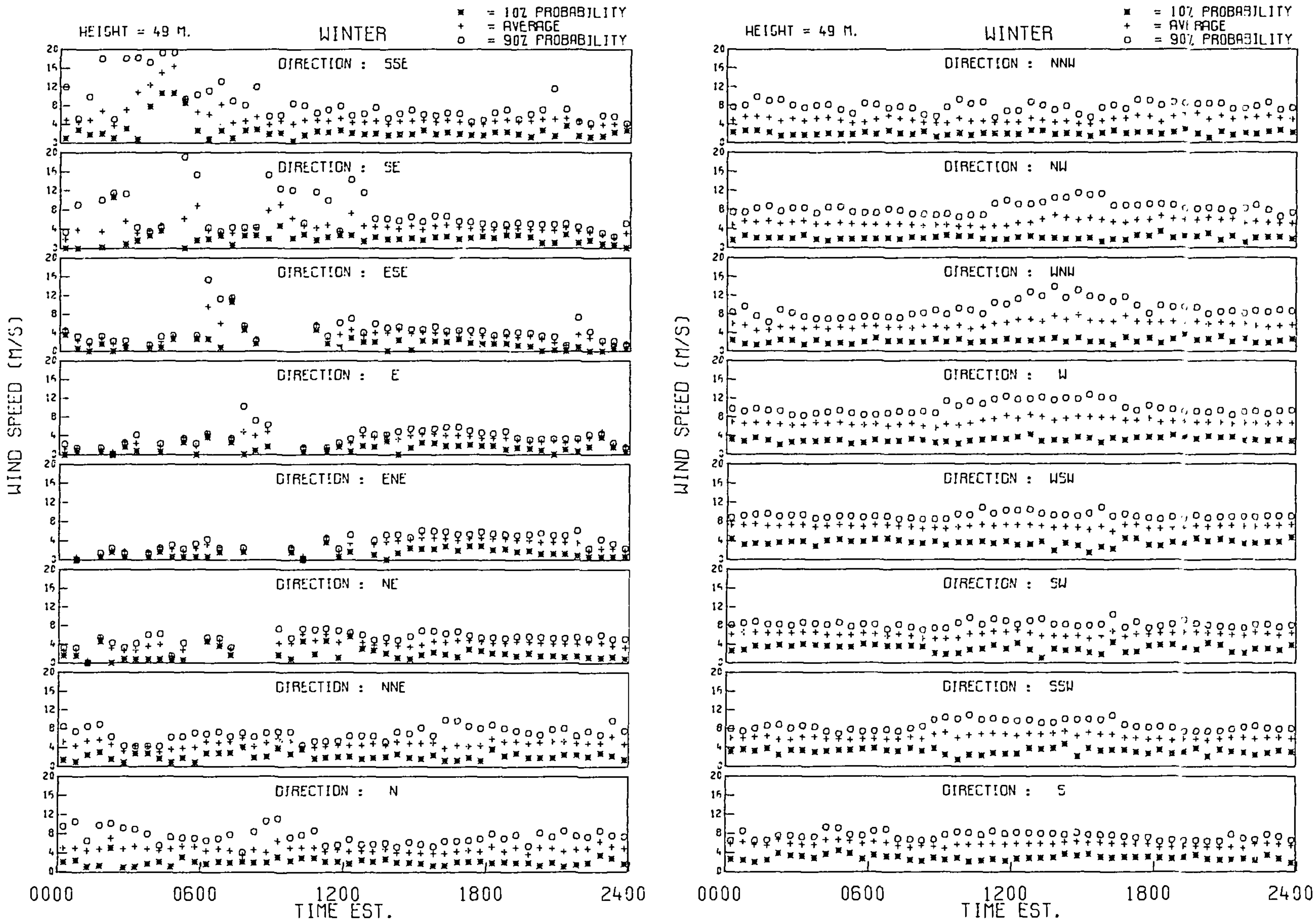

Figure 25 Winter, diurnal variation of average, 10 and 90% of 49 m wind speeds as a function of wind direction

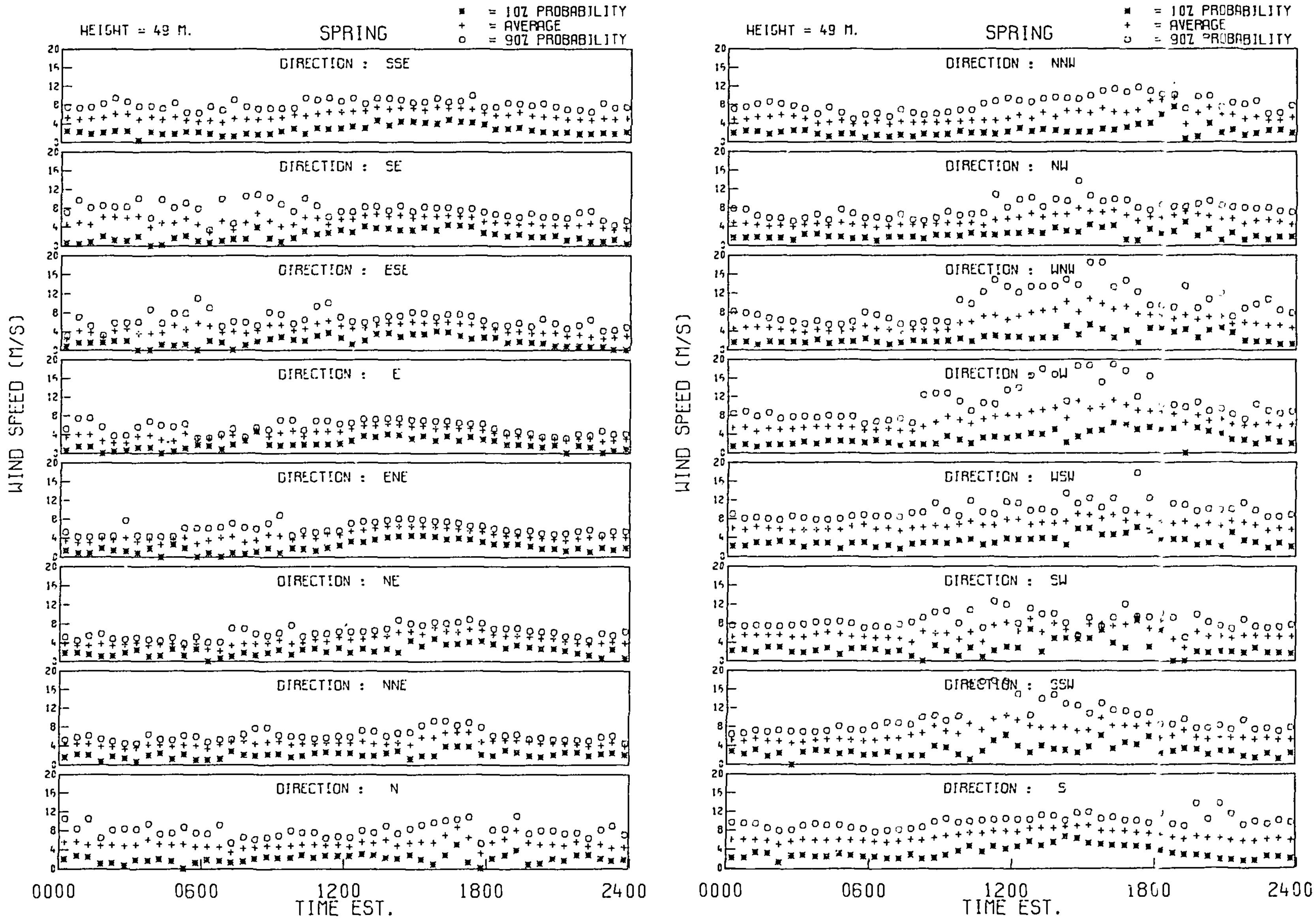

Figure 26 Spring, diurnal variation of average, 10 and 90% of 49 m wind speeds as a function of wind direction

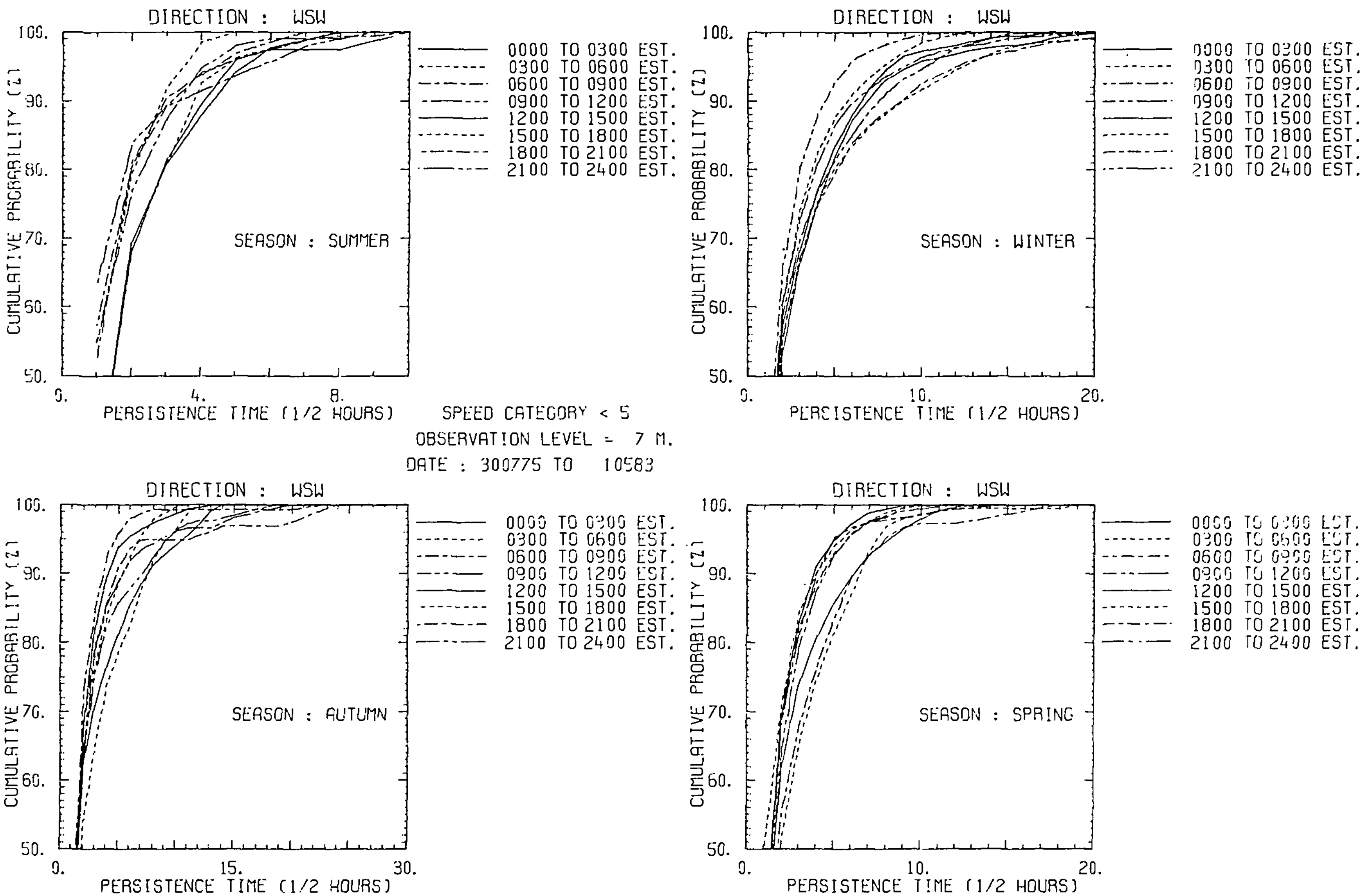

Figure 27 Diurnal variation of the 7 m west-south-west wind direction persistence as a function of season

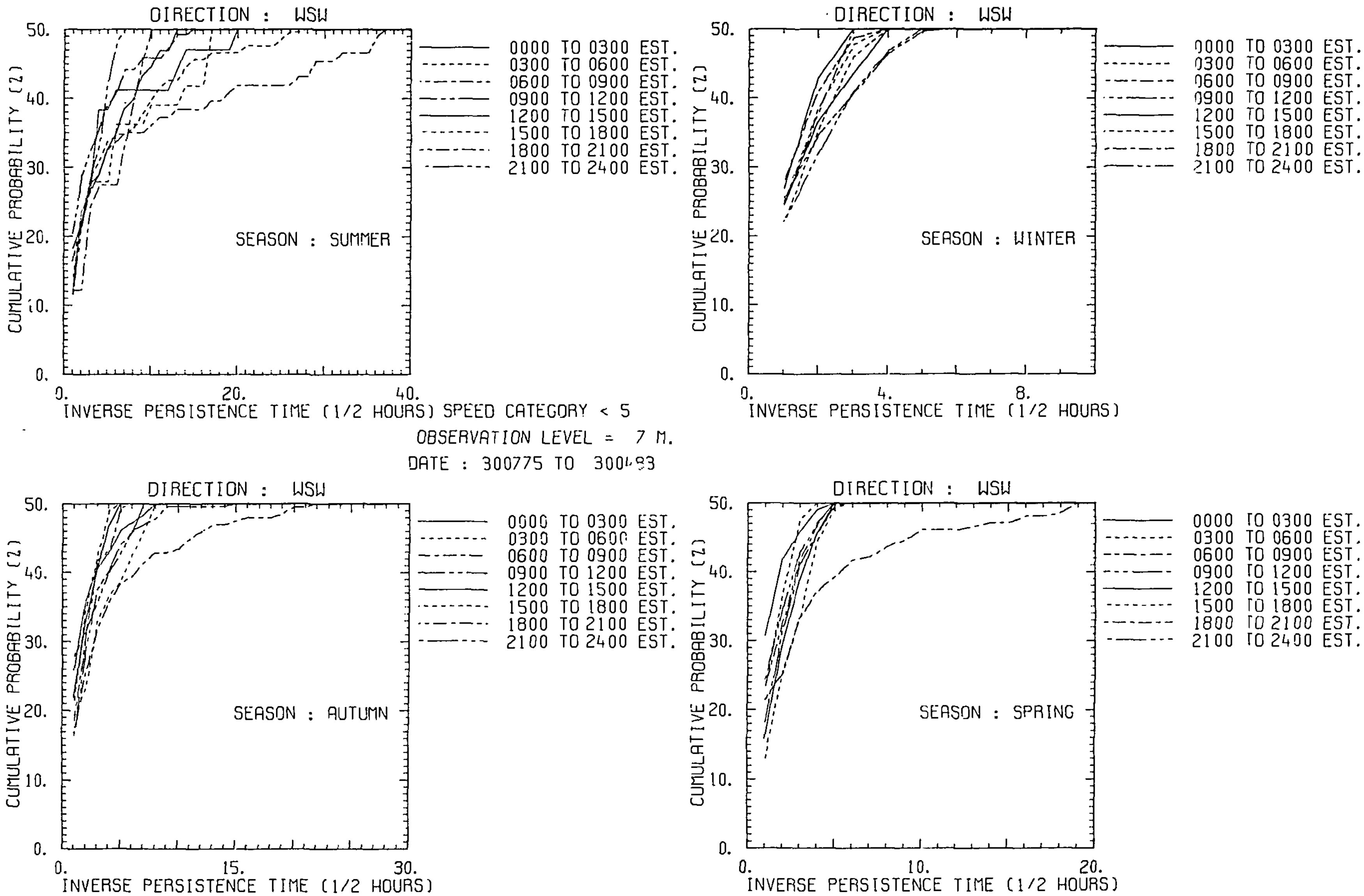

Figure 28 Diurnal variation of the 'inverse' persistence of the 7 m west-south-west wind direction as a function of season

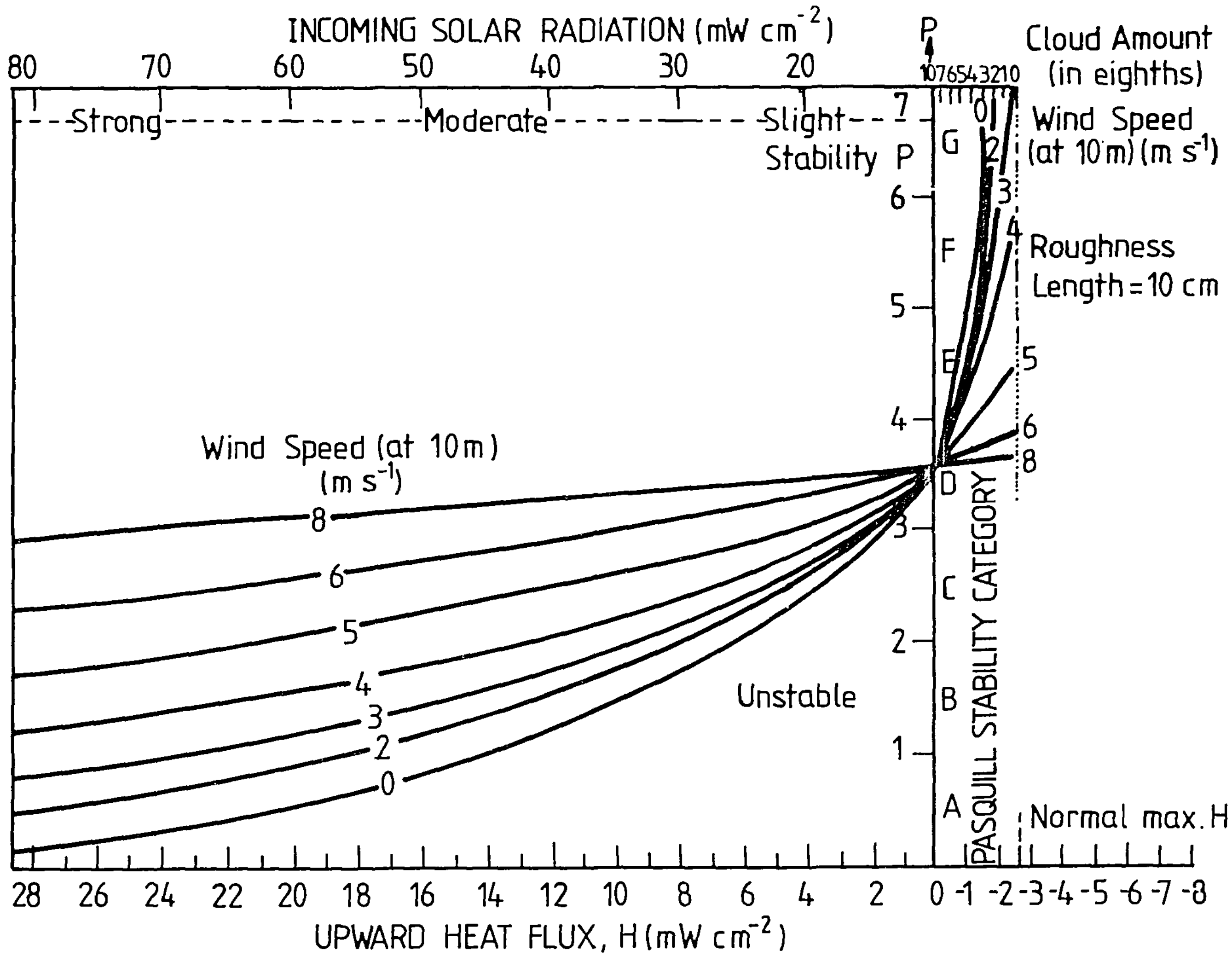

Figure 29 Pasquill stability category as a function of the upward sensible heat flux and wind speed [after Smith 1972]

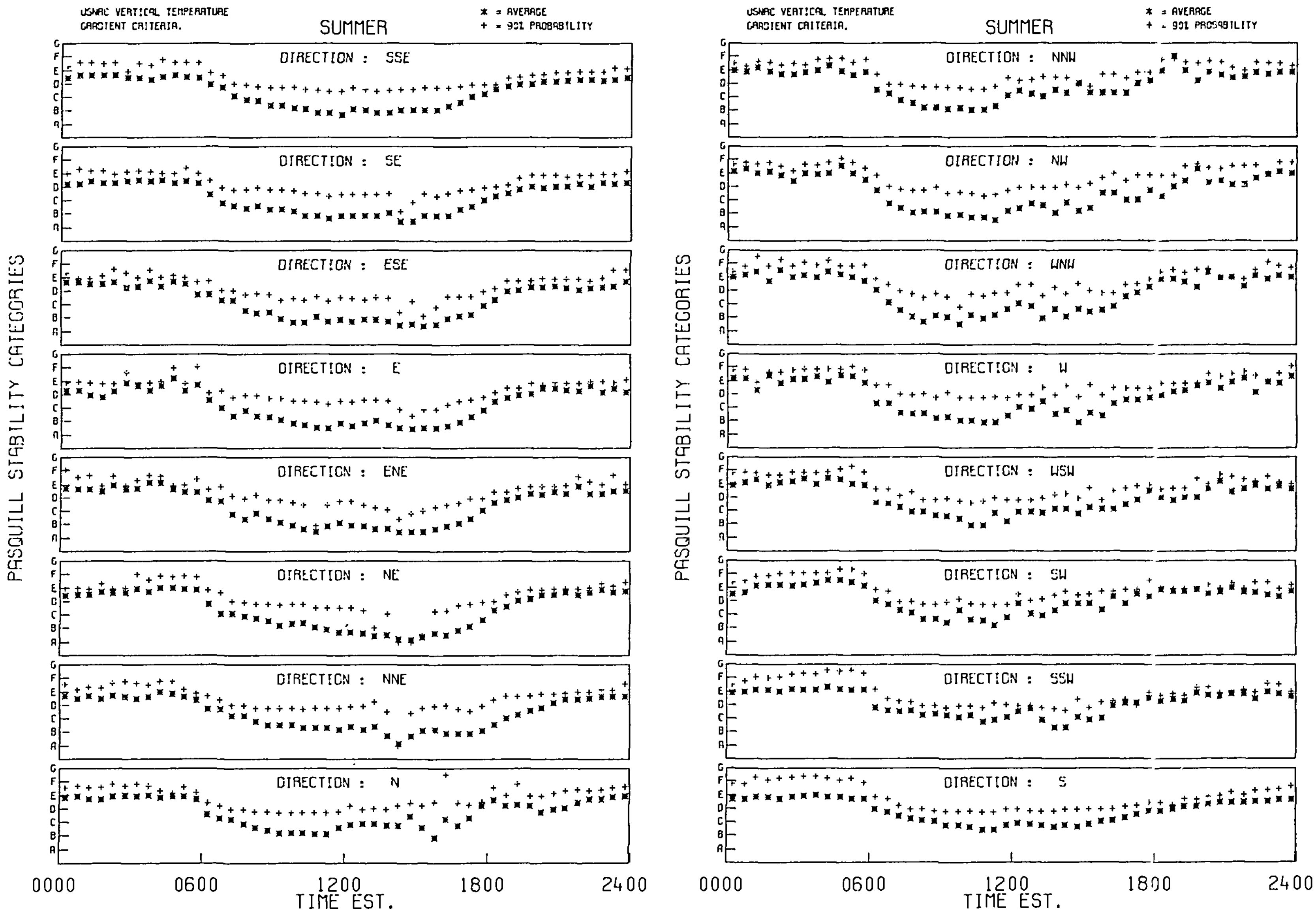

Figure 30 Diurnal variation of average and 90% probability atmospheric stabilities based on the USNRC temperature gradient criteria as a function of wind direction: Summer

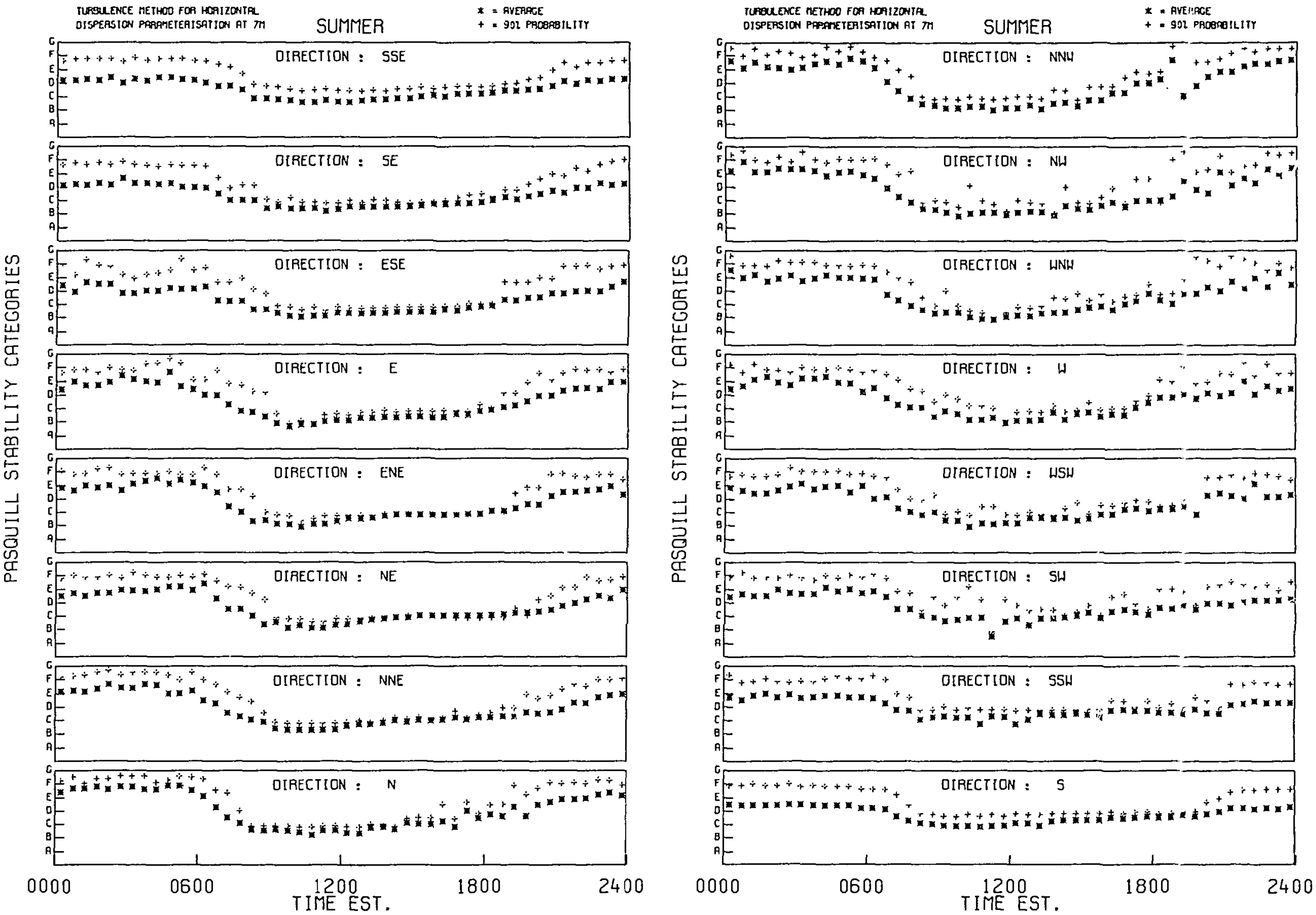

Figure 31 Diurnal variation of average and 90% probability atmospheric stabilities: turbulence method at 7 m: a function of wind direction: Summer

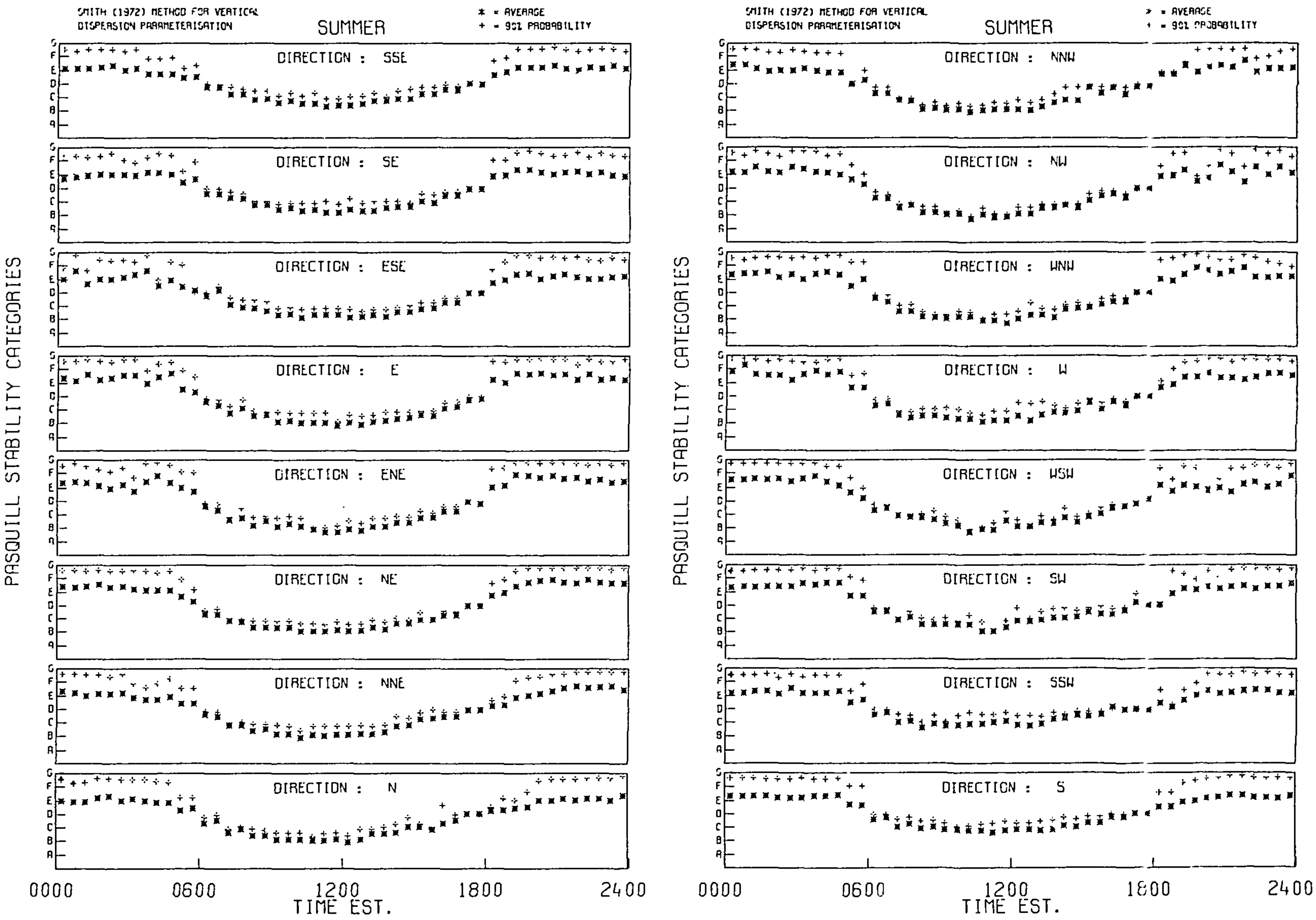

Figure 32 Diurnal variation of average and 90% probability atmospheric stabilities: turbulence method at 7 m: a function of wind direction: Summer: Smith [1972] method

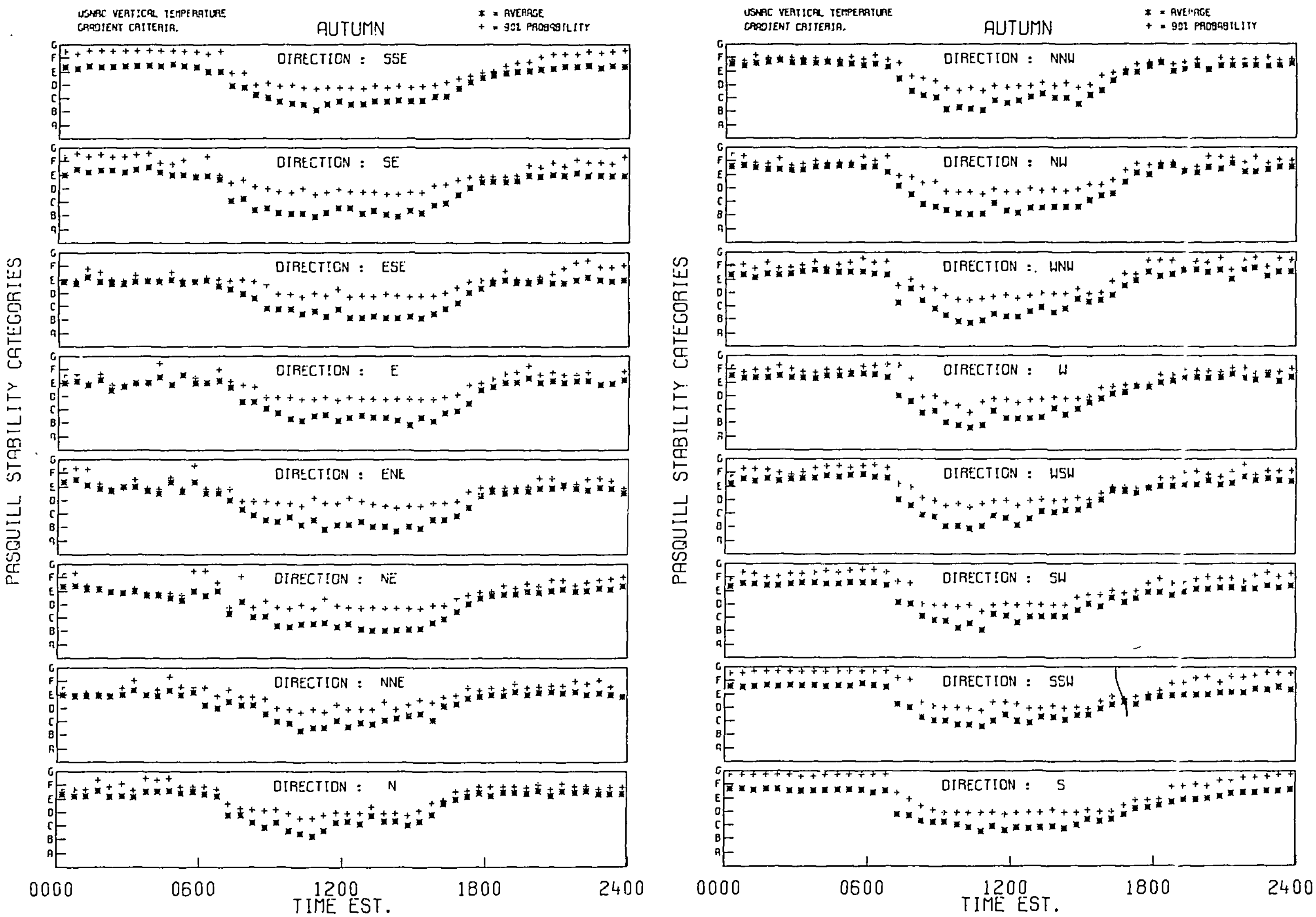

Figure 33 Diurnal variation of average and 90% probability atmospheric stabilities based on the USNRC temperature gradient criteria as a function of wind direction: Autumn

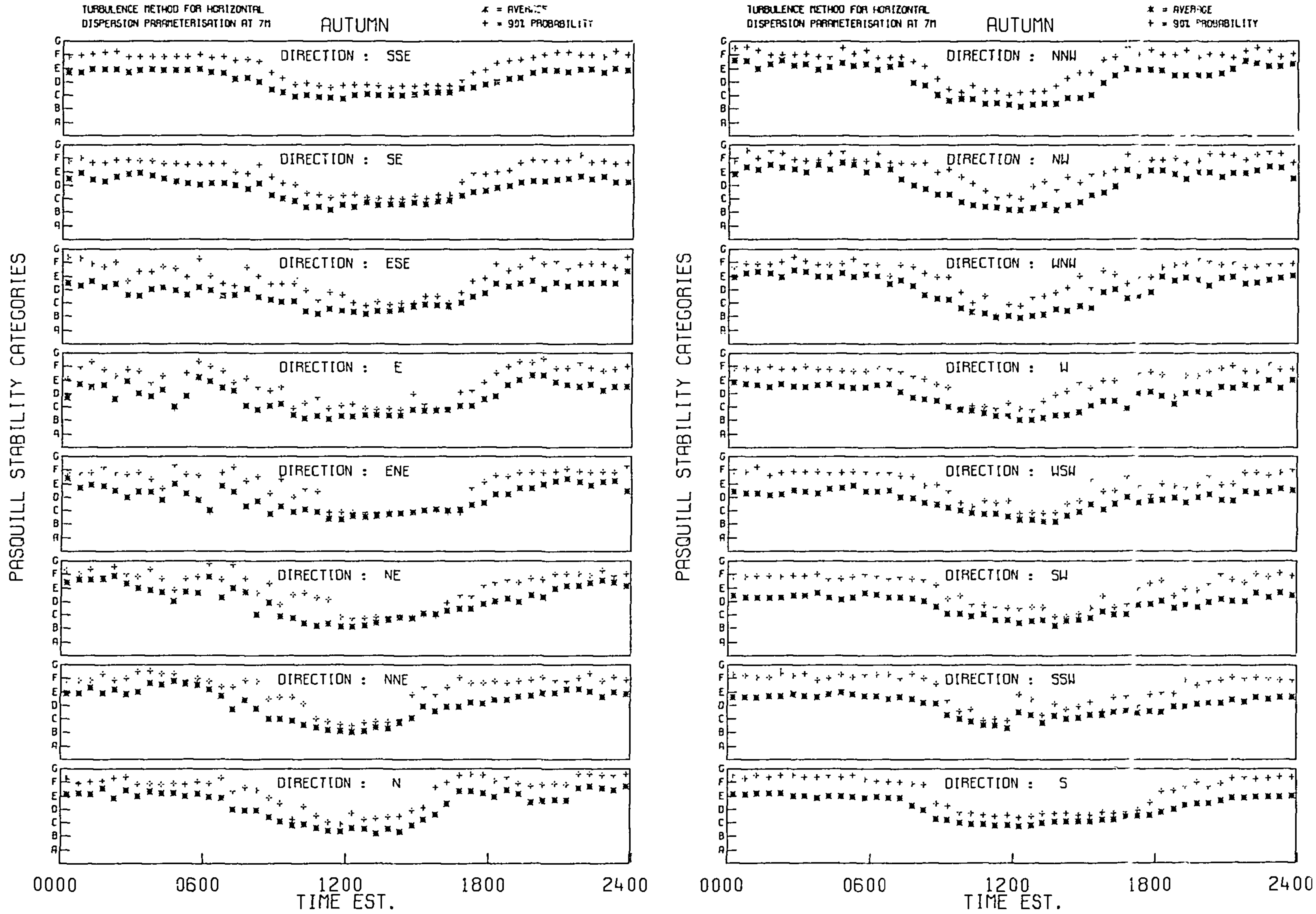

Figure 34 Diurnal variation of average and 90% probability atmospheric stabilities; turbulence method at 7 m; a function of wind direction: Autumn

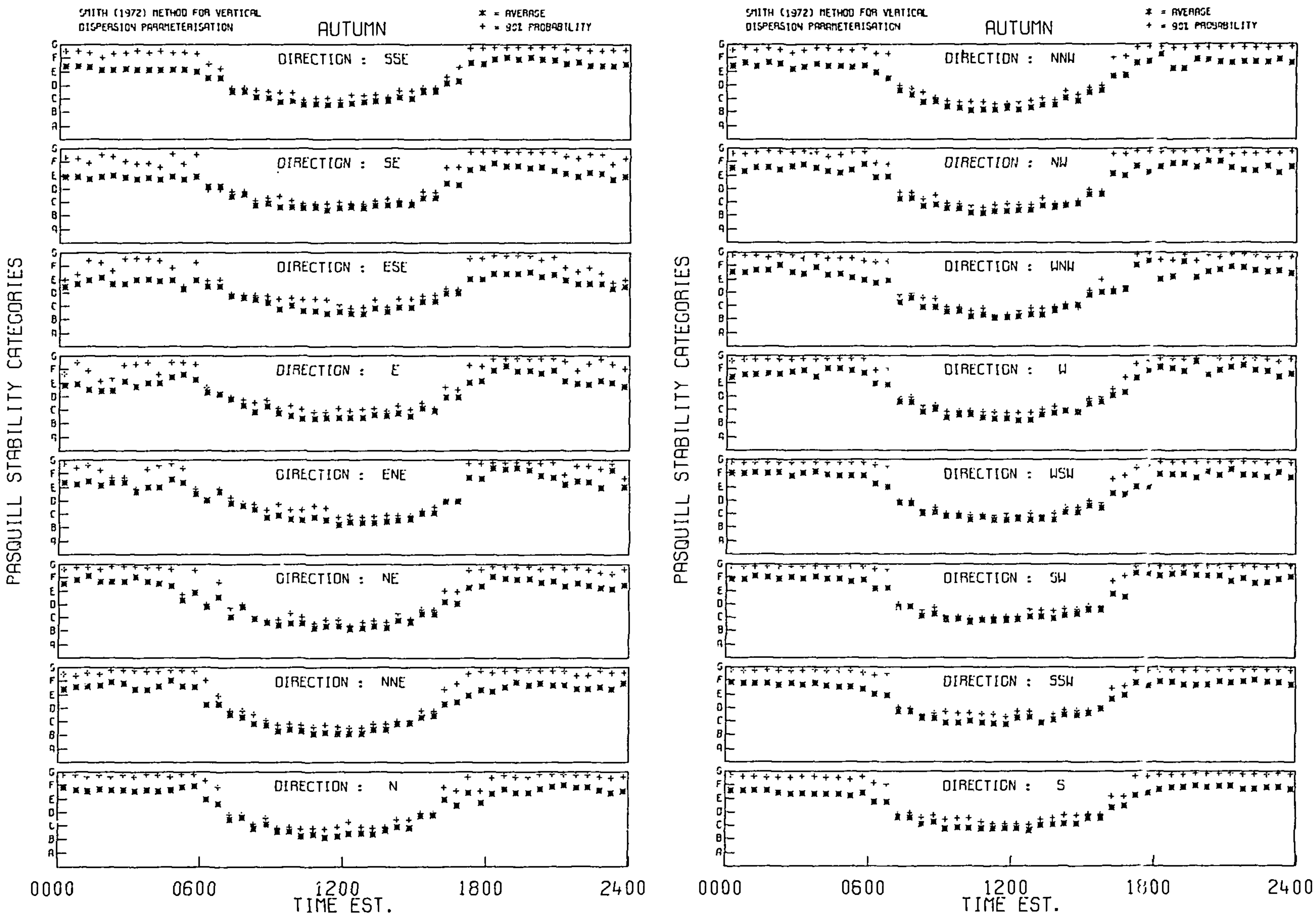

Figure 35 Diurnal variation of average and 90% probability atmospheric stabilities: turbulence method at 7 m; a function of wind direction: Smith [1972] method; Autumn

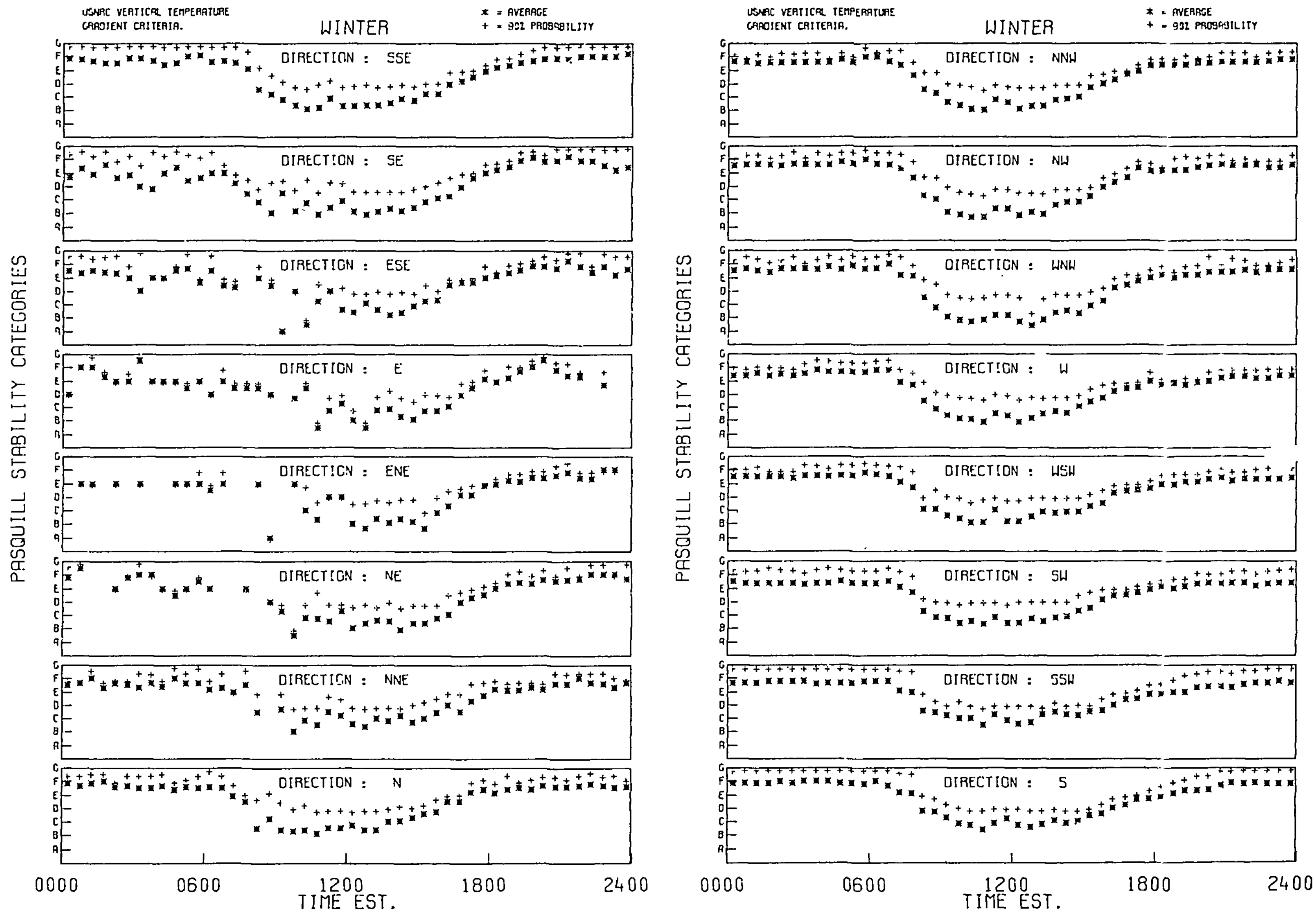

Figure 36 Diurnal variation of average and 90% probability atmospheric stabilities based on the USNRC temperature gradient criteria as a function of wind direction: Winter

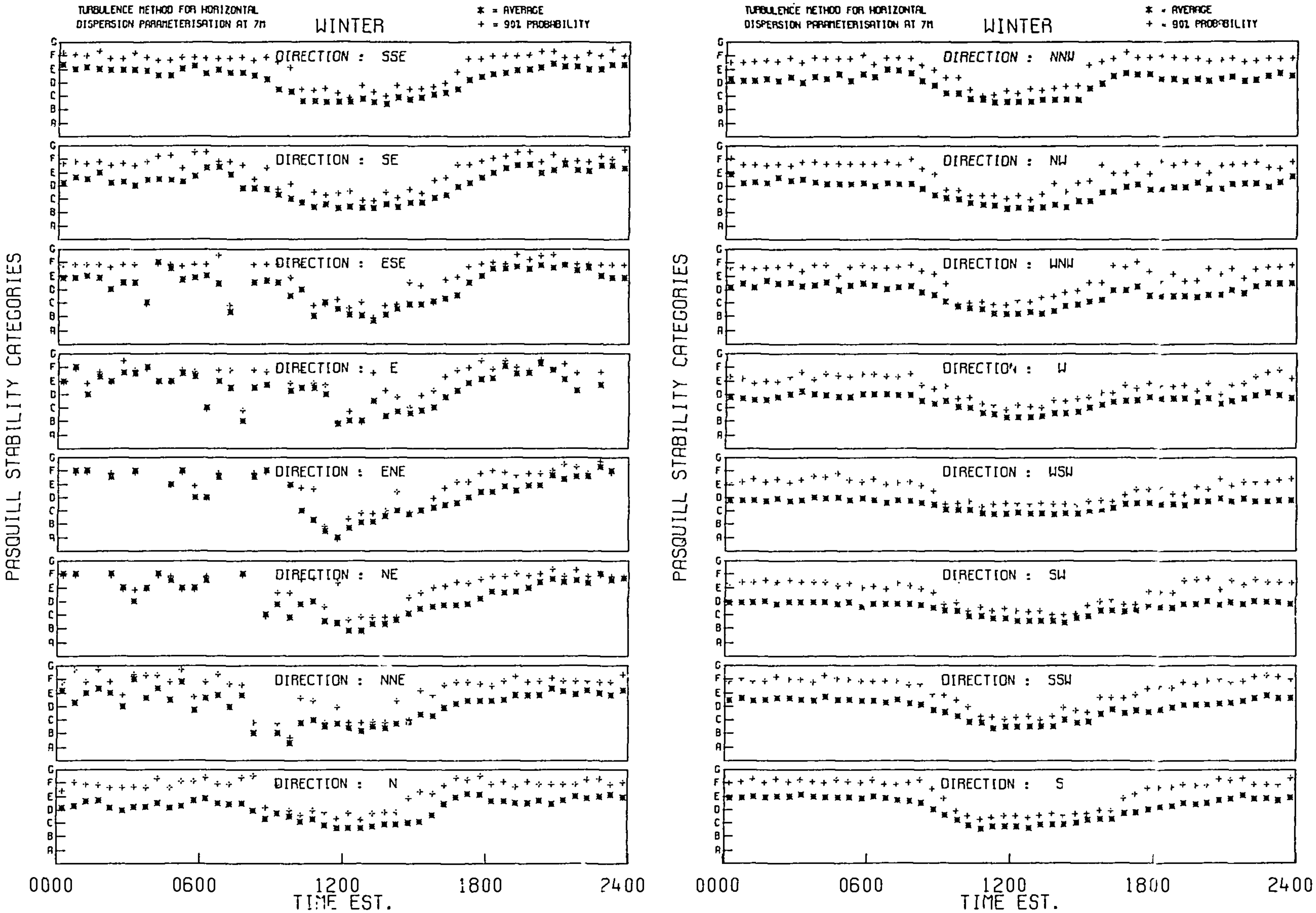

Figure 37 Diurnal variation of average and 90% probability atmospheric stabilities; turbulence method at 7 m; a function of wind direction; Winter

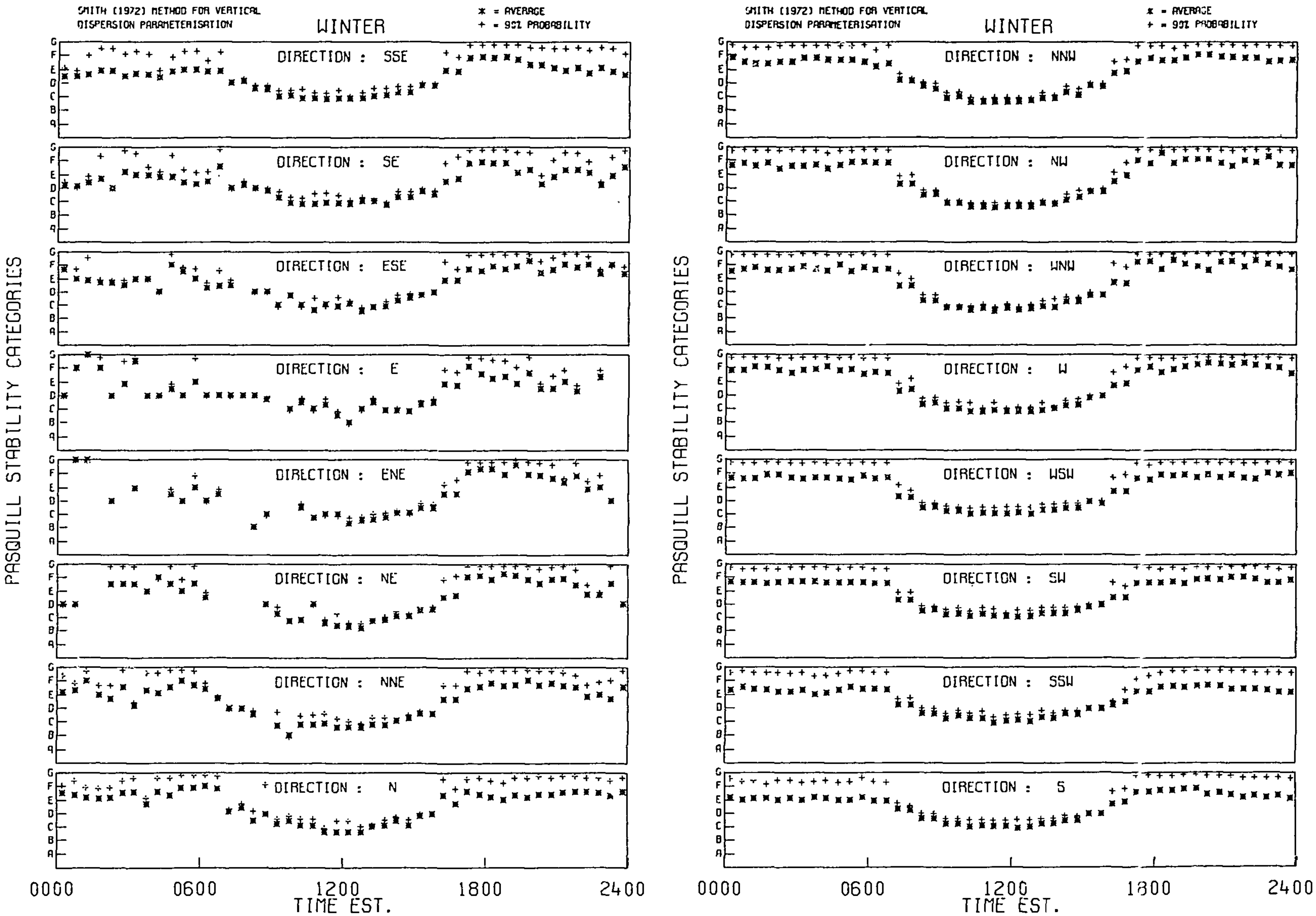

Figure 38 Diurnal variation of average and 90% probability atmospheric stabilities; turbulence method at 7 m; a function of wind direction; Winter; Smith [1972] method

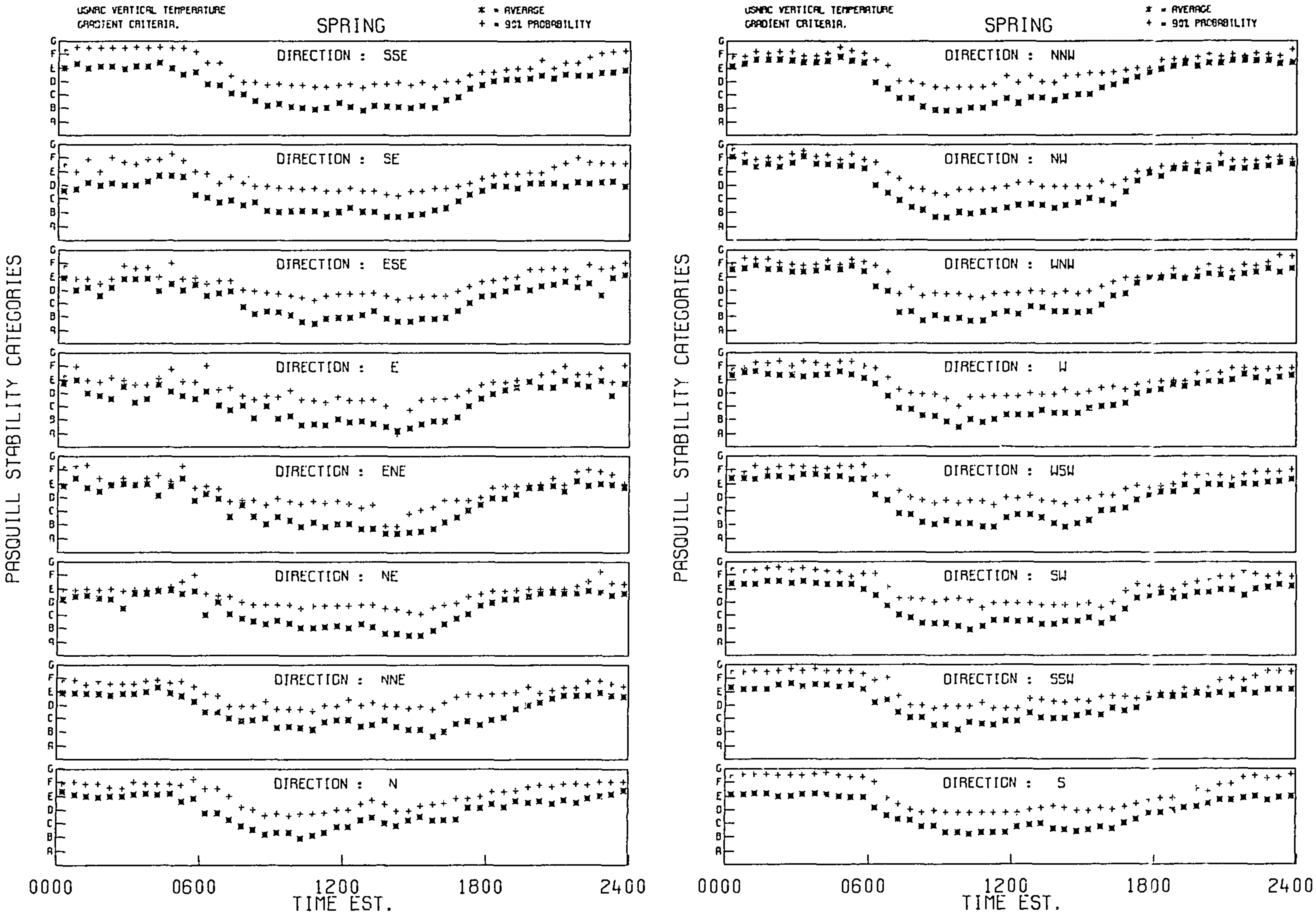

Figure 39 Diurnal variation of average and 90% probability atmospheric stabilities based on the USNRC temperature gradient criteria as a function of wind direction: Spring

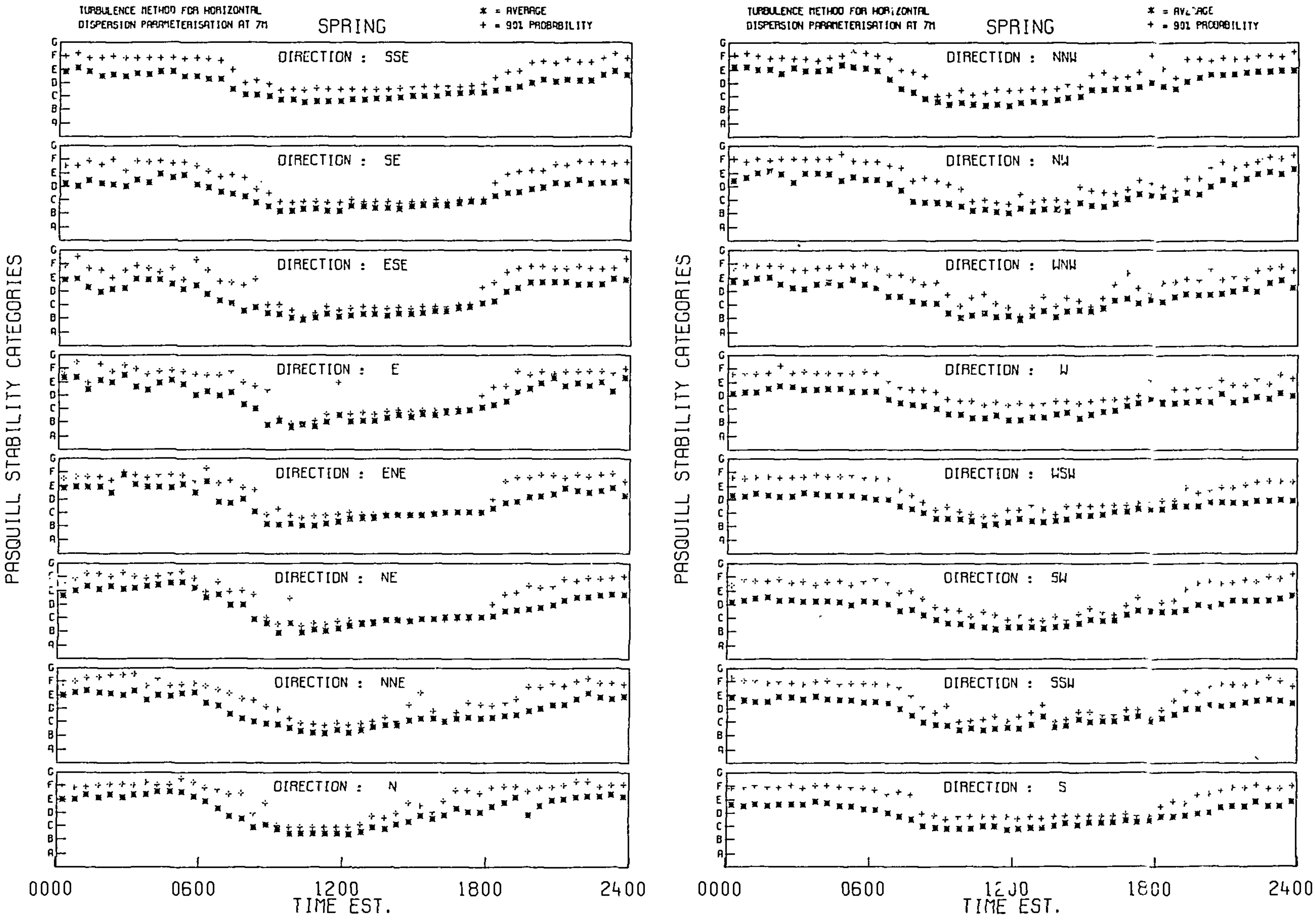

Figure 40 Diurnal variation of average and 90% probability atmospheric stabilities; turbulence method at 7 m; a function of wind direction: Spring

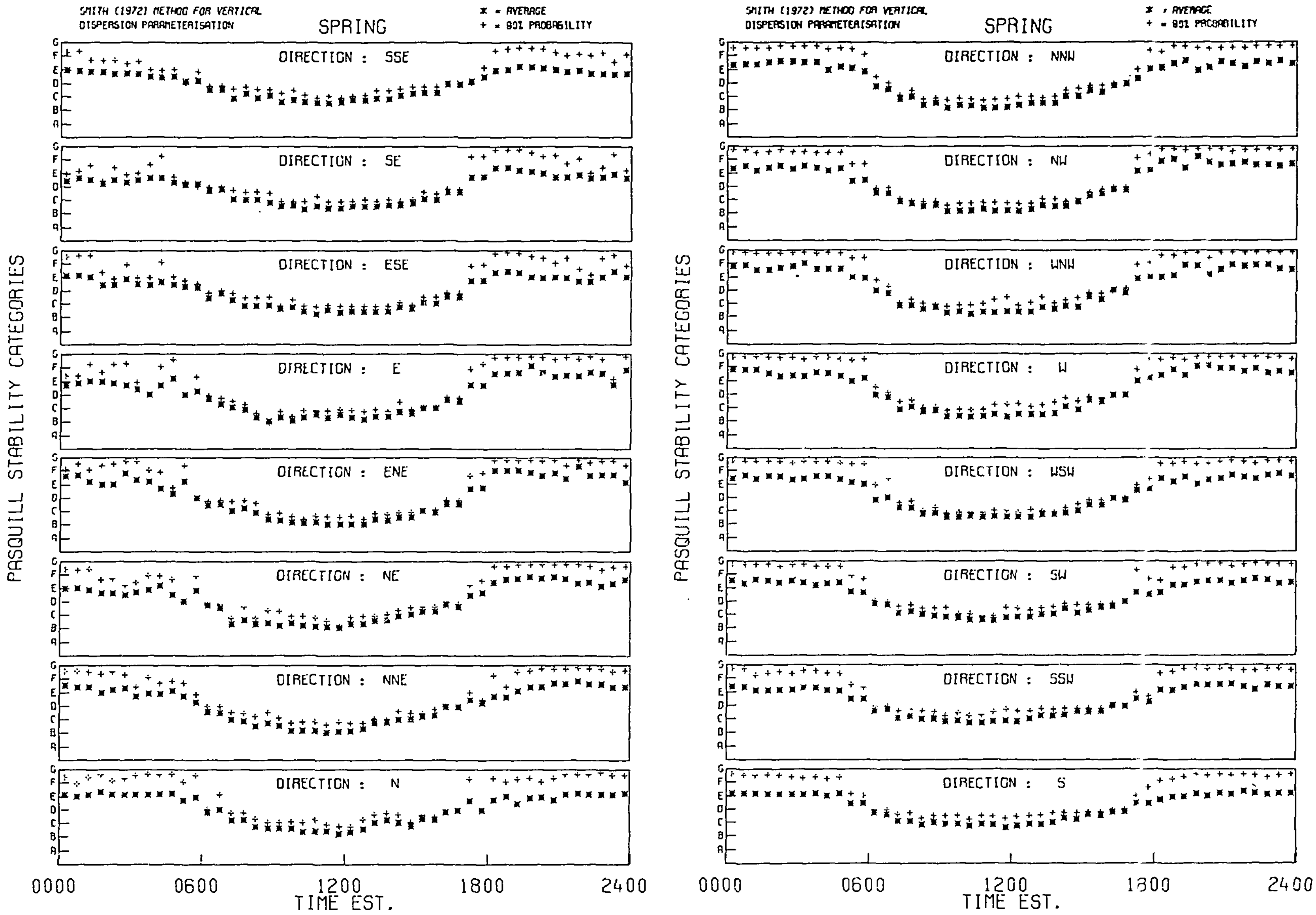

Figure 41 Diurnal variation of average and 90% probability atmospheric stabilities: turbulence method at 7 m: a function of wind direction; Spring: Smith [1972] method

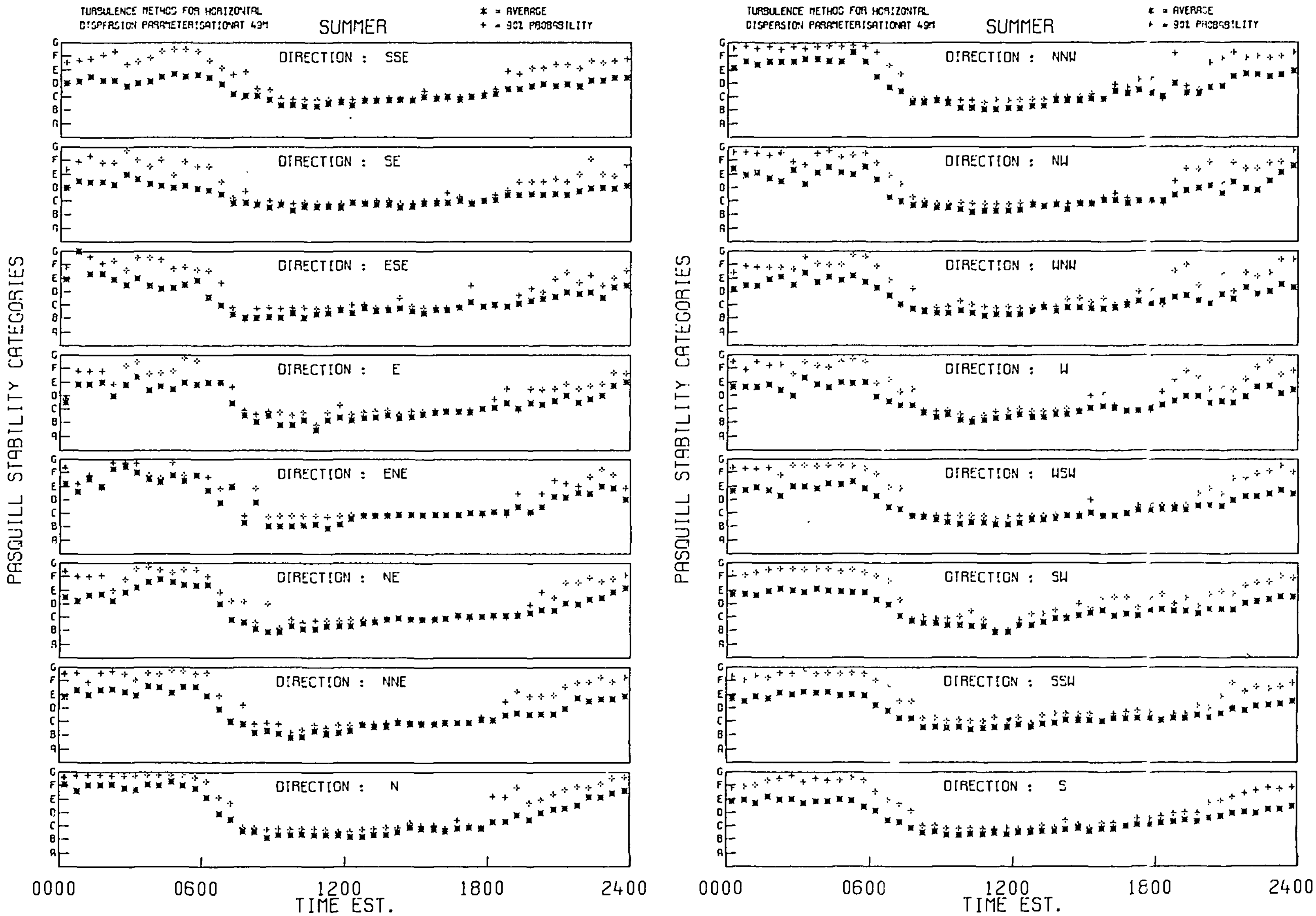

Figure 42 Diurnal variation of average and 90% probability atmospheric stabilities: turbulence method at 49 m: a function of wind direction: Summer

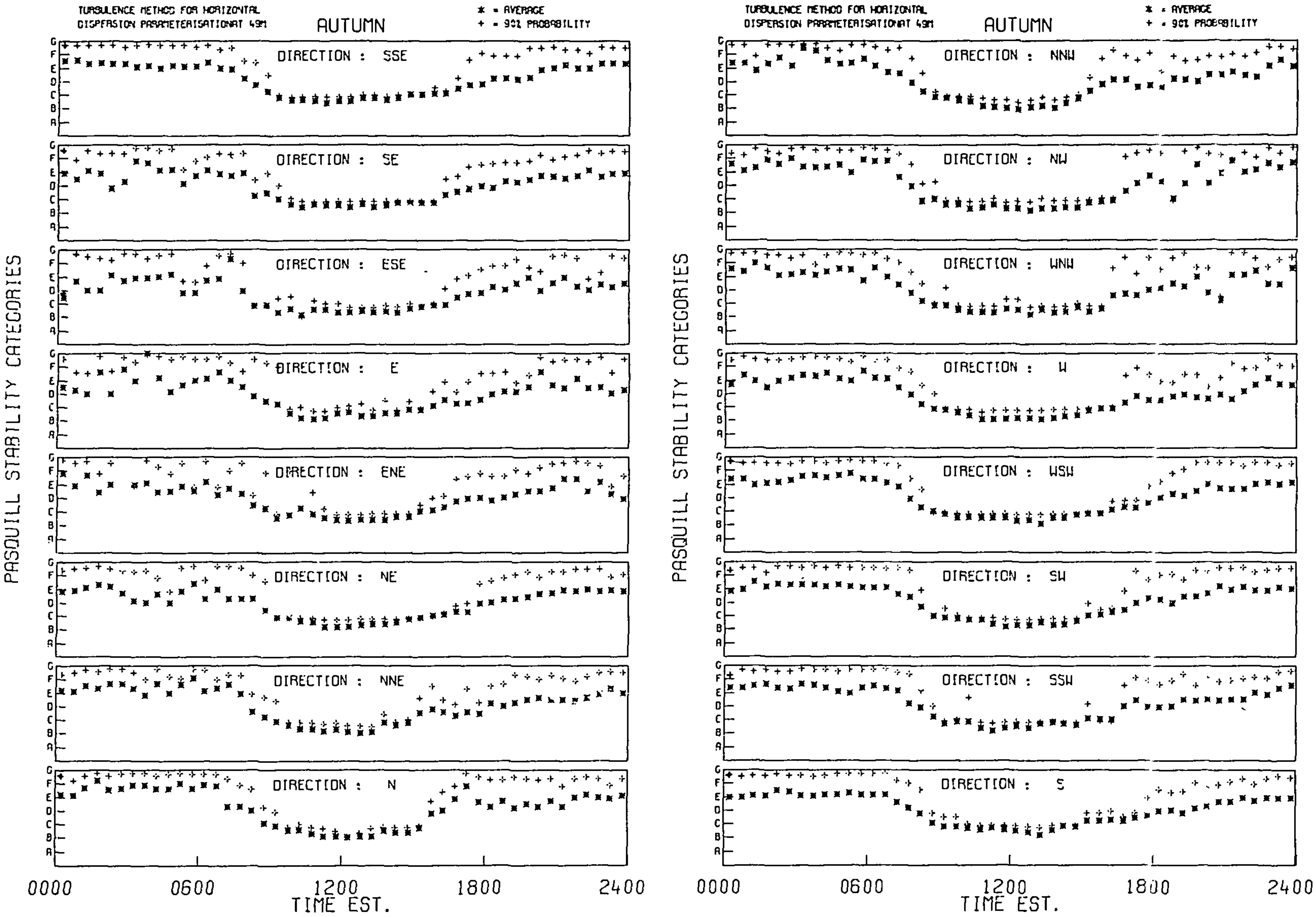

Figure 43 Diurnal variation of average and 90% probability atmospheric stabilities: turbulence method at 49 m: a function of wind direction: Autumn

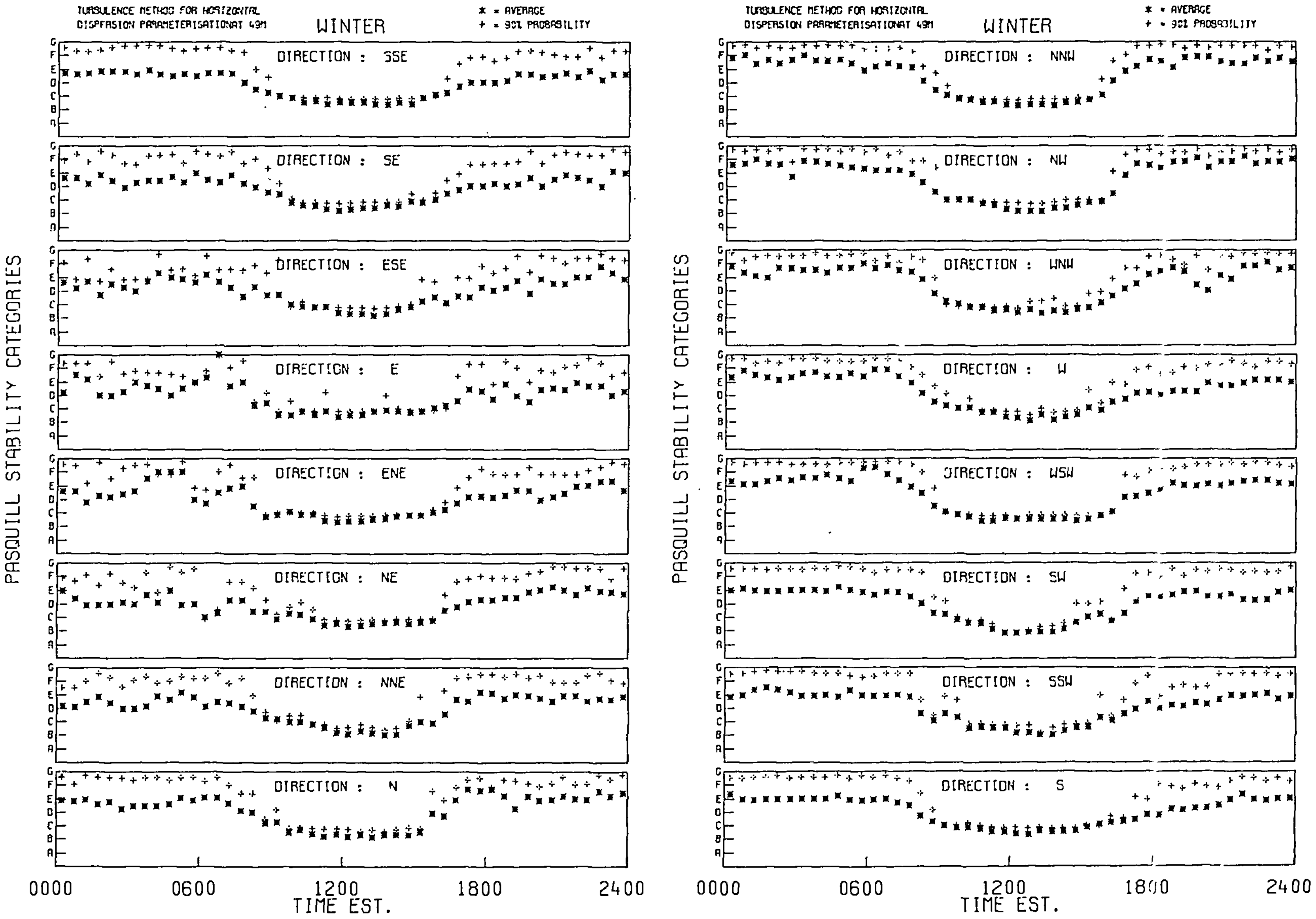

Figure 44 Diurnal variation of average and 90% probability atmospheric stabilities: turbulence method at 49 m; a function of wind direction: Winter

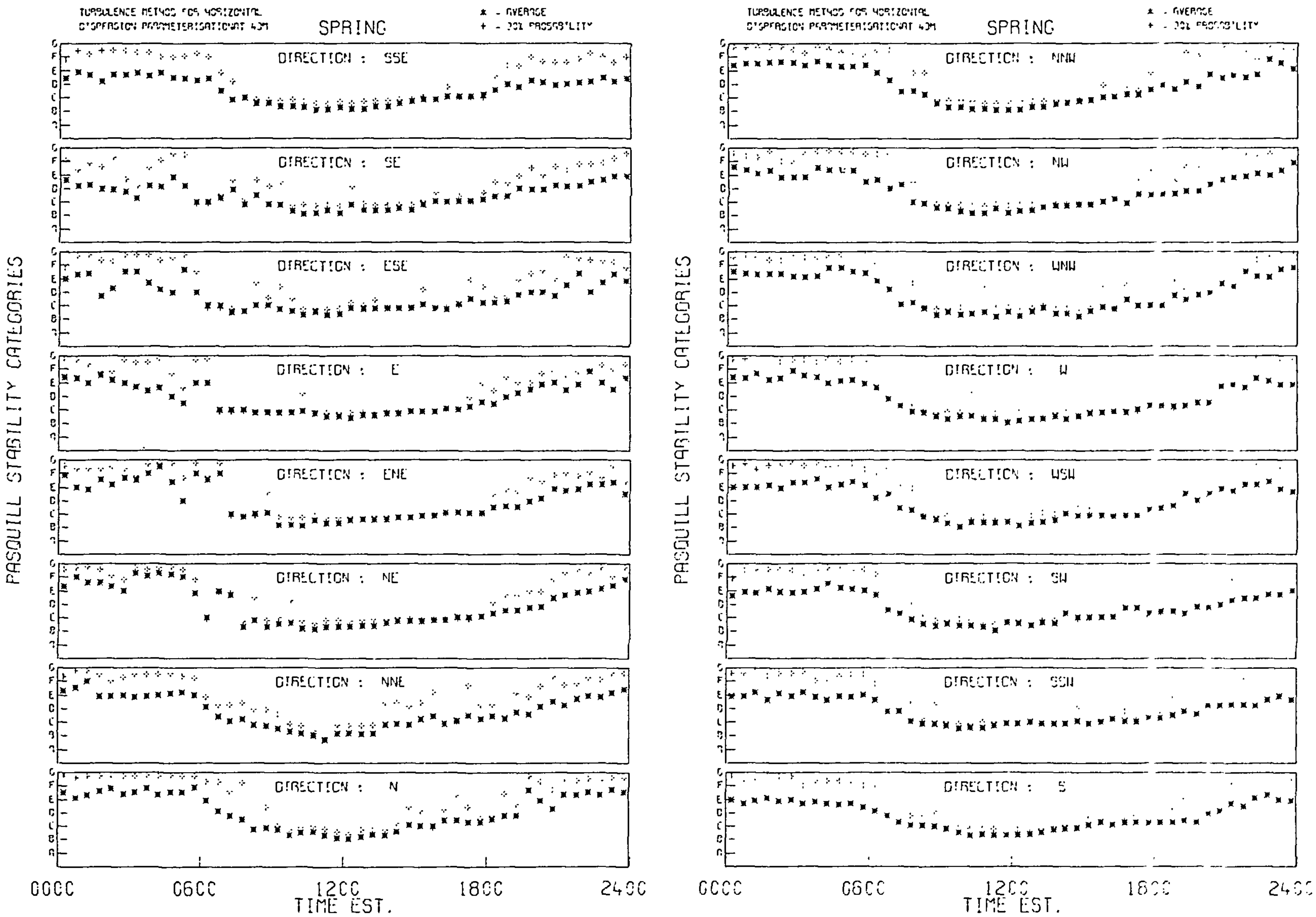

Figure 45 Diurnal variation of average and 90% probability atmospheric stabilities; turbulence method at 49 m; a function of wind direction; Spring

APPENDIX A
FREQUENCY OF OCCURRENCE OF WIND DIRECTION, WIND SPEEDS AND DIFFUSION PARAMETERS *v.* TIME OF DAY

TABLE A1
FREQUENCY OF OCCURRENCE OF 7 m WIND DIRECTIONS, AVERAGE WIND SPEEDS, HORIZONTAL AND VERTICAL DIFFUSION PARAMETERS *v.* TIME OF DAY — SUMMER

SEASON : SUMMER HEIGHT : 7 M.

TIME (EST.)	STATS.	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW
0000-0300	PROB(%)	6.7	6.3	5.5	3.1	2.6	3.2	8.0	13.4	20.3	7.9	6.1	4.1	2.6	2.2	2.9	5.1
	UBAR	1.1	1.2	1.4	1.2	1.3	1.4	1.8	2.0	2.2	1.7	1.6	1.3	1.2	1.3	1.2	1.2
	SY AV.	F	E	E	E	E	D	D	D	D	E	E	E	E	E	E	E
	SZ AV.	E	E	E	E	D	E	D	E	E	E	E	E	E	E	E	E
0300-0600	PROB(%)	6.6	4.9	4.3	1.8	1.8	2.3	6.4	13.2	21.0	10.6	7.3	4.2	3.6	3.4	3.8	4.9
	UBAR	1.1	1.3	1.3	1.1	1.1	1.5	1.8	2.0	2.1	1.8	1.4	1.4	1.2	1.2	1.2	1.2
	SY AV.	F	E	E	E	E	D	D	D	D	E	E	E	E	E	E	E
	SZ AV.	E	E	E	E	E	D	D	D	E	E	E	E	E	E	E	E
0600-0900	PROB(%)	7.4	7.4	4.1	2.3	2.4	3.2	7.2	12.3	15.7	6.9	3.8	3.5	3.9	3.9	6.3	9.5
	UBAR	1.9	2.0	1.8	1.5	1.7	1.8	2.2	2.4	2.5	2.5	2.1	2.2	1.9	1.8	1.7	1.9
	SY AV.	C	C	C	C	C	C	C	C	D	D	D	C	C	C	C	C
	SZ AV.	C	C	C	C	C	C	C	C	C	D	C	C	C	C	B	C
0900-1200	PROB(%)	8.5	11.3	8.4	6.1	4.6	5.0	8.4	11.0	10.8	2.6	1.2	2.2	3.1	2.8	5.0	9.0
	UBAR	2.9	2.8	2.8	2.4	2.3	2.6	2.9	3.3	3.6	4.2	3.3	3.2	3.5	2.9	2.6	2.7
	SY AV.	B	B	B	B	B	B	B	C	C	C	C	B	B	B	B	B
	SZ AV.	B	B	B	B	B	B	B	B	C	C	C	B	B	B	B	B
1200-1500	PROB(%)	3.0	6.0	13.7	15.9	8.2	7.7	11.6	10.9	9.0	1.5	1.3	1.7	2.1	2.4	2.1	3.0
	UBAR	3.4	3.6	3.5	3.3	3.0	3.1	3.5	3.9	4.3	4.6	4.2	3.9	3.9	3.8	3.7	3.4
	SY AV.	C	C	C	C	B	B	C	C	C	C	C	B	B	B	B	B
	SZ AV.	C	B	A	B	B	B	B	B	C	C	C	C	C	C	B	C
1500-1800	PROB(%)	0.9	4.6	15.1	18.4	8.8	7.6	13.5	11.7	9.6	1.7	1.3	1.8	1.9	1.5	1.0	0.6
	UBAR	3.6	3.8	3.6	3.5	2.9	3.0	3.4	4.0	4.4	4.0	4.1	4.1	3.7	4.0	4.1	3.6
	SY AV.	C	C	C	C	C	C	C	C	C	D	C	C	C	C	C	C
	SZ AV.	C	B	B	B	B	B	B	C	C	D	D	C	C	C	C	D
1800-2100	PROB(%)	2.7	10.1	14.1	11.3	6.7	6.7	14.3	13.7	9.8	2.7	2.1	1.5	1.4	1.0	0.9	0.9
	UBAR	2.0	2.6	2.7	2.4	2.0	2.1	2.5	2.9	3.6	3.3	2.8	2.7	2.2	2.2	2.3	2.0
	SY AV.	D	C	C	C	C	C	C	C	D	D	D	D	D	D	D	D
	SZ AV.	D	C	D	D	D	D	D	D	D	E	E	D	D	E	D	E
2100-2400	PROB(%)	7.6	10.0	7.5	5.2	3.8	5.1	11.3	14.3	14.9	5.6	3.7	2.2	2.0	1.4	1.9	3.4
	UBAR	1.3	1.7	1.8	1.4	1.4	1.5	2.0	2.3	2.5	2.1	2.1	1.9	1.4	1.3	1.3	1.3
	SY AV.	E	D	D	E	E	D	D	D	D	D	D	D	D	E	E	E
	SZ AV.	E	E	E	D	D	D	D	D	D	E	E	E	E	E	E	E

BEGINNING DATE : 300775 END DATE : 10583

NOTE : PROB(%) IS THE FREQUENCY OF OCCURRENCE OF A WIND DIRECTION IN THE TIME PERIOD.

UBAR IS THE AVERAGE WIND SPEED IN M/S.

SY AV. IS THE AVERAGE PASQUILL STABILITY CATEGORY BASED ON THE TURBULENCE METHOD.

SZ AV. PASQUILL STABILITY CATEGORY BASED ON THE USNRC TEMPERATURE GRADIENT CRITERIA.

TABLE A2
FREQUENCY OF OCCURRENCE OF 7 m WIND DIRECTIONS, AVERAGE WIND SPEEDS, HORIZONTAL AND VERTICAL DIFFUSION PARAMETERS v. TIME OF DAY — AUTUMN

SEASON : AUTUMN HEIGHT : 7 M.

TIME (EST.)	STATS.	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW
0000-0300	PROB(%)	2.9	2.6	1.7	1.3	1.4	2.3	3.6	12.8	20.6	13.9	10.3	8.1	4.7	3.7	4.2	3.9
	UBAR	1.4	1.3	1.0	1.7	2.3	2.7	2.2	1.6	1.6	1.7	1.7	1.6	1.6	1.2	1.2	1.2
	SY AV.	E	E	F	E	D	D	E	E	E	E	D	D	E	E	E	E
	SZ AV.	E	E	E	E	E	E	E	E	F	F	E	E	E	E	E	F
0300-0600	PROB(%)	2.5	2.0	0.9	0.8	0.8	2.2	3.8	12.8	20.4	15.4	13.0	8.7	5.6	3.5	3.3	4.4
	UBAR	1.4	1.1	1.7	2.6	2.0	2.6	2.3	1.8	1.7	1.6	1.9	1.6	1.6	1.3	1.2	1.2
	SY AV.	E	F	E	D	D	D	E	E	E	E	D	E	E	E	E	E
	SZ AV.	E	E	E	E	E	E	E	E	F	F	F	F	F	F	F	F
0600-0900	PROB(%)	2.4	2.4	1.2	1.3	1.7	1.7	2.9	10.4	19.3	12.4	13.7	10.3	6.5	4.8	4.6	4.5
	UBAR	1.8	1.7	1.5	2.4	2.1	2.7	2.4	2.0	1.9	1.8	2.0	1.9	1.8	1.5	1.5	1.7
	SY AV.	D	D	D	D	D	D	D	D	D	E	D	D	D	D	D	D
	SZ AV.	D	D	D	C	D	D	C	D	D	E	D	D	D	D	D	D
0900-1200	PROB(%)	5.1	5.4	3.3	3.2	3.3	3.7	6.1	10.9	10.3	4.9	4.9	6.9	7.0	7.6	8.4	9.0
	UBAR	2.7	2.4	2.2	2.5	2.4	2.6	2.7	3.1	3.1	3.2	3.3	3.0	2.6	2.1	2.3	2.6
	SY AV.	C	C	B	C	B	C	C	C	C	C	C	C	C	B	C	B
	SZ AV.	C	C	B	B	B	C	B	C	C	C	C	B	B	B	B	B
1200-1500	PROB(%)	4.7	4.6	6.9	7.8	5.6	7.7	9.2	11.9	6.0	3.3	3.9	5.4	4.1	4.3	6.4	8.3
	UBAR	2.7	2.4	2.7	2.7	2.6	2.7	2.9	3.5	3.6	3.5	3.5	3.1	2.5	2.5	2.3	2.7
	SY AV.	B	B	C	C	B	B	C	C	C	C	B	B	B	B	B	B
	SZ AV.	C	C	B	B	B	B	B	C	C	C	C	C	C	C	B	C
1500-1800	PROB(%)	2.7	4.1	11.9	11.7	5.5	7.7	12.4	12.6	8.4	3.1	3.4	3.9	2.9	2.0	3.1	4.4
	UBAR	2.0	1.8	2.5	2.5	2.2	2.4	2.4	2.9	3.3	3.0	3.2	3.1	2.6	2.3	2.2	1.6
	SY AV.	D	D	C	C	C	C	C	C	C	C	C	D	D	C	D	D
	SZ AV.	D	D	C	C	C	C	C	D	D	D	D	D	D	D	D	D
1800-2100	PROB(%)	3.6	7.4	11.7	5.9	3.7	5.1	10.4	15.1	12.6	6.8	5.7	4.0	2.5	1.7	1.3	2.3
	UBAR	1.3	1.5	1.7	1.5	1.4	1.7	1.9	1.8	2.1	2.3	2.3	2.3	2.0	1.5	1.6	1.5
	SY AV.	E	E	D	D	E	D	D	D	D	D	D	D	D	E	E	E
	SZ AV.	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
2100-2400	PROB(%)	5.1	5.4	4.3	1.9	2.3	2.1	6.9	12.9	17.7	11.0	10.4	6.2	3.3	2.6	3.6	4.5
	UBAR	1.3	1.4	1.3	1.3	2.0	2.2	2.1	1.6	1.7	1.9	2.2	1.8	1.7	1.5	1.2	1.2
	SY AV.	E	E	E	E	D	E	D	E	E	E	D	D	E	E	E	E
	SZ AV.	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E

BEGINNING DATE : 300775 END DATE : 10583

NOTE : PROB(%) IS THE FREQUENCY OF OCCURRENCE OF A WIND DIRECTION IN THE TIME PERIOD.

UBAR IS THE AVERAGE WIND SPEED IN M/S.

SY AV. IS THE AVERAGE PASQUILL STABILITY CATEGORY BASED ON THE TURBULENCE METHOD.

SZ AV. PASQUILL STABILITY CATEGORY BASED ON THE USNRC TEMPERATURE GRADIENT CRITERIA.

TABLE A3
FREQUENCY OF OCCURRENCE OF 7 m WIND DIRECTIONS, AVERAGE WIND SPEEDS, HORIZONTAL AND VERTICAL DIFFUSION PARAMETERS v. TIME OF DAY — WINTER

SEASON : WINTER HEIGHT : 7 M.

TIME (EST.)	STATS.	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW
0000-0300	PROB(%)	1.9	0.5	0.3	0.1	0.3	0.6	1.2	4.7	14.6	16.3	21.5	13.9	8.4	4.9	5.6	5.3
	UBAR	2.1	1.2	1.2	0.9	1.2	1.3	2.1	1.6	1.8	2.1	2.7	2.5	2.2	1.6	1.7	2.1
	SY AV.	D	E	F	F	E	E	D	E	E	E	D	D	D	D	D	D
	SZ AV.	F	F	F	E	E	E	E	F	F	F	E	E	E	F	F	F
0300-0600	PROB(%)	2.0	0.8	0.3	0.2	0.3	0.4	1.1	4.2	13.7	16.8	22.0	14.9	9.2	5.3	4.9	4.1
	UBAR	2.0	1.4	1.1	1.1	1.1	1.8	2.3	1.8	1.6	2.1	2.7	2.3	2.2	1.6	1.8	1.9
	SY AV.	D	E	E	E	E	E	D	E	E	D	D	D	D	D	D	D
	SZ AV.	F	F	E	E	E	E	E	F	F	F	E	F	F	F	F	F
0600-0900	PROB(%)	1.7	0.5	0.1	0.2	0.3	0.5	1.0	3.0	10.8	14.5	21.3	16.3	12.1	6.7	5.8	5.2
	UBAR	2.2	1.5	2.0	1.1	2.1	2.1	2.5	1.8	1.8	2.2	2.7	2.6	2.2	1.9	2.0	2.1
	SY AV.	D	D	E	E	D	D	E	E	E	D	D	D	D	D	D	D
	SZ AV.	E	E	E	D	D	E	D	E	E	E	D	D	E	E	D	E
0900-1200	PROB(%)	2.5	1.0	0.7	0.3	0.4	0.6	2.1	5.6	8.6	7.7	13.3	16.5	12.0	8.6	11.2	9.0
	UBAR	3.4	2.5	2.0	1.3	1.6	1.9	2.8	3.0	3.4	3.7	4.0	3.9	3.3	2.6	2.6	2.8
	SY AV.	C	C	C	B	D	C	C	C	C	C	C	C	C	C	C	C
	SZ AV.	B	C	C	C	C	C	C	B	C	C	C	B	B	B	B	B
1200-1500	PROB(%)	4.7	2.9	1.6	1.9	1.0	1.9	5.2	9.4	9.3	5.8	8.7	12.6	9.0	6.6	8.5	10.7
	UBAR	3.0	2.4	2.2	2.2	1.9	2.1	2.6	3.0	3.7	3.8	4.1	4.4	3.5	3.2	2.8	2.7
	SY AV.	C	C	C	C	C	B	B	C	C	C	C	C	B	B	B	C
	SZ AV.	C	C	B	B	B	C	B	C	C	C	C	C	B	B	B	C
1500-1800	PROB(%)	4.5	3.5	3.5	5.2	2.4	2.2	6.9	10.0	12.5	6.5	7.1	11.7	7.9	4.2	4.7	7.3
	UBAR	2.0	2.0	2.0	1.9	1.4	1.6	2.0	2.4	2.8	3.3	3.5	3.7	3.4	2.6	2.4	2.0
	SY AV.	D	D	D	D	D	D	D	D	D	C	C	C	C	D	D	D
	SZ AV.	D	D	D	C	D	D	D	D	D	D	D	D	D	D	D	D
1800-2100	PROB(%)	3.9	4.5	3.8	2.6	1.2	1.6	3.8	10.0	16.5	10.0	11.6	11.0	7.9	3.4	3.8	4.4
	UBAR	2.0	1.4	1.1	1.2	1.1	1.1	1.3	1.6	1.9	2.4	2.7	2.8	2.6	2.2	2.0	2.0
	SY AV.	E	E	E	E	F	F	E	E	D	D	D	D	D	D	D	D
	SZ AV.	E	E	E	E	E	E	F	F	E	E	E	E	E	E	E	E
2100-2400	PROB(%)	3.7	2.2	1.2	0.6	0.4	0.8	1.8	5.7	14.5	16.0	17.1	12.7	8.4	3.9	4.8	6.2
	UBAR	1.9	1.4	1.0	1.0	1.2	1.1	1.5	1.6	1.8	2.1	2.6	2.6	2.2	1.6	1.7	1.9
	SY AV.	E	E	E	F	E	E	E	E	E	E	D	D	D	D	D	D
	SZ AV.	F	F	F	F	E	F	F	F	F	F	E	E	E	F	E	F

BEGINNING DATE : 300775 END DATE : 10583

NOTE : PROB(%) IS THE FREQUENCY OF OCCURRENCE OF A WIND DIRECTION IN THE TIME PERIOD.

UBAR IS THE AVERAGE WIND SPEED IN M/S.

SY AV. IS THE AVERAGE PASQUILL STABILITY CATEGORY BASED ON THE TURBULENCE METHOD.

SZ AV. PASQUILL STABILITY CATEGORY BASED ON THE USNRC TEMPERATURE GRADIENT CRITERIA.

TABLE A4
FREQUENCY OF OCCURRENCE OF 7 m WIND DIRECTIONS, AVERAGE WIND SPEEDS, HORIZONTAL AND VERTICAL DIFFUSION PARAMETERS *v.* TIME OF DAY — SPRING

SEASON : SPRING HEIGHT : 7 M.

TIME (EST.)	STATS.	DIRECTION N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW
0000-0300	PROB(%)	4.2	3.2	3.1	1.5	1.5	1.6	3.8	9.7	16.7	13.8	11.2	8.6	5.6	4.4	5.1	6.0
	UBAR	1.4	1.3	1.4	1.3	1.2	1.4	2.1	1.7	2.1	1.8	2.1	1.8	1.7	1.4	1.3	1.3
	SY AV.	E	E	E	E	E	D	D	E	E	E	D	D	D	E	E	E
	SZ AV.	E	E	D	E	D	D	D	E	E	E	E	E	E	F	F	E
0300-0600	PROB(%)	5.2	2.8	1.9	1.3	1.4	1.4	3.2	8.5	16.3	13.2	12.7	10.3	7.5	5.1	4.6	4.5
	UBAR	1.3	1.6	1.4	1.3	1.5	1.6	1.9	1.7	2.0	1.8	2.1	2.0	1.6	1.4	1.3	1.2
	SY AV.	E	E	E	E	E	E	E	E	E	E	D	D	D	D	E	E
	SZ AV.	E	E	E	E	D	D	D	E	E	E	E	E	E	F	E	E
0600-0900	PROB(%)	5.6	4.2	1.8	1.4	1.4	1.5	3.9	7.9	12.4	9.2	9.4	9.7	7.9	6.3	8.3	9.1
	UBAR	2.4	2.4	1.9	1.8	1.6	1.9	2.4	2.5	2.6	2.5	2.9	2.6	2.3	1.9	1.9	2.0
	SY AV.	D	C	C	D	D	C	C	D	D	D	D	C	C	C	C	C
	SZ AV.	C	C	C	C	C	C	C	C	C	D	C	C	C	C	C	C
0900-1200	PROB(%)	8.0	8.0	4.8	3.7	2.7	3.8	6.2	8.9	7.6	3.8	4.8	6.2	6.3	5.8	7.7	11.5
	UBAR	3.1	3.0	2.7	2.4	2.4	2.7	3.1	3.6	3.9	3.9	3.9	3.8	3.5	2.9	2.7	2.9
	SY AV.	B	B	B	B	B	B	B	C	C	C	B	B	B	B	B	B
	SZ AV.	B	B	B	B	B	B	B	B	B	C	B	P	B	B	B	B
1200-1500	PROB(%)	3.3	5.7	10.3	12.2	5.8	6.8	9.5	9.9	6.0	2.6	3.9	5.4	5.0	3.7	4.3	5.6
	UBAR	3.5	3.1	3.4	3.2	2.9	3.1	3.4	4.0	4.3	4.1	4.2	4.0	4.2	3.3	2.9	3.3
	SY AV.	C	C	C	C	B	B	B	C	C	C	B	B	B	B	B	C
	SZ AV.	C	C	B	B	B	B	B	B	C	C	B	B	B	B	C	C
1500-1800	PROB(%)	1.7	4.3	11.6	16.0	8.9	7.3	10.3	10.5	7.5	3.2	2.8	4.5	3.8	2.0	2.7	3.0
	UBAR	2.7	3.4	3.2	3.1	2.6	2.7	3.1	3.8	4.3	3.9	4.1	4.3	4.1	3.2	3.1	2.9
	SY AV.	D	C	C	C	C	C	C	C	C	C	C	C	C	C	C	D
	SZ AV.	D	B	C	B	B	B	C	C	C	D	C	C	C	D	C	D
1800-2100	PROB(%)	3.1	8.9	11.6	7.6	5.2	5.8	9.8	11.9	10.8	5.0	4.2	4.8	4.2	2.1	2.3	2.6
	UBAR	1.7	2.3	2.2	1.9	1.5	1.5	2.0	2.5	3.0	2.5	2.8	2.8	2.7	2.4	2.3	2.2
	SY AV.	E	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
	SZ AV.	D	D	D	D	D	D	D	D	D	E	E	E	E	E	E	E
2100-2400	PROB(%)	7.2	7.4	4.4	2.6	2.1	2.3	6.0	11.1	13.9	9.2	8.6	7.2	5.0	3.3	3.3	6.3
	UBAR	1.4	1.5	1.4	1.4	1.3	1.3	1.8	1.9	2.1	2.1	2.0	2.2	2.0	1.7	1.4	1.5
	SY AV.	E	E	E	E	E	E	D	D	E	D	D	D	D	D	E	E
	SZ AV.	E	E	E	E	E	D	D	E	E	E	E	E	E	E	E	E

BEGINNING DATE : 300775 END DATE : 10583

NOTE : PROB(%) IS THE FREQUENCY OF OCCURRENCE OF A WIND DIRECTION IN THE TIME PERIOD.

UBAR IS THE AVERAGE WIND SPEED IN M/S.

SY AV. IS THE AVERAGE PASQUILL STABILITY CATEGORY BASED ON THE TURBULENCE METHOD.

SZ AV. PASQUILL STABILITY CATEGORY BASED ON THE USNRC TEMPERATURE GRADIENT CRITERIA.

TABLE A5
FREQUENCY OF OCCURRENCE OF 7 m WIND DIRECTIONS, AVERAGE WIND SPEEDS, HORIZONTAL AND VERTICAL DIFFUSION PARAMETERS *v.* TIME OF DAY — ALL SEASONS COMBINED

ALL SEASONS COMBINED HEIGHT : 7 M.

TIME (EST.)	STATS.	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW
0000-0300	PROB(%)	4.0	3.2	2.7	1.5	1.5	2.0	4.7	10.2	18.0	12.9	12.2	8.6	5.3	3.8	4.4	5.1
	UBAR	1.3	1.3	1.3	1.3	1.5	1.8	2.0	1.8	1.9	1.8	2.2	2.0	1.8	1.4	1.4	1.5
	SY AV.	E	E	E	E	E	D	D	E	E	E	D	D	D	E	E	E
	SZ AV.	E	E	E	E	D	E	E	E	E	E	E	E	E	E	E	E
0300-0600	PROB(%)	4.2	2.7	1.9	1.0	1.1	1.6	3.7	9.7	17.8	13.9	13.6	9.4	6.5	4.3	4.1	4.5
	UBAR	1.3	1.4	1.4	1.4	1.4	1.9	2.0	1.9	1.9	1.8	2.2	2.0	1.7	1.4	1.4	1.3
	SY AV.	E	E	E	E	E	D	D	E	E	E	D	D	D	E	E	E
	SZ AV.	E	E	E	E	D	E	E	E	E	F	E	F	E	E	E	E
0600-0900	PROB(%)	4.4	3.7	1.9	1.3	1.5	1.7	3.8	8.4	14.5	10.6	11.8	9.8	7.5	5.4	6.3	7.2
	UBAR	2.1	2.0	1.8	1.8	1.8	2.1	2.3	2.3	2.2	2.2	2.5	2.4	2.1	1.8	1.8	1.9
	SY AV.	D	D	D	D	C	C	C	D	D	D	D	D	D	D	D	D
	SZ AV.	C	C	C	C	C	C	C	D	D	D	D	D	D	D	C	C
0900-1200	PROB(%)	6.1	6.6	4.4	3.4	2.8	3.3	5.7	9.1	9.3	4.7	5.9	7.8	7.0	6.1	8.0	9.7
	UBAR	3.0	2.8	2.6	2.4	2.3	2.6	2.9	3.3	3.5	3.7	3.8	3.6	3.2	2.6	2.5	2.8
	SY AV.	C	B	B	B	B	B	B	C	C	C	C	C	C	B	B	B
	SZ AV.	B	B	B	B	B	B	B	B	C	C	B	B	B	B	B	B
1200-1500	PROB(%)	3.9	4.8	8.3	9.6	5.2	6.0	8.9	10.5	7.6	3.2	4.4	6.2	5.0	4.2	5.3	6.8
	UBAR	3.1	3.0	3.3	3.1	2.8	2.9	3.2	3.6	4.0	3.9	4.0	4.0	3.6	3.1	2.8	2.9
	SY AV.	C	C	C	C	B	B	B	C	C	C	B	C	B	B	B	C
	SZ AV.	C	C	B	B	B	B	B	B	C	C	C	C	C	B	B	C
1500-1800	PROB(%)	2.4	4.1	10.6	13.0	6.5	6.3	10.8	11.2	9.5	3.6	3.6	5.4	4.1	2.4	2.8	2.7
	UBAR	2.3	2.8	3.1	3.0	2.5	2.6	2.8	3.3	3.6	3.4	3.6	3.8	3.5	2.9	2.7	2.1
	SY AV.	D	D	C	C	C	C	C	C	C	C	C	C	C	C	C	D
	SZ AV.	D	C	C	B	B	C	C	C	D	D	D	D	D	D	D	D
1800-2100	PROB(%)	3.3	7.8	10.4	7.0	4.3	4.8	9.7	12.7	12.3	6.1	5.8	5.3	4.0	2.1	2.1	2.5
	UBAR	1.8	2.1	2.1	2.0	1.7	1.7	2.1	2.2	2.5	2.5	2.7	2.7	2.5	2.1	2.1	2.0
	SY AV.	E	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
	SZ AV.	E	D	D	D	D	D	D	E	E	E	E	E	E	E	E	E
2100-2400	PROB(%)	6.0	6.3	4.4	2.6	2.2	2.6	6.6	11.0	15.2	10.3	9.8	7.0	4.6	2.8	3.4	5.1
	UBAR	1.4	1.5	1.6	1.3	1.5	1.6	1.9	1.9	2.0	2.1	2.3	2.3	2.0	1.6	1.4	1.5
	SY AV.	E	E	E	E	E	D	D	E	E	E	D	D	D	D	E	E
	SZ AV.	E	E	E	E	E	E	D	E	E	E	E	E	E	E	E	E

BEGINNING DATE : 300775 END DATE : 10583

NOTE : PROB(%) IS THE FREQUENCY OF OCCURRENCE OF A WIND DIRECTION IN THE TIME PERIOD.

UBAR IS THE AVERAGE WIND SPEED IN M/S.

SY AV. IS THE AVERAGE PASQUILL STABILITY CATEGORY BASED ON THE TURBULENCE METHOD.

SZ AV. PASQUILL STABILITY CATEGORY BASED ON THE USNRC TEMPERATURE GRADIENT CRITERIA.

TABLE A6
FREQUENCY OF OCCURRENCE OF 7 m WIND DIRECTIONS, AVERAGE WIND SPEEDS, HORIZONTAL AND VERTICAL DIFFUSION PARAMETERS *v.* TIME OF DAY — ALL TIMES COMBINED

ALL TIMES COMBINED HEIGHT : 7 M.

SEASON	STATS.	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW
									DIRECTION								
SUMMER	PROB(%)	5.4	7.6	9.1	8.0	4.9	5.1	10.1	12.6	13.9	5.0	3.4	2.7	2.6	2.3	3.0	4.5
	UBAR	1.9	2.3	2.7	2.7	2.3	2.3	2.6	2.8	2.9	2.4	2.1	2.3	2.3	2.2	2.0	2.0
	SY AV.	D	D	C	C	C	C	C	D	D	D	D	D	D	D	D	D
	SZ AV.	D	C	C	C	C	C	C	C	D	D	E	D	D	D	C	C
AUTUMN	PROB(%)	3.6	4.2	5.3	4.2	3.0	4.1	7.2	12.4	14.4	8.8	8.2	6.7	4.6	3.8	4.4	5.2
	UBAR	1.9	1.7	2.0	2.3	2.2	2.4	2.3	2.3	2.1	2.0	2.2	2.2	2.0	1.8	1.8	1.9
	SY AV.	D	D	D	C	C	C	D	D	D	D	D	D	D	D	D	D
	SZ AV.	D	D	D	C	D	C	D	D	E	E	E	D	D	D	D	D
WINTER	PROB(%)	3.1	2.0	1.4	1.4	0.8	1.1	2.9	6.6	12.6	11.7	15.3	13.7	9.3	5.4	6.1	6.5
	UBAR	2.3	1.8	1.6	1.7	1.4	1.6	2.1	2.2	2.2	2.5	3.0	3.1	2.7	2.2	2.2	2.3
	SY AV.	D	D	D	D	D	D	D	D	D	D	D	C	C	C	C	D
	SZ AV.	D	D	D	D	D	D	D	D	E	E	E	D	D	D	D	D
SPRING	PROB(%)	4.8	5.6	6.2	5.8	3.6	3.8	6.6	9.8	11.4	7.5	7.2	7.1	5.7	4.1	4.8	6.1
	UBAR	2.2	2.4	2.6	2.6	2.2	2.3	2.6	2.7	2.7	2.4	2.7	2.7	2.6	2.2	2.1	2.2
	SY AV.	D	D	C	C	C	C	C	D	D	D	D	D	C	D	D	D
	SZ AV.	D	D	C	C	C	C	C	D	D	E	D	D	D	D	D	D
COMBINED	PROB(%)	4.3	4.9	5.6	4.9	3.1	3.5	6.7	10.3	13.0	8.2	8.4	7.4	5.5	3.9	4.5	5.6
	UBAR	2.1	2.2	2.5	2.5	2.2	2.3	2.5	2.5	2.5	2.3	2.7	2.7	2.5	2.1	2.1	2.1
	SY AV.	D	D	C	C	C	C	C	D	D	D	D	D	D	D	D	D
	SZ AV.	D	D	C	C	C	C	C	D	D	E	E	D	D	D	D	D

BEGINNING DATE : 300775 END DATE : 10583

NOTE : PROB(%) IS THE FREQUENCY OF OCCURRENCE OF A WIND DIRECTION IN THE TIME PERIOD.

UBAR IS THE AVERAGE WIND SPEED IN M/S.

SY AV. IS THE AVERAGE PASQUILL STABILITY CATEGORY BASED ON THE TURBULENCE METHOD.

SZ AV. PASQUILL STABILITY CATEGORY BASED ON THE USNRC TEMPERATURE GRADIENT CRITERIA.

TABLE A7
FREQUENCY OF OCCURRENCE OF 7 m WIND DIRECTIONS, 50 PERCENTILE WIND SPEEDS, HORIZONTAL AND VERTICAL DIFFUSION PARAMETERS *v.* TIME OF DAY — SUMMER

SEASON : SUMMER HEIGHT : 7 M.

TIME (EST.)	STATS.	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW
0000-0300	PROB(%)	6.7	6.3	5.5	3.1	2.6	3.2	8.0	13.4	20.3	7.9	6.1	4.1	2.6	2.2	2.9	3.1
	U50%	0.0	0.3	0.8	0.5	0.3	0.7	1.1	1.3	1.2	0.8	0.9	0.6	0.5	0.4	0.2	0.3
	SY50%	E	E	D	E	E	D	C	C	D	D	D	D	E	E	E	E
	SZ50%	D	D	D	D	D	D	D	D	D	E	E	E	E	E	E	E
0300-0600	PROB(%)	6.6	4.9	4.3	1.8	1.8	2.3	6.4	13.2	21.0	10.6	7.3	4.2	3.6	3.4	3.8	4.9
	U50%	0.0	0.5	0.6	0.3	0.6	0.8	1.1	1.3	1.2	0.9	0.7	0.6	0.6	0.6	0.5	0.1
	SY50%	E	E	E	E	E	C	C	D	D	D	E	E	E	E	E	E
	SZ50%	D	D	D	D	D	D	D	D	D	E	E	E	E	E	E	E
0600-0900	PROB(%)	7.4	7.4	4.1	2.3	2.4	3.2	7.2	12.3	15.7	6.9	3.8	3.5	3.9	3.9	6.3	9.5
	U50%	1.5	1.5	1.1	1.0	1.1	1.3	1.7	1.8	1.9	1.8	1.3	1.5	1.3	1.3	1.3	1.5
	SY50%	C	C	C	B	B	B	C	C	C	C	C	C	C	B	B	B
	SZ50%	C	C	C	C	B	C	B	C	C	C	C	C	B	B	A	B
0900-1200	PROB(%)	8.5	11.3	8.4	6.1	4.6	5.0	8.4	11.0	10.8	2.6	1.2	2.2	3.1	2.8	5.0	9.0
	U50%	2.4	2.3	2.3	2.0	1.9	2.2	2.3	2.8	3.0	3.7	2.7	2.7	2.9	2.3	2.1	2.2
	SY50%	B	B	B	B	A	B	B	B	B	C	B	B	B	A	A	B
	SZ50%	A	A	A	A	A	A	A	A	B	C	B	A	A	A	A	A
1200-1500	PROB(%)	3.0	6.0	13.7	15.9	8.2	7.7	11.6	10.9	9.0	1.5	1.3	1.7	2.1	2.4	2.1	3.0
	U50%	2.8	3.1	3.0	2.8	2.4	2.7	3.0	3.4	3.7	4.2	3.8	3.4	3.2	3.2	3.0	2.7
	SY50%	B	B	B	B	B	B	B	B	C	C	B	B	B	B	B	B
	SZ50%	C	A	A	A	A	A	A	A	B	C	C	C	B	B	B	C
1500-1800	PROB(%)	0.9	4.6	15.1	18.4	8.8	7.6	13.5	11.7	9.6	1.7	1.3	1.8	1.9	1.5	1.0	0.6
	U50%	3.5	3.3	3.1	3.0	2.4	2.6	2.8	3.4	3.7	3.9	3.6	3.4	3.1	3.4	3.8	3.2
	SY50%	C	C	B	B	B	B	B	C	C	C	C	B	B	B	B	C
	SZ50%	C	A	A	A	A	A	A	B	C	D	D	C	C	C	C	D
1800-2100	PROB(%)	2.7	10.1	14.1	11.3	6.7	6.7	14.3	13.7	9.8	2.7	2.1	1.5	1.4	1.0	0.9	0.9
	U50%	1.3	2.1	2.3	1.9	1.5	1.7	1.9	2.3	3.0	2.3	2.2	2.0	1.8	1.6	1.7	1.3
	SY50%	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	D
	SZ50%	D	C	D	D	D	D	D	D	D	D	D	D	D	D	D	E
2100-2400	PROB(%)	7.6	10.0	7.5	5.2	3.8	5.1	11.3	14.3	14.9	5.6	3.7	2.2	2.0	1.4	1.9	3.4
	U50%	0.6	1.1	1.1	0.7	0.9	0.9	1.2	1.4	1.5	1.3	1.3	1.1	0.8	0.8	0.7	0.4
	SY50%	E	D	C	D	D	C	C	C	C	C	C	C	D	D	E	E
	SZ50%	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D

BEGINNING DATE : 300775 END DATE : 10583

NOTE : PROB(%) IS THE FREQUENCY OF OCCURRENCE OF A WIND DIRECTION IN THE TIME PERIOD.

U50% IS THE 50% PROBABILITY VALUE OF WIND SPEED IN M/S.

SY50% IS THE 50% PROBABILITY VALUE OF THE PASQUILL STABILITY CATEGORY BASED ON THE TURBULENCE METHOD.

SZ50% IS THE 50% PROBABILITY VALUE OF THE PASQUILL STABILITY CATEGORY BASED ON THE USNRC TEMPERATURE GRADIENT CRITERIA.

TABLE A8
FREQUENCY OF OCCURRENCE OF 7 m WIND DIRECTIONS, 50 PERCENTILE WIND SPEEDS, HORIZONTAL AND VERTICAL DIFFUSION PARAMETERS *v.* TIME OF DAY — AUTUMN

SEASON : AUTUMN   HEIGHT : 7 M.

TIME (EST.)	STATS.	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW
0000-0300	PROB(%)	2.9	2.6	1.7	1.3	1.4	2.3	5.6	12.8	20.6	13.9	10.3	8.1	4.7	3.7	4.2	3.9
	U50%	0.3	0.2	0.0	0.0	1.4	1.8	0.9	0.5	0.4	0.9	1.1	1.0	0.9	0.4	0.5	0.1
	SY50%	E	E	E	E	D	C	D	D	E	D	D	C	D	E	E	E
	SZ50%	E	D	E	E	D	D	E	E	E	E	E	E	E	E	E	E
0300-0600	PROB(%)	2.5	2.0	0.9	0.8	0.8	2.2	3.8	12.8	20.4	15.4	13.0	8.7	5.6	3.5	3.3	4.4
	U50%	0.4	0.2	0.6	1.2	1.3	1.9	1.2	0.6	0.8	0.9	1.3	1.0	0.9	0.6	0.6	0.5
	SY50%	E	E	D	C	C	C	D	E	E	D	D	D	D	E	E	E
	SZ50%	E	E	D	D	E	D	E	E	E	E	E	E	E	E	E	E
0600-0900	PROB(%)	2.4	2.4	1.2	1.3	1.7	1.7	2.9	10.4	19.3	12.4	13.7	10.3	6.5	4.8	4.6	4.5
	U50%	1.2	1.1	1.0	1.3	1.4	2.2	1.6	1.3	1.1	1.1	1.3	1.3	1.1	1.0	1.0	1.1
	SY50%	C	C	D	C	C	C	C	D	D	D	C	C	C	D	D	C
	SZ50%	D	D	C	C	D	D	C	D	D	D	D	D	D	D	D	D
0900-1200	PROB(%)	5.1	5.4	3.3	3.2	3.3	3.7	6.1	10.9	10.3	4.9	4.9	6.9	7.0	7.6	8.4	9.0
	U50%	2.1	1.9	1.8	1.9	1.8	2.0	2.2	2.5	2.6	2.7	2.7	2.4	2.0	1.8	1.8	2.0
	SY50%	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
	SZ50%	B	B	A	A	A	B	A	B	C	C	B	A	A	A	A	B
1200-1500	PROB(%)	4.7	4.6	6.9	7.8	5.6	7.7	9.2	11.9	6.0	3.3	3.9	5.4	4.1	4.3	6.4	8.3
	U50%	2.1	2.0	2.2	2.2	2.0	2.1	2.3	2.9	3.3	3.1	2.9	2.5	2.0	1.9	1.7	2.0
	SY50%	B	B	B	B	B	B	B	C	B	C	B	B	B	A	B	B
	SZ50%	C	C	A	A	A	A	A	B	C	C	C	C	B	B	B	C
1500-1800	PROB(%)	2.7	4.1	11.9	11.7	5.5	7.7	12.4	12.6	8.4	3.1	3.4	3.9	2.9	2.0	3.1	4.4
	U50%	1.2	1.2	2.0	2.0	1.8	2.0	1.9	2.3	2.9	2.4	2.4	2.4	2.1	1.5	1.2	1.0
	SY50%	D	C	C	C	B	B	B	C	C	C	C	C	C	C	C	D
	SZ50%	D	D	C	C	C	C	C	C	C	D	D	D	D	D	D	D
1800-2100	PROB(%)	3.6	7.4	11.7	5.9	3.7	5.1	10.4	15.1	12.6	6.8	5.7	4.0	2.5	1.7	1.3	2.3
	U50%	0.6	0.8	1.1	0.8	0.7	0.9	1.1	1.0	1.3	1.7	1.9	1.5	1.4	0.9	0.8	0.9
	SY50%	E	D	C	D	D	D	C	D	C	C	C	C	C	D	E	D
	SZ50%	E	E	D	D	D	D	D	D	D	D	E	E	E	E	E	E
2100-2400	PROB(%)	5.1	5.4	4.3	1.9	2.3	2.1	6.9	12.9	17.7	11.0	10.4	6.2	3.3	2.6	3.6	4.5
	U50%	0.1	0.4	0.3	0.0	1.1	0.8	1.1	0.5	0.6	1.1	1.4	1.1	1.0	0.8	0.7	0.4
	SY50%	E	E	E	E	D	D	D	E	E	D	C	D	D	E	E	E
	SZ50%	E	D	E	D	D	D	D	E	E	E	E	E	E	E	E	E

BEGINNING DATE : 300775 END DATE : 10583

NOTE : PROB(%) IS THE FREQUENCY OF OCCURRENCE OF A WIND DIRECTION IN THE TIME PERIOD.

U50% IS THE 50% PROBABILITY VALUE OF WIND SPEED IN M/S.

SY50% IS THE 50% PROBABILITY VALUE OF THE PASQUILL STABILITY CATEGORY BASED ON THE TURBULENCE METHOD.

SZ50% IS THE 50% PROBABILITY VALUE OF THE PASQUILL STABILITY CATEGORY BASED ON THE USNRC TEMPERATURE GRADIENT CRITERIA.

TABLE A9
FREQUENCY OF OCCURRENCE OF 7 m WIND DIRECTIONS, 50 PERCENTILE WIND SPEEDS, HORIZONTAL AND VERTICAL DIFFUSION PARAMETERS *v.* TIME OF DAY — WINTER

SEASON : WINTER HEIGHT : 7 M.

TIME (EST.)	STATS.	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW
0000-0300	PROB(%)	1.9	0.5	0.3	0.1	0.3	0.6	1.2	4.7	14.6	16.3	21.5	13.9	8.4	4.9	5.6	5.3
	U50%	1.1	0.7	0.0	0.5	0.9	0.6	1.1	0.6	0.7	1.3	2.2	1.8	1.4	1.0	1.0	1.3
	SY50%	C	E	E	E	E	E	D	E	E	D	C	C	C	D	D	C
	SZ50%	E	E	E	D	E	E	E	E	F	E	E	E	E	E	E	E
0300-0600	PROB(%)	2.0	0.8	0.3	0.2	0.3	0.4	1.1	4.2	13.7	16.8	22.0	14.9	9.2	5.3	4.9	4.1
	U50%	1.3	0.7	0.5	0.8	0.6	0.8	1.4	0.9	0.8	1.3	2.3	1.6	1.4	1.1	1.2	1.3
	SY50%	C	E	E	E	E	E	D	E	E	D	C	C	C	D	C	C
	SZ50%	E	E	E	D	E	D	D	F	F	E	E	E	E	E	E	E
0600-0900	PROB(%)	1.7	0.5	0.1	0.2	0.3	0.5	1.0	3.0	10.8	14.5	21.3	16.3	12.1	6.7	5.8	5.2
	U50%	1.4	1.0	0.5	0.6	1.1	1.1	1.6	1.1	1.1	1.5	2.3	2.1	1.4	1.3	1.4	1.4
	SY50%	C	D	E	E	C	C	D	D	D	C	C	C	C	C	C	D
	SZ50%	D	E	D	D	D	D	D	E	E	E	D	D	D	D	D	D
0900-1200	PROB(%)	2.5	1.0	0.7	0.3	0.4	0.6	2.1	5.6	8.6	7.7	13.3	16.5	12.0	8.6	11.2	9.0
	U50%	2.9	1.9	1.3	0.9	1.1	1.5	2.2	2.4	2.8	3.3	3.4	3.2	2.4	2.0	2.0	2.2
	SY50%	C	B	B	A	C	B	B	B	B	B	B	B	B	B	B	B
	SZ50%	A	C	B	C	C	B	B	B	C	C	B	B	A	A	A	B
1200-1500	PROB(%)	4.7	2.9	1.6	1.9	1.0	1.9	5.2	9.4	9.3	5.8	8.7	12.6	9.0	6.6	8.5	10.7
	U50%	2.2	2.0	1.8	1.8	1.7	1.7	2.1	2.4	3.2	3.3	3.6	3.9	2.8	2.4	2.1	2.2
	SY50%	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
	SZ50%	C	C	A	A	B	B	A	B	C	C	B	B	B	A	A	B
1500-1800	PROB(%)	4.5	3.5	3.5	5.2	2.4	2.2	6.9	10.0	12.5	6.5	7.1	11.7	7.9	4.2	4.7	7.3
	U50%	1.1	1.3	1.4	1.5	1.0	1.1	1.4	1.8	2.2	2.8	2.9	3.2	2.7	2.0	1.7	1.2
	SY50%	D	C	C	C	C	C	C	C	C	C	C	C	C	C	C	D
	SZ50%	D	D	C	C	D	D	D	D	D	D	D	D	D	D	D	D
1800-2100	PROB(%)	3.9	4.5	3.8	2.6	1.2	1.6	3.8	10.0	16.5	10.0	11.6	11.0	7.9	3.4	3.8	4.4
	U50%	1.2	0.9	0.3	0.5	0.0	0.0	0.4	0.7	1.2	1.9	2.3	2.1	2.1	1.5	1.5	1.3
	SY50%	D	E	E	E	E	E	E	E	D	C	C	C	C	C	C	C
	SZ50%	E	E	E	E	E	E	E	E	E	E	E	E	D	E	E	E
2100-2400	PROB(%)	3.7	2.2	1.2	0.6	0.4	0.8	1.8	5.7	14.5	16.0	17.1	12.7	8.4	3.9	4.8	6.2
	U50%	0.9	0.6	0.0	0.1	0.8	0.0	0.0	0.2	0.8	1.2	2.2	1.9	1.5	1.1	1.1	1.2
	SY50%	E	E	E	E	E	E	E	E	E	D	C	C	C	C	C	D
	SZ50%	E	E	E	E	E	E	F	F	F	E	E	E	E	E	E	E

BEGINNING DATE : 300775 END DATE : 10583

NOTE : PROB(%) IS THE FREQUENCY OF OCCURRENCE OF A WIND DIRECTION IN THE TIME PERIOD.

U50% IS THE 50% PROBABILITY VALUE OF WIND SPEED IN M/S.

SY50% IS THE 50% PROBABILITY VALUE OF THE PASQUILL STABILITY CATEGORY BASED ON THE TURBULENCE METHOD.

SZ50% IS THE 50% PROBABILITY VALUE OF THE PASQUILL STABILITY CATEGORY BASED ON THE USNRC TEMPERATURE GRADIENT CRITERIA.

TABLE A10
FREQUENCY OF OCCURRENCE OF 7 m WIND DIRECTIONS, 50 PERCENTILE WIND SPEEDS, HORIZONTAL AND VERTICAL DIFFUSION PARAMETERS *v.* TIME OF DAY — SPRING

SEASON : SPRING HEIGHT : 7 M.

TIME (EST.)	STATS.	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW
0000-0300	PROB(%)	4.2	3.2	3.1	1.5	1.5	1.6	3.8	9.7	16.7	13.8	11.2	8.6	5.6	4.4	5.1	6.0
	U50%	0.7	0.7	0.5	0.5	0.5	0.8	1.2	0.9	1.2	1.0	1.2	1.1	1.0	0.8	0.7	0.7
	SY50%	E	E	E	E	E	D	C	D	D	D	D	D	D	D	E	E
	SZ50%	E	E	D	D	D	D	D	E	E	E	E	E	E	E	E	E
0300-0600	PROB(%)	5.2	2.8	1.9	1.3	1.4	1.4	3.2	8.5	16.3	13.2	12.7	10.3	7.5	5.1	4.6	4.5
	U50%	0.6	0.9	0.3	0.5	0.8	0.8	1.0	0.9	1.2	1.1	1.3	1.2	1.0	0.9	0.7	0.7
	SY50%	E	E	E	E	E	D	D	D	D	D	C	D	D	D	D	E
	SZ50%	E	E	D	D	D	D	D	E	E	E	E	E	E	E	E	E
0600-0900	PROB(%)	5.6	4.2	1.8	1.4	1.4	1.5	3.9	7.9	12.4	9.2	9.4	9.7	7.9	6.3	8.3	9.1
	U50%	1.9	1.7	1.4	1.3	1.0	1.3	2.0	2.0	2.0	1.9	2.4	1.9	1.7	1.4	1.4	1.5
	SY50%	C	C	C	C	C	B	C	C	C	C	C	C	C	C	C	B
	SZ50%	C	C	B	C	C	C	B	C	C	C	C	C	C	B	B	B
0900-1200	PROB(%)	8.0	8.0	4.8	3.7	2.7	3.8	6.2	8.9	7.6	3.8	4.8	6.2	6.3	5.8	7.7	11.5
	U50%	2.6	2.4	2.2	2.0	1.9	2.3	2.5	3.1	3.3	3.3	3.3	3.2	2.9	2.2	2.2	2.3
	SY50%	B	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B
	SZ50%	A	B	A	A	A	A	A	A	A	B	A	A	A	A	A	A
1200-1500	PROB(%)	3.3	5.7	10.3	12.2	5.8	6.8	9.5	9.9	6.0	2.6	3.9	5.4	5.0	3.7	4.3	5.6
	U50%	3.0	2.5	2.9	2.8	2.5	2.6	2.9	3.5	3.7	3.6	3.7	3.5	3.3	2.6	2.3	2.6
	SY50%	B	B	B	B	B	B	B	B	C	B	B	B	B	B	B	B
	SZ50%	C	B	A	A	A	A	A	A	B	C	B	A	B	B	B	B
1500-1800	PROB(%)	1.7	4.3	11.6	16.0	8.9	7.3	10.3	10.5	7.5	3.2	2.8	4.5	3.8	2.0	2.7	3.0
	U50%	2.1	2.8	2.8	2.7	2.1	2.3	2.7	3.2	3.7	3.4	3.6	3.9	3.5	2.9	2.6	2.2
	SY50%	C	C	B	B	B	B	B	C	C	C	C	C	C	B	B	C
	SZ50%	D	A	B	A	A	A	B	C	C	D	C	C	C	D	C	D
1800-2100	PROB(%)	3.1	8.9	11.6	7.6	5.2	5.8	9.8	11.9	10.8	5.0	4.2	4.8	4.2	2.1	2.3	2.6
	U50%	1.1	1.7	1.7	1.3	0.9	1.0	1.3	1.9	2.2	1.7	2.1	2.1	1.9	1.8	1.8	1.6
	SY50%	D	C	C	C	C	D	C	C	C	C	C	C	C	C	C	C
	SZ50%	D	D	D	D	D	D	D	D	D	D	D	D	D	D	E	E
2100-2400	PROB(%)	7.2	7.4	4.4	2.6	2.1	2.3	6.0	11.1	13.9	9.2	8.6	7.2	5.0	3.3	3.3	6.3
	U50%	0.6	0.9	0.8	0.7	0.7	0.6	1.0	1.2	1.2	1.3	1.2	1.4	1.2	1.0	0.8	0.8
	SY50%	E	E	D	D	E	D	D	D	D	D	D	C	C	D	E	E
	SZ50%	E	D	D	D	D	D	D	D	D	E	E	E	E	E	E	E

BEGINNING DATE : 300775 END DATE : 10583

NOTE : PROB(%) IS THE FREQUENCY OF OCCURRENCE OF A WIND DIRECTION IN THE TIME PERIOD.

U50% IS THE 50% PROBABILITY VALUE OF WIND SPEED IN M/S.

SY50% IS THE 50% PROBABILITY VALUE OF THE PASQUILL STABILITY CATEGORY BASED ON THE TURBULENCE METHOD.

SZ50% IS THE 50% PROBABILITY VALUE OF THE PASQUILL STABILITY CATEGORY BASED ON THE USNRC TEMPERATURE GRADIENT CRITERIA.

TABLE A11
FREQUENCY OF OCCURRENCE OF 7 m WIND DIRECTIONS, 50 PERCENTILE WIND SPEEDS, HORIZONTAL AND VERTICAL DIFFUSION PARAMETERS *v.* TIME OF DAY — ALL SEASONS COMBINED

ALL SEASONS COMBINED HEIGHT : 7 M.

TIME (EST.)	STATS.	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW
0000-0300	PROB(%)	3.9	3.2	2.6	1.5	1.4	1.9	4.7	10.1	18.0	13.0	12.3	8.7	5.3	3.8	4.4	5.1
	U50%	0.3	0.4	0.5	0.4	0.5	0.9	1.1	0.9	0.9	1.0	1.4	1.2	1.1	0.7	0.7	0.7
	SY50%	E	E	E	E	E	D	D	D	D	D	C	C	C	E	E	E
	SZ50%	E	D	D	D	D	D	D	D	E	E	E	E	E	E	E	E
0300-0600	PROB(%)	4.1	2.6	1.8	1.0	1.1	1.6	3.6	9.7	17.8	14.0	13.8	9.5	6.5	4.3	4.1	4.5
	U50%	0.4	0.6	0.5	0.6	0.7	1.1	1.1	1.0	1.1	1.1	1.5	1.2	1.1	0.8	0.8	0.7
	SY50%	E	E	E	E	E	C	D	D	D	D	C	C	D	D	E	E
	SZ50%	E	D	D	D	D	D	D	E	E	E	E	E	E	E	E	E
0600-0900	PROB(%)	4.3	3.6	1.8	1.3	1.5	1.7	3.8	8.4	14.6	10.7	12.0	9.9	7.6	5.4	6.2	7.1
	U50%	1.6	1.5	1.2	1.1	1.1	1.5	1.7	1.6	1.5	1.5	1.9	1.8	1.4	1.3	1.3	1.4
	SY50%	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
	SZ50%	C	C	C	C	C	C	C	C	D	D	D	D	D	C	C	C
0900-1200	PROB(%)	6.0	6.4	4.3	3.3	2.7	3.3	5.7	9.1	9.3	4.8	6.1	8.0	7.1	6.2	8.0	9.7
	U50%	2.4	2.2	2.2	1.9	1.8	2.1	2.3	2.7	2.9	3.2	3.2	3.0	2.5	2.0	2.0	2.2
	SY50%	B	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B
	SZ50%	A	B	A	A	A	A	A	A	B	C	B	A	A	A	A	A
1200-1500	PROB(%)	3.9	4.8	8.1	9.4	5.1	6.0	8.9	10.5	7.6	3.3	4.4	6.3	5.1	4.3	5.3	6.9
	U50%	2.4	2.4	2.8	2.7	2.3	2.4	2.7	3.1	3.5	3.4	3.5	3.4	2.8	2.5	2.1	2.3
	SY50%	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
	SZ50%	C	B	A	A	A	A	A	A	C	C	B	B	B	A	B	C
1500-1800	PROB(%)	2.4	4.1	10.5	12.8	6.4	6.2	10.8	11.2	9.5	3.6	3.6	5.5	4.1	2.4	2.9	3.8
	U50%	1.5	2.3	2.6	2.6	2.1	2.2	2.3	2.8	3.0	2.9	3.0	3.3	2.9	2.4	2.0	1.3
	SY50%	C	C	C	B	B	B	B	C	C	C	C	C	C	C	C	C
	SZ50%	D	C	B	A	A	B	C	C	C	D	D	D	D	D	D	D
1800-2100	PROB(%)	3.3	7.7	10.3	6.9	4.2	4.8	9.6	12.7	12.4	6.1	5.9	5.3	4.0	2.1	2.1	2.6
	U50%	1.0	1.5	1.6	1.3	1.0	1.1	1.4	1.4	1.7	1.9	2.1	2.0	1.9	1.4	1.5	1.3
	SY50%	D	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
	SZ50%	E	D	D	D	D	D	D	D	D	D	E	E	D	E	E	E
2100-2400	PROB(%)	5.9	6.2	4.4	2.6	2.1	2.6	6.5	11.0	15.2	10.4	10.0	7.1	4.7	2.8	3.4	5.1
	U50%	0.6	0.9	0.8	0.6	0.8	0.8	1.1	1.0	1.1	1.2	1.7	1.5	1.2	1.0	0.9	0.7
	SY50%	E	E	D	E	D	D	C	D	D	D	C	C	C	D	D	E
	SZ50%	E	D	D	D	D	D	D	D	E	E	E	E	E	E	E	E

BEGINNING DATE : 300775 END DATE : 10583

NOTE : PROB(%) IS THE FREQUENCY OF OCCURRENCE OF A WIND DIRECTION IN THE TIME PERIOD.

U50% IS THE 50% PROBABILITY VALUE OF WIND SPEED IN M/S.

SY50% IS THE 50% PROBABILITY VALUE OF THE PASQUILL STABILITY CATEGORY BASED ON THE TURBULENCE METHOD.

SZ50% IS THE 50% PROBABILITY VALUE OF THE PASQUILL STABILITY CATEGORY BASED ON THE USNRC TEMPERATURE GRADIENT CRITERIA.

TABLE A12
FREQUENCY OF OCCURRENCE OF 7 m WIND DIRECTIONS, 50 PERCENTILE WIND SPEEDS, HORIZONTAL AND VERTICAL DIFFUSION PARAMETERS v. TIME OF DAY — ALL TIMES COMBINED

ALL TIMES COMBINED HEIGHT : 7 M.

SEASON	STATS.	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW
		DIRECTION															
SUMMER	PROB(%)	5.4	7.6	9.1	8.0	4.9	5.1	10.1	12.6	13.9	5.0	3.4	2.7	2.6	2.3	3.0	4.5
	U50%	1.2	1.8	2.3	2.3	1.8	1.9	2.0	2.2	2.2	1.5	1.2	1.4	1.4	1.4	1.3	1.4
	SY50%	C	C	C	B	B	B	C	C	C	D	C	C	C	C	C	C
	SZ50%	D	C	C	B	B	C	C	C	D	D	D	D	D	D	C	C
AUTUMN	PROB(%)	3.6	4.2	5.3	4.2	3.0	4.1	7.2	12.4	14.4	8.8	8.2	6.7	4.6	3.8	4.4	5.2
	U50%	1.1	1.1	1.5	1.7	1.6	1.9	1.7	1.5	1.2	1.3	1.6	1.4	1.3	1.2	1.2	1.3
	SY50%	C	C	C	C	C	C	C	C	D	C	C	C	C	C	C	C
	SZ50%	D	D	D	C	C	C	D	D	D	E	D	D	D	D	D	D
WINTER	PROB(%)	3.1	2.0	1.4	1.4	0.8	1.1	2.9	6.6	12.6	11.7	15.3	13.7	9.3	5.4	6.1	6.5
	U50%	1.5	1.1	0.9	1.2	0.9	1.0	1.5	1.5	1.5	1.8	2.5	2.4	2.0	1.6	1.6	1.7
	SY50%	C	C	D	C	D	C	C	C	D	C	C	C	C	C	C	C
	SZ50%	D	D	D	D	D	D	D	D	E	E	D	D	D	D	D	D
SPRING	PROB(%)	4.8	5.6	6.2	5.8	3.6	3.8	6.6	9.8	11.4	7.5	7.2	7.1	5.7	4.1	4.8	6.1
	U50%	1.4	1.8	2.1	2.2	1.7	1.8	2.1	2.2	2.0	1.5	1.9	2.0	1.8	1.4	1.5	1.6
	SY50%	C	C	C	B	B	B	B	C	C	C	C	C	C	C	C	C
	SZ50%	D	D	C	B	C	C	C	D	D	D	D	D	D	D	D	D
COMBINED	PROB(%)	4.3	4.9	5.6	4.9	3.1	3.5	6.7	10.3	13.0	8.2	8.4	7.4	5.5	3.9	4.5	5.6
	U50%	1.3	1.6	1.9	2.0	1.7	1.8	1.9	1.9	1.7	1.5	2.0	2.0	1.7	1.4	1.4	1.5
	SY50%	C	C	C	C	B	B	C	C	C	C	C	C	C	C	C	C
	SZ50%	D	D	C	C	C	C	C	D	D	D	D	D	D	D	D	D

BEGINNING DATE : 300775 END DATE : 10583

NOTE : PROB(%) IS THE FREQUENCY OF OCCURRENCE OF A WIND DIRECTION IN THE TIME PERIOD.

U50% IS THE 50% PROBABILITY VALUE OF WIND SPEED IN M/S.

SY50% IS THE 50% PROBABILITY VALUE OF THE PASQUILL STABILITY CATEGORY BASED ON THE TURBULENCE METHOD.

SZ50% IS THE 50% PROBABILITY VALUE OF THE PASQUILL STABILITY CATEGORY BASED ON THE USNRC TEMPERATURE GRADIENT CRITERIA.

TABLE A13
FREQUENCY OF OCCURRENCE OF 49 m WIND DIRECTIONS, AVERAGE WIND SPEEDS, HORIZONTAL AND VERTICAL DIFFUSION PARAMETERS v. TIME OF DAY — SUMMER

SEASON : SUMMER HEIGHT : 49 M.

TIME (EST.)	STATS.	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW
		DIRECTION															
0000-0300	PROB(%)	6.4	7.7	7.6	4.5	4.2	3.4	5.0	10.5	19.8	5.7	4.9	4.0	3.1	3.8	4.7	4.6
	UBAR	3.4	3.6	3.6	3.0	2.7	3.1	4.1	5.0	6.1	4.6	4.2	4.2	4.0	3.6	4.1	4.1
	SY AV.	F	F	E	E	E	D	D	D	D	D	E	F	F	F	F	F
	SZ AV.	E	E	E	E	E	E	D	D	D	E	E	E	E	E	E	E
0300-0600	PROB(%)	4.8	6.9	5.5	2.5	2.3	3.3	3.8	8.7	20.8	8.4	5.3	5.4	4.1	6.3	7.0	4.8
	UBAR	3.6	3.4	3.4	3.3	2.6	3.0	4.3	4.7	5.8	4.9	4.2	3.8	3.4	3.3	3.7	3.9
	SY AV.	F	F	E	E	E	E	D	D	D	E	E	F	F	F	F	F
	SZ AV.	E	E	E	D	E	E	D	D	D	E	E	F	F	E	E	E
0600-0900	PROB(%)	8.5	7.3	3.9	2.1	2.7	3.0	5.0	11.3	17.5	4.6	3.0	3.1	3.9	7.1	8.3	8.8
	UBAR	3.7	3.7	3.7	3.3	3.0	3.8	4.3	4.8	6.0	5.5	4.7	5.7	4.4	3.9	3.7	3.9
	SY AV.	C	C	C	C	C	C	C	C	C	C	D	D	D	C	C	C
	SZ AV.	C	C	D	C	C	C	C	D	D	D	D	C	C	C	C	C
0900-1200	PROB(%)	10.0	10.3	6.6	7.9	3.5	3.9	8.5	13.3	12.2	1.7	0.6	2.0	3.5	4.1	4.5	7.4
	UBAR	4.9	4.5	4.6	4.9	4.6	4.8	5.3	6.2	7.7	6.7	5.0	6.1	6.5	5.7	4.9	5.1
	SY AV.	B	B	B	B	B	B	B	C	C	C	B	B	B	B	B	B
	SZ AV.	C	C	C	B	B	B	C	B	C	C	C	C	B	B	C	C
1200-1500	PROB(%)	3.4	2.0	4.2	22.1	13.5	7.6	10.4	13.0	10.5	1.3	0.3	1.4	2.9	2.5	2.0	2.8
	UBAR	5.6	5.4	5.8	6.8	6.1	6.3	6.5	7.4	9.5	7.6	8.4	8.8	8.4	8.2	7.6	6.6
	SY AV.	B	B	B	C	C	B	C	C	C	C	B	B	B	B	B	B
	SZ AV.	C	D	C	B	B	B	B	B	C	D	D	D	C	C	C	D
1500-1800	PROB(%)	0.3	1.0	8.4	21.4	13.8	9.7	12.8	12.5	10.2	1.2	0.7	2.1	2.5	1.9	1.0	0.4
	UBAR	4.7	7.1	7.0	6.8	6.2	6.1	6.8	7.9	9.8	6.5	6.5	9.2	9.2	9.1	8.0	7.6
	SY AV.	D	C	C	C	C	C	C	C	C	C	C	C	C	C	C	D
	SZ AV.	D	C	C	B	B	B	C	C	C	D	D	D	C	C	D	D
1800-2100	PROB(%)	1.1	2.4	17.3	15.2	9.0	7.7	11.1	13.5	12.4	2.6	1.0	1.9	1.8	1.5	0.6	0.8
	UBAR	6.6	4.9	5.7	5.3	4.5	4.2	5.3	6.0	7.9	6.4	5.9	7.0	7.1	5.8	6.1	5.3
	SY AV.	D	D	C	C	C	C	C	C	D	C	D	D	C	D	E	E
	SZ AV.	C	D	D	D	D	D	D	D	D	D	E	D	D	D	E	D
2100-2400	PROB(%)	3.7	10.1	13.2	6.2	4.7	6.5	8.0	11.2	18.0	5.3	2.1	2.6	2.1	1.9	1.7	2.7
	UBAR	3.9	4.1	4.3	3.5	3.3	3.4	4.6	4.6	6.6	5.1	5.4	6.3	5.2	4.6	4.8	4.8
	SY AV.	F	E	D	D	D	D	D	D	D	D	D	E	E	E	E	E
	SZ AV.	E	E	E	E	D	D	D	D	D	D	D	E	E	E	E	E

BEGINNING DATE : 81177 END DATE : 10583

NOTE : PROB(%) IS THE FREQUENCY OF OCCURRENCE OF A WIND DIRECTION IN THE TIME PERIOD.

UBAR IS THE AVERAGE WIND SPEED IN M/S.

SY AV. IS THE AVERAGE PASQUILL STABILITY CATEGORY BASED ON THE TURBULENCE METHOD.

SZ AV. PASQUILL STABILITY CATEGORY BASED ON THE USNRC TEMPERATURE GRADIENT CRITERIA.

TABLE A14
FREQUENCY OF OCCURRENCE OF 49 m WIND DIRECTIONS, AVERAGE WIND SPEEDS, HORIZONTAL AND VERTICAL DIFFUSION PARAMETERS *v.* TIME OF DAY — AUTUMN

SEASON : AUTUMN HEIGHT : 49 M.

TIME (EST.)	STATS.	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW
0000-0300	PROB(%)	2.7	3.6	3.0	1.7	2.4	3.6	3.8	5.2	13.1	9.9	7.3	13.2	10.7	7.9	8.1	3.9
	UBAR	4.2	3.5	3.7	3.7	4.0	4.5	5.7	5.4	5.8	5.2	5.5	5.9	4.9	4.1	4.2	4.3
	SY AV.	F	F	E	E	E	D	E	D	D	E	E	E	F	F	F	F
	SZ AV.	E	E	E	E	F	E	E	E	E	E	E	E	F	F	F	F
0300-0600	PROB(%)	2.9	2.8	2.2	1.2	1.5	3.0	3.5	5.3	13.2	10.2	9.6	16.9	11.3	6.8	5.6	4.2
	UBAR	4.4	3.7	4.0	4.0	3.5	4.8	5.9	5.4	5.9	5.4	5.4	6.2	4.9	4.2	4.2	4.0
	SY AV.	F	F	E	E	E	E	D	E	D	D	E	F	F	F	F	F
	SZ AV.	E	E	E	E	F	E	E	E	E	E	F	F	F	F	E	E
0600-0900	PROB(%)	2.9	3.0	1.1	1.8	1.7	1.9	2.3	7.1	13.7	10.3	7.6	17.0	11.4	6.7	7.0	4.6
	UBAR	3.7	4.0	3.9	4.4	4.6	4.9	6.1	5.2	5.3	5.1	4.7	6.1	4.9	4.0	4.0	4.0
	SY AV.	D	D	D	C	C	D	D	D	D	D	E	E	E	E	D	D
	SZ AV.	D	D	E	D	D	D	D	D	D	E	D	D	D	D	D	D
0900-1200	PROB(%)	6.9	4.2	2.6	2.8	3.5	2.3	4.0	10.1	13.4	5.4	3.3	8.6	8.7	8.6	7.9	7.6
	UBAR	4.3	4.4	3.6	4.9	5.0	5.7	5.7	5.5	6.4	6.0	5.3	6.8	5.5	4.2	4.3	4.3
	SY AV.	B	B	B	B	C	C	C	C	C	C	C	C	C	C	B	B
	SZ AV.	C	C	C	B	C	C	C	C	C	C	C	B	B	B	B	C
1200-1500	PROB(%)	6.4	4.5	3.8	6.9	8.1	4.4	7.0	11.2	12.8	3.9	2.1	5.3	6.8	4.6	6.3	5.8
	UBAR	4.2	4.4	4.4	5.7	5.8	5.5	5.7	6.3	7.2	7.1	6.5	6.9	6.4	5.4	4.9	4.8
	SY AV.	B	B	B	C	C	B	B	C	C	C	B	B	B	B	B	B
	SZ AV.	D	D	C	B	B	B	C	C	C	C	C	C	C	C	C	C
1500-1800	PROB(%)	2.4	2.9	5.5	11.1	11.0	6.2	10.6	11.7	14.0	4.0	1.6	4.0	5.5	3.1	3.6	2.8
	UBAR	4.5	4.2	5.5	5.5	5.4	5.0	5.6	5.9	6.9	7.4	6.3	7.0	7.4	6.5	4.6	4.6
	SY AV.	D	E	D	C	C	C	C	C	C	C	C	C	C	D	D	D
	SZ AV.	E	E	D	C	C	C	D	D	D	D	D	D	D	D	D	D
1800-2100	PROB(%)	1.9	4.0	11.9	9.2	5.5	7.7	9.0	8.5	12.8	6.8	4.6	5.1	5.7	2.4	2.2	2.6
	UBAR	4.4	4.4	4.9	4.3	3.8	3.9	4.9	5.6	5.8	6.0	5.6	7.2	6.8	6.3	4.9	4.9
	SY AV.	F	E	D	D	D	E	D	D	D	D	D	E	E	E	F	E
	SZ AV.	F	E	E	E	E	E	E	E	E	E	E	E	E	E	F	E
2100-2400	PROB(%)	4.1	6.4	4.7	3.8	3.6	4.4	6.1	5.8	10.9	10.0	6.1	9.9	6.1	6.0	7.0	5.2
	UBAR	4.4	3.9	4.0	3.6	2.9	4.0	5.1	6.0	5.6	5.4	5.7	6.7	5.6	4.3	4.0	4.2
	SY AV.	E	E	E	E	E	E	E	D	D	D	D	E	F	F	F	F
	SZ AV.	E	E	E	E	F	F	E	E	E	E	E	E	F	F	F	E

BEGINNING DATE : 81177 END DATE : 10583

NOTE : PROB(%) IS THE FREQUENCY OF OCCURRENCE OF A WIND DIRECTION IN THE TIME PERIOD.

UBAR IS THE AVERAGE WIND SPEED IN M/S.

SY AV. IS THE AVERAGE PASQUILL STABILITY CATEGORY BASED ON THE TURBULENCE METHOD.

SZ AV. PASQUILL STABILITY CATEGORY BASED ON THE USNRC TEMPERATURE GRADIENT CRITERIA.

TABLE A15
FREQUENCY OF OCCURRENCE OF 49 m WIND DIRECTIONS, AVERAGE WIND SPEEDS, HORIZONTAL AND VERTICAL DIFFUSION PARAMETERS v. TIME OF DAY — WINTER

SEASON : WINTER HEIGHT : 49 M.

TIME (EST.)	STATS.	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW
0000-0300	PROB(%)	2.6	2.0	0.7	0.2	0.4	0.5	0.7	1.1	5.5	8.7	12.6	22.8	15.4	9.4	11.4	5.9
	UBAR	5.1	4.9	2.9	1.3	1.4	2.1	4.3	5.7	6.0	6.0	6.5	7.2	6.6	5.2	5.4	5.3
	SY AV.	E	E	E	E	F	E	E	E	E	D	D	E	F	E	E	F
	SZ AV.	F	F	F	F	F	F	E	E	E	E	E	E	F	F	F	F
0300-0600	PROB(%)	2.8	1.1	0.6	0.5	0.4	0.4	0.5	0.6	5.6	8.5	12.9	23.3	18.0	10.8	8.5	5.4
	UBAR	5.0	3.9	3.1	2.2	2.3	2.3	5.8	11.8	6.2	5.9	6.3	7.0	6.5	5.1	5.2	4.9
	SY AV.	E	E	E	E	E	D	D	D	D	D	D	E	F	E	E	E
	SZ AV.	F	F	F	F	F	E	E	D	E	E	E	E	F	F	F	F
0600-0900	PROB(%)	2.6	1.3	0.2	0.2	0.5	0.4	0.6	1.3	5.2	8.3	9.6	25.0	19.2	12.3	3.7	4.5
	UBAR	4.4	5.2	4.2	2.9	4.4	7.2	4.5	5.0	5.6	6.1	5.8	6.9	6.2	5.3	4.9	4.9
	SY AV.	E	E	F	E	D	D	E	D	D	D	D	D	E	E	E	E
	SZ AV.	E	E	E	E	D	D	E	E	E	E	E	D	E	E	D	E
0900-1200	PROB(%)	3.8	0.8	1.0	0.3	0.2	0.3	1.4	3.2	8.1	9.1	5.9	15.8	17.3	13.8	11.8	7.2
	UBAR	4.8	4.8	4.8	2.4	1.7	3.7	5.0	4.7	5.6	6.8	6.1	6.9	7.0	5.5	4.6	4.6
	SY AV.	B	B	C	C	B	B	B	C	C	C	C	C	C	C	C	C
	SZ AV.	C	B	C	C	C	D	C	C	C	C	C	B	B	B	B	B
1200-1500	PROB(%)	6.7	4.8	1.8	1.5	1.3	1.9	2.2	5.4	11.2	8.5	4.4	8.6	16.8	10.4	8.4	6.2
	UBAR	4.3	4.7	4.1	3.8	3.8	4.1	4.7	4.4	6.0	6.9	6.1	6.9	7.9	7.1	5.8	4.6
	SY AV.	B	B	C	C	C	C	C	B	C	C	B	B	B	B	B	B
	SZ AV.	C	C	C	B	B	B	C	C	C	C	C	C	C	B	B	C
1500-1800	PROB(%)	3.7	2.7	2.8	5.2	4.5	2.8	5.2	6.2	12.8	8.3	4.3	7.7	15.4	7.0	6.7	4.7
	UBAR	4.0	4.6	4.6	4.5	4.0	3.8	4.3	4.4	5.8	6.4	6.0	6.6	7.7	6.6	5.7	5.0
	SY AV.	D	D	D	D	D	C	D	D	C	C	C	D	C	D	D	D
	SZ AV.	E	D	D	D	D	D	D	D	D	D	E	D	D	D	D	E
1800-2100	PROB(%)	2.5	4.8	5.9	4.6	2.9	3.1	4.0	4.3	10.7	8.8	7.4	11.1	13.8	6.8	5.6	3.6
	UBAR	4.8	5.2	4.3	4.1	3.1	3.1	3.9	4.8	5.1	5.8	6.5	6.8	6.9	6.2	6.1	5.6
	SY AV.	E	E	E	E	E	E	E	D	D	D	D	D	E	E	E	E
	SZ AV.	E	E	E	E	F	F	F	E	E	E	E	E	E	E	E	E
2100-2400	PROB(%)	3.1	4.5	2.7	1.2	0.6	0.7	1.3	1.9	6.0	9.8	11.4	17.9	14.7	8.7	8.1	7.3
	UBAR	5.0	5.1	4.0	3.0	2.7	2.2	3.4	4.1	5.4	6.0	6.2	7.0	6.6	5.6	5.3	5.3
	SY AV.	E	F	E	E	F	E	F	E	E	D	D	E	E	E	E	F
	SZ AV.	F	F	F	F	F	F	F	E	E	E	E	E	E	F	F	F

BEGINNING DATE : 81177 END DATE : 10583

NOTE : PROB(%) IS THE FREQUENCY OF OCCURRENCE OF A WIND DIRECTION IN THE TIME PERIOD.

UBAR IS THE AVERAGE WIND SPEED IN M/S.

SY AV. IS THE AVERAGE PASQUILL STABILITY CATEGORY BASED ON THE TURBULENCE METHOD.

SZ AV. PASQUILL STABILITY CATEGORY BASED ON THE USNRC TEMPERATURE GRADIENT CRITERIA.

TABLE A16
FREQUENCY OF OCCURRENCE OF 49 m WIND DIRECTIONS, AVERAGE WIND SPEEDS, HORIZONTAL AND VERTICAL DIFFUSION PARAMETERS *v.* TIME OF DAY — SPRING

SEASON : SPRING HEIGHT : 49 M.

TIME (EST.)	STATS.	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW
0000-0300	PROB(%)	3.8	4.3	4.3	4.0	2.9	1.3	3.1	7.2	12.6	8.8	9.3	9.8	8.7	6.8	7.0	6.0
	UBAR	5.1	4.2	3.6	3.5	3.3	3.9	5.1	5.4	5.8	5.1	5.5	5.9	5.2	4.7	4.3	5.4
	SY AV.	F	F	E	E	E	E	D	D	D	D	E	F	F	F	F	F
	SZ AV.	E	E	E	E	E	E	E	D	D	E	E	F	F	F	E	E
0300-0600	PROB(%)	4.9	4.3	4.0	1.7	2.0	2.1	1.8	5.0	15.7	7.7	8.4	11.5	10.0	6.7	8.1	6.0
	UBAR	5.1	4.1	3.7	3.3	3.4	4.4	4.9	5.0	5.9	5.2	5.6	6.0	5.4	4.4	4.5	4.3
	SY AV.	F	F	E	E	D	D	D	D	D	D	E	E	F	F	F	F
	SZ AV.	E	E	E	E	E	E	E	D	D	E	E	F	F	F	F	E
0600-0900	PROB(%)	7.2	4.5	2.0	1.4	0.9	2.0	2.4	6.4	15.6	6.4	5.2	9.4	9.8	9.0	9.9	7.8
	UBAR	4.4	4.4	3.5	3.7	3.6	4.5	4.9	4.8	5.9	6.0	5.1	6.0	5.3	4.4	4.3	4.3
	SY AV.	C	C	C	C	C	C	C	C	C	D	D	D	D	D	D	C
	SZ AV.	C	C	C	C	C	C	C	C	C	D	D	C	C	C	C	C
0900-1200	PROB(%)	9.8	6.2	4.5	4.4	3.0	3.9	4.6	9.0	12.3	3.0	2.0	5.8	7.0	5.3	9.2	10.1
	UBAR	4.9	4.6	4.5	4.3	4.5	5.3	5.1	6.0	7.4	7.8	6.3	6.9	7.4	6.3	4.8	4.7
	SY AV.	B	B	P	B	B	B	B	B	C	B	B	B	B	B	B	B
	SZ AV.	C	C	B	B	B	B	C	B	C	C	B	B	B	B	B	C
1200-1500	PROB(%)	5.3	4.3	3.8	15.5	8.0	7.1	7.4	9.4	10.4	2.4	1.2	4.2	5.4	5.6	4.9	5.0
	UBAR	5.4	4.6	5.4	6.2	5.8	5.6	6.2	7.0	8.4	8.0	7.0	7.6	8.8	8.4	6.5	6.0
	SY AV.	B	B	B	C	C	C	C	C	C	C	C	B	B	B	B	B
	SZ AV.	C	C	B	A	B	B	B	B	C	D	D	C	C	C	C	C
1500-1800	PROB(%)	2.0	1.4	7.5	20.2	10.7	9.7	8.5	10.2	10.0	2.4	1.0	3.1	4.2	3.4	2.9	2.8
	UBAR	6.2	6.1	6.6	5.9	5.3	5.6	6.1	7.0	7.9	8.3	7.7	8.6	9.7	8.9	6.7	6.7
	SY AV.	D	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
	SZ AV.	D	C	C	B	C	C	C	C	C	D	D	D	C	C	D	D
1800-2100	PROB(%)	1.6	4.6	14.5	12.1	7.2	7.8	7.4	10.6	10.1	4.7	2.2	4.7	4.8	3.4	2.6	1.7
	UBAR	5.8	4.7	5.3	4.3	3.6	3.9	4.6	5.8	6.4	5.8	5.3	6.9	7.4	7.0	6.1	6.5
	SY AV.	D	E	D	D	D	D	D	C	D	D	D	D	D	D	E	E
	SZ AV.	D	E	D	D	D	E	D	D	D	D	E	E	E	E	E	E
2100-2400	PROB(%)	5.1	9.3	7.0	5.6	2.6	3.3	4.3	8.1	10.6	7.1	7.6	6.6	6.9	6.2	5.2	4.4
	UBAR	4.8	4.2	3.9	3.9	2.8	2.9	4.1	4.9	5.9	5.5	5.2	6.3	6.0	5.3	5.1	5.1
	SY AV.	F	F	E	E	E	E	D	D	D	D	E	E	E	F	F	F
	SZ AV.	E	E	E	E	E	E	E	E	D	E	E	E	E	F	F	E

BEGINNING DATE : 81177 END DATE : 10583

NOTE : PROB(%) IS THE FREQUENCY OF OCCURRENCE OF A WIND DIRECTION IN THE TIME PERIOD.

UBAR IS THE AVERAGE WIND SPEED IN M/S.

SY AV. IS THE AVERAGE PASQUILL STABILITY CATEGORY BASED ON THE TURBULENCE METHOD.

SZ AV. PASQUILL STABILITY CATEGORY BASED ON THE USNRC TEMPERATURE GRADIENT CRITERIA.

TABLE A17
FREQUENCY OF OCCURRENCE OF 49 m WIND DIRECTIONS, AVERAGE WIND SPEEDS, HORIZONTAL AND VERTICAL DIFFUSION PARAMETERS v. TIME OF DAY — ALL SEASONS COMBINED

ALL SEASONS COMBINED   HEIGHT : 49 M.

TIME (EST.)	STATS.	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW
0000-0300	PROB(%)	3.8	4.3	3.8	2.5	2.4	2.2	3.1	5.9	12.7	8.3	8.5	12.7	9.6	7.1	7.9	5.1
	UBAR	4.2	3.9	3.5	3.3	3.1	3.8	4.9	5.2	5.9	5.3	5.7	6.4	5.6	4.5	4.6	4.8
	SY AV.	F	F	E	E	E	E	D	D	D	D	E	E	F	E	F	F
	SZ AV.	E	E	E	E	E	E	E	E	E	E	E	E	F	F	F	E
0300-0600	PROB(%)	3.8	3.7	3.0	1.4	1.5	2.2	2.4	4.9	13.7	8.8	9.1	14.5	11.0	7.7	7.2	5.1
	UBAR	4.5	3.7	3.6	3.4	3.0	3.9	5.1	5.2	5.9	5.4	5.6	6.3	5.6	4.4	4.4	4.3
	SY AV.	F	F	E	E	E	E	D	D	D	D	E	E	F	F	F	F
	SZ AV.	E	E	E	F	E	E	E	E	E	E	E	F	F	F	F	E
0600-0900	PROB(%)	5.2	3.9	1.8	1.4	1.5	1.8	2.6	6.5	12.9	7.5	6.5	14.0	11.2	8.8	8.4	6.3
	UBAR	4.0	4.1	3.7	3.8	3.7	4.5	4.9	5.0	5.7	5.6	5.2	6.4	5.5	4.5	4.3	4.2
	SY AV.	C	C	C	C	C	C	C	C	C	D	D	D	E	D	D	D
	SZ AV.	C	D	D	D	C	D	D	D	D	D	D	D	D	D	D	D
0900-1200	PROB(%)	7.5	5.3	3.6	3.8	2.5	2.5	4.6	8.8	11.5	4.9	3.0	8.2	9.2	8.1	8.4	8.0
	UBAR	4.7	4.5	4.4	4.7	4.7	5.2	5.3	5.8	6.8	6.7	5.8	6.8	6.7	5.3	4.6	4.7
	SY AV.	B	B	B	B	B	B	B	C	C	C	C	C	C	C	C	B
	SZ AV.	C	C	C	B	B	B	C	C	C	C	C	B	B	B	B	C
1200-1500	PROB(%)	5.5	3.9	3.4	11.1	7.6	5.2	6.7	9.7	11.3	4.1	2.1	4.9	8.1	5.8	5.5	5.0
	UBAR	4.7	4.7	5.0	6.3	5.9	5.7	6.1	6.5	7.6	7.1	6.4	7.2	7.7	7.1	5.8	5.2
	SY AV.	B	B	B	C	C	B	C	C	C	C	B	B	B	B	B	B
	SZ AV.	C	C	C	B	B	B	B	B	C	C	C	C	C	B	C	C
1500-1800	PROB(%)	2.1	2.0	6.0	14.1	9.9	6.9	9.3	10.1	11.9	4.1	1.9	4.3	7.1	3.9	3.6	2.7
	UBAR	4.6	5.0	6.2	6.0	5.5	5.4	5.9	6.5	7.4	6.9	6.3	7.3	8.0	7.3	5.8	5.4
	SY AV.	D	D	C	C	C	C	C	C	C	C	C	C	C	C	D	D
	SZ AV.	E	D	C	C	C	C	C	C	D	D	D	D	D	D	D	D
1800-2100	PROB(%)	1.8	3.9	12.2	10.1	6.1	6.5	7.9	9.1	11.6	5.8	3.9	5.8	6.7	3.5	2.8	2.2
	UBAR	5.1	4.6	5.2	4.6	3.9	3.9	4.8	5.7	6.3	5.9	6.0	6.9	7.0	6.4	5.8	5.5
	SY AV.	E	E	D	D	D	D	D	D	D	D	D	D	D	E	E	E
	SZ AV.	E	E	D	D	E	E	D	D	D	E	E	E	E	E	E	E
2100-2400	PROB(%)	4.0	7.5	6.8	4.1	2.9	3.7	4.9	6.6	11.3	8.2	6.8	9.5	7.5	5.8	5.6	5.0
	UBAR	4.5	4.2	4.1	3.6	3.0	3.4	4.6	5.0	6.1	5.5	5.8	6.8	6.2	5.1	4.8	4.9
	SY AV.	F	E	E	E	D	D	D	D	D	D	D	E	E	E	F	F
	SZ AV.	E	E	E	E	E	E	E	D	E	E	E	E	E	F	F	E

BEGINNING DATE : 81177 END DATE : 10583

NOTE : PROB(%) IS THE FREQUENCY OF OCCURRENCE OF A WIND DIRECTION IN THE TIME PERIOD.

UBAR IS THE AVERAGE WIND SPEED IN M/S.

SY AV. IS THE AVERAGE PASQUILL STABILITY CATEGORY BASED ON THE TURBULENCE METHOD.

SZ AV. PASQUILL STABILITY CATEGORY BASED ON THE USNRC TEMPERATURE GRADIENT CRITERIA.

TABLE A18
FREQUENCY OF OCCURRENCE OF 49 m WIND DIRECTIONS. AVERAGE WIND SPEEDS. HORIZONTAL AND VERTICAL DIFFUSION PARAMETERS v. TIME OF DAY — ALL TIMES COMBINED

ALL TIMES COMBINED HEIGHT : 49 M.

SEASON	STATS.	DIRECTION N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW
SUMMER	PROB(%)	4.8	6.0	3.3	10.2	6.7	5.6	8.1	11.7	15.2	3.8	2.2	2.8	3.0	3.6	3.7	4.0
	UBAR	4.2	4.1	4.9	5.7	4.9	4.7	5.5	5.9	7.1	5.4	4.7	5.7	5.7	4.8	4.5	4.6
	SY AV.	D	D	D	C	C	C	C	C	D	D	E	D	D	D	D	D
	SZ AV.	D	D	D	C	C	C	C	C	D	D	E	E	D	D	D	D
AUTUMN	PROB(%)	3.8	3.9	4.4	4.8	4.7	4.2	5.8	8.1	13.0	7.5	5.3	10.0	8.3	5.8	5.9	4.6
	UBAR	4.3	4.1	4.5	4.9	4.8	4.7	5.5	5.7	6.1	5.7	5.4	6.4	5.6	4.6	4.3	4.3
	SY AV.	D	D	D	D	D	D	D	C	D	D	D	E	E	D	E	D
	SZ AV.	D	D	D	D	D	D	D	D	D	E	E	E	E	D	D	D
WINTER	PROB(%)	3.5	2.7	2.0	1.7	1.4	1.3	2.0	3.0	8.1	8.8	8.6	16.5	16.3	9.9	8.6	5.6
	UBAR	4.6	4.9	4.2	4.0	3.5	3.5	4.3	4.8	5.7	6.2	6.2	7.0	6.9	5.7	5.3	5.0
	SY AV.	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
	SZ AV.	D	E	E	D	D	D	D	D	D	D	E	E	D	D	D	D
SPRING	PROB(%)	5.0	4.8	6.0	8.1	4.7	4.6	5.0	8.2	12.2	5.3	4.6	6.9	7.1	5.8	6.2	5.5
	UBAR	5.0	4.4	4.9	5.1	4.6	4.8	5.3	5.9	6.6	5.9	5.6	6.5	6.5	5.8	5.0	5.1
	SY AV.	D	D	D	C	C	C	C	C	C	D	D	D	D	D	D	D
	SZ AV.	D	D	D	C	C	C	C	C	D	D	E	D	D	D	D	D
COMBINED	PROB(%)	4.2	4.3	5.1	6.1	4.3	3.9	5.2	7.7	12.1	6.5	5.2	9.2	8.8	6.3	6.2	4.9
	UBAR	4.5	4.3	4.8	5.2	4.7	4.6	5.3	5.7	6.4	5.9	5.7	6.6	6.4	5.3	4.8	4.8
	SY AV.	D	D	D	C	C	C	C	C	D	D	D	D	D	D	D	D
	SZ AV.	D	D	D	C	C	D	D	D	D	D	E	E	D	D	D	D

BEGINNING DATE : 81177 END DATE : 10583

NOTE : PROB(%) IS THE FREQUENCY OF OCCURRENCE OF A WIND DIRECTION IN THE TIME PERIOD.

UBAR IS THE AVERAGE WIND SPEED IN M/S.

SY AV. IS THE AVERAGE PASQUILL STABILITY CATEGORY BASED ON THE TURBULENCE METHOD.

SZ AV. PASQUILL STABILITY CATEGORY BASED ON THE USNRC TEMPERATURE GRADIENT CRITERIA.

TABLE A19
FREQUENCY OF OCCURRENCE OF 49 m WIND DIRECTIONS, 50 PERCENTILE WIND SPEEDS, HORIZONTAL AND VERTICAL DIFFUSION PARAMETERS v. TIME OF DAY — SUMMER

SEASON : SUMMER HEIGHT : 49 M.

TIME (EST.)	STATS.	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW
0000-0300	PROB(%)	6.4	7.7	7.6	4.5	4.2	3.4	5.0	10.5	19.8	5.7	4.9	4.0	3.1	3.8	4.7	4.6
	U50%	2.9	3.2	3.1	2.4	2.2	2.4	3.7	4.2	5.1	3.5	3.8	3.6	3.5	2.5	3.1	3.7
	SY50%	F	E	E	D	D	D	C	C	C	C	E	F	E	E	F	F
	SZ50%	E	E	E	D	D	D	D	D	D	D	E	E	E	E	E	E
0300-0600	PROB(%)	4.8	6.9	5.5	2.5	2.3	3.3	3.8	8.7	20.8	8.4	5.3	5.4	4.1	6.3	7.0	4.8
	U50%	3.1	2.9	3.0	2.9	2.2	2.3	3.7	4.0	5.2	3.9	3.6	3.1	2.9	2.6	3.0	3.1
	SY50%	F	F	E	E	D	D	C	C	C	D	E	F	F	E	F	F
	SZ50%	E	E	E	D	E	E	D	D	D	D	E	E	E	E	E	E
0600-0900	PROB(%)	8.5	7.3	3.9	2.1	2.7	3.0	5.0	11.3	17.5	4.6	3.0	3.1	3.9	7.1	8.3	8.8
	U50%	3.3	3.1	2.9	2.8	2.2	2.9	3.6	4.3	5.4	5.1	3.9	5.5	3.8	3.2	3.0	3.2
	SY50%	B	B	B	C	B	C	B	B	C	C	C	C	C	C	C	B
	SZ50%	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
0900-1200	PROB(%)	10.0	10.3	6.6	7.9	3.5	3.9	8.5	13.3	12.2	1.7	0.6	2.0	3.5	4.1	4.5	7.4
	U50%	4.1	4.0	3.9	4.4	3.9	4.2	4.6	5.5	7.1	6.8	4.4	5.7	5.9	5.0	3.8	4.2
	SY50%	A	A	B	B	B	B	B	B	B	B	A	B	B	B	A	B
	SZ50%	C	C	C	A	A	B	B	B	C	C	C	B	A	A	B	C
1200-1500	PROB(%)	3.4	2.0	4.2	22.1	13.5	7.6	10.4	13.0	10.5	1.3	0.3	1.4	2.9	2.5	2.0	2.8
	U50%	4.7	4.8	5.1	6.4	5.6	5.9	5.9	6.5	8.4	7.2	7.8	7.6	8.0	8.1	6.6	6.0
	SY50%	B	B	B	B	B	B	B	B	C	C	B	B	B	B	B	B
	SZ50%	C	D	B	A	A	A	A	B	C	D	C	C	B	C	C	C
1500-1800	PROB(%)	0.3	1.0	8.4	21.4	13.8	9.7	12.8	12.5	10.2	1.2	0.7	2.1	2.5	1.9	1.0	0.4
	U50%	4.0	6.7	6.7	6.5	5.7	5.5	6.5	6.9	9.1	5.4	5.4	8.8	8.8	8.3	8.3	7.1
	SY50%	D	B	C	B	B	B	B	B	C	C	C	C	B	B	B	C
	SZ50%	D	C	C	A	A	A	B	C	C	D	D	D	C	C	D	C
1800-2100	PROB(%)	1.1	2.4	17.3	15.2	9.0	7.7	11.1	13.5	12.4	2.6	1.0	1.9	1.8	1.5	0.6	0.8
	U50%	6.6	4.6	5.1	4.8	3.9	3.7	4.8	5.1	7.2	5.5	5.1	6.5	6.7	5.1	5.8	5.0
	SY50%	C	D	C	C	C	C	C	C	C	C	C	C	C	D	E	D
	SZ50%	D	D	D	D	D	D	D	D	D	D	D	D	D	D	E	D
2100-2400	PROB(%)	3.7	10.1	13.2	6.2	4.7	6.5	8.0	11.2	18.0	5.3	2.1	2.6	2.1	1.9	1.7	2.7
	U50%	3.6	3.7	3.8	3.1	2.9	2.9	3.9	3.8	5.3	3.7	4.1	6.1	4.1	4.2	4.5	4.1
	SY50%	F	E	D	C	C	C	C	C	C	C	C	D	E	E	E	E
	SZ50%	E	D	D	D	D	D	D	D	D	D	D	D	D	E	E	E

BEGINNING DATE : 81177 END DATE : 10583

NOTE : PROB(%) IS THE FREQUENCY OF OCCURRENCE OF A WIND DIRECTION IN THE TIME PERIOD.

U50% IS THE 50% PROBABILITY VALUE OF WIND SPEED IN M/S.

SY50% IS THE 50% PROBABILITY VALUE OF THE PASQUILL STABILITY CATEGORY BASED ON THE TURBULENCE METHOD.

SZ50% IS THE 50% PROBABILITY VALUE OF THE PASQUILL STABILITY CATEGORY BASED ON THE USNRC TEMPERATURE GRADIENT CRITERIA.

TABLE A20
FREQUENCY OF OCCURRENCE OF 49 m WIND DIRECTIONS, 50 PERCENTILE WIND SPEEDS, HORIZONTAL AND VERTICAL DIFFUSION PARAMETERS v. TIME OF DAY — AUTUMN

SEASON : AUTUMN HEIGHT : 49 M.

TIME (EST.)	STATS.	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW
0000-0300	PROB(%)	2.7	3.5	3.0	1.7	2.4	3.6	3.8	5.2	13.1	9.9	7.3	13.2	10.7	7.9	8.1	3.9
	U50%	3.8	3.1	3.5	2.6	3.0	4.0	4.4	4.4	4.9	4.6	5.2	5.9	4.2	3.3	3.5	3.7
	SY50%	E	F	E	E	E	C	D	C	C	D	E	F	F	F	F	F
	SZ50%	E	E	E	E	E	E	E	D	D	D	E	E	F	E	E	E
0300-0600	PROB(%)	2.9	2.8	2.2	1.2	1.5	3.0	3.5	5.3	13.2	10.2	9.6	16.9	11.3	6.8	5.6	4.2
	U50%	3.8	3.2	3.0	3.4	2.5	3.0	4.6	4.6	5.0	4.9	5.1	6.0	4.3	3.4	3.5	3.5
	SY50%	E	F	E	E	D	D	C	D	D	C	E	F	F	E	F	F
	SZ50%	E	E	E	E	E	E	E	E	D	E	E	E	F	E	E	E
0600-0900	PROB(%)	2.9	3.0	1.1	1.8	1.7	1.9	2.3	7.1	13.7	10.3	7.6	17.0	11.4	6.7	7.0	4.6
	U50%	2.8	3.7	3.0	3.3	3.3	4.1	4.1	4.3	4.7	4.3	4.2	5.7	4.3	3.2	3.5	3.2
	SY50%	C	C	C	C	C	C	C	C	C	C	D	D	E	D	D	C
	SZ50%	D	D	D	C	D	D	D	D	D	D	D	D	D	D	D	D
0900-1200	PROB(%)	6.9	4.2	2.6	2.8	3.5	2.3	4.0	10.1	13.4	5.4	3.3	8.6	8.7	8.6	7.9	7.6
	U50%	3.7	3.7	2.9	3.6	4.3	5.1	4.4	4.8	5.8	5.7	4.5	6.5	4.2	3.2	3.4	3.4
	SY50%	A	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B
	SZ50%	C	C	C	B	B	B	C	C	C	C	B	B	A	A	B	B
1200-1500	PROB(%)	6.4	4.5	3.8	6.9	8.1	4.4	7.0	11.2	12.8	3.9	2.1	5.3	6.8	4.6	6.3	5.8
	U50%	3.7	3.6	3.7	5.2	5.2	4.7	4.9	5.6	6.7	6.6	5.3	6.7	5.3	3.9	3.7	3.9
	SY50%	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B
	SZ50%	C	C	B	A	A	A	B	B	C	C	C	C	C	C	C	C
1500-1800	PROB(%)	2.4	2.9	5.5	11.1	11.0	6.2	10.6	11.7	14.0	4.0	1.6	4.0	5.5	3.1	3.6	2.8
	U50%	3.8	3.2	4.9	5.0	4.9	4.5	4.7	5.0	6.3	7.0	5.3	6.5	6.7	5.3	3.4	4.1
	SY50%	C	D	C	C	C	B	C	C	C	C	C	C	C	C	C	C
	SZ50%	D	D	D	C	C	C	C	C	D	D	D	D	D	D	D	D
1800-2100	PROB(%)	1.9	4.0	11.9	9.2	5.5	7.7	9.0	8.5	12.8	6.8	4.6	5.1	5.7	2.4	2.2	2.6
	U50%	3.9	3.9	4.4	3.8	3.4	3.2	4.1	4.2	4.9	5.6	5.2	6.7	6.4	5.8	4.3	4.6
	SY50%	E	E	C	C	D	D	D	C	C	C	D	D	D	D	F	E
	SZ50%	E	E	D	D	D	D	D	D	D	D	D	D	E	E	E	E
2100-2400	PROB(%)	4.1	6.4	4.7	3.8	3.6	4.4	6.1	5.8	10.9	10.0	6.1	9.9	6.1	6.0	7.0	5.2
	U50%	3.7	3.5	3.6	3.0	2.1	3.4	3.9	4.3	4.5	4.7	5.4	6.4	4.8	3.7	3.3	3.8
	SY50%	E	E	D	E	E	E	D	C	C	C	C	D	E	E	F	E
	SZ50%	E	E	D	E	E	E	D	D	D	D	D	E	E	E	E	E

BEGINNING DATE : 81177 END DATE : 10583

NOTE : PROB(%) IS THE FREQUENCY OF OCCURRENCE OF A WIND DIRECTION IN THE TIME PERIOD.

U50% IS THE 50% PROBABILITY VALUE OF WIND SPEED IN M/S.

SY50% IS THE 50% PROBABILITY VALUE OF THE PASQUILL STABILITY CATEGORY BASED ON THE TURBULENCE METHOD.

SZ50% IS THE 50% PROBABILITY VALUE OF THE PASQUILL STABILITY CATEGORY BASED ON THE USNRC TEMPERATURE GRADIENT CRITERIA.

TABLE A21
FREQUENCY OF OCCURRENCE OF 49 m WIND DIRECTIONS, 50 PERCENTILE WIND SPEEDS, HORIZONTAL AND VERTICAL DIFFUSION PARAMETERS v. TIME OF DAY — WINTER

SEASON : WINTER HEIGHT : 49 M.

TIME (EST.)	STATS.	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW
0000-0300	PROB(%)	2.6	2.0	0.7	0.2	0.4	0.5	0.7	1.1	5.5	8.7	12.6	22.8	15.4	9.4	11.4	5.9
	U50%	4.1	4.3	2.8	1.0	1.0	1.7	2.0	3.8	5.2	5.5	6.1	7.0	6.2	4.2	4.6	4.2
	SY50%	E	E	E	E	E	D	D	D	D	C	C	E	F	E	E	E
	SZ50%	E	E	E	F	F	E	D	D	E	E	E	E	E	E	E	E
0300-0600	PROB(%)	2.8	1.1	0.6	0.5	0.4	0.4	0.5	0.6	5.6	8.5	12.9	23.3	18.0	10.8	8.5	5.4
	U50%	4.4	3.5	2.0	1.5	1.8	2.0	3.0	10.8	5.4	5.3	5.7	6.9	6.0	4.6	4.4	4.1
	SY50%	E	E	E	E	E	D	C	C	C	C	D	E	F	E	E	E
	SZ50%	E	E	E	E	E	D	E	D	E	E	E	E	E	E	E	E
0600-0900	PROB(%)	2.6	1.3	0.2	0.2	0.5	0.4	0.6	1.3	5.2	8.3	9.6	25.0	19.2	12.3	8.7	4.5
	U50%	3.6	4.8	4.0	2.0	3.0	4.5	3.3	3.7	4.7	5.2	5.3	6.7	5.4	4.5	4.1	4.2
	SY50%	E	D	E	E	D	C	E	C	C	C	C	C	E	E	E	D
	SZ50%	E	D	D	D	D	D	D	D	D	D	D	D	D	E	D	D
0900-1200	PROB(%)	3.8	0.8	1.0	0.3	0.2	0.3	1.4	3.2	8.1	9.1	5.9	15.8	17.3	13.8	11.8	7.2
	U50%	4.1	4.4	4.8	1.5	1.2	3.0	3.5	3.8	5.1	6.1	5.6	6.5	6.0	4.1	3.7	3.8
	SY50%	B	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B
	SZ50%	B	A	C	C	C	D	C	C	C	C	C	B	A	A	A	A
1200-1500	PROB(%)	6.7	4.8	1.8	1.5	1.3	1.9	2.2	5.4	11.2	8.5	4.4	8.6	16.8	10.4	8.4	6.2
	U50%	3.7	3.8	3.5	3.6	3.6	3.7	3.5	3.6	5.6	6.2	5.7	6.5	7.0	5.7	4.3	3.6
	SY50%	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
	SZ50%	C	C	B	B	A	A	B	C	C	C	C	C	B	A	A	B
1500-1800	PROB(%)	3.7	2.7	2.8	5.2	4.5	2.8	5.2	6.2	12.8	8.3	4.3	7.7	15.4	7.0	6.7	4.7
	U50%	3.3	3.4	4.3	4.0	3.5	3.3	3.6	3.4	5.3	5.7	5.6	6.2	7.1	5.5	4.6	3.9
	SY50%	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
	SZ50%	D	D	D	C	C	D	D	D	D	D	D	D	D	D	D	D
1800-2100	PROB(%)	2.5	4.8	5.9	4.6	2.9	3.1	4.0	4.3	10.7	8.8	7.4	11.1	13.8	6.8	5.6	3.6
	U50%	4.1	4.5	4.0	3.9	2.7	2.6	3.4	3.8	4.7	5.3	6.1	6.6	6.4	5.5	5.8	5.1
	SY50%	E	E	E	E	E	E	E	D	C	C	C	C	D	D	D	E
	SZ50%	E	E	E	E	E	E	E	D	D	D	D	D	E	E	E	E
2100-2400	PROB(%)	3.1	4.5	2.7	1.2	0.6	0.7	1.3	1.9	6.0	9.8	11.4	17.9	14.7	8.7	8.1	7.3
	U50%	4.3	4.4	3.5	2.2	2.1	1.3	2.8	3.3	4.7	5.4	5.9	6.9	6.4	5.1	4.7	4.7
	SY50%	E	E	E	E	E	D	F	E	D	C	D	D	E	E	E	E
	SZ50%	E	E	E	F	F	F	F	E	E	D	E	E	E	E	E	E

BEGINNING DATE : 81177 END DATE : 10583

NOTE : PROB(%) IS THE FREQUENCY OF OCCURRENCE OF A WIND DIRECTION IN THE TIME PERIOD.

U50% IS THE 50% PROBABILITY VALUE OF WIND SPEED IN M/S.

SY50% IS THE 50% PROBABILITY VALUE OF THE PASQUILL STABILITY CATEGORY BASED ON THE TURBULENCE METHOD.

SZ50% IS THE 50% PROBABILITY VALUE OF THE PASQUILL STABILITY CATEGORY BASED ON THE USNRC TEMPERATURE GRADIENT CRITERIA.

TABLE A22
FREQUENCY OF OCCURRENCE OF 49 m WIND DIRECTIONS, 50 PERCENTILE WIND SPEEDS, HORIZONTAL AND VERTICAL DIFFUSION PARAMETERS *v.* TIME OF DAY — SPRING

SEASON : SPRING HEIGHT : 49 M.

TIME (EST.)	STATS.	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW
0000-0300	PROB(%)	3.8	4.3	4.3	4.0	2.9	1.3	3.1	7.2	12.6	8.8	9.3	9.8	8.7	6.8	7.0	6.0
	U50%	4.2	3.6	3.1	2.9	2.7	3.1	4.5	4.6	5.1	4.8	5.1	5.4	4.4	4.1	3.8	4.8
	SY50%	F	F	E	E	E	D	C	C	C	C	D	F	F	E	F	F
	SZ50%	E	E	D	E	E	E	D	D	D	D	E	E	E	E	E	E
0300-0600	PROB(%)	4.9	4.3	4.0	1.7	2.0	2.1	1.8	5.0	15.7	7.7	8.4	11.5	10.0	6.7	8.1	6.0
	U50%	4.3	3.6	3.3	2.5	2.6	4.0	4.3	4.2	5.2	4.6	4.9	5.7	5.0	3.8	3.8	3.7
	SY50%	E	F	E	E	D	C	D	C	C	C	D	E	F	E	F	F
	SZ50%	E	E	D	E	E	E	D	D	D	D	E	E	E	E	E	E
0600-0900	PROB(%)	7.2	4.5	2.0	1.4	0.9	2.0	2.4	6.4	15.6	6.4	5.2	9.4	9.8	9.0	9.9	7.8
	U50%	3.6	3.8	2.9	3.0	3.0	3.9	3.9	4.1	5.3	4.9	4.6	5.3	4.3	3.6	3.7	3.7
	SY50%	B	C	B	B	B	B	B	B	C	C	C	C	C	C	C	C
	SZ50%	C	C	C	C	B	C	C	C	C	C	C	C	C	C	C	C
0900-1200	PROB(%)	9.8	6.2	4.5	4.4	3.0	3.9	4.6	9.0	12.3	3.0	2.0	5.8	7.0	5.3	9.2	10.1
	U50%	4.0	4.1	3.9	3.8	4.0	4.4	4.2	5.5	7.0	6.3	5.1	6.5	6.3	5.0	3.8	3.7
	SY50%	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
	SZ50%	B	B	B	A	A	A	B	A	B	B	A	A	A	A	A	C
1200-1500	PROB(%)	5.3	4.3	3.8	15.5	8.0	7.1	7.4	9.4	10.4	2.4	1.2	4.2	5.4	5.6	4.9	5.0
	U50%	4.2	3.9	4.9	5.8	5.6	5.1	5.6	6.7	7.7	7.5	6.5	7.5	6.8	7.5	5.3	4.7
	SY50%	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
	SZ50%	C	C	B	A	A	A	A	A	B	C	C	C	C	C	C	C
1500-1800	PROB(%)	2.0	1.4	7.5	20.2	10.7	9.7	8.5	10.2	10.0	2.4	1.0	3.1	4.2	3.4	2.9	2.8
	U50%	5.0	6.0	6.2	5.4	4.9	5.1	5.6	6.2	7.0	8.0	8.0	7.5	8.6	7.2	6.4	5.6
	SY50%	C	C	C	C	B	B	B	B	C	C	B	B	B	C	B	B
	SZ50%	D	C	C	A	B	B	B	C	C	D	C	D	C	C	C	D
1800-2100	PROB(%)	1.6	4.6	14.5	12.1	7.2	7.8	7.4	10.6	10.1	4.7	2.2	4.7	4.8	3.4	2.6	1.7
	U50%	4.8	4.4	4.7	3.8	3.1	3.3	4.1	4.9	5.4	5.1	4.8	6.2	7.0	6.1	5.7	6.6
	SY50%	C	D	C	C	C	C	C	C	C	C	D	C	C	C	E	E
	SZ50%	D	E	D	D	D	D	D	D	D	D	D	D	D	D	E	E
2100-2400	PROB(%)	5.1	9.3	7.0	5.6	2.6	3.3	4.3	8.1	10.6	7.1	7.6	6.6	6.9	6.2	5.2	4.4
	U50%	4.0	3.6	3.4	3.3	2.3	2.1	3.6	4.1	5.2	5.0	4.8	5.9	5.6	4.7	4.4	4.4
	SY50%	E	E	E	D	D	D	C	C	C	C	D	E	E	E	F	E
	SZ50%	E	E	D	D	D	E	D	D	D	D	E	E	E	E	E	E

BEGINNING DATE : 81177 END DATE : 10583

NOTE : PROB(%) IS THE FREQUENCY OF OCCURRENCE OF A WIND DIRECTION IN THE TIME PERIOD.

U50% IS THE 50% PROBABILITY VALUE OF WIND SPEED IN M/S.

SY50% IS THE 50% PROBABILITY VALUE OF THE PASQUILL STABILITY CATEGORY BASED ON THE TURBULENCE METHOD.

SZ50% IS THE 50% PROBABILITY VALUE OF THE PASQUILL STABILITY CATEGORY BASED ON THE USNRC TEMPERATURE GRADIENT CRITERIA.

TABLE A23
FREQUENCY OF OCCURRENCE OF 49 m WIND DIRECTIONS, 50 PERCENTILE WIND SPEEDS, HORIZONTAL AND VERTICAL DIFFUSION PARAMETERS v. TIME OF DAY — ALL SEASONS COMBINED

ALL SEASONS COMBINED HEIGHT : 49 M.

TIME (EST.)	STATS.	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW
0000-0300	PROB(%)	3.9	4.4	3.9	2.6	2.5	2.2	3.1	6.0	12.8	8.3	8.5	12.5	9.5	7.0	7.8	5.1
	U50%	3.4	3.3	3.2	2.6	2.4	2.8	4.0	4.3	5.0	4.8	5.3	6.2	4.9	3.7	3.8	4.0
	SY50%	F	E	E	F	F	D	D	C	C	C	D	E	F	E	F	F
	SZ50%	E	E	E	E	E	E	D	D	D	D	E	E	E	E	E	E
0300-0600	PROB(%)	3.8	3.8	3.1	1.5	1.5	2.2	2.4	4.9	13.8	8.7	9.0	14.3	10.9	7.6	7.3	5.1
	U50%	3.8	3.2	3.1	2.8	2.3	2.7	4.1	4.3	5.2	4.7	5.1	6.1	4.8	3.6	3.7	3.6
	SY50%	E	F	E	E	D	D	C	C	C	C	E	E	F	E	F	F
	SZ50%	E	E	E	E	E	E	D	D	D	D	E	E	E	E	E	E
0600-0900	PROB(%)	5.3	4.0	1.8	1.4	1.4	1.8	2.6	6.5	13.0	7.4	6.4	13.6	11.1	8.8	8.5	6.4
	U50%	3.4	3.4	3.0	2.9	2.7	3.4	3.7	4.2	5.0	4.9	4.8	6.1	4.7	3.7	3.6	3.4
	SY50%	B	C	B	C	B	C	C	C	C	C	C	C	D	C	C	C
	SZ50%	C	C	C	C	C	D	C	C	C	D	D	D	D	D	D	C
0900-1200	PROB(%)	7.6	5.4	3.6	3.8	2.6	2.6	4.6	8.9	11.5	4.8	3.0	8.1	9.1	7.9	8.4	8.1
	U50%	4.0	4.0	3.8	4.1	4.0	4.4	4.4	5.2	6.3	6.1	5.1	6.4	5.6	4.0	3.6	3.8
	SY50%	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
	SZ50%	C	C	C	A	A	B	B	B	C	C	B	B	A	A	A	B
1200-1500	PROB(%)	5.4	3.9	3.4	11.5	7.7	5.3	6.8	9.8	11.2	4.0	2.0	4.9	8.0	5.8	5.4	5.0
	U50%	3.9	3.9	4.3	6.0	5.4	5.1	5.5	6.0	7.0	6.4	5.8	6.8	6.7	5.7	4.4	4.0
	SY50%	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
	SZ50%	C	C	B	A	A	A	A	B	C	C	C	C	C	B	B	C
1500-1800	PROB(%)	2.1	2.0	6.1	14.5	10.0	7.1	9.3	10.2	11.7	4.0	1.9	4.2	6.9	3.9	3.5	2.7
	U50%	3.7	3.9	5.8	5.6	5.1	5.0	5.3	5.6	6.5	6.2	5.7	6.8	7.3	6.5	4.7	4.4
	SY50%	C	C	C	C	B	B	B	B	C	C	C	C	C	C	C	C
	SZ50%	D	D	C	B	B	C	C	C	C	D	D	D	D	D	D	D
1800-2100	PROB(%)	1.8	3.9	12.4	10.3	6.2	6.6	7.9	9.2	11.5	5.7	3.8	5.7	6.5	3.5	2.7	2.2
	U50%	4.3	4.3	4.7	4.2	3.3	3.3	4.2	4.5	5.3	5.4	5.7	6.5	6.5	5.7	5.4	5.0
	SY50%	E	E	C	C	C	C	C	C	C	C	C	C	C	D	E	E
	SZ50%	E	E	D	D	D	D	D	D	D	D	D	D	D	E	E	E
2100-2400	PROB(%)	4.0	7.6	6.9	4.2	2.9	3.7	4.9	6.7	11.4	8.1	6.8	9.2	7.5	5.7	5.5	4.9
	U50%	3.8	3.7	3.6	3.1	2.5	2.7	3.7	4.0	4.9	4.9	5.5	6.6	5.8	4.4	4.1	4.3
	SY50%	E	E	D	D	D	D	C	C	C	C	D	D	E	E	E	E
	SZ50%	E	E	E	D	D	E	D	D	D	D	E	E	E	E	E	E

BEGINNING DATE : 81177 END DATE : 10583

NOTE : PROB(%) IS THE FREQUENCY OF OCCURRENCE OF A WIND DIRECTION IN THE TIME PERIOD.

U50% IS THE 50% PROBABILITY VALUE OF WIND SPEED IN M/S.

SY50% IS THE 50% PROBABILITY VALUE OF THE PASQUILL STABILITY CATEGORY BASED ON THE TURBULENCE METHOD.

SZ50% IS THE 50% PROBABILITY VALUE OF THE PASQUILL STABILITY CATEGORY BASED ON THE USNRC TEMPERATURE GRADIENT CRITERIA.

TABLE A24
FREQUENCY OF OCCURRENCE OF 49 m WIND DIRECTIONS, 50 PERCENTILE WIND SPEEDS, HORIZONTAL AND VERTICAL DIFFUSION PARAMETERS v. TIME OF DAY — ALL TIMES COMBINED

ALL TIMES COMBINED HEIGHT : 49 M.

SEASON	STATS.	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW
SUMMER	PROB(%)	4.8	6.0	8.3	10.2	6.7	5.6	8.1	11.7	15.2	3.8	2.2	2.8	3.0	3.6	3.7	4.0
	U50%	3.6	3.6	4.2	5.3	4.6	4.1	5.0	5.2	6.3	4.2	3.9	5.0	4.9	3.7	3.4	3.7
	SY50%	C	C	C	B	B	B	B	C	C	C	D	C	C	C	D	C
	SZ50%	D	D	D	B	C	C	C	C	D	D	D	D	D	D	D	D
AUTUMN	PROB(%)	3.8	3.9	4.4	4.8	4.7	4.2	5.8	8.1	13.0	7.5	5.3	10.0	8.3	5.8	5.9	4.6
	U50%	3.7	3.5	4.0	4.2	4.2	3.9	4.4	4.7	5.4	5.0	5.0	6.2	4.7	3.5	3.5	3.7
	SY50%	B	D	C	C	C	C	C	C	C	C	D	D	D	D	E	C
	SZ50%	D	D	D	D	C	D	D	D	D	D	D	D	D	D	D	D
WINTER	PROB(%)	3.5	2.7	2.0	1.7	1.4	1.3	2.0	3.0	8.1	8.8	8.6	16.5	16.3	9.9	8.6	5.6
	U50%	3.9	4.2	3.8	3.8	3.0	2.9	3.4	3.6	5.1	5.5	5.8	6.8	6.3	4.8	4.3	4.1
	SY50%	C	D	D	C	C	C	C	C	C	C	C	C	C	C	D	D
	SZ50%	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
SPRING	PROB(%)	5.0	4.8	6.0	8.1	4.7	4.6	5.0	8.2	12.2	5.3	4.6	6.9	7.1	5.8	6.2	5.5
	U50%	4.0	3.9	4.3	4.7	4.1	4.3	4.7	5.2	6.0	5.1	5.0	5.9	5.6	4.7	4.1	4.1
	SY50%	C	D	C	C	C	C	C	B	C	C	D	C	C	C	C	C
	SZ50%	D	D	D	C	C	C	C	C	C	D	D	D	D	D	D	D
COMBINED	PROB(%)	4.2	4.3	5.1	6.1	4.3	3.9	5.2	7.7	12.1	6.5	5.2	9.2	8.8	6.3	6.2	4.9
	U50%	3.8	3.7	4.1	4.7	4.2	4.0	4.6	4.9	5.6	5.2	5.3	6.4	5.6	4.2	3.9	3.9
	SY50%	C	D	C	C	C	C	C	C	C	C	C	C	C	C	D	C
	SZ50%	D	D	D	C	C	D	C	C	D	D	D	D	D	D	D	D

BEGINNING DATE : 81177 END DATE : 10583

NOTE : PROB(%) IS THE FREQUENCY OF OCCURRENCE OF A WIND DIRECTION IN THE TIME PERIOD.

U50% IS THE 50% PROBABILITY VALUE OF WIND SPEED IN M/S.

SY50% IS THE 50% PROBABILITY VALUE OF THE PASQUILL STABILITY CATEGORY BASED ON THE TURBULENCE METHOD.

SZ50% IS THE 50% PROBABILITY VALUE OF THE PASQUILL STABILITY CATEGORY BASED ON THE USNRC TEMPERATURE GRADIENT CRITERIA.